REQUEST FOR FLOODWAY REVISION

WASHOE COUNTY, NEVADA

ON:

STEAMBOAT CREEK

Near Mira Loma Drive

City of Reno, Washoe County, Nevada

Prepared for:

City of Reno, Nevada
Engineering
450 Sinclair Street
Reno, Nevada 89502

NIMBUS JOB # 9507
March 1996

Nimbus Engineers
3710 Grant Drive Reno, Nevada 89509 (702) 689-8630

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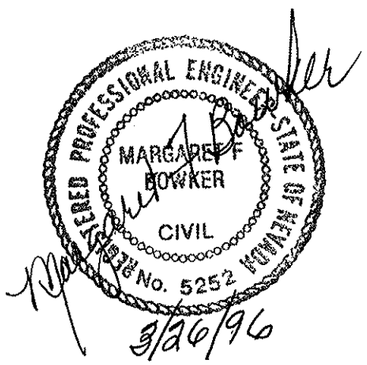

March 1996
Nimbus Job # 9507

Nimbus Engineers
3710 Grant St., Suite D, Reno, NV 89509
Mail : P.O. Box 10220, Reno, NV 89510
(702) 689-8630

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1.0 INTRODUCTION

This report has been prepared for the purpose of obtaining a revision to a portion of the floodway of Steamboat Creek, located in Section 28, T.19 N., R. 20 E., MDB&M in the City of Reno, Washoe County, Nevada (See Figures 1 and 2).

The original floodway for Steamboat Creek was delineated by Tudor Engineers in the original Washoe County Flood Insurance Study (FIS) in 1984, and was modified by information submitted by Nimbus Engineers in 1986. The revision presented by Nimbus Engineers, approved and adopted by the Federal Emergency Management Agency (FEMA) for Washoe County and the City of Reno, was based upon technical errors found in the 1984 FIS. In September of 1990, Nimbus submitted a request for a floodway revision to model the effects of more detailed topography, channel improvements, and grading alterations along Steamboat Creek from upstream of Pembroke Drive to just south of the Mira Loma Road Extension (Reference 5). This request was approved and adopted by FEMA on February 4, 1991.

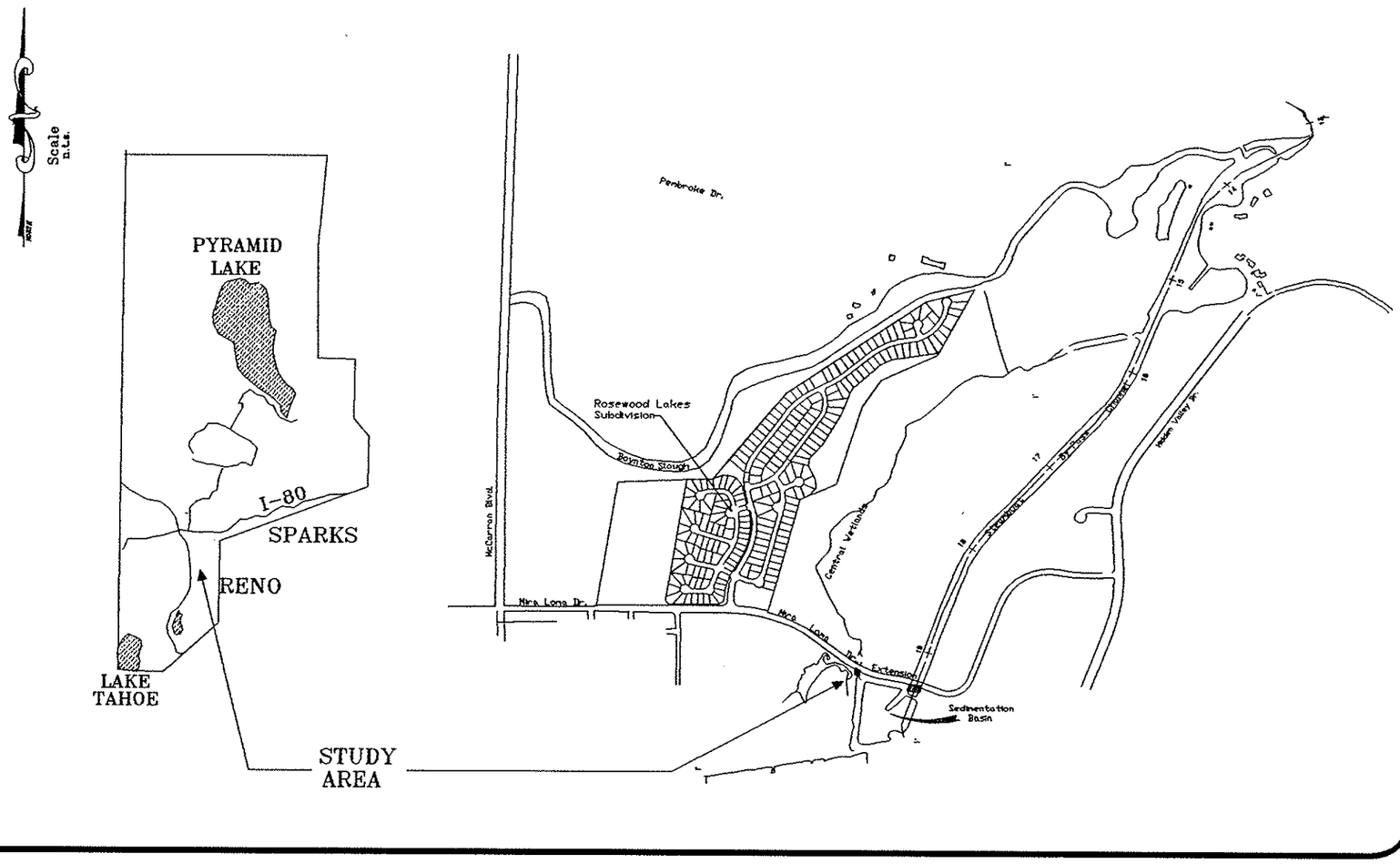
In April of 1991, Nimbus Engineers submitted a request for Letter of Map Revision to FEMA incorporating the widening of the Steamboat Creek channel and placement of fill between Hidden Valley Drive and Steamboat Creek (Reference 6). This request was approved and adopted by FEMA on July 5, 1991. Additional LOMRs based on fill were submitted and approved by FEMA as the Rosewood Lakes Subdivision construction continued.

Since the last request for a floodway revision in 1990, the City of Reno constructed the Mira Loma Road Extension across entire span of the Steamboat Creek floodplain and floodway as shown on Figure 3. Two bridge structures were placed under the road to convey the 100-year peak flow. This request for a floodway revision is based on modifications to the stream hydraulics caused by the construction of the Mira Loma Road Extension.

2.0 PHYSICAL DESCRIPTION OF STUDY AREA

Steamboat Creek originates at the outlet of Little Washoe Lake in the Southern Washoe County and flows in a northerly direction to the Truckee River. The lower portion of the creek is within an alluvial plain known as the Truckee Meadows.

The proposed area of revision is located in the meadows, just upstream and downstream of the Mira Loma Road Extension (see Figure 3 & 4). This area is affected by both Steamboat Creek and the Truckee River Backwater. The regulatory base flood elevation is from the Truckee River backwater, and is at an elevation of 4391.7 feet. A more detailed physical description of this area can be found in the previously submitted reports as listed in Section 6, References.



Nimbus Engineers

Figure 1
Vicinity Map

Nimbus Job #: 9507

3.0 Hydraulic Analysis

The floodway revision submitted by Nimbus Engineers in September of 1990 (Reference 5) included the major grading changes which have occurred, and also the by-pass channel. This is the base model for this area and contains the currently accepted Base Flood Elevations (BFEs) and regulatory floodway (see Figure 2). A printout of this HEC-2 model output (STMROSE.DAT) is included in Appendix B of this report.

The base model was modified to include the Mira Loma Road Extension and the Rosewood Lakes Subdivision. A print out of the modified model (507STM1.DAT) is included in Appendix C.

The following list is a summary of revisions made to the base model:

1) Relocation of Channel Bank Stations - In cross sections 201.57, 202.07, 202.47, and 205.67, channel bank stations were relocated from the irrigation channel to Steamboat Creek.

2) Realignment of the Hydraulic Base Line - After relocating channel bank stations, the hydraulic base line was also changed to follow Steamboat Creek.

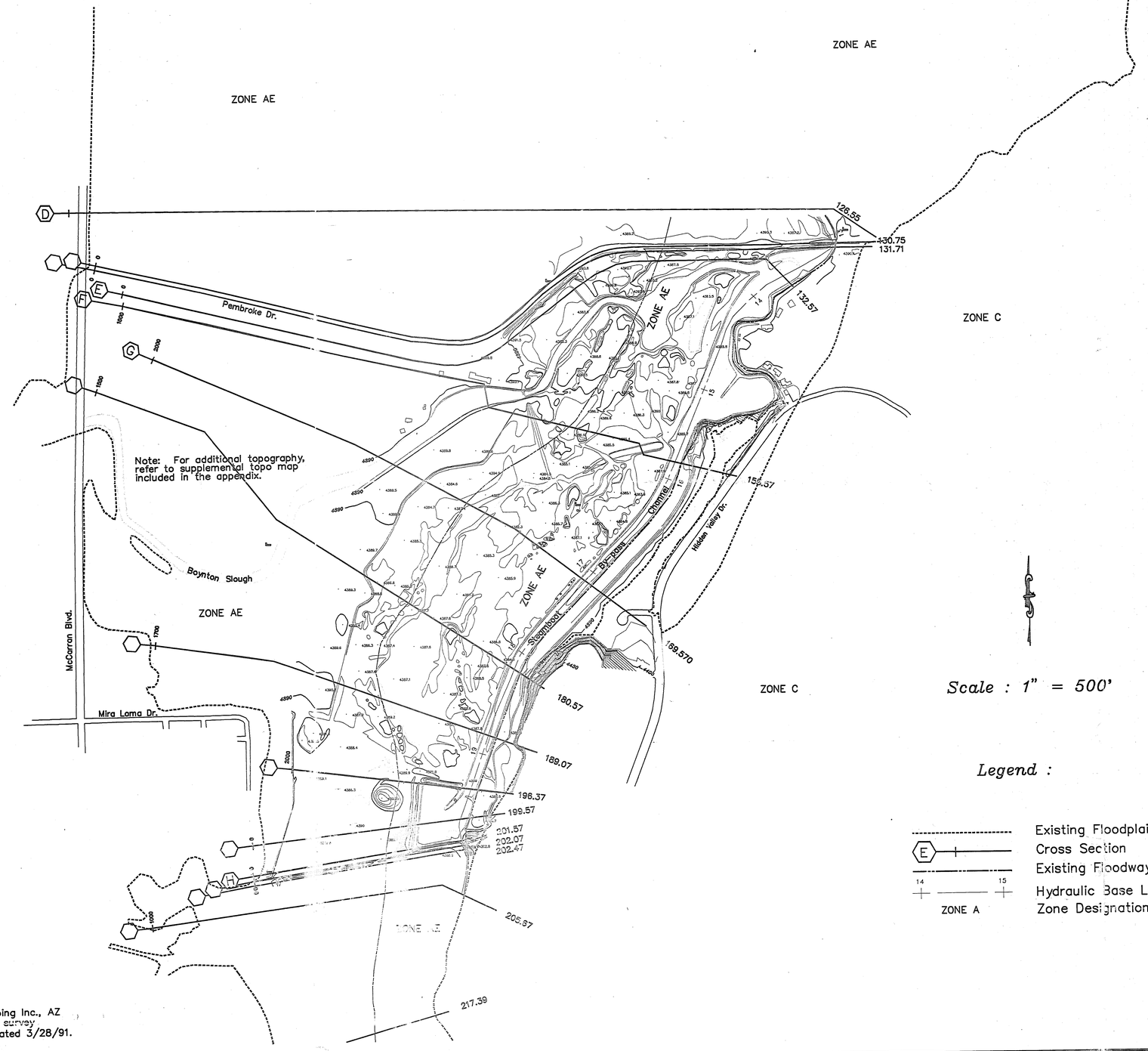
3) Removal of Special Bridge Routine at Cross Section 202.07 - In the previous FIS HEC-2 model, a special bridge routine was used at this location. Currently, this area is in a backwater condition with an open channel.

4) Normal Bridge Routine at the Mira Loma Road Extension - The roadway extension and arch bridges are modeled using a normal bridge routine as suggested by the HEC-2 Users Manual. The bridge and roadway information was from the "As-Built" construction plans (see Appendix D). Additional cross sections 196.17, 196.97, and 197.17 were added to model the arch bridges.

5) Revisions to Floodway Limits Between Cross Sections 189.07 and 205.67 - The encroachment cards were revised to delineate revised floodway boundaries.

As illustrated in Table 1, the Mira Loma Road Extension and developments in the floodway fringe area increased upstream base flood elevations by approximately 0.3 feet. This increase is caused by developments and the roadway extension in the floodway fringe only. No increase in base flood elevations is caused by the roadway extension in the floodway. The arch bridges in the floodway have sufficient conveyance capacity to effectively pass the 100-year peak flow without increase in BFEs. A more detailed discussion and the analysis can be found in Appendix E.

In the floodway fringe, construction is permitted as long as it does not increase the



Note : Contour generated by Kenney Aerial Mapping Inc., AZ from photographs dated 6/22/90, updated with survey information provided by Castle Land Surveying, dated 3/28/91.

Nimbus Engineers
3710 Grant Dr.
Reno NV. 89509
(702)689-8630

SCALE: 1"=500'
DATE: MARCH 1996
FILE: 507EFFFW
JOB NO.: 9507
REVISIONS:

FIGURE 2
Steamboat Creek
Existing Floodway Workmap

SHEET NO. 1

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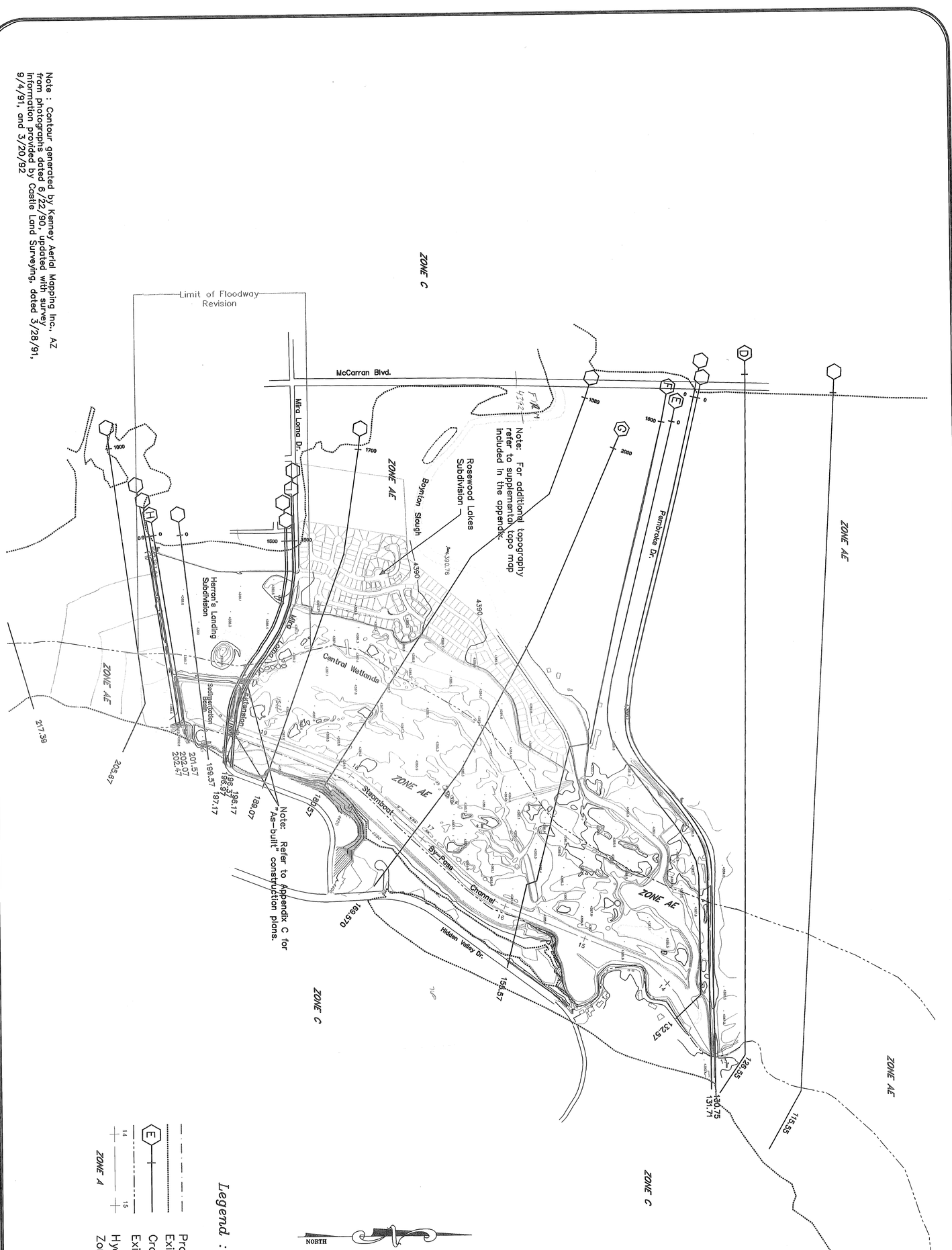


SHEET NO.			
1	FIGURE 3 Steamboat Creek Proposed Floodway Workmap	SCALE: 1" =500' DATE: March 1996 FILE: 507FWPRO JOB NO.: 9507 REVISIONS:	Nimbus Engineers 3710 Grant Dr. Reno NV. 89509 (702)689-8630

base flood elevation by over one foot. No construction is permitted in the floodway unless it can be shown that there is no increase in the water surface elevation.

TABLE 1. Summary of Water Surface Elevations

Sec. No.	Base Model		Revised Model		Difference	
	WSEL	FLOODWAY	WSEL	FLOODWAY	WSEL	FLOODWAY
155.57	4391.25[1]	4391.67	4391.25	4391.66	0.00	-0.01
169.57	4391.26[1]	4391.69	4391.26	4391.69	0.00	0.00
180.57	4391.27[1]	4391.71	4391.27	4391.71	0.00	0.00
189.07	4391.28[1]	4391.71	4391.27	4391.74	-0.01	0.03
196.17			4391.22	4391.69		
196.37	4391.31[1]	4391.59	4391.09	4391.56	-0.22	-0.03
196.97			4391.13	4391.60		
197.17			4391.46	4391.91		
199.57	4391.39[1]	4392.19	4391.73	4392.15	0.34	-0.04
201.57	4391.42[1]	4392.24	4391.76	4392.17	0.34	-0.07
202.07	4391.46[1]	4392.29	4391.77	4392.21	0.31	-0.08
202.47	4391.46[1]	4392.30	4391.77	4392.21	0.31	-0.09
205.67	4391.58[1]	4392.47	4391.85	4392.42	0.27	-0.05
217.39	4393.23	4394.10	4393.18	4394.11	-0.05	0.01
224.98	4396.69	4397.55	4396.70	4397.54	0.01	-0.01
235.23	4399.92	4400.77	4399.91	4400.77	-0.01	0.00

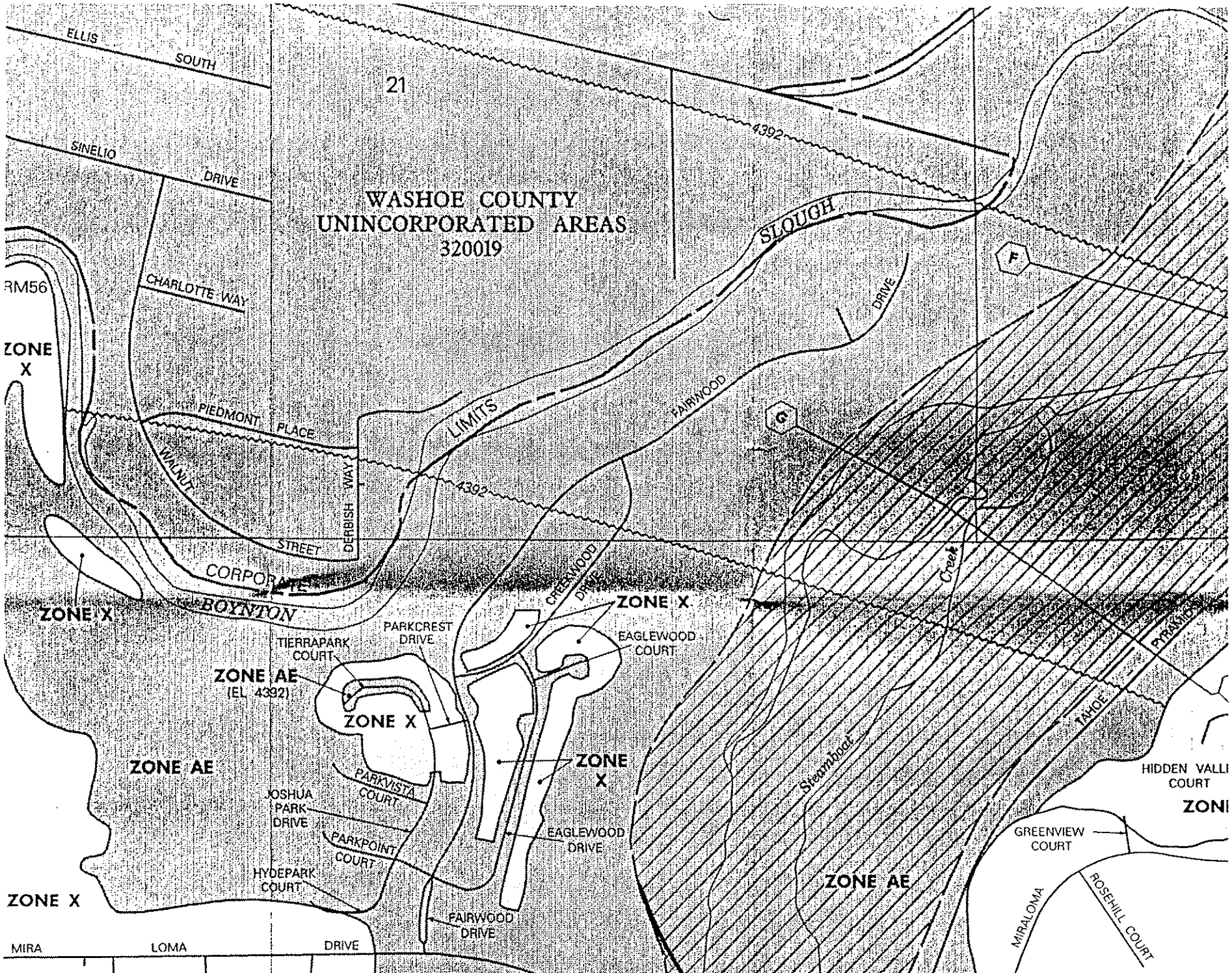
1. The regulatory BFE is from the Truckee River Backwater, and is at an elevation of 4391.7.

4.0 CONCLUSIONS

The construction of the Mira Loma Road Extension has modified the stream hydraulics of Steamboat Creek. The "As-built" construction plans , supplied to Nimbus by CFA, have been used to model the roadway extension and arch bridges. The roadway

encroachment increased upstream base flood elevations by approximately 0.3 feet. This increase is caused by encroachment in floodway fringe only. No increase is caused by the roadway extension in floodway. In the floodway fringe, construction is permitted as long as it does not increase the base flood elevations by over one foot.

As shown on Table 1, the revised floodway resulted in insignificant changes from the regulatory floodway water surface elevations


21
WASHOE COUNTY
UNINCORPORATED AREAS
320019
ELLIS
SOUTH
SINELIO
DRIVE
4392
SLOUGH
F
RM56
CHARLOTTE WAY
ZONE
X
DRIVE
PIEDMONT
PLACE
LIMITS
FAIRWOOD
G
WALNUT
DERBISH WAY
4392
STREET
CORPORATE
CREEKWOOD
DRIVE
ZONE X
BOYNTON
ZONE X
PARKCREST
DRIVE
EAGLEWOOD
COURT
TIERRAPARK
COURT
ZONE AE
(EL 4392)
ZONE X
ZONE AE
ZONE
X
PARKVISTA
COURT
JOSHUA
PARK
DRIVE
PARKPOINT
COURT
EAGLEWOOD
DRIVE
HYDEPARK
COURT
ZONE X
FAIRWOOD
DRIVE
MIRA
LOMA
DRIVE
Steamboat
Creek
TAHOE
HIDDEN VALLI
COURT
ZONI
GREENVIEW
COURT
ZONE AE
MIRALOMA
ROSEHILL COURT

5.0 REFERENCES

1. Federal Emergency Management Agency, Flood Insurance Rate Map, Washoe County, Nevada and Incorporated Areas, Panel 3176E of 3350, Scale 1" = 500', September 30, 1994.

2. Federal Emergency Management Agency, Flood Insurance Study, City of Reno, Washoe County, Nevada, September 30, 1994.

3. Federal Emergency Management Agency, Flood Insurance Study, Washoe County, Nevada and Incorporated Areas, September 30, 1994

4. Nimbus Engineers, Hydraulic Report for Brookside Lakes Golf Course, October 1986.

5. Nimbus Engineers, Request for Floodway Revision, Steamboat Creek, September 1990.

6. Nimbus Engineers, Request for Letter of Map Revision, Steamboat Creek, Rosewood Lakes Subdivision, April 1991.

7. Nimbus Engineers, Request for Letter of Map Revision, Steamboat Creek, Rosewood Lakes Subdivision, September 1991.

6. Nimbus Engineers, Steamboat Creek, Application for Letter of Map Revision of City of Reno, Nevada and Washoe County, Nevada, July 1986.

8. U.S. Department of the Army, Corps of Engineers, Hydrologic Engineering Center, Computer Program 723-X6-LZ02A, HEC II, Water Surface Profiles, Ver. 4.6.2, May 1991.

9. Castle Land Surveying, 1" = 200' scale topographic mapping, March 28, 1991.

10. Castle Land Surveying, 1" = 200' scale topographic mapping, September 4, 1991.

11. Castle Land Surveying, 1" = 200' scale topographic mapping, March 20, 1992

12. Kenney Aerial Mapping, 1" = 200' scale topographic mapping, June 22, 1990.

APPENDIX

FEMA FORMS

FEDERAL EMERGENCY MANAGEMENT AGENCY **REVISION REQUESTOR AND COMMUNITY OFFICIAL FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

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.

1. OVERVIEW

1. The basis for this revision request is (are): *(check all that apply)*
   - ☒ Physical change
     - ☒ Existing
     - ☐ Proposed
   - ☐ Improved methodology
   - ☐ Improved data
   - ☐ Floodway revision
   - ☐ Other _____

   Explain _____
2. Flooding Source: Steamboat Creek
3. Project Name/Identifier: Request for Floodway Revision on Steamboat Creek
4. FEMA zone designations affected: AE
   (example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)
5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
EX: 480301	Katy, City	Harris, Fort Bend	TX	480301	0005D	02/08/83
480287	Harris County	Harris	TX	48201C	0220G	09/28/90
320020	City of Reno	Washoe	NV	32031C	3176	09/30/94

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines: *(check all that apply)*

Types of Flooding	Structures	Disciplines*
☒ Riverine	☐ Channelization	☒ Water Resources
☐ Coastal	☐ Levee/Floodwall	☐ Hydrology
☐ Alluvial Fan	☒ Bridge/Culvert	☒ Hydraulics
☐ Shallow Flooding *(e.g. Zones AO and AH)*	☐ Dam	☐ Sediment Transport
☐ Lakes	☐ Coastal	☐ Interior Drainage
	☐ Fill	☐ Structural
Affected by wind/wave action	☐ Pump Station	☐ Geotechnical
☐ Yes	☐ None	☐ Land Surveying
☐ No	☐ Channel Relocation	☐ Other *(describe)*
	☐ Excavation	
	☐ Other *(describe)*	

☐ Other(describe) _____ _____ _____

* **Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)**

2. FLOODWAY INFORMATION

7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM? ☒ Yes ☐ No
8. Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM ☒ Yes ☐ No
   If yes, give reason: Construction of Mira Loma Dr. Extension has altered the flow hydraulics

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions.

9. 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.

3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway? ☒ Yes ☐ No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet? ☐ Yes ☒ No

11. Without floodways:

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain? ☐ Yes ☐ No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot (*or other surcharge limit if community or state has adopted more stringent criteria)*? ☐ Yes ☐ No

If the answer to either Items 1B or 2B is yes, please provide 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.

4. REVISION REQUESTOR ACKNOWLEDGMENT

12. Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, and 72, I believe that the proposed revision ☒ is ☐ is not in compliance with the requirements of the aforementioned NFIP Regulations.

5. COMMUNITY OFFICIAL ACKNOWLEDGMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? ☒ Yes ☐ No

14. Does this revision request have the endorsement of the community? ☒ Yes ☐ No

If no to either of the above questions, please explain: _____

Please note that community acknowledgment and /or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g., levees, floodwalls, channelization, basins, dams)? ☐ Yes ☒ No

If yes, please provide the following information for each of the new flood control structures:

A. Inspection of the flood control project will be conducted periodically by _____ (entity)

_____ with a maximum interval of _____ months between inspections.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by _____ (entity)

to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year, ☐ has ☐ has not been prepared for the flood control structure.

D. 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.

Attach operation and maintenance plans

7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to Flood Insurance Maps: A guide for Community Officials," dated January 1990, this request is for a:

_____a.	CLOMR	A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision *(LOMR or PMR)*, or proposed hydrology changes *(see 44 CFR Ch. I, Parts 60, 65, and 72)*.
X b.	LOMR	A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. *(See 44 CFR Ch. I Parts 60 and 65.)*
_____c.	PMR	A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. *(See 44 CFR Ch. I, Parts 60 and 65.)*
_____d.	Other:	Describe_____

8. FORMS INCLUDED

.7. Form 2 entitled, "Certification By Registered Professional Engineer and/or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

• Hydrologic analysis for flooding source differs from that used to develop FIRM	☐ Hydrologic Analysis Form (Form 3)
• Hydraulic analysis for riverine flooding differs from that used to develop FIRM	☒ Riverine Hydraulic Analysis Form (Form 4)
• The request is based on updated topographic information or a revised floodplain or floodway delineation is requested	☒ Riverine /Coastal Mapping Form (Form 5)
• The request involves any type of channel modification	☐ Channelization Form (Form 6)
• The request involves new bridge or culvert or revised analysis of an existing bridge or culvert	☒ Bridge/Culvert Form (Form 7)
• The request involves a new revised levee/floodwall system	☐ Levee/Floodwall System Analysis Form (Form 8)
• The request involves analysis of coastal flooding	☐ Coastal Analysis Form (Form 9)
• The request involves coastal structures credited as providing protection from the 100-year flood	☐ Coastal Structures (Form 10)
• The request involves an existing, proposed, or modified dam	☐ Dam Form (Form 11)
• The request involves structures credited as providing protection from the 100-year flood on an alluvial fan	☐ Alluvial Fan Flooding Form (Form 12)

9. INITIAL REVIEW FEE

18. The minimum initial review fee for the appropriate request category has been included. ☐ Yes ☒ No

Initial fee amount: $ _____

Check or money order only. Make check or money order payable to : **National Flood Insurance Program.** If paying by Visa or Mastercard please refer to the credit card information form which follows this form.

or

19. This request is for a project that is for public benefit and is primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to the commencement of construction of the flood control project. ☐ Yes ☒ No

or

20. This request is to correct map errors, to include the effects of natural changes within the areas of special flood hazard, or solely to provide more detailed data. ☒ Yes ☐ No

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

Margaret F Bowker
Signature of Revision Requester

Margaret F. Bowker
Printed Name and Title of Revision Requester

Nimbus Engineers
Company Name

(702) 689-8630 — Telephone No.

3/26/96 — 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

Dave Price, County Engineer
Printed Name and Title of Community Official

Washoe County
Community Name

3/28/96
Date

Does this request impact any other communities? ☒ Yes ☐ No

If yes, attach letters from all affected jurisdictions acknowledging revision request and approving changes to floodway, if applicable.

Note: Although a photograph of physical changes is not required, it may be helpful for FEMA's review.

9. INITIAL REVIEW FEE

18. The minimum initial review fee for the appropriate request category has been included. ☐ Yes ☒ No

Initial fee amount: $ _____

Check or money order only. Make check or money order payable to : **National Flood Insurance Program.** If paying by Visa or Mastercard please refer to the credit card information form which follows this form.

or

19. This request is for a project that is for public benefit and is primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to the commencement of construction of the flood control project. ☐ Yes ☒ No

or

20. This request is to correct map errors, to include the effects of natural changes within the areas of special flood hazard, or solely to provide more detailed data. ☒ Yes ☐ No

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

Margaret F Bowker
Signature of Revision Requester

Margaret F. Bowker
Printed Name and Title of Revision Requester

Nimbus Engineers
Company Name

(702) 689-8630 — Telephone No.

3/26/96 — 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

Steve Varela, City Engineer
Printed Name and Title of Community Official

City of Reno
Community Name

4/22/96
Date

Does this request impact any other communities? ☒ Yes ☐ No

If yes, attach letters from all affected jurisdictions acknowledging revision request and approving changes to floodway, if applicable.

Note: Although a photograph of physical changes is not required, it may be helpful for FEMA's review.

FEDERAL EMERGENCY MANAGEMENT AGENCY **CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

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1. This certification is in accordance with 44 CFR Ch. I, Section 65.2
2. I am licensed with an expertise in Water Resources (hydrology and hydraulics)
   [example: water resources *(hydrology, hydraulics, sediment transport, interior drainage)** structural, geotechnical, land surveying.]
3. I have 20 years experience in the expertise listed above.
4. I have ☐ prepared ☒ reviewed the attached supporting data and analyses related to my expertise.
5. I ☒ have ☐ have not visited and physically viewed the project.
6. In my opinion, the following analyses and /or designs, is/are being certified:
   Hydraulic Analysis of Portions of Steamboat Creek
7. Base upon the following review, the modifications in place have been constructed in general accordance with plans and specifications.

   Basis for above statement: (check all that apply)

   a. ☐ Viewed all phases of actual construction.
   b. ☐ Compared plans and specifications with as-built survey information.
   c. ☒ Examined plans and specifications and compared with completed projects.
   d. ☐ Other _____

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

Name: Margaret F. Bowker
(please print or type)

Title: Principal
(please print or type)

Registration No. 5252 Expiration Date: December 31, 1996

State Nevada

Type of License Professional Engineer

_____
Signature

_____
Date

_____
Seal
(Optional)

*Specify Subdiscipline

Note: Insert not applicable (N/A) when statement does not apply.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	FEMA USE ONLY

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Community Name: City of Reno, Nevada

Flooding Source: Steamboat Creek
(One form for each flooding source)

Project Name/Identifier: Request for Floodway Revision on Steamboat Creek

1. REACH TO BE REVISED

Downstream limit: 500' downstream of Mira Loma Drive

Upstream limit: 1000' upstream of Mira Loma Drive

2. EFFECTIVE FIS

☐ Not studied

☐ Studied by approximate methods

Downstream limit of study _____

Upstream limit of study _____

☐ Studied by detailed methods

Downstream limit of study _____

Upstream limit of study _____

☒ Floodway delineated

Downstream limit of Floodway Confluence with the Truckee River

Upstream limit of Floodway 4750' upstream of Mira Loma Drive

3. HYDRAULIC ANALYSIS

Why is the hydraulic analysis different from that used to develop the FIRM. *(Check all that apply)*

☐ Not studied in FIS

☐ Improved hydrologic data/analysis. Explain: _____

☐ Improved hydraulic analysis. Explain: _____

☐ Flood control structure. Explain: _____

☒ Other. Explain: Two Conspan bridges have been built at Mira Loma Drive. These new structures have a significant impact on the analysis of Steamboat Creek.

For areas which have detailed flooding:

ull input and output listings along with files on diskette (if available) for each of the models listed below (items 1, 2, 3, 4, and 5) and summary of the source of input parameters used in the models must be provided. The summary must include a complete 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.

For areas which do not have detailed flooding:

Only the 100-year 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 for existing or pre-project conditions and revised or post-project conditions must be submitted. All calculations must be submitted for these analyses. (See item 6 below)

1. Duplicate Effective Model — Natural ☐ Floodway ☒

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 requestor's equipment to produce the duplicate effective model. This is required to assure that the effective model input data has been transferred correctly to the requestor'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 ☐ Floodway ☐

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 corrected 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 ☐ Floodway ☐

The duplicate effective or corrected 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 or duplicate effective model.

4. Revised or Post-Project Conditions Model — Natural ☐ Floodway ☒

The existing or pre-project conditions model *(or duplicate effective 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 proposed project this model should reflect proposed conditions.

5. Other: Please attach a sheet describing all other models submitted. — Natural ☐ Floodway ☐

6. Hydraulic Analyses (Only if Hydraulic Models are not developed)

Please attach all calculations for the existing or pre-project conditions and the revised or post-project conditions. Proceed to Form 5, "Riverine/Coastal Mapping Form".

4. MODEL PARAMETERS *(from model used to revise 100-year water surface elevation)*

1. Discharges:	Upstream Limit	Downstream Limit
10-year		
50-year		
100-year	5000	6950
500-year		

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined by Known Water Surface elevation taken from the effective FIS.

3. Give range of friction loss coefficients (*Manning's "N"*) Channel ..... 0.016 - 0.0

Overbanks ..... 0.025 - 0.250

If friction loss coefficients are different anywhere along the revised reach from those used to develop the FIRM, give location, value used in the effective FIS, and revised values and an explanation as to how the revised values were determined.

Location	FIS	Revised
at Mira Loma Bridge	0.025	0.016

Explain: Two bridges were constructed at Mira Loma Drive.

4. Describe how the cross section geometry data were determined *(e.g., field survey, topographic map, taken from previous study)* and list cross sections that were added.

Cross section geometry data were taken from the previously accepted model. Additional cross section data were from "As-built" plans.

5. Were natural channel banks selected as the location of the left and right channel banks in the model?

☐ Yes ☒ No If no, explain why not: Yes in all instances except at location of detention basin

6. Explain how reach lengths for channel and overbanks were determined:

Reach lengths were determined by measuring distances on topographic work maps and overbanks were determined from HEC-2 cross section plots and topographic work maps.

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

1. Do the results indicate:

a. Water surface elevations higher than end points of cross sections? ☒ Yes ☐ No

b. Supercritical depth? ☐ Yes ☒ No

c. Critical depth? ☐ Yes ☒ No

d. Other unique situations ☐ Yes ☒ No

If yes to any of the above, attach an explanation that discusses the situation and how it is presented on the profiles, tables, and maps. 1a. Cross sections were taken from the accepted HEC-2 model.

What is the maximum change in energy gradient between cross-sections? 14.04

Specify location 235.23 & 269.39

3. What is the distance between the cross-sections in 2 above? 3416

4. What is the maximum distance between cross-sections? 1380'

Specify location 169.57 & 155.57

5. Floodway determination

a. What is the maximum surcharge allowed by the community or State? 1.0' foot

b. What is the maximum surcharge for the revised conditions? 1.0' foot

Specify location 126.550 & 283.16

c. What is the maximum velocity? 10.91 fps

Specify location 314.160

d. Are there any negeative surcharge values at any cross-section? ☒ Yes ☐ No

If yes, the floodway may need to be widened. If it is not widened, please explain and indicate the maximum negative surcharge.

Explain: A negative surcharge value exists at section 314.16 which was taken from the accepted HEC-2 model.

6. Is the discharge value used to determine the floodway anywhere different from that used to determine the natural 100-year flood elevations? ..... ☐ Yes ☒ No

If Yes, explain:

7. Do 100-year water surface elevations increase at any location? ..... ☒ Yes ☐ No

If yes, please attach a list of the locations where the increases occur, state whether or not the increases are located on the requestor's property, and provide an explanation of the reason for the increases. *(For example: State if the increase is due to fill placed within the floodway fringe or placed within the currently adopted floodway limits)*

The 100 year WSEL is increased by approximately 0.4' in areas upstream of the Mira Loma Drive Extension. This increase is caused by fill placed within the floodway fringe.

Please attach a completed comparison table entitled: Water Surface Elevation Check (See page 6)

6. REVISED FIRM/FBFM AND FLOOD PROFILES

A. The revised water surface elevations tie into those computed by the effective FIS Model *(10-, 50-, 100-, and 500-year)*, downstream of the project at cross-section 189.07 within 0 feet *(vertical)* and upstream of the project at cross section 217.39 within 0 feet *(vertical)*.

B. The revised floodway elevations tie into those computed by the effective FIS model, dowstream of the project at cross section 189.07 within 0 feet *(vertical)* and upstream of the project at cross section 205.67 within 0 feet *(vertical)*.

C. Attach profiles, at the same vertical and horizontal scale as the profiles in the effective FIS report, showing stream bed and profiles of all floods studied (without encroachment). Also, label all cross sections, road crossings (including low chord and top-of-road data), culverts, tributaries, corporate limits, and study limits. If channel distance has changed, the stationing should be revised for all profile sheets.

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

Proceed to Riverine /Coastal Mapping Form

FEDERAL EMERGEN ANAGMENT AGENCY

WATER SURFACE ELEVATION CHECK

COMMUNITY NAME: City of Reno, Nevada

FLOODIND SOURCE: Steamboat Creek

PROJECT NAME /IDENTIFIER: Herrons Landing

	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
SECNO	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]
2	4386.0	4386.6	0										4386.0	4386.0	0
7.3	4386.2	4386.2	0										4386.2	4386.2	0
13.9	4386.2	4386.2	0										4386.2	4386.2	0
19.9	4387.3	4387.3	0										4387.3	4386.3	0
23.9	4387.7	4387.7	0										4387.7	4387.7	0
29.1	4387.9	4387.9	0										4387.9	4387.9	0
38.6	4388.3	4388.3	0										4388.3	4388.3	0
39.6	4388.4	4388.4	0										4388.4	4388.4	0
40.4	4388.4	4388.4	0										4388.4	4388.4	0
40.75	4388.5	4388.5	0										4388.5	4388.5	0
41.35	4388.5	4388.5	0										4388.5	4388.5	0
45.15	4388.5	4388.5	0										4388.5	4388.5	0
55.65	4388.5	4388.6	0.1										4388.5	4388.6	0.1

COMMENTS:

1-100-year (natural) Water Surface Elevation 2-Encroachment (floodway) Water Surface Elevation 3-Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

FEDERAL EMERGE MANAGMENT AGENCY
WATER SURFACE ELEVATION CHECK

COMMUNITY NAME	FLOODIND SOURCE	PROJECT NAME /IDENTIFIER
City of Reno, Nevada	Steamboat Creek	Herrons Landing

	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
SECNO	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]
69.35	4388.6	4388.8	0.2										4388.6	4388.8	0.2
78.85	4388.6	4388.8	0.2										4388.6	4388.8	0.2
84.05	4388.7	4388.9	0.2										4388.7	4388.9	0.2
96.25	4388.7	4389.0	0.3										4388.7	4389.0	0.3
105.55	4388.9	4389.6	0.7										4388.9	4389.6	0.7
115.55	4389.1	4390.0	0.9										4389.1	4390.0	0.9
126.55	4389.2	4390.2	1.0										4389.2	4390.2	1.0
130.75	4389.5	4390.3	0.8										4389.5	4390.3	0.8
131.17	4390.9	4391.2	0.3										4390.9	4391.2	0.3
132.57	4391.2	4391.6	0.4										4391.2	4391.6	0.4
155.57	4391.3	4391.7	0.4										4391.3	4391.7	0.4
169.57	4391.3	4391.7	0.4										4391.3	4391.7	0.4
180.57	4391.3	4391.7	0.4										4391.3	4391.7	0.4

COMMENTS:

1-100-year (natural) Water Surface Elevation | 2-Encroachment (floodway) Water Surface Elevation | 3-Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

FEDERAL EMERGEN /IANAGMENT AGENCY

WATER SURFACE ELEVATION CHECK

COMMUNITY NAME	FLOODIND SOURCE	PROJECT NAME /IDENTIFIER
City of Reno, Nevada	Steamboat Creek	Herrons Landing

	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
SECNO	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]
189.07	4391.3	4391.8	0.5										4391.3	4391.8	0.5
196.17	—	—	—										4391.2	4391.7	0.5
196.37	4391.3	4391.6	0.3										4391.1	4391.6	0.5
196.97	—	—	—										4391.1	4391.6	0.5
197.17	—	—	—										4391.5	4392.0	0.5
199.57	4391.4	4392.2	0.8										4391.7	4392.1	0.4
201.57	4391.4	4392.2	0.8										4391.8	4392.2	0.4
202.07	4391.5	4392.3	0.8										4391.8	4392.2	0.4
202.47	4391.5	4392.3	0.8										4391.8	4392.2	0.4
205.67	4391.6	4392.5	0.9										4391.9	4392.5	0.6
217.39	4393.2	4394.1	0.9										4393.2	4394.1	0.9
224.98	4396.7	4397.6	0.9										4396.7	4397.5	0.8

COMMENTS:

1-100-year (natural) Water Surface Elevation

2-Encroachment (floodway) Water Surface Elevation

3-Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

FEDERAL EMERGEN :ANAGMENT AGENCY

WATER SURFACE ELEVATION CHECK

COMMUNITY NAME	FLOODIND SOURCE	PROJECT NAME /IDENTIFIER
City of Reno, Nevada	Steamboat Creek	Herrons Landing

	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
SECNO	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]
235.23	4399.9	4400.8	0.9										4399.9	4400.8	0.9
269.39	4413.8	4414.5	0.7										4413.8	4414.5	0.7
273.00	4415.2	4415.7	0.5										4415.2	4415.7	0.5
283.16	4417.7	4418.7	1.0										4417.7	4418.7	1.0
314.16	4428.3	4427.6	-0.7										4428.3	4427.6	-0.7

COMMENTS:

1-100-year (natural) Water Surface Elevation 2-Encroachment (floodway) Water Surface Elevation 3-Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE/COASTAL MAPPING FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

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.

Community Name: City of Reno, Nevada Washoe County

Flooding Source: Steamboat Creek

Project Name/Identifier: Request for Floodway Revision on Steamboat Creek

1. MAPPING CHANGES

1. A topographic work map of suitable scale, contour interval, and planimetric definition must be submitted showing *(indicate N/A when not applicable)*:

		Included		
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 100-year floodway boundaries	☒ Yes	☐ No	☐ N/A
D.	Location and alignment of all cross sections used in the revised hydraulic model with stationing control indicated	☒ Yes	☐ No	☐ N/A
E.	Stream alignments, road and dam alignments	☒ Yes	☐ No	☐ N/A
F.	Current community boundaries	☒ Yes	☐ No	☐ N/A
G.	Effective 100- and 500-year floodplain and 100-year floodway boundaries from the FIRM/FBFM reduced or enlarged to the scale of the topographic work map	☒ Yes	☐ No	☐ N/A
H.	Tie-ins between the effective and revised 100- and 500-year floodplains and 100-year floodway boundaries	☒ Yes	☐ No	☐ N/A
I.	The requestor'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 etc.)	☒ 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 analyses	☐ Yes	☐ No	☒ N/A

If any of the items above are marked no or N/A, please explain: b) 500 year analysis not required m), n) not in a coastal zone

2. What is the source and date of the updated topographic information *(example: orthophoto maps, July 1985; field survey, May 1979, beach profiles, June 1987, etc.)*? Aerial photo 6/90, Survey 3/91, 4/91, 3/92

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

   a. Effective FIS 1"=500' scale _____ Contour interval

   b. Revision Request 1"=500' scale 1' Contour interval

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

4. Attach an annotated FIRM and FBFM at the scale of the effective FIRM and FBFM showing the revised 100-year and 500-year floodplains and the 100-year floodway boundaries and how they tie into those shown on the effective FIRM and FBFM downstream and upstream of the revision or adjacent to the area of revision for coastal studies.

   Attach additional pages if needed.

c. Flood Boundaries and 100-year water surface elevations:

Has the 100-year floodplain been shifted or increased or the 100-year water surface elevation increased at any location on property other than the requestor's or community's? ☒ Yes ☐ No

If yes, please give the location of shift or increase and an explanation for the increase.

The 100-year water surface elevation has increased about 0.4 feet in areas upstream of Mira Loma Drive. This increase is due to fill placed in the floodway fringe. In the floodway fringe, construction is permitted as long as it does not increase the WSEL by over 1 foot.

a. Have the affected property owners been notified of this shift or increase and the effect it will have on their property? ..... ☐ Yes ☒ No

If yes, please attach letters from these property owners stating they have no objections to the revised flood boundaries if a LOMR is being requested.

b. What is the number of insurable structures that will be impacted by this shift or increase? 0

6. Have the floodway boundaries shifted or increased at any location compared to those shown on the effective FBFM or FIRM? ..... ☒ Yes ☐ No

If yes, explain:

Construction of two bridges at Mira Loma Drive has created a significant change in flow hydraulics.

7. If a V-zone has been designated, has it been delineated to extend landward to the heel of the primary frontal dune? N/A ☐ Yes ☐ No

If no, explain:

8. Manual or digital map submission:

☒ Manual

☐ Digital

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 of submission as possible.

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.

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, provide certification of fill compaction (item C. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer.

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.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	FEMA USE ONLY

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.

Community Name: City of Reno, Nevada Washoe County

Flooding Source: Steamboat Creek

Project Name/Identifier: Request for Floodway Revision on Steamboat Creek

1. IDENTIFIER

1. Name of roadway, railroad, etc.: Mira Loma Drive

2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): Cross sections 196.37 and 196.97

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

- [X] 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

(Explain why new analysis was performed)

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway) 3 cell - arched Air-O-Form bridge (Conspan)

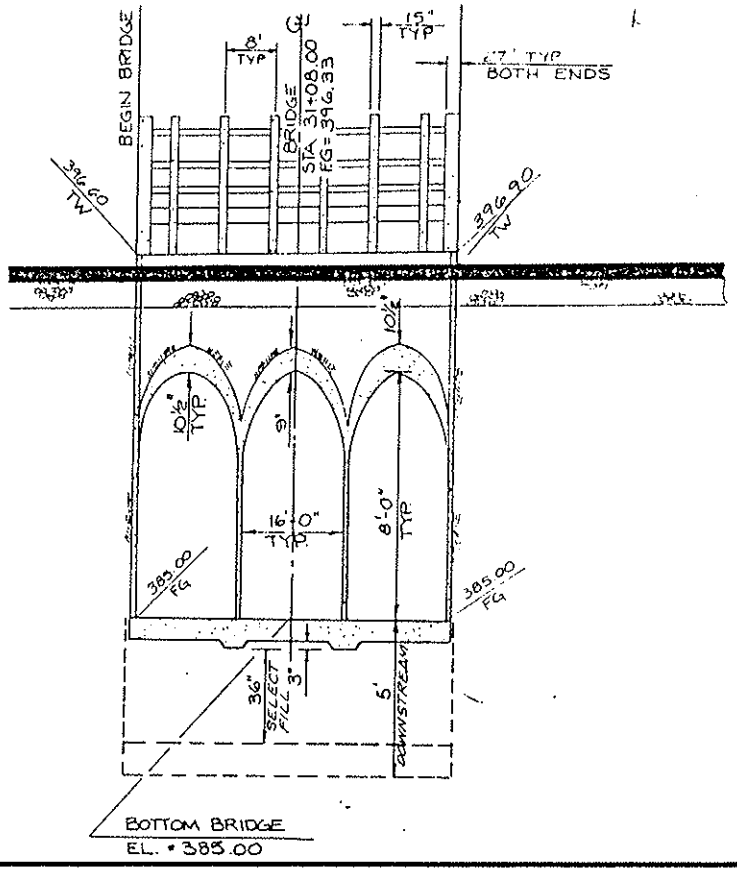
2. Entrance geometry of culvert/type of bridge opening (e.g. 30 ° - 75 ° wing walls with square top edge, sloping embankments and vertical abutments) 2:1 side slopes, vertical headwall, 45° wing walls

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

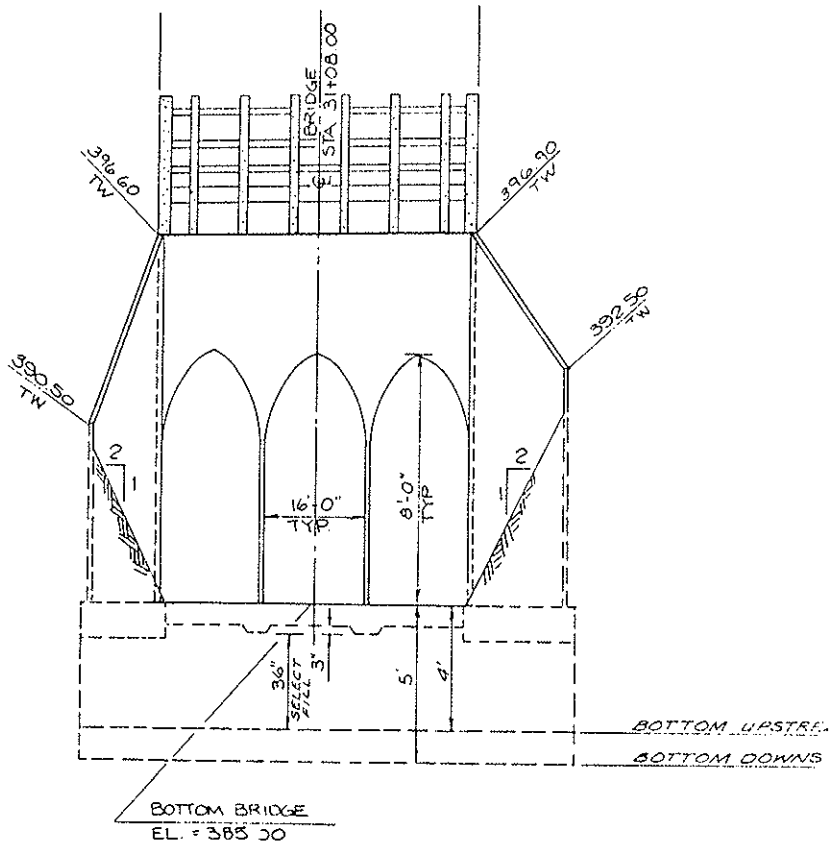
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

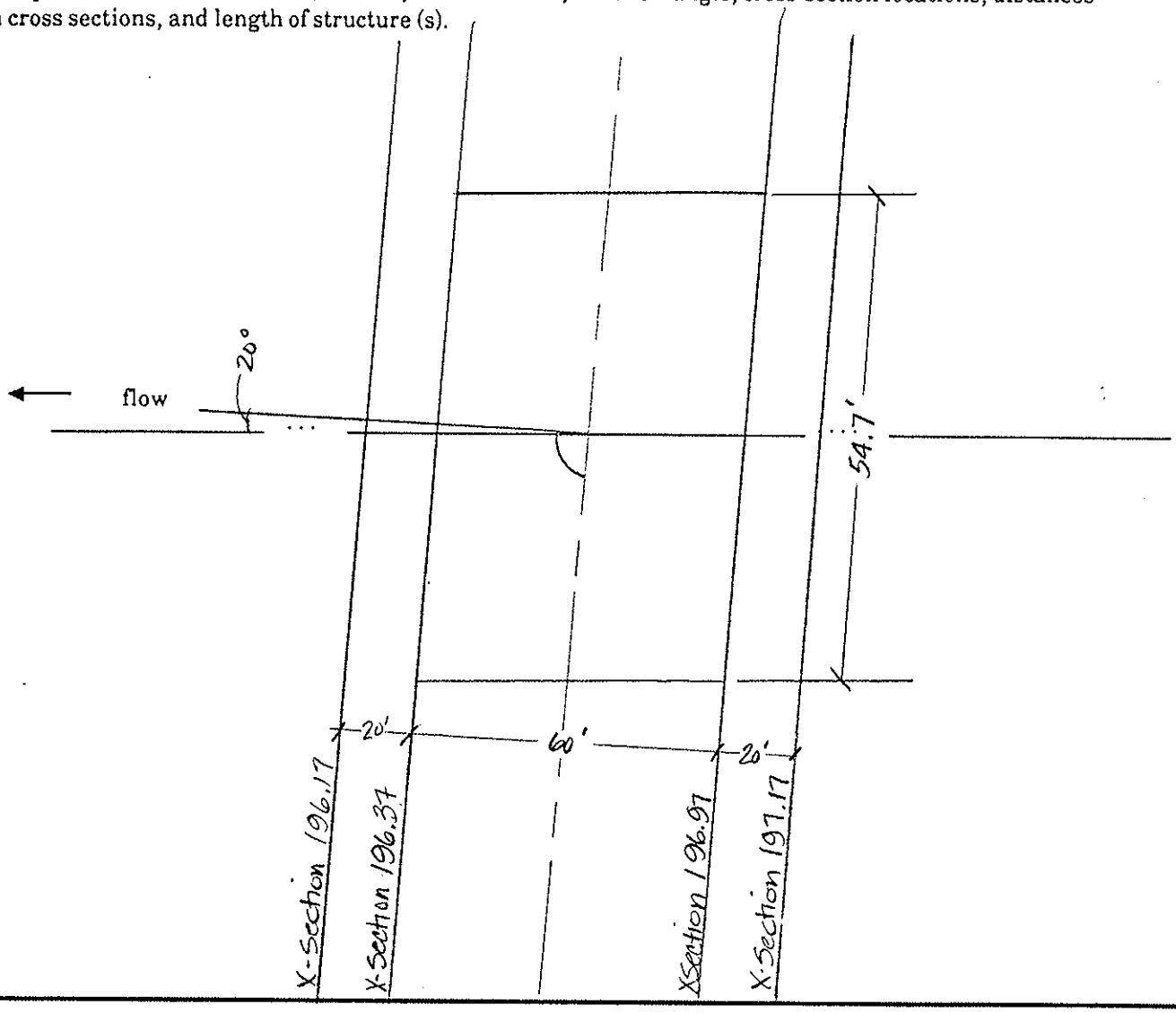
Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.



Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	60'
Calculated culvert/bridge area (ft²) by the hydraulic model, if applicable	357'
Total culvert/bridge area (ft²)	357'

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	4384.86	4384.89
Downstream face	4384.86	4384.82

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	4393.55	4395.81
Downstream face	4391.52	4395.84

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	4391.13	4392.07
Downstream face	4391.09	4392.03

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	5000			5000

The maximum depth of flow over the roadway/railroad (ft.) ..... —

Weir length (ft.) ..... —

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	602.79	602.79	602.79
Downstream face	602.79	602.79	602.79

Loss Coefficients

Entrance loss coefficient	—
Manning's "n" value assigned to the structure(s)	0.016
Friction loss coefficient through structure (s)	—
Other loss coefficients (e.g., bend manhole, etc.)	—
Total loss coefficient	—
Weir coefficient	—
Pier coefficient	—
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport *(including scour and deposition)* can affect the 100-year water surface elevations? ..... ☐ Yes ☒ No

   B Based on the conditions *(such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions)*, is there a potential for debris and sediment transport *(including scour and deposition)* to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☒ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment *(bed material)* load?
   _____cfs *(attach gradation curve)*

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition_____

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert?_____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) Normal Bridge Routine was used. with the ET Card Method X.11.

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	FEMA USE ONLY

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.

Community Name: City of Reno, Nevada Washoe County

Flooding Source: Steamboat Creek

Project Name/Identifier: Request For Floodway Revision on Steamboat Creek

1. IDENTIFIER

1. Name of roadway, railroad, etc.: Mira Loma Dr.
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): Cross sections 196.37 and 196.97
3. This revision reflects *(check one of the following)*:
   - [x] 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

   (Explain why new analysis was performed) _____

2. BACKGROUND

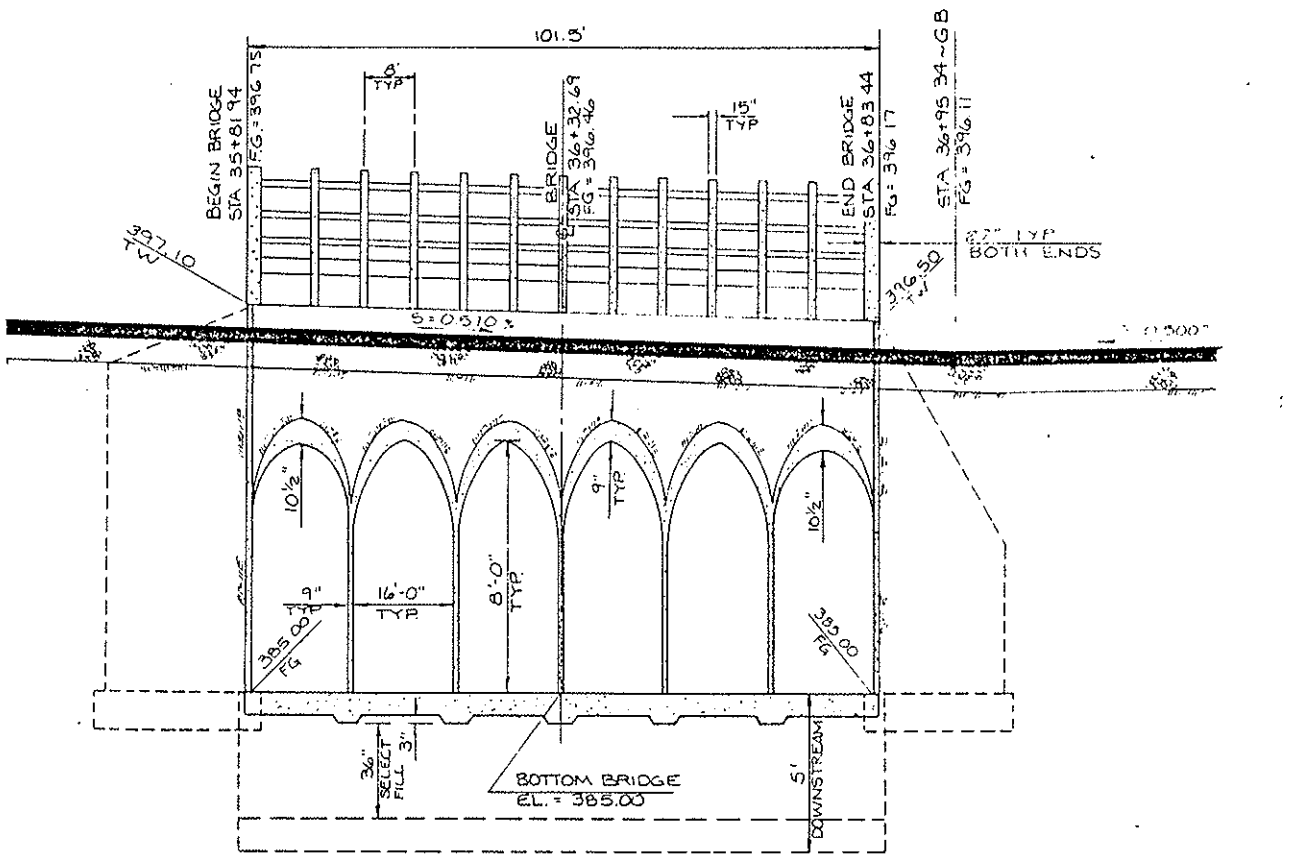
Provide the following information about the structure:

1. Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway) 6 Cell - arched Air-o-Form bridge (Conspan)
2. Entrance geometry of culvert/type of bridge opening (e.g. 30 ° - 75 ° wing walls with square top edge, sloping embankments and vertical abutments) 2:1 side slopes vertical Headwall 45° Wing walls
3. Hydraulic model used to analyze the structure (*e.g., HEC-2 with special bridge routine, WSPRO, HY8*) HEC-2 Normal Bridge Routine

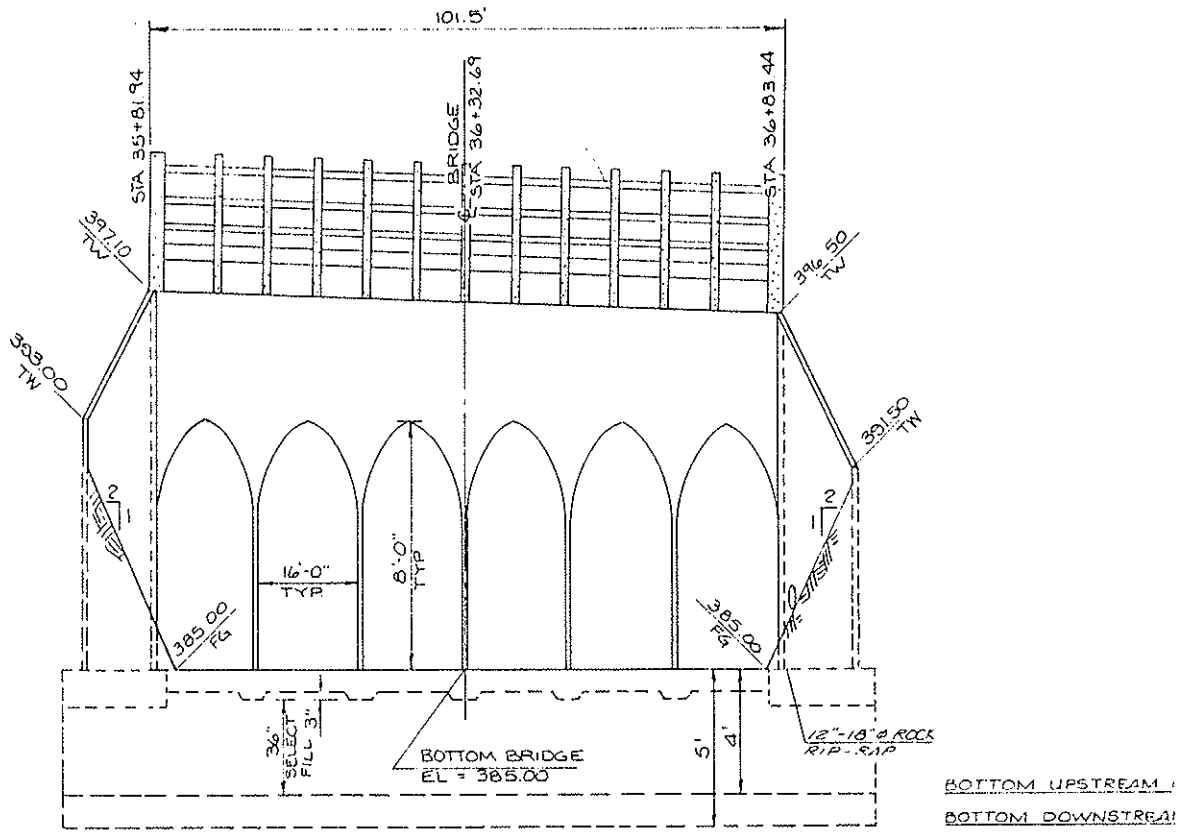
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

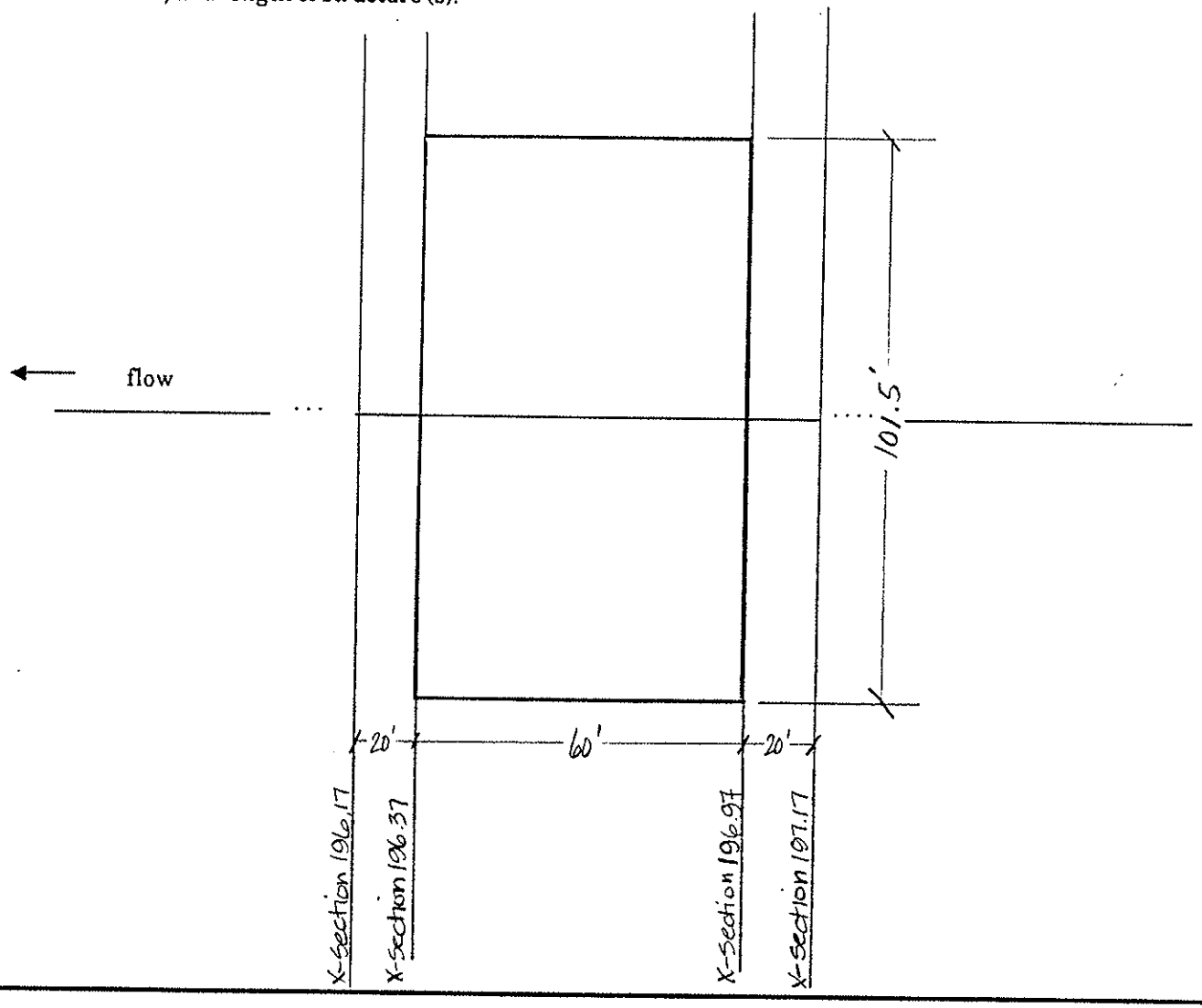
Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.



Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	60ft
Calculated culvert/bridge area (ft²) by the hydraulic model, if applicable	714 ft²
Total culvert/bridge area (ft²)	714 ft²

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	4384.86	4384.89
Downstream face	4384.86	4384.82

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	4393.55	4395.81
Downstream face	4391.52	4395.84

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	4391.13	4392.07
Downstream face	4391.09	4392.03

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	5000			5000

The maximum depth of flow over the roadway/railroad (ft.) ..... —

Weir length (ft.) ..... —

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	602.79	602.79	602.79
Downstream face	602.79	602.79	602.79

Loss Coefficients

Entrance loss coefficient	–
Manning's "n" value assigned to the structure(s)	0.016
Friction loss coefficient through structure (s)	–
Other loss coefficients (e.g., bend manhole, etc.)	–
Total loss coefficient	–
Weir coefficient	–
Pier coefficient	–
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport *(including scour and deposition)* can affect the 100-year water surface elevations? ..... ☐ Yes ☒ No

   B Based on the conditions *(such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions)*, is there a potential for debris and sediment transport *(including scour and deposition)* to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☒ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment *(bed material)* load?
   _____cfs *(attach gradation curve)*

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition_____

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert?_____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) Normal Bridge Routine was used with the ET card method X.11.

Comments *(explain any unusual situations)*:

Attach analysis.

BASE HEC-2 MODEL

STMROSE.DAT

```
1*****************************************
 *  HEC-2 WATER SURFACE PROFILES          *
 *                                        *
 *  Version   4.6.2;  May 1991            *
 *                                        *
 *    N DATE    26FEB96    TIME   15:58:56  *
 *****************************************
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**************************************
*  U.S. ARMY CORPS OF ENGINEERS      *
*  HYDROLOGIC ENGINEERING CENTER     *
*  609 SECOND STREET, SUITE D        *
*  DAVIS, CALIFORNIA 95616-4687      *
*          (916) 756-1104            *
**************************************
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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
```

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26FEB96 15:58:56 PAGE 1

THIS RUN EXECUTED 26FEB96 15:58:56

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

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

Section numbers in this model are consistent with the current regulatory FIS (April, 1990).
This model ties into the downstream current regulatory model at Pembroke Drive (STM2.601). Upstream of Pembroke, this model was modified from the current model STMFW6. Section numbers were revised to be consistent with the downstream model, and the April 1990 FIS.

NOTE : Section numbers are not consistent with channel distance in the revised area.

```
T2      Nimbus Engineers     File : STMROSE.DAT   Job No. 9006    August, 1990
T3      Revised from sect. 130.75 to sect 202.47 (Golf Course)

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                                                          4386.04

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1                 -1

J3  VARIABLE CODES FOR SUMMARY PRINTOUT
```

38 43 4 53 54 1 50 25 26 0
200

QT	2	6950	6950							
N	.080	.080	.025	.1	.3					
E			9.1						0	243.5
X1	2.00	21	165.5	243.5	0	0	0			
GR	4385.0	0.0	4383.5	22.1	4383.7	28.7	4378.0	39.9	4376.8	53.2
GR	4376.8	71.7	4382.3	88.6	4385.9	107.2	4385.9	131.0	4387.7	149.3
GR	4387.8	165.5	4370.0	182.7	4370.0	230.9	4385.5	243.5	4394.9	260.7
GR	4394.8	271.7	4394.8	274.9	4395.0	304.0	4395.1	389.1	4395.1	449.1
GR	4399.7	453.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET			9.1						0	840.7
X1	7.30	28	761.5	840.7	420	530	530			
GR	4388.7	0.0	4389.5	26.2	4387.7	50.8	4388.5	75.8	4387.6	105.1
GR	4388.1	133.9	4386.8	145.6	4386.5	148.3	4386.2	193.6	4388.2	206.2
GR	4387.6	243.1	4386.3	257.2	4385.0	276.8	4385.0	292.2	4386.5	636.3
GR	4385.4	642.2	4384.7	662.0	4383.8	675.8	4383.6	704.6	4383.6	761.5
GR	4370.0	772.7	4370.0	825.9	4382.9	840.7	4391.5	858.5	4397.1	870.6

1

GR	4397.8	891.8	4398.1	937.8	4398.6	1005.3	0.0	0.0	0.0	0.0
ET			9.1						0	1269
X1	13.90	32	1208.5	1269.0	570	660	660			
GR	4389.9	0.0	4389.1	19.1	4387.8	36.8	4388.3	55.7	4386.8	73.2
GR	4386.6	93.7	4386.5	106.5	4386.5	164.3	4385.0	407.8	4385.0	623.6
G	4384.5	689.8	4384.6	754.9	4384.6	820.5	4385.7	841.9	4399.7	906.7
GR	4399.6	1119.8	4396.6	1135.2	4393.8	1158.5	4393.4	1173.5	4385.6	1188.5
GR	4385.3	1208.5	4384.2	1215.0	4370.2	1223.2	4370.2	1259.2	4385.0	1269.0
GR	4389.9	1291.6	4393.9	1306.9	4396.9	1315.1	4397.8	1341.8	4393.2	1355.2
GR	4393.2	1367.9	4401.1	1375.6	0.0	0.0	0.0	0.0	0.0	0.0
ET			9.1						2576.1	4175.5
X1	19.90	32	4092.6	4175.5	520	600	600			
GR	4389.8	2576.1	4386.4	2584.0	4387.0	2598.6	4387.0	2618.0	4387.0	2682.3
GR	4387.0	2795.0	4386.3	2919.3	4385.8	3038.1	4385.6	3148.1	4385.1	3283.0
GR	4385.1	3887.0	4388.1	3915.3	4391.4	3938.7	4392.3	3961.2	4390.2	3968.8
GR	4390.0	3984.1	4386.5	3995.3	4386.5	4012.0	4385.8	4041.2	4388.0	4062.9
GR	4388.3	4077.6	4388.8	4083.3	4383.5	4092.6	4383.9	4111.5	4380.7	4119.4
GR	4370.6	4128.3	4370.6	4159.1	4386.3	4175.5	4390.3	4187.0	4390.6	4203.8
GR	4390.6	4216.5	4402.8	4236.1	0.0	0.0	0.0	0.0	0.0	0.0
ET			9.1						2738.3	4705.8
X1	23.90	19	4621.3	4705.8	450	400	400			
GR	4389.4	2738.3	4386.5	2752.2	4386.8	2781.1	4386.8	2884.6	4386.9	3002.5
GR	4386.8	3146.4	4386.4	3301.2	4385.7	3429.7	4385.5	3551.4	4385.2	3678.0
GR	4385.0	4576.6	4385.7	4588.4	4384.8	4621.3	4383.3	4642.3	4370.8	4655.5
GR	4370.8	4691.8	4387.8	4705.8	4389.9	4713.2	4390.3	4729.8	0.0	0.0
ET			9.1						3191.0	5284.3
X1	29.10	27	5225.3	5284.3	500	520	520			
	4391.0	3191.0	4387.0	3213.9	4387.0	3279.3	4386.7	3369.4	4386.5	3475.5
GR	4385.7	3602.9	4385.4	3764.2	4385.4	5082.9	4385.9	5089.3	4385.8	5100.6
GR	4384.3	5115.3	4384.1	5135.0	4384.7	5161.6	4386.0	5189.5	4386.0	5204.2
GR	4387.8	5213.3	4389.0	5225.3	4370.8	5235.8	4370.8	5273.6	4388.0	5284.3
GR	4387.5	5294.5	4385.3	5310.4	4386.3	5329.5	4389.9	5340.0	4390.9	5354.7

GR	4391.4	5363.5	4391.5	5388.7	0.0	0.0	0.0	0.0	0.0	0.0
NH	4	.070	637.1	.045	2068.0	.025	2152.0	.045	2395.0	
ET			9.1						0	2152
X	38.60	24	2068.0	2152.0	1450	1000	950			
G	4390.5	0.0	4391.4	17.2	4391.6	22.6	4389.1	29.1	4389.1	41.5
GR	4390.5	48.4	4389.3	61.4	4388.4	142.8	4387.7	193.9	4387.3	270.7
GR	4386.8	375.4	4386.4	498.4	4385.7	637.1	4385.5	1948.8	4386.5	2037.3
GR	4387.3	2051.5	4384.7	2068.0	4370.9	2079.8	4370.9	2116.3	4380.5	2126.2
GR	4383.9	2152.0	4384.0	2174.5	4384.2	2195.6	4390	2395	0.0	0.0
NC				.3	.5					
NH	4	.100	780.9	.050	2366.9	.025	2468.4	.040	2700.0	
ET			9.1						0	2468.4

1

X1	39.60	30	2366.9	2468.4	300	80	100			
GR	4391.6	0.0	4391.2	10.0	4390.6	22.8	4389.0	29.0	4389.0	46.2
GR	4390.0	49.4	4388.5	60.5	4388.6	113.1	4388.5	179.5	4387.8	275.6
GR	4387.7	367.2	4386.7	444.5	4386.3	549.9	4385.9	692.2	4385.5	780.9
GR	4385.5	2101.2	4385.2	2182.0	4385.2	2285.5	4386.6	2306.7	4386.0	2338.4
GR	4386.0	2355.9	4387.5	2366.9	4371.0	2393.4	4371.0	2432.6	4383.0	2443.5
GR	4384.9	2468.4	4383.9	2523.4	4384.4	2579.0	4387.0	2600.0	4390.0	2700.0
NH	4	.070	374.8	.045	2348.4	.025	2469.1	.040	3172.1	
ET			9.1						0	2469.1
X1	40.40	53	2348.4	2469.1	100	80	80			
G	4391.2	0.0	4388.6	1.8	4387.5	13.9	4387.9	36.9	4388.5	73.0
G	4388.0	142.5	4388.0	210.7	4388.0	295.2	4386.7	374.8	4386.7	463.3
GR	4386.4	547.1	4385.8	627.2	4385.3	713.1	4384.7	797.4	4383.9	871.9
GR	4383.2	913.9	4383.8	922.6	4383.4	927.8	4384.8	945.1	4384.8	1750.8
GR	4384.7	1813.8	4384.3	1873.0	4384.2	1944.2	4384.0	2022.4	4384.3	2065.6
GR	4384.5	2103.9	4384.7	2137.5	4386.3	2196.8	4385.9	2238.6	4386.4	2287.8
GR	4386.7	2314.2	4388.3	2348.4	4388.8	2361.7	4388.3	2392.6	4387.9	2401.8
GR	4371.0	2424.6	4371.0	2458.8	4384.3	2469.1	4387.3	2479.7	4387.3	2484.6
GR	4388.9	2511.2	4388.4	2548.8	4388.1	2610.5	4388.2	2674.8	4388.5	2737.6
GR	4389.1	2796.3	4389.2	2868.3	4388.9	2936.9	4389.0	2996.7	4389.2	3063.7
GR	4389.6	3123.6	4390.0	3151.5	4390.2	3172.1				
SB	1.05	1.5	2.5		18.0	2.0	890	1.75	4371.0	4371.0
ET			9.1						0	2469.1
X1	40.75				35	35	35			
X2			1	4389.5	4387.0			1.33		
BT	-8	0	4387.6		260	4387.4		380	4386.5	
BT		800	4387.5		1610	4386.6		1980	4391.7	
BT		2430	4390.0		2830	4391.7				
NH	4	.500	819.0	.045	2534.1	.025	2615.7	.040	2666.4	
ET			17.4							
X1	41.35	50	2534.1	2615.7	45	55	55			
GR	4390.9	0.0	4389.8	27.2	4389.8	139.6	4387.9	231.9	4387.8	324.0
GR	4385.6	410.3	4386.7	443.8	4386.7	480.9	4385.9	545.0	4385.8	638.1
GR	4383.7	819.0	4387.3	861.8	4385.9	904.2	4381.5	987.4	4384.7	1050.3
	4386.3	1053.3	4385.9	1093.8	4384.7	1108.3	4384.7	1125.6	4385.0	1154.3
GR	4384.6	1186.0	4383.6	1221.7	4383.9	1266.1	4383.7	1430.0	4383.1	1559.5
GR	4383.1	1779.3	4383.5	1803.2	4383.6	1846.9	4383.8	1906.8	4383.8	1978.2
GR	4383.4	2054.5	4383.5	2135.9	4384.1	2172.2	4388.1	2189.3	4384.4	2205.7
GR	4384.2	2262.9	4383.5	2293.8	4383.5	2381.1	4386.2	2395.8	4386.5	2414.3

GR	4386.0	2470.2	4385.8	2502.7	4383.5	2534.1	4381.3	2552.4	4371.4	2562.7
GR	4371.4	2606.8	4384.7	2615.7	4384.0	2648.3	4383.7	2666.0	4391.0	2666.4
NC				.1	.3					
Q"	2	6650	6650							
N	4	.500	798.5	.055	2779.5	.025	2844.6	.040	3225	
X1	45.15	52	2779.5	2844.6	380	410	380			
GR	4392.0	24.7	4389.9	39.7	4389.7	110.4	4387.4	145.8	4388.2	179.6
GR	4388.2	371.8	4384.5	798.5	4387.4	849.4	4385.5	868.4	4385.3	948.5
GR	4384.2	974.5	4384.0	1030.4	4384.7	1055.1	4386.5	1086.9	4392.0	1145.4
GR	4393.5	1214.6	4392.9	1239.6	4389.8	1273.3	4384.5	1325.1	4384.1	1400.5
GR	4384.1	1617.0	4383.8	1679.1	4384.1	1741.9	4383.8	1800.3	4383.8	1925.9

1

GR	4384.1	2012.4	4386.7	2050.4	4383.8	2065.1	4383.7	2106.6	4383.3	2271.0
GR	4383.3	2553.0	4383.9	2598.7	4383.7	2658.5	4383.9	2690.3	4386.3	2707.0
GR	4386.7	2724.0	4385.7	2744.6	4384.6	2767.2	4383.6	2779.5	4371.6	2787.5
GR	4371.6	2831.5	4383.8	2844.6	4385.1	2854.0	4384.2	2879.2	4385.0	2912.1
GR	4384.8	2924.6	4387.2	2941.2	4386.9	2961.4	4385.6	2989.3	4386.0	3024.2
GR	4387	3220	4391	3225						
NH	4	.500	802.0	.055	3116.5	.025	3189.5	.040	3500	
X1	55.65	66	3116.5	3189.5	700	1000	1050			
GR	4391.0	8.8	4388.7	156.1	4388.9	304.6	4387.1	319.6	4387.1	343.8
GR	4388.9	383.8	4387.8	415.8	4388.4	453.4	4385.5	479.1	4389.8	544.1
GR	4386.5	600.8	4386.0	661.3	4388.5	680.9	4385.2	711.3	4387.7	763.7
GR	4385.6	802.0	4386.0	907.2	4387.3	945.2	4386.8	1007.2	4389.0	1056.0
GR	4394.1	1108.9	4403.0	1214.8	4402.6	1588.8	4384.7	1639.5	4383.0	1699.4
C	4383.0	1763.6	4386.8	1809.0	4384.6	1841.9	4384.9	1916.8	4384.7	2015.4
GR	4384.3	2071.0	4384.3	2132.8	4384.1	2190.4	4384.1	2491.8	4384.3	2506.3
GR	4385.4	2517.3	4386.9	2526.1	4386.0	2533.7	4387.1	2539.2	4386.5	2544.5
GR	4384.2	2556.4	4384.3	2598.1	4384.1	2657.7	4384.0	2721.6	4383.6	2780.1
GR	4383.7	2835.7	4383.7	2878.4	4383.7	2906.5	4383.6	2924.9	4383.8	2975.0
GR	4383.7	3023.9	4383.8	3056.5	4387.0	3073.4	4388.0	3089.9	4388.2	3116.5
GR	4372.0	3129.9	4372.0	3166.6	4383.1	3174.0	4384.1	3189.5	4382.9	3225.6
GR	4384.1	3261.3	4384.8	3284.3	4384.2	3324.7	4386.7	3351.9	4387.6	3376.6
GR	4391	3500								
NH	4	.500	831.9	.045	3089.6	.025	3164.3	.040	3820.9	
X1	69.35	80	3089.6	3164.3	670	1050	1370			
GR	4390.1	0.0	4389.0	175.5	4387.5	238.0	4388.3	409.4	4387.0	457.3
GR	4387.0	533.4	4386.3	650.4	4386.2	676.6	4388.7	700.6	4384.8	754.2
GR	4385.0	831.9	4384.6	945.3	4384.3	985.1	4384.3	1226.3	4386.5	1254.6
GR	4400.5	1356.5	4401.3	1835.6	4393.8	1900.1	4392.5	1962.9	4392.7	2089.6
GR	4384.8	2146.0	4384.8	2160.3	4391.2	2183.9	4387.9	2212.7	4384.1	2249.2
GR	4387.7	2323.2	4387.7	2389.1	4387.6	2477.6	4385.2	2484.6	4384.8	2544.2
GR	4382.4	2632.6	4382.9	2662.7	4382.9	2784.9	4385.7	2935.8	4385.2	2964.8
GR	4385.3	2988.5	4387.9	3014.6	4388.3	3089.6	4373.0	3099.3	4373.0	3139.5
GR	4380.8	3143.3	4384.4	3152.4	4385.7	3164.3	4385.3	3178.7	4383.5	3201.3
GR	4384.2	3222.8	4384.8	3249.1	4385.2	3277.7	4385.2	3327.0	4385.0	3337.0
GR	4385.4	3357.5	4385.8	3378.4	4387.1	3396.4	4387.3	3409.3	4386.5	3426.3
GR	4386.0	3446.2	4385.9	3473.0	4385.5	3498.8	4385.9	3528.2	4385.7	3553.4
GR	4385.8	3575.4	4385.8	3592.6	4384.9	3605.1	4385.6	3620.7	4382.5	3625.4
C	4382.6	3633.2	4384.4	3636.3	4383.8	3650.4	4384.2	3668.9	4384.9	3683.1
GR	4384.9	3691.5	4385.5	3698.8	4385.8	3709.6	4386.0	3722.0	4384.3	3736.7
GR	4383.5	3750.1	4382.5	3760.9	4382.0	3775.3	4385.5	3791.6	4398.5	3820.9
NH	4	.500	846.3	.045	3923.7	.025	4020.4	.040	4394.5	

X1	78.85	92	3923.7	4020.4	430	780	950			
GR	4390.8	0.0	4390.7	22.7	4389.6	61.6	4389.5	138.4	4388.7	237.3
GR	4387.3	436.9	4386.3	467.4	4388.7	487.4	4386.3	548.7	4386.2	613.3
GR	4385.3	660.9	4388.8	686.4	4389.0	691.5	4385.6	738.9	4385.3	846.3
G	4384.7	937.0	4384.7	1066.9	4385.0	1117.2	4384.6	1174.3	4384.5	1352.2
(	4384.9	1465.4	4390.8	1547.2	4401.0	1660.5	4400.1	1992.0	4393.1	2042.8
GR	4393.8	2117.7	4391.7	2180.8	4385.5	2279.7	4390.7	2291.2	4388.0	2325.4
GR	4383.8	2339.7	4383.7	2467.3	4384.2	2500.1	4384.0	2616.2	4383.6	2647.5
GR	4383.9	2771.2	4384.8	2794.4	4384.8	2900.1	4385.4	2973.7	4386.0	2996.7
GR	4386.0	3037.4	4385.3	3069.4	4386.2	3131.3	4387.7	3157.7	4386.7	3178.5

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GR	4386.7	3191.0	4387.1	3245.4	4387.2	3297.0	4388.6	3376.2	4388.2	3389.1
GR	4387.9	3408.6	4388.2	3482.9	4389.4	3536.6	4389.3	3558.7	4388.6	3592.5
GR	4388.6	3630.1	4386.0	3652.1	4385.6	3684.2	4385.8	3714.1	4385.9	3753.3
GR	4385.4	3809.1	4384.4	3825.9	4384.1	3838.9	4384.5	3863.7	4388.6	3892.4
GR	4384.7	3902.2	4385.3	3908.7	4386.0	3916.4	4385.3	3923.7	4373.5	3938.0
GR	4373.5	3981.4	4379.1	3988.4	4380.6	3993.8	4380.1	4001.7	4382.7	4011.6
GR	4386.0	4020.4	4387.6	4030.4	4387.8	4034.6	4384.9	4048.4	4384.8	4060.8
GR	4383.6	4094.6	4383.2	4121.7	4383.5	4217.6	4383.4	4278.8	4386.5	4300.7
GR	4384.1	4308.7	4384.1	4323.6	4384.0	4344.4	4386.0	4353.2	4390.5	4369.0
GR	4396.8	4384.1	4402.0	4394.5	0.0	0.0	0.0	0.0	0.0	0.0
NH	5	.50	844.2	.100	2494.8	.045	4263.1	.025	4353.0	.040
NH	5009.9									
X1	84.05	86	4263.1	4353.0	470	500	520			
GR	4393.7	35.4	4393.5	49.6	4391.0	68.1	4389.0	72.9	4389.2	97.2
GP	4387.1	699.5	4386.5	765.5	4387.1	844.2	4389.3	862.9	4386.9	919.6
	4385.9	1074.6	4386.3	1181.8	4385.3	1414.2	4385.3	1452.2	4385.5	1492.9
GR	4385.8	2494.8	4390.0	2532.9	4390.0	2544.6	4389.5	2564.9	4385.0	2590.3
GR	4384.8	2685.9	4384.0	2721.0	4384.0	2738.8	4384.8	2758.8	4385.6	2769.8
GR	4386.0	3374.6	4386.8	3435.1	4386.2	3521.1	4386.2	3553.5	4387.0	3636.0
GR	4387.0	3677.3	4386.8	3708.5	4388.1	3754.4	4387.7	3873.8	4388.5	3888.5
GR	4388.4	4017.6	4388.9	4023.7	4388.9	4034.9	4387.5	4070.0	4387.8	4096.3
GR	4387.8	4126.3	4388.8	4146.7	4388.9	4191.2	4388.5	4196.1	4387.5	4203.0
GR	4386.4	4213.2	4386.3	4225.1	4385.7	4237.6	4385.1	4250.2	4384.7	4263.1
GR	4382.9	4267.2	4379.7	4274.8	4373.9	4282.1	4373.9	4285.2	4376.6	4341.4
GR	4382.2	4345.6	4385.7	4353.0	4387.5	4364.6	4388.6	4374.5	4389.8	4379.3
GR	4387.0	4411.8	4387.7	4437.3	4386.0	4554.2	4386.1	4584.2	4386.1	4593.2
GR	4386.3	4603.6	4385.7	4634.9	4385.7	4678.6	4385.3	4716.8	4385.2	4769.1
GR	4385.3	4788.7	4384.6	4795.3	4385.1	4802.8	4385.8	4806.9	4384.8	4826.2
GR	4385.1	4852.0	4385.3	4880.5	4385.4	4912.3	4385.7	4937.2	4386.5	4950.8
GR	4386.7	4965.3	4387.2	4970.9	4387.1	4977.7	4387.4	4987.4	4387.7	4997.5
GR	4388.2	5009.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NH	5	.25	1608.8	.100	2792.2	.045	4077.5	.025	4142.7	.040
NH	5808.2									
X1	96.25	85	4077.5	4142.7	1000	1000	1220			
GR	4393.7	29.8	4393.6	54.1	4390.5	100.0	4390.5	254.5	4392.6	287.2
GR	4389.9	302.3	4389.8	683.3	4389.2	945.4	4389.6	1026.5	4389.3	1433.0
GR	4388.8	1552.0	4389.2	1608.8	4388.9	1693.5	4388.0	2035.4	4387.7	2094.4
GR	4389.2	2107.9	4387.3	2115.0	4389.1	2156.1	4389.3	2196.8	4392.3	2250.7
GR	4392.5	2266.2	4392.0	2299.3	4389.6	2342.6	4389.2	2372.7	4388.2	2389.4
	4387.2	2497.5	4385.8	2534.0	4387.9	2570.6	4386.1	2730.5	4385.8	2792.2
GR	4386.4	2832.9	4385.8	2864.5	4387.0	3307.7	4387.4	3356.3	4386.9	3407.8
GR	4386.9	3564.9	4388.6	3891.7	4389.6	3938.8	4389.7	4005.4	4390.2	4021.5
GR	4390.1	4030.9	4389.3	4042.9	4389.3	4054.8	4392.8	4064.7	4392.4	4071.8
GR	4389.9	4077.5	4374.5	4087.3	4374.5	4129.0	4384.0	4133.4	4386.8	4142.7

GR	4388.2	4151.5	4387.6	4167.2	4385.0	4187.5	4387.2	4224.6	4388.9	4291.3
GR	4388.5	4359.3	4387.6	4408.8	4386.9	4449.4	4385.0	4547.7	4385.0	4556.3
GR	4385.8	4580.4	4385.3	4637.2	4385.9	4694.9	4387.0	4712.3	4387.4	4731.1
GR	4386.0	4759.2	4386.8	5002.5	4386.3	5146.9	4386.8	5312.7	4386.3	5329.5
GR	4387.2	5345.1	4387.1	5371.8	4387.3	5405.9	4387.8	5438.3	4388.9	5467.3
GR	4388.7	5490.9	4389.4	5518.9	4390.4	5560.0	4391.5	5595.9	4392.4	5642.4
GR	4394.0	5678.6	4395.4	5718.5	4396.6	5763.4	4397.4	5790.1	4397.9	5808.2

NH	5	.25	3989.7	.100	5512.7	.045	7308.6	.025	7354.8	.040
NH	8295.6									
X1	105.55	76	7308.6	7354.8	980	730	930			
GR	4397.3	22.7	4393.6	53.8	4392.9	86.3	4390.8	1050.1	4391.9	1100.0
GR	4390.3	1117.2	4390.4	1189.1	4389.6	1843.6	4390.6	1900.0	4389.5	1906.8
GR	4387.9	2628.5	4389.2	2688.2	4389.3	2743.9	4388.3	2747.6	4388.2	2753.5
GR	4387.5	3522.5	4386.8	3606.5	4387.9	3656.1	4387.7	3746.9	4386.7	3762.3
GR	4385.9	3989.7	4386.0	4532.6	4386.7	4576.9	4385.4	4583.6	4385.0	5413.3
GR	4385.7	5452.7	4385.7	5512.7	4386.8	5646.0	4386.3	5688.2	4387.4	5944.8
GR	4386.9	6029.4	4387.0	6209.9	4386.6	6287.3	4387.6	6322.6	4386.9	6326.6
GR	4388.1	6889.2	4388.9	6936.0	4391.1	6984.1	4390.5	6997.3	4389.7	7022.8
GR	4389.5	7059.5	4389.6	7094.5	4389.3	7123.7	4388.7	7142.6	4387.1	7166.5
GR	4386.5	7180.6	4386.5	7195.5	4385.3	7209.5	4385.7	7238.9	4386.9	7265.2
GR	4387.0	7283.4	4387.5	7297.0	4386.9	7308.6	4375.0	7318.8	4375.0	7354.5
GR	4385.0	7354.8	4390.3	7363.4	4389.3	7381.0	4388.7	7456.2	4388.1	7552.9
GR	4388.0	7643.5	4388.5	7707.1	4388.6	7859.0	4390.6	7936.0	4389.3	7997.2
GR	4390.0	8019.0	4390.5	8047.8	4390.5	8071.2	4390.8	8080.1	4391.9	8101.0
GR	4392.0	8136.8	4392.3	8162.8	4393.4	8192.7	4394.2	8222.5	4395.2	8259.8
GR	4396.5	8295.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

NH	5	.25	3226.2	.100	5189.7	.045	7192.2	.025	7244.1	.040
NH	7819.5									
X1	115.55	90	7192.2	7244.1	1050	750	1000			
GR	4394.0	0.0	4390.9	58.7	4389.4	935.8	4389.0	1137.1	4389.3	1252.4
GR	4387.9	2087.5	4388.8	2115.0	4388.3	2147.6	4387.6	2315.8	4386.6	3151.5
GR	4387.2	3188.3	4387.2	3223.9	4386.7	3226.2	4385.4	3981.3	4385.3	4672.8
GR	4385.4	4803.4	4386.8	4808.7	4387.3	4895.0	4387.0	5003.1	4387.0	5189.7
GR	4387.4	5312.7	4388.0	5350.8	4389.0	5360.9	4388.8	5396.3	4387.6	5402.4
GR	4388.2	5704.8	4389.6	5803.5	4391.2	5830.5	4388.9	5849.1	4389.0	5991.1
GR	4388.8	6073.9	4389.7	6164.0	4390.5	6180.7	4388.3	6244.0	4388.3	6271.6
GR	4389.8	6341.1	4389.1	6367.7	4389.0	6419.9	4390.2	6495.7	4389.3	6564.6
GR	4390.7	6595.1	4389.8	6602.9	4389.4	6634.9	4389.8	6674.5	4389.8	6694.9
GR	4390.2	6705.6	4390.5	6741.7	4390.2	6794.6	4389.9	6809.5	4390.1	6819.1
GR	4389.6	6831.7	4387.8	6848.1	4385.7	6862.2	4385.8	6887.2	4385.6	6918.1
GR	4384.9	6945.9	4384.7	6970.0	4384.5	7014.4	4384.6	7048.9	4385.3	7093.9
GR	4385.8	7136.5	4385.6	7167.3	4385.7	7185.8	4385.3	7192.2	4375.6	7198.5
GR	4375.6	7230.1	4383.8	7238.1	4389.5	7244.1	4389.2	7251.9	4389.8	7264.1
GR	4389.9	7278.2	4389.3	7301.0	4389.1	7323.3	4389.2	7379.0	4388.8	7412.1
GR	4389.0	7433.3	4389.1	7450.9	4388.8	7465.2	4389.4	7495.9	4389.6	7526.4
GR	4390.1	7545.1	4391.1	7553.0	4392.1	7557.7	4392.0	7586.5	4390.7	7620.5
GR	4390.6	7660.1	4391.0	7692.7	4392.1	7725.5	4392.6	7773.7	4394.1	7819.5

NH	5	.25	2530.1	.100	4825.1	.045	6560.2	.025	6640.5	.040
NH	7360.4									
E1			9.1						5430	6740

Cross Section "D" on existing FIRM

X1	126.55	87	6560.2	6640.5	550	550	1100			
GR	4395.5	0.0	4390.5	50.4	4390.2	168.9	4391.5	207.6	4390.5	246.1

GR	4390.1	361.6	4390.1	619.6	4389.2	671.2	4390.6	704.1	4390.6	760.1
GR	4389.1	926.8	4389.0	1435.3	4389.8	1480.0	4389.5	1653.8	4389.0	1686.4
GR	4389.1	2183.5	4387.3	2530.1	4386.5	3173.8	4387.3	3243.6	4386.6	3267.9
GR	4386.5	3789.8	4387.2	3862.2	4386.4	3919.9	4386.4	4001.1	4387.3	4071.1
GR	4387.6	4197.7	4387.5	4373.7	4387.8	4627.1	4388.6	4776.9	4387.6	4825.1

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GR	4388.9	4991.9	4388.8	5088.6	4388.3	5153.0	4388.3	5232.7	4388.9	5362.3
GR	4388.3	5392.8	4388.3	5641.3	4389.0	5950.7	4389.8	6241.2	4391.8	6351.5
GR	4391.2	6377.0	4391.0	6404.1	4390.9	6417.8	4388.3	6435.3	4386.6	6450.7
GR	4386.2	6478.2	4385.8	6507.7	4385.3	6533.1	4385.7	6553.3	4386.4	6560.2
GR	4383.6	6567.5	4376.2	6569.4	4376.2	6624.2	4384.7	6630.1	4386.1	6640.5
GR	4387.8	6651.7	4388.2	6666.6	4388.1	6688.1	4388.2	6726.2	4388.0	6760.5
GR	4388.3	6788.7	4390.2	6805.4	4390.0	6836.9	4390.2	6852.3	4390.7	6864.8
GR	4390.2	6871.7	4390.1	6883.7	4390.0	6901.6	4390.8	6917.9	4390.5	6932.3
GR	4390.0	6947.0	4389.5	6959.4	4390.8	6972.3	4391.0	6988.4	4390.4	7002.5
GR	4390.0	7016.7	4390.3	7041.3	4390.1	7072.0	4390.2	7099.5	4390.1	7114.7
GR	4390.6	7126.4	4390.5	7142.2	4390.2	7161.2	4390.1	7184.7	4391.0	7201.2
GR	4391.1	7232.5	4394.2	7360.4	0.0	0.0	0.0	0.0	0.0	0.0

NC				.3	.5					
NH	5	.25	2072.7	.100	5048.6	.045	7165.0	.035	7228.1	.040
NH	7925.0									
QT	2	6650	6650							
ET			9.1						5610	7228.1

Begin Floodway Revision

Inneffective area is coded out with high roughness

X	.30.75	71	7165.0	7228.1	370	320	420			
X3	10							4388.0	4388.0	
GR	4393.3	0.0	4391.3	199.5	4388.6	313.0	4392.1	535.8	4392.3	570.6
GR	4391.1	597.1	4389.8	821.3	4390.2	1148.7	4388.5	1258.1	4388.7	1370.1
GR	4390.1	1438.2	4390.1	1643.8	4389.0	2072.7	4389.1	2393.5	4388.0	2679.1
GR	4387.8	2937.9	4388.9	3005.9	4389.6	3362.4	4390.0	3771.3	4390.0	3991.8
GR	4389.7	4084.7	4389.4	4286.5	4391.2	4458.8	4390.6	4562.2	4390.0	4669.6
GR	4390.1	4932.9	4391.3	5048.6	4390.1	5128.7	4390.4	5397.4	4389.8	5420.3
GR	4390.9	5446.4	4390.0	5495.7	4390.5	5511.6	4389.9	5535.7	4390.0	5581.2
GR	4390.1	5629.9	4389.8	5666.7	4389.8	5718.1	4390.0	5756.9	4390.0	5947.3
GR	4390.3	5974.4	4389.8	6159.1	4390.4	6352.3	4390.9	6410.8	4390.4	6458.5
GR	4390.7	6588.1	4390.5	6626.9	4389.5	6656.6	4388.9	6690.9	4388.8	6793.0
GR	4388.2	6829.9	4388.6	6939.6	4388.3	6973.3	4388.4	7006.1	4388.0	7041.0
GR	4389.8	7151.4	4389.7	7165.0	4376.8	7183.9	4376.8	7217.6	4387.8	7228.1
GR	4392.3	7235.7	4392.7	7246.6	4392.5	7262.8	4392.7	7294.5	4392.3	7327.6
GR	4392.3	7358.1	4392.2	7389.6	4392.5	7431.1	4393.1	7454.2	4393.7	7486.5
GR	4403.7	7925.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

NH	8	.250	1258.1	.045	2072.7	0.250	2679.1	.045	3005.9	0.250
NH	5128.7	.040	7165.0	.025	7228.1	.045	7549.0			
SB	1.05	1.5	3.0		33	1	498	1.1	4378.7	4378.7
ET			9.11						5600	7300

BT and GR points edited to match at ends, and to not cross

Inneffective area immediately upstream of road (wsel below road)

is coded out with a high roughness value

X	131.17	71	7165.0	7228.1	42	42	42			
X2			1	4390.3	4389.7					
X3	10							4388.0	4388.0	
BT	37	0	4393.3	0	49	4393.23	0	349	4391.81	0
BT	649	4391.16	0	949	4391.63	0	1021	4391.58	0	1176

BT	4392.5	0	1249	4392.09	0	1494	4390.26	0	1549	4390.38
BT	0	1731	4390.85	0	1871	4390.33	0	2149	4391.08	0
BT	2449	4391.15	0	2749	4391.28	0	3049	4390.67	0	3199

1

BT	4390.9	0	3349	4391.14	0	3499	4391.44	0	3649	4391.63
BT	0	3799	4392.08	0	3949	4391.56	0	4249	4391.05	0
BT	4549	4391.43	0	4849	4391.31	0	5149	4390.98	0	5449
BT	4391.4	0	5749	4391.14	0	6049	4391.01	0	6349	4391.07
BT	0	6649	4390.87	0	6949	4389.69	0	7044	4389.83	0
BT	7220	4392.49	0	7269	4392.49	0	7364	4391.66	0	7549
BT	4394.2	0								
GR	4393.3	0.0	4391.3	199.5	4390.0	313.0	4391.1	535.8	4391.1	570.6
GR	4391.1	597.1	4389.8	821.3	4390.2	1148.7	4390.0	1258.1	4390.0	1370.1
GR	4390.1	1438.2	4390.1	1643.8	4390.0	2072.7	4390.0	2393.5	4390.0	2679.1
GR	4390.0	2937.9	4390.0	3005.9	4390.0	3362.4	4390.0	3771.3	4390.0	3991.8
GR	4389.7	4084.7	4390.0	4286.5	4391.2	4458.8	4390.6	4562.2	4390.0	4669.6
GR	4390.1	4932.9	4391.0	5048.6	4390.1	5128.7	4390.4	5397.4	4389.8	5420.3
GR	4390.9	5446.4	4390.0	5495.7	4390.5	5511.6	4389.9	5535.7	4390.0	5581.2
GR	4390.1	5629.9	4389.8	5666.7	4389.8	5718.1	4390.0	5756.9	4390.0	5947.3
GR	4390.3	5974.4	4389.8	6159.1	4390.4	6352.3	4390.9	6410.8	4390.4	6458.5
GR	4390.7	6588.1	4390.5	6626.9	4389.5	6656.6	4388.9	6690.9	4388.8	6793.0
GR	4388.2	6829.9	4388.6	6939.6	4388.3	6973.3	4388.4	7006.1	4388.0	7041.0
GR	4389.8	7151.4	4389.7	7165.0	4378.7	7183.9	4378.7	7217.6	4387.8	7228.1
GR	4392.3	7235.7	4392.4	7246.6	4392.4	7262.8	4392.0	7294.5	4391.6	7327.6
GR	4391.6	7358.1	4391.6	7389.6	4391.6	7431.1	4391.6	7454.2	4391.6	7486.5
GR	4394.2	7549.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

			.3	.5					
NH	8	.100	1220	.045	2250	.100	2580	.045	3075	.250
NH	4570	.040	6230	.025	6660	.040	6680			
ET			9.1						5300	6660

Inneffective area coded out with high roughness

Cross Section "E" on existing FIRM (alignment slightly modified)

X1	132.57	45	6230	6660	100	570	550			
GR	4391.6	0	4391	560	4390	750	4389.1	860	4390	1000
GR	4389	1220	4388	1520	4387.4	1920	4388	2250	4388.2	2320
GR	4388	2390	4388	2400	4388	2580	4389	2610	4389	2855
GR	4390	2915	4390	3000	4390	3075	4390.2	3225	4390	3685
GR	4388	3820	4386	3950	4386	4250	4385	4370	4386	4460
GR	4388	4470	4390	4570	4392	4620	4392	4830	4392.2	4900
GR	4393	5000	4393	5150	4392	5220	4390	5280	4390	5350
GR	4390	5650	4390	6000	4390	6140	4390	6230	4383	6320
GR	4383	6430	4380	6440	4380	6620	4390	6660	4393	6680

NC				.1	.3					
NH	7	.100	2820	.045	5000	.025	5200	.045	6090	.035
NH	6980	.025	7135	.045	7635					
QT	2	5000	5000							
ET			9.1						6000	7135

Cross Section "F" on existing FIRM (alignment slightly modified)

X1	155.57	43	6980	7135	1700	2065	2065			
GR	4391.4	1600	4390	2200	4390	2820	4389	2870	4388	3260
	4387.4	3420	4388	3860	4388	4010	4389	4200	4389	4320
GR	4390	4530	4390	5000	4382.5	5020	4382.5	5180	4390	5200
GR	4390	5450	4388	5600	4386	5680	4388	5710	4388	5870
GR	4390	5880	4388	5950	4387	6000	4388	6050	4390	6075
GR	4392	6090	4390	6160	4388	6230	4386	6250	4385.4	6420

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GR     4384      6650      4382      6660      4382      6720      4386      6735      4386      6980
1
          4381      7005      4381      7100      4386      7135      4387      7485      4388      7535
GR        4389      7551      4391      7565      4392      7635

NH           8       .10      2950      .045      4250      .025      4479      .040      4760      .035
NH        6000      .040      6430      .025      6590      .045      7200
ET                             9.1                                                     5200      6590
               Cross Section "G" on existing FIRM
X1     169.57        45      6430      6590      1070      1390      1380
GR     4391.5      2000      4391      2230      4390      2700      4389      2950      4389      3100
GR        4388      3350      4388      3950      4390      4100      4390      4250      4390      4275
GR        4390      4300      4383      4325      4383      4435      4390      4479      4390      4480
GR        4390      4760      4386      4790    4384.8      4890      4386      5180      4386      5290
GR        4384      5340    4383.5      5430      4384      5520      4384      5700      4386      5820
GR        4386      5900      4388      5960      4390      6000      4388      6020      4388      6420
GR        4388      6430      4386      6460      4382      6470      4382      6570      4386      6590
GR        4386      6660    4385.5      6665      4386      6670      4387      6830      4388      6890
GR        4389      6990      4390      7010      4391      7030      4391      7190      4392      7200

NH           6      .100      3900      .025      4050      .040      5310      .045      6300      .025
NH        6420      .045      6570
ET                             9.1                                                     5200      6420
X1     180.57        42      6300      6420      1090      1060      1060
GR        4392      2000      4392      2400      4391      2700      4392      2950      4391      3200
GR        4391      3570      4391      3840      4390      3900      4385      3935      4384      3980
GR        4384      4025      4390      4050      4390      4100    4389.7      4700      4388      4705
          4386      4710    4386.8      4870      4386      4930    4385.3      5020      4386      5110
GR        4388      5115      4388      5220      4386      5230      4388      5260      4388      5310
GR        4386      5350      4385      5390      4386      5405    4387.6      5490      4386      5610
GR        4386      5840    4384.8      6000      4386      6160      4388      6270      4388      6300
GR        4383      6330      4383      6400      4386      6420      4386      6460      4388      6510
GR        4390      6550      4392      6570

NH           4      .100      2900      .040      4860      .025      4970      .050      5370
ET                             9.1                                                     3860      4970
          Inneffective area coded out with high roughness value
X1     189.07        28      4860      4970       890       640       640
GR        4392      1700      4391      1800      4390      2000      4390      2900      4390      3380
GR        4388      3430    4387.8      3540      4388      3600    4388.5      3650      4388      3720
GR      4387.3      3900    4387.5      4000    4387.5      4400      4388      4490      4388      4530
GR        4388      4720      4388      4830      4388      4860      4384      4870      4384      4960
GR        4388      4970    4388.4      5040      4388      5080      4386      5085      4386      5100
GR        4387      5340      4390      5360      4392      5370

NH           5      .040      2800      .100      3050      .040      3550      .025      3730       .08
NH        4070
ET                             9.1                                                     3000      3730
          Inneffective area coded out with high roughness value
X1     196.37        26      3590      3730       810       515       525
GR        4392      2000      4390      2020      4387      2300      4388      2720      4392      2800
GR        4392      3050      4387      3070      4390      3110      4390      3130      4389      3150
          4390      3180      4392      3220      4394      3250      4394      3550      4390      3590
GR        4388      3610      4385      3620      4385      3710      4388      3730    4389.6      3800
GR        4388      3900    4387.5      3905      4388      3910      4388      4000      4389      4050
GR        4392      4070
1
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NC        0         0         0        .3        .5
I         5      .040      1450      .030      1510      .080      1700      .040      2050      .250
NH     2350
ET                             9.1                                                    1270      2050
          Inneffective area coded out with high roughness value
X1   199.57        19      1700      2050       480       350       370
GR     4395         0      4394        80      4390       250      4389       270      4388       610
GR     4388      1400      4390      1450      4388      1475      4388      1500      4390      1510
GR     4385      1550      4385      1700      4385      2000      4390      2040      4390      2050
GR   4389.7      2100      4388      2170      4390      2190      4392      2350

NC      .045      .045       .03
ET                             9.1                                                    1250      1985
          Cross Section "H" on existing FIRM (alignment shifted to immediately
          downstream of dirt road)
X1   201.57        13      1475      1500       260       240       500
GR     4394         0      4392        30      4390       130      4389       150      4388       570
GR     4388      1200    4387.2      1475    4387.5      1500    4387.1      1650      4390      1950
GR     4389      1970      4389      1985      4400      2000

ET                             9.11                                                   1230      1980
SB      .90       1.5       3.0                25         1        25         0    4387.6    4387.6
X1   202.07         0         0         0        50        50        50
X2                             1      4389      4390
X3       10                                                            4390      4390
BT       14         0      4395         0        25      4394         0        60      4393         0
I       125      4392         0       195      4391         0       920      4390         0      1475
BT     4390      4389      1500      4390      4389      1900      4391         0      1960      4390
BT        0      1965      4389         0      1975      4389         0      1980      4390         0
BT     1995      4400         0

ET                             9.1                                                    1220      1990
          End Floodway Revision
X1   202.47        20      1490      1530        40        40        40
GR     4393         0      4392        20      4391        50      4391       200      4390       250
GR     4390       620      4388       660      4389       670      4388       800      4390       860
GR     4390      1140      4389      1160      4389      1400      4388      1490      4388      1530
GR     4389      1630      4390      1900      4389      1970      4389      1990      4400      2030

NC      .045      .045       .03        .1        .3
ET                             9.1                                                    3150      3878
X1   205.67        28      3842      3878       270       350       320
GR   4394.5        0.    4393.7       92.    4396.2      163.    4394.0      198.    4393.7      457.
GR   4396.9      535.    4396.1      912.    4393.0      981.    4394.7     1141.    4393.7     1413.
GR   4390.9     1427.    4396.7     1439.    4392.8     1612.    4394.0     1730.    4390.4     2105.
GR   4387.9     2156.    4390.2     2207.    4388.2     3492.    4386.0     3556.    4388.3     3624.
GR   4387.7     3778.    4389.7     3827.    4395.0     3842.    4390.5     3856.    4390.9     3877.
GR   4390.5     3878.    4413.0     3964.    4420.5     4013.
1
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NC      .030      .030      .025        .1        .3
ET                             9.1                                              1253.33   1841.00
X1   217.39        16      1807      1841      1360      1172      1172
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GR	4402.7	0	4400.7	101	4397.6	137	4393.0	327	4394.0	400
GR	4389.0	412.	4389.0	422.	4393.5	442.	4391.8	869.	4392.9	1023.
GR	4392.0	1512.	4395.0	1807.	4391.2	1827.	4395.7	1841.	4402.5	1886.
GR	4435.4	1975								
E			9.1						2298.56	3211.00
X1	224.98	23	3150	3211	1160	759	759			
GR	4413.7	0.	4402.9	109.	4406.4	122.	4404.4	174.	4409.2	383.
GR	4405.9	433.	4398.2	889.	4401.4	901.	4392.7	930.	4398.3	945.
GR	4397.0	972.	4394.3	983.	4396.5	1024.	4395.1	1816.	4395.8	2679.
GR	4394.9	2840.	4395.3	3109.	4399.7	3150.	4392.6	3162.	4402.1	3211.
GR	4417.2	3263.	4436.9	3315.	4450.6	3366.				
ET			9.1						782.75	1755.00
X1	235.23	19	1716	1755	960	1025	1025			
GR	4426.8	0.	4412.6	35.	4404.6	43.	4409.0	55.	4404.3	67.
GR	4404.4	88.	4400.3	98.	4395.7	104.	4398.8	129.	4398.7	501.
GR	4400.1	659.	4398.7	824.	4400.3	1302.	4400.2	1594.	4401.8	1716.
GR	4398.1	1727.	4398.1	1739.	4403.3	1755.	4429.2	1868.		
QT	2	4750	4750							
ET			9.1						229.98	378.00
X1	269.39	14	313	378	2880	3416	3416			
GR	4438.3	0.	4421.8	73.	4414.4	98.	4414.0	136.	4411.0	146.
GR	4410.7	313.	4407.0	320.	4407.0	330.	4410.2	341.	4409.6	364.
GR	4412.7	378.	4415.5	516.	4415.2	640.	4422.3	754.		
ET			9.1						184.42	337.00
X1	273.00	21	300	337	240	240	361			
GR	4444.8	0.	4422.0	52.	4422.4	58.	4413.5	85.	4411.4	115.
C	4413.5	120.	4413.2	162.	4411.8	174.	4413.1	179.	4413.4	250.
GR	4412.1	300.	4407.5	313.	4407.5	326.	4409.6	334.	4413.5	337.
GR	4415.2	366.	4413.4	409.	4423.1	519.	4423.1	534.	4425.3	547.
GR	4430.3	636.								
ET			9.1						420.51	751.39
X1	283.16	29	652	724	840	1040	1016			
GR	4443.8	0.	4422.7	80.	4415.9	100.	4418.2	109.	4415.8	313.
GR	4415.8	348.	4414.5	362.	4415.9	367.	4414.9	652.	4410.8	658.
GR	4410.8	664.	4414.4	679.	4415.5	724.	4413.5	744.	4415.4	763.
GR	4417.1	938.	4414.8	947.	4418.7	957.	4419.5	965.	4414.9	985.
GR	4417.7	1008.	4417.0	1024.	4418.5	1037.	4417.3	1061.	4419.2	1080.
GR	4417.9	1104.	4424.5	1268.	4426.8	1286.	4430.8	1391.		
ET			9.1						3050.00	3130.00
X1	314.16	21	3050	3130	3100	3100	3100			
GR	4432.5	0	4432.0	250	4429.8	360	4430.0	1700	4431.0	1800
GR	4429.6	2170	4427.5	2190	4429.5	2210	4428.8	3050	4417.4	3085
GR	4428.7	3130	4429.2	3500	4428.9	4060	4429.0	4139	4427.0	4230
GR	4429.0	4260	4429.3	4760	4427.0	4780	4429.3	4820	4430.0	4950

1

GR	4432.8	5200

1

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

* 1

0

CCHV= .100 CEHV= .300

*SECNO 2.000

3265 DIVIDED FLOW

3280 CROSS SECTION 2.00 EXTENDED 1.04 FEET

2.000	16.04	4386.04	.00	4386.04	4386.58	.54	.00	.00	4387.80
6950.0	743.4	6206.6	.0	548.9	1001.9	.3	.0	.0	4385.50
.00	1.35	6.19	.15	.080	.025	.080	.000	4370.00	.00
.000440	0.	0.	0.	0	0	0	.00	209.71	244.49

*SECNO 7.300

3265 DIVIDED FLOW

7.300	16.24	4386.24	.00	.00	4386.78	.54	.21	.00	4383.60
6950.0	232.2	6712.4	5.4	487.7	1115.3	11.6	17.9	3.8	4382.90
.02	.48	6.02	.46	.080	.025	.080	.000	4370.00	186.15
.000360	420.	530.	530.	1	0	0	.00	538.63	847.63

*SECNO 13.900

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

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

13.900	16.04	4386.25	4380.05	.00	4387.31	1.07	.37	.16	4385.30
6950.0	520.0	6428.5	1.5	754.1	746.4	3.6	40.3	12.3	4385.00
.05	.69	8.61	.42	.080	.025	.080	.000	4370.20	205.20
.001008	570.	660.	660.	4	18	0	.00	726.74	1274.76

1

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 19.900

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

19.900	16.73	4387.33	.00	.00	4387.81	.48	.44	.06	4383.50
950.0	1484.4	5465.2	.4	2196.2	872.9	1.5	69.1	25.6	4386.30
.08	.68	6.26	.27	.080	.025	.080	.000	4370.60	2581.85
.000572	520.	600.	600.	3	0	0	.00	1482.30	4178.45

*SECNO 23.900

23.900	16.95	4387.75	.00	.00	4388.01	.26	.18	.02	4384.80
6950.0	2231.0	4719.0	.0	3816.9	952.3	.0	108.5	43.3	4387.80
.11	.58	4.96	.00	.080	.025	.000	.000	4370.80	2746.22
.000333	450.	400.	400.	2	0	0	.00	1959.53	4705.76

*SECNO 29.100

3265 DIVIDED FLOW

29.100	17.13	4387.93	.00	.00	4388.17	.24	.17	.00	4389.00
6950.0	2731.5	4184.4	34.0	4614.1	823.5	70.8	167.9	66.7	4388.00
.16	.59	5.08	.48	.080	.025	.080	.000	4370.80	3208.57
.000314	500.	520.	520.	2	0	0	.00	2112.92	5334.26

1490 NH CARD USED

*SECNO 38.600

: WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.55

38.600	17.42	4388.32	.00	.00	4388.41	.09	.22	.02	4384.70
6950.0	3062.1	3521.7	366.3	4569.4	1042.9	479.3	347.5	136.2	4383.90
.31	.67	3.38	.76	.047	.025	.045	.000	4370.90	148.58
.000131	1450.	950.	1000.	2	0	0	.00	2188.69	2337.27

CCHV= .300 CEHV= .500

1

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

1490 NH CARD USED

*SECNO 39.600

39.600	17.38	4388.38	.00	.00	4388.44	.07	.02	.01	4387.50
6950.0	3053.6	3398.1	498.3	5454.8	1156.1	539.5	385.4	150.9	4384.90
.34	.56	2.94	.92	.054	.025	.040	.000	4371.00	198.00
.000108	300.	100.	80.	1	0	0	.00	2447.51	2645.51

1490 NH CARD USED

*SECNO 40.400

3265 DIVIDED FLOW

40.400	17.43	4388.43	.00	.00	4388.46	.03	.01	.01	4388.30
6950.0	4730.5	2192.9	26.5	6841.4	915.6	78.6	402.0	156.6	4384.30
.36	.69	2.39	.34	.045	.025	.040	.000	4371.00	3.67
00085	100.	80.	80.	2	0	0	.00	2629.30	2722.87

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.50	2.50	.00	18.00	2.00	890.00	1.75	4371.00	4371.00

*SECNO 40.750
6840, FLOW IS BY WEIR AND LOW FLOW

3265 DIVIDED FLOW

3420 BRIDGE W.S.= 4388.43 BRIDGE VELOCITY= 2.05 CALCULATED CHANNEL AREA= 811.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
4389.50	4388.50	.00	5332.	1664.	890.	895.	4389.50	4387.00	1748.

40.750	17.47	4388.47	.00	.00	4388.50	.03	.03	.00	4388.30
6950.0	4778.4	2143.2	28.3	6926.9	918.9	86.5	408.4	158.7	4384.30
.37	.69	2.33	.33	.045	.025	.040	.000	4371.00	3.27
000084	35.	35.	35.	2	0	6	.00	2651.27	2730.54

1490 NH CARD USED
*SECNO 41.350

41.350	17.08	4388.48	.00	.00	4388.50	.02	.00	.00	4383.50
6950.0	4631.5	2186.1	132.5	8983.5	1081.5	216.7	418.0	161.4	4384.70
.38	.52	2.02	.61	.050	.025	.040	.000	4371.40	204.17
.000044	45.	55.	55.	0	0	0	.00	2462.09	2666.26

1

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
1490 NH CARD USED
*SECNO 45.150

3265 DIVIDED FLOW

45.150	16.89	4388.49	.00	.00	4388.52	.03	.02	.00	4383.60
6650.0	3980.2	2206.1	463.6	8721.0	972.2	928.8	509.6	185.0	4383.80
.48	.46	2.27	.50	.059	.025	.040	.000	4371.60	128.89
.000049	380.	380.	410.	1	0	0	.00	2915.14	3221.87

1490 NH CARD USED
*SECNO 55.650

3. DIVIDED FLOW

55.650	16.54	4388.54	.00	.00	4388.57	.03	.05	.00	4388.20
6650.0	3996.2	2048.2	605.7	7375.5	877.7	752.7	680.5	230.8	4384.10
.69	.54	2.33	.80	.057	.025	.040	.000	4372.00	307.63
.000070	700.	1050.	1000.	0	0	0	.00	2460.54	3410.57

1490 NH CARD USED
*SECNO 69.350

3265 DIVIDED FLOW

69.350	15.61	4388.61	.00	.00	4388.63	.02	.06	.00	4388.30
6650.0	3277.2	1811.8	1561.1	5792.2	845.8	2194.4	844.4	275.6	4385.70
.94	.57	2.14	.71	.050	.025	.040	.000	4373.00	192.04
.000064	670.	1370.	1050.	0	0	0	.00	2723.10	3798.59

1490 NH CARD USED
*SECNO 78.850

3265 DIVIDED FLOW

78.850	15.15	4388.65	.00	.00	4388.67	.02	.03	.00	4385.30
650.0	3654.8	1980.5	1014.8	8255.1	1099.8	1539.4	968.4	310.1	4386.00
1.15	.44	1.80	.66	.049	.025	.040	.000	4373.50	243.15
.000040	430.	950.	780.	0	0	0	.00	3278.77	4362.54

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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

1490 NH CARD USED
*SECNO 84.050

3265 DIVIDED FLOW

3280 CROSS SECTION 84.05 EXTENDED .47 FEET

84.050	14.76	4388.66	.00	.00	4388.70	.04	.03	.01	4384.70
6650.0	3149.0	2497.7	1003.4	8912.0	1036.4	1628.4	1091.9	353.1	4385.70
1.27	.35	2.41	.62	.068	.025	.040	.000	4373.90	249.56
00069	470.	520.	500.	1	0	0	.00	4603.85	5009.90

1490 NH CARD USED
*SECNO 96.250

3265 DIVIDED FLOW

3? WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .61

96.250	14.24	4388.74	.00	.00	4388.83	.08	.12	.01	4389.90
6650.0	1674.5	2610.7	2364.8	2912.7	731.5	2661.6	1301.7	443.9	4386.80
1.43	.57	3.57	.89	.053	.025	.040	.000	4374.50	1752.31
.000185	1000.	1220.	1000.	2	0	0	.00	3267.82	5492.70

1490 NH CARD USED
*SECNO 105.550

3265 DIVIDED FLOW

105.550	13.93	4388.93	.00	.00	4388.99	.06	.16	.00	4386.90
6650.0	4528.1	2028.5	93.4	10200.8	581.6	251.9	1487.6	536.0	4385.00
1.61	.44	3.49	.37	.082	.025	.040	.000	4375.00	2161.83
.000172	980.	930.	730.	2	0	0	.00	5376.73	7871.88

1490 NH CARD USED
*SECNO 115.550

3265 DIVIDED FLOW

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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
115.550	13.52	4389.12	.00	.00	4389.17	.05	.18	.00	4385.30
6650.0	4711.5	1936.5	2.0	10831.8	571.5	14.1	1756.6	664.1	4389.50
1.83	.43	3.39	.14	.087	.025	.040	.000	4375.60	1082.54
.000169	1050.	1000.	750.	1	0	0	.00	5411.01	7480.99

1490 NH CARD USED
*SECNO 126.550

3265 DIVIDED FLOW

Cross Section "D" on existing FIRM

126.550	13.01	4389.21	.00	.00	4389.36	.16	.16	.03	4386.40
6650.0	2876.7	3651.1	122.1	6615.9	852.4	177.6	1886.0	732.2	4386.10
1.92	.43	4.28	.69	.086	.025	.040	.000	4376.20	670.81
.000263	550.	1100.	550.	2	0	0	.00	5252.98	6796.67

CCHV= .300 CEHV= .500
1490 NH CARD USED
*SECNO 130.750

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

% MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
Begin Floodway Revision
Inneffective area is coded out with high roughness

130.750	12.69	4389.49	4389.49	.00	4390.37	.88	.23	.36	4389.70
6650.0	1394.1	5252.5	3.4	1649.6	621.3	2.4	1928.8	764.5	4387.80
1.94	.85	8.45	1.42	.080	.035	.040	.000	4376.80	275.45
.002216	370.	420.	320.	2	8	0	.00	2349.26	7230.96

1490 NH CARD USED

1

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

K	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.05	1.50	3.00	.00	33.00	1.00	498.00	1.10	4378.70	4378.70

*SECNO 131.170

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.19

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
4391.14	4391.06	.05	2519.	4193.	498.	519.	4390.30	4389.70	3371.

Inneffective area immediately upstream of road (wsel below road)
is coded out with a high roughness value

131.170	12.20	4390.90	.00	.00	4391.14	.24	.77	.00	4389.70
6650.0	3250.3	3392.7	7.0	5999.7	618.4	8.1	1933.1	768.9	4387.80
1.94	.54	5.49	.86	.062	.025	.045	.000	4378.70	233.95
.000462	42.	42.	42.	3	0	5	.00	6751.28	7233.34

CCHV= .300 CEHV= .500

1490 NH CARD USED
*SECNO 132.570

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.48

Inneffective area coded out with high roughness
Cross Section "E" on existing FIRM (alignment slightly modified)

132.570	11.22	4391.22	.00	.00	4391.23	.01	.02	.07	4390.00
6650.0	2247.5	4401.9	.6	12074.7	3694.5	5.0	1981.2	785.8	4390.00
2.06	.19	1.19	.13	.081	.025	.040	.000	4380.00	354.96
.000023	100.	550.	570.	2	0	0	.00	5670.26	6668.13

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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

CCHV= .100 CEHV= .300
1490 NH CARD USED
*SECNO 155.570

3. ;IVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.54

Cross Section "F" on existing FIRM (alignment slightly modified)

155.570	10.25	4391.25	.00	.00	4391.26	.00	.02	.00	4386.00
5000.0	3715.4	878.8	405.8	15270.2	1439.6	1916.1	2682.0	1015.7	4386.00
3.76	.24	.61	.21	.037	.025	.045	.000	4381.00	1661.95
.000005	1700.	2065.	2065.	2	0	0	.00	5889.28	7582.88

1490 NH CARD USED
*SECNO 169.570

Cross Section "G" on existing FIRM

169.570	9.26	4391.26	.00	.00	4391.26	.00	.01	.00	4388.00
5000.0	3961.9	688.0	350.2	14841.6	1272.7	1782.8	3153.8	1155.5	4386.00
4.82	.27	.54	.20	.036	.025	.045	.000	4382.00	2107.36
.000005	1070.	1380.	1390.	1	0	0	.00	5085.30	7192.67

1490 NH CARD USED
*SECNO 180.570

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .58

180.570	8.27	4391.27	.00	.00	4391.27	.00	.01	.00	4388.00

5000.0	4029.3	792.2	178.6	9902.8	887.1	522.7	3517.7	1263.5	4386.00
5.44	.41	.89	.34	.040	.025	.045	.000	4383.00	2619.87
.000016	1090.	1060.	1060.	0	0	0	.00	3576.34	6562.67

14 .H CARD USED
*SECNO 189.070
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

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .62

Inneffective area coded out with high roughness value

189.070	7.28	4391.28	.00	.00	4391.29	.01	.02	.00	4388.00
5000.0	3126.1	1041.3	832.6	7052.0	760.4	1644.9	3719.0	1334.5	4388.00
5.79	.44	1.37	.51	.043	.025	.050	.000	4384.00	1772.36
.000041	890.	640.	640.	0	0	0	.00	3594.02	5366.38

1490 NH CARD USED
*SECNO 196.370

3: IVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .51

Inneffective area coded out with high roughness value

196.370	6.31	4391.31	.00	.00	4391.35	.04	.05	.01	4390.00
5000.0	2838.8	1735.2	425.9	2795.8	758.2	918.0	3834.8	1377.9	4388.00
5.93	1.02	2.29	.46	.040	.025	.080	.000	4385.00	2006.91
.000157	810.	525.	515.	1	0	0	.00	1421.14	4065.39

CCHV= .300 CEHV= .500
1490 NH CARD USED
*SECNO 199.570

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

Inneffective area coded out with high roughness value

199.570	6.39	4391.39	.00	.00	4391.40	.01	.04	.01	4385.00
5000.0	3024.6	1949.1	26.4	5144.0	2087.1	380.3	3895.9	1395.8	4390.00
6.10	.59	.93	.07	.046	.040	.250	.000	4385.00	190.86
.000059	480.	370.	350.	2	0	0	.00	2110.47	2301.33

*: 201.570
Cross Section "H" on existing FIRM (alignment shifted to immediately downstream of dirt road)

201.570	4.32	4391.42	.00	.00	4391.43	.01	.02	.00	4387.20
5000.0	3617.8	139.8	1242.4	4522.9	101.8	1558.6	3942.6	1408.7	4387.50

6.20	.80	1.37	.80	.045	.030	.045	.000	4387.10	58.91
.000118	260.	500.	240.	1	0	0	.00	1929.40	1988.30

1

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
	.90	1.50	3.00	.00	25.00	1.00	25.00	.00	4387.60	4387.60

*SECNO 202.070

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
5323.09	4391.43	.00	4955.	38.	25.	34.	4389.00	4390.00	1820.
^ 2.070	4.36	4391.46	.00	.00	4391.47	.01	.04	.00	4387.20
00.0	3618.0	139.3	1242.7	4581.1	102.8	1578.6	3949.8	1411.0	4387.50
6.22	.79	1.36	.79	.045	.030	.045	.000	4387.10	56.86
.000114	50.	50.	50.	1	0	13	.00	1931.50	1988.36

*SECNO 202.470

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

End Floodway Revision

202.470	3.46	4391.46	.00	.00	4391.49	.03	.01	.01	4388.00
5000.0	3292.2	363.4	1344.4	2629.1	138.5	1023.7	3954.4	1412.8	4388.00
6.23	1.25	2.62	1.31	.045	.030	.045	.000	4388.00	36.13
.000536	40.	40.	40.	0	0	0	.00	1962.83	1998.95

CCHV= .100 CEHV= .300

*SECNO 205.670

3265 DIVIDED FLOW

205.670	5.58	4391.58	.00	.00	4391.59	.02	.11	.00	4395.00
5000.0	4984.2	15.0	.8	4647.2	20.9	2.2	3981.6	1425.1	4390.50
6.30	1.07	.72	.35	.045	.030	.045	.000	4386.00	1423.66
.000277	270.	320.	350.	1	0	0	.00	1883.01	3882.08

CCHV= .100 CEHV= .300

1

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

*SECNO 217.390

3265 DIVIDED FLOW

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

217.390	4.23	4393.23	4393.23	.00	4393.64	.42	1.13	.12	4395.00
5000.0	4890.5	109.5	.0	951.3	17.2	.0	4069.6	1473.2	4395.70
6.37	5.14	6.37	.00	.030	.025	.000	.000	4389.00	317.62
.011727	1360.	1172.	1172.	20	17	0	.00	1203.97	1833.31

*SECNO 224.980

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.19

224.980	4.09	4396.69	.00	.00	4396.75	.06	3.08	.04	4399.70
000.0	4820.7	179.3	.0	2526.0	57.1	.0	4116.5	1518.4	4402.10
6.54	1.91	3.14	.00	.030	.025	.000	.000	4392.60	916.72
.001156	1160.	759.	759.	8	0	0	.00	2200.52	3183.06

*SECNO 235.230

3265 DIVIDED FLOW

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

235.230	4.22	4399.92	4399.92	.00	4400.37	.45	2.55	.12	4401.80
5000.0	4755.7	244.3	.0	903.4	31.8	.0	4155.4	1554.4	4403.30
6.59	5.26	7.69	.00	.030	.025	.000	.000	4395.70	98.50
.011249	960.	1025.	1025.	20	9	0	.00	1069.33	1744.59

*SECNO 269.390

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.04

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

269.390	6.78	4413.78	.00	.00	4414.41	.63	13.99	.05	4410.70
4750.0	2493.2	2210.0	46.8	502.5	285.5	28.8	4215.4	1600.4	4412.70
6.72	4.96	7.74	1.62	.030	.025	.030	.000	4407.00	136.73
002442	2880.	3416.	3416.	7	0	0	.00	294.58	431.31

*SECNO 273.000

3265 DIVIDED FLOW

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

273.000	7.66	4415.16	4415.16	.00	4416.15	.99	.79	.11	4412.10
4750.0	2155.6	2406.4	187.9	476.4	232.9	78.0	4220.6	1602.3	4413.50
6.73	4.52	10.33	2.41	.030	.025	.030	.000	4407.50	79.97
.002881	240.	361.	240.	20	8	0	.00	347.30	428.95

*SECNO 283.160

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.60

3.160	6.85	4417.65	.00	.00	4417.82	.17	1.59	.08	4414.90
4750.0	2381.4	1255.8	1112.8	911.4	267.5	451.8	4246.1	1615.2	4415.50
6.82	2.61	4.70	2.46	.030	.025	.030	.000	4410.80	94.84
.001119	840.	1016.	1040.	2	0	0	.00	876.80	1064.54

*SECNO 314.160

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

1

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

3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

314.160	10.90	4428.30	4428.30	.00	4430.09	1.78	5.77	.48	4428.80
4750.0	10.3	4573.2	166.5	6.3	419.2	73.6	4321.9	1653.7	4428.70
6.90	1.63	10.91	2.26	.030	.025	.030	.000	4417.40	2182.35
.003698	3100.	3100.	3100.	20	17	0	.00	205.48	4802.68

T1 PROPOSED FLOODWAY REVISION (Sections 126.55 thru 201.57)
T2 Method 1 and Method 4
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		3							4386.04	

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

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
*SECNO 2.000

3265 DIVIDED FLOW

3280 CROSS SECTION 2.00 EXTENDED 1.04 FEET

2.000	16.04	4386.04	.00	4386.04	4386.57	.53	.00	.00	4387.80
6950.0	746.0	6204.0	.0	548.9	1001.9	.0	.0	.0	4385.50
.00	1.36	6.19	.00	.080	.025	.000	.000	4370.00	.00
.000443	0.	0.	0.	0	0	0	.00	208.72	243.50

*SECNO 7.300

3265 DIVIDED FLOW

7.300	16.24	4386.24	.00	4386.24	4386.79	.54	.21	.00	4383.60
6950.0	232.5	6717.5	.0	488.0	1115.4	.0	17.9	3.8	4382.90
.02	.48	6.02	.68	.080	.025	.080	.000	4370.00	186.07
000360	420.	530.	530.	1	0	0	.00	531.90	840.70

*SECNO 13.900

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3- /ARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .60

13.900	16.04	4386.25	4380.05	4386.25	4387.31	1.07	.37	.16	4385.30
6950.0	519.8	6430.2	.0	753.8	746.4	.0	40.1	12.1	4385.00
.05	.69	8.62	.00	.080	.025	.000	.000	4370.20	205.28
.001009	570.	660.	660.	4	18	0	.00	720.90	1269.00

1

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 19.900

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 2576.1 4175.5 TYPE= 1 TARGET= 1599.400

19.900	16.73	4387.33	.00	4387.33	4387.81	.48	.44	.06	4383.50
6950.0	1499.8	5450.2	.0	2207.1	873.5	.0	68.9	25.4	100000.00
.08	.68	6.24	.00	.080	.025	.000	.000	4370.60	2581.83
.000575	520.	600.	600.	3	0	0	.00	1479.56	4175.50

*SECNO 23.900

3470 ENCROACHMENT STATIONS= 2738.3 4705.8 TYPE= 1 TARGET= 1967.500

23.900	16.95	4387.75	.00	4387.75	4388.01	.26	.18	.02	4384.80
6950.0	2234.2	4715.8	.0	3823.3	952.5	.0	108.5	43.0	100000.00
.11	.58	4.95	.00	.080	.025	.000	.000	4370.80	2746.21
.000332	450.	400.	400.	2	0	0	.00	1959.55	4705.76

*SECNO 29.100

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 3191.0 5284.3 TYPE= 1 TARGET= 2093.300

29.100	17.13	4387.93	.00	4387.93	4388.18	.25	.17	.00	4389.00
6950.0	2743.5	4206.5	.0	4611.2	823.4	.0	167.5	66.2	100000.00
.16	.59	5.11	.00	.080	.025	.000	.000	4370.80	3208.58
.000318	500.	520.	520.	2	0	0	.00	2064.35	5284.25

1490 NH CARD USED

*SECNO 38.600

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

38.600	17.42	4388.32	.00	4388.32	4388.43	.11	.24	.01	4384.70
950.0	3235.0	3715.0	.0	4575.0	1043.1	.0	340.7	133.1	4383.90
.30	.71	3.56	.69	.047	.025	.045	.000	4370.90	148.36
.000146	1450.	950.	1000.	2	0	0	.00	2003.64	2152.00

1

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

1490 NH CARD USED

*SECNO 39.600

39.600	17.38	4388.38	.00	4388.38	4388.47	.08	.03	.01	4387.50
6950.0	3303.3	3646.7	.0	5492.9	1157.9	.0	377.9	147.4	4384.90
.33	.60	3.15	.57	.054	.025	.040	.000	4371.00	195.58
.000124	300.	100.	80.	2	0	0	.00	2272.82	2468.40

1490 NH CARD USED

* D 40.400

3265 DIVIDED FLOW

40.400	17.46	4388.46	.00	4388.43	4388.49	.03	.01	.02	4388.30
6950.0	4789.6	2160.4	.0	6912.1	918.3	.0	394.1	152.7	4384.30
.35	.69	2.35	.33	.045	.025	.040	.000	4371.00	3.34
.000084	100.	80.	80.	2	0	0	.00	2427.74	2469.10

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.50	2.50	.00	18.00	2.00	890.00	1.75	4371.00	4371.00

*SECNO 40.750

6840, FLOW IS BY WEIR AND LOW FLOW

3265 DIVIDED FLOW

3420 BRIDGE W.S.= 4388.46 BRIDGE VELOCITY= 2.00 CALCULATED CHANNEL AREA= 813.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
39.50	4388.52	.00	5372.	1625.	890.	895.	4389.50	4387.00	1750.

3470 ENCROACHMENT STATIONS= .0 2469.1 TYPE= 1 TARGET= 2469.100

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    40.750     17.49   4388.49       .00   4388.47   4388.52       .03       .03       .00   4388.30
    6950.0    4872.1    2077.9        .0    6992.1     921.5        .0     400.4     154.7 100000.00
       .36       .70      2.25       .00      .045      .025      .000      .000   4371.00      2.97
   .000085       35.       35.       35.         2         0         6       .00   2437.95   2469.10


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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


 1490 NH CARD USED
 *SECNO 41.350
  2800 NAT Q1=   10504.78  WSELK=    4388.48  ENC Q1=   10504.78  WSEL=    4390.18  RATIO=    .0000
  NAT Q1=   16356.  RATIOS LOB, CH, ROB=    .7316   .2473   .0211  WSEL=    4390.18

 3470 ENCROACHMENT STATIONS=     1602.5    2615.7  TYPE=       4  TARGET=         .358
     41.350     17.08   4388.48       .00   4388.48   4388.55       .07       .00       .02   4383.50
     6950.0    3782.7    3167.3        .0    4186.2    1082.9        .0     407.4     156.5   4384.70
        .36       .90      2.92       .00      .045      .025      .000      .000   4371.40   1602.47
    .000096       .45.      55.       55.         1         0         0       .00   1013.23   2615.70


 CCHV=      .100 CEHV=      .300
 14°° NH CARD USED
 *E      45.150
  2800 NAT Q1=    9501.84  WSELK=    4388.49  ENC Q1=    9501.84  WSEL=    4390.19  RATIO=    .0000
  NAT Q1=   15153.  RATIOS LOB, CH, ROB=    .6500   .2488   .1012  WSEL=    4390.19

 3470 ENCROACHMENT STATIONS=     1807.7    2947.1  TYPE=       4  TARGET=         .373
     45.150     16.91   4388.51       .00   4388.49   4388.58       .07       .04       .00   4383.60
     6650.0    3315.5    3033.3      301.3    4524.4     972.4     358.1     456.1     165.9   4383.80
        .42       .73      3.12       .84      .055      .025      .040      .000   4371.60   1807.74
    .000093       380.      380.      410.         0         0         0       .00   1139.41   2947.15


 1490 NH CARD USED
 *SECNO 55.650
  2800 NAT Q1=    7934.05  WSELK=    4388.54  ENC Q1=    7934.05  WSEL=    4390.24  RATIO=    .0000
  NAT Q1=   12944.  RATIOS LOB, CH, ROB=    .6616   .2355   .1029  WSEL=    4390.24

 3470 ENCROACHMENT STATIONS=     2206.0    3189.5  TYPE=       4  TARGET=         .387
     55.650     16.60   4388.60       .00   4388.54   4388.69       .09       .10       .00   4388.20
     6650.0    3655.0    2995.0        .0    3946.8     882.7        .0     550.6     183.9   4384.10
        .54       .93      3.39       .00      .055      .025      .000      .000   4372.00   2206.01
    .000158       700.     1050.     1000.         2         0         0       .00    983.49   3189.50


 1490 NH CARD USED
 *SECNO 69.350
  :    NAT Q1=    8294.90  WSELK=    4388.61  ENC Q1=    8294.90  WSEL=    4390.31  RATIO=    .0000
  NAT Q1=   14106.  RATIOS LOB, CH, ROB=    .5349   .2025   .2626  WSEL=    4390.31
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

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 2152.4 3283.9 TYPE= 4 TARGET= .412

69.350	15.76	4388.76	.00	4388.61	4388.84	.08	.15	.00	4388.30
6650.0	3269.7	2809.6	570.7	3101.7	857.7	493.2	638.1	201.6	4385.70
.68	1.05	3.28	1.16	.045	.025	.040	.000	4373.00	2152.38
.000147	670.	1370.	1050.	2	0	0	.00	1101.32	3283.95

1490 NH CARD USED
*SECNO 78.850
2800 NAT Q1= 10572.70 WSELK= 4388.65 ENC Q1= 10572.70 WSEL= 4390.35 RATIO= .0000
NAT Q1= 17824. RATIOS LOB, CH, ROB= .6261 .2226 .1513 WSEL= 4390.35

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 2392.4 4020.4 TYPE= 4 TARGET= .407

78.850	15.36	4388.86	.00	4388.65	4388.92	.06	.08	.00	4385.30
6650.0	3576.0	3074.0	.0	4598.6	1119.6	.0	702.1	216.2	4386.00
.79	.78	2.75	.00	.045	.025	.000	.000	4373.50	2392.44
.00093	430.	950.	780.	2	0	0	.00	1560.76	4020.40

1490 NH CARD USED
*SECNO 84.050
2800 NAT Q1= 7979.16 WSELK= 4388.66 ENC Q1= 7979.16 WSEL= 4390.36 RATIO= .0000
NAT Q1= 15187. RATIOS LOB, CH, ROB= .5739 .2480 .1781 WSEL= 4390.36

3265 DIVIDED FLOW

3280 CROSS SECTION 84.05 EXTENDED .66 FEET

3470 ENCROACHMENT STATIONS= 2807.4 4451.8 TYPE= 4 TARGET= .475

84.050	14.96	4388.86	.00	4388.66	4389.01	.15	.06	.03	4384.70
6650.0	2490.0	4089.8	70.2	3027.3	1053.9	111.7	756.9	233.4	4385.70
.84	.82	3.88	.63	.045	.025	.040	.000	4373.90	2807.40
.000176	470.	520.	500.	2	0	0	.00	1600.99	4451.80

1

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

1490 NH CARD USED
*SECNO 96.250
2800 NAT Q1= 4893.39 WSELK= 4388.74 ENC Q1= 4893.39 WSEL= 4390.44 RATIO= .0000
NAT Q1= 10838. RATIOS LOB, CH, ROB= .3594 .2215 .4191 WSEL= 4390.44

3 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .61

3470 ENCROACHMENT STATIONS= 3448.7 4639.8 TYPE= 4 TARGET= .549

96.250	14.53	4389.03	.00	4388.74	4389.39	.36	.31	.06	4389.90
6650.0	649.7	4375.4	1624.9	669.2	749.7	1035.0	837.7	264.0	4386.80
.91	.97	5.84	1.57	.045	.025	.040	.000	4374.50	3448.69
.000481	1000.	1220.	1000.	2	0	0	.00	1024.90	4639.79

1490 NH CARD USED
*SECNO 105.550
2800 NAT Q1= 5075.01 WSELK= 4388.93 ENC Q1= 5075.01 WSEL= 4390.63 RATIO= .0000
NAT Q1= 11224. RATIOS LOB, CH, ROB= .7644 .1703 .0652 WSEL= 4390.63

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 5888.0 7354.8 TYPE= 4 TARGET= .548

105.550	14.58	4389.58	.00	4388.93	4389.81	.22	.41	.01	4386.90
6650.0	3415.8	3234.2	.0	2860.7	611.6	.0	900.6	289.4	4385.00
.99	1.19	5.29	.00	.045	.025	.000	.000	4375.00	5888.04
)0406	980.	930.	730.	3	0	0	.00	1366.41	7354.80

1490 NH CARD USED
*SECNO 115.550
2800 NAT Q1= 5110.89 WSELK= 4389.12 ENC Q1= 5110.89 WSEL= 4390.82 RATIO= .0000
NAT Q1= 10844. RATIOS LOB, CH, ROB= .8046 .1734 .0220 WSEL= 4390.82

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 5435.9 7244.1 TYPE= 4 TARGET= .529

115.550	14.40	4390.00	.00	4389.12	4390.18	.17	.37	.00	4385.30
6650.0	3673.6	2976.4	.0	2946.4	617.9	.0	984.7	325.0	4389.50
1.09	1.25	4.82	.00	.045	.025	.000	.000	4375.60	5435.85
.000315	1050.	1000.	750.	2	0	0	.00	1594.31	7244.10

1

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
LOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1490 NH CARD USED
*SECNO 126.550

3265 DIVIDED FLOW

34[illegible] ENCROACHMENT STATIONS= 5430.0 6740.0 TYPE= 1 TARGET= 1310.000
Cross Section "D" on existing FIRM

126.550	14.00	4390.20	.00	4389.21	4390.49	.29	.28	.03	4386.40
6650.0	1674.3	4724.6	251.2	1645.6	932.4	219.8	1034.7	343.2	4386.10
1.16	1.02	5.07	1.14	.045	.025	.040	.000	4376.20	5430.00
.000327	550.	1100.	550.	2	0	0	.00	1150.95	6740.00

CCHV= .300 CEHV= .500
1490 NH CARD USED
*SECNO 130.750

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .44

3470 ENCROACHMENT STATIONS= 5610.0 7228.1 TYPE= 1 TARGET= 1618.100
Begin Floodway Revision
Inneffective area is coded out with high roughness

130.750	13.47	4390.27	4386.25	4389.49	4390.94	.67	.25	.19	4389.70
6650.0	1623.8	5026.2	.0	998.1	670.2	.0	1054.4	353.5	100000.00
1.17	1.63	7.50	.00	.045	.035	.000	.000	4376.80	5610.00
001661	370.	420.	320.	4	15	0	.00	1279.18	7228.10

1490 NH CARD USED

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.50	3.00	.00	33.00	1.00	498.00	1.10	4378.70	4378.70

*SECNO 131.170
BTCARD, BRIDGE STENCL= 5600.00 STENCR= 7300.00
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

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.82

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
4391.50	4391.37	.03	3052.	3620.	498.	519.	4390.30	4389.70	1554.

```
3470 ENCROACHMENT STATIONS=     5600.0    7300.0  TYPE=      1  TARGET=     1700.000
          Inneffective area immediately upstream of road (wsel below road)
          is coded out with a high roughness value
   131.170     12.49   4391.19       .00   4390.90   4391.50       .31       .56       .00   4389.70
    6650.0    2924.2    3716.6       9.3    2352.1     636.5       9.7    1056.7     354.9   4387.80
      1.18      1.24      5.84       .95      .040      .025      .045      .000   4378.70   5600.00
   .000503       42.       42.       42.         3         0         4       .00   1633.83   7233.83


CCHV=      .300 CEHV=      .500
1490 NH CARD USED
*SECNO 132.570

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.56


3470 ENCROACHMENT STATIONS=     5300.0    6660.0  TYPE=      1  TARGET=     1360.000
          Inneffective area coded out with high roughness
          Cross Section "E" on existing FIRM (alignment slightly modified)
   132.570     11.58   4391.58       .00   4391.22   4391.62       .04       .04       .08   4390.00
    6650.0     467.1    6182.9         .0    1471.7    3850.5         .0    1089.5     360.9 100000.00
      1.26       .32      1.61       .00      .040      .025      .000      .000   4380.00   5300.00
   .000040      100.      550.      570.         2         0         0       .00   1360.00   6660.00


CCHV=      .100 CEHV=      .300
14^^ NH CARD USED
*     ) 155.570

3265 DIVIDED FLOW

1
   26FEB96       15:58:56                                                                          PAGE   35


    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



3470 ENCROACHMENT STATIONS=     6000.0    7135.0  TYPE=      1  TARGET=     1135.000
          Cross Section "F" on existing FIRM (alignment slightly modified)
   155.570     10.67   4391.67       .00   4391.25   4391.68       .01       .05       .00   4386.00
    5000.0    3306.7    1693.3         .0    5400.1    1503.2         .0    1350.5     411.8 100000.00
      1.94       .61      1.13       .00      .035      .025      .000      .000   4381.00   6000.00
   .000018      1700.     2065.     2065.         2         0         0       .00   1120.80   7135.00


1490 NH CARD USED
*SECNO 169.570

3470 ENCROACHMENT STATIONS=     5200.0    6590.0  TYPE=      1  TARGET=     1390.000
          Cross Section "G" on existing FIRM
   169.570      9.69   4391.69       .00   4391.26   4391.70       .01       .02       .00   4388.00
    5000.0    3742.4    1257.6         .0    6880.2    1341.2         .0    1546.3     443.8 100000.00
```

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      2.44        .54        .94        .00       .036       .025       .000       .000   4382.00   5200.00
    .000015     1070.      1380.      1390.          1          0          0        .00   1390.00   6590.00


14   NH CARD USED
*S      180.570

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


3470 ENCROACHMENT STATIONS=     5200.0    6420.0  TYPE=       1  TARGET=     1220.000
   180.570       8.71    4391.71        .00    4391.27    4391.72        .01        .02        .00   4388.00
    5000.0     3716.0     1284.0          .0     5943.3      939.8          .0     1734.5      476.3 100000.00
      2.81        .63       1.37        .00        .045       .025       .000       .000   4383.00   5200.00
    .000036     1090.      1060.      1060.          0          0          0        .00   1220.00   6420.00


1490 NH CARD USED
*SECNO 189.070

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


3470 ENCROACHMENT STATIONS=     3860.0    4970.0  TYPE=       1  TARGET=     1110.000
          Inneffective area coded out with high roughness value
   189.070       7.74    4391.74        .00    4391.28    4391.77        .03        .04        .00   4388.00
    5000.0     3413.8     1586.2          .0     4042.8      810.9          .0     1849.4      499.5 100000.00
      3.00        .84       1.96        .00        .040       .025       .000       .000   4384.00   3860.00
    .000080      890.       640.       640.          1          0          0        .00   1110.00   4970.00


1
   26FEB96      15:58:56                                                                                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


1490 NH CARD USED
*SECNO 196.370

3265 DIVIDED FLOW


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .31


3470 ENCROACHMENT STATIONS=     3000.0    3730.0  TYPE=       1  TARGET=      730.000
          Inneffective area coded out with high roughness value
   196.370       6.59    4391.59        .00    4391.31    4392.00        .41        .12        .12   4390.00
    5000.0      642.4     4357.6          .0      340.9      798.3          .0     1899.9      511.9 100000.00
      3.04       1.88       5.46        .00        .040       .025       .000       .000   4385.00   3051.62
      0862       810.       525.       515.          2          0          0        .00    316.24   3730.00


CCHV=      .300 CEHV=      .500
1490 NH CARD USED
```

*SECNO 199.570

3280 CROSS SECTION 199.57 EXTENDED .19 FEET

02 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.86

3470 ENCROACHMENT STATIONS= 1270.0 2050.0 TYPE= 1 TARGET= 780.000

Inneffective area coded out with high roughness value

199.570	7.19	4392.19	.00	4391.39	4392.21	.02	.09	.12	4385.00
5000.0	1787.5	3212.5	.0	2186.9	2366.6	.0	1927.2	517.3	100000.00
3.13	.82	1.36	.00	.058	.040	.000	.000	4385.00	1270.00
.000105	480.	370.	350.	2	0	0	.00	780.00	2050.00

*SECNO 201.570

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .57

3470 ENCROACHMENT STATIONS= 1250.0 1985.0 TYPE= 1 TARGET= 735.000

Cross Section "H" on existing FIRM (alignment shifted to immediately downstream of dirt road)

201.570	5.14	4392.24	.00	4391.42	4392.28	.04	.06	.01	4387.20
5000.0	1738.3	312.1	2949.6	1060.1	122.2	1950.8	1956.6	522.8	4387.50
3.19	1.64	2.55	1.51	.045	.030	.045	.000	4387.10	1250.00
.000320	260.	500.	240.	2	0	0	.00	735.00	1985.00

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
	.90	1.50	3.00	.00	25.00	1.00	25.00	.00	4387.60	4387.60

*SECNO 202.070

BTCARD, BRIDGE STENCL= 1230.00 STENCR= 1980.00

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
5323.92	4392.28	.00	4984.	51.	25.	34.	4389.00	4390.00	750.

70 ENCROACHMENT STATIONS= 1230.0 1980.0 TYPE= 1 TARGET= 750.000

202.070	5.19	4392.29	.00	4391.46	4392.33	.04	.05	.00	4387.20
5000.0	1829.8	304.2	2866.0	1160.9	123.6	1961.5	1960.2	523.6	4387.50
3.20	1.58	2.46	1.46	.045	.030	.045	.000	4387.10	1230.00

```
    .000293       50.       50.       50.         2         0        12       .00    750.00   1980.00


*SECNO 202.470

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


3470 ENCROACHMENT STATIONS=     1220.0    1990.0  TYPE=       1  TARGET=      770.000
          End Floodway Revision
   202.470      4.30   4392.30       .00   4391.46   4392.37       .07       .02       .02   4388.00
    5000.0    1850.6     591.7    2557.8     936.5     172.1    1398.8    1962.9     524.3   4388.00
      3.20      1.98      3.44      1.83      .045      .030      .045      .000   4388.00   1220.00
   .000689       40.       40.       40.         1         0         0       .00    770.00   1990.00


CCHV=     .100 CEHV=     .300
*SECNO 205.670

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=     3150.0    3878.0  TYPE=       1  TARGET=      728.000
   205.670      6.47   4392.47       .00   4391.58   4392.51       .04       .14       .00   4395.00
    5000.0    4945.7      54.3        .0    2951.8      44.7        .0    1981.4     529.4 100000.00
      3.25      1.68      1.22       .00      .045      .030      .000      .000   4386.00   3150.00
   .000361       270.      320.      350.         1         0         0       .00    712.91   3878.00


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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


CCHV=     .100 CEHV=     .300
*SECNO 217.390

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS

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

3470 ENCROACHMENT STATIONS=     1253.3    1841.0  TYPE=       1  TARGET=      587.670
   217.390      5.10   4394.10   4394.10   4393.23   4394.82       .72      1.38       .20   4395.00
    5000.0    4735.5     264.5        .0     699.6      35.3        .0    2039.4     548.0 100000.00
      3.31      6.77      7.50       .00      .030      .025      .000      .000   4389.00   1253.33
   .010079      1360.     1172.     1172.        20        14         0       .00    489.72   1836.03


*SECNO 224.980
```

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.06

3470 ENCROACHMENT STATIONS= 2298.6 3211.0 TYPE= 1 TARGET= 912.440

224.980	4.95	4397.55	.00	4396.69	4397.66	.12	2.78	.06	4399.70
5000.0	4713.2	286.8	.0	1750.7	83.5	.0	2073.1	565.8	100000.00
3.42	2.69	3.44	.00	.030	.025	.000	.000	4392.60	2298.56
.001075	1160.	759.	759.	5	0	0	.00	865.09	3187.46

*SECNO 235.230

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

1

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

3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 782.8 1755.0 TYPE= 1 TARGET= 972.250

235.230	5.07	4400.77	4400.77	4399.92	4401.28	.51	2.33	.12	4401.80
5000.0	4530.1	469.9	.0	851.5	53.7	.0	2103.4	585.1	100000.00
3.47	5.32	8.76	.00	.030	.025	.000	.000	4395.70	782.75
.009561	960.	1025.	1025.	20	9	0	.00	883.06	1747.22

*SECNO 269.390

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.82

3470 ENCROACHMENT STATIONS= 230.0 378.0 TYPE= 1 TARGET= 148.020

269.390	7.51	4414.51	.00	4413.78	4415.45	.93	14.04	.13	4410.70
4750.0	1843.5	2906.5	.0	311.0	333.5	.0	2157.0	619.8	100000.00
3.58	5.93	8.72	.00	.030	.025	.000	.000	4407.00	229.98
.002607	2880.	3416.	3416.	7	0	0	.00	148.02	378.00

*SECNO 273.000

1 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 184.4 337.0 TYPE= 1 TARGET= 152.580

273.000	8.14	4415.64	4415.64	4415.16	4417.26	1.62	.98	.21	4412.10
4750.0	1727.8	3022.2	.0	300.9	250.9	.0	2161.1	620.7	100000.00
3.59	5.74	12.05	.00	.030	.025	.000	.000	4407.50	184.42
.003805	240.	361.	240.	20	8	0	.00	152.58	337.00

*SECNO 283.160

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.05

1

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

3470 ENCROACHMENT STATIONS= 420.5 751.4 TYPE= 1 TARGET= 330.880

283.160	7.89	4418.69	.00	4417.65	4418.94	.25	1.54	.14	4414.90
4750.0	2611.4	1704.1	434.5	782.6	341.8	119.3	2179.9	625.7	4415.50
3.66	3.34	4.99	3.64	.030	.025	.030	.000	4410.80	420.51
.000910	840.	1016.	1040.	3	0	0	.00	330.88	751.39

*SECNO 314.160

3301 HV CHANGED MORE THAN HVINS

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

3470 ENCROACHMENT STATIONS= 3050.0 3130.0 TYPE= 1 TARGET= 80.000

314.160	10.20	4427.60	4427.60	4428.30	4430.20	2.60	5.76	.71	4428.80
4750.0	.0	4750.0	.0	.0	366.8	.0	2237.2	640.0	100000.00
3.72	.00	12.95	.00	.000	.025	.000	.000	4417.40	3053.69
.005699	3100.	3100.	3100.	20	11	0	.00	71.92	3125.61

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THIS RUN EXECUTED 26FEB96 15:59:04

****
.EC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Revised from sect. 130.7

SUMMARY PRINTOUT

	SECNO	Q	TOPWID	SSTA	ENDST	CWSEL	DIFWSP	AREA	VCH
	2.000	6950.00	209.71	.00	244.49	4386.04	.00	1551.01	6.19
	2.000	6950.00	208.72	.00	243.50	4386.04	.00	1550.75	6.19
	7.300	6950.00	538.63	186.15	847.63	4386.24	.00	1614.69	6.02
	7.300	6950.00	531.90	186.07	840.70	4386.24	.00	1603.34	6.02
*	13.900	6950.00	726.74	205.20	1274.76	4386.25	.00	1504.12	8.61
*	13.900	6950.00	720.90	205.28	1269.00	4386.25	.00	1500.18	8.62
	19.900	6950.00	1482.30	2581.85	4178.45	4387.33	.00	3070.53	6.26
	19.900	6950.00	1479.56	2581.83	4175.50	4387.33	.01	3080.56	6.24
	23.900	6950.00	1959.53	2746.22	4705.76	4387.75	.00	4769.11	4.96
	23.900	6950.00	1959.55	2746.21	4705.76	4387.75	.00	4775.80	4.95
	29.100	6950.00	2112.92	3208.57	5334.26	4387.93	.00	5508.40	5.08
	29.100	6950.00	2064.35	3208.58	5284.25	4387.93	.00	5434.56	5.11
	38.600	6950.00	2188.69	148.58	2337.27	4388.32	.00	6091.56	3.38
*	38.600	6950.00	2003.64	148.36	2152.00	4388.32	.00	5618.15	3.56
	39.600	6950.00	2447.51	198.00	2645.51	4388.38	.00	7150.38	2.94
	39.600	6950.00	2272.82	195.58	2468.40	4388.38	.01	6650.81	3.15
	40.400	6950.00	2629.30	3.67	2722.87	4388.43	.00	7835.68	2.39
	40.400	6950.00	2427.74	3.34	2469.10	4388.46	.03	7830.40	2.35
	40.750	6950.00	2651.27	3.27	2730.54	4388.47	.00	7932.37	2.33
	40.750	6950.00	2437.95	2.97	2469.10	4388.49	.03	7913.54	2.25
	41.350	6950.00	2462.09	204.17	2666.26	4388.48	.00	10281.77	2.02
	41.350	6950.00	1013.23	1602.47	2615.70	4388.48	.00	5269.11	2.92

1

	SECNO	Q	TOPWID	SSTA	ENDST	CWSEL	DIFWSP	AREA	VCH
	45.150	6650.00	2915.14	128.89	3221.87	4388.49	.00	10622.07	2.27
	45.150	6650.00	1139.41	1807.74	2947.15	4388.51	.02	5854.93	3.12
	55.650	6650.00	2460.54	307.63	3410.57	4388.54	.00	9005.97	2.33
	55.650	6650.00	983.49	2206.01	3189.50	4388.60	.06	4829.46	3.39
	69.350	6650.00	2723.10	192.04	3798.59	4388.61	.00	8832.43	2.14
	69.350	6650.00	1101.32	2152.38	3283.95	4388.76	.15	4452.66	3.28

	78.850	6650.00	3278.77	243.15	4362.54	4388.65	.00	10894.31	1.80
	78.850	6650.00	1560.76	2392.44	4020.40	4388.86	.21	5718.20	2.75
	84.050	6650.00	4603.85	249.56	5009.90	4388.66	.00	11576.77	2.41
	84.050	6650.00	1600.99	2807.40	4451.80	4388.86	.20	4192.89	3.88
*	96.250	6650.00	3267.82	1752.31	5492.70	4388.74	.00	6305.73	3.57
*	96.250	6650.00	1024.90	3448.69	4639.79	4389.03	.28	2453.97	5.84
	105.550	6650.00	5376.73	2161.83	7871.88	4388.93	.00	11034.30	3.49
	105.550	6650.00	1366.41	5888.04	7354.80	4389.58	.65	3472.25	5.29
	115.550	6650.00	5411.01	1082.54	7480.99	4389.12	.00	11417.42	3.39
	115.550	6650.00	1594.31	5435.85	7244.10	4390.00	.89	3564.38	4.82
	126.550	6650.00	5252.98	670.81	6796.67	4389.21	.00	7646.02	4.28
	126.550	6650.00	1150.95	5430.00	6740.00	4390.20	1.00	2797.81	5.07
*	130.750	6650.00	2349.26	275.45	7230.96	4389.49	.00	2273.35	8.45
*	130.750	6650.00	1279.18	5610.00	7228.10	4390.27	.77	1668.26	7.50
*	131.170	6650.00	6751.28	233.95	7233.34	4390.90	.00	6626.28	5.49
*	131.170	6650.00	1633.83	5600.00	7233.83	4391.19	.29	2998.30	5.84
*	132.570	6650.00	5670.26	354.96	6668.13	4391.22	.00	15774.17	1.19
*	132.570	6650.00	1360.00	5300.00	6660.00	4391.58	.36	5322.22	1.61
*	155.570	5000.00	5889.28	1661.95	7582.88	4391.25	.00	18625.91	.61
	155.570	5000.00	1120.80	6000.00	7135.00	4391.67	.41	6903.31	1.13
	169.570	5000.00	5085.30	2107.36	7192.67	4391.26	.00	17897.08	.54
	169.570	5000.00	1390.00	5200.00	6590.00	4391.69	.43	8221.48	.94
*	180.570	5000.00	3576.34	2619.87	6562.67	4391.27	.00	11312.56	.89
*	180.570	5000.00	1220.00	5200.00	6420.00	4391.71	.44	6883.09	1.37
*	189.070	5000.00	3594.02	1772.36	5366.38	4391.28	.00	9457.31	1.37
*	189.070	5000.00	1110.00	3860.00	4970.00	4391.74	.46	4853.64	1.96
*	196.370	5000.00	1421.14	2006.91	4065.39	4391.31	.00	4472.02	2.29
*	196.370	5000.00	316.24	3051.62	3730.00	4391.59	.28	1139.20	5.46

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	SECNO	Q	TOPWID	SSTA	ENDST	CWSEL	DIFWSP	AREA	VCH
*	199.570	5000.00	2110.47	190.86	2301.33	4391.39	.00	7611.31	.93
*	199.570	5000.00	780.00	1270.00	2050.00	4392.19	.80	4553.53	1.36
	201.570	5000.00	1929.40	58.91	1988.30	4391.42	.00	6183.32	1.37
*	201.570	5000.00	735.00	1250.00	1985.00	4392.24	.82	3133.07	2.55
	202.070	5000.00	1931.50	56.86	1988.36	4391.46	.00	6262.50	1.36
	202.070	5000.00	750.00	1230.00	1980.00	4392.29	.84	3246.10	2.46
*	202.470	5000.00	1962.83	36.13	1998.95	4391.46	.00	3791.29	2.62
*	202.470	5000.00	770.00	1220.00	1990.00	4392.30	.84	2507.35	3.44

	205.670	5000.00	1883.01	1423.66	3882.08	4391.58	.00	4670.21	.72
	205.670	5000.00	712.91	3150.00	3878.00	4392.47	.89	2996.48	1.22
*	217.390	5000.00	1203.97	317.62	1833.31	4393.23	.00	968.48	6.37
	217.390	5000.00	489.72	1253.33	1836.03	4394.10	.88	734.91	7.50
*	224.980	5000.00	2200.52	916.72	3183.06	4396.69	.00	2583.08	3.14
*	224.980	5000.00	865.09	2298.56	3187.46	4397.55	.85	1834.19	3.44
*	235.230	5000.00	1069.33	98.50	1744.59	4399.92	.00	935.16	7.69
*	235.230	5000.00	883.06	782.75	1747.22	4400.77	.86	905.22	8.76
*	269.390	4750.00	294.58	136.73	431.31	4413.78	.00	816.76	7.74
*	269.390	4750.00	148.02	229.98	378.00	4414.51	.73	644.53	8.72
*	273.000	4750.00	347.30	79.97	428.95	4415.16	.00	787.38	10.33
*	273.000	4750.00	152.58	184.42	337.00	4415.64	.48	551.75	12.05
*	283.160	4750.00	876.80	94.84	1064.54	4417.65	.00	1630.68	4.70
*	283.160	4750.00	330.88	420.51	751.39	4418.69	1.03	1243.69	4.99
*	314.160	4750.00	205.48	2182.35	4802.68	4428.30	.00	499.13	10.91
*	314.160	4750.00	71.92	3053.69	3125.61	4427.60	-.71	366.77	12.95

UMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 13.900 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 13.900 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 38.600 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 38.600 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 96.250 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 96.250 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 130.750 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 130.750 PROFILE= 1 MINIMUM SPECIFIC ENERGY
WARNING SECNO= 130.750 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 131.170 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 131.170 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 132.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 132.570 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 155.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 180.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
RNING SECNO= 180.570 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 189.070 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 189.070 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

```
 WARNING SECNO=    196.370  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=    196.370  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=    199.570  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
  .RNING SECNO=    199.570  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=    201.570  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 WARNING SECNO=    202.470  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=    202.470  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=    217.390  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    217.390  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=    217.390  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=    217.390  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    217.390  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=    217.390  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

 WARNING SECNO=    224.980  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=    224.980  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=    235.230  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    235.230  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=    235.230  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
1
    26FEB96      15:58:56                                                  PAGE   45


 CAUTION SECNO=    235.230  PROFILE=  2  CRITICAL DEPTH ASSUMED
  `UTION SECNO=    235.230  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
  .JTION SECNO=    235.230  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

 WARNING SECNO=    269.390  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=    269.390  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=    273.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    273.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=    273.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=    273.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    273.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=    273.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

 WARNING SECNO=    283.160  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=    283.160  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=    314.160  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    314.160  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=    314.160  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=    314.160  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    314.160  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=    314.160  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

1
    26FEB96      15:58:56                                                  PAGE   46


FLOODWAY DATA,   Revised from sect. 130.7
PROFILE NO.  2
```

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
2.000	244.	1551.	4.5	4386.0	4386.0	.0
7.300	655.	1603.	4.3	4386.2	4386.2	.0
13.900	1064.	1500.	4.6	4386.2	4386.2	.0
19.900	1594.	3081.	2.3	4387.3	4387.3	.0
23.900	1960.	4776.	1.5	4387.7	4387.7	.0
29.100	2076.	5435.	1.3	4387.9	4387.9	.0
38.600	2004.	5618.	1.2	4388.3	4388.3	.0
39.600	2273.	6651.	1.0	4388.4	4388.4	.0
40.400	2466.	7830.	.9	4388.4	4388.4	.0
40.750	2466.	7914.	.9	4388.5	4388.5	.0
41.350	1013.	5269.	1.3	4388.5	4388.5	.0
45.150	1139.	5855.	1.1	4388.5	4388.5	.0
55.650	983.	4829.	1.4	4388.6	4388.5	.1
69.350	1132.	4453.	1.5	4388.8	4388.6	.2
78.850	1628.	5718.	1.2	4388.8	4388.6	.2
84.050	1644.	4193.	1.6	4388.9	4388.7	.2
96.250	1191.	2454.	2.7	4389.0	4388.7	.3
105.550	1467.	3472.	1.9	4389.6	4388.9	.7
115.550	1808.	3564.	1.9	4390.0	4389.1	.9
126.550	1310.	2798.	2.4	4390.2	4389.2	1.0
130.750	1618.	1668.	4.0	4390.3	4389.5	.8
131.170	1634.	2998.	2.2	4391.2	4390.9	.3
132.570	1360.	5322.	1.2	4391.6	4391.2	.4
155.570	1135.	6903.	.7	4391.7	4391.3	.4
169.570	1390.	8221.	.6	4391.7	4391.3	.4
180.570	1220.	6883.	.7	4391.7	4391.3	.4
189.070	1110.	4854.	1.0	4391.8	4391.3	.5
196.370	678.	1139.	4.4	4391.6	4391.3	.3
199.570	780.	4554.	1.1	4392.2	4391.4	.8
201.570	735.	3133.	1.6	4392.2	4391.4	.8
202.070	750.	3246.	1.5	4392.3	4391.5	.8
202.470	770.	2507.	2.0	4392.3	4391.5	.8
205.670	728.	2996.	1.7	4392.5	4391.6	.9
217.390	583.	735.	6.8	4394.1	4393.2	.9
224.980	889.	1834.	2.7	4397.6	4396.7	.9
235.230	964.	905.	5.5	4400.8	4399.9	.9
269.390	148.	645.	7.4	4414.5	4413.8	.7
273.000	153.	552.	8.6	4415.7	4415.2	.5
283.160	331.	1244.	3.8	4418.7	4417.7	1.0
314.160	72.	367.	13.0	4427.6	4428.3	-.7

Scale : 1"=200'

FIGURE 3

Supplemental
Topography Map

Job No. : 9006 Date : 9/4/90

REVISED HEC-2 MODEL

507STM1.DAT

```
1*****************************************
 *  HEC-2 WATER SURFACE PROFILES           *
 *                                         *
 *  Version   4.6.2;  May 1991             *
 *                                         *
 *  RUN DATE    18MAR96    TIME   17:32:01  *
 *****************************************
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*************************************
*  U.S. ARMY CORPS OF ENGINEERS     *
*  HYDROLOGIC ENGINEERING CENTER    *
*  609 SECOND STREET, SUITE D       *
*  DAVIS, CALIFORNIA 95616-4687     *
*          (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

18MAR96 17:32:01 PAGE 1

THIS RUN EXECUTED 18MAR96 17:32:01

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

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

```
T1     HERONS LANDING - MIRA LOMA BRIDGE        CITY OF RENO, WASHOE COUNTY
T2     BY NIMBUS ENGINEERS, RENO, NV            NIMBUS JOB # : 9507
T3           STEAMBOAT CREEK                    FILE NAME: 507STM1.DAT
       Y.K.S.                  DATE: FEB. 27, 1996
```

****

This model was modified from the current regulatory model STMROSE.DAT and includes improvements incorporated in STMROSE1.DAT which was previously submitted and approved by FEMA.

Modifications:

1. Includes Mira Loma Drive Extension & arch culverts
   New sections 196.17, 196.37, 196.97, & 197.17
   Ineffective flow area encroached using ET cards
2. Removed SB Routine @ x-sect @ 202.07
3. Relocated channel bank stations to the banks of Steamboat Creek
   @ x-sect 201.57, 202.07, 202.47, and 205.67.
4. Floodway revision between sections 189.07 & 205.67

****

Section numbers in this model are consistent with the current regulatory FIS
This model ties into the downstream current regulatory model at Pembroke Drive (STM2.601). Upstream of Pembroke, this model was modified from the model STMFW6. Section numbers were revised to be consistent

with the downstream model, and the April 1990 FIS.

NOTE : Section numbers are not consistent with channel distance in the revised area.

****

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	0	0	0	0	0	4386.04	0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1							

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	43	4	53	54	1	50	25	26	0
200									

1

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QT	2	6950	6950							
NC	.080	.080	.025	.1	.3					
ET			9.1						0	243.5
X1	2.00	21	165.5	243.5	0	0	0			
GR	4385.0	0.0	4383.5	22.1	4383.7	28.7	4378.0	39.9	4376.8	53.2
	4376.8	71.7	4382.3	88.6	4385.9	107.2	4385.9	131.0	4387.7	149.3
	4387.8	165.5	4370.0	182.7	4370.0	230.9	4385.5	243.5	4394.9	260.7
GR	4394.8	271.7	4394.8	274.9	4395.0	304.0	4395.1	389.1	4395.1	449.1
GR	4399.7	453.9								
ET			9.1						0	840.7
X1	7.30	28	761.5	840.7	420	530	530			
GR	4388.7	0.0	4389.5	26.2	4387.7	50.8	4388.5	75.8	4387.6	105.1
GR	4388.1	133.9	4386.8	145.6	4386.5	148.3	4386.2	193.6	4388.2	206.2
GR	4387.6	243.1	4386.3	257.2	4385.0	276.8	4385.0	292.2	4386.5	636.3
GR	4385.4	642.2	4384.7	662.0	4383.8	675.8	4383.6	704.6	4383.6	761.5
GR	4370.0	772.7	4370.0	825.9	4382.9	840.7	4391.5	858.5	4397.1	870.6
GR	4397.8	891.8	4398.1	937.8	4398.6	1005.3	0.0	0.0	0.0	0.0
ET			9.1						0	1269
X1	13.90	32	1208.5	1269.0	570	660	660			
GR	4389.9	0.0	4389.1	19.1	4387.8	36.8	4388.3	55.7	4386.8	73.2
GR	4386.6	93.7	4386.5	106.5	4386.5	164.3	4385.0	407.8	4385.0	623.6
GR	4384.5	689.8	4384.6	754.9	4384.6	820.5	4385.7	841.9	4399.7	906.7
GR	4399.6	1119.8	4396.6	1135.2	4393.8	1158.5	4393.4	1173.5	4385.6	1188.5
GR	4385.3	1208.5	4384.2	1215.0	4370.2	1223.2	4370.2	1259.2	4385.0	1269.0
GR	4389.9	1291.6	4393.9	1306.9	4396.9	1315.1	4397.8	1341.8	4393.2	1355.2
GR	4393.2	1367.9	4401.1	1375.6	0.0	0.0	0.0	0.0	0.0	0.0
ET			9.1						2576.1	4175.5
X1	19.90	32	4092.6	4175.5	520	600	600			
	4389.8	2576.1	4386.4	2584.0	4387.0	2598.6	4387.0	2618.0	4387.0	2682.3
GR	4387.0	2795.0	4386.3	2919.3	4385.8	3038.1	4385.6	3148.1	4385.1	3283.0
GR	4385.1	3887.0	4388.1	3915.3	4391.4	3938.7	4392.3	3961.2	4390.2	3968.8
GR	4390.0	3984.1	4386.5	3995.3	4386.5	4012.0	4385.8	4041.2	4388.0	4062.9
GR	4388.3	4077.6	4388.8	4083.3	4383.5	4092.6	4383.9	4111.5	4380.7	4119.4

GR	4370.6	4128.3	4370.6	4159.1	4386.3	4175.5	4390.3	4187.0	4390.6	4203.8
GR	4390.6	4216.5	4402.8	4236.1	0.0	0.0	0.0	0.0	0.0	0.0
ET			9.1						2738.3	4705.8
1	23.90	19	4621.3	4705.8	450	400	400			
GR	4389.4	2738.3	4386.5	2752.2	4386.8	2781.1	4386.8	2884.6	4386.9	3002.5
GR	4386.8	3146.4	4386.4	3301.2	4385.7	3429.7	4385.5	3551.4	4385.2	3678.0
GR	4385.0	4576.6	4385.7	4588.4	4384.8	4621.3	4383.3	4642.3	4370.8	4655.5
GR	4370.8	4691.8	4387.8	4705.8	4389.9	4713.2	4390.3	4729.8	0.0	0.0
ET			9.1						3191.0	5284.3
X1	29.10	27	5225.3	5284.3	500	520	520			
GR	4391.0	3191.0	4387.0	3213.9	4387.0	3279.3	4386.7	3369.4	4386.5	3478.5
GR	4385.7	3602.9	4385.4	3764.2	4385.4	5082.9	4385.9	5089.3	4385.8	5100.6
GR	4384.3	5115.3	4384.1	5135.0	4384.7	5161.6	4386.0	5189.5	4386.0	5204.2
GR	4387.8	5213.3	4389.0	5225.3	4370.8	5235.8	4370.8	5273.6	4388.0	5284.3
GR	4387.5	5294.5	4385.3	5310.4	4386.3	5329.5	4389.9	5340.0	4390.9	5354.7

1

GR	4391.4	5363.5	4391.5	5388.7	0.0	0.0	0.0	0.0	0.0	0.0
NH	4	.070	637.1	.045	2068.0	.025	2152.0	.045	2395.0	
ET			9.1						0	2152
X1	38.60	24	2068.0	2152.0	1450	1000	950			
GR	4390.5	0.0	4391.4	17.2	4391.6	22.6	4389.1	29.1	4389.1	41.5
GR	4390.5	48.4	4389.3	61.4	4388.4	142.8	4387.7	193.9	4387.3	270.7
GR	4386.8	375.4	4386.4	498.4	4385.7	637.1	4385.5	1948.8	4386.5	2037.3	
	4387.3	2051.5	4384.7	2068.0	4370.9	2079.8	4370.9	2116.3	4380.5	2126.2
R	4383.9	2152.0	4384.0	2174.5	4384.2	2195.6	4390	2395	0.0	0.0
NC				.3	.5					
NH	4	.100	780.9	.050	2366.9	.025	2468.4	.040	2700.0	
ET			9.1						0	2468.4
X1	39.60	30	2366.9	2468.4	300	80	100			
GR	4391.6	0.0	4391.2	10.0	4390.6	22.8	4389.0	29.0	4389.0	46.2
GR	4390.0	49.4	4388.5	60.5	4388.6	113.1	4388.5	179.5	4387.8	275.6
GR	4387.7	367.2	4386.7	444.5	4386.3	549.9	4385.9	692.2	4385.5	780.9
GR	4385.5	2101.2	4385.2	2182.0	4385.2	2285.5	4386.6	2306.7	4386.0	2338.4
GR	4386.0	2355.9	4387.5	2366.9	4371.0	2393.4	4371.0	2432.6	4383.0	2443.5
GR	4384.9	2468.4	4383.9	2523.4	4384.4	2579.0	4387.0	2600.0	4390.0	2700.0
NH	4	.070	374.8	.045	2348.4	.025	2469.1	.040	3172.1	
ET			9.1						0	2469.1
X1	40.40	53	2348.4	2469.1	100	80	80			
GR	4391.2	0.0	4388.6	1.8	4387.5	13.9	4387.9	36.9	4388.5	73.0
GR	4388.0	142.5	4388.0	210.7	4388.0	295.2	4386.7	374.8	4386.7	463.3
GR	4386.4	547.1	4385.8	627.2	4385.3	713.1	4384.7	797.4	4383.9	871.9
GR	4383.2	913.9	4383.8	922.6	4383.4	927.8	4384.8	945.1	4384.8	1750.8
GR	4384.7	1813.8	4384.3	1873.0	4384.2	1944.2	4384.0	2022.4	4384.3	2065.6
GR	4384.5	2103.9	4384.7	2137.5	4386.3	2196.8	4385.9	2238.6	4386.4	2287.8
GR	4386.7	2314.2	4388.3	2348.4	4388.8	2361.7	4388.3	2392.6	4387.9	2401.8
GR	4371.0	2424.6	4371.0	2458.8	4384.3	2469.1	4387.3	2479.7	4387.3	2484.6
GR	4388.9	2511.2	4388.4	2548.8	4388.1	2610.5	4388.2	2674.8	4388.5	2737.6
	4389.1	2796.3	4389.2	2868.3	4388.9	2936.9	4389.0	2996.7	4389.2	3063.7
GR	4389.6	3123.6	4390.0	3151.5	4390.2	3172.1				
SB	1.05	1.5	2.5		18.0	2.0	890	1.75	4371.0	4371.0
ET			9.1						0	2469.1

X1	40.75				35	35	35			
X2			1	4389.5	4387.0			1.33		
BT	-8	0	4387.6		260	4387.4		380	4386.5	
BT		800	4387.5		1610	4386.6		1980	4391.7	
T		2430	4390.0		2830	4391.7				
NH	4	.500	819.0	.045	2534.1	.025	2615.7	.040	2666.4	
ET			17.4							
X1	41.35	50	2534.1	2615.7	45	55	55			
GR	4390.9	0.0	4389.8	27.2	4389.8	139.6	4387.9	231.9	4387.8	324.0
GR	4385.6	410.3	4386.7	443.8	4386.7	480.9	4385.9	545.0	4385.8	638.1
GR	4383.7	819.0	4387.3	861.8	4385.9	904.2	4381.5	987.4	4384.7	1050.3
GR	4386.3	1053.3	4385.9	1093.8	4384.7	1108.3	4384.7	1125.6	4385.0	1154.3
GR	4384.6	1186.0	4383.6	1221.7	4383.9	1266.1	4383.7	1430.0	4383.1	1559.5
GR	4383.1	1779.3	4383.5	1803.2	4383.6	1846.9	4383.8	1906.8	4383.8	1978.2

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GR	4383.4	2054.5	4383.5	2135.9	4384.1	2172.2	4388.1	2189.3	4384.4	2205.7
GR	4384.2	2262.9	4383.5	2293.8	4383.5	2381.1	4386.2	2395.8	4386.5	2414.3
GR	4386.0	2470.2	4385.8	2502.7	4383.5	2534.1	4381.3	2552.4	4371.4	2562.7
GR	4371.4	2606.8	4384.7	2615.7	4384.0	2648.3	4383.7	2666.0	4391.0	2666.4
NC				.1	.3					
QT	2	6650	6650							
NH	4	.500	798.5	.055	2779.5	.025	2844.6	.040	3225	
X1	45.15	52	2779.5	2844.6	380	410	380			
GR	4392.0	24.7	4389.9	39.7	4389.7	110.4	4387.4	145.8	4388.2	179.6
GR	4388.2	371.8	4384.5	798.5	4387.4	849.4	4385.5	868.4	4385.3	948.5
GR	4384.2	974.5	4384.0	1030.4	4384.7	1055.1	4386.5	1086.9	4392.0	1145.4
GR	4393.5	1214.6	4392.9	1239.6	4389.8	1273.3	4384.5	1325.1	4384.1	1400.5
GR	4384.1	1617.0	4383.8	1679.1	4384.1	1741.9	4383.8	1800.3	4383.8	1925.9
GR	4384.1	2012.4	4386.7	2050.4	4383.8	2065.1	4383.7	2106.6	4383.3	2271.0
GR	4383.3	2553.0	4383.9	2598.7	4383.7	2658.5	4383.9	2690.3	4386.3	2707.0
GR	4386.7	2724.0	4385.7	2744.6	4384.6	2767.2	4383.6	2779.5	4371.6	2787.5
GR	4371.6	2831.5	4383.8	2844.6	4385.1	2854.0	4384.2	2879.2	4385.0	2912.1
GR	4384.8	2924.6	4387.2	2941.2	4386.9	2961.4	4385.6	2989.3	4386.0	3024.2
GR	4387	3220	4391	3225						
NH	4	.500	802.0	.055	3116.5	.025	3189.5	.040	3500	
X1	55.65	66	3116.5	3189.5	700	1000	1050			
GR	4391.0	8.8	4388.7	156.1	4388.9	304.6	4387.1	319.6	4387.1	343.8
GR	4388.9	383.8	4387.8	415.8	4388.4	453.4	4385.5	479.1	4389.8	544.1
GR	4386.5	600.8	4386.0	661.3	4388.5	680.9	4385.2	711.3	4387.7	763.7
GR	4385.6	802.0	4386.0	907.2	4387.3	945.2	4386.8	1007.2	4389.0	1056.0
GR	4394.1	1108.9	4403.0	1214.8	4402.6	1588.8	4384.7	1639.5	4383.0	1699.4
GR	4383.0	1763.6	4386.8	1809.0	4384.6	1841.9	4384.9	1916.8	4384.7	2015.4
GR	4384.3	2071.0	4384.3	2132.8	4384.1	2190.4	4384.1	2491.8	4384.3	2506.3
GR	4385.4	2517.3	4386.9	2526.1	4386.0	2533.7	4387.1	2539.2	4386.5	2544.5
GR	4384.2	2556.4	4384.3	2598.1	4384.1	2657.7	4384.0	2721.6	4383.6	2780.1
GR	4383.7	2835.7	4383.7	2878.4	4383.7	2906.5	4383.6	2924.9	4383.8	2975.0
GR	4383.7	3023.9	4383.8	3056.5	4387.0	3073.4	4388.0	3089.9	4388.2	3116.5
GR	4372.0	3129.9	4372.0	3166.6	4383.1	3174.0	4384.1	3189.5	4382.9	3225.6
GR	4384.1	3261.3	4384.8	3284.3	4384.2	3324.7	4386.7	3351.9	4387.6	3376.6
	4391	3500								
NH	4	.500	831.9	.045	3089.6	.025	3164.3	.040	3820.9	
X1	69.35	80	3089.6	3164.3	670	1050	1370			
GR	4390.1	0.0	4389.0	175.5	4387.5	238.0	4388.3	409.4	4387.0	457.3

GR	4387.0	533.4	4386.3	650.4	4386.2	676.6	4388.7	700.6	4384.8	754.2
GR	4385.0	831.9	4384.6	945.3	4384.3	985.1	4384.3	1226.3	4386.5	1254.6
GR	4400.5	1356.5	4401.3	1835.6	4393.8	1900.1	4392.5	1962.9	4392.7	2089.6
	4384.8	2146.0	4384.8	2160.3	4391.2	2183.9	4387.9	2212.7	4384.1	2249.2
	4387.7	2323.2	4387.7	2389.1	4387.6	2477.6	4385.2	2484.6	4384.8	2544.2
GR	4382.4	2632.6	4382.9	2662.7	4382.9	2784.9	4385.7	2935.8	4385.2	2964.8
GR	4385.3	2988.5	4387.9	3014.6	4388.3	3089.6	4373.0	3099.3	4373.0	3139.5
GR	4380.8	3143.3	4384.4	3152.4	4385.7	3164.3	4385.3	3178.7	4383.5	3201.3
GR	4384.2	3222.8	4384.8	3249.1	4385.2	3277.7	4385.2	3327.0	4385.0	3337.0
GR	4385.4	3357.5	4385.8	3378.4	4387.1	3396.4	4387.3	3409.3	4386.5	3426.3
GR	4386.0	3446.2	4385.9	3473.0	4385.5	3498.8	4385.9	3528.2	4385.7	3553.4
GR	4385.8	3575.4	4385.8	3592.6	4384.9	3605.1	4385.6	3620.7	4382.5	3625.4
GR	4382.6	3633.2	4384.4	3636.3	4383.8	3650.4	4384.2	3668.9	4384.9	3683.1

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GR	4384.9	3691.5	4385.5	3698.8	4385.8	3709.6	4386.0	3722.0	4384.3	3736.7
GR	4383.5	3750.1	4382.5	3760.9	4382.0	3775.3	4385.5	3791.6	4398.5	3820.9
NH	4	.500	846.3	.045	3923.7	.025	4020.4	.040	4394.5	
X1	78.85	92	3923.7	4020.4	430	780	950			
GR	4390.8	0.0	4390.7	22.7	4389.6	61.6	4389.5	138.4	4388.7	237.3
GR	4387.3	436.9	4386.3	467.4	4388.7	487.4	4386.3	548.7	4386.2	613.3
GR	4385.3	660.9	4388.8	686.4	4389.0	691.5	4385.6	738.9	4385.3	846.3
GR	4384.7	937.0	4384.7	1066.9	4385.0	1117.2	4384.6	1174.3	4384.5	1352.2
GR	4384.9	1465.4	4390.8	1547.2	4401.0	1660.5	4400.1	1992.0	4393.1	2042.8
GR	4393.8	2117.7	4391.7	2180.8	4385.5	2279.7	4390.7	2291.2	4388.0	2325.4
GR	4383.8	2339.7	4383.7	2467.3	4384.2	2500.1	4384.0	2616.2	4383.6	2647.5
	4383.9	2771.2	4384.8	2794.4	4384.8	2900.1	4385.4	2973.7	4386.0	2996.7
	4386.0	3037.4	4385.3	3069.4	4386.2	3131.3	4387.7	3157.7	4386.7	3178.5
GR	4386.7	3191.0	4387.1	3245.4	4387.2	3297.0	4388.6	3376.2	4388.2	3389.1
GR	4387.9	3408.6	4388.2	3482.9	4389.4	3536.6	4389.3	3558.7	4388.6	3592.5
GR	4388.6	3630.1	4386.0	3652.1	4385.6	3684.2	4385.8	3714.1	4385.9	3753.3
GR	4385.4	3809.1	4384.4	3825.9	4384.1	3838.9	4384.5	3863.7	4388.6	3892.4
GR	4384.7	3902.2	4385.3	3908.7	4386.0	3916.4	4385.3	3923.7	4373.5	3938.0
GR	4373.5	3981.4	4379.1	3988.4	4380.6	3993.8	4380.1	4001.7	4382.7	4011.6
GR	4386.0	4020.4	4387.6	4030.4	4387.8	4034.6	4384.9	4048.4	4384.8	4060.8
GR	4383.6	4094.6	4383.2	4121.7	4383.5	4217.6	4383.4	4278.8	4386.5	4300.7
GR	4384.1	4308.7	4384.1	4323.6	4384.0	4344.4	4386.0	4353.2	4390.5	4369.0
GR	4396.8	4384.1	4402.0	4394.5	0.0	0.0	0.0	0.0	0.0	0.0
NH	5	.50	844.2	.100	2494.8	.045	4263.1	.025	4353.0	.040
NH	5009.9									
X1	84.05	86	4263.1	4353.0	470	500	520			
GR	4393.7	35.4	4393.5	49.6	4391.0	68.1	4389.0	72.9	4389.2	97.2
GR	4387.1	699.5	4386.5	765.5	4387.1	844.2	4389.3	862.9	4386.9	919.6
GR	4385.9	1074.6	4386.3	1181.8	4385.3	1414.2	4385.3	1452.2	4385.5	1492.9
GR	4385.8	2494.8	4390.0	2532.9	4390.0	2544.6	4389.5	2564.9	4385.0	2590.3
GR	4384.8	2685.9	4384.0	2721.0	4384.0	2738.8	4384.8	2758.8	4385.6	2769.8
GR	4386.0	3374.6	4386.8	3435.1	4386.2	3521.1	4386.2	3553.5	4387.0	3636.0
GR	4387.0	3677.3	4386.8	3708.5	4388.1	3754.4	4387.7	3873.8	4388.5	3888.5
GR	4388.4	4017.6	4388.9	4023.7	4388.9	4034.9	4387.5	4070.0	4387.8	4096.3
GR	4387.8	4126.3	4388.8	4146.7	4388.9	4191.2	4388.5	4196.1	4387.5	4203.0
GR	4386.4	4213.2	4386.3	4225.1	4385.7	4237.6	4385.1	4250.2	4384.7	4263.1
	4382.9	4267.2	4379.7	4274.8	4373.9	4282.1	4373.9	4285.2	4376.6	4341.4
GR	4382.2	4345.6	4385.7	4353.0	4387.5	4364.6	4388.6	4374.5	4389.8	4379.3
GR	4387.0	4411.8	4387.7	4437.3	4386.0	4554.2	4386.1	4584.2	4386.1	4593.2
GR	4386.3	4603.6	4385.7	4634.9	4385.7	4678.6	4385.3	4716.8	4385.2	4769.1
GR	4385.3	4788.7	4384.6	4795.3	4385.1	4802.8	4385.8	4806.9	4384.8	4826.2

GR	4385.1	4852.0	4385.3	4880.5	4385.4	4912.3	4385.7	4937.2	4386.5	4950.8
GR	4386.7	4965.3	4387.2	4970.9	4387.1	4977.7	4387.4	4987.4	4387.7	4997.5
GR	4388.2	5009.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H	5	.25	1608.8	.100	2792.2	.045	4077.5	.025	4142.7	.040
NH	5808.2									
X1	96.25	85	4077.5	4142.7	1000	1000	1220			
GR	4393.7	29.8	4393.6	54.1	4390.5	100.0	4390.5	254.5	4392.6	287.2
GR	4389.9	302.3	4389.8	683.3	4389.2	945.4	4389.6	1026.5	4389.3	1433.0
GR	4388.8	1552.0	4389.2	1608.8	4388.9	1693.5	4388.0	2035.4	4387.7	2094.4
GR	4389.2	2107.9	4387.3	2115.0	4389.1	2156.1	4389.3	2196.8	4392.3	2250.7

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GR	4392.5	2266.2	4392.0	2299.3	4389.6	2342.6	4389.2	2372.7	4388.2	2389.4
GR	4387.2	2497.5	4385.8	2534.0	4387.9	2570.6	4386.1	2730.5	4385.8	2792.2
GR	4386.4	2832.9	4385.8	2864.5	4387.0	3307.7	4387.4	3356.3	4386.9	3407.8
GR	4386.9	3564.9	4388.6	3891.7	4389.6	3938.8	4389.7	4005.4	4390.2	4021.5
GR	4390.1	4030.9	4389.3	4042.9	4389.3	4054.8	4392.8	4064.7	4392.4	4071.8
GR	4389.9	4077.5	4374.5	4087.3	4374.5	4129.0	4384.0	4133.4	4386.8	4142.7
GR	4388.2	4151.5	4387.6	4167.2	4385.0	4187.5	4387.2	4224.6	4388.9	4291.3
GR	4388.5	4359.3	4387.6	4408.8	4386.9	4449.4	4385.0	4547.7	4385.0	4556.3
GR	4385.8	4580.4	4385.3	4637.2	4385.9	4694.9	4387.0	4712.3	4387.4	4731.1
GR	4386.0	4759.2	4386.8	5002.5	4386.3	5146.9	4386.8	5312.7	4386.3	5329.5
GR	4387.2	5345.1	4387.1	5371.8	4387.3	5405.9	4387.8	5438.3	4388.9	5467.3
GR	4388.7	5490.9	4389.4	5518.9	4390.4	5560.0	4391.5	5595.9	4392.4	5642.4
GR	4394.0	5678.6	4395.4	5718.5	4396.6	5763.4	4397.4	5790.1	4397.9	5808.2
H	5	.25	3989.7	.100	5512.7	.045	7308.6	.025	7354.8	.040
H	8295.6									
X1	105.55	76	7308.6	7354.8	980	730	930			
GR	4397.3	22.7	4393.6	53.8	4392.9	86.3	4390.8	1050.1	4391.9	1100.0
GR	4390.3	1117.2	4390.4	1189.1	4389.6	1843.6	4390.6	1900.0	4389.5	1906.8
GR	4387.9	2628.5	4389.2	2688.2	4389.3	2743.9	4388.3	2747.6	4388.2	2753.5
GR	4387.5	3522.5	4386.8	3606.5	4387.9	3656.1	4387.7	3746.9	4386.7	3762.3
GR	4385.9	3989.7	4386.0	4532.6	4386.7	4576.9	4385.4	4583.6	4385.0	5413.3
GR	4385.7	5452.7	4385.7	5512.7	4386.8	5646.0	4386.3	5688.2	4387.4	5944.8
GR	4386.9	6029.4	4387.0	6209.9	4386.6	6287.3	4387.6	6322.6	4386.9	6326.6
GR	4388.1	6889.2	4388.9	6936.0	4391.1	6984.1	4390.5	6997.3	4389.7	7022.8
GR	4389.5	7059.5	4389.6	7094.5	4389.3	7123.7	4388.7	7142.6	4387.1	7166.5
GR	4386.5	7180.6	4386.5	7195.5	4385.3	7209.5	4385.7	7238.9	4386.9	7265.2
GR	4387.0	7283.4	4387.5	7297.0	4386.9	7308.6	4375.0	7318.8	4375.0	7354.5
GR	4385.0	7354.8	4390.3	7363.4	4389.3	7381.0	4388.7	7456.2	4388.1	7552.9
GR	4388.0	7643.5	4388.5	7707.1	4388.6	7859.0	4390.6	7936.0	4389.3	7997.2
GR	4390.0	8019.0	4390.5	8047.8	4390.5	8071.2	4390.8	8080.1	4391.9	8101.0
GR	4392.0	8136.8	4392.3	8162.8	4393.4	8192.7	4394.2	8222.5	4395.2	8259.8
GR	4396.5	8295.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NH	5	.25	3226.2	.100	5189.7	.045	7192.2	.025	7244.1	.040
NH	7819.5									
X1	115.55	90	7192.2	7244.1	1050	750	1000			
GR	4394.0	0.0	4390.9	58.7	4389.4	935.8	4389.0	1137.1	4389.3	1252.4
GR	4387.9	2087.5	4388.8	2115.0	4388.3	2147.6	4387.6	2315.8	4386.6	3151.5
GR	4387.2	3188.3	4387.2	3223.9	4386.7	3226.2	4385.4	3981.3	4385.3	4672.8
	4385.4	4803.4	4386.8	4808.7	4387.3	4895.0	4387.0	5003.1	4387.0	5189.7
GR	4387.4	5312.7	4388.0	5350.8	4389.0	5360.9	4388.8	5396.3	4387.6	5402.4
GR	4388.2	5704.8	4389.6	5803.5	4391.2	5830.5	4388.9	5849.1	4389.0	5991.1
GR	4388.8	6073.9	4389.7	6164.0	4390.5	6180.7	4388.3	6244.0	4388.3	6271.6
GR	4389.8	6341.1	4389.1	6367.7	4389.0	6419.9	4390.2	6495.7	4389.3	6564.6

GR	4390.7	6595.1	4389.8	6602.9	4389.4	6634.9	4389.8	6674.5	4389.8	6694.9
GR	4390.2	6705.6	4390.5	6741.7	4390.2	6794.6	4389.9	6809.5	4390.1	6819.1
GR	4389.6	6831.7	4387.8	6848.1	4385.7	6862.2	4385.8	6887.2	4385.6	6918.1
	4384.9	6945.9	4384.7	6970.0	4384.5	7014.4	4384.6	7048.9	4385.3	7093.9
	4385.8	7136.5	4385.6	7167.3	4385.7	7185.8	4385.3	7192.2	4375.6	7198.5
	4375.6	7230.1	4383.8	7238.1	4389.5	7244.1	4389.2	7251.9	4389.8	7264.1
GR	4389.9	7278.2	4389.3	7301.0	4389.1	7323.3	4389.2	7379.0	4388.8	7412.1
GR	4389.0	7433.3	4389.1	7450.9	4388.8	7465.2	4389.4	7495.9	4389.6	7526.4
GR	4390.1	7545.1	4391.1	7553.0	4392.1	7557.7	4392.0	7586.5	4390.7	7620.5

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GR	4390.6	7660.1	4391.0	7692.7	4392.1	7725.5	4392.6	7773.7	4394.1	7819.5
NH	5	.25	2530.1	.100	4825.1	.045	6560.2	.025	6640.5	.040
NH	7360.4									
ET			9.1						5430	6740
X1	126.55	87	6560.2	6640.5	550	550	1100			
GR	4395.5	0.0	4390.5	50.4	4390.2	168.9	4391.5	207.6	4390.5	246.1
GR	4390.1	361.6	4390.1	619.6	4389.2	671.2	4390.6	704.1	4390.6	760.1
GR	4389.1	926.8	4389.0	1435.3	4389.8	1480.0	4389.5	1653.8	4389.0	1686.4
GR	4389.1	2183.5	4387.3	2530.1	4386.5	3173.8	4387.3	3243.6	4386.6	3267.9
GR	4386.5	3789.8	4387.2	3862.2	4386.4	3919.9	4386.4	4001.1	4387.3	4071.1
GR	4387.6	4197.7	4387.5	4373.7	4387.8	4627.1	4388.6	4776.9	4387.6	4825.1
GR	4388.9	4991.9	4388.8	5088.6	4388.3	5153.0	4388.3	5232.7	4388.9	5362.3
GR	4388.3	5392.8	4388.3	5641.3	4389.0	5950.7	4389.8	6241.2	4391.8	6351.5
GR	4391.2	6377.0	4391.0	6404.1	4390.9	6417.8	4388.3	6435.3	4386.6	6450.7
GR	4386.2	6478.2	4385.8	6507.7	4385.3	6533.1	4385.7	6553.3	4386.4	6560.2
	4383.6	6567.5	4376.2	6569.4	4376.2	6624.2	4384.7	6630.1	4386.1	6640.5
	4387.8	6651.7	4388.2	6666.6	4388.1	6688.1	4388.2	6726.2	4388.0	6760.5
GR	4388.3	6788.7	4390.2	6805.4	4390.0	6836.9	4390.2	6852.3	4390.7	6864.8
GR	4390.2	6871.7	4390.1	6883.7	4390.0	6901.6	4390.8	6917.9	4390.5	6932.3
GR	4390.0	6947.0	4389.5	6959.4	4390.8	6972.3	4391.0	6988.4	4390.4	7002.5
GR	4390.0	7016.7	4390.3	7041.3	4390.1	7072.0	4390.2	7099.5	4390.1	7114.7
GR	4390.6	7126.4	4390.5	7142.2	4390.2	7161.2	4390.1	7184.7	4391.0	7201.2
GR	4391.1	7232.5	4394.2	7360.4	0.0	0.0	0.0	0.0	0.0	0.0
NC				.3	.5					
NH	5	.25	2072.7	.100	5048.6	.045	7165.0	.035	7228.1	.040
NH	7925.0									
QT	2	6650	6650							
ET			9.1						5610	7228.1
X1	130.75	71	7165.0	7228.1	370	320	420			
X3	10							4388.0	4388.0	
GR	4393.3	0.0	4391.3	199.5	4388.6	313.0	4392.1	535.8	4392.3	570.6
GR	4391.1	597.1	4389.8	821.3	4390.2	1148.7	4388.5	1258.1	4388.7	1370.1
GR	4390.1	1438.2	4390.1	1643.8	4389.0	2072.7	4389.1	2393.5	4388.0	2679.1
GR	4387.8	2937.9	4388.9	3005.9	4389.6	3362.4	4390.0	3771.3	4390.0	3991.8
GR	4389.7	4084.7	4389.4	4286.5	4391.2	4458.8	4390.6	4562.2	4390.0	4669.6
GR	4390.1	4932.9	4391.3	5048.6	4390.1	5128.7	4390.4	5397.4	4389.8	5420.3
GR	4390.9	5446.4	4390.0	5495.7	4390.5	5511.6	4389.9	5535.7	4390.0	5581.2
GR	4390.1	5629.9	4389.8	5666.7	4389.8	5718.1	4390.0	5756.9	4390.0	5947.3
GR	4390.3	5974.4	4389.8	6159.1	4390.4	6352.3	4390.9	6410.8	4390.4	6458.5
GR	4390.7	6588.1	4390.5	6626.9	4389.5	6656.6	4388.9	6690.9	4388.8	6793.0
	4388.2	6829.9	4388.6	6939.6	4388.3	6973.3	4388.4	7006.1	4388.0	7041.0
	4389.8	7151.4	4389.7	7165.0	4376.8	7183.9	4376.8	7217.6	4387.8	7228.1
GR	4392.3	7235.7	4392.7	7246.6	4392.5	7262.8	4392.7	7294.5	4392.3	7327.6
GR	4392.3	7358.1	4392.2	7389.6	4392.5	7431.1	4393.1	7454.2	4393.7	7486.5
GR	4403.7	7925.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

NH	8	.250	1258.1	.045	2072.7	0.250	2679.1	.045	3005.9	0.250
NH	5128.7	.040	7165.0	.025	7228.1	.045	7549.0			
GB	1.05	1.5	3.0		33	1	498	1.1	4378.7	4378.7
ET			9.11						5600	7300

BT and GR points edited to match at ends, and to not cross

1

Lost Chord

X1	131.17	71	7165.0	7228.1	42	42	42			
X2			1	4390.3	4389.7					
X3	10							4388.0	4388.0	
BT	37	0	4393.3	0	49	4393.23	0	349	4391.81	0
BT	649	4391.16	0	949	4391.63	0	1021	4391.58	0	1176
BT	4392.5	0	1249	4392.09	0	1494	4390.26	0	1549	4390.38
BT	0	1731	4390.85	0	1871	4390.33	0	2149	4391.08	0
BT	2449	4391.15	0	2749	4391.28	0	3049	4390.67	0	3199
BT	4390.9	0	3349	4391.14	0	3499	4391.44	0	3649	4391.63
BT	0	3799	4392.08	0	3949	4391.56	0	4249	4391.05	0
BT	4549	4391.43	0	4849	4391.31	0	5149	4390.98	0	5449
BT	4391.4	0	5749	4391.14	0	6049	4391.01	0	6349	4391.07
BT	0	6649	4390.87	0	6949	4389.69	0	7044	4389.83	0
BT	7220	4392.49	0	7269	4392.49	0	7364	4391.66	0	7549
BT	4394.2	0								
GR	4393.3	0.0	4391.3	199.5	4390.0	313.0	4391.1	535.8	4391.1	570.6
GR	4391.1	597.1	4389.8	821.3	4390.2	1148.7	4390.0	1258.1	4390.0	1370.1
GR	4390.1	1438.2	4390.1	1643.8	4390.0	2072.7	4390.0	2393.5	4390.0	2679.1
GR	4390.0	2937.9	4390.0	3005.9	4390.0	3362.4	4390.0	3771.3	4390.0	3991.8
GR	4389.7	4084.7	4390.0	4286.5	4391.2	4458.8	4390.6	4562.2	4390.0	4669.6
GR	4390.1	4932.9	4391.0	5048.6	4390.1	5128.7	4390.4	5397.4	4389.8	5420.3
GR	4390.9	5446.4	4390.0	5495.7	4390.5	5511.6	4389.9	5535.7	4390.0	5581.2
GR	4390.1	5629.9	4389.8	5666.7	4389.8	5718.1	4390.0	5756.9	4390.0	5947.3
GR	4390.3	5974.4	4389.8	6159.1	4390.4	6352.3	4390.9	6410.8	4390.4	6458.5
GR	4390.7	6588.1	4390.5	6626.9	4389.5	6656.6	4388.9	6690.9	4388.8	6793.0
GR	4388.2	6829.9	4388.6	6939.6	4388.3	6973.3	4388.4	7006.1	4388.0	7041.0
GR	4389.8	7151.4	4389.7	7165.0	4378.7	7183.9	4378.7	7217.6	4387.8	7228.1
GR	4392.3	7235.7	4392.4	7246.6	4392.4	7262.8	4392.0	7294.5	4391.6	7327.6
GR	4391.6	7358.1	4391.6	7389.6	4391.6	7431.1	4391.6	7454.2	4391.6	7486.5
GR	4394.2	7549.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

NC				.3	.5					
NH	8	.100	1220	.045	2250	.100	2580	.045	3075	.250
NH	4570	.040	6230	.025	6660	.040	6680			
ET			9.1						5300	6660
X1	132.57	45	6230	6660	100	570	550			
GR	4391.6	0	4391	560	4390	750	4389.1	860	4390	1000
GR	4389	1220	4388	1520	4387.4	1920	4388	2250	4388.2	2320
GR	4388	2390	4388	2400	4388	2580	4389	2610	4389	2855
GR	4390	2915	4390	3000	4390	3075	4390.2	3225	4390	3685
GR	4388	3820	4386	3950	4386	4250	4385	4370	4386	4460
GR	4388	4470	4390	4570	4392	4620	4392	4830	4392.2	4900
GR	4393	5000	4393	5150	4392	5220	4390	5280	4390	5350
GR	4390	5650	4390	6000	4390	6140	4390	6230	4383	6320
GR	4383	6430	4380	6440	4380	6620	4390	6660	4393	6680

NC				.1	.3					
NH	7	.100	2820	.045	5000	.025	5200	.045	6090	.035
NH	6980	.025	7265	.045	7635					

X-sect 155.07 thru 189.07 changed according to STMROSE1.DAT

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QT        2       5000       5000
ET                            9.1                                                                  6000        7135
1
X1     155.57         48       6980       7265       1700       2065       2065
GR     4391.4       1600       4390       2200       4390       2820       4389       2870       4388       3260
GR     4387.4       3420       4388       3860       4388       4010       4389       4200       4389       4320
GR       4390       4530       4390       5000     4382.5       5020     4382.5       5180       4390       5200
GR       4390       5450       4388       5600       4386       5680       4388       5710       4388       5870
GR       4390       5880       4388       5950       4387       6000       4388       6050       4390       6075
GR       4392       6090       4390       6160       4388       6230       4386       6250     4385.4       6420
GR       4384       6650       4382       6660       4382       6720       4386       6735       4386       6980
GR       4381       7005       4381       7100   4382.46        7193   4383.82        7205   4389.49        7265
GR     4391.8       7365   4393.28        7395   4393.24        7440     4392.2       7490   4391.27        7523
GR     4390.8       7560   4390.71        7585       4392       7635

NH          9        .10       2950       .045       4250       .025       4479       .040       4500       .100
NH       4790        .035      6000       .040       6430       .025       6715       .045       7200
ET                            9.1                                                                  5200        6590
X1     169.57         40       6430       6715       1070       1390       1380
GR     4391.5       2000       4391       2230       4390       2700       4389       2950       4389       3100
GR       4388       3350       4388       3950       4390       4100       4390       4250       4390       4275
GR       4390       4300       4383       4325       4383       4435       4390       4479       4390       4500
GR       4390       4760       4386       4790     4384.8       4890       4386       5180       4386       5290
GR       4384       5340     4383.5       5430       4384       5520       4384       5700       4386       5820
GR       4386       5900       4388       5960       4390       6000       4388       6020       4388       6420
         4388       6430       4386       6460       4382       6470       4382       6570     4382.5       6685
GR     4388.5       6715   4392.71        6812   4391.67        6880   4392.68        6945   4393.99        7200

NH          8        .100      3900       .025       4050       .040       4100       .100       4710       .040
NH       5310        .045      6300       .025       6536       .045       6570
ET                            9.1                                                                  5200        6420
X1     180.57         41       6300       6536       1090       1060       1060
GR       4392       2000       4392       2400       4391       2700       4392       2950       4391       3200
GR       4391       3570       4391       3840       4390       3900       4385       3935       4384       3980
GR       4384       4025       4390       4050       4390       4100     4389.7       4700       4388       4705
GR       4386       4710     4386.8       4870       4386       4930     4385.3       5020       4386       5110
GR       4388       5115       4388       5220       4386       5230       4388       5260       4388       5310
GR       4386       5350       4385       5390       4386       5405     4387.6       5490       4386       5610
GR       4386       5840     4384.8       6000       4386       6160       4388       6270       4388       6300
GR       4383       6330       4383       6400     4384.5       6502     4388.9       6536     4396.3       6548
GR     4396.6       6570

NH          4        .100      3430       .040       4860       .025       5180       .050       5370
ET                    7.1       9.1                                                     3860       4970       3860       4970
   ineffective flow area encroached
X1     189.07         33       4860       5180        890        640        640
GR       4392       1700       4391       1800       4390       2000       4390       2900       4390       3380
GR       4388       3430     4387.8       3540       4388       3600     4388.5       3650       4388       3720
GR     4387.3       3900     4387.5       4000     4387.5       4400       4388       4490       4388       4530
GR       4388       4720       4388       4830       4388       4860       4384       4870       4384       4960
         4386.4       5005   4386.71        5067   4385.24        5070     4386.6       5080     4386.6       5151
GR       4393       5180   4395.53        5192   4395.66        5238   4399.39        5262   4399.57        5288
GR     4399.7       5298   4398.63        5336   4401.61        5370

   Start Normal Bridge Routine
```

GR Points used to model effective area within channel
X3 Card used to model effective area outside channel

NC	.250	.250	.025	.1	.3				-.1	
ET			9.1						3062.0	3697
	ineffective area between arches is coded out with GR data									
X1	196.17	20	3061.1	3697	550	450	450			
X3	10							4391.5	4391.5	
GR	4394	1800	4388	1830	4387	2242	4386	2664	4386	3000
GR	4385	3061.1	4385	3075.25	4385	3126.76	4385	3140	4400	3141
GR	4400	3400	4400	3569	4385	3569.5	4385	3583.5	4385	3683.25
GR	4385	3683.26	4385	3697	4388	3770	4389	3865	4400	4048

Mira Loma Road Extension -- Normal Bridge
Downstream face of Bridge

NC	.04	.04	.016	.3	.5					
ET			9.11						3080.65	3683.44
X1	196.37	76	3080.65	3683.44	20	20	20			
X3	10							4392	4392	
BT	-76	1800	4393.7	4393.7	1829.9	4393.55	4388	2347.18	4391.52	4387
BT		2664	4393.46	4386	3000	4395.51	4386	3061.1	4395.83	4385
BT		3080.65	4395.93	4384.86	3080.66	4395.93	4388.86	3082.65	4395.94	4390.86
		3089.15	4395.97	4392.86	3095.65	4396.01	4390.86	3097.64	4396.02	4388.86
		3097.65	4396.02	4384.86	3099.50	4396.03	4384.89	3099.51	4396.03	4388.89
BT		3101.50	4396.04	4390.89	3108.00	4396.07	4392.89	3114.5	4396.10	4390.89
BT		3116.49	4396.12	4388.89	3116.50	4396.12	4384.89	3118.35	4396.13	4384.90
BT		3118.36	4396.13	4388.87	3120.35	4396.14	4390.87	3126.85	4396.17	4392.87
BT		3133.35	4396.20	4390.87	3135.34	4396.21	4388.87	3135.35	4396.21	4384.87
BT		3140	4396.24	4385	3400	4397.59	4387	3569.5	4396.63	4385
BT		3581.94	4396.56	4384.9	3581.95	4396.56	4388.91	3583.94	4396.55	4390.91
BT		3589.94	4396.52	4392.91	3595.94	4396.48	4390.91	3597.93	4396.47	4388.91
BT		3597.94	4396.47	4384.91	3599.04	4396.47	4384.89	3599.05	4396.47	4388.89
BT		3601.04	4396.45	4390.89	3607.04	4396.42	4392.89	3613.04	4396.39	4390.89
BT		3615.03	4396.38	4388.89	3615.04	4396.38	4384.89	3616.14	4396.37	4384.89
BT		3616.15	4396.37	4388.89	3618.14	4396.36	4390.89	3624.14	4396.33	4392.89
BT		3630.14	4396.29	4390.89	3632.13	4396.28	4388.89	3632.14	4396.28	4384.9
BT		3633.24	4396.27	4384.93	3633.25	4396.27	4388.93	3635.24	4396.26	4390.93
BT		3641.24	4396.23	4392.93	3647.24	4396.19	4390.93	3649.23	4396.18	4388.93
BT		3649.24	4396.18	4384.93	3650.34	4396.18	4384.89	3650.35	4396.18	4388.89
BT		3652.34	4396.16	4390.89	3658.34	4396.13	4392.89	3664.34	4396.10	4390.89
BT		3666.33	4396.09	4388.89	3666.34	4396.09	4384.89	3667.44	4396.08	4384.8
BT		3667.45	4396.08	4388.82	3669.44	4396.07	4390.82	3675.44	4396.03	4392.82
BT		3681.44	4396.00	4390.82	3683.43	4395.99	4388.82	3683.44	4395.99	4384.82
BT		3695.34	4395.92	4385	3800	4395.81	4388	3865	4395.84	4389
BT		4048	4400	4400						
GR	4393.7	1800	4388	1829.9	4387	2347.18	4386	2664.00	4386	3000.00
GR	4385	3061.1	4384.86	3080.65	4384.86	3080.66	4384.86	3082.65	4384.86	3089.15
GR	4384.9	3095.65	4384.86	3097.64	4384.86	3097.65	4384.89	3099.50	4384.89	3099.51
	4384.9	3101.50	4384.89	3108.00	4384.89	3114.5	4384.89	3116.49	4384.89	3116.50
GR	4384.9	3118.35	4384.87	3118.36	4384.87	3120.35	4384.87	3126.85	4384.87	3133.35
GR	4384.9	3135.34	4384.87	3135.35	4385	3140	4387	3400	4385	3569.5

GR	4384.9	3581.94	4384.91	3581.95	4384.91	3583.94	4384.91	3589.94	4384.91	3595.94
GR	4384.9	3597.93	4384.91	3597.94	4384.89	3599.04	4384.89	3599.05	4384.89	3601.04
	4384.9	3607.04	4384.89	3613.04	4384.89	3615.03	4384.89	3615.04	4384.89	3616.14
GR	4384.9	3616.15	4384.89	3618.14	4384.89	3624.14	4384.89	3630.14	4384.89	3632.13
GR	4384.9	3632.14	4384.93	3633.24	4384.93	3633.25	4384.93	3635.24	4384.93	3641.24
GR	4384.9	3647.24	4384.93	3649.23	4384.93	3649.24	4384.89	3650.34	4384.89	3650.35
GR	4384.9	3652.34	4384.89	3658.34	4384.89	3664.34	4384.89	3666.33	4384.89	3666.34
GR	4384.8	3667.44	4384.82	3667.45	4384.82	3669.44	4384.82	3675.44	4384.82	3681.44
GR	4384.8	3683.43	4384.82	3683.44	4385	3695.34	4388	3800	4389	3865
GR	4400	4048								

Upstream face of bridge

ET			9.11						3080.65	3683.44
X1	196.97	76	3080.65	3683.44	60	60	60			
X3	10							4392	4392	
BT	-76	1800	4393.7	4393.7	1829.9	4393.55	4388	2347.18	4391.52	4387
BT		2664	4393.46	4386	3000	4395.51	4386	3061.1	4395.83	4385
BT		3080.65	4395.93	4384.86	3080.66	4395.93	4388.86	3082.65	4395.94	4390.86
BT		3089.15	4395.97	4392.86	3095.65	4396.01	4390.86	3097.64	4396.02	4388.86
BT		3097.65	4396.02	4384.86	3099.50	4396.03	4384.84	3099.51	4396.03	4388.84
BT		3101.50	4396.04	4390.84	3108.00	4396.07	4392.84	3114.5	4396.10	4390.84
BT		3116.49	4396.12	4388.84	3116.50	4396.12	4384.84	3118.35	4396.13	4384.80
BT		3118.36	4396.13	4388.81	3120.35	4396.14	4390.81	3126.85	4396.17	4392.81
BT		3133.35	4396.20	4390.81	3135.34	4396.21	4388.81	3135.35	4396.21	4384.81
BT		3140	4396.24	4385	3400	4397.59	4387	3569.5	4396.63	4385
BT		3581.94	4396.56	4384.9	3581.95	4396.56	4388.94	3583.94	4396.55	4390.94
BT		3589.94	4396.52	4392.94	3595.94	4396.48	4390.94	3597.93	4396.47	4388.94
		3597.94	4396.47	4384.94	3599.04	4396.47	4384.94	3599.05	4396.47	4388.94
		3601.04	4396.45	4390.94	3607.04	4396.42	4392.94	3613.04	4396.39	4390.94
BT		3615.03	4396.38	4388.94	3615.04	4396.38	4384.94	3616.14	4396.37	4384.95
BT		3616.15	4396.37	4388.95	3618.14	4396.36	4390.95	3624.14	4396.33	4392.95
BT		3630.14	4396.29	4390.95	3632.13	4396.28	4388.95	3632.14	4396.28	4384.9
BT		3633.24	4396.27	4384.91	3633.25	4396.27	4388.91	3635.24	4396.26	4390.91
BT		3641.24	4396.23	4392.91	3647.24	4396.19	4390.91	3649.23	4396.18	4388.91
BT		3649.24	4396.18	4384.91	3650.34	4396.18	4384.91	3650.35	4396.18	4388.91
BT		3652.34	4396.16	4390.91	3658.34	4396.13	4392.91	3664.34	4396.10	4390.91
BT		3666.33	4396.09	4388.91	3666.34	4396.09	4384.91	3667.44	4396.08	4384.9
BT		3667.45	4396.08	4388.89	3669.44	4396.07	4390.89	3675.44	4396.03	4392.89
BT		3681.44	4396.00	4390.89	3683.43	4395.99	4388.90	3683.44	4395.99	4384.89
BT		3695.34	4395.92	4385	3800	4395.81	4388	3865	4395.84	4389
BT		4048	4400	4400						
GR	4393.7	1800	4388	1829.9	4387	2347.18	4386	2664.00	4386	3000.00
GR	4385	3061.1	4384.86	3080.65	4384.86	3080.66	4384.86	3082.65	4384.86	3089.15
GR	4384.9	3095.65	4384.86	3097.64	4384.86	3097.65	4384.84	3099.50	4384.84	3099.51
GR	4384.8	3101.50	4384.84	3108.00	4384.84	3114.5	4384.84	3116.49	4384.84	3116.50
GR	4384.8	3118.35	4384.81	3118.36	4384.81	3120.35	4384.81	3126.85	4384.81	3133.35
GR	4384.8	3135.34	4384.81	3135.35	4385	3140	4387	3400	4385	3569.5
GR	4384.9	3581.94	4384.94	3581.95	4384.94	3583.94	4384.94	3589.94	4384.94	3595.94
GR	4384.9	3597.93	4384.94	3597.94	4384.94	3599.04	4384.94	3599.05	4384.94	3601.04
GR	4384.9	3607.04	4384.94	3613.04	4384.94	3615.03	4384.94	3615.04	4384.95	3616.14
GR	4384.9	3616.15	4384.95	3618.14	4384.95	3624.14	4384.95	3630.14	4384.95	3632.13
GR	4384.9	3632.14	4384.91	3633.24	4384.91	3633.25	4384.91	3635.24	4384.91	3641.24
GR	4384.9	3647.24	4384.91	3649.23	4384.91	3649.24	4384.91	3650.34	4384.91	3650.35
	4384.9	3652.34	4384.91	3658.34	4384.91	3664.34	4384.91	3666.33	4384.91	3666.34

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GR   4384.9    3667.44   4384.89   3667.45   4384.89   3669.44   4384.89   3675.44   4384.89   3681.44
GR   4384.9    3683.43   4384.89   3683.44      4385   3695.34      4388      3800      4389      3865
GR      4400       4048
   Just upstream of bridge
   Inneffective areas coded out with NC outside of channel and GR inside


NC      .250       .250       .025         .1         .3
ET                            9.1                                                            3062      3697
X1   197.17         20     3061.1       3697         20         20         20                 .03
X3       10                                                                  4391.5    4391.5
GR     4394       1800       4388       1830       4387       2242       4386      2664    4386      3000
GR     4385     3061.1       4385    3075.25       4385    3126.76       4385      3140    4400      3141
GR     4400       3400       4400       3569       4385     3569.5       4385    3583.5    4385   3683.25
GR     4385    3683.26       4385       3697       4388       3770       4389      3865    4400      4048

   Bridge Routine Over


NC        0          0          0         .1         .3
NH        6       .040       1100       .040       1450       .030       1510      .080    1700      .040
NH     2050       .250       2350
ET                  7.1        9.1                                       1100      2100    1447      2050
   ineffective flow area encroached
X1   199.57         20       1700       2050        425        250        250
GR     4395          0       4394         80       4390        250       4389       270    4388       610
GR     4388       1100       4388       1400       4390       1450     4386.8      1475  4386.8      1500
GR     4390       1510       4385       1550       4385       1700       4385      2000    4390      2040
GR     4390       2050     4389.7       2100       4388       2170       4390      2190    4392      2350
     4399       0     4399       80     4399      250     4399      270     4399      610
     4399     1100     4399     1397 4398.54     1425  4387.9     1447  4387.9     1459
   4385.4     1464 4385.40     1467 4385.40     1473 4387.43     1487 4387.44     1488


NH        6       .045        750       .045       1475       .030       1500      .045    1950       .03
NH   1984.5       .045       2000
ET                  7.1        9.1                                        750      2000    1435      1985
   Cross Section "H" on existing FIRM
   ineffective flow area encroached
X1   201.57         16       1950     1984.5        225        200        200
GR     4394          0       4392         30       4390        130       4389       150    4388       570
GR     4388        650       4388        750       4388       1200     4387.2      1475  4387.5      1500
GR   4387.1       1650       4390       1950     4387.5       1970     4387.5      1984    4392    1984.5
GR     4400       2000
     4388      650     4388      750  4388.5     1200 4388.06     1439 4385.56     1446
   4385.5     1453 4385.56     1459 4387.70     1465  4388.3     1475  4387.5     1500


NH        6       .045        650       .045       1475       .030       1500      .045    1950       .030
NH   1984.5       .045       2000
ET                  7.1        9.1                                        650      2000    1400      1980
   ineffective flow area encroached
1
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A1   202.07          0          0          0         50         50         50


NH        6       .045        450       .045       1490       .030       1530      .045    1900       .030
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NH     1990        .045        2030
ET                  7.1         9.1                                          450         2030        1370        1990
     ineffective flow area encroached
X1   202.47         22          1900        1990         40          40          40
R    4393           0           4392          20       4391          50        4391          200       4390          250
GR   4390         450           4390         620       4388         660        4389          670       4388          800
GR   4390         860           4390        1140       4389        1160        4389         1400       4388         1490
GR   4388        1530           4389        1630       4390        1900        4389         1970       4389         1989
GR   4392        1990           4400        2030

NC      0           0           0           .1          .3
NH      5        .045        3492         .03        3624        .045        3842          .03       3878         .045
NH   3964
ET                  7.1         9.1                                          1050        3964        3150        3878
     ineffective flow area encroached
X1   205.67         29          3842        3878         270         425         425
GR   4394.5          0.        4393.7        92.        4396.2        163.      4394.0        198.      4393.7        457.
GR   4396.9        535.        4396.1       912.        4393.0        981.      4393.7       1050.      4394.7       1141.
GR   4393.7       1413.        4390.9      1427.        4396.7       1439.      4392.8       1612.      4394.0       1730.
GR   4390.4       2105.        4387.9      2156.        4390.2       2207.      4388.2       3492.      4386.0       3556.
GR   4388.3       3624.        4387.7      3778.        4389.7       3827.      4395.0       3842.      4390.5       3856.
GR   4390.5       3876.        4390.5      3877.        4393.0       3878.      4413.0       3964.

NC      .030        .030        .025          .1          .3
ET                              9.1                                                                    1253.33     1841.00
X1   217.39         16          1807        1841         1250        1172        1172
GR   4402.7          0        4400.7         101       4397.6         137      4393.0         327       4394.0         400
GR   4389.0        412.        4389.0        422.       4393.5         442.     4391.8         869.      4392.9        1023.
GR   4392.0       1512.        4395.0      1807.        4391.2       1827.      4395.7       1841.      4402.5        1886.
R    4435.4       1975

ET                              9.1                                                                    2298.56     3211.00
X1   224.98         23          3150        3211         1160         759         759
GR   4413.7          0.        4402.9        109.       4406.4         122.     4404.4         174.      4409.2         383.
GR   4405.9        433.        4398.2        889.       4401.4         901.     4392.7         930.      4398.3         945.
GR   4397.0        972.        4394.3        983.       4396.5        1024.     4395.1        1816.      4395.8        2679.
GR   4394.9       2840.        4395.3      3109.        4399.7       3150.      4392.6       3162.      4402.1        3211.
GR   4417.2       3263.        4436.9      3315.        4450.6       3366.

ET                              9.1                                                                    782.75      1755.00
X1   235.23         19          1716        1755         960         1025        1025
GR   4426.8          0.        4412.6         35.       4404.6          43.     4409.0          55.      4404.3          67.
GR   4404.4         88.        4400.3         98.       4395.7         104.     4398.8         129.      4398.7         501.
GR   4400.1        659.        4398.7        824.       4400.3        1302.     4400.2        1594.      4401.8        1716.
GR   4398.1       1727.        4398.1      1739.        4403.3       1755.      4429.2       1868.
1
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QT       2        4750        4750
ET                              9.1                                                                    229.98      378.00
X1   269.39         14           313         378         2880        3416        3416
GR   4438.3          0.        4421.8         73.       4414.4         98.      4414.0         136.      4411.0         146.
GR   4410.7        313.        4407.0        320.       4407.0        330.      4410.2        341.      4409.6         364.
R    4412.7        378.        4415.5        516.       4415.2        640.      4422.3        754.

ET                              9.1                                                                    184.42      337.00
X1   273.00         21           300         337         240         240         361
GR   4444.8          0.        4422.0         52.       4422.4         58.      4413.5          85.      4411.4         115.
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GR   4413.5      120.     4413.2      162.     4411.8      174.     4413.1      179.     4413.4      250.
GR   4412.1      300.     4407.5      313.     4407.5      326.     4409.6      334.     4413.5      337.
GR   4415.2      366.     4413.4      409.     4423.1      519.     4423.1      534.     4425.3      547.
GR   4430.3      636.

ET                        9.1                                                              420.51     751.39
X1   283.16        29      652       724       840       1040      1016
GR   4443.8        0.     4422.7       80.     4415.9       100.     4418.2       109.     4415.8      313.
GR   4415.8      348.     4414.5      362.     4415.9       367.     4414.9       652.     4410.8      658.
GR   4410.8      664.     4414.4      679.     4415.5       724.     4413.5       744.     4415.4      763.
GR   4417.1      938.     4414.8      947.     4418.7       957.     4419.5       965.     4414.9      985.
GR   4417.7     1008.     4417.0     1024.     4418.5      1037.     4417.3      1061.     4419.2     1080.
GR   4417.9     1104.     4424.5     1268.     4426.8      1286.     4430.8      1391.

ET                        9.1                                                             3050.00    3130.00
X1   314.16        21      3050      3130       3100       3100      3100
GR   4432.5         0     4432.0       250     4429.8        360     4430.0       1700     4431.0      1800
GR   4429.6      2170     4427.5      2190     4429.5       2210     4428.8       3050     4417.4      3085
GR   4428.7      3130     4429.2      3500     4428.9       4060     4429.0       4139     4427.0      4230
GR   4429.0      4260     4429.3      4760     4427.0       4780     4429.3       4820     4430.0      4950
GR   4432.8      5200
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

*PROF 1
0

CCHV=      .100 CEHV=      .300
*SECNO 2.000

3265 DIVIDED FLOW

3280 CROSS SECTION      2.00 EXTENDED      1.04 FEET

      2.000      16.04    4386.04       .00    4386.04    4386.58       .54       .00       .00    4387.80
     6950.0      743.4     6206.6        .0      548.9     1001.9        .3        .0        .0    4385.50
        .00       1.35       6.19       .15       .080       .025       .080       .000   4370.00       .00
    .000440         0.         0.         0.          0          0          0       .00    209.71    244.49


*SECNO 7.300

3265 DIVIDED FLOW

      7.300      16.24    4386.24       .00        .00    4386.78       .54       .21       .00    4383.60
     6950.0      232.2     6712.4        5.4      487.7     1115.3       11.6       17.9       3.8    4382.90
        .02        .48       6.02       .46       .080       .025       .080       .000   4370.00    186.15
    .000360       420.       530.       530.          1          0          0       .00    538.63    847.63


*SECNO 13.900

3265 DIVIDED FLOW
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3301 HV CHANGED MORE THAN HVINS

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

13.900	16.04	4386.25	4380.05	.00	4387.31	1.07	.37	.16	4385.30
6950.0	520.0	6428.5	1.5	754.1	746.4	3.6	40.3	12.3	4385.00
.05	.69	8.61	.42	.080	.025	.080	.000	4370.20	205.20
.001008	570.	660.	660.	4	18	0	.00	726.74	1274.76

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 19.900

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

19.900	16.73	4387.33	.00	.00	4387.81	.48	.44	.06	4383.50
6950.0	1484.4	5465.2	.4	2196.2	872.9	1.5	69.1	25.6	4386.30
.08	.68	6.26	.27	.080	.025	.080	.000	4370.60	2581.85
.000572	520.	600.	600.	3	0	0	.00	1482.30	4178.45

*SECNO 23.900

23.900	16.95	4387.75	.00	.00	4388.01	.26	.18	.02	4384.80
6950.0	2231.0	4719.0	.0	3816.9	952.3	.0	108.5	43.3	4387.80
.11	.58	4.96	.00	.080	.025	.000	.000	4370.80	2746.22
.000333	450.	400.	400.	2	0	0	.00	1959.53	4705.76

*SECNO 29.100

3265 DIVIDED FLOW

29.100	17.13	4387.93	.00	.00	4388.17	.24	.17	.00	4389.00
6950.0	2731.5	4184.4	34.0	4614.1	823.5	70.8	167.9	66.7	4388.00
.16	.59	5.08	.48	.080	.025	.080	.000	4370.80	3208.57
.000314	500.	520.	520.	2	0	0	.00	2112.92	5334.26

1490 NH CARD USED
*SECNO 38.600

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.55

38.600	17.42	4388.32	.00	.00	4388.41	.09	.22	.02	4384.70
6950.0	3062.1	3521.7	366.3	4569.4	1042.9	479.3	347.5	136.2	4383.90

.31	.67	3.38	.76	.047	.025	.045	.000	4370.90	148.58
.000131	1450.	950.	1000.	2	0	0	.00	2188.69	2337.27

.HV= .300 CEHV= .500

1

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

1490 NH CARD USED

*SECNO 39.600

39.600	17.38	4388.38	.00	.00	4388.44	.07	.02	.01	4387.50
6950.0	3053.6	3398.1	498.3	5454.8	1156.1	539.5	385.4	150.9	4384.90
.34	.56	2.94	.92	.054	.025	.040	.000	4371.00	198.00
.000108	300.	100.	80.	1	0	0	.00	2447.51	2645.51

1490 NH CARD USED

*SECNO 40.400

3265 DIVIDED FLOW

40.400	17.43	4388.43	.00	.00	4388.46	.03	.01	.01	4388.30
6950.0	4730.5	2192.9	26.5	6841.4	915.6	78.6	402.0	156.6	4384.30
.36	.69	2.39	.34	.045	.025	.040	.000	4371.00	3.67
.000085	100.	80.	80.	2	0	0	.00	2629.30	2722.87

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.50	2.50	.00	18.00	2.00	890.00	1.75	4371.00	4371.00

*SECNO 40.750

6840, FLOW IS BY WEIR AND LOW FLOW

3265 DIVIDED FLOW

3420 BRIDGE W.S.= 4388.43 BRIDGE VELOCITY= 2.05 CALCULATED CHANNEL AREA= 811.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
4389.50	4388.50	.00	5332.	1664.	890.	895.	4389.50	4387.00	1748.

40.750	17.47	4388.47	.00	.00	4388.50	.03	.03	.00	4388.30
6950.0	4778.4	2143.2	28.3	6926.9	918.9	86.5	408.4	158.7	4384.30
.37	.69	2.33	.33	.045	.025	.040	.000	4371.00	3.27
.000084	35.	35.	35.	2	0	6	.00	2651.27	2730.54

1490 NH CARD USED

*SECNO 41.350

41.350	17.08	4388.48	.00	.00	4388.50	.02	.00	.00	4383.50
6950.0	4631.5	2186.1	132.5	8983.5	1081.5	216.7	418.0	161.4	4384.70
.38	.52	2.02	.61	.050	.025	.040	.000	4371.40	204.17
.000044	45.	55.	55.	0	0	0	.00	2462.09	2666.26

1

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
1490 NH CARD USED
*SECNO 45.150

3265 DIVIDED FLOW

45.150	16.89	4388.49	.00	.00	4388.52	.03	.02	.00	4383.60
6650.0	3980.2	2206.1	463.6	8721.0	972.2	928.8	509.6	185.0	4383.80
.48	.46	2.27	.50	.059	.025	.040	.000	4371.60	128.89
.000049	380.	380.	410.	1	0	0	.00	2915.14	3221.87

1490 NH CARD USED
*SECNO 55.650

3265 DIVIDED FLOW

55.650	16.54	4388.54	.00	.00	4388.57	.03	.05	.00	4388.20
6650.0	3996.2	2048.2	605.7	7375.5	877.7	752.7	680.5	230.8	4384.10
.69	.54	2.33	.80	.057	.025	.040	.000	4372.00	307.63
.000070	700.	1050.	1000.	0	0	0	.00	2460.54	3410.57

1490 NH CARD USED
*SECNO 69.350

3265 DIVIDED FLOW

69.350	15.61	4388.61	.00	.00	4388.63	.02	.06	.00	4388.30
6650.0	3277.2	1811.8	1561.1	5792.2	845.8	2194.4	844.4	275.6	4385.70
.94	.57	2.14	.71	.050	.025	.040	.000	4373.00	192.04
.000064	670.	1370.	1050.	0	0	0	.00	2723.10	3798.59

1490 NH CARD USED
*SECNO 78.850

3265 DIVIDED FLOW

78.850	15.15	4388.65	.00	.00	4388.67	.02	.03	.00	4385.30
6650.0	3654.8	1980.5	1014.8	8255.1	1099.8	1539.4	968.4	310.1	4386.00
1.15	.44	1.80	.66	.049	.025	.040	.000	4373.50	243.15
.000040	430.	950.	780.	0	0	0	.00	3278.77	4362.54

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

1490 NH CARD USED
*SECNO 84.050

3265 DIVIDED FLOW

3280 CROSS SECTION 84.05 EXTENDED .47 FEET

84.050	14.76	4388.66	.00	.00	4388.70	.04	.03	.01	4384.70
6650.0	3149.0	2497.7	1003.4	8912.0	1036.4	1628.4	1091.9	353.1	4385.70
1.27	.35	2.41	.62	.068	.025	.040	.000	4373.90	249.56
.000069	470.	520.	500.	1	0	0	.00	4603.85	5009.90

1490 NH CARD USED
*SECNO 96.250

3265 DIVIDED FLOW

-302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .61

96.250	14.24	4388.74	.00	.00	4388.83	.08	.12	.01	4389.90
6650.0	1674.5	2610.7	2364.8	2912.7	731.5	2661.6	1301.7	443.9	4386.80
1.43	.57	3.57	.89	.053	.025	.040	.000	4374.50	1752.31
.000185	1000.	1220.	1000.	2	0	0	.00	3267.82	5492.70

1490 NH CARD USED
*SECNO 105.550

3265 DIVIDED FLOW

105.550	13.93	4388.93	.00	.00	4388.99	.06	.16	.00	4386.90
6650.0	4528.1	2028.5	93.4	10200.8	581.6	251.9	1487.6	536.0	4385.00
1.61	.44	3.49	.37	.082	.025	.040	.000	4375.00	2161.83
.000172	980.	930.	730.	2	0	0	.00	5376.73	7871.88

1490 NH CARD USED
*SECNO 115.550

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
115.550	13.52	4389.12	.00	.00	4389.17	.05	.18	.00	4385.30
6650.0	4711.5	1936.5	2.0	10831.8	571.5	14.1	1756.6	664.1	4389.50
1.83	.43	3.39	.14	.087	.025	.040	.000	4375.60	1082.54
.000169	1050.	1000.	750.	1	0	0	.00	5411.01	7480.99

1490 NH CARD USED
*SECNO 126.550

3265 DIVIDED FLOW

126.550	13.01	4389.21	.00	.00	4389.36	.16	.16	.03	4386.40
6650.0	2876.7	3651.1	122.1	6615.9	852.4	177.6	1886.0	732.2	4386.10
1.92	.43	4.28	.69	.086	.025	.040	.000	4376.20	670.81
.000263	550.	1100.	550.	2	0	0	.00	5252.98	6796.67

CCHV= .300 CEHV= .500
1490 NH CARD USED
*SECNO 130.750

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

.85 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

130.750	12.69	4389.49	4389.49	.00	4390.37	.88	.23	.36	4389.70
6650.0	1394.1	5252.5	3.4	1649.6	621.3	2.4	1928.8	764.5	4387.80
1.94	.85	8.45	1.42	.080	.035	.040	.000	4376.80	275.45
.002216	370.	420.	320.	2	8	0	.00	2349.26	7230.96

1490 NH CARD USED

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.50	3.00	.00	33.00	1.00	498.00	1.10	4378.70	4378.70

*SECNO 131.170

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 = 2.19

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
4391.14	4391.06	.05	2519.	4193.	498.	519.	4390.30	4389.70	3371.
131.170	12.20	4390.90	.00	.00	4391.14	.24	.77	.00	4389.70
6650.0	3250.3	3392.7	7.0	5999.7	618.4	8.1	1933.1	768.9	4387.80
1.94	.54	5.49	.86	.062	.025	.045	.000	4378.70	233.95
.000462	42.	42.	42.	3	0	5	.00	6751.28	7233.34

CCHV= .300 CEHV= .500
1490 NH CARD USED
*SECNO 132.570

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.48

132.570	11.22	4391.22	.00	.00	4391.23	.01	.02	.07	4390.00
6650.0	2247.5	4401.9	.6	12074.7	3694.5	5.0	1981.2	785.8	4390.00
2.06	.19	1.19	.13	.081	.025	.040	.000	4380.00	354.96
.000023	100.	550.	570.	2	0	0	.00	5670.26	6668.13

CCHV= .100 CEHV= .300
1490 NH CARD USED
*SECNO 155.570

3265 DIVIDED FLOW

1

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 = 1.58

155.570	10.25	4391.25	.00	.00	4391.26	.00	.02	.00	4386.00
5000.0	3626.4	1368.0	5.7	15259.9	2426.9	93.6	2662.0	1011.9	4389.49
3.65	.24	.56	.06	.037	.025	.045	.000	4381.00	1662.78
.000005	1700.	2065.	2065.	2	0	0	.00	5728.59	7606.06

1490 NH CARD USED

*SECNO 169.570

169.570	9.26	4391.26	.00	.00	4391.26	.00	.01	.00	4388.00
5000.0	3756.7	1235.4	7.9	14837.4	2337.0	88.1	3110.0	1142.5	4388.50
4.65	.25	.53	.09	.036	.025	.045	.000	4382.00	2107.81
.000005	1070.	1380.	1390.	1	0	0	.00	4670.91	6778.72

1490 NH CARD USED
*SECNO 180.570

3265 DIVIDED FLOW

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

180.570	8.27	4391.27	.00	.00	4391.27	.00	.01	.00	4388.00
5000.0	3647.0	1352.4	.6	9896.3	1673.3	4.5	3469.4	1245.1	4388.90
5.26	.37	.81	.12	.041	.025	.045	.000	4383.00	2620.46
.000014	1090.	1060.	1060.	0	0	0	.00	3551.94	6539.84

1490 NH CARD USED
*SECNO 189.070

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .35

3470 ENCROACHMENT STATIONS= 3860.0 4970.0 TYPE= 1 TARGET= 1110.000

189.070	7.27	4391.27	.00	.00	4391.30	.03	.02	.01	4388.00
5000.0	3282.9	1717.1	.0	3580.4	777.4	.0	3625.1	1291.8	100000.00
5.43	.92	2.21	.00	.040	.025	.000	.000	4384.00	3860.00
.000111	890.	640.	640.	0	0	0	.00	1110.00	4970.00

1

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 196.170

3265 DIVIDED FLOW

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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4391.50 ELREA= 4391.50

196.170	6.22	4391.22	.00	.00	4391.46	.23	.09	.06	4385.00
5000.0	.0	5000.0	.0	.0	1286.0	.0	3658.4	1299.7	4385.00
5.46	.00	3.89	.00	.000	.025	.000	.000	4385.00	3061.10
.000403	550.	450.	450.	2	0	0	.00	207.02	3697.00

CCHV= .300 CEHV= .500
*SECNO 196.370

70 NORMAL BRIDGE, NRD= 76 MIN ELTRD= 4391.52 MAX ELLC= 4392.93

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4392.00 ELREA= 4392.00

196.370	6.29	4391.09	.00	.00	4391.61	.52	.01	.14	4384.86
5000.0	.0	5000.0	.0	.0	867.3	.0	3658.9	1299.9	4384.82
5.46	.00	5.76	.00	.000	.016	.000	.000	4384.80	3080.65
.000581	20.	20.	20.	2	0	0	-2466.85	602.79	3683.44

*SECNO 196.970

3370 NORMAL BRIDGE, NRD= 76 MIN ELTRD= 4391.52 MAX ELLC= 4392.95

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4392.00 ELREA= 4392.00

196.970	6.33	4391.13	.00	.00	4391.64	.51	.03	.00	4384.86
5000.0	.0	5000.0	.0	.0	869.8	.0	3660.1	1300.7	4384.89
5.47	.00	5.75	.00	.000	.016	.000	.000	4384.80	3080.65
.000580	60.	60.	60.	0	0	0	-2481.21	602.79	3683.44

1

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 197.170

3265 DIVIDED FLOW

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4391.50 ELREA= 4391.50

197.170	6.43	4391.46	.00	.00	4391.68	.22	.01	.03	4385.03
5000.0	.0	5000.0	.0	.0	1329.6	.0	3660.6	1300.9	4385.03
5.47	.00	3.76	.00	.000	.025	.000	.000	4385.03	3061.10
.000362	20.	20.	20.	2	0	0	.00	207.04	3697.00

CCHV= .100 CEHV= .300
1490 NH CARD USED
*SECNO 199.570

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.88

3470 ENCROACHMENT STATIONS= 1100.0 2100.0 TYPE= 1 TARGET= 1000.000

199.570	6.73	4391.73	.00	.00	4391.75	.02	.05	.02	4385.00
5000.0	2168.2	2823.4	8.4	2675.5	2206.3	94.1	3684.0	1305.6	4390.00
5.54	.81	1.28	.09	.053	.040	.250	.000	4385.00	1100.00
.000102	425.	250.	250.	2	0	0	.00	1000.00	2100.00

1490 NH CARD USED
*SECNO 201.570

3470 ENCROACHMENT STATIONS= 750.0 2000.0 TYPE= 1 TARGET= 1250.000

201.570	4.66	4391.76	.00	.00	4391.78	.02	.03	.00	4390.00
5000.0	4834.7	165.3	.0	4591.4	121.2	.0	3708.4	1311.2	4392.00
5.60	1.05	1.36	.00	.044	.030	.000	.000	4387.10	750.00
.000164	225.	200.	200.	1	0	0	.00	1234.47	1984.47

1490 NH CARD USED
*SECNO 202.070

3470 ENCROACHMENT STATIONS= 650.0 2000.0 TYPE= 1 TARGET= 1350.000

202.070	4.67	4391.77	.00	.00	4391.79	.02	.01	.00	4390.00
5000.0	4846.6	153.4	.0	4964.7	121.1	.0	3714.0	1312.7	4392.00
5.61	.98	1.27	.00	.044	.030	.000	.000	4387.10	650.00
.000142	50.	50.	50.	0	0	0	.00	1334.47	1984.47

1

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

1490 NH CARD USED
*SECNO 202.470

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

3470 ENCROACHMENT STATIONS= 450.0 2030.0 TYPE= 1 TARGET= 1580.000

202.470	3.77	4391.77	.00	.00	4391.80	.03	.01	.00	4390.00
5000.0	4634.3	365.7	.0	3637.9	213.5	.0	3718.1	1314.0	4392.00
5.62	1.27	1.71	.00	.044	.030	.000	.000	4388.00	450.00
.000389	40.	40.	40.	0	0	0	.00	1539.93	1989.93

CCHV= .100 CEHV= .300
1490 NH CARD USED
*SECNO 205.670

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.53

3470 ENCROACHMENT STATIONS= 1050.0 3964.0 TYPE= 1 TARGET= 2914.000

205.670	5.85	4391.85	.00	.00	4391.87	.01	.07	.00	4395.00
5000.0	4977.2	22.8	.0	5198.8	31.9	.0	3746.7	1324.9	4393.00
5.70	.96	.72	.00	.042	.030	.000	.000	4386.00	1422.19
.000167	270.	425.	425.	1	0	0	.00	1913.03	3877.54

CCHV= .100 CEHV= .300

*SECNO 217.390

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

217.390	4.18	4393.18	4393.18	.00	4393.65	.47	.68	.14	4395.00
5000.0	4888.5	111.5	.0	896.2	16.4	.0	3834.8	1369.3	4395.70
5.77	5.45	6.79	.00	.030	.025	.000	.000	4389.00	319.56
.013760	1250.	1172.	1172.	20	13	0	.00	1181.51	1833.16

1

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 224.980

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.54

224.980	4.10	4396.70	.00	.00	4396.76	.06	3.07	.04	4399.70
5000.0	4822.9	177.1	.0	2565.2	57.6	.0	3881.5	1414.1	4402.10
5.93	1.88	3.07	.00	.030	.025	.000	.000	4392.60	916.66
.001101	1160.	759.	759.	11	0	0	.00	2200.99	3183.16

*SECNO 235.230

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

235.230	4.21	4399.91	4399.91	.00	4400.37	.46	2.46	.12	4401.80
5000.0	4755.4	244.6	.0	900.8	31.7	.0	3920.8	1450.2	4403.30
5.98	5.28	7.71	.00	.030	.025	.000	.000	4395.70	98.50
.011332	960.	1025.	1025.	20	9	0	.00	1068.02	1744.58

*SECNO 269.390

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.05

269.390	6.78	4413.78	.00	.00	4414.41	.63	13.99	.05	4410.70
4750.0	2493.9	2208.9	47.2	503.2	285.7	29.0	3980.7	1496.1	4412.70
6.12	4.96	7.73	1.63	.030	.025	.030	.000	4407.00	136.71
.002433	2880.	3416.	3416.	7	0	0	.00	294.79	431.50

*SECNO 273.000

3265 DIVIDED FLOW

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

1

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
273.000	7.66	4415.16	4415.16	.00	4416.15	.99	.79	.11	4412.10
4750.0	2155.9	2406.1	188.0	476.6	233.0	78.0	3985.9	1498.0	4413.50
6.13	4.52	10.33	2.41	.030	.025	.030	.000	4407.50	79.96
.002879	240.	361.	240.	20	8	0	.00	347.33	428.96

*SECNO 283.160

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.60

283.160	6.85	4417.65	.00	.00	4417.82	.17	1.59	.08	4414.90
4750.0	2381.3	1256.0	1112.7	911.2	267.4	451.6	4011.4	1510.9	4415.50
6.21	2.61	4.70	2.46	.030	.025	.030	.000	4410.80	94.84
.001120	840.	1016.	1040.	2	0	0	.00	876.72	1064.54

*SECNO 314.160

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

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

314.160	10.90	4428.30	4428.30	.00	4430.09	1.78	5.78	.49	4428.80
4750.0	10.3	4573.5	166.2	6.3	419.2	73.5	4087.2	1549.4	4428.70
6.29	1.63	10.91	2.26	.030	.025	.030	.000	4417.40	2182.36
.003700	3100.	3100.	3100.	20	17	0	.00	205.37	4802.66

T1 Floodway Run - proposed floodway revision (between #189.07 & #205.67)
T2 Method 1 and Method 4
T3

	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
J1	0	3	0	0	0	0	0	0	4386.04	0

	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
J2	2	0	-1							

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

CHV= .100 CEHV= .300
*SECNO 2.000

3265 DIVIDED FLOW

3280 CROSS SECTION 2.00 EXTENDED 1.04 FEET

2.000	16.04	4386.04	.00	4386.04	4386.57	.53	.00	.00	4387.80
6950.0	746.0	6204.0	.0	548.9	1001.9	.0	.0	.0	4385.50
.00	1.36	6.19	.00	.080	.025	.000	.000	4370.00	.00
.000443	0.	0.	0.	0	0	0	.00	208.72	243.50

*SECNO 7.300

3265 DIVIDED FLOW

7.300	16.24	4386.24	.00	4386.24	4386.79	.54	.21	.00	4383.60
6950.0	232.5	6717.5	.0	488.0	1115.4	.0	17.9	3.8	4382.90
.02	.48	6.02	.68	.080	.025	.080	.000	4370.00	186.07
.000360	420.	530.	530.	1	0	0	.00	531.90	840.70

*SECNO 13.900

265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

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

13.900	16.04	4386.25	4380.05	4386.25	4387.31	1.07	.37	.16	4385.30
6950.0	519.8	6430.2	.0	753.8	746.4	.0	40.1	12.1	4385.00
.05	.69	8.62	.00	.080	.025	.000	.000	4370.20	205.28
.001009	570.	660.	660.	4	18	0	.00	720.90	1269.00

1

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 19.900

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 2576.1 4175.5 TYPE= 1 TARGET= 1599.400

19.900	16.73	4387.33	.00	4387.33	4387.81	.48	.44	.06	4383.50
6950.0	1499.8	5450.2	.0	2207.1	873.5	.0	68.9	25.4	100000.00
.08	.68	6.24	.00	.080	.025	.000	.000	4370.60	2581.83
.000575	520.	600.	600.	3	0	0	.00	1479.56	4175.50

*SECNO 23.900

3470 ENCROACHMENT STATIONS= 2738.3 4705.8 TYPE= 1 TARGET= 1967.500

23.900	16.95	4387.75	.00	4387.75	4388.01	.26	.18	.02	4384.80
6950.0	2234.2	4715.8	.0	3823.3	952.5	.0	108.5	43.0	100000.00
.11	.58	4.95	.00	.080	.025	.000	.000	4370.80	2746.21
.000332	450.	400.	400.	2	0	0	.00	1959.55	4705.76

*SECNO 29.100

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 3191.0 5284.3 TYPE= 1 TARGET= 2093.300

29.100	17.13	4387.93	.00	4387.93	4388.18	.25	.17	.00	4389.00
6950.0	2743.5	4206.5	.0	4611.2	823.4	.0	167.5	66.2	100000.00
.16	.59	5.11	.00	.080	.025	.000	.000	4370.80	3208.58
.000318	500.	520.	520.	2	0	0	.00	2064.35	5284.25

490 NH CARD USED
*SECNO 38.600

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

38.600	17.42	4388.32	.00	4388.32	4388.43	.11	.24	.01	4384.70
6950.0	3235.0	3715.0	.0	4575.0	1043.1	.0	340.7	133.1	4383.90
.30	.71	3.56	.69	.047	.025	.045	.000	4370.90	148.36
.000146	1450.	950.	1000.	2	0	0	.00	2003.64	2152.00

1

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
1490 NH CARD USED
*SECNO 39.600

39.600	17.38	4388.38	.00	4388.38	4388.47	.08	.03	.01	4387.50
6950.0	3303.3	3646.7	.0	5492.9	1157.9	.0	377.9	147.4	4384.90
.33	.60	3.15	.57	.054	.025	.040	.000	4371.00	195.58
.000124	300.	100.	80.	2	0	0	.00	2272.82	2468.40

1490 NH CARD USED
*SECNO 40.400

3265 DIVIDED FLOW

40.400	17.46	4388.46	.00	4388.43	4388.49	.03	.01	.02	4388.30
6950.0	4789.6	2160.4	.0	6912.1	918.3	.0	394.1	152.7	4384.30
.35	.69	2.35	.33	.045	.025	.040	.000	4371.00	3.34
.000084	100.	80.	80.	2	0	0	.00	2427.74	2469.10

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.50	2.50	.00	18.00	2.00	890.00	1.75	4371.00	4371.00

*SECNO 40.750
6840, FLOW IS BY WEIR AND LOW FLOW

3265 DIVIDED FLOW

3420 BRIDGE W.S.= 4388.46 BRIDGE VELOCITY= 2.00 CALCULATED CHANNEL AREA= 813.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
4389.50	4388.52	.00	5372.	1625.	890.	895.	4389.50	4387.00	1750.

470 ENCROACHMENT STATIONS= .0 2469.1 TYPE= 1 TARGET= 2469.100

40.750	17.49	4388.49	.00	4388.47	4388.52	.03	.03	.00	4388.30
6950.0	4872.1	2077.9	.0	6992.1	921.5	.0	400.4	154.7	100000.00
.36	.70	2.25	.00	.045	.025	.000	.000	4371.00	2.97
.000085	35.	35.	35.	2	0	6	.00	2437.95	2469.10

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

1490 NH CARD USED
*SECNO 41.350
2800 NAT Q1= 10504.78 WSELK= 4388.48 ENC Q1= 10504.78 WSEL= 4390.18 RATIO= .0000
NAT Q1= 16356. RATIOS LOB, CH, ROB= .7316 .2473 .0211 WSEL= 4390.18

3470 ENCROACHMENT STATIONS= 1602.5 2615.7 TYPE= 4 TARGET= .358

41.350	17.08	4388.48	.00	4388.48	4388.55	.07	.00	.02	4383.50
6950.0	3782.7	3167.3	.0	4186.2	1082.9	.0	407.4	156.5	4384.70
.36	.90	2.92	.00	.045	.025	.000	.000	4371.40	1602.47
.000096	45.	55.	55.	1	0	0	.00	1013.23	2615.70

CCHV= .100 CEHV= .300
1490 NH CARD USED
*SECNO 45.150
2800 NAT Q1= 9501.84 WSELK= 4388.49 ENC Q1= 9501.84 WSEL= 4390.19 RATIO= .0000
NAT Q1= 15153. RATIOS LOB, CH, ROB= .6500 .2488 .1012 WSEL= 4390.19

70 ENCROACHMENT STATIONS= 1807.7 2947.1 TYPE= 4 TARGET= .373

45.150	16.91	4388.51	.00	4388.49	4388.58	.07	.04	.00	4383.60
6650.0	3315.5	3033.3	301.3	4524.4	972.4	358.1	456.1	165.9	4383.80
.42	.73	3.12	.84	.055	.025	.040	.000	4371.60	1807.74
.000093	380.	380.	410.	0	0	0	.00	1139.41	2947.15

1490 NH CARD USED
*SECNO 55.650
2800 NAT Q1= 7934.05 WSELK= 4388.54 ENC Q1= 7934.05 WSEL= 4390.24 RATIO= .0000
NAT Q1= 12944. RATIOS LOB, CH, ROB= .6616 .2355 .1029 WSEL= 4390.24

3470 ENCROACHMENT STATIONS= 2206.0 3189.5 TYPE= 4 TARGET= .387

55.650	16.60	4388.60	.00	4388.54	4388.69	.09	.10	.00	4388.20
6650.0	3655.0	2995.0	.0	3946.8	882.7	.0	550.6	183.9	4384.10
.54	.93	3.39	.00	.055	.025	.000	.000	4372.00	2206.01
.000158	700.	1050.	1000.	2	0	0	.00	983.49	3189.50

1490 NH CARD USED
*SECNO 69.350
2800 NAT Q1= 8294.90 WSELK= 4388.61 ENC Q1= 8294.90 WSEL= 4390.31 RATIO= .0000
NAT Q1= 14106. RATIOS LOB, CH, ROB= .5349 .2025 .2626 WSEL= 4390.31

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

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    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


  65 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=      2152.4     3283.9  TYPE=       4  TARGET=          .412
    69.350      15.76    4388.76        .00    4388.61    4388.84        .08        .15        .00    4388.30
    6650.0     3269.7     2809.6      570.7     3101.7      857.7      493.2      638.1      201.6    4385.70
       .68       1.05       3.28       1.16       .045       .025       .040       .000    4373.00    2152.38
   .000147       670.      1370.      1050.          2          0          0        .00    1101.32    3283.95


1490 NH CARD USED
*SECNO 78.850
 2800 NAT Q1=    10572.70  WSELK=     4388.65  ENC Q1=    10572.70  WSEL=     4390.35  RATIO=     .0000
 NAT Q1=    17824.  RATIOS LOB, CH, ROB=     .6261    .2226    .1513  WSEL=     4390.35

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=      2392.4     4020.4  TYPE=       4  TARGET=          .407
    78.850      15.36    4388.86        .00    4388.65    4388.92        .06        .08        .00    4385.30
    6650.0     3576.0     3074.0          .0     4598.6     1119.6          .0      702.1      216.2    4386.00
       .79        .78       2.75        .00        .045       .025       .000       .000    4373.50    2392.44
   .000093       430.       950.       780.          2          0          0        .00    1560.76    4020.40


 '90 NH CARD USED
 ,ECNO 84.050
 2800 NAT Q1=     7979.16  WSELK=     4388.66  ENC Q1=     7979.16  WSEL=     4390.36  RATIO=     .0000
 NAT Q1=    15187.  RATIOS LOB, CH, ROB=     .5739    .2480    .1781  WSEL=     4390.36

3265 DIVIDED FLOW

3280 CROSS SECTION      84.05 EXTENDED        .66 FEET


3470 ENCROACHMENT STATIONS=      2807.4     4451.8  TYPE=       4  TARGET=          .475
    84.050      14.96    4388.86        .00    4388.66    4389.01        .15        .06        .03    4384.70
    6650.0     2490.0     4089.8        70.2     3027.3     1053.9      111.7      756.9      233.4    4385.70
       .84        .82       3.88        .63        .045       .025       .040       .000    4373.90    2807.40
   .000176       470.       520.       500.          2          0          0        .00    1600.99    4451.80


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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


,490 NH CARD USED
*SECNO 96.250
 2800 NAT Q1=     4893.39  WSELK=     4388.74  ENC Q1=     4893.39  WSEL=     4390.44  RATIO=     .0000
 NAT Q1=    10838.  RATIOS LOB, CH, ROB=     .3594    .2215    .4191  WSEL=     4390.44
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3265 DIVIDED FLOW

02 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .61

3470 ENCROACHMENT STATIONS= 3448.7 4639.8 TYPE= 4 TARGET= .549

96.250	14.53	4389.03	.00	4388.74	4389.39	.36	.31	.06	4389.90
6650.0	649.7	4375.4	1624.9	669.2	749.7	1035.0	837.7	264.0	4386.80
.91	.97	5.84	1.57	.045	.025	.040	.000	4374.50	3448.69
.000481	1000.	1220.	1000.	2	0	0	.00	1024.90	4639.79

1490 NH CARD USED
*SECNO 105.550
2800 NAT Q1= 5075.01 WSELK= 4388.93 ENC Q1= 5075.01 WSEL= 4390.63 RATIO= .0000
NAT Q1= 11224. RATIOS LOB, CH, ROB= .7644 .1703 .0652 WSEL= 4390.63

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 5888.0 7354.8 TYPE= 4 TARGET= .548

105.550	14.58	4389.58	.00	4388.93	4389.81	.22	.41	.01	4386.90
6650.0	3415.8	3234.2	.0	2860.7	611.6	.0	900.6	289.4	4385.00
.99	1.19	5.29	.00	.045	.025	.000	.000	4375.00	5888.04
.000406	980.	930.	730.	3	0	0	.00	1366.41	7354.80

1490 NH CARD USED
SECNO 115.550
2800 NAT Q1= 5110.89 WSELK= 4389.12 ENC Q1= 5110.89 WSEL= 4390.82 RATIO= .0000
NAT Q1= 10844. RATIOS LOB, CH, ROB= .8046 .1734 .0220 WSEL= 4390.82

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 5435.9 7244.1 TYPE= 4 TARGET= .529

115.550	14.40	4390.00	.00	4389.12	4390.18	.17	.37	.00	4385.30
6650.0	3673.6	2976.4	.0	2946.4	617.9	.0	984.7	325.0	4389.50
1.09	1.25	4.82	.00	.045	.025	.000	.000	4375.60	5435.85
.000315	1050.	1000.	750.	2	0	0	.00	1594.31	7244.10

1

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

1490 NH CARD USED
SECNO 126.550

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 5430.0 6740.0 TYPE= 1 TARGET= 1310.000

126.550	14.00	4390.20	.00	4389.21	4390.49	.29	.28	.03	4386.40
6650.0	1674.3	4724.6	251.2	1645.6	932.4	219.8	1034.7	343.2	4386.10
1.16	1.02	5.07	1.14	.045	.025	.040	.000	4376.20	5430.00
.000327	550.	1100.	550.	2	0	0	.00	1150.95	6740.00

CCHV= .300 CEHV= .500

1490 NH CARD USED

*SECNO 130.750

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .44

3470 ENCROACHMENT STATIONS= 5610.0 7228.1 TYPE= 1 TARGET= 1618.100

130.750	13.47	4390.27	4386.25	4389.49	4390.94	.67	.25	.19	4389.70
6650.0	1623.8	5026.2	.0	998.1	670.2	.0	1054.4	353.8	100000.00
1.17	1.63	7.50	.00	.045	.035	.000	.000	4376.80	5610.00
.001661	370.	420.	320.	4	15	0	.00	1279.18	7228.10

1490 NH CARD USED

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.50	3.00	.00	33.00	1.00	498.00	1.10	4378.70	4378.70

*SECNO 131.170

BTCARD, BRIDGE STENCL= 5600.00 STENCR= 7300.00

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.82

1

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

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
4391.50	4391.37	.03	3052.	3620.	498.	519.	4390.30	4389.70	1554.

170 ENCROACHMENT STATIONS= 5600.0 7300.0 TYPE= 1 TARGET= 1700.000

131.170	12.49	4391.19	.00	4390.90	4391.50	.31	.56	.00	4389.70
6650.0	2924.2	3716.6	9.3	2352.1	636.5	9.7	1056.7	354.9	4387.80
1.18	1.24	5.84	.95	.040	.025	.045	.000	4378.70	5600.00
.000503	42.	42.	42.	3	0	4	.00	1633.83	7233.83

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CCHV=      .300 CEHV=      .500
1490 NH CARD USED
 SECNO 132.570

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.56


3470 ENCROACHMENT STATIONS=     5300.0    6660.0  TYPE=       1  TARGET=     1360.000
   132.570      11.58   4391.58       .00   4391.22   4391.62       .04       .04       .08   4390.00
    6650.0      467.1    6182.9        .0    1471.7    3850.5        .0    1089.5     360.9 100000.00
      1.26        .32       1.61       .00       .040      .025      .000      .000   4380.00   5300.00
   .000040       100.      550.      570.         2         0         0       .00   1360.00   6660.00


CCHV=      .100 CEHV=      .300
1490 NH CARD USED
*SECNO 155.570

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=     6000.0    7135.0  TYPE=       1  TARGET=     1135.000
   155.570      10.66   4391.66       .00   4391.25   4391.67       .01       .05       .00   4386.00
    5000.0    3230.1    1769.9        .0    5397.7    1580.7        .0    1352.3     411.8 100000.00
      1.94        .60       1.12       .00       .035      .025      .000      .000   4381.00   6000.00
   .000018      1700.     2065.     2065.         2         0         0       .00   1120.70   7135.00



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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


1490 NH CARD USED
*SECNO 169.570

3470 ENCROACHMENT STATIONS=     5200.0    6590.0  TYPE=       1  TARGET=     1390.000
   169.570       9.69   4391.69       .00   4391.26   4391.69       .01       .02       .00   4388.00
    5000.0    3710.0    1290.0        .0    6879.0    1380.2        .0    1549.9     443.7 100000.00
      2.45        .54        .93       .00       .036      .025      .000      .000   4382.00   5200.00
   .000015      1070.     1380.     1390.         1         0         0       .00   1390.00   6590.00


1490 NH CARD USED
*SECNO 180.570

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


3470 ENCROACHMENT STATIONS=     5200.0    6420.0  TYPE=       1  TARGET=     1220.000
   180.570       8.71   4391.71       .00   4391.27   4391.72       .01       .02       .00   4388.00
    5000.0    3682.8    1317.2        .0    5941.1     966.7        .0    1738.9     476.3 100000.00
      2.82        .62       1.36       .00       .045      .025      .000      .000   4383.00   5200.00
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   .000036     1090.     1060.     1060.        0         0         0       .00   1220.00   6420.00


1490 NH CARD USED
  ECNO 189.070

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


3470 ENCROACHMENT STATIONS=     3860.0    4970.0  TYPE=       1  TARGET=     1110.000
   189.070       7.74   4391.74       .00   4391.27   4391.77       .03       .04       .00   4388.00
    5000.0     3391.9     1608.1        .0    4040.8     828.0        .0    1854.0     499.4 100000.00
      3.01        .84       1.94       .00       .040      .025      .000      .000   4384.00   3860.00
   .000079      890.      640.      640.         1         0         0       .00   1110.00   4970.00


CCHV=      .100 CEHV=      .300
*SECNO 196.170

3265 DIVIDED FLOW

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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 =    .48


3470 ENCROACHMENT STATIONS=     3062.0    3697.0  TYPE=       1  TARGET=      635.000
   196.170       6.69   4391.69       .00   4391.22   4391.89       .20       .07       .05 100000.00
    5000.0         .0    5000.0        .0         .0    1376.1        .0    1890.9     507.4 100000.00
      3.04        .00       3.63       .00       .000      .025      .000      .000   4385.00   3062.00
   .000348      550.      450.      450.         2         0         0       .00    206.17   3697.00


CCHV=      .300 CEHV=      .500
*SECNO 196.370
BTCARD, BRIDGE STENCL=    3080.65   STENCR=    3683.44

3370 NORMAL BRIDGE, NRD=  76 MIN ELTRD=  4391.52 MAX ELLC=  4392.93


3470 ENCROACHMENT STATIONS=     3080.6    3683.4  TYPE=       1  TARGET=      602.790

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      4392.00 ELREA=      4392.00

   196.370       6.76   4391.56       .00   4391.09   4392.03       .47       .01       .13   4384.86
    5000.0         .0    5000.0        .0         .0     907.8        .0    1891.5     507.6 100000.00
      3.05        .00       5.51       .00       .000      .016      .000      .000   4384.80   3080.65
   .000610       20.       20.       20.        15         0         0  -2634.75    602.79   3683.44


*SECNO 196.970
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BTCARD, BRIDGE STENCL= 3080.65 STENCR= 3683.44

3840 SECTION NOT HIGH ENOUGH268125.200100050.000 4384.800100000.000 4391.451 2

3370 NORMAL BRIDGE, NRD= 76 MIN ELTRD= 4391.52 MAX ELLC= 4392.95

3470 ENCROACHMENT STATIONS= 3080.6 3683.4 TYPE= 1 TARGET= 602.790

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4392.00 ELREA= 4392.00

196.970	6.80	4391.60	4388.18	4391.13	4392.07	.47	.04	.00	4384.86
5000.0	.0	5000.0	.0	.0	910.4	.0	1892.7	508.4	100000.00
3.05	.00	5.49	.00	.000	.016	.000	.000	4384.80	3080.65
.000609	60.	60.	60.	1	15	0	-2653.83	602.79	3683.44

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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

CCHV= .100 CEHV= .300

*SECNO 197.170

765 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 3062.0 3697.0 TYPE= 1 TARGET= 635.000

197.170	6.88	4391.91	.00	4391.46	4392.11	.19	.01	.03	100000.00
5000.0	.0	5000.0	.0	.0	1417.0	.0	1893.3	508.6	100000.00
3.05	.00	3.53	.00	.000	.025	.000	.000	4385.03	3062.00
.000318	20.	20.	20.	2	0	0	.00	206.19	3697.00

CCHV= .100 CEHV= .300

1490 NH CARD USED

*SECNO 199.570

3280 CROSS SECTION 199.57 EXTENDED .15 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.53

3470 ENCROACHMENT STATIONS= 1447.0 2050.0 TYPE= 1 TARGET= 603.000

199.570	7.15	4392.15	.00	4391.73	4392.18	.03	.05	.02	4385.00
5000.0	1392.1	3607.9	.0	1529.5	2351.6	.0	1911.5	511.4	100000.00
3.11	.91	1.53	.00	.065	.040	.000	.000	4385.00	1447.00
.000136	425.	250.	250.	2	0	0	.00	603.00	2050.00

90 NH CARD USED

SECNO 201.570

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .47

3470 ENCROACHMENT STATIONS= 1435.0 1985.0 TYPE= 1 TARGET= 550.000

201.570	5.07	4392.17	.00	4391.76	4392.24	.08	.05	.01	4390.00
5000.0	4622.3	377.7	.0	2132.4	134.9	.0	1926.7	514.3	4392.00
3.13	2.17	2.80	.01	.044	.030	.045	.000	4387.10	1435.00
.000604	225.	200.	200.	2	0	0	.00	549.82	1984.82

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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

1490 NH CARD USED
*SECNO 202.070

3470 ENCROACHMENT STATIONS= 1400.0 1980.0 TYPE= 1 TARGET= 580.000

202.070	5.11	4392.21	.00	4391.77	4392.27	.07	.03	.00	4390.00
5000.0	4707.9	292.1	.0	2322.7	116.3	.0	1929.4	514.9	100000.00
3.14	2.03	2.51	.00	.044	.030	.000	.000	4387.10	1400.00
.000517	50.	50.	50.	2	0	0	.00	580.00	1980.00

1490 NH CARD USED
*ECNO 202.470

3470 ENCROACHMENT STATIONS= 1370.0 1990.0 TYPE= 1 TARGET= 620.000

202.470	4.21	4392.21	.00	4391.77	4392.31	.10	.03	.01	4390.00
5000.0	4213.9	786.1	.0	1700.8	252.3	.0	1931.4	515.5	100000.00
3.14	2.48	3.12	.00	.043	.030	.000	.000	4388.00	1370.00
.001036	40.	40.	40.	2	0	0	.00	620.00	1990.00

CCHV= .100 CEHV= .300
1490 NH CARD USED
*SECNO 205.670

3265 DIVIDED FLOW

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

3470 ENCROACHMENT STATIONS= 3150.0 3878.0 TYPE= 1 TARGET= 728.000

205.670	6.42	4392.42	.00	4391.85	4392.46	.04	.14	.01	4395.00
5000.0	4946.4	53.6	.0	2921.4	46.7	.0	1947.2	519.8	100000.00
3.19	1.69	1.15	.00	.040	.030	.000	.000	4386.00	3150.00
.000289	270.	425.	425.	2	0	0	.00	712.41	3877.77

CCHV= .100 CEHV= .300
*SECNO 217.390

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

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

3470 ENCROACHMENT STATIONS= 1253.3 1841.0 TYPE= 1 TARGET= 587.670

217.390	5.11	4394.11	4394.11	4393.18	4394.82	.72	1.05	.20	4395.00
5000.0	4735.5	264.5	.0	701.2	35.4	.0	2000.3	537.0	100000.00
3.24	6.75	7.48	.00	.030	.025	.000	.000	4389.00	1253.33
.010012	1250.	1172.	1172.	20	14	0	.00	490.09	1836.04

*SECNO 224.980

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.05

3470 ENCROACHMENT STATIONS= 2298.6 3211.0 TYPE= 1 TARGET= 912.440

224.980	4.94	4397.54	.00	4396.70	4397.65	.12	2.77	.06	4399.70
5000.0	4713.3	286.7	.0	1751.5	83.5	.0	2034.0	554.8	100000.00
3.36	2.69	3.43	.00	.030	.025	.000	.000	4392.60	2298.56
.001073	1160.	759.	759.	6	0	0	.00	865.11	3187.47

*SECNO 235.230

3265 DIVIDED FLOW

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

3470 ENCROACHMENT STATIONS= 782.8 1755.0 TYPE= 1 TARGET= 972.250

235.230	5.07	4400.77	4400.77	4399.91	4401.28	.51	2.32	.12	4401.80
5000.0	4529.9	470.1	.0	851.1	53.7	.0	2064.3	574.1	100000.00
3.40	5.32	8.76	.00	.030	.025	.000	.000	4395.70	782.75
.009574	960.	1025.	1025.	20	9	0	.00	883.02	1747.22

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 269.390

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.82

3470 ENCROACHMENT STATIONS= 230.0 378.0 TYPE= 1 TARGET= 148.020

269.390	7.51	4414.51	.00	4413.78	4415.45	.93	14.04	.13	4410.70
4750.0	1843.6	2906.4	.0	311.1	333.6	.0	2117.9	608.8	100000.00
3.52	5.93	8.71	.00	.030	.025	.000	.000	4407.00	229.98
.002605	2880.	3416.	3416.	7	0	0	.00	148.02	378.00

*SECNO 273.000

3301 HV CHANGED MORE THAN HVINS

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

3470 ENCROACHMENT STATIONS= 184.4 337.0 TYPE= 1 TARGET= 152.580

273.000	8.14	4415.64	4415.64	4415.16	4417.26	1.62	.98	.21	4412.10
4750.0	1728.2	3021.8	.0	301.0	250.9	.0	2122.0	609.8	100000.00
3.53	5.74	12.04	.00	.030	.025	.000	.000	4407.50	184.42
.003803	240.	361.	240.	20	8	0	.00	152.58	337.00

*SECNO 283.160

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.04

3470 ENCROACHMENT STATIONS= 420.5 751.4 TYPE= 1 TARGET= 330.880

283.160	7.89	4418.69	.00	4417.65	4418.94	.25	1.54	.14	4414.90
4750.0	2611.4	1704.2	434.5	782.5	341.8	119.3	2140.8	614.7	4415.50
3.59	3.34	4.99	3.64	.030	.025	.030	.000	4410.80	420.51
.000910	840.	1016.	1040.	3	0	0	.00	330.88	751.39

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 314.160

3301 HV CHANGED MORE THAN HVINS

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

3470 ENCROACHMENT STATIONS= 3050.0 3130.0 TYPE= 1 TARGET= 80.000

314.160	10.20	4427.60	4427.60	4428.30	4430.20	2.60	5.76	.71	4428.80
4750.0	.0	4750.0	.0	.0	366.8	.0	2198.1	629.0	100000.00
3.66	.00	12.95	.00	.000	.025	.000	.000	4417.40	3053.69
.005699	3100.	3100.	3100.	20	11	0	.00	71.92	3125.61

THIS RUN EXECUTED 18MAR96 17:32:10

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

STEAMBOAT CREEK

SUMMARY PRINTOUT

	SECNO	Q	TOPWID	SSTA	ENDST	CWSEL	DIFWSP	AREA	VCH
	2.000	6950.00	209.71	.00	244.49	4386.04	.00	1551.01	6.19
	2.000	6950.00	208.72	.00	243.50	4386.04	.00	1550.75	6.19
	7.300	6950.00	538.63	186.15	847.63	4386.24	.00	1614.69	6.02
	7.300	6950.00	531.90	186.07	840.70	4386.24	.00	1603.34	6.02
*	13.900	6950.00	726.74	205.20	1274.76	4386.25	.00	1504.12	8.61
*	13.900	6950.00	720.90	205.28	1269.00	4386.25	.00	1500.18	8.62
	19.900	6950.00	1482.30	2581.85	4178.45	4387.33	.00	3070.53	6.26
	19.900	6950.00	1479.56	2581.83	4175.50	4387.33	.01	3080.56	6.24
	23.900	6950.00	1959.53	2746.22	4705.76	4387.75	.00	4769.11	4.96
	23.900	6950.00	1959.55	2746.21	4705.76	4387.75	.00	4775.80	4.95
	29.100	6950.00	2112.92	3208.57	5334.26	4387.93	.00	5508.40	5.08
	29.100	6950.00	2064.35	3208.58	5284.25	4387.93	.00	5434.56	5.11
	38.600	6950.00	2188.69	148.58	2337.27	4388.32	.00	6091.56	3.38
*	38.600	6950.00	2003.64	148.36	2152.00	4388.32	.00	5618.15	3.56
	39.600	6950.00	2447.51	198.00	2645.51	4388.38	.00	7150.38	2.94

39.600	6950.00	2272.82	195.58	2468.40	4388.38	.01	6650.81	3.15
40.400	6950.00	2629.30	3.67	2722.87	4388.43	.00	7835.68	2.39
40.400	6950.00	2427.74	3.34	2469.10	4388.46	.03	7830.40	2.35
40.750	6950.00	2651.27	3.27	2730.54	4388.47	.00	7932.37	2.33
40.750	6950.00	2437.95	2.97	2469.10	4388.49	.03	7913.54	2.25
41.350	6950.00	2462.09	204.17	2666.26	4388.48	.00	10281.77	2.02
41.350	6950.00	1013.23	1602.47	2615.70	4388.48	.00	5269.11	2.92

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	SECNO	Q	TOPWID	SSTA	ENDST	CWSEL	DIFWSP	AREA	VCH
	45.150	6650.00	2915.14	128.89	3221.87	4388.49	.00	10622.07	2.27
	45.150	6650.00	1139.41	1807.74	2947.15	4388.51	.02	5854.93	3.12
	55.650	6650.00	2460.54	307.63	3410.57	4388.54	.00	9005.97	2.33
	55.650	6650.00	983.49	2206.01	3189.50	4388.60	.06	4829.46	3.39
	69.350	6650.00	2723.10	192.04	3798.59	4388.61	.00	8832.43	2.14
	69.350	6650.00	1101.32	2152.38	3283.95	4388.76	.15	4452.66	3.28
	78.850	6650.00	3278.77	243.15	4362.54	4388.65	.00	10894.31	1.80
	78.850	6650.00	1560.76	2392.44	4020.40	4388.86	.21	5718.20	2.75
	84.050	6650.00	4603.85	249.56	5009.90	4388.66	.00	11576.77	2.41
	84.050	6650.00	1600.99	2807.40	4451.80	4388.86	.20	4192.89	3.88
*	96.250	6650.00	3267.82	1752.31	5492.70	4388.74	.00	6305.73	3.57
*	96.250	6650.00	1024.90	3448.69	4639.79	4389.03	.28	2453.97	5.84
	105.550	6650.00	5376.73	2161.83	7871.88	4388.93	.00	11034.30	3.49
	105.550	6650.00	1366.41	5888.04	7354.80	4389.58	.65	3472.25	5.29
	115.550	6650.00	5411.01	1082.54	7480.99	4389.12	.00	11417.42	3.39
	115.550	6650.00	1594.31	5435.85	7244.10	4390.00	.89	3564.38	4.82
	126.550	6650.00	5252.98	670.81	6796.67	4389.21	.00	7646.02	4.28
	126.550	6650.00	1150.95	5430.00	6740.00	4390.20	1.00	2797.81	5.07
*	130.750	6650.00	2349.26	275.45	7230.96	4389.49	.00	2273.35	8.45
*	130.750	6650.00	1279.18	5610.00	7228.10	4390.27	.77	1668.26	7.50
*	131.170	6650.00	6751.28	233.95	7233.34	4390.90	.00	6626.28	5.49
*	131.170	6650.00	1633.83	5600.00	7233.83	4391.19	.29	2998.30	5.84
*	132.570	6650.00	5670.26	354.96	6668.13	4391.22	.00	15774.17	1.19
*	132.570	6650.00	1360.00	5300.00	6660.00	4391.58	.36	5322.22	1.61
*	155.570	5000.00	5728.59	1662.78	7606.06	4391.25	.00	17780.35	.56
	155.570	5000.00	1120.70	6000.00	7135.00	4391.66	.41	6978.46	1.12
	169.570	5000.00	4670.91	2107.81	6778.72	4391.26	.00	17262.46	.53
	169.570	5000.00	1390.00	5200.00	6590.00	4391.69	.43	8259.25	.93
*	180.570	5000.00	3551.94	2620.46	6539.84	4391.27	.00	11574.10	.81

*	180.570	5000.00	1220.00	5200.00	6420.00	4391.71	.44	6907.77	1.36
*	189.070	5000.00	1110.00	3860.00	4970.00	4391.27	.00	4357.70	2.21
*	189.070	5000.00	1110.00	3860.00	4970.00	4391.74	.47	4868.80	1.94
*	196.170	5000.00	207.02	3061.10	3697.00	4391.22	.00	1285.99	3.89
*	196.170	5000.00	206.17	3062.00	3697.00	4391.69	.46	1376.11	3.63

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	SECNO	Q	TOPWID	SSTA	ENDST	CWSEL	DIFWSP	AREA	VCH
	196.370	5000.00	602.79	3080.65	3683.44	4391.09	.00	867.31	5.76
	196.370	5000.00	602.79	3080.65	3683.44	4391.56	.47	907.82	5.51
	196.970	5000.00	602.79	3080.65	3683.44	4391.13	.00	869.82	5.75
	196.970	5000.00	602.79	3080.65	3683.44	4391.60	.47	910.40	5.49
	197.170	5000.00	207.04	3061.10	3697.00	4391.46	.00	1329.56	3.76
	197.170	5000.00	206.19	3062.00	3697.00	4391.91	.45	1416.98	3.53
*	199.570	5000.00	1000.00	1100.00	2100.00	4391.73	.00	4975.92	1.28
*	199.570	5000.00	603.00	1447.00	2050.00	4392.15	.41	3881.11	1.53
	201.570	5000.00	1234.47	750.00	1984.47	4391.76	.00	4712.62	1.36
*	201.570	5000.00	549.82	1435.00	1984.82	4392.17	.41	2267.34	2.80
	202.070	5000.00	1334.47	650.00	1984.47	4391.77	.00	5085.81	1.27
	202.070	5000.00	580.00	1400.00	1980.00	4392.21	.44	2438.95	2.51
*	202.470	5000.00	1539.93	450.00	1989.93	4391.77	.00	3851.37	1.71
	202.470	5000.00	620.00	1370.00	1990.00	4392.21	.44	1953.07	3.12
*	205.670	5000.00	1913.03	1422.19	3877.54	4391.85	.00	5230.67	.72
*	205.670	5000.00	712.41	3150.00	3877.77	4392.42	.56	2968.03	1.15
*	217.390	5000.00	1181.51	319.56	1833.16	4393.18	.00	912.57	6.79
*	217.390	5000.00	490.09	1253.33	1836.04	4394.11	.93	736.59	7.48
*	224.980	5000.00	2200.99	916.66	3183.16	4396.70	.00	2622.84	3.07
*	224.980	5000.00	865.11	2298.56	3187.47	4397.54	.83	1835.03	3.43
*	235.230	5000.00	1068.02	98.50	1744.58	4399.91	.00	932.56	7.71
*	235.230	5000.00	883.02	782.75	1747.22	4400.77	.86	904.78	8.76
*	269.390	4750.00	294.79	136.71	431.50	4413.78	.00	817.92	7.73
*	269.390	4750.00	148.02	229.98	378.00	4414.51	.74	644.67	8.71
*	273.000	4750.00	347.33	79.96	428.96	4415.16	.00	787.54	10.33
*	273.000	4750.00	152.58	184.42	337.00	4415.64	.48	551.90	12.04
*	283.160	4750.00	876.72	94.84	1064.54	4417.65	.00	1630.25	4.70
*	283.160	4750.00	330.88	420.51	751.39	4418.69	1.03	1243.53	4.99
*	314.160	4750.00	205.37	2182.36	4802.66	4428.30	.00	498.93	10.91
*	314.160	4750.00	71.92	3053.69	3125.61	4427.60	-.70	366.77	12.95

1

SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 13.900 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 13.900 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 38.600 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 38.600 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 96.250 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 96.250 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 130.750 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 130.750 PROFILE= 1 MINIMUM SPECIFIC ENERGY
WARNING SECNO= 130.750 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 131.170 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 131.170 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 132.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 132.570 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 155.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

ARNING SECNO= 180.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
ARNING SECNO= 180.570 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 189.070 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 189.070 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 196.170 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 196.170 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 199.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 199.570 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 201.570 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 202.470 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 205.670 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 205.670 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 217.390 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 217.390 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 217.390 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 217.390 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 217.390 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 217.390 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

ARNING SECNO= 224.980 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 224.980 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 235.230 PROFILE= 1 CRITICAL DEPTH ASSUMED

1

CAUTION SECNO= 235.230 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
AUTION SECNO= 235.230 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 235.230 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 235.230 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 235.230 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 269.390 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 269.390 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 273.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 273.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 273.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 273.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 273.000 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 273.000 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 283.160 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 283.160 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 314.160 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 314.160 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 314.160 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 314.160 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 314.160 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 314.160 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

FLOODWAY DATA, STEAMBOAT CREEK
PROFILE NO. 2

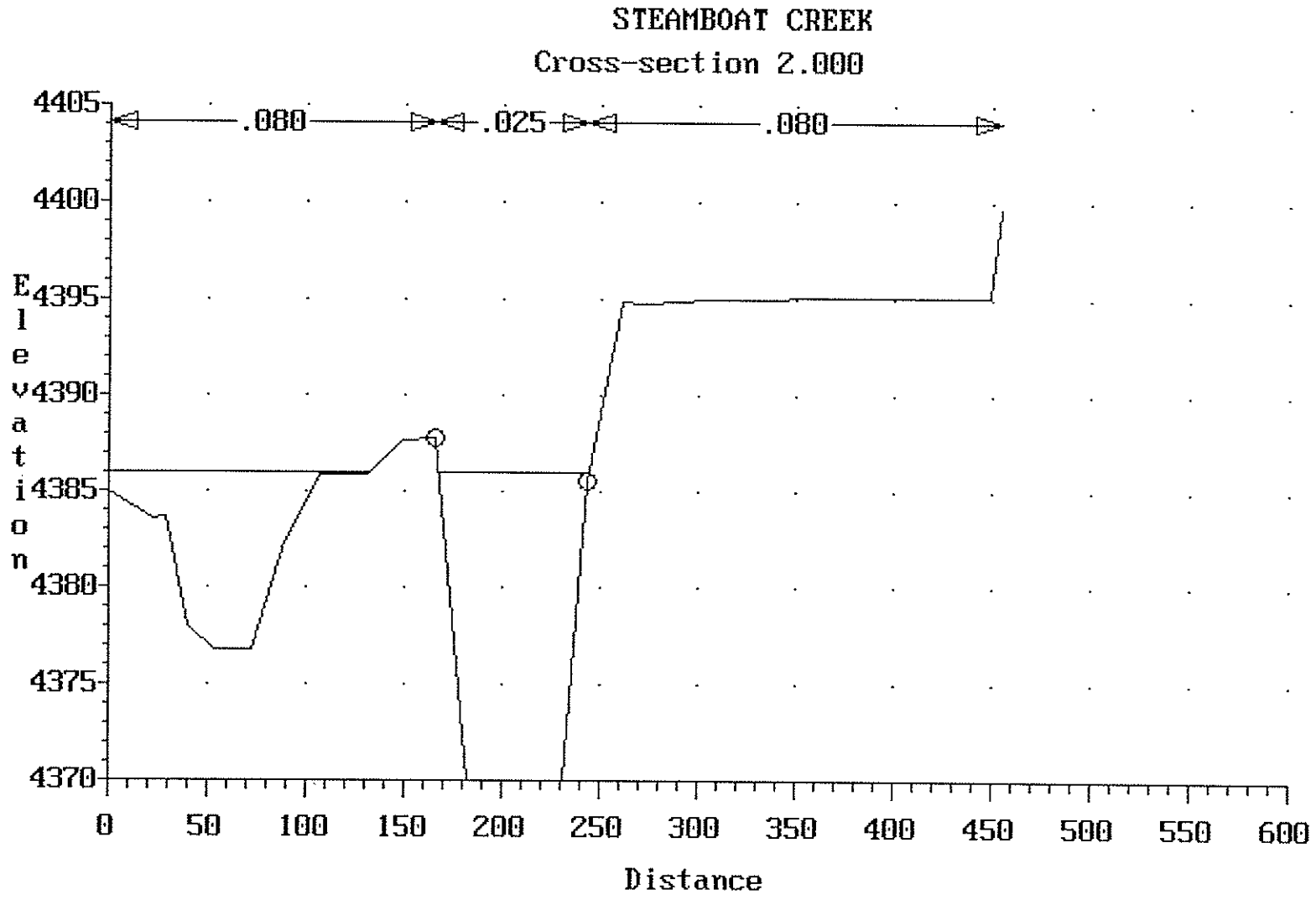
STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
2.000	244.	1551.	4.5	4386.0	4386.0	.0
7.300	655.	1603.	4.3	4386.2	4386.2	.0
13.900	1064.	1500.	4.6	4386.2	4386.2	.0
19.900	1594.	3081.	2.3	4387.3	4387.3	.0
23.900	1960.	4776.	1.5	4387.7	4387.7	.0
29.100	2076.	5435.	1.3	4387.9	4387.9	.0
38.600	2004.	5618.	1.2	4388.3	4388.3	.0
39.600	2273.	6651.	1.0	4388.4	4388.4	.0
40.400	2466.	7830.	.9	4388.4	4388.4	.0
40.750	2466.	7914.	.9	4388.5	4388.5	.0
41.350	1013.	5269.	1.3	4388.5	4388.5	.0
45.150	1139.	5855.	1.1	4388.5	4388.5	.0
55.650	983.	4829.	1.4	4388.6	4388.5	.1
69.350	1132.	4453.	1.5	4388.8	4388.6	.2
78.850	1628.	5718.	1.2	4388.8	4388.6	.2
84.050	1644.	4193.	1.6	4388.9	4388.7	.2
96.250	1191.	2454.	2.7	4389.0	4388.7	.3

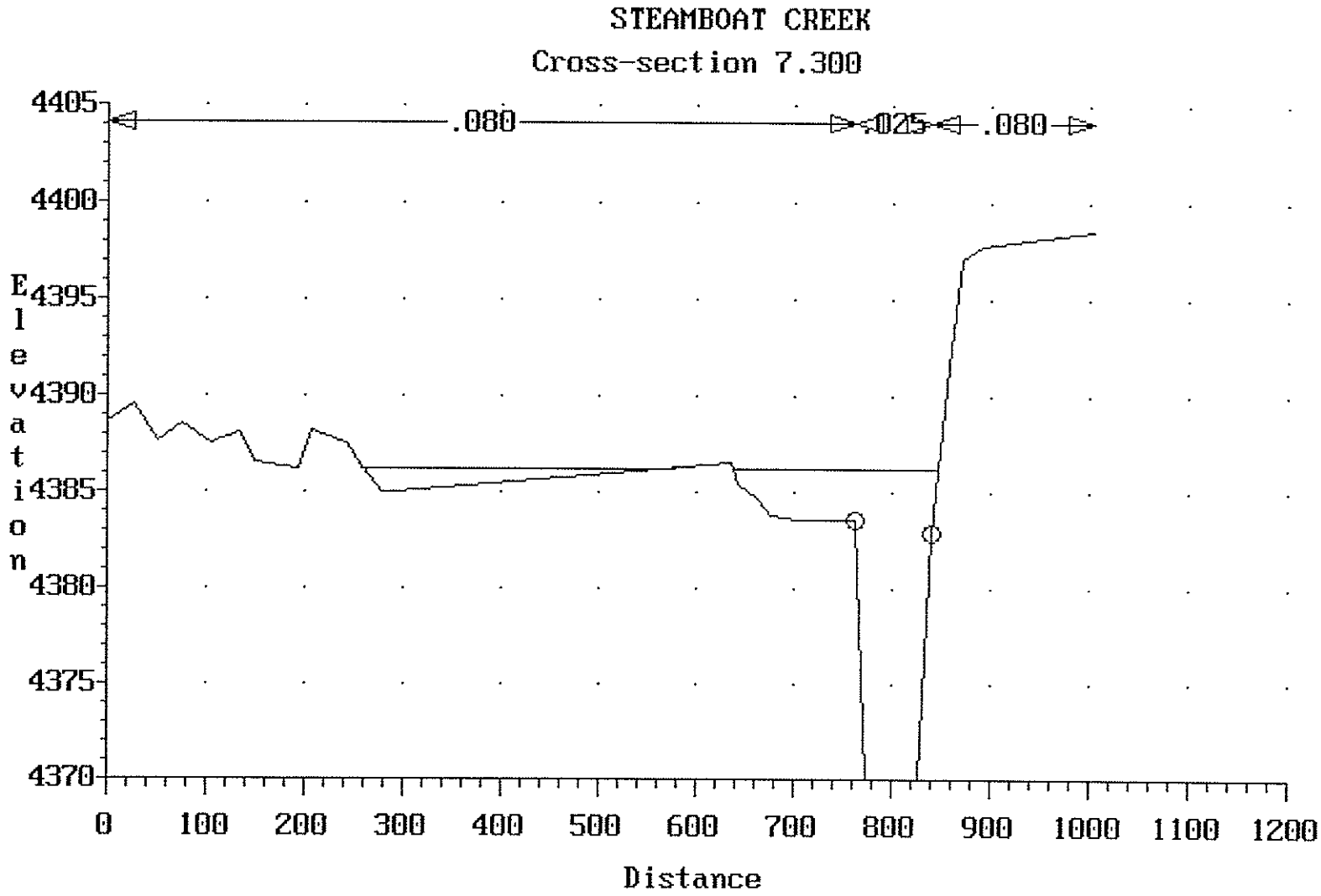
105.550	1467.	3472.	1.9	4389.6	4388.9	.7
115.550	1808.	3564.	1.9	4390.0	4389.1	.9
126.550	1310.	2798.	2.4	4390.2	4389.2	1.0
130.750	1618.	1668.	4.0	4390.3	4389.5	.8
131.170	1634.	2998.	2.2	4391.2	4390.9	.3
132.570	1360.	5322.	1.2	4391.6	4391.2	.4
155.570	1135.	6978.	.7	4391.7	4391.3	.4
169.570	1390.	8259.	.6	4391.7	4391.3	.4
180.570	1220.	6908.	.7	4391.7	4391.3	.4
189.070	1110.	4869.	1.0	4391.8	4391.3	.5
196.170	635.	1376.	3.6	4391.7	4391.2	.5
196.370	603.	908.	5.5	4391.6	4391.1	.5
196.970	603.	910.	5.5	4391.6	4391.1	.5
197.170	635.	1417.	3.5	4392.0	4391.5	.5
199.570	603.	3881.	1.3	4392.1	4391.7	.4
201.570	550.	2267.	2.2	4392.2	4391.8	.4
202.070	580.	2439.	2.1	4392.2	4391.8	.4
202.470	620.	1953.	2.6	4392.2	4391.8	.4
205.670	728.	2968.	1.7	4392.5	4391.9	.6
217.390	583.	737.	6.8	4394.1	4393.2	.9
224.980	889.	1835.	2.7	4397.5	4396.7	.8
235.230	964.	905.	5.5	4400.8	4399.9	.9
269.390	148.	645.	7.4	4414.5	4413.8	.7
273.000	153.	552.	8.6	4415.7	4415.2	.5
283.160	331.	1244.	3.8	4418.7	4417.7	1.0

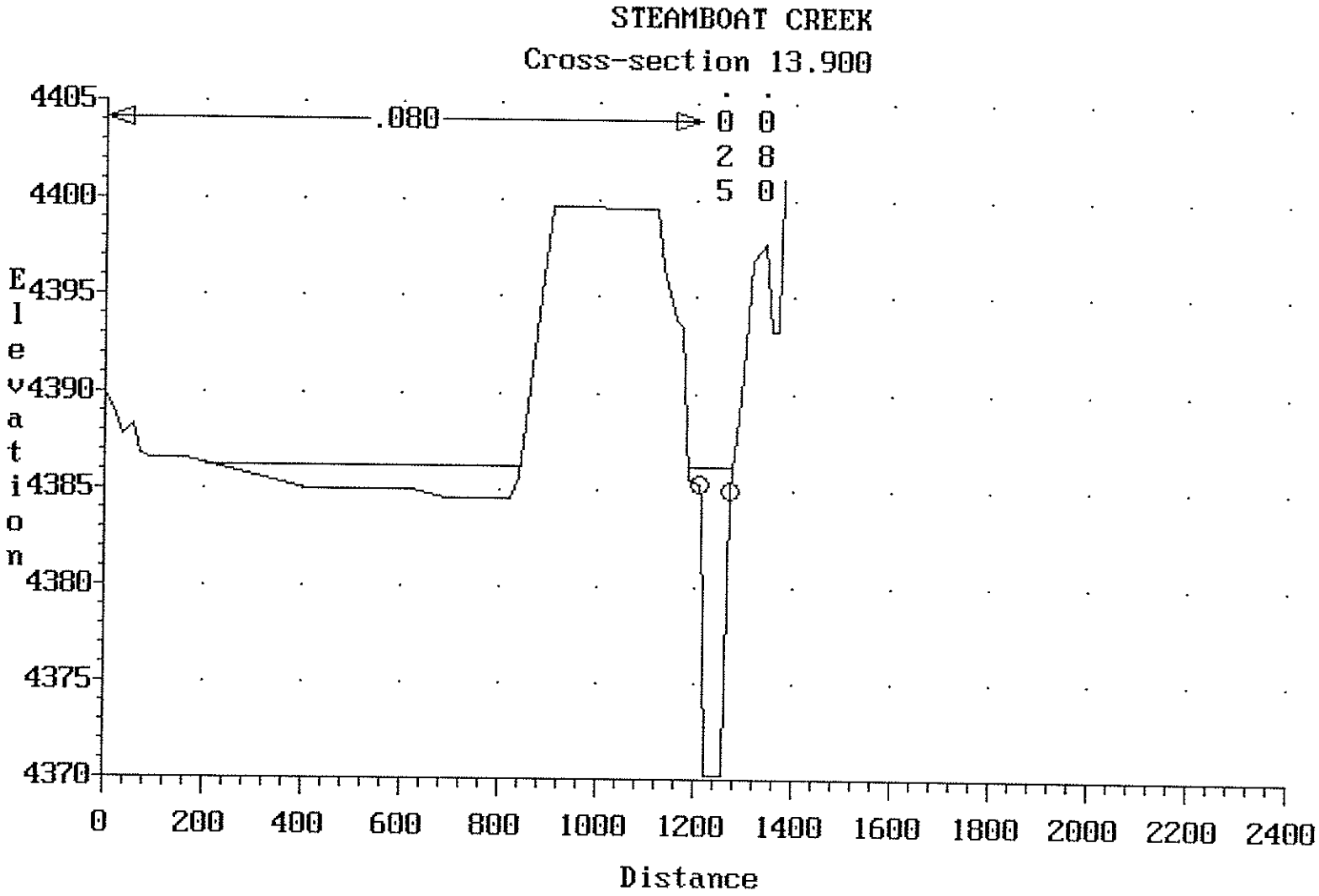
1

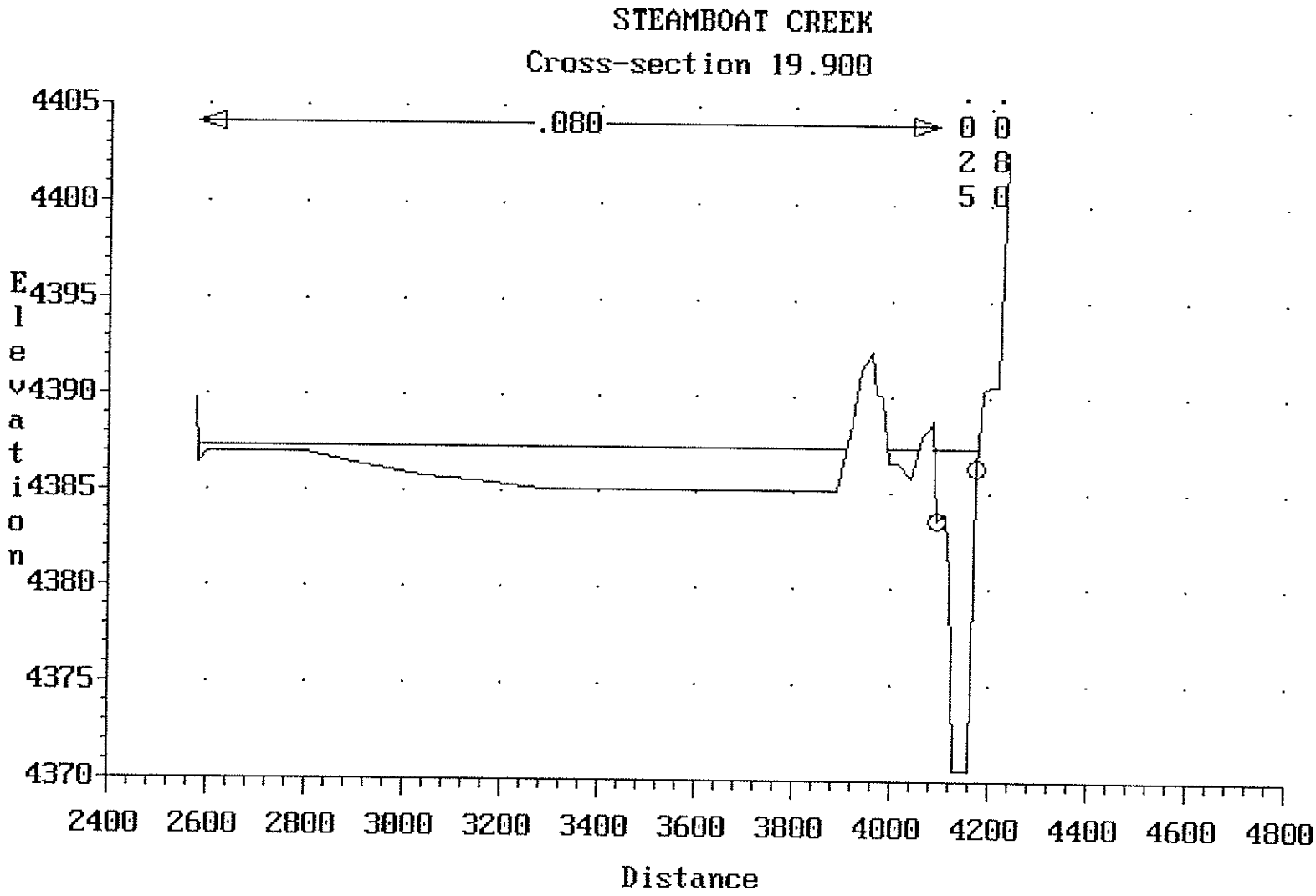
FLOODWAY DATA, STEAMBOAT CREEK
PROFILE NO. 2

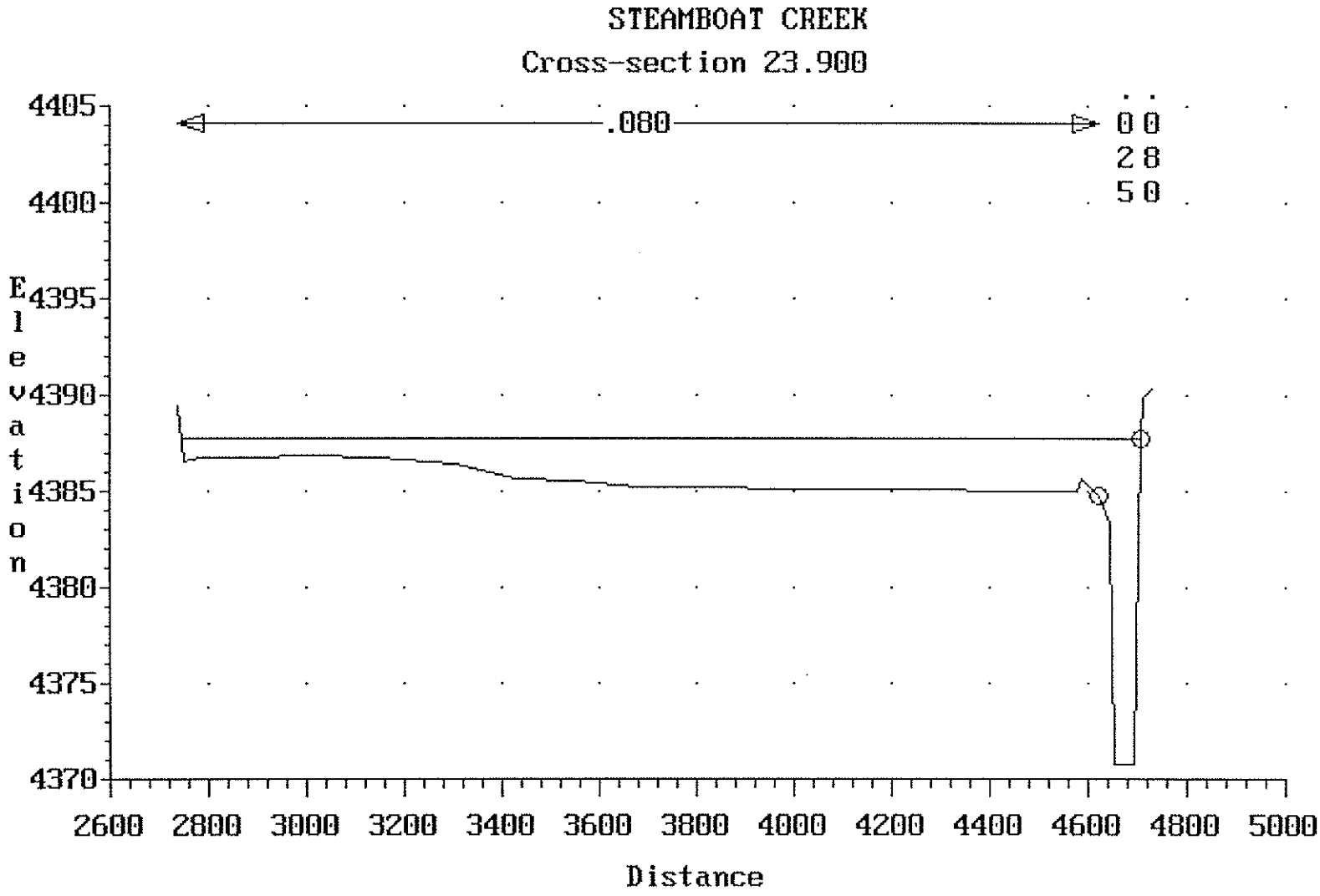
STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
314.160	72.	367.	13.0	4427.6	4428.3	-.7

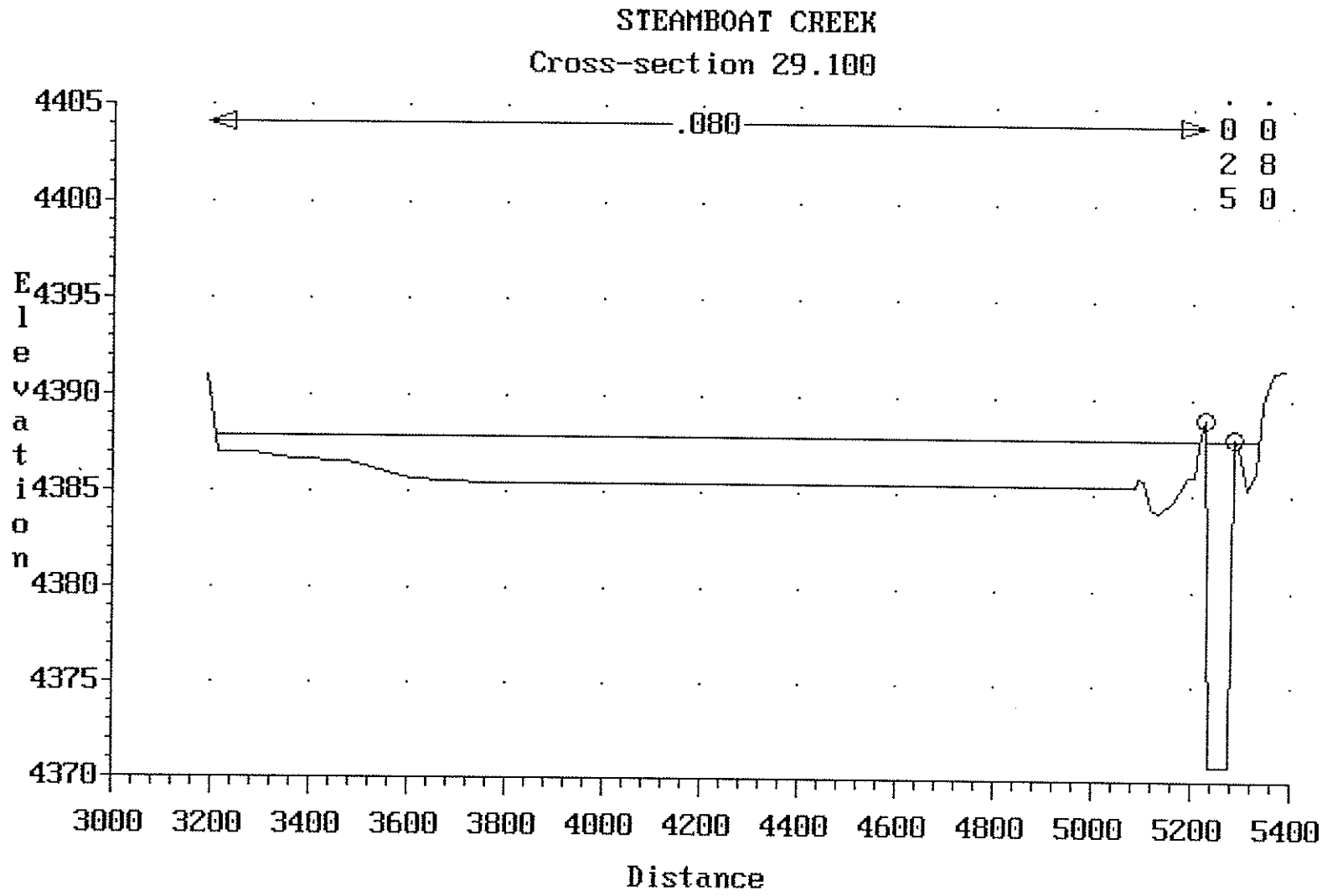

STEAMBOAT CREEK
Cross-section 2.000
.080
.025
.080
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
0
50
100
150
200
250
300
350
400
450
500
550
600
Distance

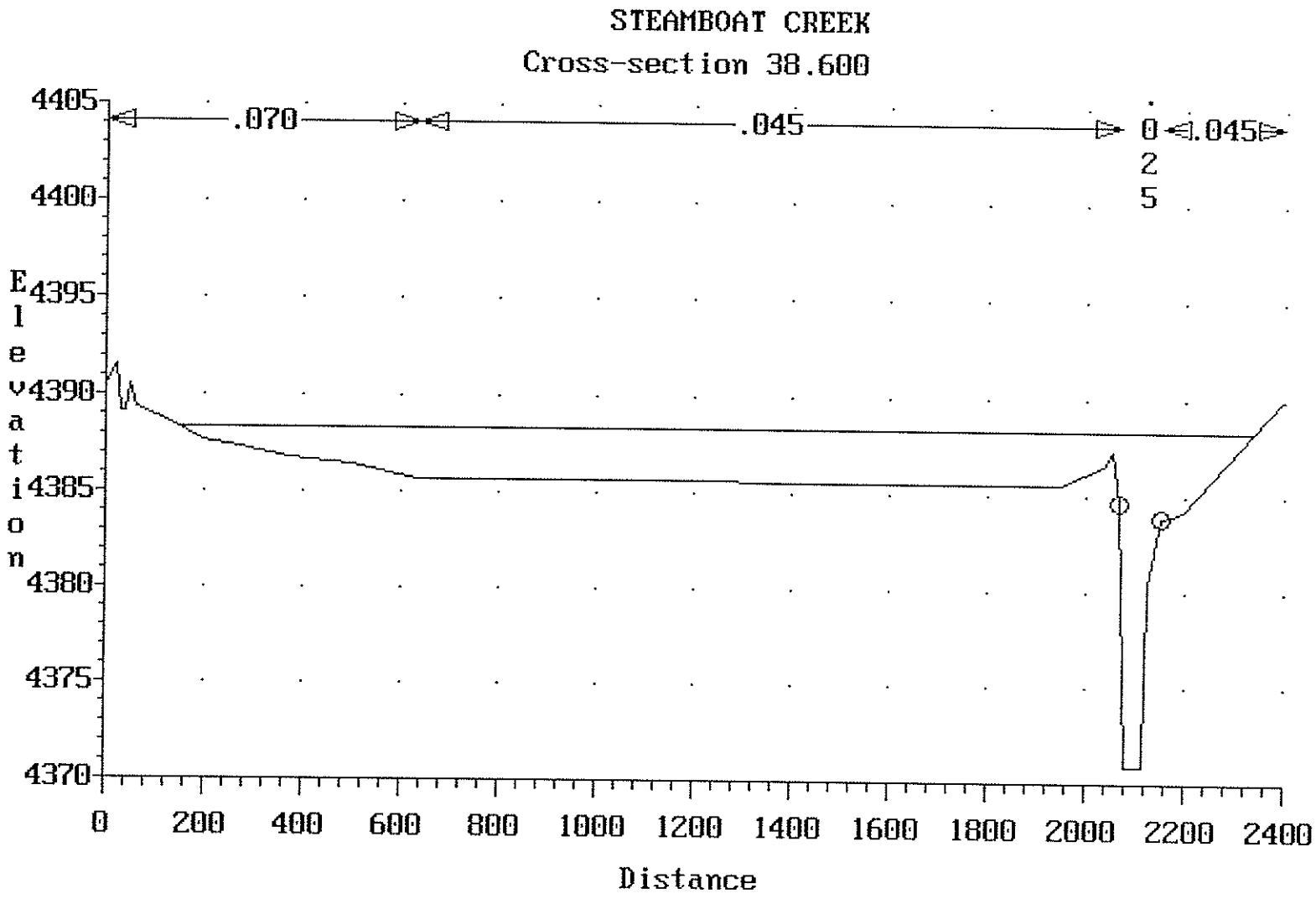

STEAMBOAT CREEK
Cross-section 7.300
.080
.025
.080
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
Distance

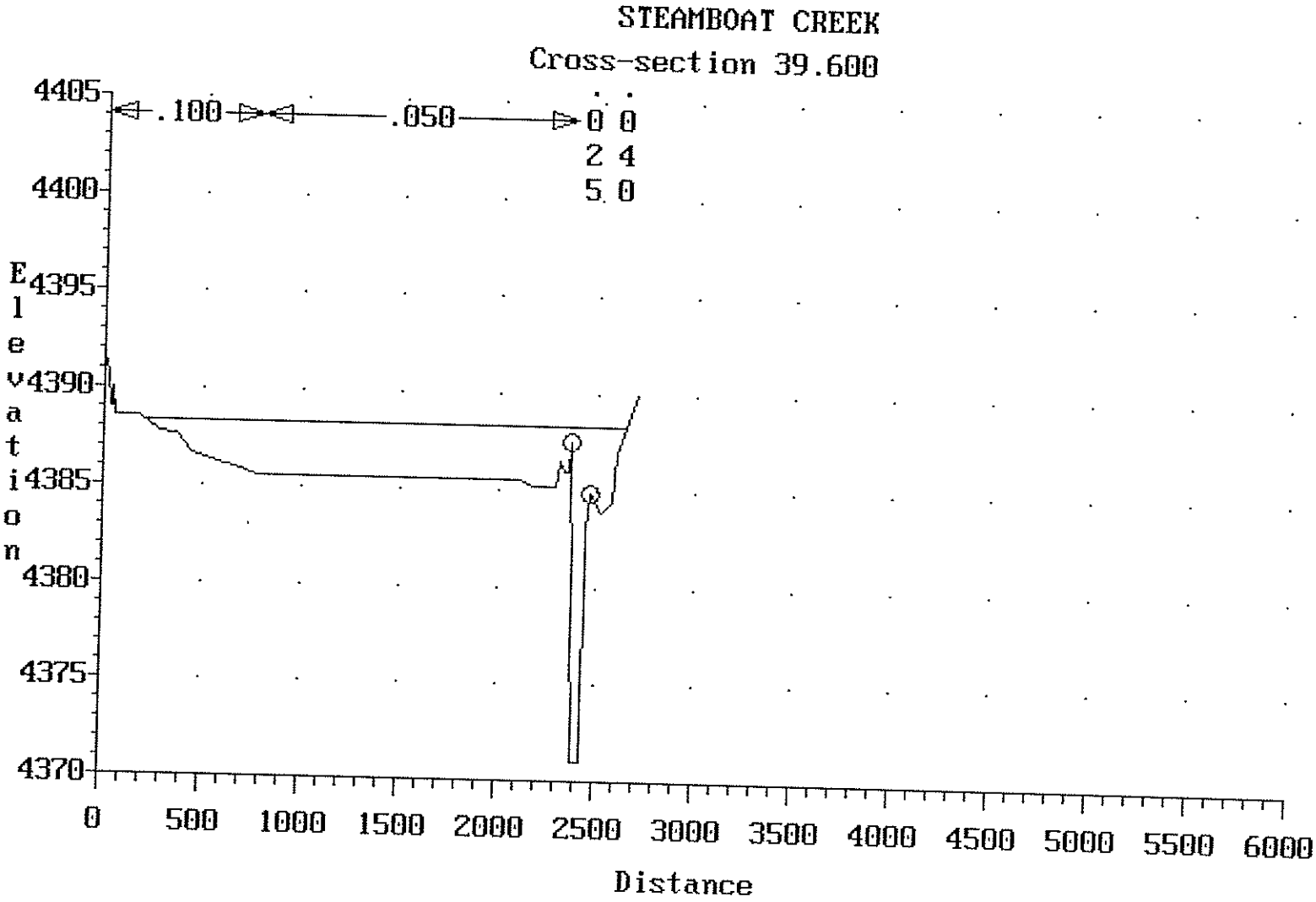

STEAMBOAT CREEK
Cross-section 13.900
.080
0 0
2 8
5 0
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
Distance

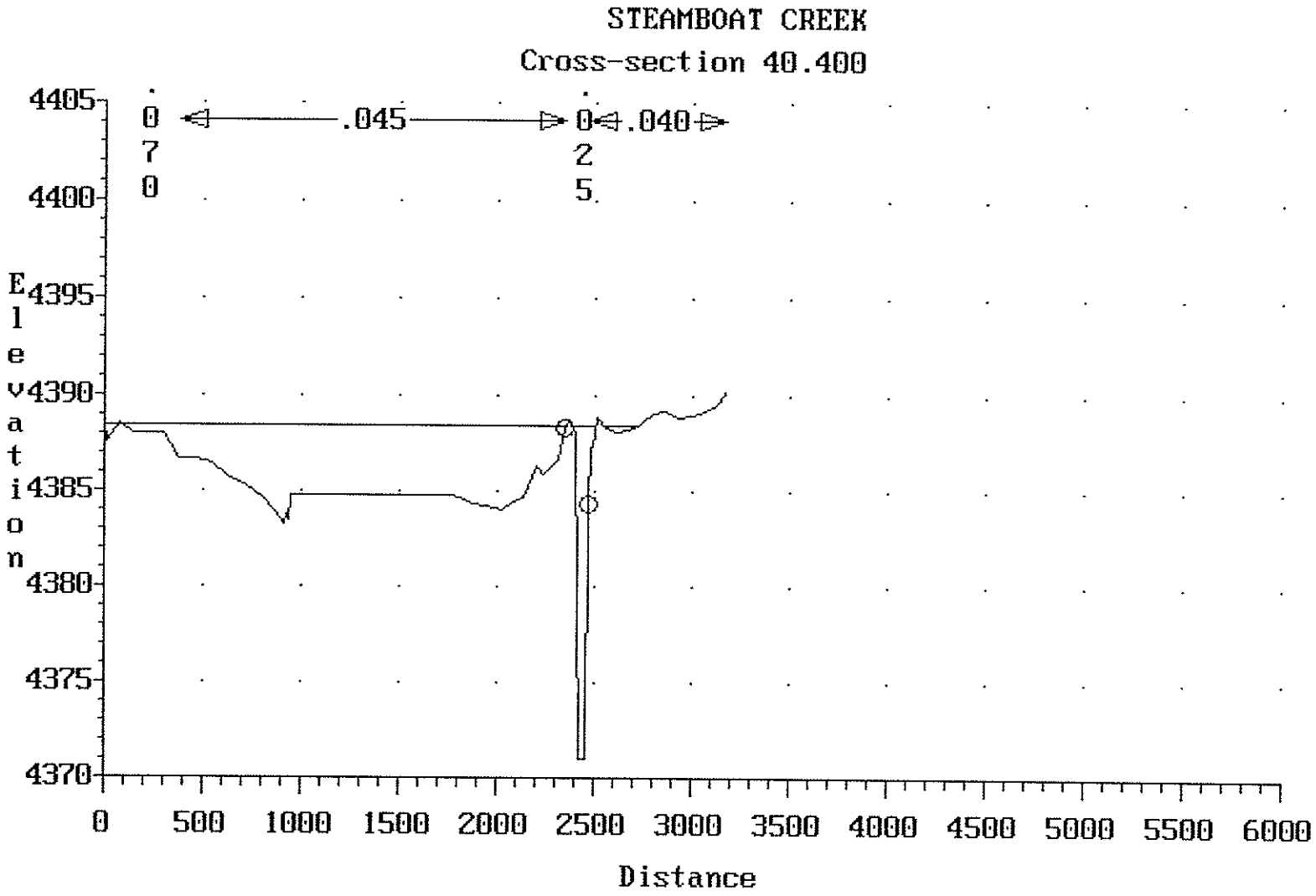

STEAMBOAT CREEK
Cross-section 19.900
.080
0 0
2 8
5 0
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
2400 2600 2800 3000 3200 3400 3600 3800 4000 4200 4400 4600 4800
Distance

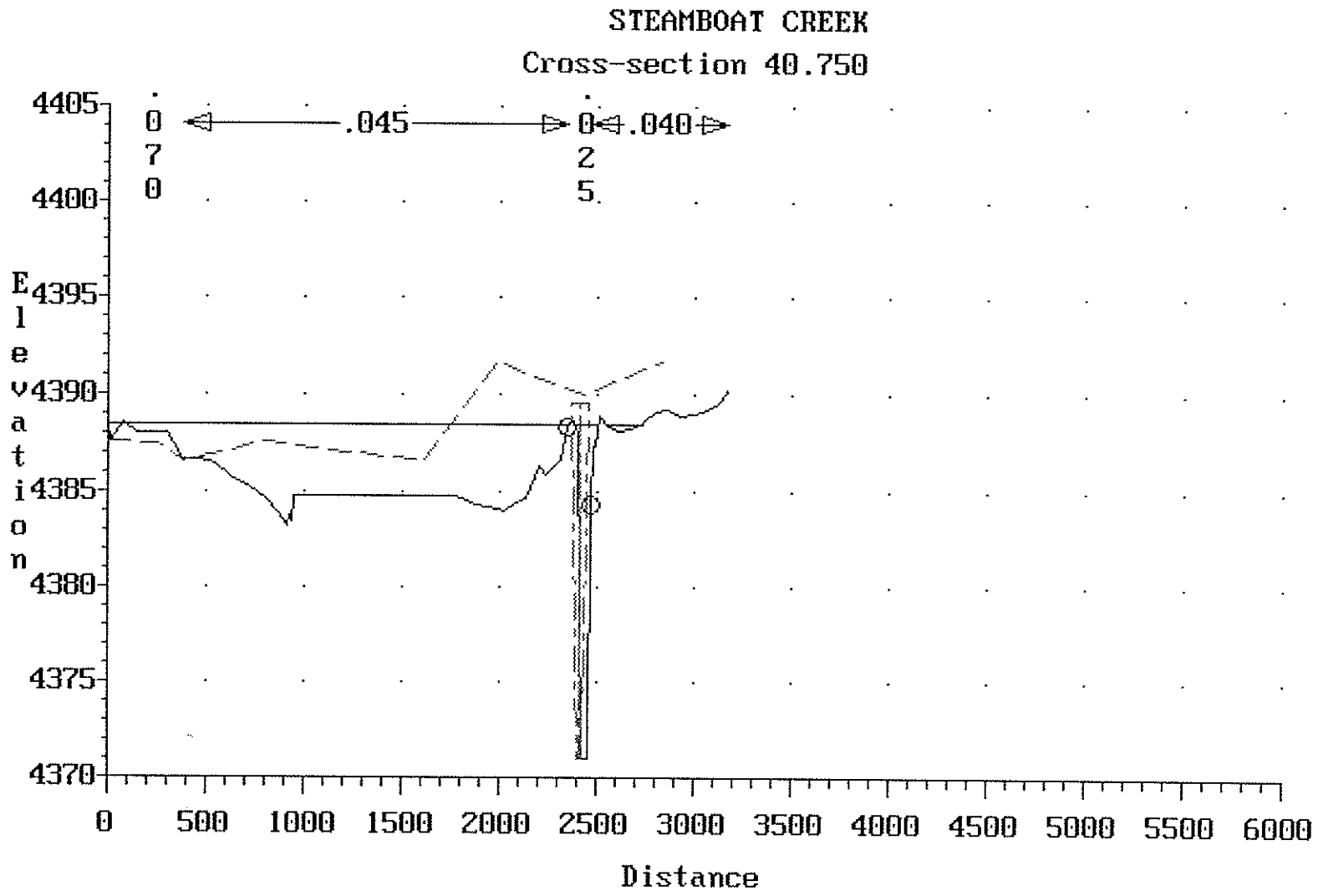

STEAMBOAT CREEK
Cross-section 23.900
.080
0 0
2 8
5 0
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
2600
2800
3000
3200
3400
3600
3800
4000
4200
4400
4600
4800
5000
Distance

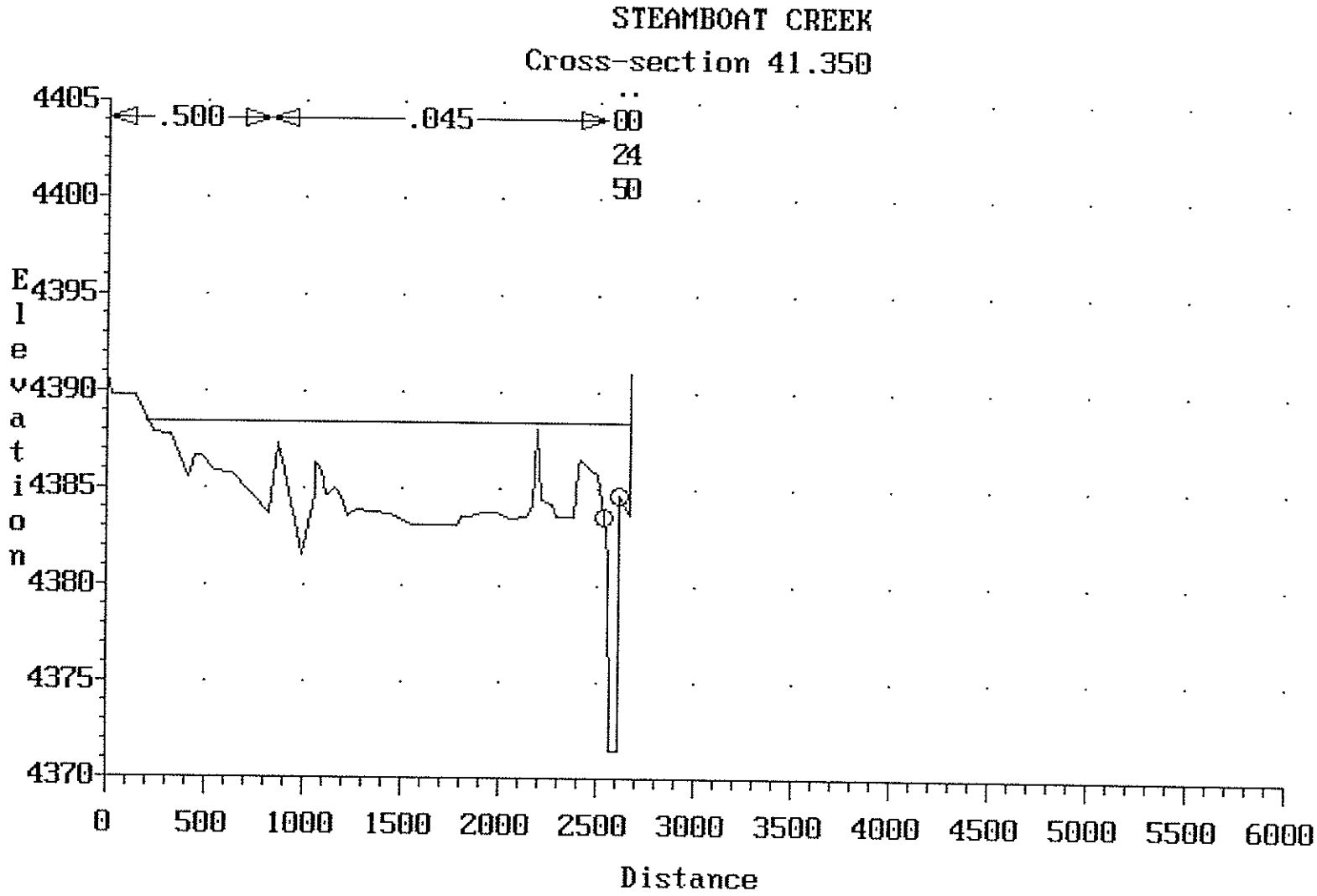

STEAMBOAT CREEK
Cross-section 29.100
.080
0 0
2 8
5 0
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
3000 3200 3400 3600 3800 4000 4200 4400 4600 4800 5000 5200 5400
Distance

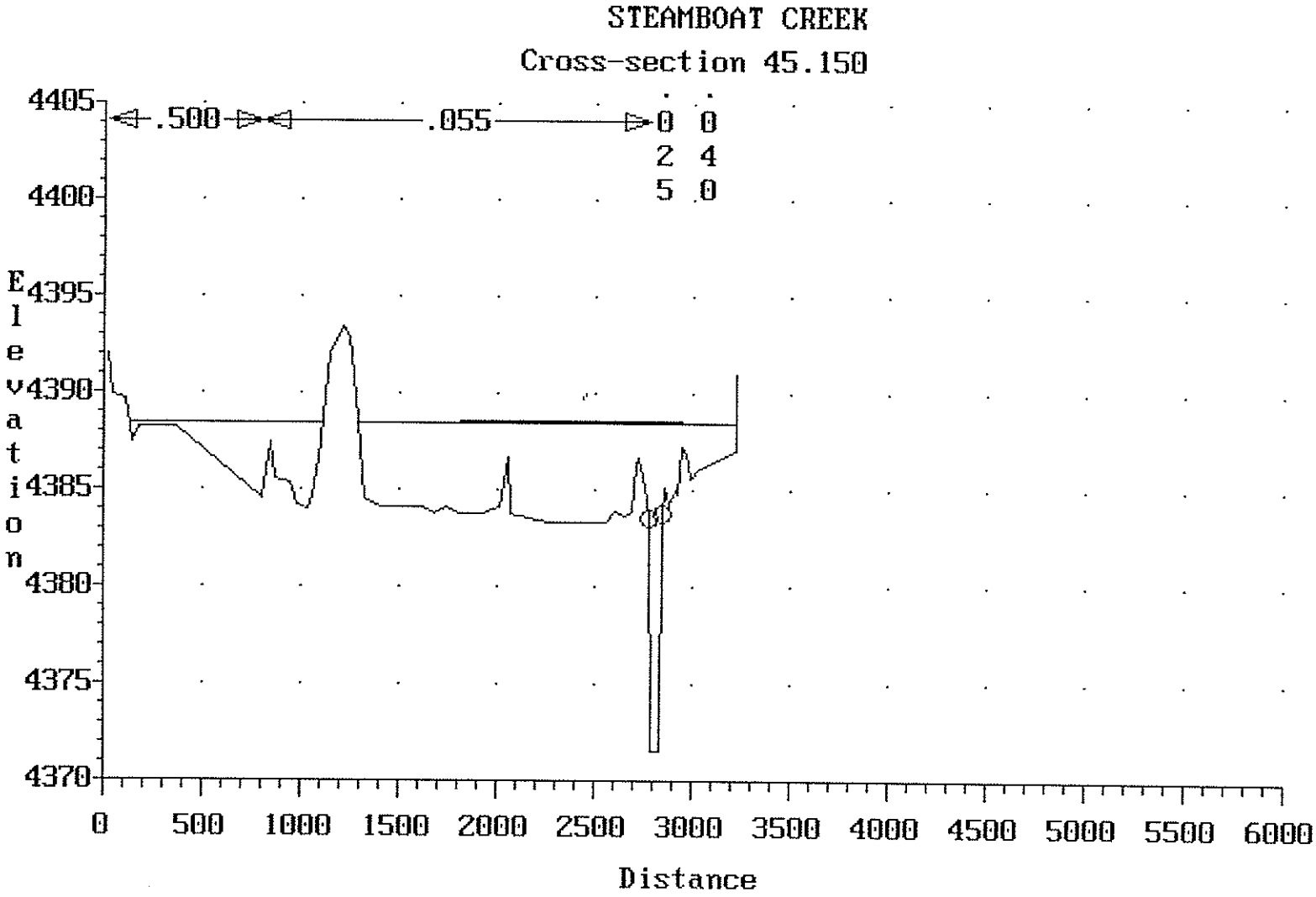

STEAMBOAT CREEK
Cross-section 38.600
.070
.045
0
.045
2
5
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
Distance

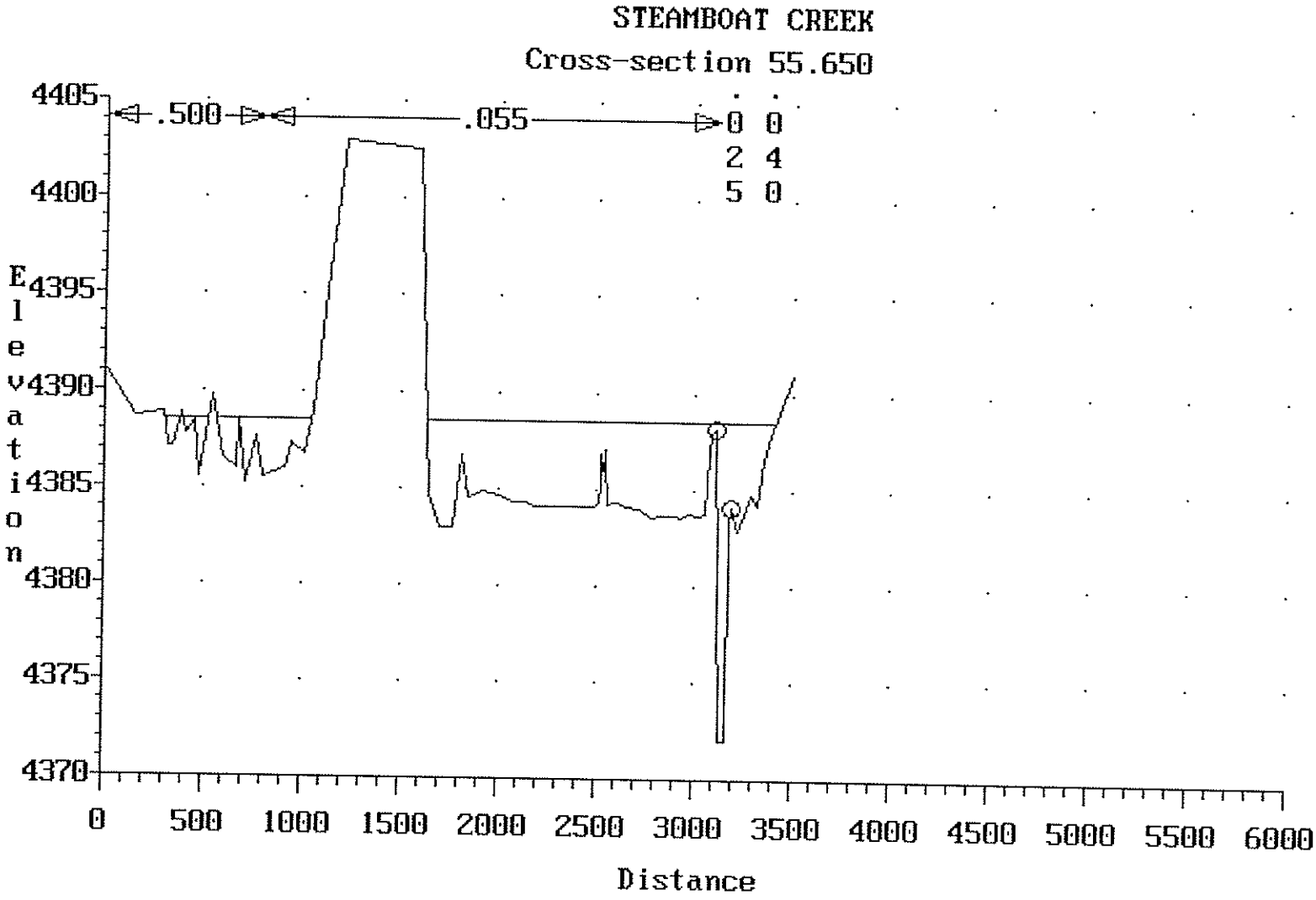

STEAMBOAT CREEK
Cross-section 39.600
.100
.050
0 0
2 4
5 0
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
Distance

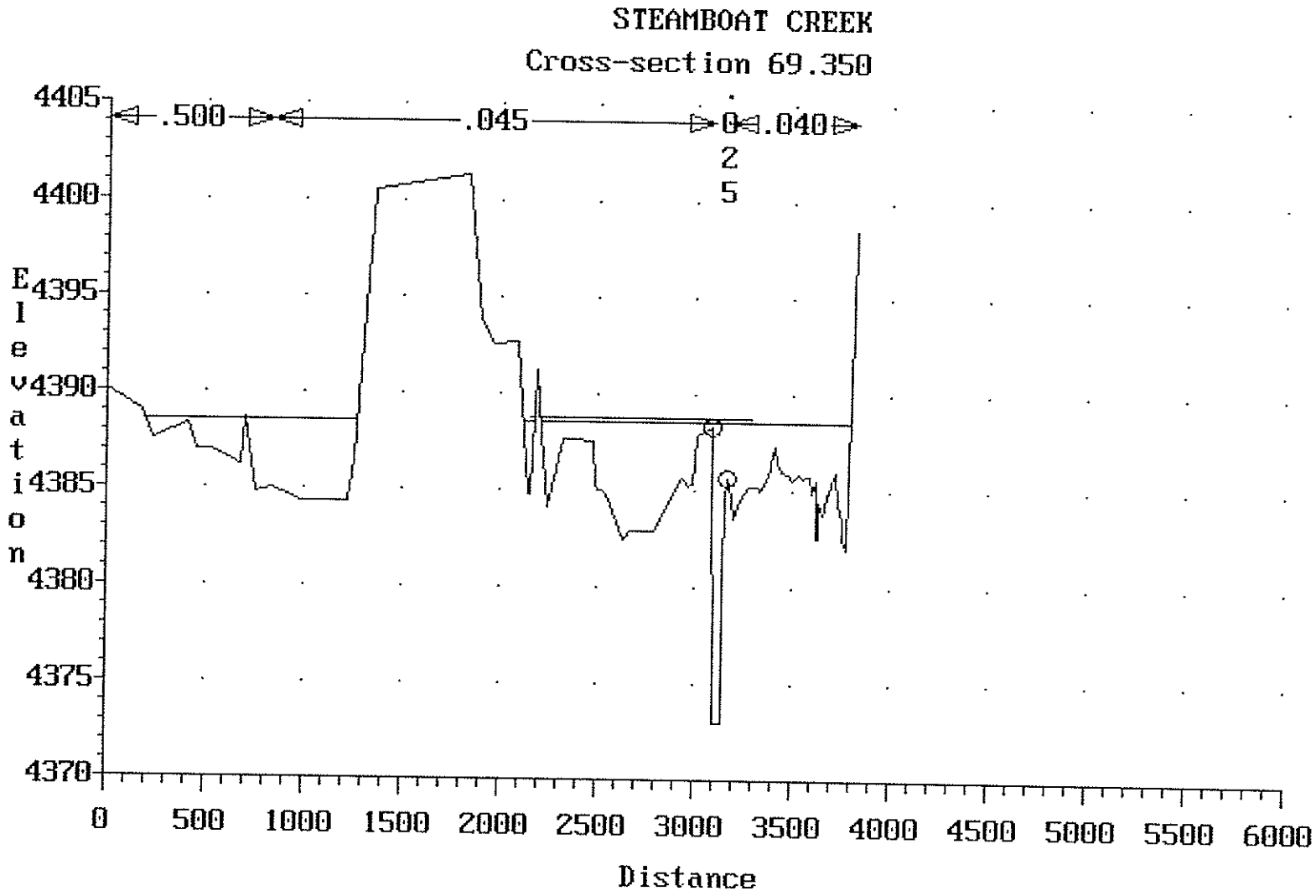

STEAMBOAT CREEK
Cross-section 40.400
0
7
0
.045
0
2
5
.040
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
Distance

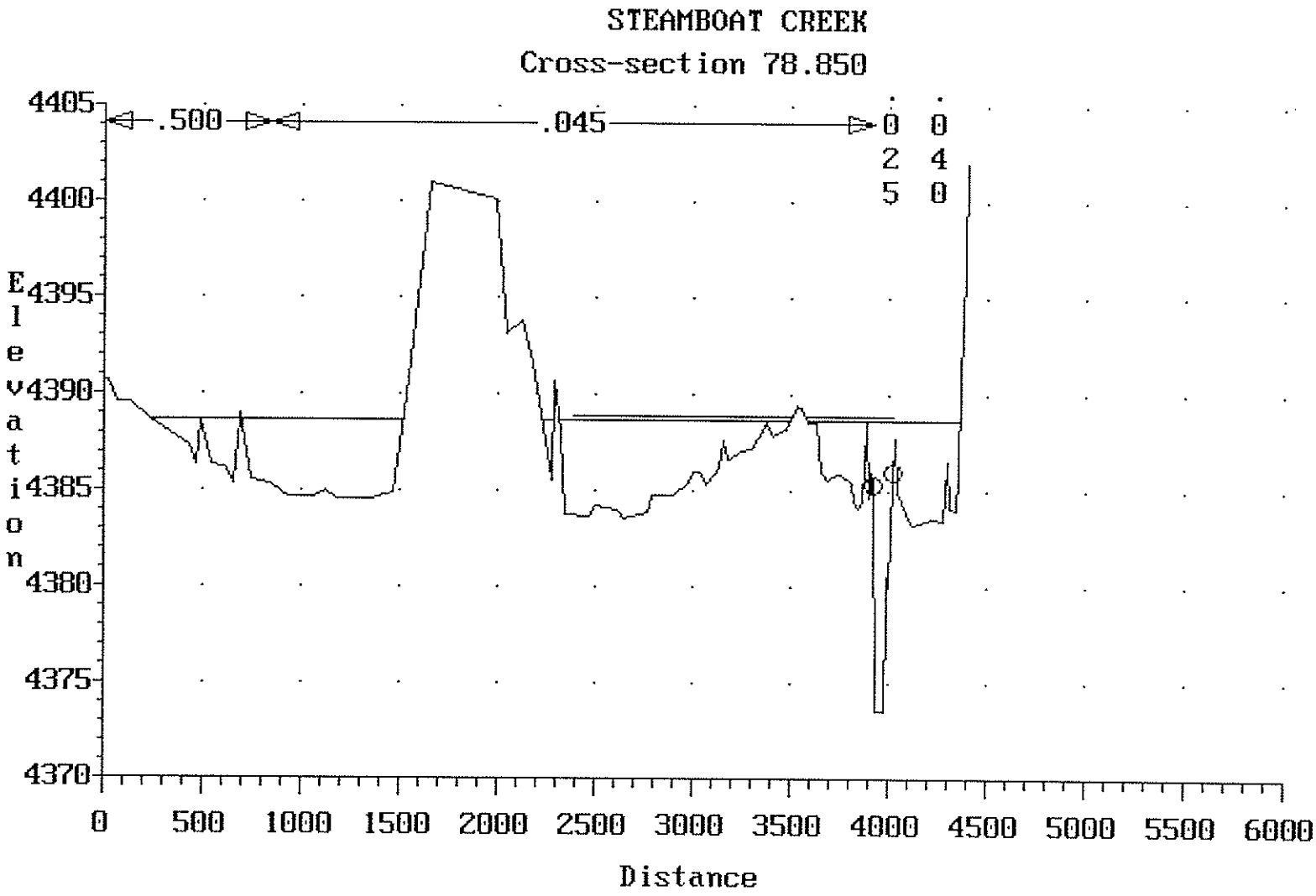

STEAMBOAT CREEK
Cross-section 40.750
0
7
0
.045
0
2
5
.040
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
Distance

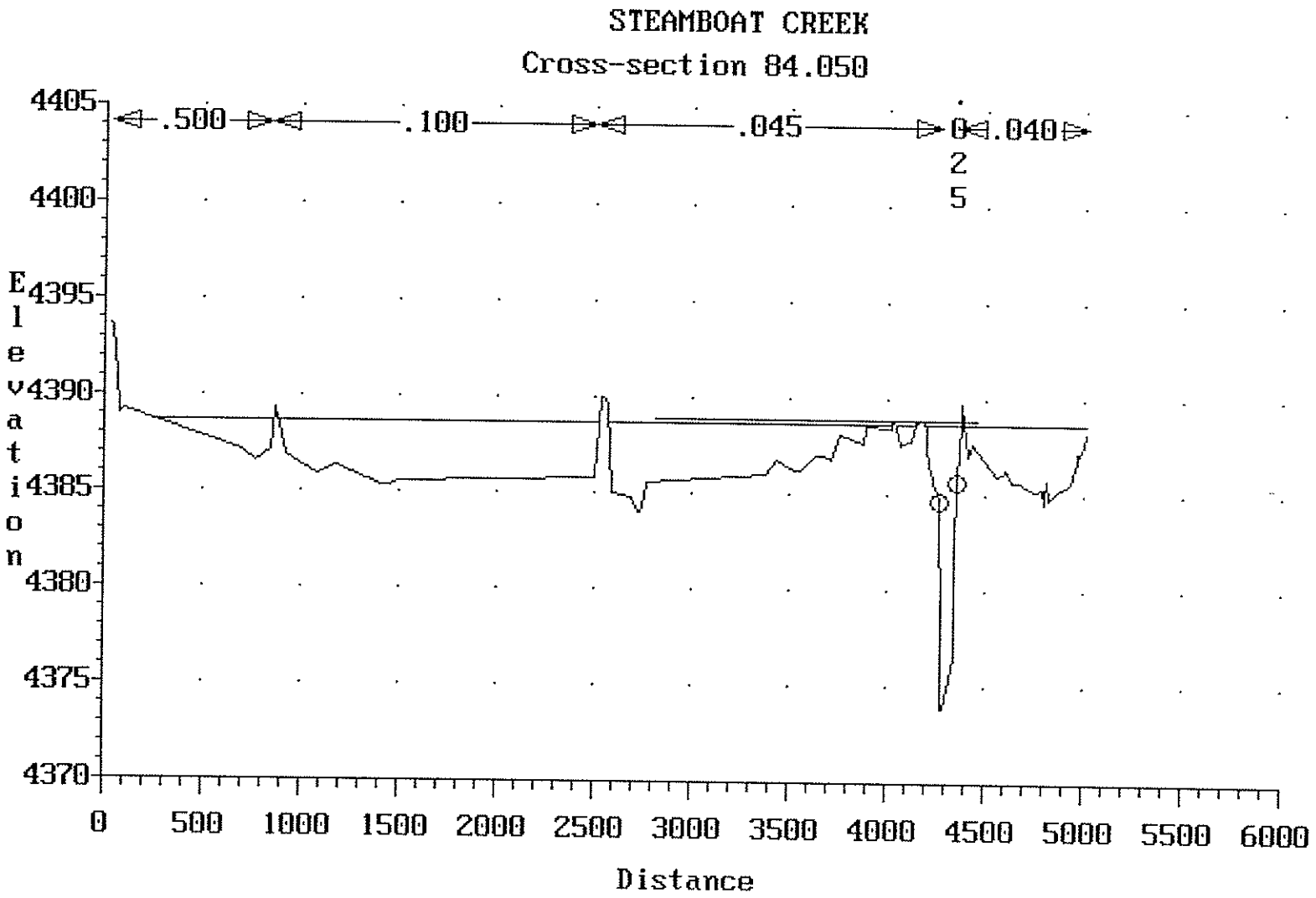

STEAMBOAT CREEK
Cross-section 41.350
.500
.045
00
24
50
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
Distance

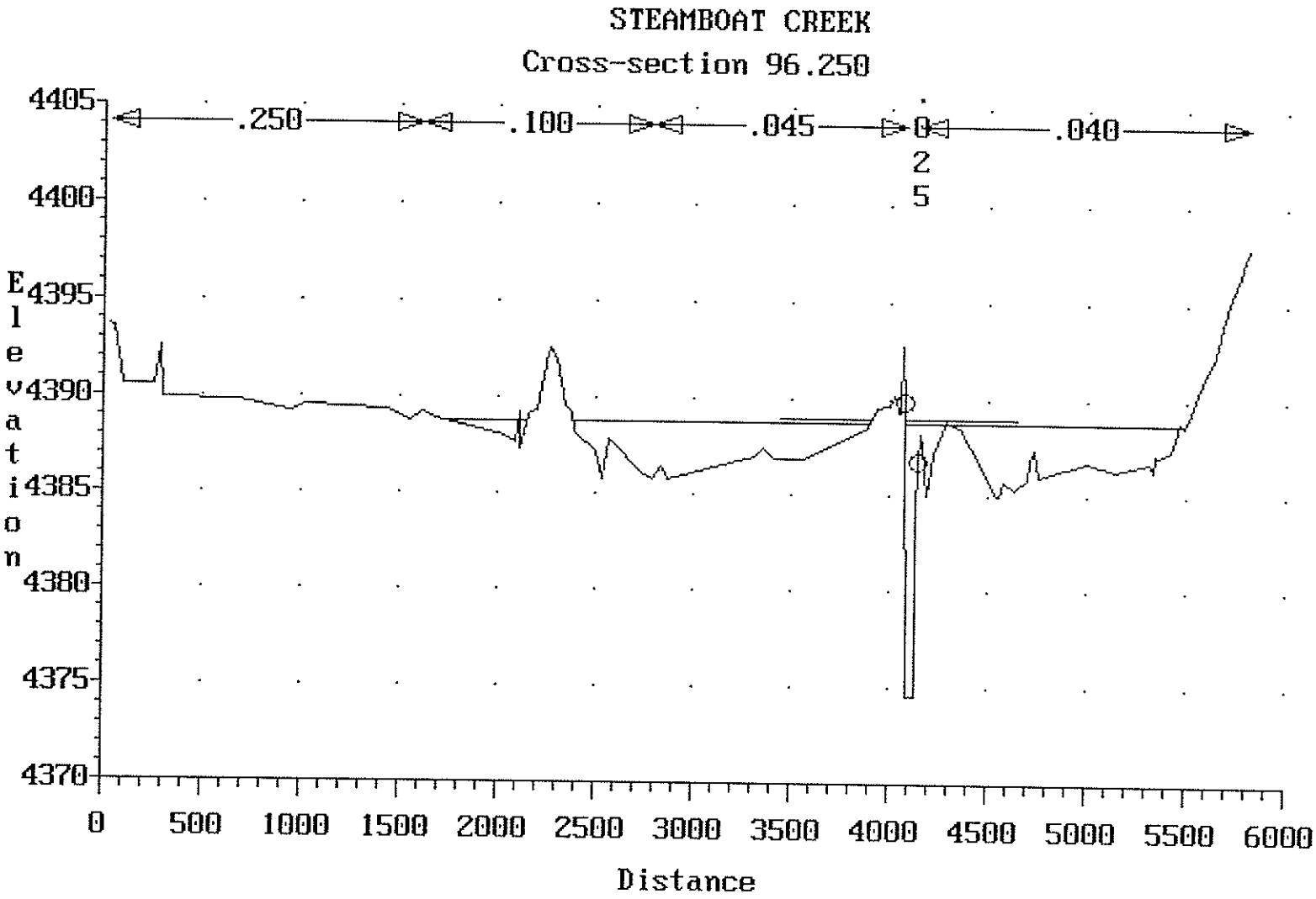

STEAMBOAT CREEK
Cross-section 45.150
.500
.055
0 0
2 4
5 0
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
Distance

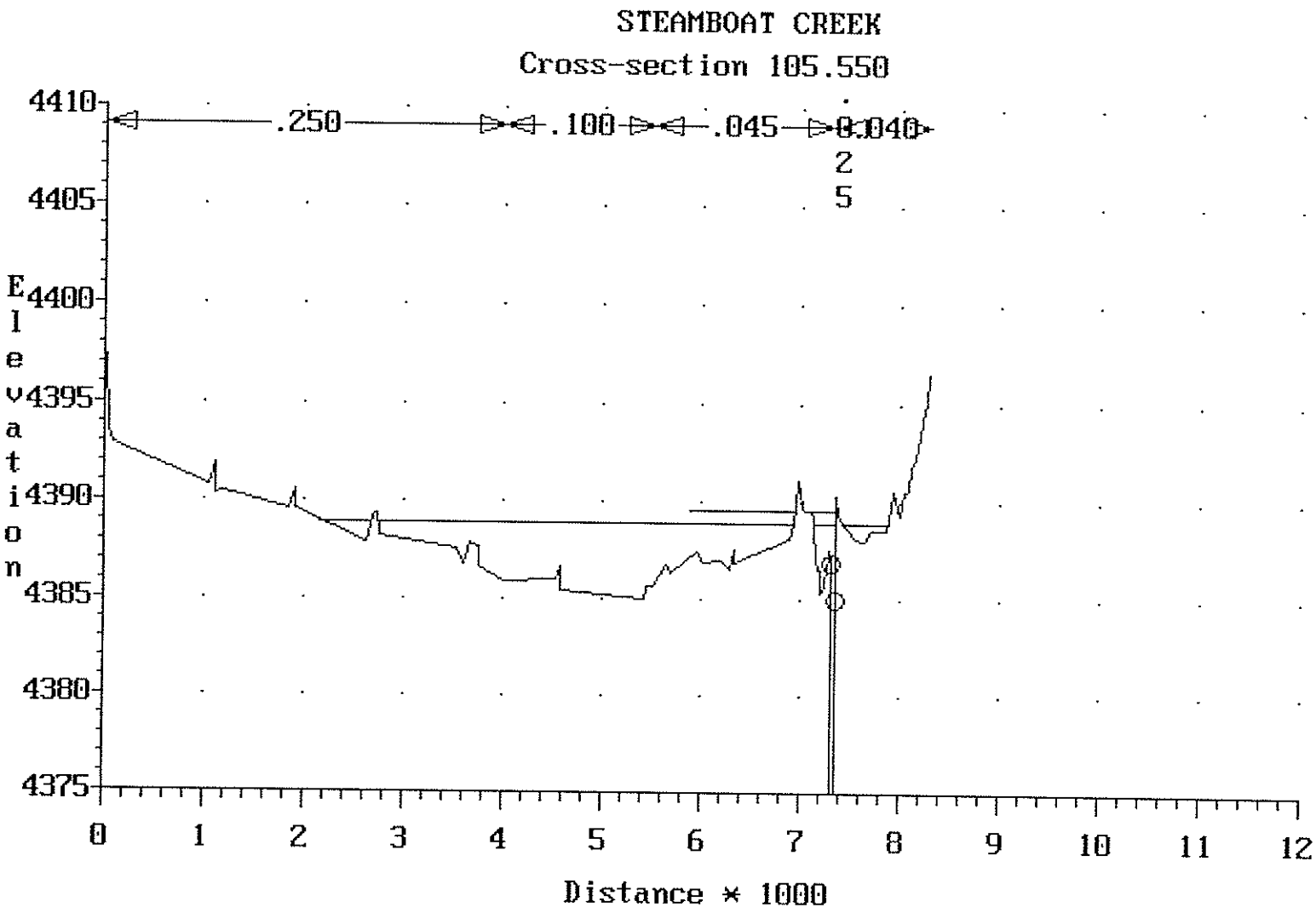

STEAMBOAT CREEK
Cross-section 55.650
.500
.055
0 0
2 4
5 0
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
Distance

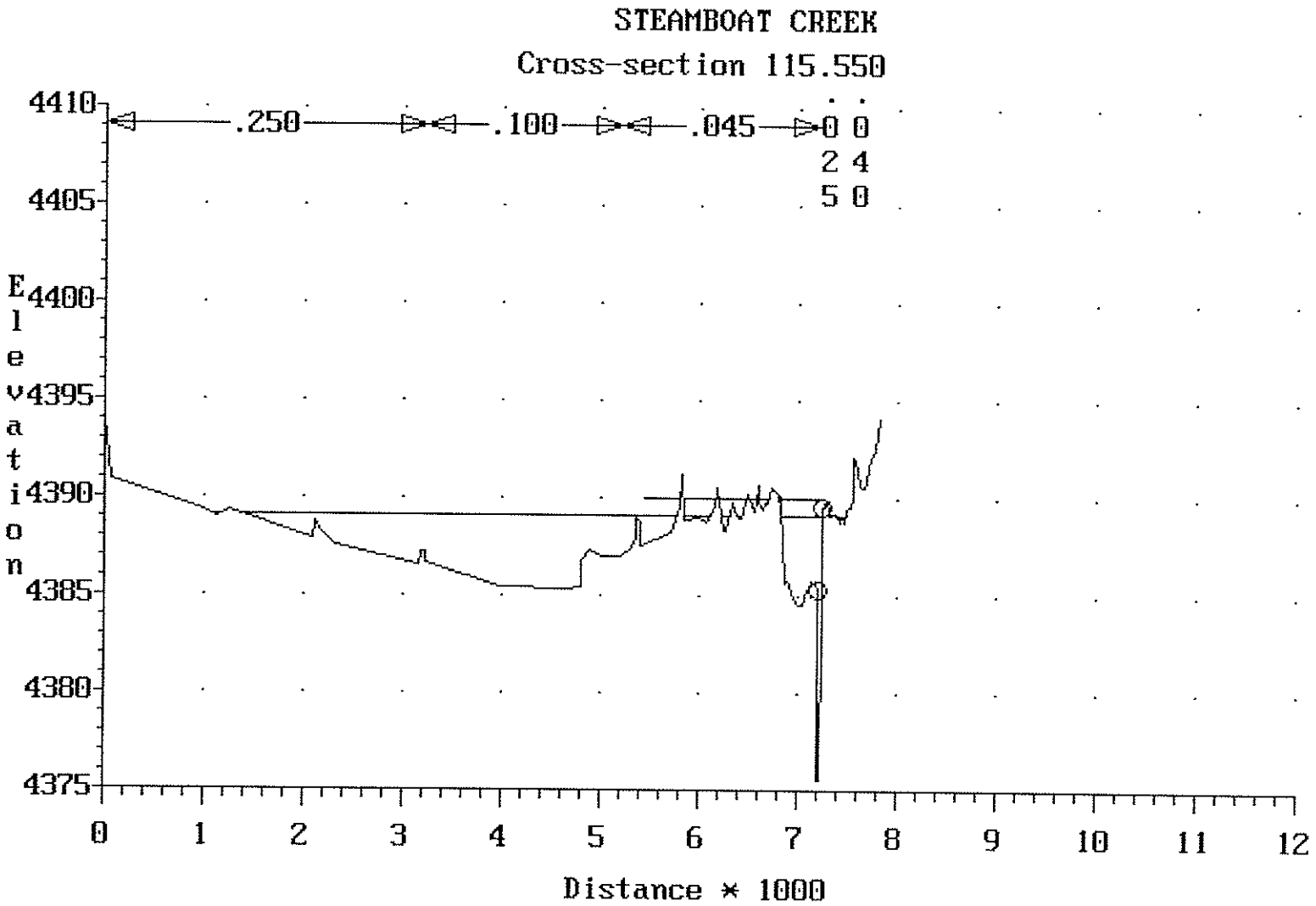

STEAMBOAT CREEK
Cross-section 69.350
.500
.045
0
.040
2
5
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
Distance

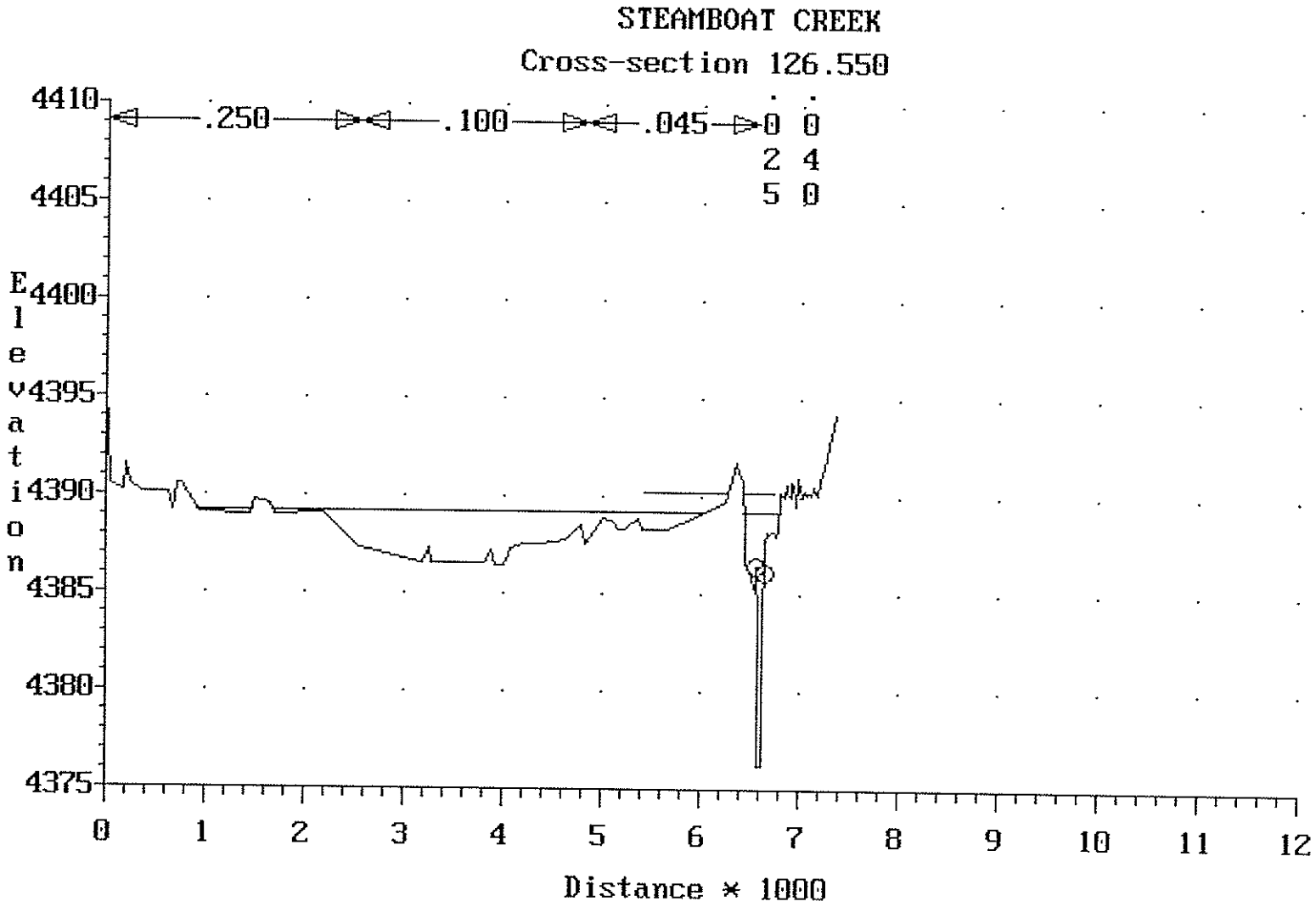

STEAMBOAT CREEK
Cross-section 78.850
.500
.045
0 0
2 4
5 0
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
Distance

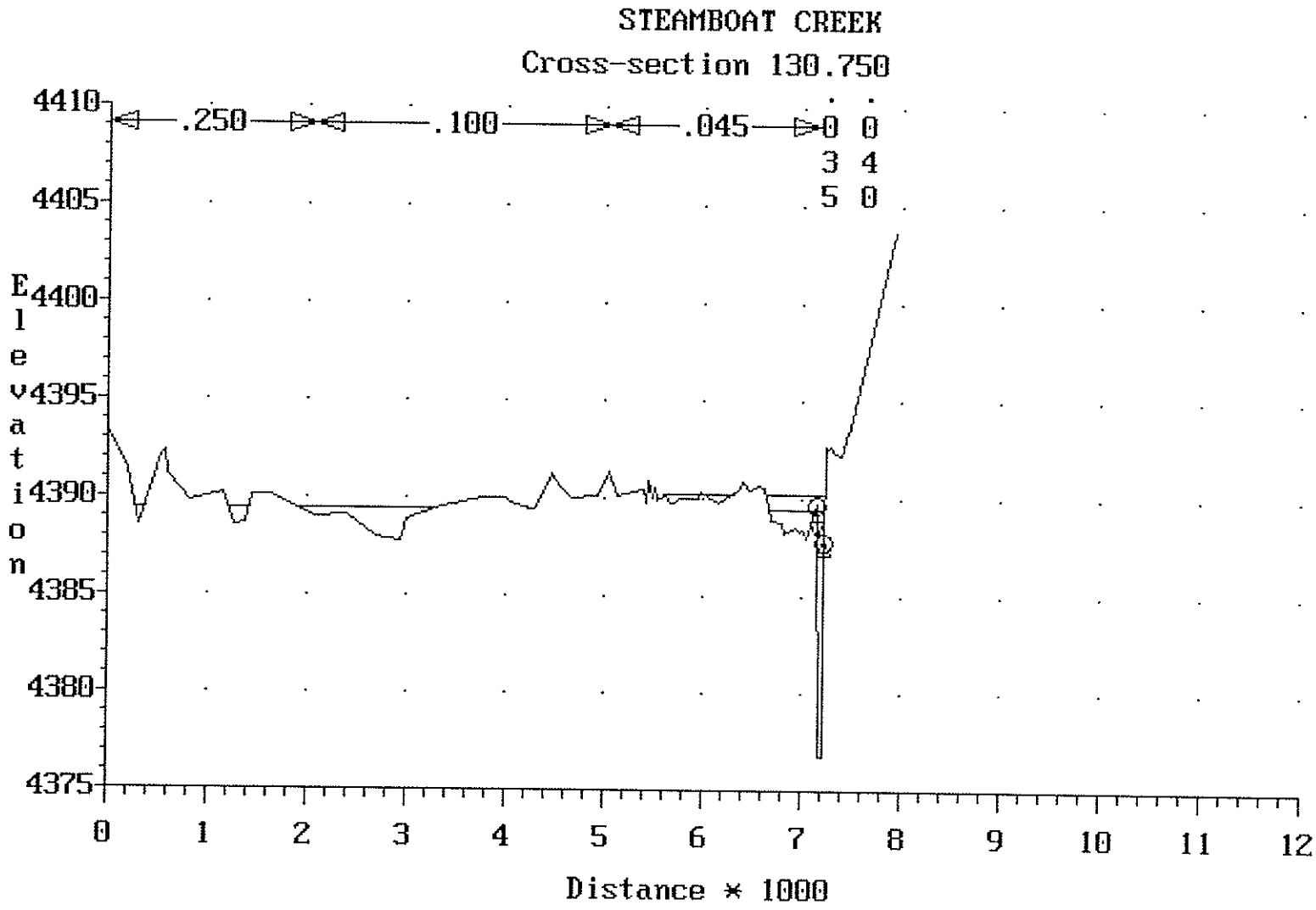

STEAMBOAT CREEK
Cross-section 84.050
.500
.100
.045
0
.040
2
5
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
Distance

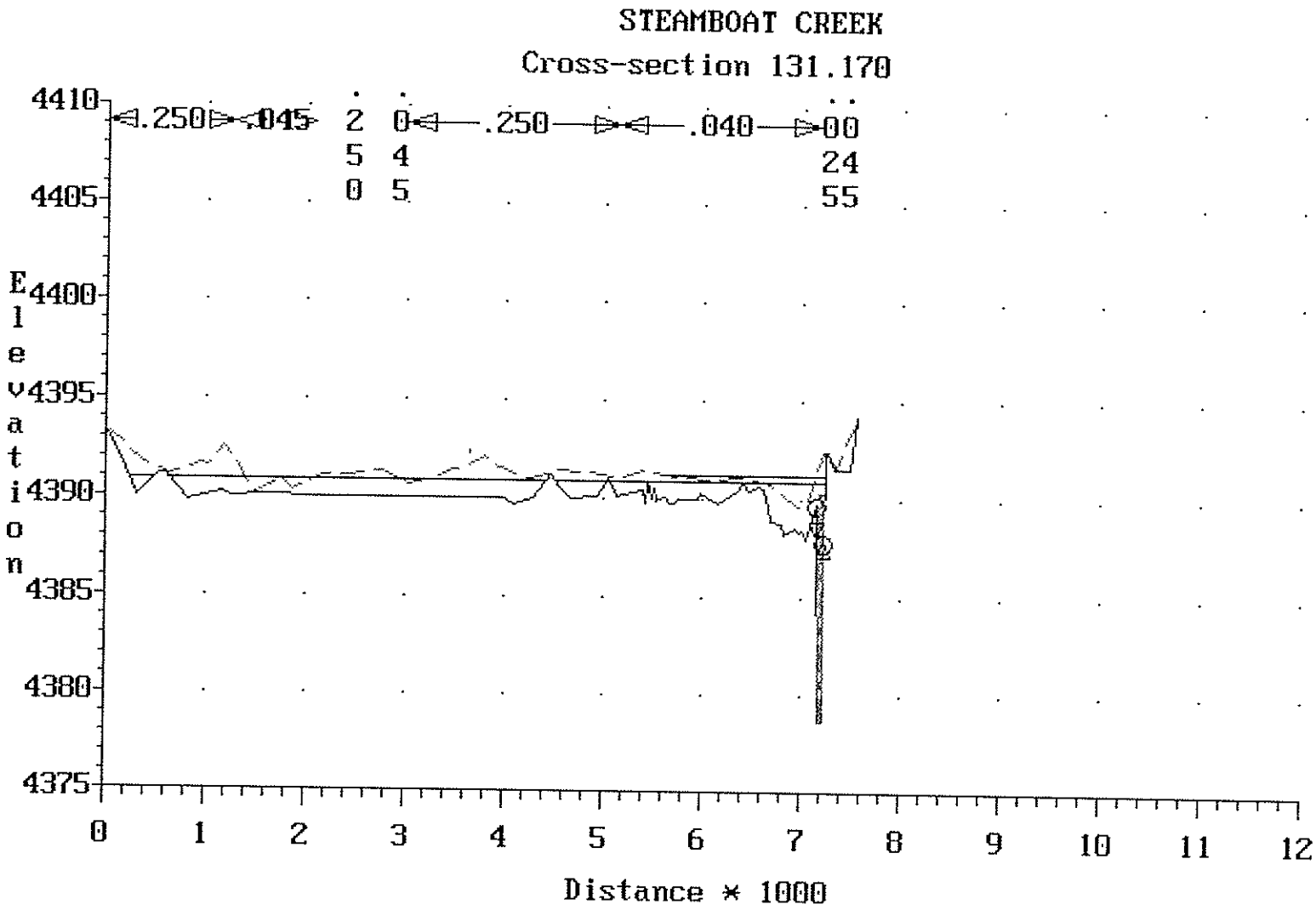

STEAMBOAT CREEK
Cross-section 96.250
.250
.100
.045
0
2
5
.040
4405
4400
4395
4390
4385
4380
4375
4370
Elevation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
Distance


STEAMBOAT CREEK
Cross-section 105.550
.250
.100
.045
.040
2
5
4410
4405
4400
4395
4390
4385
4380
4375
Elevation
0
1
2
3
4
5
6
7
8
9
10
11
12
Distance * 1000


STEAMBOAT CREEK
Cross-section 115.550
.250
.100
.045
0 0
2 4
5 0
4410
4405
4400
4395
4390
4385
4380
4375
Elevation
0
1
2
3
4
5
6
7
8
9
10
11
12
Distance * 1000


STEAMBOAT CREEK
Cross-section 126.550
.250
.100
.045
0 0
2 4
5 0
4410
4405
4400
4395
4390
4385
4380
4375
Elevation
0
1
2
3
4
5
6
7
8
9
10
11
12
Distance * 1000


STEAMBOAT CREEK
Cross-section 130.750
.250
.100
.045
0 0
3 4
5 0
4410
4405
4400
4395
4390
4385
4380
4375
Elevation
0
1
2
3
4
5
6
7
8
9
10
11
12
Distance * 1000


STEAMBOAT CREEK
Cross-section 131.170
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.250
.040
Elevation
4410
4405
4400
4395
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4380
4375
0
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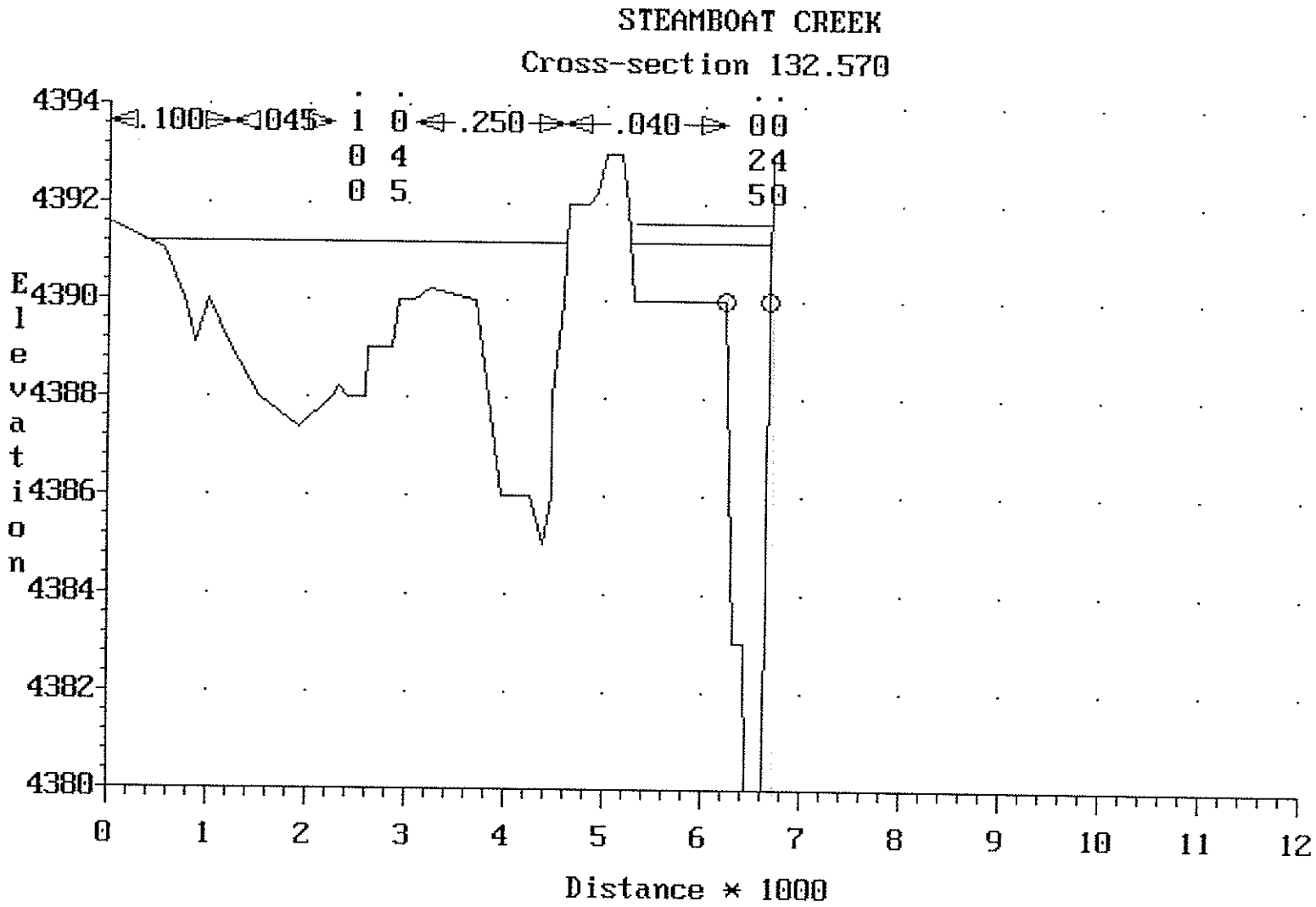
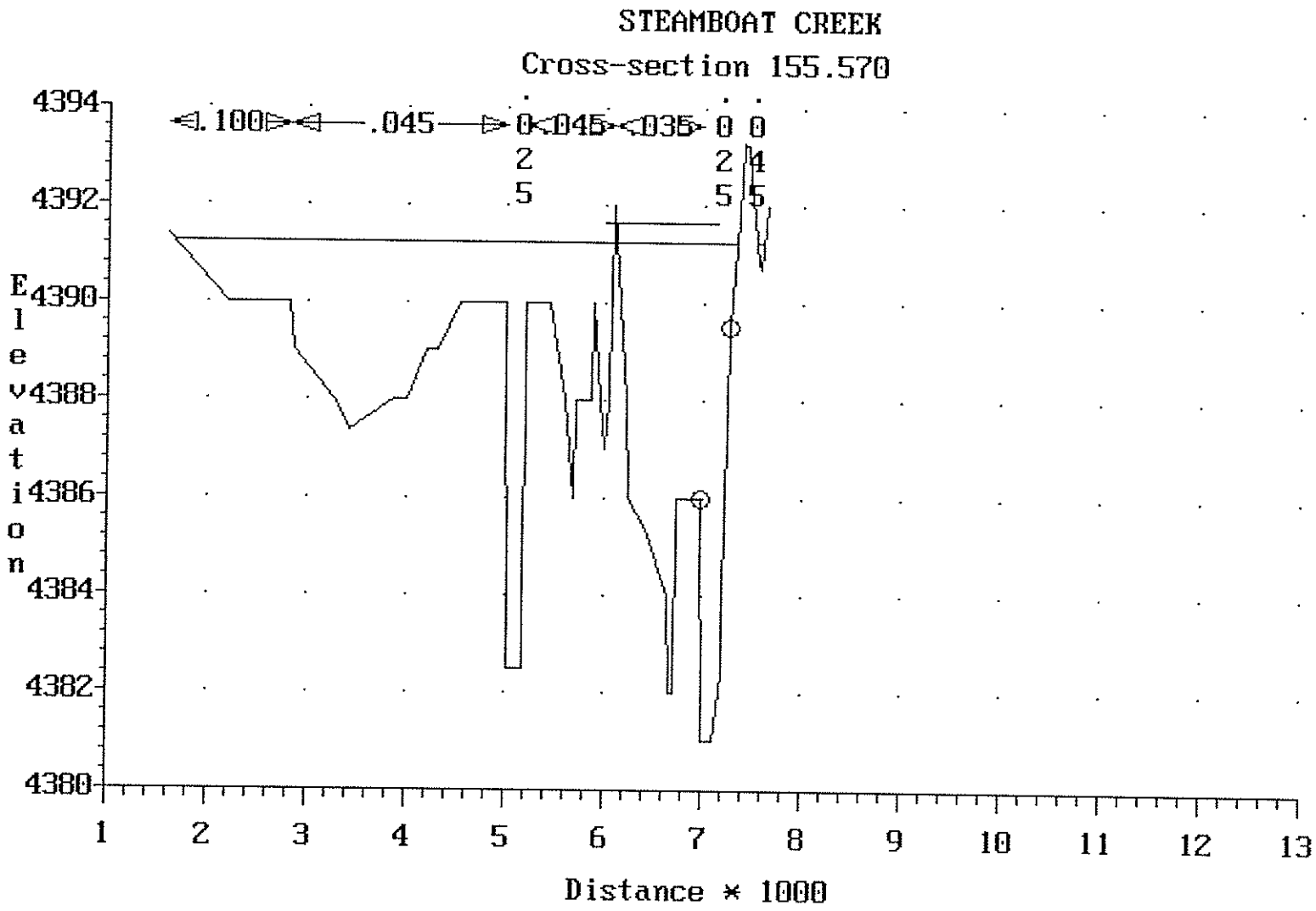
2
3
4
5
6
7
8
9
10
11
12
Distance * 1000


STEAMBOAT CREEK
Cross-section 132.570
.100
.045
1 0
0 4
0 5
.250
.040
0 0
2 4
5 0
Elevation
4394
4392
4390
4388
4386
4384
4382
4380
0
1
2
3
4
5
6
7
8
9
10
11
12
Distance * 1000


STEAMBOAT CREEK
Cross-section 155.570
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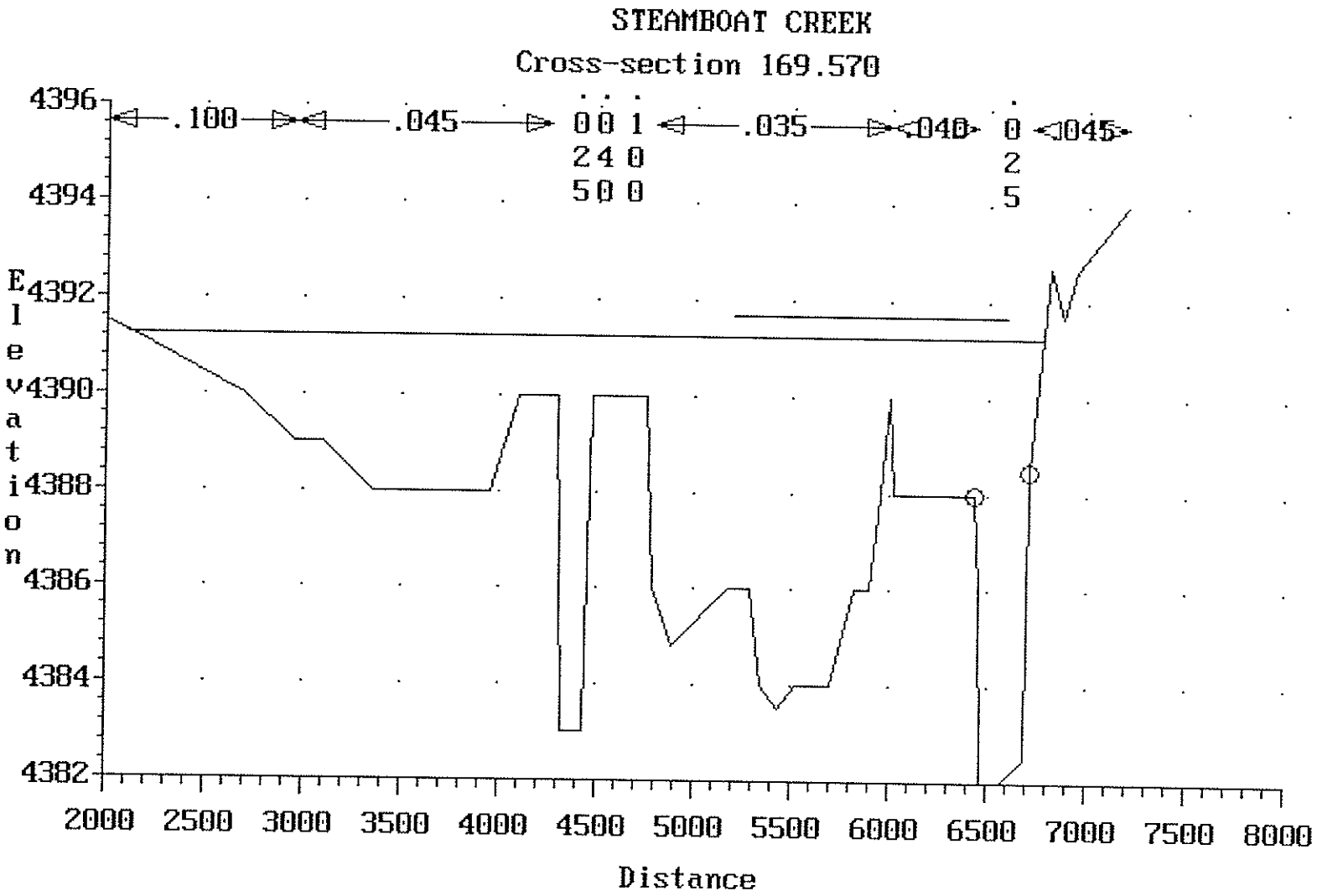
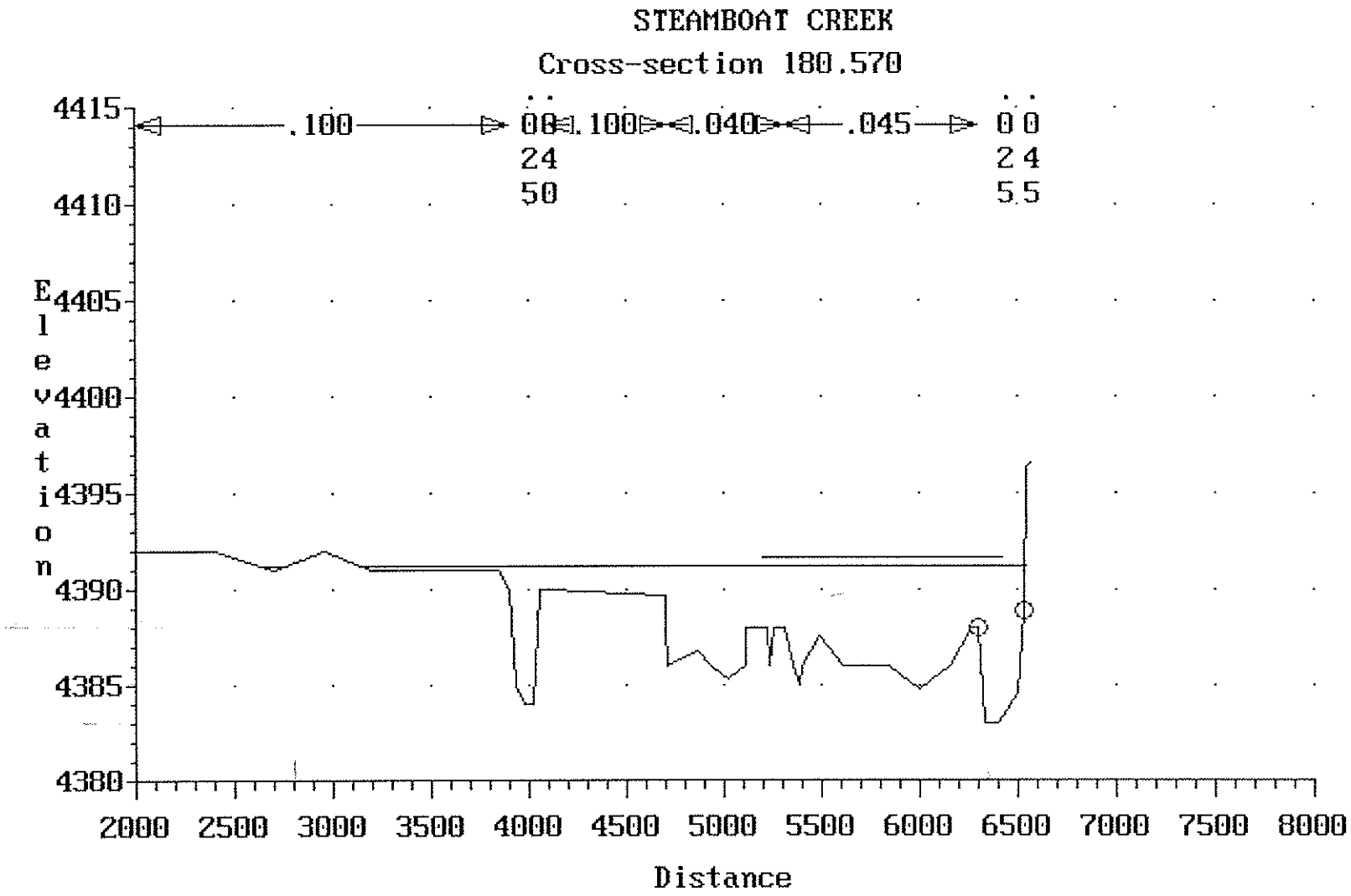
.045
0
2
5
.045
.035
0
2
5
0
4
5
4394
4392
4390
4388
4386
4384
4382
4380
Elevation
1
2
3
4
5
6
7
8
9
10
11
12
13
Distance * 1000


STEAMBOAT CREEK
Cross-section 169.570
.100
.045
.035
.040
.045
0 0 1
2 4 0
5 0 0
0
2
5
4396
4394
4392
4390
4388
4386
4384
4382
Elevation
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
Distance


STEAMBOAT CREEK
Cross-section 180.570
.100
.100
.040
.045
0 0
24
50
0 0
2 4
5.5
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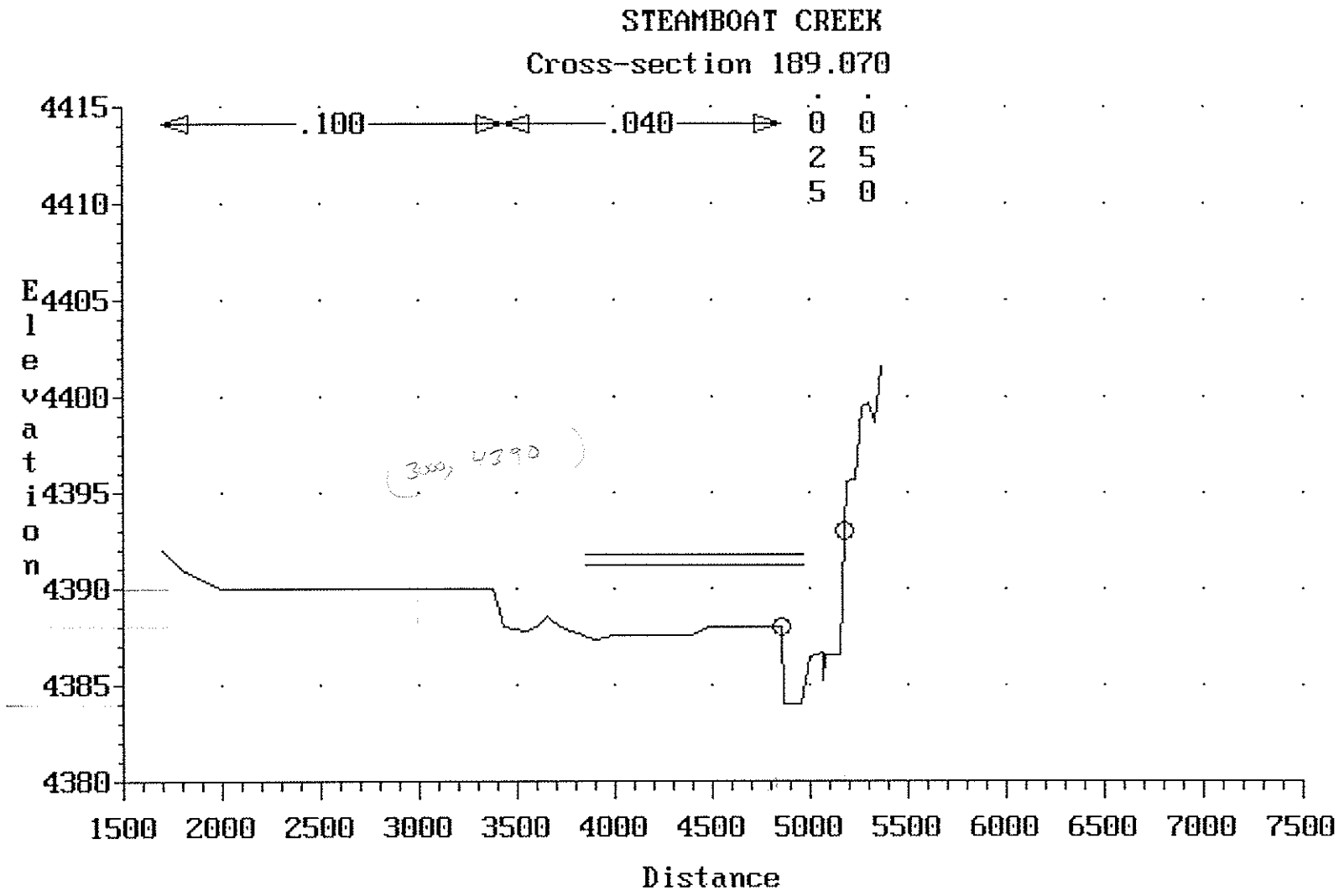
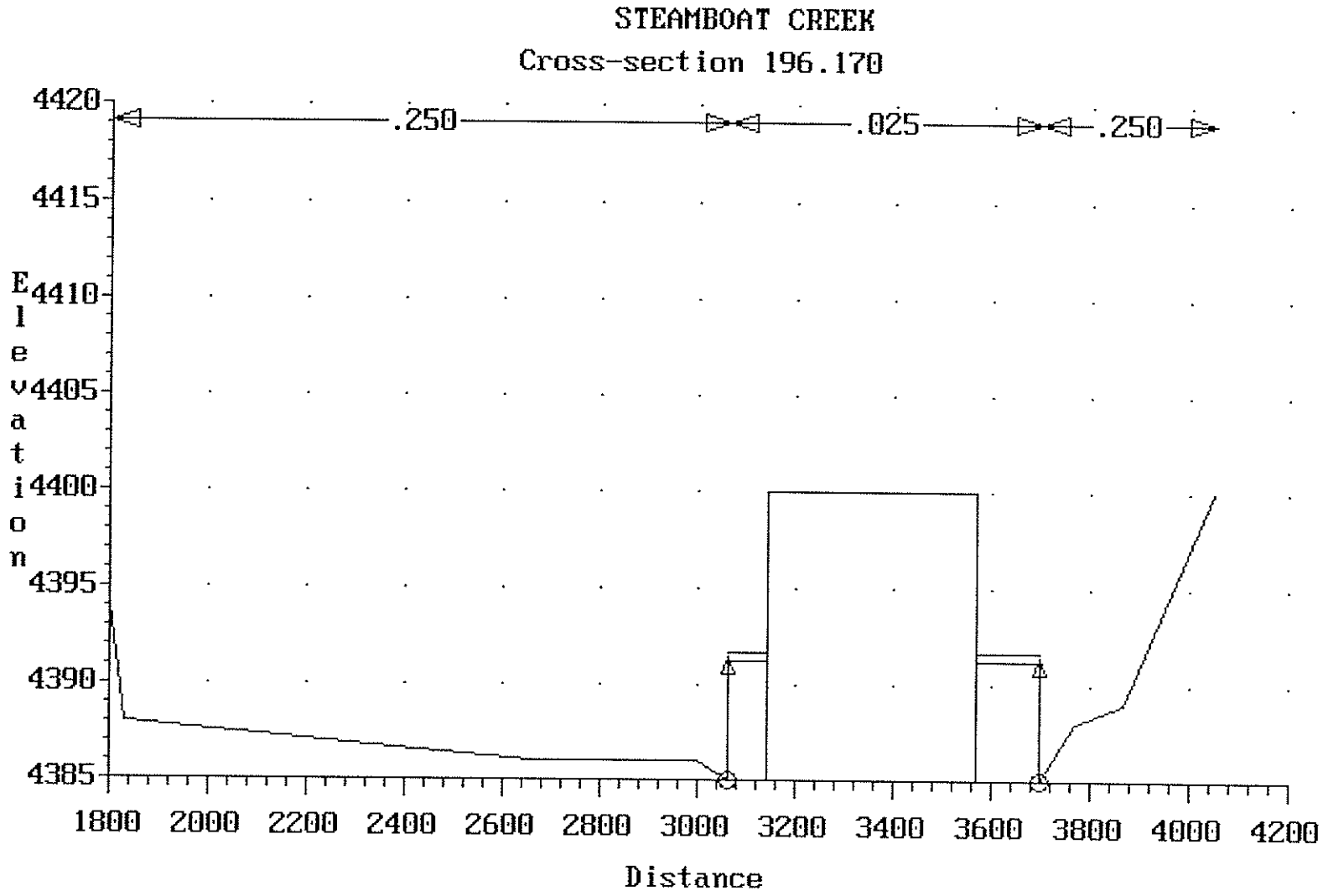
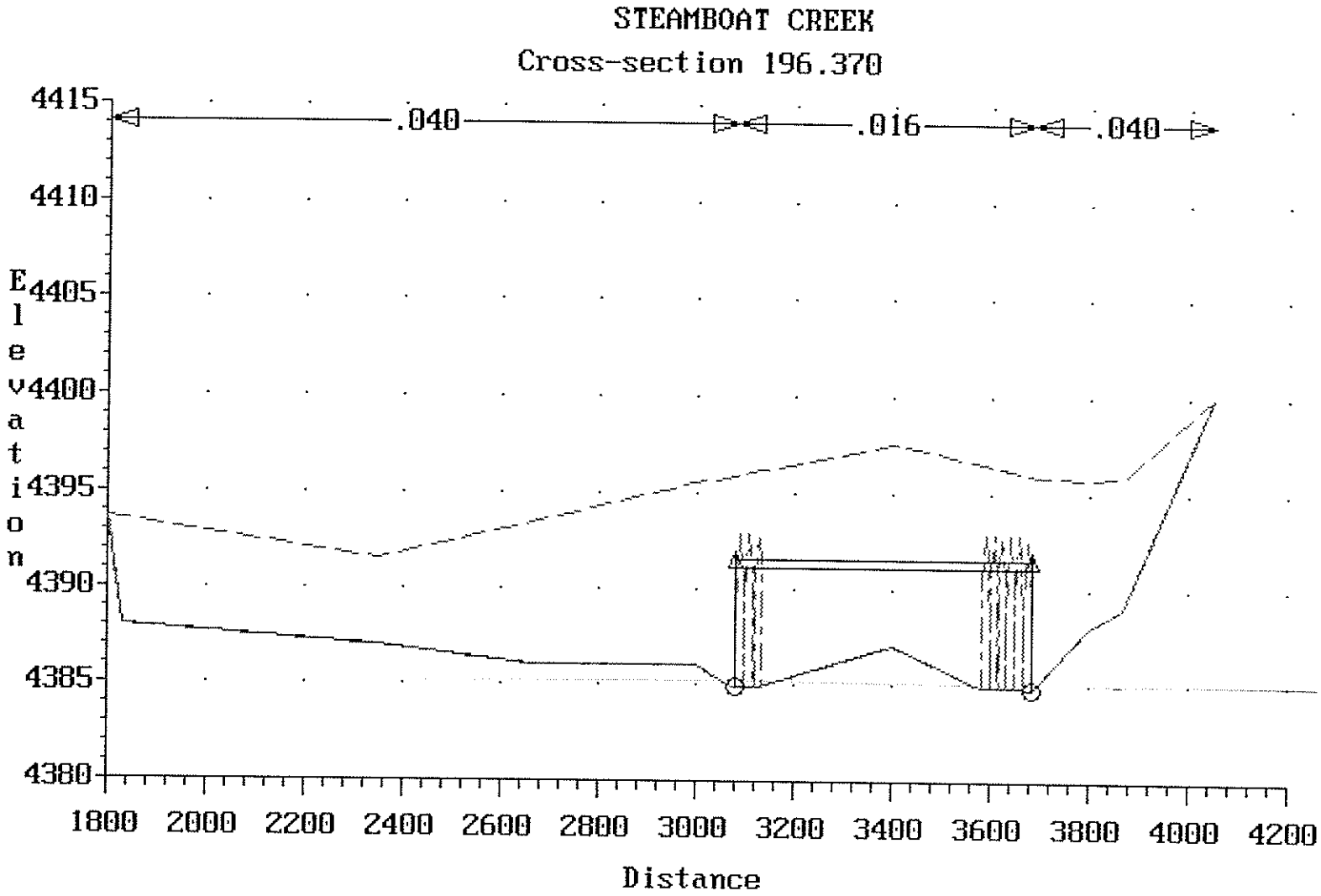
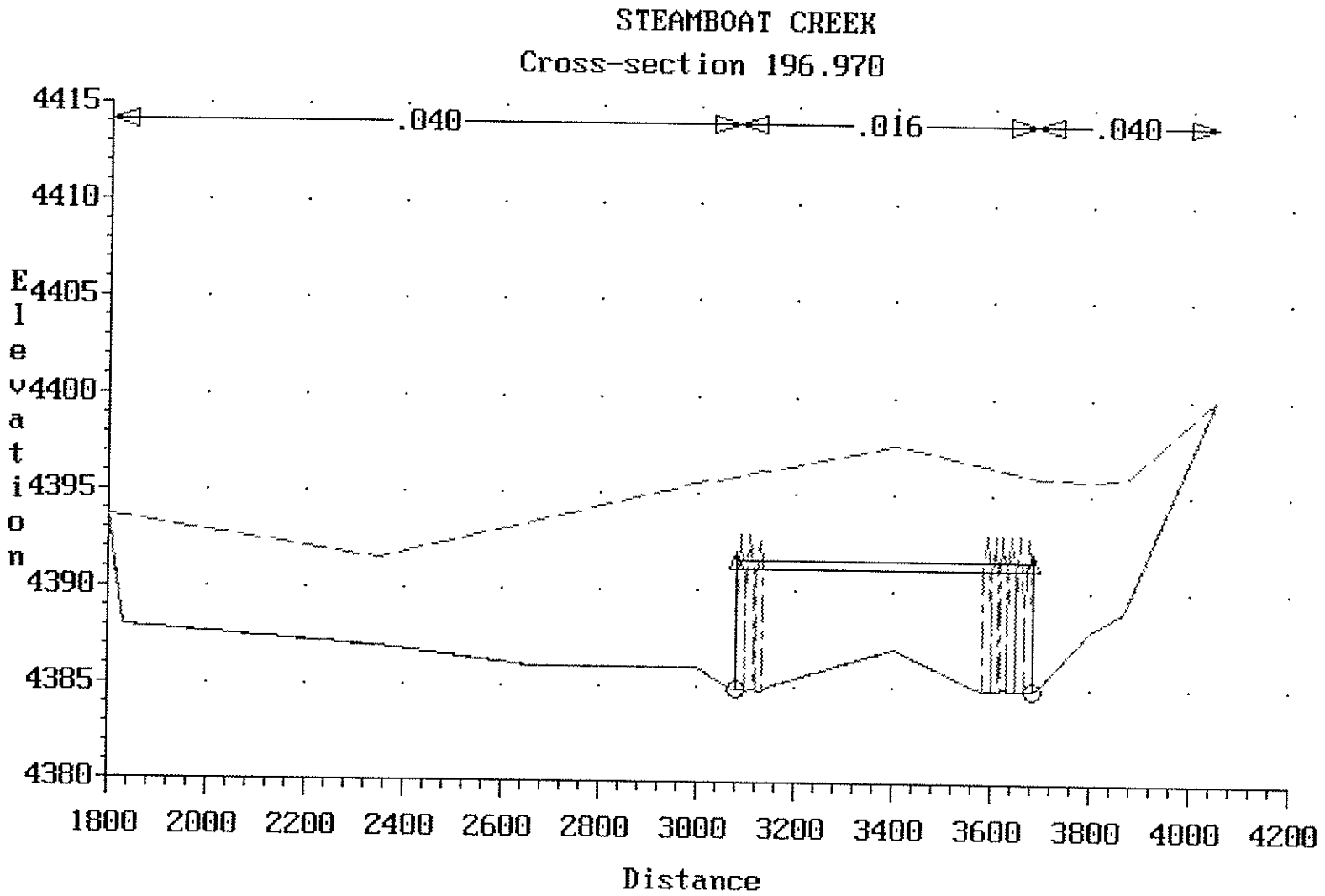
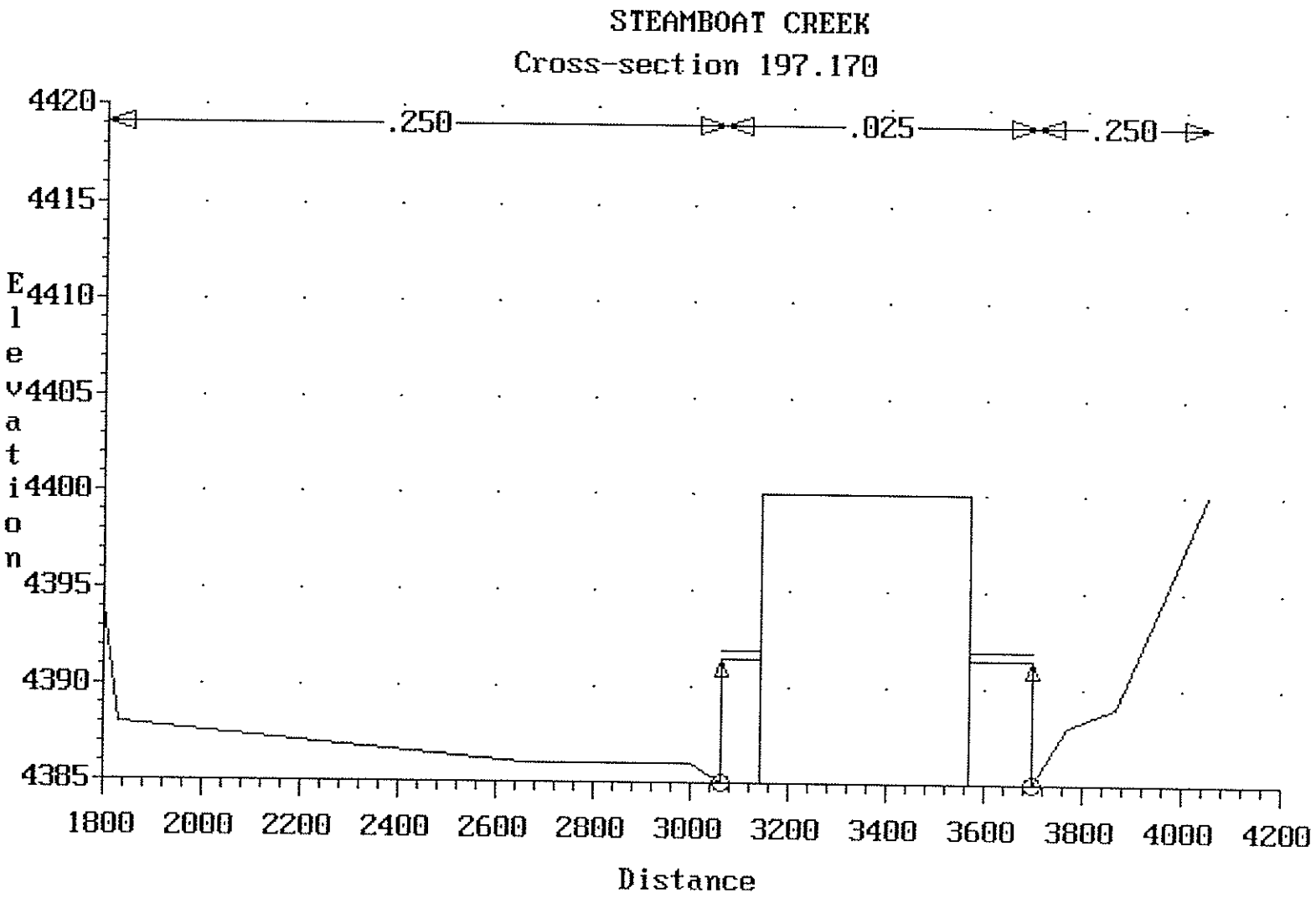
4410
4405
4400
4395
4390
4385
4380
Elevation
2000 2500 3000 3500 4000 4500 5000 5500 6000 6500 7000 7500 8000
Distance

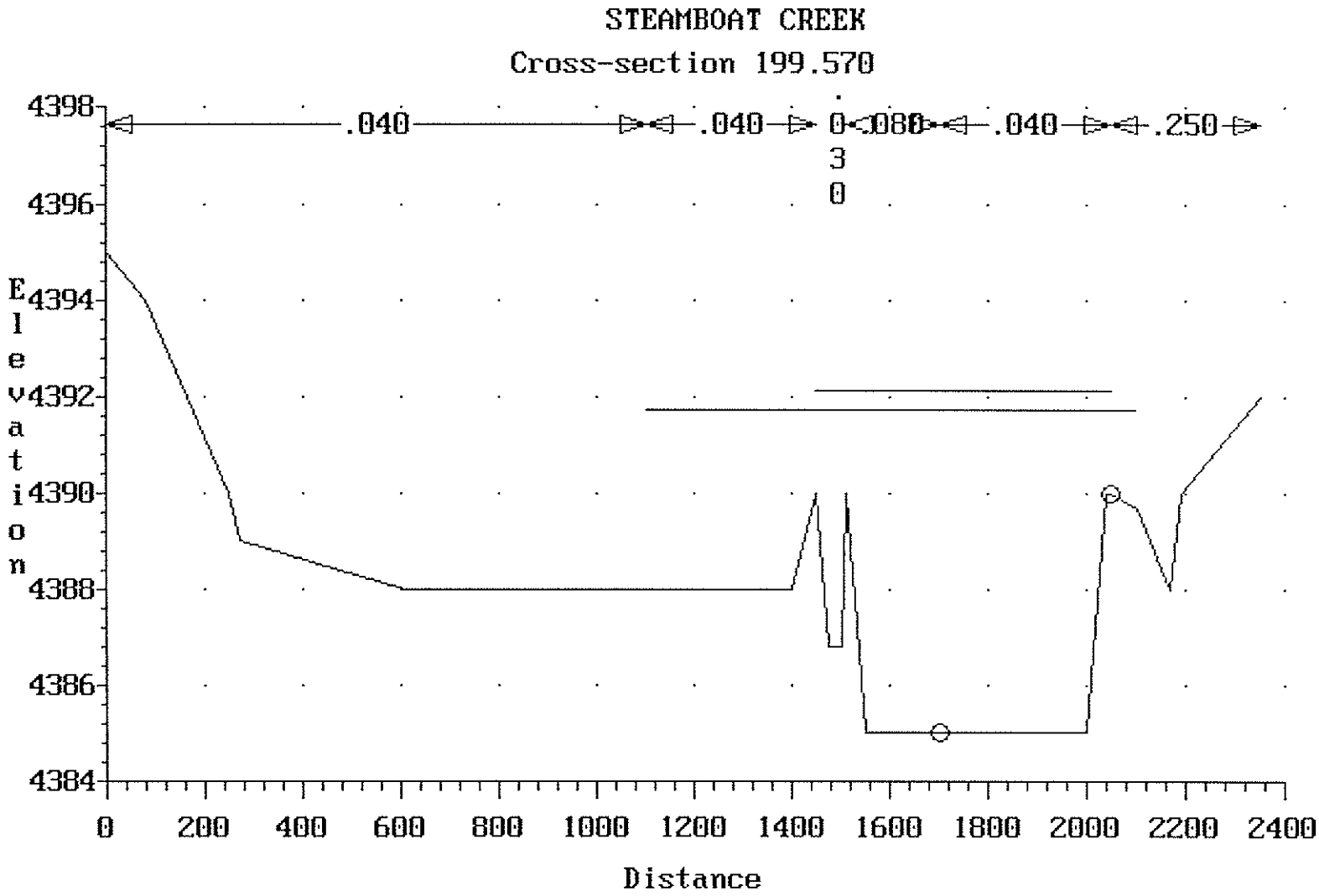

STEAMBOAT CREEK
Cross-section 189.070
.100
.040
0 0
2 5
5 0
4415
4410
4405
4400
4395
4390
4385
4380
Elevation
1500 2000 2500 3000 3500 4000 4500 5000 5500 6000 6500 7000 7500
Distance

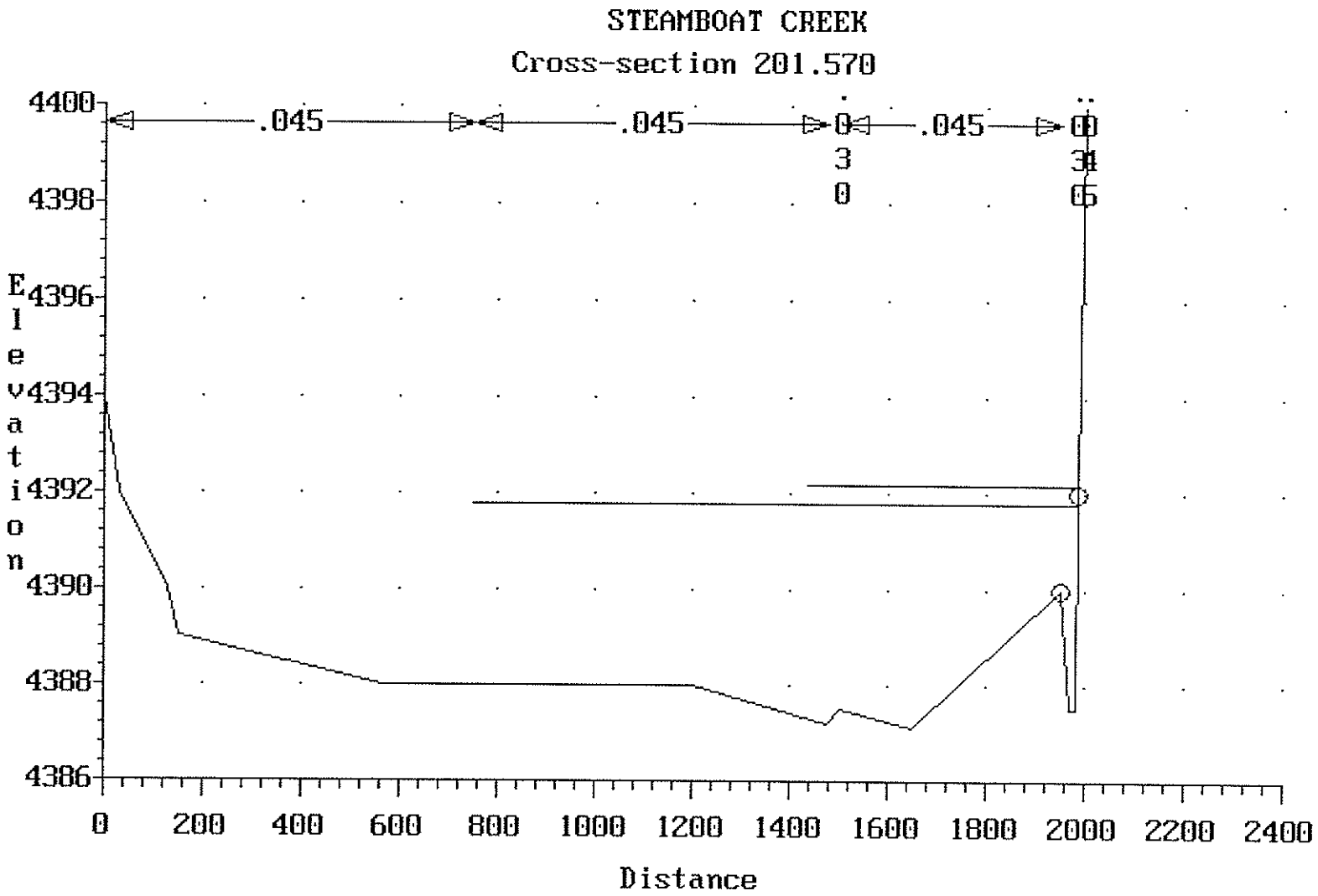

STEAMBOAT CREEK
Cross-section 196.170
.250
.025
.250
4420
4415
4410
4405
4400
4395
4390
4385
Elevation
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
4200
Distance

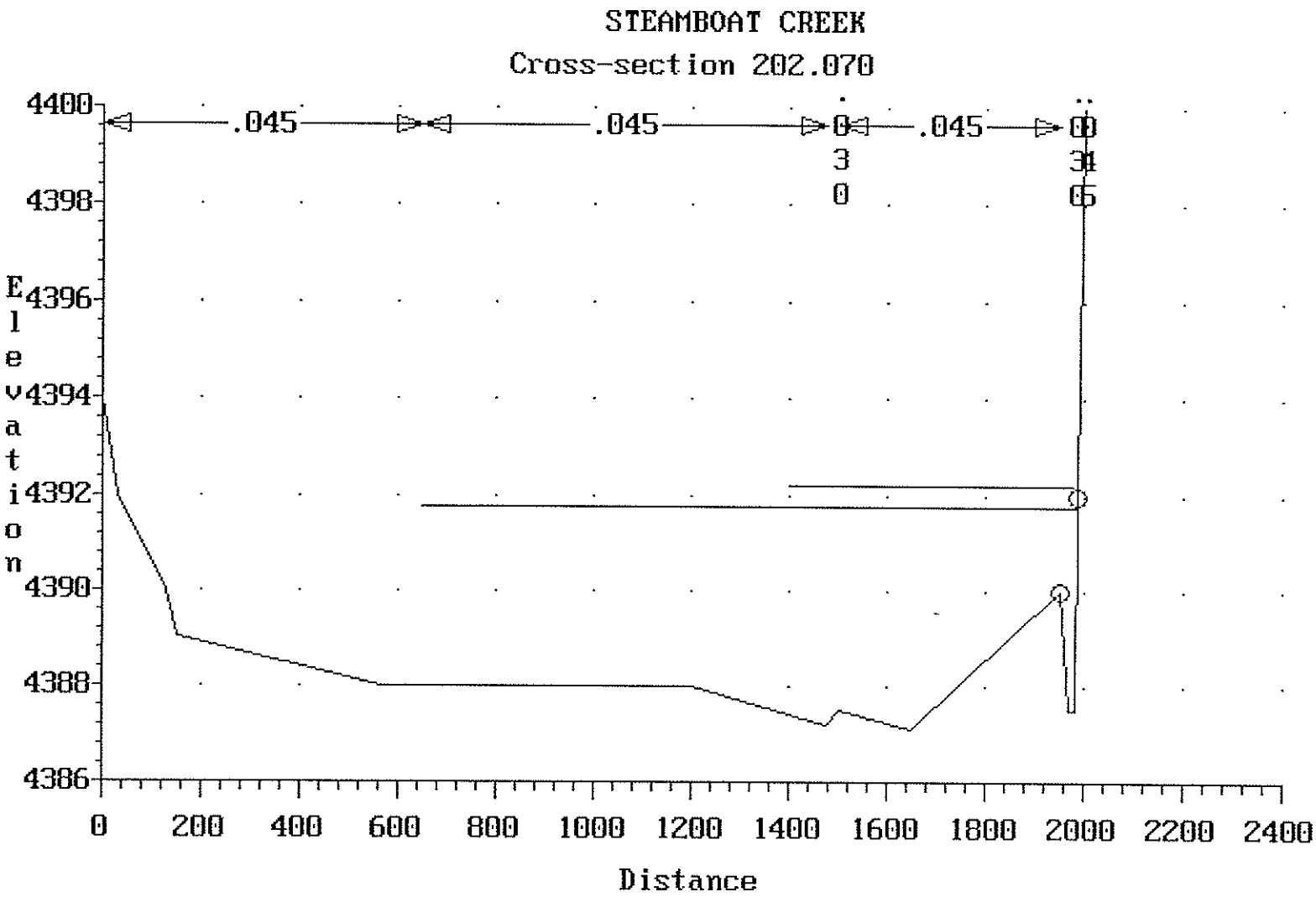

STEAMBOAT CREEK
Cross-section 196.370
.040
.016
.040
4415
4410
4405
4400
4395
4390
4385
4380
Elevation
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
4200
Distance

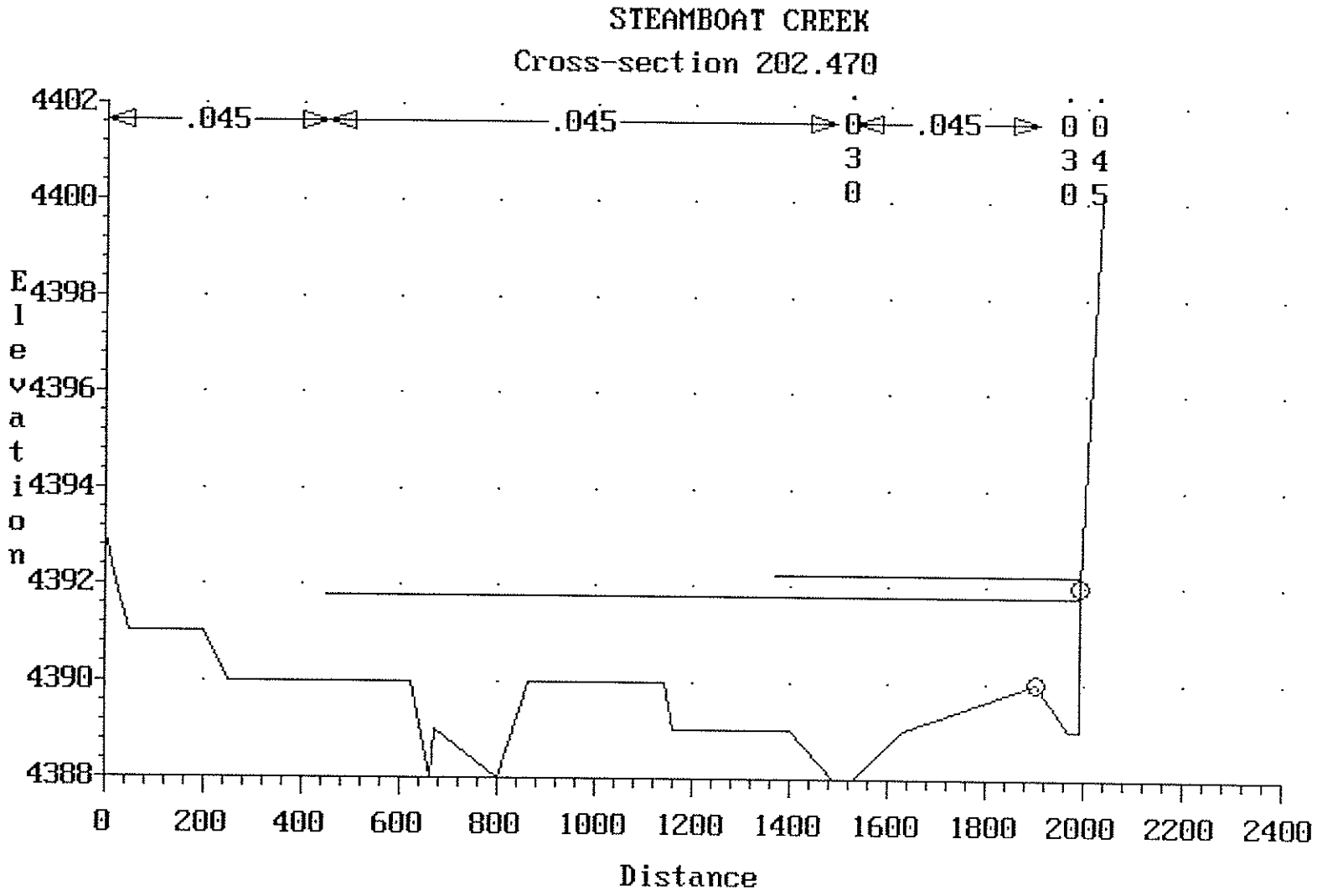

STEAMBOAT CREEK
Cross-section 196.970
.040
.016
.040
4415
4410
4405
4400
4395
4390
4385
4380
Elevation
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
4200
Distance

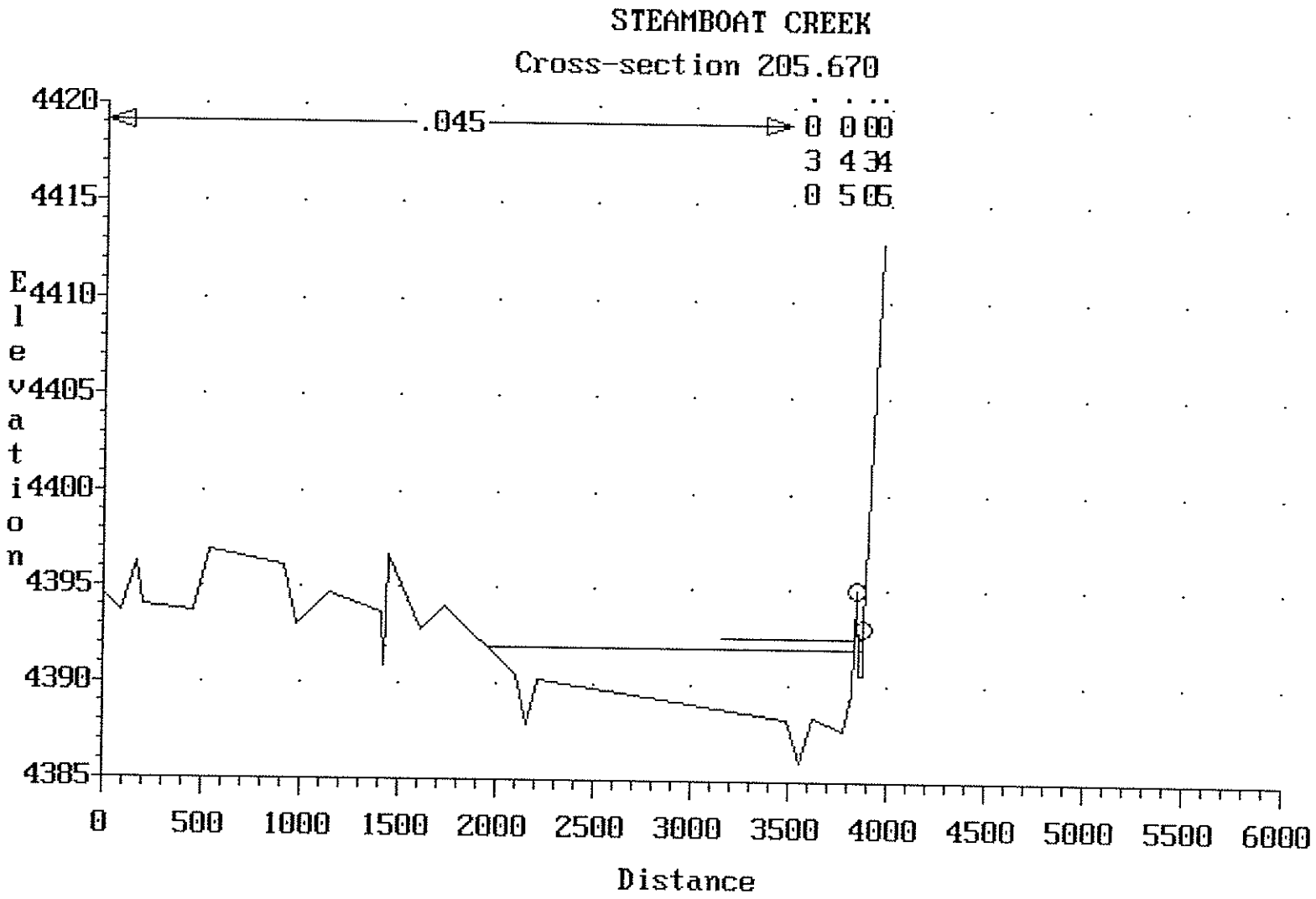

STEAMBOAT CREEK
Cross-section 197.170
.250
.025
.250
4420
4415
4410
4405
4400
4395
4390
4385
Elevation
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
4200
Distance

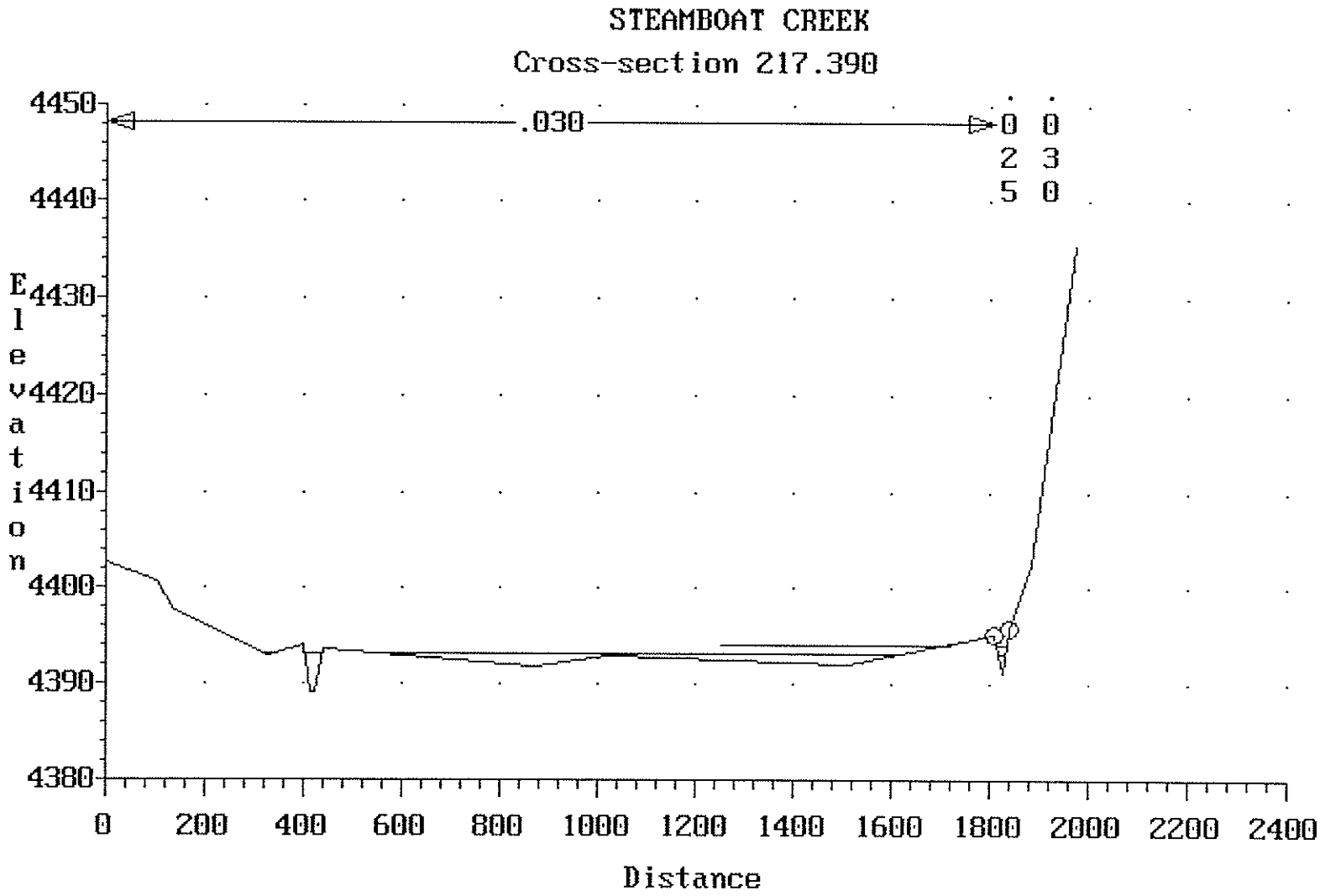

STEAMBOAT CREEK
Cross-section 199.570
.040
.040
0.080
.040
.250
3
0
4398
4396
4394
4392
4390
4388
4386
4384
Elevation
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
Distance

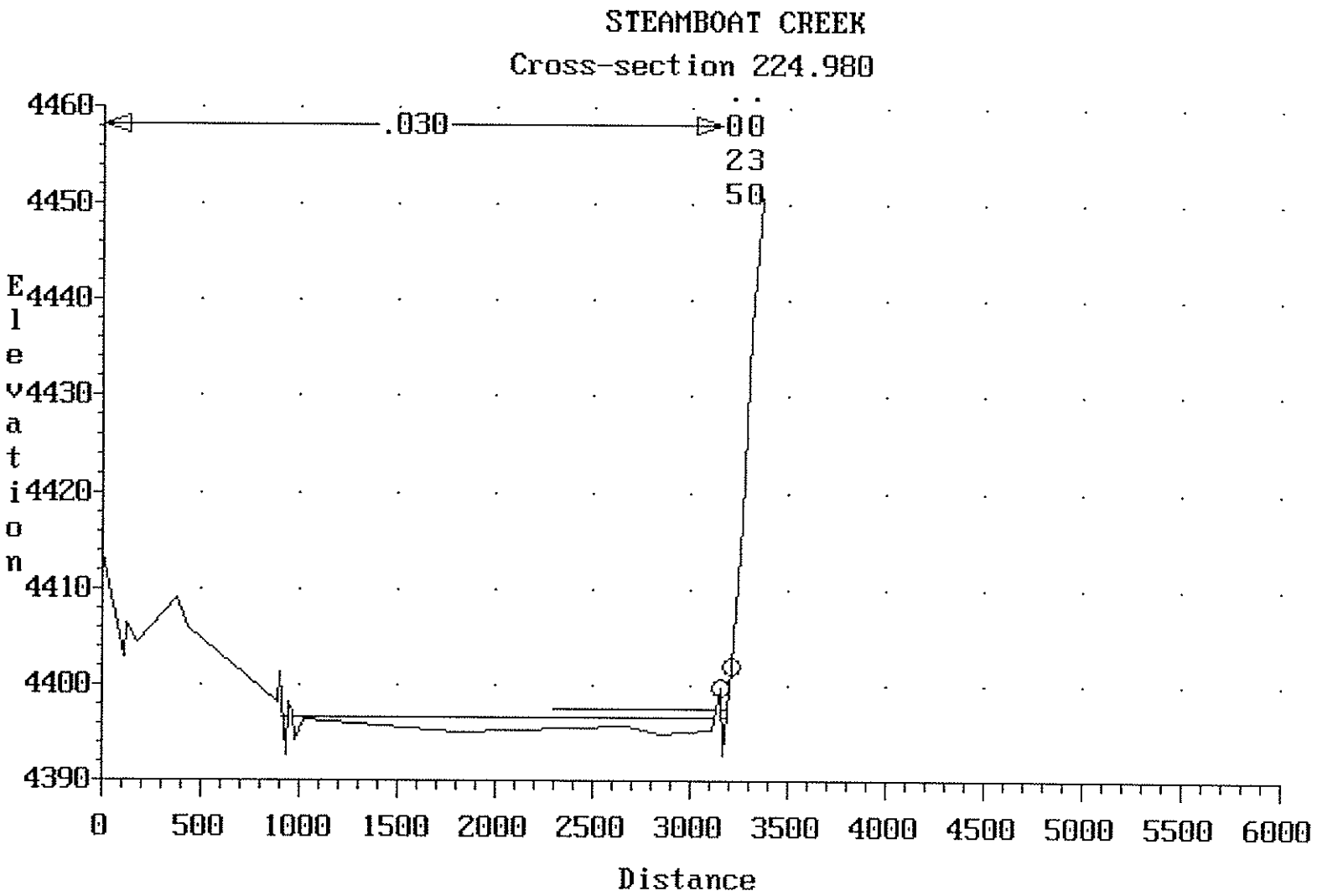

STEAMBOAT CREEK
Cross-section 201.570
.045
.045
.045
4400
4398
4396
4394
4392
4390
4388
4386
Elevation
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
Distance

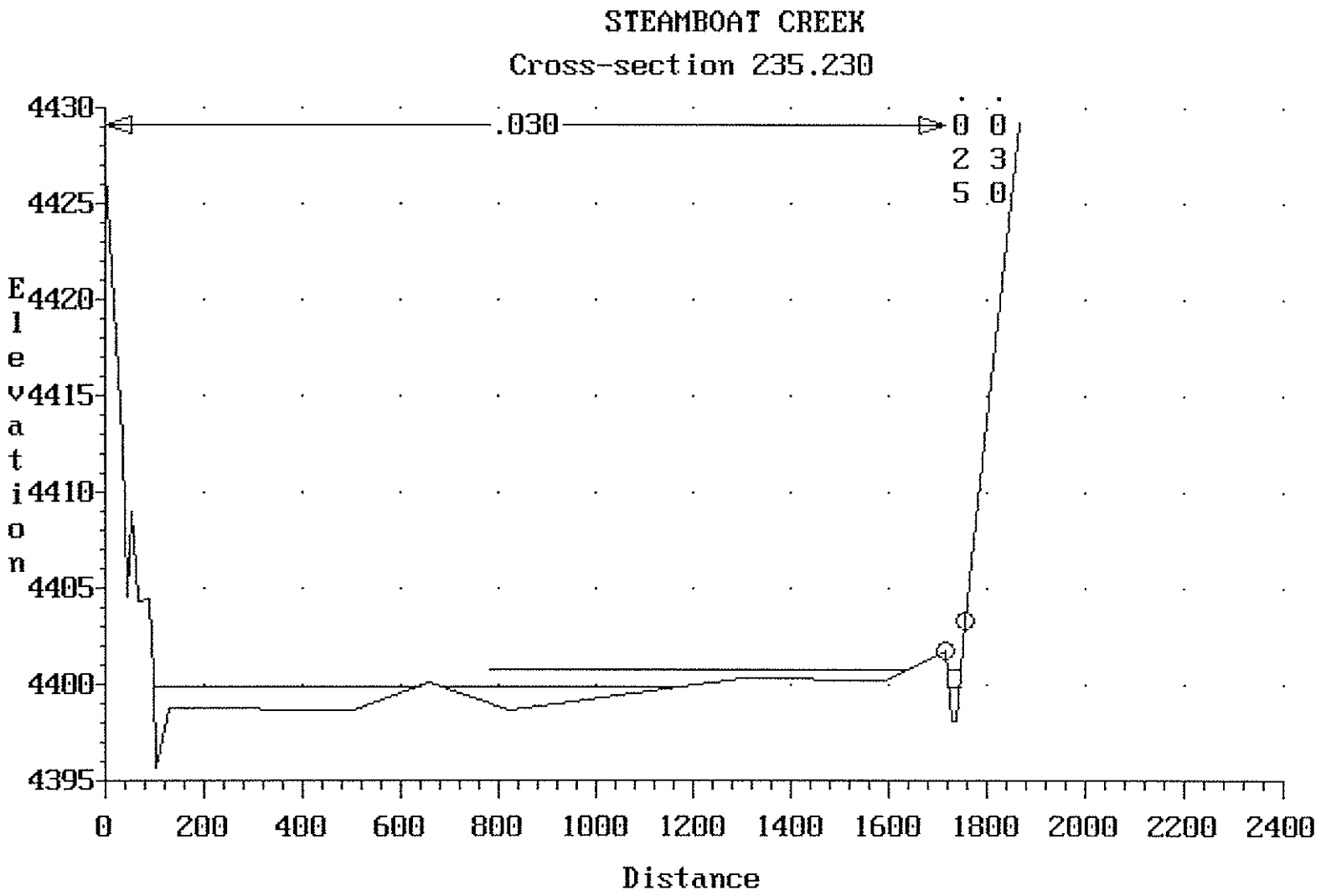

STEAMBOAT CREEK
Cross-section 202.070
.045
.045
.045
Elevation
4400
4398
4396
4394
4392
4390
4388
4386
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
Distance

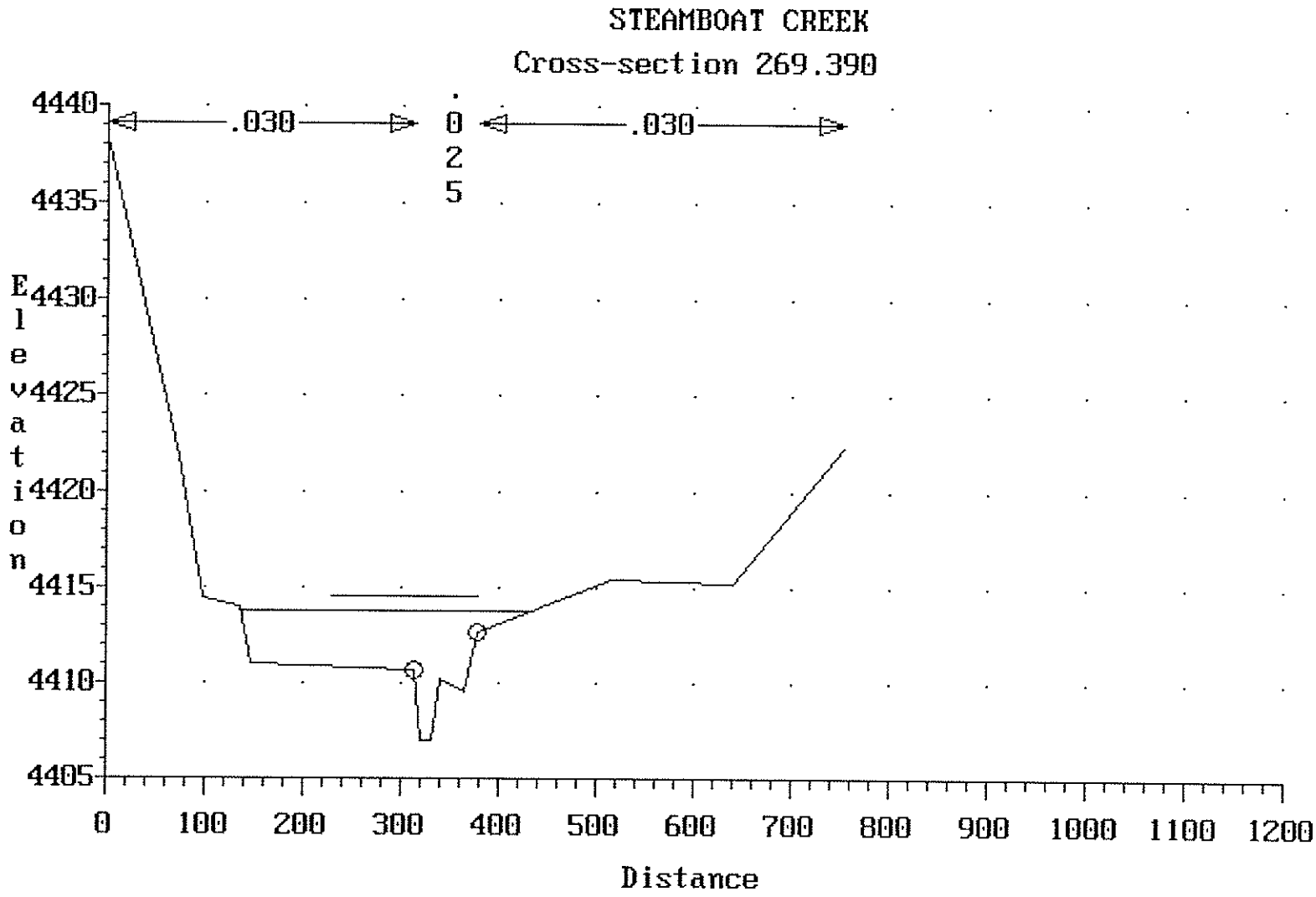

STEAMBOAT CREEK
Cross-section 202.470
.045
.045
.045
0
3
0
0 0
3 4
0 5
4402
4400
4398
4396
4394
4392
4390
4388
Elevation
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
Distance

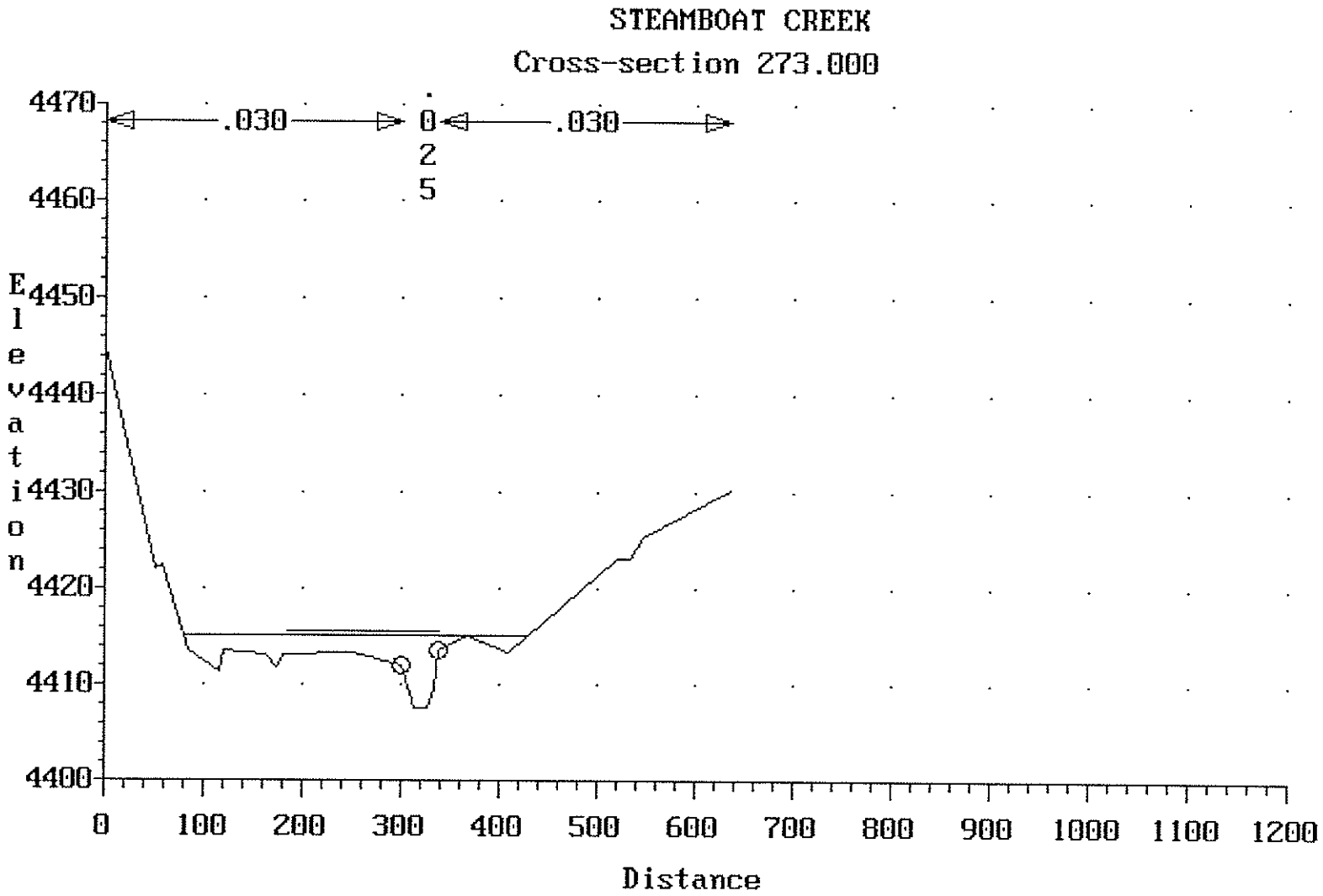

STEAMBOAT CREEK
Cross-section 205.670
.045
4420
4415
4410
4405
4400
4395
4390
4385
Elevation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
Distance

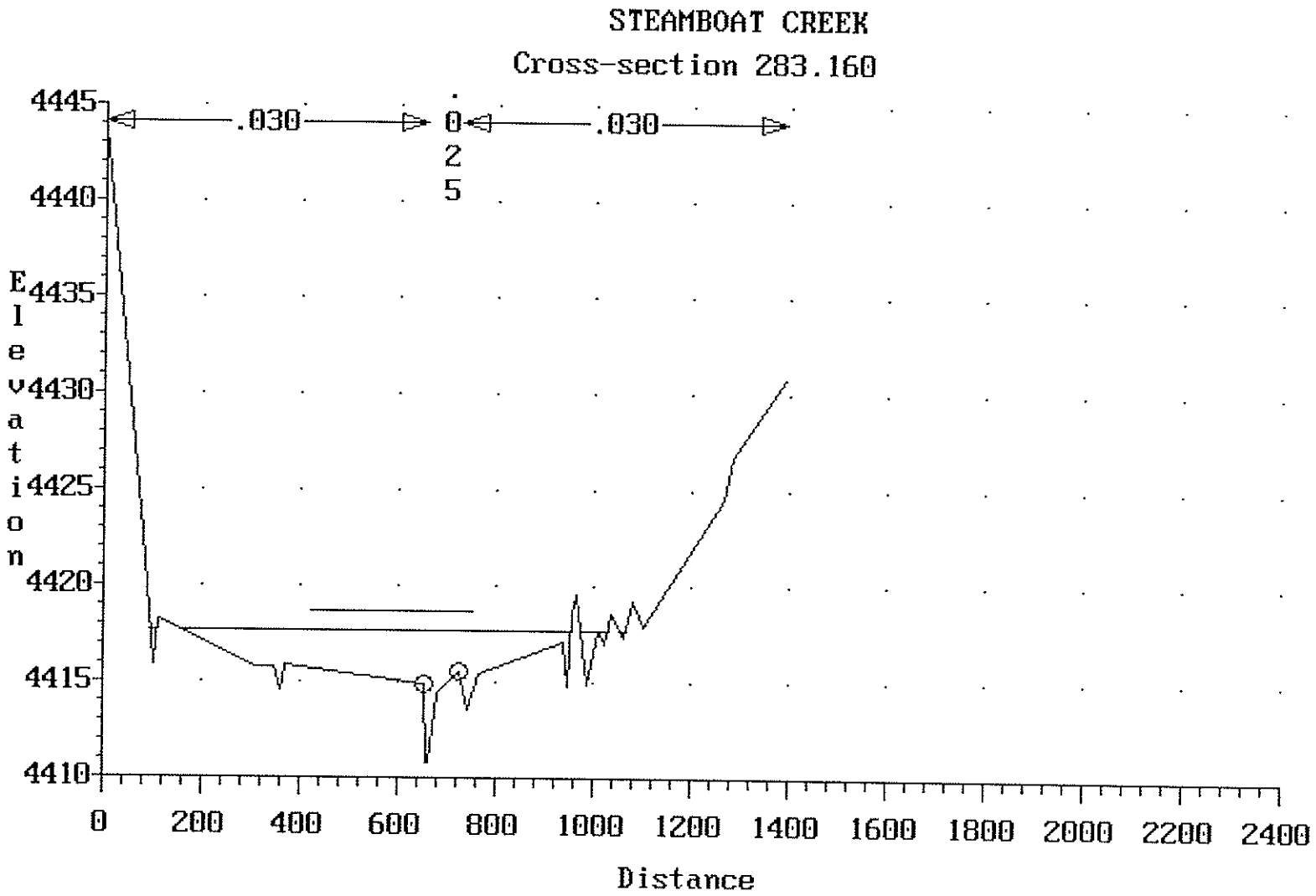

STEAMBOAT CREEK
Cross-section 217.390
.030
0 0
2 3
5 0
4450
4440
4430
4420
4410
4400
4390
4380
Elevation
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
Distance

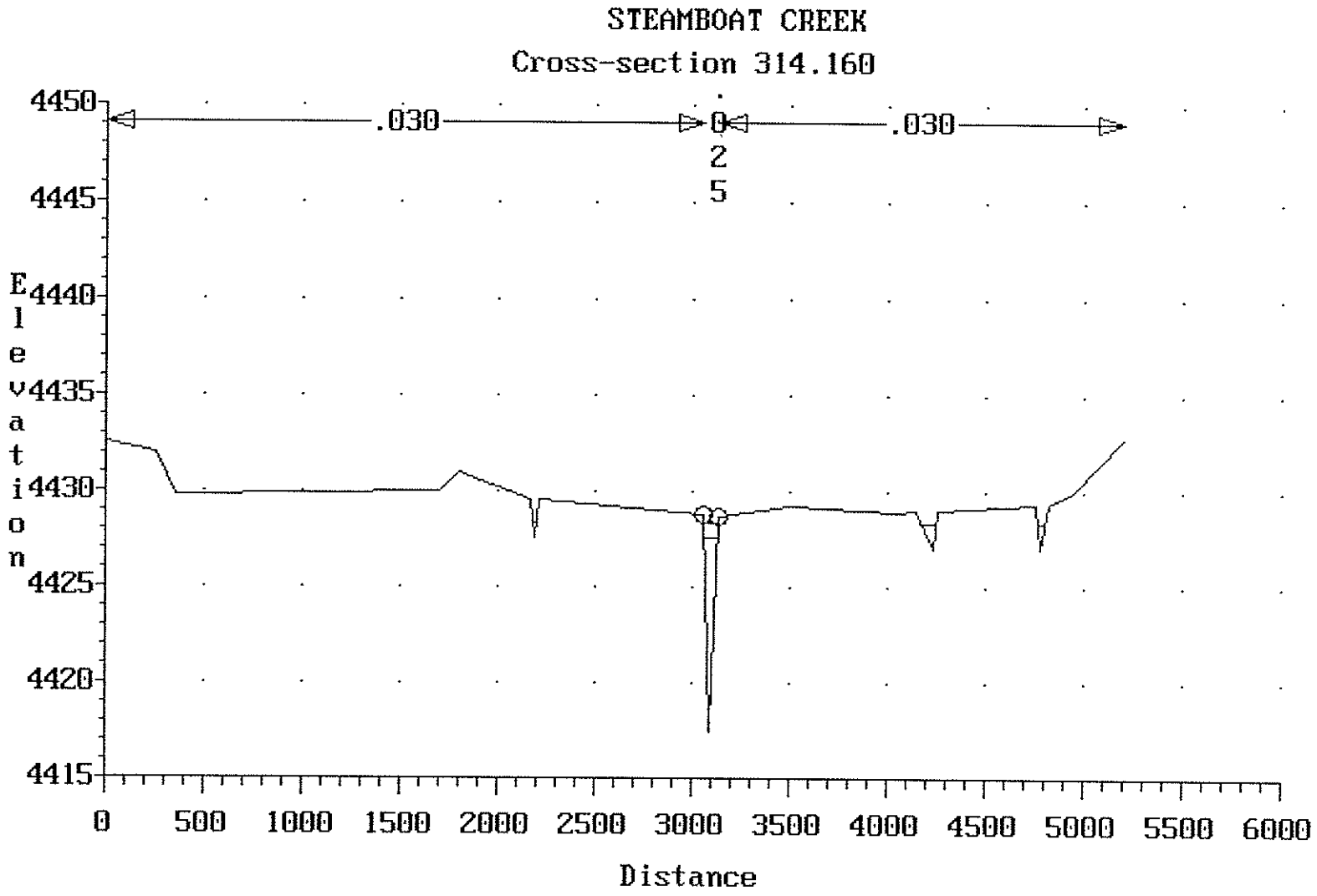

STEAMBOAT CREEK
Cross-section 224.980
.030
00
23
50
4460
4450
4440
4430
4420
4410
4400
4390
Elevation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
Distance


STEAMBOAT CREEK
Cross-section 235.230
.030
0 0
2 3
5 0
4430
4425
4420
4415
4410
4405
4400
4395
Elevation
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
Distance

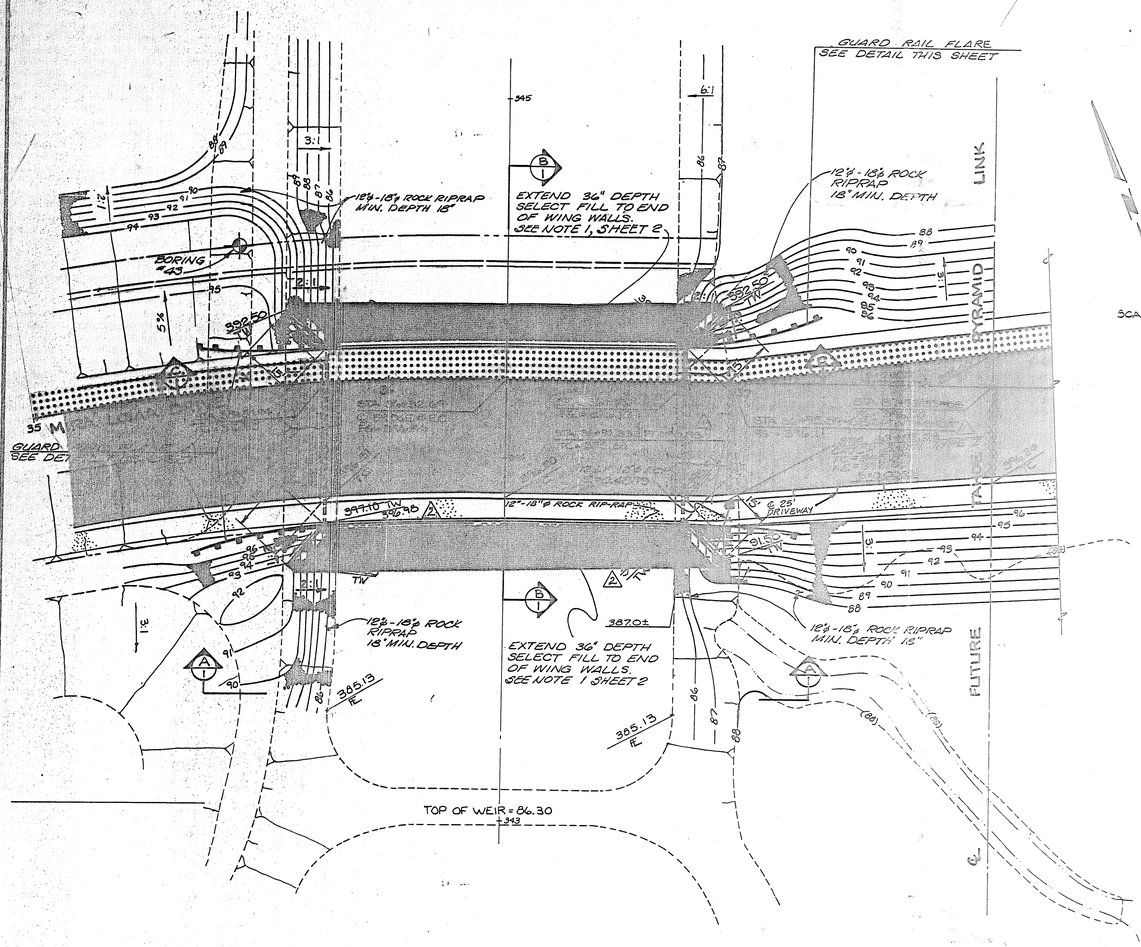

STEAMBOAT CREEK
Cross-section 269.390
.030
.025
.030
Elevation
4440
4435
4430
4425
4420
4415
4410
4405
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
Distance

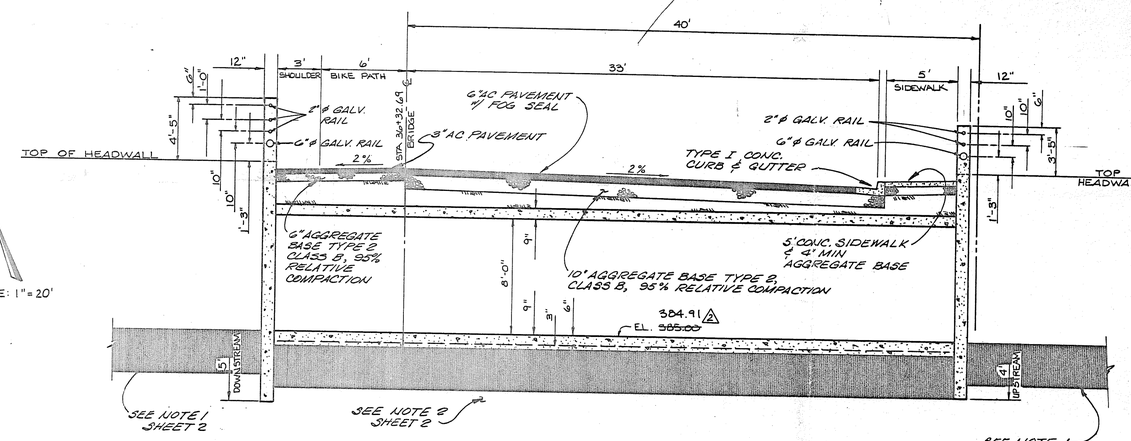

STEAMBOAT CREEK
Cross-section 273.000
.030
0
.030
2
5
4470
4460
4450
4440
4430
4420
4410
4400
Elevation
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
Distance


STEAMBOAT CREEK
Cross-section 283.160
.030
0
2
5
.030
4445
4440
4435
4430
4425
4420
4415
4410
Elevation
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
Distance

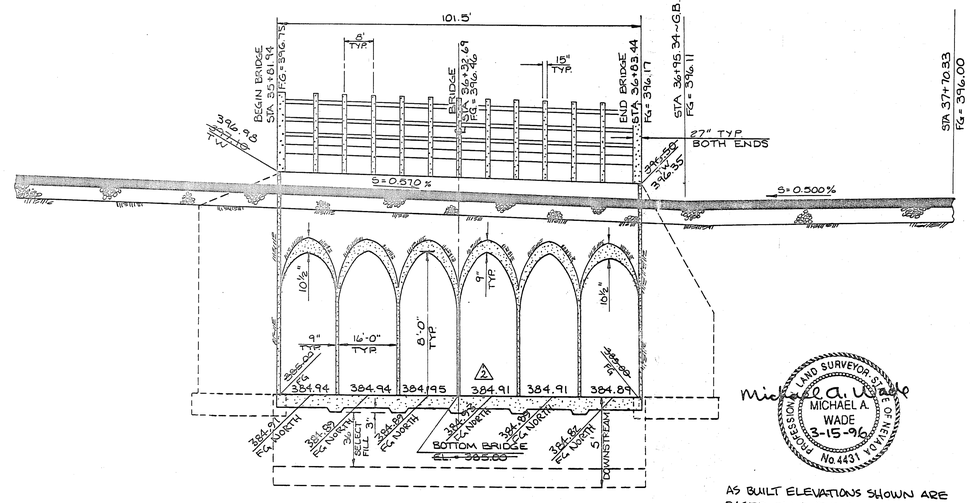

STEAMBOAT CREEK
Cross-section 314.160
.030
.030
0
2
5
4450
4445
4440
4435
4430
4425
4420
4415
Elevation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
Distance

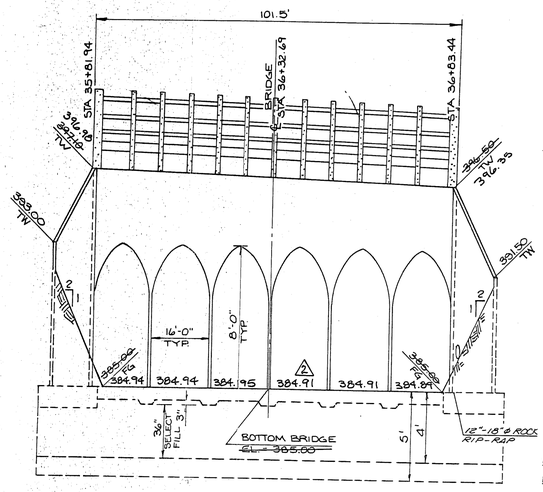
"AS-BUILT" CONSTRUCTION PLAN





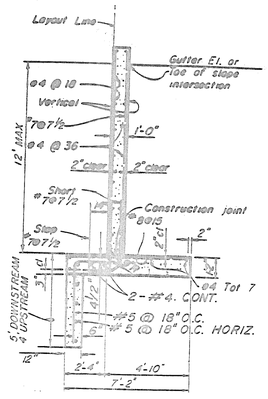
SECTION (B/1)
SCALE: Horiz. 1" = 5'
Vert. 1" = 5'





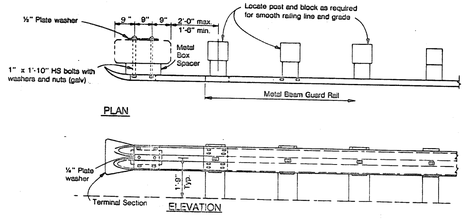
SECTION (A/1)
SCALE: Horiz. 1" = 20'
Vert. 1" = 4'

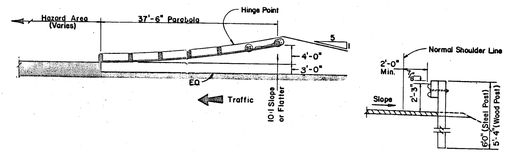
BOTTOM UPSTREAM CUTOFF W.L.
BOTTOM DOWNSTREAM CUTOFF W.L.



SPREAD FOOTING SECTION

Place concrete in toe against undisturbed material, except as permitted by the Engineer.



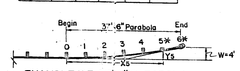


SHOULDER DIKE INSTALLATION

POST NUMBER	1	2	3	4	5 R	6 R
X	6.25'	12.50'	18.75'	25.00'	31.25'	37.50'
Y	1.1'	4.4'	1.00'	1.78'	2.78'	4.00'

* FLARE RATES

OPERATING SPEED	FLARE RATE
--	a:b
70	15:1
60	13:1
50	11:1
40	9:1



EXAMPLE OF 37'-6" PARABOLA

AS BUILT ELEVATIONS SHOWN ARE BASED ON A FIELD SURVEY DATED 2-29-96 AND 3-2-96.

MICHAEL A. WADE 03-15-96 PROFESSIONAL LAND SURVEYOR STATE OF NEVADA No. 4431

RECORD DRAWING 1/22-97 DATE

REGISTERED PROFESSIONAL ENGINEER BRYAN G. SPRAGUE CIVIL STATE OF NEVADA No. 8103

BENCH MARK: 3" BRASS CAP IN MONUMENT WELL AT CENTERLINE INTERSECTION OF HIDDEN VALLEY DRIVE AND INVERNESS DRIVE ELEVATION = 4391.03.

GUARD RAIL DETAILS

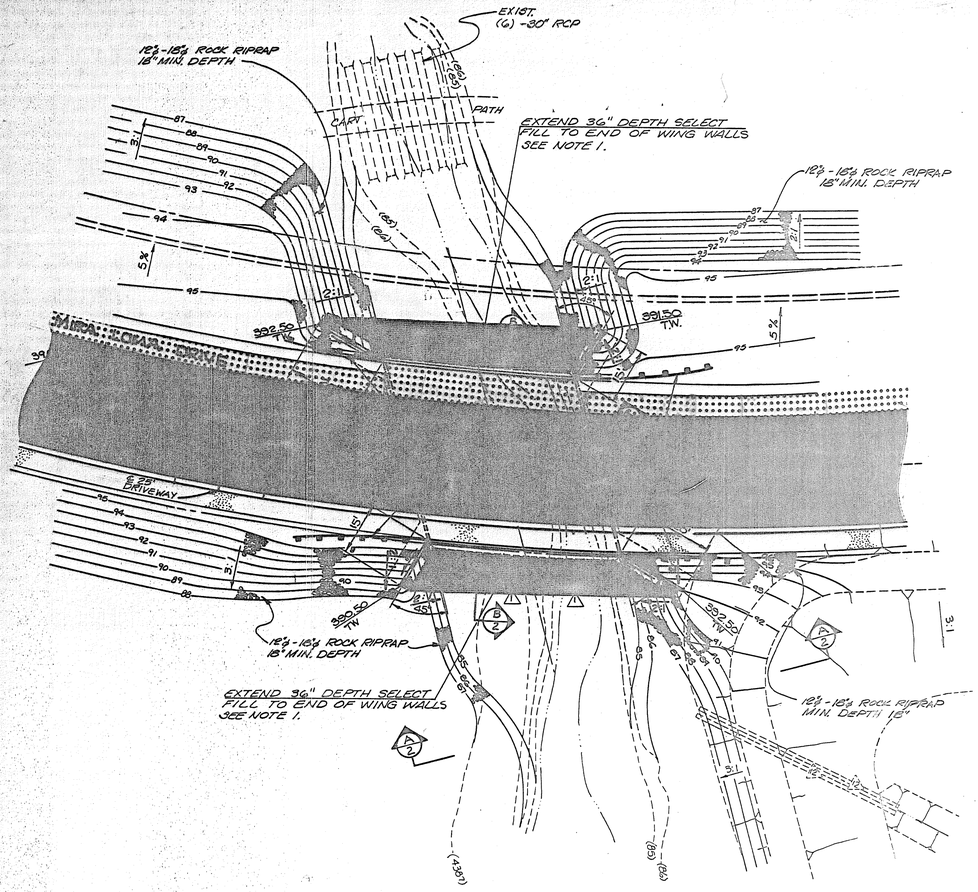
REVISIONS	DATE	BY
AS BUILT SURVEY ELEV'S	3/5/96	BS
REVISED CB & PT. STATIONING	3/26/91	BL

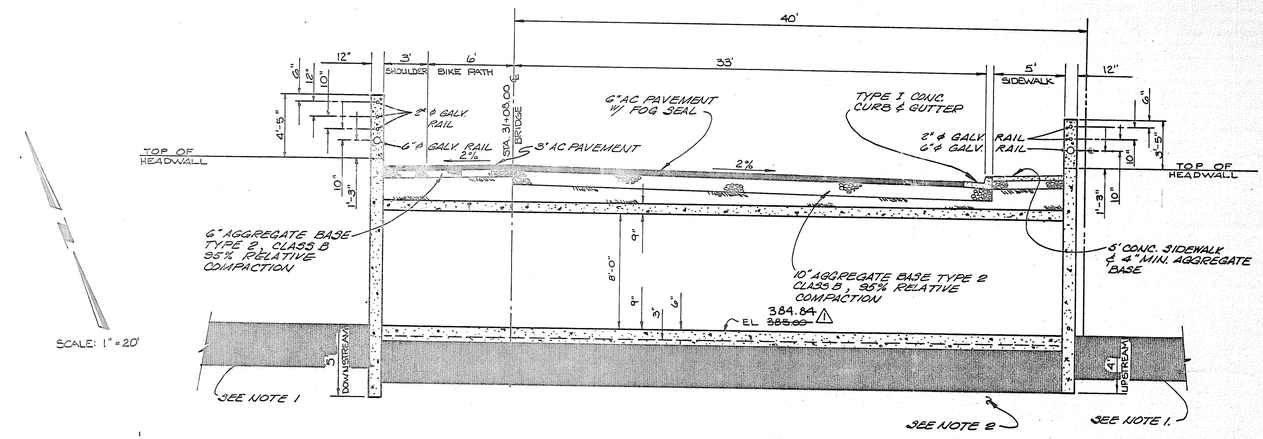
DESIGNED BY DH — DATE SURVEYED
DRAWN BY RB — DATE 1-9-91
CHECKED BY BS — DATE
APPROVED BY — DATE — R.E. NO.

cfa PLANNERS • ENGINEERS • SURVEYORS LANDSCAPE ARCHITECTS
1150 CORPORATE BLVD. RENO, NV 89502 (702) 786-1160 FAX: (702) 786-1169

MIRA LOMA DRIVE EXTENSION
EAST AIR-O-FORM BRIDGE
RENO NEVADA

JOB NO. 84-002.11
DATE JAN., 1991
SHEET 1 OF 2

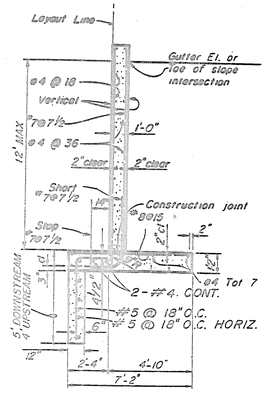




SCALE: 1" = 20'

SECTION (B/2)

SCALE: Horiz. 1"=5'
Vert. 1"=5'



SPREAD FOOTING SECTION

Place concrete in toe against undisturbed material, except as permitted by the Engineer.

Laboratory Tests (and other information)	Sample Number	Moisture Content (%)	Dry Density (pcf)	Depth (ft) Symbols	LOG OF 43
					Equipment 4" x 11" Tube w/ 6" Auger
					Elevation N/A Date 1/17/91
	6			0	
					BROWN SAND (SP) with gravel, cobbles and occasional boulders, dense, moist — FILL
				5	
					BLACK CLAY (CH) stiff, moist
*Percent Passing the No. 200 = 60	2	46.9	65	10	
					GREY BROWN SAND (SP) loose, saturated
	5			15	

Laboratory Tests (and other information)	Sample Number	Moisture Content (%)	Dry Density (pcf)	Depth (ft) Symbols	LOG OF 44
Elevation Reference:					Equipment CME 55 Hollow Stem Auger
					Elevation N/A Date 1/18/91
	4			0	
					BROWN CLAYEY SAND (SC) with gravel, medium dense, moist — FILL
				5	
					BLACK SILTY SAND (SM) loose, moist to wet
*Percent Passing the No. 200 = 93	2	70.0	53	10	
					BLACK SILT (MH) stiff, moist
				15	
					GREY GREEN SILTY SAND (SM) medium dense, moist
					GREY SAND (SP) medium dense, moist

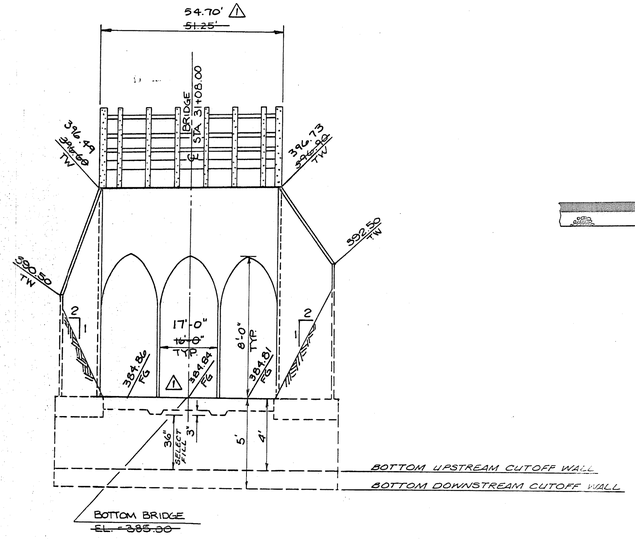
Personette Associates, Inc. — Consulting Engineers and Geologists

Job No. 2780.04 | Appr. ✓ Feld | Date 2/1/91

LOGS OF BORING 43 AND 44 — PLATE

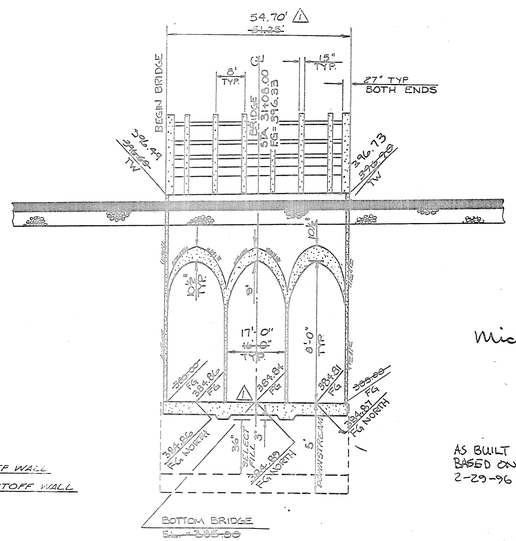
ROSEWOOD - MIRA LOMA Extension Bridges Reno, Nevada

BORINGS LOG



SECTION (A/2)

SCALE: Horiz. 1"=20'
Vert. 1"=4'



SECTION (C/2)

SCALE: Horiz. 1"=20'
Vert. 1"=4'

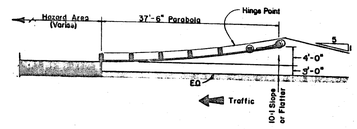
NOTES:

1. SELECT FILL MATERIAL UPSTREAM AND DOWNSTREAM OF STRUCTURES SHALL HAVE MINIMUM D_{75} OF 1.2" MATERIAL. GRADATION SHALL MEET THE REQUIREMENTS FOR SCOUR PROTECTION FROM "MIRA LOMA ROAD EXTENSION HYDRAULIC ANALYSIS ON STEAMBOAT CREEK" PREPARED BY NIMBUS ENGINEERS. SOILS ENGINEER TO VERIFY SIZE AND GRADATION.
2. DUE TO THE HIGH MOISTURE CONTENT AND FINE GRAINED CHARACTERISTICS OF THE NATIVE SOILS EQUIPMENT MOBILITY MAY BE RESTRICTED. A STABILIZING LAYER OF ROCK OR A GEOTEXTILE MAY BE NEEDED PRIOR TO FILL PLACEMENT. SPECIFIC RECOMMENDATIONS FOR APPROPRIATE STABILIZATION MEASURES, IF NEEDED. THE USE OF VIBRATORY OR RUBBER TIRED EQUIPMENT SHOULD BE AVOIDED.

AS BUILT ELEVATIONS SHOWN ARE BASED ON A FIELD SURVEY DATED 2-29-96 AND 3-2-96

RECORD DRAWING 1/22-99 DATE

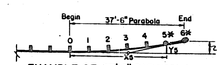
BENCH MARK: 3" BRASS CAP IN MONUMENT WELL AT CENTERLINE INTERSECTION OF HIDDEN VALLEY DRIVE AND INVERNESS DRIVE ELEVATION = 4391.03.



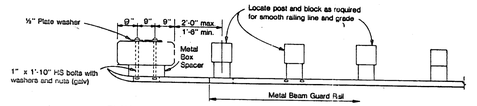
POST NUMBER	1	2	3	4	5*	6*
X	6.25'	12.50'	18.75'	25.00'	31.25'	37.50'
Y	1.1'	.44'	1.00'	1.7'	2.76'	4.00'

* FLARE RATES

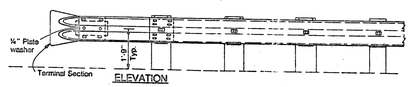
OPERATING SPEED	FLARE RATE
--	0:1
70	15:1
60	13:1
50	11:1
40	9:1



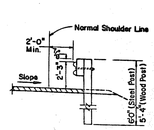
EXAMPLE OF 37'-6" PARABOLA



PLAN



ELEVATION



SHOULDER DIKE INSTALLATION

GUARD RAIL DETAILS

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
DH	RB	BS	

DATE SURVEYED	DATE	DATE	DATE
	1-24-91	/	

DATE	MARK	REVISIONS	BY
3/5/96	1	AS BUILT SURVEY	BS

R.E. NO.

cfa PLANNERS • ENGINEERS • SURVEYORS
LANDSCAPE ARCHITECTS
1150 CORPORATE BLVD. RENO, NV 89502 (702) 785-0159 FAX: (702) 786-1160

MIRA LOMA DRIVE EXTENSION
WEST AIR-O-FORM BRIDGE
RENO NEVADA

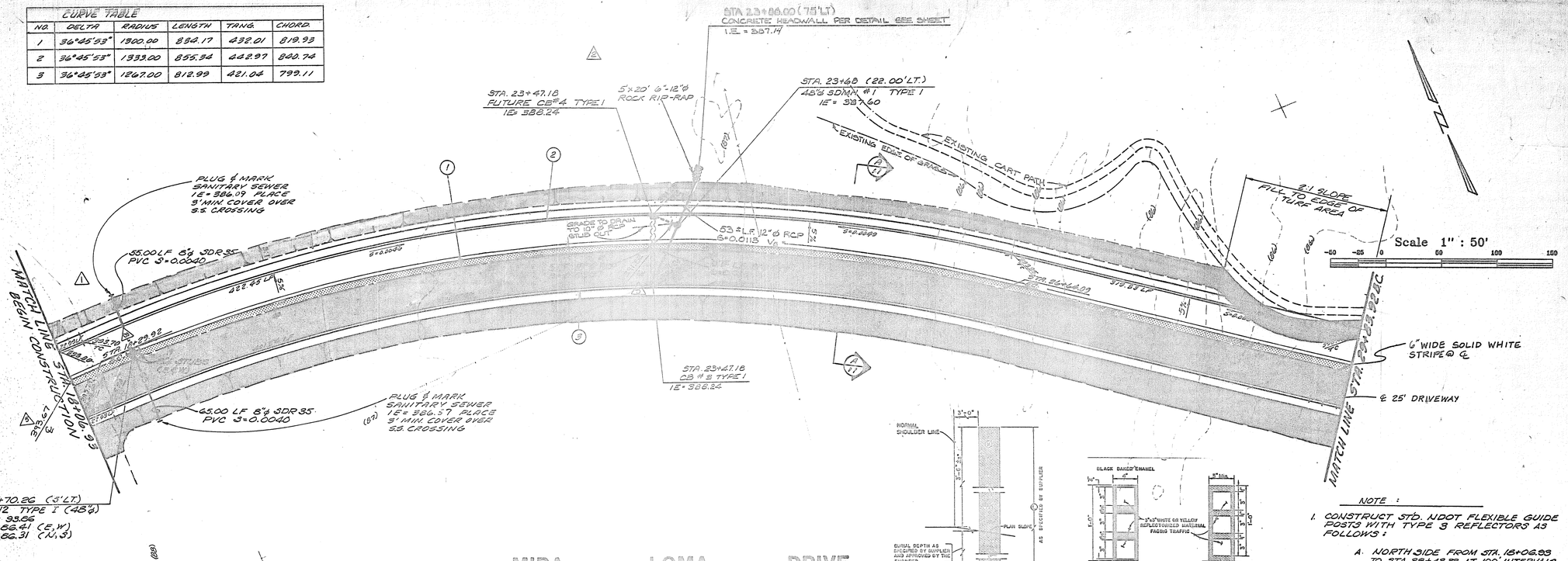
JOB NO. 84-002.11

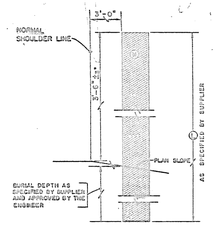
DATE JAN. 1991

SHEET 2 OF 2

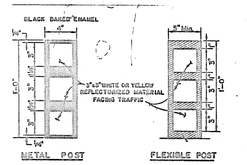
CURVE TABLE					
NO.	DELTA	RADIUS	LENGTH	TANG.	CHORD.
1	36°45'53"	1300.00	834.17	432.01	819.93
2	36°45'53"	1333.00	855.34	442.97	840.74
3	36°45'53"	1267.00	812.99	421.04	799.11

AS BUILT ELEVATIONS SHOWN ARE BASED ON A FIELD SURVEY DATED 2-29-96 AND 3-2-96.





FLEXIBLE POST
For Tubular Post, Wraparound Reflectors are Acceptable. (See Types for Vertical Dimensions.)

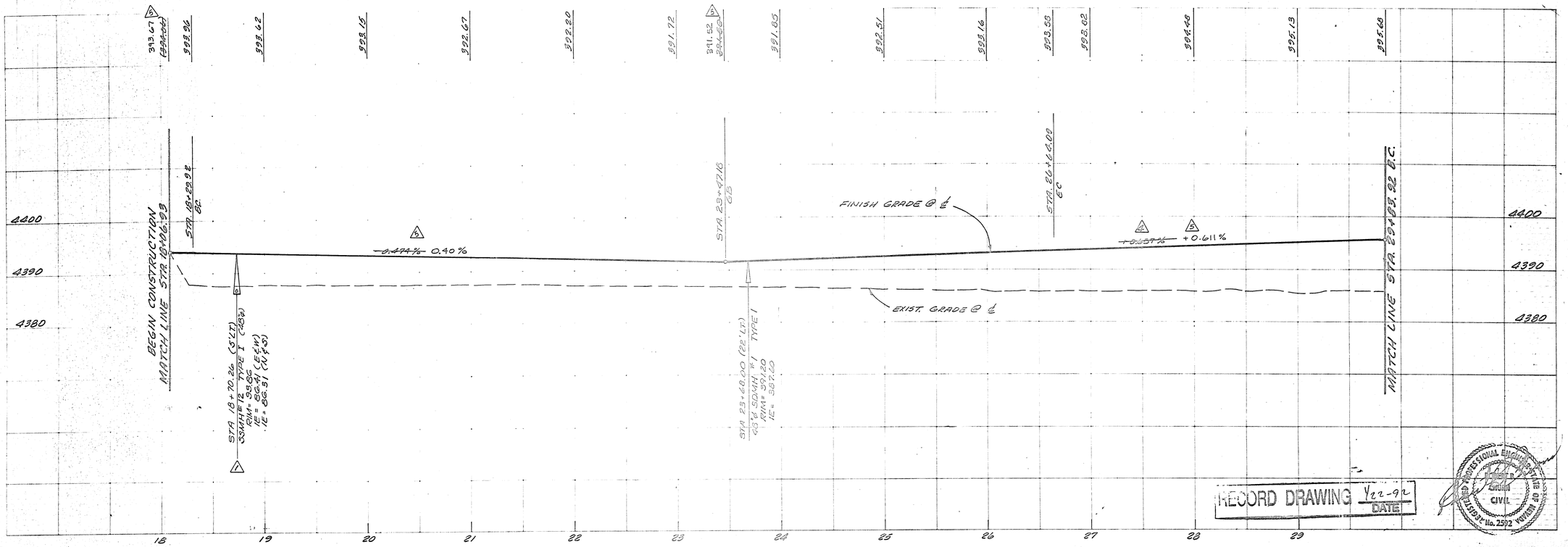


TYPE 3 REFLECTORS
(ISLANDS, CURBS, SHOULDER DIKES) △5

NOTE :

1. CONSTRUCT STD. NDOT FLEXIBLE GUIDE POSTS WITH TYPE 3 REFLECTORS AS FOLLOWS :
   - A. NORTH SIDE FROM STA. 18+06.93 TO STA. 38+43.33 AT 100' INTERVALS.
   - B. SOUTH EAST SIDE FROM STA. 36+95.34 TO STA. 41+57.49 AT 95' INTERVALS.

MIRA LOMA DRIVE



RECORD DRAWING 7-22-96 DATE

PROFESSIONAL ENGINEER STATE OF NEVADA No. 2502 CIVIL

NO.	DATE	BY	REVISIONS
3	9/5/96		AS BUILT SURVEY
2	2/29/96		REVISED VERTICAL ALIGNMENT
1	2/13/96		ADDED 36" MIN. ø 12 NOTES & ADDED DETAIL 5
0	1/19/96		REVISED STORM DRAIN
	12/19/95		REVISED SANITARY SEWER CROSSING

DESIGNED BY — DATE SURVEYED
DRAWN BY — DATE
CHECKED BY — DATE
APPROVED BY — DATE

cfa
CHURCHILL-FITTINGHOFF & ASSOCIATES
PLANNERS, ENGINEERS & SURVEYORS
1150 CORPORATE BLVD. RENO, NV 89502 (702) 786-1150

MIRA LOMA DRIVE EXTENSION
PLAN AND PROFILE
STA. 18+00.93 TO STA. 23+88.22
RENO NEVADA

JOB NO. 94-022.11
DATE FEB. 1996

SHEET 5 OF 12

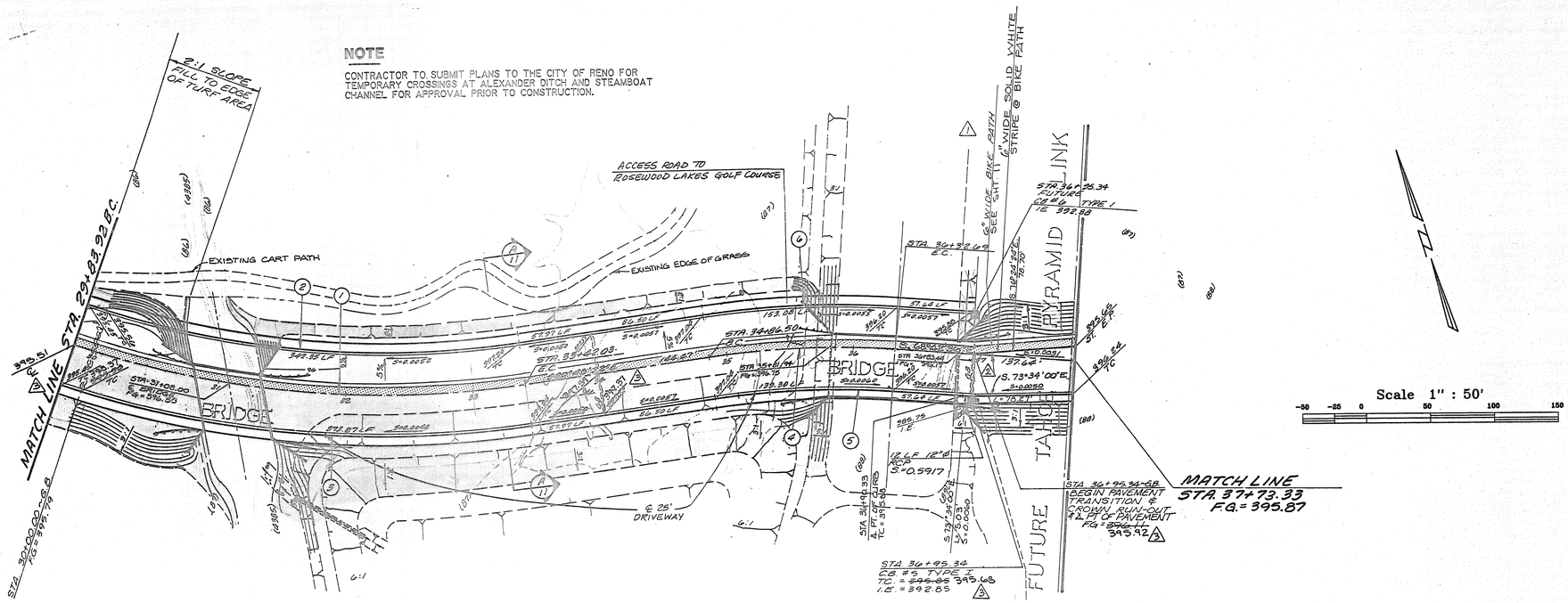
CURVE TABLE					
NO.	DELTA	RADIUS	LENGTH	TANG.	CHORD
1	27°21'27"	750.00	358.11	182.54	354.72
2	27°21'27"	717.00	342.35	174.50	339.11
3	27°21'27"	783.00	373.87	190.57	370.32
4	11°57'56"	700.00	146.19	73.36	145.92
5	11°57'56"	667.00	139.30	69.90	139.04
6	11°57'56"	733.00	153.08	76.82	152.80

MICHAEL A. WADE — PROFESSIONAL LAND SURVEYOR — STATE OF NEVADA — No. 4431 — 3-15-96

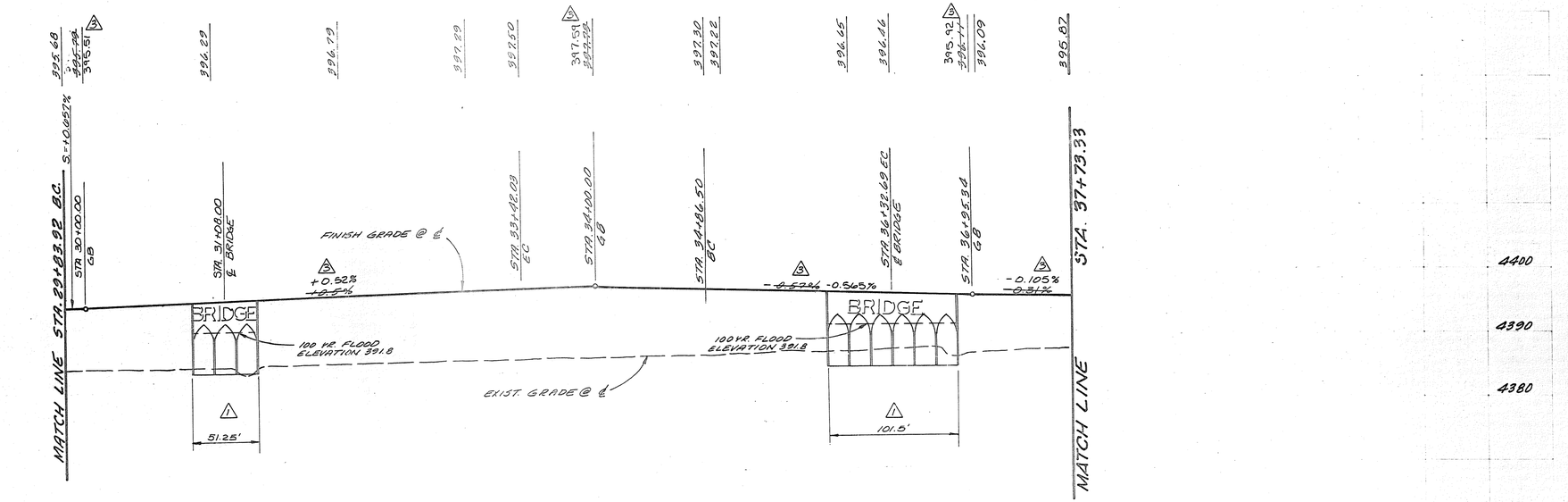
AS BUILT ELEVATIONS SHOWN ARE BASED ON A FIELD SURVEY DATED 2-29-96 AND 3-2-96.

NOTE

CONTRACTOR TO SUBMIT PLANS TO THE CITY OF RENO FOR TEMPORARY CROSSINGS AT ALEXANDER DITCH AND STEAMBOAT CHANNEL FOR APPROVAL PRIOR TO CONSTRUCTION.



Scale 1" : 50'



AS BUILT DRAWING — DATE

ROBERT B. CHURM — CIVIL — STATE OF NEVADA — REGISTERED PROFESSIONAL ENGINEER

NO	REVISIONS	DATE	BY
3	AS BUILT SURVEY	3/5/96	BS
2	REVISED HORIZ. ALIGNMENT @ APPROX STA 36+95	3/24/94	BL
1	REV. BRIDGE LOCATION, SIZE, REVISE RAW & PROFILE EAST OF BRIDGE, ADDED STORM D	2/19/91	

DESIGNED BY — DATE — SURVEYED — DATE — R.E. NO

DRAWN BY — DATE

CHECKED BY — DATE

APPROVED BY — DATE

cfa — CHURM, FITTINGHOFF & ASSOCIATES — PLANNERS, ENGINEERS & SURVEYORS — 1150 CORPORATE BLVD. RENO, NV 89502 (702) 786-1150

MIRA LOMA DRIVE EXTENSION
PLAN AND PROFILE
STA. 29+83.92 TO STA. 37+70.33
RENO NEVADA

JOB NO 84-002.11

DATE Feb 1988

SHEET 6 OF 12

CURVE TABLE					
NO.	DELTA	RADIUS	LENGTH	TANG.	CHORD
1	90°00'00"	200.00	314.16	200.00	282.84
2	90°00'00"	220.00	345.58	220.00	311.13
3	90°00'00"	180.00	282.74	180.00	254.56

MICHAEL A. WADE
PROFESSIONAL LAND SURVEYOR STATE OF NEVADA
No 4431
Michael A Wade 3-15-96

AS BUILT ELEVATIONS SHOWN ARE BASED ON A FIELD SURVEY DATED 2-29-96 AND 3-2-96.

Scale 1" : 50'
−50 −25 0 50 100 150

NOTE:
AT THE TIME OF EXCAVATION THE CONTRACTOR SHALL REQUEST VERIFICATION FROM THE SOILS ENGINEER THAT 2:1 SLOPES ARE STABLE IN ACCORDANCE WITH CITY OF RENO REQUIREMENTS. IF NOT STABLE, SLOPES SHALL BE STABILIZED TO THE SATIFICATION OF THE SOILS ENGINEER IN ACCORDANCE WITH CITY OF RENO REQUIREMENTS.

BY	DATE	REVISIONS
BS	3/15/96	AS BUILT SURVEY
BL	3/22/91	REVISED CURVE TABLE & DIST. & BEARING OF C&G
TFH	2/19/91	ADDED CONCRETE HEADWALL, TYPE 4R C&G
TFH	2/19/91	RELOCATED STORM DRAIN
BL	2/5/91	ADDED SUPERELEVATION, REVISED PLAN
BL	1/21/91	REVISED STORM DRAIN, ADDED SPEED LIMIT SIGNS, ADDED TYPE 4R C&G'S
BL	12/5/90	REVISED STREET VERTICAL ALIGNMENT & SEWER PROFILE

cfa
CIVIL ENGINEERS · SURVEYORS · PLANNERS

MIRA LOMA DRIVE EXTENSION
PLAN AND PROFILE
STA. 37+70.33 TO STA. 48+89.60
RENO NEVADA

84-002.11
Feb. 1988

SHEET 7 / 12

RECORD DRAWING ____ DATE

SEAL ENGINEER STATE OF NEVADA 10878 CHIEN

BENCHMARK: 44.172

MIRA LOMA ROAD EXTENSION
HYDRAULIC ANALYSIS

Mira Loma Road Extension Hydraulic Analysis

on

Steamboat Creek

City of Reno, Washoe County, Nevada

Prepared for:

City of Reno, Nevada
Engineering
450 Sinclair Street
Reno, Nevada 89502

January 1991
Nimbus Job # 9006

Nimbus Engineers
3710 Grant St., Suite D, Reno, NV 89509
Mail : P.O. Box 10220, Reno, NV 89510
(702) 689-8630

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- Effective Area Model
- Bridge Model
- Profile Through Bridge
- Scour Calculations

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1.0 INTRODUCTION AND PURPOSE

This report was prepared to illustrate the effects of the proposed roadway and two bridges for the Mira Loma Drive extension across Steamboat Creek, in the City of Reno (See Figure 1). Nimbus Engineers has recently prepared a report for the City of Reno to obtain a revision to the floodway in this area; a more detailed physical description of this area can be found in that report (Reference 9). Mira Loma Drive is proposed to be extended as a feature of the Rosewood Lakes Development. The proposed extension is located at the southern end of Rosewood Lakes Golf Course and incorporates two hydraulic structures near the south sedimentation basin to accommodate the 100-Year flows from Steamboat Creek (See Figure 2).

The golf course was designed to allow low flows through the central portion of the course to maintain wetlands. To accommodate higher flows, a flood control channel was constructed along the east side of the course. Low flows will be passed into the central wetlands under the proposed roadway extension by three arches. Six arches convey additional high flows to the flood control channel. A series of low flow pipes and the sedimentation basin regulate the distribution of low flow between the two sets of arches, but are completely inundated and ineffective during flood conditions.

The proposed roadway spans the entire floodplain of Steamboat Creek. A cross section showing existing ground and the proposed roadway is shown in Figure 3. As can be seen in Figure 3, there are modifications proposed to the hydraulics within the floodway. The purpose of this report is to analyze and quantify the impact created by the roadway and bridges.

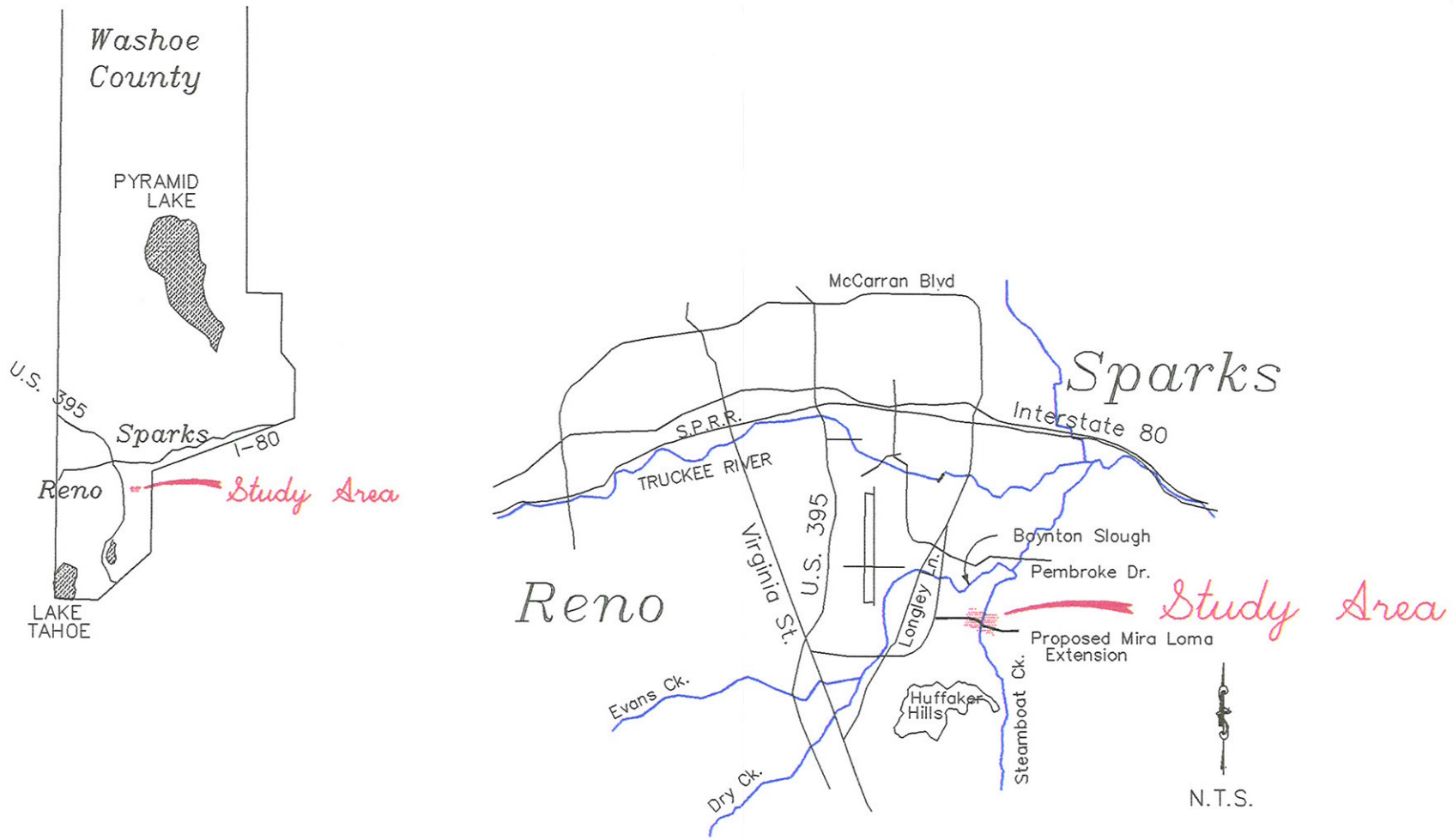
2.0 METHOD OF ANALYSIS

The Corps of Engineers HEC-2 computer model (Reference 16) was used for the hydraulic modeling. An existing conditions model or "Base" model was reproduced from the previously referenced Nimbus report and from a former model used to prepare the current Flood Insurance Study (FIS). In the previous Nimbus report, the floodway revision ended at the southern end of the sedimentation basin. Some minor modifications were made to the model in the area south of the sedimentation basin in order to properly extend the modeling effort upstream.

Modifications made are as follows:

1) Relocation of Channel Bank Stations - In cross sections 201.57, 202.07, 202.47, and 205.67, channel bank stations were relocated to the banks of Steamboat Creek. Previously, the bank stations of these sections were at the banks of an irrigation ditch.

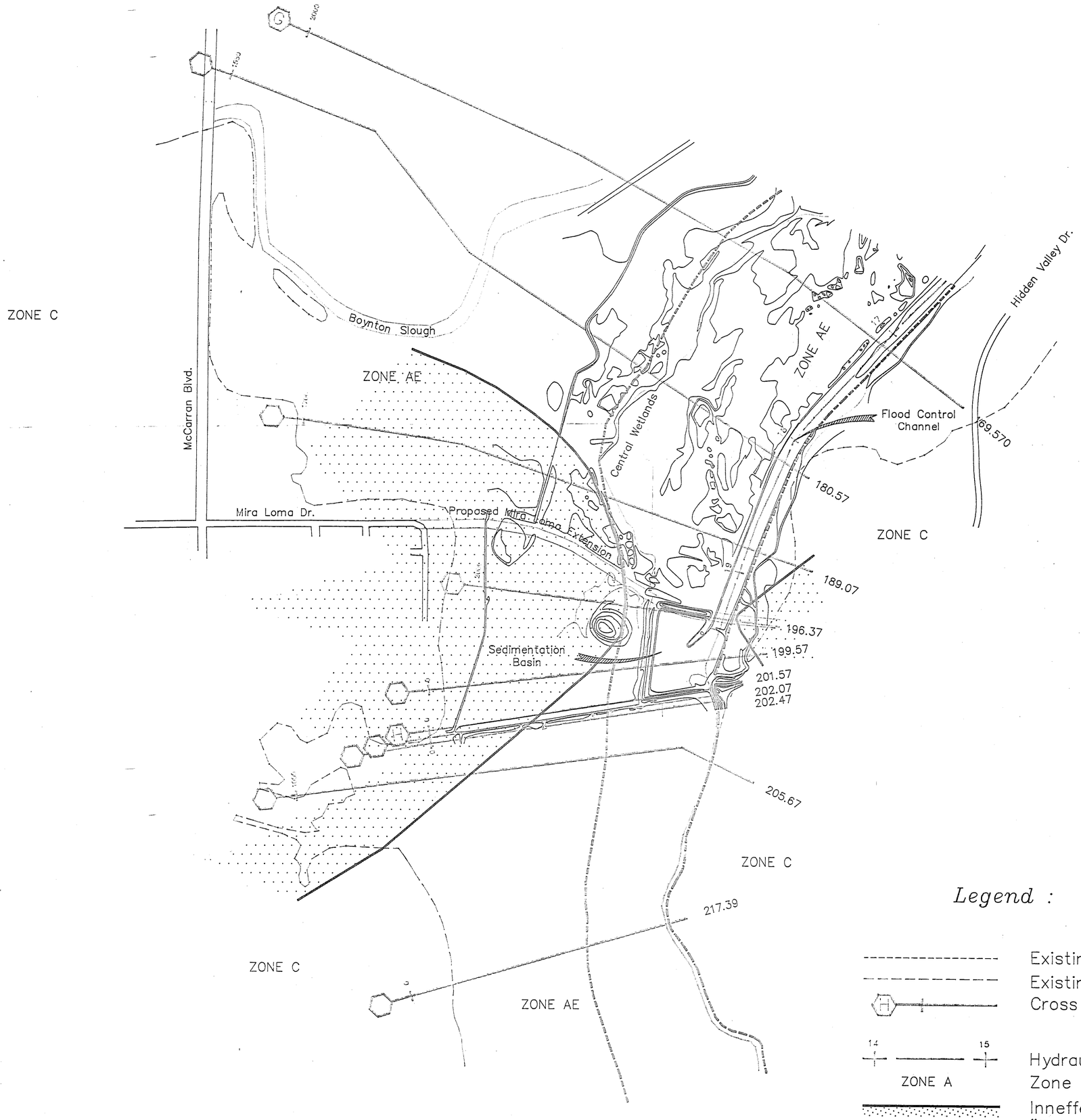
2) Realignment of Hydraulic Base Line - After relocating channel bank stations, the hydraulic base line was also changed to follow Steamboat Creek.



Nimbus Engineers

FIGURE 1
Vicinity Map

Job No.: 9507 Date: 3/4/96



Legend :

- Existing Floodway
- Existing Floodplain
- Cross Section
- Hydraulic Base Line
- Zone Designation
- Inneffective Area in "Effective Area" Model

Scale : 1" = 500'

FIGURE 2

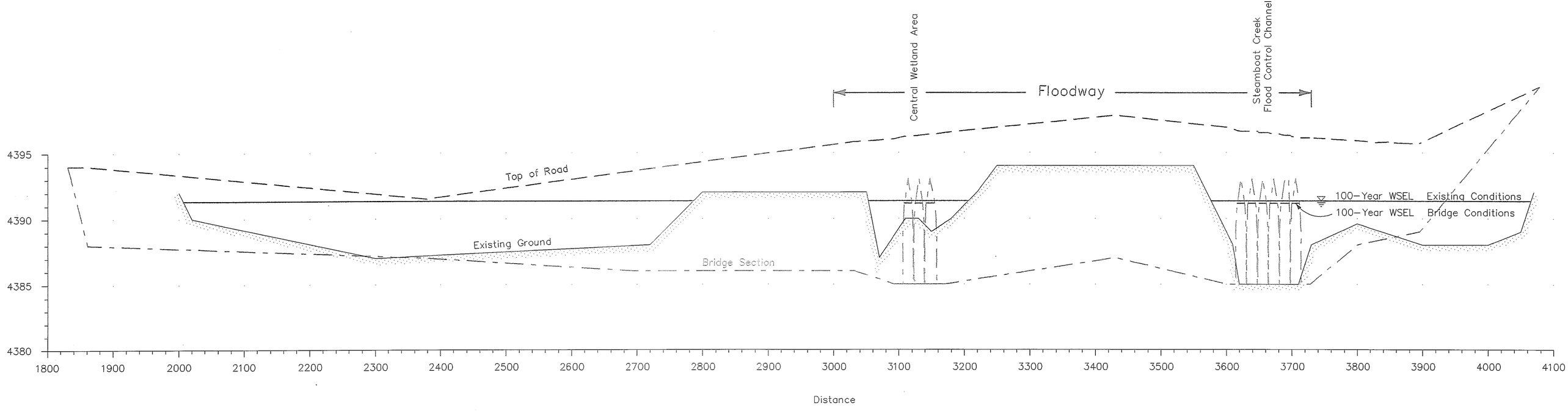
Mira Loma Extension Existing Conditions Workmap

Job No. : 9006 Date : 1/31/90

Nimbus Engineers
3710 Grant St., Suite D, Reno, NV 89509
Mail : P.O. Box 10220, Reno, NV 89510
(702) 689-8630

¥ No SFRT Elevs.

Mira Loma Bridge
Cross Section 196.37



3) Removal of Special Bridge Routine at Cross Section 202.07 - In the previous FIS model, the bridge routine assumes weir flow and pressure flow at this location. This area is in a backwater condition which would not be best represented by a weir, and also is not under a pressure flow condition, but in an open channel condition.

The improvements to the model change the hydraulic parameters for the area, but have little effect on water surface elevations and floodway elevations. The model, which incorporates these modifications, will be referred to as the "Base" model.

As can be seen in Figure 2, the roadway extension is proposed to be constructed in both the floodway fringe (area between the floodway and floodplain boundaries) and the floodway. In the fringe, construction is permitted as long as it does not increase the water surface elevation over one foot. No construction is permitted in the floodway unless it can be shown there is no increase in the water surface elevation.

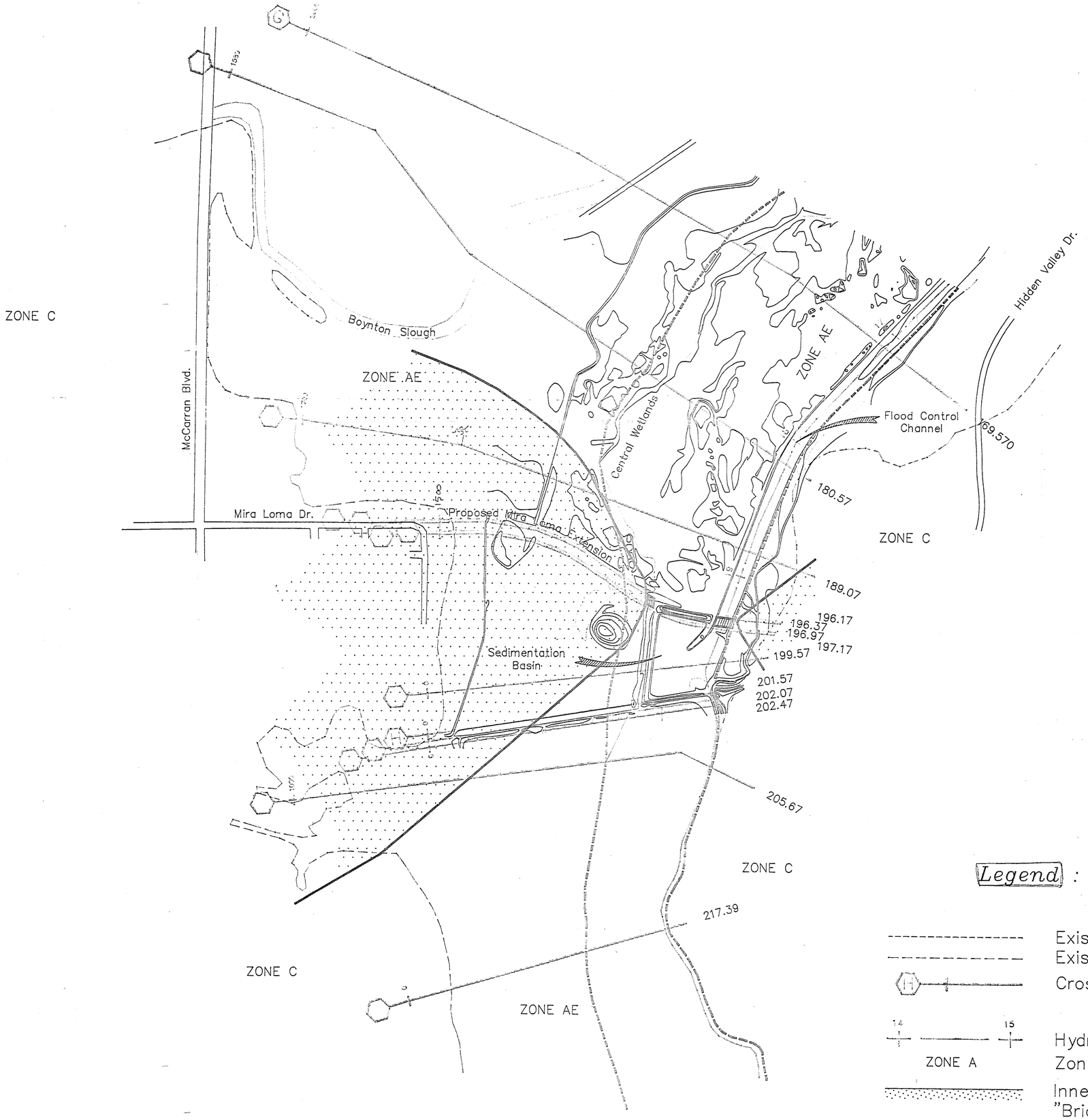
For this project, a second hydraulic model was created to show the increase in water surface elevation due to encroachment of the floodway fringe. A third model was then created to show the effects of floodway encroachment.

The second model is referred to as the "Effective Area" model. All areas in the floodway fringe which will become ineffective upon construction of the road and bridges are coded out of the model (See Figure 2). The bridge structures are not included in this model and no modifications were made within the floodway. The purpose of this model is to determine the rise in the water surface from encroachment of the floodway fringe.

A third HEC-2 model, referred to as the "Bridge" model, was created to include the arches and the entire roadway. The arches were modeled with the normal bridge routine, as suggested by the HEC-2 Users Manual. The normal bridge routine is able to model irregular openings, such as arches, using standard backwater equations. As outlined in the HEC-2 users manual, the normal bridge routine requires additional cross sections just inside and outside of the upstream and downstream openings of the bridges (See Figure 4).

3.0 RESULTS

The results of all three models are included in Table 1. The results of the Effective Area model are compared to those of the Base Model to determine the rise caused by fringe encroachment only. The next columns in the table show the results of the bridge model and how they compare to the results of the effective area model. This comparison shows the change in water surface elevation caused by modifications within the floodway. All the increase in water surface elevation created by this roadway extension results from encroachment in the floodway fringe. Modifications within the floodway actually increase flow conveyance and cause a decrease in the water surface elevations. The last column in the table contains the net results of all encroachment.



Legend :

- Existing Floodway
- Existing Floodplain
- Cross Section
- 14 — 15 Hydraulic Base Line
- ZONE A Zone Designation
- Inneffective Area in "Bridge" Model

Scale : 1" = 500'

FIGURE 4

Mira Loma Extension Future Conditions Workmap

Job No. : 9006 Date : 1/31/90

Nimbus Engineers
3710 Grant St., Suite D, Reno, NV 89509
Mail : P.O. Box 10220, Reno, NV 89510
(702) 689-8830

TABLE 1
Summary Water Surface Elevations

Sec. No.	Base Run WSEL	Base Run FWAY	Effective Area WSEL	Effective Area Diff.*	Bridge Model WSEL	Bridge Model Diff.**	Total Rise Bridge + Eff. Area
155.57	4391.25	4391.67	4391.25	0.00	4391.25	0.00	0.00
169.57	4391.26	4391.69	4391.26	0.00	4391.26	0.00	0.00
180.57	4391.26	4391.71	4391.26	0.00	4391.26	0.00	0.00
189.07	4391.28	4391.75	4391.27	-0.01	4391.27	0.00	-0.01
196.17					4391.22		
196.37	4391.31	4391.60	4391.13	-0.18	4391.08	-0.05	-0.23
196.97					4391.12		
197.17					4391.48		
199.57	4391.38	4392.10	4391.76	0.38	4391.75	-0.01	0.37
201.57	4391.39	4392.13	4391.79	0.40	4391.78	-0.01	0.39
202.07	4391.40	4392.14	4391.80	0.40	4391.79	-0.01	0.39
202.47	4391.40	4392.14	4391.80	0.40	4391.79	-0.01	0.39
205.67	4391.51	4392.30	4391.88	0.37	4391.87	-0.01	0.36
217.39	4393.23	4394.10	4393.22	-0.01	4393.17	-0.05	-0.06
224.98	4396.68	4397.54	4396.69	0.01	4396.71	0.02	0.03
235.23	4399.92	4400.77	4399.92	0.00	4399.91	-0.01	-0.01

* Difference between effective area model and base model

** Difference between bridge model and effective area model

Development or construction of the floodway fringe and floodway is usually accompanied by an increase in the flow velocity. If the velocity increase is significant, attention should be given to scour potential. The roadway extension will increase the channel velocity from 2.3 to 5.9 feet per second in the vicinity of the bridges. The velocity increase has been incorporated into the bridge plans and geotechnical design (References 3 and 11 respectively). Appropriate cut-off walls are to be constructed at a depth of 4 and 5' respectively at the upstream and downstream faces of the bridge, and a backfill suitable to withstand the increased velocity will be placed three feet deep for approximately 20 feet upstream and downstream of the arches.

The information contained within the soils report indicates a ready availability of material at the project site which is suitable for scour protection. Scour calculations by Nimbus indicate that the material placed downstream of the structures should have at a minimum 25% (or a D_{75}) of 1.2" or larger material. This backfill should also be well graded so that the formation of open pockets is avoided. Scour calculations and a suggested gradation curve are included in the appendix. These recommendations are for material to withstand the scour only and do not incorporate any foundation specifications.

4.0 CONCLUSIONS

The entire roadway extension project will cause a maximum rise over the current FEMA base flood elevations of four tenths of a foot. All increases in water surface elevation can be attributed to encroachment in the floodway fringe. Modifications within the floodway increase flow capacity and lower water surface elevations.

As the total rise in water surface is less than the allowable one foot, and encroachment within the floodway does not raise the water surface, the proposed roadway and bridge comply with local and federal floodplain regulations.

5.0 REFERENCES

1. Chow, Ven Te, Open-Channel Hydraulics, 1959.

2. Churn, Fittinghoff, and Associates, Mira Loma Drive Extension East Air-O-Form Bridge, January 1991.

3. Churn, Fittinghoff, and Associates, Mira Loma Drive Extension West Air-O-Form Bridge, January 1991.

4. Federal Emergency Management Agency, Flood Boundary and Floodway Map, City of Reno, Washoe County, Nevada, copy Panels 1453 and 1461 April 16, 1990.

5. Federal Emergency Management Agency, Flood Insurance Rate Map, City of Reno, Washoe County, Nevada, Scale 1" = 500', April 16, 1990.

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9. Nimbus Engineers, Request for Floodway Revision, Steamboat Creek, September 1990.

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15. U.S. Department of the Army, Corps of Engineers, Engineering and Design, Routing of Floods Through River Channels - EM-1110-2-1408, March 1, 1960.

16. U.S. Department of the Army, Corps of Engineers, Hydrologic Engineering Center, Computer Program 723-X6-LZ02A, HEC II, Water Surface Profiles, Ver. 4.5.1, September 1990.

17. U.S. Geological Survey, Roughness Characteristic of Natural Channels, Geological Survey Water - Supply Paper 1949, 1977.

APPENDIX

Bridge Model

```
*****************************************
*  HEC-2 WATER SURFACE PROFILES         *
*                                       *
   Version  4.5.1X  September 1990      *
                                        *
*  RUN DATE     31MAR91     TIME   14:13:43  *
*****************************************
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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*        (916) 756-1104                 *
*****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXX
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
```

END OF BANNER

THIS RUN EXECUTED 31JAN91 14:36:43

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

 Version  4.6.1A  September 1990
**************************************
```

```
T1      Mira Loma Bridge on Steamboat Creek          WASHOE CO & RENO, NEVADA
T2      Wilsons Engineers     File : MIRABRIG.DAT   Job No. 9006    January 1991
T3       Steamboat Creek          area around Proposed Mira Loma only

   This is the "Bridge Model" which illustrates effects of the
   Bridge encroachments in the FLOODWAY FRINGE AND the FLOODWAY.

   Compare the results of this model to the results from model "MIRAEFFA.DAT"
   for effects of construction in the FLOODWAY ONLY

   Modified from files: mirabase.dat, miraeffa.dat

   FILENAME : MIRABRIG.DAT
```

	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2							4391.25	
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	-1		-1							

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

30	43	4	53	54	1	50	25	26	0
150									

NC				.1	.3				
NH	7	.10[illegible]	8880	.045	5000	.065	5300	.045	6090	.035
NR	5780	.035	7135	045	7135					
ET	1	5000								
X1	155.57	43	6[illegible]0	7135	1700	2065	2065			
GR	4391.4	1[illegible]0	4350	2300	4390	2820	4389	2870	4388	3260
GR	4387.4	3420	4386	3860	4388	4010	4389	4200	4389	4320
GR	4390	4530	4390	5000	4382.5	5080	4382.5	5130	4390	5200
GR	4390	5450	4388	5690	4386	5680	4388	5710	4388	5870
GR	4390	5894	4388	5950	4387	6000	4388	6050	4390	6075
"	4392	6090	4390	6160	4388	6220	4385	6250	4385.4	6420
	4384	6450	4386	6660	4382	6720	4386	6735	4386	6930
GR	4381	7000	4381	7100	4386	7135	4387	7485	4388	7535
GR	4387	7551	4391	7565	4392	7635				

NH	3	.17	3450	.045	4250	.035	4479	.040	47c0	.035
.4	c=09	.0=4	c=30	.023	6390	.045	7200			
X1	1c9.57	45	c=90	c590	1070	1390	1380			
GR	4391.5	3000	4391	2250	4390	2700	4389	2950	4389	3100
GR	4383	3350	4383	3950	4390	4100	4390	4250	4390	4275
GR	4391	4390	4383	4325	4383	4435	4390	4479	4390	4480
GR	4390	4787	4386	4749	4384.8	4870	4386	5180	4386	5250
GR	4384	5340	4383.9	5430	4384	5520	4384	5700	4384	5820
GR	4386	5500	4383	5560	4390	6000	4388	c020	4389	c420
GR	4388	c430	4385	c=e9	4382	c470	4382	c570	4385	c570
GR	4382	c6c7	4385.5	c665	4386	6670	4387	6830	4388	c870
GR	4389	6990	4397	7010	4391	7030	4391	7190	4392	7200
NH	6	.100	3900	.025	4050	.040	5310	.045	6300	.025
NH	c420	.045	c570							
X1	160.57	42	4300	6420	1090	1060	1060			
GR	4392	2000	4393	2400	4391	2700	4392	2950	4391	3200
GR	4391	3570	4391	3840	4390	3900	4385	3935	4384	3980
GR	4384	4025	4390	4050	4390	4100	4389.7	4700	4388	4705
GR	4386	4710	4386.8	4870	4386	4930	4385.3	5020	4386	5110
GR	4388	5115	4384	5280	4386	5230	4388	5260	4388	5310
GR	4386	5350	4385	5390	4386	5405	4387.6	5490	4386	5410
GR	4386	5840	4384.8	6000	4386	6160	4388	6270	4388	6300
	4383	6330	4383	6400	4386	6420	4386	6460	4388	6510
...	4390	6550	4392	6570						
NH	4	.100	2900	.040	4660	.025	4970	.050	5370	
ET		9.1							3860	4970
X1	139.07	28	49c0	4970	890	640	640			
GR	4392	1700	4391	1800	4390	2000	4390	2900	4390	3380
GR	4388	3430	4387.8	3540	4388	3600	4388.5	3650	4388	3720
GR	4387.3	3900	4387.5	4000	4387.5	4400	4388	4490	4388	4530
GR	4386	4720	4388	4830	4388	4860	4384	4870	4384	4960
GR	4388	4970	4392.4	5040	4388	5060	4386	5085	4386	5100
GR	4387	5340	4390	5360	4392	5370				

Start Normal Bridge Portion
GR Points used to model effective area within channel
X3 Card used to model effective area outside channel

NC	.250	.350	.025	.1	.3				-.1	

Ineffective flow between arches is coded out with GR data

X1	176.17	36	31c1.1	3697	350	450	450			
X3	10							4391.5	4391.5	
GR	4394	1800	4388	1820	4387	2242	4386	2664	4386	3000
	4385	30c1.7	4388	3073.23	4385	3126.76	4385	3140	4400	3141
	4403	3400	4404	3589	4385	3569.5	4385	3583.5	4385	3583.25
GR	4385	3e83.75	4389	3647	4388	3770	4389	38e3	4410	4045

Proceed More Cone Pool E xpansion -- Normal Bridge

Downstream face of Pier

XC	.3*	.3*	.01e	.3	.5					
		Normal Bridge Spring								
X1	196.37	7e	3075.2e	3e83.2e	20	20	20			
X3	10							4391.5	4391.5	
BT	-7e	1800	4394	4394	1830	4394	4388	2347	4391.5	4387
BT		2e6*	4393.6	438e	3000	4395.3	4356	3061.1	439e	4385
BT		3075.25	4396.17	4385	3075.2e	4396.17	4389	3077.2e	4396.2	4391
BT		3083.25	4396.21	4393	3089.25	4396.22	4391	3091.24	4396.25	4389
BT		3091.25	4396.25	4385	3092	4396.25	4388	3092.01	4396.25	4389
BT		3094	4396.2e	4391	3100	4396.29	4393	3106	4396.31	4391
BT		3102	4396.32	4389	3108.01	4396.32	4383	3108.75	4396.32	4385
BT		3108.76	4396.32	4389	3110.75	4396.34	4391	3116.75	4396.37	4393
BT		3124.75	4396.39	4391	3126.75	4396.4	4389	3126.76	4396.41	4385
BT		3140	4396.5	4385	3400	4397.6	4387	3569.5	4396.9	4385
BT		3583.5	4396.7	4383	3583.51	4396.7	4387	3585.5	4396.65	4391
BT		3591.5	4396.e	4393	3597.5	4396.6	4391	3599.5	4396.6	4389
BT		3599.51	4396.e	4385	3600.25	4396.6	4385	3e00.26	4396.6	4389
BT		3602.25	4396.6	4391	3608.25	4396.6	4393	3614.25	4396.e	4391
BT		3e16.25	4396.e	4389	3e16.26	4396.6	4385	3617	4396.6	4385
		3617.01	4396.6	4389	3619	4396.5	4391	3625	4396.5	4393
		3e31	4396.5	4391	3633	4396.5	4389	3633.01	4396.5	4385
BT		3633.75	4396.5	4385	3633.76	4396.5	4389	3635.75	4396.45	4391
BT		3641.75	4396.4	4393	3647.75	4396.4	4391	3e49.75	4396.4	4389
BT		3649.76	4396.4	4385	3650.5	4396.4	4385	3650.51	4396.4	4389
BT		3e52.5	4396.35	4391	3658.5	4396.3	4393	3664.5	4396.3	4393
BT		3666.5	4396.3	4389	3e66.51	4396.3	4385	3667.25	4396.3	4385
BT		3e67.2e	4396.3	4389	3669.25	4396.2	4391	3675.25	4396.2	4393
BT		3681.25	4396.2	4391	3683.25	4396.2	4389	3683.26	4396.1	4385
BT		3e97	4396.1	4385	3770	4397.6	4388	3865	4395.7	4389
BT		4048	4400	4400						
GR	4394	1800	4385	1830	4387	2347	4386	2664	438e	3000
GR	4385	3061.1	4385	3073.25	4385	3075.26	4385	3077.26	4385	3083.25
GR	4385	3089.25	4395	3091.24	4385	3091.25	4385	3092	4385	3092.01
GR	4385	3094	4385	3100	4385	3106	4385	3108	4385	3108.01
GR	4385	3108.75	4385	3108.76	4385	3110.75	4385	3116.75	4385	3124.75
GR	4385	3126.75	4385	3126.76	4385	3140	4387	3400	4385	3569.5
GR	4385	3583.5	4385	3583.51	4385	3585.5	4385	3591.5	4385	3597.5
GR	4385	3599.5	4385	3599.51	4385	3600.25	4385	3600.26	4385	3e02.25
GR	4385	3e08.25	4385	3e14.25	4385	3e16.25	4385	3e16.26	4385	3617
GR	4385	3617.01	4385	3619	4385	3625	4385	3631	4385	3633
GR	4385	3e33.01	4385	3e33.75	4385	3633.76	4385	3e35.75	4385	3e41.75
GR	4385	3647.75	4385	3e49.75	4385	3649.76	4385	3650.5	4385	3e50.51
GR	4385	3e52.5	4385	3e58.5	4385	3664.5	4385	3666.5	4385	3ee6.51
GR	4385	3667.25	4385	3e67.2e	4385	3669.25	4385	3675.25	4385	3e81.25
GR	4385	3e83.25	4385	3e83.2e	4385	3697	4388	3770	4389	38e5
	4400	4043								

Upstream face of Pier

ST									3075	3684
X1	1965.97	7=	3775.85	3683.25	60	60	60			
X3	16							4391.5	4391.5	
ST	-76	1845	4394	4394	1830	4394	4385	2347	4391.5	4387
ST		2000	4393.5	4386	3000	4395.5	4386	3061.1	4396	4385
ST		3075.25	4396.17	4385	3075.25	4396.17	4389	3077.25	4396.5	4391
ST		3083.25	4396.21	4393	3089.25	4396.32	4391	3091.24	4396.25	4389
ST		3091.25	4396.29	4385	3092	4396.25	4385	3092.01	4396.25	4389
ST		3095	4396.25	4391	3100	4396.29	4393	3106	4396.31	4391
ST		3105	4396.36	4389	3108.01	4396.32	4385	3108.75	4396.35	4385
ST		3108.76	4396.32	4389	3110.75	4396.34	4391	3116.75	4396.37	4393
ST		3124.75	4396.39	4391	3126.75	4396.4	4389	3126.76	4396.41	4385
ST		3140	4396.5	4385	3400	4397.8	4387	3569.5	4396.9	4385
ST		3583.5	4396.7	4385	3588.51	4396.7	4387	3588.5	4396.65	4391
ST		3591.5	4396.8	4393	3597.5	4396.8	4391	3599.5	4396.8	4389
ST		3599.51	4396.8	4385	3600.25	4396.8	4385	3600.26	4396.8	4389
ST		3602.25	4396.8	4391	3603.25	4396.8	4393	3614.25	4396.8	4391
ST		3616.25	4396.8	4389	3616.26	4396.8	4385	3617	4396.8	4385
ST		3617.01	4396.8	4389	3619	4396.5	4391	3625	4396.5	4393
ST		3631	4396.5	4391	3633	4396.5	4389	3633.01	4396.5	4385
ST		3633.75	4396.5	4385	3633.76	4396.5	4389	3635.75	4396.45	4391
ST		3641.75	4396.4	4393	3647.75	4396.4	4391	3649.75	4396.4	4389
ST		3649.76	4396.4	4385	3650.5	4396.4	4385	3650.51	4396.4	4389
		3652.5	4396.35	4391	3658.5	4396.3	4393	3664.5	4396.3	4393
		3666.5	4396.3	4389	3666.51	4396.3	4385	3667.25	4396.3	4385
ST		3667.25	4396.3	4389	3669.25	4396.2	4391	3675.25	4396.2	4393
ST		3691.25	4396.2	4391	3863.25	4396.2	4389	3863.26	4396.1	4383
ST		3877	4396.1	4385	3770	4397.6	4388	3865	4395.7	4389
ST		4042	4400	4400						
GS	4394	1830	4398	1830	4387	2347	4386	2364	4386	3000
GR	4385	3061.1	4385	3075.25	4385	3075.26	4385	3077.26	4385	3083.25
GR	4385	3089.25	4385	3091.24	4385	3091.25	4385	3092	4385	3092.01
GR	4385	3095	4385	3100	4385	3106	4385	3108	4385	3108.01
GR	4385	3108.75	4385	3108.76	4385	3110.75	4385	3116.75	4385	3124.75
GR	4385	3126.75	4385	3126.76	4385	3140	4387	3400	4385	3569.5
GR	4385	3583.5	4385	3588.51	4385	3588.5	4385	3591.5	4385	3597.5
GR	4385	3599.5	4385	3599.51	4385	3600.25	4385	3600.26	4385	3602.25
GR	4385	3609.25	4385	3614.25	4385	3616.25	4385	3616.26	4385	3617
GR	4385	3617.01	4385	3619	4385	3625	4385	3631	4385	3633
GR	4385	3633.01	4385	3633.75	4385	3633.76	4385	3635.75	4385	3641.75
GR	4385	3647.75	4385	3647.76	4385	3649.76	4385	3650.5	4385	3650.51
GR	4385	3652.5	4385	3658.5	4385	3664.5	4385	3666.5	4385	3666.51
GR	4385	3667.25	4385	3667.26	4385	3669.25	4385	3675.25	4385	3681.25
GR	4385	3683.25	4385	3683.26	4385	3697	4388	3770	4389	3865
GS	4400	4042								

Just westbreak of bridge

Ineffectual pressure drops out from 70 outside of channel and GR inside

NC	.050	.050	.045	.1	.3					

Ineffective area between arches is coded out with GR data

XI	197.17	20	3961.1	3977	20	20	20		.03	
X3	15							4391.5	4391.5	
GR	4394	1500	4388	1930	4387	2242	4386	2364	4386	3000
GR	4385	3961.1	4389	3975.25	4385	3186.7s	4385	3140	4400	3141
GR	4400	3400	4400	3547	4385	3367.5	4385	3525.5	4325	3483.25
GR	4385	3683.2s	4389	3977	4386	3770	4389	3853	4400	4043

Bridge Routine Over

NC	0	0	0	.1	.3					
NH	s	.040	1100	.040	1450	.030	1510	.080	1700	.040
NH	2050	.250	2350							
ET		9.1							1100	2100
X1	199.57	20	1700	2050	425	250	250			
GR	4395	0	4394	50	4390	230	4389	270	4388	610
GR	4388	1100	4388	1400	4390	1450	4386.8	1475	4386.5	1500
GR	4390	1510	4385	1530	4385	1700	4385	2000	4390	2040
GR	4390	2050	4389.7	2100	4388	2170	4390	2190	4392	2350
	s	.045	750	.045	1475	.030	1500	.045	1950	.03
NH	1984.5	.045	2000							
ET		9.1							750	2000
X1	201.57	16	1750	1984.5	225	200	200			
GR	4394	0	4392	30	4390	130	4389	150	4388	570
GR	4388	650	4388	750	4388	1200	4387.8	1475	4387.5	1500
GR	4387.1	1650	4390	1950	4387.5	1970	4387.5	1984	4392	1984.5
GR	4400	2000								
NH	s	.045	650	.045	1475	.030	1500	.045	1950	.030
NH	1984.5	.045	2000							
ET		9.1							650	2000
X1	202.07	0	0	0	50	50	50			
NH	s	.045	450	.045	1490	.030	1530	.045	1500	.030
NH	1990	.045	2030							
ET		9.1							450	2030
X1	202.47	22	1500	1990	40	40	40			
GR	4392	0	4378	30	4391	50	4391	230	4390	250
GR	4390	450	4390	630	4388	660	4389	670	4388	800
GR	4390	860	4390	1140	4389	1160	4389	1400	4388	1490
GR	4388	1530	4389	1630	4390	1900	4389	1970	4389	1989
GR	4392	1990	4400	2030						

NC	0	--	0	.1	.3					
GR	5	.---5	3443	.03	3824	.045	3845	.03	3873	.045
GR	3964									
ST		9.3							1050	3954
CI	205.67	55	3848	3878	270	425	425			
GR	4364.5	--.	4391.7	43.	4396.2	163.	4394.0	198.	4393.7	457.
GR	4396.9	539.	4396.2	912.	4393.0	961.	4393.7	1050.	4394.7	1141.
GR	4393.7	1413.	4390.9	1437.	4396.7	1439.	4396.5	1518.	4394.0	1730.
GR	4390.4	2105.	4387.9	3153.	4390.2	2207.	4388.2	3492.	4386.0	3536.
GR	4388.5	3564.	4387.7	3773.	4389.7	3827.	4393.0	3842.	4390.5	3850.
GR	4390.5	3870.	4450.8	3877.	4393.0	3878.	4413.9	3964.		
NC	.080	.050	.105	.1	.3					
CI	217.39	15	1807	1841	1250	1172	1172			
GR	4402.7	0	4400.7	101	4397.6	137	4393.0	327	4394.0	400
GR	4389.0	412.	4389.0	422.	4393.5	442.	4391.8	869.	4392.9	1023.
GR	4392.0	1512.	4395.0	1807.	4391.2	1827.	4395.7	1841.	4402.5	1886.
GR	4435.4	1575								
CI	224.95	23	3150	3211	1160	759	759			
GR	4413.7	0.	4402.3	109.	4406.4	122.	4404.4	174.	4409.2	385.
GR	4405.9	435.	4399.2	889.	4401.4	901.	4398.7	930.	4398.3	945.
GR	4397.0	978.	4394.3	983.	4396.5	1024.	4395.1	1816.	4395.8	2679.
--	4394.9	2840.	4395.3	3109.	4399.7	3150.	4398.6	3162.	4402.1	3211.
	4417.2	3263.	4436.9	3315.	4450.6	3366.				
CI	235.23	19	1716	1755	960	1025	1025			
GR	4426.8	0.	4412.6	35.	4404.6	43.	4409.0	55.	4404.3	67.
GR	4404.4	88.	4400.3	98.	4395.7	104.	4398.8	129.	4398.7	501.
GR	4400.1	659.	4398.7	624.	4400.3	1302.	4400.2	1594.	4401.3	1716.
GR	4398.1	1727.	4399.1	1739.	4403.3	1755.	4429.2	1868.		

SECNO	DEPTH	[illegible]	CRITS	WSELS	ES	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	ACH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	XLOB	FR	XROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOSL	HICH	XLOSR	ITRIAL	IBC	ICONT	CORMAN	TOPWID	ENDST

*PROF !

DCHV= .100 DEHV= .300
1490 NM CARD USED
*SECNO 155.570

3265 DIVIDED FLOW

155.570	10.25	4391.25	.00	4391.25	4391.25	.00	.00	.00	4386.00
5000.0	3714.7	879.6	405.7	15241.8	1438.8	1913.7	.0	.0	4386.00
.00	.24	.21	.21	.037	.025	.045	.000	4381.00	1664.25
.000005	1700.	2485.	2065.	0	0	0	.00	5886.38	7582.50

1490 NM CARD USED
*SECNO 169.570

169.570	9.25	4391.25	.00	.00	4391.26	.00	.01	.00	4388.00
5000.0	3961.3	688.8	349.9	14799.4	1271.1	1776.9	470.8	139.7	4386.00
1.06	.27	.54	.20	.036	.025	.045	.000	4382.00	2111.36
.000005	1070.	1380.	1390.	0	0	0	.00	5080.71	7192.57

1490 NM CARD USED
*SECNO 180.570

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .58

180.570	8.26	4391.25	.00	.00	4391.27	.00	.01	.00	4388.00
5000.0	4035.9	[illegible]	173.5	9866.2	886.5	522.1	833.9	247.5	4386.00
1.66	.41	.39	.34	.040	.025	.045	.000	4383.00	2621.19
.000015	1040.	[illegible]	1620.	0	0	0	.00	3572.78	6568.53

1490 NM CARD USED
*SECNO 189.070

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .37

SECNO	DEPTH	CHPRI	CHSEL	WSELK	EG	KK	HL	OLOSS	L-BANK ELEV
Q	QLOB	FCH	QROB	WLOB	ACH	AREA	VOL	TWA	R-BANK ELEV
TIME	WLOB	XCH	PCE	ANL	XNCH	ANF	WTH	ELMIN	SSTA
SLOPE	ALOSL	FCH	ALOSR	ITRIAL	IDC	ICONT	DSRAR	TOPWID	ENDST

3470 ENCROACHMENT STATION= 3800.00 4970.0 TYPE= 1 TARGET= 1110.000

196.170	7.27	4391.27	.00	.00	4391.30	.03	.03	.01	4388.00
5000.0	3367.4	1633.5	.0	3573.4	759.7	.0	937.4	354.4	100000.00
1.85	.48	2.93	.00	.040	.025	.000	.000	4384.00	3860.00
.000113	840.	440.	640.	0	0	0	.00	1110.00	4970.00

CCHV= .100 CEHV= .300
+SECNO 196.170

3265 DIVIDED FLOW

3502 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .53

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4391.50 ELREA= 4391.50

Ineffective area between arches is coded out with GR data

196.170	6.58	4391.58	.00	.00	4391.46	.23	.09	.06	4385.00
5000.0	.0	5000.0	.0	.0	1286.6	.0	1020.6	302.3	4385.00
1.88	.00	3.87	.00	.000	.025	.000	.000	4385.00	3061.10
.000408	550.	450.	450.	2	0	0	.00	207.02	3697.00

CCHV= .300 CEHV= .500
+SECNO 196.370

3370 NORMAL BRIDGE, NPO= 3 WSH ELTRD= 4391.50 MAX ELLO= 4393.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4391.50 ELREA= 4391.50

Normal bridge section

196.370	6.69	4391.69	.00	.00	4391.62	.54	.01	.15	4385.00
5000.0	.0	5000.0	.0	.0	850.6	.0	1021.0	302.5	4385.00
1.98	.34	3.65	.00	.000	.015	.000	.000	4385.00	3075.26
.000585	80.	80.	80.	2	0	0	-2501.99	698.00	3683.26

SECNO	DEPTH	CHSEL	ISTAB	WSELA	ES	AV	HL	CLOSS	L-BANK ELEV
Q	QLOB	SAL	QPOB	ALOB	ACH	AREA	VOL	TW	R-BANK ELEV
TIME	VLOB	FR	FROB	ANL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	ALOSL	TRN	ALOSP	ITRIAL	IOC	ICONT	CCHAN	TOPWID	ENDST

+SECNO 196.970

3370 NORMAL BRIDGE, NPB= 1, WITH ELTRD= 4391.50 MAX ELLC= 4393.00

3495 OVERBANK AREA ASSUMED NON EFFECTIVE, ELLEA= 4391.50 ELREA= 4391.50

196.970	6.12	4391.12	.00	.00	4391.60	.53	.04	.00	4385.00
5000.0	.0	5000.0	.0	.0	854.2	.0	1062.2	303.3	4385.00
1.89	.00	4.85	.00	.000	.016	.000	.000	4385.00	3075.26
.000564	60.	60.	60.	1	0	0	-2519.62	608.00	3683.26

CCHV= .100 CEHV= .300
+SECNO 197.170

3205 DIVIDED FLOW

 XS OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4391.50 ELREA= 4391.50

Ineffecti e area between arches is coded out with GR data

197.170	6.45	4391.45	.00	.00	4391.70	.25	.01	.03	4385.03
5000.0	.0	5000.0	.0	.0	1333.2	.0	1032.7	303.5	4385.03
1.89	.00	3.75	.00	.000	.025	.000	.000	4385.03	3061.10
.000359	20.	20.	20.	2	0	0	.00	207.04	3697.00

CCHV= .100 CEHV= .300
1490 NH CARD USED
+SECNO 197.370

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.85

3470 ENCROACHMENT STATIONS= 1100.0 2100.0 TYPE= 1 TARGET= 1000.000

197.370	6.75	4391.75	.00	.00	4391.77	.02	.05	.02	4385.00
5000.0	2170.2	2829.8	8.5	2684.0	2211.3	94.8	1046.3	308.2	4390.00
1.98	.81	1.93	.09	.053	.040	.250	.000	4385.00	1100.00
.000104	425.	250.	250.	2	0	0	.00	1000.00	2100.00

SECNO	DEPTH	CHES	CRIMS	WSELA	EG	hV	HL	OLOSS	L-BANK ELEV
Q	QLOC	Q -	QFOB	ALOB	AOH	AFOB	VOL	TW4	R-BANK ELEV
TIME	VLOC	[illegible]	VFOB	XNL	XHCH	XNR	WTH	ELMIN	SBTH
SLOPE	HLOBL	[illegible]	HLOBR	ITRIAL	IDC	ICONT	CORAR	TOP-ID	ENDST

1490 NH CARD USED
*SECNO 201.570

3470 ENCROACHMENT STATIONS= [illegible] 2000.0 TYPE= 1 TARGET= 1250.000

201.570	4.28	4391.78	.00	.00	4391.79	.02	.05	.00	4390.00
5000.0	4834.5	145.4	.0	4538.4	121.7	.0	1070.7	313.8	4392.00
2.02	1.05	1.35	.00	.044	.030	.000	.000	4387.10	750.00
.0001e2	285.	290.	280.	1	0	0	.00	1234.48	1984.48

1490 NH CARD USED
*SECNO 202.070

3470 ENCROACHMENT STATIONS= 650.0 2000.0 TYPE= 1 TARGET= 1350.000

202.070	4.69	4391.79	.00	.00	4391.80	.02	.01	.00	4390.00
5000.0	4845.5	153.5	.0	4982.5	131.5	.0	1076.3	315.3	4392.00
2.03	.97	1.26	.00	.044	.030	.000	.000	4387.10	650.00
.0001e0	50.	50.	50.	0	0	0	.00	1334.48	1984.48

1490 NH CARD USED
*SECNO 202.470

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .61

3470 ENCROACHMENT STATIONS= 450.0 2030.0 TYPE= 1 TARGET= 1580.000

202.470	3.79	4391.79	.00	.00	4391.81	.03	.01	.00	4390.00
5000.0	4634.4	365.6	.0	3657.7	214.7	.0	1080.4	316.9	4392.00
2.04	1.27	1.70	.00	.044	.030	.000	.000	4387.00	450.00
.0002E2	40.	40.	40.	0	0	0	.00	1539.93	1989.93

CCHV= .00 CEHV= .00
1490 NH CARD USED
*SECNO 205.370

3205 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.52

SECNE	DEPTH	CWSS	CRIWS	ASEL/	EG	HV	HL	OLOSS	L-BANK ELEV
Q	ELOE	ST=	CROS	ALOB	ACH	PROS	VOL	TWA	R-BANK ELEV
TIME	VLOE	/F/	VPO3	XNL	XNCH	XNR	WTD	ELMIN	SSTA
SLOPE	ALOEL	=1"H	ALOER	ITRIAL	IOC	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATION= 1050.0 3904.0 TYPE= 1 TARGET= 8914.000

205.370	5.37	4391.37	.00	.00	4391.35	.01	.07	.00	4395.00
5000.0	4793.3	93.4	.0	5288.3	38.2	.0	1104.2	337.5	4398.00
2.18	.99	.72	.00	.042	.030	.000	.000	4386.00	1432.13
.000168	2?=.	=8?.	=E?.	1	0	0	.00	1914.53	3877.55

CCHV= .100 CEHV= .300
*SECNO 217.370

3265 DIVIDED FLOW

3e35 20 TRIALS ATTEMPTED USE/CONSEL
3473 PROBABLE MINIMUM SPECIFIC ENERG;
3720 CRITICAL DEPTH ASSUMED

217.370	4.17	4393.17	4393.17	.00	4393.65	.48	.87	.14	4395.00
5000.0	4823.1	111.9	.0	663.7	16.2	.0	1197.4	371.9	4395.70
2.19	3.53	=.89	.00	.030	.025	.000	.000	4385.00	320.00
.014284	1250.	1172.	1172.	20	13	0	.00	1176.37	1853.13

*SECNO 224.980

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE. KRATIO = 3.82

224.980	4.11	4394.71	.00	.00	4396.77	.06	3.07	.04	4399.70
5000.0	4823.4	170.6	.0	2573.7	57.7	.0	1244.1	416.6	4402.10
2.35	1.87	3.?=	.00	.030	.025	.000	.000	4392.60	916.65
.001085	11=3.	?5?.	759.	11	0	0	.00	2201.09	3183.18

+SECNO 235.250

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED USE/CONSEL
3693 PROBABLE MINIMUM SPECIFIC ENERG;
3720 CRITICAL DEPTH ASSUMED

235.250	4.21	4399.21	4399.21	.00	4400.37	.46	2.44	.12	4401.80
5000.0	=755.?	24=.?	.0	?01.?	31.7	.0	1283.5	452.7	4403.30
2.49	5.37	?.?1	.00	.030	.025	.000	.000	4395.70	98.50
.011277	?=?.	1 =?.	1025.	20	?	?	.00	1068.34	1744.58

THIS RUN EXECUTED 31JAN91 14:37:03

HEC-2 WATER SURFACE PROFILES

Version 4.5.11 September 1990

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NO. OR SEP INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Steamboat Creek

SUMMARY PRINTOUT

	SECNO	Q	ZLOBOW	SSTA	ENDST	CWSEL	DIFWSP	AREA	VCH
	155.570	5000.00	9286.38	1664.25	7582.50	4391.25	.00	18594.29	.61
	169.570	5000.00	5090.71	2111.66	7198.57	4391.26	.00	17647.45	.54
	180.570	5000.00	3572.73	2621.19	6562.63	4391.26	.00	11296.36	.89
*	189.070	5000.00	1114.00	3600.00	4970.00	4391.27	.00	4339.29	2.23
*	196.170	5000.00	907.92	3061.10	3697.00	4391.22	.00	1256.60	3.89
	196.370	5000.00	408.00	3075.26	3683.26	4391.08	.00	850.56	5.88
	196.970	5000.00	608.00	3075.26	3683.26	4391.18	.00	854.18	5.85
	197.170	5000.00	907.04	3061.10	3697.00	4391.48	.00	1333.80	3.75
*	199.570	5000.00	1000.00	1100.00	2100.00	4391.75	.00	4990.08	1.28
	201.570	5000.00	1334.48	750.00	1984.48	4391.78	.00	4730.10	1.36
	202.370	5000.00	1334.48	650.00	1984.48	4391.79	.00	5104.06	1.26
*	202.470	5000.00	1458.93	450.00	1983.93	4391.79	.00	3872.46	1.70
*	205.670	5000.00	1414.58	1422.13	3577.55	4391.87	.00	5254.97	.72
*	217.370	5000.00	1174.37	320.00	1303.13	4393.17	.00	899.91	6.89
*	224.480	5000.00	1691.19	516.65	2153.18	4396.71	.00	6631.44	3.06
	235.280	5000.00	1252.94	95.50	1744.56	4399.91	.00	933.50	7.71

Strawboss Creek

SUMMARY PRINTOUT TABLE (F1

	SECNO	ELCH	ELIFD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*S	VCH	AREA	.01K
	155.570	.00	.00	.00	4381.00	5000.00	4391.25	.00	4391.25	.05	.61	18594.29	21394.30
	165.570	1350.00	.00	.00	4382.00	5000.00	4391.26	.00	4391.26	.05	.54	17347.45	21786.15
*	180.570	1060.00	.00	.00	4383.00	5000.00	4391.26	.00	4391.27	.16	.87	11296.86	12566.06
*	189.070	540.00	.00	.00	4384.00	5000.00	4391.27	.00	4391.30	1.13	2.23	4339.29	4704.07
*	196.170	450.00	.00	.00	4385.00	5000.00	4391.28	.00	4391.45	4.03	3.89	1286.60	2491.09
	196.370	20.00	4391.50	4393.00	4385.00	5000.00	4391.08	.00	4391.62	5.85	5.88	850.56	2067.05
	196.970	60.00	4391.50	4393.06	4385.00	5000.00	4391.18	.00	4391.66	5.84	5.85	854.18	2068.66
	197.170	20.00	.00	.00	4385.03	5000.00	4391.48	.00	4391.70	3.59	3.75	1333.89	2639.66
*	199.570	250.00	.00	.00	4385.00	5000.00	4391.75	.00	4391.77	1.01	1.28	4990.08	4972.93
	201.570	200.00	.00	.00	4387.10	5000.00	4391.78	.00	4391.79	1.62	1.36	4730.10	3929.08
	202.070	50.00	.00	.00	4387.10	5000.00	4391.79	.00	4391.80	1.40	1.26	5104.06	4226.63
*	202.470	40.00	.00	.00	4388.00	5000.00	4391.79	.00	4391.81	3.82	1.70	3872.42	2557.38
*	205.670	425.00	.00	.00	4386.00	5000.00	4391.87	.00	4391.88	1.65	.72	5854.77	3697.20
*	217.390	1172.00	.00	.00	4389.00	5000.00	4393.17	4393.17	4393.65	148.84	6.89	899.91	418.35
*	224.960	759.00	.00	.00	4392.60	5000.00	4396.71	.00	4396.77	10.89	3.06	2631.44	1514.87
*	235.230	1025.00	.00	.00	4395.70	5000.00	4399.91	4399.91	4400.37	112.99	7.71	933.66	470.38

clearwater Creek

SUMMARY PRINTOUT TABLE 1**

	SECNO	Q	CUBSE	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLOW
	155.570	5000.00	4391.25	.00	.00	.00	5886.38	.00
	168.570	5000.00	4391.24	.00	.01	.00	5030.71	1330.00
*	180.570	5000.00	4391.26	.00	.01	.00	3572.76	1060.00
*	189.070	5000.00	4391.27	.00	.01	.00	1110.00	640.00
*	196.170	5000.00	4391.22	.00	-.05	.00	207.06	450.00
	196.370	5000.00	4391.08	.00	-.14	.00	608.30	20.00
	196.970	5000.00	4391.12	.00	.04	.00	608.00	60.00
	197.170	5000.00	4391.48	.00	.35	.00	207.04	20.00
*	199.570	5000.00	4391.75	.00	.27	.00	1000.00	250.00
	201.570	5000.00	4391.78	.00	.03	.00	1234.48	200.00
	202.070	5000.00	4391.79	.00	.01	.00	1334.48	50.00
*	202.470	5000.00	4391.79	.00	.00	.00	1539.93	40.00
*	205.670	5000.00	4391.87	.00	.08	.00	1914.53	425.00
*	217.370	5000.00	4393.17	.00	1.30	.00	1176.37	1172.00
*	224.980	5000.00	4396.71	.00	3.54	.00	2201.09	759.00
*	235.239	5000.00	4399.91	.00	3.21	.00	1068.54	1025.00

SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 180.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 187.070 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 196.170 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 199.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 202.470 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 205.670 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 217.370 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 217.370 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 217.370 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 224.980 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 235.230 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 235.230 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 235.230 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

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*****************************************
*  HEC-2 WATER SURFACE PROFILES         *
*                                       *
   Version  4.6.1X  September 1990      *
*                                       *
*  RUN DATE    31JAN91     TIME  14:50:13 *
*****************************************
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*************************************
*  U.S. ARMY CORPS OF ENGINEERS     *
*  HYDROLOGIC ENGINEERING CENTER    *
*  609 SECOND STREET, SUITE D       *
*  DAVIS, CALIFORNIA 95616-4687     *
*        (916) 756-1104             *
*************************************
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X     X  XXXXXX   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
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END OF BANNER

THIS RUN EXECUTED 31JAN91 14:50:13

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

 Version  4.5.1  September 1990
*********************************************

T1      Mira Loma Bridge - @ Steamboat Creek,        WSPGE CO & READ, NE=400
T2      Drawn Engineers      File : MIRA8ASE.DAT   Job No. 3006    January 1991
T3       Steamboat Creek          area around Proposed Mira Loma only

   This is the "Base Model" -
   - Mira Loma Bridge not in place
   - Sections upstream of sedimentation basin are improved :
      Special Bridge removed
      Channel banks relocated to Steamboat Creek
      Hydraulic base line re-established
      NH cards implemented

   FILENAME : MIRA8ASE.DAT

J1  ICHECK    INQ      NRUN      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                3                                                          4391.85

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FW        ALLOC     IBW       CHNIN     ITRACE

      1                  -1


J3  VARIABLE CODES FOR SHWNGR PRINTOUT

     33        43         4         53        54         1         59        25        28         0
    150       200

NC                                      .1        .3
NH       7       .100      PRFS      .045      .060      .025      .060      .045      .060      .025
NH    .0980      .025      .125      .045      .060
NT       2      5000      5000
ET                          7.1                                                     .0000     .7125
X1   155.87        48      .750      .7135     .1700     .2065     .2065
GR   4391.4      .1.0      .230      .2200     .4350     .2850     .4389     .2870     .4388     .4361
GR   4357.4      .342      .389      .3880     .4388     .4010     .4589     .4200     .4327     .4320
GR    .4390      .475      .450      .5000     .4388.3   .5020     .4388.3   .5180     .4390     .5200
GR    .4391      .545      .495      .5500     .4386     .5650     .4383     .5710     .4388     .5870
      .4393      .589      .539      .6750     .4387     .6000     .4385     .6050     .4390     .6075
     .4392      .605      .495      .6150     .4386     .6230     .4386     .6250     .4385.4   .6420
GR    .4384      .665      .539      .6950     .4388     .7150     .4385     .6735     .4386     .6925
GR    .4381      .715      .438      .7150     .4386     .7135     .4387     .7435     .4385     .7535
GR    .4389      .755      .391      .7580     .4392     .7625
```

MH	8	.1[illegible]	7850	.045	4230	.025	4479	.040	4760	.035
MH	6[illegible]	.04[illegible]	6[illegible]30	.025	6590	.045	7200			
ET			9.1						5200	6530
X1	159.57	45	6[illegible]30	6570	1070	1350	1320			
GR	4391.5	2[illegible]	4391	3230	4390	2700	4389	2950	4389	3100
GR	4388	335[illegible]	4388	3750	4390	4100	4390	4250	4390	4275
GR	4390	4300	4393	4325	4383	4435	4390	4479	4390	4460
GR	4390	47[illegible]	4392	4750	4384.5	4890	4386	5180	4386	5290
GR	4384	5[illegible]0	4[illegible]3.5	5430	4384	5520	4394	5700	4392	5320
GR	4382	5[illegible]0	4383	5960	4390	6000	4388	6120	4388	6420
GR	4388	6[illegible]30	4386	6[illegible]50	4382	6[illegible]70	4382	6[illegible]70	4386	6[illegible]90
GR	4386	6[illegible]5	4385.5	6665	4386	6670	4387	6830	4388	6890
GR	4389	6990	4390	7010	4391	7030	4391	7190	4392	7200
MH	6	.100	3910	.025	4050	.040	5310	.045	6300	.025
MH	6420	.045	6[illegible]70							
ET			9.1						5200	6420
X1	180.57	48	6300	6420	1090	1060	1060			
GR	4392	2000	4397	2400	4391	2700	4392	2950	4391	3200
GR	4391	355[illegible]	4393	3340	4390	3900	4385	3935	4384	3960
GR	4384	402[illegible]	4390	4050	4390	4100	4389.7	4700	4388	4705
GR	4386	471[illegible]	4[illegible]6.8	4870	4386	4930	4385.3	5020	4386	5110
GR	4388	5115	4386	5220	4386	5230	4388	5260	4388	5310
	4386	5350	4385	5390	4386	5405	4387.6	5490	4386	5610
GR	4386	5840	4384.8	6000	4386	6160	4383	6270	4388	6300
GR	4383	6330	4383	6400	4386	6420	4386	6460	4388	6510
GR	4390	6550	4392	6570						
MH	4	.10[illegible]	3900	.040	4850	.025	4970	.050	5370	
ET			9.1						3860	4970
X1	189.07	26	4850	4970	890	840	840			
GR	4392	1700	4391	1800	4390	2000	4390	2900	4390	3380
GR	4388	3430	4387.2	3540	4388	3600	4382.5	3650	4386	3720
GR	4387.3	3900	4387.8	4000	4387.5	4400	4386	4490	4388	4530
GR	4388	4720	4388	4830	4388	4860	4384	4870	4384	4960
GR	4388	4900	4388.4	5040	4388	5080	4386	5085	4386	5100
GR	4387	5340	4394	5360	4392	5370				

Proceed into Lone Mountain Anticline -Not in place-

MH	5	.04[illegible]	95[illegible]	.100	3050	.040	3550	.025	3730	.02
MH	4070									
ET			9.2						3000	3730
X1	196.37	2[illegible]	3950	3730	810	515	520			
GR	4392	2000	4394	2020	4387	2300	4388	2720	4392	2800
GR	4392	305[illegible]	4[illegible]7	3070	4390	3110	4390	3130	4389	3150
GR	4390	3190	4[illegible]9	3220	4394	3250	4394	3350	4390	3590
[illegible]	4388	4[illegible]0	4[illegible]5	3[illegible]20	4383	3710	4388	3730	4389.6	3800
GR	4388	3[illegible]0	4[illegible]7.5	3[illegible]5	4388	3910	4383	4000	4389	4050
GR	4392	4[illegible]0								

RC	0	0	0	.1	.3					
RH	0	.045	1.0	.045	1450	.030	1510	.045	.700	.040
HH	2050	.05	2450							
ET			5..						1230	2050
XI	199.57	0	1700	2050	450	250	220			
GR	4385	0	4384	30	4390	250	4389	250	4388	610
GR	4386	1170	4388	1450	4390	1450	4386.2	1475	4387.5	1500
GR	4390	1710	4389	1550	4388	1700	4385	2000	4390	2040
GR	4390	2040	4391.2	31..	4388	2170	4390	2192	4393	2350
RC	0	.045	750	.045	1475	.030	1500	.045	1950	.03
HH	1984.5	.045	2000							
ET			5.1						1250	1985
XI	201.57	10	1750	1984.5	225	200	200			
GR	4394	0	4392	30	4390	130	4389	150	4388	570
GR	4385	650	4388	750	4388	1200	4387.2	1475	4387.5	1500
GR	4387.1	1650	4389	1950	4387.5	1970	4387.5	1984	4392	1984.5
GR	4400	2000								
RC	0	.045	750	.045	1475	.030	1500	.045	1950	.030
HH	1984.5	.045	2000							
ET			5.1						1230	1985
XI	202.07	0	0	0	50	50	50			
RC	0	.045	750	.045	1490	.030	1530	.045	1900	.030
HH	1990	.045	2030							
ET			5.1						1220	1990
XI	203.47	22	1750	1990	40	40	40			
GR	4393	0	4392	30	4391	50	4391	200	4390	250
GR	4390	450	4391	620	4388	660	4389	670	4388	800
GR	4390	850	4390	1140	4389	1160	4389	1400	4388	1490
GR	4388	1550	4389	1630	4390	1900	4389	1970	4389	1989
GR	4392	1990	4390	2030						
RC	0	0	0	.1	.3					
RH	3	.045	3.3	.03	3624	.045	3842	.03	3878	.045
HH	3964									
ET			5.1						3150	3878
XI	205.57	22	1642	3878	270	425	425			
GR	4394.3	0	4393.7	32.	4396.2	168.	4394.0	198.	4393.7	457.
GR	4396.3	525	4394.1	912.	4393.3	981.	4393.7	1050.	4394.7	1141.
GR	4395.7	1413.	4394.9	1427.	4396.7	1439.	4392.6	1612.	4394.0	1730.
GR	4390.4	2105.	4387.9	2156.	4390.2	2207.	4388.2	3442.	4386.0	3856.
GR	4386.3	3424.	4387.7	3773.	4389.7	3827.	4393.0	3842.	4390.5	3856.
GR	4390.5	3870.	4394.5	3877.	4393.0	3878.	4413.0	3964.		
RC	.030	.03	.029	.1	.3					
ET			5.1						1253.33	1841.00
XI	217.37	10	1847	1841	1250	1172	1172			
GR	4402.7	0	4403.7	101	4397.5	137	4393.0	337	4394.5	400
GR	4399.7	443.	4399.	422.	4393.5	442.	4391.5	667.	4392.9	1023.
GR	4398.0	1624	4404.	1807.	4391.2	1827.	4395.7	1841.	4405.5	1836.
GR	4435.4	1977								

ET									2298.50	32.1.00
01	884.55	55	117	3811	1150	759	759			
02	4413.7	0.	4404.4	109.	4406.4	122.	4404.4	17.	4407.2	353.
03	4408.9	437.	4398.6	339.	4401.9	901.	4392.7	930.	4398.3	945.
04	4397.6	477.	4394.3	986.	4396.3	1824.	4395.1	1816.	4395.8	2679.
05	4394.9	2594.	4395.2	3104.	4399.7	3159.	4398.6	3162.	4402.1	3211.
06	4410.2	2963.	4404.9	3315.	4450.6	3300.				
ET									782.78	1755.00
01	850.55	55	1116	1755	960	1065	1065			
02	4426.3	3.	4418.2	35.	4409.3	43.	4409.3	55.	4404.3	87.
03	4404.4	66	4401.3	98.	4395.7	104.	4398.8	124.	4398.7	501.
04	4400.1	659.	4398.7	884.	4400.3	1302.	4400.2	1574.	4401.3	1715.
05	4398.1	1787	4395.1	1739.	4403.3	1755.	4429.2	1868.		

SECND	DEPTH	CHAN	CRING	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	CLOB	WTH	VFOB	ALOB	WCH	AFCB	WOL	TWP	R-BANK ELEV
TIME	VELB	QCH	AFCB	ZAL	FRCH	LAB	WTH	ELMIN	SSTA
SLOPE	VLOB	VTH	VLOBR	ITRIAL	IBC	ICONT	CDPAR	TOPWID	ENDST

+PROF 1

OCH=F .1.0 CEN.F .3

1490 NH CARD USED
+SECND 185.570

3203 DIVIDED FLOW

185.570	10.25	4391.35	.00	4391.25	4391.25	.00	.00	.00	4386.00
5000.0	3714.7	875.3	405.7	15241.8	1436.8	1913.7	.0	.0	4386.00
.09	.24	.21	.21	.037	.023	.045	.000	4381.00	1664.25
.000005	170.	2069.	2065.	0	0	0	.00	5386.39	7582.50

1490 NH CARD USED
+SECND 169.570

169.570	9.25	4391.75	.00	.00	4391.25	.00	.01	.00	4386.00
5000.0	3761.2	838.8	349.9	14799.4	1871.1	1776.9	470.8	139.7	4386.00
1.06	.27	.24	.20	.036	.025	.045	.000	4382.00	2111.36
.000005	107.	1390.	1390.	0	0	0	.00	5080.71	7192.57

1490 NH CARD USED
+SECND 160.570

3203 DIVIDED FLOW

3802 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .56

160.570	8.25	4391.75	.00	.00	4391.27	.00	.01	.00	4386.00
5000.0	4035.2	789.4	173.5	9886.2	936.5	522.1	803.9	247.6	4386.00
1.58	.41	.35	.34	.040	.025	.045	.000	4336.00	3621.14
.000016	1093.	2044.	2038.	0	0	0	.00	3572.76	5612.63

1490 NH CARD USED
+SECND 169.570

3802 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .56

169.570	9.25	4391.25	.00	.00	4391.27	.71	.02	.00	4386.00
5000.0	3754.5	844.7	435.9	7038.5	759.1	1045.1	1034.8	318.6	4386.00
2.05	.44	1.5	.5	.043	.025	.050	.003	4384.00	1772.59
.000041	547.	2441.	2435.	0	0	1	.00	3553.35	5326.35

SECND	DEPTH	CHSQ	CRIMS	VELK	ZO	KP	AL	BLOSS	L-B-WK ELE.
0	BLCK	TOT	BKDS	ALOS	ACH	ARSS	VOL	TWA	R-BANK ELEV
TIME	FOO	TOT	.506	VNL	XMOM	CUR	ATH	ELAIR	BSTA
BLOPE	ELEV	VEL	ELOSS	ITRIAL	IDC	IBOUT	CORAR	TOPWID	ENDST

1490 NH CARD USED
*SECND 199.370

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .51

196.370	6.31	4391.31	.00	.00	4391.35	.04	.05	.01	4390.00
5000.0	2837.9	1736.5	425.6	2791.2	757.5	916.4	1150.4	361.7	4388.00
2.17	1.02	2.29	.46	.040	.025	.080	.000	4385.00	2006.96
.000158	810.	520.	515.	1	0	0	.00	1420.80	4065.36

CONV= .100 DEPV= .30
1490 NH CARD USED
*SECND 199.570

302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.00

199.370	6.58	4391.38	.00	.00	4391.39	.01	.04	.00	4385.00
5000.0	3049.7	1994.5	65.8	5134.4	2082.3	376.8	1597.4	378.8	4390.00
2.32	.59	.95	.07	.046	.040	.250	.000	4385.00	191.44
.000052	960.	780.	270.	2	0	0	.00	2108.80	2300.23

1490 NH CARD USED
*SECND 201.570

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .71

201.570	4.29	4391.39	.00	.00	4391.40	.01	.02	.00	4390.00
5000.0	4883.0	137.4	.0	6883.9	108.2	.0	1242.3	335.0	4892.00
2.40	.81	1.59	.00	.045	.053	.000	.000	4387.13	59.98
.000117	325.	240.	200.	0	0	0	.00	1434.48	1984.43

1490 NH CARD USED
*SECND 202.370

202.070	4.34	4391.40	.00	.00	4391.41	.01	.01	.00	4390.00
5000.0	4893.0	107.4	.0	5060.2	108.4	.0	1249.4	391.3	4893.00
2.41	.81	1.59	.00	.045	.030	.000	.000	4387.10	60.06
.000119	50.	50.	50.	0	0	0	.00	1984.35	1984.46

SECNO	DEPTH	VMAG	CHNS	WSELS	EG	HV	HL	BLOSS	L-BANK ELEV
Q	ZERO	VCH	ORDE	VLOC	ACH	ASSO	WOL	TAR	R-BANK ELEV
TIME	LOCS	VCH	CHIS	VHL	NCH	VHF	WTH	ELMIN	BETA
SLOPE	FLOBL	VFR	VICAR	CRITHL	ICC	ICONT	CORAR	TOPWID	EMBET

1490 NM CARD USED
*SECNO 8.470

3102 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, XRATIO = .40

8.470	3.40	4.14	.00	.00	4391.45	.03	.01	.01	4395.00
5000.0	4667.7	937.3	.0	4486.3	180.0	.0	1253.9	393.0	4395.00
2.45	1.34	1.85	.00	.044	.030	.000	.000	4388.00	37.86
.000304	44.	44.	44.	0	0	0	.00	1981.95	1989.80

CCHV= .100 CEHV= .30
1490 NM CARD USED
*SECNO 205.670

3205 DIVIDED FLOW

'02 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, XRATIO = 1.50

205.670	5.51	4541.51	.00	.00	4391.55	.02	.10	.00	4395.00
5000.0	4928.0	17.0	.0	4549.6	83.1	.0	1279.8	408.1	4393.00
2.49	1.10	.73	.00	.041	.030	.000	.000	4386.00	1423.93
.000250	270.	425.	425.	1	0	0	.00	1872.16	3877.41

CCHV= .100 CEHV= .30
*SECNO 217.390

3205 DIVIDED FLOW

3085 20 TRIALS ATTEMPTED WSEL/CWSEL
3093 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

217.390	4.25	4394.73	4398.23	.00	4392.04	.46	.95	.12	4395.00
5000.0	4854.4	1 7.4	.0	944.5	17.2	.0	1359.3	449.2	4395.70
2.54	5.15	4.38	.00	.030	.025	.000	.000	4389.00	317.66
.011785	1650.	1179.	1175.	20	17	0	.00	1208.27	1833.30

*SECNO 224.980

SECNO	DEPTH	CO=N	CRWS	WSELK	EG	HV	HL	SLOPE	L-BANK ELEV
Q	Q CH	VCH	VPRS	ALOB	ACH	AROB	VOL	TAW	R-BANK ELEV
TIME	.YY	.Y	.RCP	XNL	LNCH	XNR	WTH	ELMIN	BSTA
SLOPE	.05Y	dl Y	.LOSS	ITRIAL	ICC	ICONT	CORAR	TOPWID	ENDST

3&&3 DIVIDED FLOW

3&1& WARNING: CONVEYANCE RATIO OUTSIDE OF ACCEPTABLE RANGE, <RATIO = 3.2>

234.980	4.02	4394.99	.00	.00	4396.74	.06	3.07	.04	4399.70
5000.0	4821.9	179.9	.0	2530.2	57.1	.0	1406.2	494.3	4403.10
2.72	1.91	3.19	.00	.039	.025	.000	.000	4392.50	91&.72
.001136	11&0.	79&.	79&.	9	0	0	.00	2200.57	3183.07

*SECND 235.25>

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED USE>CWEEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
`720 CRITICAL DEPTH ASSUMED

235.230	4.22	4399.92	4399.92	.00	4400.37	.45	2.54	.12	4401.30
5000.0	4755.8	244.4	.0	902.9	31.8	.0	1445.1	530.4	4403.30
2.77	5.27	1.77	.00	.039	.025	.000	.000	4395.70	98.50
.011225	9&0.	1&95.	1025.	20	9	0	.00	1069.07	1744.59

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11      PROPOSED PLOADWAY 66 (SIGN (Sections 165.00 thru 201.57)
12      Metric 1 and Method 1
13
14  ICHECK    INO       NIN       IDIF      STRT      METRIC    MXTNS     O         WSEL      FO

                3                                                          4391.87

15  NPROF     IPLOT     PFP F     ABSCI     ORDCH     PN        ALLOC     IBW       CHNIM     ITRACE

     15                  1
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SECNO	DEPTH	UNIT	CRIMP	WSEL	EG	KT	WL	CLOSS	L-BANK ELEV
Q	VEL	AREA	AREA	HLOS	ACH	AREA	VOL	TAP	R-BANK ELEV
TIME	WIDTH	FR	.REA	ENL	ENCH	ONE	WTN	ELMIN	SSTA
SLOPE	WIDTH	FROUD	WTBR	ITRIAL	IBC	ICONT	ESRAR	TOPWID	ENDST

*PAGE 9

CCHG= .170 CE= .300
1490 NH CARD USED
*SECNO 155.570

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 5000.0 7135.0 TYPE= 1 TARGET= 1135.000
155.570 10.67 4391.67 .00 4391.25 4391.68 .01 .00 .00 4386.00
5000.0 3307.2 1692.8 .0 5403.9 1503.8 .0 .0 .0 100000.00
.00 .01 1.13 .00 .035 .025 .000 .000 4381.00 6000.00
.000016 1760. 4465. 2065. 0 0 0 .00 1120.97 7135.00

1490 NH CARD USED
*SECNO 169.570

3470 ENCROACHMENT STATIONS= 5000.0 6590.0 TYPE= 1 TARGET= 1390.000
169.570 9.69 4391.69 .00 4391.26 4391.70 .01 .02 .00 4388.00
5000.0 3748.2 1241.8 .0 6877.8 1340.9 .0 195.9 32.0 100000.00
.50 .54 .34 .00 .036 .025 .000 .000 4382.00 5200.00
.000015 1070. 1380. 1390. 0 0 0 .00 1390.00 6590.00

1490 NH CARD USED
*SECNO 180.570

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

3470 ENCROACHMENT STATIONS= 5200.0 6420.0 TYPE= 1 TARGET= 1220.000
180.570 8.71 4391.71 .00 4391.26 4391.73 .01 .02 .00 4388.00
5000.0 3716.5 1283.5 .0 5946.6 940.4 .0 384.1 89.5 100000.00
.37 .52 1.36 .00 .045 .025 .000 .000 4383.00 5200.00
.000036 1040. 1540. 1060. 0 0 0 .00 1220.00 6420.00

1490 NH CARD USED
*SECNO 184.570

SECNO	XSECTN	CHORD	CRIMP	WSELS	EG	AV	HL	CLOSS	L-BANK ELEV
0	0.00	0000	0000	4000	0000	0000	000	TAN	R-BANK ELEV
TIME	.100	0	0	0000	ANL	ANCH	ANR	WTN	ELMIN	SSTA
ELOPE	0.000	0.00	4000	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3502 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .07

3470 ENCROACHMENT STATIONS= 3000.0 3780.0 TYPE= . TARGET= .10.00

186.370	3.75	4391.75	.00	4391.28	4391.77	.03	.04	.00	4385.00
5000.0	3414.2	1758.2	.0	4047.6	811.4	.0	499.1	87.7	100000.00
1.00	.24	.39	.00	.040	.025	.030	.000	4384.00	3660.00
.000080	870.	444.	840.	1	0	0	.00	1110.00	4970.00

1490 NH CARD USED
*SECND 196.370

3265 DIVIDED FLOW

3502 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .31

3470 ENCROACHMENT STATIONS= 3000.0 3780.0 TYPE= 1 TARGET= 780.000

196.370	2.60	4391.60	.00	4391.31	4392.01	.41	.12	.11	4350.00
5000.0	648.2	4856.8	.0	341.5	798.8	.0	549.5	100.1	100000.00
1.10	1.88	5.49	.00	.040	.025	.000	.000	4383.00	3651.61
.000880	810.	520.	515.	2	0	0	.00	316.35	3730.00

CONV= .190 CONV= .300
1490 NH CARD USED
*SECND 199.570
3230 CROSS SECTION 197.57 EXTENDED .10 FEET

3502 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.65

3470 ENCROACHMENT STATIONS= 1270.0 2050.0 TYPE= 1 TARGET= 780.000

199.570	7.11	4392.11	.00	4391.38	4392.12	.02	.08	.04	4385.00
5000.0	1345.7	3654.3	.0	2199.5	2535.4	.0	575.0	105.0	100000.00
1.15	.64	1.55	.00	.038	.040	.000	.000	4385.00	1270.00
.000170	440.	384.	370.	2	0	0	.00	780.00	2050.00

SECNO	FLOW	TYPE	CHNS	WSELS	EG	HV	HL	CLOSS	L-BANK ELEV
Q	CLOB	SO1	CROS	ALOS	ROH	AREA	VOL	TWA	R-BANK ELEV
TIME	VLOB	FR	CRCS	COL	FINCH	HAS	WTN	ELMIN	BETA
SLOPE	.0050	010	CLOSR	ITRIAL	ISO	ICONT	CORAR	TOPWID	ENDST

1490 NM CARD USED
*SECNO 202.070

3302 WARNING: CONVEYANCE CHANNEL OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .57

3470 ENCROACHMENT STATIONS= 1250.0 1965.0 TYPE= 1 TARGET= 735.000

201.570	5.03	4395.13	.00	4391.39	4398.17	.04	.04	.01	4390.00
5000.0	4725.8	273.2	.0	2950.1	133.4	.0	598.5	106.8	4392.00
1.21	1.60	2.05	.01	.044	.030	.000	.000	4387.10	1230.00
.000328	225.	200.	200.	8	0	0	.00	734.74	1984.74

1490 NM CARD USED
*SECNO 202.070

3470 ENCROACHMENT STATIONS= 1230.0 1985.0 TYPE= 1 TARGET= 755.000

202.070	5.04	4395.14	.00	4391.40	4398.18	.04	.02	.00	4390.00
5000.0	4733.8	266.2	.0	3043.0	133.8	.0	598.2	109.7	4392.00
1.22	1.58	1.99	.01	.044	.030	.045	.000	4387.10	1230.00
.000308	50.	50.	50.	0	0	0	.00	734.76	1984.76

1490 NM CARD USED
*SECNO 202.070

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

3470 ENCROACHMENT STATIONS= 1220.0 1990.0 TYPE= 1 TARGET= 770.000

202.070	4.14	4392.14	.00	4391.40	4398.21	.07	.02	.01	4390.00
5000.0	4359.8	640.2	.0	2140.9	246.9	.0	598.7	110.4	100000.00
1.23	2.04	2.59	.00	.043	.030	.000	.000	4388.00	1220.00
.000737	40.	40.	40.	1	0	0	.00	770.00	1990.00

CCHV= .100 CEHV= .300
1490 NM CARD USED
*SECNO 205.670

3265 DIVIDED FLOW

SECNO	DEPTH	CWSEL	CRITW	AREA	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VCL	TRA	R-BANK ELEV
TIME	VLOB	VCH	VROB	WNL	WCH	WNR	WTN	ELMIN	SSTA
SLOPE	KLOB	KCH	KROB	ITRIAL	IDC	ICONT	CCHAN	TOPWID	ENDST

3302 WARNING: CONVEYANCE RATIO OUTSIDE OF ACCEPTABLE RANGE. KRATIO = 1.53

3470 ENCROACHMENT STATIONS= 5151.3 3378.0 TYPE= 1 TARGET= 783.000

2e5.e79	6.29	4392.90	.00	4391.81	4393.34	.05	.13	.00	4395.00
5000.0	4943.7	50.3	.0	2939.5	43.4	.0	613.6	115.2	100000.00
1.87	1.74	1.15	.00	.040	.030	.000	.000	4386.00	3150.00
.000317	270.	425.	425.	2	0	0	.00	711.65	3877.72

ECHV= .100 DEHV= .300
*SECND 217.370

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HTOL

3685 20 TRIALS ATTEMPTED HERE,ENGEL
3673 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1253.3 1841.0 TYPE= 1 TARGET= 587.670

217.370	5.19	4394.19	4394.10	4393.23	4394.82	.72	1.14	.20	4395.00
5000.0	4735.4	264.6	.0	698.5	33.2	.0	667.4	132.4	100000.00
1.32	6.78	7.51	.00	.030	.025	.000	.000	4389.00	1253.33
.010127	1250.	1172.	1172.	20	14	0	.00	489.46	1836.02

*SECND 224.980

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HTOL

3302 WARNING: CONVEYANCE RATIO OUTSIDE OF ACCEPTABLE RANGE. KRATIO = 3.07

3470 ENCROACHMENT STATIONS= 4275.5 3511.0 TYPE= 1 TARGET= 912.440

224.980	4.74	4397.54	.00	4395.86	4397.66	.12	8.73	.06	4399.70
5000.3	4716.8	283.7	.0	1752.4	83.5	.0	701.1	150.1	100000.00
1.44	6.69	5.86	.00	.030	.025	.000	.000	4392.60	2293.56
.001671	1.e+4	177	159.	5	0	0	.00	863.13	3187.47

SECNO	DEPTH	COEF	CRITS	WSELP	EG	HV	HL	CLOSS	L-BANK ELEV
Q	QLOB	ATW	AREA	WLOB	ACH	ARES	VOL	TWA	R-BANK ELEV
TIME	WLCH	XTW	XPOS	XHL	XNCH	XWR	WTW	ELMIN	SSTA
SLOPE	WLOB	XTCH	WLOB	ITRIAL	IOC	ICONT	CORAP	TOPWID	ENDST

*SECNO 235.230

3e3 DIVIDED FLOW

3e5 20 TRIALS ATTEMPTED WSEL CONVER
3e73 PROBABLE MINIMUM SPECIFIC ENERGY
3730 CRITICAL DEPTH ASSUMED

3470 ENCRO=CHANNEL STATIONS= 788.3 1755.0 TYPE= 1 TARGET= 972.250

235.230	5.07	4406.77	4400.77	4399.92	4401.28	.51	2.32	.12	4401.60
5000.0	4530.2	469.8	.0	852.0	53.7	.0	731.4	169.4	100000.00
1.49	5.32	8.75	.00	.030	.025	.000	.000	4395.70	782.75
.009548	960.	1495.	1025.	20	9	0	.00	883.10	1747.22

THIS RUN EXECUTED 8:OMAP1 14:50:54

****
HEC-2 WATER SURFACE PROFILES

Version 4.5.11 September 1990
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERROR LIST

Steamboat Creek

SUMMARY PRINTOUT

	SECNO	Q	CRWSEL	SSTA	ENDST	CWSEL	DIFWSP	AREA	VCH
	185.570	5000.00	7894.35	1664.28	7582.50	4391.25	.00	18594.29	.61
	185.570	5460.00	11844.37	6000.00	7185.00	4391.67	.42	6937.69	1.18
	183.570	5000.00	5069.71	2111.66	7192.57	4391.66	.00	17647.45	.54
	183.570	5460.00	1394.69	5200.00	6590.00	4391.69	.44	8218.76	.94
*	180.570	5000.00	3572.73	2421.19	6362.63	4391.36	.00	11296.86	.89
*	180.570	5460.00	1494.00	5200.00	6420.00	4391.71	.45	6869.05	1.36
*	189.070	5000.00	3593.56	1772.80	5366.36	4391.28	.00	9441.51	1.37
*	189.070	5460.00	1110.00	3860.00	4970.00	4391.75	.47	4654.00	1.95
*	196.370	5460.00	1490.89	2606.96	4063.36	4391.31	.00	4465.02	2.29
*	196.370	5460.00	814.35	3051.61	3730.00	4391.80	.29	1140.28	5.45
*	199.570	5000.00	2193.60	191.44	2300.23	4391.38	.00	7638.45	.93
*	199.570	5000.00	780.00	1270.00	2650.00	4392.10	.72	4534.64	1.85
*	201.570	5000.00	1994.45	59.98	1934.43	4391.39	.00	6178.44	1.08
*	201.570	5000.00	794.74	1250.00	1934.74	4392.13	.73	3088.82	3.35
	202.070	5000.00	1994.19	60.08	1984.43	4391.46	.00	6168.64	1.08
	202.070	5460.00	794.74	1230.00	1964.76	4392.14	.74	3174.64	1.99
*	202.470	5000.00	1995.45	37.86	1989.80	4391.40	.00	3666.39	1.85
*	202.470	5460.00	773.00	1220.00	1990.00	4392.14	.75	2387.85	2.59
*	205.670	5000.00	1972.16	1423.93	3677.41	4391.21	.00	4572.76	.73
*	205.670	5460.00	711.45	1150.00	3677.72	4392.30	.79	2382.65	1.16
*	217.370	5000.00	2473.57	217.62	1833.30	4393.23	.00	966.72	5.88
*	217.370	5460.00	1491.64	1251.28	1833.03	4394.13	.87	723.72	7.51

*	224.56	5[illegible]	[illegible]	1.6.72	3183.17	4396.66	.00	2587.33	3.13
*	224.780	5000.00	6[illegible]	2643.56	3167.47	4397.84	.86	1635.68	3.46
*	225.210	5000.00	[illegible]	46.50	1744.89	4399.92	.00	934.04	7.70
*	225.230	5000.00	963.[illegible]	782.75	1747.22	4400.37	.86	935.68	6.75

Steamboat Creek

SUMMARY PRINTOUT TABLE 1**

	FEDNO	XLOC	ELFEA	ELLC	ELMIN	Q	CWSEL	CRITS	EG	IOPRS	VCH	AREA	.01*
	188.570	.00	.00	.00	4381.00	5000.00	4391.23	.00	4391.23	.05	.81	18394.29	21394.29
	188.570	.00	.00	.00	4381.00	5000.00	4391.27	.00	4391.31	.15	1.13	4907.39	11535.29
	189.570	1360.00	.00	.00	4383.00	5000.00	4391.25	.00	4391.29	.05	.84	17847.45	21784.89
	189.570	1360.00	.00	.00	4383.00	5000.00	4391.29	.00	4391.70	.15	.94	9818.75	16709.35
*	180.570	1060.00	.00	.00	4383.00	5000.00	4391.26	.00	4391.27	.16	.89	11296.36	18586.06
*	190.570	1060.00	.00	.00	4383.00	5000.00	4391.71	.00	4391.73	.36	1.36	6389.05	9591.67
*	189.070	640.00	.00	.00	4384.00	5000.00	4391.29	.00	4391.29	.41	1.37	9441.51	7787.69
*	189.070	640.00	.00	.00	4384.00	5000.00	4391.73	.00	4391.77	.80	1.93	4859.06	8587.58
*	196.370	520.00	.00	.00	4385.00	5000.00	4391.31	.00	4391.35	1.58	2.29	4465.08	3491.74
*	196.370	520.00	.00	.00	4385.00	5000.00	4391.80	.00	4392.01	8.60	5.45	1140.28	1704.80
*	199.570	250.00	.00	.00	4385.00	5000.00	4391.38	.00	4391.39	.57	.92	7638.48	6595.37
*	199.570	250.00	.00	.00	4385.00	5000.00	4392.10	.00	4392.12	1.06	1.35	4534.84	4856.37
*	201.570	200.00	.00	.00	4387.10	5000.00	4391.39	.00	4391.40	1.17	1.08	6172.40	4613.73
*	201.570	200.00	.00	.00	4387.10	5000.00	4392.13	.00	4392.17	3.28	2.05	3038.53	2761.87
	202.070	50.00	.00	.00	4387.10	5000.00	4391.40	.00	4391.41	1.18	1.08	6168.64	4609.21
	202.070	50.00	.00	.00	4387.10	5000.00	4392.14	.00	4392.18	3.08	1.99	3176.84	2847.76
*	202.470	40.00	.00	.00	4388.00	5000.00	4391.40	.00	4391.42	5.64	1.85	3866.30	2105.27
*	202.470	40.00	.00	.00	4388.00	5000.00	4392.14	.00	4392.21	7.39	2.59	2387.80	1339.74
*	205.670	425.00	.00	.00	4386.00	5000.00	4391.51	.00	4391.52	2.50	.73	4572.70	3164.48
*	205.670	425.00	.00	.00	4386.00	5000.00	4392.30	.00	4392.34	3.17	1.16	2682.85	2807.49
*	217.390	1172.00	.00	.00	4389.00	5000.00	4393.23	4393.23	4395.64	117.85	6.38	986.72	4606.38
*	217.390	1172.00	.00	.00	4389.00	5000.00	4394.10	4394.10	4394.22	101.27	7.51	783.78	4486.85
*	224.980	759.00	.00	.00	4392.00	5000.00	4395.28	.00	4396.74	11.56	3.13	2587.38	1474.28
*	224.980	759.00	.00	.00	4392.00	5000.00	4397.54	.00	4397.66	10.71	3.48	1835.28	1527.83
*	235.250	1085.00	.00	.00	4395.70	5000.00	4399.92	4399.92	4400.37	112.65	7.70	934.64	471.68
*	235.250	1085.00	.00	.00	4395.70	5000.00	4400.77	4400.77	4401.28	95.48	8.75	905.35	511.71

Steamboat Creek

SUMMARY PRINTOUT TABLE [illegible]

	SECMD	Q	CHSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLOW
	183.570	5000.00	4391.25	.00	.00	.00	5586.38	.00
	183.570	5000.00	4391.67	.42	.00	.42	1180.47	.00
	183.570	5000.00	4391.26	.00	.01	.00	5060.71	1360.00
	183.570	5000.00	4391.69	.44	.02	.44	1390.00	1380.00
*	180.570	5000.00	4391.26	.00	.01	.00	3572.78	1060.00
*	180.570	5000.00	4391.71	.45	.02	.45	1220.00	1060.00
*	189.070	5000.00	4391.28	.00	.02	.00	3593.56	640.00
*	189.070	5000.00	4391.75	.47	.03	.47	1110.00	640.00
*	196.370	5000.00	4391.31	.00	.03	.00	1420.80	520.00
*	196.370	5000.00	4391.60	.29	-.15	.29	316.35	520.00
*	199.570	5000.00	4391.38	.00	.07	.00	2108.80	280.00
*	199.570	5000.00	4392.10	.72	.50	.72	780.00	280.00
*	201.570	5000.00	4391.39	.00	.02	.00	1924.45	200.00
*	201.570	5000.00	4392.13	.73	.02	.73	734.74	200.00
	202.070	5000.00	4391.40	.00	.01	.00	1924.35	50.00
	202.070	5000.00	4392.14	.74	.02	.74	754.76	50.00
*	202.470	5000.00	4391.40	.00	.00	.00	1931.95	40.00
*	202.470	5000.00	4392.14	.75	.00	.75	770.00	40.00
*	205.670	5000.00	4391.51	.00	.11	.00	1872.16	425.00
*	205.670	5000.00	4392.30	.79	.15	.79	711.65	425.00
*	217.390	5000.00	4393.23	.00	1.72	.00	1203.27	1172.00
*	217.390	5000.00	4393.10	.87	1.80	.87	489.46	1172.00
*	224.980	5000.00	4395.05	.00	3.46	.00	2200.37	759.00
*	224.980	5000.00	4397.54	.85	3.44	.85	865.13	759.00
*	235.280	5000.00	4393.49	.00	3.33	.00	1067.07	1025.00
*	235.280	5000.00	4396.77	.86	3.23	.86	883.10	1025.00

SUMMARY OF ERRORS AND SPECIAL CONDITIONS

WARNING SECNO= 164.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 164.570 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 169.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 169.570 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 174.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 174.570 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 179.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 179.570 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 184.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 184.570 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 189.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 189.570 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 194.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 194.570 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 217.390 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 217.390 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 217.390 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 217.390 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 217.390 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 217.390 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 224.780 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 224.780 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 235.230 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 235.230 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 235.230 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 235.230 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 235.230 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 235.230 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

FLOODWAY DATA Stagecoach Creek
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
155.570	1135.	6398.	.7	4391.7	4391.3	.4
169.570	1390.	8819.	.6	4391.7	4391.3	.4
180.570	1220.	6889.	.7	4391.8	4391.3	.5
189.070	1110.	4854.	1.0	4391.8	4391.3	.5
196.370	678.	1140.	4.4	4391.6	4391.3	.3
199.570	780.	4835.	1.1	4392.1	4391.4	.7
201.570	735.	3484.	1.6	4392.1	4391.4	.7
202.070	755.	3177.	1.6	4392.1	4391.4	.7
202.470	770.	2383.	2.1	4392.1	4391.4	.7
205.670	729.	2693.	1.7	4392.3	4391.5	.8
217.390	583.	734.	6.3	4394.1	4393.2	.9
224.980	889.	1936.	2.9	4397.6	4396.7	.9
235.230	964.	906.	5.5	4400.8	4399.9	.9

Effective Area Model

```
*****************************************
*  HEC-1 WATER SURFACE PROFILES         *
*                                       *
   Version  4.1  September 1990         *
                                        *
*  RUN DATE    31JAN91    TIME   15:27:16 *
*****************************************
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*************************************
*  U.S. ARMY CORPS OF ENGINEERS     *
*  HYDROLOGIC ENGINEERING CENTER    *
*  609 SECOND STREET, SUITE D       *
*  DAVIS, CALIFORNIA 95616-4687     *
*        (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
```

END OF BANNER

THIS RUN EXECUTED 3/3/91 15:27:16

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

 Version  4.6.1(  September 1990
**************************************


T1      Mira Loma Bridge -- at Sweetbriar Creek,        WASHOE CO & RENO, NEVADA
T2      Nimbus Engineers     File : MIRAEFF.DAT   Job No. 9906    January 1991
T3       Steamboat Creek          area around Proposed Mira Loma only

   This is the "Effects.o Flow Model" which illustrates effects of the
   Bridge encroachments in the FLOODWAY FRINGE ONLY, no encroachment into the
   floodway.

   Profile 1 is existing (unencroached) conditions
   Profile 2 is encroached conditions

   Modified from file : mir-trea.dat

   FILENAME : MIRAEFFA.DAT


J1  ICHECK    INQ       NINP      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                                                          4391.25

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1                 -1


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        43         4         53        54         1         50        25        26         0
    150


NC                                          .1        .3
NH        7       .100      7520      .045      5000      .025      5200      .045      6090      .035
NH     6980       .025      7135      .045      7635
NT        2      5000      5000
X1   155.57        43      6650      7138      1700      2065      2065
GR   4391.4      1610      4390      2500      4390      2820      4389      2870      4388      3260
GR   4387.4      3420      4388      3800      4388      4010      4386      4200      4389      4320
GR     4390      4950      4390      5000      4382.5    5020      4382.5    5180      4390      5200
GR     4390      5450      4388      5600      4386      5650      4388      5710      4385      5870
GR     4390      5850      4385      5950      4387      6000      4388      6050      4390      6075
GR     4392      6094      4390      6160      4388      6230      4386      6250      4385.4    6420
GR     4394      6675      4392      6800      4382      6720      4386      6735      4386      6980
GR     4381      7005      4391      7100      4386      7135      4387      7485      4388      7535
GR     4385      7570      4391      7585      4392      7635
```

NM	8	.10	3[illegible]	.045	4850	.035	4479	.040	4760	.035
MM	0920	.04[illegible]	[illegible]	.035	0890	.045	7800			
X1	169.57	45	[illegible]	6590	1070	1390	1380			
GR	4391.5	8000	4391	2230	4390	2700	4389	2950	4389	3100
GR	4388	3350	[illegible]	3950	4390	4100	4390	4250	4390	4275
GR	4390	4300	[illegible]	4325	4388	4435	4390	4479	4390	4460
GR	4390	[illegible]	[illegible]	4790	4384.8	4850	4386	5180	4386	5290
GR	4384	5[illegible]	4383.5	5430	4384	5520	4384	5760	4382	5620
GR	4386	[illegible]	4389	5960	4390	6000	4382	6020	4382	6420
GR	4388	0430	4391	0460	4382	0470	4388	0570	4385	0590
GR	4386	0000	4387.5	6625	4386	6670	4387	6830	4385	6870
GR	4387	6990	4390	7010	4391	7030	4391	7190	4392	7200
NM	6	.100	3900	.025	4050	.040	5310	.045	6300	.025
MM	0420	.045	0570							
X1	130.57	42	6300	6420	1090	1060	1060			
GR	4392	2000	4392	2400	4391	2700	4392	2950	4391	3200
GR	4391	3570	4391	3840	4390	3900	4385	3935	4384	3980
GR	4384	4025	4390	4050	4390	4100	4389.7	4700	4388	4705
GR	4386	4710	4386.8	4870	4386	4930	4385.3	5020	4386	5110
GR	4388	5115	4388	5220	4386	5230	4388	5260	4388	5310
GR	4386	5350	4385	5390	4386	5405	4387.6	5490	4386	5610
GR	4386	5840	4384.8	6000	4386	6160	4388	6270	4388	6300
R	4383	6330	4383	6400	4386	6460	4386	6460	4388	6510
GR	4390	6550	4392	6570						
NM	4	.100	2900	.040	4860	.025	4970	.050	5370	
ET			9.1						3860	4970
X1	189.07	28	4864	4970	890	640	640			
GR	4392	1700	4391	1800	4390	2000	4390	2900	4390	3380
GR	4388	3434	4387.8	3540	4389	3600	4388.5	3650	4388	3720
GR	4387.3	3900	4387.5	4000	4387.5	4400	4388	4490	4388	4530
GR	4388	4720	4386	4830	4388	4860	4384	4870	4384	4960
GR	4388	4970	4388.4	5040	4388	5060	4386	5085	4386	5100
GR	4387	5340	4390	5360	4392	5370				

Proposed Nora Lone Road Extension (Not in place)
Coefficients of expansion and contraction increased to reflect shock losses

NC	.4	0	0	.2	.4					
NM	5	.040	6800	.100	3050	.040	3550	.025	3750	.08
MM	4070									
ET			9.1						3000	3750
X1	169.37	25	3590	3730	870	515	520			
GR	4392	2000	4390	2020	4387	2300	4388	2720	4392	2800
GR	4392	3050	4387	3070	4390	3110	4390	3130	4389	3150
GR	4390	3180	4393	3220	4394	3850	4394	3550	4390	3590
GR	4388	3610	4387	3620	4385	3710	4388	3730	4389.6	3800
GR	4388	3900	4387.5	3905	4388	3910	4388	4000	4389	4050
GR	4392	4070								

NC	0	0	0	.1	.3					
NH	0	.045	1100	.045	1450	.030	1510	.060	1700	.040
NH	2050	.25	2050							
ET			9.1						1100	2100
X1	199.57	24	1700	2050	400	277	280			
GR	4375	0	4378	80	4390	250	4389	270	4386	610
GR	4388	1100	4388	1400	4390	1450	4386.2	1478	4386.3	1500
GR	4390	1510	4389	1550	4385	1700	4385	2000	4390	2040
GR	4390	2050	4385.7	2100	4388	2170	4390	2190	4392	2350
NC	0	0	0	.1	.3					
NH	0	.045	750	.045	1475	.030	1500	.045	1950	.03
NH	1984.5	.045	2000							
ET			9.1						750	2000
X1	201.57	16	1950	1984.5	225	200	200			
GR	4394	0	4392	30	4390	130	4389	150	4388	570
GR	4388	650	4388	750	4388	1200	4387.2	1475	4387.5	1500
GR	4387.1	1650	4390	1950	4387.5	1970	4387.5	1984	4392	1984.5
GR	4400	2000								
NH	0	.045	650	.045	1475	.030	1500	.045	1950	.030
NH	1984.5	.045	2000							
ET			9.1						650	2000
X1	202.07	0	0	0	50	50	50			
NH	0	.045	450	.045	1490	.030	1530	.045	1900	.030
NH	1990	.045	2030							
ET			9.1						450	2030
X1	202.47	22	1500	1990	40	40	40			
GR	4393	0	4392	20	4391	50	4391	200	4390	250
GR	4390	450	4390	620	4388	660	4389	670	4388	800
GR	4390	860	4389	1140	4389	1160	4389	1400	4385	1490
GR	4388	1530	4389	1630	4390	1900	4389	1970	4389	1989
GR	4392	1990	4400	2030						
NC	0	0	0	.1	.3					
NH	5	.045	3492	.03	3624	.045	3842	.03	3878	.045
NH	3964									
ET			9.1						1050	3964
X1	205.67	27	3842	3878	270	425	425			
GR	4394.5	0.	4393.7	32.	4396.2	163.	4394.0	193.	4393.7	457.
GR	4396.9	585.	4394.1	913.	4393.0	981.	4393.7	1050.	4394.7	1141.
GR	4393.7	1413.	4390.9	1427.	4396.7	1439.	4392.8	1612.	4394.0	1730.
GR	4390.4	2105.	4387.5	2156.	4390.2	2607.	4388.2	3492.	4386.0	3536.
GR	4388.3	3624.	4397.7	3778.	4389.7	3827.	4395.0	3842.	4390.5	3864.
GR	4390.5	3870.	4394.5	3877.	4393.0	3878.	4413.0	3964.		
NC	.030	.030	.035	.1	.3					
X1	217.37	16	1807	1841	1250	1172	1172			
.	4402.7	0	4400.7	101	4397.2	137	4393.0	327	4394.0	400
GR	4389.0	418.	4386.0	422.	4393.5	442.	4391.8	869.	4392.9	1023.
GR	4396.0	1518.	4395.1	1547.	4391.3	1557.	4395.7	1841.	4402.5	1855.
GR	4403.4	1975								

XI	224.48	22	5150	3211	1160	759	759			
BP	4413.7	0.	4402.7	109.	4406.4	122.	4404.4	174.	4404.3	383.
BR	4403.9	433.	4393.5	889.	4401.4	961.	4398.7	930.	4398.3	945.
BR	4397.0	972.	4394.3	982.	4396.5	1024.	4395.1	1316.	4395.8	2679.
BR	4394.9	2240.	4395.3	3107.	4399.7	3150.	4392.6	3162.	4402.1	3211.
BR	4417.2	3203.	4412.9	3315.	4450.6	3300.				
XI	235.23	19	1716	1758	760	1025	1025			
BP	4426.8	0.	4415.6	35.	4404.6	43.	4409.0	55.	4404.3	67.
BR	4404.4	33.	4410.3	98.	4398.7	104.	4398.8	129.	4398.7	301.
BR	4406.1	654.	4396.7	824.	4400.3	1302.	4400.2	1594.	4401.6	1716.
BR	4398.1	1727.	4396.1	1739.	4403.3	1755.	4429.2	1868.		

SECND	DEPTH	COREI	CRIUS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	WLOB	ACH	AROB	VOL	TAW	R-BANK ELEV
TIME	VLOB	FR	VROB	XNL	XMCH	XMR	WTH	ELMIN	SSTA
SLOPE	KLOSS	[illegible]	KLOBF	ITRIAL	IDC	ICONT	DOFAR	TOPWID	ENDST

*PROF 1

ECH= .100 EBH= .3[illegible]
1490 NM CARD USED
*SECND 155.570

3265 DIVIDED FLOW

155.570	10.25	4391.25	.00	4391.25	4391.25	.00	.00	.00	4386.00
5000.0	3714.7	8[illegible]3.6	405.7	15241.8	1438.8	1913.7	.0	.0	4386.00
.00	.2[illegible]	.[illegible]1	.21	.037	.025	.045	.000	4381.00	1664.25
.000005	1700.	2065.	2065.	0	0	0	.00	5886.38	7532.50

1490 NM CARD USED
*SECND 169.570

169.570	9.2[illegible]	4391.2[illegible]	.00	.00	4391.26	.00	.01	.00	4386.00
5000.0	3961.3	888.8	349.9	14799.4	1271.1	1776.9	470.8	139.7	4386.00
1.06	.27	.74	.20	.036	.025	.045	.000	4382.00	2111.86
.000005	1070.	1380.	1390.	0	0	0	.00	5080.71	7192.57

1490 NM CARD USED
*SECND 180.570

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE. KRATIO = .58

180.570	8.2[illegible]	4391.2[illegible]	.00	.00	4391.27	.00	.01	.00	4388.00
5000.0	4028.3	[illegible]28.[illegible]	178.5	9888.2	886.5	522.1	833.9	247.6	4386.00
1.08	.41	.5[illegible]	.34	.040	.025	.045	.000	4383.00	2621.19
.000016	1070.	[illegible]0.	1080.	0	0	0	.00	2572.78	8262.83

1490 NM CARD USED
*SECND 189.070

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE. KRATIO = .82

189.070	7.25	4391.2[illegible]	.00	.00	4391.29	.01	.03	.00	4386.00
5000.0	5184.6	[illegible]49.3	233.5	7038.5	759.9	1643.1	1034.8	318.[illegible]	4383.00
2.03	.4[illegible]	.[illegible]7	.51	.043	.025	.050	.000	435[illegible].00	1772.80
.000041	540.	[illegible]0.	[illegible]40.	0	0	0	.00	3593.6[illegible]	5366.36

SECNO	DEPTH	CHSQ	CFLWS	WSELA	ES	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TW4	R-BANK ELEV
TIME	VLOB	AV	FOB	XNL	ENCH	XNR	WTA	ELMIN	6574
SLOPE	ALOBL	VTH	ALOBR	ITRIAL	IGC	ICONT	CDPAP	TOPWID	ENDST

CCHV= .600 CEV = .400
1490 VM CARD USED
*SECNO 196.370

BRIDGE FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .51

196.370	6.31	4391.31	.00	.00	4391.34	.04	.04	.01	4390.00
5000.0	2937.5	1736.9	425.5	2789.3	757.2	915.7	1134.6	355.4	4389.00
2.15	1.02	2.29	.46	.040	.025	.080	.000	4385.00	2006.96
.000158	670.	524.	515.	1	0	0	.00	1420.66	4063.34

CCHV= .100 CEHV= .300
1490 VM CARD USED
*SECNO 199.570

302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.65

199.570	6.37	4391.37	.00	.00	4391.38	.01	.03	.00	4385.00
5000.0	3046.3	1756.9	25.8	5164.8	2080.1	375.3	1184.2	370.1	4390.00
2.29	.54	.93	.07	.046	.040	.250	.000	4385.00	191.71
.000056	400.	250.	270.	2	0	0	.00	2108.02	2899.78

CCHV= .100 CEHV= .300
1490 VM CARD USED
*SECNO 201.570

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

201.570	4.35	4391.35	.00	.00	4391.40	.01	.02	.00	4390.00
5000.0	4585.0	117.0	.0	6050.1	108.2	.0	1219.0	380.3	4392.00
3.36	.81	1.08	.00	.045	.030	.000	.000	4387.10	60.35
.000118	335.	298.	300.	0	0	0	.00	1924.09	1764.45

1490 VM CARD USED
*SECNO 202.070
202.070	4.34	4391.34	.00	.00	4391.40	.01	.01	.00	4390.00
5000.0	4583.0	117.0	.0	6046.4	108..	.0	1226.1	382.5	4392.00
3.36	.81	1.08	.00	.045	.030	.000	.000	4387.10	60.44
.000117	50.	50.	50.	0	0	0	.00	1923.99	1964.45

SECNO	DEPTH	CHSEL	CRIWS	WSELK	ES	F1	AL	QLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	WLOB	WCH	WROB	VOL	TWA	R-BANK ELEV
TIME	XLOB	XL	XROB	KLOB	KCH	KROB	WTW	ELMIN	SSTA
SLOPE	XLOBL	XLOB	XLOBR	ITRIAL	IEC	ICONT	CDRAG	TOPWID	ENDST

1490 NM CARD USED
+SECNO 202.470

3366 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, XRATIO = .46

202.470	3.59	4391.59	.00	.00	4391.62	.03	.01	.01	4390.00
5000.0	4967.8	332.2	.0	3472.7	179.3	.0	1230.0	384.3	4392.00
2.39	1.34	1.85	.00	.044	.030	.000	.000	4388.00	36.08
.000571	40.	40.	40.	0	0	0	.00	1951.72	1989.80

CONV= .100 CEHV= .300
1490 NM CARD USED
+SECNO 205.670

3365 DIVIDED FLOW

702 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.51

205.670	5.50	4391.50	.00	.00	4391.52	.02	.10	.00	4395.00
5000.0	4983.1	16.9	.0	4537.0	22.9	.0	1256.4	376.3	4393.00
2.46	1.10	.78	.00	.041	.030	.000	.000	4386.00	1423.96
.000232	270.	425.	425.	1	0	0	.00	1871.36	3877.40

CONV= .100 CEHV= .300
+SECNO 217.390

3365 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED USE1 .CHSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

217.390	4.23	4393.23	4393.23	.00	4393.64	.42	.96	.12	4395.00
5000.0	4890.4	109.6	.0	950.7	17.2	.0	1353.7	440.4	4395.70
2.52	5.14	5.37	.00	.039	.025	.000	.000	4389.00	317.64
.011745	1654.	1172.	1172.	20	17	0	.00	1205.73	1833.30

+SECNO 224.980

SECNO	DEPTH	[illegible]	CRIWS	WSELK	EG	HV	HL	QLOSS	L-BANK ELEV
Q	QLOB	[illegible]	QROB	WLOB	AOB	SROB	VOL	TAW	R-BANK ELEV
TIME	QLOB	[illegible]	ROB	ANL	XNCH	XNR	WTI	ELMIN	SSTA
SLOPE	WLOB	[illegible]	WLOB	ITRIAL	IBC	ICONT	CORAR	TOPWID	ENDST

3838 DIVIDED FLOW

3842 WARNING: CONVEYANCE RATIO OUTSIDE OF ACCEPTABLE RANGE. KRATIO = 5.15

234.980	4.04	4398.44	.00	.00	4396.75	.06	3.07	.04	4399.70
5000.0	4824.8	173.2	.0	2527.0	57.1	.0	1382.7	485.6	4402.10
2.67	1.91	3.14	.00	.030	.025	.000	.000	4392.60	916.72
.001154	[illegible]	799.	799.	8	0	0	.00	2200.53	3183.06

*SECNO 235.230

3855 DIVIDED FLOW

3865 20 TRIALS ATTEMPTED USE;CNSEL
3873 PROBABLE MINIMUM SPECIFIC ENERGY
3920 CRITICAL DEPTH ASSUMED

235.230	4.22	4399.22	4399.92	.00	4400.37	.45	2.55	.12	4401.80
5000.0	4755.7	244.3	.0	903.4	31.8	.0	1421.5	521.6	4403.30
2.74	5.26	7.69	.00	.030	.025	.000	.000	4395.70	98.50
.011849	960.	1065.	1065.	20	9	0	.00	1069.33	1744.59

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. Floodway Fringe encro-chmd at bridge location and ineffective areas
T2  coded out with ET cards
T3
J1  ICHECK    INRD      METRIC    IDIF      STRT      METRIC    HVINS     0         WSEL      FB
                3                                                                 4671.25
J2  JPROF     IPLOT     PRFSW     IDEC      IGECH     FN        ALLDC     ICN       CHNIM     ITRACE
     15                   -1
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SECND	DEPTH	CHAN	CRIMS	WSELA	EG	HV	HL	GLOSS	L-BANK ELEV
Q	VLOC	VCH	KROB	KLOS	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	KLOP	KCH	KROS	KNL	XNCH	XNA	KTW	ELMIN	SSTA
SLOPE	KLOB	KTH	KLOSS	ITRIAL	IBS	IECONT	CSPAR	TOPWID	SNOST

*PROF 2

CONV= .100 CE= .30
1490 NM CARD USED
*SECND 159.570

SBS DIVIDED FLOW

159.570	10.25	4391.25	.00	4391.25	4391.25	.00	.00	.00	4386.00
5000.0	3714.7	878.6	405.7	15241.8	1438.8	1913.7	.0	.0	4386.00
.00	.24	.61	.21	.037	.025	.045	.000	4381.00	1664.25
.000005	1700.	2065.	2065.	0	0	0	.00	5886.36	7582.50

1490 NM CARD USED
*SECND 169.570

169.570	9.25	4391.25	.00	.00	4391.26	.00	.01	.00	4388.00
5000.0	3961.3	688.8	349.9	14799.4	1271.1	1776.9	470.8	139.7	4386.00
1.06	.27	.54	.20	.036	.025	.045	.000	4382.00	2111.86
.000005	1050.	1394.	1390.	0	0	0	.00	5080.71	7192.57

1490 NM CARD USED
*SECND 180.570

SBS DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .58

180.570	8.26	4391.25	.00	.00	4391.27	.00	.01	.00	4388.00
5000.0	4028.9	787.1	178.5	9882.2	886.5	522.1	383.7	547.5	4386.00
1.08	.41	.29	.34	.040	.025	.045	.000	4383.00	2681.19
.000015	1090.	1460.	1060.	0	0	0	.00	3572.78	6252.62

1490 NM CARD USED
*SECND 189.570

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .57

SECNO	DEPTH	COEFF	CRIMS	WSELA	FS	KV	AL	OLOSS	L-BANK ELEV
Q	ELOB	TYP	DFOE	ALOB	HCH	WROE	VOL	TWA	R-BANK ELEV
TIME	ALOB	XTH	JFOE	XNL	ANGH	AWF	WTH	EL MIN	SETH
SLOPE	WLOBL	WTH	WLOBR	ITRIAL	IOC	IOBKT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 3850.0 4370.0 TYPE= 1 TARGET= 4110.000

199.370	7.27	4391.27	.00	4391.22	4391.36	.13	.03	.01	4388.00
5000.0	1537.4	1444.4	.0	3579.4	789.9	.0	987.4	294.4	100000.00
1.85	.49	2.23	.00	.040	.025	.000	.000	4384.00	3850.00
.000113	570.	549.	540.	0	0	0	.00	1110.00	4370.00

CCHV= .200 CEHV= .400
1490 NM CARD USED
*SECNO 196.370

3865 DIVIDED FLOW

3502 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .31

470 ENCROACHMENT STATIONS= 3000.0 3730.0 TYPE= 1 TARGET= 730.000

196.370	6.13	4391.13	.00	4391.31	4391.65	.52	.15	.20	4390.00
5000.0	524.6	4475.4	.0	262.5	733.1	.0	1025.8	304.8	100000.00
1.99	2.00	2.10	.00	.040	.025	.000	.000	4385.00	3053.48
.001203	670.	550.	515.	2	0	0	.00	300.40	3730.00

CCHV= .100 CEHV= .300
1490 NM CARD USED
*SECNO 199.570

3301 HV CHANGED MORE THAN 4*THS

3502 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.47

3470 ENCROACHMENT STATIONS= 1100.0 2100.0 TYPE= 1 TARGET= 1000.000

199.570	5.73	4391.73	.00	4391.37	4391.78	.32	.08	.05	4385.00
5000.0	2172.3	2827.8	8.5	2692.3	2216.3	95.5	1049.2	310.0	4390.00
1.94	.51	1.27	.07	.053	.040	.259	.000	4385.00	1100.00
.000100	460.	250.	270.	2	0	0	.00	1000.00	2100.00

SECNO	DEPTH	SLOPE	ENTRS	WIDTH	EG	HV	HL	BLOSS	L-BANK ELEV
0	0.00	[illegible]	0R05	ALGB	ACH	AP-OB	VOL	TRA	R-BANK ELEV
TIME	VLOB	TCH	V-CH	INL	VNCH	XNP	WTH	ELMIN	SSTA
SLOPE	VLOBL	[illegible]	VLOBR	ITRIAL	IOC	ICONT	OCHAR	TOPWID	ENDST

CCHV= .100 CEHV= .300
1490 NH CARD USED
+SECNO 201.570

3470 ENCROACHMENT STATIONS= 750.0 2000.0 TYPE= 1 TARGET= 1350.000

201.570	4.69	4371.78	.00	4391.39	4391.81	.02	.03	.00	4390.00
5000.0	4834.6	167.4	.0	4613.1	121.7	.0	1073.6	315.6	4392.00
2.01	1.05	1.36	.00	.044	.030	.000	.000	4387.10	750.00
.000161	265.	900.	200.	2	0	0	.00	1834.48	1984.48

1490 NH CARD USED
+SECNO 202.070

3470 ENCROACHMENT STATIONS= 650.0 2000.0 TYPE= 1 TARGET= 1350.000

202.070	4.76	4371.66	.00	4391.39	4391.81	.01	.01	.00	4390.00
5000.0	4844.5	153.5	.0	5000.2	122.1	.0	1079.3	317.1	4392.00
2.03	.97	1.26	.00	.044	.030	.000	.000	4387.10	650.00
.000138	50.	50.	50.	0	0	0	.00	1834.48	1984.48

1490 NH CARD USED
+SECNO 202.470

3392 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .61

3470 ENCROACHMENT STATIONS= 450.0 2050.0 TYPE= 1 TARGET= 1580.000

202.470	3.99	4371.80	.00	4391.39	4391.63	.03	.01	.00	4390.00
5000.0	4833.7	366.3	.0	3677.5	216.0	.0	1083.4	318.4	4392.00
2.04	1.25	1.79	.00	.044	.030	.000	.000	4388.00	450.00
.000376	40.	40.	40.	0	0	0	.00	1539.94	1989.94

CCHV= .100 CEHV= .300
1490 NH CARD USED
+SECNO 203.070

3265 DIVIDED FLOW

3392 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.32

SECNO	DEPTH	DISP	SFLUX	WSELS	EG	HV	HL	BLOSS	L-BANK ELE.
Q	SLOP	ST	SSSP	ALOB	ACH	ARCH	VOL	TWA	R-BANK ELEV
TIME	%LOB	%Q	%QP	CHL	xWCH	ZWR	WTN	ELMIN	SSTA
SLOPE	ALOSS	xFCH	ALOSS	ITRIAL	IOC	ICONT	CORAR	TOPWID	ENDST

3470 ENERGY EQUATION ITERATION ... SECNO= 240.000 FRICTION SLOPE METHOD= 1 TARGET= 291.000

205.870	5.38	4391.48	.00	4391.50	4391.89	.01	.07	.00	4395.00
5000.0	4872.3	93.2	.0	5245.5	32.5	.0	1112.3	389.4	4393.30
2.12	.97	.71	.00	.042	.030	.000	.000	4356.00	1422.65
.000162	276.	479.	425.	1	0	0	.00	1915.96	3677.55

CCHV= .100 CEHV= .300
*SECNO 217.390

3265 DIVIDED FLOW

3683 20 TRIALS ATTEMPTED USE1 .COUSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

217.390	4.28	4393.59	4393.22	4393.23	4393.64	.42	.65	.12	4395.00
5000.0	4840.2	109.8	.0	948.8	17.1	.0	1201.8	374.0	4395.70
2.19	5.18	3.42	.00	.030	.025	.000	.000	4389.00	317.28
.011980	1250.	1172.	1172.	20	14	0	.00	1200.93	1833.29

*SECNO 224.990

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE RATIO OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.24

224.980	4.09	4396.89	.00	4396.89	4396.75	.06	3.07	.04	4399.70
5000.0	4821.2	178.8	.0	2534.5	57.2	.0	1248.7	419.1	4402.10
2.35	1.90	3.13	.00	.030	.025	.000	.000	4392.60	916.71
.001144	1150.	759.	759.	9	0	0	.00	2200.62	3183.08

*SECNO 235.230

3265 DIVIDED FLOW

3683 20 TRIALS ATTEMPTED USE1 .CNSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

235.230	4.25	4399.33	4399.33	4399.92	4400.37	.45	2.53	.12	4401.60
5000.0	4755.1	244.9	.0	902.9	31.8	.0	1887.7	455.2	4403.30
2.40	5.27	3.79	.00	.030	.025	.000	.000	4395.70	98.30
.011825	960.	1425.	1025.	20	9	0	.00	1969.07	1744.59

THIS RUN EXECUTED 31JAN91 15:27:39

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.1(September 1990
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Steamboat Creek

SUMMARY PRINTOUT

	SECNO	Q	TOPWID	SSTA	ENDST	CWSEL	DIFWSP	AREA	VCH
	155.570	5000.00	5844.38	1664.25	7582.50	4391.25	.00	18594.29	.61
	155.570	5000.00	5844.38	1664.25	7582.50	4391.25	.00	18594.29	.61
	169.570	5000.00	5090.71	2111.86	7198.57	4391.26	.00	17847.45	.54
	169.570	5000.00	5090.71	2111.86	7198.57	4391.26	.00	17847.45	.54
*	180.570	5000.00	3572.78	2621.19	6562.63	4391.26	.00	11296.86	.89
*	180.570	5000.00	3572.78	2621.19	6562.63	4391.26	.00	11296.86	.89
*	189.070	5000.00	3573.56	1772.80	5366.36	4391.28	.00	9441.51	1.37
*	189.070	5000.00	1110.00	3860.00	4970.00	4391.27	-.01	4339.29	2.23
*	196.370	5000.00	1920.56	2006.98	4065.54	4391.31	.00	4462.30	2.29
*	196.370	5000.00	300.40	3053.48	3730.00	4391.13	-.18	995.58	6.10
*	199.570	5000.00	2109.02	191.71	2299.73	4391.37	.00	7620.09	.93
*	199.570	5000.00	1000.00	1100.00	2100.00	4391.76	.39	5004.24	1.27
*	201.570	5000.00	1994.44	60.35	1984.43	4391.39	.00	6158.30	1.08
	201.570	5000.00	1834.48	750.00	1984.48	4391.79	.40	4734.92	1.36
	202.070	5000.00	1993.99	60.44	1984.43	4391.39	.00	6154.54	1.08
	202.070	5000.00	1834.48	650.00	1984.48	4391.80	.41	5122.30	1.26
*	202.470	5000.00	1991.72	36.06	1989.80	4391.39	.00	5652.00	1.35
*	202.470	5000.00	1839.94	450.00	1989.94	4391.80	.41	3893.48	1.70
*	205.570	5000.00	1871.56	1428.94	3877.40	4391.50	.00	4589.90	.73
*	205.570	5000.00	1839.94	1428.06	3877.85	4391.86	.33	5278.35	.71
	217.370	5000.00	1839.72	317.55	1833.30	4393.23	.00	767.89	6.37
*	217.370	5000.00	1839.72	317.85	1833.29	4393.22	-.01	760.85	6.42

	SECTION	Q	[illegible]	STA	ENGST	CHGEL	DIFHGP	AREA	WSH
+	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	[illegible]	[illegible]
+	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-.01	[illegible]	[illegible]
+	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	[illegible]	[illegible]
+	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.00	[illegible]	[illegible]

Steamboat Creek

SUMMARY PRINTOUT TABLE 150

	SECNO	HIGH	ELMFD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*FS	VCH	AREA	.OIK
	155.570	.00	.00	.00	4381.00	5000.00	4391.25	.00	4391.25	.05	.61	18594.29	21394.60
	153.570	.00	.00	.00	4381.00	5000.00	4391.25	.00	4391.25	.05	.61	18594.29	21394.60
	169.570	1360.00	.00	.00	4382.00	5000.00	4391.26	.00	4391.26	.05	.54	17847.45	21726.08
	169.570	1360.00	.00	.00	4382.00	5000.00	4391.26	.00	4391.26	.05	.54	17847.45	21726.08
*	180.570	1060.00	.00	.00	4383.00	5000.00	4391.26	.00	4391.27	.16	.89	11296.86	12566.06
*	180.570	1060.00	.00	.00	4383.00	5000.00	4391.26	.00	4391.27	.16	.89	11296.86	12566.06
*	189.070	640.00	.00	.00	4384.00	5000.00	4391.28	.00	4391.29	.41	1.37	9441.51	7787.69
*	189.070	640.00	.00	.00	4384.00	5000.00	4391.27	.00	4391.30	1.13	2.23	4339.29	4704.07
*	196.370	520.00	.00	.00	4385.00	5000.00	4391.31	.00	4391.34	1.58	2.29	4462.30	3978.23
*	176.370	520.00	.00	.00	4385.00	5000.00	4391.13	.00	4391.65	12.05	6.10	965.58	1441.54
*	199.570	280.00	.00	.00	4385.00	5000.00	4391.37	.00	4391.38	.58	.93	7620.09	6578.43
*	199.570	280.00	.00	.00	4385.00	5000.00	4391.76	.00	4391.78	1.00	1.27	5004.24	4995.27
*	201.570	200.00	.00	.00	4387.10	5000.00	4391.39	.00	4391.40	1.18	1.08	6158.30	4596.79
	201.570	200.00	.00	.00	4387.10	5000.00	4391.79	.00	4391.81	1.61	1.36	4734.92	3935.69
	202.070	50.00	.00	.00	4387.10	5000.00	4391.39	.00	4391.40	1.19	1.08	6154.54	4592.25
	202.070	50.00	.00	.00	4387.10	5000.00	4391.80	.00	4391.81	1.38	1.26	5122.30	4251.56
*	202.470	40.00	.00	.00	4388.00	5000.00	4391.39	.00	4391.42	5.71	1.85	3652.00	2093.12
*	202.470	40.00	.00	.00	4388.00	5000.00	4391.80	.00	4391.83	3.76	1.70	3893.48	2580.12
*	205.670	425.00	.00	.00	4386.00	5000.00	4391.50	.00	4391.52	2.52	.73	4559.90	3151.26
*	205.670	425.00	.00	.00	4386.00	5000.00	4391.38	.00	4391.89	1.62	.71	5278.35	3923.25
*	217.370	1172.00	.00	.00	4389.00	5000.00	4393.23	4393.23	4393.64	117.46	6.37	987.89	461.34
*	217.370	1172.00	.00	.00	4389.00	5000.00	4393.22	4393.22	4393.64	119.80	6.42	960.85	456.82
*	224.980	752.00	.00	.00	4392.60	5000.00	4396.69	.00	4396.75	11.54	3.14	2534.15	1471.69
*	224.980	752.00	.00	.00	4392.60	5000.00	4396.69	.00	4396.75	11.44	3.13	2591.68	1478.52
*	235.250	1025.00	.00	.00	4395.70	5000.00	4399.92	4399.92	4400.37	112.49	7.69	935.16	471.43
*	235.250	1025.00	.00	.00	4395.70	5000.00	4399.92	4399.92	4400.37	112.65	7.70	934.64	471.08

Steamboat Creek

SUMMARY PRINTOUT TABLE 15

	SECND	Q	CHSEL	DIFWSP	DIFWSX	DIFRWS	TOPWID	XLCH
	188.570	5000.00	4391.25	.00	.00	.00	5886.38	.00
	188.570	5000.00	4391.25	.00	.00	.00	5886.38	.00
	189.570	5000.00	4391.26	.00	.01	.00	5080.71	1380.00
	189.570	5000.00	4391.26	.00	.01	.00	5080.71	1380.00
*	180.570	5000.00	4391.26	.00	.01	.00	3572.78	1060.00
*	180.570	5000.00	4391.26	.00	.01	.00	3572.78	1060.00
*	189.070	5000.00	4391.28	.00	.02	.00	3593.56	640.00
*	189.070	5000.00	4391.27	-.01	.01	-.01	1110.00	640.00
*	196.370	5000.00	4391.31	.00	.03	.00	1420.66	520.00
*	196.370	5000.00	4391.13	-.18	-.14	-.18	300.40	520.00
*	199.570	5000.00	4391.37	.00	.06	.00	2108.02	280.00
*	199.570	5000.00	4391.76	.39	.63	.39	1000.00	280.00
	201.570	5000.00	4391.39	.00	.02	.00	1924.09	200.00
	201.570	5000.00	4391.79	.40	.03	.40	1234.48	200.00
	202.070	5000.00	4391.39	.00	.01	.00	1923.99	50.00
	202.070	5000.00	4391.80	.41	.01	.41	1334.48	50.00
*	202.470	5000.00	4391.39	.00	.00	.00	1951.72	40.00
*	202.470	5000.00	4391.80	.41	.00	.41	1539.94	40.00
*	205.670	5000.00	4391.50	.00	.11	.00	1371.36	425.00
*	205.670	5000.00	4391.89	.38	.08	.38	1915.96	425.00
*	217.370	5000.00	4393.23	.00	1.73	.00	1203.73	1172.00
*	217.370	5000.00	4393.22	-.01	1.34	-.01	1200.93	1172.00
*	224.780	5000.00	4396.69	.00	3.46	.00	2200.53	759.00
*	224.780	5000.00	4394.49	-.01	3.46	-.01	2200.62	759.00
*	235.230	5000.00	4399.73	.00	3.23	.00	1069.33	1025.00
*	235.230	5000.00	4399.52	.00	3.23	.00	1069.07	1025.00

SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 180.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 190.570 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 189.070 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 189.070 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 196.370 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 196.370 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 199.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 199.570 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 201.570 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

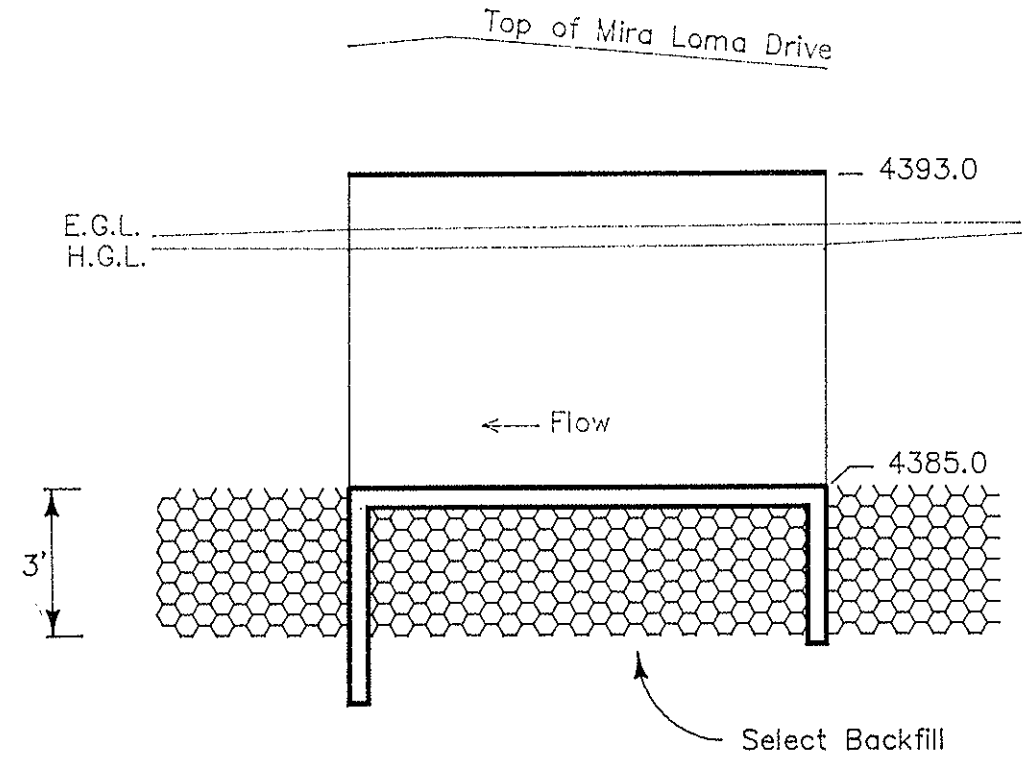
WARNING SECNO= 202.470 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 202.470 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 205.670 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 205.670 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 217.390 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 217.390 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 217.390 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 217.390 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 217.390 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 217.390 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 224.990 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 224.990 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 235.230 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 235.230 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 235.230 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 235.230 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 235.230 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 235.230 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL



Scale :
Horizontal : 1" = 20'
Vertical : 1" = 5'

Typical Arch Section

Nimbus Engineers

Profile Through Bridge

Nimbus Engineers
3710 Grant Dr., Suite D • Reno, NV 89509
Mail: P.O. Box 10220 • Reno, NV 89510
(702) 689-8630

JOB 9006
SHEET NO. 1 OF 4
CALCULATED BY RMF DATE 2/5/91
CHECKED BY DATE
SCALE MIRA LOMA EXT.

SCOUR ANALYSIS

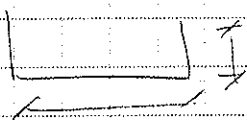
MIRA LOMA DRIVE EXT

BASED ON "METHOD OF TRACTIVE FORCE"
(REFERENCE 1, AND 12)

COURSE, NONCOHESIVE MATERIAL
SLIGHTLY TO MODERATELY ANGULAR

UNIT TRACTIVE FORCE

$\tau_o = WRS$ CRITICAL SECTION



$W = 62.4$ LB/FT^3
$R = 7.00/11.4 = 6.14$
$S = .0006$ (FROM HEC-2)

$\tau_o = 0.23$ > CRITICAL τ_o ON LEVEL BOTTOM (SIDES ARE WINGWALLS)

MINIMUM FACTOR OF SAFETY = 2.0

$$\tau_o = 0.46 \text{ LB/FT}^2$$

Nimbus Engineers
3710 Grant Dr., Suite D • Reno, NV 89509
Mail: P.O. Box 10220 • Reno, NV 89510
(702) 689-8630

JOB 9006
SHEET NO. 2 OF 4
CALCULATED BY ____ DATE ____
CHECKED BY PMF DATE 2/5/91
SCALE ____

MINIMUM D_{75} TO WITHSTAND

$\tau_o = 0.46$ LB/FT^2

FIG 7-10 CHOW (U.S.B.R.)

$D_{75\ MIN} = 30$ mm
$= 1.2$ IN. DIA

@ 25% RIP RAP MUST BE LARGER THAN 1.2" DIA - AND MEET "SUGGESTED GRADATION OF RIP RAP" (SIMONS, LI + ASSOC.)

SCOUR DEPTH (MAX.)

$V_c = 18.4\ D_s^{1/2}$

ASSUME $V_c = 6$ FT/S

$D_s = 0.11$ ft. $= 1.28$"
$= 32.4$ mm

$\Delta Z = \frac{2(D_s)}{P_c}$ P_c = % COMPSER = 0.25 MINIMUM

$= \frac{2(1.28)}{.25} = 10.2$"

$\Delta Z = 0.85'$ MAX.

APRON DEPTH O.K. (3')

Nimbus Engineers
3710 Grant Dr., Suite D • Reno, NV 89509
Mail: P.O. Box 10220 • Reno, NV 89510
(702) 689-8630

JOB 9006
SHEET NO. 3 OF 4
CALCULATED BY PMF DATE 2/15/91
CHECKED BY DATE
SCALE

LOCAL PIER SCOUR

$$\frac{ds}{d_1} = 2.2\left(\frac{b}{d_1}\right)^{0.65} Fr_1^{0.43}$$

Rer U/S D

$b = .75$

$d_1 = 7$

$Fr = V/\sqrt{gd} = 6/\sqrt{32.2(7)} = 0.4$

$$ds = 7\left(2.2\left(\frac{.75}{7}\right)^{0.65} .4^{(.43)}\right)$$

$ds = 2.43'$

FOR ALL SED @ INCIPENT MOTION - CONSERVATIVE

∴ CUT-OFF WALLS ARE ADEQUATE

12.8.4 Riprap Gradation and Placement

Riprap gradation should follow a smooth size distribution curve such as that shown in Figure 12.25. The ratio of maximum size to median size D_{50} should be approximately two and the ratio between median size and the 20 percent size should also be about two. This means that the largest stones would be 6.5 times the weight of the median size and small sizes would range down to gravels. Representative rock size D for the gradation shown in Figure 12.25 is 1.25 times the median rock size, D_{50}, which is approximately equal to the D_{67} .

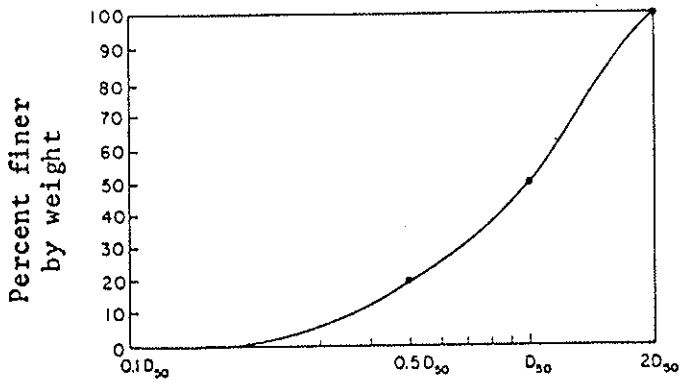


Figure 12.25. Suggested gradation for riprap.

With a distributed size range, the interstices formed by larger stones are filled with smaller sizes in an interlocking fashion, preventing formation of open pockets. Riprap consisting of angular stones is more suitable than that consisting of rounded stones. Control of the gradation of the riprap is almost always made by visual inspection.

If it is necessary, poor gradations of rock can be employed as riprap provided the proper filter is placed between the riprap and the bank of bed material. Representative grain size of riprap is approximately D_{67} and the filter is designed in accordance with the criteria given in the next section.

Riprap placement is usually accomplished by dumping directly from trucks. If riprap is placed during

– Ref. 12