NIMBUS COPY

Application for Letter of Map Revision (LOMR)

DOUBLE DIAMOND RANCH

PHASE 1

City of Reno, Nevada

Prepared for:

DOUBLE DIAMOND RANCH, LLC
601 W. Moana Lane, Suite 1
Reno, NV 89509

NIMBUS JOB NO: 9508

AUGUST 1996

Nimbus Engineers
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Mail : P.O. Box 10220, Reno, NV 89510
(702) 689-8630

TABLE OF CONTENTS

Introduction 1

Project Description 4

"As-Built" Conditions 6

Conclusions 8

References 9

LIST OF FIGURES

Figure 1 - Vicinity Map 2

Figure 2 - Culvert Index Map 3

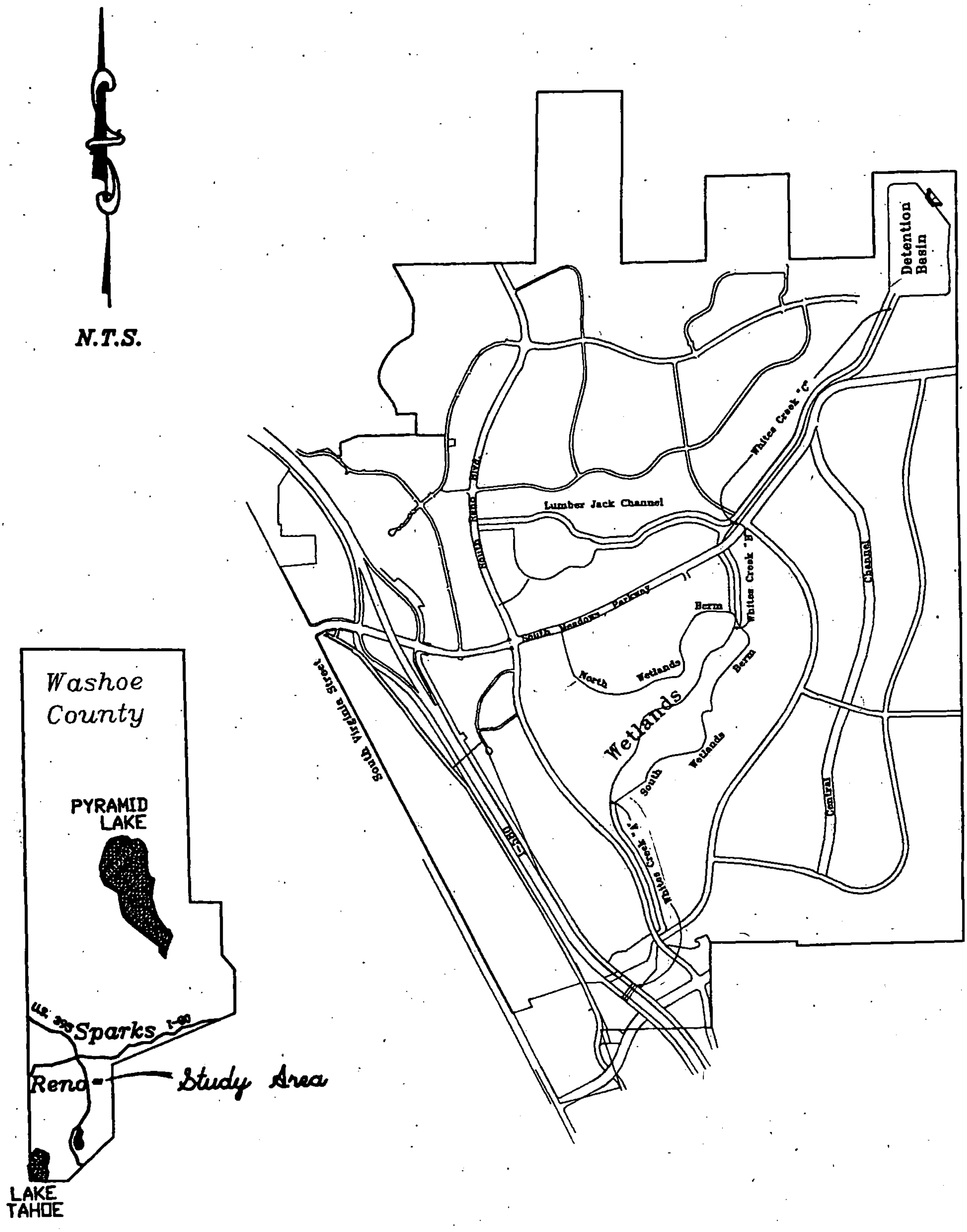
Figure 3 - Phase 1 Channel Location Map 7

INTRODUCTION

This narrative has been prepared to accompany an application for a Letter of Map Revision (LOMR) for the Double Diamond Ranch Phase 1 development. The project lies in the south Truckee Meadows within the corporate boundaries of the City of Reno in Washoe County, Nevada. It is within the lower Steamboat Creek drainage basin and is affected by both lower Thomas Creek and lower Whites Creek. See Figure 1 for the Vicinity Map.

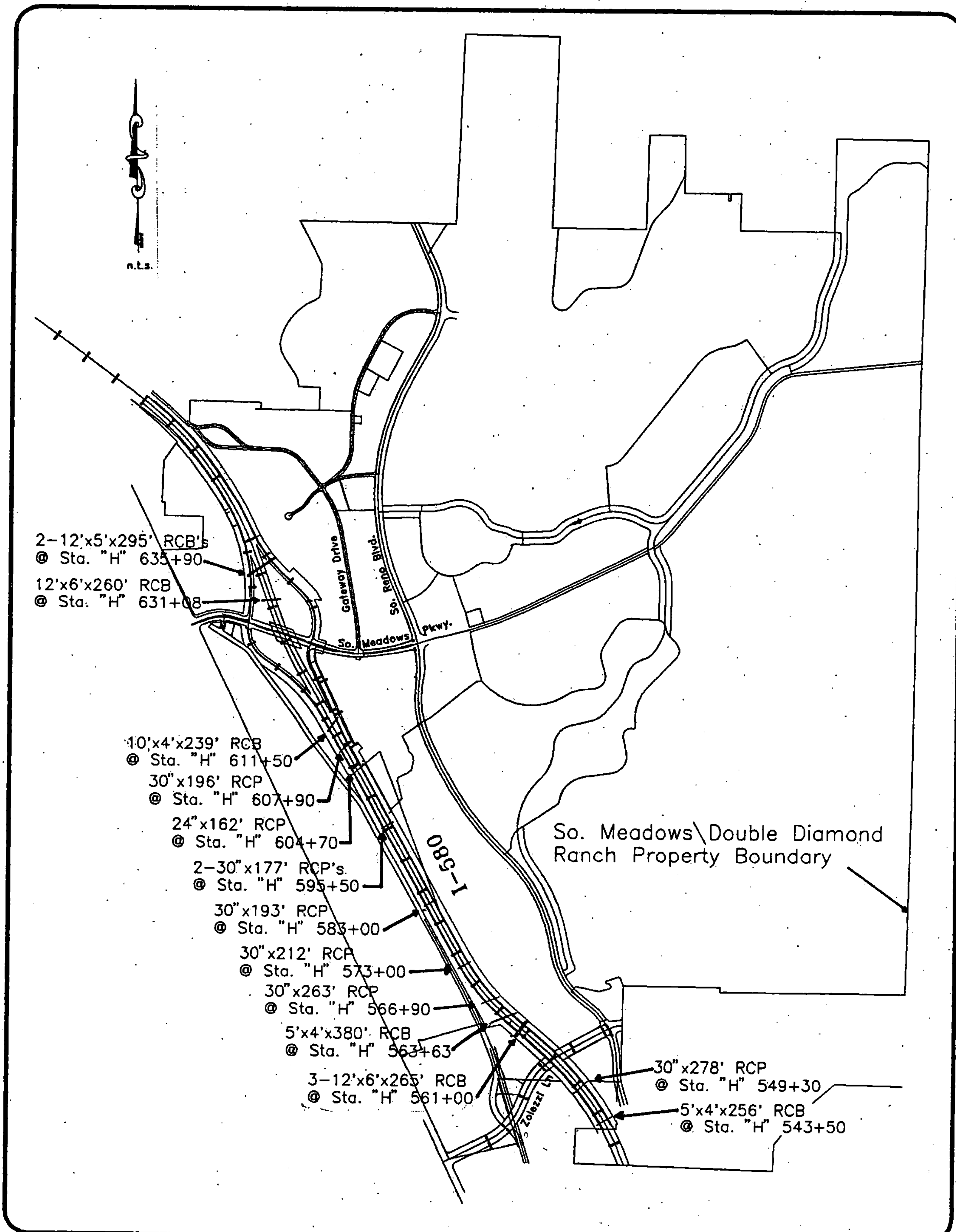
The Double Diamond Ranch is being planned for residential development and has been recently annexed to the City of Reno. See the Annexation map located in Appendix C.

Drainage and flooding patterns on the parcel have been significantly altered since the floodplain analysis which was done to produce the current Flood Insurance Rate Maps (FIRM) in the area of concern. The western portion of the area is affected by the construction of the U.S. 395/I-580 extension. This portion of the roadway is built on fill and effectively directs any flows which are affecting the parcel into large concrete box structures and earthen channels. Figure 2 is a culvert index map which shows the location of all new highway structures. Some channels were previously built to contain the flows from these structures and to convey the flows in an easterly direction toward Steamboat Creek. These physical changes are shown on new, one foot contour interval topography, which along with "As-Built" survey information forms the basis of this analysis. The channels and culverts which were a result of the construction of the I-580 extension, associated on-ramps, Gateway Drive and South Meadows Parkway were built since the effective flood insurance restudy. The required analysis of each of these structures was previously submitted to FEMA under Case 94-09-632P. This LOMR is for new channels that were constructed to convey flood water away from or around Phase 1 of this project.



Nimbus Engineers

FIGURE 1
Vicinity Map



Nimbus Engineers

Figure 2
Culvert Index Map

PROJECT DESCRIPTION

Wetlands

A number of wetlands have been delineated within the entire study area. A plan for mitigation of any impacts of this project to the wetlands has been submitted to the Corps of Engineers and a wetlands specialist has been retained by the developer to work with the Corps. All existing channels which are proposed to remain have been reviewed by the Corps, under the 404 Permit which was issued for the construction of the I-580 extension. For the Phase 1 development, berms were constructed around portions of the Whites Creek "A" Channel Wetlands to contain the flows. No excavation was performed within the wetlands boundary.

Thomas Creek

Thomas Creek does not affect Phase 1 of this project.

Whites Creek

Whites Creek originates in the Sierra Nevada Range and flows to the east into Steamboat Creek. Approximately 2 miles upstream of South Virginia Street the watercourse diverges into four smaller channels as shown on the effective Flood Insurance Rate Maps. These channels travel east as shallow flow across South Virginia Street and continue as sheet flow north towards the Double Diamond Ranch. The freeway construction noted above has altered that pattern and reroutes Branches 1 and 2 to the project. The culvert which contains Branch 3 outlets near the southwest corner of the proposed Whites Creek Meadows Subdivision.

The branches of Whites Creek which affect this project on its western boundary are 1, 1A and 2. These branches are collected at highway stations H 561+00 and H 563+63 and directed into the area of interest. The flows which are attributed to these branches are based upon the design flows of the box culverts by NDOT. Flows exiting these culverts have been channelized into the "A" Channel and routed through the Wetlands and to the "BC" Channel.

On the southern boundary, Branches 3 and 4 of Whites Creek enter the site as sheet flow. The analysis of the 3rd and 4th branch sheet flow was previously submitted to FEMA for review with a request for a Letter of Map Revision for Whites Creek Meadows Subdivision in unincorporated Washoe County, FEMA Case 95-09-133R. This request was submitted to obtain a LOMR for the existing conditions based upon the completion of the flood control structures at the southern end of the highway construction. This sheet flooding is now captured within the project site at the inlet of the Central Channel. See Figure E2 located in Appendix F.

Washoe County has developed interim policies for all projects affected by Whites Creek. These policies are documented in Reference 17. The reader is referred to that report for further discussion..

Steamboat Creek

Steamboat Creek originates at Little Washoe Lake and flows in a northerly direction, through Pleasant Valley and the Truckee Meadows, and ultimately to the Truckee River. Before reaching the project site, Steamboat is combined with Browns Creek, Galena Creek, and Bailey Canyon Creek as well as local contributing subbasins. These basins are vegetated mainly with pines and junipers in the upper elevations, and sagebrush and pastures in the lower areas.

Including the East Side Drainages which originate in the Virginia Foothills area, more than 123 square miles contribute runoff to Steamboat Creek at the project boundary. A portion of that drainage area is impounded by Washoe Lake and Little Washoe Lake. That portion of the drainage basin has traditionally been represented in hydrologic models as base flow. The Corps of Engineers has performed extensive studies within the basin and their value of 500 cfs is a commonly used and the locally accepted number for that flow.

The Double Diamond Project is minimally affected by the Steamboat Creek floodplain. Phase 1 of the project is not affected by Steamboat Creek and no improvements have been made.

"AS-BUILT" CONDITIONS

A series of channels and a detention/flow retarding basin have been constructed for the flood control improvements for this project. These channels are shown on Figure 3. These improvements have been designed to enhance and/or preserve wetlands found on the site and to mitigate the effects of channelization on peak flows at the property boundary. Portions of the property are proposed to be filled to elevate the proposed development above the base flood elevation. Temporary berms have been constructed to direct and contain flows until the final placement of fill. None of the ultimate improvements are proposed to be protected by these berms. The height of the berms indicate the final recommended finish grade of the project or 3 feet above the water surface elevation, whichever is higher. The only exception is at the upstream end of "A" Channel where the height of the berm is 2 feet or higher above the water surface elevation. Since the depth of water against the berm in this area is less than 2 feet, and the land outside of the berms (which contain the wetland) will ultimatly be filled to the top of berm elevation, 2 feet of fill is adequate to contain the flows.

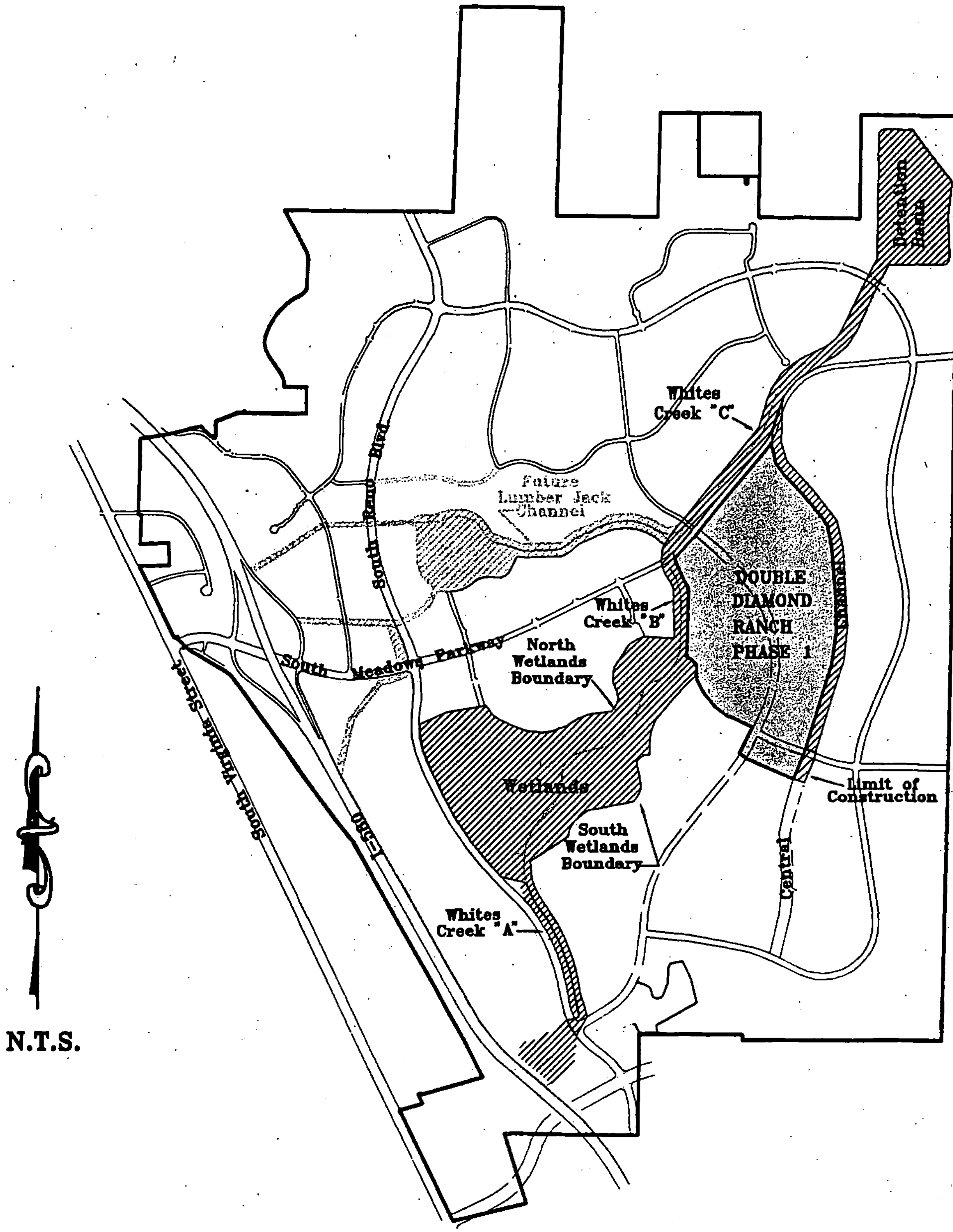


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FIGURE 3
Phase 1 Channel Location Map

Job # : 9508 Date : August 1996

Channels "A", "BC" and part of the Central Channel have been constructed for Phase 1 of the project. "As-Built" construction plans submitted to Nimbus Engineers by SEA, Incorporated were used to analyze these channels. See Figures A1-A6, C1-C3, and E2-E4 in Appendix F. Portions of the northwest side of "BC" Channel and the northwest side of "A" Channel have not yet been constructed because they do not affect Phase 1 of the project. The resulting floodplain is shown on Hydraulic Work Maps, Figures 4 and 5 in Appendix G.

While updating the hydrologic analyses it was noted that peak flows increased at the northeast property boundary. In order to mitigate this increase, a detention basin has been constructed in the northeast corner. The outlet was designed to reduce the peak flows to present conditions flow. A HEC-1 report, located in Appendix D, shows the "As-Built" Phase 1 conditions for the detention basins' volume requirements.

CONCLUSION

The information and certification contained in this report is adequate to demonstrate that the Double Diamond Ranch Phase 1 can be removed from the Special Flood Hazard Area with construction that has been completed to date.

REFERENCES

1. Chow, Ven Te, Open Channel Hydraulics, 1959.

2. Federal Emergency Management Agency, Flood Insurance Study: Washoe County, Nevada, Unincorporated Areas, April 1990.

3. Federal Emergency Management Agency, Flood Insurance Rate Maps, Washoe County, Nevada, Panels 1463, 1464 and 1501.

4. Kennedy/Jenks, Concept Level Report, Washoe County Master Plan, Volume I and II, January 1991.

5. Nimbus Engineers, Feasibility Analysis for Huffaker Hills Detention Facility, February 1990.

6. U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Washoe County Nevada, South Part, August 1983.

7. U.S. Department of Agriculture, Soil Conservation Service, Engineering Division, Urban Hydrology for Small Watersheds, Technical Release 55, June 1986.

8. U.S. Department of Agriculture, Soil Conservation Service, SCS National Engineering Handbook, Section 4, Hydrology, March 1985.

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

10. U.S. Department of the Army, Corps of Engineers, Hydrologic Engineering Center, Flood Hydrograph Package, February 1981, September 1990.

11. U.S. Department of the Army, Corps of Engineers, Sacramento District, Floodplain Information, Southwest Foothills Streams (Evans, Thomas and Whites Creek & Skyline Wash): Reno, Nevada, June 1974.

12. U.S. Department of the Army, Corps of Engineers, Sacramento District, Truckee River, California and Nevada, Hydrology, February 1980.

13. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, NOAA Atlas 2, Precipitation - Frequency Atlas of the Western United States, Volume VII - Nevada, 1973.

14. U.S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Intervals 10, 20, and 40 feet: Mount Rose NE (1982) Steamboat (1982) Mount Rose NW (1982) Mount Rose (1982), Nevada.

15. U.S. Department of the Interior, Geological Survey, 15-Minute Series Topographic Maps, Scale 1:62,500, Contour Interval 40 feet: Mt. Rose (1950) and Virginia City (1950), Nevada.

16. U.S. Department of Transportation, Federal Highway Administration, Office of Engineering, Bridge Division, Hydraulic Branch, Hydraulic Charts for the Selection of Highway Culverts, Hydraulic Engineering Circular No. 5, June 1980.

17. Cella Barr Associates, Preliminary Whites Creek Basin Management Study, April 4, 1994.

18. Nimbus Engineers, Whites Creek Detention Facility Feasibility Study for Nevada Department of Transportation, June 1993.

19. Nevada Aerial Mapping, 1' = 100' a foot contour interval topograph, December 1994.

20. Nimbus Engineers, Application for Conditional Letter of Map Revision, Hydrologic and Hydraulic Analyses, South Meadows/Double Diamond Ranch, February 8, 1995.

LIST OF APPENDICES

Appendix A: FEMA Forms and Operation and Maintenance Agreement

Appendix B: Annotated FIRM's (Existing and Proposed)

Appendix C: Annexation Map

Appendix D: Hydrologic Analysis

Appendix E: Hydraulic Analyses

Appendix F: "As-Built" Plans

Appendix G: Hydraulic Work Maps

APPENDIX A:

FEMA Forms and Operation and Maintenance Agreement

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: Whites Creek
3. Project Name/Identifier: Double Diamond Ranch Phase 1
4. FEMA zone designations affected: A, X
   (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
320020/320019	City of Reno/Washoe Co	Washoe Co	NV	32031C	3159E	09/30/94
320020/320019	City of Reno/Washoe Co	Washoe Co.	NV	32031C	3170E	09/30/94
320020/320019	City of Reno/Washoe Co	Washoe Co.	NV	32031C	3178E	09/30/94
320020/320019	City of Reno/Washoe Co	Washoe Co	NV	32031C	3186E	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
- ☒ Riverine
- ☐ Coastal
- ☐ Alluvial Fan
- ☐ Shallow Flooding *(e.g. Zones AO and AH)*
- ☐ Lakes

Affected by wind/wave action
- ☐ Yes
- ☐ No

Structures
- ☒ Channelization
- ☒ Levee/Floodwall
- ☒ Bridge/Culvert
- ☐ Dam
- ☐ Coastal
- ☒ Fill
- ☐ Pump Station
- ☐ None
- ☐ Channel Relocation
- ☐ Excavation
- ☐ Other *(describe)*

Disciplines*
- ☒ Water Resources
  - ☐ Hydrology
  - ☒ Hydraulics
  - ☐ Sediment Transport
  - ☐ Interior Drainage
- ☐ Structural
- ☐ Geotechnical
- ☐ Land Surveying
- ☐ 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: ______

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. N/A

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

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 the HOA (with written report to city) (entity) with a maximum interval of 12 months between inspections.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by the HOA (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 Double Diamond Ranch (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 * see Appendix A

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

17. 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: $ 225.00

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.

[signature]
Signature of Revision Requester

Ralph M. Hogoboom, P.E.
Printed Name and Title of Revision Requester

Nimbus Engineers
Company Name

(702) 689-8630 8/16/96
Telephone No. Date

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

[signature]
Signature of Community Official

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

City of Reno
Community Name

8/16/96
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

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*

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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 & hydraulics)
   [example: water resources *(hydrology, hydraulics, sediment transport, interior drainage)** structural, geotechnical, land surveying.]
3. I have 35 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 analyses Double Damond Ranch Phase I
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: Ralph M. Hogoboom
(please print or type)

Title: Engineering Manager
(please print or type)

Registration No. CE 011813 Expiration Date: 6/30/97

State Nevada

Type of License Professional Engineer

[signature]
Signature

8/16/96
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 and Washoe County

Flooding Source: Whites Creek BC Channel
(One form for each flooding source)

Project Name/Identifier: Double Diamond Ranch / South Meadows

1. REACH TO BE REVISED

Downstream limit: Northeast Property Corner

Upstream limit: I 580

2. EFFECTIVE FIS

☐ Not studied

☒ Studied by approximate methods

Downstream limit of study: Confluence with Steamboat Creek

Upstream limit of study: Approximatly 4.5 mi upstream of South Virginia St.

☐ Studied by detailed methods

Downstream limit of study: ____

Upstream limit of study: ____

☐ Floodway delineated

Downstream limit of Floodway: ____

Upstream limit of Floodway: ____

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: Use of 1' Contour Interval maps and "As Built" Construction Plans

☒ Flood control structure. Explain: Channelization of flows through project

☐ Other. Explain: ____

For areas which have detailed flooding:

All 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	2020	4586
500-year		

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined The starting water surface elevation was determined from the Detention Basin pond elevation at the downstream end of the project

3. Give range of friction loss coefficients (*Manning's "N"*) Channel .... .035 - .040

Overbanks ...... .035 - .040

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
See below		

Explain: Friction loss coefficients were changed throughout the project where Channelization occurs

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 sections were taken from 1' contour interval topographic maps "as-Built" channel 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: In most cases the improved channel formed the bank.

6. Explain how reach lengths for channel and overbanks were determined:
Reach lengths were determined from 1' topographic maps and channel stations

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. Critical depth occurs at the inlet structure to the detention basin

What is the maximum change in energy gradient between cross-sections? .... 3.26'
Specify location .... 7912 & 7955
3. What is the distance between the cross-sections in 2 above? .... 43'
4. What is the maximum distance between cross-sections? .... 300'
Specify location 10400, 9900,
5. Floodway determination N/A
a. What is the maximum surcharge allowed by the community or State? .... ________ foot
b. What is the maximum surcharge for the revised conditions? .... ________ foot
Specify location .... ________
c. What is the maximum velocity? .... ________ fps
Specify location .... ________

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: ________

N/A

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)*

____

____

____

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 N/A within ________ feet *(vertical)* and upstream of the project at cross section ________ within ____ feet *(vertical)*.

B. The revised floodway elevations tie into those computed by the effective FIS model, dowstream of the project at cross section ______ within ________ feet *(vertical)* and upstream of the project at cross section _____ within ________ feet *(vertical)*. N/A

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 EMERGENC[illegible]AGMENT AGENCY
WATER SURFAC[illegible]VATION CHECK

COMMUNITY NAME	FLOODIND SOURCE	PROJECT NAME /IDENTIFIER

	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]

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.

Sheet ________ of ________

FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE HYDRAULIC ANALYSIS 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 2.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

Community Name: City of Reno and Washoe County

Flooding Source: Whites Creek Central Channel
(One form for each flooding source)

Project Name/Identifier: Double Diamond Ranch / South Meadows

1. REACH TO BE REVISED

Downstream limit: Confluence with Whites Creek Channel "BC"

Upstream limit: Phase 1 boundary.

2. EFFECTIVE FIS

☐ Not studied

☒ Studied by approximate methods

Downstream limit of study Confluence with Steamboat Creek

Upstream limit of study Approximately 4.5 miles upstream of South Virginia St.

☐ Studied by detailed methods

Downstream limit of study

Upstream limit of study

☐ Floodway delineated

Downstream limit of Floodway

Upstream limit of Floodway

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: Use of 1' interval contour maps and "As-Built" channel plans

☒ Flood control structure. Explain: Channelization of flows through property

☐ Other. Explain:

For areas which have detailed flooding:

.ll input and output listings along with files on diskette (if available) for each of the models listed below (items 1, 2, 3, -, 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	3000	3000
500-year		

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined Starting water surface elevation was taken from HEC-2 run @ Confluence of Channel "BC" (508AS-BC.DAT)

3. Give range of friction loss coefficients (*Manning's "N"*) Channel .... .038

Overbanks ...... .038

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

Explain:

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 sections were taken from 1' interval contour maps and "As-Built" channel 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: In most cases the improved channel formed the bank.

6. Explain how reach lengths for channel and overbanks were determined:
Reach lengths were obtained from 1' contour interval maps and Channel stations

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.

What is the maximum change in energy gradient between cross-sections? 1.28

Specify location Sta 55+00

3. What is the distance between the cross-sections in 2 above? 300'

4. What is the maximum distance between cross-sections? 300'

Specify location 55+50, 67+00, 74+00, 79+00, 82+00, 85+00

5. Floodway determination

a. What is the maximum surcharge allowed by the community or State? N/A foot

b. What is the maximum surcharge for the revised conditions? N/A foot

Specify location N/A

c. What is the maximum velocity? N/A fps

Specify location N/A

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:

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: N/A

____

____

____

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)*

____

____

____

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 N/A within ________ feet *(vertical)* and upstream of the project at cross section ____________ within ______ feet *(vertical)*.

B. The revised floodway elevations tie into those computed by the effective FIS model, dowstream of the project at cross section N/A within __________ feet *(vertical)* and upstream of the project at cross section ______ within __________ 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 EMERGENCY MANAGMENT AGENCY
WATER SURFACE ELEVATION CHECK

COMMUNITY NAME	FLOODIND SOURCE	PROJECT NAME /IDENTIFIER

	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]

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.

Sheet________ of ________

FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE HYDRAULIC ANALYSIS FORM

O.M.B. Burden No. 3067-0148
Expires July 31, 1997

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Community Name: City of Reno, Washoe County, Nevada

Flooding Source: Whites Creek "A" Channel
(One form for each flooding source)

Project Name/Identifier: Double Diamond Ranch, Phase 1

1. REACH TO BE REVISED

Downstream limit: Confluence with "BC" Channel

Upstream limit: I-580 Culvert

2. EFFECTIVE FIS

☐ Not studied

☒ Studied by approximate methods

Downstream limit of study: Confluence with Steamboat Creek

Upstream limit of study: Approximately 4.5 miles upstream of South Virginia Street.

☐ Studied by detailed methods

Downstream limit of study: ____

Upstream limit of study: ____

☐ Floodway delineated

Downstream limit of Floodway: ____

Upstream limit of Floodway: ____

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: Use of 1' Contour Interval Maps and "As-built" Channel plans

☒ Flood control structure. Explain: Channelization of flows through project. Levees to contain flows during phasing of the project

☐ Other. Explain: ____

For areas which have detailed flooding:

.ll input and output listings along with files on diskette (if available) for each of the models listed below (items 1, 2, 3, ·, 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	2020	2020
500-year		

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined starting water surface elevation was determined at Critical depth at the drop structure

3. Give range of friction loss coefficients (*Manning's "N"*) Channel .... .038 - .040

Overbanks ...... .038 - .040

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

Explain:

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 sections were taken from 1' Contour interval topographic maps and "As Built" Channel 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: In most cases the improved Channel formed the banks

6. Explain how reach lengths for channel and overbanks were determined:
Reach lengths were determined from 1' topographic maps and Channel stations

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.

What is the maximum change in energy gradient between cross-sections? 3.21
Specify location .... 79+25 & 79+60
3. What is the distance between the cross-sections in 2 above? .... 35 FEET
4. What is the maximum distance between cross-sections? .... 300 FEET
Specify location .... 104+00 & 99+00
5. Floodway determination
a. What is the maximum surcharge allowed by the community or State? .... ______ foot
b. What is the maximum surcharge for the revised conditions? .... ______ foot
Specify location .... ______
c. What is the maximum velocity? .... ______ fps
Specify location .... ______
d. Are there any negative 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: ______

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)*

____

____

____

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 N/A within ________ feet *(vertical)* and upstream of the project at cross section ____________ within ______ feet *(vertical)*.

B. The revised floodway elevations tie into those computed by the effective FIS model, dowstream of the project at cross section N/A within ____________ feet *(vertical)* and upstream of the project at cross section ______ within ____________ 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 EMERGENC[illegible]NAGMENT AGENCY

WATER SURFACE ELEVATION CHECK

COMMUNITY NAME	FLOODIND SOURCE	PROJECT NAME /IDENTIFIER

	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]

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.

MT-2   Form 4 Page 6 of 6

Sheet ________ of ________

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

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Community Name: City of Reno and Washoe County

Flooding Source: Whites Creek Channel "A"

Project Name/Identifier: Double Diamond Ranch / South Meadows

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. - no previous detailed study performed C. & H. - no floodway analysis performed. M & N. - not near 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.)*? Channel As-built plans July 1996

3. What is the scale and contour interval of the following workmaps?
   a. Effective FIS N/A scale ______ Contour interval
   b. Revision Request 1" = 100' scale As-built profiles 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.

5. 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.

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?______

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:

N/A

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

If no, explain:

N/A

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

N/A

If yes, attach the coastal structures form.

N/A

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

Community Name: City of Reno and Washoe County

Flooding Source: Whites Creek Branch "BC"

Project Name/Identifier: Double Diamond Ranch / South Meadows

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.	<u>Tie-ins</u> between the <u>effective</u> and <u>revised</u> 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. - no previous detailed study performed C.&H. - no floodway analysis performed M.&N. - not near 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.)*? Channel As built plans July 1996

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

   a. Effective FIS N/A scale ______ Contour interval

   b. Revision Request 1" = 100' scale As-built profiles 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.

5. 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.

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? ________

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:

N/A

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

If no, explain:

N/A

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

N/A

If yes, attach the coastal structures form.

N/A

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

ublic 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 / Washoe Co.

Flooding Source: Whites Creek Central Channel

Project Name/Identifier: Double Diamond Ranch

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.c.) no previous detailed study performed. c.h.) no previous floodway analysis. m.n.) not near 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.)*? Channel As-built plans August 1996

3. What is the scale and contour interval of the following workmaps?
   a. Effective FIS N/A scale ______ Contour interval
   b. Revision Request 1"=100' scale As built profiles 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.

5. 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.

___

___

___

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? ___

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: N/A

___

___

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

If no, explain: N/A

___

___

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 N/A

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 **CHANNELIZATION FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

Community Name: City of Reno / Washoe Co

Flooding Source: Whites Creek Branch "A"

Project Name/Identifier: Double Diamond Ranch

1. EXTENT OF CHANNELIZATION

Downstream limit: At the confluence of the wetlands

Upstream limit: Outlet of culvert under I-580

2. CHANNEL DESCRIPTION

1. Describe the inlet to the channel Inlet to the channel is outlet of 6 - 5x10 RCB's

2. Briefly describe the shape of the channel *(both cross sectional and planimetric configuration)* and its lining *(channel bottom and sides)* 175' grassed channel w/ 25' First Flow Channel at ℄. 5:1 side slopes and flat bottom

3. Describe the outlet from the channel Matches existing ground at Wetlands

4. The channelization includes:

   - ☒ Levees *(Attach Levee Form)*
   - ☒ Drop structures
   - ☐ Superelevated sections
   - ☒ Transitions in cross sectional geometry
   - ☐ Debris basin/detention basin
   - ☒ Energy dissipater
   - ☐ Other ______

5. Attach the following:

   a. Certified engineering drawings showing channel alignment and locations of inlet, outlet, and items checked in item 4

   b. Typical cross sections and profiles of channel banks and invert

3. HYDRAULIC CONSIDERATIONS

1. What is the 100-year discharge? .... 2020 cfs

Do the cross sections in the hydraulic model match the typical cross sections in the plans? ☒ Yes ☐ No

3. Are the channel banks higher than the 100- year flood elevations everywhere? .... ☒ Yes ☐ No

4. Are the channel banks higher than the 100-year flood energy grade lines everywhere? .. ☐ Yes ☒ No

5. Is the land on both sides of the channel above the adjacent 100-year flood elevation at all points along the channel? .... ☐ Yes ☒ No

6. What is the range of freeboard? .... 2 - 6 feet

7. What is the range of the 100-year flood velocities? .... 1.52 - 7.19 ft/sec

8. What is the lining type? (both bottom and sides) grass lined or rip rap lined

Explain how the channel lining prevents erosion and maintains channel stability *(attach documentation)*

Grass is used to stabilize soils in Channels with velocities between 5 and 6fps and rip rap is used to reduce velocities to allowable levels

9. What is the design elevation in the channel based on?

☒ Subcritical flow
☐ Critical flow
☐ Supercritical flow
☐ Energy grade line

Is 100-year flood profile based on the above type of flow? .... ☒ Yes ☐ No

If no, explain: ______

10. Is there the potential for a hydraulic jump at the following locations?

Inlet to channel .... ☐ Yes ☒ No
Outlet of channel .... ☐ Yes ☒ No
At Drop Structures .... ☐ Yes ☒ No
At Transitions .... ☐ Yes ☒ No
Other locations. Explain: ______

If the answer to any of the above is yes, please explain how the hydraulic jump is controlled and the effects of the hydraulic jump on the stability of the channel.

Explain: ______

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 and/or the capacity of the channel? ..... ☐ Yes ☒ No

   B. Based on the conditions of the watershed and stream bed, is there a potential for sediment transport (including scour and deposition) to affect the 100-year water surface elevations and /or the capacity of the channel? .... ☐ Yes ☒ No

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

   A. What is the estimated sediment (bed) load?
   ______________cfs (attach gradation curve)

   Explain method used to estimate load____

   B. Is the 100-year flood velocity anywhere within the channel less than the 100-year flood velocity of the inlet? ☐ Yes ☐ No

   C. Will sediment accumulate anywhere within the channel? ☐ Yes ☐ No

   D. Will deposition or scour occur at or near the inlet? ☐ Yes ☐ No

   E. Will deposition or scour occur at or near the outlet? ☐ Yes ☐ No

Attach documentation showing affects on the Hydrologic and Hydraulic analyses

FEDERAL EMERGENCY MANAGEMENT AGENCY **CHANNELIZATION 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 1.75 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 / Washoe Co.

Flooding Source: Whites Creek Branch "BC"

Project Name/Identifier: Double Diamond Ranch

1. EXTENT OF CHANNELIZATION

Downstream limit: at Inlet of detention basin

Upstream limit: at outlet of wetlands

2. CHANNEL DESCRIPTION

1. Describe the inlet to the channel Rock rip-rap lined drop structure

2. Briefly describe the shape of the channel *(both cross sectional and planimetric configuration)* and its lining *(channel bottom and sides)* 175' grassed Channel with 25' first flow notch 3:1 side slopes w/ flat bottom transitions to 150' grassed Channel with 5' elev increase from ℄ to toe (R) and (L) and 3:1 side slopes

3. Describe the outlet from the channel Rock-rip-rap lined drop structure

4. The channelization includes:

   - ☒ Levees *(Attach Levee Form)*
   - ☒ Drop structures
   - ☐ Superelevated sections
   - ☒ Transitions in cross sectional geometry
   - ☒ Debris basin/detention basin
   - ☐ Energy dissipater
   - ☐ Other ______

5. Attach the following:

   a. Certified engineering drawings showing channel alignment and locations of inlet, outlet, and items checked in item 4

   b. Typical cross sections and profiles of channel banks and invert

1. What is the 100-year discharge? .... 2020 to 4585 cfs

Do the cross sections in the hydraulic model match the typical cross sections in the plans? ☒ Yes ☐ No

3. Are the channel banks higher than the 100- year flood elevations everywhere? .... ☐ Yes ☒ No

4. Are the channel banks higher than the 100-year flood energy grade lines everywhere? .. ☐ Yes ☒ No

5. Is the land on both sides of the channel above the adjacent 100-year flood elevation at all points along the channel? .... ☐ Yes ☒ No

6. What is the range of freeboard? .... 0 - 1 feet

7. What is the range of the 100-year flood velocities? .... 1.22 - 7.22 ft/sec

8. What is the lining type? (both bottom and sides) grass lined / rip rap

Explain how the channel lining prevents erosion and maintains channel stability *(attach documentation)*
Grass is used to stabilize soils in channels with velocities between 5 and 6 fps and rip rap is used to reduce velocities to allowable levels

9. What is the design elevation in the channel based on?

☒ Subcritical flow
☐ Critical flow
☐ Supercritical flow
☐ Energy grade line

Is 100-year flood profile based on the above type of flow? .... ☒ Yes ☐ No

If no, explain: ______________________________

10. Is there the potential for a hydraulic jump at the following locations?

Inlet to channel .... ☐ Yes ☒ No
Outlet of channel .... ☐ Yes ☒ No
At Drop Structures .... ☐ Yes ☒ No
At Transitions .... ☐ Yes ☒ No
Other locations. Explain: ______________________________

If the answer to any of the above is yes, please explain how the hydraulic jump is controlled and the effects of the hydraulic jump on the stability of the channel.

Explain: ______________________________

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 and/or the capacity of the channel? ..... ☐ Yes ☒ No

B. Based on the conditions of the watershed and stream bed, is there a potential for sediment transport (including scour and deposition) to affect the 100-year water surface elevations and/or the capacity of the channel? .... ☐ Yes ☒ No

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

A. What is the estimated sediment (bed) load?
_______________cfs (attach gradation curve)

Explain method used to estimate load_______________________________________

____

____

____

____

B. Is the 100-year flood velocity anywhere within the channel less than the 100-year flood velocity of the inlet? ☐ Yes ☐ No

C. Will sediment accumulate anywhere within the channel? ☐ Yes ☐ No

D. Will deposition or scour occur at or near the inlet? ☐ Yes ☐ No

E. Will deposition or scour occur at or near the outlet? ☐ Yes ☐ No

Attach documentation showing affects on the Hydrologic and Hydraulic analyses

FEDERAL EMERGENCY MANAGEMENT AGENCY **CHANNELIZATION 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 1.75 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 / Washoe County

Flooding Source: Whites Creek Central Channel

Project Name/Identifier: Double Diamond Ranch

1. EXTENT OF CHANNELIZATION

Downstream limit: Confluence with Whites Creek "BC"

Upstream limit: Approximately 400' upstream of Carat Avenue

2. CHANNEL DESCRIPTION

1. Describe the inlet to the channel 350' x 600' collection basin

2. Briefly describe the shape of the channel *(both cross sectional and planimetric configuration)* and its lining *(channel bottom and sides)* 150' tw grassed channel w/ flat bottom and 4:1 side slopes

3. Describe the outlet from the channel Channel converges with whites Channel "BC"

4. The channelization includes:

   - ☐ Levees *(Attach Levee Form)*
   - ☐ Drop structures
   - ☐ Superelevated sections
   - ☐ Transitions in cross sectional geometry
   - ☐ Debris basin/detention basin
   - ☐ Energy dissipater
   - ☐ Other ________

5. Attach the following:

   a. Certified engineering drawings showing channel alignment and locations of inlet, outlet, and items checked in item 4

   b. Typical cross sections and profiles of channel banks and invert

3. HYDRAULIC CONSIDERATIONS

1. What is the 100-year discharge? .... 3000 cfs

Do the cross sections in the hydraulic model match the typical cross sections in the plans? ☒ Yes ☐ No

3. Are the channel banks higher than the 100- year flood elevations everywhere? .... ☒ Yes ☐ No

4. Are the channel banks higher than the 100-year flood energy grade lines everywhere? .. ☐ Yes ☒ No

5. Is the land on both sides of the channel above the adjacent 100-year flood elevation at all points along the channel? .... ☒ Yes ☐ No

6. What is the range of freeboard? .... 0.05' – 6.47 feet

7. What is the range of the 100-year flood velocities? .... 4.47 – 8.64 ft/sec

8. What is the lining type? (both bottom and sides) grass lined

Explain how the channel lining prevents erosion and maintains channel stability *(attach documentation)*
Grass is used to stabilize soils in channels with velocities between 5 and 6 fps

9. What is the design elevation in the channel based on?

☒ Subcritical flow
☐ Critical flow
☐ Supercritical flow
☐ Energy grade line

Is 100-year flood profile based on the above type of flow? .... ☒ Yes ☐ No

If no, explain:

10. Is there the potential for a hydraulic jump at the following locations?

Inlet to channel .... ☐ Yes ☒ No
Outlet of channel .... ☐ Yes ☒ No
At Drop Structures .... ☐ Yes ☒ No
At Transitions .... ☐ Yes ☒ No
Other locations. Explain:

If the answer to any of the above is yes, please explain how the hydraulic jump is controlled and the effects of the hydraulic jump on the stability of the channel.

Explain:

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 and/or the capacity of the channel? ..... ☐ Yes ☒ No

   B. Based on the conditions of the watershed and stream bed, is there a potential for sediment transport (including scour and deposition) to affect the 100-year water surface elevations and /or the capacity of the channel? .... ☐ Yes ☒ No

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

   A. What is the estimated sediment (bed) load?
   ____________cfs (attach gradation curve)

   Explain method used to estimate load________________________________

   ____

   ____

   ____

   ____

   B. Is the 100-year flood velocity anywhere within the channel less than the 100-year flood velocity of the inlet? ☐ Yes ☐ No

   C. Will sediment accumulate anywhere within the channel? ☐ Yes ☐ No

   D. Will deposition or scour occur at or near the inlet? ☐ Yes ☐ No

   E. Will deposition or scour occur at or near the outlet? ☐ Yes ☐ No

Attach documentation showing affects on the Hydrologic and Hydraulic analyses

FEDERAL EMERGENCY MANAGEMENT AGENCY
BRIDGE/CULVERT FORM

O.M.B. Burden No. 3067-0148
Expires July 31, 1997

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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 / Washoe Co

Flooding Source: Whites Creek Branch "BC"

Project Name/Identifier: Double Diamond Ranch

1. IDENTIFIER

1. Name of roadway, railroad, etc.: South Meadows Parkway
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): located between cross sections 89+18 and 90+35
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- 10 x 5 RCB's

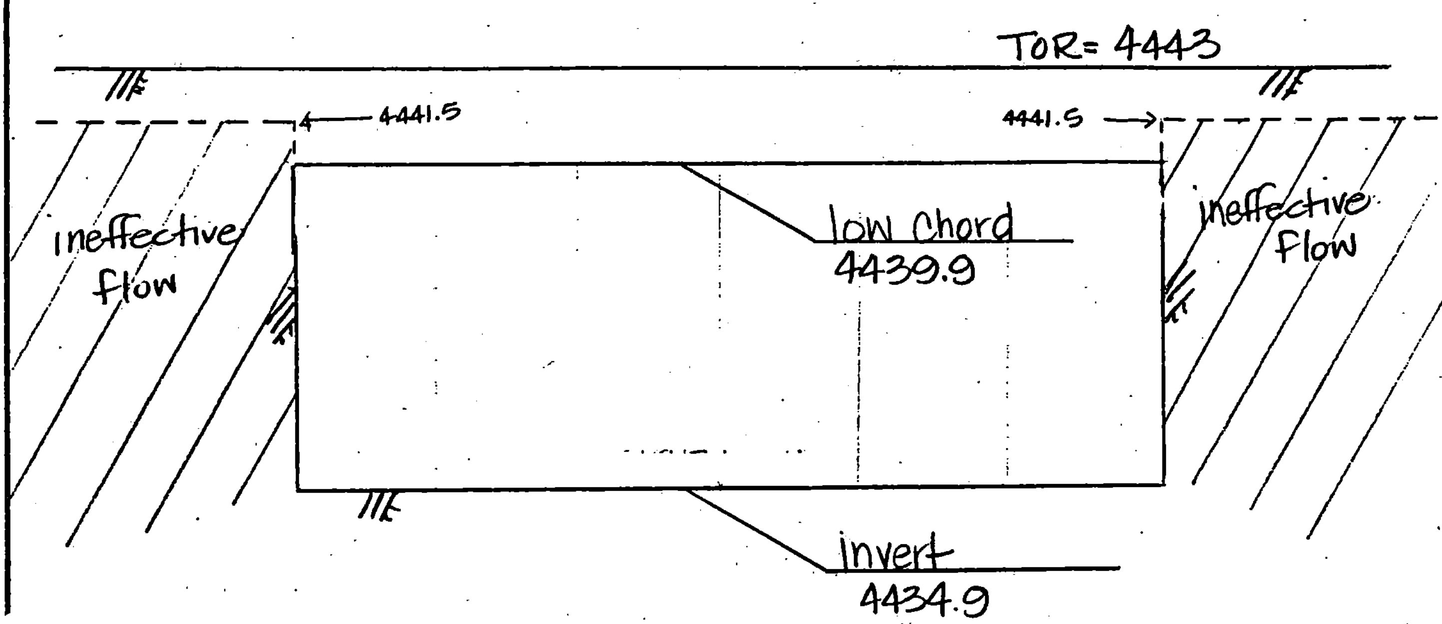
2. Entrance geometry of culvert/type of bridge opening (e.g. 30° - 75° wing walls with square top edge, sloping embankments and vertical abutments) FHWA Chart, scale number = 11.2

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

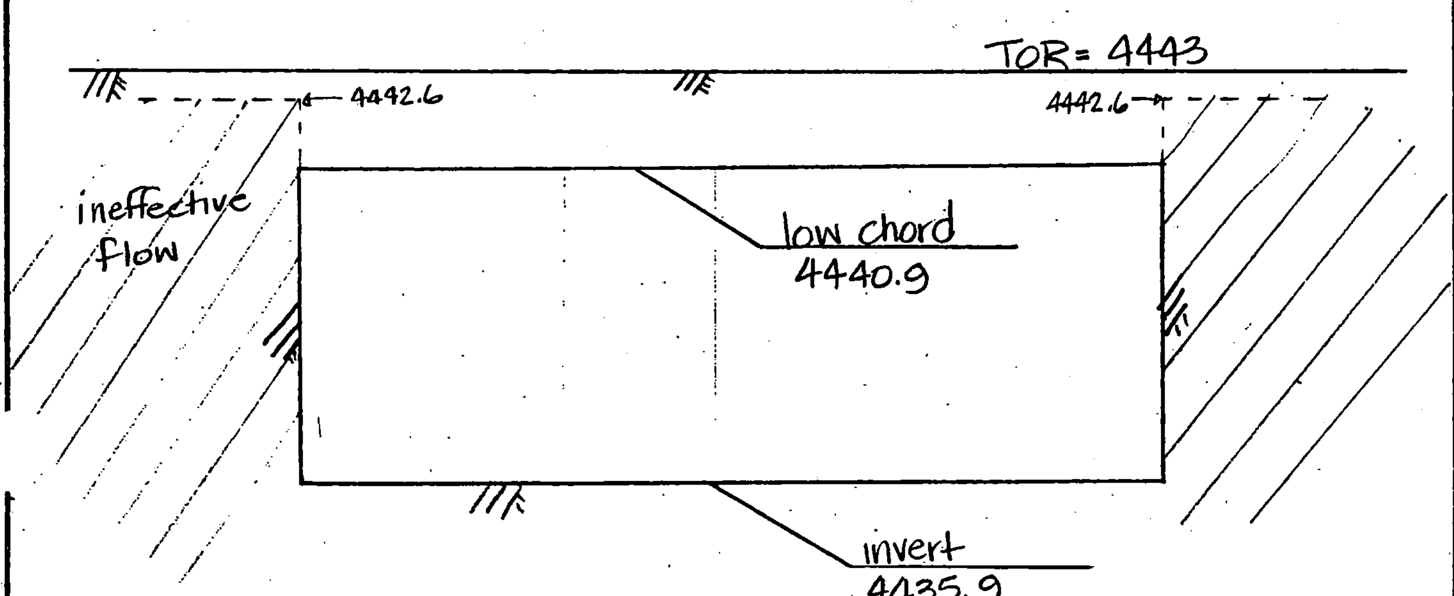
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

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

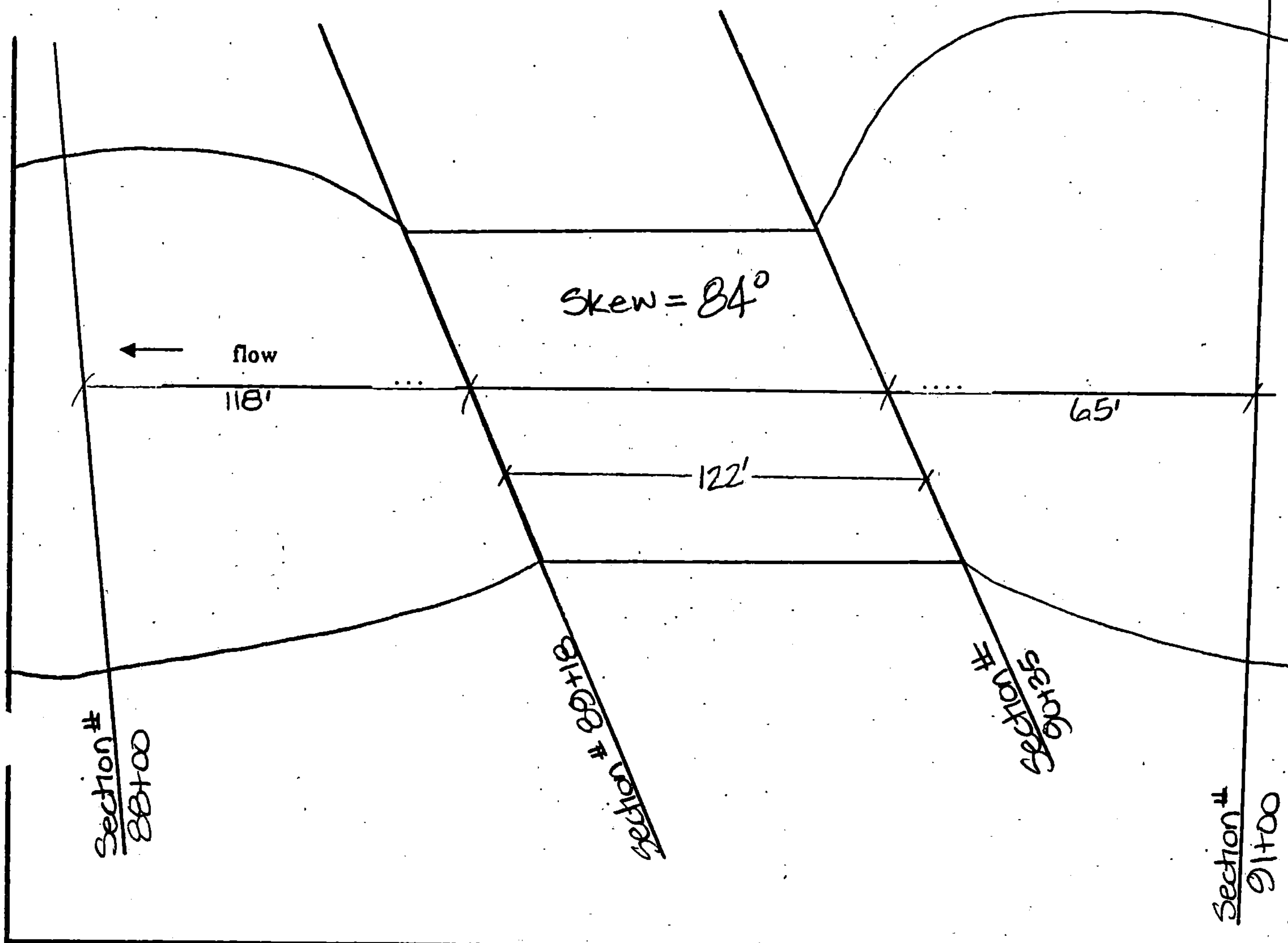
Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



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)	120ft
Calculated culvert/bridge area (ft²) by the hydraulic model, if applicable	300 ft²
Total culvert/bridge area (ft²)	300 ft²

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	4442.6	4442.6
Downstream face	4441.5	4441.5

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	4443	4443
Downstream face	4443	4443

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	4441.01	4441.46
Downstream face	4440.19	4440.60

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	2020	—	—	2020

The maximum depth of flow over the roadway/railroad (ft.) 0

Weir length (ft.) .... N/A

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	74.53	60'	N/A
Downstream face	74.80	60'	N/A

<u>Loss Coefficients</u>

Entrance loss coefficient	.4
Manning's "n" value assigned to the structure(s)	.013
Friction loss coefficient through structure (s)	
Other loss coefficients (e.g., bend manhole, etc.)	
Total loss coefficient	
Weir coefficient	
Pier coefficient	3.0
Contraction loss coefficient	.3
Expansion loss coefficient	.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) N/A

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **LEVEE/FLOODWALL SYSTEM ANALYSES 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 3.0. 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 / Washoe County

Flooding Source: Whites Creek "A" Channel

Project Name/Identifier: Double Diamond Ranch

REACH TO BE REVISED

Downstream limit: Confluence with Channel "BC"

Upstream limit: Outlet of Culvert at I-580

This Levee/Floodwall analysis is based on:

- ☐ upgrading of an existing levee/floodwall system
- ☒ a newly constructed levee/floodwall system
- ☐ reanalysis of an existing levee/floodwall system

LEVEE/FLOODWALL SYSTEM ELEMENTS

1. Levee elements and locations are:

- ☒ earthen embankment, dike, berm etc. Station 10+35 to 18+20; 21+00 to 47+50; 55+50 to 79+12
- ☒ structural floodwall Station 18+20 to 21+00
- ☐ other (describe)______ Station______ to______

Structural Type:

- ☐ monolithic cast-in place reinforced concrete
- ☐ reinforced concrete masonry block
- ☐ sheet piling
- ☒ other (describe) rock rip-rap

2. Has this levee/floodwall system been certified by a Federal agency to provide protection against the 100-year flood event?

☐ Yes ☒ No

If yes, by which agency?______

If yes, complete only the interior drainage section on pages 7 and 8 of this form and the operation and maintenance section of Revision Requestor and Community Official Form.

3. Attach certified drawings containing the following information (indicate drawing sheet numbers):

a. Plan of the levee embankment and floodwall structures. Sheet Numbers A1-A6

b. A profile of the levee/floodwall system showing the 100-year water surface elevations, levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers A1- A6

c. A profile of the 100-year water surface elevation, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure device. Sheet Numbers A1-A6

d. A layout detail for the embankment protection measures. Sheet Numbers *

e. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers *

FREEBOARD

* See CLOMR for berm details

1. The minimum freeboard provided above the 100-year water surface elevation is:

Riverine

3.0 feet or more at the downstream end and throughout ☐ Yes ☐ No
3.5 feet or more at the upstream end ☐ Yes ☐ No
4.0 feet immediately upstream and downstream of all structures and constrictions ☐ Yes ☐ No

Coastal

1.0 foot above the height of the one percent wave for the 100-year stillwater surge elevation or maximum wave runup (whichever is greater). N/A ☐ Yes ☐ No

2.0 feet above 100-year stillwater surge elevation ☐ Yes ☐ No

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Part 65.10 (b) (1) (ii) of the National Flood Insurance Program regulations.

If no is answered to any of the above, please explain where and why: Please see "As-Built" section of Report Text

2. Is there an indication from historical records that ice-jamming can effect the 100-year water surface elevation?
☐ Yes ☒ No If yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Tabulate the elevations at critical locations (tabulate values at each levee crest grade change)

Station	Location	100-Year Water Surface Elevation	Levee Crest	Freeboard (ft.)
18+40	Upper end	79.85	4484.8	4.95
19+30	↓	79.74	4484.3	4.56
19+80	↓	79.69	4483.6	3.91
21+00	↓	79.35	4483.1	3.75
23+50	↓	78.75	4482.2	3.45
26+00	Lower end	78.16	4481.6	3.44

(Extend table on an added sheet as needed and reference)

3. Attach certified drawings containing the following information (indicate drawing sheet numbers):

a. Plan of the levee embankment and floodwall structures. Sheet Numbers A1-A6

b. A profile of the levee/floodwall system showing the 100-year water surface elevations, levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers A1- A6

c. A profile of the 100-year water surface elevation, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure device. Sheet Numbers A1-A6

d. A layout detail for the embankment protection measures. Sheet Numbers *

e. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers *

FREEBOARD

* See CLOMR for berm details

1. The minimum freeboard provided above the 100-year water surface elevation is:

Riverine

3.0 feet or more at the downstream end and throughout ☐ Yes ☐ No
3.5 feet or more at the upstream end ☐ Yes ☐ No
4.0 feet immediately upstream and downstream of all structures and constrictions ☐ Yes ☐ No

Coastal

1.0 foot above the height of the one percent wave for the 100-year stillwater surge elevation or maximum wave runup (whichever is greater). N/A ☐ Yes ☐ No

2.0 feet above 100-year stillwater surge elevation ☐ Yes ☐ No

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Part 65.10 (b) (1) (ii) of the National Flood Insurance Program regulations.

If no is answered to any of the above, please explain where and why: Please see "As-Built" section of Report Text

2. Is there an indication from historical records that ice-jamming can effect the 100-year water surface elevation? ☐ Yes ☒ No If yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Tabulate the elevations at critical locations (tabulate values at each levee crest grade change)

Station	Location	100-Year Water Surface Elevation	Levee Crest	Freeboard (ft.)
29+00	Upper end	77.37	4480.8	3.43
31+50	↓	76.73	4480.0	3.27
34+00	↓	76.16	4479.7	3.54
37+00	↓	75.14	4479.2	4.06
39+50	↓	73.64	4478.4	4.76
40+50	Lower end	72.38	4477.5	5.12

(Extend table on an added sheet as needed and reference)

3. Attach certified drawings containing the following information (indicate drawing sheet numbers):

a. Plan of the levee embankment and floodwall structures. Sheet Numbers A1-A6

b. A profile of the levee/floodwall system showing the 100-year water surface elevations, levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers A1- A6

c. A profile of the 100-year water surface elevation, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure device. Sheet Numbers A1-A6

d. A layout detail for the embankment protection measures. Sheet Numbers *

e. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers *

FREEBOARD

* See CLOMR for berm details

1. The minimum freeboard provided above the 100-year water surface elevation is:

Riverine

3.0 feet or more at the downstream end and throughout ☐ Yes ☐ No
3.5 feet or more at the upstream end ☐ Yes ☐ No
4.0 feet immediately upstream and downstream of all structures and constrictions ☐ Yes ☐ No

Coastal

1.0 foot above the height of the one percent wave for the 100-year stillwater surge elevation or maximum wave runup (whichever is greater). N/A ☐ Yes ☐ No

2.0 feet above 100-year stillwater surge elevation ☐ Yes ☐ No

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Part 65.10 (b) (1) (ii) of the National Flood Insurance Program regulations.

If no is answered to any of the above, please explain where and why: Please see "As-Built" section of Report Text

2. Is there an indication from historical records that ice-jamming can effect the 100-year water surface elevation? ☐ Yes ☒ No If yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Tabulate the elevations at critical locations (tabulate values at each levee crest grade change)

Station	Location	100-Year Water Surface Elevation	Levee Crest	Freeboard (ft.)
44+50	Upper end	66.41	70.1	3.69
47+50	↓	63.26	67.1	3.84
55+50	↓	56.68	60.5	3.82
57+50	Lower end	54.34	~~44~~ 59.9	5.56

(Extend table on an added sheet as needed and reference)

3. Attach certified drawings containing the following information (indicate drawing sheet numbers):

a. Plan of the levee embankment and floodwall structures. Sheet Numbers A1-A6

b. A profile of the levee/floodwall system showing the 100-year water surface elevations, levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers A1- A6

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d. A layout detail for the embankment protection measures. Sheet Numbers *

e. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers *

FREEBOARD

* See CLOMR for berm details

1. The minimum freeboard provided above the 100-year water surface elevation is:

Riverine

3.0 feet or more at the downstream end and throughout ☐ Yes ☐ No
3.5 feet or more at the upstream end ☐ Yes ☐ No
4.0 feet immediately upstream and downstream of all structures and constrictions ☐ Yes ☐ No

Coastal

1.0 foot above the height of the one percent wave for the 100-year stillwater surge elevation or maximum wave runup (whichever is greater). N/A ☐ Yes ☐ No

2.0 feet above 100-year stillwater surge elevation ☐ Yes ☐ No

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Part 65.10 (b) (1) (ii) of the National Flood Insurance Program regulations.

If no is answered to any of the above, please explain where and why: Please see "As-Built" section of Report Text

2. Is there an indication from historical records that ice-jamming can effect the 100-year water surface elevation?
☐ Yes ☒ No If yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Tabulate the elevations at critical locations (tabulate values at each levee crest grade change)

Station	Location	100-Year Water Surface Elevation	Levee Crest	Freeboard (ft.)
59+30	Upper end	4453.13	4459.5	6.37
62+30	↓	4452.23	4458.0	5.77
65+10	↓	4451.58	4455.8	4.22
68+10	↓	4450.25	4454.5	4.25
70+90	↓	4449.02	4454.3	5.28
73+60	Lower end	4448.07	4453.1	5.03

(Extend table on an added sheet as needed and reference)

3. Attach certified drawings containing the following information (indicate drawing sheet numbers):

a. Plan of the levee embankment and floodwall structures. Sheet Numbers A1-A6

b. A profile of the levee/floodwall system showing the 100-year water surface elevations, levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers A1-A6

c. A profile of the 100-year water surface elevation, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure device. Sheet Numbers A1-A6

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e. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers *

FREEBOARD

* See CLOMR for berm details

1. The minimum freeboard provided above the 100-year water surface elevation is:

Riverine

3.0 feet or more at the downstream end and throughout ☐ Yes ☐ No
3.5 feet or more at the upstream end ☐ Yes ☐ No
4.0 feet immediately upstream and downstream of all structures and constrictions ☐ Yes ☐ No

Coastal

1.0 foot above the height of the one percent wave for the 100-year stillwater surge elevation or maximum wave runup (whichever is greater). N/A ☐ Yes ☐ No

2.0 feet above 100-year stillwater surge elevation ☐ Yes ☐ No

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Part 65.10 (b) (1) (ii) of the National Flood Insurance Program regulations.

If no is answered to any of the above, please explain where and why: Please see "As-Built" section of Report Text

2. Is there an indication from historical records that ice-jamming can effect the 100-year water surface elevation? ☐ Yes ☒ No If yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Tabulate the elevations at critical locations (tabulate values at each levee crest grade change)

Station	Location	100-Year Water Surface Elevation	Levee Crest	Freeboard (ft.)
75+60	Upper end	4447.75	4451.7	3.95
78+00	↓	4447.38	4450.5	3.12
79+12	↓	4445.58	4450.7	5.12
	Lower end			

(Extend table on an added sheet as needed and reference)

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 the freeboard for the levee/floodwall?

☐ 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 along the levee/floodwall (such as along any bends in the channel)?

☐ Yes ☐ No

If yes, what is the minimum freeboard at these locations?_______________feet.

CLOSURES

1. Openings through the levee system:

☐ exist ☒ do not exist

If openings exist, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as neded and reference)

Geotechnical and geologic data:

In addition to the required detail analysis reports, data obtained during field and laboratory investigations and used in the design analysis should be submitted in a tabulated summary form for the following levee system features . (Reference U.S. Army Corps of Engineers EM-1110-2-1906 Form 2086).

1. Identify locations and describe the basis for selection of critical locations for analyses:________________

____

☐ Overall height: Sta______________, height_________________ft.

☐ Limiting foundation soil strength:

Sta_________________, depth___________________to_________________

strength $\varnothing$ = ___________degrees, c = ______________psf

☐ slope: SS = ____________(h) to_______________(v)

(Repeat as needed on an added sheet for additional slopes and locations)

2. Specify the embankment stability analyses methodology used (e.g. circular arc, sliding block, infinite slope, etc.):____

____

3. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction	__________	1.3
II	Sudden drawdown	__________	1.0
III	Critical flood stage	__________	1.4
IV	Steady seepage at flood stage	__________	1.4
VI	Earthquake (Case I)	__________	1.0

(Reference: U.S. Army Corps of Engineers EM-1110-2-1913 Table 6-1)

4. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

Describe methodology used:_____________________________________

____

5. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

6. The duration of 100-year flood hydrograph against the embankment is____________Hrs.

<u>Note</u>: Attach engineering analysis to support construction plans.

1. Identify locations and describe the basis for selection of critical locations for analyses: Various locations - Channel, mostly in cut - Condition 1

☐ Overall height: Sta ______, height 5 ft.

☐ Limiting foundation soil strength:

Sta ______, depth 0 to 1

strength Ø = 0 degrees, c = 300 psf

☐ slope: SS = 3 (h) to 1 (v)

(Repeat as needed on an added sheet for additional slopes and locations)

2. Specify the embankment stability analyses methodology used (e.g. circular arc, sliding block, infinite slope, etc.): Circular arc

3. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction	3.0	1.3
II	Sudden drawdown	3.1	1.0
III	Critical flood stage	5.2	1.4
IV	Steady seepage at flood stage	Not evaluated	1.4
VI	Earthquake (Case I)	1.1	1.0

(Reference: U.S. Army Corps of Engineers EM-1110-2-1913 Table 6-1)

4. Was a seepage analysis for the embankment performed? ☒ Yes ☐ No

Describe methodology used: Flow net

5. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

6. The duration of 100-year flood hydrograph against the embankment is ______ Hrs.

Note: Attach engineering analysis to support construction plans.

EMBANKMENT AND FOUNDATION STABILITY

1. Identify locations and describe the basis for selection of critical locations for analyses:
Various locations - Levee is composed of fill - Condition 2

☐ Overall height: Sta ______, height 6 ft.

☐ Limiting foundation soil strength:

Sta ______, depth 6 to Bottom

strength Ø = 0 degrees, c = 300 psf

☐ slope: SS = 3 (h) to 1 (v)

(Repeat as needed on an added sheet for additional slopes and locations)

2. Specify the embankment stability analyses methodology used (e.g. circular arc, sliding block, infinite slope, etc.): Circular arc

3. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction	2.7	1.3
II	Sudden drawdown	3.0	1.0
III	Critical flood stage	5.3	1.4
IV	Steady seepage at flood stage	3.3	1.4
VI	Earthquake (Case I)	1.4	1.0

(Reference: U.S. Army Corps of Engineers EM-1110-2-1913 Table 6-1)

4. Was a seepage analysis for the embankment performed? ☒ Yes ☐ No

Describe methodology used: Flow net

5. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

6. The duration of 100-year flood hydrograph against the embankment is ______ Hrs.

Note: Attach engineering analysis to support construction plans.

1. Identify locations and describe the basis for selection of critical locations for analyses: Various locations. Condition 2 with fill on land side - Condition 3

- ☐ Overall height: Sta ______, height 6 ft.
- ☐ Limiting foundation soil strength:
  - Sta ______, depth 6 to Bottom
  - strength $\varnothing$ = 0 degrees, c = 300 psf
- ☐ slope: SS = 3 (h) to 1 (v)

(Repeat as needed on an added sheet for additional slopes and locations)

2. Specify the embankment stability analyses methodology used (e.g. circular arc, sliding block, infinite slope, etc.): Circular arc

3. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction	2.6	1.3
II	Sudden drawdown	3.0	1.0
III	Critical flood stage	5.2	1.4
IV	Steady seepage at flood stage	Not evaluated	1.4
VI	Earthquake (Case I)	1.4	1.0

(Reference: U.S. Army Corps of Engineers EM-1110-2-1913 Table 6-1)

4. Was a seepage analysis for the embankment performed? ☑ Yes ☐ No

   Describe methodology used: Flow net

5. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

   Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

   Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

6. The duration of 100-year flood hydrograph against the embankment is ______ Hrs.

Note: Attach engineering analysis to support construction plans.

1. Identify locations and describe the basis for selection of critical locations for analyses: Various locations - Rip-rap on native soils in cut - Condition 4

☐ Overall height: Sta ____________, height 6 ft.

☐ Limiting foundation soil strength:

Sta ____________, depth 0 to Bottom

strength Ø = 0 degrees, c = 300 psf

☐ slope: SS = ____________ (h) to ____________ (v)

(Repeat as needed on an added sheet for additional slopes and locations)

2. Specify the embankment stability analyses methodology used (e.g. circular arc, sliding block, infinite slope, etc.): Circular arc

3. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction	2.1	1.3
II	Sudden drawdown	2.1	1.0
III	Critical flood stage	2.2	1.4
IV	Steady seepage at flood stage	Not evaluated	1.4
VI	Earthquake (Case I)	1,0	1.0

(Reference: U.S. Army Corps of Engineers EM-1110-2-1913 Table 6-1)

4. Was a seepage analysis for the embankment performed? ☒ Yes ☐ No

Describe methodology used: Flow net

5. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

6. The duration of 100-year flood hydrograph against the embankment is ____________ Hrs.

Note: Attach engineering analysis to support construction plans.

1. Identify locations and describe the basis for selection of critical locations for analyses: Various locations - Levee half in cut, half in fill - Condition 5

☐ Overall height: Sta ______, height 5.5 ft.

☐ Limiting foundation soil strength:

Sta ______, depth 2.50 to Bottom

strength Ø = 0 degrees, c = 300 psf

☐ slope: SS = 3 (h) to 1 (v)

(Repeat as needed on an added sheet for additional slopes and locations)

2. Specify the embankment stability analyses methodology used (e.g. circular arc, sliding block, infinite slope, etc.): Circular arc

3. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction	2.8	1.3
II	Sudden drawdown	3.1	1.0
III	Critical flood stage	5.7	1.4
IV	Steady seepage at flood stage	3.3	1.4
VI	Earthquake (Case I)	1.2	1.0

(Reference: U.S. Army Corps of Engineers EM-1110-2-1913 Table 6-1)

4. Was a seepage analysis for the embankment performed? ☒ Yes ☐ No

Describe methodology used: Flow net

5. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

6. The duration of 100-year flood hydrograph against the embankment is ______ Hrs.

Note: Attach engineering analysis to support construction plans.

1. Identify locations and describe the basis for selection of critical locations for analyses: Various locations - Condition 5 with land side filled - Condition 6

☐ Overall height: Sta ________, height 5.5 ft.

☐ Limiting foundation soil strength:

Sta ________, depth 2.50 to Bottom

strength Ø = 0 degrees, c = 300 psf

☐ slope: SS = 3 (h) to 1 (v)

(Repeat as needed on an added sheet for additional slopes and locations)

2. Specify the embankment stability analyses methodology used (e.g. circular arc, sliding block, infinite slope, etc.): Circular arc

3. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction	2.7	1.3
II	Sudden drawdown	3.1	1.0
III	Critical flood stage	5.7	1.4
IV	Steady seepage at flood stage	Not evaluated	1.4
VI	Earthquake (Case I)	1.2	1.0

(Reference: U.S. Army Corps of Engineers EM-1110-2-1913 Table 6-1)

4. Was a seepage analysis for the embankment performed? ☒ Yes ☐ No

Describe methodology used: Flow net

5. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

6. The duration of 100-year flood hydrograph against the embankment is ________ Hrs.

Note: Attach engineering analysis to support construction plans.

SETTLEMENT

1. Anticipated potential settlement has been determined and incorporated into the specified construction elevations to maintain the established freeboard margin.
   XX Yes ☐ No

2. The computed range of settlement is 0 ft. to .12 ft.

3. Settlement of the levee crest is determined to be primarily from:

   ☒ Foundation consolidation.
   ☐ Embankment compression
   ☐ Other (describe) ____________________

4. Differential settlement of floodwalls

   ☐ has ☐ has not been accommodated in the structural design and construction.

Note: Attach engineering analysis to support construction plans.

INTERIOR DRAINAGE

1. Specify size of each interior watershed N/A

   Draining to pressure conduit ____________________

   Draining to ponding area ____________________

2. Relationships Established

   Ponding elevation vs. storage ☐ Yes ☐ No
   Ponding elevation vs. gravity flow ☐ Yes ☐ No
   Differential head vs. gravity flow ☐ Yes ☐ No

3. The river flow duration curve is enclosed ☐ Yes ☐ No

4. Specify the discharge capacity of the head pressure conduit ____________________

5. Which Flooding Conditions Were Analyzed?

   - Gravity flow (Interior Watershed) ☐ Yes ☐ No
   - Common storm (River Watershed) ☐ Yes ☐ No
   - Historical ponding probability ☐ Yes ☐ No
   - Coastal wave overtopping ☐ Yes ☐ No

   If no, explain why: ____________________

6. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection.
   ☐ Yes ☐ No

   If no, explain why: ____________________

7. The rate of seepage through the levee system for the 100-year flood is ____________________ cfs

Notes-South Meadows Channel Settlement Analysis

From B1: Geotechnical Investigation South Meadows Parkway Extension
Using Soils and Foundations Workshop Manual - Second Edition # FHWA HI-88-009
Beginning Page 164

Layer	H	N	Po	N'/N	N'	PressCoef	C'	Delta P*	F1=H/C"	F2=Log((Po+DeltaP)/Po)	DeltaH=F1*F2
1	3	19	221.4	2	38	1	65	708	0.05	0.62	0.029
2	5	4	475.8	2	8	1	25	708	0.20	0.40	0.079
3	5	32	793.8	1.3	41.6	0.8	70	566.4	0.07	0.23	0.017
										Settlement in feet	0.125
										Settlement in inches	1.50

Perssure Coefficient from page 1 Figure 11

Settlement estimated to be less than 1 1/2 inches
In conversation with Dr. Gary Norris of UNR in regards to settlement of nearby 20 ft high Highway Fill
Settlement was essientually complete with in a few days of fill completion -- therefore
settlement of this fill should be within a short time of fill completion

Notes-South Meadows Channel Stability Analysis

Soil Samples from Test Pits for Preliminary
Geotechnical Investigation 768 Acre Single-Family Residential Project dated May, 1995

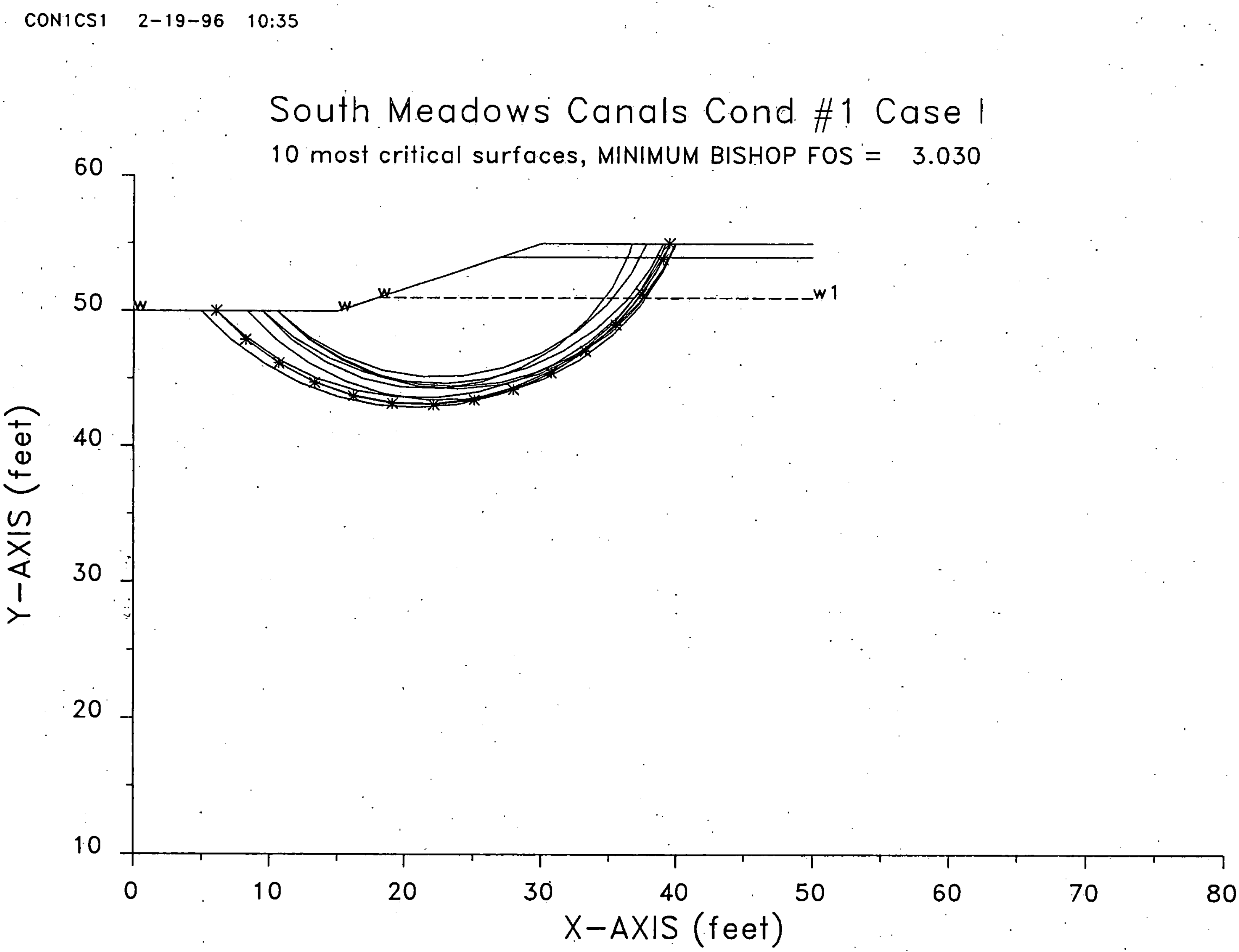
Test Pit #	passing#200	LL	PI	Moisture Cont.
67	52	46	25	26.6
14	26	26	2	20.1
20	44	28	6	22.2
56	68	34	15	28.8
40	77	49	29	30.9
35	6	0	0	9.2
36	57	45	25	27.4
avg	47	33	15	23.6
Std Dev	24	17	12	7.4
- Std Dev	23	16	3	16
+Std Dev	72	50	27	31

For Fill with: > #200 = "23 to 72 LL= 16 to 50 PI = 3 to 27
These are SM, SC and CL soils
From Table 1 Typical Properties of Compacted Soil - NAVFAC DM - 7.2 Dated May, 1982 - Worst Case Condition
Cohesion(saturated) = 230 psf
PHI = 28 degrees

For Native Soils with
N= 4 at 5' in boring 13 from Geotechnical Investigation South Meadows Parkway Extension
This represents an worst case in comparing all the borings
> #200 = "23 to 72 LL= 16 to 50 PI = 3 to 27
These are SM, SC and CL soils
From Figure 3-2 in EM 1110-2-1913 on page 3-7 for native soils
For PI = 27 PHI = 25 degrees
From Figure 4 DM-7.1 page 7.1-88 CL - ML Soils for N=4
Qu = 600 psf for c=1/2 Qu c= 300 psf
For Case I condition right after construction with pore pressure
c= 300 psf PHI = 0 degrees
For Case II, III, IV and VI conditons after reduction of pore pressure
PHI = 25 degrees c=Qu/2*(1-tan(PHI))
= 160 psf

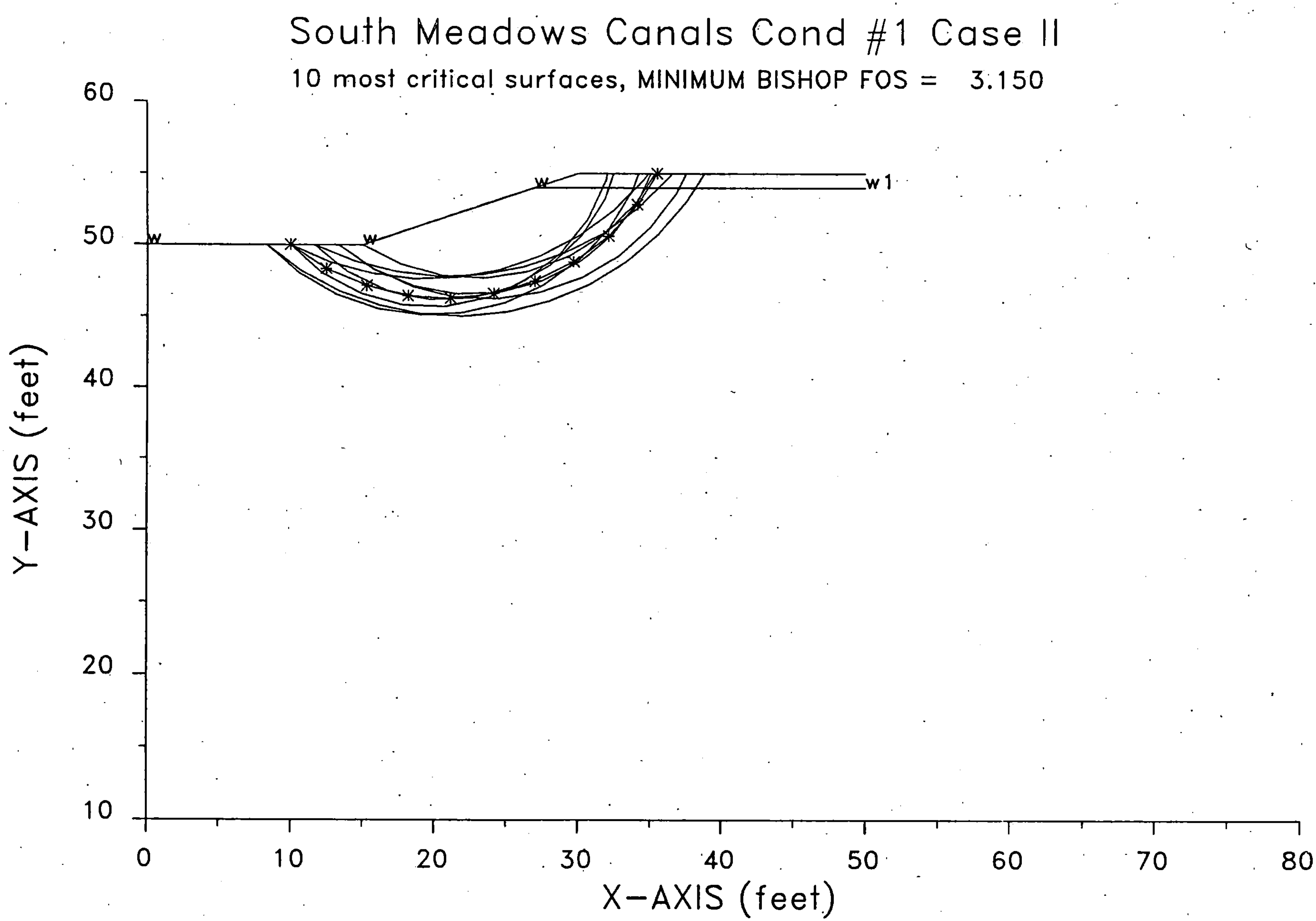
From Records during Construction of Levees

Dry Unit Weight of Fill GammaDry = 90.6 to 99.6 lbs/cu.ft. use 95
Moisture Cont MC= 27 to 21 percent
Moist Unit Weight GammaMoist= GammaDry*(1+MC)
= 115 to 121 lbs/cu.ft. use 118
From Table 6 DM-7.1 page 7.1-22 Mixed Soils -Sandy or Silty Clay
Void Ratio
eMax = 1.8 eMin = 0.25
for Dry Unit Weights of GammaMin= 60 GammaMax= 135 lbs/cu.ft.
so: e=(eMax-eMin)/(GammaMax-GammaMin)*(GammaDry-GammaMin)+eMin
= 0.97
Saturated Unit Weight = GammaDry+(e/(1+e))*62.4
= 126 lbs/cu.ft.



CON1CS1 2-19-96 10:35
South Meadows Canals Cond #1 Case I
10 most critical surfaces, MINIMUM BISHOP FOS = 3.030
w1
Y-AXIS (feet)
X-AXIS (feet)
60
50
40
30
20
10
0
10
20
30
40
50
60
70
80

CON1CS2 2-17-96 11:56



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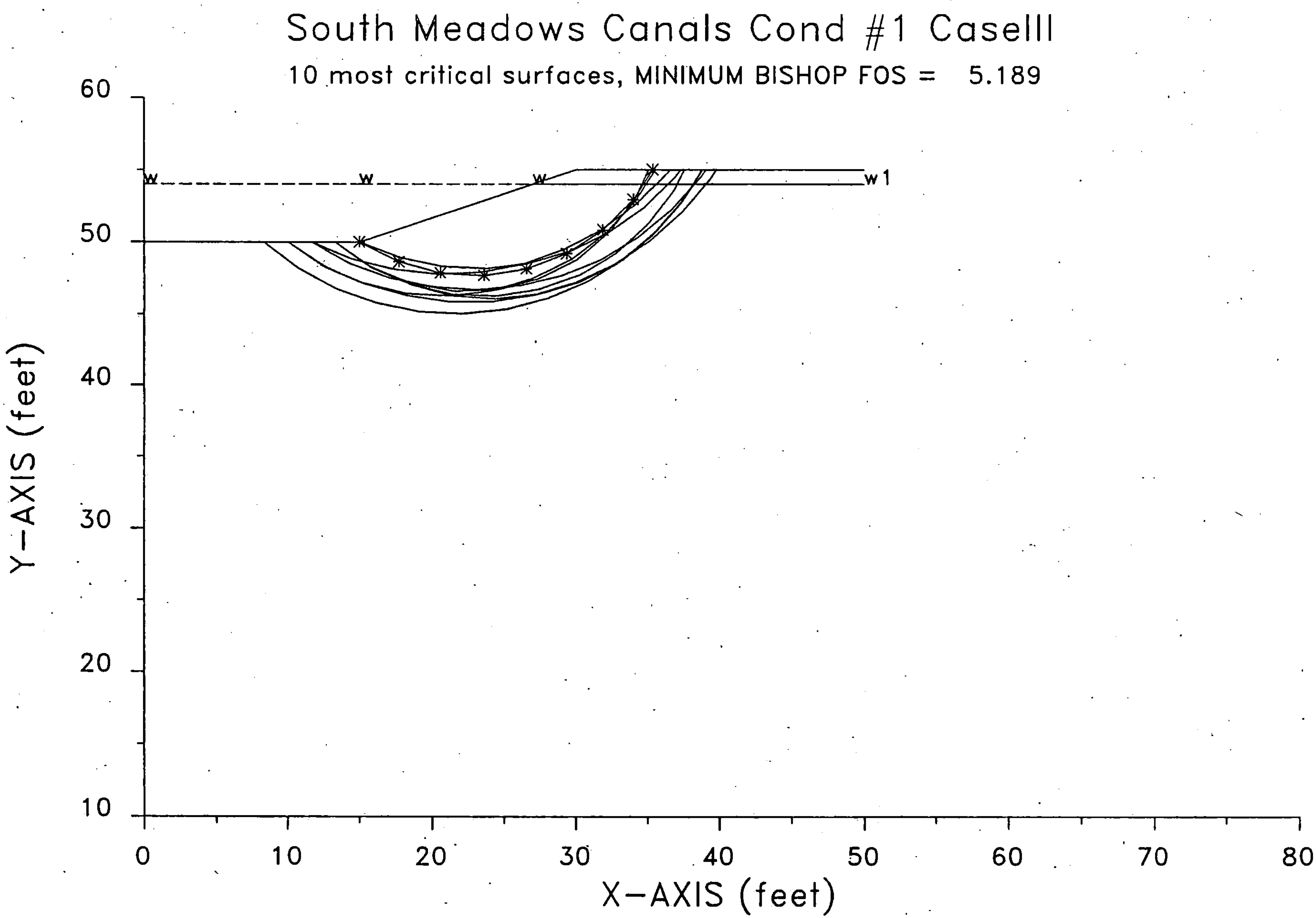

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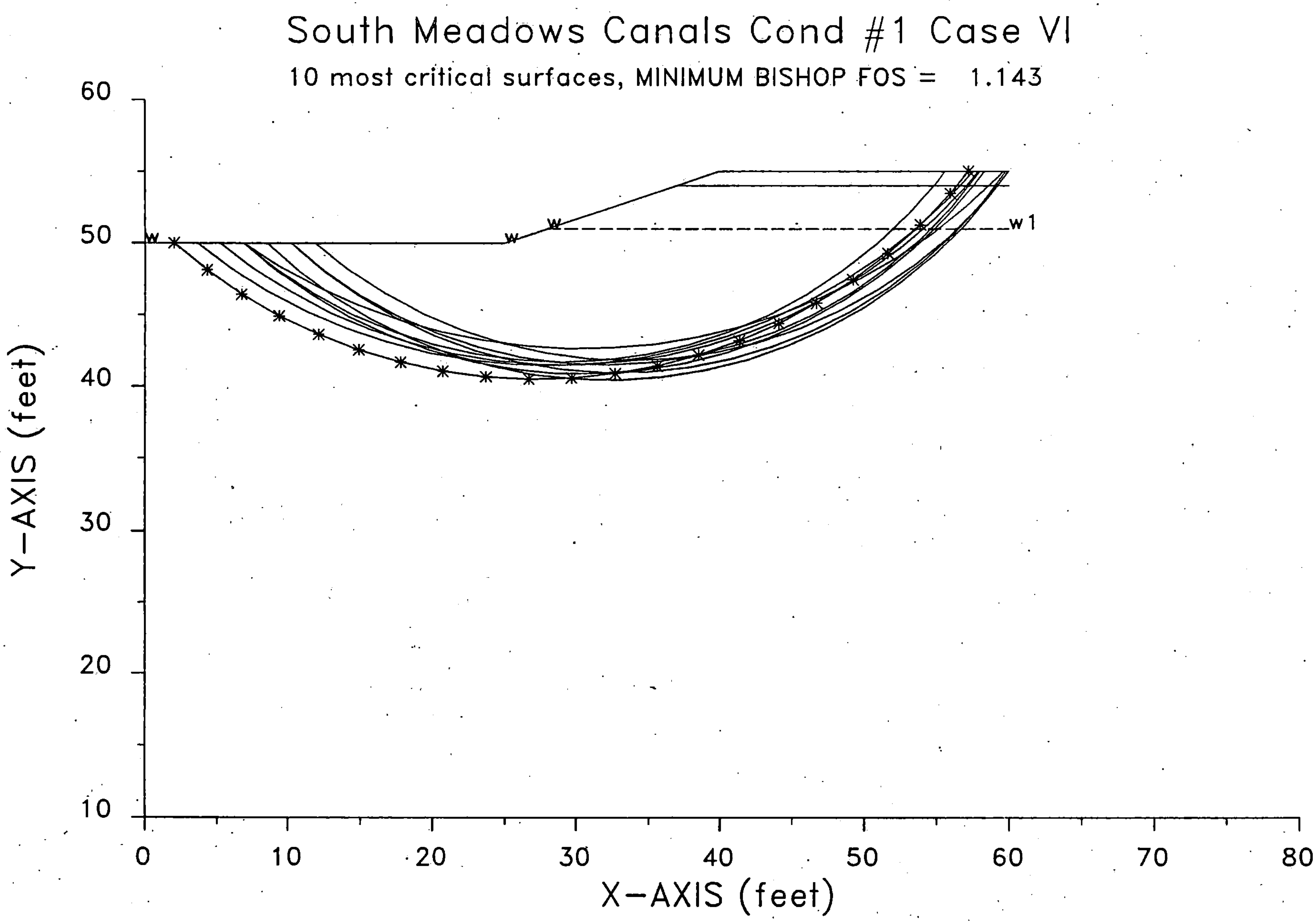

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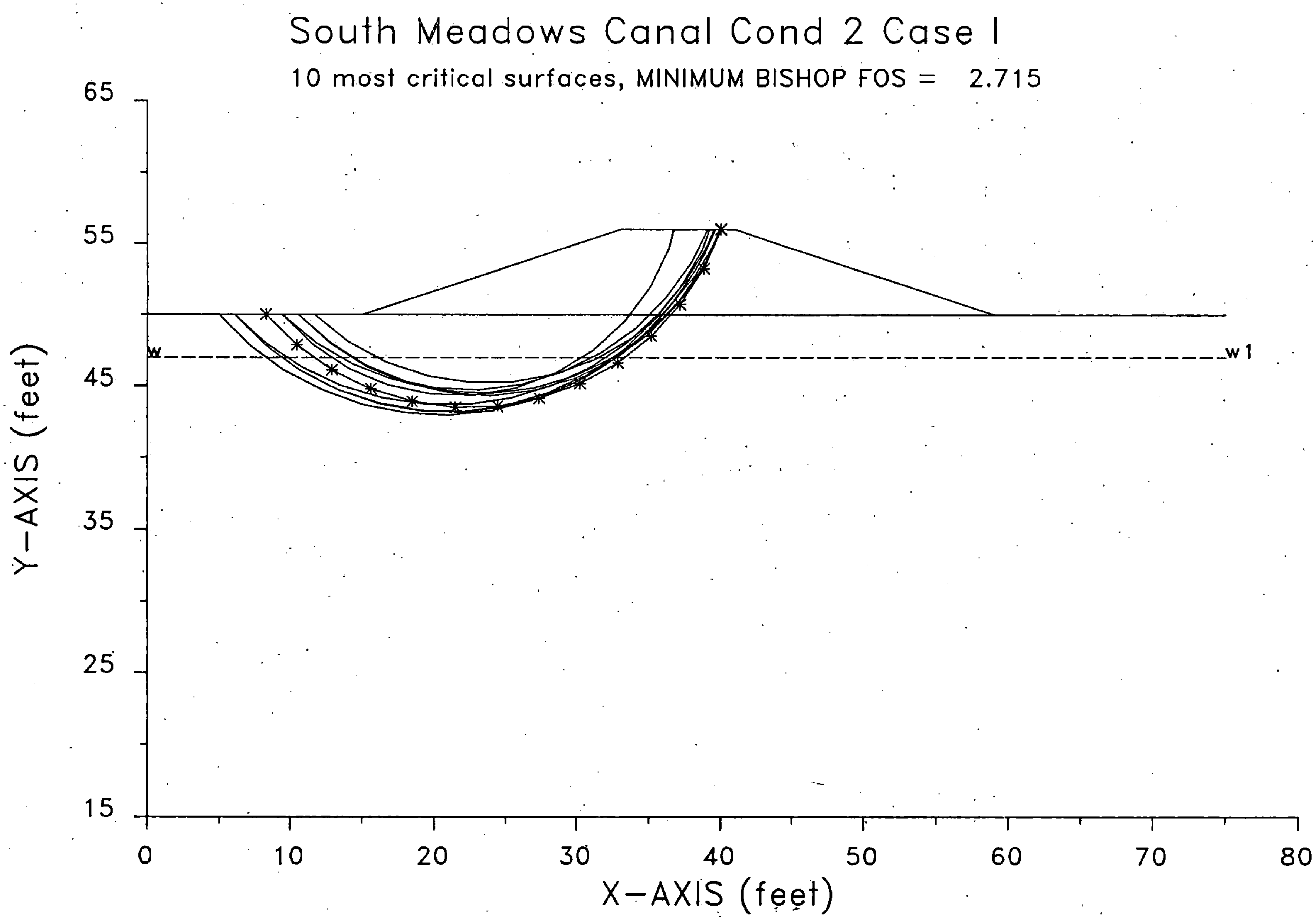

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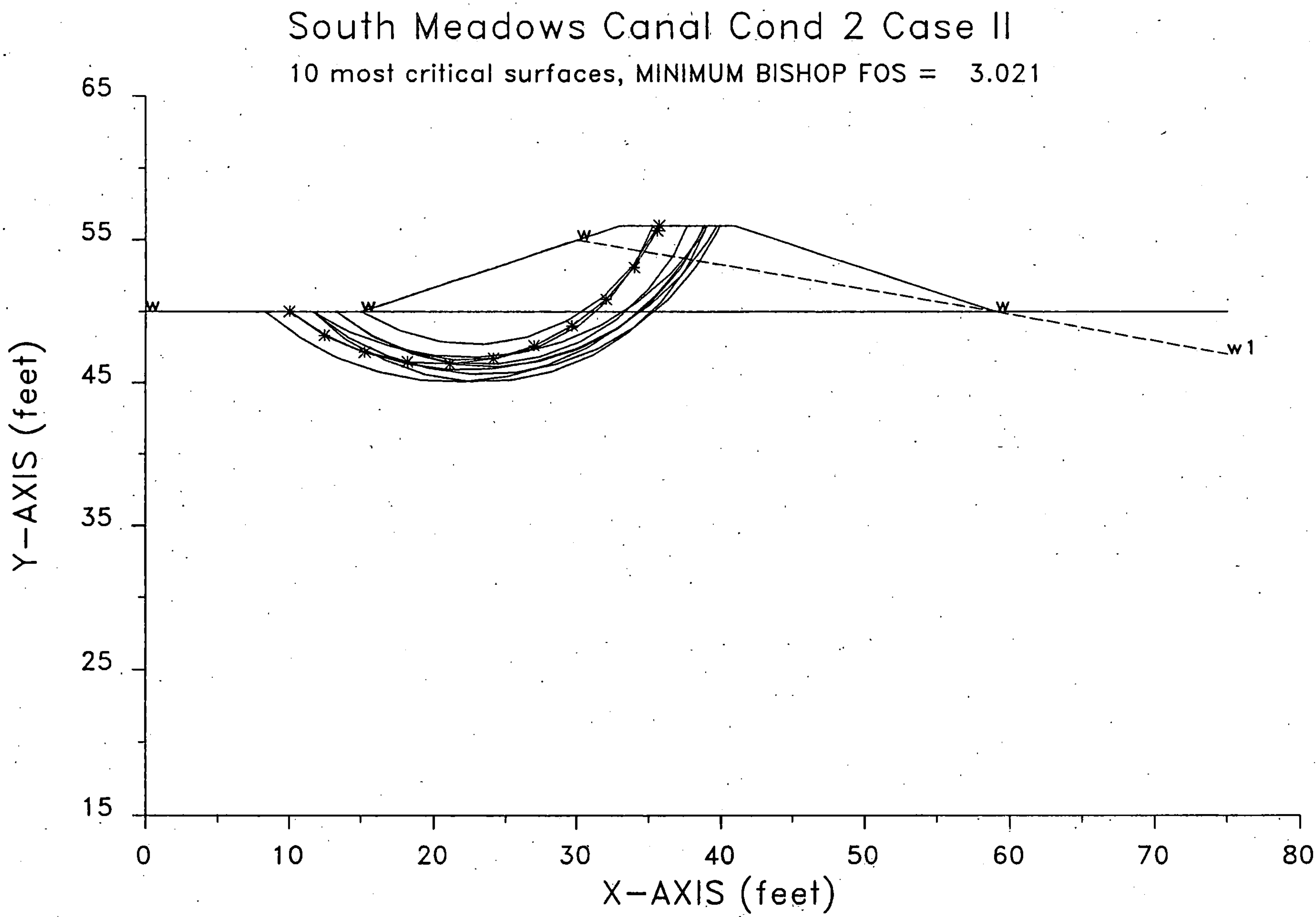

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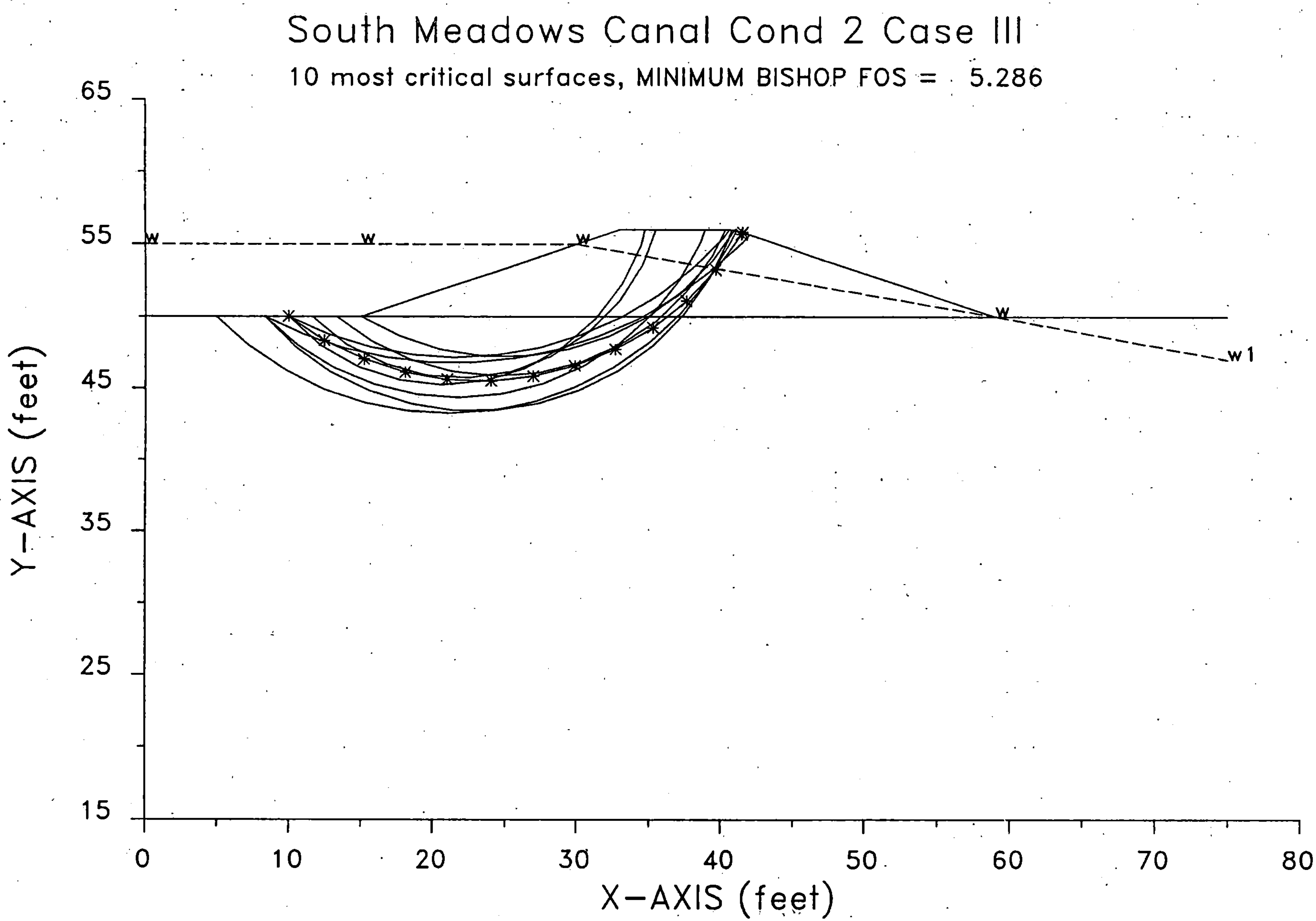

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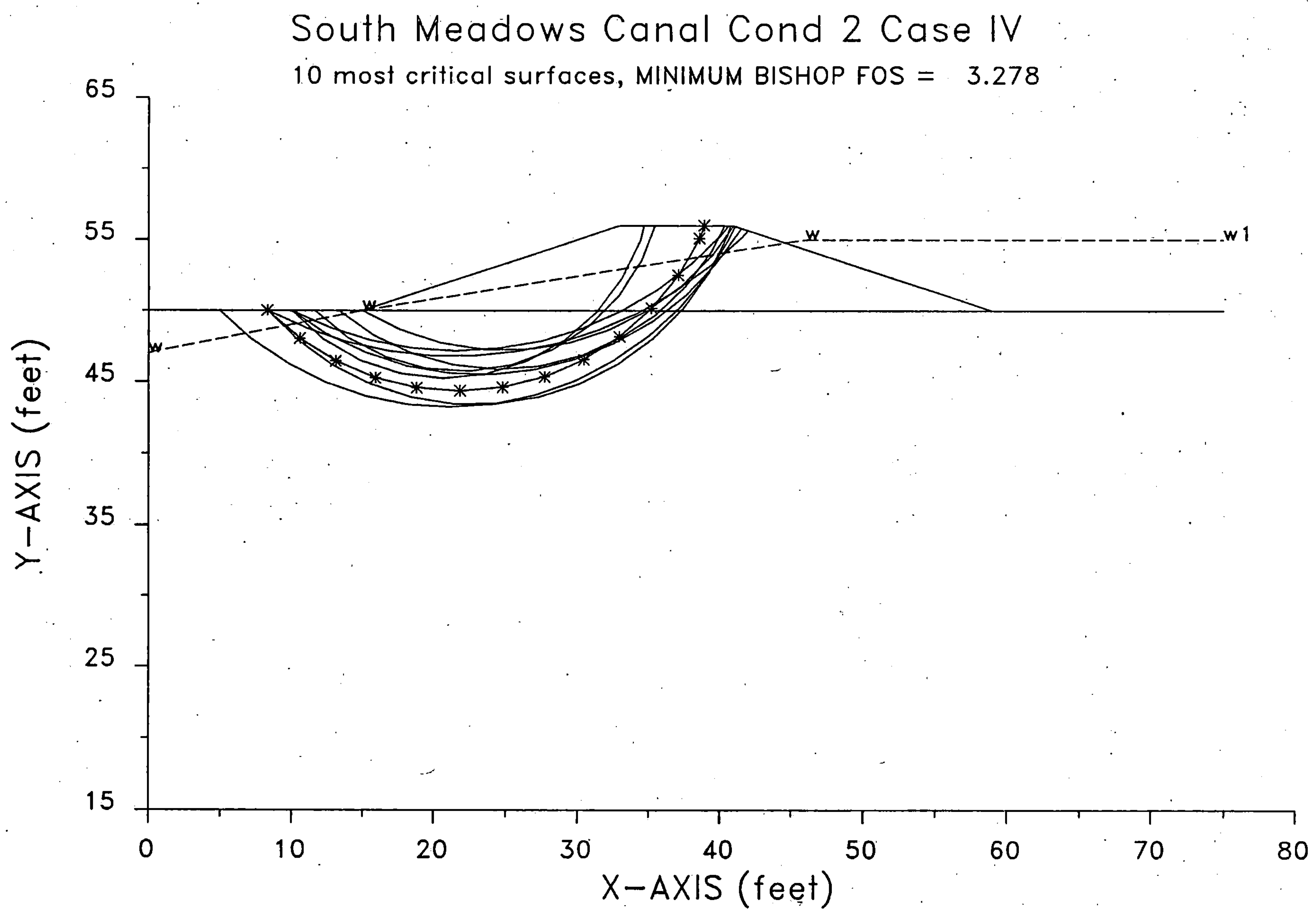

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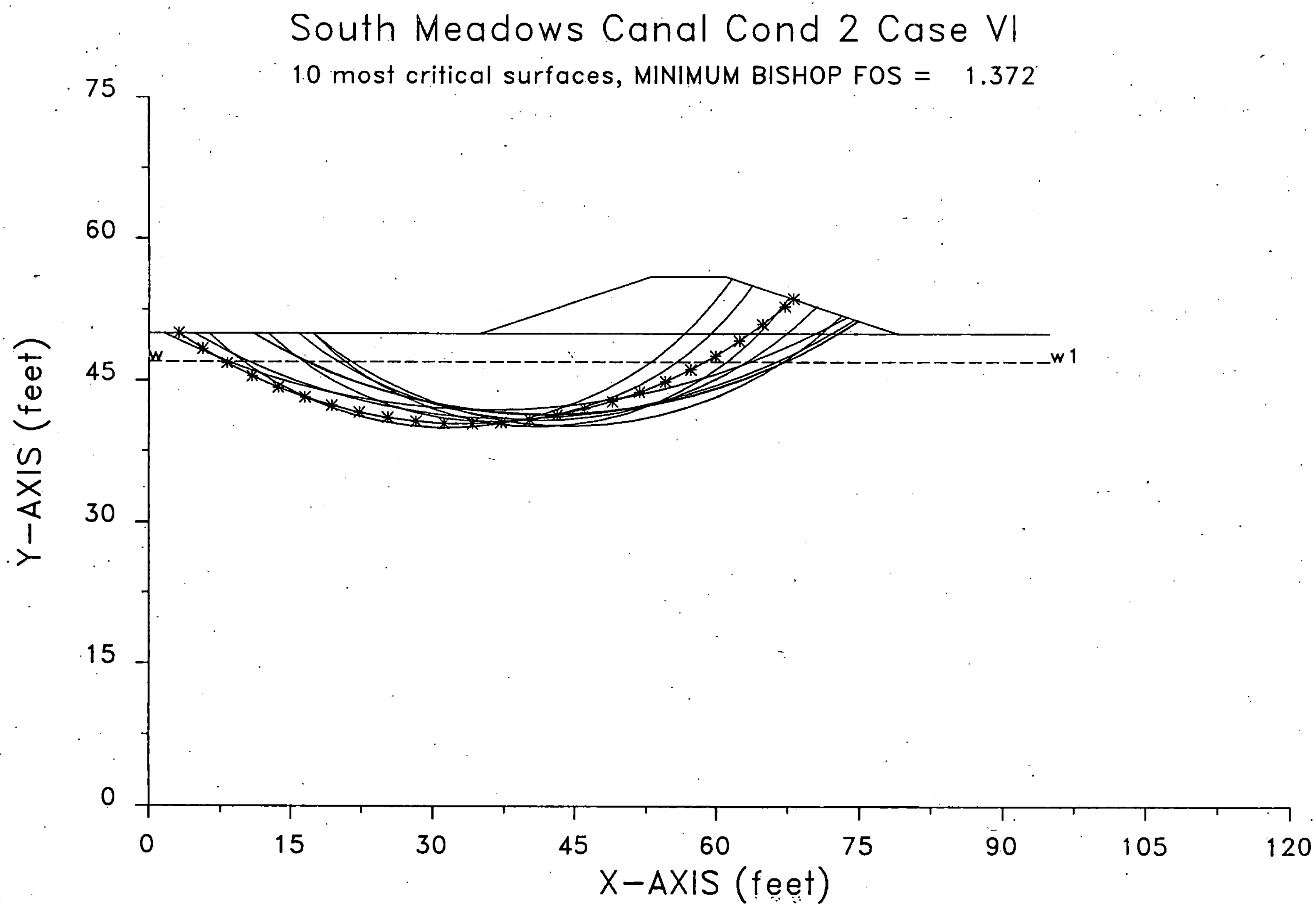

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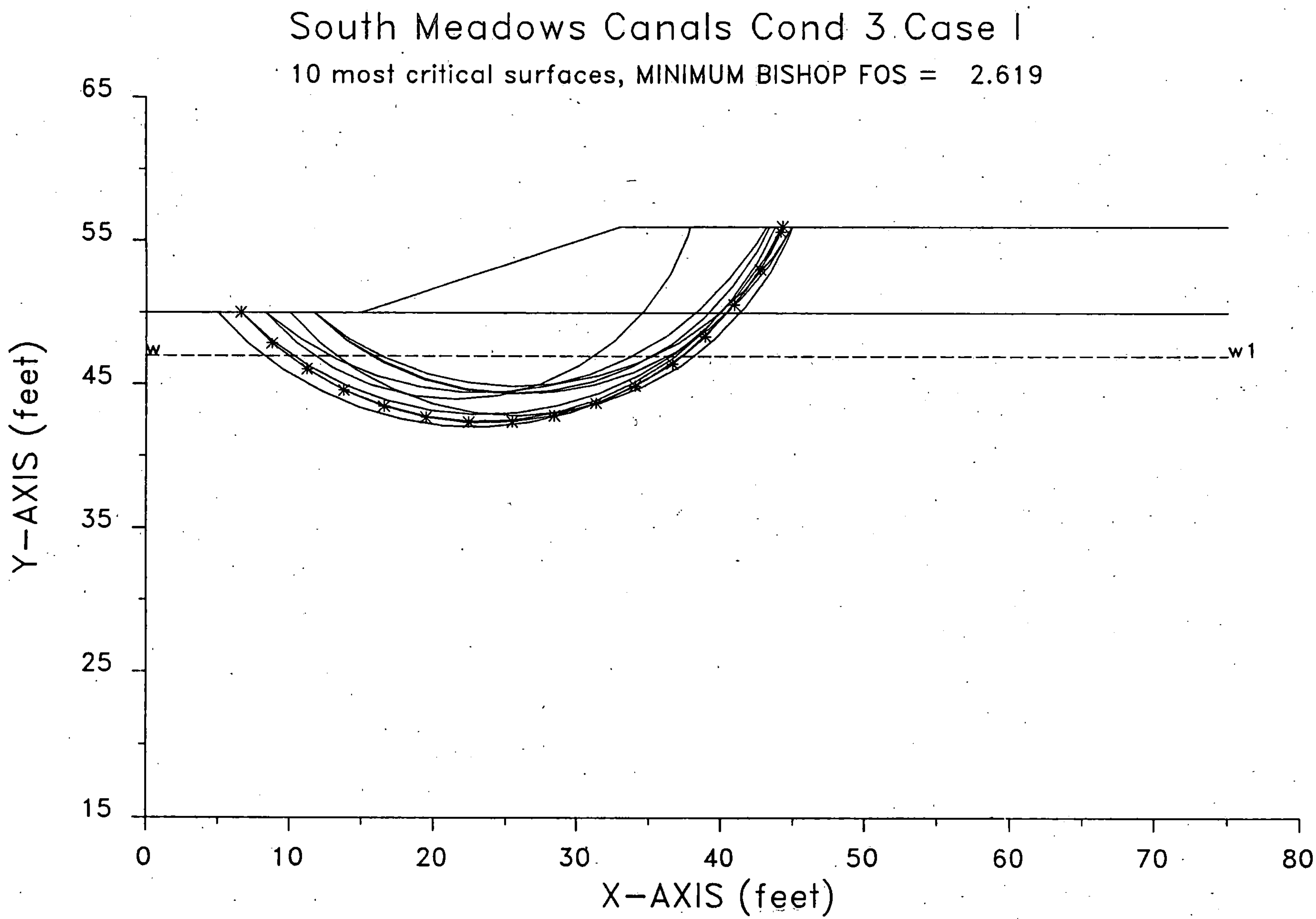

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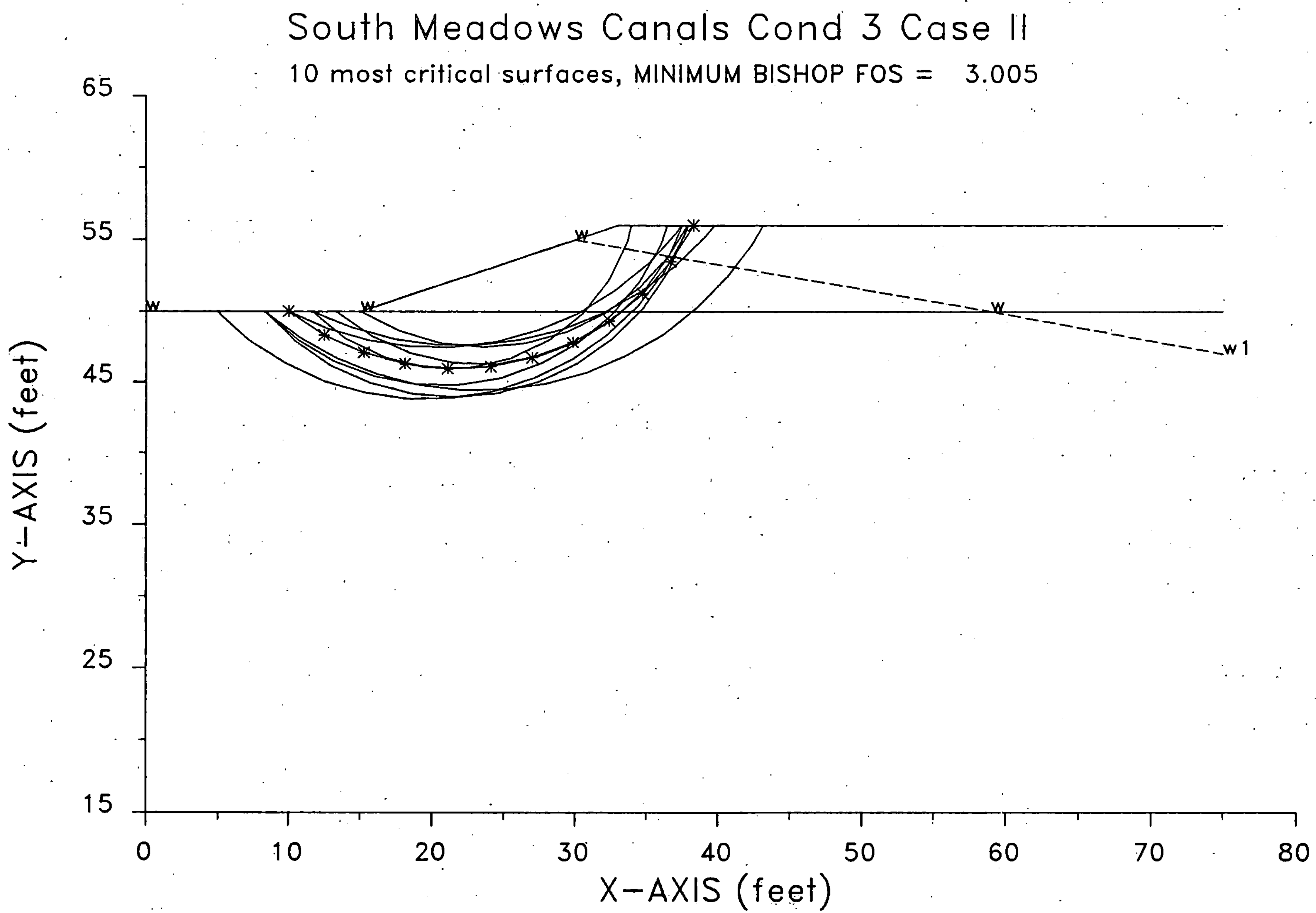

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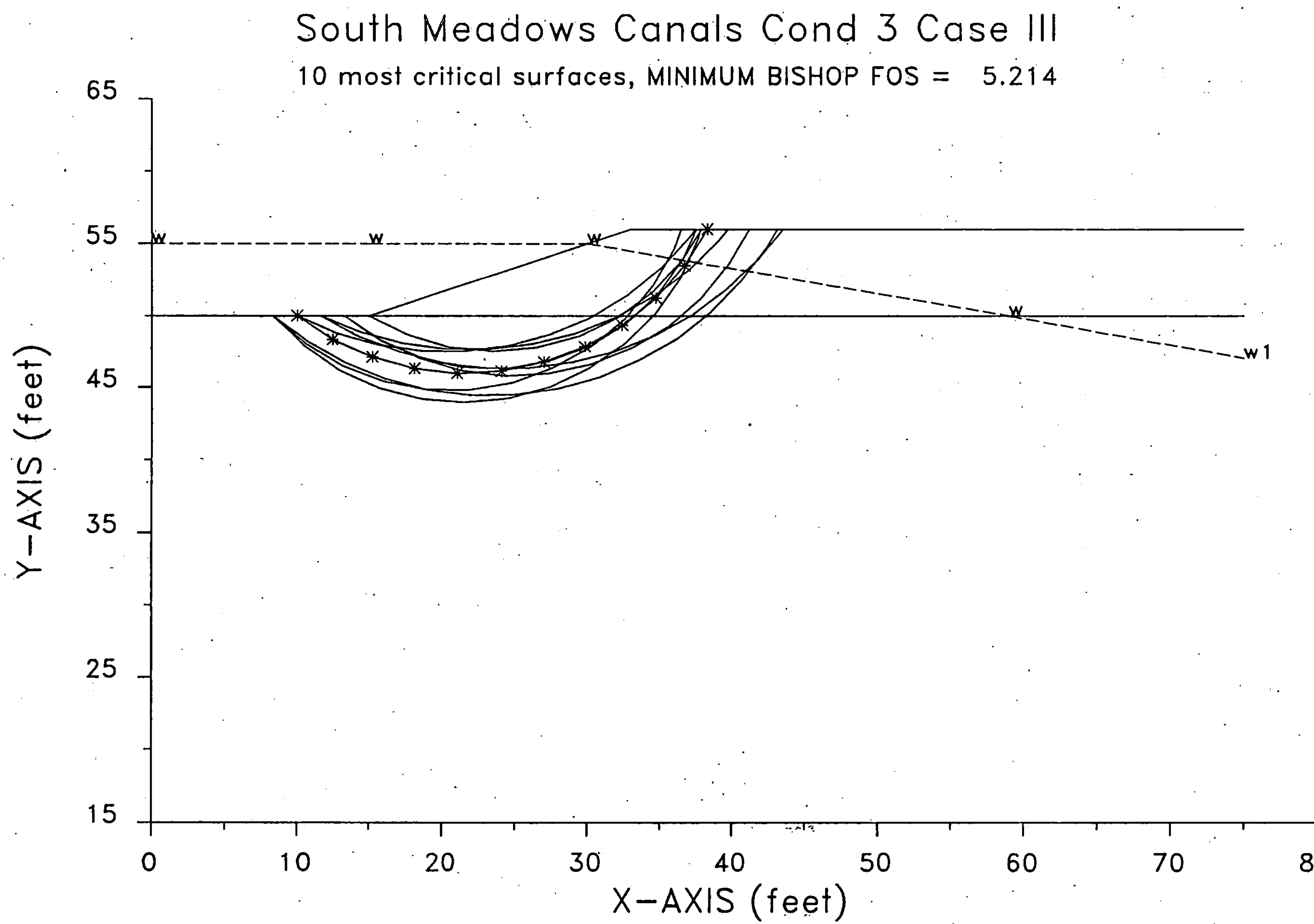

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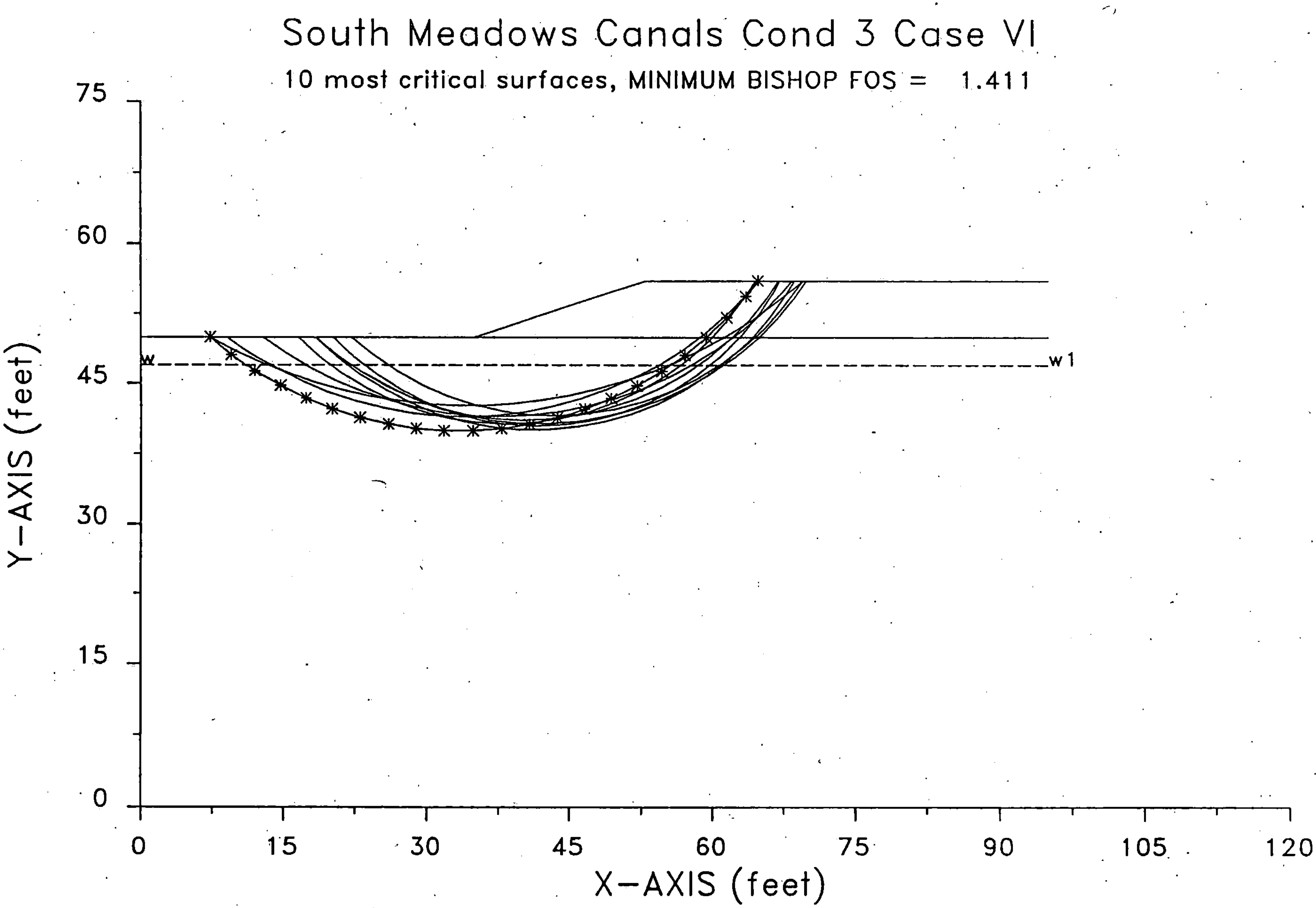

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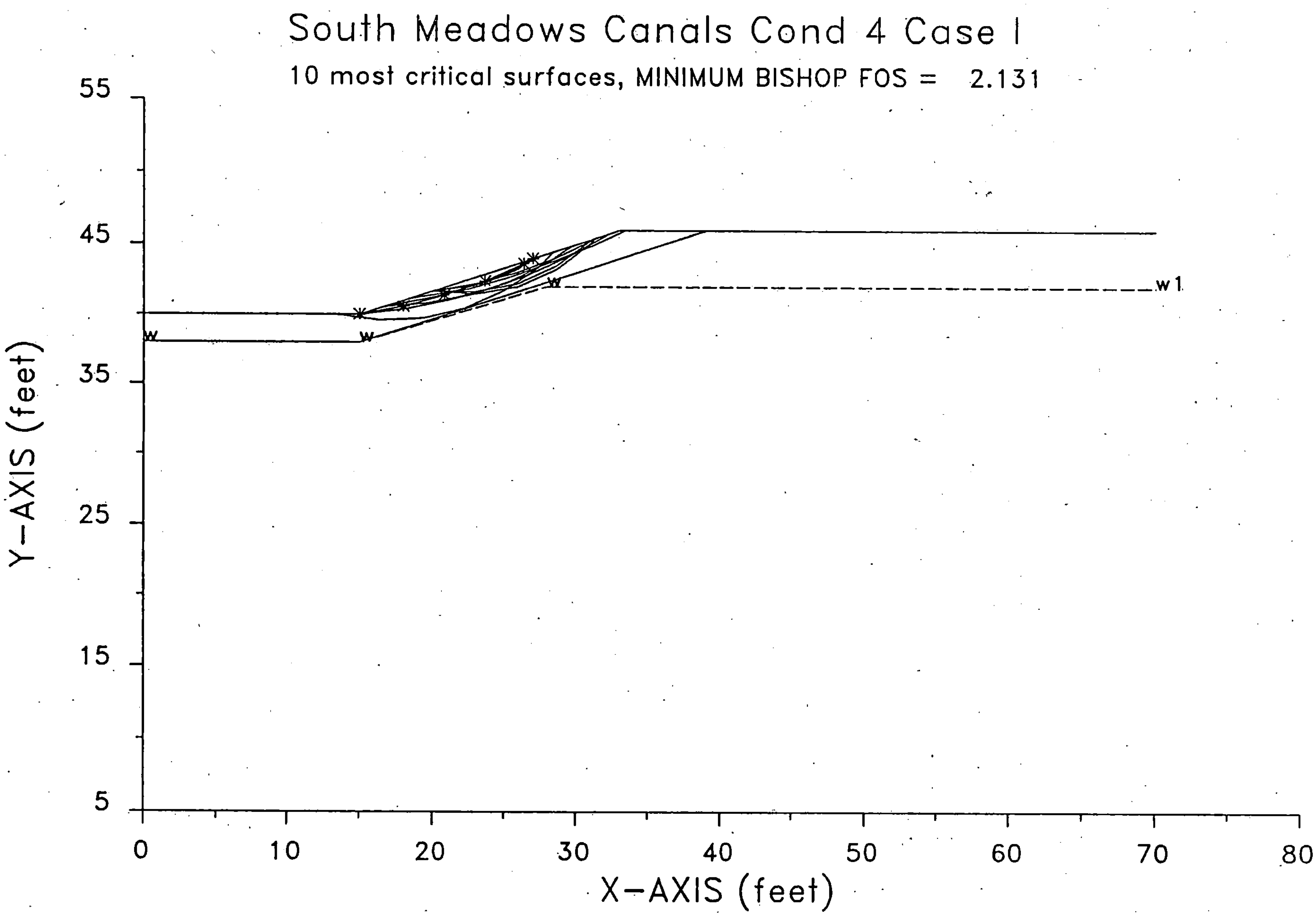

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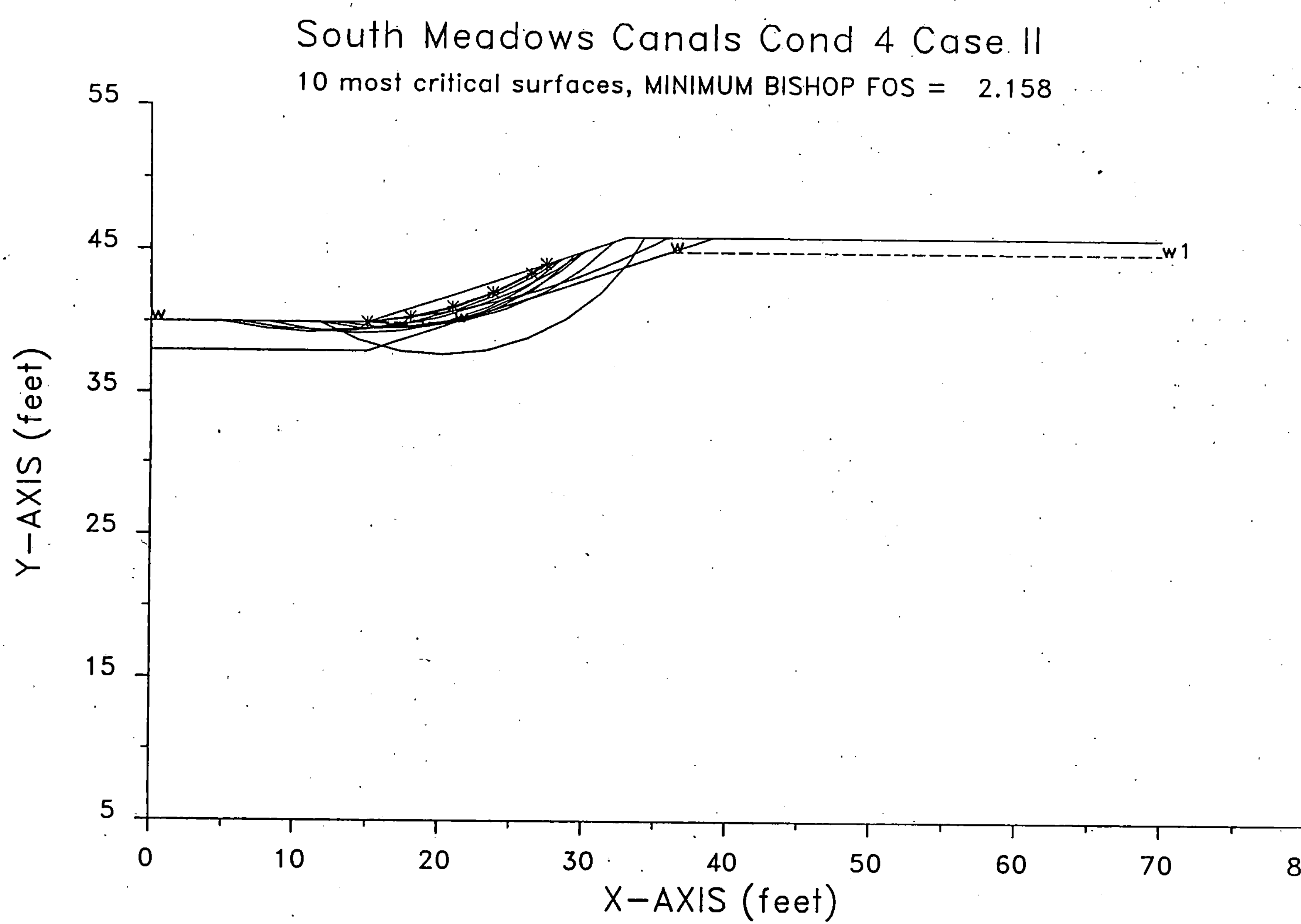

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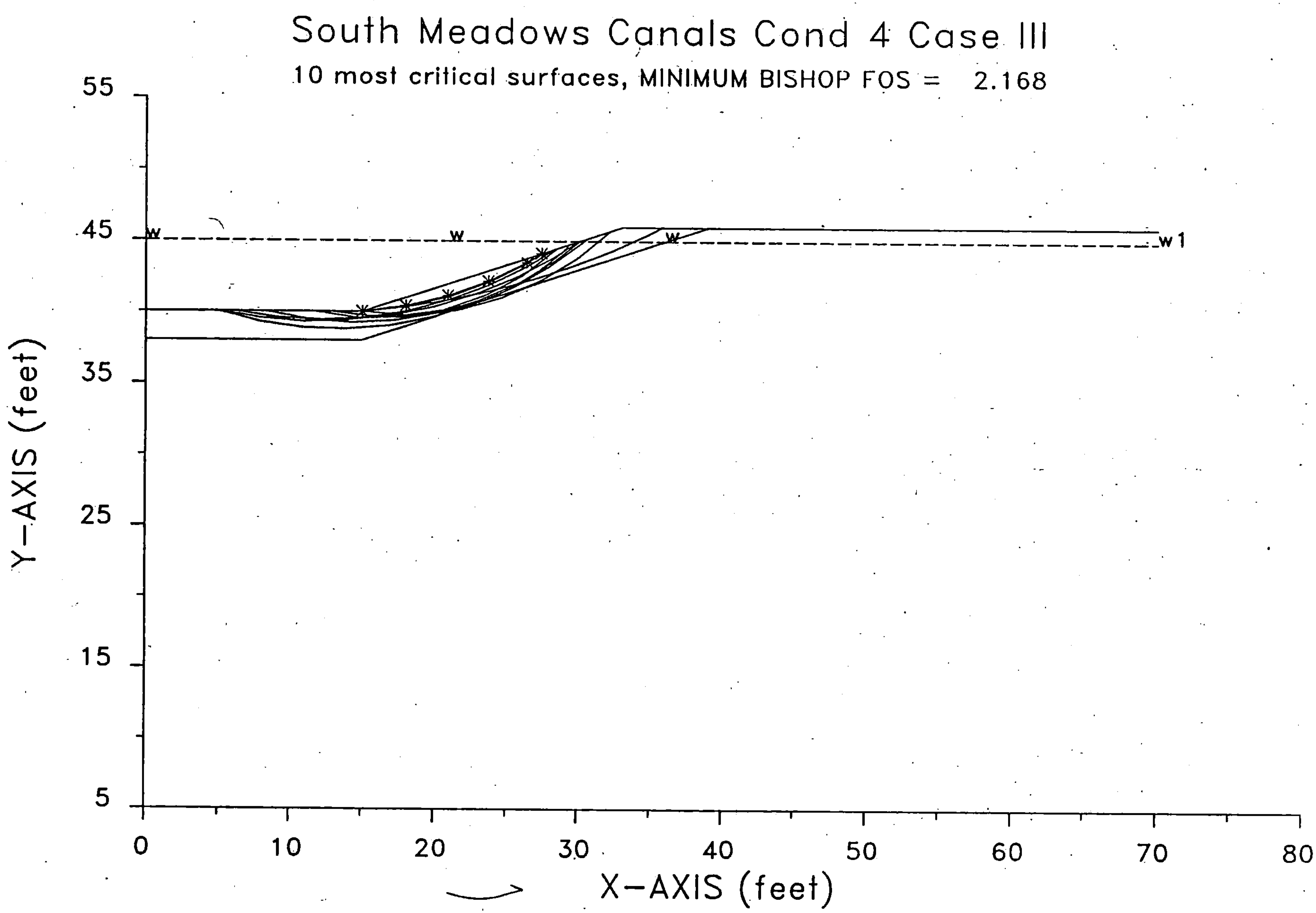

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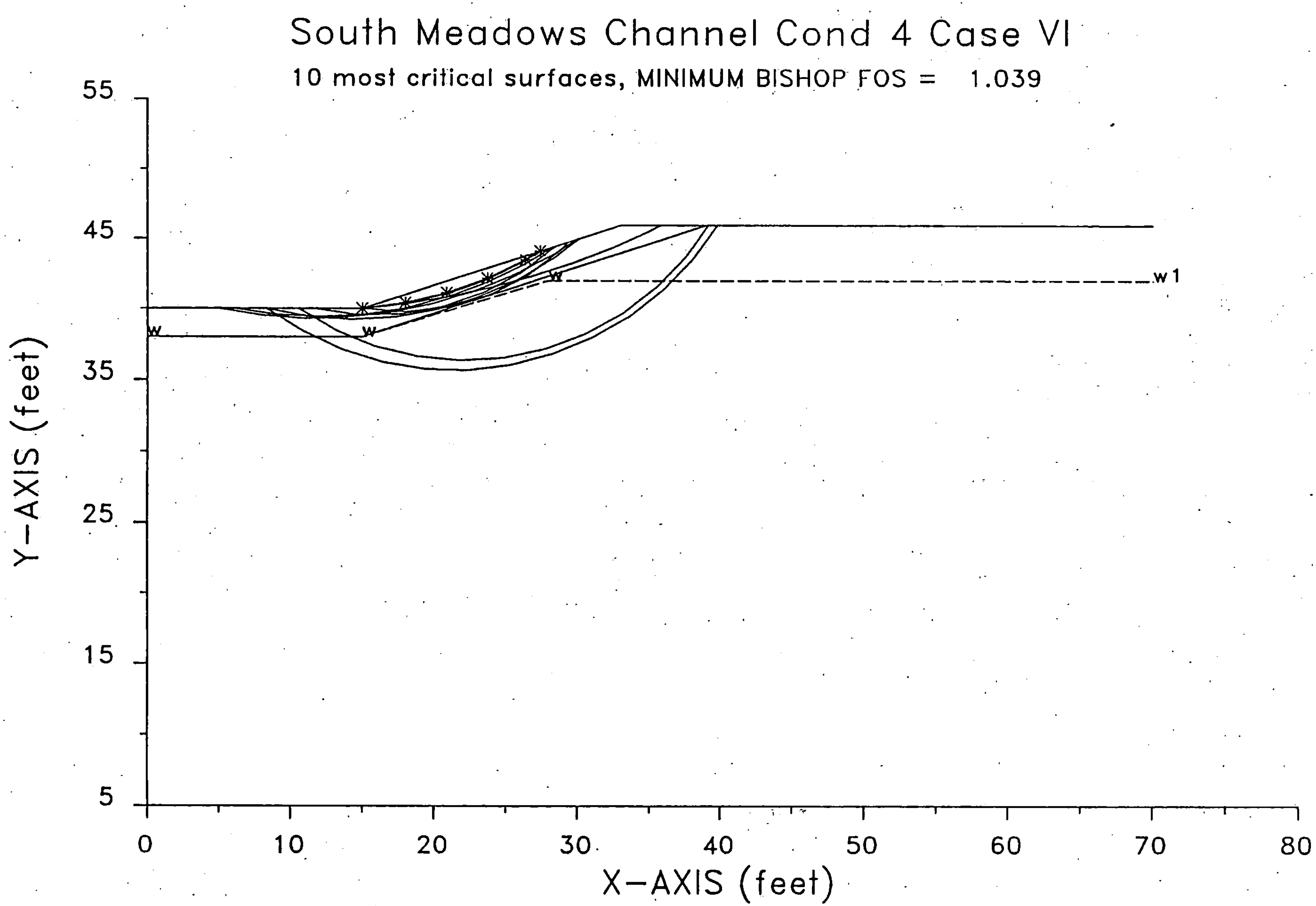

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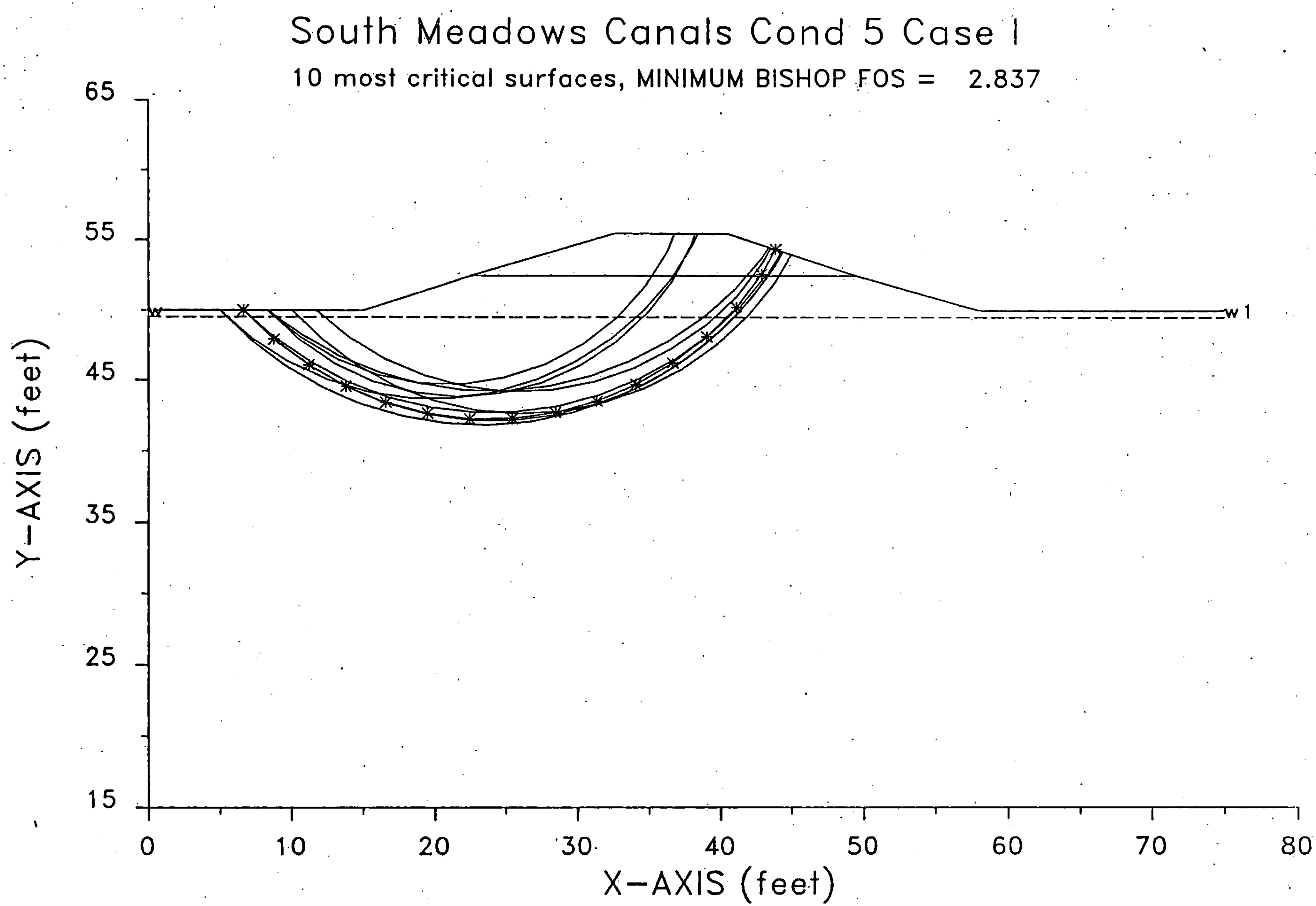

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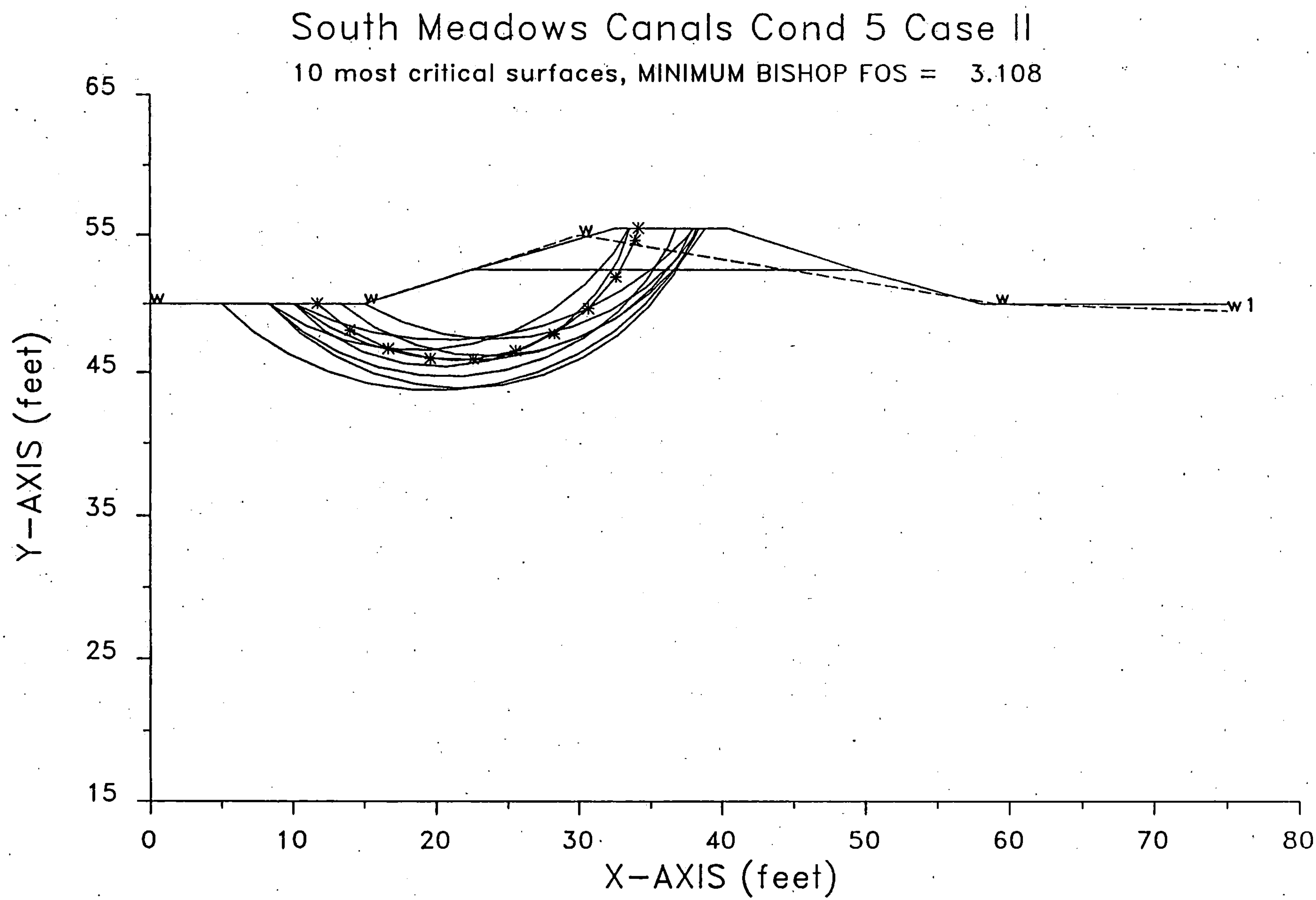

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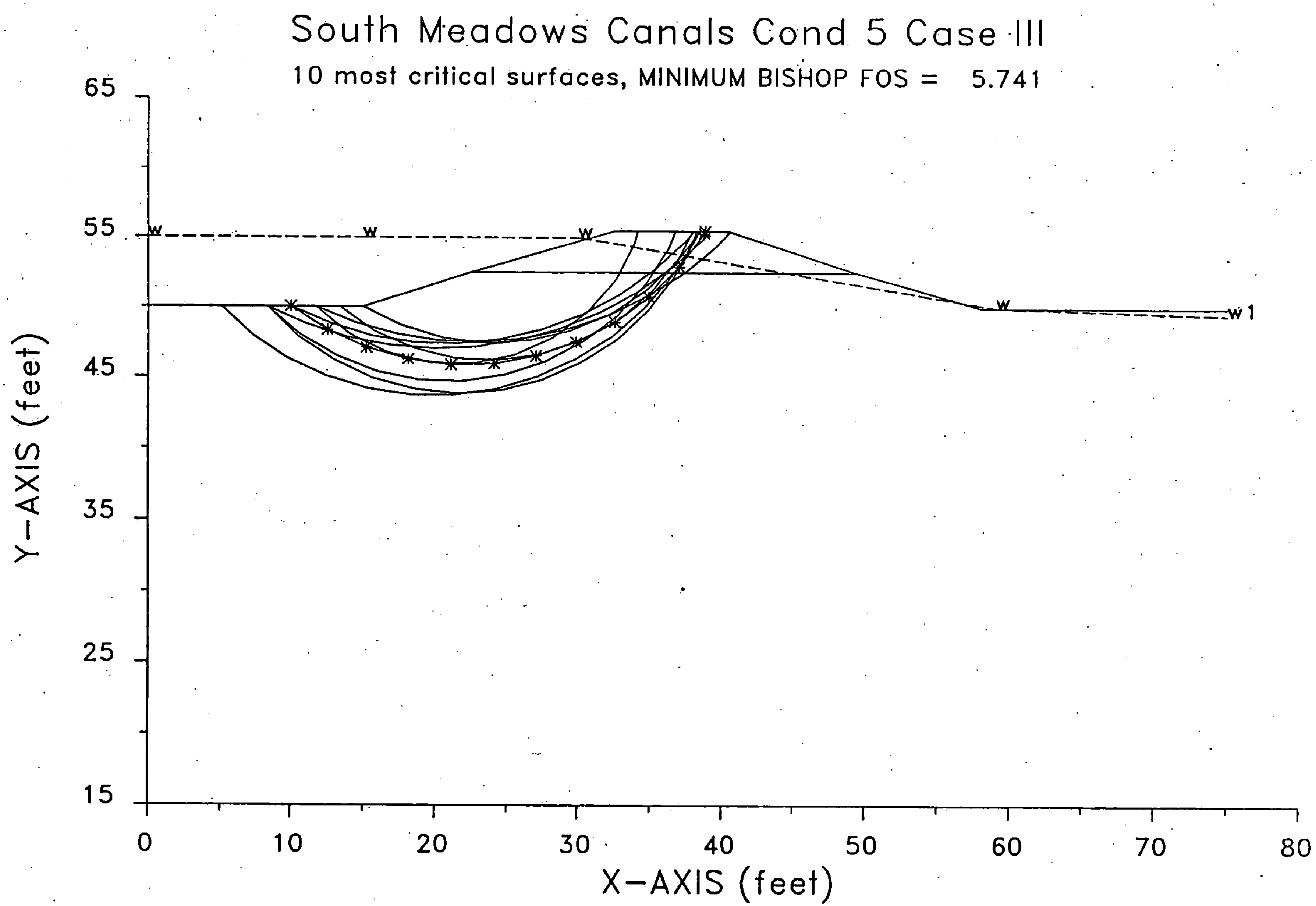

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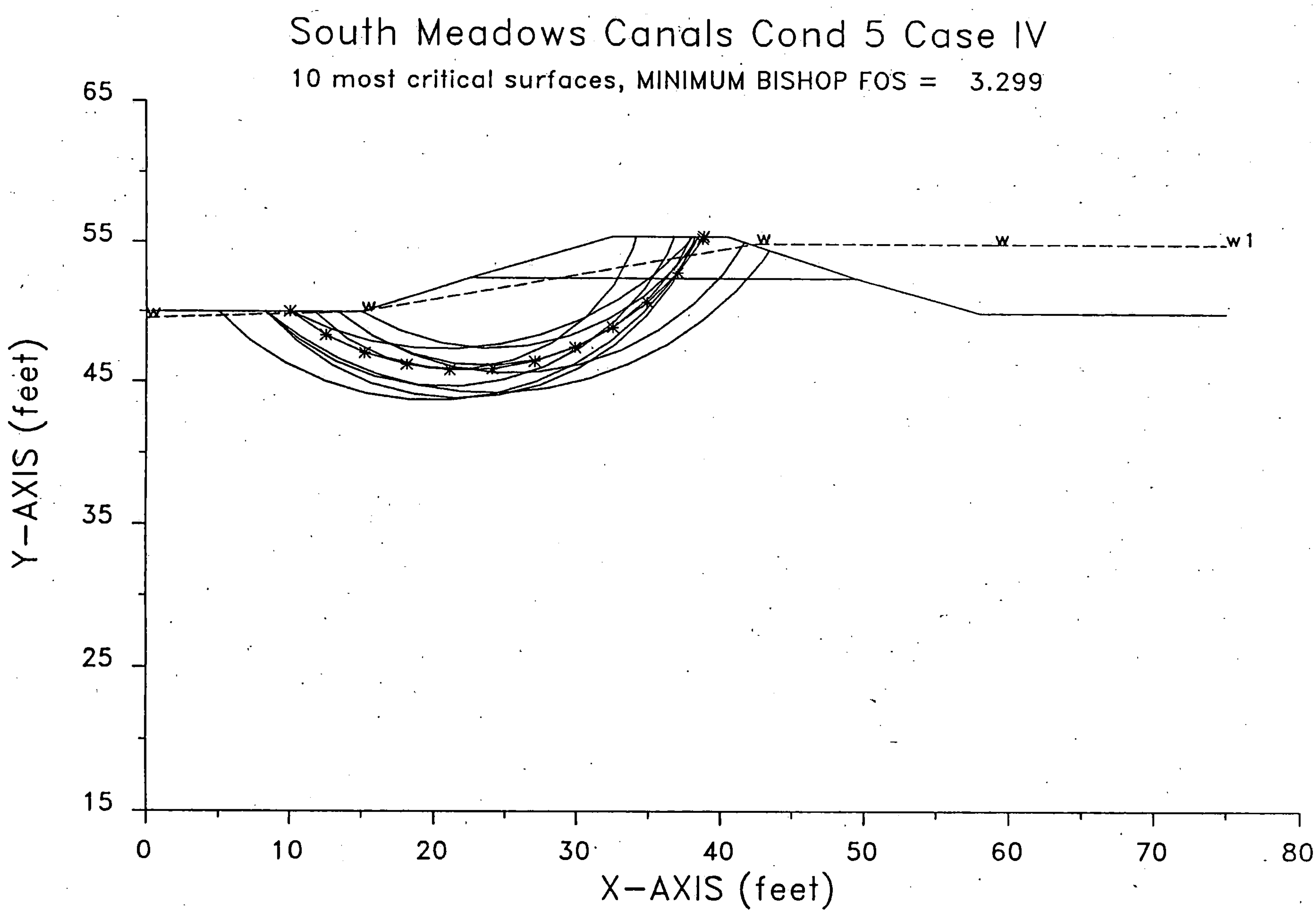

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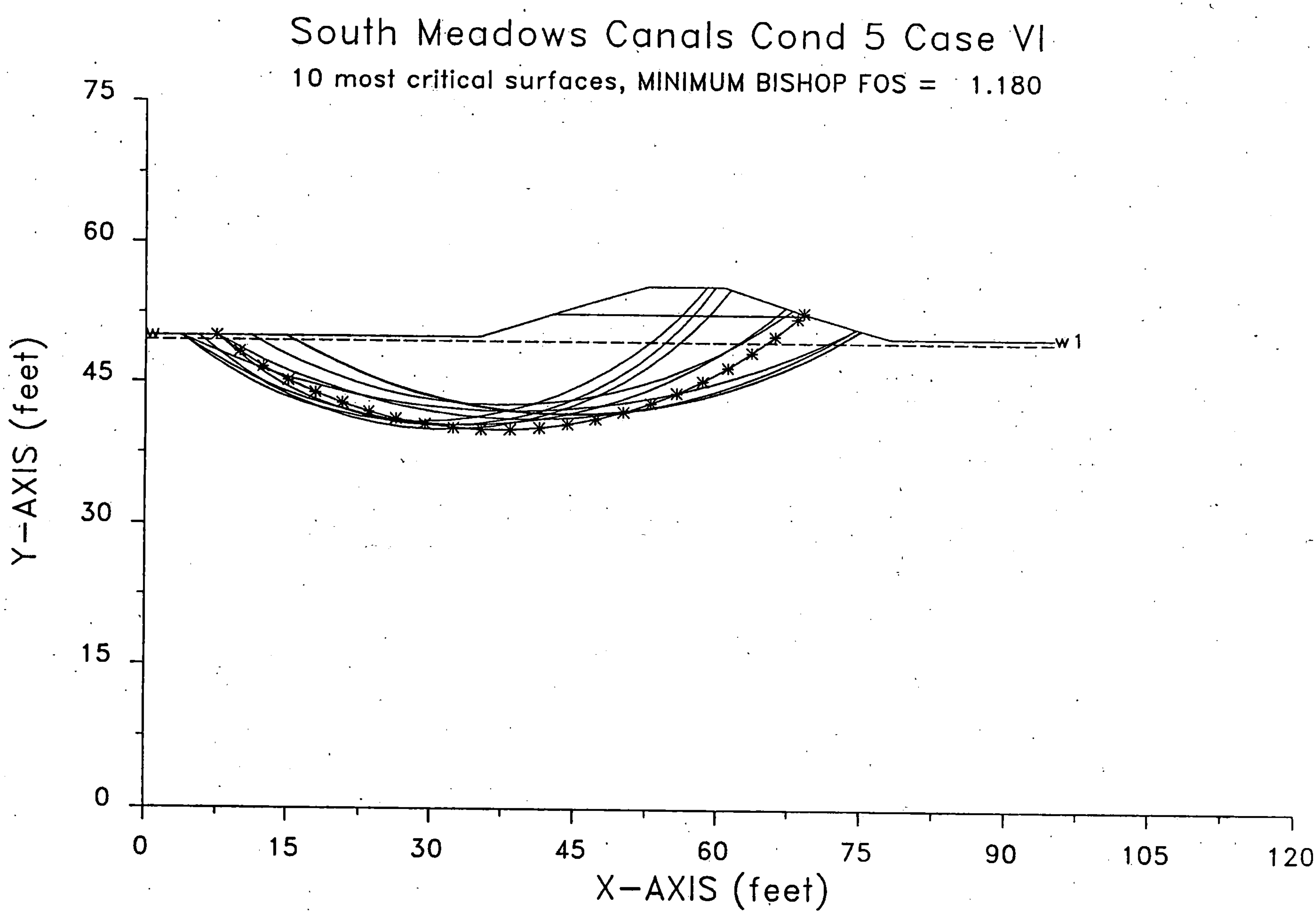

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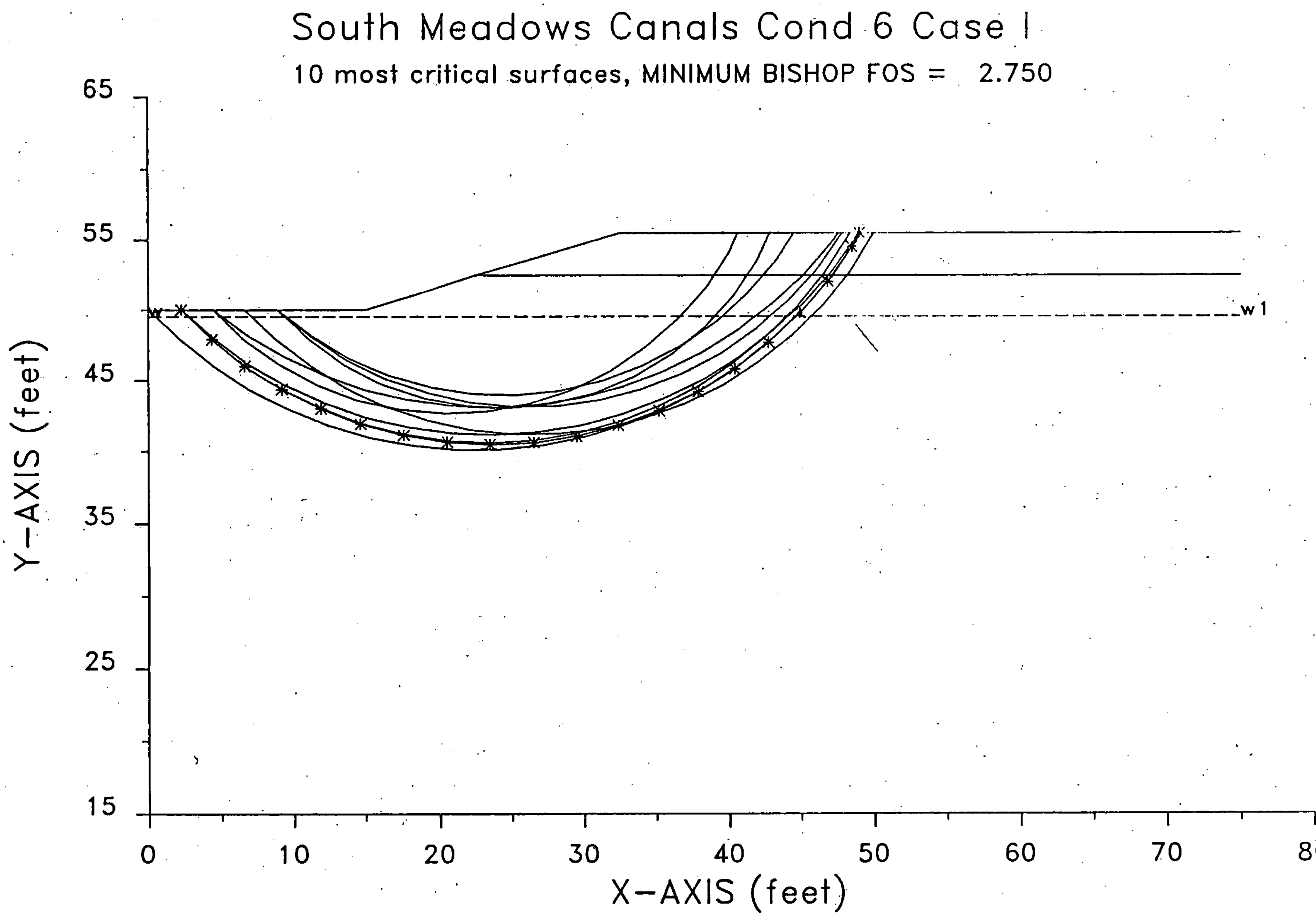

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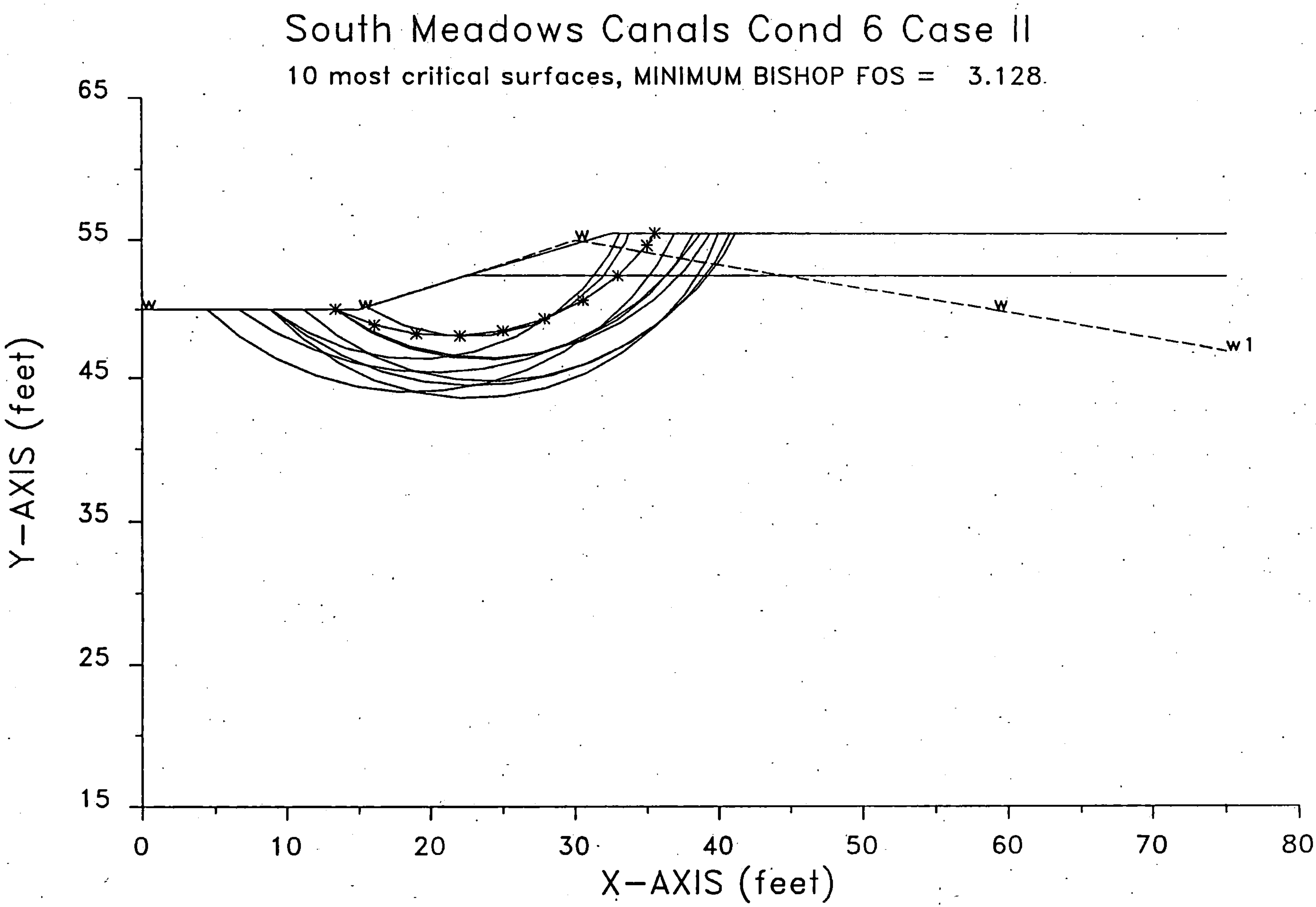

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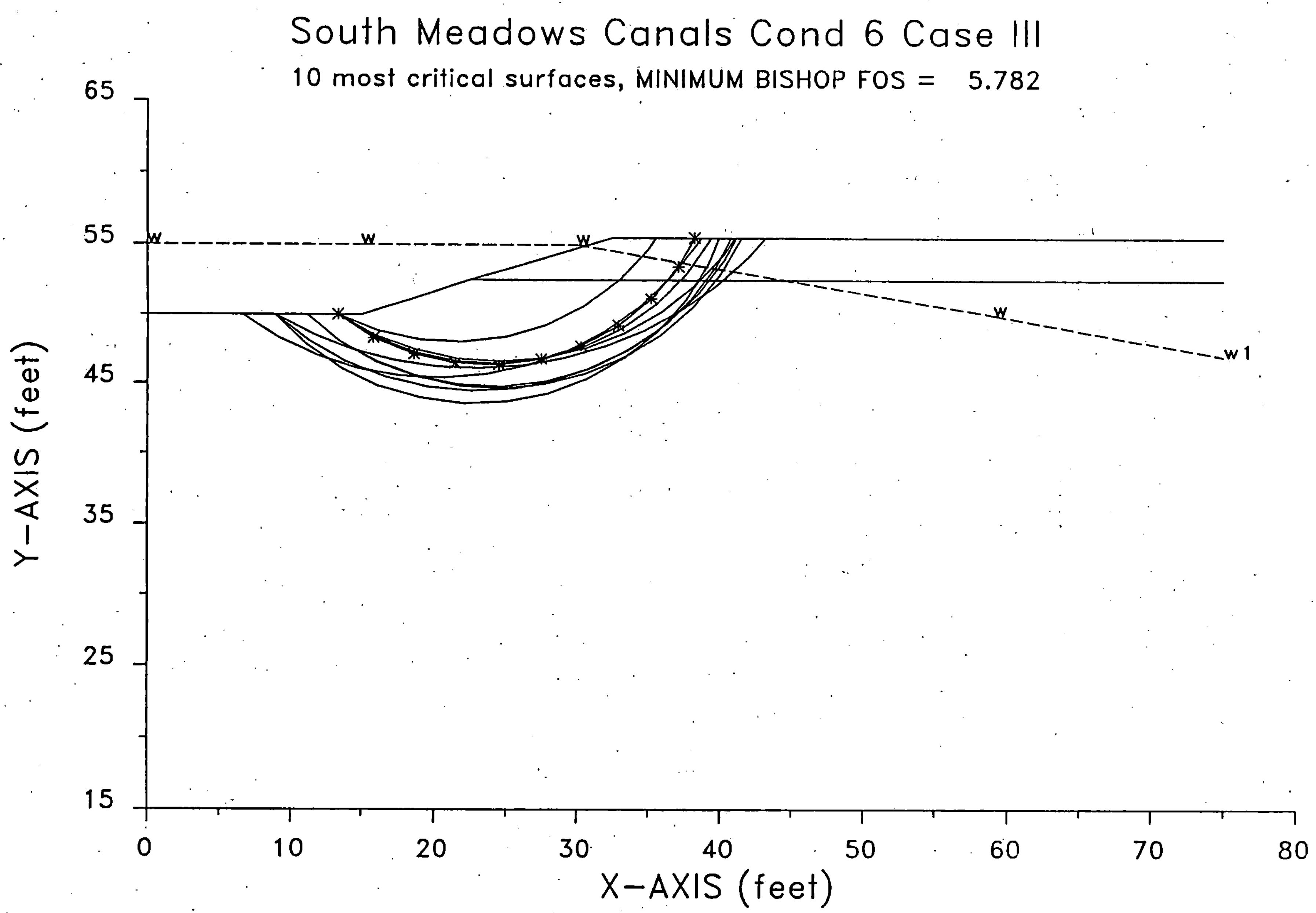

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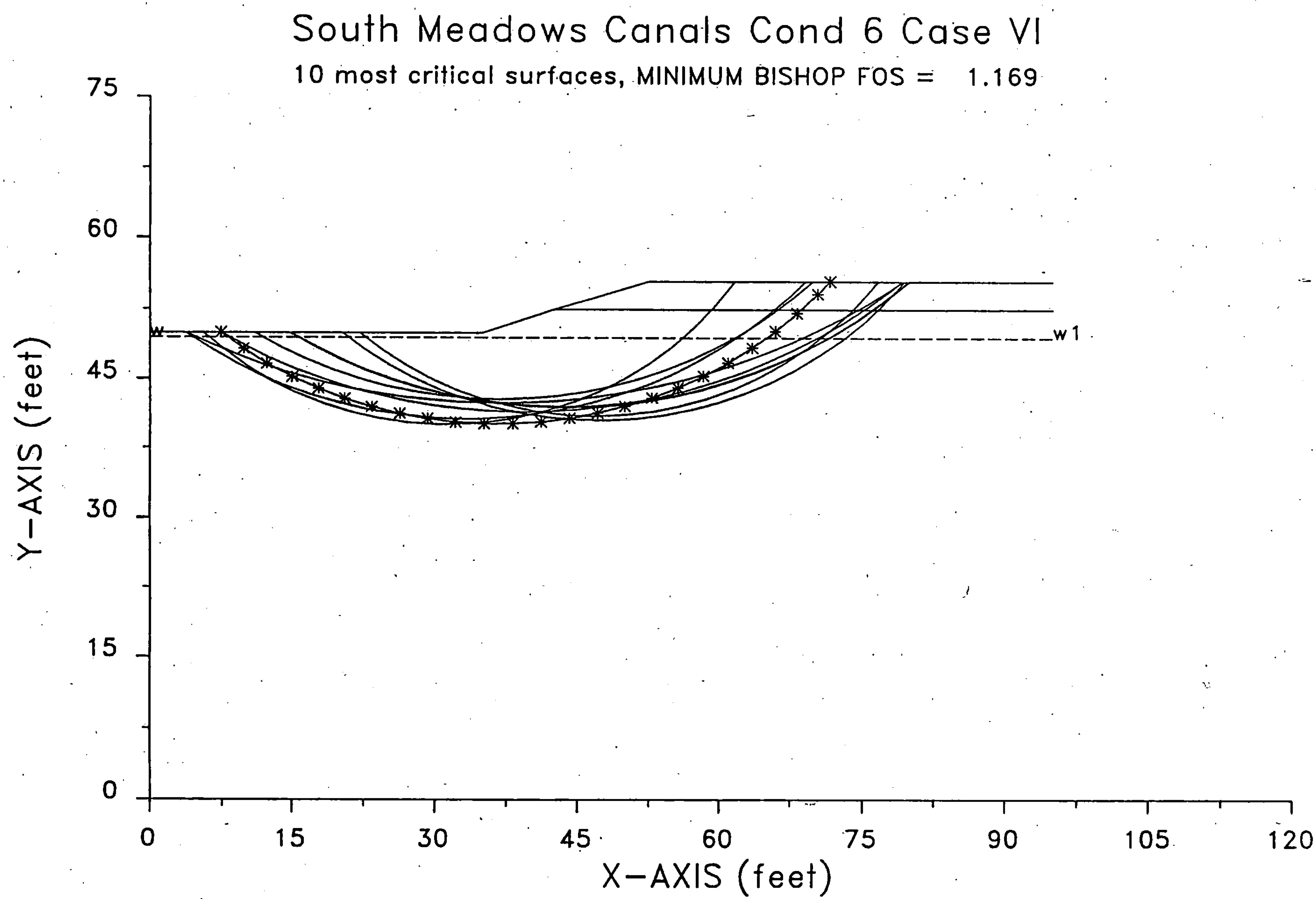


FEDERAL EMERGENCY MANAGEMENT AGENCY **DAM FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 0.5 hour 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 / Washoe County

Flooding Source: Whites Creek

Project Name/Identifier: Double Diamond Ranch

IDENTIFIER

Name of Dam: Detention Basin

Location of dam along flood source (in terms of stream distance or cross section identifier):

End of project downstream of section #134+00
Note: we do not believe that this basin is a dam but have completed the form because it was requested.

Check one of the following:

- ☐ Existing dam
- ☒ New dam
- ☐ Modifications of existing dam (describe modifications)__________

Was the dam designed by ____ Federal agency ____ State agency

____ Local government agency X Private organization?

BACKGROUND

Does the dam have dedicated flood control storage? ☒ Yes ☐ No

Does the project involve revised hydrology? ☐ Yes ☒ No

If yes, complete Hydrologic Analysis Form and include calculations of the 100-year inflow flood hydrograph routed through the dam with the beginning pool at the normal pool elevation (spillway crest elevation for ungated spillway). Include any inflow hydrograph bulking by watershed sediment yield and provide necessary debris and sediment yield analysis.

Does the revised hydrology affect the 100-year water-surface elevation behind the dam or downstream of the dam? N/A ☐ Yes ☐ No

If yes, complete the Riverine Hydraulic Analysis Form and complete the table shown on the following page.

	Stillwater Elevation Behind the Dam	
	FIS	Revised
10-year		
50-year		
100-year		
500-year		
Normal Pool Elevation	empty	

Was long term sediment accumulation taken into consideration in determining the normal pool elevation? N/A ☐ Yes ☐ No

Was the dam designed to withstand the hydrostatic and hydrodynamic forces associated with floods greater than the 100-year flood? ☐ Yes ☒ No

If no, and the dam has a reasonable probability of failure during the 100-year flood, please attach dam break analysis.

Provide the following data on the dam:

Dimensional Height: 5.00 feet

Crest Elevation of top of dam: 4430

100-year flood storage capacity: ________

Freeboard (measured from 100-year water surface elevation): ± 1.00

Spillway(s):

Type: ☐ gated ☒ ungated

Dimensional Width: 98' with 3:1 SS

Dimensional Height: 5.0' with [illegible] flow notch

Crest Elevation of top of spillway: 4425

Outlet(s):

Type: ☐ gated ☐ ungated

Width: ________

Height ________

Diameter: ________

Invert Elevation: ________

Explain flow regulation plan: N/A

Are the project features, including the emergency spillway, designed to accommodate the 100-year flood discharge without overtopping the dam? ☒ Yes ☐ No

Was the dam designed in accordance with all currently applicable local, State, and Federal regulations? N/A ☐ Yes ☐ No

If no, please provide explanation. Not applicable for max h = 6.5 feet

FEMA may request a list of regulations that have been complied with and supporting documentation demonstrating compliance with these regulations.

Attach copy of formal operation and maintenance plan

Answer N/A to any questions which are not applicable

MAINTENANCE AND OPERATION AGREEMENT

1. SCOPE OF AGREEMENT
   1.1. As a requirement for obtaining a Letter of Map Revision (LOMR) for the South Meadows/Double Diamond Project located with the City of Reno, the Federal Emergency Management Agency (FEMA) is requiring "an officially adopted maintenance and operation plan for the project". See FEMA letter dated July 14, 1995.
   1.2. DEFINITIONS
      1.2.1. City of Reno (City) is the City of Reno, NV acting through its Chief Executive Officer or his designated employees. The address of the City is 490 So. Center Street, Reno, NV 89502.
      1.2.2. Home Owners Association (HOA) is the DOUBLE DIAMOND HOA, a non-profit corporation under chapter 82 of the Nevada Revised Statutes acting through its duly elected officers. The address of the HOA is 601 West Moana, Suite 1, Reno, Nevada 89509.

2. FACILITY DESCRIPTION
   2.1. The facilities to be maintained are the unlined earthen channel portion of the Double Diamond/South Meadows flood control channels and rock rip-rap protection. Plans for these flood control facilities are entitled Double Diamond/South Meadows Civil Design Plans for Flood Control Channels dated August 1995 and on file in the City Engineer's Office. The individual channels are more particularly described as follows:
      2.1.1. The earth channel and wetlands berms for Whites Creek Channel "A" beginning at the east side of Highway 395 and continuing downstream to its connection to Whites Creek Channel "B". The facilities are shown on sheets A1 through A6 of the Civil Plans.
      2.1.2. The earth channel for Whites Creek Channel "B" beginning at the end of Whites Creek Channel "A" and continuing downstream to its confluence with Lumberjack Channel. The facilities are shown on sheets C1, C5 and C6 of the Civil Plans.
      2.1.3. The earth channel for Whites Creek Channel "C" beginning downstream of the confluence of Whites Creek Channel "B" and Lumberjack Channel and continuing downstream to the detention basin. These facilities are shown on sheets C1 through C5 of the Civil Plans.
      2.1.4. The rock rip rap entrance structure and earth channel for Whites Creek Central Channel from the south property line downstream to its confluence with Whites Creek Channel "C". These facilities are shown on sheets E1 through E4 of the Civil Plans.
      2.1.5. The detention basin along with its entrance and outlet structures at the downstream end of Whites Creek Channel "C". These facilities are shown on sheets D1 through D3 of the Civil Plans.
   2.2. The City shall maintain all drainage structures beneath public roadways.

3. FUTURE MODIFICATIONS REVIEW AND APPROVAL

3.1. The City reserves the right to review and approve any future modifications that are made to these facilities.

4. LEVEL OF MAINTENANCE

4.1. The minimum level of maintenance required for these facilities is as follows:

4.1.1. Woody plant species within the channels will be removed by hand annually, or as needed.

4.1.2. Sedimentation of more than six inches in depth shall be removed from the channel. The removal shall be to the original geometric section of the channel.

4.1.3. Portions of the channel that have eroded more than one foot in depth shall be back filled and compacted.

4.1.4. Areas of the channel that have been disturbed for sediment removal or erosion backfill shall be immediately hydroseeded with the same type of vegetation that was originally planted.

4.1.5. Following any storm that produces channel flow depth in excess of two feet the channels shall be inspected. Any sediment removal or erosion backfill required shall be commenced as soon as the channel bottom has dried sufficiently to allow construction equipment to operate.

4.1.6. Following or during any storm, if the degree of erosion or sedimentation on any part of the facility is deemed to be a threat to public safety, remedial steps shall commence immediately to keep the flows confined within the flood facilities.

4.1.7. Within wetland mitigation areas woody plant species will be removed by hand annually, or as needed. No mowing will be permitted within these areas.

4.1.8. Within any jurisdictional wetland areas, located along the channel corridors, no mowing or construction will be permitted. Maintenance will be limited to the perimeter berms.

5. ADHERENCE TO LEVEL OF MAINTENANCE/MAINTENANCE RESERVE ACCOUNT

5.1. The primary maintenance responsibility for the drainage facilities falls to the HOA.

5.2. The City shall assume maintenance responsibility only if the HOA fails to do so. If the City is forced to assume maintenance responsibility, the City is entitled to reimbursement in accordance with Article 8.

5.3. If the City is forced to perform maintenance of the facilities it will be done in a manner that, in the sole discretion of the City, is in the best public interest.

5.4. Within 30 days from the date of this Agreement, the HOA shall establish and maintain a maintenance reserve account (MRA) in its official budget in the amount of fifty thousand dollars, ($50,000), or procure and maintain a surety bond in the amount of fifty thousand dollars, ($50,000), for the sole purpose of reimbursing the City, pursuant to Article 8, for maintenance costs incurred in the event the City is forced to assume maintenance of the facilities because of the HOA's failure to do so. The funds shall not be used for any other purpose, including emergency maintenance costs.

6. STATUS REPORT

6.1. Once a year the HOA shall retain a registered civil engineer to inspect the flood facilities and submit a written report to the City. The report shall address the status of the maintenance of the flood facilities as it conforms to the requirements of Section 4 of this agreement.

6.2. The status report shall be submitted to the City on or before July 1 of each year.

7. NOTICE TIME FRAMES

7.1. If the City determines that the HOA is not in compliance with the level of maintenance the City shall notify the HOA of its finding in writing at the current address of the HOA on file with the City. The City shall give the HOA thirty (30) calendar days to come into compliance with the level of maintenance. If after 30 days the HOA has not come into compliance the City may proceed with the necessary maintenance and be reimbursed by the HOA by the methods set forth in Article 8.

7.2. The City at its sole discretion may determine that there is an immediate need for maintenance on the drainage facilities due to a threat to public safety and welfare. The City may immediately proceed with emergency remedial measures to correct the situation without notice to the HOA.

8. CITY REIMBURSEMENT

8.1. The City is entitled for reimbursement for all work that the City does in connection with this agreement. The HOA will be billed by the City for this work within forty-five (45) calendar days of the date that the charges are incurred.

8.2. The HOA is required to pay the reimbursement within forty-five (45) days of the date of the City's invoice.

9. EMERGENCY RESERVE ACCOUNT

9.1. Within 30 days from the date of this Agreement, the HOA shall establish and maintain an emergency reserve account (ERA) in its official budget for emergency maintenance costs in the amount of ten thousand dollars, ($10,000).

9.2. The HOA is solely responsible for all maintenance costs arising from and relating to the emergency.

10. RIGHT TO LIEN

10.1. If the income of the HOA and the ERA are insufficient to meet the reimbursement requirements, the City shall have the right to place liens on the property(s) of the HOA.

11. REQUIRED PERMITS, LICENSES, AND OTHER RIGHTS REQUIRED

11.1. The HOA is responsible for obtaining and maintaining in perpetuity, all licenses, permits and other rights required for the proper maintenance of the drainage facilities.

12. ACCESS RIGHTS FOR INSPECTION

12.1. It is understood that the City has complete access rights to the drainage facilities including use of private streets and driveways to access the facilities.

13. MISCELLANEOUS

13.1. A copy of the HOA's audited financial statement shall be sent to the City each year for the purpose of verifying the balance in the MRA and ERA accounts.

13.2. The City shall be furnished with a copy of the HOA's official budget year within 30 days of the beginning of the HOA's fiscal year.

____
KREG D. ROWE, President
Double Diamond Ranch Master Association

APPROVED THIS_____DAY OF___________________________, 1996.

CITY OF RENO

By:______________________________
JEFF GRIFFIN
Mayor

ATTEST:

____
DONALD J. COOK
CITY CLERK AND CLERK OF THE CITY
COUNCIL OF THE CITY OF RENO

APPROVED AS TO FORM ONLY

By: [signature]
WILLIAM MURANO
Chief Deputy City Attorney

APPENDIX B:

Annotated FIRM's (Existing and Proposed)

Existing Annotated Firm

Sources : FEMA
Washoe Co. Dept. of Comprehensive Planning
Nimbus Engineers GIS Dept.

Date: August 12, 1996

Projection : State Plane
Zone : Nevada, West
Datum : NAD83

Feet
0 1000 2000 3000

Nimbus Engineers
3710 Grant Dr., Suite A • Reno, NV 89509
Mail: P.O. Box 10220 • Reno, NV 89510
(702) 689-8630 • Fax (702) 689-8614

Proposed Annotated Firm

COMR 96-07-1085P

Nimbus Engineers
3710 Grant Dr., Suite A • Reno, NV 89509
Mail: P.O. Box 10220 • Reno, NV 89510
(702) 689-8630 • Fax (702) 689-8614

Sources : FEMA
Washoe Co. Dept. of Comprehensive Planning
Nimbus Engineers GIS Dept.

Date: October 23, 1996
Nimbus Job # 9508

Projection : State Plane
Zone : Nevada, West
Datum : NAD83

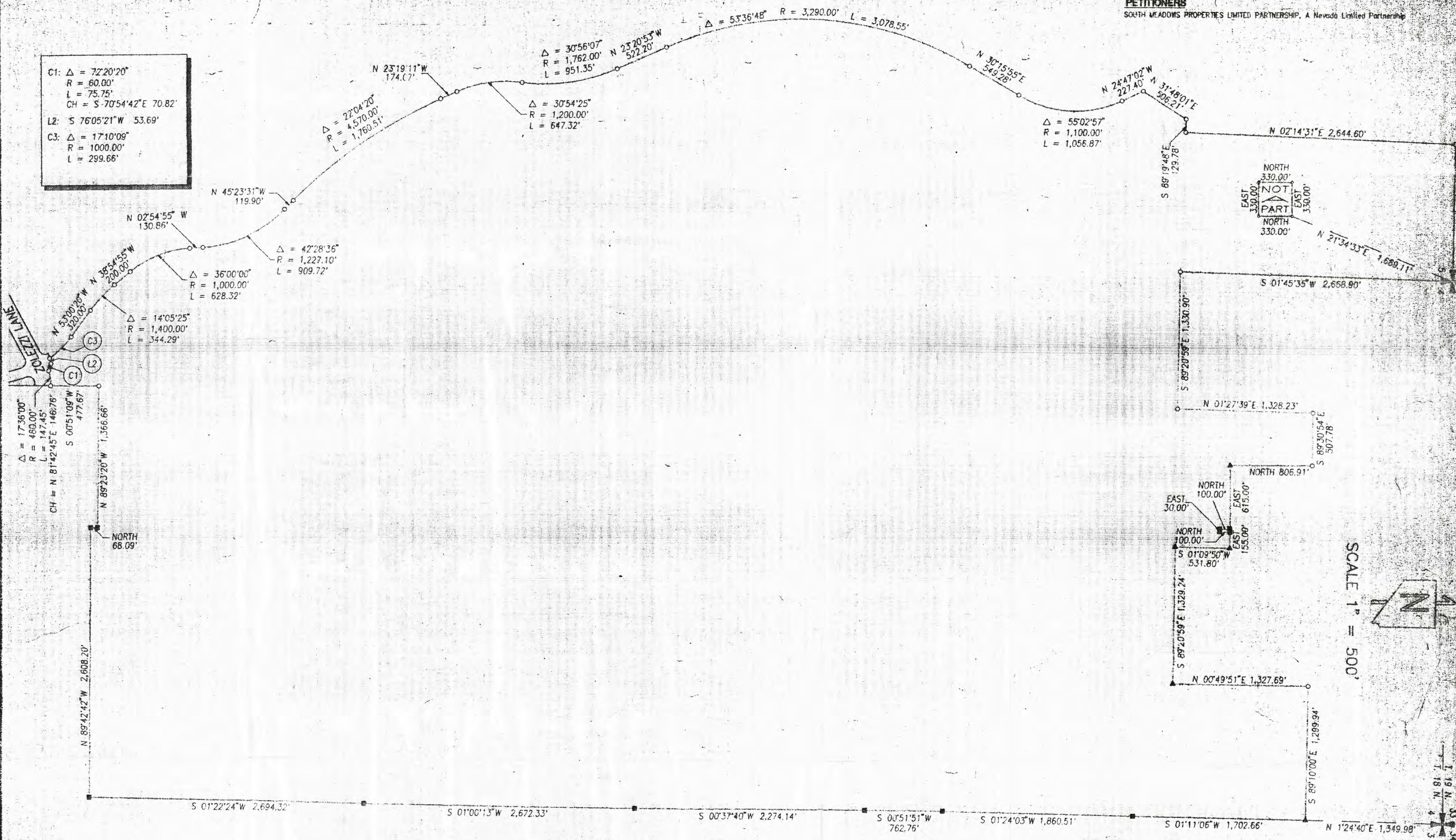
Feet
0 1000 2000 3000

APPENDIX C:

Annexation Map

3122

PETITIONERS
SOUTH MEADOWS PROPERTIES LIMITED PARTNERSHIP, A Nevada Limited Partnership



SURVEYOR'S CERTIFICATE

I, GILBERT W. PATTERSON, A PROFESSIONAL LAND SURVEYOR REGISTERED IN THE STATE OF NEVADA CERTIFY THAT THE PARCEL SHOWN HEREON TRULY REPRESENTS THE LAND PROPOSED FOR ANNEXATION TO THE CITY OF RENO, NEVADA.

GILBERT W. PATTERSON, RLS No. 5666

2/4/95

BASIS OF BEARINGS

SURVEY MAP #2130 RECORDED ON NOVEMBER 29, 1989 IN THE OFFICE OF THE COUNTY RECORDER OF WASHOE COUNTY, NEVADA AS FILE NO. 496759.

1871921

CITY COUNCIL APPROVAL

APPROVED AND ACCEPTED BY THE CITY COUNCIL OF THE CITY OF RENO, WASHOE COUNTY, THIS 24th DAY OF JANUARY 1995

ORDINANCE NO. 4471

MAYOR

ATTEST: CITY CLERK AND CLERK OF THE CITY OF RENO

CITY OF RENO CORPORATE SEAL WASHOE COUNTY NEVADA

LEGEND

- ■ – 5/8" REBAR RLS 445 per R/S 2130.
- ● – FOUND AS DESCRIBED.
- ○ – DIMENSION POINT – NOTHING SET/NOTHING FOUND
- ▲ 5/8" REBAR STAMPED RLS 4787 per R/S 2130
- ✛ – PUBLIC LAND CORNER – AS DESCRIBED

TOTAL AREA: 1,797.427 ACRES

COUNTY RECORDER CERTIFICATE

FILE NO. 1871921
FILED FOR RECORD AT THE REQUEST OF City of Reno ON THE 16 DAY OF FEB 1995 AT 7 MINUTES PAST 4 O'CLOCK, _M OFFICIAL RECORDS OF WASHOE COUNTY, NEVADA

Joe Melcher
COUNTY RECORDER

BY: DEPUTY
FEE: No Fee

MAP TO SUPPORT PETITION TO ANNEX CERTAIN LANDS TO THE CITY OF RENO, NEVADA

LOCATED IN PORTIONS OF SECTIONS 4, 5, 8, 9, 16 & 17, TOWNSHIP 18 NORTH, RANGE 20 EAST, M.D.B. & M., WASHOE COUNTY, NEVADA

CASTLE LAND SURVEYING
240 Linden St.
Reno, NV 89502 702-689-8620

sht 1 of 1

ANNEXATION-TRACT MAP # 3122

APPENDIX D:

Hydrologic Analysis

```
1***************************************                                     ***************************************
 *                                     *                                     *                                     *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                    *   U.S. ARMY CORPS OF ENGINEERS      *
 *             SEPTEMBER 1990           *                                    *   HYDROLOGIC ENGINEERING CENTER     *
 *              VERSION 4.0             *                                    *        609 SECOND STREET            *
 *                                     *                                     *     DAVIS, CALIFORNIA 95616         *
 * RUN DATE  08/12/1996  TIME  11:36:37 *                                    *         (916) 756-1104              *
 *                                     *                                     *                                     *
***************************************                                      ***************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X               X
XXXXXXX  XXXX     X       XXXXX   X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

              *DIAGRAM
   1          ID     AS-BUILT DETENTION BASIN FOR PHASE 1
   2          ID
   3          ID    SOUTH MEADOWS/DOUBLE DIAMOND RANCH
   4          ID
   5          ID    DETENTION BASIN PHASING  ---- PHASE 1
   6          ID
   7          ID    INCLUDES ONLY CAPITAL REALTY UNIT 1 DEVELOPMENT & ASSOCIATED CHANNELS
   8          ID    INCLUDES THOMAS CREEK TEMPORARY DIVERSION
   9          ID
  10          ID
  11          ID    ASSUMED NO ON-SITE DETENTION BASIN
  12          ID    DESIGN REGIONAL DETENTION BASIN @ NORTHEAST CORNER  -----PHASE 1
  13          ID
  14          ID
  15          ID    SOUTH MEADOW/DOUBLE DIAMOND                       DATE: MAY 1995
  16          ID    BY NIMBUS ENGINEERS, RENO, NV                     FILE : AS-PH1.DAT
  17          ID
  18          ID    100-Year, 24 hour model
  19          ID    WHITES CREEK MODEL COPIED FROM WHITECN.DAT
  20          ID    FIS THOMAS CREEK 100-YEAR PEAK = 2544 CFS @ S. VIRGINIA STREET.
  21          ID
```

```
  22          IT       5                    300
  23          IO       5       0
  24          IN    15.0
              *
              *   JR ratio option used to evaluate the detention basin for events lesser then
              *   100-year event.
              *
              *   100-YEAR EVENT - JR RATIO = 1.0
              *
  25          JR    FLOW     1.0     0.8     0.6     0.4     0.2     0.1

  26          KK     W1R Whites Creek 1
  27          BA    1.36
  28          PB     5.5
  29          PC     0.0    .002    .005    .008    .011    .014    .017    .020    .023    .026
  30          PC    .029    .032    .035    .038    .041    .044    .048    .052    .056    .060
  31          PC    .064    .068    .072    .076    .080    .085    .090    .095    .100    .105
  32          PC    .110    .115    .120    .126    .133    .140    .147    .155    .163    .172
  33          PC    .181    .191    .203    .218    .236    .257    .283    .387    .663    .707
  34          PC    .735    .758    .776    .791    .804    .815    .825    .834    .842    .849
  35          PC    .856    .863    .869    .875    .881    .887    .893    .898    .903    .908
  36          PC    .913    .918    .922    .926    .930    .934    .938    .942    .946    .950
  37          PC    .953    .956    .959    .962    .965    .968    .971    .974    .977    .980
  38          PC    .983    .986    .992    .995    .998    1.00
  39          LS              63
  40          UD    0.48

  41          KK     W2R  Whites Creek No. 2
  42          BA    0.84
  43          PB     5.4
  44          LS              65
  45          UD    0.52
1                                     HEC-1 INPUT                                        PAGE  2

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9.......10


  46          KK   W1+W2  Combine W1 and W2
  47          HC       2

  48          KK    RT-A  Route to pt A
  49          RM       1   0.122     0.4

  50          KK     W3R  Whites Creek No. 3
  51          BA    1.38
  52          PB    5.25
  53          LS              65
  54          UD    0.54

  55          KK    RT-A  Route to pt A
  56          RM       1   0.095     0.4

  57          KK     W4R  Whites Creek No. 4
  58          BA    1.47
  59          PB     5.0
  60          LS              57
  61          UD    0.72

  62          KK   W1234  Combine W1-W4
  63          HC       3
```

```
  64          KK    RT-B  Route to pt B
  65          RM       1  0.0597     0.4

  66          KK     W5R  Whites Creek No. 5
  67          BA    1.27
  68          PB     4.8
  69          LS              58
  70          UD    0.85

  71          KK   W5+CH  Combine W5 and channel
  72          HC       2

  73          KK    RT-C  Route to pt C
  74          RM       2   0.185     0.4

  75          KK     W6R  Whites Creek No. 6
  76          BA    1.43
  77          PB     4.1
  78          LS              57
  79          UD    1.23

  80          KK   W6+CH  Combine W6 and channel
  81          HC       2

  82          KK    RT-D  Route to pt D
  83          RM       1   0.122     0.4
1                                       HEC-1 INPUT                                   PAGE  3

 LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


  84          KK     W7R  Whites Creek No. 7
  85          BA    0.85
  86          PB     3.4
  87          LS              68
  88          UD    0.96

  89          KK   W7+CH  Combine W7 and channel
  90          HC       2

  91          KK  RT-DIF  Route flows to Diffluence
  92          RM       1   0.104     0.4

  93          KK     W8R  Whites Creek No. 8
  94          BA    0.75
  95          PB     3.0
  96          LS              65
  97          UD    1.19

  98          KK  CP DIF  Combine flows at Diffluence
  99          HC       2

 100          KK    DV 4  Divert flows into channel #4 - south branch
 101          KM          Hydrograph at this station is flow in channel 4
 102          DT  CH 123
 103          DI       0    2000    3500    5100
 104          DQ       0    1700    2700    3750

 105          KK   RT W4  Route flows in channel #4 to Wedge Parkway
```

```
106           RM       2    .178      .3

107           KK    W17R  Whites Creek No. 17
108           BA    0.58
109           PB     2.8
110           LS             67
111           UD    0.31

112           KK   CP W4  Combine flows at Wedge Parkway
113           HC       2

114           KK   RT F4  Route flows to proposed RCB at 580
115           RM       1   0.111      .3

116           KK    W19R  Whites Creek No. 19
117           BA    0.33
118           PB    2.75
119           LS             60
120           UD    0.22

121           KK     W9R  Whites Creek No. 9  (Steamboat Hills Area, above Mt. Rose Hwy)
122           BA    2.39
123           PB     2.8
124           LS             69
125           UD    0.51
1                                           HEC-1 INPUT                                    PAGE  4

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


126           KK   RT F4  Route flows to proposed RCB at 580  (Channel 4)
127           RM       2   0.181     0.3

128           KK   CP F4  Combine flows at proposed I-580 RCB  (Channel 4)
129           HC       3

130           KK   RT V4  Route flows to Virginia Street (Channel 4 near Browns School)
131           RM       1   0.121      .3

132           KK    W20R  Whites Creek No. 20
133           BA    0.22
134           PB    2.73
135           LS             61
136           UD    0.22

137           KK   CP V4  Combine flows at Channel #4 and Virginia St. (near Browns School)
138           HC       2

139           KK  RT WHT  ROUTE TO SOUTH BOUNDARY OF WHITES CREEK MEADOW
140           RM       5    0.42      .2

141           KK  RT WHN  ROUTE TO NORTH BOUNDARY OF WHTIES CREEK MEADOW
142           RM       4    0.36     0.2
              *
              *

143           KK  DR 123  Recall channel 1, 2, and 3 flows
144           DR  CH 123

145           KK  DV 2&3  Divert flows into channels 2 and 3 - two middle branches
```

```
 146          KM          Hydrograph at this station is flow in channels 2 and 3
 147          DT    CH 1
 148          DI       0    1700    2700    3750
 149          DQ       0     350     550     700

 150          KK  RT 2&3  Route flows to pt where channels 2 and 3 combine (2000' u/s Virginia)
 151          RM       3    .245      .3

 152          KK    W10R  Whites Creek No. 10
 153          BA     0.3
 154          PB     2.8
 155          LS              55
 156          UD     .32

 157          KK   CP 23  Combine local flows with channels 2 and 3
 158          HC       2

 159          KK  DV 23A  Divert flows at CP 23 (Channels 2 and 3 Diverge)
 160          KM          Hydrograph at this station is in channel 3 (Channel 2 is diverted)
 161          DT    CH 2
 162          DI       0    2000    3500
 163          DQ       0    1000    1750
1                                     HEC-1 INPUT                                         PAGE  5

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 164          KK   RT V3  Route flow to Virginia St. (CP V3)
 165          RM       2   0.136      .2

 166          KK    W11R  Whites Creek No. 11
 167          BA    0.32
 168          PB     2.7
 169          LS              75
 170          UD    0.27

 171          KK   CP V3  Combine Subbasin W11R, and Channel 3 at Virginia Street
 172          HC       2

 173          KK   RT F3  Route flow to F3 (Channel 3 at 580)
 174          RM       3   0.234     0.2

 175          KK    W16R  Whites Creek No. 16
 176          BA    0.11
 177          PB     2.7
 178          LS              81
 179          UD    0.21

 180          KK   CP F3  Combine flows at proposed RCB on 580  (Channel 3)
 181          HC       2

 182          KK  RT WHN  ROUTE TO NORTH BOUNDARY OF WHITES CREEK MEADOW
 183          RM       5    0.41     0.2

 184          KK    W18R  Whites Creek No. 18 - SOUTH OF WHITES CREEK MEADOW
 185          BA    0.57
 186          PB     2.7
 187          LS              80
 188          UD    0.72
              *
```

```
189    KK  CB 3&4  COMBINE WHITES CREEK BRANCHES 3 & 4 & W18R
190    HC       3
       *
       *  ROUTE TO WHITES CREEK "C"

191    KK  RT PH1   ROUTE TO BEGINING OF PHASE 1 CENTRAL CHANNEL
192    RM       6   0.48    0.15

193    KK  W 6P25   WATERSHED WT 6P25-  UNITS  2 & 5 - CAPITAL REALTY
       * EXISTING CONDTION
194    BA    0.45
195    PB     2.7
196    LS              79
197    UD    0.77
```



```
LINE   ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

198    KK  CB 6PA   COMBINE WHITES CREEK BRANCHES 3&4 & WS WT6PA
199    HC       2

200    KK  RT WHC  ROUTE BRANCHES 3 & 4 THRU CENTRAL CHANNEL TO WHITES CREEK "C"
201    RD    5136  0.0029   0.035            TRAP     110     3.5
       *  WHITES CREEK BRANCHES 1 & 2

202    KK    DR 1  Recall Channel 1 Hydrograph (@ Diffluence)
203    DR    CH 1

204    KK   RT Z1  Route Channel 1 to Zolezzi Lane (approx. 2800' West of Virginia St.)
205    RM       4    .34     .3

206    KK    W13R  Whites Creek No. 13
207    BA     1.3
208    PB     2.8
209    LS              61
210    UD    0.52

211    KK   CP Z1  Combine channel 1 w/ W13R at Zolezzi Lane
212    HC       2

213    KK   DV 1B  Divert flows to the north of Zolezzi (Channel 1A)
214    KM          Hydrograph is for flows along Zolezzi (Channel 1B, Ea. to Virginia)
215    DT   CH 1A
216    DI       0     200    1500
217    DQ       0     200     200

218    KK  RT V12  Route Channel 1B to Virginia St.
219    RM       1   0.12     .25

220    KK    W12R  Whites Creek No. 12
221    BA     0.6
222    PB     2.8
223    LS              61
224    UD    0.45

225    KK  CP V12  Combine Channel 1B and W12R at int. of Virginia and Zolezzi
226    HC       2
```

```
227          KK  DR CH2  Recall Channel 2 Hydrograph
228          DR    CH 2

229          KK  RT V12  Route Flows to int. of Virginia and Zolezzi
230          RM       3   .221      .2

231          KK  CP V12  Combine channels 1B and 2 at int. of Virginia and Zolezzi
232          HC       2
1                                       HEC-1 INPUT                                                  PAGE  7

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


233          KK  RT F12  Route flows to proposed RCB at 580 (Channels 1B and 2)
234          RM       2  0.201     0.2

235          KK    W15R  Whites Creek No. 15
236          BA    0.21
237          PB     2.7
238          LS              79
239          UD    0.21

240          KK  CP F12  Combine flows at proposed RCB at 580 (Channels 1B and 2)
241          HC       2
             *

242          KK   DR 1A  Recall Channel 1A Hydrograph
243          DR   CH 1A

244          KK  RT F1A  Route flows to proposed RCB at 580 (Channel 1A)
245          RM       4  0.306     0.2

246          KK    W14R  Whites Creek No. 14
247          BA    0.18
248          PB     2.7
249          LS              77
250          UD    0.26

251          KK  CP F1A  Combine flows at proposed RCB at 580 (Channel 1A)
252          HC       2
             *

253          KK  CB 1&2  COMBINE WHITES CREEK BRANCHES 1 & 2 @ I-580
254          HC       2
             *
             *  ROUTE WHITES CREEK BRANCHES 1 & 2 TO THE CONFLUENCE W/ LUMBERJACK CHANNEL
             *

255          KK  RT WT2  ROUTE WHITES 1&2 THRU WS WT2P - CHANNEL "A"
256          RD    3040  0.0026   0.035              TRAP     135       5

257          KK  RT WT2  ROUTE WHITES 1&2 THRU WS WT2P- PARK AND OPEN SPACE
258          RM       5   0.44    0.20

259          KK  RT WT2  ROUTE WHITES CREEK 1&2 THRU WS WT2P - CHANNEL "B"
260          RD    1914  0.0028   0.035              TRAP     151       3
             *

261          KK  W WT2P  ON-SITE WATERSHED WT2P
             *  EXISTING CONDITION(NO ON-SITE DETENTION)
```

```
 262          BA    0.59
 263          PB     2.7
 264          LS               79
 265          UD    0.73
1                                   HEC-1 INPUT                                          PAGE  8

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 266          KK  CB WT2   COMBINE WHITES CREEK 1&2 & WT2P
 267          HC       2
              *

 268          KK  WS WT1  WATERSHED WT1 - AREAS BETWEEN WHITES CREEK AND THOMAS CREEK
 269          BA   1.93
 270          PB   2.75
 271          LS               66
 272          UD   0.97
              *

 273          KK  RT WT3  ROUTE TO CONFLUENCE
 274          RM       3    0.29    0.25
              *

 275          KK  THOMAS
 276          KM      HYDROGRAPH FROM FIS HYDROLOGY MODEL - THOM100.901
 277          KM      THOMAS CREEK PEAK FLOW @ S. VIRGINIA STREET
 278          BA   11.54
 279          QI       0       0       0       0       0       0       0       0       0       0
 280          QI       0       0       0       0       0       0       0       0       0       0
 281          QI       0       0       0       0       0       0       0       0       0       0
 282          QI       0       0       0       0       0       0       0       2       6      12
 283          QI      20      29      41      54      70      89     112     144     203     385
 284          QI     790    1223    1828    2544    2447    1943    1462    1170    1019     933
 285          QI     873     825     786     756     729     698     665     636     613     594
 286          QI     577     562     549     535     521     504     481     445     407     379
 287          QI     362     350     341     334     327     321     316     310     305     300
 288          QI     295     291     287     282     278     275     271

 289          KK  DV HOL
 290          KM     SPLIT FLOW ACROSS HOLCOME LANE TO NORTH.
 291          KM     REFER TO FIS HEC-2 MODEL FOR THOMAS CREEK - THOMAS A.DAT
 292          KM     SPLIT FLOW RATING CALCULATED USING THOMAS A.DAT
 293          DT  HOLCOM
 294          DI       0    1000    2000    2550    3000    4000
 295          DQ       0     274     955    1385    1746    2562

 296          KK  RT WT3   ROUTE TO OPEN SPACE/WETLAND
 297          RM       2   0.167    0.25

 298          KK  DV THO   THOMAS CREEK DIVERSION AT WETLAND/OPEN SPACE
 299          DT    THOM
 300          DI       0     500    1000    1465
 301          DQ       0       0       0     159

 302          KK  RT WT3   ROUTE TO CONFLUENCE
 303          RM       1   0.083    0.25
1                                   HEC-1 INPUT                                          PAGE  9

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
```

```
304   KK   WT3P  WATERSHED WT3P  - EXISTING CONDITION ( NO ON-SITE DETENTION)
305   BA   0.49
306   PB    2.7
307   LS              79
308   UD   0.33

309   KK  CB WT3  COMBINE OFFSITE FLOWS -WT1 & THOMAS CREEK & WT3P
310   HC      3

311   KK  CB OFF  COMBINE WHITES CREEK 1&2 & THOMAS CREEK
312   HC      2
      *

313   KK  RT WHC  ROUTE THRU WHITES CHANNEL "C"
314   RD    1689  0.0021   0.035            TRAP     150       3

315   KK  WT 6P1  ON-SITE WATERSHED WT6P - CAPITAL REALTY UNIT 1
      *  PROPOSED CONDITION (NO ON-SITE DETENTION)
316   BA   0.25
317   PB    2.7
318   LS              83
319   UD   0.38

320   KK  CB WHC  COMBINE WATERSHED WT6P & WHITES CREEK BRANCHES 1,2,3,&4 & THOMAS CREEK
321   HC      3

322   KK  RT DET ROUTE TO DETENTION BASIN THRU PROPOSED CHANNEL
323   RD    1985 0.00275   0.035            TRAP     170       3
      *
      *   ROUTE THRU DETENTION BASIN

324   KK  RT DET
325   RS      1.    FLOW     -1
      *   volume w/o archeological site (w/west area elevated 1.5' above design)
      *     0     16.5    42.69    75.88   126.84  169.81  209.25  227.64
      *   AS-BUILT VOLUME- PHASE 1
326   SV       0   16.64   41.62   72.60   123.04  170.39  216.38  238.36
327   SE  4422.7 4424.09 4425.20 4426.25 4427.55 4428.60 4429.52 4429.94
328   SQ       0     200     500    1000     2000    3000    4000    4500
      *

329   KK   RT WT  ROUTE TO CP WT
330   RM       1    0.06    0.15
      *
      *
      *

331   KK  THOMAS  RECALL DIVERSION FROM THOMAS CREEK
332   DR    THOM
```



```
333   KK   RT WT   ROUTE TO NORTHEAST PROP
334   RM      19    1.59     0.2

335   KK    WT4P  ON-SITE WATERSHED WP4P
```

```
                 *  EXISTING CONDITION (NO ON-SITE DETENTION)
   336           BA    1.73
   337           PB     2.7
   338           LS              82
   339           UD    1.62

   340           KK    WT7P  ON-SITE WATERSHED WT7P
                 * EXISTING CONDITIONS
   341           BA    0.52
   342           PB     2.7
   343           LS              80
   344           UD    1.48

   345           KK    RT WT   ROUTE TO CP WT
   346           RM       8    0.65    0.15

   347           KK  WS WT5  WATERSHED WT5
   348           BA    0.49
   349           PB    2.65
   350           LS              83
   351           UD    0.28

   352           KK    RT WT  ROUTE TO CP WT
   353           RM       6    0.47    0.15

   354           KK    CB WT  COMBINE FLOWS AT NORTHEAST PROPERTY CORNER
   355           HC       4

   356           KK    CP WT  COMBINE ALL FLOWS @ CP WT
   357           HC       2
   358           ZZ
1
            SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE     (V) ROUTING            (--->) DIVERSION OR PUMP FLOW

  NO.     (.) CONNECTOR          (<---) RETURN OF DIVERTED OR PUMPED FLOW

  26         W1R
              .
              .
  41          .          W2R
              .            .
              .            .
  46       W1+W2............
              V
              V
  48        RT-A
              .
              .
  50          .          W3R
              .            V
              .            V
              .         RT-A
              .            .
              .            .
  57          .            .           W4R
              .            .             .
              .            .             .
  62       W1234.........................
```

```
                V
                V
 64          RT-B
                .
                .
 66             .          W5R
                .            .
                .            .
 71          W5+CH............
                V
                V
 73          RT-C
                .
                .
 75             .          W6R
                .            .
                .            .
 80          W6+CH............
                V
                V
 82          RT-D
                .
                .
 84             .          W7R
                .            .
                .            .
 89          W7+CH............
                V
                V
             RT-DIF
                .
                .
 93             .          W8R
                .            .
                .            .
 98          CP DIF...........
                .
                .
102             .------->  CH 123
100          DV 4
                V
                V
105          RT W4
                .
                .
107             .          W17R
                .            .
                .            .
112          CP W4............
                V
                V
114          RT F4
                .
                .
                .          W19R
                .            .
                .            .
121             .            .            W9R
                .            .              V
                .            .              V
```

```
126          .           .           RT F4
             .           .               .
             .           .               .
        CP F4.................................
             V
             V
130     RT V4
             .
             .
132          .         W20R
             .           .
             .           .
137     CP V4...............
             V
             V
139     RT WHT
             V
             V
141     RT WHN
             .
             .
144          .           .<-------   CH 123
143          .        DR 123
             .           .
             .           .
147          .           .------->    CH 1
145          .        DV 2&3
             .           V
             .           V
             .        RT 2&3
             .           .
             .           .
152          .           .           W10R
             .           .               .
             .           .               .
157          .         CP 23...............
             .           .
             .           .
161          .           .------->    CH 2
159          .        DV 23A
             .           V
             .           V
164          .         RT V3
             .           .
             .           .
166          .           .           W11R
             .           .               .
             .           .               .
171          .         CP V3...............
             .           V
             .           V
173          .         RT F3
             .           .
             .           .
             .           .           W16R
             .           .               .
             .           .               .
180          .         CP F3...............
             .           V
             .           V
```

```
182          .      RT WHN
             .           .
             .           .
             .           .          W18R
             .           .             .
             .           .             .
189     CB 3&4......................
             V
             V
191     RT PH1
             .
             .
193          .      W 6P25
             .           .
             .           .
198     CB 6PA...........
             V
             V
200     RT WHC
             .
             .
203          .           .<-------    CH 1
202          .         DR 1
             .           V
             .           V
204          .      RT Z1
             .           .
             .           .
             .           .          W13R
             .           .             .
             .           .             .
211          .      CP Z1...........
             .           .
             .           .
215          .           .------->   CH 1A
213          .      DV 1B
             .           V
             .           V
218          .     RT V12
             .           .
             .           .
220          .           .          W12R
             .           .             .
             .           .             .
225          .     CP V12...........
             .           .
             .           .
228          .           .             .<-------    CH 2
227          .           .          DR CH2
             .           .             V
             .           .             V
229          .           .          RT V12
             .           .             .
             .           .             .
             .     CP V12...........
             .          V
             .          V
233          .     RT F12
             .          .
             .          .
```

```
235      .      .     W15R
         .      .        .
         .      .        .
         .   CP F12.......
         .      .
         .      .
243      .      .        .<-------   CH 1A
242      .      .     DR 1A
         .      .        V
         .      .        V
244      .      .     RT F1A
         .      .        .
         .      .        .
246      .      .        .      W14R
         .      .        .         .
         .      .        .         .
251      .      .     CP F1A.......
         .      .        .
         .      .        .
253      .   CB 1&2.......
         .      V
         .      V
255      .   RT WT2
         .      V
         .      V
257      .   RT WT2
         .      V
         .      V
         .   RT WT2
         .      .
         .      .
261      .      .     W WT2P
         .      .        .
         .      .        .
266      .   CB WT2.......
         .      .
         .      .
268      .      .     WS WT1
         .      .        V
         .      .        V
273      .      .     RT WT3
         .      .        .
         .      .        .
275      .      .        .    THOMAS
         .      .        .         .
         .      .        .         .
293      .      .        .         .-------> HOLCOM
289      .      .        .    DV HOL
         .      .        .         V
         .      .        .         V
296      .      .        .    RT WT3
         .      .        .         .
         .      .        .         .
         .      .        .         .------->   THOM
         .      .        .    DV THO
         .      .        .         V
         .      .        .         V
302      .      .        .    RT WT3
         .      .        .         .
         .      .        .         .
```

```
     304            .           .           .           .        WT3P
                    .           .           .           .           .
                    .           .           .           .           .
                    .           .      CB WT3........................
                    .           .           .
                    .           .           .
     311            .      CB OFF............
                    .           V
                    .           V
     313            .      RT WHC
                    .           .
                    .           .
     315            .           .      WT 6P1
                    .           .           .
                    .           .           .
     320       CB WHC........................
                    V
                    V
     322       RT DET
                    V
                    V
     324       RT DET
                    V
                    V
     329        RT WT
                    .
                    .
     332            .           .<-------   THOM
                    .      THOMAS
                    .           V
                    .           V
     333            .       RT WT
                    .           .
                    .           .
     335            .           .        WT4P
                    .           .           .
                    .           .           .
     340            .           .           .        WT7P
                    .           .           .           V
                    .           .           .           V
     345            .           .           .       RT WT
                    .           .           .           .
                    .           .           .           .
     347            .           .           .           .      WS WT5
                    .           .           .           .           V
                    .           .           .           .           V
     352            .           .           .           .       RT WT
                    .           .           .           .           .
                    .           .           .           .           .
     354            .       CB WT....................................
                    .           .
                    .           .
     356        CP WT............

         RUNOFF ALSO COMPUTED AT THIS LOCATION
```

```
1*****************************************                          ***************************************
 *                                       *                          *                                     *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                          *   U.S. ARMY CORPS OF ENGINEERS      *
 *            SEPTEMBER 1990             *                          *   HYDROLOGIC ENGINEERING CENTER     *
 *             VERSION 4.0               *                          *         609 SECOND STREET           *
```

DAVIS, CALIFORNIA 95616
(916) 756-1104

AS-BUILT DETENTION BASIN FOR PHASE 1

SOUTH MEADOWS/DOUBLE DIAMOND RANCH

DETENTION BASIN PHASING ---- PHASE 1

INCLUDES ONLY CAPITAL REALTY UNIT 1 DEVELOPMENT & ASSOCIATED CHANNELS
INCLUDES THOMAS CREEK TEMPORARY DIVERSION

ASSUMED NO ON-SITE DETENTION BASIN
DESIGN REGIONAL DETENTION BASIN @ NORTHEAST CORNER -----PHASE 1

SOUTH MEADOW/DOUBLE DIAMOND DATE: MAY 1995
BY NIMBUS ENGINEERS, RENO, NV FILE : AS-PH1.DAT

100-Year, 24 hour model
WHITES CREEK MODEL COPIED FROM WHITECN.DAT
FIS THOMAS CREEK 100-YEAR PEAK = 2544 CFS @ S. VIRGINIA STREET.

```
23 IO        OUTPUT CONTROL VARIABLES
                   IPRNT          5  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT        HYDROGRAPH TIME DATA
                    NMIN          5  MINUTES IN COMPUTATION INTERVAL
                   IDATE      1   0  STARTING DATE
                   ITIME       0000  STARTING TIME
                      NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                  NDDATE      2   0  ENDING DATE
                  NDTIME       0055  ENDING TIME
                   ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL     .08 HOURS
                   TOTAL TIME BASE   24.92 HOURS

       ENGLISH UNITS
            DRAINAGE AREA          SQUARE MILES
            PRECIPITATION DEPTH    INCHES
            LENGTH, ELEVATION      FEET
            FLOW                   CUBIC FEET PER SECOND
            STORAGE VOLUME         ACRE-FEET
            SURFACE AREA           ACRES
            TEMPERATURE            DEGREES FAHRENHEIT

   JP         MULTI-PLAN OPTION
                  NPLAN           1  NUMBER OF PLANS
```

```
JR          MULTI-RATIO OPTION
                RATIOS OF RUNOFF
              1.00      .80      .60      .40      .20      .10
      WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH    RT-A.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH    RT-A.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
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***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH    RT-A.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH    RT-B.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH    RT-B.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
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***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH    RT-B.
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***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH    RT-D.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
      WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH    RT-D.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH    RT-D.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH    RT-D.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH    RT-D.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH    RT-D.
      REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).
1
```

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6
					RATIOS APPLIED TO FLOWS					
					1.00	.80	.60	.40	.20	.10
HYDROGRAPH AT										
+	W1R	1.36	1	FLOW	932.	745.	559.	373.	186.	93.
				TIME	12.42	12.42	12.42	12.42	12.42	12.42
GRAPH AT										
+	W2R	.84	1	FLOW	581.	465.	349.	232.	116.	58.
				TIME	12.42	12.42	12.42	12.42	12.42	12.42
2 COMBINED AT										
+	W1+W2	2.20	1	FLOW	1513.	1210.	908.	605.	303.	151.

				TIME	12.42	12.42	12.42	12.42	12.42	12.42
ROUTED TO										
+	RT-A	2.20	1	FLOW	1481.	1185.	889.	593.	296.	148.
				TIME	12.50	12.50	12.50	12.50	12.50	12.50
HYDROGRAPH AT										
+	W3R	1.38	1	FLOW	874.	699.	524.	349.	175.	87.
				TIME	12.50	12.50	12.50	12.50	12.50	12.50
ROUTED TO										
+	RT-A	1.38	1	FLOW	870.	696.	522.	348.	174.	87.
				TIME	12.58	12.58	12.58	12.58	12.58	12.58
HYDROGRAPH AT										
+	W4R	1.47	1	FLOW	405.	324.	243.	162.	81.	41.
				TIME	12.75	12.75	12.75	12.75	12.75	12.75
3 COMBINED AT										
+	W1234	5.05	1	FLOW	2737.	2189.	1642.	1095.	547.	274.
				TIME	12.58	12.58	12.58	12.58	12.58	12.58
ROUTED TO										
+	RT-B	5.05	1	FLOW	2717.	2174.	1630.	1087.	543.	272.
				TIME	12.67	12.67	12.67	12.67	12.67	12.67
HYDROGRAPH AT										
+	W5R	1.27	1	FLOW	300.	240.	180.	120.	60.	30.
				TIME	12.92	12.92	12.92	12.92	12.92	12.92
2 COMBINED AT										
+	W5+CH	6.32	1	FLOW	2992.	2394.	1795.	1197.	598.	299.
				TIME	12.67	12.67	12.67	12.67	12.67	12.67
ROUTED TO										
+	RT-C	6.32	1	FLOW	2964.	2371.	1778.	1185.	593.	296.
				TIME	12.83	12.83	12.83	12.83	12.83	12.83
HYDROGRAPH AT										
+	W6R	1.43	1	FLOW	146.	117.	88.	58.	29.	15.
				TIME	13.42	13.42	13.42	13.42	13.42	13.42
2 COMBINED AT										
+	W6+CH	7.75	1	FLOW	3068.	2455.	1841.	1227.	614.	307.
				TIME	12.83	12.83	12.83	12.83	12.83	12.83
ROUTED TO										
+	RT-D	7.75	1	FLOW	3021.	2416.	1812.	1208.	604.	302.
				TIME	13.00	13.00	13.00	13.00	13.00	13.00
HYDROGRAPH AT										
+	W7R	.85	1	FLOW	153.	122.	92.	61.	31.	15.
				TIME	13.00	13.00	13.00	13.00	13.00	13.00
BINED AT										
+	W7+CH	8.60	1	FLOW	3174.	2539.	1904.	1269.	635.	317.
				TIME	13.00	13.00	13.00	13.00	13.00	13.00
ROUTED TO										
+	RT-DIF	8.60	1	FLOW	3163.	2531.	1898.	1265.	633.	316.

				TIME	13.08	13.08	13.08	13.08	13.08	13.08
HYDROGRAPH AT										
+	W8R	.75	1	FLOW	61.	49.	36.	24.	12.	6.
				TIME	13.42	13.42	13.42	13.42	13.42	13.42
2 COMBINED AT										
+	CP DIF	9.35	1	FLOW	3220.	2576.	1932.	1288.	644.	322.
				TIME	13.08	13.08	13.08	13.08	13.08	13.08
DIVERSION TO										
+	CH 123	9.35	1	FLOW	2513.	2084.	1642.	1095.	547.	274.
				TIME	13.08	13.08	13.08	13.08	13.08	13.08
HYDROGRAPH AT										
+	DV 4	9.35	1	FLOW	707.	492.	290.	193.	97.	48.
				TIME	13.08	13.08	13.08	13.08	13.08	13.08
ROUTED TO										
+	RT W4	9.35	1	FLOW	688.	477.	285.	190.	95.	47.
				TIME	13.25	13.25	13.25	13.25	13.25	13.25
HYDROGRAPH AT										
+	W17R	.58	1	FLOW	110.	88.	66.	44.	22.	11.
				TIME	12.25	12.25	12.25	12.25	12.25	12.25
2 COMBINED AT										
+	CP W4	9.93	1	FLOW	716.	500.	302.	201.	101.	50.
				TIME	13.25	13.25	13.25	13.25	13.25	13.25
ROUTED TO										
+	RT F4	9.93	1	FLOW	699.	487.	297.	198.	99.	50.
				TIME	13.33	13.33	13.33	13.33	13.33	13.33
HYDROGRAPH AT										
+	W19R	.33	1	FLOW	23.	19.	14.	9.	5.	2.
				TIME	12.25	12.25	12.25	12.25	12.25	12.25
HYDROGRAPH AT										
+	W9R	2.39	1	FLOW	410.	328.	246.	164.	82.	41.
				TIME	12.50	12.50	12.50	12.50	12.50	12.50
ROUTED TO										
+	RT F4	2.39	1	FLOW	399.	319.	240.	160.	80.	40.
				TIME	12.67	12.67	12.67	12.67	12.67	12.67
3 COMBINED AT										
+	CP F4	12.65	1	FLOW	910.	656.	426.	284.	142.	71.
				TIME	13.33	13.33	13.25	13.25	13.25	13.25
ROUTED TO										
+	RT V4	12.65	1	FLOW	894.	645.	422.	281.	141.	70.
				TIME	13.42	13.42	13.42	13.42	13.42	13.42
RAPH AT										
+	W20R	.22	1	FLOW	18.	15.	11.	7.	4.	2.
				TIME	12.17	12.17	12.17	12.17	12.17	12.17
2 COMBINED AT										
+	CP V4	12.87	1	FLOW	899.	650.	425.	284.	142.	71.

				TIME	13.42	13.42	13.42	13.42	13.42	13.42
ROUTED TO										
+	RT WHT	12.87	1	FLOW	855.	619.	414.	276.	138.	69.
				TIME	13.83	13.83	13.83	13.83	13.83	13.83
ROUTED TO										
+	RT WHN	12.87	1	FLOW	824.	599.	406.	270.	135.	68.
				TIME	14.25	14.17	14.17	14.17	14.17	14.17
HYDROGRAPH AT										
+	DR 123	.00	1	FLOW	2513.	2084.	1642.	1095.	547.	274.
				TIME	13.08	13.08	13.08	13.08	13.08	13.08
DIVERSION TO										
+	CH 1	.00	1	FLOW	513.	427.	338.	225.	113.	56.
				TIME	13.08	13.08	13.08	13.08	13.08	13.08
HYDROGRAPH AT										
+	DV 2&3	.00	1	FLOW	2001.	1657.	1304.	869.	435.	217.
				TIME	13.08	13.08	13.08	13.08	13.08	13.08
ROUTED TO										
+	RT 2&3	.00	1	FLOW	1962.	1626.	1275.	850.	425.	212.
				TIME	13.33	13.33	13.33	13.33	13.33	13.33
HYDROGRAPH AT										
+	W10R	.30	1	FLOW	5.	4.	3.	2.	1.	1.
				TIME	12.58	12.58	12.58	12.58	12.58	12.58
2 COMBINED AT										
+	CP 23	.30	1	FLOW	1966.	1630.	1277.	852.	426.	213.
				TIME	13.33	13.33	13.33	13.33	13.33	13.33
DIVERSION TO										
+	CH 2	.30	1	FLOW	983.	815.	639.	426.	213.	106.
				TIME	13.33	13.33	13.33	13.33	13.33	13.33
HYDROGRAPH AT										
+	DV 23A	.30	1	FLOW	983.	815.	639.	426.	213.	106.
				TIME	13.33	13.33	13.33	13.33	13.33	13.33
ROUTED TO										
+	RT V3	.30	1	FLOW	968.	803.	628.	418.	209.	105.
				TIME	13.50	13.50	13.50	13.50	13.50	13.50
HYDROGRAPH AT										
+	W11R	.32	1	FLOW	126.	101.	76.	50.	25.	13.
				TIME	12.17	12.17	12.17	12.17	12.17	12.17
2 COMBINED AT										
+	CP V3	.62	1	FLOW	986.	817.	638.	425.	213.	106.
				TIME	13.50	13.50	13.50	13.50	13.50	13.50
[illegible] TO										
+	RT F3	.62	1	FLOW	963.	798.	621.	414.	207.	103.
				TIME	13.75	13.75	13.75	13.75	13.75	13.75
HYDROGRAPH AT										
+	W16R	.11	1	FLOW	73.	59.	44.	29.	15.	7.

				TIME	12.08	12.08	12.08	12.08	12.08	12.08
2 COMBINED AT										
+	CP F3	.73	1	FLOW	969.	803.	624.	416.	208.	104.
				TIME	13.75	13.75	13.75	13.75	13.75	13.75
ROUTED TO										
+	RT WHN	.73	1	FLOW	934.	774.	599.	399.	200.	100.
				TIME	14.17	14.17	14.17	14.17	14.17	14.17
HYDROGRAPH AT										
+	W18R	.57	1	FLOW	172.	137.	103.	69.	34.	17.
				TIME	12.67	12.67	12.67	12.67	12.67	12.67
3 COMBINED AT										
+	CB 3&4	14.17	1	FLOW	1801.	1408.	1031.	687.	344.	172.
				TIME	14.17	14.17	14.17	14.17	14.17	14.17
ROUTED TO										
+	RT PH1	14.17	1	FLOW	1731.	1353.	992.	661.	331.	165.
				TIME	14.67	14.67	14.58	14.58	14.58	14.58
HYDROGRAPH AT										
+	W 6P25	.45	1	FLOW	121.	97.	73.	48.	24.	12.
				TIME	12.75	12.75	12.75	12.75	12.75	12.75
2 COMBINED AT										
+	CB 6PA	14.62	1	FLOW	1756.	1373.	1008.	672.	336.	168.
				TIME	14.67	14.67	14.58	14.58	14.58	14.58
ROUTED TO										
+	RT WHC	14.62	1	FLOW	1745.	1364.	1001.	668.	334.	167.
				TIME	14.83	14.83	14.83	14.92	15.00	15.08
HYDROGRAPH AT										
+	DR 1	.00	1	FLOW	513.	427.	338.	225.	113.	56.
				TIME	13.08	13.08	13.08	13.08	13.08	13.08
ROUTED TO										
+	RT Z1	.00	1	FLOW	499.	416.	327.	218.	109.	55.
				TIME	13.42	13.42	13.42	13.42	13.42	13.42
HYDROGRAPH AT										
+	W13R	1.30	1	FLOW	78.	63.	47.	31.	16.	8.
				TIME	12.58	12.58	12.58	12.58	12.58	12.58
2 COMBINED AT										
+	CP Z1	1.30	1	FLOW	544.	451.	354.	236.	118.	59.
				TIME	13.42	13.42	13.42	13.42	13.42	13.42
DIVERSION TO										
+	CH 1A	1.30	1	FLOW	200.	200.	200.	200.	118.	59.
				TIME	12.83	12.92	13.00	13.25	13.42	13.42
GRAPH AT										
+	DV 1B	1.30	1	FLOW	344.	251.	154.	36.	0.	0.
				TIME	13.42	13.42	13.42	13.42	.08	.08
ROUTED TO										
+	RT V12	1.30	1	FLOW	334.	243.	147.	32.	0.	0.

				TIME	13.50	13.50	13.50	13.50	.08	.08
HYDROGRAPH AT										
+	W12R	.60	1	FLOW	39.	31.	24.	16.	8.	4.
				TIME	12.50	12.50	12.50	12.50	12.50	12.50
2 COMBINED AT										
+	CP V12	1.90	1	FLOW	353.	258.	158.	39.	8.	4.
				TIME	13.50	13.50	13.50	13.50	12.50	12.50
HYDROGRAPH AT										
+	DR CH2	.00	1	FLOW	983.	815.	639.	426.	213.	106.
				TIME	13.33	13.33	13.33	13.33	13.33	13.33
ROUTED TO										
+	RT V12	.00	1	FLOW	960.	796.	621.	414.	207.	104.
				TIME	13.58	13.58	13.58	13.58	13.58	13.58
2 COMBINED AT										
+	CP V12	1.90	1	FLOW	1311.	1053.	778.	452.	211.	105.
				TIME	13.58	13.58	13.58	13.58	13.58	13.58
ROUTED TO										
+	RT F12	1.90	1	FLOW	1277.	1024.	753.	437.	205.	102.
				TIME	13.75	13.75	13.75	13.75	13.75	13.75
HYDROGRAPH AT										
+	W15R	.21	1	FLOW	123.	99.	74.	49.	25.	12.
				TIME	12.08	12.08	12.08	12.08	12.08	12.08
2 COMBINED AT										
+	CP F12	2.11	1	FLOW	1288.	1033.	760.	441.	207.	104.
				TIME	13.75	13.75	13.75	13.75	13.75	13.75
HYDROGRAPH AT										
+	DR 1A	.00	1	FLOW	200.	200.	200.	200.	118.	59.
				TIME	12.83	12.92	13.00	13.25	13.42	13.42
ROUTED TO										
+	RT F1A	.00	1	FLOW	200.	200.	200.	199.	114.	57.
				TIME	13.83	13.92	14.00	13.83	13.75	13.75
HYDROGRAPH AT										
+	W14R	.18	1	FLOW	84.	68.	51.	34.	17.	8.
				TIME	12.17	12.17	12.17	12.17	12.17	12.17
2 COMBINED AT										
+	CP F1A	.18	1	FLOW	211.	208.	206.	203.	116.	58.
				TIME	13.42	13.50	13.67	13.75	13.75	13.75
2 COMBINED AT										
+	CB 1&2	2.29	1	FLOW	1497.	1241.	965.	645.	323.	161.
				TIME	13.75	13.75	13.75	13.75	13.75	13.75
) TO										
+	RT WT2	2.29	1	FLOW	1487.	1232.	957.	637.	320.	160.
				TIME	13.92	13.92	13.92	13.92	14.00	14.08
ROUTED TO										
+	RT WT2	2.29	1	FLOW	1424.	1180.	913.	609.	304.	152.

				TIME	14.33	14.42	14.42	14.42	14.50	14.58
ROUTED TO										
+	RT WT2	2.29	1	FLOW	1420.	1177.	910.	606.	303.	151.
				TIME	14.50	14.50	14.50	14.58	14.67	14.75
HYDROGRAPH AT										
+	W WT2P	.59	1	FLOW	165.	132.	99.	66.	33.	16.
				TIME	12.67	12.67	12.67	12.67	12.67	12.67
2 COMBINED AT										
+	CB WT2	2.88	1	FLOW	1455.	1205.	931.	619.	309.	154.
				TIME	14.50	14.50	14.50	14.58	14.67	14.75
HYDROGRAPH AT										
+	WS WT1	1.93	1	FLOW	147.	118.	88.	59.	29.	15.
				TIME	13.08	13.08	13.08	13.08	13.08	13.08
ROUTED TO										
+	RT WT3	1.93	1	FLOW	145.	116.	87.	58.	29.	15.
				TIME	13.42	13.42	13.42	13.42	13.42	13.42
HYDROGRAPH AT										
+	THOMAS	11.54	1	FLOW	2544.	2035.	1526.	1018.	509.	254.
				TIME	13.25	13.25	13.25	13.25	13.25	13.25
DIVERSION TO										
+	HOLCOM	11.54	1	FLOW	1380.	983.	632.	286.	139.	70.
				TIME	13.25	13.25	13.25	13.25	13.25	13.25
HYDROGRAPH AT										
+	DV HOL	11.54	1	FLOW	1164.	1053.	894.	732.	369.	185.
				TIME	13.25	13.25	13.25	13.25	13.25	13.25
ROUTED TO										
+	RT WT3	11.54	1	FLOW	1151.	1040.	883.	720.	361.	181.
				TIME	13.50	13.50	13.50	13.50	13.50	13.50
DIVERSION TO										
+	THOM	11.54	1	FLOW	52.	14.	0.	0.	0.	0.
				TIME	13.50	13.50	.08	.08	.08	.08
HYDROGRAPH AT										
+	DV THO	11.54	1	FLOW	1099.	1027.	883.	720.	361.	181.
				TIME	13.50	13.50	13.50	13.50	13.50	13.50
ROUTED TO										
+	RT WT3	11.54	1	FLOW	1097.	1024.	880.	715.	359.	179.
				TIME	13.58	13.58	13.58	13.58	13.58	13.58
HYDROGRAPH AT										
+	WT3P	.49	1	FLOW	229.	183.	138.	92.	46.	23.
				TIME	12.25	12.25	12.25	12.25	12.25	12.25
BINED AT										
+	CB WT3	13.96	1	FLOW	1271.	1163.	984.	785.	394.	197.
				TIME	13.58	13.58	13.58	13.58	13.58	13.58
2 COMBINED AT										
+	CB OFF	16.84	1	FLOW	2381.	2009.	1548.	1016.	492.	239.

				TIME	14.33	14.33	14.33	14.42	14.58	14.67
ROUTED TO										
+	RT WHC	16.84	1	FLOW	2376.	2004.	1543.	1012.	490.	237.
				TIME	14.42	14.42	14.42	14.50	14.67	14.83
HYDROGRAPH AT										
+	WT 6P1	.25	1	FLOW	137.	110.	82.	55.	27.	14.
				TIME	12.25	12.25	12.25	12.25	12.25	12.25
3 COMBINED AT										
+	CB WHC	31.71	1	FLOW	3957.	3217.	2424.	1611.	802.	399.
				TIME	14.67	14.67	14.67	14.75	14.83	15.00
ROUTED TO										
+	RT DET	31.71	1	FLOW	3943.	3211.	2420.	1608.	799.	398.
				TIME	14.75	14.75	14.75	14.83	14.92	15.17
ROUTED TO										
+	RT DET	31.71	1	FLOW	3402.	2749.	2057.	1353.	627.	297.
				TIME	15.25	15.17	15.25	15.33	15.58	15.83
			** PEAK STAGES IN FEET **							
			1	STAGE	4428.97	4428.34	4427.61	4426.71	4425.47	4424.45
				TIME	15.17	15.17	15.25	15.33	15.58	15.83
ROUTED TO										
+	RT WT	31.71	1	FLOW	3400.	2747.	2054.	1351.	626.	297.
				TIME	15.25	15.25	15.33	15.42	15.67	15.92
HYDROGRAPH AT										
+	THOMAS	.00	1	FLOW	52.	14.	0.	0.	0.	0.
				TIME	13.50	13.50	.08	.08	.08	.08
ROUTED TO										
+	RT WT	.00	1	FLOW	32.	5.	0.	0.	0.	0.
				TIME	15.08	15.08	.08	.08	.08	.08
HYDROGRAPH AT										
+	WT4P	1.73	1	FLOW	330.	264.	198.	132.	66.	33.
				TIME	13.67	13.67	13.67	13.67	13.67	13.67
HYDROGRAPH AT										
+	WT7P	.52	1	FLOW	93.	75.	56.	37.	19.	9.
				TIME	13.50	13.50	13.50	13.50	13.50	13.50
ROUTED TO										
+	RT WT	.52	1	FLOW	91.	73.	55.	37.	18.	9.
				TIME	14.17	14.17	14.17	14.17	14.17	14.17
HYDROGRAPH AT										
+	WS WT5	.49	1	FLOW	311.	249.	186.	124.	62.	31.
				TIME	12.17	12.17	12.17	12.17	12.17	12.17
[illegible] TO										
+	RT WT	.49	1	FLOW	250.	200.	150.	100.	50.	25.
				TIME	12.67	12.67	12.67	12.67	12.67	12.67
4 COMBINED AT										
+	CB WT	2.74	1	FLOW	454.	363.	273.	182.	91.	45.

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                                         TIME         13.67    13.67    13.67    13.67    13.67    13.67

 COMBINED AT
+             CP WT    34.45     1       FLOW         3674.    2947.    2200.    1444.    667.     314.
                                         TIME         15.25    15.25    15.25    15.33    15.58    15.83
1
                                         SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
                                             (FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)
                                                                              INTERPOLATED TO
                                                                            COMPUTATION INTERVAL
          ISTAQ    ELEMENT     DT        PEAK     TIME TO     VOLUME      DT       PEAK     TIME TO     VOLUME
                                                   PEAK                                       PEAK

                              (MIN)      (CFS)     (MIN)      (IN)       (MIN)     (CFS)     (MIN)       (IN)

         FOR PLAN = 1  RATIO=  .00
           RT WHC  MANE        5.00    1745.15    890.00       .58       5.00    1745.15    890.00       .58

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .4608E+03 EXCESS= .0000E+00 OUTFLOW= .4540E+03 BASIN STORAGE= .1002E+02 PERCENT ERROR=   -.7

         FOR PLAN = 1  RATIO=  .00
           RT WHC  MANE        5.00    1364.48    890.00       .46       5.00    1364.48    890.00       .46

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .3658E+03 EXCESS= .0000E+00 OUTFLOW= .3603E+03 BASIN STORAGE= .8711E+01 PERCENT ERROR=   -.9

         FOR PLAN = 1  RATIO=  .00
           RT WHC  MANE        5.00    1001.33    890.00       .34       5.00    1001.33    890.00       .34

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .2727E+03 EXCESS= .0000E+00 OUTFLOW= .2679E+03 BASIN STORAGE= .7279E+01 PERCENT ERROR=   -.9

         FOR PLAN = 1  RATIO=  .00
           RT WHC  MANE        5.00     668.05    895.00       .23       5.00     668.05    895.00       .23

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .1818E+03 EXCESS= .0000E+00 OUTFLOW= .1781E+03 BASIN STORAGE= .5649E+01 PERCENT ERROR=  -1.1

         FOR PLAN = 1  RATIO=  .00
           RT WHC  MANE        5.00     333.80    900.00       .11       5.00     333.80    900.00       .11

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .9092E+02 EXCESS= .0000E+00 OUTFLOW= .8835E+02 BASIN STORAGE= .3662E+01 PERCENT ERROR=  -1.2

         FOR PLAN = 1  RATIO=  .00
           RT WHC  MANE        5.00     166.74    905.00       .06       5.00     166.74    905.00       .06

     IUITY SUMMARY (AC-FT) - INFLOW= .4546E+02 EXCESS= .0000E+00 OUTFLOW= .4381E+02 BASIN STORAGE= .2372E+01 PERCENT ERROR=  -1.6

         FOR PLAN = 1  RATIO=  .00
           RT WT2  MANE        5.00    1486.83    835.00      2.87       5.00    1486.83    835.00      2.87
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CONTINUITY SUMMARY (AC-FT) - INFLOW= .3547E+03 EXCESS= .0000E+00 OUTFLOW= .3513E+03 BASIN STORAGE= .5802E+01 PERCENT ERROR=   -.7

        FOR PLAN = 1  RATIO=  .00
          RT WT2  MANE          5.00   1232.38    835.00      2.32      5.00   1232.38    835.00       2.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2866E+03 EXCESS= .0000E+00 OUTFLOW= .2832E+03 BASIN STORAGE= .5056E+01 PERCENT ERROR=   -.5

        FOR PLAN = 1  RATIO=  .00
          RT WT2  MANE          5.00    957.12    835.00      1.75      5.00    957.12    835.00       1.75

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2166E+03 EXCESS= .0000E+00 OUTFLOW= .2139E+03 BASIN STORAGE= .4220E+01 PERCENT ERROR=   -.7

        FOR PLAN = 1  RATIO=  .00
          RT WT2  MANE          5.00    637.30    835.00      1.16      5.00    637.30    835.00       1.16

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1444E+03 EXCESS= .0000E+00 OUTFLOW= .1422E+03 BASIN STORAGE= .3274E+01 PERCENT ERROR=   -.8

        FOR PLAN = 1  RATIO=  .00
          RT WT2  MANE          5.00    319.77    840.00       .58      5.00    319.77    840.00        .58

    UITY SUMMARY (AC-FT) - INFLOW= .7219E+02 EXCESS= .0000E+00 OUTFLOW= .7089E+02 BASIN STORAGE= .2116E+01 PERCENT ERROR=  -1.1

        FOR PLAN = 1  RATIO=  .00
          RT WT2  MANE          5.00    159.80    845.00       .29      5.00    159.80    845.00        .29

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3610E+02 EXCESS= .0000E+00 OUTFLOW= .3525E+02 BASIN STORAGE= .1364E+01 PERCENT ERROR=  -1.4

        FOR PLAN = 1  RATIO=  .00
          RT WT2  MANE          5.00   1420.33    870.00      2.82      5.00   1420.33    870.00       2.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3467E+03 EXCESS= .0000E+00 OUTFLOW= .3445E+03 BASIN STORAGE= .3646E+01 PERCENT ERROR=   -.4

        FOR PLAN = 1  RATIO=  .00
          RT WT2  MANE          5.00   1177.22    870.00      2.27      5.00   1177.22    870.00       2.27

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2795E+03 EXCESS= .0000E+00 OUTFLOW= .2777E+03 BASIN STORAGE= .3176E+01 PERCENT ERROR=   -.5

        FOR PLAN = 1  RATIO=  .00
          RT WT2  MANE          5.00    910.19    870.00      1.71      5.00    910.19    870.00       1.71

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2112E+03 EXCESS= .0000E+00 OUTFLOW= .2093E+03 BASIN STORAGE= .2660E+01 PERCENT ERROR=   -.4
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FOR PLAN = 1  RATIO=  .00
  RT WT2  MANE         5.00    605.64    875.00      1.14      5.00    605.64    875.00       1.14

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1404E+03 EXCESS= .0000E+00 OUTFLOW= .1391E+03 BASIN STORAGE= .2074E+01 PERCENT ERROR=   -.6

FOR PLAN = 1  RATIO=  .00
  RT WT2  MANE         5.00    302.95    880.00       .57      5.00    302.95    880.00        .57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6999E+02 EXCESS= .0000E+00 OUTFLOW= .6915E+02 BASIN STORAGE= .1355E+01 PERCENT ERROR=   -.7

FOR PLAN = 1  RATIO=  .00
  RT WT2  MANE         5.00    151.24    885.00       .28      5.00    151.24    885.00        .28

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3480E+02 EXCESS= .0000E+00 OUTFLOW= .3420E+02 BASIN STORAGE= .8832E+00 PERCENT ERROR=   -.8

FOR PLAN = 1  RATIO=  .00
  RT WHC  MANE         5.00   2376.42    865.00      1.01      5.00   2376.42    865.00       1.01

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9113E+03 EXCESS= .0000E+00 OUTFLOW= .9059E+03 BASIN STORAGE= .6535E+01 PERCENT ERROR=   -.1

FOR PLAN = 1  RATIO=  .00
  RT WHC  MANE         5.00   2003.64    865.00       .82      5.00   2003.64    865.00        .82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7451E+03 EXCESS= .0000E+00 OUTFLOW= .7406E+03 BASIN STORAGE= .5699E+01 PERCENT ERROR=   -.2

FOR PLAN = 1  RATIO=  .00
  RT WHC  MANE         5.00   1542.73    865.00       .63      5.00   1542.73    865.00        .63

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5699E+03 EXCESS= .0000E+00 OUTFLOW= .5664E+03 BASIN STORAGE= .4775E+01 PERCENT ERROR=   -.2

FOR PLAN = 1  RATIO=  .00
  RT WHC  MANE         5.00   1012.35    870.00       .43      5.00   1012.35    870.00        .43

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3862E+03 EXCESS= .0000E+00 OUTFLOW= .3837E+03 BASIN STORAGE= .3721E+01 PERCENT ERROR=   -.3

FOR PLAN = 1  RATIO=  .00
  RT WHC  MANE         5.00    490.38    880.00       .21      5.00    490.38    880.00        .21

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1927E+03 EXCESS= .0000E+00 OUTFLOW= .1909E+03 BASIN STORAGE= .2427E+01 PERCENT ERROR=   -.3

FOR PLAN = 1  RATIO=  .00
  RT WHC  MANE         5.00    237.30    890.00       .11      5.00    237.30    890.00        .11
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CONTINUITY SUMMARY (AC-FT) - INFLOW= .9597E+02 EXCESS= .0000E+00 OUTFLOW= .9483E+02 BASIN STORAGE= .1580E+01 PERCENT ERROR=   -.5


         FOR PLAN = 1  RATIO=  .00
           RT DET  MANE          4.96   3945.65   883.49       .81       5.00   3943.22    885.00         .81


CONTINUITY SUMMARY (AC-FT) - INFLOW= .1375E+04 EXCESS= .0000E+00 OUTFLOW= .1368E+04 BASIN STORAGE= .9398E+01 PERCENT ERROR=   -.1


         FOR PLAN = 1  RATIO=  .00
           RT DET  MANE          5.00   3211.33   885.00       .65       5.00   3211.33    885.00         .65


CONTINUITY SUMMARY (AC-FT) - INFLOW= .1114E+04 EXCESS= .0000E+00 OUTFLOW= .1107E+04 BASIN STORAGE= .8195E+01 PERCENT ERROR=   -.2


         FOR PLAN = 1  RATIO=  .00
           RT DET  MANE          5.00   2419.91   885.00       .50       5.00   2419.91    885.00         .50


CONTINUITY SUMMARY (AC-FT) - INFLOW= .8440E+03 EXCESS= .0000E+00 OUTFLOW= .8390E+03 BASIN STORAGE= .6870E+01 PERCENT ERROR=   -.2


         FOR PLAN = 1  RATIO=  .00
           RT DET  MANE          5.00   1608.19   890.00       .33       5.00   1608.19    890.00         .33


     NUITY SUMMARY (AC-FT) - INFLOW= .5682E+03 EXCESS= .0000E+00 OUTFLOW= .5647E+03 BASIN STORAGE= .5356E+01 PERCENT ERROR=   -.3


         FOR PLAN = 1  RATIO=  .00
           RT DET  MANE          5.00    799.30   895.00       .17       5.00    799.30    895.00         .17


CONTINUITY SUMMARY (AC-FT) - INFLOW= .2825E+03 EXCESS= .0000E+00 OUTFLOW= .2800E+03 BASIN STORAGE= .3497E+01 PERCENT ERROR=   -.4


         FOR PLAN = 1  RATIO=  .00
           RT DET  MANE          5.00    397.76   910.00       .08       5.00    397.76    910.00         .08


CONTINUITY SUMMARY (AC-FT) - INFLOW= .1402E+03 EXCESS= .0000E+00 OUTFLOW= .1386E+03 BASIN STORAGE= .2285E+01 PERCENT ERROR=   -.5



*** NORMAL END OF HEC-1 ***
```

APPENDIX E:

Hydraulic Analyses

HYD WORKMAP
MISSING FROM THIS
SECTION!

```
1******************************************                  **************************************
 *  HEC-2 WATER SURFACE PROFILES          *                  *  U.S. ARMY CORPS OF ENGINEERS      *
 *                                        *                  *  HYDROLOGIC ENGINEERING CENTER     *
      sion   4.6.2;  May 1991             *                  *  609 SECOND STREET, SUITE D        *
                                          *                  *  DAVIS, CALIFORNIA 95616-4687      *
 *  RUN DATE    15AUG96    TIME   10:35:03 *                  *         (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
```



```
                                                                  THIS RUN EXECUTED 15AUG96    10:35:03

      **********************************
      2 WATER SURFACE PROFILES

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

```
T1        NIMBUS ENGINEERS
T2        9508 DOUBLE DIAMOND AS-BUILT CHECK          FILE:  508AS-A.DAT
T3        WHITES CREEK CHANNEL A

J1  ICHECK    INQ      NINV      IDIR      STRT      METRIC    HVINS     Q        WSEL      FQ

      0         2        0         0        -1                            0        47

J2  NPROF    IPLOT     PRFVS     XSECV     XSECH     FN       ALLDC     IBW      CHNIM     ITRACE

     1         0        -1                                       -1                          15


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        43         1        53        54                  38        43         1        23
     24         0       105       150

       .04       .04       .04       .1        .3
        1       2020

     THIS RUN WAS TAKEN FROM FILE WHITE-WC.DAT AND MODIFIED TO REFLECT AS-BUILT
     CONDITIONS SHOWN IN DRAWINGS SUBMITTED TO NIMBUS BY SEA ON 7/16/96
```

SECNO 7912 IS THE MATCH LINE BETWEEN WHITES CREEK CHANNEL 'A' WETLANDS AND THE BEGINNING OF WHITES CREEK CHANNEL 'B'. FLOW PASSES THROUGH CRITICAL DEPTH AT THE TOP OF THE DROP STRUCTURE.

X1	7912	4	1000	1199	0	0	0			
GR	48	1000	44	1012	44	1187	48	1199		
X1	7800	7	727.5	1097.5	272	272	272			
GR	52.5	727.5	45	750	45	890	44	1000	45	1020
GR	50	1090	52.5	1097.5						
X1	7560	17	366.5	1334.2	430	380	230			
GR	52.5	366.5	48	380	47	510	47	620	46.1	700
GR	46	925	45	975	46	1040	46.1	1075	46	1100
GR	46	1125	46.2	1155	46	1170	45.9	1200	46	1225
GR	46.1	1315	52.5	1334.2						

3225 fr u1750 SA

X1	7360	21	373.1	1381.5	200	200	200			
GR	52.5	373.1	50.2	380	50	405	49	470	48	550
GR	47	620	48	650	47	700	47	740	46.9	800
GR	47	850	47	880	47.1	920	47	935	46.9	970
GR	47	1015	47	1045	46.9	1170	47	1320	47	1365
GR	52.5	1381.5								
	7090	22	510	1403.5	255	210	260			
	51.7	510	51	585	50	670	49	750	48	825
GR	47	950	47.5	1000	48	1050	48.2	1075	48	1100
GR	48.1	1125	48	1140	47.9	1150	48	1165	48.1	1180
GR	48	1195	47	1295	46.9	1310	47	1335	48	1360
GR	48	1390	52.5	1403.5						
X1	6810	16	557	1310.5	290	315	280			
GR	52.5	557	51.5	660	51	730	50	905	49	950
GR	48	965	49	1050	49	1100	49.2	1120	49	1145
GR	49.2	1210	49	1250	48	1275	49	1290	49	1300
GR	52.5	1310.5								
X1	6510	9	700	1315	260	310	290			
GR	54.0	700	53.0	705	52.0	750	51.0	880	50.0	1000
GR	49.0	1270	49.0	1290	50.0	1310	52.3	1315		
X1	6230	10	550	1396	300	350	280			
GR	56.0	550	55.0	630	54.0	730	53.0	850	52.0	950
GR	51.0	1000	51.0	1090	50.0	1120	50.0	1390	53.0	1396
X1	5930	13	530	1825	240	450	280			
GR	58.0	530	56.0	550	55.0	690	54.0	765	53.0	900
GR	52.5	1000	53.0	1070	53.0	1120	52.0	1150	51.5	1370
GR	52.0	1580	53.0	1820	55.0	1825				
	5750	20	380	1610	150	320	180			
GR	59.0	380	57.0	390	57.0	500	56.0	545	55.0	610
GR	54.0	800	53.5	900	54.0	960	54.0	990	53.0	1000
GR	54.0	1002	55.0	1010	54.0	1030	53.0	1250	52.8	1290
GR	53.0	1320	53.0	1430	54.0	1510	54.5	1600	59.0	1610

X1	5550	15	270	1445	150	320	300			
GR	59.0	270	58.0	280	57.2	315	58.0	330	57.0	460
GR	56.0	560	55.1	750	56.0	980	55.0	1000	56.0	1015
	55.5	1095	56.0	1190	56.9	1310	57.0	1440	59.0	1445
X1	5050	16	-270	1105	300	320	520			
X3	10			-260	65					
GR	61.5	-270	60.5	-260	60	-50	60.5	0	60	150
GR	59	300	58.8	450	59	550	59	600	60	690
GR	60.2	750	60	815	61	930	61.5	1000	61.2	1100
GR	63	1105								

X1	4750	20	-720	1105	450	250	280			
X3	10			80	65					
GR	64.0	-720	63.0	-700	62.5	-370	63.0	-150	63.0	-50
GR	62.0	-15	63	0	63.0	80	62.0	200	62.0	260
GR	61.5	400	62.0	420	63.0	600	63.2	800	63.0	900
GR	63.2	950	63.0	970	63.0	1000	63.0	1100	64.0	1105
X1	4450	28	-670	1427	350	250	250			
X3	10			320	68					
GR	67.0	-670	66.0	-650	64.0	-645	66.0	-640	66.5	-625
GR	66.0	-565	65.5	-465	65.7	-410	66.0	-370	66.0	-80
GR	65.6	20	65.7	165	66.0	250	66.0	320	65.0	515
	66.0	570	66.0	750	65.9	810	66.0	850	66.0	955
	65.5	1000	65.6	1065	66.0	1105	66.0	1280	65.5	1310
GR	65.5	1360	66.0	1425	67.0	1427				
NC	.035	.035	.035							
X1	4050	6	530	1095	1950	250	250			
X3	10			770	0					
GR	75.5	530	74.0	537.5	73	770	70.4	1000	70.4	1067.5
GR	75.5	1095								
X1	3950	5	1000	1320	100	100	100			
GR	79.2	1000	75.7	1020	72	1180	70.4	1300	78.5	1320
X1	3700	8	1000	1210	240	225	250			
GR	77.9	1000	74.2	1020	72.3	1110	71.3	1117.5	71.6	1127.5
GR	72.6	1135	72	1190	79.2	1210				
X1	3400	13	1000	1175	300	285	300			
GR	79	780	78	850	78	888	75	900	74.5	988
GR	77.6	1000	73.8	1020	73.1	1075	72.1	1082.5	72.2	1092.5
GR	73.2	1100	73.3	1155	79.7	1175				
X1	3150	13	1000	1175	240	260	250			
GR	78	765	77	820	77	868	75.5	910	76	980
GR	78	1000	74.2	1020	73.7	1075	72.7	1082.5	72.6	1092.5
	73.7	1100	74	1155	80	1175				
X1	2900	18	1000	1175	240	260	250			
GR	79.5	805	79	815	78	843	75.9	852	78	869
GR	78.1	877	78	907	77.8	935	77	948	76.4	990
GR	78.6	1000	74.7	1020	74.2	1075	73.2	1082.5	73.2	1092.5
GR	74.3	1100	74.7	1155	80.8	1175				

X1	2600	18	1000	1175	300	300	300			
GR	82	605	80.5	693	79.4	713	81	735	79	850
	79	922	79	930	79	952	76	968	75.5	990
GR	79.4	1000	75.4	1020	75	1075	74.1	1082.5	74.1	1092.5
GR	75.1	1100	75.5	1155	81.5	1175				

X1	2350	22	1000	1180	260	260	260			
GR	83	525	82	562	82	578	82.7	584	80.7	591
GR	82.4	605	81	655	80	720	79	813	78.8	908
GR	79	936	79.9	945	76.4	967	77	982	77.3	992
GR	80.2	1000	76.1	1020	75.2	1090	75.2	1095	75.4	1100
GR	76.1	1155	82.2	1180						
X1	2100	5	1000	1180	270	240	250			
GR	80.7	1000	77.1	1020	76.3	1080	75.8	1160	83.1	1180
X1	1980	5	1000	1170	30	220	120			
GR	80.4	1000	75	1020	75.3	1080	76.6	1155	83.1	1170
X1	1930	4	1000	1170	1	80	50			
GR	80.4	1000	75.5	1010	76.1	1150	83.5	1170		
X1	1840	5	1000	1185	75	85	90			
	81.7	1000	75.8	1010	76.7	1115	76.7	1165	83.9	1185
NC	.04	.04	.04							
X1	1820	5	1000	1195	30	20	20			
GR	84.2	1000	81.3	1010	80	1110	80.4	1180	85	1195
X1	1565	29	1000	1389	275	250	240			
	10		1000							
GR	86.3	580	86	615	83.1	642	85	650	85.7	661
GR	85.4	688	85	718	85.4	783	84.8	879	84.5	968
GR	87.3	1000	84.9	1010	84.2	1030	84.3	1070	84.5	1095
GR	84.3	1164	85.4	1173	84.9	1182	85	1240	85.5	1264
GR	86.7	1272	84	1280	84	1302	86.5	1315	86	1326
GR	85.4	1343	85.6	1368	85.5	1378	88.9	1389		
X1	1300	25	1000	1578	200	290	280			
	10		1148							
GR	91	1000	90	1117	91.45	1148	89.8	1158	89.4	1175
GR	88.5	1195	89	1228	88.6	1250	89.1	1272	88.8	1291
GR	88.8	1328	89.0	1341	89	1354	89	1372	89.1	1403
GR	91.6	1415	90	1422	89.2	1430	90	1446	92.2	1452
GR	90	1470	89	1515	88.3	1552	88.7	1565	92.3	1578
X1	1170	33	1230	1703	130	135	130			
X3	10			1230						
	93.5	1000	93	1050	91.9	1135	92.5	1160	91.1	1180
	93	1210	92.5	1225	95.7	1230	92.8	1240	91.6	1251
GR	91.7	1272	91.5	1295	91.3	1320	91.5	1355	91.1	1380
GR	91	1400	91.1	1415	91.5	1438	91.2	1455	91.4	1485
GR	94.1	1502	91.6	1515	91.8	1525	94.1	1540	93	1545
GR	92	1560	91	1582	90.5	1592	90.7	1618	91	1638
GR	91	1680	91.2	1694	95.1	1703				

X1	1035	13	1000	1620	230	100	135			
GR	98.7	1000	96.9	1004	95	1100	97	1175	95	1290
GR	94	1380	96	1395	94	1420	96	1435	94	1480
GR	90	1565	91.3	1610	95.9	1620				

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

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

0

CCHV= .100 CEHV= .300

*SECNO 7912.000

CRITICAL DEPTH ASSUMED

.2.000	1.58	45.58	45.58	47.00	46.37	.78	.00	.00	48.00
2020.0	.0	2020.0	.0	.0	284.9	.0	.0	.0	48.00
.00	.00	7.09	.00	.000	.040	.000	.000	44.00	1007.25
.020489	0.	0.	0.	0	10	0	.00	184.51	1191.75

FLOW DISTRIBUTION FOR SECNO= 7912.00 CWSEL= 45.58

STA= 1007. 1199.
PER Q= 100.0
AREA= 284.9
VEL= 7.1
DEPTH= 1.5

*SECNO 7800.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.59

7800.000	3.38	47.38	45.94	.00	47.49	.11	1.06	.07	52.50
2020.0	.0	2020.0	.0	.0	754.6	.0	3.2	1.5	52.50
.03	.00	2.68	.00	.000	.040	.000	.000	44.00	742.87
'01592	272.	272.	272.	5	11	0	.00	310.40	1053.27

FLOW DISTRIBUTION FOR SECNO= 7800.00 CWSEL= 47.38

STA= 743. 1098.
PER Q= 100.0

AREA= 754.6
VEL= 2.7
DEPTH= 2.4

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 7560.000

7560.000	2.75	47.75	46.65	.00	47.79	.04	.29	.01	52.50
2020.0	.0	2020.0	.0	.0	1332.5	.0	8.8	4.8	52.50
.07	.00	1.52	.00	.000	.040	.000	.000	45.00	412.49
.000998	430.	230.	380.	4	9	0	.00	907.46	1319.95

FLOW DISTRIBUTION FOR SECNO= 7560.00 CWSEL= 47.75

STA= 412. 1334.
PER Q= 100.0
AREA= 1332.5
VEL= 1.5
DEPTH= 1.5

NO 7360.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .48

7360.000	1.17	48.07	47.61	.00	48.17	.09	.37	.02	52.50
2020.0	.0	2020.0	.0	.0	823.3	.0	13.7	8.7	52.50
.09	.00	2.45	.00	.000	.040	.000	.000	46.90	544.03
.004370	200.	200.	200.	2	14	0	.00	824.19	1368.22

FLOW DISTRIBUTION FOR SECNO= 7360.00 CWSEL= 48.07

STA= 544. 1382.
PER Q= 100.0
AREA= 823.3
VEL= 2.5
DEPTH= 1.0

*SECNO 7090.000

7090.000	2.12	49.02	48.36	.00	49.12	.09	.95	.00	51.70
2020.0	.0	2020.0	.0	.0	828.5	.0	18.6	13.1	52.50
.12	.00	2.44	.00	.000	.040	.000	.000	46.90	748.16
.003085	255.	260.	210.	3	11	0	.00	644.90	1393.07

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

F... DISTRIBUTION FOR SECNO= 7090.00 CWSEL= 49.02

STA= 748. 1404.
PER Q= 100.0
AREA= 828.5
VEL= 2.4
DEPTH= 1.3

*SECNO 6810.000

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

6810.000	2.25	50.25	49.84	.00	50.47	.22	1.32	.04	52.50
2020.0	.0	2020.0	.0	.0	534.6	.0	23.0	16.6	52.50
.14	.00	3.78	.00	.000	.040	.000	.000	48.00	861.06
.008054	290.	280.	315.	2	16	0	.00	442.70	1303.75

FLOW DISTRIBUTION FOR SECNO= 6810.00 CWSEL= 50.25

STA= 861. 1311.
PER Q= 100.0
AREA= 534.6
VEL= 3.8
TH= 1.2

*SECNO 6510.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.80

6510.000	2.58	51.58	50.57	.00	51.68	.10	1.19	.01	54.00
2020.0	.0	2020.0	.0	.0	803.5	.0	27.5	19.8	52.30
.18	.00	2.51	.00	.000	.040	.000	.000	49.00	806.01
.002484	260.	290.	310.	1	19	0	.00	507.40	1313.41

FLOW DISTRIBUTION FOR SECNO= 6510.00 CWSEL= 51.58

STA= 806. 1315.
PER Q= 100.0
AREA= 803.5
VEL= 2.5
DEPTH= 1.6

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

*SECNO 6230.000

6230.000	2.23	52.23	51.21	.00	52.33	.10	.65	.00	56.00

2020.0	.0	2020.0	.0	.0	809.7	.0	32.7	22.9	53.00
.21	.00	2.49	.00	.000	.040	.000	.000	50.00	926.81
002172	300.	280.	350.	3	14	0	.00	467.66	1394.46

FLOW DISTRIBUTION FOR SECNO= 6230.00 CWSEL= 52.23

STA= 927. 1396.
PER Q= 100.0
AREA= 809.7
VEL= 2.5
DEPTH= 1.7

*SECNO 5930.000

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

5930.000	1.63	53.13	52.63	.00	53.22	.09	.89	.00	58.00
2020.0	.0	2020.0	.0	.0	825.3	.0	37.9	27.4	55.00
.24	.00	2.45	.00	.000	.040	.000	.000	51.50	883.96
.005137	240.	280.	450.	1	8	0	.00	936.34	1820.30

FLOW DISTRIBUTION FOR SECNO= 5930.00 CWSEL= 53.13

STA= 884. 1825.
PER Q= 100.0
AREA= 825.3
EL= 2.4
TH= .9

*SECNO 5750.000

3265 DIVIDED FLOW

5750.000	1.54	54.34	54.09	.00	54.50	.16	1.26	.02	59.00
2020.0	.0	2020.0	.0	.0	639.0	.0	40.9	31.0	59.00
.25	.00	3.16	.00	.000	.040	.000	.000	52.80	735.14
.010068	150.	180.	320.	3	15	0	.00	817.86	1571.45

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

FLOW DISTRIBUTION FOR SECNO= 5750.00 CWSEL= 54.34

735. 1610.
Q= 100.0
AREA= 639.0
VEL= 3.2
DEPTH= .8

*SECNO 5550.000

5550.000	1.68	56.68	56.29	.00	56.79	.12	2.29	.00	59.00
2020.0	.0	2020.0	.0	.0	735.9	.0	45.7	36.6	59.00
.28	.00	2.74	.00	.000	.040	.000	.000	55.00	491.58
)5998	150.	300.	320.	4	15	0	.00	789.64	1281.22

FLOW DISTRIBUTION FOR SECNO= 5550.00 CWSEL= 56.68

STA= 492. 1445.
PER Q= 100.0
AREA= 735.9
VEL= 2.7
DEPTH= .9

*SECNO 5050.000

3265 DIVIDED FLOW

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 61.50 ELREA= 63.00

5050.000	1.55	60.35	59.92	.00	60.47	.12	3.68	.00	61.50
2020.0	.0	2020.0	.0	.0	729.4	.0	54.4	47.3	63.00
.34	.00	2.77	.00	.000	.040	.000	.000	58.80	-199.89
.008450	300.	520.	320.	3	14	0	.00	998.69	856.04

FLOW DISTRIBUTION FOR SECNO= 5050.00 CWSEL= 60.35

S -200. 1105.
PER Q= 100.0
AREA= 729.4
VEL= 2.8
DEPTH= .7

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 4750.000

3470 ENCROACHMENT STATIONS= 80.0 1105.0 TYPE= 1 TARGET= -80.000
ELENCL= 65.00 ELENCR= 100000.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 65.00 ELREA= 100000.00

4750.000	1.76	63.26	63.07	.00	63.42	.15	2.94	.01	65.00
`020.0	.0	2020.0	.0	.0	641.4	.0	58.8	53.8	100000.00
.36	.00	3.15	.00	.000	.040	.000	.000	61.50	80.00
.013366	450.	280.	250.	4	5	0	.00	1021.31	1101.31

FLOW DISTRIBUTION FOR SECNO= 4750.00 CWSEL= 63.26

```
STA=       80.    1105.
  PER Q=     100.0
   AREA=     641.4
     EL=       3.1
   PTH=         .6

*SECNO 4450.000

3470 ENCROACHMENT STATIONS=      320.0    1427.0  TYPE=       1  TARGET=     -320.000
 ELENCL=     68.00  ELENCR= 100000.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=        68.00 ELREA=    100000.00

  4450.000      1.41     66.41     66.25       .00     66.55       .13      3.13       .00     68.00
    2020.0        .0    2020.0        .0        .0     688.3        .0      62.6      59.9 100000.00
       .38       .00      2.93       .00      .000      .040      .000      .000     65.00    320.00
   .011750      350.      250.      250.         4        13         0       .00   1105.83   1425.83


FLOW DISTRIBUTION FOR SECNO=   4450.00          CWSEL=     66.41

STA=      320.    1427.
  PER Q=     100.0
   AREA=     688.3
    VEL=       2.9
  DEPTH=        .6
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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 4050.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      770.0    1095.0  TYPE=       1  TARGET=     -770.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=    100000.00 ELREA=    100000.00

  4050.000      1.98     72.38     72.38       .00     73.01       .63      3.47       .15 100000.00
    2020.0        .0    2020.0        .0        .0     317.0        .0      65.5      63.8 100000.00
       .40       .00      6.37       .00      .000      .035      .000      .000     70.40    825.05
   .016697     1950.      250.      250.         0        11         0       .00    253.11   1078.16


FLOW DISTRIBUTION FOR SECNO=   4050.00          CWSEL=     72.38

S         825.    1095.
    . Q=     100.0
   AREA=     317.0
    VEL=       6.4
  DEPTH=       1.3

*SECNO 3950.000
```

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

).000	3.24	73.64	73.20	.00	74.12	.48	1.10	.01	79.20
2020.0	.0	2020.0	.0	.0	362.5	.0	66.3	64.3	78.50
.40	.00	5.57	.00	.000	.035	.000	.000	70.40	1109.39
.007755	100.	100.	100.	2	14	0	.00	198.60	1307.98

FLOW DISTRIBUTION FOR SECNO= 3950.00 CWSEL= 73.64

STA=	1109.	1320.
PER Q=	100.0	
AREA=	362.5	
VEL=	5.6	
DEPTH=	1.8	

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 3700.000

).000	3.84	75.14	74.31	.00	75.49	.34	1.35	.01	77.90
.020.0	.0	2020.0	.0	.0	429.2	.0	68.6	65.4	79.20
.42	.00	4.71	.00	.000	.035	.000	.000	71.30	1014.86
.003990	240.	250.	225.	3	11	0	.00	183.90	1198.75

FLOW DISTRIBUTION FOR SECNO= 3700.00 CWSEL= 75.14

STA=	1015.	1210.
PER Q=	100.0	
AREA=	429.2	
VEL=	4.7	
DEPTH=	2.3	

*SECNO 3400.000

3265 DIVIDED FLOW

3400.000	4.06	76.16	75.17	.00	76.38	.22	.88	.01	77.60
2020.0	328.3	1691.7	.0	132.4	429.8	.0	72.0	66.9	79.70
.44	2.48	3.94	.00	.035	.035	.000	.000	72.10	895.35
.002248	300.	300.	285.	3	15	0	.00	255.48	1163.95

FLOW DISTRIBUTION FOR SECNO= 3400.00 CWSEL= 76.16

	895.	900.	988.	994.	1175.
PER Q=	.2	15.6	.5	83.7	
AREA=	2.7	124.4	5.4	429.8	
VEL=	1.4	2.5	1.7	3.9	
DEPTH=	.6	1.4	.8	2.7	

*SECNO 3150.000

3265 DIVIDED FLOW

3150.000	4.13	76.73	75.63	.00	76.99	.26	.60	.01	78.00
2020.0	181.8	1838.2	.0	92.4	434.6	.0	75.1	68.4	80.00
.46	1.97	4.23	.00	.035	.035	.000	.000	72.60	875.57
.002579	240.	250.	260.	2	15	0	.00	269.14	1164.10

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

FLOW DISTRIBUTION FOR SECNO= 3150.00 CWSEL= 76.73

STA=	876.	910.	980.	987.	1175.
PER Q=	1.6	7.2	.1	91.0	
AREA=	21.2	68.6	2.7	434.6	
VEL=	1.6	2.1	1.1	4.2	
DEPTH=	.6	1.0	.4	2.8	

*SECNO 2900.000

3265 DIVIDED FLOW

2900.000	4.17	77.37	76.18	.00	77.66	.29	.66	.01	78.60
2020.0	74.3	1945.7	.0	44.6	444.3	.0	78.0	69.8	80.80
.47	1.67	4.38	.00	.035	.035	.000	.000	73.20	845.71
.002685	240.	250.	260.	2	19	0	.00	227.94	1163.74

FLOW DISTRIBUTION FOR SECNO= 2900.00 CWSEL= 77.37

STA=	846.	852.	864.	948.	990.	994.	1175.
PER Q=	.4	.8	.0	2.3	.1	96.3	
AREA=	4.6	8.7	1.1	28.0	2.1	444.3	
VEL=	1.8	1.8	.7	1.7	1.3	4.4	
DEPTH=	.7	.7	.0	.7	.5	2.8	

*SECNO 2600.000

3265 DIVIDED FLOW

2600.000	4.06	78.16	76.89	.00	78.40	.24	.74	.00	79.40
2020.0	238.3	1781.7	.0	74.4	444.8	.0	81.5	71.2	81.50
.49	3.20	4.01	.00	.035	.035	.000	.000	74.10	956.50
.002248	300.	300.	300.	0	19	0	.00	197.95	1163.85

FLOW DISTRIBUTION FOR SECNO= 2600.00 CWSEL= 78.16

STA=	956.	968.	990.	997.	1175.
PER Q=	1.3	9.5	1.0	88.2	

AREA=	12.4	52.9	9.0	444.8
VEL=	2.1	3.6	2.3	4.0
DEPTH=	1.1	2.4	1.3	2.8

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 2350.000

3265 DIVIDED FLOW

2350.000	3.55	78.75	77.56	.00	78.99	.25	.60	.00	80.20
2020.0	189.9	1830.1	.0	66.9	448.0	.0	84.5	72.4	82.20
.51	2.84	4.09	.00	.035	.035	.000	.000	75.20	952.25
.002333	260.	260.	260.	2	11	0	.00	202.50	1165.85

FLOW DISTRIBUTION FOR SECNO= 2350.00 CWSEL= 78.75

STA=	952.	967.	982.	992.	996. 1180.
PER Q=	1.9	5.0	2.2	.2	90.6
AREA=	17.3	30.7	16.0	2.9	448.0
VEL=	2.3	3.3	2.8	1.6	4.1
DEPTH=	1.2	2.0	1.6	.7	2.8

*SECNO 2100.000

2100.000	3.55	79.35	78.16	.00	79.66	.31	.64	.02	80.70
2020.0	.0	2020.0	.0	.0	452.4	.0	87.3	73.5	83.10
.53	.00	4.46	.00	.000	.035	.000	.000	75.80	1007.57
.002834	270.	250.	240.	1	14	0	.00	162.13	1169.69

FLOW DISTRIBUTION FOR SECNO= 2100.00 CWSEL= 79.35

STA=	1008. 1180.
PER Q=	100.0
AREA=	452.4
VEL=	4.5
DEPTH=	2.8

*SECNO 1980.000

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

1980.000	4.69	79.69	77.45	.00	79.87	.17	.20	.01	80.40
2020.0	.0	2020.0	.0	.0	605.1	.0	88.8	73.9	83.10
.54	.00	3.34	.00	.000	.035	.000	.000	75.00	1002.62
01056	30.	120.	220.	2	19	0	.00	159.52	1162.14

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

FLOW DISTRIBUTION FOR SECNO= 1980.00 CWSEL= 79.69

STA= 1003. 1170.
PER Q= 100.0
AREA= 605.1
VEL= 3.3
DEPTH= 3.8

*SECNO 1930.000

1930.000	4.24	79.74	77.63	.00	79.92	.18	.06	.00	80.40
2020.0	.0	2020.0	.0	.0	587.9	.0	89.5	74.1	83.50
.54	.00	3.44	.00	.000	.035	.000	.000	75.50	1001.35
.001156	1.	50.	80.	2	14	0	.00	158.49	1159.84

FLOW DISTRIBUTION FOR SECNO= 1930.00 CWSEL= 79.74

STA= 1001. 1170.
PER Q= 100.0
AREA= 587.9
VEL= 3.4
H= 3.7

*SECNO 1840.000

1840.000	4.05	79.85	78.11	.00	80.05	.20	.12	.01	81.70
2020.0	.0	2020.0	.0	.0	561.3	.0	90.7	74.5	83.90
.55	.00	3.60	.00	.000	.035	.000	.000	75.80	1003.15
.001487	75.	90.	85.	1	11	0	.00	170.57	1173.72

FLOW DISTRIBUTION FOR SECNO= 1840.00 CWSEL= 79.85

STA= 1003. 1185.
PER Q= 100.0
AREA= 561.3
VEL= 3.6
DEPTH= 3.3

*SECNO 1820.000

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

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1820.000	2.08	82.08	82.08	.00	82.89	.80	.07	.18	84.20
2020.0	.0	2020.0	.0	.0	280.9	.0	90.9	74.5	85.00
.55	.00	7.19	.00	.000	.040	.000	.000	80.00	1007.30
.020479	30.	20.	20.	0	11	0	.00	178.19	1185.49

FLOW DISTRIBUTION FOR SECNO= 1820.00 CWSEL= 82.08

STA=	1007.	1195.
PER Q=	100.0	
AREA=	280.9	
VEL=	7.2	
DEPTH=	1.6	

*SECNO 1565.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

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

1565.000	2.66	85.76	85.46	.00	85.92	.16	2.97	.06	87.30
2020.0	856.2	1163.8	.0	281.0	348.8	.0	93.5	77.1	88.90
.57	3.05	3.34	.00	.040	.040	.000	.000	83.10	617.24
17873	275.	240.	250.	6	11	0	.00	706.84	1378.84

FLOW DISTRIBUTION FOR SECNO= 1565.00 CWSEL= 85.76

STA=	617.	642.	650.	661.	688.	718.	783.	879.	968.	982.	1389.
PER Q=	6.5	3.1	.4	.3	1.9	4.0	7.8	17.3	1.1	57.6	
AREA=	32.9	13.7	4.5	5.7	16.8	36.4	63.3	98.7	9.1	348.8	
VEL=	4.0	4.6	1.8	1.2	2.2	2.2	2.5	3.5	2.4	3.3	
DEPTH=	1.3	1.7	.4	.2	.6	.6	.7	1.1	.6	1.0	

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 1300.000

3265 DIVIDED FLOW

MINIMUM SPECIFIC ENERGY

CRITICAL DEPTH ASSUMED

1300.000	1.68	89.98	89.98	.00	90.47	.49	3.36	.10	91.00
2020.0	.0	2020.0	.0	.0	358.1	.0	96.4	80.3	92.30
.58	.00	5.64	.00	.000	.040	.000	.000	88.30	1156.92
.024302	200.	280.	290.	0	14	0	.00	372.22	1569.61

FLOW DISTRIBUTION FOR SECNO= 1300.00 CWSEL= 89.98

1157. 1578.
PER Q= 100.0
AREA= 358.1
VEL= 5.6
DEPTH= 1.0

*SECNO 1170.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 1230.0 1703.0 TYPE= 1 TARGET= -1230.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 95.70 ELREA= 100000.00

1170.000	1.90	92.40	92.18	.00	92.71	.31	2.22	.02	95.70
2020.0	.0	2020.0	.0	.0	452.4	.0	97.6	81.4	100000.00
.59	.00	4.47	.00	.000	.040	.000	.000	90.50	1243.72
.012622	130.	130.	135.	4	5	0	.00	408.19	1696.75

FLOW DISTRIBUTION FOR SECNO= 1170.00 CWSEL= 92:40

STA= 1244. 1703.
PER Q= 100.0
AREA= 452.4
VEL= 4.5
DEPTH= 1.1

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 1035.000

1035.000	3.73	93.73	93.38	.00	94.47	.74	1.64	.13	98.70
2020.0	.0	2020.0	.0	.0	293.4	.0	98.8	82.2	95.90
.60	.00	6.89	.00	.000	.040	.000	.000	90.00	1485.65
.011638	230.	135.	100.	4	14	0	.00	129.64	1615.29

FLOW DISTRIBUTION FOR SECNO= 1035.00 CWSEL= 93.73

STA= 1486. 1620.
PER Q= 100.0
AREA= 293.4
VEL= 6.9
DEPTH= 2.3

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HEC-2 WATER SURFACE PROFILES

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

WHITES CREEK CHANNEL A

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	SSTA	ENDST
*	7912.000	2020.00	45.58	1007.25	1191.75
*	7800.000	2020.00	47.38	742.87	1053.27
	7560.000	2020.00	47.75	412.49	1319.95
*	7360.000	2020.00	48.07	544.03	1368.22
	7090.000	2020.00	49.02	748.16	1393.07
*	6810.000	2020.00	50.25	861.06	1303.75
*	6510.000	2020.00	51.58	806.01	1313.41
	6230.000	2020.00	52.23	926.81	1394.46
*	5930.000	2020.00	53.13	883.96	1820.30
	5750.000	2020.00	54.34	735.14	1571.45
	5550.000	2020.00	56.68	491.58	1281.22
	5050.000	2020.00	60.35	-199.89	856.04
	4750.000	2020.00	63.26	80.00	1101.31
	4450.000	2020.00	66.41	320.00	1425.83
*	4050.000	2020.00	72.38	825.05	1078.16
*	3950.000	2020.00	73.64	1109.39	1307.98
	3700.000	2020.00	75.14	1014.86	1198.75

SECNO	Q	CWSEL	SSTA	ENDST

	3400.000	2020.00	76.16	895.35	1163.95
	150.000	2020.00	76.73	875.57	1164.10
	2900.000	2020.00	77.37	845.71	1163.74
	2600.000	2020.00	78.16	956.50	1163.85
	2350.000	2020.00	78.75	952.25	1165.85
	2100.000	2020.00	79.35	1007.57	1169.69
*	1980.000	2020.00	79.69	1002.62	1162.14
	1930.000	2020.00	79.74	1001.35	1159.84
	1840.000	2020.00	79.85	1003.15	1173.72
*	1820.000	2020.00	82.08	1007.30	1185.49
*	1565.000	2020.00	85.76	617.24	1378.84
*	1300.000	2020.00	89.98	1156.92	1569.61
	1170.000	2020.00	92.40	1243.72	1696.75
	1035.000	2020.00	93.73	1485.65	1615.29

WHITES CREEK CHANNEL A

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	XLBEL	RBEL
*	7912.000	2020.00	45.58	48.00	48.00
*	7800.000	2020.00	47.38	52.50	52.50
	7560.000	2020.00	47.75	52.50	52.50
*	7360.000	2020.00	48.07	52.50	52.50
	7090.000	2020.00	49.02	51.70	52.50
*	6810.000	2020.00	50.25	52.50	52.50
*	6510.000	2020.00	51.58	54.00	52.30
	230.000	2020.00	52.23	56.00	53.00
*	5930.000	2020.00	53.13	58.00	55.00
	5750.000	2020.00	54.34	59.00	59.00

	5550.000	2020.00	56.68	59.00	59.00
	5050.000	2020.00	60.35	61.50	63.00
	750.000	2020.00	63.26	65.00	100000.00
	4450.000	2020.00	66.41	68.00	100000.00
*	4050.000	2020.00	72.38	100000.00	100000.00
*	3950.000	2020.00	73.64	79.20	78.50
	3700.000	2020.00	75.14	77.90	79.20
	3400.000	2020.00	76.16	77.60	79.70
	3150.000	2020.00	76.73	78.00	80.00
	2900.000	2020.00	77.37	78.60	80.80
	2600.000	2020.00	78.16	79.40	81.50
	2350.000	2020.00	78.75	80.20	82.20
	2100.000	2020.00	79.35	80.70	83.10
*	1980.000	2020.00	79.69	80.40	83.10

	SECNO	Q	CWSEL	XLBEL	RBEL
	1930.000	2020.00	79.74	80.40	83.50
	1840.000	2020.00	79.85	81.70	83.90
*	1820.000	2020.00	82.08	84.20	85.00
*	1565.000	2020.00	85.76	87.30	88.90
*	1300.000	2020.00	89.98	91.00	92.30
	1170.000	2020.00	92.40	95.70	100000.00
	1035.000	2020.00	93.73	98.70	95.90

WHITES CREEK CHANNEL A

RY PRINTOUT TABLE 105

	SECNO	CWSEL	HL	OLOSS	TOPWID	QLOB	QCH	QROB
*	7912.000	45.58	.00	.00	184.51	.00	2020.00	.00

*	7800.000	47.38	1.06	.07	310.40	.00	2020.00	.00
	[illegible]60.000	47.75	.29	.01	907.46	.00	2020.00	.00
*	7360.000	48.07	.37	.02	824.19	.00	2020.00	.00
	7090.000	49.02	.95	.00	644.90	.00	2020.00	.00
*	6810.000	50.25	1.32	.04	442.70	.00	2020.00	.00
*	6510.000	51.58	1.19	.01	507.40	.00	2020.00	.00
	6230.000	52.23	.65	.00	467.66	.00	2020.00	.00
*	5930.000	53.13	.89	.00	936.34	.00	2020.00	.00
	5750.000	54.34	1.26	.02	817.86	.00	2020.00	.00
	5550.000	56.68	2.29	.00	789.64	.00	2020.00	.00
	5050.000	60.35	3.68	.00	998.69	.00	2020.00	.00
	4750.000	63.26	2.94	.01	1021.31	.00	2020.00	.00
	4450.000	66.41	3.13	.00	1105.83	.00	2020.00	.00
*	4050.000	72.38	3.47	.15	253.11	.00	2020.00	.00
	[illegible]50.000	73.64	1.10	.01	198.60	.00	2020.00	.00
	3700.000	75.14	1.35	.01	183.90	.00	2020.00	.00
	3400.000	76.16	.88	.01	255.48	328.31	1691.69	.00
	3150.000	76.73	.60	.01	269.14	181.76	1838.24	.00
	2900.000	77.37	.66	.01	227.94	74.27	1945.73	.00
	2600.000	78.16	.74	.00	197.95	238.29	1781.71	.00
	2350.000	78.75	.60	.00	202.50	189.89	1830.11	.00
	2100.000	79.35	.64	.02	162.13	.00	2020.00	.00
*	1980.000	79.69	.20	.01	159.52	.00	2020.00	.00

	SECNO	CWSEL	HL	OLOSS	TOPWID	QLOB	QCH	QROB
	[illegible]930.000	79.74	.06	.00	158.49	.00	2020.00	.00
	1840.000	79.85	.12	.01	170.57	.00	2020.00	.00
*	1820.000	82:08	.07	.18	178.19	.00	2020.00	.00
*	1565.000	85.76	2.97	.06	706.84	856.21	1163.79	.00

*	1300.000	89.98	3.36	.10	372.22	.00	2020.00	.00
	170.000	92.40	2.22	.02	408.19	.00	2020.00	.00
	1035.000	93.73	1.64	.13	129.64	.00	2020.00	.00

WHITES CREEK CHANNEL A

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	7912.000	.00	.00	.00	44.00	2020.00	45.58	45.58	46.37	204.89	7.09	284.88	141.12
*	7800.000	272.00	.00	.00	44.00	2020.00	47.38	45.94	47.49	15.92	2.68	754.61	506.33
	7560.000	230.00	.00	.00	45.00	2020.00	47.75	46.65	47.79	9.98	1.52	1332.48	639.37
*	7360.000	200.00	.00	.00	46.90	2020.00	48.07	47.61	48.17	43.70	2.45	823.26	305.56
	7090.000	260.00	.00	.00	46.90	2020.00	49.02	48.36	49.12	30.85	2.44	828.53	363.68
	310.000	280.00	.00	.00	48.00	2020.00	50.25	49.84	50.47	80.54	3.78	534.55	225.08
*	6510.000	290.00	.00	.00	49.00	2020.00	51.58	50.57	51.68	24.84	2.51	803.47	405.32
	6230.000	280.00	.00	.00	50.00	2020.00	52.23	51.21	52.33	21.72	2.49	809.72	433.41
*	5930.000	280.00	.00	.00	51.50	2020.00	53.13	52.63	53.22	51.37	2.45	825.29	281.84
	5750.000	180.00	.00	.00	52.80	2020.00	54.34	54.09	54.50	100.68	3.16	639.00	201.32
	5550.000	300.00	.00	.00	55.00	2020.00	56.68	56.29	56.79	59.98	2.74	735.89	260.82
	5050.000	520.00	.00	.00	58.80	2020.00	60.35	59.92	60.47	84.50	2.77	729.38	219.74
	4750.000	280.00	.00	.00	61.50	2020.00	63.26	63.07	63.42	133.66	3.15	641.45	174.73
	4450.000	250.00	.00	.00	65.00	2020.00	66.41	66.25	66.55	117.50	2.93	688.32	186.35
*	4050.000	250.00	.00	.00	70.40	2020.00	72.38	72.38	73.01	168.97	6.37	317.04	156.33
*	3950.000	100.00	.00	.00	70.40	2020.00	73.64	73.20	74.12	77.55	5.57	362.52	229.38
	3700.000	250.00	.00	.00	71.30	2020.00	75.14	74.31	75.49	39.90	4.71	429.25	319.77
	3400.000	300.00	.00	.00	72.10	2020.00	76.16	75.17	76.38	22.48	3.94	562.22	426.07
	.50.000	250.00	.00	.00	72.60	2020.00	76.73	75.63	76.99	25.79	4.23	527.06	397.80
	2900.000	250.00	.00	.00	73.20	2020.00	77.37	76.18	77.66	26.85	4.38	488.87	389.83
	2600.000	300.00	.00	.00	74.10	2020.00	78.16	76.89	78.40	22.48	4.01	519.14	426.06

WSE ≈ 79.35 | | | | | | | | EGL | | V/H | | |

2350.000	260.00	.00	.00	75.20	2020.00	78.75	77.56	78.99	23.33	4.09	514.84	418.18
2100.000	250.00	.00	.00	75.80	2020.00	79.35	78.16	79.66	28.34	4.46	452.41	379.43
1980.000	120.00	.00	.00	75.00	2020.00	79.69	77.45	79.87	10.56	3.34	605.05	621.51

1

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	1930.000	50.00	.00	.00	75.50	2020.00	79.74	77.63	79.92	11.56	3.44	587.95	594.13
	1840.000	90.00	.00	.00	75.80	2020.00	79.85	78.11	80.05	14.87	3.60	561.32	523.92
*	1820.000	20.00	.00	.00	80.00	2020.00	82.08	82.08	82.89	204.79	7.19	280.90	141.16
*	1565.000	240.00	.00	.00	83.10	2020.00	85.76	85.46	85.92	78.73	3.34	629.72	227.66
*	1300.000	280.00	.00	.00	88.30	2020.00	89.98	89.98	90.47	243.02	5.64	358.14	129.58
	1170.000	130.00	.00	.00	90.50	2020.00	92.40	92.18	92.71	126.22	4.47	452.36	179.80
	1035.000	135.00	.00	.00	90.00	2020.00	93.73	93.38	94.47	116.38	6.89	293.37	187.25

1

WHITES CREEK CHANNEL A

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	7912.000	2020.00	45.58	.00	.00	-1.42	184.51	.00
*	7800.000	2020.00	47.38	.00	1.80	.00	310.40	272.00
	7560.000	2020.00	47.75	.00	.37	.00	907.46	230.00
*	7360.000	2020.00	48.07	.00	.33	.00	824.19	200.00
	7090.000	2020.00	49.02	.00	.95	.00	644.90	260.00
*	6810.000	2020.00	50.25	.00	1.23	.00	442.70	280.00
*	6510.000	2020.00	51.58	.00	1.33	.00	507.40	290.00
	6230.000	2020.00	52.23	.00	.65	.00	467.66	280.00
*	5930.000	2020.00	53.13	.00	.90	.00	936.34	280.00
	5750.000	2020.00	54.34	.00	1.22	.00	817.86	180.00
	5550.000	2020.00	56.68	.00	2.33	.00	789.64	300.00
	5050.000	2020.00	60.35	.00	3.67	.00	998.69	520.00

4750.000	2020.00	63.26	.00	2.91	.00	1021.31	280.00
450.000	2020.00	66.41	.00	3.15	.00	1105.83	250.00
* 4050.000	2020.00	72.38	.00	5.96	.00	253.11	250.00
* 3950.000	2020.00	73.64	.00	1.26	.00	198.60	100.00
3700.000	2020.00	75.14	.00	1.51	.00	183.90	250.00
3400.000	2020.00	76.16	.00	1.02	.00	255.48	300.00
3150.000	2020.00	76.73	.00	.57	.00	269.14	250.00
2900.000	2020.00	77.37	.00	.63	.00	227.94	250.00
2600.000	2020.00	78.16	.00	.79	.00	197.95	300.00
2350.000	2020.00	78.75	.00	.59	.00	202.50	260.00
2100.000	2020.00	79.35	.00	.60	.00	162.13	250.00
* 1980.000	2020.00	79.69	.00	.35	.00	159.52	120.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
1930.000	2020.00	79.74	.00	.05	.00	158.49	50.00
1840.000	2020.00	79.85	.00	.11	.00	170.57	90.00
* 1820.000	2020.00	82.08	.00	2.24	.00	178.19	20.00
* 1565.000	2020.00	85.76	.00	3.68	.00	706.84	240.00
* 1300.000	2020.00	89.98	.00	4.22	.00	372.22	280.00
1170.000	2020.00	92.40	.00	2.42	.00	408.19	130.00
1035.000	2020.00	93.73	.00	1.34	.00	129.64	135.00

SUMMARY OF ERRORS AND SPECIAL NOTES

ON SECNO= 7912.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

WARNING SECNO= 7800.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 7360.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

```
WARNING SECNO=   6810.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   6510.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

    .NG SECNO=   5930.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=   4050.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4050.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=   3950.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   1980.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=   1820.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1820.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=   1565.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=   1300.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1300.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
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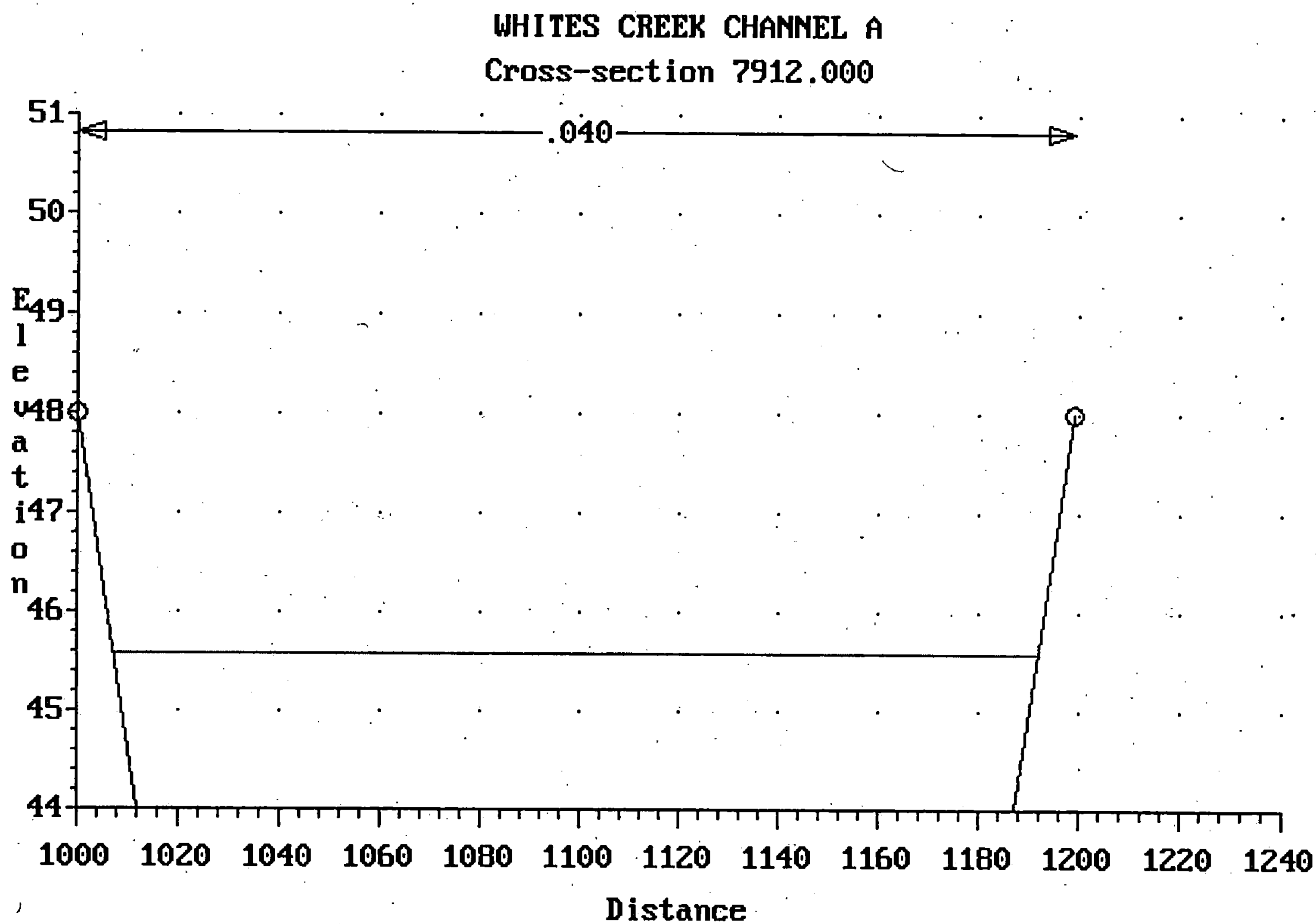
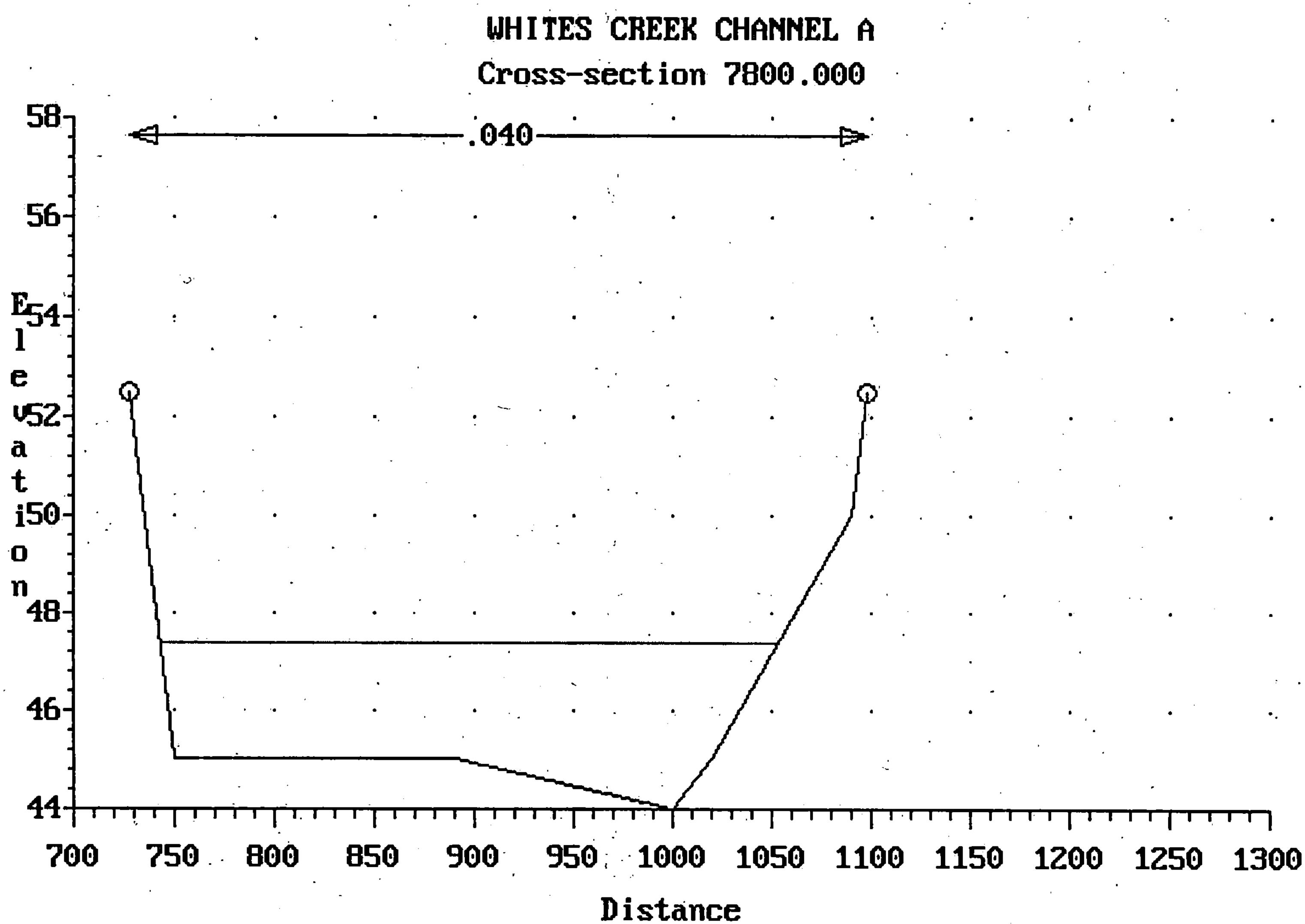
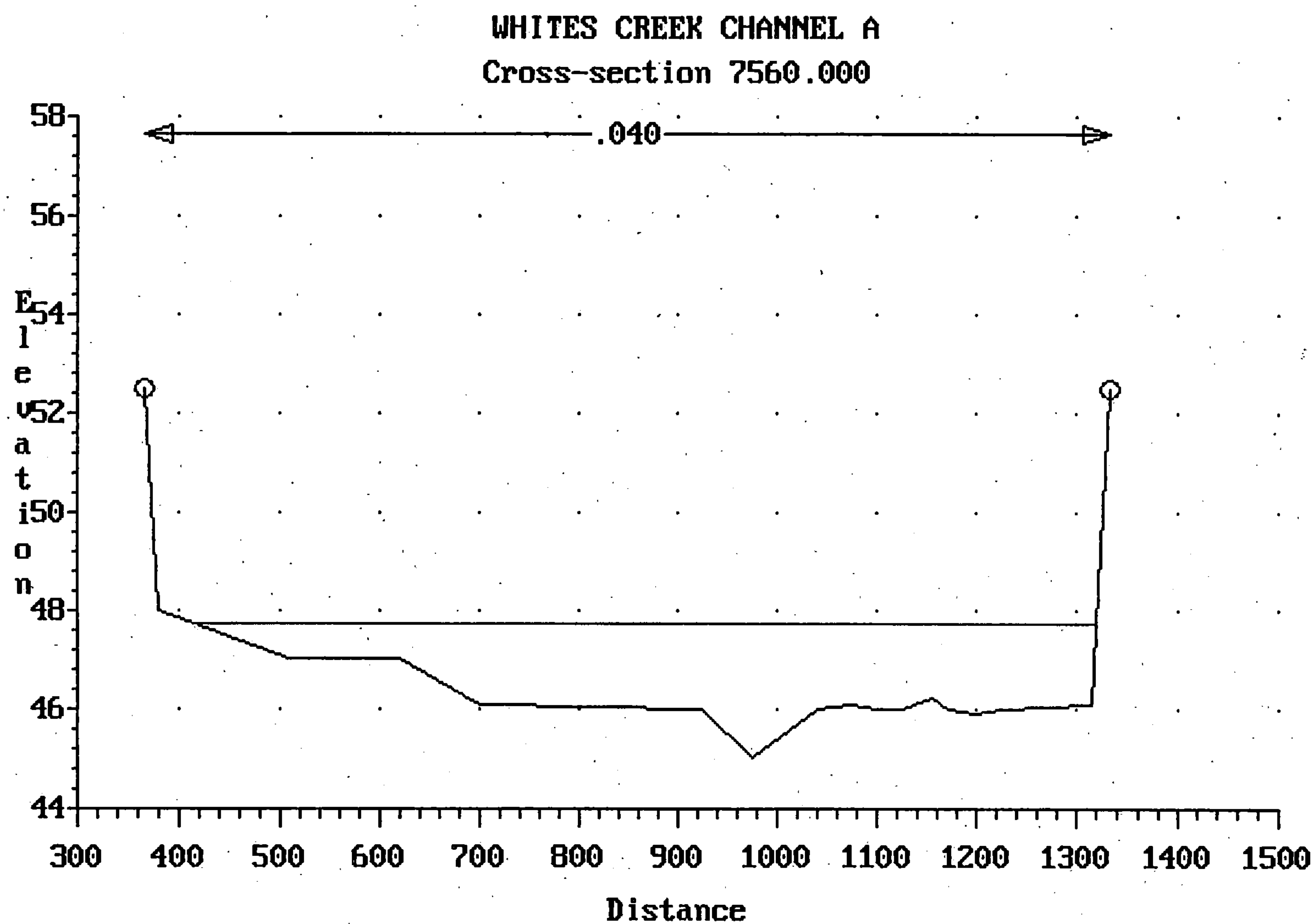


WHITES CREEK CHANNEL A
Cross-section 7912.000
.040
Elevation
51
50
49
48
47
46
45
44
1000
1020
1040
1060
1080
1100
1120
1140
1160
1180
1200
1220
1240
Distance

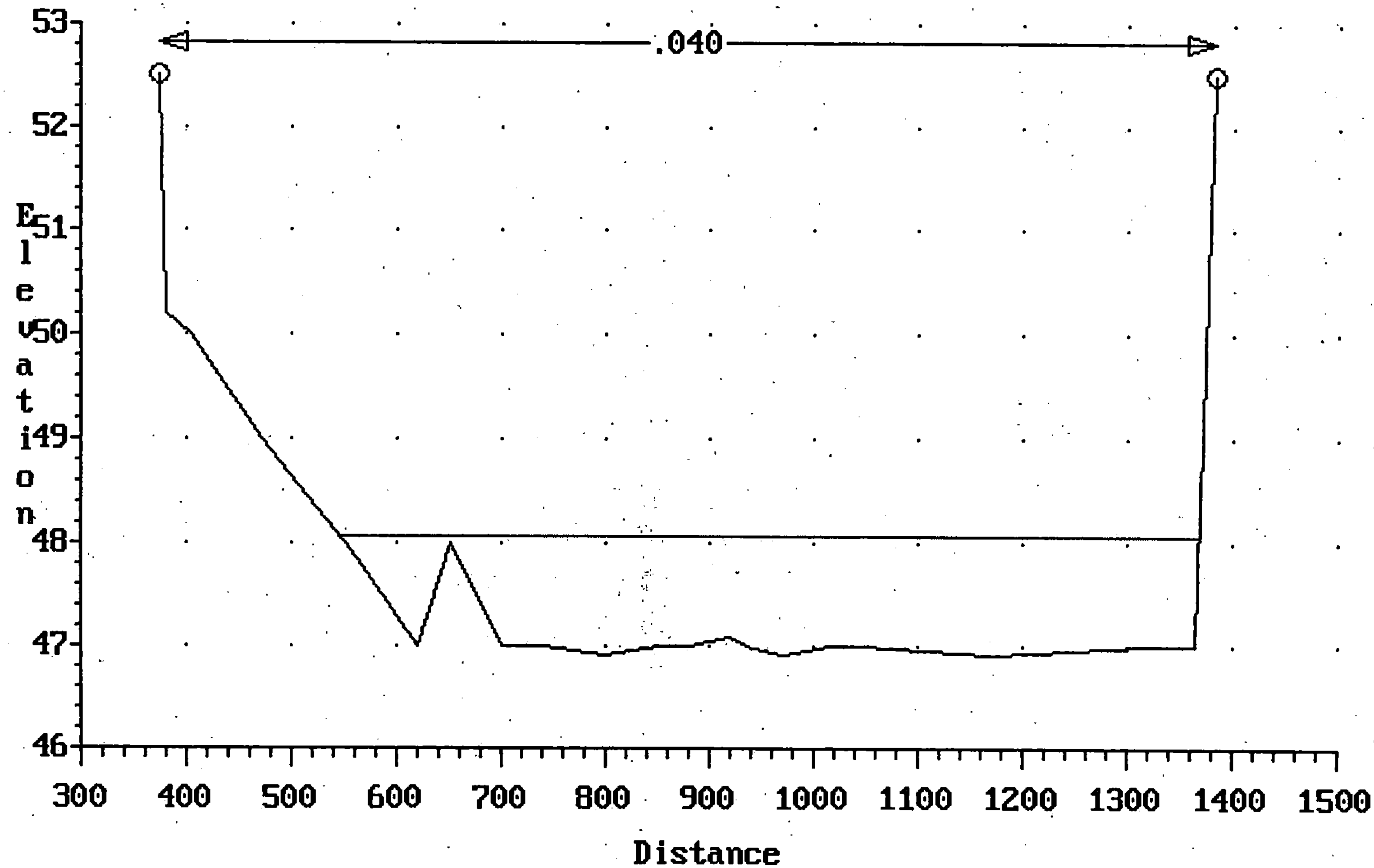

WHITES CREEK CHANNEL A
Cross-section 7800.000
.040
58
56
54
52
50
48
46
44
Elevation
700
750
800
850
900
950
1000
1050
1100
1150
1200
1250
1300
Distance

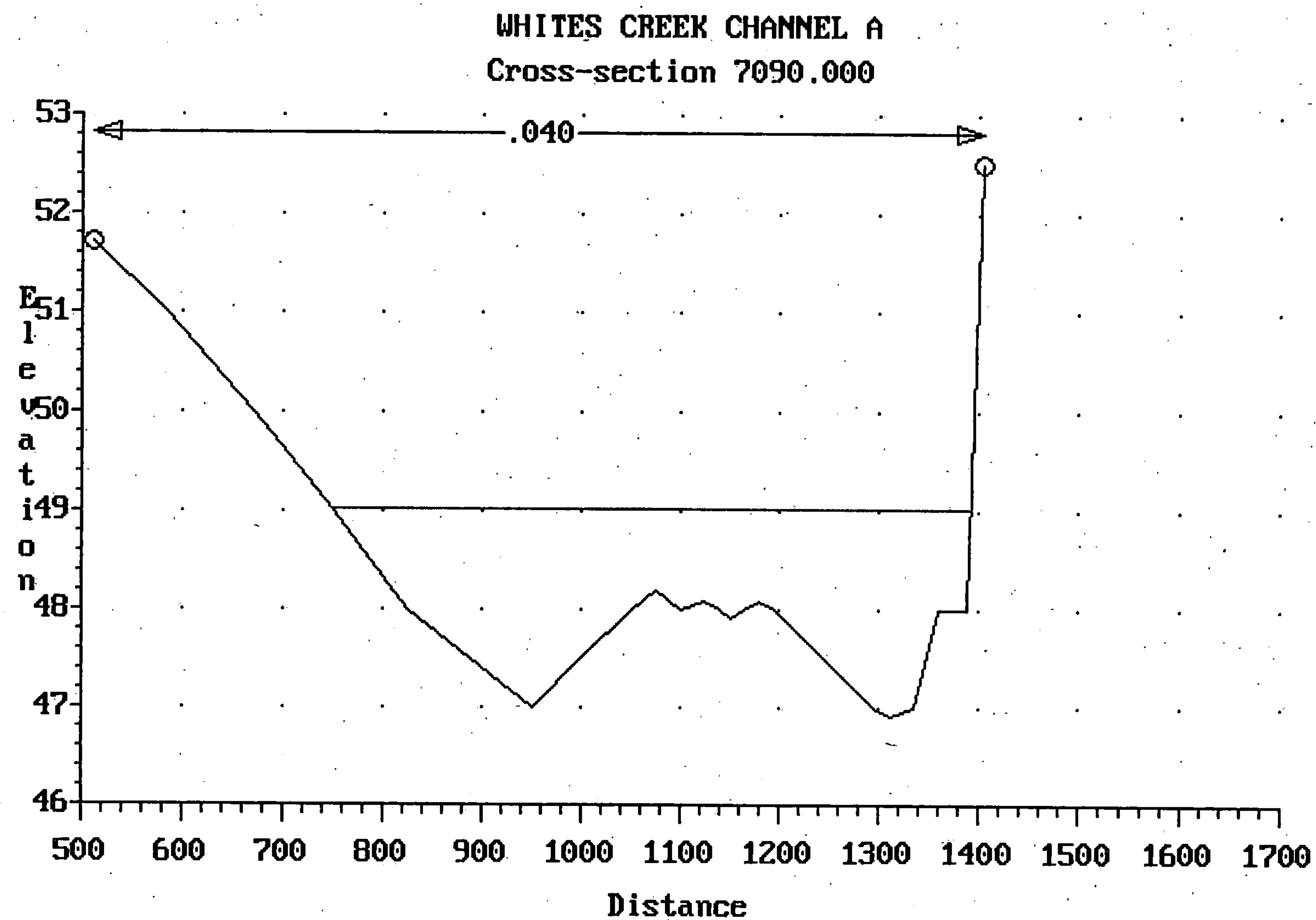


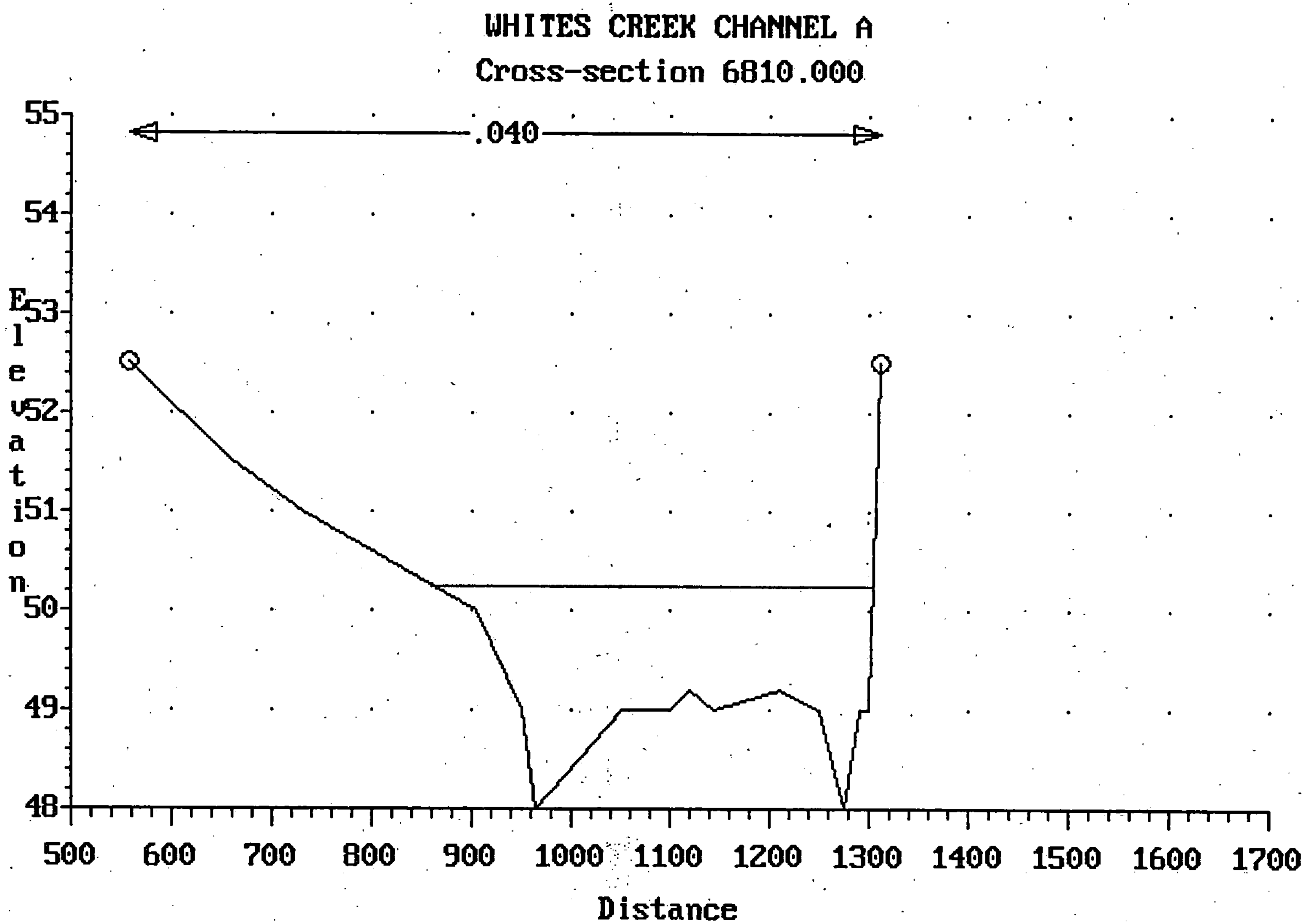
WHITES CREEK CHANNEL A
Cross-section 7560.000
.040
58
56
54
52
50
48
46
44
Elevation
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
Distance

WHITES CREEK CHANNEL A

Cross-section 7360.000




WHITES CREEK CHANNEL A
Cross-section 7090.000
.040
Elevation
53
52
51
50
49
48
47
46
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
Distance



WHITES CREEK CHANNEL A
Cross-section 6810.000
.040
Elevation
55
54
53
52
51
50
49
48
500
600
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800
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1000
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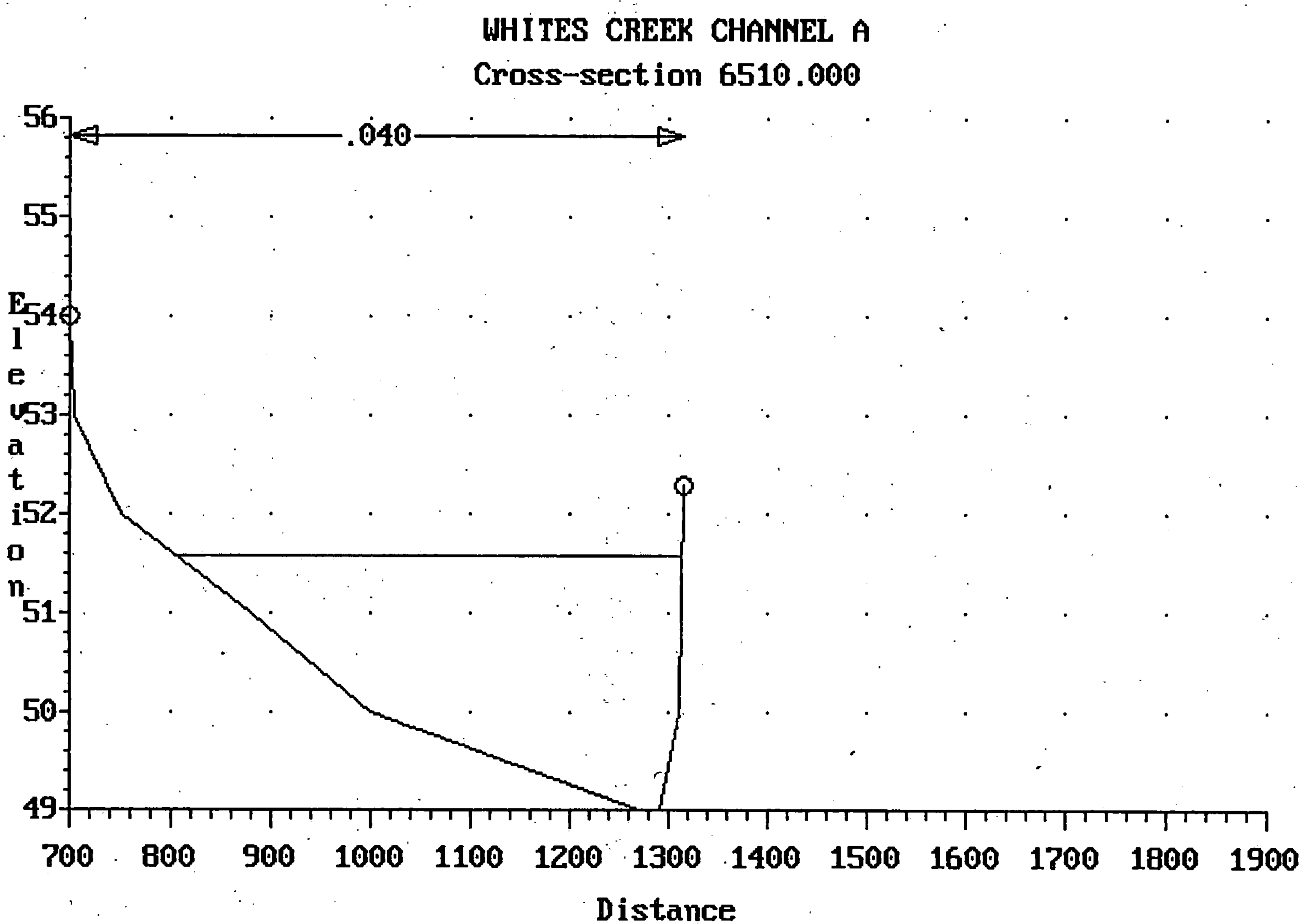
1300
1400
1500
1600
1700
Distance


WHITES CREEK CHANNEL A
Cross-section 6510.000
.040
Elevation
56
55
54
53
52
51
50
49
700
800
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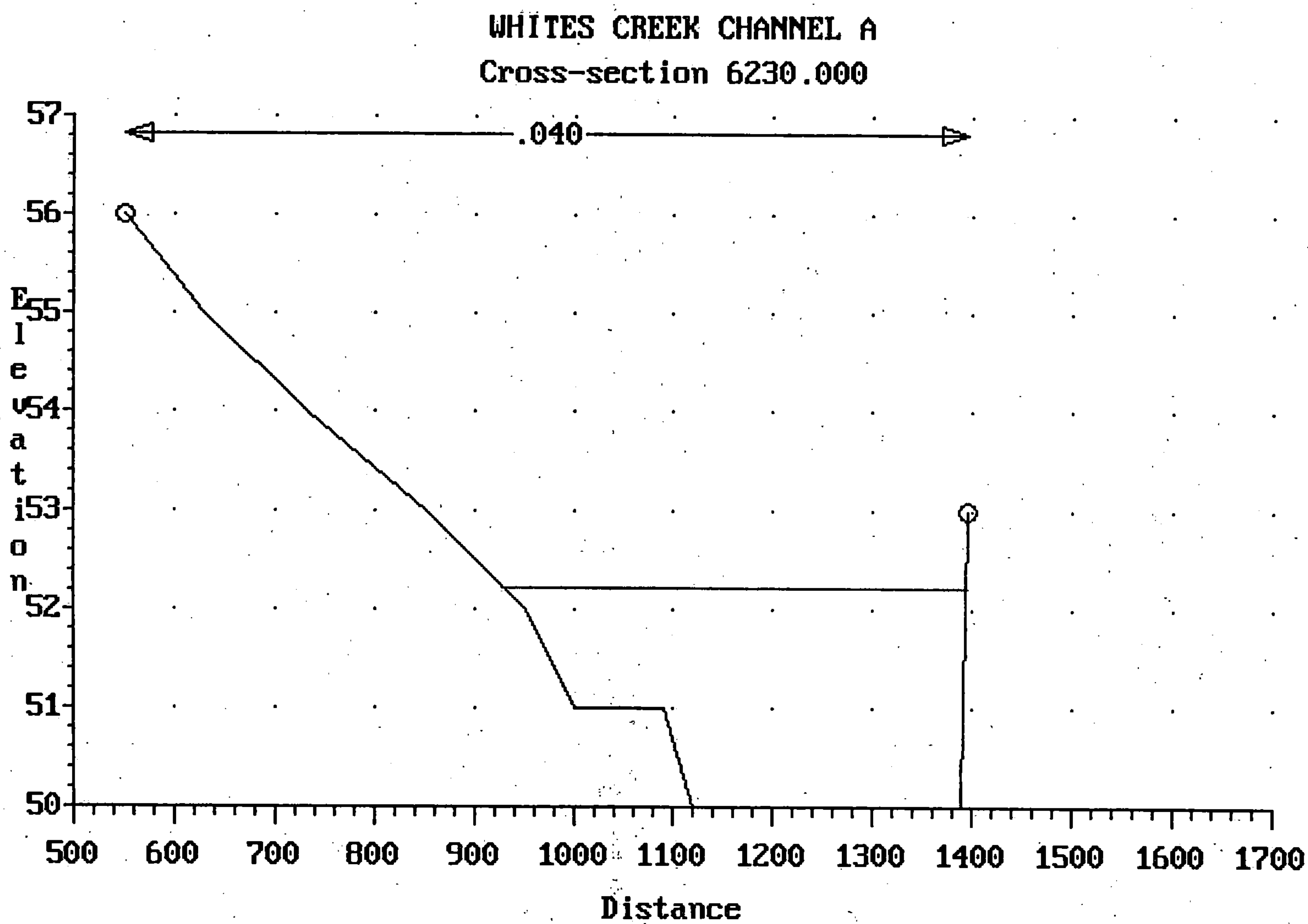
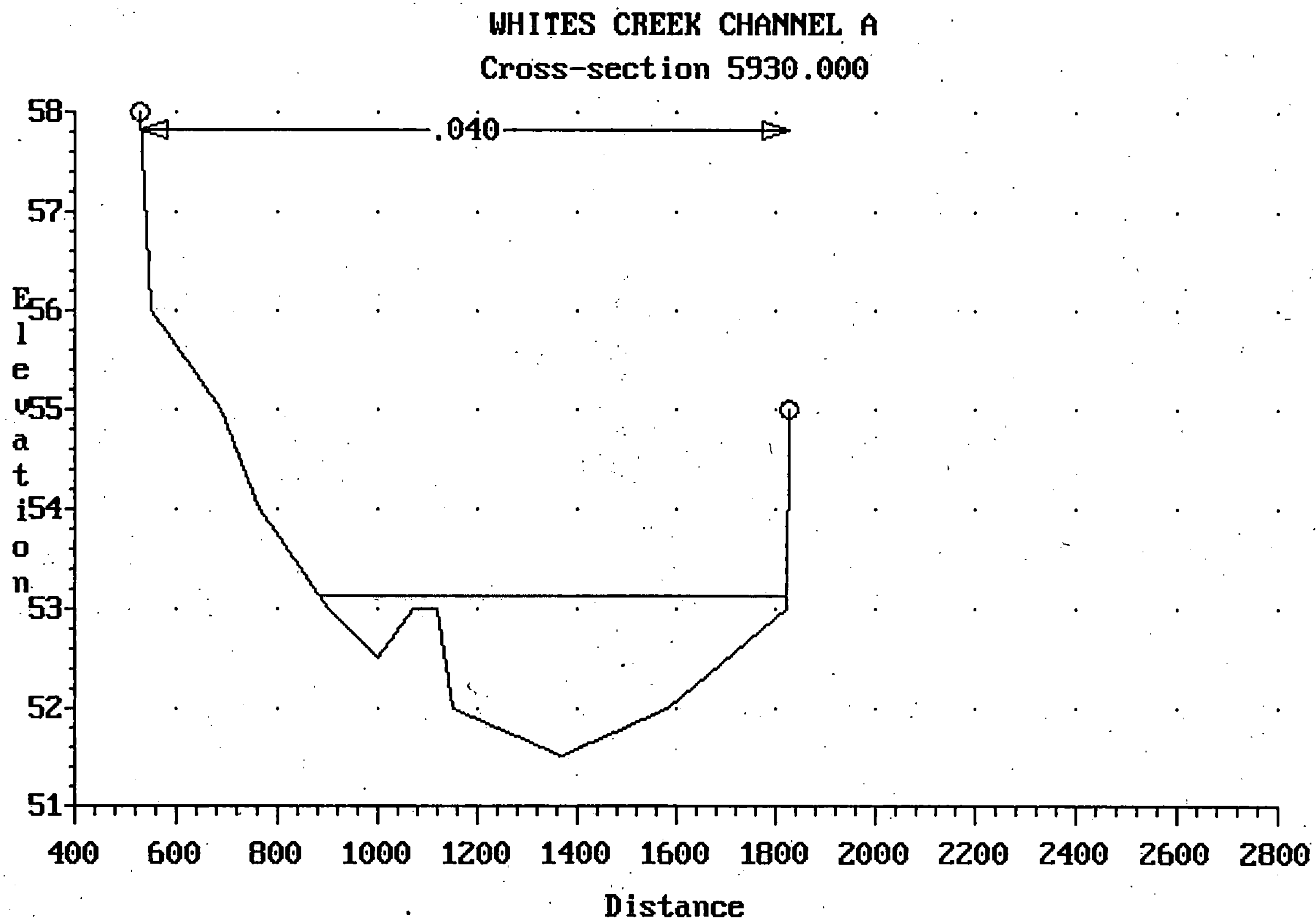
1200
1300
1400
1500
1600
1700
1800
1900
Distance



WHITES CREEK CHANNEL A
Cross-section 6230.000
.040
Elevation
57
56
55
54
53
52
51
50
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
Distance


WHITES CREEK CHANNEL A
Cross-section 5930.000
.040
Elevation
58
57
56
55
54
53
52
51
400
600
800
1000
1200
1400
1600
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2000
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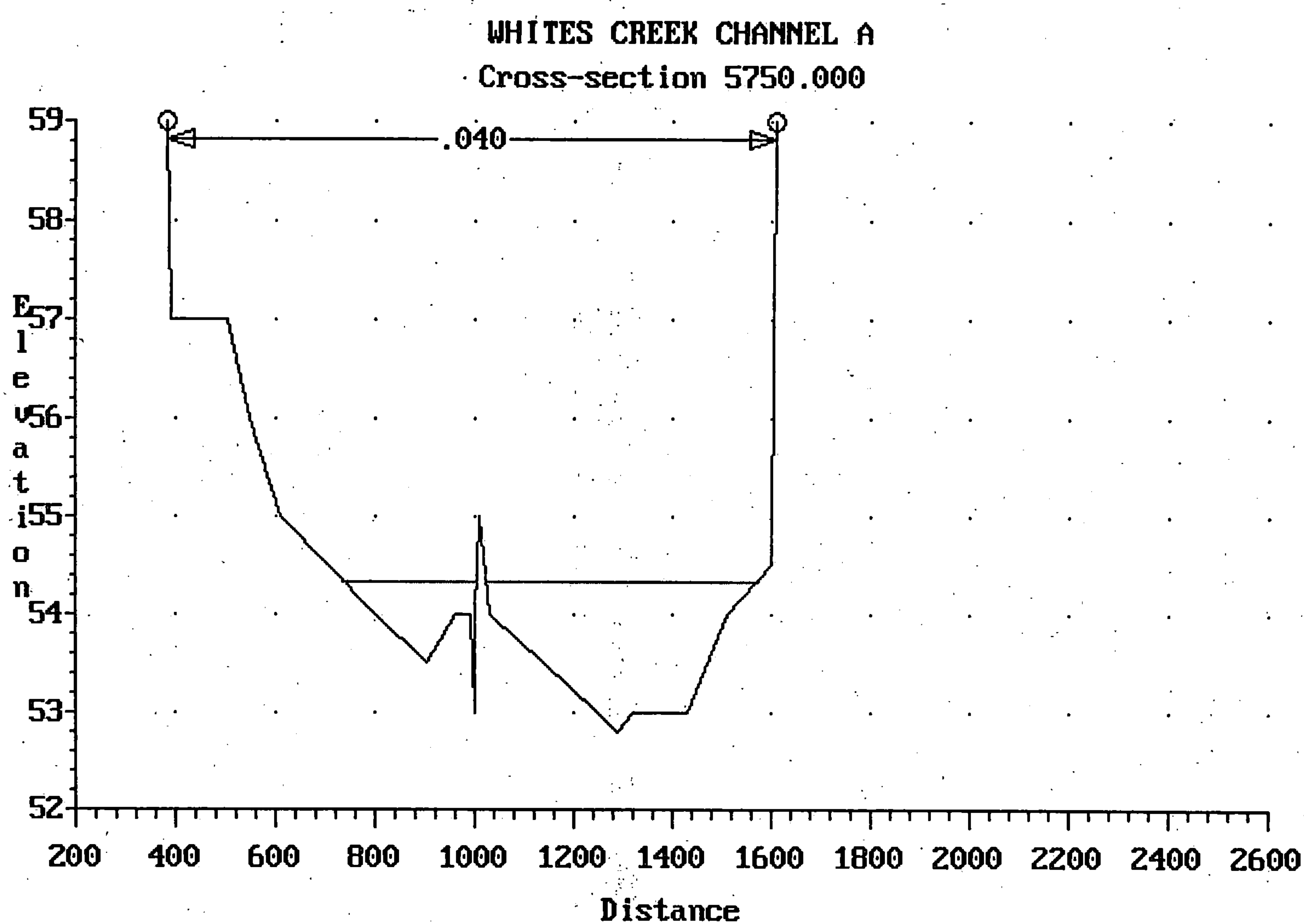
2400
2600
2800
Distance


WHITES CREEK CHANNEL A
Cross-section 5750.000
.040
Elevation
59
58
57
56
55
54
53
52
200
400
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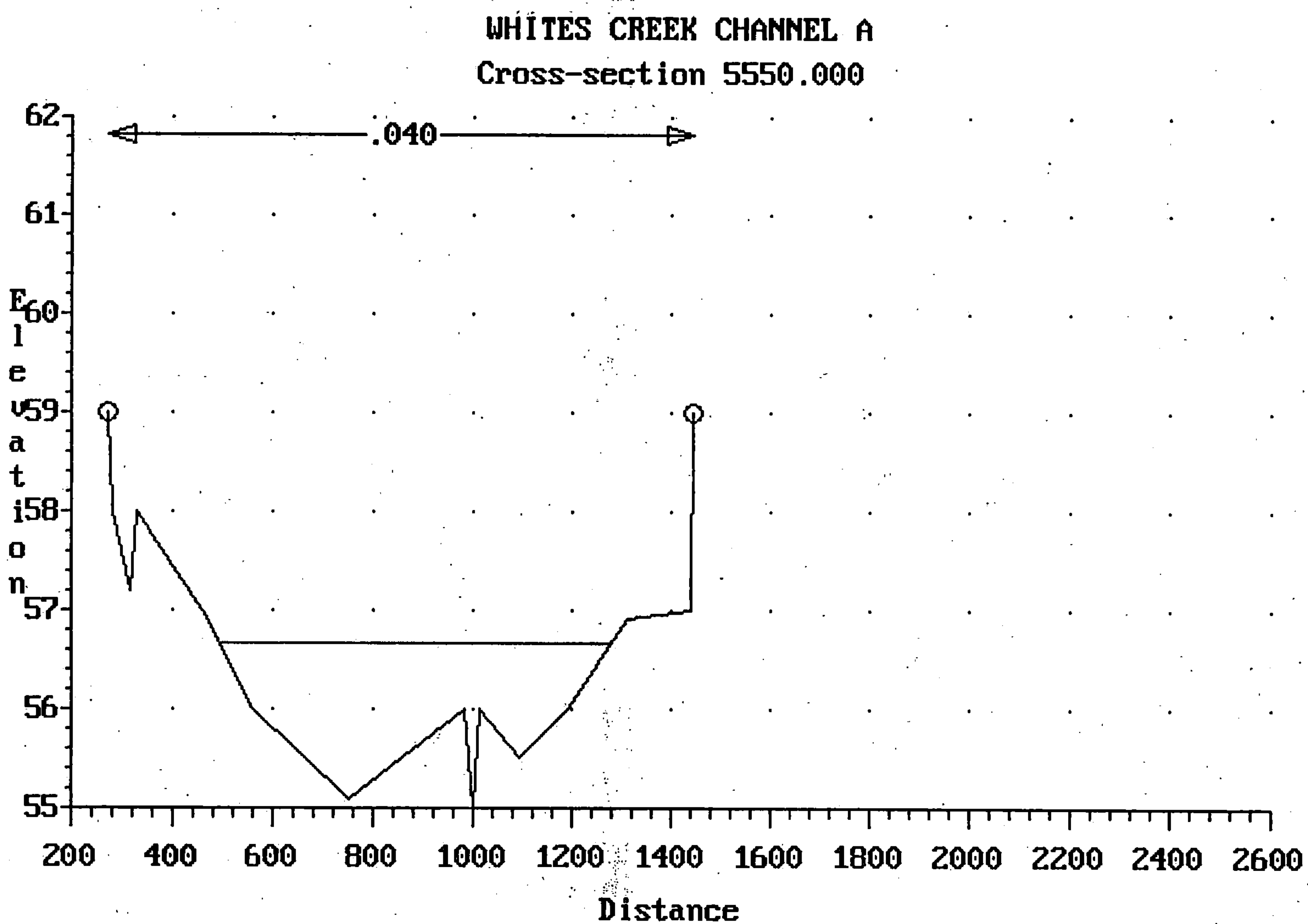
2200
2400
2600
Distance


WHITES CREEK CHANNEL A
Cross-section 5550.000
.040
62
61
60
59
58
57
56
55
Elevation
200
400
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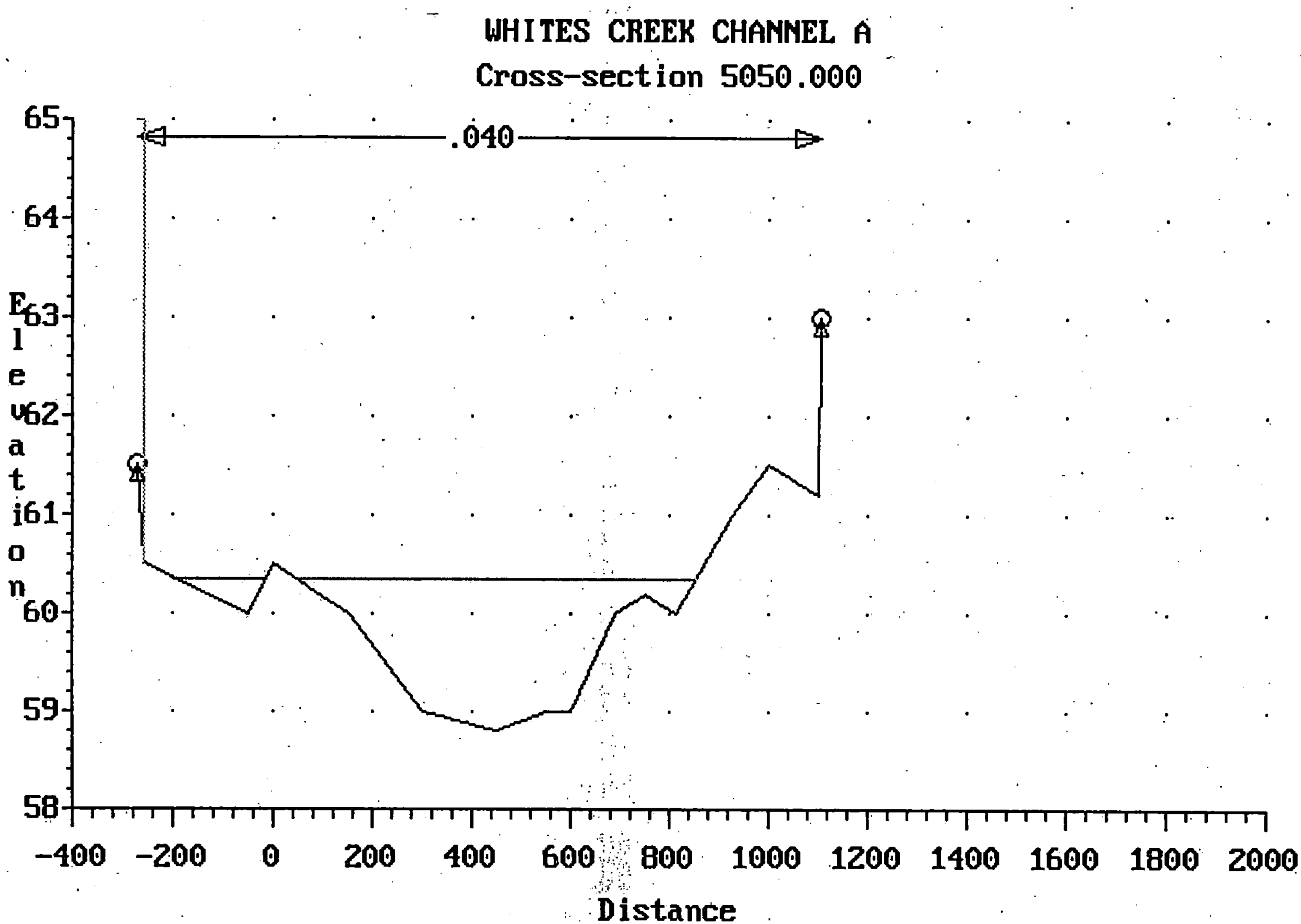
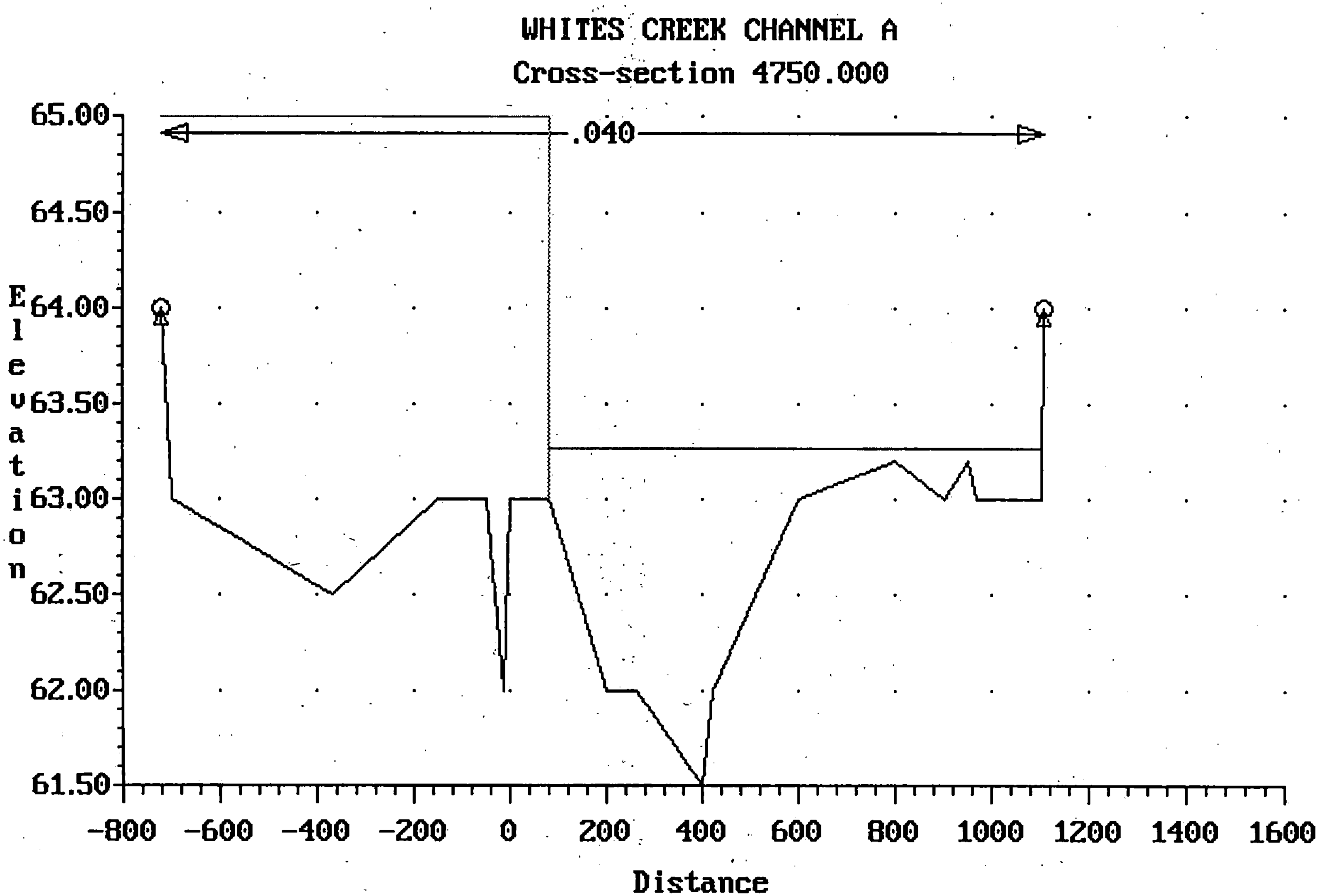
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
Distance



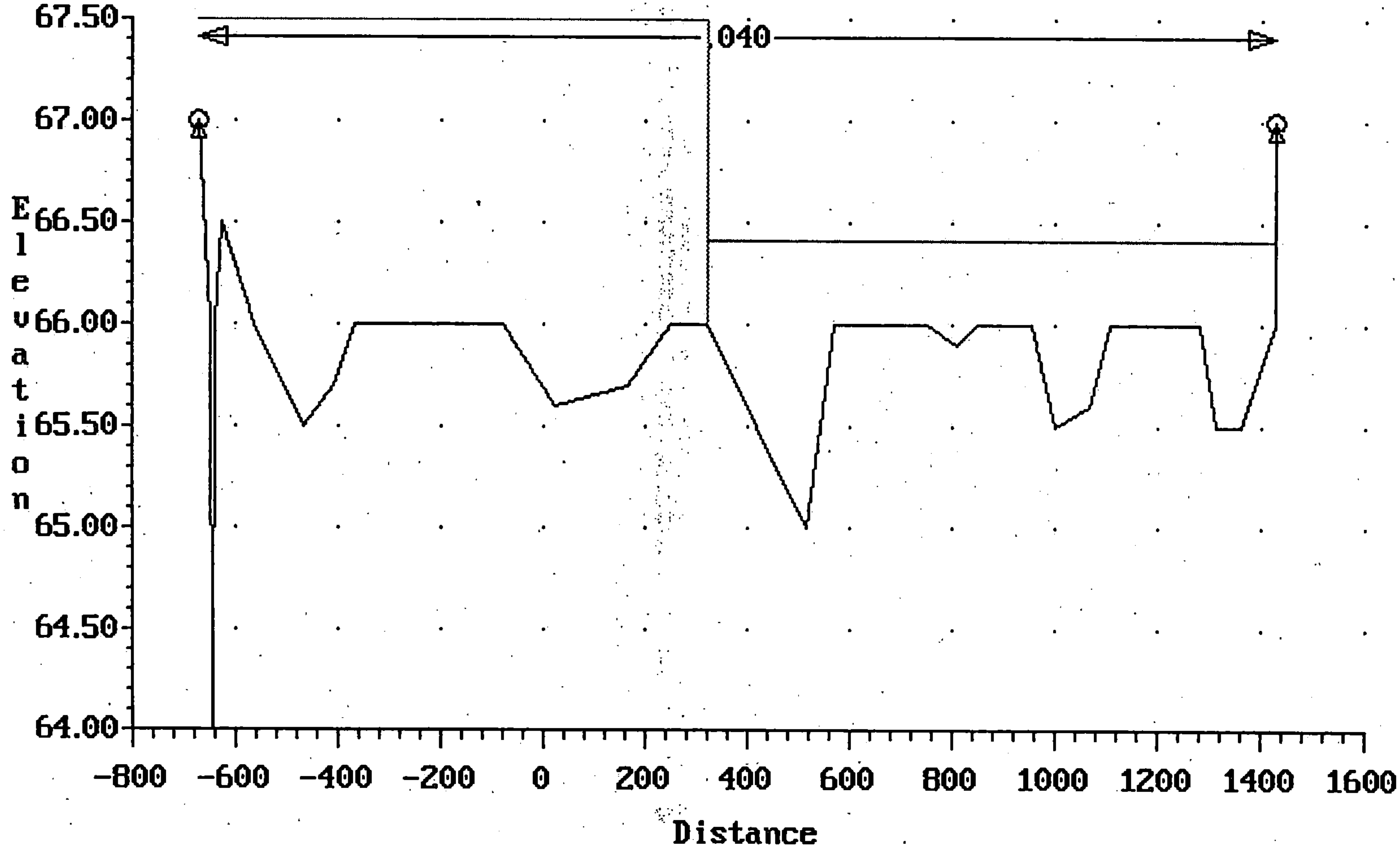
WHITES CREEK CHANNEL A
Cross-section 5050.000
.040
Elevation
65
64
63
62
61
60
59
58
-400
-200
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Distance

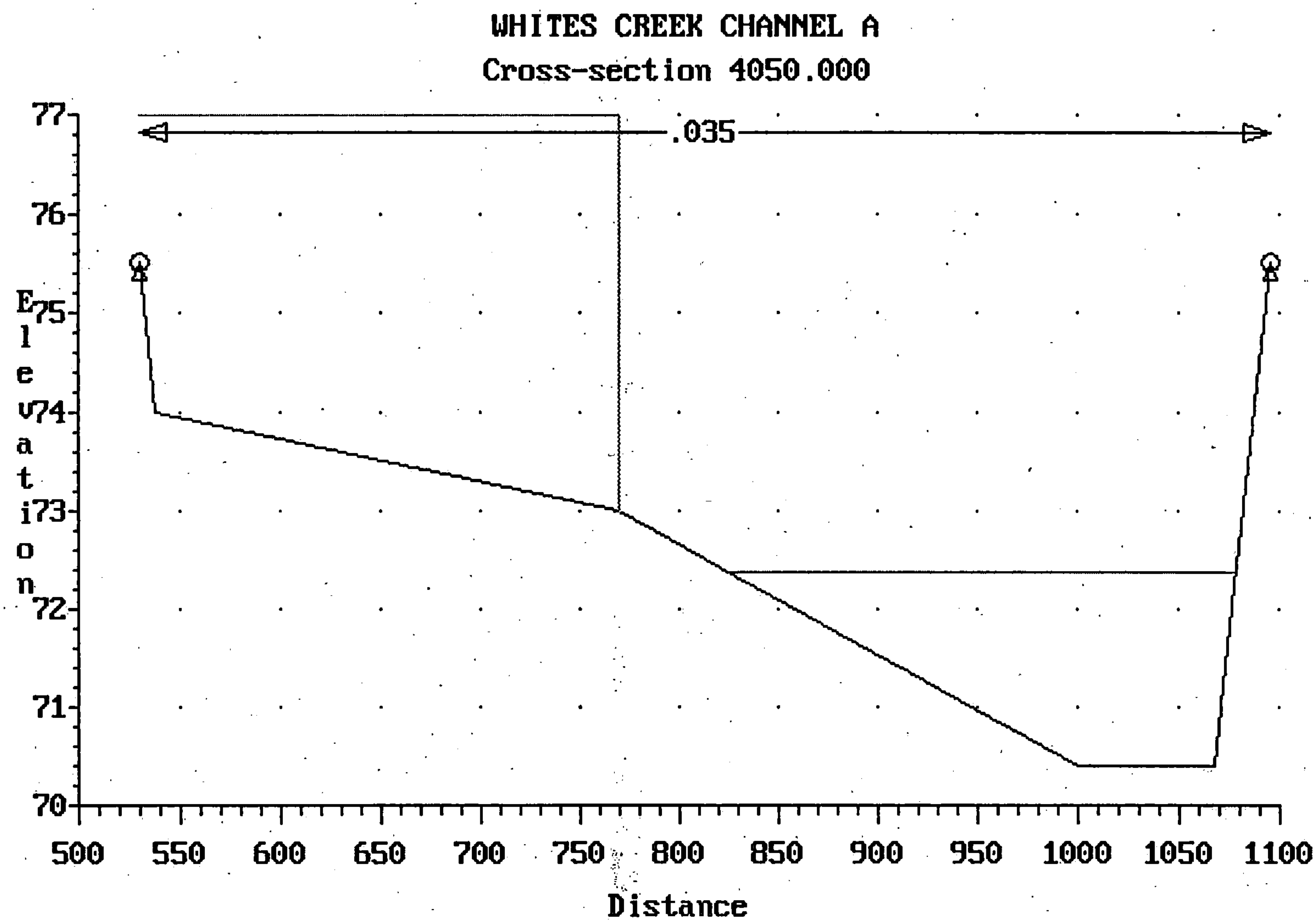


WHITES CREEK CHANNEL A
Cross-section 4750.000
.040
65.00
64.50
64.00
63.50
63.00
62.50
62.00
61.50
Elevation
-800
-600
-400
-200
0
200
400
600
800
1000
1200
1400
1600
Distance

WHITES CREEK CHANNEL A

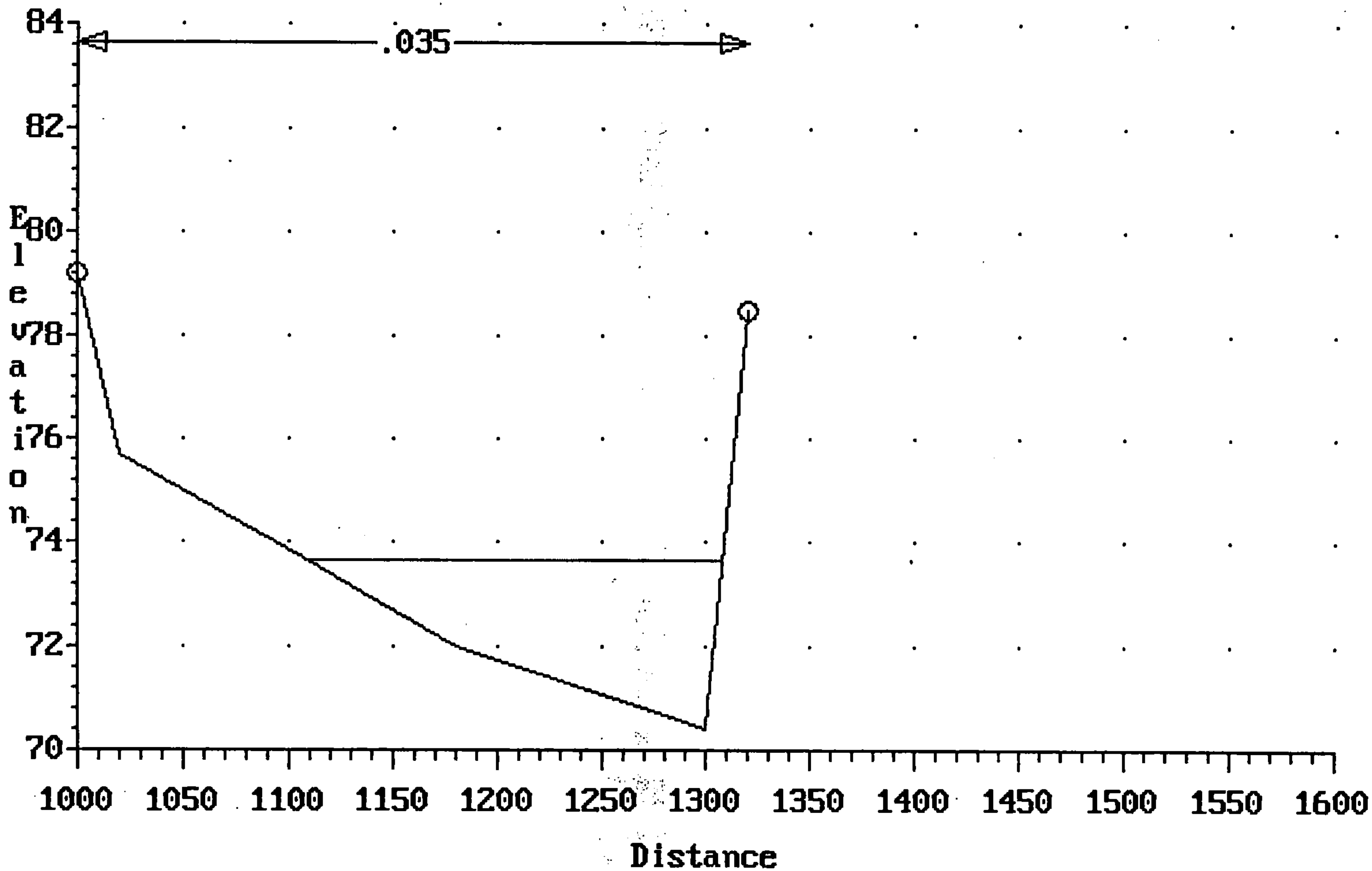
Cross-section 4450.000

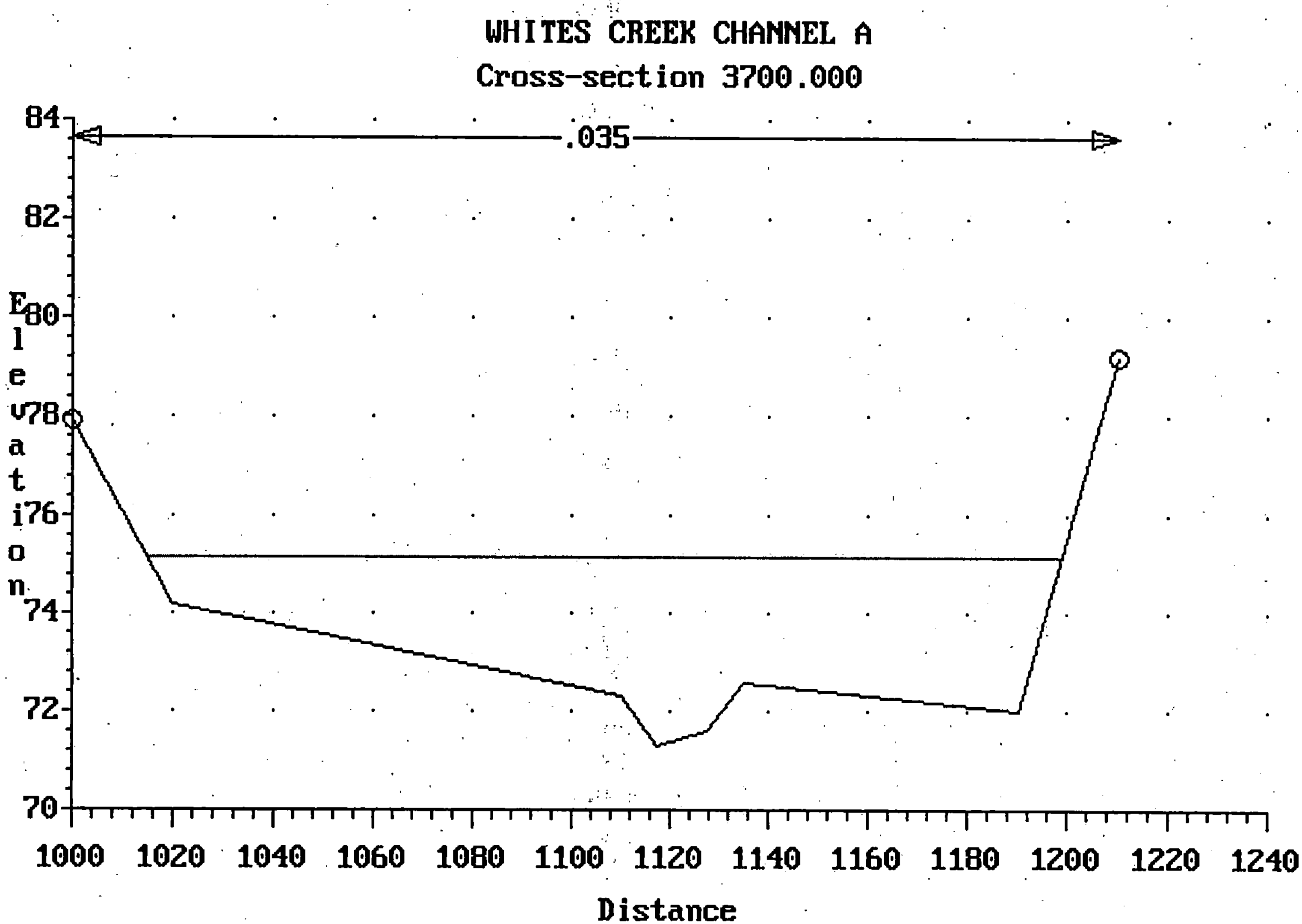


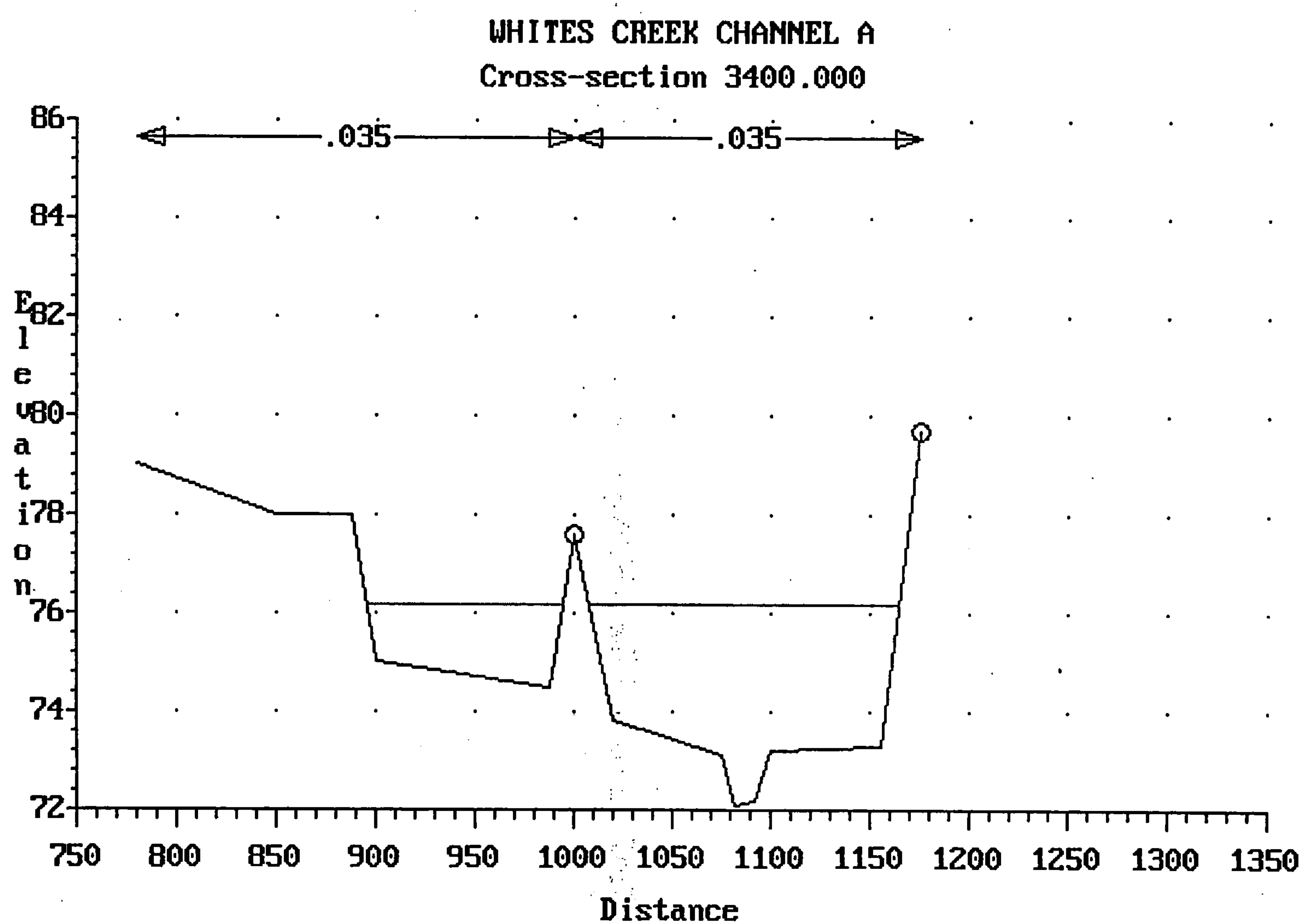

WHITES CREEK CHANNEL A
Cross-section 4050.000
.035
Elevation
77
76
75
74
73
72
71
70
500
550
600
650
700
750
800
850
900
950
1000
1050
1100
Distance

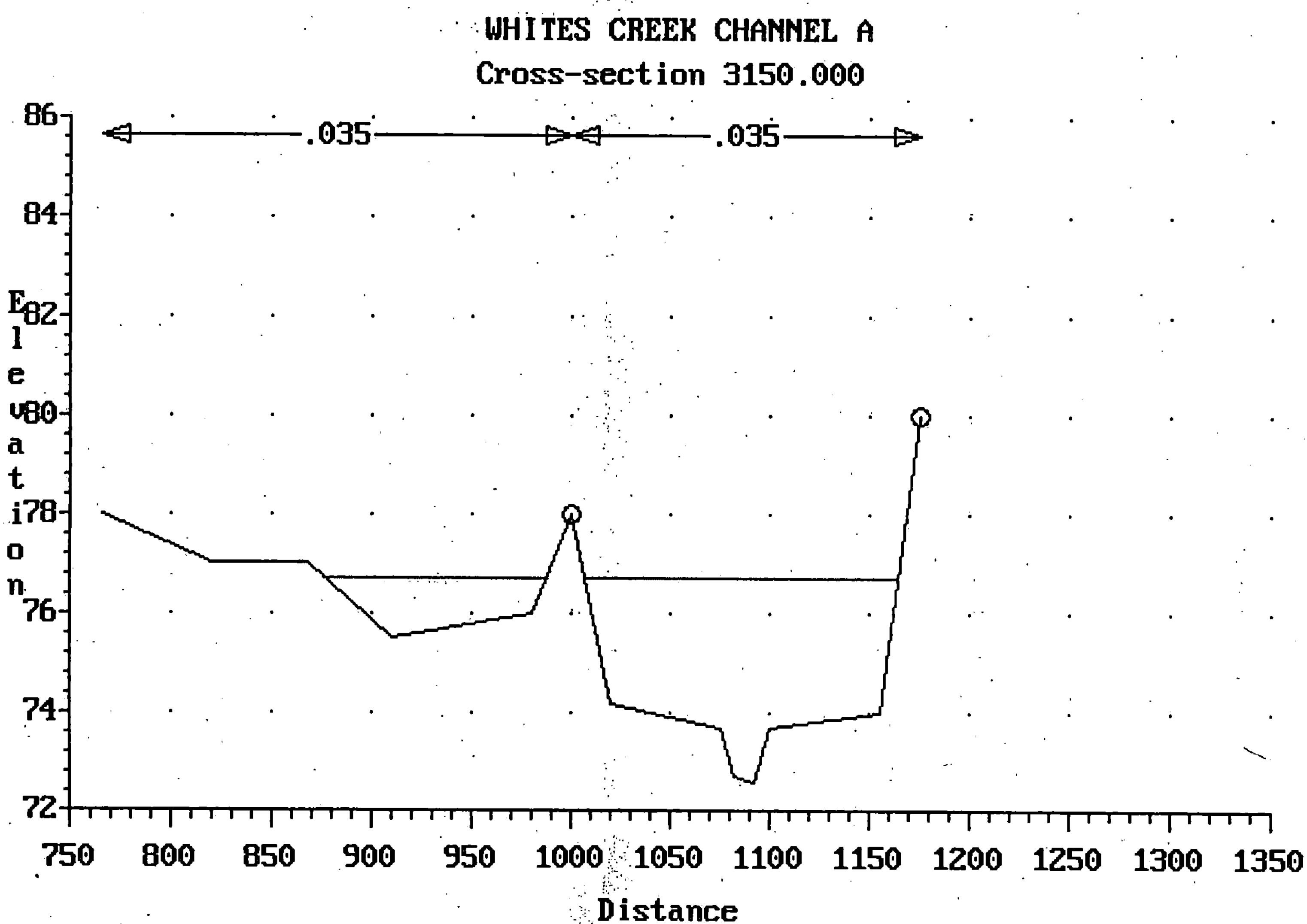
WHITES CREEK CHANNEL A

Cross-section 3950.000

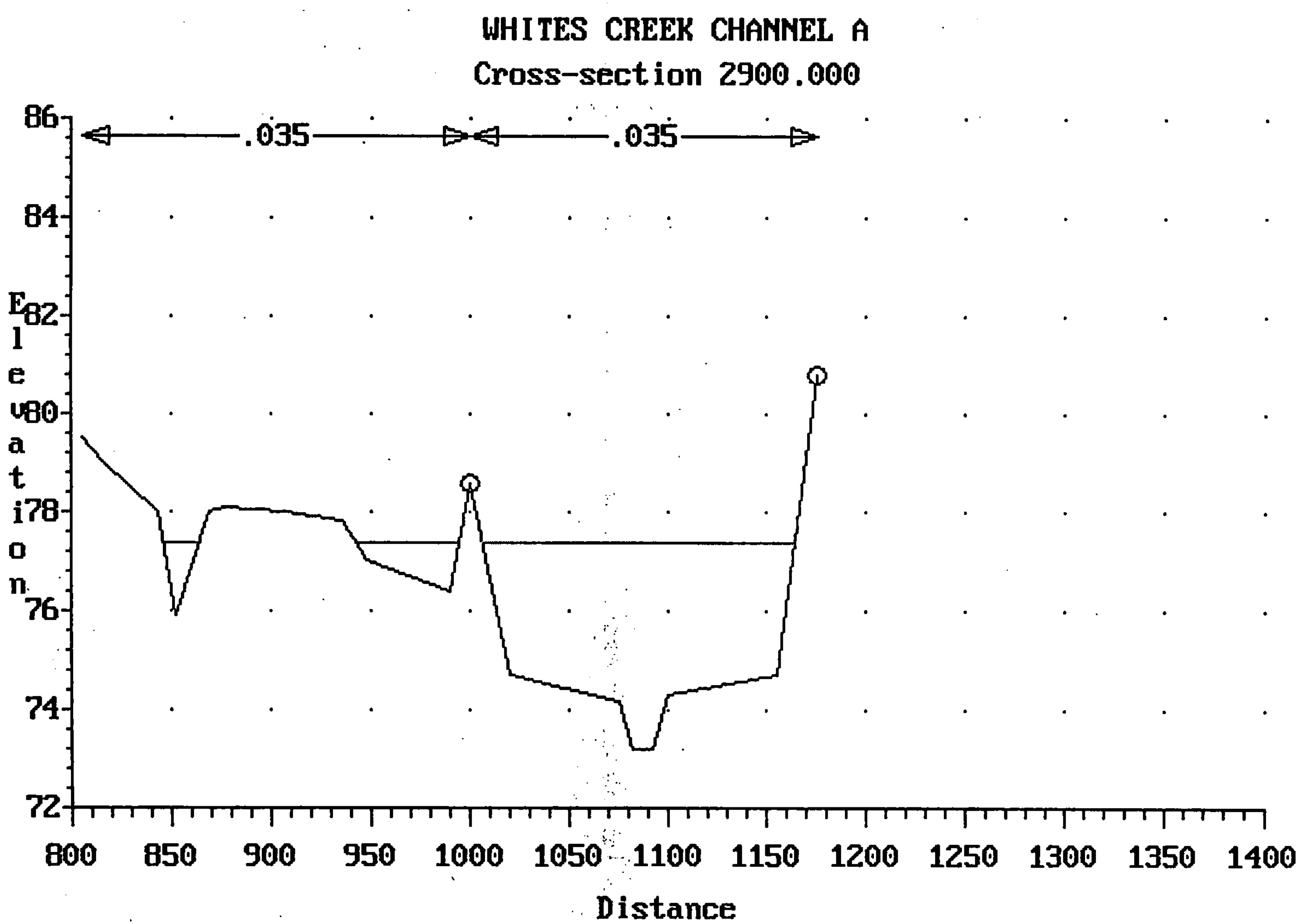



WHITES CREEK CHANNEL A
Cross-section 3700.000
.035
Elevation
84
82
80
78
76
74
72
70
1000
1020
1040
1060
1080
1100
1120
1140
1160
1180
1200
1220
1240
Distance

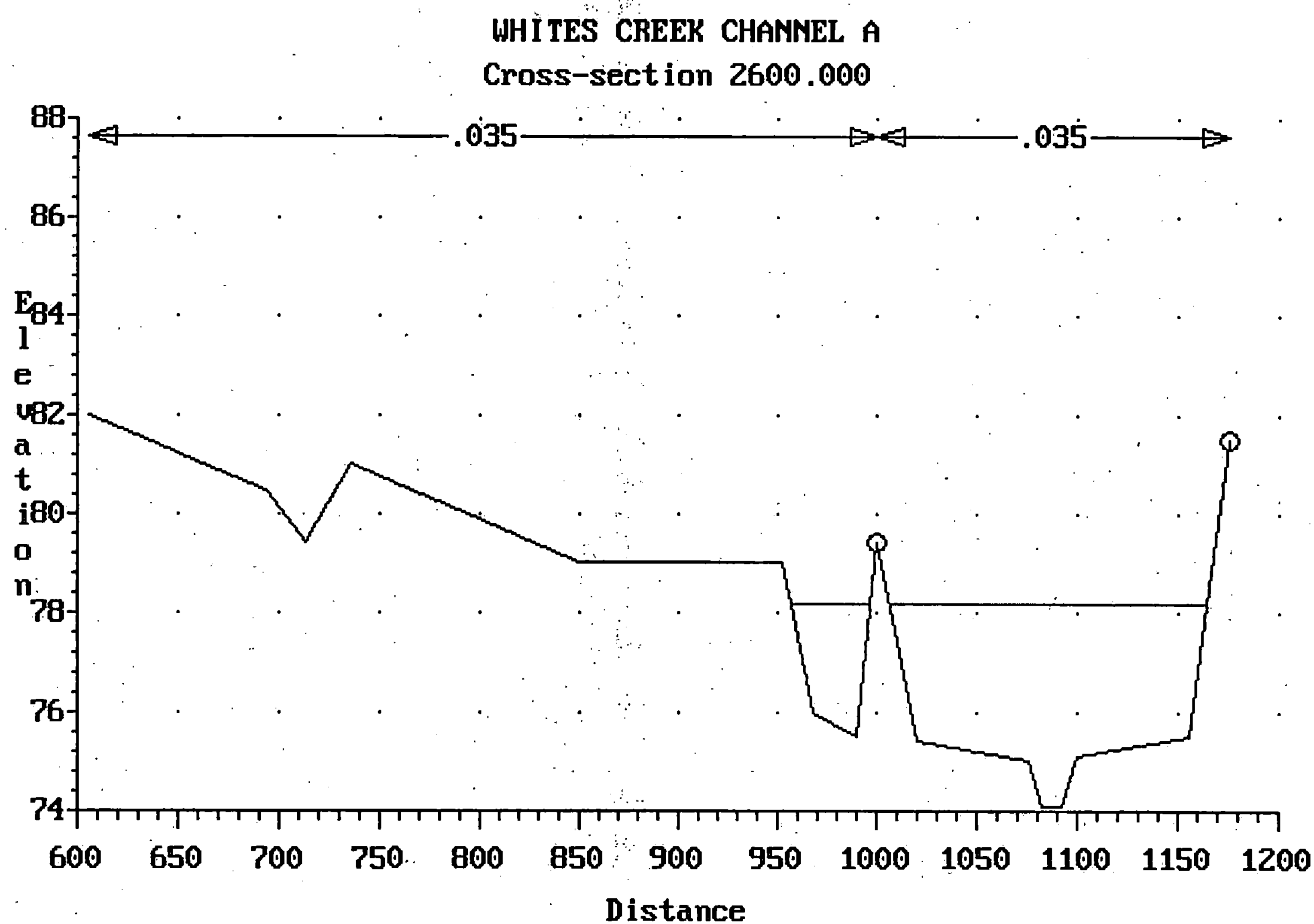

WHITES CREEK CHANNEL A
Cross-section 3400.000
.035
.035
Elevation
86
84
82
80
78
76
74
72
750
800
850
900
950
1000
1050
1100
1150
1200
1250
1300
1350
Distance



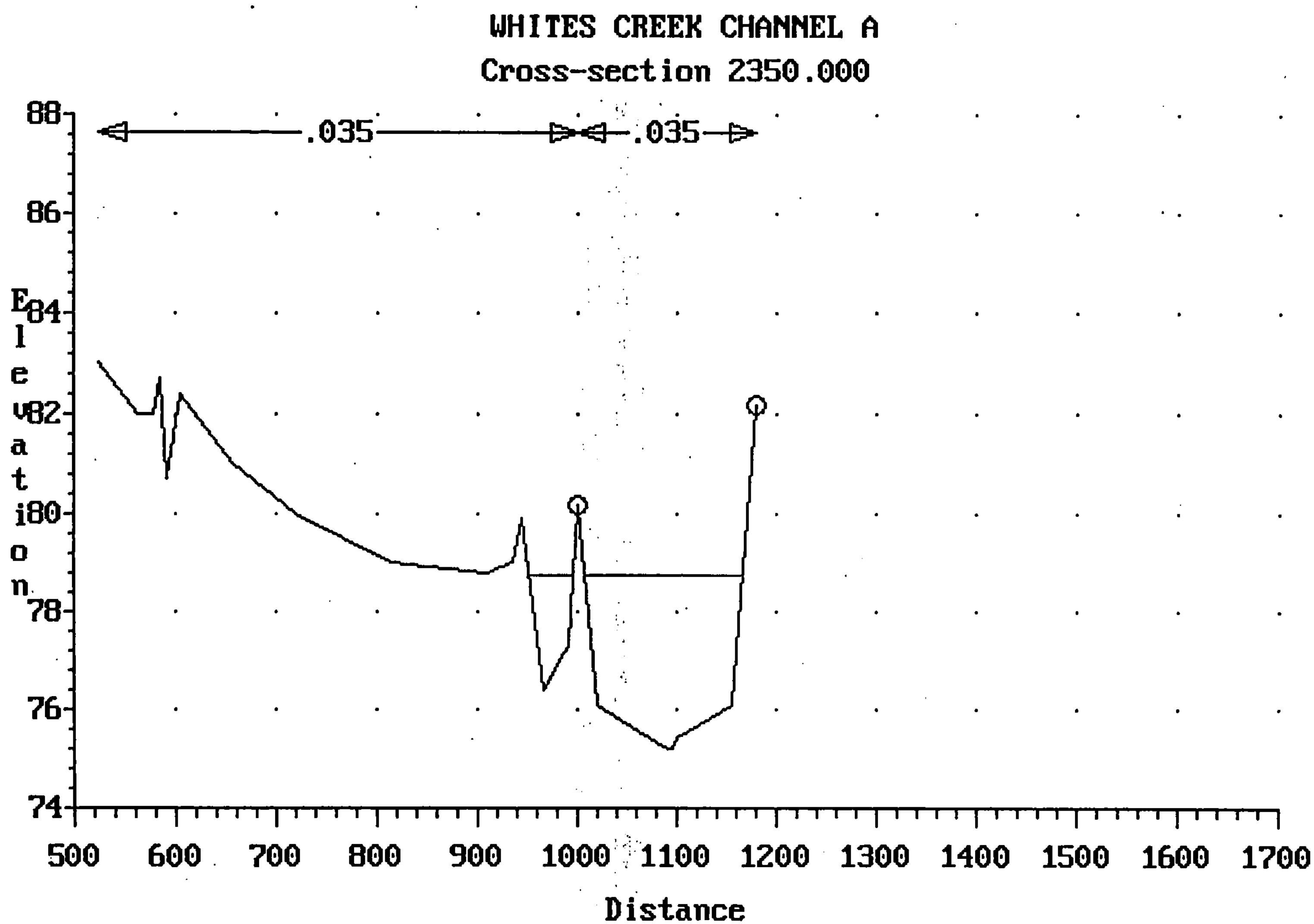
WHITES CREEK CHANNEL A
Cross-section 3150.000
.035
.035
86
84
82
80
78
76
74
72
Elevation
750
800
850
900
950
1000
1050
1100
1150
1200
1250
1300
1350
Distance



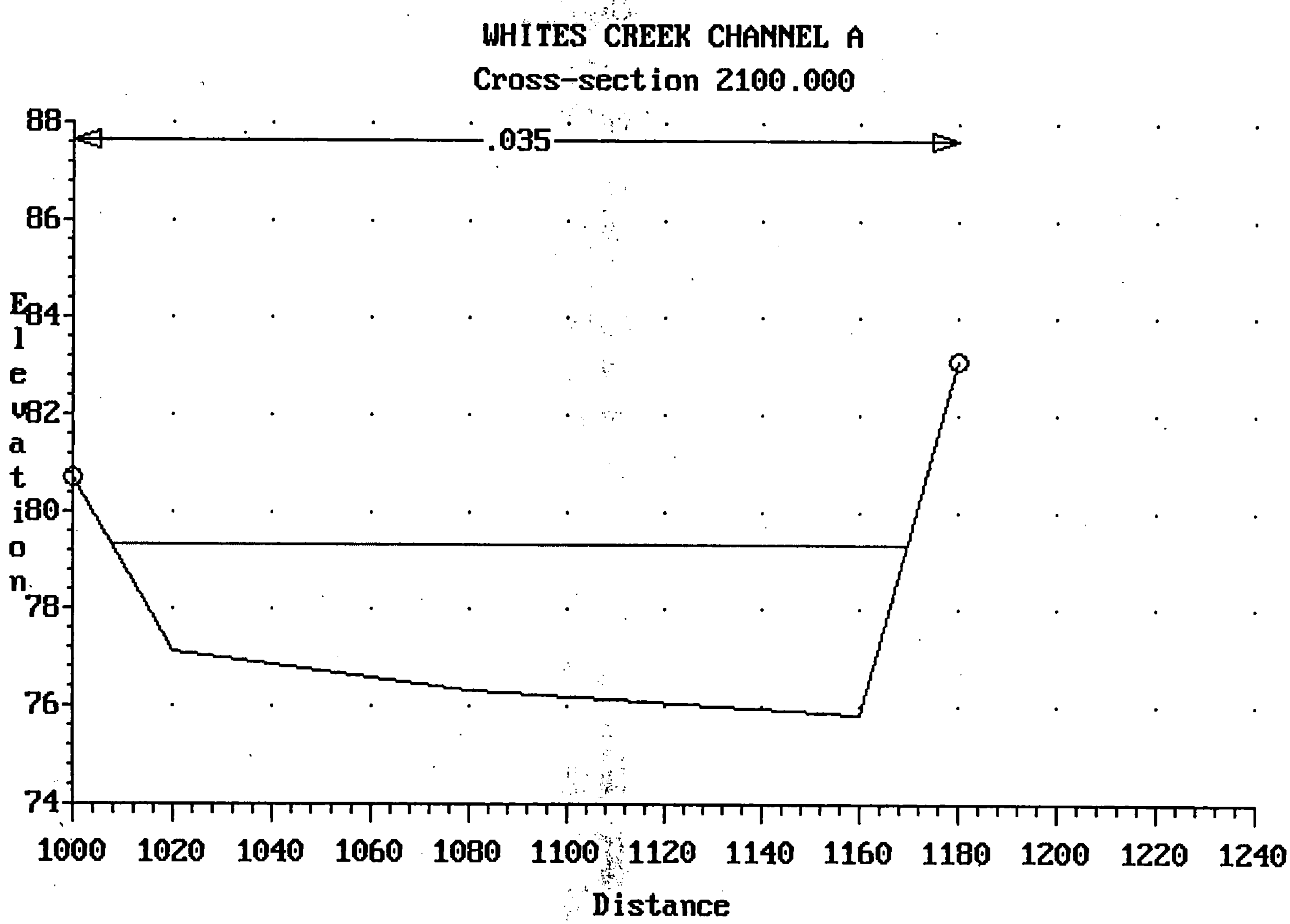
WHITES CREEK CHANNEL A
Cross-section 2900.000
.035
.035
86
84
82
80
78
76
74
72
Elevation
800
850
900
950
1000
1050
1100
1150
1200
1250
1300
1350
1400
Distance

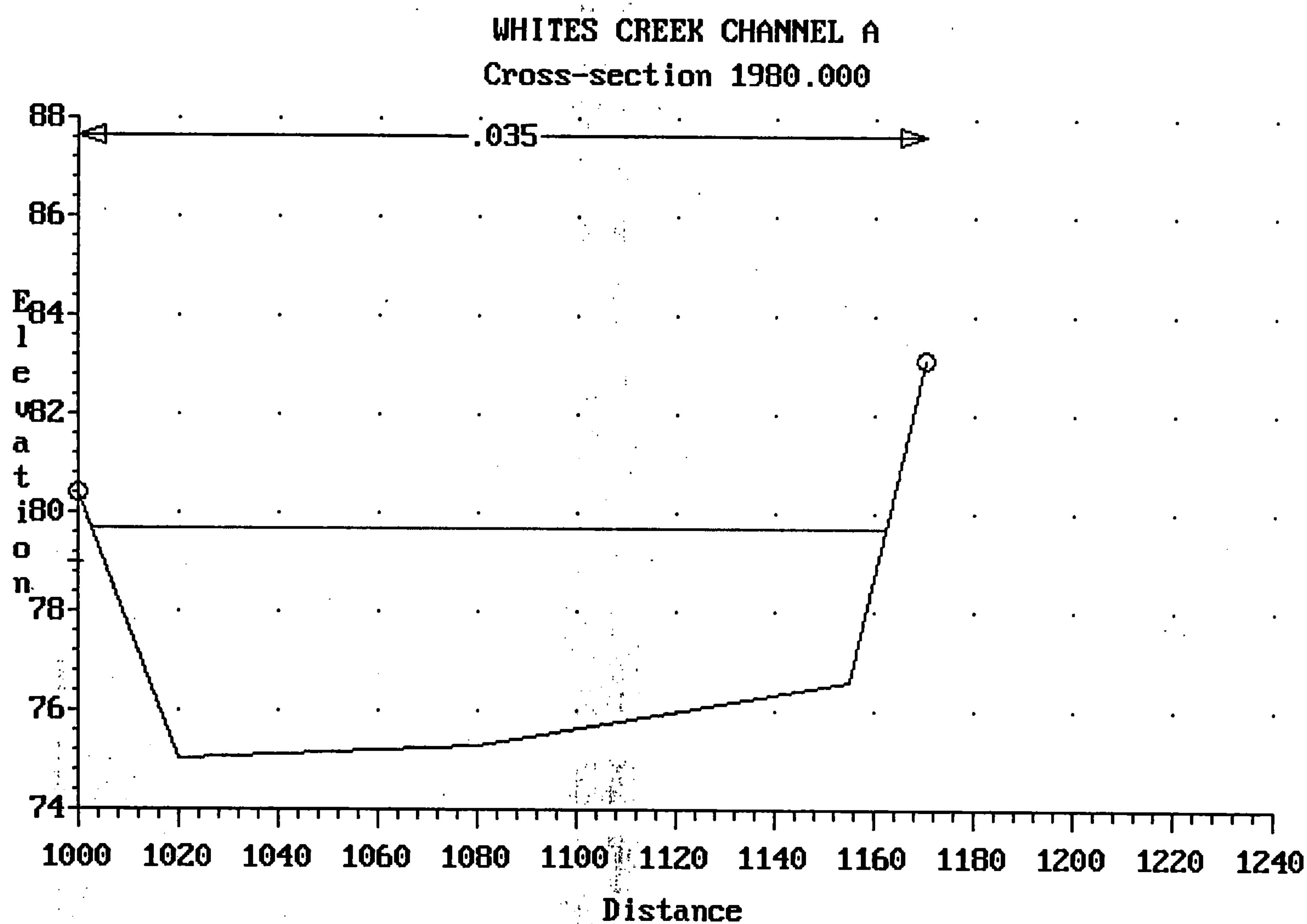


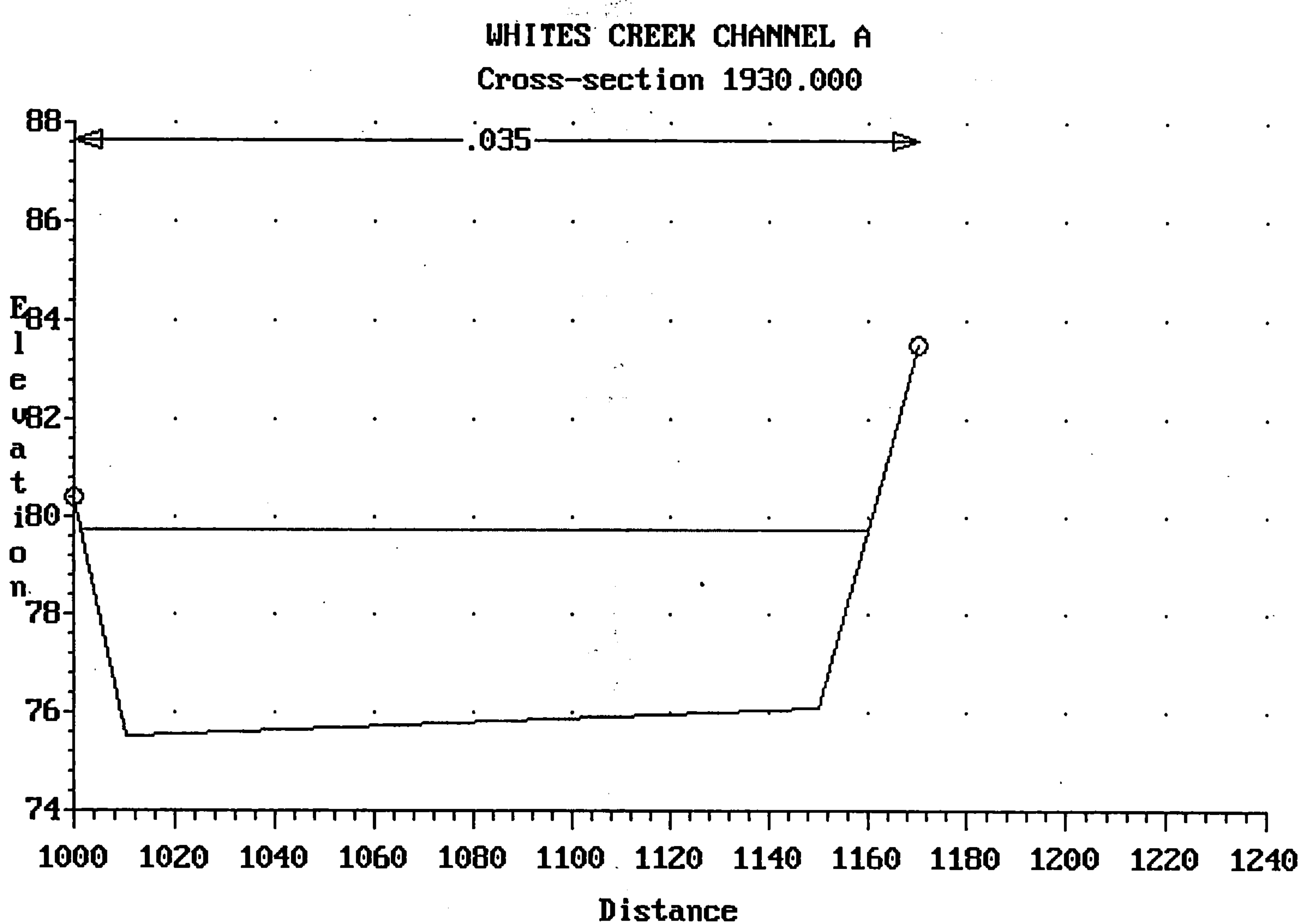
WHITES CREEK CHANNEL A
Cross-section 2600.000
.035
.035
88
86
84
82
80
78
76
74
Elevation
600
650
700
750
800
850
900
950
1000
1050
1100
1150
1200
Distance



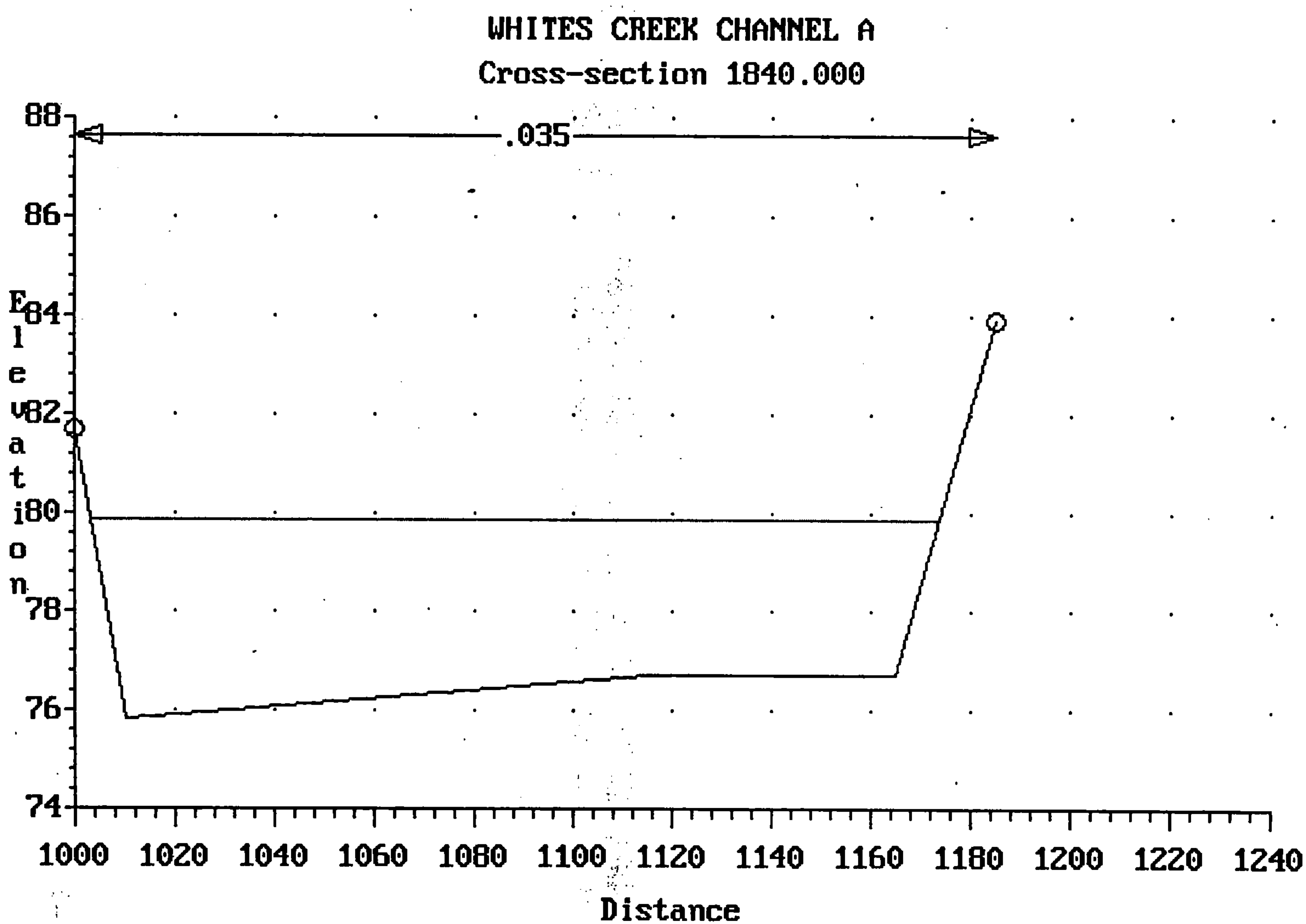
WHITES CREEK CHANNEL A
Cross-section 2350.000
.035
.035
88
86
84
82
80
78
76
74
Elevation
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
Distance


WHITES CREEK CHANNEL A
Cross-section 2100.000
.035
Elevation
88
86
84
82
80
78
76
74
1000
1020
1040
1060
1080
1100
1120
1140
1160
1180
1200
1220
1240
Distance


WHITES CREEK CHANNEL A
Cross-section 1980.000
.035
Elevation
88
86
84
82
80
78
76
74
1000
1020
1040
1060
1080
1100
1120
1140
1160
1180
1200
1220
1240
Distance



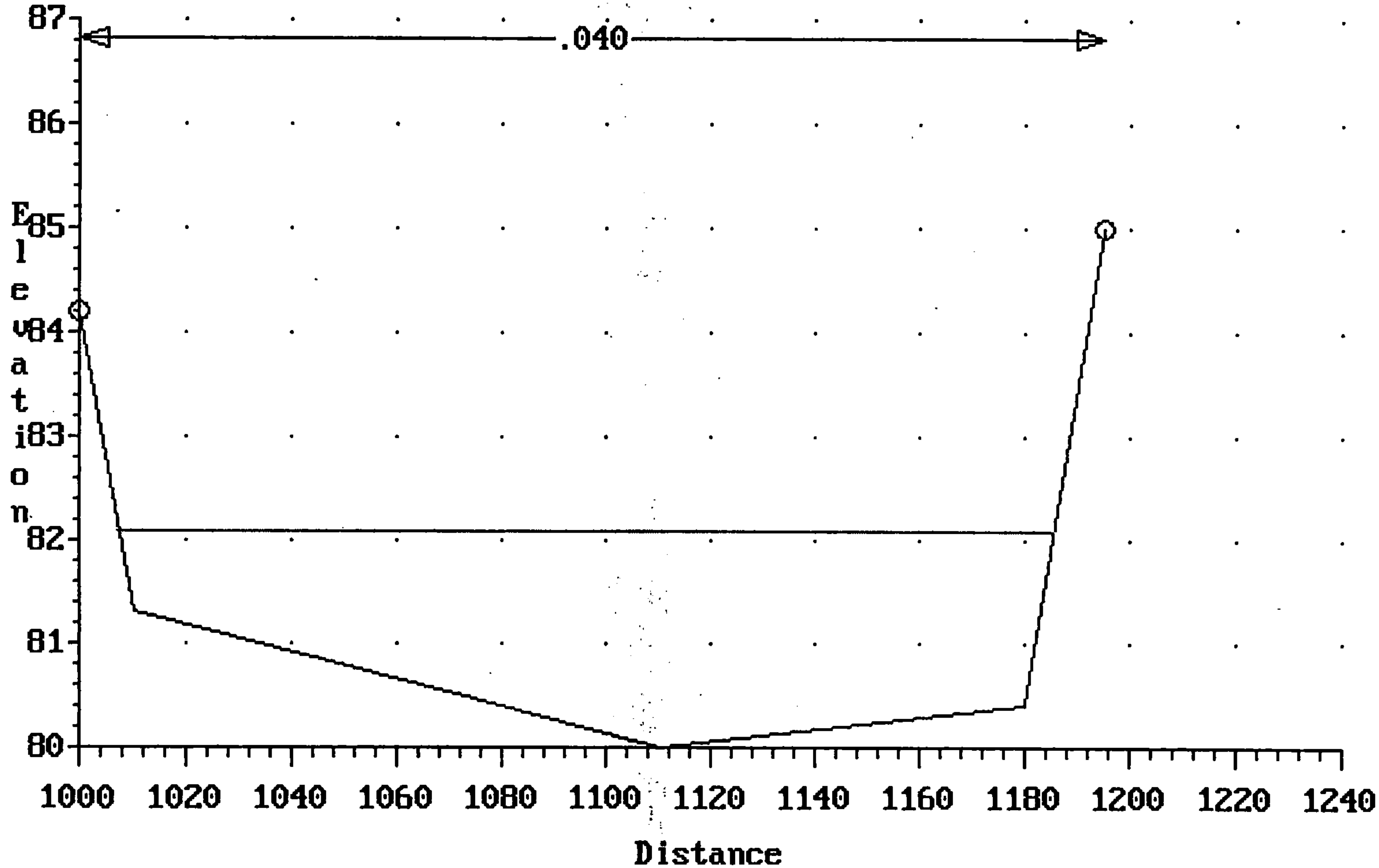
WHITES CREEK CHANNEL A
Cross-section 1930.000
.035
88
86
84
82
80
78
76
74
Elevation
1000
1020
1040
1060
1080
1100
1120
1140
1160
1180
1200
1220
1240
Distance



WHITES CREEK CHANNEL A
Cross-section 1840.000
.035
Elevation
88
86
84
82
80
78
76
74
1000
1020
1040
1060
1080
1100
1120
1140
1160
1180
1200
1220
1240
Distance

WHITES CREEK CHANNEL A

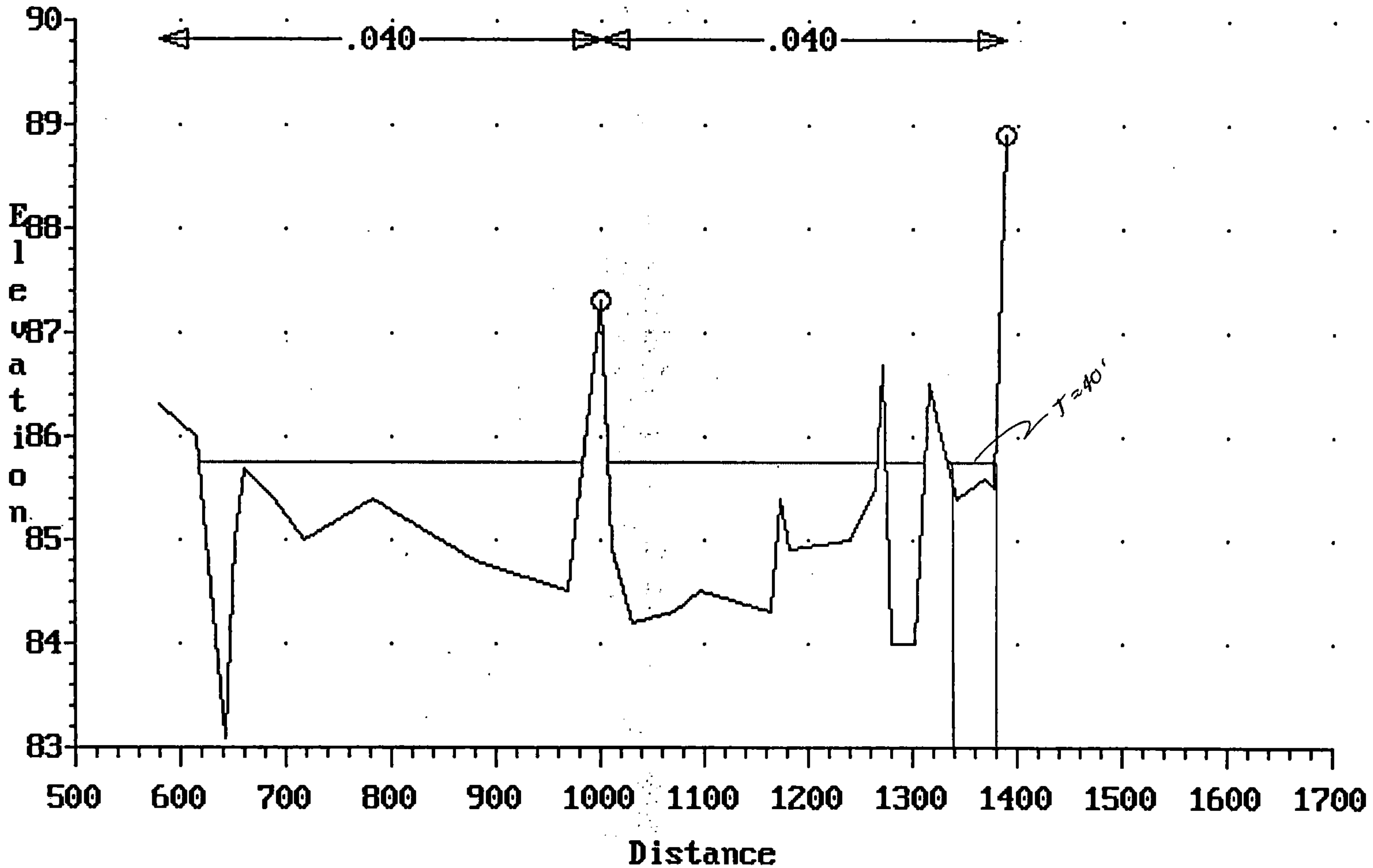
Cross-section 1820.000



D/S OF DOUBLE R, FLOWS
CONTAINED W/IN LEVEES

WHITES CREEK CHANNEL A

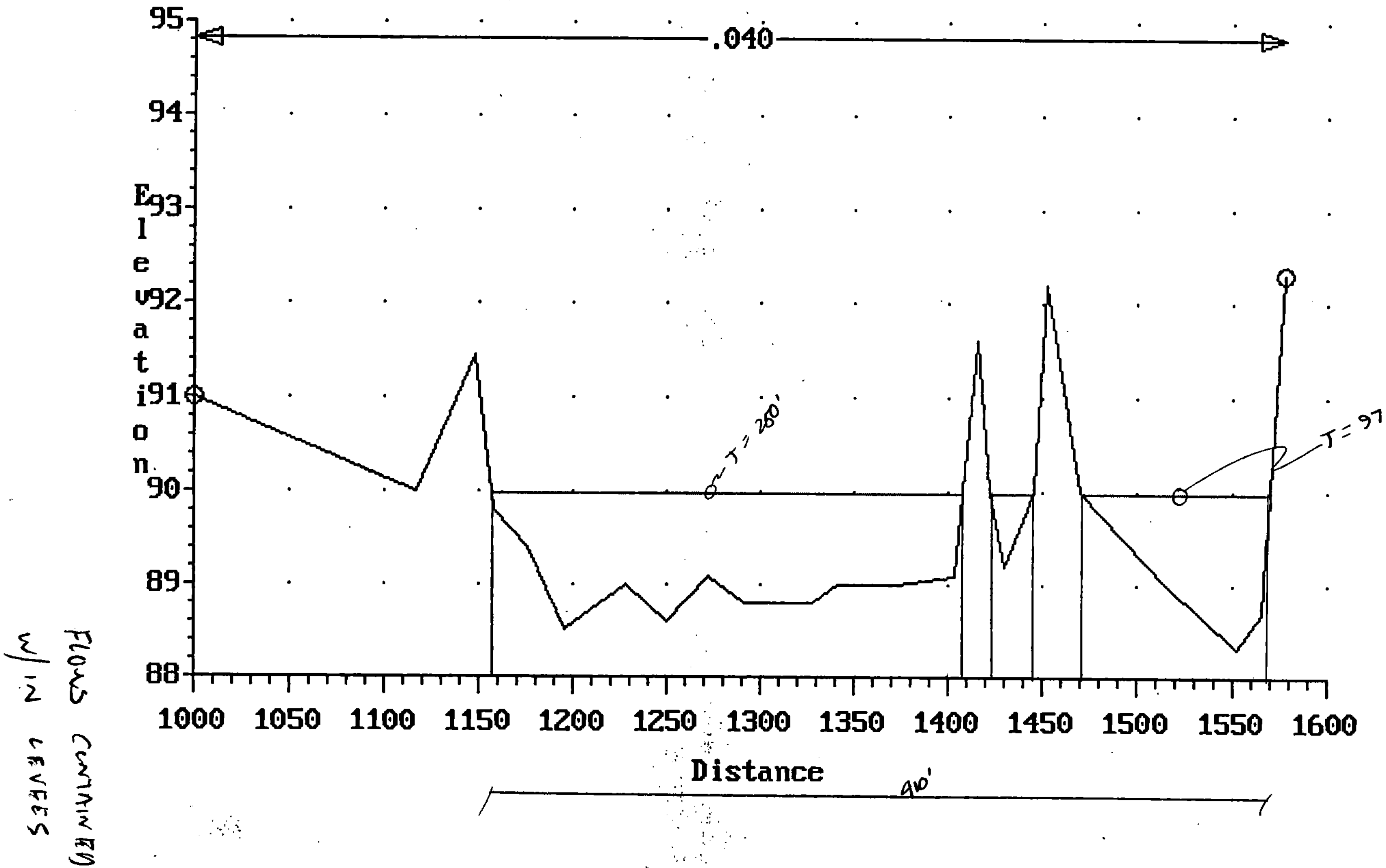
Cross-section 1565.000



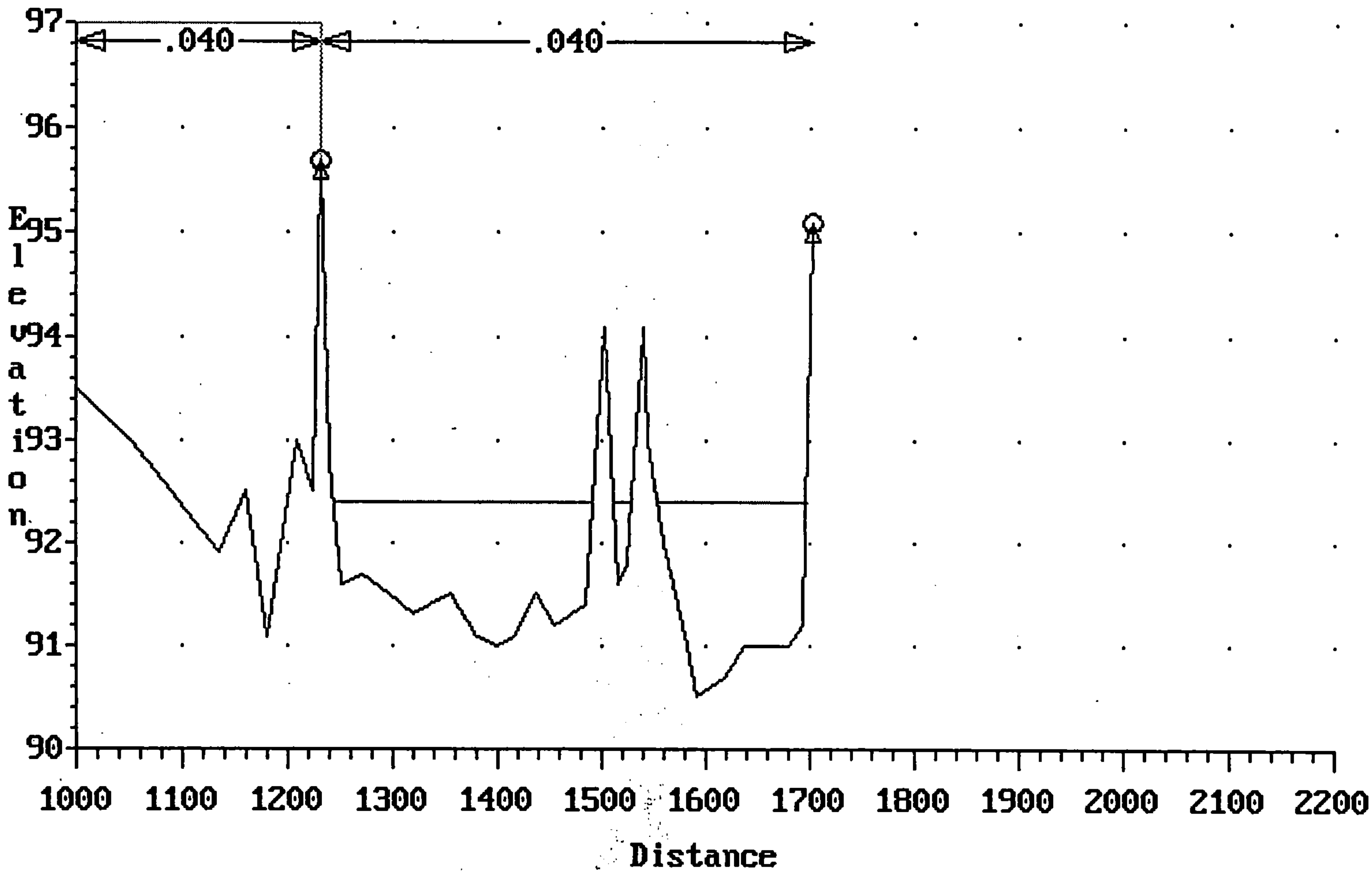
FLOWS NOT CONTAINED W/IN LEVEE

LEVEE TO LEVEE DISTANCE IS ≈ 375' WHILE FLOWS @ 57A 1565 TOP WIDTH ≈ 750'

WHITES CREEK CHANNEL A
Cross-section 1300.000



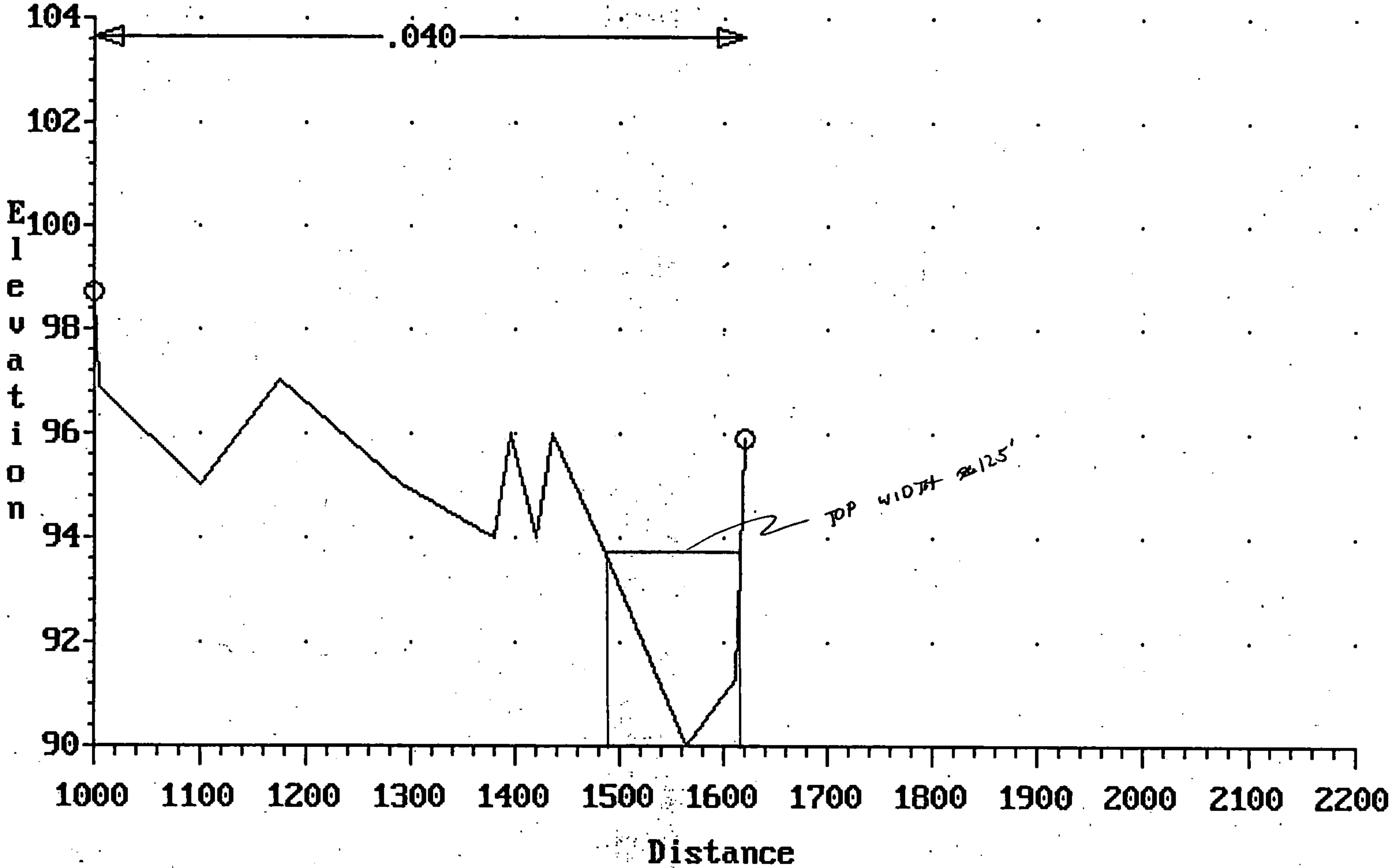
WHITES CREEK CHANNEL A
Cross-section 1170.000



FLOWS CONTAINED w/ IN LEVEES

WHITES CREEK CHANNEL A

Cross-section 1035.000



FLOWS CONTAINED w/in LEVEES

```
1*****************************************                    ***************************************
 *  HEC-2 WATER SURFACE PROFILES          *                    *  U.S. ARMY CORPS OF ENGINEERS       *
 *                                        *                    *  HYDROLOGIC ENGINEERING CENTER      *
 *    rsion  4.6.2;  May 1991             *                    *  609 SECOND STREET, SUITE D         *
 *                                        *                    *  DAVIS, CALIFORNIA 95616-4687       *
 *  RUN DATE   14AUG96    TIME   09:24:46 *                    *        (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

14AUG96 09:24:46 PAGE 1

```
                                                       THIS RUN EXECUTED 14AUG96    09:24:46

    *******************************
    2 WATER SURFACE PROFILES

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


T1       NIMBUS ENGINEERS
T2       9508 DOUBLE DIAMOND AS-BUILT CHECK          FILE:  508AS-BC.DAT
T3       WHITES CREEK BC CHANNEL
         STARTING WATER SURFACE ELEVATION FROM PONDING DEPTH OF DETENTION BASIN
         CROSS SECTIONS FROM AS-BUILT SURVEY INFO RECEIVED FROM SEA 8/5/96

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC    HVINS     Q        WSEL      FQ

       0        2        0        0        0        0         0        0   4429.32

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH     FN      ALLDC     IBW      CHNIM     ITRACE

      1        0       -1


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150       38       43       13       15       16       26        1       53       54
      4       25

NC     .040     .040     .038      .1       .3
QT        2     4585     1263

X1    13740        4     1000     1750        0        0        0
GR     4430     1000   4423.8     1040   4423.8     1670     4430     1750
```

X1	13540	4	1000	1250	200	200	200			
	4430	1000	4424	1040	4424	1200	4430	1250		
X1	13500	4	1000	1203	40	40	40			
GR	4430.5	1000	4425	1016.5	4425	1186.5	4430.5	1203		
X1	13450	5	1000	1201.5	50	50	50			
GR	4431.1	1000	4425.35	1015.75	4425.1	1100.75	4425.35	1185.75	4431.10	1201.5
X1	13400	6	1000	1200	50	50	50			
GR	4431.3	1000	4425.8	1015	4425.2	1075	4425.0	1130	4425.3	1180
GR	4430.4	1200								

X1	13200	32	1000	1205	200	200	200			
GR	4431	280	4430	395	4429	405	4428.3	435	4428.5	478
GR	4429	548	4430.9	565	4430.9	575	4429.7	595	4430	605
GR	4433	630	4429	658	4428	692	4427	757	4428	783
GR	4428.2	806	4428	830	4428	865	4429	884	4434	905
	4430	922	4429	937	4427	942	4426.9	955	4427	970
	4431.5	1000	4426.0	1013	4424.2	1025	4425.5	1115	4425.8	1185
GR	4431.4	1205	4431.3	1342						
X1	13000	21	1000	1201	200	200	200			
GR	4432	415	4431	450	4430	485	4428	510	4429.2	535
GR	4429	565	4428.8	605	4429	648	4428.5	720	4428	795
GR	4427.5	820	4428	842	4428.5	892	4428	945	4428.7	985
GR	4432.5	1000	4426.6	1015	4426.0	1090	4426.5	1188	4431.8	1201
GR	4432.0	1322								
X1	12750	21	1000	1202	250	250	250			
GR	4432	403	4430	530	4429	540	4428.7	545	4429	552
GR	4429.9	570	4430	625	4430.1	678	4430	690	4429	795
GR	4428.7	875	4429	940	4429	965	4428.8	978	4429	990
GR	4432.9	1000	4426.9	1015	4426.6	1100	4426.5	1180	4432.5	1202
GR	4432.8	1305								
X1	12500	16	1000	1202	250	250	250			
GR	4433	392	4430	500	4429	510	4430	518	4431	615
GR	4431	765	4430	815	4429.7	880	4430	958	4429	990
GR	4433.5	1000	4427.7	1015	4427.2	1102	4426.6	1182	4433.5	1202
GR	4433.9	1310								
X1	12250	21	1000	1202	250	250	250			
GR	4433	465	4431	545	4430	555	4430	562	4431	570
GR	4432	700	4432	735	4431	778	4431	782	4431.2	795
GR	4429	812	4430.3	835	4430.3	905	4430	922	4430.2	935

```
GR   4434.1    1000   4428.5    1018   4427.8    1108   4428.6    1185   4434.4    1202
GR   4434.9    1318

X1    12000      31      450    1205      250     250      250
X3       10                      450
GR     4435     410   4432.3     425   4432.3     432     4433     438   4434.5     450
GR   4434.2     463     4433     478     4432     498   4431.3     572     4431     602
GR     4431     625   4431.3     644     4431     663     4431     678     4432     700
GR     4432     732   4431.7     755   4431.9     804   4431.9     842   4431.2     947
GR     4432     958     4433     966     4434     975   4434.4     981     4434     990
GR   4434.6    1000   4429.3    1015   4428.7    1102   4429.4    1185   4435.2    1205
GR   4435.6    1320
```



```
X1    11760      21      615    1205      240     240      240
X3       10                      615
GR     4436     585   4432.7     598   4432.7     605     4434     615     4434     635
GR   4433.7     680     4432     718     4432     765     4433     802   4434.8     835
GR     4429     862     4429     872     4432     888     4432     965   4431.8     982
GR   4435.7    1000   4430.1    1015   4429.5    1115   4430.2    1185   4436.0    1205
GR   4436.3    1320

     JUNCTION OF WHITES CREEK CHANNEL 'C' AND CENTRAL CHANNEL

                                  .5       .8

X1    11520      21      815    1210      255     230      240
X3       10                      815
GR     4437     668     4436     678     4435     692     4435     735   4436.6     760
GR     4436     772   4432.7     792     4433     798   4435.4     815     4433     860
GR   4432.8     880     4432     898     4433     905     4433     925   4431.9     988
GR   4436.5    1000   4430.6    1015   4430.3    1120   4430.7    1200   4436.1    1210
GR   4436.8    1430

     UPSTREAM OF JUNCTION OF WHITES CREEK CHANNEL 'C' AND CENTRAL CHANNEL

QT        2    3485      825

X1    11360      18      940    1335      205     130      160
X3       10                      940
GR     4437     635     4435     758     4434     880     4434     895     4435     925
GR     4437     940     4433     965     4433     972     4436     982     4436     992
GR   4436.4    1000   4432.3    1010   4430.7    1120   4430.5    1180   4431.0    1265
GR   4431.3    1320   4436.5    1335   4437.0    1490


NC                                .1       .3

X1    11300      17      912    1320       78      65       60
X3       10                      912
GR     4437     578     4435     728     4435     895     4437     912     4437     922
GR     4434     942   4433.5     957     4434     970     4436     975     4436     992
GR   4435.3    1000   4431.1    1030   4430.6    1120   4430.7    1190   4431.1    1235
GR   4431.4    1300   4436.8    1320
```

X1	11220	20	1000	1181	78	85	80			
GR	4437	550	4436	565	4435	625	4435	710	4435	770
	4435	790	4435	810	4435	860	4434	875	4434	910
GR	4434	940	4434	950	4435	970	4435	980	4436	990
GR	4435.2	1000	4431.2	1012	4430.8	1088	4431.3	1163	4435.7	1181

X1	11100	15	1000	1175	120	120	120			
GR	4437.5	560	4437	570	4436	630	4435	720	4435	740
GR	4435	810	4434	920	4434	930	4434	940	4435	970
GR	4435.5	1000	4431.3	1010	4431.2	1090	4431.4	1150	4437.6	1175
X1	10900	16	1000	1180	105	132	200			
GR	4437.5	590	4437	615	4436	720	4435	775	4434	820
GR	4434	915	4435	920	4435.25	940	4435.5	960	4435.75	980
GR	4436.1	1000	4431.7	1012	4431.8	1090	4431.9	1155	4437.9	1180
GR	4437.2	1270								
X1	10700	16	1000	1170	185	210	200			
GR	4437.5	665	4437	680	4437	720	4436	745	4435	815
GR	4433.9	835	4435	860	4435.2	890	4433.9	902	4435	910
	4436.5	1000	4432.2	1015	4432.3	1090	4432.5	1155	4438.5	1170
	4437.7	1270								
X1	10400	16	1000	1175	300	300	300			
GR	4440.0	682	4438	770	4437	800	4437	801	4437	802
GR	4437	803	4437	835	4436	935	4437	970	4436	990
GR	4437.2	1000	4433.5	1012	4433.0	1078	4434.1	1160	4438.8	1175
GR	4438.4	1270								
X1	10200	11	1000	1175	200	200	200			
GR	4440	760	4437	850	4436	855	4436	870	4437	875
GR	4437.6	1000	4433.9	1012	4433.4	1095	4434.2	1160	4439.1	1175
GR	4438.1	1270								
X1	9900	11	1165	1340	300	300	300			
GR	4441	1000	4437	1065	4436	1075	4438	1089	4438.5	1150
GR	4438.3	1165	4434.6	1175	4434.0	1250	4434.3	1322	4439.7	1340
GR	4439.1	1435								
X1	9650	13	1190	1370	250	250	250			
GR	4442	1000	4438	1095	4436	1100	4438	1105	4439	1115
GR	4439.3	1150	4439.1	1180	4439.4	1190	4435.1	1205	4434.5	1285
	4435.0	1350	4440.2	1370	4440.3	1465				
X1	9400	13	1260	1440	250	250	250			
GR	4441.0	1000	4439	1105	4438.7	1112	4439.2	1125	4436	1135
GR	4439.0	1155	4439.2	1220	4440.5	1260	4435.5	1270	4434.9	1345

```
GR   4435.6     1425    4440.7     1440    4442.1     1550
```



```
QT        2     2020       420

X1     9300       16      1000     1240       120      100      100
GR     4441      765      4440      845    4439.4      871   4439.2      891     4439      901
GR   4436.9      918      4439      928    4439.2      950   4439.2      965   4439.1      989
GR   4441.1     1000    4435.6     1115    4434.9     1160   4435.6     1225   4441.2     1240
GR   4442.3     1370

X1     9200       16      1000     1210       105      100      100
GR     4441      800      4440      825    4437.9      831     4440      838   4440.3      847
GR   4440.3      865      4440      895      4439      925   4439.1      945     4439      980
GR   4441.2     1000    4435.4     1020    4434.9     1125   4435.6     1190   4441.8     1210
GR   4442.4     1355

NC                                   .3        .5

X1     9100       16       785     1150       140       80      100
X3       10                         785
GR     4442      670      4441      752      4440      760     4441      766     4441      785
       4440      860      4440      885      4439      900     4439      945   4439.5      980
     4441.7     1000    4435.4     1020    4434.9     1095   4435.6     1135   4442.1     1150
GR   4442.6     1345
   DOWNSTREAM SIDE OF CULVERTS

X1     9035        5      1000     1075       120       45       65
X3       10                                                            4441.5   4441.5
GR   4441.5     1000    4434.9     1001    4434.9     1040   4434.9     1075   4441.5     1075

SC    6.013       .4         3      200         5       10      120     11.2   4435.9   4434.9
   UPSTREAM SIDE OF CULVERTS

X1     8918        5      1000     1075       117      117      117
X2        0        0         2   4440.9      4443        0        0        0        0        0
X3       10                                                            4442.6   4442.6
GR   4442.6     1000    4435.9     1001    4435.9     1040   4435.9     1074   4442.6     1075

X1     8865       16      1000     1160        85       50       53
GR     4442      730      4441      775    4441.2      795   4440.7      815   4441.1      843
GR   4440.3      875      4441      910    4441.1      925     4441      968   4440.9      988
GR   4442.7     1000    4436.9     1015    4436.8     1075   4436.7     1145   4442.1     1160
GR   4442.9     1350

       8815       16      1000     1180        70       50       50
GR     4442      688    4441.8      700    4442.1      768   4441.2      790   4441.3      815
GR   4441.1      845    4441.1      870    4441.3      910   4441.3      952     4441      982
GR   4442.6     1000    4437.7     1012    4436.9     1080   4437.0     1160   4442.2     1180
GR   4443.2     1350
```

NC				.1	.3					
X1	8600	16	738	1175	175	252	215			
X3	10			738						
GR	4443	622	4442	698	4441.7	715	4442.1	738	4441.9	755
GR	4441.7	810	4441.5	822	4441.8	842	4441.6	922	4441.4	970
GR	4442.5	1000	4438.0	1010	4437.4	1090	4437.8	1165	4442.3	1175
GR	4444.1	1275								
X1	8410	16	1385	1565	168	210	190			
X3	10			1385						
GR	4443	1000	4442.5	1010	4442.5	1150	4442.8	1175	4441.8	1220
GR	4442.4	1245	4442.1	1270	4442.1	1300	4442.4	1320	4442.5	1350
GR	4442.6	1385	4438.0	1400	4438	1475	4438.4	1550	4442.4	1565
GR	4444.7	1640								
X1	8200	8	1160	1345	210	210	210			
X3	10			1160						
GR	4444	1000	4443.2	1140	4443.2	1160	4439.3	1172	4439.0	1250
GR	4439.3	1325	4444.1	1345	4446.0	1435				
X1	8022	6	1000	1172	178	178	178			
GR	4444.8	1000	4440.2	1010	4438.9	1085	4440.5	1160	4444.4	1172
	4447.4	1310								
X1	7960	5	1000	1180	62	62	62			
GR	4444.9	1000	4440.5	1010	4439.6	1165	4444.8	1180	4447.5	1325
X1	7925	7	1000	1198	35	35	35			
GR	4450.4	1000	4443.7	1015	4444.2	1045	4444.3	1082	4443.9	1133
GR	4444.0	1190	4449.7	1198						

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

CCHV= .100 CEHV= .300

*SECNO 13740.000

1[illegible]40.000	5.52	4429.32	.00	4429.32	4429.34	.02	.00	.00	4430.00
85.0	.0	4585.0	.0	.0	3772.5	.0	.0	.0	4430.00
.00	.00	1.22	.00	.000	.038	.000	.000	4423.80	1004.39
.000110	0.	0.	0.	0	0	0	.00	736.84	1741.22

*SECNO 13540.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .24

0.000	5.18	4429.18	.00	.00	4429.48	.31	.06	.09	4430.00
585.0	.0	4585.0	.0	.0	1029.2	.0	11.0	2.2	4430.00
.01	.00	4.46	.00	.000	.038	.000	.000	4424.00	1005.49
.001846	200.	200.	200.	2	0	0	.00	237.64	1243.14

*SECNO 13500.000

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

13500.000	4.09	4429.09	.00	.00	4429.68	.59	.11	.08	4430.50
4585.0	.0	4585.0	.0	.0	745.1	.0	11.8	2.4	4430.50
.01	.00	6.15	.00	.000	.038	.000	.000	4425.00	1004.24
.004169	40.	40.	40.	2	0	0	.00	194.53	1198.76

*SECNO 13450.000

13450.000	4.19	4429.29	.00	.00	4429.89	.61	.21	.01	4431.10
4585.0	.0	4585.0	.0	.0	732.7	.0	12.7	2.7	4431.10
.02	.00	6.26	.00	.000	.038	.000	.000	4425.10	1004.97
.004322	50.	50.	50.	2	0	0	.00	191.56	1196.53

*SECNO 13400.000

13400.000	4.54	4429.54	.00	.00	4430.10	.57	.20	.00	4431.30
585.0	.0	4585.0	.0	.0	759.5	.0	13.5	2.9	4430.40
.02	.00	6.04	.00	.000	.038	.000	.000	4425.00	1004.81
.003835	50.	50.	50.	2	0	0	.00	191.80	1196.61

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 13200.000

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.24

13200.000	6.13	4430.33	.00	.00	4430.44	.11	.29	.05	4431.50
4585.0	1713.0	2872.0	.0	987.6	944.5	.0	19.7	5.0	4431.40
.04	1.73	3.04	.00	.040	.038	.000	.000	4424.20	355.81
000764	200.	200.	200.	1	0	0	.00	738.93	1201.22

*SECNO 13000.000

3265 DIVIDED FLOW

13000.000	4.51	4430.51	.00	.00	4430.63	.12	.18	.00	4432.50
4585.0	2042.1	2542.9	.0	1012.8	770.6	.0	28.3	8.4	4431.80
.06	2.02	3.30	.00	.040	.038	.000	.000	4426.00	467.47
.01134	200.	200.	200.	2	0	0	.00	717.37	1197.81

*SECNO 12750.000

3265 DIVIDED FLOW

12750.000	4.31	4430.81	.00	.00	4431.01	.21	.36	.03	4432.90
4585.0	1500.5	3084.5	.0	695.8	738.4	.0	37.5	12.4	4432.50
.08	2.16	4.18	.00	.040	.038	.000	.000	4426.50	478.78
.001892	250.	250.	250.	2	0	0	.00	706.41	1195.79

*SECNO 12500.000

3265 DIVIDED FLOW

12500.000	4.69	4431.29	.00	.00	4431.59	.30	.55	.03	4433.50
4585.0	1018.8	3566.2	.0	490.6	733.7	.0	45.1	16.6	4433.50
.10	2.08	4.86	.00	.040	.038	.000	.000	4426.60	453.58
.002574	250.	250.	250.	2	0	0	.00	731.39	1195.59

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 12250.000

3265 DIVIDED FLOW

12250.000	4.18	4431.98	.00	.00	4432.31	.33	.71	.01	4434.10
4585.0	1149.1	3435.9	.0	442.8	671.8	.0	51.8	20.4	4434.40
.11	2.59	5.11	.00	.040	.038	.000	.000	4427.80	505.84
.003157	250.	250.	250.	2	0	0	.00	608.26	1194.90

*SECNO 12000.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 450.0 1320.0 TYPE= 1 TARGET= -450.000

[illegible] OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4434.50 ELREA= 4435.20

12000.000	4.22	4432.92	.00	.00	4433.11	.18	.78	.01	4434.50
4585.0	.0	4585.0	.0	.0	1340.2	.0	58.9	24.1	4435.20
.13	.00	3.42	.00	.000	.038	.000	.000	4428.70	479.55
.003094	250.	250.	250.	2	0	0	.00	678.22	1197.15

*SECNO 11760.000

DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 615.0 1320.0 TYPE= 1 TARGET= -615.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4434.00 ELREA= 4436.00

11760.000	4.64	4433.64	.00	.00	4433.88	.25	.76	.02	4434.00
4585.0	.0	4585.0	.0	.0	1147.7	.0	65.7	27.3	4436.00
.15	.00	3.99	.00	.000	.038	.000	.000	4429.00	681.45
.003225	240.	240.	240.	2	0	.0	.00	473.56	1196.85

CCHV= .500 CEHV= .800
*SECNO 11520.000

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

DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 815.0 1430.0 TYPE= 1 TARGET= -815.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4435.40 ELREA= 4436.10

11520.000	4.11	4434.41	.00	.00	4434.73	.32	.79	.05	4435.40
4585.0	.0	4585.0	.0	.0	1017.4	.0	71.7	29.6	4436.10
.16	.00	4.51	.00	.000	.038	.000	.000	4430.30	833.60
.003382	255.	240.	230.	1	0	0	.00	362.50	1206.87

*SECNO 11360.000

3265 DIVIDED FLOW

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

3470 ENCROACHMENT STATIONS= 940.0 1490.0 TYPE= 1 TARGET= -940.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4437.00 ELREA= 4436.50

).000	4.48	4434.98	.00	.00	4435.10	.12	.27	.10	4437.00
3485.0	.0	3485.0	.0	.0	1278.5	.0	75.9	30.9	4436.50
.18	.00	2.73	.00	.000	.038	.000	.000	4430.50	952.59
.000880	205.	160.	130.	2	0	0	.00	353.20	1330.63

CCHV= .100 CEHV= .300

*SECNO 11300.000

DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 912.0 1320.0 TYPE= 1 TARGET= -912.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4437.00 ELREA= 100000.00

11300.000	4.43	4435.03	.00	.00	4435.16	.12	.06	.00	4437.00
3485.0	.0	3485.0	.0	.0	1236.2	.0	77.6	31.4	100000.00
.19	.00	2.82	.00	.000	.038	.000	.000	4430.60	935.10
.000966	78.	60.	65.	2	0	0	.00	349.05	1313.46

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 11220.000

DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .56

11220.000	4.17	4434.97	.00	.00	4435.37	.39	.13	.08	4435.20
3485.0	169.5	3315.5	.0	89.5	645.0	.0	79.4	32.0	4435.70
.19	1.89	5.14	.00	.040	.038	.000	.000	4430.80	860.42
.003114	78.	80.	85.	2	0	0	.00	286.36	1178.02

*SECNO 11100.000

3265 DIVIDED FLOW

11100.000	4.16	4435.36	.00	.00	4435.73	.36	.36	.00	4435.50
3485.0	325.7	3159.3	.0	191.0	624.3	.0	81.6	33.0	4437.60
.20	1.71	5.06	.00	.040	.038	.000	.000	4431.20	687.22
.002885	120.	120.	120.	3	0	0	.00	470.30	1165.98

*SECNO 10900.000

3265 DIVIDED FLOW

10900.000	4.25	4435.95	.00	.00	4436.19	.24	.45	.01	4436.10
3485.0	703.3	2781.7	.0	317.2	652.3	.0	85.1	34.5	4437.90
.21	2.22	4.26	.00	.040	.038	.000	.000	4431.70	722.95
.002021	105.	200.	132.	2	0	0	.00	439.70	1171.86

*SECNO 10700.000

3265 DIVIDED FLOW

0.000	4.15	4436.35	.00	.00	4436.65	.30	.44	.02	4436.50
3485.0	606.7	2878.3	.0	275.5	612.8	.0	89.3	36.3	4438.50
.22	2.20	4.70	.00	.040	.038	.000	.000	4432.20	736.25
.002516	185.	200.	210.	2	0	0	.00	418.86	1164.63

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 10400.000

3265 DIVIDED FLOW

10400.000	4.16	4437.16	.00	.00	4437.62	.46	.92	.05	4437.20
3485.0	193.6	3291.4	.0	114.5	591.3	.0	94.8	39.1	4438.80
.24	1.69	5.57	.00	.040	.038	.000	.000	4433.00	795.11
.003866	300.	300.	300.	2	0	0	.00	374.24	1169.78

O 10200.000

10200.000	4.51	4437.91	.00	.00	4438.25	.35	.62	.01	4437.60
3485.0	230.9	3254.1	.0	130.6	666.9	.0	98.2	40.7	4439.10
.25	1.77	4.88	.00	.040	.038	.000	.000	4433.40	822.84
.002565	200.	200.	200.	2	0	0	.00	348.50	1171.34

*SECNO 9900.000

9900.000	4.64	4438.64	.00	.00	4438.97	.33	.72	.00	4438.30
3485.0	177.0	3308.0	.0	94.0	702.6	.0	103.7	43.0	4439.70
.27	1.88	4.71	.00	.040	.038	.000	.000	4434.00	1038.30
.002233	300.	300.	300.	2	0	0	.00	298.18	1336.48

*SECNO 9650.000

3265 DIVIDED FLOW

9650.000	4.71	4439.21	.00	.00	4439.56	.35	.58	.01	4439.40
3485.0	98.1	3386.9	.0	49.9	705.5	.0	108.2	44.6	4440.20
.28	1.97	4.80	.00	.040	.038	.000	.000	4434.50	1066.37
.002378	250.	250.	250.	2	0	0	.00	267.49	1366.17

*SECNO 9400.000

3265 DIVIDED FLOW

9400.000	4.90	4439.80	.00	.00	4440.07	.26	.50	.01	4440.50
3485.0	277.9	3207.1	.0	154.2	754.1	.0	112.9	46.4	4440.70
.30	1.80	4.25	.00	.040	.038	.000	.000	4434.90	1062.81

.001721	250.	250.	250.	2	0	0	.00	351.74	1437.36

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

*SECNO 9300.000

3265 DIVIDED FLOW

9300.000	5.22	4440.12	.00	.00	4440.20	.08	.12	.02	4441.10
2020.0	182.0	1838.0	.0	159.4	777.1	.0	115.1	47.3	4441.20
.31	1.14	2.37	.00	.040	.038	.000	.000	4434.90	835.23
.000670	120.	100.	100.	2	0	0	.00	376.05	1237.11

*SECNO 9200.000

3265 DIVIDED FLOW

9200.000	5.29	4440.19	.00	.00	4440.25	.07	.05	.00	4441.20
2020.0	77.9	1942.1	.0	108.3	923.2	.0	117.4	48.1	4441.80
.33	.72	2.10	.00	.040	.038	.000	.000	4434.90	820.32
.000383	105.	100.	100.	2	0	0	.00	339.10	1204.80

CCHV= .300 CEHV= .500

*SECNO 9100.000

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .54

3470 ENCROACHMENT STATIONS= 785.0 1345.0 TYPE= 1 TARGET= -785.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4441.00 ELREA= 4442.10

9100.000	5.33	4440.23	.00	.00	4440.34	.11	.06	.02	4441.00
2020.0	.0	2020.0	.0	.0	754.5	.0	119.5	48.9	4442.10
.34	.00	2.68	.00	.000	.038	.000	.000	4434.90	842.28
.001293	140.	100.	80.	1	0	0	.00	285.47	1145.70

*SECNO 9035.000

OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4441.50 ELREA= 4441.50

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

9035.000	5.29	4440.19	.00	.00	4440.60	.41	.11	.15	4441.50
2020.0	.0	2020.0	.0	.0	393.5	.0	120.4	49.2	4441.50
.34	.00	5.13	.00	.000	.038	.000	.000	4434.90	1000.20
.002220	120.	65.	45.	2	0	0	.00	74.80	1075.00

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	6	.013	.40	3.00	200.00	5.00	10.00	120.00	11	2	4435.90	4434.90

CHART 11 - BOX CULVERT; SKEWED HEADWALL; CHAMFERED OR BEVELED INLET EDGES
SCALE 2 - HEADWALL SKEWED 30 DEGREES; INLET EDGES CHAMFERED 3/4-INCH

*SECNO 8918.000

SPECIAL CULVERT INLET CONTROL
EGIC = 4441.459 EGOC = 4441.385 PCWSE= 4440.188 ELTRD= 4443.000

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
41.46	4441.38	.86	0.	2020.	5.349	300.0	4443.00	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4442.60 ELREA= 4442.60

8918.000	5.11	4441.01	.00	.00	4441.46	.44	.86	.00	4442.60
2020.0	.0	2020.0	.0	.0	377.6	.0	121.4	49.4	4442.60
.35	.00	5.35	.00	.000	.038	.000	.000	4435.90	1000.24
.002496	117.	117.	117.	2	0	0	.00	74.53	1074.76

*SECNO 8865.000

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.80

8865.000	4.80	4441.50	.00	.00	4441.62	.12	.07	.10	4442.70
2020.0	102.2	1917.8	.0	136.4	671.7	.0	122.2	49.7	4442.10
.35	.75	2.86	.00	.040	.038	.000	.000	4436.70	752.26
.000767	85.	53.	50.	2	0	0	.00	395.04	1158.35

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

*SECNO 8815.000

3265 DIVIDED FLOW

8815.000	4.65	4441.55	.00	.00	4441.66	.12	.04	.00	4442.60
2020.0	34.6	1985.4	.0	68.1	714.2	.0	123.1	50.3	4442.20
.36	.51	2.78	.00	.040	.038	.000	.000	4436.90	781.55
.000782	70.	50.	50.	2	0	0	.00	381.49	1177.48

CCHV= .100 CEHV= .300

*SECNO 8600.000

3265 DIVIDED FLOW

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

3470 ENCROACHMENT STATIONS= 738.0 1275.0 TYPE= 1 TARGET= -738.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4442.10 ELREA= 4442.30

8600.000	4.41	4441.81	.00	.00	4441.93	.12	.27	.00	4442.10
020.0	.0	2020.0	.0	.0	712.9	.0	126.8	52.1	4442.30
.38	.00	2.83	.00	.000	.038	.000	.000	4437.40	779.07
.002240	175.	215.	252.	2	0	0	.00	374.57	1173.92

*SECNO 8410.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.41

3470 ENCROACHMENT STATIONS= 1385.0 1640.0 TYPE= 1 TARGET= -1385.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 4442.60 ELREA= 4442.40

8410.000	4.08	4442.08	.00	.00	4442.23	.15	.29	.01	4442.60
2020.0	.0	2020.0	.0	.0	650.8	.0	129.8	53.3	4442.40
.40	.00	3.10	.00	.000	.038	.000	.000	4438.00	1386.67
.001121	168.	190.	210.	1	0	0	.00	177.15	1563.83

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 8200.000

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3470 ENCROACHMENT STATIONS=     1160.0     1435.0  TYPE=       1  TARGET=     -1160.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      4443.20 ELREA=      4444.10

   ̗0.000      3.35   4442.35       .00       .00   4442.58       .23       .33       .02   4443.20
   2020.0        .0    2020.0        .0        .0     523.4        .0     132.6      54.1   4444.10
      .41       .00      3.86       .00      .000      .038      .000      .000   4439.00   1162.61
  .002276      210.      210.      210.         2         0         0       .00    175.10   1337.71


*SECNO 8022.000
 8022.000      3.86   4442.76       .00       .00   4443.03       .27       .44       .01   4444.80
   2020.0        .0    2020.0        .0        .0     485.3        .0     134.7      54.8   4444.40
      .42       .00      4.16       .00      .000      .038      .000      .000   4438.90   1004.43
  .002656      178.      178.      178.         2         0         0       .00    162.52   1166.95


*SECNO 7960.000
 7960.000      3.33   4442.93       .00       .00   4443.22       .29       .18       .01   4444.90
   2020.0        .0    2020.0        .0        .0     467.3        .0     135.3      55.0   4444.80
      .43       .00      4.32       .00      .000      .038      .000      .000   4439.60   1004.50
  .003202       62.       62.       62.         1         0         0       .00    170.07   1174.58


*SECNO 7925.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   `5.000      1.95   4445.65   4445.65       .00   4446.43       .78       .22       .15   4450.40
    020.0        .0    2020.0        .0        .0     284.6        .0     135.6      55.2   4449.70
      .43       .00      7.10       .00      .000      .038      .000      .000   4443.70   1010.64
  .018225       35.       35.       35.        20        11         0       .00    181.68   1192.31
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THIS RUN EXECUTED 14AUG96   09:24:49

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

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

WHITES CREEK BC CHANNEL

S''''ARY PRINTOUT

SECNO	Q	QLOB	QROB	K*XNL	VCH	CWSEL	SSTA	ENDST	TOPWID	AREA
13740.000	4585.00	.00	.00	.00	1.22	4429.32	1004.39	1741.22	736.84	3772.48

*	13540.000	4585.00	.00	.00	.00	4.46	4429.18	1005.49	1243.14	237.64	1029.16
*	13500.000	4585.00	.00	.00	.00	6.15	4429.09	1004.24	1198.76	194.53	745.07
	.3450.000	4585.00	.00	.00	.00	6.26	4429.29	1004.97	1196.53	191.56	732.72
	13400.000	4585.00	.00	.00	.00	6.04	4429.54	1004.81	1196.61	191.80	759.50
*	13200.000	4585.00	1713.02	.00	40.00	3.04	4430.33	355.81	1201.22	738.93	1932.10
	13000.000	4585.00	2042.06	.00	40.00	3.30	4430.51	467.47	1197.81	717.37	1783.47
	12750.000	4585.00	1500.48	.00	40.00	4.18	4430.81	478.78	1195.79	706.41	1434.26
	12500.000	4585.00	1018.79	.00	40.00	4.86	4431.29	453.58	1195.59	731.39	1224.28
	12250.000	4585.00	1149.12	.00	40.00	5.11	4431.98	505.84	1194.90	608.26	1114.63
	12000.000	4585.00	.00	.00	.00	3.42	4432.92	479.55	1197.15	678.22	1340.21
	11760.000	4585.00	.00	.00	.00	3.99	4433.64	681.45	1196.85	473.56	1147.72
	11520.000	4585.00	.00	.00	.00	4.51	4434.41	833.60	1206.87	362.50	1017.44
*	11360.000	3485.00	.00	.00	.00	2.73	4434.98	952.59	1330.63	353.20	1278.46
	11300.000	3485.00	.00	.00	.00	2.82	4435.03	935.10	1313.46	349.05	1236.22
	220.000	3485.00	169.50	.00	40.00	5.14	4434.97	860.42	1178.02	286.36	734.44
	11100.000	3485.00	325.73	.00	40.00	5.06	4435.36	687.22	1165.98	470.30	815.36

	SECNO	Q	QLOB	QROB	K*XNL	VCH	CWSEL	SSTA	ENDST	TOPWID	AREA
	10900.000	3485.00	703.27	.00	40.00	4.26	4435.95	722.95	1171.86	439.70	969.49
	10700.000	3485.00	606.68	.00	40.00	4.70	4436.35	736.25	1164.63	418.86	888.37
	10400.000	3485.00	193.62	.00	40.00	5.57	4437.16	795.11	1169.78	374.24	705.78
	10200.000	3485.00	230.88	.00	40.00	4.88	4437.91	822.84	1171.34	348.50	797.49
	9900.000	3485.00	177.00	.00	40.00	4.71	4438.64	1038.30	1336.48	298.18	796.60
	9650.000	3485.00	98.07	.00	40.00	4.80	4439.21	1066.37	1366.17	267.49	755.32
	9400.000	3485.00	277.86	.00	40.00	4.25	4439.80	1062.81	1437.36	351.74	908.26
	9300.000	2020.00	181.96	.00	40.00	2.37	4440.12	835.23	1237.11	376.05	936.48
	200.000	2020.00	77.92	.00	40.00	2.10	4440.19	820.32	1204.80	339.10	1031.59
*	9100.000	2020.00	.00	.00	.00	2.68	4440.23	842.28	1145.70	285.47	754.53
	9035.000	2020.00	.00	.00	.00	5.13	4440.19	1000.20	1075.00	74.80	393.55

8918.000	2020.00	.00	.00	.00	5.35	4441.01	1000.24	1074.76	74.53	377.61
* 8865.000	2020.00	102.20	.00	40.00	2.86	4441.50	752.26	1158.35	395.04	808.06
8815.000	2020.00	34.64	.00	40.00	2.78	4441.55	781.55	1177.48	381.49	782.35
* 8600.000	2020.00	.00	.00	.00	2.83	4441.81	779.07	1173.92	374.57	712.86
* 8410.000	2020.00	.00	.00	.00	3.10	4442.08	1386.67	1563.83	177.15	650.76
8200.000	2020.00	.00	.00	.00	3.86	4442.35	1162.61	1337.71	175.10	523.41
8022.000	2020.00	.00	.00	.00	4.16	4442.76	1004.43	1166.95	162.52	485.27
7960.000	2020.00	.00	.00	.00	4.32	4442.93	1004.50	1174.58	170.07	467.30
* 7925.000	2020.00	.00	.00	.00	7.10	4445.65	1010.64	1192.31	181.68	284.64

WHITES CREEK BC CHANNEL

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
13740.000	.00	.00	.00	4423.80	4585.00	4429.32	.00	4429.34	1.10	1.22	3772.48	4379.98
* 13540.000	200.00	.00	.00	4424.00	4585.00	4429.18	.00	4429.48	18.46	4.46	1029.16	1067.24
* 13500.000	40.00	.00	.00	4425.00	4585.00	4429.09	.00	4429.68	41.69	6.15	745.07	710.07
13450.000	50.00	.00	.00	4425.10	4585.00	4429.29	.00	4429.89	43.22	6.26	732.72	697.45
13400.000	50.00	.00	.00	4425.00	4585.00	4429.54	.00	4430.10	38.35	6.04	759.50	740.35
* 13200.000	200.00	.00	.00	4424.20	4585.00	4430.33	.00	4430.44	7.64	3.04	1932.10	1659.16
13000.000	200.00	.00	.00	4426.00	4585.00	4430.51	.00	4430.63	11.34	3.30	1783.47	1361.73
12750.000	250.00	.00	.00	4426.50	4585.00	4430.81	.00	4431.01	18.92	4.18	1434.26	1054.11
12500.000	250.00	.00	.00	4426.60	4585.00	4431.29	.00	4431.59	25.74	4.86	1224.28	903.78
12250.000	250.00	.00	.00	4427.80	4585.00	4431.98	.00	4432.31	31.57	5.11	1114.63	816.00
12000.000	250.00	.00	.00	4428.70	4585.00	4432.92	.00	4433.11	30.94	3.42	1340.21	824.28
11760.000	240.00	.00	.00	4429.00	4585.00	4433.64	.00	4433.88	32.25	3.99	1147.72	807.37
11520.000	240.00	.00	.00	4430.30	4585.00	4434.41	.00	4434.73	33.82	4.51	1017.44	788.43
* 11360.000	160.00	.00	.00	4430.50	3485.00	4434.98	.00	4435.10	8.80	2.73	1278.46	1175.07
11300.000	60.00	.00	.00	4430.60	3485.00	4435.03	.00	4435.16	9.66	2.82	1236.22	1121.02
* 11220.000	80.00	.00	.00	4430.80	3485.00	4434.97	.00	4435.37	31.14	5.14	734.44	624.55

11100.000	120.00	.00	.00	4431.20	3485.00	4435.36	.00	4435.73	28.85	5.06	815.36	648.87
900.000	200.00	.00	.00	4431.70	3485.00	4435.95	.00	4436.19	20.21	4.26	969.49	775.14
10700.000	200.00	.00	.00	4432.20	3485.00	4436.35	.00	4436.65	25.16	4.70	888.37	694.74
10400.000	300.00	.00	.00	4433.00	3485.00	4437.16	.00	4437.62	38.66	5.57	705.78	560.51
10200.000	200.00	.00	.00	4433.40	3485.00	4437.91	.00	4438.25	25.65	4.88	797.49	688.05
9900.000	300.00	.00	.00	4434.00	3485.00	4438.64	.00	4438.97	22.33	4.71	796.60	737.48
9650.000	250.00	.00	.00	4434.50	3485.00	4439.21	.00	4439.56	23.78	4.80	755.32	714.65
9400.000	250.00	.00	.00	4434.90	3485.00	4439.80	.00	4440.07	17.21	4.25	908.26	839.98

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	9300.000	100.00	.00	.00	4434.90	2020.00	4440.12	.00	4440.20	6.70	2.37	936.48	780.31
	9200.000	100.00	.00	.00	4434.90	2020.00	4440.19	.00	4440.25	3.83	2.10	1031.59	1031.95
*	9100.000	100.00	.00	.00	4434.90	2020.00	4440.23	.00	4440.34	12.93	2.68	754.53	561.73
	035.000	65.00	.00	.00	4434.90	2020.00	4440.19	.00	4440.60	22.20	5.13	393.55	428.75
	8918.000	117.00	4443.00	4440.90	4435.90	2020.00	4441.01	.00	4441.46	24.96	5.35	377.61	404.31
*	8865.000	53.00	.00	.00	4436.70	2020.00	4441.50	.00	4441.62	7.67	2.86	808.06	729.31
	8815.000	50.00	.00	.00	4436.90	2020.00	4441.55	.00	4441.66	7.82	2.78	782.35	722.39
*	8600.000	215.00	.00	.00	4437.40	2020.00	4441.81	.00	4441.93	22.40	2.83	712.86	426.83
*	8410.000	190.00	.00	.00	4438.00	2020.00	4442.08	.00	4442.23	11.21	3.10	650.76	603.40
	8200.000	210.00	.00	.00	4439.00	2020.00	4442.35	.00	4442.58	22.76	3.86	523.41	423.39
	8022.000	178.00	.00	.00	4438.90	2020.00	4442.76	.00	4443.03	26.56	4.16	485.27	391.99
	7960.000	62.00	.00	.00	4439.60	2020.00	4442.93	.00	4443.22	32.02	4.32	467.30	357.00
*	7925.000	35.00	.00	.00	4443.70	2020.00	4445.65	4445.65	4446.43	182.25	7.10	284.64	149.63

ES CREEK BC CHANNEL

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH

	13740.000	4585.00	4429.32	.00	.00	.00	736.84	.00
*	13540.000	4585.00	4429.18	.00	-.14	.00	237.64	200.00
*	13500.000	4585.00	4429.09	.00	-.09	.00	194.53	40.00
	13450.000	4585.00	4429.29	.00	.20	.00	191.56	50.00
	13400.000	4585.00	4429.54	.00	.25	.00	191.80	50.00
*	13200.000	4585.00	4430.33	.00	.80	.00	738.93	200.00
	13000.000	4585.00	4430.51	.00	.17	.00	717.37	200.00
	12750.000	4585.00	4430.81	.00	.30	.00	706.41	250.00
	12500.000	4585.00	4431.29	.00	.48	.00	731.39	250.00
	12250.000	4585.00	4431.98	.00	.69	.00	608.26	250.00
	12000.000	4585.00	4432.92	.00	.95	.00	678.22	250.00
	11760.000	4585.00	4433.64	.00	.71	.00	473.56	240.00
	11520.000	4585.00	4434.41	.00	.78	.00	362.50	240.00
*	11360.000	3485.00	4434.98	.00	.57	.00	353.20	160.00
	300.000	3485.00	4435.03	.00	.05	.00	349.05	60.00
*	11220.000	3485.00	4434.97	.00	-.06	.00	286.36	80.00
	11100.000	3485.00	4435.36	.00	.39	.00	470.30	120.00
	10900.000	3485.00	4435.95	.00	.58	.00	439.70	200.00
	10700.000	3485.00	4436.35	.00	.40	.00	418.86	200.00
	10400.000	3485.00	4437.16	.00	.81	.00	374.24	300.00
	10200.000	3485.00	4437.91	.00	.74	.00	348.50	200.00
	9900.000	3485.00	4438.64	.00	.74	.00	298.18	300.00
	9650.000	3485.00	4439.21	.00	.56	.00	267.49	250.00
	9400.000	3485.00	4439.80	.00	.60	.00	351.74	250.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	300.000	2020.00	4440.12	.00	.32	.00	376.05	100.00
	9200.000	2020.00	4440.19	.00	.07	.00	339.10	100.00
*	9100.000	2020.00	4440.23	.00	.04	.00	285.47	100.00

	9035.000	2020.00	4440.19	.00	-.04	.00	74.80	65.00
	8918.000	2020.00	4441.01	.00	.83	.00	74.53	117.00
*	8865.000	2020.00	4441.50	.00	.49	.00	395.04	53.00
	8815.000	2020.00	4441.55	.00	.04	.00	381.49	50.00
*	8600.000	2020.00	4441.81	.00	.26	.00	374.57	215.00
*	8410.000	2020.00	4442.08	.00	.27	.00	177.15	190.00
	8200.000	2020.00	4442.35	.00	.27	.00	175.10	210.00
	8022.000	2020.00	4442.76	.00	.41	.00	162.52	178.00
	7960.000	2020.00	4442.93	.00	.17	.00	170.07	62.00
*	7925.000	2020.00	4445.65	.00	2.72	.00	181.68	35.00

SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 13540.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 13500.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 13200.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 11360.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 11220.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

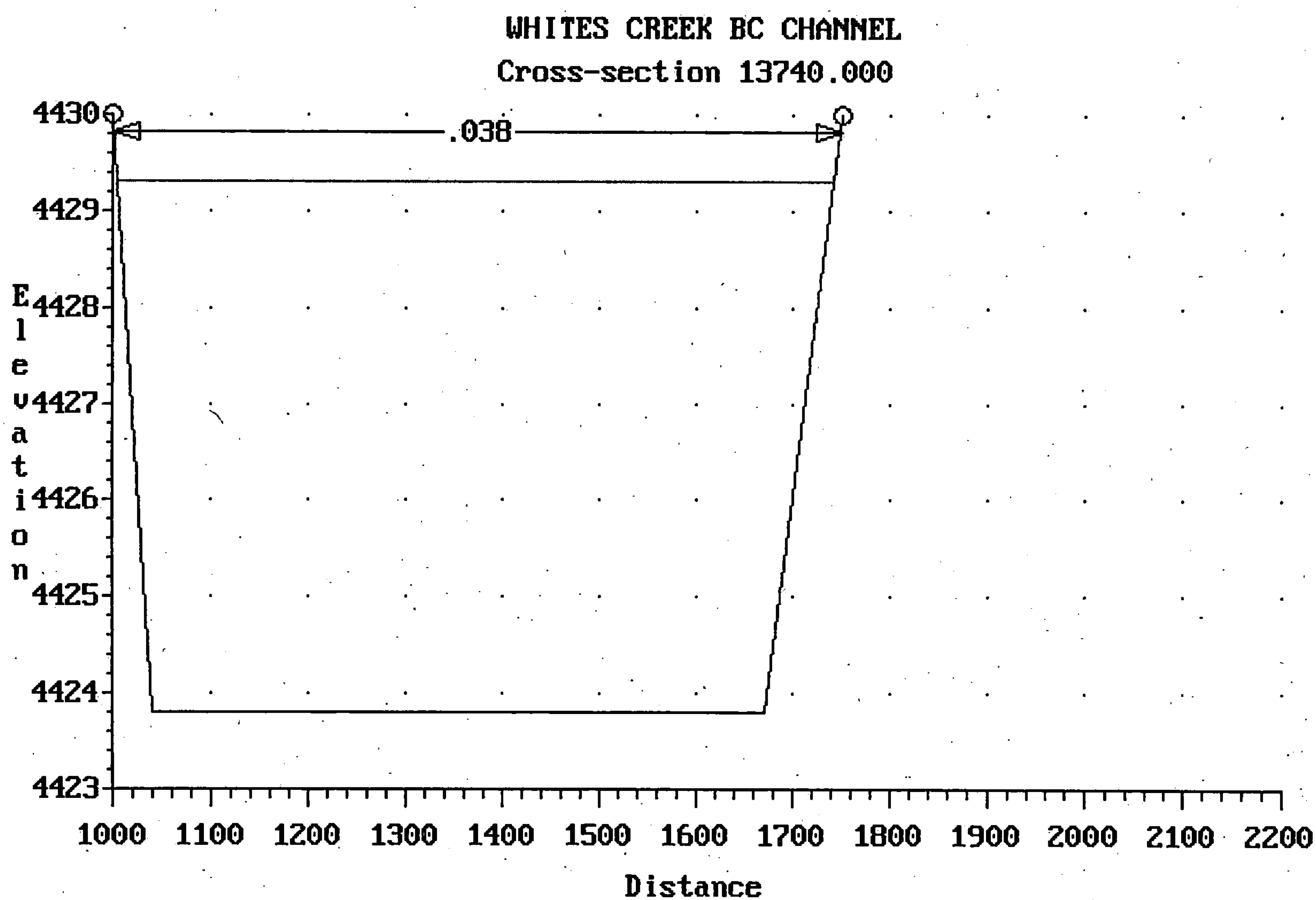
WARNING SECNO= 9100.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 8865.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 8600.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 8410.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

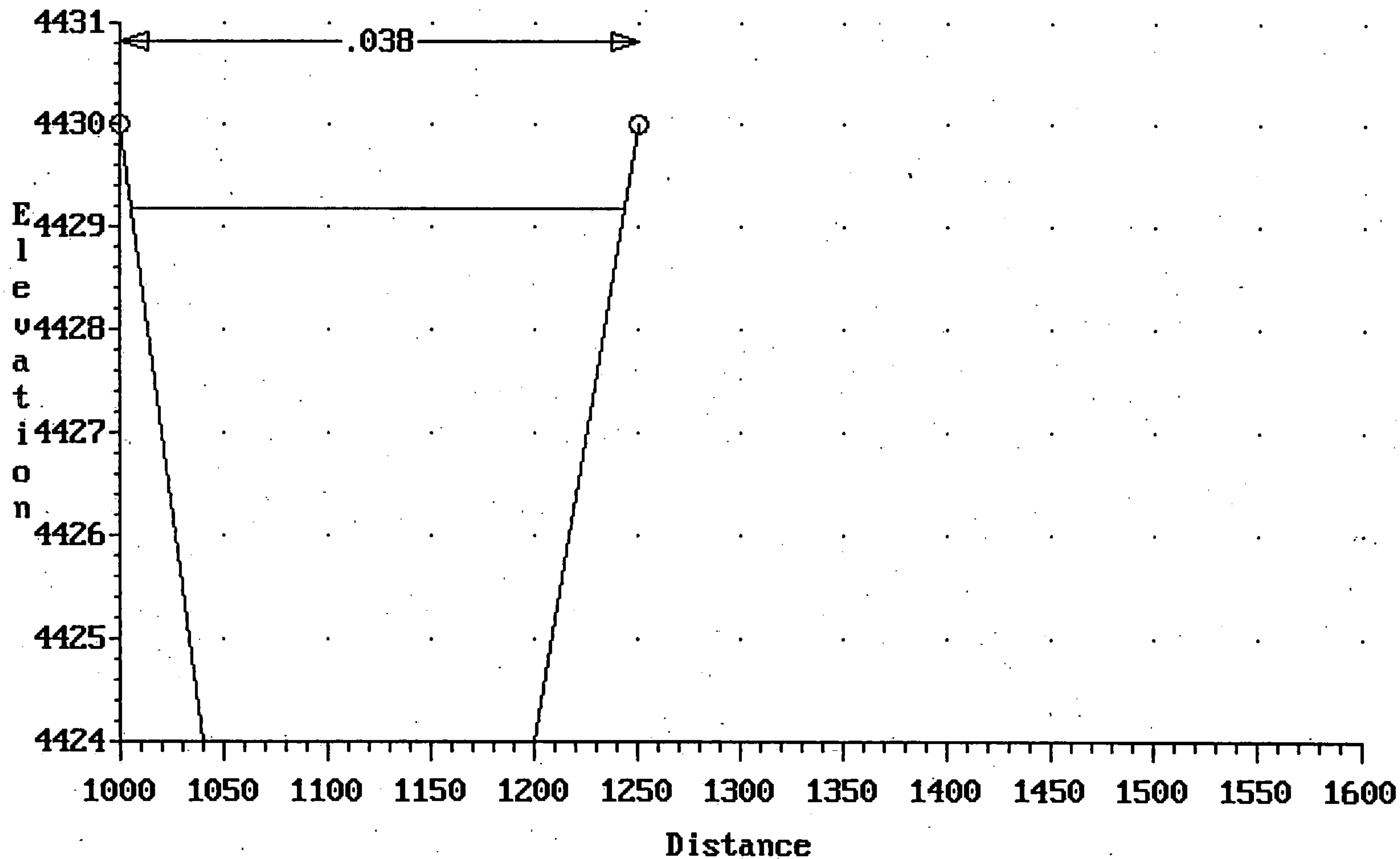
CAUTION SECNO= 7925.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 7925.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 7925.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

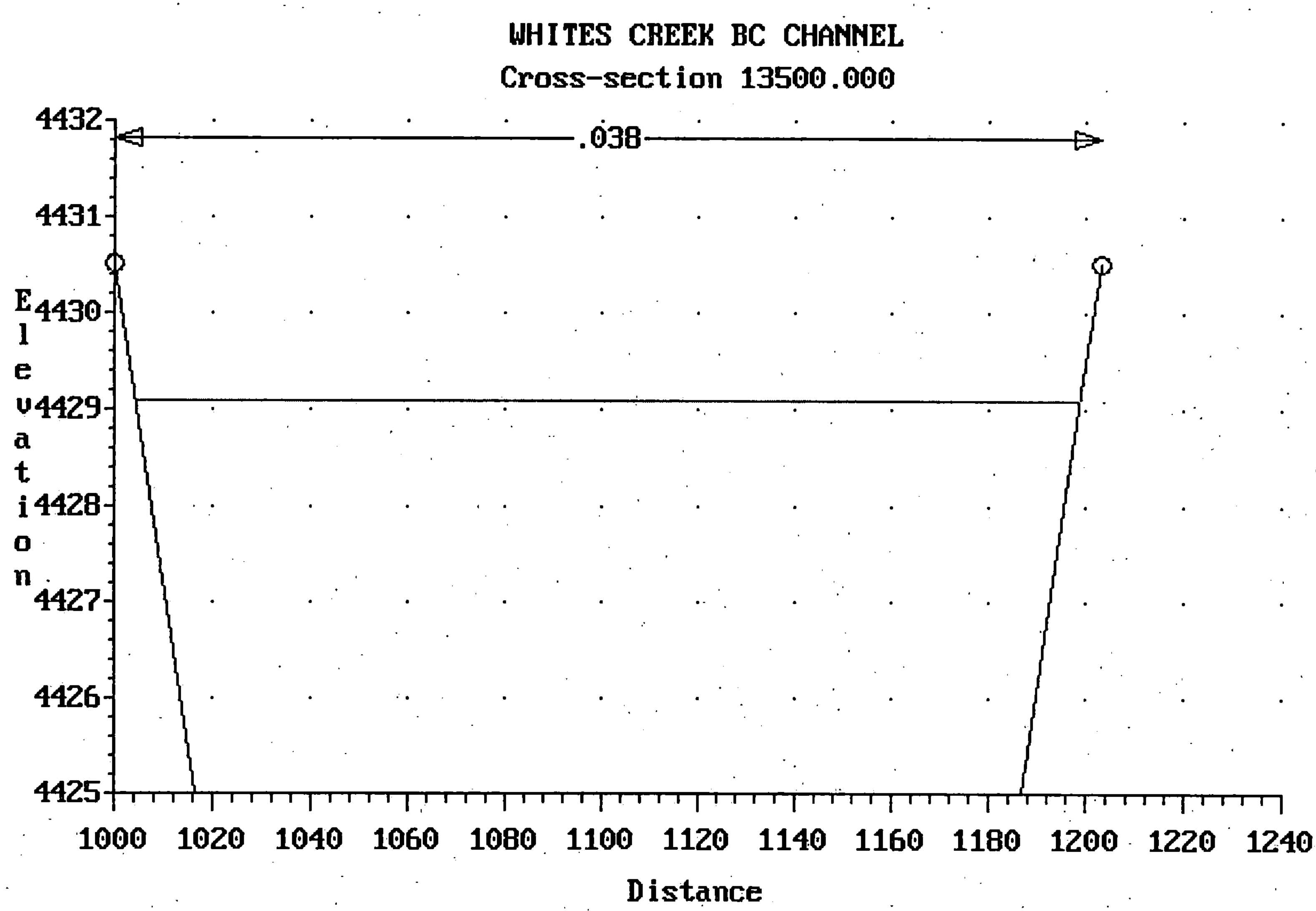


WHITES CREEK BC CHANNEL
Cross-section 13740.000
.038
4430
4429
4428
4427
4426
4425
4424
4423
Elevation
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
Distance

WHITES CREEK BC CHANNEL

Cross-section 13540.000




WHITES CREEK BC CHANNEL
Cross-section 13500.000
.038
Elevation
4432
4431
4430
4429
4428
4427
4426
4425
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1040
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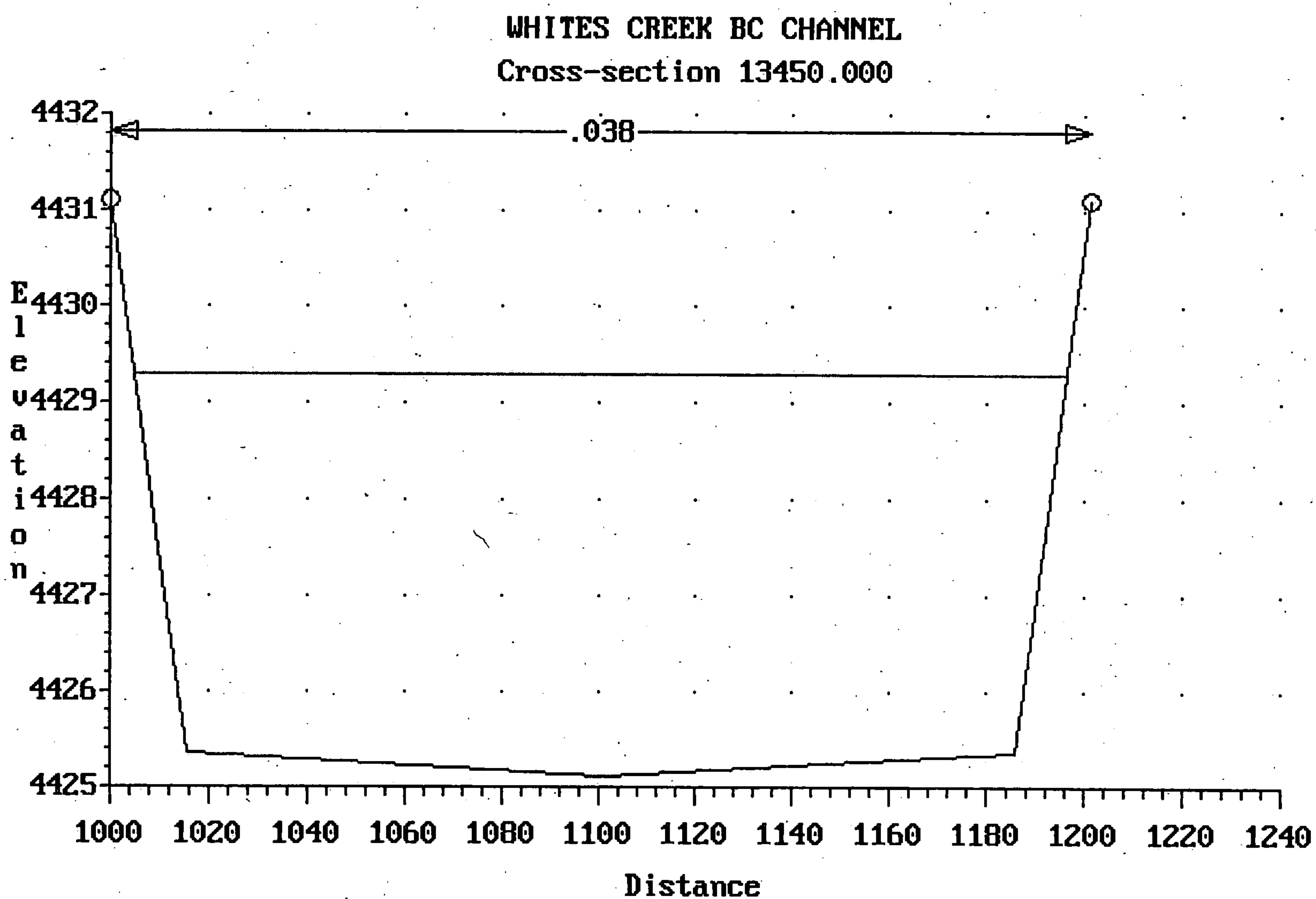
1200
1220
1240
Distance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Cross-section 13450.000
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Elevation
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4430
4429
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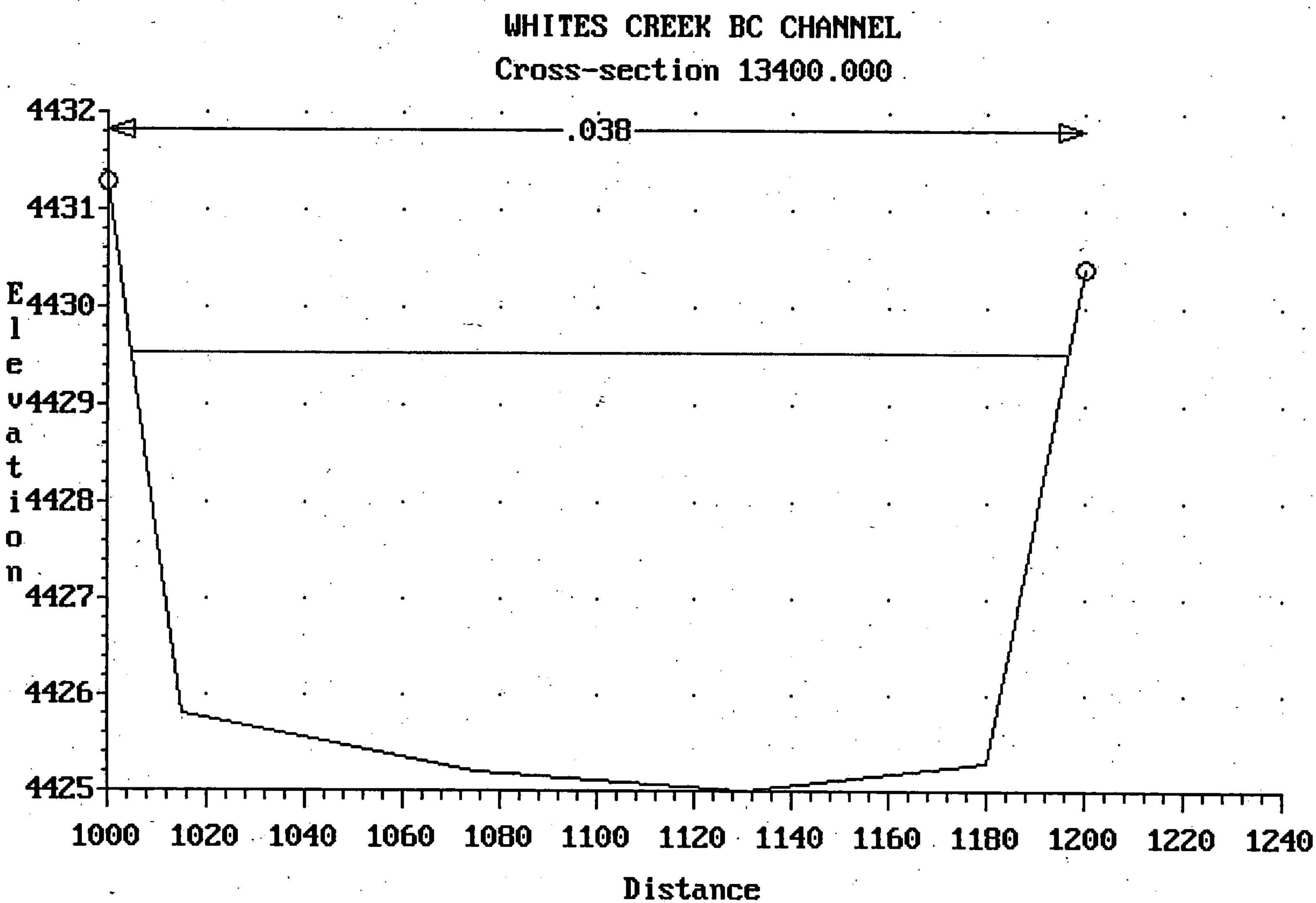
1200
1220
1240
Distance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Cross-section 13400.000
.038
4432
4431
4430
4429
4428
4427
4426
4425
Elevation
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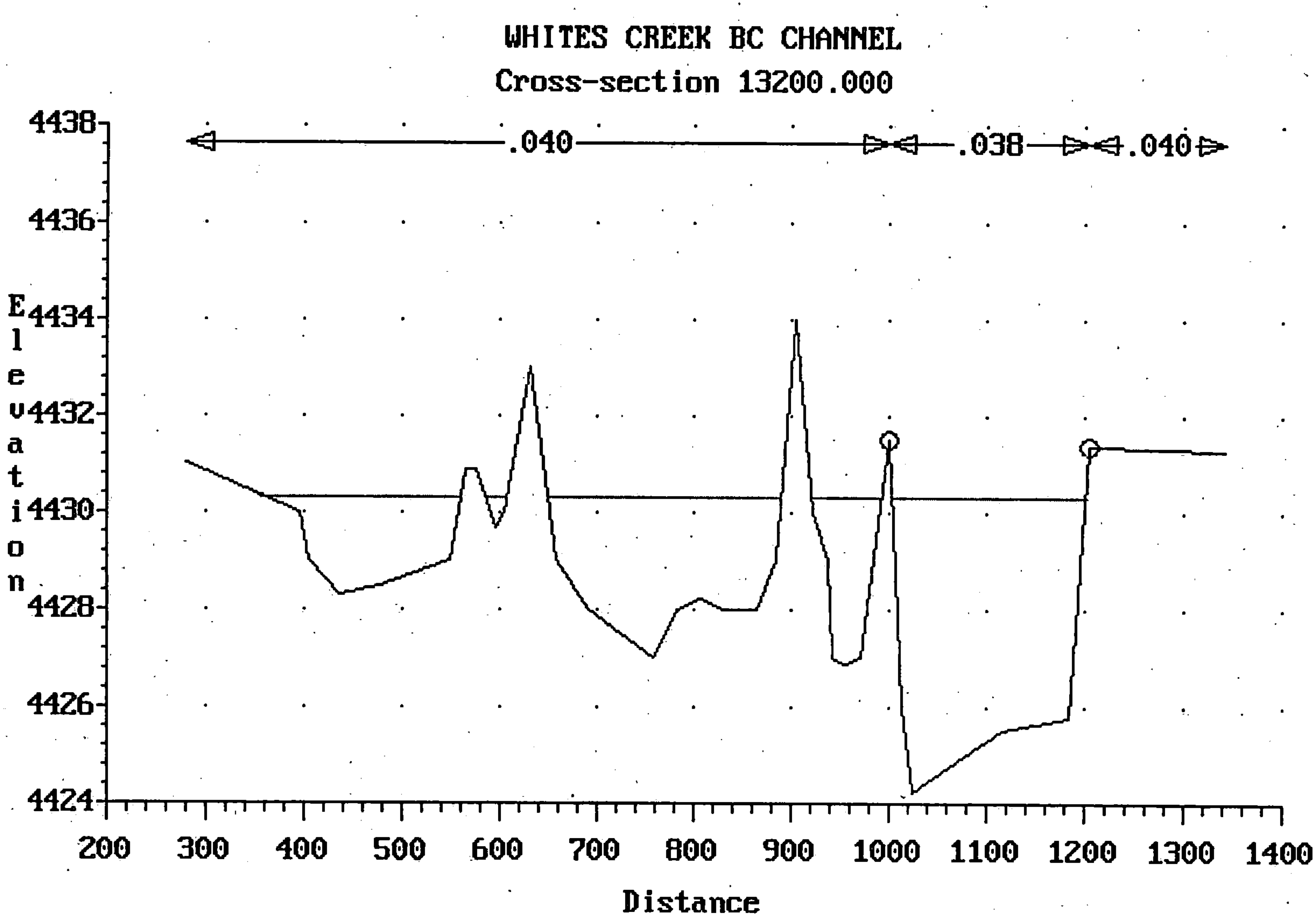
1020
1040
1060
1080
1100
1120
1140
1160
1180
1200
1220
1240
Distance



WHITES CREEK BC CHANNEL
Cross-section 13200.000
.040
.038
.040
Elevation
4438
4436
4434
4432
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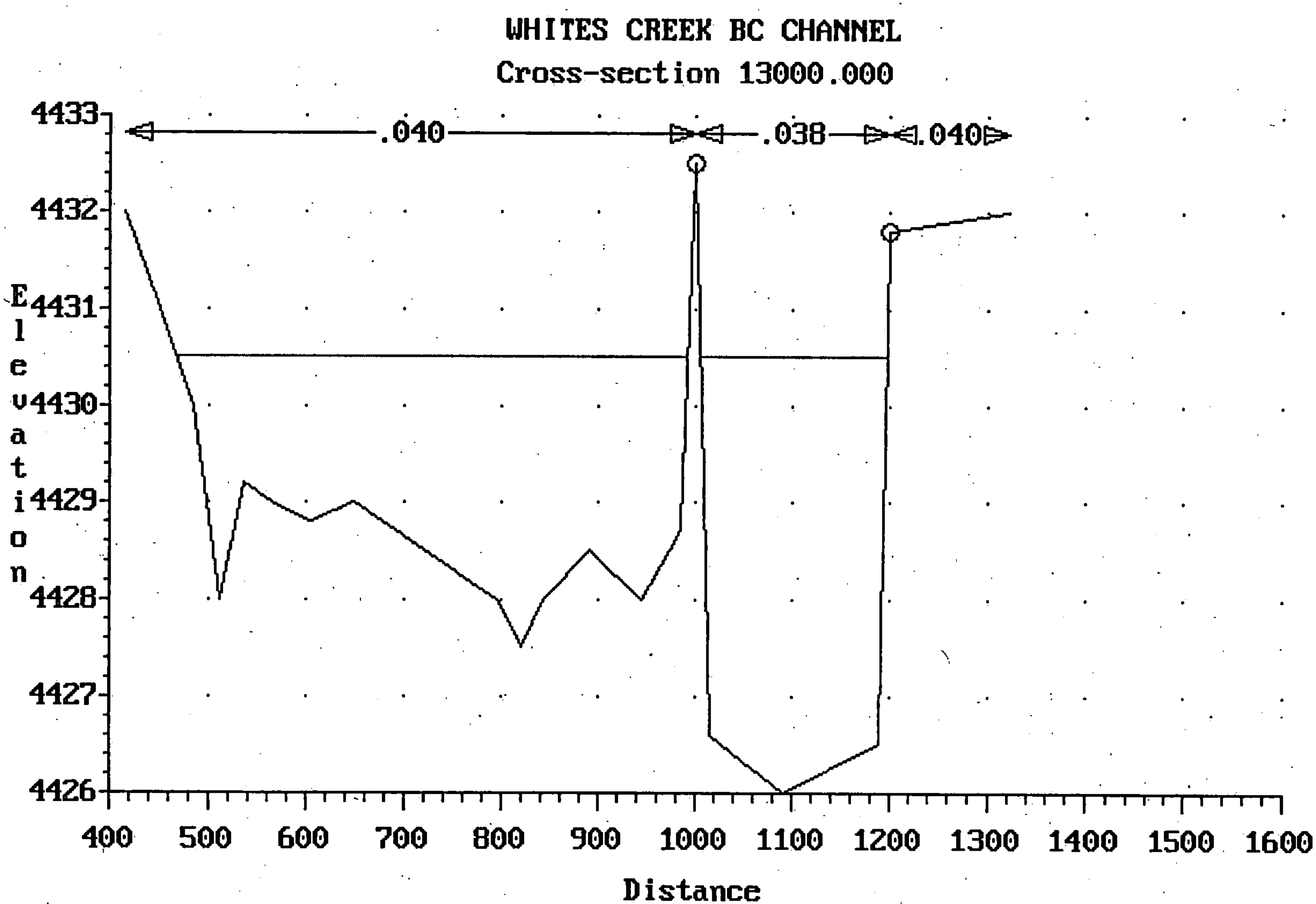
1100
1200
1300
1400
Distance



WHITES CREEK BC CHANNEL
Cross-section 13000.000
.040
.038
.040
Elevation
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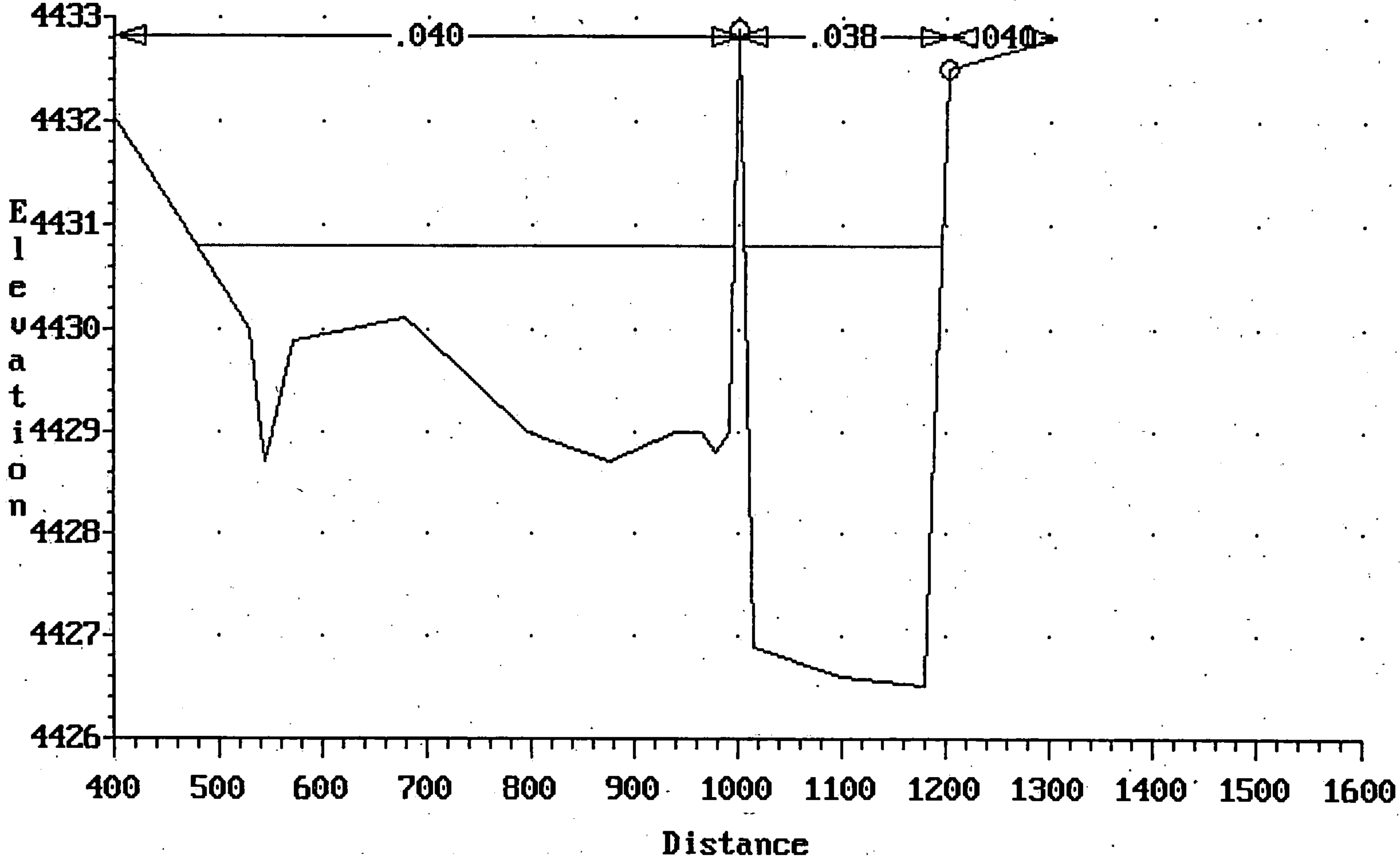
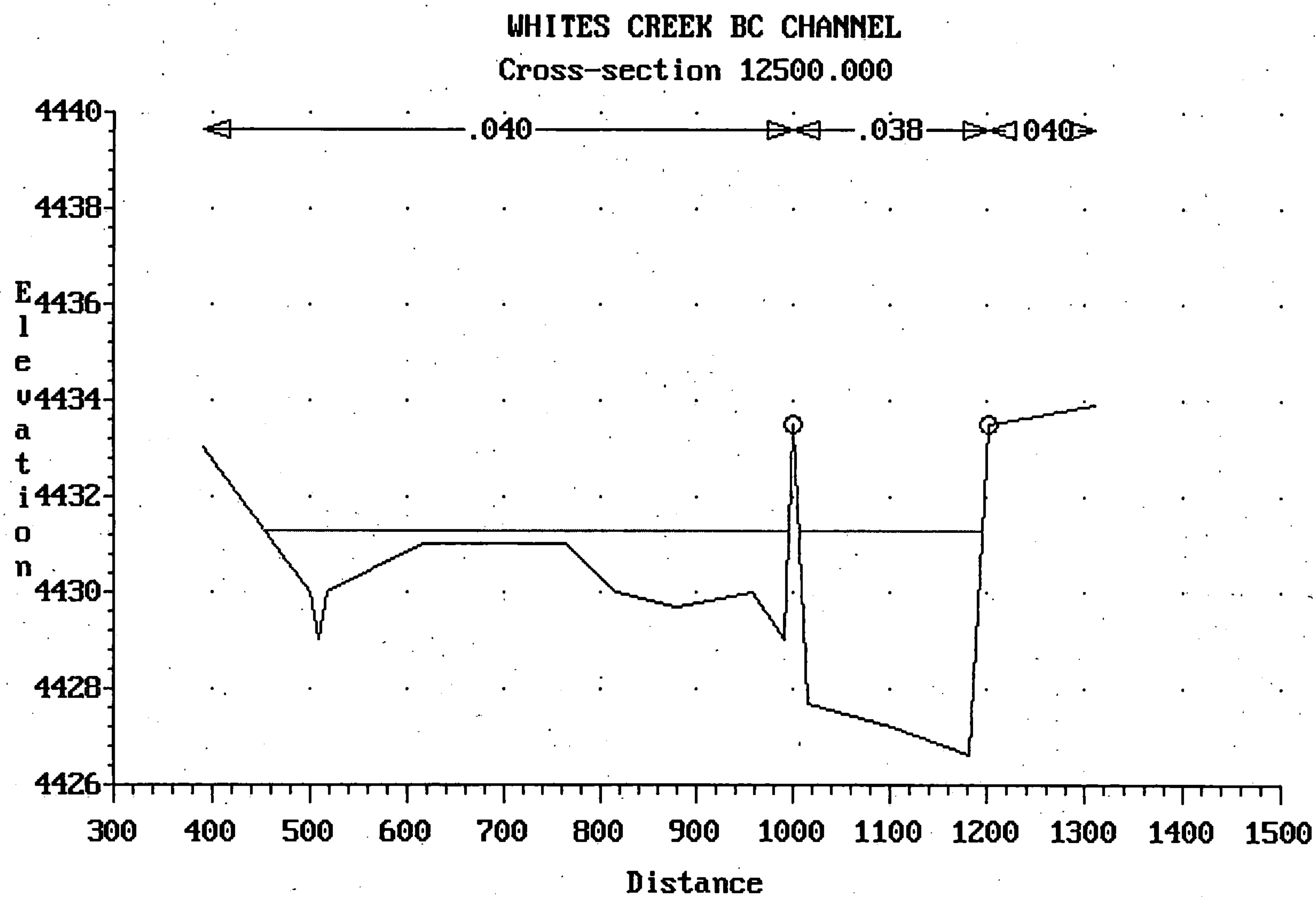
4432
4431
4430
4429
4428
4427
4426
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
Distance

WHITES CREEK BC CHANNEL
Cross-section 12750.000





WHITES CREEK BC CHANNEL
Cross-section 12500.000
.040
.038
040
Elevation
4440
4438
4436
4434
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4430
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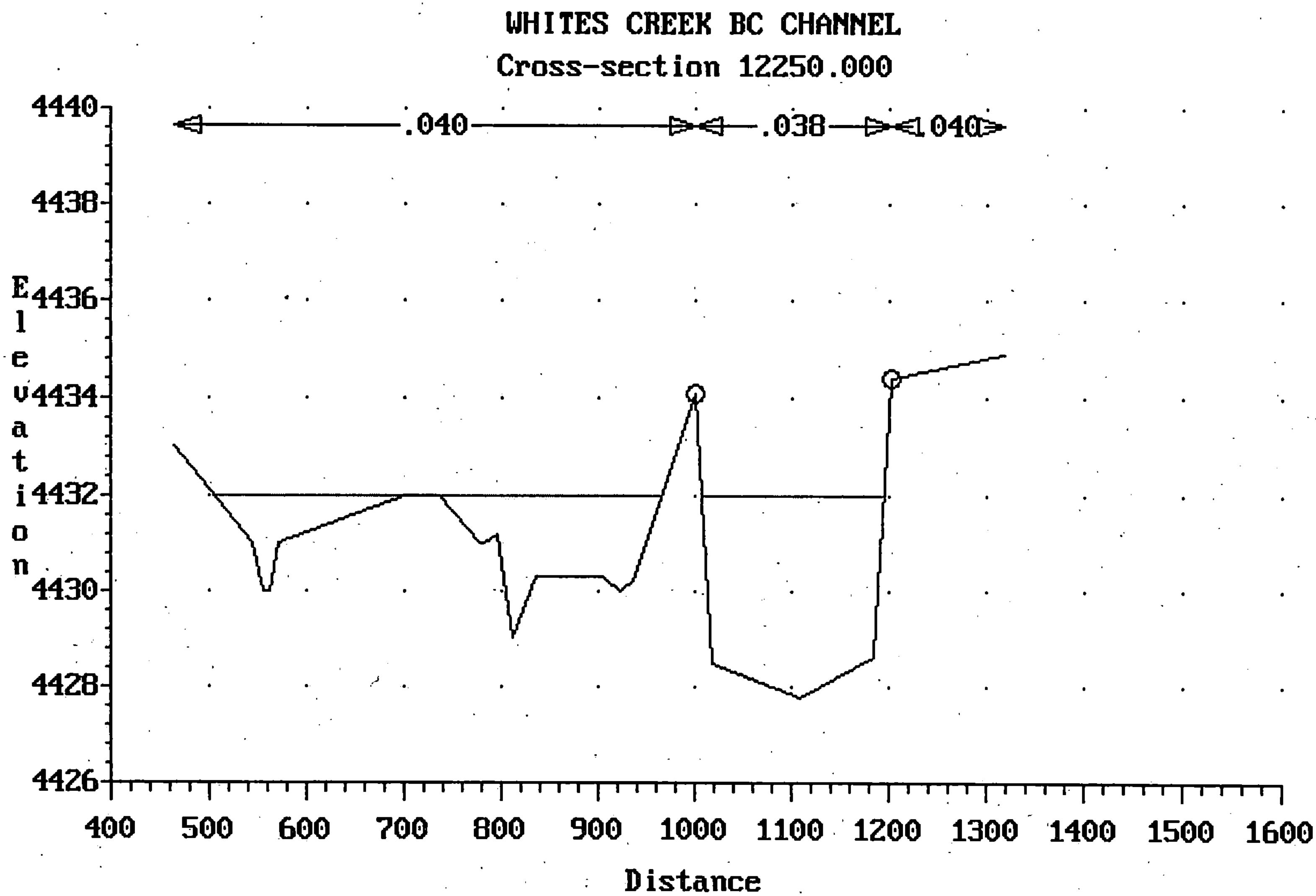
4426
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
Distance



WHITES CREEK BC CHANNEL
Cross-section 12250.000
.040
.038
.040
Elevation
4440
4438
4436
4434
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4430
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4426
400
500
600
700
800
900
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1100
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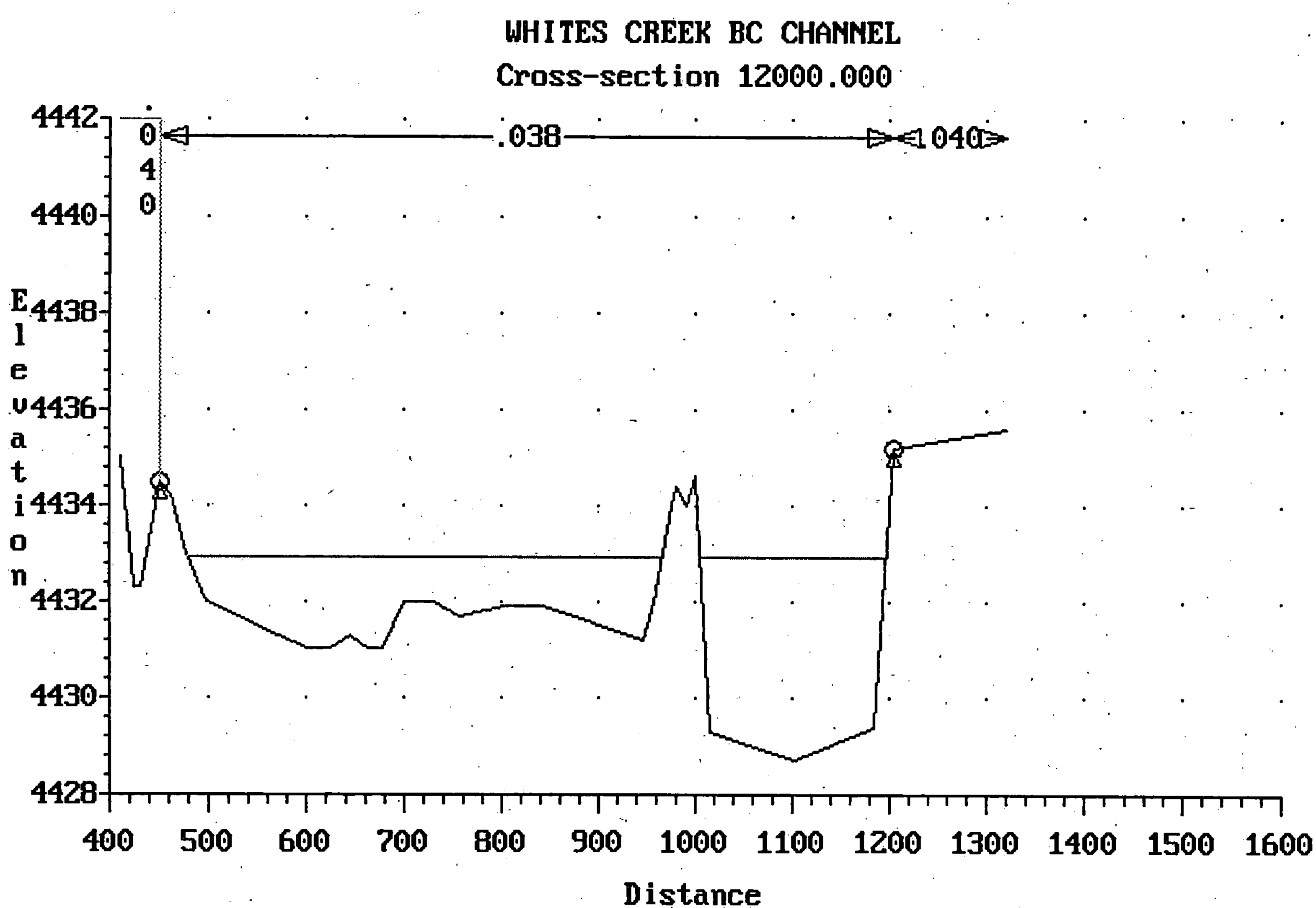
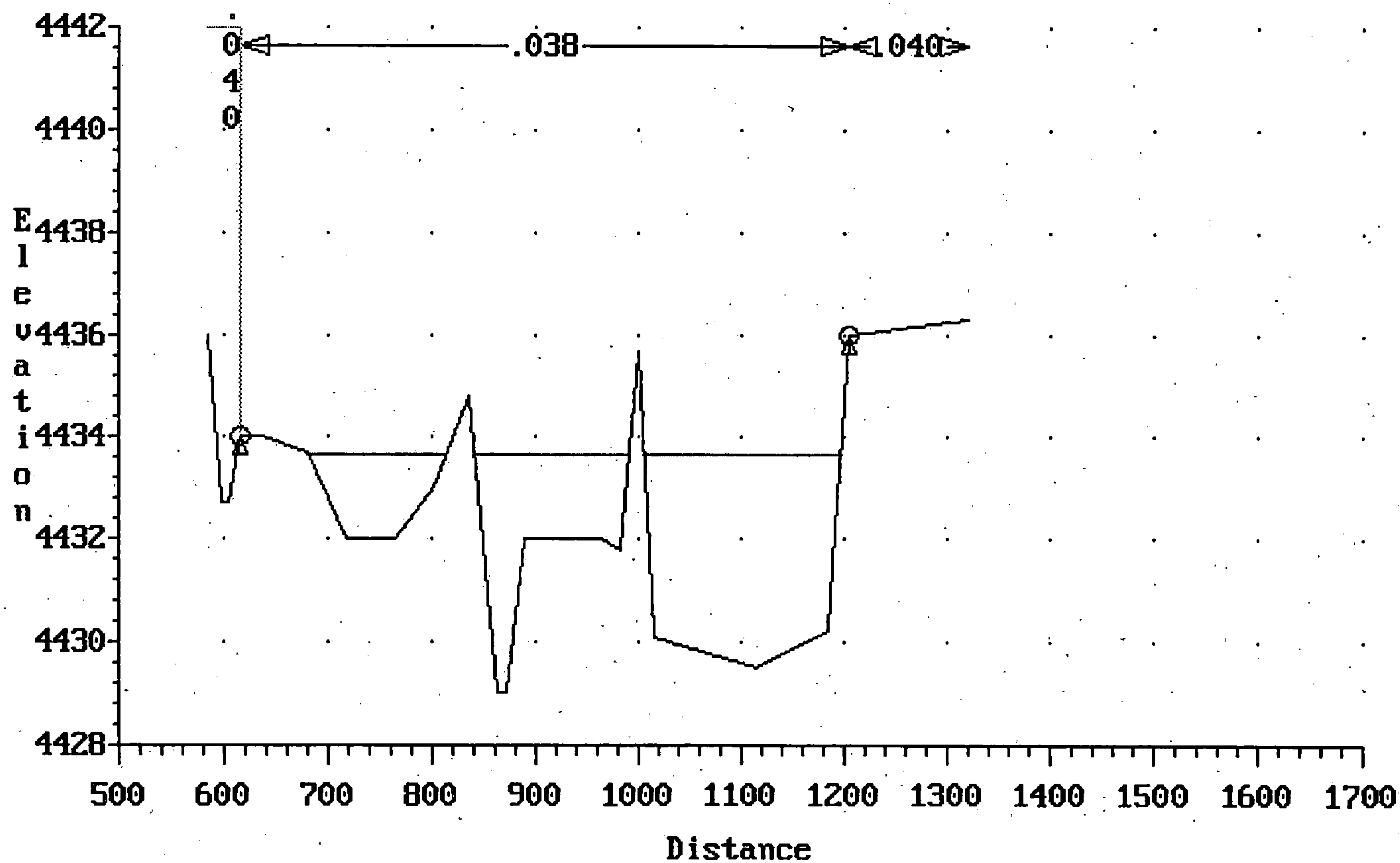
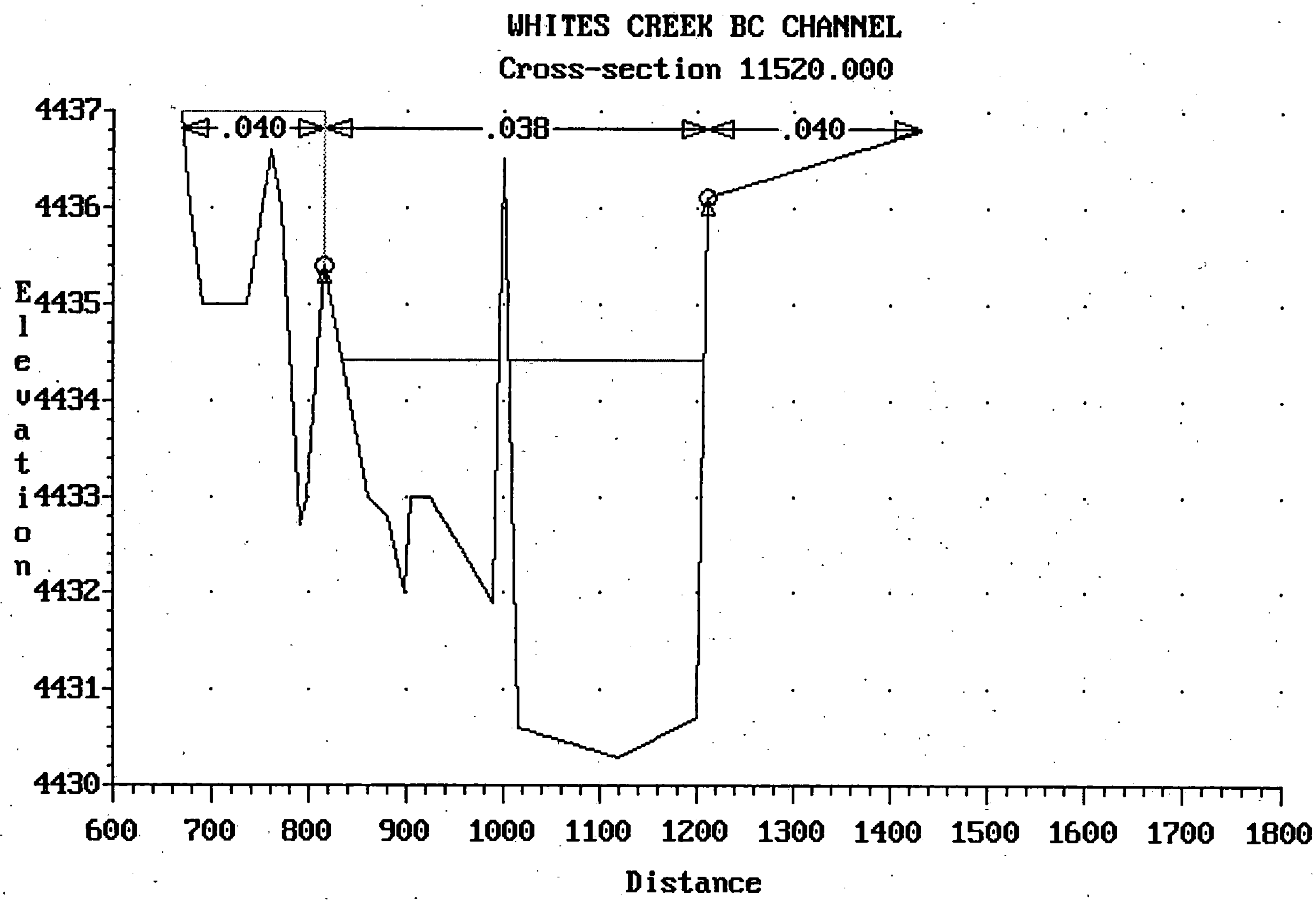
1300
1400
1500
1600
Distance


WHITES CREEK BC CHANNEL
Cross-section 12000.000
040
.038
.040
4442
4440
4438
4436
4434
4432
4430
4428
Elevation
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
Distance

WHITES CREEK BC CHANNEL
Cross-section 11760.000




WHITES CREEK BC CHANNEL
Cross-section 11520.000
.040
.038
.040
Elevation
4437
4436
4435
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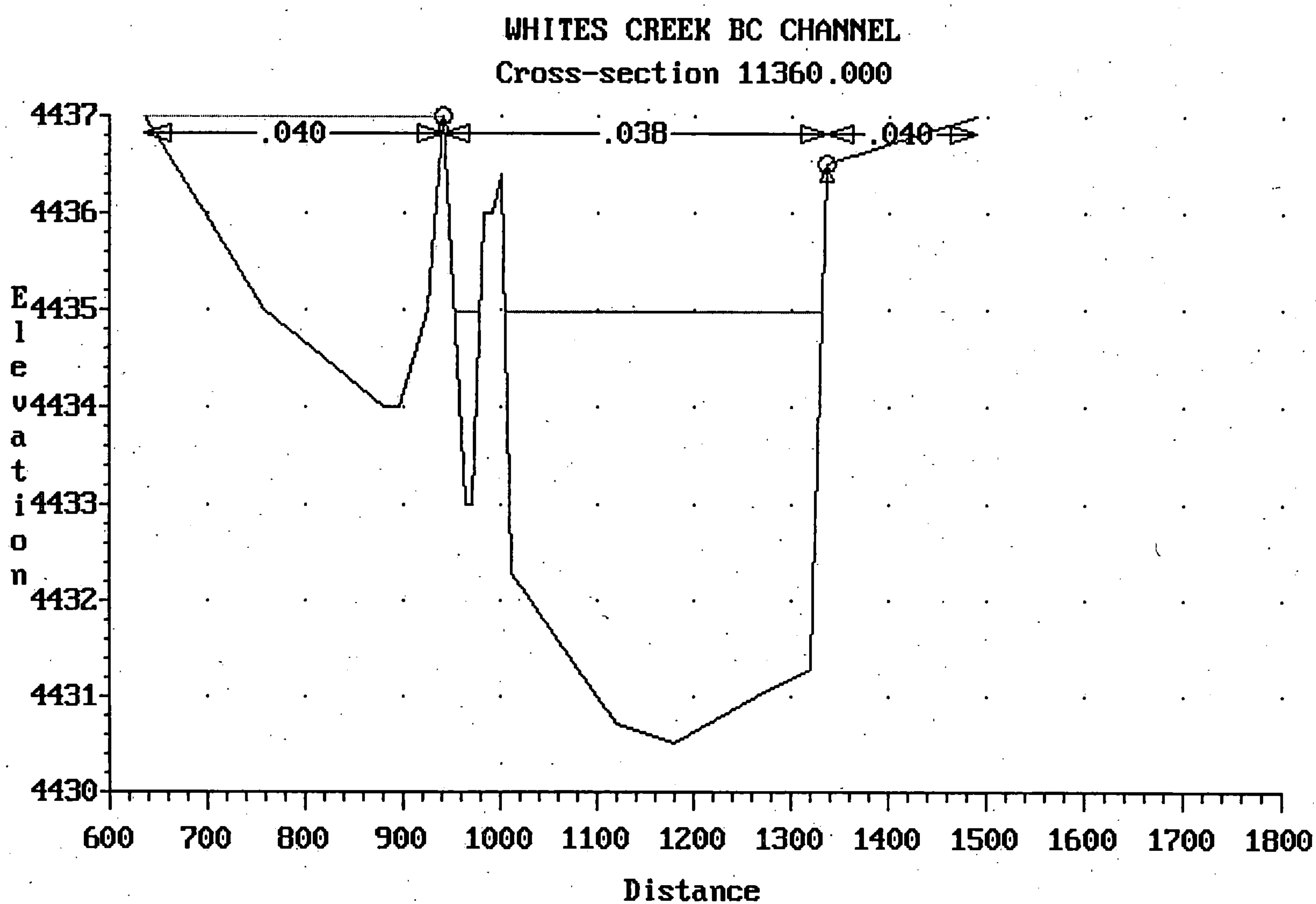
4430
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
Distance



WHITES CREEK BC CHANNEL
Cross-section 11360.000
.040
.038
.040
4437
4436
4435
4434
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Elevation
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700
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1000
1100
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1300
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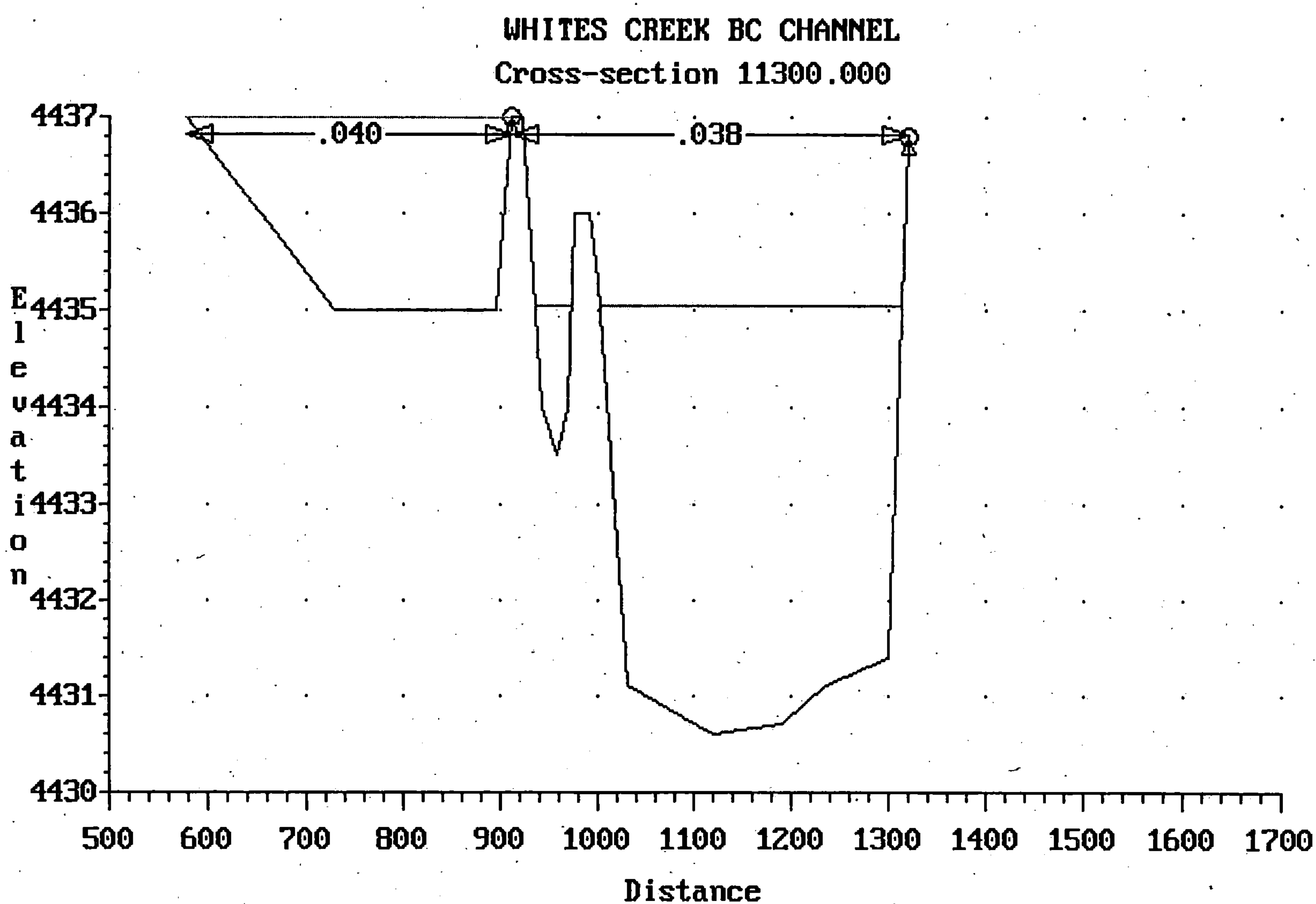
1500
1600
1700
1800
Distance


WHITES CREEK BC CHANNEL
Cross-section 11300.000
.040
.038
Elevation
4437
4436
4435
4434
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4430
500
600
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800
900
1000
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1200
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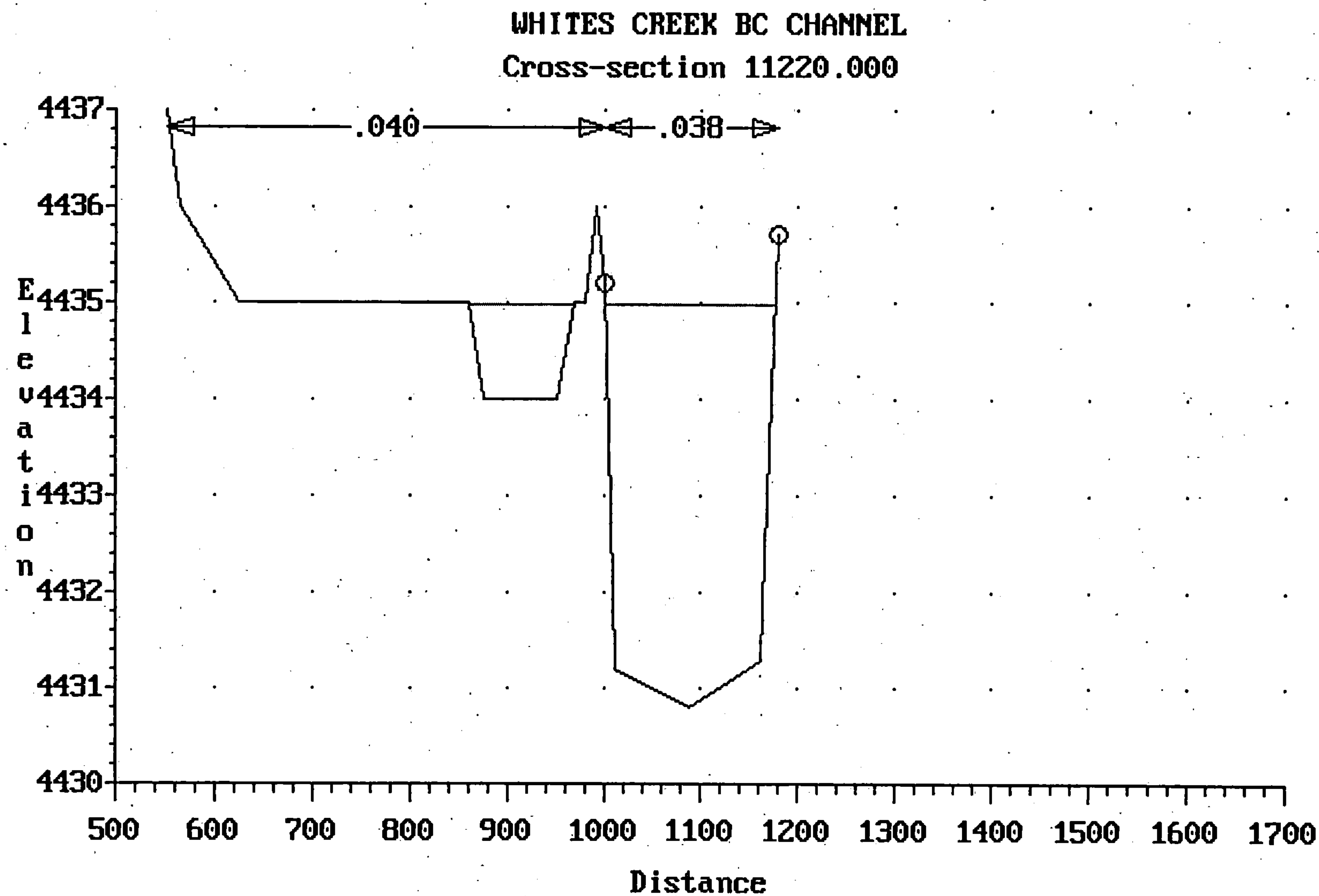
1400
1500
1600
1700
Distance


WHITES CREEK BC CHANNEL
Cross-section 11220.000
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.038
4437
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4435
4434
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Elevation
500
600
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800
900
1000
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1200
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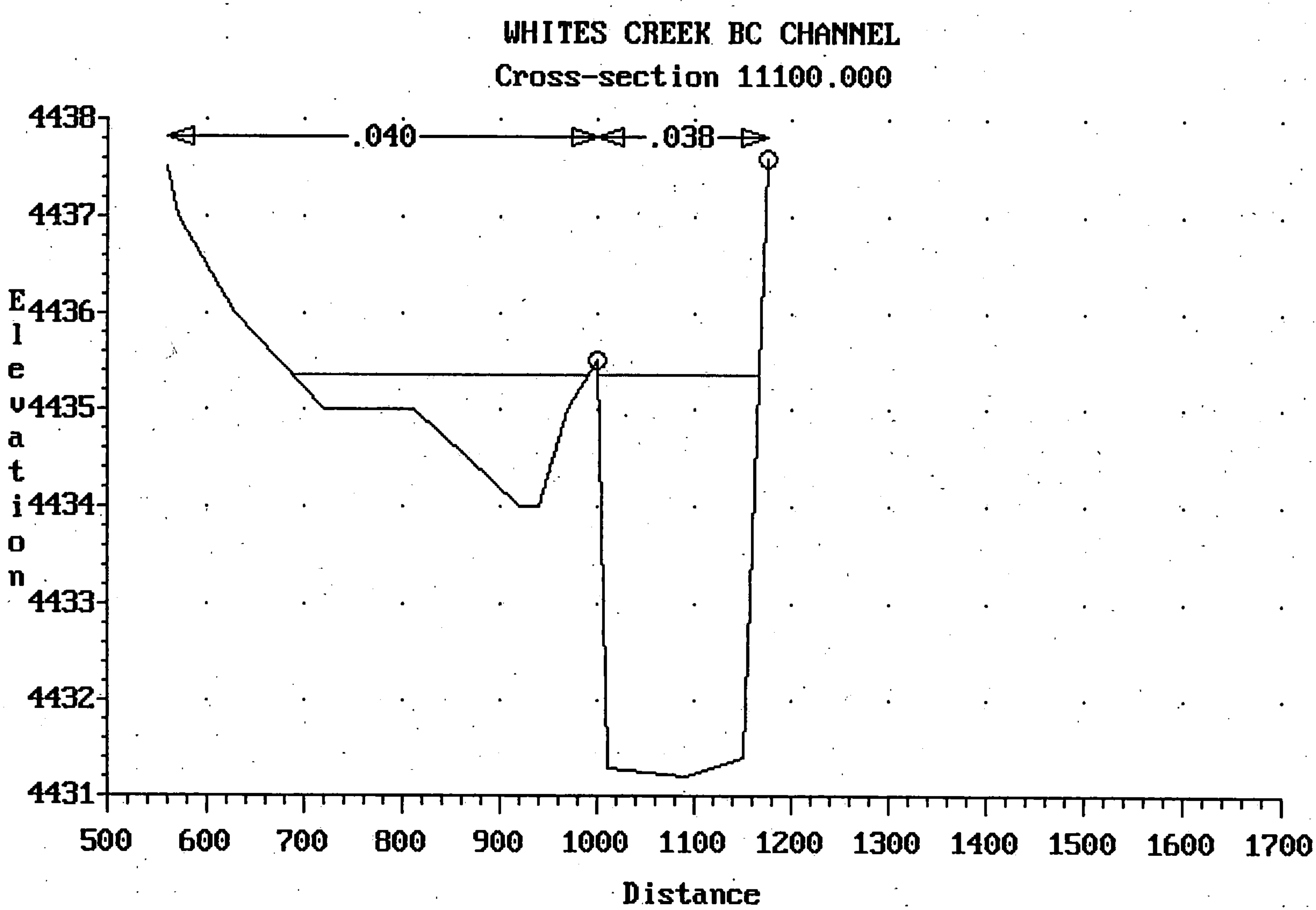
1400
1500
1600
1700
Distance


WHITES CREEK BC CHANNEL
Cross-section 11100.000
.040
.038
4438
4437
4436
4435
4434
4433
4432
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Elevation
500
600
700
800
900
1000
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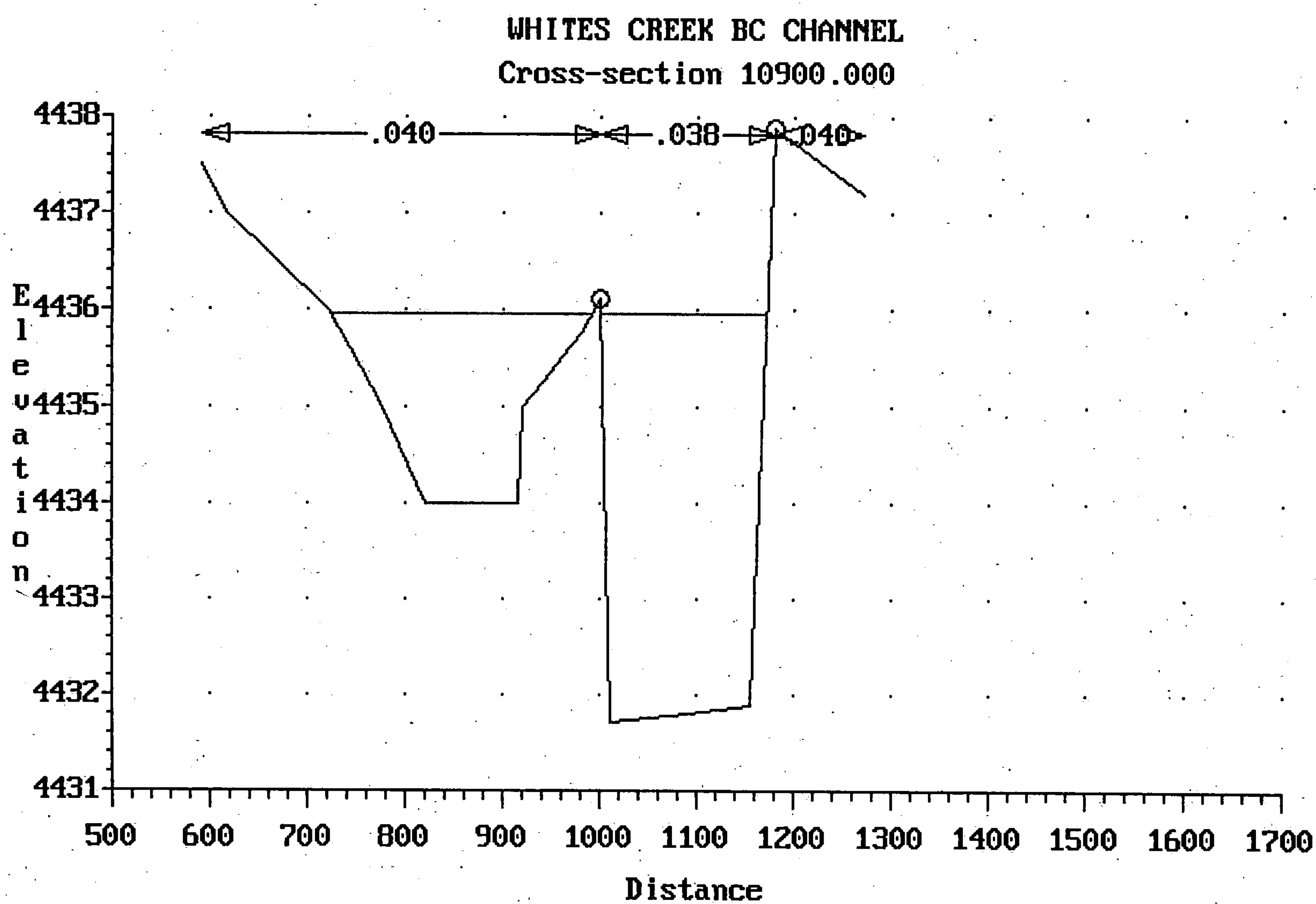
1200
1300
1400
1500
1600
1700
Distance


WHITES CREEK BC CHANNEL
Cross-section 10900.000
.040
.038
.040
Elevation
4438
4437
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4435
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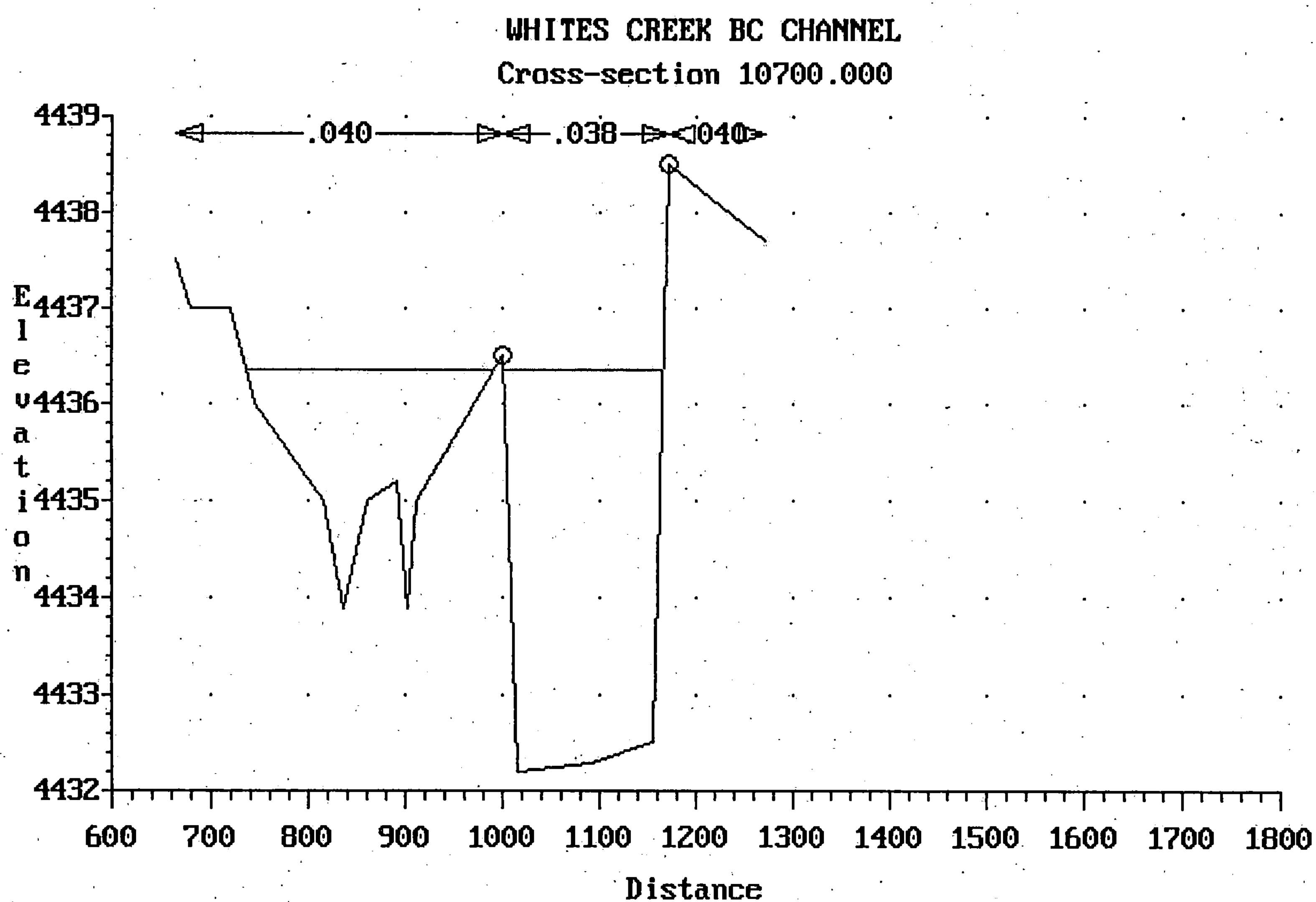
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
Distance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Cross-section 10700.000
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.038
.040
Elevation
4439
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4437
4436
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1000
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1300
1400
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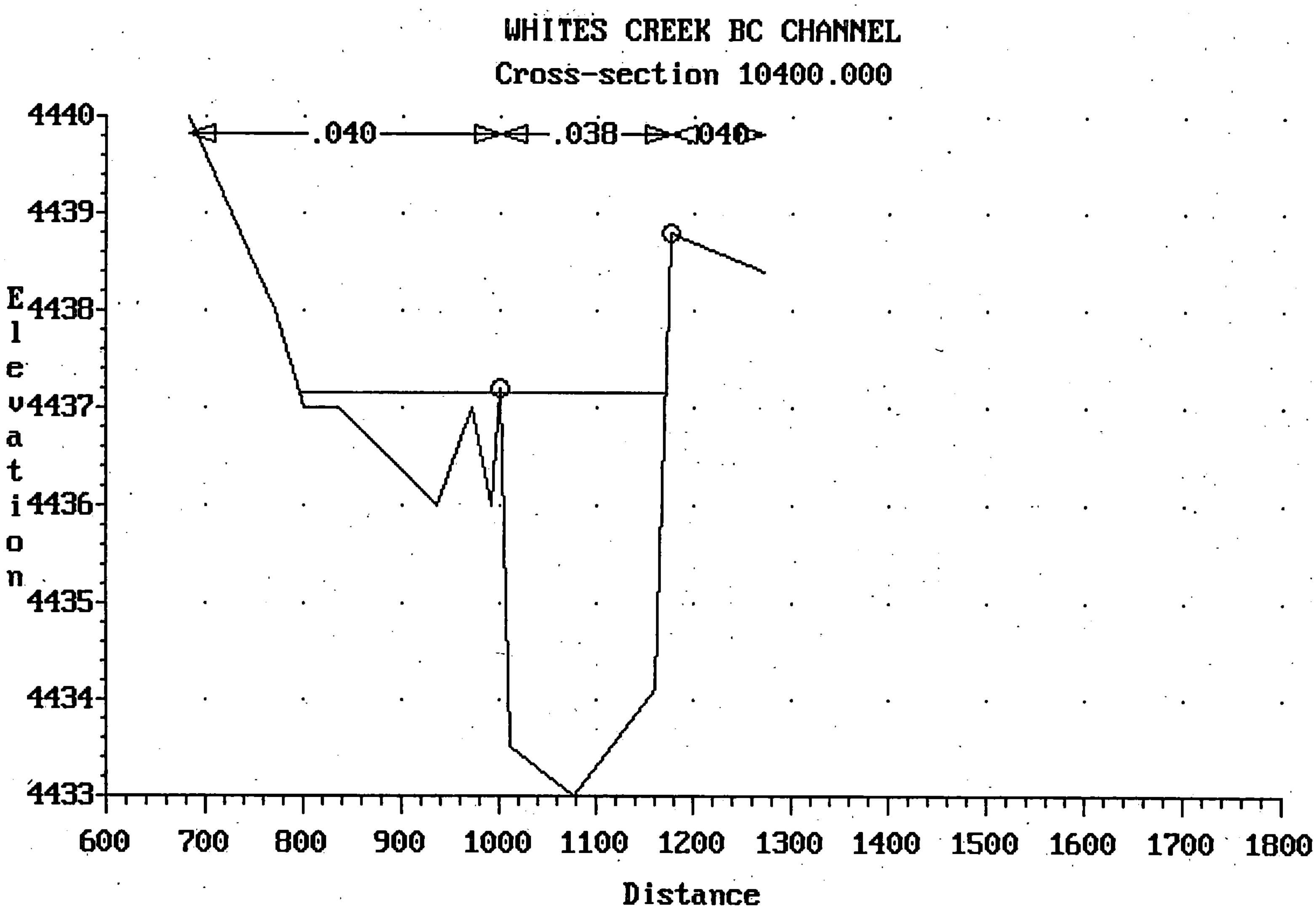
1600
1700
1800
Distance


WHITES CREEK BC CHANNEL
Cross-section 10400.000
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.040
Elevation
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4433
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900
1000
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1300
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1500
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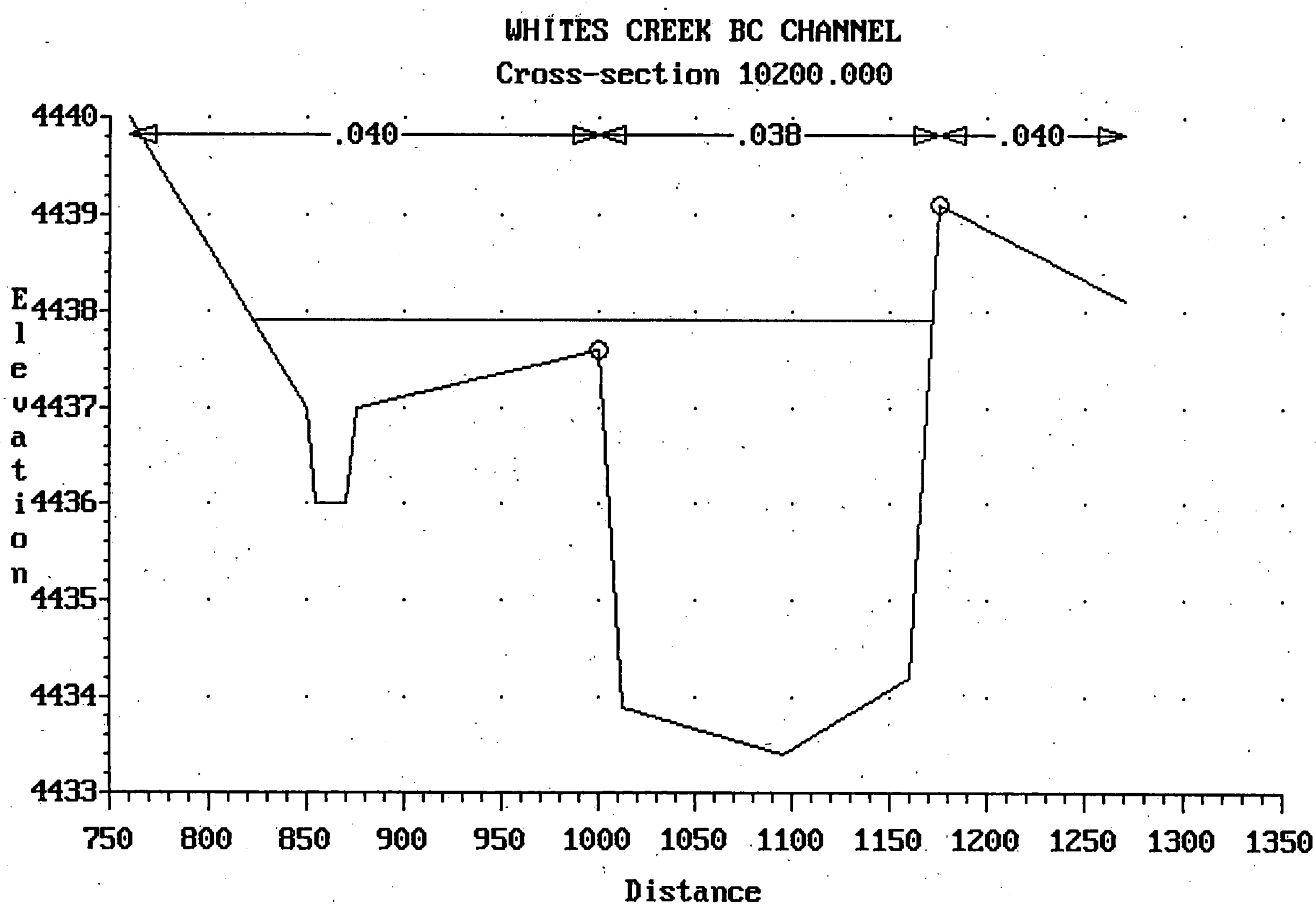
1700
1800
Distance


WHITES CREEK BC CHANNEL
Cross-section 10200.000
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.038
.040
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4439
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4437
4436
4435
4434
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Elevation
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900
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1000
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1100
1150
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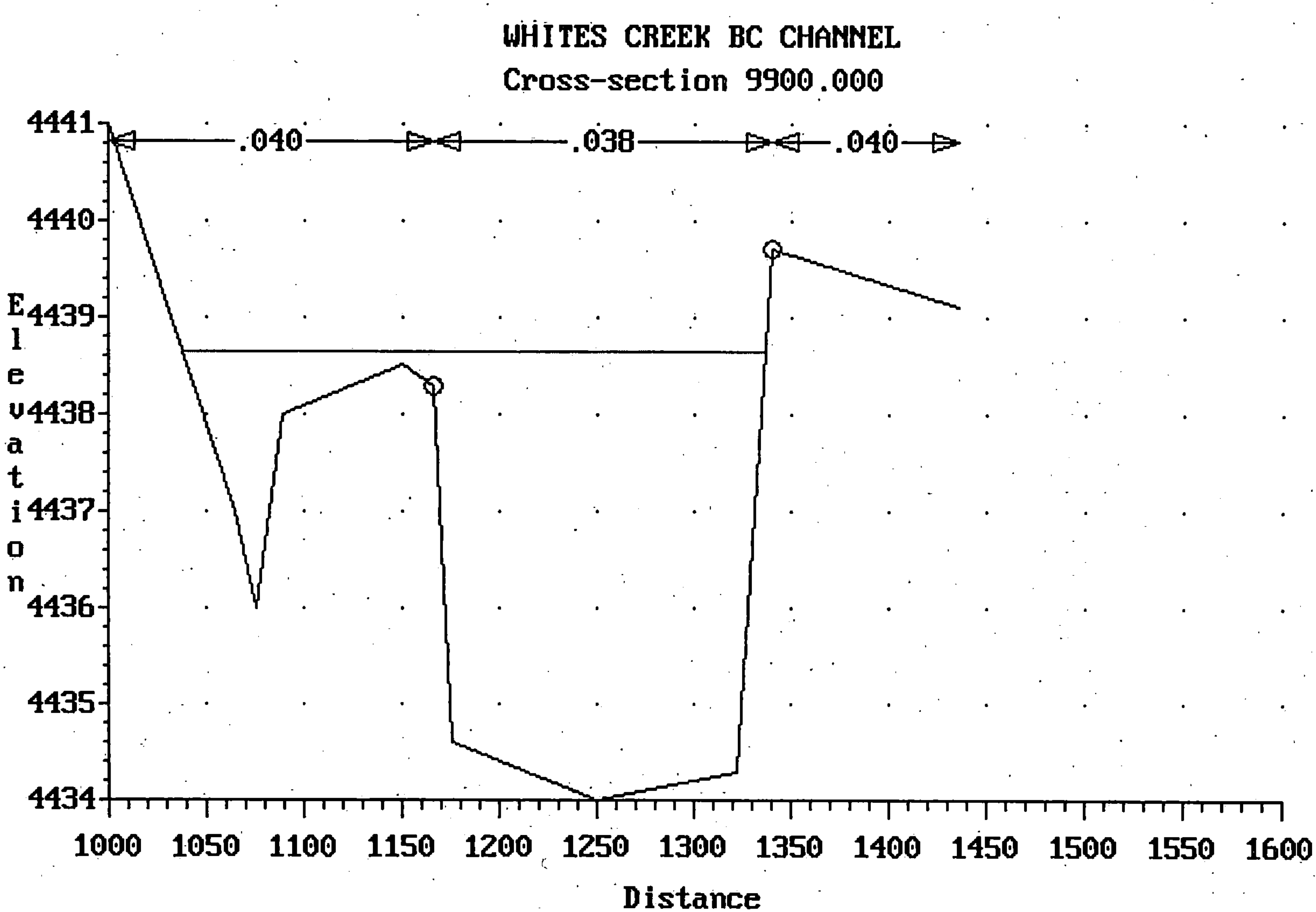
1300
1350
Distance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.038
.040
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4439
4438
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4436
4435
4434
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1100
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1200
1250
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1400
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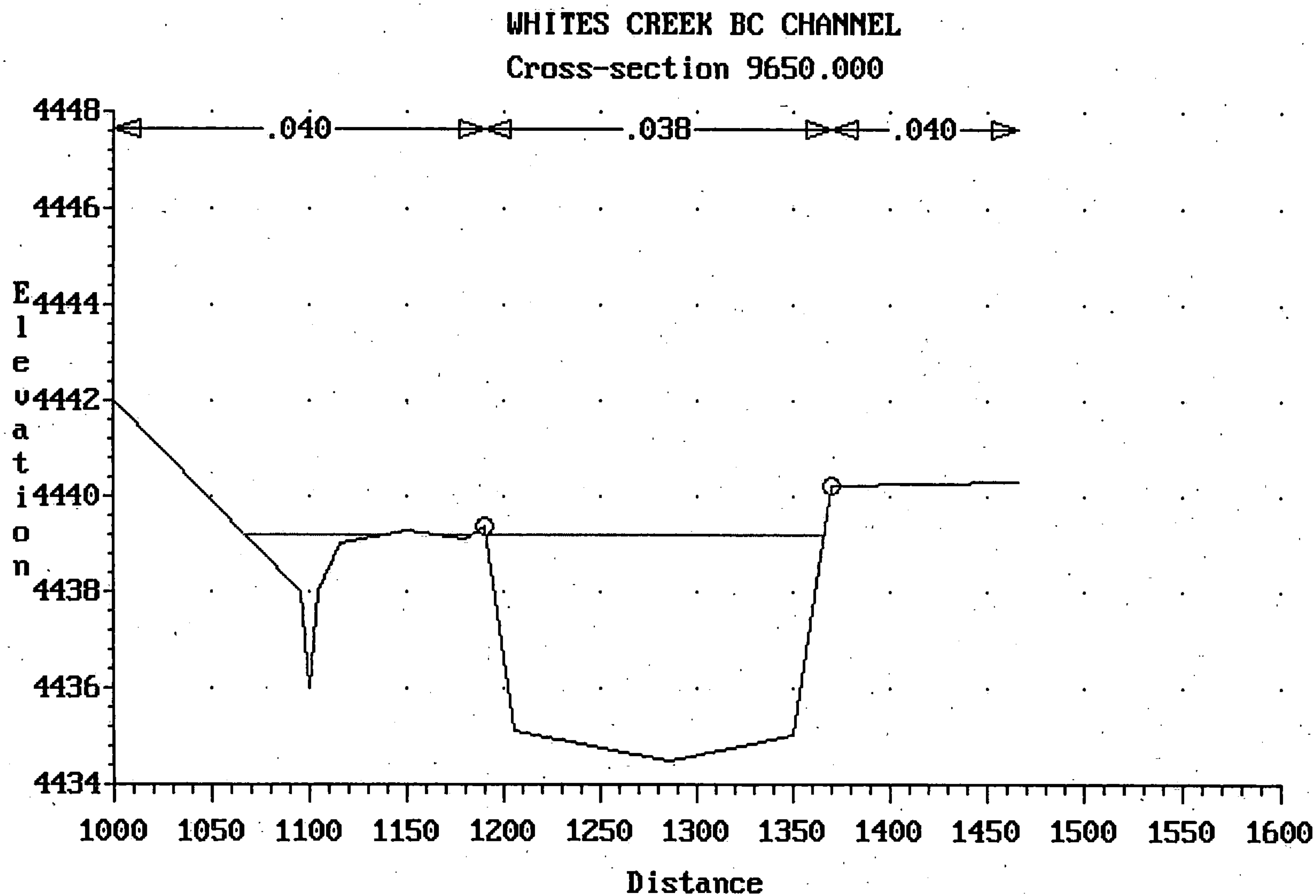
1500
1550
1600
Distance


WHITES CREEK BC CHANNEL
Cross-section 9650.000
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.038
.040
Elevation
4448
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4444
4442
4440
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1100
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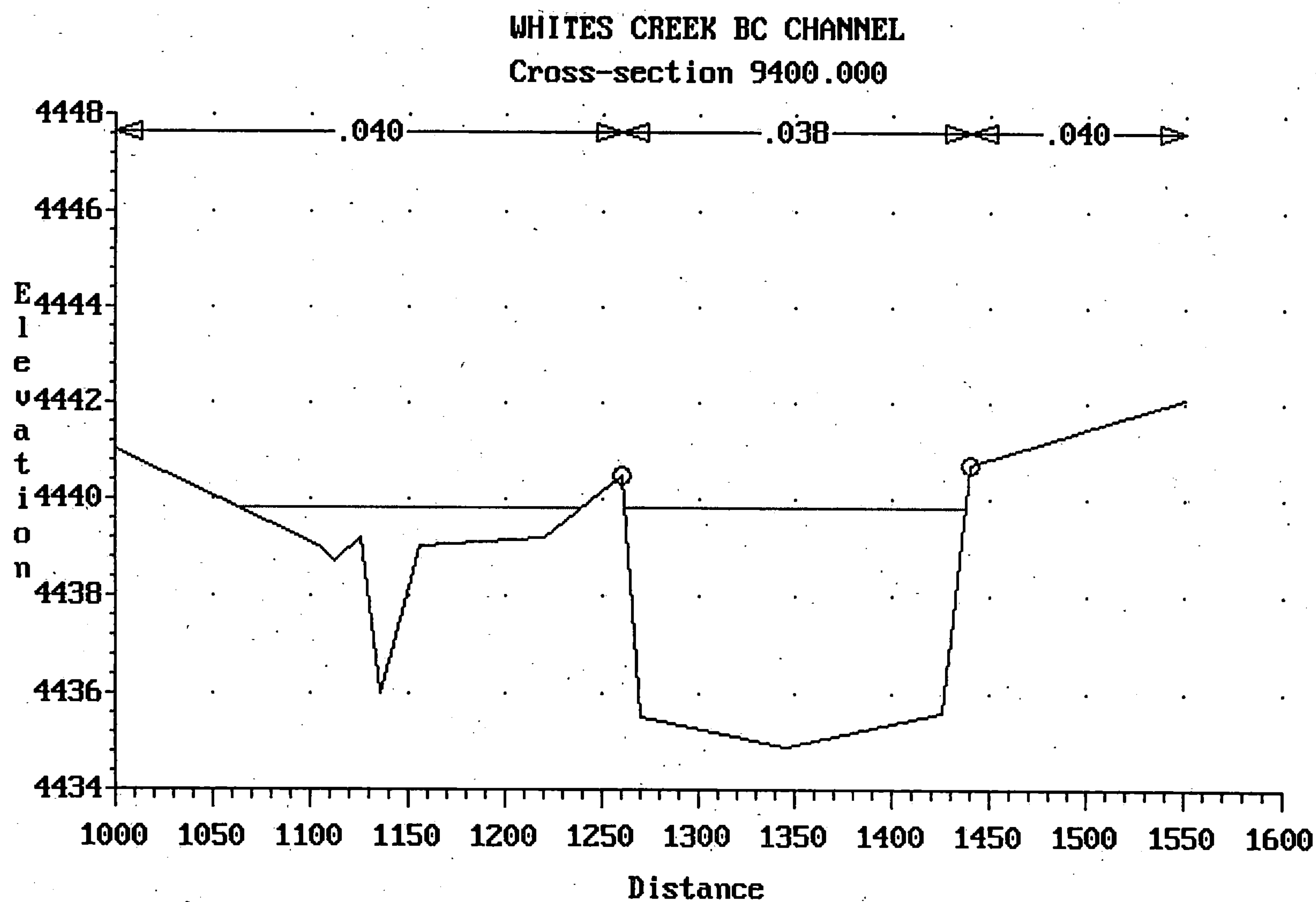
1300
1350
1400
1450
1500
1550
1600
Distance


WHITES CREEK BC CHANNEL
Cross-section 9400.000
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.038
.040
Elevation
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4444
4442
4440
4438
4436
4434
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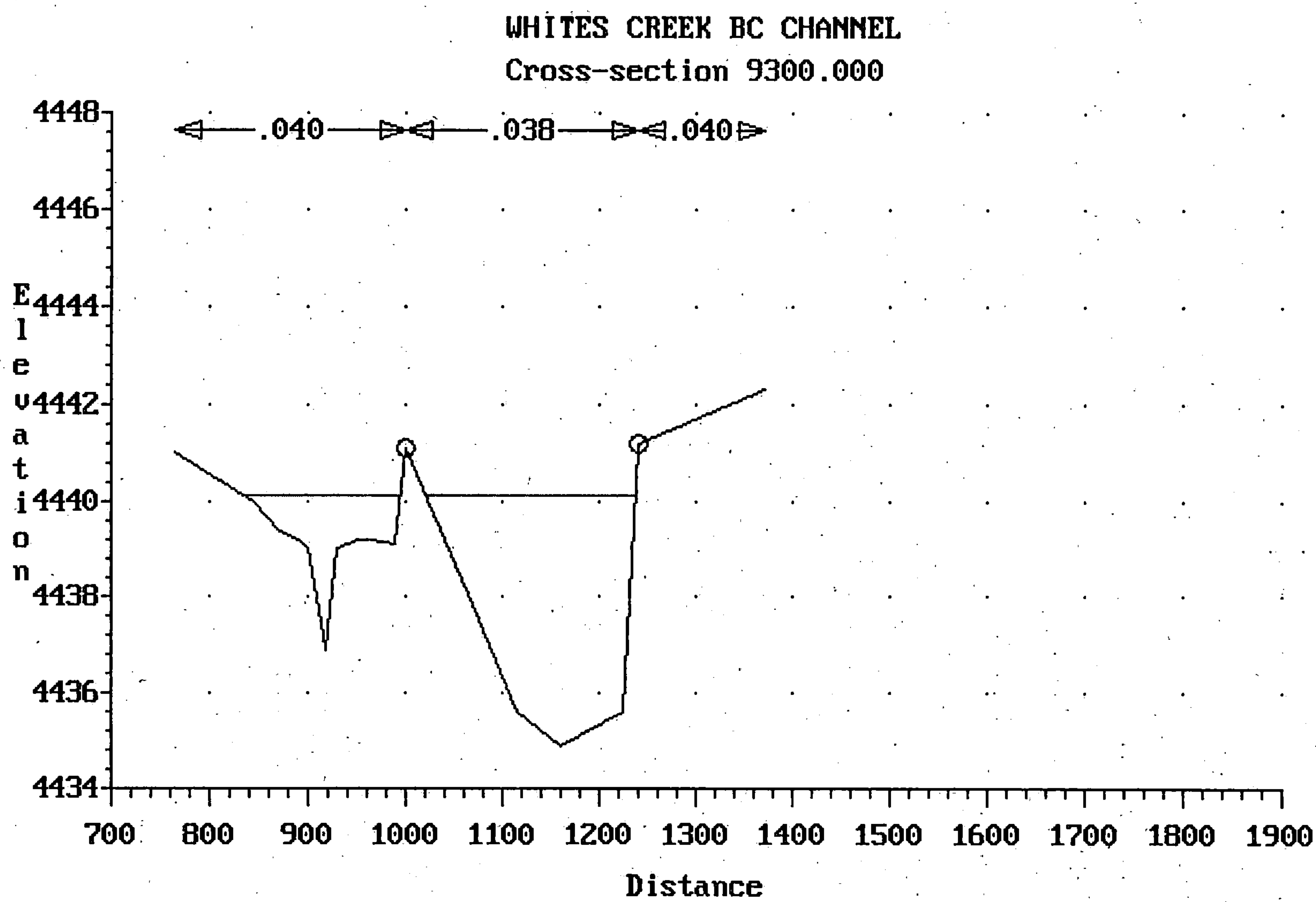
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance



WHITES CREEK BC CHANNEL
Cross-section 9300.000
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.038
.040
Elevation
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4444
4442
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4438
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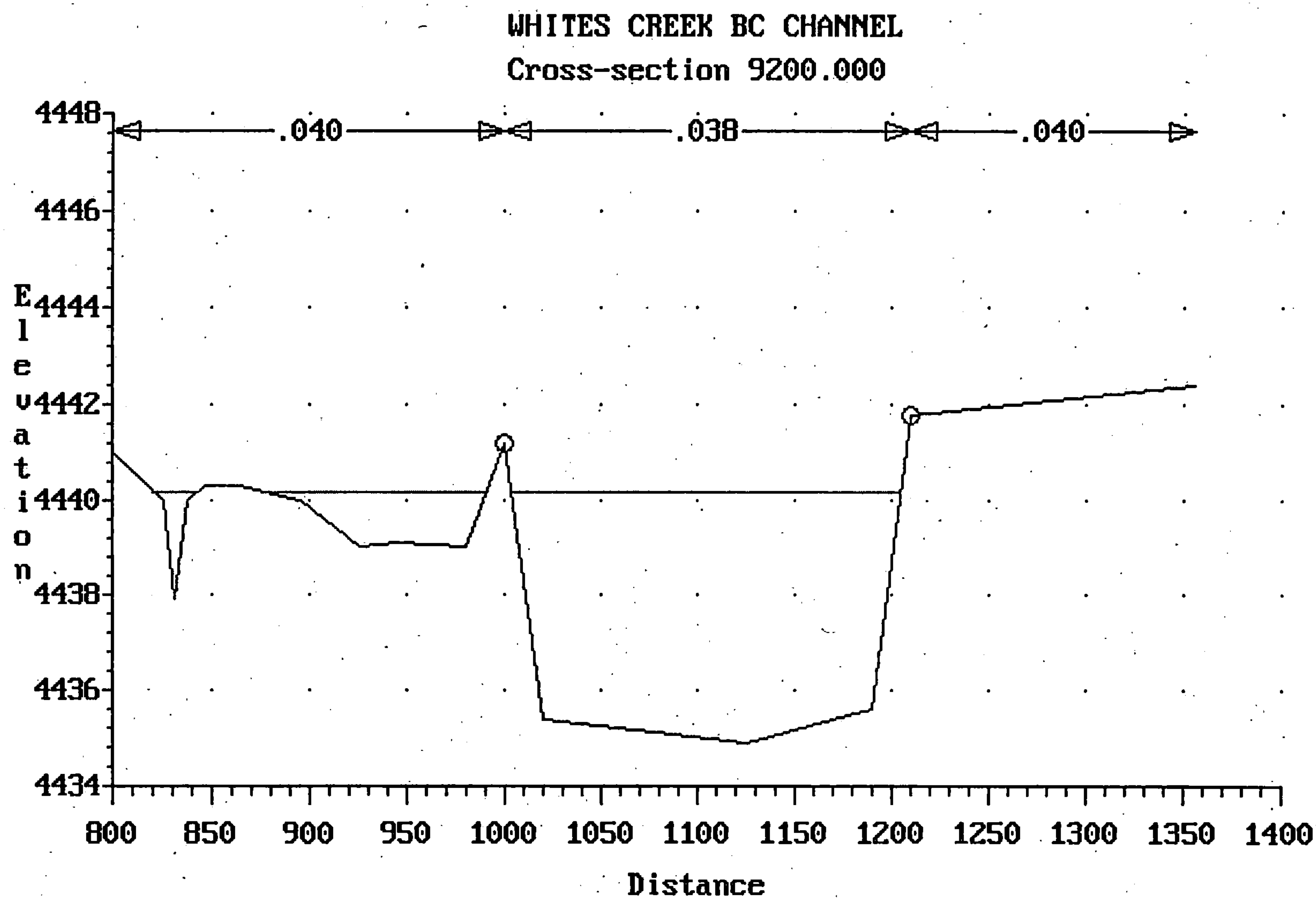
4434
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
Distance



WHITES CREEK BC CHANNEL
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4440
4438
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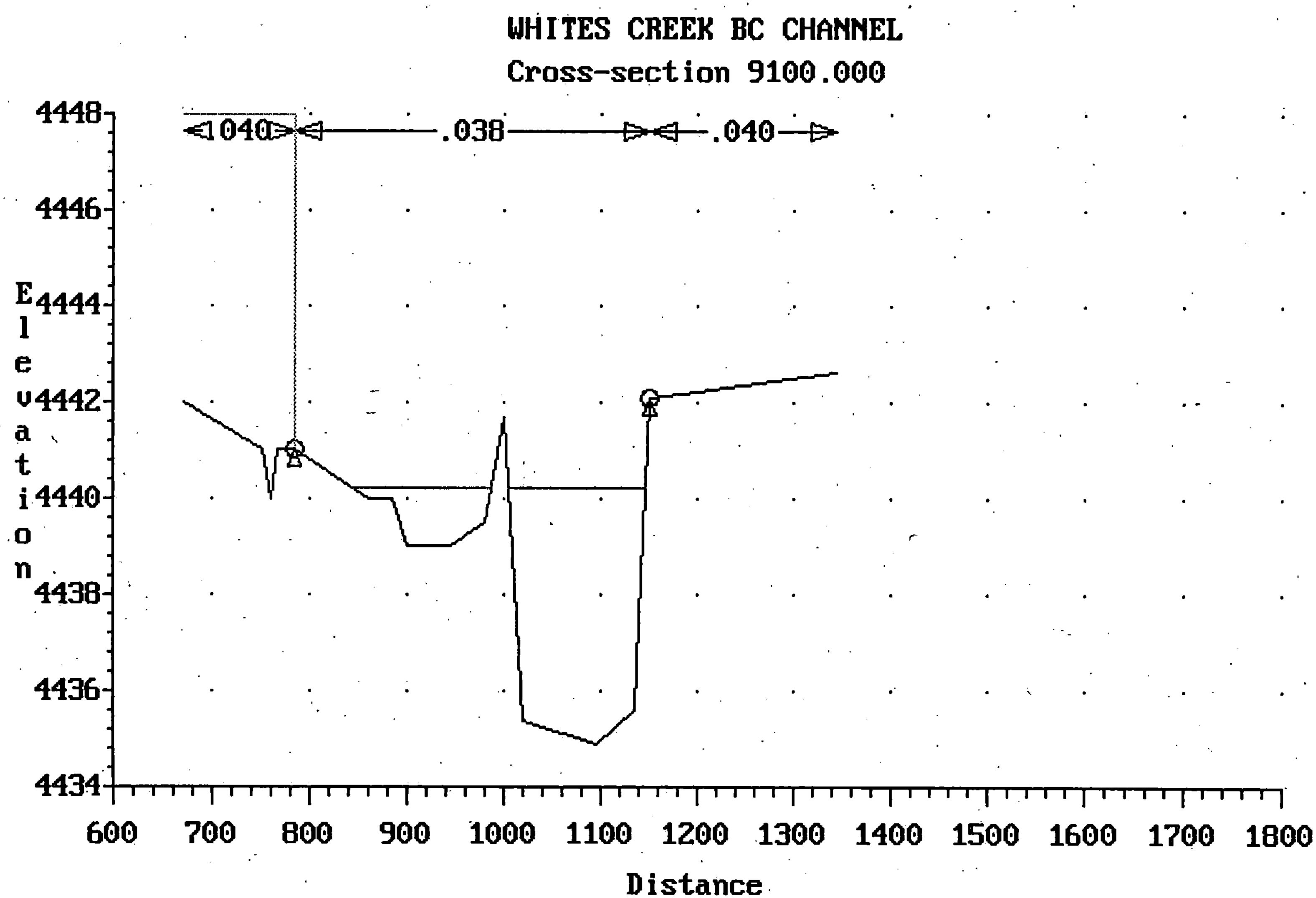
850
900
950
1000
1050
1100
1150
1200
1250
1300
1350
1400
Distance



WHITES CREEK BC CHANNEL
Cross-section 9100.000
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.038
.040
Elevation
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4434
600
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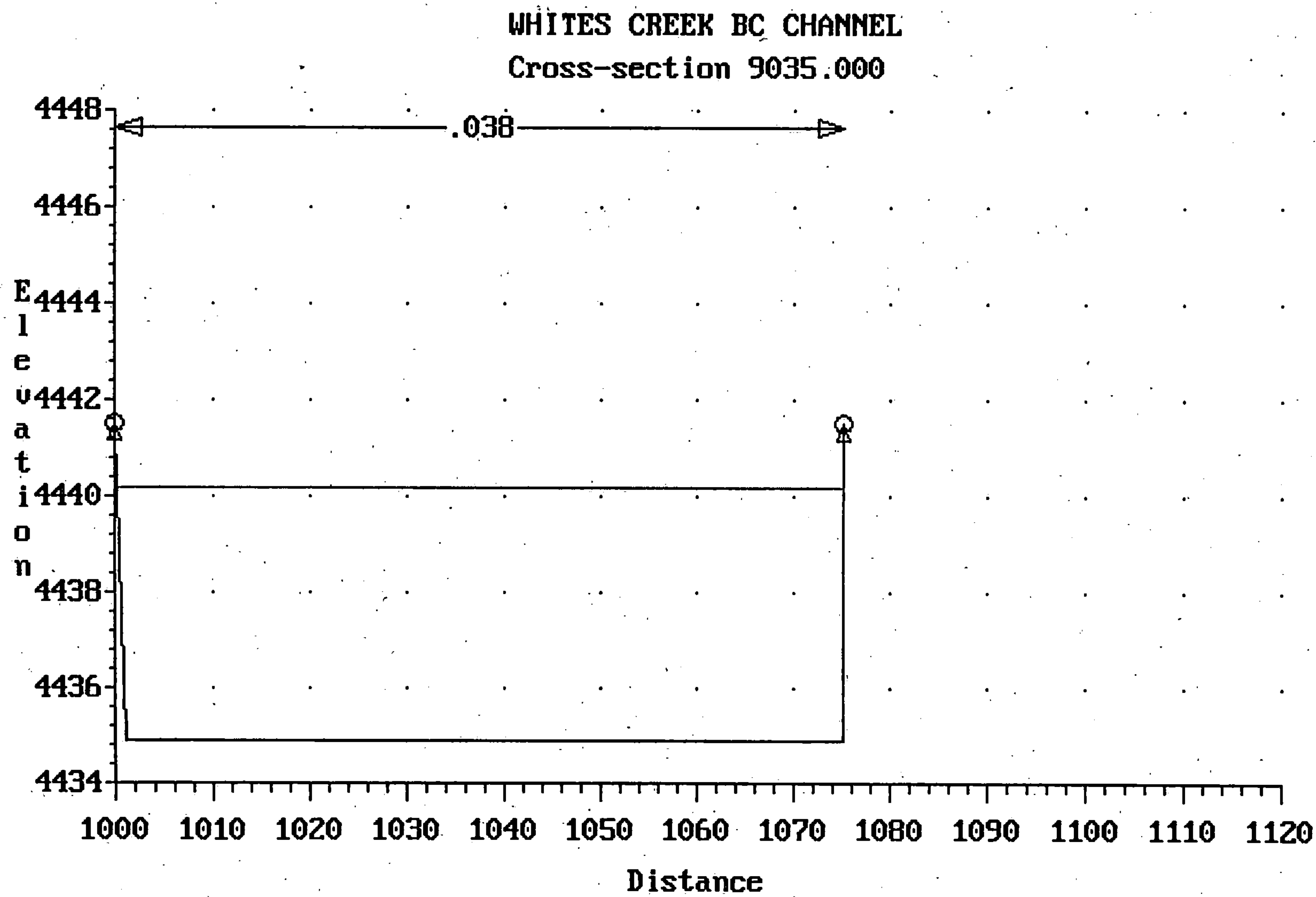
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
Distance


WHITES CREEK BC CHANNEL
Cross-section 9035.000
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Elevation
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4446
4444
4442
4440
4438
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1010
1020
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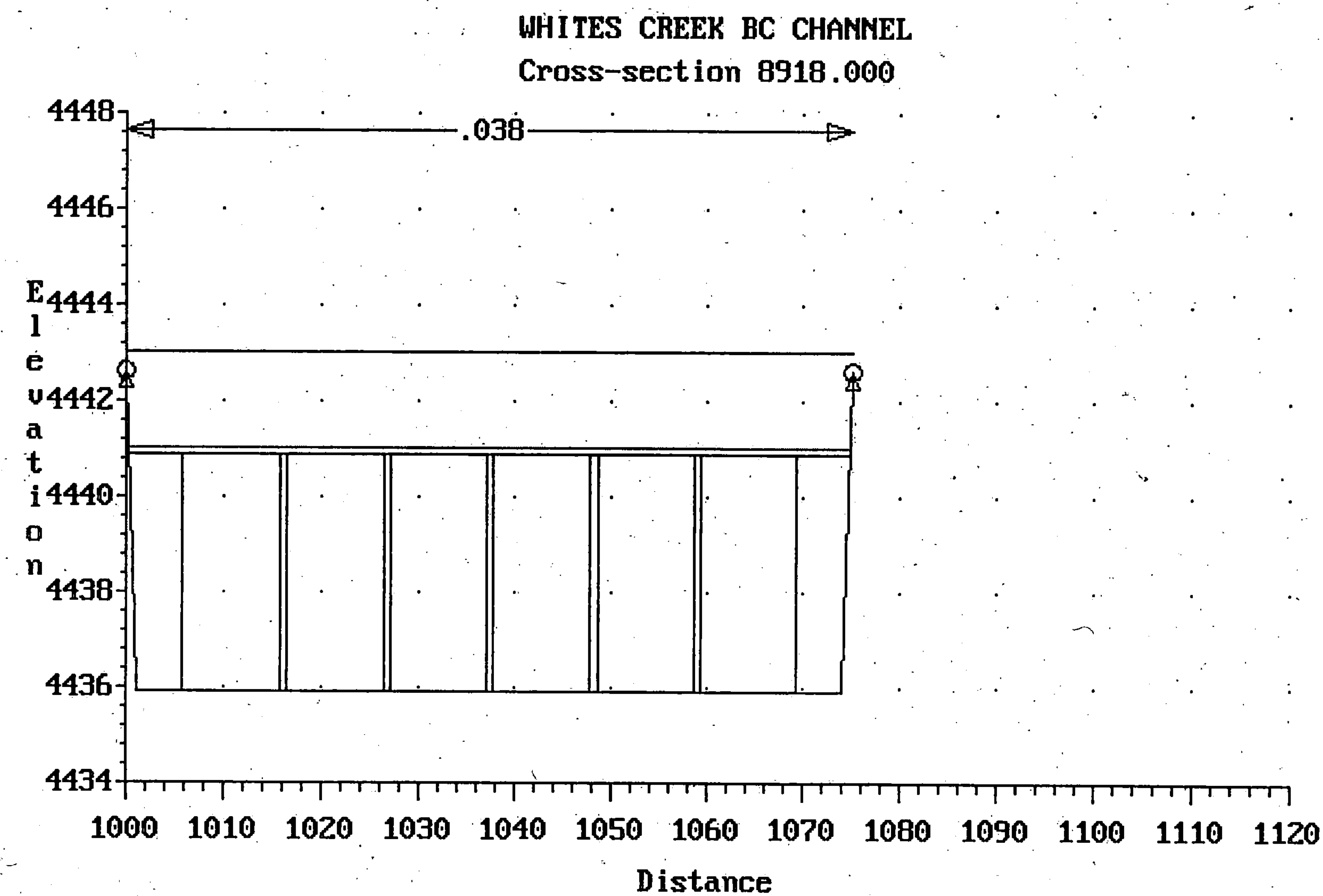
1040
1050
1060
1070
1080
1090
1100
1110
1120
Distance


WHITES CREEK BC CHANNEL
Cross-section 8918.000
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Elevation
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4440
4438
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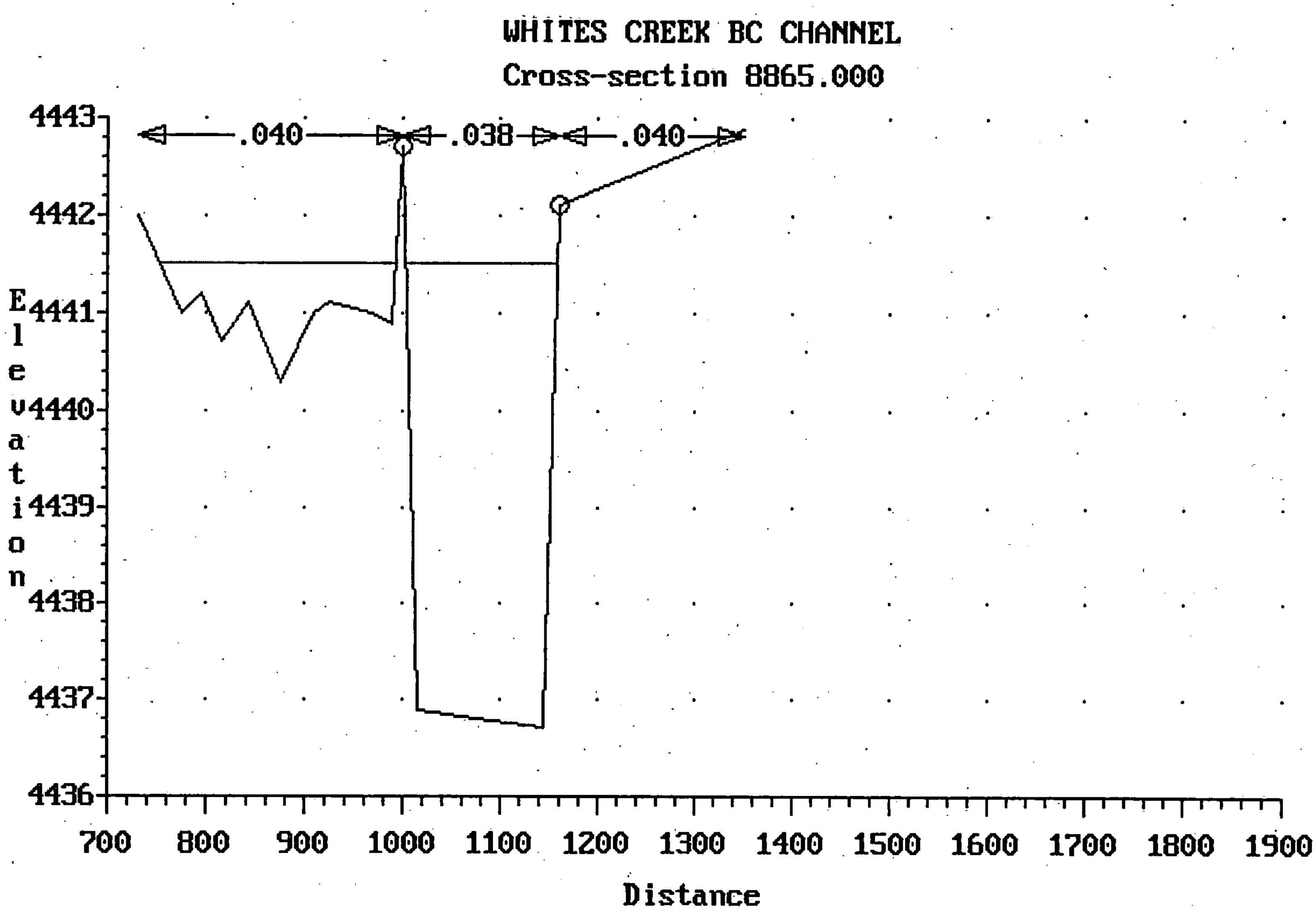
1010
1020
1030
1040
1050
1060
1070
1080
1090
1100
1110
1120
Distance



WHITES CREEK BC CHANNEL
Cross-section 8865.000
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.038
.040
Elevation
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4442
4441
4440
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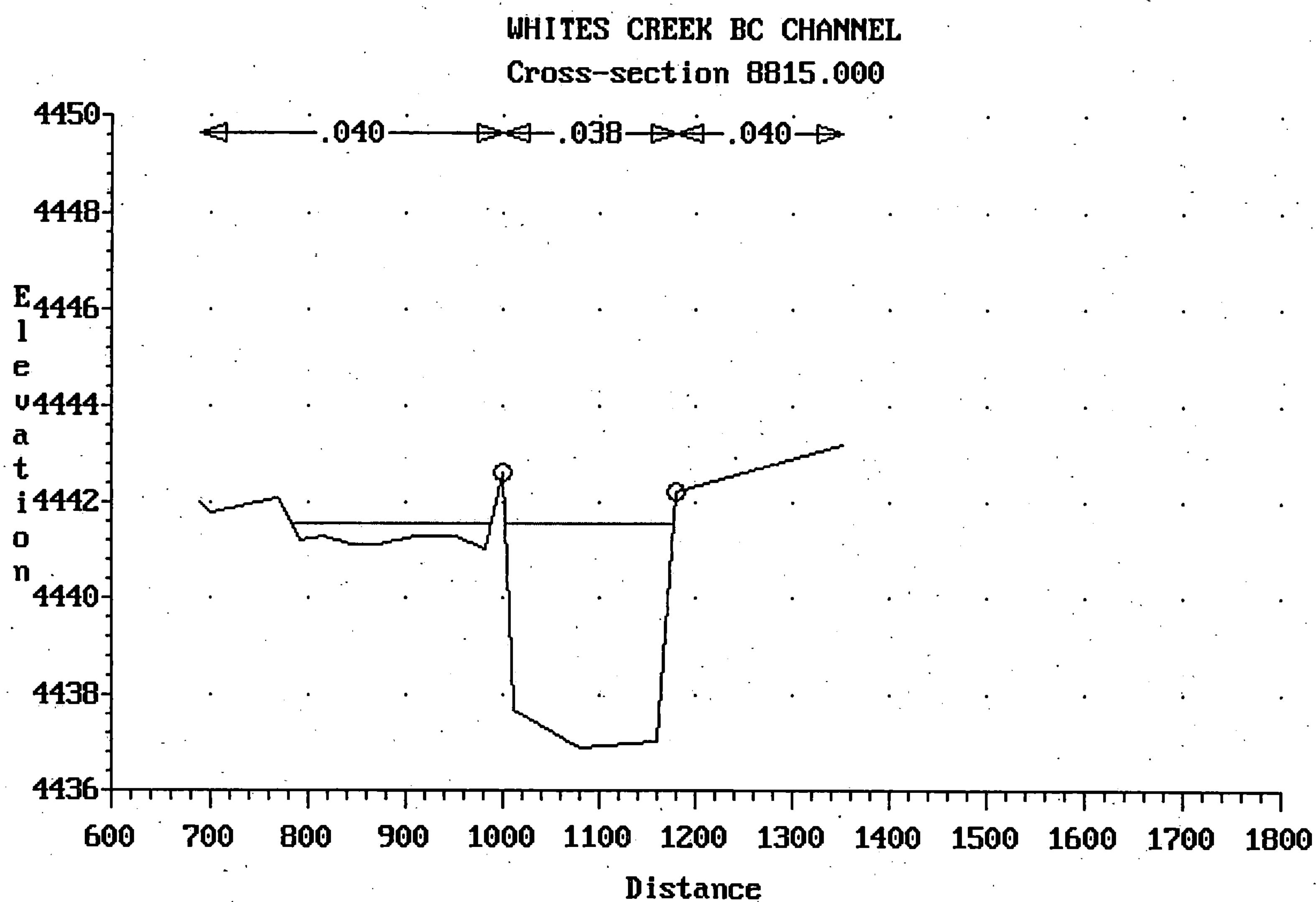
4438
4437
4436
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
Distance



WHITES CREEK BC CHANNEL
Cross-section 8815.000
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.038
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Elevation
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4444
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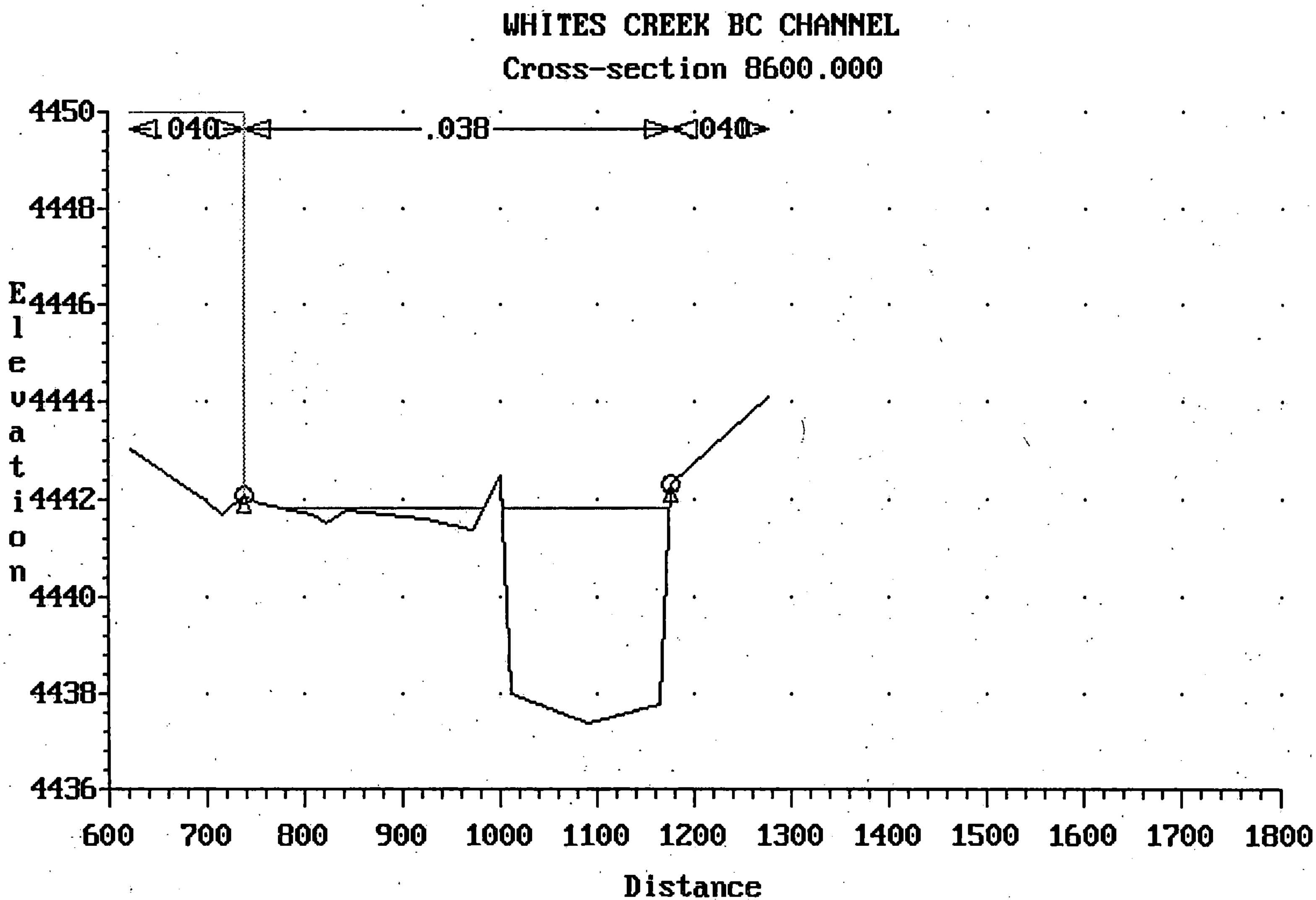
4436
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
Distance



WHITES CREEK BC CHANNEL
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Elevation
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4444
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900
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1100
1200
1300
1400
1500
1600
1700
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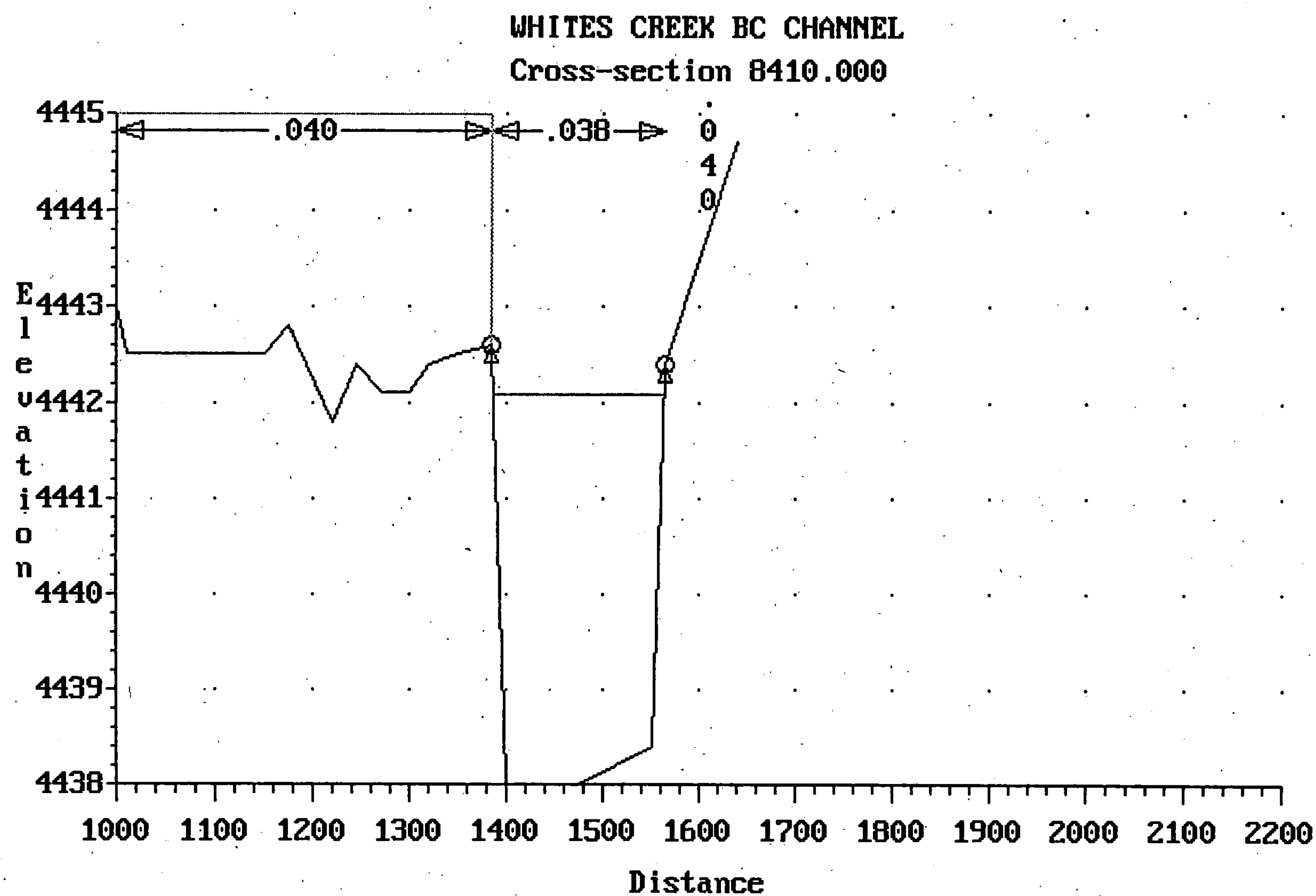
Distance



WHITES CREEK BC CHANNEL
Cross-section 8410.000
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.038
0
4
0
Elevation
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4443
4442
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1000
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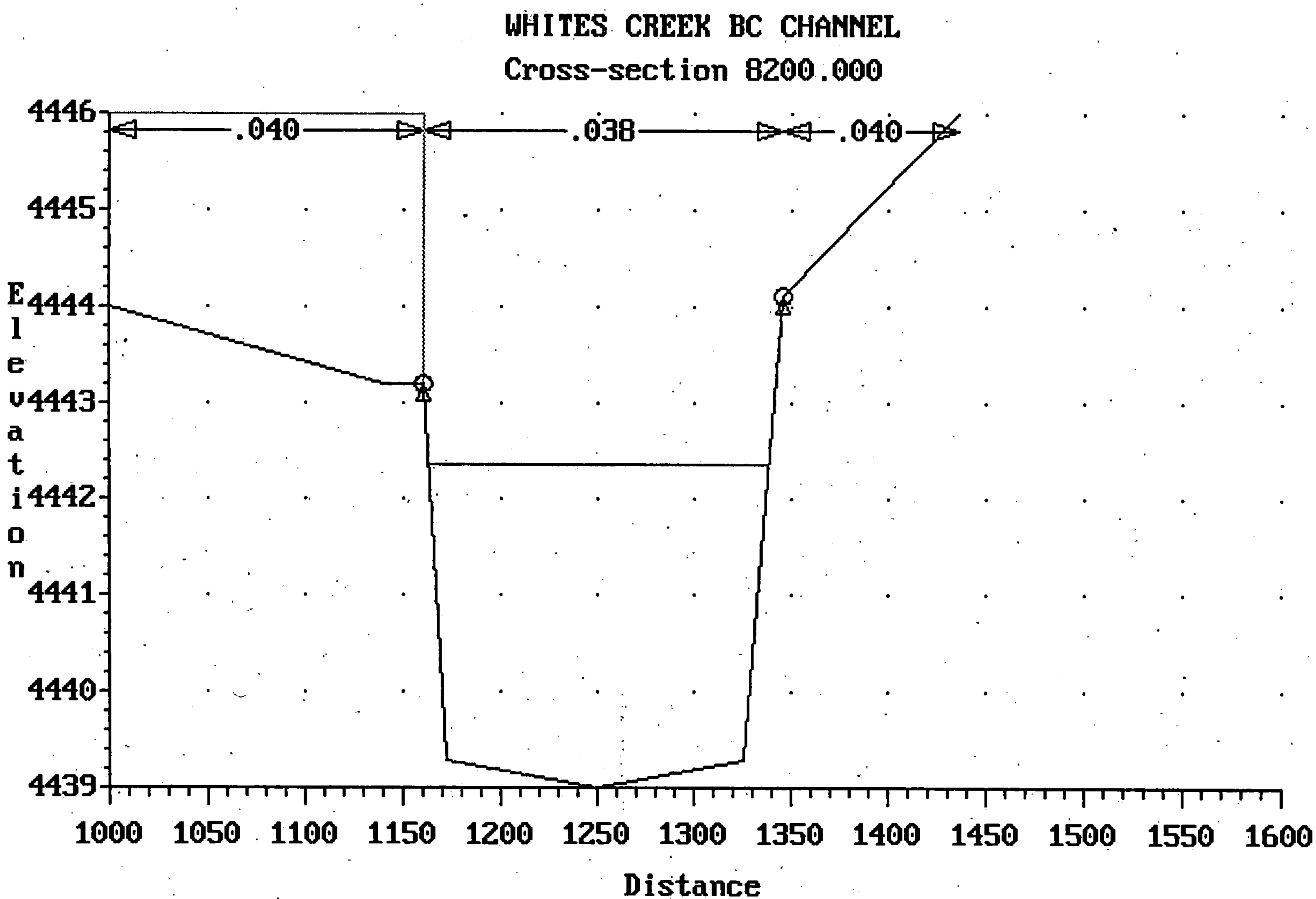
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
Distance



WHITES CREEK BC CHANNEL
Cross-section 8200.000
.040
.038
.040
Elevation
4446
4445
4444
4443
4442
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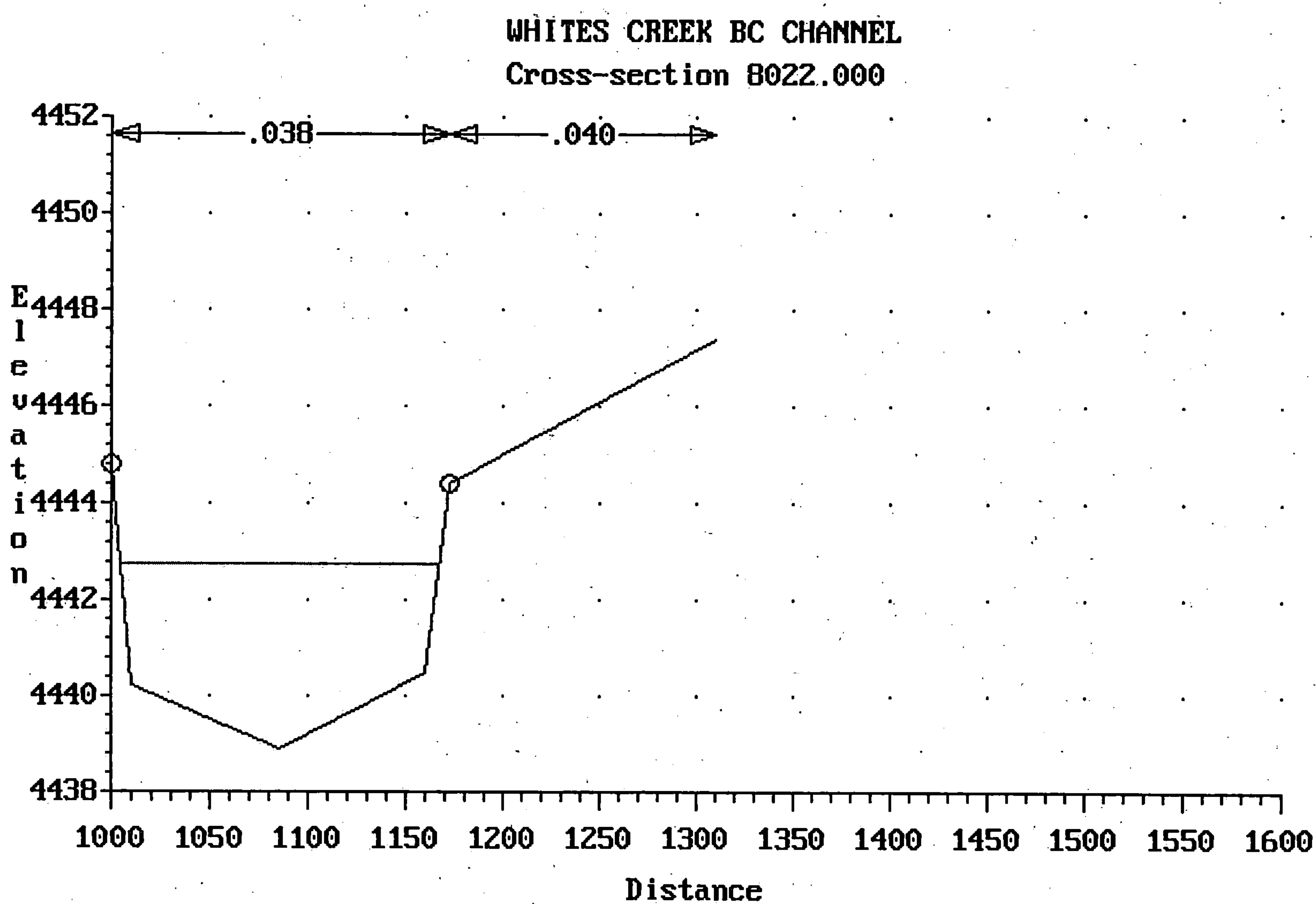
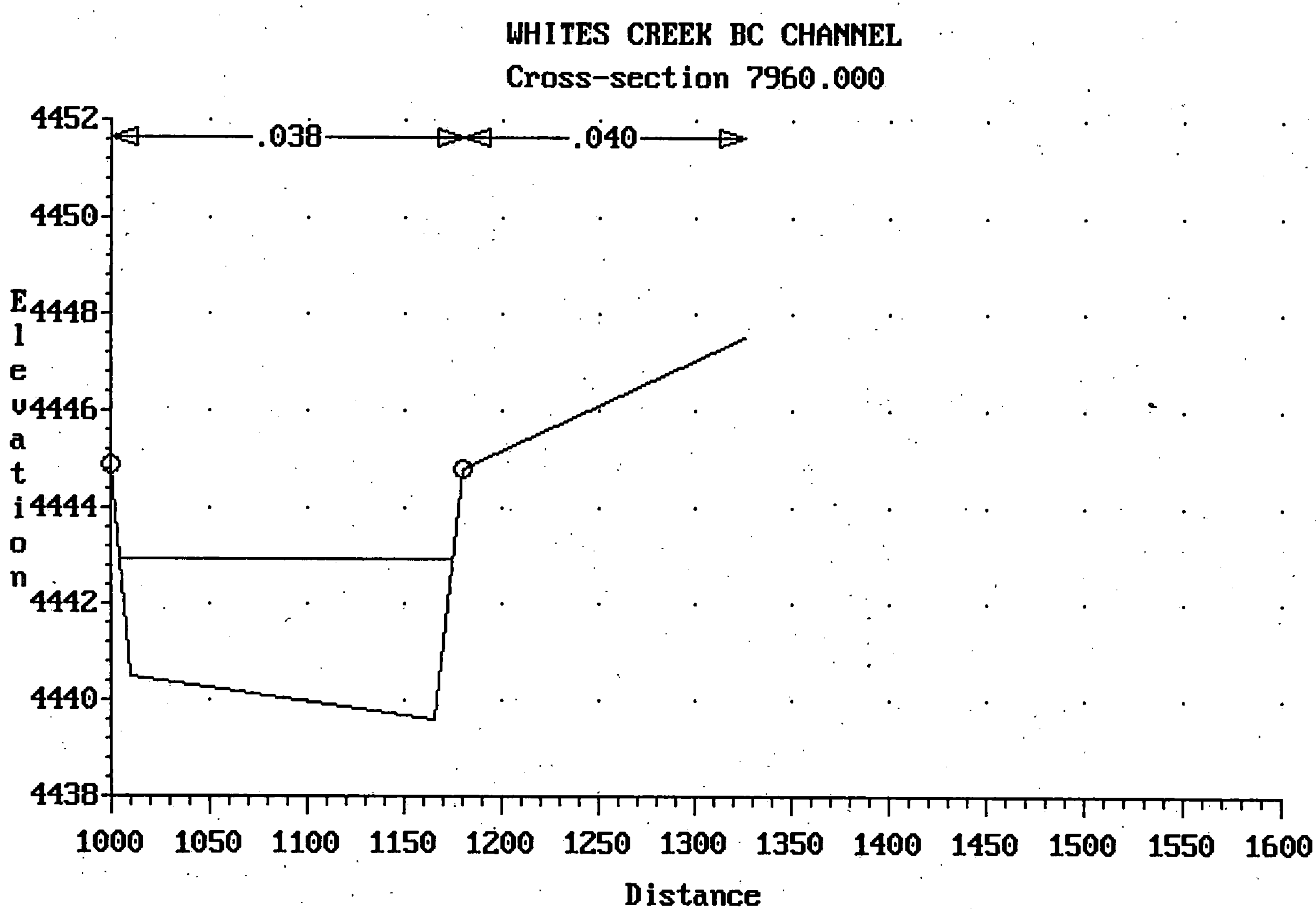
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance


WHITES CREEK BC CHANNEL
Cross-section 8022.000
.038
.040
Elevation
4452
4450
4448
4446
4444
4442
4440
4438
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance


WHITES CREEK BC CHANNEL
Cross-section 7960.000
.038
.040
Elevation
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4450
4448
4446
4444
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4440
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1050
1100
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1250
1300
1350
1400
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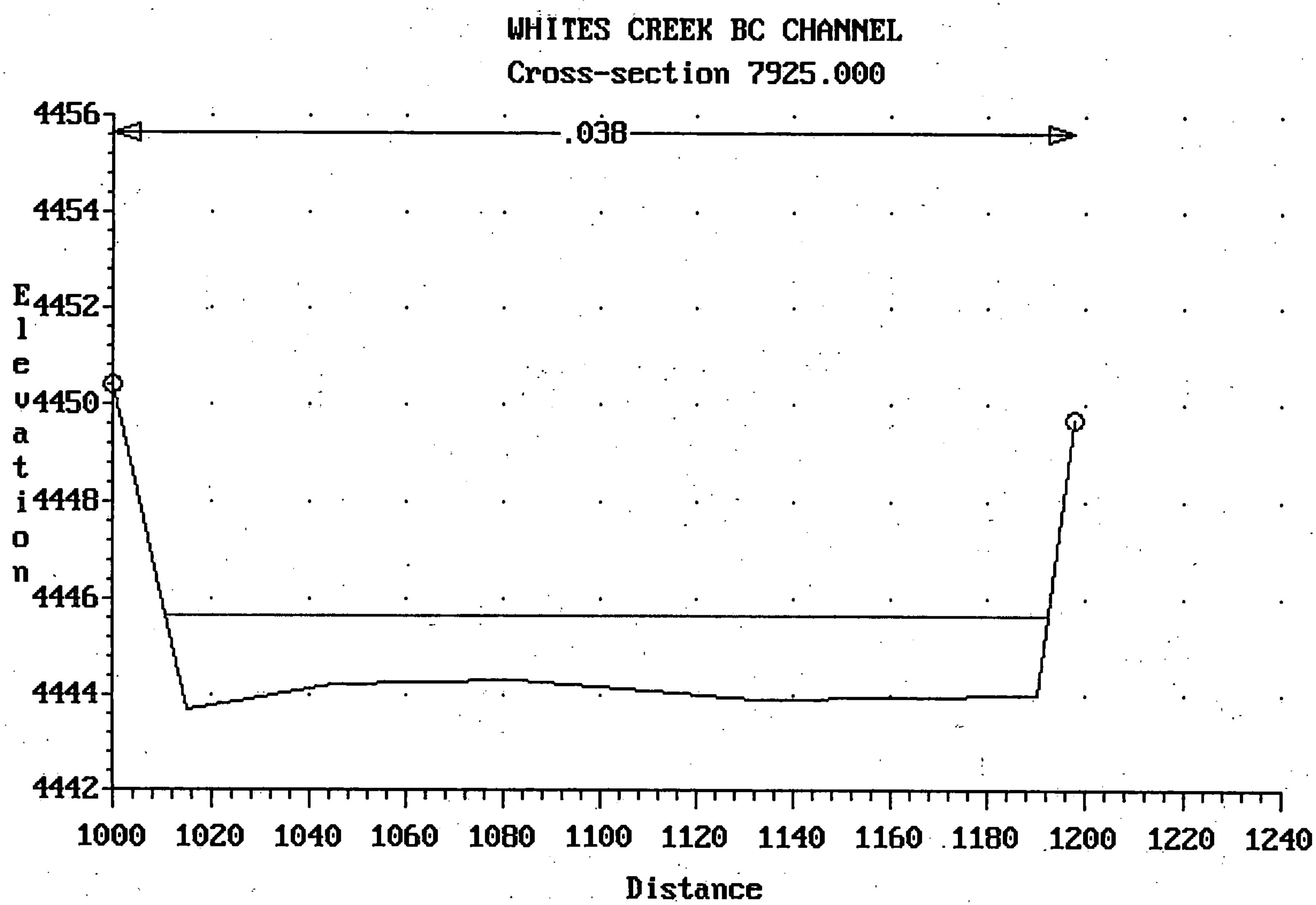
1500
1550
1600
Distance


WHITES CREEK BC CHANNEL
Cross-section 7925.000
.038
4456
4454
4452
4450
4448
4446
4444
4442
Elevation
1000
1020
1040
1060
1080
1100
1120
1140
1160
1180
1200
1220
1240
Distance

APPENDIX F:

"As-Built" Plans

```
1*****************************************                    *****************************************
 *  HEC-2 WATER SURFACE PROFILES        *                    *  U.S. ARMY CORPS OF ENGINEERS         *
 *                                      *                    *  HYDROLOGIC ENGINEERING CENTER        *
     rsion   4.6.2;  May 1991           *                    *  609 SECOND STREET, SUITE D           *
 *                                      *                    *  DAVIS, CALIFORNIA 95616-4687         *
 *  RUN DATE    14AUG96    TIME  09:29:06 *                  *         (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
   14AUG96     09:29:06                                                                          PAGE    1



                                                                  THIS RUN EXECUTED 14AUG96    09:29:06

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

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


T1      NIMBUS ENGINEERS
T2      9508 DOUBLE DIAMOND AS-BUILT CHECK      FILE:  508AS-CC.DAT
T3      WHITES CREEK CENTRAL CHANNEL

J1  ICHECK   INQ       NINV     IDIR      STRT     METRIC    HVINS     Q         WSEL      FQ

       0       2         0        0         0        0         0         0    4434.41

J2  NPROF    IPLOT     PRFVS    XSECV     XSECH     FN       ALLDC     IBW       CHNIM     ITRACE

      1        0        -1


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150      38        43        13        15        16        26        1        53        54
      4      25

        .038      .038      .038
           1      3000
X1    10090         5      1000      1138         0         0         0
GR   4437.7      1000    4431.3      1010    4431.2     .1062    4431.4      1120    4436.9      1138

X1     9945         5      1000      1150       145       150       145
GR   4438.3      1000    4431.4      1022    4431.3      1072    4431.6      1135    4436.6      1150
```

X1	9826	6	1065	1216	125	119	119			
GR	4437.3	1000	4440.4	1065	4431.8	1093	4431.8	1151	4431.9	1200
	4437.2	1216								
X1	9600	6	1125	1275	245	215	226			
GR	4440.0	1000	4439.9	1125	4432.3	1148	4432.3	1212	4431.7	1259
GR	4437.2	1275								
X1	9400	6	1165	1318	215	185	200			
GR	4440.0	1000	4440.1	1165	4432.7	1185	4432.3	1250	4432.3	1298
GR	4438.3	1318								
X1	9200	6	1175	1325	202	195	200			
GR	4439.5	1000	4438.4	1175	4433.2	1192	4432.8	1245	4432.3	1310
GR	4438.0	1325								

X1	9050	6	1185	1330	150	150	150			
GR	4439.6	1000	4438.5	1185	4433.4	1200	4433.1	1252	4433.3	1315
GR	4438.1	1330								
X1	8800	6	1210	1355	248	152	150			
GR	4439.8	1000	4439.4	1210	4433.7	1230	4433.6	1270	4433.9	1340
GR	4438.7	1355								
	8500	6	1205	1345	270	325	300			
GR	4439.8	1000	4439.9	1205	4434.3	1220	4434.0	1278	4434.3	1322
GR	4439.4	1345								
X1	8200	6	1172	1320	285	310	300			
GR	4440.8	1000	4440.5	1172	4434.8	1190	4434.9	1248	4435.0	1305
GR	4440.0	1320								
X1	7900	6	1150	1298	300	300	300			
GR	4441.6	1000	4441.2	1150	4435.5	1165	4435.4	1222	4435.55	1278
GR	4441.3	1298								
X1	7700	6	1122	1275	200	200	200			
GR	4442.1	1000	4442.0	1122	4436.1	1140	4435.8	1200	4435.8	1255
GR	4442.4	1275								
X1	7400	6	1135	1300	303	300	300			
GR	4443.9	1000	4444.6	1135	4436.8	1170	4436.6	1222	4436.5	1275
GR	4443.6	1300								
X1	7200	6	1110	1278	195	202	200			
GR	4445.1	1000	4445.7	1110	4437.4	1145	4437.6	1198	4437.5	1250
GR	4446.9	1278								
X1	7000	6	1100	1270	185	215	200			
	4445.9	1000	4446.1	1100	4438.2	1135	4438.1	1200	4438.1	1230
GR	4446.9	1270								
X1	6700	6	1104	1262	295	305	300			
GR	4446.9	1000	4447.1	1104	4439.6	1130	4439.4	1180	4439.4	1230
GR	4447.1	1262								

```
X1     6500          6       1104       1265        200        200        200
GR   4447.7       1000     4447.7       1104     4440.5       1134     4440.3       1172     4440.2       1233
     4447.2       1265

X1     6300          6       1130       1290        198        202        200
GR   4448.1       1000     4448.0       1130     4441.1       1155     4440.9       1210     4441.2       1260
GR   4448.2       1290
1
   14AUG96      09:29:06                                                                                PAGE     3


X1     6050          6       1150       1305        250        250        250
GR   4449.4       1000     4448.4       1150     4442.4       1170     4441.8       1235     4442.3       1280
GR   4449.2       1305

X1     5800          6       1145       1300        250        250        250
GR   4449.7       1000     4449.4       1145     4443.2       1168     4443.0       1220     4443.2       1270
GR   4450.2       1300

X1     5500          7       1140       1288        300        300        300
GR   4451.2       1000     4450.6       1140     4445.3       1155     4444.2       1170     4444.3       1210
GR   4444.2       1260     4451.1       1288

X1     5300          5       1000       1150        200        200        200
GR   4450.7       1000     4445.7       1020     4444.9       1070     4445.3       1120     4452.2       1150

       5110         12       1000       1780        190        190        190
     4456.7       1000     4456.0       1075     4455.8       1160     4454.1       1320     4452.7       1350
GR   4446.0       1370     4445.5       1425     4446.2       1475     4452.8       1500     4452.9       1600
GR   4452.7       1730     4452.4       1780


1
   14AUG96      09:29:06                                                                                PAGE     4


    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

*SECNO 10090.000
 10090.000      3.21   4434.41       .00   4434.41   4435.45      1.04       .00       .00   4437.70
    3000.0        .0    3000.0        .0        .0     367.1        .0        .0        .0   4436.90
       .00       .00      8.17       .00      .000      .038      .000      .000   4431.20   1005.14
   .010502        0.        0.        0.         0         0         0       .00    124.71   1129.85


*SECNO 9945.000

3301 HV CHANGED MORE THAN HVINS
```

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.81

9945.000	4.45	4435.75	.00	.00	4436.22	.47	.77	.00	4438.30
000.0	.0	3000.0	.0	.0	547.3	.0	1.5	.4	4436.60
.01	.00	5.48	.00	.000	.038	.000	.000	4431.30	1008.12
.003212	145.	145.	150.	2	0	0	.00	139.33	1147.46

*SECNO 9826.000

9826.000	4.30	4436.10	.00	.00	4436.63	.53	.41	.00	4440.40
3000.0	.0	3000.0	.0	.0	515.9	.0	3.0	.8	4437.20
.01	.00	5.81	.00	.000	.038	.000	.000	4431.80	1078.96
.003703	125.	119.	119.	2	0	0	.00	133.75	1212.71

*SECNO 9600.000

9600.000	5.21	4436.91	.00	.00	4437.30	.39	.67	.00	4439.90
3000.0	.0	3000.0	.0	.0	596.3	.0	5.9	1.5	4437.20
.03	.00	5.03	.00	.000	.038	.000	.000	4431.70	1134.07
.002435	245.	226.	215.	1	0	0	.00	140.06	1274.13

*SECNO 9400.000

9400.000	5.10	4437.40	.00	.00	4437.74	.35	.44	.00	4440.10
3000.0	.0	3000.0	.0	.0	636.1	.0	8.7	2.2	4438.30
.04	.00	4.72	.00	.000	.038	.000	.000	4432.30	1172.30
.002011	215.	200.	185.	2	0	0	.00	142.69	1314.99

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 9200.000

9200.000	5.51	4437.81	.00	.00	4438.12	.31	.38	.00	4438.40
3000.0	.0	3000.0	.0	.0	671.3	.0	11.7	2.8	4438.00
.05	.00	4.47	.00	.000	.038	.000	.000	4432.30	1176.93
.001759	202.	200.	195.	2	0	0	.00	147.56	1324.50

*SECNO 9050.000

9050.000	4.95	4438.05	.00	.00	4438.41	.36	.29	.00	4438.50
3000.0	.0	3000.0	.0	.0	622.3	.0	13.9	3.3	4438.10
.06	.00	4.82	.00	.000	.038	.000	.000	4433.10	1186.32
.002179	150.	150.	150.	2	0	0	.00	143.52	1329.85

*SECNO 8800.000

).000	4.76	4438.36	.00	.00	4438.77	.42	.36	.00	4439.40
3000.0	.0	3000.0	.0	.0	579.7	.0	16.0	3.8	4438.70
.07	.00	5.18	.00	.000	.038	.000	.000	4433.60	1213.66
.002674	248.	150.	152.	2	0	0	.00	140.26	1353.92

*SECNO 8500.000

8500.000	5.13	4439.13	.00	.00	4439.53	.40	.76	.00	4439.90
3000.0	.0	3000.0	.0	.0	592.4	.0	20.0	4.8	4439.40
.08	.00	5.06	.00	.000	.038	.000	.000	4434.00	1207.05
.002407	270.	300.	325.	2	0	0	.00	136.75	1343.80

*SECNO 8200.000

8200.000	5.05	4439.85	.00	.00	4440.19	.34	.65	.00	4440.50
3000.0	.0	3000.0	.0	.0	644.7	.0	24.3	5.8	4440.00
.10	.00	4.65	.00	.000	.038	.000	.000	4434.80	1174.06
.001973	285.	300.	310.	2	0	0	.00	145.49	1319.55

*SECNO 7900.000

7900.000	5.04	4440.44	.00	.00	4440.78	.35	.60	.00	4441.20
3000.0	.0	3000.0	.0	.0	636.0	.0	28.7	6.7	4441.30
.12	.00	4.72	.00	.000	.038	.000	.000	4435.40	1152.00
.002018	300.	300.	300.	2	0	0	.00	143.00	1295.01

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 7700.000

7700.000	5.05	4440.85	.00	.00	4441.18	.34	.40	.00	4442.00
3000.0	.0	3000.0	.0	.0	643.0	.0	31.6	7.4	4442.40
.13	.00	4.67	.00	.000	.038	.000	.000	4435.80	1125.55
.001977	200.	200.	200.	0	0	0	.00	144.72	1270.27

*SECNO 7400.000

7400.000	4.95	4441.45	.00	.00	4441.85	.39	.66	.00	4444.60
3000.0	.0	3000.0	.0	.0	597.9	.0	35.9	8.4	4443.60
.15	.00	5.02	.00	.000	.038	.000	.000	4436.50	1149.15
.002478	303.	300.	300.	0	0	0	.00	143.27	1292.42

*SECNO 7200.000

7200.000	4.53	4441.93	.00	.00	4442.42	.49	.58	.00	4445.70
3000.0	.0	3000.0	.0	.0	535.5	.0	38.5	9.0	4446.90
.16	.00	5.60	.00	.000	.038	.000	.000	4437.40	1125.88
.003383	195.	200.	202.	2	0	0	.00	137.32	1263.21

*SECNO 7000.000

7000.000	4.51	4442.61	.00	.00	4443.14	.53	.71	.00	4446.10
3000.0	.0	3000.0	.0	.0	514.1	.0	40.9	9.7	4446.90
.17	.00	5.83	.00	.000	.038	.000	.000	4438.10	1115.47
.003780	185.	200.	215.	2	0	0	.00	135.01	1250.49

*SECNO 6700.000

6700.000	4.35	4443.75	.00	.00	4444.31	.56	1.18	.00	4447.10
3000.0	.0	3000.0	.0	.0	499.4	.0	44.4	10.6	4447.10
.18	.00	6.01	.00	.000	.038	.000	.000	4439.40	1115.61
.004067	295.	300.	305.	2	0	0	.00	132.48	1248.08

*SECNO 6500.000

6500.000	4.38	4444.58	.00	.00	4445.13	.56	.82	.00	4447.70
3000.0	.0	3000.0	.0	.0	501.2	.0	46.7	11.2	4447.20
.19	.00	5.99	.00	.000	.038	.000	.000	4440.20	1117.01
.004155	200.	200.	200.	2	0	0	.00	136.00	1253.01

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 6300.000

6300.000	4.50	4445.40	.00	.00	4445.90	.50	.76	.00	4448.00
3000.0	.0	3000.0	.0	.0	530.8	.0	49.1	11.8	4448.20
.20	.00	5.65	.00	.000	.038	.000	.000	4440.90	1139.42
.003522	198.	200.	202.	0	0	0	.00	138.58	1278.00

*SECNO 6050.000

6050.000	4.49	4446.29	.00	.00	4446.81	.52	.91	.00	4448.40
3000.0	.0	3000.0	.0	.0	517.1	.0	52.1	12.6	4449.20
.21	.00	5.80	.00	.000	.038	.000	.000	4441.80	1157.04
.003801	250.	250.	250.	2	0	0	.00	137.42	1294.45

*SECNO 5800.000

5800.000	4.25	4447.25	.00	.00	4447.84	.58	1.03	.00	4449.40
3000.0	.0	3000.0	.0	.0	489.2	.0	55.0	13.4	4450.20
.22	.00	6.13	.00	.000	.038	.000	.000	4443.00	1152.97
.004436	250.	250.	250.	2	0	0	.00	134.40	1287.37

*SECNO 5500.000

5500.000	4.35	4448.55	.00	.00	4449.12	.57	1.28	.00	4450.60
3000.0	.0	3000.0	.0	.0	497.3	.0	58.4	14.3	4451.10
.24	.00	6.03	.00	.000	.038	.000	.000	4444.20	1145.80
.004099	300.	300.	300.	2	0	0	.00	131.85	1277.65

*SECNO 5300.000

5300.000	4.48	4449.38	.00	.00	4449.98	.60	.87	.00	4450.70
3000.0	.0	3000.0	.0	.0	481.3	.0	60.6	14.9	4452.20
.25	.00	6.23	.00	.000	.038	.000	.000	4444.90	1005.28
.004591	200.	200.	200.	2	0	0	.00	132.46	1137.74

*SECNO 5110.000

5110.000	4.73	4450.23	.00	.00	4450.74	.51	.76	.00	4456.70

3000.0	.0	3000.0	.0	.0	523.0	.0	62.8	15.5	4452.40
.25	.00	5.74	.00	.000	.038	.000	.000	4445.50	1357.37
.003506	190.	190.	190.	2	0	0	.00	132.90	1490.27

THIS RUN EXECUTED 14AUG96 09:29:07

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

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

WHITES CREEK CENTRAL CHA

SUMMARY PRINTOUT

	SECNO	Q	QLOB	QROB	K*XNL	VCH	CWSEL	SSTA	ENDST	TOPWID	AREA
	0090.000	3000.00	.00	.00	.00	8.17	4434.41	1005.14	1129.85	124.71	367.10
*	9945.000	3000.00	.00	.00	.00	5.48	4435.75	1008.12	1147.46	139.33	547.25
	9826.000	3000.00	.00	.00	.00	5.81	4436.10	1078.96	1212.71	133.75	515.91
	9600.000	3000.00	.00	.00	.00	5.03	4436.91	1134.07	1274.13	140.06	596.32
	9400.000	3000.00	.00	.00	.00	4.72	4437.40	1172.30	1314.99	142.69	636.15
	9200.000	3000.00	.00	.00	.00	4.47	4437.81	1176.93	1324.50	147.56	671.32
	9050.000	3000.00	.00	.00	.00	4.82	4438.05	1186.32	1329.85	143.52	622.32
	8800.000	3000.00	.00	.00	.00	5.18	4438.36	1213.66	1353.92	140.26	579.70
	8500.000	3000.00	.00	.00	.00	5.06	4439.13	1207.05	1343.80	136.75	592.41
	8200.000	3000.00	.00	.00	.00	4.65	4439.85	1174.06	1319.55	145.49	644.74
	7900.000	3000.00	.00	.00	.00	4.72	4440.44	1152.00	1295.01	143.00	636.03
	7700.000	3000.00	.00	.00	.00	4.67	4440.85	1125.55	1270.27	144.72	643.00
	7400.000	3000.00	.00	.00	.00	5.02	4441.45	1149.15	1292.42	143.27	597.89
	7200.000	3000.00	.00	.00	.00	5.60	4441.93	1125.88	1263.21	137.32	535.54
	7000.000	3000.00	.00	.00	.00	5.83	4442.61	1115.47	1250.49	135.01	514.14
	6700.000	3000.00	.00	.00	.00	6.01	4443.75	1115.61	1248.08	132.48	499.37

6500.000	3000.00	.00	.00	.00	5.99	4444.58	1117.01	1253.01	136.00	501.18

SECNO	Q	QLOB	QROB	K*XNL	VCH	CWSEL	SSTA	ENDST	TOPWID	AREA
6300.000	3000.00	.00	.00	.00	5.65	4445.40	1139.42	1278.00	138.58	530.78
6050.000	3000.00	.00	.00	.00	5.80	4446.29	1157.04	1294.45	137.42	517.10
5800.000	3000.00	.00	.00	.00	6.13	4447.25	1152.97	1287.37	134.40	489.19
5500.000	3000.00	.00	.00	.00	6.03	4448.55	1145.80	1277.65	131.85	497.31
5300.000	3000.00	.00	.00	.00	6.23	4449.38	1005.28	1137.74	132.46	481.26
5110.000	3000.00	.00	.00	.00	5.74	4450.23	1357.37	1490.27	132.90	522.99

WHITES CREEK CENTRAL CHA

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	10090.000	.00	.00	.00	4431.20	3000.00	4434.41	.00	4435.45	105.02	8.17	367.10	292.74
*	9945.000	145.00	.00	.00	4431.30	3000.00	4435.75	.00	4436.22	32.12	5.48	547.25	529.36
	9826.000	119.00	.00	.00	4431.80	3000.00	4436.10	.00	4436.63	37.03	5.81	515.91	492.98
	9600.000	226.00	.00	.00	4431.70	3000.00	4436.91	.00	4437.30	24.35	5.03	596.32	607.95
	9400.000	200.00	.00	.00	4432.30	3000.00	4437.40	.00	4437.74	20.11	4.72	636.15	668.94
	9200.000	200.00	.00	.00	4432.30	3000.00	4437.81	.00	4438.12	17.59	4.47	671.32	715.32
	9050.000	150.00	.00	.00	4433.10	3000.00	4438.05	.00	4438.41	21.79	4.82	622.32	642.63
	8800.000	150.00	.00	.00	4433.60	3000.00	4438.36	.00	4438.77	26.74	5.18	579.70	580.15
	8500.000	300.00	.00	.00	4434.00	3000.00	4439.13	.00	4439.53	24.07	5.06	592.41	611.48
	8200.000	300.00	.00	.00	4434.80	3000.00	4439.85	.00	4440.19	19.73	4.65	644.74	675.41
	7900.000	300.00	.00	.00	4435.40	3000.00	4440.44	.00	4440.78	20.18	4.72	636.03	667.75
	700.000	200.00	.00	.00	4435.80	3000.00	4440.85	.00	4441.18	19.77	4.67	643.00	674.75
	7400.000	300.00	.00	.00	4436.50	3000.00	4441.45	.00	4441.85	24.78	5.02	597.89	602.71
	7200.000	200.00	.00	.00	4437.40	3000.00	4441.93	.00	4442.42	33.83	5.60	535.54	515.75

7000.000	200.00	.00	.00	4438.10	3000.00	4442.61	.00	4443.14	37.80	5.83	514.14	487.95
6700.000	300.00	.00	.00	4439.40	3000.00	4443.75	.00	4444.31	40.67	6.01	499.37	470.40
6500.000	200.00	.00	.00	4440.20	3000.00	4444.58	.00	4445.13	41.55	5.99	501.18	465.43
6300.000	200.00	.00	.00	4440.90	3000.00	4445.40	.00	4445.90	35.22	5.65	530.78	505.54
6050.000	250.00	.00	.00	4441.80	3000.00	4446.29	.00	4446.81	38.01	5.80	517.10	486.61
5800.000	250.00	.00	.00	4443.00	3000.00	4447.25	.00	4447.84	44.36	6.13	489.19	450.42
5500.000	300.00	.00	.00	4444.20	3000.00	4448.55	.00	4449.12	40.99	6.03	497.31	468.59
5300.000	200.00	.00	.00	4444.90	3000.00	4449.38	.00	4449.98	45.91	6.23	481.26	442.75
5110.000	190.00	.00	.00	4445.50	3000.00	4450.23	.00	4450.74	35.06	5.74	522.99	506.69

WHITES CREEK CENTRAL CHA

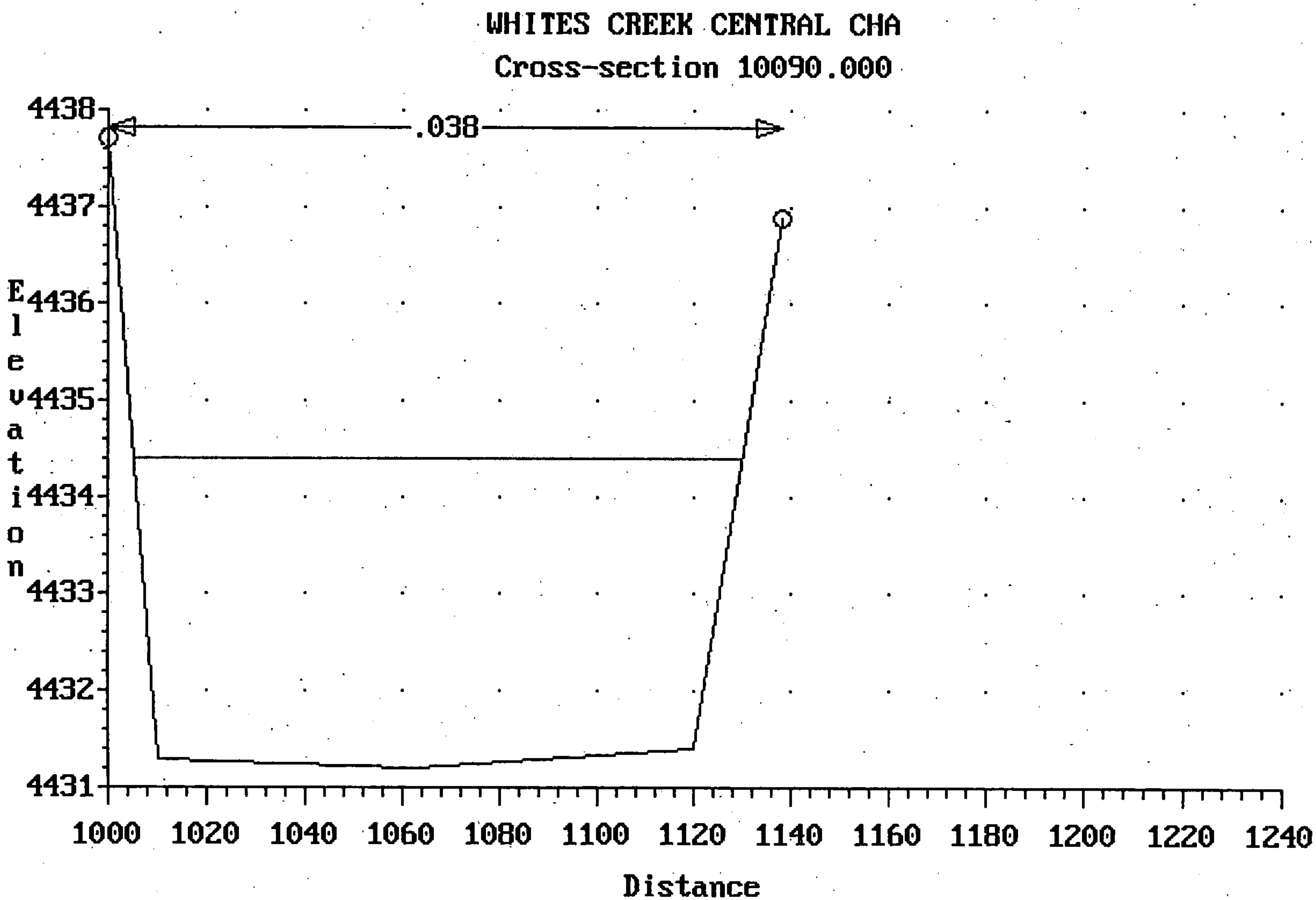
SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	J090.000	3000.00	4434.41	.00	.00	.00	124.71	.00
*	9945.000	3000.00	4435.75	.00	1.34	.00	139.33	145.00
	9826.000	3000.00	4436.10	.00	.35	.00	133.75	119.00
	9600.000	3000.00	4436.91	.00	.80	.00	140.06	226.00
	9400.000	3000.00	4437.40	.00	.49	.00	142.69	200.00
	9200.000	3000.00	4437.81	.00	.41	.00	147.56	200.00
	9050.000	3000.00	4438.05	.00	.24	.00	143.52	150.00
	8800.000	3000.00	4438.36	.00	.31	.00	140.26	150.00
	8500.000	3000.00	4439.13	.00	.78	.00	136.75	300.00
	8200.000	3000.00	4439.85	.00	.71	.00	145.49	300.00
	7900.000	3000.00	4440.44	.00	.59	.00	143.00	300.00
	7700.000	3000.00	4440.85	.00	.41	.00	144.72	200.00
	7400.000	3000.00	4441.45	.00	.61	.00	143.27	300.00
	7200.000	3000.00	4441.93	.00	.48	.00	137.32	200.00
	7000.000	3000.00	4442.61	.00	.67	.00	135.01	200.00
	6700.000	3000.00	4443.75	.00	1.14	.00	132.48	300.00

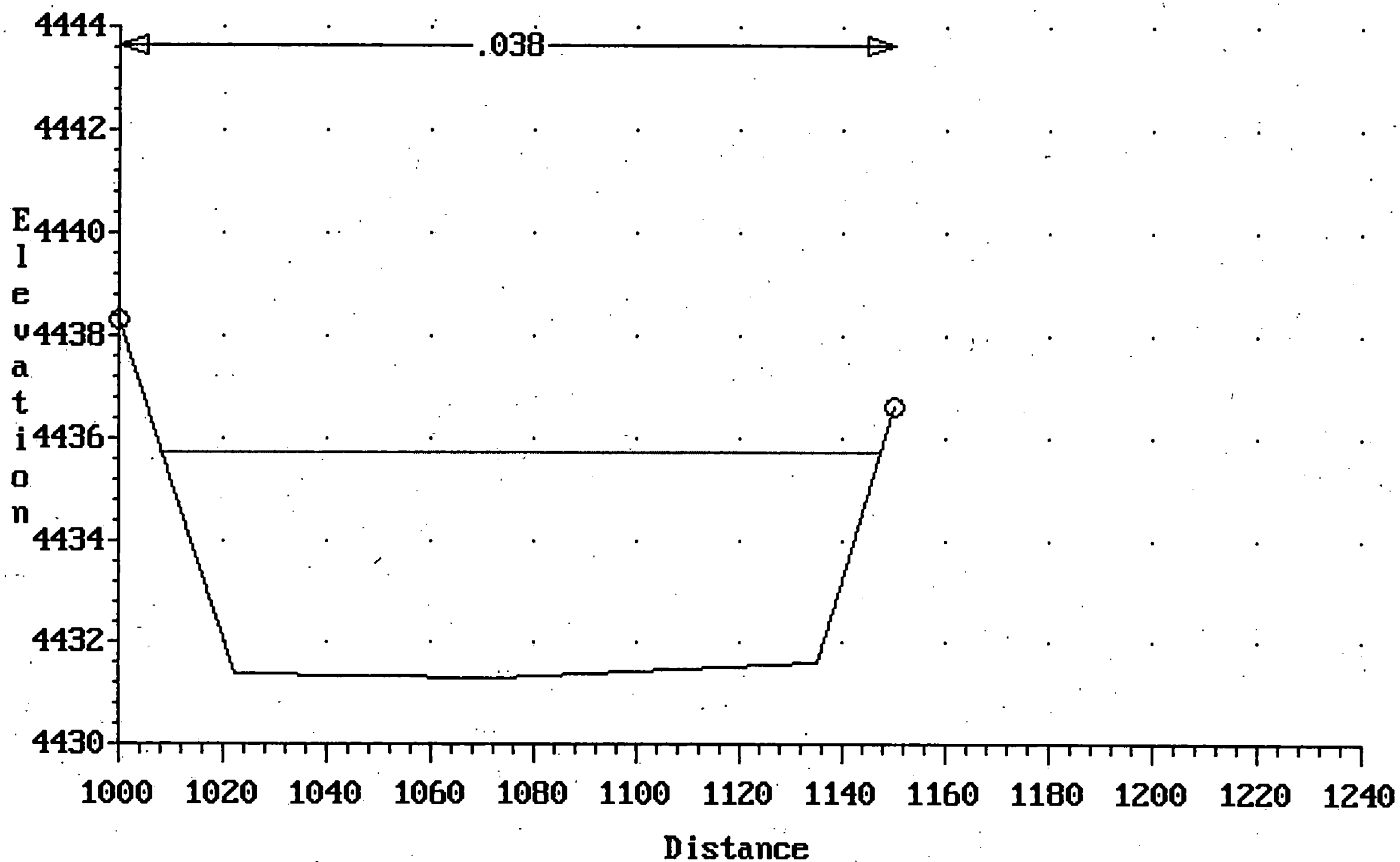
6500.000	3000.00	4444.58	.00	.83	.00	136.00	200.00
300.000	3000.00	4445.40	.00	.82	.00	138.58	200.00
6050.000	3000.00	4446.29	.00	.89	.00	137.42	250.00
5800.000	3000.00	4447.25	.00	.96	.00	134.40	250.00
5500.000	3000.00	4448.55	.00	1.30	.00	131.85	300.00
5300.000	3000.00	4449.38	.00	.83	.00	132.46	200.00
5110.000	3000.00	4450.23	.00	.85	.00	132.90	190.00

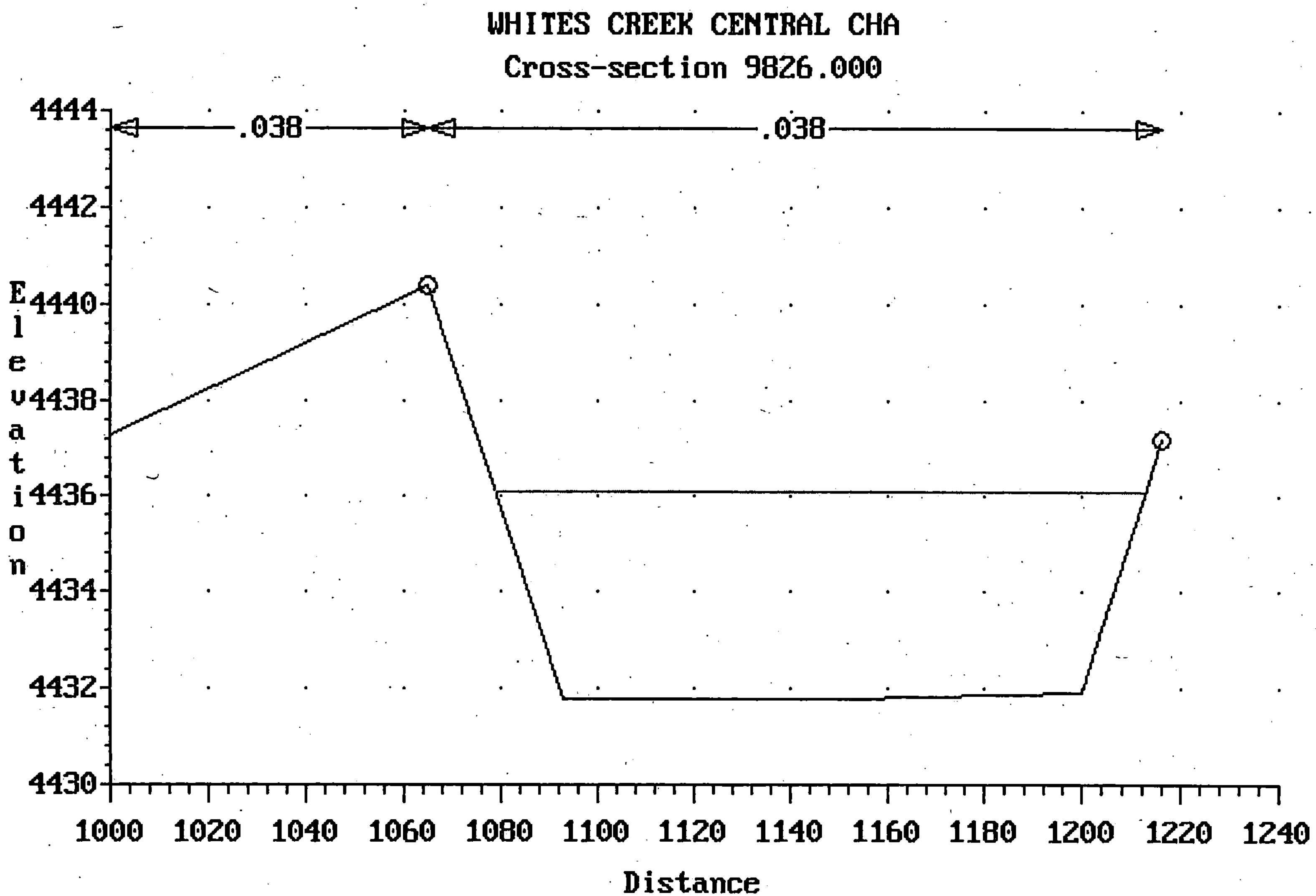
SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 9945.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

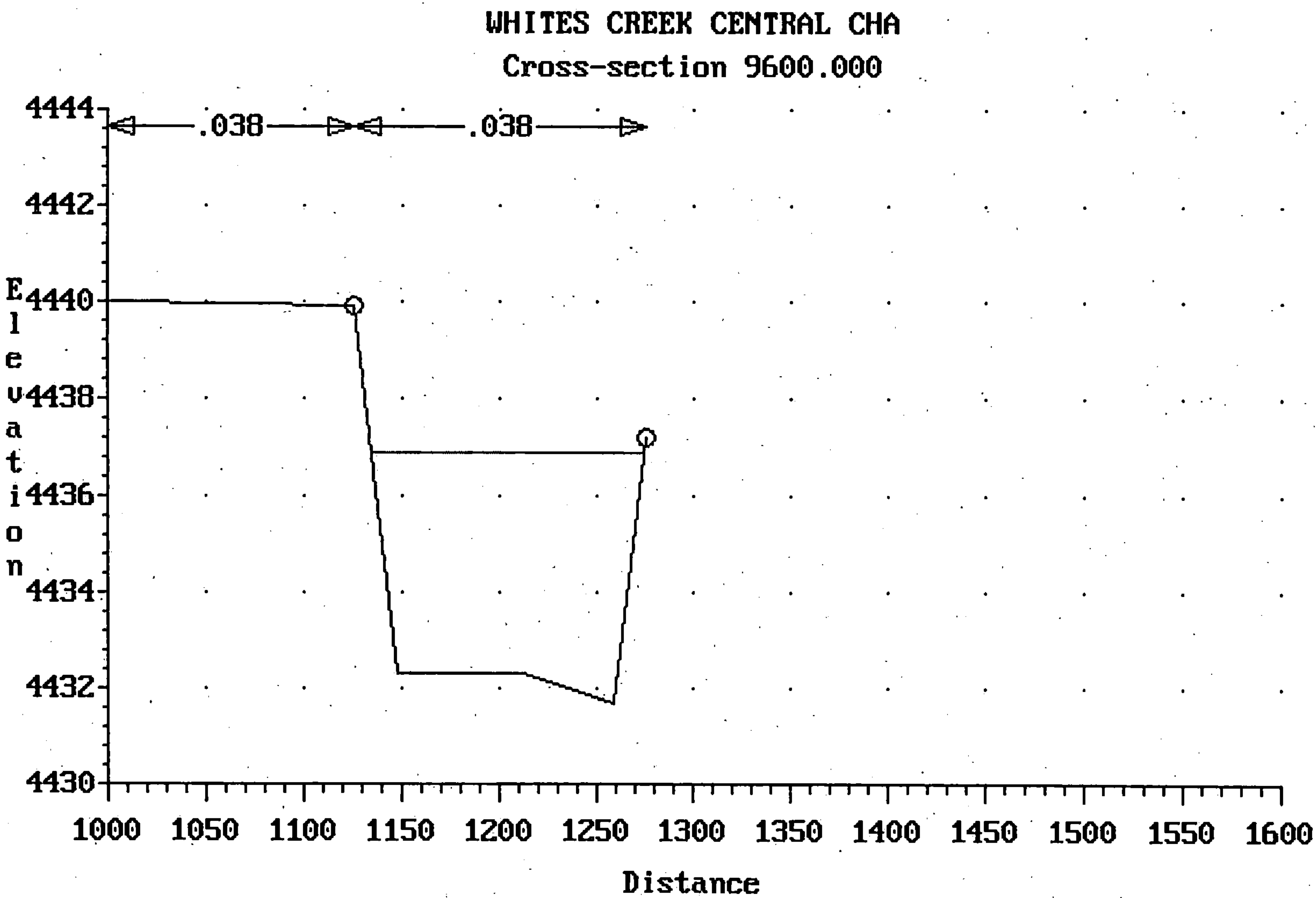

WHITES CREEK CENTRAL CHA
Cross-section 10090.000
.038
Elevation
4438
4437
4436
4435
4434
4433
4432
4431
1000
1020
1040
1060
1080
1100
1120
1140
1160
1180
1200
1220
1240
Distance

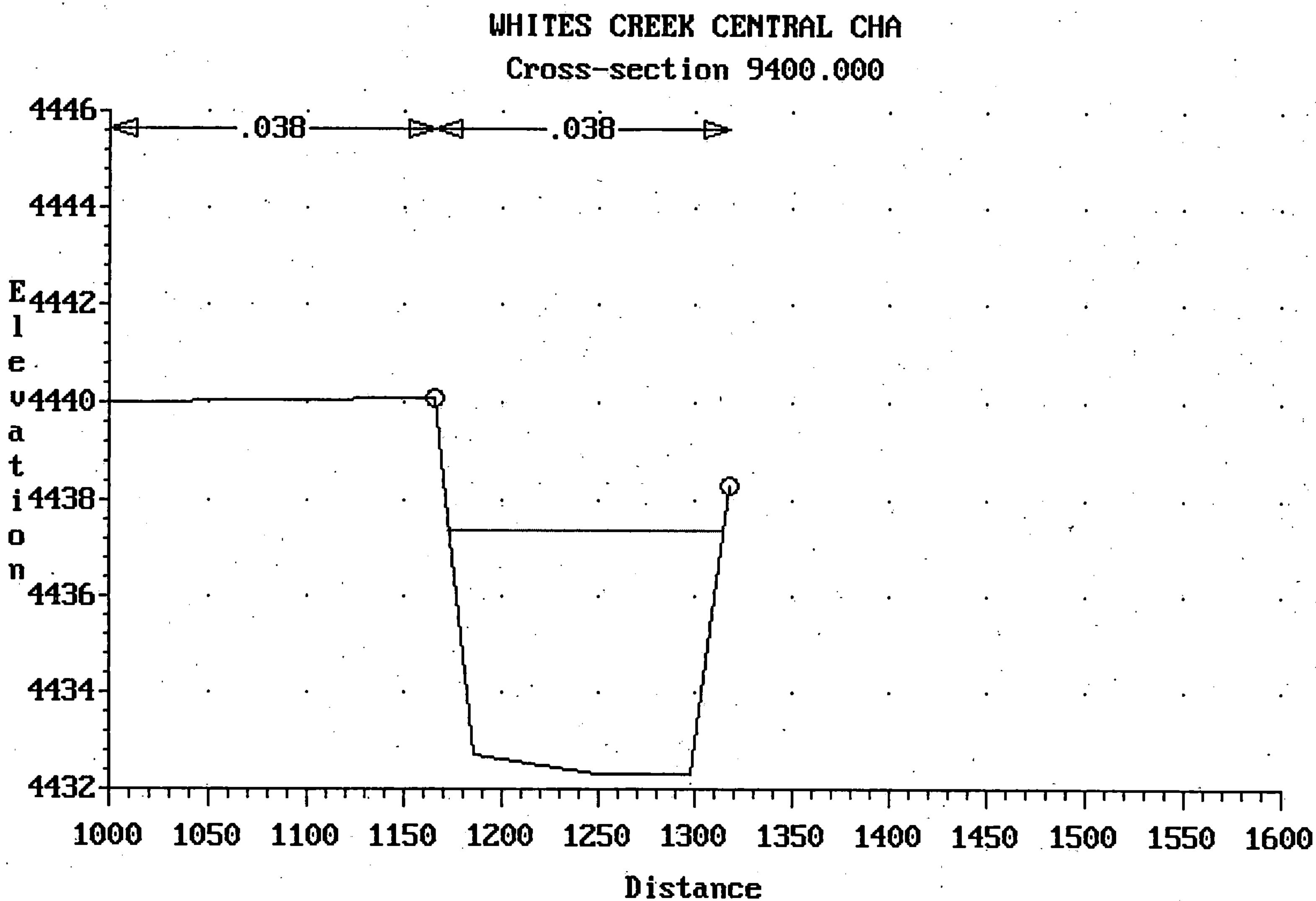
WHITES CREEK CENTRAL CHA
Cross-section 9945.000



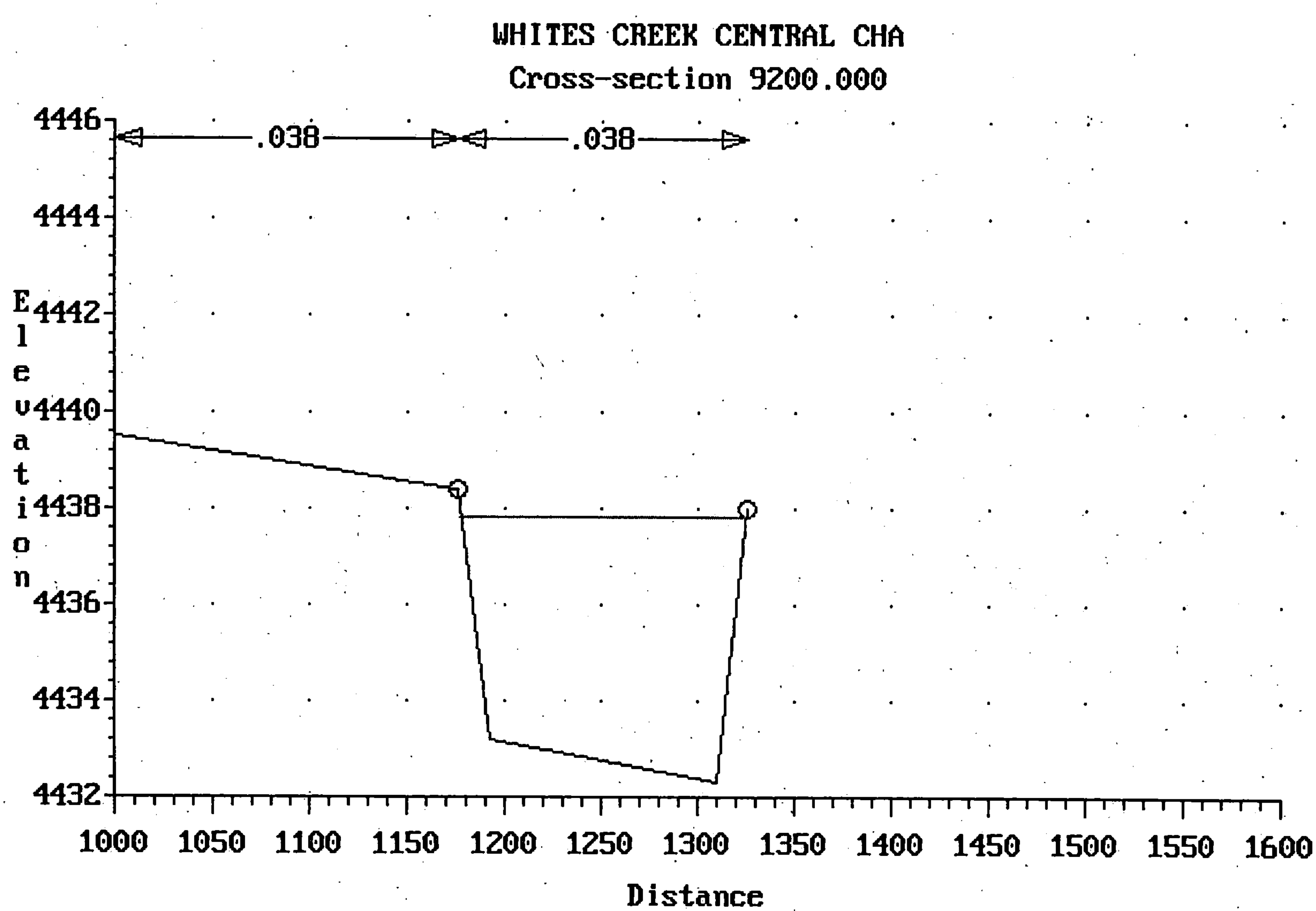


WHITES CREEK CENTRAL CHA
Cross-section 9826.000
.038
.038
4444
4442
4440
4438
4436
4434
4432
4430
Elevation
1000
1020
1040
1060
1080
1100
1120
1140
1160
1180
1200
1220
1240
Distance

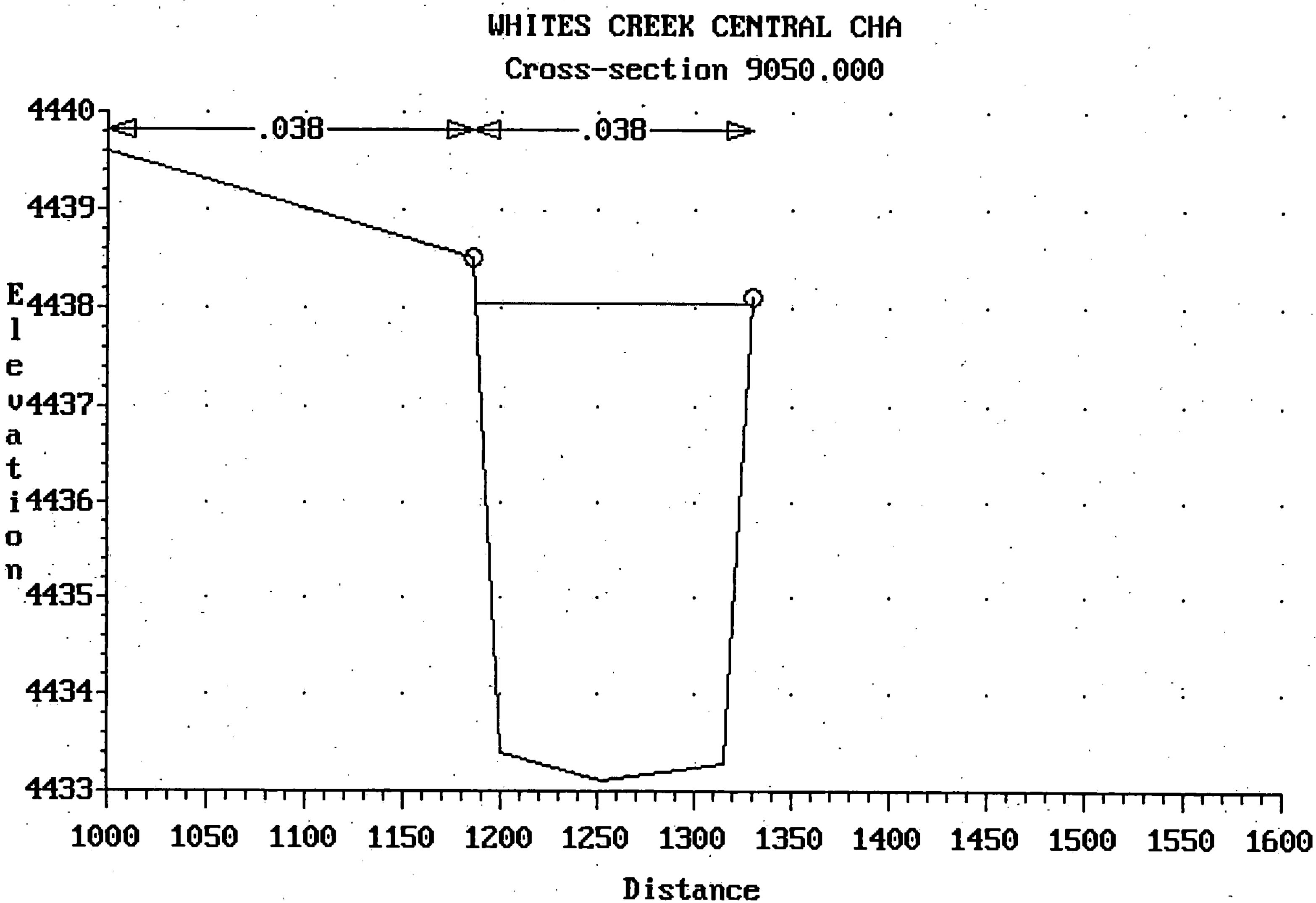

WHITES CREEK CENTRAL CHA
Cross-section 9600.000
.038
.038
Elevation
4444
4442
4440
4438
4436
4434
4432
4430
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance



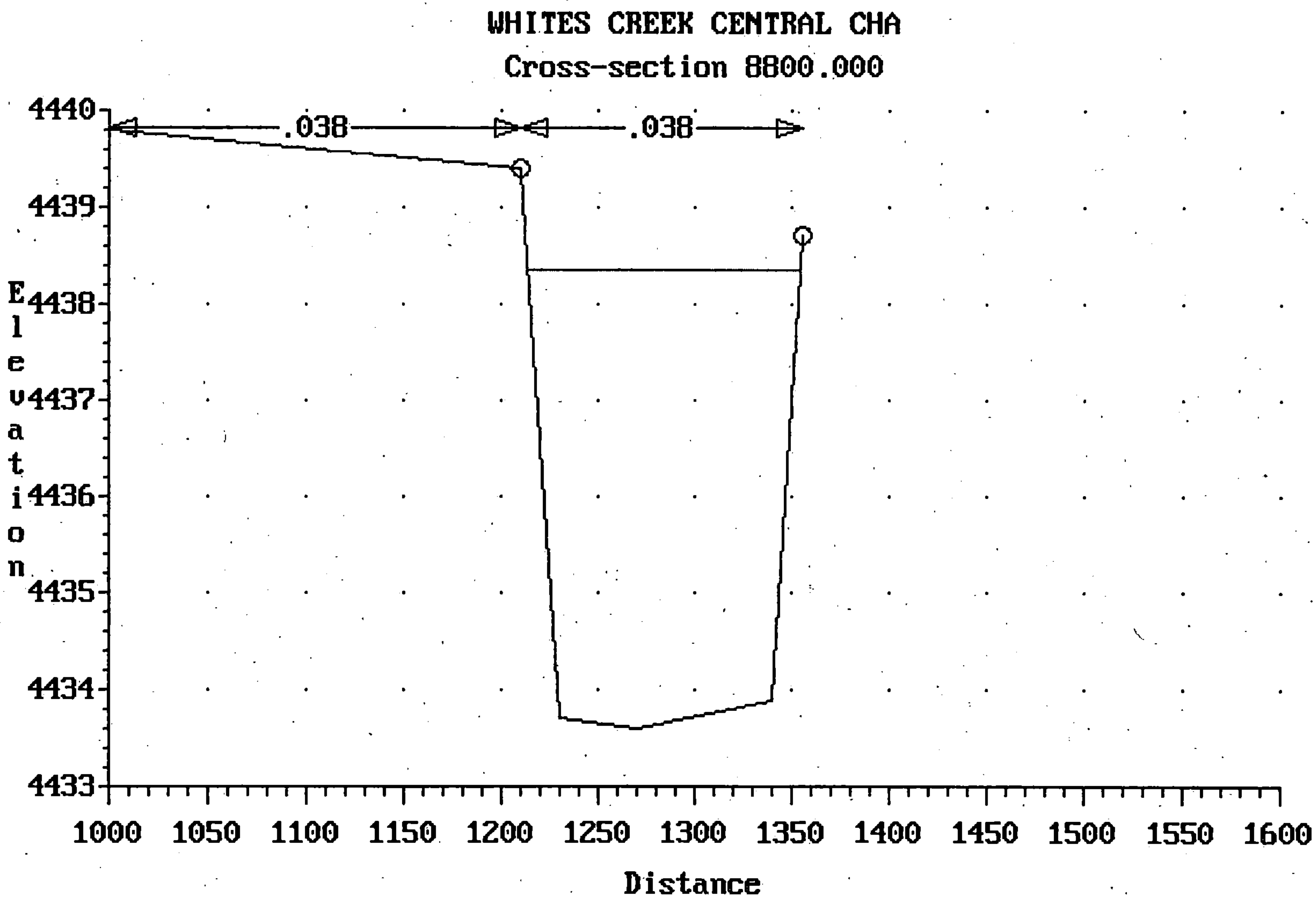
WHITES CREEK CENTRAL CHA
Cross-section 9400.000
.038
.038
Elevation
4446
4444
4442
4440
4438
4436
4434
4432
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance

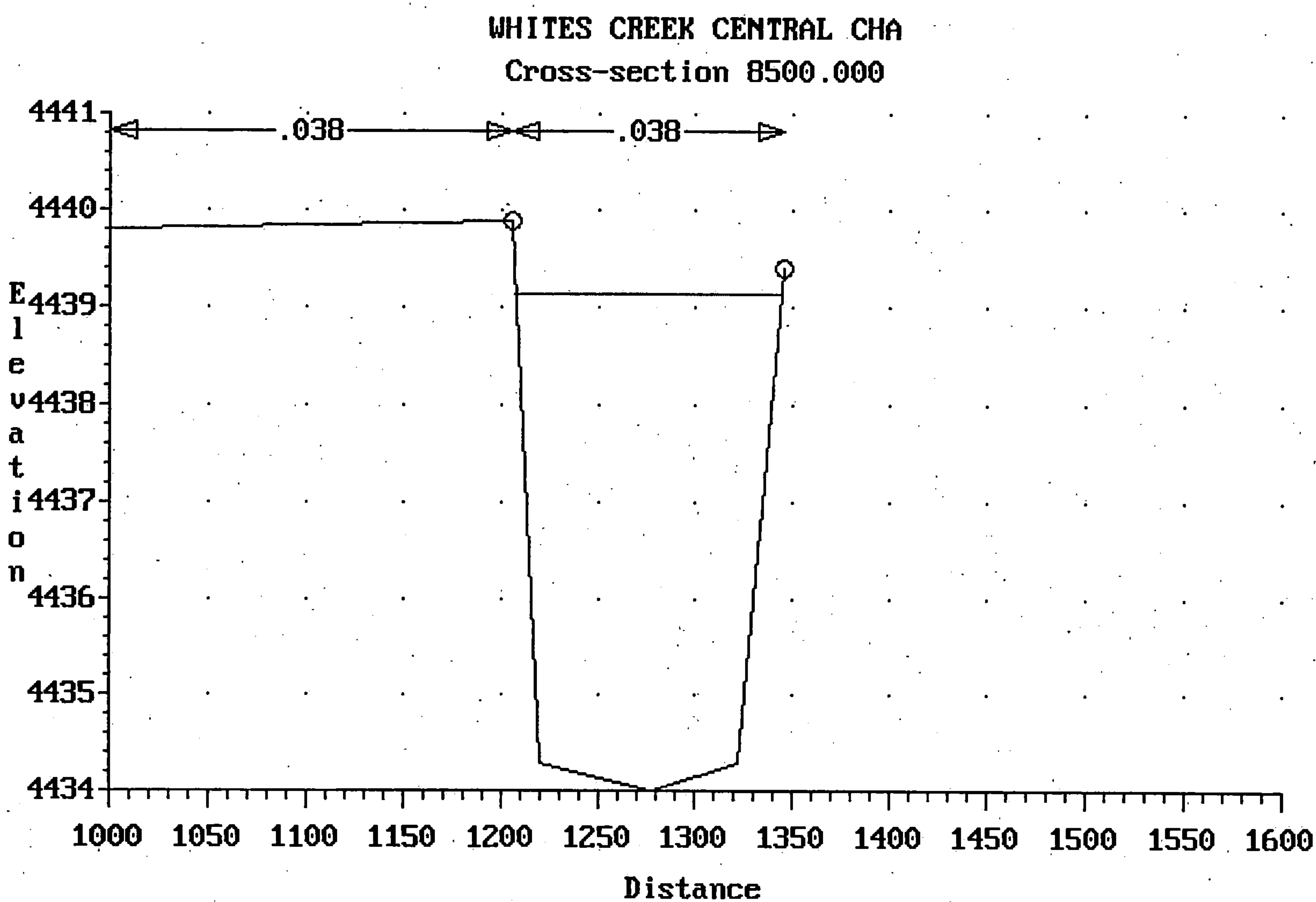


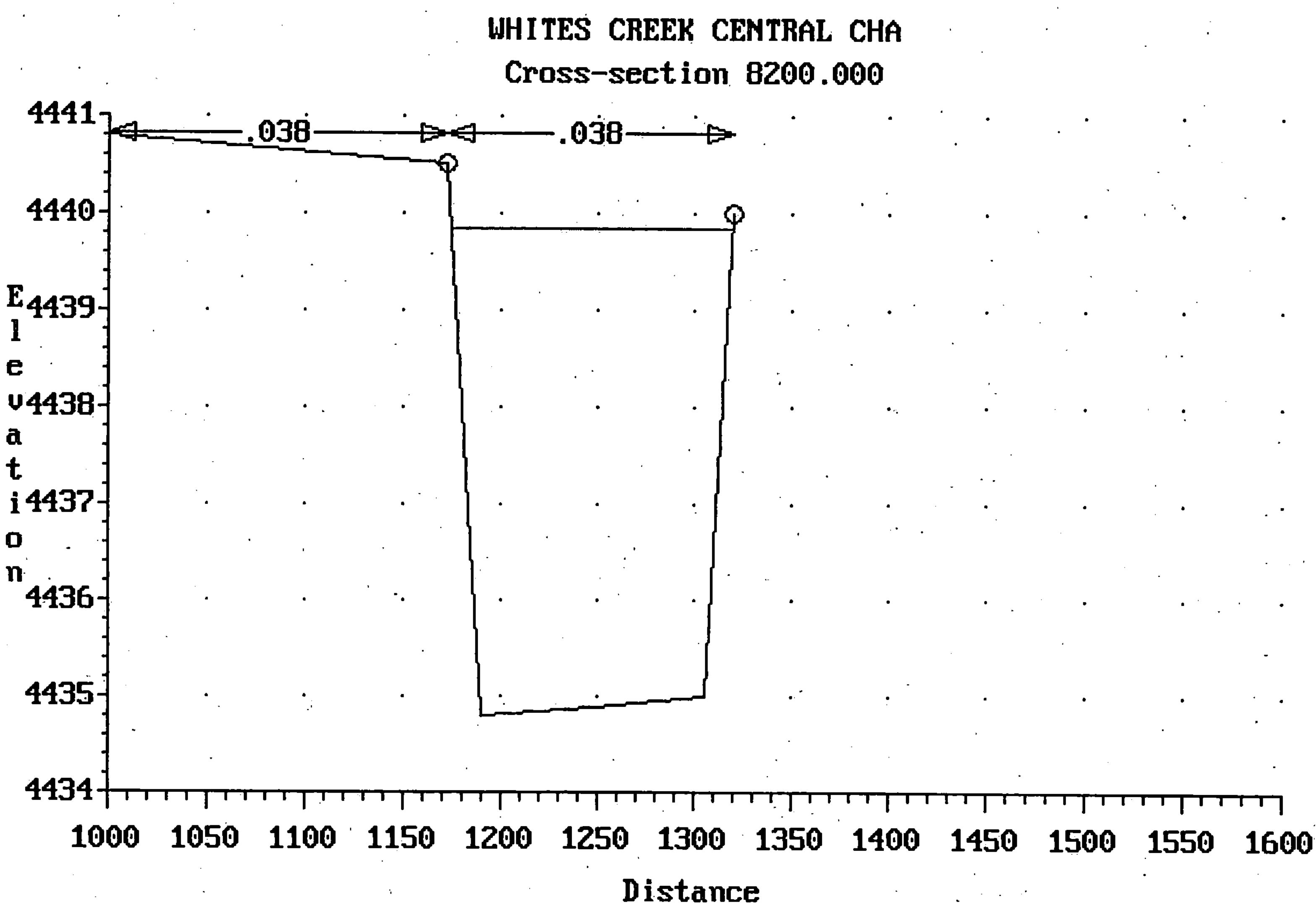
WHITES CREEK CENTRAL CHA
Cross-section 9200.000
.038
.038
Elevation
4446
4444
4442
4440
4438
4436
4434
4432
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance



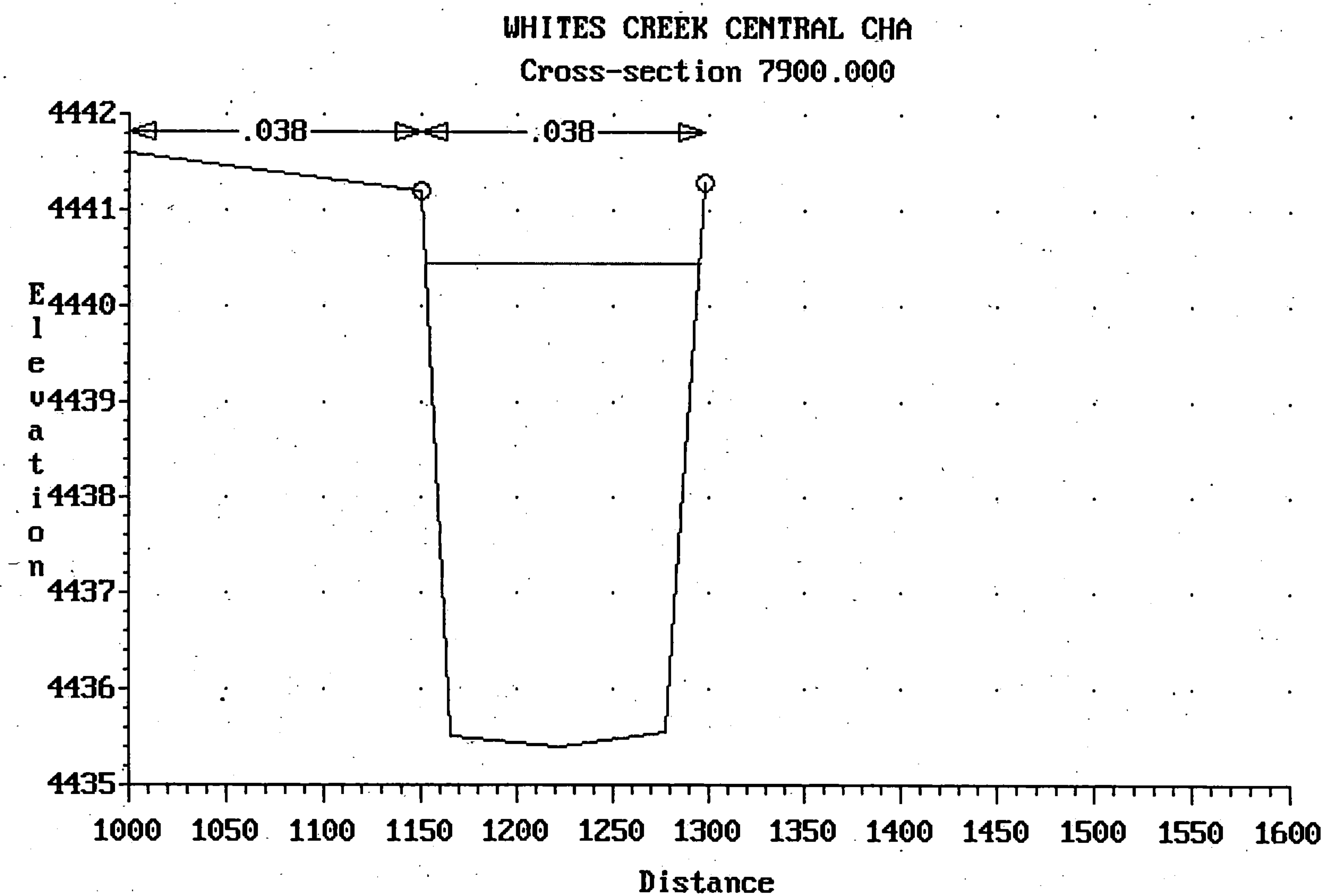
WHITES CREEK CENTRAL CHA
Cross-section 9050.000
.038
.038
Elevation
4440
4439
4438
4437
4436
4435
4434
4433
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance

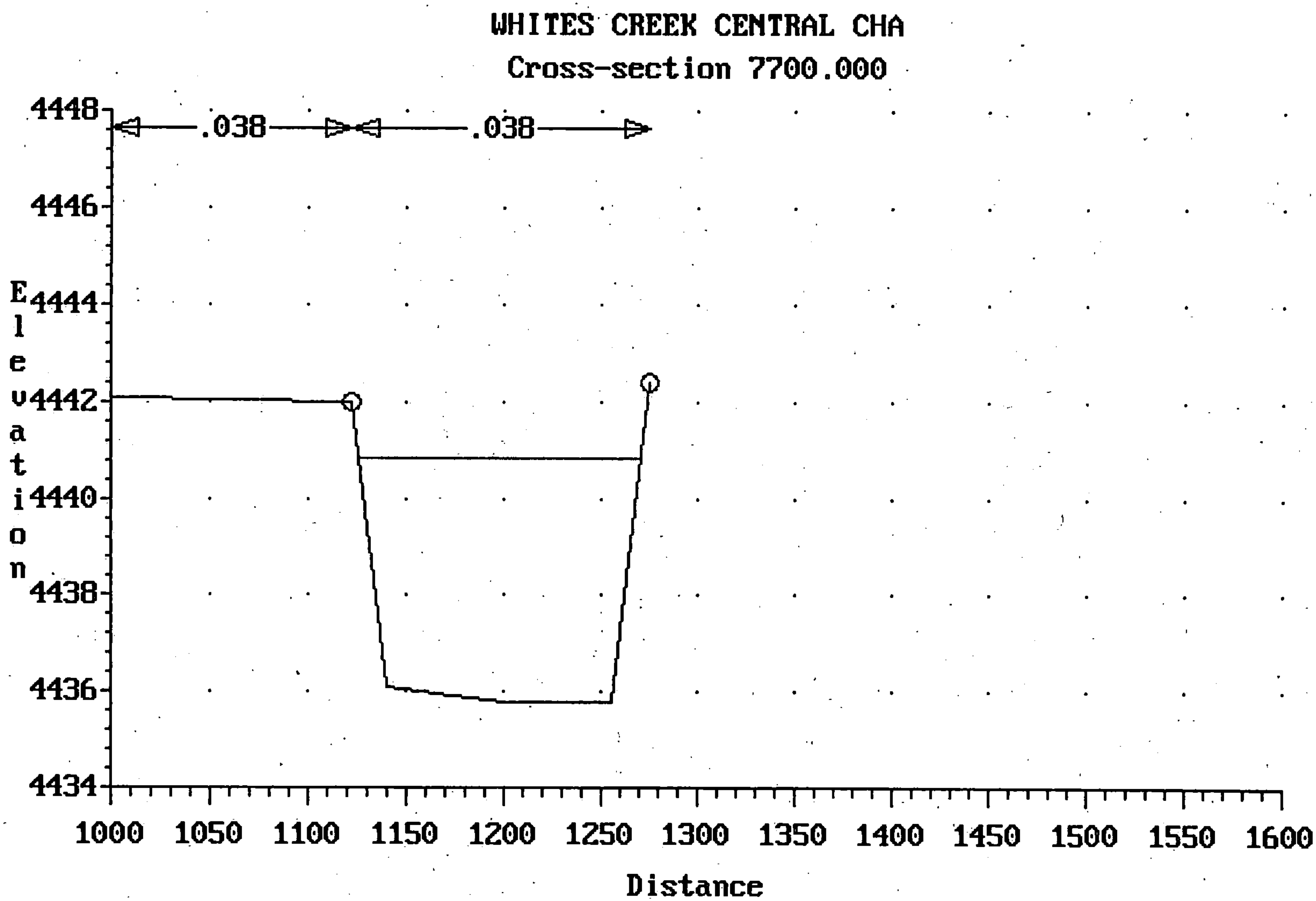

WHITES CREEK CENTRAL CHA
Cross-section 8800.000
.038
.038
4440
4439
4438
4437
4436
4435
4434
4433
Elevation
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance


WHITES CREEK CENTRAL CHA
Cross-section 8500.000
.038
.038
Elevation
4441
4440
4439
4438
4437
4436
4435
4434
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance

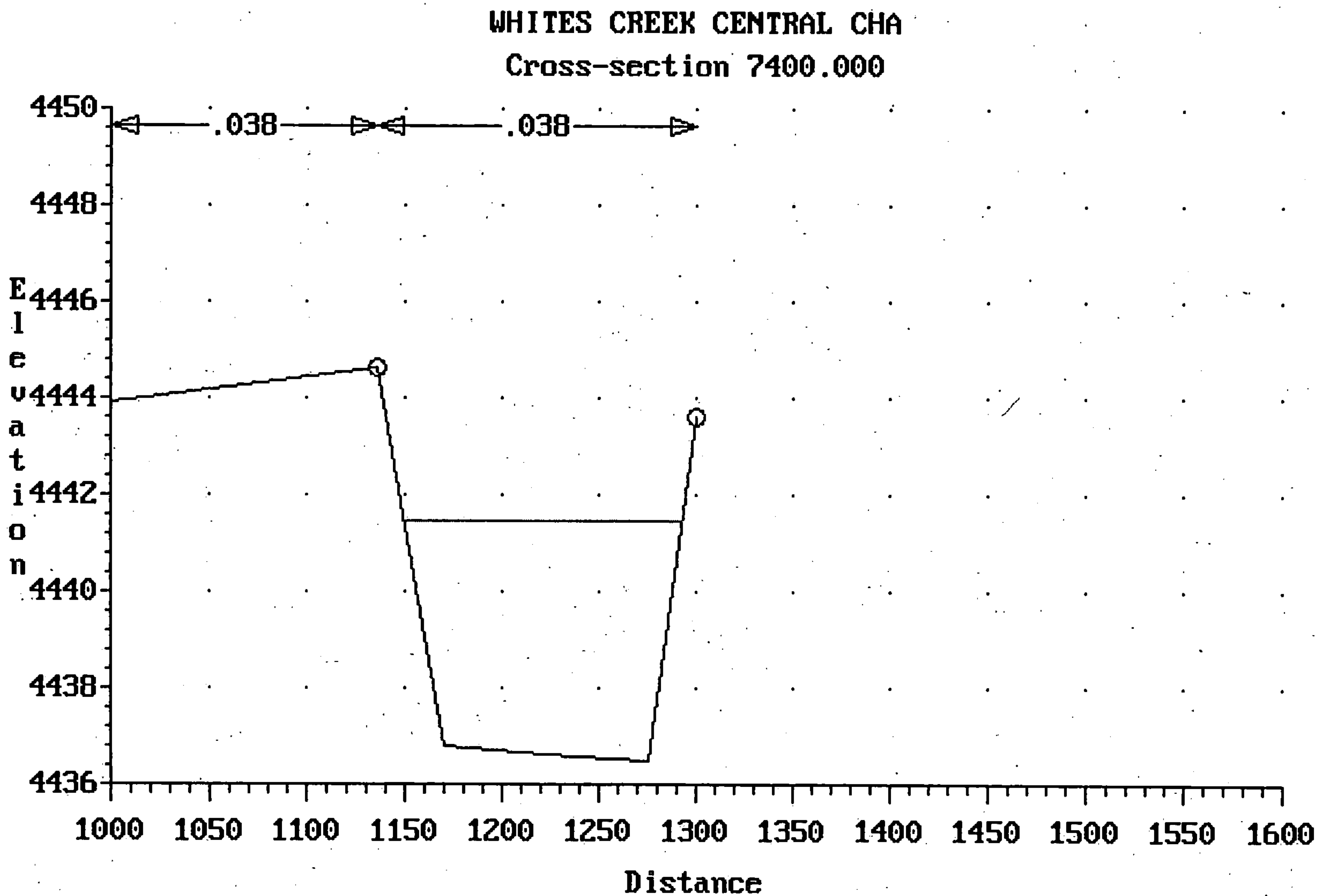


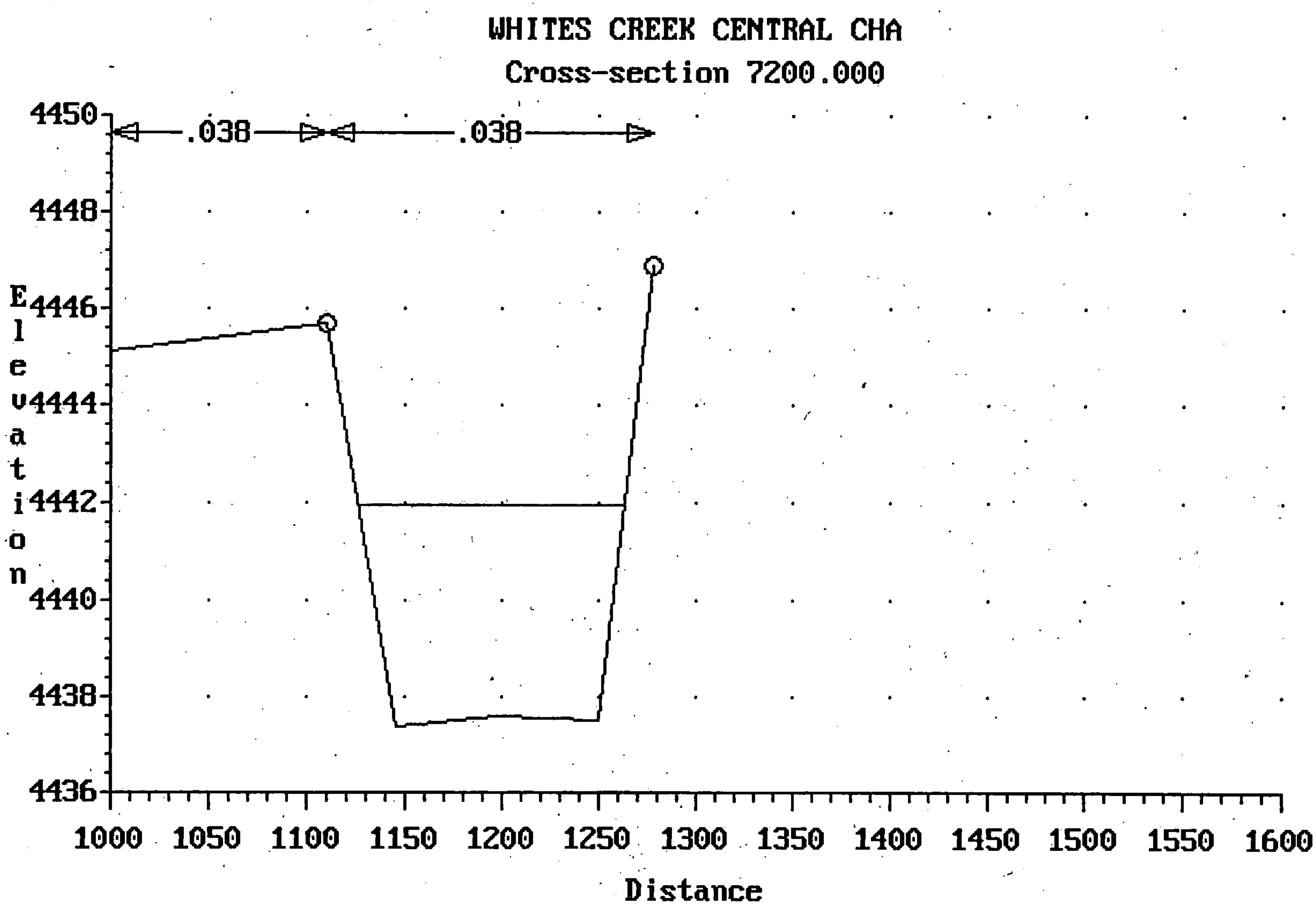
WHITES CREEK CENTRAL CHA
Cross-section 8200.000
.038
.038
4441
4440
4439
4438
4437
4436
4435
4434
Elevation
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance


WHITES CREEK CENTRAL CHA
Cross-section 7900.000
.038
.038
4442
4441
4440
4439
4438
4437
4436
4435
Elevation
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance

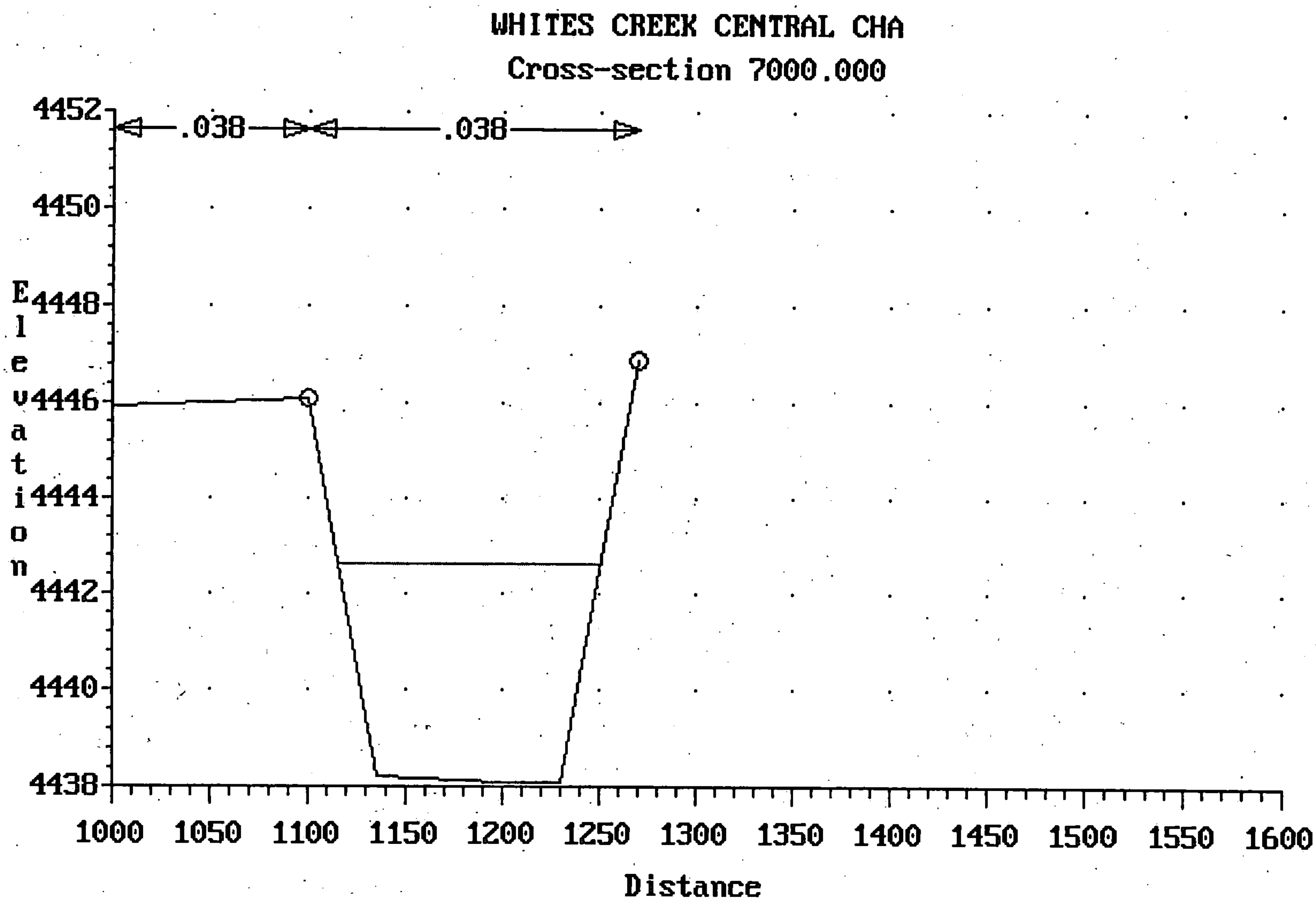


WHITES CREEK CENTRAL CHA
Cross-section 7700.000
.038
.038
Elevation
4448
4446
4444
4442
4440
4438
4436
4434
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance

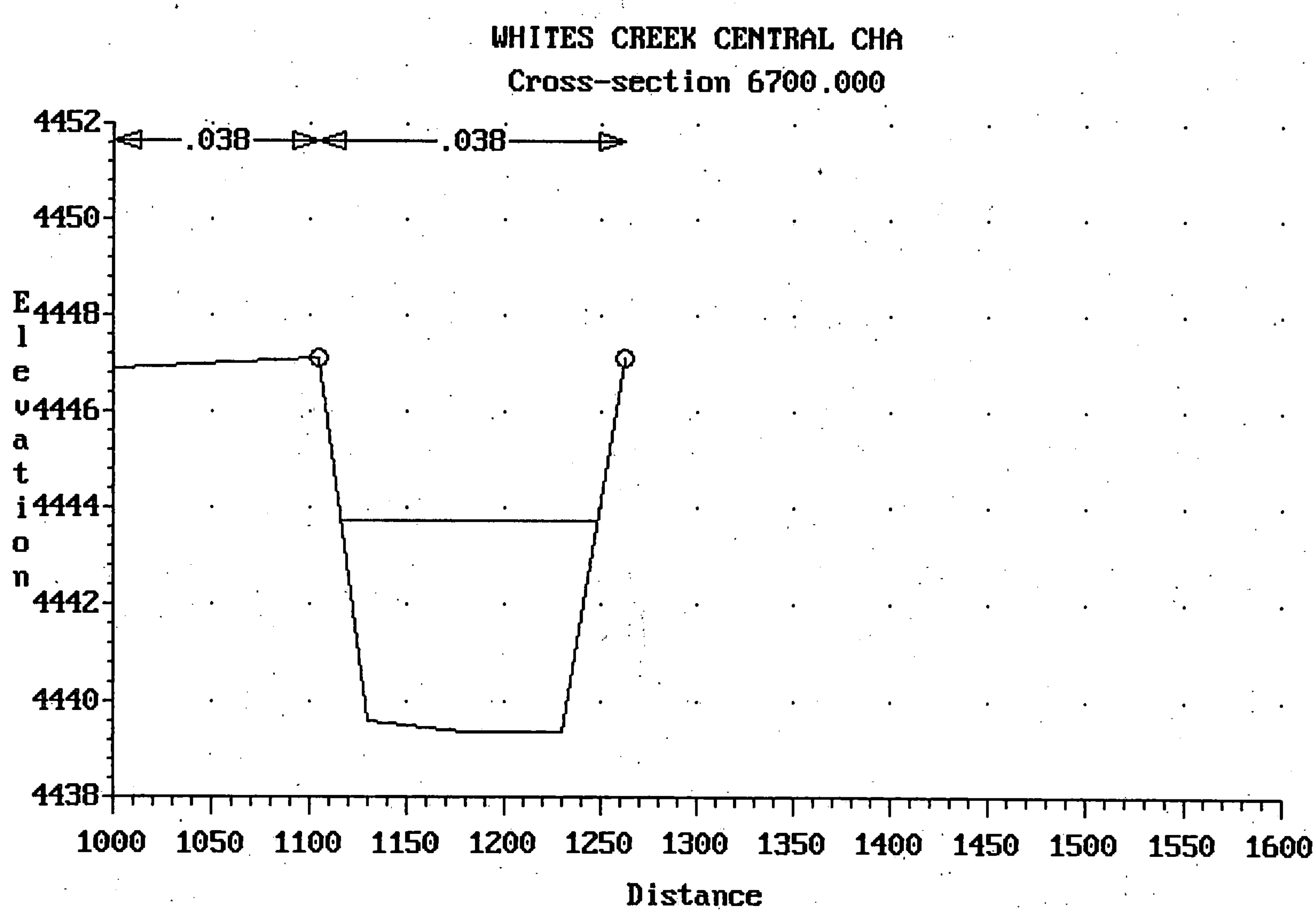

WHITES CREEK CENTRAL CHA
Cross-section 7400.000
.038
.038
Elevation
4450
4448
4446
4444
4442
4440
4438
4436
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance

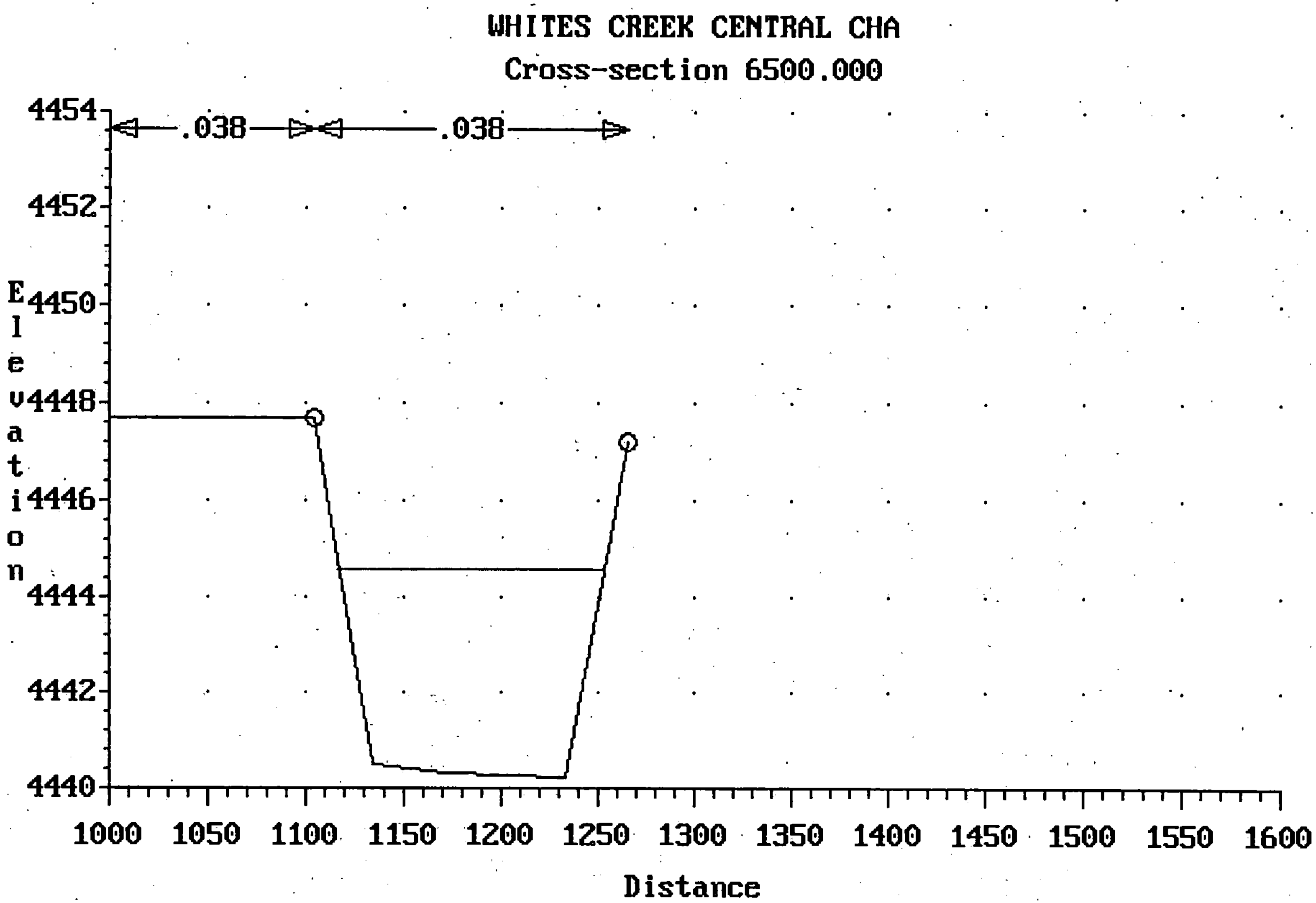


WHITES CREEK CENTRAL CHA
Cross-section 7200.000
.038
.038
Elevation
4450
4448
4446
4444
4442
4440
4438
4436
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance

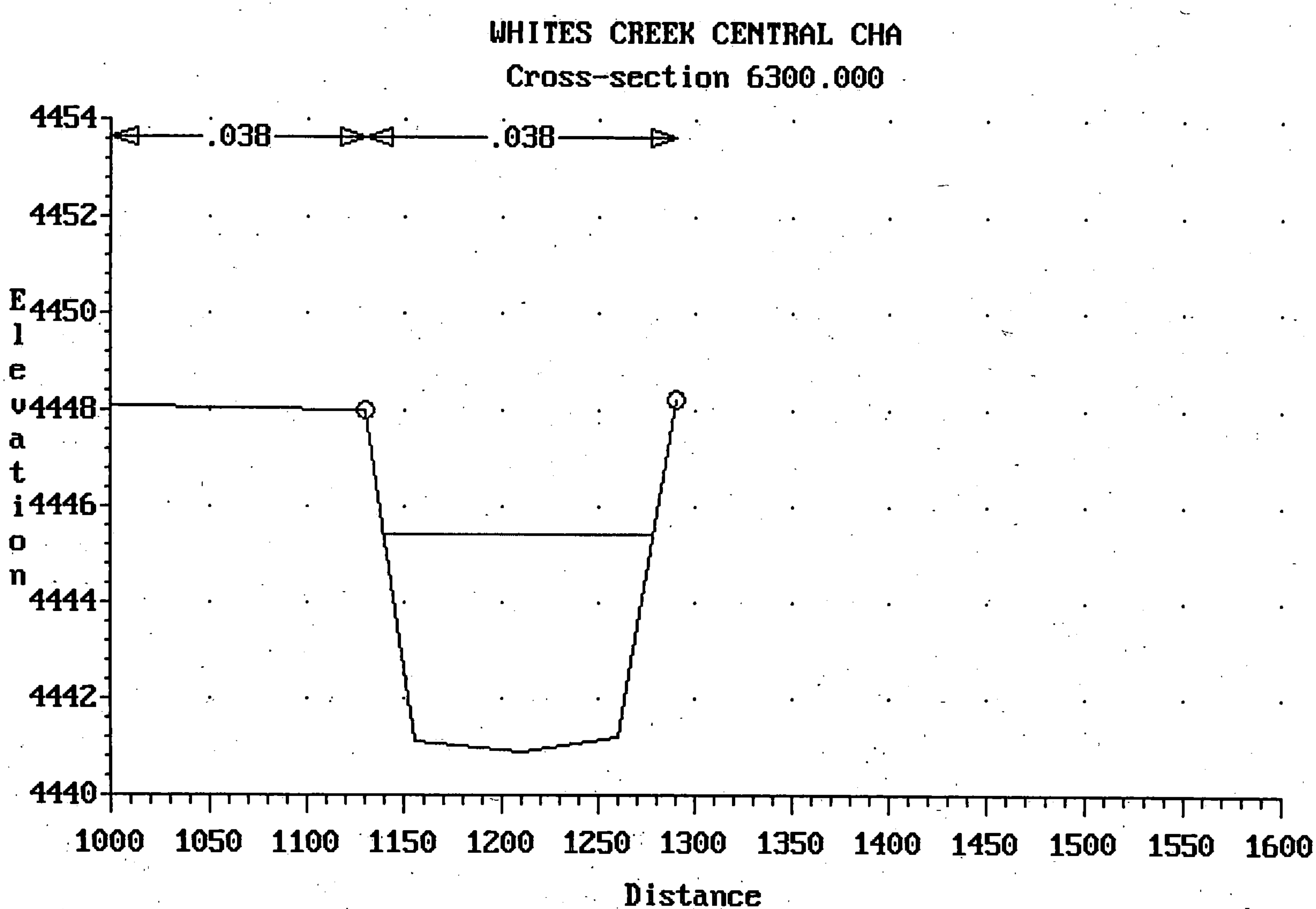


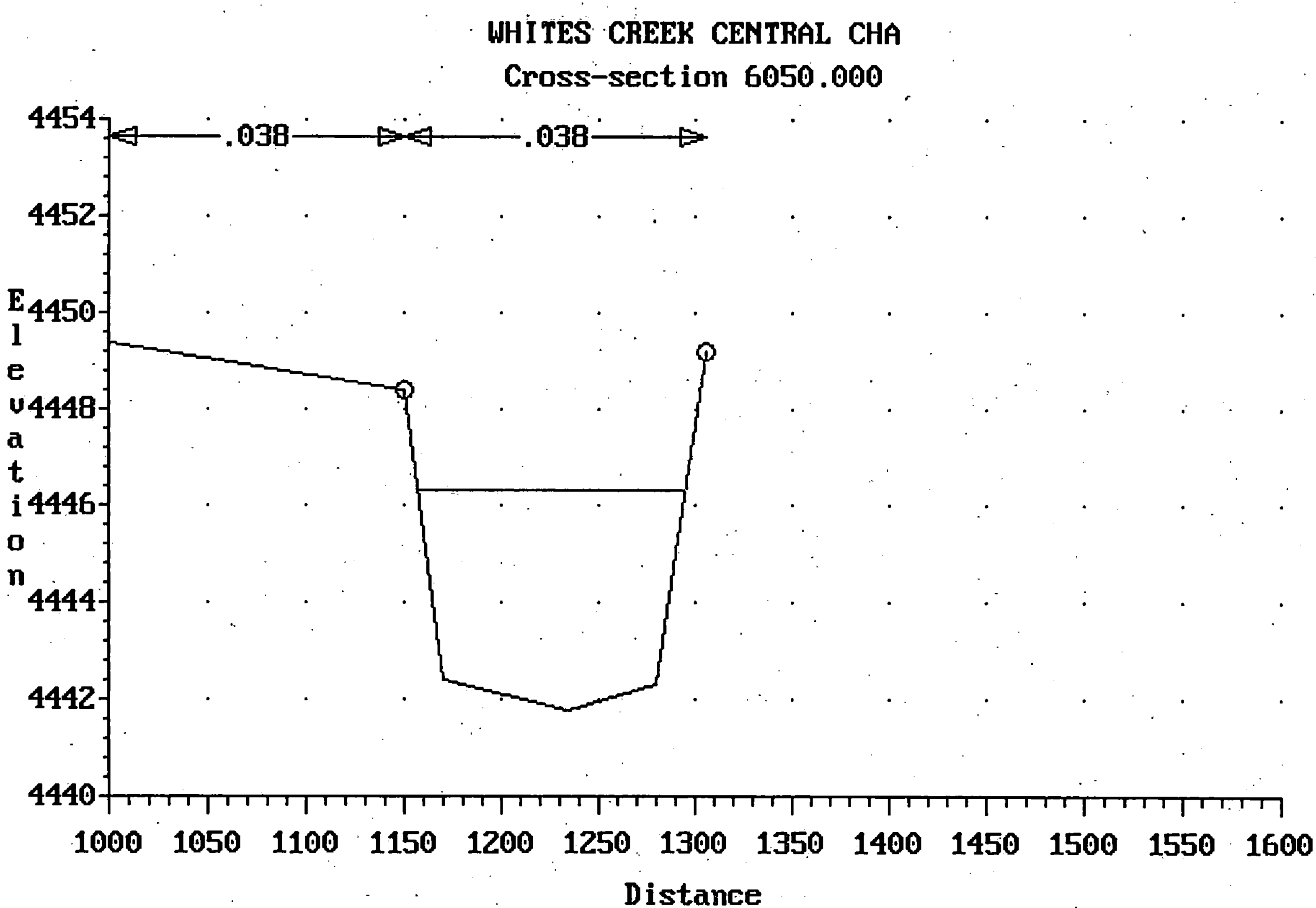
WHITES CREEK CENTRAL CHA
Cross-section 7000.000
.038
.038
4452
4450
4448
4446
4444
4442
4440
4438
Elevation
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance

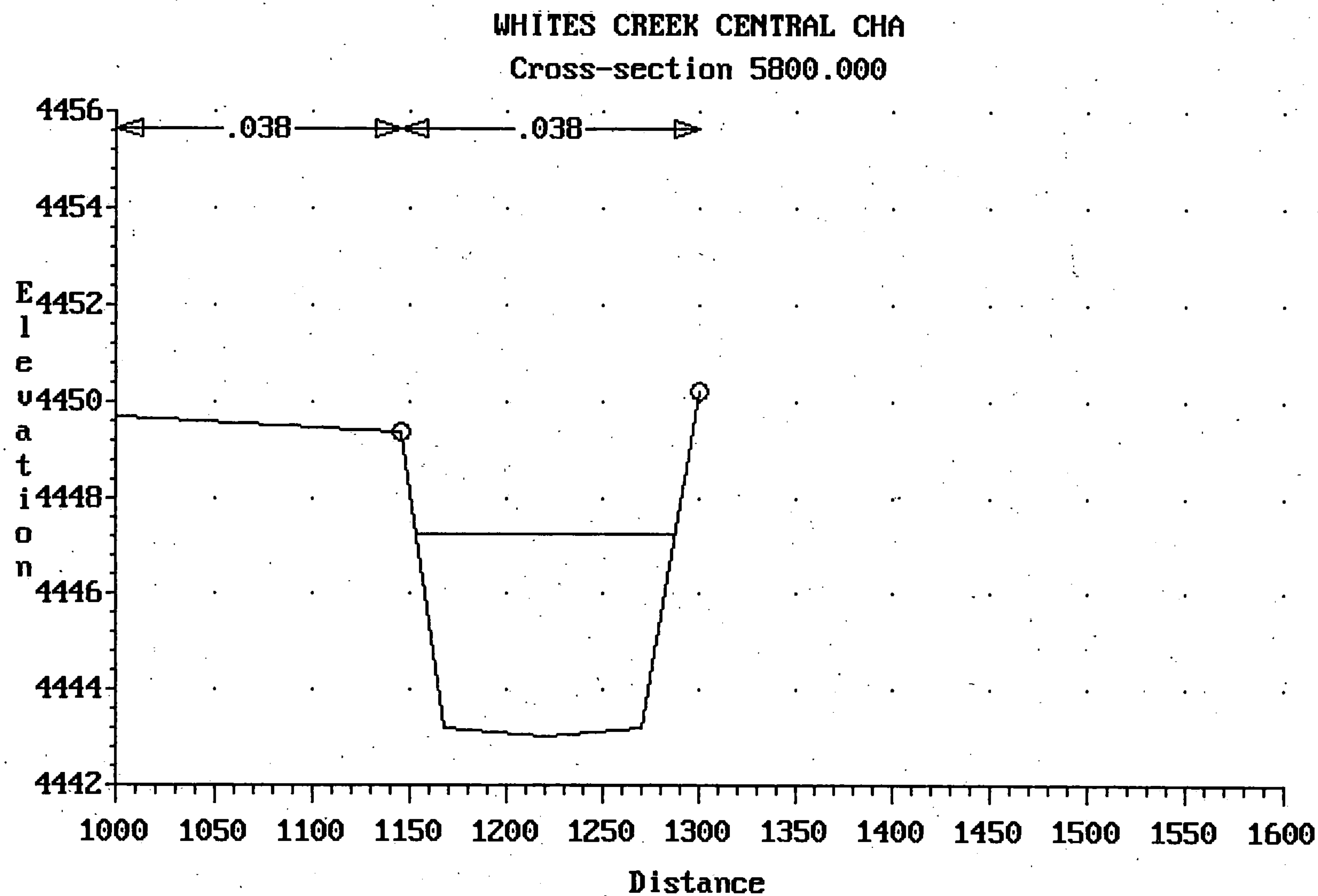

WHITES CREEK CENTRAL CHA
Cross-section 6700.000
.038
.038
Elevation
4452
4450
4448
4446
4444
4442
4440
4438
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance



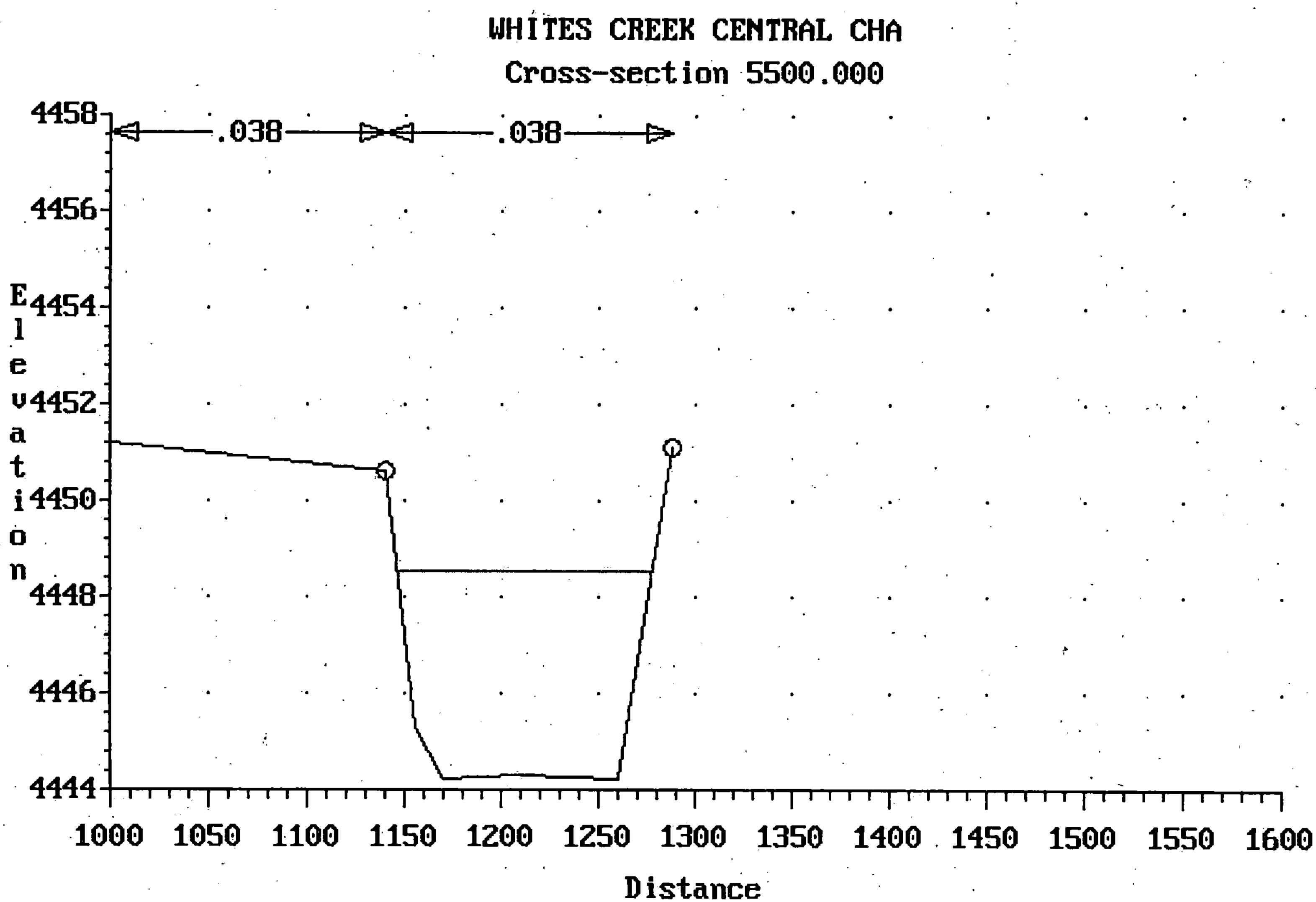
WHITES CREEK CENTRAL CHA
Cross-section 6500.000
.038
.038
4454
4452
4450
4448
4446
4444
4442
4440
Elevation
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance

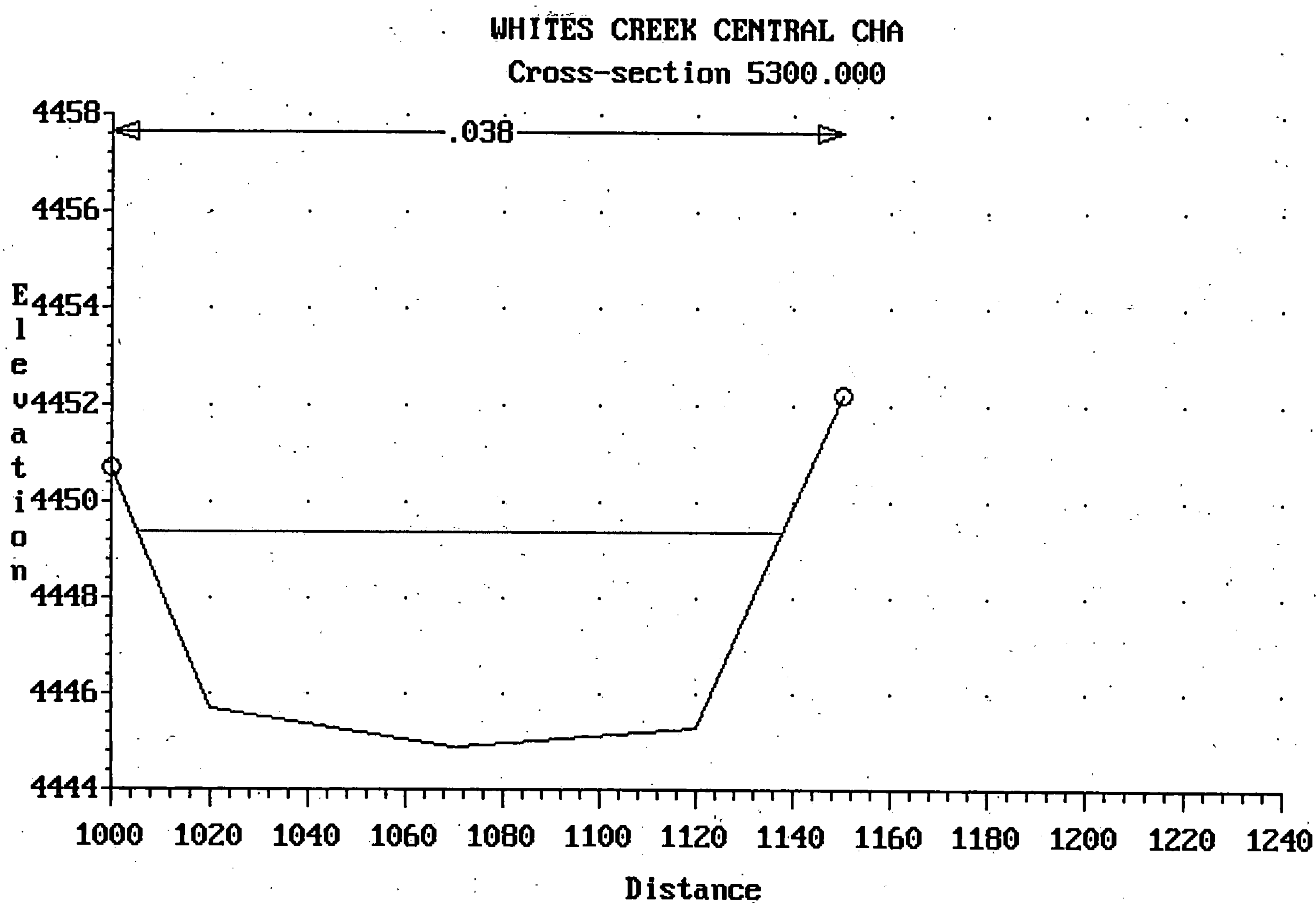

WHITES CREEK CENTRAL CHA
Cross-section 6300.000
.038
.038
Elevation
4454
4452
4450
4448
4446
4444
4442
4440
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance


WHITES CREEK CENTRAL CHA
Cross-section 6050.000
.038
.038
Elevation
4454
4452
4450
4448
4446
4444
4442
4440
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance

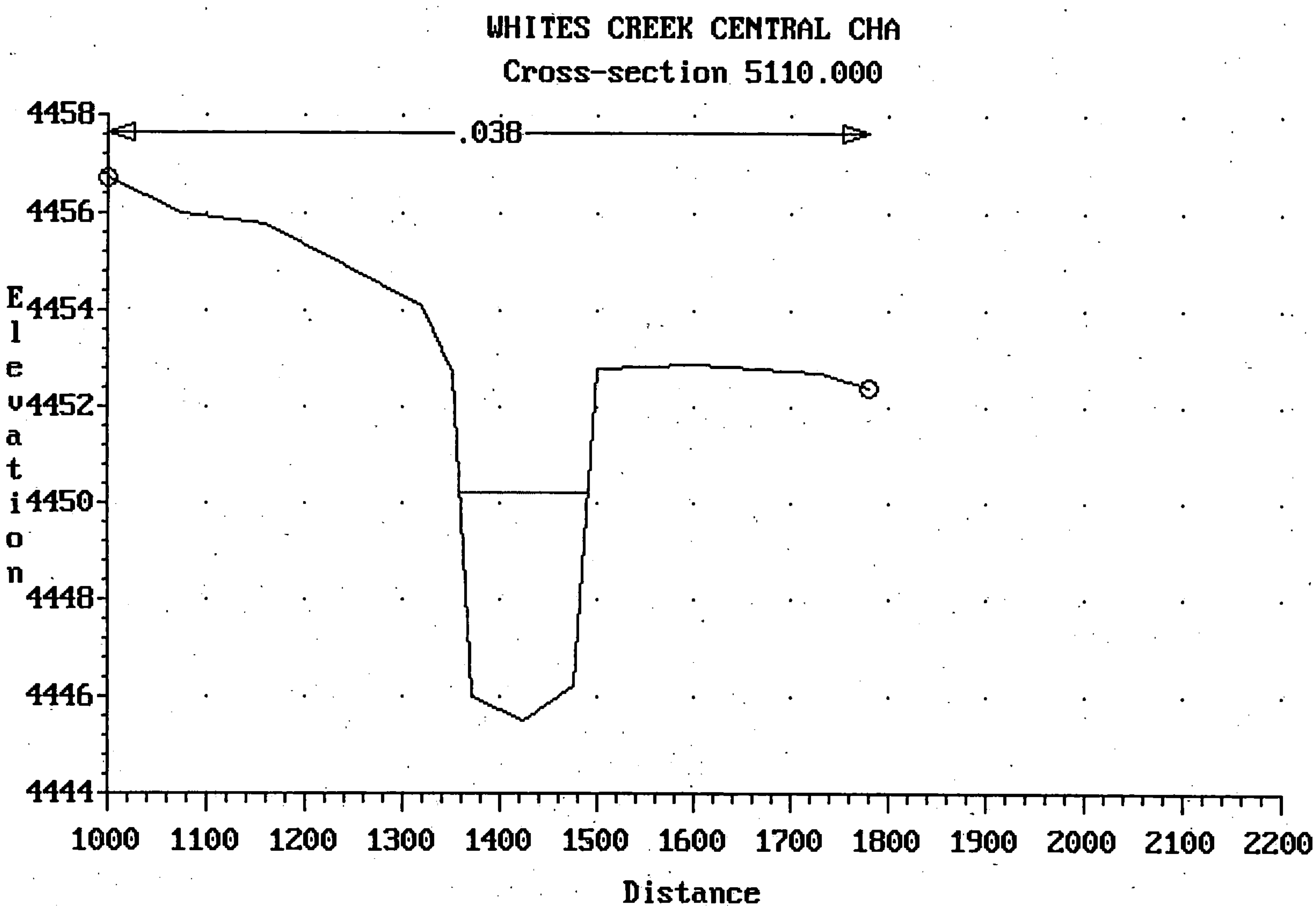


WHITES CREEK CENTRAL CHA
Cross-section 5800.000
.038
.038
Elevation
4456
4454
4452
4450
4448
4446
4444
4442
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance


WHITES CREEK CENTRAL CHA
Cross-section 5500.000
.038
.038
Elevation
4458
4456
4454
4452
4450
4448
4446
4444
1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
Distance



WHITES CREEK CENTRAL CHA
Cross-section 5300.000
.038
Elevation
4458
4456
4454
4452
4450
4448
4446
4444
1000
1020
1040
1060
1080
1100
1120
1140
1160
1180
1200
1220
1240
Distance


WHITES CREEK CENTRAL CHA
Cross-section 5110.000
.038
Elevation
4458
4456
4454
4452
4450
4448
4446
4444
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
Distance

Project DOUBLE DIAMOND LOMR
Project No. 0508
Sheet No. 1 of 2
Calculated by [initials] Date 8/8/06

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

CROSS SECTION PARAMETERS: FILENAME: 508AS-C.SEC

No. of Cross Section Points: 21 Bed Slope:0.00500 Max Elev.:4433.00
Bank Stations..........Left: 1000.0 Right....: 1675.0 Min Elev.:4426.80
Encroachment Stations..Left: Right....: 1675.0
Manning-n Values........LOB: 0.038 CHANNEL..: 0.038 ROB.....: 0.038

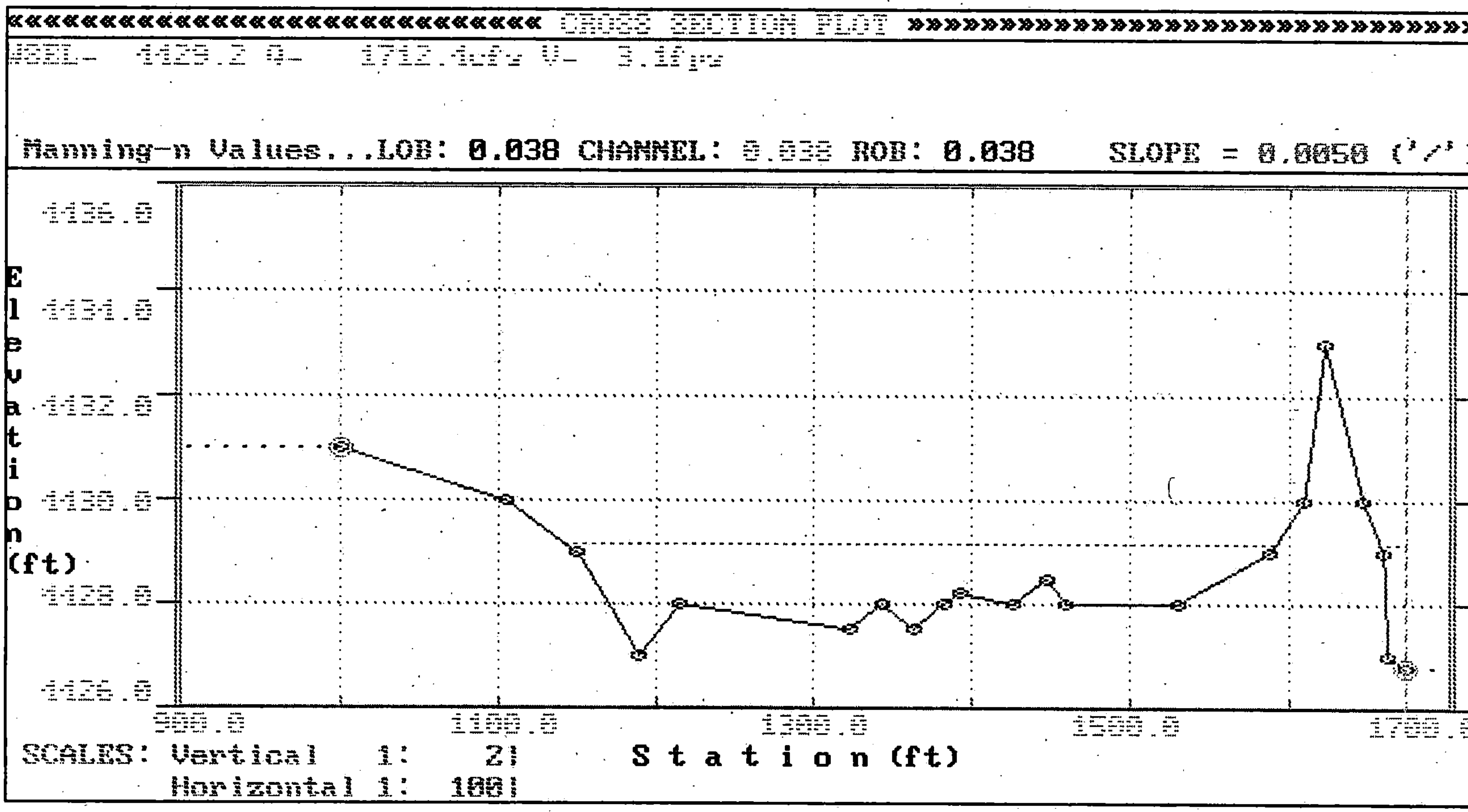
CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	4431.00	1000.00	2)	4430.00	1105.00	3)	4429.00	1150.00
4)	4427.00	1190.00	5)	4428.00	1215.00	6)	4427.50	1325.00
7)	4428.00	1345.00	8)	4427.50	1365.00	9)	4428.00	1385.00
10)	4428.20	1395.00	11)	4428.00	1428.00	12)	4428.50	1450.00
13)	4428.00	1462.00	14)	4428.00	1532.00	15)	4429.00	1590.00
[illegible]	4430.00	1612.00	17)	4433.00	1625.00	18)	4430.00	1648.00
[illegible]	4429.00	1660.00	20)	4427.00	1664.00	21)	4426.80	1675.00

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	ALPHA	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
4429.16	1712.4	3.1	0.50	0.038	1.0	467.6	553.7	468.2	4428.67

NOTES:


CROSS SECTION PLOT
WSEL- 4129.2 Q- 1712.4cfs V- 3.1fps
Manning-n Values...LOB: 0.038 CHANNEL: 0.038 ROB: 0.038 SLOPE = 0.0050 ('/')
4136.0
4134.0
4132.0
4130.0
4128.0
4126.0
Elevation (ft)
900.0
1100.0
1300.0
1500.0
1700.0
Station (ft)
SCALES: Vertical 1: 2
Horizontal 1: 100

Project Duble Diamond LOMR
Project No. 9508
Sheet No. 1 of 2
Calculated by (TMD) Date 8/8/96

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

CROSS SECTION PARAMETERS: FILENAME: 508AS-B.SEC

No. of Cross Section Points: 22 Bed Slope:0.00500 Max Elev.:4431.00
Bank Stations..........Left: 1000.0 Right....: 1678.0 Min Elev.:4425.90
Encroachment Stations..Left: Right....:
Manning-n Values........LOB: 0.038 CHANNEL..: 0.038 ROB.....: 0.038

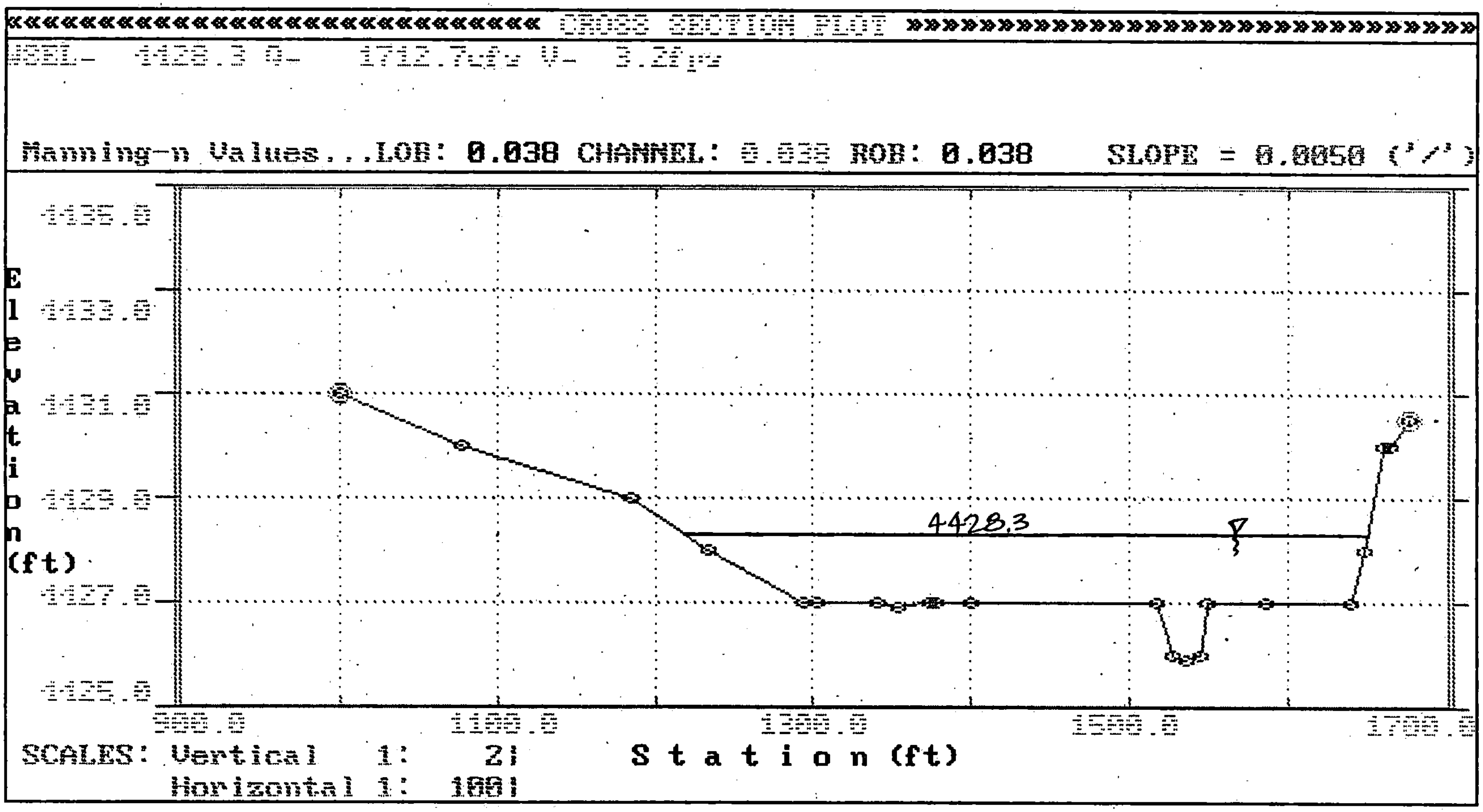
CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	4431.00	1000.00	2)	4430.00	1078.00	3)	4429.00	1185.00
4)	4428.00	1235.00	5)	4427.00	1295.00	6)	4427.00	1305.00
7)	4427.00	1342.00	8)	4426.90	1355.00	9)	4427.00	1375.00
10)	4427.00	1380.00	11)	4427.00	1402.00	12)	4427.00	1520.00
13)	4426.00	1530.00	14)	4425.90	1538.00	15)	4426.00	1548.00
	4427.00	1552.00	17)	4427.00	1588.00	18)	4427.00	1642.00
	4428.00	1650.00	20)	4430.00	1662.00	21)	4430.00	1666.00
22)	4430.50	1678.00						

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	ALPHA	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
4428.30	1712.7	3.2	0.50	0.038	1.0	431.9	536.3	432.2	4427.80

NOTES:



CROSS SECTION PLOT
WSEL- 4428.3 Q- 1712.7cfs V- 3.2fps
Manning-n Values...LOB: 0.038 CHANNEL: [illegible] ROB: 0.038 SLOPE = 0.0050 ('/')
4435.0
4433.0
4431.0
4429.0
4427.0
4425.0
Elevation (ft)
4428.3
900.0
1100.0
1300.0
1500.0
1700.0
SCALES: Vertical 1: 2
Horizontal 1: 100
Station (ft)

Project DOUBLE DIAMOND LOOP
Project No. 0508
Sheet No. 1 of 2
Calculated by MD Date 8/8/06

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

CROSS SECTION PARAMETERS: FILENAME : 508AS-A.SEC

No. of Cross Section Points: 12 Bed Slope:0.00500 Max Elev.:4431.00
Bank Stations..........Left: 1000.0 Right.....: 1638.0 Min Elev.:4426.00
Encroachment Stations..Left: Right....: 1638.0
Manning-n Values........LOB: 0.038 CHANNEL..: 0.038 ROB.....: 0.038

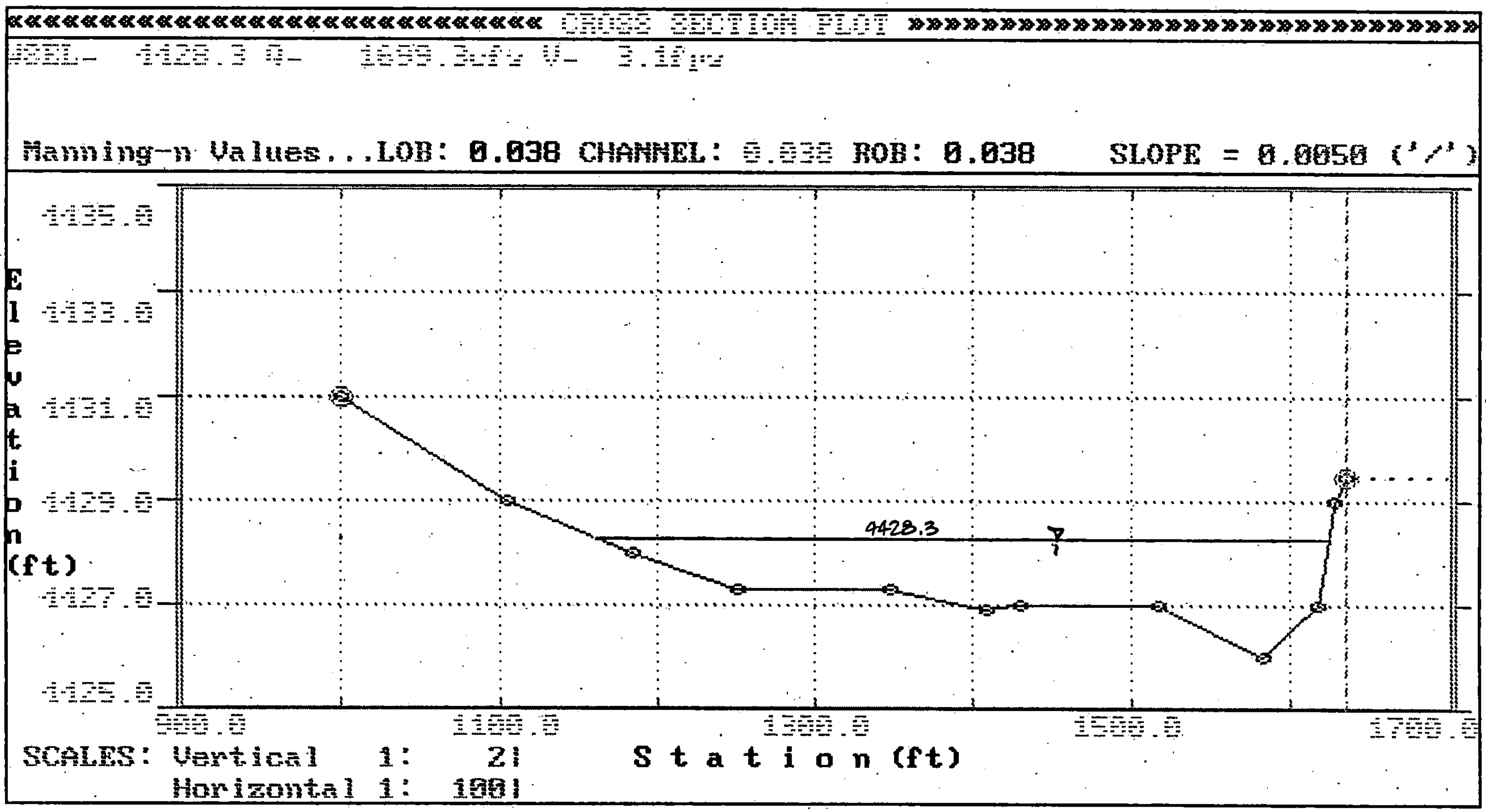
CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	4431.00	1000.00	2)	4429.00	1105.00	3)	4428.00	1185.00
4)	4427.30	1252.00	5)	4427.30	1350.00	6)	4426.90	1410.00
7)	4427.00	1432.00	8)	4427.00	1520.00	9)	4426.00	1585.00
10)	4427.00	1620.00	11)	4429.00	1630.00	12)	4429.50	1638.00

PUTED PARAMETERS:

L(ft)	Q(cfs)	V(fps)	Fr No.	ne	ALPHA	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
4428.31	1699.3	3.1	0.50	0.038	1.0	466.4	550.4	466.6	4427.82
4428.32	1712.2	3.1	0.50	0.038	1.0	466.9	553.2	467.1	4427.82

NOTES:



CROSS SECTION PLOT
Manning-n Values...LOB: 0.038 CHANNEL: 0.038 ROB: 0.038 SLOPE = 0.0050 ('/')
4435.0
4433.0
4431.0
4429.0
4427.0
4425.0
Elevation (ft)
4428.3
900.0
1100.0
1300.0
1500.0
1700.0
SCALES: Vertical 1: 2|
Horizontal 1: 100|
Station (ft)

```
1*********************************************                 *****************************************
*  HEC-2 WATER SURFACE PROFILES               *                 *  U.S. ARMY CORPS OF ENGINEERS          *
*                                             *                 *  HYDROLOGIC ENGINEERING CENTER         *
*  Version   4.6.2;  May 1991                 *                 *  609 SECOND STREET, SUITE D            *
*                                             *                 *  DAVIS, CALIFORNIA 95616-4687          *
*  RUN DATE   27SEP95     TIME   11:37:35     *                 *        (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
  27SEP95      11:37:35                                                              PAGE    1


                                                         THIS RUN EXECUTED 27SEP95     11:37:35
****************************************
 HEC-2 WATER SURFACE PROFILES

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


T1      DOUBLE DIAMOND CENTRAL CHANNEL
T2      PHASING RUN FOR PARTIAL COMPLETION OF CENTRAL CHANNEL
T3      FILE 506phas1.DAT


J1  ICHECK    INQ     NINV     IDIR     STRT    METRIC    HVINS      Q       WSEL      FQ

       0        2       0        0     .005       0         0        0    4453.5       0

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH     FN      ALLDC     IBW     CHNIM     ITRACE

    -1        0       -1


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   150       38       43       13       15       16       26        1       53       54
     4       25

NC     .045     .045     .045      .3       .5
QT        1     3000
X1      102       48     1643     1830        0        0        0
GR   4453.9     1000   4454.0     1025   4453.8     1058   4454.0     1089   4453.9     1112
GR   4454.0     1130   4454.1     1195   4453.7     1212   4454.0     1235   4454.0     1281
--   4454.1     1294   4453.9     1340   4454.1     1385   4454.3     1448   4453.9     1501
     4454.1     1502   4453.4     1533   4453.1     1560   4453.8     1572   4452.9     1580
ur   4453.4     1585   4453.5     1615   4453.5     1643   4453.2     1710   4452.9     1738
GR   4453.3     1758   4453.5     1830   4453.9     1898   4453.7     1935   4453.9     1956
GR   4453.7     1975   4454.2     2015   4453.9     2035   4454.1     2040   4453.8     2085
GR   4454.0     2112   4453.3     2130   4454.3     2172   4453.9     2202   4454.3     2243
GR   4454.4     2315   4453.4     2335   4454.4     2345   4454.5     2364   4454.0     2395
```

```
GR   4453.6     2485   4454.0     2540   4455.0     2618

X1      104       54     1970     2148      800      575      600
     4456.0     1000   4456.5     1030   4455.7     1060   4456.5     1115   4456.4     1172
     4456.6     1357   4456.3     1403   4456.8     1412   4455.9     1422   4456.8     1430
     4456.0     1437   4456.4     1445   4456.0     1480   4456.5     1495   4456.7     1520
GR   4456.0     1530   4457.0     1540   4456.7     1555   4456.5     1634   4456.4     1781
GR   4456.6     1830   4456.8     1852   4457.0     1970   4456.6     1990   4457.2     2020
GR   4456.3     2048   4458.0     2068   4456.0     2090   4455.0     2100   4456.1     2135
GR   4457.0     2148   4457.0     2172   4456.6     2215   4456.4     2245   4456.5     2273
GR   4456.0     2305   4456.3     2328   4455.9     2368   4456.3     2465   4456.0     2495
GR   4457.1     2515   4456.7     2568   4457.0     2595   4456.5     2625   4457.0     2650
GR   4457.3     2660   4456.0     2672   4456.9     2690   4456.6     2717   4456.5     2825
GR   4457.0     2905   4456.6     2940   4457.0     3080   4458.0     3145
1
  27SEP95     11:37:35                                                          PAGE    2


X1      106       51     2430     2570      700      850      810
GR   4465.0     1000   4464.0     1015   4462.9     1070   4463.5     1080   4463.0     1122
GR   4462.0     1170   4461.0     1320   4461.0     1420   4460.0     1560   4461.0     1613
GR   4460.0     1720   4460.0     1805   4459.9     1830   4460.0     1848   4459.8     1871
GR   4460.2     1920   4459.9     1970   4460.2     2000   4460.0     2045   4460.8     2212
GR   4461.1     2235   4460.8     2260   4461.1     2280   4460.4     2312   4460.8     2328
GR   4460.6     2370   4461.0     2408   4460.0     2422   4461.0     2430   4460.0     2440
GR   4460.2     2475   4460.0     2523   4458.9     2530   4460.0     2540   4461.0     2570
GR   4462.0     2690   4463.0     2795   4463.0     2825   4462.0     2912   4462.0     2965
GR   4462.0     3005   4463.0     3060   4463.4     3090   4463.1     3108   4463.4     3120
GR   4463.0     3165   4462.8     3198   4463.0     3222   4464.5     3260   4464.0     3275
GR   4465.0     3285

        108       45     2196     2323      800      850      745
     4467.0     1000   4466.0     1230   4465.5     1355   4466.0     1435   4466.2     1493
GR   4466.0     1528   4465.0     1545   4466.0     1560   4465.0     1665   4464.1     1810
GR   4464.4     1858   4464.0     1902   4464.8     2040   4464.0     2112   4464.5     2196
GR   4463.9     2265   4464.1     2273   4463.2     2282   4464.7     2291   4462.5     2298
GR   4463.5     2304   4464.4     2323   4464.0     2448   4463.8     2461   4464.0     2480
GR   4463.6     2500   4464.0     2555   4465.0     2652   4465.0     2690   4465.3     2772
GR   4465.5     2805   4466.0     2855   4465.0     2910   4464.7     2925   4465.0     2970
GR   4465.4     3030   4465.0     3078   4464.4     3108   4465.0     3130   4466.0     3250
GR   4466.5     3295   4466.0     3315   4465.7     3320   4466.0     3328   4466.7     3390

X1      110       39     1495     1550      575      625      625
GR   4470.0     1000   4468.9     1020   4469.5     1070   4468.6     1155   4467.8     1240
GR   4467.8     1284   4468.2     1330   4467.6     1360   4468.1     1375   4466.9     1430
GR   4467.0     1460   4467.6     1495   4466.0     1520   4467.0     1525   4468.0     1550
GR   4467.5     1565   4468.1     1595   4467.9     1605   4468.1     1630   4467.5     1660
GR   4467.8     1712   4466.8     1760   4467.0     1780   4467.0     1795   4468.0     1890
GR   4469.0     2078   4470.0     2130   4469.0     2158   4468.9     2190   4470.0     2210
GR   4470.0     2230   4470.0     2262   4470.1     2295   4469.8     2352   4469.0     2428
GR   4467.9     2458   4469.0     2490   4470.0     2533   4470.6     2670
1
  27SEP95     11:37:35                                                          PAGE    3


   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

CCHV=      .300 CEHV=      .500
*SECNO 102.000
```

3280 CROSS SECTION 102.00 EXTENDED .80 FEET

102.000	1.80	4454.70	.00	4453.50	4454.78	.08	.00	.00	4453.50
3000.0	1108.7	772.7	1118.6	517.5	262.2	555.8	.0	.0	4453.50
.00	2.14	2.95	2.01	.045	.045	.045	.000	4452.90	1000.00
.005075	0.	0.	0.	0	0	6	.00	1594.58	2594.58

*SECNO 104.000

3265 DIVIDED FLOW

3280 CROSS SECTION 104.00 EXTENDED 1.38 FEET

104.000	2.38	4457.38	.00	.00	4457.42	.05	2.63	.01	4457.00
3000.0	1491.3	270.1	1238.6	858.5	154.1	742.3	24.1	28.6	4457.00
.11	1.74	1.75	1.67	.045	.045	.045	.000	4455.00	1000.00
.003063	800.	600.	575.	6	0	0	.00	2090.32	3104.50

*SECNO 106.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .54

106.000	2.28	4461.18	.00	.00	4461.33	.15	3.86	.05	4461.00
3000.0	2495.0	503.8	1.2	813.2	145.1	1.8	47.5	57.9	4461.00
.18	3.07	3.47	.66	.045	.045	.045	.000	4458.90	1294.22
.010560	700.	810.	850.	3	0	0	.00	1296.41	2590.63

*SECNO 108.000

DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.83

108.000	3.03	4465.53	.00	.00	4465.59	.07	4.23	.03	4464.50
3000.0	1249.9	474.4	1275.7	625.0	193.6	646.2	70.0	84.2	4464.40
.28	2.00	2.45	1.97	.045	.045	.045	.000	4462.50	1348.04
.003159	800.	745.	850.	5	0	0	.00	1538.88	3193.34

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

*SECNO 110.000

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .54

10.000	2.66	4468.66	.00	.00	4468.87	.21	3.21	.07	4467.60
3000.0	1071.7	398.2	1530.1	306.4	86.5	435.5	85.9	101.2	4468.00
.33	3.50	4.60	3.51	.045	.045	.045	.000	4466.00	1149.00
.010672	575.	625.	625.	4	0	0	.00	908.79	2480.21

1

27SEP95 11:37:35 PAGE 5

THIS RUN EXECUTED 27SEP95 11:37:35

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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

FILE 506phas1.DAT

SUMMARY PRINTOUT

	SECNO	Q	QLOB	QROB	K*XNL	VCH	CWSEL	SSTA	ENDST	TOPWID	AREA	
	102.000	3000.00	1108.66	1118.62	45.00	2.95	4454.70	1000.00	2594.58	1594.58	1335.48	.84
	104.000	3000.00	1491.28	1238.58	45.00	1.75	4457.38	1000.00	3104.50	2090.32	1754.96	.84
*	106.000	3000.00	2495.03	1.17	45.00	3.47	4461.18	1294.22	2590.63	1296.41	960.04	.74
*	108.000	3000.00	1249.89	1275.72	45.00	2.45	4465.53	1348.04	3193.34	1538.88	1464.75	.95
	110.000	3000.00	1071.71	1530.06	45.00	4.60	4468.66	1149.00	2480.21	908.79	828.36	.91

1

27SEP95 11:37:35 PAGE 6

FILE 506phas1.DAT

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	102.000	.00	.00	.00	4452.90	3000.00	4454.70	.00	4454.78	50.75	2.95	1335.48	421.11
	104.000	600.00	.00	.00	4455.00	3000.00	4457.38	.00	4457.42	30.63	1.75	1754.96	542.10
*	106.000	810.00	.00	.00	4458.90	3000.00	4461.18	.00	4461.33	105.60	3.47	960.04	291.93
*	108.000	745.00	.00	.00	4462.50	3000.00	4465.53	.00	4465.59	31.59	2.45	1464.75	533.72
*	110.000	625.00	.00	.00	4466.00	3000.00	4468.66	.00	4468.87	106.72	4.60	828.36	290.40

1

27SEP95 11:37:35 PAGE 7

[illegible]E 506phas1.DAT

[illegible]MARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH

	102.000	3000.00	4454.70	.00	.00	1.20	1594.58	.00
	104.000	3000.00	4457.38	.00	2.68	.00	2090.32	600.00
	106.000	3000.00	4461.18	.00	3.80	.00	1296.41	810.00
*	108.000	3000.00	4465.53	.00	4.35	.00	1538.88	745.00
*	110.000	3000.00	4468.66	.00	3.14	.00	908.79	625.00

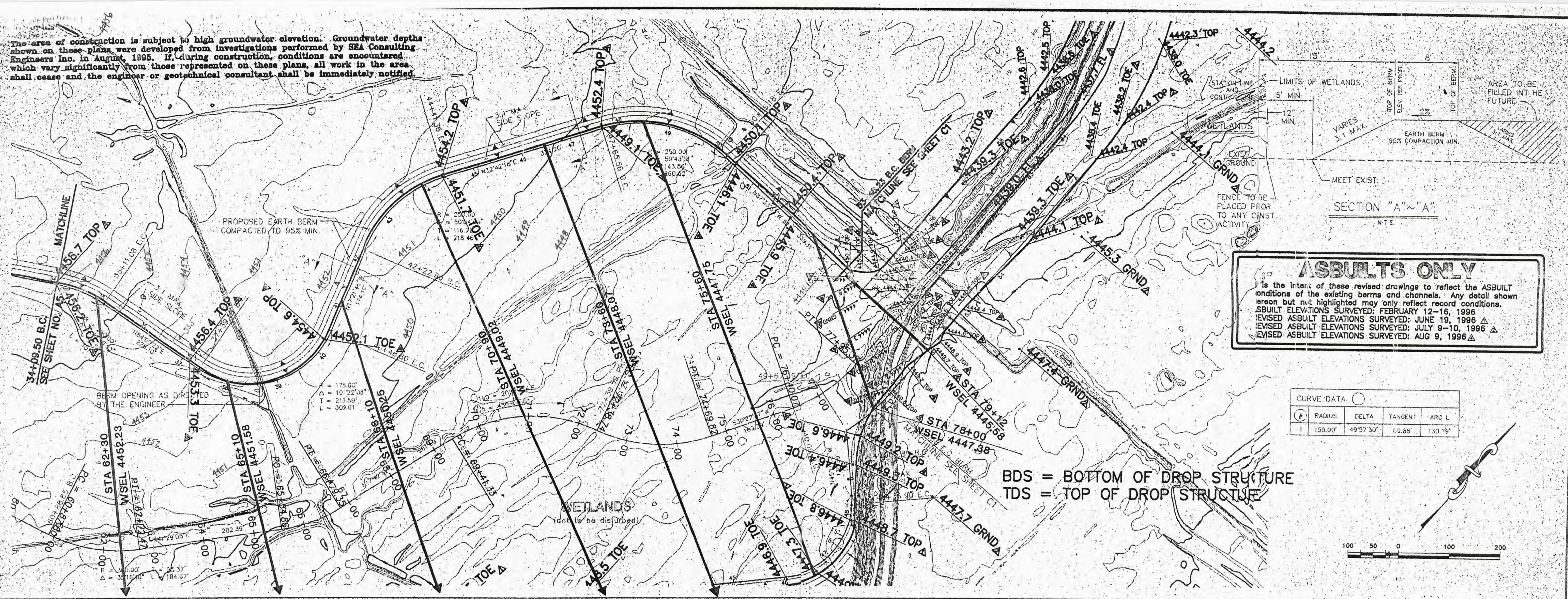
SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 106.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 108.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 110.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

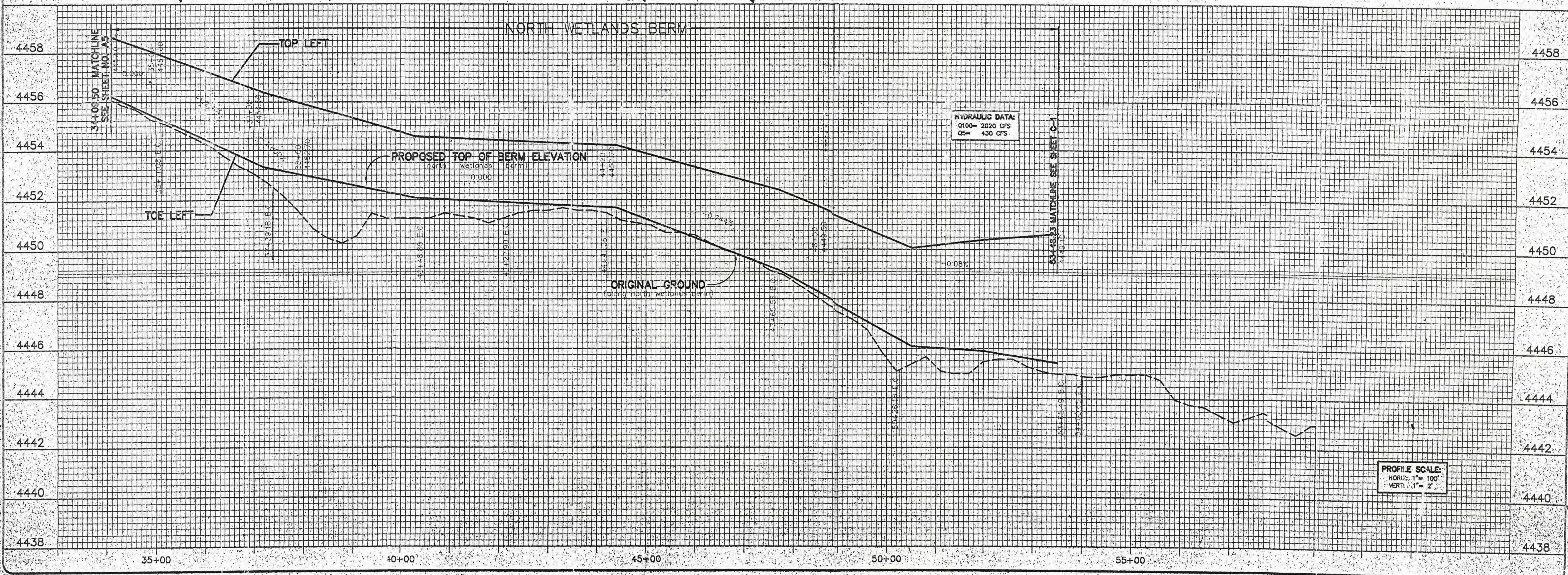
NOTE: The area of construction is subject to high groundwater elevation. Groundwater depths shown on these plans were developed from investigations performed by SEA Consulting Engineers Inc. in August, 1995. If, during construction, conditions are encountered which vary significantly from those represented on these plans, all work in the area shall cease and the engineer or geotechnical consultant shall be immediately notified.



ASBUILTS ONLY

It is the intent of these revised drawings to reflect the ASBUILT conditions of the existing berms and channels. Any detail shown hereon but not highlighted may only reflect record conditions.
ASBUILT ELEVATIONS SURVEYED: FEBRUARY 12–16, 1996
REVISED ASBUILT ELEVATIONS SURVEYED: JUNE 19, 1996 △1
REVISED ASBUILT ELEVATIONS SURVEYED: JULY 9–10, 1996 △2
REVISED ASBUILT ELEVATIONS SURVEYED: AUG 9, 1996 △4

CURVE DATA				
#	RADIUS	DELTA	TANGENT	ARC L
1	150.00'	49°57'30"	69.88'	130.79'



DATE	REVISIONS
9/27/95	FORMAT
	RECEIVED AUG 1 2 1996
	NIMBUS ENGINEERS

RAYMOND R. HEBERT — PROFESSIONAL LAND SURVEYOR — 8/12/96

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

Double Diamond Flood Control Channels
North Wetlands Berm
Reno — Washoe — Nevada

JOB NO.:	9506
SCALE:	1"=100'
FILE:	3289CH02
DATE:	AUG.1995
DESIGN BY:	
DRAWN BY:	
CHECKED BY:	

A6 / 13

A6 AS BUILTS

NOTE: The area of construction is subject to high groundw[illegible] elevation. Groundwater depths shown on these plans were developed from investigations performed by SEA Consulting Engineers Inc. in August, 1995. If, during construction, conditions are encountered which vary significantly from those represented on these plans, all work in the area shall cease and the engineer or geotechnical consultant shall be immediately notified.

CURVE DATA

#	RADIUS	DELTA	TANGENT	ARC L	B.C. STA	E.C. STA
1	150.00'	88°46'49"	146.84'	232.43'	46+04.47	48+36.90
2	287.50'	10°16'27"	55.41'	110.08'	49+67.40	50+77.55
3	300.00'	23°46'33"	63.15'	124.49'	65+55.71	66+80.20
4	300.00'	56°18'04"	162.21'	297.41'	69+42.18	72+39.59 PRC
5	300.00'	44°08'00"	121.61'	231.08'	72+39.59 PRC	74+70.67
6	380.00'	23°39'39"	79.43'	155.30'	76+40.92	77+96.22
7	150.00'	49°57'30"	69.93'	130.79'		

ASBUILTS ONLY

It is the intent of these revised drawings to reflect the ASBUILT conditions of the existing berms and channels. Any detail shown hereon but not highlighted may only reflect record conditions.
ASBUILT ELEVATIONS SURVEYED: FEBRUARY 12–16, 1996
REVISED ASBUILT ELEVATIONS SURVEYED: JUNE 19, 1996
REVISED ASBUILT ELEVATIONS SURVEYED: JULY 9–10, 1996 △
REVISED ASBUILT ELEVATIONS SURVEYED: AUG 9, 1996 △

DATE	REVISIONS
9/27/95	FORMAT
	RECEIVED AUG 12 1996 NIMBUS ENGINEERS

PROFESSIONAL LAND SURVEYOR STATE OF NEVADA RAYMOND R. HEBERT No. 6630 8/12/96

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

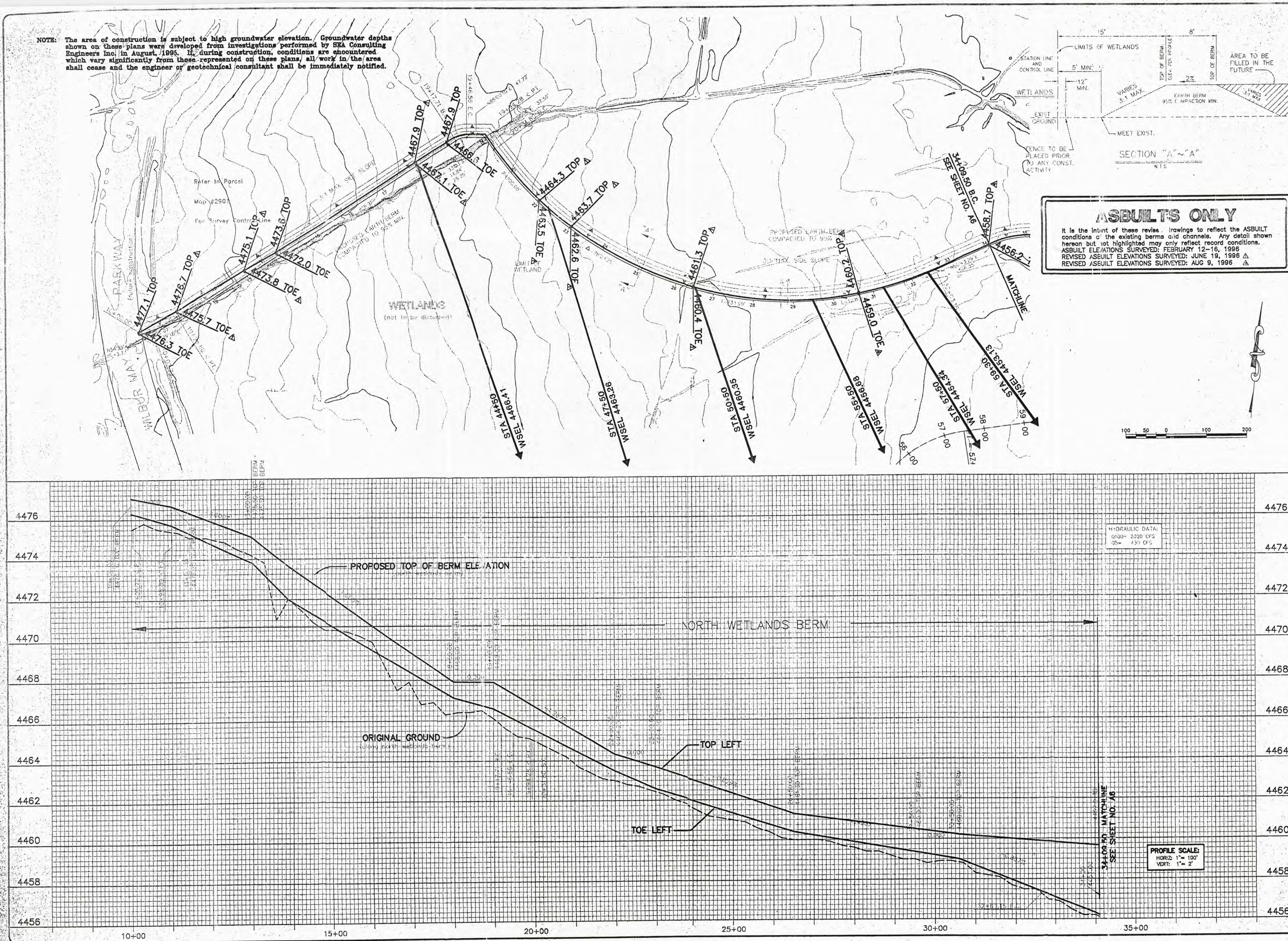
Double Diamond Flood Control Channels
South Wetlands Berm

Reno Washoe Nevada

JOB NO.: 9506
SCALE: 1"=100'
FILE: 3289CH03
DATE: AUG.1995
DESIGN BY:
DRAWN BY:
CHECKED BY:

A4 13

A4 AS BUILTS



DATE: | REVISIONS
RECEIVED AUG 12 1996 NIMBUS ENGINEERS

RAYMOND R. HEBERT — Professional Land Surveyor, State of Nevada — 8/12/96

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

Double Diamond Flood Control Channels
Whites Creek Channel "A"
Reno, Washoe, Nevada

JOB NO.:	9506
SCALE:	1"=100'
FILE:	3289CH01
DATE:	AUG.1995
DESIGN BY:	
DRAWN BY:	
CHECKED BY:	

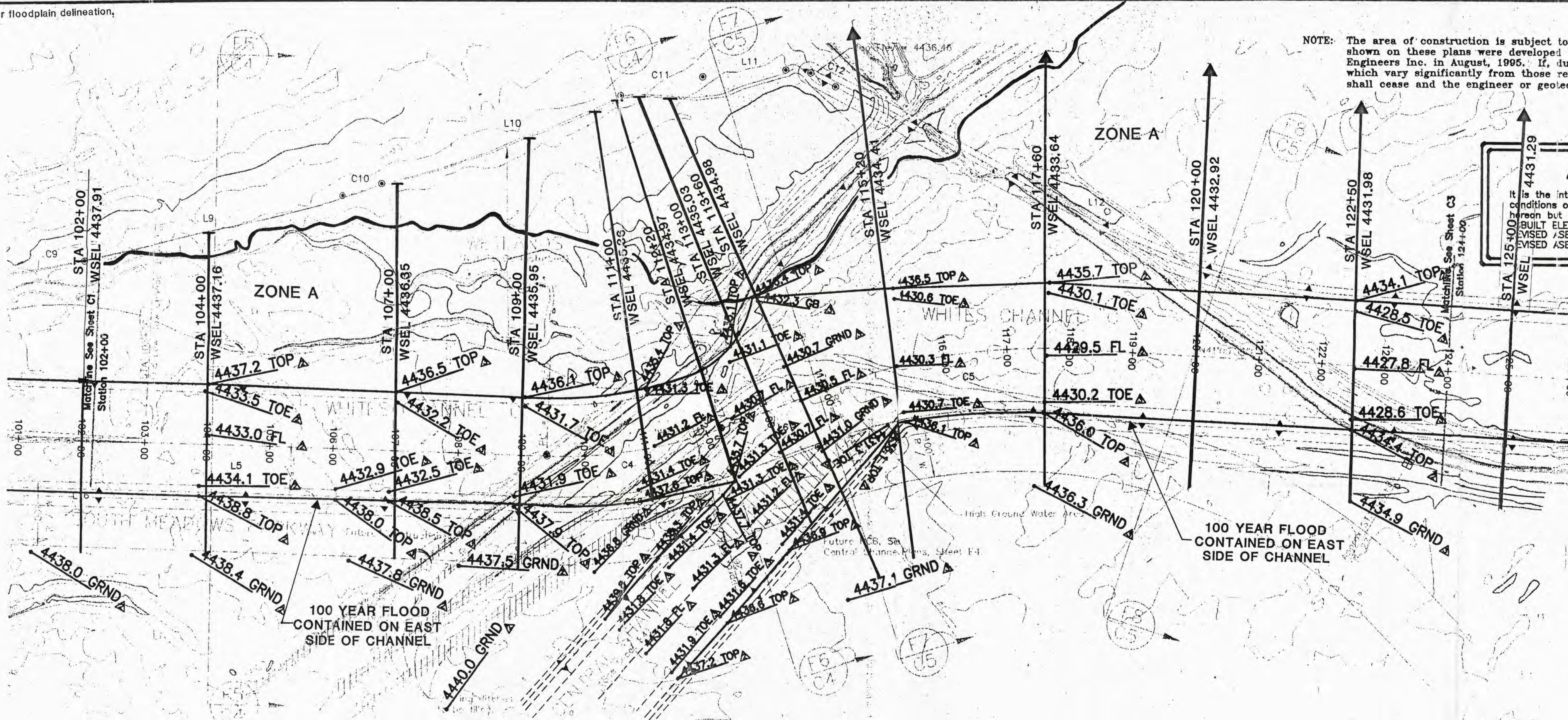
A5 / 13

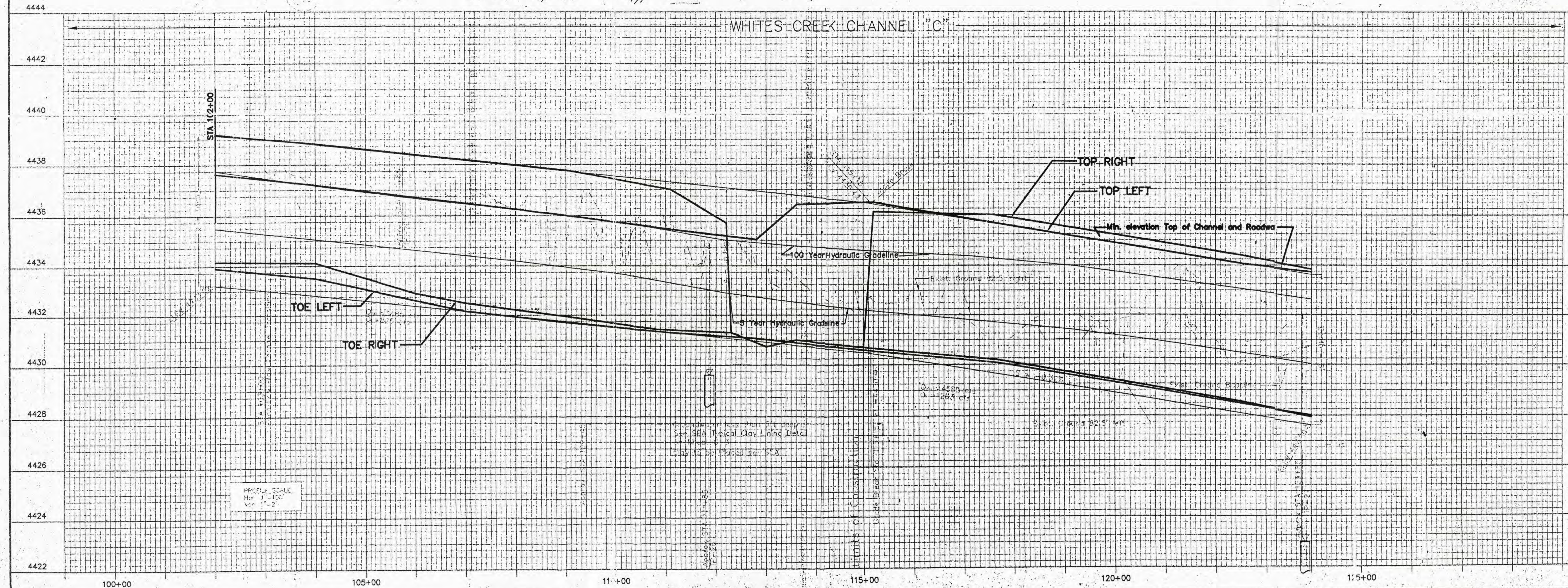
See Figures 4 & 5 for floodplain delineation.

NOTE: The area of construction is subject to high groundwater elevation. Groundwater depths shown on these plans were developed from investigations performed by SEA Consulting Engineers Inc. in August, 1995. If, during construction, conditions are encountered which vary significantly from those represented on these plans, all work in the area shall cease and the engineer or geotechnical consultant shall be immediately notified.

ASBUILTS ONLY CHNL "C"

It is the intent of these revised drawings to reflect the ASBUILT conditions of the existing berms and channels. Any detail shown hereon but not highlighted may only reflect record conditions.
ASBUILT ELEVATIONS SURVEYED: FEBRUARY 12-16, 1996
REVISED ASBUILT ELEVATIONS SURVEYED: JULY 9-10, 1996
REVISED ASBUILT ELEVATIONS SURVEYED: AUG 1, 1996





DATE	REVISIONS
8/31/95	Centerline Profile, Line Table
9/20/95	Format
12/13/95	UPDATE AS-BUILT

RECEIVED AUG 0 5 1996 NIMBUS ENGINEERS

Professional Land Surveyor, Raymond R. Hebert, 8/05/96

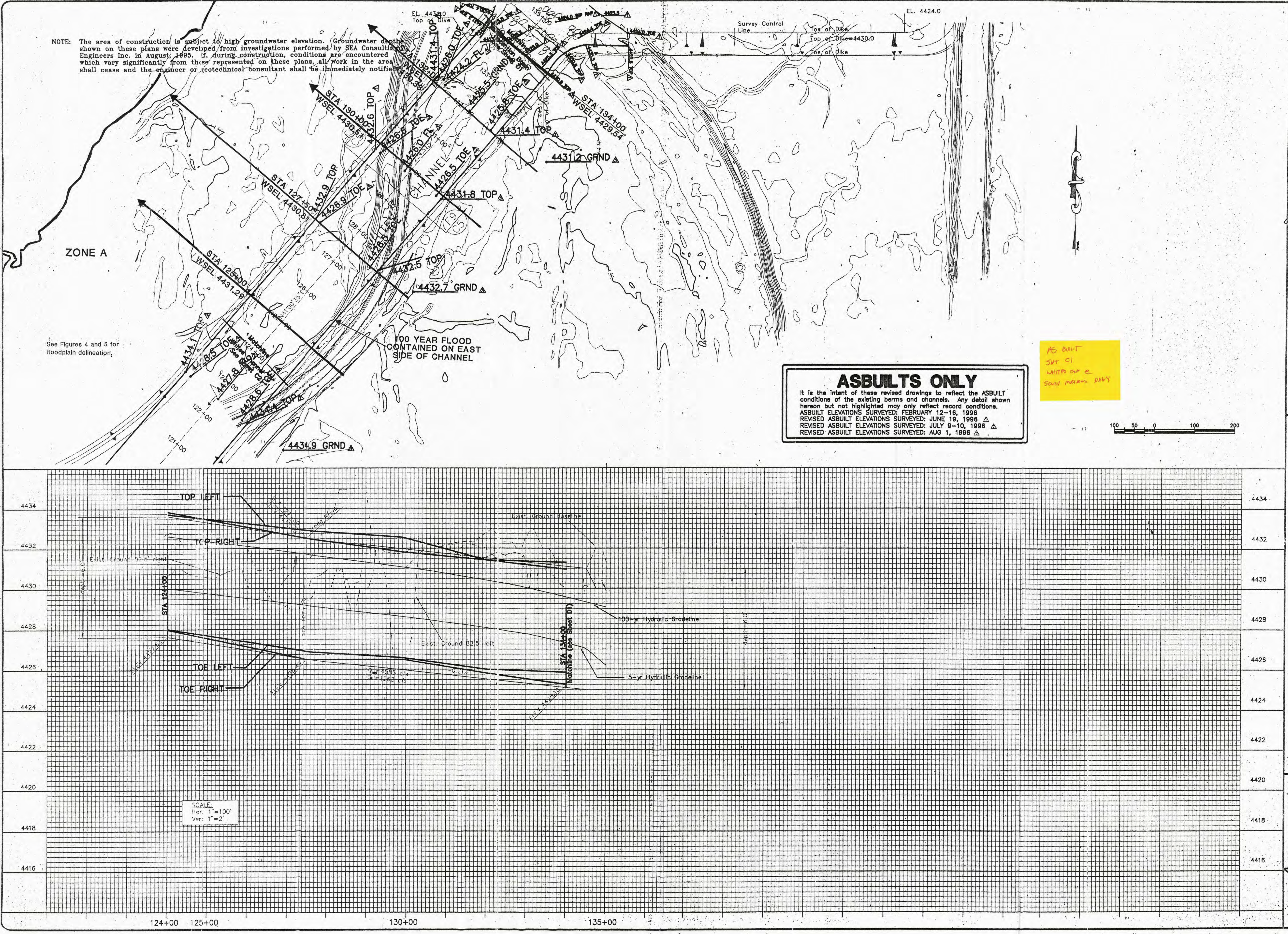
Nimbus Engineers
3710 Grant Dr., Suite A, Reno, NV 89509
Mail: P.O. Box 10220, Reno, NV 89510
(702) 689-8630

Double Diamond Flood Control Channels
Whites Channel "C"

Reno, Washoe, Nevada

JOB NO.:	9506
SCALE:	1"=100'
FILE:	WH-PRO
DATE:	AUG 1995
DESIGN BY:	S.D.M.
DRAWN BY:	T.M.
CHECKED BY:	Y.S.

C2 / 17



DATE	REVISIONS
9/1/95	MOVE DB & LOWER GRADE
9/21/95	FORMAT
12/13/95	UPDATE "AS-BUILT"
	RECEIVED AUG 0 5 1996 NIMBUS ENGINEERS

RAYMOND R. HEBERT — PROFESSIONAL LAND SURVEYOR — STATE OF NEVADA — 8/05/96

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

Double Diamond Flood Control Channels
Whites Channel "C"
Reno — Washoe — Nevada

JOB NO.:	9506
SCALE:	1"=100'
FILE:	WH-BC
DATE:	AUG 1995
DESIGN BY:	T.M.M.
DRAWN BY:	S.D.M.
CHECKED BY:	Y.K.S.

C3 / 17

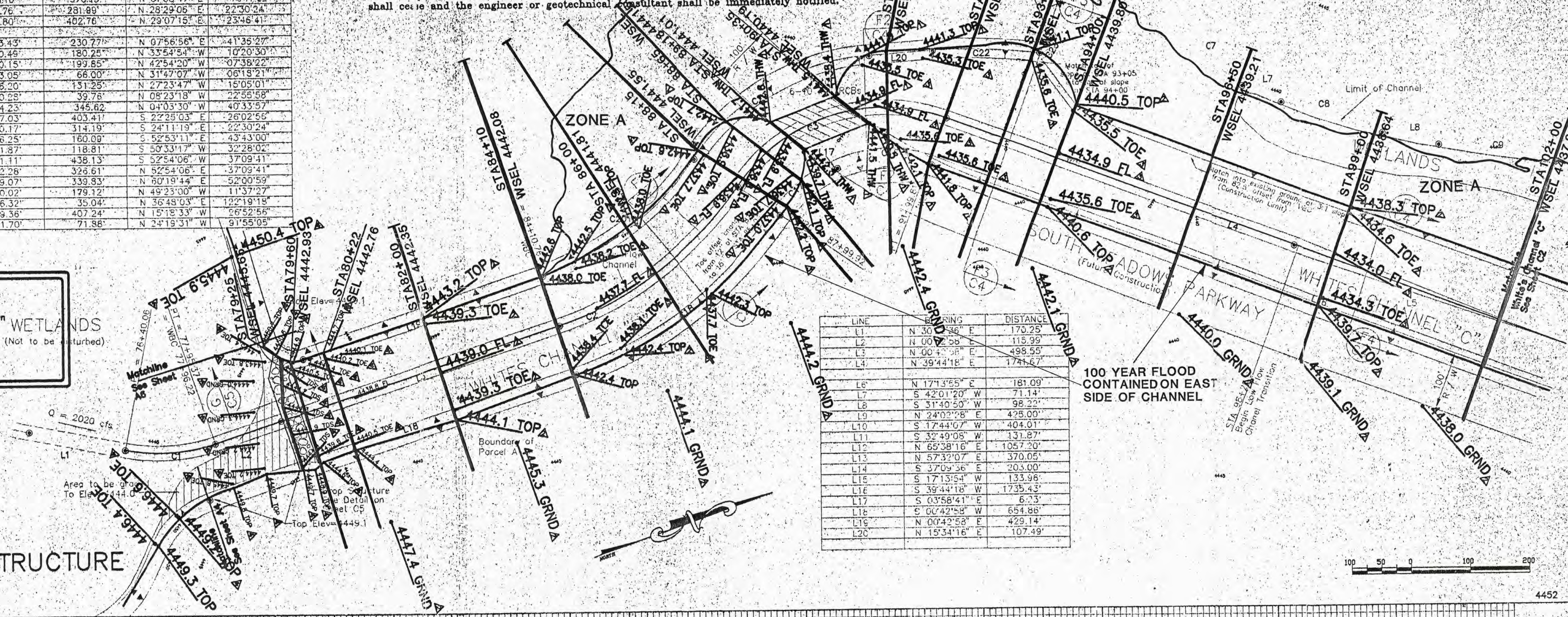
CURVE	RADIUS	LENGTH	TANGENT	CHORD	BEARING	DELTA
C1	300.00'	155.30'	79.43'	153.58'	N 15°32'47" E	29°39'59"
C2	600.00'	389.15'	201.70'	382.37'	N 17°51'53" W	37°09'41"
C3	300.00'	398.90'	235.16'	370.15'	N 01°38'47" E	76°11'02"
C4	722.50'	283.81'	143.76'	281.89'	N 28°29'06" E	22°30'24"
C5	977.50'	405.67'	206.80'	402.76'	N 29°07'15" E	23°46'41"
C7	325.00'	235.92'	123.43'	230.77'	N 07°56'56" E	41°35'27"
C8	1000.00'	180.50'	90.49'	180.25'	N 33°54'54" W	10°20'30"
C9	1500.00'	200.00'	100.15'	199.85'	N 42°54'20" W	07°38'22"
C10	600.00'	66.03'	33.05'	66.00'	N 31°47'07" W	06°18'21"
C11	500.00'	131.63'	66.20'	131.25'	N 27°23'47" W	15°05'01"
C12	100.00'	40.03'	20.28'	39.76'	N 08°23'18" W	22°55'58"
C13	498.50'	352.94'	184.23'	345.62'	N 04°03'30" W	40°33'57"
C14	895.00'	406.90'	207.03'	403.41'	S 22°25'03" E	26°02'56"
C15	805.00'	316.22'	160.17'	314.19'	S 24°11'19" E	22°30'24"
C16	215.00'	164.04'	86.25'	160.09'	S 52°53'11" E	43°43'00"
C17	212.50'	120.42'	61.87'	118.81'	S 50°33'17" W	32°28'02"
C18	687.50'	445.90'	231.11'	438.13'	S 52°54'06" W	37°09'41"
C20	512.50'	332.40'	172.28'	326.61'	N 52°54'06" E	37°09'41"
C21	387.50'	351.50'	189.07'	339.83'	N 60°19'44" E	52°00'59"
C22	884.42'	170.43'	90.02'	179.12'	N 49°23'00" W	11°37'27"
C23	20.00'	42.70'	36.32'	35.04'	N 36°48'03" E	122°19'18"
C24	876.00'	411.00'	209.36'	407.24'	N 15°18'33" W	26°52'56"
C25	50.00'	80.21'	51.70'	71.88'	N 24°19'31" W	91°55'05"

NOTE: The area of construction is subject to high groundwater elevation. Groundwater depths shown on these plans were developed from investigations performed by SEA Consulting Engineers Inc, in August, 1995. If, during construction, conditions are encountered which vary significantly from those represented on these plans, all work in the area shall cease and the engineer or geotechnical consultant shall be immediately notified.

See Figures 4 & 5 for floodplain delineation

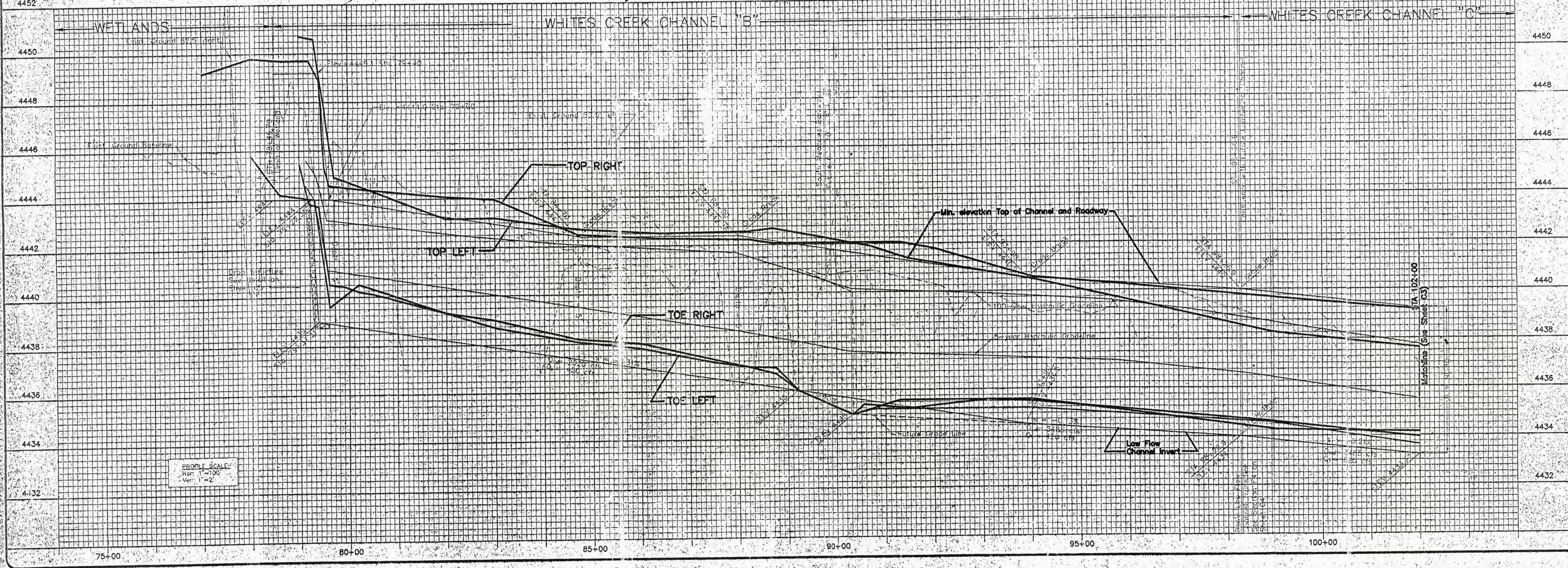
ASBUILTS ONLY

It is the intent of these revised drawings to reflect the ASBUILT conditions of the existing berms and channels. Any detail shown hereon but not highlighted may only reflect record conditions.
ASBUILT ELEVATIONS SURVEYED: FEBRUARY 12–16, 1996
REVISED ASBUILT ELEVATIONS SURVEYED: JUNE 19, 1996 △1
REVISED ASBUILT ELEVATIONS SURVEYED: JULY 9–10, 1996 △2
REVISED ASBUILT ELEVATIONS SURVEYED: AUG 1, 1996 △3
REVISED ASBUILT ELEVATIONS SURVEYED: AUG 9, 1996 △4



LINE	BEARING	DISTANCE
L1	N 30°[illegible]'36" E	170.25'
L2	N 00°[illegible]'58" E	115.99'
L3	N 00°[illegible]'58" E	498.55'
L4	N 39°44'18" E	1741.67'
L6	N 17°13'55" E	181.09'
L7	S 42°01'20" W	71.14'
L8	S 31°40'50" W	98.22'
L9	N 24°02'28" E	425.00'
L10	S 17°44'07" W	404.01'
L11	S 32°49'08" W	131.87'
L12	N 65°38'16" E	1057.20'
L13	N 57°32'07" E	370.05'
L14	S 37°09'36" E	203.00'
L15	S 17°13'54" W	133.96'
L16	S 39°44'18" W	1735.43'
L17	S 03°58'41" E	[illegible]
L18	S 00°42'58" W	654.86'
L19	N 00°42'58" E	429.14'
L20	N 15°34'16" E	107.49'

TDS = TOP OF DROP STRUCTURE



DATE	REVISIONS
9/20/95	WETLANDS OUTLET
12/12/95	UPDATE TO "AS-BUILT"
	RECEIVED AUG 1 2 1996 NIMBUS ENGINEERS

PROFESSIONAL LAND SURVEYOR STATE OF NEVADA — RAYMOND P. HEBERT — No. 6630 — 8/2/96

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

Double Diamond Flood Control Channels

Whites Channel "B" and "C"

Reno Washoe Nevada

JOB NO.: 9506
SCALE: 1" = 100'
FILE: WH-PRO
DATE: AUG. 1995
DESIGN BY: S.M.
DRAWN BY: A.C.P.
CHECKED BY: R.H.

C1 / 17

NOTE: The area of construction is subject to high groundwater elevation. Groundwater depths shown on these plans were developed from investigations performed by SEA Consulting Engineers Inc. in August, 1995. If, during construction, conditions are encountered which vary significantly from those represented on these plans, all work in the area shall cease and the engineer or geotechnical consultant shall be immediately notified.

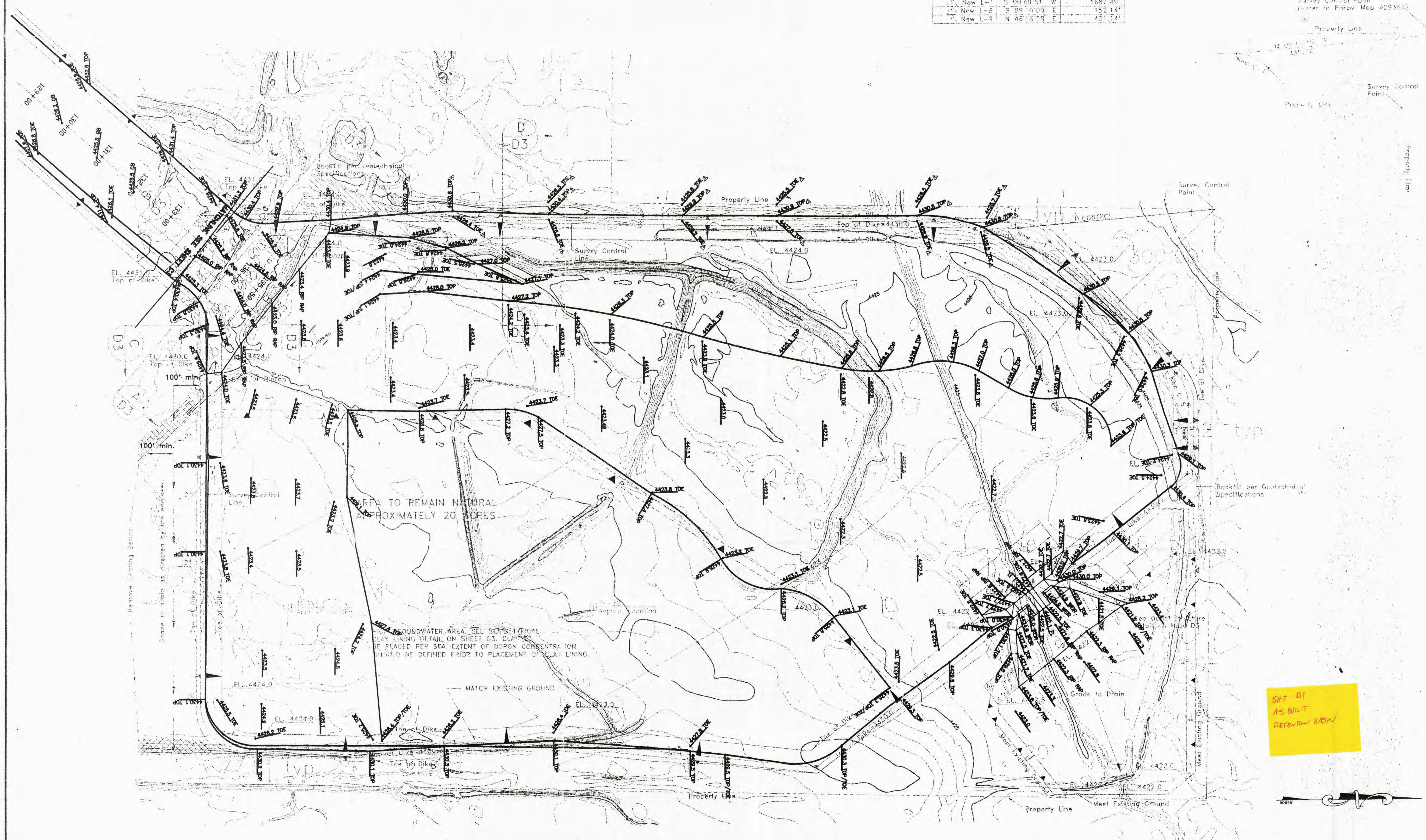
Exsiting dikes which do not meet the 95% compaction requirement are to be removed and recompacted as directed by the engineer.

ASBUILTS ONLY

It is the intent of these revised drawings to reflect the ASBUILT conditions of the existing berms and channels. Any detail shown hereon but not highlighted may only reflect record conditions.
ASBUILT ELEVATIONS SURVEYED: FEBRUARY 12-16, 1996 ⚠
REVISED ASBUILT ELEVATIONS SURVEYED: JUNE 24, 1996

CURVE	RADIUS	LENGTH	TANGENT	CHORD	BEARING	DELTA
C-2	50.00'	25.45'	13.01'	25.18'	N 13°45'04" E	29°09'46"
C-3	50.00'	53.82'	29.85'	51.25'	N 59°09'58" E	61°40'03"
C-4	100.00'	153.57'	96.55'	138.92'	N 46°00'19" E	87°59'22"
⚠1 New C-1	100.00'	79.39'	4[illegible].92'	77.32'	S [illegible]°34'25" W	45°29'07"
⚠1 New C-5	100.00'	77.70'	40.93'	75.76'	N 68°34'29" E	44°31'02"

LINE	DIRECTION	DISTANCE
⚠1 CONTROL	N 05°16'35" W	435.72'
L-2	S 90°00'00" E	868.53'
L-3	S 02°00'38" W	237.39'
L-4	S 03°06'03" E	437.75'
L-5	S 05°11'43" W	577.89'
L-6	S 38°00'13" E	489.81'
L-7	N 38°00'13" W	310.12'
⚠1 New L-1	S 00°49'51" W	1687.49'
⚠1 New L-8	S 89°10'00" E	152.14'
⚠1 New L-9	N 46°18'58" E	401.14'



SHT D1 AS BUILT DETENTION BASIN

REVISIONS

RECEIVED JUL 1 5 1996 NIMBUS ENGINEERS

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(702) 689-8630

Double Diamond Flood Control Channels

Detention Basin

Reno | Washoe | Nevada

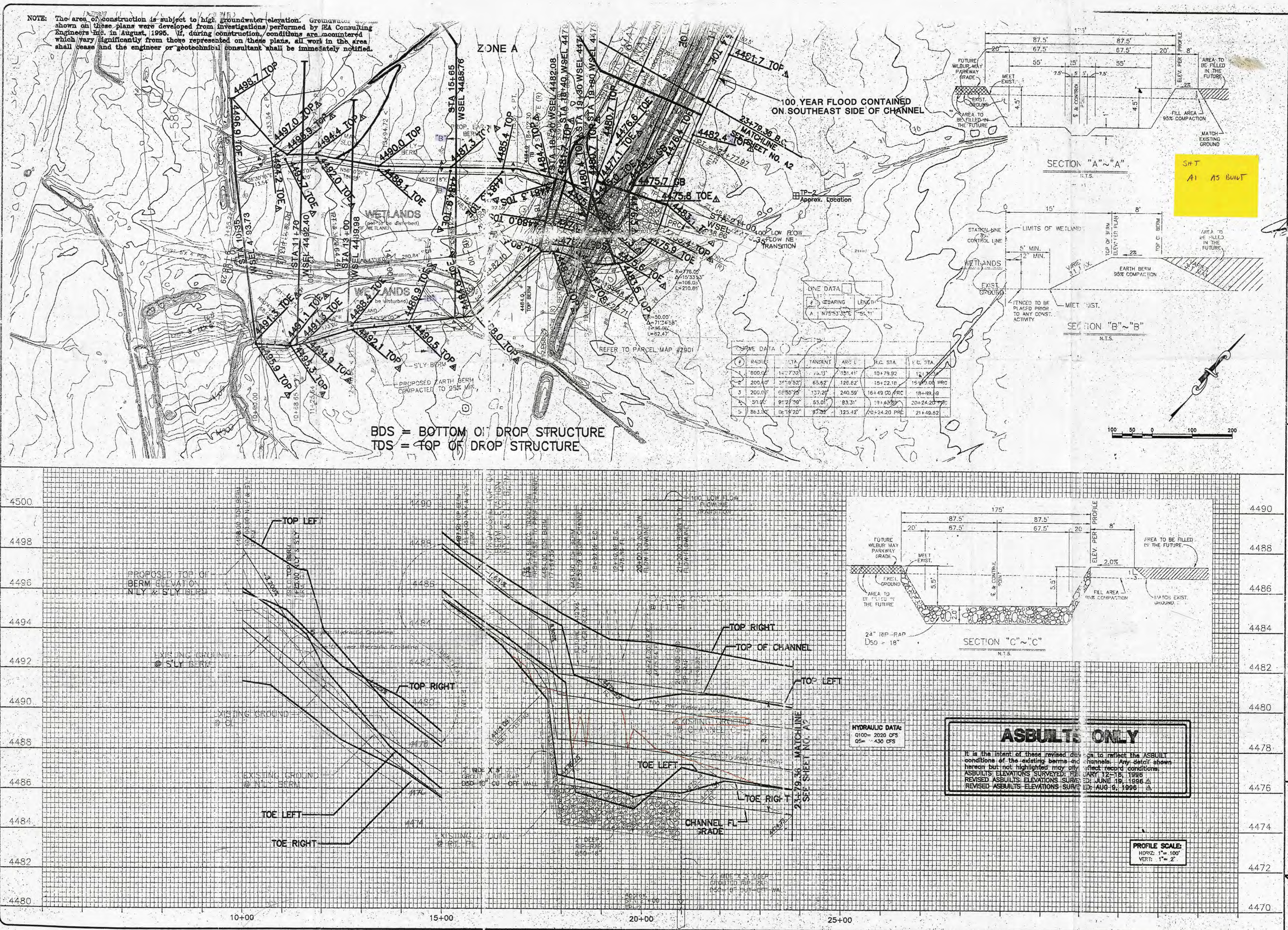
JOB NO.:	9506
SCALE:	1"=100'
FILE:	506DB3A
DATE:	AUG.1995
DESIGN BY:	YKS
DRAWN BY:	GCA
CHECKED BY:	YKS

D1 / 3

APPENDIX G:

Hydraulic Work Maps

NOTE: The area of construction is subject to high groundwater elevation. Groundwater ... shown on these plans were developed from investigations performed by EA Consulting Engineers Inc. in August, 1995. If, during construction, conditions are encountered which vary significantly from those represented on these plans, all work in the area shall cease and the engineer or geotechnical consultant shall be immediately notified.



LINE DATA

#	BEARING	LENGTH
A	N75°53'30"E	51.31'

CURVE DATA

#	RADIUS	DELTA	TANGENT	ARC L	B.C. STA.	E.C. STA.
1	600.00'	14°27'32"	76.11'	151.41'	10+79.92	12+31.34
2	200.00'	36°19'52"	65.62'	126.82'	15+22.18	16+49.00 PRC
3	200.00'	68°55'25"	137.20'	240.59'	16+49.00 PRC	18+89.69
4	50.00'	95°27'39"	55.01'	83.31'	19+40.89	20+24.20 PRC
5	863.00'	08°19'20"	62.82'	125.42'	20+24.20 PRC	21+49.62

ASBUILTS ONLY

It is the intent of these revised drawings to reflect the ASBUILT conditions of the existing berms and channels. Any detail shown hereon but not highlighted may only reflect record conditions.
ASBUILTS ELEVATIONS SURVEYED: FEBRUARY 12-16, 1996
REVISED ASBUILTS ELEVATIONS SURVEYED: JUNE 19, 1996 △1
REVISED ASBUILTS ELEVATIONS SURVEYED: AUG 9, 1996 △4

DATE	REVISIONS
	RECEIVED AUG 14 1996 NIMBUS ENGINEERS

PROFESSIONAL LAND SURVEYOR STATE OF NEVADA 8/14/96 RAYMOND R. HEBERT No. 8698

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(702) 689-8630

Double Diamond Flood Control Channels
Whites Creek Channel "A"
Reno Washoe Nevada

JOB NO.: 9506
SCALE: 1"=100'
FILE: 3289CH06
DATE: AUG.1995
DESIGN BY:
DRAWN BY:
CHECKED BY:

A1 / 13

A1 AS BUILTS