

**QUEEN CREEK WASH
CHANNELIZATION
SOSSAMAN ROAD TO HAWES ROAD
Contract No.: 2000D-03**

**LOMR
TECHNICAL DATA NOTEBOOK**

Prepared for:
TOWN OF QUEEN CREEK



Prepared by:

**Dibble
Engineering™**

7500 North Dreamy Draw Drive, #200
Phoenix, Arizona 85020-4660
(602) 957-1155

FLOOD CONTROL DISTRICT RECEIVED	
JUN 19 '07	
CH & GM	FINANCE
PIO	LANDS
ADMIN	IC & N
REG	P & PV
ENG	FILE
CONTRACTS	
ROUTING	

June 2007



Flood Control District

of Maricopa County

Board of Directors
Fulton Brock, District 1
Don Stapley, District 2
Andrew Kunasek, District 3
Max Wilson, District 4
Mary Rose Wilcox, District 5

www.fcd.maricopa.gov

2801 West Durango Street
Phoenix, Arizona 85009
Phone: 602-506-1501
Fax: 602-506-4601
TT: 602-505-5897

March 9, 2007

Mr. Jim Leubner, P.E.
Engineering Manager
Town of Queen Creek
22350 South Ellsworth Road
Queen Creek, Arizona 85242

SUBJECT: FAC07-031 (Queen Creek Letter of Map Revision, Sossaman to Hawes Road)

Dear Mr. Leubner:

We have completed our review of the Technical Data Notebook Report, and Workmaps prepared by Dibble Engineering. We feel the information is ready to submit to the Federal Emergency Management Agency (FEMA) to begin their review. A copy of the attached Overview and Concurrence Form is included for your signature. A second copy of the Form has been signed by the District since areas of unincorporated Maricopa County may be affected by the revision request. This will avoid future delays while FEMA begins their review. We appreciate your cooperation in maintaining both the Town and the District's good standing in the National Flood Insurance Program.

If you have any questions or if I can be of further assistance, feel free to contact me at (602) 506-4779.

Sincerely,

A handwritten signature in cursive script that reads "Lynn M. Thomas".

Lynn M. Thomas, P.E., C.F.M.
Floodplain Management Branch, Regulatory Division

Copy to: Josh Papworth, P.E., Dibble Engineering

C. REVIEW FEE

Has the review fee for the appropriate request category been included? Yes Fee amount: \$ _____
 No, Attach Explanation

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

D. SIGNATURE

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

Name:	Company:	
Mailing Address:	Daytime Telephone No.:	Fax No.:
	E-Mail Address:	
Signature of Requester (required):		Date:

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Lynn M. Thomas, P.E., CFM, Floodplain Mgmt. Branch		Telephone No.: (602) 506-4779
Community Name: Flood Control District of Maricopa County	Community Official's Signature (required): <i>Lynn M. Thomas</i>	Date: 6/29/07

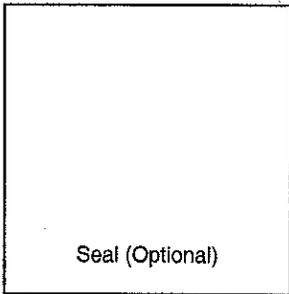
CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

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

Certifier's Name:	License No.:	Expiration Date:
Company Name:	Telephone No.:	Fax No.:
Signature:		Date:

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

- | <u>Form Name and (Number)</u> | <u>Required if ...</u> |
|--|---|
| <input type="checkbox"/> Riverine Hydrology and Hydraulics Form (Form 2) | New or revised discharges or water-surface elevations |
| <input type="checkbox"/> Riverine Structures Form (Form 3) | Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam |
| <input type="checkbox"/> Coastal Analysis Form (Form 4) | New or revised coastal elevations |
| <input type="checkbox"/> Coastal Structures Form (Form 5) | Addition/revision of coastal structure |
| <input type="checkbox"/> Alluvial Fan Flooding Form (Form 6) | Flood control measures on alluvial fans |



Letter Of Transmittal

To: FCDMC
2801 West Durango Street
Phoenix, AZ 85009

Date: June 18, 2007
Re: Queen Creek Wash LOMR – Sossaman
Road to Hawes Road

Attention: Lynn Thomas, P.E.

Transmitted herewith are the following items:

- | | | | |
|--|---|---|---|
| <input type="checkbox"/> Calculations | <input type="checkbox"/> Copy of Letter | <input type="checkbox"/> Plans | <input type="checkbox"/> Shop Drawings |
| <input type="checkbox"/> Change Order | <input type="checkbox"/> Details | <input checked="" type="checkbox"/> Prints | <input type="checkbox"/> Specifications |
| <input type="checkbox"/> Construction Cost | <input type="checkbox"/> Electronic Media | <input checked="" type="checkbox"/> Reports | <input type="checkbox"/> Other |

Copies	Date	I.D. Number	Description
3	6/18		Queen Creek Wash LOMR TDN
3	6/18		Queen Creek Wash LOMR Workmaps

FLOOD CONTROL DISTRICT	
RECEIVED	
JUN 19 '07	
CH & GM	FINANCE
PIO	LANDS
ADMIN	O & M
REG	P & PM
ENG	FILE
CONTRACTS	
REGISTRATION	

These are transmitted as checked below:

- | | | |
|--|--|--|
| <input type="checkbox"/> Approve | <input checked="" type="checkbox"/> For Approval | <input checked="" type="checkbox"/> For Your Use |
| <input type="checkbox"/> Approve with Comments | <input type="checkbox"/> For Information Only | <input type="checkbox"/> Returned |
| <input checked="" type="checkbox"/> As Requested | <input type="checkbox"/> For Use as Guideline Only | <input type="checkbox"/> Other |
| <input type="checkbox"/> Disapprove | <input type="checkbox"/> For Review and Comment | |

Remarks: 1 copy for FCDMC
1 copy for Town of Queen Creek
1 copy for FEMA

cc: 10-0606.1 Letter
Cathy Register, P.E.

Sincerely,
Dibble Engineering



Josh Papworth, P.E.

Letter Of Transmittal

To: FCDMC
2801 West Durango Street
Phoenix, AZ 85009

Date: June 18, 2007
Re: Queen Creek Wash LOMR – Sossaman
Road to Hawes Road

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| <input type="checkbox"/> Construction Cost | <input type="checkbox"/> Electronic Media | <input checked="" type="checkbox"/> Reports | <input type="checkbox"/> Other |

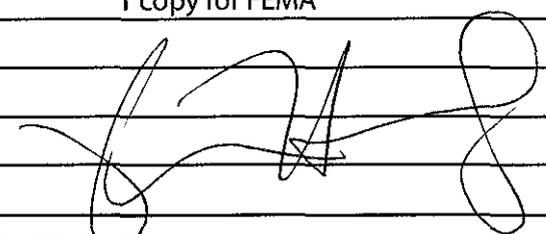
Copies	Date	I.D. Number	Description
3	6/18		Queen Creek Wash LOMR TDN
3	6/18		Queen Creek Wash LOMR Workmaps

These are transmitted as checked below:

- | | | |
|--|--|--|
| <input type="checkbox"/> Approve | <input checked="" type="checkbox"/> For Approval | <input checked="" type="checkbox"/> For Your Use |
| <input type="checkbox"/> Approve with Comments | <input type="checkbox"/> For Information Only | <input type="checkbox"/> Returned |
| <input checked="" type="checkbox"/> As Requested | <input type="checkbox"/> For Use as Guideline Only | <input type="checkbox"/> Other |
| <input type="checkbox"/> Disapprove | <input type="checkbox"/> For Review and Comment | |

Remarks: 1 copy for FCDMC
1 copy for Town of Queen Creek
1 copy for FEMA

4 CATHY REGISTER



cc: 10-0606.1 Letter
Cathy Register, P.E.

Sincerely,
Dibble Engineering

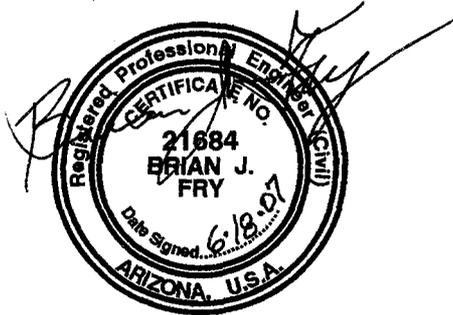


Josh Papworth, P.E.

**QUEEN CREEK WASH
CHANNELIZATION
SOSSAMAN ROAD TO HAWES ROAD
Contract No.: 2000D-03**

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Prepared for:
TOWN OF QUEEN CREEK



Prepared by:

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7500 North Dreamy Draw Drive, #200
Phoenix, Arizona 85020-4660
(602) 957-1155

June 2007

**QUEEN CREEK WASH CHANNELIZATION
SOSSAMAN ROAD TO HAWES ROAD**

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SOSSAMAN ROAD TO HAWES ROAD**

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(none)

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Queen Creek Wash Flood Profile Drawings (HEC-RAS)
Sossaman Road Bridge Selected As-built Sheets

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MT-2 Forms
Current Effective FIRM Panel with Proposed Floodplain

Exhibit Map (in map pocket) Floodplain Work Map, 1 in. = 200 ft.
HEC-RAS Files on CD-ROM (in map pocket)



QUEEN CREEK WASH CHANNELIZATION SOSSAMAN ROAD TO HAWES ROAD

Section 1.0: Introduction

1.1 Purpose of Study

Prior to channelization Queen Creek Wash did not fully contain the 100-year runoff within its banks. The wash consisted of constructed berms on both sides of the wash, and a thick, sandy bed. Vegetation in the wash included mature and seedling Palo Verde and Mesquite trees, as well as other species. Most of this vegetation was concentrated along the toes of slopes. Today the wash has been channelized from Sossaman Road to Hawes Road. The channel ties into existing wash channelization at the project's downstream end (Ryland Reach) and ties into the existing wash at the upstream end. Four grade control structures have been constructed.

The improvements were designed to provide 100-year flow capacity in the wash, as well as enhance the community with recreational opportunities. The constructed improvements also include a new bridge at Sossaman Road, a paved pathway system, and equestrian access. The new bridge at Sossaman Road is designed to pass the 100-year flood.

In January 2004 a CLOMR was submitted to FEMA and approved for the proposed channel construction. This CLOMR is FEMA case No. 04-09-0638R. Prior to completion of the channel construction a large winter storm flooded the existing wash and the portions of the channel under construction. This storm permanently changed the nature of the channel, resulting in its current condition. Based on this, the original CLOMR for the project is no longer valid. This LOMR is presented independently of the previous CLOMR and is based on new mapping for the existing channel. The resulting hydraulic model is presented as the "Revised Conditions Model". Also included is the delineation of the wash prior to channelization, and is presented here as the "Pre-Project Conditions Model".

This report presents the results of the floodplain delineation and requests a Letter of Map Revision (LOMR) for this reach of Queen Creek Wash. The project location is shown on **Figure 1**.

1.2 Authority for Study

Dibble & Associates performed the hydrologic and hydraulic analyses for the Town of Queen Creek, Arizona. The Project Managers for the Queen Creek Wash Channelization were Tom Narva for The Town of Queen Creek and Brian Fry, P.E. for Dibble & Associates. The project was coordinated with Paul Stears, P.E., Don Rerick, P.E. and Tim Murphy, P.E. with the Flood Control District of Maricopa County (FCDMC). The FCDMC performs the floodplain administration for the Town of Queen Creek.

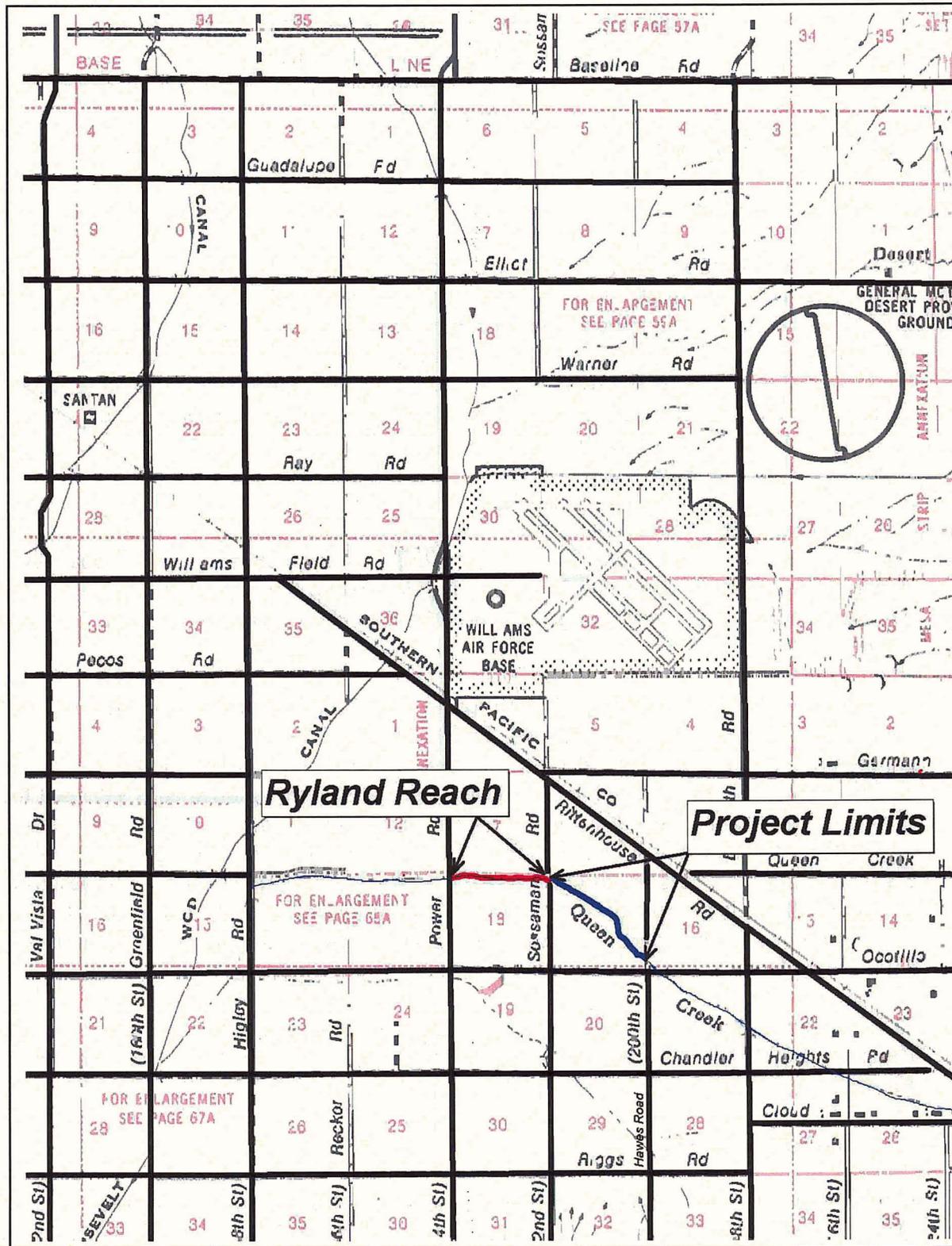


Figure 1 - Project Location

1.3 Location of Study

The Queen Creek Wash study area is located within portions of the Town of Queen Creek and unincorporated Maricopa County. The project is located in Section 17, Township 2 South, Range 7 East (Sec17, T2S, R7E). This land section is bounded by Queen Creek Road (extension) on the north, Hawes Road on the east, Ocotillo Road on the south and Sossaman Road on the west. The downstream tie-in occurs in portions of Sections 7 and 18 of Township 2 North, Range 7 East and the upstream tie-in occurs in portions of Section 16 of Township 2 North, Range 7 East. Queen Creek Wash flows from the southeast to the northwest, and is depicted on Flood Insurance Rate Maps (FIRM) 04013C2695G and 04013C3060G. Queen Creek Wash is a tributary to the East Maricopa Floodway (EMF), a constructed channel parallel to the Roosevelt Water Conservation District Canal. The EMF is tributary to the Gila River.

1.4 Summary of Methodology

Floodplain areas are delineated using the HEC-RAS Version 3.1.3 computer model. The starting water surface was taken from the downstream channelization project, and the upstream water surface ties into the upstream floodplain delineation study. Rainfall-runoff methodology (HEC-1) was utilized for the project hydrology, as explained in Section 4. Using HEC-RAS, water surface elevations are calculated for the channel and the resulting floodplain is delineated. No floodway is delineated. Based on study results, the 100-Year flood is completely contained within the channel banks.

1.5 Coordination and Acknowledgments

The channelization project was coordinated with the following agencies during the study:

- The Town of Queen Creek
- Federal Emergency Management Agency (FEMA)
- The Flood Control District of Maricopa County (FCDMC)

The project was also coordinated with the LOMR for the downstream channelization project, known as Ryland Reach. The title of this LOMR is *Queen Creek Wash LOMR, Power Road to Sossaman Road*; it has been approved by FEMA under case number 03-09-0247P, effective date January 22, 2004. The downstream tie-in is made to the LOMR model for the Ryland Reach. The Pre-Project Conditions Model, submitted here with the Revised Conditions Model, also represents the completed condition of the downstream Ryland Reach.

Initially, the upstream tie-in was the Arroyo de la Reina channelization project. That channelization occurred from Hawes Road to approximately 1,700 feet downstream of Hawes Road. The FIRM panels were revised to reflect the Letter of Map Revision (LOMR) for the Arroyo de la Reina project on June 21, 2000 (Case Number 00-09-145P). The Arroyo de la Reina LOMR is superseded by this study from Hawes Road to Sossaman Road, because it was decided to modify one bank in the Arroyo de la Reina

Section 2.0: FEMA and ADWR Abstracts

The FEMA Revision Request MT-2 Forms are found in **Appendix H**. The FEMA and ADWR abstracts are included in this section.

Section 2.0: FEMA & ADWR Abstracts

STUDY DOCUMENTATION ABSTRACT			
INITIAL STUDY	RE STUDY	LOMR <input checked="" type="checkbox"/> CLOMR	OTHER
Section 2.1. Study Documentation Abstract for FEMA Submittals			
2.1.1	Date Study Accepted		
2.1.2	Study Contractor: Contacts Address Phone Internal Reference No. Subconsultants	Dibble & Associates Brian Fry, P.E. 7500 North Dreamy Draw, Suite 200 Phoenix, AZ 85020-4660 (602) 957-1155 Dibble Job No. 10-0078 West Consultants, Sediment Transport Cannon & Associates, Structural Engineers McCloskey Peltz, Inc., Landscape Architects Z&H Engineering, Survey Ricker Atkinson McBee & Associates, Inc., Geotechnical Engineers	
2.1.3	FEMA Technical Review Contractor Address Phone Internal Reference Number	Michael Baker Jr., Inc. 3601 Eisenhower Avenue Alexandria, VA Pernille Buch-Pedersen (703) 317-6224 04-09-0638R	
2.1.4	FEMA Regional Reviewer Phone	Pending	
2.1.5	State Technical Reviewer Phone	(ADWR nor ADEM no longer provide technical review)	
2.1.6	Local Technical Reviewer Phone	Timothy Murphy, P.E. Flood Control District of Maricopa County (602) 506-1501	
2.1.7	Reach Description	a. Queen Creek Hawes Road to Sossaman Road Approximately 1.4 miles <u>FIRM Panels:</u> 04013C2695 G; 04013C3060 G	

Study Documentation Abstract for Local Government and ADWR Submittals		
Section 2.1: General Information		
2.1.1	Community	Town of Queen Creek, Arizona Maricopa County (Unincorporated), Arizona
2.1.2	Community Number(s)	#040037 (Unincorporated Maricopa County) #0401032 (Town of Queen Creek)
2.1.3	County	Maricopa
2.1.4	State	Arizona
2.1.5	Date Study Accepted	Pending
2.1.6	Study Contractor: Contacts Address Phone Internal Reference No. Subconsultants:	Dibble & Associates Brian Fry, P.E. 7500 North Dreamy Draw, Suite 200 Phoenix, AZ 85020-4660 (602) 957-1155 Dibble Job No: 10-0078 West Consultants, Sediment Transport Cannon & Associates, Structural Engineers McCloskey Peltz, Inc., Landscape Architects Z&H Engineering, Survey Ricker Atkinson McBee & Associates, Inc., Geotechnical Engineers
2.1.7	State Technical Reviewer Phone	(ADWR nor ADEM no longer provide technical review)
2.1.8	Local Technical Reviewer Phone	Timothy Murphy, P.E. Flood Control District of Maricopa County (602) 506-1501
2.1.9	River or Stream Name	Queen Creek Wash
2.1.10	Reach Description	a. Queen Creek Hawes Road to Sossaman Road Approximately 1.4 miles <i>FIRM Panels:</i> 04013C2695 G; 04013C3060 G
2.1.11	Study Type	Channel Improvement Analysis
Section 2.2: Mapping Information		
2.2.1	<i>USGS Quadrangle Sheets</i>	Higley, Arizona, 7.5 minute, 10' C.I. Photo Date: 1956 Latest Photo Revision: 1981 Chandler Heights, Arizona, 7.5 min, 10' C.I. Photo Date: 1956 Latest Photo Revision: 1973

Section 2.3: Hydrology		
2.3.1	Model or Method Used	Existing Hydrology: FEMA Approved Hydrology Presented in the Publication <i>Queen Creek Wash – Hawes Road to Power Road, Revised Hydrology</i> . Approved as part of FEMA Case No. 03-09-0247P. Specifically requested for use on this project by FEMA.
2.3.2	Storm Duration	24 Hour
2.3.3	Hyetograph Type	Clarke Unit Hydrograph
2.3.4	Frequencies Determined	100 Year
2.3.5	List of Gages Used in Frequency Analysis or Calibration	No stream gages in study area
2.3.6	Rainfall Amounts and Reference	3.58" NOAA Atlas II Reproduced in FCDMC Drainage Design Manual for Maricopa County, Volume 1 Hydrology.
2.3.7	Unique Conditions and Problems	None
2.3.8	Coordination of Discharge Estimates	N/A
Section 2.4: Hydraulics		
2.4.1	Model or Method Used	HEC-RAS Version 3.1.3 (May. 2005)
2.4.2	Regime	Subcritical
2.4.3	Frequencies for Which Flood Limits Computed	100-year
2.4.4	Method of Floodway Calculation	No Floodway is determined.
2.4.5	Unique Conditions and Problems	None

In 2001 a 400' swath of new mapping was generated along Queen Creek Wash from Sossaman Rd. to Hawes Rd. to be used for construction document generation. This mapping was performed by Aerial Mapping Company, Inc. (AMC). This mapping was not used for hydraulic modeling, but was compared to the mapping obtained from FCDMC to ensure quality and duplicity. This mapping was also based on NAVD '88 datum. Results of survey for this mapping area are provided in **Appendix C.1**.

Mapping for the revised conditions hydraulic analysis is provided by Kenney Aerial Mapping with ground control provided by Dibble & Associates. This mapping was performed in January, 2006 and is based on NAVD '88 datum. **Appendix C.2** contains the project results of survey for this mapping. As stated in **Section 3.1**, a small portion of the aerial mapping provided by Kenney Aerial Mapping is not used for hydraulic modeling. Hydraulic modeling is based on topographic survey performed by Dibble & Associates. This area is shown on project workmaps.

Section 4.0: Hydrology

Existing and future conditions hydrology for this reach is presented in the document *Queen Creek Wash - Power Road to Hawes Road Pre-Design Report* and reproduced in the subsequent report *Queen Creek Wash - Hawes Road to Power Road, Revised Hydrology*. This hydrology has been approved as part of the LOMR for Queen Creek Wash, Power Road to Sossaman Road, FEMA Case No. 03-09-0247P. Under the specific direction of FEMA, the approved future conditions runoff values have been used for this LOMR study. The 100-year flow rate is 2,839 cfs.

4.1 Method Description

Existing land use, and future land use hydrology for the Queen Creek area has been developed using the U.S. Army Corps of Engineers, *HEC-1 Flood Hydrograph Package* (HEC-1) computer program. Guidance is given in the *Drainage Design Manual for Maricopa County, Arizona, Volume I, Hydrology* (DDM1) for application of the HEC-1 program within Maricopa County. The application of these tools and the project hydrology are more specifically described in the publication *Queen Creek Wash, Power Road to Hawes Road, Revised Hydrology*.

Manual for Engineering Analysis of Fluvial Systems provides an equation for calculating a “n”-value based on the size of bed material.

$$n_b = 0.0395 \times D_{50}^{(1/6)}$$

Where D_{50} = Diameter, in feet, in which 50% of the particles (by weight) are smaller.

This equation yields a base Manning’s n-value of 0.035 for the bank armor sections. However, as stated above, the actual “n”-value is affected by many factors. Further refinements to the n-value are made based on, *Estimated Manning’s Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona*. From this publication, it is found that the primary factors affecting the n-value are surface irregularities, obstructions and vegetation with consideration also given for depth and meander. An excerpt from this publication is included in **Appendix E.1**. Based on the primary factors, the n-value is estimated from the equation;

$$n = (n_b + n_1 + n_2 + n_3) f_m$$

Where;

- nb = base Manning’s value for a straight uniform channel
- n1 = value for surface irregularities
- n2 = value for obstructions
- n3 = value for vegetation
- fm = factor for meander

There are three typical “n”-values used in this analysis and are summarized in **Table 5.3.1**.

Condition	nb	n1	n2	n3	fm	n
Pre-project	.024	.001	.004	.010	1.0	.039
New Landscape	.024	.001	.004	.015	1.0	.044
New Landscape in Bank Armor	.035	.001	.004	.015	1.0	.055

Adjustment for surface irregularities (n1): While the channel is intended to be as smooth as possible, it is expected that since this is an earth channel, there will be a minor degree of irregularity. Hence, the value for n1 is 0.001.

Adjustment for obstructions (n2): Since the channel is expected to be regularly maintained, the channel will be mostly free of large rocks and debris during dry times. However, because this is a “natural” channel, it is expected that minor debris could be present during flood events. Therefore, the value for n2 is 0.004.

Adjustment for vegetation (n3): The pre-project landscape consisted of un-maintained desert trees and native brush. This vegetation was mostly concentrated along the channel banks with the main part of the channel open and the depth of flow was one to two times the height of the vegetation. This relates to a value of n3, for pre-project conditions, of 0.010. Because of the plant type and density of landscape for the revised condition, the value for n3 is 0.015 (when the landscape is mature and well maintained). The higher

5.5 Modeling Considerations

5.5.1 Hydraulic Jump and Drop Analysis

No hydraulic jumps are modeled in the study area. Four grade control structures exist along the improved channel; however, these structures are short, less than a 2' drop, and do not produce a hydraulic jump.

5.5.2 Bridges and Culverts

The Town of Queen Creek has constructed a new bridge to convey Sossaman Road traffic over Queen Creek Wash. The bridge replaced existing pipe culverts. Selected sheets from bridge as-builts are included with this submittal and can be found in **Appendix G**. There are no other culverts or bridges within the study limits. A bridge exists at Hawes Road; this bridge was previously modeled and reviewed by FEMA as part of a previous project.

The Sossaman Road Bridge has been designed for the following hydraulic requirements:

- a) The bridge opening under the bridge is 115 feet based on requirements determined by hydraulic analysis using the HEC-RAS computer program.
- b) The bridge is designed to pass flow from the 100-year flood event

Q ₁₀₀ =	2839 cfs
Velocity ₁₀₀ =	6.34 feet/second
Water Surface Elevation ₁₀₀ =	1359.31
- c) The bridge is checked for scour to verify that it will be stable when subjected to the 500-year flood event.

Q ₅₀₀ =	4813 cfs
Velocity ₅₀₀ =	7.41 feet/second
Water Surface Elevation ₅₀₀ =	1360.55
- d) Bridge piers and abutments are designed for scour forces presented in **Appendix F**.

5.5.3 Levees and Dikes

No levees or dikes are modeled in the study area. No levees or dikes exist in the areas mapped by detailed methods.

5.5.4 Islands and Flow Splits

No islands or flow splits are modeled in the study area. No islands or flow splits exist in the areas mapped by detailed methods.

5.9 Final Results

5.9.1 Hydraulic Analysis Results

The HEC-RAS summary tables in **Appendix E.3** summarize the results of the hydraulic analyses, for the areas modeled in the HEC-RAS computer program. The final water surface elevations are reported on the floodplain delineation map.

5.9.2 Verification of Results

The input parameters for the HEC-RAS model are applied in a manner consistent with standard engineering practices for floodplain delineation studies. The channel floodplain is completely contained within the channel banks. There is no reason to doubt the accuracy or validity of the floodplain delineated in this study.

Appendix A: References

A.2 Reference Documents

- Arizona Department of Transportation, *Highway Drainage Design Manual, Hydrology*, April 1994.
- Arizona Department of Water Resources, 1996, *State Standard 5-96, State Standard for Watercourse system Sediment Balance*, September 1996.
- Arizona Department of Water Resources, 1997, *State Standard 1-97, Requirements for Flood Study Technical Documentation*, November 1997.
- Arizona Department of Water Resources, 2002, *State Standard 9-02, State Standard for Floodplain Hydraulic Modeling*, July 2002.
- Collins/Pina Consulting Engineers, Inc., *Technical Data Notebook, Application for Letter of Map Revision, Queen Creek LOMR (Hawes Road to SPRR)*, Prepared for Flood Control District of Maricopa County, FCD No. 95-43, 1997.
- Coe & Van Loo Consultants, Inc., *Queen Creek Wash CLOMR, Power Road to Sossaman Road*, Prepared for Ryland Homes, September 2002.
- Chow, Ven Te, *Open Channel Hydraulics*, 1959
- Dibble & Associates, Consulting Engineers, 2001, *Queen Creek Wash, Hawes to Power Road, Revised Hydrology, Technical Memorandum #1*, Prepared for Town of Queen Creek, September, 2001.
- Dibble & Associates, Consulting Engineers, *Queen Creek Wash, Hawes Road to Power Road, Pre-Design Report, Contract No. 2000d03*, Prepared for Town of Queen Creek, June 2002.
- Dibble & Associates, Consulting Engineers, *Queen Creek Wash Channelization, Sossaman Road to Hawes Road, CLOMR Technical Data Notebook*, Prepared for Town of Queen Creek, January 2004.
- Federal Emergency Management Agency, *Flood Insurance Study: Guidelines and Specifications for Study Contractors (FEMA 37)*, January 1995.
- Federal Highway Administration, *Hydraulic Design of Highway Culverts, HDS No. 5*, September 1985.
- Federal Highway Administration, *FHWA Culvert Analysis Program, HY8, Version 6.1*, June 1996.
- FEMA, *Flood Insurance Study, Maricopa County, Arizona and Incorporated Areas, Volume 1 of 16*, July 19, 2001.

APPENDIX B

*GENERAL DOCUMENTATION AND
CORRESPONDENCE*

APPENDIX B.1

SPECIAL PROBLEM REPORTS (NONE)

APPENDIX B.2

CONTACT (TELEPHONE) REPORTS (NONE)

APPENDIX B.3

MEETING MINUTES OR REPORTS

QUEEN CREEK WASH - POWER ROAD TO HAWES ROAD

Project Kick-off Meeting
Town of Queen Creek
Wednesday, January 24, 2001

Attendees:

Dick Schaner	(Town of Queen Creek)
Tom Narva	(Town of Queen Creek)
Rich Perry	(Dibble)
Brian Fry	(Dibble)
Kevin Roberts	(Dibble)
Dennis Richards	(WEST Consultants)
Gary Freeman	(WEST Consultants)
Diane McCloskey	(McCloskey Peltz)
Dave Vanderlinden	(Z&H Engineering)
Ken Ricker	(Ricker, Atkinson, Mcbee)
A.J. Powell	(Cannon)
Paul Stears	(FCDMC)
David Degerness	(FCDMC)

Discussion of Scope Items:

> ***Survey / Mapping:***

- Almost 100% of the survey work will be performed during the pre-design phase of the project, including providing the color aerial photo and utility locating.
- Z&H will set panel for the project flight next week. The aerial mapping company will fly the job next week. The mapping will be complete and delivered to Dibble 4 weeks after the flight.
- The vertical datum used for control will be NAD 88. David Degerness will verify that this is the same datum used in the existing hydraulic model.

> ***Geotechnical Investigation:***

- All samples/borings required for the sediment transport analysis will be performed during the pre-design phase of the project. Samples/borings required for the Sossaman bridge design will be done during phase II.

- Locations of required test pits / borings will be identified by WEST Consultants on a map.
- Information regarding right-of-entry is needed before this work can begin. The Town of Queen Creek has agreements with all of the adjacent land developers. Letters have been mailed to all adjacent residences and properties that do not have an existing agreement with the Town. Tom Narva will delineate rights-of-entry on either a map or an aerial photo and provide it to Dibble by 1/25/01. Dibble will share this information with RAM and WEST.

➤ ***Hydrology & Hydraulics:***

- The existing hydrology model (HEC-1) will be reviewed and updated/modified if necessary. The model will be run for several different return periods, thus generating a hydrograph for each frequency storm.
- The existing hydraulics model will also be reviewed and updated/modified if necessary. In particular, the n-values used in the existing model will be evaluated to determine their appropriateness.
- Dibble will provide the results from both the hydrology model and the hydraulics model to WEST Consultants for use in the sediment transport and scour analyses.

➤ ***Sediment Transport / Scour Analyses:***

- The sediment transport analysis will be performed during the pre-design phase of the project. The HEC-6 model will be run for several different return periods from information provided by Dibble.
- The bridge scour analysis will be performed during the 30% design phase. The Hydraulic model developed by Dibble will be used for this scour analysis.
- After the HEC-6 analysis has been reviewed and approved by the Town and by FCDMC, this information should be shared with Coe & Van Loo, who is the engineer designing Queen Creek Wash from Sossaman to Power.

➤ ***Sossaman Road Bridge:***

- No work will be performed during the pre-design phase of the project.

- The structure selection report will be done during the 30% design phase. Cannon needs to know what the Sossaman Road profile will be in order to proceed with the design of the bridge.

➤ ***Landscape & Irrigation Design:***

- The work performed during the pre-design phase of the project will consist of reviewing the native plant inventory, coordinating with SWCA regarding 404 mitigation requirements, and developing a landscape concept which incorporates the mitigation requirements, the multi-use pathway, and the equestrian trail. The Town made it clear that a trail “benched” in a side slope is NOT a town-mandated design. It can be wherever it needs to be.

➤ ***Design Review for Sossaman Estates Channelization:***

- Dibble is acting as reviewer on behalf of the Town. The developer submittals must be made formally to the Town. Dibble is to review the *design* of the channel as it relates to hydraulics and sediment transport. Dibble is not to review the *plans* for clarity, completeness or constructability.

➤ ***FEMA CLOMR Submittal:***

- No work will be performed for this task during pre-design. This will happen at the end of the project.

➤ ***Public Involvement:***

- The first public meeting will be held after pre-design. The second public meeting will be held following either the 60% submittal or the 90% submittal.
- The Stakeholders’ meeting will be held after the 90% submittal.

Discussion of Project Schedule:

➤ ***Contract & Notice to Proceed:***

- Funding is in place for the pre-design phase of the project. The only remaining hold-up is the Town attorney’s review of the contract. Formal notice-to-proceed will be given as soon as signatures are on the contract.
- Survey and Geotechnical tasks are on the critical path for this project. Both should begin work next week.

- The project schedule is a total of 52 weeks long. The pre-design phase spans the first 12 weeks.

Discussion of Pre-Design Coordination:

➤ ***Critical Path Tasks:***

- Survey, Mapping & Geotechnical Investigation.

➤ ***Existing Data Needs:***

- Dibble needs a set of plans, and a copy of the report for the Sossaman Estates Development as soon as they become available. Dick Schaner will coordinate with Ryland Homes.
- Dibble also needs to know the alignment of Queen Creek Road at Sossaman Road. Tom Narva reports that this intersection is shown on the plans of 2 different developers, and the 2 plans do not agree. The Town sewer line was installed on 'centerline' of Queen Creek Road. A comparison between a dimension shown on one of the plan sets and a field measurement from that point to the sewer manhole shows a bust of approximately 35' somewhere. The sewer manhole scales about 8' from the Queen Creek Road centerline on the plan, but the manhole was installed on the centerline. As soon as this bust is resolved, and the alignment of Queen Creek Road is known, the Town will provide this information to Dibble.

QUEEN CREEK WASH - POWER ROAD TO HAWES ROAD

Project Datum Resolution Meeting
Dibble & Associates
Monday, February 26, 2001

ATTENDEES:

- Tom Narva (Town of Queen Creek)
- Paul Stears (FCDMC)
- David Degerness (FCDMC)
- Marta Dent (FCDMC)
- John Stocks (FCDMC)
- Brian Fry (Dibble)
- Kevin Roberts (Dibble)
- Myron Jasmann (Dibble)
- Burke Lokey (Coe & Van Loo)
- Rick Lozano (Coe & Van Loo)
- Bob Phillips (GPS Services)

PURPOSE OF MEETING:

To attempt to determine the vertical datum used for the various projects that have been/are being done in the area of Queen Creek Wash between the Central Arizona Project (CAP) canal and the East Maricopa Floodway (EMF), in order to determine what datum should be used for the new mapping that Dibble & Associates will be acquiring for the project. This will also facilitate the "marrying" of the Dibble design with the CVL design.

DISCUSSION:

Several studies have been conducted by several consultants along Queen Creek Wash between the CAP and the EMF. These projects include both aerial mapping and hydraulic models (HEC-2 or HEC-RAS). Marta Dent is fairly confident that all of these projects west of the County line used a vertical datum of NGVD '29, as stated in the FCDMC consultant manual as a requirement. Dibble & Associates suspected that the mapping provided by the District (covering the area between Power Rd and Ellsworth Rd) is not based on NGVD '29. Marta Dent said that there was a project done by Huitt-Zollars that used a vertical datum of NAVD '88 for the area east of the County line, but everything else is based on NGVD '29.

FEMA requires (for the time being) that all projects submitted to them be based on NGVD '29. Since this project will eventually be submitted to FEMA for a LOMR, the datum for this project must be NGVD '29.

The county will soon be changing their datum requirement from NGVD '29 to "GDACS", which is based on NAVD '88. The FCDMC has the ability to convert digital aerial mapping quickly

and easily from one vertical datum to another. If all mapping panel points for each of the completed projects in the area are surveyed and provided to the District, Marta can convert all of the existing mapping to be on the same datum (NGVD '29).

John Stock pointed out that only 3 or 4 mapping control points on either side of a "seam" (where one project mapping overlaps another) would have to be surveyed for this conversion to occur. We are not concerned with all of the panel points within the limits of a given project. Bob Phillips agreed and stated the existing scope would cover this work.

ACTION ITEMS:

- **Marta Dent** will provide all of the control points used for each of the mapping projects that the District has to Dibble. **Marta** will also inform Dibble what HEC-RAS models are based on what mapping.
- **Burke Lokey** will provide all of the control points used for the mapping for both of the CVL projects (Power Ranch & Queen Creek Channel) in the area to Dibble. **Burke** will also provide to Dibble the LOMR package submitted to FEMA for the Power Ranch project.
- **Dibble** will gather all of the control points, decide which control points are near the seams of the various mapping reaches, and provide a list of control points to Bob Phillips.
- **Bob Phillips** will survey all of the control points provided to him by Dibble, and provide Dibble with a list of northings, eastings, and elevations for those points.
- **Dibble** will provide the list of coordinates and elevations to **Marta Dent** at the District for conversion to (or verification of) NGVD '29 datum.
- The new mapping that Dibble will obtain for the project will be done on NGVD '29 at Grid elevations. A factor for conversion to NAVD '88 will be provided.
- **Dave Degerness** will provide to Dibble the original HEC-2 existing conditions models for use in the existing conditions sediment transport analysis.

QUEEN CREEK WASH - POWER ROAD TO HAWES ROAD

Project Kick-off Meeting (#2)
Dibble & Associates Conference Room
Wednesday, September 12, 2001

Attendees:

Dick Schaner	(Town of Queen Creek)	dschaner@queencreek.org
Tom Narva	(Town of Queen Creek)	tnarva@queencreek.org
Brian Fry	(Dibble)	bfry@dibblecorp.com
Kevin Roberts	(Dibble)	kroberts@dibblecorp.com
Susan Detwiler	(Dibble)	sdetwiler@dibblecorp.com
Dennis Richards	(WEST Consultants)	drichards@westconsultants.com
Gary Freeman	(WEST Consultants)	gfreeman@westconsultants.com
Diane McCloskey	(McCloskey Peltz)	rundmc@mindspring.com
Noelle Sanders	(SWCA)	nsanders@swca.com
Ken Houser	(SWCA)	khouser@swca.com
Paul Stears	(FCDMC)	pjs@mail.maricopa.gov
David Degerness	(FCDMC)	djd@mail.maricopa.gov
Burke Lokey	(Coe & Van Loo)	blokey@cvlci.com

Discussion of Scope Items:

> ***Public Involvement:***

- The first of 2 public meetings will be held following the pre-design phase of the project. According to the current schedule, this would fall during the week of Thanksgiving. Everyone in attendance agreed that the public meeting should be held the week after Thanksgiving (week of November 26).
- Dick Schaner commented that all right-of-way issues should be evaluated prior to the public meeting. Any required right-of-way acquisitions should be clearly shown on some sort of exhibit at the public meeting.

> ***404 permit:***

- The 404-permit application was originally submitted for the "full reach" (Power to Hawes) in March of 2000. The project was then broken into 2 pieces (Power to Sossaman, and Sossaman to Hawes). The permit application for the reach from Power to Sossaman was submitted in March of 2001. The corps has not responded to this application, as they believe the 2 reaches still constitute 1 project, not 2.

- The 404-permit process is likely on hold until the design for the reach from Sossaman to Hawes (this project) is complete. The 404-permit application submittal to the Corps will occur after the pre-design phase of this project is complete.

➤ ***Geotechnical Investigation:***

- All geotechnical work that is to be conducted for the pre-design phase of the project has been completed.
- The only remaining geotechnical work yet to be completed is borings for the Sossaman Road Bridge piers and abutments. This work will be completed after the pre-design phase of the project is complete.

➤ ***Hydrology & Hydraulics:***

- The Revised Hydrology Technical Memorandum has been completed and reviewed by the Flood Control District. The initial review generated a few comments regarding suggested revisions to the report. These comments have been addressed, and the report is now ready to be reviewed once again by the FCD. Dibble & Associates gave a copy of the revised report to Dave Degerness at this meeting. The lower flow rates, which were developed as a result of this revised hydrology study, will be the flow rates used for design of Queen Creek Wash, contingent on FCD approval of the report.
- The existing conditions hydraulic model (HEC-RAS) has been supplied to Dibble & Associates by the FCD. This model was created from aerial mapping which not on NAVD '88 datum. The mapping behind the existing model is the same mapping that this project is "correcting". Dibble has the cross section locations from this model in digital format. The original plan was to re-cut these cross sections once the corrected mapping was complete, thus "moving" the existing conditions model to the same datum as this project. Dibble has performed an investigation to compare the "shape" of the cross sections in the model to that of the same cross sections cut from the corrected mapping. Copies of plots of these cross sections were distributed at this meeting. The geometry of the cross sections appears to be relatively consistent between the existing model and the corrected mapping. Rather than "re-cutting" the same cross sections from the corrected mapping, it was decided that Dibble would simply adjust the elevations of the cross sections in the existing model by the adjustment factors recommended by Z&H and Bob Phillips as a result of their survey investigation. This will save the project money, as less time and effort is required to simply adjust the cross section elevations, and the resulting model will be no different than it would have been with "re-cut" cross sections.

- From the date of this meeting, Coe & Van Loo will require approximately 3 weeks before their work is ready to be reviewed by the Dibble team. Their current plans call for a slight re-alignment of the Queen Creek Wash just downstream from Sossaman Road. Per Dick Schaner, the Town of Queen Creek will most likely not allow the re-alignment of the wash as shown on the CVL plans. If this indeed is the case, and CVL is required to modify their plans to eliminate the wash re-alignment, then the time before their work is ready to be reviewed by the Dibble team could be substantially longer than 3 weeks.
- The Dibble reach of the wash (Sossaman to Hawes) should attempt to maintain a consistent "feel" when compared to the CVL reach (Power to Sossaman). The flattest side slope currently shown on the CVL plans is 8:1 (h:v).

QUEEN CREEK WASH - POWER ROAD TO HAWES ROAD

Project Datum Resolution Meeting
Dibble & Associates
Monday, July 16, 2001

ATTENDEES:

- Tom Narva (Town of Queen Creek)
- Paul Stears (FCDMC)
- John Stock (FCDMC)
- Blair Haines (Z&H Engineering)
- Bob Phillips (GPS Services)
- Brian Fry (Dibble)

PURPOSE OF MEETING:

To identify the course of action to correct the FCDMC mapping for use on the Queen Creek Wash project. The datum issue impacts three sets of mapping. FCDMC mapping from Hawes Road west to the EMF was completed by Kenney Aerial Mapping, Inc. (KAM), FCDMC mapping from Hawes Road east to the Maricopa County line was completed by Lee Harbers of DTM, Inc., and project design mapping was prepared from Sossaman Road to Ocotillo Road by Aerial Mapping Company, Inc. (AMCI). All three sets of mapping will be corrected based on the results of the field control surveys.

DECISIONS:

The mapping will be adjusted to NAVD 88 vertical datum. Per John Stock, since all the mapping is being updated it is better to go to the 88 datum instead of NGVD 1929.

Bob Phillips will provide equations for conversion to NGVD 1929 and Town of Gilbert datums.

Bob Phillips will provide results of surveys and the required mapping adjustments for each set of mapping to Dave VanderLinden of Z&H Engineers. Upon review and approval of the data, Dave will forward the mapping adjustments to KAM, DTM, and AMCI.

Lee Harbers of DTM, Inc. will submit a proposal for mapping adjustments to Brian Fry at Dibble and Associates. Brian will incorporate DTM's cost into a new work assignment under Dibble's on-call contract with FCDMC.

DTM, Inc. and KAM were instructed to coordinate edge matching of the corrected mapping at the common mapping boundary at Hawes Road.

Upon completion of the mapping corrections, the Flood Insurance Study (FIS) hydraulic model will need to be updated using the corrected mapping to produce a "corrected effective" model. The corrected effective model will then form the basis of the hydraulic modeling for the Queen Creek Channel sediment transport and design analysis. Paul Stears and Brian Fry will meet with Tim Phillips and other FCDMC staff to determine the extent of HEC-RAS modeling to be completed under the on-call contract.

HEC-RAS modeling to produce a "corrected effective" model will be included in the proposal for the on-call work assignment. The preparation of a Conditional Letter of Map Revision (CLOMR) for the Queen Creek Wash improvements from Sossaman Road to Hawes Road is included in the Queen Creek Wash contract.

QUEEN CREEK WASH - POWER ROAD TO HAWES ROAD

Project Datum Resolution Meeting
Dibble & Associates
Thursday, April 26, 2001

ATTENDEES:

- Dick Schaner (Town of Queen Creek)
- Tom Narva (Town of Queen Creek)
- Paul Stears (FCDMC)
- Tim Phillips (FCDMC)
- John Stock (FCDMC)
- Dave VanderLinden (Z&H Engineering)
- Bob Phillips (GPS Services)
- Brian Fry (Dibble)
- Kevin Roberts (Dibble)

PURPOSE OF MEETING:

To attempt to determine the extent of the problems which exist with the County's mapping and HEC-RAS models discovered during the survey for the Queen Creek Wash project.

DISCUSSION:

Per Bob Phillips, the existing mapping owned by the Flood Control District (FCD) was performed during 2 separate projects. Collins-Pina performed the survey control for both projects. The "east" project was contract no. 9503, and runs from the County line to Hawes Rd. The "west" project was contract no. 9703, and runs from Hawes Rd to a point near the East Maricopa Floodway.

It appears that for the east project, Collins Pina began the survey at a benchmark with an erroneous elevation. This can be easily corrected by determining a correction factor to be applied to the elevations. Once this is done, the vertical difference between the Collins Pina corrected control and our survey is plus/minus 0.2'. This difference is within the realm of normal GPS error. The horizontal aspect of the Collins Pina survey appears to be O.K.

The west project has a much more complicated error. The vertical difference between our survey and the Collins Pina survey for this area is 3.57'. That is, the survey performed for this project is 3.57' higher than mapping provided by the FCD.

Part of this difference is possibly due to the difference between Town of Queen Creek datum, and Town of Gilbert datum. In addition to this difference, at least 2 elevation reference marks

(ERM's), which were used for mapping control in the area, are labeled with incorrect elevations. This translates into a "tilt" error in the new mapping acquired for this project, and possible any other mapping performed in the area. Since the alignment of the wash within the limits of this project parallels the axis of the mapping control, a constant can be applied to the elevations in the mapping to generate an accurate representation of the ground. Aerial Mapping Company has indicated this can be done for \$1000.00 or less.

CONCLUSIONS:

It was agreed by all that a problem exists that must be corrected. This is in the best interest of both the Town of Queen Creek and the FCD. The following plan of action was generated:

- 1) Check Wood & Associates mapping to determine if same error exists.
- 2) Correct the mapping performed by Collins Pina (both the east and the west).
- 3) Regenerate the HEC-RAS model for Queen Creek Wash.
 - i. From 1/2 mile west of Power to Ellsworth Road.
 - ii. Remainder – EMF to County Line.
- 3a) Perform Additional Ground Surveys.
 - i. Will Rogers Equestrian Ranch
 - ii. Power Ranch entrance bridge
- 4) Correct ERM's (if directed to do so by John Stock).

ACTION ITEMS:

Dibble & Associates will prepare a fee proposal for FCD to accomplish the above action plan in 2 different steps. The first fee proposal will include items 1 & 2 from the action plan. The second fee proposal will include items 3 & 3a from the action plan. Item 4 will not be included unless Dibble is approached by John Stock and specifically instructed to do so.

The FCD will provide Dibble & Associates with a CAD file containing the linework representing locations where all cross sections were cut for the RAS model. This is critical to regenerating the RAS model.

Fry, Brian

To: Timothy S Phillips (E-mail); Paul J. Stears (E-mail)
Cc: Roberts, Kevin
Subject: Queen Creek Mapping

Tim & Paul,

Upon review of the corrected mapping received from Kenney and DTM I believe I now understand the situation. I will summarize as best I can.

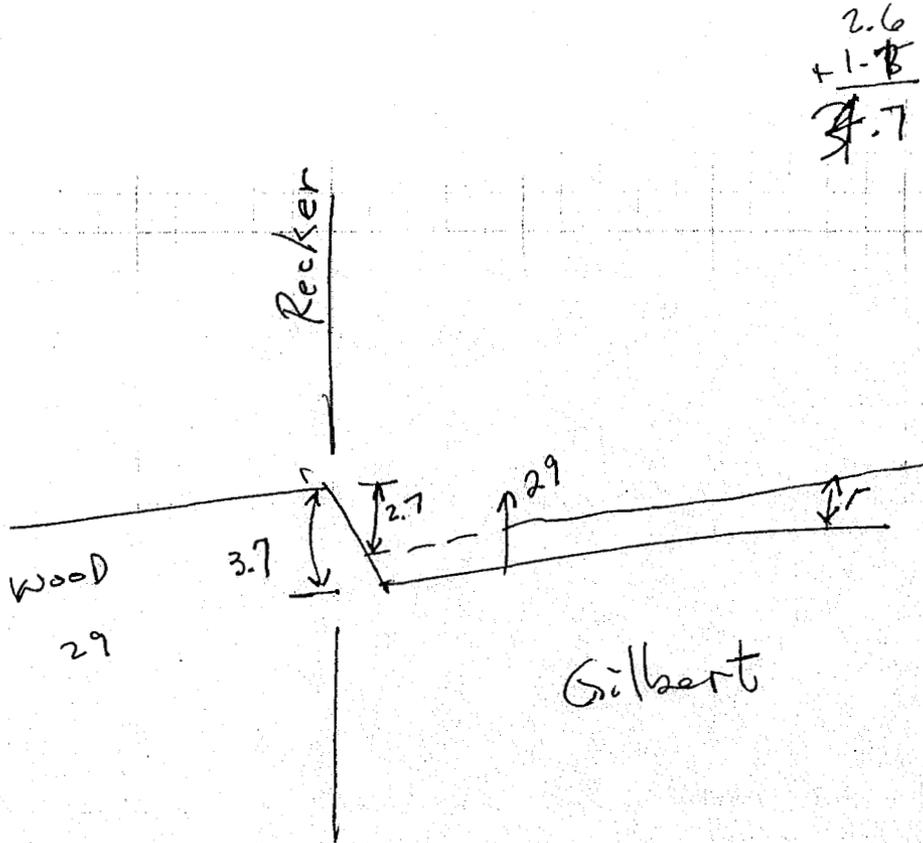
1. Although the Collins-Pina mapping prepared by Kenney and DTM was reported to be on NGVD 29 vertical datum, it appears that it was actually mapped to the Town of Gilbert Datum. The Town of Gilbert datum appears to be approximately 3.7 feet lower than NGVD 29.
2. Although the Collins-Pina mapping extends all the way to the EMF, the HEC-RAS model that everyone is using only contains Collins-Pina cross-sections from Recker Road upstream. The 1992 Wood mapping is used from Recker Road downstream to the EMF.
3. The Wood mapping is on NGVD 29 datum, as it should be.
4. The 3.7 foot vertical bust resulting from the datum difference between Gilbert and NGVD 29 is clearly visible in the HEC-RAS profile at Recker Road. The flowline elevation rises about 3.7 vertically in the downstream direction at Recker Road. Raising the profile from Recker Road upstream by the 3.7 feet would result in a smooth continuous flowline as would be expected in this area.
5. At our last meeting to discuss the findings of all the field survey, it was recommended by the surveyor that we correct the mapping to NAVD 88 vertical datum instead of NGVD 29 because there was better agreement when a constant adjustment factor was applied to the mapping. It was agreed by all in attendance that this was the best approach to use and was subsequently done.
6. Since the mapping adjustment was a constant, Dibble recommended that the HEC-RAS cross-sections simply be adjusted by the constant rather than re-cutting the cross-sections as originally envisioned. Comparison of about 10 representative cross-sections from the HEC-RAS model and the corrected mapping confirmed that this was a reasonable approach. The adjustment factor was to raise the Collins-Pina cross-sections by approximately 2.6 feet.
7. Keeping the Wood cross-sections as presented in the HEC-RAS and adjusting the Collins-Pina cross-sections by the 2.6 feet now results in a datum difference between NGVD 29 in the Wood mapping section and NAVD 88 in the corrected mapping sections. This results in a discrepancy of 1.1 feet, which is better than the 3.7 but still not as we would like.
8. Reviewing the survey data it appears that the difference between the NAVD 88 and NGVD 29 datums is about the 1.1 feet.
9. We can use the NAVD 88 cross-sections for the Queen Creek project, however, there is still the 1.1 foot discrepancy that somehow needs to be resolved to complete the model from Recker Road to the EMF.



DIBBLE & ASSOCIATES
CONSULTING ENGINEERS

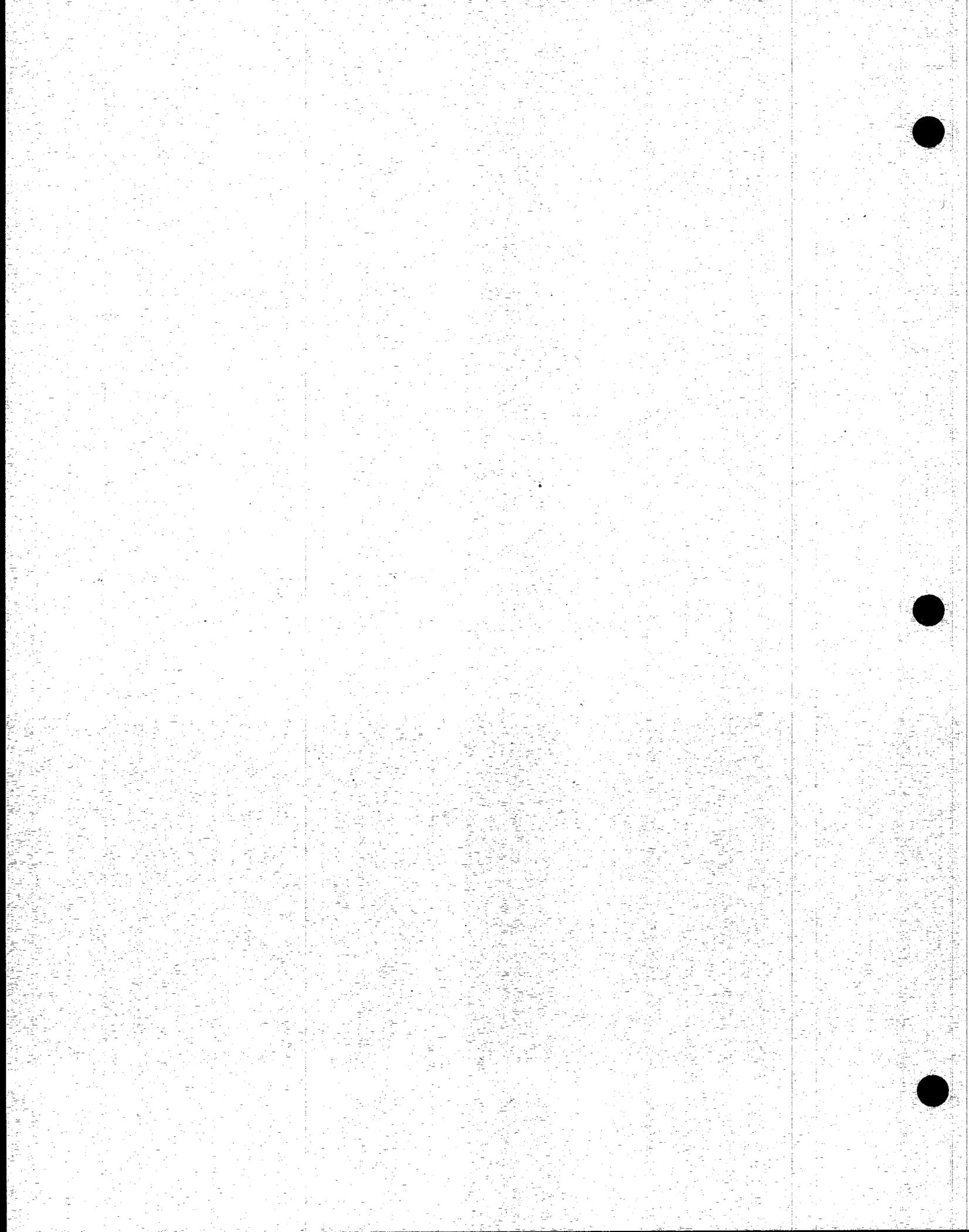
CALC _____ DATE _____ JOB _____
CHKD _____ DATE _____ SHT _____ OF _____

TITLE _____



APPENDIX B.4

GENERAL CORRESPONDENCE



Letter Of Transmittal

To: FCDMC
2801 West Durango Street
Phoenix, AZ 85009

Date: June 18, 2007
Re: Queen Creek Wash LOMR – Sossaman
Road to Hawes Road

Attention: Lynn Thomas, P.E.

Transmitted herewith are the following items:

- | | | | |
|--|---|---|---|
| <input type="checkbox"/> Calculations | <input type="checkbox"/> Copy of Letter | <input type="checkbox"/> Plans | <input type="checkbox"/> Shop Drawings |
| <input type="checkbox"/> Change Order | <input type="checkbox"/> Details | <input checked="" type="checkbox"/> Prints | <input type="checkbox"/> Specifications |
| <input type="checkbox"/> Construction Cost | <input type="checkbox"/> Electronic Media | <input checked="" type="checkbox"/> Reports | <input type="checkbox"/> Other |

Copies	Date	I.D. Number	Description
3	6/18		Queen Creek Wash LOMR TDN
3	6/18		Queen Creek Wash LOMR Workmaps

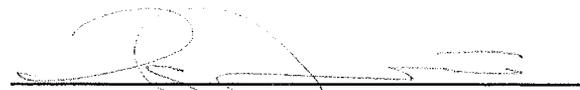
These are transmitted as checked below:

- | | | |
|--|--|--|
| <input type="checkbox"/> Approve | <input checked="" type="checkbox"/> For Approval | <input checked="" type="checkbox"/> For Your Use |
| <input type="checkbox"/> Approve with Comments | <input type="checkbox"/> For Information Only | <input type="checkbox"/> Returned |
| <input checked="" type="checkbox"/> As Requested | <input type="checkbox"/> For Use as Guideline Only | <input type="checkbox"/> Other |
| <input type="checkbox"/> Disapprove | <input type="checkbox"/> For Review and Comment | |

Remarks: 1 copy for FCDMC
1 copy for Town of Queen Creek
1 copy for FEMA

cc: 10-0606.1 Letter
Cathy Register, P.E.

Sincerely,
Dibble Engineering


Josh Papworth, P.E.



10-0078 1/3

2633 East Indian School Road, Suite 401
Phoenix, Arizona 85016-6763
Tel. (602) 957-1155
Fax (602) 957-2838



DIBBLE & ASSOCIATES

CONSULTING ENGINEERS

CIVIL ENGINEERING ■ Transportation ■ Airports ■ Drainage/Flood Control ■ Water Resources ■ Site Infrastructure ■ Surveying

March 10, 2005

Mr. Dick Schaner
Public Works Director
TOWN OF QUEEN CREEK
22350 S. Ellsworth Road
Queen Creek, AZ 85242-9311

Re: Queen Creek Wash
Hawes Road to Sossaman Road
Flood Response Recommendations

Dear Mr. Schaner,

Per your request, attached are our recommendations for the Town's actions in response to the recent flooding event which occurred within the construction limits of the Queen Creek Wash Improvements project. A significant flow event occurred around February 14, 2005 prior to completion of construction. The flow was sustained for several days and caused extensive erosion in the freshly graded construction areas resulting in natural reshaping of the wash, loss of landscape and irrigation improvements, as well as portions of walls that were constructed with the project. The Flood Control District of Maricopa County (FCDMC), the Town of Queen Creek, Dibble & Associates, and our subconsultant Dennis Richards from WEST Consultants met at the site and reviewed the conditions together. We believe the attached recommendations are consistent with the group's conclusions from the site visit and will be a cost effective means to adapt to nature's sudden changes to the site conditions.

If you have any questions or require additional information, please give me a call.

Very truly yours,
DIBBLE & ASSOCIATES

Brian J. Fry, P.E.
Project Manager

213

QUEEN CREEK WASH CHANNEL IMPROVEMENTS
HAWES ROAD TO SOSSAMAN ROAD
TOWN OF QUEEN CREEK

Flood Response Recommendations

March 10, 2005

1. Physical Improvements

The cost to restore the channel to the grades and cross-sections from the design plans would be extensive. The eroded channel looks natural and likely has greater capacity than under the design condition. The recommended approach is to minimize the modifications to the existing channel, limiting activities to those required to protect the channel banks and adjacent property from erosion and to create the required maintenance road.

a. Channel Cross-Section

The designed cross-section had "benches" on one or both sides of the historic wash bottom for most of the length of the project. The benches have been washed away in several locations resulting in multiple or relocated main channel flow paths. It is recommended that the channel be generally left as is with a few exceptions as described herein. To encourage the wash to move back to its historic flowpath in the center of the channel, construction of "guide berms" should be considered to reduce the velocity in the former bench areas and direct the flow back to the historic main channel location. It is anticipated that future flow events would then deposit sediment in the low velocity bench areas naturally reconstructing the benches over time. In locations where the channel banks have caved resulting in near vertical side slopes, the slopes should be flattened by placing and compacting fill to a safe slope. Additional riprap slope protection should be placed in the worst effected areas. The location of slope flattening and erosion protection would be based on a field review on a case-by-case basis at each erosion location.

b. Maintenance Road

A new maintenance road alignment should be established in conjunction with the north bank improvements. The slope and riprap modifications described above would be integrated with a maintenance roadway section that would be slightly higher than the channel bottom and protected with asphalt paving and a concrete or rip-rap cut-off wall on the channel side. The maintenance road access point from Sossaman Road is on the south side of the channel while the majority of the maintenance road is on the north side of the channel. To connect the Sossaman Road access to the north side road a new channel crossing will be required near the location of the originally designed crossing.

c. Landscaping

Landscape plantings and an irrigation system were constructed in the bench areas. The irrigation system was washed away in several locations. It is recommended that landscaping not be re-established in the wash areas. Existing plants that are still in place would be left in place with a low expected survivability rate. The tangled irrigation pipes left in the wash would be removed and disposed of. Plantings in the bank and overbank areas that were not damaged would be left in place and irrigation system repairs would be made in those areas.

d. Pedestrian Stops

It is recommended that the pedestrian stops be repaired and completed per the construction plans. The pavement within the structures would have helped resist erosion if it had been in place. Additional erosion protection would be placed in select locations for added protection from future flow events.

e. Grade Control Structures

All but one of the grade control structures was completed. The unfinished structure should be completed as originally designed. The structure immediately upstream from the Sossaman Road Bridge should be modified to add the concrete wing to penetrate the north bank. The concrete aprons in the main channel area should be covered with sandy material from the channel bottom to a minimum depth of six inches for aesthetic purposes. The portions of the grade control structures in the bench areas should be backfilled to provide a continuous path for equestrian use.

2. FEMA Floodplain Recommendations

The FEMA Conditional Letter of Map Revision (CLOMR) previously submitted will no longer be valid. A new Letter of Map Revision (LOMR) submittal should be prepared and submitted to the Federal Emergency Management Agency (FEMA). The following elements will be required:

a. Existing (Modified) Topography

Updated topographic information will be required as an initial task to allow computer modeling of the wash capacity. This could be done with ground level cross-section surveys or by preparing new aerial mapping. After the protective measures are constructed, an as-built survey will be required for the LOMR submittal.

b. Hydraulic Analysis

A new HEC-RAS hydraulic model will need to be prepared to depict the channel flow conditions with the new cross-sections.

c. Letter of Map Revision

The new mapping, hydraulic analysis, and as-built survey data will be assembled in a new LOMR submittal package. FEMA will then modify the Flood Insurance Rate Maps (FIRMs) based on the new analysis. The previous CLOMR submittal will be of no effect.

3. U. S. Army Corps of Engineers (COE) 404 Permit Issues

As a result of the flow event, the limits of the "waters of the US" may have changed. The 404 permit rules and general conditions should be reviewed to determine the appropriate action to be taken by the Town.



Federal Emergency Management Agency

Washington, D.C. 20472

DEC 20 2004

1/3

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 04-09-0638R

The Honorable Andrew W. Kunasek
Chairman, Maricopa County
Board of Supervisors
301 West Jefferson Street, 10th Floor
Phoenix, AZ 85003

Community: Maricopa County, AZ
Community No.: 040037

104

Dear Mr. Kunasek:

This responds to a request that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) comment on the effects that a proposed project would have on the effective Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for Maricopa County, Arizona and Incorporated Areas, in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated February 17, 2004, Mr. Richard L. Schaner, P.E., Public Works Director, Town of Queen Creek, requested that FEMA evaluate the effects that proposed improvements along Queen Creek from just downstream of Sossaman Road to just upstream of Hawes Road would have on the flood hazard information shown on the effective FIRM and FIS report. The proposed improvements will include channelization and construction of a bridge at Sossaman Road. On the effective FIRM, the Special Flood Hazard Area (SFHA), the area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood), along the project reach of Queen Creek is designated Zone A, with no Base Flood Elevations (BFEs) determined.

All data required to complete our review of this request for a Conditional Letter of Map Revision (CLOMR) were submitted with letters from Mr. Frank Edward Brown, P.E., CFM, Project Manager, Dibble & Associates, and Mr. Schaner.

We reviewed the submitted information and the data used to prepare the effective FIRM for your community and determined that the proposed project meets the minimum floodplain management criteria of the NFIP. We believe that, if the proposed project is constructed as shown on the plans entitled "Queen Creek Wash Channelization CLOMR Sossaman Road to Hawes Road," Sheets 1 and 2, dated August 31, 2004, and as described in the submitted report entitled "Queen Creek Wash Channelization Sossaman Road to Hawes Road CLOMR Technical Data Notebook," dated August 2004, both prepared by Dibble & Associates, and the data listed below are received, a revision to the FIRM would be warranted.

As a result of the restudy of a portion of Queen Creek from approximately 100 feet upstream to approximately 500 feet upstream of Sossaman Road and from approximately 1,400 feet upstream to approximately 2,500 feet upstream of Sossaman Road, the FIS report will be revised, BFEs will be established, and the flood zone designation of the SFHA will change from Zone A to Zone AE, with BFEs determined. The width of the SFHA along the revised reach of Queen Creek will decrease compared to the effective SFHA width. The maximum decrease in SFHA width, approximately 500 feet, will occur approximately 2,500 feet upstream of Sossaman Road.

Upon completion of the project, your community may submit the data listed below and request that we make a final determination on revising the effective FIRM and FIS report.

- Detailed application and certification forms must be used for requesting final revisions to the maps. Therefore, when the map revision request for the area covered by this letter is submitted, Form 1, entitled "Overview & Concurrence Form," must be included. (A copy of this form is enclosed.)
- The detailed application and certification forms listed below may be required if as-built conditions differ from the conceptual plans. If required, please submit new forms (copies of which are enclosed) or annotated copies of the previously submitted forms showing the revised information.

Form 2, entitled "Riverine Hydrology & Hydraulics Form"

Form 3, entitled "Riverine Structures Form"

Hydraulic analyses, for as-built conditions, of the base flood, together with a topographic work map showing the revised floodplain boundaries, must be submitted with Form 2.

- Effective September 1, 2002, FEMA revised the fee schedule for reviewing and processing requests for conditional and final modifications to published flood information and maps. In accordance with this schedule, the current fee for this map revision request is \$3,800 and must be received before we can begin processing the request. Please note, however, that the fee schedule is subject to change, and requesters are required to submit the fee in effect at the time of the submittal. Payment of this fee shall be made in the form of a check or money order, made payable in U.S. funds to the National Flood Insurance Program, or by credit card. The payment must be forwarded to the following address:

Federal Emergency Management Agency
 Fee-Charge System Administrator
 P.O. Box 22787
 Alexandria, VA 22304

- As-built plans, certified by a registered professional engineer, of all proposed project elements
- Community acknowledgment of the map revision request

After receiving appropriate documentation to show that the project has been completed, FEMA will initiate a revision to the FIRM and FIS report. Because BFEs would be established as a result of the project, a 90-day appeal period would be initiated, during which community officials and interested persons may appeal the BFEs based on scientific or technical data.

The basis of this CLOMR is, in whole or in part, a channel-modification/bridge project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel and bridge rests with your community.

This CLOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

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If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by calling the Director, Federal Insurance and Mitigation Division of FEMA in Oakland, California, at (510) 627-7103. If you have any questions regarding this CLOMR, please call our Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Max H. Yuan

Max H. Yuan, P.E., Project Engineer
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

For: Doug Bellomo, P.E., CFM, Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

Enclosures

cc: The Honorable Wendy Feldman-Kerr
Mayor, Town of Queen Creek

Mr. Timothy S. Phillips, P.E.
Acting Chief Engineer and General Manager
Flood Control District of Maricopa County

Mr. Ted Collins
Principal Floodplain Coordinator
Flood Control District of Maricopa County

Mr. Richard L. Schaner, P.E.
Public Works Director
Town of Queen Creek

Mr. Brian Cosson
NFIP Coordinator
Arizona Department of Water Resources

Mr. Brian J. Fry, P.E.
Dibble & Associates

Mr. Frank Edward Brown, P.E., CFM
Project Manager
Dibble & Associates



NATIONAL FLOOD INSURANCE PROGRAM
FEMA MAP COORDINATION CONTRACTOR

MAR 11 2004

1/4

March 8, 2004

Mr. Richard Schaner
Public Works Director
Town of Queen Creek
22350 South Ellsworth Road
Queen Creek, AZ 85242-9311

IN REPLY REFER TO:
Case No.: 04-09-0638R
Communities: Town of Queen Creek and
Maricopa County, AZ
Community Nos.: 040132 and 040037

316-ACK.FRQ

Dear Mr. Schaner:

This responds to your request dated February 17, 2004, that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issue a conditional revision to the Flood Insurance Rate Map (FIRM) for Maricopa County, Arizona and Incorporated Areas. Pertinent information about the request is listed below.

Identifier:	Queen Creek Channelization Between Sossaman Road and Hawes Road
Flooding Source:	Queen Creek
FIRM Panel(s) Affected:	04013C2695 G and 3060 G

FEMA has implemented a procedure to recover costs associated with reviewing and processing requests for modifications to published flood information and maps. Effective September 1, 2002, FEMA revised that fee schedule. A copy of the notice summarizing the current fee schedule, which was published in the *Federal Register*, is enclosed for your information. In accordance with this schedule, the fee for your request is \$4,000 and must be submitted before we can continue processing your request. Payment of this fee must be made in the form of a check or money order, made payable in U.S. funds to the National Flood Insurance Program (NFIP), or credit card payment. For identification purposes, the case number referenced above must be included on the check or money order. We will not perform a detailed technical review of your request until we receive this payment.

Payment must be forwarded to one of the addresses listed below.

Using U.S. Postal Service:
Federal Emergency Management Agency
Fee-Charge System Administrator
P.O. Box 3173
Merrifield, VA 22116-3173

Using overnight service:
FEMA Fee-Charge System Administrator
c/o Dewberry & Davis
METS Division, Stop 19A
8401 Arlington Boulevard
Fairfax, VA 22031

We have completed an inventory of the items that you submitted. The items identified below are required before we can begin a detailed review of your request.

1. Our preliminary review revealed that the unincorporated areas of Maricopa County will be affected by this revision. Please provide community acknowledgment in the form of a letter stating that Maricopa County has reviewed the revision request and understands the effects of the revision on flooding conditions in the community, or Application/Certification Form 1, entitled "Overview & Concurrence Form" (copy enclosed), signed by a county official. Alternatively, please provide an official annexation map showing that the Town of Queen Creek has annexed the area of revision.
2. Our review of the submitted proposed conditions hydraulic model for Queen Creek revealed that HEC-RAS Version 2.2 was used. Effective April 2003, this version of HEC-RAS is no longer on FEMA's list of hydraulic models accepted for NFIP usage. Please submit a hydraulic model for Queen Creek using HEC-RAS Version 3.0 or above.
3. Our review of the submitted proposed conditions HEC-RAS hydraulic model revealed that a discharge value of 3,010 cubic feet per second (cfs) was used to model Queen Creek between Sossaman Road and Hawes Road. The hydrologic model submitted to support the Letter of Map Revision issued on January 22, 2004 (Case No. 03-09-0247P), modified the effective discharge value to 2,839 cfs for the area upstream of Power Road. Please submit the proposed conditions HEC-RAS model for Queen Creek using the effective discharge value of 2,839 cfs.
4. The scale and topographic definition of the submitted topographic work map entitled "Queen Creek Wash Channelization CLOMR Sossaman Road to Hawes Road," prepared by Dibble and Associates, dated November 26, 2003, is not sufficient to provide reasonable accuracy for the area between Sossaman Road and Hawes Road. Please submit a topographic map to show how the proposed floodplain boundary delineations will tie into the effective floodplain boundary delineations upstream and downstream of the revised reach, and provide an electronic version of the topographic work map. The scale and topographic definition of the map must be sufficient to provide reasonable accuracy, and the map must be certified by a registered professional engineer.

All required items (except the required fee) are to be submitted to us at the address shown at the bottom of the first page. If all required items are not submitted within 90 days of the date of this letter, we will treat any subsequent request as an original submittal, and it will be subject to all submittal/payment procedures.

If you are unable to meet the 90-day deadline for submittal of required items, and would like FEMA to continue processing your request, you must request an extension of the deadline. This request must be submitted to us in writing and must provide (1) the reason why the data cannot be submitted within the requested timeframe, and (2) a new date for the submittal of the data. FEMA receives a very large volume of requests and cannot maintain inactive requests for an indefinite period of time. Therefore, the fees will be forfeited for any request for which neither the requested data nor a written extension request is received within 90 days.

When you write us about your request, please include the case number referenced above in your letter.

If you have general questions about your request, FEMA policy, or the NFIP, please call the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627). If you have specific questions concerning your request, please call the Revisions Coordinator for your State, Pernille Buch-Pedersen, who may be reached at (703) 317-6224.

Sincerely,



Andrea L. Ryon, P.E., Director
Engineering Division
Michael Baker Jr., Inc.

Enclosures

cc: Ms. Lynn M. Thomas, P.E., CFM
Branch Manager
Floodplain Management Branch
Flood Control District of Maricopa County

Ms. Shanna Yager, CFM
Principal
Floodplain Administration
Flood Control District of Maricopa County

Mr. Brian Cosson
NFIP Coordinator
Arizona Department of Water Resources

Mr. Brian J. Fry, P.E.
Dibbles and Associates

1/4



TOWN OF
QUEEN CREEK

June 16, 2004

Baker Engineering & Energy

3601 Eisenhower Avenue
Alexandria, VA 22304-6425

Attn: Al Soujd

RE: Case No. 04-09-0638R

I hereby request that you extend the time frame for completion of the CLOMR. I apologize for the delay in submittal of information requested in your firms March 8th letter from Andrea Ryon.

In addition to this request for an extension of time I have directed the Town's consultant, Mr. Brian Fry of Dibble and Associates, to submit a response to the four items outlined in your letter of March 8th, 2004. A research of our records shows that a \$4,000 check (#17796) was mailed on 3-35-04 and cleared our bank on 4-2-04.

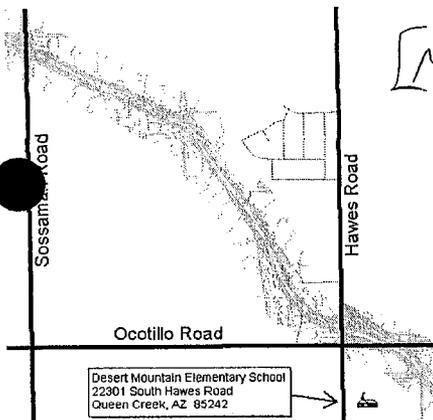
Again, I am sorry for delays caused by miscommunication between the Town and its consultant. Thank you for taking the initiative to contact me on this matter.

Sincerely,

Richard L. Schaner, P.E.
Public Works Director
Town of Queen Creek
480-987-9887
dschaner@queencreek.org

To:

copy:
Brian Fry - Dibble & Associates 602-957-2038
Lynn Thomas - Flood Control District of Maricopa County



[mailed to all property owners in the area.]
Queen Creek Wash Improvements

1/1

Monday, January 14, 2002

Desert Mountain Elementary School

22301 South Hawes Rd.
Queen Creek, AZ 85242

6 p.m. – 8 p.m.

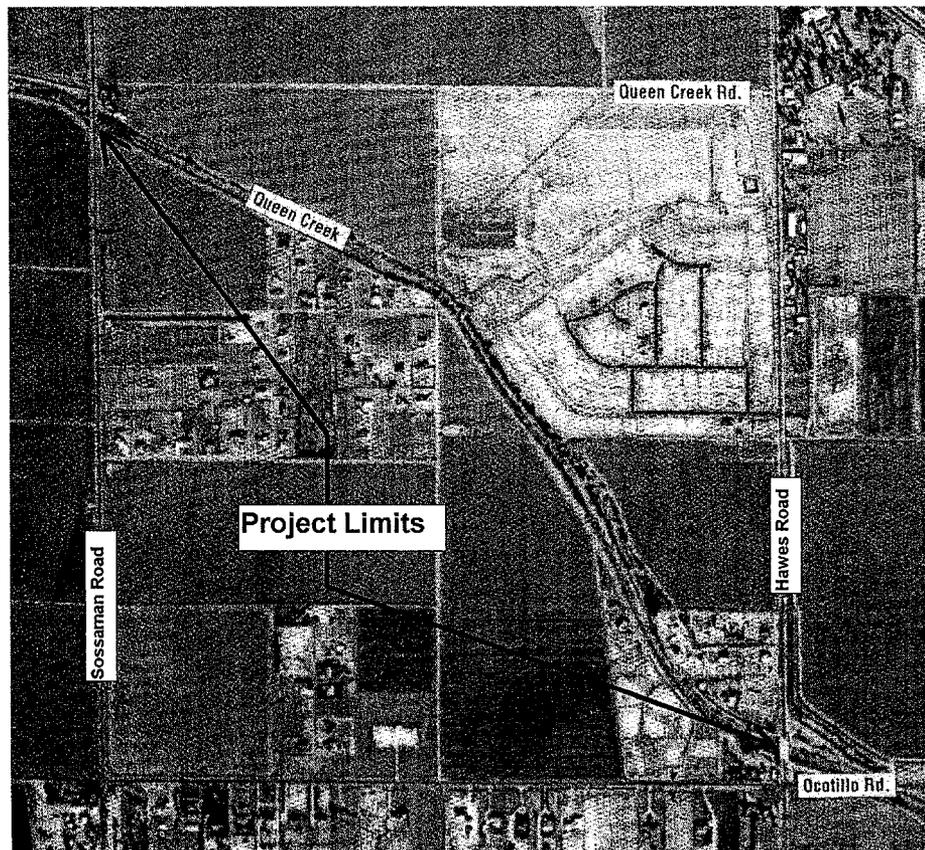
The Town of Queen Creek invites you to attend a public meeting to discuss the upcoming improvements to Queen Creek Wash, between Hawes Road and Sossaman Road. As a resident, with property near or adjacent to the wash, your opinion and insight is valued by the Town. We would like to hear your views.

Exhibits showing the proposed improvements, including aerial photographs will be on display at the meeting for all to view and comment on. Opportunity will be provided for you to write your comments down, and submit them to the Town.

A brief description of the project follows:

The existing Queen Creek Wash does not contain the flows produced by the 100-year storm. The improvements made as part of this project will provide 100-year flow capacity in the wash, while removing the existing berms along both banks. The project will also enhance the community with recreational opportunities. The improvements include a bridge at Sossaman Road, a paved pathway system, and equestrian access.

Please stop in on January 14, 2002 between 6 p.m. and 8 p.m. to see what is planned, and how it will benefit your area.



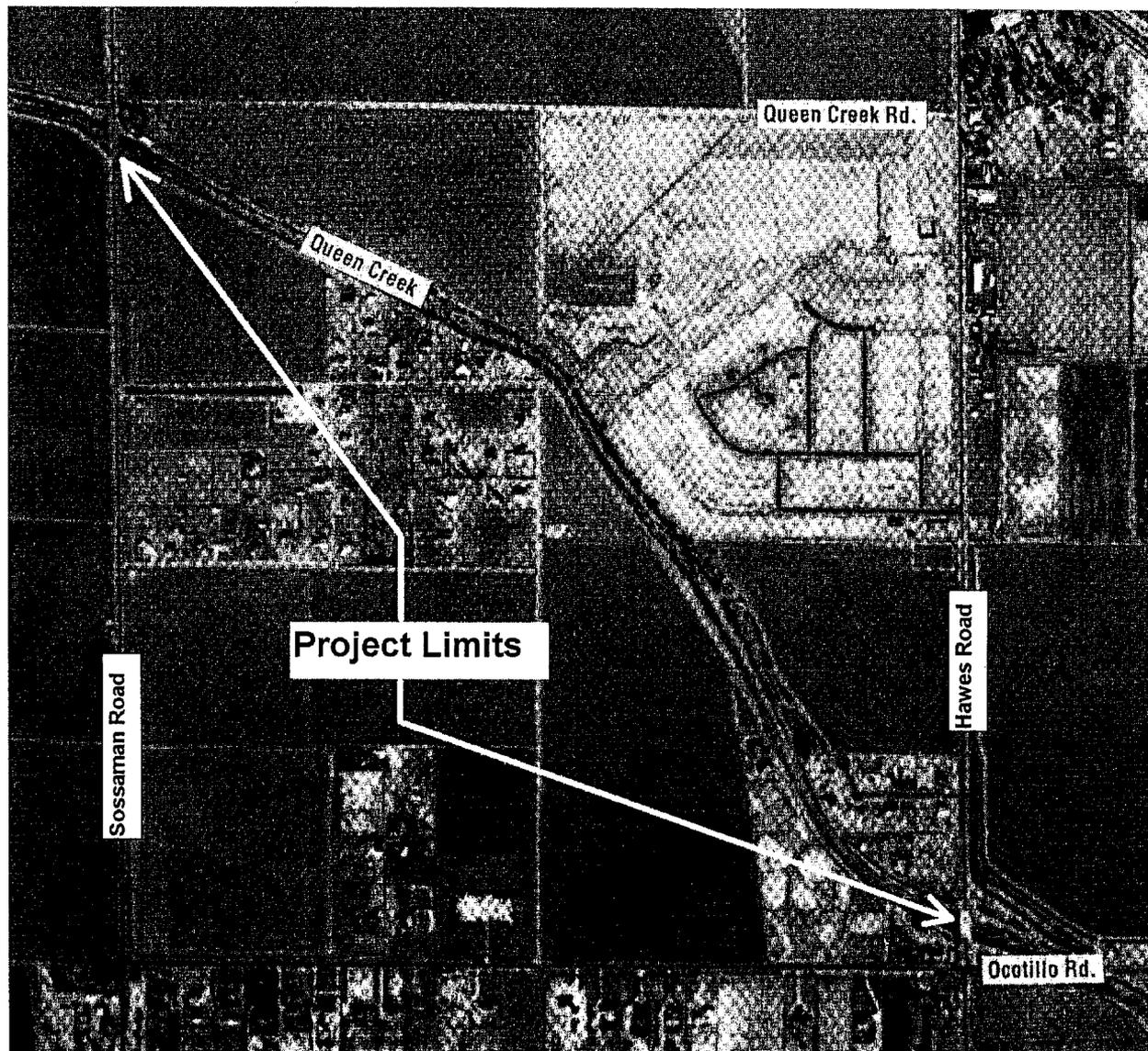
[Distributed at January 14, 2002 public meeting]

1/2

QUEEN CREEK WASH IMPROVEMENT PROJECT

Hawes Road to Sossaman Road

Project Information

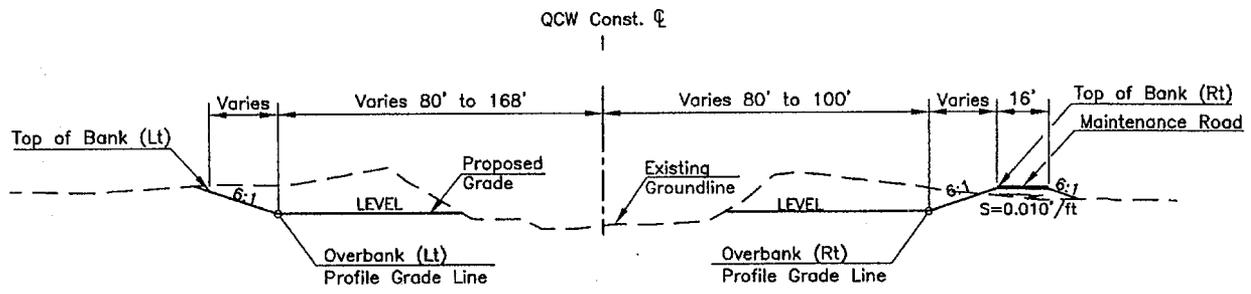


In order to ensure flood protection for the current and future residents of the Town of Queen Creek who live in the vicinity of Queen Creek Wash between Hawes Road and Sossaman Road, Queen Creek Wash must be improved. This project will improve Queen Creek Wash, increase the capacity of the wash, and remove the existing berms along the banks of the wash. After construction of the improvements is complete, residents will have flood protection from the 100-year storm. The project will also enhance the community with recreational opportunities. The

improvements include a bridge at Sossaman Road, a paved pathway system, and equestrian access.

The current concept is to preserve the sandy bottom of the existing wash along with much of the vegetation along the wash bottom. Additional capacity will be created by cutting into the sides of the wash starting at a point approximately 2' above the sandy bottom, and carving out an area that will convey flood waters down the wash. The design shows these cuts occurring on both sides of the wash for the majority of the length of the project.

At 2 different locations within the project, the existing side slopes of the wash on the south side are extremely steep. Several locations have begun to show undercutting of the slope. The improvements associated with this project include "flattening" these steep slopes to a slope not steeper than 4 to 1 (horizontal to vertical).



Typical Wash Cross Section

1/1
[mailed to all property owners in the area]

Queen Creek Wash Improvements

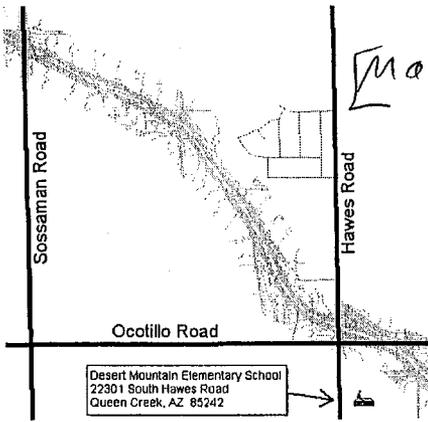
Tuesday, November 19, 2002

Desert Mountain Elementary School, Room #214

22301 South Hawes Rd.

Queen Creek, AZ 85242

5:30 p.m. – 7:30 p.m.



The Town of Queen Creek and the Flood Control District of Maricopa County invite you to attend a public meeting to discuss the upcoming improvements to Queen Creek Wash, between Hawes Road and Sossaman Road. As an owner of property near or adjacent to the wash, your opinion and insight is valued by the Town and by the Flood Control District. We would like to hear your views.

Exhibits showing the proposed improvements, including aerial photographs will be on display at the meeting for all to view and comment on. Opportunity will be provided for you to write your comments down, and submit them to the Town and the Flood Control District.

A brief description of the project follows:

The existing Queen Creek Wash does not contain the flows produced by the 100-year storm. The improvements made as part of this project will provide 100-year flow and flood control capacity in the wash, while removing the existing berms along both banks. The project will also enhance the community with recreational opportunities. The improvements include a bridge at Sossaman Road, a paved pathway system, and equestrian access.

Please stop in on November 19, 2002 between 5:30 p.m. and 7:30 p.m. to see what is planned, and how it will benefit your area.

For information, please contact Kevin Roberts by phone at 602-957-1155, or by email at kroberts@dibblecorp.com.



APPENDIX B.5

CONTRACT DOCUMENTS (SCOPE OF WORK)

May 12, 2005

Mr. Tom Narva, C.I.P. Manager
Town of Queen Creek
22350 S. Ellsworth Road
Queen Creek, AZ 85242-9311

Re: **Queen Creek Wash- Power Road to Hawes Road
Contract Change Order – FEMA LOMR Submittal**

Dear Mr. Narva:

Dibble & Associates (DIBBLE) presents our fee proposal for providing engineering services for the above referenced project required to prepare the FEMA Letter of Map Revision (LOMR) submittal. The scope of work is described as follows:

SCOPE OF WORK

I. Project Coordination

Project Coordination will include project management and meetings required during preparation of the LOMR submittal. It is anticipated that up to two meetings will be required with the Town and/or FCDMC.

II. Data Collection

Data collection will include site visits to evaluate the channel conditions upon completion of construction as required to establish n-values and for determination of hydraulic cross-section locations.

III. Survey, Photogrammetry, & Mapping

A. Survey

Control panels will be set for aerial mapping using established project horizontal and vertical control. Additional points will be surveyed for the mapping accuracy check required by FEMA. The results will be submitted on a Results of Survey exhibit. Ground surveys will be conducted under bridges, at culverts, and at other locations not visible by aerial photography.

B. Aerial Mapping

The project limits will be re-flown after the construction is complete. Aerial mapping will be prepared to meet FEMA requirements for 2-foot contour mapping. The mapping will consist of a 400-foot wide strip along the Queen Creek Channel centerline extending from the upstream side of the Ocotillo Road bridge to 500 feet downstream of the Sossaman Road Bridge.

IV. Public Involvement

No additional public notification or public meetings are anticipated for the LOMR submittal.

V. Letter of Map Revision

A. Hydraulic Modeling

The HEC-RAS model submitted to FEMA with the CLOMR submittal will be revised from Hawes Road to Sossaman Road to incorporate the new channel conditions. The previously approved flow rates from the CLOMR submittal will be used.

B. Technical Data Notebook (TDN)

The TDN will be revised to incorporate the new floodplain results for submittal to FEMA. Four copies of the TDN will be provided. The sediment transport and scour analysis will not be modified as part of this scope of work.

The fee associated with the work described herein is \$29,890.37. However, our original contract included \$1,851 to cover the cost of submitting final as-built plans of the channel to FEMA after construction completion to allow FEMA to issue the final Letter of Map Revision. Since the as-built submittal has not been made, the original contract amount can be deducted from the fee for the current work. This results in a required new authorization of \$28,039.37. The fee does not include review fees, including the FEMA review fee, which will be paid directly by the Town. Enclosed are copies of our man-hour breakdown and fee proposal worksheet.

If you have any questions, please feel free to call me 602-957-1155.

Sincerely,

Brian J. Fry, P.E.
Project Manager

enclosures

TOWN OF QUEEN CREEK
QUEEN CREEK WASH
POWER ROAD TO HAWES ROAD

SCOPE OF WORK
January 16, 2001

INTRODUCTION

The purpose of this project is to reconstruct approximately 1.4 miles of Queen Creek Wash from Sossaman Road to Hawes Road within the Town of Queen Creek including construction of a bridge and approaches at Sossaman Road. The project will include technical review of reconstruction design by others for approximately one mile of Queen Creek Wash from Power Road to Sossaman Road. The Flood Control District of Maricopa County (District) is a project partner with the Town of Queen Creek (Town) and will provide input and review of the project during design development. The terms of the District's project involvement are described in Intergovernmental Agreement IGA FCD 2000A004. The improvements will provide 100-year flood protection, preserve and re-establish native vegetation and habitat, and provide recreational and open space benefits to the community. Project tasks include public involvement and coordination with stakeholders, survey & mapping, utility locating and relocation design, 404 permit, geotechnical investigation, hydrology and hydraulic analysis, sediment transport & bridge scour analysis, channelization design, Sossaman Road bridge design, landscape and environmental mitigation design, preparation of construction documents, FEMA CLOMR submittal, and engineering assistance during construction. The scope of work is described more fully as follows:

SCOPE OF WORK

I. PROJECT COORDINATION
A. Project Management

The Consultant's Project Manager will be knowledgeable of the progress and have responsible charge of the progress of each phase of the project. The Project Manager will be the point of contact for the Town and will keep the Town informed of all coordination with outside agencies and other affected parties. The Project Manager will be responsible for all administrative issues, technical direction of the work, scheduling, and budgetary oversight for the project as well as coordination and reporting with the Town's project manager.

Project coordination will be required with the following entities during development of the channel plans:

- Flood Control District of Maricopa County (District)
- Maricopa County Department of Transportation (MCDOT)
- U.S. Army Corps of Engineers, Regulatory Branch (COE)
- Sossaman Estates, LLC

Project coordination will include preparation, attendance, and follow-up minutes for project coordination meetings in addition to the continuous coordination through telephone conversations and written correspondence.

B. Meetings

In addition to meetings identified elsewhere, attendance at the following milestone meetings will be required:

- Project Kick-off Meeting
- Pre-Design Report Review Meeting
- 30% Review Meeting
- 60% Review Meeting
- 90% Review Meeting
- Final Design Review Meeting.

C. Utility Coordination

The following utility providers have facilities within the project vicinity. Coordination will be required to identify existing and planned utilities, conflicts, and relocation.

<u>Utility Co</u>	<u>Contact</u>	<u>Phone no.</u>	
Queen Creek Water Co	Paul Gardner	480-987-3240	
Queen Creek Irrigation District	Dean Griffith	480-987-3002	
SRP	Design Engineer	Larry Neil	602-236-6233
Qwest	Design Consultant	Herb Cox	480-831-4465
	Working on new lines in this area		
	Const coordinator	John Aker	602-630-0496
CableAmerica	Jerry Blount	480-558-7260	
Queen Creek Sewer	Tom Narva	480-987-9887	

There are no conflicts with sewer at this time.

II. DATA COLLECTION

A. Site Visits

An initial site visit will be conducted with representatives from the Town, the District and the consultant project team to identify existing conditions along the channel reach and to identify key project issues. A representative from Sossaman Estates, LLC will be invited to attend. A more detailed site reconnaissance will be undertaken as part of the sediment transport analysis to observe channel development, hydraulic roughness, hydraulic structures, and sediment characteristics. Additional site visits will be made during the course of project development to verify site conditions and observe changes that may take place over time.

B. Existing Data and Reports

Existing data and reports will be obtained from the Town, the District and other sources pertaining to previous and existing studies and plans for Queen Creek Wash. Data to be collected includes the following:

- Queen Creek/Sanokai Wash Hydraulic Master Plan, FCD 98-26, September 2000 prepared by Huitt-Zollars.
- Sediment Transport Analysis – Queen Creek and Sanokai Wash Hydraulic Master Plan, East Maricopa Floodway Capacity Mitigation Study, September 5, 2000 prepared by WEST Consultants, Inc.
- Town of Queen Creek Open Space and Trails Plan, October 1994 prepared by Conoyer-Hedrick Inc., which describes trail concepts and standards.

- Native Plant Inventory for Queen Creek Wash 404 prepared by Desierto Verde dated February 2, 2000.
- Landscape, Irrigation, Salvage and Mitigation Plans for the 1 mile section of Queen Creek Wash between Power Road and Sossaman Road prepared by others. (Technical review required)
- 404 permit application and Corp. of Engineers mitigation requirements.
- Developer plans for adjacent properties (to be provided by the Town)
- Existing mapping
- Existing utility information

III. SURVEY, PHOTOGRAMMETRY, & MAPPING

All survey, photogrammetry, and mapping shall conform to Section 3 of the FCDMC *Consultant Guidelines*, Second Edition, August 1, 2000, except that data submittals will not be required to be in the GIS form prescribed in the FCDMC *Data Delivery Specifications*.

A. Field Surveys

The Consultant will establish horizontal and vertical control for aerial mapping along the design reach from Hawes Road to Sossaman Road. The mapping will be based on NAD 88 vertical control datum and the state plane coordinate system. Existing monuments and section corners will be surveyed within the project vicinity to establish project control. Surface features, including existing culverts, surface utilities, and other structures will be included. Cross-sections will be surveyed along Sossaman Road at 50 foot spacing extending 600 feet north and south of the Queen Creek Wash centerline.

B. Aerial Mapping

Aerial mapping will be prepared for a 500-foot wide strip along the Queen Creek Channel centerline from the upstream side of the Ocotillo Road Bridge east of Hawes Road to 500 feet downstream of the Sossaman Road crossing. Mapping will be prepared at 1"=40' scale with a 1-foot contour interval.

A color aerial photo digital image in TIFF format will be provided, rectified to match the aerial mapping.

C. Utilities

Surface and underground utilities within the project limits will be identified in the field survey. An ALLOWANCE will be established for potholing where critical underground utility conflicts may exist.

IV. PUBLIC INVOLVEMENT

A. Stakeholders

Project stakeholders include the equestrian community that will use the trail system and the adjacent landowners. Adjacent landowners include:

- ◆ Queen Creek 46 Partnership
- ◆ Lawther Family Ltd Partnership
- ◆ Emperor Estates Development Inc.
- ◆ Healy Investments Ltd Partnership
- ◆ Hankin LLC

A meeting will be conducted with the stakeholders at the 90% or final plans completion level to discuss project implementation issues.

B. Public Meetings

Two public meetings will be held. One public meeting will be held at completion of the pre-design phase to inform the public of the project and to receive input and comments from the public. The second meeting will be held following the 60% or 90% design to receive comments and input on the design. The Town will determine the timing of the second meeting. The Consultant will be responsible for meeting preparation and scheduling. The Town will assist the Consultant in identifying the meeting location. Meetings will be in an open house format with display boards showing the proposed project elements. Information brochures will be provided by the Consultant to be distributed at the meetings.

V. RIGHTS-OF-WAY AND EASEMENTS

Existing ROW will be shown on the base drawings. Preliminary ROW requirements will be shown on the 30% plans. Legal descriptions with exhibits will be prepared for required new ROW, easements, and temporary construction easements (TCE's) following the 60% submittal. Legal descriptions and exhibits will be updated as necessary during the 90% and final plans completion to incorporate required changes. The Town will acquire all ROW and easements. The Town will obtain rights-of-entry for access to the Wash during design and data collection.

VI. 404 PERMIT

An individual 404 permit has already been submitted to the COE with the Town designated as the permittee. The COE has requested additional information and has not distributed the application package for public comment. On-going coordination will be required with the COE to obtain the final 404 permit for this project. The permit will cover all construction activities between Power Road and Hawes Road, including the Power Road Bridge and Sossaman Road Bridge. The following tasks will be required to complete the 404 permit process.

A. Mitigation Plan

The Consultant will prepare a Habitat Mitigation and Monitoring Plan (HMMP) for submittal to the COE and the Arizona Game and Fish Department. The HMMP will be coordinated with the channel and landscape design to incorporate the proposed channel cross-section configuration and landscape plant species to be integrated within and around the mitigation areas. The limits of the HMMP will be from Power Road to Hawes Road. Coordination will be required with Sossaman Estates, LLC for the reach from Power Road to Sossaman Road.

B. Arizona State 401 Water Quality Certification

The Consultant will complete the Arizona State Water Quality certification for this project as required by the Arizona Department of Environmental Quality (ADEQ). The application form will be submitted to ADEQ on behalf of the Town. Specifically, the certification will state that construction will not occur while Queen Creek Wash is flowing, thus eliminating the potential for surface water contamination.

C. Environmental Assessment

The Consultant will assist the COE in completing the Environmental Assessment for this project. Specifically, the Consultant will provide a summary of the potential direct, indirect, and cumulative impacts to jurisdictional waters of the U.S. as a result of this project. In addition, the Consultant will provide an analysis of the contextual relationship between the Proposed Action and other activities that may occur within the foreseeable future.

VII. GEOTECHNICAL INVESTIGATION

A. Sediment Transport Sampling

Specific requirements for channel sampling and testing of channel bed and bank materials will be defined during the field reconnaissance. It is assumed that a total of 15 bed and bank material samples will be required to define sediment size distribution characteristics for sediment transport, erosion control, and scour evaluations. Bed and bank samples taken along Queen Creek will be excavated to a depth of 3 feet using a rubber-tire backhoe.

B. Bridge Foundation Sampling

Bridge and road test borings will be performed. Materials encountered will be sampled at 5-foot intervals. Borings at the bridge abutment and pier locations will be advanced to a depth of 80 feet. Samples for pavement design along Sossaman Road will be advanced to a depth of 5 feet.

C. Geotechnical Testing and Reports

Representative samples of the materials encountered will be tested for:

<u>Test</u>	<u>No. of Tests</u>
Moisture Content/Dry Density (rings)	50
Direct Shear	5
Consolidation	5
pH/ Resistivity, Salts, Chlorides, Sulfates	2
Sieve Analysis/Atterberg Limits	25
Standard Proctors	1
R-Value	1

The results of all field exploration and laboratory tests will be used in the engineering analysis and evaluation for foundation support and roadway design. The Geotechnical/Foundation Report for the bridge/road project will include recommendations for bridge foundations, earthwork factors, pavement design, site grading and preparation, and corrosion. The Geotechnical Report for the bed and bank sampling along Queen Creek will include the results of the laboratory testing.

VIII. HYDROLOGY

A. Review and Update Existing Model

The District will provide the Queen Creek watershed HEC-1 hydrology model and DDMS files for the Consultant's use. Per the recommendation in the Queen Creek / Sanokai Wash Hydraulic Master Plan (HMP), the outflow hydrograph from the Sonoqui Detention Dike will be reviewed with the District to determine if modifications are required. This task does not include generating hydrology for the Queen Creek watershed tributary to the Dike.

B. Design Flood Hydrographs

The rainfall values within the HEC-1 model will be modified to develop flood hydrographs for the 2-, 5-, 10-, 25-, 50- and 100-year return period events. Simplified methods were used to accomplish this task for the development of the HMP. The results of the hydrologic analysis will be reviewed with the Town and the District. The developed flood hydrographs will be used to evaluate flood conditions for individual flood events and for long-term conditions.

IX. HYDRAULICS

A. HEC-RAS Modeling

The District will provide the Queen Creek Wash HEC-RAS hydraulic model for the Consultant's use. The hydraulic model will be updated between the Meadowbrook Road wash crossing in the Trilogy at Power Ranch Development and Ellsworth Road, to reflect current topographic and development conditions along the channel using the best available existing data. Additional cross-sections may be added to the existing model, if necessary. New existing conditions cross-sections will be generated from the mapping being generated for this project between Sossaman Road and Hawes Road.

B. Channel Design

The channel design will develop an earth channel with mild sideslopes, landscaped with native vegetation species. The cross-section will include a meandering low flow channel designed to protect existing mature trees, where possible. Equestrian passage shall be accommodated in the drop structure design. Design features must minimize erosion and maintenance requirements.

The hydraulic design will define the channel geometry necessary for flood control, identify the location and dimension of required structures, and determine the location and specifications for erosion control revetments. The location and dimensions of required grade control structures will be defined. Preservation of existing mature trees will be considered in placement of drop structures. Hydraulic design will be conducted in accordance with Maricopa County design criteria. The results of the hydraulic design will define conditions that will influence the future elements of Queen Creek Wash.

X. SEDIMENT TRANSPORT AND SCOUR

A. HEC-6 Modeling

The Consultant will develop a HEC-6 sediment transport model for Queen Creek Wash between the Meadowbrook Road wash crossing in the Trilogy at Power Ranch Development and Ellsworth Road. The model will be used to evaluate hydraulic design elements and define requirements for erosion and sedimentation control.

The HEC-6 model will be used in conjunction with other appropriate methods to define general degradation, and scour potential characteristics in the vicinity of all hydraulic structures, including bridges, drop structures, levees, and revetments.

B. Bridge Scour Analysis

The Consultant will conduct a detailed assessment of scour potential for all proposed and existing bridge structures influenced by the design project. Hydraulic analysis will be conducted to establish existing and proposed hydraulic conditions at each bridge crossing. Hydraulic analyses will consider both the 100-year flood and a "superflood" event. The discharge of both the 100-year

flood and the superflood event will be coordinated with the Town of Queen Creek. Hydraulic characteristics will be analyzed and evaluated for each bridge. Hydraulic impacts due to debris build-up on piers will be analyzed. Scour analyses of bridges will be conducted according to the procedures outlined in the Federal Highway Administration's publication HEC-18. Results of the HEC-6 sediment transport analysis will be used to define the long-term degradation potential component of the total scour potential at each bridge site. Requirements for abutment erosion protection will also be defined.

XI. SOSSAMAN ROAD BRIDGE DESIGN

The Consultant shall design a bridge and approach roadway modifications for the Sossaman Road crossing of Queen Creek Wash. The bridge length will be approximately 150' to 250' long and the bridge width will accommodate 4 driving lanes plus a center left turn lane, curb and gutter, barriers, and a sidewalk. The bridge design shall provide a minimum of 10 feet of clearance under the bridge for equestrian passage. In addition to structural design and bridge construction plans a Bridge Structure Selection Report will be prepared for the 30% submittal.

A. Bridge Structure Selection Report

The Consultant will submit a Bridge Structure Selection Report for the new bridge prior to preparation of preliminary design and construction documents. The report will include concept sketches and studies of the type, size, and location of the bridge; aesthetic treatments; preliminary foundation investigation; preliminary cost estimate; analysis of constructability, traffic control, and environmental consequences for each alternative. Town, MCDOT, and District approval will be obtained before beginning preliminary bridge design. An initial and final Bridge Structure Selection Report will be submitted.

B. Approach Roadway Design

Approach roadway modifications will be designed for the new bridge. The bridge deck will accommodate a standard MCDOT roadway section, unless directed otherwise. Strategies for access to adjacent properties and maintenance roads at the approaches to the bridge will be considered in design.

Approach Roadway Geometry:

The horizontal alignment and final grade lines for the approach roadway will be established in conjunction with the bridge plans and required clearances at Queen Creek Wash. The horizontal alignment and bridge footprint will be presented at the first public meeting.

Temporary Construction Detour (Allowance):

A traffic detour is not anticipated to be required during bridge construction. Design of a traffic detour is included as an ALLOWANCE in this Scope of Work.

Traffic Signing and Striping:

Roadway signing and striping plans will comply with Maricopa County and ADOT practices and with the *Manual on Uniform Traffic Control Devices*. Signing plans will include location layouts for ground-mounted signs; sign layout formats; and details for regulatory, warning, and information signs. Pavement marking plans will include details for striping centerlines, shoulders, and "no-passing" zones.

XII. LANDSCAPE DESIGN

The Town has adopted Queen Creek Wash as part of its Open Space and Trails Plan. The landscape design intent is to preserve and enhance the "natural" character of the wash, preserve the rural character of the Town, and provide a corridor for a bike/pedestrian multi-use trail and a separate equestrian trail.

A. Native Plant Inventory & Salvage

Desierto Verde has completed a native plant inventory of Queen Creek Wash as part of the 404 permit requirements. The Native Plant Survey consists of an in field survey of native plant material within the project limits. A database has been developed listing each individual specimen along with information regarding species, height, width, caliper, condition, aesthetic rating, and salvageability. This information will be used for evaluation of existing material for preservation, reuse potential and to estimate salvage costs. Supplemental Native Plant Inventory (fieldwork) will be conducted as required to review and verify the information previously gathered by Desierto Verde for this area.

Based on the information gathered in the field and preliminary engineering plans and details, a native plant inventory / salvage plan will be prepared designating protected native plants impacted by the proposed construction. Each individual specimen will be located on the plan, identified by tag number, and keyed to a legend indicating whether that plant is "to be salvaged", "to be demolished", or "to be preserved in place."

An aerial photograph at a minimum scale of 1"=50' will be utilized for preparation of the Native Plant Inventory and Salvage Plans. Existing and proposed grading will be shown on the aerial photograph to determine the extent and impact on existing vegetation.

B. Preliminary Landscape Architectural Concept / Pre-design

Based on the preliminary engineering plans, native plant survey and on other pertinent data and information gathered and evaluated, a preliminary landscape concept plan will be developed. The landscape concept package will consist of the following:

- An overall plan and/or typical plan sections graphically depicting the proposed landscape design for Queen Creek Wash. The landscape concept will include the typical trail system landscape concept and incorporation of the required 404 permit landscape mitigation areas. The landscape concept plan will also include a preliminary plant list and notes.
- Cross sections or elevations as required illustrating the proposed landscape design (if necessary)
- A preliminary opinion of probable construction cost
- Narrative text will be prepared describing the proposed landscape concept.
- Text and graphics will be incorporated in the overall project Pre-Design Study Report and will be submitted to the Town, FCD, and other Project Stakeholders for review and comment.
- The landscape concept design package will be rendered in color and mounted, suitable for presentation at public meetings.

C. Landscape Construction Documents

The final landscape construction documents shall provide for rock groundcover, plantings and a complete automated irrigation system design for designated landscape areas within the project limits including the required 404 permit landscape mitigation and the trail system. Plans will include: native plant salvage, planting & irrigation along with associated details and special provisions.

XIII. CONDITIONAL LETTER OF MAP REVISION (CLOMR)

The District will provide the currently effective FEMA HEC-RAS hydraulic model, to be used as the base hydraulic model for the CLOMR submittal. Per FEMA requirements, the water surface must tie into the currently effective FEMA study water surface at the upstream and downstream end of the modified reach. The CLOMR submittal will include the following:

A. ADWR Requirements

The Arizona Department of Water Resources (ADWR) requires submittal of a *Technical Data Notebook* (TDN) along with each FEMA submittal. Requirements for TDN submittals are presented in *Instructions for Organizing and Submitting Technical Documentation for Flood Studies*, SSA 1-97, November 1997.

B. FEMA Requirements

FEMA submittal requirements are described in 44 CFR 65.6, *Revision of base flood elevation determinations*, & 65.8, *Review of Proposed Projects*. The following items will be included in the FEMA submittal:

- FEMA Forms
- Construction plans
- Revised hydraulic analysis
- Revised floodplain delineation

C. LOMR Submittal

The CLOMR submittal will be made at the conclusion of the design and will include final, sealed construction plans. Construction can proceed without the CLOMR during the FEMA review. Upon FEMA approval and completion of construction, a LOMR submittal will be prepared consisting of certified as-built channel and bridge construction plans. The Contractor will be required to prepare and certify the as-built plans

XIV. PRE-DESIGN

The pre-design phase will further develop the design concept identified in the Hydraulic Master Plan to a level of detail that can be used for the 30% design.

A. Sossaman Estates Channel Design Review

The Consultant will review the channel modifications proposed by Sossaman Estates, LLC between Power Road and Sossaman Road. Review comments on the proposed hydraulic design elements for the proposed improvements and recommendations for coordination of the proposed development with the current project will be developed and provided to the Town during the Pre-design. Subsequent plan submittals will be reviewed until final plan approval.

B. Pre-Design Study Report

The Pre-Design will include the following tasks:

- ◆ Data Collection
- ◆ Aerial mapping and topographic surveys
- ◆ Habitat mitigation and monitoring plan
- ◆ Geotechnical investigation
- ◆ Preliminary hydraulic analysis & HEC-RAS modeling
- ◆ Preliminary profile design
- ◆ Sediment transport analysis
- ◆ Native plant inventory
- ◆ Preliminary landscape concept
- ◆ Ryland channel design review

A *Pre-Design Study Report* will be submitted presenting the results of all the pre-design tasks.

XV. FINAL DESIGN AND CONSTRUCTION DOCUMENTS

Construction documents will generally be prepared according to District *Consultant Guidelines* and *Drafting Guides* using AutoCAD software. Design review submittals will be made at the 30%, 60%, 90%, and Final completion levels. A three-week review period will be included in the schedule for each submittal.

A. 30% Design

Base map preparation will begin during the pre-design, however, the 30% design will be developed after approval of the pre-design submittal. The 30% plans will show all existing features including utilities and existing ROW. The channel alignment, profile, and cross-section will be shown along with anticipated required new ROW and easements. Conflicting utilities will be identified for relocation. The preliminary planting plan will depict a landscape concept indicating proposed materials. Preliminary quantities and cost estimates final Bridge Structure Selection Report, and preliminary design calculations will also be included with the submittal.

B. 60% Design

The 60% plans will incorporate comments from the 30% review and will refine the design and hydraulic analysis. Preliminary construction details will be developed to show the size, configuration, materials, and section of the proposed improvements. Preliminary planting and native plant salvage plans will be included along with a "skeleton" irrigation design. The first draft construction special provisions (SP) and supplementary general conditions (SGC) and an updated quantity and cost estimate will be included.

C. 90% Design

The 90% plans will include all final details with reinforcing steel for concrete structures. The plans will be complete and ready for final agency review. Updated SP's, SGC's, quantity and cost estimates, and the bid form will be included as well as the final design report.

D. Final Design

The final design plans will incorporate any comments from the 90% review. The plans, SP's, and SGC's will be ready for contractor advertisement and bidding.

E. Special Provisions & Bid Documents

Special Provisions will be based on MAG Standard Specifications. All Special Provision items will be organized and numbered according to the MAG Specifications with each provision identifying whether it modifies, adds to, or replaces the applicable MAG provision. The front-end boilerplate provisions will be provided by the Town.

F. Engineer's Construction Cost Estimate

An Engineer's estimate will be provided with each plan submittal. The 60%, 90%, and Final estimates will be numbered according to the MAG specifications.

G. Bidding Assistance

The Town will provide copies of plans for bidding. The Consultant will attend the pre-bid meeting, respond to contractor questions, and issue necessary addenda during the bidding process.

XVI. ENGINEERING SERVICES DURING CONSTRUCTION (Allowance)

An ALLOWANCE will be established for the Consultant to respond to questions and design issues during construction. The allowance will be used on a time and materials basis as needed.

APPENDIX C

SURVEY FIELD NOTES

APPENDIX C.1

PRE-CONSTRUCTION SURVEY REPORT

QUEEN CREEK

GPS DATA

Prepared By:
Z & H ENGINEERING, INC.

For:
DIBBLE & ASSOCIATES



717 West Dunlap Avenue, Suite 100
Phoenix, Arizona 85021

QUEEN CREEK

**GPS CONTROL
DATA**



Final mapping data for Queen Creek Wash Old Panel points in West area from Hawes Rd.to Confluence															
Pt #	Northing	Easting	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation							
	NAD83(92)	NAD83(92)			NAVD 29	NGVD 88	NGVD 88	NGVD 88							
	GPS	GPS	Collins Pina	DTM	GPS	GPS	PUB	Z&H Levels			88-GPS	88-29	gps-cp		
1023a	819250.245	780272.991	1375.020			1377.370							2.350		
1024a	818942.882	779836.097	1375.380			1377.730							2.350		
1025	819741.053	779672.211	1369.470		1372.732	1371.816		1371.710	tbm1025	Rock near old panel 1025	-0.106	-0.916	2.346		
1026			1370.750			1373.100							2.350		
1027	820870.798	779290.274											0.000		
1028	821584.961	778591.949	1364.590		1368.243	1367.245						-0.998	2.655		
1029	821657.249	777893.022	1365.210			1367.810							2.600		
1030	822207.799	777867.981	1366.720			1369.320							2.600		
1031	822596.133	776927.690	1356.210		1359.823	1358.762							-1.061	2.552	
1032	822951.573	775649.932	1359.850		1363.402	1362.308							-1.094	2.458	
1033	823434.178	775640.650	1359.920			1362.430							2.510		
1034	823463.446	775649.932	1355.270			1357.780							2.510		
1035	823311.066	773033.122	1350.430			1352.940							2.510		
1036	823850.522	773000.465	1349.830			1352.340							2.510		
1037	823641.753	771685.378	1347.290		1351.031	1349.846		1349.613	tbm1037	1/2" RB on North side of Queen Creek	-0.233	-1.185	2.556		
1038	823397.533	770507.590	1349.020			1351.670							2.650		
1039	824053.288	770494.328	1347.030		1350.992	1349.772		1349.373	tbm1039	pk nail Power Rd. N of Queen Creek	-0.399	-1.220	2.742		
1040	823546.188	769210.798	1338.690			1341.400							2.710		
1042	823738.274	767872.291	1335.650			1338.380							2.730		
1043	823414.078	766545.908	1334.570			1337.300							2.730		
1044	823135.749	765178.934	1329.420			1332.150							2.730		
1045	823593.212	765201.885	1327.850			1330.570							2.720		
1046	823348.593	763985.930	1327.880			1330.600							2.720		
1047	823136.292	762599.659	1324.430			1327.150							2.720		
1048	823661.919	762527.362	1320.730			1323.440							2.710		
1049	822795.678	761320.750	1322.050		1326.084	1324.755		1324.323	tbm1049	tbm1049 rebar in old panel	-0.432	-1.329	2.705		
1050	822243.682	760377.060	1321.450			1324.160							2.710		
1051	822644.812	760280.758	1317.020			1319.730							2.710		
1052	821592.029	759789.655	1315.430			1318.160							2.730		
1053	820203.689	759670.781	1315.620			1318.370							2.750		
1054	820236.781	760200.515	1318.310			1321.080							2.770		
1055	819133.263	759665.711	1311.450			1314.250							2.800		
1056	818238.604	758720.955	1313.440			1316.260							2.820		
1057	817892.383	759044.465	1313.580			1316.420							2.840		
1058	817091.107	758188.310	1311.510			1314.360							2.850		
1059	816117.076	757151.906	1307.660		1311.689	1310.523		1309.923	tbm1059	nail West side canal	-0.600	-1.166	2.863		
1060	815841.662	757429.294	1309.970			1312.820							2.850		
1061	815244.485	756794.924	1308.400		1312.396	1311.254		1310.683	tbm1061	nail west side canal	-0.571	-1.142	2.854		
1062	814689.606	755499.731	1307.080			1309.940							2.860		
1063	814553.857	756257.103	1308.560			1311.430							2.870		
1064	813728.037	755341.759	1296.520			1299.400							2.880		
1065	812646.717	754597.779	1307.720			1310.610							2.890		
1066	812337.071	755087.546	1304.230		1308.202	1307.133		1306.478	tbm1066	tbm1066 nail in old panel	-0.655	-1.069	2.903		
														Average Correction to Kenney Data	2.683

Final mapping data for Queen Creek Wash points in Culvert Crossing Meadowbrook Rd. & Other areas											
Pt#	Northing	Easting	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation			
	NAD83(92)	NAD83(92)			NAVD 29	NGVD 88	NGVD 88	NGVD 88			
	GPS	GPS	Collins Pina	DTM	GPS	GPS	PUB	Z&H Levels		88-GPS	88-29
472	818064.412	785600.127				1398.936	1398.881	1398.862	2DN1	GDACS Point 2DN1 Rod Driven Refusal	-0.074
1381	818117.241	780979.932			1381.080	1383.429		1383.309	tbm3	BC Hole Hawes & Ocotillo	-0.120
						1378.923		1378.823	tbm6	BC FL in Culdesac	-0.100
						1363.123		1363.013	tp111	Pan 32	-0.110
								1344.333	tp141	E6 SW	
								1332.978	tbm70	nail	
								1331.808	tp148	FL North pipe East End	
								1331.838	tp149	FL Center pipe East end North	
								1331.818	tp150	FL Center pipe East end South	
								1333.438	tp151	FL South pipe East end	
								1332.916	tp153	FL South pipe West end	
								1332.746	tp154	FL Center pipe West end South	
								1331.356	tp155	FL Center pipe West end North	
								1331.404	tp156	FL North pipe West end	
								1340.632	tp157	BSW NW Cor Bridge	
								1342.062	tp158	CLS West side pipe to N on West side	
								1342.722	tp159	CLS West side center pipe West end North	
								1343.252	tp160	CLS West side center pipe West end South	
								1343.612	tp161	CLS West side South end pipe West side	
								1344.162	tp162	CLS East side center pipe West end South	
								1336.888	tp167	NE Cor Bridge nail	
								1340.618	tbm17	NW Cor Bridge BSW	
						1335.030		1334.803	bm7	bchh SW Cor Bridge Recker & Queen Creek R	-0.227
						1334.310		1334.158	bm8	1/2"RB 1/2 mile West Recker & Queen Creek F	-0.152
						1335.540		1335.353	bm9	BCF Top Wall on Bridge Queen Creek & Higley	-0.187
1326	820669.357	759938.356			1326.010	1328.648		1328.143	bm1326	BCHH Southbound Lane Higley Rd.	-0.505
						1325.960		1325.748	bm10	1/2"RB 1/2 mile S on Higley Rd	-0.212
						1315.310		1315.083	bm11	1/2"RB East side of Canal	-0.227
						1312.830		1312.568	bm12	rock in cc East side canal	-0.262
						1331.620		1331.393	bm13	1/2"RB N side of wash 200' E bridge	-0.227

Final mapping data for Queen Creek Wash New Panel points in Center area from Hawes Rd.to Power Rd.												
Pt #	Northing	Easting	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation				
	NAD83(92)	NAD83(92)			NAVD 29	NGVD 88	NGVD 88	NGVD 88				
	GPS	GPS	Collins Pina	DTM	GPS	GPS	PUB	Z&H Levels			88-GPS	88-29
11	823594.378	770504.624			1354.028	1352.825		1352.633	bm6	bc fl Power Rd & Queen Creek	-0.192	-1.203
20	823425.703	780889.819			1378.358	1377.334		1377.228	tbn7	BCHH Hawes & Queen Creek	-0.106	-1.024
21	820771.116	780934.889			1379.849	1378.919				BCHH		-0.930
23	818117.187	783624.381			1393.899	1393.106				BC FL		-0.793
24	815460.578	780992.652			1385.591	1384.846				BCHH		-0.745
25	818109.586	778355.830			1377.336	1376.455				CPS		-0.881
26	818101.829	775730.982			1371.254	1370.330				PK		-0.924
27	820587.212	775689.146			1366.142	1365.130				CPS		-1.012
28	823433.544	775641.007			1363.232	1362.121		1362.023	tbn8	RB Queen Creek & Sossmann	-0.098	-1.111
30	823986.466	775635.089			1360.965	1359.835				PNL		-1.130
31	823235.611	775645.866			1362.395	1361.291				PNL		-1.104
32	823319.584	775317.167			1366.252	1365.139				PNL		-1.113
33	822258.056	775660.905			1363.336	1362.266				PNL		-1.070
34	822175.175	778340.255			1369.221	1368.198				PNL		-1.023
35	823052.562	776090.265			1365.102	1364.011				PNL		-1.091
36	822576.322	777095.203			1369.312	1368.254				PNL		-1.058
37	821755.557	778301.691			1372.334	1371.326				PNL		-1.008
38	821704.553	777905.384			1368.118	1367.104				PNL		-1.014
39	821418.023	778551.088			1373.624	1372.632				PNL		-0.992
40	820739.858	779262.283			1373.751	1372.794				PNL		-0.957
41	818496.284	780974.011			1385.814	1384.964		1384.836	tbn4	PK Nail Hawes Rd. N. Queen Creek	-0.128	-0.850
42	818524.085	780860.181			1390.448	1389.594				PNL		-0.854
43	817531.288	782254.940			1386.835	1386.040				PNL		-0.795
44	818287.423	782691.525			1389.932	1389.117				PNL		-0.815
45	818117.397	781854.390			1390.044	1389.221		1389.119	tbn2	PK Nail Ocotillo E. of Bridge	-0.102	-0.823
46	819881.462	779572.178			1379.572	1378.650				PNL		-0.922
47	819279.965	779836.789			1378.737	1377.840				PNL		-0.897
48	818903.720	780047.057			1379.871	1378.991				PNL		-0.880
49	818304.576	779735.879			1380.998	1380.134				PNL		-0.864
103	823235.944	775666.393			1362.435	1361.331				ZH3		-1.104
											Average Correction to Aerial Data	-1.000

Final mapping data for Misc. Points, ERMs										
Pt #	Northing	Easting	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation		
	NAD83(92)	NAD83(92)			NAVD 29	NGVD 88	NGVD 88	NGVD 88		
	GPS	GPS	Collins Pina	DTM	GPS	GPS	PUB	Z&H Levels		88-GPS 88-29
473	804890.688	786304.644			1419.197	1418.909			erm 1416 mcbchh	-0.288
474	818117.657	786280.328			1402.166	1401.417			erm 2126 mcbchh	-0.749
475	826095.760	775601.968			1359.859	1358.655			5007 1 1/2" AC	-1.204
476	820767.897	775686.133			1365.351	1364.333			5002 1 1/2" AC	-1.018
477	820868.800	773055.694			1357.066	1356.001			5005 1" IP	-1.065
478	818333.238	770587.137			1355.694	1354.675			7002 bchh dea108	-1.019
479	820964.782	770546.089			1349.408	1348.298			7003 bchh dea107	-1.110
480	824533.981	770490.628			1346.644	1345.409			7050 bchh dea122	-1.235
481	826224.738	770465.656			1344.293	1342.998			7007 bchh dea107	-1.295

Pt#	Northing (ft)		Easting (ft)		Elevation (ft) NGVD 29	Description
	NAD83(92) GRID	NAD83(92) GRID	NAD83(92) GRID	NAD83(92) GRID		
1	819434.552	780562.032	1382.843	Base PNL		
2	828701.969	786118.009	1392.000	T2SR7ES10NW		
3	818117.579	786260.325	1403.000	T2SR7ES15		
4	817323.000	791109.000	1414.520	R364 1967		
5	843940.971	785927.070	1384.711	BILLY 1975		
6	815117.146	794086.093	1427.507	G 68 1980		
7	811778.000	798622.000	1445.906	Q 364 1967		
8	802184.150	781039.045	1426.000	T2SR7ES33SW		
9	802246.129	786320.889	1438.000	T2SR7ES34SW		
10	823713.289	771621.312	1350.750	MCDOT Cap Given		
11	823594.378	770504.624	1356.228	MCDOT Cap GPS		
20	823425.703	780889.819	1378.710	BCHH		
21	820771.116	780934.889	1380.847	BCHH		
22	818116.636	780979.987	1385.910	BC .05		
23	818117.187	783624.381	1395.062	BC FL		
24	815460.578	780992.652	1387.887	BCHH		
25	818109.586	778355.830	1379.459	CPS		
26	818101.829	775730.982	1373.857	PK		
27	820587.212	775689.146	1368.140	CPS		
28	823433.544	775641.007	1364.538	1/2"RB		
29	823429.622	778265.413	1378.710	TP		
30	823986.466	775635.089	1362.136	PNL		
31	823235.611	775645.866	1363.748	PNL		
32	823319.584	775317.167	1367.644	PNL		
33	822258.056	775660.905	1364.928	PNL		
34	822175.175	778340.255	1370.345	PNL		
35	823052.562	776090.265	1366.420	PNL		
36	822576.322	777095.203	1370.564	PNL		
37	821755.557	778301.691	1373.569	PNL		
38	821704.553	777905.384	1369.437	PNL		
39	821418.023	778551.088	1374.897	PNL		
40	820739.858	779262.283	1375.062	PNL		
41	818496.284	780974.011	1387.366	PNL		
42	818524.085	780860.181	1392.013	PNL		
43	817531.288	782254.940	1388.391	PNL		
44	818287.423	782691.525	1391.223	PNL		
45	818117.397	781854.390	1391.529	PNL		
46	819881.462	779572.178	1381.038	PNL		
47	819279.965	779836.789	1380.302	PNL		
48	818903.720	780047.057	1381.491	PNL		
49	818304.576	779735.879	1382.822	PNL		
103	823235.944	775666.393	1363.785	ZH3		

Pt#	Northing (ft)	Easting (ft)	Elevation (ft)	Description
	NAD83(92)	NAD83(92)	NGVD 29	
	GROUND	GROUND		
1	819513.121	780636.873	1382.843	Base Panel
2	828781.425	786193.382	1392.000	T2SR7ES10NW
3	818196.021	786335.712	1403.000	T2SR7ES15
4	817401.366	791184.852	1414.520	R364 1967
5	844021.889	786002.426	1384.711	BILLY 1975
6	815195.300	794162.230	1427.507	G 68 1980
7	811855.834	798698.573	1445.906	Q 364 1967
8	802261.065	781113.932	1426.000	T2SR7ES33SW
9	802323.049	786396.282	1438.000	T2SR7ES34SW
10	823713.289	771621.312	1350.750	MCDOT Cap Given
11	823673.345	770578.500	1356.228	MCDOT Cap GPS
20	823504.654	780964.692	1378.710	BCHH
21	820849.813	781009.766	1380.847	BCHH
22	818195.078	781054.868	1385.910	BC .05
23	818195.629	783699.516	1395.062	BC FL
24	815538.765	781067.535	1387.887	BCHH
25	818188.027	778430.460	1379.459	CPS
26	818180.269	775805.360	1373.857	PK
27	820665.891	775763.520	1368.140	CPS
28	823512.496	775715.376	1364.538	1/2"RB
29	823508.573	778340.034	1378.710	TP
30	824065.471	775709.457	1362.136	PNL
31	823314.544	775720.235	1363.748	PNL
32	823398.525	775391.505	1367.644	PNL
33	822336.895	775735.276	1364.928	PNL
34	822254.006	778414.883	1370.345	PNL
35	823131.477	776164.677	1366.420	PNL
36	822655.191	777169.712	1370.564	PNL
37	821834.348	778376.315	1373.569	PNL
38	821783.339	777979.970	1369.437	PNL
39	821496.781	778625.736	1374.897	PNL
40	820818.552	779336.999	1375.062	PNL
41	818574.762	781048.892	1387.366	PNL
42	818602.566	780935.050	1392.013	PNL
43	817609.673	782329.943	1388.391	PNL
44	818365.881	782766.570	1391.223	PNL
45	818195.839	781929.355	1391.529	PNL
46	819960.073	779646.924	1381.038	PNL
47	819358.519	779911.560	1380.302	PNL
48	818982.237	780121.848	1381.491	PNL
49	818383.036	779810.641	1382.822	PNL
103	823314.876	775740.764	1363.785	ZH3

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PROJECT REPORT
Queen Creek Wash
26 April 2001

AUG 23 2001

DIBBLE & ASSOC.

Section 1: Project Overview

Introduction

This is the report for Z&H Engineering of the survey of the Queen Creek Wash between Hawes Road and Sossaman Road. This report contains a project overview and then details the observations, problems encountered, reduction and adjustments performed to provide Horizontal and Vertical control for mapping a 400 foot wide strip along Queen Creek.

Method

The geodetic control survey was completed using ASHTECH- Z12 dual channel GPS receivers and a WILD N-3 Level with a Philly rod. The receivers collected data from the GPS, a constellation of satellites developed for the Department of Defense using RTK methods. The level was used for verification of elevation data from NSRS bench mark stations using 3rd Order procedures.

Control Selection

Horizontal Control

The following National Geodetic Survey (NGS) stations were used as the basis for the horizontal control:

G 68 1980 "B" Order station NGS
T2SR7ES15
T2SR7ES34SW

Vertical Control

The following stations were used as the basis for the vertical control:

R 364 1967 NGS
G 68 1980 NGS
Q 364 1967 NGS
ERM 1416 Maricopa County Brass Cap
ERM 1381 Maricopa County Brass Cap

The two ERM's were used as an effort to stabilize the vertical plane. However, they actually created a tilt.

Sequence of Events

1. After completing the original tasking we tied to the Bench mark on Power Road and the Queen Creek Bridge. The difference in elevation was slightly less than 5 feet. The position was off 125 feet by 115 feet, indicating to me that this coordinate might be a Ground coordinate instead of a Grid coordinate. After applying the Grid/Ground factor for this area the coordinate checked within a few hundredth of a foot horizontally. The vertical was still a problem that could not be explained without further investigation.
2. Next, I was invited to attend a meeting at Dibble to discuss the vertical problem we had found. (Ref Attachment A).
3. I was assigned to survey the additional points provided by Dibble (See Action Items, Attachment A). I was given two additional days of GPS to complete the Action Items. Upon completion of the two days, I found that the data provided was on different datums in the vertical and some of the points were on Grid while others were on Ground. I also found that the points selected were not the points used to create the primary models of the Queen Creek Wash. The points were instead, other projects that had been done near the wash. I discovered that there were two main studies for the Queen Creek Wash. One done in 1995 from the County line to just past Hawes Road and the other in 1997 from Hawes Road to Greenfield Road. In order for me to evaluate the elevation problem, I needed some of both projects points or the stations and data used to establish them.
4. I spoke with Dave Vanderlinden of Z & H Engineering to get approval to go to the Flood Control office and get the data on the points I needed. He spoke with Dibble and got the okay to gather the correct information from Marta Dent at Flood Control.
5. I contacted Marta Dent and arranged for a time to come in to do research on the points I needed. I took my research person, Trent Moody, with me to Flood Control. Marta gave us the folders containing the original survey data for both projects as well as a third one that was in the area. We looked through the folders and found the level and the horizontal survey data collected for each of the points in the two studies. I found an error in the starting elevation for one of the projects level loops. That changed all of the elevations in the East project by about 0.6 feet. I also found several other problems with the data, such as Grid/Ground errors. I was running out of time for the day so we asked Marta if we could copy the pertinent data and take it with us for further investigation. She said that would be fine and to let her know what we found out. This process took one full day of office time for both Trent and myself including the time with Marta.
6. Errors were found in the data which required additional observations to prove the corrections and the GPS data, as well as tie down the apparent differences in datums from the East study to the West study.

7. Our research and additional observations led to another meeting at Queen Creek to discuss the findings and make a Plan of Action to proceed. Approval was given at that meeting for 2 additional GPS observation days and four days of levels to verify the datum differences and the originally assigned GPS data from Hawes Road to Sossaman Road.
8. The levels were run by Z & H Engineering, processed and compared with the GPS solution. This resulted in a correction to the GPS data of about 1.5 feet, reducing the differences in the datums to about 3.5 feet. The GPS files were adjusted to account for the errors found in the ERMs and the adjusted data was then compared to the level loops run by Z & H Engineering resulting in a check on the level loops of less than 0.1 foot. This is within the expected error of GPS Vertical observations. At this point we had two sources that agreed on the vertical datum differences. The average difference in the West study from the corrected Level loop data of the East study is 3.56 feet. It should be noted that the errors in the ERMs caused a tilt in the GPS vertical plane. Which results in the need to readjust the aerial mapping by about 1.5 feet.
9. This information was presented at the last meeting at Dibble where we were assigned to continue to check to the West study to see if the datum differences were still 3.56 feet and to bring together all of Queen Creek Wash in the same Datum.

To be continued after additional data collection.....

Bob Phillips

The remaining observations and levels were obtained in the 29 vertical datum and check sections were run to verify the final solution in the 29 datum. The check sections revealed that the NGS control points did not agree within the allowable tolerances. Additional levels were run to attempt to find two NGS Control points that fall within the tolerance. Stations G 68, and S 364 resulted in the best solution and just within the tolerances of third order leveling. These points and the other points not meeting the allowable error are all part of a NGS First Order level line and should all be within the allowable tolerances. The same level data was processed using the NAVD 88 control values and all control points fell within the allowable tolerances.

I contacted NGS to discuss the history of this particular level line and was sent the complete history of the line and others within the area. I was told that there is documented subsidence issues in the area of the Queen Creek Wash. This explained the problems originally encountered in the earlier observations addressed in this report. It was the recommendation of the NGS that we not use NGVD 29 for our study. This along with the data problems led me to the decision that we should be using NAVD 88 to complete the study.

**Project Datum Resolution Meeting
Dibble & Associates
Monday, July 16, 2001**

ATTENDEES:

Tom Narva	(Town of Queen Creek)
Paul Stears	(FCDMC)
John Stock	(FCDMC)
Blair Haines	(Z&H Engineering)
Bob Phillips	(GPS Services)
Brian Fry	(Dibble)

PURPOSE OF MEETING:

To identify the course of action to correct the FCDMC mapping for use on the Queen Creek Wash project. The datum issue impacts three sets of mapping. FCDMC mapping from Hawes Road west to the EMF was completed by Kenney Aerial Mapping, Inc. (KAM), FCDMC mapping from Hawes Road east to the Maricopa County line was completed by Lee Harbers of DTM, Inc., and project design mapping was prepared from Hawes Road to Ocotillo Road by Aerial Mapping Company, Inc. (AMCI). All three sets of mapping will be corrected based on the results of the field control surveys.

DECISIONS:

The mapping will be adjusted to NAVD 88 vertical datum. Per John Stock, since all the mapping is being updated it is better to go to the 88 datum instead of NGVD 1929.

Bob Phillips will provide equations for conversion to NGVD 1929 and Town of Gilbert datums.

Bob Phillips will provide results of surveys and the required mapping adjustments for each set of mapping to Dave VanderLinden of Z&H Engineers. Upon review and approval of the data, Dave will forward the mapping adjustments to KAM, DTM, and AMCI.

The GPS data collected for this project was readjusted using NAVD 88 vertical data and the results are found at the end of this report. The level data was adjusted using Starnet and NAVD 88 and the results are found at the end of this report.

**Queen Creek Wash Panel Points in East Area From the County Line to Hawes Rd. Study 95-03
DTM Inc.**

The data originally provided by Collins Pina for the East portion of the Queen Creek Wash, County line to Hawes Rd., proved to be NAVD 88 values not NGVD 29 as reported. However, DTM Inc. used a modified version of these values as shown on the spreadsheet provided at the end of the report. This results in the need for readjustment of the mapping provided by DTM Inc. The average correction to the data used by DTM is +2.427 feet, the range of the correction is +1.958 to +3.032 feet with most of the corrections around +2.35 feet. The Conversion for the observed points to NGVD 29 are given in the spreadsheet at the end of the report.

**Queen Creek Wash Panel Points in West Area From the Hawes Rd. to the EMF. Study 97-11
Kenney Aerial Mapping Inc.**

The data provided by Collins Pina for the West portion of the Queen Creek Wash, Hawes Rd. to the EMF, was established using points included in the town of Gilbert. The town of Gilbert apparently has it's own datum and is different than the NGS points used in the East area. The difference appears to be on the magnitude of +2.5 feet. That is to say that Gilbert's data is 2.5 feet lower than NGS at least in the area of Queen Creek Wash. The mapping data done by Kenney Aerial Mapping, Inc. should be corrected using the data provided at the end of the study. The average correction to Kenney mapping is +2.683 feet. The range is from +2.350 to 2.903 feet with most of the corrections around +2.7 feet. The Conversion for the observed points to NGVD 29 are given in the spreadsheet at the end of the report.

**Queen Creek Wash Panel Points in the middle Area From the Hawes Rd. to Ocotillo Rd. Aerial
Mapping Inc.**

The mapping provided by Aerial Mapping Inc. needs to be corrected because of the tilt introduced into the data from the use of bad ERM's . The average correction is -1.000 feet. The range is -.745 to -1.203 feet, with most of the corrections around -1.0 feet. The Conversion for the observed points to NGVD 29 are given in the spreadsheet at the end of the report. In the future, it is not recommended to use NGVD 29 data for survey control.

We are converting and combining all of the Queen Creek Wash studies into one datum. I believe this will result in the least amount of cost and will result in a database of common datum throughout the Queen Creek Wash.

Robert A. Phillips II
Geodesist,
GPS Services L.L.C.

1. Reference Email from Dave VanderLinden, Z& H Engineering, dated 16 May 2001, Subject: Queen Creek Additional GPS & Survey Level Requirements:
2. Reference Email from Brian Fry, Dibble, dated 17 May 2001, Subject: Queen Creek Survey Proposal.
3. Paragraph 2 of Ref 2 above, the additional survey work to the West of Meadowbrook Road to include the EMF and Paragraph 4 of Ref 2 above, culvert crossings at Meadowbrook Road, would require at a minimum the following:
 - a. One day of Static GPS Observations to extend control @ \$950/ Day (GPS Services)
 - b. Three days of Office Research on known Queen Creek Data & Wood data @ \$700/Day (GPS Services)
 - c. Two days of RTK GPS Observations to find and tag points researched in office @ \$950/Day (GPS Services)
 - d. Five days of levels to maintain and check existing vertical datum and survey the culvert crossings at Meadowbrook Road @ \$950/Day (Z&H)
 - e. One day of Office data processing to combine and evaluate all data in the West area @ \$700/Day (GPS Services)
4. Paragraph 2 of Ref 2 above, the additional survey work to the East to the County Line and Paragraph 4 of Ref 2 above, the crossing at Will Rogers, would require at a minimum the following:
 - a. One day of Office Research to extend to the county line @ \$700/Day (GPS Services)
 - b. One day of RTK GPS Observations to find and tag researched points @ \$950/Day (GPS Services)
 - c. Two days of levels to maintain and check existing vertical datum and survey a crossing at Will Rogers @ \$950/Day (Z&H)
 - d. One day of Office data processing to combine and evaluate all data in the East area @ \$700/Day (GPS Services)

Bob Phillips

DTM Mapping Company

Final mapping data for Queen Creek Wash from County Line to Hawes Rd. DTM						
Pt #	Northing	Easting	Elevation	Elevation		
	NAD83(92)	NAD83(92)	Old Coords	NGVD 88		
	GPS	GPS	DTM	GPS		gps-dtm
1000	812686.061	799375.037		1447.825		
1001	811343.494	800028.607	1422.340			
1002	811841.410	798614.897	1439.450	1441.517	1/2" RB E of RR N of Wash	2.067
1003	811365.561	797705.646	1439.480	1441.620		2.140
1004	810908.853	796925.392	1437.560	1439.805		2.245
1005	811432.260	796814.312	1437.760	1439.920		2.160
1006	811523.220	795394.016	1432.960	1434.994	RB 1006 N-side of wash	2.034
1007	812033.484	794185.393	1429.200	1431.360		2.180
1008	811565.270	794286.710	1428.610	1430.775		2.165
1009	812071.076	792869.294	1415.010	1417.270		2.260
1010	812801.314	791534.509	1419.050	1421.008	1010 RB N-side of wash	1.958
1011	812329.747	791584.550	1419.670	1421.940		2.270
1012	813488.917	789770.027	1403.050	1405.270		2.220
1013	814025.073	788990.155	1407.490	1409.820		2.330
1014	813718.877	789006.558	1409.880	1412.190		2.310
1015	814366.805	787648.422	1394.790	1397.170		2.380
1016	815513.336	786266.798	1401.260	1403.655		2.395
1017	814915.643	786270.956	1401.860	1404.394	PK Nail Ellsworth S. of Qwncrk Bridge	2.534
1018	816130.750	785017.190	1384.870	1387.270		2.400
1019	816333.149	783621.997	1387.630	1390.208		2.578
1020	816953.517	783735.732	1387.300	1389.720		2.420
1021	817311.904	782684.779	1377.800	1380.190		2.390
1022	818110.957	781589.730	1386.070	1389.102		3.032
1023	818428.750	780288.056	1376.110	1378.580		2.470
1024	818729.624	780427.755	1381.960	1384.420		2.460
						2.427

Kenney Aerial Mapping

Final mapping data for Queen Creek Wash from Hawes Rd.to EMF.					
Pt #	Northing	Easting	Elevation	Elevation	
	NAD83(92)	NAD83(92)		NGVD 88	
	GPS	GPS	Collins Pina	GPS	gps-cp
1023a	819250.245	780272.991	1375.020	1377.370	2.350
1024a	818942.882	779836.097	1375.380	1377.730	2.350
1025	819741.053	779672.211	1369.470	1371.816	Rock near old panel 1025 2.346
1026			1370.750	1373.100	2.350
1027	820870.798	779290.274			0.000
1028	821584.961	778591.949	1364.590	1367.245	2.655
1029	821657.249	777893.022	1365.210	1367.810	2.600
1030	822207.799	777867.981	1366.720	1369.320	2.600
1031	822596.133	776927.690	1356.210	1358.762	2.552
1032	822951.573	775649.932	1359.850	1362.308	2.458
1033	823434.178	775640.650	1359.920	1362.430	2.510
1034	823463.446	775649.932	1355.270	1357.780	2.510
1035	823311.066	773033.122	1350.430	1352.940	2.510
1036	823850.522	773000.465	1349.830	1352.340	2.510
1037	823641.753	771665.378	1347.290	1349.846	1/2" RB on North side of Queen Creek 2.556
1038	823397.533	770507.590	1349.020	1351.670	2.650
1039	824053.288	770494.328	1347.030	1349.772	pk nail Power Rd. N of Queen Creek 2.742
1040	823546.168	769210.798	1338.690	1341.400	2.710
1042	823738.274	767872.291	1335.650	1338.380	2.730
1043	823414.078	766545.908	1334.570	1337.300	2.730
1044	823135.749	765178.934	1329.420	1332.150	2.730
1045	823593.212	765201.885	1327.850	1330.570	2.720
1046	823348.593	763985.930	1327.880	1330.600	2.720
1047	823136.292	762599.659	1324.430	1327.150	2.720
1048	823661.919	762527.362	1320.730	1323.440	2.710
1049	822795.678	761320.750	1322.050	1324.755	tbrn1049 rebar in old panel 2.705
1050	822243.682	760377.060	1321.450	1324.160	2.710
1051	822644.812	760280.758	1317.020	1319.730	2.710
1052	821592.029	759789.655	1315.430	1318.160	2.730
1053	820203.689	759670.781	1315.620	1318.370	2.750
1054	820236.791	760200.515	1318.310	1321.080	2.770
1055	819133.263	759665.711	1311.450	1314.250	2.800
1056	818238.604	758720.955	1313.440	1316.260	2.820
1057	817892.383	759044.465	1313.580	1316.420	2.840
1058	817091.107	758188.310	1311.510	1314.360	2.850
1059	816117.076	757151.906	1307.660	1310.523	nail West side canal 2.863
1060	815841.662	757429.294	1309.970	1312.820	2.850
1061	815244.485	756794.924	1308.400	1311.254	nail west side canal 2.854
1062	814689.606	755499.731	1307.080	1309.940	2.860
1063	814553.857	756257.103	1308.560	1311.430	2.870
1064	813728.037	755341.759	1296.520	1299.400	2.880
1065	812646.717	754597.779	1307.720	1310.610	2.890
1066	812337.071	755087.546	1304.230	1307.133	tbrn1066 nail in old panel 2.903
					2.683

Aerial Mapping Company

Final mapping data for Queen Creek Wash from Hawes Rd. to Ocotillo Rd. AMC						
Pt #	Northing	Easting	Elevation	Elevation		
	NAD83(92)	NAD83(92)	NAVD 29	NGVD 88		
	GPS	GPS	GPS	GPS		88-29
11	823594.378	770504.624	1354.028	1352.825	bc fl Power Rd & Queen Creek	-1.203
20	823428.703	780889.819	1378.358	1377.334	BCHH Hawes & Queen Creek	-1.024
21	820771.116	780934.889	1379.849	1378.919	BCHH	-0.930
23	818117.187	783624.381	1393.899	1393.106	BC FL	-0.793
24	815460.578	780992.652	1385.591	1384.846	BCHH	-0.745
25	818109.586	778355.830	1377.336	1376.455	CPS	-0.881
26	818101.829	775730.982	1371.254	1370.830	PK	-0.924
27	820587.212	775689.148	1366.142	1365.130	CPS	-1.012
28	823433.544	775641.007	1363.232	1362.121	RB Queen Creek & Sossmann	-1.111
30	823986.466	775635.089	1360.965	1359.835	PNL	-1.130
31	823235.611	775645.866	1362.395	1361.291	PNL	-1.104
32	823319.584	775317.167	1366.252	1365.139	PNL	-1.113
33	822259.056	775660.905	1363.336	1362.266	PNL	-1.070
34	822175.175	778340.255	1369.221	1368.198	PNL	-1.023
35	823052.562	776090.265	1365.102	1364.011	PNL	-1.091
36	822576.322	777095.203	1369.312	1368.254	PNL	-1.058
37	821755.557	778301.691	1372.334	1371.328	PNL	-1.008
38	821704.553	777905.384	1368.118	1367.104	PNL	-1.014
39	821418.023	778551.088	1373.624	1372.632	PNL	-0.992
40	820739.858	779262.283	1373.751	1372.794	PNL	-0.957
41	818496.284	780974.011	1385.814	1384.964	PK Nail Hawes Rd. N. Queen Creek	-0.850
42	818524.085	780860.181	1390.448	1389.594	PNL	-0.854
43	817531.288	782254.940	1386.835	1386.040	PNL	-0.795
44	818287.423	782691.525	1389.932	1389.117	PNL	-0.815
45	818117.397	781854.390	1390.044	1389.221	PK Nail Ocotillo E. of Bridge	-0.823
46	819881.462	779572.178	1379.572	1378.650	PNL	-0.922
47	819279.965	779836.789	1378.737	1377.840	PNL	-0.897
48	818903.720	780047.057	1379.871	1378.991	PNL	-0.880
49	818304.576	779735.879	1380.998	1380.134	PNL	-0.864
103	823235.944	775666.393	1362.435	1361.331	ZH3	-1.104
						-1.000

Final mapping data for Queen Creek Wash Old Panel points in West area from Hawes Rd.to Confluence													
Pt #	Northing	Easting	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation					
	NAD83(92)	NAD83(92)			NAVD 29	NGVD'88	NGVD 88	NGVD 88					
	GPS	GPS	Collins Pina	DTM	GPS	GPS	PUB	Z&H Levels			88-GPS	88-29	gps-cp
1023a	819250.245	780272.991	1375.020			1377.370							2.350
1024a	818942.882	779836.097	1375.380			1377.730							2.350
1025	819741.053	779872.211	1369.470		1372.732	1371.816		1371.710	tbn1025	Rock near old panel 1025	-0.106	-0.916	2.346
1026			1370.750			1373.100							2.350
1027	820870.798	779290.274											0.000
1028	821584.961	778591.949	1364.590		1368.243	1367.245						-0.998	2.655
1029	821657.249	777893.022	1365.210			1367.810							2.600
1030	822207.799	777867.981	1366.720			1369.320							2.600
1031	822596.133	776927.690	1356.210		1359.823	1356.762						-1.061	2.552
1032	822951.573	775649.932	1359.850		1363.402	1362.308						-1.094	2.458
1033	823434.178	775640.650	1359.920			1362.430							2.510
1034	823463.446	775649.932	1355.270			1357.780							2.510
1035	823311.066	773033.122	1350.430			1352.940							2.510
1036	823850.522	773000.465	1349.830			1352.340							2.510
1037	823641.753	771685.378	1347.290		1351.031	1349.646		1349.613	tbn1037	1/2" RB on North side of Queen Creek	-0.233	-1.185	2.556
1038	823397.533	770507.590	1349.020			1351.670							2.650
1039	824053.288	770494.328	1347.030		1350.992	1349.772		1349.373	tbn1039	pk nail Power Rd. N of Queen Creek	-0.399	-1.220	2.742
1040	823546.188	769210.798	1338.690			1341.400							2.710
1042	823738.274	767872.291	1335.650			1338.380							2.730
1043	823414.078	766545.908	1334.570			1337.300							2.730
1044	823135.749	765178.934	1329.420			1332.150							2.730
1045	823593.212	765201.885	1327.850			1330.570							2.720
1046	823348.593	763985.930	1327.880			1330.600							2.720
1047	823136.292	762599.659	1324.430			1327.150							2.720
1048	823661.919	762527.362	1320.730			1323.440							2.710
1049	822795.678	761320.750	1322.050		1326.084	1324.755		1324.323	tbn1049	tbn1049 rebar in old panel	-0.432	-1.329	2.705
1050	822243.682	760377.060	1321.450			1324.160							2.710
1051	822644.812	760280.758	1317.020			1319.730							2.710
1052	821592.029	759789.655	1315.430			1318.160							2.730
1053	820203.689	759670.781	1315.620			1318.370							2.750
1054	820236.781	760200.515	1318.310			1321.080							2.770
1055	819133.263	759665.711	1311.450			1314.250							2.800
1056	818238.604	758720.955	1313.440			1316.260							2.820
1057	817892.383	759044.465	1313.580			1316.420							2.840
1058	817091.107	758188.310	1311.510			1314.360							2.850
1059	816117.076	757151.906	1307.660		1311.689	1310.523		1309.923	tbn1059	nail West side canal	-0.600	-1.166	2.863
1060	815841.662	757429.294	1309.970			1312.620							2.850
1061	815244.485	756794.924	1308.400		1312.396	1311.254		1310.683	tbn1061	nail west side canal	-0.571	-1.142	2.854
1062	814689.606	755499.731	1307.080			1309.940							2.860

Ocotillo
23

Final mapping data for Queen Creek Wash New Panel points in Center area from Hawes Rd.to Power-Rd.												
Pt #	Northing	Easting	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation				
	NAD83(92)	NAD83(92)			NAVD 29	NGVD 88	NGVD 88	NGVD 88				
	GPS	GPS	Collins Pina	DTM	GPS	GPS	PUB	Z&H Levels			88-GPS	88-29
11	823594.378	770504.624			1354.028	1352.825		1352.633	brm6	bc fl Power Rd & Queen Creek	-0.192	-1.203
20	823425.703	780889.819			1378.358	1377.334		1377.228	tbrn7	BCHH Hawes & Queen Creek	-0.106	-1.024
21	820771.116	780934.889			1379.849	1378.919				BCHH		-0.930
23	818117.187	783624.381			1393.899	1393.106				BC FL		-0.793
24	815460.578	780992.652			1385.591	1384.846				BCHH		-0.745
25	818109.586	778355.830			1377.336	1376.455				CPS		-0.881
26	818101.829	775730.982			1371.254	1370.330				PK		-0.924
27	820587.212	775689.146			1366.142	1365.130				CPS		-1.012
28	823433.544	775641.007			1363.232	1362.121		1362.023	tbrn8	RB Queen Creek & Sossmann	-0.098	-1.111
30	823986.466	775635.089			1360.965	1359.835				PNL		-1.130
31	823235.611	775645.866			1362.395	1361.291				PNL		-1.104
32	823319.584	775317.167			1366.252	1365.139				PNL		-1.113
33	822258.056	775660.905			1363.336	1362.266				PNL		-1.070
34	822175.175	778340.255			1369.221	1368.198				PNL		-1.023
35	823052.562	776090.265			1365.102	1364.011				PNL		-1.091
36	822576.322	777095.203			1369.312	1368.254				PNL		-1.058
37	821755.557	778301.691			1372.334	1371.326				PNL		-1.008
38	821704.553	777905.384			1368.118	1367.104				PNL		-1.014
39	821418.023	778551.088			1373.624	1372.632				PNL		-0.992
40	820739.858	779262.283			1373.751	1372.794				PNL		-0.957
41	818496.284	780974.011			1385.814	1384.964		1384.836	tbrn4	PK Nail Hawes Rd. N. Queen Creek	-0.128	-0.850
42	818524.085	780860.181			1390.448	1389.594				PNL		-0.854
43	817531.288	782254.940			1386.835	1386.040				PNL		-0.795
44	818287.423	782691.525			1389.932	1389.117				PNL		-0.815
45	818117.397	781854.390			1390.044	1389.221		1389.119	tbrn2	PK Nail Ocotillo E. of Bridge	-0.102	-0.823
46	819881.462	779572.178			1379.572	1378.650				PNL		-0.922
47	819279.965	779836.789			1378.737	1377.840				PNL		-0.897
48	818903.720	780047.057			1379.871	1378.991				PNL		-0.880
49	818304.576	779735.879			1380.998	1380.134				PNL		-0.864
103	823235.944	775666.393			1362.435	1361.331				ZH3		-1.104
											Average Correction to Aerial Data	-1.000

Final mapping data for Queen Creek Wash points in Culvert Crossing Meadowbrook Rd. & Other areas													
Pt #	Northing	Easting	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation					
	NAD83(92)	NAD83(92)			NAVD 29	NGVD 88	NGVD 88	NGVD 88					
	GPS	GPS	Collins Pina	DTM	GPS	GPS	PUB	Z&H Levels			88-GPS	88-29	
472	818064.412	785600.127				1398.936	1398.881	1398.862	2DN1	GDACS Point 2DN1 Rod Driven Refusal	-0.074		
1381	818117.241	780979.932			1381.080	1383.429		1383.309	tbn3	BC Hole Hawes & Ocotillo	-0.120	2.349	
						1378.923		1378.823	tbn6	BC FL in Cuidesac	-0.100		
						1363.123		1363.013	tp111	Pan 32	-0.110		
								1344.333	tp141	E6 SW			
								1332.978	tbn70	nail			
								1331.808	tp148	FL North pipe East End			
								1331.838	tp149	FL Center pipe East end North			
								1331.818	tp150	FL Center pipe East end South			
								1333.438	tp151	FL South pipe East end			
								1332.916	tp153	FL South pipe West end			
								1332.746	tp154	FL Center pipe West end South			
								1331.356	tp155	FL Center pipe West end North			
								1331.404	tp156	FL North pipe West end			
								1340.632	tp157	BSW NW Cor Bridge			
								1342.062	tp158	CLS West side pipe to N on West side			
								1342.722	tp159	CLS West side center pipe West end North			
								1343.252	tp160	CLS West side center pipe West end South			
								1343.612	tp161	CLS West side South end pipe West side			
								1344.162	tp162	CLS East side center pipe West end South			
								1336.888	tp167	NE Cor Bridge nail			
								1340.618	tbn17	NW Cor Bridge BSW			
						1335.030		1334.803	bm7	bchh SW Cor Bridge Recker & Queen Creek Rd	-0.227		
						1334.310		1334.158	bm8	1/2"RB 1/2 mile West Recker & Queen Creek Rd	-0.152		
						1335.540		1335.353	bm9	BCF Top Wall on Bridge Queen Creek & Higley	-0.187		
1326	820669.357	759938.356			1326.010	1328.648		1328.143	bm1326	BCHH Southbound Lane Higley Rd.	-0.505	2.638	
						1325.960		1325.748	bm10	1/2"RB 1/2 mile S on Higley Rd	-0.212		
						1315.310		1315.083	bm11	1/2"RB East side of Canal	-0.227		
						1312.830		1312.568	bm12	rock in cc East side canal	-0.262		
						1331.620		1331.393	bm13	1/2"RB N side of wash 200' E bridge	-0.227		

Final mapping data for Misc. Points, ERMs													
Pt #	Northing	Easting	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation				
	NAD83(92)	NAD83(92)			NAVD 29	NGVD 88	NGVD 88	NGVD 88					
	GPS	GPS	Collins Pina	DTM	GPS	GPS	PUB	Z&H Levels			88-GPS	88-29	
473	804890.688	786304.644			1419.197	1418.909				erm 1416 mcbchh		-0.288	
474	818117.657	786260.328			1402.166	1401.417				erm 2126 mcbchh		-0.749	
475	826095.760	775601.968			1359.859	1358.655				5007 1 1/2" AC		-1.204	
476	820767.897	775686.133			1365.351	1364.333				5002 1 1/2" AC		-1.018	
477	820868.800	773055.694			1357.066	1356.001				5005 1" IP		-1.065	
478	818333.238	770587.137			1355.694	1354.675				7002 bchh dea108		-1.019	
479	820964.782	770546.089			1349.408	1348.298				7003 bchh dea107		-1.110	
480	824533.981	770490.628			1346.644	1345.409				7050 bchh dea122		-1.235	
481	826224.738	770465.656			1344.293	1342.998				7007 bchh dea107		-1.295	

APPENDIX C.2

REVISED CONDITION MAPPING SURVEY REPORT

Queen Creek Wash:
Sossaman Road to Hawes Road
Project #2000D-03
Town of Queen Creek, Arizona

Land Survey Report



April 20, 2007

BASIS OF PROJECT CONTROL

Basis of Control

For

Queen Creek Wash: Sossaman Road to Hawes Road Project #2000D-03

Data Collection:

Data was collected using Static and Real-time Kinematic GPS methods. The project is tied to the (Maricopa County G.D.A.C.S. Network) National Geodetic Survey (NGS).

Datum:

The datum is the North American Datum 1983 (NAD '83); 1992 Adjustment. Arizona State Plane Coordinates; Central Zone (0202). The vertical datum is based on the North American Vertical Datum; published 1988.

Horizontal Control & Project Vertical Benchmarks:

BRASS CAP in HAND HOLE AT HAWES RD & OCOTILLO RD
SE Corner Section 17 T2S-R7E
ARIZONA STATE PLANE COORDINATES – GRID
NORTHING: 818117.241 IFT
EASTING: 780979.932 IFT
ELEVATION: 1383.309 IFT

ALUMINUM CAP in POT HOLE AT SOSSAMAN RD & QUEEN CREEK RD
NW Corner Section 17 T2S-R7E
ARIZONA STATE PLANE COORDINATES – GRID
NORTHING: 823433.510 IFT
EASTING: 775641.020 IFT
ELEVATION: 1362.170 IFT

These benchmarks were verified using GPS and were accepted within 3rd order tolerances.

COMBINED SCALE FACTOR (CSF) for project = **0.99984595** if ground coordinates are desired

Tie to NGS Monument:

See NGS datasheet on following pages for NGS Monument PID #AJ3639

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

DATABASE = Sybase ,PROGRAM = datasheet, VERSION = 7.42
1 National Geodetic Survey, Retrieval Date = APRIL 13, 2007
AJ3639 *****
AJ3639 HT_MOD - This is a Height Modernization Survey Station.
AJ3639 DESIGNATION - 2DN1
AJ3639 PID - AJ3639
AJ3639 STATE/COUNTY- AZ/MARICOPA
AJ3639 USGS QUAD - CHANDLER HEIGHTS (1973)
AJ3639
AJ3639 *CURRENT SURVEY CONTROL
AJ3639
AJ3639* NAD 83(1992)- 33 14 54.66694(N) 111 38 11.99192(W) ADJUSTED
AJ3639* NAVD 88 - 426.38 (meters) 1398.9 (feet) GPS OBS
AJ3639
AJ3639 X - -1,968,867.849 (meters) COMP
AJ3639 Y - -4,963,510.406 (meters) COMP
AJ3639 Z - 3,477,259.282 (meters) COMP
AJ3639 LAPLACE CORR- 1.82 (seconds) DEFLEC99
AJ3639 ELLIP HEIGHT- 396.74 (meters) (04/12/01) GPS OBS
AJ3639 GEOID HEIGHT- -29.66 (meters) GEOID03
AJ3639
AJ3639 HORZ ORDER - B
AJ3639 ELLP ORDER - THIRD CLASS II
AJ3639
AJ3639.The horizontal coordinates were established by GPS observations
AJ3639.and adjusted by the National Geodetic Survey in April 2001..
AJ3639
AJ3639.The orthometric height was determined by GPS observations and a
AJ3639.high-resolution geoid model using precise GPS observation and
AJ3639.processing techniques.
AJ3639
AJ3639.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AJ3639
AJ3639.The Laplace correction was computed from DEFLEC99 derived deflections.
AJ3639
AJ3639.The ellipsoidal height was determined by GPS observations
AJ3639.and is referenced to NAD 83.
AJ3639
AJ3639.The geoid height was determined by GEOID03.
AJ3639

AJ3639; North East Units Scale Factor Converg.
AJ3639;SPC AZ C - 249,346.110 239,450.937 MT 0.99990839 +0 09 12.7
AJ3639;SPC AZ C - 818,064.67 785,600.19 iFT 0.99990839 +0 09 12.7
AJ3639;UTM 12 - 3,679,018.955 440,692.268 MT 0.99964337 -0 20 56.7
AJ3639

AJ3639! - Elev Factor x Scale Factor = Combined Factor
AJ3639!SPC AZ C - 0.99993772 x 0.99990839 = 0.99984611
AJ3639!UTM 12 - 0.99993772 x 0.99964337 = 0.99958111
AJ3639

AJ3639 SUPERSEDED SURVEY CONTROL

AJ3639

AJ3639.No superseded survey control is available for this station.

AJ3639

AJ3639_U.S. NATIONAL GRID SPATIAL ADDRESS: 12SVB4069279019(NAD 83)

AJ3639_MARKER: 1 = METAL ROD

AJ3639_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)

AJ3639_STAMPING: 2DN1 999

AJ3639_MARK LOGO: MCDOT

AJ3639_PROJECTION: FLUSH

AJ3639_MAGNETIC: B = BAR MAGNET IMBEDDED IN MONUMENT

AJ3639_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD

AJ3639+STABILITY: POSITION/ELEVATION WELL

AJ3639_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR

AJ3639+SATELLITE: SATELLITE OBSERVATIONS - 1999

AJ3639_ROD/PIPE-DEPTH: 6.1 meters

AJ3639_SLEEVE-DEPTH : 0.8 meters

AJ3639

AJ3639 HISTORY - Date Condition Report By

AJ3639 HISTORY - 1999 MONUMENTED MCDOT

AJ3639 HISTORY - 20061117 GOOD GEOCAC

AJ3639

AJ3639 STATION DESCRIPTION

AJ3639

AJ3639'DESCRIBED BY MARICOPA CO DOT 1999 (RAP)

AJ3639'THE STATION IS LOCATED WITHIN THE TOWN OF QUEEN CREEK, TOWNSHIP 02

AJ3639'SOUTH, RANGE 07 EAST, SECTION 21

AJ3639'OWNERSHIP - MARICOPA COUNTY RIGHT OF WAY

AJ3639'TO REACH THE STATION FROM THE JUNCTION OF US 60 AND ELLSWORTH ROAD

AJ3639'(EXIT 191) , DRIVE SOUTH ON ELLSWORTH ROAD FOR 9.5 MI (15.3 KM) TO

AJ3639'OCOTILLO ROAD, THENCE TURN RIGHT (WEST) ON TO OCOTILLO RD AND DRIVE

AJ3639'600 FT (182.9 M) AND PARK AT THIS LOCATION AND WALK SOUTH 56 FT (17.1

AJ3639'M) TO THE STATION AS DESCRIBED

AJ3639'MONUMENT DESCRIPTION - THE STATION IS MARKED BY AN ALUMINUM CAP

AJ3639'COMPRESSED ON A 16 FOOT (52.5 M) STAINLESS STEEL ROD DRIVEN TO REFUSAL

AJ3639'ENCASED IN A 1INCH GREASED PVC SLEEVE ENCLOSED IN A 5 INCH PVC PIPE

AJ3639'WITH A COUNTY LOGO ACCESS COVER STAMPED 2DN1 1999, SURROUNDED WITH A

AJ3639'CONCRETE COLLAR FLUSH WITH THE GROUND, WITNESSED BY A WHITE CARSONITE

AJ3639'MARKER

AJ3639'STATION TIES

AJ3639'56 FT (17.1 M) SOUTH OF THE CENTERLINE OF OCOTILLO ROAD

AJ3639'25 FT (7.6 M) WEST OF AND 20 FT (6.1 M) NORTH OF THE NORTHWEST CORNER

AJ3639'OF THE PARKING LOT FOR RAIN I AUTO SALES 20775 EAST OCOTILLO ROAD

AJ3639'4 FT (1.2 M) WEST AND 2FT NORTH OF A 1/2 INCH REBAR WITH CAP 8899

AJ3639'4.7 FT (1.4 M) EAST OF THE CENTERLINE OF A CONCRETE IRRIGATION DITCH

AJ3639'RUNNING NORTH-SOUTH

AJ3639'3.7 FT (1.1 M) SOUTH OF CARSONITE WITNESS POST
AJ3639'FOR A TO REACH MAP, STATION IMAGES AND ADDITIONAL INFORMATION, YOU CAN
AJ3639'VISIT WWW.MCDOT.MARICOPA.GOV SEARCH KEYWORD GDACS
AJ3639
AJ3639 STATION RECOVERY (2006)
AJ3639
AJ3639'RECOVERY NOTE BY GEOCACHING 2006 (JM)
AJ3639'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:00

SURVEY CONTROL

Point #	Northing	Easting	Elevation	Description
1	818527.090	780822.421	1379.390	½" Rebar (set)
2	818457.632	780900.408	1375.267	PK nail (set)
3	818321.322	781079.649	1375.335	½" Rebar (set)
4	818408.874	780957.298	1385.192	"X" IN CONC (set)
5	817550.116	782324.715	1387.723	½" Rebar (set) AERIAL TARGET
6	817622.410	782471.105	1387.563	½" Rebar (set) AERIAL TARGET
7	818154.540	781654.887	1389.623	PK nail (set) AERIAL TARGET
8	818002.598	781793.460	1387.177	PK nail (set)
9	819695.409	779888.517	1379.265	½" Rebar (set) AERIAL TARGET
10	819522.302	779717.161	1379.709	½" Rebar (set) AERIAL TARGET
11	820371.505	779531.983	1375.016	PK nail (set) AERIAL TARGET
12	820566.983	779286.339	1368.614	½" Rebar (set)
13	821460.103	778695.325	1365.835	½" Rebar (set)
14	822118.777	778236.968	1368.542	½" Rebar (set) AERIAL TARGET
15	821928.840	778013.302	1368.369	½" Rebar (set) AERIAL TARGET
16	822586.884	777027.505	1360.343	½" Rebar (set) AERIAL TARGET
17	823062.510	775799.478	1358.346	½" Rebar (set) AERIAL TARGET
18	823196.465	775561.418	1355.305	PK nail (set)
19	823489.369	775218.052	1358.403	½" Rebar (set) AERIAL TARGET
20	823052.634	775197.746	1357.541	½" Rebar (set) AERIAL TARGET
101	818117.241	780979.932	1383.309	BCHH @ OCOTILLO & HAWS
102	823425.995	780889.907	1377.490	BCHH
103	823783.822	775636.024	1361.664	BCHH
104	818102.331	775731.142	1370.407	BCF
105	820587.595	775689.120	1365.222	COTTON SPINDLE (set)
106	823440.876	778895.628	1369.673	BCF
107	823433.510	775641.020	1362.170	BCHH @ QUEEN CREEK RD & HAWS RD
108	818109.538	778307.844	1376.851	COTTON SPINDLE (set)
109	818117.395	783624.437	1393.364	BCF

SURVEY NOTES

Queen Creek Wash:
 Sossaman Road to Hawes Road
 Project #2000D-03

Dibble Engineering

Data Collector Code List

ABUT	ABUTMENT TOP	EBOX	ELECTRIC BOX
AG	AGGREGATE	EC	EDGE CONCRETE
ANCHOR	GUY WIRE ANCHOR (OTHER)	EDR	EDGE OF DIRT ROAD
AS	ASPHALT SHOT	EMETER	ELEC METER
BCF	BRASS CAP FLUSH	EP	EDGE OF PAVEMENT
BCHH	BRASS HAND HOLE	EPB	ELECTRIC PULL BOX
BCOM	BURIED COMM	ERISER	ELECTRIC RISER
BFH	BUILDING FIRE HYDRANT	ES	EDGE OF SHOULDER
BFPV	BACK FLOW PREVENTION VALVE	ESW	SIDEWALK
BKL	BREAKLINE	FF	FINISH FLOOR
BLDC	BUILDING CORNER	FH	FIRE HYDRANT
BLDF	BUILDING FACE	FL	FLOWLINE
BM	BENCH MARK	FNC	FENCE (TYPE)
BOC	BACK OF CURB (NOTE TYPE)	FP	FLAG POLE
BOL	BOLLARD	GDACS/NGS	MARICOPA COUNTY CONTROL POINT
BOULDER	LARGE BOULDER	GI	GRATE (INLET TOP)
BP	BOTTOM PIPE	GM	GAS METER
BRK	BRICK SURFACE	GR	GUARD RAIL
BSCATV	BLUE STAKE CABLE TV	GRAVEL	GRAVEL
BSE	BLUE STAKE ELECTRIC	GUT	GUTTER
BSFO	BLUE STAKE FIBER OPTIC	GUY	GUY WIRE ANCHOR
BSG	BLUE STAKE GAS LINE	GV	GAS VALVE
BSIR	BLUE STAKE IRRIGATION	GVT	GAS VALVE TEST STATION
BSSD	BLUE STAKE STORM DRAIN	HCR	HANDICAP RAMP
BSSS	BLUE STAKE SANITARY SEWER LINE	HDWL	(CONCRETE) HEADWALL
BST	BLUE STAKE TELEPHONE LINE	HUB	FOUND HUB
BSW	BLUE STAKE WATER LINE	INS	ELECTRICAL INSULATOR
BUSH	BUSH/(DIAMETER)	INV	INVERT OF PIPE
CAC	CACTUS (TYPE & SIZE))	IRCV	IRRIGATION CONTROL VALVE
CALC	CALCULATED POINT	LP	LIGHT POLE
CARSON	CARSONITE MARKER/TYPE	LUM	LUMINAIRE [LIGHT (UNDERGROUND)]
CATV	TV CABLE (BOX/PED)		
CB	CATCH BASIN (IN CURB)	0.1	USE dot & THEN #
CE	CONDUIT ELECTRIC	0.2	
CI	CURB INLET	0.3	
CK	DATUM CHECK	-BS	BEGIN STRING
CL	CENTER LINE ROAD	-ES	END STRING
CNOTE	SPECIAL NOTE		
CO	CLEAN OUT	-CL	CLOSE STRING
COL	COLUMN	-BS/NOTE	BEGIN STRING
CONDUIT	MISC. CONDUIT	-CN	CONTINUE STRING
CP/ (TYPE)	CONTROL POINT		
CPAD	CONC PAD	-BC	BEGIN CURVE
CRBSTP	CURB STOP/BUMPER CURB	-C	POINT ON CURVE
CRWN	CROWN OF ROAD	-EC	END CURVE
CS	CONCRETE SHOT		
CTSP	COTTON SPINDLE		
DW	DRIVEWAY		
EPB	ELECTRIC PULL BOX	RRAP	RIP RAP
MB	MAIL BOX	SHD	SHOULDER (EDGE)

MESQ	MESQUITE TREE	SAG	SAGUARO
MHCOM	MANHOLE COMMUNICATIONS	SAW	SAWCUT
MHEL	MH ELECTRIC	SC	STANDARD CORNER
MHFUEL	MANHOLE PETROLEUM FUEL	SCO	SEWER CLEANOUT
MHG	MANHOLE GAS	SCUP	SCUPPER
MHSS	MH SSANITARY SEWER	SDP	SIGN POST DOUBLE POST
MHST	MH STORM	SEC	SECTION CORNER
MHT	MANHOLE TELEPHONE	SET	SET (TYPE)
MHUN	MANHOLE UNKNOWN	SIGN	SIGN POST
MHW	MH WATER	SIXC	SIXTEENTH CORNER
MON	/(TYPE)	SLD	SLOTTED DRAIN
TYPES OF	MONUMENTS & CONTROL POINTS	SP	STAND PIPE (NOTE IF FIRE HYDRANT)
BCF	BRASS CAP FLUSH	STA	STATION
BCHH	BRASS CAP HAND HOLE	STK	STAKE OUT CALC
STONE	STONE (NOTE IF IN HAND HOLE)	STR	PAVEMENT MARKING STRIPE
ACF	ALUMINUM CAP FLUSH	STUMP	STUMP
ACHH	ALUMINUM CAP HAND HOLE	TARGET	TARGET
CTSP	COTTON-PICKING SPINDLE	TB	TEL BOOTH
RB	REBAR	TCAB	TELEPHONE CABINET
CHISX	CHISELED X	TOB	TOP OF SLOPE
PIPE	NOTE DIAMETER SIZE	TOE	TOE OF SLOPE
CHISX	CHISELED X	TOP	TOP PIPE
MP	MILEPOST MARKER	TP	TURN POINT
NAIL	NAIL (60d)	TPED	TELEPHONE PEDESTAL
NG	NATURAL GROUND	TRANS	TRANSFORMER (ELECTRICAL)
NUT	TOP NUT	TREE	DECIDUOUS TREE (TYPE) /DIA./HGT./CANOPY
OH	OVERHANG (BUILDING)	TRISER	TELEPHONE RISER
OHP	OVERHEAD LINE POWER	TS	TRAFFIC SIGNAL
OLT	OVERHEAD LINE TELEPHONE	TSCAB	TRAFFIC SIGNAL SWITCH CABINET
PALM	PALM TREE	TSP	TRAFFIC SIGNAL POLE
PALO	PALOVERDE	TSPB	TRAFFIC SIGNAL PULL BOX
PB	PULL BOX	TT	TRANSMISSION TOWER
PC	PROPERTY CORNER	TWL	TAXIWAY LIGHT (AIRPORT)
PED	PEDESTAL	UPL	UTILITY POLE
PILECAPS	PILECAPS	UPWT	UTILITY POLE WITH TRANSFORMER
PIV	PRESSURE INDICATOR VALVE	UUM	UNDERGROUND UTIL MARKER
PKM	PARKING METER	VG	VALLEY GUTTER (NOTE WIDTH)
POST	POST	VLT	Vault (NOTE TYPE IF KNOWN)
PP	POWER POLE	WALL	WALL/(TYPE)
PS	PARKING STRIPE	WELL	EXIST WELL
PTR	PLANTER	WH	WEEP HOLE
QC	QUARTER CORNER	WM	WATER METER
REFL	REFLECTIVE DELIN POST	WV	WATER VALVE
RKL	ROCK LINE	WW	WINGWALL
RRT	RAILROAD TRACK		

Queen Creek Wash:
Sossaman Road to Hawes Road
Project #2000D-03

Point List

Dibble Engineering

1,818527.090,780822.421,1379.390,CP/RB OPUS DETERMINED 2006_0118
2,818457.632,780900.408,1375.267,CP/PK
3,818321.322,781079.649,1375.335,CP/RB
4,818408.874,780957.298,1385.192,CP/X IN CONC
5,817550.116,782324.715,1387.723,CP/RB AP
6,817622.410,782471.105,1387.563,CP/RB AP
7,818154.540,781654.887,1389.623,CP/PK BROKEN BLI
8,818002.598,781793.460,1387.177,CP/PK
9,819695.409,779888.517,1379.265,CP/RB AP
10,819522.302,779717.161,1379.709,CP/RB AP
11,820371.505,779531.983,1375.016,CP/PK BLIND
12,820566.983,779286.339,1368.614,CP/RB
13,821460.103,778695.325,1365.835,CP/RB BLIND
14,822118.777,778236.968,1368.542,CP/RB AP
15,821928.840,778013.302,1368.369,CP/RB AP
16,822586.884,777027.505,1360.343,CP/RB AP
17,823062.510,775799.478,1358.346,CP/PK AP BLIND
18,823196.465,775561.418,1355.305,CP/PK
19,823489.369,775218.052,1358.403,CP/RB AP
20,823052.634,775197.746,1357.541,CP/RB AP
51,818333.238,770587.137,1345.675,BCHH
52,820964.782,770546.089,13483.298,BCHH (DEA107)
53,823594.378,770504.624,1352.825,BCFL
54,823433.420,775641.020,1352.825,Aluminum Cap
55,820767.740,775685.900,1364.333,Aluminum Cap
56,818101.829,775730.982,1370.330,PK Nail - SW Cor Sec 17
57,818109.586,778355.830,1376.455,CPS - S1/4 Cor Sec 17
58,818117.241,780979.932,1183.309,BC Pot Hole
59,820771.116,780934.889,1378.919,BCHH - E1/4 Cor Sec 17
60,823425.703,780889.819,1377.334,BCHH
101,818117.044,780979.992,1383.627,BCHH
102,823425.995,780889.907,1377.490,BCHH
103,823783.822,775636.024,1361.664,BCHH
104,818102.331,775731.142,1370.407,BCF
105,820587.595,775689.120,1365.222,CPS

106,823440.876,778895.628,1369.673,BCF
107,823430.701,778265.656,1367.028,BCHH
108,818109.538,778307.844,1376.851,CP/CPS
109,818117.395,783624.437,1393.364,BCF
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201,818938.849,780340.278,0.000,STK LINE.1
202,818651.822,780208.085,0.000,STK LINE.2
203,818931.268,780450.593,0.000,STK LINE.2
204,818581.998,780295.141,0.000,STK LINE.3
205,818879.382,780515.284,0.000,STK LINE.3
206,818519.124,780387.341,0.000,STK LINE.3
207,818773.342,780546.630,0.000,STK LINE.3
208,823108.836,775271.017,0.000,STK LINE.4
209,823408.659,775281.324,0.000,STK LINE.4
210,823099.643,775554.468,0.000,STK LINE.5
211,823399.614,775550.313,0.000,STK LINE.5
212,822941.163,775835.767,0.000,STK LINE.5
213,823204.763,775978.997,0.000,STK LINE.5
214,822750.190,776187.235,0.000,STK LINE.5
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216,822559.216,776538.702,0.000,STK LINE.6
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221,822501.508,777403.253,0.000,STK LINE.8
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224,821821.529,778071.785,0.000,STK LINE.10
225,822110.638,778222.425,0.000,STK LINE.10
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248,823125.740,776148.070,1361.600,STK SPOT
249,822704.030,776456.600,1359.100,STK SPOT
250,822910.880,776553.420,1362.700,STK SPOT
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252,822606.585,776772.030,1359.300,STK SPOT
253,822688.867,776797.133,1358.800,STK SPOT
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266,819121.400,780141.660,1377.400,STK SPOT
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517,822384.864,777373.735,1361.215,SC 10229
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519,822476.592,777411.480,1362.758,SC 10231
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521,822098.838,777644.288,1366.760,SC 10226
522,822137.168,777664.699,1361.459,SC 10225
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524,822289.299,777755.525,1363.497,SC 10223
525,822299.249,777761.074,1363.724,SC 10222
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527,821918.572,778057.875,1367.974,SC 10213
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529,821990.005,778095.161,1362.988,SC 10215
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531,822100.628,778145.980,1363.437,SC 10217
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533,822136.897,778162.336,1368.191,SC 10219
534,821778.349,778286.916,1370.525,SC 10212
535,821823.946,778304.859,1363.477,SC 10211
536,821912.869,778356.413,1364.031,SC 10210
537,821958.306,778390.941,1364.187,SC 10209
538,821966.768,778398.656,1364.367,SC 10208
539,821989.680,778412.836,1367.976,SC 10207
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541,821656.670,778454.494,1364.194,SC 10201
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552,821283.799,778811.308,1366.218,SC 10194
553,821286.391,778814.038,1366.354,SC 10193
554,821311.340,778842.417,1371.024,SC 10192
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557,820892.640,779066.324,1368.058, SC 10189
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5014,818151.498,781779.913,1389.640,CK BCF
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5032,823118.454,775829.494,1356.285,ECON WEIR
5033,823149.629,775846.533,1356.258,ECON WEIR
5034,823196.455,775561.430,1355.307,CK CP/PK
5035,823210.446,775552.142,1354.170,ECON WEIR
5036,823240.809,775551.974,1354.048,ECON WEIR
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10022,818689.520,780504.591,1379.202,NG WL
10023,818656.031,780558.429,1379.441,WL
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10025,818639.571,780549.820,1376.425,EP
10026,818629.459,780544.473,1376.048,EP1
10027,818626.245,780542.202,1374.367,TOE1
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10125,818514.041,780800.451,1376.086,EP3
10126,818504.200,780795.280,1375.739,EP4
10127,818498.849,780793.323,1373.395,TOE1
10128,818480.046,780783.100,1372.828,NG
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10130,818456.278,780771.276,1375.214,NG
10131,818448.248,780766.742,1376.094,TOE2
10132,818411.753,780754.170,1385.477,TOP1
10133,818548.144,780736.814,1377.422,EP3 EP1
10134,818547.462,780745.317,1377.829,EP1
10135,818540.975,780727.464,1377.049,EP4
10136,818923.678,780084.434,1379.911,TOP
10137,818937.496,780094.475,1373.482,TOE
10138,818956.805,780125.819,1371.424,NG
10139,818967.544,780137.850,1371.448,TOE
10140,818972.528,780143.036,1374.567,EP1

10141,818980.603,780152.134,1374.867,EP
10142,818990.602,780167.450,1379.453,TOP
10143,819145.871,780067.218,1378.937,TOP
10144,819137.130,780050.893,1374.659,EP
10145,819131.544,780040.648,1374.366,EP1
10146,819131.407,780032.465,1371.447,TOE1
10147,819117.796,780009.649,1371.578,NG
10148,819103.887,779992.652,1372.061,TOE
10149,819094.362,779969.484,1379.912,TOP
10150,819234.628,779898.044,1379.131,TOP
10151,819241.847,779917.739,1371.262,TOE
10152,819253.892,779945.242,1371.060,NG
10153,819262.147,779966.092,1371.481,TOE1
10154,819266.516,779973.334,1373.454,EP1
10155,819272.564,779982.910,1373.774,EP
10156,819281.254,780002.386,1378.938,TOP
10158,819684.708,779845.692,1376.646,EP
10159,819682.513,779834.908,1376.286,EP1
10160,819681.908,779832.428,1375.911,TOP
10161,819674.766,779822.713,1372.284,TOE1
10162,819665.837,779770.476,1368.729,NG
10163,819648.094,779722.252,1369.822,NG
10164,819629.896,779700.134,1371.274,TOE
10165,819620.754,779666.996,1378.389,TOP
10166,819861.166,779544.151,1377.134,TOP
10167,819875.851,779571.391,1371.717,TOE
10168,819902.522,779626.772,1368.655,NG
10169,819919.605,779648.946,1368.111,NG
10170,819937.303,779687.560,1371.585,NG
10171,819947.415,779715.418,1371.704,TOE1
10172,819959.664,779740.880,1376.213,TOP
10174,820366.619,779526.936,1374.797,TOP
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10176,820342.752,779469.155,1370.037,NG
10177,820330.195,779437.328,1368.538,NG
10178,820322.795,779424.105,1367.433,NG
10179,820281.585,779355.161,1371.059,TOE
10180,820269.052,779330.875,1375.823,TOP
10181,820560.849,779415.645,1374.070,TOP
10182,820542.928,779392.849,1368.816,TOE1
10183,820520.090,779363.941,1369.782,NG
10184,820500.415,779329.048,1366.940,NG
10185,820455.485,779259.810,1369.560,TOE
10186,820440.319,779228.342,1375.373,TOP
10187,820785.871,778959.530,1373.151,TOP
10188,820830.903,779000.013,1367.414,TOE

10189,820892.640,779066.324,1368.256,NG
10190,820921.320,779098.177,1368.839,TOE1
10191,820937.729,779117.807,1372.814,TOP
10192,821311.340,778842.417,1371.336,TOP
10193,821286.391,778814.038,1366.278,TOE1
10194,821283.799,778811.308,1366.448,EP
10195,821276.441,778802.748,1366.338,EP1
10196,821233.242,778746.491,1365.110,NG
10197,821200.688,778700.265,1366.936,NG
10198,821181.331,778672.420,1367.115,TOE
10199,821170.444,778651.235,1371.155,TOP
10200,821627.710,778424.770,1371.940,TOP
10201,821656.670,778454.494,1364.333,TOE
10202,821684.398,778484.663,1363.993,NG
10203,821704.443,778509.480,1363.889,NG
10204,821723.207,778545.472,1365.039,EP1
10205,821730.000,778554.724,1365.383,EP
10206,821753.818,778583.665,1370.909,TOP
10207,821989.680,778412.836,1368.355,TOP
10208,821966.768,778398.656,1364.791,EP
10209,821958.306,778390.941,1364.656,EP1
10210,821912.869,778356.413,1363.898,NG
10211,821823.946,778304.859,1363.381,TOE
10212,821778.349,778286.916,1370.949,TOP
10213,821918.572,778057.875,1368.281,TOP
10214,821944.036,778069.068,1362.598,TOE
10215,821990.005,778095.161,1362.529,NG
10216,822094.922,778143.461,1362.702,TOE1
10217,822100.628,778145.980,1363.812,EP1
10218,822110.780,778151.255,1363.931,EP
10219,822136.897,778162.336,1368.575,TOP
10221,822320.005,777772.020,1367.442,TOP
10222,822299.249,777761.074,1363.872,EP
10223,822289.299,777755.525,1363.726,EP1
10224,822214.534,777723.429,1362.321,NG
10225,822137.168,777664.699,1361.658,TOE
10226,822098.838,777644.288,1367.135,TOP
10227,822267.558,777322.028,1368.131,TOP
10228,822312.035,777345.932,1360.578,TOE
10229,822384.864,777373.735,1360.995,NG
10230,822465.978,777406.967,1362.601,EP1
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10232,822496.213,777420.340,1366.176,TOP
10233,822727.650,776860.936,1364.075,TOP
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10235,822664.891,776839.438,1359.582,EP

10236,822653.331,776834.978,1359.392,EP1
10237,822585.266,776806.345,1358.924,NG
10238,822519.909,776787.724,1360.459,TOE
10239,822503.203,776775.081,1364.644,TOP
10240,822795.563,776165.217,1362.722,TOP
10241,822814.454,776173.832,1358.391,TOE
10242,822898.923,776227.333,1356.720,NG
10243,822973.294,776263.064,1356.660,TOE1
10244,823010.027,776282.318,1362.545,TOP
30000,823387.531,786182.205,1397.559,MHSS
30001,823390.139,785625.620,1393.431,MHSS
30002,822028.790,786125.292,1395.067,FCL
30003,822064.908,786124.364,1395.100,FCL
30004,822055.603,785479.754,1393.188,FCL
30005,821853.059,785351.228,1393.554,FCL
30006,821848.721,785176.490,1393.221,FCL
30007,821972.121,785599.405,1393.913,BKL
30008,822030.215,785600.349,1393.778,BKL
30009,822029.757,785557.588,1393.629,BKL
30010,821970.024,785559.902,1393.554,BKL
30011,822011.128,785593.513,1393.904,C-NOTE
30012,822024.762,785593.235,1393.981,C-NOTE
30013,822024.079,785577.535,1393.899,C-NOTE
30014,821986.679,785578.861,1394.015,C-NOTE
30015,821986.078,785563.871,1393.974,C-NOTE
30016,822023.578,785562.702,1393.860,C-NOTE
30017,821986.128,785550.112,1393.536,UP

MONDAY 3 APRIL 2006

#10-0078

QUEEN CREEK WASH

CONFIRMATION OF
AERIAL MAPPING

MARICOPA COUNTY
QUEEN CREEK, ARIZONA

±80° F HAZY/SUNNY

WIND: WEST @ ±3 mph

HIGH: ±84° F

LANCE EVELAND

10-0078

Q.C. WASH

GPS / TOPCON PG-AA + HYPER+ (UNIT-2)
STATIC + RTK

DATUM: ARIZONA STATE PLANE COORDINATES - GRID

ZONE: AZCENTRAL (2002)

NAD '83 (CORR '96) (EPOCH 2002.0000)

NAVD '88

GEOID: 2003 (06)

UNITS: int. ft.

BASE@ CP-8 / MAG NAIL

HA = $\frac{369}{1000}$

STICK ✓ = 4.49'

CORR = 4.491'

10,000 ROVER ✓ TO #2 DNI - GDACS / NGS pt

A

N: 0.078

E: 0.075

EL: 0.434

* - difference due to
Published vertical in
'72 EPOCH / OPUS SOLUTION
15 '2002 EPOCH

L. EVELAND

4/3/06 cont.

18 / MISC G

PTS: 10,000 → 10,085

MONS:

CP'S: 61, 1, 2, 4, 5013

FILE: "078 GPS2 2006 0403.HSV"

* - SEE PROJECT'S INCERTION; NOTES ON FILE
FROM JANUARY 1, 2006 by Sean Twomey

RECORD COORDS.

N: 848.002 $\frac{578}{1000}$ E: 781.793 $\frac{460}{1000}$ EL: 1387 $\frac{180}{1000}$

} from 1/18/2006

10,084 END ✓ ROVER TO #2

A

N: 0.095

E: 0.031

EL: 0.052

#10-0078

QC/WASH

PT. #	CODE	DESCRIPTION
10,000	CK TO #61	-GDACS "2DNA"
10,002	CK TO CP-1/RB	

90 EPOCHS

N: 0030

E: 0001

EL: 0199 ? eh?

10,003 CK TO #4 CP/X

90 EPOCHS

N: 0009

E: 0039

EL: 0051

LEVELAND

4/03/06 cont.

19/MISC. G

* - CP-1/RB - DISTURBED! VERTICAL IS OFF

+0.300

BASE HEIGHT TRIPLE CHECKED

OTHER ✓ IS GOOD

30,000 → 30,019 PROJECT #10-0516

- END 4/03/06 -

McDaniels Residence Grading

Job No. 10-0078

Queen Creek, AZ

File: 0078-2007-0123-GP52

Coordinates:

Projection: SPC83 (AZ Central)

Datum: NAD83

Geoid: g2003v06

Sunny & Cool
60°F

R. Garland

January 23, 2007

1/2

10-0078

Occupied Point No. 101

base height = 1.539m = 5.05 ft

8000 Check 102/8000

ΔN +0.001 Pk missing
 ΔE +0.021 Pk hole used
 ΔZ -0.193

Final Check

8274 CP-4/8274
 Not in file

8275 103/8275

$\Delta N = -0.029$
 $\Delta E = +0.004$
 $\Delta Z = -0.203$

Did not collect static data

McDaniels Residence

1/23/07

Pictures 1880-1914 on ~~F~~
 P drive

Drainage from lot is

flowing under path
 undermining Asphalt trail.

APPENDIX D

HYDROLOGIC ANALYSIS SUPPORTING DOCUMENTATION

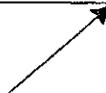
Revised (Future Conditions) Hydrology

The effective flow rate for this analysis is drawn from the hydrology presented in the publication *Queen Creek Wash, Power Road to Hawes Road, Revised Hydrology*, and is available upon request. This hydrology has been approved as part of the LOMR for Queen Creek Wash, Power Road to Sossaman Road, FEMA Case No. 03-09-0247P.

Table 3. Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs)			
		10-Year	50-Year	100-Year	500-Year
Queen Creek Wash Above Power Road	24.62	-- ¹	-- ¹	2,839	-- ¹

REVISED AREA



REVISED TO
 REFLECT LGAR
 DATED JAN 22 2004

¹Not Computed

APPENDIX E

*HYDRAULIC ANALYSIS SUPPORTING
DOCUMENTATION*

APPENDIX E.1

ROUGHNESS COEFFICIENT ESTIMATION

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC METHOD

Project: Queen Creek Wash, Power Road to Hawes Road *LOMR APRIL 2007*

Stream: Queen Creek Wash

Location:

Notes:

Channel Conditions		Manning's n Adjustment		Left Overbank	Left Bank (Earth)	Left Bank (Rip-Rap)	Channel	Right Bank (Earth)	Right Bank (Rip-Rap)	Right Overbank
Channel Material	Firm Soil	n _b	.025 - .032							
	Coarse Sand		.026 - .035	0.032	0.030	0.026	0.030	0.030	0.032	
	Gravel		.028 - .035							
	Cobble		.030 - .050			0.045				
	Boulder		.040 - .070							
Degree of Irregularity	Smooth	n ₁	0							
	Minor		.001 - .005	0.005	0.002	0.002	0.002	0.002	0.002	0.005
	Moderate		.006 - .010							
Effects of Obstruction	Severe	n ₂	.011 - .020							
	Negligible		.000 - .004		0.001	0.001	0.001	0.001	0.003	
	Minor		.005 - .015	0.005						0.005
	Appreciable		.020 - .030							
Vegetation	Severe	n ₃	.040 - .060							
	Small		.002 - .010			0.004				
	Medium		.010 - .025	0.010	0.008	0.010	0.008	0.008	0.010	
	Large		.025 - .050							
Variations in Channel Cross Section	Very Large	n ₄	.050 - .100							
	Gradual		0			0.000		0.000		
	Occ. Alt.		.001 - .005	0.005	0.002	0.002	0.002	0.002	0.005	
	Freq. Alt.		.010 - .015							
Subtotal				0.057	0.043	0.054	0.039	0.043	0.043	0.057
Degree of Meandering	Minor	m	1	1	1	1	1	1	1	1
	Appreciable		1.15							
	Severe		1.3							
n = (n _b +n ₁ +n ₂ +n ₃ +n ₄)m				0.057	0.043	0.054	0.039	0.043	0.043	0.057
Manning's n Value Used				0.055	0.045	0.055	0.040	0.045	0.045	0.055

Excerpts from:

Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona

By B.W. Thomsen and H.W. Hjalmarson

Prepared by the
U.S. GEOLOGICAL SURVEY
Water Resources Division
375 South Euclid Avenue
Tucson, Arizona 85719

Prepared for the
Flood Control District
of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

April 1991

and, for convenience in the absence of a more suitable method, the coefficient is assumed to be unity (Chow, 1959). A detailed study of the velocity-head coefficient, alpha, in natural channels showed a significant correlation between alpha and channel roughness for channels without overbank flow. Variation in the horizontal distribution of velocity had a greater effect on the value of alpha than variation in the vertical. Computed values of alpha at 894 sites in a variety of settings ranged from 1.03 to 4.70; and the median value for trapezoidal channels was 1.40 (Hulsing and others, 1966). In the computation of water-surface profiles in open channels, the value of alpha is assumed to be 1.0 if the section is not subdivided (Davidian, 1984). In subdivided channel cross sections, the value of alpha is computed as

$$\alpha = \frac{\sum(k_i^3/a_i^2)}{K_T^3/A_T^2} \quad (6)$$

where

- k_i = conveyance of individual subsections,
- a_i = area of individual subsections,
- K_T = conveyance of entire cross section, and
- A_T = area of entire cross section.

Channel n Values

The Manning roughness coefficient, n , is a measure of the flow resistance or relative roughness of a channel or overflow area. The flow resistance is affected by many factors including bed material, cross-section irregularities, depth of flow, vegetation, channel alignment, channel shape, obstructions, suspended material, and bedload. In general, all factors that cause turbulence and retard flow tend to increase the roughness coefficient (Jarrett, 1984). Channel roughness also is directly related to channel slope (Riggs, 1976; Jarrett, 1984). The relation of roughness to slope results partly from the interrelation between channel slope and bed-material particle size. For similar bed material, however, channels with low gradients have lower roughness coefficients than channels with high gradients (Jarrett, 1984). The direct relation between channel roughness and channel slope is not evident in low-gradient channels where high roughness coefficients result from vegetation. Roughness coefficients as great as 0.20 have been verified for channels with low gradients and dense vegetation (Arcement and Schneider, 1984). For vegetation that will bend under the force of flowing water, the relation between roughness and gradient can be inversely related. Steep slopes cause greater velocities that bend and flatten vegetation if depths of flow are sufficient, resulting in lower n values. Because of the relation between channel slope and size of bed material, the effect of slope on n values is considered in the selection of base n values.

A common method of selecting the roughness coefficient, n , is to first select a base value of n for the bed material (table 1). The base values of n are for a straight uniform channel of a given bed material. Cross-section irregularities, channel alignment, obstructions, vegetation, and other factors that increase roughness are accounted for by adding increments of roughness to the base value of n . Ranges of adjustments for the factors that may add to channel roughness are shown in table 2.

Many alluvial channels in Maricopa County have bed material that moves during floodflow. In addition to the changing channel geometry of these channels, the roughness coefficient may change during floodflow because of the changing form of the channel bed in parts of the channel cross section (Davidian, 1984). Bedforms, such as dunes, antidunes, and plane bed have been observed during large floods. Within a few minutes, dunes can appear, disappear, and reappear at different locations across a large stream channel. The Manning roughness coefficient can double or triple when the bedform changes from plane to dunes. A method of defining reliable values of Manning's n for unstable alluvial channels is not available. A plane bedform is common during large floods, and for this report, plane-bed conditions are assumed where the roughness coefficient is related to the size of the channel material and not the form of the channel bed. Plane-bed conditions were assumed for nearly all indirect measurements of peak discharge where the slope-area method was used.

Table 1.--Base values of Manning's n for stable channels

[Modified from Aldridge and Garrett, 1973, table 1]

n_b Channel material	Size of bed material		Base n values	
	Millimeters	Inches	Benson and Dalrymple (1967) ¹	Chow (1959) ²
Concrete.....	-----	-----	0.012-0.018	0.011
Rock cut.....	-----	-----	-----	.025
Firm soil.....	-----	-----	.025- .032	.020
Coarse sand.....	1-2	-----	.026- .035	-----
Fine gravel.....	-----	-----	-----	.024
Gravel.....	2-64	0.08-2.5	.028- .035	-----
Coarse gravel.....	-----	-----	-----	.028
Cobble.....	64-256	2.5-10.0	.030- .050	-----
Boulder.....	>256	>10.0	.040- .070	-----

¹Straight uniform channel.

²Smoothest channel attainable in indicated material.

Table 2.--Adjustment factors for the determination of overall Manning's n values

[Modified from Chow, 1959]

Channel conditions	Manning's n adjustment ¹	Example
Degree of irregularity: n_1		
Smooth	0.000	Smoothest channel attainable in given bed material.
Minor	<i>.001</i> → .001- .005	Channels with slightly eroded or scoured side slopes.
Moderate	.006- .010	Channels with moderately sloughed or eroded side slopes.
Severe	.011- .020	Channels with badly sloughed banks; unshaped, jagged, and irregular surfaces of channels in rock.
Effects of obstruction ² : n_2		
Negligible	.000- .004	A few scattered obstructions, which include debris deposits, stumps, exposed roots, logs, piers, or isolated boulders, that occupy less than 5 percent of the cross-sectional area.
Minor	.005- .015	Obstructions occupy 5 to 15 percent of the cross-sectional area and the spacing between obstructions is such that the sphere of influence around one obstruction does not extend to the sphere of influence around another obstruction. Smaller adjustments are used for curved smooth-surfaced objects than are used for sharp-edged angular objects.
Appreciable	.020- .030	Obstructions occupy from 15 to 50 percent of the cross-sectional area or the space between obstructions is small enough to cause the effects of several obstructions to be additive, thereby blocking an equivalent part of a cross section.
Severe	.040- .060	Obstructions occupy more than 50 percent of the cross-sectional area or the space between obstructions is small enough to cause turbulence across most of the cross section.
Vegetation: n_3		
Small	.002- .010	Dense growths of flexible turf grass, such as Bermuda, or weeds where the average depth of flow is at least two times the height of the vegetation; supple tree seedlings such as willow, cottonwood, arrow weed, or saltcedar where the average depth of flow is at least three times the height of the vegetation.
Medium	<i>.015</i> FUTURE → .010- .025 <i>.010</i> EXISTING →	Grass or weeds where the average depth of flow is from one to two times the height of the vegetation; moderately dense stemmy grass, weeds, or tree seedlings where the average depth of flow is from two to three times the height of the vegetation; <u>moderately dense brush, similar to 1- to 2-year-old saltcedar in the dormant season, along the banks and no significant vegetation along the channel bottoms where the hydraulic radius exceeds 2 feet.</u>
Large	.025- .050	Turf grass or weeds where the average depth to flow is about equal to the height of vegetation; small trees intergrown with some weeds and brush where the hydraulic radius exceeds 2 feet.

.004

.015
FUTURE

.010
EXISTING

FUTURE CON
.015

EXIST. CON
.010

See footnotes at end of table.

Table 2.--Adjustment factors for the determination of overall Manning's n values--Continued

Channel conditions	Manning's n adjustment ¹	Example
Vegetation--Continued:		
Very large	.050- .100	Turf grass or weeds where the average depth of flow is less than half the height of vegetation; small bushy trees intergrown with weeds along side slopes of dense cattails growing along channel bottom; trees intergrown with weeds and brush.
Variations in channel cross section: n_4		
Gradual	.000	Size and shape of cross sections change gradually.
Alternating	.001- .005	Large and small cross sections alternate occasionally, or the main flow occasionally shifts from side to side owing to changes in cross-sectional shape.
Alternating	.010- .015	Large and small cross sections alternate frequently, or the main flow frequently shifts from side to side owing to changes in cross-sectional shape.
Degree of meandering ³ : m		
Minor	1.00	Ratio of the meander length to the straight length of the channel reach is 1.0 to 1.2.
Appreciable	1.15	Ratio of the meander length to the straight length of channel is 1.2 to 1.5.
Severe	1.30	Ratio of the meander length to the straight length of channel is greater than 1.5.

¹Adjustments for degree of irregularity, variations in cross section, effect of obstructions, and vegetation are added to the base n value (table 1) before multiplying by the adjustment for meander.

²Conditions considered in other steps must not be reevaluated or duplicated in this section.

³Adjustment values apply to flow confined in the channel and do not apply where downvalley flow crosses meanders. The adjustment is a multiplier.

For floodflows in sand channels with moveable beds, roughness mainly is a function of the size of the bed material as shown in the following table (Benson and Dalrymple, 1967, p. 22).

Median grain size, in millimeters	Manning's n	Median grain size, in millimeters	Manning's n
0.2	0.012	0.6	.023
.3	.017	.8	.025
.4	.020	1.0	.026
.5	.022		

The above n values are for upper-regime flow that is common during floods. Where these n values are used, the assumed flow regime should be confirmed (Benson and Dalrymple, 1967, p. 24). Stream channels in Maricopa County commonly are sandy in the low-flow part of the channel where flows are common. Higher parts of the channel beds and the channel banks commonly are stabilized by gravel, cobbles, and boulders, and (or) to some extent by vegetation.

Depth of flow must be considered in selection of n values. The effects of roughness elements on and near the channel bottom tend to diminish as the depth of flow increases. The effect of vegetation on n values depends greatly on the depth of flow and to some extent on the flexibility of the vegetation. If the flow is of sufficient depth to submerge and (or) flatten the vegetation, n values will be lowered. Density of vegetation below the high-water level and the alignment of vegetation in relation to direction of flow also affect n values. If the vegetation is aligned in rows along the direction of flow, less vegetation is in contact with higher velocity flow. The roughness of aligned vegetation tends to be less than the roughness of nonaligned vegetation.

Generally an n value is selected for a cross section that is representative of a reach of channel. If two or more cross sections are being considered, the reach that applies to a given section extends halfway to the next section. In this study, channel data including maps showing cross-section locations were furnished by Maricopa County Flood Control District. A cross section for each of the 16 sites was selected on the basis of the following criteria: (1) cross section should be located so that visual inspection is reasonably convenient; (2) cross section should be within a reach that is minimally affected by roads, bridges, and other structures that may obstruct floodflow; and (3) cross section should contain roughness elements typical of the reach. Widths of the cross sections range from a few hundred feet to a few thousand feet. Some sections have a distinct main channel and overflow areas; others are one large trapezoidal section.

Components of Manning's n

The general procedure for determining n values was to first select a base value of n for the bed material (table 1) followed by selection of n -value adjustments for channel irregularities and alignment, obstructions, vegetation, and other factors (table 2). In this procedure, the value of n was computed by

$$n = n_b + n_1 + n_2 + n_3, \quad (7)$$

where

n_b = base value of n for a straight uniform channel,

n_1 = value for surface irregularities,

n_2 = value for obstruction, and

n_3 = value for vegetation.

APPENDIX E.1.1

PRE-CONSTRUCTION CHANNEL PHOTOGRAPHS



PHOTO #2



PHOTO # 4



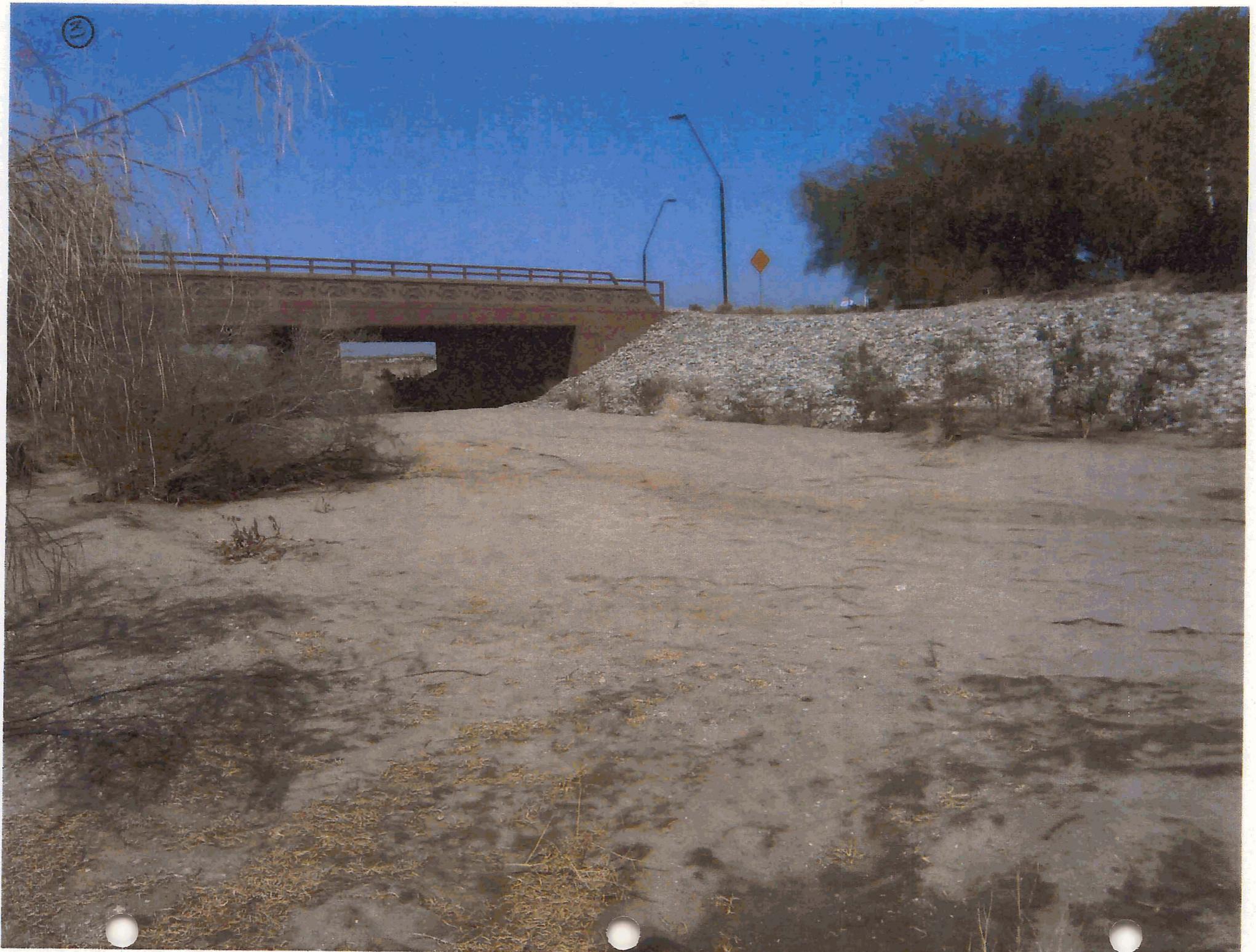
PHOTO # 7

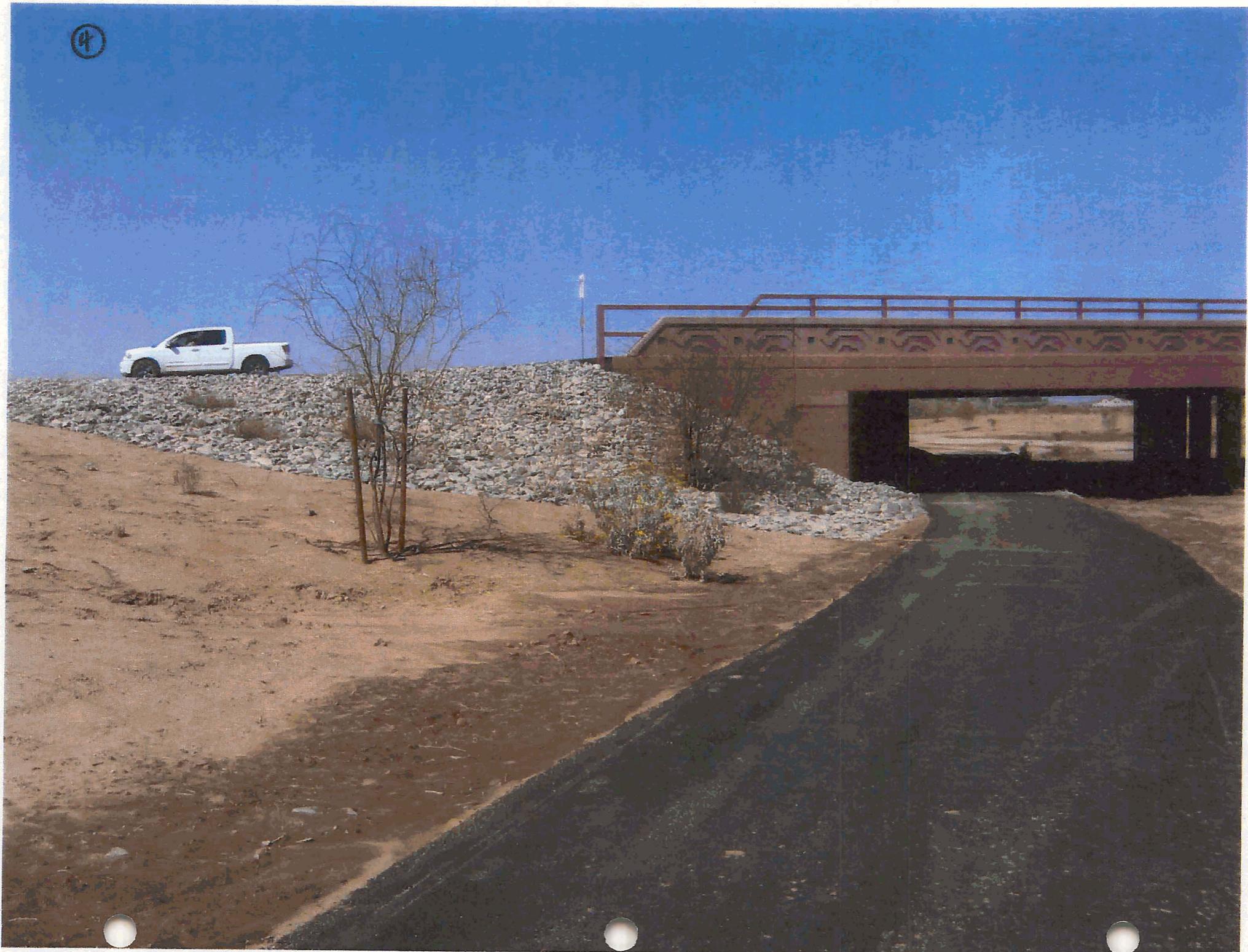


PHOTO #9









5



6





8



9





11



12



13

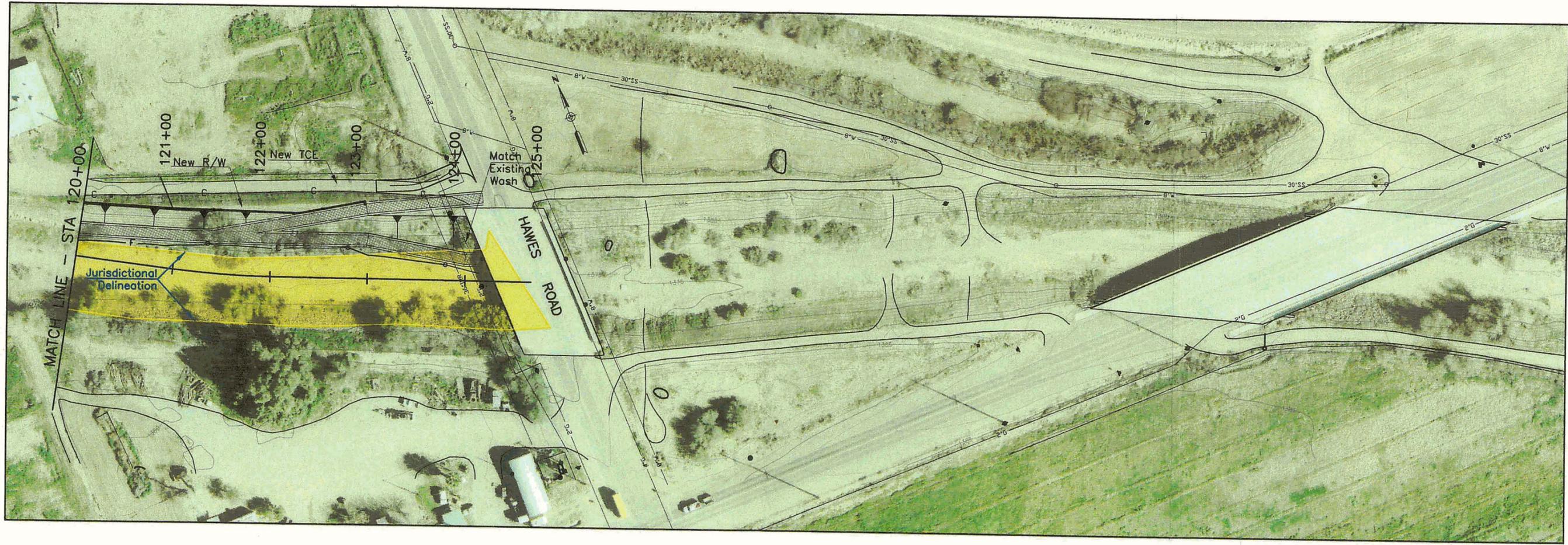


(4)



APPENDIX E.1.2

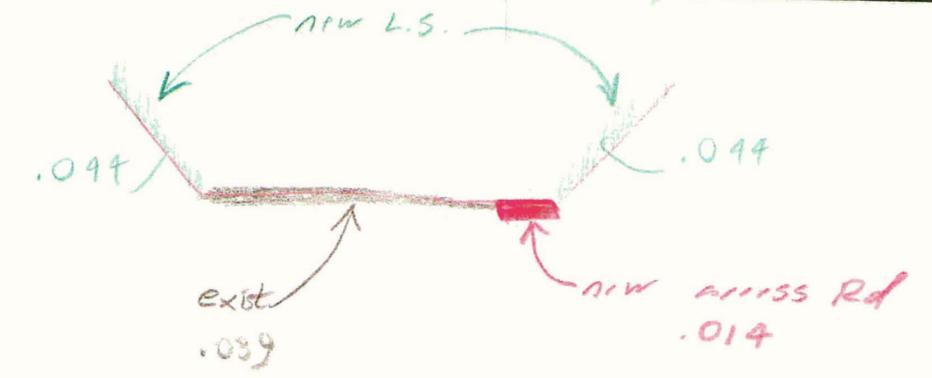
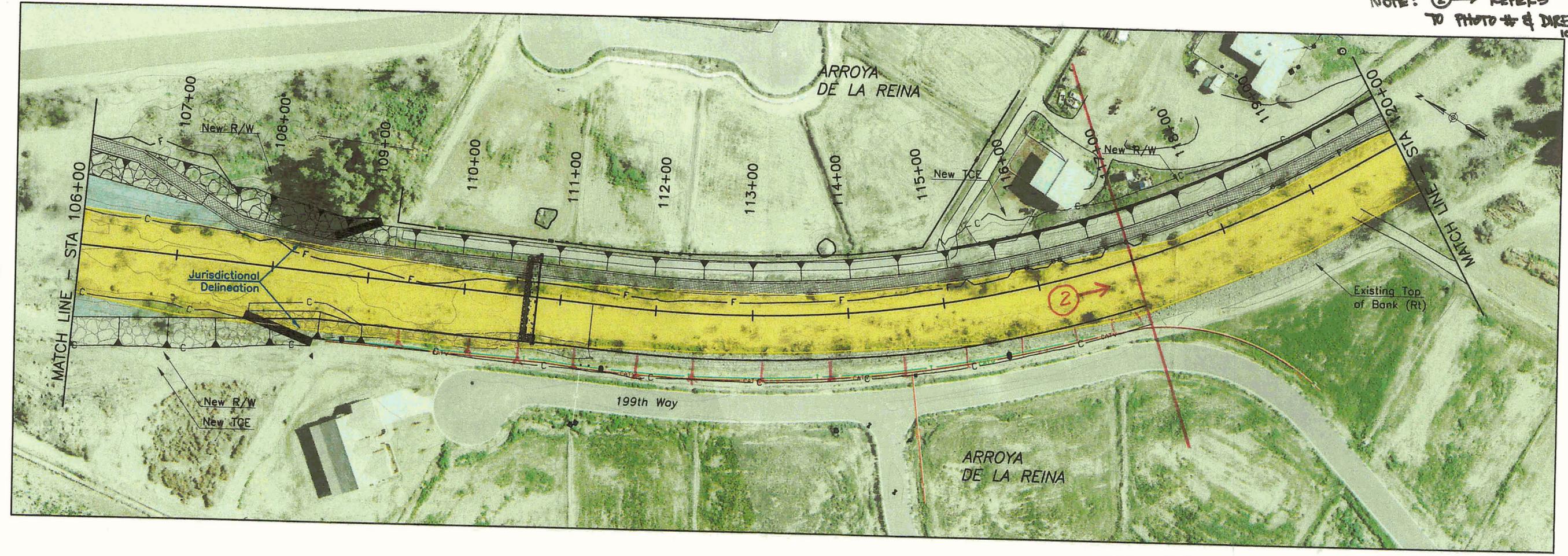
**REVISED CONDITIONS CHANNEL PHOTOGRAPHS & SAMPLE
PHOTOGRAPHS OF LANDSCAPE TREATMENT**



NOTE: MAPS ARE INTENDED FOR
ROUGHNESS ESTIMATION ONLY -
CHANNEL NOT CONSTRUCTED
AS SHOWN.

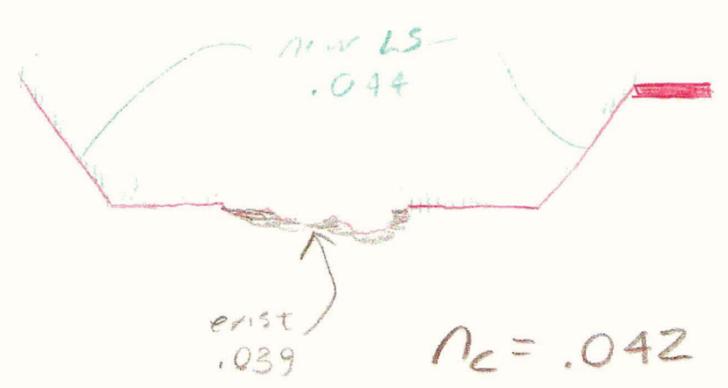
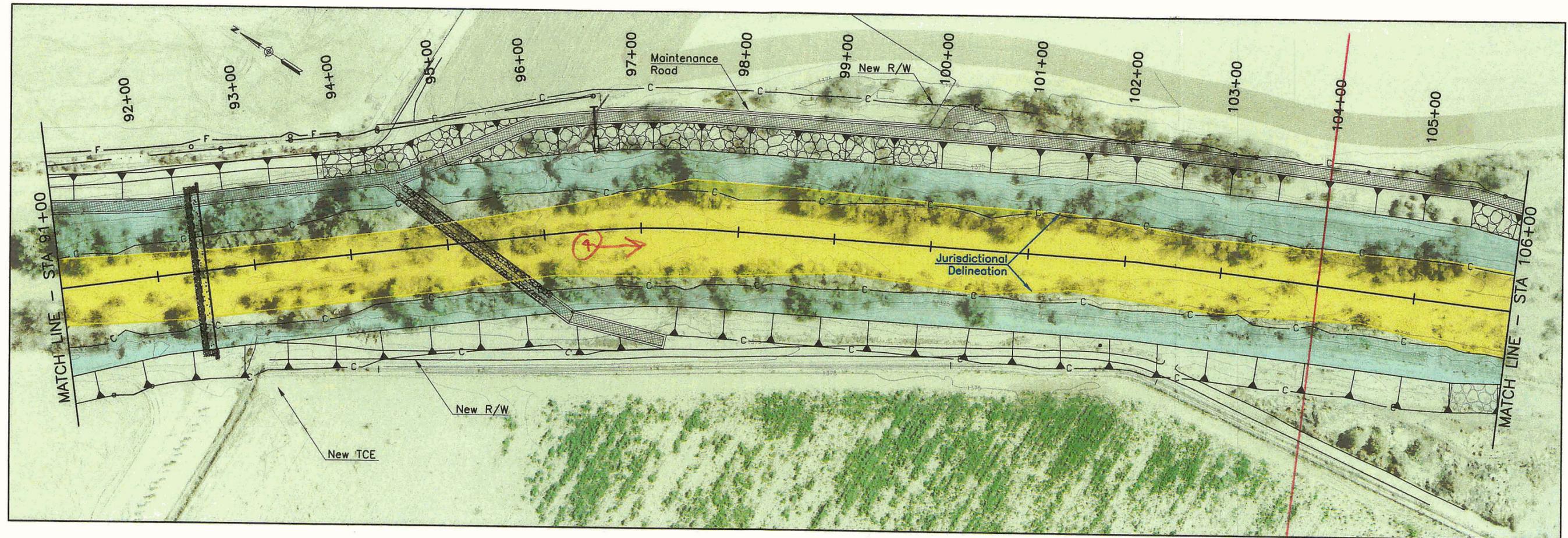
2ko

NOTE: ② → REFERS TO PHOTO # & DIRE

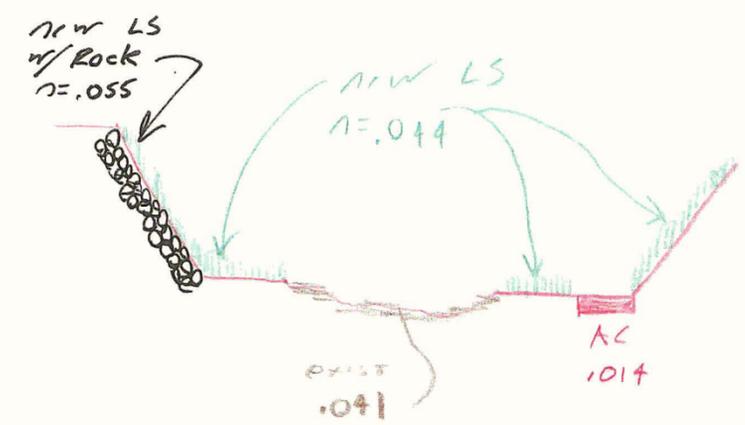
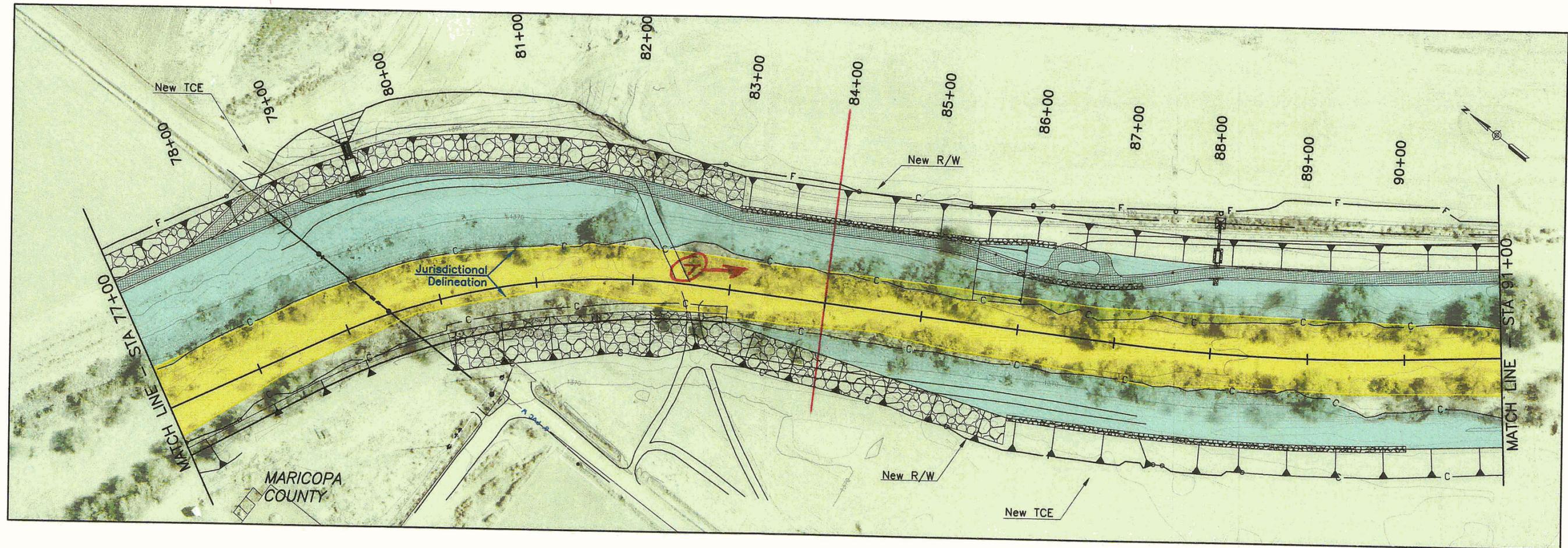


$n_c = .039$

3ke

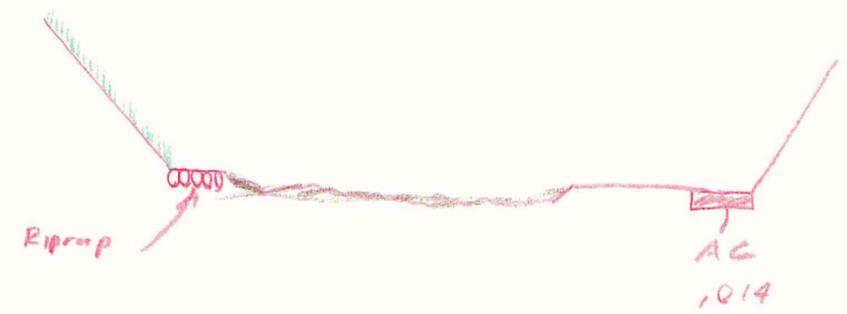
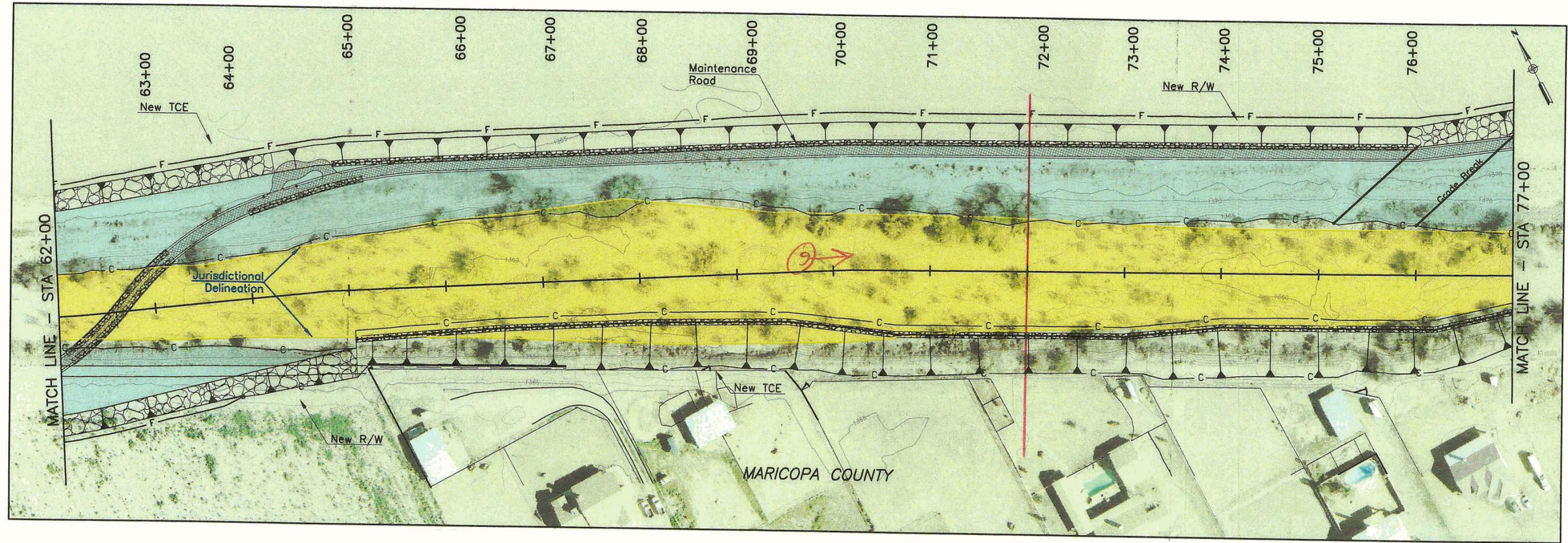


4/je

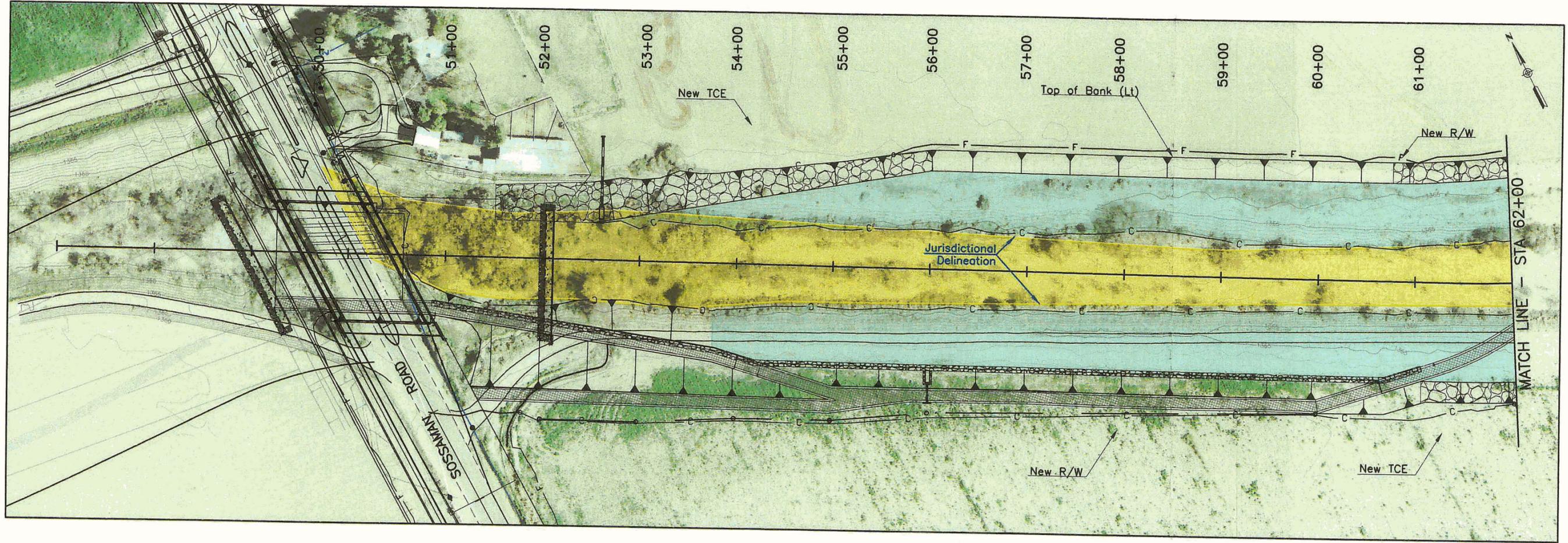


$n_c = \cancel{.042}$
 $.044$

5/ke



oke

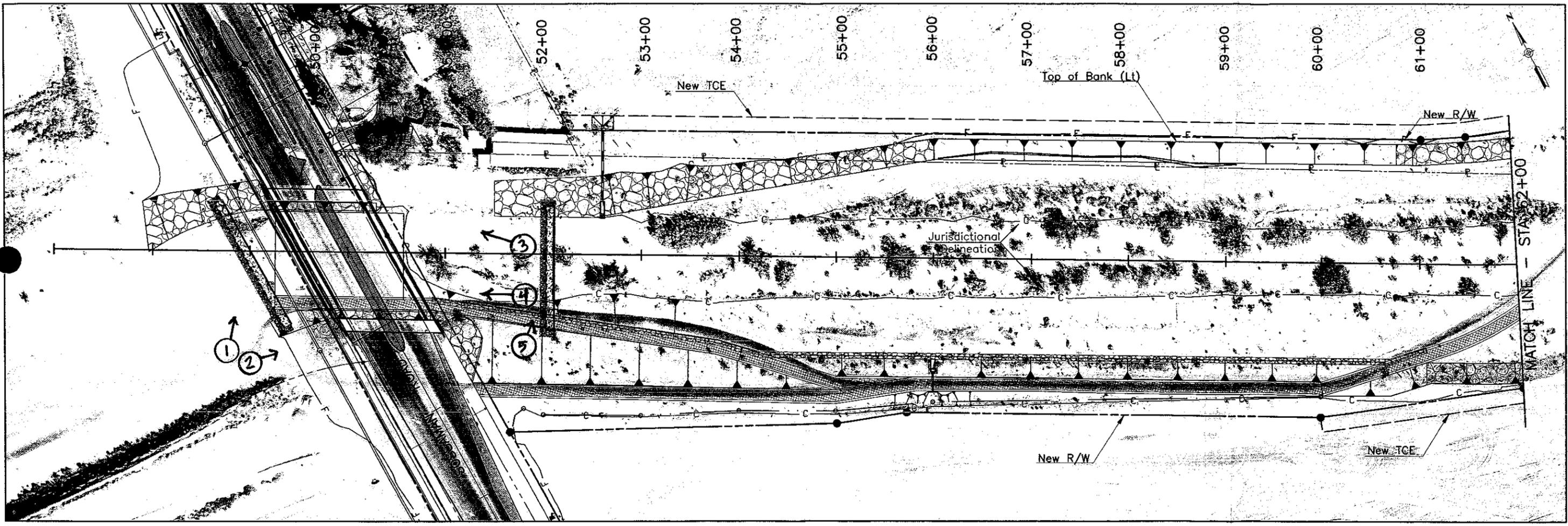


$$n_b = 0.0395 \times D_{50}^{(1/6)} \quad (D \text{ in feet}) \quad D = .5 \Rightarrow n = .035$$

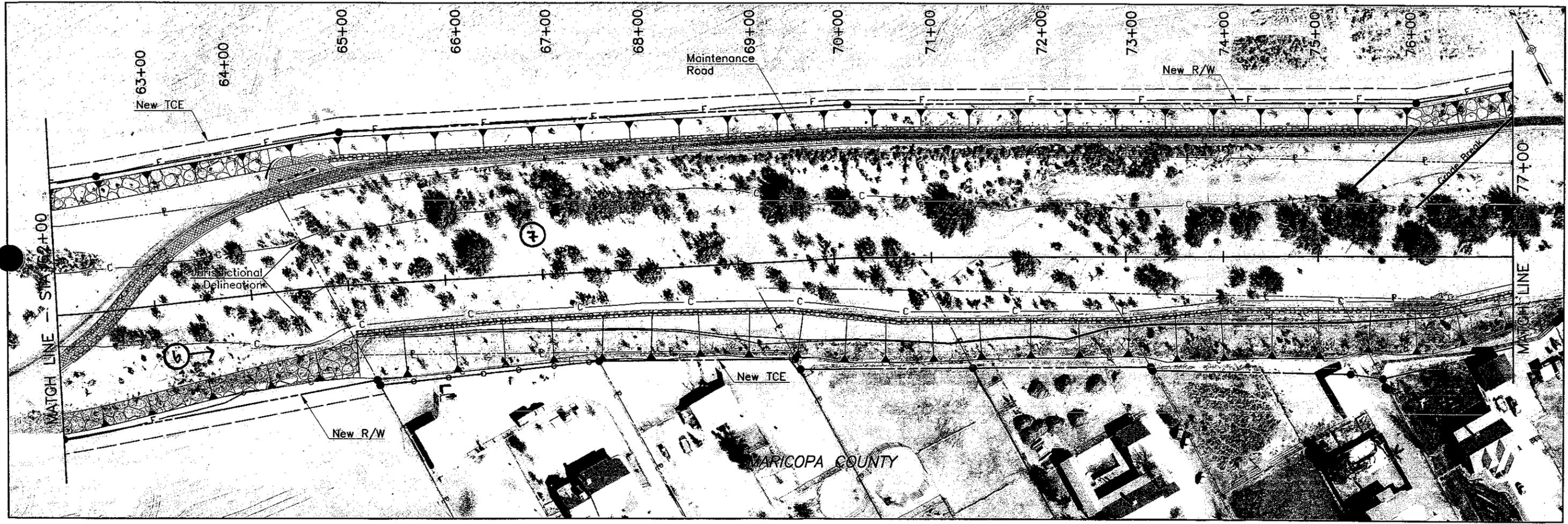
ADWR

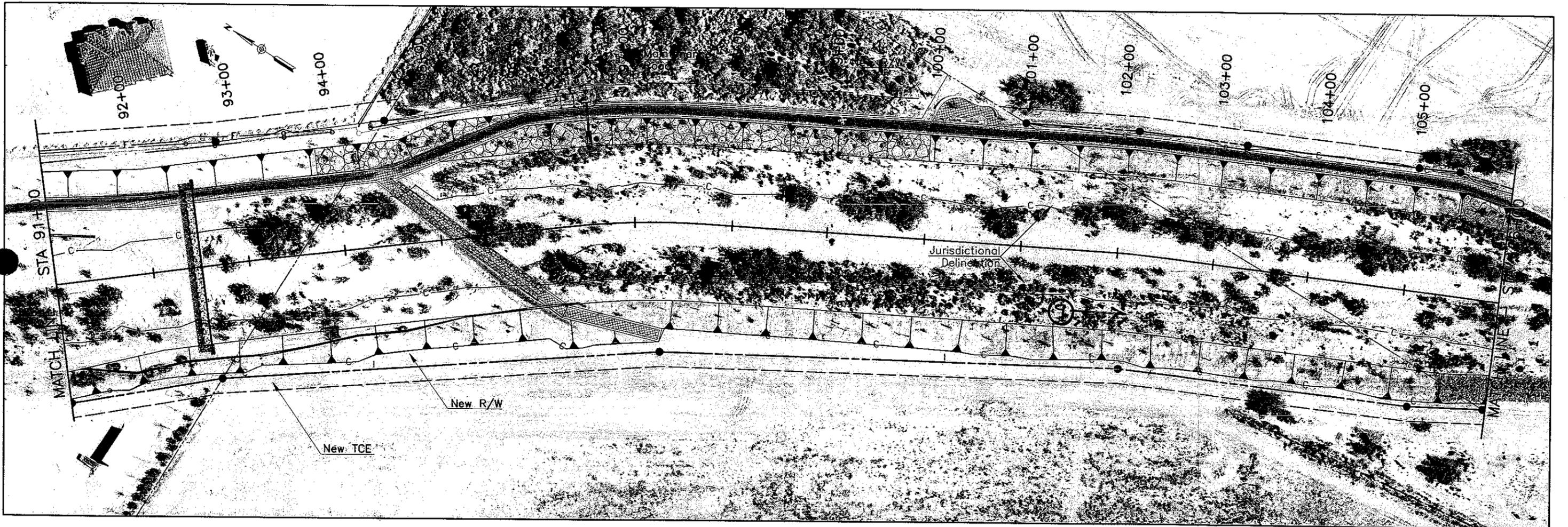
APPENDIX E.2

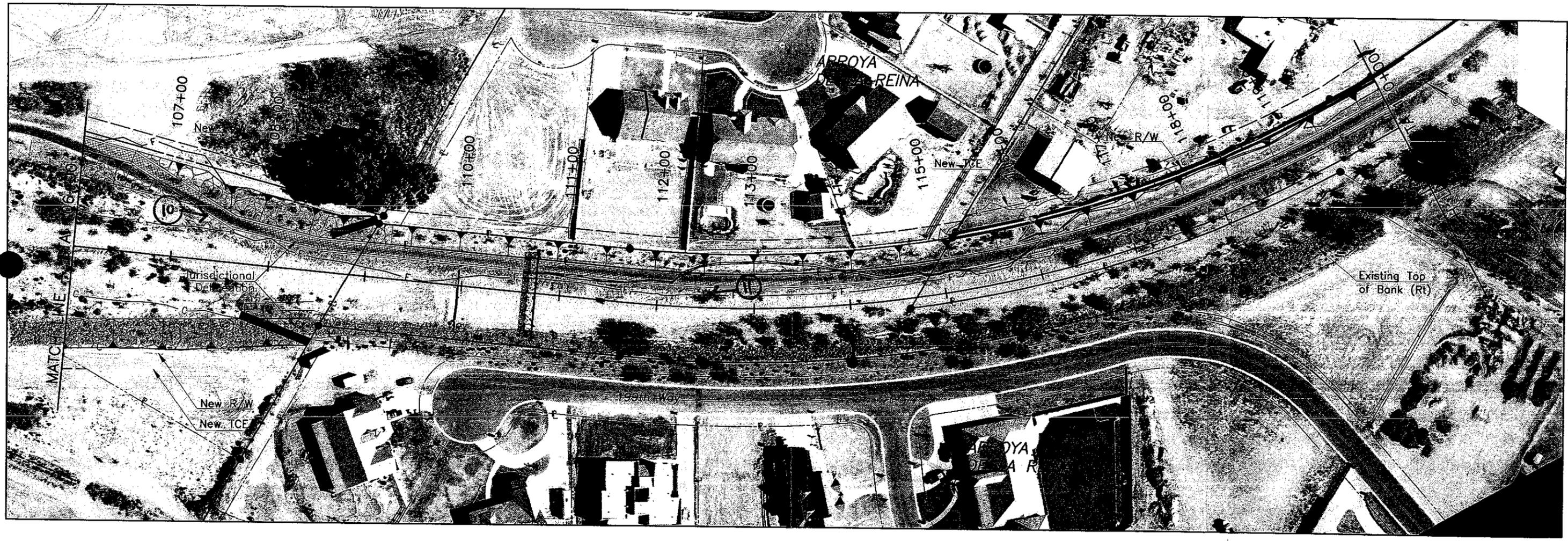
REVISED CONDITION HECRAS CROSS SECTION PLOTS

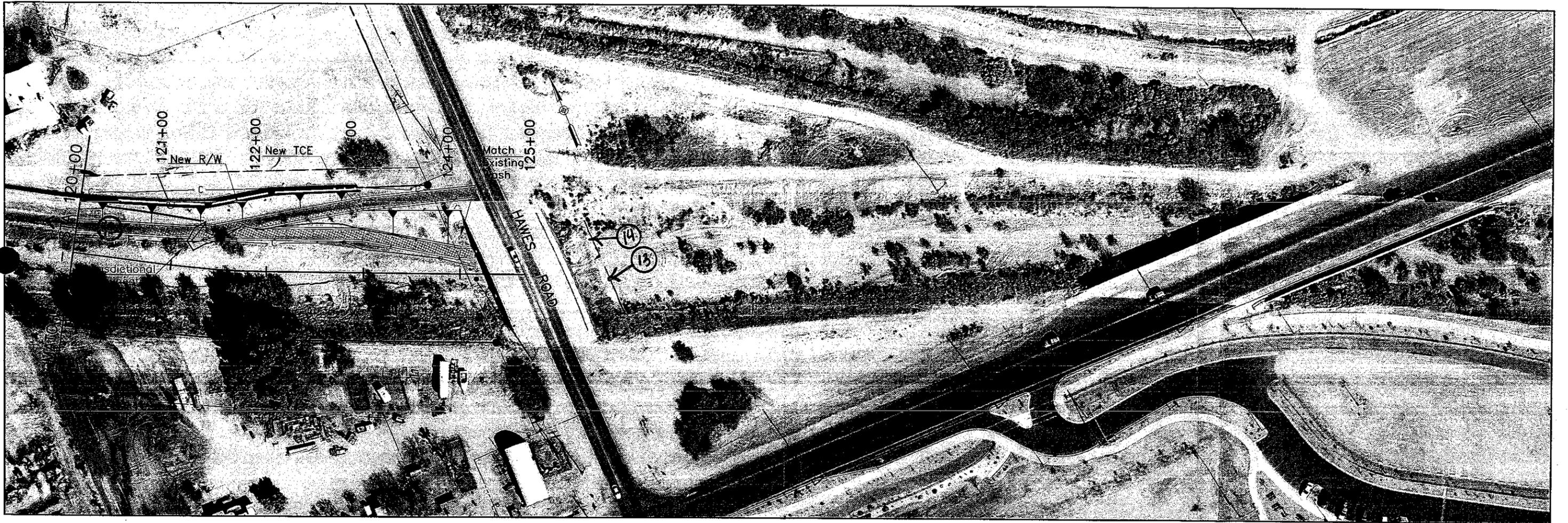


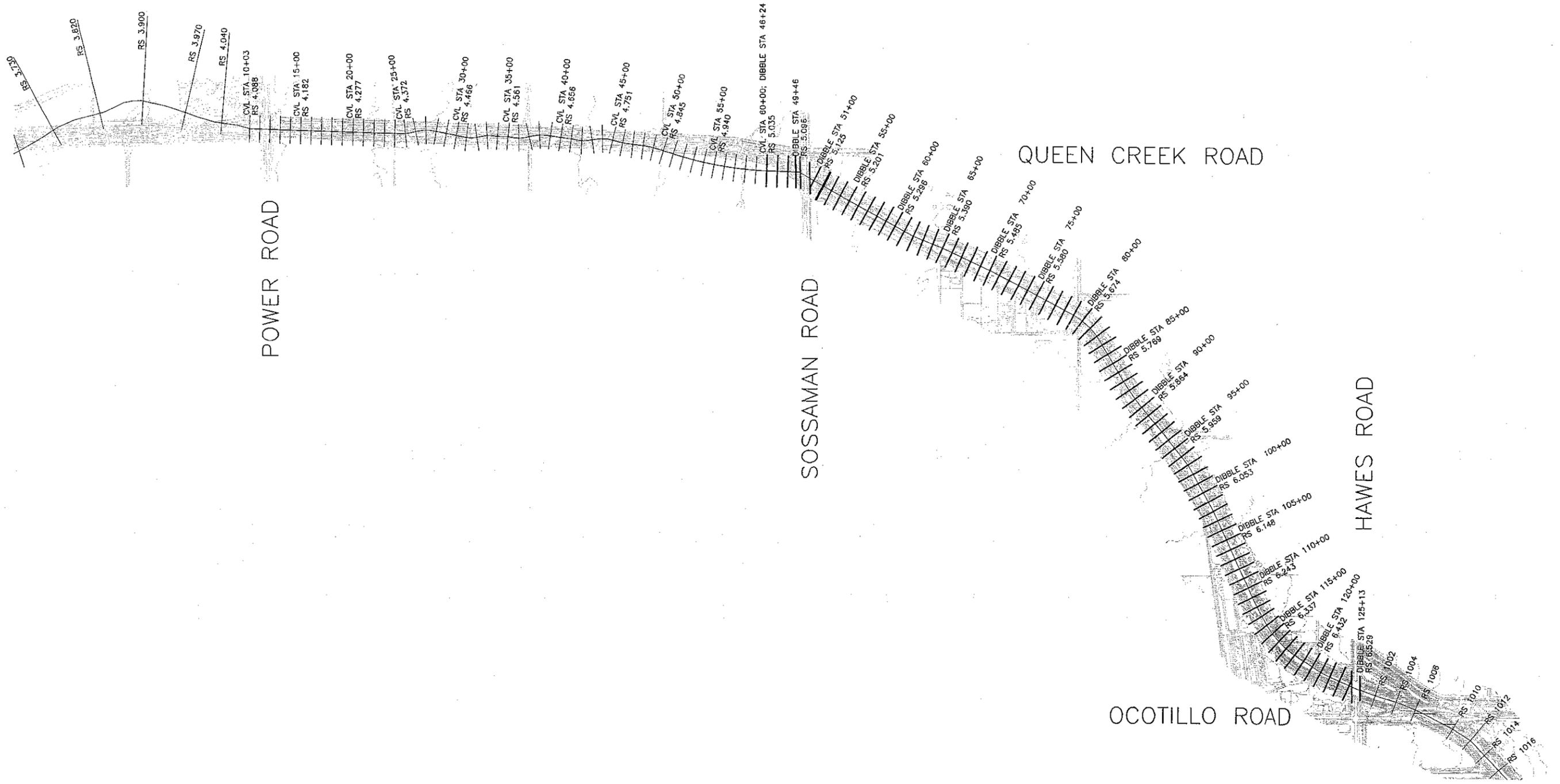
NOTE: MAPS ARE INTENDED FOR
ROUGHNESS ESTIMATION ONLY -
CHANNEL NOT CONSTRUCTED
AS SHOWN.





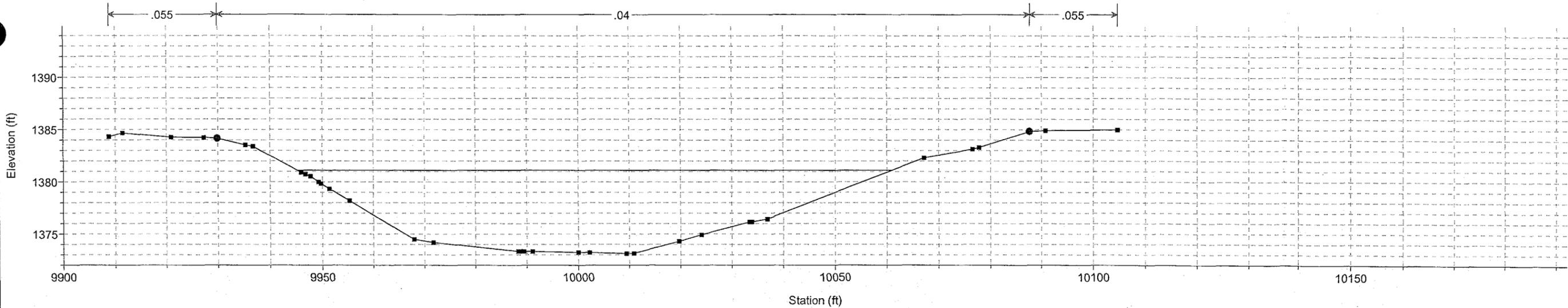




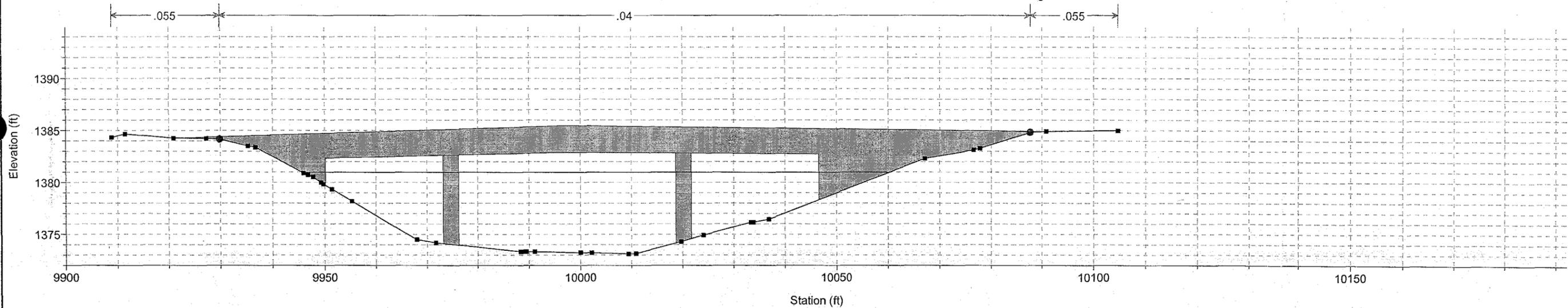


	COUNTY PROJECT NO. 2000D03	QUEEN CREEK WASH IMPROVEMENTS	
	PROJECT DESCRIPTION POST CONSTRUCTION HEC-RAS CROSS SECTION LAYOUT		
	DRN. PAF DATE: 6/1/06	SCALE	SHEETS
	DES. JEP DATE: 6/1/06	1"=1000' HORIZONTAL	
	CKD. KWR DATE: 6/1/06	n/a VERTICAL	NO. 1 OF 1

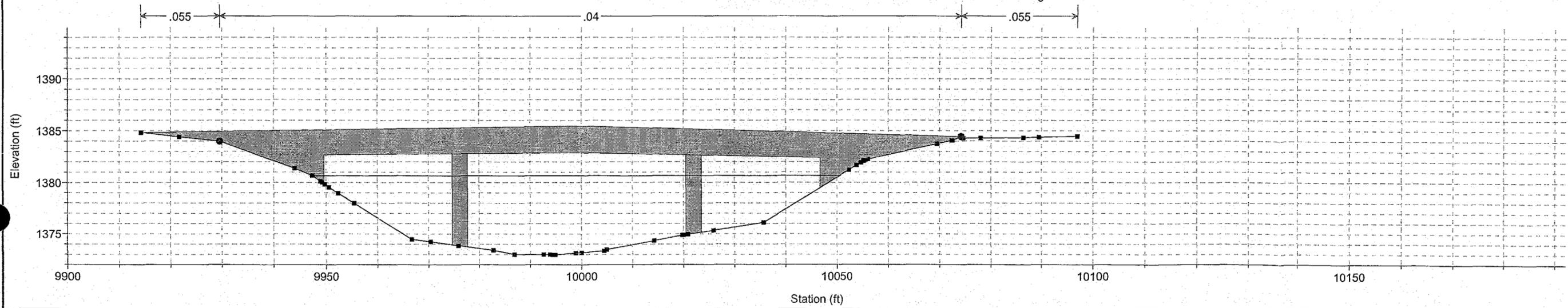
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 6.529 END OF DETAILED STUDY; DIBBLE Sta 125+13;



QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 6.528 BR Hawes Road Bridge

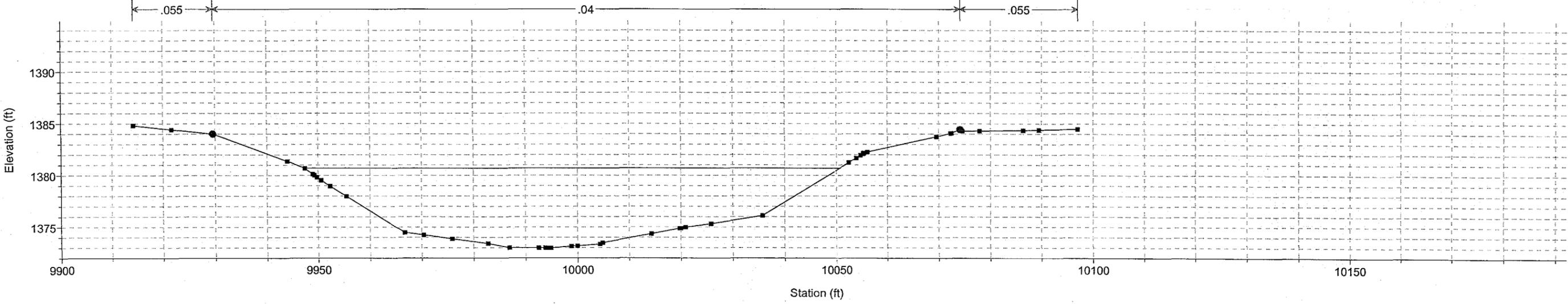


QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 6.528 BR Hawes Road Bridge

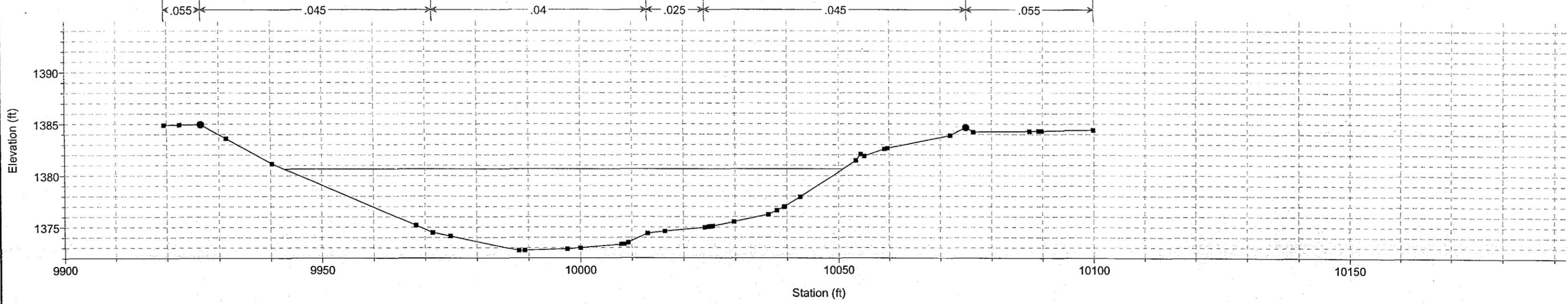


1 in Horiz. = 20 ft 1 in Vert. = 10 ft

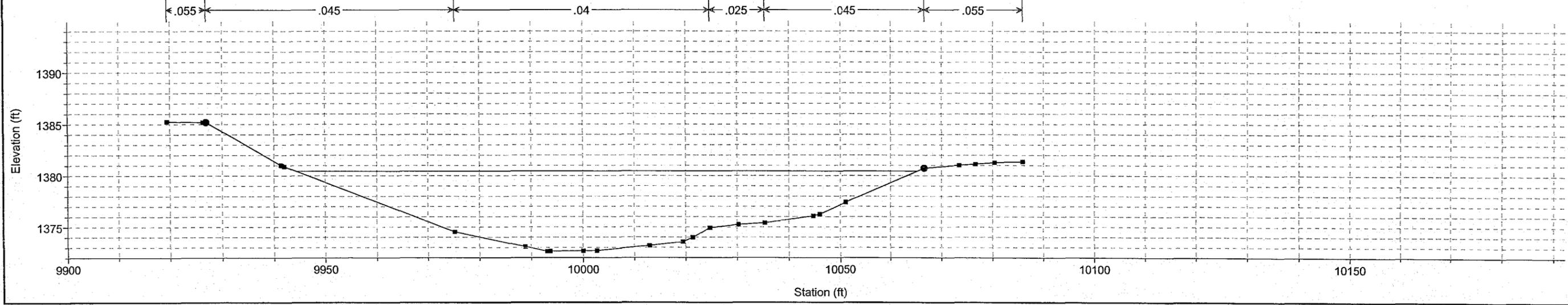
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 6.513 DIBBLE Sta 124+28



QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 6.508 DIBBLE Sta 124+00

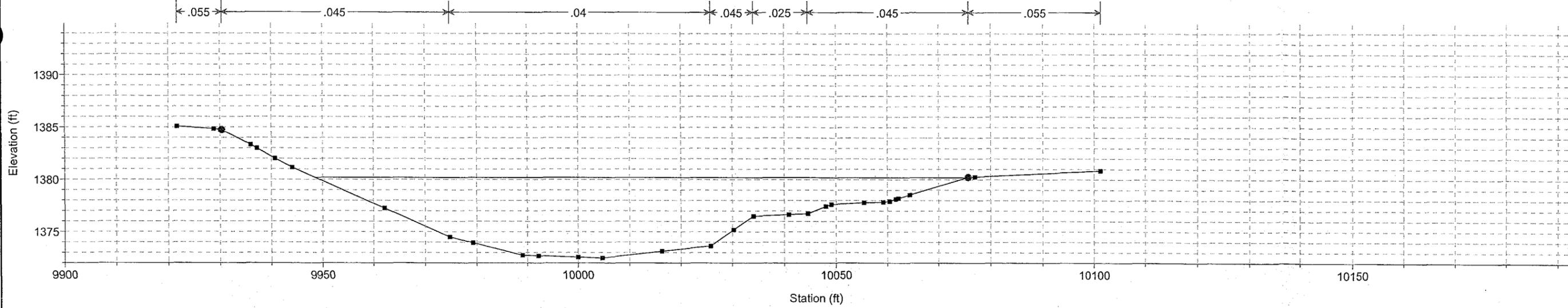


QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 6.489 DIBBLE Sta 123+00



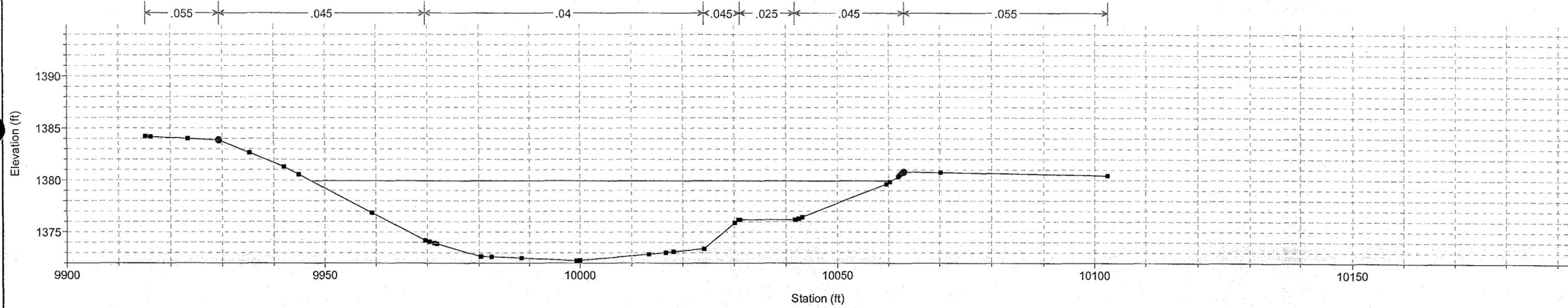
1 in Horiz. = 20 ft 1 in Vert. = 10 ft

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 6.470 DIBBLE Sta 122+00



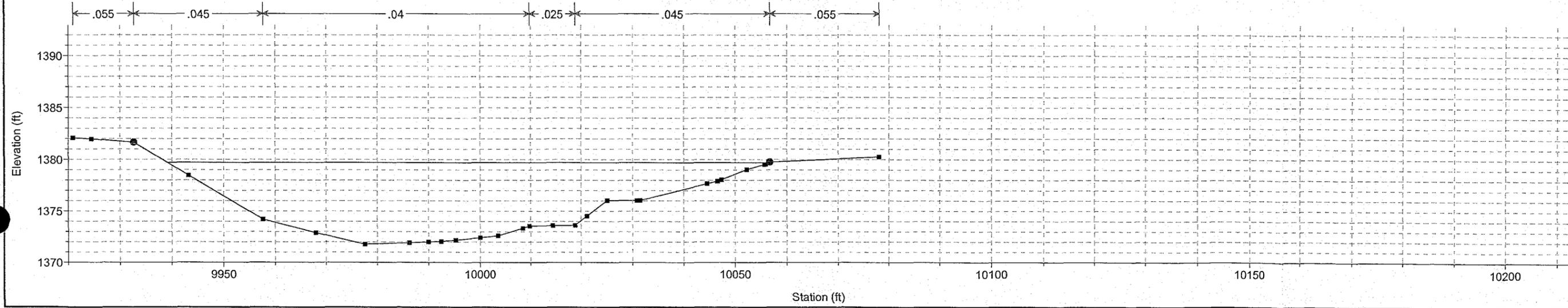
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 6.451 DIBBLE Sta 121+00



Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 6.432 DIBBLE Sta 120+00

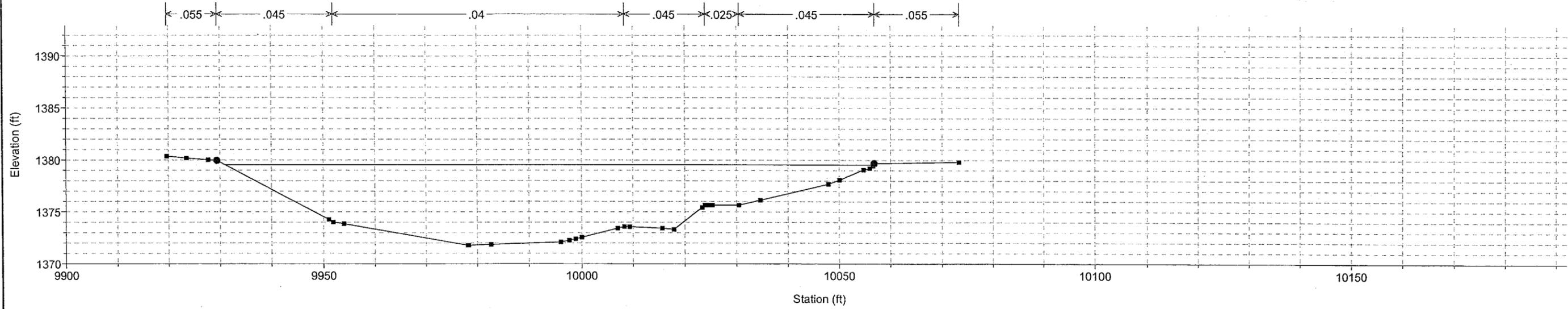


Legend
 WS PF 1
 Ground
 Bank Sta

1 in Horiz. = 20 ft 1 in Vert. = 10 ft

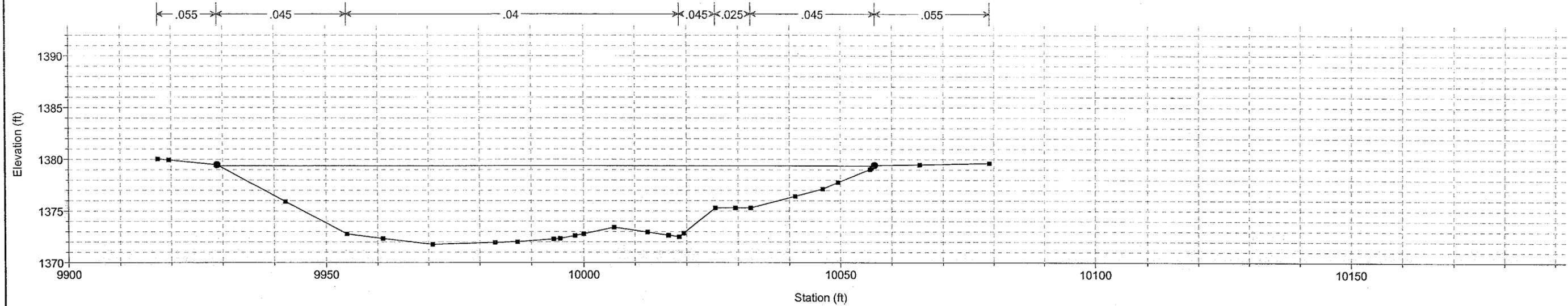
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 6.413 DIBBLE Sta 119+00



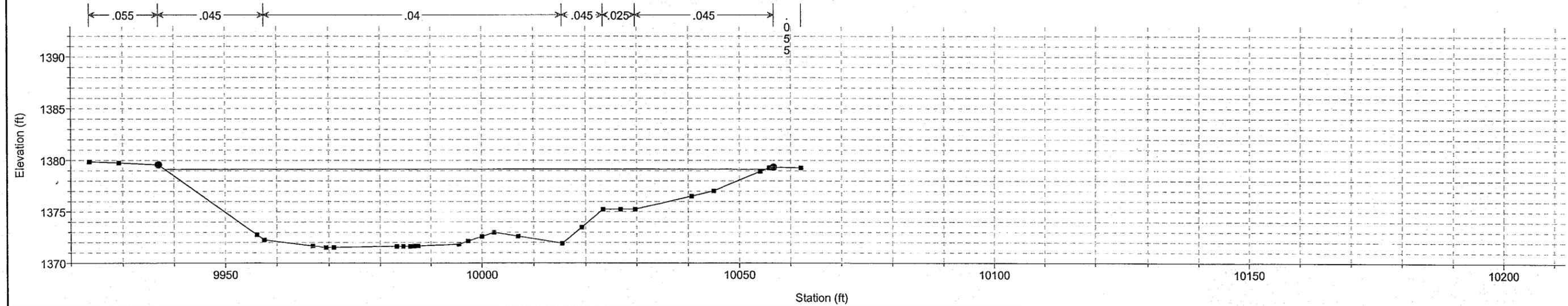
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 6.394 DIBBLE Sta 118+00



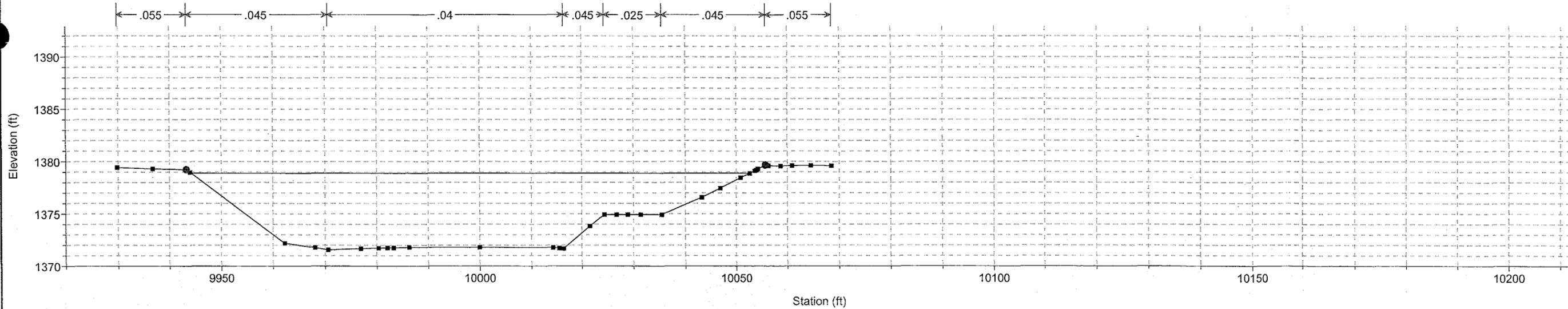
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 6.375 DIBBLE Sta 117+00



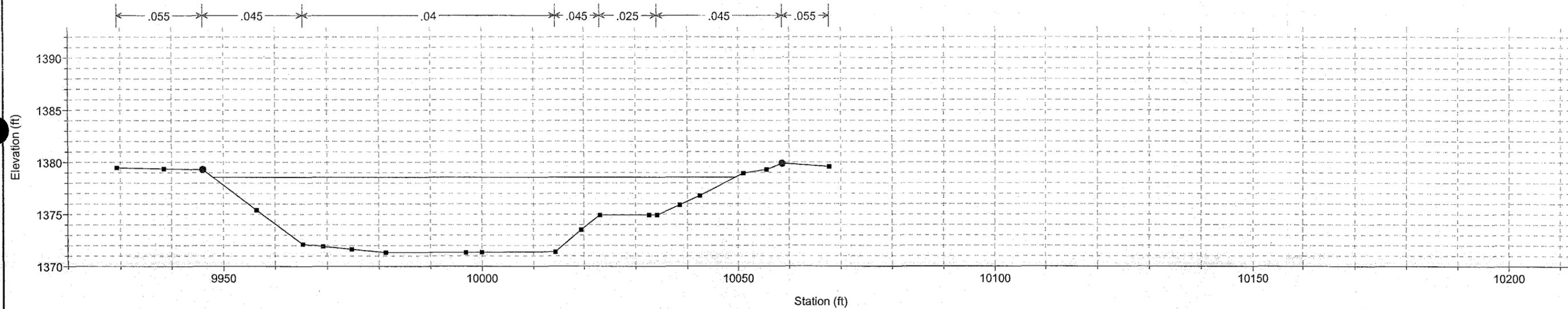
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 6.356 DIBBLE Sta 116+00



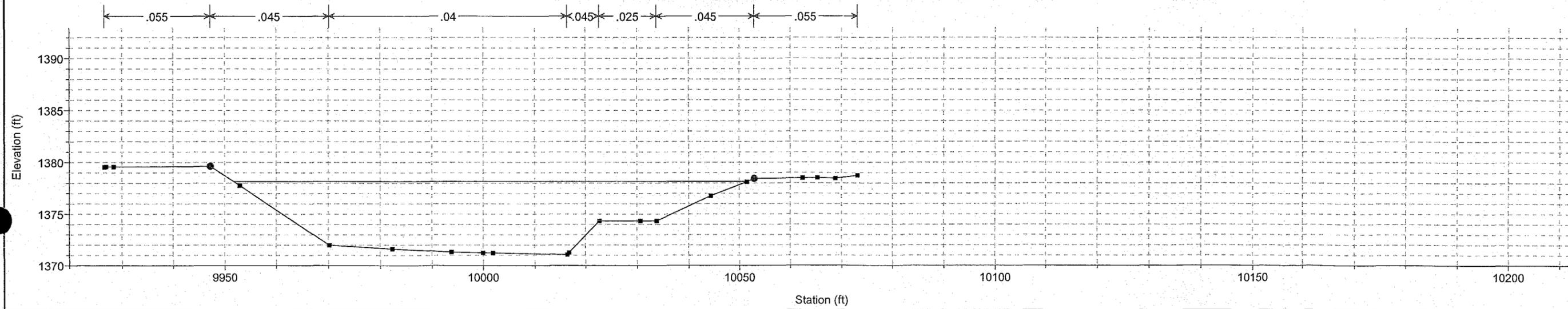
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 6.337 DIBBLE Sta 115+00



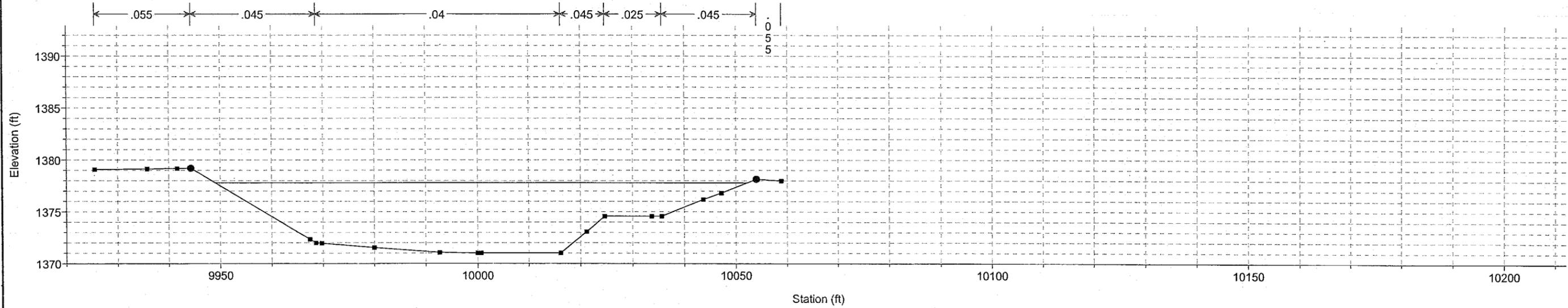
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 6.318 DIBBLE Sta 114+00



QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 6.299 DIBBLE Sta 113+00

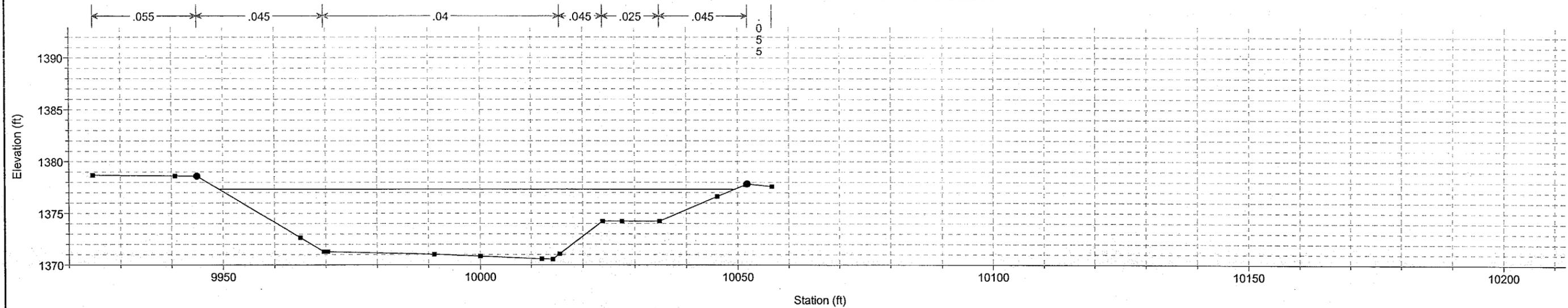


Legend

- WS PF 1
- Ground
- Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 6.281 DIBBLE Sta 112+00

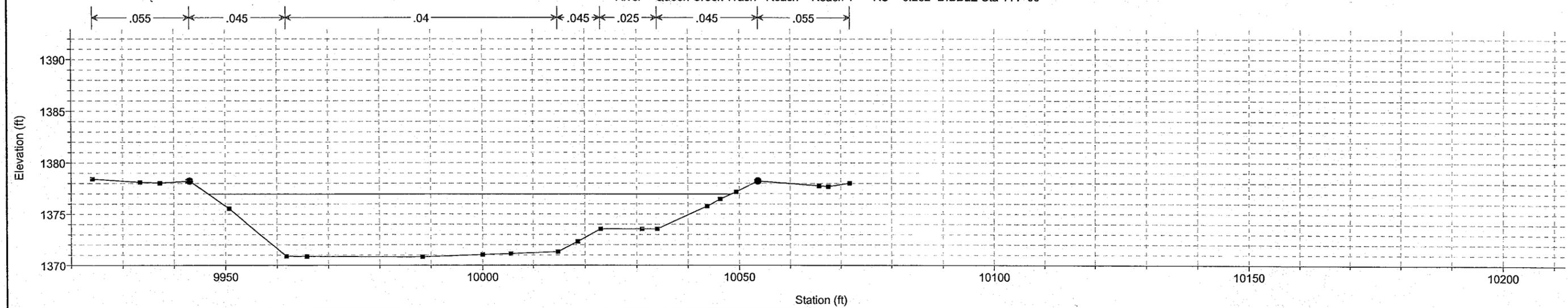


Legend

- WS PF 1
- Ground
- Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 6.262 DIBBLE Sta 111+00

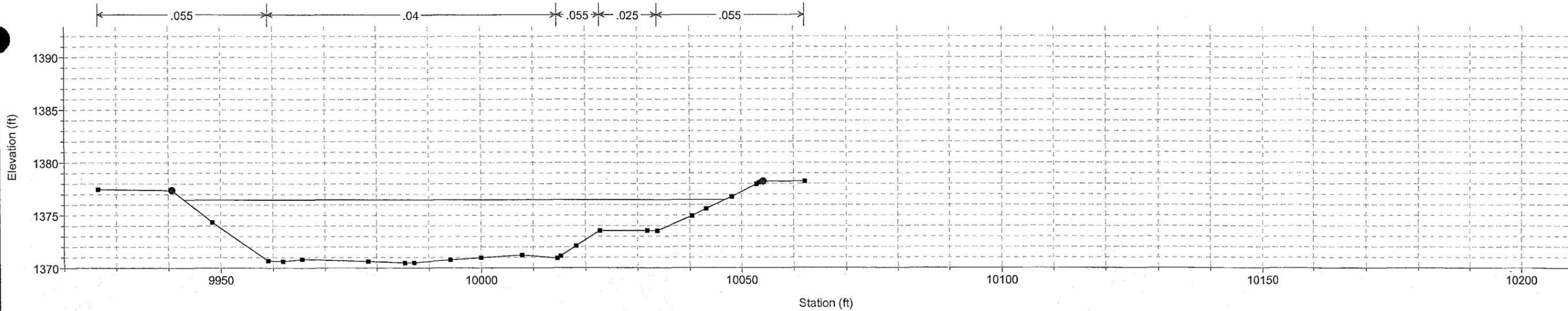


Legend

- WS PF 1
- Ground
- Bank Sta

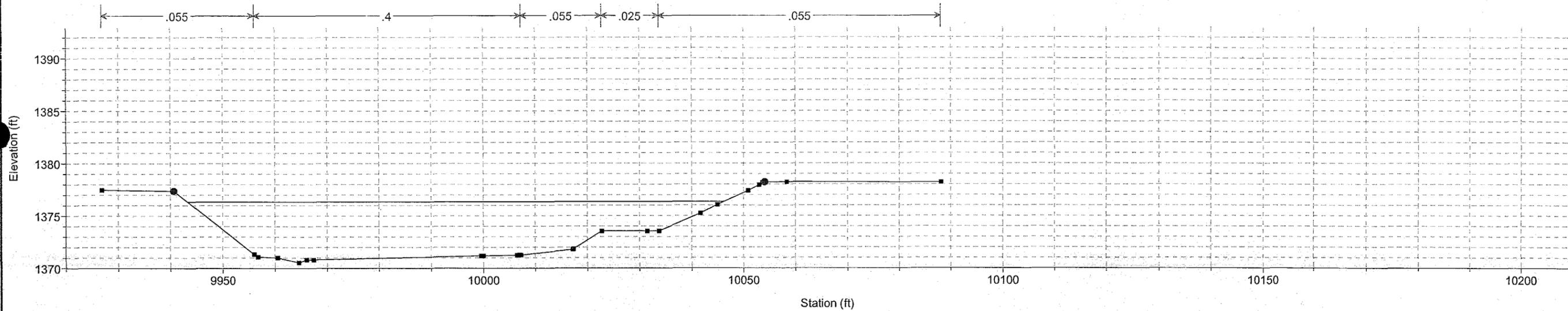
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River = Queen Creek Wash Reach = Reach 1 RS = 6.243 DIBBLE Sta 110+00



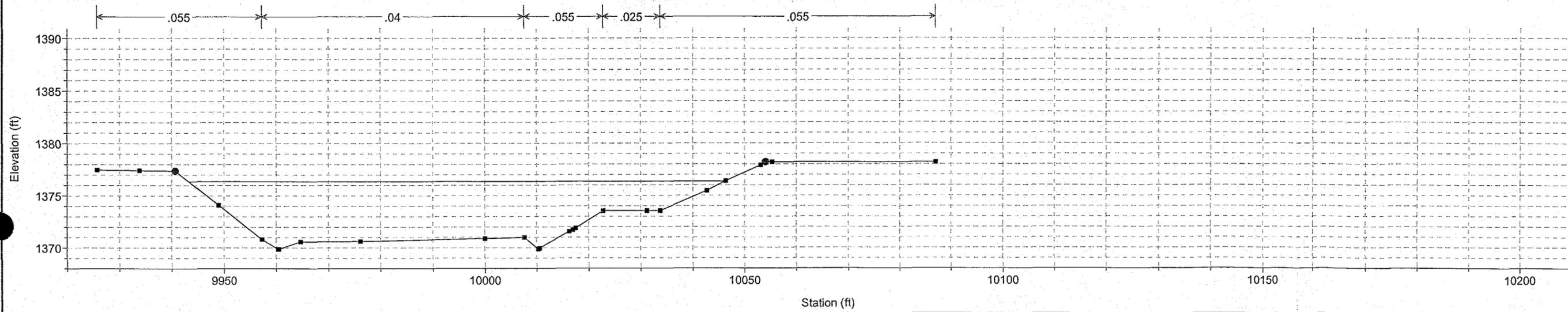
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 6.242 DIBBLE Sta 109+97



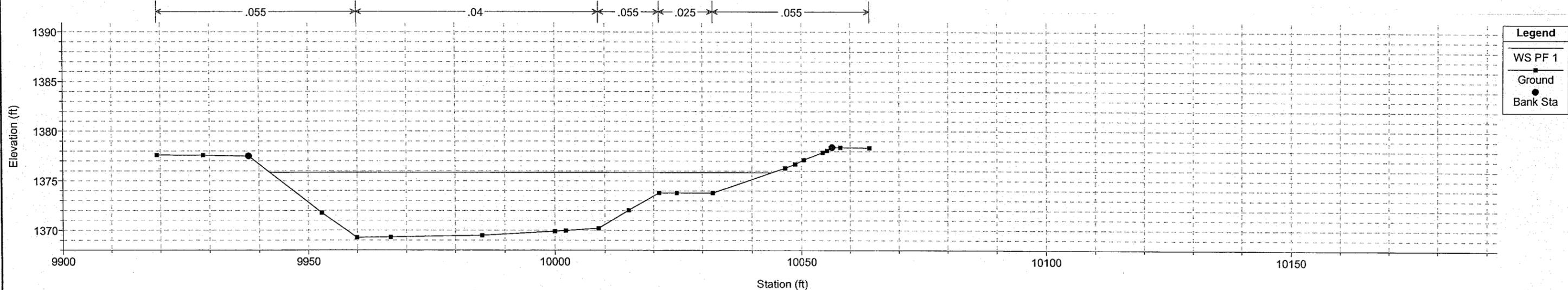
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 6.241 DIBBLE Sta 109+95



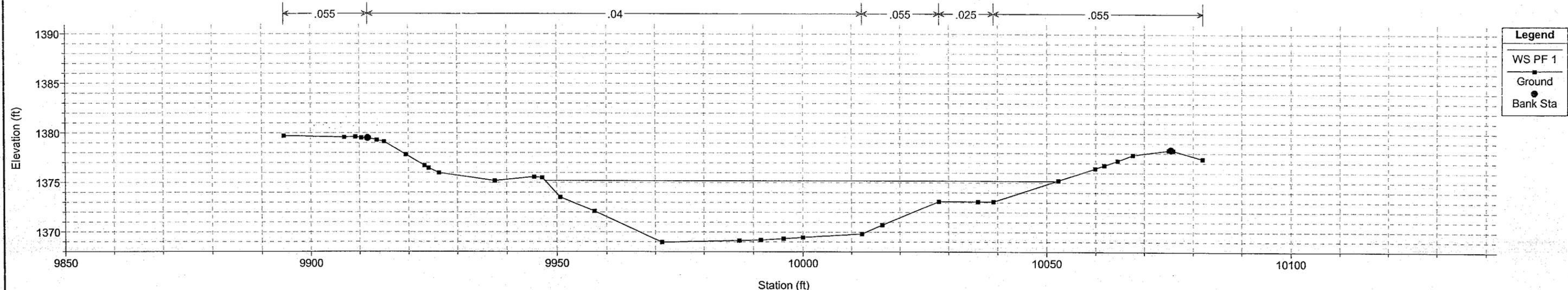
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 6.224 DIBBLE Sta 109+00



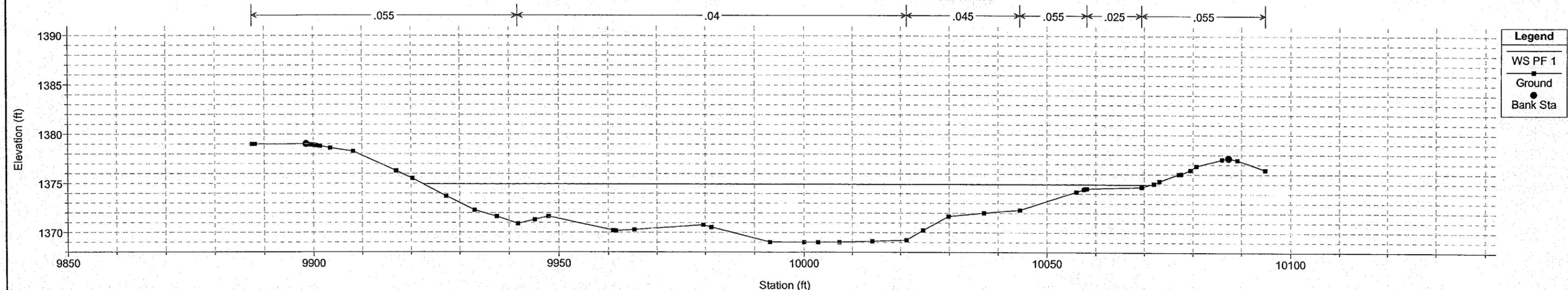
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 6.205 DIBBLE Sta 108+00

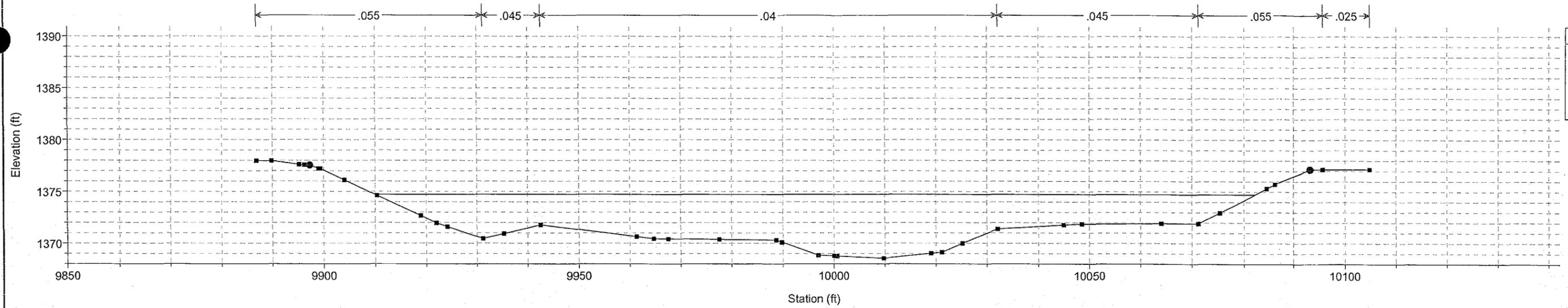


QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 6.186 DIBBLE Sta 107+00



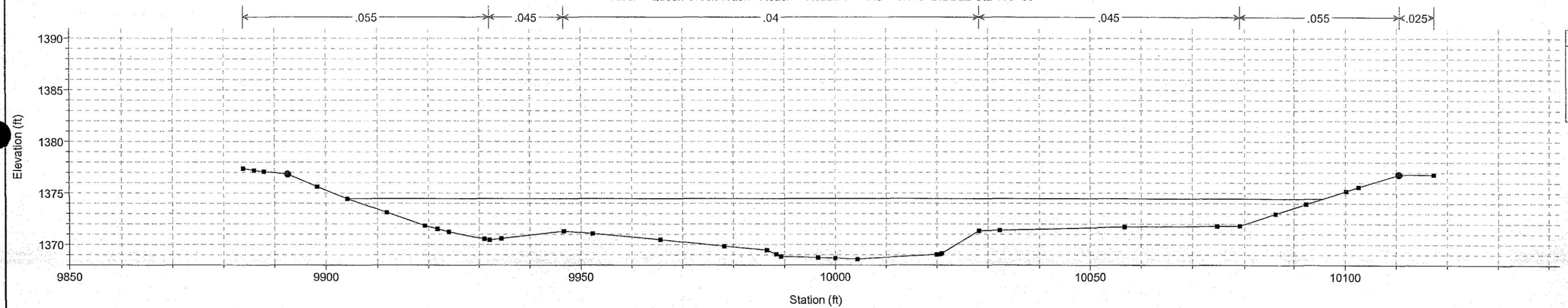
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 6.167 DIBBLE Sta 106+00



Legend

- WS PF 1
- Ground
- Bank Sta

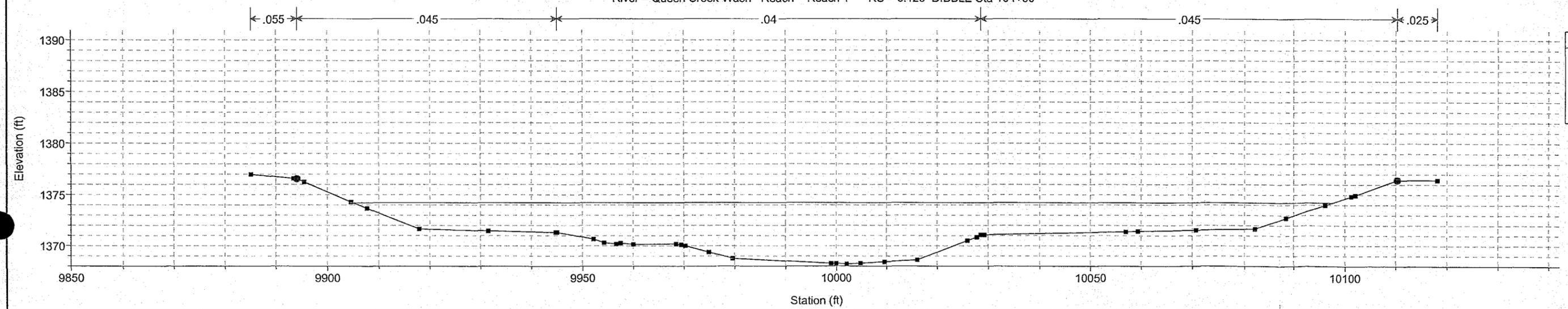
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 6.148 DIBBLE Sta 105+00



Legend

- WS PF 1
- Ground
- Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 6.129 DIBBLE Sta 104+00

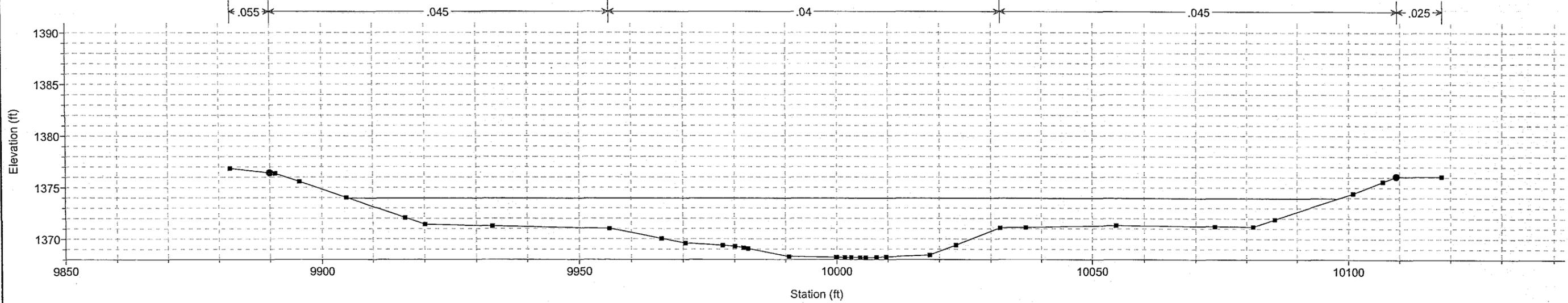


Legend

- WS PF 1
- Ground
- Bank Sta

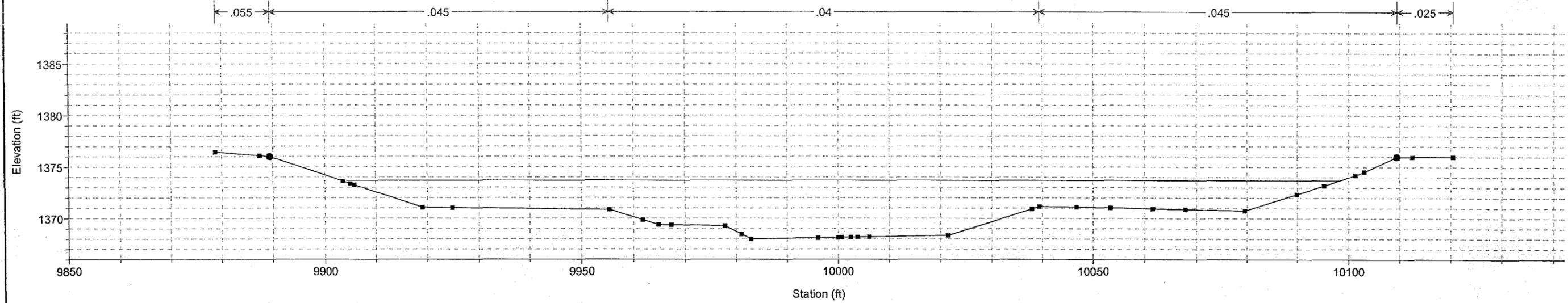
1 in Horiz. = 20 ft 1 in Vert. = 10 ft

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 6.110 DIBBLE Sta 103+00



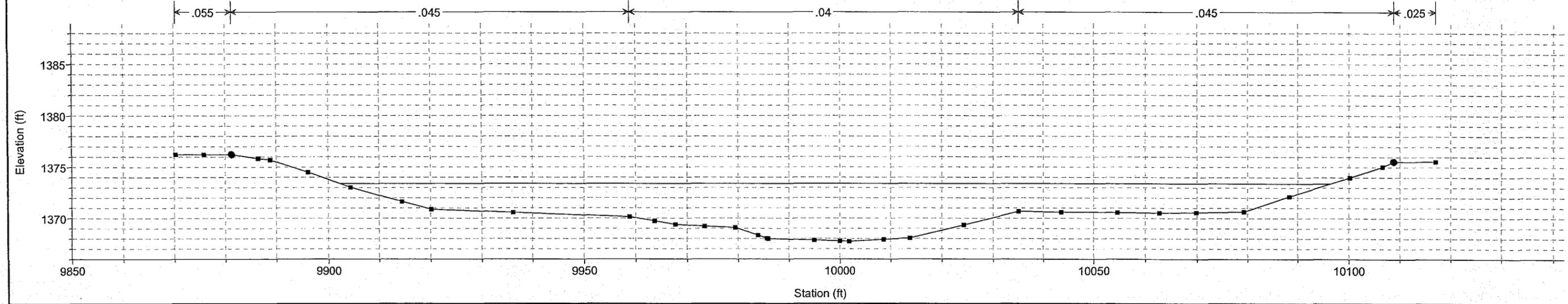
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 6.091 DIBBLE Sta 102+00



Legend
 WS PF 1
 Ground
 Bank Sta

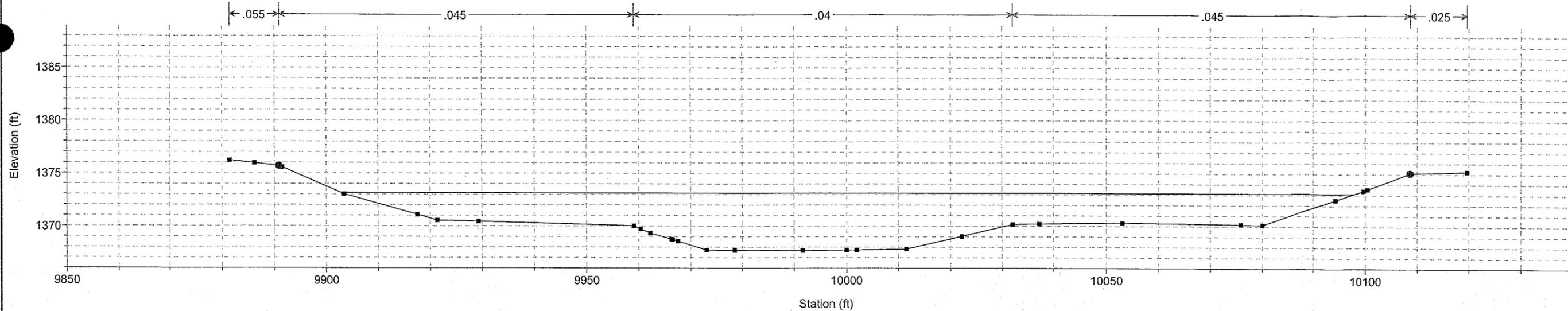
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 6.072 DIBBLE Sta 101+00



Legend
 WS PF 1
 Ground
 Bank Sta

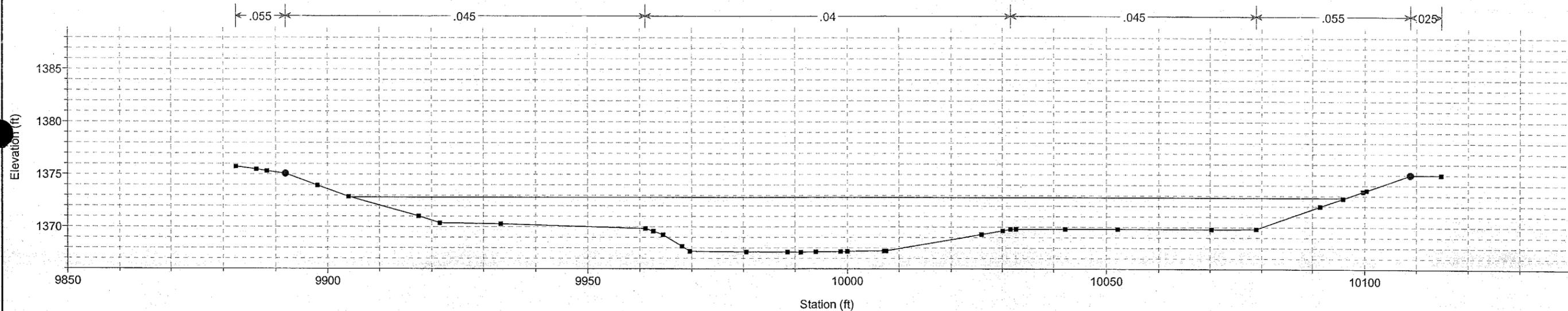
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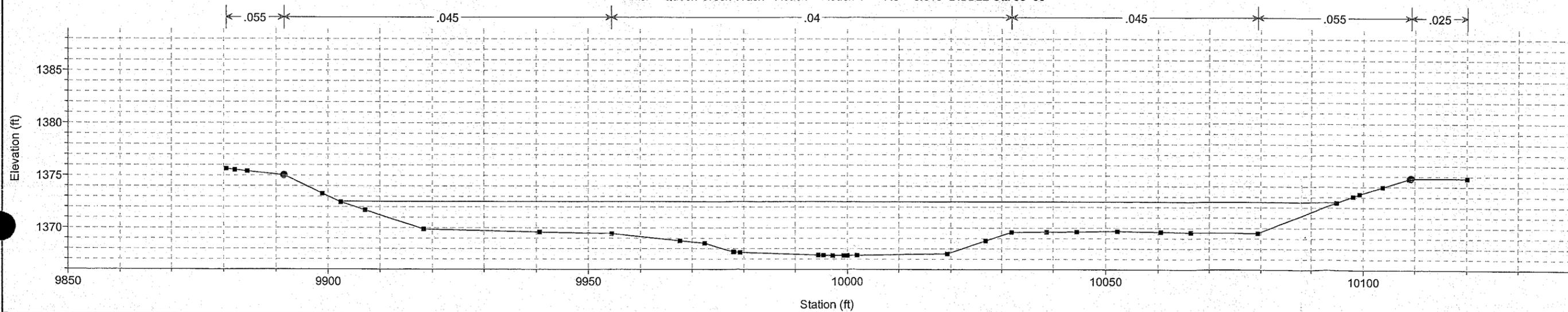
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River = Queen Creek Wash Reach = Reach 1 RS = 6.034 DIBBLE Sta 99+00

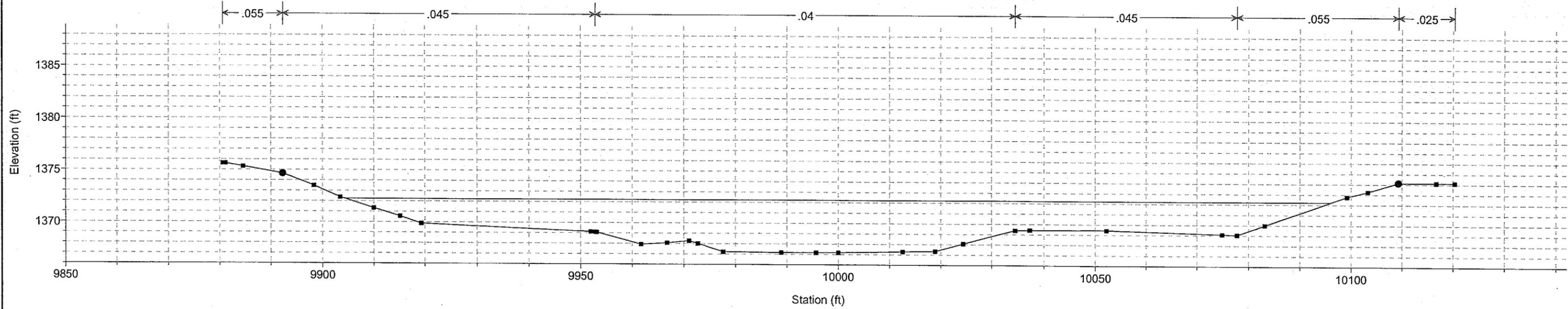


QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 6.015 DIBBLE Sta 98+00

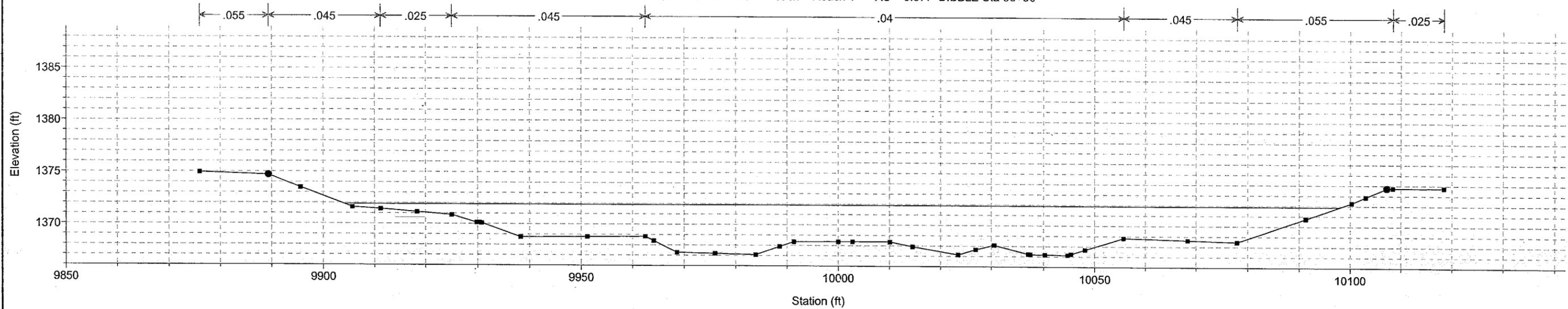


QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.996 DIBBLE Sta 97+00



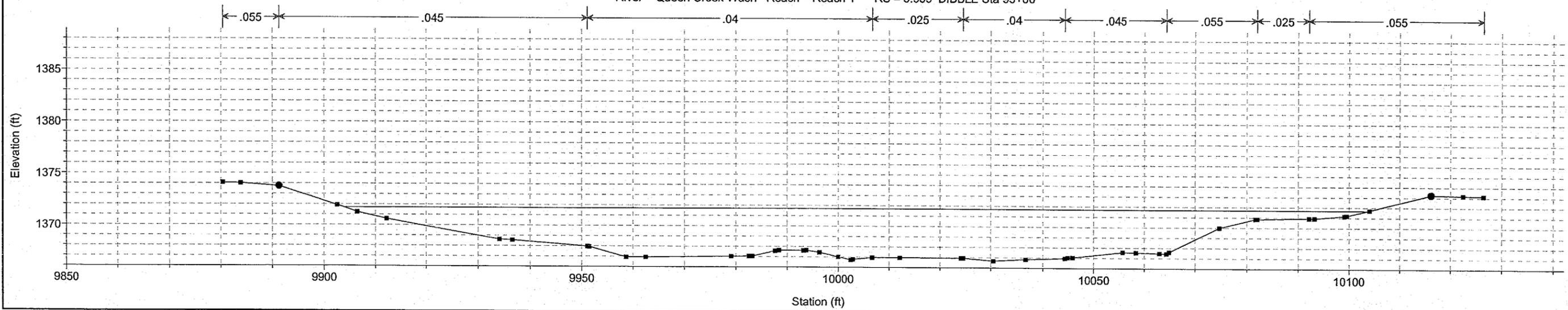
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.977 DIBBLE Sta 96+00



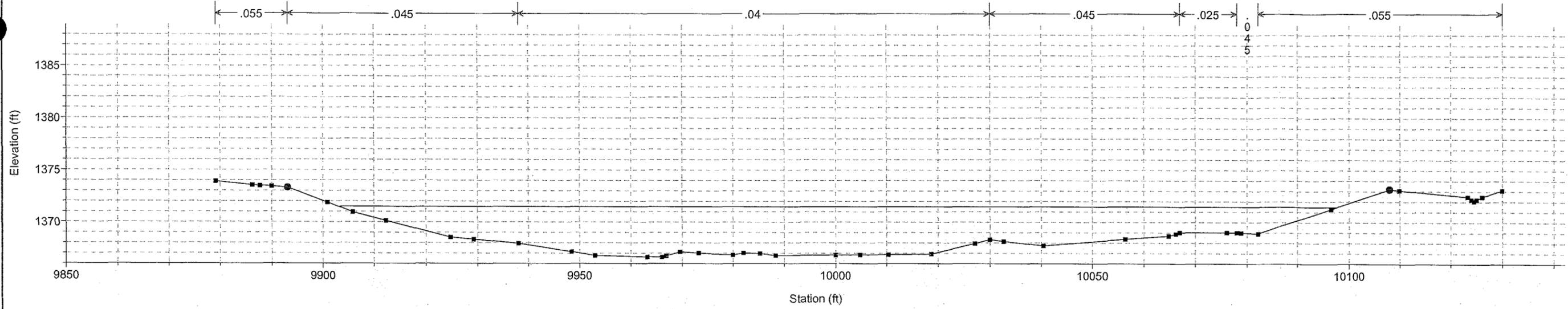
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.959 DIBBLE Sta 95+00

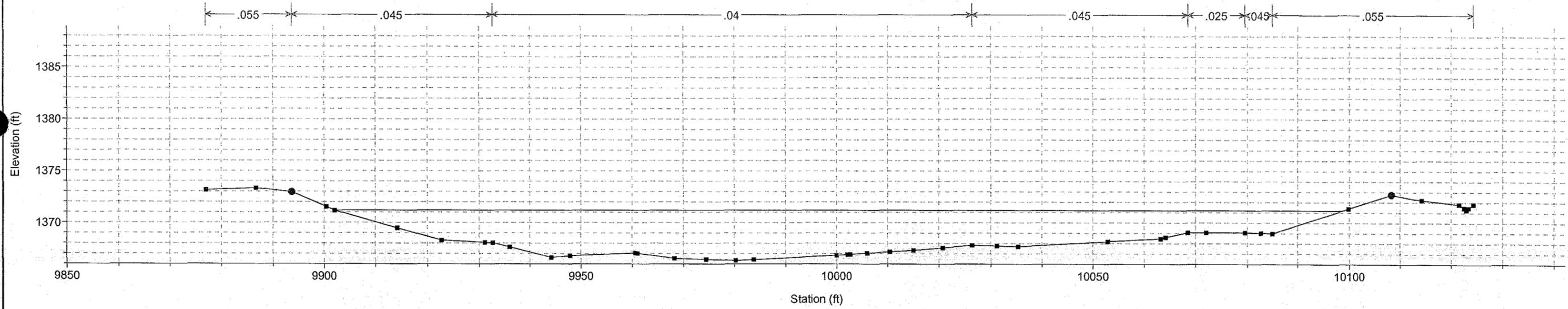


Legend
 WS PF 1
 Ground
 Bank Sta

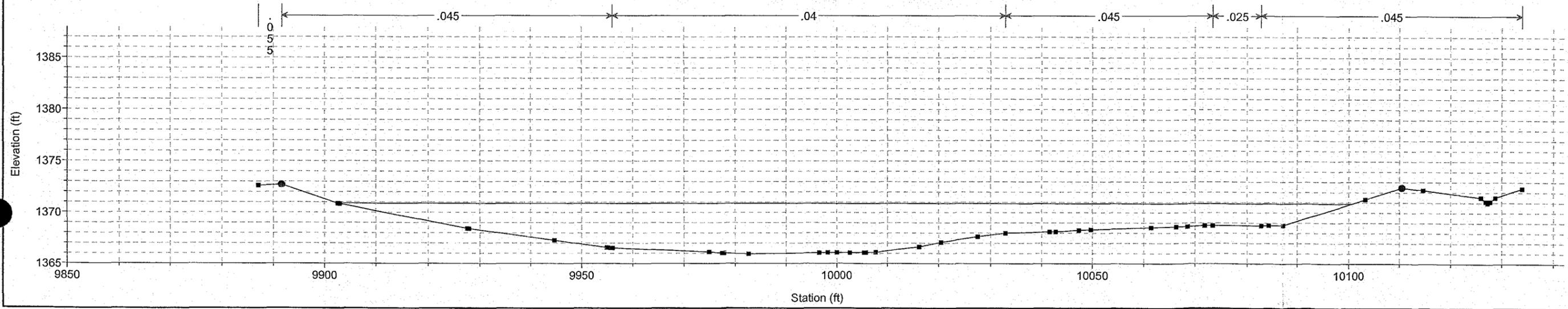
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.940 DIBBLE Sta 94+00



QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.921 DIBBLE Sta 93+00

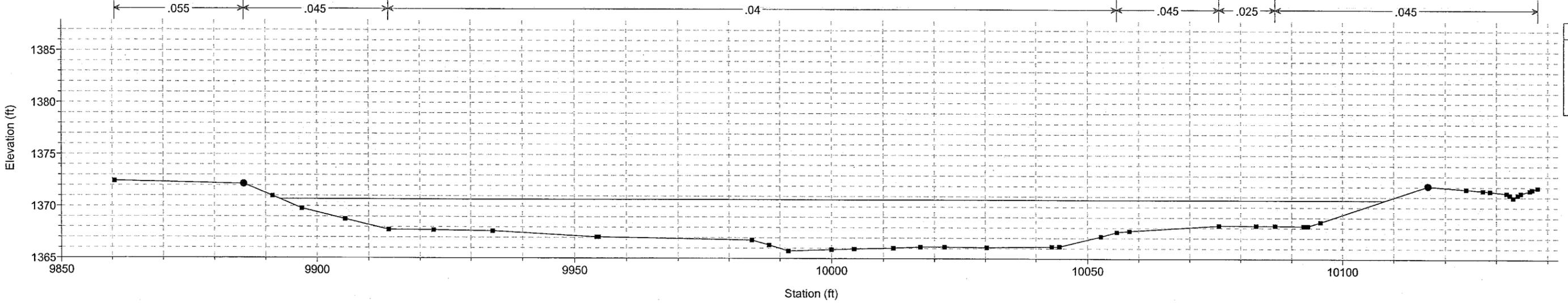


QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.902 DIBBLE Sta 92+00



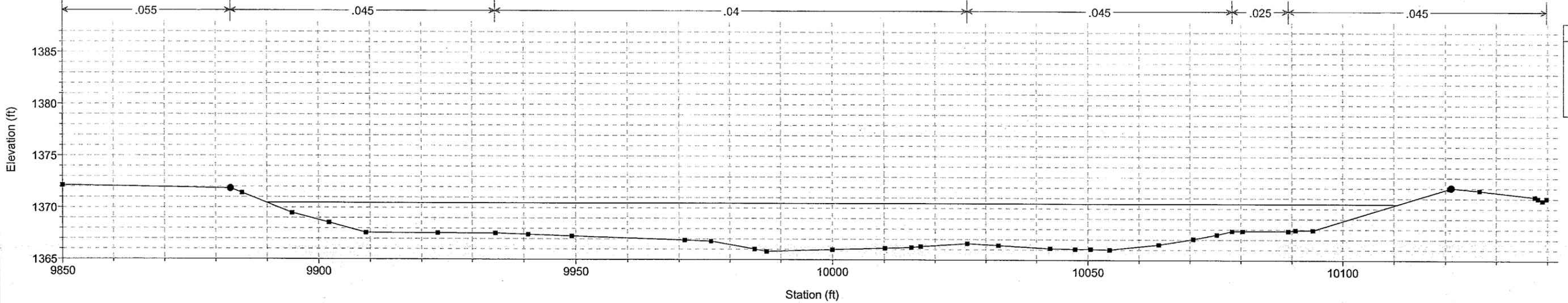
1 in Horiz. = 20 ft 1 in Vert. = 10 ft

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.883 DIBBLE Sta 91+00



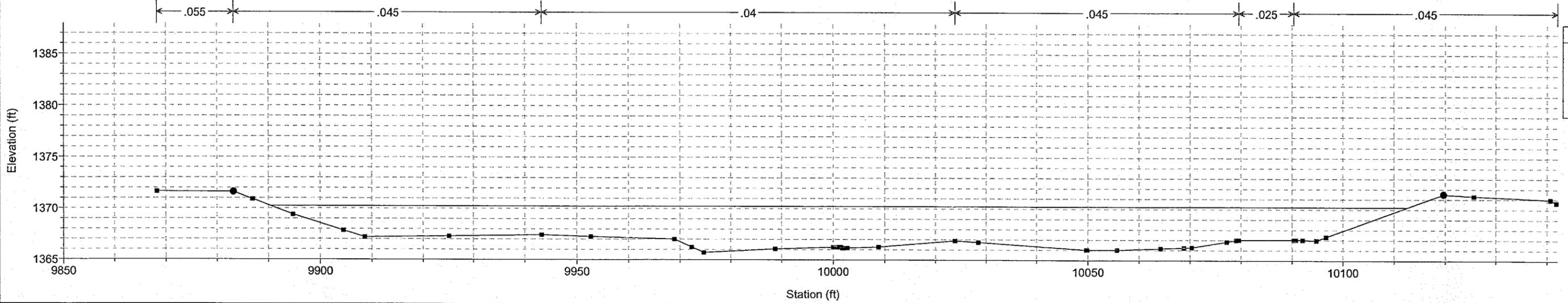
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.864 DIBBLE Sta 90+00



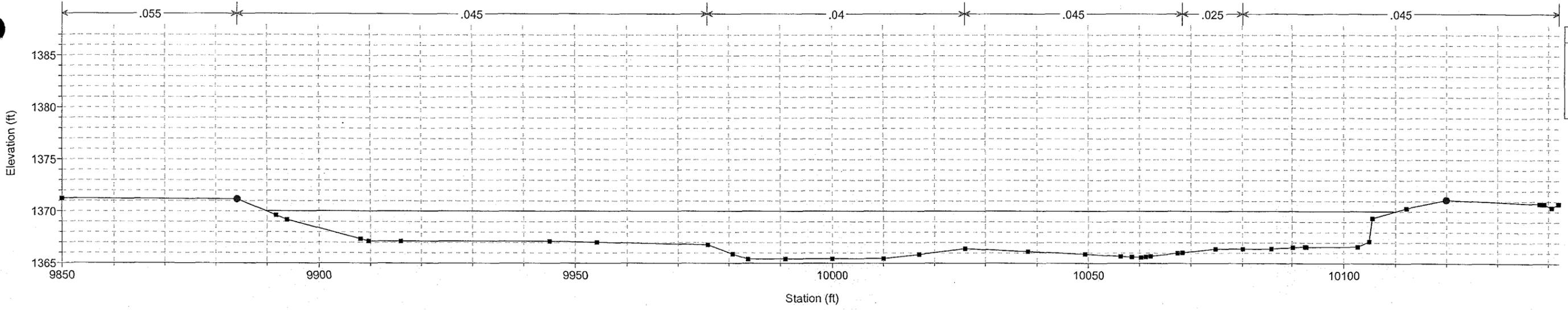
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.845 DIBBLE Sta 89+00



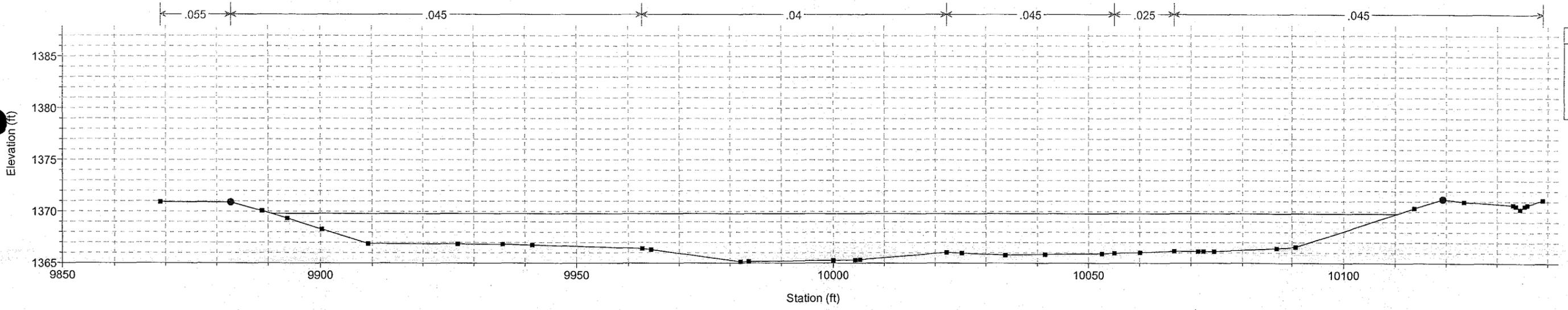
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.826 DIBBLE Sta 88+00



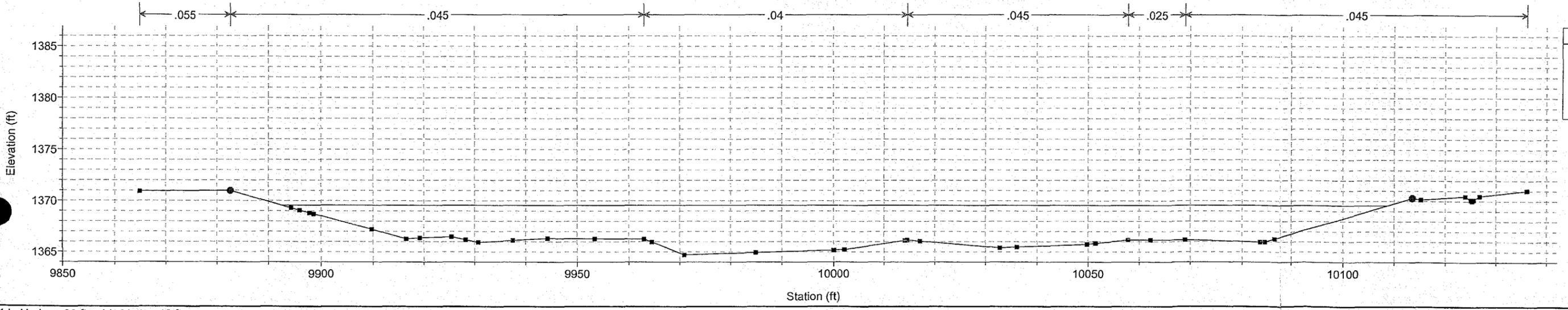
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.807 DIBBLE Sta 87+00



Legend
 WS PF 1
 Ground
 Bank Sta

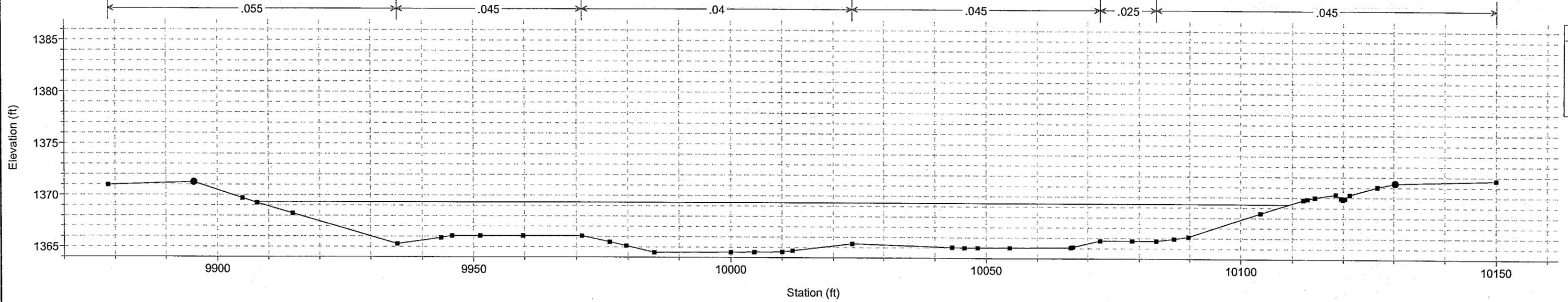
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.788 DIBBLE Sta 86+00



Legend
 WS PF 1
 Ground
 Bank Sta

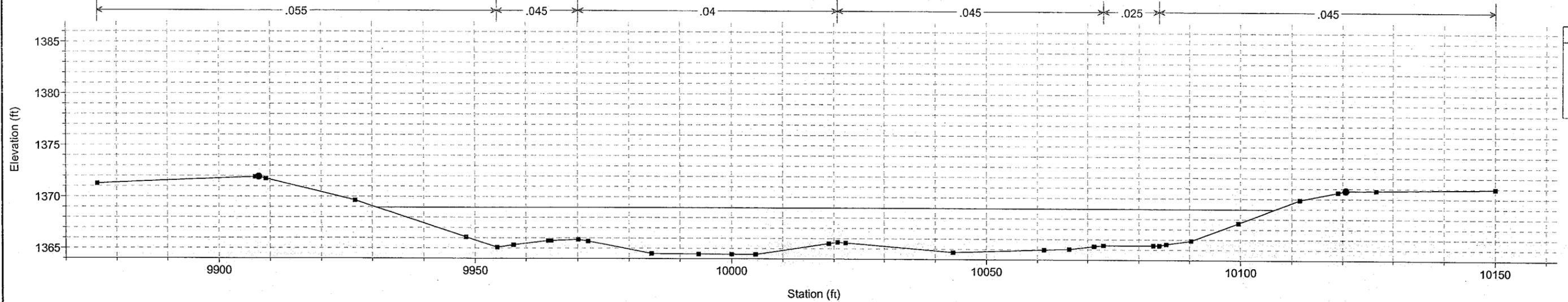
1 in Horiz. = 20 ft 1 in Vert. = 10 ft

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.769 DIBBLE Sta 85+00



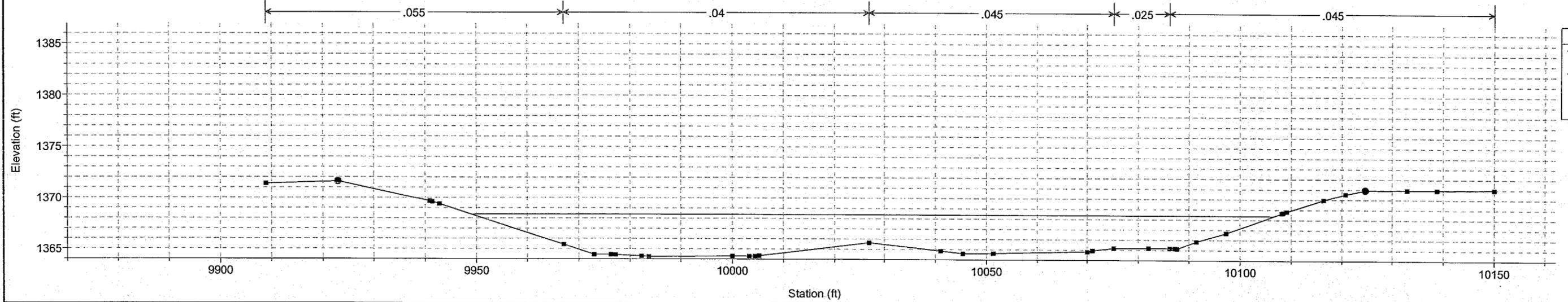
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.750 DIBBLE Sta 84+00



Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.731 DIBBLE Sta 83+00

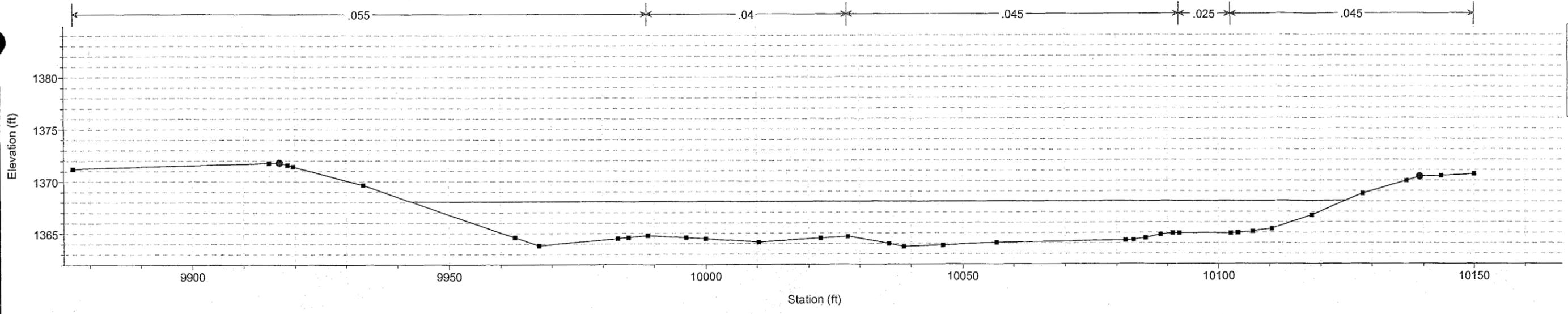


Legend
 WS PF 1
 Ground
 Bank Sta

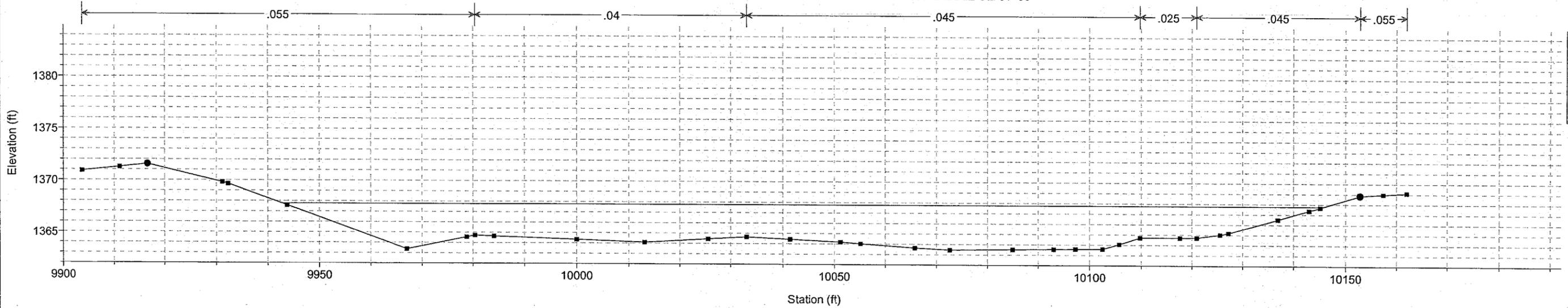
1 in Horiz. = 20 ft 1 in Vert. = 10 ft

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 5.712 DIBBLE Sta 82+00

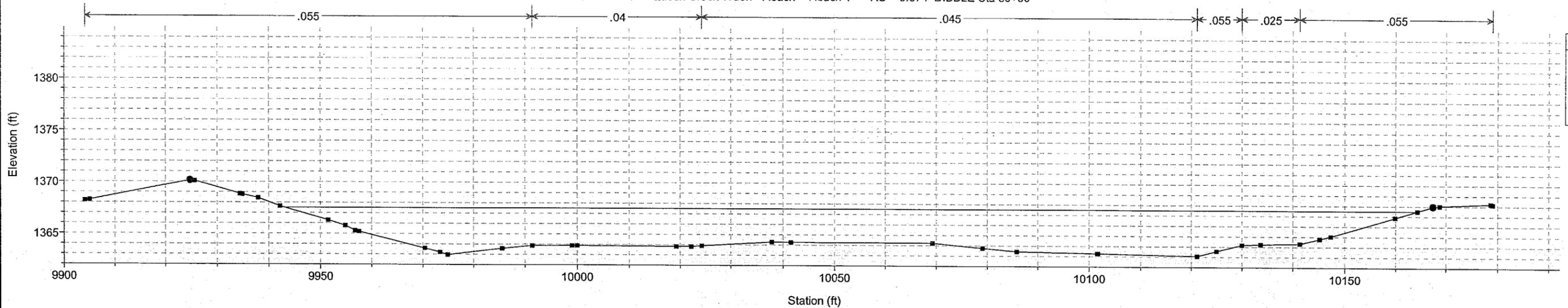


QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.693 DIBBLE Sta 81+00



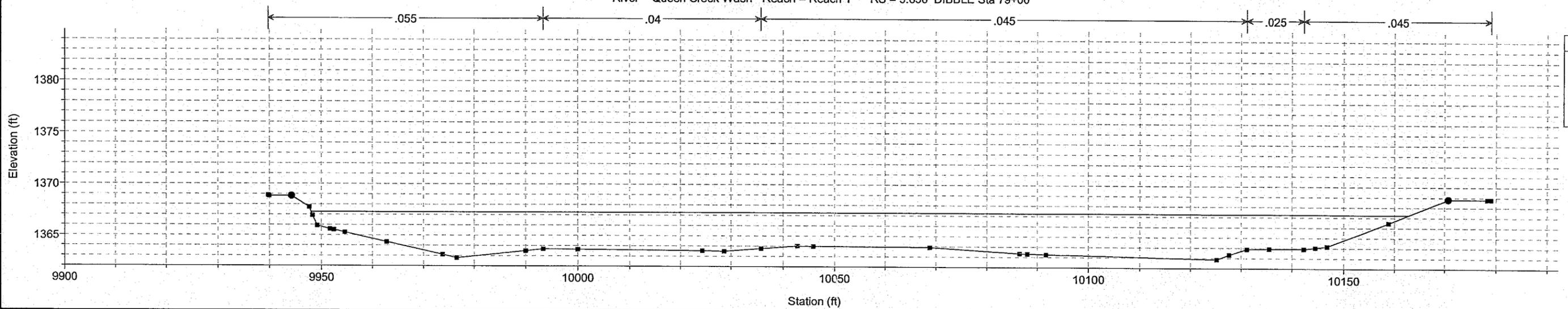
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.674 DIBBLE Sta 80+00



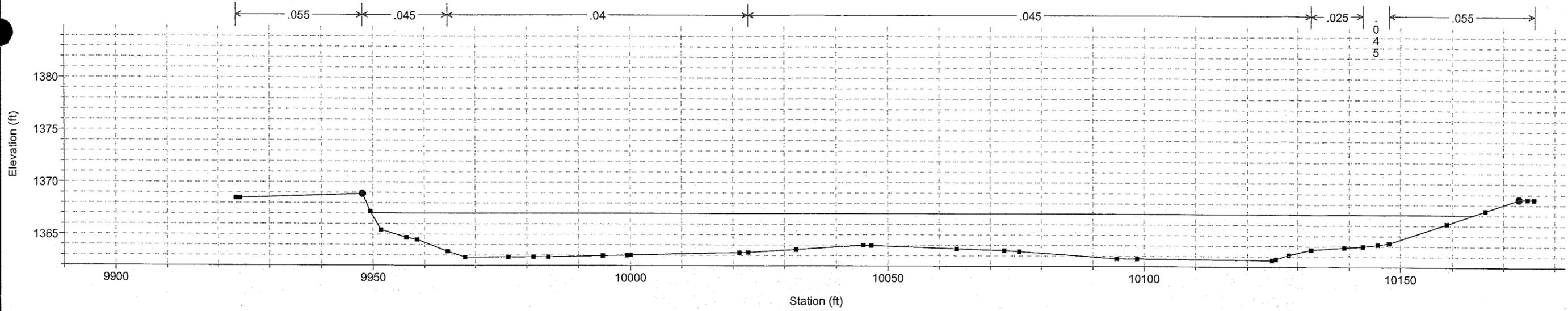
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.656 DIBBLE Sta 79+00

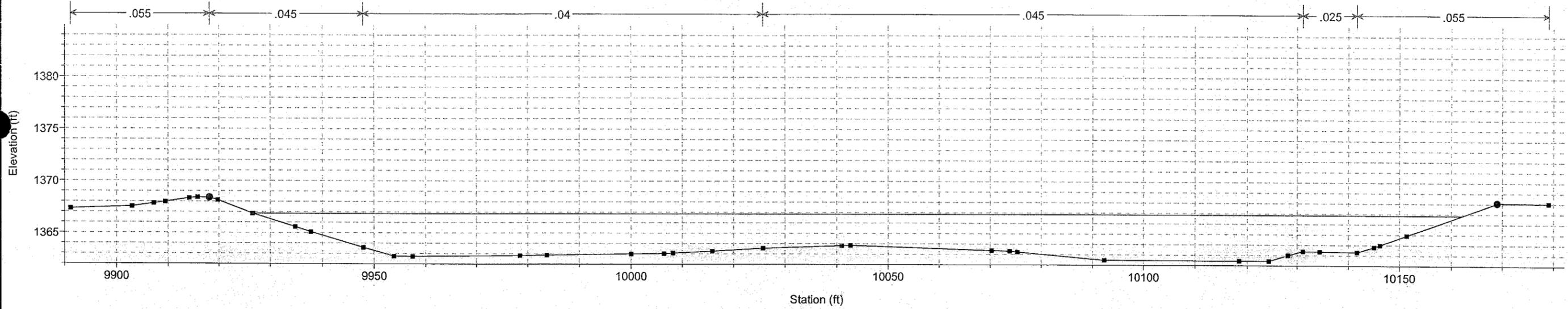


Legend
 WS PF 1
 Ground
 Bank Sta

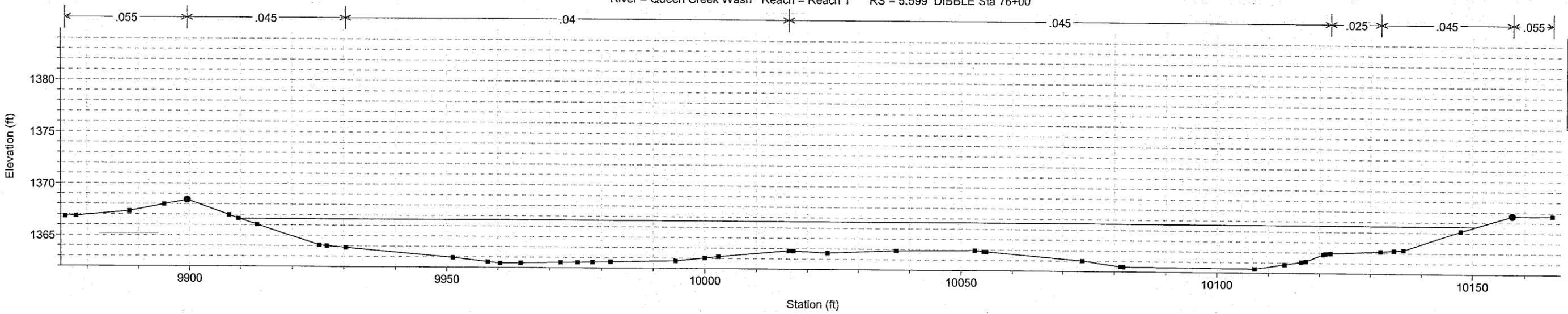
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.637 DIBBLE Sta 78+00



QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.618 DIBBLE Sta 77+00

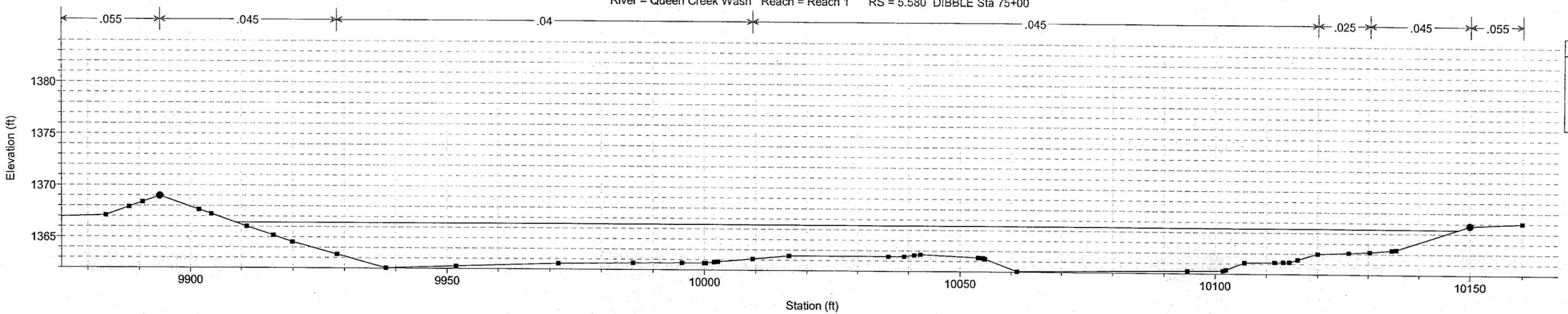


QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.599 DIBBLE Sta 76+00



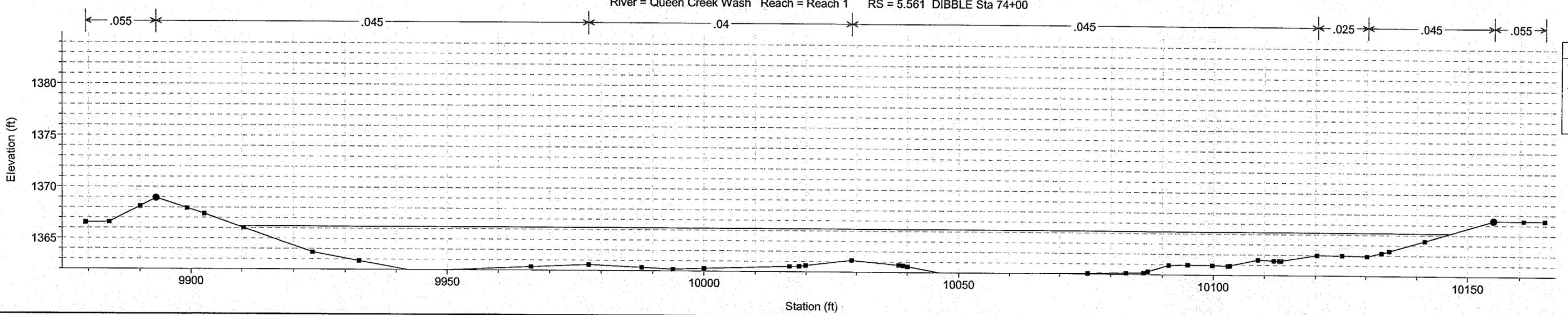
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.580 DIBBLE Sta 75+00



Legend
 WS PF 1
 Ground
 Bank Sta

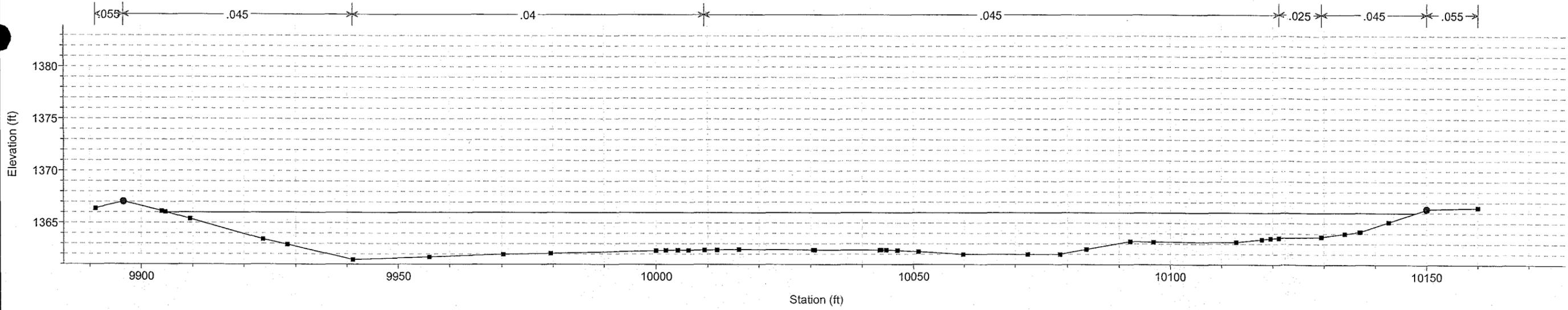
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.561 DIBBLE Sta 74+00



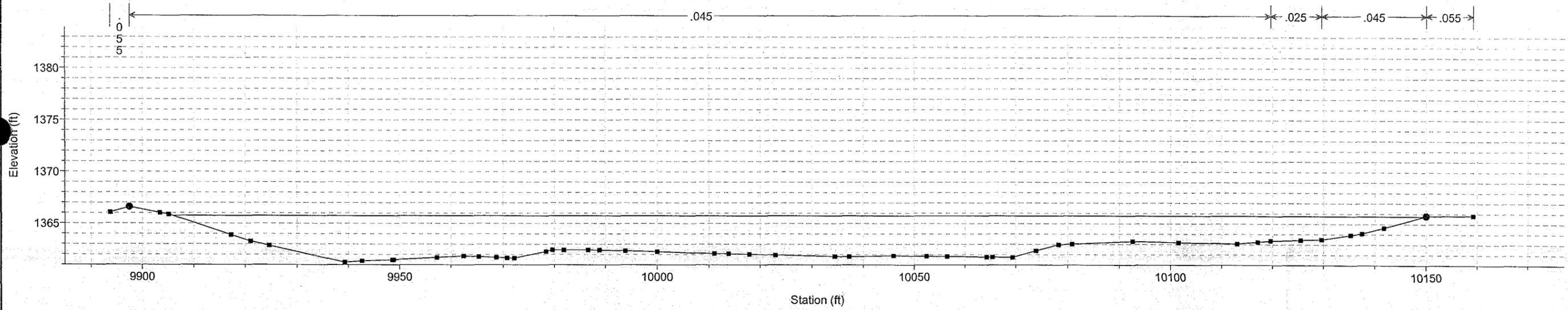
Legend
 WS PF 1
 Ground
 Bank Sta

1 in Horiz. = 20 ft 1 in Vert. = 10 ft

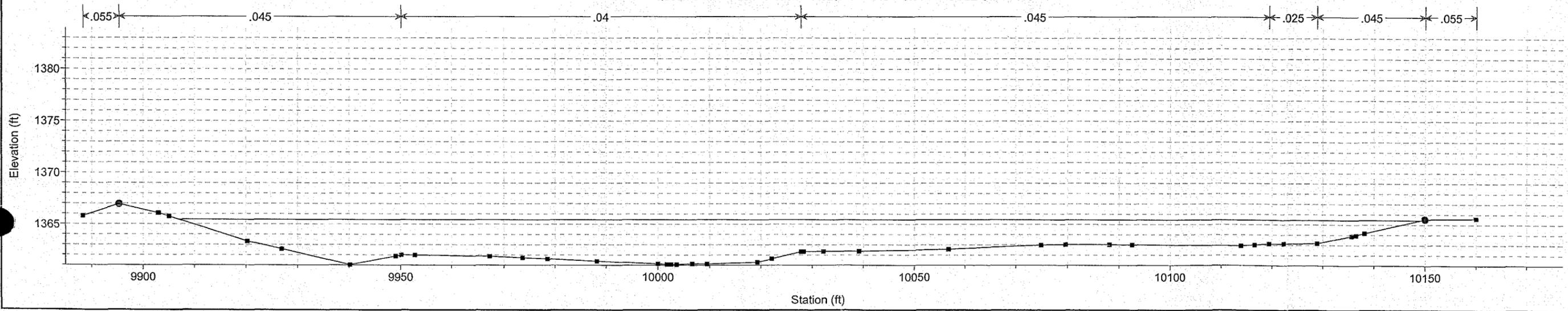
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
River = Queen Creek Wash Reach = Reach 1 RS = 5.542 DIBBLE Sta 73+00



QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
River = Queen Creek Wash Reach = Reach 1 RS = 5.523 DIBBLE Sta 72+00

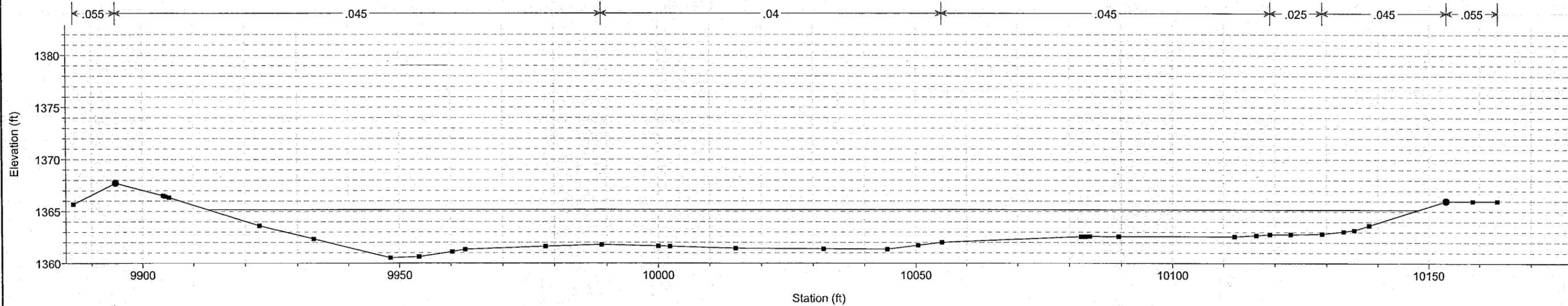


QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
River = Queen Creek Wash Reach = Reach 1 RS = 5.504 DIBBLE Sta 71+00

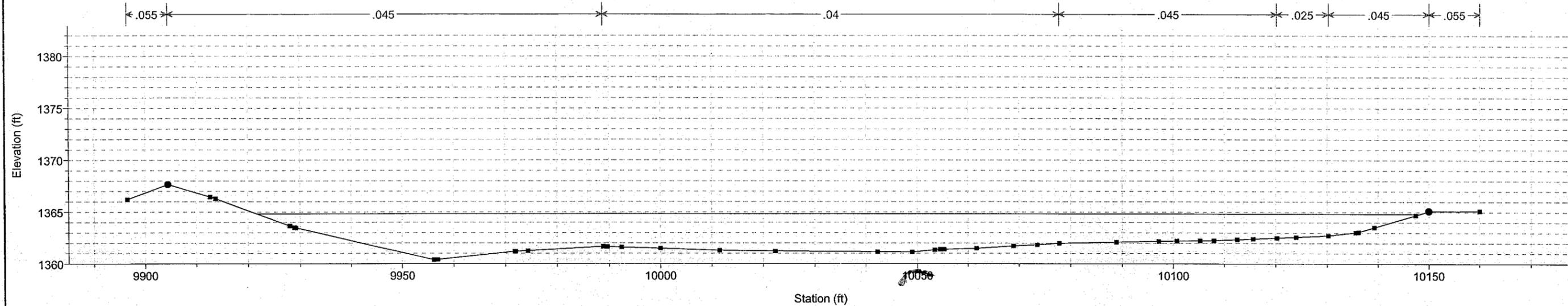


1 in Horiz. = 20 ft 1 in Vert. = 10 ft

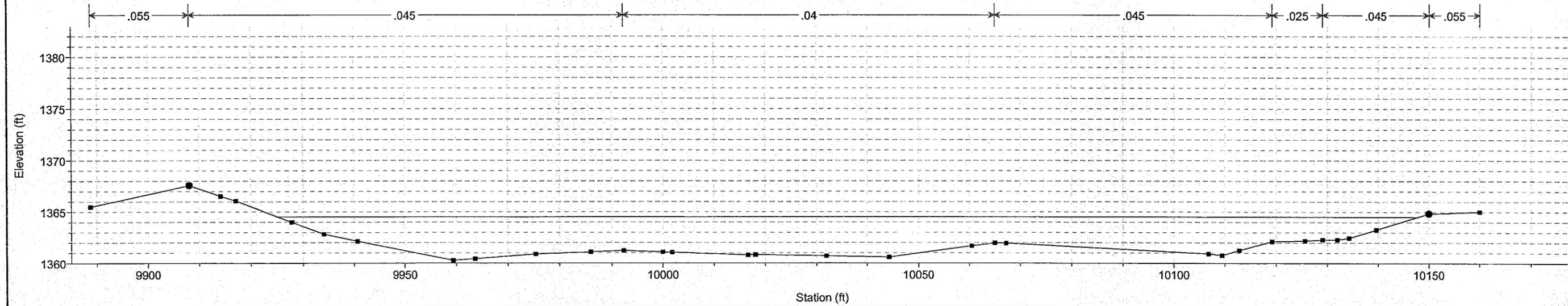
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.485 DIBBLE Sta 70+00



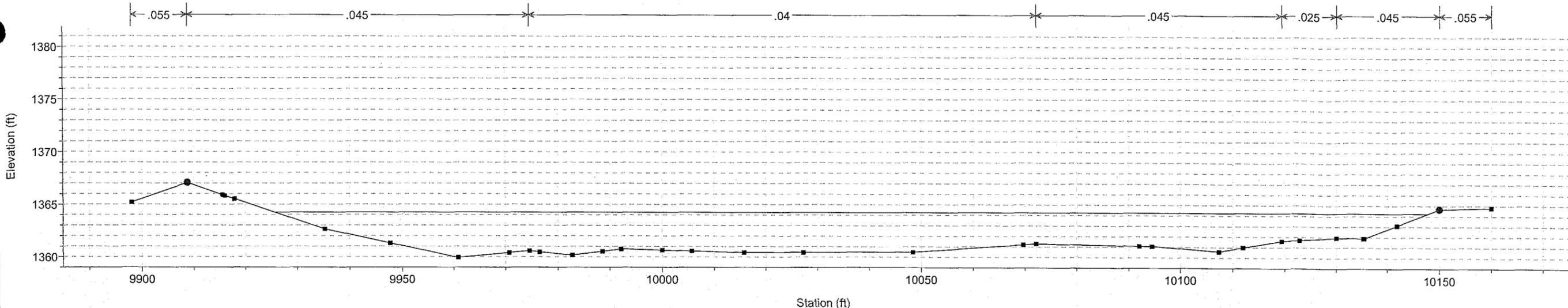
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.466 DIBBLE Sta 69+00



QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.447 DIBBLE Sta 68+00

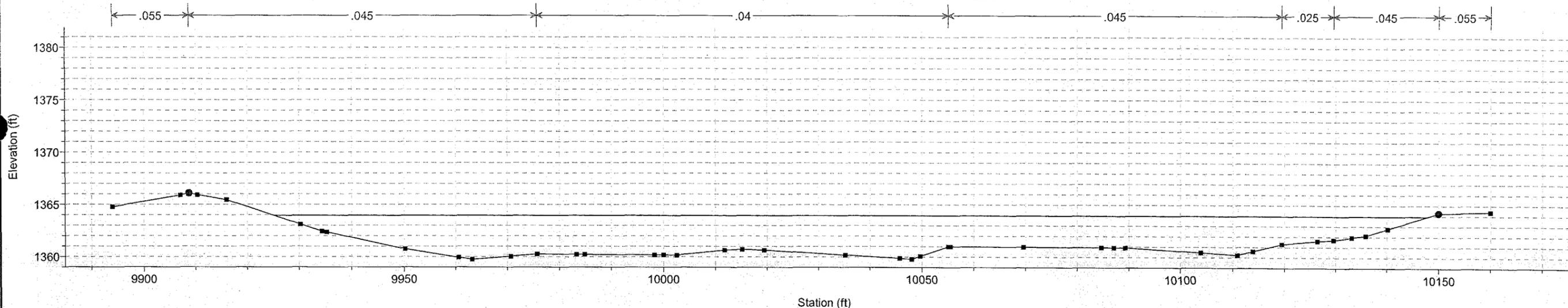


QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.428 DIBBLE Sta 67+00



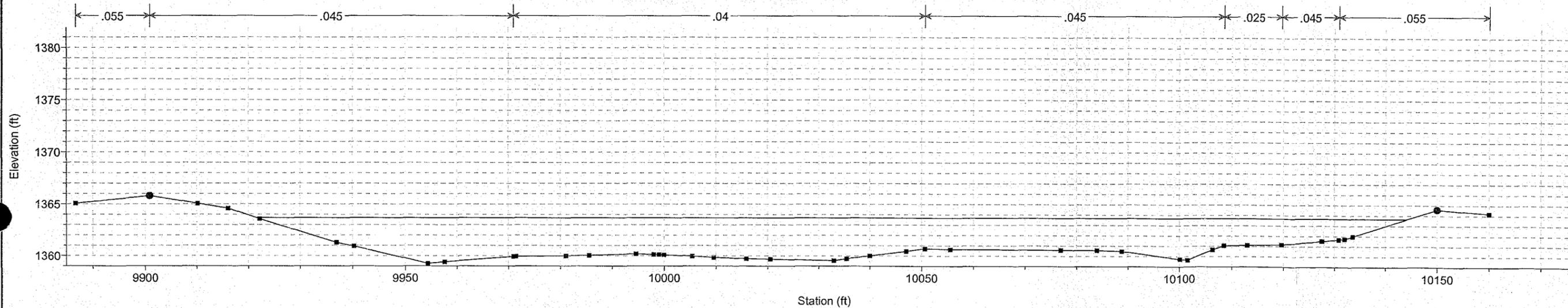
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.409 DIBBLE Sta 66+00



Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.390 DIBBLE Sta 65+00

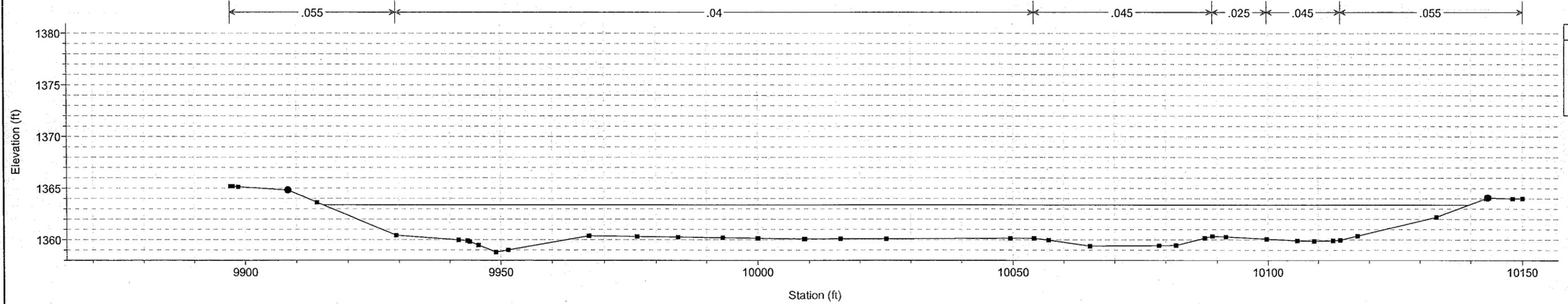


Legend
 WS PF 1
 Ground
 Bank Sta

1 in Horiz. = 20 ft 1 in Vert. = 10 ft

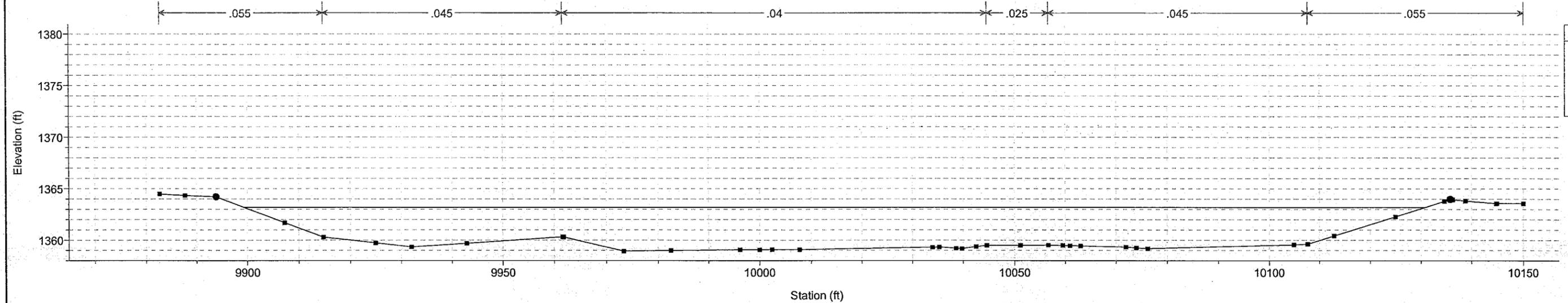
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 5.371 DIBBLE Sta 64+00



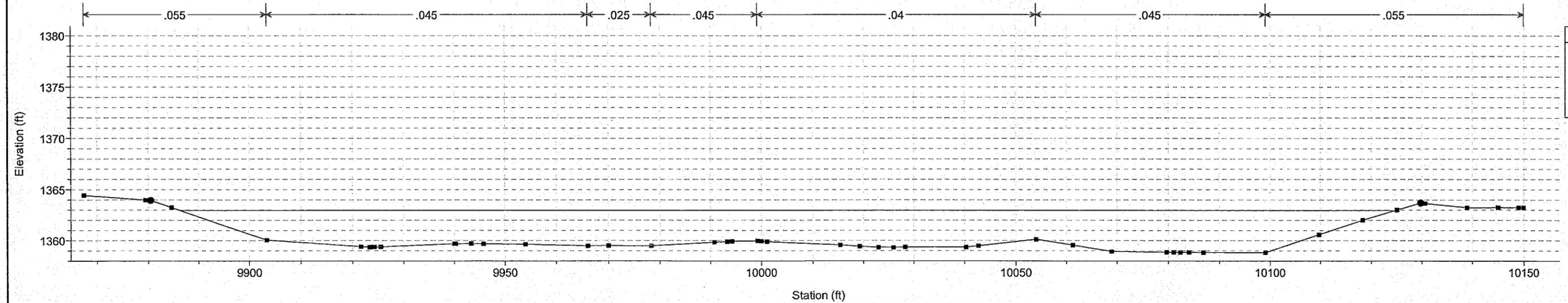
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 5.352 DIBBLE Sta 63+00

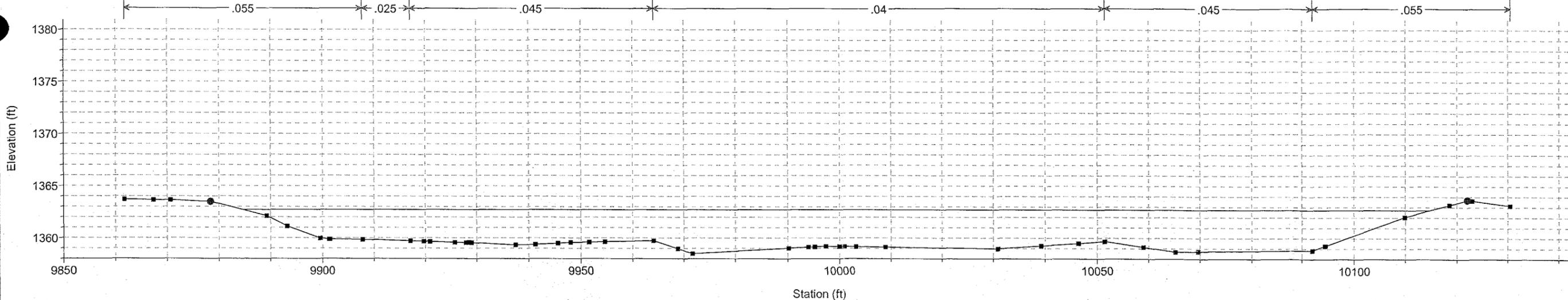


QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

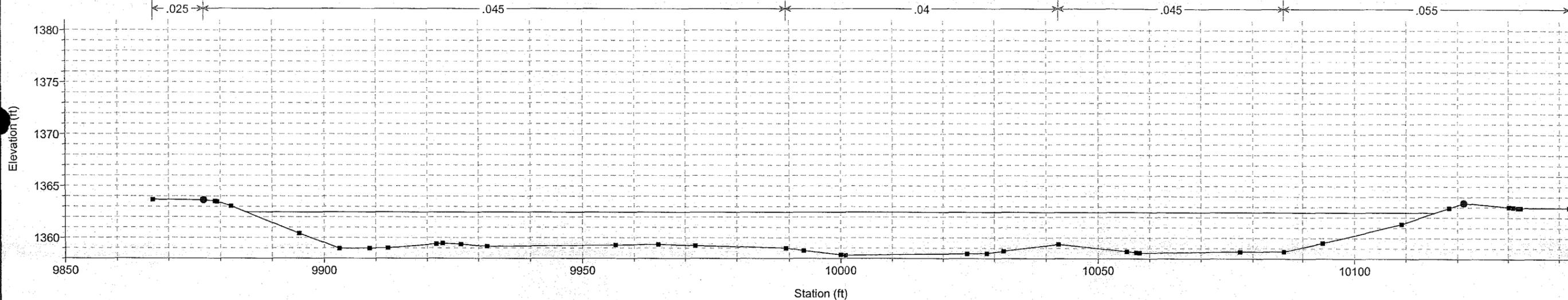
River = Queen Creek Wash Reach = Reach 1 RS = 5.334 DIBBLE Sta 62+00



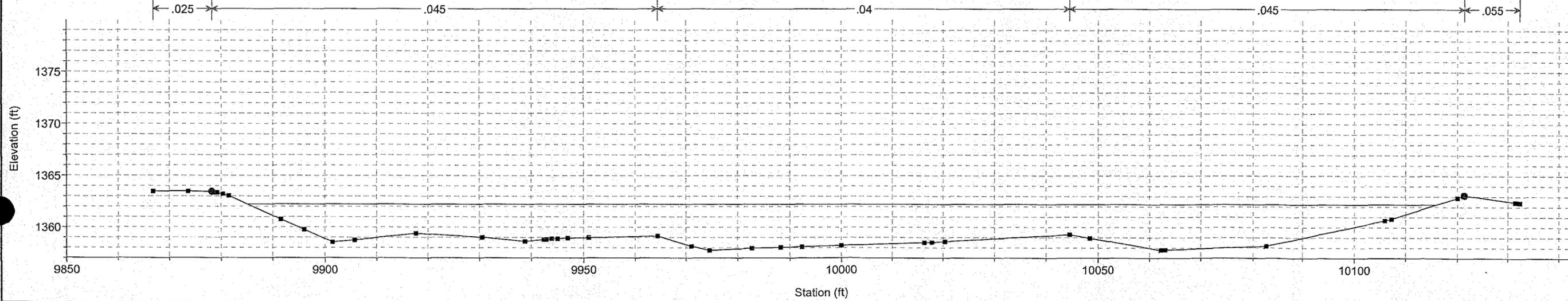
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.315 DIBBLE Sta 61+00



QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.296 DIBBLE Sta 60+00

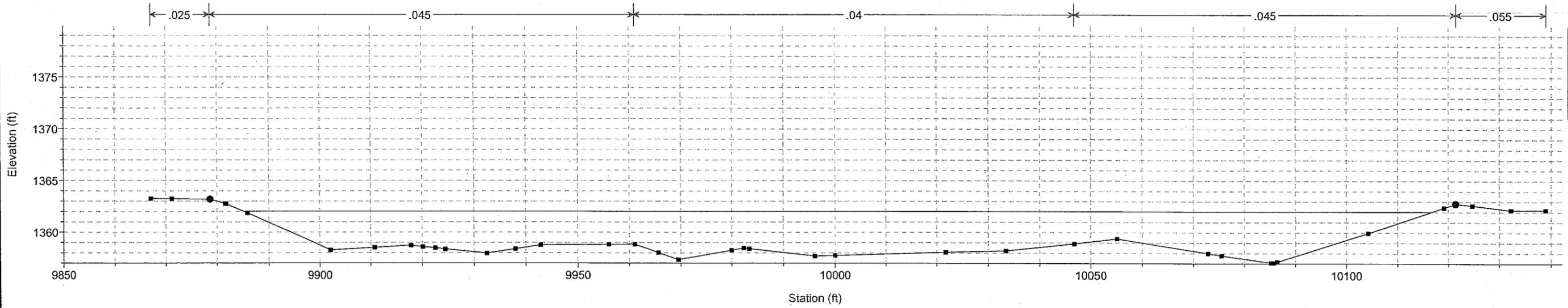


QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.277 DIBBLE Sta 59+00



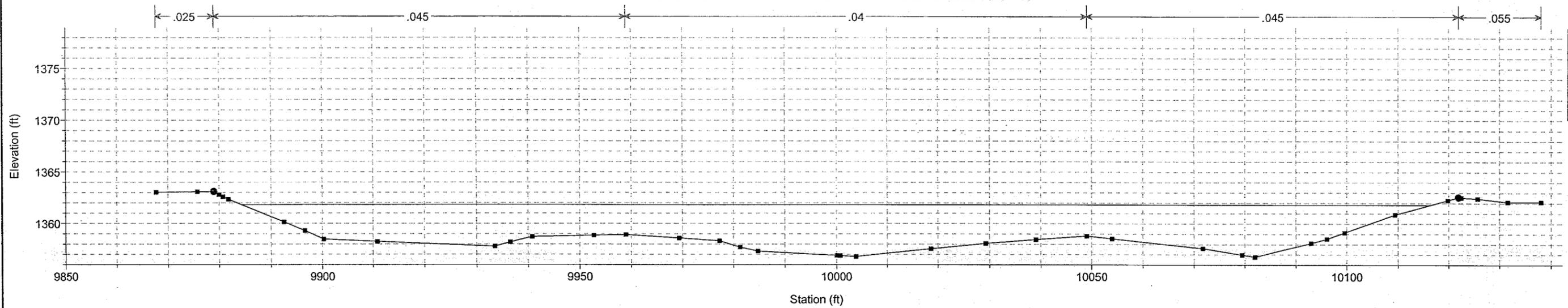
1 in Horiz. = 20 ft 1 in Vert. = 10 ft

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.258 DIBBLE Sta 58+00



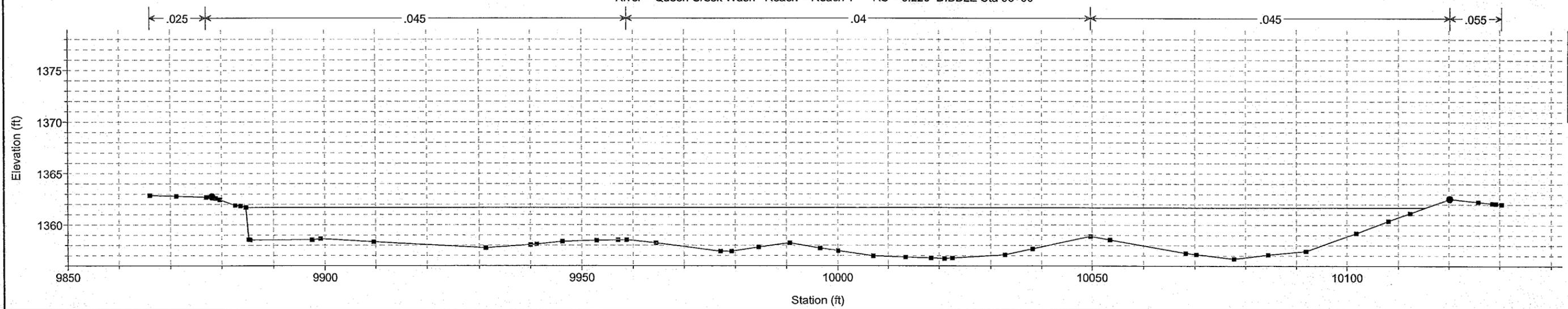
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.239 DIBBLE Sta 57+00



Legend
 WS PF 1
 Ground
 Bank Sta

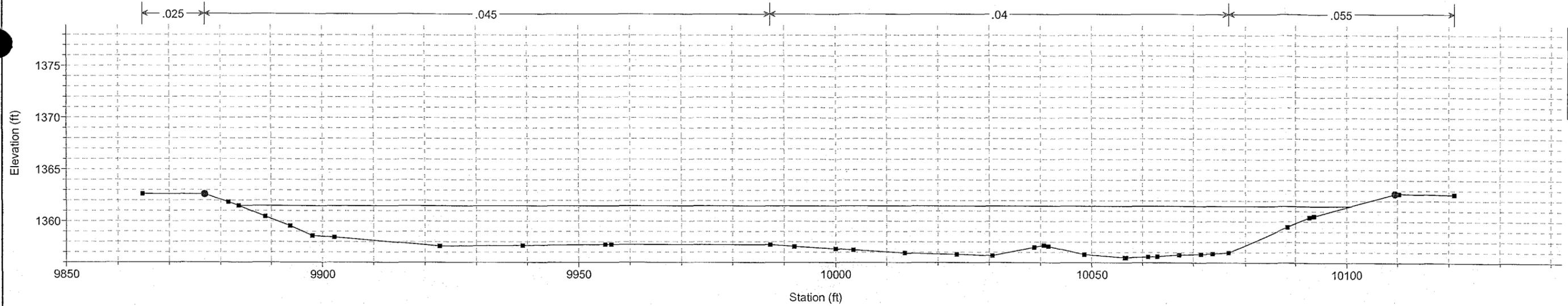
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.220 DIBBLE Sta 56+00



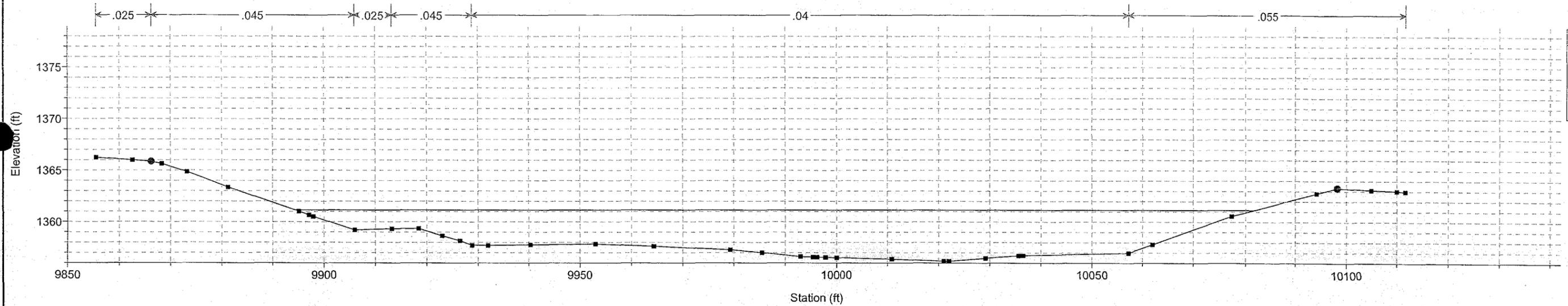
Legend
 WS PF 1
 Ground
 Bank Sta

1 in Horiz. = 20 ft 1 in Vert. = 10 ft

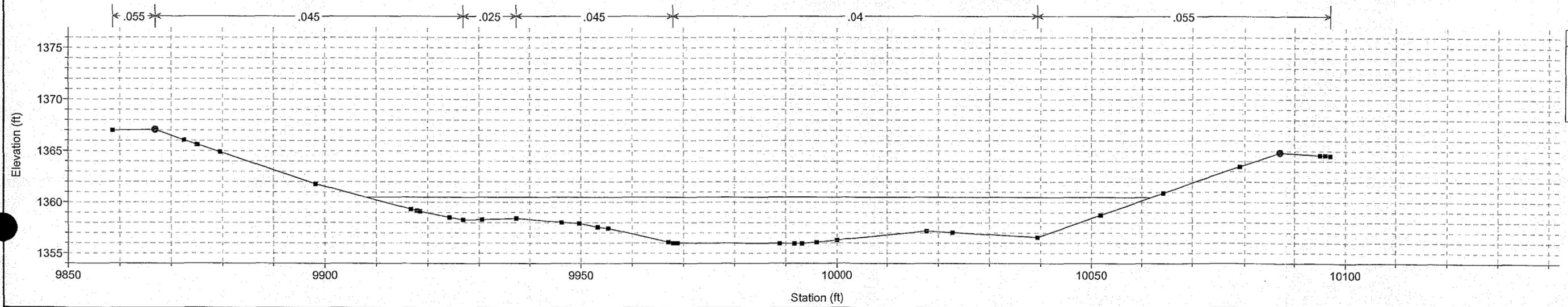
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.201 DIBBLE Sta 55+00



QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.182 DIBBLE Sta 54+00

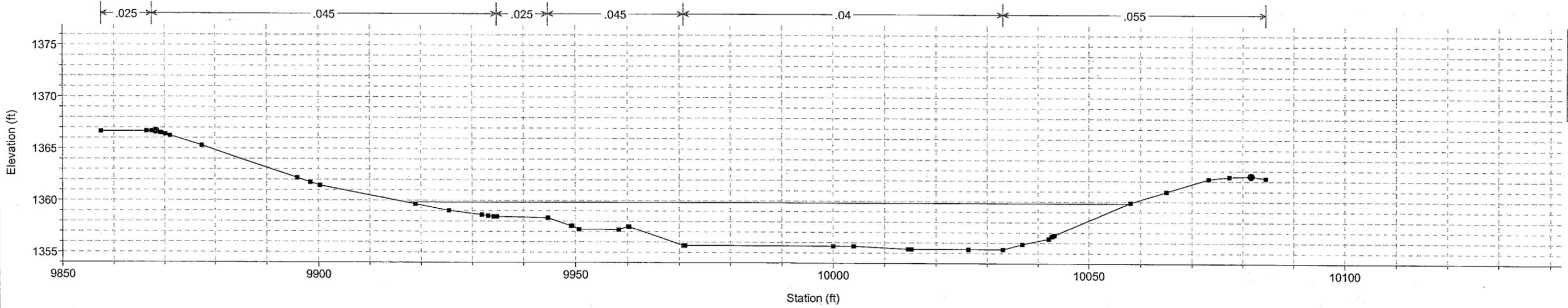


QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.163 DIBBLE Sta 53+00



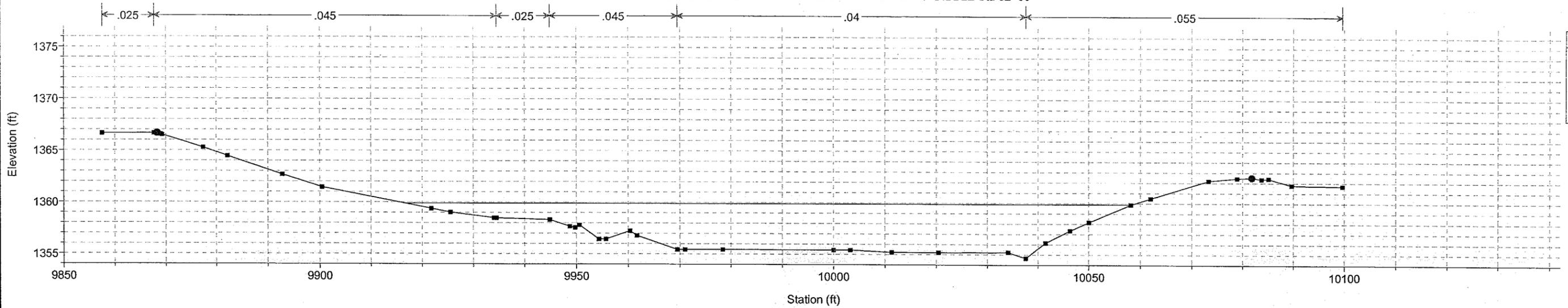
1 in Horiz. = 20 ft 1 in Vert. = 10 ft

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.146 DIBBLE Sta 52+10



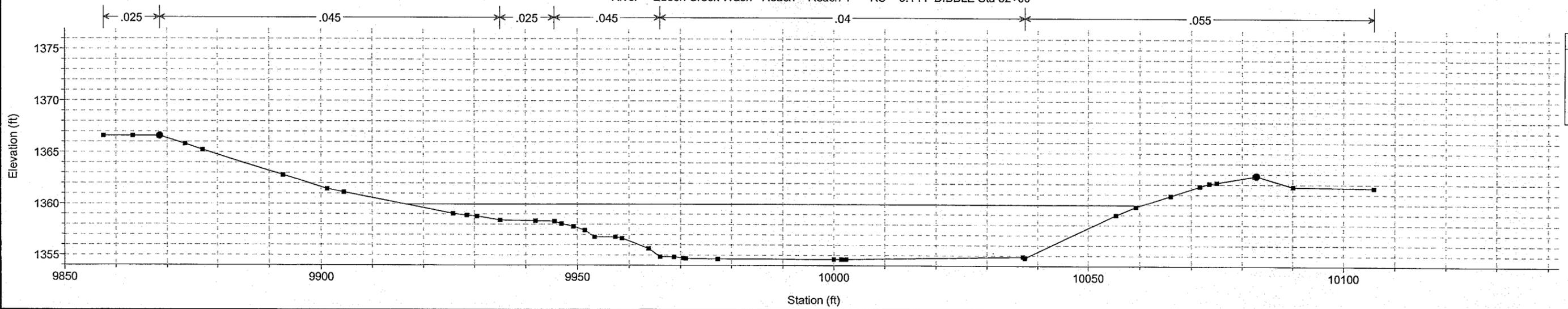
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.145 DIBBLE Sta 52+08



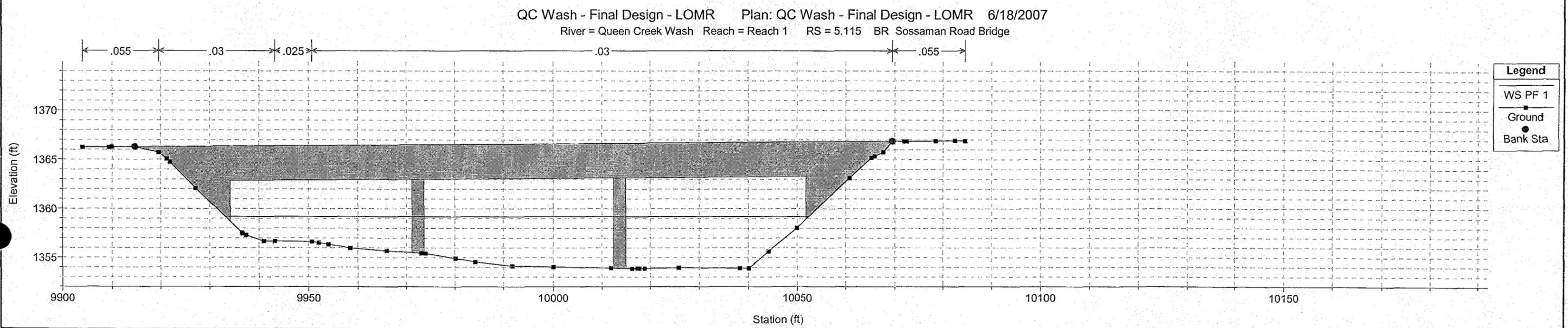
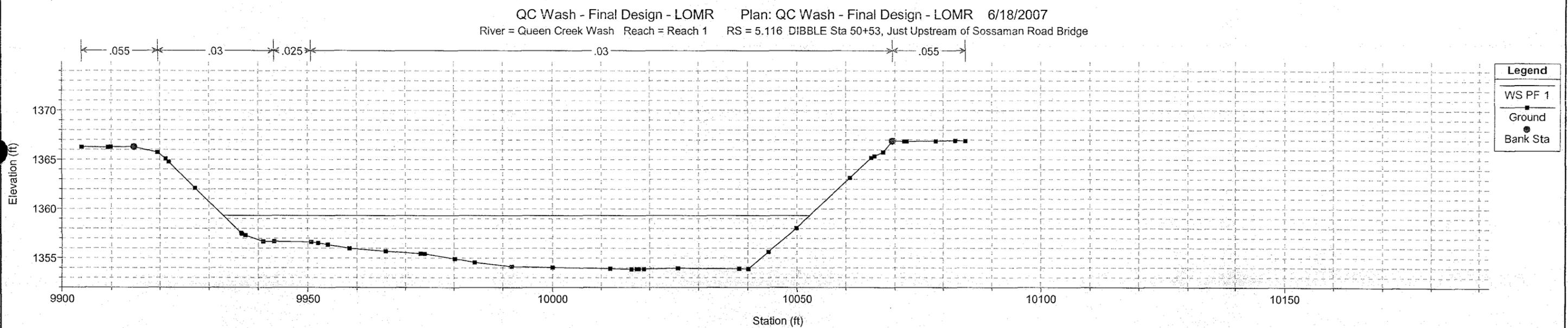
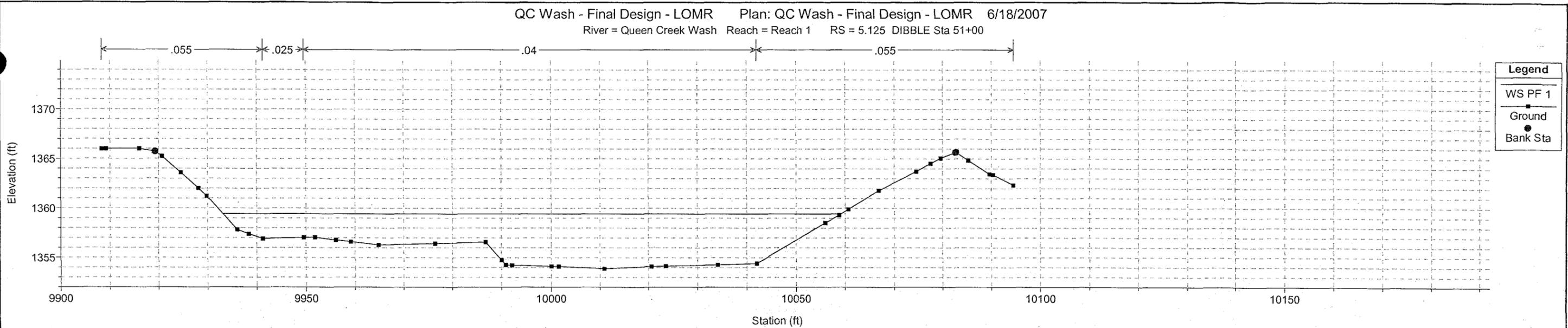
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.144 DIBBLE Sta 52+00



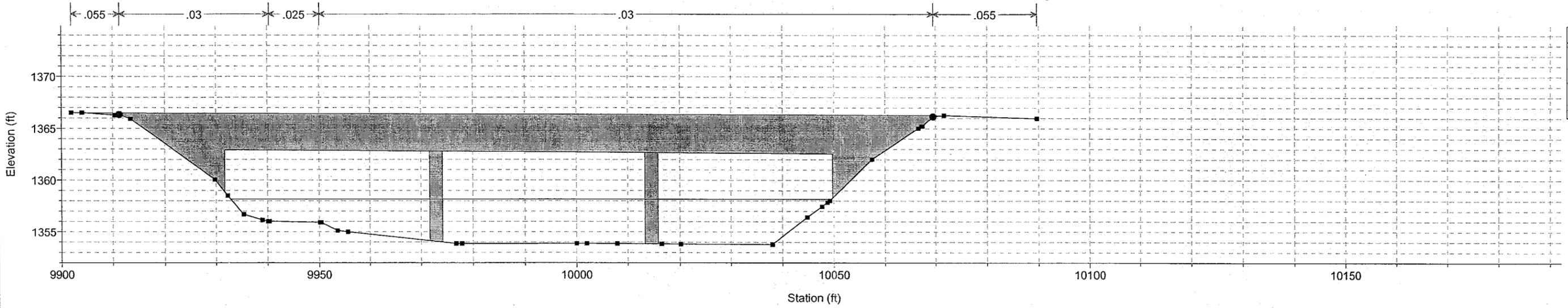
Legend
 WS PF 1
 Ground
 Bank Sta

1 in Horiz. = 20 ft 1 in Vert. = 10 ft

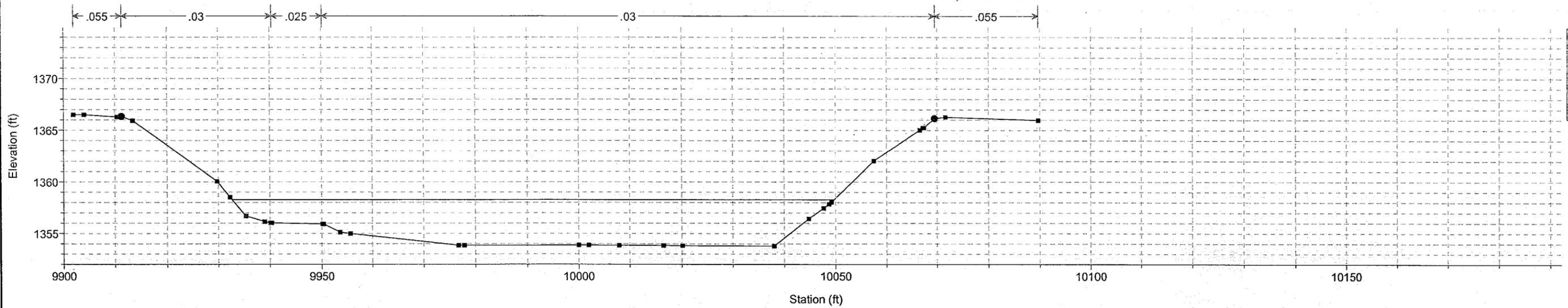


1 in Horiz. = 20 ft 1 in Vert. = 10 ft

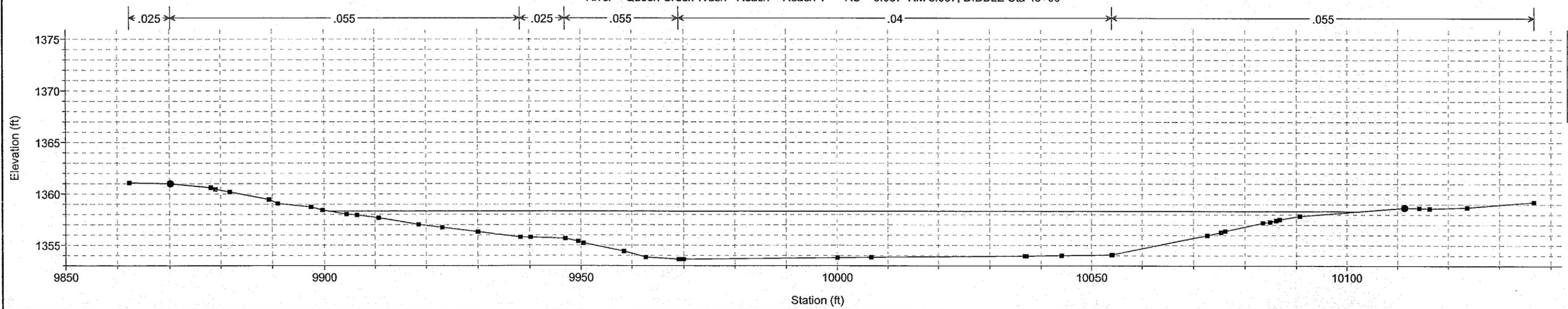
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.115 BR Sossaman Road Bridge



QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.096 RM 5.096; DIBBLE Sta 49+46



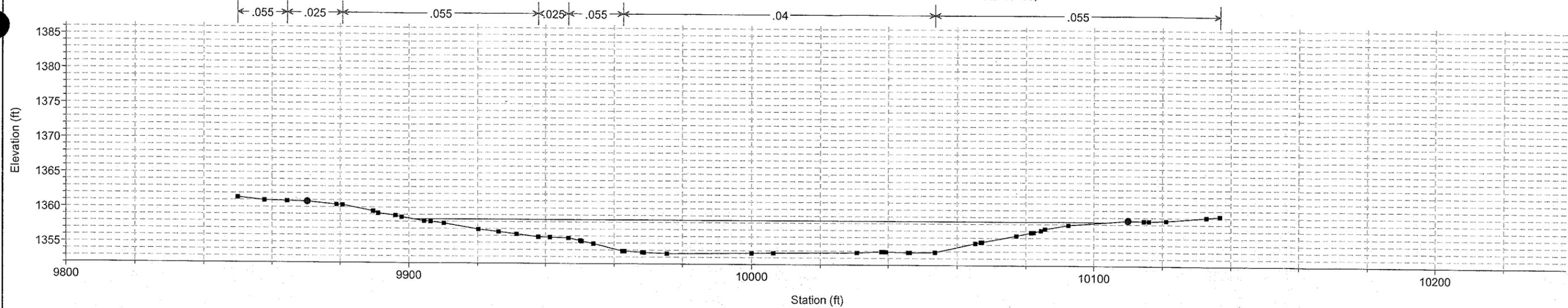
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.087 RM 5.087; DIBBLE Sta 49+00



1 in Horiz. = 20 ft 1 in Vert. = 10 ft

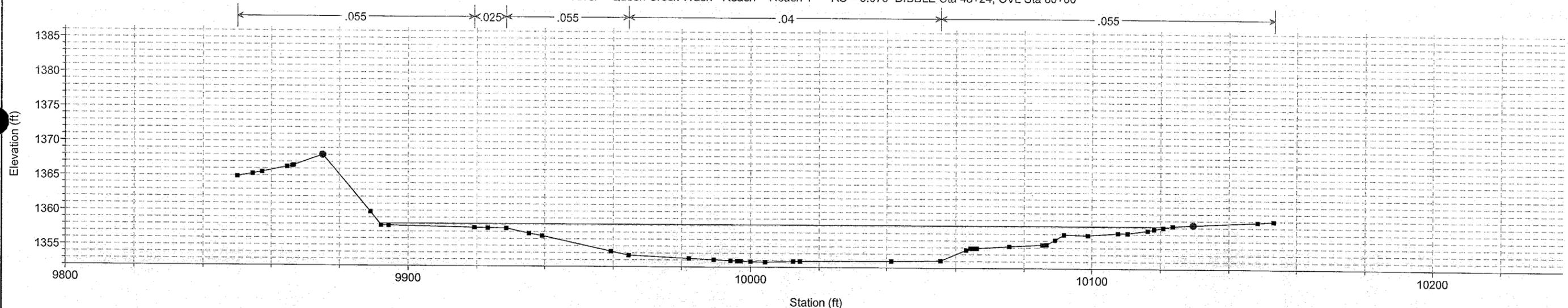
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 5.086 DIBBLE Sta 48+98,



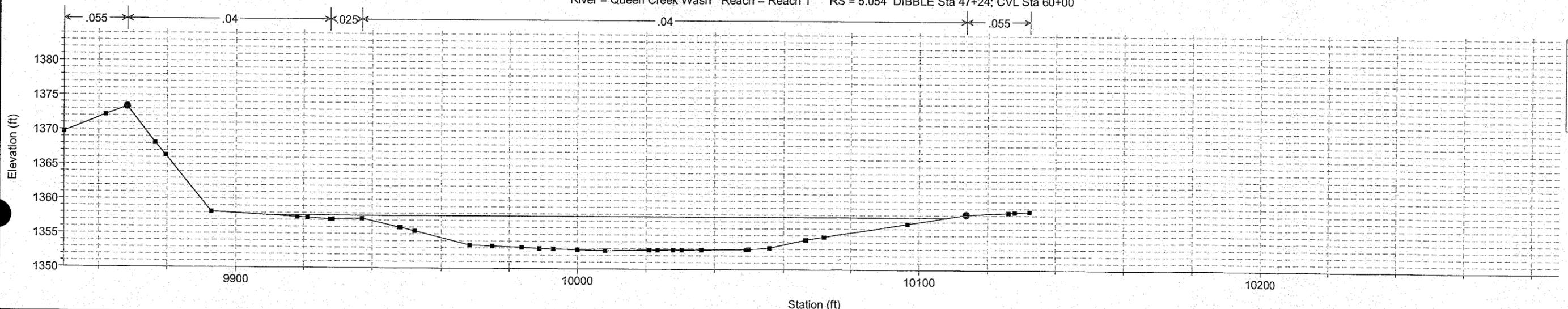
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

River = Queen Creek Wash Reach = Reach 1 RS = 5.073 DIBBLE Sta 48+24; CVL Sta 60+00

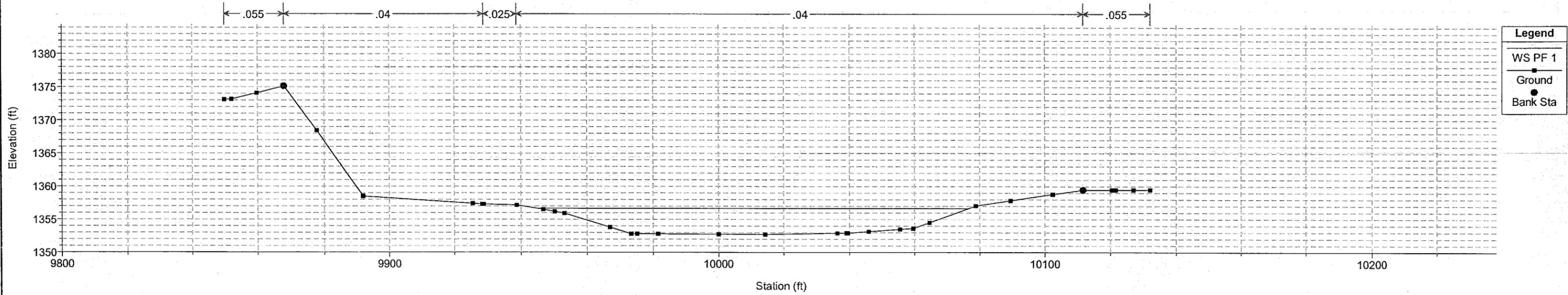


QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007

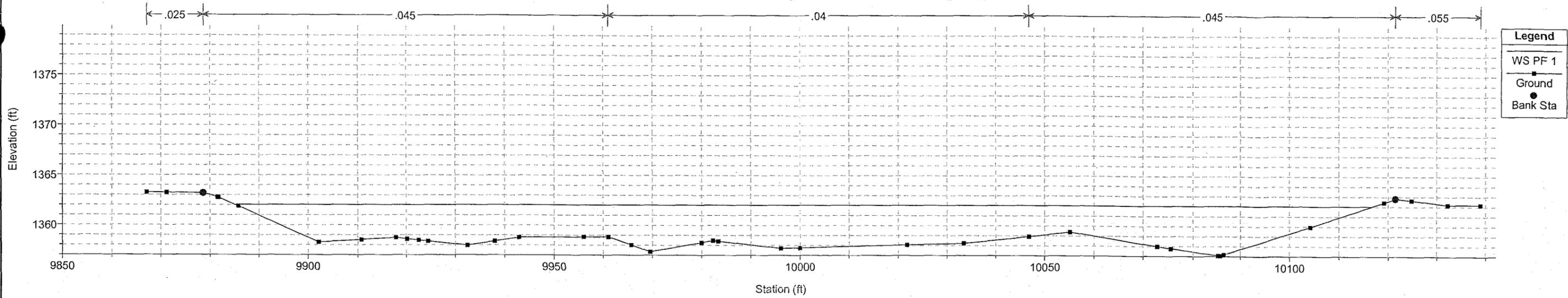
River = Queen Creek Wash Reach = Reach 1 RS = 5.054 DIBBLE Sta 47+24; CVL Sta 60+00



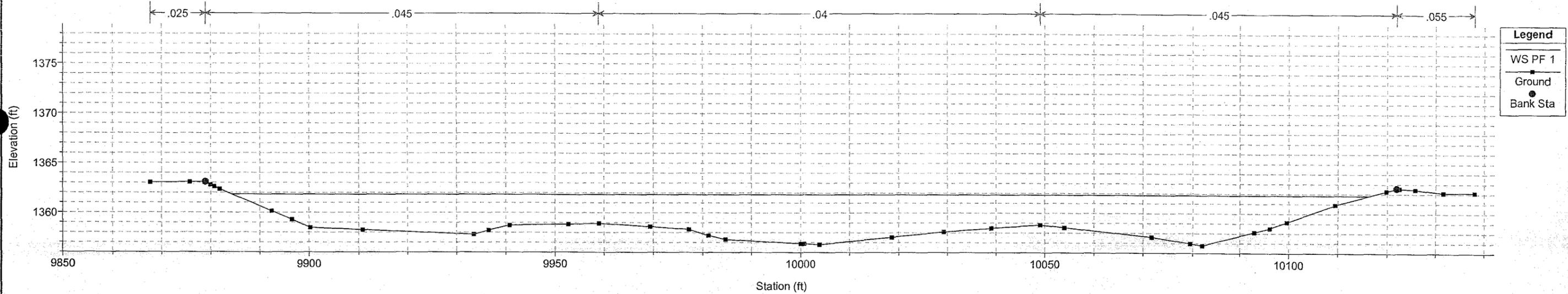
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
River = Queen Creek Wash Reach = Reach 1 RS = 5.035 END OF DETAILED STUDY; DIBBLE Sta 46+24;



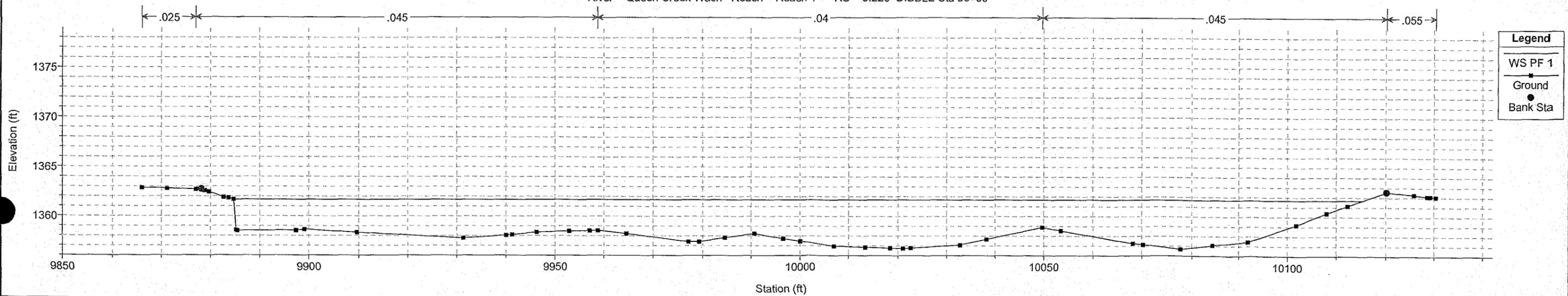
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.258 DIBBLE Sta 58+00



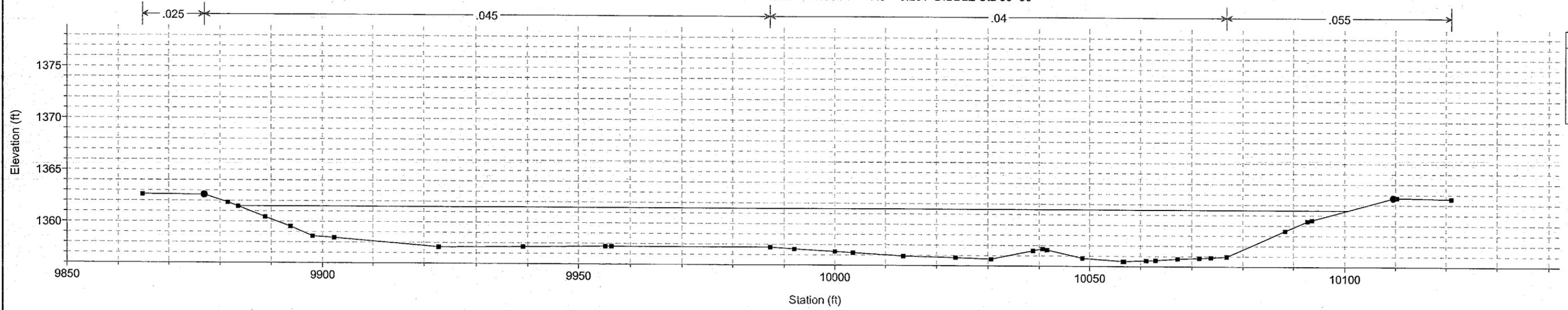
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.239 DIBBLE Sta 57+00



QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.220 DIBBLE Sta 56+00

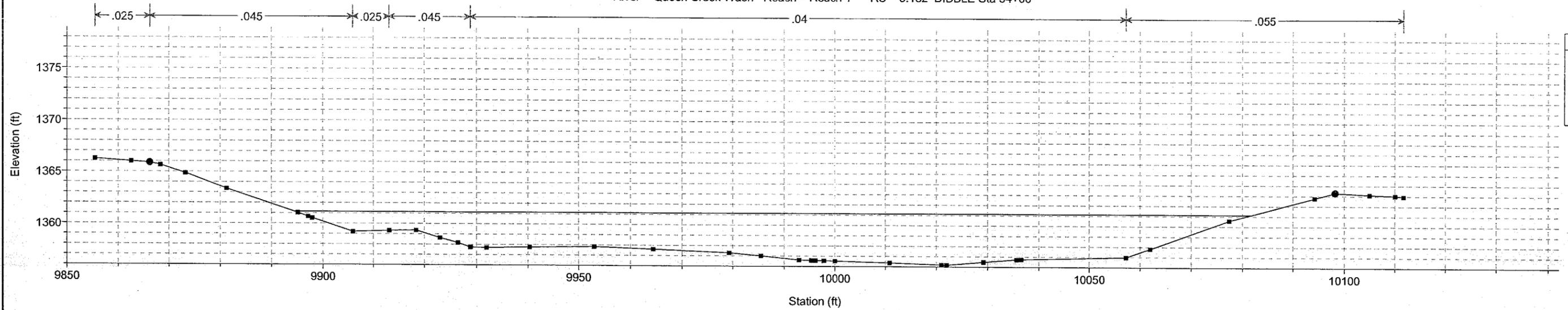


QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.201 DIBBLE Sta 55+00



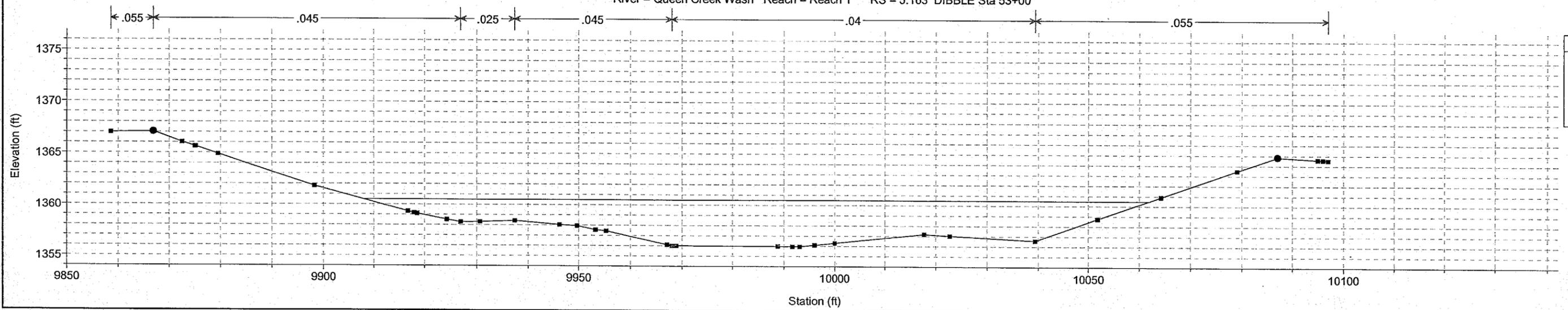
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.182 DIBBLE Sta 54+00



Legend
 WS PF 1
 Ground
 Bank Sta

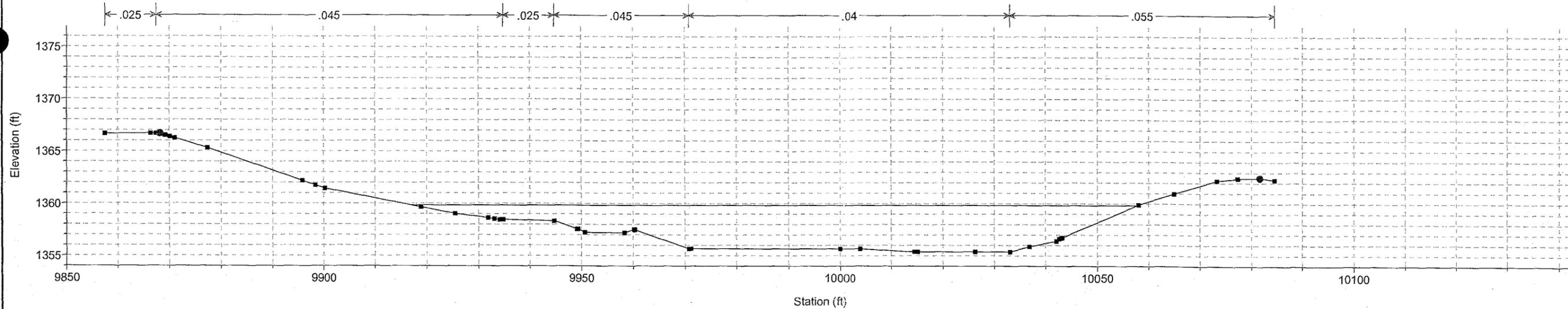
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.163 DIBBLE Sta 53+00



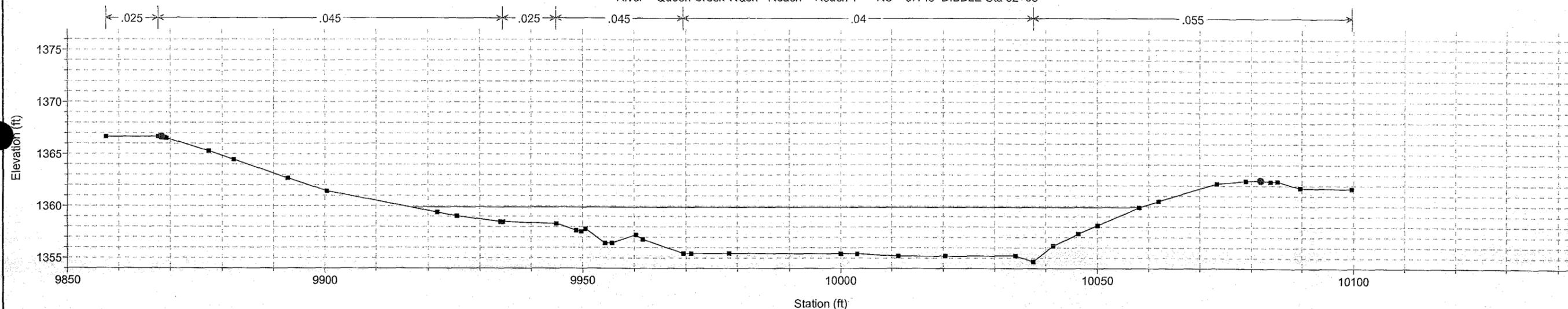
Legend
 WS PF 1
 Ground
 Bank Sta

1 in Horiz. = 20 ft 1 in Vert. = 10 ft

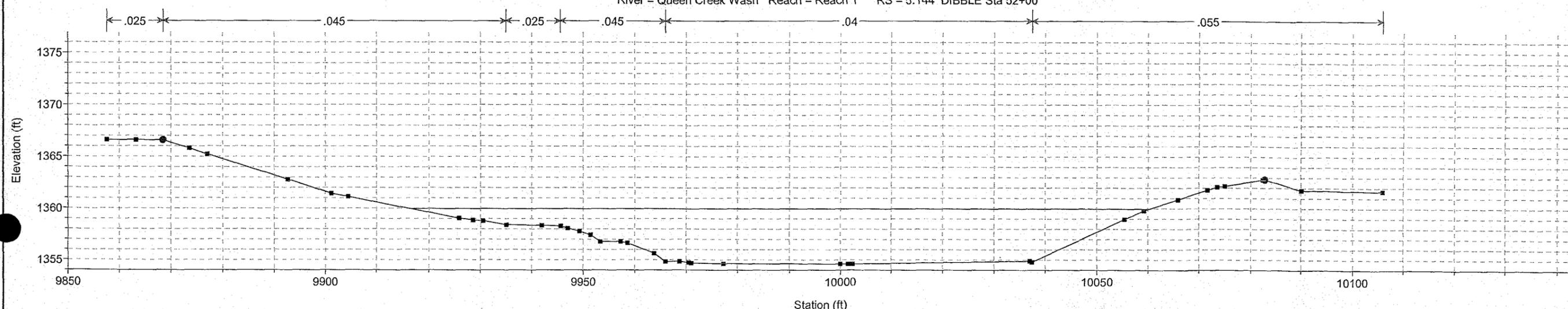
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.146 DIBBLE Sta 52+10



QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.145 DIBBLE Sta 52+08

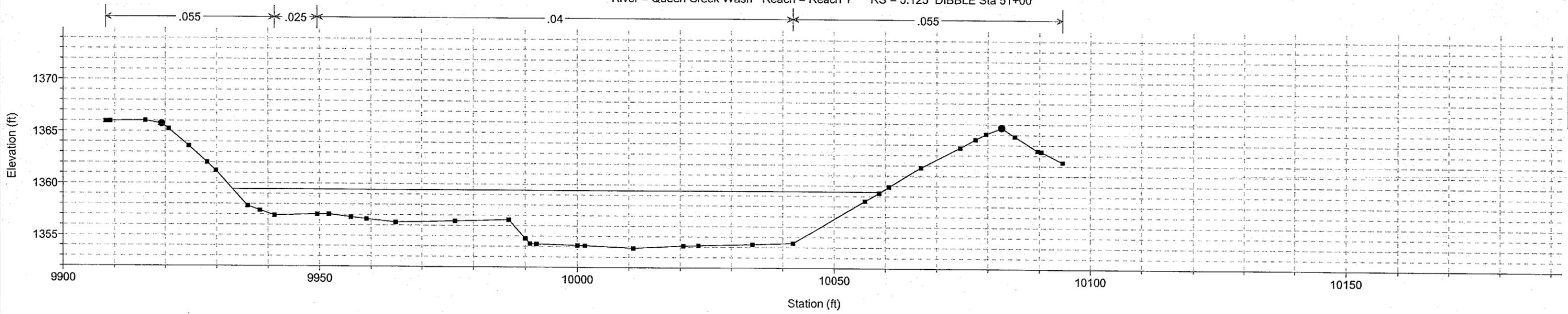


QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.144 DIBBLE Sta 52+00



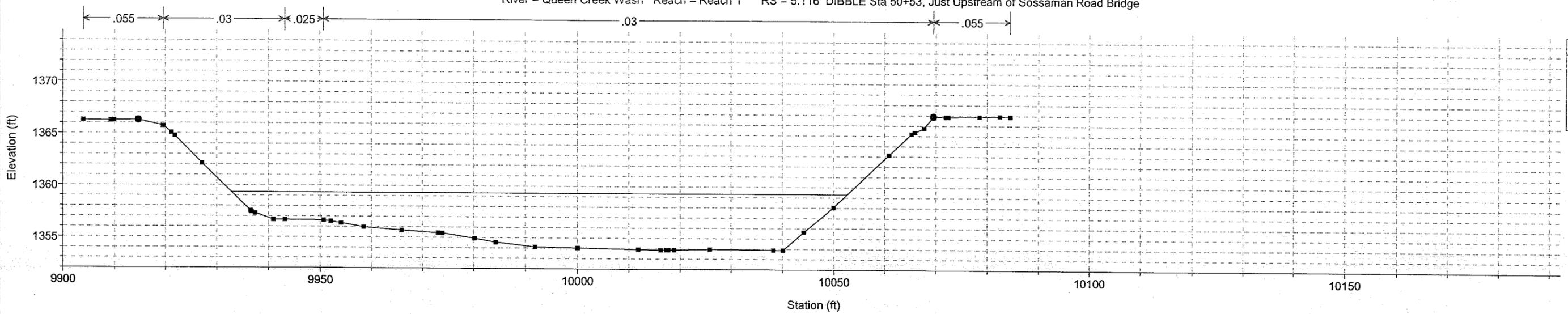
1 in Horiz. = 20 ft 1 in Vert. = 10 ft

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.125 DIBBLE Sta 51+00



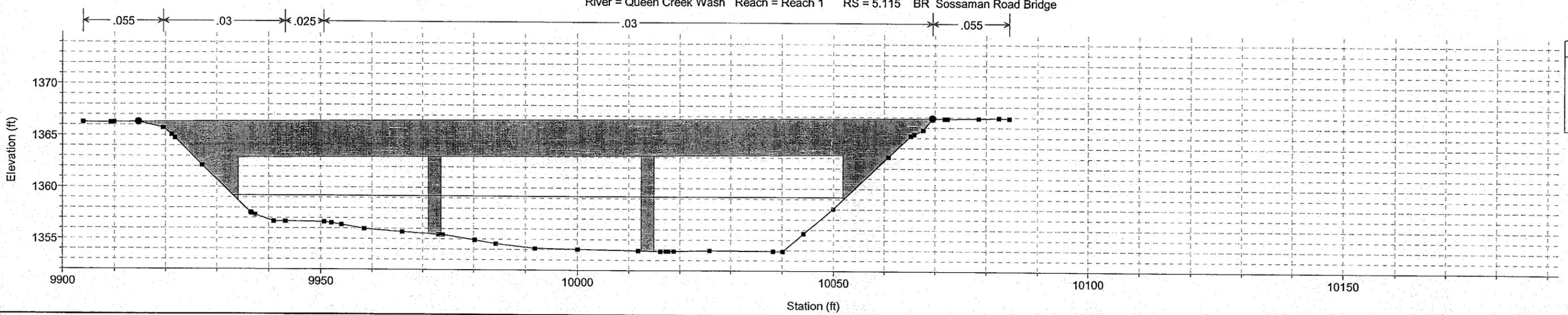
Legend
 WS PF 1
 Ground
 Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.116 DIBBLE Sta 50+53, Just Upstream of Sossaman Road Bridge



Legend
 WS PF 1
 Ground
 Bank Sta

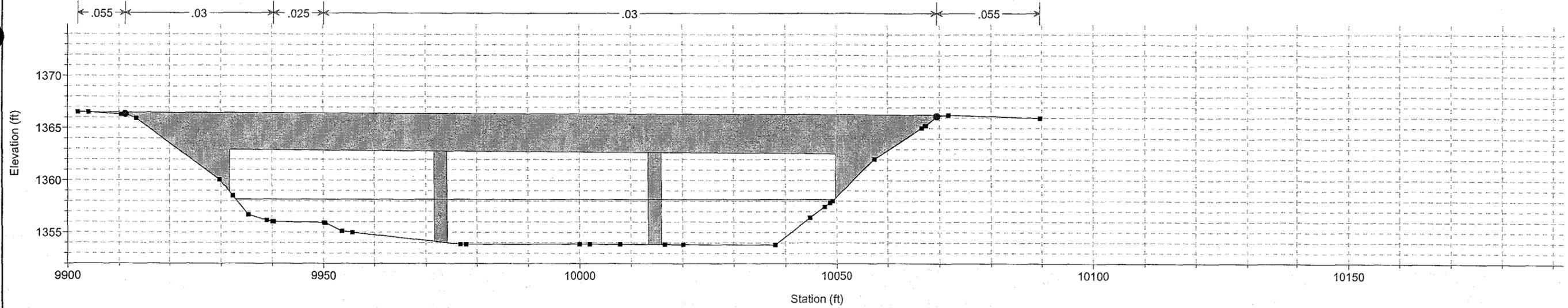
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.115 BR Sossaman Road Bridge



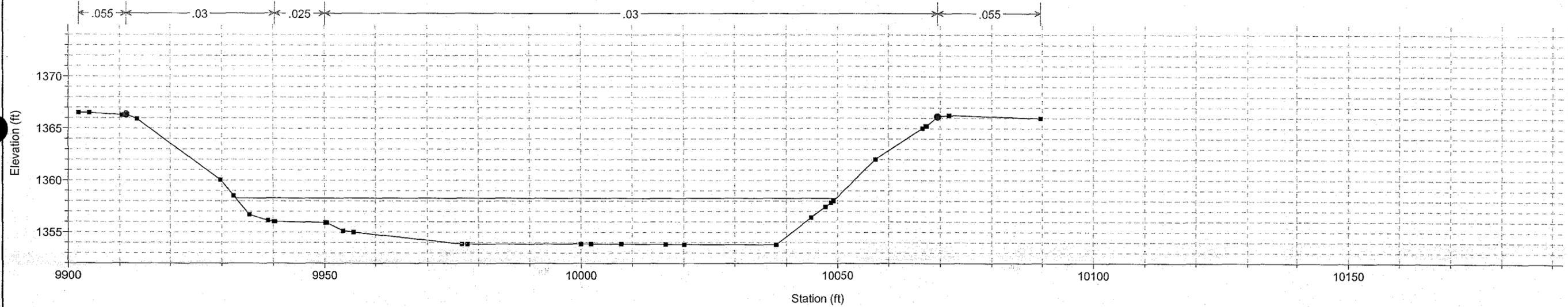
Legend
 WS PF 1
 Ground
 Bank Sta

1 in Horiz. = 20 ft 1 in Vert. = 10 ft

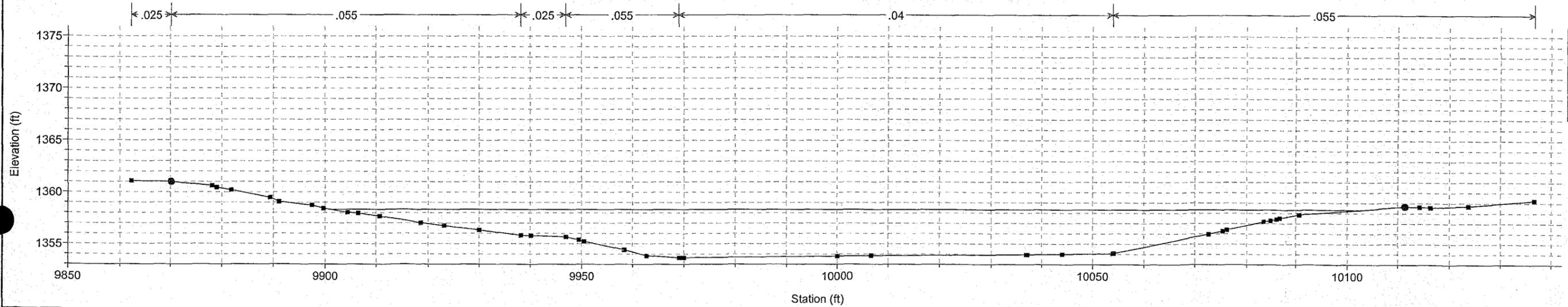
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.115 BR Sossaman Road Bridge



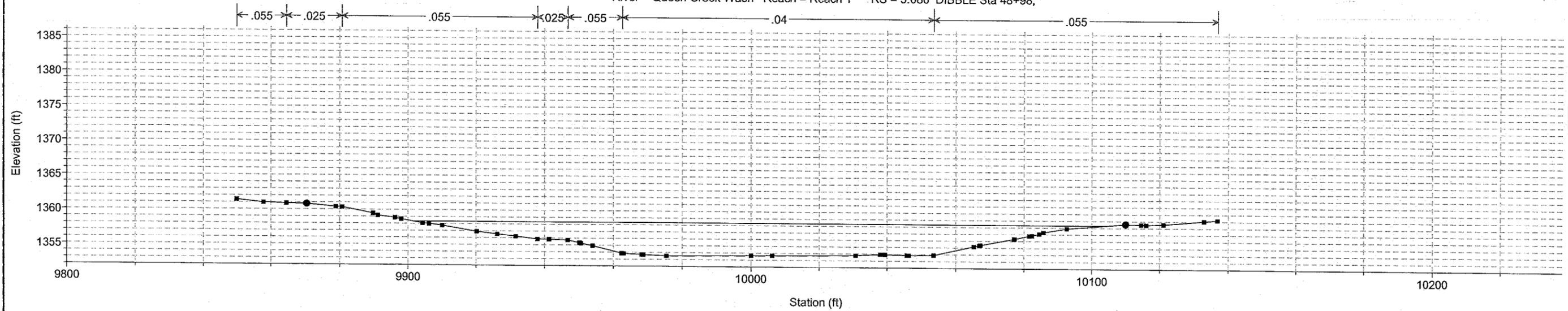
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.096 RM 5.096; DIBBLE Sta 49+46



QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.087 RM 5.087; DIBBLE Sta 49+00



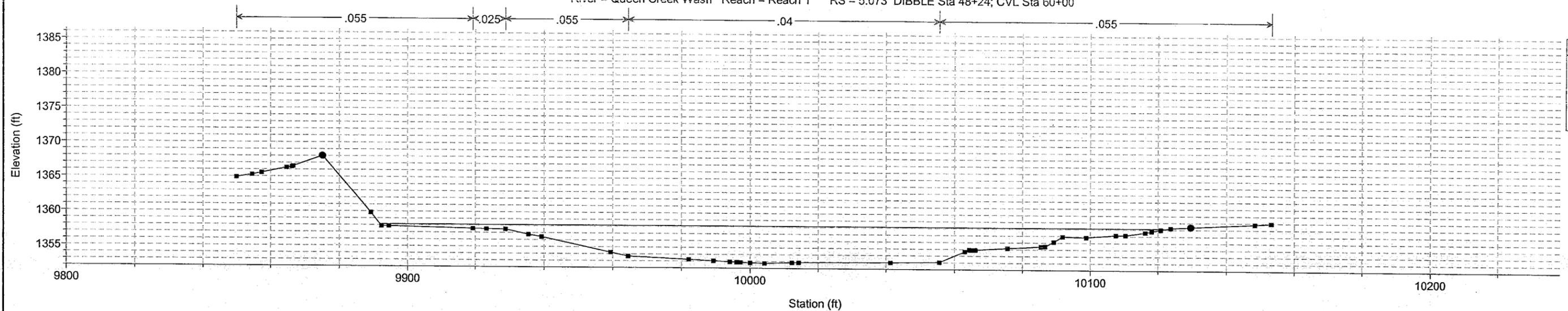
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.086 DIBBLE Sta 48+98,



Legend

- WS PF 1
- Ground
- Bank Sta

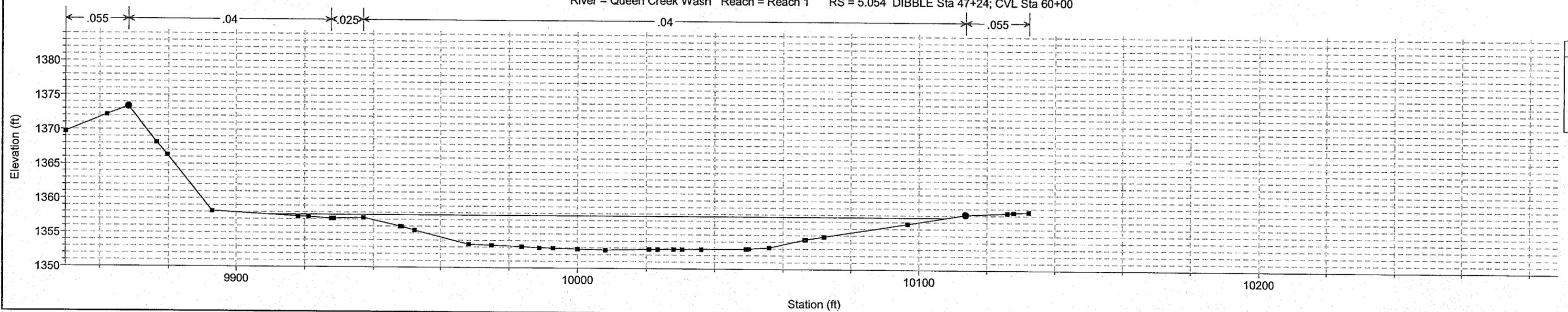
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.073 DIBBLE Sta 48+24; CVL Sta 60+00



Legend

- WS PF 1
- Ground
- Bank Sta

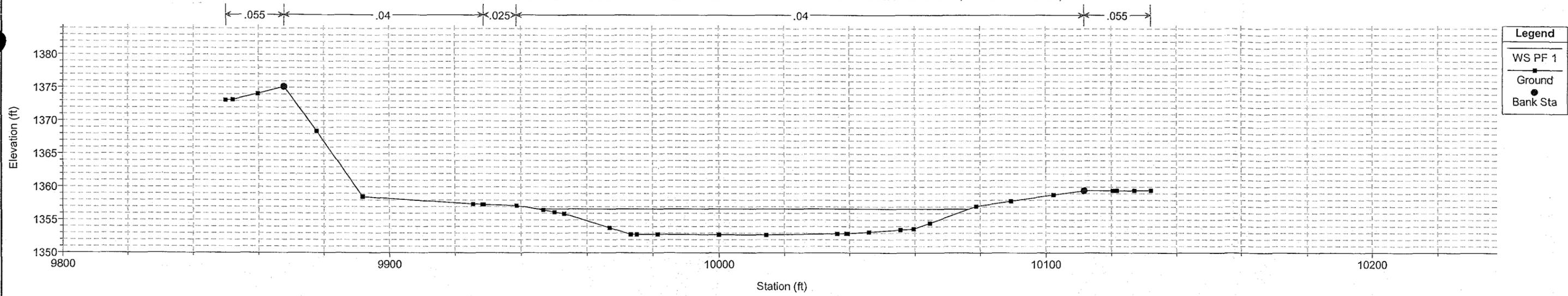
QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
 River = Queen Creek Wash Reach = Reach 1 RS = 5.054 DIBBLE Sta 47+24; CVL Sta 60+00



Legend

- WS PF 1
- Ground
- Bank Sta

QC Wash - Final Design - LOMR Plan: QC Wash - Final Design - LOMR 6/18/2007
River = Queen Creek Wash Reach = Reach 1 RS = 5.035 END OF DETAILED STUDY; DIBBLE Sta 46+24;



APPENDIX E.3

REVISED CONDITION HEC-RAS OUTPUT

HEC-RAS Plan: QCW - LOMR River: Queen Creek Wash Reach: Reach 1 Profile: PF 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 1	6.529	PF 1	2839.00	1373.12	1381.10	1377.75	1381.43	0.001665	4.59	618.64	115.81	0.35
Reach 1	6.528		Bridge									
Reach 1	6.513	PF 1	2839.00	1372.96	1380.69		1381.10	0.002095	5.14	552.77	103.42	0.39
Reach 1	6.508	PF 1	2839.00	1372.74	1380.63		1381.04	0.002358	5.13	553.09	108.20	0.40
Reach 1	6.489	PF 1	2839.00	1372.62	1380.44		1380.80	0.002209	4.81	589.86	120.96	0.38
Reach 1	6.470	PF 1	2839.00	1372.46	1380.18		1380.56	0.002594	4.94	574.47	126.96	0.41
Reach 1	6.451	PF 1	2839.00	1372.24	1379.91		1380.31	0.002324	5.04	563.14	113.16	0.40
Reach 1	6.432	PF 1	2839.00	1371.77	1379.71		1380.07	0.002205	4.86	584.54	117.46	0.38
Reach 1	6.413	PF 1	2839.00	1371.77	1379.53		1379.85	0.002001	4.57	621.62	125.67	0.36
Reach 1	6.394	PF 1	2839.00	1371.77	1379.37		1379.66	0.001694	4.34	654.15	127.23	0.34
Reach 1	6.375	PF 1	2839.00	1371.52	1379.13		1379.47	0.001965	4.68	606.76	116.92	0.36
Reach 1	6.356	PF 1	2839.00	1371.55	1378.87		1379.26	0.002161	4.99	568.65	108.51	0.38
Reach 1	6.337	PF 1	2839.00	1371.34	1378.55		1379.01	0.002645	5.48	517.99	101.43	0.43
Reach 1	6.318	PF 1	2839.00	1371.06	1378.16		1378.71	0.003411	5.95	477.39	99.87	0.48
Reach 1	6.299	PF 1	2839.00	1371.02	1377.78		1378.35	0.003744	6.04	469.85	103.12	0.50
Reach 1	6.281	PF 1	2839.00	1370.55	1377.32		1377.94	0.004207	6.33	448.28	100.17	0.53
Reach 1	6.262	PF 1	2839.00	1370.82	1376.94		1377.53	0.003857	6.16	460.80	101.64	0.51
Reach 1	6.243	PF 1	2839.00	1370.49	1376.46		1377.08	0.005192	6.32	449.36	103.83	0.54
Reach 1	6.242	PF 1	2839.00	1370.55	1376.33		1377.04	0.210755	6.74	421.27	102.86	0.59
Reach 1	6.241	PF 1	2839.00	1369.86	1376.36		1376.98	0.005390	6.33	448.17	103.02	0.54
Reach 1	6.224	PF 1	2839.00	1369.26	1375.84		1376.47	0.005339	6.35	447.16	101.83	0.53
Reach 1	6.205	PF 1	2839.00	1368.95	1375.16		1375.88	0.006254	6.81	416.78	104.34	0.60
Reach 1	6.186	PF 1	2839.00	1369.01	1374.93		1375.36	0.003119	5.26	539.82	148.68	0.49
Reach 1	6.167	PF 1	2839.00	1368.53	1374.71		1375.02	0.003113	4.44	638.83	172.21	0.41
Reach 1	6.148	PF 1	2839.00	1368.58	1374.45		1374.73	0.002433	4.25	667.55	191.61	0.40
Reach 1	6.129	PF 1	2839.00	1368.21	1374.21		1374.49	0.002352	4.25	667.80	192.62	0.40
Reach 1	6.110	PF 1	2839.00	1368.16	1373.93		1374.24	0.002767	4.47	635.61	192.63	0.43
Reach 1	6.091	PF 1	2839.00	1367.99	1373.68		1373.97	0.002531	4.33	654.98	195.04	0.42
Reach 1	6.072	PF 1	2839.00	1367.72	1373.38		1373.69	0.002904	4.48	633.18	194.01	0.44
Reach 1	6.053	PF 1	2839.00	1367.66	1373.11		1373.41	0.002673	4.38	647.95	194.94	0.42
Reach 1	6.034	PF 1	2839.00	1367.59	1372.80		1373.12	0.003063	4.58	620.01	191.60	0.45
Reach 1	6.015	PF 1	2839.00	1367.34	1372.51		1372.82	0.002942	4.49	632.95	192.84	0.44
Reach 1	5.996	PF 1	2839.00	1367.16	1372.21		1372.53	0.002905	4.50	630.24	191.54	0.44
Reach 1	5.977	PF 1	2839.00	1367.07	1371.88		1372.22	0.003213	4.70	604.52	193.73	0.47
Reach 1	5.959	PF 1	2839.00	1366.66	1371.69		1371.96	0.001850	4.17	680.45	199.96	0.40
Reach 1	5.940	PF 1	2839.00	1366.61	1371.46		1371.75	0.002377	4.28	663.82	194.65	0.41
Reach 1	5.921	PF 1	2839.00	1366.34	1371.19		1371.49	0.002704	4.43	640.46	196.71	0.43
Reach 1	5.902	PF 1	2839.00	1365.93	1370.86		1371.20	0.003135	4.63	612.95	197.91	0.46
Reach 1	5.883	PF 1	2839.00	1365.73	1370.67		1370.92	0.002121	3.99	711.81	215.45	0.39
Reach 1	5.864	PF 1	2839.00	1365.80	1370.46		1370.70	0.002235	3.91	726.07	220.96	0.38

HEC-RAS Plan: QCW - LOMR River: Queen Creek Wash Reach: Reach 1 Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 1	5.845	PF 1	2839.00	1365.70	1370.22		1370.46	0.002372	3.94	720.64	222.28	0.39
Reach 1	5.826	PF 1	2839.00	1365.40	1370.01		1370.24	0.002086	3.79	748.65	220.21	0.36
Reach 1	5.807	PF 1	2839.00	1365.14	1369.79		1370.02	0.002181	3.88	732.08	219.85	0.37
Reach 1	5.788	PF 1	2839.00	1364.70	1369.55		1369.80	0.002328	3.95	718.20	216.18	0.38
Reach 1	5.769	PF 1	2839.00	1364.48	1369.32		1369.57	0.002168	4.00	709.90	202.15	0.38
Reach 1	5.750	PF 1	2839.00	1364.41	1368.95		1369.30	0.003188	4.76	596.81	175.82	0.46
Reach 1	5.731	PF 1	2839.00	1364.24	1368.36		1368.89	0.005052	5.80	489.68	157.60	0.58
Reach 1	5.712	PF 1	2839.00	1363.68	1368.05		1368.40	0.003793	4.74	599.26	182.20	0.46
Reach 1	5.693	PF 1	2839.00	1363.36	1367.74		1368.04	0.003146	4.35	653.32	202.76	0.43
Reach 1	5.674	PF 1	2839.00	1362.95	1367.50		1367.73	0.002656	3.90	728.14	220.98	0.38
Reach 1	5.656	PF 1	2839.00	1362.78	1367.25		1367.48	0.002429	3.86	736.03	214.83	0.37
Reach 1	5.637	PF 1	2839.00	1362.64	1367.01		1367.24	0.002349	3.79	749.71	214.38	0.36
Reach 1	5.618	PF 1	2839.00	1362.44	1366.83		1367.02	0.001812	3.54	801.97	235.35	0.34
Reach 1	5.599	PF 1	2839.00	1362.39	1366.60		1366.82	0.002273	3.75	756.15	240.93	0.37
Reach 1	5.580	PF 1	2839.00	1362.03	1366.39		1366.60	0.002029	3.64	779.66	238.75	0.36
Reach 1	5.561	PF 1	2839.00	1361.85	1366.19		1366.39	0.002098	3.61	786.88	237.31	0.35
Reach 1	5.542	PF 1	2839.00	1361.45	1365.98		1366.18	0.002060	3.60	787.96	242.85	0.35
Reach 1	5.523	PF 1	2839.00	1361.23	1365.74		1365.95	0.002538	3.71	765.51	243.73	0.37
Reach 1	5.504	PF 1	2839.00	1361.03	1365.44		1365.69	0.002763	4.00	710.00	242.15	0.41
Reach 1	5.485	PF 1	2839.00	1360.52	1365.15		1365.40	0.002871	4.03	705.25	235.22	0.41
Reach 1	5.466	PF 1	2839.00	1360.36	1364.81		1365.10	0.003257	4.28	663.03	226.45	0.44
Reach 1	5.447	PF 1	2839.00	1360.26	1364.50		1364.78	0.003084	4.21	674.79	222.57	0.43
Reach 1	5.428	PF 1	2839.00	1359.91	1364.23		1364.48	0.002647	4.07	697.70	222.08	0.40
Reach 1	5.409	PF 1	2839.00	1359.74	1363.94		1364.21	0.002915	4.17	681.36	222.64	0.42
Reach 1	5.390	PF 1	2839.00	1359.25	1363.66		1363.92	0.002718	4.09	694.56	222.64	0.41
Reach 1	5.371	PF 1	2839.00	1358.78	1363.37		1363.63	0.003096	4.06	699.20	224.41	0.41
Reach 1	5.352	PF 1	2839.00	1358.92	1363.18		1363.38	0.001799	3.59	791.20	231.51	0.34
Reach 1	5.334	PF 1	2839.00	1358.81	1362.96		1363.18	0.002330	3.76	755.48	238.48	0.37
Reach 1	5.315	PF 1	2839.00	1358.48	1362.70		1362.94	0.002446	3.88	731.26	230.23	0.38
Reach 1	5.296	PF 1	2839.00	1358.30	1362.45		1362.68	0.002602	3.83	740.83	230.70	0.38
Reach 1	5.277	PF 1	2839.00	1357.74	1362.22		1362.43	0.002313	3.73	761.77	230.79	0.36
Reach 1	5.258	PF 1	2839.00	1357.07	1362.01		1362.21	0.002012	3.58	793.82	231.62	0.34
Reach 1	5.239	PF 1	2839.00	1356.77	1361.82		1362.02	0.001883	3.51	809.12	232.15	0.33
Reach 1	5.220	PF 1	2839.00	1356.68	1361.66		1361.84	0.001620	3.34	849.07	230.49	0.31
Reach 1	5.201	PF 1	2839.00	1356.48	1361.47		1361.67	0.001728	3.56	798.17	217.11	0.33
Reach 1	5.182	PF 1	2839.00	1356.17	1361.14		1361.45	0.002581	4.46	637.03	187.31	0.43
Reach 1	5.163	PF 1	2839.00	1355.95	1360.49		1361.06	0.005455	6.04	470.12	153.95	0.61
Reach 1	5.146	PF 1	2839.00	1355.36	1359.82		1360.51	0.006555	6.65	426.66	140.75	0.67
Reach 1	5.145	PF 1	2839.00	1354.65	1359.88		1360.47	0.004877	6.13	462.78	141.69	0.60
Reach 1	5.144	PF 1	2839.00	1354.60	1359.95		1360.39	0.003067	5.36	529.64	143.83	0.49

HEC-RAS Plan: QCW - LOMR River: Queen Creek Wash Reach: Reach 1 Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 1	5.125	PF 1	2839.00	1353.87	1359.42		1359.99	0.005216	6.03	471.15	126.08	0.55
Reach 1	5.116	PF 1	2839.00	1353.87	1359.30	1357.68	1359.82	0.002049	5.76	492.81	119.71	0.50
Reach 1	5.115	Bridge										
Reach 1	5.096	PF 1	2839.00	1353.78	1358.27		1358.95	0.003105	6.60	429.91	117.05	0.61
Reach 1	5.087	PF 1	2839.00	1353.63	1358.31		1358.63	0.003042	4.55	623.82	201.61	0.46
Reach 1	5.086	PF 1	2839.00	1353.49	1358.32		1358.62	0.002673	4.42	642.87	202.70	0.44
Reach 1	5.073	PF 1	2839.00	1352.72	1358.12		1358.37	0.003753	3.99	711.91	230.74	0.40
Reach 1	5.054	PF 1	2839.00	1352.68	1357.66		1358.00	0.003476	4.67	607.41	199.08	0.47
Reach 1	5.035	PF 1	2839.00	1352.72	1356.65	1355.95	1357.44	0.008478	7.13	398.23	131.80	0.72

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

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X   X   XXXXXX   XXXX   XXXX   XX   XXXX
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X   X   X       X   X   X   X   X   X
XXXXXXXX XXXX   X       XXX XXXX   XXXXXX   XXXX
X   X   X       X   X   X   X   X   X
X   X   X       X   X   X   X   X   X
X   X   XXXXXX   XXXX   X   X   X   X   XXXXX
  
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PROJECT DATA

Project Title: QC Wash - Final Design - LOMR
 Project File : QC_SOSS_HAWES_LOMR.prj
 Run Date and Time: 6/18/2007 8:10:23 AM

Project in English units

Project Description:

Project Title: Queen Creek Wash Sossaman Road to Hawes Road Channel
 Improvement Project - Town of Queen Creek Proj No. 2000D-03

Prepared By:

Dibble and Associates Consulting Engineers

Model Created: April,
 2007

Prepared For: Town of Queen Creek

Contact: Tom Narva, PH:

480-987-0109

Reviewing Agency: Flood Control District of Maricopa County

Contact: Tim Murphy, PH: 602-506-1501

Note: Crosssections

face downstream. River Miles increase in the upstream direction.

Note:

This project is on NAVD 88 vertical datum.

Note: Levees modeled in this

model do not represent physical levees to be constructed with the channel improvements. The modeling tool termed levee is used to keep flood waters out of low lying ground, below the water surface elevation, on either side of actual physical containments of flow. It would be unreasonable to expect that flood waters will erode the substantial length of earth beside the channel.

Th

is model is the post project conditions model for the Queen Creek Wash Improvement project, Sossaman Road to Hawes Road. It has been prepared for LOMR application. Cross sections for this model are generated from aerial mapping produced after construction of the channel improvements. Mapping is provided by Kenney Aerial Mapping, Inc. Flight Date: 1/20/06. Ground Control survey provided by Dibble & Associates, Inc.

Hydraulic tie-ins with

existing floodplain delineations, already accepted by FEMA as a map LOMR, exist at the upstream and downstream limits of the model. Downstream, the floodplain ties into the delineation of Queen Creek Wash, Power Road to Sossaman Road, performed by Coe and Van Loo Consultants, Inc. This occurs at RM 5.035, CVL Station 60+00. CVL mapping was on Town of Queen Creek datum, rather than NAVD 88 datum. Therefore, a correction factor of -2.00' was applied to Coe & Van Loo water surface elevations to resolve the discrepancy. Upstream, the floodplain ties into the delineation of Queen Creek Wash, Hawes Road to SPRR, performed by Collins/Pina Consulting Engineers, Inc. This occurs at RM 6.529, Collins/Pina Station 1000+40. Collins/Pina mapping was a modified NAVD 88, requiring a correction factor of +2.427 applied to the water surface elevation.

Flow Rates:

The effective discharge for this model was obtained from Queen Creek Wash - Power Road to Hawes Road Pre-Design Report and reproduced in the subsequent report Queen Creek Wash - Hawes Road to Power Road, Revised Hydrology, completed by Dibble & Associates and approved as part of the LOMR for Queen Creek Wash, Power Road to Sossaman Road- Case No. 03-09-0247P.

At Cross Section 6.529 - 2839 cfs.

Starting WS
Elevation:

The starting water surface value for the HEC-RAS computer model has been determined from the approved LOMR for Queen Creek Wash, Power Road to Sossaman Road- Case No. 03-09-0247P. The effective discharge for this model was obtained from _Queen Creek Wash - Power Road to Hawes Road Pre-Design Report_ and reproduced in the subsequent report _Queen Creek Wash - Hawes Road to Power Road, Revised Hydrology _ completed by Dibble & Associates and approved as part of the LOMR for Queen Creek Wash, Power Road to Sossaman Road- Case No. 03-09-0247P.

PLAN DATA

Plan Title: QC Wash - Final Design - LOMR
Plan File : j:\10-0078\LOMR Data\HEC-RAS\QC_SOSS_HAWES_LOMR.p01

Geometry Title: QC Wash - Final Design - LOMR
Geometry File : j:\10-0078\LOMR Data\HEC-RAS\QC_SOSS_HAWES_LOMR.g01

Flow Title : QC Wash - Final Design - LOMR
Flow File : j:\10-0078\LOMR Data\HEC-RAS\QC_SOSS_HAWES_LOMR.f02

Plan Summary Information:

Number of:	Cross Sections =	87	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	2	Lateral Structures =	0

Computational Information

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

Computation Options

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

FLOW DATA

Flow Title: QC Wash - Final Design - LOMR
Flow File : j:\10-0078\LOMR Data\HEC-RAS\QC_SOSS_HAWES_LOMR.f02

Flow Data (cfs)

River	Reach	RS	PF 1
Queen Creek Wash	Reach 1	6.529	2839

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Queen Creek Wash	Reach 1	PF 1		Known WS = 1356.65

GEOMETRY DATA

Geometry Title: QC Wash - Final Design - LOMR
Geometry File : j:\10-0078\LOMR Data\HEC-RAS\QC_SOSS_HAWES_LOMR.g01

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 6.529

INPUT

Description: END OF DETAILED STUDY; DIBBLE Sta 125+13;
Collins/Pina Sta
1000+40. Just Upstream from Hawes Road.

Station	Elevation	Data	num=	36							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

9908.781 1384.329911.447 1384.659920.902 1384.259927.254 1384.249929.857 1384.15
 9935.28 1383.529936.745 1383.399945.946 1380.99946.756 1380.729947.747 1380.52
 9949.258 1379.989949.749 1379.839951.378 1379.34 9955.31 1378.189967.931 1374.48
 9971.699 1374.18 9988.37 1373.339988.798 1373.339988.816 1373.349989.444 1373.32
 9991.064 1373.31 10000 1373.2410002.16 1373.2210009.41 1373.12 10010.9 1373.14
 10019.7 1374.2810024.01 1374.9110033.46 1376.15 10033.9 1376.1510036.89 1376.43
 10067.18 1382.310076.57 1383.12 10077.8 1383.2910087.66 1384.81 10090.8 1384.9
 10104.66 1384.99

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

9908.781 .0559929.857 .0410087.66 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9929.85710087.66 80.88 84.93 91.74 .3 .5

BRIDGE

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 6.528

INPUT

Description: Hawes Road Bridge
 Distance from Upstream XS = .01
 Deck/Roadway Width = 84
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates

num= 9
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 9920.902 1384.25 13749950.1321384.712 13749950.1321384.7121382.309
 9974.701 1385.11382.6119997.451 1385.46 1382.89 10020.21385.3231382.819
 10046.591385.1651382.73710046.591385.165 1374 10090.8 1384.9 1374

Upstream Bridge Cross Section Data

Station Elevation Data num= 36
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9908.781 1384.329911.447 1384.659920.902 1384.259927.254 1384.249929.857 1384.15
 9935.28 1383.529936.745 1383.399945.946 1380.99946.756 1380.729947.747 1380.52
 9949.258 1379.989949.749 1379.839951.378 1379.34 9955.31 1378.189967.931 1374.48
 9971.699 1374.18 9988.37 1373.339988.798 1373.339988.816 1373.349989.444 1373.32
 9991.064 1373.31 10000 1373.2410002.16 1373.2210009.41 1373.12 10010.9 1373.14
 10019.7 1374.2810024.01 1374.9110033.46 1376.15 10033.9 1376.1510036.89 1376.43
 10067.18 1382.310076.57 1383.12 10077.8 1383.2910087.66 1384.81 10090.8 1384.9
 10104.66 1384.99

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

9908.781 .0559929.857 .0410087.66 .055

Bank Sta: Left Right Coeff Contr. Expan.
 9929.85710087.66 .3 .5

Downstream Deck/Roadway Coordinates

num= 9
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 9913.649 1384.82 13749949.6011385.089 13749949.6011385.0891382.676
 9976.171385.2881382.7919999.074 1385.46 1382.8910021.981385.1421382.654
 10046.721384.7981382.39810046.721384.798 137410074.66 1384.41 1374

Downstream Bridge Cross Section Data

Station Elevation Data num= 46
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9914.232 1384.829921.694 1384.49929.611 1383.999943.989 1381.379947.383 1380.67
 9948.921 1380.129949.258 1380.019949.759 1379.829950.596 1379.549952.334 1378.95
 9955.419 1377.98 9966.73 1374.479970.398 1374.249975.903 1373.85 9982.81 1373.4
 9986.941 13739992.583 1372.999993.821 1372.989994.331 1372.969994.822 1372.97
 9998.826 1373.13 10000 1373.1710004.36 1373.3310004.86 1373.4610014.29 1374.33
 10019.79 1374.8710020.03 1374.8910020.91 1374.9610025.83 1375.3210035.75 1376.1
 10052.39 1381.2110053.89 1381.6610054.75 1381.9410055.23 1382.0910055.31 1382.16
 10055.39 1382.1410056.08 1382.2510069.45 1383.7410072.31 1384.0610072.44 1384.07
 10074.16 1384.4110074.56 1384.2610077.92 1384.29 10086.4 1384.3410089.46 1384.38
 10096.96 1384.46

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

9914.232 .0559929.611 .0410074.16 .055

Bank Sta: Left Right Coeff Contr. Expan.
 9929.61110074.16 .3 .5

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

Number of Piers = 2

Pier Data
 Pier Station Upstream=9974.701 Downstream= 9976.17
 Upstream num= 2
 Width Elev Width Elev
 3 1372 3 1382.89
 Downstream num= 2
 Width Elev Width Elev
 3 1372 3 1382.89

Pier Data
 Pier Station Upstream= 10020.2 Downstream=10021.98
 Upstream num= 2
 Width Elev Width Elev
 3 1372 3 1382.89
 Downstream num= 2
 Width Elev Width Elev
 3 1372 3 1382.89

Number of Bridge Coefficient Sets = 1

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

High Flow Method
 Energy Only

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

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 6.513

INPUT
 Description: DIBBLE Sta 124+28
 Just Downstream from Hawes Road
 Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9914.232	1384.829921.694	1384.49929.611	1383.999943.989	1381.379947.383	1380.67				
9948.921	1380.129949.258	1380.019949.759	1379.829950.596	1379.549952.334	1378.95				
9955.419	1377.98 9966.73	1374.479970.398	1374.249975.903	1373.85 9982.81	1373.4				
9986.941	13739992.583	1372.999993.821	1372.989994.331	1372.969994.822	1372.97				
9998.826	1373.13 10000	1373.1710004.36	1373.3310004.86	1373.4610014.29	1374.33				
10019.79	1374.8710020.03	1374.8910020.91	1374.9610025.83	1375.3210035.75	1376.1				
10052.39	1381.2110053.89	1381.6610054.75	1381.9410055.23	1382.0910055.31	1382.16				
10055.39	1382.1410056.08	1382.2510069.45	1383.7410072.31	1384.0610072.44	1384.07				
10074.16	1384.4110074.56	1384.2610077.92	1384.29 10086.4	1384.3410089.46	1384.38				
10096.96	1384.46								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9914.232	.0559929.611	.0410074.16	.055		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	9929.611	10074.16	89.29	28.29	2	.3	.5		

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 6.508

INPUT
 Description: DIBBLE Sta 124+00

Station Elevation Data num= 40									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9919.48	1384.89	9922.54	1384.91	9926.59	1384.94	9931.38	1383.59	9940.26	1381.15
9968.24	1375.18	9971.51	1374.49	9974.92	1374.13	9988.09	1372.74	9989.22	1372.75
9997.44	1372.88	10000	1372.99	10007.97	1373.33	10008.54	1373.35	10009.29	1373.52
10013.07	1374.41	10016.39	1374.61	10024.09	1374.96	10024.92	1375.03	10025.35	1375.06
10025.68	1375.09	10029.81	1375.52	10036.43	1376.22	10038.08	1376.61	10039.47	1376.96
10039.61	1377.10	10042.57	1377.94	10053.41	1381.44	10054.38	1382.06	10055.11	1381.89
10059.09	1382.57	10059.68	1382.63	10071.89	1383.88	10075.02	1384.64	10075.12	1384.66
10076.44	1384.21	10087.4	1384.29	10089.16	1384.3	10089.8	1384.31	10099.86	1384.41

Manning's n Values num= 6									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9919.48	.055	9926.59	.045	9971.51	.04	10013.07	.025	10024.09	.045
10075.02	.055								

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	9926.59	10075.02		100	100	67.68		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 6.489

INPUT

Description: DIBBLE Sta 123+00

Station Elevation Data num= 26									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9919.44	1385.27	9926.37	1385.19	9926.96	1385.19	9941.37	1381.02	9941.56	1380.97
9942.03	1380.88	9975.25	1374.51	9988.84	1373.08	9993.09	1372.62	9993.64	1372.63
10000	1372.66	10002.64	1372.68	10012.95	1373.19	10019.49	1373.55	10021.39	1373.97
10024.72	1374.92	10030.3	1375.23	10035.38	1375.41	10044.78	1376.06	10045.99	1376.23
10051.06	1377.41	10066.64	1380.72	10073.48	1381.02	10076.64	1381.13	10080.38	1381.29
10085.88	1381.36								

Manning's n Values num= 6									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9919.44	.055	9926.96	.045	9975.25	.04	10024.72	.025	10035.98	.045
10066.64	.055								

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	9926.96	10066.64		100	100	100		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 6.470

INPUT

Description: DIBBLE Sta 122+00

Station Elevation Data num= 31									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9921.66	1385.06	9928.83	1384.81	9930.37	1384.72	9935.94	1383.33	9937.17	1382.99
9940.65	1382	9944.05	1381.15	9962.09	1377.25	9974.72	1374.48	9979.27	1373.93
9988.99	1372.74	9992.18	1372.69	10000	1372.55	10004.72	1372.46	10016.25	1373.12
10025.81	1373.63	10030.23	1375.18	10034.08	1376.48	10040.83	1376.65	10044.49	1376.74
10047.95	1377.43	10049.02	1377.62	10055.43	1377.78	10059.15	1377.84	10060.39	1377.91
10061.64	1378.13	10062.18	1378.21	10064.39	1378.53	10075.75	1380.21	10077.02	1380.25
10101.28	1380.85								

Manning's n Values num= 7									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9921.66	.055	9930.37	.045	9974.72	.04	10025.81	.045	10034.08	.025
10044.49	.045	10075.75	.055						

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	9930.37	10075.75		113.51	99.92	86.41		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 6.451

INPUT

Description: DIBBLE Sta 121+00

Station Elevation Data num= 38									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9915.2	1384.2	9916.19	1384.16	9923.36	1383.98	9929.36	1383.83	9935.26	1382.64
9941.98	1381.28	9944.84	1380.55	9959.24	1376.85	9969.59	1374.18	9970.4	1374.06

9971.34 1373.93 9971.79 1373.86 9980.34 1372.63 9980.4 1372.64 9982.43 1372.61
 9988.4 1372.5 9999.29 1372.24 10000 1372.2710013.34 1372.8510016.62 1373.01
 10018.16 1373.1110024.15 1373.3910030.11 1375.88 10030.8 1376.1810031.12 1376.18
 10041.71 1376.1810041.81 1376.18 10042.4 1376.2910043.07 1376.4310059.57 1379.61
 10060.23 1379.8410061.86 1380.3210062.11 1380.4710062.42 1380.6310062.98 1380.77
 10063.06 1380.7910070.18 1380.7410102.54 1380.44

Manning's n Values num= 7
 Sta n Val
 9915.2 .055 9929.36 .045 9969.59 .0410024.15 .04510031.12 .025
 10041.71 .04510062.98 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9929.3610062.98 106.56 99.92 93.43 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 6.432

INPUT

Description: DIBBLE Sta 120+00
 Station Elevation Data num= 30
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9920.87 1382.07 9924.43 1381.96 9932.68 1381.65 9943.19 1378.46 9957.68 1374.2
 9967.92 1372.89 9977.59 1371.77 9986.24 1371.92 9989.97 1372 9992.39 1372.03
 9995.21 1372.16 10000 1372.4210003.48 1372.610008.39 1373.3310009.76 1373.55
 10014.41 1373.5810018.85 1373.6210021.17 1374.51 10025.1 1376.0410030.85 1376.04
 10031.46 1376.0410044.58 1377.6710046.57 1377.9 10047.3 1378.0510052.27 1379.04
 10055.65 1379.5110055.88 1379.5210056.62 1379.7310056.71 1379.7510078.04 1380.27

Manning's n Values num= 6
 Sta n Val
 9920.87 .055 9932.68 .045 9957.68 .0410009.76 .02510018.85 .045
 10056.71 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9932.6810056.71 103.08 100.01 96.92 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 6.413

INPUT

Description: DIBBLE Sta 119+00
 Station Elevation Data num= 32
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9919.68 1380.37 9923.45 1380.19 9927.71 1380.01 9929.42 1379.95 9951.05 1374.26
 9951.91 1374.02 9953.98 1373.85 9978.17 1371.77 9978.35 1371.77 9982.65 1371.85
 9995.99 1372.09 9997.6 1372.25 9998.82 1372.38 10000 1372.5310007.01 1373.43
 10008.3 1373.5810009.38 1373.5610015.68 1373.43 10017.9 1373.3210023.32 1375.43
 10023.88 1375.6510024.53 1375.6510025.35 1375.6510030.47 1375.6510034.59 1376.14
 10047.89 1377.6910050.06 1378.0810054.78 1379.0610055.98 1379.210056.62 1379.45
 10056.87 1379.6910073.31 1379.82

Manning's n Values num= 7
 Sta n Val
 9919.68 .055 9929.42 .045 9951.91 .04 10008.3 .04510023.88 .025
 10030.47 .04510056.87 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9929.4210056.87 111.6 100 88.35 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 6.394

INPUT

Description: DIBBLE Sta 118+00
 Station Elevation Data num= 30
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9917.38 1380.03 9919.52 1379.93 9928.92 1379.47 9942.16 1375.91 9954 1372.79
 9961.01 1372.34 9970.79 1371.77 9982.97 1371.95 9987.34 1372.01 9994.28 1372.28
 9995.49 1372.34 9998.3 1372.62 9999.98 1372.79 10000 1372.7910005.94 1373.42
 10012.44 1372.9510016.54 1372.6510018.57 1372.5110019.42 1372.8510025.56 1375.3
 10029.48 1375.310032.41 1375.310041.14 1376.4210046.52 1377.1410049.53 1377.76
 10055.77 1379.0410056.07 1379.1510056.66 1379.4210065.44 1379.4910079.09 1379.62

Manning's n Values	num=	7								
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	
9917.38	.055	9928.92	.045	9954	.0410018.57	.04510025.56	.025			
10032.41	.04510056.66	.055								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
9928.92	10056.66	111.6	100	88.35	.1	.3	

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 6.375

INPUT

Description: DIBBLE Sta 117+00
 Station Elevation Data num= 30

Sta	Elev								
9923.5	1379.86	9929.26	1379.75	9936.99	1379.56	9956.14	1372.76	9957.55	1372.25
9966.94	1371.67	9969.45	1371.52	9970.96	1371.53	9983.15	1371.63	9984.47	1371.63
9985.86	1371.64	9986.71	1371.65	9987.45	1371.66	9995.52	1371.81	9997.35	1372.14
10000	1372.58	10002.36	1372.98	10007.04	1372.62	10015.47	1371.91	10019.23	1373.49
10023.41	1375.23	10026.84	1375.23	10029.69	1375.23	10040.65	1376.51	10044.98	1377.04
10054.05	1378.91	10055.8	1379.27	10055.96	1379.31	10056.67	1379.34	10062.02	1379.29

Manning's n Values	num=	7							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9923.5	.055	9936.99	.045	9957.55	.0410015.47	.04510023.41	.025		
10029.69	.04510056.67	.055							

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
9936.99	10056.67	111.6	100	88.35	.1	.3	

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 6.356

INPUT

Description: DIBBLE Sta 116+00
 Station Elevation Data num= 36

Sta	Elev								
9929.81	1379.41	9936.71	1379.3	9943.24	1379.22	9943.93	1378.96	9962.28	1372.19
9968.11	1371.76	9970.61	1371.55	9976.92	1371.66	9980.38	1371.71	9982.09	1371.75
9983.29	1371.75	9986.32	1371.79	10000	1371.78	10014.31	1371.77	10015.54	1371.7
10016.41	1371.66	10021.59	1373.81	10024.4	1374.92	10026.76	1374.92	10028.9	1374.92
10031.36	1374.92	10035.41	1374.92	10043.23	1376.57	10046.87	1377.45	10050.87	1378.45
10052.67	1378.87	10053.67	1379.12	10053.95	1379.19	10054.22	1379.28	10055.72	1379.65
10056.11	1379.61	10056.27	1379.59	10058.66	1379.56	10060.93	1379.58	10064.58	1379.61
10068.49	1379.59								

Manning's n Values	num=	7							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9929.81	.055	9943.24	.045	9970.61	.0410016.41	.04510024.4	.025		
10035.41	.04510055.72	.055							

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
9943.24	10055.72	111.6	100	88.35	.1	.3	

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 6.337

INPUT

Description: DIBBLE Sta 115+00
 Station Elevation Data num= 21

Sta	Elev								
9929.32	1379.47	9938.47	1379.37	9946.05	1379.29	9956.46	1375.4	9965.38	1372.11
9969.25	1371.92	9974.76	1371.64	9981.36	1371.34	9996.89	1371.34	10000	1371.35
10014.33	1371.39	10019.43	1373.51	10023.13	1374.92	10032.59	1374.92	10034.13	1374.92
10038.47	1375.89	10042.42	1376.79	10051	1378.93	10055.58	1379.29	10058.62	1379.88
10067.78	1379.57								

Manning's n Values	num=	7							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9929.32	.055	9946.05	.045	9965.38	.0410014.33	.04510023.13	.025		
10034.13	.04510058.62	.055							

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

9946.0510058.62 111.6 100 88.35 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 6.318

INPUT

Description: DIBBLE Sta 114+00
 Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9926.66	1379.54	9926.94	1379.57	9928.39	1379.57	9947.22	1379.62	9952.97	1377.77
9970.2	1371.99	9982.39	1371.61	9993.84	1371.31	10000	1371.2510001.92	1371.24	
10016.43	1371.0610016.78	1371.2710022.77	1374.3410030.68	1374.3410033.77	1374.34				
10044.34	1376.7610051.46	1378.1210052.98	1378.4410062.42	1378.4910065.33	1378.51				
10068.83	1378.4610073.12	1378.74							

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9926.66	.055	9947.22	.045	9970.2	.041	10016.43	.045	10022.77	.025
10033.77	.045	10052.98	.055						

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9947.2210052.98 111.6 100 88.35 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 6.299

INPUT

Description: DIBBLE Sta 113+00
 Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9925.48	1379.07	9935.79	1379.12	9941.65	1379.16	9944.32	1379.18	9967.43	1372.34
9968.61	1371.99	9969.72	1371.95	9979.96	1371.54	9992.68	1371.06	10000	1371.02
10000.67	1371.0210016.25	1371.0210021.15	1373.0610024.62	1374.5710033.72	1374.57				
10035.62	1374.5710043.65	1376.1910047.15	1376.8110053.98	1378.1310058.84	1377.99				

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9925.48	.055	9944.32	.045	9968.61	.041	10016.25	.045	10024.62	.025
10035.62	.045	10053.98	.055						

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9944.3210053.98 111.6 100 88.35 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 6.281

INPUT

Description: DIBBLE Sta 112+00
 Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9924.61	1378.68	9940.69	1378.62	9944.97	1378.59	9965.07	1372.65	9969.59	1371.29
9970.41	1371.29	9991.13	1371.02	10000	1370.84	10012.1	1370.5910014.26	1370.55	
10015.61	1371.09	10023.8	1374.2410027.54	1374.2410034.79	1374.24	10046	1376.61		
10051.51	1377.7510051.88	1377.8310056.65	1377.58						

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9924.61	.055	9944.97	.045	9969.59	.041	10015.61	.045	10023.8	.025
10034.79	.045	10051.88	.055						

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9944.9710051.88 103.75 100 96.24 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 6.262

INPUT

Description: DIBBLE Sta 111+00
 Station Elevation Data num= 23

Sta	Elev								
-----	------	-----	------	-----	------	-----	------	-----	------

9924.11 1378.41 9933.42 1378.1 9937.31 1378.04 9942.69 1378.2 9943.1 1378.21
 9950.73 1375.53 9961.84 1370.88 9965.83 1370.87 9988.37 1370.82 10000 1371.03
 10005.55 1371.1310014.85 1371.3110018.64 1372.3110022.99 1373.5510031.02 1373.55
 10033.99 1373.5510043.73 1375.7610046.27 1376.4710049.36 1377.1710053.62 1378.22
 10065.73 1377.7610067.53 1377.68 10071.8 1378.02

Manning's n Values num= 7
 Sta n Val
 9924.11 .055 9943.1 .045 9961.84 .0410014.85 .04510022.99 .025
 10033.99 .04510053.62 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9943.110053.62 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 6.243

INPUT
 Description: DIBBLE Sta 110+00
 Station Elevation Data num= 26
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9926.48 1377.46 9940.69 1377.37 9948.4 1374.35 9959.1 1370.68 9961.92 1370.62
 9965.61 1370.82 9978.38 1370.62 9985.39 1370.49 9987.17 1370.5 9994.11 1370.76
 10000 1370.9610007.86 1371.2210014.64 1370.9410015.28 1371.1310018.21 1372.1
 10022.78 1373.5310031.88 1373.5310033.79 1373.52 10040.4 1374.9410043.12 1375.62
 10048.09 1376.7510052.86 1377.9510053.32 1378.110053.69 1378.1510054.18 1378.21
 10062.14 1378.22

Manning's n Values num= 5
 Sta n Val
 9926.48 .055 9959.1 .0410014.64 .05510022.78 .02510033.79 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9940.6910054.18 2.54 2.54 2.54 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 6.242

INPUT
 Description: DIBBLE Sta 109+97
 Station Elevation Data num= 28
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9926.83 1377.46 9940.68 1377.37 9956.08 1371.33 9956.8 1371.08 9960.53 1371
 9964.52 1370.55 9966.02 1370.81 9967.39 1370.81 9999.59 1371.18 10000 1371.19
 10006.55 1371.2410006.71 1371.2510007.02 1371.2610007.29 1371.2510017.17 1371.78
 10017.31 1371.8310022.77 1373.5410031.51 1373.5410033.78 1373.5410041.68 1375.23
 10044.95 1376.0510050.89 1377.3910053.02 1377.9310053.67 1378.1510053.87 1378.17
 10054.13 1378.210058.34 1378.2110088.11 1378.19

Manning's n Values num= 5
 Sta n Val
 9926.83 .055 9956.08 .410007.29 .05510022.77 .02510033.78 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9940.6810054.13 2 2 2 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 6.241

INPUT
 Description: DIBBLE Sta 109+95
 Station Elevation Data num= 28
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9925.66 1377.46 9933.82 1377.41 9940.68 1377.37 9948.95 1374.12 9957.29 1370.82
 9960.41 1369.86 9960.55 1369.87 9964.67 1370.58 9976.2 1370.62 10000 1370.89
 10007.63 1370.9810010.34 1369.8710010.57 1369.9510016.25 1371.56 10016.9 1371.71
 10017.46 1371.8810022.77 1373.5410031.21 1373.5410033.77 1373.5410042.69 1375.46
 10046.38 1376.3810053.09 1377.910053.13 1377.9110053.95 1378.18 10054 1378.19
 10054.08 1378.210055.34 1378.210087.01 1378.19

Manning's n Values num= 5
 Sta n Val
 9925.66 .055 9957.29 .0410007.63 .05510022.77 .02510033.77 .055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
9940.6810054.08		95.46	95.46	95.46	.1		.3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 6.224

INPUT

Description: DIBBLE Sta 109+00
 Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9919.28	1377.59	9928.69	1377.56	9937.9	1377.49	9952.76	1371.77	9959.9	1369.26
9966.77	1369.31	9985.44	1369.48	10000	1369.9	10002.2	1369.9710008.75		1370.2
10014.87	1372.0310021.14	1373.7910024.81	1373.7910032.14	1373.7910046.68					1376.3
10048.69	1376.6910050.46	1377.1210054.32	1377.8810055.22	1378.07	10056.3				1378.38
10058.01	1378.3810063.98	1378.34							

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9919.28	.055	9959.9	.0410008.75	10021.14	.02510032.14		.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
9937.9	10056.3	100	100	100	.1		.3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 6.205

INPUT

Description: DIBBLE Sta 108+00
 Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9894.52	1379.72	9906.92	1379.57	9909.21	1379.62	9910.4	1379.52	9911.7	1379.5
9913.5	1379.3	9915.05	1379.14	9919.45	1377.81	9923.26	1376.71	9924.12	1376.46
9926.27	1375.99	9937.61	1375.17	9945.51	1375.56	9947.09	1375.48	9950.71	1373.52
9957.52	1372.1	9971.37	1368.95	9987.17	1369.14	9991.51	1369.19	9996.07	1369.34
10000	1369.4610012.17	1369.8210016.38	1370.7110028.01	1373.110035.98					1373.09
10039.13	1373.0810052.34	1375.21	10059.9	1376.4510061.73	1376.7710064.48	1377.24			
10067.65	1377.8210075.03	1378.310075.48	1378.34	10075.9	1378.2710081.94	1377.41			

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9894.52	.055	9911.7	.0410012.17	10028.01	.02510039.13		.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
9911.710075.48		100.26	100	99.74	.1		.3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 6.186

INPUT

Description: DIBBLE Sta 107+00
 Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9887.54	1379	9888.13	1379	9898.58	1379.01	9899.49	1378.95	9899.65	1378.95
9899.85	1378.93	9900.18	1378.9	9900.6	1378.86	9901.39	1378.82	9903.47	1378.61
9908.18	1378.26	9916.98	1376.28	9920.27	1375.52	9927.22	1373.72	9933.04	1372.29
9937.58	1371.63	9941.81	1370.9	9945.16	1371.32	9947.9	1371.65	9961	1370.21
9961.5	1370.16	9965.33	1370.29	9979.57	1370.78	9981.25	1370.55	9993.12	1369.03
10000	1369.0210002.87	1369.0210007.29	1369.0110014.18	1369.1110021.22					1369.23
10024.64	1370.2310029.82	1371.6710037.07	1372.0210044.42	1372.3210056.01					1374.18
10057.53	1374.4410057.82	1374.5210058.18	1374.5210069.46	1374.6810071.94					1375.04
10073.07	1375.2910077.11	1376.0210077.36	1376.0210077.53	1376.0310079.42					1376.43
10080.69	1376.8310085.93	1377.5410087.32	1377.6310089.13	1377.4610094.84					1376.45

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9887.54	.055	9941.81	.0410021.22	10044.42	.05510058.18		.025
10069.46	.055						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
9898.5810087.32		100	100	100	.1		.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 6.167

INPUT

Description: DIBBLE Sta 106+00

Station Elevation Data		num=		39							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9886.85	1377.96	9889.79	1377.96	9895.24	1377.61	9896.27	1377.56	9897.38	1377.53		
9899.04	1377.22	9899.32	1377.21	9904.01	1376.12	9910.38	1374.62	9918.92	1372.67		
9922.02	1371.95	9924.17	1371.6	9931.18	1370.45	9935.3	1370.92	9942.57	1371.77		
9961.3	1370.64	9964.65	1370.44	9967.54	1370.42	9977.5	1370.37	9988.67	1370.3		
9989.77	1370.1	9996.91	1368.84	10000	1368.77	10000.64	1368.75	10009.72	1368.53		
10019.07	1369.01	10021.15	1369.12	10025.21	1369.98	10032.06	1371.39	10044.92	1371.76		
10048.55	1371.86	10064.09	1371.91	10071.23	1371.92	10075.4	1372.95	10084.58	1375.32		
10086.29	1375.71	10093.29	1377.15	10095.65	1377.15	10104.88	1377.16				

Manning's n Values		num=		7							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9886.85	.055	9931.18	.045	9942.57	.041	10032.06	.045	10071.23	.055		
10095.65	.025	10104.88	.055								

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9897.38	10093.29		100	100		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 6.148

INPUT

Description: DIBBLE Sta 105+00

Station Elevation Data		num=		37							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9883.85	1377.36	9886	1377.19	9887.94	1377.09	9892.65	1376.81	9898.38	1375.62		
9904.11	1374.43	9911.82	1373.11	9919.28	1371.84	9921.75	1371.52	9924.01	1371.24		
9931.04	1370.53	9932.02	1370.44	9934.39	1370.58	9946.67	1371.3	9952.31	1371.06		
9965.61	1370.47	9978.15	1369.83	9986.57	1369.45	9988.39	1369.05	9989.29	1368.84		
9996.58	1368.72	10000	1368.66	10004.38	1368.58	10019.97	1369.03	10020.6	1369.05		
10020.92	1369.14	10028.28	1371.33	10032.27	1371.38	10056.74	1371.72	10074.71	1371.79		
10079.02	1371.81	10086.27	1372.98	10092.39	1373.94	10100.18	1375.18	10102.62	1375.59		
10110.53	1376.81	10117.33	1376.8								

Manning's n Values		num=		6							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9883.85	.055	9932.02	.045	9946.67	.041	10028.28	.045	10079.02	.055		
10110.53	.025										

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9892.65	10110.53		100	100		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 6.129

INPUT

Description: DIBBLE Sta 104+00

Station Elevation Data		num=		42							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9885.09	1376.96	9893.49	1376.58	9894.15	1376.54	9895.55	1376.24	9904.57	1374.29		
9907.71	1373.67	9917.9	1371.65	9931.49	1371.47	9944.81	1371.32	9944.97	1371.32		
9945.06	1371.32	9952.21	1370.66	9954.28	1370.32	9956.68	1370.19	9957.52	1370.26		
9960.05	1370.15	9968.45	1370.19	9969.51	1370.11	9970.3	1370	9974.96	1369.38		
9979.62	1368.77	9998.97	1368.28	10000	1368.26	10002.1	1368.21	10004.88	1368.29		
10009.64	1368.44	10016.14	1368.61	10025.97	1370.52	10027.78	1370.85	10027.84	1370.86		
10028.58	1371.08	10029.23	1371.09	10057.01	1371.39	10059.38	1371.43	10070.7	1371.54		
10082.17	1371.66	10088.51	1372.72	10096.13	1373.97	10101.24	1374.83	10102.02	1374.94		
10110.26	1376.44	10118.07	1376.44								

Manning's n Values		num=		5							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9885.09	.055	9894.15	.045	9945.06	.041	10028.58	.045	10110.26	.025		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9894.15	10110.26		99.21	100	100.79	.1	.3

CROSS SECTION

RIVER: Queen Creek Wash

REACH: Reach 1 RS: 6.110

INPUT

Description: DIBBLE Sta 103+00

Station Elevation Data num= 36											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9882.23	1376.83	9890.01	1376.4	9891	1376.33	9895.62	1375.56	9904.83	1374.01		
9916.27	1372.06	9920.07	1371.41	9933.14	1371.26	9955.77	1371.01	9965.84	1370.04		
9970.43	1369.59	9977.67	1369.37	9980.06	1369.29	9981.78	1369.14	9982.65	1369.05		
9990.68	1368.28	9999.84	1368.21	10000	1368.2110001.58	1368.1910002.83	1368.19				
10004.61	1368.1810005.68	1368.1610007.78	1368.210009.66	1368.2510018.14	1368.44						
10023.19	1369.410031.78	1371.0910036.79	1371.1210054.53	1371.3210073.69	1371.22						
10081.24	1371.1910085.58	1371.910100.89	1374.4110106.71	1375.5710109.38	1376.06						
10118.21	1376.06										

Manning's n Values num= 5											
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9882.23	.055	9890.01	.045	9955.77	.0410031.78	.04510109.38	.025				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9890.01	10109.38		91.91	100	108.06	.1	.3

CROSS SECTION

RIVER: Queen Creek Wash

REACH: Reach 1 RS: 6.091

INPUT

Description: DIBBLE Sta 102+00

Station Elevation Data num= 36											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9878.75	1376.43	9887.4	1376.08	9889.44	1375.99	9903.52	1373.62	9904.98	1373.37		
9905.76	1373.24	9919.05	1371.06	9924.82	1371.03	9955.32	1370.85	9961.79	1369.85		
9964.86	1369.38	9967.35	1369.36	9977.77	1369.27	9981	1368.46	9982.91	1367.99		
9996.04	1368.1	10000	1368.14	10000.7	1368.1510002.43	1368.1610003.81	1368.18				
10006.11	1368.210021.42	1368.3310037.85	1370.9110039.36	1371.1510046.72	1371.1						
10053.32	1371.0410061.49	1370.94	10067.8	1370.8810079.53	1370.7510089.84	1372.35					
10095.18	1373.1710101.29	1374.1810103.02	1374.5310109.44	1375.99	10112.5	1375.99					
10120.46	1375.99										

Manning's n Values num= 6											
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9878.75	.055	9889.44	.045	9955.32	.0410039.36	.04510109.44	.025				
10120.46	.055										

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9889.44	10109.44		100	100	100	.1	.3

CROSS SECTION

RIVER: Queen Creek Wash

REACH: Reach 1 RS: 6.072

INPUT

Description: DIBBLE Sta 101+00

Station Elevation Data num= 35											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9870.31	1376.21	9875.84	1376.21	9881.31	1376.21	9886.49	1375.84	9888.83	1375.7		
9896.08	1374.49	9904.38	1373.02	9914.4	1371.64	9920.15	1370.86	9936.24	1370.56		
9958.83	1370.14	9963.7	1369.73	9967.72	1369.38	9973.34	1369.21	9979.42	1369.08		
9983.96	1368.33	9985.68	1368.04	9985.92	1367.99	9994.98	1367.85	10000	1367.76		
10001.86	1367.7210008.67	1367.9110013.78	1368.0510024.27	1369.3310035.01	1370.67						
10043.57	1370.610054.61	1370.5610062.71	1370.5210069.86	1370.5610079.28	1370.64						
10088.34	1372.1310100.16	1373.9810106.52	1375.0410108.78	1375.5410117.01	1375.55						

Manning's n Values num= 5											
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9870.31	.055	9881.31	.045	9958.83	.0410035.01	.04510108.78	.025				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9881.31	10108.78		100	100	100	.1	.3

CROSS SECTION

RIVER: Queen Creek Wash

REACH: Reach 1 RS: 6.053

INPUT

Description: DIBBLE Sta 100+00

Station Elevation Data num= 31											
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Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9881.42	1376.2	9886.2	1375.95	9890.89	1375.68	9891.43	1375.57	9903.42	1373.02
9917.52	1371.09	9921.4	1370.54	9929.34	1370.43	9959.07	1370.02	9960.35	1369.72
9962.18	1369.32	9966.27	1368.76	9966.51	1368.72	9967.49	1368.57	9973.07	1367.71
9978.54	1367.7	9991.67	1367.66	10000	1367.7110001.94	1367.7210011.52	1367.81		
10022.16	1369.0410032.09	1370.1610037.29	1370.2210052.99	1370.3210075.88	1370.18				
10080.06	1370.1410094.31	1372.53	10099.7	1373.410100.42	1373.5510108.69	1375.08			
10119.68	1375.23								

Manning's n Values		num= 6							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9881.42	.055	9890.89	.045	9959.07	.0410032.09	.04510108.69	.025		
10119.68	.045								

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9890.8910108.69		100	100	100		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 6.034

INPUT

Description: DIBBLE Sta 99+00

Station Elevation Data		num= 36							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9882.44	1375.72	9886.33	1375.47	9888.32	1375.3	9891.91	1375.05	9898.04	1373.93
9904.05	1372.87	9917.49	1371.01	9921.61	1370.36	9933.3	1370.26	9961.07	1369.83
9962.57	1369.59	9964.46	1369.24	9968.11	1368.15	9969.63	1367.66	9980.58	1367.62
9988.49	1367.6	9991.11	1367.59	9993.96	1367.61	9998.7	1367.65	10000	1367.66
10007.16	1367.7110007.45	1367.7110025.93	1369.29	10030.1	1369.6410031.59	1369.78			
10032.66	1369.7810042.17	1369.810052.11	1369.810070.27	1369.8	10078.9	1369.81			
10091.46	1371.9910095.79	1372.7310099.66	1373.4210100.33	1373.5110108.84	1374.98				
10114.72	1374.98								

Manning's n Values		num= 6							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9882.44	.055	9891.91	.045	9961.07	.0410031.59	.045	10078.9	.055	
10108.84	.025								

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9891.9110108.84		100	100	100		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 6.015

INPUT

Description: DIBBLE Sta 98+00

Station Elevation Data		num= 38							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9880.51	1375.63	9882.13	1375.54	9884.53	1375.4	9891.52	1375.01	9898.9	1373.27
9902.44	1372.45	9907.12	1371.69	9918.31	1369.87	9940.59	1369.59	9954.5	1369.43
9967.63	1368.75	9972.42	1368.51	9977.99	1367.68	9978.11	1367.66	9979.26	1367.64
9994.44	1367.38	9995.42	1367.36	9997.19	1367.34	9999.33	1367.35	10000	1367.35
10001.87	1367.3710019.34	1367.5110026.82	1368.7610031.93	1369.5810038.78	1369.61				
10044.51	1369.6410052.17	1369.6810060.55	1369.61	10066.5	1369.5610079.41	1369.51			
10094.79	1372.46	10098	1373.0710099.26	1373.310103.72	1373.9710108.91	1374.75			
10108.95	1374.7610109.28	1374.810120.06	1374.8						

Manning's n Values		num= 7							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9880.51	.055	9891.52	.045	9954.5	.0410031.93	.04510079.41	.055		
10109.28	.02510120.06	.055							

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9891.5210109.28		86.75	100	113.17		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.996

INPUT

Description: DIBBLE Sta 97+00

Station Elevation Data		num= 34							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9880.61	1375.61	9881.13	1375.61	9884.61	1375.31	9892.34	1374.63	9898.31	1373.48

9903.39 1372.37 9909.96 1371.34 9915.15 1370.55 9919.29 1369.86 9951.98 1369.12
 9952.86 1369.1 9953.12 1369.07 9961.69 1367.91 9966.76 1368.07 9970.99 1368.26
 9972.68 1368.01 9977.59 1367.21 9988.9 1367.17 9995.68 1367.16 10000 1367.19
 10012.54 1367.2910018.88 1367.33 10024.4 1368.0610034.49 1369.3810037.23 1369.41
 10052.12 1369.4410074.93 1369.0810077.78 1369.0310083.12 1369.9810099.16 1372.77
 10103.31 1373.27 10109.3 1374.1310116.66 1374.13 10120.3 1374.13

Manning's n Values num= 7
 Sta n Val
 9880.61 .055 9892.34 .045 9952.86 .0410034.49 .04510077.78 .055
 10109.3 .025 10120.3 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9892.34 10109.3 87.22 100 112.7 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.977

INPUT

Description: DIBBLE Sta 96+00
 Station Elevation Data num= 41
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9875.96 1374.93 9889.4 1374.69 9895.6 1373.46 9905.67 1371.59 9911.17 1371.41
 9918.38 1371.13 9925.06 1370.85 9929.8 1370.12 9930.35 1370.14 9930.72 1370.09
 9938.26 1368.73 9951.19 1368.77 9962.45 1368.82 9964.11 1368.4 9968.6 1367.28
 9976.01 1367.18 9983.89 1367.07 9988.55 1367.88 9991.34 1368.35 10000 1368.36
 10002.81 1368.3610010.08 1368.3710014.51 1367.9210023.46 1367.1310026.94 1367.65
 10030.55 1368.0910037.06 1367.2210037.37 1367.1910040.25 1367.1710044.62 1367.14
 10045.3 1367.24 10048.1 1367.6610055.71 1368.8210068.34 1368.6110077.94 1368.47
 10091.26 1370.7410100.27 1372.2910103.05 1372.8710107.25 1373.7210108.41 1373.73
 10118.4 1373.75

Manning's n Values num= 9
 Sta n Val
 9875.96 .055 9889.4 .045 9911.17 .025 9925.06 .045 9962.45 .04
 10055.71 .04510077.94 .05510108.41 .025 10118.4 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9889.410107.25 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.959

INPUT

Description: DIBBLE Sta 95+00
 Station Elevation Data num= 52
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9880.38 1374.07 9883.88 1374.01 9891.35 1373.73 9902.53 1371.9 9906.43 1371.24
 9912.16 1370.58 9934.1 1368.62 9936.59 1368.55 9951.12 1367.97 9951.47 1367.93
 9958.66 1366.93 9962.46 1366.94 9979.06 1367.03 9982.58 1367.05 9983.18 1367.05
 9983.21 1367.05 9987.62 1367.57 9988.41 1367.63 9993.19 1367.62 9993.74 1367.64
 9996.33 1367.43 10000 1367 10002.5 1366.7210002.89 1366.7610006.71 1366.95
 10012.1 1366.9510024.12 1366.9310024.23 1366.9310024.34 1366.9310024.53 1366.93
 10030.45 1366.6610036.65 1366.8310044.26 1366.9510044.84 1367.0110045.81 1367.04
 10055.72 1367.5610058.38 1367.5410062.96 1367.4710064.33 1367.4510064.88 1367.6
 10074.71 1369.9810081.65 1370.8510081.67 1370.8510081.95 1370.85 10092.1 1370.93
 10093.15 1370.9410099.09 1371.1710099.48 1371.210104.04 1371.7210116.16 1373.25
 10122.44 1373.1910126.42 1373.15

Manning's n Values num= 9
 Sta n Val
 9880.38 .055 9891.35 .045 9951.12 .0410006.71 .02510024.53 .04
 10044.26 .04510064.33 .05510081.95 .025 10092.1 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9891.3510116.16 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.940

INPUT

Description: DIBBLE Sta 94+00
 Station Elevation Data num= 47
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

9879.14	1373.89	9886.28	1373.53	9887.69	1373.48	9889.97	1373.41	9893.09	1373.28
9900.9	1371.86	9905.9	1370.94	9912.3	1370.11	9924.65	1368.51	9929.21	1368.32
9938.02	1367.94	9948.44	1367.14	9953.04	1366.77	9963.2	1366.64	9966.07	1366.61
9966.9	1366.73	9969.58	1367.12	9973.25	1367.02	9979.93	1366.81	9982.03	1367.01
9985.22	1366.97	9988.31	1366.77	10000	1366.8210004.81	1366.84	10010.3	1366.87	10018.67
10018.67	1366.9110027.09	1367.9310029.92	1368.3110032.64	1368.1410040.39	1367.71	10056.36	1368.3610064.81	1368.6610066.23	1368.8610066.98
10056.36	1368.3610064.81	1368.6610066.23	1368.8610066.98	1369.0110076.08	1369.01	10077.99	1369.0110078.79	1368.98	10082.2
10077.99	1369.0110078.79	1368.98	10082.2	1368.92	10096.5	1371.2610108.01	1373.18	10109.91	1373.0910123.29
10109.91	1373.0910123.29	1372.4810124.03	1372.2210124.58	1372.0710125.02	1372.22	10126.09	1372.4910129.97	1373.09	

Manning's n Values		num= 7							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9879.14	.055	9893.09	.045	9938.02	.041	10029.92	.045	10066.98	.025
10077.99	.045	10082.2	.055						

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	9893.09	10108.01		97.06	100	102.94		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.921

INPUT
Description: DIBBLE Sta 93+00
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9876.97	1373.13	9886.7	1373.31	9893.66	1372.94	9900.42	1371.53	9902.06	1371.16
9914.21	1369.46	9922.71	1368.28	9931.12	1368.08	9932.69	1368.04	9936.02	1367.64
9944.17	1366.63	9947.87	1366.78	9960.65	1367.05	9961.06	1367.02	9968.21	1366.53
9974.43	1366.43	9980.25	1366.34	9983.75	1366.41	10000	1366.8410002.15	1366.9	10002.78
10002.78	1366.9310006.05	1367.0310010.45	1367.1710015.11	1367.3210020.79	1367.56	10026.42	1367.8110031.19	1367.7510035.32	1367.6910052.86
10026.42	1367.8110031.19	1367.7510035.32	1367.6910052.86	1368.1810063.27	1368.47	10064.2	1368.610068.55	1369.0710072.07	1369.0710079.55
10064.2	1368.610068.55	1369.0710072.07	1369.0710079.55	1369.0710082.74	1369.02	10084.99	1368.9610099.85	1371.3810108.29	1372.74
10084.99	1368.9610099.85	1371.3810108.29	1372.74	10114.2	1372.210121.52	1371.81	10122.54	1371.4610122.97	1371.26
10122.54	1371.4610122.97	1371.26	10123.4	1371.4610124.32	1371.81				

Manning's n Values		num= 7							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9876.97	.055	9893.66	.045	9932.69	.041	10026.42	.045	10068.55	.025
10079.55	.045	10084.99	.055						

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	9893.66	10108.29		100	100	100		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.902

INPUT
Description: DIBBLE Sta 92+00
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9887.12	1372.6	9891.65	1372.68	9902.61	1370.87	9902.73	1370.85	9902.99	1370.82
9927.51	1368.42	9927.84	1368.4	9944.64	1367.27	9954.93	1366.57	9955.2	1366.55
9955.71	1366.52	9955.88	1366.52	9956.03	1366.51	9974.93	1366.13	9977.42	1366.02
9977.79	1366.01	9982.63	1365.93	9996.52	1366.05	9998.21	1366.06	10000	1366.06
10002.59	1366.0610005.43	1366.0810005.78	1366.0810007.71	1366.1110016.19	1366.64	10020.45	1367.0910027.49	1367.6410032.87	1367.9910041.56
10020.45	1367.0910027.49	1367.6410032.87	1367.9910041.56	1368.1210042.81	1368.12	10047.32	1368.26	10049.7	1368.3210061.43
10047.32	1368.26	10049.7	1368.3210061.43	1368.5410066.38	1368.63	10071.85	1368.7410073.36	1368.7410082.86	1368.7410084.35
10071.85	1368.7410073.36	1368.7410082.86	1368.7410084.35	1368.7510087.24	1368.75	10103.31	1371.310110.49	1372.4510114.67	1372.2210125.93
10103.31	1371.310110.49	1372.4510114.67	1372.2210125.93	1371.510126.88	1371.12	10127.23	1370.9810127.72	1371.1210128.72	1371.510133.94
10127.23	1370.9810127.72	1371.1210128.72	1371.510133.94	1372.38					

Manning's n Values		num= 6							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9887.12	.055	9891.65	.045	9956.03	.041	10032.87	.045	10073.36	.025
10082.86	.045								

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	9891.65	10110.49		100	100	100		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.883

INPUT
Description: DIBBLE Sta 91+00

Station Elevation Data num= 43									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9860.47	1372.41	9885.78	1372.14	9891.35	1370.97	9897.02	1369.77	9905.46	1368.75
9913.83	1367.73	9922.65	1367.7	9934.21	1367.61	9954.28	1367.05	9954.44	1367.05
9954.63	1367.05	9984.51	1366.76	9987.86	1366.3	9991.67	1365.73	10000	1365.86
10004.35	1365.9310011.98	1366.0210017.21	1366.1310021.96	1366.1410030.22	1366.09				
10043.08	1366.1710044.55	1366.1810052.53	1367.1510055.66	1367.5910058.18	1367.68				
10075.69	1368.2210082.99	1368.22	10086.7	1368.2210092.34	1368.1810093.19	1368.18			
10095.7	1368.5910116.67	1372.0710124.09	1371.7610127.36	1371.6310128.76	1371.56				
10131.97	1371.3910132.56	1371.2210133.24	1370.9510134.16	1371.2210134.77	1371.39				
10136.54	1371.6410136.96	1371.7510138.05	1371.91						

Manning's n Values num= 6									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9860.47	.055	9885.78	.045	9913.83	.041	10055.66	.045	10075.69	.025
10086.7	.045								

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9885.78	10116.67		100	100		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.864

INPUT

Description: DIBBLE Sta 90+00

Station Elevation Data num= 39									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9850	1372.14	9882.92	1371.84	9885.17	1371.4	9894.85	1369.46	9902.02	1368.53
9909.15	1367.57	9923.21	1367.55	9934.47	1367.54	9940.84	1367.41	9949.22	1367.26
9971.12	1366.88	9976.27	1366.79	9984.88	1366.02	9987.19	1365.8	10000	1365.98
10010.12	1366.1110015.33	1366.210017.14	1366.2810026.31	1366.5910032.45	1366.4				
10042.67	1366.1110047.49	1366.0710050.51	1366.0710054.16	1366.0110063.81	1366.5				
10070.62	1367.0510075.27	1367.4810078.27	1367.84	10080.3	1367.8410089.28	1367.84			
10090.65	1367.9110094.13	1367.9210120.73	1371.9610121.16	1372.03	10126.7	1371.76			
10137.54	1371.17	10138.1	1371.0110138.98	1370.810139.77	1371.01				

Manning's n Values num= 6									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9850	.055	9882.92	.045	9934.47	.041	10026.31	.045	10078.27	.025
10089.28	.045								

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9882.92	10121.16		107.18	100	92.8	.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.845

INPUT

Description: DIBBLE Sta 89+00

Station Elevation Data num= 47									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9868.22	1371.64	9883.26	1371.6	9886.98	1370.88	9894.74	1369.38	9904.51	1367.84
9908.59	1367.19	9925.16	1367.29	9943.23	1367.41	9952.69	1367.25	9968.92	1367
9972.29	1366.24	9974.65	1365.7	9988.75	1366.07	10000	1366.2310000.61	1366.23	
10001.16	1366.2510001.41	1366.2510001.46	1366.2310001.82	1366.1710001.92	1366.14				
10002.76	1366.17	10008.8	1366.2710023.85	1366.8810028.44	1366.7310049.69	1366.01			
10049.83	1366.0110055.64	1366.0110064.13	1366.1610068.81	1366.2410070.32	1366.27				
10077.2	1366.8310079.08	1366.9810079.58	1367.0210090.34	1367.0210090.58	1367.02				
10090.7	1367.0210092.08	1367.0110094.79	1366.97	10096.7	1367.3110119.65	1371.5			
10125.67	1371.3110140.65	1370.9610141.86	1370.6710142.11	1370.6110142.35	1370.67				
10143.45	1370.9610147.24	1371.81							

Manning's n Values num= 6									
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9868.22	.055	9883.26	.045	9943.23	.041	10023.85	.045	10079.58	.025
10090.34	.045								

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9883.26	10119.65		107.49	100	92.49	.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.826

INPUT

Description: DIBBLE Sta 88+00

Station Elevation Data		num= 48		Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9850	1371.23	9884.27	1371.16	9891.77	1369.62	9893.85	1369.19	9908.02	1367.33		
9909.62	1367.12	9915.93	1367.12	9945.05	1367.12	9954.13	1367.02	9975.86	1366.79		
9980.72	1365.89	9983.77	1365.4	9990.96	1365.42	10000	1365.43	10010.02	1365.45		
10016.96	1365.84	10025.99	1366.41	10038.21	1366.12	10049.36	1365.87	10056.34	1365.67		
10058.49	1365.62	10060.31	1365.57	10061.25	1365.63	10062.18	1365.69	10067.43	1365.99		
10068.38	1366.02	10074.83	1366.39	10080.09	1366.39	10085.87	1366.41	10090.15	1366.54		
10092.61	1366.62	10092.84	1366.59	10102.69	1366.61	10104.94	1367.11	10105.55	1369.37		
10112.15	1370.31	10119.95	1371.11	10138.29	1370.75	10138.7	1370.74	10138.9	1370.74		
10139.19	1370.73	10139.21	1370.73	10140.6	1370.39	10141.97	1370.73	10141.99	1370.73		
10142.07	1370.75	10142.12	1370.76	10142.71	1370.9						

Manning's n Values		num= 6		Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9850	.055	9884.27	.045	9975.86	.041	10025.99	.045	10068.38	.025		
10080.09	.045										

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9884.27	10119.95	107.49	100	92.49	.1	.3	

CROSS SECTION

RIVER: Queen Creek Wash

REACH: Reach 1 RS: 5.807

INPUT

Description: DIBBLE Sta 87+00

Station Elevation Data		num= 39		Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9868.95	1370.91	9882.8	1370.89	9888.82	1370.05	9893.69	1369.34	9900.29	1368.27		
9909.17	1366.88	9926.81	1366.85	9935.61	1366.81	9941.4	1366.75	9962.71	1366.41		
9964.42	1366.3	9982.08	1365.14	9983.71	1365.15	10000	1365.27	10004.36	1365.3		
10005.3	1365.34	10022.22	1366.03	10025.28	1365.96	10033.73	1365.79	10041.51	1365.85		
10052.61	1365.92	10055.06	1365.96	10060.07	1366.02	10066.73	1366.15	10071.38	1366.14		
10072.4	1366.13	10072.42	1366.13	10074.5	1366.12	10086.92	1366.42	10090.75	1366.55		
10113.76	1370.33	10119.35	1371.21	10123.47	1370.97	10133.09	1370.65	10133.6	1370.53		
10134.47	1370.21	10135.41	1370.53	10135.91	1370.65	10138.98	1371.12				

Manning's n Values		num= 6		Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9868.95	.055	9882.8	.045	9962.71	.041	10022.22	.045	10055.06	.025		
10066.73	.045										

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9882.81	10119.35	100.11	100	99.89	.1	.3	

CROSS SECTION

RIVER: Queen Creek Wash

REACH: Reach 1 RS: 5.788

INPUT

Description: DIBBLE Sta 86+00

Station Elevation Data		num= 43		Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9864.86	1370.94	9882.68	1370.96	9894.34	1369.29	9895.98	1369.05	9897.82	1368.8		
9898.61	1368.7	9909.73	1367.2	9916.53	1366.27	9919.19	1366.37	9925.42	1366.47		
9928.25	1366.18	9930.74	1365.92	9937.51	1366.12	9944.28	1366.32	9953.4	1366.29		
9962.97	1366.25	9964.51	1365.96	9970.89	1364.7	9984.92	1364.94	10000	1365.17		
10002.11	1365.21	10014.14	1366.12	10014.55	1366.15	10017.09	1366.05	10032.77	1365.4		
10036.02	1365.47	10049.78	1365.74	10051.38	1365.83	10057.82	1366.17	10062.25	1366.17		
10069.05	1366.17	10083.67	1365.97	10084.62	1365.96	10086.7	1366.26	10113.6	1370.29		
10115.23	1370.14	10123.97	1370.46	10125.03	1370.12	10125.3	1370.02	10125.58	1370.12		
10126.78	1370.47	10136.01	1371.02	10136.1	1371.03						

Manning's n Values		num= 6		Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9864.86	.055	9882.68	.045	9962.97	.041	10014.55	.045	10057.82	.025		
10069.05	.045										

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9882.68	10113.6	100	100	100	.1	.3	

CROSS SECTION

RIVER: Queen Creek Wash

REACH: Reach 1 RS: 5.769

INPUT

Description: DIBBLE Sta 85+00

Station Elevation Data		num= 42		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9878.64	1370.96	9895.46	1371.23	9904.9	1369.69	9907.75	1369.24	9914.69	1368.22		
9935.16	1365.26	9943.63	1365.86	9945.8	1366.06	9951.27	1366.06	9959.7	1366.06		
9971.08	1366.07	9976.46	1365.48	9979.65	1365.12	9985.16	1364.48	10000	1364.52		
10004.59	1364.53	10010.03	1364.55	10012.06	1364.68	10023.77	1365.36	10043.36	1365.04		
10045.74	1365.10	10048.32	1365.01	10054.54	1365.03	10066.59	1365.07	10066.95	1365.11		
10072.34	1365.74	10078.56	1365.74	10083.37	1365.74	10086.89	1365.94	10089.74	1366.13		
10103.78	1368.45	10112.13	1369.75	10112.91	1369.83	10114.36	1370.10	10118.47	1370.3		
10119.52	1369.93	10119.91	1369.78	10120.34	1369.91	10121.27	1370.26	10126.76	1371.03		
10130.31	1371.38	10150	1371.66								

Manning's n Values		num= 6		Sta		n Val		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9878.64	.055	9935.16	.045	9971.08	.041	10023.77	.045	10072.34	.025		
10083.37	.045										

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	9895.46	10130.31		100	100	100		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.750

INPUT

Description: DIBBLE Sta 84+00

Station Elevation Data		num= 34		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9876.18	1371.25	9907.09	1371.9	9907.81	1371.91	9909.17	1371.74	9926.63	1369.64		
9948.22	1366.08	9954.32	1365.07	9957.56	1365.31	9964.37	1365.73	9964.86	1365.73		
9970.14	1365.85	9972.03	1365.68	9984.44	1364.48	9993.6	1364.45	10000	1364.43		
10004.7	1364.41	10018.99	1365.51	10020.74	1365.63	10022.33	1365.56	10043.45	1364.69		
10061.31	1364.97	10066.34	1365.04	10071.25	1365.31	10073.04	1365.41	10082.82	1365.4		
10084.05	1365.41	10085.43	1365.53	10090.35	1365.89	10099.57	1367.61	10111.54	1369.88		
10119.05	1370.61	10120.64	1370.77	10126.66	1370.79	10149.99	1370.95				

Manning's n Values		num= 6		Sta		n Val		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9876.18	.055	9954.32	.045	9970.14	.041	10020.74	.045	10073.04	.025		
10084.05	.045										

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	9907.81	10120.64		100	100	100		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.731

INPUT

Description: DIBBLE Sta 83+00

Station Elevation Data		num= 37		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9908.91	1371.36	9922.96	1371.59	9940.87	1369.66	9941.41	1369.6	9942.76	1369.38		
9967.07	1365.41	9972.96	1364.44	9976.22	1364.43	9977.13	1364.41	9982.22	1364.28		
9983.69	1364.24	10000	1364.28	10003.29	1364.29	10004.47	1364.29	10005.22	1364.33		
10026.96	1365.63	10040.99	1364.85	10045.36	1364.61	10051.34	1364.64	10070.04	1364.84		
10071.01	1364.94	10075.21	1365.17	10082	1365.18	10086.22	1365.18	10087.25	1365.18		
10087.67	1365.14	10091.46	1365.83	10097.24	1366.66	10108.15	1368.65	10108.41	1368.7		
10109.08	1368.81	10116.32	1369.96	10120.69	1370.53	10124.66	1370.94	10132.94	1370.95		
10138.78	1370.95	10150	1370.98								

Manning's n Values		num= 5		Sta		n Val		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9908.91	.055	9967.07	.041	10026.96	.045	10075.21	.025	10086.22	.045		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	9922.96	10124.66		86.36	100	113.55		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.712

INPUT

Description: DIBBLE Sta 82+00

Station Elevation Data		num= 37	
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Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9876.76	1371.21	9914.96	1371.76	9917	1371.78	9918.53	1371.58	9919.59	1371.43
9933.33	1369.65	9962.77	1364.6	9967.51	1363.81	9982.97	1364.5	9985.02	1364.59
9988.75	1364.78	9996.19	1364.57	10000	1364.4610010.35	1364.1510022.34	1364.53		
10027.63	1364.6810035.65		1364	10038.6	1363.6810046.18	1363.8310056.62	1364.06		
10081.71	1364.2810083.37	1364.3110085.74	1364.49	10088.7	1364.8110091.06	1364.96			
10092.36	1364.9610102.32	1364.9510103.63			136510103.76	136510106.64	1365.14		
10110.43	1365.3510118.31	1366.6910128.23	1368.7510136.73	1369.9810139.33	1370.36				
10143.5	1370.4510150.01	1370.61							

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9876.76	.055	9988.75	.0410027.63	.04510092.36	.02510102.32	.045			

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
991710139.33 78.5 100 121.33 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.693

INPUT
Description: DIBBLE Sta 81+00
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9903.65	1370.89	9911.1	1371.25	9916.62	1371.54	9931.16	1369.8	9932.28	1369.65
9943.75	1367.58	9967.05	1363.36	9978.78	1364.55	9980.38	1364.71	9984.09	1364.64
9999.99	1364.33	10000	1364.3310013.09	1364.0810025.56	1364.4310033.02	1364.63			
10041.41	1364.41	10051.2	1364.1610055.15	1364.0210065.72	1363.6310072.59	1363.45			
10084.95	1363.5110093.05	1363.5510097.25	1363.5710102.44	1363.5910105.71	1364.05				
10109.76	1364.710117.64	1364.710120.92	1364.7110125.52	1365.0110127.15	1365.17				
10136.89	1366.510142.97	1367.3710145.11	1367.6710152.84	1368.8410157.37	1368.96				
10161.99	1369.1								

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9903.65	.055	9980.38	.0410033.02	.04510109.76	.02510120.92	.045			
10152.84	.055								

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9916.6210152.84 78.5 100 121.32 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.674

INPUT
Description: DIBBLE Sta 80+00
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9904.08	1368.18	9904.99	1368.24	9924.8	1370.14	9925.67	1370.08	9934.39	1368.83
9934.82	1368.78	9937.92	1368.44	9942.21	1367.64	9951.49	1366.28	9954.84	1365.77
9956.74	1365.28	9957.5	1365.2	9970.41	1363.59	9973.39	1363.2	9974.9	1362.95
9985.61	1363.58	9991.39	1363.87	9999.02	1363.88	10000	1363.8810000.01	1363.88	
10019.25	1363.8410022.18	1363.8410024.28	1363.910037.79	1364.2810041.49	1364.27				
10069.25	1364.2410079.06	1363.7510085.84	1363.4310101.59	1363.2710121.12	1363.06				
10124.92	1363.5510129.96	1364.1910133.59	1364.2310141.33	1364.3210145.09	1364.77				
10147.26	1365.04	10159.9	1366.8710164.34	1367.52	10167.4	1367.9610168.75	1368.02		
10178.65	1368.2310179.01	1368.16							

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9904.08	.055	9991.39	.0410024.28	.04510121.12	.05510129.96	.025			
10141.33	.055								

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9924.8 10167.4 78.5 100 121.32 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.656

INPUT
Description: DIBBLE Sta 79+00
Station Elevation Data num= 35

Sta	Elev								
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9939.76 1368.89 9939.96 1368.81 9944.27 1368.82 9947.63 1367.72 9948.24 1366.91
 9949.15 1365.92 9951.65 1365.59 9952.43 1365.51 9954.58 1365.27 9962.77 1364.33
 9973.72 1363.11 9976.49 1362.78 9990.01 1363.48 9993.4 1363.67 10000 1363.64
 10024.32 1363.5310028.59 1363.4810035.75 1363.7510042.74 1364.0110045.84 1363.99
 10068.79 1363.9110086.48 1363.3510087.99 1363.31 10091.7 1363.2710125.14 1362.87
 10127.61 1363.3110131.09 1363.8810135.46 1363.9110142.27 1363.9210144.47 1364.04
 10146.75 1364.1710158.81 1366.4610170.74 1368.810178.35 1368.8 10179 1368.8

Manning's n Values num= 5
 Sta n Val
 9939.76 .055 9993.4 .0410035.75 .04510131.09 .02510142.27 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9944.2710170.74 96.04 100 103.95 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.637

INPUT

Description: DIBBLE Sta 78+00
 Station Elevation Data num= 38
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9923.43 1368.48 9924.25 1368.47 9947.98 1368.89 9949.47 1367.18 9951.53 1365.41
 9956.47 1364.7 9958.52 1364.49 9964.57 1363.35 9967.97 1362.8 9976.4 1362.81
 9981.29 1362.83 9984.16 1362.84 9994.66 1362.95 9999.37 1363 10000 1363.01
 10021.27 1363.2610022.97 1363.2810032.22 1363.5710045.28 1363.9810046.77 1363.95
 10063.36 1363.6610072.72 1363.510075.62 1363.4 10094.6 1362.7510098.62 1362.74
 10124.85 1362.6410125.61 1362.7410128.21 1363.1110132.62 1363.6810139.03 1363.86
 10142.67 1363.9610145.64 1364.1510147.84 1364.2810158.92 1366.1510166.47 1367.42
 10173.13 1368.5110174.76 1368.51 10176 1368.51

Manning's n Values num= 7
 Sta n Val
 9923.43 .055 9947.98 .045 9964.57 .0410022.97 .04510132.62 .025
 10142.67 .04510147.84 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9947.9810173.13 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.618

INPUT

Description: DIBBLE Sta 77+00
 Station Elevation Data num= 38
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9891.09 1367.32 9903.05 1367.51 9907.26 1367.81 9909.47 1367.96 9914.17 1368.31
 9915.82 1368.39 9918.14 1368.37 9919.72 1368.13 9926.57 1366.85 9934.76 1365.57
 9937.72 1365.09 9947.9 1363.59 9953.84 1362.75 9957.45 1362.74 9978.5 1362.81
 9983.75 1362.87 10000 1362.9810006.42 1363.0210008.14 1363.0710015.84 1363.25
 10025.71 1363.5510040.97 1363.810042.64 1363.8410070.27 1363.3710073.85 1363.31
 10075.31 1363.2410092.22 1362.4610118.42 1362.4410124.35 1362.4410128.17 1363
 10131.13 1363.3810134.41 1363.3510141.68 1363.310145.08 1363.810146.25 1363.99
 10151.38 1364.9110169.01 1368.0710179.05 1368.03

Manning's n Values num= 6
 Sta n Val
 9891.09 .055 9918.14 .045 9947.9 .0410025.71 .04510131.13 .025
 10141.68 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9918.1410169.01 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.599

INPUT

Description: DIBBLE Sta 76+00
 Station Elevation Data num= 46
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9875.87 1366.82 9877.97 1366.87 9888.2 1367.31 9895 1367.98 9899.56 1368.42
 9907.76 1366.97 9909.56 1366.63 9913.12 1366.05 9925.22 1364.09 9926.7 1364
 9930.4 1363.85 9951.22 1362.94 9958 1362.55 9960.37 1362.42 9964.34 1362.45
 9972.06 1362.52 9975.34 1362.54 9978.25 1362.57 9981.74 1362.6 9994.33 1362.73

10000 1363.0310002.64 1363.1710016.38 1363.7910017.25 1363.7610023.91 1363.6
 10037.36 1363.8610052.62 1363.9310054.41 1363.8410054.83 1363.8210073.82 1363.02
 10081.22 1362.4710081.31 1362.4610081.71 1362.4610107.34 1362.3910113.15 1362.82
 10116.43 1363.0610117.33 1363.1410120.71 1363.81 10121.2 1363.8910122.12 1363.91
 10132.02 1364.1510134.64 1364.2310136.51 1364.2910147.73 1366.1510157.58 1367.64
 10165.46 1367.65

Manning's n Values num= 7
 Sta n Val
 9875.87 .055 9899.56 .045 9930.4 .0410016.38 .04510122.12 .025
 10132.02 .04510157.58 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9899.5610157.58 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.580

INPUT
 Description: DIBBLE Sta 75+00
 Station Elevation Data num= 46
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9866.74 1366.77 9883.51 1367.09 9888.02 1367.9 9890.64 1368.37 9893.99 1368.95
 9901.65 1367.63 9904.13 1367.24 9911.04 1366.01 9916.23 1365.17 9919.9 1364.54
 9928.54 1363.35 9938.08 1362.03 9951.73 1362.25 9971.63 1362.55 9986.12 1362.63
 9995.63 1362.66 10000 1362.6710000.22 1362.6710001.89 1362.7710002.59 1362.8
 10009.36 1363.0910016.51 1363.4110036.02 1363.4210039.16 1363.44 10041.1 1363.56
 10042.31 1363.6310053.49 1363.3510054.35 1363.3310054.46 1363.3110054.84 1363.24
 10061.18 1362.0510094.57 1362.2510101.49 1362.2910102.07 1362.39 10105.7 1363.09
 10111.63 1363.1410113.28 1363.15 10114.5 1363.1510116.09 1363.4 10120 1363.99
 10126.17 1364.1 10130.3 1364.1910134.63 1364.3910135.49 1364.44 10150 1366.77
 10160 1367

Manning's n Values num= 7
 Sta n Val
 9866.74 .055 9893.99 .045 9928.54 .0410009.36 .045 10120 .025
 10130.3 .045 10150 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9893.99 10150 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.561

INPUT
 Description: DIBBLE Sta 74+00
 Station Elevation Data num= 46
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9879.48 1366.53 9884.04 1366.57 9890.04 1368.11 9893.12 1368.92 9899.24 1367.95
 9902.64 1367.38 9910.36 1366.01 9923.64 1363.68 9932.75 1362.85 9943.67 1361.85
 9966.38 1362.34 9977.52 1362.57 9987.87 1362.32 9993.94 1362.17 10000 1362.26
 10016.7 1362.51 10018.6 1362.5410019.86 1362.6110029.02 1363.1310038.31 1362.7
 10039.16 1362.6610040.03 1362.5710047.43 1361.8610056.59 1361.9310075.53 1362.07
 10082.95 1362.1210086.38 1362.1510087.16 1362.2810091.22 1362.92 10095 1362.96
 10099.79 1362.9410102.89 1362.8710103.25 1362.9110108.75 1363.5 10111.9 1363.42
 10112.97 1363.410113.35 1363.4210120.31 1363.9810125.27 1363.9610130.25 1363.92
 10133.11 1364.2310134.58 1364.4410141.57 1365.4410154.98 1367.4110160.77 1367.41
 10164.99 1367.41

Manning's n Values num= 7
 Sta n Val
 9879.48 .055 9893.12 .045 9977.52 .0410029.02 .04510120.31 .025
 10130.25 .04510154.98 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9893.1210154.98 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.542

INPUT
 Description: DIBBLE Sta 73+00
 Station Elevation Data num= 42
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9879.48 1366.53 9884.04 1366.57 9890.04 1368.11 9893.12 1368.92 9899.24 1367.95
 9902.64 1367.38 9910.36 1366.01 9923.64 1363.68 9932.75 1362.85 9943.67 1361.85
 9966.38 1362.34 9977.52 1362.57 9987.87 1362.32 9993.94 1362.17 10000 1362.26
 10016.7 1362.51 10018.6 1362.5410019.86 1362.6110029.02 1363.1310038.31 1362.7
 10039.16 1362.6610040.03 1362.5710047.43 1361.8610056.59 1361.9310075.53 1362.07
 10082.95 1362.1210086.38 1362.1510087.16 1362.2810091.22 1362.92 10095 1362.96
 10099.79 1362.9410102.89 1362.8710103.25 1362.9110108.75 1363.5 10111.9 1363.42
 10112.97 1363.410113.35 1363.4210120.31 1363.9810125.27 1363.9610130.25 1363.92
 10133.11 1364.2310134.58 1364.4410141.57 1365.4410154.98 1367.4110160.77 1367.41
 10164.99 1367.41

9891.09	1366.37	9896.58	1367.01	9903.97	1366.11	9904.71	1366.01	9909.45	1365.37
9923.62	1363.42	9928.37	1362.9	9941.14	1361.45	9956.06	1361.7	9970.28	1361.96
9979.52	1362.05	10000	1362.3210001.89		1362.3510004.18		1362.3610006.25		1362.37
10009.37	1362.39	10011.8	1362.4	10016.1	1362.4310030.48		1362.410030.77		1362.39
10043.47	1362.3910043.71		1362.4	10044.7	1362.3910046.86		1362.3510050.95		1362.23
10059.81	1361.9610072.37		1361.9710078.61		1361.9910083.62		1362.4710092.17		1363.23
10096.72	1363.1910112.84		1363.1610117.88		1363.4310119.56		1363.5310121.28		1363.57
10129.53	1363.68	10134	1363.9810136.92		1364.1710137.09		1364.1810142.59		1365.12
10150	1366.35	10160	1366.5						

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9891.09	.055	9896.58	.045	9941.14	.0410009.37	.04510121.28		.025	
10129.53	.045	10150	.055						

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9896.58 10150 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.523

INPUT

Description: DIBBLE Sta 72+00
 Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9893.76	1366.05	9897.53	1366.59	9903.41	1366.02	9905.11	1365.87	9917.23	1363.88
9921	1363.26	9924.57	1362.85	9939.34	1361.23	9942.63	1361.37	9948.57	1361.47
9948.67	1361.47	9948.8	1361.48	9957.27	1361.7	9962.43	1361.85	9965.3	1361.79
9968.71	1361.71	9970.72	1361.66	9972.15	1361.65	9978.36	1362.29	9979.62	1362.44
9981.87	1362.43	9986.63	1362.43	9988.86	1362.41	9993.83	1362.36	10000	1362.26
10011.02	1362.0910013.83		1362.0610017.91		1362.0110022.99		1361.9510034.43		1361.81
10037.25	1361.810045.92		1361.8910052.36		1361.8410056.48		1361.82	10064.3	1361.76
10065.42	1361.7510069.37		1361.7310073.84		1362.3610078.21		1362.96	10080.8	1363.02
10092.58	1363.2910101.56		1363.1710112.97		1363.0610117.02		1363.24	10119.6	1363.35
10125.62	1363.4310129.63		1363.4810135.25		1363.9310137.48		1364.0810141.78		1364.63
10149.99	1365.79	10159.2	1365.81						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9893.76	.055	9897.53	.045	10119.6	.02510129.63	.04510149.99	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9897.5310149.99 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.504

INPUT

Description: DIBBLE Sta 71+00
 Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9888.34	1365.78	9895.34	1366.94	9902.92	1366.07	9903.03	1366.06	9905.11	1365.73
9920.25	1363.34	9926.89	1362.58	9940.17	1361.03	9949.04	1361.89	9950.12	1362
9952.8	1361.98	9967.27	1361.86	9973.63	1361.71	9978.53	1361.61	9988.19	1361.39
10000	1361.1310001.78		1361.0910002.28		1361.0810002.52		1361.0810003.59		1361.06
10006.61	1361.1410009.46		1361.1210019.34		1361.2910022.12		1361.6210027.86		1362.32
10028.35	1362.3310032.12		1362.3510039.18		1362.36	10056.7	1362.5610074.86		1362.98
10079.62	1363.04	10088.1	1363.0310092.55		1363.0110113.79		1362.9210116.51		1363.02
10119.43	1363.1210122.41		1363.1310128.91		1363.1810135.59		1363.8910136.47		1363.95
10138.14	1364.1710150.01		1365.5410160.01		1365.6				

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9888.34	.055	9895.34	.045	9950.12	.0410027.86	.04510119.43	.025
10128.91	.04510150.01		.055				

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9895.3410150.01 92.76 100 107.21 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.485

INPUT

Description: DIBBLE Sta 70+00
 Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9886.43	1365.66	9894.72	1367.71	9904.07	1366.5	9904.46	1366.44	9905.24	1366.32
9922.74	1363.62	9933.16	1362.33	9948.21	1360.52	9953.76	1360.61	9953.79	1360.61
9960.25	1361.1	9962.72	1361.33	9978.27	1361.61	9988.96	1361.79	10000	1361.65
10002.24	1361.6210014.97	1361.4410032.04	1361.3810044.42	1361.35	10050.4	1361.71			
10055.11	136210082.26	1362.5610082.89	1362.5710083.06	1362.5710083.15	1362.58				
10083.38	1362.58	10083.7	1362.5810083.94	1362.5810089.51	1362.5610112.15	1362.57			
10116.41	1362.6910119.02	1362.7810123.06	1362.7910129.12	1362.8310133.34	1363.07				
10135.43	1363.1810138.31	1363.6510153.39	1365.9810158.64	1365.9810163.39	1365.98				

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9886.43	.055	9894.72	.045	9988.96	.041	10055.11	.045	10119.02	.025
10129.12	.045	10153.39	.055						

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
9894.72	10153.39		100	100	100	.1		.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.466

INPUT

Description: DIBBLE Sta 69+00
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9896.54	1366.2	9904.49	1367.65	9912.65	1366.45	9913.69	1366.29	9928.08	1363.65
9928.91	1363.5	9929.16	1363.47	9956.17	1360.36	9956.89	1360.4	9971.85	1361.18
9971.95	1361.18	9974.34	1361.25	9988.79	1361.67	9989.62	1361.65	9992.4	1361.6
10000	1361.4810011.51	1361.2810022.31	1361.2210042.22	1361.1510048.95	1361.11				
10053.44	1361.3310054.48	1361.3810055.26	1361.3910061.67	1361.4810068.93	1361.71				
10073.54	1361.8310077.84	1361.9910088.86	1362.110097.13	1362.1810100.69	1362.22				
10105.24	1362.2410107.95	1362.2510112.52	1362.3510115.62	1362.4210120.22	1362.52				
10124.01	1362.5810130.25	1362.7310135.65	1363.0410136.17	1363.0710139.27	1363.52				
10147.44	1364.69	10150	1365.09	10160	1365.1				

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9896.54	.055	9904.49	.045	9988.79	.041	10077.84	.045	10120.22	.025
10130.25	.045	10150	.055						

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
9904.49	10150		100	100	100	.1		.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.447

INPUT

Description: DIBBLE Sta 68+00
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9888.75	1365.48	9908.09	1367.57	9914.1	1366.53	9917.1	1366.06	9927.87	1363.98
9934.03	1362.81	9940.67	1362.13	9959.4	1360.26	9963.64	1360.43	9975.36	1360.88
9985.92	1361.08	9992.33	1361.21	10000	1361.0810001.79	1361.0510016.63	1360.8		
10018.03	1360.8310018.09	1360.83	10031.9	1360.710044.22	1360.5910060.49	1361.69			
10064.99	1361.9710067.23	1361.9510106.79	1360.9210109.46	1360.7610112.84	1361.25				
10119.19	1362.1110125.61	1362.1810129.07	1362.2810131.93	1362.2910134.33	1362.45				
10139.62	1363.27	10150	1364.84	10160	1365.02				

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9888.75	.055	9908.09	.045	9992.33	.041	10064.99	.045	10119.19	.025
10129.07	.045	10150	.055						

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
9908.09	10150		100	100	100	.1		.3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.428

INPUT

Description: DIBBLE Sta 67+00
Station Elevation Data num= 34

Sta	Elev								
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9898.08	1365.18	9908.8	1367.05	9915.67	1365.89	9916.06	1365.82	9917.89	1365.52
9935.26	1362.63	9947.76	1361.3	9960.85	1359.91	9970.7	1360.38	9974.58	1360.56
9976.48	1360.47	9982.73	1360.15	9988.52	1360.51	9992.16	1360.75	10000	1360.64
10005.67	1360.55	10015.77	1360.41	10027.28	1360.43	10048.37	1360.46	10069.65	1361.2
10072.12	1361.29	10092	1361.08	10094.42	1361.06	10094.53	1361.06	10107.32	1360.59
10111.84	1360.98	10119.4	1361.61	10122.97	1361.69	10130.07	1361.93	10135.33	1361.89
10135.49	1361.89	10141.86	1363.1	10150	1364.66	10160	1364.8		

Manning's n Values		num=	7						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9898.08	.055	9908.8	.045	9974.58	.041	10072.12	.045	10119.4	.025
10130.07	.045	10150	.055						

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	9908.8	10150		100	100	100		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.409

INPUT

Description: DIBBLE Sta 66+00
 Station Elevation Data num= 42

Sta	Elev								
9894	1364.75	9906.96	1365.89	9908.68	1366.06	9910.3	1365.92	9916.01	1365.44
9930.27	1363.1	9934.37	1362.44	9935.23	1362.35	9950.18	1360.74	9960.53	1359.94
9963.16	1359.74	9970.68	1360.03	9975.7	1360.25	9983.27	1360.21	9984.84	1360.21
9998.23	1360.16	10000	1360.16	10002.49	1360.15	10011.73	1360.63	10015.12	1360.71
10019.44	1360.64	10035.19	1360.17	10045.7	1359.86	10048.04	1359.76	10049.65	1360.06
10055.11	1360.98	10055.48	1360.98	10069.56	1360.95	10084.68	1360.92	10087.03	1360.92
10089.28	1360.92	10103.91	1360.47	10110.84	1360.23	10113.72	1360.61	10119.43	1361.29
10126.46	1361.58	10129.61	1361.68	10133.08	1361.94	10135.83	1362.11	10140.14	1362.76
10150	1364.27	10160	1364.4						

Manning's n Values		num=	7						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9894	.055	9908.68	.045	9975.7	.041	10055.11	.045	10119.43	.025
10129.61	.045	10150	.055						

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	9908.68	10150		100	100	100		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.390

INPUT

Description: DIBBLE Sta 65+00
 Station Elevation Data num= 42

Sta	Elev								
9886.74	1365.05	9900.9	1365.78	9910.2	1365.05	9916.13	1364.59	9922.18	1363.55
9936.97	1361.28	9940.31	1360.92	9954.37	1359.25	9957.65	1359.4	9971.07	1359.93
9971.49	1359.93	9981.09	1359.98	9985.57	1360.03	9994.62	1360.18	9998.01	1360.11
9999.03	1360.12	10000	1360.09	10005.47	1359.96	10009.61	1359.84	10015.88	1359.72
10020.56	1359.66	10032.99	1359.54	10035.47	1359.72	10040.03	1360.10	10047.07	1360.45
10050.65	1360.71	10055.58	1360.63	10076.97	1360.59	10084.01	1360.56	10088.82	1360.49
10100.13	1359.74	10101.6	1359.64	10106.37	1360.65	10108.53	1361.05	10112.94	1361.1
10119.65	1361.17	10127.61	1361.52	10130.88	1361.66	10132.01	1361.73	10133.56	1361.97
10150	1364.59	10160	1364.2						

Manning's n Values		num=	7						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9886.74	.055	9900.9	.045	9971.07	.041	10050.65	.045	10108.53	.025
10119.65	.045	10130.88	.055						

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	9900.9	10150		91.21	100	108.74		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.371

INPUT

Description: DIBBLE Sta 64+00
 Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9897.1	1365.19	9897.29	1365.18	9897.54	1365.18	9898.63	1365.14	9908.37	1364.82

9914	1363.62	9929.42	1360.41	9941.73	1359.97	9943.5	1359.9	9943.9	1359.82
9945.63	1359.47	9949.02	1358.78	9951.48	1359	9967.08	1360.36	9976.33	1360.3
9984.33	1360.25	9993.15	1360.18	10000	1360.1410000.11	1360.1410008.99	1360.07		
10009.13	1360.0710016.15	1360.08	10025.2	1360.0810049.48	1360.1410054.07	1360.13			
10056.93	1359.97	10065.2	1359.3910078.67	1359.4310082.01	1359.4510087.59	1360.15			
10089.07	1360.33	10091.7	1360.28	10099.7	1360.0710105.83	1359.9110109.16	1359.86		
10112.88	1359.9210114.31	1359.9610117.67	1360.3710133.26	1362.210142.96	1364				
10143.27	1364.0610143.52	1364.0610148.06	1363.99	10150	1364				

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9897.1	.055	9929.42	.0410054.07	.04510089.07	.025	10099.7	.045		
10114.31	.055								

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

9908.37	10143.27		100	100	100	.1	.3		
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CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.352

INPUT

Description: DIBBLE Sta 63+00

Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9882.71	1364.46	9887.72	1364.33	9893.9	1364.2	9907.27	1361.69	9914.77	1360.28
9924.92	1359.74	9931.97	1359.33	9942.9	1359.69	9961.62	1360.32	9961.69	1360.31
9961.81	1360.3	9973.33	1358.92	9982.53	1358.98	9996.2	1359.05	10000	1359.05
10002.44	1359.0610007.78	1359.0710033.92	1359.310035.27	1359.3110038.61	1359.2				
10039.78	1359.1710042.53	1359.36	10044.6	1359.4910051.13	1359.4910056.61	1359.52			
10059.5	1359.4910060.93	1359.4610063.02	1359.4410071.94	1359.3210073.98	1359.24				
10076.21	1359.1610104.92	1359.5510107.65	1359.6110112.88	1360.4210124.97	1362.26				
10134.65	1363.7810135.83	1363.9610136.28	1363.9310138.76	1363.8110144.81	1363.57				
10150.01	1363.57								

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9882.71	.055	9914.77	.045	9961.62	.04	10044.6	.02510056.61	.045	
10107.65	.055								

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

9893.91	10135.83		109.12	99.99	90.84	.1	.3		
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CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.334

INPUT

Description: DIBBLE Sta 62+00

Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9867.51	1364.44	9879.47	1363.98	9880.48	1363.93	9884.64	1363.24	9903.37	1360.05
9921.64	1359.4	9923.32	1359.35	9923.76	1359.37	9924.28	1359.37	9925.46	1359.39
9940.05	1359.68	9940.27	1359.68	9943.38	1359.71	9945.77	1359.69	9954.01	1359.63
9966.02	1359.48	9970.02	1359.5	9978.29	1359.49	9990.81	1359.83	9993.34	1359.89
9994.29	1359.91	9999.26	1359.96	10000	1359.93	10001.1	1359.8910015.36	1359.57	
10019.22	1359.4410023.01	1359.3410025.97	1359.3310028.27	1359.35	10040.3	1359.35			
10042.71	1359.4810053.92	1360.1110061.26	1359.5510068.95	1358.9410079.68	1358.86				
10081.06	1358.8510082.38	1358.84	10084.1	1358.8510086.91	1358.8310099.04	1358.81			
10109.75	1360.59	10118.3	136210125.08	136310129.83	1363.6910130.65	1363.64			
10138.93	1363.2410144.95	1363.2410148.94	1363.24	10149.9	1363.24				

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9867.51	.055	9903.37	.045	9966.02	.025	9978.29	.045	9999.26	.04
10053.92	.04510099.04	.055							

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

9880.48	10129.83		109.43	100	90.53	.1	.3		
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CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.315

INPUT

Description: DIBBLE Sta 61+00

DIBBLE Sta 61+00
Station Elevation Data num= 48

Sta	Elev								
9861.72	1363.68	9867.37	1363.64	9870.62	1363.62	9878.37	1363.46	9889.26	1362.11
9893.16	1361.12	9899.54	1359.97	9901.26	1359.87	9901.44	1359.86	9907.78	1359.83
9917.06	1359.72	9919.66	1359.67	9920.87	1359.63	9925.71	1359.57	9927.91	1359.54
9928.48	1359.56	9928.97	1359.54	9937.51	1359.32	9941.24	1359.37	9945.57	1359.49
9948	1359.56	9951.55	1359.59	9954.58	1359.64	9964.11	1359.74	9968.83	1358.96
9971.73	1358.48	9990.18	1359.01	9994.01	1359.11	9995.23	1359.15	9997.36	1359.2
10000	1359.19	10000.99	1359.18	10003.22	1359.16	10008.89	1359.12	10030.88	1358.96
10039.25	1359.25	10046.42	1359.49	10051.43	1359.69	10058.97	1359.14	10065.22	1358.68
10069.65	1358.71	10092.05	1358.84	10094.5	1359.28	10109.87	1362.05	10118.58	1363.22
10122.1	1363.69	10122.96	1363.64	10130.49	1363.15				

Manning's n Values		num= 6		Sta		n Val		Sta		n Val	
9861.72	.055	9907.78	.025	9917.06	.045	9964.11	.041	10051.43	.045		
10092.05	.055										

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9878.37	10122.1		100	100		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.296

INPUT

Description: DIBBLE Sta 60+00

Station Elevation Data		num= 38		Sta		Elev		Sta		Elev	
9866.92	1363.67	9876.69	1363.61	9878.93	1363.51	9879.29	1363.46	9882.05	1363.04		
9895.22	1360.4	9902.94	1358.95	9908.78	1358.97	9912.29	1359	9921.76	1359.4		
9922.99	1359.45	9926.53	1359.37	9931.63	1359.15	9956.32	1359.29	9964.75	1359.35		
9971.96	1359.24	9989.38	1359	9992.8	1358.75	10000	1358.35	10000.94	1358.3		
10024.65	1358.46	10028.51	1358.48	10031.73	1358.71	10042.36	1359.39	10055.53	1358.68		
10057.36	1358.58	10058	1358.55	10077.5	1358.66	10086.28	1358.68	10093.87	1359.51		
10109.21	1361.35	10118.35	1362.91	10121.23	1363.41	10130.13	1363.02	10131.01	1362.98		
10131.98	1362.94	10132.41	1362.94	10141.98	1362.94						

Manning's n Values		num= 5		Sta		n Val		Sta		n Val	
9866.92	.025	9876.69	.045	9989.38	.041	10042.36	.045	10086.28	.055		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9876.69	10121.23		100	100		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.277

INPUT

Description: DIBBLE Sta 59+00

Station Elevation Data		num= 42		Sta		Elev		Sta		Elev	
9866.87	1363.47	9873.57	1363.46	9878.21	1363.44	9878.93	1363.35	9879.22	1363.33		
9880.33	1363.2	9881.49	1363.04	9891.53	1360.75	9896.01	1359.75	9901.47	1358.54		
9905.77	1358.73	9917.65	1359.39	9930.58	1359	9938.79	1358.62	9942.39	1358.77		
9942.88	1358.8	9943.89	1358.87	9945.05	1358.86	9946.98	1358.93	9951	1358.97		
9964.47	1359.14	9971.11	1358.13	9974.62	1357.74	9982.77	1357.95	9988.22	1358.04		
9992.37	1358.08	10000	1358.21	10016.34	1358.51	10017.82	1358.52	10020.34	1358.6		
10044.53	1359.28	10048.39	1358.94	10062.21	1357.78	10063.08	1357.81	10082.65	1358.17		
10105.92	1360.68	10107.25	1360.82	10120	1362.88	10121.39	1363.12	10131.39	1362.45		
10131.87	1362.41	10132.32	1362.38								

Manning's n Values		num= 5		Sta		n Val		Sta		n Val	
9866.87	.025	9878.21	.045	9964.47	.041	10044.53	.045	10121.39	.055		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9878.21	10121.39		100	100		.1	.3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.258

INPUT

Description: DIBBLE Sta 58+00

Station Elevation Data		num= 39		Sta		Elev		Sta		Elev	
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9867.11	1363.25	9871.15	1363.24	9878.66	1363.19	9881.57	1362.77	9881.74	1362.73
9885.82	1361.86	9902.1	1358.26	9910.75	1358.52	9917.82	1358.73	9920.12	1358.59
9922.53	1358.48	9924.48	1358.37	9932.46	1357.96	9937.96	1358.39	9942.86	1358.76
9956	1358.81	9961.02	1358.83	9965.65	1358.01	9969.55	1357.35	9979.92	1358.25
9982.3	1358.46	9983.37	1358.4	9996.09	1357.7	10000	1357.7510021.76	1358.07	
10033.41	1358.2110046.78		1358.9	10055.1	1359.3810072.85		1357.9810075.58	1357.76	
10085.25	1357.0910085.72		1357.0710086.42		1357.1710104.24		1359.9510119.12	1362.41	
10121.48	1362.7910124.76		1362.6410132.25		1362.1910138.94		1362.19		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9867.11	.025	9878.66	.045	9961.02	.041	10046.78	.045	10121.48	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9878.6610121.48 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.239

INPUT
 Description: DIBBLE Sta 57+00
 Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9867.71	1363.02	9875.76	1363.06	9878.96	1363.08	9879.97	1362.79	9880.7	1362.58
9881.77	1362.34	9892.47	1360.13	9896.53	1359.28	9900.26	1358.47	9910.81	1358.25
9933.52	1357.78	9936.54	1358.2	9940.77	1358.71	9952.7	1358.85	9958.93	1358.92
9969.36	1358.58	9977.2	1358.31	9981.23	1357.7	9984.75	1357.3	10000	1356.89
10000.75	1356.8710003.85		1356.7910018.64		1357.5510029.26		1358.0910039.05	1358.45	
10049.07	1358.810053.96		1358.5310071.74		1357.610079.45		1356.9710081.96	1356.77	
10092.94	1358.1110096.06		1358.5110099.57		1359.14	10109.4	1360.8810119.81	1362.28	
10121.92	1362.5610122.45		1362.5410125.74		1362.4510131.56		1362.1110138.01	1362.11	

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9867.71	.025	9878.96	.045	9958.93	.041	10049.07	.045	10121.92	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9878.9610121.92 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.220

INPUT
 Description: DIBBLE Sta 56+00
 Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9866.05	1362.87	9871.17	1362.8	9877.04	1362.7	9878.18	1362.73	9878.83	1362.59
9879.66	1362.45	9882.63	1361.88	9883.66	1361.83	9884.7	1361.7	9885.22	1358.57
9885.48	1358.51	9897.39	1358.53	9897.45	1358.52	9899.13	1358.63	9909.59	1358.33
9931.29	1357.75	9940.01	1358.05	9941.19	1358.1	9946.22	1358.37	9952.87	1358.46
9957.07	1358.52	9958.72	1358.53	9964.51	1358.23	9977.1	1357.41	9979.26	1357.42
9984.56	1357.82	9990.64	1358.23	9996.53	1357.72	10000	1357.4710007.05	1356.97	
10013.4	1356.8510018.43		1356.7710021.02		1356.7210022.58		1356.7710032.76	1357.08	
10038.19	1357.6610049.69		1358.8810053.47		1358.5310068.21		1357.2510070.26	1357.14	
10077.78	1356.6810084.39		1357.0810091.86		1357.4410101.81		1359.1810108.05	1360.39	
10112.28	1361.1410120.16		1362.5510125.79		1362.2610128.58		1362.1210129.23	1362.08	
10130.36	1362.03								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9866.05	.025	9877.04	.045	9958.72	.041	10049.69	.045	10120.16	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9878.1810120.16 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.201

INPUT
 Description: DIBBLE Sta 55+00
 Station Elevation Data num= 38

Sta	Elev								
9864.83	1362.61	9876.94	1362.58	9881.49	1361.84	9883.53	1361.47	9888.79	1360.43

9893.69 1359.53 9898.05 1358.59 9902.31 1358.43 9922.8 1357.58 9939.09 1357.64
 9955.2 1357.71 9956.37 1357.71 9987.28 1357.71 9991.97 1357.55 10000 1357.32
 10003.56 1357.21 10013.5 1356.9110023.67 1356.79 10030.6 1356.6610038.74 1357.48
 10040.62 1357.6710041.55 1357.5610048.56 1356.7910048.58 1356.7910056.49 1356.48
 10056.75 1356.4810061.09 1356.56 10062.9 1356.610067.24 1356.7510071.47 1356.81
 10073.69 1356.8710076.79 1356.9610088.37 1359.4610092.72 1360.41 10093.6 1360.52
 10109.57 1362.6710110.28 1362.6810121.05 1362.6

Manning's n Values num= 4
 Sta n Val Sta n Val Sta n Val Sta n Val
 9864.83 .025 9876.94 .045 9987.28 .0410076.79 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9876.9410109.57 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.182

INPUT

Description: DIBBLE Sta 54+00

Station Elevation Data num= 40
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9855.43 1366.24 9862.57 1365.98 9866.27 1365.85 9868.3 1365.63 9873.22 1364.85
 9881.22 1363.35 9895.09 1361.03 9897.07 1360.67 9897.86 1360.52 9905.96 1359.2
 9913.13 1359.32 9918.4 1359.35 9922.95 1358.63 9926.42 1358.17 9928.81 1357.74
 9931.93 1357.7 9940.34 1357.76 9953.02 1357.84 9964.37 1357.62 9979.31 1357.28
 9985.48 1357 9992.92 1356.61 9995.34 1356.58 9996.12 1356.57 9997.8 1356.55
 10000 1356.5110010.83 1356.36 10021 1356.19 10022 1356.1710029.15 1356.46
 10035.61 1356.7210036.46 1356.7310057.19 1356.9610061.97 1357.810077.38 1360.56
 10094.2 1362.7710098.25 1363.310104.97 1363.1110110.01 1363.01110111.68 1362.95

Manning's n Values num= 6
 Sta n Val Sta n Val Sta n Val Sta n Val
 9855.43 .025 9866.27 .045 9905.96 .025 9913.13 .045 9928.81 .04
 10057.19 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9866.2710098.25 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.163

INPUT

Description: DIBBLE Sta 53+00

Station Elevation Data num= 37
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9858.58 1366.98 9866.91 1367.05 9872.53 1366.03 9874.99 1365.61 9875.1 1365.61
 9879.5 1364.88 9898.19 1361.78 9916.75 1359.32 9917.92 1359.17 9918.54 1359.1
 9924.24 1358.51 9926.91 1358.29 9930.59 1358.3 9937.39 1358.42 9946.21 1358.04
 9949.65 1357.94 9953.28 1357.55 9955.35 1357.43 9967.02 1356.1 9967.96 1356
 9968.71 1356 9968.85 1356 9988.79 1355.96 9991.67 1355.95 9993.1 1355.95
 9995.99 1356.09 10000 1356.2910017.67 1357.1910022.74 1357.0410039.35 1356.56
 10051.76 1358.7310064.22 1360.910079.05 1363.4810087.06 1364.8410094.92 1364.59
 10095.97 1364.5610096.97 1364.51

Manning's n Values num= 6
 Sta n Val Sta n Val Sta n Val Sta n Val
 9858.58 .055 9866.91 .045 9926.91 .025 9937.39 .045 9967.96 .04
 10039.35 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9866.9110087.06 89.68 89.68 89.68 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.146

INPUT

Description: DIBBLE Sta 52+10

Station Elevation Data num= 46
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9857.52 1366.65 9866.43 1366.66 9867.47 1366.66 9868.27 1366.66 9869.17 1366.51
 9869.34 1366.48 9870.14 1366.37 9871.05 1366.24 9877.36 1365.28 9895.83 1362.17
 9898.41 1361.73 9900.28 1361.43 9918.91 1359.64 9925.45 1359.01 9931.86 1358.61
 9933.1 1358.51 9934.15 1358.45 9934.83 1358.45 9944.71 1358.31 9949.18 1357.55

9949.26 1357.54 9949.33 1357.56 9950.71 1357.22 9958.32 1357.18 9960.2 1357.51
 9960.32 1357.47 9970.8 1355.67 9970.85 1355.67 9971.12 1355.67 10000 1355.65
 10003.94 1355.6510014.55 1355.3610015.17 1355.36 10026.3 1355.3710033.08 1355.37
 10036.85 1355.87 10042.1 1356.410042.64 1356.6210042.95 1356.6910043.19 1356.74
 10058.04 1359.8810064.98 1360.9610073.22 1362.2210077.32 1362.4110081.64 1362.48
 10084.48 1362.28

Manning's n Values num= 6
 Sta n Val
 9857.52 .025 9867.47 .045 9934.83 .025 9944.71 .045 9970.8 .04
 10033.08 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9868.2710081.64 2 2 2 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.145

INPUT
 Description: DIBBLE Sta 52+08
 Station Elevation Data num= 48
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9857.53 1366.63 9867.67 1366.65 9868.02 1366.65 9868.3 1366.65 9868.61 1366.6
 9868.66 1366.59 9868.94 1366.55 9869.25 1366.5 9877.39 1365.27 9882.21 1364.45
 9892.78 1362.66 9900.44 1361.43 9921.77 1359.38 9925.52 1359.01 9934.03 1358.48
 9934.11 1358.47 9934.28 1358.46 9934.55 1358.46 9944.87 1358.3 9948.74 1357.65
 9949.78 1357.53 9950.54 1357.8 9950.61 1357.78 9954.36 1356.43 9955.71 1356.43
 9960.34 1357.24 9961.65 1356.78 9969.51 1355.43 9971 1355.43 9978.41 1355.43
 10000 1355.4210003.25 1355.42 10011.3 1355.210020.44 1355.1910034.07 1355.21
 10037.54 1354.6510041.43 1356.1510046.34 1357.3410050.02 1358.1510058.16 1359.87
 10061.95 1360.4610073.28 1362.2 10078.9 1362.4510081.82 1362.510083.73 1362.36
 10085.11 1362.4210089.67 1361.7610099.64 1361.69

Manning's n Values num= 6
 Sta n Val
 9857.53 .025 9867.67 .045 9934.55 .025 9944.87 .045 9969.51 .04
 10037.54 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9868.310081.82 8.32 8.32 8.32 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.144

INPUT
 Description: DIBBLE Sta 52+00
 Station Elevation Data num= 42
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9857.6 1366.59 9863.29 1366.59 9868.55 1366.56 9873.55 1365.79 9877.05 1365.22
 9892.66 1362.79 9901.16 1361.43 9904.43 1361.12 9925.82 1359.03 9928.5 1358.86
 9930.46 1358.78 9935.02 1358.4 9941.9 1358.34 9945.57 1358.28 9946.93 1358.05
 9949.24 1357.78 9951.42 1357.41 9953.32 1356.76 9957.33 1356.76 9958.64 1356.63
 9963.77 1355.63 9966.01 1354.84 9968.71 1354.83 9970.5 1354.72 9971.01 1354.67
 9977.3 1354.64 10000 1354.610001.45 1354.610001.83 1354.610002.41 1354.6
 10037.01 1354.8910037.39 1354.7610055.41 1358.9710059.25 1359.7810065.94 1360.87
 10071.64 1361.810073.51 1362.0910074.98 1362.1610082.42 1362.7910082.82 1362.81
 10090.08 1361.7610105.89 1361.65

Manning's n Values num= 6
 Sta n Val
 9857.6 .025 9868.55 .045 9935.02 .025 9945.57 .045 9966.01 .04
 10037.39 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 9868.5510082.82 74.43 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.125

INPUT
 Description: DIBBLE Sta 51+00
 Station Elevation Data num= 42
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9908.24 1365.96 9909.14 1365.99 9916.05 1366.02 9919.01 1365.72 9919.31 1365.72

9920.67	1365.23	9924.56	1363.58	9928.14	1362.01	9929.85	1361.21	9936.04	1357.82
9938.4	1357.39	9941.22	1356.92	9949.52	1357.01	9951.8	1357.03	9956.03	1356.76
9959.11	1356.6	9964.85	1356.29	9976.45	1356.41	9986.8	1356.56	9990	1354.77
9990.88	1354.26	9992.09	1354.24	10000	1354.1210000.01	1354.1210001.48	1354.1		
10010.86	1353.8710020.61	1354.110023.56	1354.1410034.11	1354.2710041.97	1354.4				
10056.01	1358.5110058.81	1359.310060.67	1359.910066.89	1361.7810074.56	1363.72				
10077.55	1364.52	10079.6	1365.0510082.71	1365.6510085.22	1364.8410089.59	1363.45			
10090.33	1363.38	10094.5	1362.35						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9908.24	.055	9941.22	.025	9949.52	.041	10041.97	.055

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

9919.3110082.71			2	47	122.18	.3	.5
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CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.116

INPUT

Description: DIBBLE Sta 50+53, Just Upstream of Sossaman Road Bridge

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9903.939	1366.279909.288	1366.249909.915	1366.26	9914.7	1366.299919.508	1365.72			
9919.586	1365.729921.189	1365.069921.851	1364.769927.122	1362.19936.557	1357.54				
9936.74	1357.439937.385	1357.39940.966	1356.669943.196	1356.669950.671	1356.62				
9952.057	1356.519953.991	1356.359958.425	1355.969965.935	1355.699973.088	1355.43				
9973.95	1355.419980.162	1354.929984.257	1354.559991.802	1354.12	10000	1354.04			
10011.85	1353.9210016.21	1353.8710017.31	1353.8810017.71	1353.8810018.79	1353.89				
10025.82	1353.9510038.25	1353.910040.11	1353.8910044.13	1355.6310049.94	1358.05				
10060.81	1363.1310065.24	1365.1910065.86	1365.3410067.63	1365.75	10069.5	1366.88			
10071.9	1366.8510072.41	1366.8510078.47	1366.8910082.48	1366.9310084.53	1366.89				

Manning's n Values num= 5

Sta	n Val	Sta	n Val						
9903.939	.055	9919.586	.039	9943.196	.025	9950.671	.03	10069.5	.055

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

9914.7	10069.5		106.37	107	107.63	.3	.5
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BRIDGE

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.115

INPUT

Description: Sossaman Road Bridge

Distance from Upstream XS = 3.34
Deck/Roadway Width = 103
Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num= 10

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
9914.7	1366.29		13509920.037	1366.31	13509934.177	1366.36		1350						
9934.177	1366.36	1362.85	9972.37	1366.511362.989	10013.67	1366.671363.139								
10051.87	1366.811363.278	10051.87	1366.81	1350	10066	1366.87	1350							
10069.5	1366.88	1350												

Upstream Bridge Cross Section Data

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9903.939	1366.279909.288	1366.249909.915	1366.26	9914.7	1366.299919.508	1365.72			
9919.586	1365.729921.189	1365.069921.851	1364.769927.122	1362.19936.557	1357.54				
9936.74	1357.439937.385	1357.39940.966	1356.669943.196	1356.669950.671	1356.62				
9952.057	1356.519953.991	1356.359958.425	1355.969965.935	1355.699973.088	1355.43				
9973.95	1355.419980.162	1354.929984.257	1354.559991.802	1354.12	10000	1354.04			
10011.85	1353.9210016.21	1353.8710017.31	1353.8810017.71	1353.8810018.79	1353.89				
10025.82	1353.9510038.25	1353.910040.11	1353.8910044.13	1355.6310049.94	1358.05				
10060.81	1363.1310065.24	1365.1910065.86	1365.3410067.63	1365.75	10069.5	1366.88			
10071.9	1366.8510072.41	1366.8510078.47	1366.8910082.48	1366.9310084.53	1366.89				

Manning's n Values num= 5

Sta	n Val	Sta	n Val						
9903.939	.055	9919.586	.039	9943.196	.025	9950.671	.03	10069.5	.055

Bank Sta: Left Right Coeff Contr. Expan.

9914.7	10069.5		.3	.5
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Downstream Deck/Roadway Coordinates

num= 10
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 9904 1366.5 13509917.546 1366.47 13509931.686 1366.45 1350
 9931.686 1366.451362.9179969.879 1366.41362.80110011.54 1366.351362.674
 10049.74 1366.311362.55810049.74 1366.31 135010063.88 1366.29 1350
 10071.68 1366.27 1350

Downstream Bridge Cross Section Data

Station Elevation Data num= 35
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 9901.935 1366.5 9904 1366.59910.412 1366.299911.301 1366.319913.418 1365.92
 9929.779 1360.059932.297 1358.5 9935.39 1356.699939.006 1356.139940.086 1356.02
 9940.356 1356.029950.149 1355.929950.384 1355.99953.633 1355.119955.655 1354.99
 9976.773 1353.859977.862 1353.85 10000 1353.8710001.95 1353.8710007.91 1353.85
 10016.5 1353.8310020.14 1353.8210038.04 1353.7810044.79 1356.4110047.67 1357.45
 10048.75 1357.8510049.21 1358.0210057.46 1362.0410066.61 1365.0110067.21 1365.24
 10067.29 1365.2410067.41 1365.2410069.54 1366.1410071.68 1366.2710089.67 1365.97

Manning's n Values num= 5
 Sta n Val
 9901.935 .0559911.301 .039940.356 .0259950.149 .0310069.54 .055

Bank Sta: Left Right Coeff Contr. Expan.
 9911.30110069.54 .3 .5

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

Number of Piers = 2

Pier Data
 Pier Station Upstream= 9972.37 Downstream=9972.917
 Upstream num= 2
 Width Elev Width Elev
 2.5 1350 2.51363.278
 Downstream num= 2
 Width Elev Width Elev
 2.5 1350 2.5 1370

Pier Data
 Pier Station Upstream=10013.67 Downstream=10014.58
 Upstream num= 2
 Width Elev Width Elev
 2.5 1350 2.51363.278
 Downstream num= 2
 Width Elev Width Elev
 2.5 1350 2.5 1370

Number of Bridge Coefficient Sets = 1

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

High Flow Method
 Energy Only

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

CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.096

INPUT
 Description: RM 5.096; DIBBLE Sta 49+46
 Station Elevation Data num= 35
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

9901.935	1366.5	9904	1366.59910.412	1366.299911.301	1366.319913.418	1365.92
9929.779	1360.059932.297		1358.5 9935.39	1356.699939.006	1356.139940.086	1356.02
9940.356	1356.029950.149		1355.929950.384	1355.99953.633	1355.119955.655	1354.99
9976.773	1353.859977.862		1353.85 10000	1353.8710001.95	1353.8710007.91	1353.85
10016.5	1353.8310020.14		1353.8210038.04	1353.7810044.79	1356.4110047.67	1357.45
10048.75	1357.8510049.21		1358.0210057.46	1362.0410066.61	1365.0110067.21	1365.24
10067.29	1365.2410067.41		1365.2410069.54	1366.1410071.68	1366.2710089.67	1365.97

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9901.935	.0559911.301	.039940.356	.0259950.149	.0310069.54	.055		

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

9911.30110069.54		45.54	45.67	43.67	.3	.5
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CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.087

INPUT

Description: RM 5.087; DIBBLE Sta 49+00

Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9862.32	1361.08	9870.2	1360.99	9878.08	1360.62	9878.98	1360.45	9881.79	1360.2
9889.38	1359.47	9891.09	1359.07	9897.44	1358.71	9899.68	1358.42	9904.4	1358.03
9906.48	1357.95	9910.69	1357.67	9918.54	1357.01	9923.16	1356.74	9930.05	1356.31
9938.24	1355.8	9940.17	1355.78	9946.94	1355.66	9949.47	1355.38	9950.51	1355.22
9958.42	1354.41	9958.44	1354.41	9962.7	1353.84	9969.02	1353.63	9969.14	1353.63
9969.97	1353.63	10000	1353.7910000.01	1353.79	10006.7	1353.8310036.84	1353.95		
10036.98	1353.9510037.01	1353.9510037.03	1353.9510037.09	1353.9510044.05	1354				
10053.91	1354.0710054.06	1354.0810072.66	1355.9710075.36	1356.2710076.15	1356.38				
10083.48	1357.1810084.91	1357.2610086.11	1357.4110086.78	1357.5210090.65	1357.85				
10111.39	1358.6510114.27	1358.6410116.32	1358.5910123.68	1358.710136.69	1359.23				

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9862.32	.025	9870.2	.055	9938.24	.025	9946.94	.055
10053.91	.055					9969.02	.04

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

9870.210111.39		2	2	2	.1	.3
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CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.086

INPUT

Description: DIBBLE Sta 48+98,
 Just Downstream of Sossaman Road Bridge

Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9849.92	1361.37	9857.79	1360.95	9864.49	1360.84	9870.47	1360.77	9878.91	1360.38
9880.65	1360.33	9889.72	1359.46	9891.08	1359.14	9896.16	1358.85	9897.95	1358.62
9904.4	1358.08	9906.29	1358.01	9910.13	1357.76	9920.21	1356.91	9926.15	1356.56
9931.51	1356.23	9937.89	1355.83	9941.28	1355.79	9946.69	1355.7	9950.13	1355.32
9950.57	1355.25	9953.93	1354.9	9962.41	1353.86	9962.65	1353.83	9963.02	1353.82
9968.18	1353.67	9968.72	1353.65	9975.42	1353.49	10000	1353.6210006.19	1353.65	
10030.82	1353.7510038.02	1353.9210038.59	1353.9210039.33	1353.9110045.74	1353.83				
10046.27	1353.8210053.48	1353.8710065.28	1355.17	10066.9	1355.3310067.23	1355.37			
10077.21	1356.2910081.56	1356.7710082.32	1356.8110084.46	1357.0710085.67	1357.29				
10092.57	1357.8710109.99	1358.5410114.62	1358.5110116.03	1358.4810121.11	1358.56				
10132.91	1359.0410136.81	1359.19							

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9849.92	.055	9864.49	.025	9880.65	.055	9937.89	.025
9962.65	.0410053.48	.055				9946.69	.055

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

9870.4710109.99		81.6	74.37	67.14	.1	.3
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CROSS SECTION

RIVER: Queen Creek Wash
 REACH: Reach 1 RS: 5.073

INPUT

Description: DIBBLE Sta 48+24; CVL Sta 60+00
 Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9849.99	1364.87	9854.56	1365.26	9857.33	1365.52	9864.72	1366.27	9866.27	1366.39
9866.62	1366.49	9875.15	1368.01	9889.09	1359.82	9892.2	1357.88	9894.4	1357.86
9919.27	1357.57	9923.21	1357.53	9928.7	1357.51	9935.38	1356.74	9939.26	1356.42
9959.33	1354.22	9964.52	1353.66	9982.14	1353.22	9989.34	1353.05	9994.13	1352.92
9996.15	1352.88	9997.16	1352.85	10000	1352.8	10004.2	1352.7210012.31	1352.85	
10014.28	1352.8810041.29		1352.9410055.56		1353.0410063.03		1354.6210064.33	1354.89	
10064.83	1354.8610065.12		1354.8810066.13		1354.910075.65		1355.1710085.41	1355.42	
10086.6	1355.4410089.15		1356.1310091.75		1356.89	10098.8	1356.8210107.55	1357.16	
10110.42	1357.1610116.24		1357.5510118.16		1357.7410120.78		1357.9710123.65	1358.22	
10123.72	1358.2210129.58		1358.3810148.31		1358.8110153.05		1358.9410153.24	1358.94	

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9849.99	.055	9919.27	.025	9928.7	.055	9964.52	.0410055.56	.055	

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9875.1510129.58 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.054

INPUT

Description: DIBBLE Sta 47+24; CVL Sta 60+00

Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9850	1369.69	9862.05	1372.15	9868.34	1373.36	9876.5	1368.13	9879.58	1366.32
9892.85	1358.13	9918.1	1357.41	9921.09	1357.32	9927.72	1357.11	9928.39	1357.12
9936.99	1357.23	9947.85	1356	9948.3	1355.95	9952.25	1355.43	9968.25	1353.39
9974.96	1353.27	9983.63	1353.11	9988.8	1352.96	9992.89	1352.89	10000	1352.79
10008.09	1352.6810020.84		1352.810023.35		1352.810027.99		1352.8310030.52	1352.83	
10036.17	1352.8610049.16		1352.9310049.83		1352.9610055.86		1353.1610066.33	1354.34	
10066.63	1354.3710071.97		1354.7910096.65		1356.7210113.67		1358.0910126.06	1358.37	
10127.85	1358.4510132.27		1358.52						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9850	.055	9868.34	.04	9927.72	.025	9936.99	.0410113.67	.055	

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9868.3410113.67 100 100 100 .1 .3

CROSS SECTION

RIVER: Queen Creek Wash
REACH: Reach 1 RS: 5.035

INPUT

Description: END OF DETAILED STUDY; DIBBLE Sta 46+24;
CVL Sta 60+00

Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9849.97	1373.1	9852.15	1373.16	9859.79	1374.07	9867.81	1375.13	9877.73	1368.43
9891.85	1358.55	9891.95	1358.48	9925.48	1357.39	9928.39	1357.29	9928.77	1357.29
9938.71	1357.16	9946.7	1356.49	9950.16	1356.17	9953.11	1355.93	9966.93	1353.81
9973.33	1352.81	9975.17	1352.81	9981.51	1352.79	10000	1352.7510000.01	1352.75	
10014.35	1352.7210036.26		1352.910039.02		1352.9310039.44		1352.9310045.92	1353.15	
10055.56	1353.4910059.61		1353.6210064.53		1354.4910078.77		1357.0410089.49	1357.85	
10102.33	1358.810111.68		1359.4510120.46		1359.4510121.68		1359.4510127.08	1359.46	
10132.13	1359.47								

Manning's n Values num= 5

Sta	n Val	Sta	n Val						
9849.97	.055	9867.81	.04	9928.77	.025	9938.71	.0410111.68	.055	

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9867.8110111.68 0 0 0 .1 .3

SUMMARY OF MANNING'S N VALUES

River: Queen Creek Wash

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8	n9
Reach 1	6.529	.055	.04	.055						
Reach 1	6.528	Bridge								
Reach 1	6.513	.055	.04	.055						

Reach 1	6.508	.055	.045	.04	.025	.045	.055		
Reach 1	6.489	.055	.045	.04	.025	.045	.055		
Reach 1	6.470	.055	.045	.04	.045	.025	.045	.055	
Reach 1	6.451	.055	.045	.04	.045	.025	.045	.055	
Reach 1	6.432	.055	.045	.04	.025	.045	.055		
Reach 1	6.413	.055	.045	.04	.045	.025	.045	.055	
Reach 1	6.394	.055	.045	.04	.045	.025	.045	.055	
Reach 1	6.375	.055	.045	.04	.045	.025	.045	.055	
Reach 1	6.356	.055	.045	.04	.045	.025	.045	.055	
Reach 1	6.337	.055	.045	.04	.045	.025	.045	.055	
Reach 1	6.318	.055	.045	.04	.045	.025	.045	.055	
Reach 1	6.299	.055	.045	.04	.045	.025	.045	.055	
Reach 1	6.281	.055	.045	.04	.045	.025	.045	.055	
Reach 1	6.262	.055	.045	.04	.045	.025	.045	.055	
Reach 1	6.243	.055	.04	.055	.025	.055			
Reach 1	6.242	.055	.04	.055	.025	.055			
Reach 1	6.241	.055	.04	.055	.025	.055			
Reach 1	6.224	.055	.04	.055	.025	.055			
Reach 1	6.205	.055	.04	.055	.025	.055			
Reach 1	6.186	.055	.04	.045	.055	.025	.055		
Reach 1	6.167	.055	.045	.04	.045	.055	.025	.055	
Reach 1	6.148	.055	.045	.04	.045	.055	.025		
Reach 1	6.129	.055	.045	.04	.045	.025			
Reach 1	6.110	.055	.045	.04	.045	.025			
Reach 1	6.091	.055	.045	.04	.045	.025	.055		
Reach 1	6.072	.055	.045	.04	.045	.025			
Reach 1	6.053	.055	.045	.04	.045	.025	.045		
Reach 1	6.034	.055	.045	.04	.045	.055	.025		
Reach 1	6.015	.055	.045	.04	.045	.055	.025	.055	
Reach 1	5.996	.055	.045	.04	.045	.055	.025	.055	
Reach 1	5.977	.055	.045	.025	.045	.04	.045	.055	.025
Reach 1	5.959	.055	.045	.04	.025	.04	.045	.055	.025
Reach 1	5.940	.055	.045	.04	.045	.025	.045	.055	.055
Reach 1	5.921	.055	.045	.04	.045	.025	.045	.055	
Reach 1	5.902	.055	.045	.04	.045	.025	.045		
Reach 1	5.883	.055	.045	.04	.045	.025	.045		
Reach 1	5.864	.055	.045	.04	.045	.025	.045		
Reach 1	5.845	.055	.045	.04	.045	.025	.045		
Reach 1	5.826	.055	.045	.04	.045	.025	.045		
Reach 1	5.807	.055	.045	.04	.045	.025	.045		
Reach 1	5.788	.055	.045	.04	.045	.025	.045		
Reach 1	5.769	.055	.045	.04	.045	.025	.045		
Reach 1	5.750	.055	.045	.04	.045	.025	.045		
Reach 1	5.731	.055	.04	.045	.025	.045			
Reach 1	5.712	.055	.04	.045	.025	.045			
Reach 1	5.693	.055	.04	.045	.025	.045	.055		
Reach 1	5.674	.055	.04	.045	.055	.025	.055		
Reach 1	5.656	.055	.04	.045	.025	.045			
Reach 1	5.637	.055	.045	.04	.045	.025	.045	.055	
Reach 1	5.618	.055	.045	.04	.045	.025	.055		
Reach 1	5.599	.055	.045	.04	.045	.025	.045	.055	
Reach 1	5.580	.055	.045	.04	.045	.025	.045	.055	
Reach 1	5.561	.055	.045	.04	.045	.025	.045	.055	
Reach 1	5.542	.055	.045	.04	.045	.025	.045	.055	
Reach 1	5.523	.055	.045	.025	.045	.055			
Reach 1	5.504	.055	.045	.04	.045	.025	.045	.055	
Reach 1	5.485	.055	.045	.04	.045	.025	.045	.055	
Reach 1	5.466	.055	.045	.04	.045	.025	.045	.055	
Reach 1	5.447	.055	.045	.04	.045	.025	.045	.055	
Reach 1	5.428	.055	.045	.04	.045	.025	.045	.055	
Reach 1	5.409	.055	.045	.04	.045	.025	.045	.055	
Reach 1	5.390	.055	.045	.04	.045	.025	.045	.055	
Reach 1	5.371	.055	.04	.045	.025	.045	.055		
Reach 1	5.352	.055	.045	.04	.025	.045	.055		
Reach 1	5.334	.055	.045	.025	.045	.04	.045	.055	
Reach 1	5.315	.055	.025	.045	.04	.045	.055		
Reach 1	5.296	.025	.045	.04	.045	.055			
Reach 1	5.277	.025	.045	.04	.045	.055			
Reach 1	5.258	.025	.045	.04	.045	.055			
Reach 1	5.239	.025	.045	.04	.045	.055			
Reach 1	5.220	.025	.045	.04	.045	.055			
Reach 1	5.201	.025	.045	.04	.055				
Reach 1	5.182	.025	.045	.025	.045	.04	.055		
Reach 1	5.163	.055	.045	.025	.045	.04	.055		
Reach 1	5.146	.025	.045	.025	.045	.04	.055		
Reach 1	5.145	.025	.045	.025	.045	.04	.055		
Reach 1	5.144	.025	.045	.025	.045	.04	.055		
Reach 1	5.125	.055	.025	.04	.055				
Reach 1	5.116	.055	.03	.025	.03	.055			
Reach 1	5.115	Bridge							
Reach 1	5.096	.055	.03	.025	.03	.055			
Reach 1	5.087	.025	.055	.025	.055	.04	.055		
Reach 1	5.086	.055	.025	.055	.025	.055	.04	.055	
Reach 1	5.073	.055	.025	.055	.04	.055			
Reach 1	5.054	.055	.04	.025	.04	.055			
Reach 1	5.035	.055	.04	.025	.04	.055			

SUMMARY OF REACH LENGTHS

River: Queen Creek Wash

Reach	River Sta.	Left	Channel	Right
Reach 1	6.529	80.88	84.93	91.74
Reach 1	6.528	Bridge		
Reach 1	6.513	89.29	28.29	2
Reach 1	6.508	100	100	67.68
Reach 1	6.489	100	100	100
Reach 1	6.470	113.51	99.92	86.41
Reach 1	6.451	106.56	99.92	93.43
Reach 1	6.432	103.08	100.01	96.92
Reach 1	6.413	111.6	100	88.35
Reach 1	6.394	111.6	100	88.35
Reach 1	6.375	111.6	100	88.35
Reach 1	6.356	111.6	100	88.35
Reach 1	6.337	111.6	100	88.35
Reach 1	6.318	111.6	100	88.35
Reach 1	6.299	111.6	100	88.35
Reach 1	6.281	103.75	100	96.24
Reach 1	6.262	100	100	100
Reach 1	6.243	2.54	2.54	2.54
Reach 1	6.242	2	2	2
Reach 1	6.241	95.46	95.46	95.46
Reach 1	6.224	100	100	100
Reach 1	6.205	100.26	100	99.74
Reach 1	6.186	100	100	100
Reach 1	6.167	100	100	100
Reach 1	6.148	100	100	100
Reach 1	6.129	99.21	100	100.79
Reach 1	6.110	91.91	100	108.06
Reach 1	6.091	100	100	100
Reach 1	6.072	100	100	100
Reach 1	6.053	100	100	100
Reach 1	6.034	100	100	100
Reach 1	6.015	86.75	100	113.17
Reach 1	5.996	87.22	100	112.7
Reach 1	5.977	100	100	100
Reach 1	5.959	100	100	100
Reach 1	5.940	97.06	100	102.94
Reach 1	5.921	100	100	100
Reach 1	5.902	100	100	100
Reach 1	5.883	100	100	100
Reach 1	5.864	107.18	100	92.8
Reach 1	5.845	107.49	100	92.49
Reach 1	5.826	107.49	100	92.49
Reach 1	5.807	100.11	100	99.89
Reach 1	5.788	100	100	100
Reach 1	5.769	100	100	100
Reach 1	5.750	100	100	100
Reach 1	5.731	86.36	100	113.55
Reach 1	5.712	78.5	100	121.33
Reach 1	5.693	78.5	100	121.32
Reach 1	5.674	78.5	100	121.32
Reach 1	5.656	96.04	100	103.95
Reach 1	5.637	100	100	100
Reach 1	5.618	100	100	100
Reach 1	5.599	100	100	100
Reach 1	5.580	100	100	100
Reach 1	5.561	100	100	100
Reach 1	5.542	100	100	100
Reach 1	5.523	100	100	100
Reach 1	5.504	92.76	100	107.21
Reach 1	5.485	100	100	100
Reach 1	5.466	100	100	100
Reach 1	5.447	100	100	100
Reach 1	5.428	100	100	100
Reach 1	5.409	100	100	100
Reach 1	5.390	91.21	100	108.74
Reach 1	5.371	100	100	100
Reach 1	5.352	109.12	99.99	90.84
Reach 1	5.334	109.43	100	90.53
Reach 1	5.315	100	100	100
Reach 1	5.296	100	100	100
Reach 1	5.277	100	100	100
Reach 1	5.258	100	100	100
Reach 1	5.239	100	100	100
Reach 1	5.220	100	100	100
Reach 1	5.201	100	100	100
Reach 1	5.182	100	100	100
Reach 1	5.163	89.68	89.68	89.68
Reach 1	5.146	2	2	2
Reach 1	5.145	8.32	8.32	8.32
Reach 1	5.144	74.43	100	100
Reach 1	5.125	2	47	122.18
Reach 1	5.116	106.37	107	107.63

Reach 1	5.115	Bridge			
Reach 1	5.096	45.54	45.67	43.67	
Reach 1	5.087	2	2	2	
Reach 1	5.086	81.6	74.37	67.14	
Reach 1	5.073	100	100	100	
Reach 1	5.054	100	100	100	
Reach 1	5.035	0	0	0	

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Queen Creek Wash

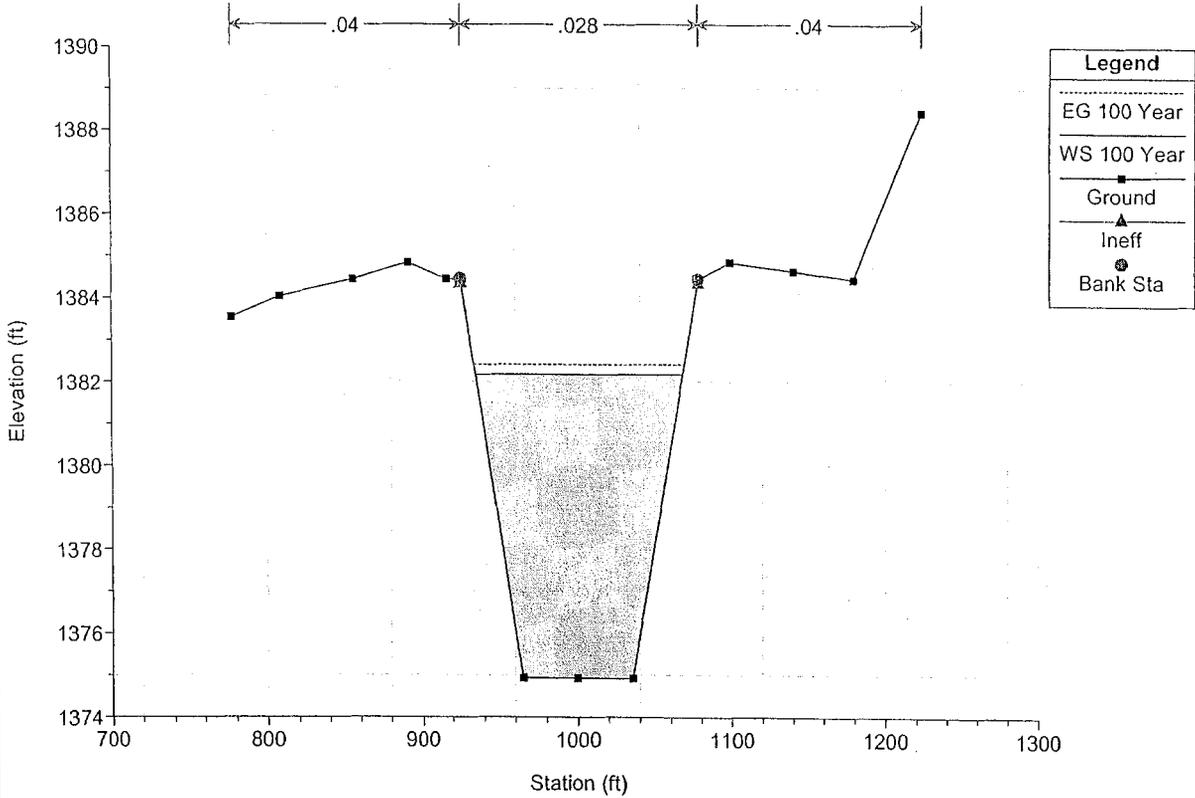
Reach	River Sta.	Contr.	Expan.
Reach 1	6.529	.3	.5
Reach 1	6.528	Bridge	
Reach 1	6.513	.3	.5
Reach 1	6.508	.1	.3
Reach 1	6.489	.1	.3
Reach 1	6.470	.1	.3
Reach 1	6.451	.1	.3
Reach 1	6.432	.1	.3
Reach 1	6.413	.1	.3
Reach 1	6.394	.1	.3
Reach 1	6.375	.1	.3
Reach 1	6.356	.1	.3
Reach 1	6.337	.1	.3
Reach 1	6.318	.1	.3
Reach 1	6.299	.1	.3
Reach 1	6.281	.1	.3
Reach 1	6.262	.1	.3
Reach 1	6.243	.1	.3
Reach 1	6.242	.1	.3
Reach 1	6.241	.1	.3
Reach 1	6.224	.1	.3
Reach 1	6.205	.1	.3
Reach 1	6.186	.1	.3
Reach 1	6.167	.1	.3
Reach 1	6.148	.1	.3
Reach 1	6.129	.1	.3
Reach 1	6.110	.1	.3
Reach 1	6.091	.1	.3
Reach 1	6.072	.1	.3
Reach 1	6.053	.1	.3
Reach 1	6.034	.1	.3
Reach 1	6.015	.1	.3
Reach 1	5.996	.1	.3
Reach 1	5.977	.1	.3
Reach 1	5.959	.1	.3
Reach 1	5.940	.1	.3
Reach 1	5.921	.1	.3
Reach 1	5.902	.1	.3
Reach 1	5.883	.1	.3
Reach 1	5.864	.1	.3
Reach 1	5.845	.1	.3
Reach 1	5.826	.1	.3
Reach 1	5.807	.1	.3
Reach 1	5.788	.1	.3
Reach 1	5.769	.1	.3
Reach 1	5.750	.1	.3
Reach 1	5.731	.1	.3
Reach 1	5.712	.1	.3
Reach 1	5.693	.1	.3
Reach 1	5.674	.1	.3
Reach 1	5.656	.1	.3
Reach 1	5.637	.1	.3
Reach 1	5.618	.1	.3
Reach 1	5.599	.1	.3
Reach 1	5.580	.1	.3
Reach 1	5.561	.1	.3
Reach 1	5.542	.1	.3
Reach 1	5.523	.1	.3
Reach 1	5.504	.1	.3
Reach 1	5.485	.1	.3
Reach 1	5.466	.1	.3
Reach 1	5.447	.1	.3
Reach 1	5.428	.1	.3
Reach 1	5.409	.1	.3
Reach 1	5.390	.1	.3
Reach 1	5.371	.1	.3
Reach 1	5.352	.1	.3
Reach 1	5.334	.1	.3
Reach 1	5.315	.1	.3
Reach 1	5.296	.1	.3
Reach 1	5.277	.1	.3
Reach 1	5.258	.1	.3

Reach 1	5.239	.1	.3
Reach 1	5.220	.1	.3
Reach 1	5.201	.1	.3
Reach 1	5.182	.1	.3
Reach 1	5.163	.1	.3
Reach 1	5.146	.1	.3
Reach 1	5.145	.1	.3
Reach 1	5.144	.1	.3
Reach 1	5.125	.3	.5
Reach 1	5.116	.3	.5
Reach 1	5.115	Bridge	
Reach 1	5.096	.3	.5
Reach 1	5.087	.1	.3
Reach 1	5.086	.1	.3
Reach 1	5.073	.1	.3
Reach 1	5.054	.1	.3
Reach 1	5.035	.1	.3

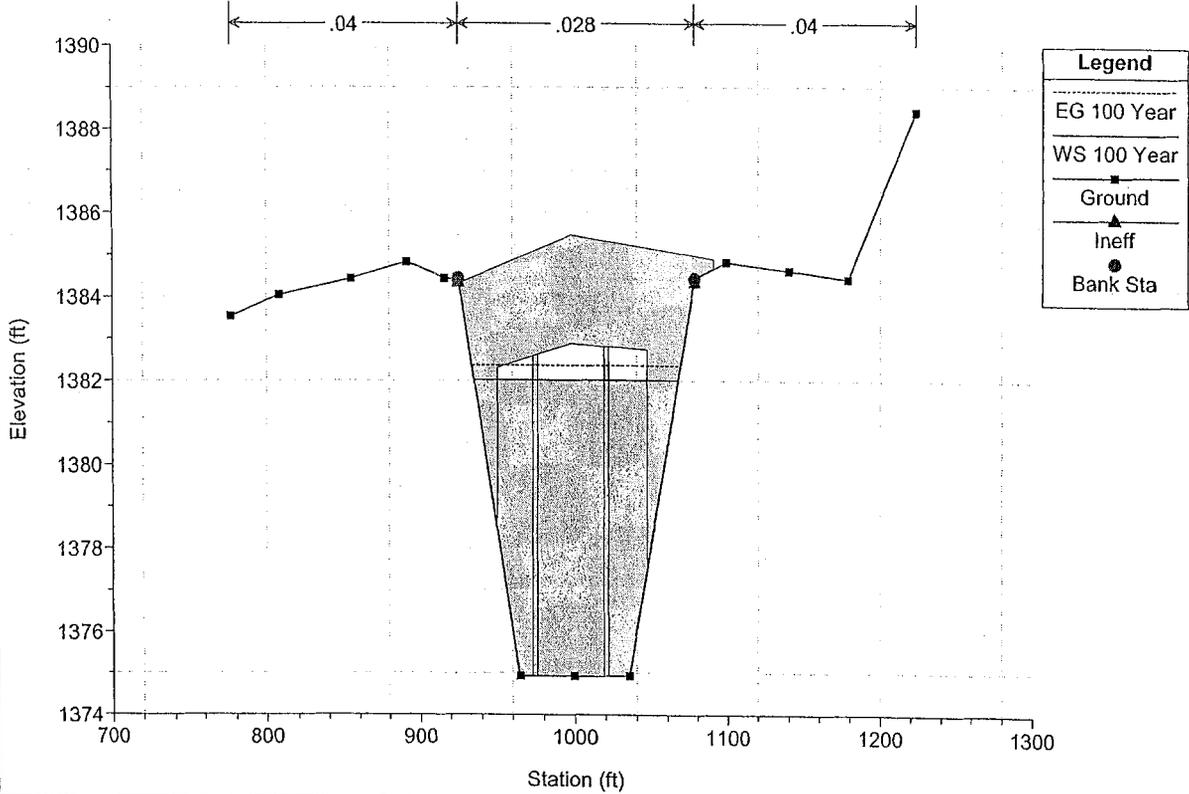
APPENDIX E.4

PRE PROJECT CONDITION HECRAS CROSS SECTION PLOTS

QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 1000.4 Collins/Pina Sta 1000+40. Just Upstream from Hawes Road. Collin

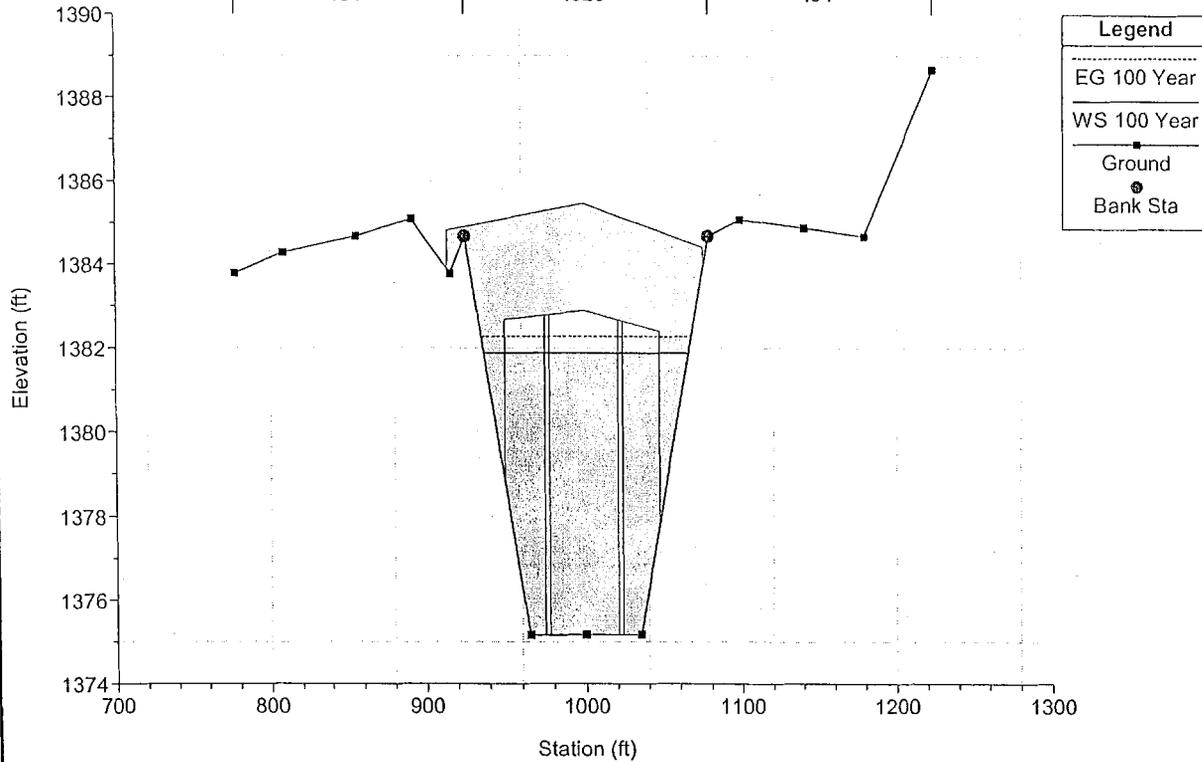
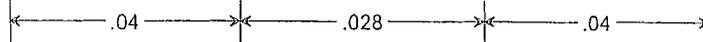


QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 1000 BR Bridge #5 - HAWES ROAD



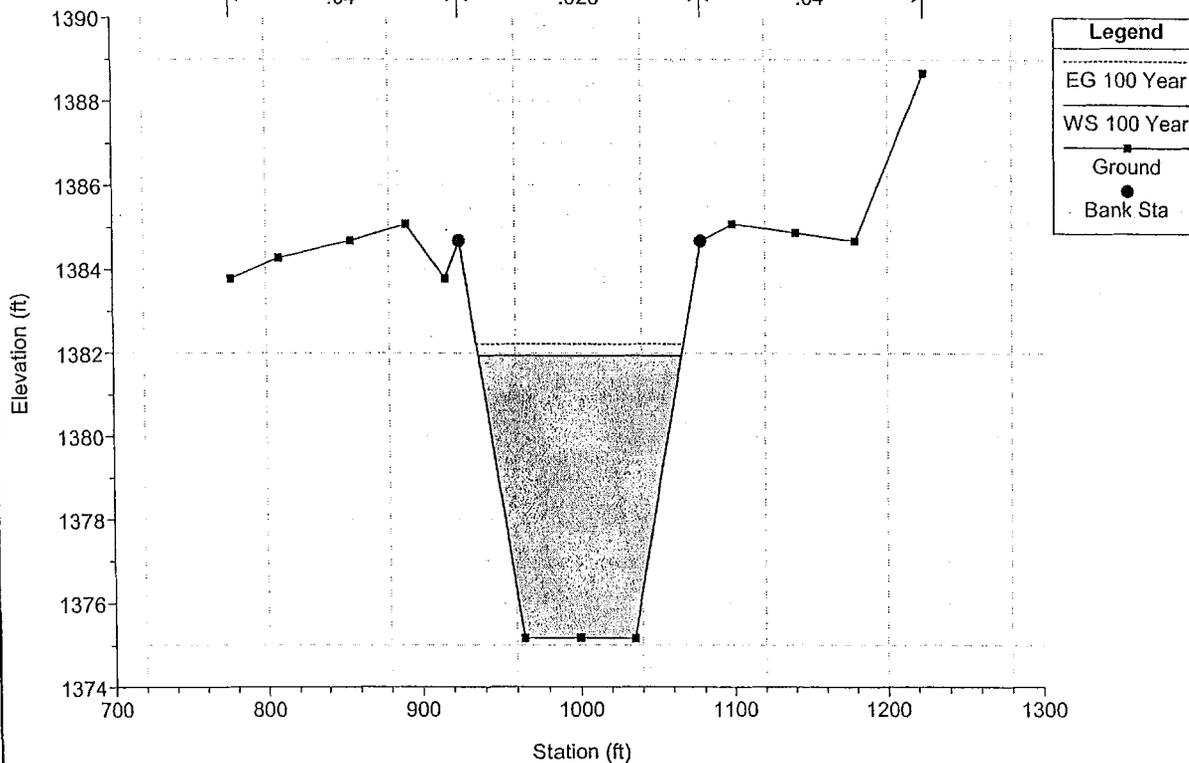
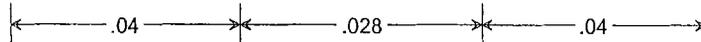
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006

River = RIVER-1 Reach = Reach-1 RS = 1000 BR Bridge #5 - HAWES ROAD

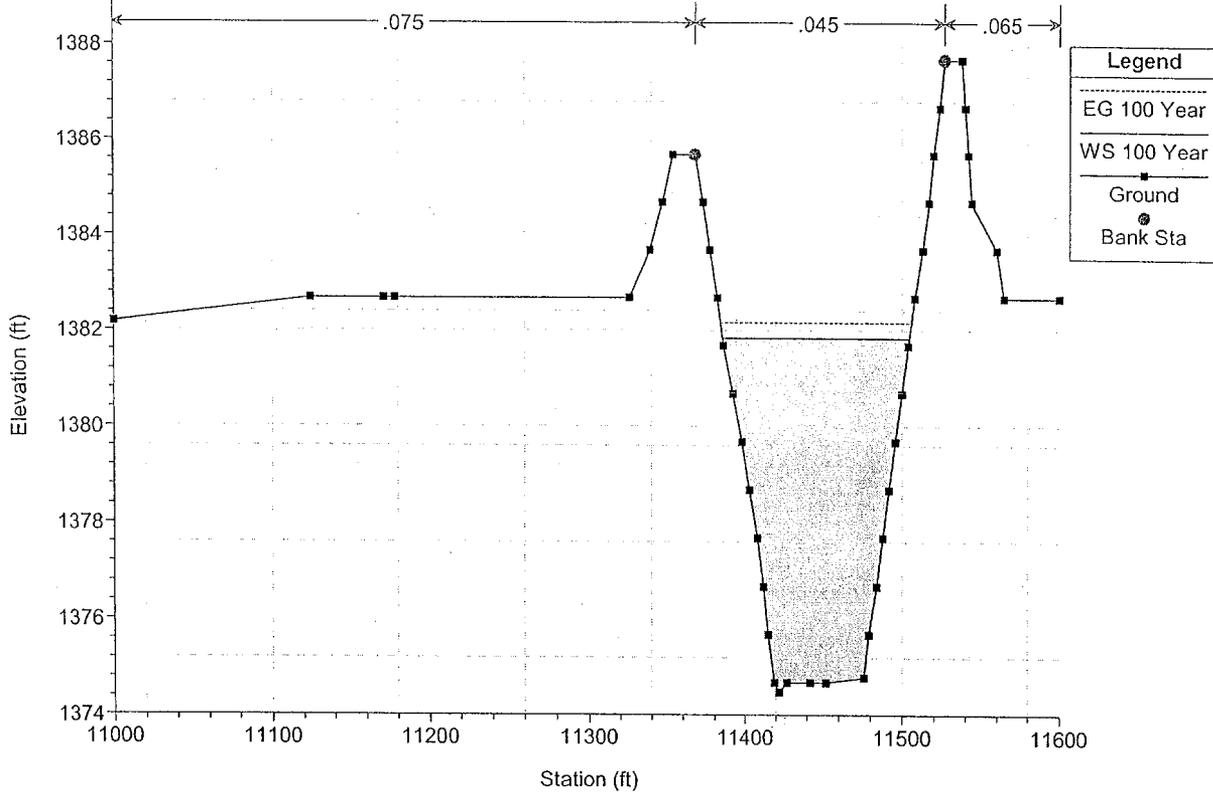


QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006

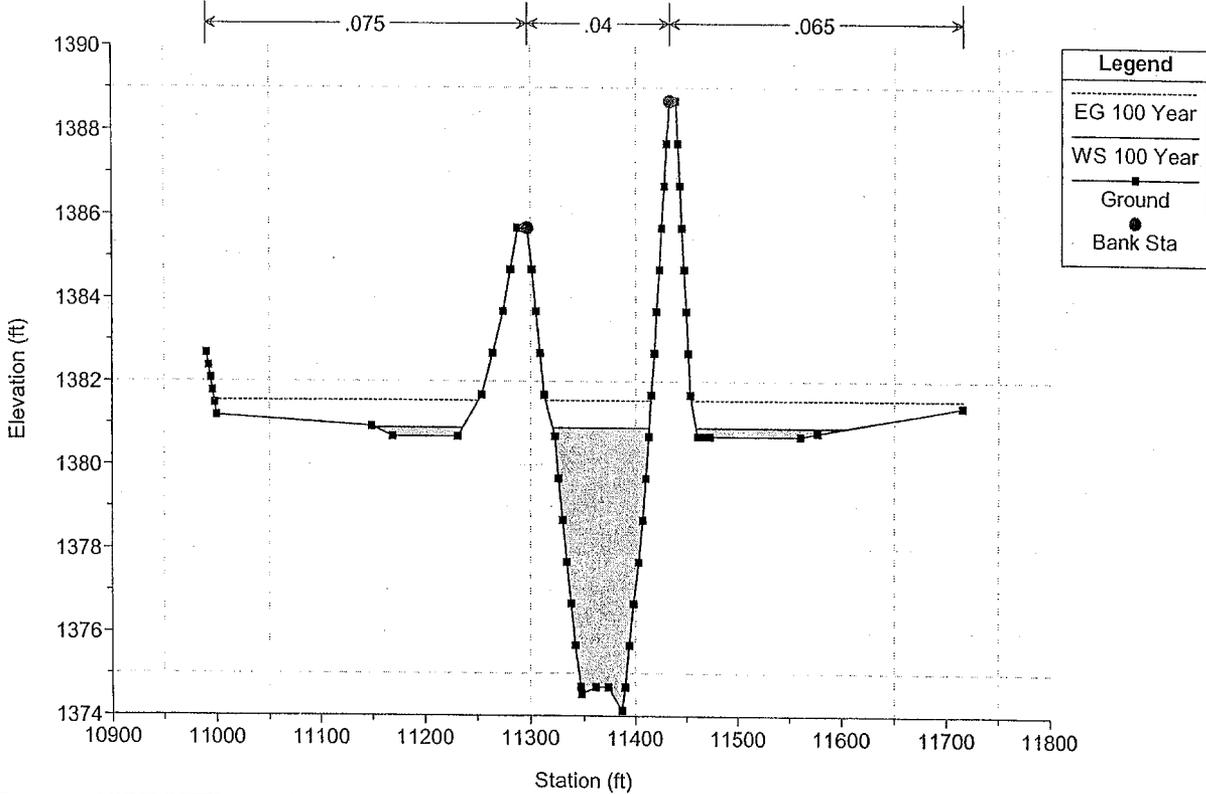
River = RIVER-1 Reach = Reach-1 RS = 6.507 Dibble Sta 6.507 - Flood Control District Sta 6.470. FCD cross



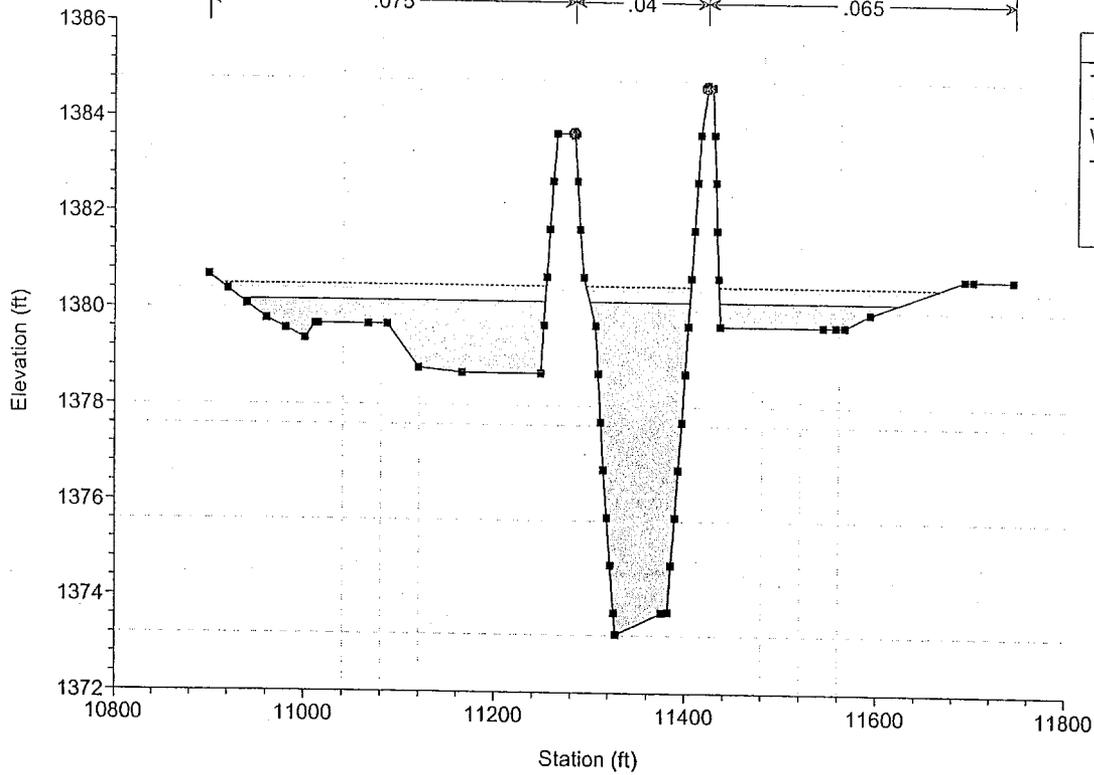
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 6.504 Dibble Sta 6.504 - Flood Control District Sta 6.467. FCD cross



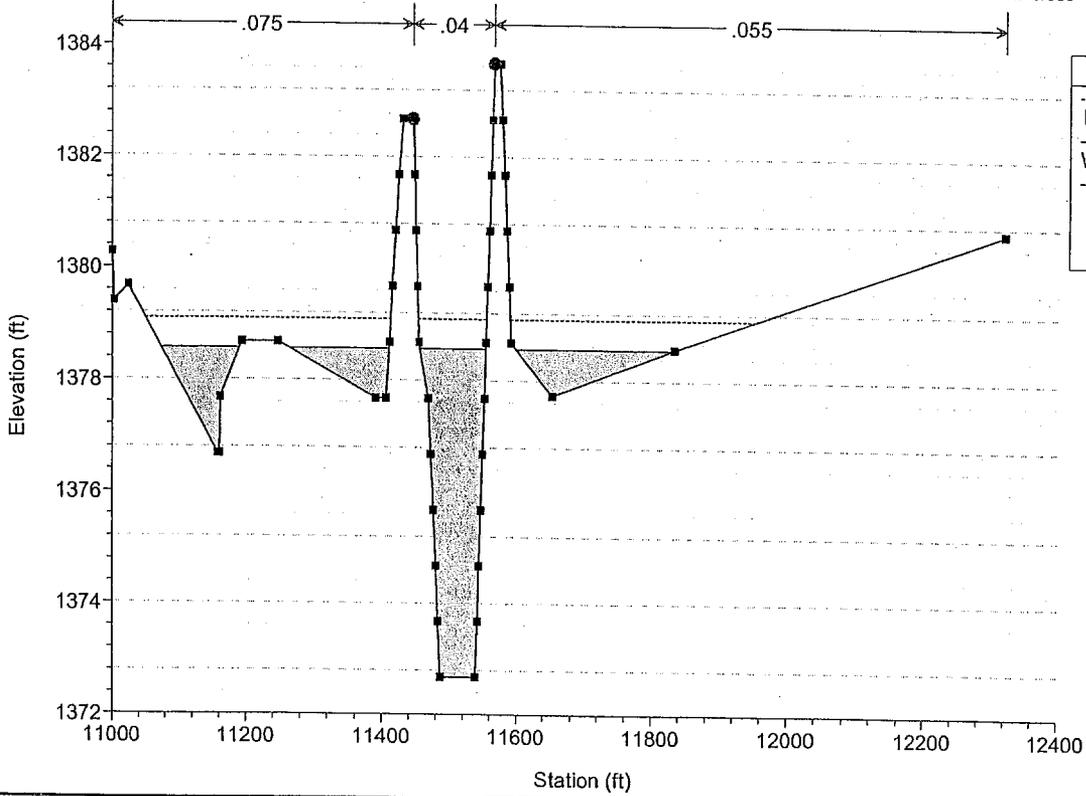
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 6.463 Dibble Sta 6.463 - Flood Control District Sta 6.426. FCD cross



QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 6.397 Dibble Sta 6.397 - Flood Control District Sta 6.360. FCD cross

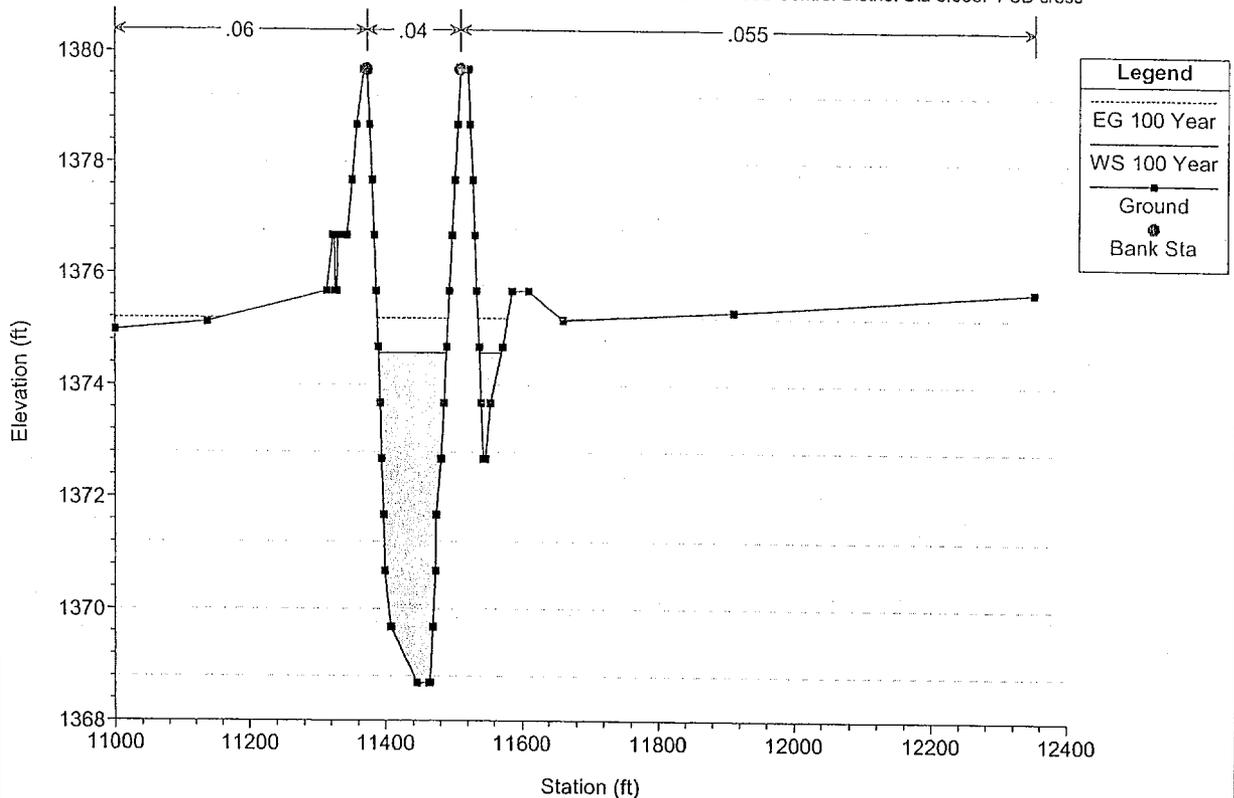


QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 6.316 Dibble Sta 6.316 - Flood Control District Sta 6.279. FCD cross



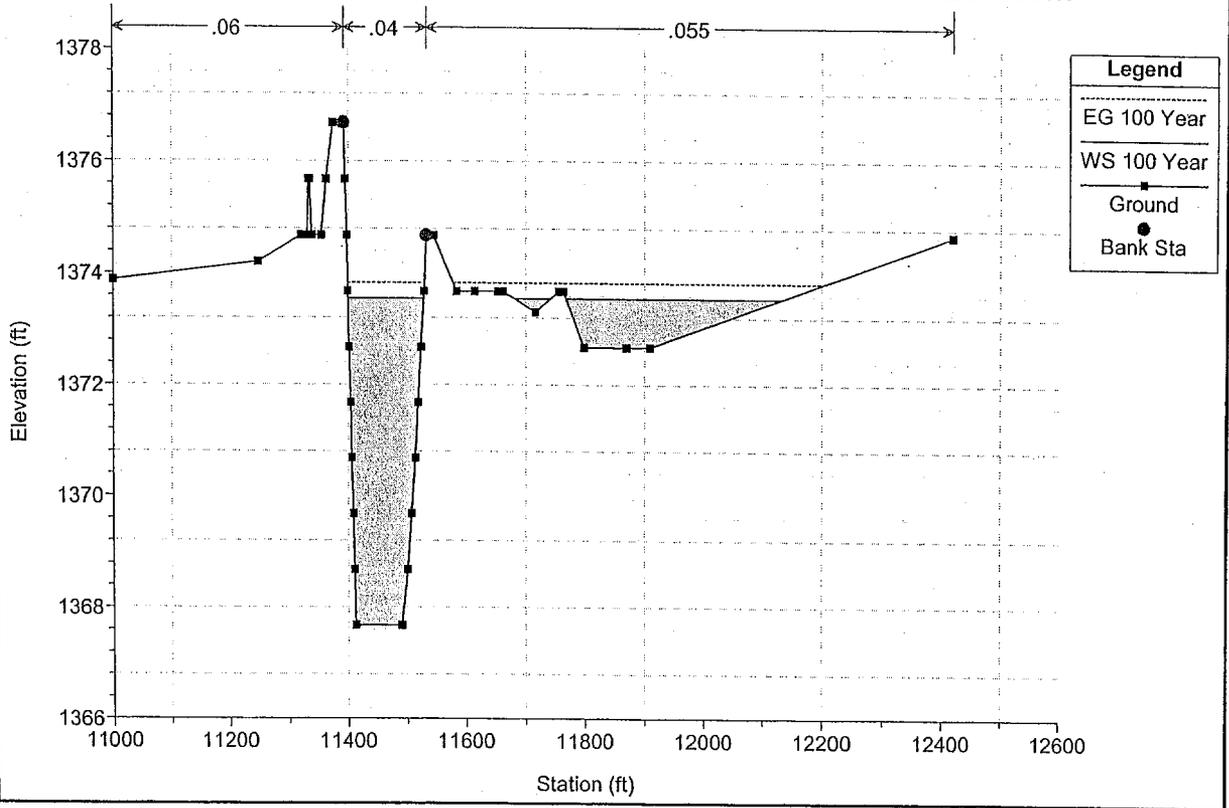
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006

River = RIVER-1 Reach = Reach-1 RS = 6.070 Dibble Sta 6.070 - Flood Control District Sta 6.033. FCD cross



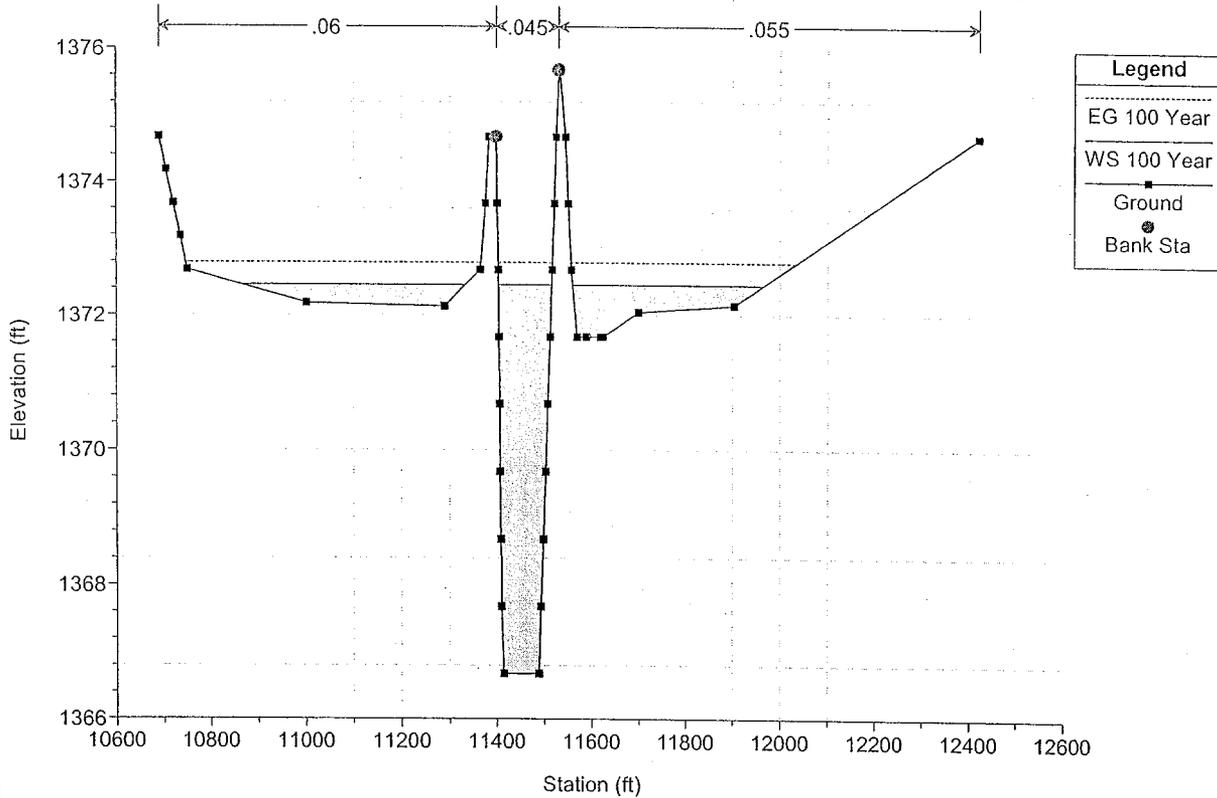
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006

River = RIVER-1 Reach = Reach-1 RS = 5.975 Dibble Sta 5.975 - Flood Control District Sta 5.938. FCD cross



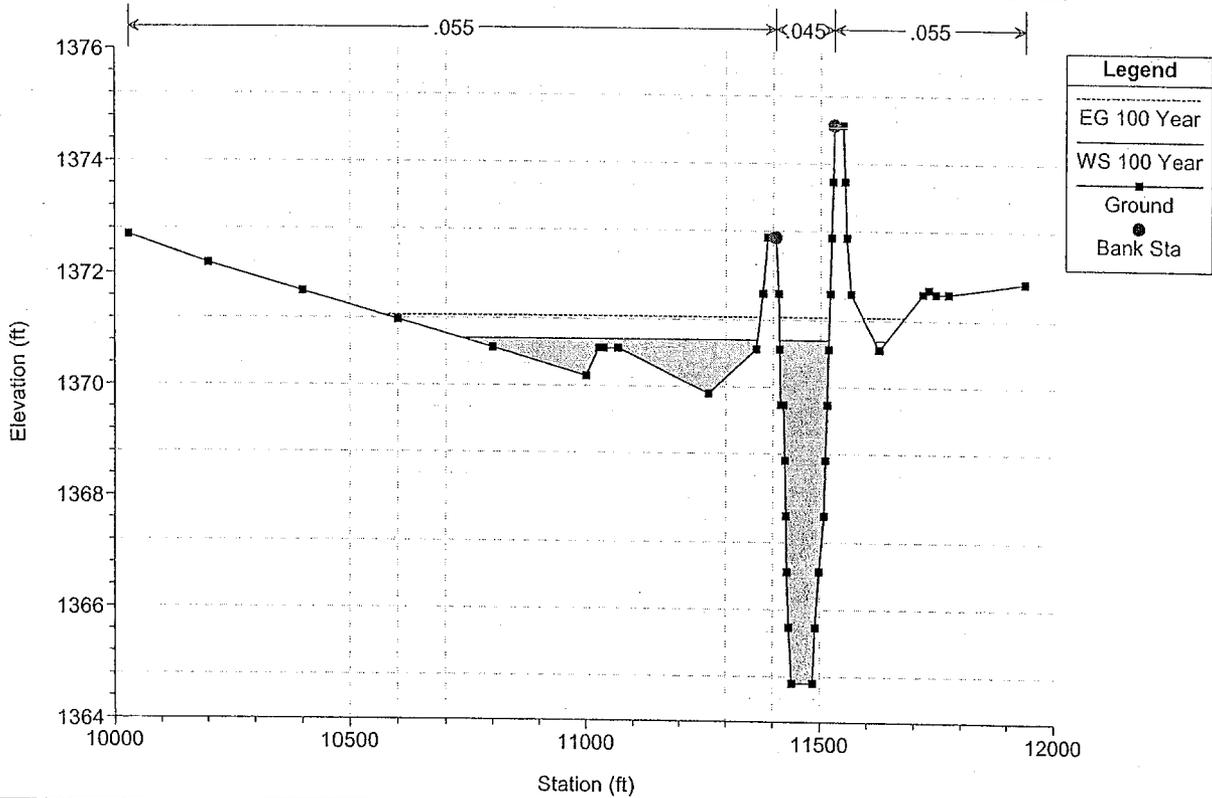
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006

River = RIVER-1 Reach = Reach-1 RS = 5.880 Dibble Sta 5.880 - Flood Control District Sta 5.843. FCD cross



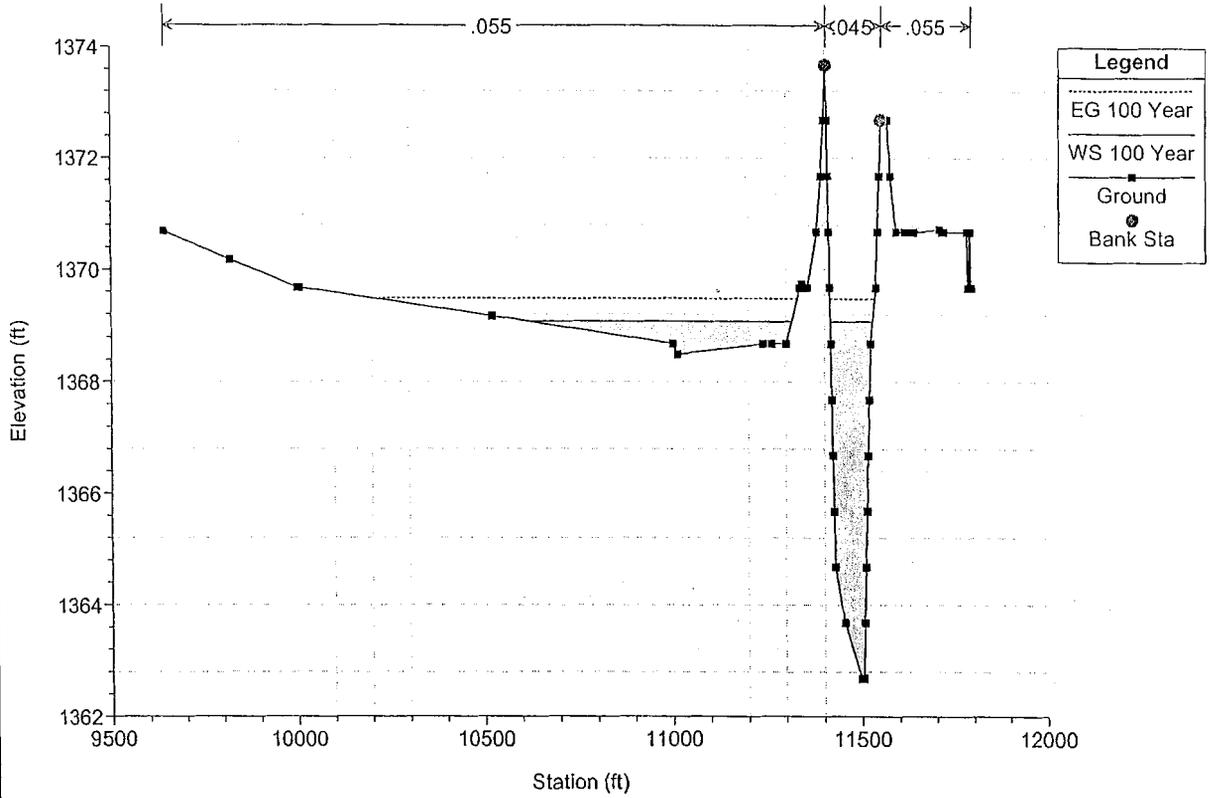
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006

River = RIVER-1 Reach = Reach-1 RS = 5.785 Dibble Sta 5.785 - Flood Control District Sta 5.748. FCD cross



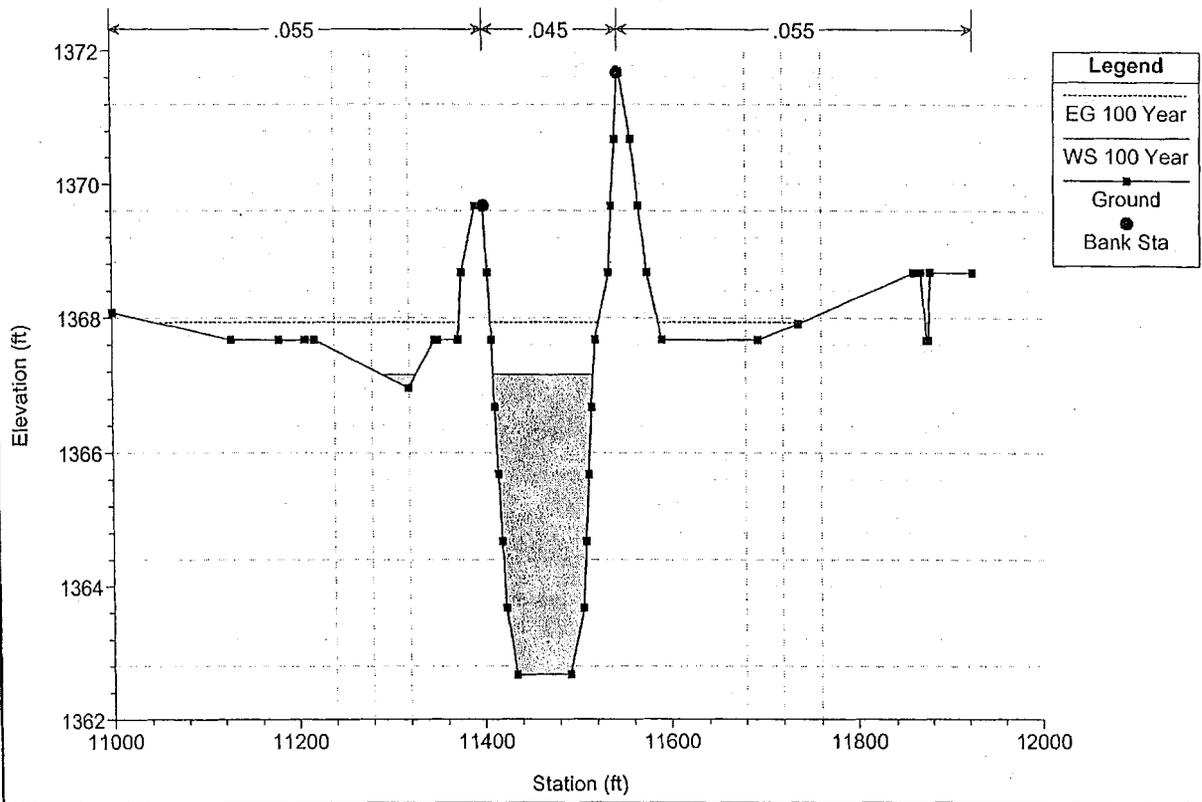
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006

River = RIVER-1 Reach = Reach-1 RS = 5.691 Dibble Sta 5.691 - Flood Control District Sta 5.654. FCD cross

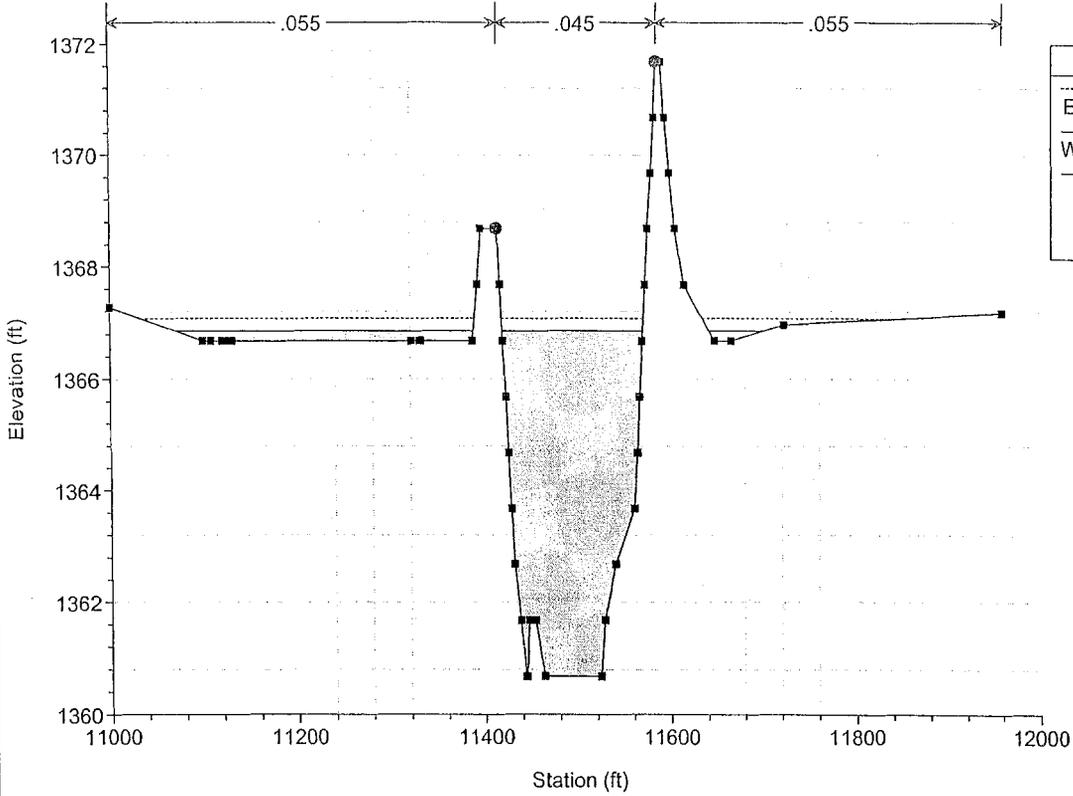


QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006

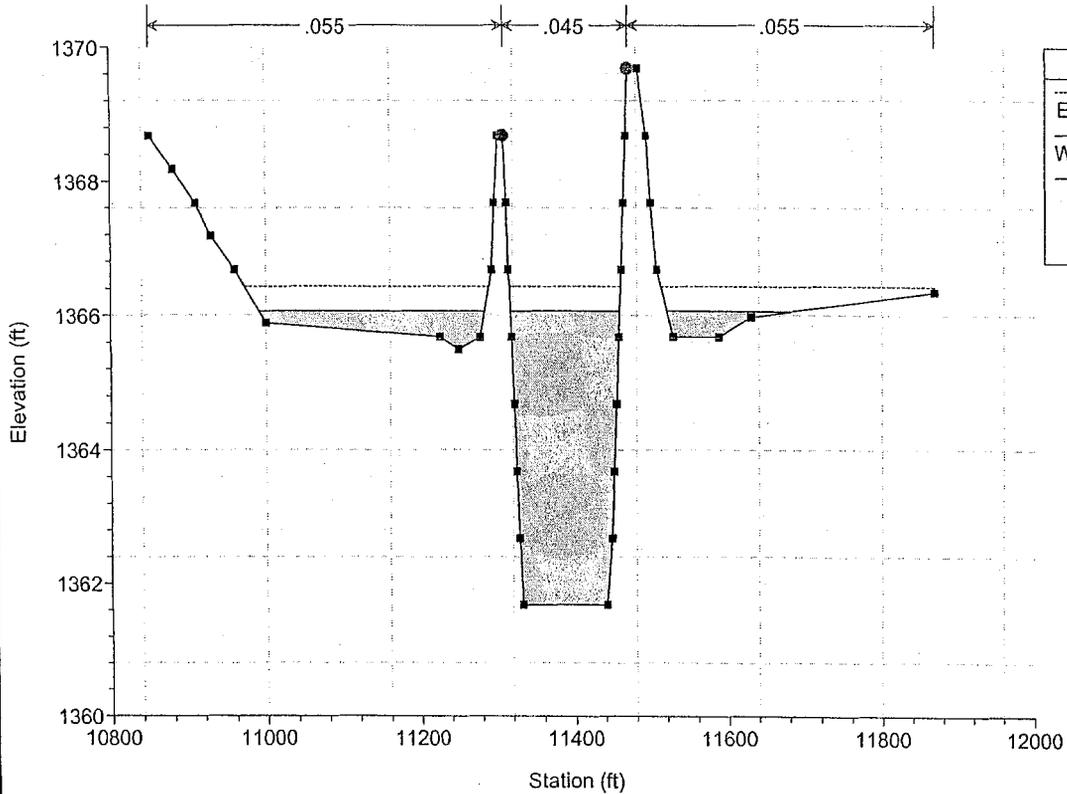
River = RIVER-1 Reach = Reach-1 RS = 5.630 Dibble Sta 5.630 - Flood Control District Sta 5.593. FCD cross



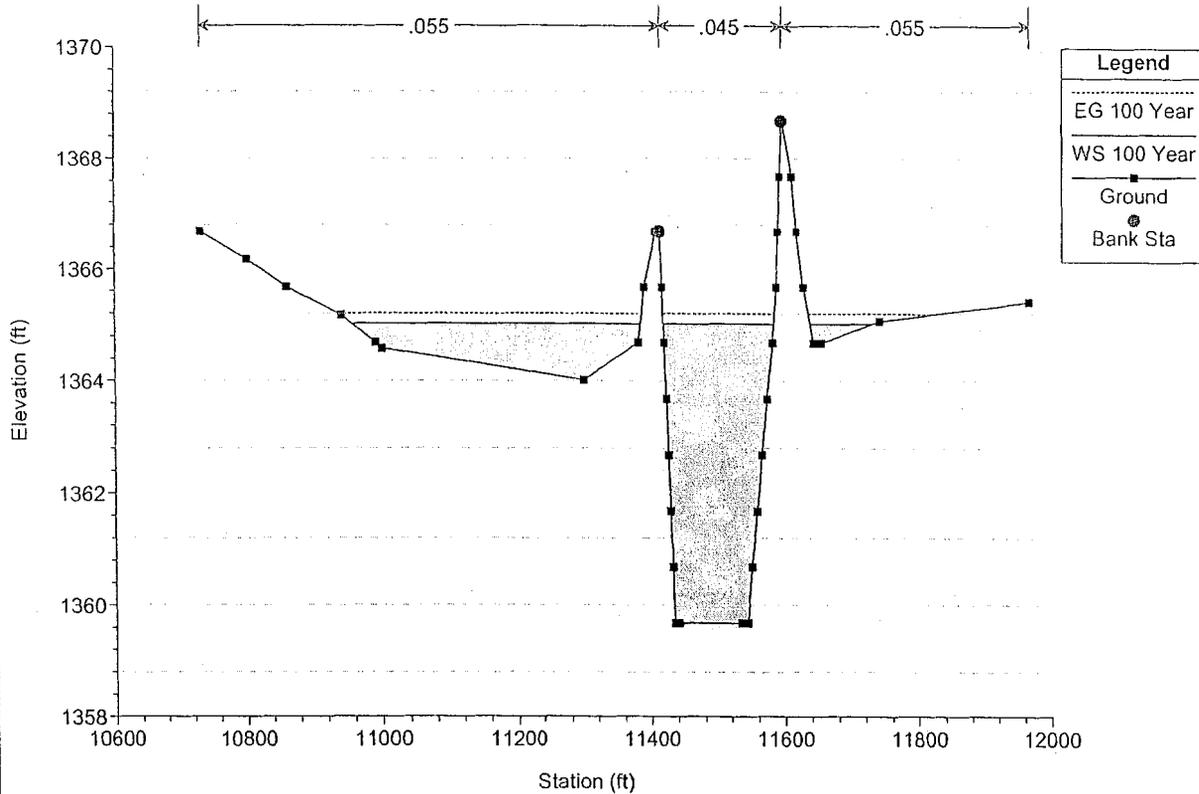
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 5.587 Dibble Sta 5.587 - Flood Control District Sta 5.550. FCD cross



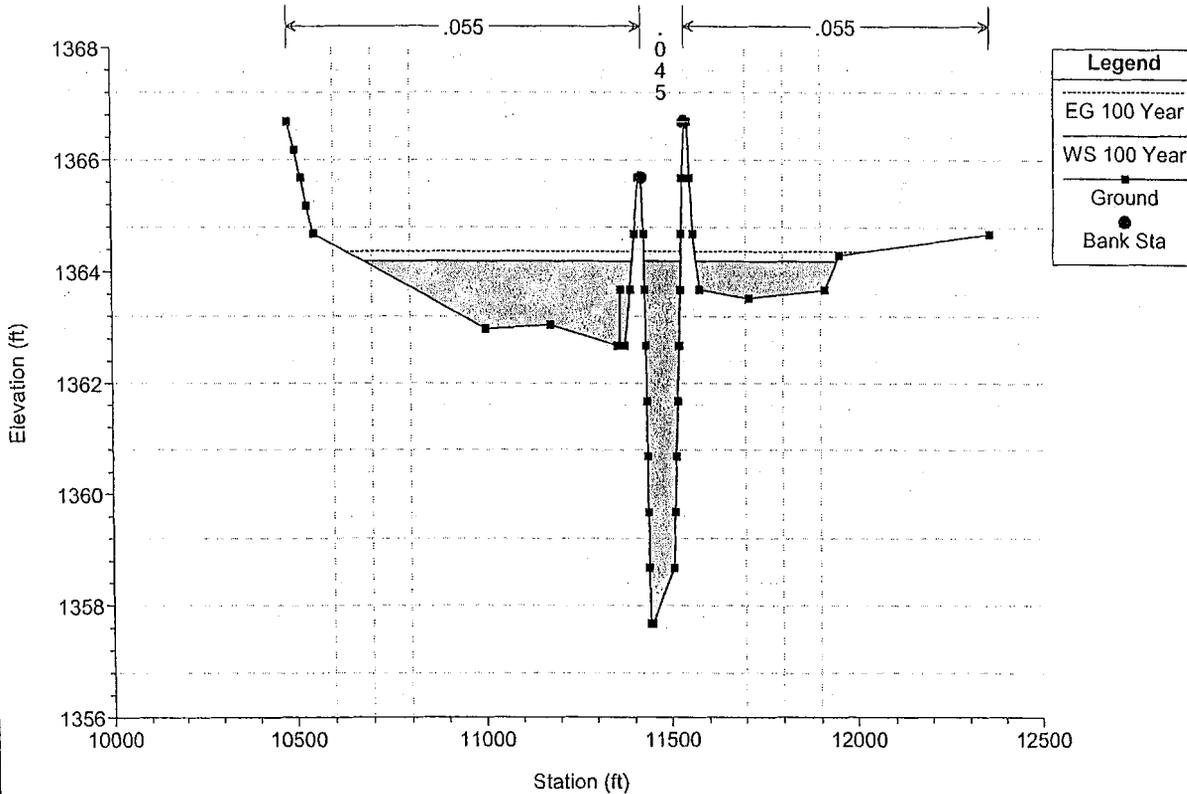
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 5.535 Dibble Sta 5.535 - Flood Control District Sta 5.498. FCD cross



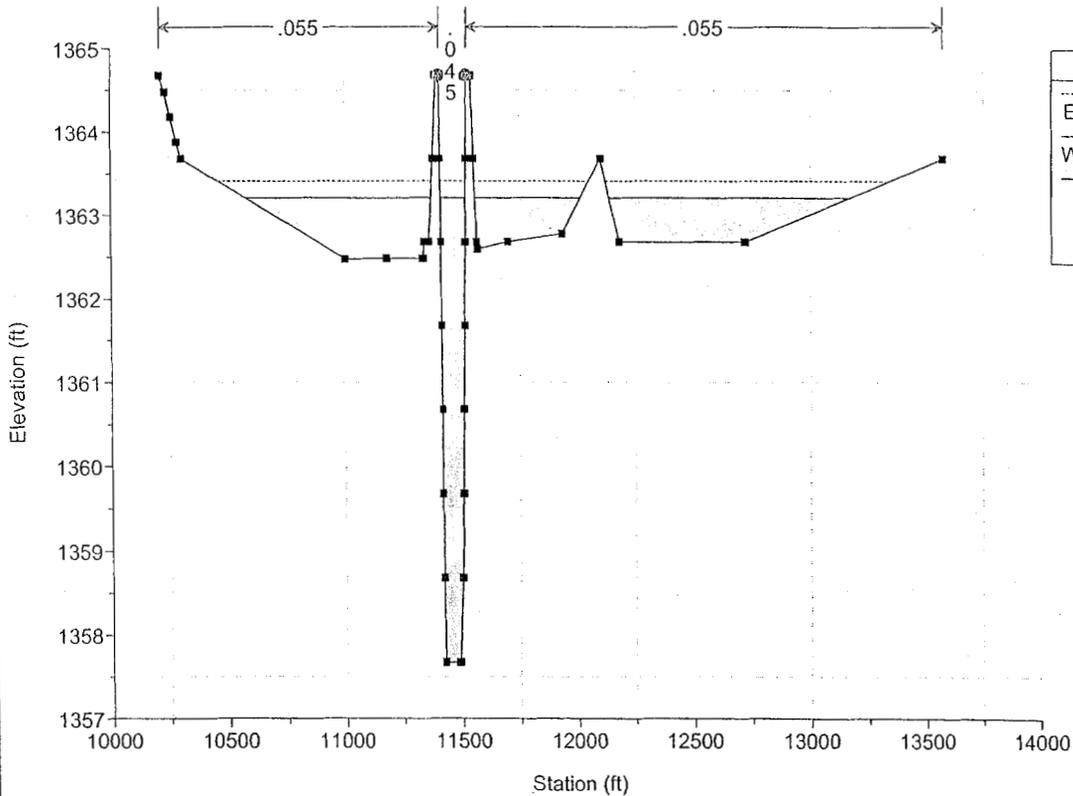
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 5.440 Dibble Sta 5.440 - Flood Control District Sta 5.403. FCD cross



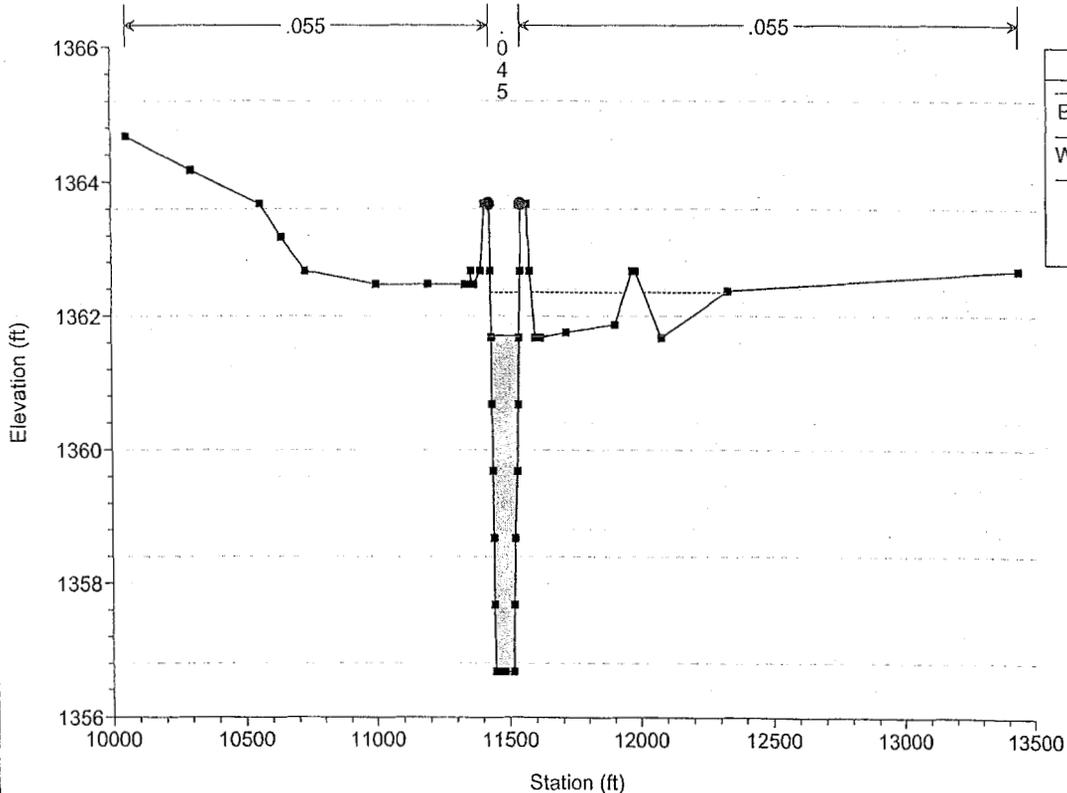
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 5.345 Dibble Sta 5.345 - Flood Control District Sta 5.308. FCD cross

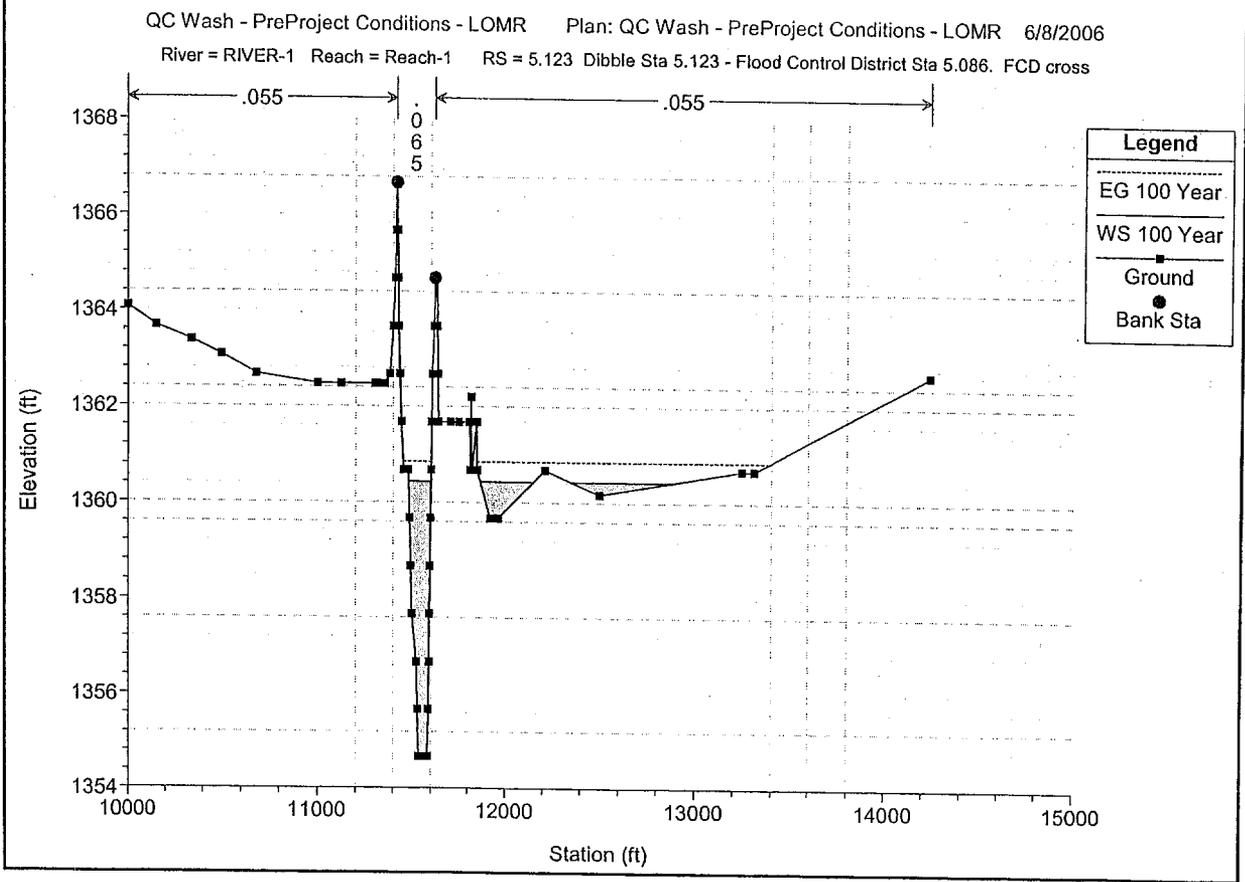
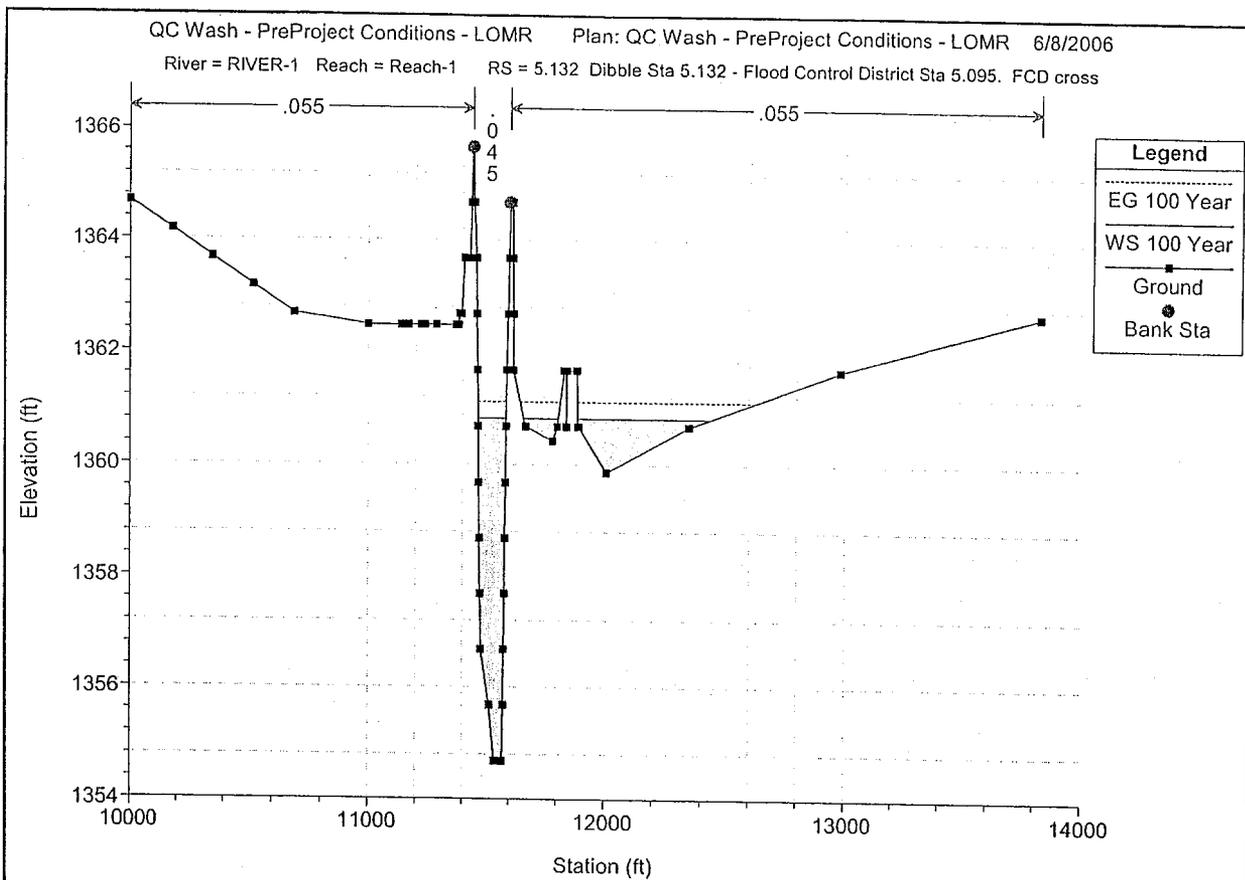


QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 5.251 Dibble Sta 5.251 - Flood Control District Sta 5.214. FCD cross

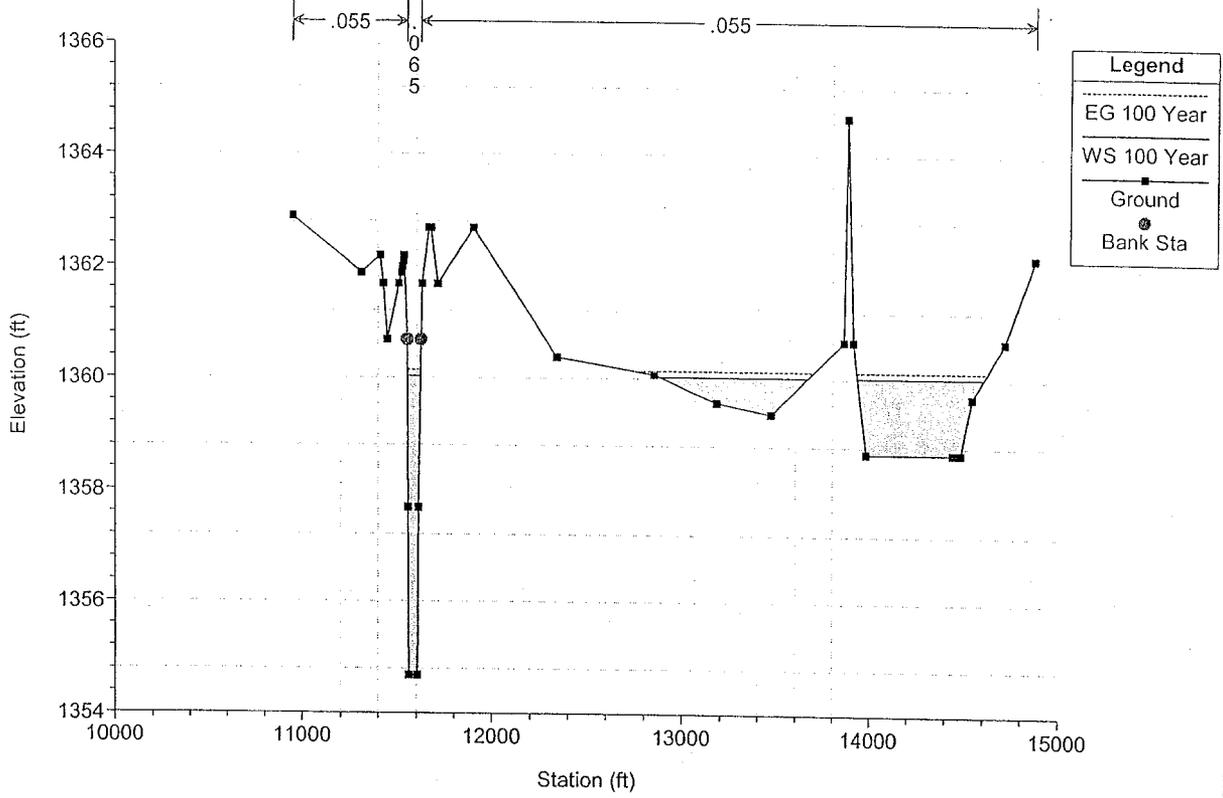


QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 5.193 Dibble Sta 5.193 - Flood Control District Sta 5.156. FCD cross

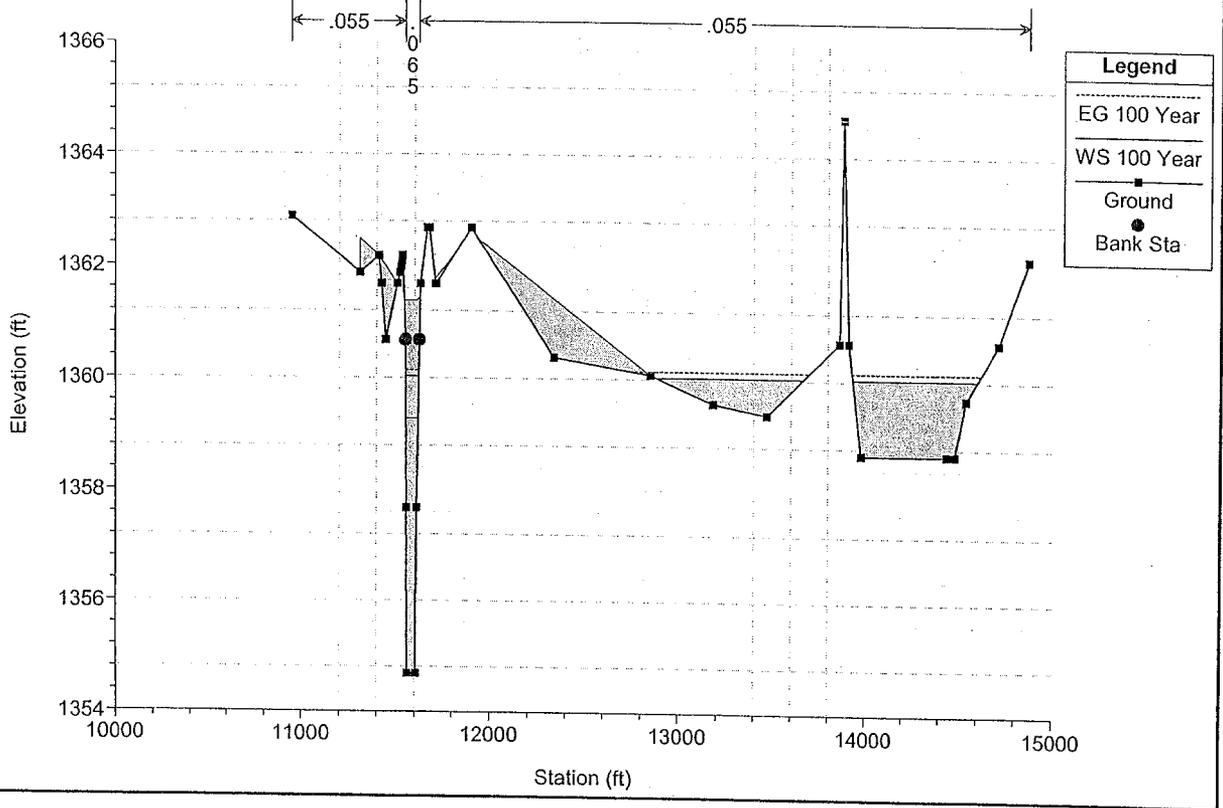




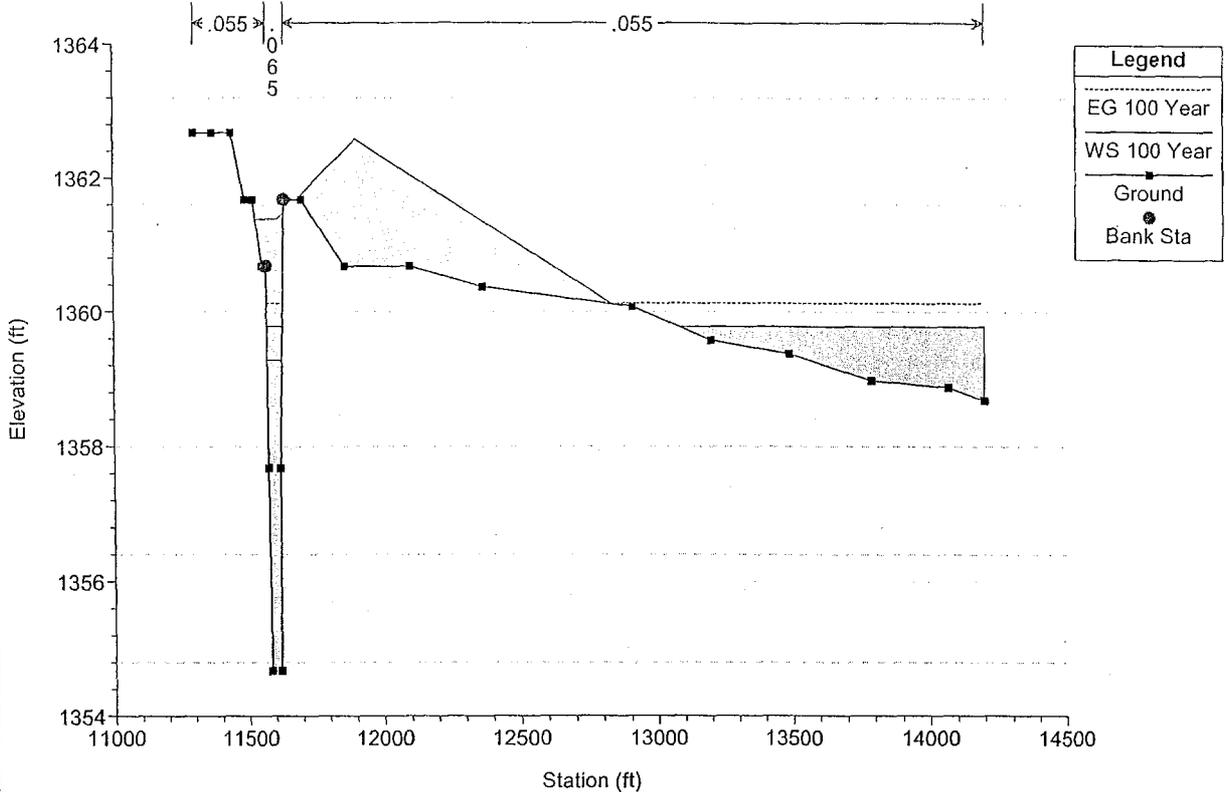
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 5.111 Dibble Sta 5.111 - Flood Control District Sta 5.074. FCD cross



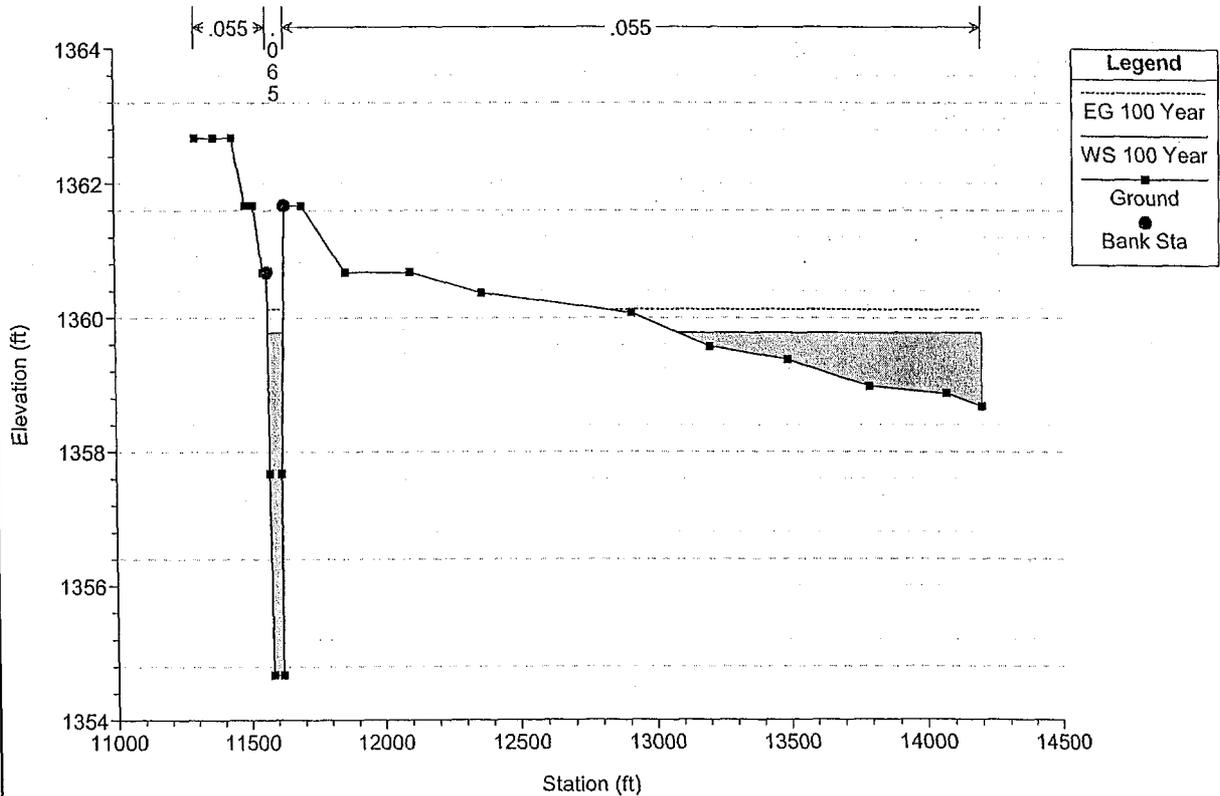
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 5.104 BR Bridge #4 - SOSSAMAN ROAD



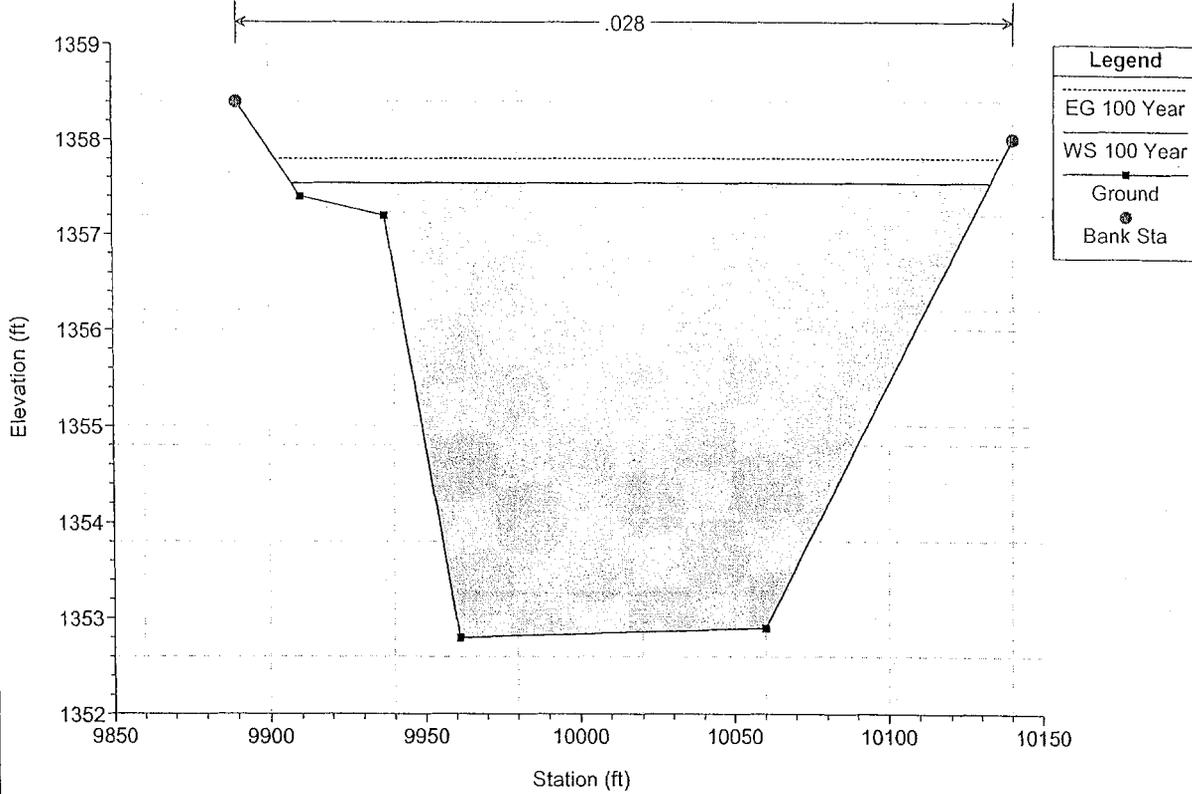
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 5.104 BR Bridge #4 - SOSSAMAN ROAD



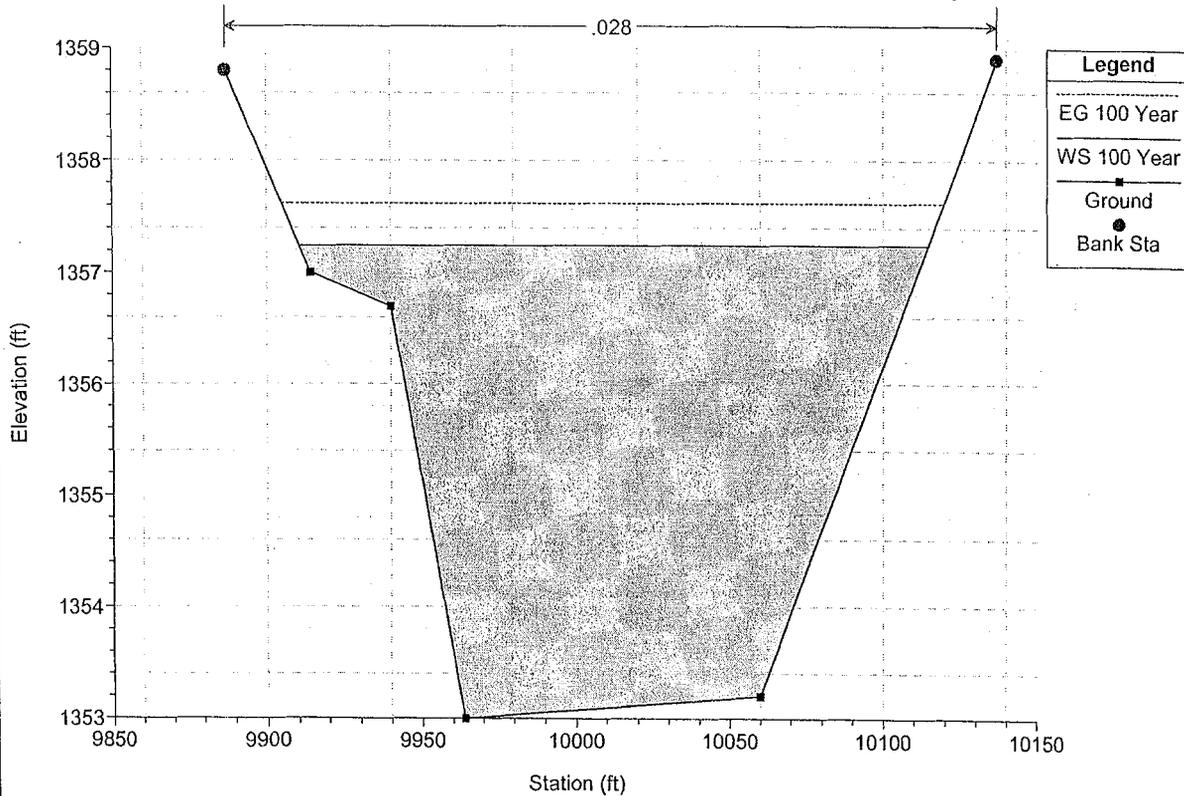
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 5.099 Dibble Sta 5.099 - Flood Control District Sta 5.065. FCD cross



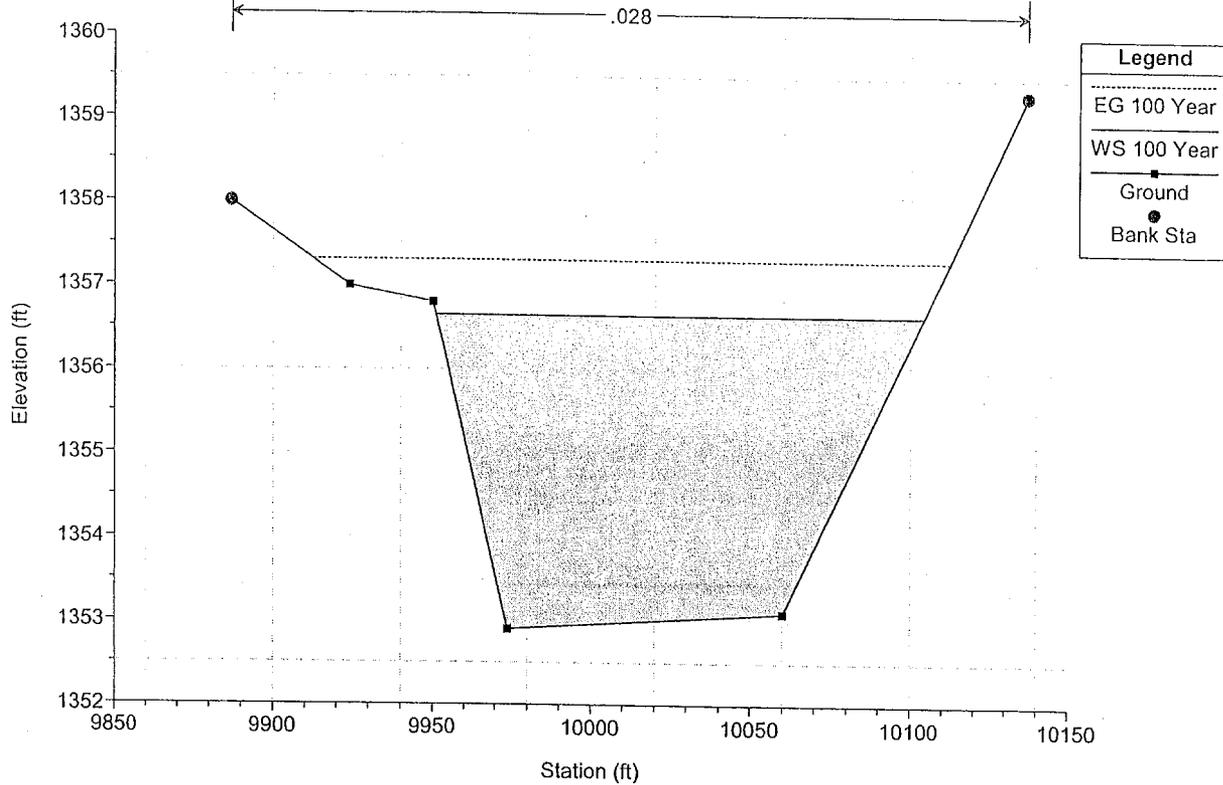
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 5.073 CVL Sta 62+00 - CVL elevations adjusted -2.0'



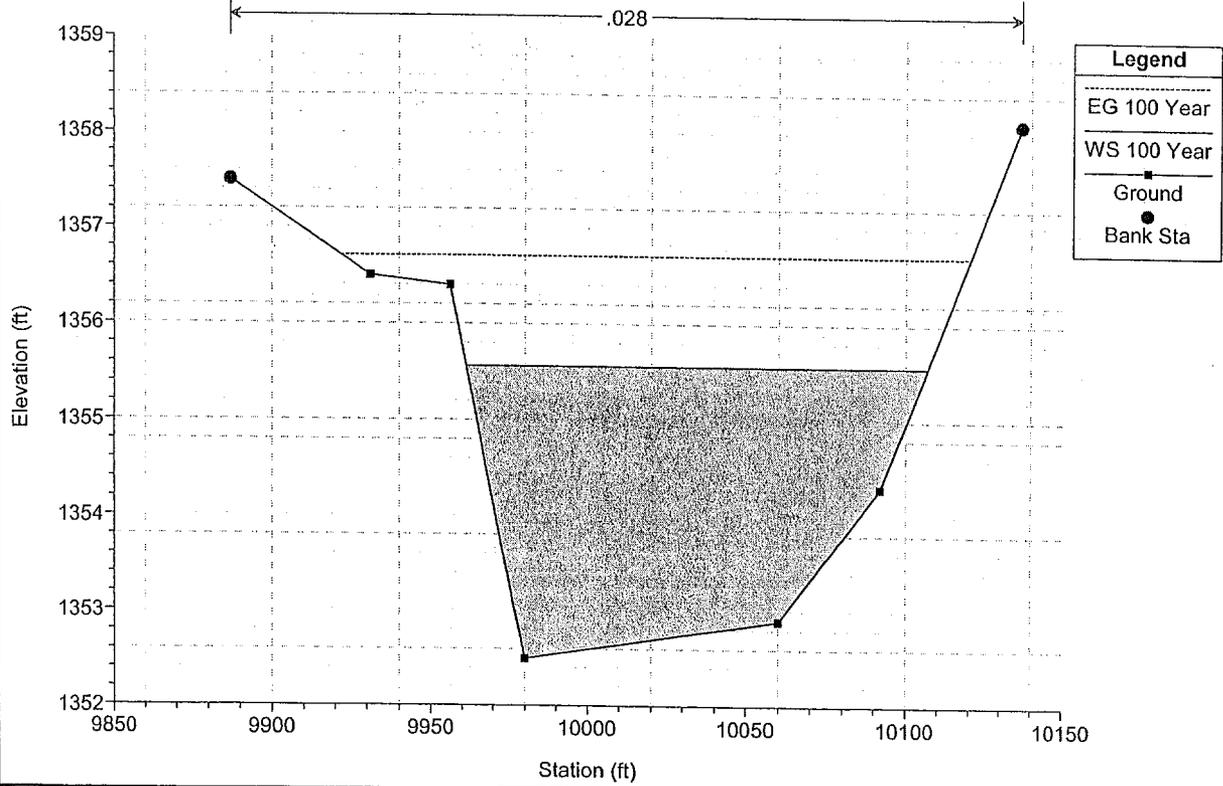
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 5.054 CVL Sta 61+00 - CVL elevations adjusted -2.0'



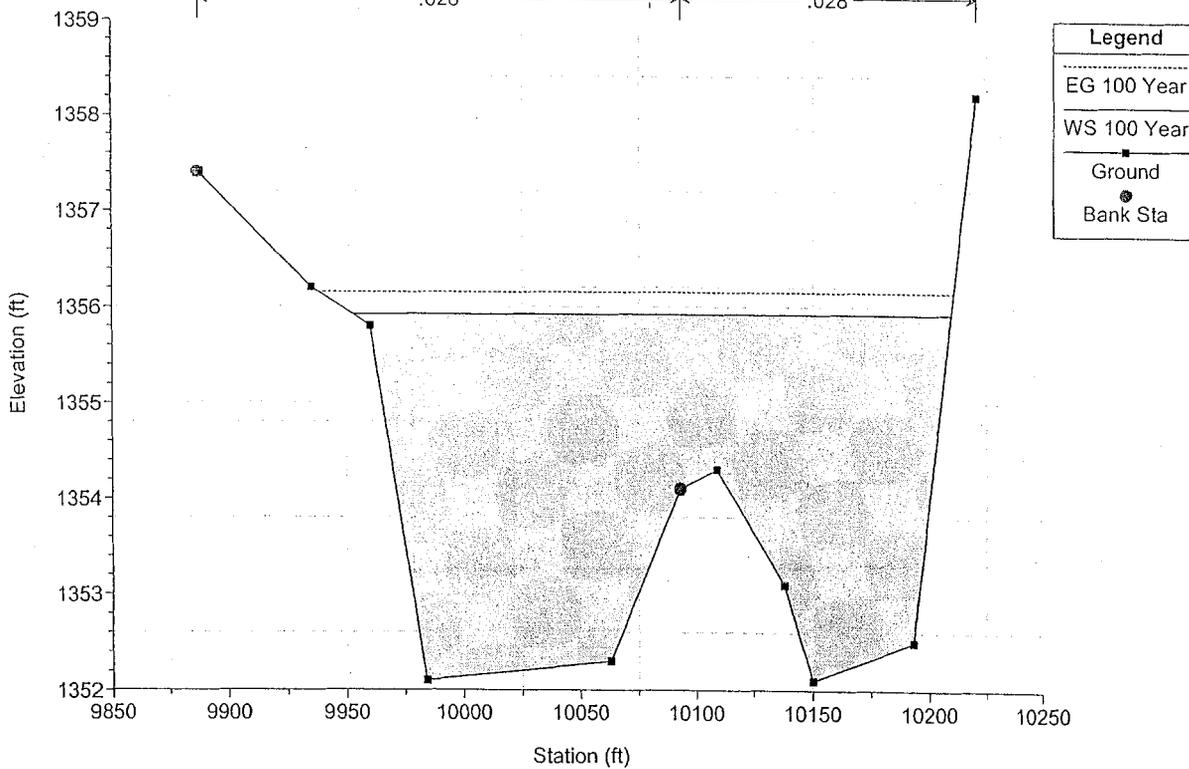
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 5.035 CVL Sta 60+00 - CVL elevations adjusted -2.0'



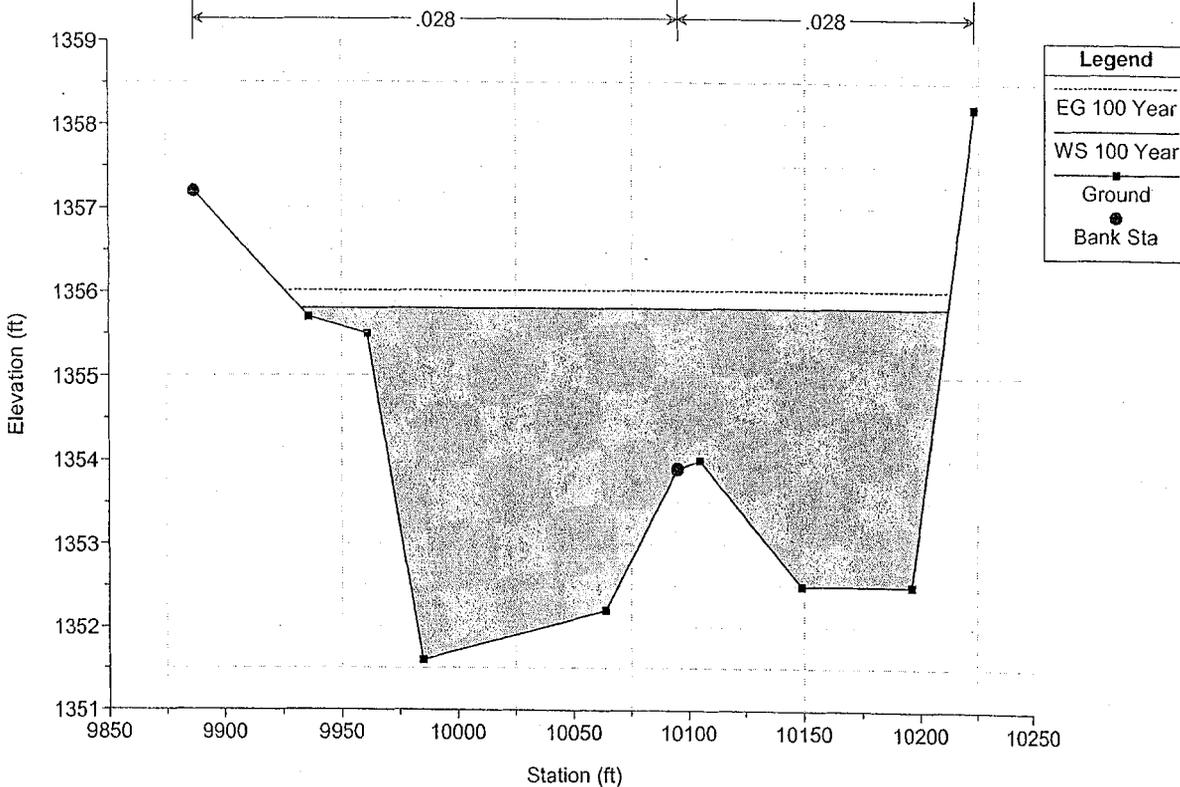
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 5.016 CVL Sta 59+00 - CVL elevations adjusted -2.0'



QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 4.997 CVL Sta 58+00 - CVL elevations adjusted -2.0'

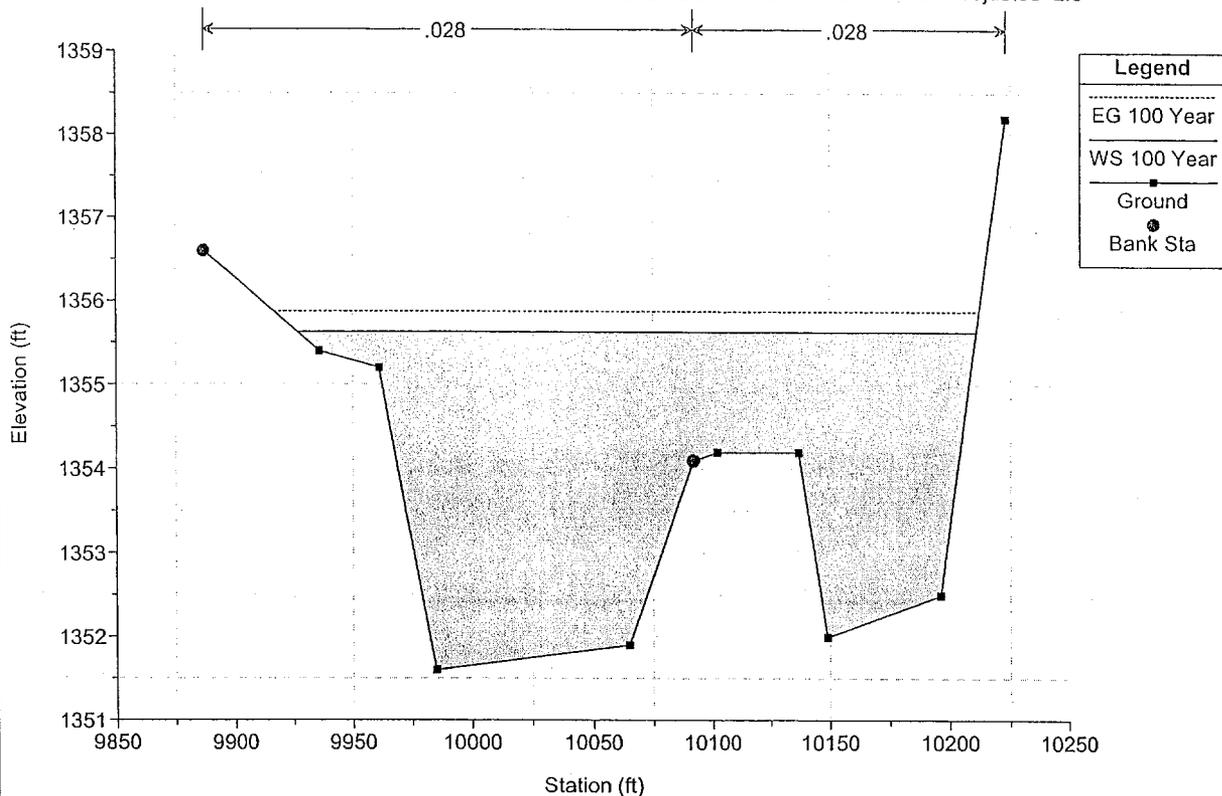


QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 4.978 CVL Sta 57+00 - CVL elevations adjusted -2.0'



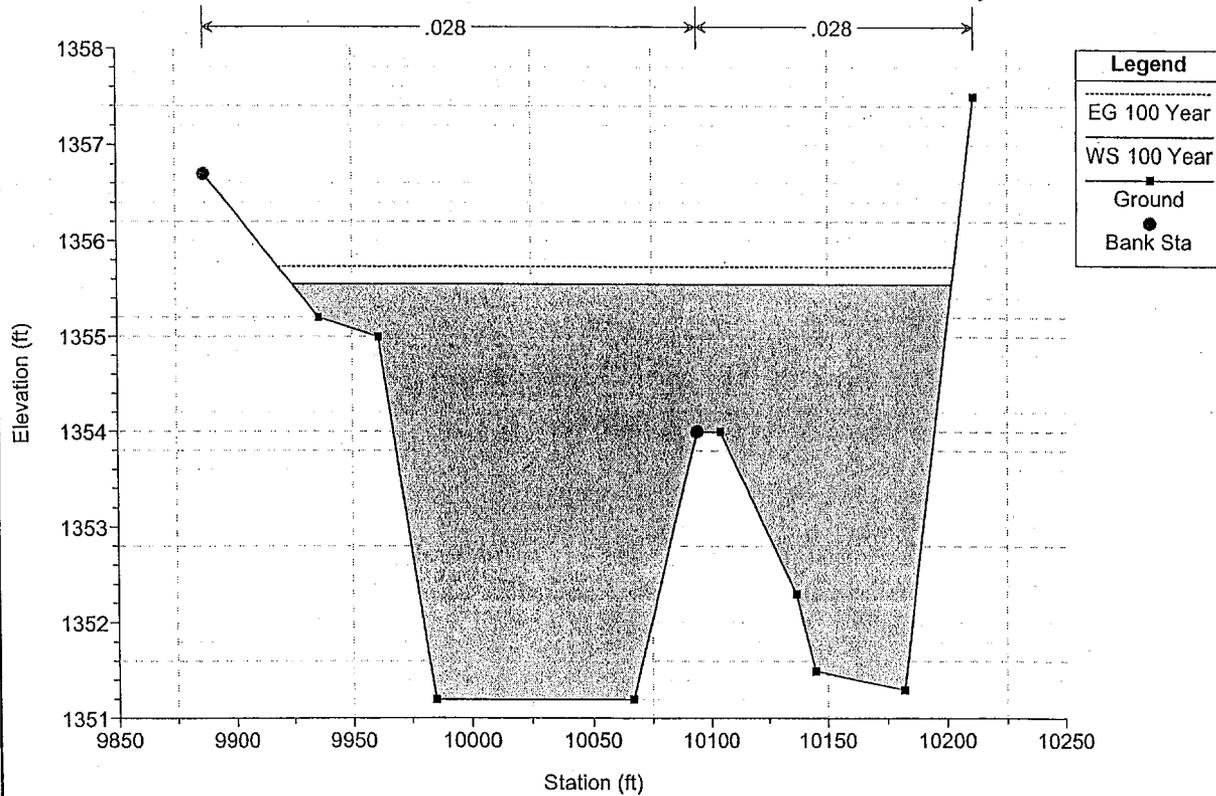
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006

River = RIVER-1 Reach = Reach-1 RS = 4.959 CVL Sta 56+00 - CVL elevations adjusted -2.0'



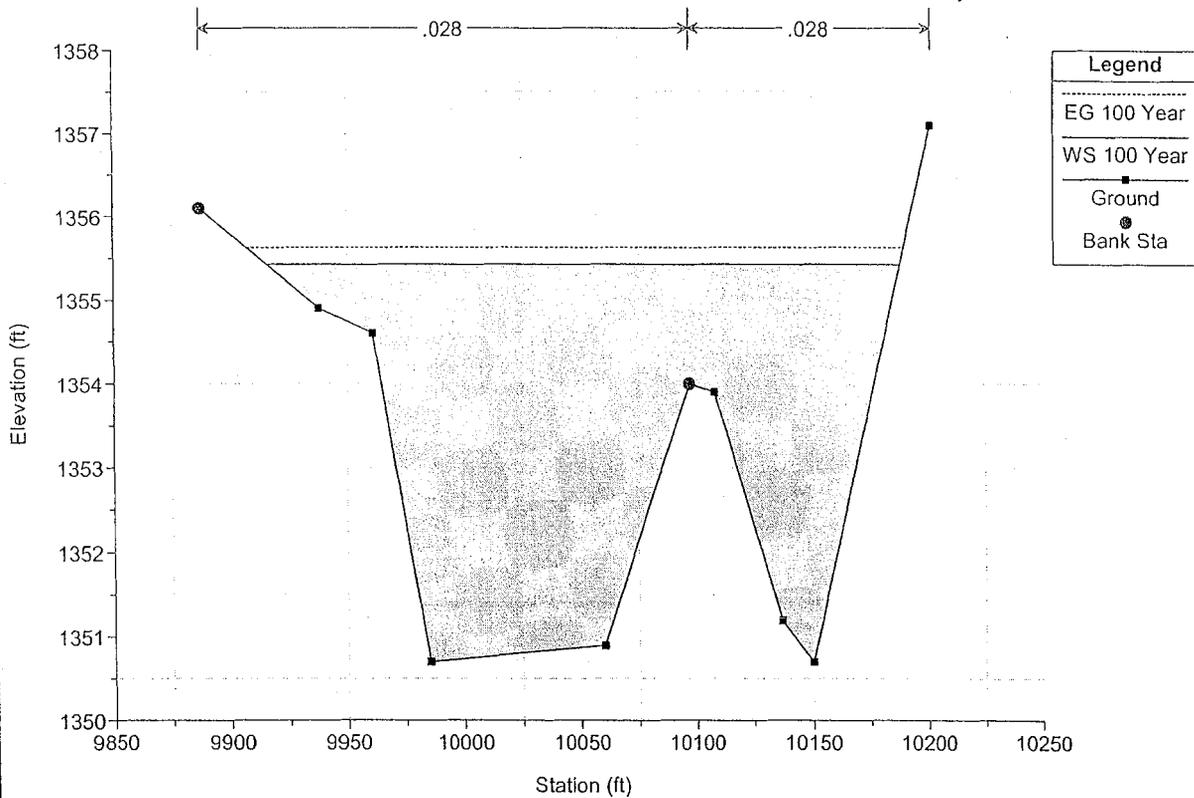
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006

River = RIVER-1 Reach = Reach-1 RS = 4.940 CVL Sta 55+00 - CVL elevations adjusted -2.0'



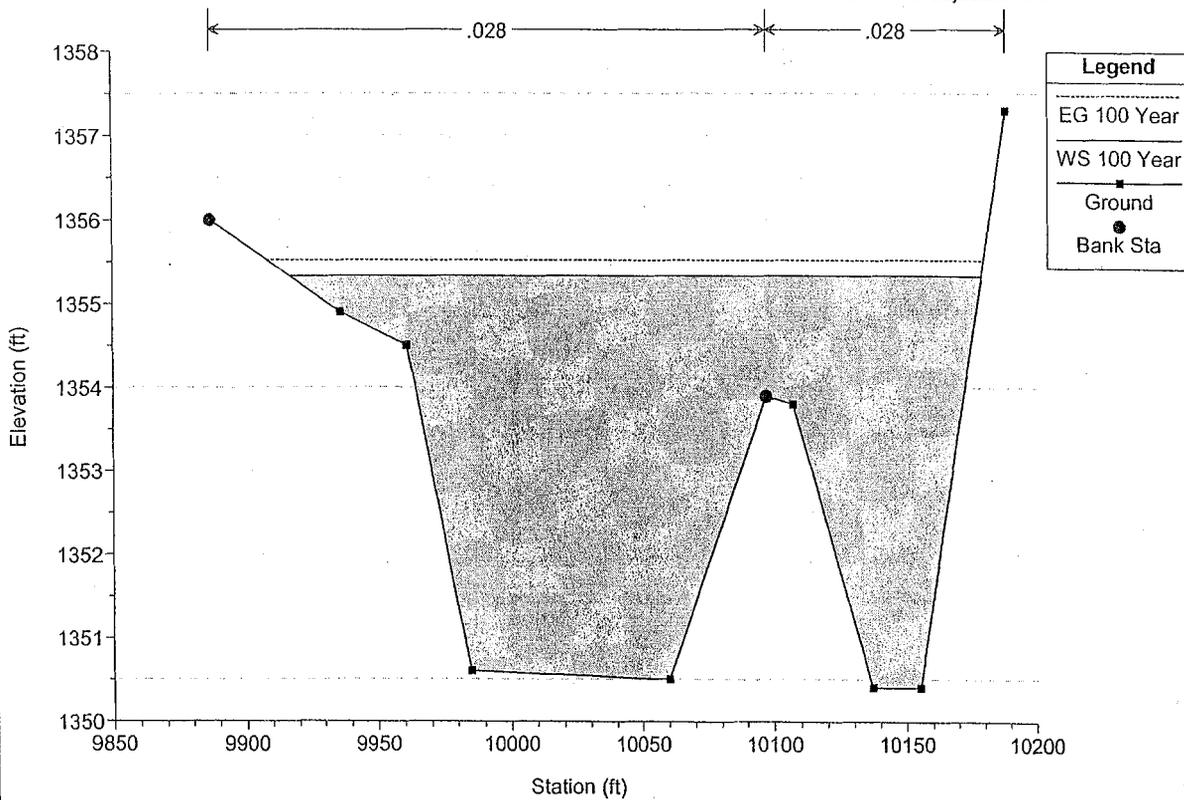
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006

River = RIVER-1 Reach = Reach-1 RS = 4.921 CVL Sta 54+00 - CVL elevations adjusted -2.0'

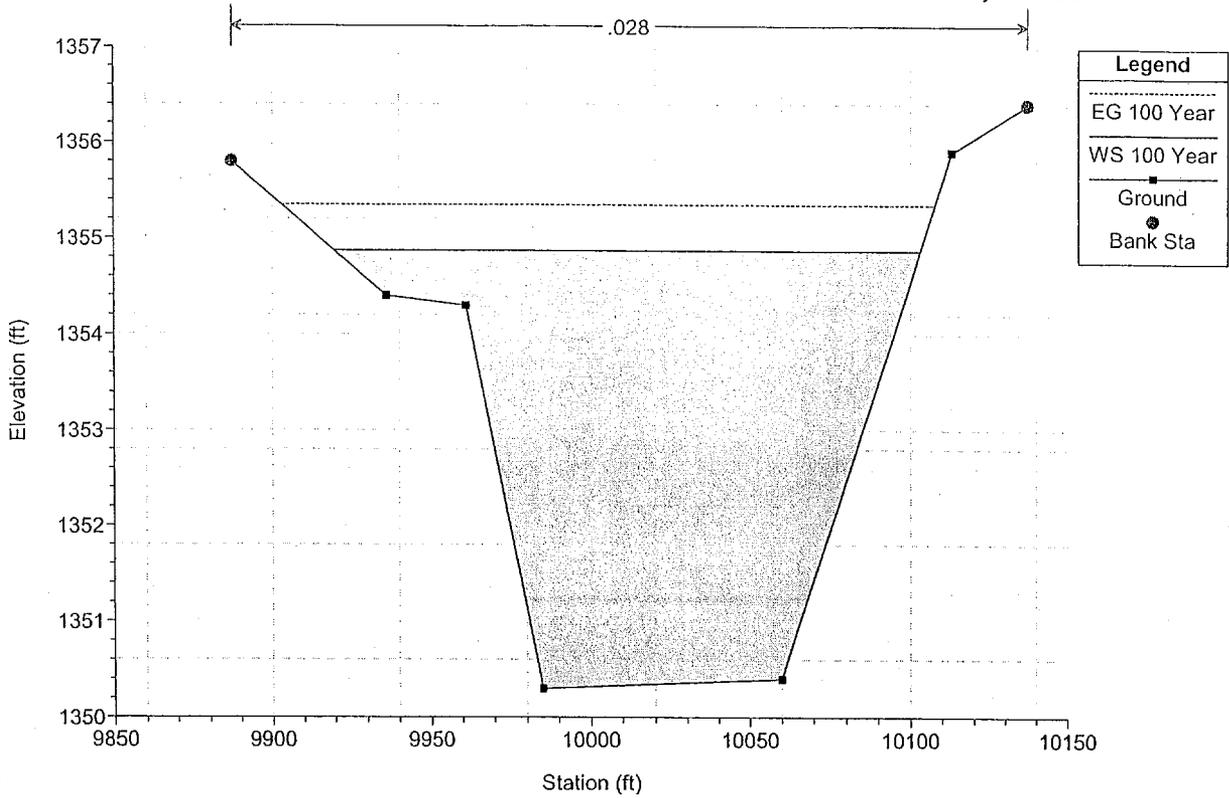


QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006

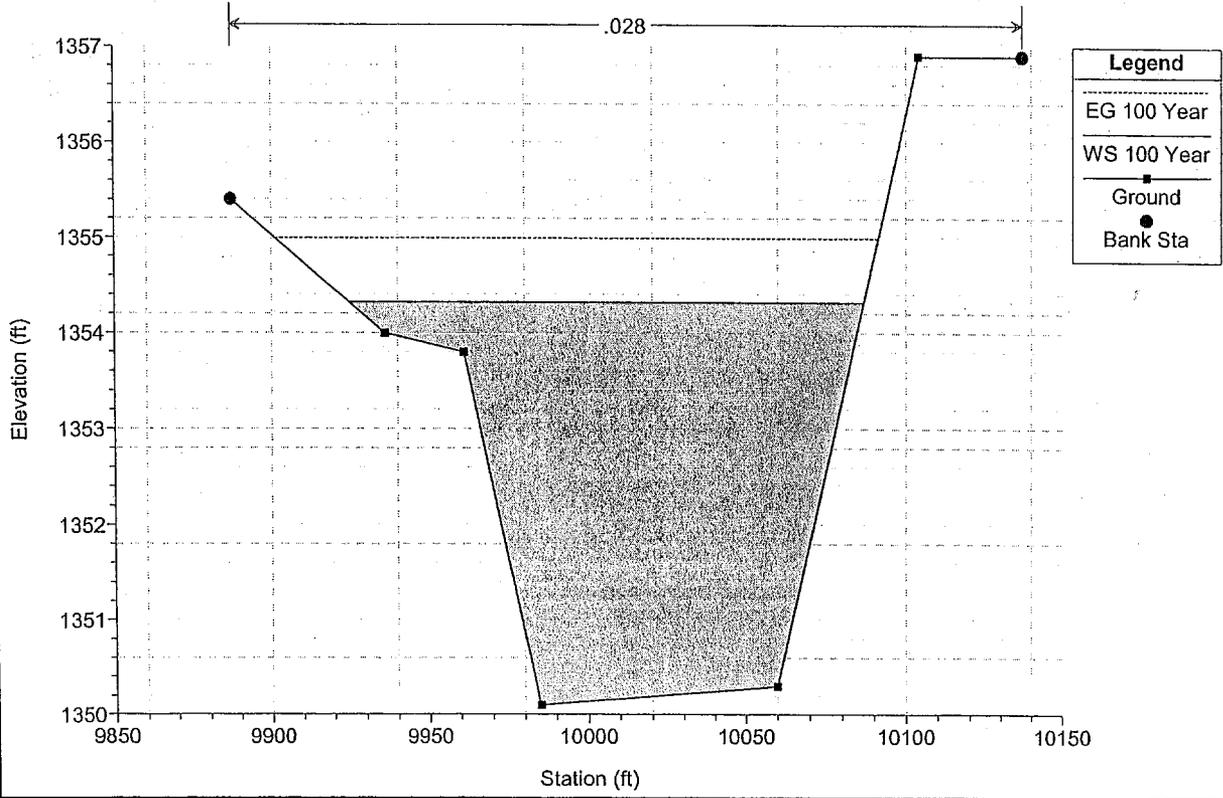
River = RIVER-1 Reach = Reach-1 RS = 4.902 CVL Sta 53+00 - CVL elevations adjusted -2.0'



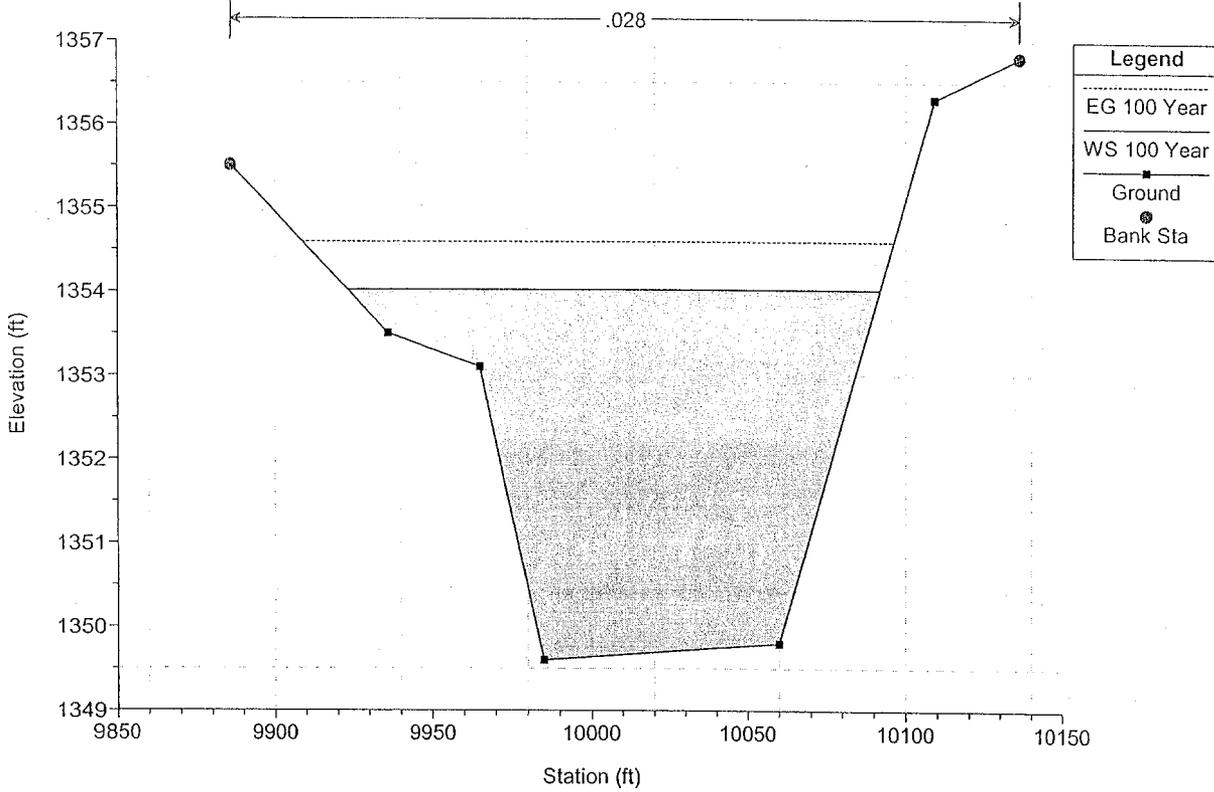
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 4.883 CVL Sta 52+00 - CVL elevations adjusted -2.0'



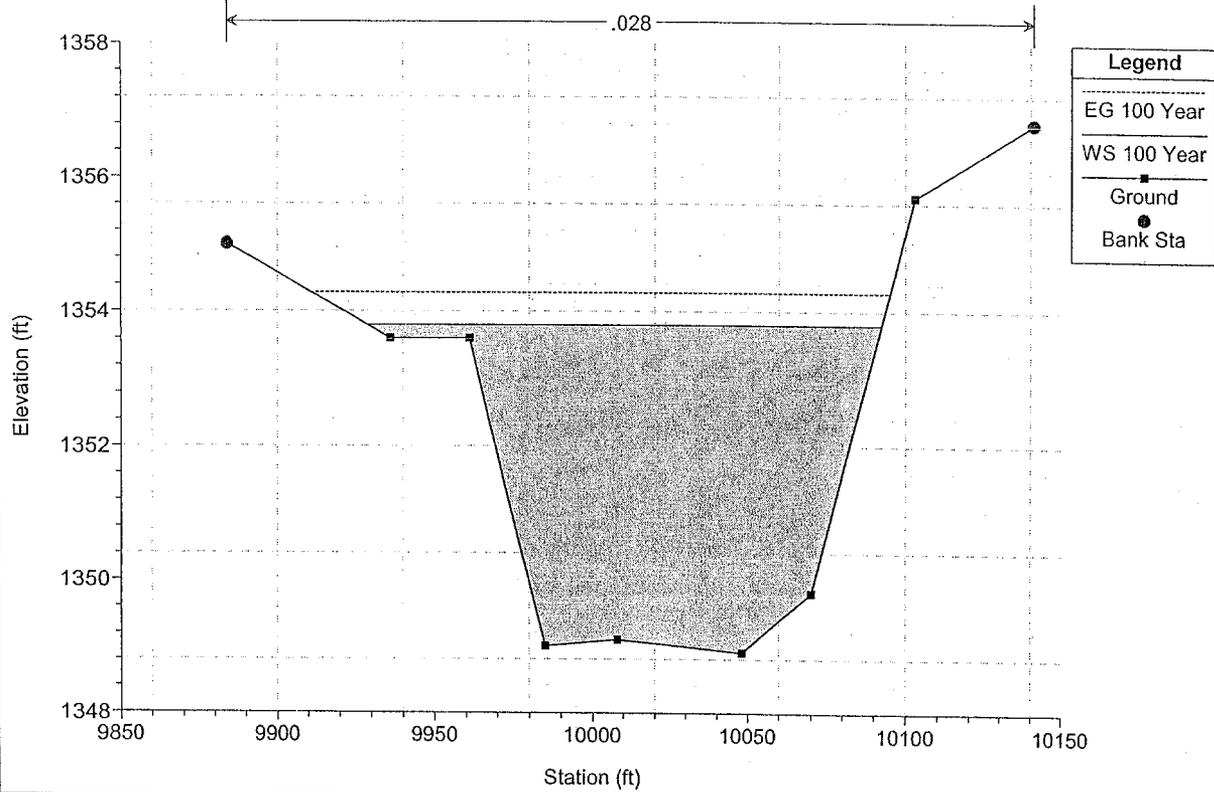
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 4.864 CVL Sta 51+00 - CVL elevations adjusted -2.0'



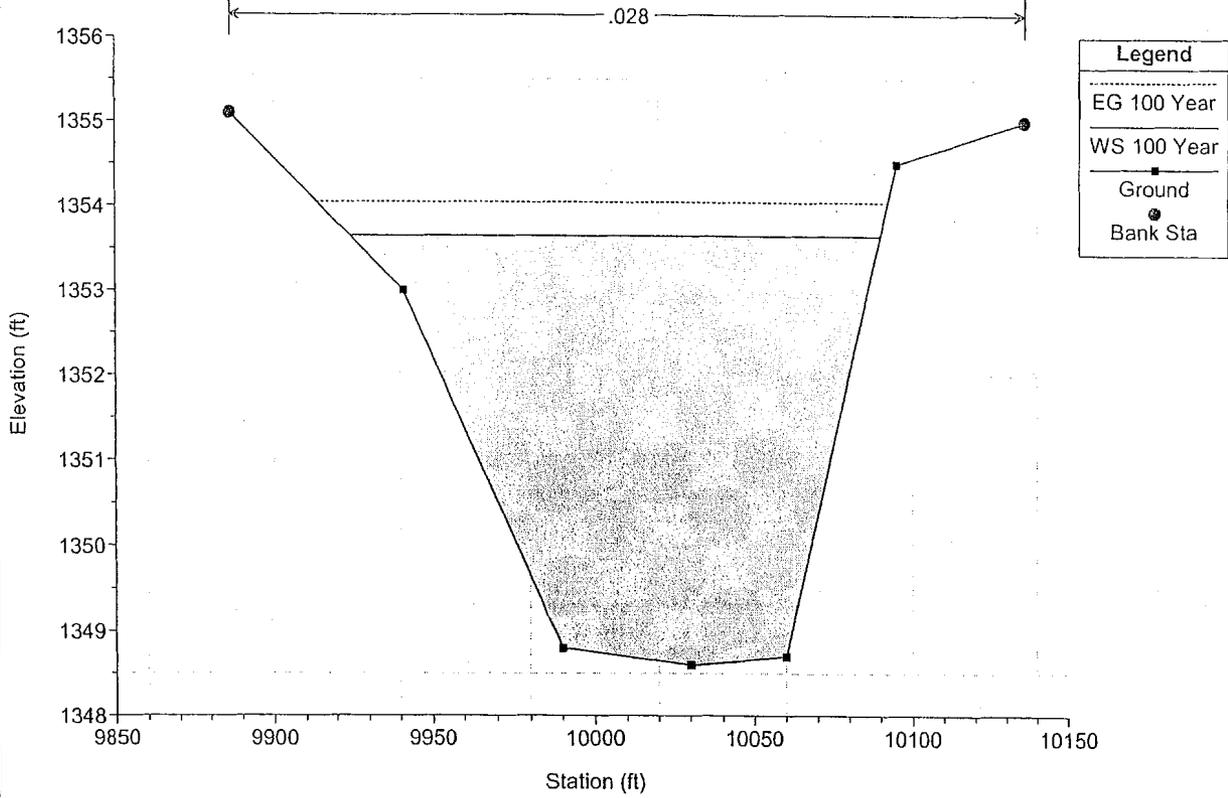
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 4.845 CVL Sta 50+00 - CVL elevations adjusted -2.0'



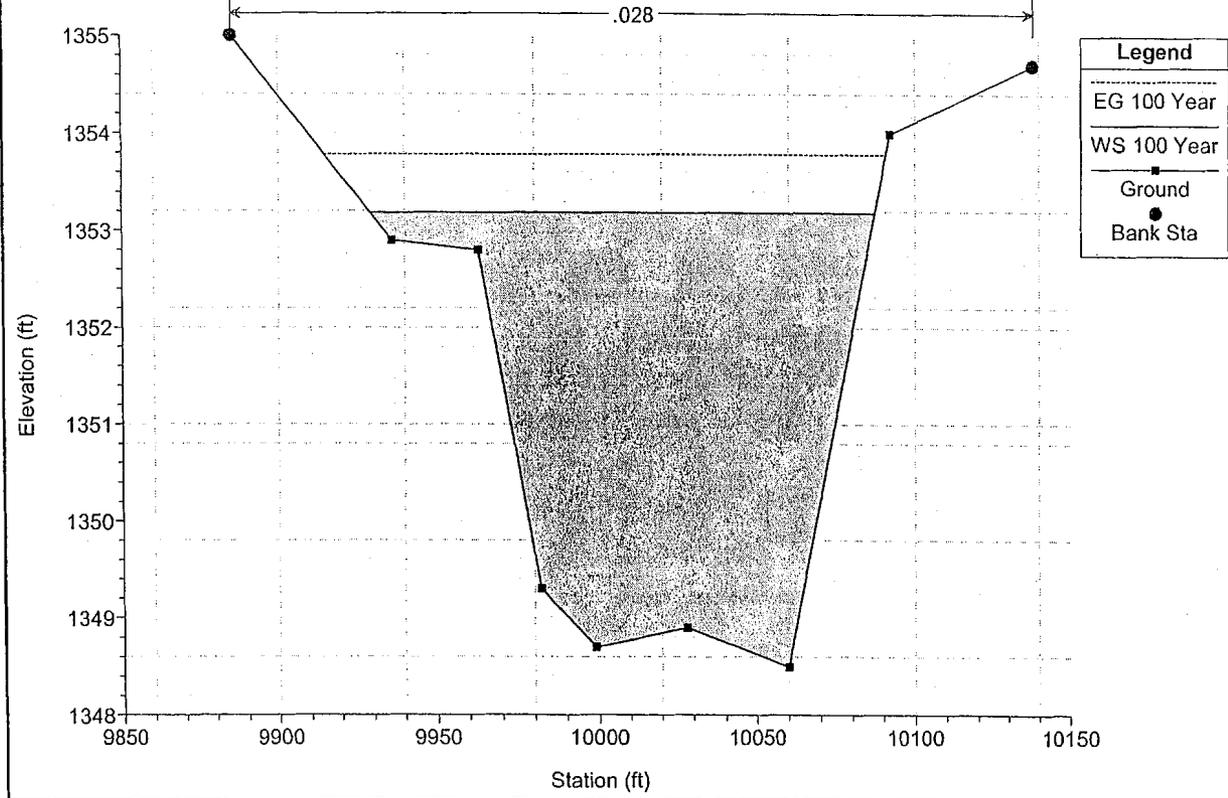
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 4.826 CVL Sta 49+00 - CVL elevations adjusted -2.0'



QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 4.807 CVL Sta 48+00 - CVL elevations adjusted -2.0'

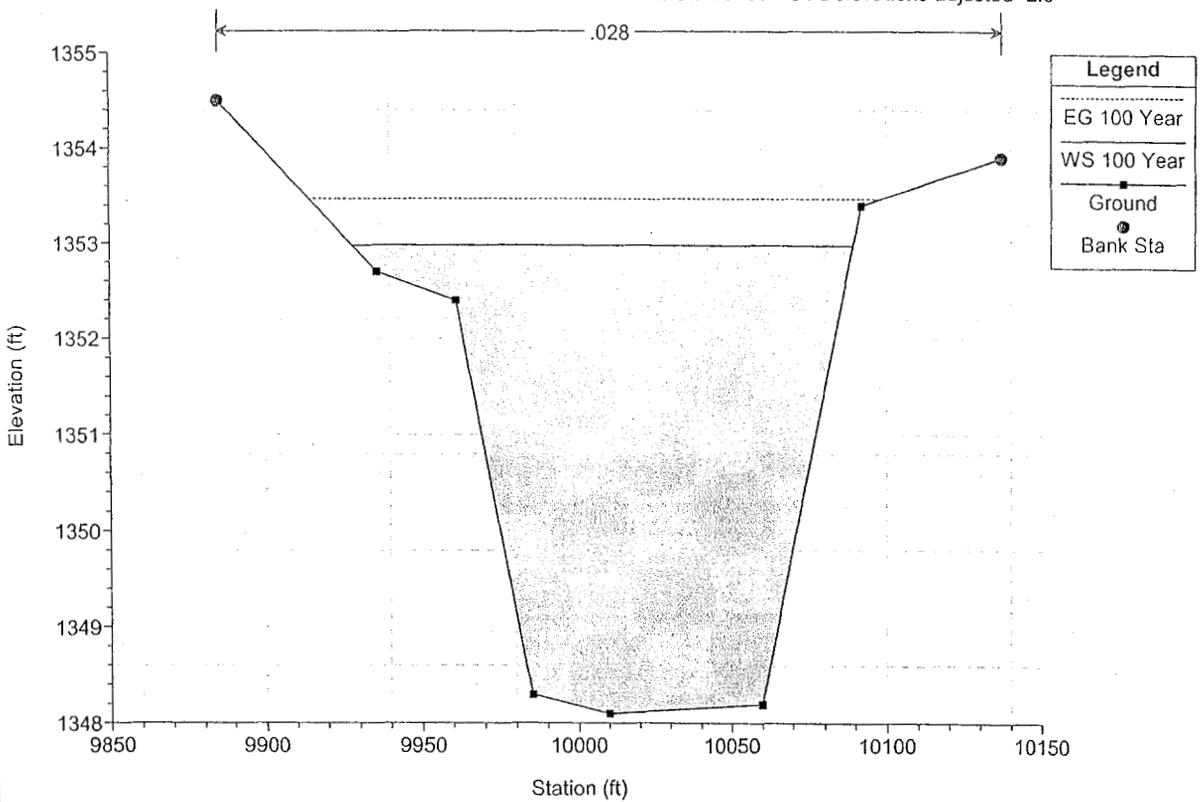


QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 4.788 CVL Sta 47+00 - CVL elevations adjusted -2.0'



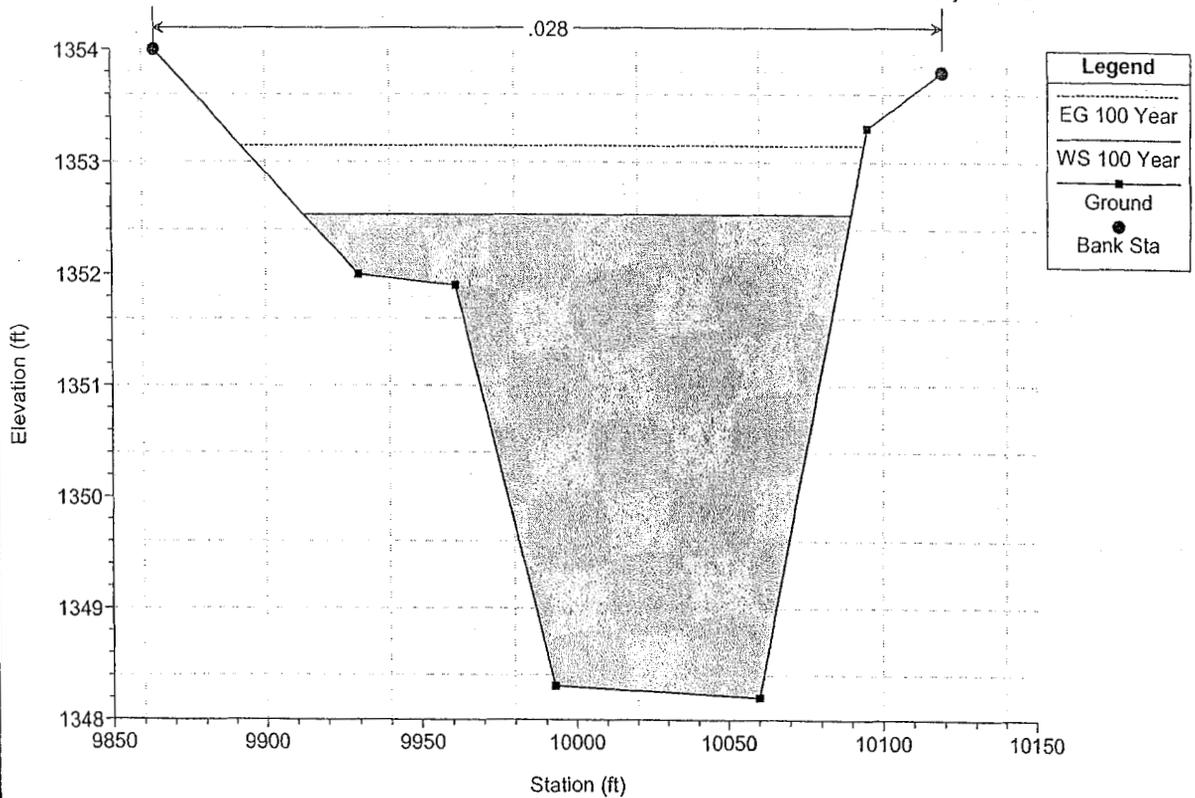
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006

River = RIVER-1 Reach = Reach-1 RS = 4.770 CVL Sta 46+00 - CVL elevations adjusted -2.0'

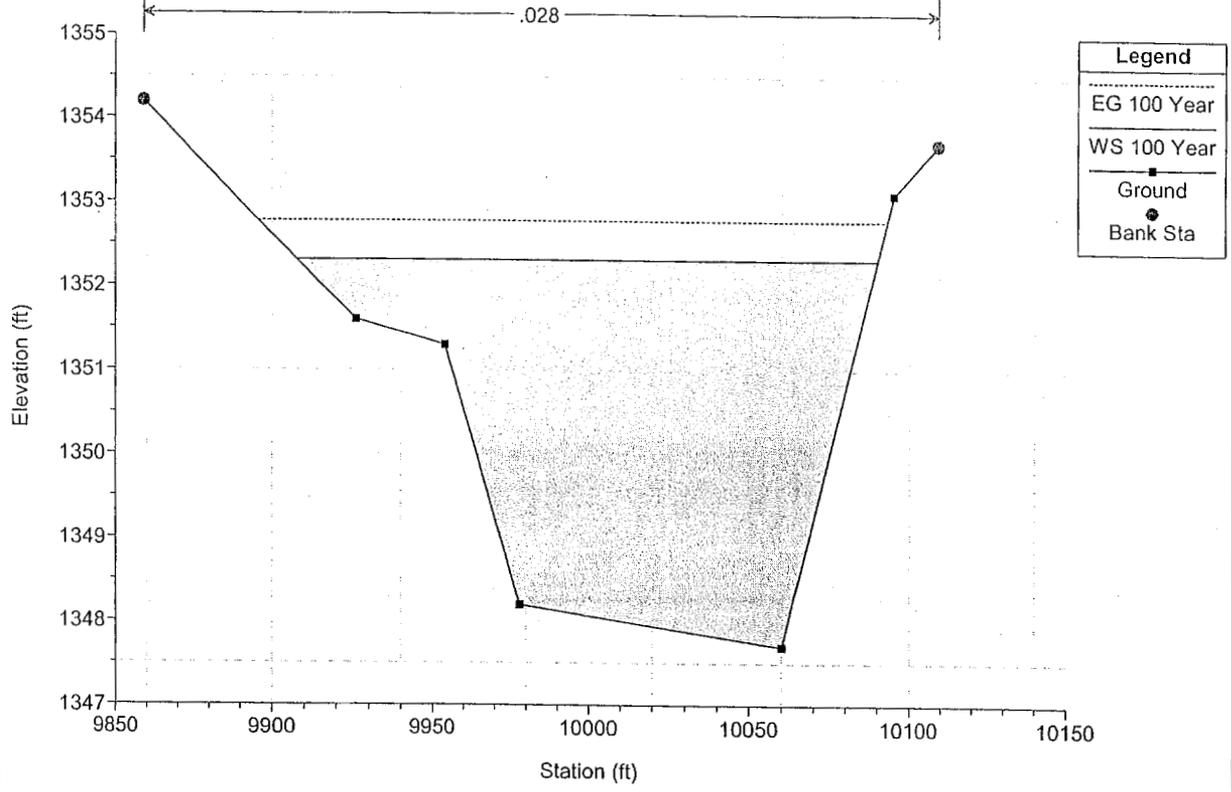


QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006

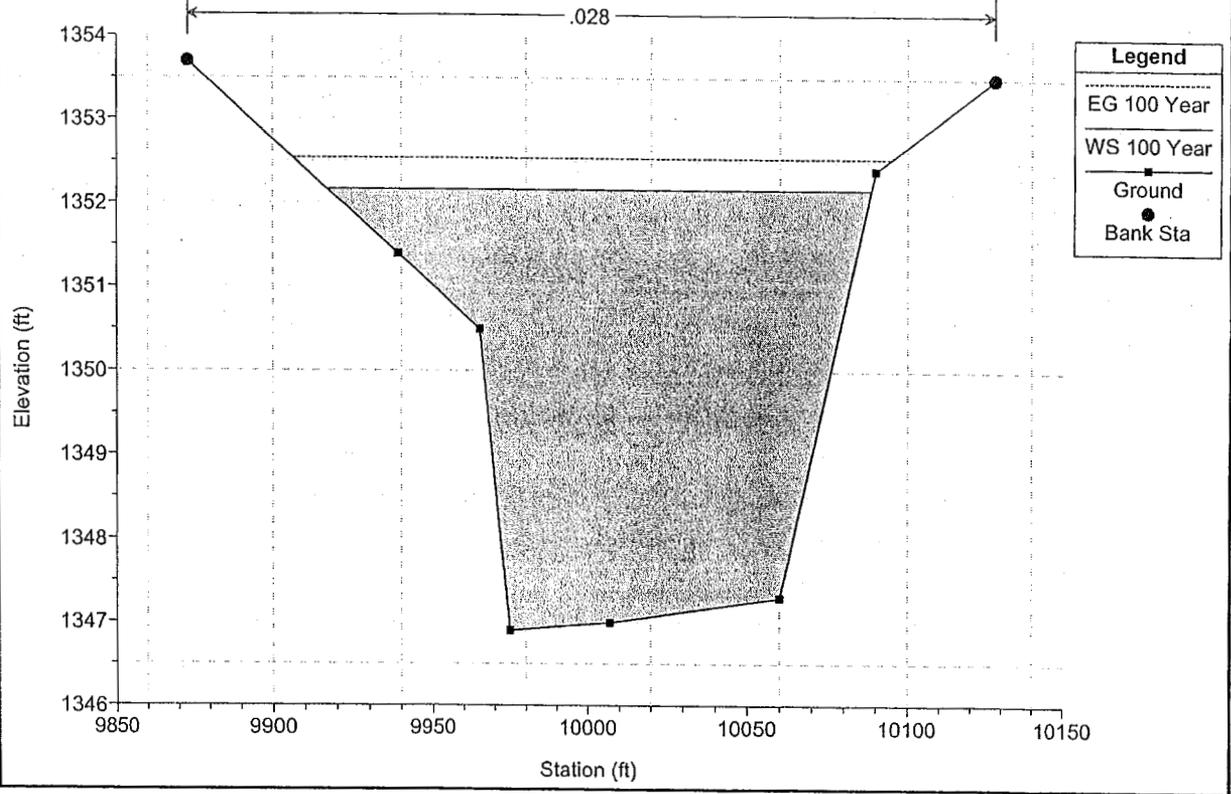
River = RIVER-1 Reach = Reach-1 RS = 4.751 CVL Sta 45+00 - CVL elevations adjusted -2.0'



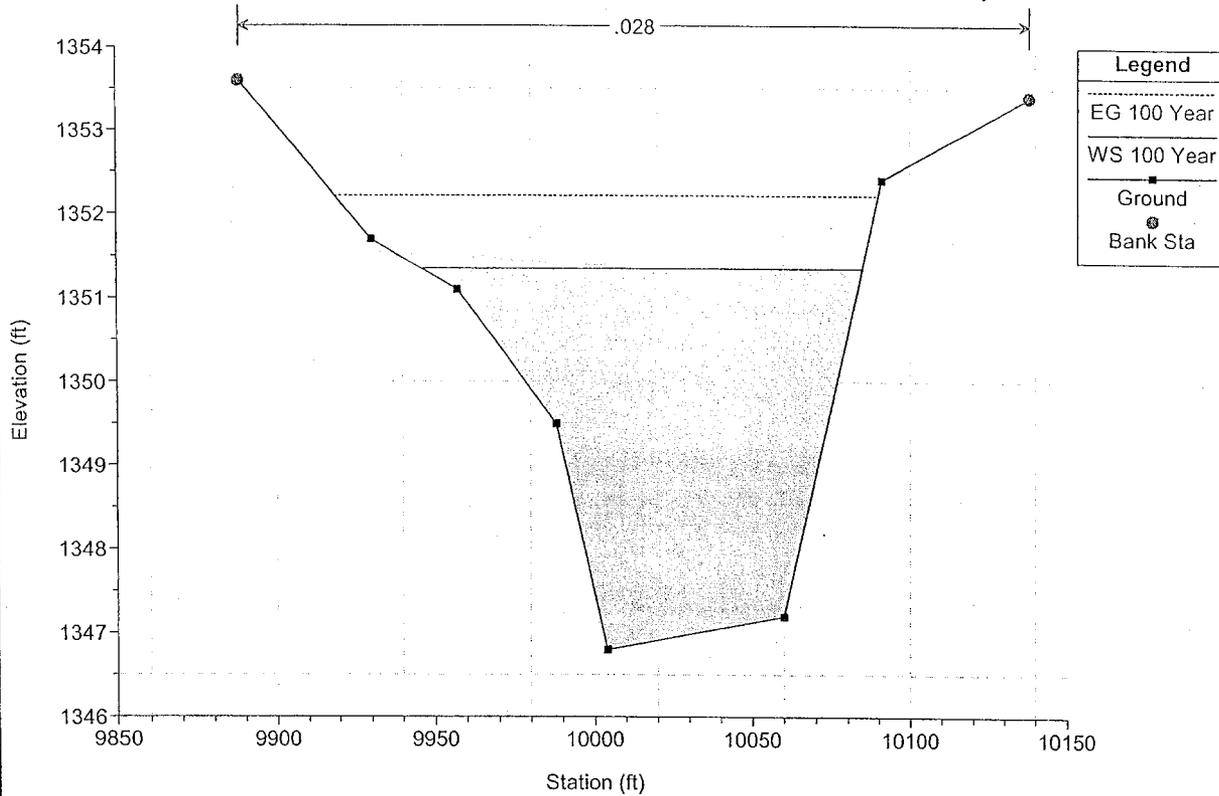
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 4.732 CVL Sta 44+00 - CVL elevations adjusted -2.0'



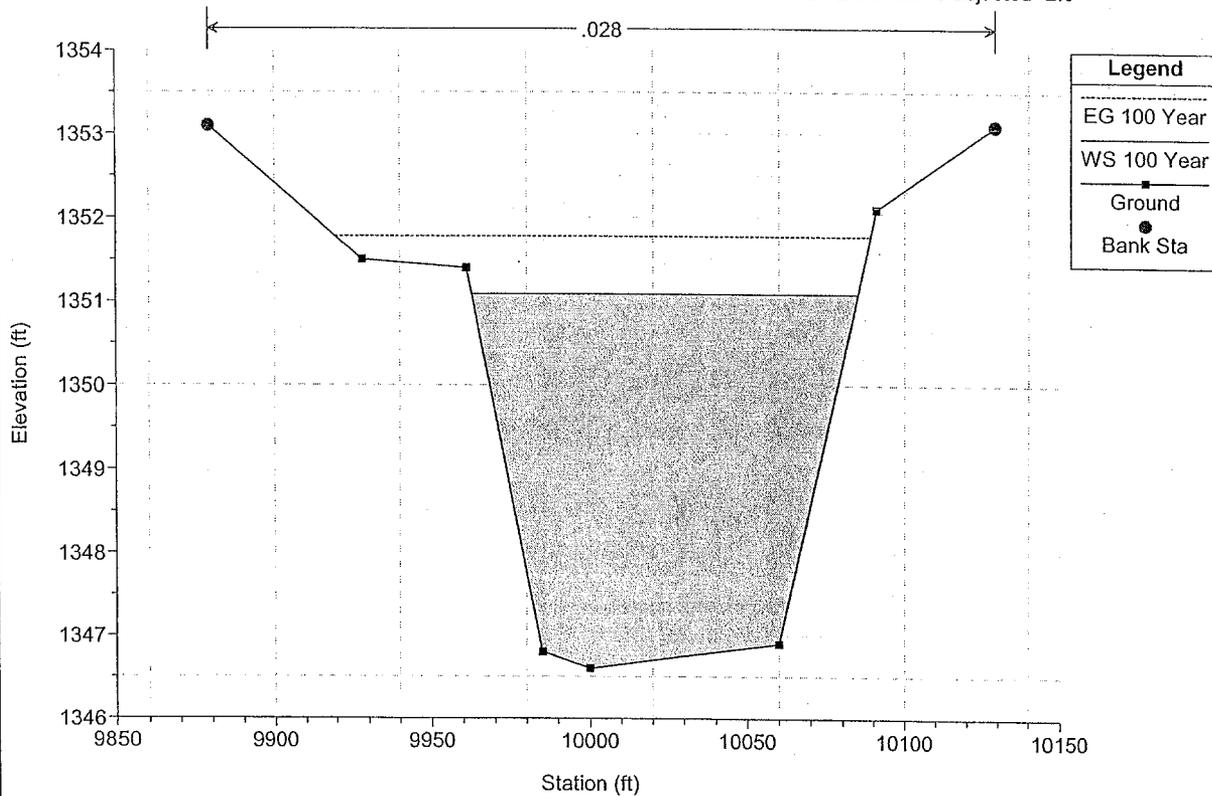
QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 4.713 CVL Sta 43+00 - CVL elevations adjusted -2.0'



QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 4.694 CVL Sta 42+00 - CVL elevations adjusted -2.0'



QC Wash - PreProject Conditions - LOMR Plan: QC Wash - PreProject Conditions - LOMR 6/8/2006
 River = RIVER-1 Reach = Reach-1 RS = 4.675 CVL Sta 41+00 - CVL elevations adjusted -2.0'



APPENDIX E.5

PRE PROJECT CONDITIONS HEC-RAS OUTPUT

HEC-RAS Plan: PreProject River: RIVER-1 Reach: Reach-1 Profile: 100 Year

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	1000.4	100 Year	2839	1374.9	1382.2	1378.39	1382.41	0.000549	3.85	736.69	133.31	0.29
Reach-1	1000		Bridge									
Reach-1	6.507	100 Year	2839	1375.2	1381.9		1382.22	0.000709	4.22	673.32	129.09	0.33
Reach-1	6.504	100 Year	2839	1374.5	1381.8		1382.17	0.002212	4.60	616.94	119.28	0.36
Reach-1	6.463	100 Year	2839	1374.1	1380.9	1378.97	1381.55	0.004015	6.51	474.45	322.68	0.53
Reach-1	6.397	100 Year	2839	1373.2	1380.2		1380.50	0.002028	4.84	900.11	610.95	0.38
Reach-1	6.316	100 Year	2839	1372.7	1378.6		1379.10	0.004051	6.15	685.27	592.05	0.52
Reach-1	6.257	100 Year	2839	1371.7	1377.8		1378.16	0.002160	4.90	758.90	556.77	0.39
Reach-1	6.163	100 Year	2839	1370.7	1376.4		1376.89	0.002982	5.61	506.13	108.33	0.46
Reach-1	6.070	100 Year	2839	1368.7	1374.6		1375.19	0.004055	6.32	471.30	131.31	0.53
Reach-1	5.975	100 Year	2839	1367.7	1373.6		1373.83	0.001709	4.34	832.38	555.14	0.35
Reach-1	5.880	100 Year	2839	1366.7	1372.5		1372.79	0.002636	4.81	834.84	988.86	0.38
Reach-1	5.785	100 Year	2839	1364.7	1370.8		1371.26	0.003674	5.43	750.06	761.38	0.45
Reach-1	5.691	100 Year	2839	1362.7	1369.1		1369.49	0.003367	5.24	737.67	817.08	0.43
Reach-1	5.630	100 Year	2839	1362.7	1367.2	1366.10	1367.94	0.007996	7.07	405.18	143.68	0.64
Reach-1	5.587	100 Year	2839	1360.7	1366.9		1367.08	0.001601	3.79	804.66	528.64	0.30
Reach-1	5.535	100 Year	2839	1361.7	1366.1		1366.43	0.003689	4.95	681.86	597.37	0.44
Reach-1	5.440	100 Year	2839	1359.7	1365.0		1365.21	0.001631	3.57	1027.31	686.12	0.30
Reach-1	5.345	100 Year	2839	1357.7	1364.2		1364.37	0.001706	3.94	1387.97	1192.37	0.31
Reach-1	5.251	100 Year	2839	1357.7	1363.2	1361.16	1363.41	0.002126	4.18	1533.81	2387.76	0.34
Reach-1	5.193	100 Year	2839	1356.7	1361.7	1360.21	1362.36	0.005838	6.45	441.57	176.85	0.56
Reach-1	5.132	100 Year	2839	1354.7	1360.8		1361.12	0.002395	4.56	870.06	823.36	0.37
Reach-1	5.123	100 Year	2839	1354.7	1360.4		1360.86	0.008649	5.40	678.34	942.67	0.47
Reach-1	5.111	100 Year	2839	1354.7	1360.0	1359.51	1360.14	0.004121	3.77	1356.55	1522.66	0.32
Reach-1	5.104		Bridge									
Reach-1	5.099	100 Year	2839	1354.7	1359.8	1359.79	1360.13	0.013137	6.31	879.11	1175.42	0.55
Reach-1	5.073	100 Year	2839	1352.8	1357.5		1357.80	0.001289	4.05	700.89	225.60	0.40
Reach-1	5.054	100 Year	2839	1353.0	1357.2		1357.62	0.002171	4.93	575.99	204.23	0.52
Reach-1	5.035	100 Year	2839	1352.9	1356.7	1355.90	1357.31	0.003761	6.52	435.49	153.17	0.68
Reach-1	5.016	100 Year	2839	1352.5	1355.6	1355.56	1356.71	0.008850	8.60	330.24	145.81	1.01
Reach-1	4.997	100 Year	2839	1352.1	1355.9		1356.15	0.001284	3.96	738.60	256.78	0.40
Reach-1	4.978	100 Year	2839	1351.6	1355.8		1356.02	0.001276	3.75	765.49	279.09	0.40
Reach-1	4.959	100 Year	2839	1351.6	1355.6		1355.87	0.001580	4.07	722.37	284.35	0.44
Reach-1	4.940	100 Year	2839	1351.2	1355.6		1355.73	0.000973	3.44	828.62	277.38	0.35
Reach-1	4.921	100 Year	2839	1350.7	1355.4		1355.63	0.001096	3.65	792.87	272.19	0.37
Reach-1	4.902	100 Year	2839	1350.5	1355.3		1355.52	0.000929	3.45	821.75	262.16	0.34
Reach-1	4.883	100 Year	2839	1350.3	1354.9		1355.35	0.002749	5.52	514.55	183.70	0.58
Reach-1	4.864	100 Year	2839	1350.1	1354.3		1354.99	0.004150	6.56	432.70	162.17	0.71

HEC-RAS Plan: PreProject River: RIVER-1 Reach: Reach-1 Profile: 100 Year (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min. Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	4.845	100 Year	2839	1349.6	1354.0		1354.59	0.003346	6.05	469.14	168.88	0.64
Reach-1	4.826	100 Year	2839	1348.9	1353.8		1354.28	0.002445	5.57	509.35	163.73	0.56
Reach-1	4.807	100 Year	2839	1348.6	1353.7		1354.05	0.001786	5.05	562.40	165.93	0.48
Reach-1	4.788	100 Year	2839	1348.5	1353.2		1353.79	0.003363	6.22	456.56	158.23	0.65
Reach-1	4.770	100 Year	2839	1348.1	1353.0		1353.47	0.002445	5.61	506.30	161.35	0.56
Reach-1	4.751	100 Year	2839	1348.2	1352.5		1353.15	0.004030	6.28	452.40	177.42	0.69
Reach-1	4.732	100 Year	2839	1347.7	1352.3		1352.78	0.002638	5.47	519.43	182.36	0.57
Reach-1	4.713	100 Year	2839	1346.9	1352.2		1352.54	0.001716	4.92	577.56	171.70	0.47
Reach-1	4.694	100 Year	2839	1346.8	1351.4		1352.22	0.005199	7.46	380.51	139.15	0.80
Reach-1	4.675	100 Year	2839	1346.6	1351.1	1350.01	1351.78	0.003004	6.66	426.38	122.34	0.63

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

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X   X   XXXXXX   XXXX   XXXX   XX   XXXX
X   X   X       X   X   X   X   X   X
X   X   X       X       X   X   X   X
XXXXXXXX XXXX   X       XXX XXXX XXXXXX XXXX
X   X   X       X       X   X   X   X   X
X   X   X       X   X   X   X   X   X
X   X   XXXXXX   XXXX   X   X   X   X   XXXXX
  
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PROJECT DATA

Project Title: QC Wash - PreProject Conditions - LOMR
 Project File : QC_PreProject.prj
 Run Date and Time: 6/8/2006 11:17:04 AM

Project in English units

Project Description:

Project Title: PRE-PROJECT CONDITIONS MODEL FOR FEMA SUBMITTAL - Queen Creek Wash, Sossaman Road to Hawes Road
 Prepared By: Dibble and Associates
 Consulting Engineers
 Model Created: April, 2003
 Prepared For: Town of Queen Creek

Contact: Tom Narva, PH: 480-987-0109

Reviewing Agency:

Flood Control District of Maricopa County
 Contact: Tim
 Murphy, PH: 602-506-1501

Note: Crosssections face downstream. River Miles increase in the upstream direction.

Note: This model is on NAVD 88 vertical datum.

 This model is being used as the Pre Project Conditions Model for the Queen Creek Wash Improvement project, Town of Queen Creek Proj. No. 2000D-03. The cross sections in this model were originally generated from erroneous mapping. The following correction factors have been applied to the elevations of the cross sections originating from the Coe & Van Loo, Flood Control District, and Collins Pina models in order to match the corrected aerial mapping:

West of
 Hawes Road: Correction = +2.683'
 East of Hawes Road: Correction = +2.427'

The Bridge & Culvert routines were also adjusted by these correction factors.

This is a combined model of Queen Creek from East of Power Road to Hawes Road. It utilizes the following models from downstream to upstream.

1. Coe and Van Loo's Ryland Homes Model (Queen Creek Wash LOMR, Power Road to Sossaman Road- Approved by FEMA - Case No. 03-09-0247P): x-sections 4.657 to 5.054.
3. The Flood Control Districts Power Road to Hawes Rd. Delineation: x-section 5.065 to 6.470.
3. Collins-Pina Delineation from Hawes Rd to the SPRR: x-section 1000.4

Model #1, the Coe and Van Loo LOMR, was performed on different mapping than the erroneous mapping provided by FCDMC for this project. CVL mapping is on Town of Queen Creek datum, rather than NAVD 88 datum. Therefore, a correction factor of -2.00' was applied to Coe & Van Loo elevations to resolve the discrepancy.

Flow Rates:

At Cross Section
 1000.40 - 2840 cfs obtained from Queen Creek Wash - Power Road to Hawes Road Pre-Design Report_ and reproduced in the subsequent report Queen Creek Wash - Hawes Road to Power Road, Revised Hydrology_ completed by Dibble & Associates and approved as part of the LOMR for Queen Creek Wash, Power Road to Sossaman Road- Case No. 03-09-0247P.

PLAN DATA

Plan Title: QC Wash - PreProject Conditions - LOMR
 Plan File : j:\10-0078\LOMR Data\HEC-RAS\QC_PreProject.p01

Geometry Title: QC Wash - PreProject Conditions - LOMR
 Geometry File : j:\10-0078\LOMR Data\HEC-RAS\QC_PreProject.g01

Flow Title : QC Wash - PreProject Conditions - LOMR
 Flow File : j:\10-0078\LOMR Data\HEC-RAS\QC_PreProject.f01

Plan Summary Information:

Number of: Cross Sections = 46 Multiple Openings = 0
 Culverts = 0 Inline Structures = 0
 Bridges = 2 Lateral Structures = 0

Computational Information

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

Computation Options

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

FLOW DATA

Flow Title: QC Wash - PreProject Conditions - LOMR
 Flow File : j:\10-0078\LOMR Data\HEC-RAS\QC_PreProject.f01

Flow Data (cfs)

River	Reach	RS	100 Year
RIVER-1	Reach-1	1000.4	2839

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	100 Year		Normal S = 0.003

GEOMETRY DATA

Geometry Title: QC Wash - PreProject Conditions - LOMR
 Geometry File : j:\10-0078\LOMR Data\HEC-RAS\QC_PreProject.g01

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 1000.4

INPUT

Description: Collins/Pina Sta 1000+40. Just Upstream from Hawes Road. Collins
 Pina cross sections raised 2.683 feet to match NAV88 vertical datum.

Station Elevation Data		num=	14				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
777	1383.53	808	1384.03	855	1384.43	891	1384.83
925	1384.43	965	1374.93	1000	1374.93	1035	1374.93
1099	1384.83	1140	1384.63	1179	1384.43	1223	1388.43

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
777	.04	925	.028	1078	.04

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	925	1078		84	84	84	.3 .5

Ineffective Flow		num=	2	
Sta L	Sta R	Elev	Permanent	
777	925	1384.33	F	
1078	1223	1384.33	F	

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1382.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.028	
W.S. Elev (ft)	1382.18	Reach Len. (ft)	0.05	0.05	0.05
Crit W.S. (ft)	1378.39	Flow Area (sq ft)		736.69	
E.G. Slope (ft/ft)	0.000549	Area (sq ft)		736.69	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	133.31	Top Width (ft)		133.31	
Vel Total (ft/s)	3.85	Avg. Vel. (ft/s)		3.85	
Max Chl Dpth (ft)	7.25	Hydr. Depth (ft)		5.53	
Conv. Total (cfs)	121205.7	Conv. (cfs)		121205.7	
Length Wtd. (ft)	0.05	Wetted Per. (ft)		134.95	
Min Ch El (ft)	1374.93	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.72	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	27.39	115.73	27.08
C & E Loss (ft)	0.03	Cum SA (acres)	50.85	28.15	52.37

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE

RIVER: RIVER-1
REACH: Reach-1 RS: 1000

INPUT
Description: Bridge #5 - HAWES ROAD

Distance from Upstream XS = .05
Deck/Roadway Width = 83.9
Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates
num= 9
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
920.902 1384.25 1374 950.1321384.712 1374 950.1321384.7121382.309
974.701 1385.11382.611 997.451 1385.46 1382.89 1020.21385.3231382.819
1046.591385.1651382.737 1046.591385.165 1374 1090.8 1384.9 1374

Upstream Bridge Cross Section Data
Station Elevation Data num= 14
Sta Elev Sta Elev Sta Elev Sta Elev
777 1383.53 808 1384.03 855 1384.43 891 1384.83 916 1384.43
925 1384.43 965 1374.93 1000 1374.93 1035 1374.93 1078 1384.43
1099 1384.83 1140 1384.63 1179 1384.43 1223 1388.43

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
777 .04 925 .028 1078 .04

Bank Sta: Left Right Coeff Contr. Expan.
925 1078 .3 .5

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
777 925 1384.33 F
1078 1223 1384.33 F

Downstream Deck/Roadway Coordinates
num= 9
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
913.649 1384.82 1374 949.6011385.089 1374 949.6011385.0891382.676
976.171385.2881382.791 999.074 1385.46 1382.89 1021.981385.1421382.654
1046.721384.7981382.398 1046.721384.798 1374 1074.66 1384.41 1374

Downstream Bridge Cross Section Data
Station Elevation Data num= 14
Sta Elev Sta Elev Sta Elev Sta Elev
777 1383.78 808 1384.28 855 1384.68 891 1385.08 916 1383.78
925 1384.68 965 1375.18 1000 1375.18 1035 1375.18 1078 1384.68
1099 1385.08 1140 1384.88 1179 1384.68 1223 1388.68

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
777 .04 925 .028 1078 .04

Bank Sta: Left Right Coeff Contr. Expan.
925 1078 .3 .5

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =1384.455
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 2

Pier Data
Pier Station Upstream= 974.701 Downstream= 976.17
Upstream num= 2
Width Elev Width Elev
3 1372 3 1382.89
Downstream num= 2
Width Elev Width Elev
3 1372 3 1382.89

Pier Data
Pier Station Upstream= 1020.2 Downstream= 1021.98
Upstream num= 2
Width Elev Width Elev
3 1372 3 1382.89
Downstream num= 2
Width Elev Width Elev
3 1372 3 1382.89

Number of Bridge Coefficient Sets = 1

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

High Flow Method
Energy Only

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

BRIDGE OUTPUT Profile #100 Year

E.G. US. (ft) 1382.41 Element Inside BR US Inside BR DS

W.S. US. (ft)	1382.18	E.G. Elev (ft)	1382.37	1382.28
Q Total (cfs)	2839.00	W.S. Elev (ft)	1382.03	1381.89
Q Bridge (cfs)	2839.00	Crit W.S. (ft)	1378.52	1378.77
Q Weir (cfs)		Max Chl Dpth (ft)	7.10	6.71
Weir Sta Lft (ft)		Vel Total (ft/s)	4.73	5.00
Weir Sta Rgt (ft)		Flow Area (sq ft)	600.78	567.88
Weir Submerg		Froude # Chl	0.32	0.35
Weir Max Depth (ft)		Specif Force (cu ft)	2445.95	2247.47
Min El Weir Flow (ft)	1384.46	Hydr Depth (ft)	6.64	6.23
Min El Prs (ft)	1382.16	W.P. Total (ft)	119.53	118.66
Delta EG (ft)	0.19	Conv. Total (cfs)	93549.0	85583.1
Delta WS (ft)	0.23	Top Width (ft)	90.46	91.12
BR Open Area (sq ft)	643.20	Frctn Loss (ft)	0.08	0.00
BR Open Vel (ft/s)	5.00	C & E Loss (ft)	0.01	0.06
Coef of Q		Shear Total (lb/sq ft)	0.29	0.33
Br Sel Method	Energy only	Power Total (lb/ft s)	1.37	1.64

Warning: The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the program will default to an energy based solution.

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 6.507

INPUT

Description: Dibble Sta 6.507 - Flood Control District Sta 6.470. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD

Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num= 14							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
777	1383.78	808	1384.28	855	1384.68	891	1385.08	916	1383.78
925	1384.68	965	1375.18	1000	1375.18	1035	1375.18	1078	1384.68
1099	1385.08	1140	1384.88	1179	1384.68	1223	1388.68		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
777	.04	925	.028	1078	.04

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	925	1078		30	30	.3	.5

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1382.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.028	
W.S. Elev (ft)	1381.94	Reach Len. (ft)	30.00	30.00	30.00
Crit W.S. (ft)		Flow Area (sq ft)		673.32	
E.G. Slope (ft/ft)	0.000709	Area (sq ft)		673.32	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	129.09	Top Width (ft)		129.09	
Vel Total (ft/s)	4.22	Avg. Vel. (ft/s)		4.22	
Max Chl Dpth (ft)	6.76	Hydr. Depth (ft)		5.22	
Conv. Total (cfs)	106623.3	Conv. (cfs)		106623.3	
Length Wtd. (ft)	30.00	Wetted Per. (ft)		130.62	
Min Ch El (ft)	1375.18	Shear (lb/sq ft)		0.23	
Alpha	1.00	Stream Power (lb/ft s)		0.96	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	27.39	114.60	27.08
C & E Loss (ft)	0.02	Cum SA (acres)	50.85	27.98	52.37

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

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 6.504

INPUT

Description: Dibble Sta 6.504 - Flood Control District Sta 6.467. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD

Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num= 45							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11000	1382.18	11124	1382.68	11171	1382.68	11178	1382.68	11326	1382.68
11339	1383.68	11347	1384.68	11354	1385.68	11368	1385.68	11373	1384.68
11377	1383.68	11382	1382.68	11386	1381.68	11392	1380.68	11398	1379.68
11403	1378.68	11408	1377.68	11412	1376.68	11415	1375.68	11419	1374.68
11422	1374.48	11427	1374.68	11442	1374.68	11452	1374.68	11476	1374.78
11479	1375.68	11484	1376.68	11488	1377.68	11492	1378.68	11496	1379.68
11500	1380.68	11504	1381.68	11508	1382.68	11513	1383.68	11517	1384.68
11520	1385.68	11524	1386.68	11527	1387.68	11538	1387.68	11540	1386.68
11542	1385.68	11544	1384.68	11560	1383.68	11565	1382.68	11600	1382.68

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

11000 .075 11368 .045 11527 .065

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
11368 11527 300 203 175 .1 .3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft) 1382.17 Element Left OB Channel Right OB
Vel Head (ft) 0.33 Wt. n-Val. 0.045
W.S. Elev (ft) 1381.84 Reach Len. (ft) 300.00 203.00 175.00
Crit W.S. (ft) Flow Area (sq ft) 616.94
E.G. Slope (ft/ft) 0.002212 Area (sq ft) 616.94
Q Total (cfs) 2839.00 Flow (cfs) 2839.00
Top Width (ft) 119.28 Top Width (ft) 119.28
Vel Total (ft/s) 4.60 Avg. Vel. (ft/s) 4.60
Max Chl Dpth (ft) 7.36 Hydr. Depth (ft) 5.17
Conv. Total (cfs) 60364.2 Conv. (cfs) 60364.2
Length Wtd. (ft) 203.05 Wetted Per. (ft) 120.95
Min Ch El (ft) 1374.48 Shear (lb/sq ft) 0.70
Alpha 1.00 Stream Power (lb/ft s) 3.24
Frctn Loss (ft) 0.59 Cum Volume (acre-ft) 27.39 114.15 27.08
C & E Loss (ft) 0.03 Cum SA (acres) 50.85 27.89 52.37

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 6.463

INPUT

Description: Dibble Sta 6.463 - Flood Control District Sta 6.426. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD

Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data num= 59
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
10990 1382.68 10992 1382.38 10994 1382.08 10996 1381.78 10998 1381.48
11000 1381.18 11149 1380.92 11169 1380.68 11231 1380.68 11254 1381.68
11264 1382.68 11274 1383.68 11281 1384.68 11288 1385.68 11297 1385.68
11301 1384.68 11305 1383.68 11309 1382.68 11313 1381.68 11323 1380.68
11326 1379.68 11330 1378.68 11334 1377.68 11338 1376.68 11342 1375.68
11347 1374.68 11348 1374.52 11362 1374.68 11374 1374.68 11387 1374.13
11390 1374.68 11394 1375.68 11398 1376.68 11403 1377.68 11407 1378.68
11410 1379.68 11413 1380.68 11415 1381.68 11418 1382.68 11420 1383.68
11423 1384.68 11425 1385.68 11428 1386.68 11430 1387.68 11433 1388.68
11439 1388.68 11441 1387.68 11443 1386.68 11445 1385.68 11447 1384.68
11449 1383.68 11451 1382.68 11453 1381.68 11460 1380.68 11467 1380.68
11472 1380.68 11561 1380.68 11577 1380.77 11715 1381.38

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
10990 .075 11297 .04 11433 .065

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
11297 11433 380 340 295 .1 .3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft) 1381.55 Element Left OB Channel Right OB
Vel Head (ft) 0.65 Wt. n-Val. 0.075 0.040 0.065
W.S. Elev (ft) 1380.89 Reach Len. (ft) 380.00 340.00 295.00
Crit W.S. (ft) 1378.97 Flow Area (sq ft) 15.41 433.32 25.72
E.G. Slope (ft/ft) 0.004015 Area (sq ft) 15.41 433.32 25.72
Q Total (cfs) 2839.00 Flow (cfs) 6.23 2821.05 11.72
Top Width (ft) 322.68 Top Width (ft) 84.39 92.53 145.76
Vel Total (ft/s) 5.98 Avg. Vel. (ft/s) 0.40 6.51 0.46
Max Chl Dpth (ft) 6.76 Hydr. Depth (ft) 0.18 4.68 0.18
Conv. Total (cfs) 44803.0 Conv. (cfs) 98.3 44519.8 184.9
Length Wtd. (ft) 341.39 Wetted Per. (ft) 84.40 94.21 145.77
Min Ch El (ft) 1374.13 Shear (lb/sq ft) 0.05 1.15 0.04
Alpha 1.18 Stream Power (lb/ft s) 0.02 7.51 0.02
Frctn Loss (ft) 0.95 Cum Volume (acre-ft) 27.34 111.71 27.03
C & E Loss (ft) 0.10 Cum SA (acres) 50.56 27.40 52.08

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 6.397

INPUT

Description: Dibble Sta 6.397 - Flood Control District Sta 6.360. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD

Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data num= 56
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
10900 1380.68 10920 1380.38 10940 1380.08 10960 1379.78 10980 1379.58
11000 1379.38 11011 1379.68 11014 1379.68 11066 1379.68 11086 1379.68
11119 1378.78 11165 1378.68 11248 1378.68 11251 1379.68 11254 1380.68
11257 1381.68 11260 1382.68 11264 1383.68 11282 1383.68 11285 1382.68
11288 1381.68 11292 1380.68 11305 1379.68 11308 1378.68 11311 1377.68

11314	1376.68	11318	1375.68	11322	1374.68	11326	1373.68	11328	1373.23
11375	1373.68	11382	1373.7	11385	1374.68	11389	1375.68	11392	1376.68
11396	1377.68	11399	1378.68	11402	1379.68	11405	1380.68	11408	1381.68
11411	1382.68	11414	1383.68	11421	1384.68	11426	1384.68	11428	1383.68
11430	1382.68	11431	1381.68	11433	1380.68	11435	1379.68	11543	1379.68
11556	1379.68	11565	1379.68	11592	1379.96	11691	1380.68	11700	1380.68
11743	1380.68								

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
10900	.075	11282	.04
		11421	.065

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	11282	11421		600	490		.1	.3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1380.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.075	0.040	0.065
W.S. Elev (ft)	1380.17	Reach Len. (ft)	600.00	490.00	380.00
Crit W.S. (ft)		Flow Area (sq ft)	297.81	525.24	77.06
E.G. Slope (ft/ft)	0.002028	Area (sq ft)	297.81	525.24	77.06
Q Total (cfs)	2839.00	Flow (cfs)	253.83	2541.30	43.86
Top Width (ft)	610.95	Top Width (ft)	318.71	104.89	187.34
Vel Total (ft/s)	3.15	Avg. Vel. (ft/s)	0.85	4.84	0.57
Max Chl Dpth (ft)	6.94	Hydr. Depth (ft)	0.93	5.01	0.41
Conv. Total (cfs)	63039.3	Conv. (cfs)	5636.3	56429.0	974.0
Length Wtd. (ft)	495.55	Wetted Per. (ft)	318.98	106.79	187.46
Min Ch El (ft)	1373.23	Shear (lb/sq ft)	0.12	0.62	0.05
Alpha	2.11	Stream Power (lb/ft s)	0.10	3.01	0.03
Frctn Loss (ft)	1.38	Cum Volume (acre-ft)	25.97	107.97	26.68
C & E Loss (ft)	0.02	Cum SA (acres)	48.80	26.63	50.95

Warning: Divided flow computed for this cross-section.
 Warning: The conveyance ratio (Upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
 Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 6.316

INPUT

Description: Dibble Sta 6.316 - Flood Control District Sta 6.279. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD

Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num=	47						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11000	1380.28	11003	1379.4	11024	1379.68	11158	1376.68	11161	1376.68
11162	1377.68	11194	1378.68	11247	1378.68	11390	1377.68	11405	1377.68
11410	1378.68	11414	1379.68	11419	1380.68	11424	1381.68	11430	1382.68
11445	1382.68	11447	1381.68	11449	1380.68	11452	1379.68	11454	1378.68
11468	1377.68	11472	1376.68	11476	1375.68	11480	1374.68	11483	1373.68
11487	1372.68	11539	1372.68	11542	1373.68	11544	1374.68	11547	1375.68
11549	1376.68	11552	1377.68	11554	1378.68	11556	1379.68	11559	1380.68
11561	1381.68	11563	1382.68	11566	1383.68	11574	1383.68	11577	1382.68
11581	1381.68	11584	1380.68	11588	1379.68	11591	1378.68	11652	1377.74
11833	1378.58	12320	1380.68						

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
11000	.075	11445	.04
		11566	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	11445	11566		325	305		.1	.3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1379.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.54	Wt. n-Val.	0.075	0.040	0.055
W.S. Elev (ft)	1378.57	Reach Len. (ft)	325.00	305.00	285.00
Crit W.S. (ft)		Flow Area (sq ft)	170.20	419.62	95.46
E.G. Slope (ft/ft)	0.004051	Area (sq ft)	170.20	419.62	95.46
Q Total (cfs)	2839.00	Flow (cfs)	167.26	2580.77	90.97
Top Width (ft)	592.05	Top Width (ft)	262.53	98.16	231.36
Vel Total (ft/s)	4.14	Avg. Vel. (ft/s)	0.98	6.15	0.95
Max Chl Dpth (ft)	5.89	Hydr. Depth (ft)	0.65	4.27	0.41
Conv. Total (cfs)	44606.1	Conv. (cfs)	2627.9	40548.9	1429.3
Length Wtd. (ft)	304.58	Wetted Per. (ft)	263.07	100.02	231.37
Min Ch El (ft)	1372.68	Shear (lb/sq ft)	0.16	1.06	0.10
Alpha	2.01	Stream Power (lb/ft s)	0.16	6.53	0.10
Frctn Loss (ft)	0.88	Cum Volume (acre-ft)	22.75	102.65	25.93
C & E Loss (ft)	0.06	Cum SA (acres)	44.80	25.48	49.13

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 6.257

INPUT

Description: Dibble Sta 6.257 - Flood Control District Sta 6.220. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD

Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data num= 47
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
11000 1378.28 11027 1378.22 11092 1378.68 11096 1379.68 11097 1379.68

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
11000 .075 11399 .04 11529 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
11399 11529 510 500 490 .1 .3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft) 1378.16 Element Left OB Channel Right OB
Vel Head (ft) 0.35 Wt. n-Val. 0.075 0.040 0.055
W.S. Elev (ft) 1377.82 Reach Len. (ft) 510.00 500.00 490.00

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 6.163

INPUT
Description: Dibble Sta 6.163 - Flood Control District Sta 6.126. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD

Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data num= 40
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
11000 1376.88 11077 1376.98 11172 1376.68 11237 1376.68 11242 1377.68

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
11000 .07 11399 .04 11530 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
11399 11530 470 488 505 .1 .3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft) 1376.89 Element Left OB Channel Right OB
Vel Head (ft) 0.49 Wt. n-Val. 0.040
W.S. Elev (ft) 1376.40 Reach Len. (ft) 470.00 488.00 505.00

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 6.070

INPUT

Description: Dibble Sta 6.070 - Flood Control District Sta 6.033. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD

Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num= 54							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11000	1374.98	11137	1375.12	11313	1375.68	11322	1376.68	11324	1376.68
11325	1375.68	11328	1375.68	11329	1376.68	11332	1376.68	11342	1376.68
11350	1377.68	11357	1378.68	11367	1379.68	11372	1379.68	11376	1378.68
11380	1377.68	11383	1376.68	11386	1375.68	11389	1374.68	11392	1373.68
11394	1372.68	11397	1371.68	11399	1370.68	11408	1369.68	11446	1368.68
11464	1368.68	11465	1368.68	11469	1369.68	11473	1370.68	11474	1371.68
11481	1372.68	11485	1373.68	11489	1374.68	11493	1375.68	11497	1376.68
11501	1377.68	11505	1378.68	11509	1379.68	11520	1379.68	11523	1378.68
11527	1377.68	11530	1376.68	11533	1375.68	11537	1374.68	11540	1373.68
11543	1372.68	11547	1372.68	11554	1373.68	11571	1374.68	11584	1375.68
11608	1375.68	11660	1375.16	11910	1375.31	12350	1375.68		

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
11000	.06	11372	.04
		11509	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11372	11509		445	500	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1375.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.		0.040	0.055
W.S. Elev (ft)	1374.58	Reach Len. (ft)	445.00	500.00	540.00
Crit W.S. (ft)		Flow Area (sq ft)		441.59	29.72
E.G. Slope (ft/ft)	0.004055	Area (sq ft)		441.59	29.72
Q Total (cfs)	2839.00	Flow (cfs)		2790.76	48.24
Top Width (ft)	131.31	Top Width (ft)		99.30	32.01
Vel Total (ft/s)	6.02	Avg. Vel. (ft/s)		6.32	1.62
Max Chl Dpth (ft)	5.90	Hydr. Depth (ft)		4.45	0.93
Conv. Total (cfs)	44584.8	Conv. (cfs)		43827.2	757.6
Length Wtd. (ft)	501.48	Wetted Per. (ft)		101.12	32.42
Min Ch El (ft)	1368.68	Shear (lb/sq ft)		1.11	0.23
Alpha	1.08	Stream Power (lb/ft s)		6.99	0.38
Frctn Loss (ft)	1.26	Cum Volume (acre-ft)	21.89	88.00	23.68
C & E Loss (ft)	0.10	Cum SA (acres)	42.15	22.33	45.76

Warning: Divided flow computed for this cross-section.

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

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 5.975

INPUT

Description: Dibble Sta 5.975 - Flood Control District Sta 5.938. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD

Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num= 42							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11000	1373.88	11248	1374.21	11320	1374.68	11328	1374.68	11331	1374.68
11333	1375.68	11335	1375.68	11339	1374.68	11355	1374.68	11363	1375.68
11374	1376.68	11392	1376.68	11394	1375.68	11397	1374.68	11399	1373.68
11401	1372.68	11404	1371.68	11406	1370.68	11409	1369.68	11411	1368.68
11413	1367.68	11490	1367.68	11500	1368.68	11507	1369.68	11513	1370.68
11518	1371.68	11523	1372.68	11528	1373.68	11532	1374.68	11544	1374.68
11583	1373.68	11614	1373.68	11654	1373.68	11661	1373.68	11716	1373.31
11756	1373.68	11762	1373.68	11764	1373.68	11798	1372.68	11869	1372.68
11909	1372.68	12420	1374.68						

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
11000	.06	11392	.04
		11532	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11392	11532		500	495	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1373.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.040	0.055
W.S. Elev (ft)	1373.56	Reach Len. (ft)	500.00	495.00	470.00
Crit W.S. (ft)		Flow Area (sq ft)		616.88	215.50
E.G. Slope (ft/ft)	0.001709	Area (sq ft)		616.88	215.50
Q Total (cfs)	2839.00	Flow (cfs)		2677.22	161.78
Top Width (ft)	555.14	Top Width (ft)		128.12	427.02
Vel Total (ft/s)	3.41	Avg. Vel. (ft/s)		4.34	0.75
Max Chl Dpth (ft)	5.87	Hydr. Depth (ft)		4.81	0.50
Conv. Total (cfs)	68674.3	Conv. (cfs)		64760.8	3913.5
Length Wtd. (ft)	493.74	Wetted Per. (ft)		129.85	427.03

Min Ch El (ft)	1367.68	Shear (lb/sq ft)	0.51	0.05
Alpha	1.53	Stream Power (lb/ft s)	2.20	0.04
Frctn Loss (ft)	1.04	Cum Volume (acre-ft)	21.89	81.93
C & E Loss (ft)	0.01	Cum SA (acres)	42.15	21.03
				42.92

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.880

INPUT
Description: Dibble Sta 5.880 - Flood Control District Sta 5.843. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD
Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num= 40	
Sta	Elev	Sta	Elev
10690	1374.68	10705	1374.18
11000	1372.18	11289	1372.13
11398	1374.68	11399	1373.68
11406	1369.68	11408	1368.68
11493	1367.68	11498	1368.68
11516	1372.68	11521	1373.68
11544	1374.68	11550	1373.68
11619	1371.68	11624	1371.68
		11698	1372.05
		11720	1373.68
		11364	1372.68
		11375	1373.68
		11403	1371.68
		11414	1366.68
		11503	1369.68
		11530	1375.68
		11569	1371.68
		11903	1372.15
		12420	1374.68

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
10690	.06	11398	.045
		11530	.055

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	11398	11530		494	492	490		.1	.3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1372.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.	0.060	0.045	0.055
W.S. Elev (ft)	1372.45	Reach Len. (ft)	494.00	492.00	490.00
Crit W.S. (ft)		Flow Area (sq ft)	112.14	550.81	171.89
E.G. Slope (ft/ft)	0.002636	Area (sq ft)	112.14	550.81	171.89
Q Total (cfs)	2839.00	Flow (cfs)	54.85	2649.75	134.40
Top Width (ft)	988.86	Top Width (ft)	469.90	112.87	406.09
Vel Total (ft/s)	3.40	Avg. Vel. (ft/s)	0.49	4.81	0.78
Max Chl Dpth (ft)	5.77	Hydr. Depth (ft)	0.24	4.88	0.42
Conv. Total (cfs)	55299.2	Conv. (cfs)	1068.5	51612.9	2617.8
Length Wtd. (ft)	492.06	Wetted Per. (ft)	469.90	115.23	406.13
Min Ch El (ft)	1366.68	Shear (lb/sq ft)	0.04	0.79	0.07
Alpha	1.87	Stream Power (lb/ft s)	0.02	3.78	0.05
Frctn Loss (ft)	1.52	Cum Volume (acre-ft)	21.25	75.29	20.07
C & E Loss (ft)	0.01	Cum SA (acres)	39.46	19.66	38.42

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.785

INPUT
Description: Dibble Sta 5.785 - Flood Control District Sta 5.748. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD
Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num= 47	
Sta	Elev	Sta	Elev
10030	1372.68	10200	1372.18
11000	1370.18	11027	1370.68
11262	1369.88	11364	1370.68
11411	1371.68	11413	1370.68
11425	1368.68	11428	1367.68
11485	1364.68	11490	1365.68
11514	1369.68	11517	1370.68
11529	1374.68	11547	1374.68
11624	1370.68	11625	1370.68
11773	1371.68	11935	1371.88
		10400	1371.68
		11036	1370.68
		11037	1370.68
		11378	1371.68
		11388	1372.68
		11417	1369.68
		11434	1365.68
		11508	1367.68
		11523	1372.68
		11551	1373.68
		11555	1372.68
		11718	1371.68
		11731	1371.76
		10800	1370.68
		11067	1370.68
		11405	1372.68
		11422	1369.68
		11441	1364.68
		11511	1368.68
		11526	1373.68
		11564	1371.68

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
10030	.055	11405	.045
		11529	.055

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	11405	11529		430	510	570		.1	.3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1371.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (ft)	1370.84	Reach Len. (ft)	430.00	510.00	570.00

Crit W.S. (ft)		Flow Area (sq ft)	272.04	475.86	2.16
E.G. Slope (ft/ft)	0.003674	Area (sq ft)	272.04	475.86	2.16
Q Total (cfs)	2839.00	Flow (cfs)	254.28	2584.04	0.68
Top Width (ft)	761.38	Top Width (ft)	630.86	104.81	25.71
Vel Total (ft/s)	3.79	Avg. Vel. (ft/s)	0.93	5.43	0.31
Max Chl Dpth (ft)	6.16	Hydr. Depth (ft)	0.43	4.54	0.08
Conv. Total (cfs)	46836.5	Conv. (cfs)	4195.0	42630.3	11.2
Length Wtd. (ft)	504.06	Wetted Per. (ft)	630.88	106.49	25.71
Min Ch El (ft)	1364.68	Shear (lb/sq ft)	0.10	1.03	0.02
Alpha	1.88	Stream Power (lb/ft s)	0.09	5.57	0.01
Frctn Loss (ft)	1.77	Cum Volume (acre-ft)	19.07	69.49	19.09
C & E Loss (ft)	0.00	Cum SA (acres)	33.22	18.43	35.99

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.691

INPUT
Description: Dibble Sta 5.691 - Flood Control District Sta 5.654. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD
Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num= 56		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9640	1370.68	9820	1370.18	10000	1369.68	10005	1369.68	10520	1369.18		
11000	1368.68	11013	1368.49	11238	1368.68	11262	1368.68	11301	1368.68		
11335	1369.68	11342	1369.75	11350	1369.68	11355	1369.68	11379	1370.68		
11390	1371.68	11397	1372.68	11402	1373.68	11403	1373.68	11406	1372.68		
11409	1371.68	11411	1370.68	11414	1369.68	11417	1368.68	11419	1367.68		
11422	1366.68	11425	1365.68	11428	1364.68	11454	1363.68	11499	1362.68		
11503	1362.68	11506	1363.68	11509	1364.68	11512	1365.68	11515	1366.68		
11518	1367.68	11521	1368.68	11535	1369.68	11539	1370.68	11544	1371.68		
11549	1372.68	11566	1372.68	11573	1371.68	11589	1370.68	11613	1370.68		
11634	1370.68	11639	1370.68	11708	1370.72	11714	1370.68	11719	1370.68		
11782	1370.68	11784	1369.68	11788	1369.68	11789	1370.68	11790	1370.68		
11793	1369.68										

Manning's n Values		num= 3		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9640	.055	11403	.045	11549	.055		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11403	11549		190	310	425	.1 .3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1369.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.40	Wt. n-Val.	0.055	0.045	
W.S. Elev (ft)	1369.09	Reach Len. (ft)	190.00	310.00	425.00
Crit W.S. (ft)		Flow Area (sq ft)	227.87	509.80	
E.G. Slope (ft/ft)	0.003367	Area (sq ft)	227.87	509.80	
Q Total (cfs)	2839.00	Flow (cfs)	168.05	2670.95	
Top Width (ft)	817.08	Top Width (ft)	706.15	110.93	
Vel Total (ft/s)	3.85	Avg. Vel. (ft/s)	0.74	5.24	
Max Chl Dpth (ft)	6.41	Hydr. Depth (ft)	0.32	4.60	
Conv. Total (cfs)	48930.0	Conv. (cfs)	2896.3	46033.7	
Length Wtd. (ft)	306.41	Wetted Per. (ft)	706.16	112.74	
Min Ch El (ft)	1362.68	Shear (lb/sq ft)	0.07	0.95	
Alpha	1.75	Stream Power (lb/ft s)	0.05	4.98	
Frctn Loss (ft)	1.52	Cum Volume (acre-ft)	16.60	63.72	19.08
C & E Loss (ft)	0.04	Cum SA (acres)	26.62	17.16	35.83

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.630

INPUT
Description: Dibble Sta 5.630 - Flood Control District Sta 5.593. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD
Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num= 43		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11000	1368.08	11128	1367.68	11180	1367.68	11207	1367.68	11208	1367.68		
11218	1367.68	11319	1366.96	11347	1367.68	11350	1367.68	11372	1367.68		
11376	1368.68	11391	1369.68	11400	1369.68	11404	1368.68	11408	1367.68		
11411	1366.68	11415	1365.68	11419	1364.68	11423	1363.68	11434	1362.68		
11491	1362.68	11506	1363.68	11509	1364.68	11512	1365.68	11515	1366.68		
11519	1367.68	11534	1368.68	11537	1369.68	11541	1370.68	11544	1371.68		
11546	1371.68	11558	1370.68	11566	1369.68	11575	1368.68	11591	1367.68		
11693	1367.68	11736	1367.92	11859	1368.68	11867	1368.68	11873	1367.68		
11875	1367.68	11877	1368.68	11923	1368.68						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 11000 .055 11400 .045 11544 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 11400 11544 216 226 236 .1 .3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1367.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.77	Wt. n-Val.	0.055	0.045	
W.S. Elev (ft)	1367.16	Reach Len. (ft)	216.00	226.00	236.00
Crit W.S. (ft)	1366.10	Flow Area (sq ft)	3.68	401.50	
E.G. Slope (ft/ft)	0.007996	Area (sq ft)	3.68	401.50	
Q Total (cfs)	2839.00	Flow (cfs)	1.93	2837.07	
Top Width (ft)	143.68	Top Width (ft)	36.30	107.38	
Vel Total (ft/s)	7.01	Avg. Vel. (ft/s)	0.53	7.07	
Max Chl Dpth (ft)	4.48	Hydr. Depth (ft)	0.10	3.74	
Conv. Total (cfs)	31749.4	Conv. (cfs)	21.6	31727.8	
Length Wtd. (ft)	225.97	Wetted Per. (ft)	36.30	108.45	
Min Ch El (ft)	1362.68	Shear (lb/sq ft)	0.05	1.85	
Alpha	1.02	Stream Power (lb/ft s)	0.03	13.06	
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	16.10	60.48	19.08
C & E Loss (ft)	0.17	Cum SA (acres)	25.00	16.39	35.83

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

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 5.587

INPUT
 Description: Dibble Sta 5.587 - Flood Control District Sta 5.550. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD
 Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data num= 46					
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev					
11000 1367.28 11099 1366.68 11108 1366.68 11120 1366.68 11122 1366.68					
11130 1366.68 11321 1366.68 11330 1366.68 11331 1366.68 11387 1366.68					
11392 1367.68 11396 1368.68 11413 1368.68 11416 1367.68 11419 1366.68					
11422 1365.68 11425 1364.68 11428 1363.68 11431 1362.68 11438 1361.68					
11443 1360.68 11444 1360.68 11447 1361.68 11454 1361.68 11463 1360.68					
11524 1360.68 11528 1361.68 11540 1362.68 11560 1363.68 11564 1364.68					
11566 1365.68 11569 1366.68 11572 1367.68 11575 1368.68 11579 1369.68					
11582 1370.68 11585 1371.68 11590 1371.68 11594 1370.68 11599 1369.68					
11605 1368.68 11614 1367.68 11647 1366.68 11665 1366.68 11722 1366.97					
11958 1367.18					

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 11000 .055 11413 .045 11585 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 11413 11585 280 272 265 .1 .3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1367.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (ft)	1366.86	Reach Len. (ft)	280.00	272.00	265.00
Crit W.S. (ft)		Flow Area (sq ft)	54.30	743.46	6.90
E.G. Slope (ft/ft)	0.001601	Area (sq ft)	54.30	743.46	6.90
Q Total (cfs)	2839.00	Flow (cfs)	18.05	2819.17	1.78
Top Width (ft)	528.64	Top Width (ft)	318.44	151.07	59.12
Vel Total (ft/s)	3.53	Avg. Vel. (ft/s)	0.33	3.79	0.26
Max Chl Dpth (ft)	6.18	Hydr. Depth (ft)	0.17	4.92	0.12
Conv. Total (cfs)	70961.0	Conv. (cfs)	451.1	70465.3	44.6
Length Wtd. (ft)	272.09	Wetted Per. (ft)	318.46	152.88	59.12
Min Ch El (ft)	1360.68	Shear (lb/sq ft)	0.02	0.49	0.01
Alpha	1.15	Stream Power (lb/ft s)	0.01	1.84	0.00
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	15.95	57.51	19.06
C & E Loss (ft)	0.01	Cum SA (acres)	24.12	15.72	35.67

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

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 5.535

INPUT
 Description: Dibble Sta 5.535 - Flood Control District Sta 5.498. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD
 Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num= 37	
Sta	Elev	Sta	Elev
10850	1368.68	10880	1368.18
11000	1365.88	11225	1365.68
11295	1367.68	11300	1368.68
11318	1365.68	11322	1364.68
11442	1361.68	11448	1362.68
11460	1366.68	11463	1367.68
11493	1368.68	11499	1367.68
11630	1365.98	11868	1366.35
10910	1367.68	10930	1367.18
11249	1365.49	11277	1365.68
11307	1368.68	11311	1367.68
11325	1363.68	11329	1362.68
11451	1363.68	11454	1364.68
11466	1368.68	11469	1369.68
11507	1366.68	11528	1365.68
10960	1366.68	11292	1366.68
11314	1366.68	11333	1361.68
11457	1365.68	11482	1369.68
11507	1365.68		

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
10850	.055	11307	.045
11469	.055		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11307	11469		490	498	499	.1
							.3

CROSS SECTION OUTPUT Profile #100 Year

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1366.43				
Vel Head (ft)	0.37	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (ft)	1366.06	Reach Len. (ft)	490.00	498.00	499.00
Crit W.S. (ft)		Flow Area (sq ft)	90.60	554.81	36.45
E.G. Slope (ft/ft)	0.003689	Area (sq ft)	90.60	554.81	36.45
Q Total (cfs)	2839.00	Flow (cfs)	68.15	2748.89	21.96
Top Width (ft)	597.37	Top Width (ft)	291.92	141.68	163.76
Vel Total (ft/s)	4.16	Avg. Vel. (ft/s)	0.75	4.95	0.60
Max Chl Dpth (ft)	4.38	Hydr. Depth (ft)	0.31	3.92	0.22
Conv. Total (cfs)	46740.0	Conv. (cfs)	1122.0	45256.5	361.6
Length Wtd. (ft)	497.58	Wetted Per. (ft)	291.94	142.89	163.77
Min Ch El (ft)	1361.68	Shear (lb/sq ft)	0.07	0.89	0.05
Alpha	1.37	Stream Power (lb/ft s)	0.05	4.43	0.03
Frctn Loss (ft)	1.17	Cum Volume (acre-ft)	15.49	53.46	18.93
C & E Loss (ft)	0.06	Cum SA (acres)	22.16	14.80	34.99

Warning: Divided flow computed for this cross-section.
 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
 Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 5.440

INPUT
 Description: Dibble Sta 5.440 - Flood Control District Sta 5.403. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD
 Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num= 38	
Sta	Elev	Sta	Elev
10730	1366.68	10800	1366.18
11000	1364.58	11299	1364.02
11413	1366.68	11416	1365.68
11429	1361.68	11432	1360.68
11544	1359.68	11550	1360.68
11581	1364.68	11586	1365.68
11597	1368.68	11610	1367.68
11654	1364.68	11741	1365.07
10860	1365.68	10940	1365.18
11380	1364.68	11389	1365.68
11419	1364.68	11423	1363.68
11435	1359.68	11441	1359.68
11558	1361.68	11565	1362.68
11589	1366.68	11592	1367.68
11617	1366.68	11642	1364.68
11966	1365.42		

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
10730	.055	11413	.045
11595	.055		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11413	11595		500	500	500	.1
							.3

CROSS SECTION OUTPUT Profile #100 Year

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1365.21				
Vel Head (ft)	0.18	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (ft)	1365.02	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)		Flow Area (sq ft)	281.43	727.68	18.21
E.G. Slope (ft/ft)	0.001631	Area (sq ft)	281.43	727.68	18.21
Q Total (cfs)	2839.00	Flow (cfs)	232.39	2599.95	6.66
Top Width (ft)	686.12	Top Width (ft)	427.48	164.75	93.89
Vel Total (ft/s)	2.76	Avg. Vel. (ft/s)	0.83	3.57	0.37
Max Chl Dpth (ft)	5.34	Hydr. Depth (ft)	0.66	4.42	0.19
Conv. Total (cfs)	70289.8	Conv. (cfs)	5753.7	64371.3	164.8
Length Wtd. (ft)	500.00	Wetted Per. (ft)	427.51	165.95	93.90
Min Ch El (ft)	1359.68	Shear (lb/sq ft)	0.07	0.45	0.02
Alpha	1.54	Stream Power (lb/ft s)	0.06	1.60	0.01
Frctn Loss (ft)	0.83	Cum Volume (acre-ft)	13.39	46.13	18.62
C & E Loss (ft)	0.00	Cum SA (acres)	18.11	13.05	33.51

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 5.345

INPUT
 Description: Dibble Sta 5.345 - Flood Control District Sta 5.308. FCD cross

sections raised 2.427 feet to match NAV88 vertical datum.

FCD

Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num=		43	
Sta	Elev	Sta	Elev	Sta	Elev
10480	1366.68	10500	1366.18	10515	1365.68
11000	1362.98	11176	1363.05	11356	1362.68
11363	1363.68	11364	1362.68	11376	1362.68
11411	1365.68	11420	1365.68	11427	1364.68
11434	1361.68	11436	1360.68	11438	1359.68
11448	1357.68	11507	1358.68	11511	1359.68
11521	1362.68	11524	1363.68	11527	1364.68
11543	1366.68	11550	1365.68	11559	1364.68
11912	1363.68	11950	1364.3	12355	1364.68

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
10480	.055	11420	.045	11535	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11420	11535		502	502	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1364.37				
Vel Head (ft)	0.17	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (ft)	1364.20	Reach Len. (ft)	502.00	502.00	502.00
Crit W.S. (ft)		Flow Area (sq ft)	687.37	490.78	209.83
E.G. Slope (ft/ft)	0.001706	Area (sq ft)	687.37	490.78	209.83
Q Total (cfs)	2839.00	Flow (cfs)	744.74	1935.82	158.45
Top Width (ft)	1192.37	Top Width (ft)	717.83	97.58	376.96
Vel Total (ft/s)	2.05	Avg. Vel. (ft/s)	1.08	3.94	0.76
Max Chl Dpth (ft)	6.52	Hydr. Depth (ft)	0.96	5.03	0.56
Conv. Total (cfs)	68728.7	Conv. (cfs)	18029.2	46863.7	3835.8
Length Wtd. (ft)	502.00	Wetted Per. (ft)	718.54	99.80	376.98
Min Ch El (ft)	1357.68	Shear (lb/sq ft)	0.10	0.52	0.06
Alpha	2.62	Stream Power (lb/ft s)	0.11	2.07	0.04
Frctn Loss (ft)	0.95	Cum Volume (acre-ft)	7.83	39.13	17.31
C & E Loss (ft)	0.00	Cum SA (acres)	11.54	11.55	30.81

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.251

INPUT

Description: Dibble Sta 5.251 - Flood Control District Sta 5.214. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD

Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num=		40	
Sta	Elev	Sta	Elev	Sta	Elev
10210	1364.68	10230	1364.48	10255	1364.18
11000	1362.48	11182	1362.48	11334	1362.48
11341	1362.68	11361	1362.68	11376	1363.68
11408	1363.68	11411	1362.68	11413	1361.68
11421	1358.68	11424	1357.68	11486	1357.68
11508	1360.68	11512	1361.68	11515	1362.68
11540	1364.68	11551	1363.68	11564	1362.68
11932	1362.78	12100	1363.68	12180	1362.68

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
10210	.055	11404	.045	11521	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11404	11521		310	303	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1363.41				
Vel Head (ft)	0.20	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (ft)	1363.21	Reach Len. (ft)	310.00	303.00	294.00
Crit W.S. (ft)	1361.16	Flow Area (sq ft)	415.57	494.82	623.42
E.G. Slope (ft/ft)	0.002126	Area (sq ft)	415.57	494.82	623.42
Q Total (cfs)	2839.00	Flow (cfs)	336.16	2066.93	435.92
Top Width (ft)	2387.76	Top Width (ft)	794.01	107.17	1486.58
Vel Total (ft/s)	1.85	Avg. Vel. (ft/s)	0.81	4.18	0.70
Max Chl Dpth (ft)	5.53	Hydr. Depth (ft)	0.52	4.62	0.42
Conv. Total (cfs)	61578.5	Conv. (cfs)	7291.4	44832.0	9455.1
Length Wtd. (ft)	302.72	Wetted Per. (ft)	794.04	108.87	1486.60
Min Ch El (ft)	1357.68	Shear (lb/sq ft)	0.07	0.60	0.06
Alpha	3.75	Stream Power (lb/ft s)	0.06	2.52	0.04
Frctn Loss (ft)	1.00	Cum Volume (acre-ft)	1.48	33.45	12.51
C & E Loss (ft)	0.04	Cum SA (acres)	2.83	10.37	20.07

Warning: Divided flow computed for this cross-section.

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

Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 5.193

INPUT
 Description: Dibble Sta 5.193 - Flood Control District Sta 5.156. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD
 Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num= 45		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10060	1364.68	10300	1364.18	10560	1363.68	10640	1363.18	10730	1362.68		
11000	1362.48	11193	1362.48	11333	1362.48	11349	1362.48	11354	1362.48		
11356	1362.68	11357	1362.68	11358	1362.48	11367	1362.48	11391	1362.68		
11405	1363.68	11423	1363.68	11428	1362.68	11431	1361.68	11434	1360.68		
11437	1359.68	11441	1358.68	11443	1357.68	11446	1356.68	11476	1356.68		
11483	1356.68	11516	1356.68	11519	1357.68	11522	1358.68	11529	1359.68		
11534	1360.68	11537	1361.68	11541	1362.68	11544	1363.68	11566	1363.68		
11576	1362.68	11599	1361.68	11618	1361.68	11716	1361.76	11902	1361.87		
11968	1362.68	11980	1362.68	12080	1361.68	12330	1362.38	13435	1362.68		

Manning's n Values		num= 3		Sta n Val		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
10060	.055	11423	.045	11544	.055				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11423	11544		100	320	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

			Left OB	Channel	Right OB
E.G. Elev (ft)	1362.36	Element			
Vel Head (ft)	0.65	Wt. n-Val.		0.045	0.055
W.S. Elev (ft)	1361.71	Reach Len. (ft)	100.00	320.00	245.00
Crit W.S. (ft)	1360.21	Flow Area (sq ft)		440.21	1.36
E.G. Slope (ft/ft)	0.005838	Area (sq ft)		440.21	1.36
Q Total (cfs)	2839.00	Flow (cfs)		2838.80	0.20
Top Width (ft)	176.85	Top Width (ft)		106.21	70.64
Vel Total (ft/s)	6.43	Avg. Vel. (ft/s)		6.45	0.15
Max Chl Dpth (ft)	5.03	Hydr. Depth (ft)		4.14	0.02
Conv. Total (cfs)	37157.2	Conv. (cfs)		37154.6	2.6
Length Wtd. (ft)	317.00	Wetted Per. (ft)		107.72	70.64
Min Ch El (ft)	1356.68	Shear (lb/sq ft)		1.49	0.01
Alpha	1.01	Stream Power (lb/ft s)		9.60	0.00
Frctn Loss (ft)	1.13	Cum Volume (acre-ft)		30.20	10.40
C & E Loss (ft)	0.10	Cum SA (acres)		9.62	14.82

Warning: Divided flow computed for this cross-section.
 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 5.132

INPUT
 Description: Dibble Sta 5.132 - Flood Control District Sta 5.095. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD
 Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num= 71		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10000	1364.68	10180	1364.18	10350	1363.68	10520	1363.18	10690	1362.68		
11000	1362.48	11139	1362.48	11168	1362.48	11223	1362.48	11238	1362.48		
11286	1362.48	11372	1362.48	11375	1362.48	11377	1362.48	11378	1362.48		
11383	1362.48	11385	1362.68	11386	1362.68	11395	1362.68	11407	1363.68		
11427	1363.68	11433	1363.68	11437	1364.68	11442	1365.68	11443	1365.68		
11449	1364.68	11458	1363.68	11461	1362.68	11464	1361.68	11466	1360.68		
11469	1359.68	11471	1358.68	11475	1357.68	11479	1356.68	11516	1355.68		
11537	1354.68	11557	1354.68	11564	1354.68	11570	1354.68	11574	1355.68		
11576	1356.68	11578	1357.68	11580	1358.68	11582	1359.68	11584	1360.68		
11587	1361.68	11592	1362.68	11596	1363.68	11600	1364.68	11611	1364.68		
11612	1363.68	11614	1362.68	11615	1361.68	11665	1360.68	11780	1360.43		
11802	1360.68	11829	1361.68	11837	1361.68	11839	1360.68	11840	1360.68		
11842	1361.68	11843	1361.68	11883	1361.68	11884	1361.68	11887	1360.68		
11889	1360.68	11892	1360.68	12007	1359.87	12350	1360.68	12980	1361.68		
13825	1362.68										

Manning's n Values		num= 3		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
10000	.055	11443	.045	11600	.055		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11443	11600		42	48	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

			Left OB	Channel	Right OB
E.G. Elev (ft)	1361.12	Element			
Vel Head (ft)	0.30	Wt. n-Val.		0.045	0.055
W.S. Elev (ft)	1360.83	Reach Len. (ft)	42.00	48.00	210.00
Crit W.S. (ft)		Flow Area (sq ft)		572.68	297.38
E.G. Slope (ft/ft)	0.002395	Area (sq ft)		572.68	297.38
Q Total (cfs)	2839.00	Flow (cfs)		2612.26	226.74

Top Width (ft)	823.36	Top Width (ft)	118.73	704.63
Vel Total (ft/s)	3.26	Avg. Vel. (ft/s)	4.56	0.76
Max Chl Dpth (ft)	6.15	Hydr. Depth (ft)	4.82	0.42
Conv. Total (cfs)	58007.1	Conv. (cfs)	53374.3	4632.8
Length Wtd. (ft)	60.89	Wetted Per. (ft)	120.77	704.73
Min Ch El (ft)	1354.68	Shear (lb/sq ft)	0.71	0.06
Alpha	1.80	Stream Power (lb/ft s)	3.23	0.05
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	26.48	9.56
C & E Loss (ft)	0.01	Cum SA (acres)	8.80	12.64

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

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.123

INPUT
Description: Dibble Sta 5.123 - Flood Control District Sta 5.086. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD
Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num= 71	
Sta	Elev	Sta	Elev
10000	1364.08	10150	1363.68
10000	1362.48	11126	1362.48
11326	1362.48	11344	1362.48
11381	1362.68	11398	1363.68
11420	1366.68	11423	1365.68
11444	1361.68	11455	1360.68
11493	1358.68	11501	1357.68
11557	1354.68	11572	1354.68
11592	1357.68	11595	1358.68
11605	1362.68	11615	1363.68
11637	1362.68	11640	1361.68
11810	1361.68	11812	1360.68
11825	1360.68	11846	1361.68
11961	1359.68	12210	1360.68
14240	1362.68	12500	1360.18
10340	1363.38	10500	1363.08
11302	1362.48	11311	1362.48
11347	1362.48	11354	1362.48
11410	1364.68	11415	1365.68
11426	1364.68	11428	1363.68
11463	1360.68	11480	1360.68
11523	1356.68	11530	1355.68
11584	1354.68	11587	1355.68
11597	1359.68	11600	1360.68
11622	1364.68	11632	1364.68
11706	1361.68	11752	1361.68
11813	1360.68	11820	1362.21
11848	1361.68	11850	1360.68
12500	1360.18	13245	1360.68
10680	1362.68	11323	1362.48
11355	1362.48	11418	1366.68
11435	1362.68	11486	1359.68
11536	1354.68	11590	1356.68
11602	1361.68	11634	1363.68
11809	1361.68	11821	1360.68
11919	1359.68	13310	1360.68

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
10000	.055	11420	.065
		11622	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11420	11622	34	70	150	.3	.5

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1360.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.		0.065	0.055
W.S. Elev (ft)	1360.44	Reach Len. (ft)	34.00	70.00	150.00
Crit W.S. (ft)		Flow Area (sq ft)		483.60	194.74
E.G. Slope (ft/ft)	0.008649	Area (sq ft)		483.60	194.74
Q Total (cfs)	2839.00	Flow (cfs)		2613.78	225.22
Top Width (ft)	942.67	Top Width (ft)		117.85	824.82
Vel Total (ft/s)	4.19	Avg. Vel. (ft/s)		5.40	1.16
Max Chl Dpth (ft)	5.76	Hydr. Depth (ft)		4.10	0.24
Conv. Total (cfs)	30527.2	Conv. (cfs)		28105.4	2421.7
Length Wtd. (ft)	97.54	Wetted Per. (ft)		119.31	824.83
Min Ch El (ft)	1354.68	Shear (lb/sq ft)		2.19	0.13
Alpha	1.54	Stream Power (lb/ft s)		11.83	0.15
Frctn Loss (ft)	0.56	Cum Volume (acre-ft)		25.90	8.37
C & E Loss (ft)	0.15	Cum SA (acres)		8.67	8.95

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

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.111

INPUT
Description: Dibble Sta 5.111 - Flood Control District Sta 5.074. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD
Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num= 35	
Sta	Elev	Sta	Elev
10950	1362.88	11310	1361.88
11505	1361.68	11520	1361.88
11533	1362.18	11550	1360.68
11610	1357.68	11623	1360.68
11710	1361.68	11900	1362.68
13470	1359.38	13860	1360.68
14440	1358.68	14480	1358.68
11410	1362.18	11425	1361.68
11530	1362.08	11532	1362.18
11561	1354.68	11605	1354.68
11665	1362.68	11678	1362.68
12850	1360.08	13180	1359.58
13910	1360.68	13980	1358.68
14715	1360.68	14870	1362.18

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
10950	.055	11550	.065
		11623	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 11550 11623 60 60 15 .3 .5

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1360.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.065	0.055
W.S. Elev (ft)	1360.03	Reach Len. (ft)	0.05	0.05	0.05
Crit W.S. (ft)	1359.51	Flow Area (sq ft)		294.49	1062.06
E.G. Slope (ft/ft)	0.004121	Area (sq ft)		294.49	1062.06
Q Total (cfs)	2839.00	Flow (cfs)		1109.72	1729.28
Top Width (ft)	1522.66	Top Width (ft)		69.12	1453.54
Vel Total (ft/s)	2.09	Avg. Vel. (ft/s)		3.77	1.63
Max Chl Dpth (ft)	5.35	Hydr. Depth (ft)		4.26	0.73
Conv. Total (cfs)	44223.6	Conv. (cfs)	17286.4	26937.2	
Length Wtd. (ft)	0.05	Wetted Per. (ft)	71.57	1453.57	
Min Ch El (ft)	1354.68	Shear (lb/sq ft)	1.06	0.19	
Alpha	1.64	Stream Power (lb/ft s)	3.99	0.31	
Frctn Loss (ft)		Cum Volume (acre-ft)	25.27	6.21	
C & E Loss (ft)		Cum SA (acres)	8.52	5.03	

BRIDGE

RIVER: RIVER-1
 REACH: Reach-1 RS: 5.104

INPUT

Description: Bridge #4 - SOSSAMAN ROAD

Distance from Upstream XS = .05
 Deck/Roadway Width = 59.9
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num=	8								
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
113101362.483	0	114101362.183	0	115051361.683	0				
115331361.3831359.283		115611361.3831359.283		116101361.3831359.283					
119001362.5831359.283		128501360.083	0						

Upstream Bridge Cross Section Data

Station Elevation Data	num=	35							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10950	1362.88	11310	1361.88	11410	1362.18	11425	1361.68	11446	1360.68
11505	1361.68	11520	1361.88	11525	1361.98	11530	1362.08	11532	1362.18
11533	1362.18	11550	1360.68	11555	1357.68	11561	1354.68	11605	1354.68
11610	1357.68	11623	1360.68	11628	1361.68	11665	1362.68	11678	1362.68
11710	1361.68	11900	1362.68	12340	1360.38	12850	1360.08	13180	1359.58
13470	1359.38	13860	1360.68	13880	1364.68	13910	1360.68	13980	1358.68
14440	1358.68	14480	1358.68	14540	1359.68	14715	1360.68	14870	1362.18

Manning's n Values

num=	3				
Sta	n Val	Sta	n Val	Sta	n Val
10950	.055	11550	.065	11623	.055

Bank Sta: Left Right Coeff Contr. Expan.
 11550 11623 .3 .5

Downstream Deck/Roadway Coordinates

num=	8								
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
113101362.483	0	114101362.183	0	115051361.683	0				
115331361.3831359.283		115611361.3831359.283		116101361.3831359.283					
119001362.5831359.283		128501360.083	0						

Downstream Bridge Cross Section Data

Station Elevation Data	num=	22							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11300	1362.68	11370	1362.68	11440	1362.68	11490	1361.68	11520	1361.68
11555	1360.68	11570	1360.68	11575	1357.68	11585	1354.68	11620	1354.68
11620	1357.68	11635	1361.68	11700	1361.68	11860	1360.68	12100	1360.68
12365	1360.38	12910	1360.08	13200	1359.58	13490	1359.38	13790	1358.98
14070	1358.88	14200	1358.68						

Manning's n Values

num=	3				
Sta	n Val	Sta	n Val	Sta	n Val
11300	.055	11570	.065	11635	.055

Bank Sta: Left Right Coeff Contr. Expan.
 11570 11635 .3 .5

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins =1360.083
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
 Selected Low Flow Methods = Energy

High Flow Method

Pressure and Weir flow
 Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd =.8006408
 Max Low Cord =1360.083

Additional Bridge Parameters

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

BRIDGE OUTPUT Profile #100 Year

E.G. US. (ft)	1360.14	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1360.03	E.G. Elev (ft)	1360.14	1360.13
Q Total (cfs)	2839.00	W.S. Elev (ft)	1360.03	1359.79
Q Bridge (cfs)	766.34	Crit W.S. (ft)	1359.38	1359.72
Q Weir (cfs)	2072.66	Max Chl Dpth (ft)	5.35	5.11
Weir Sta Lft (ft)	12826.90	Vel Total (ft/s)	2.17	3.33
Weir Sta Rgt (ft)	14621.16	Flow Area (sq ft)	1306.43	851.46
Weir Submerg	0.85	Froude # Chl	0.18	0.29
Weir Max Depth (ft)	1.46	Specif Force (cu ft)	1471.68	1083.70
Min El Weir Flow (ft)	1360.08	Hydr Depth (ft)	0.90	0.76
Min El Prs (ft)	1360.08	W.P. Total (ft)	1584.98	1231.58
Delta EG (ft)	0.01	Conv. Total (cfs)		
Delta WS (ft)	0.25	Top Width (ft)	1453.54	1119.02
BR Open Area (sq ft)	199.09	Frctn Loss (ft)		
BR Open Vel (ft/s)	3.85	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)		
Br Sel Method	Press/Weir	Power Total (lb/ft s)		

- Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
 Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
 Note: For the cross section inside the bridge at the downstream end, the water surface and energy have been projected from the downstream cross section. The selected bridge modeling method does not compute answers inside the bridge.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 5.099

INPUT
 Description: Dibble Sta 5.099 - Flood Control District Sta 5.065. FCD cross sections raised 2.427 feet to match NAV88 vertical datum.

FCD
 Cross section stationing obtained from Queen Creek ADMS has been modified for downstream channel improvements which affect the thalweg stationing.

Station Elevation Data		num= 22		Sta		Elev		Sta		Elev	
11300	1362.68	11370	1362.68	11440	1362.68	11490	1361.68	11520	1361.68		
11555	1360.68	11570	1360.68	11575	1357.68	11585	1354.68	11620	1354.68		
11620	1357.68	11635	1361.68	11700	1361.68	11860	1360.68	12100	1360.68		
12365	1360.38	12910	1360.08	13200	1359.58	13490	1359.38	13790	1358.98		
14070	1358.88	14200	1358.68								

Manning's n Values		num= 3		Sta		n Val	
11300	.055	11570	.065	11635	.055		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	11570	11635	140.46	140.46	140.46		.3	.5	

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1360.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.		0.065	0.055
W.S. Elev (ft)	1359.79	Reach Len. (ft)	140.46	140.46	140.46
Crit W.S. (ft)	1359.79	Flow Area (sq ft)		226.73	652.37
E.G. Slope (ft/ft)	0.013137	Area (sq ft)		226.73	652.37
Q Total (cfs)	2839.00	Flow (cfs)		1430.15	1408.85
Top Width (ft)	1175.42	Top Width (ft)		56.40	1119.02
Vel Total (ft/s)	3.23	Avg. Vel. (ft/s)		6.31	2.16
Max Chl Dpth (ft)	5.11	Hydr. Depth (ft)		4.02	0.58
Conv. Total (cfs)	24769.4	Conv. (cfs)		12477.6	12291.8
Length Wtd. (ft)	140.46	Wetted Per. (ft)		60.70	1120.12
Min Ch El (ft)	1354.68	Shear (lb/sq ft)		3.06	0.48
Alpha	2.14	Stream Power (lb/ft s)		19.32	1.03
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		24.97	5.03
C & E Loss (ft)	0.05	Cum SA (acres)		8.52	3.25

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

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 5.073

INPUT
 Description: CVL Sta 62+00 - CVL elevations adjusted -2.0'

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9890	1358.4	9910	1357.4	9937	1357.2	9961	1352.8	10060	1352.9
10140	1358								

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
9890	.028	9890	.028	10140	.028

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9890	10140		100	100	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

			Left OB	Channel	Right OB
E.G. Elev (ft)	1357.80	Element			
Vel Head (ft)	0.25	Wt. n-Val.		0.028	
W.S. Elev (ft)	1357.54	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		700.89	
E.G. Slope (ft/ft)	0.001289	Area (sq ft)		700.89	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	225.60	Top Width (ft)		225.60	
Vel Total (ft/s)	4.05	Avg. Vel. (ft/s)		4.05	
Max Chl Dpth (ft)	4.74	Hydr. Depth (ft)		3.11	
Conv. Total (cfs)	79066.4	Conv. (cfs)		79066.4	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		226.15	
Min Ch El (ft)	1352.80	Shear (lb/sq ft)		0.25	
Alpha	1.00	Stream Power (lb/ft s)		1.01	
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)		23.47	3.97
C & E Loss (ft)	0.01	Cum SA (acres)		8.06	1.45

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.054

INPUT

Description: CVL Sta 61+00 - CVL elevations adjusted -2.0'

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9887	1358.8	9914	1357	9940	1356.7	9964	1353	10060	1353.2
10137	1358.9								

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
9887	.028	9887	.028	10137	.028

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9887	10137		100	100	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

			Left OB	Channel	Right OB
E.G. Elev (ft)	1357.62	Element			
Vel Head (ft)	0.38	Wt. n-Val.		0.028	
W.S. Elev (ft)	1357.24	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		575.99	
E.G. Slope (ft/ft)	0.002171	Area (sq ft)		575.99	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	204.23	Top Width (ft)		204.23	
Vel Total (ft/s)	4.93	Avg. Vel. (ft/s)		4.93	
Max Chl Dpth (ft)	4.24	Hydr. Depth (ft)		2.82	
Conv. Total (cfs)	60929.4	Conv. (cfs)		60929.4	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		204.67	
Min Ch El (ft)	1353.00	Shear (lb/sq ft)		0.38	
Alpha	1.00	Stream Power (lb/ft s)		1.88	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)		22.01	3.97
C & E Loss (ft)	0.03	Cum SA (acres)		7.57	1.45

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.035

INPUT

Description: CVL Sta 60+00 - CVL elevations adjusted -2.0'

Station Elevation Data									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9887	1358	9924	1357	9950	1356.8	9974	1352.9	10060	1353.1
10137	1359.3								

Manning's n Values					
Sta	n Val	Sta	n Val	Sta	n Val
9887	.028	9887	.028	10137	.028

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9887	10137		100	100	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

			Left OB	Channel	Right OB
E.G. Elev (ft)	1357.31	Element			
Vel Head (ft)	0.66	Wt. n-Val.		0.028	
W.S. Elev (ft)	1356.65	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1355.90	Flow Area (sq ft)		435.49	
E.G. Slope (ft/ft)	0.003761	Area (sq ft)		435.49	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	153.17	Top Width (ft)		153.17	
Vel Total (ft/s)	6.52	Avg. Vel. (ft/s)		6.52	
Max Chl Dpth (ft)	3.75	Hydr. Depth (ft)		2.84	
Conv. Total (cfs)	46291.3	Conv. (cfs)		46291.3	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		153.62	
Min Ch El (ft)	1352.90	Shear (lb/sq ft)		0.67	

Alpha	1.00	Stream Power (lb/ft s)	4.34	
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)	20.85	3.97
C & E Loss (ft)	0.05	Cum SA (acres)	7.16	1.45

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

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.016

INPUT

Description: CVL Sta 59+00 - CVL elevations adjusted -2.0'

Station Elevation Data	num=	7
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
9887 1357.5 9931 1356.5 9956 1356.4 9980 1352.5 10060 1352.9		
10092 1354.3 10137 1358.1		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
9887 .028 9887 .028 10137 .028		

Bank Sta: Left Right Lengths: Left Channel Right	Coeff Contr.	Expan.
9887 10137 100 100 100	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1356.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.15	Wt. n-Val.		0.028	
W.S. Elev (ft)	1355.56	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1355.56	Flow Area (sq ft)		330.24	
E.G. Slope (ft/ft)	0.008850	Area (sq ft)		330.24	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	145.81	Top Width (ft)		145.81	
Vel Total (ft/s)	8.60	Avg. Vel. (ft/s)		8.60	
Max Chl Dpth (ft)	3.06	Hydr. Depth (ft)		2.26	
Conv. Total (cfs)	30177.7	Conv. (cfs)		30177.7	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		146.15	
Min Ch El (ft)	1352.50	Shear (lb/sq ft)		1.25	
Alpha	1.00	Stream Power (lb/ft s)		10.73	
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)		19.97	3.97
C & E Loss (ft)	0.28	Cum SA (acres)		6.82	1.45

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.997

INPUT

Description: CVL Sta 58+00 - CVL elevations adjusted -2.0'

Station Elevation Data	num=	11
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
9887 1357.4 9935 1356.2 9960 1355.8 9984 1352.1 10063 1352.3		
10093 1354.1 10109 1354.3 10138 1353.1 10150 1352.1 10193 1352.5		
10220 1358.2		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
9887 .028 9887 .028 10093 .028		

Bank Sta: Left Right Lengths: Left Channel Right	Coeff Contr.	Expan.
9887 10093 100 100 100	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1356.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.028	0.028
W.S. Elev (ft)	1355.92	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		423.37	315.24
E.G. Slope (ft/ft)	0.001284	Area (sq ft)		423.37	315.24
Q Total (cfs)	2839.00	Flow (cfs)		1676.05	1162.95
Top Width (ft)	256.78	Top Width (ft)		140.57	116.21
Vel Total (ft/s)	3.84	Avg. Vel. (ft/s)		3.96	3.69
Max Chl Dpth (ft)	3.82	Hydr. Depth (ft)		3.01	2.71
Conv. Total (cfs)	79241.9	Conv. (cfs)		46781.7	32460.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)		140.91	116.63
Min Ch El (ft)	1352.10	Shear (lb/sq ft)		0.24	0.22
Alpha	1.00	Stream Power (lb/ft s)		0.95	0.80
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		19.10	3.61
C & E Loss (ft)	0.00	Cum SA (acres)		6.49	1.32

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.978

INPUT

Description: CVL Sta 57+00 - CVL elevations adjusted -2.0'

Station Elevation Data num= 10									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9887	1357.2	9936	1355.7	9961	1355.5	9985	1351.6	10064	1352.2
10095	1353.9	10105	1354	10149	1352.5	10196	1352.5	10223	1358.2

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
9887	.028	9887	.028	10095	.028

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9887	10095		100	100	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1356.02				
Vel Head (ft)	0.21	Wt. n-Val.	0.028	0.028	0.028
W.S. Elev (ft)	1355.81	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		453.32	312.17
E.G. Slope (ft/ft)	0.001276	Area (sq ft)		453.32	312.17
Q Total (cfs)	2839.00	Flow (cfs)		1700.83	1138.17
Top Width (ft)	279.09	Top Width (ft)		162.43	116.66
Vel Total (ft/s)	3.71	Avg. Vel. (ft/s)		3.75	3.65
Max Chl Dpth (ft)	4.20	Hydr. Depth (ft)		2.79	2.68
Conv. Total (cfs)	79479.0	Conv. (cfs)		47615.4	31863.6
Length Wtd. (ft)	100.00	Wetted Per. (ft)		162.80	117.03
Min Ch El (ft)	1351.60	Shear (lb/sq ft)		0.22	0.21
Alpha	1.00	Stream Power (lb/ft s)		0.83	0.77
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		18.10	2.89
C & E Loss (ft)	0.00	Cum SA (acres)		6.14	1.05

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.959

INPUT

Description: CVL Sta 56+00 - CVL elevations adjusted -2.0'

Station Elevation Data num= 11									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9887	1356.6	9936	1355.4	9961	1355.2	9985	1351.6	10065	1351.9
10092	1354.1	10102	1354.2	10137	1354.2	10149	1352	10196	1352.5
10223	1358.2								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
9887	.028	9887	.028	10092	.028

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9887	10092		100	100	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1355.87				
Vel Head (ft)	0.24	Wt. n-Val.	0.028	0.028	0.028
W.S. Elev (ft)	1355.63	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		444.75	277.62
E.G. Slope (ft/ft)	0.001580	Area (sq ft)		444.75	277.62
Q Total (cfs)	2839.00	Flow (cfs)		1810.87	1028.13
Top Width (ft)	284.35	Top Width (ft)		165.51	118.84
Vel Total (ft/s)	3.93	Avg. Vel. (ft/s)		4.07	3.70
Max Chl Dpth (ft)	4.03	Hydr. Depth (ft)		2.69	2.34
Conv. Total (cfs)	71414.3	Conv. (cfs)		45552.0	25862.3
Length Wtd. (ft)	100.00	Wetted Per. (ft)		165.87	119.37
Min Ch El (ft)	1351.60	Shear (lb/sq ft)		0.26	0.23
Alpha	1.01	Stream Power (lb/ft s)		1.08	0.85
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		17.06	2.22
C & E Loss (ft)	0.02	Cum SA (acres)		5.76	0.78

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.940

INPUT

Description: CVL Sta 55+00 - CVL elevations adjusted -2.0'

Station Elevation Data num= 11									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9887	1356.7	9936	1355.2	9961	1355	9985	1351.2	10067	1351.2
10094	1354	10104	1354	10137	1352.3	10145	1351.5	10182	1351.3
10211	1357.5								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
9887	.028	9887	.028	10094	.028

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9887	10094		100	100	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1355.73				
Vel Head (ft)	0.18	Wt. n-Val.	0.028	0.028	0.028
W.S. Elev (ft)	1355.55	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		508.73	319.89
E.G. Slope (ft/ft)	0.000973	Area (sq ft)		508.73	319.89
Q Total (cfs)	2839.00	Flow (cfs)		1749.47	1089.53
Top Width (ft)	277.38	Top Width (ft)		169.50	107.89
Vel Total (ft/s)	3.43	Avg. Vel. (ft/s)		3.44	3.41

Max Chl Dpth (ft)	4.35	Hydr. Depth (ft)	3.00	2.97
Conv. Total (cfs)	90997.2	Conv. (cfs)	56075.0	34922.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	169.95	108.42
Min Ch El (ft)	1351.20	Shear (lb/sq ft)	0.18	0.18
Alpha	1.00	Stream Power (lb/ft s)	0.63	0.61
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	15.97	1.53
C & E Loss (ft)	0.00	Cum SA (acres)	5.38	0.52

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 4.921

INPUT

Description: CVL Sta 54+00 - CVL elevations adjusted -2.0'

Station Elevation Data	num=	10
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
9887 1356.1 9938 1354.9 9961 1354.6 9985 1350.7 10060 1350.9		
10097 1354 10108 1353.9 10137 1351.2 10150 1350.7 10201 1357.1		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
9887 .028 9887 .028 10097 .028		

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
9887 10097	100 100 100	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1355.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.028	0.028
W.S. Elev (ft)	1355.43	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		545.74	247.14
E.G. Slope (ft/ft)	0.001096	Area (sq ft)		545.74	247.14
Q Total (cfs)	2839.00	Flow (cfs)		1994.43	844.57
Top Width (ft)	272.19	Top Width (ft)		181.50	90.69
Vel Total (ft/s)	3.58	Avg. Vel. (ft/s)		3.65	3.42
Max Chl Dpth (ft)	4.73	Hydr. Depth (ft)		3.01	2.73
Conv. Total (cfs)	85740.1	Conv. (cfs)		60233.5	25506.6
Length Wtd. (ft)	100.00	Wetted Per. (ft)		181.95	91.12
Min Ch El (ft)	1350.70	Shear (lb/sq ft)		0.21	0.19
Alpha	1.00	Stream Power (lb/ft s)		0.75	0.63
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		14.76	0.88
C & E Loss (ft)	0.00	Cum SA (acres)		4.97	0.29

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 4.902

INPUT

Description: CVL Sta 53+00 - CVL elevations adjusted -2.0'

Station Elevation Data	num=	10
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
9887 1356 9936 1354.9 9961 1354.5 9985 1350.6 10060 1350.5		
10097 1353.9 10107 1353.8 10137 1350.4 10155 1350.4 10188 1357.3		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
9887 .028 9887 .028 10097 .028		

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
9887 10097	100 100 100	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1355.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.		0.028	0.028
W.S. Elev (ft)	1355.34	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		562.48	259.27
E.G. Slope (ft/ft)	0.000929	Area (sq ft)		562.48	259.27
Q Total (cfs)	2839.00	Flow (cfs)		1937.74	901.27
Top Width (ft)	262.16	Top Width (ft)		180.54	81.62
Vel Total (ft/s)	3.45	Avg. Vel. (ft/s)		3.45	3.48
Max Chl Dpth (ft)	4.94	Hydr. Depth (ft)		3.12	3.18
Conv. Total (cfs)	93123.6	Conv. (cfs)		63560.7	29562.9
Length Wtd. (ft)	100.00	Wetted Per. (ft)		181.02	82.32
Min Ch El (ft)	1350.50	Shear (lb/sq ft)		0.18	0.18
Alpha	1.00	Stream Power (lb/ft s)		0.62	0.64
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)		13.49	0.30
C & E Loss (ft)	0.03	Cum SA (acres)		4.56	0.09

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

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 4.883

INPUT

Description: CVL Sta 52+00 - CVL elevations adjusted -2.0'

Station Elevation Data	num=	7
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
9887 1355.8 9936 1354.4 9961 1354.3 9985 1350.3 10060 1350.4		
10113 1355.9 10137 1356.4		

Manning's n Values	num=	3
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Sta	n Val	Sta	n Val	Sta	n Val
9887	.028	9887	.028	10137	.028

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9887	10137		100	100		.1	.3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1355.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.47	Wt. n-Val.		0.028	
W.S. Elev (ft)	1354.87	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		514.55	
E.G. Slope (ft/ft)	0.002749	Area (sq ft)		514.55	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	183.70	Top Width (ft)		183.70	
Vel Total (ft/s)	5.52	Avg. Vel. (ft/s)		5.52	
Max Chl Dpth (ft)	4.57	Hydr. Depth (ft)		2.80	
Conv. Total (cfs)	54147.2	Conv. (cfs)		54147.2	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		184.27	
Min Ch El (ft)	1350.30	Shear (lb/sq ft)		0.48	
Alpha	1.00	Stream Power (lb/ft s)		2.64	
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)		12.25	
C & E Loss (ft)	0.02	Cum SA (acres)		4.14	

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 4.864

INPUT
 Description: CVL Sta 51+00 - CVL elevations adjusted -2.0'
 Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9887	1355.4	9936	1354	9961	1353.8	9985	1350.1	10060	1350.3
10104	1356.9	10137	1356.9						

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
9887	.028	9887	.028	10137	.028

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9887	10137		100	100		.1	.3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1354.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.67	Wt. n-Val.		0.028	
W.S. Elev (ft)	1354.32	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		432.70	
E.G. Slope (ft/ft)	0.004150	Area (sq ft)		432.70	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	162.17	Top Width (ft)		162.17	
Vel Total (ft/s)	6.56	Avg. Vel. (ft/s)		6.56	
Max Chl Dpth (ft)	4.22	Hydr. Depth (ft)		2.67	
Conv. Total (cfs)	44067.7	Conv. (cfs)		44067.7	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		162.76	
Min Ch El (ft)	1350.10	Shear (lb/sq ft)		0.69	
Alpha	1.00	Stream Power (lb/ft s)		4.52	
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)		11.16	
C & E Loss (ft)	0.03	Cum SA (acres)		3.74	

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 4.845

INPUT
 Description: CVL Sta 50+00 - CVL elevations adjusted -2.0'
 Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9886	1355.5	9936	1353.5	9965	1353.1	9985	1349.6	10060	1349.8
10109	1356.3	10136	1356.8						

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
9886	.028	9886	.028	10136	.028

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	9886	10136		100	100		.1	.3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1354.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.		0.028	
W.S. Elev (ft)	1354.02	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		469.14	
E.G. Slope (ft/ft)	0.003346	Area (sq ft)		469.14	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	168.88	Top Width (ft)		168.88	
Vel Total (ft/s)	6.05	Avg. Vel. (ft/s)		6.05	
Max Chl Dpth (ft)	4.42	Hydr. Depth (ft)		2.78	
Conv. Total (cfs)	49082.8	Conv. (cfs)		49082.8	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		169.48	
Min Ch El (ft)	1349.60	Shear (lb/sq ft)		0.58	
Alpha	1.00	Stream Power (lb/ft s)		3.50	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)		10.13	
C & E Loss (ft)	0.03	Cum SA (acres)		3.36	

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 4.826

INPUT
 Description: CVL Sta 49+00 - CVL elevations adjusted -2.0'
 Station Elevation Data num= 9

Sta	Elev								
9884	1355	9936	1353.6	9961	1353.6	9985	1349	10008	1349.1
10048	1348.9	10070	1349.8	10103	1355.7	10141	1356.8		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9884	.028	9884	.028	10141	.028

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9884	10141		100	100	100	.1 .3

CROSS SECTION OUTPUT Profile #100 Year

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1354.28				
Vel Head (ft)	0.48	Wt. n-Val.		0.028	
W.S. Elev (ft)	1353.80	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		509.35	
E.G. Slope (ft/ft)	0.002445	Area (sq ft)		509.35	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	163.73	Top Width (ft)		163.73	
Vel Total (ft/s)	5.57	Avg. Vel. (ft/s)		5.57	
Max Chl Dpth (ft)	4.90	Hydr. Depth (ft)		3.11	
Conv. Total (cfs)	57413.4	Conv. (cfs)		57413.4	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		164.54	
Min Ch El (ft)	1348.90	Shear (lb/sq ft)		0.47	
Alpha	1.00	Stream Power (lb/ft s)		2.63	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)		9.01	
C & E Loss (ft)	0.03	Cum SA (acres)		2.98	

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 4.807

INPUT
 Description: CVL Sta 48+00 - CVL elevations adjusted -2.0'
 Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9886	1355.1	9941	1353	9990	1348.8	10030	1348.6	10060	1348.7
10095	1354.5	10136	1355						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9886	.028	9886	.028	10136	.028

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9886	10136		100	100	100	.1 .3

CROSS SECTION OUTPUT Profile #100 Year

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1354.05				
Vel Head (ft)	0.40	Wt. n-Val.		0.028	
W.S. Elev (ft)	1353.65	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		562.40	
E.G. Slope (ft/ft)	0.001786	Area (sq ft)		562.40	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	165.93	Top Width (ft)		165.93	
Vel Total (ft/s)	5.05	Avg. Vel. (ft/s)		5.05	
Max Chl Dpth (ft)	5.05	Hydr. Depth (ft)		3.39	
Conv. Total (cfs)	67180.9	Conv. (cfs)		67180.9	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		166.53	
Min Ch El (ft)	1348.60	Shear (lb/sq ft)		0.38	
Alpha	1.00	Stream Power (lb/ft s)		1.90	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)		7.78	
C & E Loss (ft)	0.02	Cum SA (acres)		2.60	

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 4.788

INPUT
 Description: CVL Sta 47+00 - CVL elevations adjusted -2.0'
 Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9885	1355	9936	1352.9	9963	1352.8	9982	1349.3	9999	1348.7
10028	1348.9	10060	1348.5	10092	1354	10138	1354.7		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9885	.028	9885	.028	10138	.028

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9885	10138		100	100	100	.1 .3

CROSS SECTION OUTPUT Profile #100 Year

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1353.79				
Vel Head (ft)	0.60	Wt. n-Val.		0.028	
W.S. Elev (ft)	1353.19	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		456.56	
E.G. Slope (ft/ft)	0.003363	Area (sq ft)		456.56	

Q Total (cfs)	2839.00	Flow (cfs)	2839.00
Top Width (ft)	158.23	Top Width (ft)	158.23
Vel Total (ft/s)	6.22	Avg. Vel. (ft/s)	6.22
Max Chl Dpth (ft)	4.69	Hydr. Depth (ft)	2.89
Conv. Total (cfs)	48953.2	Conv. (cfs)	48953.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	158.97
Min Ch El (ft)	1348.50	Shear (lb/sq ft)	0.60
Alpha	1.00	Stream Power (lb/ft s)	3.75
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	6.61
C & E Loss (ft)	0.03	Cum SA (acres)	2.23

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 4.770

INPUT

Description: CVL Sta 46+00 - CVL elevations adjusted -2.0'

Station Elevation Data	num=	8
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
9885 1354.5 9936 1352.7 9961 1352.4 9985 1348.3 10010 1348.1		
10060 1348.2 10092 1353.4 10137 1353.9		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
9885 .028 9885 .028 10137 .028		

Bank Sta: Left Right Lengths: Left Channel Right	Coeff	Contr.	Expan.
9885 10137 100 100 100	.1	.3	

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1353.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.		0.028	
W.S. Elev (ft)	1352.98	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		506.30	
E.G. Slope (ft/ft)	0.002445	Area (sq ft)		506.30	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	161.35	Top Width (ft)		161.35	
Vel Total (ft/s)	5.61	Avg. Vel. (ft/s)		5.61	
Max Chl Dpth (ft)	4.88	Hydr. Depth (ft)		3.14	
Conv. Total (cfs)	57412.6	Conv. (cfs)		57412.6	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		162.09	
Min Ch El (ft)	1348.10	Shear (lb/sq ft)		0.48	
Alpha	1.00	Stream Power (lb/ft s)		2.67	
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)		5.50	
C & E Loss (ft)	0.01	Cum SA (acres)		1.87	

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 4.751

INPUT

Description: CVL Sta 45+00 - CVL elevations adjusted -2.0'

Station Elevation Data	num=	7
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
9864 1354 9930 1352 9961 1351.9 9993 1348.3 10060 1348.2		
10095 1353.3 10119 1353.8		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
9864 .028 9864 .028 10119 .028		

Bank Sta: Left Right Lengths: Left Channel Right	Coeff	Contr.	Expan.
9864 10119 100 100 100	.1	.3	

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1353.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.		0.028	
W.S. Elev (ft)	1352.54	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		452.40	
E.G. Slope (ft/ft)	0.004030	Area (sq ft)		452.40	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	177.42	Top Width (ft)		177.42	
Vel Total (ft/s)	6.28	Avg. Vel. (ft/s)		6.28	
Max Chl Dpth (ft)	4.34	Hydr. Depth (ft)		2.55	
Conv. Total (cfs)	44723.1	Conv. (cfs)		44723.1	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		177.94	
Min Ch El (ft)	1348.20	Shear (lb/sq ft)		0.64	
Alpha	1.00	Stream Power (lb/ft s)		4.01	
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)		4.40	
C & E Loss (ft)	0.04	Cum SA (acres)		1.48	

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 4.732

INPUT

Description: CVL Sta 44+00 - CVL elevations adjusted -2.0'

Station Elevation Data	num=	7
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
9859 1354.2 9926 1351.6 9954 1351.3 9978 1348.2 10060 1347.7		
10095 1353.1 10109 1353.7		

Manning's n Values	num=	3
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Sta	n Val	Sta	n Val	Sta	n Val
9859	.028	9859	.028	10109	.028

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9859	10109		100	100	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1352.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.		0.028	
W.S. Elev (ft)	1352.32	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		519.43	
E.G. Slope (ft/ft)	0.002638	Area (sq ft)		519.43	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	182.36	Top Width (ft)		182.36	
Vel Total (ft/s)	5.47	Avg. Vel. (ft/s)		5.47	
Max Chl Dpth (ft)	4.62	Hydr. Depth (ft)		2.85	
Conv. Total (cfs)	55274.4	Conv. (cfs)		55274.4	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		182.93	
Min Ch El (ft)	1347.70	Shear (lb/sq ft)		0.47	
Alpha	1.00	Stream Power (lb/ft s)		2.56	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)		3.29	
C & E Loss (ft)	0.03	Cum SA (acres)		1.06	

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 4.713

INPUT

Description: CVL Sta 43+00 - CVL elevations adjusted -2.0'

Station Elevation Data	num=	8
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
9873 1353.7 9939 1351.4 9965 1350.5 9975 1346.9 10007 1347		
10060 1347.3 10090 1352.4 10128 1353.5		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
9873 .028 9873 .028 10128 .028		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9873	10128		100	100	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1352.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.		0.028	
W.S. Elev (ft)	1352.17	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		577.56	
E.G. Slope (ft/ft)	0.001716	Area (sq ft)		577.56	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	171.70	Top Width (ft)		171.70	
Vel Total (ft/s)	4.92	Avg. Vel. (ft/s)		4.92	
Max Chl Dpth (ft)	5.27	Hydr. Depth (ft)		3.36	
Conv. Total (cfs)	68525.4	Conv. (cfs)		68525.4	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		172.77	
Min Ch El (ft)	1346.90	Shear (lb/sq ft)		0.36	
Alpha	1.00	Stream Power (lb/ft s)		1.76	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)		2.03	
C & E Loss (ft)	0.05	Cum SA (acres)		0.66	

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

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 4.694

INPUT

Description: CVL Sta 42+00 - CVL elevations adjusted -2.0'

Station Elevation Data	num=	8
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
9888 1353.6 9930 1351.7 9957 1351.1 9988 1349.5 10004 1346.8		
10060 1347.2 10091 1352.4 10138 1353.4		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
9888 .028 9888 .028 10138 .028		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9888	10138		100	100	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

E.G. Elev (ft)	1352.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.86	Wt. n-Val.		0.028	
W.S. Elev (ft)	1351.35	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)		380.51	
E.G. Slope (ft/ft)	0.005199	Area (sq ft)		380.51	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	139.15	Top Width (ft)		139.15	
Vel Total (ft/s)	7.46	Avg. Vel. (ft/s)		7.46	
Max Chl Dpth (ft)	4.55	Hydr. Depth (ft)		2.73	
Conv. Total (cfs)	39372.3	Conv. (cfs)		39372.3	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		139.76	
Min Ch El (ft)	1346.80	Shear (lb/sq ft)		0.88	
Alpha	1.00	Stream Power (lb/ft s)		6.59	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)		0.93	
C & E Loss (ft)	0.05	Cum SA (acres)		0.30	

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 4.675

INPUT

Description: CVL Sta 41+00 - CVL elevations adjusted -2.0'
 Levees added by

Dibble & Associates 5/1/02

Station Elevation Data		num= 8							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9879	1353.1	9928	1351.5	9961	1351.4	9985	1346.8	10000	1346.6
10060	1346.9	10091	1352.1	10129	1353.1				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
9879	.028	9879	.028	10129	.028

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	9879	10129		100	100	.1	.3

CROSS SECTION OUTPUT Profile #100 Year

			Left OB	Channel	Right OB
E.G. Elev (ft)	1351.78	Element			
Vel Head (ft)	0.69	Wt. n-Val.		0.028	
W.S. Elev (ft)	1351.09	Reach Len. (ft)			
Crit W.S. (ft)	1350.01	Flow Area (sq ft)		426.38	
E.G. Slope (ft/ft)	0.003004	Area (sq ft)		426.38	
Q Total (cfs)	2839.00	Flow (cfs)		2839.00	
Top Width (ft)	122.34	Top Width (ft)		122.34	
Vel Total (ft/s)	6.66	Avg. Vel. (ft/s)		6.66	
Max Chl Dpth (ft)	4.49	Hydr. Depth (ft)		3.49	
Conv. Total (cfs)	51799.2	Conv. (cfs)		51799.2	
Length Wtd. (ft)		Wetted Per. (ft)		123.10	
Min Ch El (ft)	1346.60	Shear (lb/sq ft)		0.65	
Alpha	1.00	Stream Power (lb/ft s)		4.32	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River: RIVER-1

Reach	River Sta.	n1	n2	n3
Reach-1	1000.4	.04	.028	.04
Reach-1	1000	Bridge		
Reach-1	6.507	.04	.028	.04
Reach-1	6.504	.075	.045	.065
Reach-1	6.463	.075	.04	.065
Reach-1	6.397	.075	.04	.065
Reach-1	6.316	.075	.04	.055
Reach-1	6.257	.075	.04	.055
Reach-1	6.163	.07	.04	.055
Reach-1	6.070	.06	.04	.055
Reach-1	5.975	.06	.04	.055
Reach-1	5.880	.06	.045	.055
Reach-1	5.785	.055	.045	.055
Reach-1	5.691	.055	.045	.055
Reach-1	5.630	.055	.045	.055
Reach-1	5.587	.055	.045	.055
Reach-1	5.535	.055	.045	.055
Reach-1	5.440	.055	.045	.055
Reach-1	5.345	.055	.045	.055
Reach-1	5.251	.055	.045	.055
Reach-1	5.193	.055	.045	.055
Reach-1	5.132	.055	.045	.055
Reach-1	5.123	.055	.065	.055
Reach-1	5.111	.055	.065	.055
Reach-1	5.104	Bridge		
Reach-1	5.099	.055	.065	.055
Reach-1	5.073	.028	.028	.028
Reach-1	5.054	.028	.028	.028
Reach-1	5.035	.028	.028	.028
Reach-1	5.016	.028	.028	.028
Reach-1	4.997	.028	.028	.028
Reach-1	4.978	.028	.028	.028
Reach-1	4.959	.028	.028	.028
Reach-1	4.940	.028	.028	.028
Reach-1	4.921	.028	.028	.028
Reach-1	4.902	.028	.028	.028
Reach-1	4.883	.028	.028	.028
Reach-1	4.864	.028	.028	.028
Reach-1	4.845	.028	.028	.028
Reach-1	4.826	.028	.028	.028
Reach-1	4.807	.028	.028	.028
Reach-1	4.788	.028	.028	.028
Reach-1	4.770	.028	.028	.028
Reach-1	4.751	.028	.028	.028
Reach-1	4.732	.028	.028	.028
Reach-1	4.713	.028	.028	.028
Reach-1	4.694	.028	.028	.028
Reach-1	4.675	.028	.028	.028

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	1000.4	84	84	84
Reach-1	1000	Bridge		
Reach-1	6.507	30	30	30
Reach-1	6.504	300	203	175
Reach-1	6.463	380	340	295
Reach-1	6.397	600	490	380
Reach-1	6.316	325	305	285
Reach-1	6.257	510	500	490
Reach-1	6.163	470	488	505
Reach-1	6.070	445	500	540
Reach-1	5.975	500	495	470
Reach-1	5.880	494	492	490
Reach-1	5.785	430	510	570
Reach-1	5.691	190	310	425
Reach-1	5.630	216	226	236
Reach-1	5.587	280	272	265
Reach-1	5.535	490	498	499
Reach-1	5.440	500	500	500
Reach-1	5.345	502	502	502
Reach-1	5.251	310	303	294
Reach-1	5.193	100	320	245
Reach-1	5.132	42	48	210
Reach-1	5.123	34	70	150
Reach-1	5.111	60	60	15
Reach-1	5.104	Bridge		
Reach-1	5.099	140.46	140.46	140.46
Reach-1	5.073	100	100	100
Reach-1	5.054	100	100	100
Reach-1	5.035	100	100	100
Reach-1	5.016	100	100	100
Reach-1	4.997	100	100	100
Reach-1	4.978	100	100	100
Reach-1	4.959	100	100	100
Reach-1	4.940	100	100	100
Reach-1	4.921	100	100	100
Reach-1	4.902	100	100	100
Reach-1	4.883	100	100	100
Reach-1	4.864	100	100	100
Reach-1	4.845	100	100	100
Reach-1	4.826	100	100	100
Reach-1	4.807	100	100	100
Reach-1	4.788	100	100	100
Reach-1	4.770	100	100	100
Reach-1	4.751	100	100	100
Reach-1	4.732	100	100	100
Reach-1	4.713	100	100	100
Reach-1	4.694	100	100	100
Reach-1	4.675	100	100	100

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	1000.4	.3	.5
Reach-1	1000	Bridge	
Reach-1	6.507	.3	.5
Reach-1	6.504	.1	.3
Reach-1	6.463	.1	.3
Reach-1	6.397	.1	.3
Reach-1	6.316	.1	.3
Reach-1	6.257	.1	.3
Reach-1	6.163	.1	.3
Reach-1	6.070	.1	.3
Reach-1	5.975	.1	.3
Reach-1	5.880	.1	.3
Reach-1	5.785	.1	.3
Reach-1	5.691	.1	.3
Reach-1	5.630	.1	.3
Reach-1	5.587	.1	.3
Reach-1	5.535	.1	.3
Reach-1	5.440	.1	.3
Reach-1	5.345	.1	.3
Reach-1	5.251	.1	.3
Reach-1	5.193	.1	.3
Reach-1	5.132	.1	.3
Reach-1	5.123	.3	.5
Reach-1	5.111	.3	.5
Reach-1	5.104	Bridge	
Reach-1	5.099	.3	.5
Reach-1	5.073	.1	.3
Reach-1	5.054	.1	.3
Reach-1	5.035	.1	.3
Reach-1	5.016	.1	.3
Reach-1	4.997	.1	.3
Reach-1	4.978	.1	.3
Reach-1	4.959	.1	.3
Reach-1	4.940	.1	.3
Reach-1	4.921	.1	.3
Reach-1	4.902	.1	.3
Reach-1	4.883	.1	.3
Reach-1	4.864	.1	.3
Reach-1	4.845	.1	.3
Reach-1	4.826	.1	.3
Reach-1	4.807	.1	.3

Reach-1	4.788	.1	.3
Reach-1	4.770	.1	.3
Reach-1	4.751	.1	.3
Reach-1	4.732	.1	.3
Reach-1	4.713	.1	.3
Reach-1	4.694	.1	.3
Reach-1	4.675	.1	.3

ERRORS WARNINGS AND NOTES

Errors Warnings and Notes for Plan : PreProject

River: RIVER-1 Reach: Reach-1 RS: 1000.4 Profile: 100 Year
 Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: RIVER-1 Reach: Reach-1 RS: 1000 Profile: 100 Year
 Warning:The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the program will default to an energy based solution.
 Warning:For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

River: RIVER-1 Reach: Reach-1 RS: 1000 Profile: 100 Year Upstream
 Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

River: RIVER-1 Reach: Reach-1 RS: 6.507 Profile: 100 Year
 Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 6.463 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.
 Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 6.397 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.
 Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
 Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 6.316 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.

River: RIVER-1 Reach: Reach-1 RS: 6.257 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.
 Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 6.163 Profile: 100 Year
 Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 6.070 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.
 Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
 Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 5.975 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.
 Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 5.880 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.
 Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 5.785 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.
 Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 5.691 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.
 Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
 Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 5.630 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.
 Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
 Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 5.587 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.
 Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 5.535 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.
 Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
 Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 5.440 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.

River: RIVER-1 Reach: Reach-1 RS: 5.345 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.

River: RIVER-1 Reach: Reach-1 RS: 5.251 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.
 Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
 Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 5.193 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.
 Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
 Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: RIVER-1 Reach: Reach-1 RS: 5.132 Profile: 100 Year
 Warning:Divided flow computed for this cross-section.

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 5.123 Profile: 100 Year
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 5.104 Profile: 100 Year
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
River: RIVER-1 Reach: Reach-1 RS: 5.104 Profile: 100 Year Upstream
Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
River: RIVER-1 Reach: Reach-1 RS: 5.104 Profile: 100 Year Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface and energy have been projected from the downstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
River: RIVER-1 Reach: Reach-1 RS: 5.099 Profile: 100 Year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 5.035 Profile: 100 Year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 5.016 Profile: 100 Year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RIVER-1 Reach: Reach-1 RS: 4.902 Profile: 100 Year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RIVER-1 Reach: Reach-1 RS: 4.713 Profile: 100 Year
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

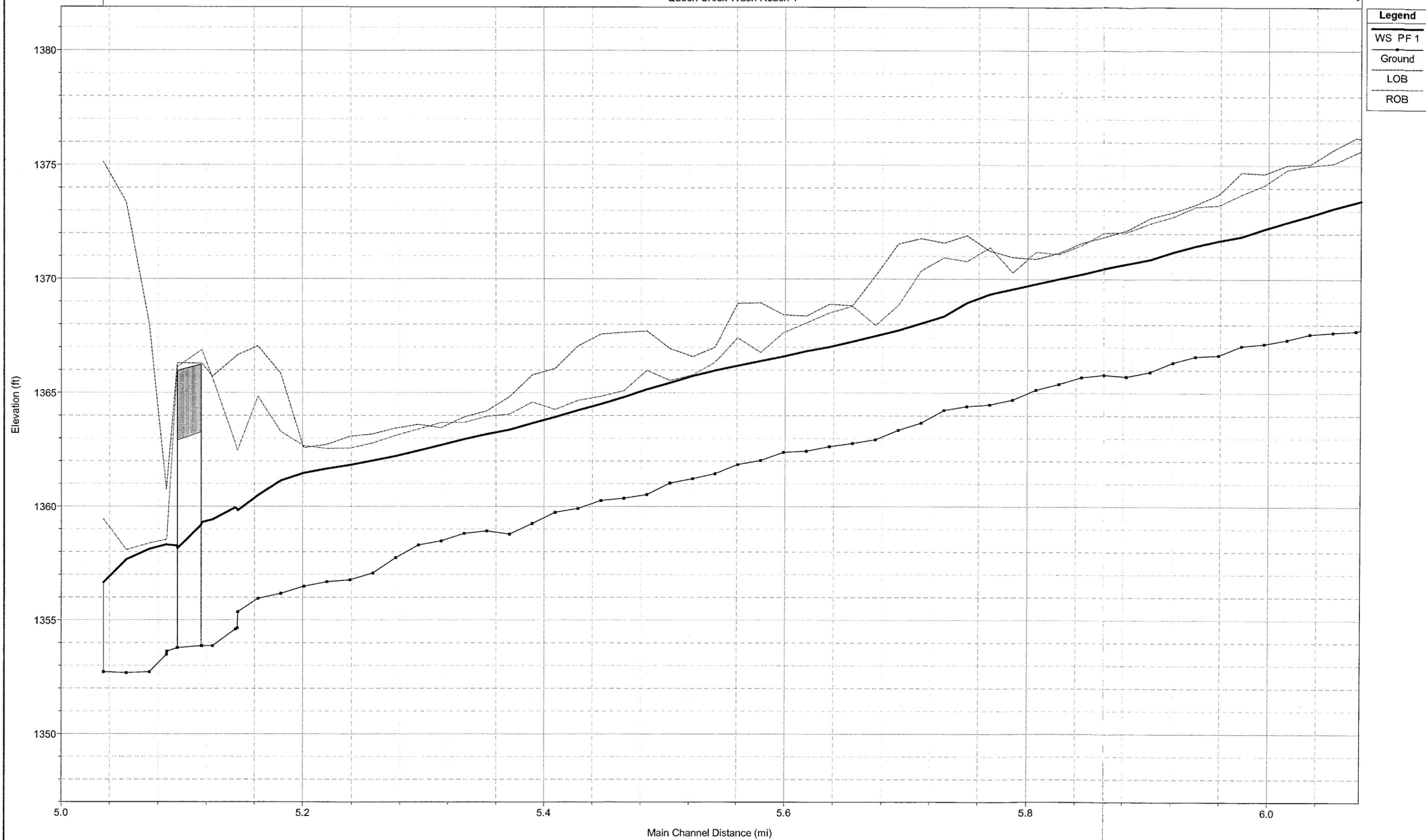
APPENDIX F

**EROSION AND SEDIMENT TRANSPORT ANALYSES
SUPPORTING DOCUMENTATION (NONE)**

APPENDIX G

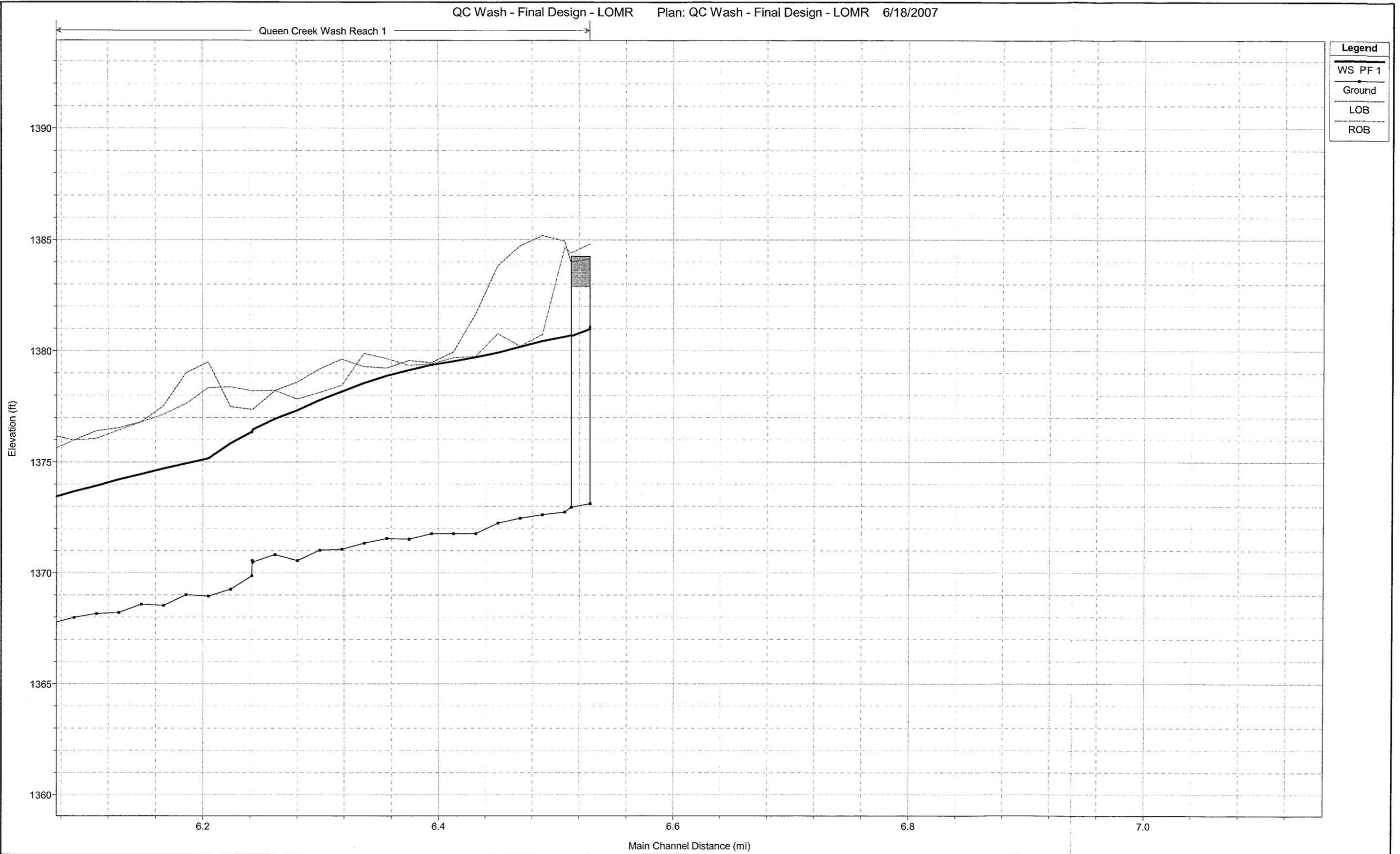
*HEC-RAS ANALYSIS SUPPORTING
DOCUMENTATION*

Queen Creek Wash Reach 1



1 in Horiz. = 7.575758E-02 mi 1 in Vert. = 4 ft

Queen Creek Wash Reach 1



Legend	
WS PF 1	(Thick solid line)
Ground	(Dotted line)
LOB	(Thin solid line)
ROB	(Thin solid line with markers)



TOWN OF QUEEN CREEK

PLANS FOR THE CONSTRUCTION OF:

QUEEN CREEK WASH SOSSAMAN ROAD TO HAWES ROAD

PROJECT NO.: 2000D-03



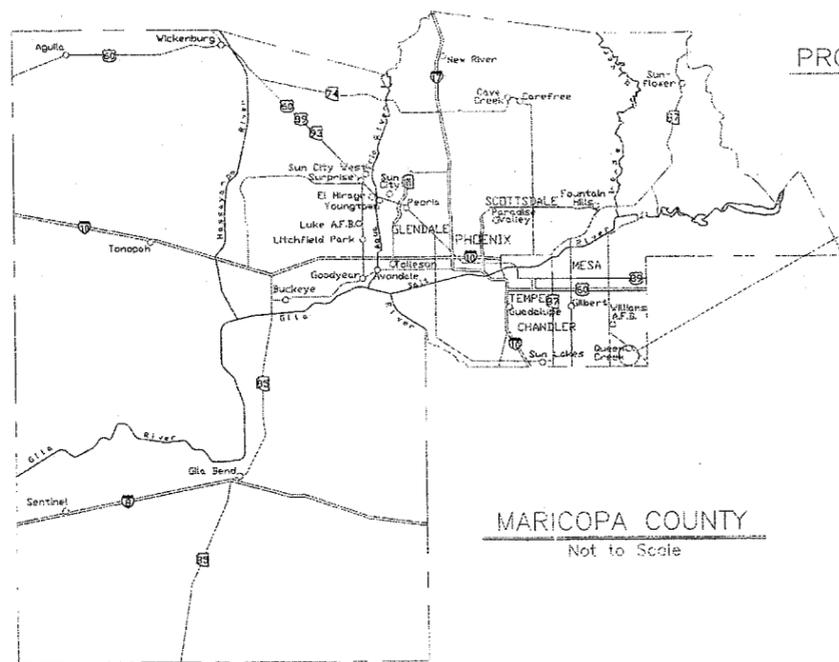
"AS BUILT CERTIFICATION":

I HEREBY CERTIFY THAT THE "AS BUILT" MEASUREMENTS AS SHOWN OR NOTED HEREON WERE MADE UNDER MY SUPERVISION AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

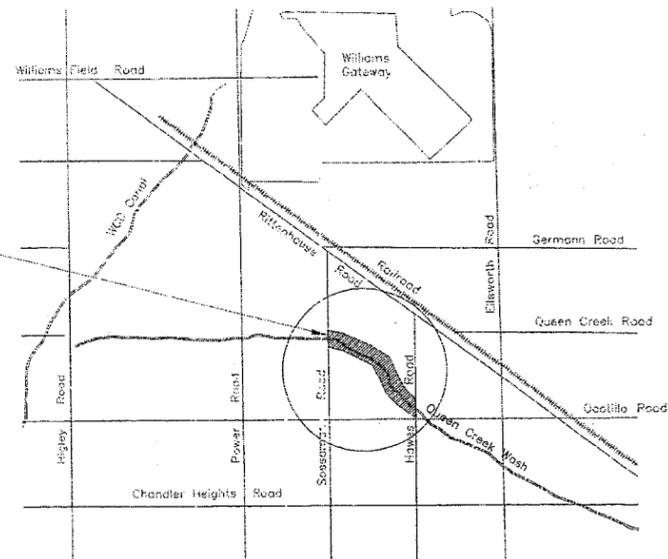


Brian J. Fry
REGISTERED ENGINEER # 31678

IN ACCORDANCE WITH AAC R18-4-119, ALL MATERIALS INSTALLED AFTER JANUARY 1, 1993, WHICH MAY COME INTO CONTACT WITH DRINKING WATER SHALL CONFORM TO NATIONAL SANITATION FOUNDATION STANDARDS 60 & 61.



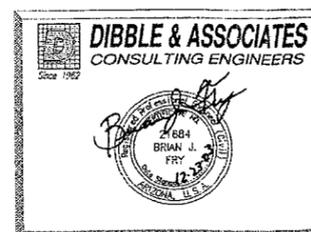
PROJECT NO. 2000D-03



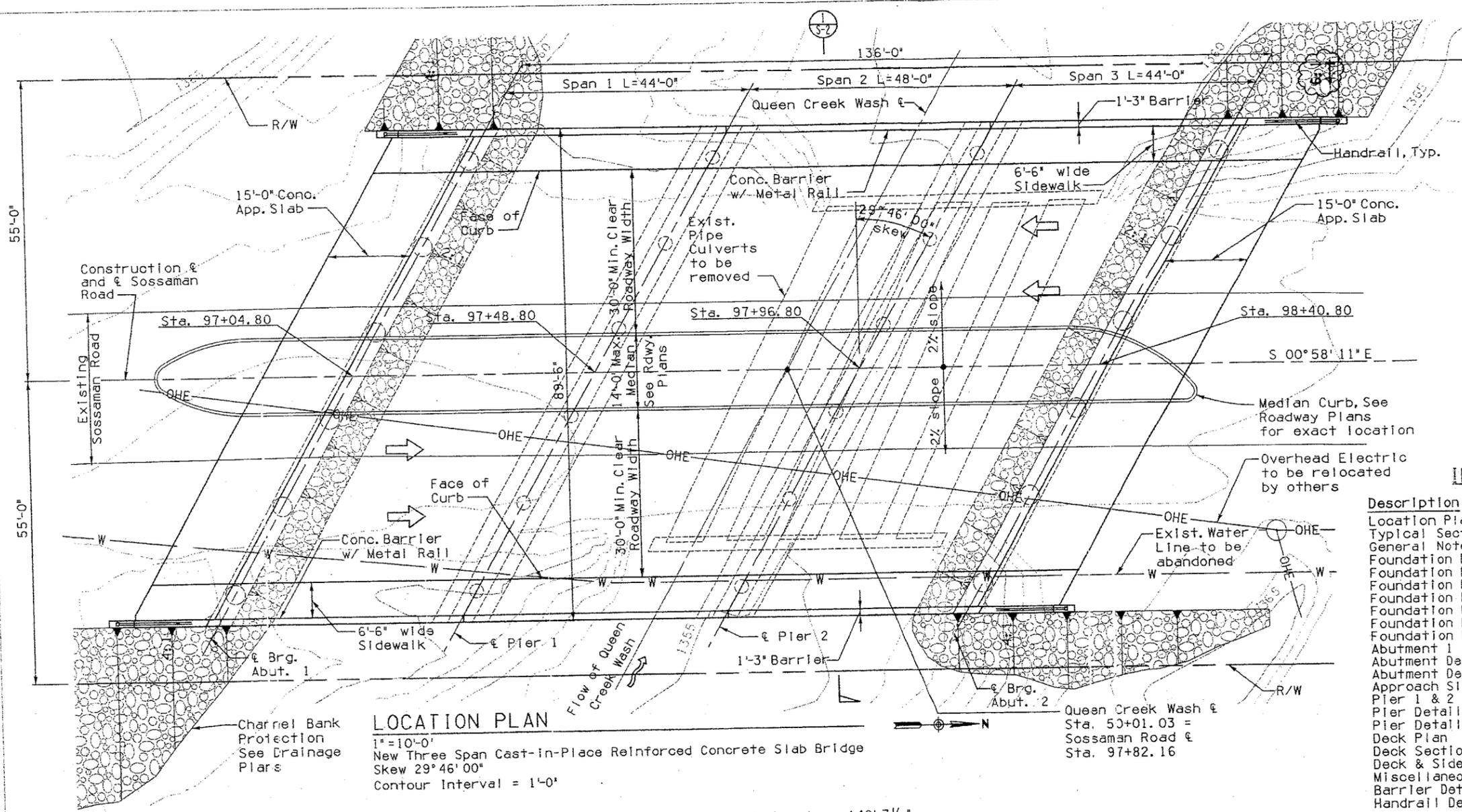
VICINITY MAP
Not to Scale

APPROVED BY:

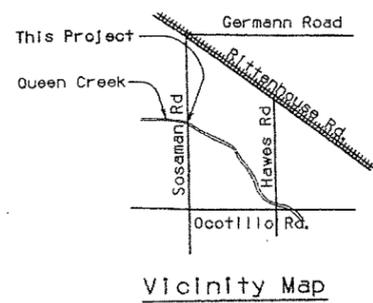
MARICOPA COUNTY ENVIRONMENTAL SERVICES DEPT. DATE



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY	
<i>[Signature]</i>	01/12/04 DATE
TOWN OF QUEEN CREEK	
<i>Thomas B. Crutt</i>	1-14-04 DATE

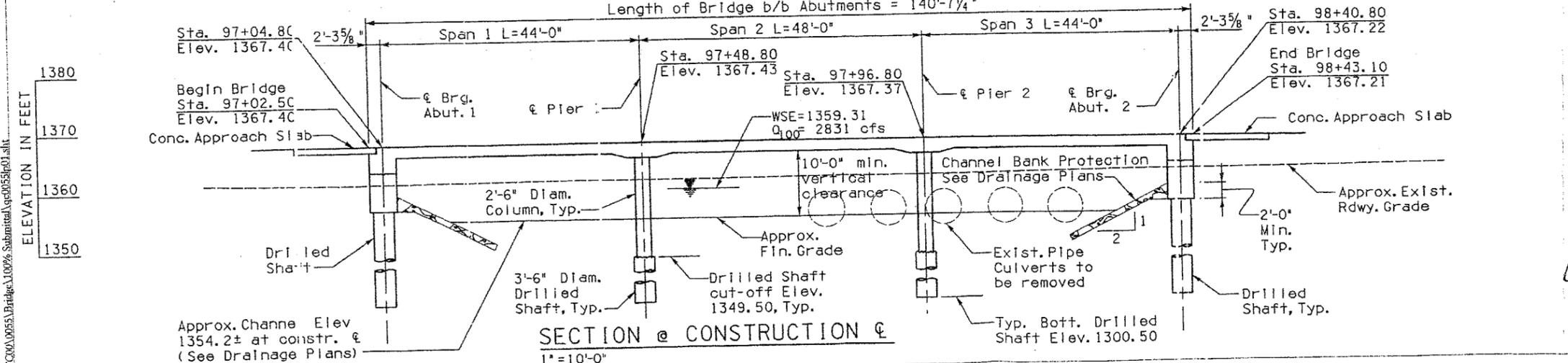


LOCATION PLAN
 1"=10'-0"
 New Three Span Cast-in-Place Reinforced Concrete Slab Bridge
 Skew 29° 46' 00"
 Contour Interval = 1'-0"



INDEX OF SHEETS

Description	Drawing No.
Location Plan & Section	S-1
Typical Section	S-2
General Notes	S-3
Foundation Data	S-4
Foundation Data	S-5
Foundation Data	S-6
Foundation Data	S-7
Foundation Data	S-8
Foundation Data	S-9
Foundation Plan	S-10
Foundation Details	S-11
Abutment 1 & 2 Plan & Elevation	S-12
Abutment Details	S-13
Abutment Details	S-14
Approach Slab Details	S-15
Pier 1 & 2 Plan & Elevation	S-16
Pier Details	S-17
Deck Plan	S-18
Deck Section	S-19
Deck & Sidewalk Details	S-20
Miscellaneous Details	S-21
Barrier Details	S-22
Handrail Details	S-23



SECTION @ CONSTRUCTION @
 1"=10'-0"

TOWN OF QUEEN CREEK
 QUEEN CREEK WASH IMPROVEMENT PLANS

SOSSAMAN ROAD AT QUEEN CREEK WASH
 BRIDGE LOCATION PLAN & SECTION

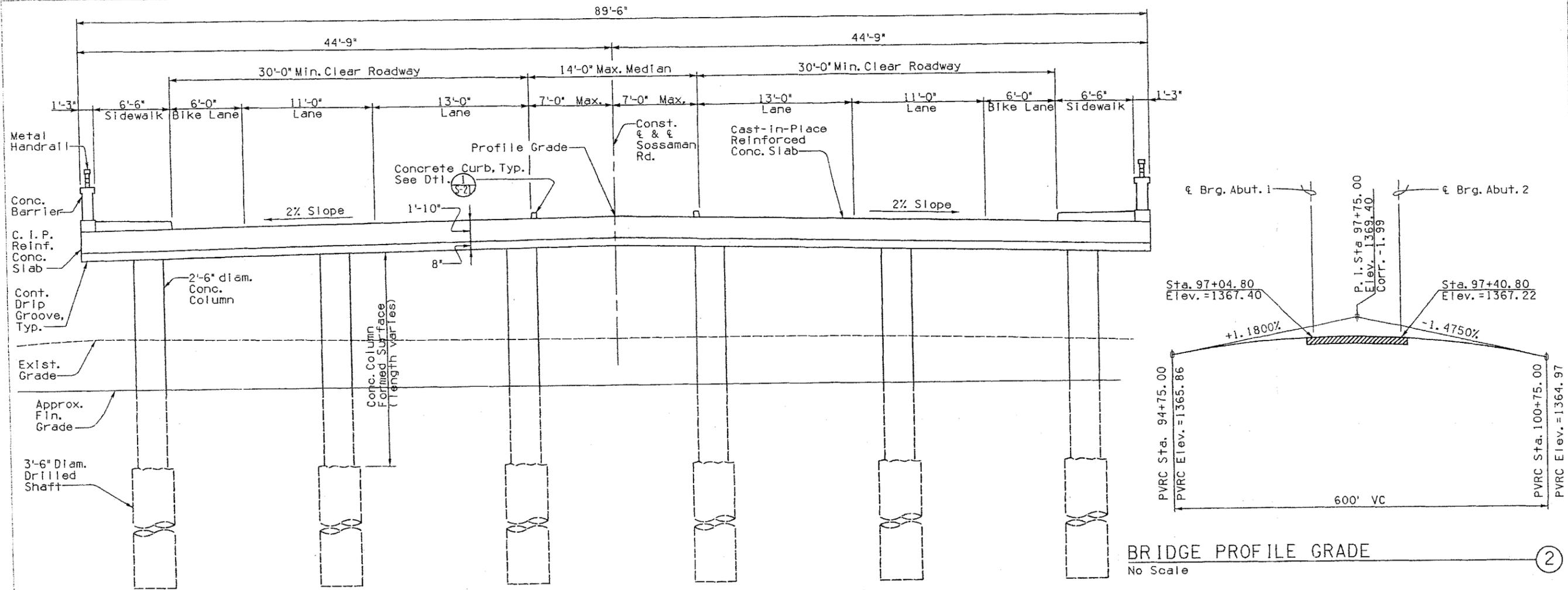
TOWN PROJECT NO. 2000D-03

DESIGNED	MJD	06/12/03
DRAWN	AL/CC	06/12/03
CHECKED	TB	06/12/03

Cannon & Associates
 a division of TransSystems Corporation
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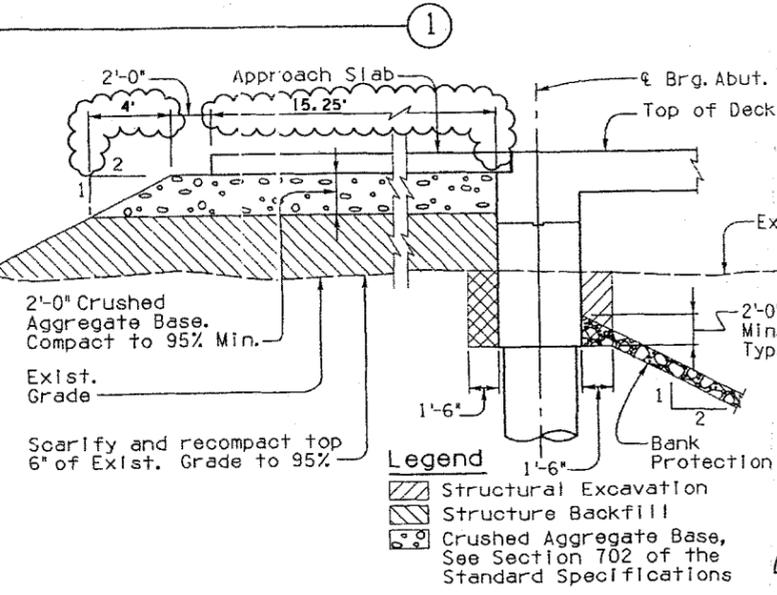
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BRIDGE PROFILE GRADE
No Scale

TYPICAL BRIDGE SECTION
1/4" = 1'-0"



ABUTMENT EXCAVATION/BACKFILL
1/4" = 1'-0"

Item	APPROXIMATE QUANTITIES		Class 'AA' Concrete (psi)		Reinf. Steel	3'-6" Diam. C. I. P. Drilled Shaft		Approach Slab	Conc. Barrier	Metal Handrail
	Structural Excavation	Structure Backfill	4000	4500		LF	No.			
	CY	CY	Cu. Yd.	Cu. Yd.	LBS					
Abutment 1	112	380	111	-	20,010	341	6	149	28.6	33
Pier 1	-	-	17	-	6,500	294	6	-	-	-
Pier 2	-	-	17	-	6,480	294	6	-	-	-
Abutment 2	143	302	111	-	20,010	339	6	149	28.6	33
Superstructure	-	-	-	929	315,990	-	-	-	277.8	278
Total	255	682	256	929	368,990	1,268	24	298	335.0	344
As Built Total										

Note: Structure Backfill quantities include crushed aggregate base.

TOWN OF QUEEN CREEK
QUEEN CREEK WASH IMPROVEMENT PLANS
SOSSAMAN ROAD AT QUEEN CREEK WASH
TYPICAL SECTION

TOWN PROJECT NO. 20000-03

DESIGNED	MJD	06/12/03
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CHECKED	TB	06/12/03

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GENERAL NOTES:

Design Specifications

American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges, 17th Edition, dated 2002.

Construction Specifications

Maricopa Association of Governments (MAG) Uniform Standard Specifications for Public Works Construction dated 1998 with revisions through 2002 as modified by the Maricopa County Department of Transportation Supplement dated July 2002 and the Special Provisions.

Design Loadings

Dead Load:
Dead Load includes allowance of 25 psf for future wearing surface.
Live Load:
AASHTO HS25-44.

Seismic Performance Category A.

Hydraulic Design Criteria

Drainage Report dated August 2002 provided by Dibble & Associates.

Q₁₀₀ = 2831 cfs downstream of bridge. Q₅₀₀ = 4813 cfs downstream of bridge. The flow that occurs through the bridge opening is as follows:

Q₁₀₀ = 2831 cfs, H.W. Elevation = 1359.31 feet, Velocity = 6.34 ft/sec
Q₅₀₀ = 4813 cfs, H.W. Elevation = 1360.55 feet, Velocity = 7.14 ft/sec

Design Flood Event: Q₁₀₀ Abutment Scour = 16.5 feet
Pier Scour = 15.0 feet

Concrete and Reinforcement Stresses

Class AA Special f'c = 4500 psi-Superstructure except Barriers
Class AA f'c = 4000 psi-Abutments, Columns, Wingwalls, Barriers and Drilled Shafts
Class A f'c = 3000 psi-Approach Slabs and Sidewalk
fs = 24,000 psi-Grade 60 Reinforcing Steel

Reinforcing steel shall conform to ASTM A615. All reinforcing shall be furnished as Grade 60.

Reinforcing steel to be welded, where approved by the Engineer, shall conform to ASTM A706.

All Mechanical splices of reinforcing steel shall develop 125% of the yield strength of the reinforcing bar. Approval for the use of mechanical splices shall be obtained from the Engineer. The mechanical splices shall be tested by an independent testing laboratory in accordance with a testing plan prepared by the Contractor and approved by the Engineer. Testing of the mechanical splices shall be paid for by the Contractor.

All dimensions for reinforcing steel shall be to center of bars, unless noted otherwise.

Adjacent lap splices shall be staggered a minimum of 40 bar diameters.

All reinforcing shall have a 2" cover unless noted otherwise.

For concrete finish, see the Standard Specifications and provisions.

Concrete Barriers

Concrete barriers shall be constructed after deck slab falsework has been removed. Barriers shall not be slip formed.

Dimensions

Dimensions shall not be scaled from drawings.

Forms

Forms for new construction shall be cambered for dead load deflection, vertical curvature and falsework settlement.

Foundations

Geotechnical Engineering Report by Ricker, Atkinson, McBee & Associates, Inc., Report No. E06046, dated August 16, 2002. Abutments and piers to be supported on drilled shaft foundations.

Construction Joints

Sandblast all construction joints in concrete prior to placement of concrete. See Standard Specifications.

Utilities

Contractor shall coordinate with utility companies that are impacted by the work. The existing water line is to be abandoned. The existing overhead electric line is to be relocated by others. See Roadway plans for additional requirements and other utilities.

Coordination

Contractor shall coordinate all existing conditions during construction of project.

Chamfer

All exposed corners shall be chamfered 3/4" unless noted otherwise in accordance with Section 505.3 of the Standard Specifications. This note applies to all bridge drawings. See Detail 4 on Sheet S-14.

Standard ADOT Drawing List

Structures, 1992 Edition: B-19.10 and Structure Detail Drawings: SD 2.01

Inventory & Operating Rating

Ratings are in accordance with the AASHTO Manual for Condition Evaluation of Bridges, 1994, Second Edition, Load Factor Method.

Inventory Rating: HS 45.6
Operating Rating: HS 76.1

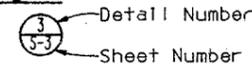
Construction of New Bridge

The road will be closed during construction of the new bridge.

Falsework Design

The falsework shall be designed for the 100 year flow of the Queen Creek Wash and provide an opening under the bridge of adequate size to pass that 100 year flow. Contractor shall provide design calculations and plans for falsework design that are signed by a professional engineer registered in the state of Arizona. See Standard Specifications.

Legend



List of Submittals

The Contractor shall submit shop drawings and other such information to the Engineer for review and approval in accordance with the Standard Specifications and the Special Provisions. The following is a partial list of items that will need to be submitted.

- Concrete Mix Designs
- Falsework & Formwork Design and Drawings
- Reinforcing Steel Shop Drawings
- Plan for Placement of Bridge Deck Concrete
- Painting Plan-Materials, Color, and Application
- Metal Handrail Shop Drawings
- Drilled Shaft Construction Procedure

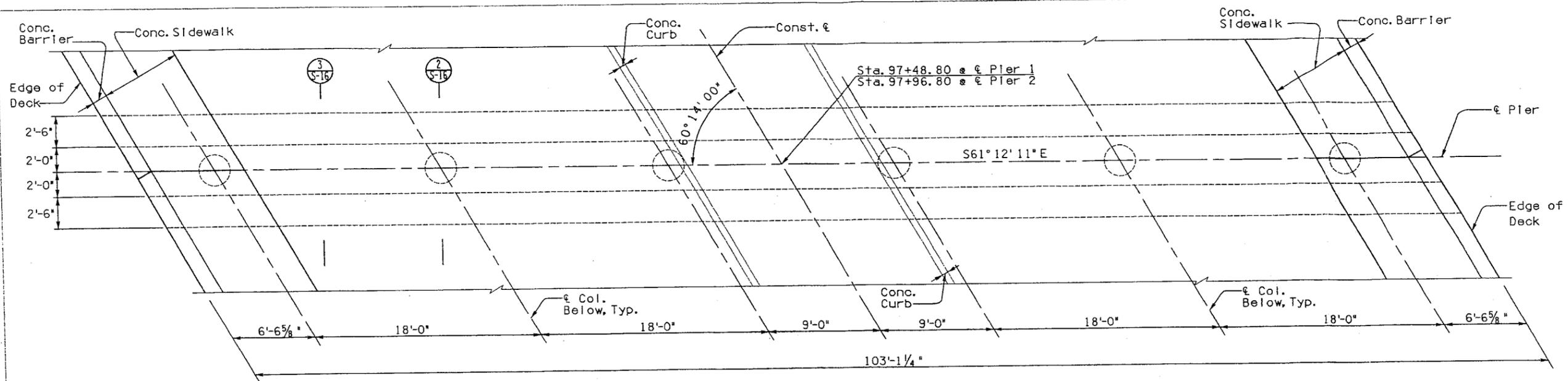
Abbreviations

Abut.	Abutment	Horiz.	Horizontal
b/b	Back-to-Back	I.D.	Inner Diameter
Bm.	Beam	Int.	Interior
Bott.	Bottom	Longit.	Longitudinal
Brg.	Bearing	Max.	Maximum
C. I. P.	Cast-In-Place	Min.	Minimum
C.G.	Center of Gravity	Misc.	Miscellaneous
€	Centerline	No., #	Number
Clr.	Clear	o.c.	On Center
Col.	Column	psi	Pounds per Square Inch
Conc.	Concrete	R	Radius
Constr.	Construction	R/W	Right-of-Way
Diam.	Diameter	Rdwy.	Roadway
Diaph.	Diaphragm	Sched.	Schedule
Dtl.	Detail	Sect.	Section
Dwgs.	Drawings	Sht.	Sheet
Ea.	Each	Sim.	Similar
Elev.	Elevation	Sp.	Space
Embed.	Embedment	Sta.	Station
Eq.	Equal	Std.	Standard
Exist.	Existing	Stl.	Steel
Ext.	Exterior	Sym.	Symmetrical
F	Fixed	Trans.	Transverse
Fin.	Finish	Typ.	Typical
Ftg.	Footing	u. n. o.	Unless Noted Otherwise
Ga.	Gage	w/	With
HK.	Hook	WSE	Water Surface Elevation



3			
2			
1			
NO.	REVISION	BY	DATE
TOWN OF QUEEN CREEK QUEEN CREEK WASH IMPROVEMENT PLANS SOSSAMAN ROAD AT QUEEN CREEK WASH GENERAL NOTES TOWN PROJECT NO. 2000D-03			
DESIGNED	MJD	06/12/03	
DRAWN	AL/JCC	06/12/03	
CHECKED	TB	06/12/03	
Cannon & Associates a division of Transwestern Corporation 0505005501			
DRAWING NO.			SHEET OF
S-3			51 108

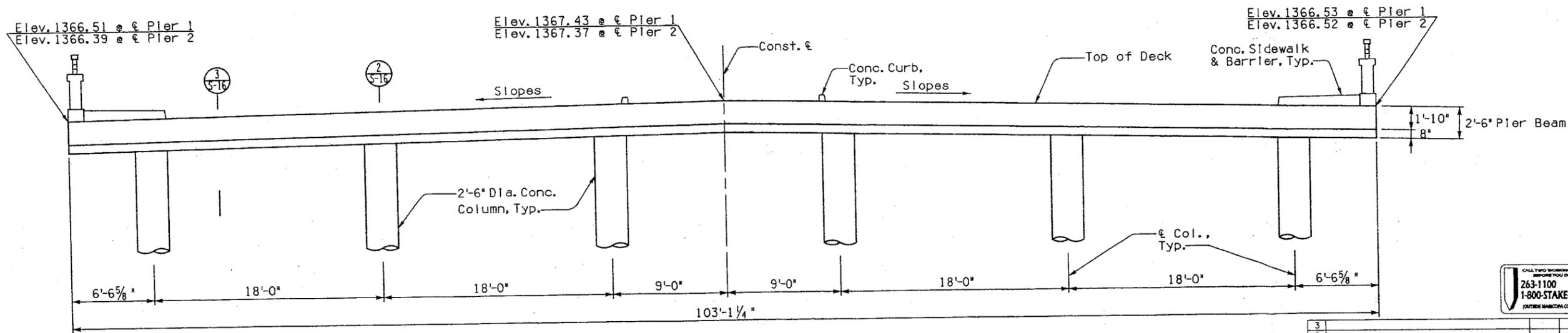
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PLAN AT PIER 1 & 2

1/4" = 1'-0"

①



ELEVATION AT PIER 1 & 2

1/4" = 1'-0"

②

Notes:
1. For Pier Beam reinforcing
See sheets 64 & 65.

CALL YOUR INSURING AGENT BEFORE YOU DRIVE
263-1100
1-800-STAKE-IT
EASTERN HANCOCK COUNTY

3			
2			
1			
NO.	REVISION	BY	DATE
 TOWN OF QUEEN CREEK QUEEN CREEK WASH IMPROVEMENT PLANS SOSSAMAN ROAD AT QUEEN CREEK WASH PIER 1 & 2 PLAN & ELEVATION TOWN PROJECT NO. 2000D-03			
DESIGNED	MJD	06/12/03	
DRAWN	AL/CC	06/12/03	
CHECKED	TB	06/12/03	
 Cannon & Associates a division of Transstare Corporation 6803006901			
DRAWING NO.	S-15	SHEET OF	63 108

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APPENDIX H

FEMA DOCUMENTS

C. REVIEW FEE

Has the review fee for the appropriate request category been included?

Yes

Fee amount: \$4,400

No, Attach Explanation

Please see the FEMA Web site at http://www.fema.gov/mit/tsd/frm_fees.htm for Fee Amounts and Exemptions.

D. SIGNATURE

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

Name: Dick Schaner		Company: Town of Queen Creek	
Mailing Address: 22350 S. Ellsworth Road Queen Creek, AZ		Daytime Telephone No.: (480) 987-9887	Fax No.: (480) 987-0109
		E-Mail Address: dschaner@queencreek.org	
Signature of Requester (required):			Date:

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title:		Telephone No.:
Community Name:	Community Official's Signature (required):	Date:

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

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

Certifier's Name: Brian Fry, P.E.	License No.: 21684	Expiration Date: 12/31/2008
Company Name: Dibble & Associates	Telephone No.: (602) 957 1155	Fax No.: (602) 957 2838
Signature: 		Date: 6/18/07

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

Form Name and (Number)

Required if ...

- | | |
|---|---|
| <input checked="" type="checkbox"/> Riverine Hydrology and Hydraulics Form (Form 2) | New or revised discharges or water-surface elevations |
| <input checked="" type="checkbox"/> Riverine Structures Form (Form 3) | Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam |
| <input type="checkbox"/> Coastal Analysis Form (Form 4) | New or revised coastal elevations |
| <input type="checkbox"/> Coastal Structures Form (Form 5) | Addition/revision of coastal structure |
| <input type="checkbox"/> Alluvial Fan Flooding Form (Form 6) | Flood control measures on alluvial fans |

Seal (Optional)

To Be Attached to MT-2 FORM 1 for Queen Creek Wash, Sossaman Road to Hawes Road

In response to Item B, Question 1. The NFIP map panels affected for all impacted communities are:

Community Number	Community Name	State	Map No.	Panel No.	Effective Date
040132 040037	Town of Queen Creek Maricopa County, unincorporated	AZ	04013C	2695G	07/19/01
040132 040037	Town of Queen Creek Maricopa County, unincorporated	AZ	04013C	3060G	07/19/01

FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE HYDROLOGY & HYDRAULICS FORM

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

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Queen Creek Wash
 Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

- Not revised (skip to section 2) No existing analysis Improved data
 Alternative methodology Proposed Conditions (CLOMR) Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)
----------	-------------------------	-----------	---------------

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

- Statistical Analysis of Gage Records Precipitation/Runoff Model [TR-20, HEC-1, HEC-HMS etc.]
 Regional Regression Equations Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/mit/tsd/en_modl.htm.

4. Review/Approval of Analysis

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

5. Impacts of Sediment Transport on Hydrology

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

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit	RM 5.035, D/S of Sossaman Rd	RM 5.035	1356.65-See Attach.	1356.65
Upstream Limit	RM 6.529, U/S of Hawes Rd	RM 6.529	1381.41-See Attach.	1381.12

2. Hydraulic Method Used

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

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

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

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

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: QC_PreProject.prj	Floodway File Name: No Floodway
Revised or Post-Project Conditions Model	Natural File Name: QC_Soss_Hawes.prj	Floodway File Name: No Floodway
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/mit/tsd/en_modl.htm.

C. MAPPING REQUIREMENTS

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

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

D. COMMON REGULATORY REQUIREMENTS

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

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:

- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

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

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

3. For LOMR requests, is the regulatory floodway being revised? Yes No

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

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

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

To Be Attached to MT-2 FORM 2 for Queen Creek Wash, Sossaman Road to Hawes Road

In response to Item B, Question 1. Explanation of Downstream and Upstream Limit Effective Water Surface Elevation:

The *downstream* tie-in effective model exists on a different datum than that of the revised model. The proposed study is on NAVD88 datum. The downstream tie-in effective model (Queen Creek Wash LOMR, Power Road to Sossaman Road, performed by Coe & Van Loo Consultants, Inc, FEMA Case No. 03-09-0247P) is on Town of Queen Creek datum. A datum shift of -2.00', applied to Coe & Van Loo LOMR results, is necessary to resolve the discrepancy; therefore, the effective water surface elevation at the downstream tie-in point (RM 5.035, Coe & Van Loo Sta 60+00), once a datum shift has been performed, is $1358.65' - 2.00' = 1356.65'$. This is equal to the revised model water surface elevation equal to 1356.65'.

The *upstream* tie-in effective model exists on a different datum than that of the revised model. The proposed study is on NAVD88 datum. The upstream tie-in effective model (Queen Creek LOMR (Hawes to SPRR) FCDMC 95-43, FEMA Case No. 97-09-1116P, performed by Collins/Pina Consulting Engineers, Inc.) was based on erroneous mapping, described in detail in **Section 3.2** and **Appendix C**. A datum shift of 2.427' is necessary to resolve the discrepancy for this section of mapping; therefore, the effective water surface elevation at the upstream tie-in point (RM 6.529, FCDMC 95-43 Station 1000.4), once a datum shift has been performed, is $1378.98' + 2.427' = 1381.41'$. This is within 0.5' of the revised model water surface elevation equal to 1381.12'.

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 7 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Queen Creek Wash
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

- Channelization..... complete Section B
- Bridge/Culvert..... complete Section C
- Dam..... complete Section D
- Levee/Floodwall..... complete Section E
- Sediment Transport complete Section F (if required)

Description Of Structure

1. **Name of Structure:**

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

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

2. **Name of Structure: Sossaman Road Bridge**

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

Location of Structure: Sossaman Road

Downstream Limit/Cross Section: River Mile 5.096, Channel Construction Station 49+46

Upstream Limit/Cross Section: River Mile 5.116, Channel Construction Station 50+53

3. **Name of Structure:**

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

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

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

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- | | |
|--|--|
| <input type="checkbox"/> Levees [Attach Section E (Levee/Floodwall)] | <input type="checkbox"/> Drop structures |
| <input type="checkbox"/> Superelevated sections | <input type="checkbox"/> Transitions in cross sectional geometry |
| <input type="checkbox"/> Debris basin/detention basin | <input type="checkbox"/> Energy dissipator |
| <input type="checkbox"/> Other (Describe): | |

2. Drawing Checklist

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

3. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the _____-year flood.

The design elevation in the channel is based on (check one):

- Subcritical flow Critical flow Supercritical flow Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

- Inlet to channel Outlet of channel At Drop Structures At Transitions
 Other locations (specify):

4. Sediment Transport Considerations

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

C. BRIDGE/CULVERT

Flooding Source: Queen Creek Wash

Name of Structure: Sossaman Road Bridge

1. This revision reflects (check one):

- New bridge/culvert not modeled in the FIS
 Modified bridge/culvert previously modeled in the FIS
 New analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- | | |
|--|--|
| <input checked="" type="checkbox"/> Dimensions (height, width, span, radius, length) | <input checked="" type="checkbox"/> Erosion Protection |
| <input type="checkbox"/> Shape (culverts only) | <input checked="" type="checkbox"/> Low Chord Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Material | <input checked="" type="checkbox"/> Top of Road Elevations – Upstream and Downstream |
| <input type="checkbox"/> Beveling or Rounding | <input type="checkbox"/> Structure Invert Elevations – Upstream and Downstream |
| <input type="checkbox"/> Wing Wall Angle | <input checked="" type="checkbox"/> Stream Invert Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Skew Angle | <input type="checkbox"/> Cross-Section Locations |
| <input type="checkbox"/> Distances Between Cross Sections | |

4. Sediment Transport Considerations

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

D. DAM

Flooding Source:

Name of Structure:

1. This request is for (check one): Existing dam New dam Modification of existing dam

2. The dam was designed by (check one): Federal agency State agency Local government agency

Private organization Name of the agency or organization:

3. Does the project involve revised hydrology? Yes No

If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

4. Does the submittal include debris/sediment yield analysis? Yes No

If yes, then fill out Section F (Sediment Transport).

If No, then attach your explanation for why debris/sediment analysis was not considered.

5. Does the Base Flood Elevation behind the dam or downstream of the dam change?

Yes No If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

Stillwater Elevation Behind the Dam

FREQUENCY (% annual chance)

FIS

REVISED

10-year (10%)

50-year (2%)

100-year (1%)

500-year (0.2%)

Normal Pool Elevation

6. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

- upgrading of an existing levee/floodwall system
- a newly constructed levee/floodwall system
- reanalysis of an existing levee/floodwall system

b. Levee elements and locations are (check one):

- earthen embankment, dike, berm, etc. Station to
- structural floodwall Station to
- Other (describe): Station to

c. Structural Type (check one):

- monolithic cast-in place reinforced concrete
- reinforced concrete masonry block
- sheet piling
- Other (describe):

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

- Yes No

If Yes, by which agency?

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

- 1. Plan of the levee embankment and floodwall structures. Sheet Numbers:
- 2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers:
- 3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure. Sheet Numbers:
- 4. A layout detail for the embankment protection measures. Sheet Numbers:
- 5. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers:

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

- 3.0 feet or more at the downstream end and throughout Yes No
- 3.5 feet or more at the upstream end Yes No
- 4.0 feet within 100 feet upstream of all structures and/or constrictions Yes No

Coastal

- 1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runoff (whichever is greater). Yes No
- 2.0 feet above the 1%-annual-chance stillwater surge elevation Yes No

E. LEVEE/FLOODWALL (CONTINUED)

2. Freeboard (continued)

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? Yes No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

a. Openings through the levee system (check one): exists does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

a. The maximum levee slope landside is:

b. The maximum levee slope floodside is:

c. The range of velocities along the levee during the base flood is: (min.) to (max.)

d. Embankment material is protected by (describe what kind):

e. Riprap Design Parameters (check one): Velocity Tractive stress
Attach references

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D ₁₀₀	D ₅₀	Thickness	
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								

(Extend table on an added sheet as needed and reference each entry)

E. LEVEE/FLOODWALL (CONTINUED)

4. Embankment Protection (continued)

- f. Is a bedding/filter analysis and design attached? Yes No
- g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

- a. Identify locations and describe the basis for selection of critical location for analysis:

Overall height: Sta. ; height ft.

Limiting foundation soil strength:

Sta. , depth to
 strength ϕ = degrees, c = psf
 slope: SS = (h) to (v)

(Repeat as needed on an added sheet for additional locations)

- b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

- c. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

- d. Was a seepage analysis for the embankment performed? Yes No

If Yes, describe methodology used:

- e. Was a seepage analysis for the foundation performed? Yes No

- f. Were uplift pressures at the embankment landside toe checked? Yes No

- g. Were seepage exit gradients checked for piping potential? Yes No

- h. The duration of the base flood hydrograph against the embankment is hours.

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one):

UBC (1988) or Other (specify):

b. Stability analysis submitted provides for:

Overturning Sliding If not, explain:

c. Loading included in the analyses were:

Lateral earth @ $P_A =$ psf; $P_p =$ psf

Surcharge-Slope @ , surface psf

Wind @ $P_w =$ psf

Seepage (Uplift); Earthquake @ $P_{eq} =$ %g

1%-annual-chance significant wave height: ft.

1%-annual-chance significant wave period: sec.

d. Summary of Stability Analysis Results: Factors of Safety.

Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)

(Note: Extend table on an added sheet as needed and reference)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

f. Foundation scour protection is, is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

i. Will pumping plants be used for interior drainage? Yes No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? Yes No

If the pumps are electric, are there backup power sources? Yes No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

- Liquefaction is is not a problem
- Hydrocompaction is is not a problem
- Heave differential movement due to soils of high shrink/swell is is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
 Yes No

Attach supporting documentation

d. Sediment Transport Considerations:

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

E. LEVEE/FLOODWALL (CONTINUED)

10. Operational Plan And Criteria

- a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? Yes No
- b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations?
 Yes No
- c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations?
 Yes No

If the answer is No to any of the above, please attach supporting documentation.

11. Maintenance Plan

- a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? Yes No
If No, please attach supporting documentation.

12. Operations and Maintenance Plan

Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

F. SEDIMENT TRANSPORT

Flooding Source:

Name of Structure:

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume acre-feet

Debris load associated with the base flood discharge: Volume acre-feet

Sediment transport rate (percent concentration by volume)

Method used to estimate sediment transport:

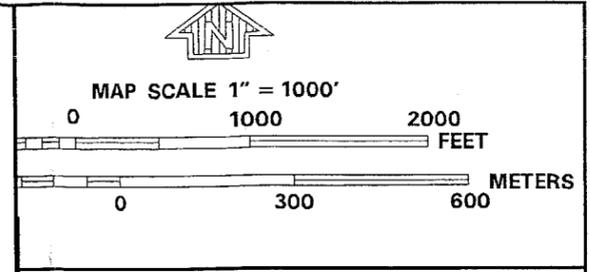
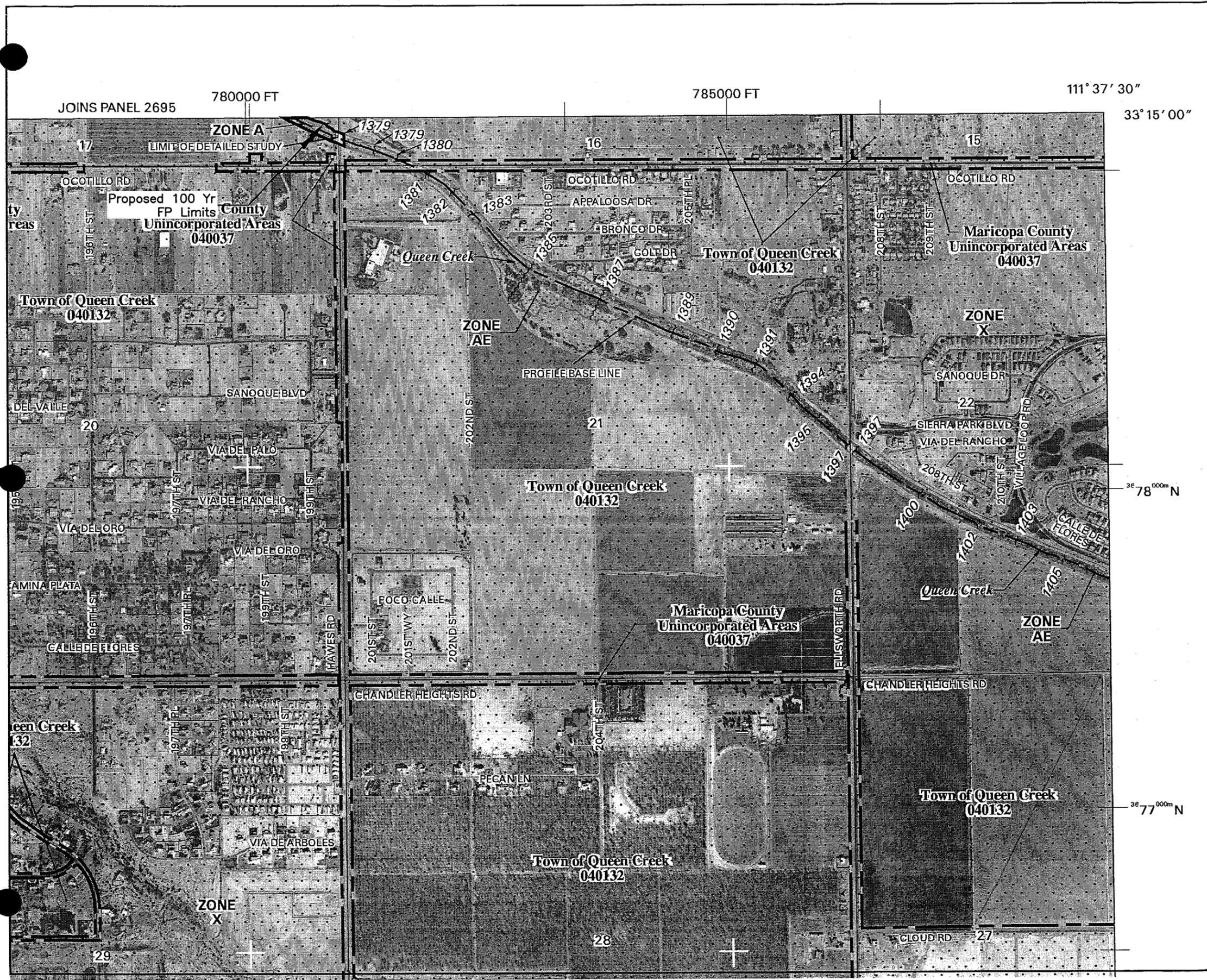
Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition:

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport:

Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.



NFP

PANEL 3060H

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

PANEL 3060 OF 4350

ISEE MAP INDEX FOR FIRM PANEL LAYOUT

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GILBERT, TOWN OF	040044	3050	H
MARICOPA COUNTY	040037	3050	H
QUEEN CREEK, TOWN OF	040132	3050	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.

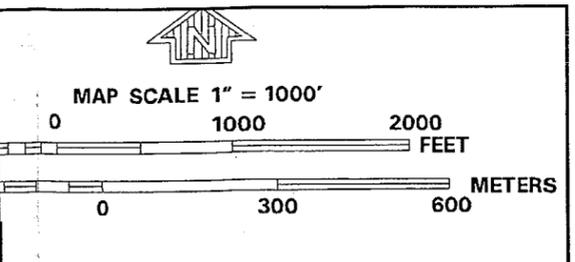
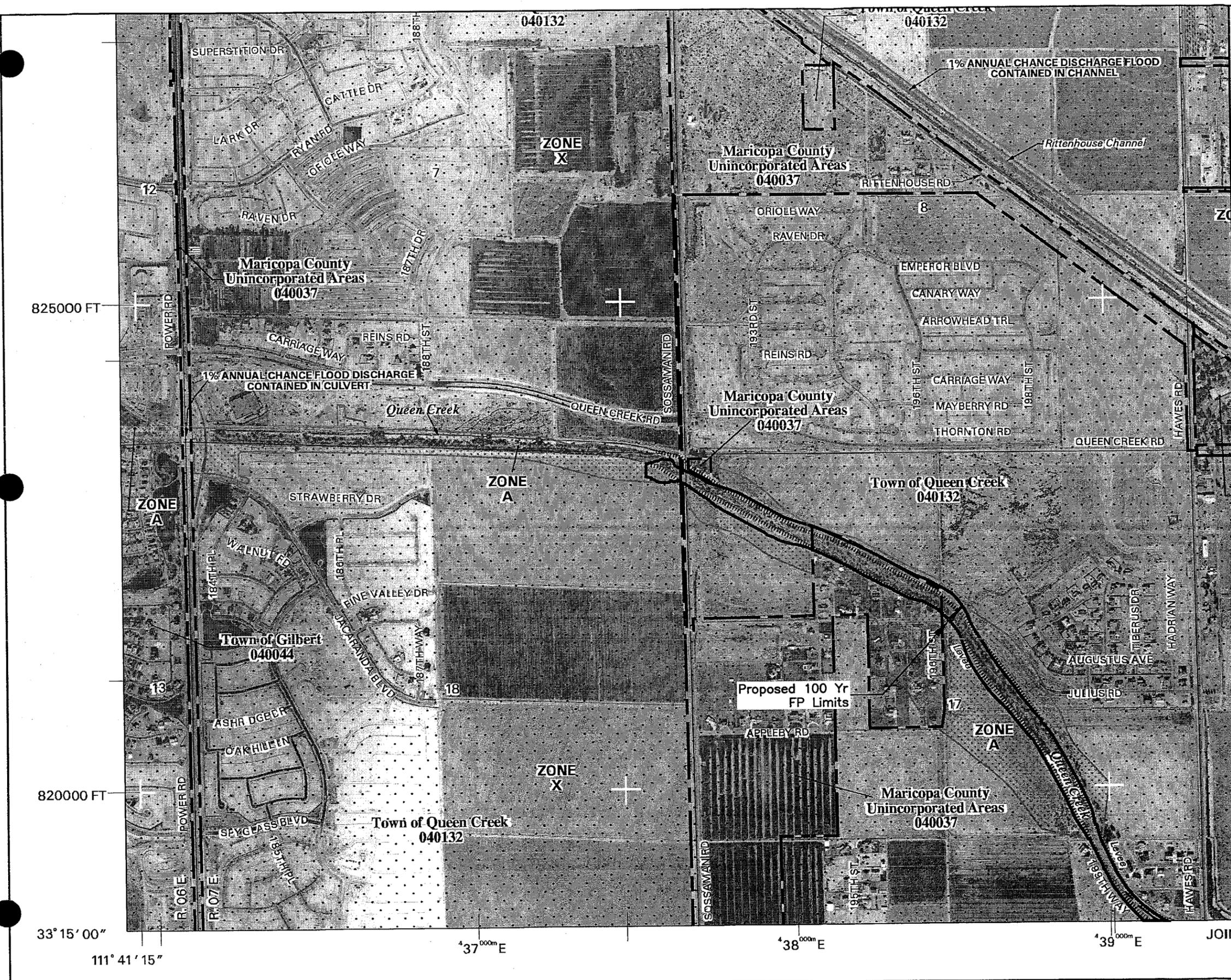
MAP NUMBER
04013C3060H

MAP REVISED
SEPTEMBER 30, 2005

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

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



NFP
PANEL 2695H

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

PANEL 2695 OF 4350
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GILBERT, TOWN OF	040044	2695	H
MARICOPA COUNTY	040037	2695	H
MESA, CITY OF	040048	2695	H
QUEEN CREEK, TOWN OF	040132	2695	H

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

MAP NUMBER
04013C2695H
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

825000 FT

820000 FT

33° 15' 00"
111° 41' 15"

437^{000m} E 438^{000m} E 439^{000m} E

GROUND CONTROL SURVEY AND SUPPLEMENTAL TOPOGRAPHICAL SURVEY WAS PERFORMED UNDER MY DIRECT SUPERVISION.



LEGEND

- 100-YR FLOODPLAIN BOUNDARY
- FLOODWAY BOUNDARY
- HYDRAULIC BASE LINE WITH RIVER MILE
- EROSION SETBACK (WHEN APPLICABLE)
- CROSS SECTION
- ELEVATION REFERENCE MARK
- BASE FLOOD ELEVATIONS
- ZONE DESIGNATIONS
- CORPORATE LIMITS
- COUNTY, PARISH, STATE OR INTERNATIONAL BOUNDARY

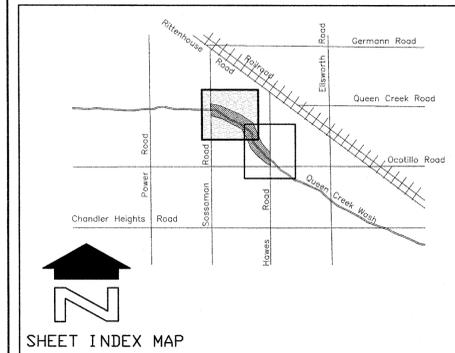
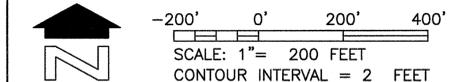
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). CONVERSION FACTOR NAVD 1988 -1.61 FEET = NGVD 1929 (PROJECT SPECIFIC)

ID NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
103	1361.66	BCHH @ QUEEN CREEK & SOSSAMAN 0.3' DN STAMPED "TOWN OF QUEEN CREEK"
105	1365.22	COTTON PICKER SPINDLE @ APPELEY & SOSSAMAN
106	1369.67	FOUND BCF STAMPED "TOWN OF QUEEN CREEK"
107	1367.03	FOUND BCHH @ N 1/4 CRNR OF SEC 17

NOTES

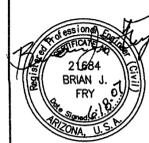
- THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 1,000 UNLESS NOTED OTHERWISE
- EAST OF HAWES ROAD: FDCMC CONTRACT NO. 95-43 + 2.427 FEET = NAVD 88. (PROJECT SPECIFIC)
- WEST OF SOSSAMAN ROAD: RYLAND REACH - 2.0 FEET = NAVD 88 (PROJECT SPECIFIC)



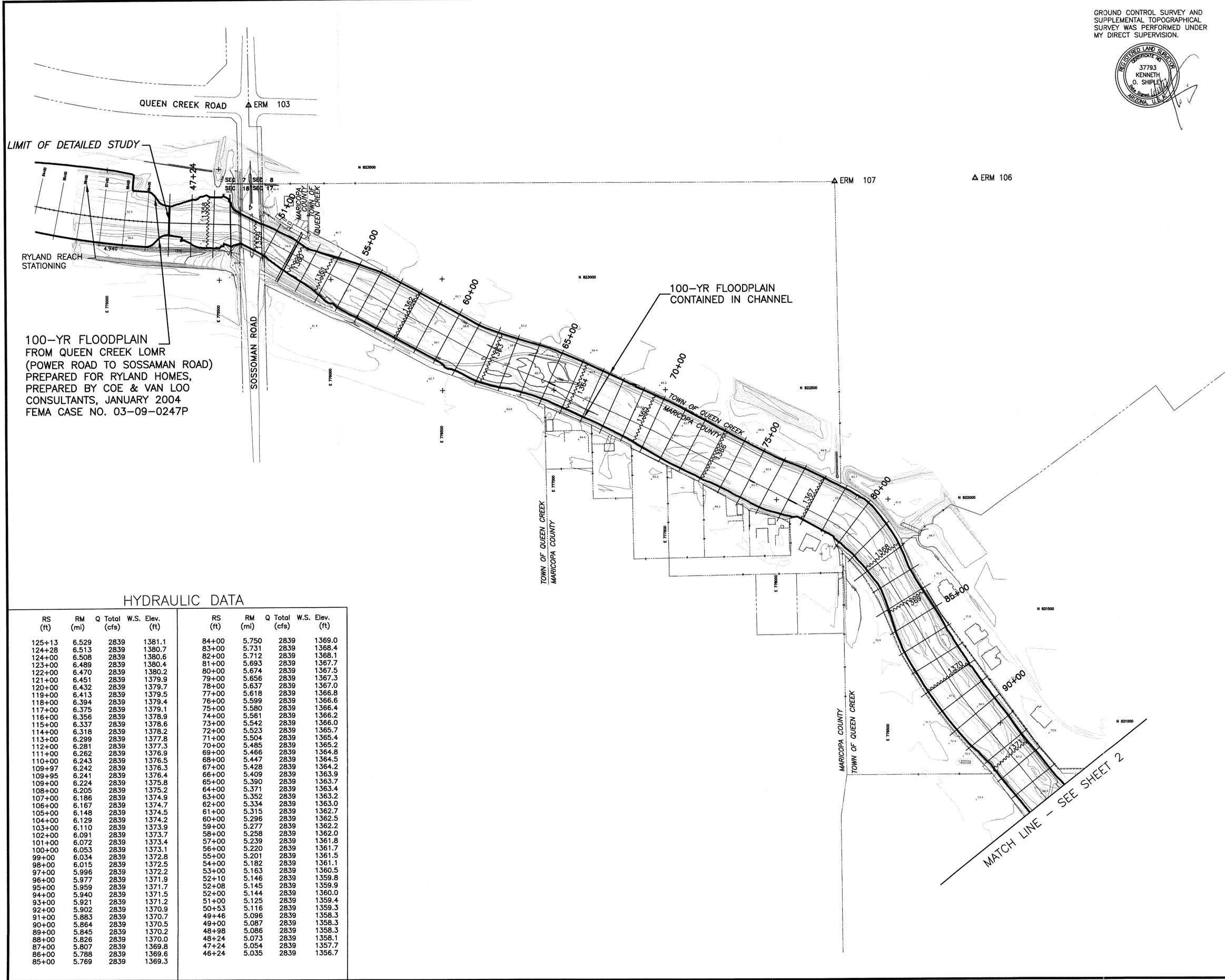
NO.	REVISION	BY	DATE

TOWN OF QUEEN CREEK

QUEEN CREEK WASH CHANNELIZATION LOMR
SOSSAMAN ROAD TO HAWES ROAD
PROJECT NO. 2000D-03



	BY	DATE
DESIGN	JWL	06/18/07
DESIGN CHK.	JEP	06/18/07
PLANS	JWL	06/18/07
PLANS CHK.	JEP	06/18/07



RYLAND REACH STATIONING

100-YR FLOODPLAIN FROM QUEEN CREEK LOMR (POWER ROAD TO SOSSAMAN ROAD) PREPARED FOR RYLAND HOMES, PREPARED BY COE & VAN LOO CONSULTANTS, JANUARY 2004 FEMA CASE NO. 03-09-0247P

HYDRAULIC DATA

RS (ft)	RM (mi)	Q (cfs)	Total W.S. Elev. (ft)	RS (ft)	RM (mi)	Q (cfs)	Total W.S. Elev. (ft)
125+13	6.529	2839	1381.1	84+00	5.750	2839	1369.0
124+28	6.513	2839	1380.7	83+00	5.731	2839	1368.4
124+00	6.508	2839	1380.6	82+00	5.712	2839	1368.1
123+00	6.489	2839	1380.4	81+00	5.693	2839	1367.7
122+00	6.470	2839	1380.2	80+00	5.674	2839	1367.5
121+00	6.451	2839	1379.9	79+00	5.656	2839	1367.3
120+00	6.432	2839	1379.7	78+00	5.637	2839	1367.0
119+00	6.413	2839	1379.5	77+00	5.618	2839	1366.8
118+00	6.394	2839	1379.4	76+00	5.599	2839	1366.6
117+00	6.375	2839	1379.1	75+00	5.580	2839	1366.4
116+00	6.356	2839	1378.9	74+00	5.561	2839	1366.2
115+00	6.337	2839	1378.6	73+00	5.542	2839	1366.0
114+00	6.318	2839	1378.2	72+00	5.523	2839	1365.7
113+00	6.299	2839	1377.8	71+00	5.504	2839	1365.4
112+00	6.281	2839	1377.3	70+00	5.485	2839	1365.2
111+00	6.262	2839	1376.9	69+00	5.466	2839	1364.8
110+00	6.243	2839	1376.5	68+00	5.447	2839	1364.5
109+97	6.242	2839	1376.3	67+00	5.428	2839	1364.2
109+95	6.241	2839	1376.4	66+00	5.409	2839	1363.9
108+00	6.224	2839	1375.8	65+00	5.390	2839	1363.7
108+00	6.205	2839	1375.2	64+00	5.371	2839	1363.4
107+00	6.186	2839	1374.9	63+00	5.352	2839	1363.2
106+00	6.167	2839	1374.7	62+00	5.334	2839	1363.0
105+00	6.148	2839	1374.5	61+00	5.315	2839	1362.7
104+00	6.129	2839	1374.2	60+00	5.296	2839	1362.5
103+00	6.110	2839	1373.9	59+00	5.277	2839	1362.2
102+00	6.091	2839	1373.7	58+00	5.258	2839	1362.0
101+00	6.072	2839	1373.4	57+00	5.239	2839	1361.8
100+00	6.053	2839	1373.1	56+00	5.220	2839	1361.7
99+00	6.034	2839	1372.8	55+00	5.201	2839	1361.5
98+00	6.015	2839	1372.5	54+00	5.182	2839	1361.1
97+00	5.996	2839	1372.2	53+00	5.163	2839	1360.5
96+00	5.977	2839	1371.9	52+10	5.146	2839	1359.8
95+00	5.959	2839	1371.7	52+08	5.145	2839	1359.9
94+00	5.940	2839	1371.5	52+00	5.144	2839	1360.0
93+00	5.921	2839	1371.2	51+00	5.125	2839	1359.4
92+00	5.902	2839	1370.9	50+53	5.116	2839	1359.3
91+00	5.883	2839	1370.7	49+46	5.096	2839	1358.3
90+00	5.864	2839	1370.5	49+00	5.087	2839	1358.3
89+00	5.845	2839	1370.2	48+98	5.086	2839	1358.3
88+00	5.826	2839	1370.0	48+24	5.073	2839	1358.1
87+00	5.807	2839	1369.8	47+24	5.054	2839	1357.7
86+00	5.788	2839	1369.6	46+24	5.035	2839	1356.7
85+00	5.769	2839	1369.3				

GROUND CONTROL SURVEY AND SUPPLEMENTAL TOPOGRAPHICAL SURVEY WAS PERFORMED UNDER MY DIRECT SUPERVISION.



LEGEND

- 100-YR FLOODPLAIN BOUNDARY
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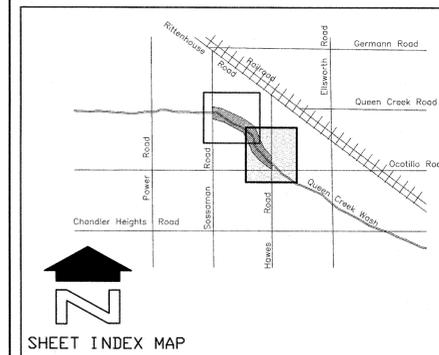
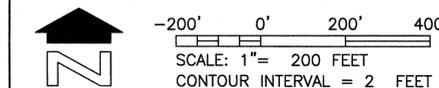
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). CONVERSION FACTOR NAVD 1988 -1.60 FEET = NGVD 1929 (PROJECT SPECIFIC)

ID NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
101	1383.63	BCHH 0.6' DN STAMPED "MARICOPA DOT 125 R7E, S17 S16"
5017	1379.07	BCHH @ APPROX. E 1/4 CRNR S17

NOTES

- THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 1,000 UNLESS NOTED OTHERWISE
- EAST OF HAWES ROAD: FCDMC CONTRACT NO. 95-43 + 2.427 FEET = NAVD 88. (PROJECT SPECIFIC)
- WEST OF SOSSAMAN ROAD: RYLAND REACH - 2.0 FEET = NAVD 88 (PROJECT SPECIFIC)



NO.	REVISION	BY	DATE

TOWN OF QUEEN CREEK

QUEEN CREEK WASH CHANNELIZATION LOMR SOSSAMAN ROAD TO HAWES ROAD PROJECT NO. 2000D-03

	BY	DATE
DESIGN	JWL	06/18/07
DESIGN CHK.	JEP	06/18/07
PLANS	JWL	06/18/07
PLANS CHK.	JEP	06/18/07



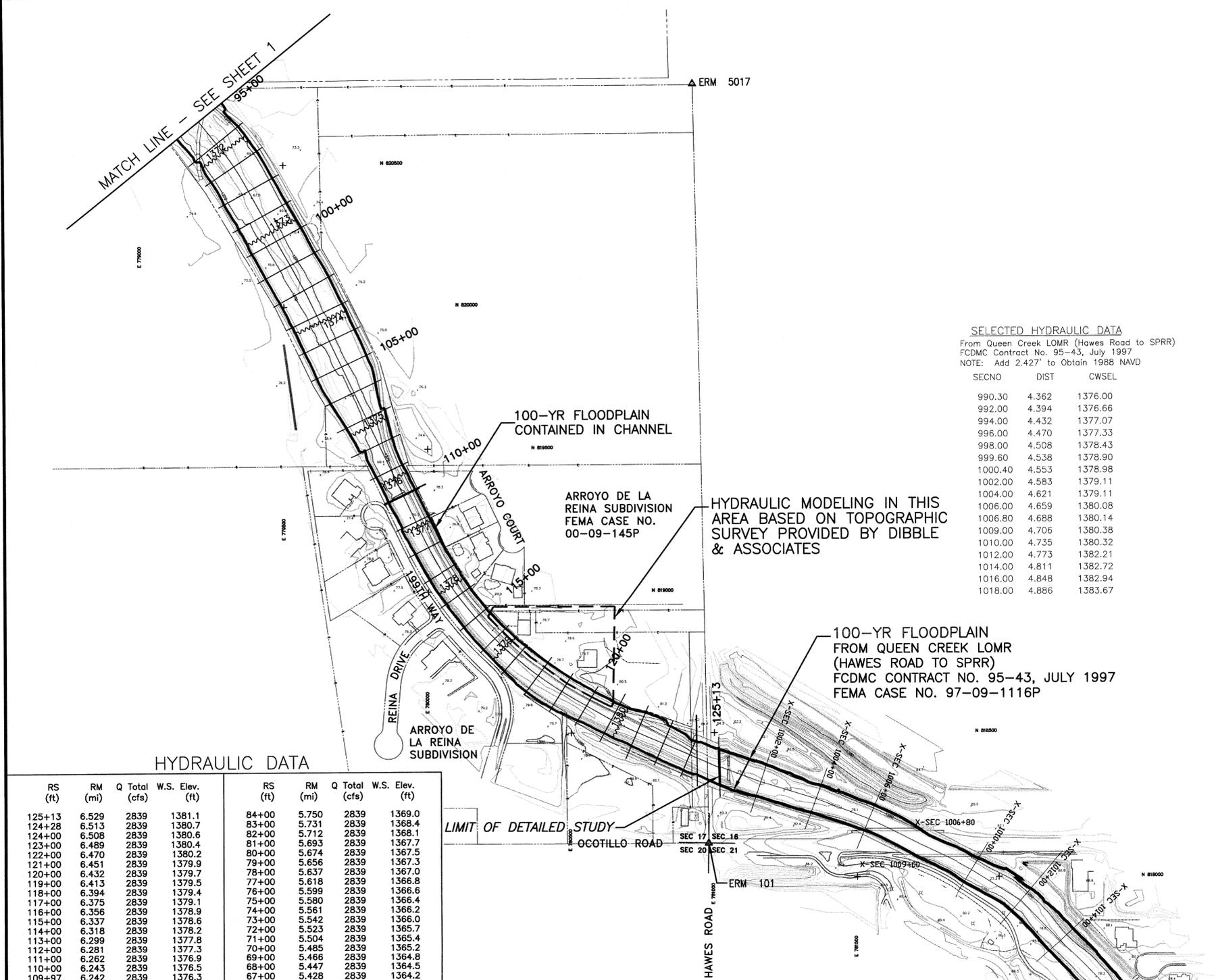
Dibble Engineering

SELECTED HYDRAULIC DATA
From Queen Creek LOMR (Hawes Road to SPRR)
FCDMC Contract No. 95-43, July 1997
NOTE: Add 2.427' to Obtain 1988 NAVD

SECNO	DIST	CWSEL
990.30	4.362	1376.00
992.00	4.394	1376.66
994.00	4.432	1377.07
996.00	4.470	1377.33
998.00	4.508	1378.43
999.60	4.538	1378.90
1000.40	4.553	1378.98
1002.00	4.583	1379.11
1004.00	4.621	1379.11
1006.00	4.659	1380.08
1006.80	4.688	1380.14
1009.00	4.706	1380.38
1010.00	4.735	1380.32
1012.00	4.773	1382.21
1014.00	4.811	1382.72
1016.00	4.848	1382.94
1018.00	4.886	1383.67

HYDRAULIC DATA

RS (ft)	RM (mi)	Q Total (cfs)	W.S. Elev. (ft)	RS (ft)	RM (mi)	Q Total (cfs)	W.S. Elev. (ft)
125+13	6.529	2839	1381.1	84+00	5.750	2839	1369.0
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123+00	6.489	2839	1380.4	81+00	5.693	2839	1367.7
122+00	6.470	2839	1380.2	80+00	5.674	2839	1367.5
121+00	6.451	2839	1379.9	79+00	5.656	2839	1367.3
120+00	6.432	2839	1379.7	78+00	5.637	2839	1367.0
119+00	6.413	2839	1379.5	77+00	5.618	2839	1366.8
118+00	6.394	2839	1379.4	76+00	5.599	2839	1366.6
117+00	6.375	2839	1379.1	75+00	5.580	2839	1366.4
116+00	6.356	2839	1378.9	74+00	5.561	2839	1366.2
115+00	6.337	2839	1378.6	73+00	5.542	2839	1366.0
114+00	6.318	2839	1378.2	72+00	5.523	2839	1365.7
113+00	6.299	2839	1377.8	71+00	5.504	2839	1365.4
112+00	6.281	2839	1377.3	70+00	5.485	2839	1365.2
111+00	6.262	2839	1376.9	69+00	5.466	2839	1364.8
110+00	6.243	2839	1376.5	68+00	5.447	2839	1364.5
109+97	6.242	2839	1376.3	67+00	5.428	2839	1364.2
109+95	6.241	2839	1376.4	66+00	5.409	2839	1363.9
109+00	6.224	2839	1375.8	65+00	5.390	2839	1363.7
108+00	6.205	2839	1375.2	64+00	5.371	2839	1363.4
107+00	6.186	2839	1374.9	63+00	5.352	2839	1363.2
106+00	6.167	2839	1374.7	62+00	5.334	2839	1363.0
105+00	6.148	2839	1374.5	61+00	5.315	2839	1362.7
104+00	6.129	2839	1374.2	60+00	5.296	2839	1362.5
103+00	6.110	2839	1373.9	59+00	5.277	2839	1362.2
102+00	6.091	2839	1373.7	58+00	5.258	2839	1362.0
101+00	6.072	2839	1373.4	57+00	5.239	2839	1361.8
100+00	6.053	2839	1373.1	56+00	5.220	2839	1361.7
99+00	6.034	2839	1372.8	55+00	5.201	2839	1361.5
98+00	6.015	2839	1372.5	54+00	5.182	2839	1361.1
97+00	5.996	2839	1372.2	53+00	5.163	2839	1360.5
96+00	5.977	2839	1371.9	52+10	5.146	2839	1359.8
95+00	5.959	2839	1371.7	52+08	5.145	2839	1359.9
94+00	5.940	2839	1371.5	52+00	5.144	2839	1360.0
93+00	5.921	2839	1371.2	51+00	5.125	2839	1359.4
92+00	5.902	2839	1370.9	50+53	5.116	2839	1359.3
91+00	5.883	2839	1370.7	49+46	5.096	2839	1358.3
90+00	5.864	2839	1370.5	49+00	5.087	2839	1358.3
89+00	5.845	2839	1370.2	48+98	5.086	2839	1358.3
88+00	5.826	2839	1370.0	48+24	5.073	2839	1358.1
87+00	5.807	2839	1369.8	47+24	5.054	2839	1357.7
86+00	5.788	2839	1369.6	46+24	5.035	2839	1356.7
85+00	5.769	2839	1369.3				



HYDRAULIC MODELING IN THIS AREA BASED ON TOPOGRAPHIC SURVEY PROVIDED BY DIBBLE & ASSOCIATES

100-YR FLOODPLAIN CONTAINED IN CHANNEL

ARROYO DE LA REINA SUBDIVISION FEMA CASE NO. 00-09-145P

100-YR FLOODPLAIN FROM QUEEN CREEK LOMR (HAWES ROAD TO SPRR) FCDMC CONTRACT NO. 95-43, JULY 1997 FEMA CASE NO. 97-09-1116P