Flood Control District of Maricopa County
Phoenix, Arizona
April, 1999

LETTER OF MAP REVISION FOR QUEEN CREEK WASH

(from Hawes Road to Power Road)

DRAFT **TECHNICAL DATA NOTEBOOK**

Prepared by:
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Prepared for:

Federal Emergency Management Agency
Hazards Study Branch
Mitigation Directorate
500 C Street SW, Room 422
Washington, DC 20472

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LETTER OF MAP REVISION

For

QUEEN CREEK

(from Hawes Road to Power Road)

TECHNICAL DATA NOTEBOOK

SECTION 1: INTRODUCTION

This Technical Data Notebook documents the hydraulic analysis conducted in support of a request for a Letter of Map Revision (LOMR) for the Queen Creek Wash from Hawes Road to Power Road. A revision of the floodplain delineation map is warranted due to high rate of growth in the vicinity of the Towns of Gilbert and Queen Creek. A letter of Map Revision for Queen Creek from the Southern Pacific Railroad to Hawes Road (Reference 1) has already been approved by the Federal Emergency Management Agency (FEMA). Additionally, a conditional Map Revision by Coe & Van Loo Consultants, Inc. has been issued by the Federal Emergency Management Agency (FEMA) from Power Road to Recker Road (Reference 2).

Queen Creek flows in a northwesterly direction from Hawes Road to Sossaman Road. At the Sossaman Road crossing, there are five (5) 6'-0" diameter skewed culverts. Downstream of the culverts the wash starts to flow in a westerly direction to the Power Road Bridge. The revised floodplain delineation is based on the 100-year flooding event as determined by the Queen Creek Area Drainage Master Study (Reference 3).

The limit of the current floodplain delineation study covers sections 7, 8, 17, and 18, of Township 2S and Range 7E. The wash flows through the Town of Queen Creek and Maricopa County, Unincorporated Areas. The location of Queen Creek for the limits of this study is shown in Figure 1.

SECTION 2: ADWR AND FEMA FORMS

2.1 Study Documentation Abstract

The completed study documentation abstract is contained within the following pages.

2.2 Application/Certification Forms

The required FEMA Application and Certification Forms are included in Appendix B of this Technical Data Notebook (TDN).

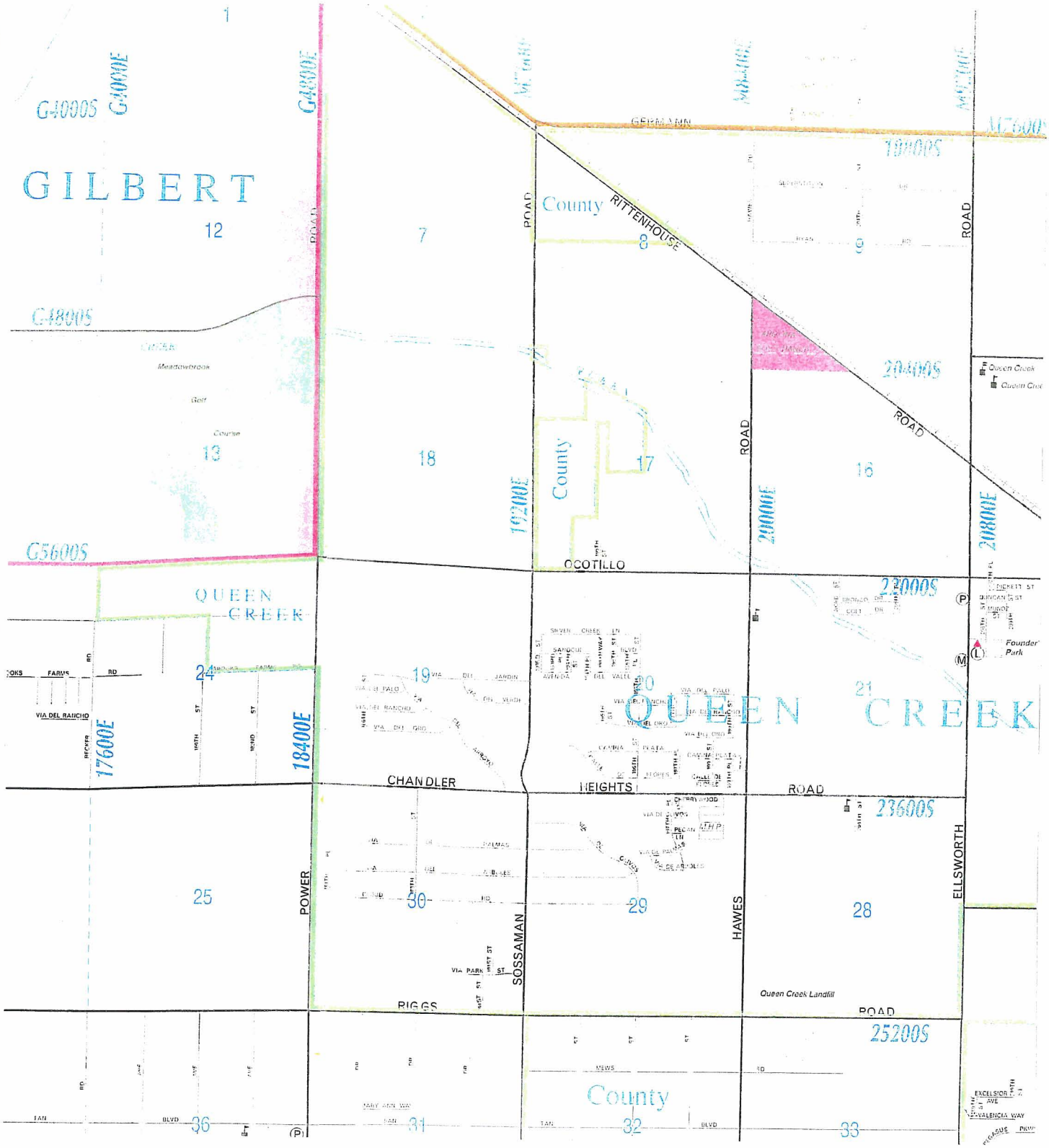


Figure 1: Project Location Map.

STUDY DOCUMENTATION ABSTRACT		INITIAL STUDY	RESTUDY	LOMR	OTHER
Queen Creek LOMR				**X**	
SECTION 1: GENERAL INFORMATION					
1A	COMMUNITY	Town of Queen Creek, Unincorporated Maricopa County			
1B	COMMUNITY NUMBER	040132, 040037			
1C	COUNTY	Maricopa			
1D	STATE	Arizona			
1E					
1F	STUDY CONTRACTOR CONTACT(S) ADDRESS PHONE	Flood Control District of Maricopa County Hasan Mushtaq, Ph.D., P.E. 2801 West Durango Street Phoenix, Arizona 85009 (602) 506-4528			
1G	TECH REVIEWER (FEMA) PHONE				
1H	FEMA REGIONAL REVIEWER PHONE				
1I	STATE REVIEWER PHONE	Arizona Department of Water Resources (602) 417-2400			
1K	RIVER OR STREAM NAME	Queen Creek			
1L	REACH DESCRIPTION	From Hawes Road to Power Road			
1M	STUDY TYPE	Channelization LOMR			
SECTION 2: MAPPING INFORMATION					
2A	USGS QUAD SHEET(S)				
2B	MAPPING FOR HYDROLOGIC STUDY: TYPE/SOURCE SCALE DATE	 USGS 7.5 Minute Series (Topographic) Map 1:24000 Various			
2C	MAPPING FOR HYDRAULIC STUDY: TYPE/SOURCE SCALE DATE	 DTM, Wood & Associates, Inc. 1"=200'; 2-foot contour interval October & November, 1986			
	TYPE/SOURCE SCALE DATE	DTM, Collins/Pina Consulting Engineers, Inc. 1"=100, 1-foot contour interval January, 1998			
	TYPE/SOURCE SCALE DATE	DTM, Collins/Pina Consulting Engineers, Inc. 1"=100', 1-foot July, 1997			
	TYPE/SOURCE SCALE DATE	Field Level Surveys January, 1999			

STUDY DOCUMENTATION ABSTRACT (CONTINUED)		
SECTION 3: HYDROLOGY (completed as part of Queen Creek ADMS, FCD No. 86-23)		
3A	MODEL OR METHODS USED (including vendor and version description)	HEC-1 Flood Hydrograph Package US Army Corps' of Engineers
3B	STORM DURATION	24-hour
3C	HYETOGRAPH	
3D	FREQUENCIES DETERMINED	2, 5, 10, 25, 50, AND 100 YEAR
3E	LIST OF GAGE USED IN FREQUENCY ANALYSIS OR CALIBRATION (Location, Years of Record, Gage Ownership)	None
3F	RAINFALL AND REFERENCE	US Department of Commerce, National Oceanic and Atmospheric Administration, Atlas 2 Precipitation-Frequency Atlas of the Western United States, Volume VIII-Arizona
3G	UNIQUE CONDITIONS AND PROBLEMS	N/A
3H	COORDINATION OF Q'S (Agency, Date, Comments)	Flood Control District of Maricopa County 2801 West Durango Street, Phoenix, Arizona 85009 August 1991
SECTION 4: HYDRAULICS		
4A	MODEL OR METHOD USED (including vendor and version description)	HEC-2 US Army Corps' of Engineers Version 4.6.2, Dated May 1991
4B	REGIME	Subcritical
4C	FREQUENCIES FOR WHICH PROFILE WERE COMPUTED	100-Year
4D	METHOD OF FLOODWAY CALCULATION	Method 1
4E	UNIQUE CONDITIONS AND PROBLEMS	See Attached Report
ADDITIONAL STUDY INFORMATION		
ITEM		DESCRIPTION/DISCUSSION
Supporting documents		Report provides technical appendices including FEMA forms, HEC-2 input/output

SECTION 3: SURVEYING AND MAPPING

3.1 Field Survey Information

The ground control survey for the project mapping was performed by Collins/Pina Consulting Engineers, Inc., under Flood Control District of Maricopa County Contract No. 97-03-3, as of April 22, 1998 (Ref. 4). During the study it was determined that the area affected by the 100-yr. flooding event exceeded the limits of the recent mapping. Therefore, a set of spot levels survey were performed by Flood Control District personnel to be used in comparing the new mapping with that from 1986 for the Queen Creek ADMS (Reference 3). The survey results are included in Appendix E.

3.2 Mapping Description

The base topographic mapping used for the hydraulic analysis conducted for this LOMR request was prepared by Kenney Aerial Mapping Inc. with flight date of January 15, 1998. This mapping covers the area from approximately 1,000 downstream of Hawes Road to Power Road. The mapping scale was at 1"=100' with 1-foot contour interval. During the study it was determined that the area affected by the 100-yr. flooding event exceeded the limits of the recent mapping. Therefore, the 1986 topographic mapping for the Queen Creek ADMS, with scale at 1"=200' with 2-foot contour interval, (Ref. 3) was used to supplement the new mapping for this study. Additionally, mapping for the area downstream of Hawes Road was used from the Letter of Map Revision from SPRR to Hawes Road (Reference 1). The final maps were then prepared at a scale of 1"=200' with contour intervals based on which set of mapping is represented.

SECTION 4: HYDROLOGIC ANALYSIS

4.1 Model description

The flooding events having a 1% chance of being equaled or exceeded was determined to be 3,010 cfs. The same discharge was also used in the Conditional Letter of Map Revision (CLOMR), between Power Road and Recker Road, by Coe & Van Loo (Reference 2) and the Letter of Map Revision (LOMR), between Southern Pacific Railroad and Hawes Road, by Collins Pina Consulting Engineers, Inc. (Reference 1)

SECTION 5: HYDRAULIC ANALYSIS

5.1 Method Description

The study consists of approximately two and a half (2.5) river miles of floodplain and floodway delineation of the Queen Creek. The limits of the delineation range from Hawes Road to Power Road. The upstream limit of the delineation is immediately downstream of the Hawes Road and the downstream limit of the delineation is immediately upstream of the Power Road.

The US Army Corps of Engineers HEC-2 Model (Reference 5) for water surface profiles was used for the final hydraulic analysis. An enhanced version of the program, entitled PROHEC-2 (Reference 6) was used to create, edit and modify the HEC-2 hydraulic model.

The HEC-2 hydraulic model relies on the use of the Manning's equation, which is a slope-conveyance computation method of determining the depth of flow for open

channel flow. The equation relates conveyance (area of flow, wetted perimeter, and roughness coefficient) and slope to its velocity or flow rate. The main deficiencies of this equation are the non-uniformity of the channel and the difficulty of determining a roughness coefficient, Manning's n-value, for a channel.

5.2 Study Work Maps

A location map for the section of Queen Creek between Hawes Road and Power Road is shown in Figure 1. The full-size work maps for the delineated floodplain/floodway are included in Appendix I.

5.3 Parameter estimation

5.3.1 Roughness Coefficients

The roughness coefficient, known as the Manning's n-value will vary depending on the bed material, vegetation type and size, depth of flow, channel meandering, and velocity of the flow. The roughness coefficient (Manning's n-value) will also vary horizontally across the cross-section of a natural channel as well as longitudinally between cross-sections. Therefore, careful consideration must be given to the effects due to channel characteristics on the roughness coefficient.

Hydraulic modeling of channels using HEC-2 requires three (3) values of the roughness coefficients. These values are for the main channel and the left and right overbanks. The coefficient values are determined for the time of peak flow through the cross-section.

The n-values for a cross-section are determined for a reach half way between the next upstream and the next downstream cross-sections. They are usually calculated by establishing a base value for a typical channel bed and adjusting this value for channel

characteristics. The base value can be determined by a comparison with typical values established through channel studies that are available in widely accepted references.

The USGS published reference, *Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona*, (Reference 7), was one of the sources used to determine the base values in this study.

Adjustments to the base value were made based on the equation presented in the USGS text as follows:

$$n = m\,(nb + n1 + n2 + n3 + n4)$$

where :

n	=	equivalent roughness coefficient
m	=	correction factor for channel meandering
nb	=	base value for straight uniform channel
n1	=	correction for surface irregularities
n2	=	variations in channel shape and size
n3	=	corrections for obstructions
n4	=	correction for vegetation

The values for each of the correction factors was considered when using the guidelines presented in *Verification of Roughness Coefficients for Selected Natural and Constructed Stream Channels in Arizona, 1998* (Reference 8). The equivalent value was rounded to the nearest 5/100th for inclusion in the HEC-2 model. The documentation of n-value determination for this study is included in Appendix C.

5.3.1.1 Surface Irregularities

Surface irregularities are obstructions to flow in the channel that cause an energy

loss in the flow. Irregularities are seen as sloughed, jagged, or eroded banks or side slopes.

5.3.1.2 Channel Shape Variations

As flows travel in a channel through its watercourse, the channel may change shape and size. The channel shape and size are influenced by the soil types, obstructions, tributary flows, and slope modifications. The degree or rapidity with which the channel changes size from large to small, or with which it shifts flow from one side to the other may cause an energy loss in the flow.

5.3.1.3 Obstructions to Flow

Obstructions to flow may act as energy dissipaters. Large boulders, exposed roots or stumps of established vegetation, or permanently resting logs or piers can act as obstructions to flow. In addition, anything that may act to hold debris or impede the natural flow will require an adjustment factor. The percentage of area influenced by obstructions and the spacing of the obstructions will influence the value of the adjustment factor.

5.3.1.4 Correction for Vegetation

Vegetation having a depth that is less than or only slightly greater than the height of the vegetation and vegetation with deep roots or that which is well established and will not become dislodged or uprooted in shallow flows exerts the most influence on flows. Deeper flows that submerge trees or large bushes should also have an adjustment for vegetation. Please see Reference 7 for a description of the adjustment factors.

5.3.1.5 Channel Meandering

Channel meandering, the variation from a straight channel to one with multiple

curves and an elongated watercourse, will have the greatest impact on the adjustment factor for the n-value. A meandering channel magnifies all adjustment factors.

5.3.1.6 Determination of Adjustment Factors

Determination of the degree of influence and the related values for the adjustment factors relies on experience and judgment. The process is aided by adequate assessment of the site. On-site inspection of the watercourse and selection of typical cross-sections aid in determining the values for the adjustment factors.

The determination of the base n-values and adjustment factors along with selected photographs are described in Appendix C.

5.3.2 Expansion and Contraction Coefficients

The expansion and contraction coefficients used throughout most of the study reach were 0.3 and 0.1, respectively. The bridges at Power Road and at Hawes Road and the culverts at Sossoman Road, were modeled using the expansion and contraction coefficients of 0.5 and 0.3 respectively.

5.4 Cross-Section Description

Cross-section locations were selected at approximately 500-foot intervals except at bends in the channel and near road crossings where the spacing interval was reduced. The cross-sections are oriented approximately perpendicular to the anticipated flow paths of the 100-yr. flooding event. The cross-sections are numbered in miles from the East Maricopa Floodway (EMF). The reach of this study is between cross-sections 4.096 on the upstream side of the Power Road Bridge and 6.470 on the downstream side of the Hawes Road Bridge.

The cross-sections are defined by data points oriented left to right, looking downstream. Each data point consists of an elevation and corresponding station number. The data points for the preliminary model were developed from digital base topographic maps using the BOSS River Modeling System (RMS) (Reference 9). Due to lack of coverage from the recent topographic mapping (Reference 4), it was decided that the Queen Creek ADMS topographic mapping (Reference 3) would be used to extend the cross-sections. Additional points were added to the cross-section by selecting them manually. Each cross-section is marked with the base station of 11000. Locations of cross-sections used in this LOMR are shown on the work maps in Appendix I. Cross-section plots for Queen Creek between Hawes Road and Power Road are included in Appendix H.

5.5 Modeling Considerations

The HEC-2 hydraulic model is developed for the subcritical flow regime and is used for this reach of Queen Creek so that it will conform to the recent studies downstream and upstream of the study reach. The downstream study from Power Road to Recker Road (Reference 2) was recently done by Coe & Van Loo Consultants, Inc. and submitted to FEMA as a CLOMR for a development in the area. The upstream study from SPRR to Hawes Road (Ref. 1) was performed by Collins/Pina Consulting Engineers, Inc. and submitted to FEMA as a Letter of Map Revision (LOMR) under Flood Control District of Maricopa County Contract No. 95-43-3.

5.5.1 Hydraulic Jump/Drop analysis

No hydraulic jump or drops occur along the project reach.

5.5.2 Bridges and Culverts

There are bridges located at both ends of the study, Hawes Road and Power Road, but both were part of the adjacent studies. There are culverts at the Sossoman Road crossing.

5.5.2.1 Sossoman Road Culverts

There are 5 existing 6-foot diameter corrugated metal pipe culverts at the Sossoman Road crossing. They are 67.5 feet long with a concrete headwall and are oriented along the length of the channel, which puts them at a large angle to the Sossoman Road. The average upstream invert is at elevation 1,250.59 feet MSL. The average downstream invert is at elevation 1,349.52 feet MSL.

The Special Culvert Routine of HEC-2 was used to model the culverts. The Culvert Computation Program HY-8, Version 6.0 (Reference 10) was then used, with a tailwater rating (the rating was developed for the downstream side of Sossoman Road using the HEC-2 model), as a check on the results of the HEC-2 model. The determination of the water surface elevation on the upstream side of the culverts computed by the two methods agreed. Thus, the result from the HEC-2 model was assumed to be acceptable. The output table from the HEC-2 model, a graphical rating curve and the input and output for HY8 are presented in Appendix D.

5.5.3 Levees and Dikes

The dikes along this reach of Queen Creek were considered unstable. Thus, the model assumes that they do not contain the flow, which causes over bank flow outside of the dikes.

5.5.4 Islands and Flows Splits

There are no Islands or split flows within this reach of Queen Creek.

5.5.5 Ineffective Flow Areas

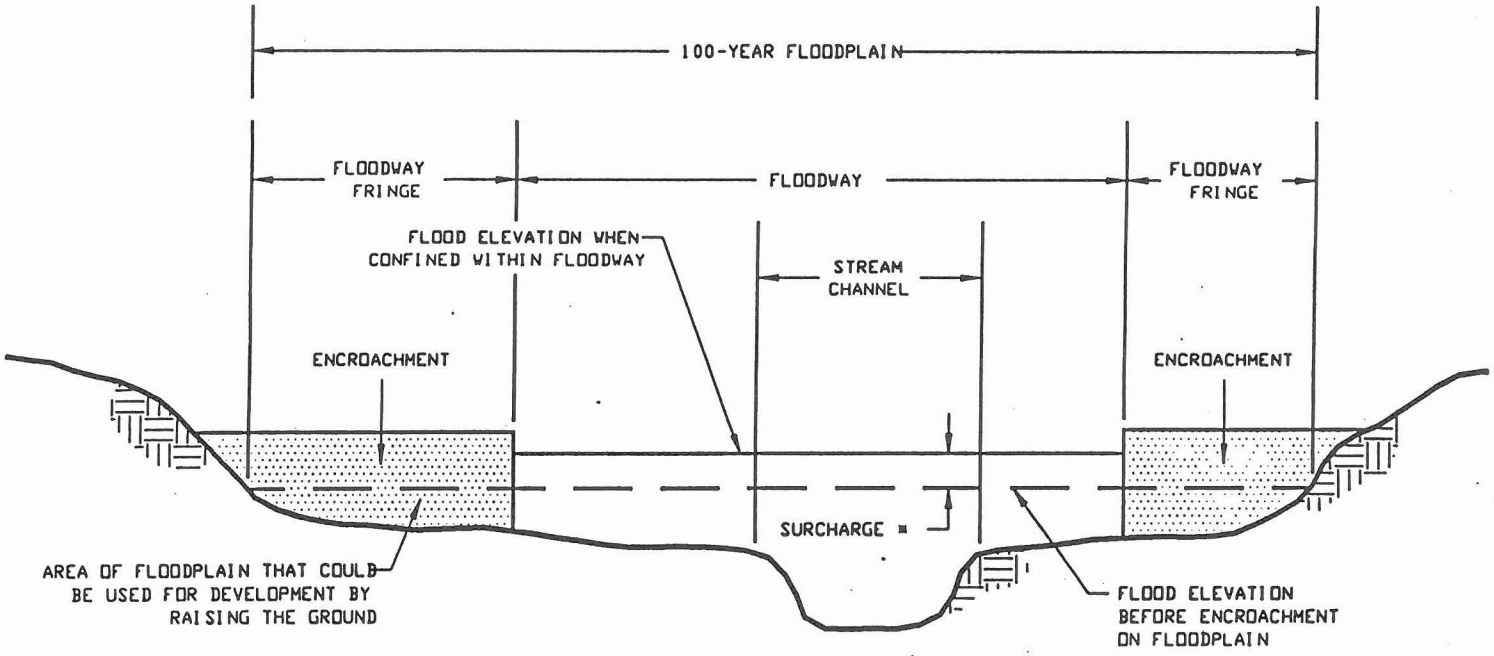
Cross-sections above Power Road and Sossoman Road with elevations lower than the road elevation were modified to cause that area below the elevation of the top of the road to become ineffective. Also, above Sossoman Road (between cross-sections 4.699 and 5.308) the floodplain extends considerably to the north and an average flow line was determined for which flows to the north were considered ineffective.

5.5.6 Supercritical flows

No supercritical flows within this study reach.

5.6 Floodway Modeling

The floodway concept is used to define the amount of floodplain encroachment that is considered acceptable for development. The principle is that limited encroachment is likely to have an insignificant effect on all but the severe flood events. A floodway consisting of the main channel of the stream plus sufficient overbank area to convey the 100-year flood without increasing flood heights by more than a specified amount. Federal standards limit the increase to one-foot above the base flood elevation; however, some jurisdictions have stricter standards. No jurisdiction affected by this project has a stricter standard, therefore, an increase of one-foot maximum will apply for this project. The relationship between the floodplain, floodway and the fringe area is shown in Figure 2.



* SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE

Figure 2: Floodway Definition Sketch

Normally, the floodway is determined by encroaching on the floodplain to reduce the conveyance by equal amounts on each side. Thus, the HEC-2 routine for equal conveyance (Floodway Method 4) was initially performed. The floodway target was varied to ensure floodway water surface elevations are not more than the maximum allowable above the floodplain water surface elevations. These floodway boundaries are then entered into the HEC-2 model and run using the Floodway Method 1. Adjustments can then be made and the model rerun.

5.7 Problems Encountered

The only special problem encountered during the study was the fact that the area affected by the floodplain extended beyond the 1998 topographic mapping (Reference 4). Thus, the 1986 topographic mapping from the Queen Creek ADMS (Reference 3) had to be used in conjunction with the 1998 mapping. In order to compare the two sets of mapping, a set of levels, using the datum of the 1998 mapping, was run to determine spot elevations along some roads and field roads. The level notes and summaries are presented in Appendix E. The spot elevations were also used to find areas where the flow was contained.

In reviewing the results, it was determined that the elevations of the two sets of mapping basically agree within 1-foot, which would be within the accuracy of the 1986 mapping.

5.8 Final Results

The detailed results of the final HEC-2 modeling are included in Appendix F. File QNCK-FW.OH2 is the final HEC-2 output file for the 100-year Floodplain and Floodway profiles. File QNCK-FW.DAT is the input for the final HEC-2 model. A

computer diskette containing files QNCK-FW.DAT and QNCK-FW.OH2 are contained in a plastic sleeve in the back of the TDN. The Floodway data table is presented in Appendix G, and the cross-section plots, for the study, are included in Appendix H.

SECTION 6: EROSION AND SEDIMENT TRANSPORT ANALYSIS

No sediment transport analysis is performed as part of this study.

SECTION 7: DRAFT FIS REPORT

7.1 Summary of Discharges

The discharge having 1% chance of being exceeded or equaled was determined to be 3,010 cfs. from Queen Creek ADMS (Reference 3).

7.2 Floodway Data Table

The post-project condition floodplain and floodway information is listed in Appendix G.

7.3 Annotated FIRM

The annotated FIRM maps are shown in Figure 3.

7.4 Flood Profiles

The flood profiles for the Queen Creek Floodplain Delineation Study are shown in Figure 4. The profile plot resulted from the HEC-2 hydraulic analysis performed on the Queen Creek Wash.

Figure 3: Annotated FIRM Map.

Figure 3: Annotated FIRM Map (continued).

Figure 4: Flood Profiles.

APPENDIX A

REFERENCES

REFERENCES

1. Collins/Pina Consulting Engineers, Inc., Letter of Map Revision for Queen Creek, SPRR to Hawes Road, FCD Contract No. 95-43-3,1996
2. Coe & Van Loo Consultants, Inc., FEMA CLOMR Submittal for a Portion of Queen Creek, Power Road to Recker road, Town of Gilbert, Maricopa County, Arizona, 1998.
3. Wood & Associates, Inc., Queen Creek Area Drainage Master Study, FCD Contract 86-23, 1991.
4. Collins/Pina Consulting Engineers, Inc, Queen Creek Wash Aerial Mapping Survey Control, FCD Contract 97-03-3, 1998.
5. U.S. Army Corps of Engineers, HEC-2 Water Surface Profiles, User's Manual, Version 4.6.2, September 1990.
6. Dodson & Associates, Inc., PROHEC-2 User's Manual and Program Reference, 1991.
7. U.S. Geological Survey, Water Resources Division, Estimating Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona, for the Flood Control District of Maricopa County, 1991.
8. U.S. Geological Survey, Water Resources Division, Verification of Roughness Coefficients for Selected Natural and Constructed Stream Channels in Arizona, U.S. Geological Survey Professional Paper, 1998.
9. BOSS International, BOSS RMS for AutoCAD, Version 3.0, 1997.
10. U.S. Department of Transportation, HY-8 Culvert Analysis Microcomputer Program Application Guide, 1987.

APPENDIX B

FEMA APPLICATION AND CERTIFICATION FORMS

FEDERAL EMERGENCY MANAGEMENT AGENCY **REVISION REQUESTER AND COMMUNITY OFFICIAL FORM**	O.M.B No. 3067-0148 Expires April 30, 2001

Public reporting burden for this form is estimated to average 2.13 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the 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, S.W., Washington DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

1. REQUESTED RESPONSE FROM FEMA

This request is for a:

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

☒ LOMR A letter from FEMA officially revising the current NFIP map to show the changes to floodplains, floodway or flood elevations. LOMRs typically decrease flood hazards. (See 44 CFR Ch. 1 Parts 60 & 65.)

☐ Other Describe: _____

2. OVERVIEW

1. The basis for this revision request is (are): (check all that apply)

☐ Physical Change ☒ Improved Methodology/Data ☐ Floodway Revision

☐ Other Describe: _____

Note: A photograph is not required, but is very helpful during review.

2. Flooding Source: Queen Creek Wash

3. Project Name/Identifier: Queen Creek Wash

4. FEMA zone designations affected: A
(example: A, AH, AO, A1-A30, A99, AE, V, V1-V30, VE, B, C, D, X)

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

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301 480287	Katy, City Harris County	TX TX	480301 48201C	0005D 0220G	02/08/83 09/28/90
040132	Town of Queen Creek	AZ	04013 C	2695 F	12/03/93
040037	Maricopa County Unincorporated Areas	AZ	04013 C	2695 F	12/03/93

6. The area of revision encompasses the following types of flooding and structures. Check all that apply.

Types of Flooding	Structures
☒ Riverine	☐ Channelization
☐ Coastal	☐ Levee/Floodwall
☐ Alluvial fan	☒ Bridge/Culvert
☐ Shallow Flooding (e.g. Zones AO and AH)	☐ Dam
☐ Lakes	☐ Fill
☐ Other (describe)	☐ Other (describe)

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

4. ENCROACHMENT INFORMATION

1. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP?
   ☐ Yes ☒ No

If Yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

2. Does the development in the floodway cause the 1% annual chance (base) elevation to increase at any location by more than 0.000 feet? ☐ Yes ☐ No ☒ N/A

3. Does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the base flood elevation to increase at any location by more than one foot (or other increase limit if community or state has adopted more stringent criteria - even if a floodway has not been delineated by FEMA)? ☐ Yes ☐ No

If the answer to either items is Yes, please attach documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

5. MAINTENANCE RESPONSIBILITY

The community is willing to assume responsibility for ☐ performing ☐ overseeing compliance with the maintenance and operation plans of the _____
(Name)
flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

Operation and maintenance plans are attached. ☐ **Yes** ☐ **No** ☐ **N/A**

6. REVIEW FEE

The review fee for the appropriate request category has been included. ☒ Yes Fee amount: $3,300.00

OR

This request is based on a federally sponsored flood-control project where 50 percent or more of the project's cost is federally sponsored, or the request is based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective FIRM; thus the project is fee exempt. ☐ Yes

Please see Instructions for Fee Amounts

7. SIGNATURE

Note: **I understand that my signature indicates that all information submitted in support of this request is correct**

_____
Signature of Revision Requester

Michael S. Ellegood, P.E.
Chief Engineer and General Manager
Printed Name and Title of Revision Requester

Flood Control District of Maricopa County
Company Name

Telephone No.: (602) 506-4700 Date:

Note: **Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.**

_____
Signature of Community Official

Richard Shaner, P.E.
Town Engineer
Printed Name and Title of Community Official

Town of Queen Creek
Community Name

Telephone No.: (602) 987-9887 Date:

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is in accordance with 44 CFR Ch. 1, Sect 65.2

_____
Signature

_____
Printed Name and Title of Revision Requester

Registr No. _____ Expires (Date) _____ State _____

Type of License/Expertise: _____

Check which forms have been included with this request

Form Name and (Number)	Required if .....
☐ **Hydrologic** (3)	new or revised discharges
☒ **Hydraulic** (4)	new or revised water-surface elevations
☒ **Mapping** (5)	floodplain/floodway changes
☐ **Channelization** (6)	channel is modified
☒ **Bridge/Culvert** (7)	addition/revision of bridge/culvert
☐ **Levee/Floodwall** (8)	addition/revision of levee/floodwall
☐ **Coastal** (9)	new or revised coastal elevations
☐ **Coastal Structures** (10)	addition/revision of coastal structure
☐ **Dam** (11)	addition/revision of dam
☐ **Alluvial Fan** (12)	structures proposed on alluvial fan

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS FORM**	O.M.B No. 3067-0148 Expires April 30, 2001

Public reporting burden for this form is estimated to average 2.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the 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, S.W., Washington DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Note: Fill out one form for each flooding source studied

Community Name: Town of Queen Creek, Maricopa County Unincorporated Areas

Flooding Source: Queen Creek Wash

Project Name/Identifier: Queen Creek Wash

1. REACH TO BE REVISED

Describe the limits of the revision OR submit a copy of the FIRM with the revision area clearly highlighted.
Copy of FIRM(s) attached depicting area of the revision (highlighted, or circled)? ☒ Yes

Downstream Limit: Upstream of Power Road

Upstream Limit: Downstream of Hawes Road

2. MODELS SUBMITTED

Requirements: for areas which have detailed flooding:	**for areas which do not have detailed flooding:**
Full input and output listings along with files on diskette for each of the models listed below (items 1-4) and a summary of the source of input parameters used in the models must be provided. The summary must include a description of any changes made from model to model (e.g., Duplicate Effective model to Corrected Effective model). At a minimum, the Duplicate Effective (item 1) and the Revised or Post-Project Conditions (item 4) models must be submitted. See instructions for directions on when other models may be required.	Only the 100-year (Base) flood profile is required. A hydraulic model is not required for areas which do not have detailed flooding; however, BFEs may not be added to the revised FIRM. If a hydraulic model is developed for the area, items 3 and 4 described below must be submitted.

If hydraulic models are not developed, hydraulic analyses (including all calculations) for existing or pre-project conditions and revised or post-project conditions must be submitted.

1. Duplicate Effective Model ☐ **Natural** **File Name** _____ ☐ **Floodway** **File Name** _____
Copies of the hydraulic analysis used in the effective FIS, referred to as the effective models (10-, 50-, 100-, and 500-year multi-profile runs and the floodway run) must be obtained and then reproduced on the requester's equipment to produce the Duplicate Effective model. This is required to assure that the effective models input data has been transferred correctly to the requester's equipment and to assure that the revised data will be integrated into the effective data to provide a continuous FIS model upstream and downstream of the revised reach.

2. Corrected Effective Model ☐ **Natural** **File Name** _____ ☐ **Floodway** **File Name** _____
The Corrected Effective model is the model that corrects any errors that occur in the Duplicate Effective model, adds any additional cross sections to the Duplicate Effective model, or incorporates more detailed topographic information than that used in the currently effective model. The Correctly Effective model must not reflect any man-made physical changes since the date of the effective model. An error could be a technical error in the modeling procedures, or any construction in the floodplain that occurred prior to the date of the effective model but was not incorporated into the effective model.

3. Existing or Pre-Project Conditions Model ☐ **Natural** **File Name** _____ ☐ **Floodway** **File Name** _____
The Duplicate Effective model or Corrective Effective model is modified to produce the Existing or Pre-Project Conditions model to reflect any modifications that have occurred within the floodplain since the date of the Effective model but prior to the construction of the project for which the revision is being requested. If no modification has occurred since the date of the effective model, then this model would be identical to the Corrected Effective model or Duplicate Effective model.

4. Revised or Post-Project Conditions Model ☒ **Natural** **File Name** QNCK-FW ☒ **Floodway** **File Name** QNCK-FW
The Existing or Pre-Project Conditions model (or Duplicate Effective model or Corrected Effective model, as appropriate) is revised to reflect revised or post-project conditions. This model must incorporate any physical changes to the floodplain since the effective model was produced as well as the effects of the project. When the request is for the proposed project this model must reflect proposed conditions.

5. Other – Please attach a sheet describing all other models submitted along with the file names. ☐ **Natural** ☐ **Floodway**

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

3. STARTING WATER-SURFACE ELEVATIONS

Explain how they were determined. Explanation Attached? ☒ Yes ☐ No

NOTE: If the effective study is an approximate study, the slope/area method is recommended. For detailed analysis studies, using a known water-surface elevation is recommended.

4. RESULTS (from the model used to revise the 100-year water surface elevations)

If the results indicate any of the following, attach an explanation - to this form, or to the hydraulic model printout- as to the reasonableness of the situation.

☐ Supercritial depth ☐ Critical Depth ☐ Drawdowns ☐ Negative Floodway Surcharges

☐ Floodway Surcharges Greater Than Maximum Allowed by Community/State

☐ Water surface elevations higher than the end points of cross sections.

☐ Floodway discharge is different than the Natural 100-year (base) flood discharge.

☐ Project causes 100-year floodplain or floodway elevations to increase (state if increases are located off the requester's property)

Explanation attached with Form ☐ **Explanation provided on attached printout** ☐

If Hydraulic model used is HEC-2, has it been checked with FEMA'S CHECK-2 computer program ☒ **Yes** ☐ **No**
(see instructions for information on how to obtain CHECK-2)

5. REVISED FIRM/FBFM AND FLOOD PROFILES

1. **Profile Transition**

a. 100-Year Water-Surface Elevations - indicate the difference in water surface elevations where the project 100-year elevations tie into the existing 100-year water surface elevations at each end of the project.

Downstream End 4.04 within 0.0 (feet) Upstream End 6.47 within 0.79 (feet)
Cross-Section # *Cross-Section #*

b. Floodway Elevations - indicate the difference in water surface elevations where the project floodway elevations tie into the existing floodway water surface elevations at each end of the project.

Downstream End _____ within _____ (feet) Upstream End _____ within _____ (feet)
Cross-Section # *Cross-Section #*

c. Floodway widths - indicate the difference in floodway widths where the project floodway widths tie into the existing floodway width at each end of the project.

Downstream End _____ within _____ (feet) Upstream End _____ within _____ (feet)
Cross-Section # *Cross-Section #*

2. **Profile Checklist (check box if information has been provided on profile)**

The following information (unless in parentheses) must be included at the same scale as the existing profiles for this project:

☒ Stream Name ☒ Community Name ☒ Corporate Limits labeled ☒ Study limits labeled

☒ Confluences labeled ☒ Channel Stationing ☒ Streambed profiled ☒ Cross Sections labeled

☒ Horizontal/Vertical Scales indicated ☒ 100-year elevs profiled*

☒ Road Crossings ☐ Labeled ☐ Low Chord Elevations ☐ Top of Road Elevations

*All recurrence intervals in the effective study must also be profiled.

Floodway Data Table

Attach a Floodway Data Table for each cross section listed in the published Floodway Data table in the FIS report.

Floodway Data Table Attached ☒ **Yes** ☐ **Not Required**

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE / COASTAL MAPPING FORM**	O.M.B No. 3067-0148 Expires April 30, 2001

Public reporting burden for this form is estimated to average 1.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the 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, S.W., Washington DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Note: Fill out one form for each flooding source studied

Community Name: Town of Queen Creek, Maricopa COunty Unincorporated Areas

Flooding Source: Queen Creek Wash

Project Name/Identifier: Queen Creek Wash

This is a ☐ Manual ☒ Digital submission. *Digital map submissions may be used to update digital FIRMs (DFIRMs). For updating DFIRMs, these submissions must be coordinated with FEMA Headquarters as far in advance as possible.*

1. MAPPING CHANGES

1. A topographic workmap must be submitted showing the following information (check N/A when not applicable):

a. Revised approximate 100-year floodplain boundaries (Zone A)	☒ Yes	☐ No	☐ N/A
b. Revised detailed 100- and 500-year floodplain boundaries.	☐ Yes	☒ No	☐ N/A
c. Revised floodway boundaries	☐ Yes	☒ No	☐ N/A
d. Location and alignment of all cross sections with stationing control indicated.	☒ Yes	☐ No	☐ N/A
e. Stream alignments, road alignments and dam alignments.	☒ Yes	☐ No	☐ N/A
f. Current community boundaries.	☒ Yes	☐ No	☐ N/A
g. Effective 100- year floodplain and floodway boundaries from FIRM/FBFM reduced or enlarged to the scale of the topographic workmap	☒ Yes	☐ No	☐ N/A
h. Tie-ins between the effective and revised 100-, 500-year and floodway boundaries	☒ Yes	☐ No	☐ N/A
i. The requester's property boundaries and community easements	☒ Yes	☐ No	☐ N/A
j. The signed certification of a registered professional engineer	☒ Yes	☐ No	☐ N/A
k. Location and description of reference marks	☒ Yes	☐ No	☐ N/A
l. Vertical datum (example: NGVD, NAVD)	☒ Yes	☐ No	☐ N/A
m. Coastal zone designations tie into adjacent areas not being revised	☐ Yes	☐ No	☒ N/A
n. Location and alignment of all coastal transects used to revise the coastal analyze	☐ Yes	☐ No	☒ N/A
o. V-zone has been delineated to extend landward to the heel of the primary frontal dune	☐ Yes	☐ No	☒ N/A

If any items are marked No or N/A please attach an explanation.

2. What is the source and date of the updated topographic information (example: orthophoto maps, July 1985; filed survey, May 1979, beach profile, June 1987 etc.)? Topographic Mapping, 1986, 1997, 1998, and Field Level Survey

3. What is the scale and contour interval of the following workmaps?

Effective FIS Scale _____ Contour Interval _____

Revision Request Scale 1" = 100' Contour Interval 2'

NOTE: Revised topographic information must be of equal or greater detail than effective.

4. Attach an annotated FIRM/FBFM at the scale of the effective FIRM/FBFM showing the revised 100- and 500-year floodplain and the floodway boundaries and how they tie into those shown on the effective FIRM/FBFM downstream and upstream of the revisions or adjacent to the area of revision for coastal studies. **FIRM/FBFM attached?** ☒ **Yes** ☐ **No**

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

2. EARTH FILL PLACEMENT

1. The fill is: ☐ Existing ☐ Proposed

2. Has fill been/will be placed in the regulatory floodway? ☐ Yes ☐ No
If Yes, please attach completed Riverine Hydraulic Analysis Form (Form 4).

3. Has fill been/will be placed in floodway fringe (*area between the floodway and 100-year floodplain boundaries*)? ☐ Yes ☐ No

If Yes, then complete A, B, C, and D below.

a. Are fill slopes for granular materials steeper than one vertical on one-and-one-half horizontal? ☐ Yes ☐ No

If Yes, justify steeper slopes _____

b. Is adequate erosion protection provided for fill slopes exposed to moving flood waters? (*Slopes exposed to flows with velocities of up to 5 feet per second (fps) during the 100-year flood must, at a minimum, be protected by a cover of grass, vines, weeds, or similar vegetation; slopes exposed to flows with velocities greater than 5 fps during the 100-year flood must, at a minimum, be protected by stone or rock riprap.)*

☐ Yes ☐ No

If No, describe erosion protection provided _____

c. Has all fill placed in revised 100-year floodplain been compacted to 95 percent of the maximum density obtainable with the Standard Proctor Test Method or acceptable equivalent method? ☐ Yes ☐ No

d. Can structures conceivably be constructed on the fill at any time in the future? ☐ Yes ☐ No

If Yes, attach certification of fill compaction (item 3c. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer in accordance with Subparagraph 65.5(a)(6) of the NFIP regulations.

Fill certification attached ☐ **Yes** ☐ **No**

4. Has fill been/will be placed in a V zone? ☐ Yes ☐ No

If Yes, is the fill protected from erosion by a flood control structure such as a revetment or seawall?

☐ Yes ☐ No

If Yes, attach the Coastal Structures Form (Form 10).

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	O.M.B. Burden No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the 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, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Community Name: Town of Queen Creek, Maricopa COunty Unincorporated Areas

Flooding Source: Queen Creek Wash

Project Name/Identifier: Queen Creek Wash

1. IDENTIFIER

1. Name of structure (roadway, railroad, etc.): Sossoman Road Culvert

2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier):

   Cross section 5.074

3. This revision reflects (check one of the following):

   ☒ New bridge/culvert not modeled in the FIS

   ☐ Modified bridge/culvert previously modeled in the FIS

   ☐ New analysis of bridge/culvert previously modeled in the FIS

4. Hydraulic model used to analyze the structure *(e.g., HEC-2 with special bridge routine, WSPRO, HY8)*

   HEC-2 special culvert routine

   If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

   Justification attached ☐ **Yes** ☐ **No** ☒ **N/A**

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

2. DRAWING CHECKLIST

Attach plans of the structure(s) certified by a registered professional engineer. The plan detail and information should include the following (check the boxes if the information has been provided):

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

3. SEDIMENT TRANSPORT CONSIDERATIONS

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the 100-year (base flood) water-surface elevations; and/or based on the stream geomorphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including sewer and deposition) to affect the base flood elevations, then provide the following information **(Check the box if provided):**

- ☐ Estimated sediment load
- ☐ Method used to estimate sediment transport
- ☐ Method used to estimate scour and/or deposition
- ☐ Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport

ATTACHMENT TO FEMA FORMS

MT-2 Form 4

3. The starting water surface elevation was selected from the approved CLOMR submitted by Coe & Van Loo from Power Road to Recker Road. Cross sections 4.04 through 4.085 are from the HEC-2 hydraulic analysis performed in the above-mentioned approved CLOMR.

MT-2 Form 5

1.1.b Existing floodplain is designated as Zone A.

1.1.c Existing floodplain is designated as Zone A.

1.1.m Not in coastal area.

1.1.n Not in coastal area.

1.1.o Not in coastal area.

APPENDIX C

MANNING'S n-VALUE
PHOTOGRAPHS AND DETERMINATIONS

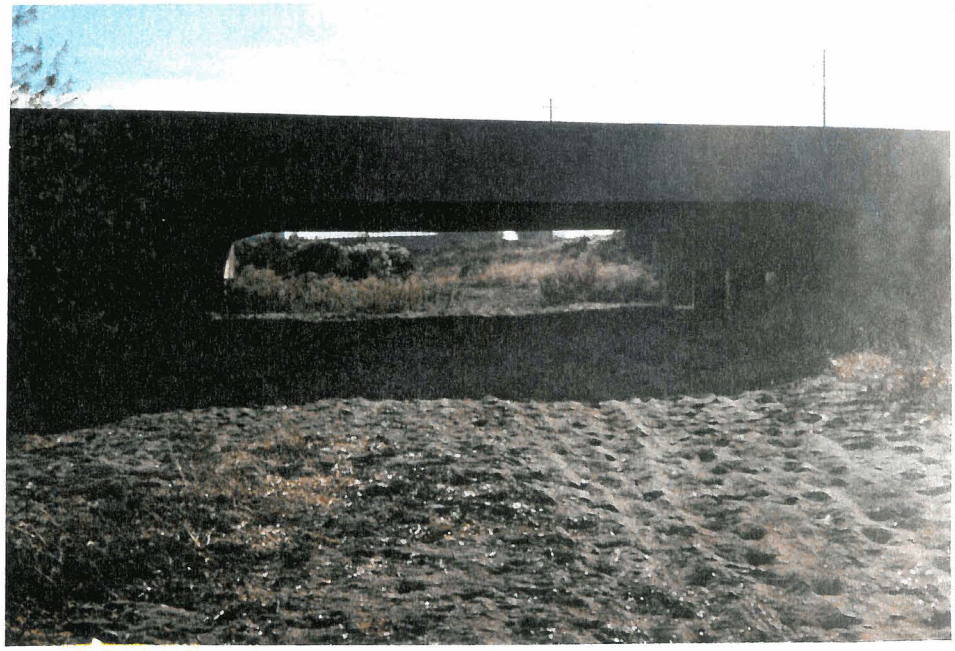
On December 4, 1998 a reconnaissance trip was made to the study area along Queen Creek between Hawes Road and Power Road. During this visit, Manning's n-values were estimated for use in the backwater modeling of this reach of Queen Creek. Manning's n-values were estimated for the main channel and for both over banks. Orientation of over banks is left and right while looking downstream.

In most of the reach the clear channel bed is comprised of silt that would have an n-value of about 0.025. In most of the reach the vegetation is the dominating factor (0.010 to 0.050) in the estimation of the n-values with some small effect (0.000 to 0.010) from channel irregularity. Thus, Manning's n-values ranging from 0.040 to 0.070 were used for the main channel.

For the over bank areas, there are a few buildings and trees that have an effect, but, in most instances the over banks are graded fields that may range from clear grading with an n-value of 0.025 to full growth Corn or Cotton with n-values of 0.10 or greater. Thus, for most sections an n-value of about 0.055 was used for the over bank areas.

The following Photographs show channel conditions at a few selected points along the reach.

Queen Creek between Hawes Road and Power Road
Photos of December 4, 1998



Channel

N = 0.040

Looking East (U.S.) at the Hawes Road Bridge

Channel

N = 0.040

Looking West (D.S.) at the Hawes Road Bridge

Queen Creek between Hawes Road and Power Road
Photos of December 4, 1998

Channel

N = 0.065

Looking East (U.S.) along the right bank above Sossoman Road

Channel

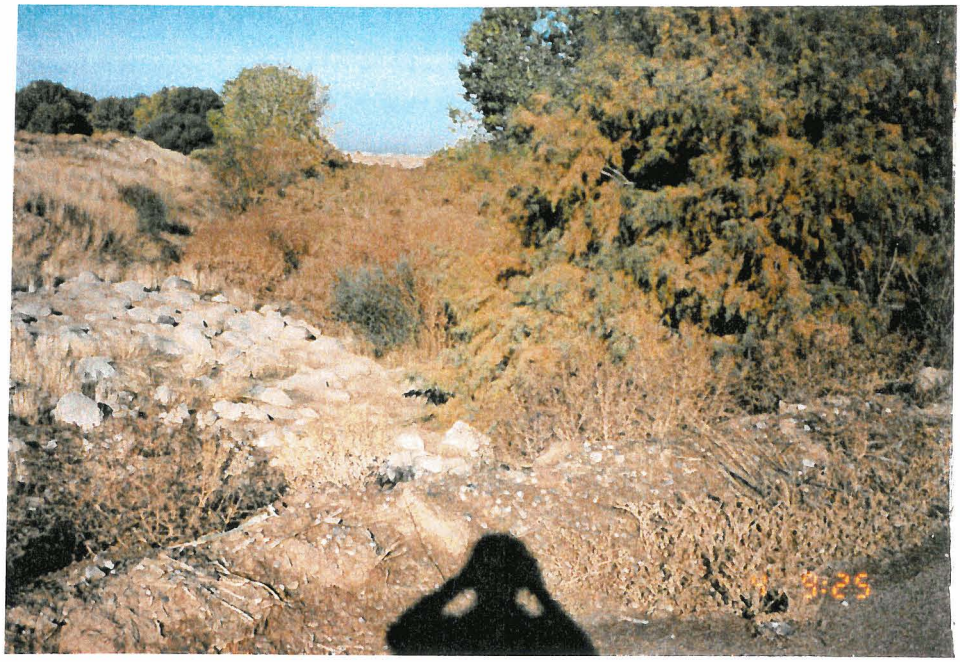
N = 0.065

Looking East (U.S.) along the left bank above Sossoman Road

Queen Creek between Hawes Road and Power Road
Photos of December 4, 1998

Looking North along the upstream side of Sossoman Road
(5 – 6 foot Diameter C.M.P.'s)
Looking at the South most culvert

Queen Creek between Hawes Road and Power Road
Photos of December 4, 1998



Channel

N = 0.055

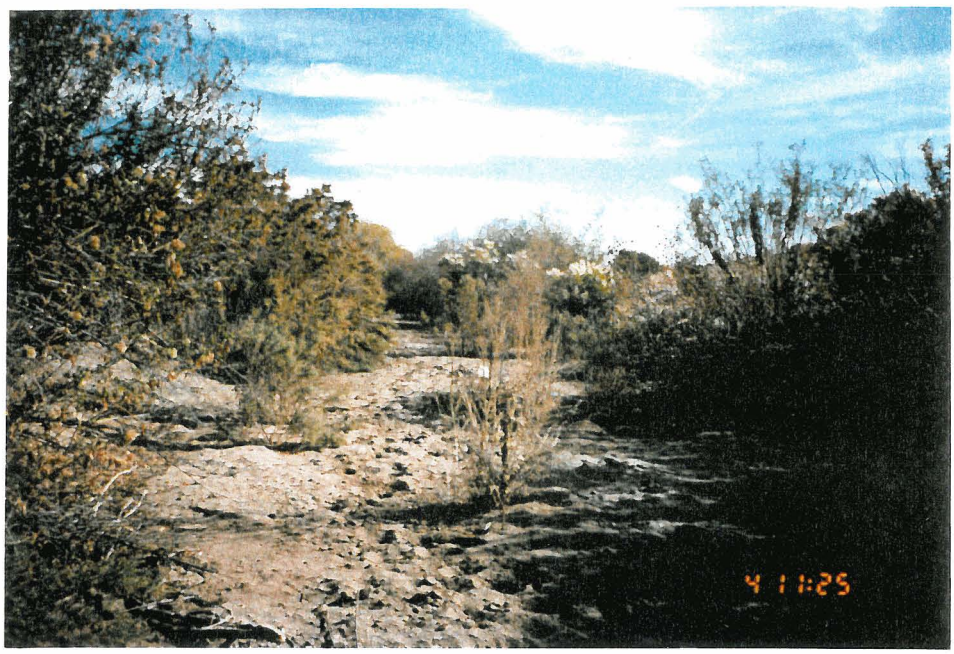
Looking West (D.S.) along the left bank below Sossoman Road

Channel

N = 0.055

Looking West (D.S.) along the right bank below Sossoman Road

Queen Creek between Hawes Road and Power Road
Photos of December 4, 1998



Channel

N = 0.055

Looking East (U.S.) from about 100 ft. east of dirt road halfway between Sossoman and Power Roads

Channel

N = 0.055

Looking West (D.S.) from 100 ft. above the dirt road halfway between Sossoman and Power Roads

Queen Creek between Hawes Road and Power Road
Photos of December 4, 1998

Channel

N = 0.050

Looking East (U.S.) from about 100 ft. above the Power Road Bridge

Channel

N = 0.050

Looking West (D.S.) at the Power Road Bridge from the right bank

APPENDIX D

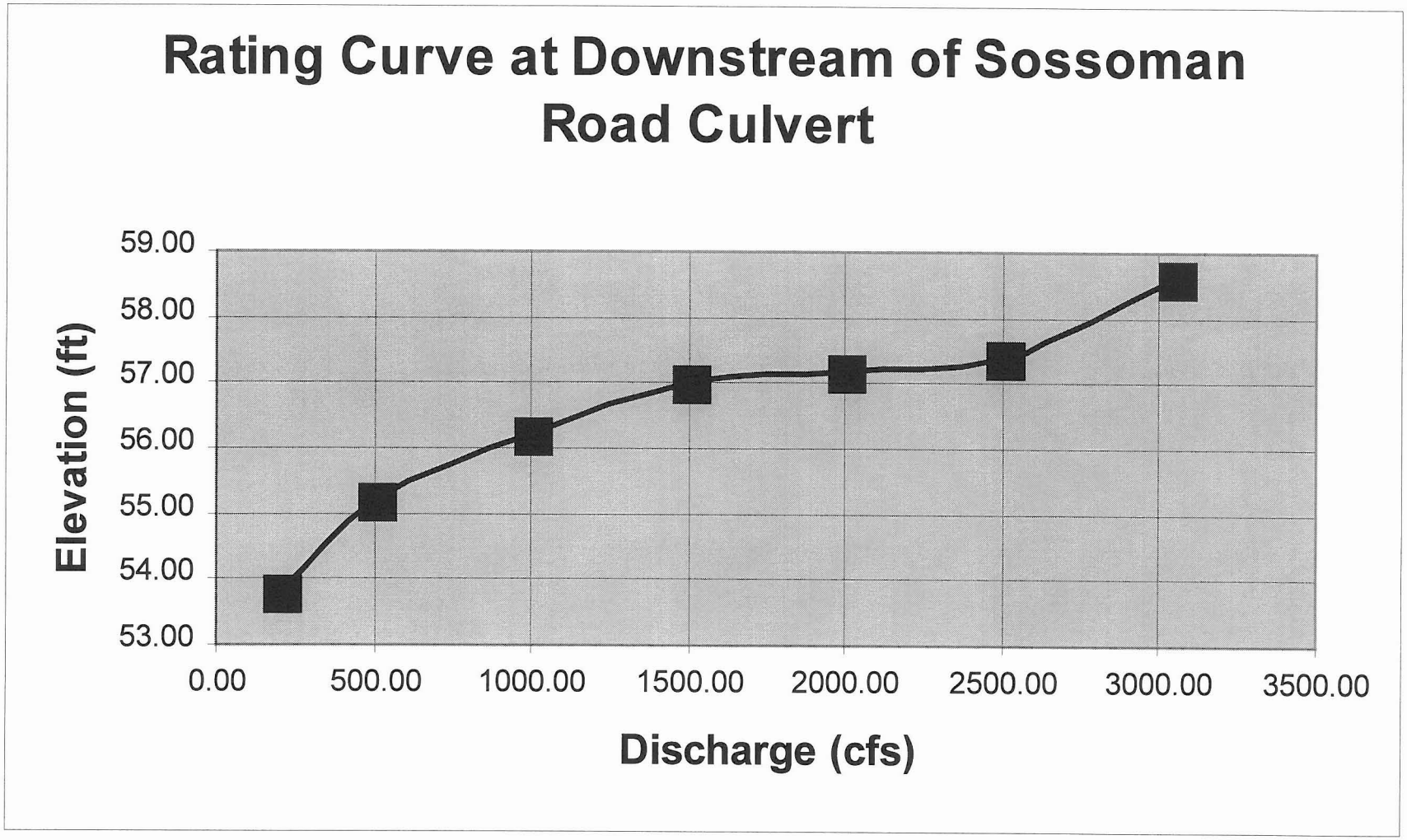
SOSSOMAN ROAD
HEC-2 RATING AT CULVERT OUTLET
AND
CULVERT COMPUTATION (HY8) INPUT AND OUTPUT

Rating curve from HEC-2 Hydraulic Model

200.00	53.80
500.00	55.20
1000.00	56.20
1500.00	57.00
2000.00	57.20
2500.00	57.40
3050.00	58.60

Input to HY8 Culvert Model

0.00	53.00
305.00	54.30
610.00	55.60
870.00	56.20
915.00	56.30
1220.00	56.75
1500.00	56.95
1830.00	57.00
2135.00	57.25
2440.00	57.40
2745.00	57.75
3050.00	58.60


Rating Curve at Downstream of Sossoman Road Culvert
Elevation (ft)
59.00
58.00
57.00
56.00
55.00
54.00
53.00
0.00
500.00
1000.00
1500.00
2000.00
2500.00
3000.00
3500.00
Discharge (cfs)

1
□

□

CURRENT DATE: 01-28-1999 FILE DATE: 01-28-1999
CURRENT TIME: 08:56:13 FILE NAME: QCR-SOSA

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS / SHAPE / MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	50.60	49.50	67.01	5 CSP	6.00	6.00	.024	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: QCR-SOSA DATE: 01-28-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
53.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
54.64	305.0	305.0	0.0	0.0	0.0	0.0	0.0	0.00	1
56.22	610.0	610.0	0.0	0.0	0.0	0.0	0.0	0.00	1
57.65	915.0	896.5	0.0	0.0	0.0	0.0	0.0	12.78	6
58.24	1220.0	944.3	0.0	0.0	0.0	0.0	0.0	264.53	4
58.51	1500.0	964.5	0.0	0.0	0.0	0.0	0.0	525.99	5
58.72	1830.0	1011.6	0.0	0.0	0.0	0.0	0.0	807.76	5
58.89	2135.0	990.2	0.0	0.0	0.0	0.0	0.0	1133.95	5
59.02	2440.0	984.4	0.0	0.0	0.0	0.0	0.0	1432.09	4
59.17	2745.0	919.0	0.0	0.0	0.0	0.0	0.0	1814.08	5
59.34	3050.0	662.2	0.0	0.0	0.0	0.0	0.0	2370.97	5
57.40	869.8	869.8	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: QCR-SOSA DATE: 01-28-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
53.00	0.000	0.00	0.00	0.00
54.64	0.000	305.00	0.00	0.00
56.22	0.000	610.00	0.00	0.00
57.65	-0.008	915.00	5.76	0.63
58.24	-0.008	1220.00	11.19	0.92
58.51	-0.004	1500.00	9.49	0.63
58.72	-0.009	1830.00	10.60	0.58
58.89	-0.008	2135.00	10.88	0.51
59.02	-0.005	2440.00	23.47	0.96
59.17	-0.006	2745.00	11.87	0.43
59.34	-0.009	3050.00	16.80	0.55

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

CURRENT DATE: 01-28-1999 FILE DATE: 01-28-1999
CURRENT TIME: 08:56:13 FILE NAME: QCR-SOSA

PERFORMANCE CURVE FOR CULVERT 1 - 5(6.00 (ft) BY 6.00 (ft)) CSP

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	53.00	0.00	2.40	0-NF	0.00	0.00	0.00	3.50	0.00	0.00
305.00	54.64	2.84	4.04	3-M1t	1.85	2.06	4.80	4.80	2.52	0.00
610.00	56.22	4.26	5.62	1-S1f	2.69	2.98	6.00	6.10	4.31	0.00
896.46	57.64	5.47	7.04	4-FFt	3.38	3.65	6.00	6.80	6.34	0.00
944.28	58.24	5.67	7.64	4-FFt	3.49	3.74	6.00	7.25	6.68	0.00
964.51	58.51	5.76	7.91	4-FFt	3.54	3.78	6.00	7.45	6.82	0.00
1011.64	58.71	5.96	8.11	4-FFt	3.66	3.88	6.00	7.50	7.16	0.00
990.17	58.89	5.87	8.29	4-FFt	3.60	3.83	6.00	7.75	7.00	0.00
984.44	59.02	5.84	8.42	4-FFt	3.59	3.82	6.00	7.90	6.96	0.00
919.05	59.16	5.56	8.56	4-FFt	3.43	3.69	6.00	8.25	6.50	0.00
662.23	59.33	4.48	8.73	4-FFt	2.82	3.11	6.00	9.10	4.68	0.00

El. inlet face invert 50.60 ft El. outlet invert 49.50 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	50.60 ft
OUTLET STATION	67.00 ft
OUTLET ELEVATION	49.50 ft
NUMBER OF BARRELS	5
SLOPE (V/H)	0.0164
CULVERT LENGTH ALONG SLOPE	67.01 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	6.00 ft
BARREL MATERIAL	CORRUGATED STEEL
BARREL MANNING'S n	0.024
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE WITH HEADWALL
INLET DEPRESSION	NONE

CURRENT DATE: 01-28-1999
CURRENT TIME: 08:56:13

FILE DATE: 01-28-1999
FILE NAME: QCR-SOSA

ÄÄ
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ TAILWATER ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
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TAILWATER RATING CURVE

FLOW (cfs)	W.S.E.(ft)	DEPTH (ft)
0	53.00	3.50
305	54.30	4.80
610	55.60	6.10
915	56.30	6.80
1220	56.75	7.25
1500	56.95	7.45
1830	57.00	7.50
2135	57.25	7.75
2440	57.40	7.90
2745	57.75	8.25
3050	58.60	9.10

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ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ROADWAY OVERTOPPING DATA ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
ÄÄ

ROADWAY SURFACE PAVED
EMBANKMENT TOP WIDTH 40.00 ft
***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X ft	Y ft
1	1310.00	59.80
2	1410.00	59.50
3	1505.00	59.00
4	1533.00	58.70
5	1561.00	58.70
6	1610.00	58.70
7	1900.00	59.90
8	2850.00	57.40

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APPENDIX E

LEVEL NOTES AND SUMMARIES
BY
FLOOD CONTROL DISTRICT PERSONNEL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PROJECT Mid Queen Creek FDS PAGE 1 OF 6

DETAIL Hawes Rd to Power Rd COMPUTED RWC DATE 1-7-99

Summary of Levels of 12-21-98, 1-5-99, & 1-7-99 CHECKED BY _____ DATE _____

1. The levels are based on the Brass Cap in H.H. on Power Road W. ½ sec. 18. E = 1,346.09 from 1998 Topo.

2. An attempt was made to survey 5 of the Panel Points from the 1998 Topo.

Panel	Elev. from 1998 Topo	Elev. from Survey	Diff	Remarks
1032	1,359.85	1,360.07	+0.22	
1033	59.92	60.17	+0.25	
1035	50.43	50.78	+0.35	Approx. Location
1038	49.02	49.[illegible]	-0.02	Approx. Location
1039	47.03	47.39	+0.36	

3. Based on the above 0.25 ft will be subtracted from the surveyed Elevations to most nearly match the 1998 topo based on Panel Points 1032, 1033, & 1039

4. Culverts: 5 - 6.0 ft Diameter C.M.P.'s
   Length = 67.5 ft
   Ave. Inlet Invert = 1,350.59
   Ave Outlet Invert = 1,349.52
   1.5 ft fill in bottom of Culverts
   Road Elevation @ South Culvert = 1,358.7

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PROJECT Mid Queen Creek FDS PAGE 2 OF 6

DETAIL Hawes to Power Rd COMPUTED RWC DATE 12-22-98

Summary of Levels of 12-21-98 CHECKED BY _____ DATE _____

Loop 1 (Along Power Rd from AP100 ≈ ½ Mi S. of Queen Cr. to the bridge over Queen Cr.)

Station	Elevation	Adj. Elev. (Elev. Adj. based on 1998 Topo)	Distance from AP100	Remarks
AP100	1,346.09		0	Elev. from 1998 ERN (BC HN Power Rd w ¼ Cor. SEC 18)
Road @ AP100	46.4	1,346.4 (1,346.15)	0	Add 0.3 to AP100 for Top of Road
T.P.1	44.86	45.1 (44.88)	464	Add 0.2 for ℄ of Rd
T.P.2	44.10	44.3 (44.0)	972	"
T.P.3	43.59	43.8 (43.65)	1,460	"
T.P.4	43.90	44.1 (43.85)	1,950	"
T.P.5	48.80	49.0 (48.75)	2,421	" (nr. site of 1238) " (E = 49.02)
R.P.1	1,353.06	1,353.07 (52.82)	2,621	chiseled "X" on S. end of west bridge rail-painted orange

Loop 2 (North on Power Rd from Bridge to T.P.2 then East along Field Road)

Station	Elevation	Adj. Elev. (Elev. Adj. based on 1998 Topo)	Dist. from R.P.1	Remarks
R.P.1	1,353.07	1,353.07 (1352.82)	0	From above
1257	50.49	50.7 (50.44)	181	Approx. Location of site 1257 from ADMS (E = 50.83)
1039	47.39	47.39 (47.14)	447	Panel 1039 from 1998 Topo (E = 47.03).
T.P.1	43.29	43.5 (43.24)	967	Add 0.2' for ℄ of Rd
T.P.2	42.75	43.0 (42.70)	1,360	"
			Dist. E. from T.P.2	
A	43.98	(43.73)	60	@ Corner of fence
T.P.3	44.44	(44.19)	496	
T.P.4	45.70	(45.45)	988	
T.P.5	46.65	(46.40)	1,491	

Survey Site: [illegible] Creek FUS (Howell to Power Rd)

Date and Time: 12-21-93

Sta/Dist	BS	HI	DIST	Top	Bottom	Foresight	Elev.	Comments
[illegible]	3.75	41.84	259	5.01	2.50	~~2.75~~	1,346.09	[illegible]
[illegible]						4.55	~~42.20~~	[illegible]
11.1			213	6.23	3.90	4.95	44.86	#511 Adj 0.2 [illegible]
	3.94	45.80	249	5.17	2.65			
T.P. [illegible]			257	6.00	3.41	4.70	[illegible]	
"	[illegible]	[illegible]	[illegible]	5.20	2.78			
T.P. [illegible]			[illegible]	5.73	3.27	4.50	[illegible]	
"	11.38	[illegible]	[illegible]	5.58	3.19			
T.P. 4			[illegible]	5.32	3.32	4.07	43.90	
"	[illegible]	[illegible]	21[illegible]	7.16	4.97			
TP 5			252	2.41	—	[illegible]	48.95	Adj to 53.07 based on closure
"	5.76	[illegible]	~~5.26~~	~~6.26~~	5.26		[illegible]	
R.P. 1	1.24	54.40	100	2.00	1.00	1.58	53.06	[illegible] S. D.C. bridge R21 (Pennsylvania)
T.P. 5	1.32	50.1[illegible]				[illegible]	48.80	
4	4.11	48.01				6.22	43.90	
3	4.70	48.29				[illegible]	43.59	
2	4.91	48.95				[illegible]	[illegible]	[illegible] T.P. 2)
1	4.69	49.84				3.80	45.15	[illegible] T.P. 1
AP100						3.73	46.11	close + 0.02
	3.21			2.91				
R.P. 1	~~1.50~~	54.41	33~~[illegible]~~	~~[illegible]~~	×		(53.07)	From above
1257			153	3.39	2.16	2.32	50.49	From ADMS
1039			113	6.38	5.45	6.32	47.39	From New TCVO
"	3.79	42.13	292	2.30	—			
TP.1			~~3.28~~	5.27	3.30	4.87	43.25	
"	4.10	47.35	~~48.89~~	3.84	[illegible]			
TP.2			195	5.60	3.65	4.64	42.75	
"	5.55	[illegible]	246	6.77	4.31			
(A)			186	[illegible]	3.39	4.32	43.83	[illegible]
T.P. 3			250	5.11	2.61	3.36	44.47	First [illegible] form 81
"	5.10	[illegible]	2~~54~~	6.31	3.89			
TP. 4			250	5.09	2.59	3.33	45.71	Inst [illegible] 50.84 - 4.85 = 46.03
"	5.3	53.39	259	6.33	3.99			
TP5	4.02	53.73	269	5.54	2.90	4.22	46.[illegible]	
TP4	3.39	~~[illegible]~~ 49.61				5.01	45.~~[illegible]~~72	OK
~~TP3~~	4.17	49.~~[illegible]~~				3.31	45.~~[illegible]~~72	
~~[illegible]~~						~~5.33~~	~~44.28~~	
Re(run)								
TP2	5.83	48.55					(42.75)	
TP3	5.29	49.63				4.19	44.39	OK
TP4						4.01	45.67	OK
error on return but 4 & 3								
	~~[illegible]~~		TP 5	OK				
T.P. 2	4.50	47.25					(42.75)	
T.P. 1	5.10	43.37				3.98	43.27	OK
1039	7.15	54.33				1.02	47.35	OK
R.P. 1						1.46	53.04	OK Close - 0.03

Weather: Sunny & Cool

Party: Loop 1: RWC π ⌂; HSM φ

Loop 2: φ; π ⌂

Page 1

✓ RWC

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PROJECT Mid Queen Creek FDS Hawes to Power Rd PAGE 3. OF 6

DETAIL Summary of Levels of 12-21-98 & 1-7-99 COMPUTED RWC DATE 1-7-99

CHECKED BY _____ DATE _____

From AP100 (on Power Rd) East along field Road about ½ mile to irrigation ditch along North-South Road (T.P.5) then north along irrigation ditch to Queen Creek.

Station	Elevation	Elev. Adj based on 1998 TOPO	Distance from AP100 (Power Rd)	Remarks
AP100	1,346.09	1,345.84	0	see description on sheet 2
Ground @ π between AP100 & T.P.1	48.61	48.36	149	
T.P.1	48.85	48.60	402	
T.P.2	49.34	49.09	884	
A	51.67	51.42	1,236	East of π
T.P.3	51.71	51.46	1,416	
T.P.4	52.92	52.67	1,916	
T.P.5	53.85	53.60	2,512	@ Irrigation ditch
			Distance from T.P.5	
T.P.5	53.85	53.60	0	
T.P.6	52.49	52.24	498	
T.P.7	52.05	51.80	950	
R.P.2	51.90	51.65	1,206	Top of 1x2 stake @ irrigation ditch & cross Road (approx @ Ground level)
T.P.8	51.76	51.51	1,715	
T.P.9	51.40	51.15	2,207	
Ground @ π between T.P.'s 9 & 10	50.78	50.53	2,453	Approx location of 1035 from 1998 TOPO (E = 50.43)
T.P.10	51.59	51.34	2,570	@ beginning of irrigation ditch below channel bank

Survey Site: Mid Queen Cr

Date and Time: 1-7-99

Sta/Dist	BS	HI	DIST	Top	Bottom	Foresight	Elev.	Comments
T.P. 3	5.31	57.02	305	[illegible]	3.79		51.71	
T.P. 4			1 95	5.08	3.13	4.10	52.92	
"	5.22	58.14	288	6.66	3.78			
T.P. 5			1305	5.52	2.77	4.29	53.85	
"	3.52	57.37	268	4.36	2.18			
T.P. 6	4.75	57.24	230	6.05	3.73	4.88	52.49	
T.P. 5	4.35	58.19				3.40	53.84	
T.P. 4	4.18	57.12				5.25	52.94	
T.P. 3						5.40	51.72	close +0.01

Weather:

Party: RWC JJR

Page 1

✓ RWC

Survey Site: Mid Queen Creek FCS
(Hawes to Power Rd)

Date and Time:

Sta/Dist	BS	HI	DIST	Top	Bottom	Foresight	Elev.	Comments
AP100	7.40	53.49	143	3.11	5.65		1,346.09	EC ⊼ = 53.49 − 4.88 = 48.61
T.P. 1			253	5.91	3.23	4.07	1,350.85	
"	4.30	53.74	2[illegible]	6.03	3.70			
TP 2			244	5.62	3.13	4.90	[illegible]	
"	1.03	54.32	247	6.21	3.79			
(A)			105	[illegible]	2.13	2.65	51.67	Edge of [illegible]
TP 3			289	4.09	1.19	2.61	[illegible]	
"	5.05	[illegible]	[illegible]	6.21	3.39			
TP 4			243	[illegible]	2.53	[illegible]	[illegible]	
"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	
TP 5			34[illegible]	5.37	[illegible]	[illegible]	[illegible]	
"	3.16	57.01	25[illegible]	4.42	1.90			
TP 6			246	[illegible]	3.03	4.52	52.49	
"	[illegible]	[illegible]	247	[illegible]	3.09			
TP 7			[illegible]	[illegible]	[illegible]	4.63	52.05	
"	4.93	55.42	117	5.02	2.35			
R.P. 2			139	[illegible]	3.32	4.53	51.90	1X2 [illegible]
"	3.30	55.22	254	5.03	[illegible]		51.76	
TP 8			254	[illegible]	2.57	[illegible]	52.06	
"	[illegible]	55.65	245	[illegible]	2.51			
TP 9			247	5.33	3.31	4.15	51.40	Flow ⊼ = 55.68 − 4.00 = 50.68
"	4.33	55.63	209	5.50	3.24			
TP 10			117	4.37	3.50	4.09	51.59	
TP 10	3.99	55.52	115	4.52	2.41			
TP 9	4.20	55.60				4.23	51.40	OK
TP 8	4.03	55.85				3.33	52.77	OK
R.P. 2	4.19	56.03				[illegible]	51.89	OK
7	4.[illegible]	55.[illegible]				4.02	52.0[illegible]	OK
6	4.44	56.93				[illegible]	[illegible]	OK
~~5~~	~~[illegible]~~	~~[illegible]~~				3.89	53.04	OK
	[illegible]	[illegible]				~~[illegible]~~	~~[illegible]~~	
~~5~~	~~3.93~~	~~7.80~~					~~(53.84)~~	~~from above~~
4	2.30	55.01	(56.81)			3.70	51.12	(52.92)
3	2.19	55.91	(53.91)			5.00	52.92	(51.72)
2	4.19	54.35	(53.55)			4.55	50.56	(49.36)
1	4.00	54.65	(53.45)			4.69	50.06	(45.86)
AP101						7.36	47.29	(46.09)

Adj. based on Elev. for T.P. 4 above

Need to Rerun TP4 to TP5 if possible
(for present time assume error made on return from 5 to 4)
Levels good from 5 to 10 & from AP100 to TP4
Thus use Elevations from AP100 to TP10
(see Levels of 1-7-99 for Rework of elevations)

The fields to the east of ditch between TP5 & TP10 are at a higher elevation than the ditch & Road
Fields to the west are considerably lower elevation
RWC

Weather: Sunny & 60°

Party: RWC ϕ
HSM ⊼ ⊔

Page 1

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PROJECT Mid Queen Creek FDS Hawes to Power Rd PAGE 4 OF 6

DETAIL Summary of Levels of 1-5-99 COMPUTED RWC DATE 1-7-99

CHECKED BY _____ DATE _____

Along field Road ≈ ¼ mile South of Queen Creek, East from R.P.2 to Sossoman Road

Station	Elevation	Elev. Adj based on 1998 Topo	Distance from R.P.2	Remarks
R.P.2	1,351.90	1,351.65	0	See sheet 3 for description
T.P. 11	53.16	52.91	465	
T.P. 12	54.58	54.33	965	
T.P. 13	56.13	55.88	1,469	
T.P. 14	57.36	57.11	2,022	
R.P. 3	59.82	59.57	2,611	Chiseled + painted orange on headwall of irrigation ditch ≈ 20' West of West side of Sossoman Rd.

Survey Site: Mid Dixon Creek TVS

Hawes to Power LD

Date and Time: 1-5-99

Sta/Dist	BS	HI	DIST	Top	Bottom	Foresight	Elev	Comments
R.P 2	5.73	57.68	246	7.00	4.54		(51.95)	~~Benchmark of 52.48 from bench of 1.5~~ Levels
T.P.11		1.87	212	5.61	3.42	4.52	53.16	(53.16)
"	5.31	57.47	232	4.72	2.93		54.54	
TP 12		59.38	218	4.93	2.93	3.39	54.58	54.58)
"	5.66	57.24	224	4.03	1.24			
TP 13		60.76	220	5.00	2.00	4.11	55.65	55.65)
"	5.29	57.12	235	5.73	2.83			
TP 14		63	269	5.45	2.72	4.06	57.06	(57.06)
"	5.33	62.67	292	4.73	2.92			
R.P 3	3.86	62.75	300	4.91	1.92	2.37	59.38	Established top of bank [illegible] (20' W. of Sassoman Rd)
TP 14	3.22	59.46	158			5.43	57.03	(57.03)
TP 13	3.75	57.18	59.84			5.45	54.09	(54.09)
TP 12	3.95	58.90	58.56			5.23	54.67	(54.67)
TP 11	4.49	57.88	57.88			5.39	53.49	53.49)
RP 2						5.75	51.94	51.94 Close +0.01

Weather: Sunny - nice

Party: HSM RWC

Page 1 of 3

V RWC

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PROJECT Mid Queen Creek FDS PAGE 5 OF 6

DETAIL Hawes Rd to Power Rd. COMPUTED RWC DATE 1-7-99

Summary of Levels of 1-5-99 CHECKED BY _____ DATE _____

South along Sossoman Rd from R.P.3, then East along field Road on S. side of ditch

Station	Elevation	Elev. Adj. based on 1998 Topo	Distance from R.P.3	Remarks
R.P.3	1,359.82	1,359.57	0	see sheet 34 for desc.
Sossoman Rd	59.96	59.71	20	East of R.P.3
Ground @ π	61.62	61.37	416	≈ 30' E. of East side of Sossoman Rd on S. side of ditch.
			Distance from Sossoman Rd	
Ground @ π	61.62	61.37	30	
∴ A.	62.76	62.51	67	
T.P.15	61.83	61.58	620	
T.P.16	62.27	62.02	1,160	
T.P.17	64.94	64.69	1,372	

North from R.P.3 along Sossoman Rd to R.P.4 @ Queen Creek

Station	Elevation		Distance from R.P3	Remarks
R.P.3	1,359.82	1,359.57	0	see sheet 34 for desc.
T.P.18	60.41	60.16	545	
B	60.07	59.82	925	Pin @ Center of White + on Sossoman Rd, S. of Queen Cr. (1032) (E=59.85)
R.P.4	58.87	58.62	1,172	Chiseled + painted on headwall 20' South Culvert.

North from R.P.4 along Sossoman Rd to Queen Cr. Rd, then East along irrigation ditch on S. side of Queen Cr. Rd

Station	Elevation		Distance from R.P.4	Remarks
R.P.4	1,358.87	1,358.62	0	See above for desc.
D	60.17	59.92	238	Road in center of white + painted on Sossoman Rd N. of Queen Cr. (1033) (E=59.92)
			Distance East from D	
T.P. 19	60.13	59.88	296	
T.P. 20	61.16	60.91	841	
T.P. 21	62.24	61.99	1,403	

Survey Site: Mid Queen Creek
Hawes to Power Rd

Date and Time: 1-5-99

Sta/Dist	BS	HI	DIST	Top	Bottom	Foresight	Elev.	Comments
R.P. 3	6.70	66.52	416	—	4.62	—	(59.82)	
Rd						6.56	59.96	Sossoman Rd ≈ 20' E. from R.P. 3
π						4.90	61.62	30' W. of Sossoman Rd @ field Rd. S. of ditch 400' S. of R.P. 3
A			37	3.95	3.58	3.76	62.76	East along field Road
T.P. 15			278	6.08	3.30	4.69	61.83	
"	4.56	66.39	275	5.93	3.18			
T.P. 16			273	5.49	2.76	4.12	62.27	
"	6.06	68.33	267	7.38	4.71			@π E = 63.33 − 5.08 = 63.25
T.P. 17	3.24	68.18	212	4.44	2.32	3.39	64.94	
T.P. 16	4.20	66.49				5.89	62.29	
T.P. 15	5.14	67.02				4.61	61.88	
R.P. 3						7.18	59.84	close + 0.02
	From	R.P. 3	North	along	Sossoman	Rd to	Queen Creek	
R.P. 3	4.55	64.37	281	5.95	3.14	—	(59.82)	
T.P. 18			264	5.29	2.65	3.96	60.41	
"	3.75	64.16	279	5.15	2.36			
B			101	4.69	3.58	4.09	60.07	White + @ center of Sossoman Rd, South of Queen Cr. (1032)
R.P. 4	5.28	64.14	348	7.06	3.58	5.31	58.86	Cb: Sighted to painted on roadway above South Culvert
T.P. 18	3.76	64.19				3.71	60.43	Use 58.87
R.P. 3						4.35	59.94	close to 0.02
	North	from	Queen	Creek	to	Queen	Cr. Rd, then	East along irrigation ditch on S. side of Queen Cr. Rd.
R.P. 4	6.32	65.19	238	7.52	5.14	—	(58.87)	from above
D						5.03	60.16	White + on Rd. North of Queen Cr. (1038) π ≈ 40 ft E of D along Road
T.P. 19			256	—	3.78	5.06	60.13	East along Queen Cr. Rd
"	3.90	64.03	271	5.26	2.55			
T.P. 20			274	4.23	1.49	2.87	61.16	
"	3.41	64.57	257	4.69	2.12			
T.P. 21	2.28	63.92	305	3.85	0.80	2.33	62.24	
T.P. 20	2.88	63.23				3.37	60.55	
T.P. 19	5.12	64.75				3.90	59.33 60.13	
D						5.07	58.88 60.18	Ave E of D = 60.17
R.P. 4						6.38	58.87	Close 0.00

Weather: Sunny - mid 60s

Party: HSM π RWC ϕ ✓RWC

Page 2 of 3

Survey Site: Mid Queen Creek

Date and Time: 1-5-99

Hawes to Power Rd

Sta/Dist	BS	HI	DIST	Top	Bottom	Foreward	Elev.	Comments
D	3.35	63.52	254'	4.62	2.08	—	(60.17)	N. along Sossaman Rd
T.P.22			271'	6.96	4.25	5.60	57.92	
"	4.78	62.70	284'	6.20	3.36			
T.P.23			268'	6.40	3.72	5.06	57.64	
"	4.57	62.21	304'	6.08	3.04			@ ⊼ 62.21 − 5.07 = 57.14
T.P.24			295'	6.73	3.78	5.24	56.97	
"	4.37	61.34	279	5.75	2.96			@ ⊼ 61.34 − 4.81 = 56.53
T.P.25	4.93	61.39	264'	6.19	3.55	4.88	56.46	Dirt mounds to the East of ⊼
T.P.24	5.26	62.22				4.43	56.96	
T.P.23	4.93	62.58				4.57	57.65	
T.P.22	5.28	63.21				4.65	57.93	
D						3.02	60.19	close +0.02
		Culverts						
R.P.4	4.75	63.62				—	(58.87)	
C #1						12.91	50.71	Invert of Inlet of S. Culvert
#2						6.75	56.87	Top of "
#3						6.75	56.87	" " "
#4						6.72	56.90	" " "
#5						6.75	56.87	" " " of N. Culvert
#1						7.47	56.15	Top of outlet of S. Culvert
#2						8.00	55.62	" " "
#3						7.88	55.74	" " "
#4						7.80	55.82	" " "
#5						8.08	55.54	" " " of N. Culvert
Road						4.71	58.91	above S. Culvert
R.P.4						4.74	58.88	close +0.01
5 - 6 ft. C.M.P.'s								
	1.5 ft silt in bottom of Culverts							
Length = 67.5 feet								

Weather: Sunny - Nice

Party: HSM ⊼ ⊔
RWC ϕ

Page 3 of 3

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PROJECT Mid Queen Creek FDS PAGE 6 OF 6

DETAIL Hawes Rd to Power Rd COMPUTED RWC DATE 1-7-99

Summary Of Levels of 1-5-99 CHECKED BY _____ DATE _____

North of Queen Creek along Sossoman Road

Station	Elevation	Elev. Adj. based on 1998 TOPO	Distance from D	Remarks
D	1,360.18	1,359.92	0	see sheet 5 for desc.
T.P. 22	57.92	57.67	525	
T.P. 23	57.64	57.39	1,077	
Ground @ TT	57.14	56.89	1,381	between T.P.'s 23 & 24
T.P. 24	56.97	56.72	1,676	
Ground @ TT	56.53	56.28	1,955	between T.P.'s 24 & 25 Dirt Mounds East of ditch in field East of Sossoman Rd
T.P. 25	56.46	56.21	2,219	

Culverts @ Queen Creek & Sossoman Road

Station	Elevation	Elev. Adj. based on 1998 TOPO	Remarks
R.P. 4	1,358.87	1,358.62	See Sheet 5 for descripta
Culvert #1	50.71	50.46	Invert of Inlet of S. Culvert
2	56.87	56.62	Top " "
3	56.87	56.62	" " "
4	56.90	56.65	" " "
5	56.87	56.62	" " " of N. Culvert
1	56.15	55.90	Top of Outlet of S. Culvert
2	55.62	55.37	" " "
3	55.74	55.49	" " "
4	55.82	55.57	" " "
5	55.54	55.29	" " " of N. Culvert
Road	58.91	58.66	Above South (#1) Culvert

5- 6.0 ft. C.M.P.'s

Length = 67.5 ft.

1.5 ft of fill in bottom of culverts

APPENDIX F

HEC-2 INPUT AND OUTPUT

```
C        4
C      4   4.085
C  4.085AT THE UPSTREAM SIDE OF POWER ROAD         5.065
C  5.065DOWNSTREAM OF SOSSAMANN ROAD       5.074
C  5.074UPSTREAM OF SOSSAMAN ROAD          6.470
C  6.470AT THE DOWNSTREAM SIDE OF HAWES ROAD
T1      01498-28-0                                RWC   3-23-99
T2      MIDDLE QUEEN CREEK FLOOD DELINEATION STUDY
T3      POWER ROAD TO HAWES ROAD
T4              THIS MODEL ASSUMES THAT THE LEVEE SYSTEM ARE NOT STABLE
T5      AND WILL BE BREACHED.
*       MODEL = QNCK-FW     INCLUDES FLOODWAY ANALYSIS
J1            2                                                   1340.35
J2     1             -1
J3    38      43       1       4      53      27      28      54
J3   150     200
NC 0.040   0.040   0.035     0.1     0.3
*
*       SECTIONS 4.04 TO 4.085 ARE FROM THE POWER RANCH PROPOSED GOLF COURSE
*               AND CHANNEL CONDITIONS MODEL USED IN THE FEMA CLOMR SUBMITTAL
*               FOR POWERR ROAD TO RECKER ROAD. MAY 27, 1998
*       FILE; QNCKPA6.H2I
*
*
QT     2    3006    3006
NH     3    .050    9960    .025   10045    .040   10182
X1  4.04      12    9960   10045     370     360     365
GR  1342    9900    1341    9925    1338    9942    1337    9950  1335.8    9960
GR1335.8   10045    1337   10051    1338   10093    1339   10115    1342   10135
GR  1342   10160    1342   10182
*
NC  .025    .025    .025
X1  4.05       7    9955   10045     310     290     300
GR  1341    9940    1338    9950  1336.5    9955  1336.5   10045    1338   10062
GR  1339   10078    1344   10105
*
NC                              .3      .5
X1 4.070      16    9940   10072     100     100     100
X3    10
GR  1344    8120    1343    8567    1344    9210    1345    9410    1350    9790
GR  1351    9915    1350    9940  1337.7    9979  1337.7   10008    1343   10038
GR  1350   10072    1350   10100    1350   10235    1349   10315    1345   10600
GR  1344   10710
*
NC 0.015   0.015   0.025     0.3     0.5
ET           9.1     9.1     9.1                                   9910.0 10110.0
*
*       BRIDGE PIER WIDTH DOUBLED TO ACCOUNT FOR DEBRIS FLOW
*       POWER RD EXISTING BRIDGE WIDTH EXPANDED FOR FUTURE WIDENING
*
SB  0.90    1.56    2.63              65      12   941.6     3.5  1337.7  1337.7
X1 4.085      18    9940   10072      90      90      90
X2                     1  1348.4  1350.9
X3    10                                                 1350.9  1350.9
BT    -2  9910.0  1350.9  1348.4 10110.0  1350.9  1348.4
GR  1344    8120    1343    8567    1344    9210    1345    9410    1350    9790
GR  1351    9915    1350    9940  1337.7    9979  1337.7   10008    1343   10038
GR  1350   10072    1350   10100    1350   10235    1349   10315    1345   10600
GR  1344   10670  1343.2   10910    1344   11240
*
*       BEGIN POWER ROAD TO HAWES ROAD STUDY
*       TOPO OF APRIL 1998 WITH 1.0 FOOT CONTOURS USED
*       TOPO EXTENDED BASED ON THE 1986 ADMS
*
QT     2    3010    3010
NC 0.055   0.055   0.050      .3      .5
ET                   9.1                                          11390   11690
* Cross-section just upstream of Power Rd. Bridge.
X1 4.096      59   11431   11560      67     180      67
* FILLED TO 1344 LEFT OF STA 11431 FOR FLOW OVER ROAD
GR1346.2    9830  1345.9    9970  1345.6   10110  1345.3   10300    1345   10500
```

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GR  1344   11000    1344   11202    1344   11297    1344   11372    1344   11383
GR  1345   11399    1346   11404    1347   11408    1348   11410    1349   11413
GR  1350   11416    1350   11431    1349   11434    1348   11438    1347   11442
GR  1346   11446    1345   11449    1344   11453    1343   11457    1342   11461
GR  1341   11464    1340   11467    1339   11471    1338   11474    1337   11487
GR  1337   11501    1338   11505    1339   11508    1340   11511    1341   11515
GR  1342   11518    1342   11538    1342   11542    1343   11546    1344   11549
GR  1345   11552    1346   11554    1347   11556    1348   11558    1349   11560
GR  1349   11583    1348   11585    1347   11587    1346   11590    1345   11592
GR  1344   11594    1344   11615    1344   11645    1344   11656 1344.06   11681
GR  1344   11685 1343.25   11951 1343.25   12590  1345.5   12980
*
ET                   9.1                                          11160   11750
NC                              .1      .3
X1 4.138      52   11399   11522     221     229     225
GR  1346    9400  1345.5    9620    1345    9870  1344.8   10200  1344.5   10780
GR1344.5   11000  1344.4   11226    1345   11377    1346   11379    1347   11381
GR  1348   11383    1349   11385    1350   11388    1351   11389    1351   11399
GR  1350   11402    1349   11405    1348   11409    1347   11412    1346   11416
GR  1345   11420    1344   11424    1343   11428    1342   11431    1341   11432
GR  1340   11433    1339   11435    1338   11439    1338   11463    1339   11466
GR  1340   11469    1341   11472    1342   11479    1343   11490    1344   11496
GR  1345   11498    1346   11503    1347   11506    1348   11509    1349   11515
GR  1348   11522    1347   11525    1346   11527    1345   11528    1344   11532
GR  1344   11547    1345   11556    1345   11560    1344   11563 1343.88   11681
GR1343.6   11926  1345.8   12980
*
NC 0.055   0.055   0.055
ET                   9.1                                          11090   11950
X1 4.226      61   11387   11522     457     473     465
GR  1347    9390    1346    9940    1345   10750  1344.7   11000  1344.9   11222
GR  1345   11283    1345   11326    1345   11360    1346   11362    1347   11363
GR  1348   11364    1349   11368    1350   11370    1351   11372    1352   11374
GR  1353   11377    1353   11387    1352   11389    1351   11391    1350   11393
GR  1349   11396    1348   11401    1347   11407    1346   11412    1345   11417
GR  1344   11423    1343   11425    1342   11428    1341   11431    1340   11435
GR  1340   11480    1341   11483    1342   11486    1343   11489    1344   11493
GR  1345   11496    1346   11502    1347   11509    1348   11513    1349   11515
GR  1350   11518    1351   11521    1352   11522    1352   11527    1351   11533
GR  1350   11535    1349   11537    1348   11540    1347   11542    1346   11544
GR  1346   11559    1346   11562    1346   11565    1346   11567    1345   11570
GR  1345   11593 1345.12   11624    1345   11658  1344.8   11937    1346   12690
GR1346.2   12910
*
NC 0.055   0.055   0.060
ET                   9.1                                          11160   12000
* cross-section just upstream of dirt road.
X1 4.321      60   11417   11552     502     490     497
GR1348.3   10030  1348.3   10031  1348.2   10220  1348.1   10410    1348   10600
GR1346.8   11000 1346.24   11247    1347   11340    1348   11362    1349   11374
GR  1350   11386    1351   11394    1352   11402    1353   11410    1353   11417
GR  1352   11421    1351   11424    1350   11428    1349   11431    1348   11435
GR  1347   11439    1346   11443    1345   11450    1344   11456    1343   11461
GR  1342   11467    1341   11472    1340   11493    1340   11503    1341   11505
GR  1342   11507    1343   11509    1344   11511    1345   11513    1346   11515
GR  1347   11516    1348   11518    1348   11519    1348   11533    1349   11539
GR  1350   11543    1351   11546    1352   11549    1353   11552    1353   11554
GR  1352   11555    1351   11557    1350   11559    1349   11560    1348   11574
GR  1347   11590    1347   11593    1347   11599    1347   11630    1347   11633
GR  1347   11645    1347   11649 1348.14   11684 1346.53   11974    1348   12940
*
NC 0.055   0.055   0.065
ET                   9.1                                          11260   12040
X1 4.416      61   11438   11571     488     505     496
GR  1350   10060    1350   10062    1350   10064    1350   10065  1347.5   10999
GR1347.5   11000 1347.64   11232    1348   11358    1349   11411    1350   11413
GR  1351   11415    1352   11417    1353   11419    1354   11422    1354   11438
GR  1353   11441    1352   11444    1351   11448    1350   11451    1349   11454
GR  1348   11457    1347   11472    1346   11475    1345   11477    1344   11480
GR  1343   11482    1342   11485    1341   11494    1341   11512    1342   11516
GR  1343   11519    1344   11523    1345   11526    1346   11530    1347   11535
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GR  1348   11540    1349   11546    1350   11549    1351   11554    1352   11559
GR  1353   11563    1354   11565    1355   11571    1355   11575    1354   11576
GR  1353   11578    1352   11579    1351   11581    1350   11582    1349   11588
GR  1349   11611    1349   11612    1348   11613    1348   11614    1349   11616
GR  1349   11617    1348   11620 1347.46   11739 1347.42   11972  1348.5   12760
GR  1350   13000
*
NC 0.100   0.055   0.070
ET                   9.1                                          11320   12000
X1 4.510      62   11390   11522     510     493     503
GR  1351   10050  1350.8   10100  1350.6   10160  1350.4   10220    1350   10340
GR1348.5   11000 1348.52   11193    1349   11325    1350   11365    1351   11367
GR  1352   11369    1353   11372    1354   11374    1354   11390    1353   11393
GR  1352   11397    1351   11400    1350   11403    1349   11407    1349   11423
GR  1349   11427    1348   11429    1347   11430    1346   11431    1345   11433
GR  1344   11434    1343   11436    1342   11452    1342   11463    1343   11466
GR  1344   11468    1345   11470    1346   11472    1347   11478    1348   11488
GR  1349   11499    1350   11504    1351   11507    1352   11511    1353   11514
GR  1354   11517    1355   11519    1356   11522    1356   11529    1355   11531
GR  1354   11533    1353   11534    1352   11536    1351   11537    1350   11539
GR  1349   11541    1349   11555    1349   11558    1349   11561    1349   11565
GR1348.3   11622    1348   11679    1348   11822    1348   11903 1347.96   11917
GR  1351   12850    1352   12960
*
NC 0.100   0.055   0.065
ET                   9.1                                          11320   12070
X1 4.605      59   11440   11573     505     496     500
GR1352.2   10080    1352   10250  1351.7   10320  1351.4   10540  1351.1   10650
GR1350.9   11000    1351   11080    1351   11087  1350.8   11320    1351   11407
GR  1352   11417    1353   11418    1354   11420    1355   11421    1356   11423
GR  1356   11440    1355   11443    1354   11446    1353   11449    1352   11452
GR  1351   11455    1350   11460    1349   11464    1348   11469    1347   11475
GR  1346   11478    1345   11482    1344   11485    1344   11503    1345   11507
GR  1346   11510    1347   11514    1348   11517    1349   11521    1350   11525
GR  1351   11528    1351   11534    1351   11546    1352   11552    1353   11557
GR  1354   11560    1355   11563    1356   11566    1357   11570    1358   11573
GR  1358   11582    1357   11584    1356   11586    1355   11588    1354   11590
GR  1353   11592    1352   11594    1351   11597    1351   11606    1351   11613
GR1350.4   11702 1350.44   11963    1352   12530    1352   12990
*
ET                   9.1                                          11280   12130
X1 4.699      66   11430   11560     473     511     490
GR  1354   10080  1353.5   10310    1353   10540  1352.5   10770  1352.2   10900
GR  1352   11000    1352   11154 1352.03   11350    1352   11372    1353   11404
GR  1354   11406    1355   11408    1356   11410    1357   11412    1358   11416
GR  1358   11430    1357   11431    1356   11433    1355   11434    1354   11436
GR  1353   11438    1352   11439    1351   11441    1350   11443    1349   11444
GR  1348   11446    1347   11448    1347   11454    1347   11458    1347   11461
GR  1347   11465    1347   11470    1347   11472    1347   11475    1347   11478
GR  1347   11481    1347   11483    1346   11486    1346   11495    1347   11498
GR  1348   11502    1349   11506    1350   11509    1351   11513    1352   11521
GR  1353   11537    1354   11541    1355   11545    1356   11548    1357   11552
GR  1358   11556    1359   11560    1359   11571    1358   11573    1357   11575
GR  1356   11576    1355   11578    1354   11580    1353   11582    1352   11591
GR  1352   11592    1352   11628 1351.65   11731 1351.61   11973  1352.5   12720
GR  1354   12900
*
NC 0.100   0.060   0.060
ET           7.1     9.1                                   12920   11280   12200
X1 4.794      59   11439   11567     503     507     503
GR  1355   10100    1355   10101    1355   10102  1354.5   10400    1354   10700
GR1353.5   11000 1353.36   11350    1354   11412    1355   11426    1356   11427
GR  1357   11428    1358   11429    1359   11431    1360   11432    1360   11439
GR  1359   11448    1358   11451    1357   11454    1356   11457    1355   11460
GR  1354   11463    1353   11466    1352   11470    1351   11475    1350   11480
GR  1349   11485    1348   11488    1348   11531    1349   11537    1350   11539
GR  1351   11542    1352   11544    1353   11547    1354   11550    1355   11552
GR  1356   11555    1357   11558    1358   11561    1359   11564    1360   11567
GR  1360   11580    1359   11582    1358   11584    1357   11586    1356   11588
GR  1355   11590    1354   11598    1354   11600    1354   11607  1353.6   11730
GR  1353   11933    1353   11938    1353   11979    1353   11980  1353.5   12450
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GR  1354   12920    1353   13180    1354   14160    1356   14210
*
NC 0.100   0.065   0.060
ET           7.1     9.1                                    12780   11280   11950
X1 4.889      63   11432   11565     488     490     495
GR  1357   10080  1356.9   10130  1356.7   10220  1356.6   10260  1356.5   10300
GR  1355   11000    1355   11007    1355   11207    1355   11280 1354.97   11305
GR  1355   11332    1355   11382    1355   11392    1356   11411    1357   11417
GR  1358   11419    1359   11420    1360   11422    1361   11424    1361   11432
GR  1360   11439    1359   11442    1358   11445    1357   11448    1356   11450
GR  1355   11453    1354   11456    1353   11461    1352   11465    1351   11469
GR  1350   11473    1350   11516    1351   11519    1352   11523    1353   11527
GR  1354   11531    1355   11535    1356   11538    1356   11541    1356   11546
GR  1357   11549    1358   11553    1359   11557    1360   11561    1361   11565
GR  1361   11576    1360   11578    1359   11580    1358   11583    1357   11585
GR  1356   11587    1356   11589    1356   11603    1355   11605    1355   11608
GR  1355   11611 1354.92   11695 1354.57   11935  1355.5   12970  1356.5   13495
GR1356.3   13660  1356.2   13690    1356   14110
*
NC 0.100   0.070   0.055
ET           7.1     9.1                                    12670   11300   11760
X1 4.985      63   11420   11554     370     500     500
* FILL TO 1356.3 TO THE RIGHT OF STA 11554 FOR FLOW OVER THE ROAD
GR  1358   10100  1357.8   10140  1357.5   10200  1357.2   10260    1357   10300
GR1355.6   11000 1355.75   11254    1356   11378    1357   11397    1358   11399
GR  1359   11401    1360   11402    1361   11404    1361   11420    1360   11423
GR  1359   11426    1358   11431    1357   11436    1356   11441    1355   11447
GR  1354   11452    1353   11458    1352   11464    1351   11471    1351   11511
GR  1352   11514    1353   11517    1354   11520    1355   11523    1356   11526
GR  1357   11528    1358   11538    1359   11543    1360   11546    1361   11549
GR  1362   11552    1363   11554    1363   11562    1362   11564    1361   11565
GR  1360   11567    1359   11568    1358   11570    1357   11574    1356   11583
GR  1356   11587    1356   11600  1356.3   11601  1356.3   11602    1356   11603
GR  1356   11604  1356.3   11744  1356.3   11807  1356.3   11814  1356.3   11951
GR  1356   12540    1356   12730    1357   12900  1356.9   12990  1356.7   13270
GR1356.3   13460  1356.2   13750    1356   13880
*
* Downstream of Sossaman Rd.
*
ET           7.1     9.1                                    12730   11350   11760
X1 5.023      58   11432   11581     235     140     207
* FILL TO 1356.3 TO THE RIGHT OF STA 11581 FOR FLOW OVER THE ROAD
GR  1358   10222  1357.9   10280  1357.8   10340  1357.7   10380  1357.6   10440
GR1357.5   10500    1356   11045    1356   11230    1356   11300    1356   11388
GR  1357   11402    1358   11407    1359   11408    1360   11410    1361   11412
GR  1362   11414    1363   11416    1363   11432    1362   11434    1361   11436
GR  1360   11439    1359   11441    1358   11444    1357   11446    1356   11448
GR  1355   11451    1354   11454    1353   11457    1352   11461    1351   11465
GR  1351   11512    1352   11523    1353   11536    1354   11544    1355   11550
GR  1356   11553    1357   11555    1358   11558    1359   11561    1360   11564
GR  1361   11567    1362   11571    1363   11574    1364   11577    1365   11581
GR  1365   11582    1364   11590    1363   11592    1359   11610    1355   11650
GR1356.3   11835  1356.3   12000  1357.4   12690  1356.9   13015  1356.7   13280
GR1356.3   13580  1356.2   13860    1356   13990
*
* JUST DOWNSTREAM FROM THE SOSSOMAN ROAD CULVERTS
*
NC                             .3      .5
ET           7.1     9.1                                    12900   11570   11635
X1 5.065      22   11570   11635     280      80     195
* FILL TO 1356.3 TO THE RIGHT OF STA 11635 FOR FLOW OVER THE ROAD
GR  1360   11300    1360   11370    1360   11440    1359   11490    1359   11520
GR  1358   11555    1358   11570    1355   11575    1352   11585    1352   11620
GR  1355   11620    1359   11635    1359   11700    1358   11860    1358   12100
GR1357.7   12365  1357.4   12910  1356.9   13200  1356.7   13490  1356.3   13790
GR1356.2   14070    1356   14200
*
* SOSSAMAN ROAD CULVERTS AND UPSTREAM SIDE OF CULVERTS
*       PROGRAM HY8 FOR CULVERT COMPUTATION WAS RUN USING THE TAILWATER
*               RATING FOR SECTION 5.065. DETERMINED FROM THIS HEC-2 ANALYSIS.
*       FOR 3,050 CFS HY8 GAVE THE SAME HEADWATER ELEVATION AS IS
```

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*                COMPUTED FROM THIS HEC-2 ANALYSIS FOR SECTION 5.074.
*
NC 0.055   0.055   0.065      .3      .5
ET           7.1     9.1                                   12850   11550   11623
SB          1.56     2.6              28           141.4          1350.6  1349.5
X1 5.074      35   11550   11623      60      15      60
X2                     1  1357.4
BT    15   11310  1359.8           11410  1359.5           11505    1359
BT 11530  1359.4           11532  1359.5           11533  1359.5           11555
BT  1355           11561  1358.7  1356.6   11610  1358.7  1356.6   11623    1358
BT         11628    1359           11678    1360           11710    1359
BT 11900    1360           12850  1357.4
GR1360.2   10950  1359.2   11310  1359.5   11410    1359   11425    1358   11446
GR  1359   11505  1359.2   11520  1359.3   11525  1359.4   11530  1359.5   11532
GR1359.5   11533    1358   11550    1355   11555    1352   11561    1352   11605
GR  1355   11610    1358   11623    1359   11628    1360   11665    1360   11678
GR  1359   11710    1360   11900  1357.7   12340  1357.4   12850  1356.9   13180
GR1356.7   13470    1358   13860    1362   13880    1358   13910    1356   13980
GR  1356   14440    1356   14480    1357   14540    1358   14715  1359.5   14870
*
* Just upstream from Sossaman Rd. culverts.
*
NC 0.055   0.055   0.065     0.1     0.3
ET           7.1     9.1                                   12490   11420   11622
X1 5.086      71   11420   11622      34     500      70
* FILL TO 1359.8 TO THE LEFT OF STA 11420 FOR FLOW OVER THE ROAD
GR1361.4   10000    1361   10150  1360.7   10340  1360.4   10500    1360   10680
GR1359.8   11000  1359.8   11126  1359.8   11302  1359.8   11311  1359.8   11323
GR1359.8   11326  1359.8   11344  1359.8   11347  1359.8   11354  1359.8   11355
GR  1360   11381    1361   11398    1362   11410    1363   11415    1364   11418
GR  1364   11420    1363   11423    1362   11426    1361   11428    1360   11435
GR  1359   11444    1358   11455    1358   11463    1358   11480    1357   11486
GR  1356   11493    1355   11501    1354   11523    1353   11530    1352   11536
GR  1352   11557    1352   11572    1352   11584    1353   11587    1354   11590
GR  1355   11592    1356   11595    1357   11597    1358   11600    1359   11602
GR  1360   11605    1361   11615    1362   11622    1362   11632    1361   11634
GR  1360   11637    1359   11640    1359   11706    1359   11752    1359   11809
GR  1359   11810    1358   11812    1358   11813 1359.53   11820    1358   11821
GR  1358   11825    1359   11846    1359   11848    1358   11850    1357   11919
GR  1357   11961    1358   12210  1357.5   12500    1358   13245    1358   13310
GR  1360   14450
*
NC 0.055   0.055   0.045      .1      .3
ET           7.1     9.1                                   12420   11443   11600
X1 5.095      71   11443   11600      42     210      48
*
* FILL TO 1359.8 TO THE LEFT OF STA 11443 FOR FLOW OVER THE ROAD
*
GR  1362   10000  1361.5   10180    1361   10350  1360.5   10520    1360   10690
GR1359.8   11000  1359.8   11139  1359.8   11168  1359.8   11223  1359.8   11238
GR1359.8   11286  1359.8   11372  1359.8   11375  1359.8   11377  1359.8   11378
GR1359.8   11383    1360   11385    1360   11386    1360   11395    1361   11407
GR  1361   11427    1361   11433    1362   11437    1363   11442    1363   11443
GR  1362   11449    1361   11458    1360   11461    1359   11464    1358   11466
GR  1357   11469    1356   11471    1355   11475    1354   11479    1353   11516
GR  1352   11537    1352   11557    1352   11564    1352   11570    1353   11574
GR  1354   11576    1355   11578    1356   11580    1357   11582    1358   11584
GR  1359   11587    1360   11592    1361   11596    1362   11600    1362   11611
GR  1361   11612    1360   11614    1359   11615    1358   11665 1357.75   11780
GR  1358   11802    1359   11829    1359   11837    1358   11839    1358   11840
GR  1359   11842    1359   11843    1359   11883    1359   11884    1358   11887
GR  1358   11889    1358   11892 1357.19   12007    1358   12350    1359   12980
GR  1360   13640
*
ET           7.1     9.1                                   12330   11423   11554
X1 5.156      45   11423   11544     100     245     320
*
* FILL TO 1359.8 TO THE LEFT OF STA 11423 FOR FLOW OVER THE ROAD
*
GR  1362   10060  1361.5   10300    1361   10560  1360.5   10640    1360   10730
GR1359.8   11000  1359.8   11193  1359.8   11333  1359.8   11349  1359.8   11354
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GR  1360   11356    1360   11357  1359.8   11358  1359.8   11367    1360   11391
GR  1361   11405    1361   11423    1360   11428    1359   11431    1358   11434
GR  1357   11437    1356   11441    1355   11443    1354   11446    1354   11476
GR  1354   11483    1354   11516    1355   11519    1356   11522    1357   11529
GR  1358   11534    1359   11537    1360   11541    1361   11544    1361   11566
GR  1360   11576    1359   11599    1359   11618 1359.08   11716 1359.19   11902
GR  1360   11968    1360   11980    1359   12080  1359.7   12330    1360   13450
*
*
ET           7.1      9.1                                   12180   11404   11521
X1 5.214      40    11404   11521     310     294     303
*
* FILL TO 1359.8 TO THE LEFT OF STA 11404 FOR FLOW OVER THE ROAD
*
GR  1362   10210  1361.8   10230  1361.5   10255  1361.2   10280    1361   10300
GR1359.8   11000  1359.8   11182  1359.8   11334  1359.8   11337    1360   11340
GR  1360   11341    1360   11361    1361   11376    1362   11388    1362   11404
GR  1361   11408    1360   11411    1359   11413    1358   11416    1357   11418
GR  1356   11421    1355   11424    1355   11486    1356   11499    1357   11505
GR  1358   11508    1359   11512    1360   11515    1361   11518    1362   11521
GR  1362   11540    1361   11551    1360   11564 1359.91   11567    1360   11699
GR1360.1   11932    1361   12100    1360   12180    1360   12720    1362   13570
*
*
ET                   9.1                                                  11300   11534
X1 5.308      43    11420   11535     502     502     502
GR  1364   10480  1363.5   10500    1363   10515  1362.5   10530    1362   10550
GR1360.3   11000 1360.37   11176    1360   11356    1360   11360    1361   11362
GR  1361   11363    1360   11364    1360   11376    1361   11390    1362   11401
GR  1363   11411    1363   11420    1362   11427    1361   11429    1360   11432
GR  1359   11434    1358   11436    1357   11438    1356   11440    1355   11443
GR  1355   11448    1356   11507    1357   11511    1358   11514    1359   11518
GR  1360   11521    1361   11524    1362   11527    1363   11529    1364   11535
GR  1364   11543    1363   11550    1362   11559    1361   11575 1360.85   11709
GR  1361   11912 1361.62   11950    1362   12355
*
ET                   9.1                                                  11414   11595
X1 5.403      38    11413   11595     500     500     500
GR  1364   10730  1363.5   10800    1363   10860  1362.5   10940    1362   10990
GR1361.9   11000 1361.34   11299    1362   11380    1363   11389    1364   11406
GR  1364   11413    1363   11416    1362   11419    1361   11423    1360   11426
GR  1359   11429    1358   11432    1357   11435    1357   11441    1357   11535
GR  1357   11544    1358   11550    1359   11558    1360   11565    1361   11573
GR  1362   11581    1363   11586    1364   11589    1365   11592    1366   11595
GR  1366   11597    1365   11610    1364   11617    1363   11627    1362   11642
GR  1362   11654 1362.39   11741 1362.74   11966
*
ET                   9.1                                                  11307   11469
X1 5.498      37    11307   11469     490     499     498
GR  1366   10850  1365.5   10880    1365   10910  1364.5   10930    1364   10960
GR1363.2   11000    1363   11225 1362.81   11249    1363   11277    1364   11292
GR  1365   11295    1366   11300    1366   11307    1365   11311    1364   11314
GR  1363   11318    1362   11322    1361   11325    1360   11329    1359   11333
GR  1359   11442    1360   11448    1361   11451    1362   11454    1363   11457
GR  1364   11460    1365   11463    1366   11466    1367   11469    1367   11482
GR  1366   11493    1365   11499    1364   11507    1363   11528    1363   11587
GR1363.3   11630 1363.67   11868
*
ET                   9.1                                                  11413   11585
X1 5.550      46    11413   11585     280     265     272
GR1364.6   11000    1364   11099    1364   11108    1364   11120    1364   11122
GR  1364   11130    1364   11321    1364   11330    1364   11331    1364   11387
GR  1365   11392    1366   11396    1366   11413    1365   11416    1364   11419
GR  1363   11422    1362   11425    1361   11428    1360   11431    1359   11438
GR  1358   11443    1358   11444    1359   11447    1359   11454    1358   11463
GR  1358   11524    1359   11528    1360   11540    1361   11560    1362   11564
GR  1363   11566    1364   11569    1365   11572    1366   11575    1367   11579
GR  1368   11582    1369   11585    1369   11590    1368   11594    1367   11599
GR  1366   11605    1365   11614    1364   11647    1364   11665 1364.29   11722
GR1364.5   11958
*
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ET                    9.1                                                11400   11544
X1 5.593       43   11400   11544     216     236     226
GR1365.4    11000    1365   11128    1365   11180    1365   11207    1365   11208
GR  1365    11218 1364.28   11319    1365   11347    1365   11350    1365   11372
GR  1366    11376    1367   11391    1367   11400    1366   11404    1365   11408
GR  1364    11411    1363   11415    1362   11419    1361   11423    1360   11434
GR  1360    11491    1361   11506    1362   11509    1363   11512    1364   11515
GR  1365    11519    1366   11534    1367   11537    1368   11541    1369   11544
GR  1369    11546    1368   11558    1367   11566    1366   11575    1365   11591
GR  1365    11693 1365.24   11736    1366   11859    1366   11867    1365   11873
GR  1365    11875    1366   11877    1366   11923
*
ET                    9.1                                                11403   11549
X1 5.654       56   11403   11549     190     425     310
GR  1367    10000    1367   10001    1367   10002    1367   10005  1366.5   10520
GR  1366    11000 1365.81   11013    1366   11238    1366   11262    1366   11301
GR  1367    11335 1367.07   11342    1367   11350    1367   11355    1368   11379
GR  1369    11390    1370   11397    1371   11402    1371   11403    1370   11406
GR  1369    11409    1368   11411    1367   11414    1366   11417    1365   11419
GR  1364    11422    1363   11425    1362   11428    1361   11454    1360   11499
GR  1360    11503    1361   11506    1362   11509    1363   11512    1364   11515
GR  1365    11518    1366   11521    1367   11535    1368   11539    1369   11544
GR  1370    11549    1370   11566    1369   11573    1368   11589    1368   11613
GR  1368    11634    1368   11639 1368.04   11708    1368   11714    1368   11719
GR  1368    11782    1367   11784    1367   11788    1368   11789    1368   11790
GR  1367    11793
*
ET                    9.1                                                11405   11529
X1 5.748       47   11405   11529     430     570     510
GR  1370    10030  1369.5   10200    1369   10400  1368.5   10600    1368   10800
GR1367.5    11000    1368   11027    1368   11036    1368   11037    1368   11067
GR1367.2    11262    1368   11364    1369   11378    1370   11388    1370   11405
GR  1369    11411    1368   11413    1367   11416    1367   11417    1367   11422
GR  1366    11425    1365   11428    1364   11430    1363   11434    1362   11441
GR  1362    11485    1363   11490    1364   11498    1365   11508    1366   11511
GR  1367    11514    1368   11517    1369   11520    1370   11523    1371   11526
GR  1372    11529    1372   11547    1371   11551    1370   11555    1369   11564
GR  1368    11624    1368   11625    1369   11718 1369.08   11731    1369   11746
GR  1369    11773  1369.2   11935
*
NC 0.060   0.055   0.045
ET                    9.1                                                11398   11530
X1 5.843       40   11398   11530     494     490     492
GR  1372    10690  1371.5   10705    1371   10720  1370.5   10735    1370   10750
GR1369.5    11000 1369.45   11289    1370   11364    1371   11375    1372   11383
GR  1372    11398    1371   11399    1370   11402    1369   11403    1368   11405
GR  1367    11406    1366   11408    1365   11409    1364   11414    1364   11489
GR  1365    11493    1366   11498    1367   11503    1368   11507    1369   11512
GR  1370    11516    1371   11521    1372   11525    1373   11530    1373   11532
GR  1372    11544    1371   11550    1370   11556    1369   11569    1369   11589
GR  1369    11619    1369   11624 1369.37   11698 1369.47   11903    1372   12420
*
NC 0.060   0.055   0.040
ET                    9.1                                                11392   11532
X1 5.938       42   11392   11532     500     470     495
GR1371.2    11000 1371.53   11248    1372   11320    1372   11328    1372   11331
GR  1373    11333    1373   11335    1372   11339    1372   11355    1373   11363
GR  1374    11374    1374   11392    1373   11394    1372   11397    1371   11399
GR  1370    11401    1369   11404    1368   11406    1367   11409    1366   11411
GR  1365    11413    1365   11490    1366   11500    1367   11507    1368   11513
GR  1369    11518    1370   11523    1371   11528    1372   11532    1372   11544
GR  1371    11583    1371   11614    1371   11654    1371   11661 1370.63   11716
GR  1371    11756    1371   11762    1371   11764    1370   11798    1370   11869
GR  1370    11909    1372   12420
*
ET                    9.1                                                11372   11509
X1 6.033       53   11372   11509     445     440     500
GR1372.3    11000 1372.44   11137    1373   11313    1374   11322    1374   11324
GR  1373    11325    1373   11328    1374   11329    1374   11332    1374   11342
GR  1375    11350    1376   11357    1377   11367    1377   11372    1376   11376
GR  1375    11380    1374   11383    1373   11386    1372   11389    1371   11392
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GR  1370   11394    1369   11397    1368   11399    1367   11408    1366   11446
GR  1366   11464    1366   11465    1367   11469    1368   11473    1369   11474
GR  1370   11481    1371   11485    1372   11489    1373   11493    1374   11497
GR  1375   11501    1376   11505    1377   11509    1377   11520    1376   11523
GR  1375   11527    1374   11530    1373   11533    1372   11537    1371   11540
GR  1370   11543    1370   11547    1371   11554    1372   11571    1373   11584
GR  1373   11608 1372.48   11660 1372.63   11910
*
NC 0.070   0.055   0.040
ET                   9.1                                          11399   11530
X1 6.126      40   11399   11530     470     505     488
GR1374.2   11000  1374.3   11077    1374   11172    1374   11237    1375   11242
GR  1375   11246    1375   11250    1375   11254    1374   11281    1374   11282
GR  1375   11366    1376   11373    1377  1138 0    1377   11399    1376   11405
GR  1375   11408    1374   11411    1373   11413    1372   11416    1371   11419
GR  1370   11422    1369   11425    1368   11427    1368   11496    1369   11500
GR  1370   11504    1371   11508    1372   11513    1373   11517    1374   11521
GR  1375   11525    1376   11530    1376   11543    1375   11548    1374   11554
GR  1374   11570    1374   11645 1373.82   11692    1374   11739 1374.45   11920
*
NC 0.075   0.055   0.040
ET                   9.1                                          11399   11529
X1 6.220      47   11399   11529     510     490     500
GR1375.6   11000 1375.54   11027    1376   11092    1377   11096    1377   11097
GR  1376   11099    1376   11100    1377   11103    1377   11113    1376   11141
GR  1375   11200    1375   11299    1375   11311    1375   11365    1376   11368
GR  1377   11372    1378   11376    1378   11399    1377   11403    1376   11406
GR  1375   11409    1374   11412    1373   11416    1372   11419    1371   11422
GR  1370   11425    1369   11428    1369   11463    1370   11499    1371   11506
GR  1372   11510    1373   11513    1374   11516    1375   11519    1376   11523
GR  1377   11526    1378   11529    1378   11539    1377   11543    1376   11548
GR  1375   11553    1374   11588    1374   11678 1374.63   11736    1375   11811
GR  1376   11909 1375.99   11910
*
ET                   9.1                                          11445   11566
X1 6.279      47   11445   11566     325     285     305
GR1377.6   11000 1376.72   11003    1377   11024    1374   11158    1374   11161
GR  1375   11162    1376   11194    1376   11247    1375   11390    1375   11405
GR  1376   11410    1377   11414    1378   11419    1379   11424    1380   11430
GR  1380   11445    1379   11447    1378   11449    1377   11452    1376   11454
GR  1375   11468    1374   11472    1373   11476    1372   11480    1371   11483
GR  1370   11487    1370   11539    1371   11542    1372   11544    1373   11547
GR  1374   11549    1375   11552    1376   11554    1377   11556    1378   11559
GR  1379   11561    1380   11563    1381   11566    1381   11574    1380   11577
GR  1379   11581    1378   11584    1377   11588    1376   11591 1375.06   11652
GR1375.9   11833    1378   12320
*
NC 0.075   0.065   0.040
ET                   9.1                                          11282   11421
X1 6.360      56   11282   11421     600     380     490
GR  1378   10900  1377.7   10920  1377.4   10940  1377.1   10960  1376.9   10980
GR1376.7   11000    1377   11011    1377   11014    1377   11066    1377   11086
GR1376.1   11119    1376   11165    1376   11248    1377   11251    1378   11254
GR  1379   11257    1380   11260    1381   11264    1381   11282    1380   11285
GR  1379   11288    1378   11292    1377   11305    1376   11308    1375   11311
GR  1374   11314    1373   11318    1372   11322    1371   11326 1370.55   11328
GR  1371   11375 1371.02   11382    1372   11385    1373   11389    1374   11392
GR  1375   11396    1376   11399    1377   11402    1378   11405    1379   11408
GR  1380   11411    1381   11414    1382   11421    1382   11426    1381   11428
GR  1380   11430    1379   11431    1378   11433    1377   11435    1377   11543
GR  1377   11556    1377   11565 1377.28   11592    1378   11691    1378   11700
GR  1378   11743
*
ET                   9.1                                          11297   11433
X1 6.426      59   11297   11433     380     295     340
GR  1380   10990  1379.7   10992  1379.4   10994  1379.1   10996  1378.8   10998
GR1378.5   11000 1378.24   11149    1378   11169    1378   11231    1379   11254
GR  1380   11264    1381   11274    1382   11281    1383   11288    1383   11297
GR  1382   11301    1381   11305    1380   11309    1379   11313    1378   11323
GR  1377   11326    1376   11330    1375   11334    1374   11338    1373   11342
GR  1372   11347 1371.84   11348    1372   11362    1372   11374 1371.45   11387
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GR  1372   11390    1373   11394    1374   11398    1375   11403    1376   11407
GR  1377   11410    1378   11413    1379   11415    1380   11418    1381   11420
GR  1382   11423    1383   11425    1384   11428    1385   11430    1386   11433
GR  1386   11439    1385   11441    1384   11443    1383   11445    1382   11447
GR  1381   11449    1380   11451    1379   11453    1378   11460    1378   11467
GR  1378   11472    1378   11561 1378.09   11577  1378.7   11715
*
NC 0.075   0.065   0.045
* Downstream of Hawes Rd.
ET                   9.1                                            11368   11527
X1 6.467      45   11368   11527     300     175     203
GR1379.5   11000    1380   11124    1380   11171    1380   11178    1380   11326
GR  1381   11339    1382   11347    1383   11354    1383   11368    1382   11373
GR  1381   11377    1380   11382    1379   11386    1378   11392    1377   11398
GR  1376   11403    1375   11408    1374   11412    1373   11415    1372   11419
GR1371.8   11422    1372   11427    1372   11442    1372   11452  1372.1   11476
GR  1373   11479    1374   11484    1375   11488    1376   11492    1377   11496
GR  1378   11500    1379   11504    1380   11508    1381   11513    1382   11517
GR  1383   11520    1384   11524    1385   11527    1385   11538    1384   11540
GR  1383   11542    1382   11544    1381   11560    1380   11565    1380   11600
*
*       THIS CROSS SECTION IS SECTION 999.6 FROM THE UPSTREAM STUDY
*               SPRR TO HAWES ROAD - AT THE DOWNSTREAM SIDE OF
*               THE HAWES ROAD BRIDGE
*
NC 0.040   0.040   0.028      .3      .5
ET                   9.1                                              925    1078
X1 6.470      14     925    1078      30      30      30
GR1381.1     777  1381.6     808    1382     855  1382.4     891  1381.1     916
GR  1382     925  1372.5     965  1372.5    1000  1372.5    1035    1382    1078
GR1382.4    1099  1382.2    1140    1382    1179    1386    1223
EJ
T1      01498-28-0      FLOODWAY  RUN           RWC   3-23-99
T2      MIDDLE QUEEN CREEK FLOOD DELINEATION STUDY
T3      POWER ROAD TO HAWES ROAD
T4              THIS MODEL ASSUMES THAT THE LEVEE SYSTEM ARE NOT STABLE
T5      AND WILL BE BREACHED.
J1            3                                                 1340.35
J2    15              -1

ER
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*************************************                                    ***************************************
 *  HEC-2 WATER SURFACE PROFILES            *                                 *  U.S. ARMY CORPS OF ENGINEERS       *
 *                                          *                                 *  HYDROLOGIC ENGINEERING CENTER      *
 *  Version   4.6.2;  May 1991              *                                 *  609 SECOND STREET, SUITE D         *
 *                                          *                                 *  DAVIS, CALIFORNIA 95616-4687       *
 *  RUN DATE    21APR99    TIME   12:13:42  *                                 *          (916) 756-1104             *
 *******************************************                                 ***************************************


                                        X     X  XXXXXXX   XXXXX              XXXXX
                                        X     X  X        X     X            X     X
                                        X     X  X        X                        X
                                        XXXXXXX  XXXX     X          XXXXX    XXXXX
                                        X     X  X        X                  X
                                        X     X  X        X     X            X
                                        X     X  XXXXXXX   XXXXX             XXXXXXX
1
   21APR99      12:13:42                                                                                    PAGE    1


                                                                                  THIS RUN EXECUTED 21APR99    12:13:42
*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************


T1      01498-28-0                              RWC   3-23-99
T2      MIDDLE QUEEN CREEK FLOOD DELINEATION STUDY
T3      POWER ROAD TO HAWES ROAD
T4              THIS MODEL ASSUMES THAT THE LEVEE SYSTEM ARE NOT STABLE
T5      AND WILL BE BREACHED.
        MODEL = QNCK-FW     INCLUDES FLOODWAY ANALYSIS

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                                                                  1340.35

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1                 -1


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38         43          1          4         53         27         28         54
    150        200

NC    0.040      0.040      0.035       0.1        0.3

        SECTIONS 4.04 TO 4.085 ARE FROM THE POWER RANCH PROPOSED GOLF COURSE
                AND CHANNEL CONDITIONS MODEL USED IN THE FEMA CLOMR SUBMITTAL
                FOR POWERR ROAD TO RECKER ROAD. MAY 27, 1998
        FILE; QNCKPA6.H2I


QT        2       3006       3006
NH        3       .050       9960       .025      10045       .040      10182
X1     4.04         12       9960      10045        370        360        365
GR     1342       9900       1341       9925       1338       9942       1337       9950     1335.8       9960
GR   1335.8      10045       1337      10051       1338      10093       1339      10115       1342      10135
GR     1342      10160       1342      10182


NC     .025       .025       .025
X1     4.05          7       9955      10045        310        290        300
GR     1341       9940       1338       9950     1336.5       9955     1336.5      10045       1338      10062
GR     1339      10078       1344      10105
1
   21APR99      12:13:42                                                                                    PAGE    2


NC                                        .3         .5
X1    4.070         16       9940      10072        100        100        100
X3       10
GR     1344       8120       1343       8567       1344       9210       1345       9410       1350       9790
GR     1351       9915       1350       9940     1337.7       9979     1337.7      10008       1343      10038
GR     1350      10072       1350      10100       1350      10235       1349      10315       1345      10600
GR     1344      10710
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NC    0.015      0.015      0.025        0.3         0.5
ET                 9.1        9.1        9.1                                                    9910.0     10110.0
        BRIDGE PIER WIDTH DOUBLED TO ACCOUNT FOR DEBRIS FLOW
        POWER RD EXISTING BRIDGE WIDTH EXPANDED FOR FUTURE WIDENING
SB     0.90       1.56       2.63                   65          12       941.6        3.5     1337.7     1337.7
        AT THE UPSTREAM SIDE OF POWER ROAD         5.065
X1    4.085         18       9940      10072         90          90          90
X2                                1     1348.4     1350.9
X3       10                                                                          1350.9     1350.9
BT       -2     9910.0     1350.9     1348.4    10110.0      1350.9      1348.4
GR     1344       8120       1343       8567       1344        9210        1345       9410       1350       9790
GR     1351       9915       1350       9940     1337.7        9979      1337.7      10008       1343      10038
GR     1350      10072       1350      10100       1350       10235        1349      10315       1345      10600
GR     1344      10670     1343.2      10910       1344       11240

        BEGIN POWER ROAD TO HAWES ROAD STUDY
        TOPO OF APRIL 1998 WITH 1.0 FOOT CONTOURS USED
        TOPO EXTENDED BASED ON THE 1986 ADMS


QT        2       3010       3010
NC    0.055      0.055      0.050         .3          .5
ET                           9.1                                                                 11390      11690
  Cross-section just upstream of Power Rd. Bridge.
X1    4.096         59      11431      11560         67         180         67
  FILLED TO 1344 LEFT OF STA 11431 FOR FLOW OVER ROAD
GR   1346.2       9830     1345.9       9970     1345.6       10110      1345.3      10300       1345      10500
GR     1344      11000       1344      11202       1344       11297        1344      11372       1344      11383
GR     1345      11399       1346      11404       1347       11408        1348      11410       1349      11413
GR     1350      11416       1350      11431       1349       11434        1348      11438       1347      11442
GR     1346      11446       1345      11449       1344       11453        1343      11457       1342      11461
GR     1341      11464       1340      11467       1339       11471        1338      11474       1337      11487
GR     1337      11501       1338      11505       1339       11508        1340      11511       1341      11515
GR     1342      11518       1342      11538       1342       11542        1343      11546       1344      11549
GR     1345      11552       1346      11554       1347       11556        1348      11558       1349      11560
GR     1349      11583       1348      11585       1347       11587        1346      11590       1345      11592
GR     1344      11594       1344      11615       1344       11645        1344      11656    1344.06      11681
GR     1344      11685    1343.25      11951    1343.25       12590      1345.5      12980
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ET                           9.1                                                                 11160      11750
NC                                        .1          .3
X1    4.138         52      11399      11522        221         229         225
GR     1346       9400     1345.5       9620       1345        9870      1344.8      10200     1344.5      10780
GR   1344.5      11000     1344.4      11226       1345       11377        1346      11379       1347      11381
GR     1348      11383       1349      11385       1350       11388        1351      11389       1351      11399
GR     1350      11402       1349      11405       1348       11409        1347      11412       1346      11416
GR     1345      11420       1344      11424       1343       11428        1342      11431       1341      11432
GR     1340      11433       1339      11435       1338       11439        1338      11463       1339      11466
GR     1340      11469       1341      11472       1342       11479        1343      11490       1344      11496
GR     1345      11498       1346      11503       1347       11506        1348      11509       1349      11515
GR     1348      11522       1347      11525       1346       11527        1345      11528       1344      11532
GR     1344      11547       1345      11556       1345       11560        1344      11563    1343.88      11681
GR   1343.6      11926     1345.8      12980


NC    0.055      0.055      0.055
ET                           9.1                                                                 11090      11950
X1    4.226         61      11387      11522        457         473         465
GR     1347       9390       1346       9940       1345       10750      1344.7      11000     1344.9      11222
GR     1345      11283       1345      11326       1345       11360        1346      11362       1347      11363
GR     1348      11364       1349      11368       1350       11370        1351      11372       1352      11374
GR     1353      11377       1353      11387       1352       11389        1351      11391       1350      11393
GR     1349      11396       1348      11401       1347       11407        1346      11412       1345      11417
GR     1344      11423       1343      11425       1342       11428        1341      11431       1340      11435
GR     1340      11480       1341      11483       1342       11486        1343      11489       1344      11493
GR     1345      11496       1346      11502       1347       11509        1348      11513       1349      11515
GR     1350      11518       1351      11521       1352       11522        1352      11527       1351      11533
GR     1350      11535       1349      11537       1348       11540        1347      11542       1346      11544
GR     1346      11559       1346      11562       1346       11565        1346      11567       1345      11570
GR     1345      11593    1345.12      11624       1345       11658      1344.8      11937       1346      12690
GR   1346.2      12910


NC    0.055      0.055      0.060
ET                           9.1                                                                 11160      12000
  cross-section just upstream of dirt road.
X1    4.321         60      11417      11552        502         490         497
GR   1348.3      10030     1348.3      10031     1348.2       10220      1348.1      10410       1348      10600
GR   1346.8      11000    1346.24      11247       1347       11340        1348      11362       1349      11374
GR     1350      11386       1351      11394       1352       11402        1353      11410       1353      11417
GR     1352      11421       1351      11424       1350       11428        1349      11431       1348      11435
GR     1347      11439       1346      11443       1345       11450        1344      11456       1343      11461
GR     1342      11467       1341      11472       1340       11493        1340      11503       1341      11505
GR     1342      11507       1343      11509       1344       11511        1345      11513       1346      11515
GR     1347      11516       1348      11518       1348       11519        1348      11533       1349      11539
GR     1350      11543       1351      11546       1352       11549        1353      11552       1353      11554
GR     1352      11555       1351      11557       1350       11559        1349      11560       1348      11574
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GR	1347	11590	1347	11593	1347	11599	1347	11630	1347	11633
GR	1347	11645	1347	11649	1348.14	11684	1346.53	11974	1348	12940

NC	0.055	0.055	0.065							
ET			9.1						11260	12040
X1	4.416	61	11438	11571	488	505	496			
GR	1350	10060	1350	10062	1350	10064	1350	10065	1347.5	10999
GR	1347.5	11000	1347.64	11232	1348	11358	1349	11411	1350	11413
GR	1351	11415	1352	11417	1353	11419	1354	11422	1354	11438
GR	1353	11441	1352	11444	1351	11448	1350	11451	1349	11454
GR	1348	11457	1347	11472	1346	11475	1345	11477	1344	11480
GR	1343	11482	1342	11485	1341	11494	1341	11512	1342	11516
GR	1343	11519	1344	11523	1345	11526	1346	11530	1347	11535
GR	1348	11540	1349	11546	1350	11549	1351	11554	1352	11559
GR	1353	11563	1354	11565	1355	11571	1355	11575	1354	11576
GR	1353	11578	1352	11579	1351	11581	1350	11582	1349	11588
GR	1349	11611	1349	11612	1348	11613	1348	11614	1349	11616
GR	1349	11617	1348	11620	1347.46	11739	1347.42	11972	1348.5	12760
GR	1350	13000								

NC	0.100	0.055	0.070							
ET			9.1						11320	12000
X1	4.510	62	11390	11522	510	493	503			
GR	1351	10050	1350.8	10100	1350.6	10160	1350.4	10220	1350	10340
GR	1348.5	11000	1348.52	11193	1349	11325	1350	11365	1351	11367
GR	1352	11369	1353	11372	1354	11374	1354	11390	1353	11393
GR	1352	11397	1351	11400	1350	11403	1349	11407	1349	11423
GR	1349	11427	1348	11429	1347	11430	1346	11431	1345	11433
GR	1344	11434	1343	11436	1342	11452	1342	11463	1343	11466
GR	1344	11468	1345	11470	1346	11472	1347	11478	1348	11488
GR	1349	11499	1350	11504	1351	11507	1352	11511	1353	11514
GR	1354	11517	1355	11519	1356	11522	1356	11529	1355	11531
GR	1354	11533	1353	11534	1352	11536	1351	11537	1350	11539
GR	1349	11541	1349	11555	1349	11558	1349	11561	1349	11565
GR	1348.3	11622	1348	11679	1348	11822	1348	11903	1347.96	11917
GR	1351	12850	1352	12960						

NC	0.100	0.055	0.065							
ET			9.1						11320	12070
X1	4.605	59	11440	11573	505	496	500			
GR	1352.2	10080	1352	10250	1351.7	10320	1351.4	10540	1351.1	10650
GR	1350.9	11000	1351	11080	1351	11087	1350.8	11320	1351	11407
GR	1352	11417	1353	11418	1354	11420	1355	11421	1356	11423
GR	1356	11440	1355	11443	1354	11446	1353	11449	1352	11452
GR	1351	11455	1350	11460	1349	11464	1348	11469	1347	11475
GR	1346	11478	1345	11482	1344	11485	1344	11503	1345	11507
GR	1346	11510	1347	11514	1348	11517	1349	11521	1350	11525
GR	1351	11528	1351	11534	1351	11546	1352	11552	1353	11557
GR	1354	11560	1355	11563	1356	11566	1357	11570	1358	11573
GR	1358	11582	1357	11584	1356	11586	1355	11588	1354	11590
GR	1353	11592	1352	11594	1351	11597	1351	11606	1351	11613
GR	1350.4	11702	1350.44	11963	1352	12530	1352	12990		

ET			9.1						11280	12130
X1	4.699	66	11430	11560	473	511	490			
GR	1354	10080	1353.5	10310	1353	10540	1352.5	10770	1352.2	10900
GR	1352	11000	1352	11154	1352.03	11350	1352	11372	1353	11404
GR	1354	11406	1355	11408	1356	11410	1357	11412	1358	11416
GR	1358	11430	1357	11431	1356	11433	1355	11434	1354	11436
GR	1353	11438	1352	11439	1351	11441	1350	11443	1349	11444
GR	1348	11446	1347	11448	1347	11454	1347	11458	1347	11461
GR	1347	11465	1347	11470	1347	11472	1347	11475	1347	11478
GR	1347	11481	1347	11483	1346	11486	1346	11495	1347	11498
GR	1348	11502	1349	11506	1350	11509	1351	11513	1352	11521
GR	1353	11537	1354	11541	1355	11545	1356	11548	1357	11552
GR	1358	11556	1359	11560	1359	11571	1358	11573	1357	11575
GR	1356	11576	1355	11578	1354	11580	1353	11582	1352	11591
GR	1352	11592	1352	11628	1351.65	11731	1351.61	11973	1352.5	12720
GR	1354	12900								

NC	0.100	0.060	0.060							
ET		7.1	9.1					12920	11280	12200
X1	4.794	59	11439	11567	503	507	503			
GR	1355	10100	1355	10101	1355	10102	1354.5	10400	1354	10700
GR	1353.5	11000	1353.36	11350	1354	11412	1355	11426	1356	11427
GR	1357	11428	1358	11429	1359	11431	1360	11432	1360	11439
GR	1359	11448	1358	11451	1357	11454	1356	11457	1355	11460
GR	1354	11463	1353	11466	1352	11470	1351	11475	1350	11480
GR	1349	11485	1348	11488	1348	11531	1349	11537	1350	11539

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GR     1351      11542      1352      11544      1353      11547      1354      11550      1355      11552
GR     1356      11555      1357      11558      1358      11561      1359      11564      1360      11567
GR     1360      11580      1359      11582      1358      11584      1357      11586      1356      11588
GR     1355      11590      1354      11598      1354      11600      1354      11607    1353.6      11730
GR     1353      11933      1353      11938      1353      11979      1353      11980    1353.5      12450
GR     1354      12920      1353      13180      1354      14160      1356      14210


NC    0.100      0.065      0.060
ET                 7.1        9.1                                                   12780      11280      11950
X1    4.889         63      11432      11565       488        490       495
GR     1357      10080     1356.9      10130    1356.7      10220    1356.6      10260    1356.5      10300
GR     1355      11000       1355      11007      1355      11207      1355      11280   1354.97      11305
GR     1355      11332       1355      11382      1355      11392      1356      11411      1357      11417
GR     1358      11419       1359      11420      1360      11422      1361      11424      1361      11432
GR     1360      11439       1359      11442      1358      11445      1357      11448      1356      11450
GR     1355      11453       1354      11456      1353      11461      1352      11465      1351      11469
GR     1350      11473       1350      11516      1351      11519      1352      11523      1353      11527
GR     1354      11531       1355      11535      1356      11538      1356      11541      1356      11546
GR     1357      11549       1358      11553      1359      11557      1360      11561      1361      11565
GR     1361      11576       1360      11578      1359      11580      1358      11583      1357      11585
GR     1356      11587       1356      11589      1356      11603      1355      11605      1355      11608
GR     1355      11611    1354.92      11695   1354.57      11935    1355.5      12970    1356.5      13495
GR   1356.3      13660     1356.2      13690      1356      14110
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NC    0.100      0.070      0.055
ET                 7.1        9.1                                                   12670      11300      11760
X1    4.985         63      11420      11554       370        500       500
  FILL TO 1356.3 TO THE RIGHT OF STA 11554 FOR FLOW OVER THE ROAD
GR     1358      10100     1357.8      10140    1357.5      10200    1357.2      10260       1357      10300
GR   1355.6      11000    1355.75      11254      1356      11378      1357      11397       1358      11399
GR     1359      11401       1360      11402      1361      11404      1361      11420       1360      11423
GR     1359      11426       1358      11431      1357      11436      1356      11441       1355      11447
GR     1354      11452       1353      11458      1352      11464      1351      11471       1351      11511
GR     1352      11514       1353      11517      1354      11520      1355      11523       1356      11526
GR     1357      11528       1358      11538      1359      11543      1360      11546       1361      11549
GR     1362      11552       1363      11554      1363      11562      1362      11564       1361      11565
GR     1360      11567       1359      11568      1358      11570      1357      11574       1356      11583
GR     1356      11587       1356      11600    1356.3      11601    1356.3      11602       1356      11603
GR     1356      11604     1356.3      11744    1356.3      11807    1356.3      11814     1356.3      11951
GR     1356      12540       1356      12730      1357      12900    1356.9      12990     1356.7      13270
GR   1356.3      13460     1356.2      13750      1356      13880
  Downstream of Sossaman Rd.


ET                 7.1        9.1                                                   12730      11350      11760
X1    5.023         58      11432      11581       235        140       207
  FILL TO 1356.3 TO THE RIGHT OF STA 11581 FOR FLOW OVER THE ROAD
GR     1358      10222     1357.9      10280    1357.8      10340    1357.7      10380     1357.6      10440
GR   1357.5      10500       1356      11045      1356      11230      1356      11300       1356      11388
GR     1357      11402       1358      11407      1359      11408      1360      11410       1361      11412
GR     1362      11414       1363      11416      1363      11432      1362      11434       1361      11436
GR     1360      11439       1359      11441      1358      11444      1357      11446       1356      11448
GR     1355      11451       1354      11454      1353      11457      1352      11461       1351      11465
GR     1351      11512       1352      11523      1353      11536      1354      11544       1355      11550
GR     1356      11553       1357      11555      1358      11558      1359      11561       1360      11564
GR     1361      11567       1362      11571      1363      11574      1364      11577       1365      11581
GR     1365      11582       1364      11590      1363      11592      1359      11610       1355      11650
GR   1356.3      11835     1356.3      12000    1357.4      12690    1356.9      13015     1356.7      13280
GR   1356.3      13580     1356.2      13860      1356      13990

  JUST DOWNSTREAM FROM THE SOSSOMAN ROAD CULVERTS


NC                                       .3         .5
ET                 7.1        9.1                                                   12900      11570      11635
        DOWNSTREAM OF SOSSAMANN ROAD       5.074
X1    5.065         22      11570      11635       280         80       195
  FILL TO 1356.3 TO THE RIGHT OF STA 11635 FOR FLOW OVER THE ROAD
GR     1360      11300       1360      11370      1360      11440      1359      11490       1359      11520
GR     1358      11555       1358      11570      1355      11575      1352      11585       1352      11620
GR     1355      11620       1359      11635      1359      11700      1358      11860       1358      12100
GR   1357.7      12365     1357.4      12910    1356.9      13200    1356.7      13490     1356.3      13790
GR   1356.2      14070       1356      14200

  SOSSAMAN ROAD CULVERTS AND UPSTREAM SIDE OF CULVERTS
        PROGRAM HY8 FOR CULVERT COMPUTATION WAS RUN USING THE TAILWATER
                RATING FOR SECTION 5.065. DETERMINED FROM THIS HEC-2 ANALYSIS.
        FOR 3,050 CFS HY8 GAVE THE SAME HEADWATER ELEVATION AS IS
                COMPUTED FROM THIS HEC-2 ANALYSIS FOR SECTION 5.074.
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NC    0.055      0.055      0.065        .3         .5
ET                 7.1        9.1                                                    12850      11550      11623
SB                1.56        2.6                   28                   141.4                 1350.6     1349.5
        UPSTREAM OF SOSSAMAN ROAD          6.470
X1    5.074         35      11550      11623         60         15         60
X2                                1     1357.4
BT       15      11310     1359.8                 11410     1359.5                  11505       1359
BT    11530     1359.4                 11532     1359.5                  11533     1359.5                 11555
BT     1355                11561     1358.7     1356.6      11610     1358.7     1356.6      11623       1358
BT                11628       1359                11678       1360                  11710       1359
BT    11900       1360                12850     1357.4
GR   1360.2      10950     1359.2     11310     1359.5      11410       1359      11425       1358      11446
GR     1359      11505     1359.2     11520     1359.3      11525     1359.4      11530     1359.5      11532
GR   1359.5      11533       1358     11550       1355      11555       1352      11561       1352      11605
GR     1355      11610       1358     11623       1359      11628       1360      11665       1360      11678
GR     1359      11710       1360     11900     1357.7      12340     1357.4      12850     1356.9      13180
GR   1356.7      13470       1358     13860       1362      13880       1358      13910       1356      13980
GR     1356      14440       1356     14480       1357      14540       1358      14715     1359.5      14870
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Just upstream from Sossaman Rd. culverts.

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NC    0.055      0.055      0.065        0.1        0.3
ET                 7.1        9.1                                                    12490      11420      11622
X1    5.086         71      11420      11622         34        500         70
  FILL TO 1359.8 TO THE LEFT OF STA 11420 FOR FLOW OVER THE ROAD
GR   1361.4      10000       1361     10150     1360.7      10340     1360.4      10500       1360      10680
GR   1359.8      11000     1359.8     11126     1359.8      11302     1359.8      11311     1359.8      11323
GR   1359.8      11326     1359.8     11344     1359.8      11347     1359.8      11354     1359.8      11355
GR     1360      11381       1361     11398       1362      11410       1363      11415       1364      11418
GR     1364      11420       1363     11423       1362      11426       1361      11428       1360      11435
GR     1359      11444       1358     11455       1358      11463       1358      11480       1357      11486
GR     1356      11493       1355     11501       1354      11523       1353      11530       1352      11536
GR     1352      11557       1352     11572       1352      11584       1353      11587       1354      11590
GR     1355      11592       1356     11595       1357      11597       1358      11600       1359      11602
GR     1360      11605       1361     11615       1362      11622       1362      11632       1361      11634
GR     1360      11637       1359     11640       1359      11706       1359      11752       1359      11809
GR     1359      11810       1358     11812       1358      11813    1359.53      11820       1358      11821
GR     1358      11825       1359     11846       1359      11848       1358      11850       1357      11919
GR     1357      11961       1358     12210     1357.5      12500       1358      13245       1358      13310
GR     1360      14450
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NC    0.055      0.055      0.045        .1         .3
ET                 7.1        9.1                                                    12420      11443      11600
X1    5.095         71      11443      11600         42        210         48
  FILL TO 1359.8 TO THE LEFT OF STA 11443 FOR FLOW OVER THE ROAD
GR     1362      10000     1361.5     10180       1361      10350     1360.5      10520       1360      10690
GR   1359.8      11000     1359.8     11139     1359.8      11168     1359.8      11223     1359.8      11238
GR   1359.8      11286     1359.8     11372     1359.8      11375     1359.8      11377     1359.8      11378
GR   1359.8      11383       1360     11385       1360      11386       1360      11395       1361      11407
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GR     1361      11427       1361     11433       1362      11437       1363      11442       1363      11443
GR     1362      11449       1361     11458       1360      11461       1359      11464       1358      11466
GR     1357      11469       1356     11471       1355      11475       1354      11479       1353      11516
GR     1352      11537       1352     11557       1352      11564       1352      11570       1353      11574
GR     1354      11576       1355     11578       1356      11580       1357      11582       1358      11584
GR     1359      11587       1360     11592       1361      11596       1362      11600       1362      11611
GR     1361      11612       1360     11614       1359      11615       1358      11665    1357.75      11780
GR     1358      11802       1359     11829       1359      11837       1358      11839       1358      11840
GR     1359      11842       1359     11843       1359      11883       1359      11884       1358      11887
GR     1358      11889       1358     11892    1357.19      12007       1358      12350       1359      12980
GR     1360      13640
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ET                 7.1        9.1                                                    12330      11423      11554
X1    5.156         45      11423      11544        100        245        320
  FILL TO 1359.8 TO THE LEFT OF STA 11423 FOR FLOW OVER THE ROAD
GR     1362      10060     1361.5     10300       1361      10560     1360.5      10640       1360      10730
GR   1359.8      11000     1359.8     11193     1359.8      11333     1359.8      11349     1359.8      11354
GR     1360      11356       1360     11357     1359.8      11358     1359.8      11367       1360      11391
GR     1361      11405       1361     11423       1360      11428       1359      11431       1358      11434
GR     1357      11437       1356     11441       1355      11443       1354      11446       1354      11476
GR     1354      11483       1354     11516       1355      11519       1356      11522       1357      11529
GR     1358      11534       1359     11537       1360      11541       1361      11544       1361      11566
GR     1360      11576       1359     11599       1359      11618    1359.08      11716    1359.19      11902
GR     1360      11968       1360     11980       1359      12080     1359.7      12330       1360      13450
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ET                 7.1        9.1                                                    12180      11404      11521
X1    5.214         40      11404      11521        310        294        303
  FILL TO 1359.8 TO THE LEFT OF STA 11404 FOR FLOW OVER THE ROAD
GR     1362      10210     1361.8     10230     1361.5      10255     1361.2      10280       1361      10300
GR   1359.8      11000     1359.8     11182     1359.8      11334     1359.8      11337       1360      11340
GR     1360      11341       1360     11361       1361      11376       1362      11388       1362      11404
GR     1361      11408       1360     11411       1359      11413       1358      11416       1357      11418
GR     1356      11421       1355     11424       1355      11486       1356      11499       1357      11505
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GR	1358	11508	1359	11512	1360	11515	1361	11518	1362	11521
GR	1362	11540	1361	11551	1360	11564	1359.91	11567	1360	11699
GR	1360.1	11932	1361	12100	1360	12180	1360	12720	1362	13570

ET			9.1						11300	11534
X1	5.308	43	11420	11535	502	502	502			
GR	1364	10480	1363.5	10500	1363	10515	1362.5	10530	1362	10550
GR	1360.3	11000	1360.37	11176	1360	11356	1360	11360	1361	11362
GR	1361	11363	1360	11364	1360	11376	1361	11390	1362	11401
GR	1363	11411	1363	11420	1362	11427	1361	11429	1360	11432
GR	1359	11434	1358	11436	1357	11438	1356	11440	1355	11443
GR	1355	11448	1356	11507	1357	11511	1358	11514	1359	11518
GR	1360	11521	1361	11524	1362	11527	1363	11529	1364	11535
GR	1364	11543	1363	11550	1362	11559	1361	11575	1360.85	11709
GR	1361	11912	1361.62	11950	1362	12355				

ET			9.1						11414	11595
X1	5.403	38	11413	11595	500	500	500			
GR	1364	10730	1363.5	10800	1363	10860	1362.5	10940	1362	10990
GR	1361.9	11000	1361.34	11299	1362	11380	1363	11389	1364	11406
GR	1364	11413	1363	11416	1362	11419	1361	11423	1360	11426
GR	1359	11429	1358	11432	1357	11435	1357	11441	1357	11535
GR	1357	11544	1358	11550	1359	11558	1360	11565	1361	11573
GR	1362	11581	1363	11586	1364	11589	1365	11592	1366	11595
GR	1366	11597	1365	11610	1364	11617	1363	11627	1362	11642
GR	1362	11654	1362.39	11741	1362.74	11966				

ET			9.1						11307	11469
X1	5.498	37	11307	11469	490	499	498			
GR	1366	10850	1365.5	10880	1365	10910	1364.5	10930	1364	10960
GR	1363.2	11000	1363	11225	1362.81	11249	1363	11277	1364	11292
GR	1365	11295	1366	11300	1366	11307	1365	11311	1364	11314
GR	1363	11318	1362	11322	1361	11325	1360	11329	1359	11333
GR	1359	11442	1360	11448	1361	11451	1362	11454	1363	11457
GR	1364	11460	1365	11463	1366	11466	1367	11469	1367	11482
GR	1366	11493	1365	11499	1364	11507	1363	11528	1363	11587
GR	1363.3	11630	1363.67	11868						

ET			9.1						11413	11585
X1	5.550	46	11413	11585	280	265	272			
GR	1364.6	11000	1364	11099	1364	11108	1364	11120	1364	11122
GR	1364	11130	1364	11321	1364	11330	1364	11331	1364	11387
GR	1365	11392	1366	11396	1366	11413	1365	11416	1364	11419
GR	1363	11422	1362	11425	1361	11428	1360	11431	1359	11438
GR	1358	11443	1358	11444	1359	11447	1359	11454	1358	11463
GR	1358	11524	1359	11528	1360	11540	1361	11560	1362	11564
GR	1363	11566	1364	11569	1365	11572	1366	11575	1367	11579
GR	1368	11582	1369	11585	1369	11590	1368	11594	1367	11599
GR	1366	11605	1365	11614	1364	11647	1364	11665	1364.29	11722
GR	1364.5	11958								

ET			9.1						11400	11544
X1	5.593	43	11400	11544	216	236	226			
GR	1365.4	11000	1365	11128	1365	11180	1365	11207	1365	11208
GR	1365	11218	1364.28	11319	1365	11347	1365	11350	1365	11372
GR	1366	11376	1367	11391	1367	11400	1366	11404	1365	11408
GR	1364	11411	1363	11415	1362	11419	1361	11423	1360	11434
GR	1360	11491	1361	11506	1362	11509	1363	11512	1364	11515
GR	1365	11519	1366	11534	1367	11537	1368	11541	1369	11544
GR	1369	11546	1368	11558	1367	11566	1366	11575	1365	11591
GR	1365	11693	1365.24	11736	1366	11859	1366	11867	1365	11873
GR	1365	11875	1366	11877	1366	11923				

ET			9.1						11403	11549
X1	5.654	56	11403	11549	190	425	310			
GR	1367	10000	1367	10001	1367	10002	1367	10005	1366.5	10520
GR	1366	11000	1365.81	11013	1366	11238	1366	11262	1366	11301
GR	1367	11335	1367.07	11342	1367	11350	1367	11355	1368	11379
GR	1369	11390	1370	11397	1371	11402	1371	11403	1370	11406
GR	1369	11409	1368	11411	1367	11414	1366	11417	1365	11419
GR	1364	11422	1363	11425	1362	11428	1361	11454	1360	11499
GR	1360	11503	1361	11506	1362	11509	1363	11512	1364	11515
GR	1365	11518	1366	11521	1367	11535	1368	11539	1369	11544
GR	1370	11549	1370	11566	1369	11573	1368	11589	1368	11613
GR	1368	11634	1368	11639	1368.04	11708	1368	11714	1368	11719
GR	1368	11782	1367	11784	1367	11788	1368	11789	1368	11790
GR	1367	11793								

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ET                          9.1                                                                  11405       11529
X1     5.748          47    11405      11529        430        570        510
GR      1370       10030   1369.5      10200       1369      10400     1368.5      10600       1368       10800
GR    1367.5       11000     1368      11027       1368      11036       1368      11037       1368       11067
GR    1367.2       11262     1368      11364       1369      11378       1370      11388       1370       11405
GR      1369       11411     1368      11413       1367      11416       1367      11417       1367       11422
GR      1366       11425     1365      11428       1364      11430       1363      11434       1362       11441
GR      1362       11485     1363      11490       1364      11498       1365      11508       1366       11511
GR      1367       11514     1368      11517       1369      11520       1370      11523       1371       11526
GR      1372       11529     1372      11547       1371      11551       1370      11555       1369       11564
GR      1368       11624     1368      11625       1369      11718    1369.08      11731       1369       11746
GR      1369       11773   1369.2      11935


NC     0.060       0.055     0.045
ET                          9.1                                                                  11398       11530
X1     5.843          40    11398      11530        494        490        492
GR      1372       10690   1371.5      10705       1371      10720     1370.5      10735       1370       10750
GR    1369.5       11000  1369.45      11289       1370      11364       1371      11375       1372       11383
GR      1372       11398     1371      11399       1370      11402       1369      11403       1368       11405
GR      1367       11406     1366      11408       1365      11409       1364      11414       1364       11489
GR      1365       11493     1366      11498       1367      11503       1368      11507       1369       11512
GR      1370       11516     1371      11521       1372      11525       1373      11530       1373       11532
GR      1372       11544     1371      11550       1370      11556       1369      11569       1369       11589
GR      1369       11619     1369      11624    1369.37      11698    1369.47      11903       1372       12420


NC     0.060       0.055     0.040
ET                          9.1                                                                  11392       11532
X1     5.938          42    11392      11532        500        470        495
GR    1371.2       11000  1371.53      11248       1372      11320       1372      11328       1372       11331
GR      1373       11333     1373      11335       1372      11339       1372      11355       1373       11363
GR      1374       11374     1374      11392       1373      11394       1372      11397       1371       11399
GR      1370       11401     1369      11404       1368      11406       1367      11409       1366       11411
GR      1365       11413     1365      11490       1366      11500       1367      11507       1368       11513
GR      1369       11518     1370      11523       1371      11528       1372      11532       1372       11544
GR      1371       11583     1371      11614       1371      11654       1371      11661    1370.63       11716
1
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GR      1371       11756     1371      11762       1371      11764       1370      11798       1370       11869
GR      1370       11909     1372      12420


ET                          9.1                                                                  11372       11509
X1     6.033          53    11372      11509        445        440        500
GR    1372.3       11000  1372.44      11137       1373      11313       1374      11322       1374       11324
GR      1373       11325     1373      11328       1374      11329       1374      11332       1374       11342
GR      1375       11350     1376      11357       1377      11367       1377      11372       1376       11376
GR      1375       11380     1374      11383       1373      11386       1372      11389       1371       11392
GR      1370       11394     1369      11397       1368      11399       1367      11408       1366       11446
GR      1366       11464     1366      11465       1367      11469       1368      11473       1369       11474
GR      1370       11481     1371      11485       1372      11489       1373      11493       1374       11497
GR      1375       11501     1376      11505       1377      11509       1377      11520       1376       11523
GR      1375       11527     1374      11530       1373      11533       1372      11537       1371       11540
GR      1370       11543     1370      11547       1371      11554       1372      11571       1373       11584
GR      1373       11608  1372.48      11660    1372.63      11910


NC     0.070       0.055     0.040
ET                          9.1                                                                  11399       11530
X1     6.126          40    11399      11530        470        505        488
GR    1374.2       11000   1374.3      11077       1374      11172       1374      11237       1375       11242
GR      1375       11246     1375      11250       1375      11254       1374      11281       1374       11282
GR      1375       11366     1376      11373       1377     1138 0       1377      11399       1376       11405
GR      1375       11408     1374      11411       1373      11413       1372      11416       1371       11419
GR      1370       11422     1369      11425       1368      11427       1368      11496       1369       11500
GR      1370       11504     1371      11508       1372      11513       1373      11517       1374       11521
GR      1375       11525     1376      11530       1376      11543       1375      11548       1374       11554
GR      1374       11570     1374      11645    1373.82      11692       1374      11739    1374.45       11920


NC     0.075       0.055     0.040
ET                          9.1                                                                  11399       11529
X1     6.220          47    11399      11529        510        490        500
GR    1375.6       11000  1375.54      11027       1376      11092       1377      11096       1377       11097
GR      1376       11099     1376      11100       1377      11103       1377      11113       1376       11141
GR      1375       11200     1375      11299       1375      11311       1375      11365       1376       11368
GR      1377       11372     1378      11376       1378      11399       1377      11403       1376       11406
GR      1375       11409     1374      11412       1373      11416       1372      11419       1371       11422
GR      1370       11425     1369      11428       1369      11463       1370      11499       1371       11506
GR      1372       11510     1373      11513       1374      11516       1375      11519       1376       11523
GR      1377       11526     1378      11529       1378      11539       1377      11543       1376       11548
GR      1375       11553     1374      11588       1374      11678    1374.63      11736       1375       11811
GR      1376       11909  1375.99      11910
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ET                          9.1                                                                  11445       11566
X1    6.279         47      11445      11566        325        285        305
GR   1377.6      11000     1376.72      11003       1377      11024       1374      11158       1374       11161
GR     1375      11162       1376      11194       1376      11247       1375      11390       1375       11405
GR     1376      11410       1377      11414       1378      11419       1379      11424       1380       11430
GR     1380      11445       1379      11447       1378      11449       1377      11452       1376       11454
GR     1375      11468       1374      11472       1373      11476       1372      11480       1371       11483
1
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GR     1370      11487       1370      11539       1371      11542       1372      11544       1373       11547
GR     1374      11549       1375      11552       1376      11554       1377      11556       1378       11559
GR     1379      11561       1380      11563       1381      11566       1381      11574       1380       11577
GR     1379      11581       1378      11584       1377      11588       1376      11591    1375.06       11652
GR   1375.9      11833       1378      12320

NC    0.075      0.065      0.040
ET                          9.1                                                                  11282       11421
X1    6.360         56      11282      11421        600        380        490
GR     1378      10900     1377.7      10920     1377.4      10940     1377.1      10960     1376.9       10980
GR   1376.7      11000       1377      11011       1377      11014       1377      11066       1377       11086
GR   1376.1      11119       1376      11165       1376      11248       1377      11251       1378       11254
GR     1379      11257       1380      11260       1381      11264       1381      11282       1380       11285
GR     1379      11288       1378      11292       1377      11305       1376      11308       1375       11311
GR     1374      11314       1373      11318       1372      11322       1371      11326    1370.55       11328
GR     1371      11375    1371.02      11382       1372      11385       1373      11389       1374       11392
GR     1375      11396       1376      11399       1377      11402       1378      11405       1379       11408
GR     1380      11411       1381      11414       1382      11421       1382      11426       1381       11428
GR     1380      11430       1379      11431       1378      11433       1377      11435       1377       11543
GR     1377      11556       1377      11565    1377.28      11592       1378      11691       1378       11700
GR     1378      11743

ET                          9.1                                                                  11297       11433
X1    6.426         59      11297      11433        380        295        340
GR     1380      10990     1379.7      10992     1379.4      10994     1379.1      10996     1378.8       10998
GR   1378.5      11000    1378.24      11149       1378      11169       1378      11231       1379       11254
GR     1380      11264       1381      11274       1382      11281       1383      11288       1383       11297
GR     1382      11301       1381      11305       1380      11309       1379      11313       1378       11323
GR     1377      11326       1376      11330       1375      11334       1374      11338       1373       11342
GR     1372      11347    1371.84      11348       1372      11362       1372      11374    1371.45       11387
GR     1372      11390       1373      11394       1374      11398       1375      11403       1376       11407
GR     1377      11410       1378      11413       1379      11415       1380      11418       1381       11420
GR     1382      11423       1383      11425       1384      11428       1385      11430       1386       11433
GR     1386      11439       1385      11441       1384      11443       1383      11445       1382       11447
GR     1381      11449       1380      11451       1379      11453       1378      11460       1378       11467
GR     1378      11472       1378      11561    1378.09      11577     1378.7      11715

NC    0.075      0.065      0.045
  Downstream of Hawes Rd.
ET                          9.1                                                                  11368       11527
X1    6.467         45      11368      11527        300        175        203
GR   1379.5      11000       1380      11124       1380      11171       1380      11178       1380       11326
GR     1381      11339       1382      11347       1383      11354       1383      11368       1382       11373
GR     1381      11377       1380      11382       1379      11386       1378      11392       1377       11398
GR     1376      11403       1375      11408       1374      11412       1373      11415       1372       11419
GR   1371.8      11422       1372      11427       1372      11442       1372      11452     1372.1       11476
GR     1373      11479       1374      11484       1375      11488       1376      11492       1377       11496
GR     1378      11500       1379      11504       1380      11508       1381      11513       1382       11517
GR     1383      11520       1384      11524       1385      11527       1385      11538       1384       11540
GR     1383      11542       1382      11544       1381      11560       1380      11565       1380       11600

1
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        THIS CROSS SECTION IS SECTION 999.6 FROM THE UPSTREAM STUDY
                SPRR TO HAWES ROAD - AT THE DOWNSTREAM SIDE OF
                THE HAWES ROAD BRIDGE

NC    0.040      0.040      0.028         .3         .5
ET                          9.1                                                                    925        1078
        AT THE DOWNSTREAM SIDE OF HAWES ROAD
X1    6.470         14        925       1078         30         30
GR   1381.1        777     1381.6        808       1382        855     1382.4        891     1381.1        916
GR     1382        925     1372.5        965     1372.5       1000     1372.5       1035       1382       1078
GR   1382.4       1099     1382.2       1140       1382       1179       1386       1223
1
   21APR99      12:13:42                                                                                    PAGE   14

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST
```

```
 *PROF 1
0

 CCHV=     .100 CEHV=     .300
 1490 NH CARD USED
 *SECNO 4.040
      4.040      4.55   1340.35       .00   1340.35   1340.81       .46       .00       .00   1335.80
     3006.0     176.6    2329.1     500.3      77.9     386.7     190.2        .0        .0   1335.80
        .00      2.27      6.02      2.63      .050      .025      .040      .000   1335.80   9928.68
    .001361      370.      365.      360.         0         0         0       .00    195.32  10124.00


 *SECNO 4.050
      4.050      4.23   1340.73       .00       .00   1341.28       .56       .44       .03   1336.50
     3006.0     128.7    2389.1     488.2      29.8     380.4     102.8       4.0       1.2   1336.50
        .01      4.32      6.28      4.75      .025      .025      .025      .000   1336.50   9940.91
    .001633      310.      300.      290.         2         0         0       .00    146.42  10087.33


 CCHV=     .300 CEHV=     .500
 *SECNO 4.070

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      1350.00 ELREA=      1350.00

      4.070      5.27   1342.97   1342.97       .00   1344.82      1.85       .28       .65   1350.00
     3006.0        .0    3006.0        .0        .0     275.3        .0       4.9       1.4   1350.00
        .02       .00     10.92       .00      .000      .025      .000      .000   1337.70   9962.30
    .006153      100.      100.      100.        20        11         0       .00     75.52  10037.81


 CCHV=     .300 CEHV=     .500

 SPECIAL BRIDGE

1
   21APR99      12:13:42                                                                                    PAGE   15

     SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
     Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
     TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
     SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


 SB  XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
       .90       1.56       2.63        .00      65.00      12.00     941.60       3.50    1337.70    1337.70

 *SECNO 4.085
 3280 CROSS SECTION      4.09 EXTENDED       .88 FEET


 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.89

 CLASS A LOW FLOW

 3420 BRIDGE W.S.=    1342.04 BRIDGE VELOCITY=      10.14     CALCULATED CHANNEL AREA=       296.

  EGPRS      EGLWC       H3        QWEIR      QLOW       BAREA    TRAPEZOID      ELLC      ELTRD      WEIRLN
                                                                     AREA
        .00   1345.62      1.91        0.      3006.       942.      968.     1348.40   1350.90         0.


 3470 ENCROACHMENT STATIONS=     9910.0   10110.0  TYPE=      1  TARGET=      200.000

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      1350.90 ELREA=      1350.90

         AT THE UPSTREAM SIDE OF POWER ROAD         5.065
      4.085      7.18   1344.88       .00       .00   1345.62       .74       .80       .00   1350.00
     3006.0        .0    3006.0        .0        .0     434.3        .0       5.6       1.6   1350.00
        .02       .00      6.92       .00      .000      .025      .000      .000   1337.70   9956.24
    .001728       90.       90.       90.         0         0         0       .00     90.88  10047.12


 CCHV=     .300 CEHV=     .500
 *SECNO 4.096

 3265 DIVIDED FLOW

 3280 CROSS SECTION      4.10 EXTENDED       .37 FEET


 3301 HV CHANGED MORE THAN HVINS
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.44

4.096	8.87	1345.87	.00	.00	1345.88	.01	.03	.22	1350.00
3010.0	693.8	608.7	1707.5	1664.3	566.9	3025.7	13.9	5.7	1349.00
.06	.42	1.07	.56	.055	.050	.055	.000	1337.00	9984.52
.000146	67.	67.	180.	2	0	0	.00	2915.90	12980.00

CCHV= .100 CEHV= .300
*SECNO 4.138

3265 DIVIDED FLOW

3280 CROSS SECTION 4.14 EXTENDED .11 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .70

4.138	7.91	1345.91	.00	.00	1345.93	.01	.05	.00	1351.00
3010.0	1106.0	596.6	1307.4	2098.6	415.1	2101.3	39.5	22.2	1348.00
.15	.53	1.44	.62	.055	.050	.055	.000	1338.00	9437.60
.000300	221.	225.	229.	2	0	0	.00	3480.38	12980.00

*SECNO 4.226

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .52

4.226	6.14	1346.14	.00	.00	1346.17	.04	.24	.01	1353.00
3010.0	1178.6	964.9	866.5	1303.6	403.1	1013.9	78.6	56.1	1352.00
.24	.90	2.39	.85	.055	.055	.055	.000	1340.00	9863.66
.001117	457.	465.	473.	2	0	0	.00	2889.13	12842.71

*SECNO 4.321

3265 DIVIDED FLOW

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .27

4.321	6.87	1346.87	1345.79	.00	1347.81	.94	1.37	.27	1353.00
3010.0	177.3	2784.5	48.2	110.9	344.4	47.9	97.0	76.6	1353.00
.26	1.60	8.09	1.01	.055	.060	.055	.000	1340.00	10977.29
.014883	502.	497.	490.	6	10	0	.00	706.03	12196.21

*SECNO 4.416

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.01

4.416	8.06	1349.06	.00	.00	1349.09	.02	1.18	.09	1354.00
3010.0	855.7	795.1	1359.1	988.7	421.6	1434.7	116.1	94.1	1355.00
.38	.87	1.89	.95	.055	.065	.055	.000	1341.00	10415.84
.000927	488.	496.	505.	5	0	0	.00	2349.76	12849.75

*SECNO 4.510

3265 DIVIDED FLOW

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3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .63

     4.510      7.75   1349.75       .00       .00   1349.79       .05       .70       .01   1354.00
    3010.0     477.3     869.7    1663.0     722.6     361.8    1078.4     144.9     118.7   1356.00
       .46       .66      2.40      1.54      .100      .070      .055      .000   1342.00  10451.18
   .002368      510.      503.      493.         4         0         0       .00   1928.48  12465.55


*SECNO 4.605
1
   21APR99      12:13:42                                                                                    PAGE   18

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3265 DIVIDED FLOW


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .60

     4.605      7.50   1351.50       .00       .00   1351.68       .18      1.85       .04   1356.00
    3010.0     347.3    1579.0    1083.7     444.7     357.9     563.9     165.1     140.0   1358.00
       .51       .78      4.41      1.92      .100      .065      .055      .000   1344.00  10468.37
   .006570      505.      500.      496.         5         0         0       .00   1791.01  12347.43


*SECNO 4.699

3265 DIVIDED FLOW


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.02

     4.699      7.09   1353.09       .00       .00   1353.13       .04      1.44       .01   1358.00
    3010.0     389.4    1042.7    1578.0     696.1     433.4    1323.0     186.8     162.7   1359.00
       .60       .56      2.41      1.19      .100      .065      .055      .000   1346.00  10498.73
   .001615      473.      490.      511.         3         0         0       .00   2213.94  12790.77


*SECNO 4.794

3265 DIVIDED FLOW


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .68

     4.794      6.16   1354.16       .00       .00   1354.31       .15      1.15       .03   1360.00
    3010.0     258.6    1657.5    1093.9     417.6     412.1     897.8     211.1     188.4   1360.00
       .65       .62      4.02      1.22      .100      .060      .060      .000   1348.00  10602.88
   .003450      503.      503.      507.         3         0         0       .00   2222.49  12920.00


*SECNO 4.889

3265 DIVIDED FLOW

     4.889      6.06   1356.06       .00       .00   1356.23       .17      1.91       .01   1361.00
    3010.0     594.1    1691.2     724.7     681.0     401.4     413.3     229.2     208.5   1361.00
       .69       .87      4.21      1.75      .100      .060      .065      .000   1350.00  10509.52
   .004409      488.      495.      490.         2         0         0       .00   1346.16  11935.02


1
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    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


*SECNO 4.985

3265 DIVIDED FLOW


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.73

     4.985      6.30   1357.30       .00       .00   1357.35       .05      1.11       .01   1361.00
    3010.0     859.2    1205.4     945.4    1310.6     432.0    1076.7     251.0     225.8   1363.00
       .78       .66      2.79       .88      .100      .055      .070      .000   1351.00  10240.54
   .001477      370.      500.      500.         3         0         0       .00   2220.70  12540.00


*SECNO 5.023

3265 DIVIDED FLOW

     5.023      6.55   1357.55       .00       .00   1357.61       .07       .26       .00   1363.00
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    3010.0      561.8    1577.5     870.8     976.7     572.9    1065.1     263.0     235.2   1365.00
       .81        .58      2.75       .82      .100      .055      .070      .000   1351.00  10474.58
   .001200       235.      207.      140.         2         0         0       .00   2107.27  12690.00


 CCHV=     .300 CEHV=     .500
 *SECNO 5.065

 3265 DIVIDED FLOW


 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
        DOWNSTREAM OF SOSSAMANN ROAD        5.074
     5.065       6.64   1358.64   1358.64       .00   1359.31       .67       .46       .30   1358.00
    3010.0       15.3    2354.8     639.9      16.8     319.4     396.3     269.6     240.3   1359.00
       .81        .91      7.37      1.61      .100      .055      .070      .000   1352.00  11532.57
   .009539       280.      195.       80.        20         8         0       .00    708.65  12365.00


 CCHV=     .300 CEHV=     .500
1
   21APR99      12:13:42                                                                                PAGE   20

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


 SPECIAL BRIDGE

 SB  XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
       .00       1.56       2.60        .00      28.00        .00     141.40        .00    1350.60    1349.50

 *SECNO 5.074
  PRESS FLOW BECAUSE EGLWC OF    1359.31  EXCEEDS 1.5 DEPTH

 3265 DIVIDED FLOW


 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.43

 PRESSURE AND WEIR FLOW,  Weir Submergence Based on TRAPEZOIDAL Shape


  EGPRS       EGLWC       H3        QWEIR       QPR        BAREA   TRAPEZOID      ELLC      ELTRD      WEIRLN
                                                                      AREA
   1369.62    1359.31       .00      2258.       781.       141.      168.     1356.60    1355.00      1018.


        UPSTREAM OF SOSSAMAN ROAD          6.470
     5.074       7.30   1359.30       .00       .00   1359.38       .08       .07       .00   1358.00
    3010.0       70.7    1287.8    1651.5      82.6     435.8    1157.6     270.4     240.8   1358.00
       .82        .86      2.96      1.43      .055      .065      .055      .000   1352.00  11272.16
   .001620        60.       60.       15.         2         0         6       .00   1171.13  12850.01


 CCHV=     .100 CEHV=     .300
 *SECNO 5.086

 3265 DIVIDED FLOW

     5.086       7.71   1359.71       .00       .00   1359.76       .05       .38       .00   1364.00
    3010.0         .0    1623.7    1386.3        .0     778.9     986.7     283.7     249.5   1362.00
       .87        .00      2.08      1.41      .000      .065      .055      .000   1352.00  11437.60
   .001079        34.       70.      500.         2         0         0       .00    738.68  12210.00


 CCHV=     .100 CEHV=     .300
1
   21APR99      12:13:42                                                                                PAGE   21

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


 *SECNO 5.095

 3265 DIVIDED FLOW


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.58
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     5.095      7.79   1359.79       .00       .00   1359.84       .05       .08       .00   1363.00
    3010.0        .0    1734.9    1275.1        .0     775.1    1423.5     290.4     252.8   1362.00
       .89       .00      2.24       .90      .000      .045      .055      .000   1352.00  11461.64
   .000433       42.       48.      210.         2         0         0       .00    865.08  12350.01

 *SECNO 5.156

 3265 DIVIDED FLOW

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .40

     5.156      5.87   1359.87       .00       .00   1360.18       .31       .26       .08   1361.00
    3010.0       6.7    2555.4     447.9      29.2     531.9     430.2     300.4     258.3   1361.00
       .91       .23      4.80      1.04      .055      .045      .055      .000   1354.00  10905.05
   .002710      100.      320.      245.         2         0         0       .00   1295.03  12330.00

 *SECNO 5.214

 3265 DIVIDED FLOW

     5.214      5.70   1360.70       .00       .00   1360.91       .21       .73       .01   1362.00
    3010.0     542.7    2191.2     276.1     557.2     512.9     306.5     308.6     268.2   1362.00
       .93       .97      4.27       .90      .055      .045      .055      .000   1355.00  10477.03
   .002147      310.      303.      294.         2         0         0       .00   1546.73  12180.00

 *SECNO 5.308

 3265 DIVIDED FLOW

     5.308      6.66   1361.66       .00       .00   1361.81       .14       .88       .01   1363.00
    3010.0     912.4    1877.5     220.1     796.2     505.2     267.2     325.6     284.5   1364.00
       .98      1.15      3.72       .82      .055      .045      .055      .000   1355.00  10638.83
   .001472      502.      502.      502.         2         0         0       .00   1289.79  11997.36

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   21APR99      12:13:42                                                                          PAGE   22

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

 *SECNO 5.403

 3265 DIVIDED FLOW

     5.403      5.42   1362.42       .00       .00   1362.61       .19       .79       .01   1364.00
    3010.0     289.5    2709.0      11.5     313.2     739.8      25.9     340.8     296.1   1366.00
      1.02       .92      3.66       .44      .055      .045      .055      .000   1357.00  10948.25
   .001684      500.      500.      500.         2         0         0       .00    723.77  11758.66

 *SECNO 5.498

 3265 DIVIDED FLOW

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .68

     5.498      4.48   1363.48       .00       .00   1363.85       .37      1.19       .05   1366.00
    3010.0     111.3    2853.2      45.5     120.5     569.2      56.4     351.2     304.0   1367.00
      1.05       .92      5.01       .81      .055      .045      .055      .000   1359.00  10985.76
   .003674      490.      498.      499.         2         0         0       .00    671.89  11748.80

 *SECNO 5.550

 3265 DIVIDED FLOW

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.49

     5.550      6.28   1364.28       .00       .00   1364.51       .23       .65       .01   1366.00
    3010.0      39.8    2965.2       5.0      86.9     758.6      13.9     356.2     307.9   1369.00
      1.07       .46      3.91       .36      .055      .045      .055      .000   1358.00  11052.97
   .001665      280.      272.      265.         2         0         0       .00    569.12  11719.82

 *SECNO 5.593

 3265 DIVIDED FLOW

 3301 HV CHANGED MORE THAN HVINS

1
   21APR99      12:13:42                                                                          PAGE   23
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    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .45

     5.593      4.58   1364.58       .00        .00   1365.41       .82        .72        .18   1367.00
    3010.0       5.9    3004.1        .0        8.4     412.7        .0      359.5      309.8   1369.00
      1.08       .70      7.28       .00       .055      .045      .000       .000    1360.00  11275.98
   .008253      216.      226.      236.          2         0         0        .00     163.05  11517.35


*SECNO 5.654

3265 DIVIDED FLOW


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.61

     5.654      6.55   1366.55       .00        .00   1366.92       .37       1.47        .05   1371.00
    3010.0     315.3    2694.7        .0      341.3     526.1        .0      363.7      312.6   1370.00
      1.10       .92      5.12       .00       .055      .045      .000       .000    1360.00  10465.18
   .003176      190.      310.      425.          3         0         0        .00     968.03  11528.75


*SECNO 5.748

3265 DIVIDED FLOW

     5.748      6.24   1368.24       .00        .00   1368.66       .42       1.72        .02   1370.00
    3010.0     347.7    2660.5       1.7      316.9     483.2       4.3      372.8      321.6   1372.00
      1.13      1.10      5.51       .40       .055      .045      .055       .000    1362.00  10707.57
   .003719      430.      510.      570.          2         0         0        .00     801.18  11646.49


*SECNO 5.843

3265 DIVIDED FLOW

     5.843      5.86   1369.86       .00        .00   1370.19       .33       1.53        .01   1372.00
    3010.0      93.4    2720.1     196.5      155.6     560.7     208.2      382.6      332.1   1373.00
      1.16       .60      4.85       .94       .060      .045      .055       .000    1364.00  10819.52
   .002632      494.      492.      490.          2         0         0        .00    1063.92  11982.90


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   21APR99      12:13:42                                                                                    PAGE   24

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


*SECNO 5.938

3265 DIVIDED FLOW

     5.938      5.96   1370.96       .00        .00   1371.25       .29       1.05        .00   1374.00
    3010.0        .0    2792.6     217.4         .0     628.5     256.3      392.8      341.4   1372.00
      1.19       .00      4.44       .85       .000      .040      .055       .000    1365.00  11399.07
   .001759      500.      495.      470.          2         0         0        .00     605.12  12155.55


*SECNO 6.033

3265 DIVIDED FLOW


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .65

     6.033      6.00   1372.00       .00        .00   1372.65       .65       1.29        .11   1377.00
    3010.0        .0    2942.6      67.4         .0     451.7      33.1      400.4      345.2   1377.00
      1.21       .00      6.52      2.04       .000      .040      .055       .000    1366.00  11389.00
   .004221      445.      500.      440.          2         0         0        .00     134.04  11571.02


*SECNO 6.126

3265 DIVIDED FLOW

     6.126      5.88   1373.88       .00        .00   1374.40       .51       1.74        .01   1377.00
    3010.0        .0    3009.9        .1         .0     523.4        .9      406.1      346.8   1376.00
      1.23       .00      5.75       .14       .000      .040      .055       .000    1368.00  11411.24
   .003033      470.      488.      505.          2         0         0        .00     140.76  11707.74


*SECNO 6.220

3265 DIVIDED FLOW
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     6.220      6.32   1375.32       .00       .00   1375.64       .32      1.22       .02   1378.00
    3010.0      22.4    2683.3     304.3      55.4     557.7     248.0     414.0     351.0   1378.00
      1.27       .40      4.81      1.23      .075      .040      .055      .000   1369.00  11181.32
   .002018      510.      500.      490.         2         0         0       .00    587.46  11842.03


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   21APR99      12:13:42                                                                                    PAGE   25

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *SECNO 6.279

 3265 DIVIDED FLOW

     6.279      6.02   1376.02   1374.32       .00   1376.53       .51       .84       .06   1380.00
    3010.0     221.8    2647.4     140.8     207.8     432.8     128.6     419.7     355.5   1381.00
      1.28      1.07      6.12      1.09      .075      .040      .055      .000   1370.00  11067.88
   .003946      325.      305.      285.         4        15         0       .00    711.57  11860.26


 *SECNO 6.360

 3265 DIVIDED FLOW

     6.360      7.05   1377.60       .00       .00   1377.92       .32      1.37       .02   1381.00
    3010.0     339.4    2604.0      66.6     331.5     536.3      97.4     429.8     363.3   1382.00
      1.31      1.02      4.86       .68      .075      .040      .065      .000   1370.55  10926.81
   .002029      600.      490.      380.         2         0         0       .00    634.43  11635.69


 *SECNO 6.426

 3265 DIVIDED FLOW


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .69

     6.426      6.85   1378.30   1376.46       .00   1379.00       .69       .97       .11   1383.00
    3010.0      13.2    2971.5      25.3      25.0     442.2      40.7     435.7     367.3   1386.00
      1.33       .53      6.72       .62      .075      .040      .065      .000   1371.45  11111.29
   .004232      380.      340.      295.         4        11         0       .00    388.37  11625.83


 *SECNO 6.467
     6.467      7.50   1379.30       .00       .00   1379.65       .35       .62       .03   1383.00
    3010.0        .0    3010.0        .0        .0     633.7        .0     438.4     368.6   1385.00
      1.34       .00      4.75       .00      .000      .045      .000      .000   1371.80  11384.80
   .002302      300.      203.      175.         2         0         0       .00    120.40  11505.20


 CCHV=     .300 CEHV=     .500
 *SECNO 6.470
1
   21APR99      12:13:42                                                                                    PAGE   26

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.77

        AT THE DOWNSTREAM SIDE OF HAWES ROAD
     6.470      6.91   1379.41       .00       .00   1379.70       .29       .04       .02   1382.00
    3010.0        .0    3010.0        .0        .0     691.3        .0     438.8     368.7   1382.00
      1.34       .00      4.35       .00      .000      .028      .000      .000   1372.50    935.94
   .000739       30.       30.       30.         1         0         0       .00    130.31   1066.24


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   21APR99      12:13:42                                                                                    PAGE   27


 T1      01498-28-0      FLOODWAY  RUN           RWC   3-23-99
 T2      MIDDLE QUEEN CREEK FLOOD DELINEATION STUDY
 T3      POWER ROAD TO HAWES ROAD
 T4              THIS MODEL ASSUMES THAT THE LEVEE SYSTEM ARE NOT STABLE
 T5      AND WILL BE BREACHED.

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                 3                                                                  1340.35

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
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      15                  -1

1
   21APR99      12:13:42                                                                                                PAGE   28

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

 *PROF 2
0

 CCHV=     .100 CEHV=     .300
 1490 NH CARD USED
 *SECNO 4.040
     4.040      4.55   1340.35       .00   1340.35   1340.81       .46       .00       .00   1335.80
    3006.0     176.6    2329.1     500.3      77.9     386.7     190.2        .0        .0   1335.80
       .00      2.27      6.02      2.63      .050      .025      .040      .000   1335.80   9928.68
   .001361      370.      365.      360.         0         0         0       .00    195.32  10124.00

 *SECNO 4.050
     4.050      4.23   1340.73       .00       .00   1341.28       .56       .44       .03   1336.50
    3006.0     128.7    2389.1     488.2      29.8     380.4     102.8       4.0       1.2   1336.50
       .01      4.32      6.28      4.75      .025      .025      .025      .000   1336.50   9940.91
   .001633      310.      300.      290.         2         0         0       .00    146.42  10087.33

 CCHV=     .300 CEHV=     .500
 *SECNO 4.070

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      1350.00 ELREA=      1350.00

     4.070      5.27   1342.97   1342.97       .00   1344.82      1.85       .28       .65   1350.00
    3006.0        .0    3006.0        .0        .0     275.3        .0       4.9       1.4   1350.00
       .02       .00     10.92       .00      .000      .025      .000      .000   1337.70   9962.30
   .006153      100.      100.      100.        20        11         0       .00     75.52  10037.81

 CCHV=     .300 CEHV=     .500

 SPECIAL BRIDGE

1
   21APR99      12:13:42                                                                                                PAGE   29

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

 SB  XK        XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
      .90       1.56       2.63        .00      65.00      12.00     941.60       3.50   1337.70   1337.70

 *SECNO 4.085
 3280 CROSS SECTION      4.09 EXTENDED       .88 FEET

 3301 HV CHANGED MORE THAN HVINS

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.89

 CLASS A LOW FLOW

 3420 BRIDGE W.S.=    1342.04 BRIDGE VELOCITY=      10.14     CALCULATED CHANNEL AREA=       296.

  EGPRS      EGLWC      H3         QWEIR      QLOW       BAREA    TRAPEZOID      ELLC      ELTRD      WEIRLN
                                                                      AREA
       .00   1345.62      1.91        0.      3006.       942.       968.     1348.40   1350.90        0.


 3470 ENCROACHMENT STATIONS=     9910.0   10110.0  TYPE=      1  TARGET=      200.000

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      1350.90 ELREA=      1350.90

        AT THE UPSTREAM SIDE OF POWER ROAD         5.065
     4.085      7.18   1344.88       .00   1344.88   1345.62       .74       .80       .00   1350.00
    3006.0        .0    3006.0        .0        .0     434.3        .0       5.6       1.6   1350.00
       .02       .00      6.92       .00      .000      .025      .000      .000   1337.70   9956.24
   .001728       90.       90.       90.         0         0         0       .00     90.88  10047.12
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CCHV=     .300 CEHV=     .500
*SECNO 4.096

3265 DIVIDED FLOW

3280 CROSS SECTION      4.10 EXTENDED       .06 FEET


3470 ENCROACHMENT STATIONS=    11390.0   11690.0  TYPE=      1  TARGET=      300.000
     4.096      8.55   1345.55       .00   1345.87   1345.91       .36       .17       .12   1350.00
    3010.0      10.3    2684.6     315.1       8.3     533.9     151.3       6.7       2.0   1349.00
       .02      1.24      5.03      2.08      .055      .050      .055      .000   1337.00  11390.00
   .003409       67.       67.      180.         2         0         0       .00    216.71  11690.00


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   21APR99      12:13:42                                                                                                PAGE   30

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


CCHV=     .100 CEHV=     .300
*SECNO 4.138

3265 DIVIDED FLOW

3280 CROSS SECTION      4.14 EXTENDED       .52 FEET


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.50


3470 ENCROACHMENT STATIONS=    11160.0   11750.0  TYPE=      1  TARGET=      590.000
     4.138      8.32   1346.32       .00   1345.91   1346.43       .11       .49       .02   1351.00
    3010.0     552.4    1497.7     959.9     371.4     450.4     521.3      12.0       3.9   1348.00
       .05      1.49      3.33      1.84      .055      .050      .055      .000   1338.00  11160.00
   .001507      221.      225.      229.         2         0         0       .00    532.48  11750.00


*SECNO 4.226

3265 DIVIDED FLOW

3280 CROSS SECTION      4.23 EXTENDED       .75 FEET


3470 ENCROACHMENT STATIONS=    11090.0   11950.0  TYPE=      1  TARGET=      860.000
     4.226      6.95   1346.95       .00   1346.14   1347.01       .05       .58       .01   1353.00
    3010.0     765.0    1164.7    1080.3     552.6     480.9     792.6      28.9      10.9   1352.00
       .12      1.38      2.42      1.36      .055      .055      .055      .000   1340.00  11090.00
   .001032      457.      465.      473.         2         0         0       .00    782.18  11950.00


*SECNO 4.321

3265 DIVIDED FLOW


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .45


3470 ENCROACHMENT STATIONS=    11160.0   12000.0  TYPE=      1  TARGET=      840.000
     4.321      7.75   1347.75       .00   1346.87   1348.06       .31       .98       .08   1353.00
    3010.0     530.0    2136.9     343.1     235.4     414.5     225.0      44.3      18.9   1353.00
       .15      2.25      5.16      1.52      .055      .060      .055      .000   1340.00  11160.00
   .005175      502.      497.      490.         2         0         0       .00    619.55  12000.00


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   21APR99      12:13:42                                                                                                PAGE   31

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


*SECNO 4.416

3265 DIVIDED FLOW


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.68


3470 ENCROACHMENT STATIONS=    11260.0   12040.0  TYPE=      1  TARGET=      780.000
     4.416      8.44   1349.44       .00   1349.06   1349.52       .08      1.43       .02   1354.00
    3010.0     297.3    1259.1    1453.7     205.7     457.6     824.8      57.8      26.5   1355.00
       .22      1.45      2.75      1.76      .055      .065      .055      .000   1341.00  11260.00
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   .001831      488.      496.      505.         2         0         0       .00    701.23  12040.00

 *SECNO 4.510

 3265 DIVIDED FLOW

 3470 ENCROACHMENT STATIONS=    11320.0   12000.0  TYPE=      1  TARGET=      680.000
      4.510      8.37   1350.37       .00   1349.75   1350.44       .07       .92       .00   1354.00
     3010.0      25.0     977.1    2007.8      41.9     425.0    1013.3      74.8      33.9   1356.00
        .29       .60      2.30      1.98      .100      .070      .055      .000   1342.00  11320.00
   .001856      510.      503.      493.         3         0         0       .00    610.72  12000.00

 *SECNO 4.605

 3265 DIVIDED FLOW

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .59

 3470 ENCROACHMENT STATIONS=    11320.0   12070.0  TYPE=      1  TARGET=      750.000
      4.605      7.76   1351.76       .00   1351.50   1351.94       .18      1.47       .03   1356.00
     3010.0      76.4    1581.9    1351.7      78.7     384.3     587.6      89.2      41.3   1358.00
        .33       .97      4.12      2.30      .100      .065      .055      .000   1344.00  11320.00
   .005382      505.      500.      496.         2         0         0       .00    667.95  12070.00

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   21APR99      12:13:42                                                                                PAGE   32

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

 *SECNO 4.699

 3265 DIVIDED FLOW

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.64

 3470 ENCROACHMENT STATIONS=    11280.0   12130.0  TYPE=      1  TARGET=      850.000
      4.699      7.42   1353.42       .00   1353.09   1353.49       .08      1.54       .01   1358.00
     3010.0     123.9    1294.0    1592.1     157.8     466.3     926.2     104.2      49.6   1359.00
        .39       .78      2.78      1.72      .100      .065      .055      .000   1346.00  11280.00
   .002003      473.      490.      511.         2         0         0       .00    775.17  12130.00

 *SECNO 4.794

 3265 DIVIDED FLOW

 3470 ENCROACHMENT STATIONS=    11280.0   12200.0  TYPE=      1  TARGET=      920.000
      4.794      6.57   1354.57       .00   1354.16   1354.71       .14      1.20       .02   1360.00
     3010.0     115.4    1710.8    1183.8     141.0     448.3     751.6     120.9      58.9   1360.00
        .44       .82      3.82      1.58      .100      .060      .060      .000   1348.00  11280.00
   .002868      503.      503.      507.         3         0         0       .00    836.35  12200.00

 *SECNO 4.889

 3265 DIVIDED FLOW

 3280 CROSS SECTION      4.89 EXTENDED       .27 FEET

 3470 ENCROACHMENT STATIONS=    11280.0   11950.0  TYPE=      1  TARGET=      670.000
      4.889      6.27   1356.27       .00   1356.06   1356.46       .20      1.74       .02   1361.00
     3010.0     176.6    1829.9    1003.5     157.4     422.3     513.8     134.7      67.0   1361.00
        .48      1.12      4.33      1.95      .100      .060      .065      .000   1350.00  11280.00
   .004428      488.      495.      490.         3         0         0       .00    593.46  11950.00

 *SECNO 4.985
1
   21APR99      12:13:42                                                                                PAGE   33

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

 3265 DIVIDED FLOW
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3280 CROSS SECTION      4.99 EXTENDED      2.05 FEET


3470 ENCROACHMENT STATIONS=    11300.0   11760.0  TYPE=      1  TARGET=      460.000
     4.985      7.05   1358.05       .00   1357.30   1358.26       .20      1.79       .00   1361.00
    3010.0     255.6    2124.9     629.4     197.0     509.3     353.4     146.5      72.3   1363.00
       .52      1.30      4.17      1.78      .100      .055      .070      .000   1351.00  11300.00
   .003062      370.      500.      500.         2         0         0       .00    396.76  11760.00


*SECNO 5.023

3265 DIVIDED FLOW

3280 CROSS SECTION      5.02 EXTENDED      2.52 FEET


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.47


3470 ENCROACHMENT STATIONS=    11350.0   11760.0  TYPE=      1  TARGET=      410.000
     5.023      7.52   1358.52       .00   1357.55   1358.66       .13       .39       .01   1363.00
    3010.0     123.4    2233.4     653.2     129.5     685.0     407.1     151.4      73.8   1365.00
       .54       .95      3.26      1.60      .100      .055      .070      .000   1351.00  11350.00
   .001417      235.      207.      140.         2         0         0       .00    319.89  11760.00


CCHV=     .300 CEHV=     .500
*SECNO 5.065
3280 CROSS SECTION      5.07 EXTENDED      2.50 FEET


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .29


3470 ENCROACHMENT STATIONS=    11570.0   11635.0  TYPE=      1  TARGET=       65.000
        DOWNSTREAM OF SOSSAMANN ROAD       5.074
1
   21APR99      12:13:42                                                                                    PAGE   34


    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


     5.065      6.49   1358.49       .00   1358.64   1359.95      1.46       .63       .67   1358.00
    3010.0        .0    3010.0        .0        .0     310.2        .0     154.5      74.5 100000.00
       .55       .00      9.70       .00      .000      .055      .000      .000   1352.00  11570.00
   .017157      280.      195.       80.         2         0         0       .00     63.11  11633.11


CCHV=     .300 CEHV=     .500

SPECIAL BRIDGE

SB  XK        XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
      .00      1.56       2.60        .00     28.00        .00     141.40       .00   1350.60   1349.50

*SECNO 5.074
 PRESS FLOW BECAUSE EGLWC OF    1359.95  EXCEEDS 1.5 DEPTH
6870 D.S. ENERGY OF  1359.95 IS HIGHER THAN COMPUTED ENERGY OF  1359.36

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW,  Weir Submergence Based on TRAPEZOIDAL Shape


 EGPRS      EGLWC      H3         QWEIR      QPR        BAREA    TRAPEZOID      ELLC       ELTRD      WEIRLN
                                                                     AREA
   1369.47   1359.95       .00     2193.      847.       141.      168.     1356.60   1355.00       998.


3470 ENCROACHMENT STATIONS=    11550.0   11623.0  TYPE=      1  TARGET=       73.000
        UPSTREAM OF SOSSAMAN ROAD          6.470
     5.074      7.18   1359.18       .00   1359.30   1359.95       .77       .00       .00   1358.00
    3010.0        .0    3010.0        .0        .0     426.5        .0     155.0      74.6 100000.00
       .55       .00      7.06       .00      .000      .065      .000      .000   1352.00  11550.00
   .009903       60.       60.       15.         2         0         6       .00     73.00  11623.00


CCHV=     .100 CEHV=     .300
*SECNO 5.086
3280 CROSS SECTION      5.09 EXTENDED       .16 FEET


3301 HV CHANGED MORE THAN HVINS

1
   21APR99      12:13:42                                                                                    PAGE   35
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    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.86


 3470 ENCROACHMENT STATIONS=    11420.0   11622.0  TYPE=      1  TARGET=      202.000
      5.086      8.15   1360.15       .00   1359.71   1360.35       .19        .34        .06   1364.00
     3010.0        .0    3010.0        .0        .0     854.1        .0      156.0       74.8 100000.00
        .56       .00      3.52       .00      .000      .065      .000       .000    1352.00  11433.91
    .002863       34.       70.      500.         2         0         0        .00     172.64  11606.55


 CCHV=     .100 CEHV=     .300
 *SECNO 5.095
 3280 CROSS SECTION      5.09 EXTENDED       .22 FEET


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.64


 3470 ENCROACHMENT STATIONS=    11443.0   11600.0  TYPE=      1  TARGET=      157.000
      5.095      8.23   1360.23       .00   1359.79   1360.43       .20        .08        .00   1363.00
     3010.0        .0    3010.0        .0        .0     832.5        .0      156.9       75.0 100000.00
        .56       .00      3.62       .00      .000      .045      .000       .000    1352.00  11460.33
    .001063       42.       48.      210.         2         0         0        .00     132.57  11592.90


 *SECNO 5.156
 3280 CROSS SECTION      5.16 EXTENDED       .60 FEET


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .66


 3470 ENCROACHMENT STATIONS=    11423.0   11554.0  TYPE=      1  TARGET=      131.000
      5.156      6.60   1360.60       .00   1359.87   1360.97       .37        .50        .05   1361.00
     3010.0        .0    3010.0        .0        .0     616.3        .0      162.2       75.9   1361.00
        .58       .00      4.88       .00      .000      .045      .000       .000    1354.00  11424.98
    .002462      100.      320.      245.         2         0         0        .00     117.84  11542.81


 *SECNO 5.214

 3470 ENCROACHMENT STATIONS=    11404.0   11521.0  TYPE=      1  TARGET=      117.000
1
    21APR99      12:13:42                                                                                    PAGE   36

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


      5.214      6.36   1361.36       .00   1360.70   1361.77       .41        .79        .01   1362.00
     3010.0        .0    3010.0        .0        .0     586.5        .0      166.4       76.7 100000.00
        .59       .00      5.13       .00      .000      .045      .000       .000    1355.00  11406.54
    .002736      310.      303.      294.         2         0         0        .00     112.55  11519.09


 *SECNO 5.308

 3265 DIVIDED FLOW

 3280 CROSS SECTION      5.31 EXTENDED       .60 FEET


 3470 ENCROACHMENT STATIONS=    11300.0   11534.0  TYPE=      1  TARGET=      234.000
      5.308      7.60   1362.60       .00   1361.66   1362.85       .25       1.06        .02   1363.00
     3010.0     455.3    2554.7        .0     235.6     600.5        .0      174.6       78.6 100000.00
        .63      1.93      4.25       .00      .055      .045      .000       .000    1355.00  11300.00
    .001685      502.      502.      502.         2         0         0        .00     212.47  11528.21


 *SECNO 5.403
 3280 CROSS SECTION      5.40 EXTENDED       .63 FEET


 3470 ENCROACHMENT STATIONS=    11414.0   11595.0  TYPE=      1  TARGET=      181.000
      5.403      6.37   1363.37       .00   1362.42   1363.54       .17        .69        .01 100000.00
     3010.0        .0    3010.0        .0        .0     900.9        .0      184.6       80.8 100000.00
        .67       .00      3.34       .00      .000      .045      .000       .000    1357.00  11414.89
    .001140      500.      500.      500.         2         0         0        .00     172.22  11587.11


 *SECNO 5.498
 3280 CROSS SECTION      5.50 EXTENDED       .41 FEET
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3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .66

3470 ENCROACHMENT STATIONS=    11307.0   11469.0  TYPE=      1  TARGET=      162.000
     5.498      5.09   1364.09       .00   1363.48   1364.42       .33       .83       .05   1366.00
    3010.0        .0    3010.0        .0        .0     655.6        .0     193.5      82.6 100000.00
       .70       .00      4.59       .00      .000      .045      .000      .000   1359.00  11313.75
   .002655      490.      498.      499.         1         0         0       .00    146.50  11460.25


1
   21APR99      12:13:42                                                                                                PAGE   37

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 5.550
3280 CROSS SECTION      5.55 EXTENDED       .22 FEET

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.42

3470 ENCROACHMENT STATIONS=    11413.0   11585.0  TYPE=      1  TARGET=      172.000
     5.550      6.72   1364.72       .00   1364.28   1364.93       .21       .49       .01   1366.00
    3010.0        .0    3010.0        .0        .0     826.1        .0     198.1      83.6 100000.00
       .72       .00      3.64       .00      .000      .045      .000      .000   1358.00  11416.84
   .001322      280.      272.      265.         2         0         0       .00    154.32  11571.16

*SECNO 5.593

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .46

3470 ENCROACHMENT STATIONS=    11400.0   11544.0  TYPE=      1  TARGET=      144.000
     5.593      4.95   1364.95       .00   1364.58   1365.63       .69       .56       .14   1367.00
    3010.0        .0    3010.0        .0        .0     451.9        .0     201.4      84.2 100000.00
       .73       .00      6.66       .00      .000      .045      .000      .000   1360.00  11408.16
   .006319      216.      226.      236.         2         0         0       .00    110.62  11518.78

*SECNO 5.654

3470 ENCROACHMENT STATIONS=    11403.0   11549.0  TYPE=      1  TARGET=      146.000
     5.654      6.65   1366.65       .00   1366.55   1367.14       .49      1.49       .02   1371.00
    3010.0        .0    3010.0        .0        .0     537.8        .0     205.0      85.0 100000.00
       .75       .00      5.60       .00      .000      .045      .000      .000   1360.00  11415.03
   .003758      190.      310.      425.         2         0         0       .00    115.14  11530.18

*SECNO 5.748

3470 ENCROACHMENT STATIONS=    11405.0   11529.0  TYPE=      1  TARGET=      124.000
     5.748      6.57   1368.57       .00   1368.24   1369.09       .52      1.94       .01   1370.00
    3010.0        .0    3010.0        .0        .0     518.7        .0     211.1      86.3 100000.00
       .77       .00      5.80       .00      .000      .045      .000      .000   1362.00  11411.87
   .003843      430.      510.      570.         3         0         0       .00    106.83  11518.70


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   21APR99      12:13:42                                                                                                PAGE   38

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 5.843

3470 ENCROACHMENT STATIONS=    11398.0   11530.0  TYPE=      1  TARGET=      132.000
     5.843      6.25   1370.25       .00   1369.86   1370.64       .38      1.53       .01   1372.00
    3010.0        .0    3010.0        .0        .0     605.4        .0     217.5      87.6 100000.00
       .80       .00      4.97       .00      .000      .045      .000      .000   1364.00  11401.25
   .002577      494.      492.      490.         2         0         0       .00    116.01  11517.26

*SECNO 5.938

3470 ENCROACHMENT STATIONS=    11392.0   11532.0  TYPE=      1  TARGET=      140.000
     5.938      6.34   1371.34       .00   1370.96   1371.65       .31      1.00       .01   1374.00
    3010.0        .0    3010.0        .0        .0     676.8        .0     224.8      89.0 100000.00
       .83       .00      4.45       .00      .000      .040      .000      .000   1365.00  11398.33
   .001636      500.      495.      470.         2         0         0       .00    131.02  11529.35

*SECNO 6.033
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3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .67

3470 ENCROACHMENT STATIONS=    11372.0   11509.0  TYPE=      1  TARGET=      137.000
     6.033      6.30   1372.30       .00   1372.00   1372.91       .60      1.17       .09   1377.00
    3010.0        .0    3010.0        .0        .0     483.0        .0     231.4      90.3 100000.00
       .85       .00      6.23       .00      .000      .040      .000      .000   1366.00  11388.06
   .003636      445.      500.      440.         0         0         0       .00    102.18  11490.25

*SECNO 6.126

3470 ENCROACHMENT STATIONS=    11399.0   11530.0  TYPE=      1  TARGET=      131.000
     6.126      5.99   1373.99       .00   1373.88   1374.48       .49      1.56       .01   1377.00
    3010.0        .0    3010.0        .0        .0     535.2        .0     237.1      91.5 100000.00
       .88       .00      5.62       .00      .000      .040      .000      .000   1368.00  11411.02
   .002839      470.      488.      505.         2         0         0       .00    109.93  11520.95

*SECNO 6.220

3470 ENCROACHMENT STATIONS=    11399.0   11529.0  TYPE=      1  TARGET=      130.000
     6.220      6.36   1375.36       .00   1375.32   1375.81       .44      1.32       .00   1378.00
    3010.0        .0    3010.0        .0        .0     563.0        .0     243.4      92.8 100000.00
       .90       .00      5.35       .00      .000      .040      .000      .000   1369.00  11407.91
   .002471      510.      500.      490.         2         0         0       .00    112.55  11520.46

1
   21APR99      12:13:42                                                                              PAGE   39

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 6.279

3470 ENCROACHMENT STATIONS=    11445.0   11566.0  TYPE=      1  TARGET=      121.000
     6.279      6.19   1376.19       .00   1376.02   1376.88       .70      1.00       .08   1380.00
    3010.0        .0    3010.0        .0        .0     449.0        .0     247.0      93.6 100000.00
       .92       .00      6.70       .00      .000      .040      .000      .000   1370.00  11453.64
   .004552      325.      305.      285.         1         0         0       .00    100.72  11554.36

*SECNO 6.360
3280 CROSS SECTION      6.36 EXTENDED       .01 FEET

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.43

3470 ENCROACHMENT STATIONS=    11282.0   11421.0  TYPE=      1  TARGET=      139.000
     6.360      7.46   1378.01       .00   1377.60   1378.43       .42      1.51       .03   1381.00
    3010.0        .0    3010.0        .0        .0     581.7        .0     252.8      94.8 100000.00
       .94       .00      5.17       .00      .000      .040      .000      .000   1370.55  11291.95
   .002236      600.      490.      380.         2         0         0       .00    113.08  11405.04

*SECNO 6.426
3280 CROSS SECTION      6.43 EXTENDED       .12 FEET

3470 ENCROACHMENT STATIONS=    11297.0   11433.0  TYPE=      1  TARGET=      136.000
     6.426      7.36   1378.81       .00   1378.30   1379.39       .58       .92       .05   1383.00
    3010.0        .0    3010.0        .0        .0     491.5        .0     257.0      95.6 100000.00
       .96       .00      6.12       .00      .000      .040      .000      .000   1371.45  11314.84
   .003322      380.      340.      295.         2         0         0       .00     99.79  11414.63

*SECNO 6.467

3470 ENCROACHMENT STATIONS=    11368.0   11527.0  TYPE=      1  TARGET=      159.000
     6.467      7.82   1379.62       .00   1379.30   1379.93       .31       .51       .03   1383.00
    3010.0        .0    3010.0        .0        .0     672.2        .0     259.7      96.1 100000.00
       .97       .00      4.48       .00      .000      .045      .000      .000   1371.80  11383.53
   .001945      300.      203.      175.         2         0         0       .00    122.93  11506.47

1
   21APR99      12:13:42                                                                              PAGE   40

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

CCHV=     .300 CEHV=     .500
*SECNO 6.470

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.76
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3470 ENCROACHMENT STATIONS=      925.0    1078.0  TYPE=      1  TARGET=      153.000
        AT THE DOWNSTREAM SIDE OF HAWES ROAD
     6.470      7.21   1379.71       .00   1379.41   1379.97       .26       .03       .01   1382.00
    3010.0        .0    3010.0        .0        .0     730.8        .0     260.2      96.2 100000.00
       .97       .00      4.12       .00      .000      .028      .000      .000   1372.50    934.67
   .000631       30.       30.       30.         1         0         0       .00    132.92   1067.60
```


THIS RUN EXECUTED 21APR99 12:13:43

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************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
************************************
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

POWER ROAD TO HAWES ROAD

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	TOPWID	SSTA	STENCL	STENCR	ENDST
	4.040	3006.00	1340.35	195.32	9928.68	.00	.00	10124.00
	4.040	3006.00	1340.35	195.32	9928.68	.00	.00	10124.00
	4.050	3006.00	1340.73	146.42	9940.91	.00	.00	10087.33
	4.050	3006.00	1340.73	146.42	9940.91	.00	.00	10087.33
*	4.070	3006.00	1342.97	75.52	9962.30	.00	.00	10037.81
*	4.070	3006.00	1342.97	75.52	9962.30	.00	.00	10037.81
*	4.085	3006.00	1344.88	90.88	9956.24	9910.00	10110.00	10047.12
*	4.085	3006.00	1344.88	90.88	9956.24	9910.00	10110.00	10047.12
*	4.096	3010.00	1345.87	2915.90	9984.52	.00	.00	12980.00
	4.096	3010.00	1345.55	216.71	11390.00	11390.00	11690.00	11690.00
*	4.138	3010.00	1345.91	3480.38	9437.60	.00	.00	12980.00
*	4.138	3010.00	1346.32	532.48	11160.00	11160.00	11750.00	11750.00
*	4.226	3010.00	1346.14	2889.13	9863.66	.00	.00	12842.71
	4.226	3010.00	1346.95	782.18	11090.00	11090.00	11950.00	11950.00
*	4.321	3010.00	1346.87	706.03	10977.29	.00	.00	12196.21
*	4.321	3010.00	1347.75	619.55	11160.00	11160.00	12000.00	12000.00
*	4.416	3010.00	1349.06	2349.76	10415.84	.00	.00	12849.75
*	4.416	3010.00	1349.44	701.23	11260.00	11260.00	12040.00	12040.00
*	4.510	3010.00	1349.75	1928.48	10451.18	.00	.00	12465.55
	4.510	3010.00	1350.37	610.72	11320.00	11320.00	12000.00	12000.00
*	4.605	3010.00	1351.50	1791.01	10468.37	.00	.00	12347.43
*	4.605	3010.00	1351.76	667.95	11320.00	11320.00	12070.00	12070.00

	SECNO	Q	CWSEL	TOPWID	SSTA	STENCL	STENCR	ENDST
*	4.699	3010.00	1353.09	2213.94	10498.73	.00	.00	12790.77
*	4.699	3010.00	1353.42	775.17	11280.00	11280.00	12130.00	12130.00
*	4.794	3010.00	1354.16	2222.49	10602.88	.00	12920.00	12920.00
	4.794	3010.00	1354.57	836.35	11280.00	11280.00	12200.00	12200.00
	4.889	3010.00	1356.06	1346.16	10509.52	.00	12780.00	11935.02
	4.889	3010.00	1356.27	593.46	11280.00	11280.00	11950.00	11950.00
*	4.985	3010.00	1357.30	2220.70	10240.54	.00	12670.00	12540.00
	4.985	3010.00	1358.05	396.76	11300.00	11300.00	11760.00	11760.00
	5.023	3010.00	1357.55	2107.27	10474.58	.00	12730.00	12690.00
*	5.023	3010.00	1358.52	319.89	11350.00	11350.00	11760.00	11760.00
*	5.065	3010.00	1358.64	708.65	11532.57	.00	12900.00	12365.00
*	5.065	3010.00	1358.49	63.11	11570.00	11570.00	11635.00	11633.11
*	5.074	3010.00	1359.30	1171.13	11272.16	.00	12850.00	12850.01
	5.074	3010.00	1359.18	73.00	11550.00	11550.00	11623.00	11623.00
	5.086	3010.00	1359.71	738.68	11437.60	.00	12490.00	12210.00

*	5.086	3010.00	1360.15	172.64	11433.91	11420.00	11622.00	11606.55
*	5.095	3010.00	1359.79	865.08	11461.64	.00	12420.00	12350.01
*	5.095	3010.00	1360.23	132.57	11460.33	11443.00	11600.00	11592.90
*	5.156	3010.00	1359.87	1295.03	10905.05	.00	12330.00	12330.00
*	5.156	3010.00	1360.60	117.84	11424.98	11423.00	11554.00	11542.81
	5.214	3010.00	1360.70	1546.73	10477.03	.00	12180.00	12180.00
	5.214	3010.00	1361.36	112.55	11406.54	11404.00	11521.00	11519.09
	5.308	3010.00	1361.66	1289.79	10638.83	.00	.00	11997.36
	5.308	3010.00	1362.60	212.47	11300.00	11300.00	11534.00	11528.21
	5.403	3010.00	1362.42	723.77	10948.25	.00	.00	11758.66
	5.403	3010.00	1363.37	172.22	11414.89	11414.00	11595.00	11587.11
*	5.498	3010.00	1363.48	671.89	10985.76	.00	.00	11748.80
*	5.498	3010.00	1364.09	146.50	11313.75	11307.00	11469.00	11460.25
*	5.550	3010.00	1364.28	569.12	11052.97	.00	.00	11719.82
*	5.550	3010.00	1364.72	154.32	11416.84	11413.00	11585.00	11571.16
*	5.593	3010.00	1364.58	163.05	11275.98	.00	.00	11517.35
*	5.593	3010.00	1364.95	110.62	11408.16	11400.00	11544.00	11518.78
*	5.654	3010.00	1366.55	968.03	10465.18	.00	.00	11528.75
	5.654	3010.00	1366.65	115.14	11415.03	11403.00	11549.00	11530.18

	SECNO	Q	CWSEL	TOPWID	SSTA	STENCL	STENCR	ENDST
	5.748	3010.00	1368.24	801.18	10707.57	.00	.00	11646.49
	5.748	3010.00	1368.57	106.83	11411.87	11405.00	11529.00	11518.70
	5.843	3010.00	1369.86	1063.92	10819.52	.00	.00	11982.90
	5.843	3010.00	1370.25	116.01	11401.25	11398.00	11530.00	11517.26
	5.938	3010.00	1370.96	605.12	11399.07	.00	.00	12155.55
	5.938	3010.00	1371.34	131.02	11398.33	11392.00	11532.00	11529.35
*	6.033	3010.00	1372.00	134.04	11389.00	.00	.00	11571.02
*	6.033	3010.00	1372.30	102.18	11388.06	11372.00	11509.00	11490.25
	6.126	3010.00	1373.88	140.76	11411.24	.00	.00	11707.74
	6.126	3010.00	1373.99	109.93	11411.02	11399.00	11530.00	11520.95
	6.220	3010.00	1375.32	587.46	11181.32	.00	.00	11842.03
	6.220	3010.00	1375.36	112.55	11407.91	11399.00	11529.00	11520.46
	6.279	3010.00	1376.02	711.57	11067.88	.00	.00	11860.26
	6.279	3010.00	1376.19	100.72	11453.64	11445.00	11566.00	11554.36
	6.360	3010.00	1377.60	634.43	10926.81	.00	.00	11635.69
*	6.360	3010.00	1378.01	113.08	11291.95	11282.00	11421.00	11405.04
*	6.426	3010.00	1378.30	388.37	11111.29	.00	.00	11625.83
	6.426	3010.00	1378.81	99.79	11314.84	11297.00	11433.00	11414.63
	6.467	3010.00	1379.30	120.40	11384.80	.00	.00	11505.20
	6.467	3010.00	1379.62	122.93	11383.53	11368.00	11527.00	11506.47
*	6.470	3010.00	1379.41	130.31	935.94	.00	.00	1066.24
*	6.470	3010.00	1379.71	132.92	934.67	925.00	1078.00	1067.60

POWER ROAD TO HAWES ROAD

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	4.040	.00	.00	.00	1335.80	3006.00	1340.35	.00	1340.81	13.61	6.02	654.86	814.69
	4.040	.00	.00	.00	1335.80	3006.00	1340.35	.00	1340.81	13.61	6.02	654.86	814.69
	4.050	300.00	.00	.00	1336.50	3006.00	1340.73	.00	1341.28	16.33	6.28	512.98	743.78
	4.050	300.00	.00	.00	1336.50	3006.00	1340.73	.00	1341.28	16.33	6.28	512.98	743.78
*	4.070	100.00	.00	.00	1337.70	3006.00	1342.97	1342.97	1344.82	61.53	10.92	275.25	383.23
*	4.070	100.00	.00	.00	1337.70	3006.00	1342.97	1342.97	1344.82	61.53	10.92	275.25	383.23
*	4.085	90.00	1350.90	1348.40	1337.70	3006.00	1344.88	.00	1345.62	17.28	6.92	434.28	723.06
*	4.085	90.00	1350.90	1348.40	1337.70	3006.00	1344.88	.00	1345.62	17.28	6.92	434.28	723.06
*	4.096	67.00	.00	.00	1337.00	3010.00	1345.87	.00	1345.88	1.46	1.07	5256.81	2487.58
	4.096	67.00	.00	.00	1337.00	3010.00	1345.55	.00	1345.91	34.09	5.03	693.45	515.56
*	4.138	225.00	.00	.00	1338.00	3010.00	1345.91	.00	1345.93	3.00	1.44	4615.00	1738.08

*	4.138	225.00	.00	.00	1338.00	3010.00	1346.32	.00	1346.43	15.07	3.33	1343.07	775.42
*	4.226	465.00	.00	.00	1340.00	3010.00	1346.14	.00	1346.17	11.17	2.39	2720.69	900.60
	4.226	465.00	.00	.00	1340.00	3010.00	1346.95	.00	1347.01	10.32	2.42	1826.16	936.83
*	4.321	497.00	.00	.00	1340.00	3010.00	1346.87	1345.79	1347.81	148.83	8.09	503.17	246.73
*	4.321	497.00	.00	.00	1340.00	3010.00	1347.75	.00	1348.06	51.75	5.16	874.94	418.40
*	4.416	496.00	.00	.00	1341.00	3010.00	1349.06	.00	1349.09	9.27	1.89	2844.97	988.44
*	4.416	496.00	.00	.00	1341.00	3010.00	1349.44	.00	1349.52	18.31	2.75	1488.07	703.46
*	4.510	503.00	.00	.00	1342.00	3010.00	1349.75	.00	1349.79	23.68	2.40	2162.78	618.52
	4.510	503.00	.00	.00	1342.00	3010.00	1350.37	.00	1350.44	18.56	2.30	1480.14	698.68
*	4.605	500.00	.00	.00	1344.00	3010.00	1351.50	.00	1351.68	65.70	4.41	1366.54	371.34
*	4.605	500.00	.00	.00	1344.00	3010.00	1351.76	.00	1351.94	53.82	4.12	1050.59	410.28
*	4.699	490.00	.00	.00	1346.00	3010.00	1353.09	.00	1353.13	16.15	2.41	2452.48	749.00
*	4.699	490.00	.00	.00	1346.00	3010.00	1353.42	.00	1353.49	20.03	2.78	1550.33	672.63
*	4.794	503.00	.00	.00	1348.00	3010.00	1354.16	.00	1354.31	34.50	4.02	1727.58	512.49
	4.794	503.00	.00	.00	1348.00	3010.00	1354.57	.00	1354.71	28.68	3.82	1340.81	562.03
	4.889	495.00	.00	.00	1350.00	3010.00	1356.06	.00	1356.23	44.09	4.21	1495.75	453.33
	4.889	495.00	.00	.00	1350.00	3010.00	1356.27	.00	1356.46	44.28	4.33	1093.45	452.33
*	4.985	500.00	.00	.00	1351.00	3010.00	1357.30	.00	1357.35	14.77	2.79	2819.31	783.26
	4.985	500.00	.00	.00	1351.00	3010.00	1358.05	.00	1358.26	30.62	4.17	1059.76	543.96
	5.023	207.00	.00	.00	1351.00	3010.00	1357.55	.00	1357.61	12.00	2.75	2614.67	868.89
*	5.023	207.00	.00	.00	1351.00	3010.00	1358.52	.00	1358.66	14.17	3.26	1221.49	799.72

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	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	5.065	195.00	.00	.00	1352.00	3010.00	1358.64	1358.64	1359.31	95.39	7.37	732.54	308.18
*	5.065	195.00	.00	.00	1352.00	3010.00	1358.49	.00	1359.95	171.57	9.70	310.21	229.80
*	5.074	60.00	1355.00	1356.60	1352.00	3010.00	1359.30	.00	1359.38	16.20	2.96	1676.00	747.90
	5.074	60.00	1355.00	1356.60	1352.00	3010.00	1359.18	.00	1359.95	99.03	7.06	426.50	302.47
	5.086	70.00	.00	.00	1352.00	3010.00	1359.71	.00	1359.76	10.79	2.08	1765.60	916.22
*	5.086	70.00	.00	.00	1352.00	3010.00	1360.15	.00	1360.35	28.63	3.52	854.14	562.59
*	5.095	48.00	.00	.00	1352.00	3010.00	1359.79	.00	1359.84	4.33	2.24	2198.61	1446.38
*	5.095	48.00	.00	.00	1352.00	3010.00	1360.23	.00	1360.43	10.63	3.62	832.50	923.27
*	5.156	320.00	.00	.00	1354.00	3010.00	1359.87	.00	1360.18	27.10	4.80	991.35	578.26
*	5.156	320.00	.00	.00	1354.00	3010.00	1360.60	.00	1360.97	24.62	4.88	616.30	606.57
	5.214	303.00	.00	.00	1355.00	3010.00	1360.70	.00	1360.91	21.47	4.27	1376.61	649.64
	5.214	303.00	.00	.00	1355.00	3010.00	1361.36	.00	1361.77	27.36	5.13	586.46	575.47
	5.308	502.00	.00	.00	1355.00	3010.00	1361.66	.00	1361.81	14.72	3.72	1568.65	784.44
	5.308	502.00	.00	.00	1355.00	3010.00	1362.60	.00	1362.85	16.85	4.25	836.07	733.21
	5.403	500.00	.00	.00	1357.00	3010.00	1362.42	.00	1362.61	16.84	3.66	1078.91	733.52
	5.403	500.00	.00	.00	1357.00	3010.00	1363.37	.00	1363.54	11.40	3.34	900.94	891.43
*	5.498	498.00	.00	.00	1359.00	3010.00	1363.48	.00	1363.85	36.74	5.01	746.14	496.60
*	5.498	498.00	.00	.00	1359.00	3010.00	1364.09	.00	1364.42	26.55	4.59	655.60	584.21
*	5.550	272.00	.00	.00	1358.00	3010.00	1364.28	.00	1364.51	16.65	3.91	859.47	737.74
*	5.550	272.00	.00	.00	1358.00	3010.00	1364.72	.00	1364.93	13.22	3.64	826.13	827.80
*	5.593	226.00	.00	.00	1360.00	3010.00	1364.58	.00	1365.41	82.53	7.28	421.14	331.33
*	5.593	226.00	.00	.00	1360.00	3010.00	1364.95	.00	1365.63	63.19	6.66	451.93	378.67
*	5.654	310.00	.00	.00	1360.00	3010.00	1366.55	.00	1366.92	31.76	5.12	867.47	534.12
	5.654	310.00	.00	.00	1360.00	3010.00	1366.65	.00	1367.14	37.58	5.60	537.81	491.01
	5.748	510.00	.00	.00	1362.00	3010.00	1368.24	.00	1368.66	37.19	5.51	804.42	493.59
	5.748	510.00	.00	.00	1362.00	3010.00	1368.57	.00	1369.09	38.43	5.80	518.66	485.54
	5.843	492.00	.00	.00	1364.00	3010.00	1369.86	.00	1370.19	26.32	4.85	924.55	586.74
	5.843	492.00	.00	.00	1364.00	3010.00	1370.25	.00	1370.64	25.77	4.97	605.42	592.89
	5.938	495.00	.00	.00	1365.00	3010.00	1370.96	.00	1371.25	17.59	4.44	884.79	717.68
	5.938	495.00	.00	.00	1365.00	3010.00	1371.34	.00	1371.65	16.36	4.45	676.83	744.29
*	6.033	500.00	.00	.00	1366.00	3010.00	1372.00	.00	1372.65	42.21	6.52	484.71	463.29
*	6.033	500.00	.00	.00	1366.00	3010.00	1372.30	.00	1372.91	36.36	6.23	483.03	499.18
	6.126	488.00	.00	.00	1368.00	3010.00	1373.88	.00	1374.40	30.33	5.75	524.32	546.52
	6.126	488.00	.00	.00	1368.00	3010.00	1373.99	.00	1374.48	28.39	5.62	535.18	564.89

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K

	6.220	500.00	.00	.00	1369.00	3010.00	1375.32	.00	1375.64	20.18	4.81	861.00	670.02
	6.220	500.00	.00	.00	1369.00	3010.00	1375.36	.00	1375.81	24.71	5.35	562.98	605.56
	6.279	305.00	.00	.00	1370.00	3010.00	1376.02	1374.32	1376.53	39.46	6.12	769.24	479.19
	6.279	305.00	.00	.00	1370.00	3010.00	1376.19	.00	1376.88	45.52	6.70	449.05	446.12
	6.360	490.00	.00	.00	1370.55	3010.00	1377.60	.00	1377.92	20.29	4.86	965.09	668.29
*	6.360	490.00	.00	.00	1370.55	3010.00	1378.01	.00	1378.43	22.36	5.17	581.75	636.60
*	6.426	340.00	.00	.00	1371.45	3010.00	1378.30	1376.46	1379.00	42.32	6.72	507.83	462.67
	6.426	340.00	.00	.00	1371.45	3010.00	1378.81	.00	1379.39	33.22	6.12	491.53	522.20
	6.467	203.00	.00	.00	1371.80	3010.00	1379.30	.00	1379.65	23.02	4.75	633.69	627.30
	6.467	203.00	.00	.00	1371.80	3010.00	1379.62	.00	1379.93	19.45	4.48	672.24	682.49
*	6.470	30.00	.00	.00	1372.50	3010.00	1379.41	.00	1379.70	7.39	4.35	691.32	1107.27
*	6.470	30.00	.00	.00	1372.50	3010.00	1379.71	.00	1379.97	6.31	4.12	730.76	1198.33

POWER ROAD TO HAWES ROAD

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	4.040	3006.00	1340.35	.00	.00	.00	195.32	.00
	4.040	3006.00	1340.35	.00	.00	.00	195.32	.00
	4.050	3006.00	1340.73	.00	.38	.00	146.42	300.00
	4.050	3006.00	1340.73	.00	.38	.00	146.42	300.00
*	4.070	3006.00	1342.97	.00	2.24	.00	75.52	100.00
*	4.070	3006.00	1342.97	.00	2.24	.00	75.52	100.00
*	4.085	3006.00	1344.88	.00	1.91	.00	90.88	90.00
*	4.085	3006.00	1344.88	.00	1.91	.00	90.88	90.00
*	4.096	3010.00	1345.87	.00	.99	.00	2915.90	67.00
	4.096	3010.00	1345.55	-.32	.67	-.32	216.71	67.00
*	4.138	3010.00	1345.91	.00	.04	.00	3480.38	225.00
*	4.138	3010.00	1346.32	.40	.76	.40	532.48	225.00
*	4.226	3010.00	1346.14	.00	.22	.00	2889.13	465.00
	4.226	3010.00	1346.95	.82	.64	.82	782.18	465.00
*	4.321	3010.00	1346.87	.00	.74	.00	706.03	497.00
*	4.321	3010.00	1347.75	.88	.80	.88	619.55	497.00
*	4.416	3010.00	1349.06	.00	2.19	.00	2349.76	496.00
*	4.416	3010.00	1349.44	.38	1.69	.38	701.23	496.00
*	4.510	3010.00	1349.75	.00	.68	.00	1928.48	503.00
	4.510	3010.00	1350.37	.62	.93	.62	610.72	503.00
*	4.605	3010.00	1351.50	.00	1.75	.00	1791.01	500.00
*	4.605	3010.00	1351.76	.26	1.39	.26	667.95	500.00
*	4.699	3010.00	1353.09	.00	1.59	.00	2213.94	490.00
*	4.699	3010.00	1353.42	.33	1.65	.33	775.17	490.00
*	4.794	3010.00	1354.16	.00	1.08	.00	2222.49	503.00
	4.794	3010.00	1354.57	.41	1.15	.41	836.35	503.00
	4.889	3010.00	1356.06	.00	1.90	.00	1346.16	495.00
	4.889	3010.00	1356.27	.21	1.70	.21	593.46	495.00
*	4.985	3010.00	1357.30	.00	1.24	.00	2220.70	500.00
	4.985	3010.00	1358.05	.76	1.79	.76	396.76	500.00
	5.023	3010.00	1357.55	.00	.25	.00	2107.27	207.00
*	5.023	3010.00	1358.52	.98	.47	.98	319.89	207.00

1

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	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	5.065	3010.00	1358.64	.00	1.10	.00	708.65	195.00
*	5.065	3010.00	1358.49	-.15	-.04	-.15	63.11	195.00
*	5.074	3010.00	1359.30	.00	.66	.00	1171.13	60.00
	5.074	3010.00	1359.18	-.13	.69	-.13	73.00	60.00
	5.086	3010.00	1359.71	.00	.40	.00	738.68	70.00
*	5.086	3010.00	1360.15	.45	.98	.45	172.64	70.00
*	5.095	3010.00	1359.79	.00	.08	.00	865.08	48.00
*	5.095	3010.00	1360.23	.44	.07	.44	132.57	48.00
*	5.156	3010.00	1359.87	.00	.08	.00	1295.03	320.00
*	5.156	3010.00	1360.60	.73	.38	.73	117.84	320.00
	5.214	3010.00	1360.70	.00	.83	.00	1546.73	303.00
	5.214	3010.00	1361.36	.66	.76	.66	112.55	303.00
	5.308	3010.00	1361.66	.00	.96	.00	1289.79	502.00
	5.308	3010.00	1362.60	.94	1.24	.94	212.47	502.00
	5.403	3010.00	1362.42	.00	.75	.00	723.77	500.00
	5.403	3010.00	1363.37	.95	.77	.95	172.22	500.00
*	5.498	3010.00	1363.48	.00	1.06	.00	671.89	498.00
*	5.498	3010.00	1364.09	.61	.72	.61	146.50	498.00
*	5.550	3010.00	1364.28	.00	.80	.00	569.12	272.00

*	5.550	3010.00	1364.72	.44	.63	.44	154.32	272.00
*	5.593	3010.00	1364.58	.00	.31	.00	163.05	226.00
*	5.593	3010.00	1364.95	.36	.22	.36	110.62	226.00
*	5.654	3010.00	1366.55	.00	1.97	.00	968.03	310.00
	5.654	3010.00	1366.65	.10	1.71	.10	115.14	310.00
	5.748	3010.00	1368.24	.00	1.68	.00	801.18	510.00
	5.748	3010.00	1368.57	.33	1.91	.33	106.83	510.00
	5.843	3010.00	1369.86	.00	1.62	.00	1063.92	492.00
	5.843	3010.00	1370.25	.39	1.69	.39	116.01	492.00
	5.938	3010.00	1370.96	.00	1.10	.00	605.12	495.00
	5.938	3010.00	1371.34	.38	1.09	.38	131.02	495.00
*	6.033	3010.00	1372.00	.00	1.04	.00	134.04	500.00
*	6.033	3010.00	1372.30	.30	.96	.30	102.18	500.00
	6.126	3010.00	1373.88	.00	1.88	.00	140.76	488.00
	6.126	3010.00	1373.99	.11	1.68	.11	109.93	488.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	6.220	3010.00	1375.32	.00	1.43	.00	587.46	500.00
	6.220	3010.00	1375.36	.05	1.37	.05	112.55	500.00
	6.279	3010.00	1376.02	.00	.70	.00	711.57	305.00
	6.279	3010.00	1376.19	.17	.82	.17	100.72	305.00
	6.360	3010.00	1377.60	.00	1.58	.00	634.43	490.00
*	6.360	3010.00	1378.01	.41	1.83	.41	113.08	490.00
*	6.426	3010.00	1378.30	.00	.71	.00	388.37	340.00
	6.426	3010.00	1378.81	.51	.80	.51	99.79	340.00
	6.467	3010.00	1379.30	.00	1.00	.00	120.40	203.00
	6.467	3010.00	1379.62	.32	.81	.32	122.93	203.00
*	6.470	3010.00	1379.41	.00	.11	.00	130.31	30.00
*	6.470	3010.00	1379.71	.30	.09	.30	132.92	30.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 4.070 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 4.070 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 4.070 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 4.070 PROFILE= 2 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 4.070 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 4.070 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 4.085 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 4.085 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 4.096 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 4.138 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 4.138 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 4.226 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 4.321 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 4.321 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 4.416 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 4.416 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 4.510 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 4.605 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 4.605 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 4.699 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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WARNING SECNO=      4.699  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      4.794  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      4.985  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      5.023  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=      5.065  PROFILE=  1  CRITICAL DEPTH ASSUMED

CAUTION SECNO=      5.065  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      5.065  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=      5.065  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      5.074  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      5.086  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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WARNING SECNO=      5.095  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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WARNING SECNO=      5.156  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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WARNING SECNO=      5.498  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      5.498  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      5.550  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      5.550  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      5.593  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      5.593  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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WARNING SECNO=      6.360  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      6.426  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      6.470  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      6.470  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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FLOODWAY DATA,   POWER ROAD TO HAWES ROAD
PROFILE NO.  2

            ------- FLOODWAY -------      WATER SURFACE ELEVATION
  STATION    WIDTH    SECTION    MEAN      WITH    WITHOUT  DIFFERENCE
                       AREA    VELOCITY  FLOODWAY  FLOODWAY


     4.040    195.       655.     4.6     1340.3    1340.3       .0
     4.050    146.       513.     5.9     1340.7    1340.7       .0
     4.070     76.       275.    10.9     1343.0    1343.0       .0
     4.085     91.       434.     6.9     1344.9    1344.9       .0
     4.096    300.       693.     4.3     1345.6    1345.9      -.3
     4.138    590.      1343.     2.2     1346.3    1345.9       .4
     4.226    860.      1826.     1.6     1346.9    1346.1       .8
     4.321    840.       875.     3.4     1347.8    1346.9       .9
     4.416    780.      1488.     2.0     1349.5    1349.1       .4
     4.510    680.      1480.     2.0     1350.3    1349.7       .6
     4.605    750.      1051.     2.9     1351.8    1351.5       .3
     4.699    850.      1550.     1.9     1353.4    1353.1       .3
     4.794    920.      1341.     2.2     1354.6    1354.2       .4
     4.889    670.      1093.     2.8     1356.3    1356.1       .2
     4.985    460.      1060.     2.8     1358.1    1357.3       .8
     5.023    410.      1221.     2.5     1358.5    1357.5      1.0
     5.065     63.       310.     9.7     1358.4    1358.6      -.2
     5.074     73.       426.     7.1     1359.2    1359.3      -.1
     5.086    173.       854.     3.5     1360.1    1359.7       .4
     5.095    133.       833.     3.6     1360.2    1359.8       .4
     5.156    118.       616.     4.9     1360.6    1359.9       .7
     5.214    113.       586.     5.1     1361.4    1360.7       .7
```

5.308	228.	836.	3.6	1362.6	1361.7	.9
5.403	172.	901.	3.3	1363.4	1362.4	1.0
5.498	146.	656.	4.6	1364.1	1363.5	.6
5.550	154.	826.	3.6	1364.7	1364.3	.4
5.593	111.	452.	6.7	1365.0	1364.6	.4
5.654	115.	538.	5.6	1366.7	1366.6	.1
5.748	107.	519.	5.8	1368.5	1368.2	.3
5.843	116.	605.	5.0	1370.3	1369.9	.4
5.938	131.	677.	4.4	1371.4	1371.0	.4
6.033	102.	483.	6.2	1372.3	1372.0	.3
6.126	110.	535.	5.6	1374.0	1373.9	.1
6.220	113.	563.	5.3	1375.3	1375.3	.0
6.279	101.	449.	6.7	1376.2	1376.0	.2
6.360	113.	582.	5.2	1378.0	1377.6	.4
6.426	100.	492.	6.1	1378.8	1378.3	.5
6.467	123.	672.	4.5	1379.6	1379.3	.3
6.470	133.	731.	4.1	1379.7	1379.4	.3

APPENDIX G

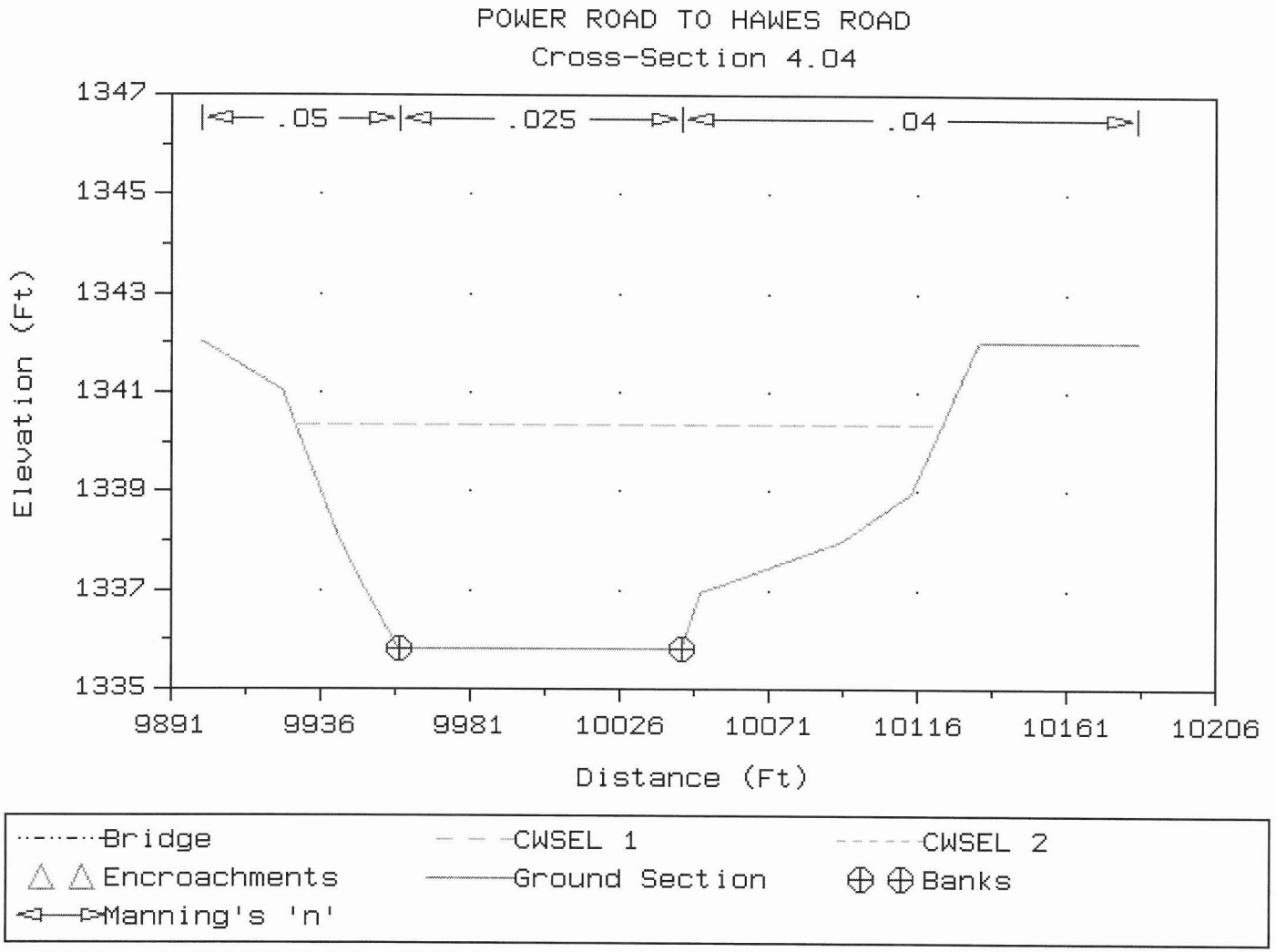
FLOODWAY DATA TABLE

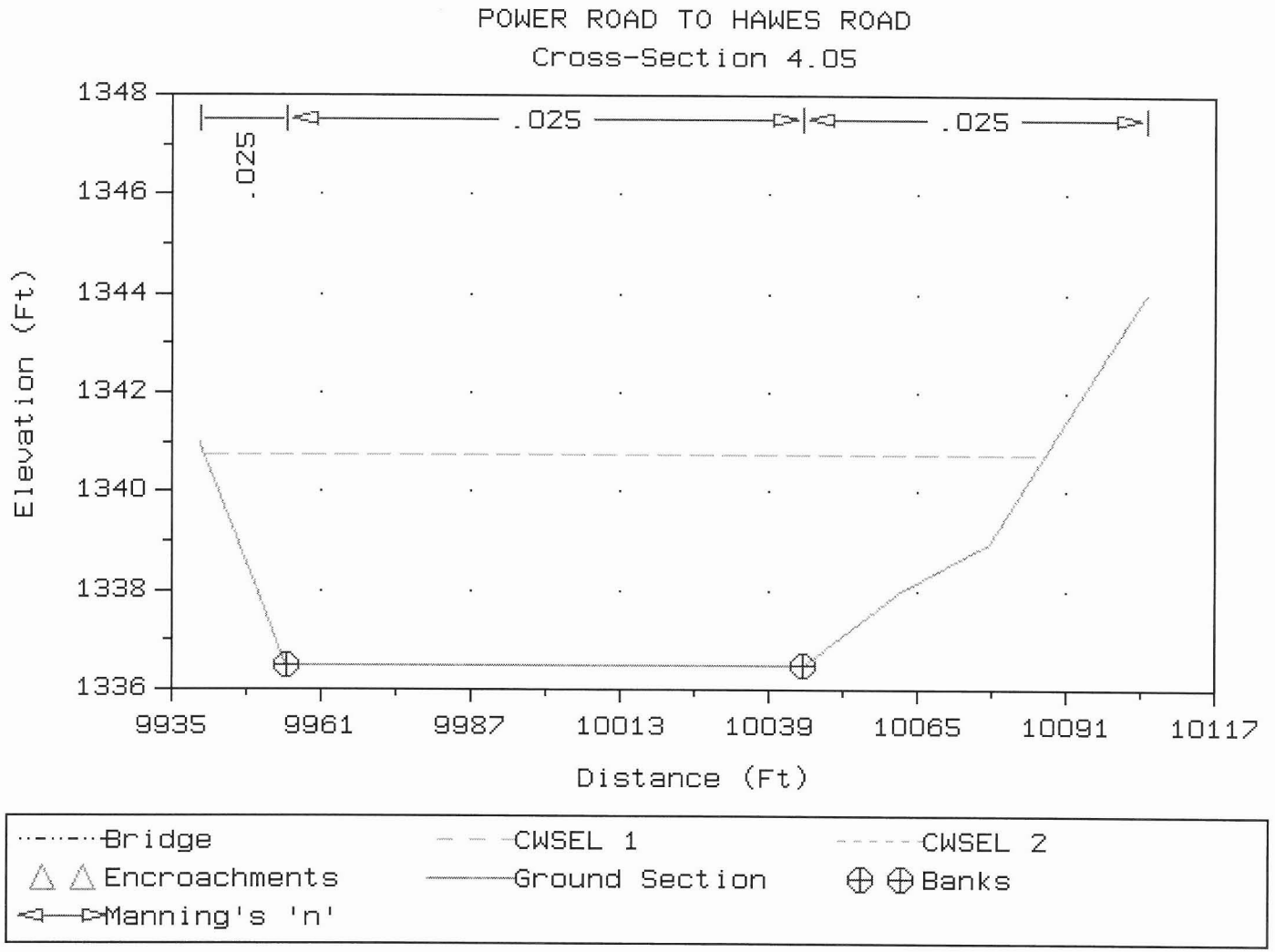
FLOODWAY DATA, POWER ROAD TO HAWES ROAD
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE
4.040	195.	655.	4.6	1340.3	1340.3	.0
4.050	146.	513.	5.9	1340.7	1340.7	.0
4.070	76.	275.	10.9	1343.0	1343.0	.0
4.085	91.	434.	6.9	1344.9	1344.9	.0
4.096	300.	693.	4.3	1345.6	1345.9	-.3
4.138	590.	1343.	2.2	1346.3	1345.9	.4
4.226	860.	1826.	1.6	1346.9	1346.1	.8
4.321	840.	875.	3.4	1347.8	1346.9	.9
4.416	780.	1488.	2.0	1349.5	1349.1	.4
4.510	680.	1480.	2.0	1350.3	1349.7	.6
4.605	750.	1051.	2.9	1351.8	1351.5	.3
4.699	850.	1550.	1.9	1353.4	1353.1	.3
4.794	920.	1341.	2.2	1354.6	1354.2	.4
4.889	670.	1093.	2.8	1356.3	1356.1	.2
4.985	460.	1060.	2.8	1358.1	1357.3	.8
5.023	410.	1221.	2.5	1358.5	1357.5	1.0
5.065	63.	310.	9.7	1358.4	1358.6	-.2
5.074	73.	426.	7.1	1359.2	1359.3	-.1
5.086	173.	854.	3.5	1360.1	1359.7	.4
5.095	133.	833.	3.6	1360.2	1359.8	.4
5.156	118.	616.	4.9	1360.6	1359.9	.7
5.214	113.	586.	5.1	1361.4	1360.7	.7
5.308	228.	836.	3.6	1362.6	1361.7	.9
5.403	172.	901.	3.3	1363.4	1362.4	1.0
5.498	146.	656.	4.6	1364.1	1363.5	.6
5.550	154.	826.	3.6	1364.7	1364.3	.4
5.593	111.	452.	6.7	1365.0	1364.6	.4
5.654	115.	538.	5.6	1366.7	1366.6	.1
5.748	107.	519.	5.8	1368.5	1368.2	.3
5.843	116.	605.	5.0	1370.3	1369.9	.4
5.938	131.	677.	4.4	1371.4	1371.0	.4
6.033	102.	483.	6.2	1372.3	1372.0	.3
6.126	110.	535.	5.6	1374.0	1373.9	.1
6.220	113.	563.	5.3	1375.3	1375.3	.0
6.279	101.	449.	6.7	1376.2	1376.0	.2
6.360	113.	582.	5.2	1378.0	1377.6	.4
6.426	100.	492.	6.1	1378.8	1378.3	.5
6.467	123.	672.	4.5	1379.6	1379.3	.3
6.470	133.	731.	4.1	1379.7	1379.4	.3

APPENDIX H

CROSS SECTION PLOTS


POWER ROAD TO HAWES ROAD
Cross-Section 4.04
.05
.025
.04
1347
1345
1343
1341
1339
1337
1335
Elevation (Ft)
9891
9936
9981
10026
10071
10116
10161
10206
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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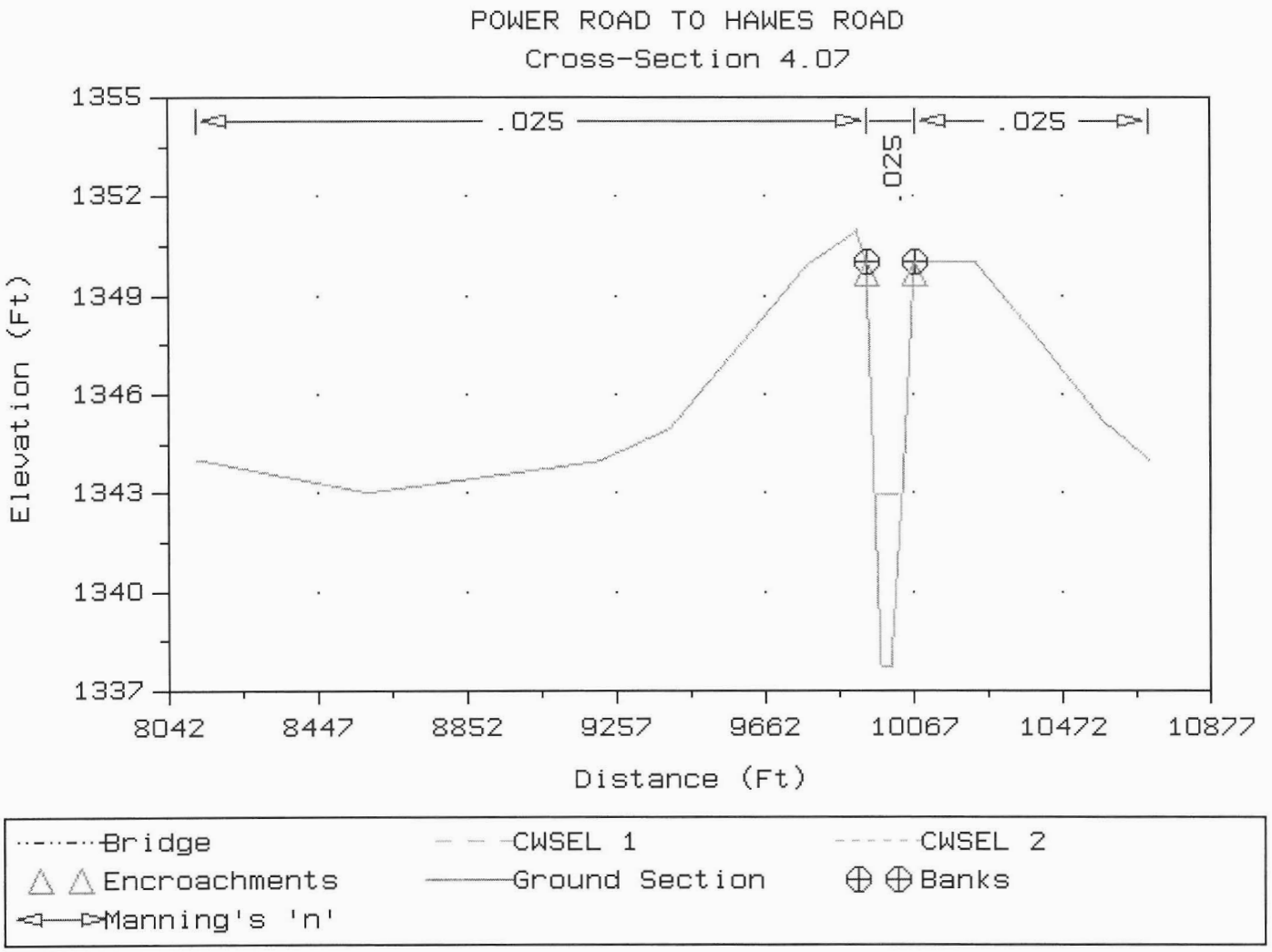
Cross-Section 4.05
.025
.025
.025
1348
1346
1344
1342
1340
1338
1336
Elevation (Ft)
9935
9961
9987
10013
10039
10065
10091
10117
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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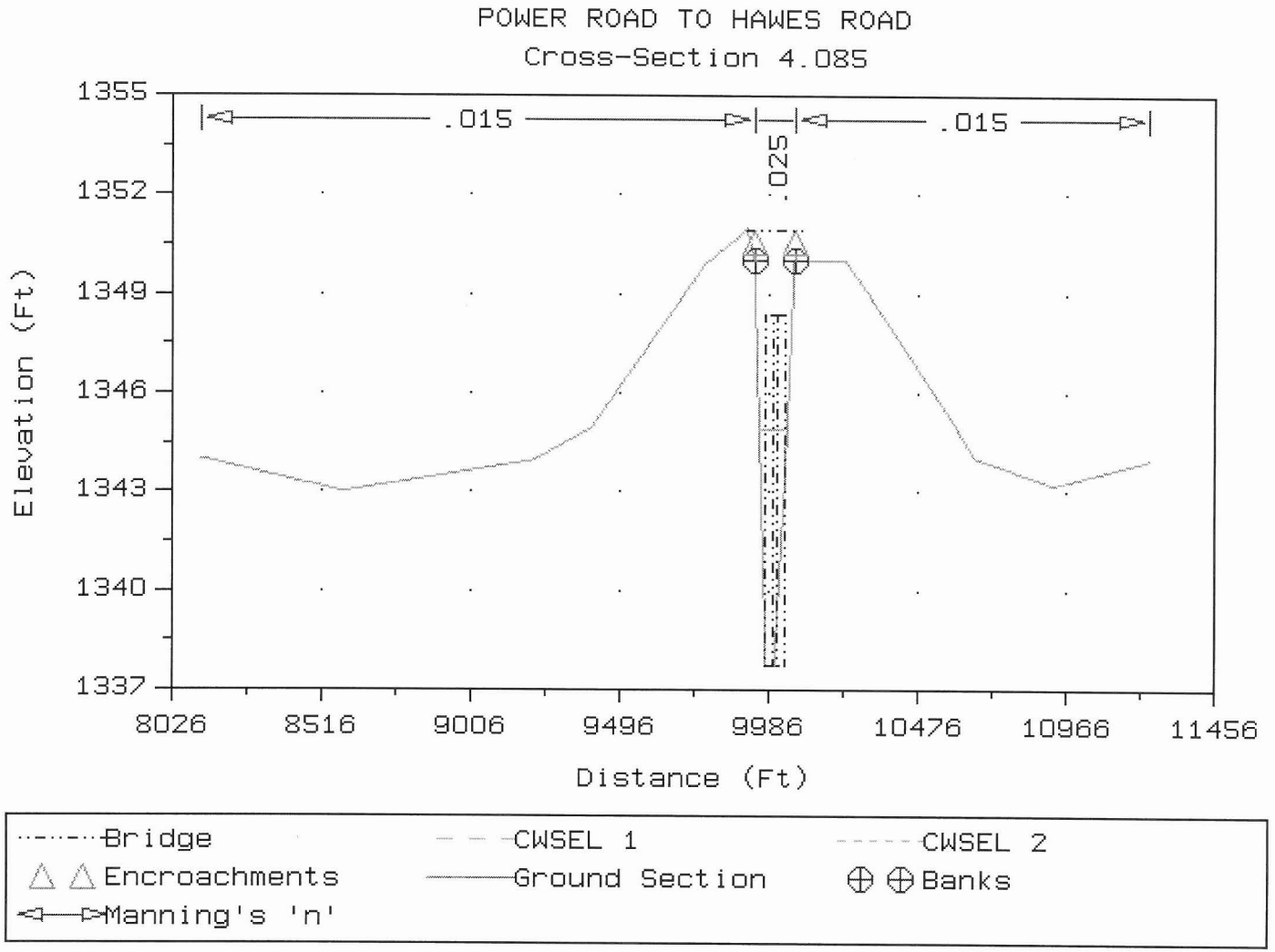
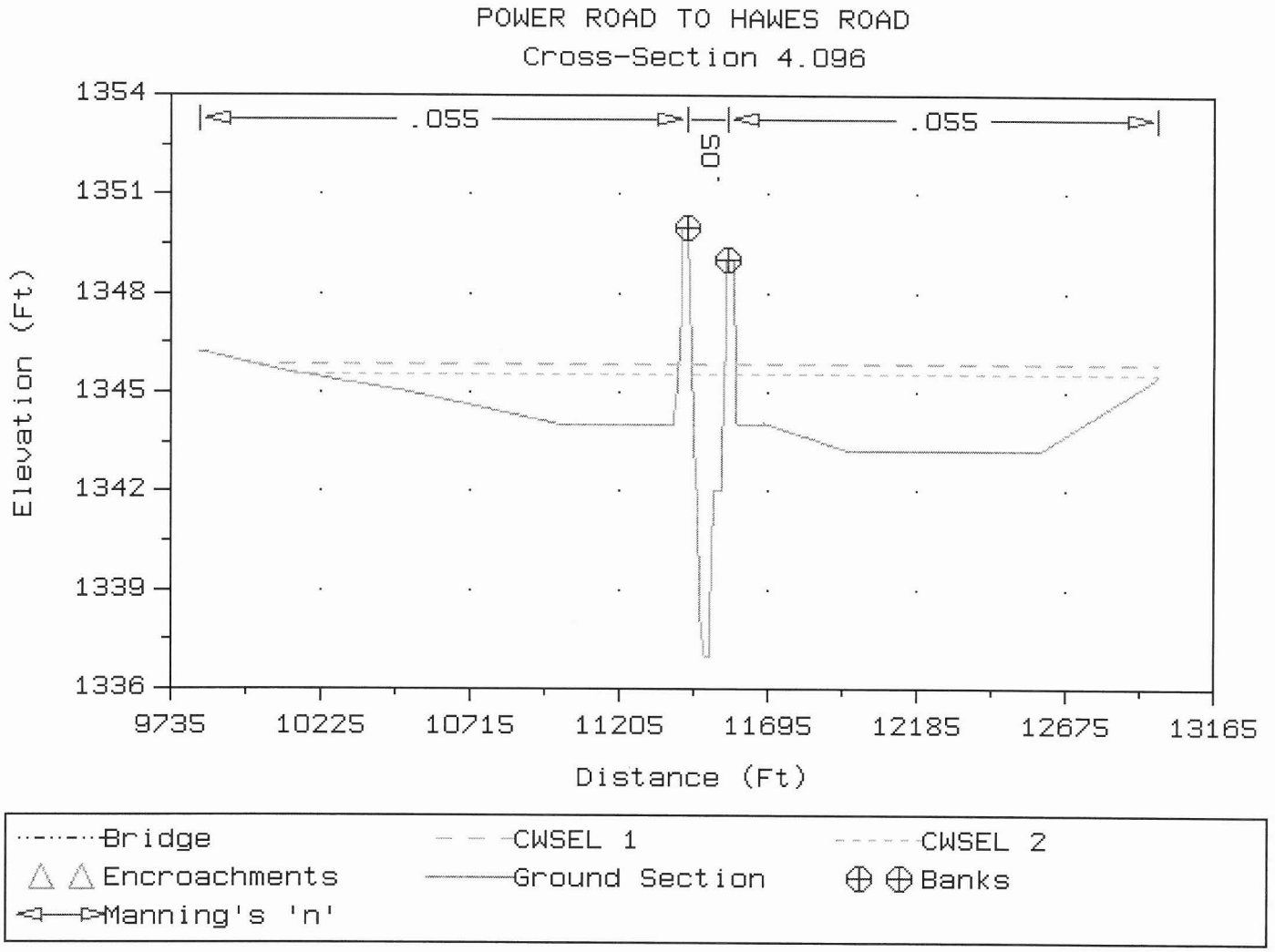
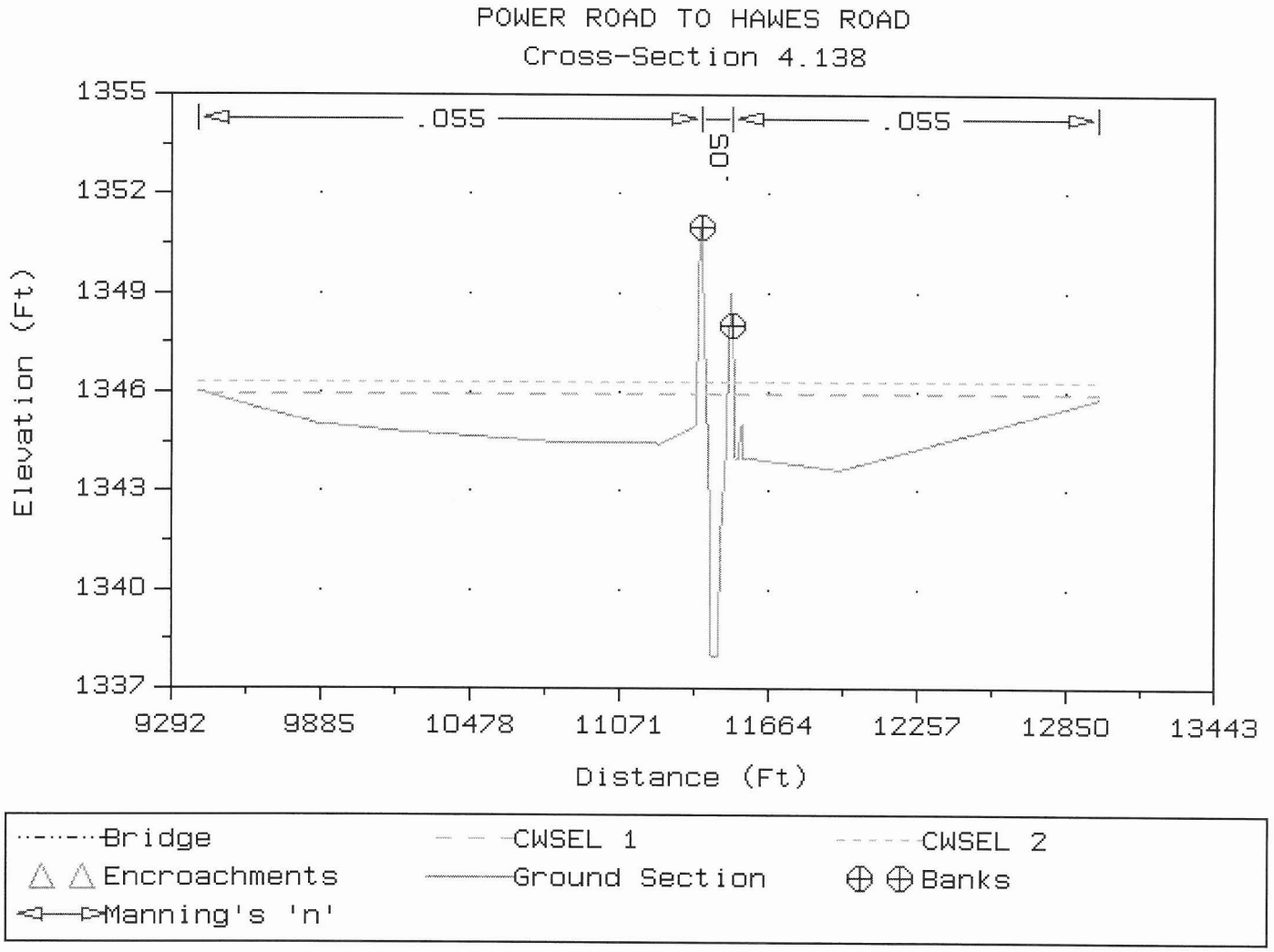
Cross-Section 4.07
.025
.025
.025
1355
1352
1349
1346
1343
1340
1337
Elevation (Ft)
8042
8447
8852
9257
9662
10067
10472
10877
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'


POWER ROAD TO HAWES ROAD
Cross-Section 4.085
.015
.025
.015
1355
1352
1349
1346
1343
1340
1337
Elevation (Ft)
8026
8516
9006
9496
9986
10476
10966
11456
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'


POWER ROAD TO HAWES ROAD
Cross-Section 4.096
.055
.05
.055
1354
1351
1348
1345
1342
1339
1336
Elevation (Ft)
9735
10225
10715
11205
11695
12185
12675
13165
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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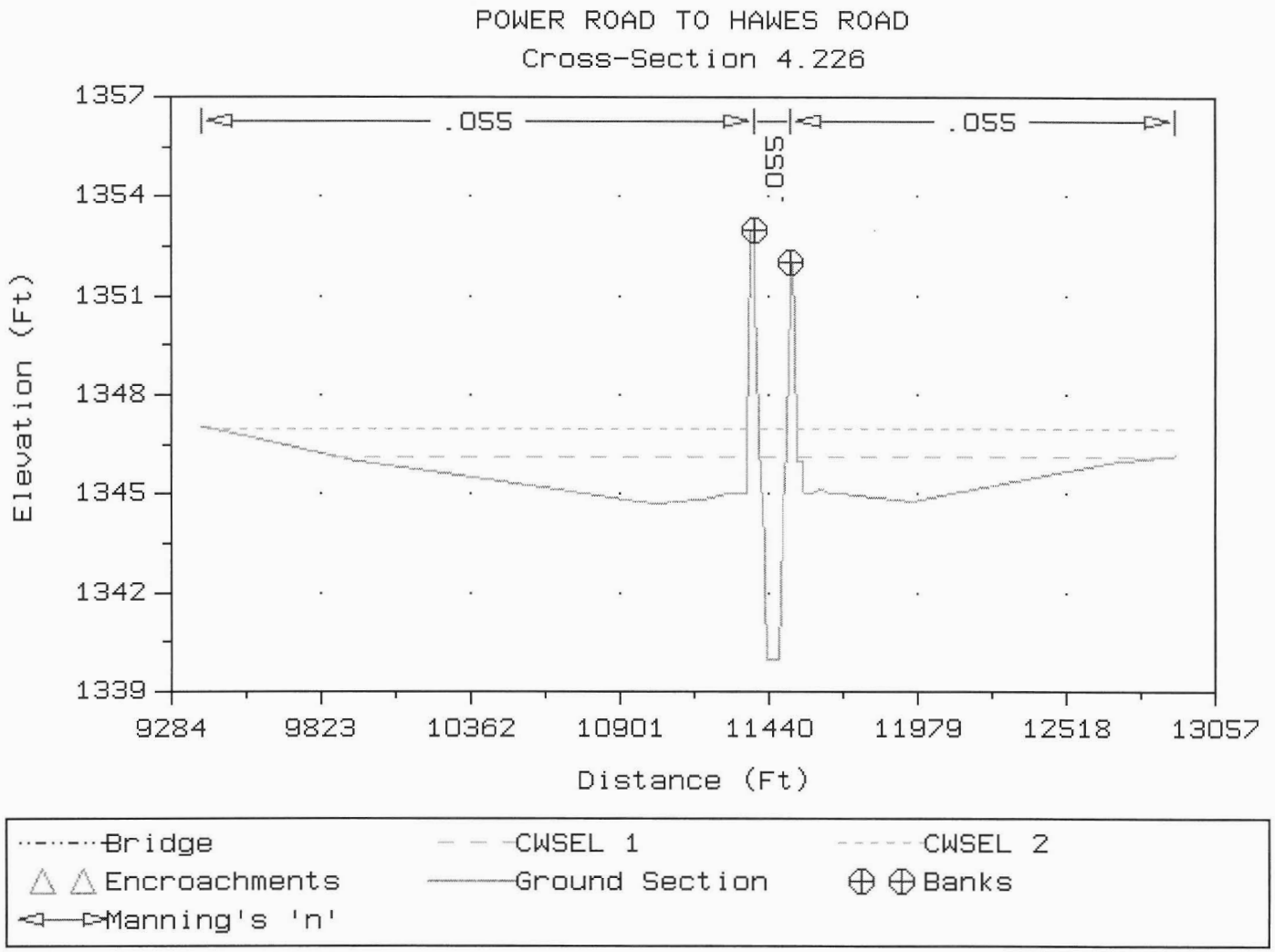
Cross-Section 4.138
.055
.05
.055
1355
1352
1349
1346
1343
1340
1337
Elevation (Ft)
9292
9885
10478
11071
11664
12257
12850
13443
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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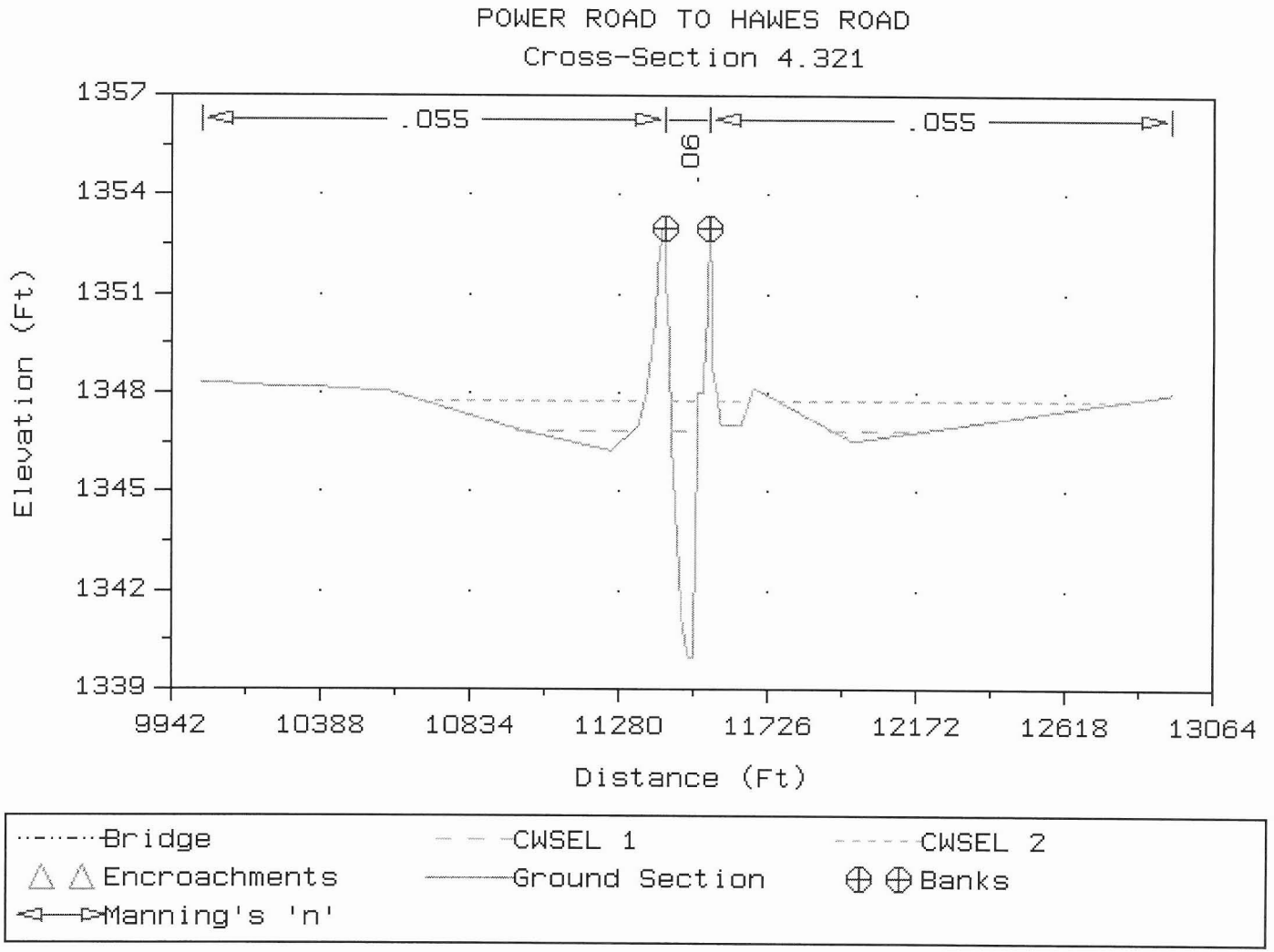
Cross-Section 4.226
.055
.055
.055
1357
1354
1351
1348
1345
1342
1339
Elevation (Ft)
9284
9823
10362
10901
11440
11979
12518
13057
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Cross-Section 4.321
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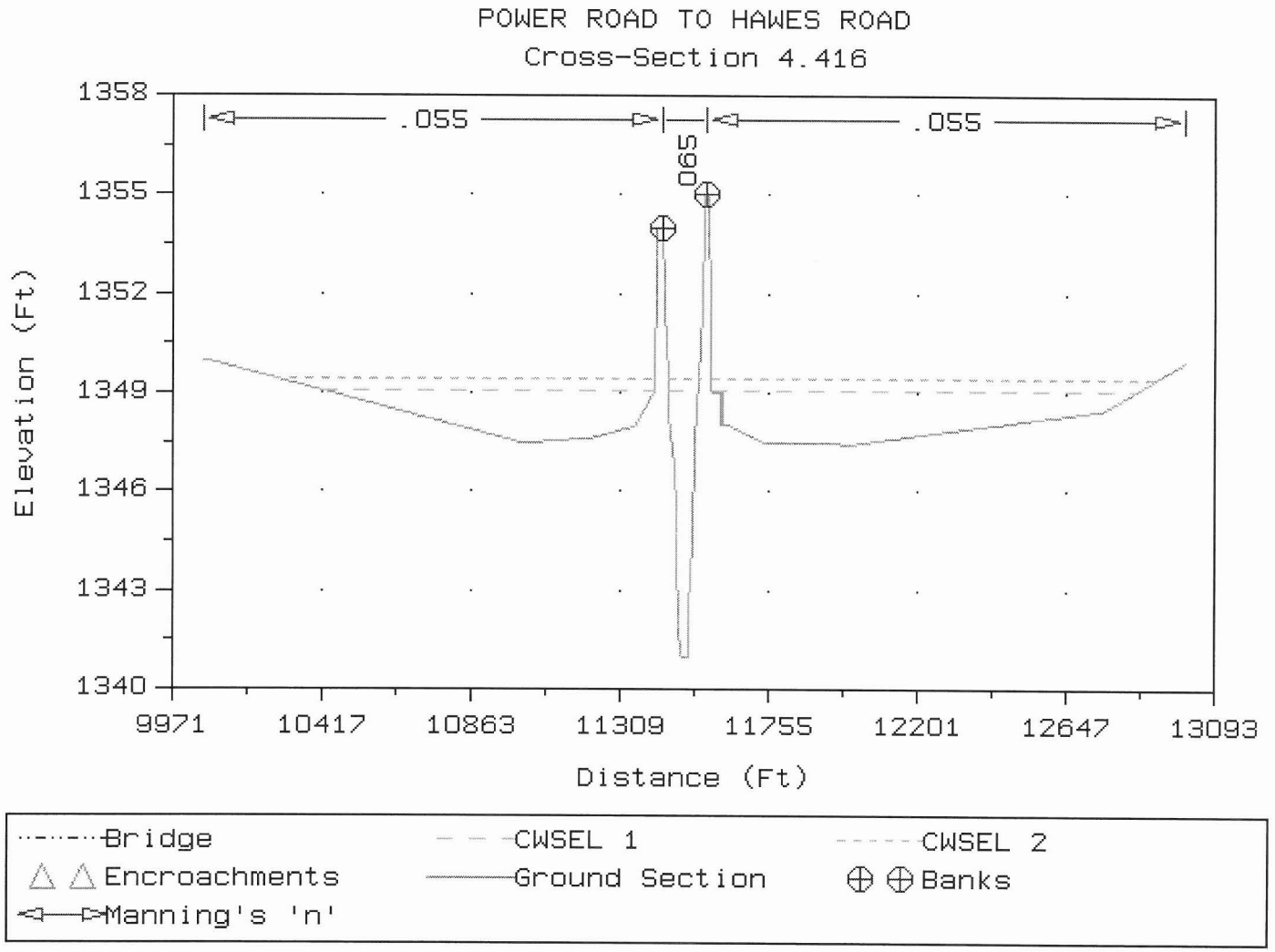
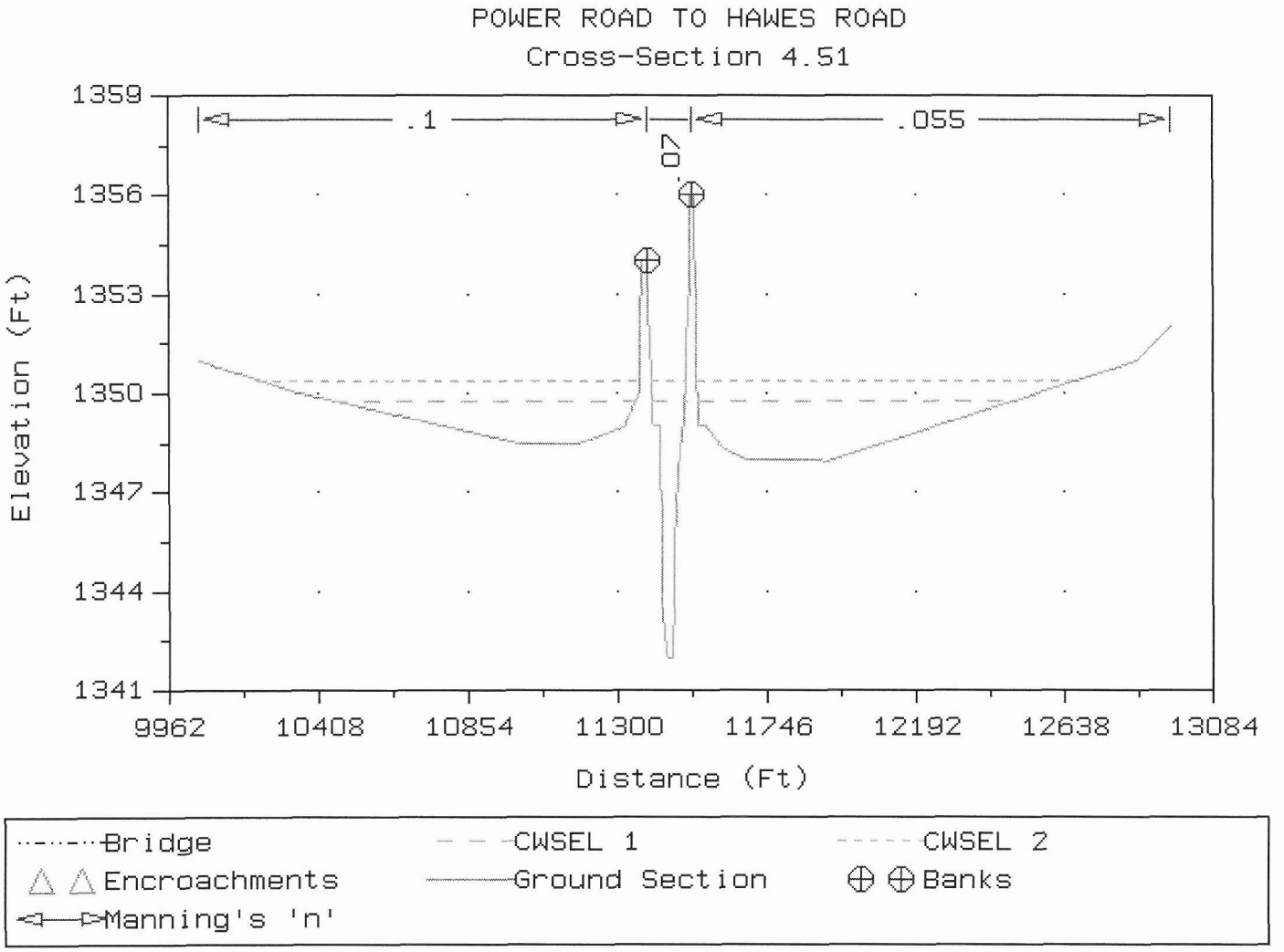
.06
.055
1357
1354
1351
1348
1345
1342
1339
Elevation (Ft)
9942
10388
10834
11280
11726
12172
12618
13064
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'


POWER ROAD TO HAWES ROAD
Cross-Section 4.416
.055
.055
.065
1358
1355
1352
1349
1346
1343
1340
Elevation (Ft)
9971
10417
10863
11309
11755
12201
12647
13093
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Cross-Section 4.51
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Elevation (Ft)
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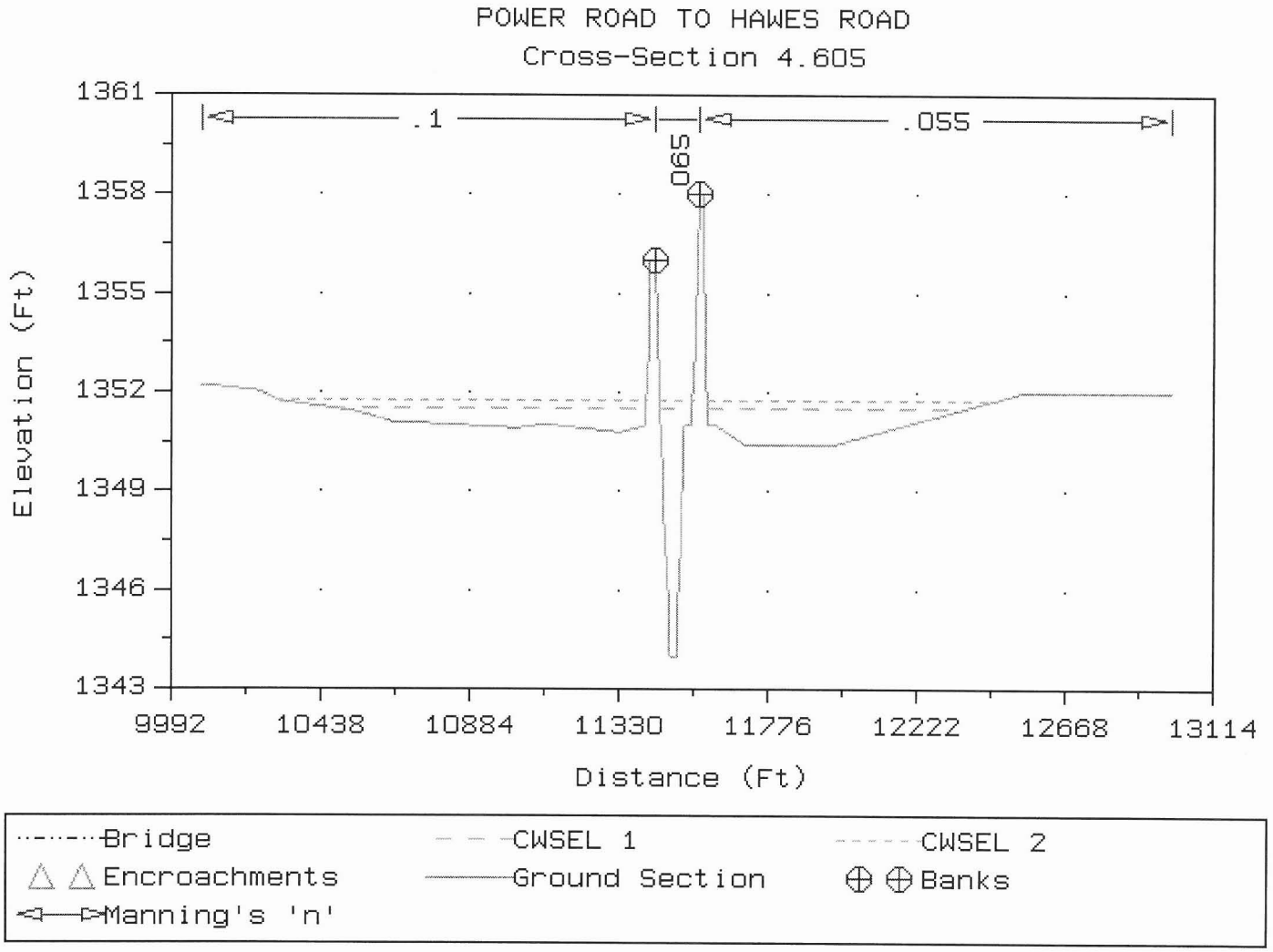
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Elevation (Ft)
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Distance (Ft)
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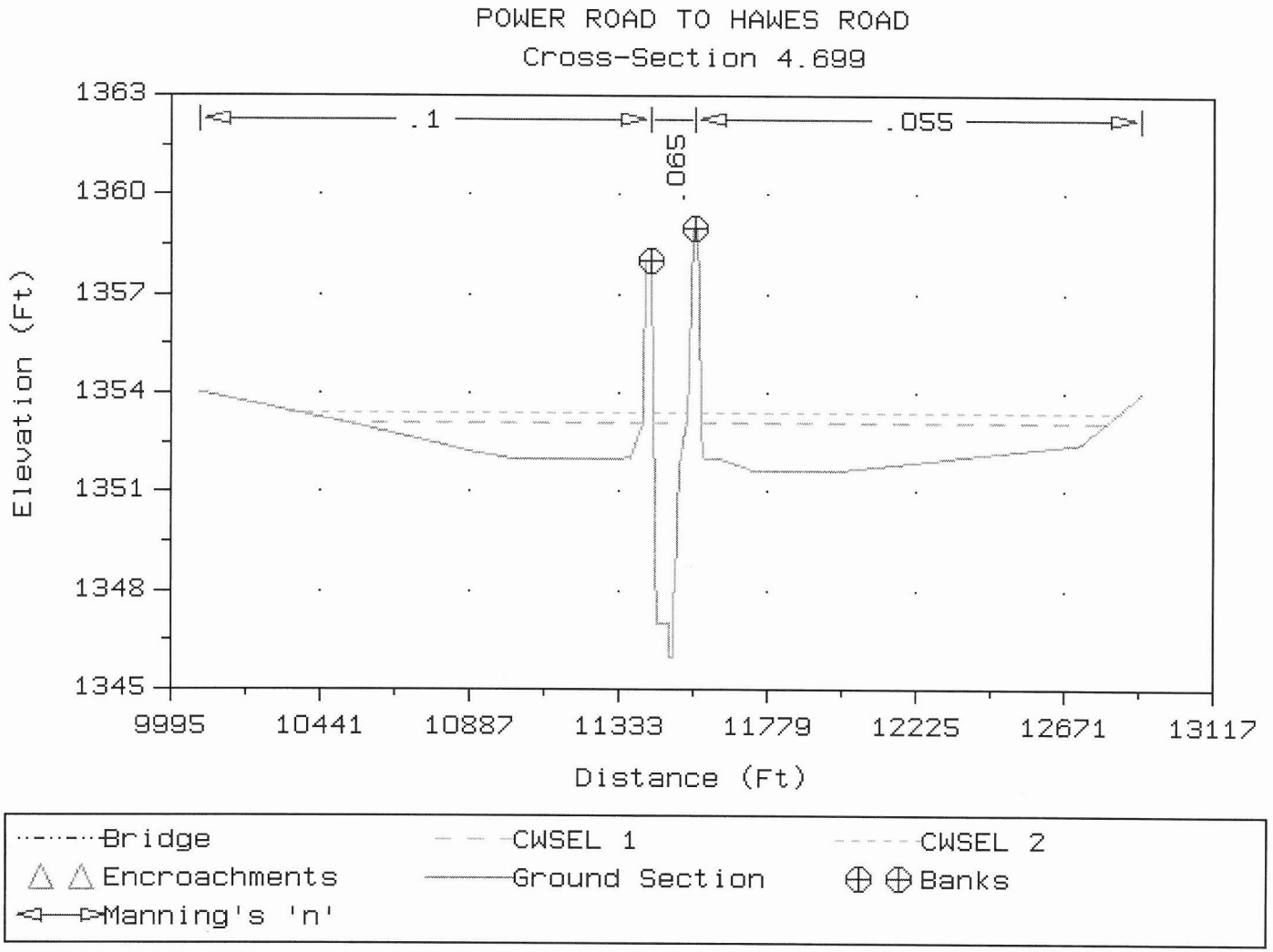
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Elevation (Ft)
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Distance (Ft)
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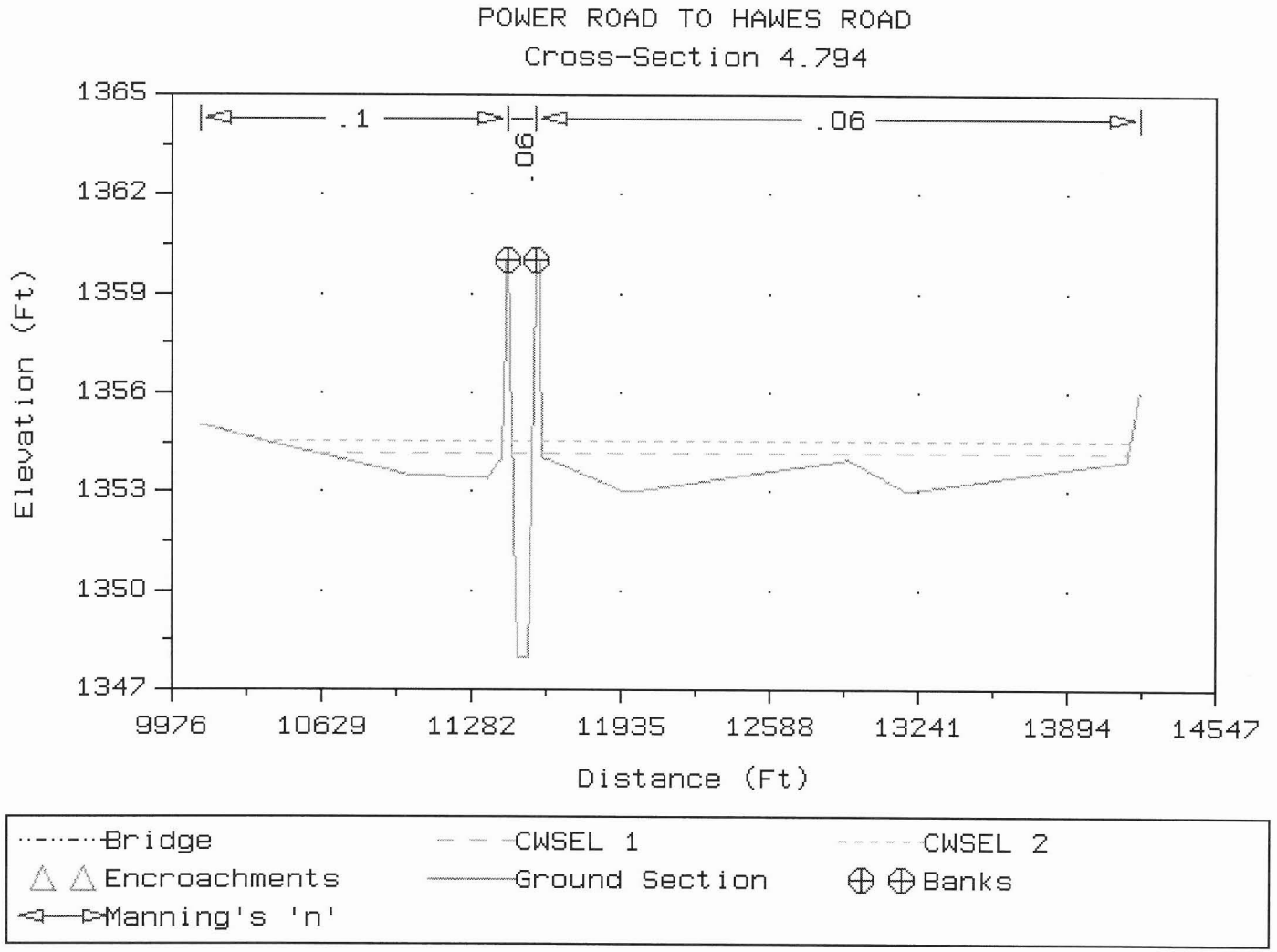
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Distance (Ft)
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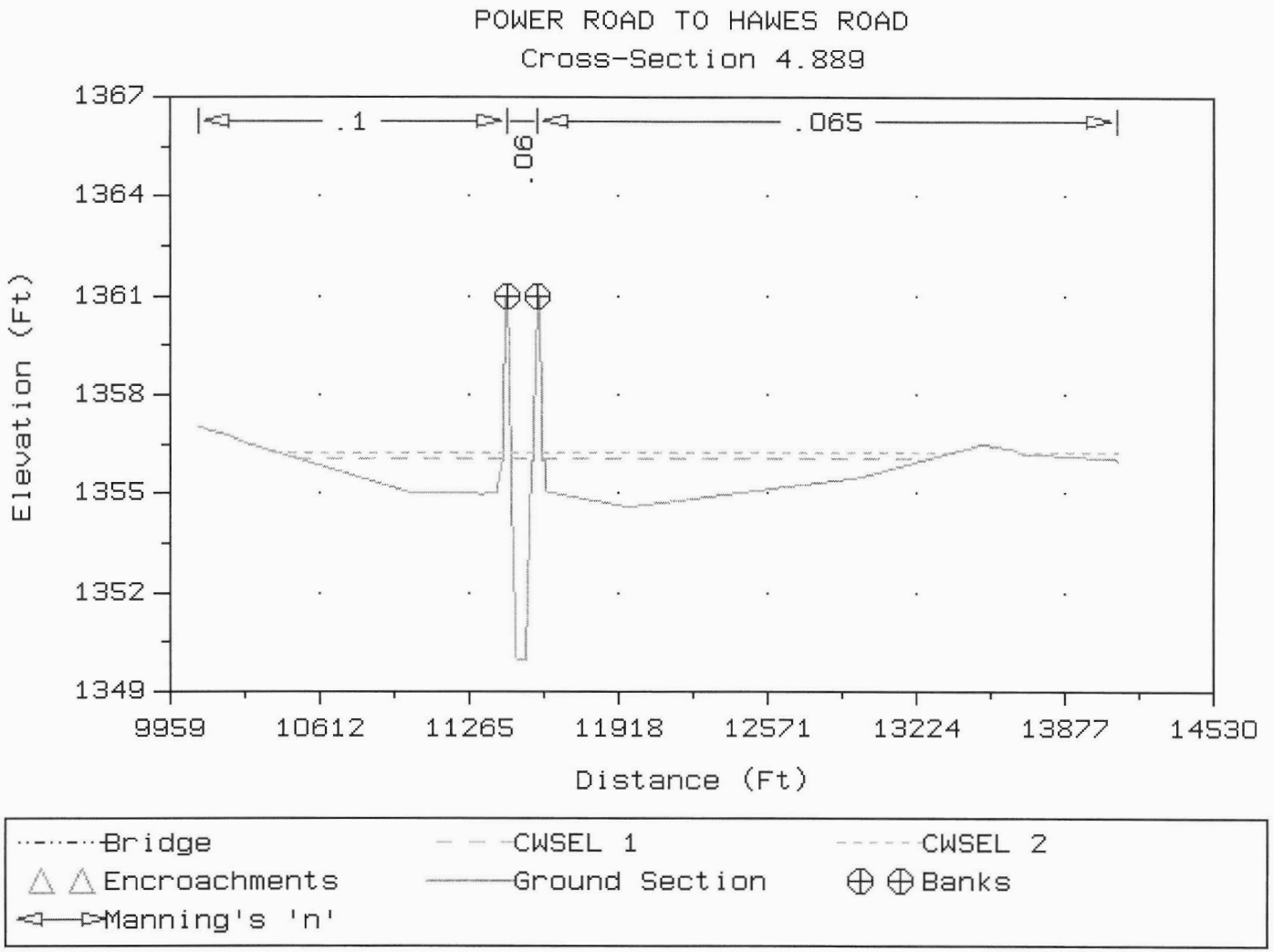
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Distance (Ft)
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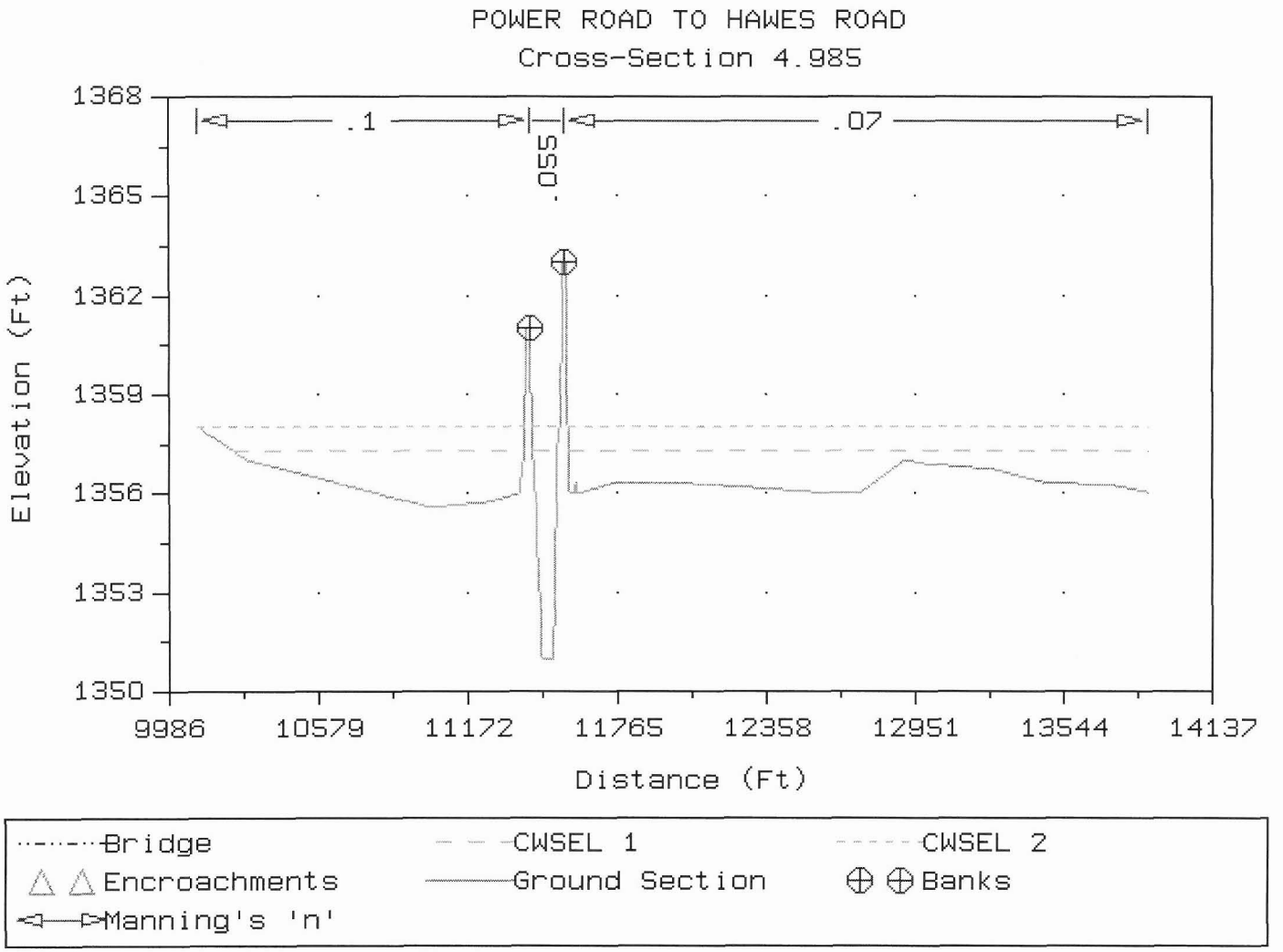
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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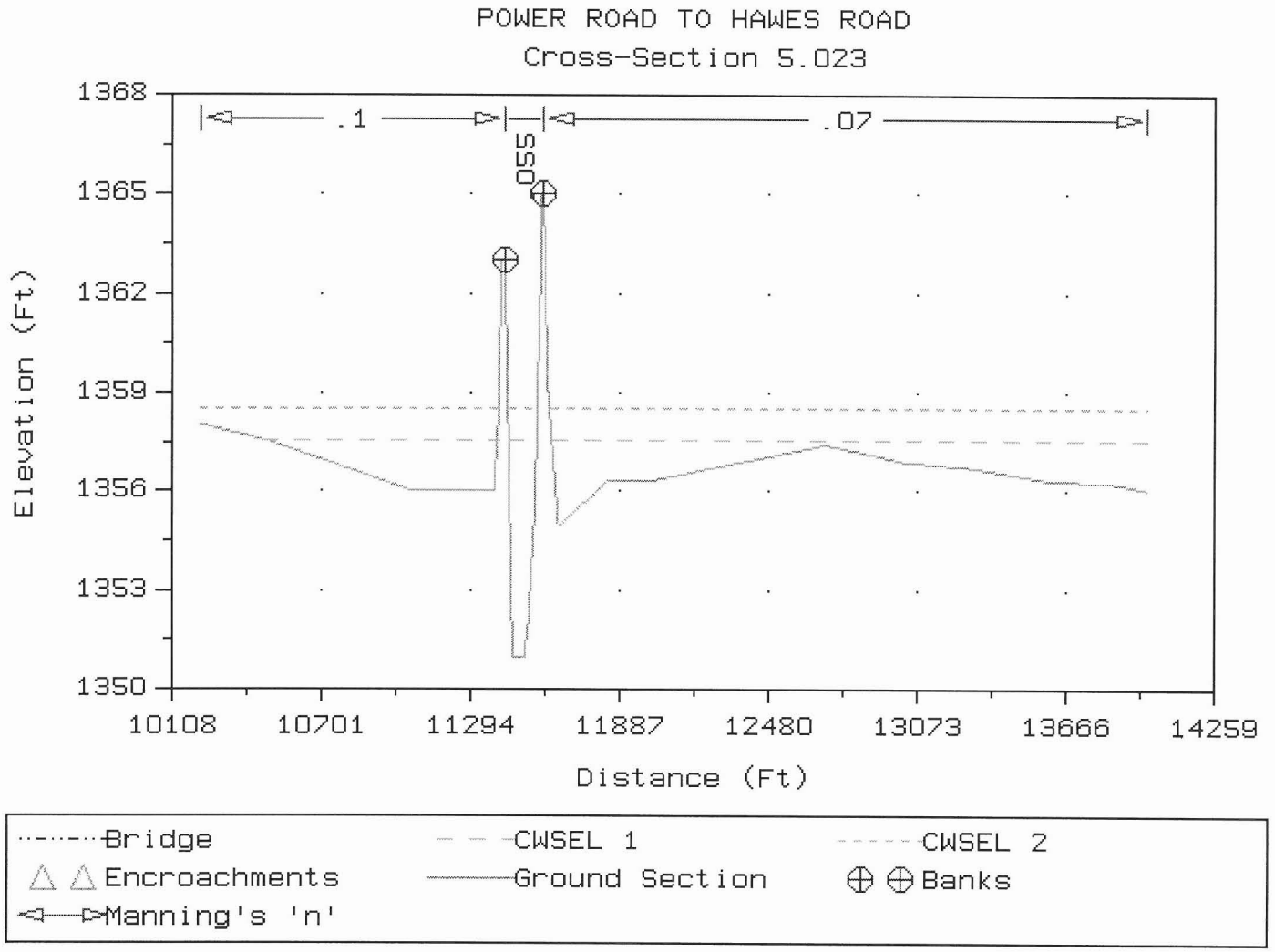
Ground Section
Banks
Manning's 'n'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Elevation (Ft)
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10701
11294
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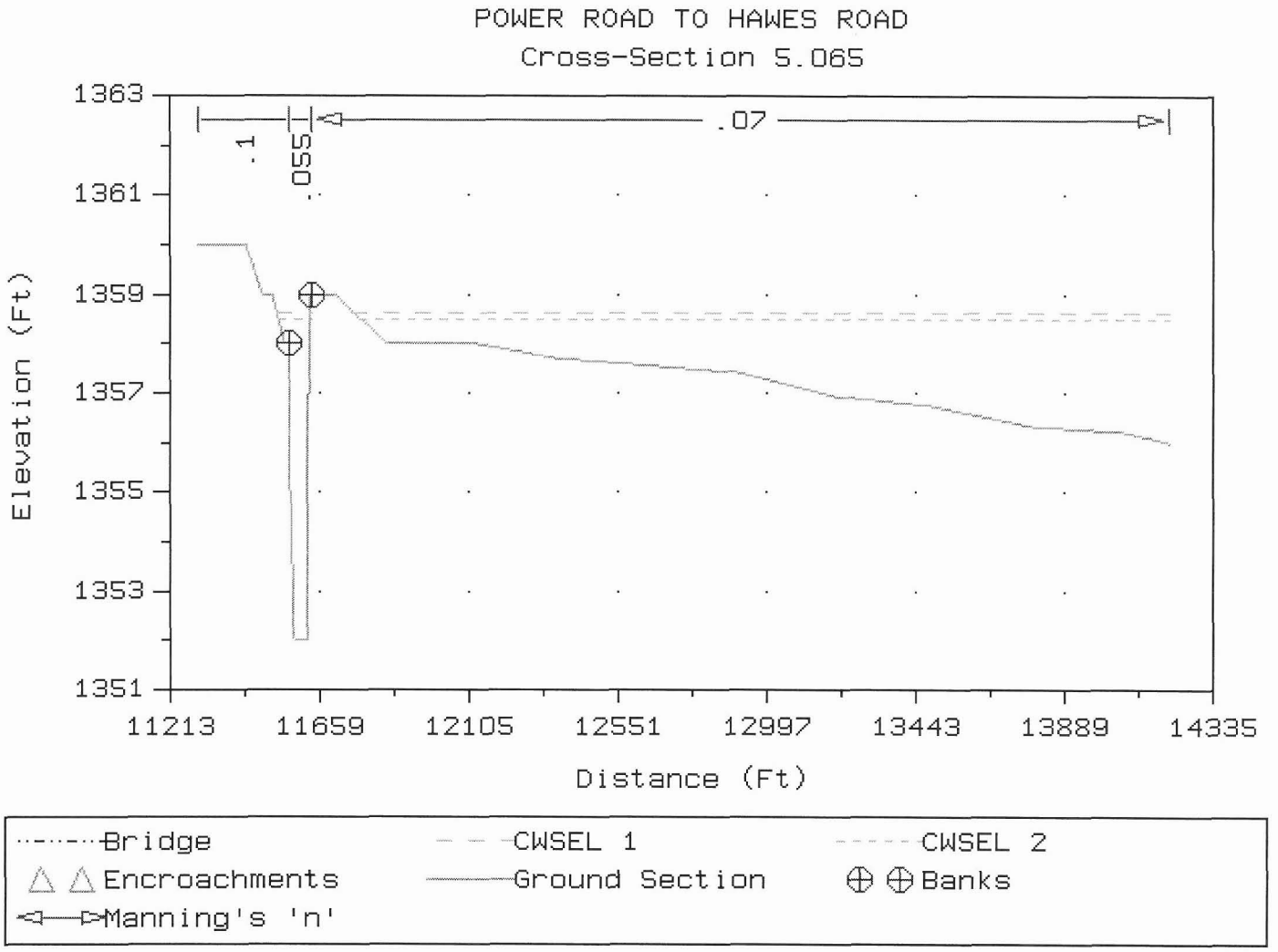
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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12105
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13889
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Distance (Ft)
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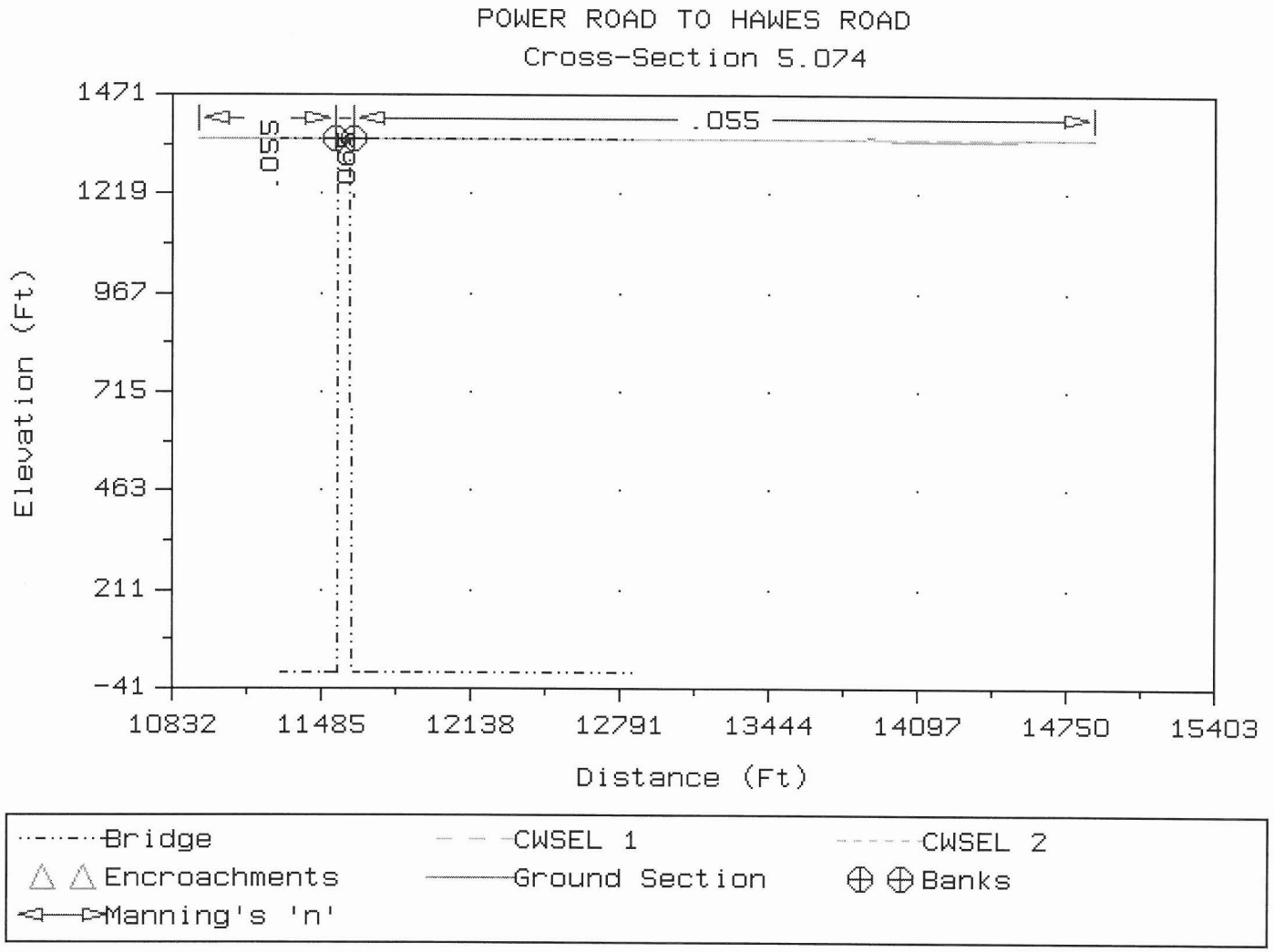
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Cross-Section 5.074
1471
1219
967
715
463
211
-41
Elevation (Ft)
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.055
.060
10832
11485
12138
12791
13444
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14750
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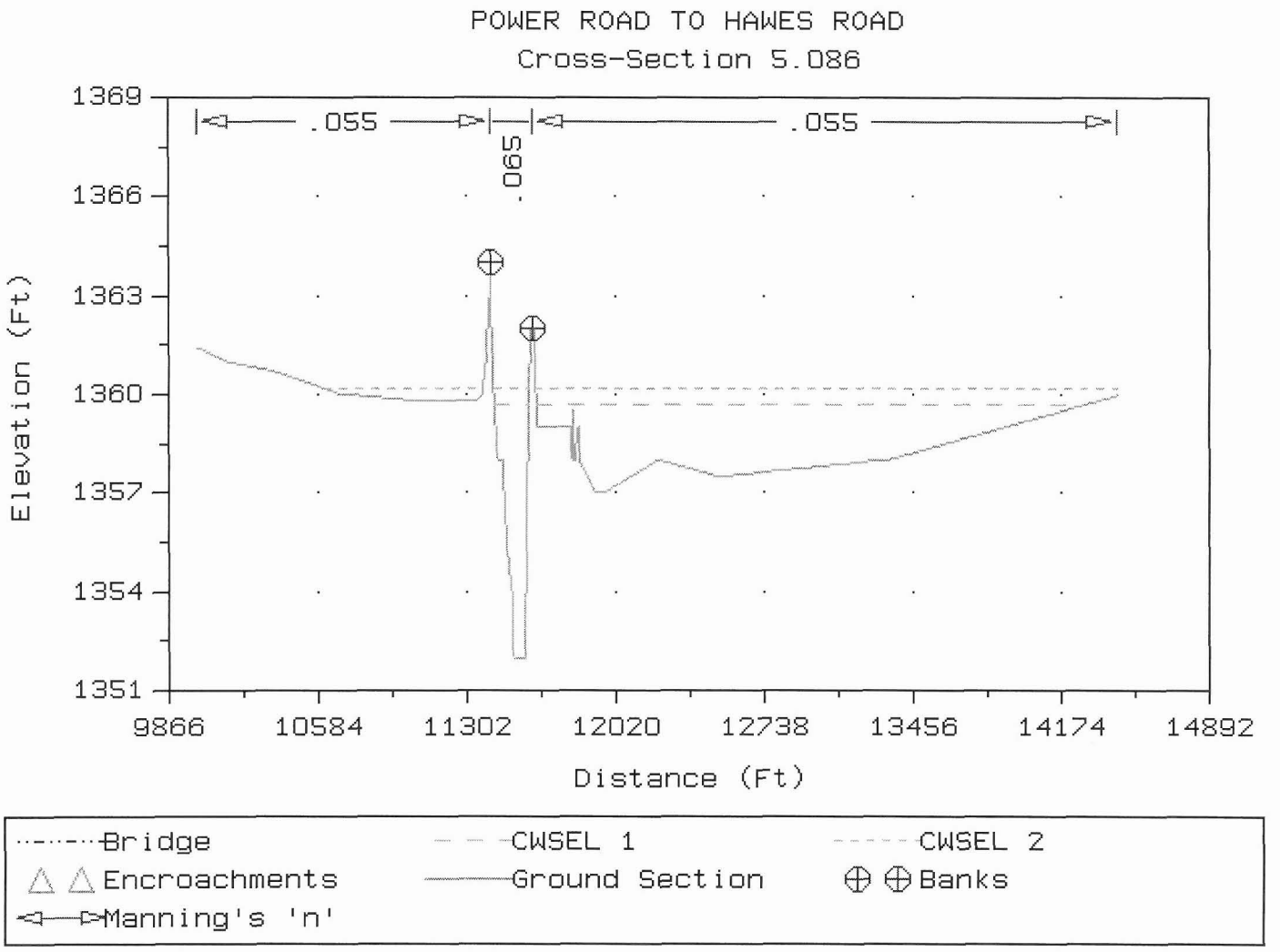
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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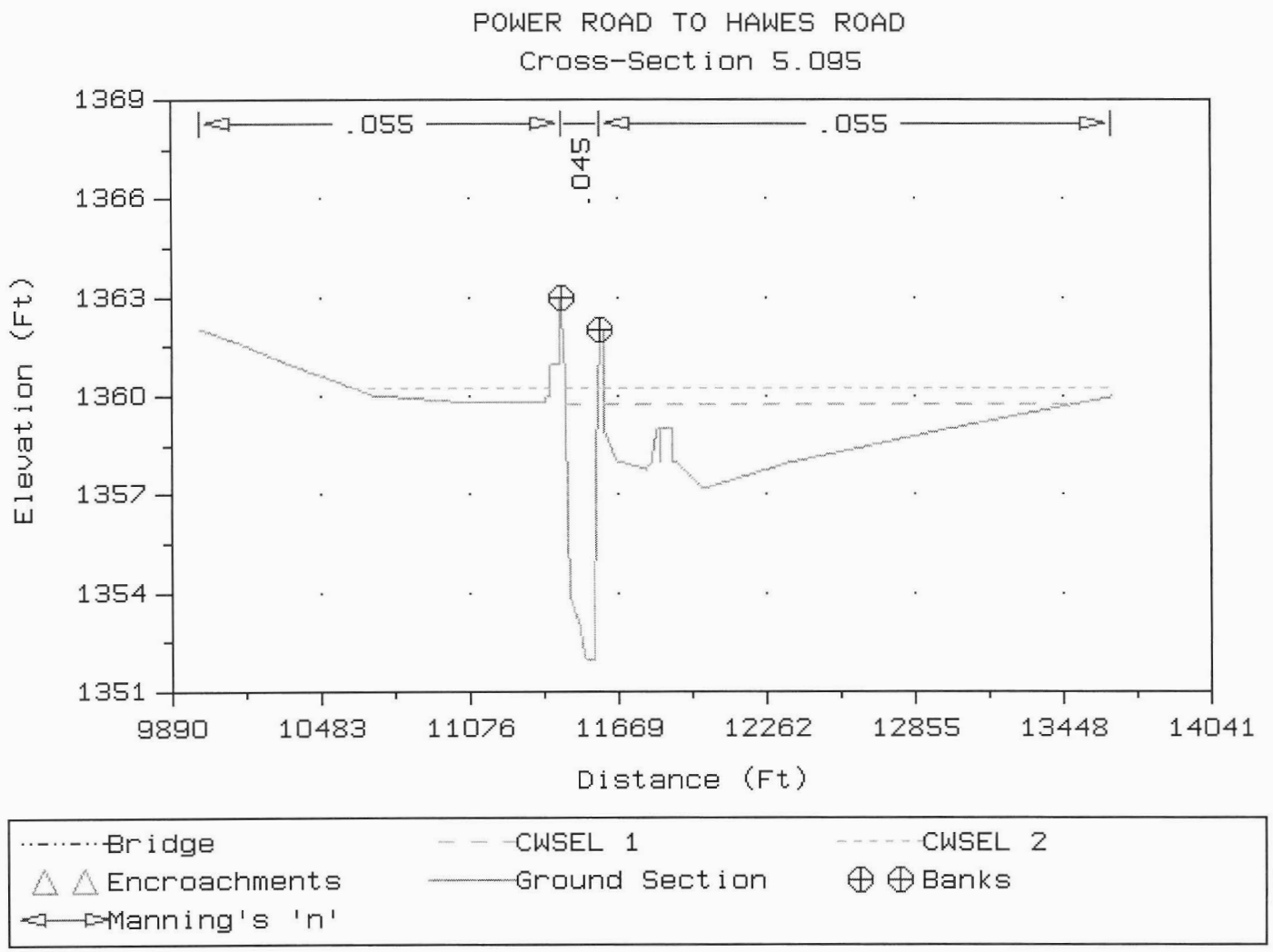
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'


POWER ROAD TO HAWES ROAD
Cross-Section 5.095
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Elevation (Ft)
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Distance (Ft)
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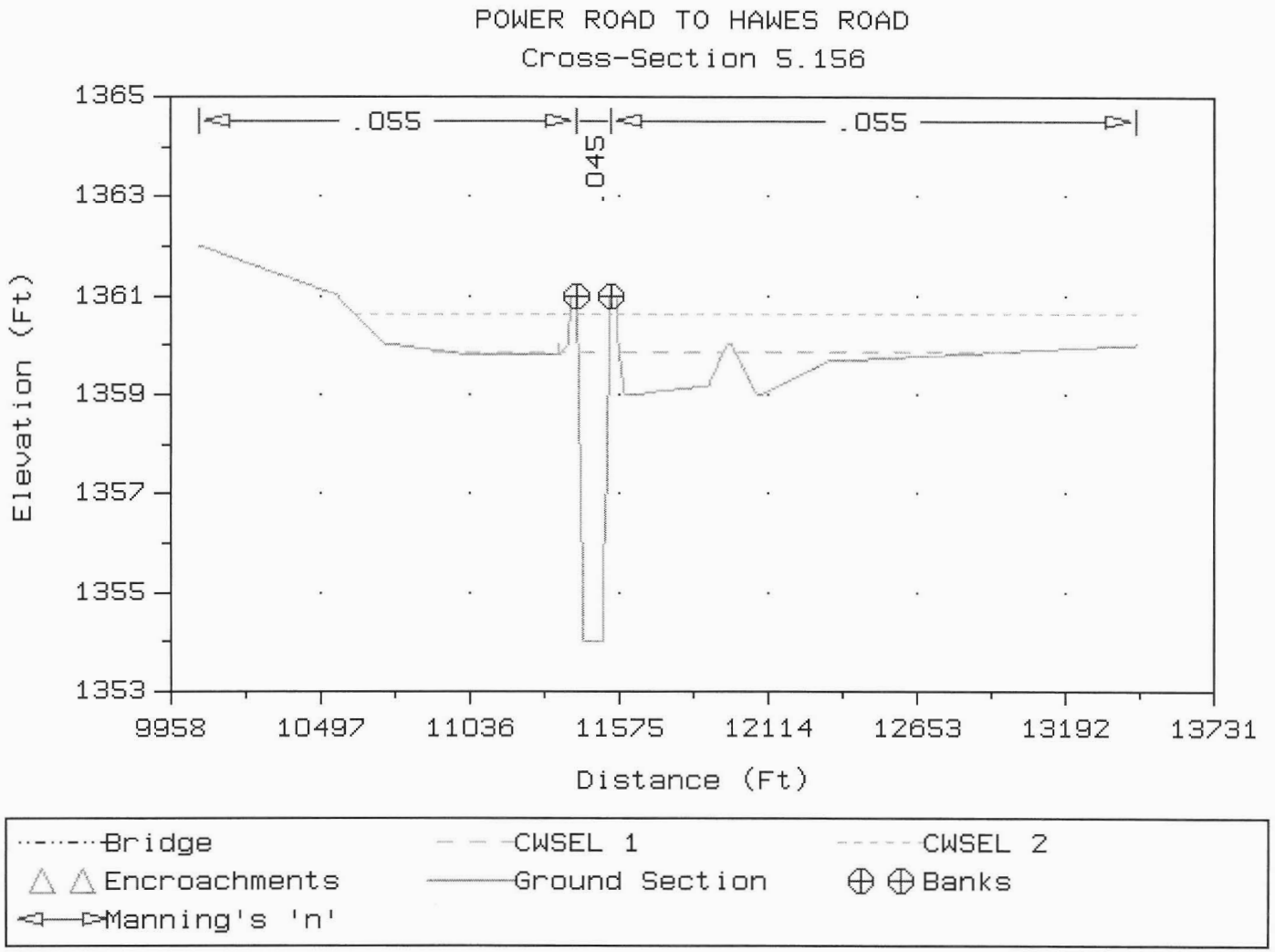
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Cross-Section 5.156
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1357
1355
1353
Elevation (Ft)
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11036
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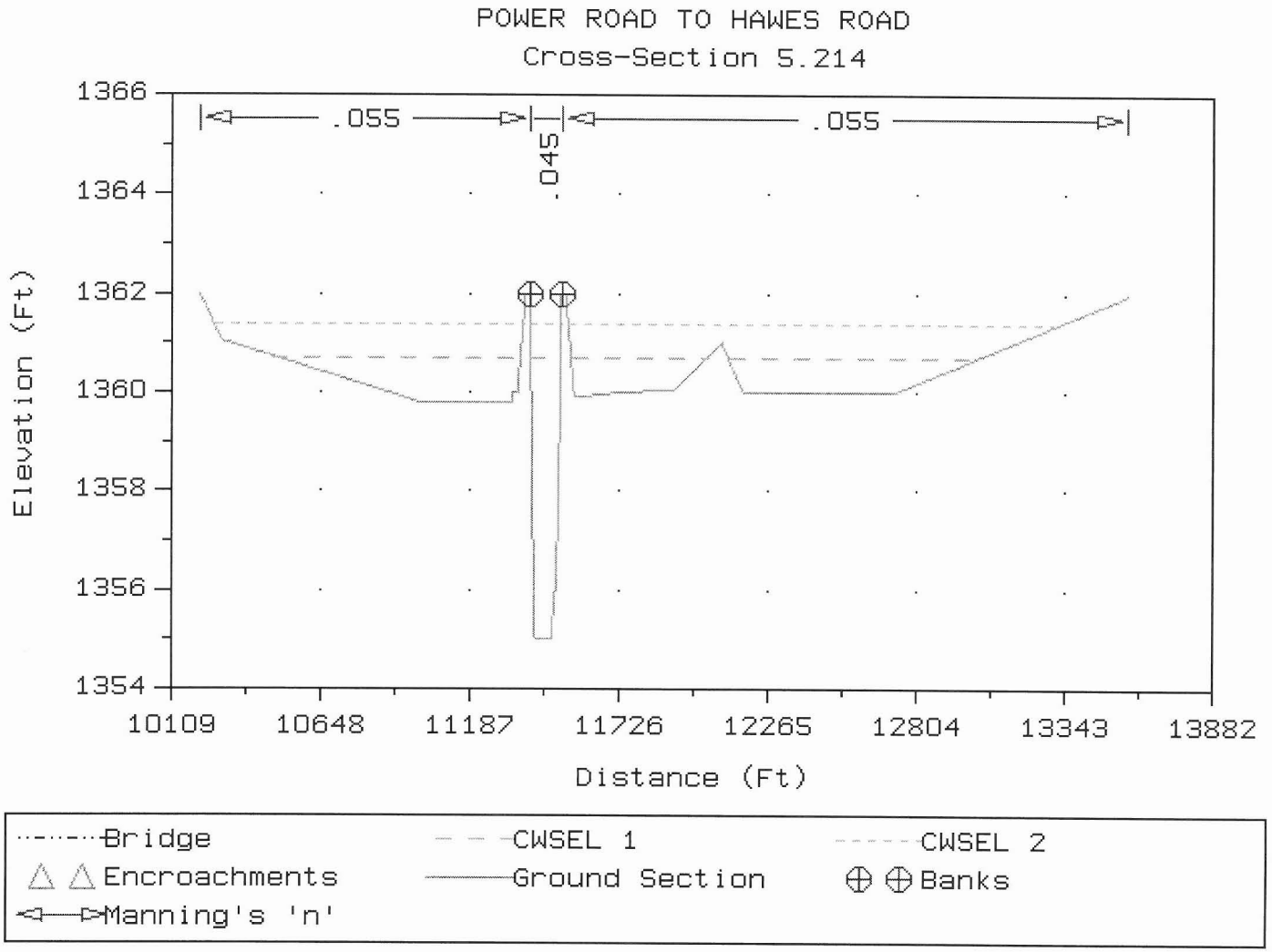
13192
13731
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Elevation (Ft)
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11187
11726
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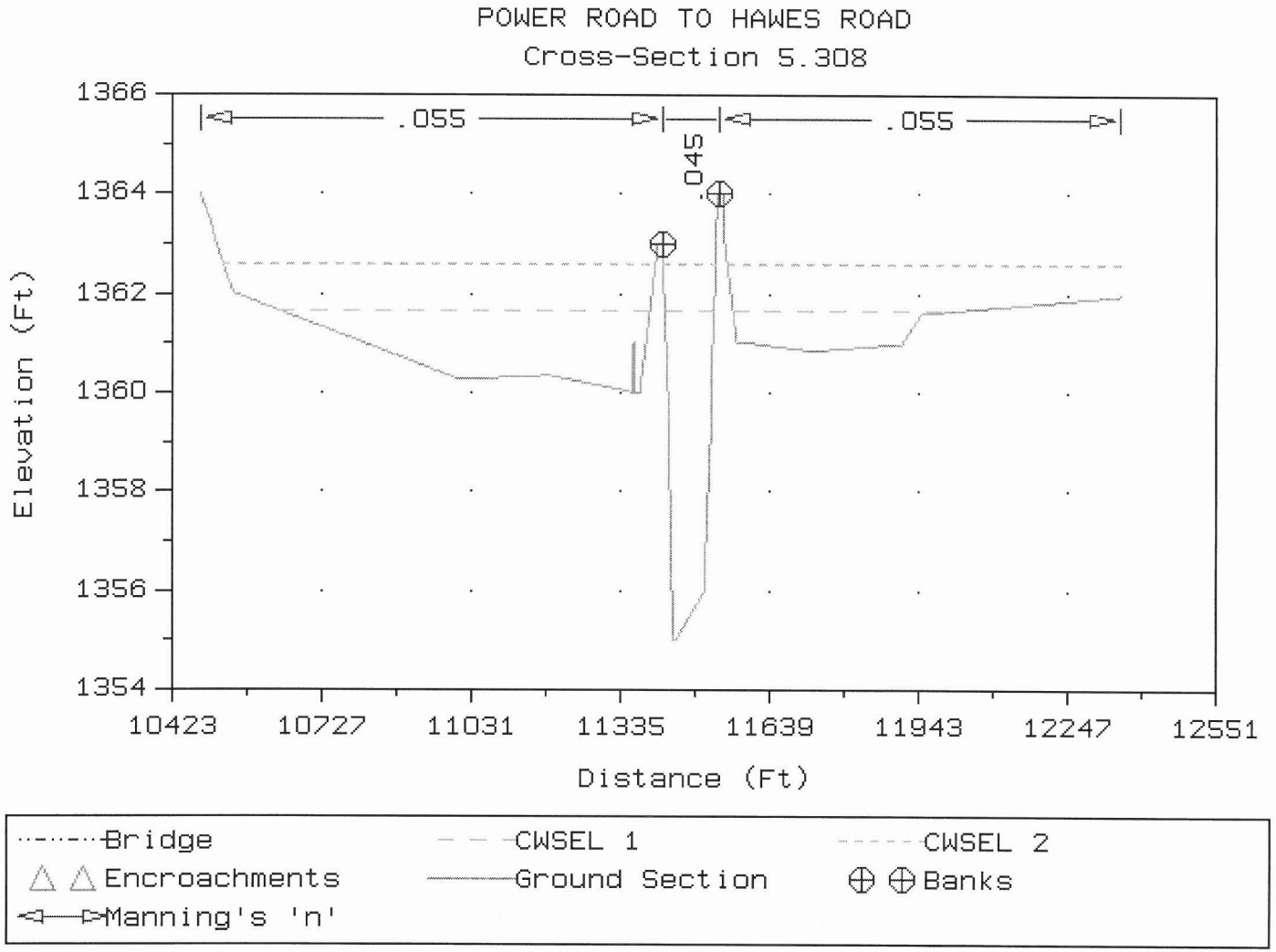
13882
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Cross-Section 5.308
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1360
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1354
Elevation (Ft)
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11031
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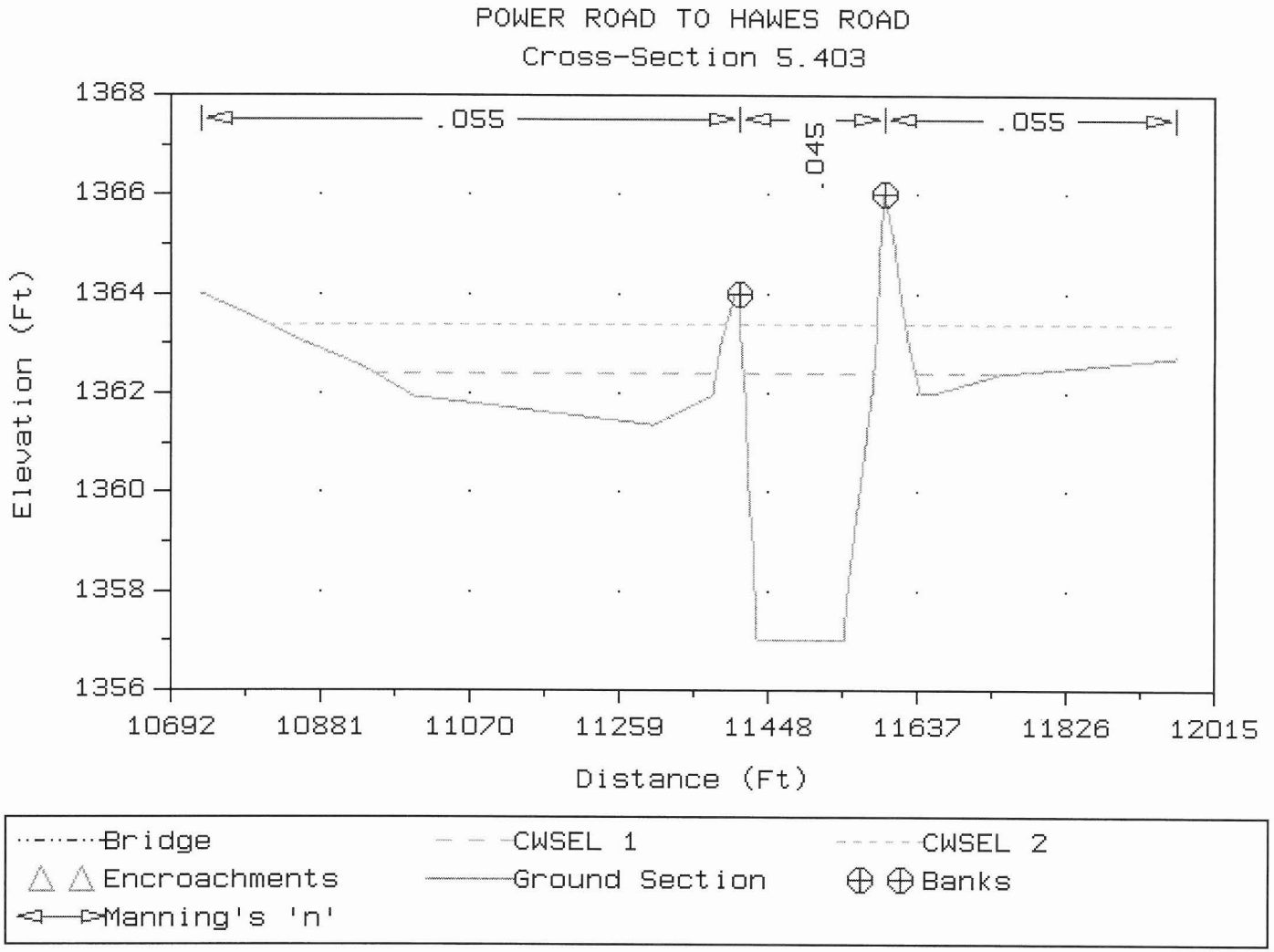
12551
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'


POWER ROAD TO HAWES ROAD
Cross-Section 5.403
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1366
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1362
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Elevation (Ft)
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11070
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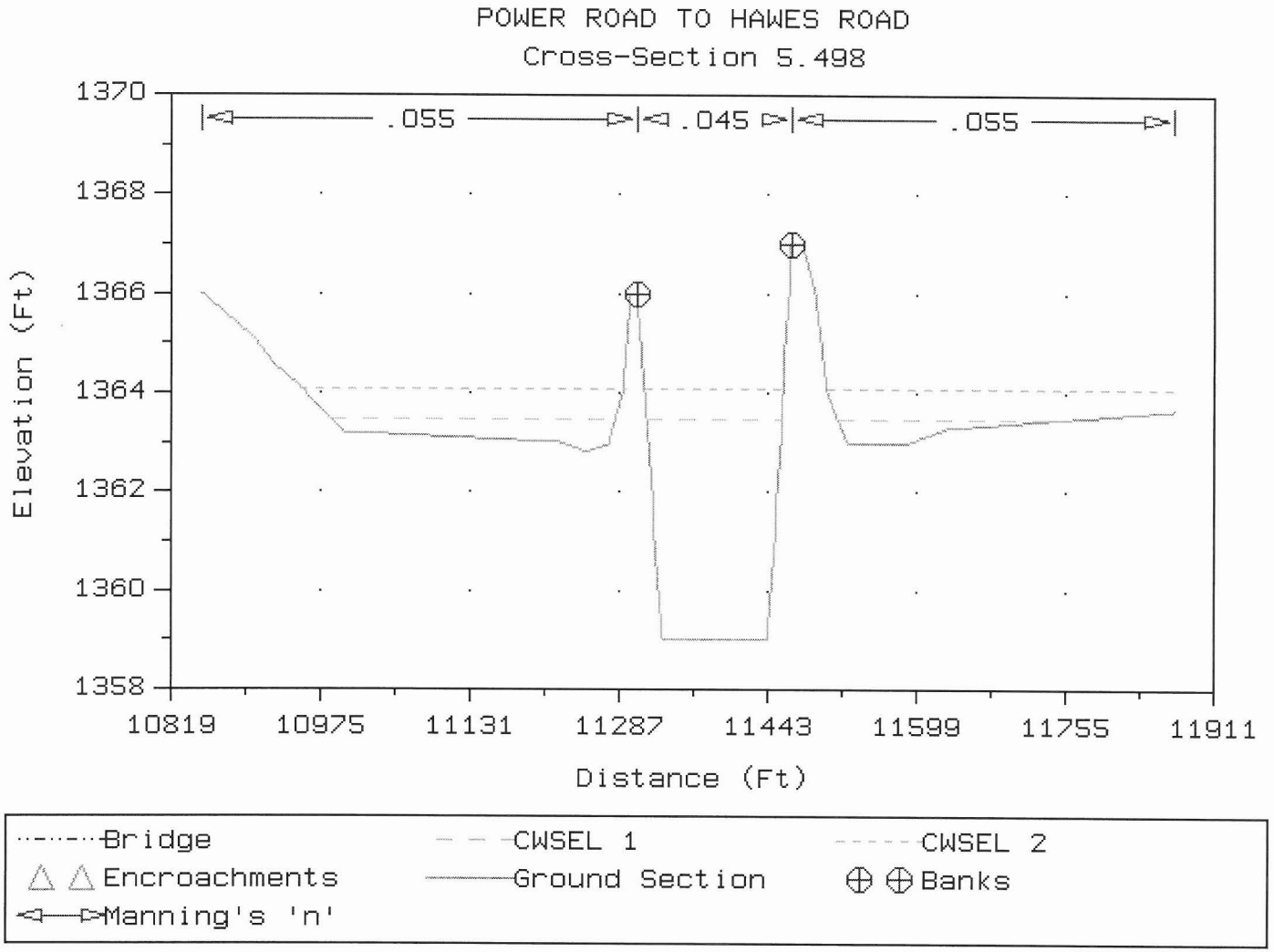
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Cross-Section 5.498
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1368
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1364
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1358
Elevation (Ft)
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10975
11131
11287
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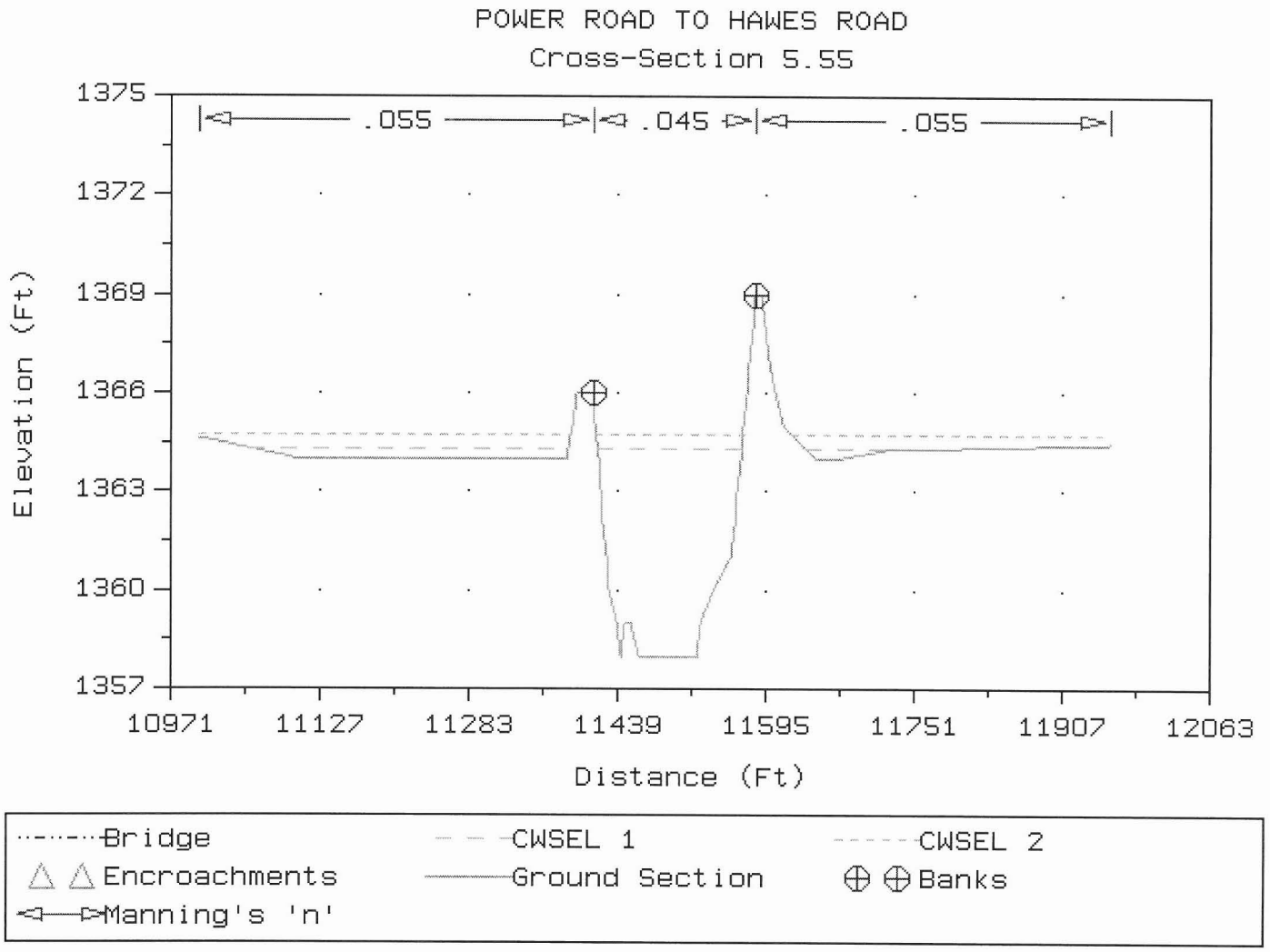
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Cross-Section 5.55
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1372
1369
1366
1363
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1357
Elevation (Ft)
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11283
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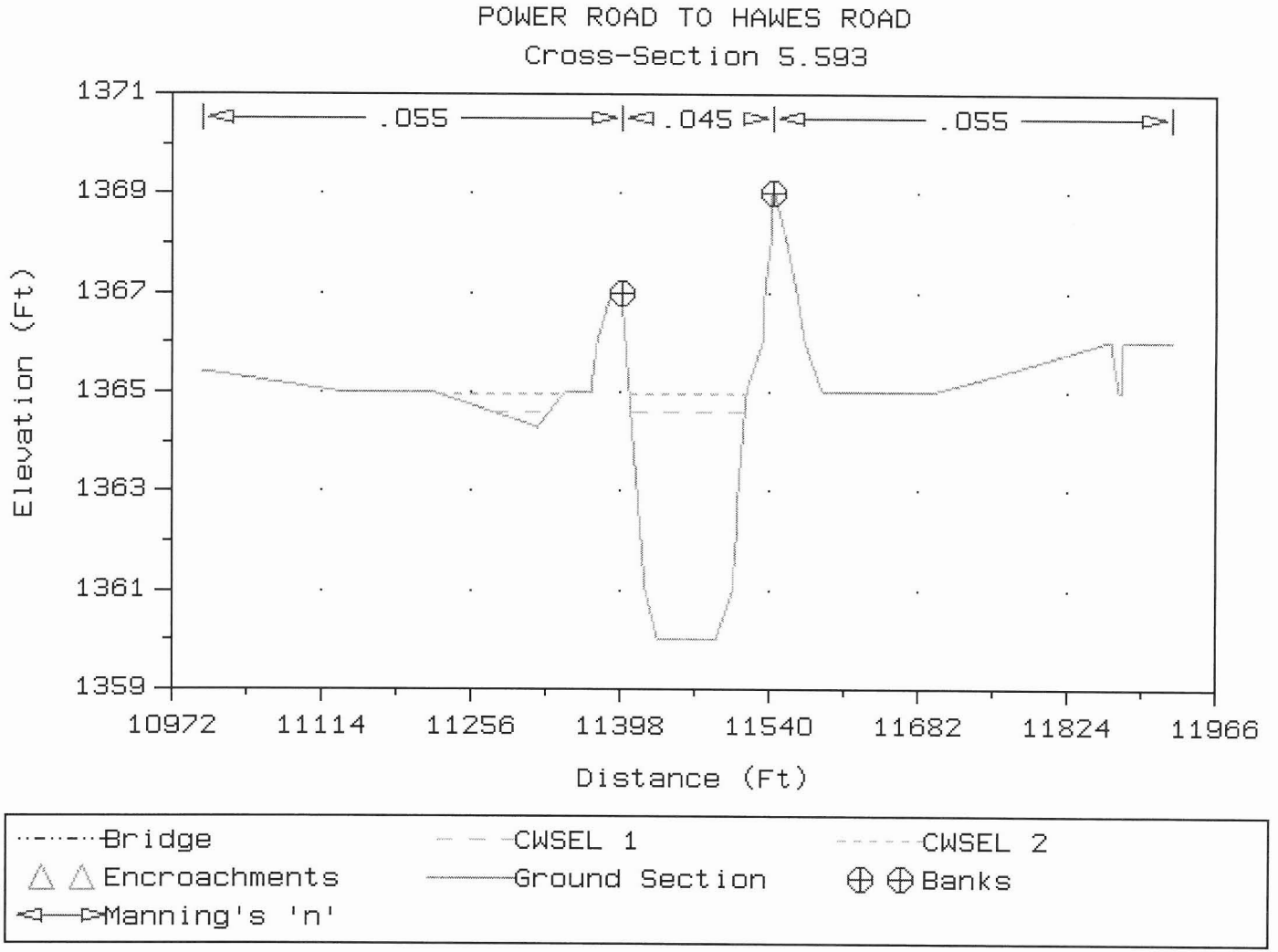
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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1369
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11114
11256
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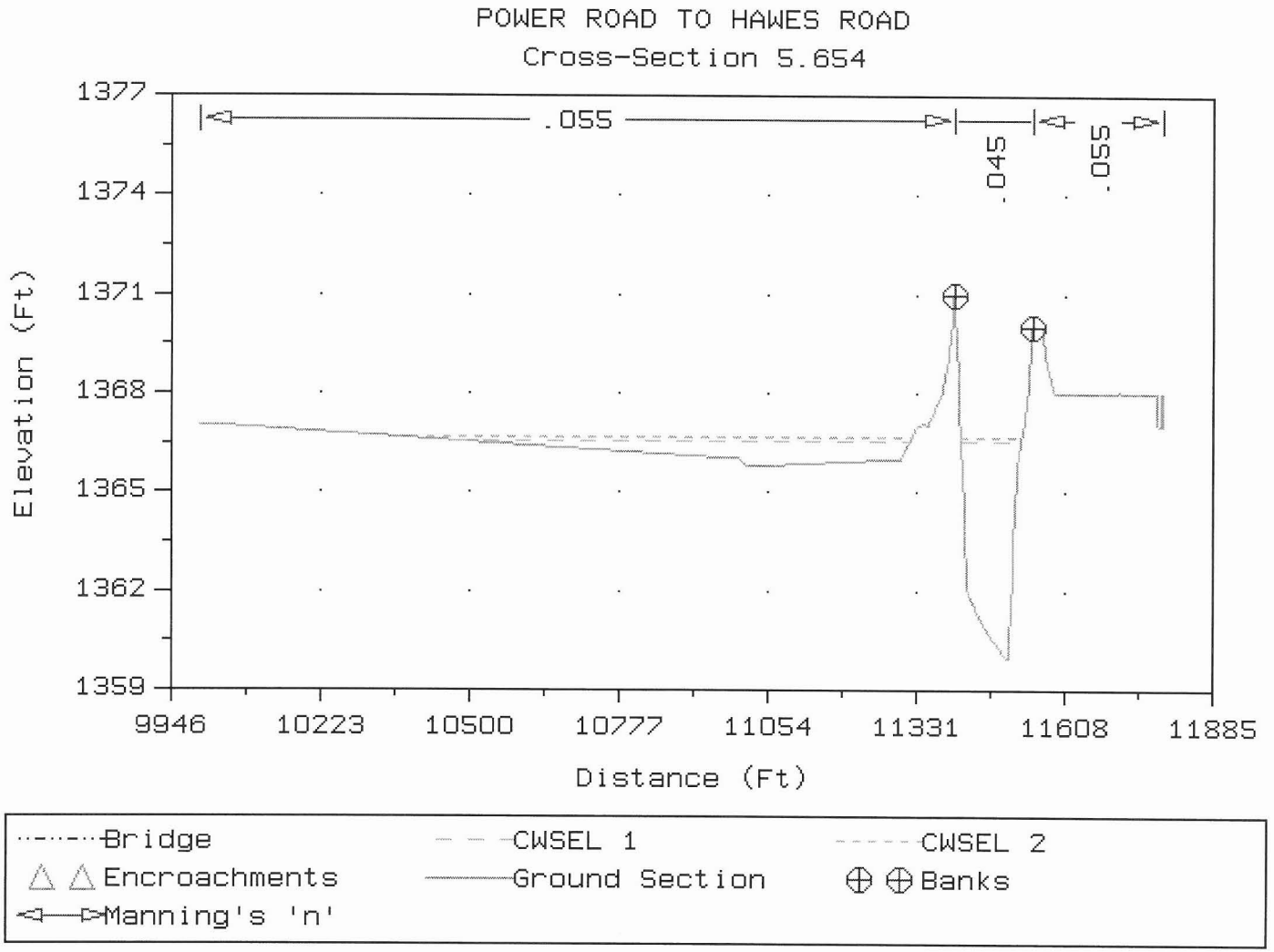
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Cross-Section 5.654
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Elevation (Ft)
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Distance (Ft)
Bridge
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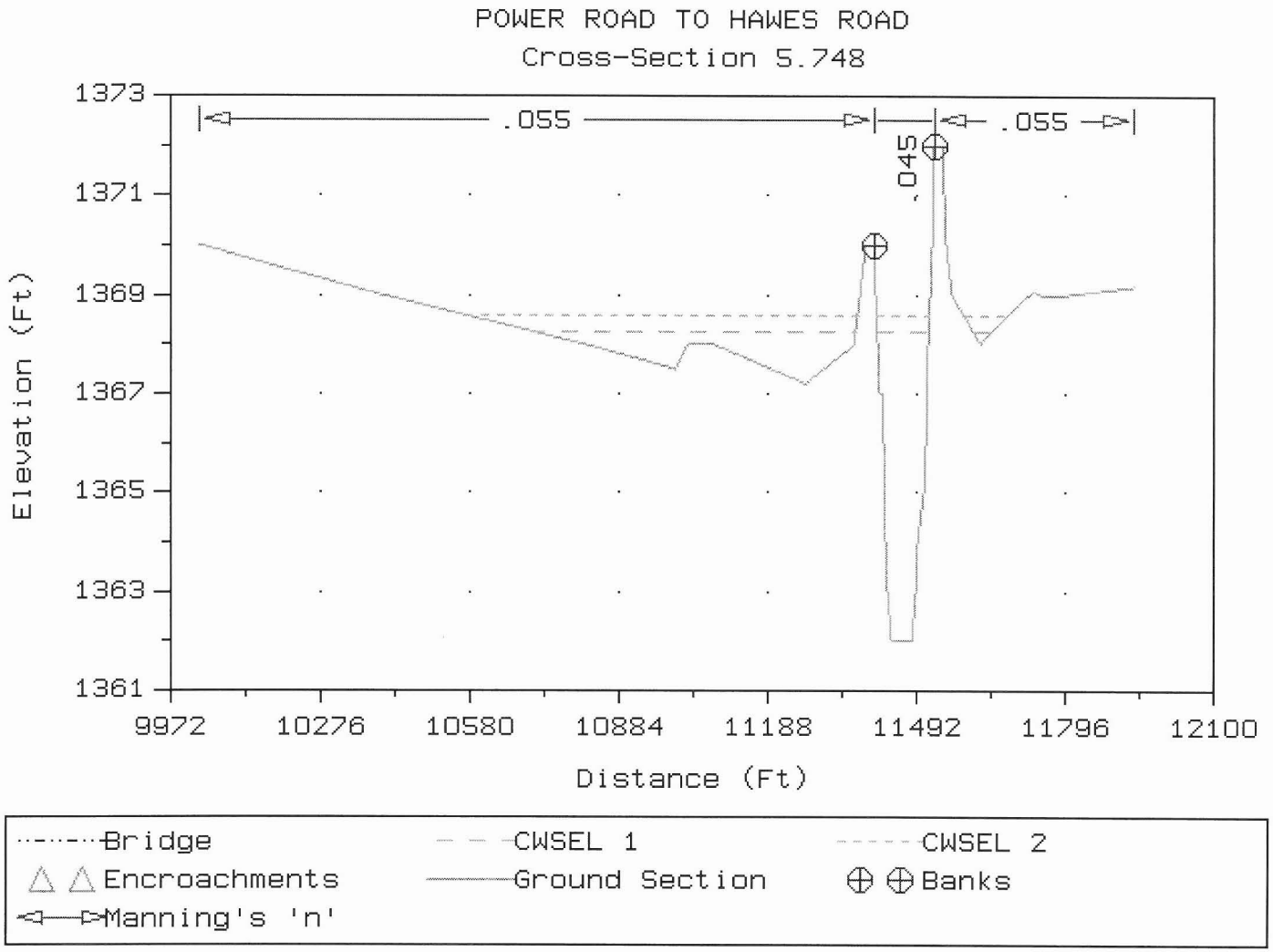
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Cross-Section 5.748
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Elevation (Ft)
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Distance (Ft)
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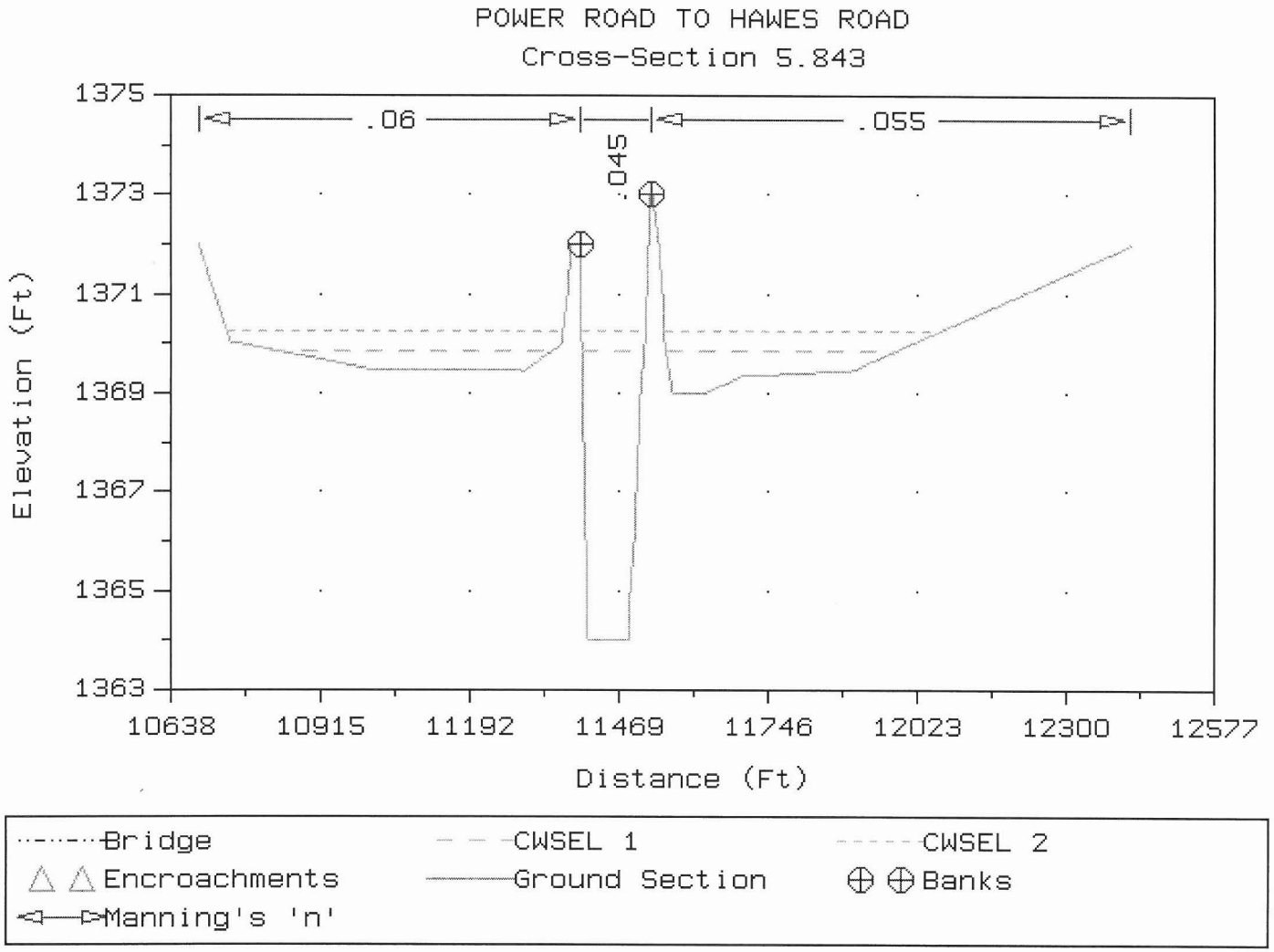
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Elevation (Ft)
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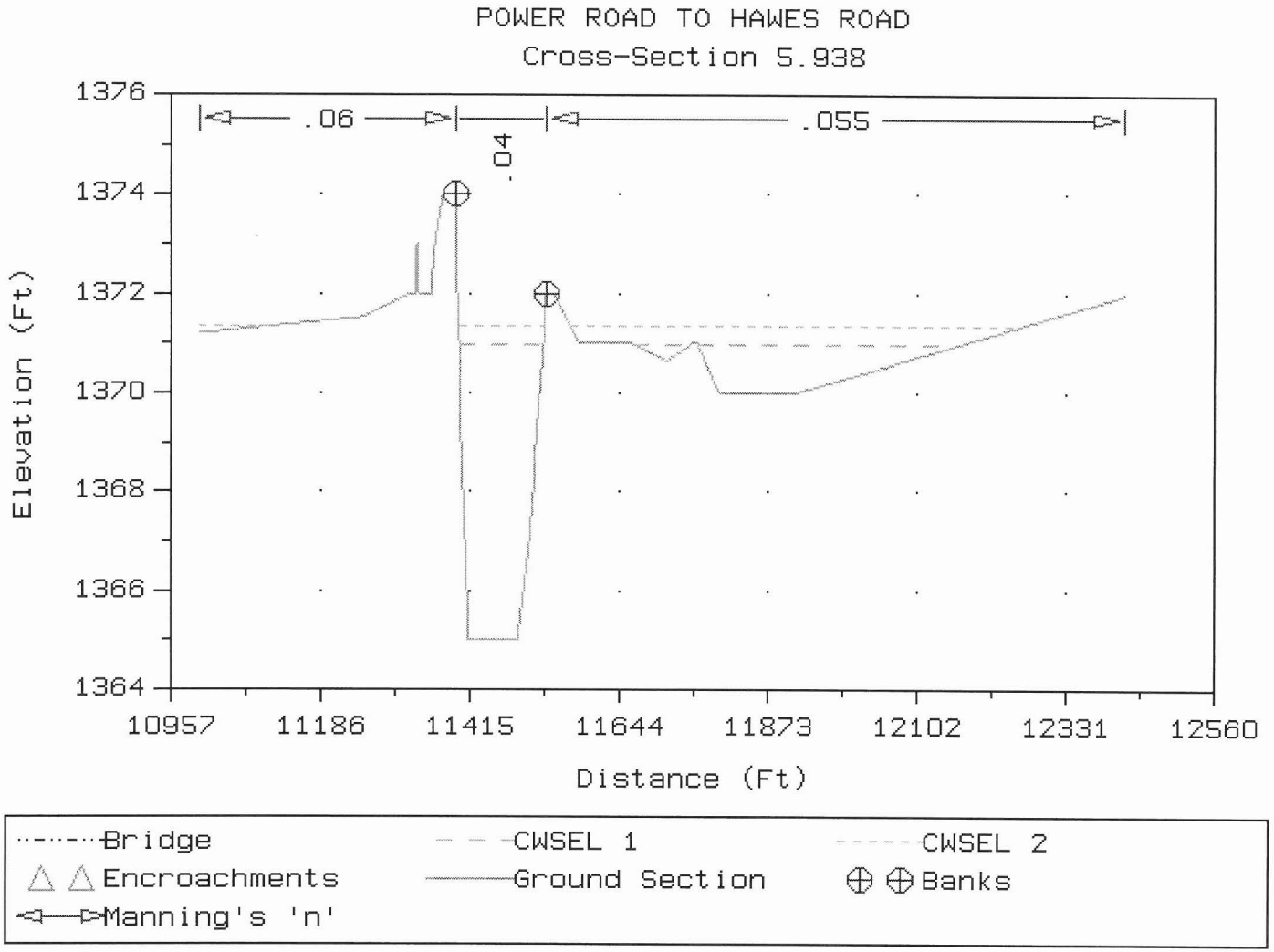
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Cross-Section 5.938
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Elevation (Ft)
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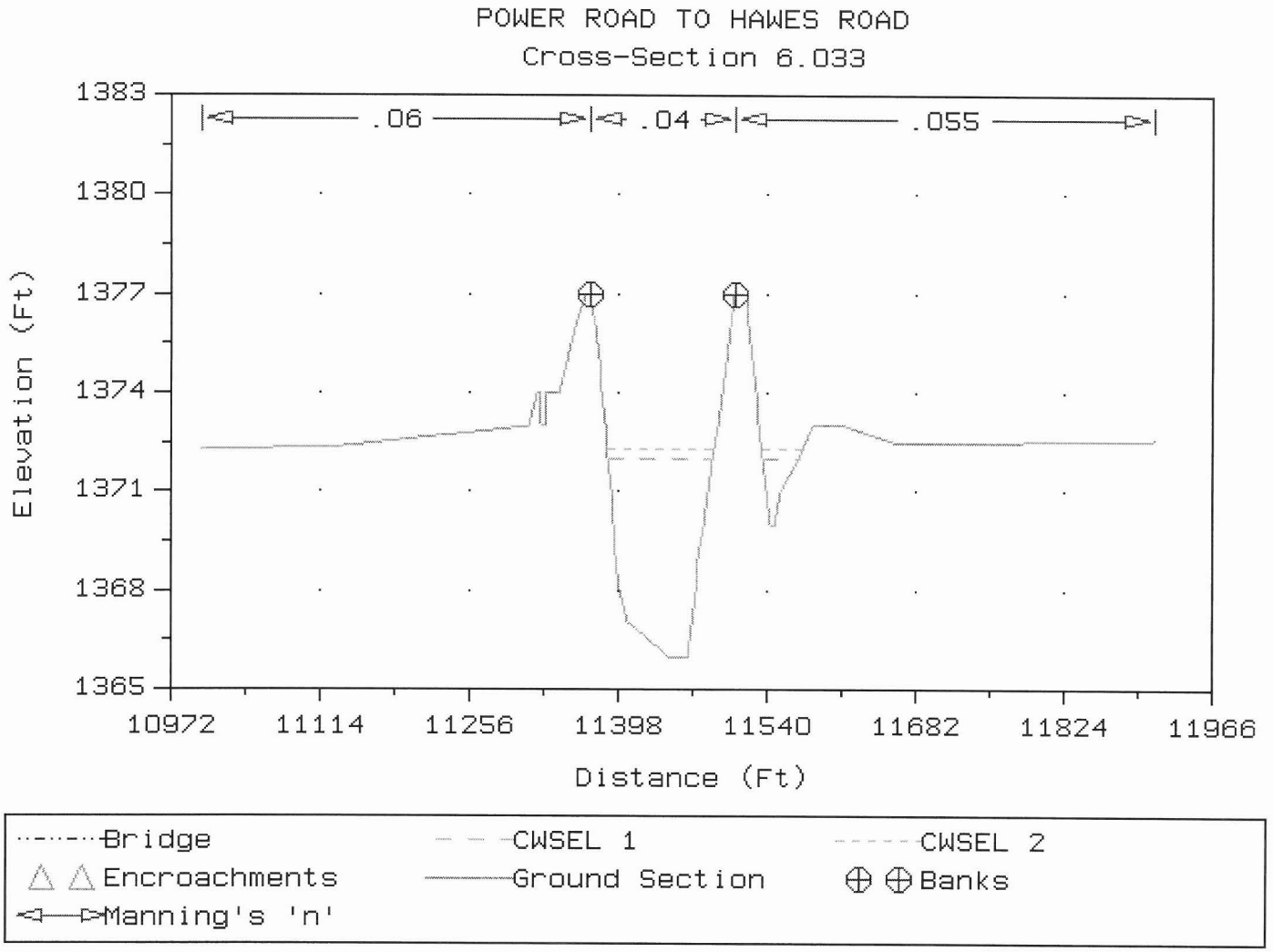
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Cross-Section 6.033
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.04
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1380
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1374
1371
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Elevation (Ft)
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11114
11256
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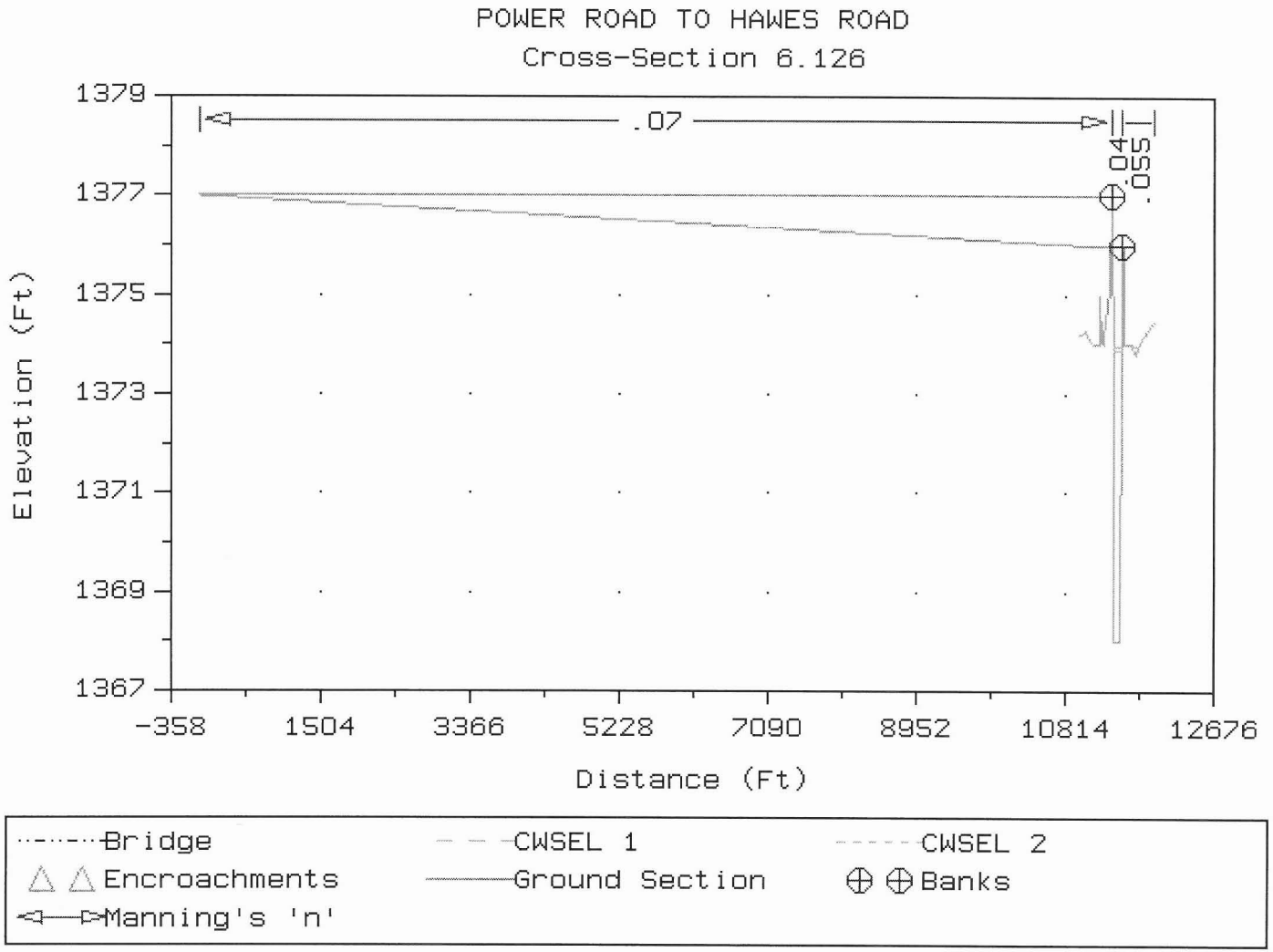
11966
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'


POWER ROAD TO HAWES ROAD
Cross-Section 6.126
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1377
1375
1373
1371
1369
1367
Elevation (Ft)
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.04
.055
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3366
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7090
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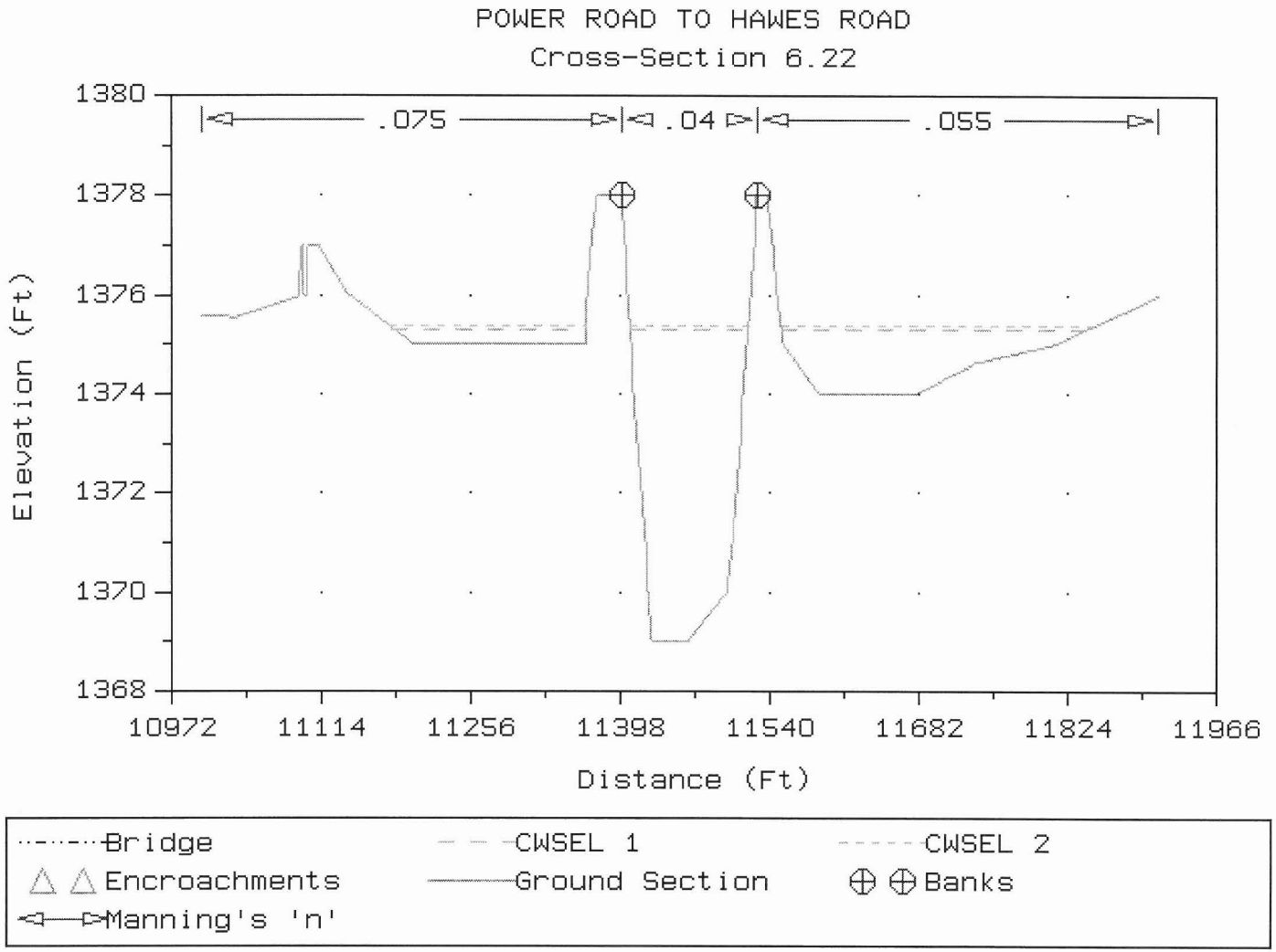
10814
12676
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Cross-Section 6.22
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1378
1376
1374
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Elevation (Ft)
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11114
11256
11398
11540
11682
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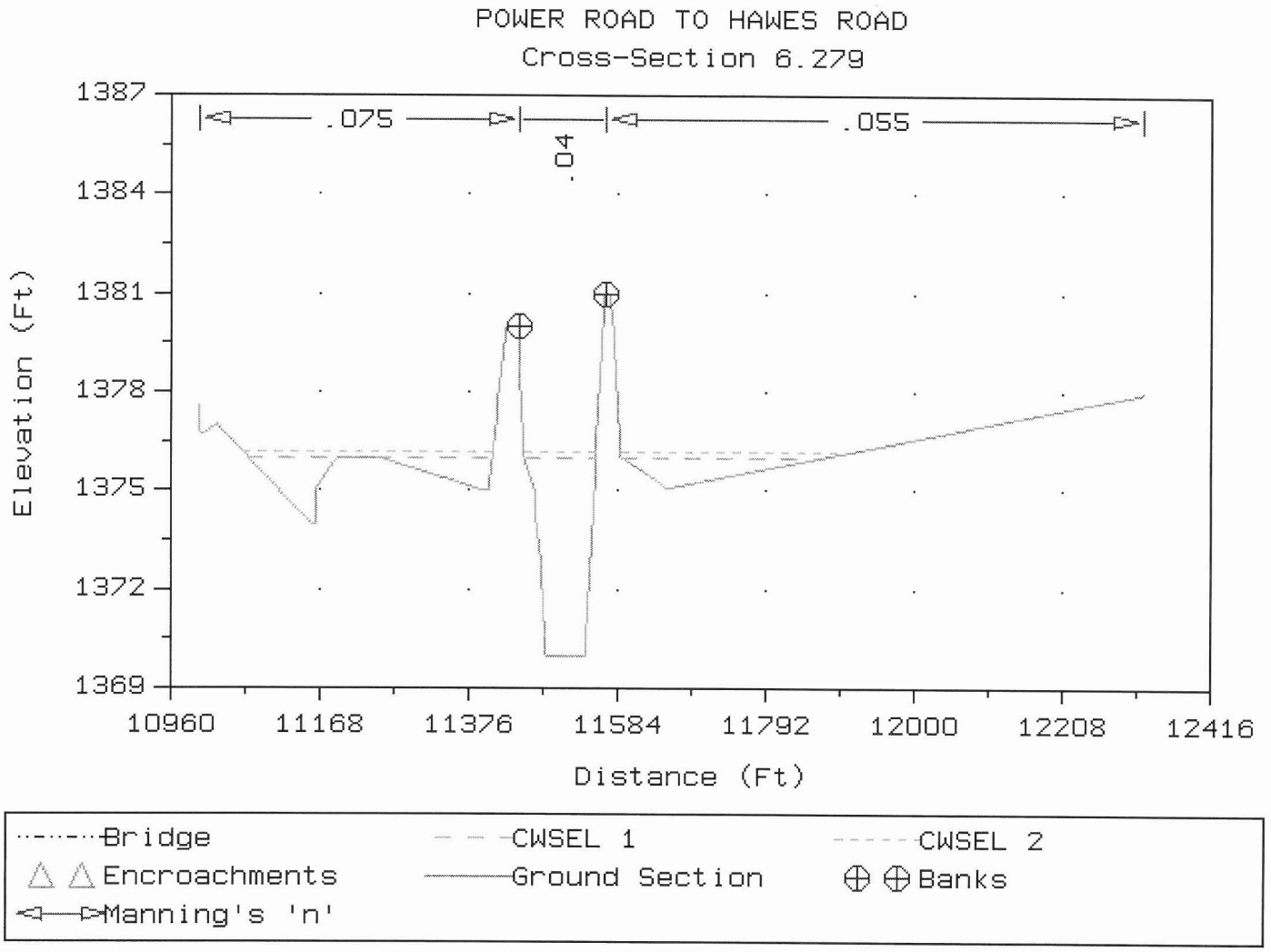
11966
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'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Cross-Section 6.279
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Elevation (Ft)
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11376
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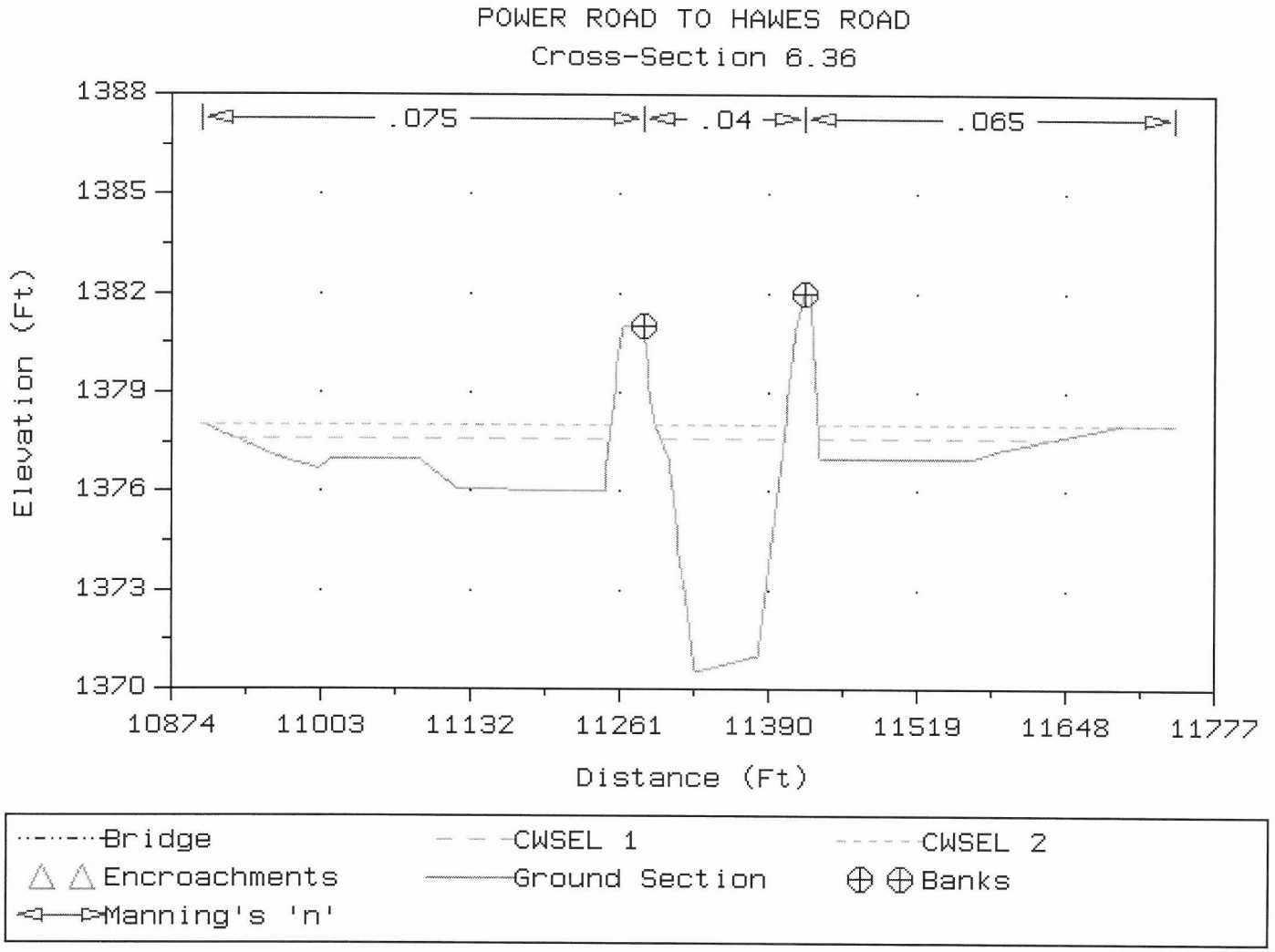
12416
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'


POWER ROAD TO HAWES ROAD
Cross-Section 6.36
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Elevation (Ft)
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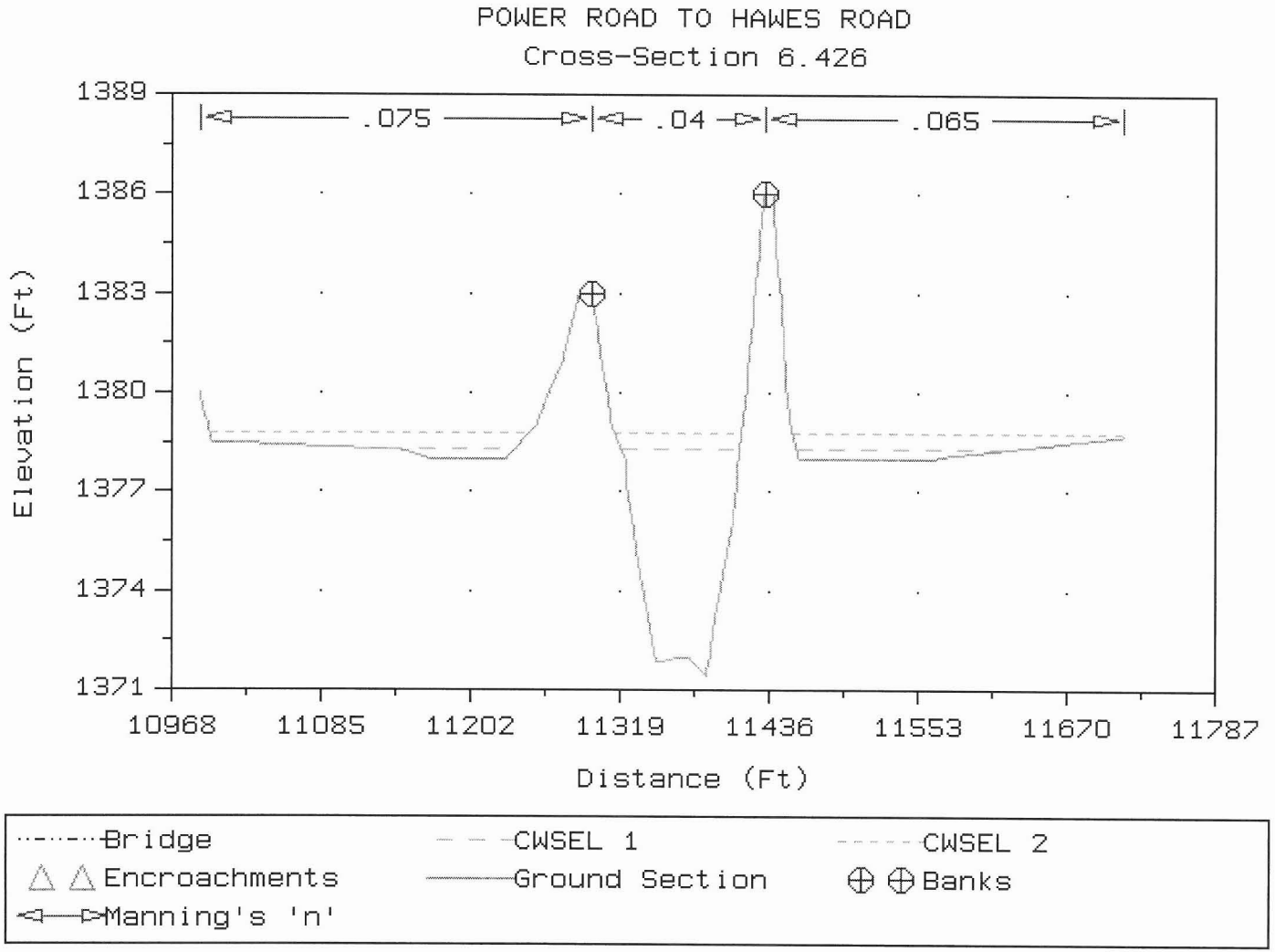
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'


POWER ROAD TO HAWES ROAD
Cross-Section 6.426
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1386
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1374
1371
Elevation (Ft)
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11085
11202
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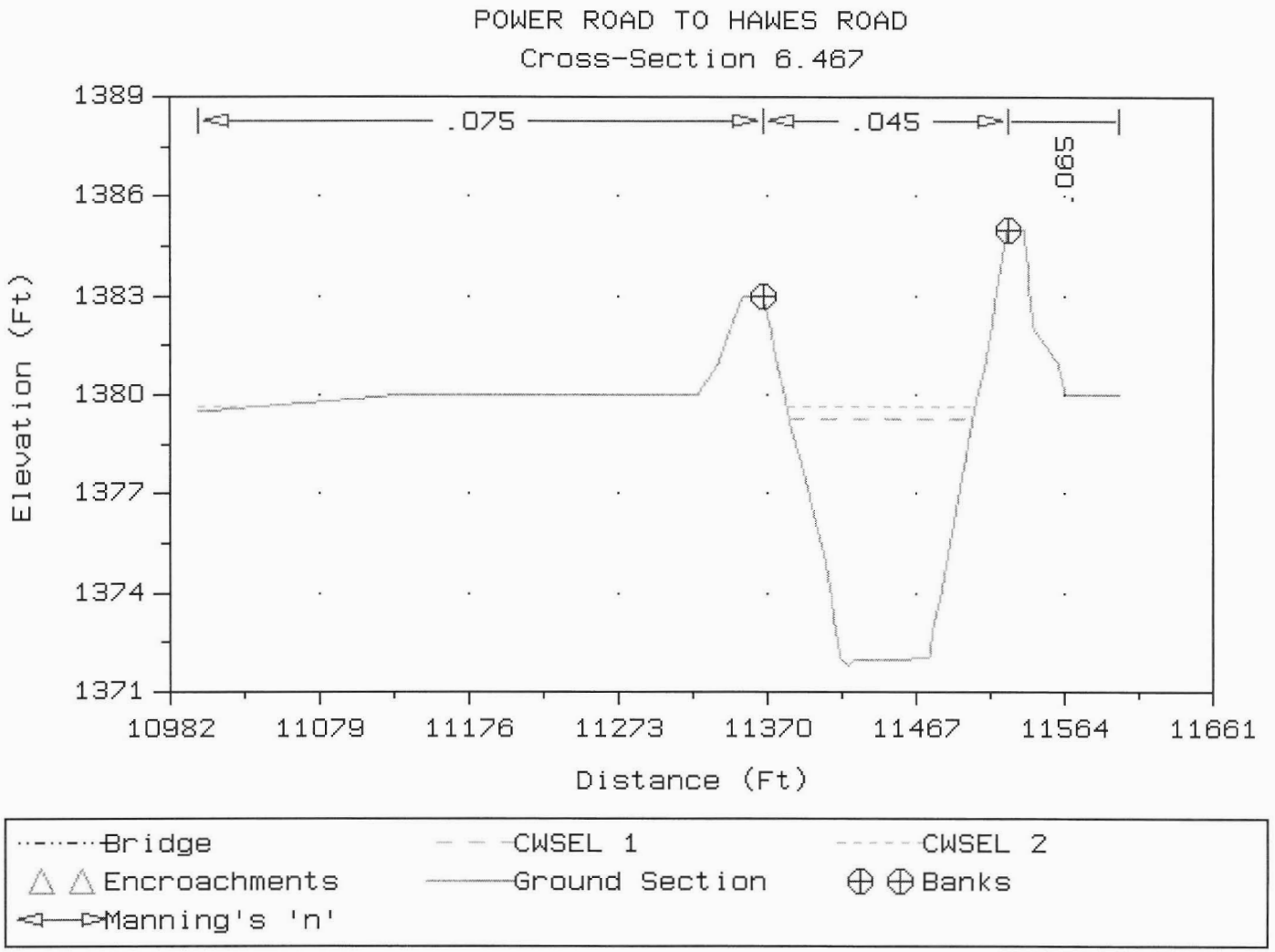
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'


POWER ROAD TO HAWES ROAD
Cross-Section 6.467
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1389
1386
1383
1380
1377
1374
1371
Elevation (Ft)
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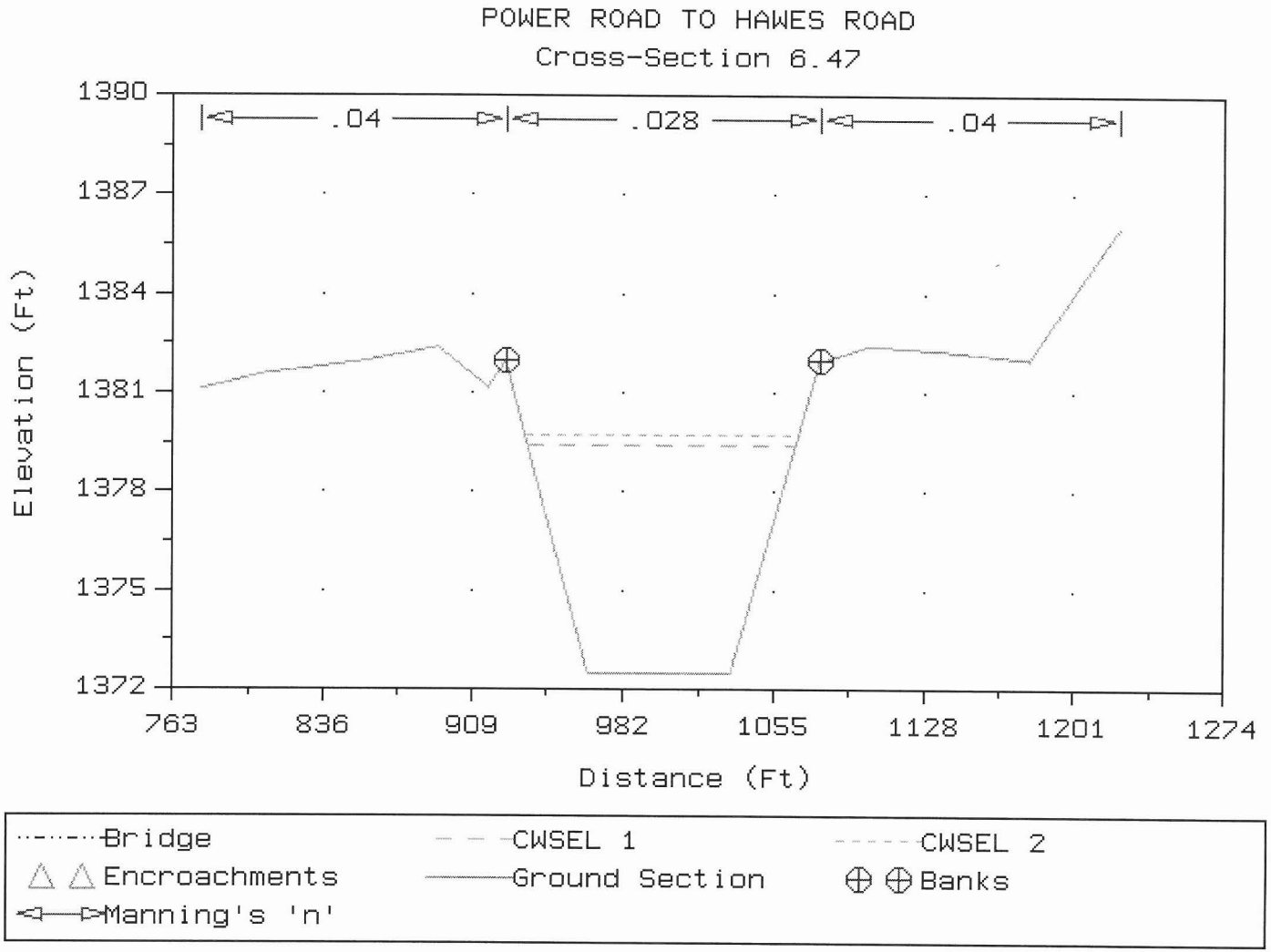
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'


POWER ROAD TO HAWES ROAD
Cross-Section 6.47
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1390
1387
1384
1381
1378
1375
1372
Elevation (Ft)
763
836
909
982
1055
1128
1201
1274
Distance (Ft)
Bridge
CWSEL 1
CWSEL 2
Encroachments
Ground Section
Banks
Manning's 'n'

APPENDIX I

Work Maps

FOR WORK MAPS,
SEE DRAWER 28
OF FLOODPLAIN MAP ROOM

Flood Control District of Maricopa County
Phoenix, Arizona
April, 1999

LETTER OF MAP REVISION FOR QUEEN CREEK WASH

(from Hawes Road to Power Road)

TECHNICAL DATA NOTEBOOK

Prepared by:

Maricopa County Flood Control District
Phoenix, Arizona 85009
2801 West Durango Street
(602) 506-1501

Prepared for:

Federal Emergency Management Agency
Hazards Study Branch
Mitigation Directorate
500 C Street SW, Room 422
Washington, DC 20472

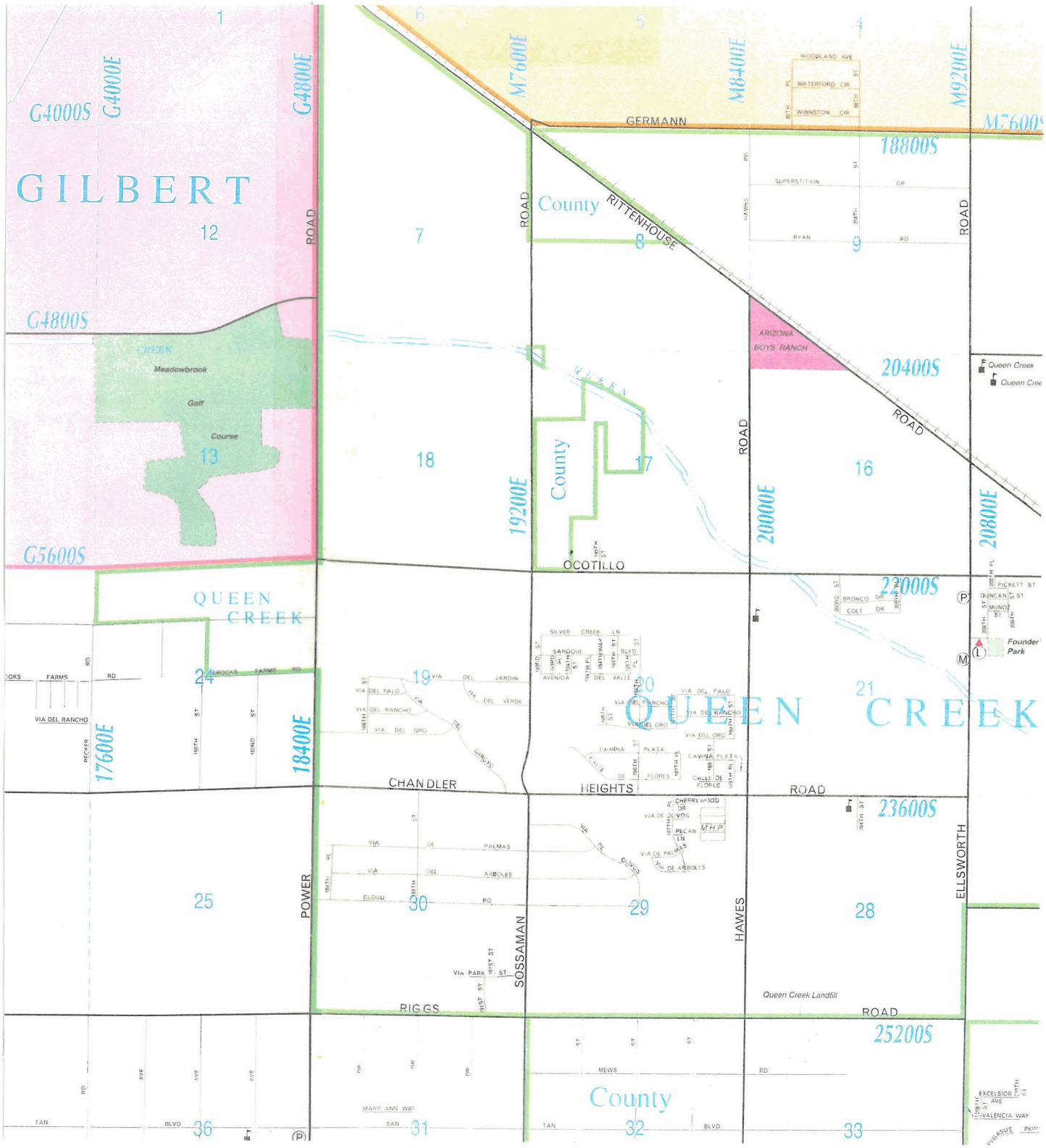
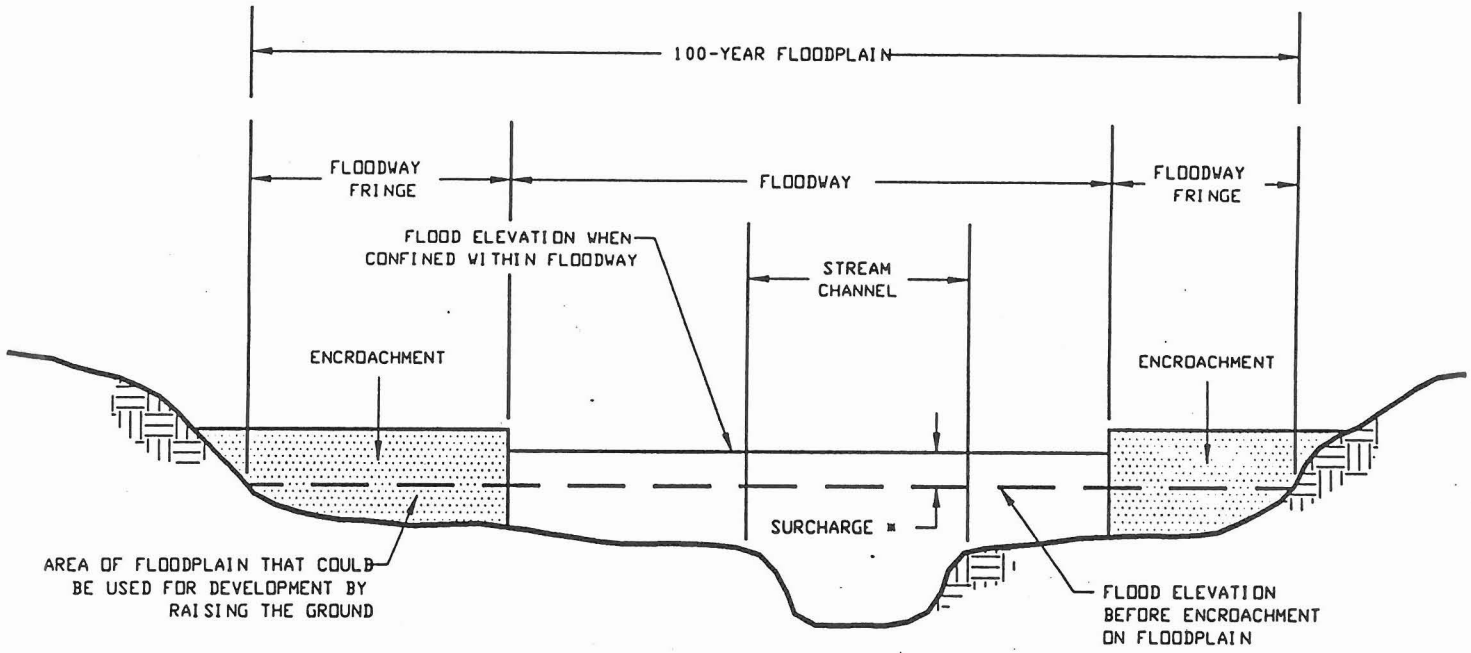


Figure 1: Project Location Map.



* SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE

Figure 2: Floodway Definition Sketch

Queen Creek between Hawes Road and Power Road
Photos of December 4, 1998

Channel

N = 0.040

Looking East (U.S.) at the Hawes Road Bridge

Channel

N = 0.040

Looking West (D.S.) at the Hawes Road Bridge

Queen Creek between Hawes Road and Power Road
Photos of December 4, 1998

Channel

N = 0.065

Looking East (U.S.) along the right bank above Sossoman Road

Channel

N = 0.065

Looking East (U.S.) along the left bank above Sossoman Road

Queen Creek between Hawes Road and Power Road
Photos of December 4, 1998

Looking North along the upstream side of Sossoman Road
(5 – 6 foot Diameter C.M.P.'s)
Looking at the South most culvert

Queen Creek between Hawes Road and Power Road
Photos of December 4, 1998

Channel

N = 0.055

Looking West (D.S.) along the left bank below Sossoman Road

Channel

N = 0.055

Looking West (D.S.) along the right bank below Sossoman Road

Queen Creek between Hawes Road and Power Road
Photos of December 4, 1998

Channel

N = 0.055

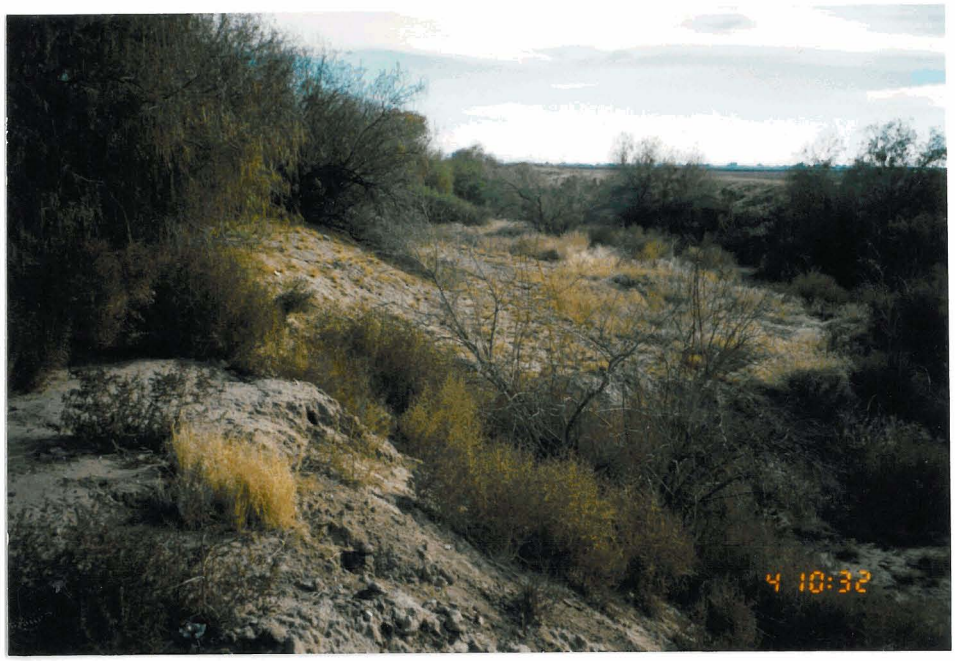
Looking East (U.S.) from about 100 ft. east of dirt road halfway between Sossoman and Power Roads

Channel

N = 0.055

Looking West (D.S.) from 100 ft. above the dirt road halfway between Sossoman and Power Roads

Queen Creek between Hawes Road and Power Road
Photos of December 4, 1998



Channel

N = 0.050

Looking East (U.S.) from about 100 ft. above the Power Road Bridge

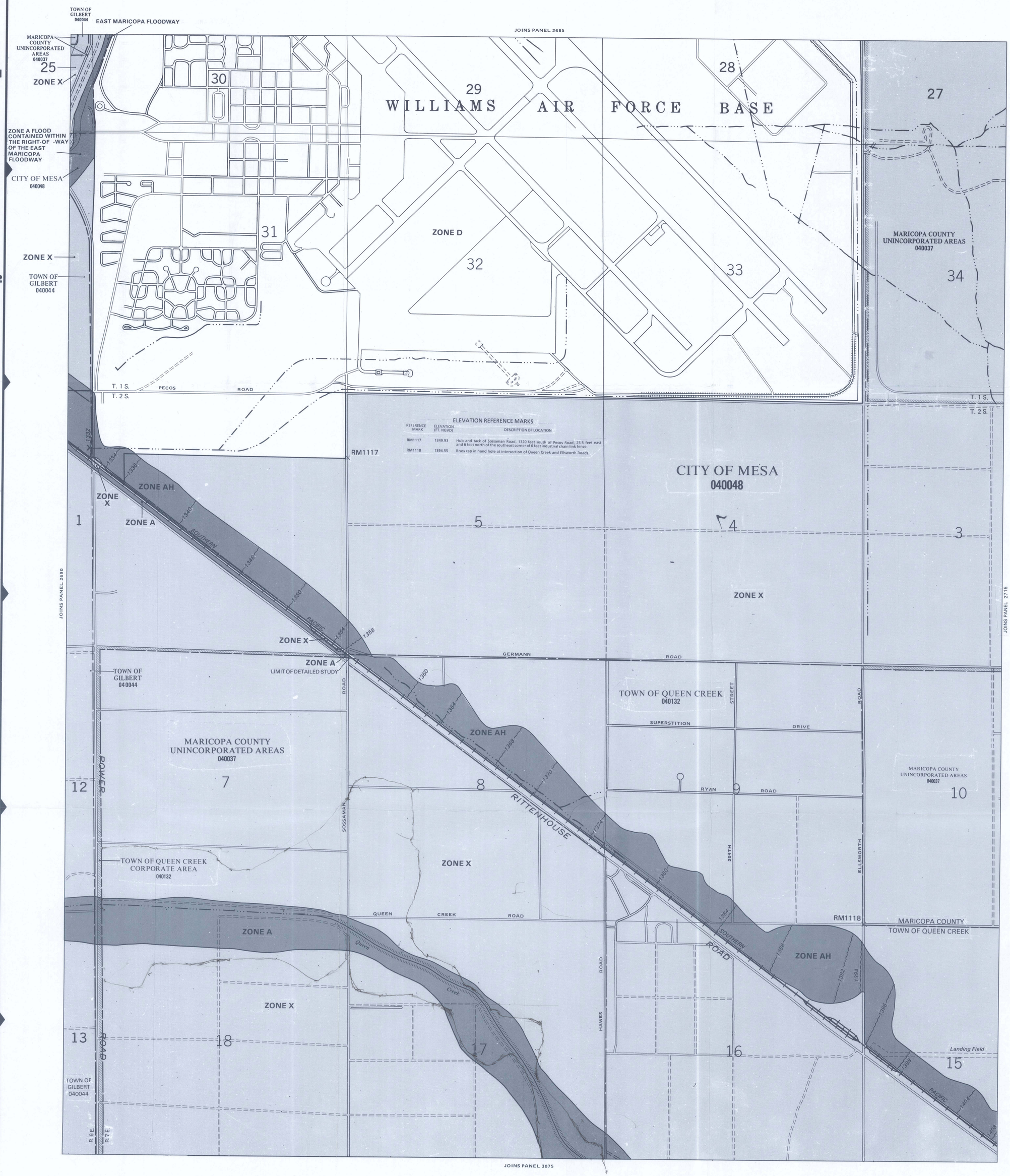
Channel

N = 0.050

Looking West (D.S.) at the Power Road Bridge from the right bank

APPENDIX J

3-1/2" Disks with HEC-2 Input/Output Files



LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- **ZONE A** — No base flood elevations determined.
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- **ZONE A99** — To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.
- **ZONE V** — Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- **ZONE VE** — Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- **ZONE X** — Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside 500-year flood plain.
- **ZONE D** — Areas in which flood hazards are undetermined.

Flood Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

~~513~~ — Base Flood Elevation Line; Elevation in Feet*

(D)——(D) — Cross Section Line

(EL 987) — Base Flood Elevation in Feet Where Uniform Within Zone*

RM7 X — Elevation Reference Mark

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas.

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Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

Coastal base flood elevations apply only landward of the shoreline.

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of the map.

For community map revision history prior to countywide mapping, see Section 6.0 of the Flood Insurance Study Report.

For adjoining map panels see separately printed Map Index

MAP REPOSITORY

Refer to Repository Listing on Index Map

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP:

APRIL 15, 1988

EFFECTIVE DATE (S) OF REVISION (S) TO THIS PANEL:

Map revised September 4, 1991 to update corporate limits, to change base flood elevations, to add base flood elevations, to add special flood hazard areas, to change special flood hazard areas, to change zone designations, to update map format, to add roads and road names and to incorporate previously issued letter of map revision.

Map revised DECEMBER 3, 1993 to change base flood elevations, to add base flood elevations, to add special flood hazard areas, to change special flood hazard areas, to change zone designations, to update map format, to add roads and road names, to reflect updated topographic information, and to incorporate previously issued letters of map revision.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE IN FEET

1000 0 1000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 2695 OF 4350

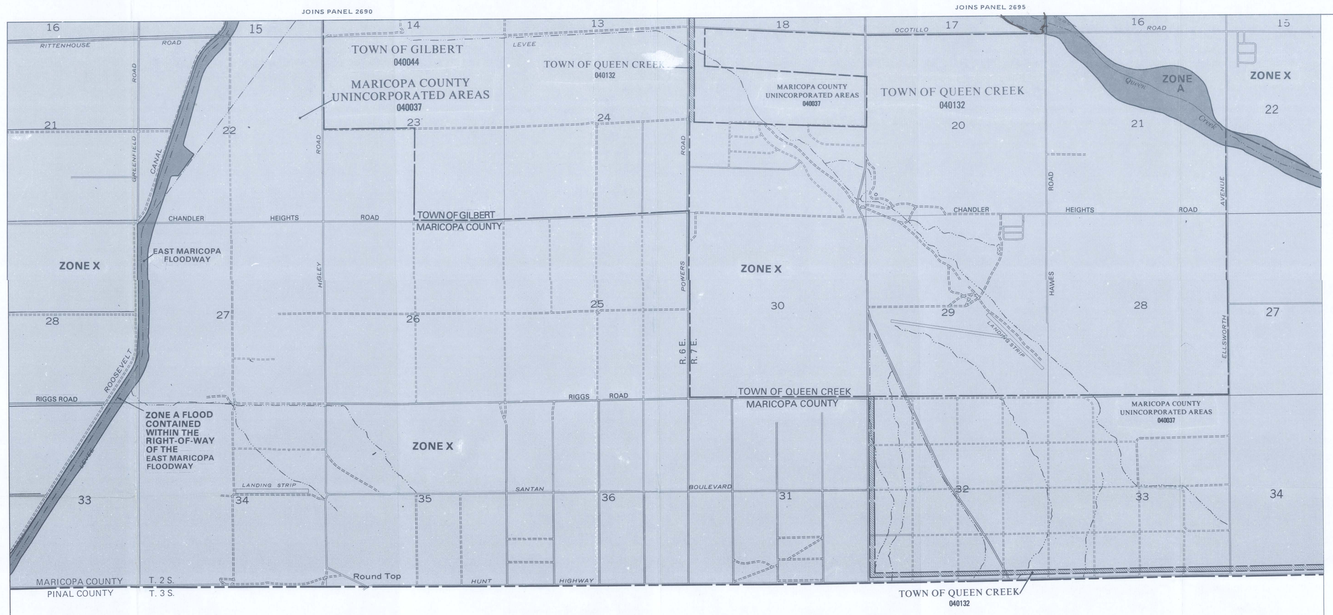
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GILBERT, TOWN OF	040044	2695	F
MARICOPA COUNTY, UNINCORPORATED AREAS	040037	2695	F
MESA, CITY OF	040048	2695	F
QUEEN CREEK, TOWN OF	040132	2695	F

MAP NUMBER
04013C2695 F

MAP REVISED:
DECEMBER 3, 1993

Federal Emergency Management Agency



THIS AREA IS SHOWN ON MAP NUMBER 04013C3080

LEGEND

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FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- **ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

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D — D Cross Section Line

(EL 987) Base Flood Elevation in Feet Where Uniform Within Zone*

RM7 X Elevation Reference Mark

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MAP REPOSITORY

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APPROXIMATE SCALE IN FEET
2000 0 2000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 3075 OF 4350

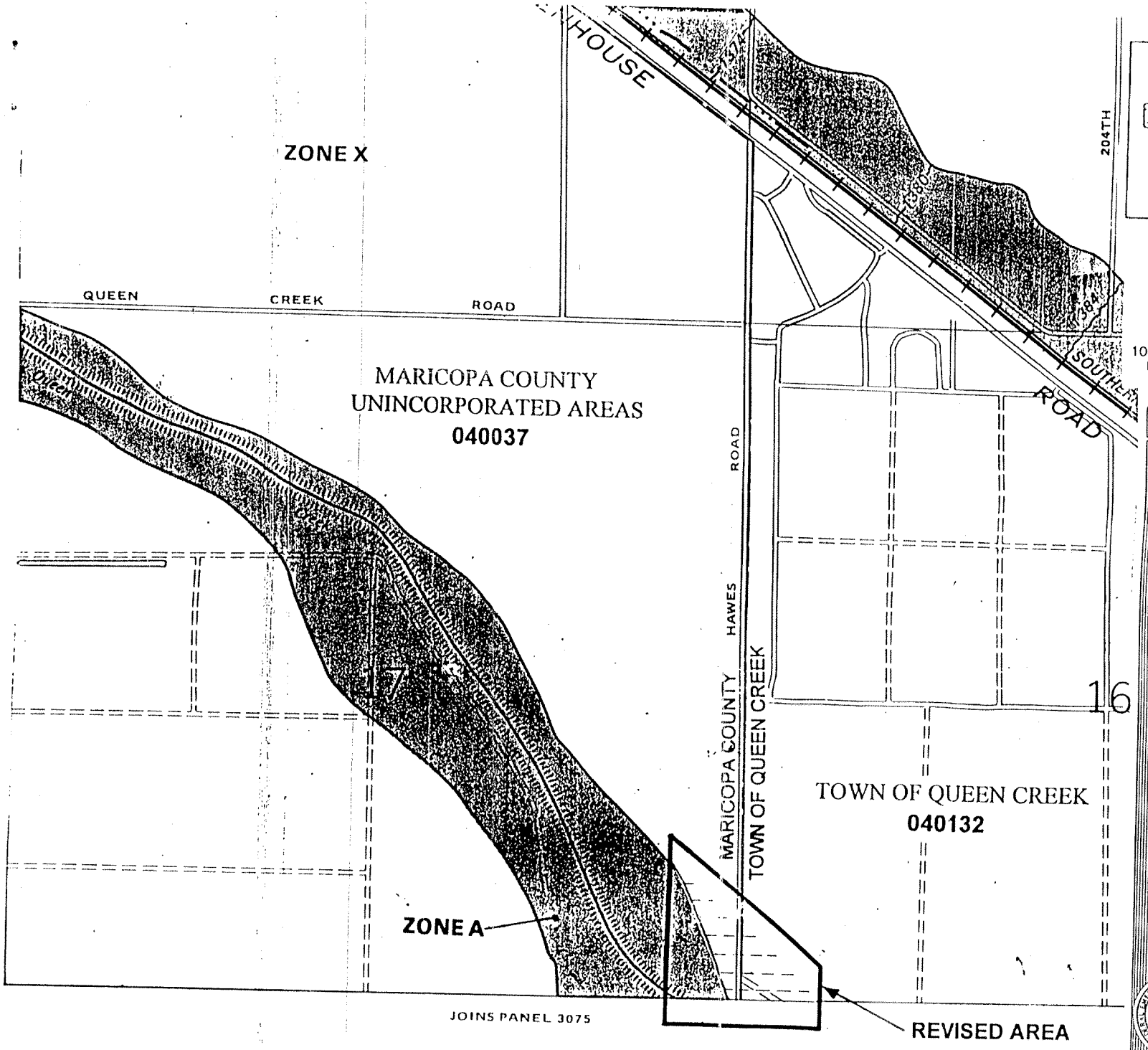
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GILBERT, TOWN OF	040044	3075	F
MARICOPA COUNTY, UNINCORPORATED AREAS	040037	3075	F
QUEEN CREEK, TOWN OF	040132	3075	F

MAP NUMBER
04013C3075F

MAP REVISED:
DECEMBER 3, 1993

Federal Emergency Management Agency



MAP LEGEND

Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

APPROXIMATE SCALE IN FEET

1000 0 1000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 2695 OF 4350

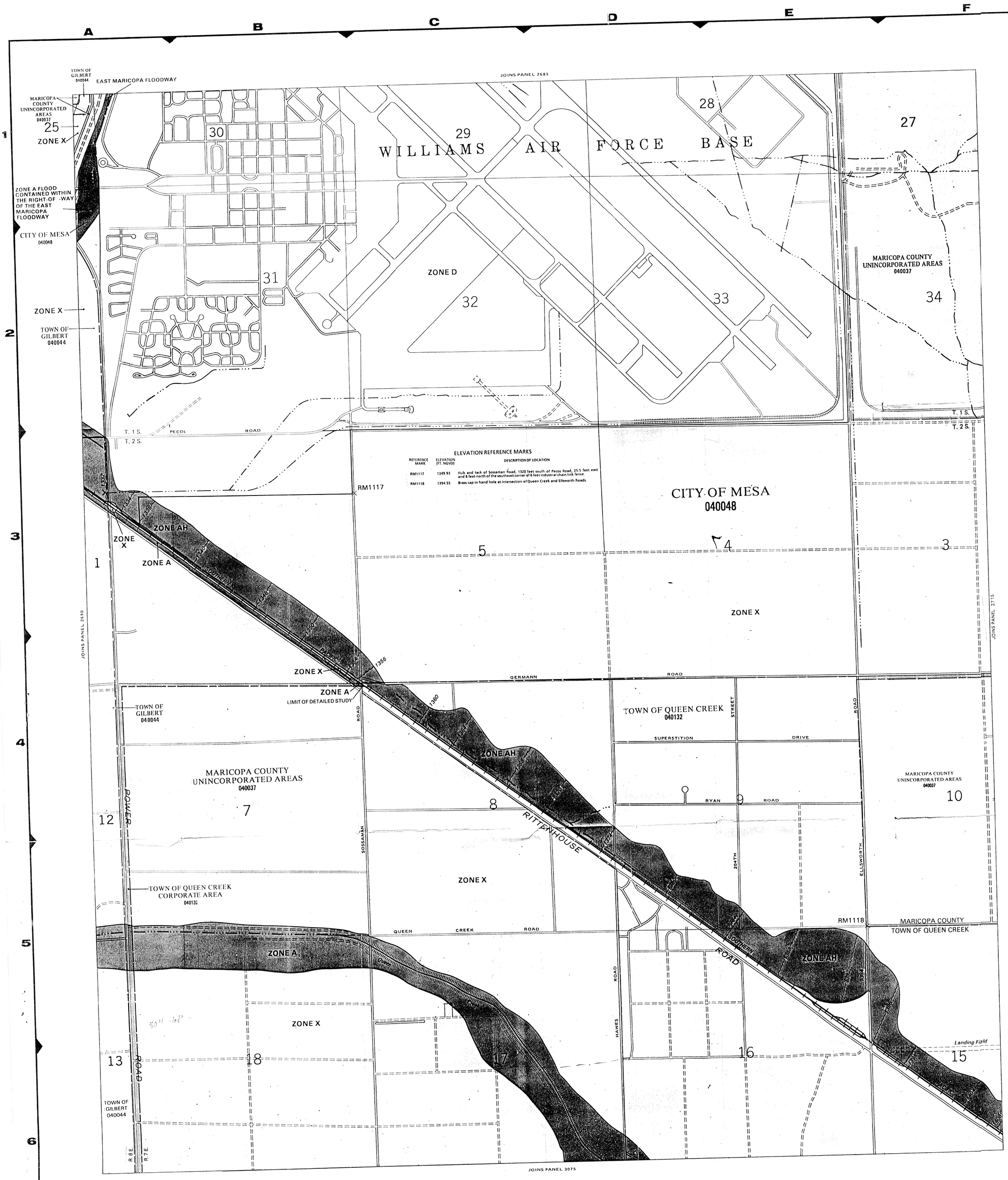
REVISED TO REFLECT LOMR DATED APR 16 1998

COMMUNITY	NUMBER	PANEL	SUFFIX
MESA, CITY OF	040132	2695	F

MAP NUMBER
04013C2695 F

MAP REVISED
DECEMBER 3, 1993

Federal Emergency Management Agency



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N

APPROXIMATE SCALE IN FEET
1000 0 1000

2695 F

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 2695 OF 4350

CONTAINS:

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MAP NUMBER
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MAP REVISED:
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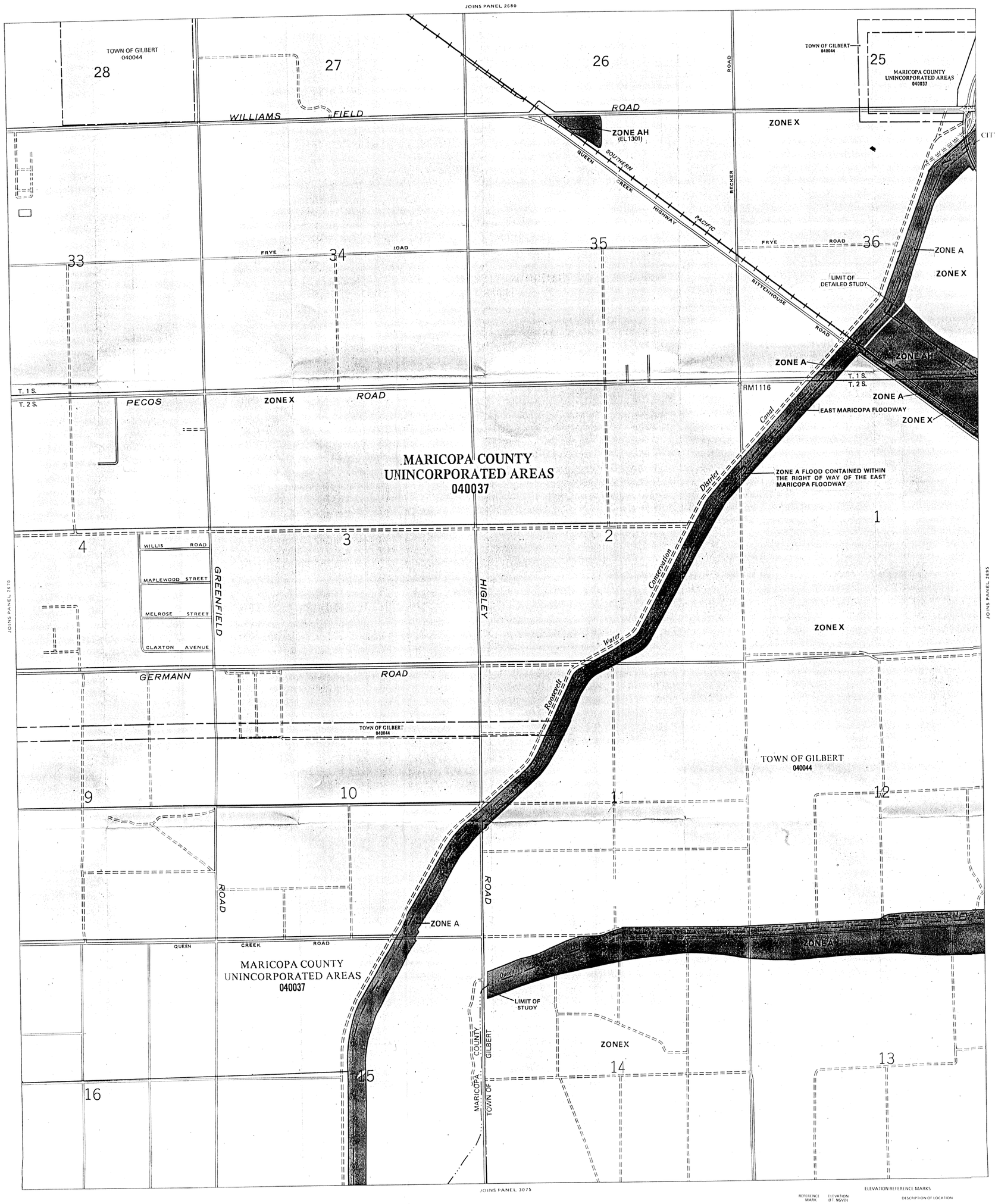
Federal Emergency Management Agency



NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 1 SOUTH, RANGE 6 EAST AND TOWNSHIP 2 SOUTH, RANGE 6 EAST

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
RM1116	1315.16	Brass cap flush at intersection of Pecos and Recker Roads

LEGEND

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N

APPROXIMATE SCALE IN FEET
1000 0 1000

2690 F

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 2690 OF 4350

CONTAINS

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

MAP NUMBER
04013C2690 F

MAP REVISED:
DECEMBER 3, 1993

Federal Emergency Management Agency
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