

ADDENDUM TO:

HYDROLOGIC AND HYDRAULIC ANALYSIS
DOUBLE DIAMOND RANCH, PHASE 1

APPLICATION FOR LETTER OF MAP REVISION
(LOMR)

City of Reno, Nevada

PREPARED FOR:
DOUBLE DIAMOND RANCH, LLC.
601 W. MOANA LANE, SUITE 1
RENO, NEVADA 89509

NIMBUS JOB # 9508
AUGUST 1996

ADDENDUM: ~~OCTOBER~~ 1996

Engineers

3750 Grant Drive Reno, Nevada 89509 (702) 689-8630

ADDENDUM TO

HYDROLOGIC AND HYDRAULIC ANALYSIS DOUBLE DIAMOND RANCH, PHASE 1

Application for Letter of Map Revision (LOMR)

City of Reno, Nevada

Prepared for:

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

NIMBUS JOB NO: 9508

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Nimbus Engineers

3710 Grant Dr., Suite D, Reno, NV 89509
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(702) 689-8630



Nimbus Engineers

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November 4, 1996

Michael K. Buckley, P.E.
Federal Emergency Management Agency
Hazard Identification Branch
500 "C" Street SW
Washington, D.C. 20472

Dear Mr. Buckley,

This response is in reference to your letter dated October 18, 1996. In your letter you requested Nimbus Engineers to provide more information to process a Request for Letter of Map Revision (LOMR) for the Double Diamond Ranch, Phase 1. (FEMA Case Number 96-09-1083P) This Addendum addresses and will clarify all questions and concerns contained in that letter.

The Appendix of this addendum is divided into sections that represent the question numbers posed in your October 18th, 1996 "additional data" letter.

DISCUSSION

Item number:

1. The southernmost (not easternmost) 30" RCP does inlet into the "A" Channel. The other two 30" RCP's at "H" 573+00 and "H" 583+00 have carrying capacities of only 25 cfs each. These culverts were previously ignored because the average depth of flow downstream of these culverts ranges between 0.13 and 0.23 feet. Supporting calculations and a work map entitled "I-580 Channel 'A' Intersection Topo" is located in Section 1 of the Appendix. The X-Zones created by these flows are now shown on the revised Proposed Annotated FIRM located in Section 2 of the Appendix.

2. The A-Zone , shown on the Annotated FIRM, between the south property line and the upstream end of Whites Creek Central Channel was a drafting error. Appendix E of our first submittal contains a HEC-2 analysis run (FILE: 506phas1.dat) that delineates this area as an X-Zone. Appendix G (of the original submittal) contains a hydraulic work map entitled "Double Diamond Ranch Flood Control Channels Hydraulic Work Map" that illustrates this delineation.

Section 2 of the Appendix of this Addendum contains the revised Proposed Annotated FIRM with this area properly shaded and labeled.

3. Section 3 addresses the question of 3' of freeboard between sections 10+35 and 18+20 on both sides of the "A" Channel. NFIP regulation Section 65.10 requires 3' or more of freeboard on all levee systems, unless technical data is submitted to support a lower freeboard. The following information is being submitted in support of allowing a lower than 3' freeboard for this area. The berms that are in place at the upstream end of the "A" Channel will contain the maximum amount of flow that can reach the channel at that point. The culverts at I-580 will convey at most 2600cfs to the "A" Channel before overtopping of the Zolezzi Lane berm. Once ponding reaches an elevation of 4500, flow will overtop the Zolezzi Lane berm and flow eastward down Zolezzi Lane. The HEC-2 output model located in Section 3 of the Appendix represents the water surface elevations in the channel with 2600 cfs. This run shows that the maximum flood will be contained with 2' or more of freeboard with the exception of cross section 10+35 which will be contained with 1.91' of freeboard. All stations will contain the 100-year flow of 2020 cfs with more than 2' of freeboard. In addition to there being a constraint to the amount of flow that can get to the levees, the depth of flow against the berms is shallow. Average depth against the levees ranges from 0.89' to 2.26'. Given the above information there is no danger of the "A" Channel levees overtopping at any time. Additionally, in the ultimate development, fill will be placed behind the berm so that it will no longer function as a levee.

IF OK
For 2600CFS
77 OK
For 2020CFS!

4. The reviewers' descriptions of station locations were unclear in Item 4. All local drainage information for the "A" Channel has been included in Section 4 of the Appendix including the revised FEMA forms. Section 4 contains information to support the drainage swale, 36" pipe and street sections that carry flows through the project to rock rip-rap structures that inlet into the "BC" Channel. The flowline of the inlet structure is above the 100 year WSEL at this point.

OK!

5. The officially adopted Maintenance and Operation Plan is included in Section 5 of the Appendix of this Addendum.

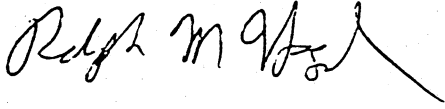
6. The following information, submitted in support of item #6, is located in Section 6 of the Appendix:

- FEMA Form 2: Certification by Registered Professional Engineer and /or Land Surveyor
- Letter From SEA, Inc. to City of Reno dated August 14, 1996:
 - RE: Certification of Public Works Improvements Double Diamond Channels Reno, Nevada stating that they (SEA, Inc.) were the "project engineering" entity and have overseen the construction, inspection and testing of the work completed on this project.
- Field Density Summary Sheets

7. The information provided on the detention basin in the August 1996 copy of this Request for LOMR was for information only. With future improvements more information on the detention basin will be provided.

Also Enclosed in this package is a letter of authorization to proceed with the review up to the amount of \$6500.00.

Sincerely,

A handwritten signature in black ink, appearing to read "Ralph M. Hogoboom". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Ralph M. Hogoboom, PE
Nimbus Engineers

RMH/tmm

cc: Thomas W. Smith, PE
Michael Baker, Jr., Inc.
3601 Eisenhower Ave, Ste. 100
Alexandria, VA 22304

Kraig Knudsen
Double Diamond Ranch, LLC.
601 W. Moana, Suite 1
Reno, NV 89509



Nimbus Engineers

3710 Grant Dr., Suite A • Reno, NV 89509
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October 28, 1996


Michael K. Buckley
Federal Emergency Management Agency
Hazard Identification Branch
500 "C" Street, SW
Washington, D.C. 20472

RE: FEMA Case # 96-09-1083P Notice to Proceed

Dear Mr. Buckley,

This letter is in response to your October 18, 1996 letter which in part requests Nimbus Engineers to provide written authorization for FEMA to proceed with the review process of the Double Diamond Ranch, Phase 1 LOMR (FEMA Case #96-09-1083P). Nimbus Engineers has been authorized by Double Diamond Ranch, LLC to authorize FEMA to proceed with its review of the above referenced project to the amount of \$6500.

Thank You,


Ralph M. Hogoboom, PE
Nimbus Engineers

RMH/tmm

cc: Thomas W. Smith, P.E.
Michael Baker, JR. Inc.
3601 Eisenhower Ave, Ste. 100
Alexandria, VA 22304

Kraig Knudsen
Double Diamond Ranch, LLC.
601 W. Moana, Suite 1
Reno, NV 89509

APPENDIX

Section 1

PIPE CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE

October 22, 1996

"H" 583+00

30" x 193' RCP

JOB NO. 9508

=====

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Culvert Diameter (feet).....	2.50
FHWA Chart Number (1,2 or 3).....	1
Scale Number on Chart (Type of Culvert Entrance).....	1
Manning's Roughness Coefficient (n-value).....	0.0130
Entrance Loss Coefficient of Culvert Opening.....	0.50
Culvert Length (feet).....	193.0
Culvert Slope (feet per foot).....	0.0052

=====

PROGRAM RESULTS:

Flow Rate (cfs)	Tailwater Depth (ft)	Headwater Inlet Control (ft)	Normal Outlet Control (ft)	Critical Depth (ft)	Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
20.0	2.50	2.32	2.34	1.51	1.52	2.50	4.07
→ 25.0	2.50	2.72	2.82	1.77	1.70	2.50	5.09
30.0	2.50	3.21	3.40	2.08	1.87	2.50	6.11
35.0	2.50	3.70	4.08	2.50	2.01	2.50	7.13
40.0	2.50	4.32	4.87	2.50	2.13	2.50	8.15

=====

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PIPE CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE

October 22, 1996

"H" 573+00

30" x 212' RCP

JOB NO. 9508

=====

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Culvert Diameter (feet).....	2.50
FHWA Chart Number (1,2 or 3).....	1
Scale Number on Chart (Type of Culvert Entrance).....	1
Manning's Roughness Coefficient (n-value).....	0.0130
Entrance Loss Coefficient of Culvert Opening.....	0.50
Culvert Length (feet).....	212.0
Culvert Slope (feet per foot).....	0.0094

=====

PROGRAM RESULTS:

Flow Rate (cfs)	Tailwater Depth (ft)	Headwater (ft) Inlet Control	Headwater (ft) Outlet Control	Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
20.0	2.50	2.32	1.39	1.25	1.52	1.25	8.12
25.0	2.50	2.72	1.89	1.44	1.70	1.44	8.54
30.0	2.50	3.21	2.50	1.61	1.87	1.61	8.97
35.0	2.50	3.70	3.22	1.82	2.01	1.82	9.16
40.0	2.50	4.32	4.05	2.06	2.13	2.06	9.26
45.0	2.50	5.02	5.00	2.50	2.23	2.50	9.17
50.0	2.50	5.80	6.05	2.50	2.30	2.50	10.19

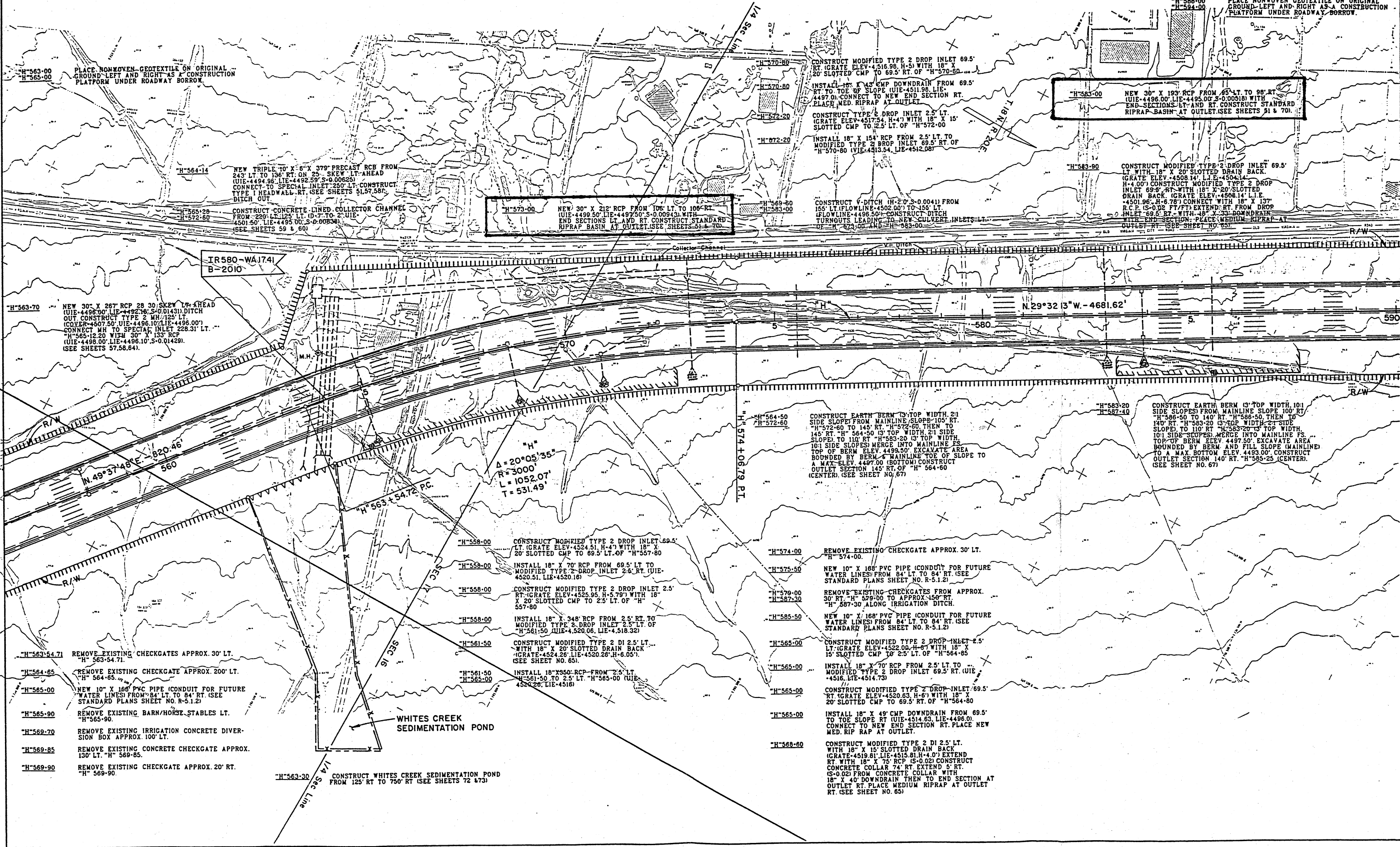
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FED. RD. REG. NO.	STATE	PROJECT NO.	COUNTY	SHEET NO.
9	NEVADA	EBNH-395-2(28)	WASHOE	8

LEGEND

== TYPE "A" CONCRETE BARRIER RAIL



"H"563-00
"H"565-00
PLACE NONWOVEN GEOTEXTILE ON ORIGINAL GROUND LEFT AND RIGHT AS A CONSTRUCTION PLATFORM UNDER ROADWAY BORROW.

"H"564-14
NEW TRIPLE 10" X 6" X 379' PRECAST RCB FROM 243' LT. TO 196' RT. ON 25' SKEW LT. AHEAD (UIE-4494.96, LIE-4492.59, S-0.00625) CONNECT TO SPECIAL INLET 250' LT. CONSTRUCT TYPE 1 HEADWALL RT. (SEE SHEETS 51, 57, 58) DITCH OUT.

"H"565-28
"H"572-80
CONSTRUCT CONCRETE LINED COLLECTOR CHANNEL FROM 220' LT. TO 125' LT. (UIE-4495.00, LIE-4495.00, S-0.00838) (SEE SHEETS 59 & 60)

"H"573-00
NEW 30" X 212' RCP FROM 106' LT. TO 106' RT. (UIE-4499.50, LIE-4497.50, S-0.00943) WITH END SECTIONS LT. AND RT. CONSTRUCT STANDARD RIPRAP BASIN AT OUTLET (SEE SHEETS 51 & 70)

"H"570-80
"H"570-80
"H"572-20
"H"572-20
CONSTRUCT MODIFIED TYPE 2 DROP INLET 69.5' RT. (GRATE ELEV. 4516.98, H-5) WITH 18" X 20' SLOTTED CMP TO 69.5' RT. OF "H"570-80
INSTALL 18" X 45' CMP DOWNDRAIN FROM 69.5' RT. TO TOE OF SLOPE (UIE-4511.98, LIE-4497.01, CONNECT TO NEW END SECTION RT. PLACE MED. RIPRAP AT OUTLET)
CONSTRUCT TYPE 2 DROP INLET 2.5' LT. (GRATE ELEV. 4517.54, H-4) WITH 18" X 15' SLOTTED CMP TO 2.5' LT. OF "H"572-00
INSTALL 18" X 154' RCP FROM 2.5' LT. TO MODIFIED TYPE 2 DROP INLET 69.5' RT. OF "H"570-80 (UIE-4513.54, LIE-4512.08)

"H"583-00
NEW 30" X 193' RCP FROM 45' LT. TO 98' RT. (UIE-4496.00, LIE-4495.00, S-0.00518) WITH END SECTIONS LT. AND RT. CONSTRUCT STANDARD RIPRAP BASIN AT OUTLET (SEE SHEETS 51 & 70)

"H"583-90
CONSTRUCT MODIFIED TYPE 2 DROP INLET 69.5' LT. WITH 18" X 20' SLOTTED DRAIN BACK (GRATE ELEV. 4508.14, LIE-4504.14, H-4.00) CONSTRUCT MODIFIED TYPE 2 DROP INLET 69.5' RT. WITH 18" X 20' SLOTTED DRAIN BACK (GRATE ELEV. 4508.14, LIE-4501.96, H-6.78) CONNECT WITH 18" X 137' RCP (S-0.02) FROM EXTENSION FROM DROP INLET 69.5' RT. WITH 18" X 20' DOWNDRAIN WITH END SECTION PLACE MEDIUM RIPRAP AT OUTLET RT. (SEE SHEET NO. 65)

"H"569-60
"H"583-00
CONSTRUCT V-DITCH (H-2.0, S-0.0041) FROM 155' LT. (FLOWLINE 4502.00) TO 155' LT. (FLOWLINE 4498.50) CONSTRUCT DITCH TURNOUTS LEADING TO NEW CULVERT INLETS LT. OF "H"573-00 AND "H"583-00

"H"563-70
NEW 30" X 267' RCP 29 30' SKEW LT. AHEAD (UIE-4498.00, LIE-4492.16, S-0.01431) DITCH OUT CONSTRUCT TYPE 2 MH/125' LT. (COVER-4507.50, UIE-4496.10, LIE-4495.00) CONNECT MH TO SPECIAL INLET 228.31' LT. "H"565-12.20 WITH 30" X 133' RCP (UIE-4498.00, LIE-4496.10, S-0.01429) (SEE SHEETS 57, 58, 64)

IR580-WA1741
B-2010

N 29°32'13"W - 4681.62'

"H"564-50
"H"572-60
CONSTRUCT EARTH BERM (3' TOP WIDTH, 10:1 SIDE SLOPE) FROM MAINLINE TOE OF SLOPE 105' RT. "H"572-60 TO 145' RT. "H"572-60 THEN TO 145' RT. "H"564-50 (3' TOP WIDTH, 2:1 SIDE SLOPE) TO 110' RT. "H"583-20 (3' TOP WIDTH, 10:1 SIDE SLOPE) MERGE INTO MAINLINE FS. TOP OF BERM ELEV. 4499.00' EXCAVATE AREA BOUNDED BY BERM & MAINLINE TOE OF SLOPE TO A MAX. ELEV. 4497.00' (BOTTOM) CONSTRUCT OUTLET SECTION 145' RT. OF "H"564-60 (CENTER). (SEE SHEET NO. 67)

"H"583-20
"H"587-40
CONSTRUCT EARTH BERM (3' TOP WIDTH, 10:1 SIDE SLOPE) FROM MAINLINE TOE OF SLOPE 100' RT. "H"586-50 TO 140' RT. "H"586-50 THEN TO 140' RT. "H"583-20 (3' TOP WIDTH, 2:1 SIDE SLOPE) TO 110' RT. "H"583-20 (3' TOP WIDTH, 10:1 SIDE SLOPE) MERGE INTO MAINLINE FS. TOP OF BERM ELEV. 4497.50' EXCAVATE AREA BOUNDED BY BERM AND FILL SLOPE (MAINLINE) TO A MAX. BOTTOM ELEV. 4493.00' CONSTRUCT OUTLET SECTION 140' RT. "H"585-25 (CENTER). (SEE SHEET NO. 67)

"H"
Δ = 20°05'35"
R = 3000'
L = 1052.07'
T = 531.49'

- "H"558-00 CONSTRUCT MODIFIED TYPE 2 DROP INLET 69.5' LT. (GRATE ELEV. 4524.51, H-4) WITH 18" X 20' SLOTTED CMP TO 69.5' LT. OF "H"557-80
- "H"558-00 INSTALL 18" X 70' RCP FROM 69.5' LT. TO MODIFIED TYPE 2 DROP INLET 2.5' RT. (UIE-4520.51, LIE-4520.16)
- "H"558-00 CONSTRUCT MODIFIED TYPE 2 DROP INLET 2.5' RT. (GRATE ELEV. 4525.95, H-5.79) WITH 18" X 20' SLOTTED CMP TO 2.5' LT. OF "H"557-80
- "H"558-00 INSTALL 18" X 348' RCP FROM 2.5' RT. TO MODIFIED TYPE 2 DROP INLET 2.5' LT. OF "H"561-50 (UIE-4520.06, LIE-4518.32)
- "H"561-50 CONSTRUCT MODIFIED TYPE 2 DI 2.5' LT. WITH 18" X 20' SLOTTED DRAIN BACK (GRATE-4524.26, LIE-4520.26, H-6.05) (SEE SHEET NO. 65)
- "H"561-50
"H"565-00
INSTALL 18" X 350' RCP FROM 2.5' LT. "H"561-50 TO 2.5' LT. "H"565-00 (UIE-4524.26, LIE-4518)

- "H"574-00 REMOVE EXISTING CHECKGATE APPROX. 30' LT. "H"574-00.
- "H"575-50 NEW 10" X 168' PVC PIPE (CONDUIT FOR FUTURE WATER LINES) FROM 84' LT. TO 84' RT. (SEE STANDARD PLANS SHEET NO. R-5.1.2)
- "H"579-00 REMOVE EXISTING CHECKGATES FROM APPROX. 30' RT. "H"579-00 TO APPROX. 150' RT. "H"587-30 ALONG IRRIGATION DITCH.
- "H"585-50 NEW 10" X 168' PVC PIPE (CONDUIT FOR FUTURE WATER LINES) FROM 84' LT. TO 84' RT. (SEE STANDARD PLANS SHEET NO. R-5.1.2)
- "H"565-00 CONSTRUCT MODIFIED TYPE 2 DROP INLET 2.5' LT. (GRATE ELEV. 4522.00, H-0) WITH 18" X 15' SLOTTED CMP TO 2.5' LT. OF "H"564-85
- "H"565-00 INSTALL 18" X 70' RCP FROM 2.5' LT. TO MODIFIED TYPE 2 DROP INLET 69.5' RT. (UIE-4516, LIE-4514.73)
- "H"565-00 CONSTRUCT MODIFIED TYPE 2 DROP INLET 69.5' RT. (GRATE ELEV. 4520.83, H-6) WITH 18" X 20' SLOTTED CMP TO 69.5' RT. OF "H"564-80
- "H"565-00 INSTALL 18" X 49' CMP DOWNDRAIN FROM 69.5' TO TOE SLOPE RT (UIE-4514.63, LIE-4498.0) CONNECT TO NEW END SECTION RT. PLACE NEW MED. RIP RAP AT OUTLET.
- "H"568-60 CONSTRUCT MODIFIED TYPE 2 DI 2.5' LT. WITH 18" X 15' SLOTTED DRAIN BACK (GRATE-4518.61, LIE-4515.81, H-4.0) EXTEND RT WITH 18" X 75' RCP (S-0.02) CONSTRUCT CONCRETE COLLAR 74' RT. EXTEND 5' RT. (S-0.02) FROM CONCRETE COLLAR WITH 18" X 40' DOWNDRAIN THEN TO END SECTION AT OUTLET RT. PLACE MEDIUM RIPRAP AT OUTLET RT. (SEE SHEET NO. 65)

- "H"563-54.71 REMOVE EXISTING CHECKGATES APPROX. 30' LT. "H"563-54.71.
- "H"564-65 REMOVE EXISTING CHECKGATE APPROX. 200' LT. "H"564-65.
- "H"565-00 NEW 10" X 168' PVC PIPE (CONDUIT FOR FUTURE WATER LINES) FROM 84' LT. TO 84' RT. (SEE STANDARD PLANS SHEET NO. R-5.1.2)
- "H"565-90 REMOVE EXISTING BARN/HORSE STABLES LT. "H"565-90.
- "H"569-70 REMOVE EXISTING IRRIGATION CONCRETE DIVERSION BOX APPROX. 100' LT.
- "H"569-85 REMOVE EXISTING CONCRETE CHECKGATE APPROX. 130' LT. "H"569-85.
- "H"569-90 REMOVE EXISTING CHECKGATE APPROX. 20' RT. "H"569-90.

"H"563-30 CONSTRUCT WHITES CREEK SEDIMENTATION POND FROM 125' RT. TO 750' RT. (SEE SHEETS 72 & 73)

WHITES CREEK SEDIMENTATION POND

Project Double Diamond PH1
 Project No. 9508
 Sheet No. 1 of 2
 Calculated by (TM) Date _____

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

"H" 573+00

CROSS SECTION PARAMETERS:

FILENAME: 508RCPIA.SEC

No. of Cross Section Points: 7 Bed Slope: 0.02400 Max Elev.: 95.00
 Bank Stations.....Left: 1000.0 Right.....: 1172.0 Min Elev.: 94.30
 Encroachment Stations..Left: Right.....:
 Manning-n Values.....LOB: 0.040 CHANNEL...: 0.035 ROB.....: 0.040

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta. No.	Elev.	Sta. No.	Elev.	Sta.		
1)	95.00	1000.00	2)	94.50	1028.00	3)	94.30	1045.00
4)	94.60	1071.00	5)	94.30	1109.00	6)	94.50	1120.00
7)	95.00	1172.00						

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr	No.	ne	ALPHA	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
94.58	25.0	1.8	0.83	0.035	1.0	101.3	14.1	101.3	94.56	

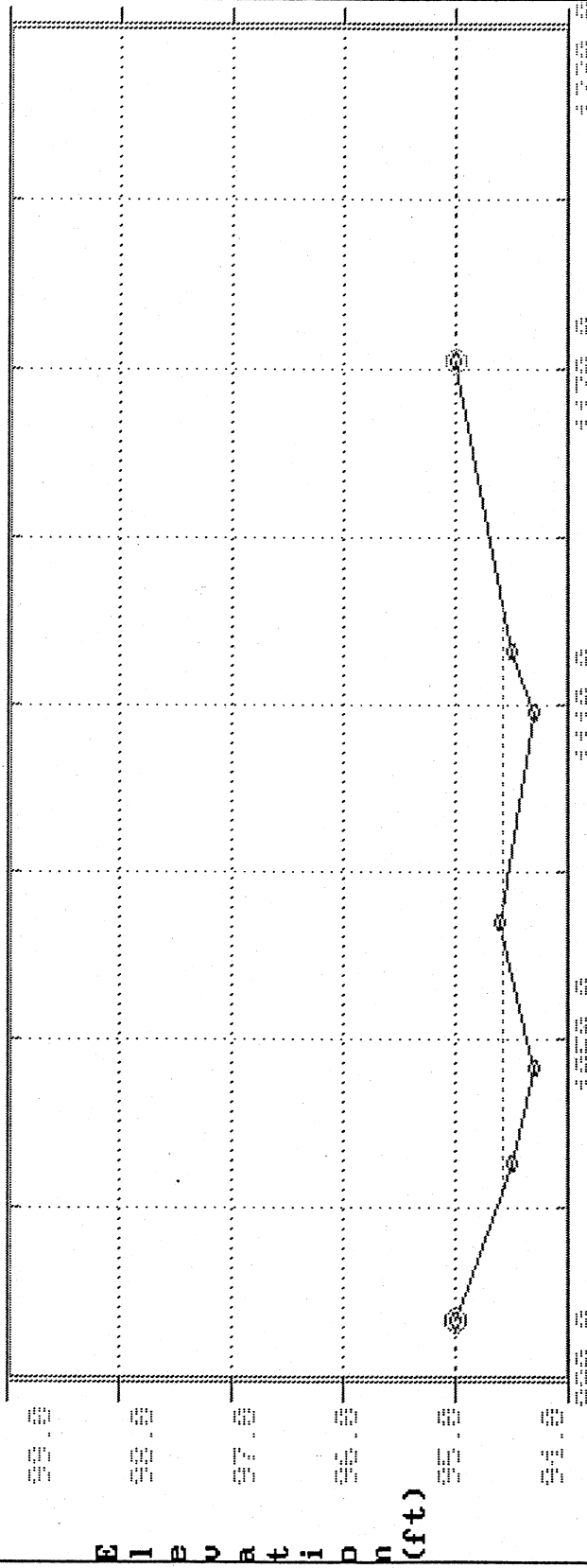
NOTES:

Avg depth = 0.14'

***** CROSS SECTION PLOT *****

FILE: 25.002 V- 1.000

Manning-n Values: .100: 0.040 CHANNEL: 0.035 ROF: 0.040 SLOPE = 0.0240 (V)



SCALES: Vertical 1: 1 Station (ft)

Horizontal 1: 300

Project Double Diamond PH1
 Project No. 9508
 Sheet No. 1 of 2
 Calculated by TMO Date _____

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

"H" 573+00

CROSS SECTION PARAMETERS:

FILENAME: 508RCP1B.SEC

No. of Cross Section Points: 8 Bed Slope: 0.01500 Max Elev.: 91.10
 Bank Stations.....Left: 1000.0 Right.....: 1312.0 Min Elev.: 89.90
 Encroachment Stations..Left: Right.....:
 Manning-n Values.....LOB: 0.040 CHANNEL...: 0.040 ROB.....: 0.040

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta. No.	Elev.	Sta. No.	Elev.	Sta.		
1)	91.00	1000.00	2)	89.90	1095.00	3)	90.00	1122.00
4)	91.00	1190.00	5)	91.10	1225.00	6)	91.00	1260.00
7)	90.10	1290.00	8)	91.00	1312.00			

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr	No.	ne	ALPHA	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
90.25	25.0	1.5	0.61	0.040	1.0	83.2	16.3	83.2	90.18	

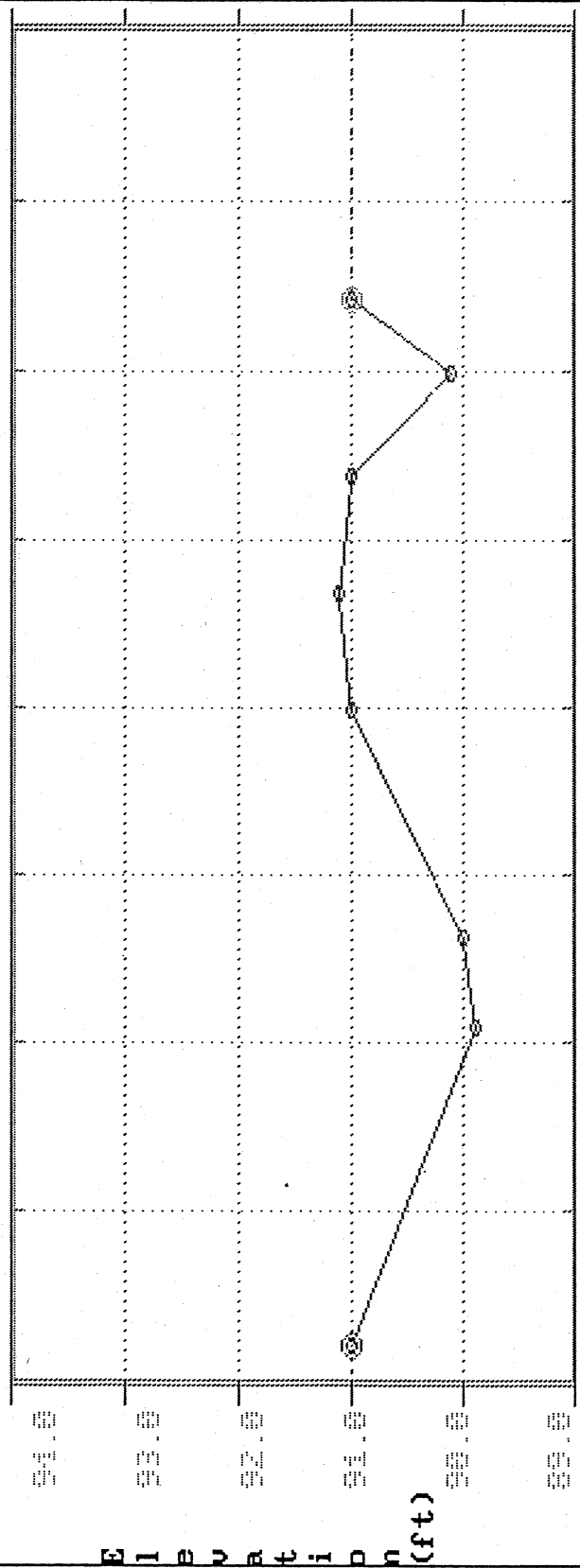
NOTES:

Avg depth 0.19'

***** GROSS SECTION PLOT *****

353- 50.0 - 25.000 V - 1.500

Manning-n Values... LOB: 0.040 CHANNEL: 5.515 ROB: 0.040 SLOPE = 0.0150 (/)



SCALES: Vertical 1: 11 Station (ft)

Horizontal 1: 501

Project Double Diamond PH1
 Project No. 9508
 Sheet No. 1 of 2
 Calculated by TTD Date _____

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

"H" 573+00

CROSS SECTION PARAMETERS:

FILENAME: 508RCP1C.SEC

No. of Cross Section Points: 13 Bed Slope: 0.01500 Max Elev.: 86.00
 Bank Stations.....Left: 1000.0 Right.....: 1385.0 Min Elev.: 85.20
 Encroachment Stations..Left: Right.....:
 Manning-n Values.....LOB: 0.040 CHANNEL...: 0.040 ROB.....: 0.040

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta. No.	Elev.	Sta. No.	Elev.	Sta.		
1)	86.00	1000.00	2)	85.70	1105.00	3)	85.60	1145.00
4)	85.50	1175.00	5)	85.40	1200.00	6)	85.60	1215.00
7)	85.70	1235.00	8)	85.50	1245.00	9)	85.80	1258.00
10)	85.60	1290.00	11)	85.20	1325.00	12)	85.30	1370.00
13)	86.00	1385.00						

COMPUTED PARAMETERS:

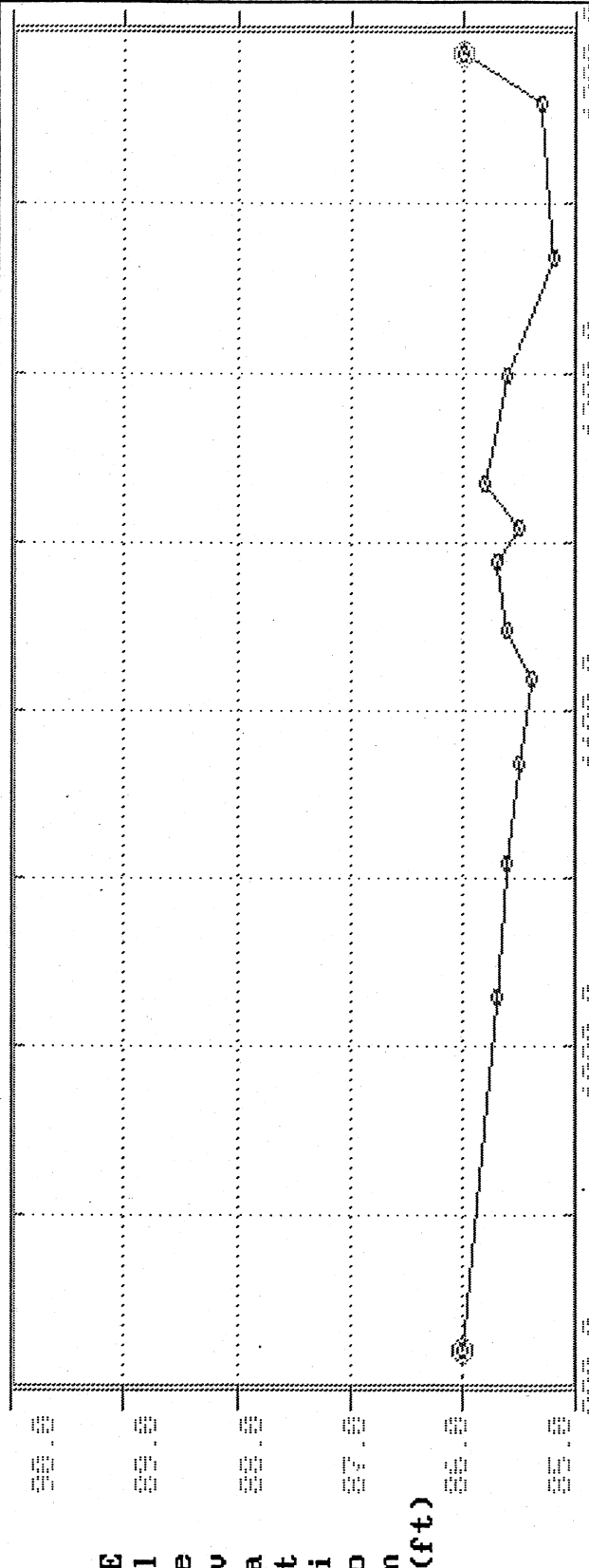
WSEL(ft)	Q(cfs)	V(fps)	Fr	No.	ne	ALPHA	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
85.51	25.0	1.3	0.59	0.040	1.0	114.7	18.5	114.7	85.44	

NOTES:

Avg depth = 0.16'

0001- 00.00- 25.0000 ft 1.0000
 CROSS SECTION FOR

Manning-n Values: 1.00: 0.040 CHANNEL: 0.010 ROF: 0.040 SLOPE = 0.0150 ('/'')



Station (ft)
 SCALES: Vertical 1: 11 Horizontal 1: 50

Project Double Diamond PH1
 Project No. 9508
 Sheet No. 1 of 2
 Calculated by (TW) Date _____

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

"H" 573+00

CROSS SECTION PARAMETERS:

FILENAME: 508RCP1D..SEC

No. of Cross Section Points: 12 Bed Slope: 0.00200 Max Elev.: 80.30
 Bank Stations.....Left: 1000.0 Right.....: 1390.0 Min Elev.: 78.90
 Encroachment Stations..Left: Right.....:
 Manning-n Values.....LOB: 0.040 CHANNEL...: 0.040 ROB.....: 0.040

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta. No.	Elev.	Sta. No.	Elev.	Sta.		
1)	80.30	1000.00	2)	79.50	1078.00	3)	79.10	1150.00
4)	78.90	1175.00	5)	79.00	1200.00	6)	79.50	1235.00
7)	80.00	1252.00	8)	79.80	1282.00	9)	79.00	1310.00
10)	80.00	1340.00	11)	79.00	1370.00	12)	80.00	1390.00

COMPUTED PARAMETERS:

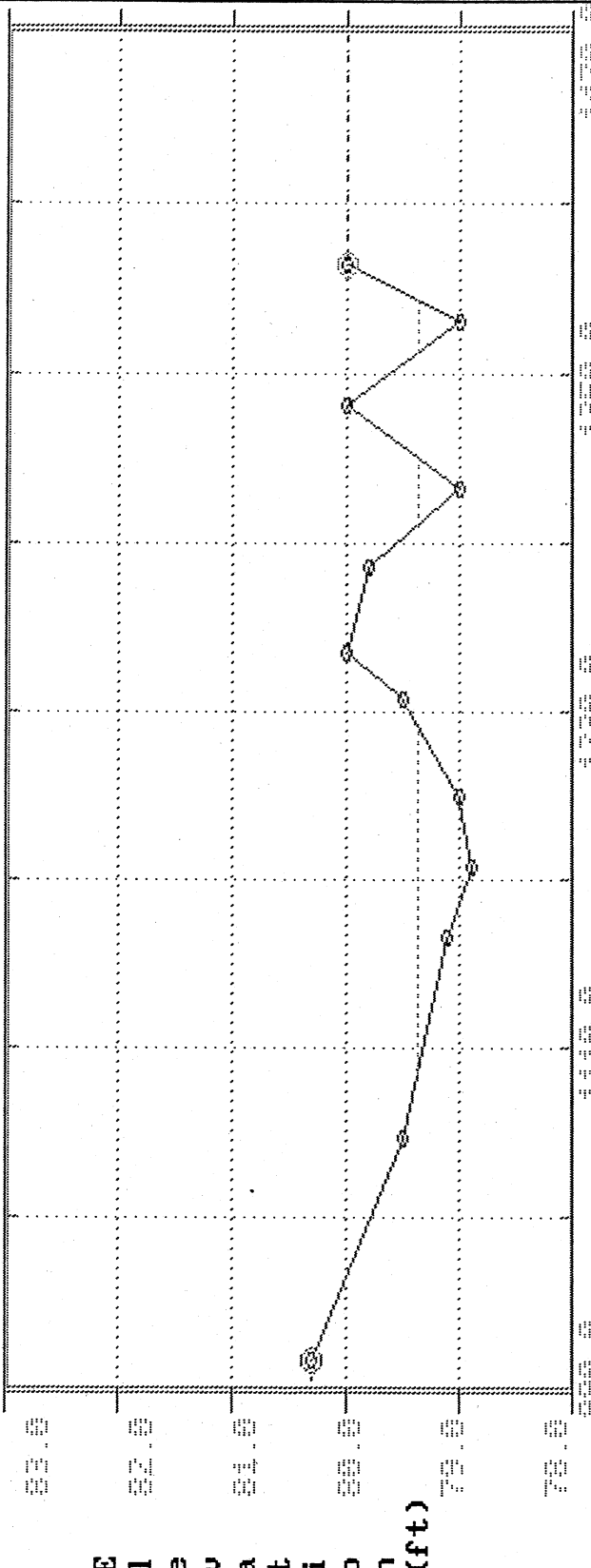
WSEL(ft)	Q(cfs)	V(fps)	Fr	No.	ne	ALPHA	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
79.37	25.0	0.6	0.23	0.040	1.0	168.2	39.5	168.3	79.16	

NOTES:

Avg. depth = 0.23'

75.4 9- 25.000 0- 0.000

Spanning Values... LOB: 0.040 CHANNEL: 0.010 ROB: 0.040 SLOPE = 0.0020 ('/')



SCALES: Vertical 1: 11 Horizontal 1: 60 Station (ft)

Project Double Diamond AH
 Project No. 9508
 Sheet No. 1 of 2
 Calculated by (TM) Date _____

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

"H" 583+00

CROSS SECTION PARAMETERS:

FILENAME: 508RCP2A.SEC

No. of Cross Section Points: 8 Bed Slope: 0.02000 Max Elev.: 92.30
 Bank Stations.....Left: 1000.0 Right.....: 1230.0 Min Elev.: 91.30
 Encroachment Stations..Left: Right.....:
 Manning-n Values.....LOB: 0.040 CHANNEL...: 0.040 ROB.....: 0.040

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta. No.	Elev.	Sta. No.	Elev.	Sta.		
1)	92.30	1000.00	2)	91.80	1015.00	3)	91.30	1045.00
4)	91.90	1095.00	5)	91.50	1128.00	6)	91.40	1142.00
7)	91.50	1175.00	8)	92.10	1230.00			

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr	No.	ne	ALPHA	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
91.62	25.0	1.5	0.67	0.040	1.0	114.9	17.0	115.0	91.58	

NOTES:

Avg. depth = 0.15'

Project Double Diamond PH1
 Project No. 9508
 Sheet No. 1 of 2
 Calculated by FND Date _____

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

"H" 583+00

CROSS SECTION PARAMETERS:

FILENAME: 508RCP2B.SEC

No. of Cross Section Points: 12 Bed Slope: 0.02500 Max Elev.: 88.00
 Bank Stations.....Left: 1000.0 Right.....: 1425.0 Min Elev.: 86.90
 Encroachment Stations..Left: Right.....:
 Manning-n Values.....LOB: 0.040 CHANNEL...: 0.040 ROB.....: 0.040

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	88.00	1000.00	2)	87.30	1080.00	3)	86.90	1103.00
4)	87.40	1125.00	5)	87.80	1150.00	6)	87.70	1182.00
7)	87.60	1230.00	8)	87.70	1252.00	9)	87.50	1282.00
10)	87.40	1342.00	11)	87.50	1365.00	12)	88.00	1425.00

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr	No.	ne	ALPHA	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
87.38	25.0	2.1	0.81	0.040	1.0	52.5	11.6	52.5	87.34	

NOTES:

Avg depth = 0.22'

Project Double Diamond PH1

Project No. 9508

Sheet No. 1 of 2

Calculated by TND Date _____

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

"H" 583+00

CROSS SECTION PARAMETERS:

FILENAME: 508RCP2C.SEC

No. of Cross Section Points: 15 Bed Slope: 0.01800 Max Elev.: 85.10
Bank Stations.....Left: 1000.0 Right....: 1510.0 Min Elev.: 83.70
Encroachment Stations..Left: Right....:
Manning-n Values.....LOB: 0.040 CHANNEL...: 0.040 ROB.....: 0.040

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta. No.	Elev.	Sta. No.	Elev.	Sta.		
1)	85.00	1000.00	2)	84.50	1035.00	3)	84.10	1062.00
4)	84.30	1095.00	5)	84.00	1120.00	6)	83.70	1180.00
7)	84.00	1230.00	8)	84.30	1280.00	9)	84.50	1315.00
10)	85.00	1340.00	11)	85.10	1360.00	12)	85.00	1385.00
13)	84.50	1415.00	14)	84.80	1450.00	15)	85.00	1510.00

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr	No.	ne	ALPHA	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
94.01	25.0	1.4	0.64	0.040	1.0	112.0	17.4	112.0	83.96	

NOTES:

Avg depth = 0.16'

Project Double Diamond D#1
 Project No. 9508
 Sheet No. 1 of 2
 Calculated by (TW) Date _____

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

"H" 583+00

CROSS SECTION PARAMETERS:

FILENAME: 508RCP2D.SEC

No. of Cross Section Points: 11 Bed Slope: 0.01500 Max Elev.: 81.00
 Bank Stations.....Left: 1000.0 Right.....: 1450.0 Min Elev.: 79.70
 Encroachment Stations..Left: Right.....:
 Manning-n Values.....LOB: 0.040 CHANNEL...: 0.040 ROB.....: 0.040

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta. No.	Elev.	Sta. No.	Elev.	Sta.		
1)	81.00	1000.00	2)	80.70	1040.00	3)	80.20	1100.00
4)	80.00	1130.00	5)	79.70	1170.00	6)	80.00	1230.00
7)	79.80	1280.00	8)	80.90	1322.00	9)	80.60	1380.00
10)	81.00	1420.00	11)	81.00	1450.00			

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr	No.	ne	ALPHA	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
80.00	25.0	1.2	0.57	0.040	1.0	158.0	21.0	158.0	79.95	

NOTES:

Avg depth = 0.13'



C:\508A\508A1T F1 Oct 25 16:11:35 1996

SHEET NO.
1
OF
1

I-580 CHANNEL "A"
INTERSECTION TOPO

SCALE: 1"=200'
DATE: 10-96
FILE: 508A1T.DWG
JOB NO: 9508
REVISIONS:



Nimbus Engineers
3710 Grant Dr.
Reno NV. 89509
(702)889-8830

Section 2

Section 3



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

JOB Y508

SHEET NO. _____ OF _____

CALCULATED BY (TW) DATE 10/23/96

CHECKED BY _____ DATE _____

SCALE _____

① elevation 4501

"H" 561+00 3-12x6 RLB's $Q_{max} = 2400 \text{ cfs}$

"H" 563+63 1-5x4 RLB $Q_{max} = 170 \text{ cfs}$

"H" 566+90 1-30" RCP $Q_{max} = 25 \text{ cfs}$

② before overtopping of Zezzu Berm $Q = 2600 \text{ cfs}$

	Freeboard @ $Q_{100} (2020 \text{ cfs})$	Freeboard @ $Q_{max} (2600 \text{ cfs})$	Q @ Capacity (of "A" Channel berms)
10+35	2.17	1.91	6030
11+70	2.70	2.53	17,630
13+00	2.32	2.12	7580
18+20	2.92	2.62	10,320

BOX CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE

January 11, 1995
So. Meadows
5 x 4 x 377' RCB
@ "H" 563+63

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Culvert Span (Width of Opening) (feet).....	5.00
Culvert Rise (Height of Opening) (feet).....	4.00
FHWA Chart Number (8,9,10,11,12 or 13).....	9
Scale Number on Chart (Type of Culvert Entrance).....	1
Manning's Roughness Coefficient (n-value).....	0.0120
Entrance Loss Coefficient of Culvert Opening.....	0.20
Culvert Length (feet).....	377.0
Culvert Slope (feet per foot).....	0.0080

PROGRAM RESULTS:

Flow Rate (cfs)	Tailwater Depth (ft)	Headwater Inlet Control (ft)	Headwater Outlet Control (ft)	Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
170.0	2.00	5.43	3.51	2.61	3.30	2.61	13.03
170.0	3.30	5.43	3.51	2.61	3.30	2.61	13.03
200.0	3.30	6.29	4.81	2.95	3.68	2.95	13.55
225.0	3.68	7.11	6.03	3.23	4.00	3.23	13.92
250.0	4.00	8.03	7.21	3.51	4.00	3.51	14.25
275.0	4.00	9.04	8.52	3.78	4.00	3.78	14.54
300.0	4.00	10.15	9.96	4.00	4.00	4.00	15.00

BOX CULVERT ANALYSIS COMPUTER PROGRAM Version 1.6 Copyright (c) 1986
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(713) 895-8322. All Rights Reserved.

Inlet Control

Q = 170 , wsc = 4801.43

NO9 = 4801.49

BOX CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE

October 21, 1994
Triple 12 x 6 x 265
Box Culvert
@ "H" 561+00

IE = 4493.0'
TK = 4502.5
Hwy = 28.4'

* This will hold 3000 cfs

PROGRAM INPUT DATA:
DESCRIPTION

VALUE

Culvert Span (Width of Opening) (feet).....	12.00
Culvert Rise (Height of Opening) (feet).....	6.00
FHWA Chart Number (8,9,10,11,12 or 13).....	9
Scale Number on Chart (Type of Culvert Entrance).....	2
Manning's Roughness Coefficient (n-value).....	0.0130
Entrance Loss Coefficient of Culvert Opening.....	0.50
Culvert Length (feet).....	265.0
Culvert Slope (feet per foot).....	0.0038

max

PROGRAM RESULTS:

Flow Rate (cfs)	Tailwater Depth (ft)	Headwater Inlet Control (ft)	Headwater Outlet Control (ft)	Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
100.0	6.00	2.00	5.05	1.19	1.29	6.00	1.39
200.0	6.00	3.17	5.23	1.87	2.05	6.00	2.78
300.0	6.00	4.16	5.54	2.45	2.69	6.00	4.17
400.0	6.00	5.04	5.96	2.99	3.26	6.00	5.56
500.0	6.00	5.84	6.50	3.49	3.78	6.00	6.94
600.0	6.00	6.60	7.17	3.97	4.27	6.00	8.33
700.0	6.00	7.33	7.95	4.44	4.73	6.00	9.72
800.0	6.00	8.05	8.86	4.89	5.17	6.00	11.11
900.0	6.00	8.87	9.88	5.33	5.59	6.00	12.50
1000.0	6.00	9.78	11.03	5.76	6.00	6.00	13.89
1100.0	6.00	10.79	12.30	6.00	6.00	6.00	15.28

200 cfs (3) = 2400
@ 4501

CHANGE ORDER ITEMS

- DELETE TRIPLE 12' X 6' RCB, SPECIAL INLET AND RIPRAP BASIN AT "H" 543+50
- "H" 543+50 NEW 5' X 4' X ^{256'}~~40'~~ PRECAST RCB FROM ^{124'}~~119'~~ LT. TO 132' ~~127'~~ RT. (WIE = 4489.5', LIE = 4488.5'). TYPE I HEADWALLS LT. AND RT. FORM INLET DEPRESSION BY GRADING OUT FROM WIE AT 10:1 SLOPE TO ORIGINAL GROUND. RIPRAP BASIN AT OUTLET (SEE DETAIL). DITCH OUT. (BEDDING AS SHOWN ON SHEET 70)
(CAMBER: X = 6" (SHEET 51))
- DELETE "V" DITCH PORTION OF "H" 549+30 CULVERT NOTE AND REPLACE WITH THE FOLLOWING:
CONSTRUCT 2' F.B.D. WITH 2:1 SIDE SLOPES FROM INLET (F.L. = 4490.0') TO OUTLET OF CULVERT AT "Z" 30+50 (F.L. = 4492.5')

4. "Z" 30+50 NEW 30" X 1150' RCP AT 10° SKEW RT. AHEAD. 81' LT. AND 69' RT. ALONG SKEW (WIE = 4493.5', LIE = 4492.5'). FLARED END SECTIONS LT. AND RT. STANDARD RIPRAP BASIN AT OUTLET. CONSTRUCT 2' F.B.D. WITH 2:1 SIDE SLOPES FROM INLET (F.L. = 4493.5') TO OUTLET OF 30" RCP AT SPLITTER BOX 215' LT. OF "H" 564+56 ±

5. "Z" 23+20
"Z" 30+60 CONSTRUCT EARTH BERM LT. (SEE DETAIL).

6. "H" 561+00 NEW TRIPLE 12' X 6' X ^{265'}~~52'~~ PRECAST RCB AT 5° SKEW RT. AHEAD. ^{133'}~~127'~~ LT. AND ^{132'}~~125'~~ RT. ALONG SKEW. (WIE = 4493.0', LIE = 4492.0'). SPECIAL INLET LT. (SEE DETAIL). TYPE I HEADWALL RT. RIPRAP BASIN AT OUTLET (SEE DETAIL).
(BEDDING AS SHOWN ON SHEET 70)
(CAMBER: X = 6" (SHEET 51))

R/W

<

211.80

PROCT 2587

9-23

O.G.

515

+20

T.B.E. = 4510.0

510

PROCT. 2587 (LN.)

PROCT. 2587 FULL SLOPE

+60

T.B.E. = 4501.0

500

4500'

45

30 T.C.P.

23+00

24+00

25+00

30+00

The following HEC-2 output file (508AS-AZ.OUT) checks $Q_{\max}=2600\text{cfs}$ ($Q_{100}=2060\text{cfs}$). This Q is the maximum that can flow through the culverts upstream of the A Channel before overtopping of the Zolezzi Lane berm.

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1*****
* HEC-2 WATER SURFACE PROFILES *
* *
* Version 4.6.2; May 1991 *
* *
RUN DATE 23OCT96 TIME 13:57:17 *
*****

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*****
* U.S. ARMY CORPS OF ENGINEERS *
* HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET, SUITE D *
* DAVIS, CALIFORNIA 95616-4687 *
* (916) 756-1104 *
*****

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X X XXXXXXXX XXXXX XXXXX
X X X X X X X
X X X X X X
XXXXXXXX XXXX X XXXXX XXXXX
X X X X X X
X X X X X X
X X XXXXXXXX XXXXX XXXXXXXX

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1
23OCT96 13:57:17

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THIS RUN EXECUTED 23OCT96 13:57:17

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*****
HEC-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	IPLLOT	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
NC .04 .04 .04 .1 .3
QT 1 2600

```

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.

THIS RUN CHECKS Qmax = 2600 CFS. THIS REPRESENTS THE MAXIMUM Q THAT CAN FLOW THROUGH THE CULVERTS UPSTREAM OF THE A CHANNEL BEFORE OVERTOPPING OF

THE ZOLEZZI LANE BERM.

X1	7912	4	1000	1199	0	0	0			
	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						

1

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PAGE 2

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						

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								

X1	7090	22	510	1403.5	255	210	260			
GR	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
	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				

X1	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
	56.0	560	55.1	750	56.0	980	55.0	1000	56.0	1015
GR	55.5	1095	56.0	1190	56.9	1310	57.0	1440	59.0	1445

1

23OCT96 13:57:17

PAGE 3

X1	5050	16	-270	1105	300	320	520			
X3	10			-260	65					
	61.5	-270	60.5	-260	60	-50	60.5	0	60	150
	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
GR	66.0	570	66.0	750	65.9	810	66.0	850	66.0	955
GR	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			
	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
GR	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				

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X1	2600	18	1000	1175	300	300	300			
GR	82	605	80.5	693	79.4	713	81	735	79	850
GR	79	922	79	930	79	952	76	968	75.5	990
	79.4	1000	75.4	1020	75	1075	74.1	1082.5	74.1	1092.5
	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			
GR	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			
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			
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						
GR	93.5	1000	93	1050	91.9	1135	92.5	1160	91.1	1180
GR	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

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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				

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SECNO	DEPTH	CWSEL	CRISW	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

CCHV= .100 CEHV= .300

*SECNO 7912.000

3720 CRITICAL DEPTH ASSUMED

7912.000	1.87	45.87	45.87	47.00	46.79	.92	.00	.00	48.00
2600.0	.0	2600.0	.0	.0	338.1	.0	.0	.0	48.00
.00	.00	7.69	.00	.000	.040	.000	.000	44.00	1006.38
.019426	0.	0.	0.	0	13	0	.00	186.23	1192.62

FLOW DISTRIBUTION FOR SECNO= 7912.00 CWSEL= 45.87

STA= 1006. 1199.

PER Q= 100.0

AREA= 338.1

VEL= 7.7

DEPTH= 1.8

*SECNO 7800.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.48

7800.000	3.79	47.79	46.17	.00	47.92	.13	1.05	.08	52.50
2600.0	.0	2600.0	.0	.0	883.6	.0	3.8	1.6	52.50
.03	.00	2.94	.00	.000	.040	.000	.000	44.00	741.64
.001605	272.	272.	272.	5	8	0	.00	317.39	1059.02

FLOW DISTRIBUTION FOR SECNO= 7800.00 CWSEL= 47.79

STA= 742. 1098.

PER Q= 100.0

AREA= 883.6

VEL= 2.9

DEPTH= 2.8

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SECNO	DEPTH	CWSEL	CRWS	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

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.44

7560.000	3.14	48.14	46.75	.00	48.18	.04	.25	.01	52.50
2600.0	.0	2600.0	.0	.0	1698.8	.0	10.6	4.9	52.50
.07	.00	1.53	.00	.000	.040	.000	.000	45.00	379.57
.000773	430.	230.	380.	4	12	0	.00	941.56	1321.13

FLOW DISTRIBUTION FOR SECNO= 7560.00 CWSEL= 48.14

STA= 380. 1334.
 PER Q= 100.0
 AREA= 1698.8
 VEL= 1.5
 JEPH= 1.8

*SECNO 7360.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .50

7360.000	1.48	48.38	47.73	.00	48.47	.09	.27	.02	52.50
2600.0	.0	2600.0	.0	.0	1080.1	.0	17.0	9.0	52.50
.09	.00	2.41	.00	.000	.040	.000	.000	46.90	519.48
.003051	200.	200.	200.	0	14	0	.00	849.66	1369.14

FLOW DISTRIBUTION FOR SECNO= 7360.00 CWSEL= 48.38

STA= 519. 1382.
 PER Q= 100.0
 AREA= 1080.1
 VEL= 2.4
 DEPTH= 1.3

*SECNO 7090.000

7090.000	2.30	49.20	48.49	.00	49.32	.12	.84	.01	51.70
2600.0	.0	2600.0	.0	.0	942.5	.0	23.0	13.5	52.50
.12	.00	2.76	.00	.000	.040	.000	.000	46.90	734.19
.003427	255.	260.	210.	2	8	0	.00	659.41	1393.59

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SECNO	DEPTH	CWSEL	CRISW	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= 7090.00 CWSEL= 49.20

STA= 734. 1404.
 PER Q= 100.0
 AREA= 942.5
 VEL= 2.8
 DEPTH= 1.4

*SECNO 6810.000

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

6810.000	2.50	50.50	50.01	.00	50.75	.25	1.39	.04	52.50
2600.0	.0	2600.0	.0	.0	651.1	.0	28.2	17.2	52.50
.14	.00	3.99	.00	.000	.040	.000	.000	48.00	817.20
.007859	290.	280.	315.	2	15	0	.00	487.31	1304.51

FLOW DISTRIBUTION FOR SECNO= 6810.00 CWSEL= 50.50

STA= 817. 1311.
 PER Q= 100.0
 AREA= 651.1
 VEL= 4.0

DEPTH= 1.3

*SECNO 6510.000

? WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.75

6510.000	2.85	51.85	50.76	.00	51.97	.12	1.20	.01	54.00
2600.0	.0	2600.0	.0	.0	953.4	.0	33.5	20.6	52.30
.17	.00	2.73	.00	.000	.040	.000	.000	49.00	768.98
.002560	260.	290.	310.	1	19	0	.00	545.05	1314.03

FLOW DISTRIBUTION FOR SECNO= 6510.00 CWSEL= 51.85

STA= 769. 1315.

PER Q= 100.0
 AREA= 953.4
 VEL= 2.7
 DEPTH= 1.7

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SECNO	DEPTH	CWSEL	CRISW	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 6230.000

6230.000	2.53	52.53	51.39	.00	52.64	.12	.68	.00	56.00
2600.0	.0	2600.0	.0	.0	952.5	.0	39.6	24.0	53.00
.19	.00	2.73	.00	.000	.040	.000	.000	50.00	897.23
.002277	300.	280.	350.	3	11	0	.00	497.83	1395.06

FLOW DISTRIBUTION FOR SECNO= 6230.00 CWSEL= 52.53

STA= 897. 1396.

PER Q= 100.0
 AREA= 952.5
 VEL= 2.7
 DEPTH= 1.9

*SECNO 5930.000

5930.000	1.87	53.37	52.77	.00	53.46	.09	.82	.00	58.00
2600.0	.0	2600.0	.0	.0	1056.8	.0	46.1	28.7	55.00
.23	.00	2.46	.00	.000	.040	.000	.000	51.50	851.17
.003912	240.	280.	450.	1	8	0	.00	969.73	1820.90

FLOW DISTRIBUTION FOR SECNO= 5930.00 CWSEL= 53.37

STA= 851. 1825.

PER Q= 100.0
 AREA= 1056.8
 VEL= 2.5
 DEPTH= 1.1

*SECNO 5750.000

.65 DIVIDED FLOW

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

5750.000	1.63	54.43	54.21	.00	54.63	.20	1.14	.03	59.00
2600.0	.0	2600.0	.0	.0	720.2	.0	49.8	32.5	59.00
.24	.00	3.61	.00	.000	.040	.000	.000	52.80	716.71
.011904	150.	180.	320.	1	19	0	.00	856.47	1588.91

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SECNO	DEPTH	CWSEL	CRISW	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= 54.43

STA= 717. 1610.

PER Q= 100.0

AREA= 720.2

VEL= 3.6

DEPTH= .8

*SECNO 5550.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.46

5550.000	1.88	56.88	56.41	.00	57.01	.13	2.37	.01	59.00
2600.0	.0	2600.0	.0	.0	893.1	.0	55.3	38.3	59.00
.27	.00	2.91	.00	.000	.040	.000	.000	55.00	472.23
.005614	150.	300.	320.	6	15	0	.00	834.79	1307.02

FLOW DISTRIBUTION FOR SECNO= 5550.00 CWSEL= 56.88

STA= 472. 1445.

PER Q= 100.0

AREA= 893.1

VEL= 2.9

DEPTH= 1.1

*SECNO 5050.000

3265 DIVIDED FLOW

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

5050.000	1.70	60.50	60.16	.00	60.64	.14	3.63	.00	61.50
2600.0	.0	2600.0	.0	.0	877.3	.0	65.9	50.0	63.00
.32	.00	2.96	.00	.000	.040	.000	.000	58.80	-258.31
.008905	300.	520.	320.	4	15	0	.00	1128.74	872.04

FLOW DISTRIBUTION FOR SECNO= 5050.00 CWSEL= 60.50

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SECNO	DEPTH	CWSEL	CRISW	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

STA= -258. 1105.
 PER Q= 100.0
 AREA= 877.3
 VEL= 3.0
 DEPTH= .8

*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	1.88	63.38	63.21	.00	63.55	.18	2.90	.01	65.00
2600.0	.0	2600.0	.0	.0	766.8	.0	71.2	56.9	100000.00
.34	.00	3.39	.00	.000	.040	.000	.000	61.50	80.00
.012227	450.	280.	250.	4	5	0	.00	1021.93	1101.93

FLOW DISTRIBUTION FOR SECNO= 4750.00 CWSEL= 63.38

STA= 80. 1105.
 PER Q= 100.0
 AREA= 766.8
 VEL= 3.4
 DEPTH= .8

*SECNO 4450.000

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

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

4450.000	1.50	66.50	66.33	.00	66.67	.17	3.12	.00	68.00
2600.0	.0	2600.0	.0	.0	782.3	.0	75.6	63.0	100000.00
.36	.00	3.32	.00	.000	.040	.000	.000	65.00	320.00
.012712	350.	250.	250.	5	13	0	.00	1106.00	1426.00

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

FLOW DISTRIBUTION FOR SECNO= 4450.00 CWSEL= 66.50

STA= 320. 1427.
 PER Q= 100.0
 AREA= 782.3
 VEL= 3.3
 DEPTH= .7

*SECNO 4050.000

001 HV CHANGED MORE THAN HVINS

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	2.23	72.63	72.63	.00	73.34	.71	3.59	.16	100000.00
2600.0	.0	2600.0	.0	.0	385.2	.0	79.0	67.0	100000.00
.37	.00	6.75	.00	.000	.035	.000	.000	70.40	802.33
.016324	1950.	250.	250.	0	14	0	.00	277.22	1079.55

FLOW DISTRIBUTION FOR SECNO= 4050.00 CWSEL= 72.63

STA= 802. 1095.
 PER Q= 100.0
 AREA= 385.2
 VEL= 6.8
 DEPTH= 1.4

*SECNO 3950.000

3950.000	3.51	73.91	73.54	.00	74.51	.60	1.15	.01	79.20
2600.0	.0	2600.0	.0	.0	419.3	.0	79.9	67.6	78.50
.38	.00	6.20	.00	.000	.035	.000	.000	70.40	1097.40
.008588	100.	100.	100.	2	11	0	.00	211.27	1308.67

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SECNO	DEPTH	CWSEL	CRISW	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= 3950.00 CWSEL= 73.91

STA= 1097. 1320.
 PER Q= 100.0
 AREA= 419.3
 VEL= 6.2
 DEPTH= 2.0

*SECNO 3700.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.46

3700.000	4.23	75.53	74.61	.00	75.95	.42	1.42	.02	77.90
2600.0	.0	2600.0	.0	.0	500.5	.0	82.5	68.7	79.20
.39	.00	5.19	.00	.000	.035	.000	.000	71.30	1012.78
.004055	240.	250.	225.	3	11	0	.00	187.04	1199.82

FLOW DISTRIBUTION FOR SECNO= 3700.00 CWSEL= 75.53

STA= 1013. 1210.
 PER Q= 100.0
 AREA= 500.5
 VEL= 5.2
 DEPTH= 2.7

*SECNO 3400.000

3265 DIVIDED FLOW

3400.000	4.49	76.59	75.47	.00	76.84	.25	.87	.02	77.60
2600.0	507.7	2092.3	.0	175.6	497.5	.0	86.6	70.3	79.70
.41	2.89	4.21	.00	.035	.035	.000	.000	72.10	893.63
.002178	300.	300.	285.	3	16	0	.00	262.44	1165.29

FLOW DISTRIBUTION FOR SECNO= 3400.00 CWSEL= 76.59

STA=	894.	900.	988.	996.	1175.
PER Q=	.3	18.6	.7	80.5	
AREA=	5.1	162.0	8.5	497.5	
VEL=	1.7	3.0	2.0	4.2	
DEPTH=	.8	1.8	1.0	3.1	

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SECNO	DEPTH	CWSEL	CRISW	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 3150.000

3265 DIVIDED FLOW

3150.000	4.54	77.14	76.10	.00	77.43	.29	.58	.01	78.00
2600.0	344.2	2255.8	.0	148.1	499.7	.0	90.3	72.0	80.00
.43	2.32	4.51	.00	.035	.035	.000	.000	72.60	812.40
.002514	240.	250.	260.	2	15	0	.00	339.90	1165.46

FLOW DISTRIBUTION FOR SECNO= 3150.00 CWSEL= 77.14

STA=	812.	868.	910.	980.	991.	1175.
PER Q=	.2	2.8	9.9	.4	86.8	
AREA=	7.2	37.3	97.2	6.5	499.7	
VEL=	.6	2.0	2.6	1.5	4.5	
DEPTH=	.1	.9	1.4	.6	3.1	

*SECNO 2900.000

3265 DIVIDED FLOW

2900.000	4.56	77.76	76.54	.00	78.10	.34	.66	.02	78.60
2600.0	162.7	2437.3	.0	75.2	507.5	.0	93.8	73.6	80.80
.44	2.16	4.80	.00	.035	.035	.000	.000	73.20	844.01
.002784	240.	250.	260.	2	15	0	.00	244.45	1165.05

FLOW DISTRIBUTION FOR SECNO= 2900.00 CWSEL= 77.76

STA=	844.	852.	867.	948.	990.	996.	1175.
PER Q=	.6	1.2	.2	4.0	.3	93.7	
AREA=	7.4	14.1	4.7	44.7	4.2	507.5	
VEL=	2.1	2.1	1.2	2.3	1.7	4.8	
DEPTH=	.9	.9	.1	1.1	.7	3.2	

*SECNO 2600.000

3265 DIVIDED FLOW

2600.000	4.48	78.58	77.20	.00	78.87	.29	.76	.00	79.40
2600.0	330.9	2269.1	.0	92.3	512.7	.0	97.9	75.1	81.50

.46	3.59	4.43	.00	.035	.035	.000	.000	74.10	954.23
.002340	300.	300.	300.	2	19	0	.00	204.87	1165.28

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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

FLOW DISTRIBUTION FOR SECNO= 2600.00 CWSEL= 78.58

STA=	954.	968.	990.	998.	1175.
PER Q=	1.6	9.9	1.2	87.3	
AREA=	17.8	62.3	12.2	512.7	
VEL=	2.4	4.1	2.6	4.4	
DEPTH=	1.3	2.8	1.5	3.2	

*SECNO 2350.000

3265 DIVIDED FLOW

2350.000	4.00	79.20	77.86	.00	79.48	.27	.60	.00	80.20
2600.0	313.2	2286.8	.0	126.8	521.1	.0	101.7	76.8	82.20
.48	2.47	4.39	.00	.035	.035	.000	.000	75.20	794.29
.002279	260.	260.	260.	2	14	0	.00	354.41	1167.71

FLOW DISTRIBUTION FOR SECNO= 2350.00 CWSEL= 79.20

STA=	794.	813.	908.	936.	967.	982.	992.	997.	1180.
PER Q=	.0	1.0	.3	2.4	5.4	2.6	.4	88.0	
AREA=	1.9	28.6	8.4	24.9	37.5	20.5	5.0	521.1	
VEL=	.4	.9	.9	2.5	3.7	3.3	1.9	4.4	
DEPTH=	.1	.3	.3	.8	2.5	2.1	1.0	3.2	

*SECNO 2100.000

2100.000	3.98	79.78	78.49	.00	80.16	.38	.65	.03	80.70
2600.0	.0	2600.0	.0	.0	524.9	.0	105.1	78.4	83.10
.49	.00	4.95	.00	.000	.035	.000	.000	75.80	1005.11
.002950	270.	250.	240.	1	14	0	.00	165.79	1170.90

FLOW DISTRIBUTION FOR SECNO= 2100.00 CWSEL= 79.78

STA=	1005.	1180.
PER Q=	100.0	
AREA=	524.9	
VEL=	5.0	
DEPTH=	3.2	

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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 1980.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.56

1980.000	5.16	80.16	77.79	.00	80.39	.23	.22	.02	80.40
2600.0	.0	2600.0	.0	.0	680.4	.0	106.7	78.8	83.10
.50	.00	3.82	.00	.000	.035	.000	.000	75.00	1000.89
.001212	30.	120.	220.	2	19	0	.00	162.33	1163.22

FLOW DISTRIBUTION FOR SECNO= 1980.00 CWSEL= 80.16

STA= 1001. 1170.
 PER Q= 100.0
 AREA= 680.4
 VEL= 3.8
 DEPTH= 4.2

*SECNO 1930.000

1930.000	4.72	80.22	77.98	.00	80.45	.24	.06	.00	80.40
2600.0	.0	2600.0	.0	.0	663.8	.0	107.5	79.0	83.50
.50	.00	3.92	.00	.000	.035	.000	.000	75.50	1000.38
.001304	1.	50.	80.	2	11	0	.00	160.75	1161.12

FLOW DISTRIBUTION FOR SECNO= 1930.00 CWSEL= 80.22

STA= 1000. 1170.
 PER Q= 100.0
 AREA= 663.8
 VEL= 3.9
 DEPTH= 4.1

SECNO 1840.000

1840.000	4.53	80.33	78.42	.00	80.59	.25	.13	.00	81.70
2600.0	.0	2600.0	.0	.0	645.2	.0	108.8	79.3	83.90
.51	.00	4.03	.00	.000	.035	.000	.000	75.80	1002.33
.001577	75.	90.	85.	1	11	0	.00	172.75	1175.08

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SECNO	DEPTH	CWSEL	CRISW	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= 1840.00 CWSEL= 80.33

STA= 1002. 1185.
 PER Q= 100.0
 AREA= 645.2
 VEL= 4.0
 DEPTH= 3.7

*SECNO 1820.000

3301 HV CHANGED MORE THAN HVINS

5 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1820.000	2.38	82.38	82.38	.00	83.32	.94	.08	.21	84.20
2600.0	.0	2600.0	.0	.0	333.7	.0	109.1	79.4	85.00
.51	.00	7.79	.00	.000	.040	.000	.000	80.00	1006.28

.019404 30. 20. 20. 0 11 0 .00 180.17 1186.45

FLOW DISTRIBUTION FOR SECNO= 1820.00 CWSEL= 82.38

STA= 1006. 1195.

PER Q= 100.0

AREA= 333.7

VEL= 7.8

DEPTH= 1.9

*SECNO 1565.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.65

1565.000	2.85	85.95	85.58	.00	86.13	.18	2.74	.08	87.30
2600.0	1139.7	1460.3	.0	352.9	416.7	.0	112.2	82.0	88.90
.53	3.23	3.50	.00	.040	.040	.000	.000	83.10	615.42
.007120	275.	240.	250.	6	8	0	.00	720.80	1379.47

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SECNO	DEPTH	CWSEL	CRISW	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= 1565.00 CWSEL= 85.95

STA= 615. 642. 650. 661. 688. 718. 783. 879. 968. 985. 1389.

PER Q=	5.8	2.8	.6	.7	2.3	4.9	8.9	16.7	1.2	56.2
AREA=	37.9	15.2	6.7	10.9	22.7	49.1	82.1	116.2	12.1	416.7
VEL=	4.0	4.7	2.2	1.7	2.6	2.6	2.8	3.7	2.5	3.5
DEPTH=	1.4	1.9	.6	.4	.8	.8	.9	1.3	.7	1.2

*SECNO 1300.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

1300.000	1.88	90.18	90.18	.00	90.73	.55	3.09	.11	91.00
2600.0	.0	2600.0	.0	.0	437.8	.0	115.8	85.3	92.30
.54	.00	5.94	.00	.000	.040	.000	.000	88.30	1095.59
.023074	200.	280.	290.	0	14	0	.00	404.99	1570.36

FLOW DISTRIBUTION FOR SECNO= 1300.00 CWSEL= 90.18

STA= 1096. 1578.

PER Q= 100.0

AREA= 437.8

VEL= 5.9

DEPTH= 1.1

*SECNO 1170.000

3265 DIVIDED FLOW

70 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	2.07	92.57	92.35	.00	92.95	.38	2.20	.02	95.70
2600.0	.0	2600.0	.0	.0	525.9	.0	117.2	86.6	100000.00
.55	.00	4.94	.00	.000	.040	.000	.000	90.50	1242.09
.012991	130.	130.	135.	4	5	0	.00	416.13	1697.17

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SECNO	DEPTH	CWSEL	CRISW	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= 1170.00 CWSEL= 92.57

STA= 1242. 1703.

PER Q= 100.0
 AREA= 525.9
 VEL= 4.9
 DEPTH= 1.3

ECNO 1035.000

3301 HV CHANGED MORE THAN HVINS

1035.000	3.99	93.99	93.73	.00	94.97	.98	1.84	.18	98.70
2600.0	.0	2600.0	.0	.0	326.9	.0	118.6	87.4	95.90
.56	.00	7.95	.00	.000	.040	.000	.000	90.00	1480.28
.014277	230.	135.	100.	4	17	0	.00	135.56	1615.84

FLOW DISTRIBUTION FOR SECNO= 1035.00 CWSEL= 93.99

STA= 1480. 1620.

PER Q= 100.0
 AREA= 326.9
 VEL= 8.0
 DEPTH= 2.4

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THIS RUN EXECUTED 23OCT96 13:57:19

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

WHITES CREEK CHANNEL A

SUMMARY PRINTOUT

SECNO	Q	CWSEL	SSTA	ENDST
* 7912.000	2600.00	45.87	1006.38	1192.62
* 7800.000	2600.00	47.79	741.64	1059.02
* 7560.000	2600.00	48.14	379.57	1321.13
* 7360.000	2600.00	48.38	519.48	1369.14
7090.000	2600.00	49.20	734.19	1393.59
* 6810.000	2600.00	50.50	817.20	1304.51
* 6510.000	2600.00	51.85	768.98	1314.03
6230.000	2600.00	52.53	897.23	1395.06
5930.000	2600.00	53.37	851.17	1820.90
* 5750.000	2600.00	54.43	716.71	1588.91
* 5550.000	2600.00	56.88	472.23	1307.02
5050.000	2600.00	60.50	-258.31	872.04
4750.000	2600.00	63.38	80.00	1101.93
4450.000	2600.00	66.50	320.00	1426.00
* 4050.000	2600.00	72.63	802.33	1079.55
3950.000	2600.00	73.91	1097.40	1308.67
* 3700.000	2600.00	75.53	1012.78	1199.82

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SECNO	Q	CWSEL	SSTA	ENDST
3400.000	2600.00	76.59	893.63	1165.29
3150.000	2600.00	77.14	812.40	1165.46
2900.000	2600.00	77.76	844.01	1165.05
2600.000	2600.00	78.58	954.23	1165.28
2350.000	2600.00	79.20	794.29	1167.71
2100.000	2600.00	79.78	1005.11	1170.90
1980.000	2600.00	80.16	1000.89	1163.22
1930.000	2600.00	80.22	1000.38	1161.12
1840.000	2600.00	80.33	1002.33	1175.08

*	1820.000	2600.00	82.38	1006.28	1186.45
*	1565.000	2600.00	85.95	615.42	1379.47
	1300.000	2600.00	90.18	1095.59	1570.36
	1170.000	2600.00	92.57	1242.09	1697.17
	1035.000	2600.00	93.99	1480.28	1615.84

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WHITES CREEK CHANNEL A

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	XLBEL	RBEL
*	7912.000	2600.00	45.87	48.00	48.00
*	7800.000	2600.00	47.79	52.50	52.50
*	7560.000	2600.00	48.14	52.50	52.50
*	7360.000	2600.00	48.38	52.50	52.50
	7090.000	2600.00	49.20	51.70	52.50
*	6810.000	2600.00	50.50	52.50	52.50
	6510.000	2600.00	51.85	54.00	52.30
	6230.000	2600.00	52.53	56.00	53.00
	5930.000	2600.00	53.37	58.00	55.00
*	5750.000	2600.00	54.43	59.00	59.00
*	5550.000	2600.00	56.88	59.00	59.00
	5050.000	2600.00	60.50	61.50	63.00
	4750.000	2600.00	63.38	65.00	100000.00
	4450.000	2600.00	66.50	68.00	100000.00
*	4050.000	2600.00	72.63	100000.00	100000.00
	3950.000	2600.00	73.91	79.20	78.50
*	3700.000	2600.00	75.53	77.90	79.20
	3400.000	2600.00	76.59	77.60	79.70
	3150.000	2600.00	77.14	78.00	80.00
	2900.000	2600.00	77.76	78.60	80.80
	2600.000	2600.00	78.58	79.40	81.50
	2350.000	2600.00	79.20	80.20	82.20
	2100.000	2600.00	79.78	80.70	83.10

* 1980.000 2600.00 80.16 80.40 83.10

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SECNO	Q	CWSEL	XLBEL	RBEL
1930.000	2600.00	80.22	80.40	83.50
1840.000	2600.00	80.33	81.70	83.90
* 1820.000	2600.00	82.38	84.20	85.00
* 1565.000	2600.00	85.95	87.30	88.90
* 1300.000	2600.00	90.18	91.00	92.30
1170.000	2600.00	92.57	95.70	100000.00
1035.000	2600.00	93.99	98.70	95.90

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WHITES CREEK CHANNEL A

SUMMARY PRINTOUT TABLE 105

SECNO	CWSEL	HL	OLOSS	TOPWID	QLOB	QCH	QROB
* 7912.000	45.87	.00	.00	186.23	.00	2600.00	.00
* 7800.000	47.79	1.05	.08	317.39	.00	2600.00	.00
* 7560.000	48.14	.25	.01	941.56	.00	2600.00	.00
* 7360.000	48.38	.27	.02	849.66	.00	2600.00	.00
7090.000	49.20	.84	.01	659.41	.00	2600.00	.00
* 6810.000	50.50	1.39	.04	487.31	.00	2600.00	.00
* 6510.000	51.85	1.20	.01	545.05	.00	2600.00	.00
6230.000	52.53	.68	.00	497.83	.00	2600.00	.00
5930.000	53.37	.82	.00	969.73	.00	2600.00	.00
* 5750.000	54.43	1.14	.03	856.47	.00	2600.00	.00
* 5550.000	56.88	2.37	.01	834.79	.00	2600.00	.00
5050.000	60.50	3.63	.00	1128.74	.00	2600.00	.00
4750.000	63.38	2.90	.01	1021.93	.00	2600.00	.00
4450.000	66.50	3.12	.00	1106.00	.00	2600.00	.00
* 4050.000	72.63	3.59	.16	277.22	.00	2600.00	.00
3950.000	73.91	1.15	.01	211.27	.00	2600.00	.00

*	3700.000	75.53	1.42	.02	187.04	.00	2600.00	.00
	3400.000	76.59	.87	.02	262.44	507.67	2092.33	.00
	3150.000	77.14	.58	.01	339.90	344.18	2255.82	.00
	2900.000	77.76	.66	.02	244.45	162.68	2437.32	.00
	2600.000	78.58	.76	.00	204.87	330.87	2269.13	.00
	2350.000	79.20	.60	.00	354.41	313.19	2286.81	.00
	2100.000	79.78	.65	.03	165.79	.00	2600.00	.00
*	1980.000	80.16	.22	.02	162.33	.00	2600.00	.00

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SECNO	CWSEL	HL	OLOSS	TOPWID	QLOB	QCH	QROB	
1930.000	80.22	.06	.00	160.75	.00	2600.00	.00	
1840.000	80.33	.13	.00	172.75	.00	2600.00	.00	
*	1820.000	82.38	.08	.21	180.17	.00	2600.00	.00
*	1565.000	85.95	2.74	.08	720.80	1139.74	1460.26	.00
*	1300.000	90.18	3.09	.11	404.99	.00	2600.00	.00
	1170.000	92.57	2.20	.02	416.13	.00	2600.00	.00
	1035.000	93.99	1.84	.18	135.56	.00	2600.00	.00

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WHITES CREEK CHANNEL A

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIBS	EG	10*KS	VCH	AREA	.01K	
*	7912.000	.00	.00	.00	44.00	2600.00	45.87	45.87	46.79	194.26	7.69	338.12	186.54
*	7800.000	272.00	.00	.00	44.00	2600.00	47.79	46.17	47.92	16.05	2.94	883.64	648.90
*	7560.000	230.00	.00	.00	45.00	2600.00	48.14	46.75	48.18	7.73	1.53	1698.82	935.11
*	7360.000	200.00	.00	.00	46.90	2600.00	48.38	47.73	48.47	30.51	2.41	1080.06	470.75
	7090.000	260.00	.00	.00	46.90	2600.00	49.20	48.49	49.32	34.27	2.76	942.48	444.16
*	6810.000	280.00	.00	.00	48.00	2600.00	50.50	50.01	50.75	78.59	3.99	651.10	293.29
*	6510.000	290.00	.00	.00	49.00	2600.00	51.85	50.76	51.97	25.60	2.73	953.36	513.89
	6230.000	280.00	.00	.00	50.00	2600.00	52.53	51.39	52.64	22.77	2.73	952.51	544.93
	5930.000	280.00	.00	.00	51.50	2600.00	53.37	52.77	53.46	39.12	2.46	1056.76	415.71
*	5750.000	180.00	.00	.00	52.80	2600.00	54.43	54.21	54.63	119.04	3.61	720.21	238.30

*	5550.000	300.00	.00	.00	55.00	2600.00	56.88	56.41	57.01	56.14	2.91	893.06	347.02
	5050.000	520.00	.00	.00	58.80	2600.00	60.50	60.16	60.64	89.05	2.96	877.33	275.53
	4750.000	280.00	.00	.00	61.50	2600.00	63.38	63.21	63.55	122.27	3.39	766.76	235.13
	4450.000	250.00	.00	.00	65.00	2600.00	66.50	66.33	66.67	127.12	3.32	782.26	230.60
*	4050.000	250.00	.00	.00	70.40	2600.00	72.63	72.63	73.34	163.24	6.75	385.15	203.50
	3950.000	100.00	.00	.00	70.40	2600.00	73.91	73.54	74.51	85.88	6.20	419.33	280.56
*	3700.000	250.00	.00	.00	71.30	2600.00	75.53	74.61	75.95	40.55	5.19	500.52	408.30
	3400.000	300.00	.00	.00	72.10	2600.00	76.59	75.47	76.84	21.78	4.21	673.07	557.12
	3150.000	250.00	.00	.00	72.60	2600.00	77.14	76.10	77.43	25.14	4.51	647.76	518.50
	2900.000	250.00	.00	.00	73.20	2600.00	77.76	76.54	78.10	27.84	4.80	582.65	492.78
	2600.000	300.00	.00	.00	74.10	2600.00	78.58	77.20	78.87	23.40	4.43	604.98	537.48
	2350.000	260.00	.00	.00	75.20	2600.00	79.20	77.86	79.48	22.79	4.39	647.86	544.65
	2100.000	250.00	.00	.00	75.80	2600.00	79.78	78.49	80.16	29.50	4.95	524.89	478.67
*	1980.000	120.00	.00	.00	75.00	2600.00	80.16	77.79	80.39	12.12	3.82	680.44	746.68

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRISWS	EG	10*KS	VCH	AREA	.01K
1930.000	50.00	.00	.00	75.50	2600.00	80.22	77.98	80.45	13.04	3.92	663.79	719.97
1840.000	90.00	.00	.00	75.80	2600.00	80.33	78.42	80.59	15.77	4.03	645.17	654.67
*	1820.000	20.00	.00	80.00	2600.00	82.38	82.38	83.32	194.04	7.79	333.70	186.65
*	1565.000	240.00	.00	83.10	2600.00	85.95	85.58	86.13	71.20	3.50	769.52	308.14
*	1300.000	280.00	.00	88.30	2600.00	90.18	90.18	90.73	230.74	5.94	437.80	171.16
	1170.000	130.00	.00	90.50	2600.00	92.57	92.35	92.95	129.91	4.94	525.87	228.12
	1035.000	135.00	.00	90.00	2600.00	93.99	93.73	94.97	142.77	7.95	326.86	217.60

1

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WHITES CREEK CHANNEL A

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
7912.000	2600.00	45.87	.00	.00	-1.13	186.23	.00
*	7800.000	2600.00	47.79	.00	1.92	317.39	272.00
*	7560.000	2600.00	48.14	.00	.36	941.56	230.00

*	7360.000	2600.00	48.38	.00	.24	.00	849.66	200.00
	7090.000	2600.00	49.20	.00	.82	.00	659.41	260.00
	6810.000	2600.00	50.50	.00	1.30	.00	487.31	280.00
*	6510.000	2600.00	51.85	.00	1.35	.00	545.05	290.00
	6230.000	2600.00	52.53	.00	.68	.00	497.83	280.00
	5930.000	2600.00	53.37	.00	.84	.00	969.73	280.00
*	5750.000	2600.00	54.43	.00	1.06	.00	856.47	180.00
*	5550.000	2600.00	56.88	.00	2.45	.00	834.79	300.00
	5050.000	2600.00	60.50	.00	3.62	.00	1128.74	520.00
	4750.000	2600.00	63.38	.00	2.87	.00	1021.93	280.00
	4450.000	2600.00	66.50	.00	3.12	.00	1106.00	250.00
*	4050.000	2600.00	72.63	.00	6.13	.00	277.22	250.00
	3950.000	2600.00	73.91	.00	1.28	.00	211.27	100.00
*	3700.000	2600.00	75.53	.00	1.62	.00	187.04	250.00
	3400.000	2600.00	76.59	.00	1.06	.00	262.44	300.00
	3150.000	2600.00	77.14	.00	.55	.00	339.90	250.00
	2900.000	2600.00	77.76	.00	.62	.00	244.45	250.00
	2600.000	2600.00	78.58	.00	.82	.00	204.87	300.00
	2350.000	2600.00	79.20	.00	.62	.00	354.41	260.00
	2100.000	2600.00	79.78	.00	.57	.00	165.79	250.00
*	1980.000	2600.00	80.16	.00	.39	.00	162.33	120.00

1

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH	
1930.000	2600.00	80.22	.00	.05	.00	160.75	50.00	
1840.000	2600.00	80.33	.00	.12	.00	172.75	90.00	
*	1820.000	2600.00	82.38	.00	2.04	.00	180.17	20.00
*	1565.000	2600.00	85.95	.00	3.58	.00	720.80	240.00
*	1300.000	2600.00	90.18	.00	4.23	.00	404.99	280.00
	1170.000	2600.00	92.57	.00	2.39	.00	416.13	130.00
	1035.000	2600.00	93.99	.00	1.42	.00	135.56	135.00

1

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SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 7912.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

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

WARNING SECNO= 7560.000 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

WARNING SECNO= 5750.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 5550.000 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= 3700.000 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

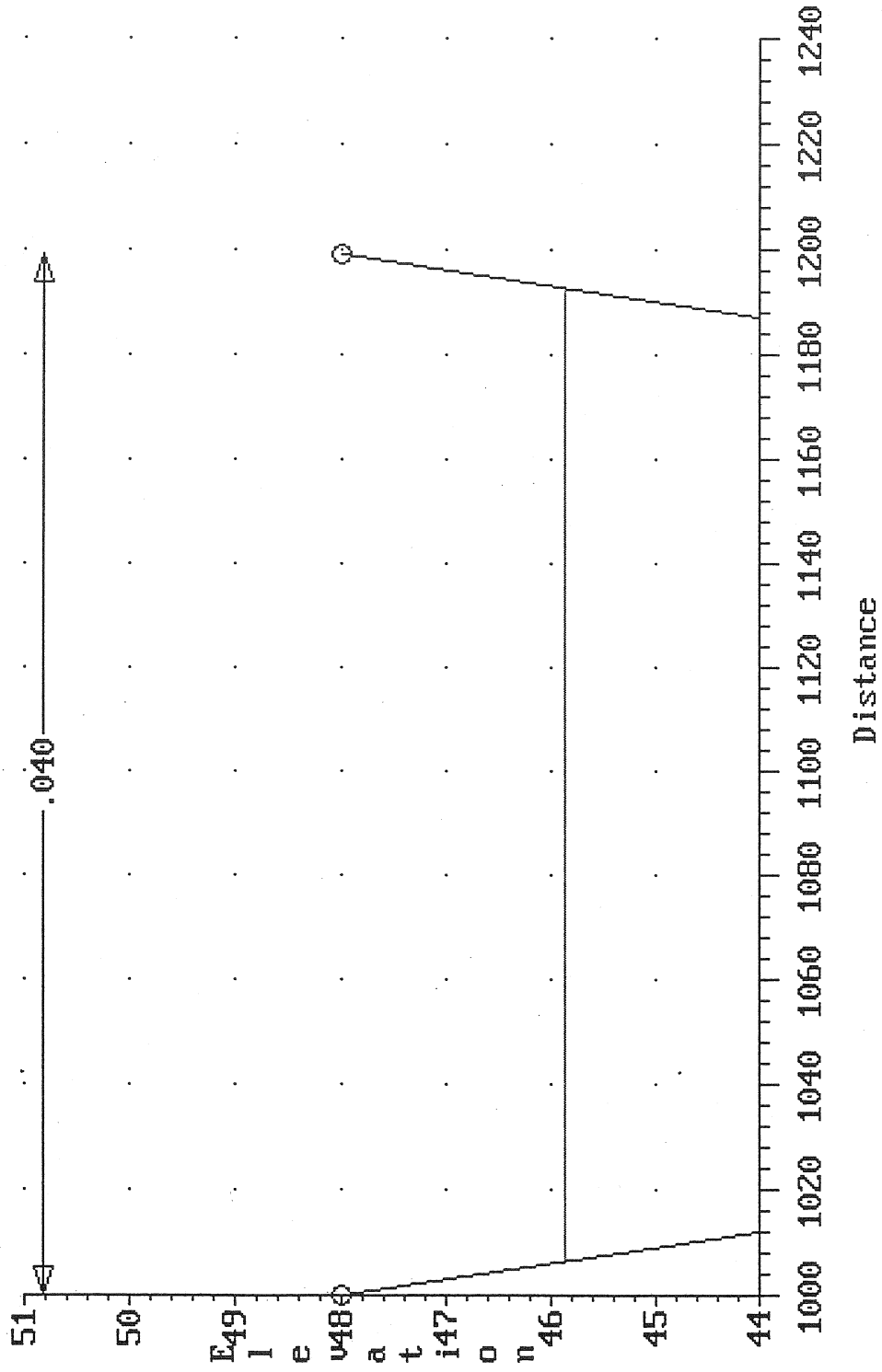
CAUTION SECNO= 1300.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 1300.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WHITES CREEK CHANNEL A

Q = 2600 CFS

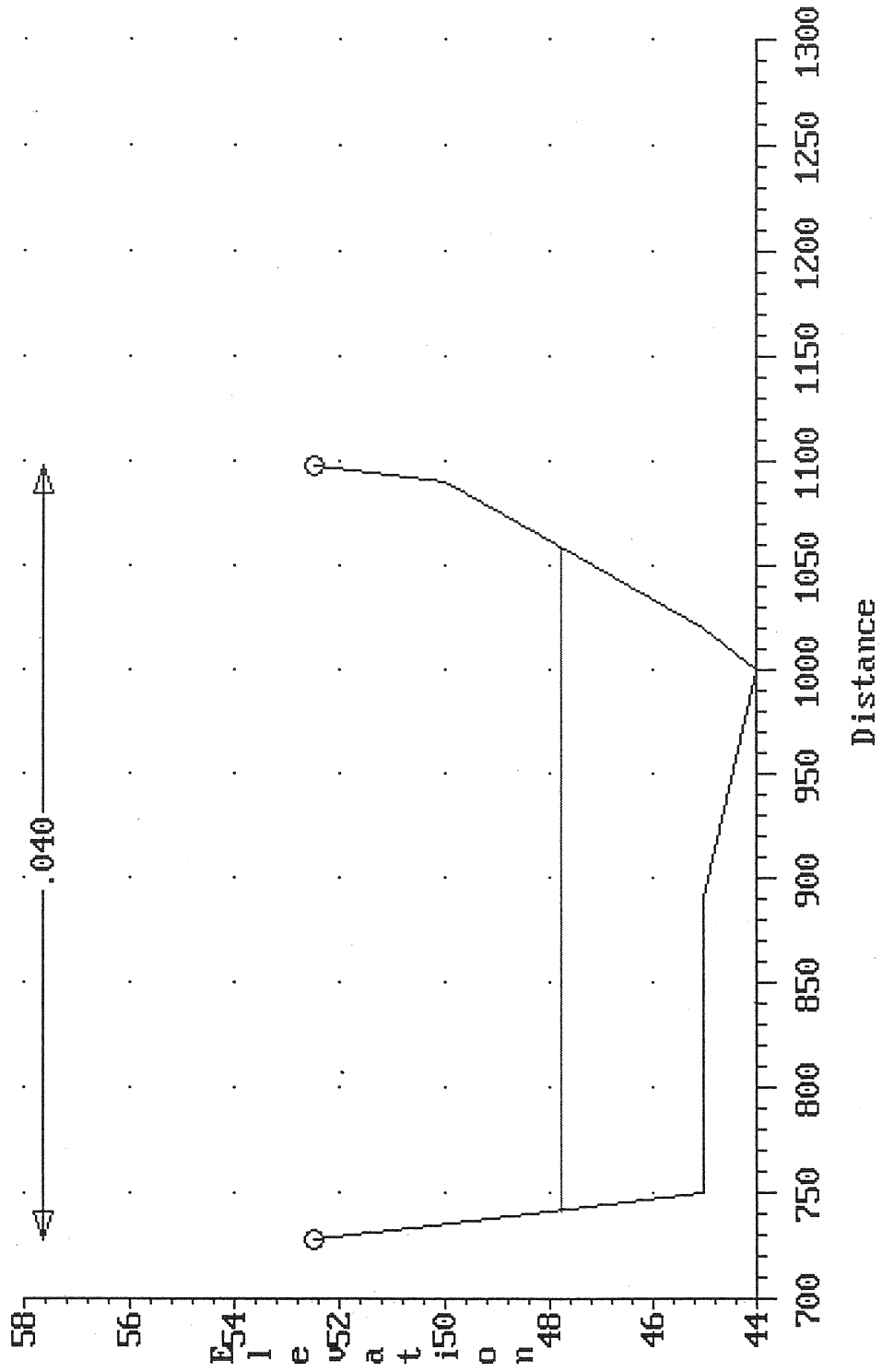
Cross-section 7912.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

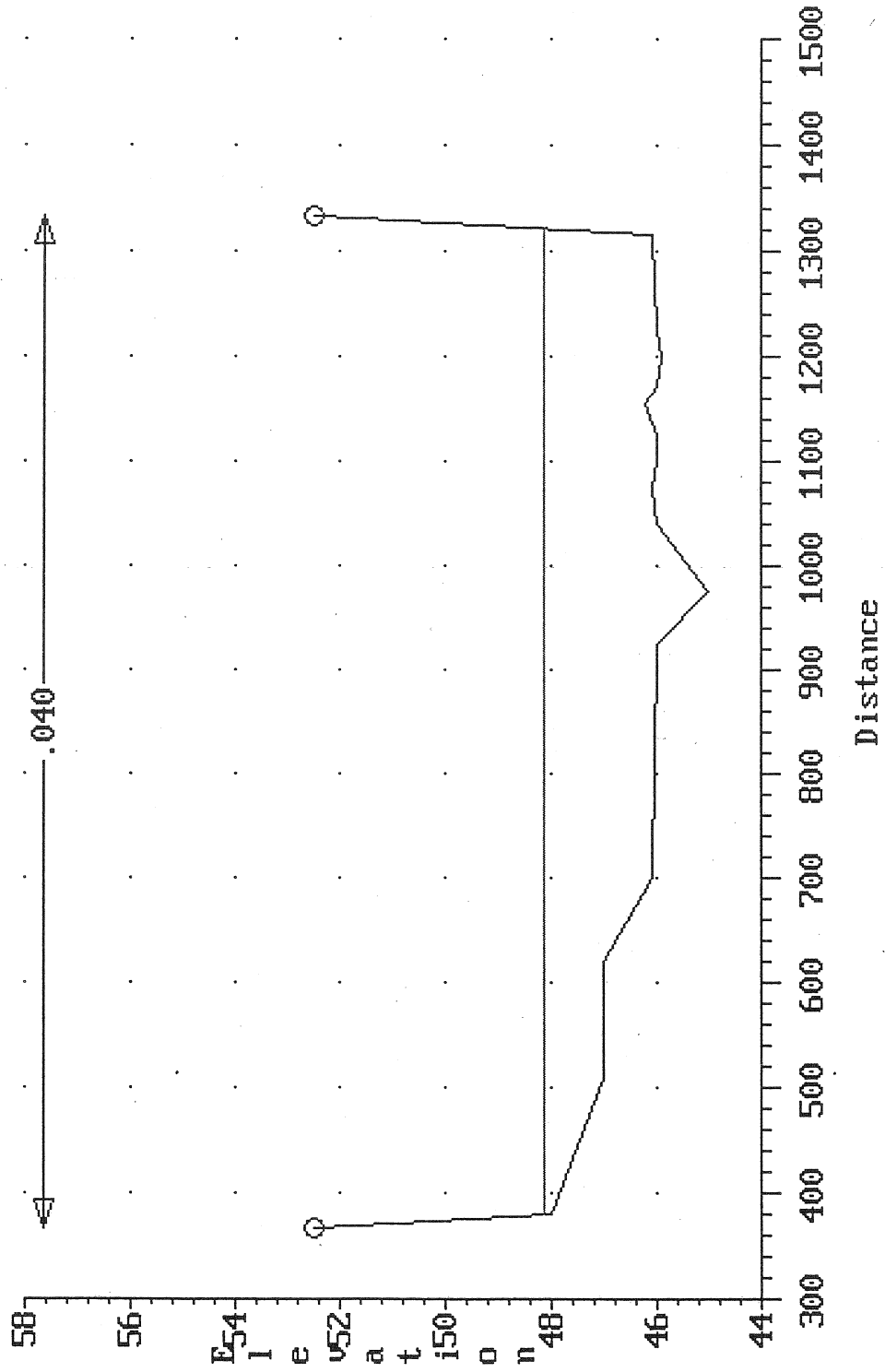
Cross-section 7800.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

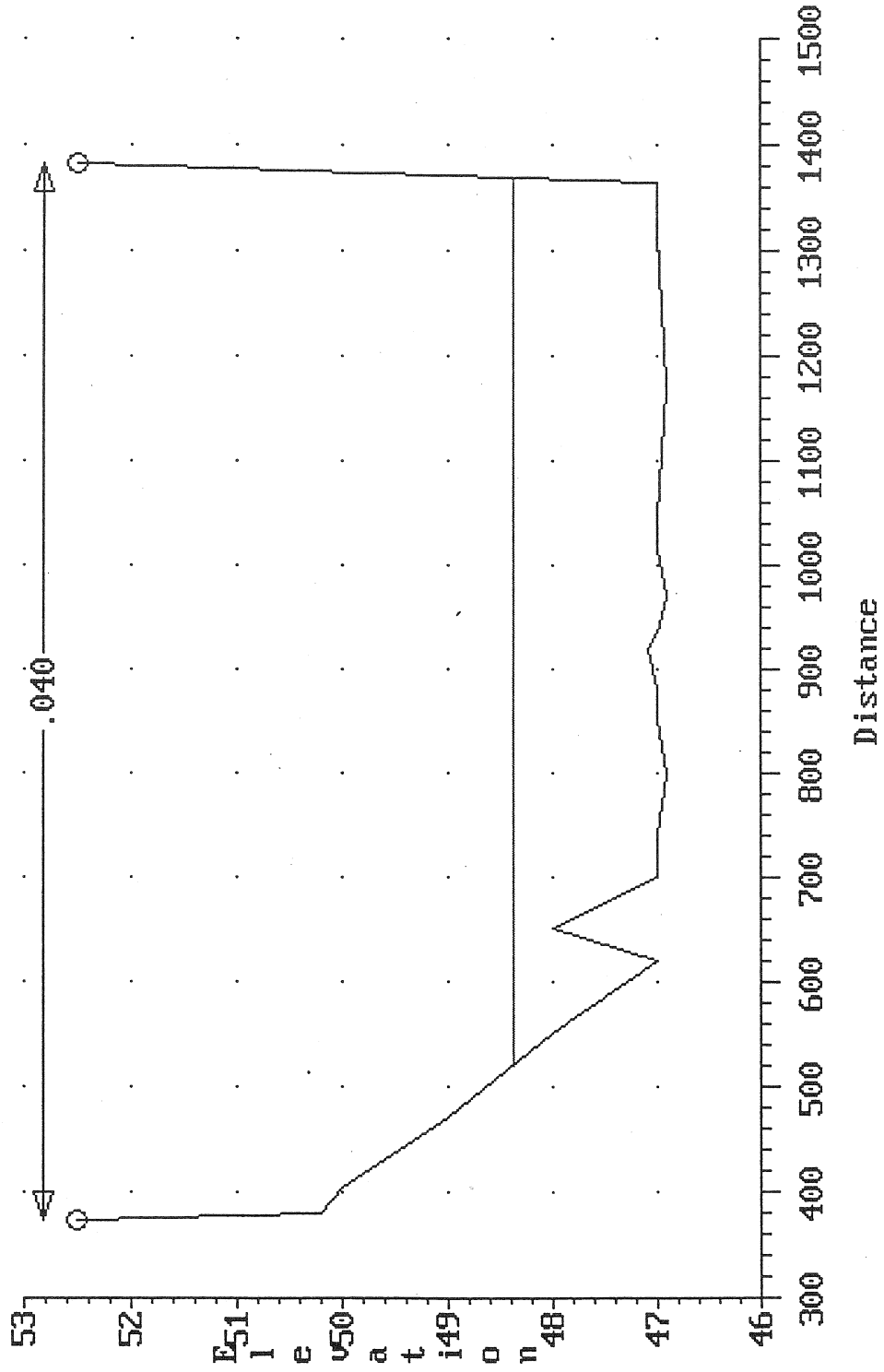
Cross-section 7560.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

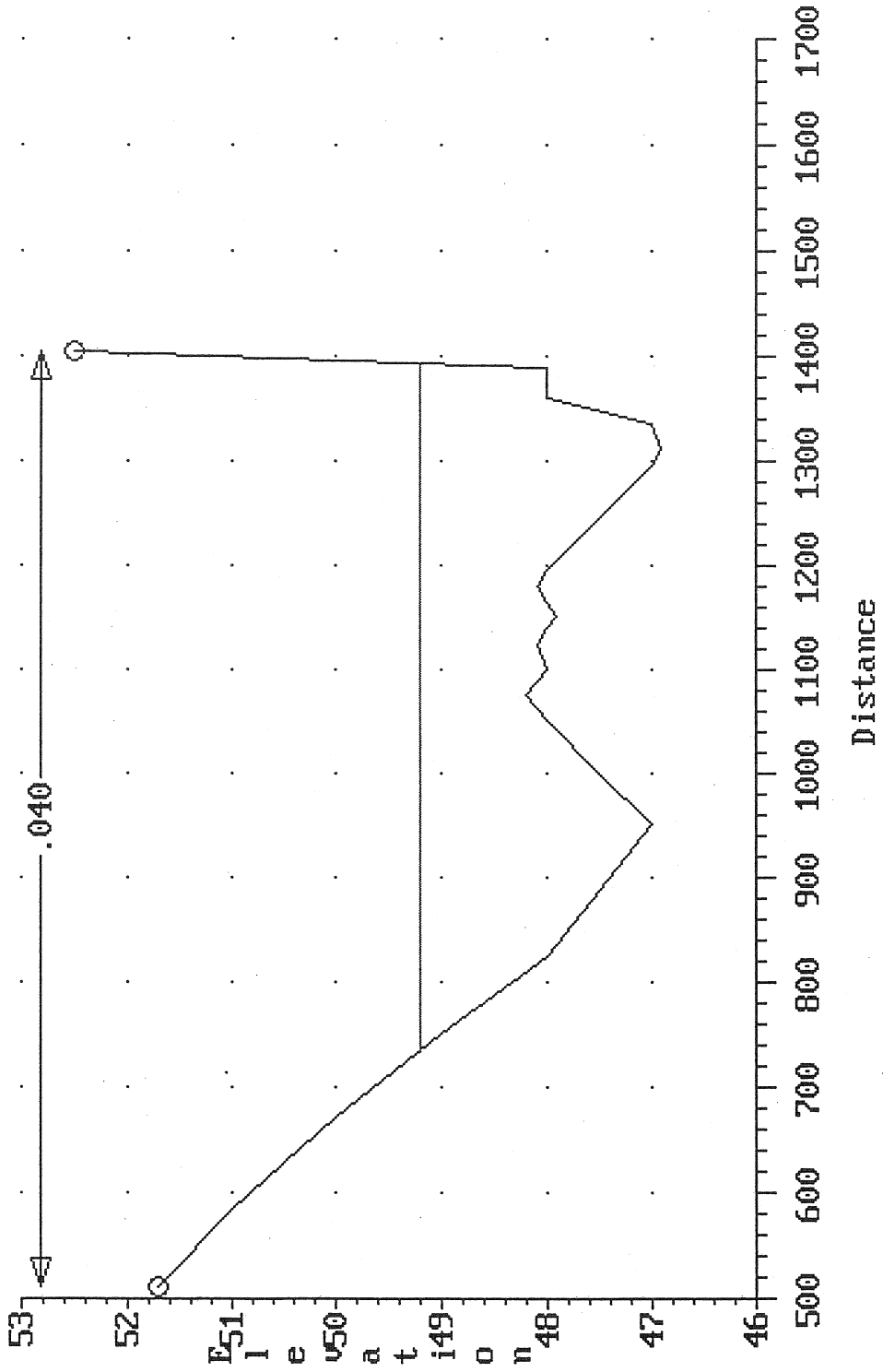
Cross-section 7360.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

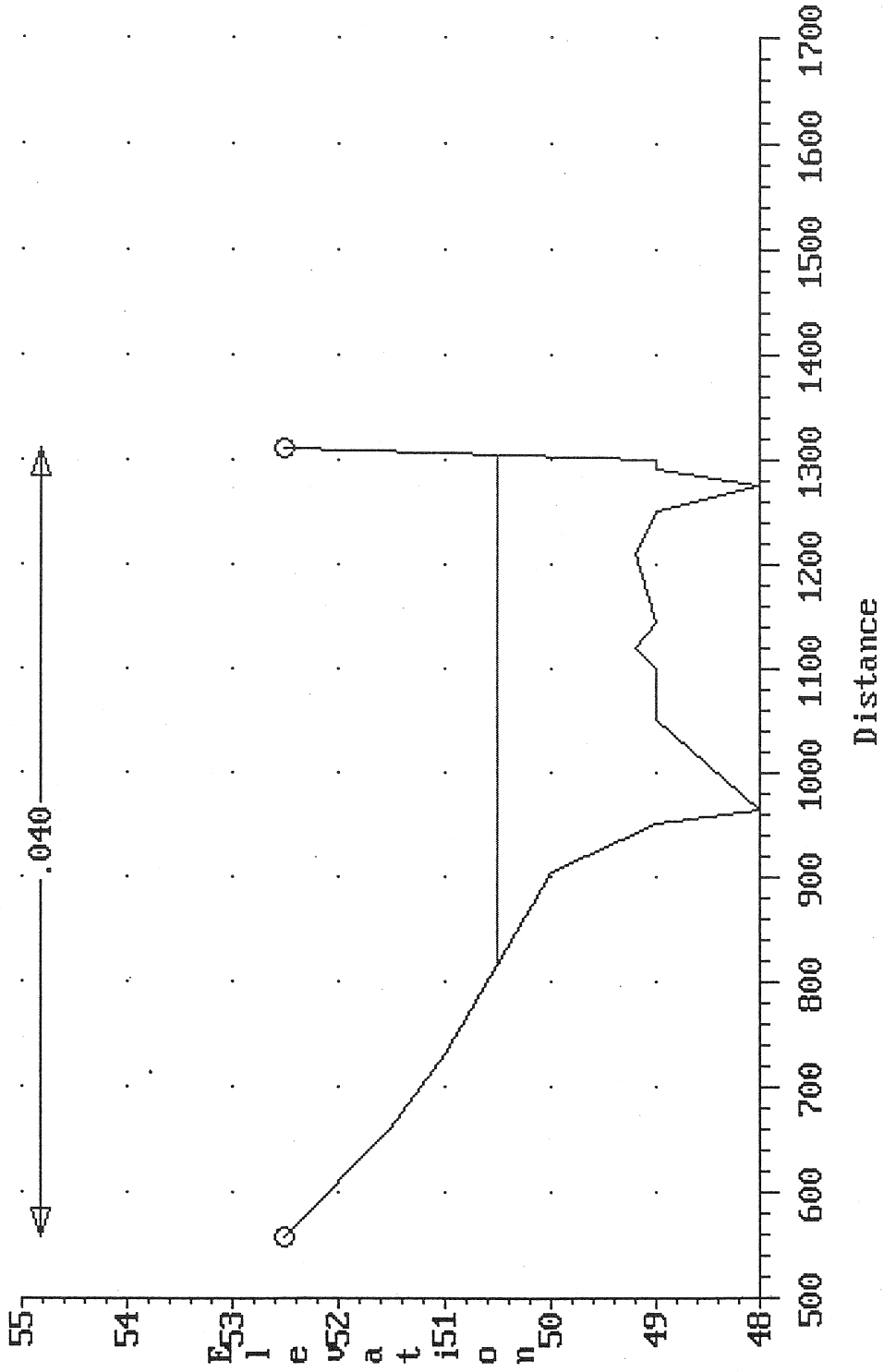
Cross-section 7090.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

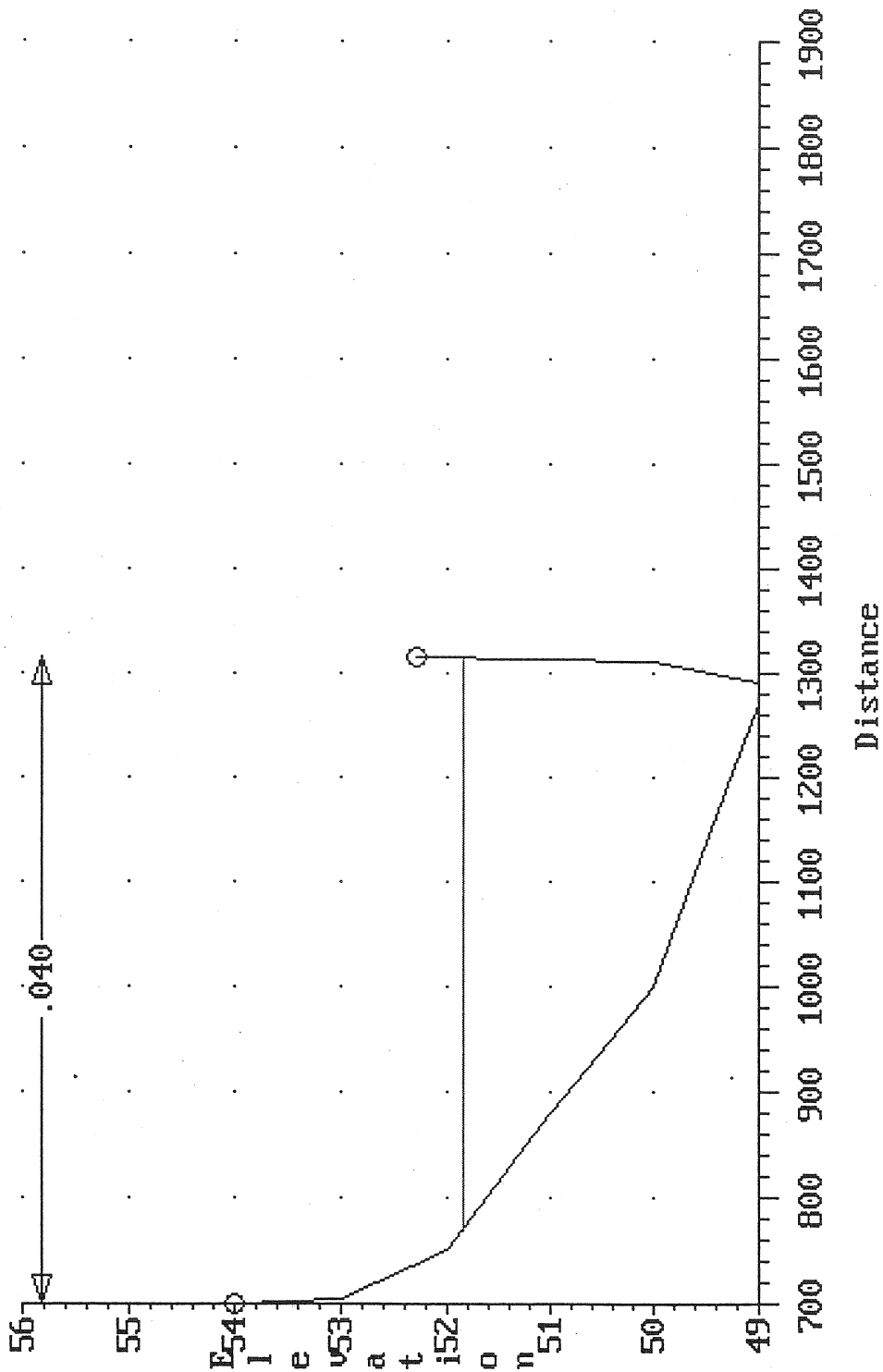
Cross-section 6810.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

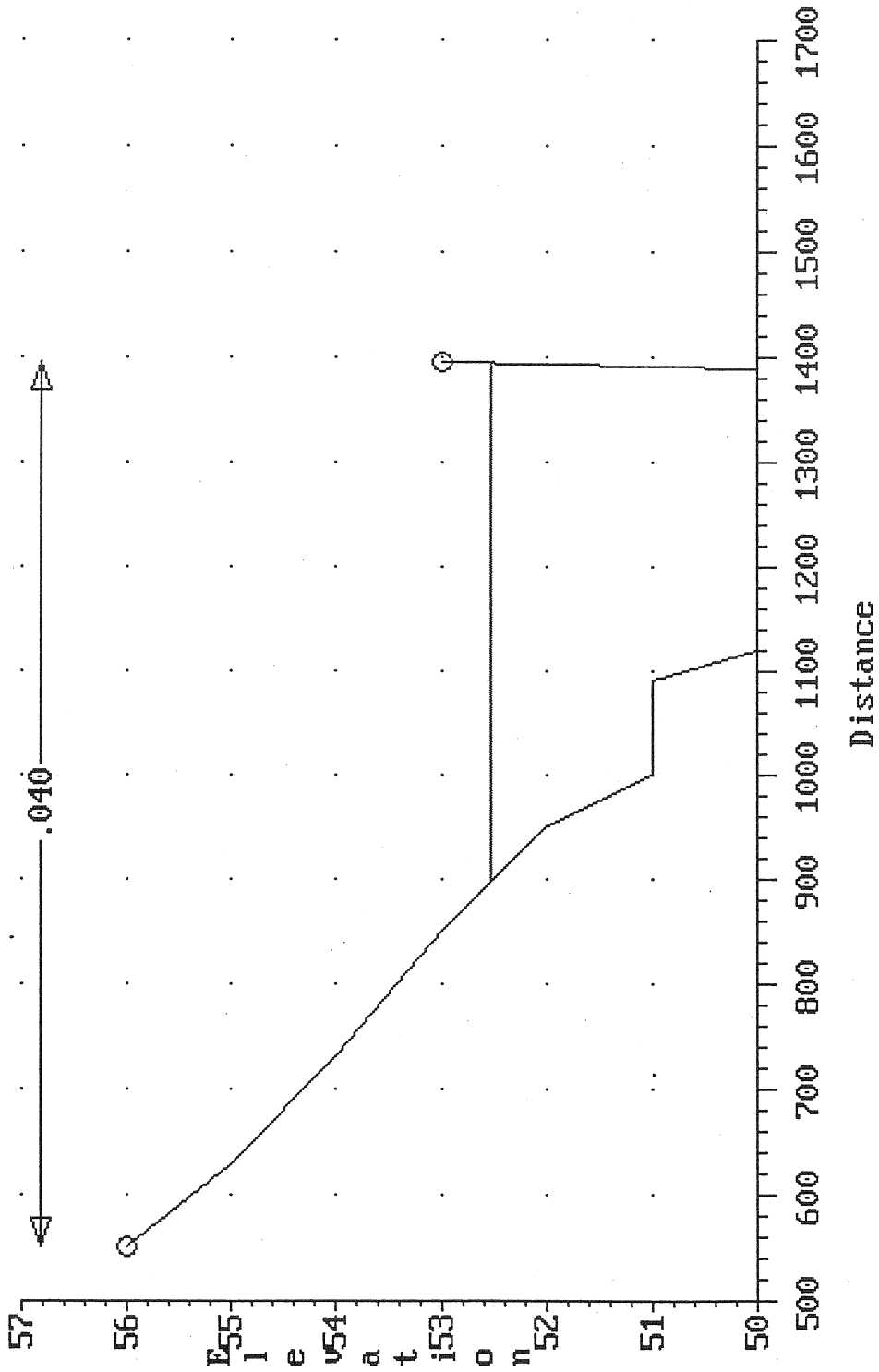
Cross-section 6510.000



WHITES CREEK CHANNEL A

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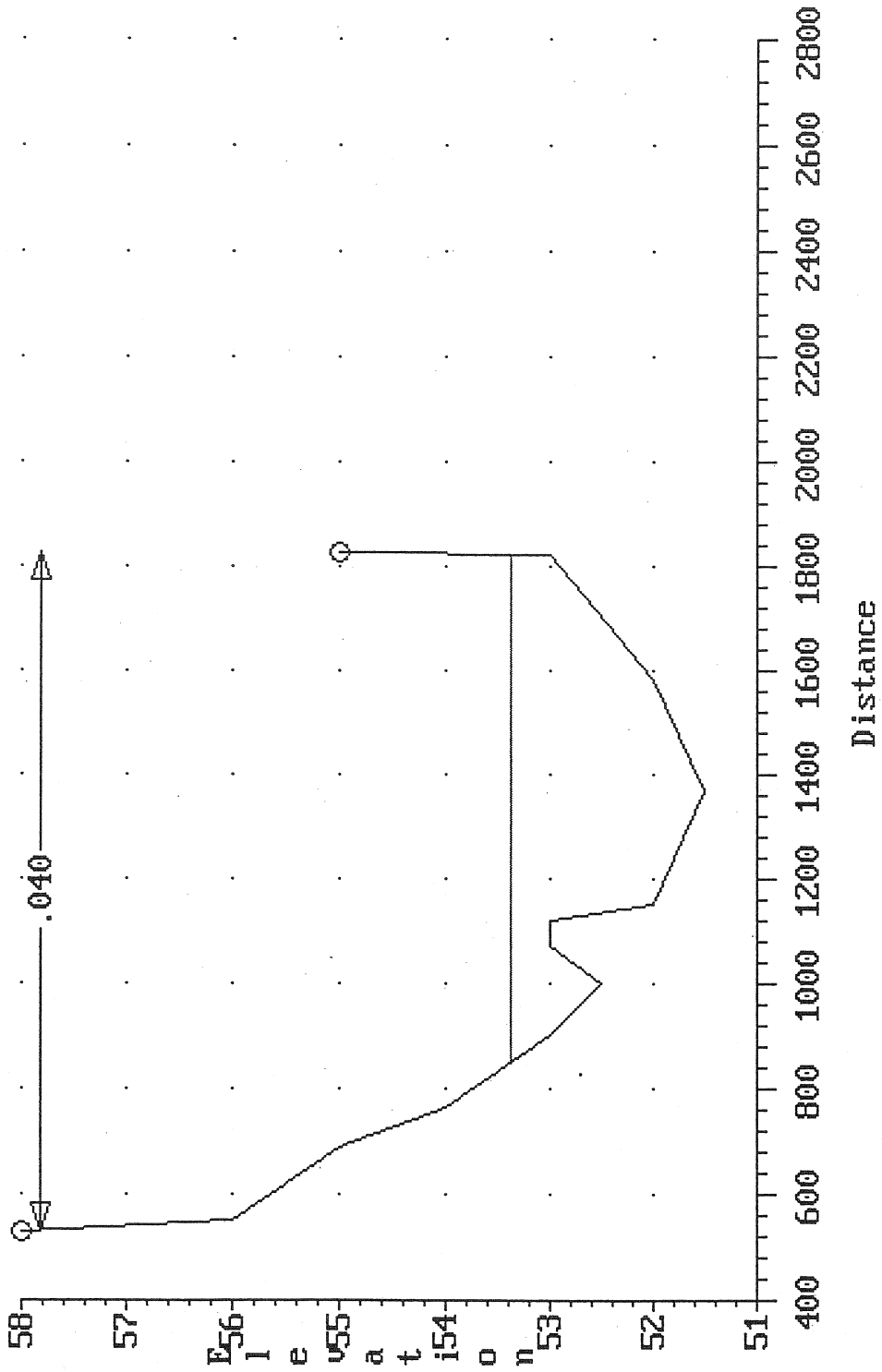
Cross-section 6230.000



WHITES CREEK CHANNEL A

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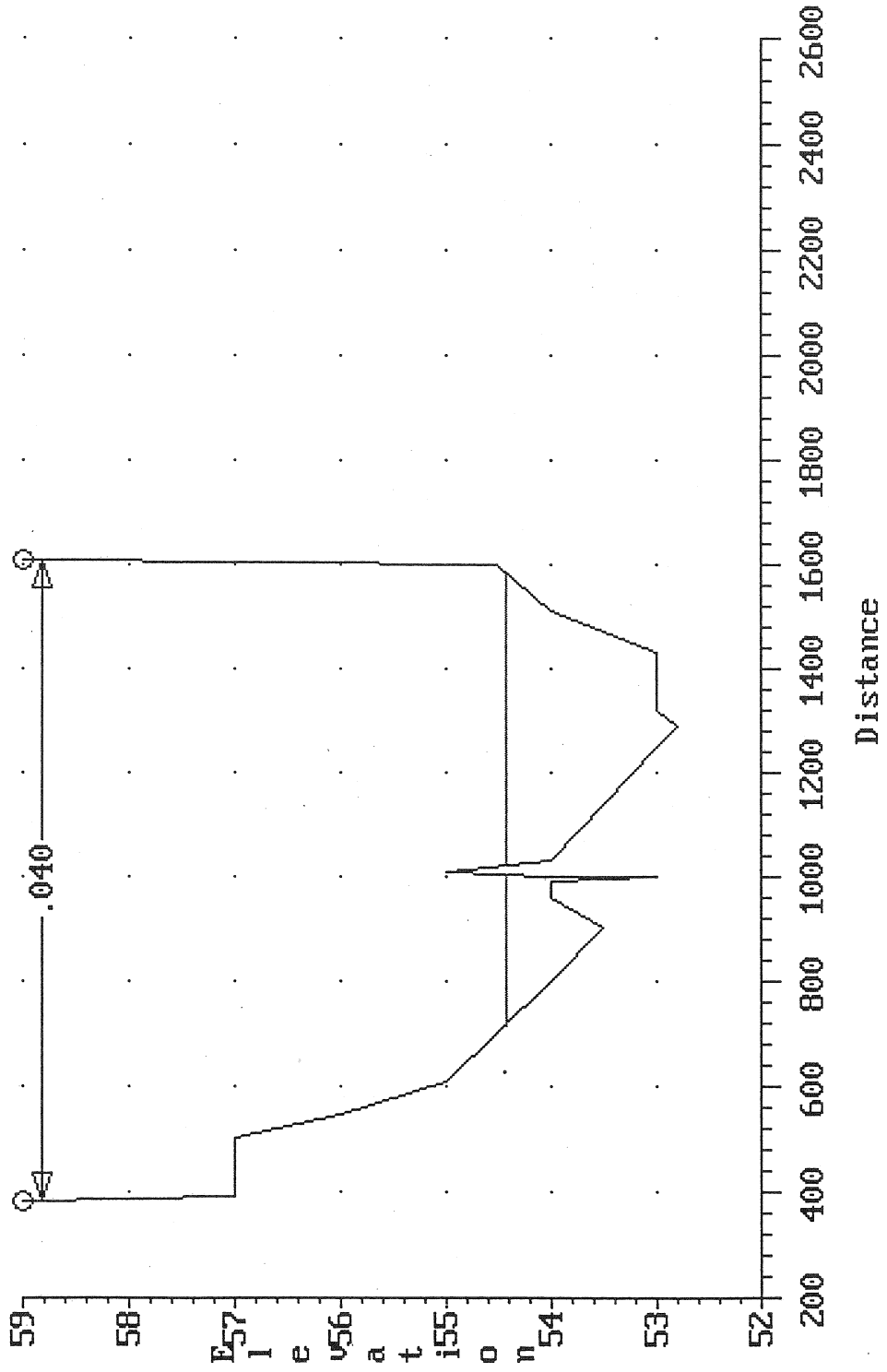
Cross-section 5930.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

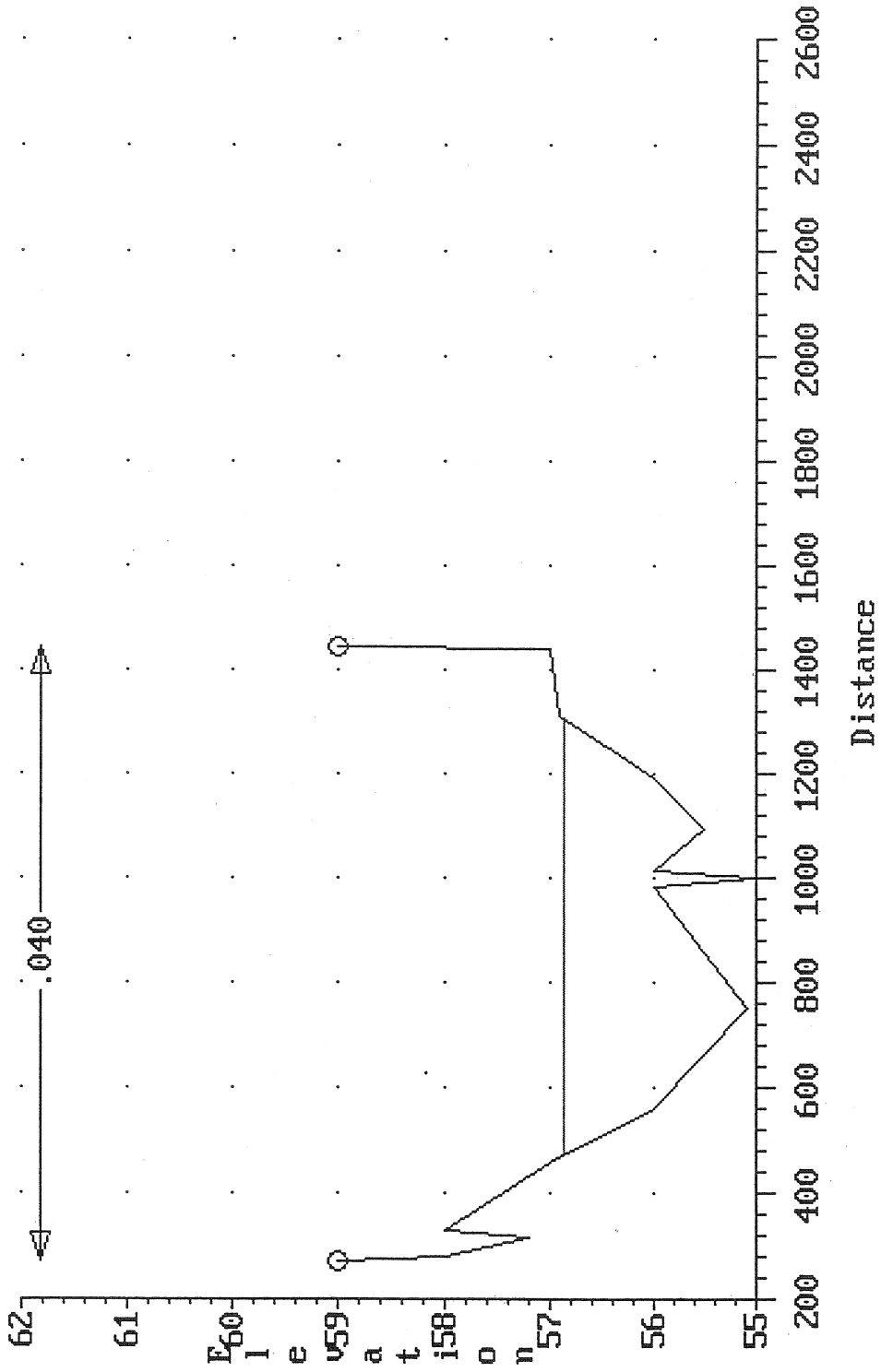
Cross-section 5750.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

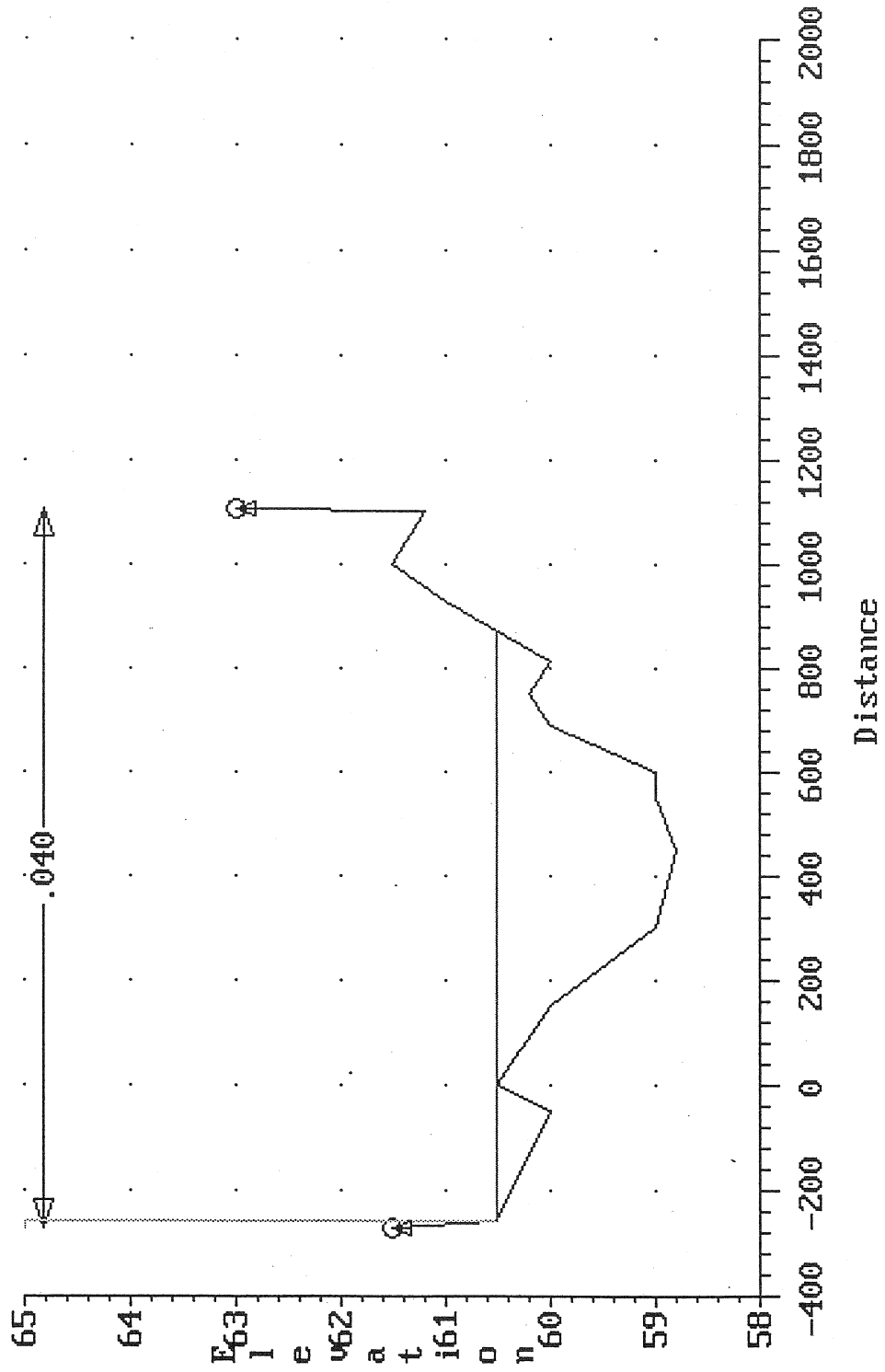
Cross-section 5550.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

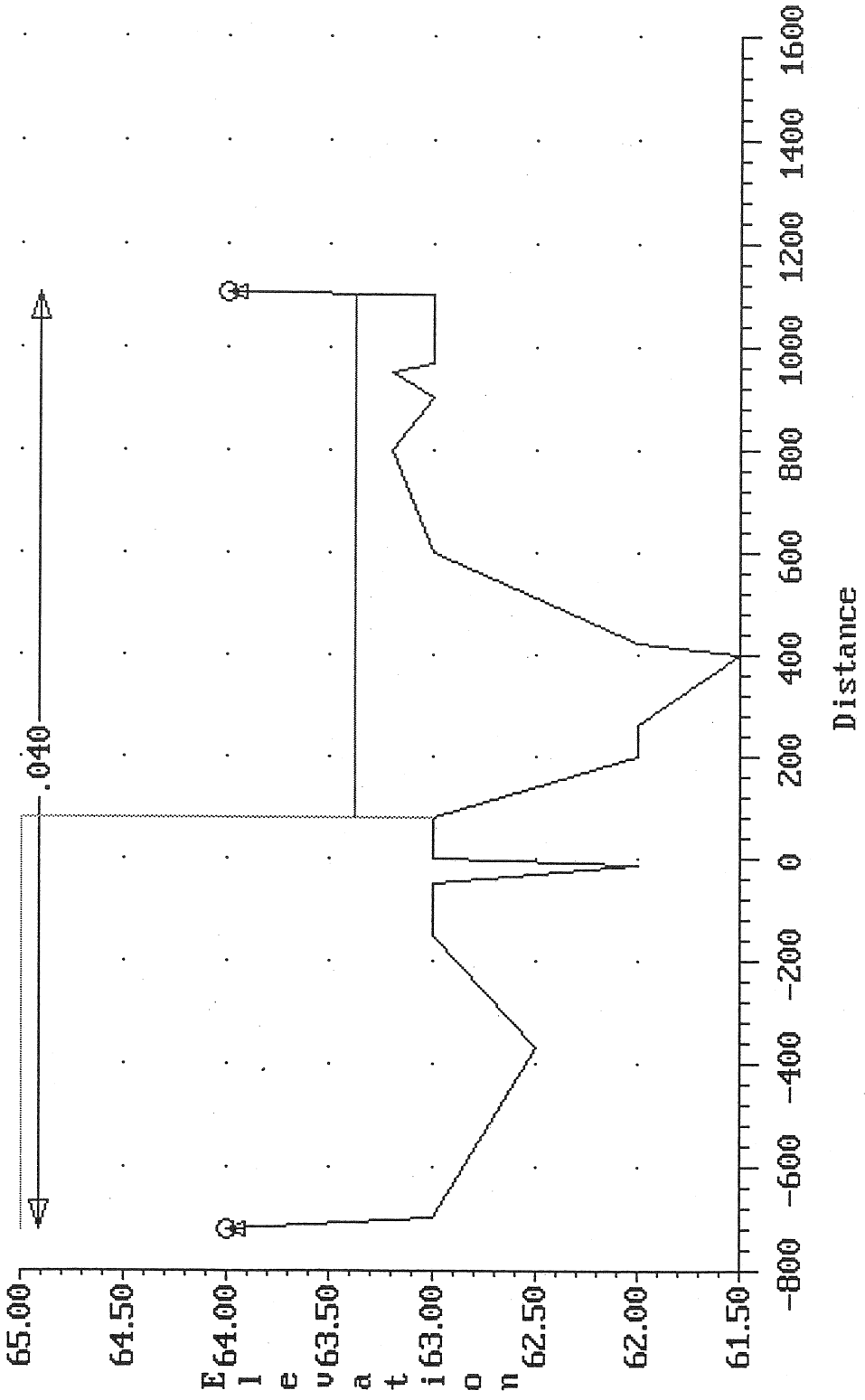
Cross-section 5050.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

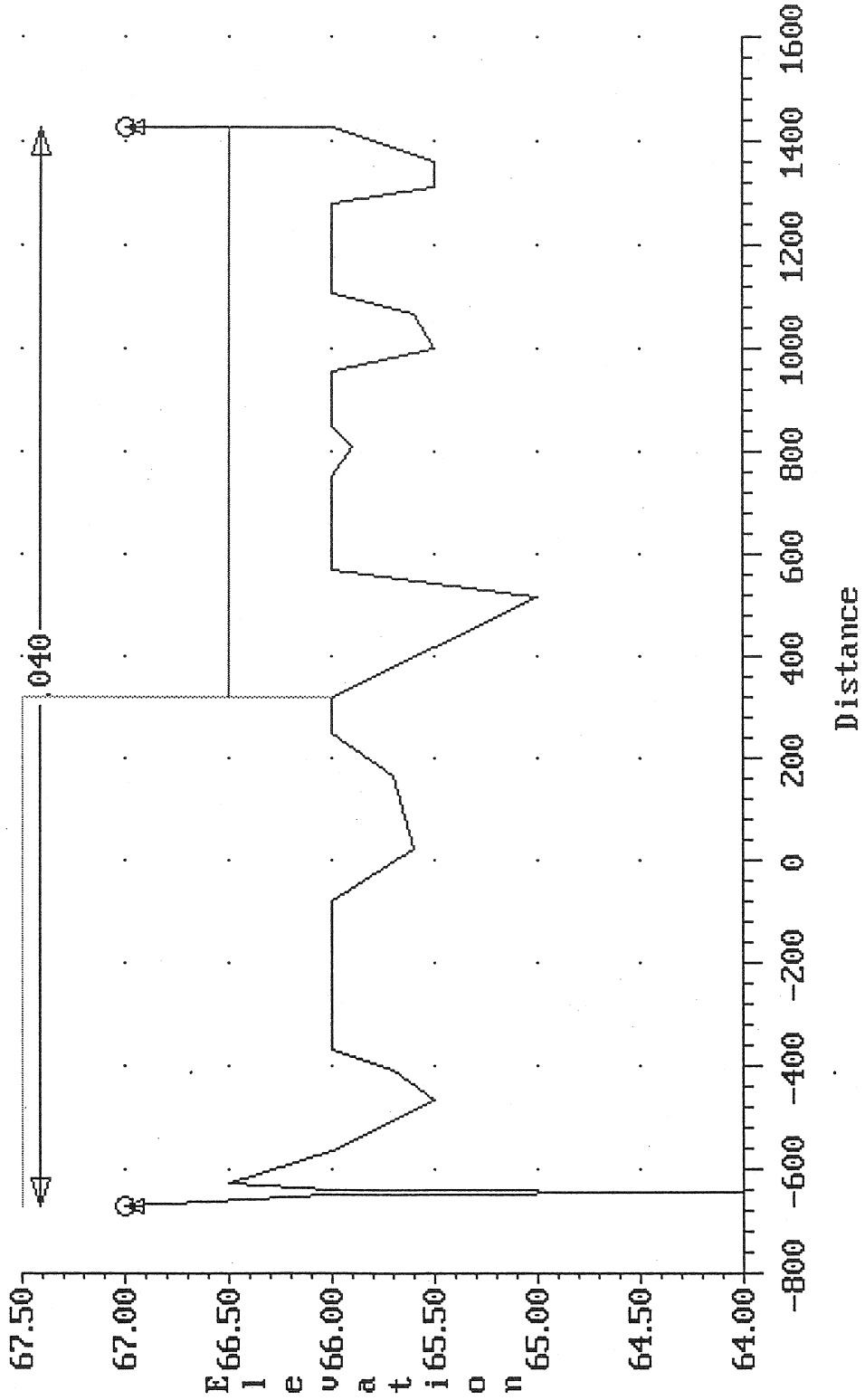
Cross-section 4750.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

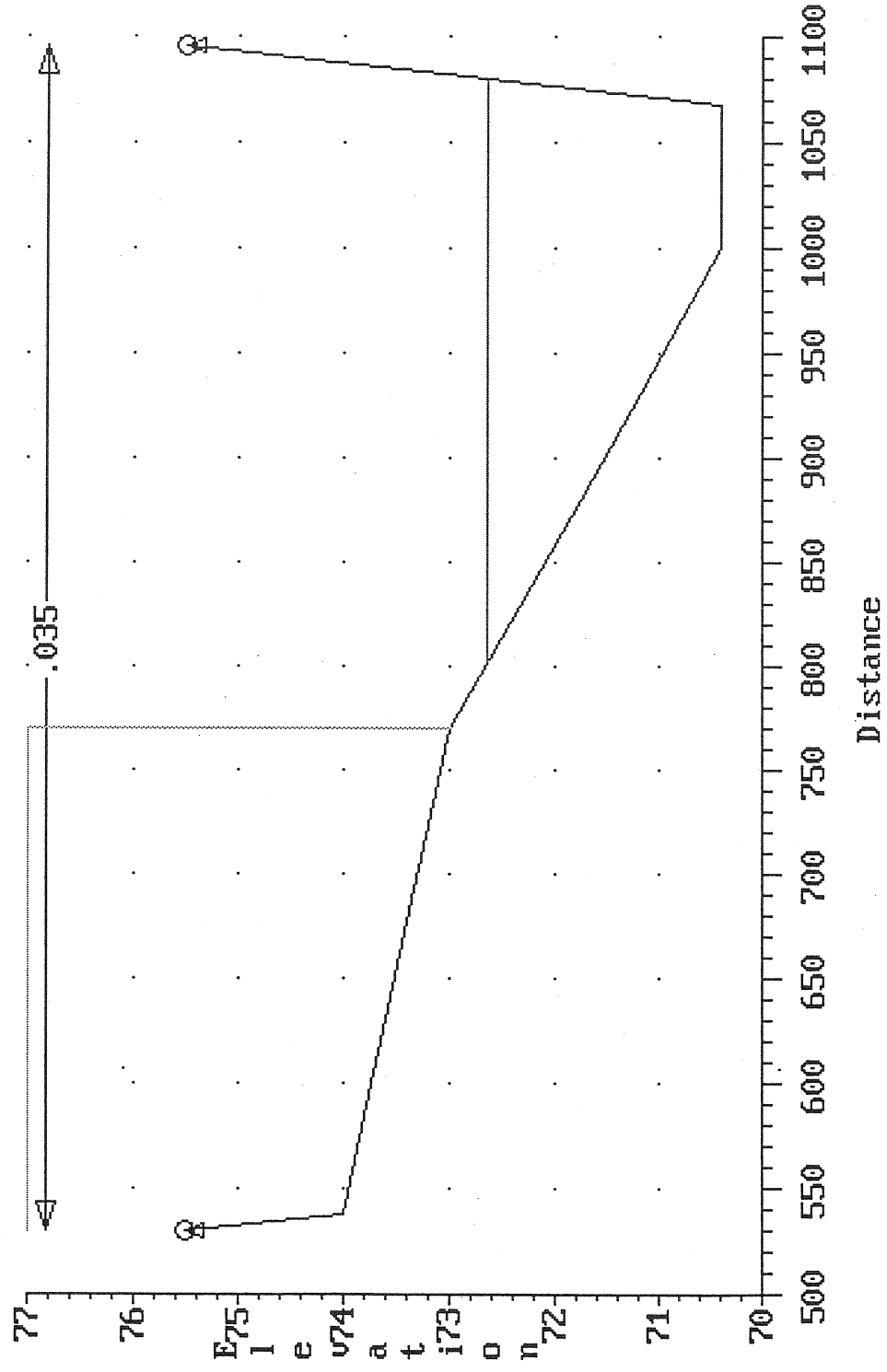
Cross-section 4450.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

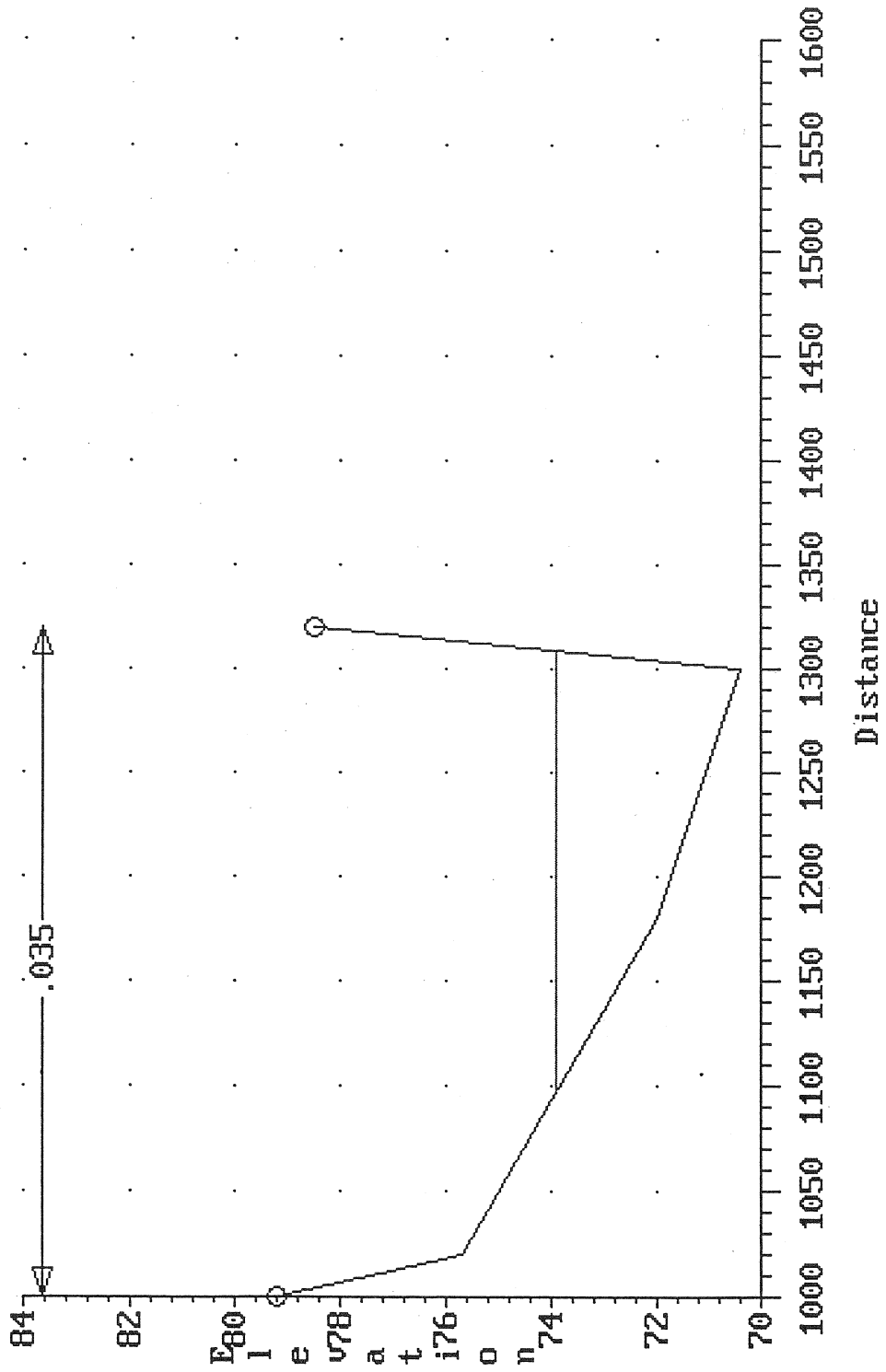
Cross-section 4050.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

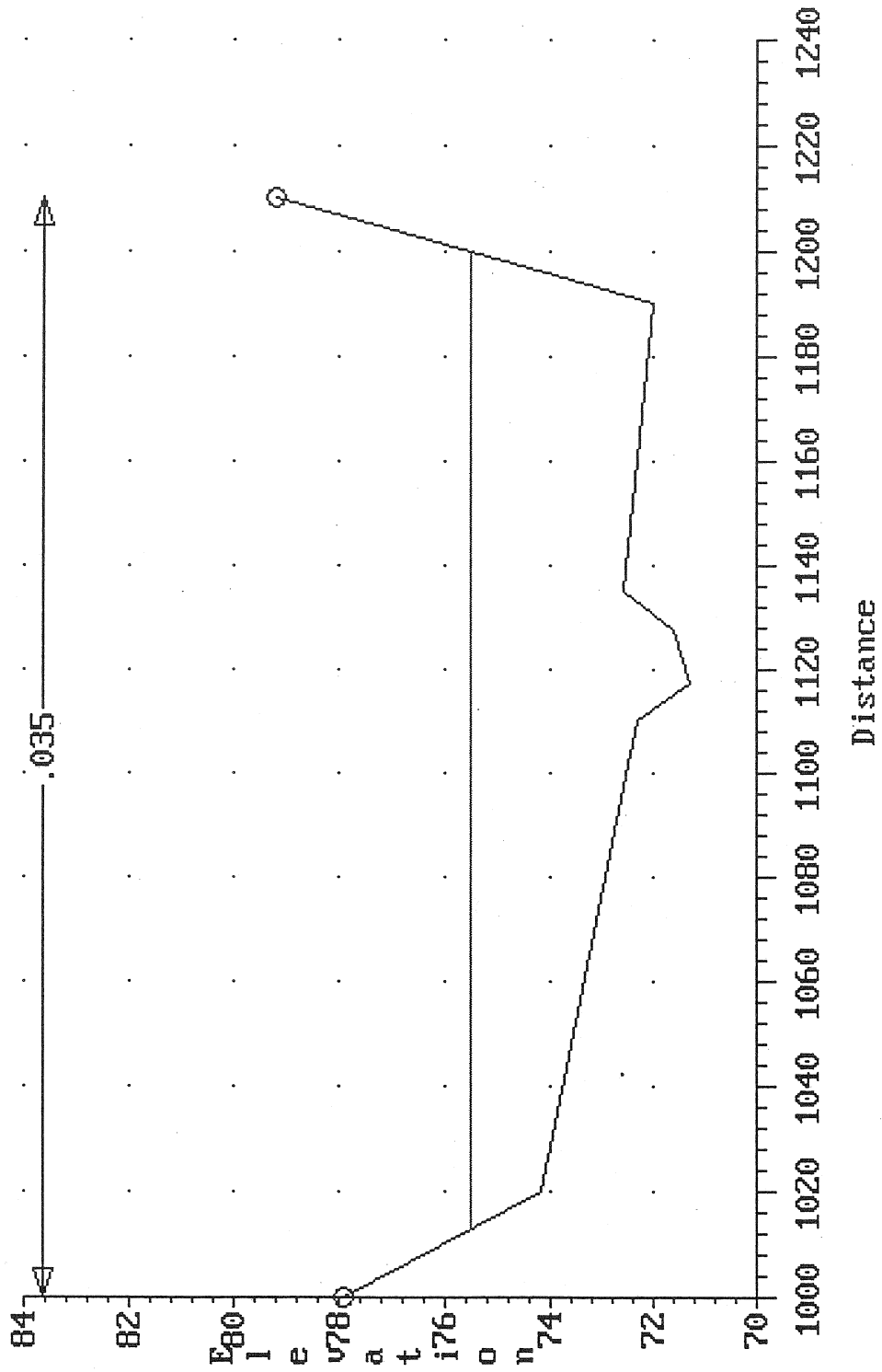
Cross-section 3950.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

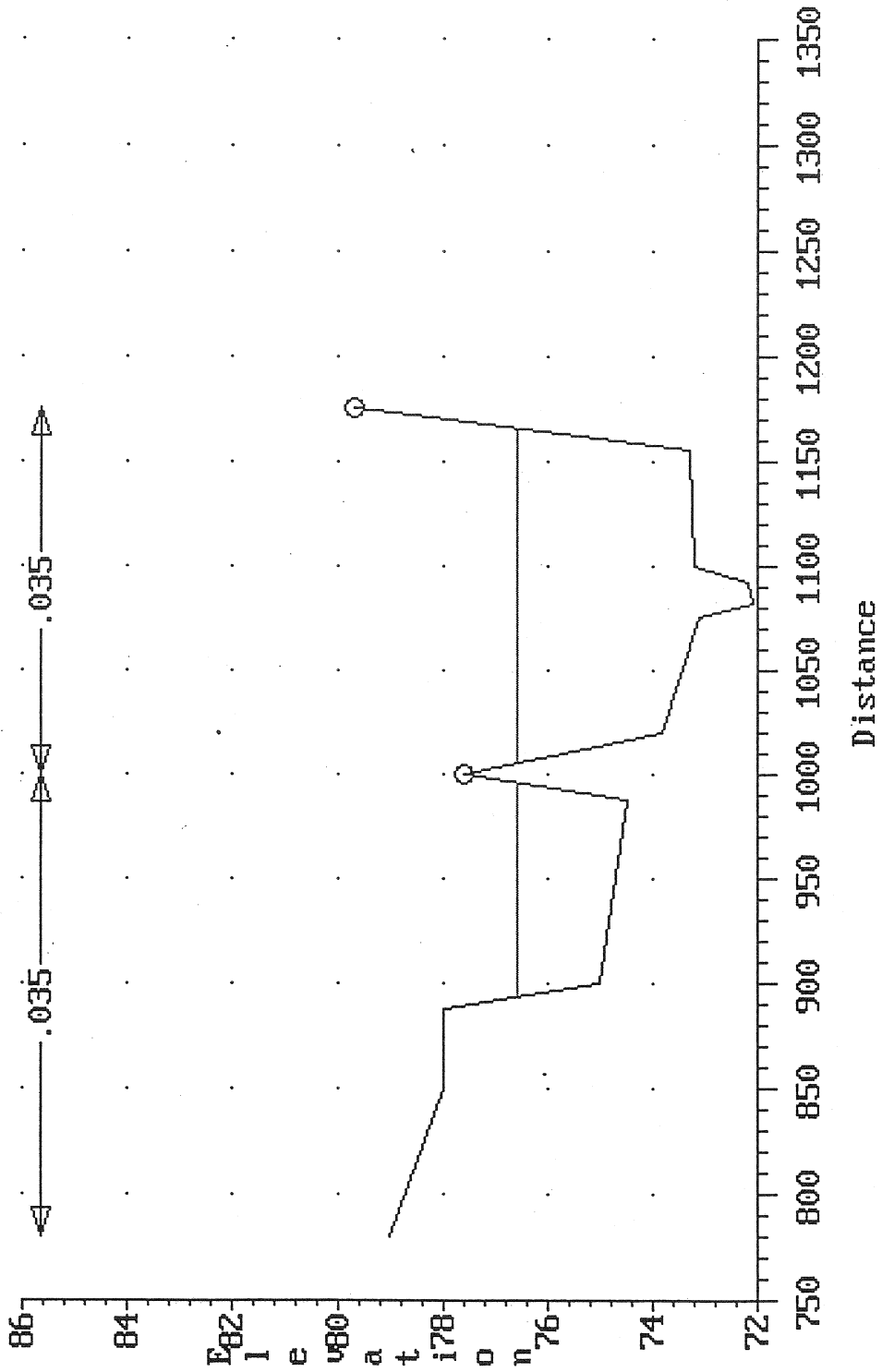
Cross-section 3700.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

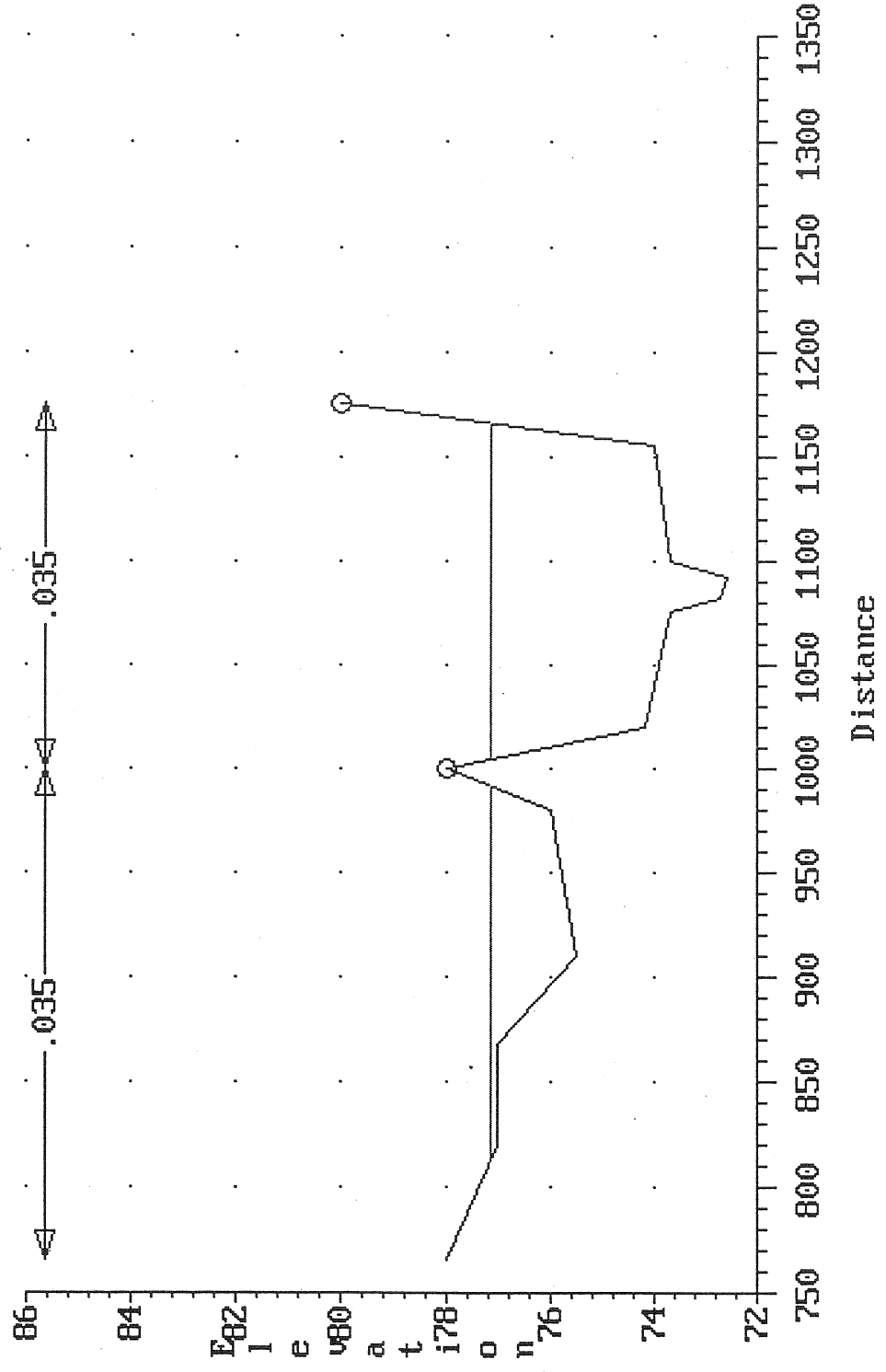
Cross-section 3400.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

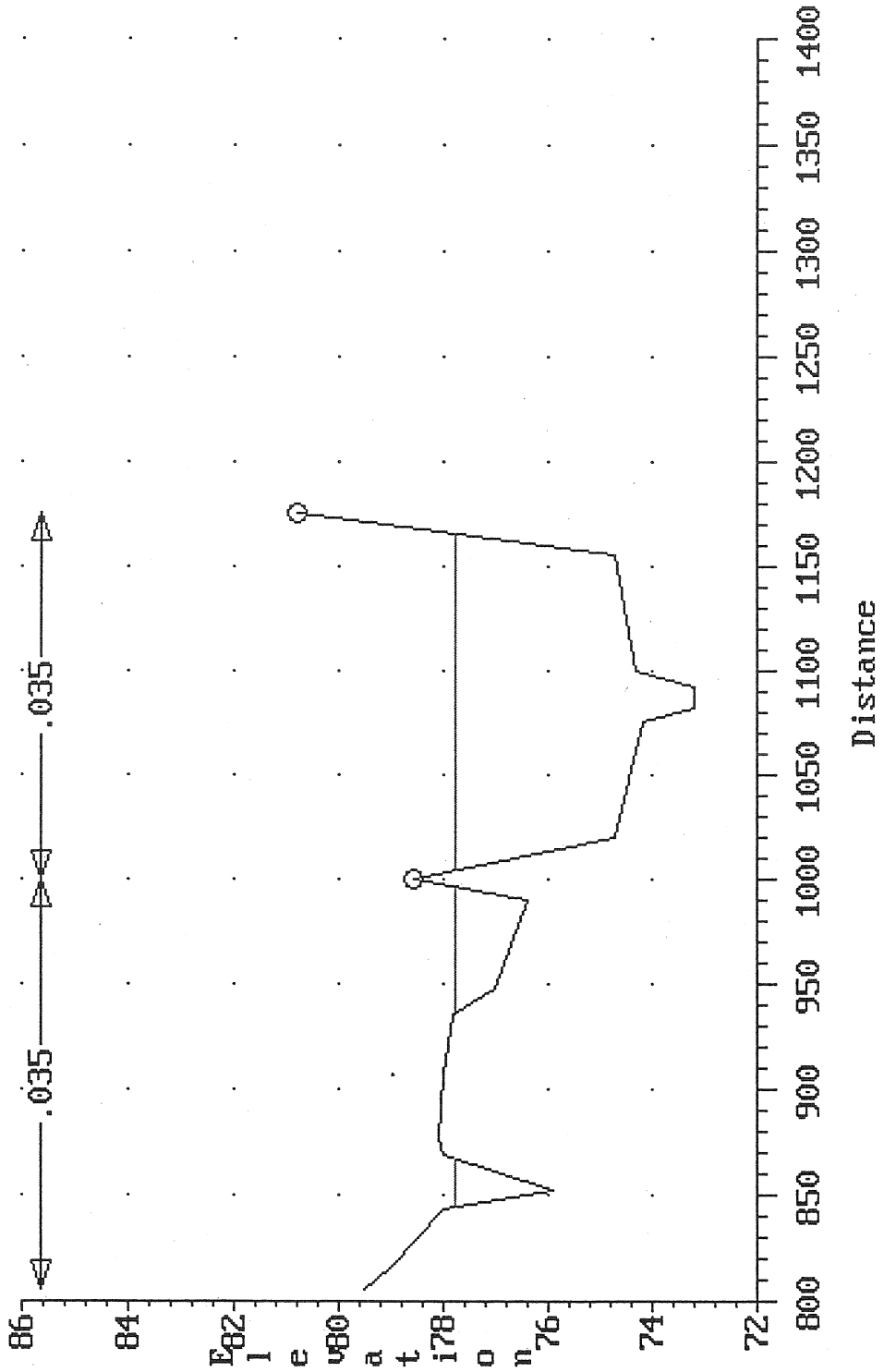
Cross-section 3150.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

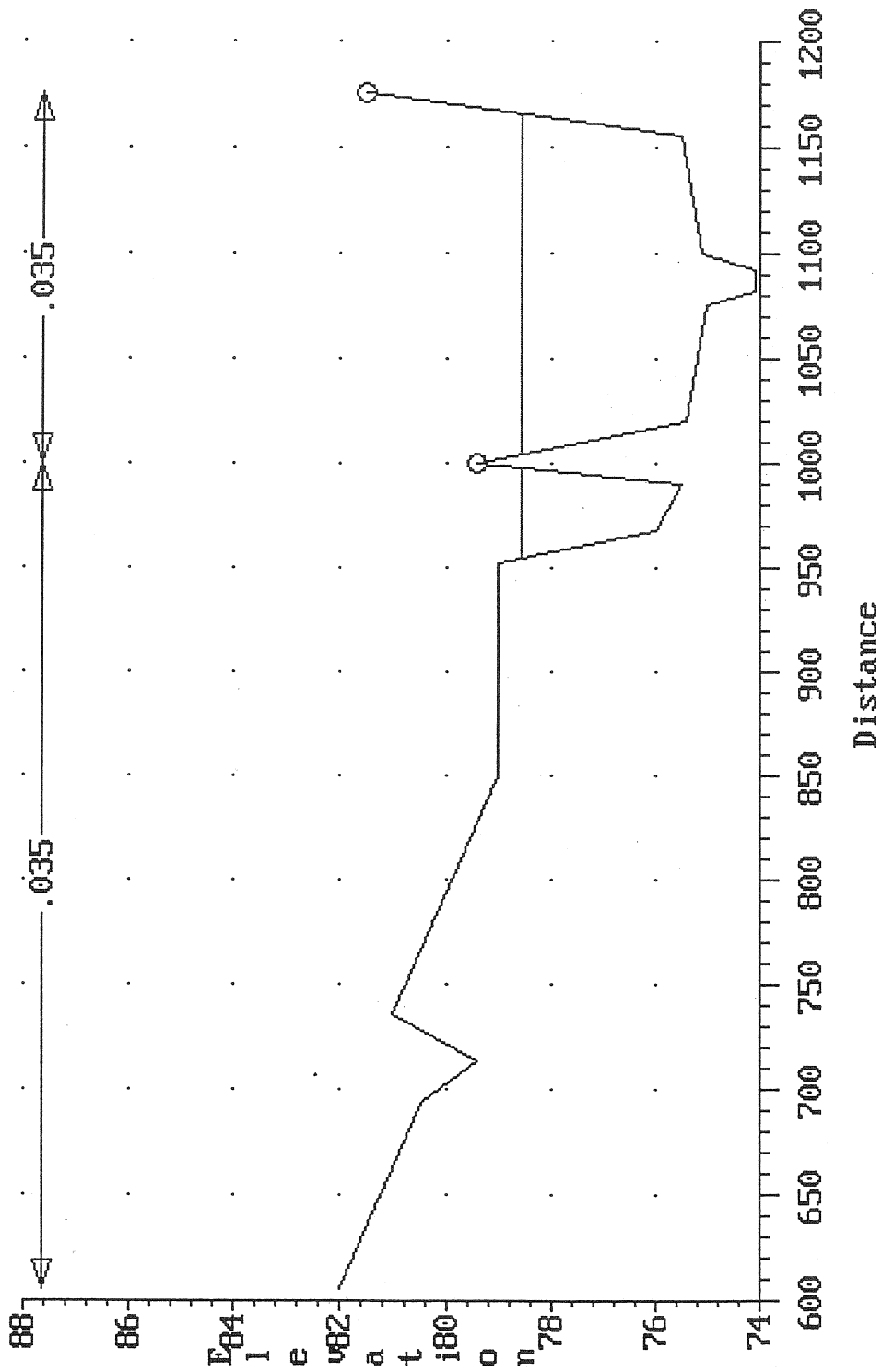
Cross-section 2900.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

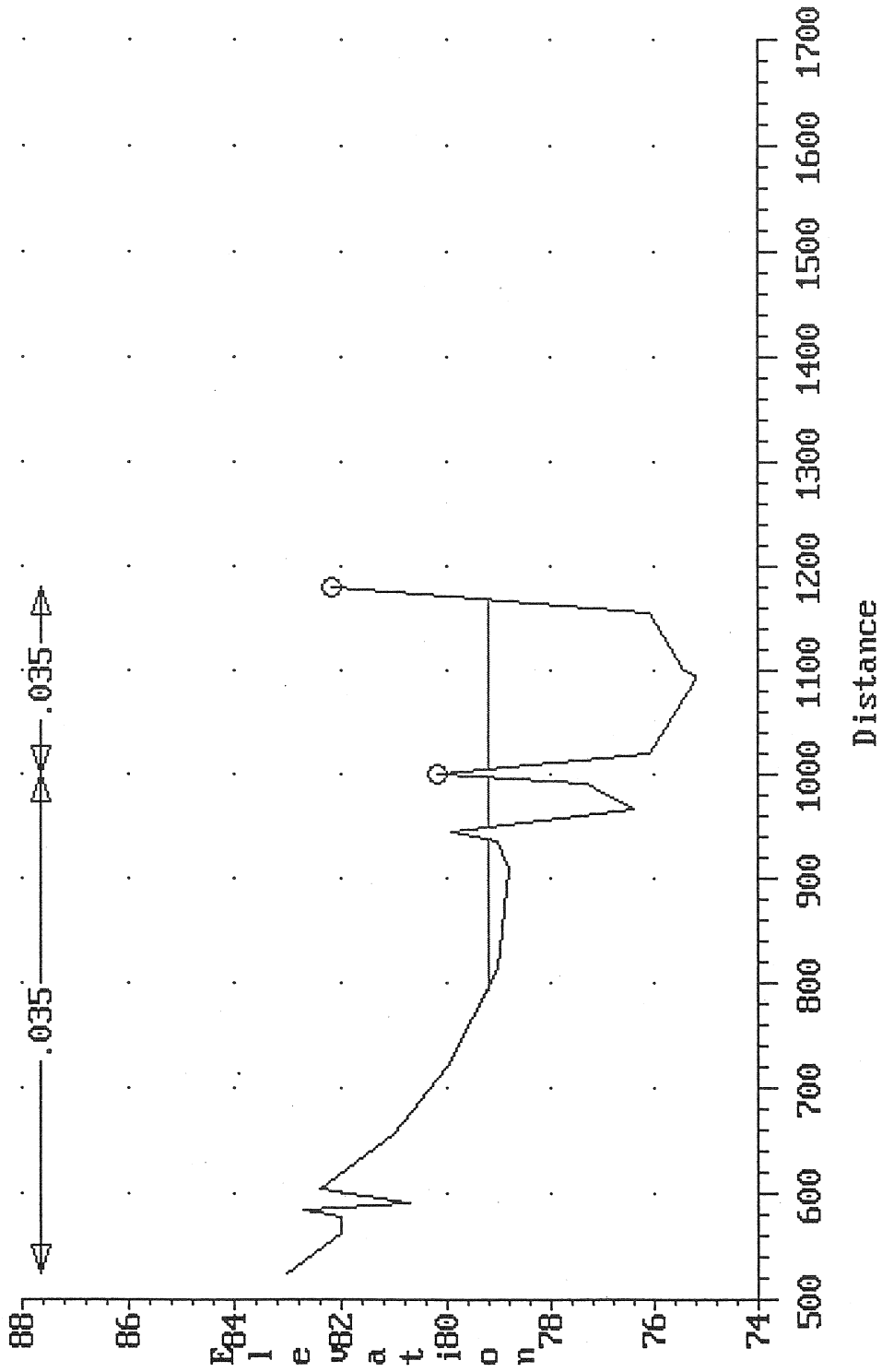
Cross-section 2600.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

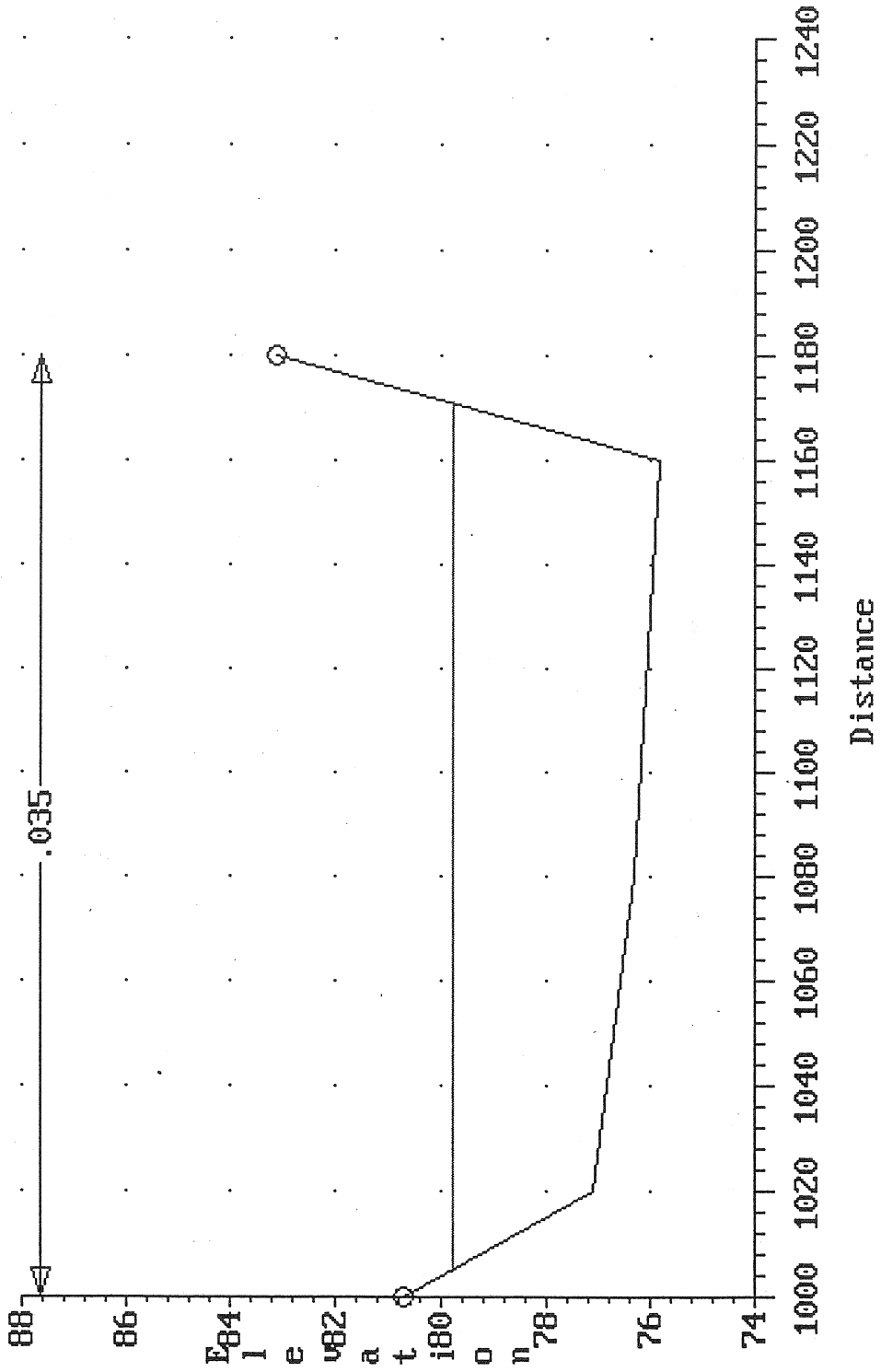
Cross-section 2350.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

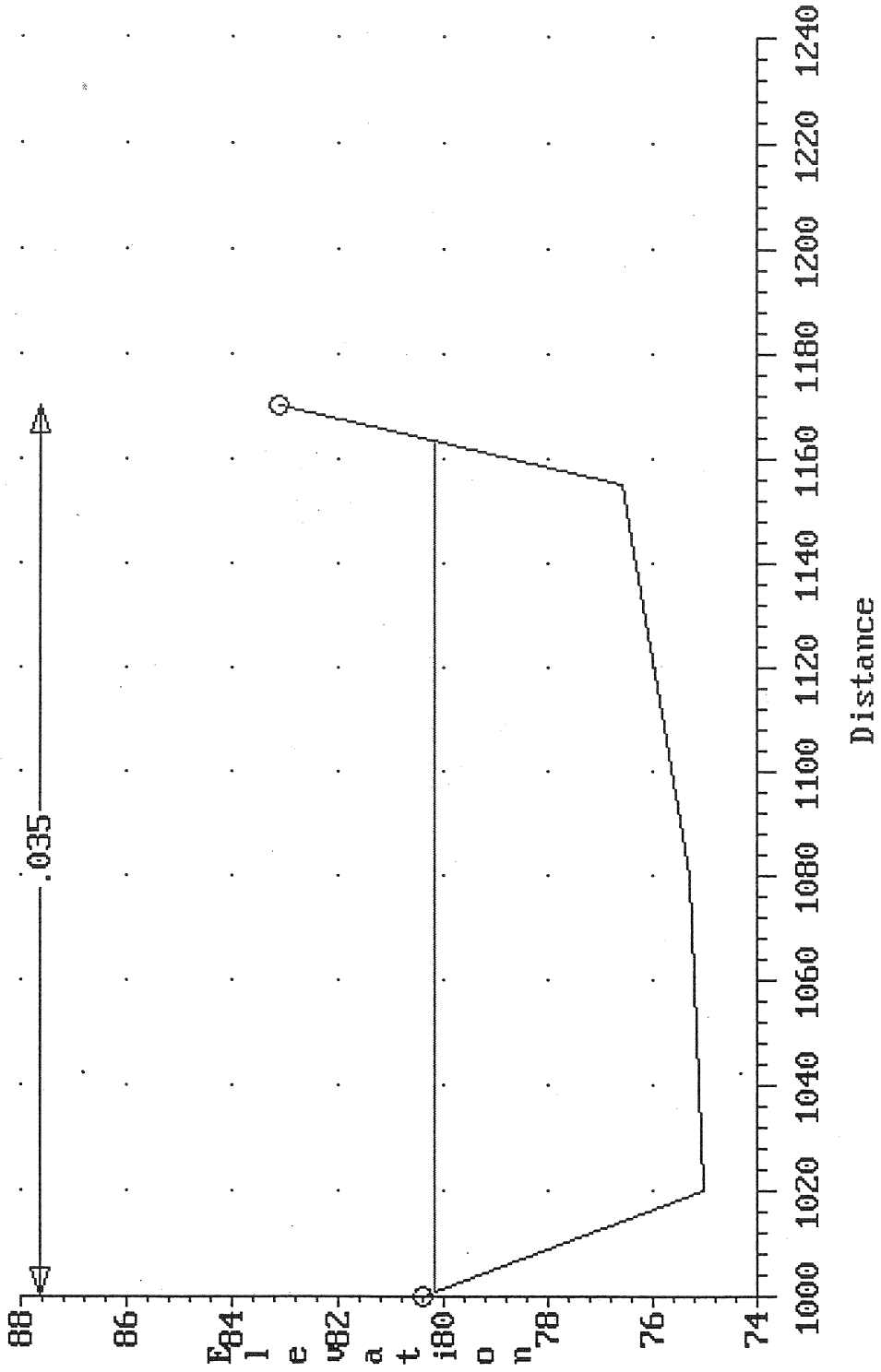
Cross-section Z100.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

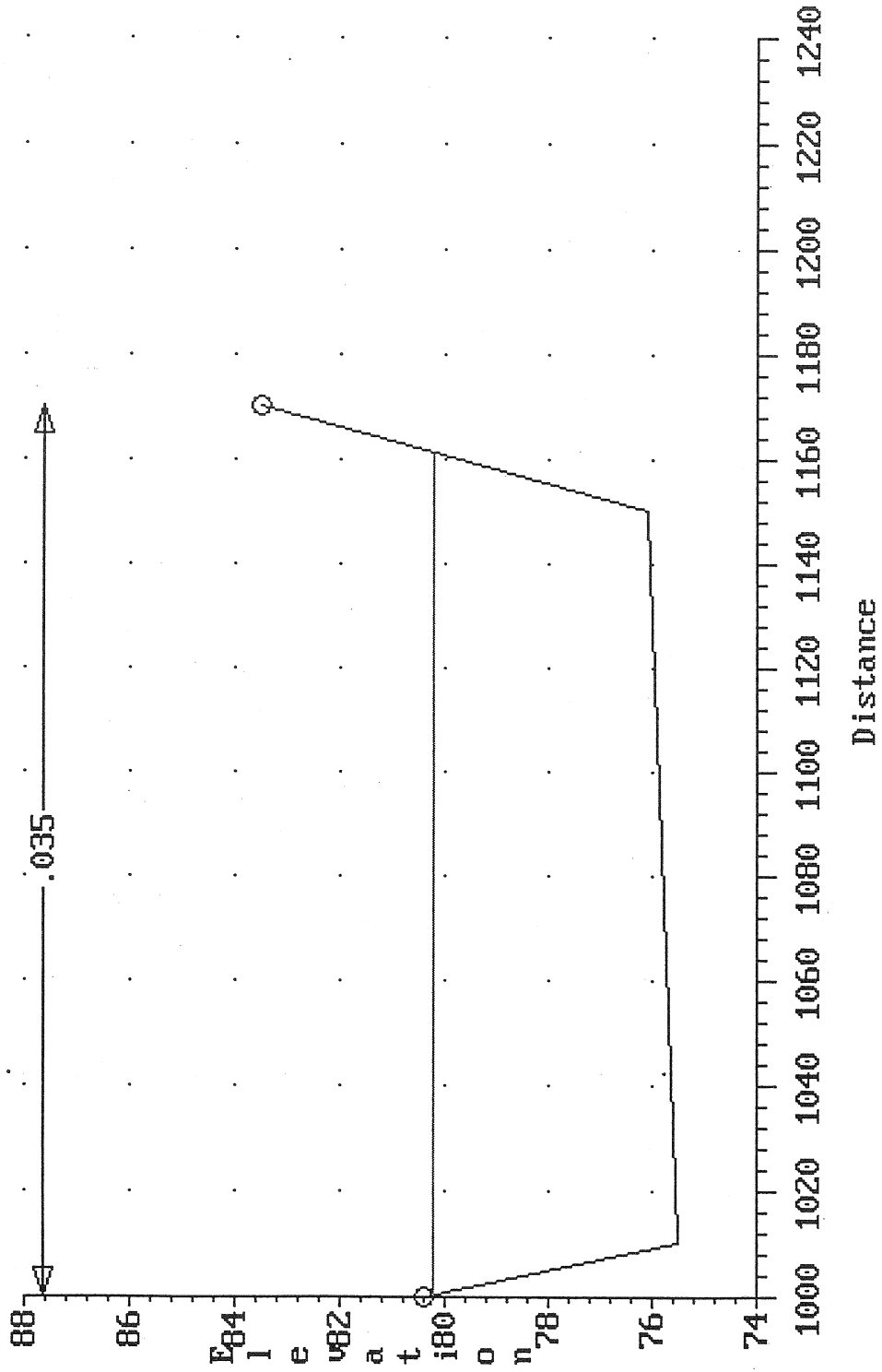
Cross-section 1980.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

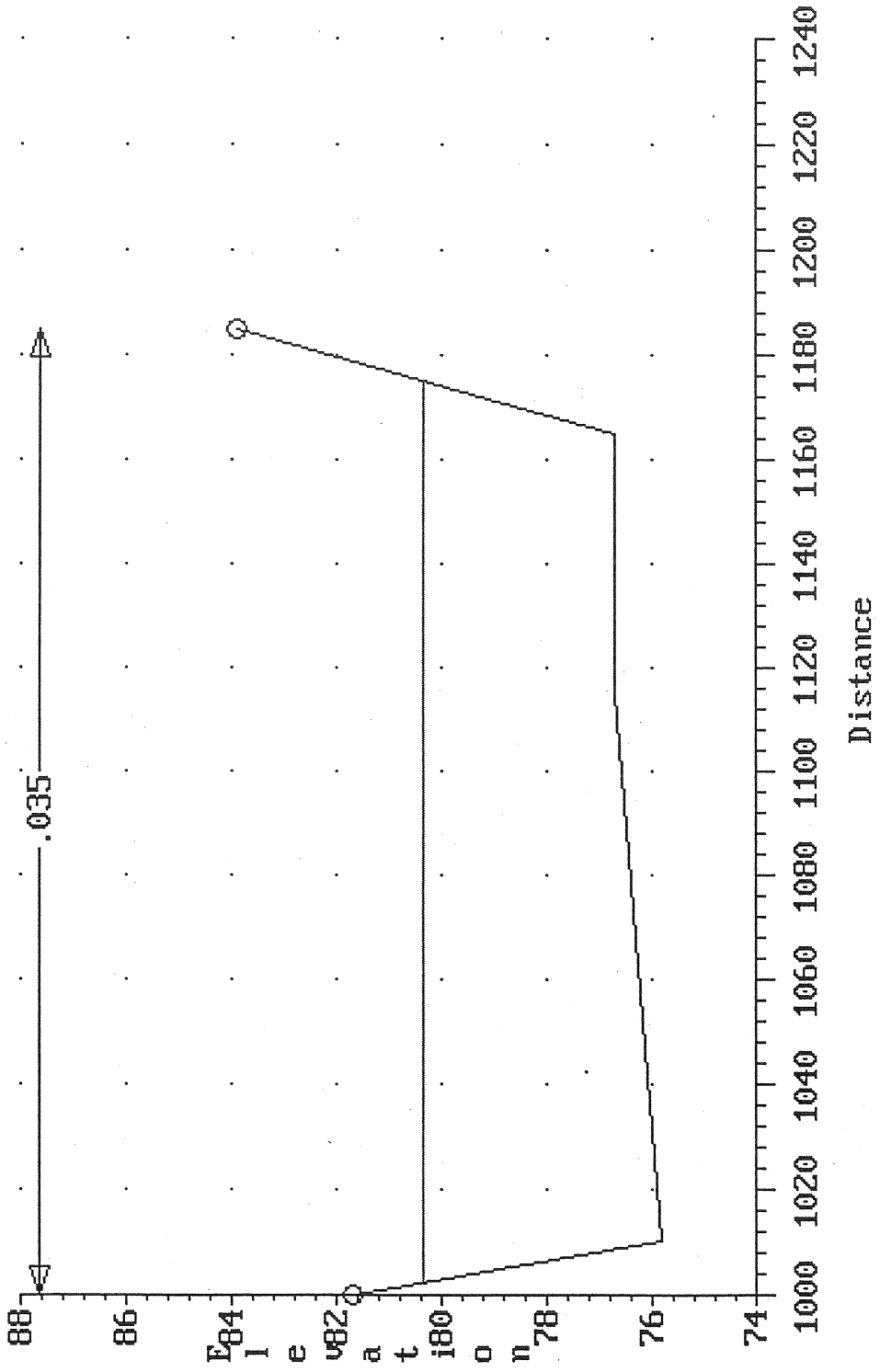
Cross-section 1930.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

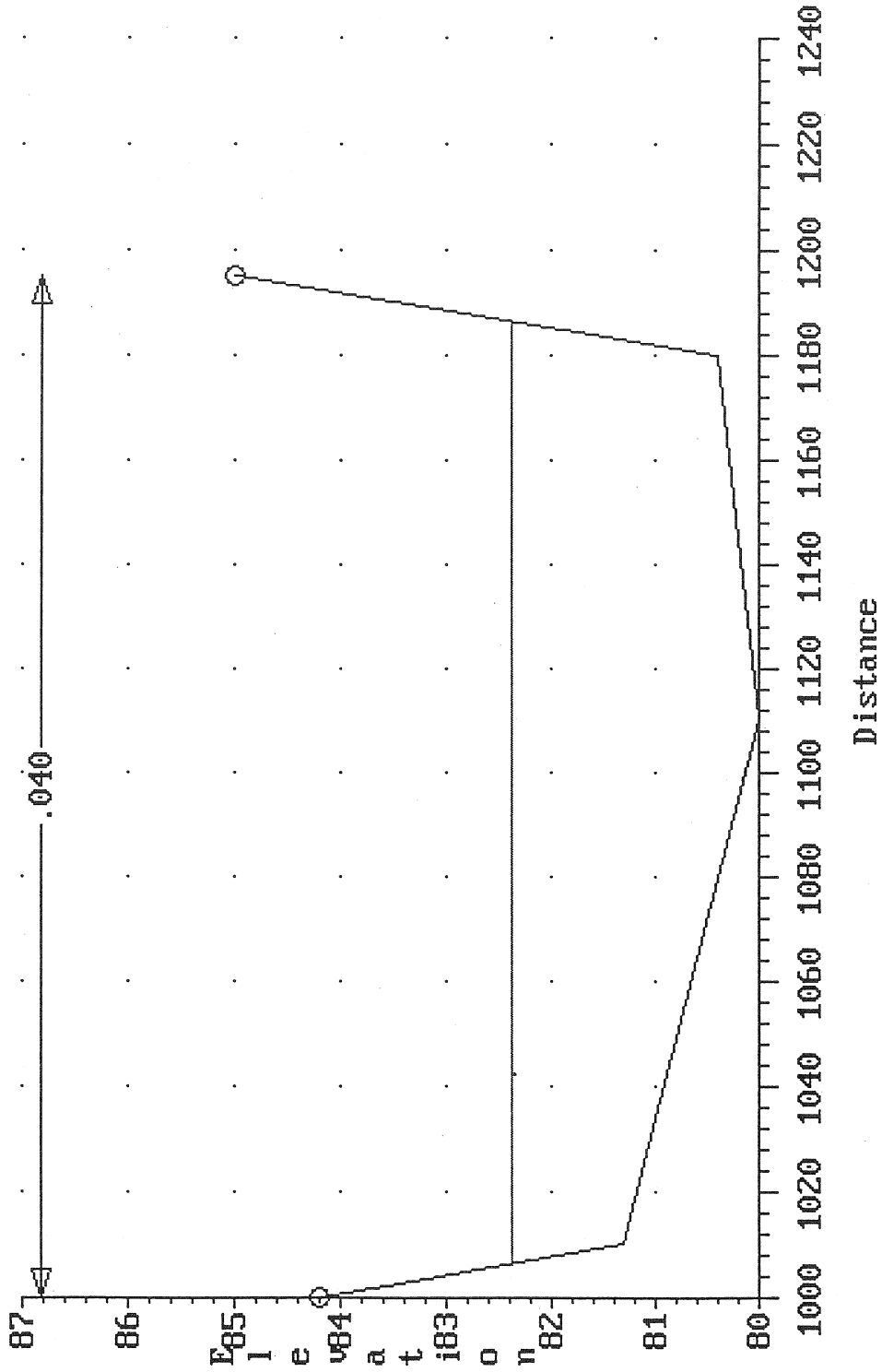
Cross-section 1840.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

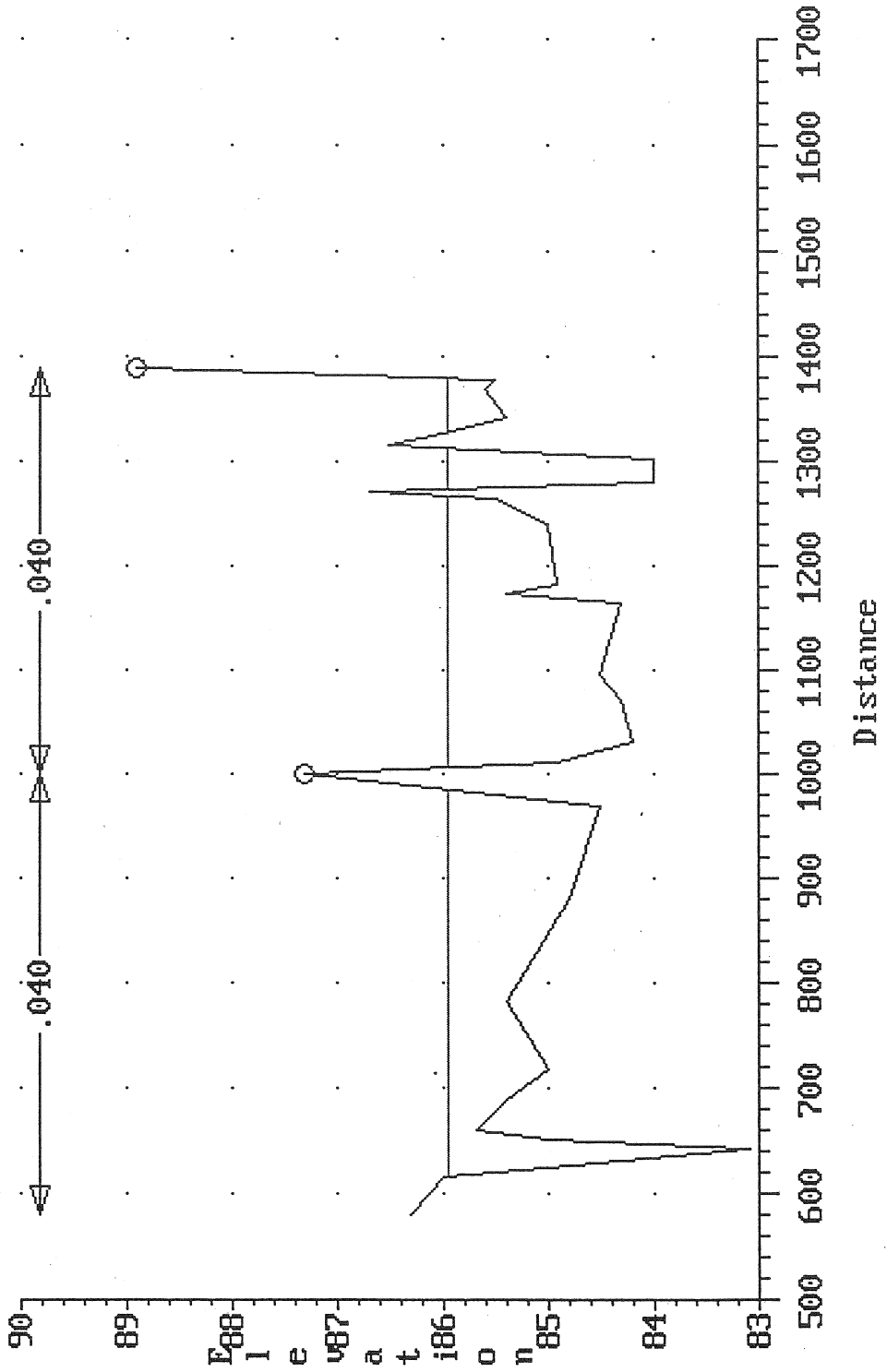
Cross-section 1820.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

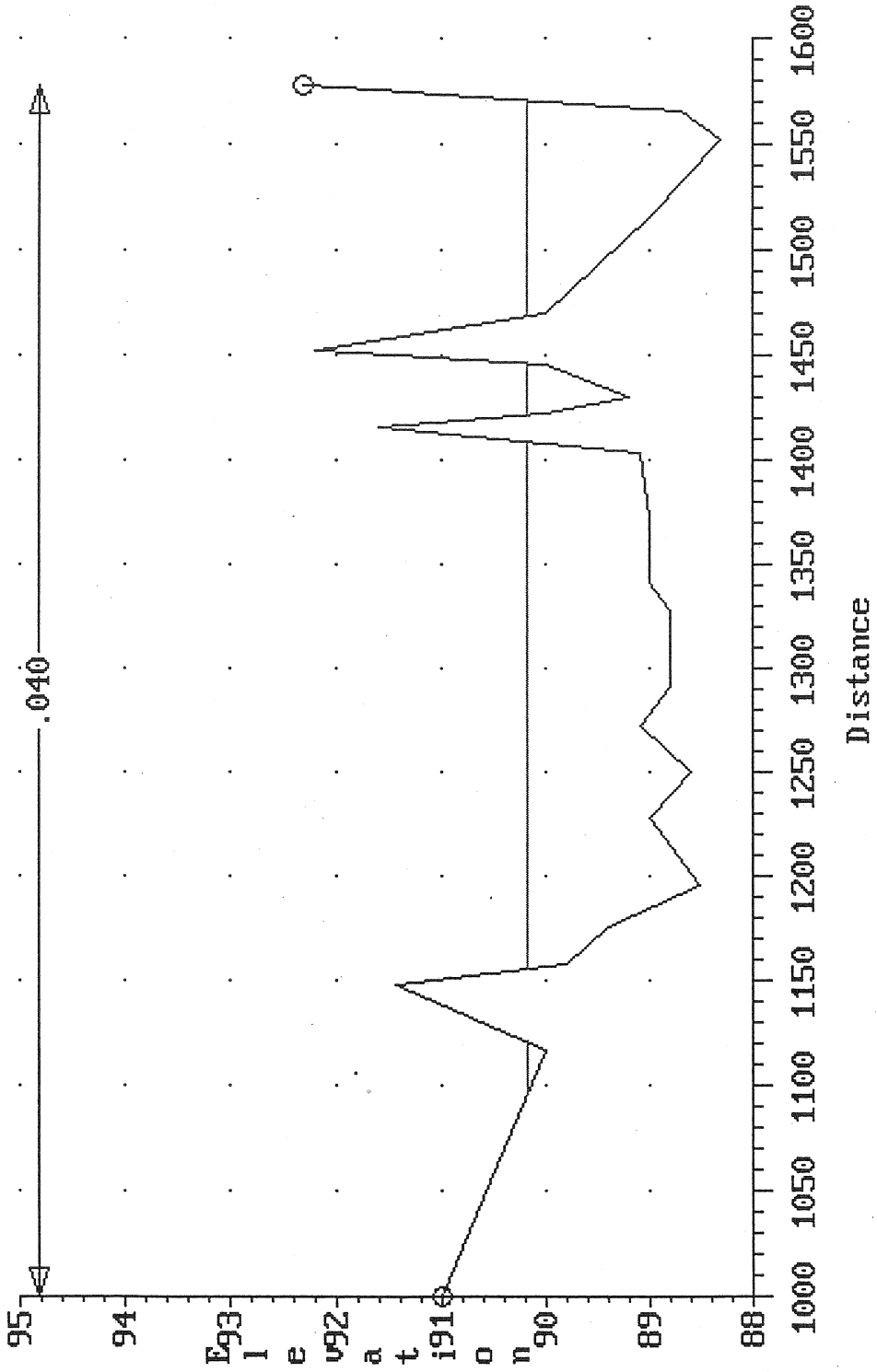
Cross-section 1565.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

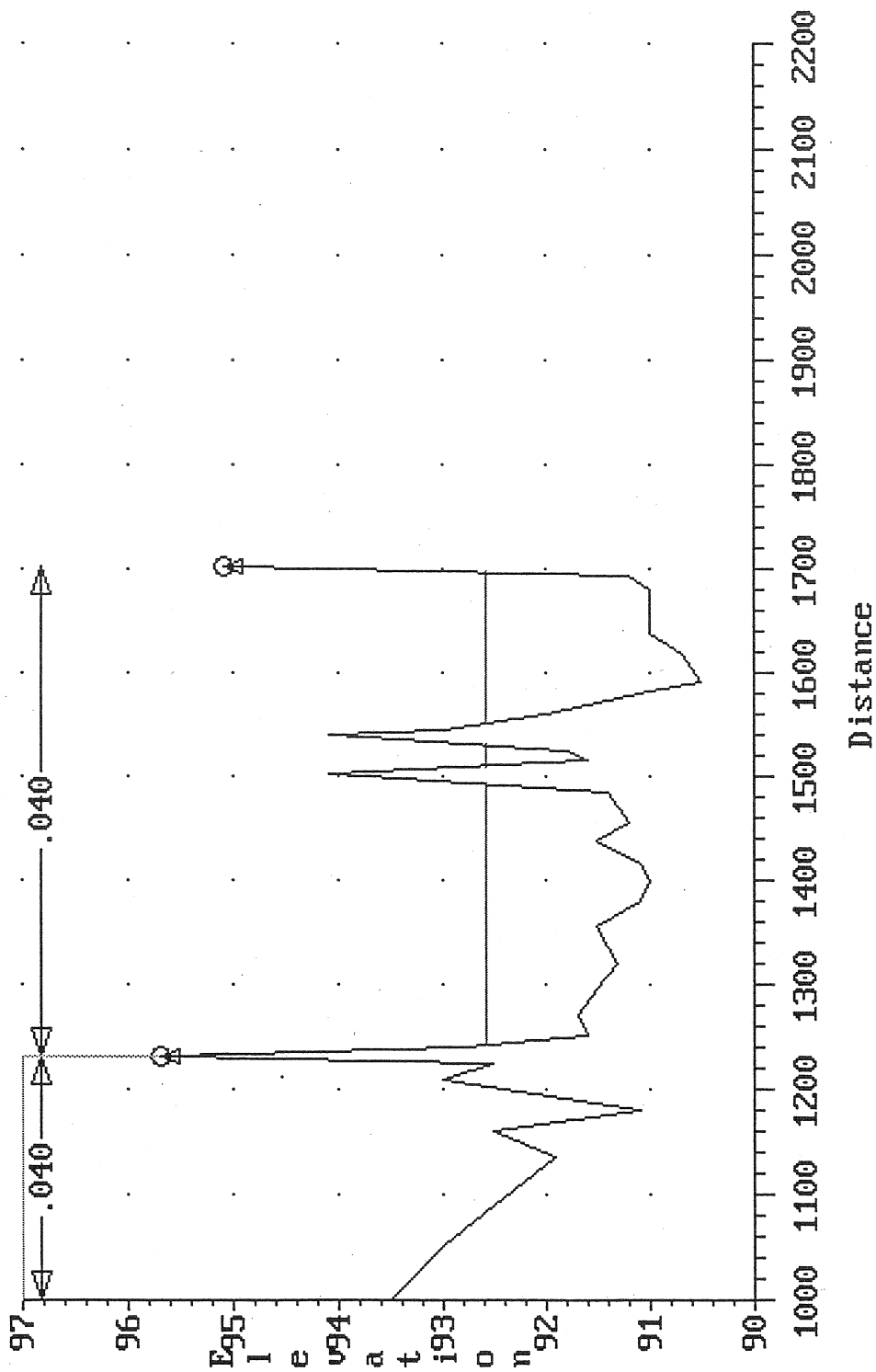
Cross-section 1300.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

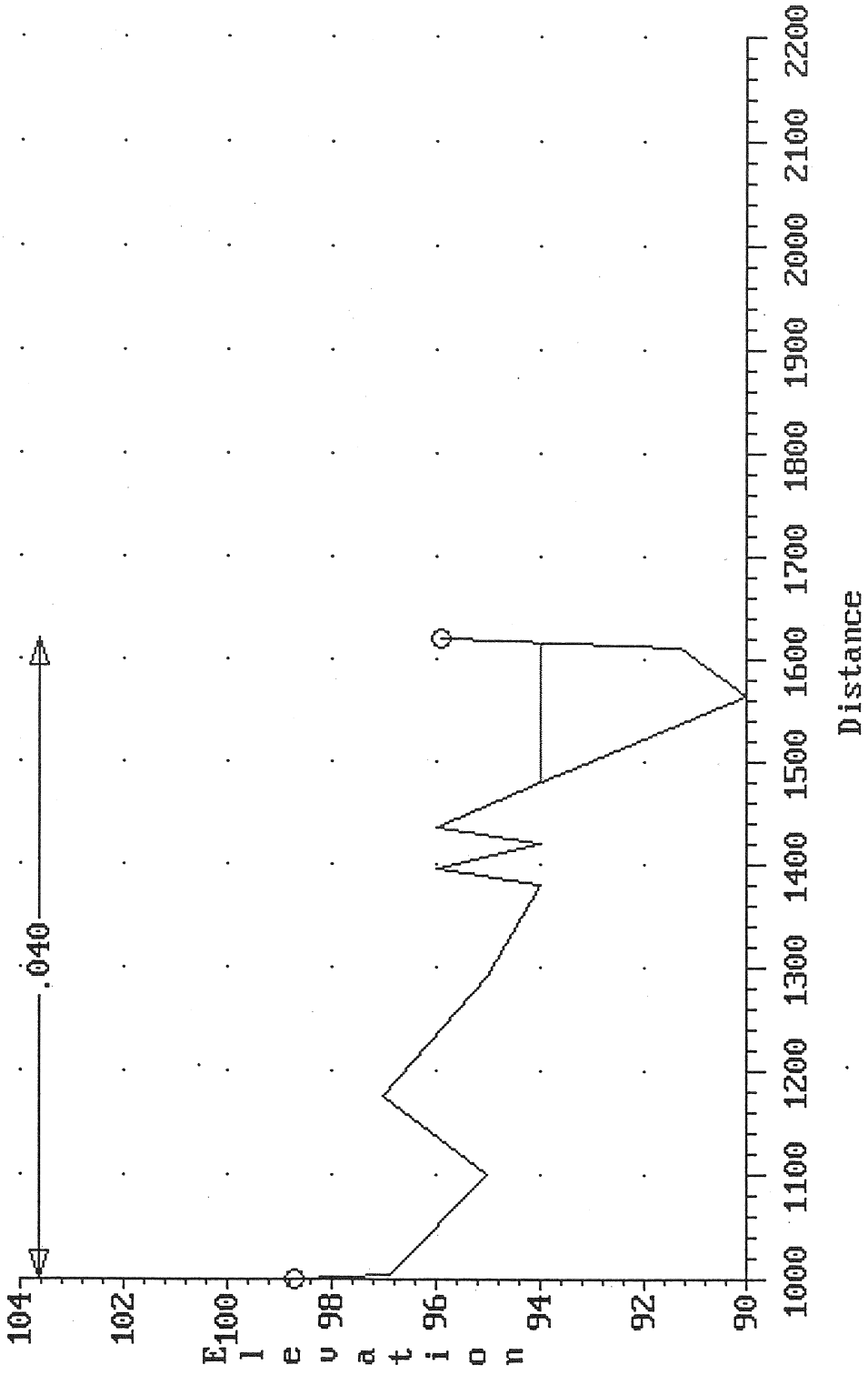
Cross-section 1170.000



WHITES CREEK CHANNEL A

Q = 2600 CFS

Cross-section 1035.000



Project 9508
 Project No. _____
 Sheet No. 1 of 2
 Calculated by TM Date 10/26/96

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

"A" Channel station 10+35

CROSS SECTION PARAMETERS:

FILENAME: 1035max.SEC

No. of Cross Section Points: 13 Bed Slope: 0.01500 Max Elev.: 98.70
 Bank Stations.....Left: 1000.0 Right.....: 1620.0 Min Elev.: 90.00
 Encroachment Stations..Left: Right.....:
 Manning-n Values.....LOB: 0.040 CHANNEL...: 0.040 ROB.....: 0.040

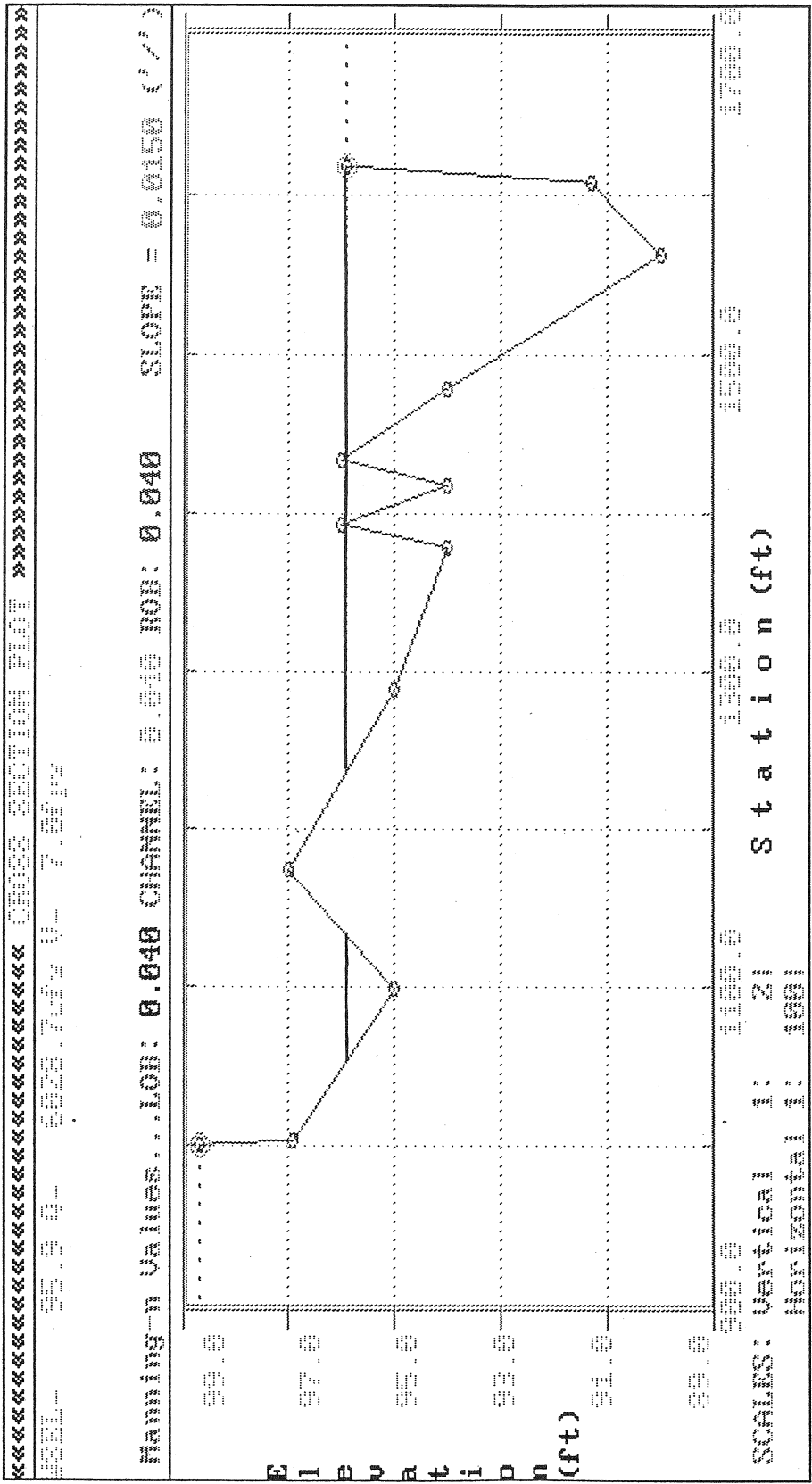
CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	98.70	1000.00	2)	96.90	1004.00	3)	95.00	1100.00
4)	97.00	1175.00	5)	95.00	1290.00	6)	94.00	1380.00
7)	96.00	1395.00	8)	94.00	1420.00	9)	96.00	1435.00
10)	94.00	1480.00	11)	90.00	1565.00	12)	91.30	1610.00
13)	95.90	1620.00						

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr	No.	ne	ALPHA	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
95.90	6028.7	7.0	0.89	0.040	1.0	456.0	865.9	457.5	95.70	

NOTES:



Project 9508
 Project No. _____
 Sheet No. 1 of 2
 Calculated by GM Date 10/25/96

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

"A" Channel Station 11+70

CROSS SECTION PARAMETERS:

FILENAME: 1170max.SEC

No. of Cross Section Points: 28 Bed Slope: 0.01500 Max Elev.: 95.70
 Bank Stations.....Left: 1230.0 Right.....: 1703.0 Min Elev.: 90.50
 Encroachment Stations..Left: 1230.0 Right.....:
 Manning-n Values.....LOB: 0.040 CHANNEL...: 0.040 ROB.....: 0.040

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	93.00	1210.00	2)	92.50	1225.00	3)	95.70	1230.00
4)	92.80	1240.00	5)	91.60	1251.00	6)	91.70	1272.00
7)	91.50	1295.00	8)	91.30	1320.00	9)	91.50	1355.00
10)	91.10	1380.00	11)	91.00	1400.00	12)	91.10	1415.00
13)	91.50	1438.00	14)	91.20	1455.00	15)	91.40	1485.00
16)	94.10	1502.00	17)	91.60	1515.00	18)	91.80	1525.00
19)	94.10	1540.00	20)	93.00	1545.00	21)	92.00	1560.00
22)	91.00	1582.00	23)	90.50	1592.00	24)	90.70	1618.00
25)	91.00	1638.00	26)	91.00	1680.00	27)	91.20	1694.00
	95.10	1703.00						

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr	No.	ne	ALPHA	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
95.10	17628.0	10.6	0.99	0.040	1.0	470.9	1670.5	473.0	95.07	

NOTES:

Project 9508
 Project No. _____
 Sheet No. 1 of 2
 Calculated by (TM) Date 10/25/96

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

"A" Channel Station 13+00

CROSS SECTION PARAMETERS:

FILENAME: 1300max.SEC

No. of Cross Section Points: 25 Bed Slope: 0.01600 Max Elev.: 92.30
 Bank Stations.....Left: 1148.0 Right.....: 1578.0 Min Elev.: 88.30
 Encroachment Stations..Left: 1148.0 Right.....:
 Manning-n Values.....LOB: 0.040 CHANNEL...: 0.040 ROB.....: 0.040

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	91.00	1000.00	2)	90.00	1117.00	3)	91.45	1148.00
4)	89.80	1158.00	5)	89.40	1175.00	6)	88.50	1195.00
7)	89.00	1228.00	8)	88.60	1250.00	9)	89.10	1272.00
10)	88.80	1291.00	11)	88.80	1328.00	12)	89.00	1341.00
13)	89.00	1354.00	14)	89.00	1372.00	15)	89.10	1403.00
16)	91.60	1415.00	17)	90.00	1422.00	18)	89.20	1430.00
19)	90.00	1446.00	20)	92.20	1452.00	21)	90.00	1470.00
22)	89.00	1515.00	23)	88.30	1552.00	24)	88.70	1565.00
25)	92.30	1578.00						

PUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr	No.	ne	ALPHA	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
91.45	7578.5	8.1	0.95	0.040	1.0	417.4	940.4	418.8	91.37	

NOTES:

Project _____
Project No. 9508
Sheet No. 1 of 2
Calculated by (TH) Date 10/25/98

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

"A" Channel station 18+20

CROSS SECTION PARAMETERS:

FILENAME: 1820max.SEC

No. of Cross Section Points: 5 Bed Slope: 0.03230 Max Elev.: 85.00
Bank Stations.....Left: 1000.0 Right.....: 1195.0 Min Elev.: 80.00
Encroachment Stations..Left: Right.....:
Manning-n Values.....LOB: 0.040 CHANNEL...: 0.040 ROB.....: 0.040

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	84.20	1000.00	2)	81.30	1010.00	3)	80.00	1110.00
4)	80.40	1180.00	5)	85.00	1195.00			

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr	No.	ne	ALPHA	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
84.20	10320.2	15.3	1.44	0.040	1.0	192.4	673.0	193.4	85.18	

NOTES:



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

JOB 4508
SHEET NO. 1 OF 1
CALCULATED BY (Signature) DATE 10/24/96
CHECKED BY _____ DATE _____
SCALE _____

100 year Offsite Flows

$$T_c = 21 \text{ min}$$

$$\text{Area} = 41 \text{ acres}$$

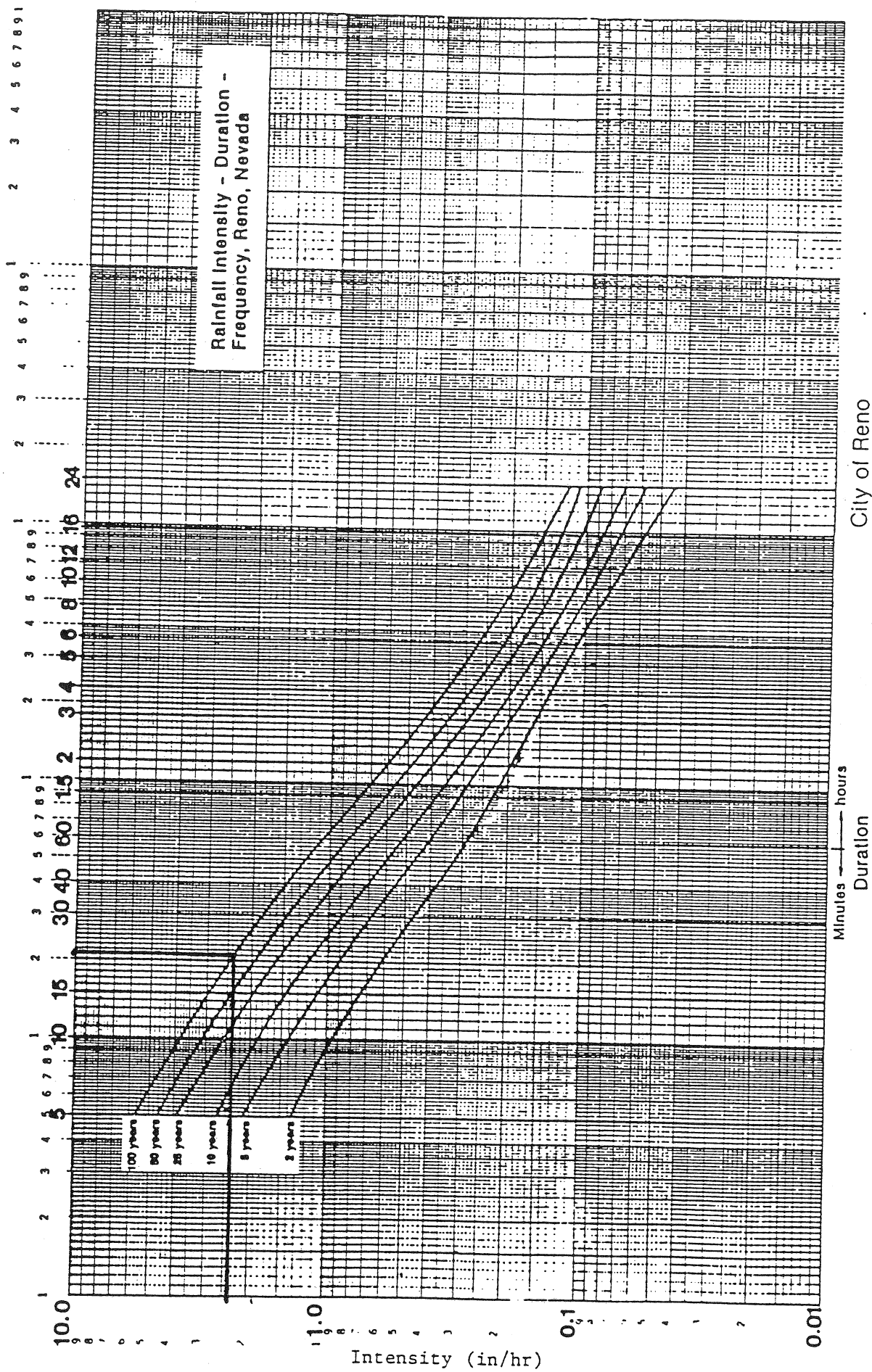
$$L = 2.4 \quad (\text{from City of Reno IDF})$$

$$C = 0.6 \quad \text{undeveloped land}$$

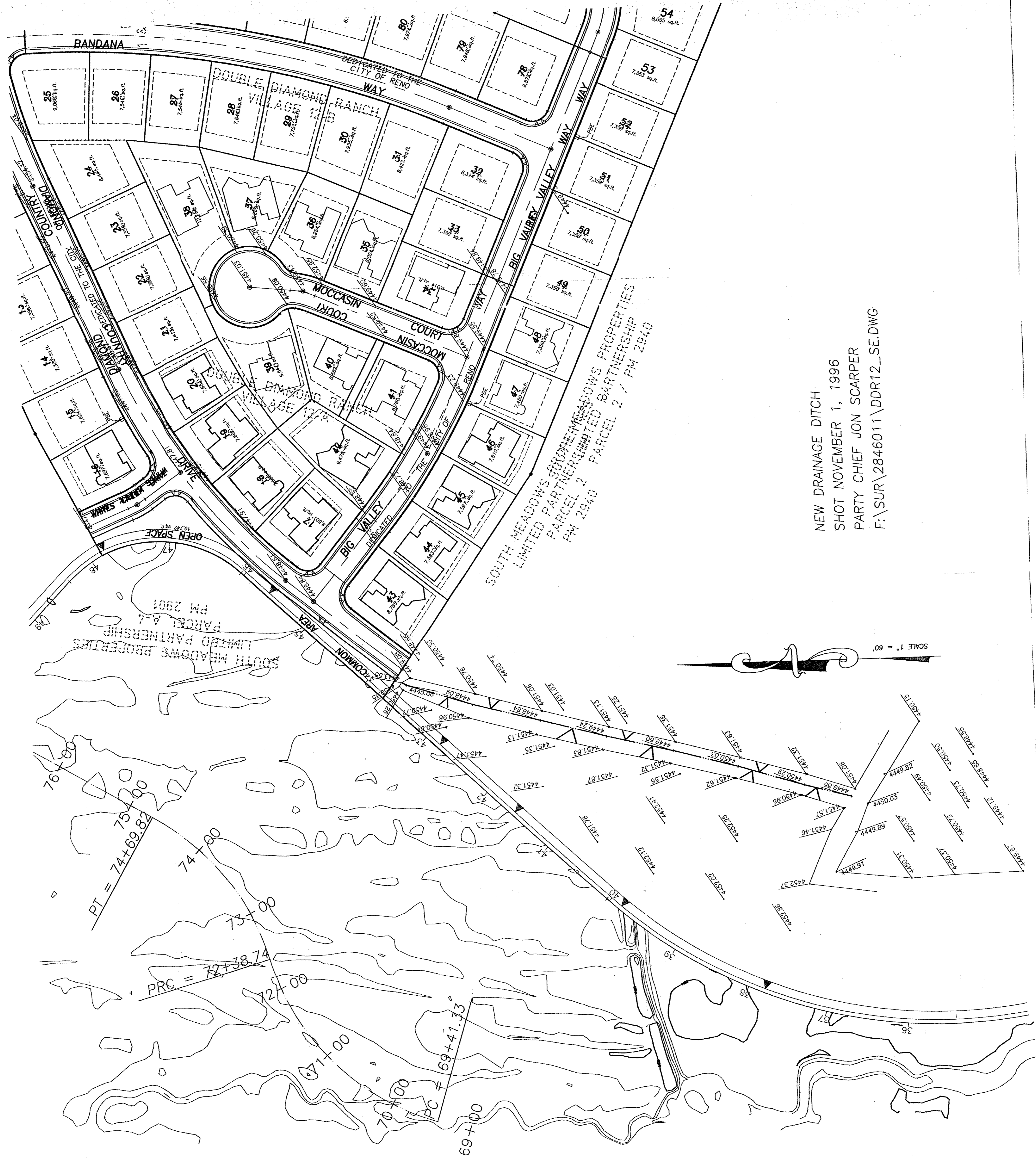
$$Q = CIA = (0.6)(2.4)(41) = 59 \text{ cfs}$$

$$36" \text{ pipe capacity at inlet} = 24.1 \text{ cfs}$$

34.9 cfs overland to
Village 12



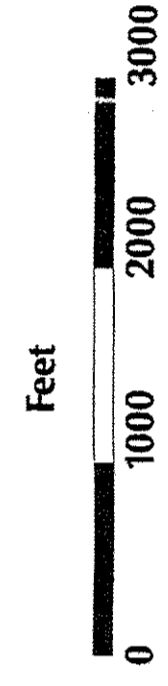
City of Reno
Rainfall Intensity - Duration - Frequency Curves for General Reno Area
 Based on Rainfall Data from Cannon Airport Gauging Station



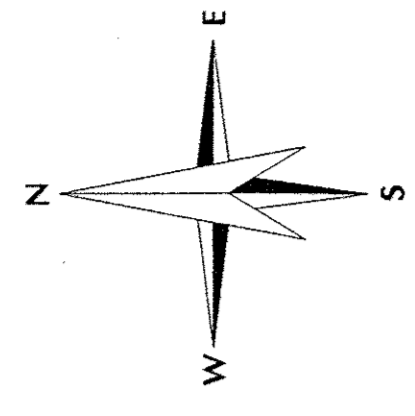
NEW DRAINAGE DITCH
 SHOT NOVEMBER 1, 1996
 PARTY CHIEF JON SCARPER
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SOUTH MEADOWS PROPERTIES
 LIMITED PARTNERSHIP
 PARCEL A-1
 PM 2901

SOUTH MEADOWS PROPERTIES
 LIMITED PARTNERSHIP
 PARCEL 2
 PM 2940



Proposed Annotated Firm



August 18, 1995
Project No. 2718-01-1



**SEA, INCORPORATED
CONSULTING ENGINEERS**

950 INDUSTRIAL WAY
SPARKS, NEVADA 89431-6092
(702) 358-6931
FAX: 358-6954

CAPITAL REALTY ADVISORS
2260 Douglas Boulevard, Suite 280
Roseville, California 95661

RE: SOUTH MEADOWS, WASHOE COUNTY, NEVADA

Gentlemen:

Presented herein are the results of our investigation of ground water depths for the proposed drainage channel project to be located on the South Meadows property, Washoe County, Nevada. The project is contained in portions of Sections 4, 9 and 16, Township 18 North, Range 20 East, M.D.M. The objectives of this study were to determine general ground water conditions pertaining to design and construction of the proposed drainage channels.

The area covered by this report is shown on Plate 1 - Plot Plan. Our investigation included field exploration and measurement of equilibrium water levels. Results of our field exploration and water level measurements are included in this report and form the basis for all conclusions and recommendations.

Exploration

The South Meadows site was explored in August, 1995 by excavation of a series of 33 test pits using a John Deere 710 backhoe. Exploration was performed specifically along the alignment of future drainage channels and the northeastern detention basin. Locations of the test pits are shown on Plate 1. Bulk samples for index testing were collected from the trench wall sides at specific depths in each soil horizon. Test pit depths ranged from 6.5 to 10.5 feet.

Test pits were excavated to determine soil lithology, ground water depths and ground water quality, as well as any subsurface anomalies which may be of importance to construction.

Three specific locations were concentrated on for exploration. Test pits 1 through 5 were excavated along the proposed drainage channel on the southwestern edge of the site. Test pits 6 through 25 were explored along the proposed central drainage channel located in the center of the property, running north-south. The third location explored consists of test pits 26 through 33 at the northeastern corner of the site in the main drainage channel paralleling South Meadows Parkway and in the proposed detention basin (see Plate 1).

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August 18, 1995

Page 2



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Test pits along the drainage channels were excavated at intervals ranging from 200 to 600 feet. Where ground water was encountered and suspected to be shallower than six feet, test pits were excavated at shorter intervals.

Soils found during exploration mainly consist of fine-grained clayey sands and silty sands, with medium to high plastic sandy clays found in many locations. These soils are commonly interbedded; with depths, horizontal extent, and thicknesses of units varying greatly.

Ground Water

Ground water was encountered in 28 of the 33 test pits excavated. Water levels were allowed to stabilize for a minimum of 36 hours before measuring. Depths to water table ranged from 3.0 to 8.6 feet, with an average depth of approximately 7.0 feet. Areas of shallow ground water, with particular interest to drainage construction and maintenance (ground water table less than 5.0 feet deep), are shown on Plate 2. As of August 14, 1995, two locations within the property are subject to shallow ground water. The first occurs on the southern end of the site, along the proposed central channel. At present an existing irrigation ditch is flowing heavy with water, and standing water was found around test pits 6 through 9. The ground water may be adversely affected by continued irrigation in the area. The second area of concern is at the proposed detention basin. Although only test pit 31 has ground water shallower than 5.0 feet, several other test pits in the basin show ground water levels just below 5.0 feet. Minor fluctuations in ground water levels in these areas may create problems with future construction.

Ground water samples were obtained from 15 test pit locations with ground water shallower than 7.0 feet. All samples were filtered and preserved in the field and tested for quantities of dissolved boron. Sierra Environmental Monitoring, Inc. has been chosen for all testing. The depth of ground water and boron concentrations measured are shown in the following Table 1:

GROUND WATER DATA (8/14/95)		
LOCATION	DEPTH TO GROUND WATER (FT)	BORON CONCENTRATION (MG/L)
TP-1	not encountered: >6.5	
TP-2	7.0	3.4
TP-3	7.9	
TP-4	7.4	
TP-5	8.1	
TP-6	4.0	5.3
TP-7	3.0	2.7



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CONSULTING ENGINEERS

GROUND WATER DATA (8/14/95)		
LOCATION	DEPTH TO GROUND WATER (FT)	BORON CONCENTRATION (MG/L)
TP-8	3.7	2.4
TP-9	6.2	7.6
TP-10	7.8	
TP-11	not encountered: >9.0	
TP-12	7.7	
TP-13	7.1	
TP-14	not encountered: >9.0	
TP-15	not encountered: >8.0	
TP-16	7.0	
TP-17	7.6	
TP-18	8.6	
TP-19	6.9	
TP-20	7.0	6.4
TP-21	8.0	
TP-22	6.0	7.7
TP-23	7.0	10
TP-24	not encountered: >9.0	
TP-25	7.7	
TP-26	5.1	17
TP-27	7.0	19
TP-28	6.3	20
TP-29	5.1	11
TP-30	5.8	5.9
TP-31	3.5	21
TP-32	5.3	161
TP-33	7.6	



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August 18, 1995

Page 4

Ground water levels have generally dropped since the late spring months. The majority of the proposed channel alignments now have design invert elevations above the present ground water elevations. Ground water will still be encountered along various intervals of channel excavation. Chemical analysis of ground water shows the presence of boron in various concentrations in all areas of shallow ground water. We, therefore, conclude that all areas with channel inverts intersecting the ground water shall be clay lined in accordance with the agreement between the City of Reno and South Meadows Properties. Areas where the water table is intersected will require dewatering to sufficient depths to allow equipment travel and grading operations. These areas shall be overexcavated one foot below invert elevations. The overexcavation should be graded as uniform and smooth as possible. Clay lining should be placed in a single one-foot thick compacted lift, densified by, at least, three complete passes with a wide-track dozer. The clay lining should extend across the entire bottom width of the channel and up the sides to a level of, at least, two feet in elevation up the side slopes of the invert. Clay lining soil should conform to the following requirements:

Sieve Size	Percent by Weight Passing
4 inch	100
No. 200	50-100
Plastic Index	25 min.

Ground water from dewatering efforts should be retained on-site for infiltration back into the ground water table.

Close coordination is necessary between the contractor and geotechnical engineer to closely define areas of high water table, requiring overexcavation of the clay lining.

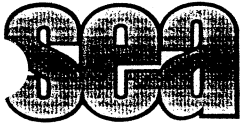
The following plates are included and complete this report:

- Plate 1 - Drainage Channel Exploration
- Plate 2 - Test Pit Logs
- Plate 3 - Graphic Soils Classification Chart
- Plate 4 - Standard Limitation Clause

CAPITAL REALTY ADVISORS

August 18, 1995

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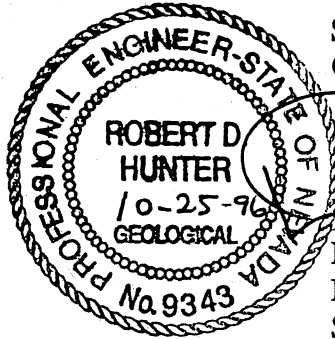


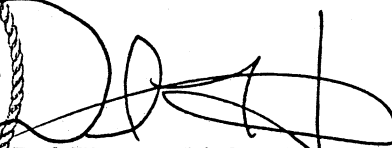
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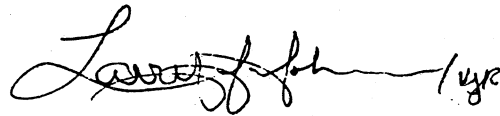
If you require any further clarification on this program, please contact us.

Sincerely,

SEA, INCORPORATED
CONSULTING ENGINEERS




Dal Hunter, Ph.D., P.E.
R.E. 9343
Senior Geological Engineer

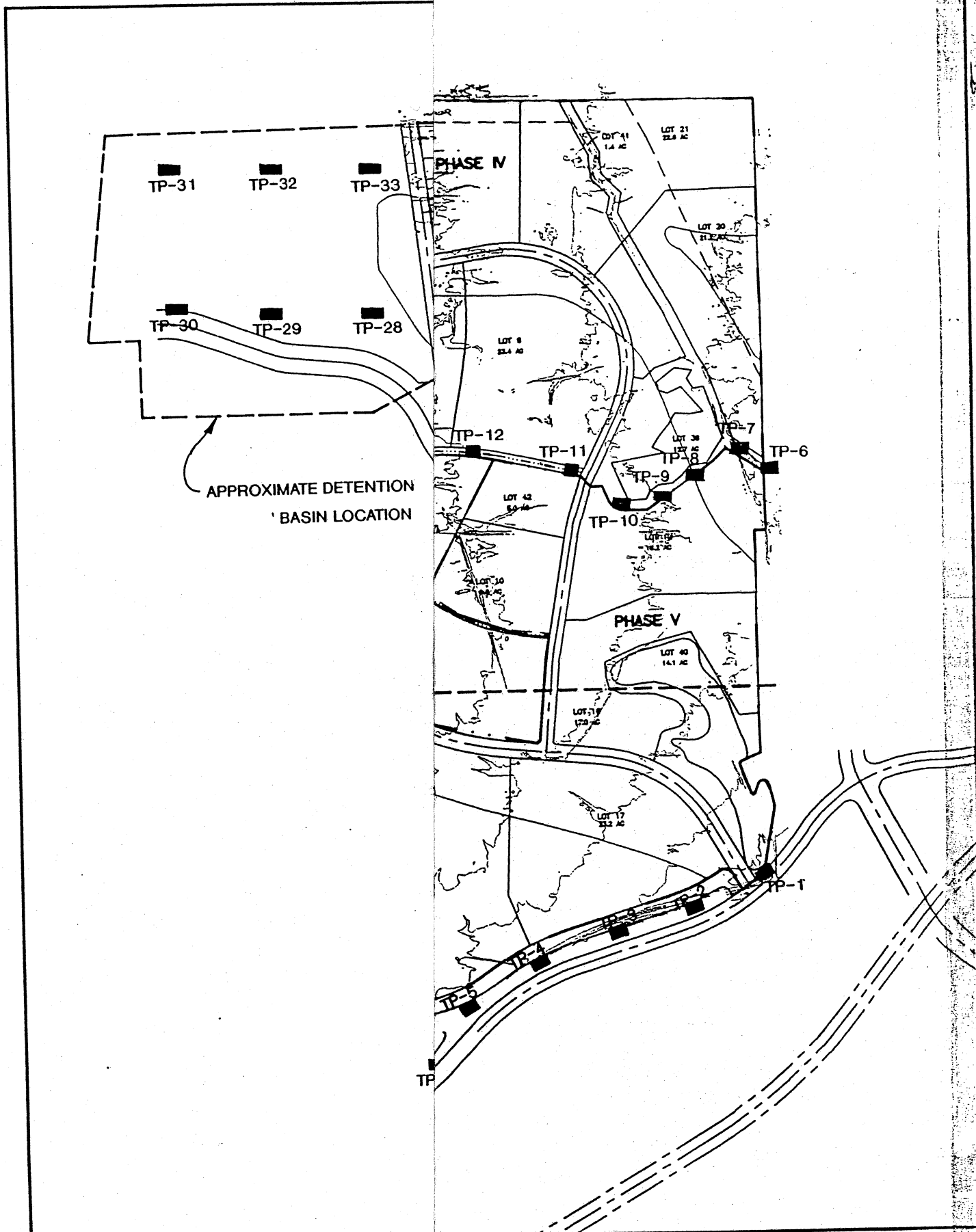


Larry J. Johnson
Vice-President, Geotechnical

LJJ:TL:MG:jl

Enclosure

cc: Nimbus Engineering
Roger Norman, Reno Engineering Corp.
Peavine Construction



Project No. 2718-01-1

Plate No. 1

TEST PIT LOGS

TEST PIT NO.: TP-1 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: Not encountered
 DATE: 8-10-95 DATE MEASURED: _____

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION
	1A			2		0.0-3.5: Slightly moist, compact, grey brown <u>Silty Sand</u> with estimated 40% slightly plastic fines, 60% very fine to medium sand.
				4		3.5-6.5: Moist, compact, brown <u>Silty Sand</u> with estimated 35% slightly plastic fines, 65% very fine to medium sand. Minor round gravel. High muscovite content.
	1B			6		
				8		
				10		
				12		

TEST PIT NO.: TP-2 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 7.0 feet
 DATE: 8-10-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION
	2A			2		0.0-2.5: Slightly moist, compact, grey brown <u>Silty Sand</u> with estimated 40% slightly plastic fines, 60% very fine to medium sand.
	2B			4		3.5-6.0: Moist, compact, brown <u>Silty Sand</u> with estimated 35% slightly plastic fines, 65% very fine to medium sand. Minor round gravel. High muscovite content.
				6		
	2C			8		6.0-9.0: Moist to wet, stiff, brown to green <u>Sandy Clay</u> with estimated 65% medium plastic fines, 35% very fine to medium sand.
				10		
				12		

EXPLANATION

Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.

TEST PIT LOGS

TEST PIT NO.: TP-3 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 7.9 feet
 DATE: 8-10-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth In Feet	Graphic Log	DESCRIPTION
				2		0.0-4.5: Slightly moist, compact, grey brown <u>Silty Sand</u> with estimated 40% slightly plastic fines, 60% very fine to medium sand.
				4		4.5-6.5: Moist, compact, brown <u>Silty Sand</u> with estimated 35% slightly plastic fines, 65% very fine to medium sand. Minor round gravel. High muscovite content.
				6		6.5-9.5: Wet, compact, brown to green <u>Silty Sand</u> with estimated 30-40% slightly plastic fines, 60-70% very fine to medium sand. Minor gravel.
	3A			8		
				10		
				12		

TEST PIT NO.: TP-4 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 7.4 feet
 DATE: 8-10-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth In Feet	Graphic Log	DESCRIPTION
	4A			2		0.0-2.0: Dry, compact, light brown <u>Clayey Gravelly Sand</u> with estimated 40% low to medium plastic fines, 45% fine to coarse sand, 15% fine gravel.
	4B			4		2.0-3.5: Moist, compact, cream <u>Silty Gravelly Sand</u> with estimated 30% slightly plastic fines, 40% very fine to coarse sand, 30% round gravel.
				6		3.5-9.0: Wet, compact, brown to green <u>Silty Sand</u> with estimated 35% slightly plastic fines, 65% very fine to medium sand. Minor gravel.
	4C			8		
				10		
				12		

EXPLANATION

Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.



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 Reno, Nevada

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 Plate 2b

TEST PIT NO.: TP-5 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 8.1 feet
 DATE: 8-10-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth In Feet	Graphic Log	DESCRIPTION
				0		0.0-5.5: Dry to moist, compact, grey brown <u>Silty Sand</u> with estimated 40% slightly plastic fines, 60% very fine to medium sand.
				2		
				4		
				6		5.5-8.5: Moist, compact, brown <u>Silty Sand</u> with estimated 35% slightly plastic fines, 65% very fine to medium sand. Minor gravel.
				8		
	5A			8.1		8.5-9.5: Wet, compact, green to blue <u>Silty Sand - Sandy Silt</u> with estimated 50% slightly plastic fines, 50% very fine to medium sand. Interbedded Clayey Sand - Sandy Clay and Silty Sand.
				10		
				12		

TEST PIT NO.: TP-6 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 4.0 feet
 DATE: 8-11-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth In Feet	Graphic Log	DESCRIPTION
				0		0.0-2.0: Dry, compact, light brown <u>Silty Sand</u> with estimated 40% slightly plastic fines, 60% fine to coarse sand. Minor gravel.
	8A			2		2.0-4.0: Wet, compact, brown <u>Silty Sand</u> with estimated 35% slightly plastic fines, 65% very fine to medium sand.
				4		4.0-5.0: Wet, stiff, grey <u>Sandy Clay</u> with estimated 75% high plastic fines, 25% very fine sand.
	8B			4		5.0-8.0: Wet, compact, blue <u>Silty Sand</u> with estimated 30-40% slightly plastic fines, 60-70% very fine to medium sand. Interbedded Sandy Silt.
				6		
				8		
	8C			8		
				10		
				12		

EXPLANATION
 Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.

TEST PIT NO.: TP-7 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 3.0 feet
 DATE: 8-11-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION
				0		0.0-5.0: Dry to wet, compact, brown <u>Clayey Sand</u> with estimated 30-40% medium plastic fines, 60-70% very fine to coarse sand.
	8A			4		
				6		5.0-10.0: Wet, compact, grey blue <u>Poorly Graded Sand</u> with estimated 5% non-plastic fines, 95% fine to coarse sand.
				8		
				10		
				12		

TEST PIT NO.: TP-8 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 3.7 feet
 DATE: 8-11-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION
	7A			0		0.0-2.0: Moist to wet, compact, brown <u>Clayey Sand - Sandy Clay</u> with estimated 50% medium plastic fines, 50% very fine to fine sand.
				2		2.0-6.5: Wet, compact, brown <u>Silty Sand</u> with estimated 30-40% slightly plastic fines, 60-70% very fine to medium sand.
				4		
				6		6.5-9.0: Wet, compact, grey blue <u>Poorly Graded Sand</u> with estimated 10% non-plastic fines, 90% fine to coarse sand. Thin Gravelly Sand interbeds.
				8		
				10		
				12		

EXPLANATION

Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.



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 Plate 2d

TEST PIT LOGS

TEST PIT NO.: TP-9 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 6.2 feet
 DATE: 8-11-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth In Feet	Graphic Log	DESCRIPTION
				2		0.0-3.0: Dry, compact, brown <u>Silty Sand</u> with estimated 15% non-plastic fines, 85% fine to medium sand.
				4		3.0-7.5: Wet, stiff, brown <u>Clayey Sand - Sandy Clay</u> with estimated 50% Medium to high plastic fines, 50% very fine to medium sand.
	9A			6		7.5-9.0: Wet, compact, grey blue <u>Poorly Graded Sand</u> with estimated 10% non-plastic fines, 90% fine to coarse sand.
				8		
				10		
				12		

TEST PIT NO.: TP-10 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 7.8 feet
 DATE: 8-11-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth In Feet	Graphic Log	DESCRIPTION
				2		0.0-2.0: Moist, compact, brown <u>Clayey Sand</u> with estimated 30-40% medium plastic fines, 60-70% very fine to medium sand.
				4		2.0-7.0: Moist to wet, highly interbedded <u>Clayey Sand, Sandy Clay, and Silty Sand</u> . Clay fines are medium plastic.
				6		7.0-9.0: Wet, stiff, rust brown <u>Sandy Clay</u> with estimated 60% medium to high plastic fines, 40% very fine to fine sand.
				8		
				10		
				12		

EXPLANATION

Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.



RENO/SPARKS, NEVADA
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 Reno, Nevada

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 Plate 2e

TEST PIT LOGS

TEST PIT NO.: TP-11 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: Not encountered
 DATE: 8-11-95 DATE MEASURED: _____

NOTES	Sample Number	Location	Moisture Percent	Depth In Feet	Graphic Log	DESCRIPTION
				2		0.0-3.0: Moist, compact, light brown <u>Clayey Sand</u> with estimated 40% low plastic fines, 60% very fine to fine sand.
				4		3.0-5.5: Wet, compact, rust brown <u>Silty Sand</u> with estimated 20% slightly plastic fines, 80% fine to medium sand.
				6		5.5-9.0: Wet, stiff, rust brown <u>Sandy Clay</u> with estimated 60% medium to high plastic fines, 40% very fine to fine sand.
	11A			8		
				10		
				12		

TEST PIT NO.: TP-12 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 7.7 feet
 DATE: 8-11-95 DATE MEASURED: _____

NOTES	Sample Number	Location	Moisture Percent	Depth In Feet	Graphic Log	DESCRIPTION
				2		0.0-5.5: Moist to wet, compact, rust brown <u>Silty Sand</u> with estimated 30-40% slight to low plastic fines, 60-70% very fine to medium sand.
				4		
				6		5.5-9.0: Wet, stiff, rust brown <u>Sandy Clay</u> with estimated 60% medium to high plastic fines, 40% very fine to fine sand. Interbedded Silty Sand.
				8		
				10		
				12		

EXPLANATION

Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.



RENO/SPARKS, NEVADA
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Capital Realty Advisors Corp.
 South Meadows
 Reno, Nevada

Project No. 2718-01-1
 Plate 2f

TEST PIT NO.: TP-13 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 7.1 feet
 DATE: 8-11-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION	
	13A			0		0.0-7.0: Moist to wet, compact, brown <u>Clayey Sand - Sandy Clay</u> with estimated 30-40% slight to low plastic fines, 60-70% very fine to medium sand. 1 ft. thick interbeds of Silty Sand at 2.5 and 4.5 feet.	
				2			
				4			
				6			
	13B			7			7.0-9.0: Wet, compact, blue <u>Silty Sand</u> with estimated 40% slightly plastic fines, 60% very fine to fine sand.
				8			
				10			
				12			

TEST PIT NO.: TP-14 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: Not encountered
 DATE: 8-11-95 DATE MEASURED: _____

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION	
				0		0.0-3.5: Slightly moist, very stiff, brown <u>Sandy Clay</u> with estimated 60% medium to high plastic fines, 40% very fine to medium sand.	
				2			
	14A			3.5			3.5-5.5: Dry to slightly moist, compact, brown <u>Silty Sand and Clayey Sand</u> with estimated 30-40% slight to medium plastic fines, 60-70% very fine to medium sand.
				4			
				6			5.5-9.0: Wet, compact, brown <u>Clayey Sand - Sandy Clay</u> with estimated 50% medium to high plastic fines, 50% very fine to medium sand. Interbedded Clayey Sand.
				8			
				10			
				12			

EXPLANATION

Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.



RENO/SPARKS, NEVADA
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 PHOENIX, ARIZONA

Capital Realty Advisors Corp.
 South Meadows
 Reno, Nevada

Project No. 2718-01-1
 Plate 2g

TEST PIT LOGS

TEST PIT NO.: TP-15 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: Not encountered
 DATE: 8-11-95 DATE MEASURED: _____

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION
				2		0.0-8.0: Dry, compact, light brown <u>Silty Sand - Poorly Graded Sand</u> with estimated 5-20% slightly plastic fines, 80-95% fine to medium sand. Minor gravel. Moist at 4.0 ft. Wet at 7.0 ft.
				4		
				6		
				8		
				10		
				12		

TEST PIT NO.: TP-16 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 7.0 feet
 DATE: 8-11-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION
				2		0.0-2.5: Slightly moist, stiff, brown <u>Sandy Clay</u> with estimated 60% medium to high plastic fines, 40% very fine to medium sand. 2.5-4.5: Moist, compact, brown <u>Silty Sand</u> with estimated 30-40% slight plastic fines, 60-70% very fine to medium sand. 4.5-8.3: Wet, stiff, brown <u>Sandy Clay</u> with estimated 60% medium to high plastic fines, 40% very fine to medium sand.
				4		
				6		
				8		
				10		
				12		

EXPLANATION

Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.



RENO/SPARKS, NEVADA
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Capital Realty Advisors Corp.
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 Reno, Nevada

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 Plate 2h

TEST PIT NO.: TP-17 GROUND ELEVATION: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 7.6 feet
 DATE: 8-11-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION
				2		0.0-5.5: Moist, compact, brown <u>Silty Sand</u> with estimated 40% slightly plastic fines, 60% very fine to medium sand. Clayey Sand interbeds with medium plastic fines.
				4		
				6		5.5-9.8: Wet, stiff, grey brown <u>Sandy Clay</u> with estimated 60% medium plastic fines, 40% very fine to medium sand. Interbedded Clayey Sand.
				8		
				10		9.8-10.0: Wet, compact, grey blue <u>Poorly Graded Sand</u> with estimated 10% non-plastic fines, 90% fine to medium sand.
				12		

TEST PIT NO.: TP-18 GROUND ELEVATION: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 8.6 feet
 DATE: 8-11-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION
				2		0.0-2.0: Dry to moist, compact, light grey <u>Silty Sand</u> with estimated 20% slightly plastic fines, 80% very fine to medium sand.
				4		2.0-7.0: Wet, stiff, brown <u>Clayey Sand - Sandy Clay</u> with estimated 50% medium plastic fines, 50% very fine to medium sand. Interbedded Clayey Sand.
	18A			6		
				8		7.0-9.0: Wet, compact, rust brown <u>Silty Sand</u> with estimated 40% slightly plastic fines, 60% very fine to fine sand. Interbedded Sandy Silt.
				10		
				12		

EXPLANATION
 Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.

TEST PIT LOGS

TEST PIT NO.: TP-19 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 6.9 feet
 DATE: 8-11-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION
				2		0.0-1.5: Moist, stiff, brown <u>Sandy Clay</u> with estimated 70% medium plastic fines, 30% very fine sand. Thin interbeds of Clayey Sand.
				4		1.5-4.0: Moist, compact, brown <u>Clayey Sand</u> with estimated 35% medium plastic fines, 65% very fine to fine sand.
				6		4.0-8.6: Wet, stiff, brown <u>Sandy Clay</u> with estimated 60% medium plastic fines, 40% very fine to fine sand. Interbedded Clayey Sand.
				8		
				10		8.6-10.0: Wet, compact, blue <u>Poorly Graded Sand</u> with estimated 10% non-plastic fines, 90% fine to medium sand. Interbeds of Silty Sand.
				12		

TEST PIT NO.: TP-20 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 7.0 feet
 DATE: 8-11-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION
				2		0.0-3.3: Dry, compact, light grey <u>Silty Sand</u> with estimated 20-30% slightly plastic fines, 70-80% very fine to medium sand.
				4		3.3-8.0: Moist, stiff, brown <u>Sandy Clay</u> with estimated 65% medium plastic fines, 35% very fine sand. Interbedded Clayey Sand.
	20A			6		
				8		
				10		8.0-9.5: Wet, compact, blue <u>Poorly Graded Sand</u> with estimated 10% non-plastic fines, 90% very fine to medium sand.
				12		

EXPLANATION

Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.



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TEST PIT LOGS

TEST PIT NO.: TP-21 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 8.0 feet
 DATE: 8-11-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth In Feet	Graphic Log	DESCRIPTION	
				2		0.0-8.5: Moist to wet, compact, brown <u>Clayey Sand</u> with estimated 30-40% medium plastic fines, 60-70% very fine to medium sand. Interbedded Silty Sand.	
				4			
				6			
				8			
	21A			10			8.5-10.0: Wet, very stiff, grey blue <u>Sandy Clay</u> with estimated 70% medium to high plastic fines, 30% very fine sand.
				12			

TEST PIT NO.: TP-22 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 6.0 feet
 DATE: 8-11-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth In Feet	Graphic Log	DESCRIPTION	
				2		0.0-4.2: Moist, compact, brown <u>Clayey Sand</u> with estimated 35% medium plastic fines, 65% very fine to medium sand. Interbedded Silty Sand.	
				4			4.2-10.5: Wet, stiff, green blue <u>Sandy Clay</u> with estimated 70% medium to high plastic fines, 30% very fine sand.
				6			
	22A			8			Poorly Graded Sand interbed 7.0-8.0 ft.
				10			
				12			

EXPLANATION

Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.



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TEST PIT LOGS

TEST PIT NO.: TP-23 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 7.0 feet
 DATE: 8-11-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth In Feet	Graphic Log	DESCRIPTION
				2		<p>0.0-7.0: Moist, highly interbedded <u>Clayey Sand and Sandy Clay</u>. Sandy Clay: 70% medium plastic fines, 30% very fine sand. Clayey Sand: 30-40% medium plastic fines, 60-70% very fine to medium sand.</p> <p>7.0-9.0: Wet, stiff, black <u>Sandy Clay</u> with estimated 60% medium plastic fines, 40% very fine sand. Interbedded Poorly Graded Sand.</p>
				4		
				6		
				8		
				10		
				12		

TEST PIT NO.: TP-24 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: Not encountered
 DATE: 8-11-95 DATE MEASURED: _____

NOTES	Sample Number	Location	Moisture Percent	Depth In Feet	Graphic Log	DESCRIPTION
				2		<p>0.0-4.0: Moist, highly interbedded <u>Clayey Sand and Sandy Clay</u>. Sandy Clay: 70% medium plastic fines, 30% very fine sand. Clayey Sand: 30-40% medium plastic fines, 60-70% very fine to medium sand.</p> <p>4.0-9.0: Moist to wet, stiff, grey <u>Sandy Clay</u> with estimated 60-90% medium plastic fines, 10-40% very fine to fine sand. Interbedded Poorly Graded Sand.</p>
				4		
				6		
				8		
				10		
				12		

EXPLANATION

Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.

TEST PIT LOGS

TEST PIT NO.: TP-25 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 7.7 feet
 DATE: 8-11-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION	
	25A			2		0.0-5.0: Moist, soft, brown <u>Sandy Clay</u> with estimated 70-90% medium plastic fines, 10-30% very fine sand. Interbedded Clayey Sand.	
				4			
				6			5.0-9.0: Wet, stiff, grey <u>Sandy Clay</u> with estimated 60-90% medium plastic fines, 10-40% very fine to fine sand. Interbedded Poorly Graded Sand.
				8			
	25B			8			
				10			
				12			

TEST PIT NO.: TP-26 GROUND ELEVATION.: _____
 LOGGED BY: D. Smith GROUND WATER DEPTH: 5.1 feet
 DATE: 8-12-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION	
				2		0.0-3.5: Moist, compact, brown <u>Silty Sand</u> with estimated 20% non-plastic fines, 80% fine to coarse sand.	
				4			3.5-6.0: Very moist, compact, mottled grey and brown <u>Clayey Sand</u> with estimated 15% low plastic fines, 80% fine to coarse sand, 5% gravel to 1 in. diameter.
				6			6.0-10.0: Wet, compact-dense, slightly cemented, dark brown <u>Gravelly Sand</u> with estimated 5% slightly plastic fines, 65% fine to coarse sand, 30% gravel to 1 in. diameter. Gravel sized particles comprised of cemented sand.
				8			
				10			
				12			

EXPLANATION

Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.

TEST PIT LOGS

TEST PIT NO.: TP-27 GROUND ELEVATION: _____
 LOGGED BY: D. Smith GROUND WATER DEPTH: 7.0 feet
 DATE: 8-12-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION
				2		0.0-3.5: Moist, compact, brown <u>Silty Sand</u> with estimated 20% non-plastic fines, 80% fine to coarse sand.
				4		3.5-6.0: Very moist, compact, mottled dark grey and brown organic <u>Clayey Sand</u> with estimated 30% low plastic fines, 70% fine to coarse sand. Interbedded Sandy Silt - Silty Sand.
				6		6.0-11.0: Wet, compact, dark grey <u>Silty Sand</u> with estimated 25% slightly plastic fines, 75% fine to coarse sand. Interbedded coarse Sand and organic Silty Sand.
				8		
				10		
				12		

TEST PIT NO.: TP-28 GROUND ELEVATION: _____
 LOGGED BY: D. Smith GROUND WATER DEPTH: 6.3 feet
 DATE: 8-12-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION
				2		0.0-3.0: Moist, compact, brown <u>Poorly Graded Sand</u> with estimated 5-10% non-plastic fines, 90-95% fine to coarse sand.
				4		3.0-5.5: Moist, compact, brown <u>Silty Sand</u> with estimated 20% non-plastic fines, 80% fine to coarse sand.
				6		5.5-7.0: Wet, soft, light tan <u>Sandy Clay</u> with estimated 65% low plastic fines, 35% fine sand.
				8		7.0-10.0: Wet, dense, dark brown <u>Gravelly Sand</u> with estimated 5% non-plastic fines, 80% fine to coarse sand, 15-20% gravel to 1.5 in. diameter.
				10		
				12		

EXPLANATION

Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.



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TEST PIT LOGS

TEST PIT NO.: TP-29 GROUND ELEVATION.: _____
 LOGGED BY: D. Smith GROUND WATER DEPTH: 5.1 feet
 DATE: 8-12-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth In Feet	Graphic Log	DESCRIPTION
				2		0.0-3.0: Moist, compact, brown <u>Silty Sand</u> with estimated 15% non-plastic fines, 85% fine to coarse sand.
				4		3.0-5.5: Moist, dense, slightly cemented, dark brown <u>Poorly Graded Sand</u> with estimated 5-10% non-plastic fines, 80-90% fine to coarse sand, 5-10% gravel to 1 in. diameter.
				6		
				8		
				10		
				12		

TEST PIT NO.: TP-30 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 5.8 feet
 DATE: 8-14-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth In Feet	Graphic Log	DESCRIPTION
				2		0.0-3.0: Dry, stiff, brown <u>Sandy Clay</u> with estimated 60% high plastic fines, 40% very fine to medium sand.
				4		3.0-5.5: Wet, compact, brown <u>Clayey Sand</u> with estimated 20% low plastic fines, 80% fine to coarse sand.
				6		
				8		
				10		
				12		

EXPLANATION

Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.





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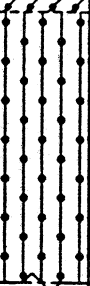
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TEST PIT LOGS

TEST PIT NO.: TP-31 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 3.5 feet
 DATE: 8-14-95 DATE MEASURED: 8-14-95

NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION
				2		0.0-4.0: Moist to wet, stiff, green blue <u>Sandy Clay</u> with estimated 60% high plastic fines, 40% very fine to medium sand.
				4		4.0-9.0: Wet, stiff, dark grey <u>Sandy Silt</u> with estimated 60% slight to low plastic fines, 40% very fine to fine sand.
				6		
				8		
				10		
				12		

TEST PIT NO.: TP-32 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 5.3 feet
 DATE: 8-14-95 DATE MEASURED: 8-14-95







NOTES	Sample Number	Location	Moisture Percent	Depth in Feet	Graphic Log	DESCRIPTION
				2		0.0-3.0: Moist, compact, brown <u>Clayey Sand</u> with estimated 25% medium plastic fines, 75% fine to coarse sand. Interbedded Poorly Graded Sand and Silty Sand.
				4		3.0-9.0: Wet, compact, grey brown <u>Silty Sand</u> with estimated 20-30% slight plastic fines, 70-80% very fine to medium sand.
				6		
				8		
				10		
				12		

EXPLANATION

Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.

TEST PIT LOG

TEST PIT NO.: TP-33 GROUND ELEVATION.: _____
 LOGGED BY: M. Griswold GROUND WATER DEPTH: 7.6 feet
 DATE: 8-15-95 DATE MEASURED: 8-15-95

NOTES	Sample Number	Location	Moisture Percent	Depth In Feet	Graphic Log	DESCRIPTION
				2		0.0-2.0: Moist, compact, brown <u>Clayey Sand</u> with estimated 30% medium plastic fines, 70% very fine to medium sand.
				4		2.0-9.0: Wet, stiff, black <u>Sandy Clay</u> with estimated 70% high plastic fines, 30% very fine sand.
				6		
				8		
				10		
				12		

EXPLANATION

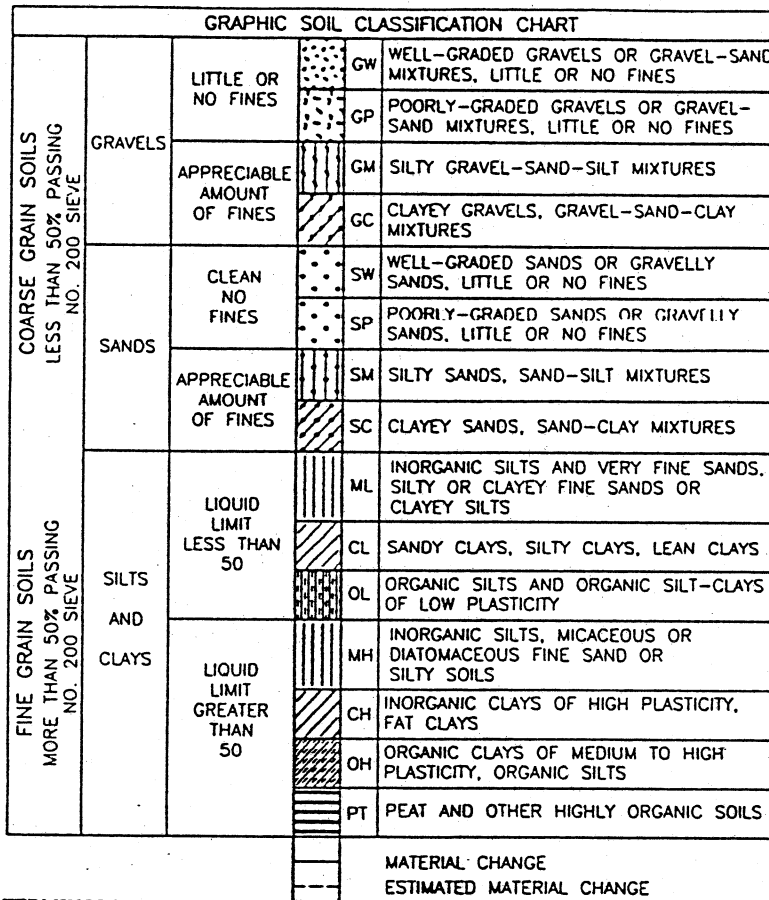
Description: Describe soil type by Unified Soil Classification System with emphasis on in-place or natural condition.



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GRAIN SIZE TERMINOLOGY

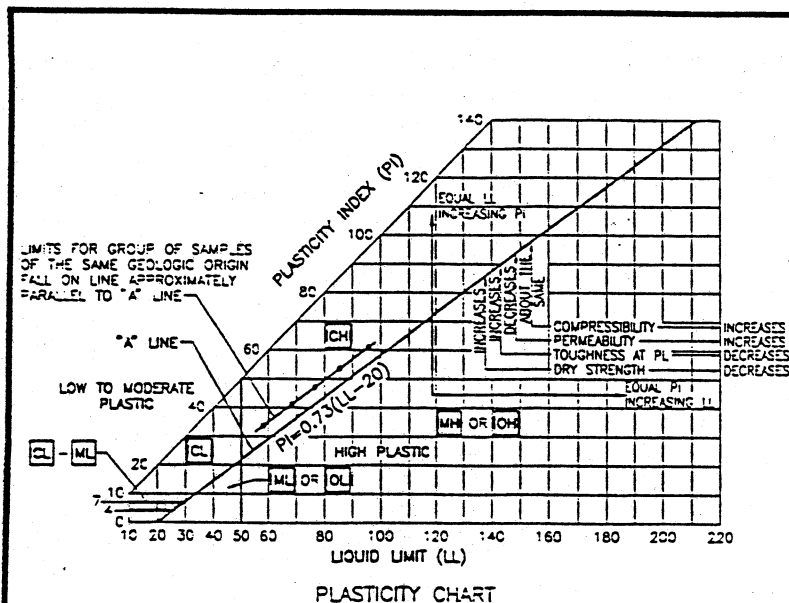
Major Component of Sample	Size Range
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 2mm)
Sand	#4 to #200 sieve (2mm to .074mm)
Silt or Clay	Passing #200 sieve (0.074mm)

RELATIVE DENSITY OF GRANULAR SOILS:

N-Blows/ft.	Relative Density
0-4	Very Loose
5-10	Loose
11-30	Compact
31-50	Dense
greater than 50	Very Dense

CONSISTENCY OF COHESIVE SOILS:

Unconfined Compressive Strength, /Qu, psi	N-Blows/ft.	Consistency
less than 500	0-1	Very Soft
500-1,000	2-4	Soft
1,000-2,000	5-8	Firm
2,000-4,000	9-15	Stiff
4,000-8,000	16-30	Very Stiff
8,000-16,000	31-60	Hard
greater than 16,000	greater than 60	Very Hard



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SOILS CLASSIFICATION

Project No. 2718-01-1

STANDARD LIMITATION CLAUSE

This report has been prepared in accordance with generally accepted geotechnical practices. The analyses and recommendations submitted are based upon field exploration performed at the locations shown on Plate 1 - Plot Plan, of this report. This report does not reflect soils variations that may become evident during the construction period, at which time re-evaluation of the recommendations may be necessary. We recommend our firm be retained to perform construction observation in all phases of the project related to geotechnical factors to insure compliance with our recommendations. The owner shall be responsible for distribution of this geotechnical investigation to all designers and contractors whose work is related to geotechnical factors.

Equilibrium water level readings were made on the date shown on Plate 2 - Log of Borings, of this report. Fluctuations in the water table may occur due to rainfall, temperature, seasonal runoff or adjacent irrigation practices. Construction planning should be based on assumptions of possible variations.

This report has been prepared to provide information allowing the architect or engineer to design the project. In the event of changes in the design or location of the project from the time of this report, recommendations should be reviewed and possibly modified by the geological engineer. If the geological engineer is not accorded the privilege of making this recommended review, he can assume no responsibility for misinterpretation or misapplication of his recommendations or their validity in the event changes have been made in the original design concept without his prior review. The geological engineer makes no other warranties, either expressed or implied, as to the professional advice provided under the terms of this agreement and included in this report.

2. EARTH FILL PLACEMENT

1. The fill is: Existing Proposed
2. Has fill been/will be placed in the regulatory floodway? Yes No
If yes, please attach completed Riverine Hydraulic Analysis Form.
3. Has fill been/will be placed in floodway fringe (*area between the floodway and 100-year floodplain boundaries*)? Yes No

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

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

If yes, justify steeper slopes _____

- B. Is adequate erosion protection provided for fill slopes exposed to moving flood waters? (*Slopes exposed to flows with velocities of up to 5 feet per second (fps) during the 100-year flood must, at a minimum, be protected by a cover of grass, vines, weeds, or similar vegetation; slopes exposed to flows with velocities greater than 5 fps during the 100-year flood must, at a minimum, be protected by stone or rock riprap.*) Yes No

If no, describe erosion protection provided _____

- C. Has all fill placed in revised 100-year floodplain been compacted to 95 percent of the maximum density obtainable with the Standard Proctor Test Method or acceptable equivalent method? Yes No
- D. Can structures conceivably be constructed on the fill at any time in the future? Yes No

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

4. Has fill been/will be placed in a V-zone? Yes No
- If yes, is the fill protected from erosion by a flood control structure such as a revetment or seawall? Yes No

If yes, attach the coastal structures form.

TABLE 1
Typical Properties of Compacted Soils

Group Symbol	Soil Type	Range of Maximum Dry Unit Weight, pcf	Range of Optimum Moisture, Percent	Typical Value of Compression		Cohesion (as compacted) pcf	Cohesion (saturated) pcf	β (Effective Stress Envelope Degrees)	Tan β	Typical Coefficient of Permeability ft./min.	Range of CBK Values	Range of Subgrade Modulus k lba/cu in.
				At 1.4 tsf (20 psi)	At 3.6 tsf (50 psi)							
GW	Well graded clean gravels, gravel-sand mixtures.	125 - 135	11 - 8	0.3	0.6	0	0	>38	>0.79	5×10^{-2}	40 - 80	300 - 500
GP	Poorly graded clean gravels, gravel-sand mix	115 - 125	14 - 11	0.4	0.9	0	0	>37	>0.74	10^{-1}	30 - 60	250 - 400
GH	Silty gravels, poorly graded gravel-sand-silt.	120 - 135	12 - 8	0.5	1.1	.....	.....	>34	>0.67	$>10^{-6}$	20 - 60	100 - 400
GC	Clayey gravels, poorly graded gravel-sand-clay.	115 - 130	14 - 9	0.7	1.6	.....	.....	>31	>0.60	$>10^{-7}$	20 - 40	100 - 300
SW	Well graded clean sands, gravelly sands.	110 - 130	16 - 9	0.6	1.2	0	0	38	0.79	$>10^{-3}$	20 - 40	200 - 300
SP	Poorly graded clean sands, sand-gravel mix.	100 - 120	21 - 12	0.8	1.4	0	0	37	0.74	$>10^{-3}$	10 - 40	200 - 300
SM	Silty sands, poorly graded sand-silt mix.	110 - 125	16 - 11	0.8	1.6	1050	420	34	0.67	$5 \times >10^{-5}$	10 - 40	100 - 300
SH-SC	Sand-silt clay mix with slightly plastic fines.	110 - 130	15 - 11	0.8	1.4	1050	300	33	0.66	$2 \times >10^{-6}$	5 - 30	100 - 300
SC	Clayey sands, poorly graded sand-clay-mix.	105 - 125	19 - 11	1.1	2.2	1550	230	31	0.60	$5 \times >10^{-7}$	5 - 20	100 - 300
ML	Inorganic silts and clayey silts.	95 - 120	24 - 12	0.9	1.7	1400	190	32	0.62	$>10^{-5}$	15 or less	100 - 200
HL-CL	Mixture of inorganic silt and clay.	100 - 120	22 - 12	1.0	2.2	1350	460	32	0.62	$5 \times >10^{-7}$	.....	.....
CL	Inorganic clays of low to medium plasticity.	95 - 120	24 - 12	1.3	2.5	1800	270	28	0.54	$>10^{-7}$	15 or less	50 - 200
OL	Organic silts and silt-clays, low plasticity.	80 - 100	33 - 21	.....	.....	.....	.....	.....	.....	.....	5 or less	50 - 100
OH	Inorganic clayey silts, elastic silts.	70 - 95	40 - 24	2.0	3.8	1500	420	25	0.47	$5 \times >10^{-7}$	10 or less	50 - 100
CH	Inorganic clays of high plasticity	75 - 105	36 - 19	2.6	3.9	2150	230	19	0.35	$>10^{-7}$	15 or less	50 - 150
OIH	Organic clays and silty clays	65 - 100	45 - 21	.....	.....	.....	.....	.....	.....	.....	5 or less	25 - 100

Notes:

- All properties are for condition of "Standard Proctor" maximum density, except values of k and CBK which are for "modified Proctor" maximum density.
- Typical strength characteristics are for effective strength envelopes and are obtained from USNR data.
- Compression values are for vertical loading with complete lateral confinement.
- (>) indicates that typical property is greater than the value shown.
(..) indicates insufficient data available for an estimate.

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: Developments drain away from the Channel in this area.

exist do not exist

If openings exist, list all closures:

<u>Channel Station</u>	<u>Left or Right Bank</u>	<u>Opening Type</u>	<u>Highest Elevation for Opening Invert</u>	<u>Type of Closure Device</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

(Extend table on an added sheet as needed 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).

EMBANKMENT PROTECTION

1. The maximum levee slope landside is 3.1
 The maximum levee slope floodside is 3:1
3. The range of 100-year riverine flood velocities along the levee? 2.93 fps (min.)
 to 7.19 fps (max.)
4. Embankment material is protected by (describe the kind): grass lined or rock rip-rap.

5. Riprap Design Parameters: (Include references) Velocity; Tractive stress

Reach	Sideslope	Flow depth	Velocity	Curve or		Stone Riprap		Depth of Toedown
				Straight		D ₁₀₀	D ₅₀ Thickness	
Sta _____ to _____								
Sta _____ to _____								
Sta _____ to _____								

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

Has a bedding/filter analysis and design been included Yes No

7. Describe the analysis for other kinds of protection used (include copies of the design analysis):

Note: Attach engineering analysis to support construction plans.

* 1/4 ton rock rip-rap was used. This is an extremely oversized design for flood velocities experienced in the channel, see chart on next page.

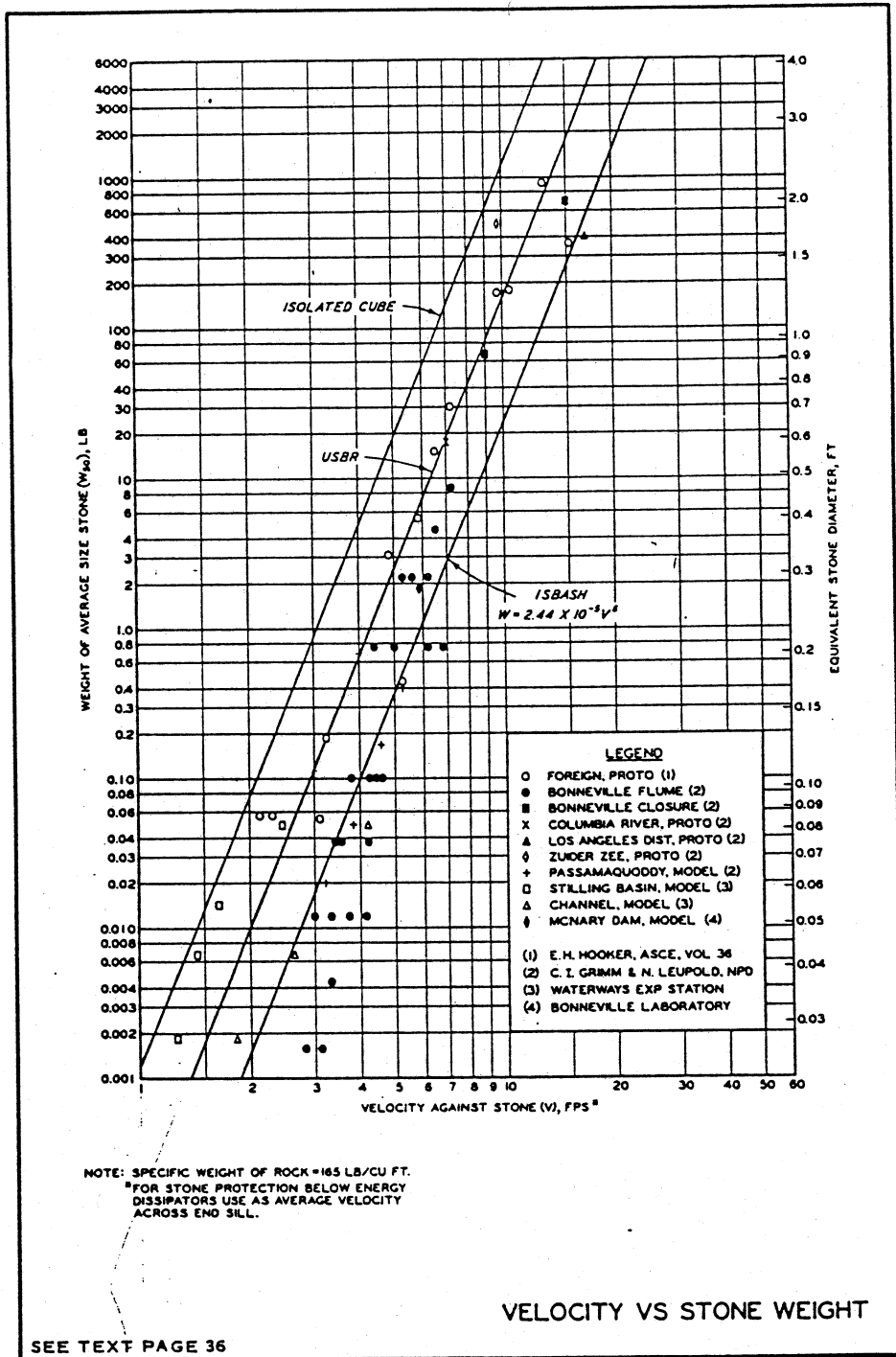


Plate 29

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 19+00, height 5 ft.
- Limiting foundation soil strength:
 Sta 19+00, depth _____ to bottom
 strength $\phi = \underline{0}$ degrees, $c = \underline{300}$ 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:

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

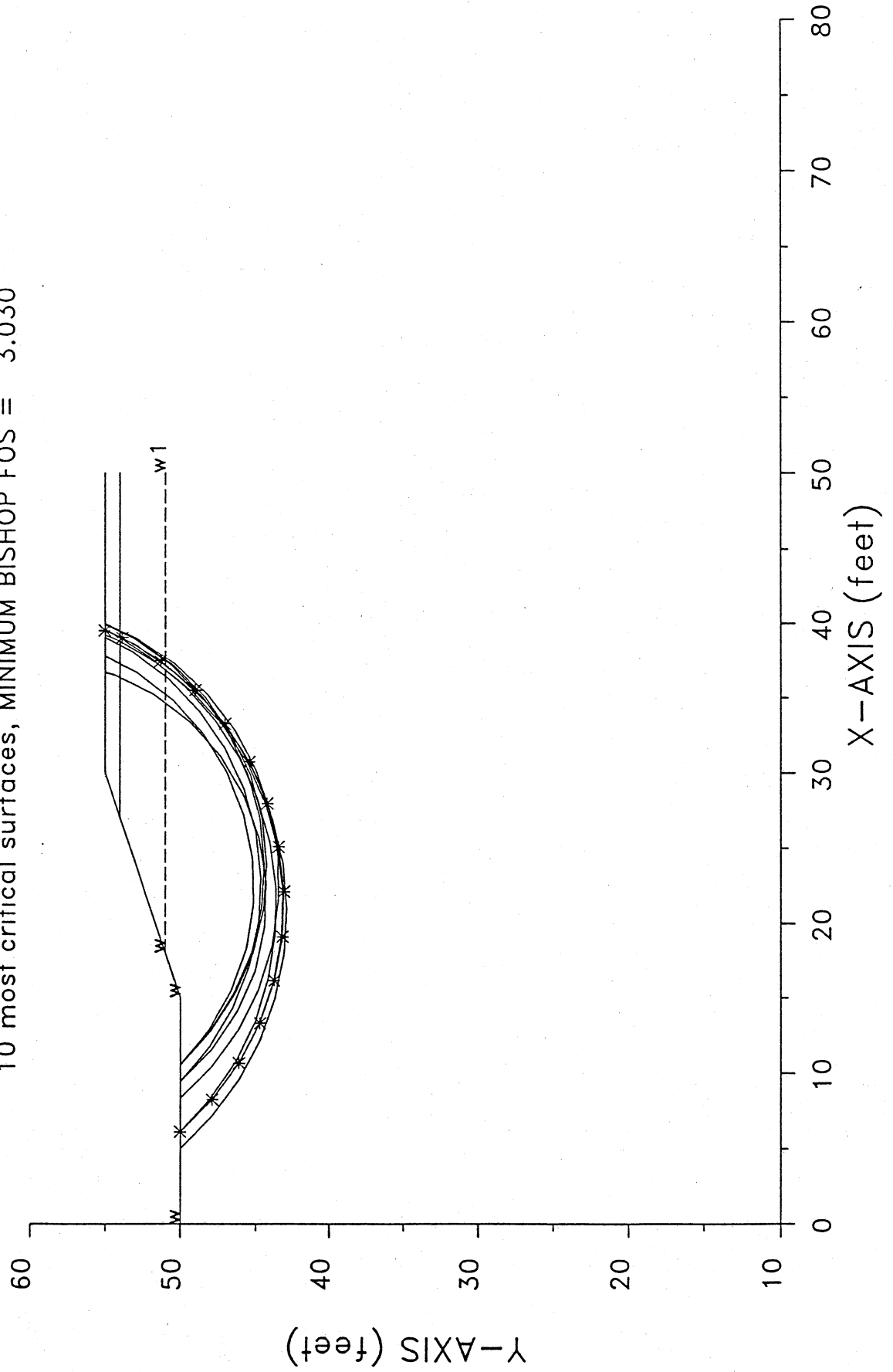
5. Was a seepage analysis for the foundation performed? Yes No
 Were uplift pressures at the embankment landside toe checked? Yes No
 Were seepage exit gradients checked for piping potential? Yes No

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

Note: Attach engineering analysis to support construction plans.

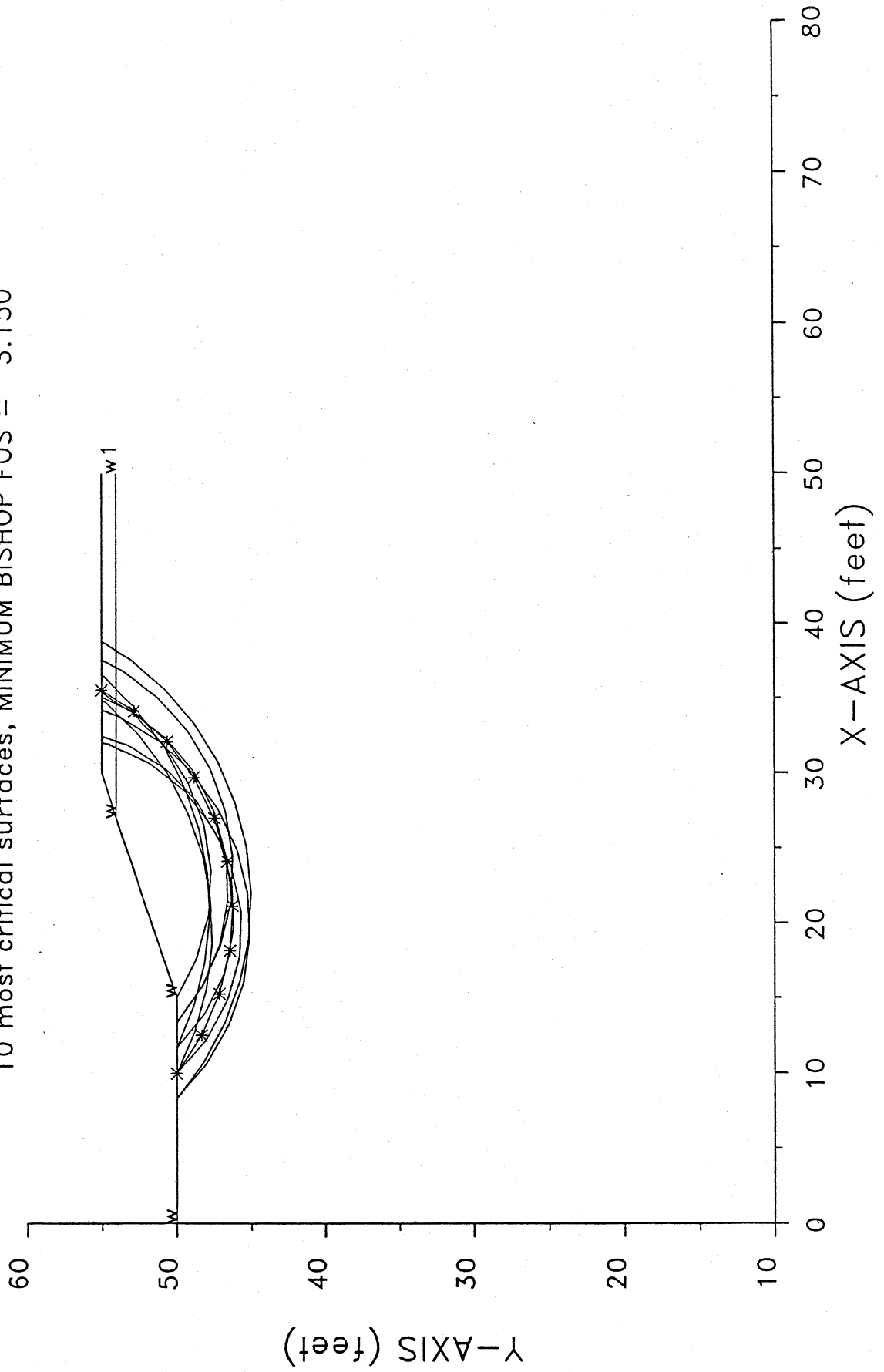
South Meadows Canals Cond #1 Case I

10 most critical surfaces, MINIMUM BISHOP FOS = 3.030



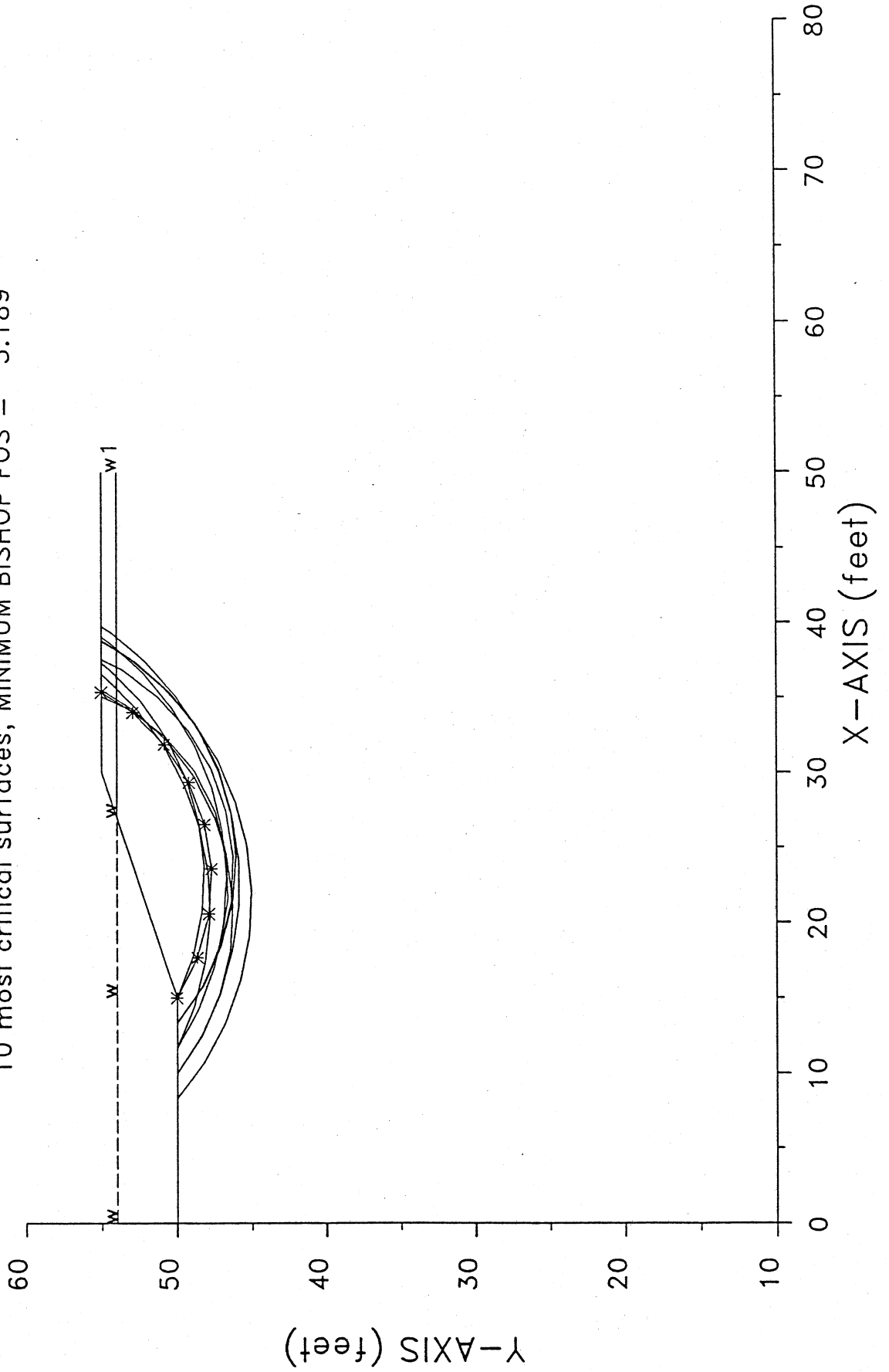
South Meadows Canals Cond #1 Case II

10 most critical surfaces, MINIMUM BISHOP FOS = 3.150



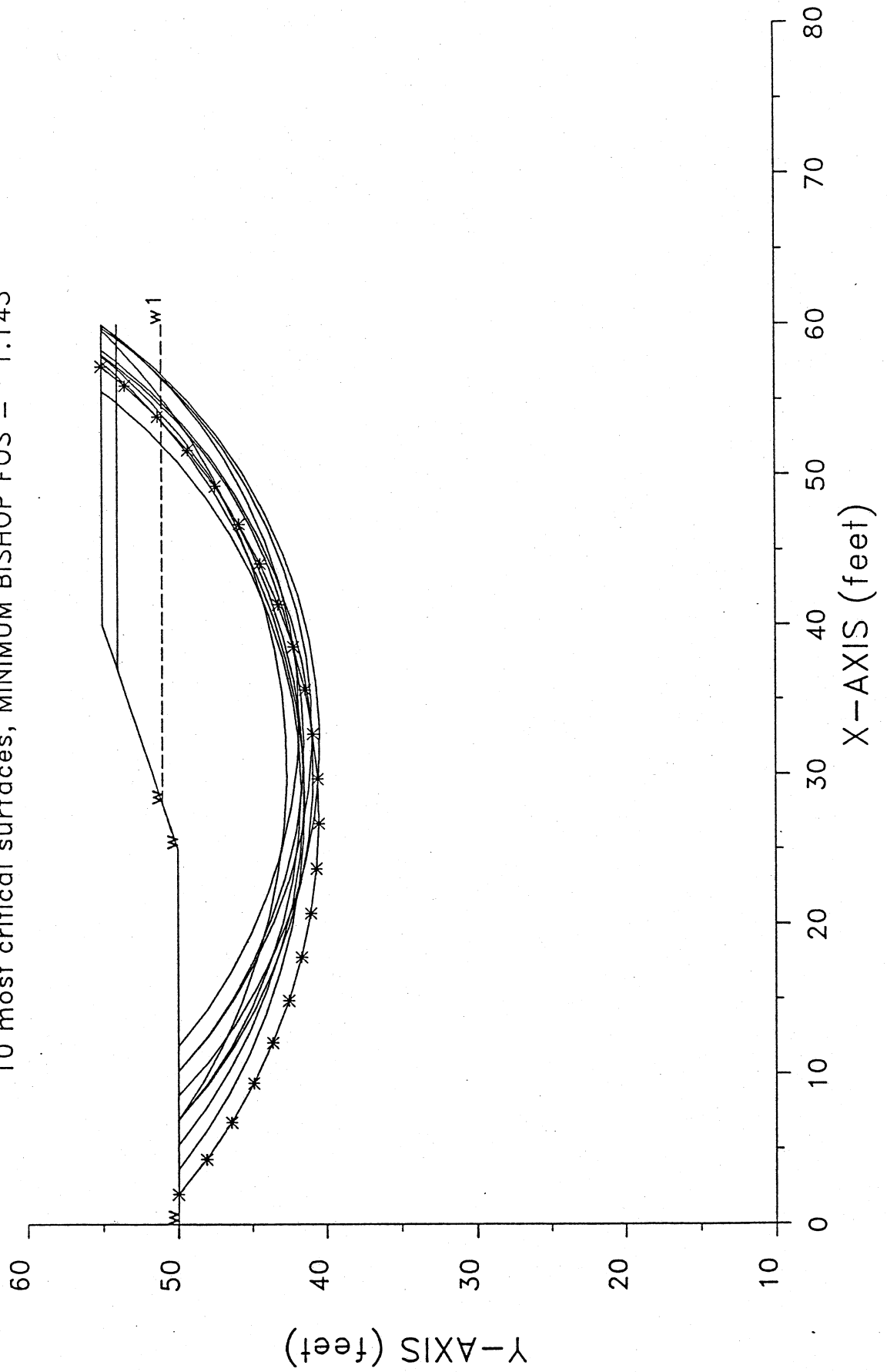
South Meadows Canals Cond #1 Caselli

10 most critical surfaces, MINIMUM BISHOP FOS = 5.189



South Meadows Canals Cond #1 Case VI

10 most critical surfaces, MINIMUM BISHOP FOS = 1.143



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 22+00, height 6 ft.
- Limiting foundation soil strength:
 Sta 22+00, depth _____ to bottom
 strength $\phi =$ 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:

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

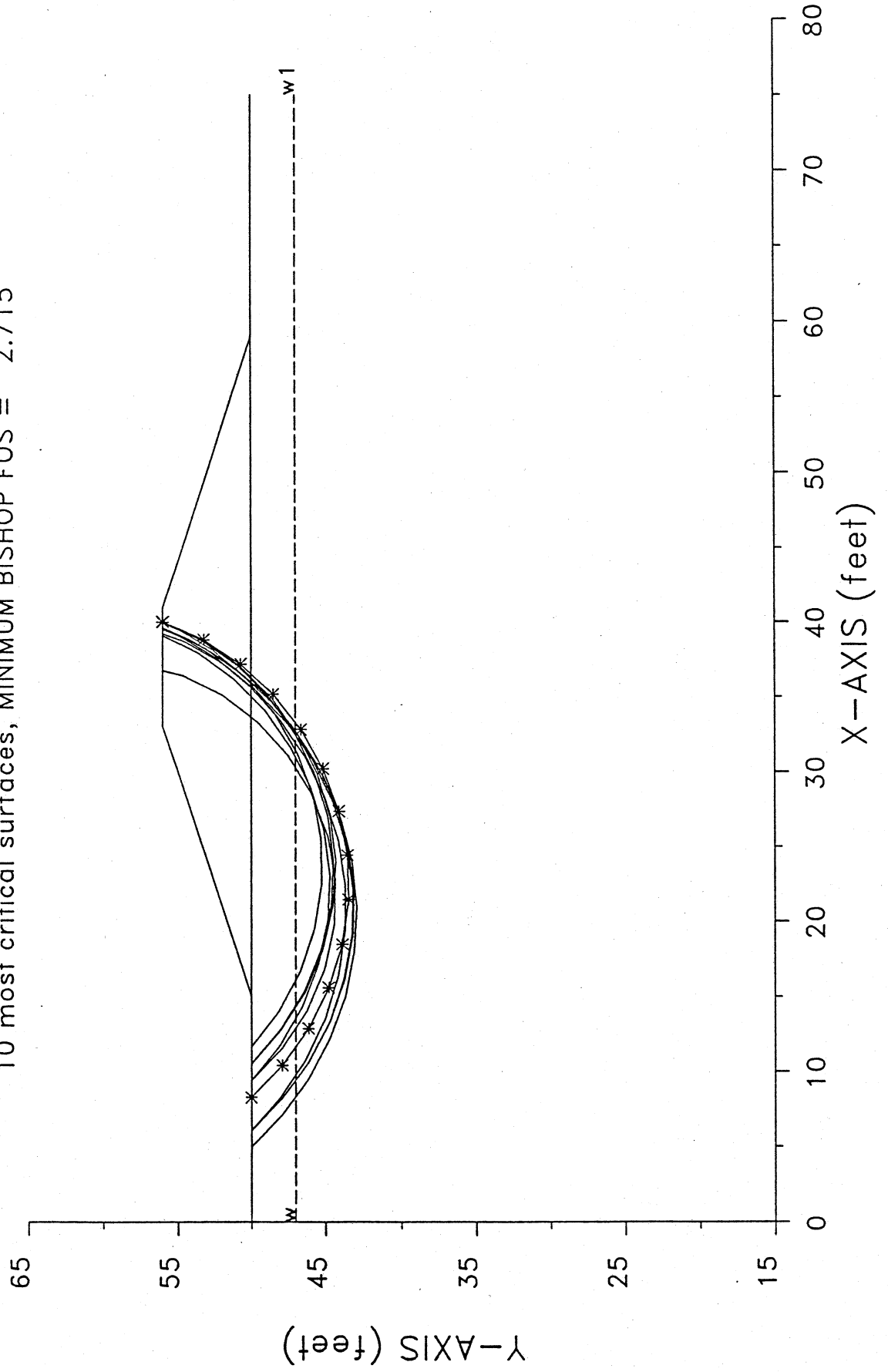
5. Was a seepage analysis for the foundation performed? Yes No
 Were uplift pressures at the embankment landside toe checked? Yes No
 Were seepage exit gradients checked for piping potential? Yes No

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

Note: Attach engineering analysis to support construction plans.

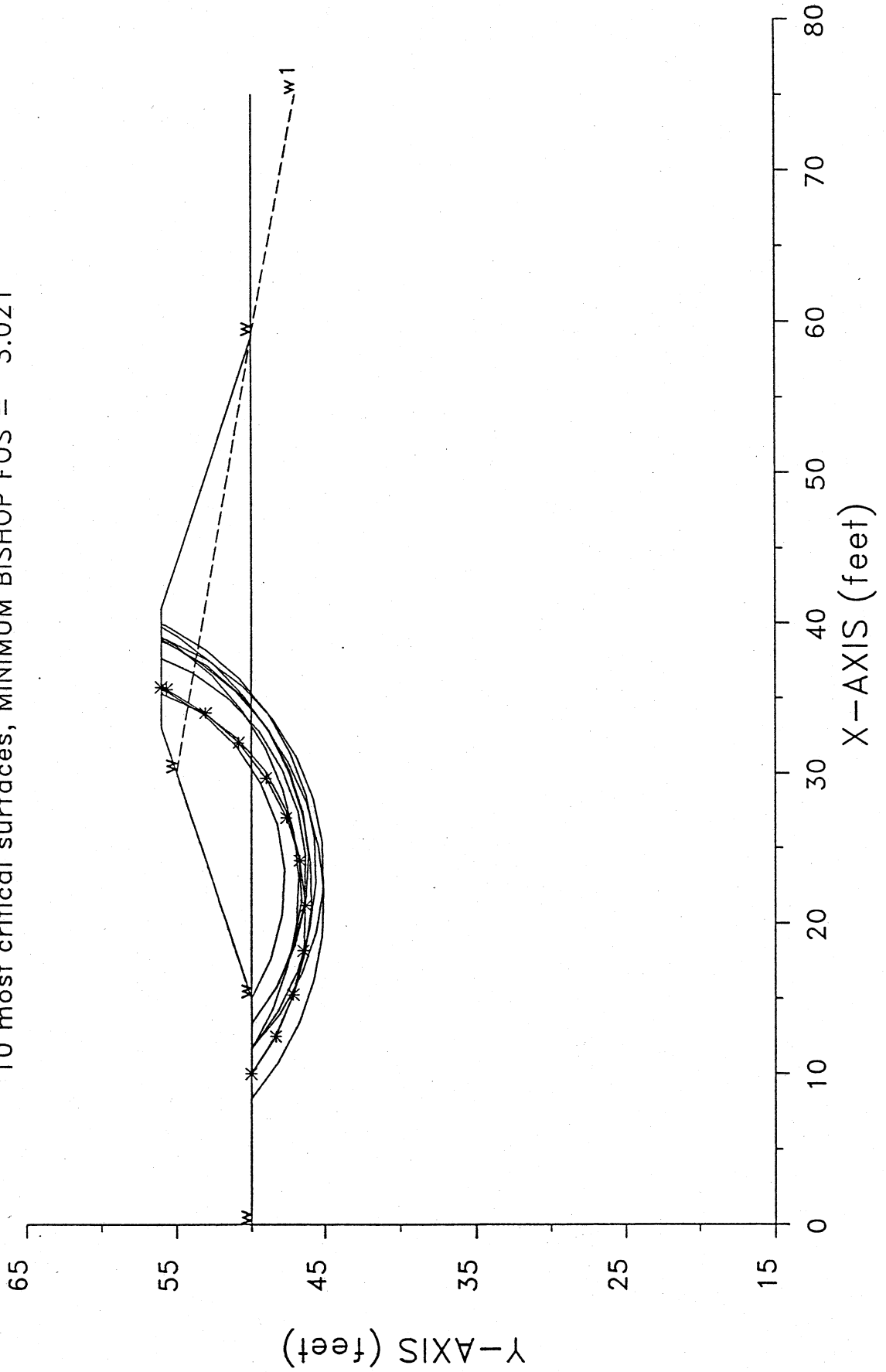
South Meadows Canal Cond 2 Case I

10 most critical surfaces, MINIMUM BISHOP FOS = 2.715



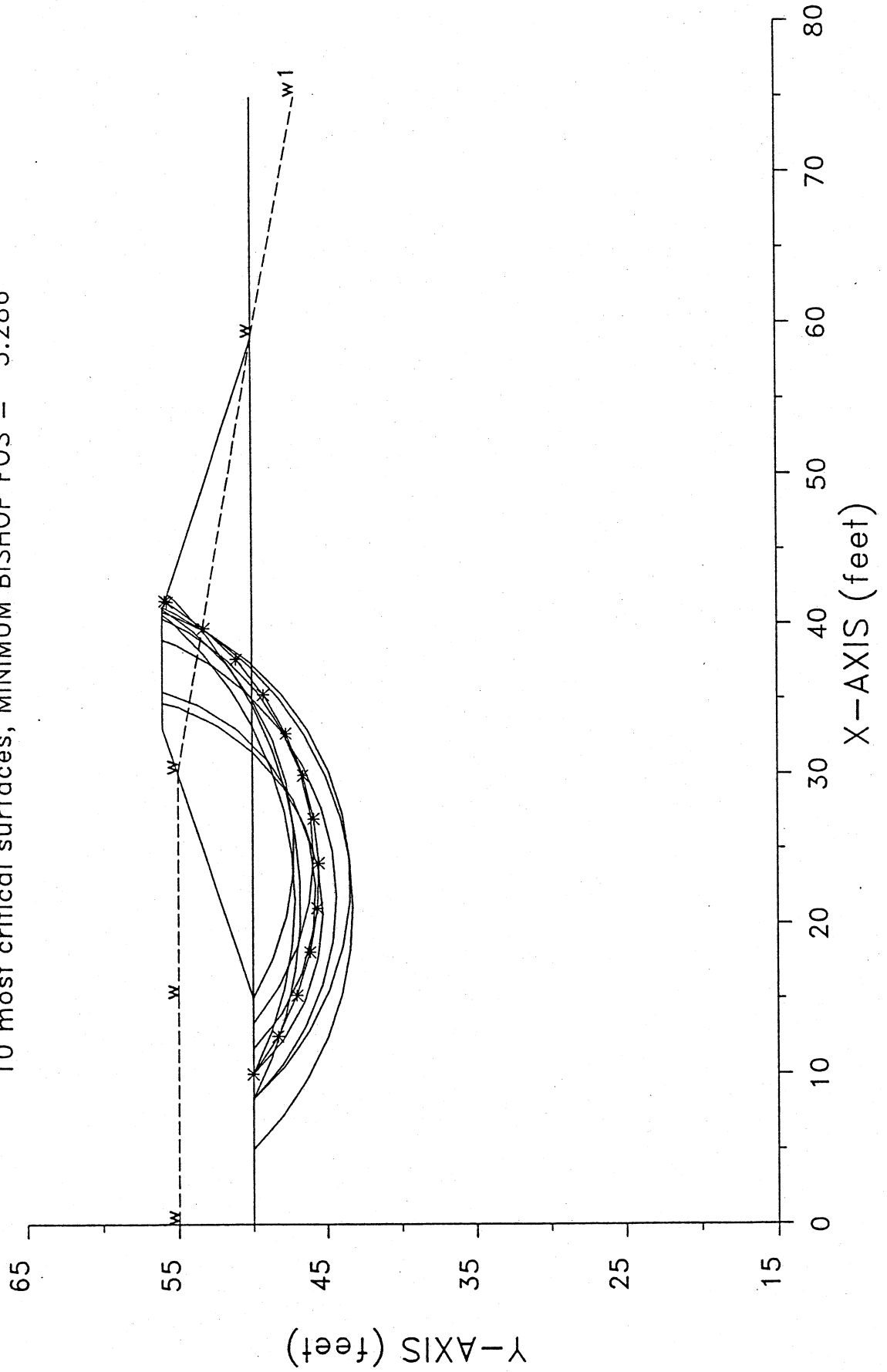
South Meadows Canal Cond 2 Case II

10 most critical surfaces, MINIMUM BISHOP FOS = 3.021



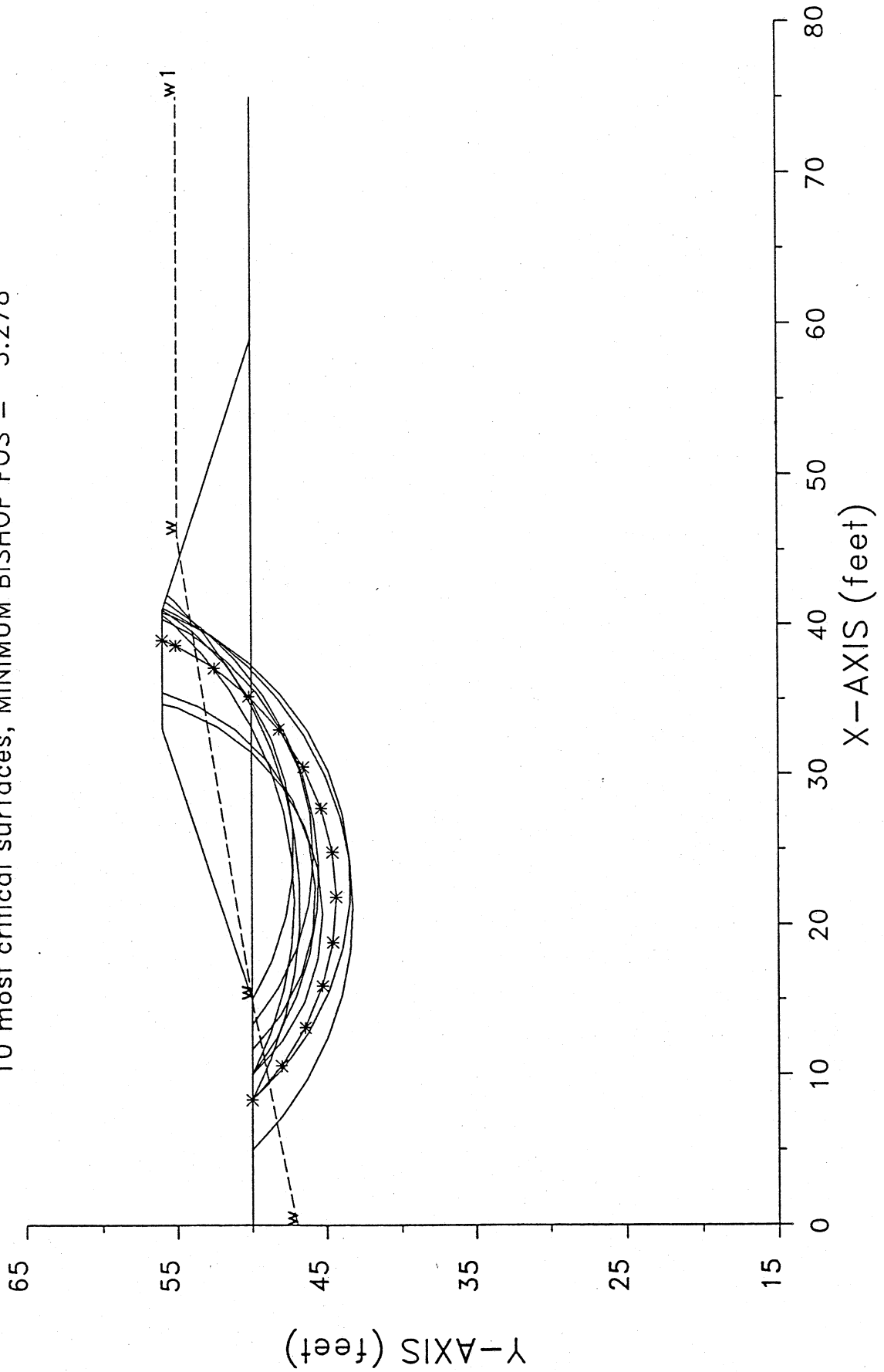
South Meadows Canal Cond 2 Case III

10 most critical surfaces, MINIMUM BISHOP FOS = 5.286



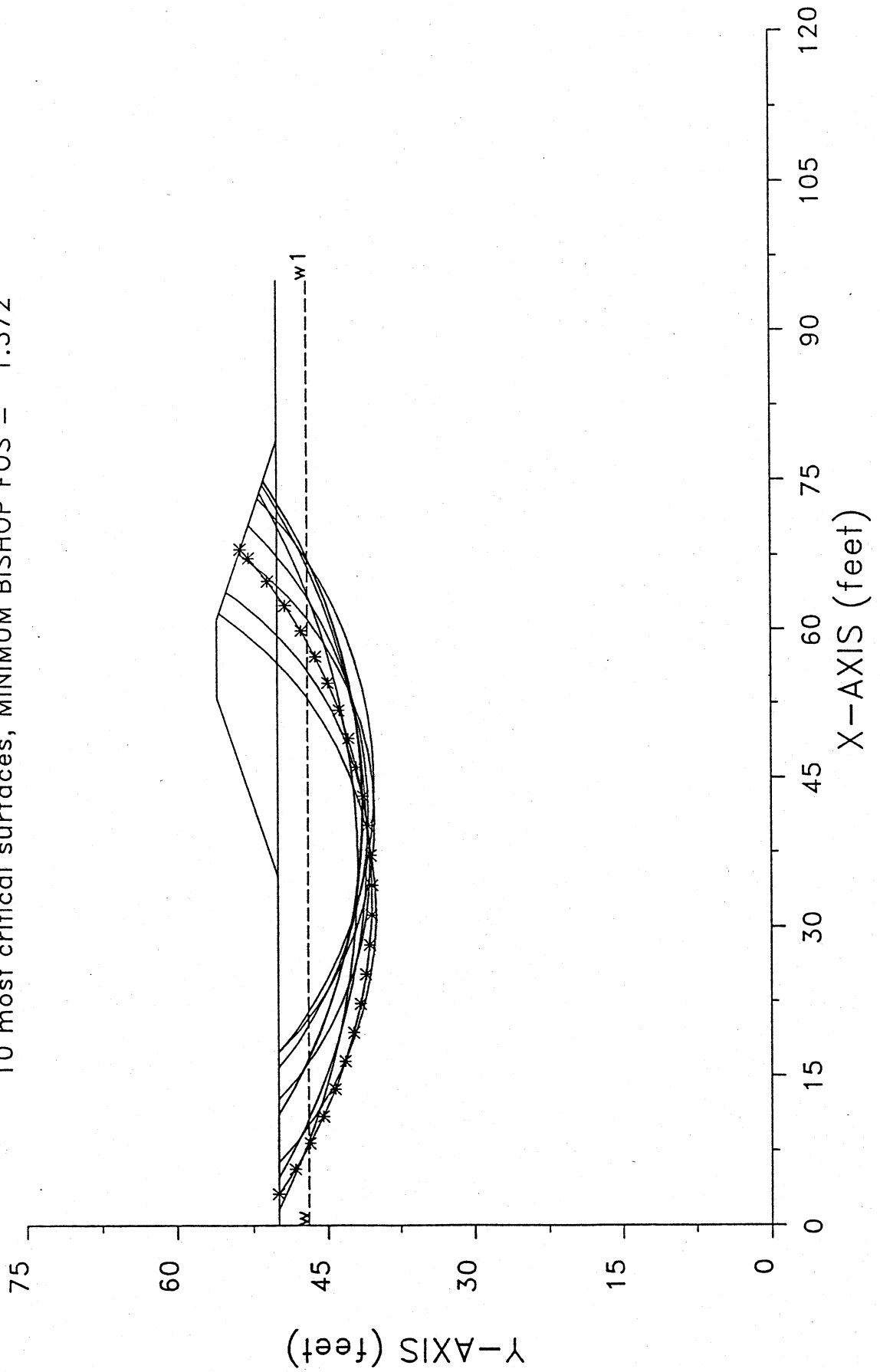
South Meadows Canal Cond 2 Case IV

10 most critical surfaces, MINIMUM BISHOP FOS = 3.278



South Meadows Canal Cond 2 Case VI

10 most critical surfaces, MINIMUM BISHOP FOS = 1.372



EMBANKMENT AND FOUNDATION STABILITY

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 22+00, height 6 ft.
- Limiting foundation soil strength:
 Sta 22+00, depth 6 to Bottom
 strength $\phi =$ 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:

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

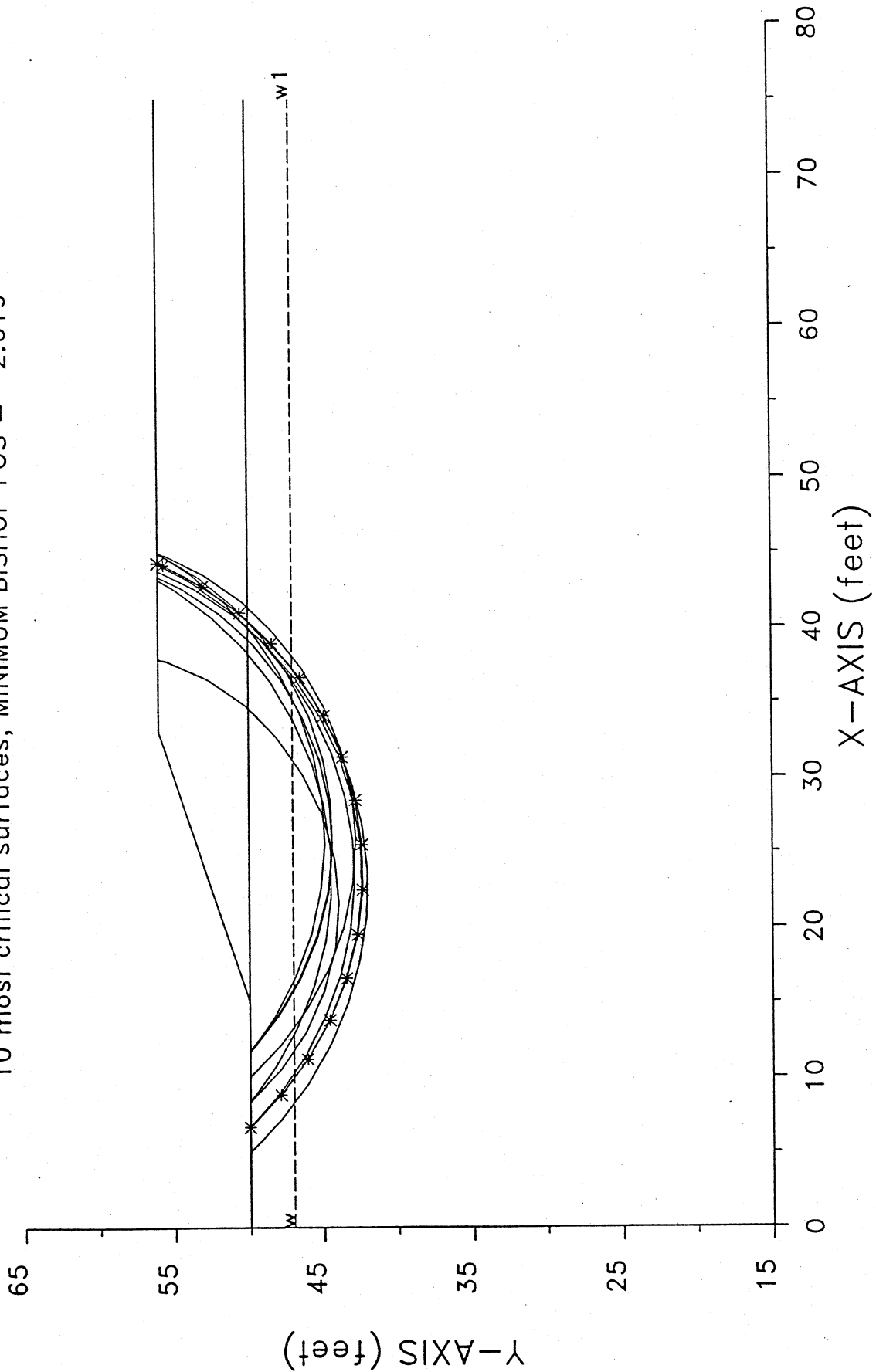
5. Was a seepage analysis for the foundation performed? Yes No
 Were uplift pressures at the embankment landside toe checked? Yes No
 Were seepage exit gradients checked for piping potential? Yes No

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

Note: Attach engineering analysis to support construction plans.

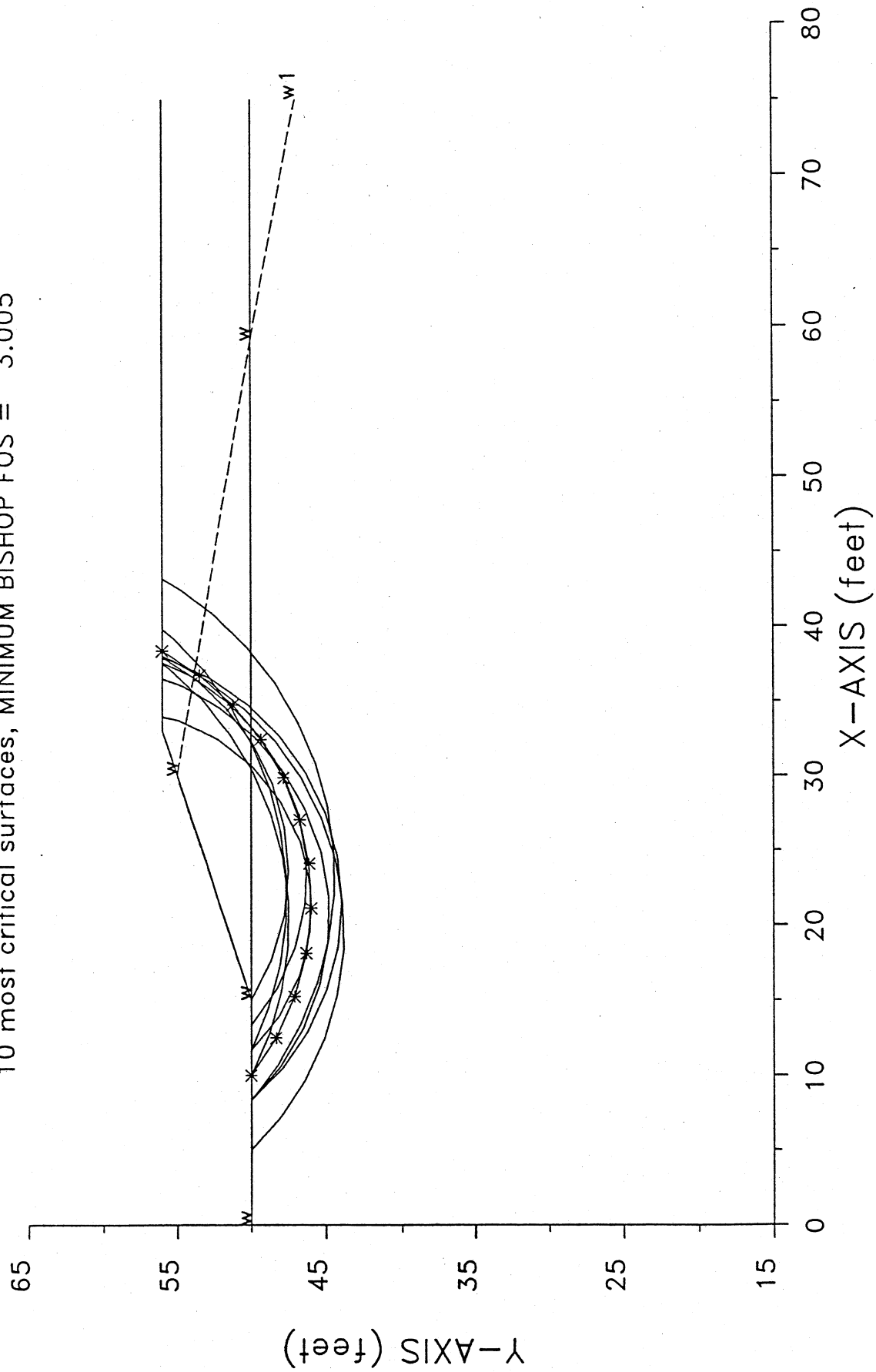
South Meadows Canals Cond 3 Case I

10 most critical surfaces, MINIMUM BISHOP FOS = 2.619



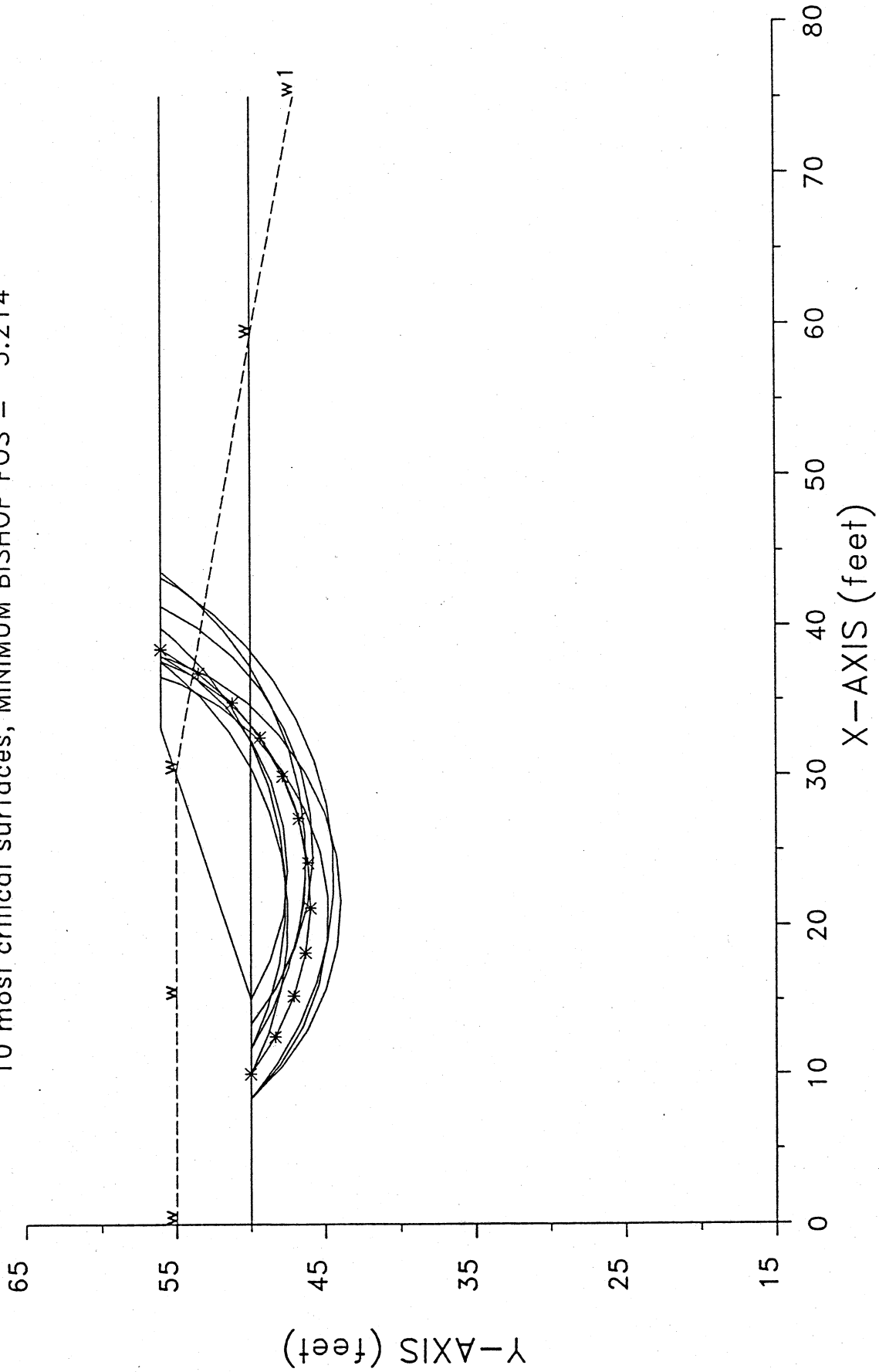
South Meadows Canals Cond 3 Case II

10 most critical surfaces, MINIMUM BISHOP FOS = 3.005



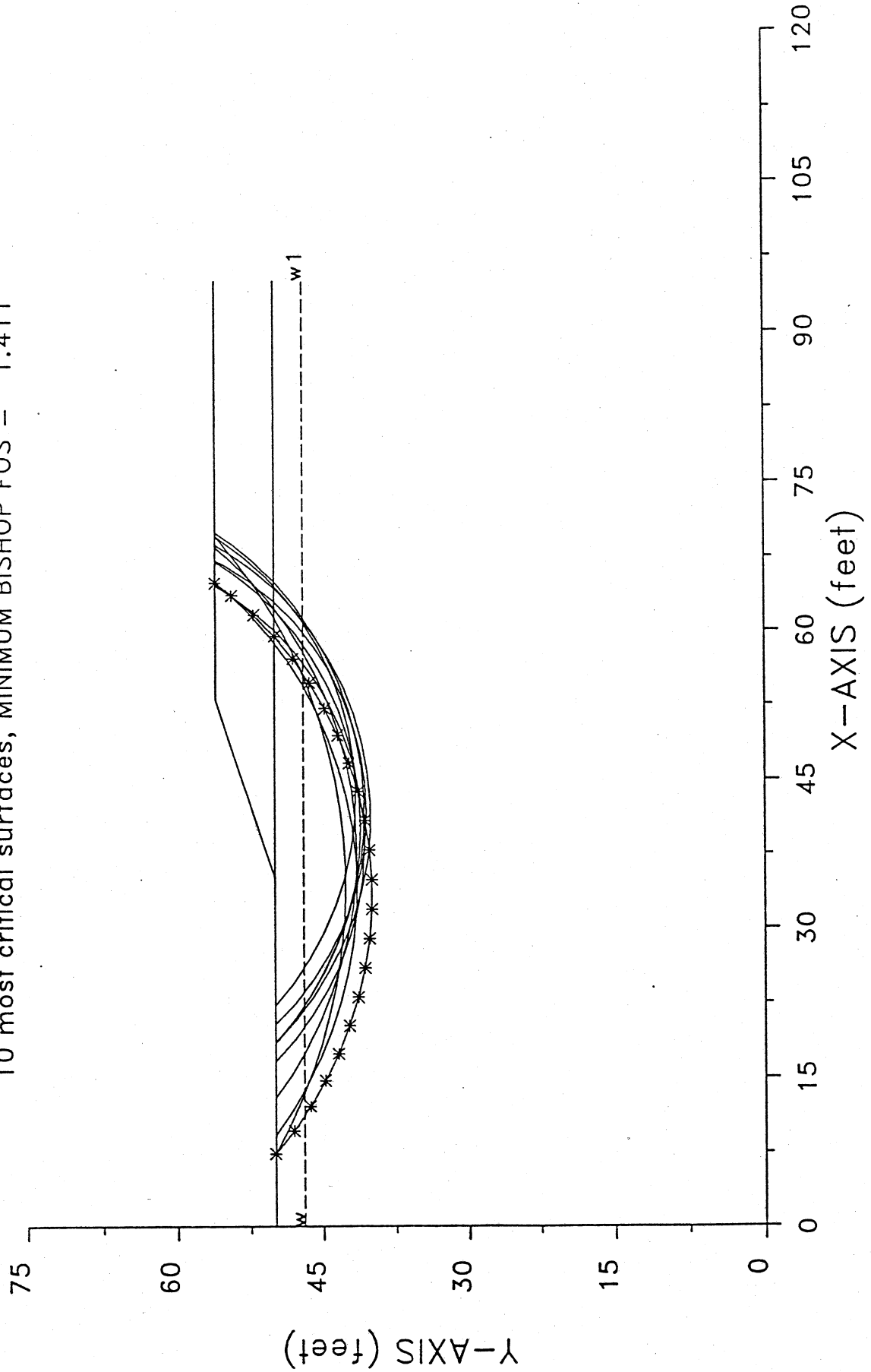
South Meadows Canals Cond 3 Case III

10 most critical surfaces, MINIMUM BISHOP FOS = 5.214



South Meadows Canals Cond 3 Case VI

10 most critical surfaces, MINIMUM BISHOP FOS = 1.411



EMBANKMENT AND FOUNDATION STABILITY

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 20+00, height 6 ft.
- Limiting foundation soil strength:
 Sta 20+00, depth 0 to Bottom
 strength $\phi = \underline{0}$ degrees, $c = \underline{300}$ 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:

<u>Case</u>	<u>Loading Conditions</u>	<u>Critical Safety Factor</u>	<u>Criteria (Min.)</u>
I	End of construction	<u>2.1</u>	1.3
II	Sudden drawdown	<u>2.1</u>	1.0
III	Critical flood stage	<u>2.2</u>	1.4
IV	Steady seepage at flood stage	<u>not evaluated</u>	1.4
VI	Earthquake (Case I)	<u>1.0</u>	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

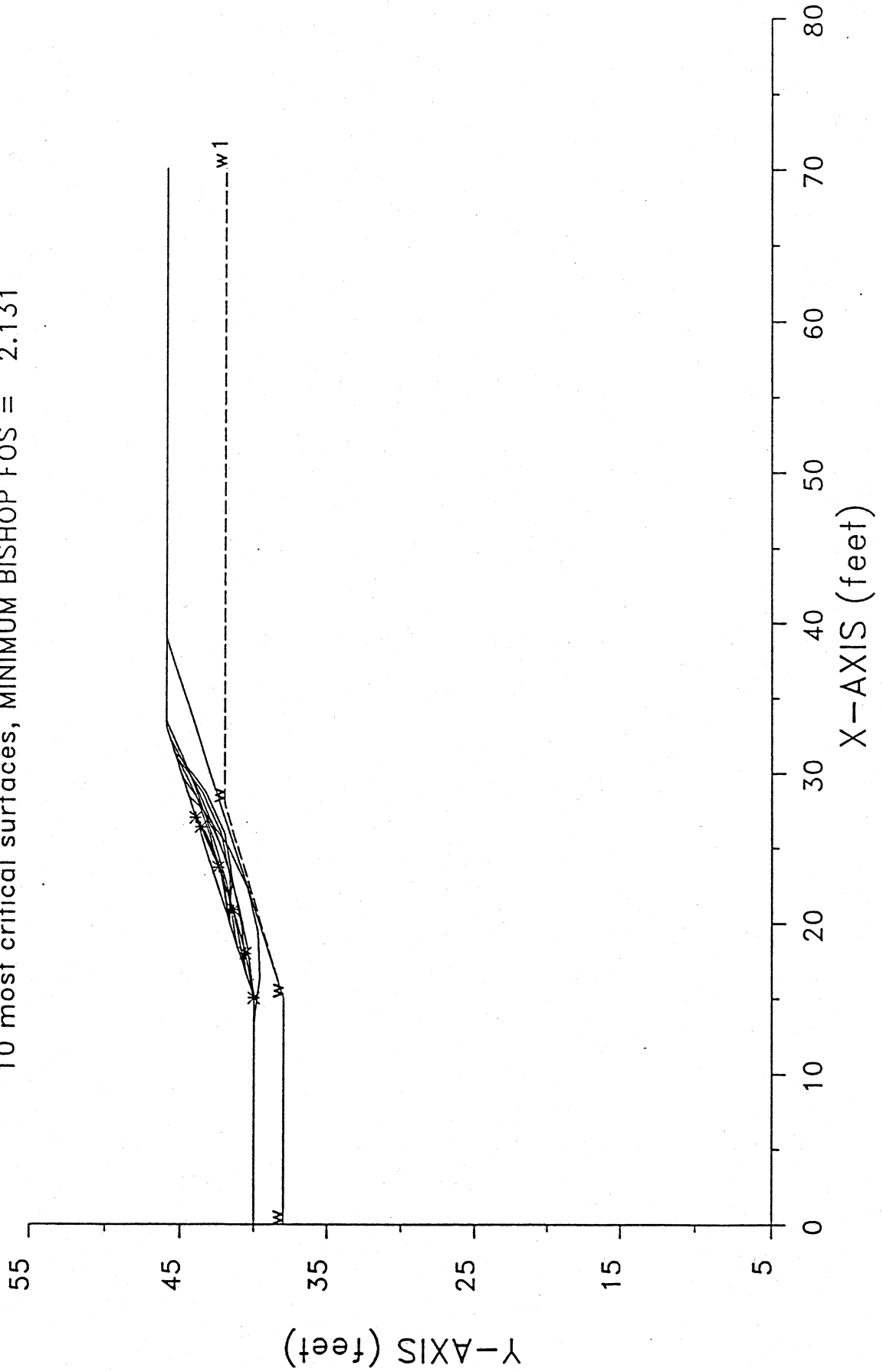
5. Was a seepage analysis for the foundation performed? Yes No
 Were uplift pressures at the embankment landside toe checked? Yes No
 Were seepage exit gradients checked for piping potential? Yes No

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

Note: Attach engineering analysis to support construction plans.

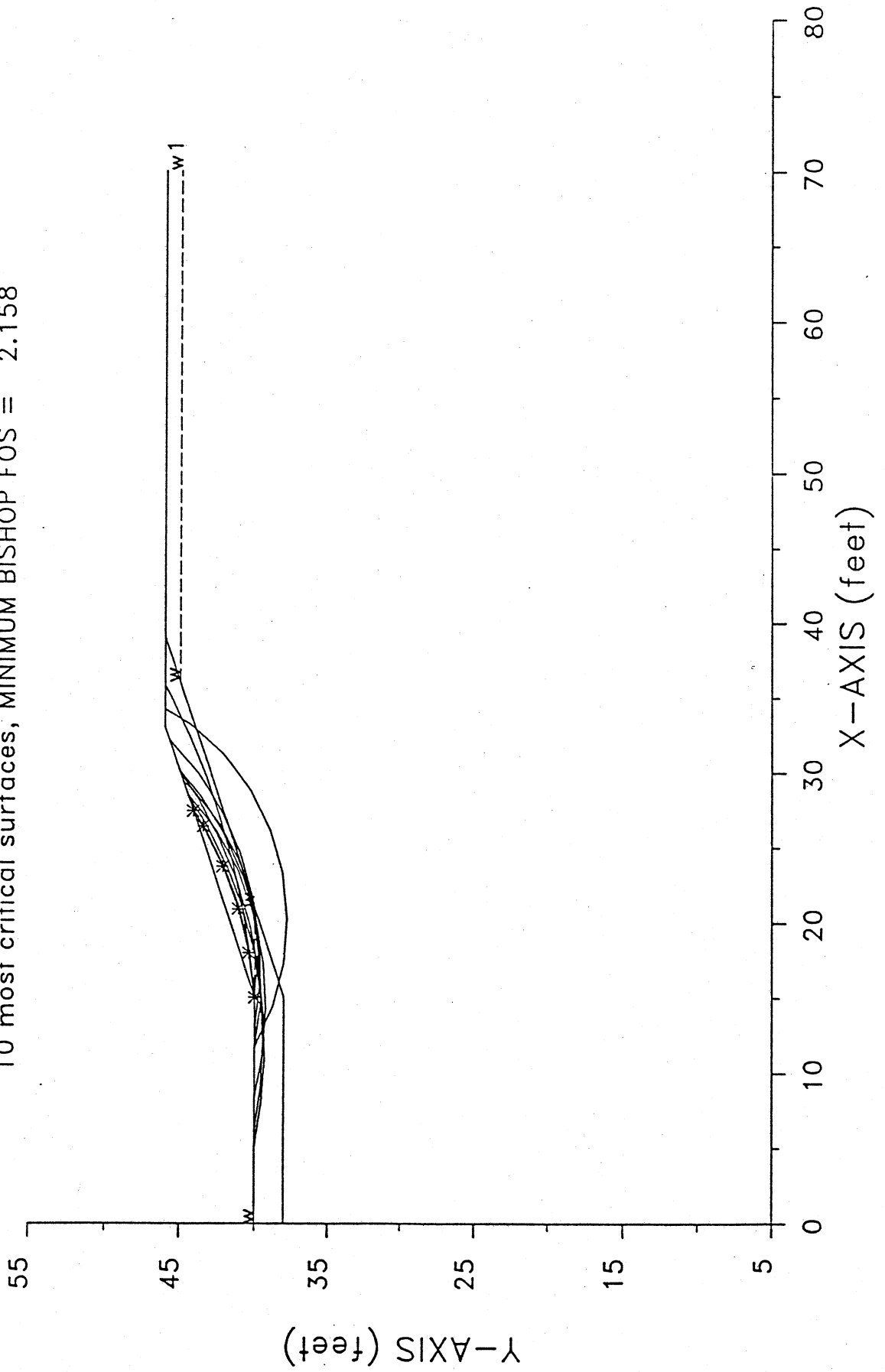
South Meadows Canals Cond 4 Case I

10 most critical surfaces, MINIMUM BISHOP FOS = 2.131



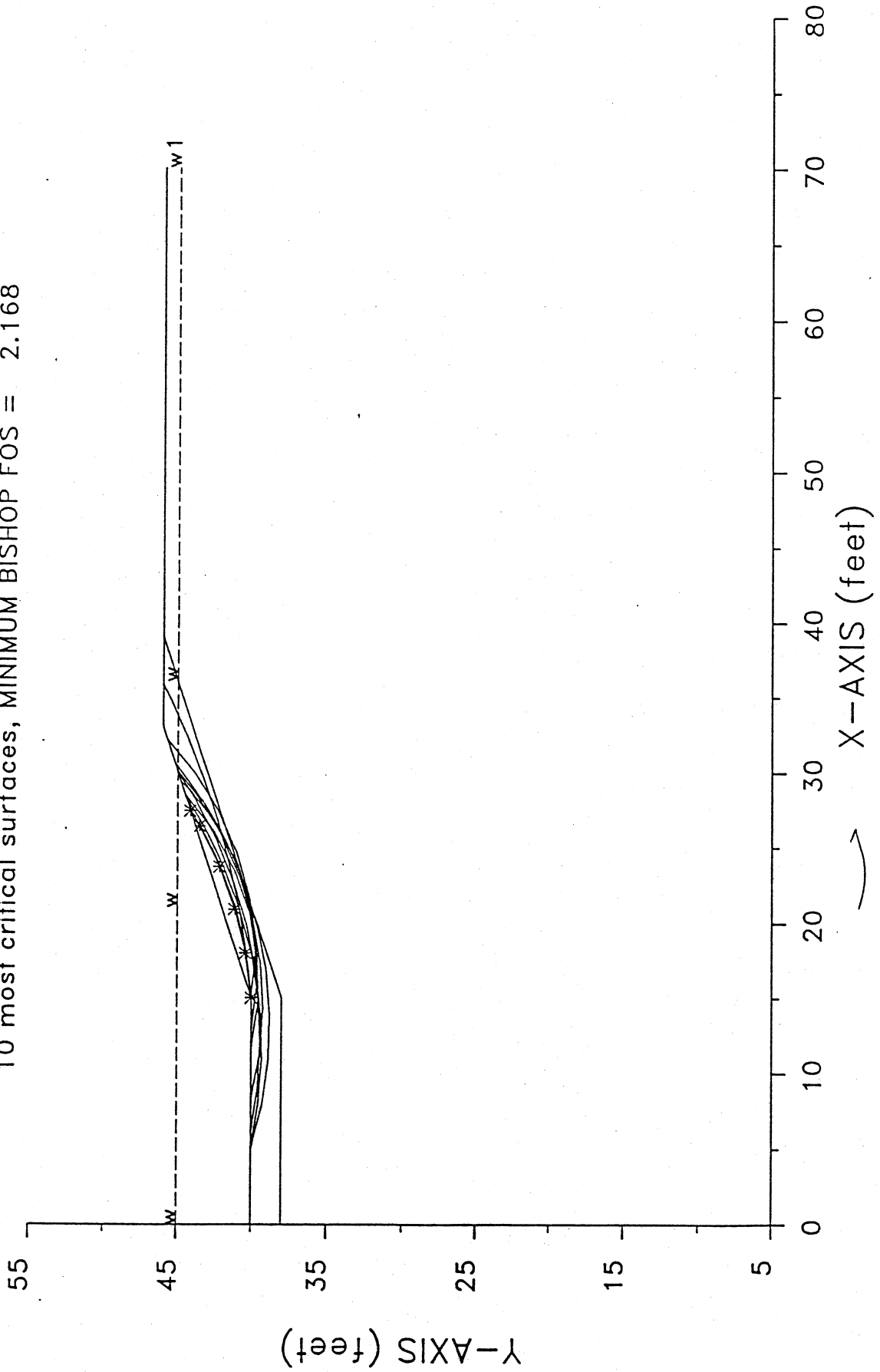
South Meadows Canals Cond 4 Case II

10 most critical surfaces, MINIMUM BISHOP FOS = 2.158



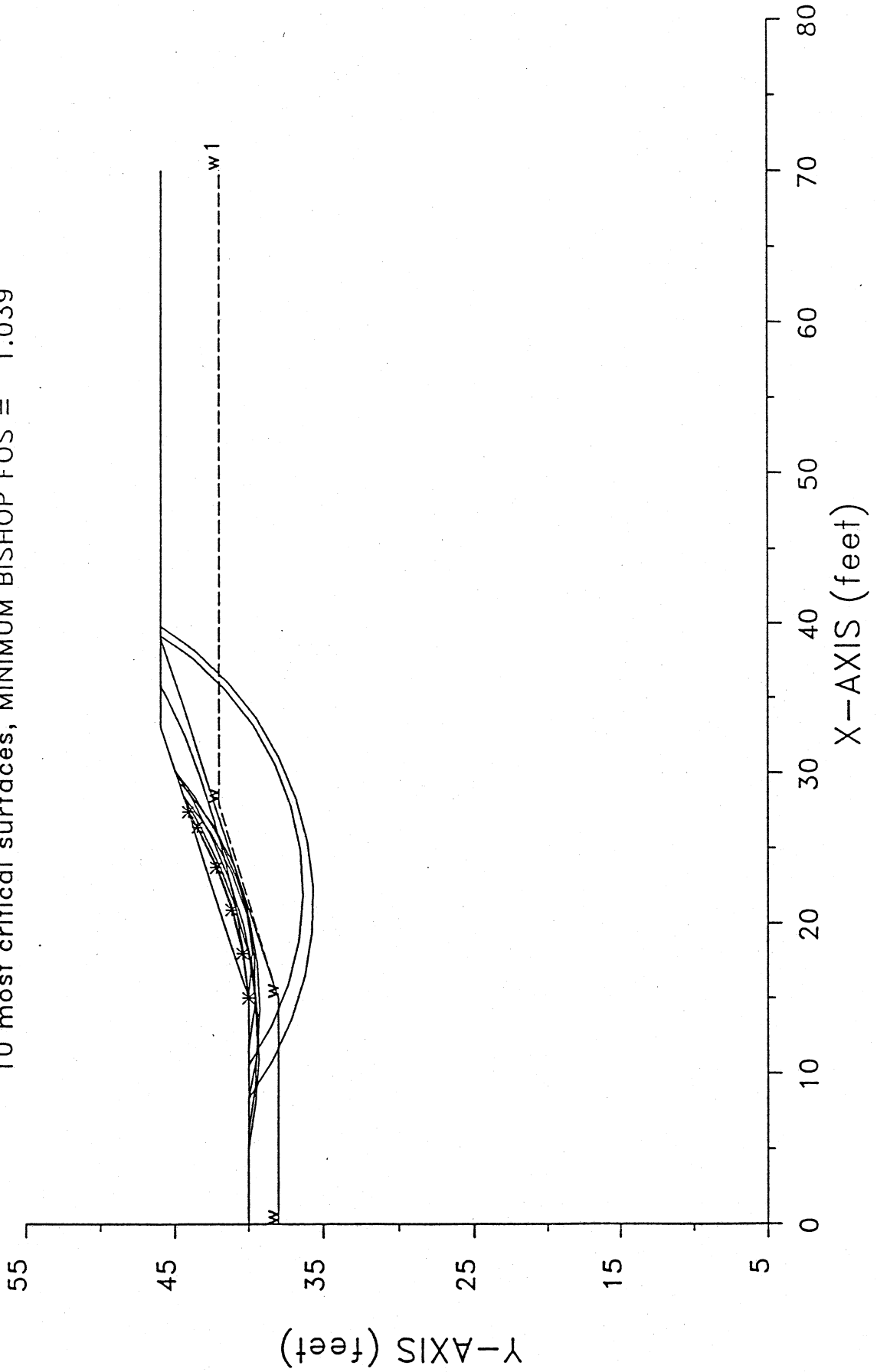
South Meadows Canals Cond 4 Case III

10 most critical surfaces, MINIMUM BISHOP FOS = 2.168



South Meadows Channel Cond 4 Case VI

10 most critical surfaces, MINIMUM BISHOP FOS = 1.039



EMBANKMENT AND FOUNDATION STABILITY

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 40+00, height 5.5 ft.

Limiting foundation soil strength:
 Sta 40+00, depth 2.50 to Bottom
 strength $\phi = \underline{0}$ degrees, $c = \underline{300}$ 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.): _____

3. Summary of stability analysis results:

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

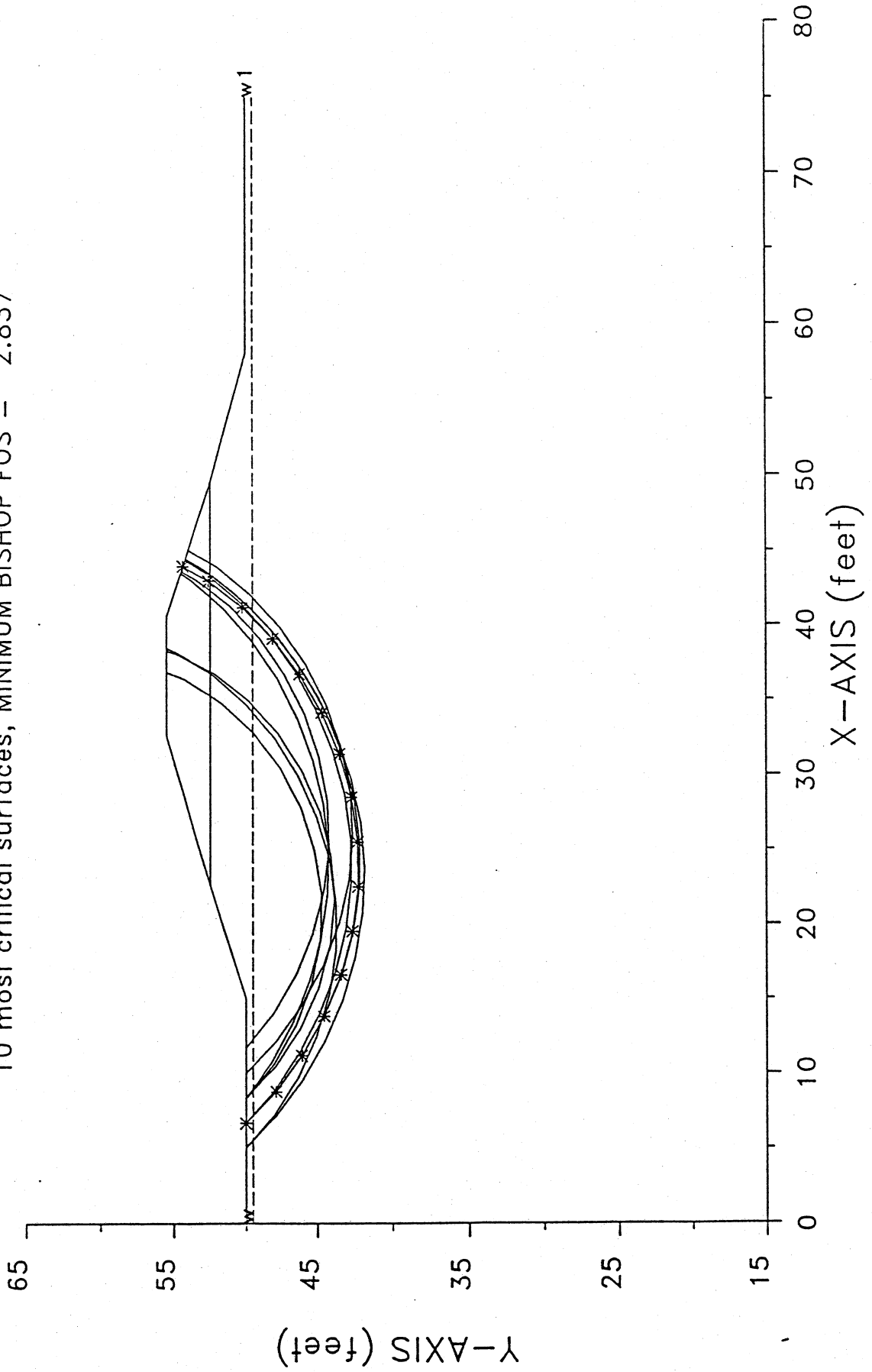
Were seepage exit gradients checked for piping potential? Yes No

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

Note: Attach engineering analysis to support construction plans.

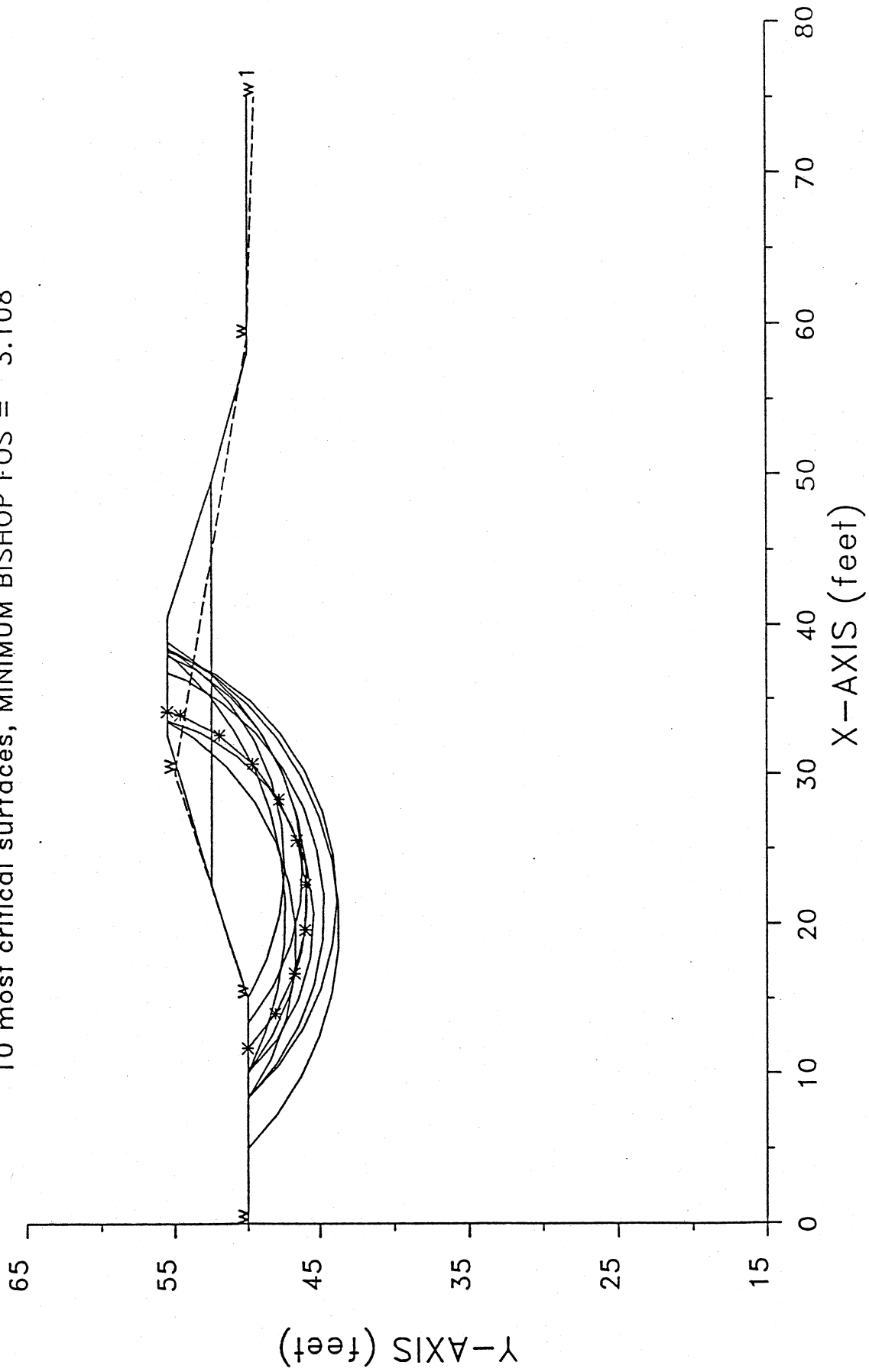
South Meadows Canals Cond 5 Case I

10 most critical surfaces, MINIMUM BISHOP FOS = 2.837



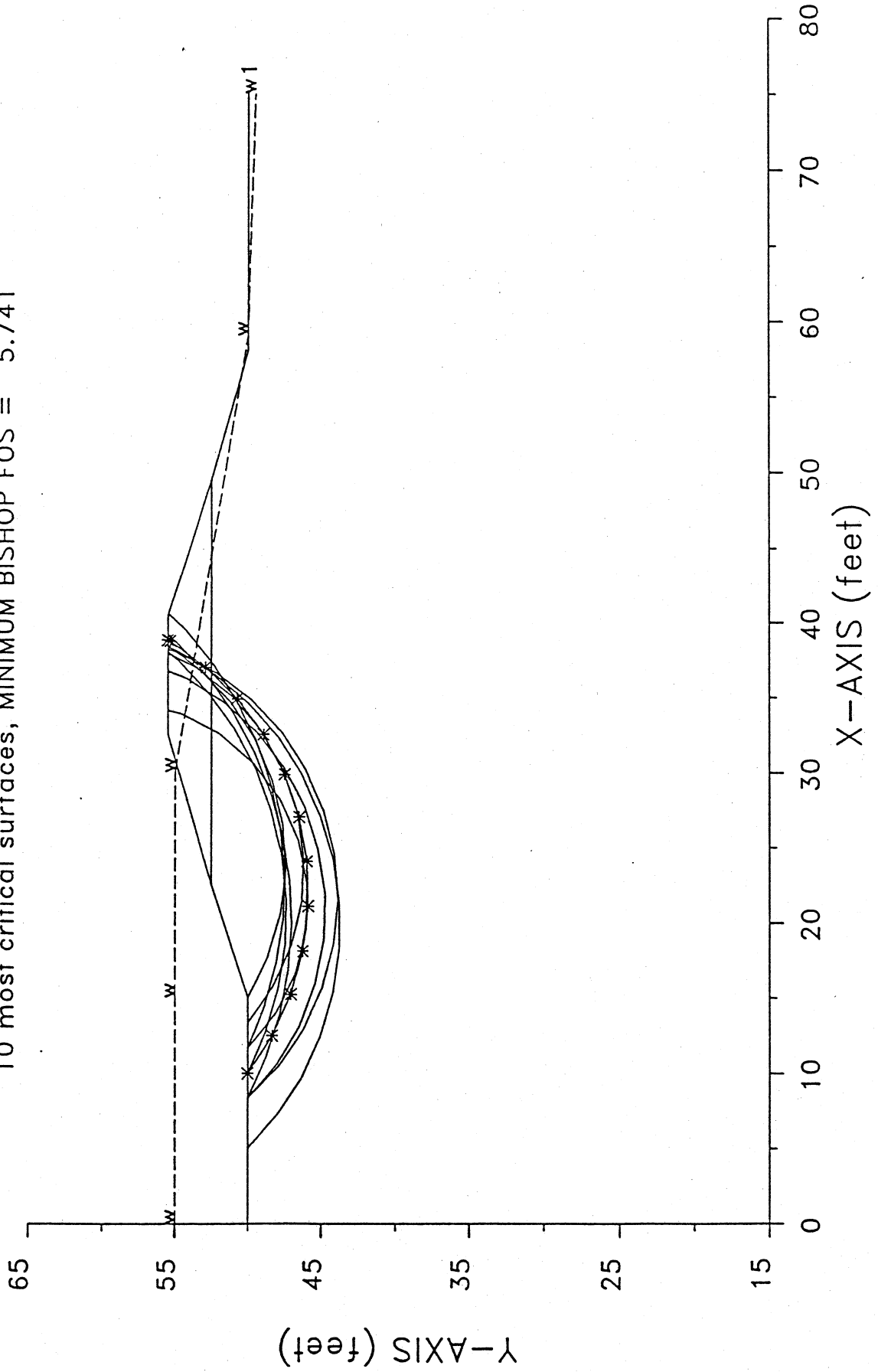
South Meadows Canals Cond 5 Case II

10 most critical surfaces, MINIMUM BISHOP FOS = 3.108



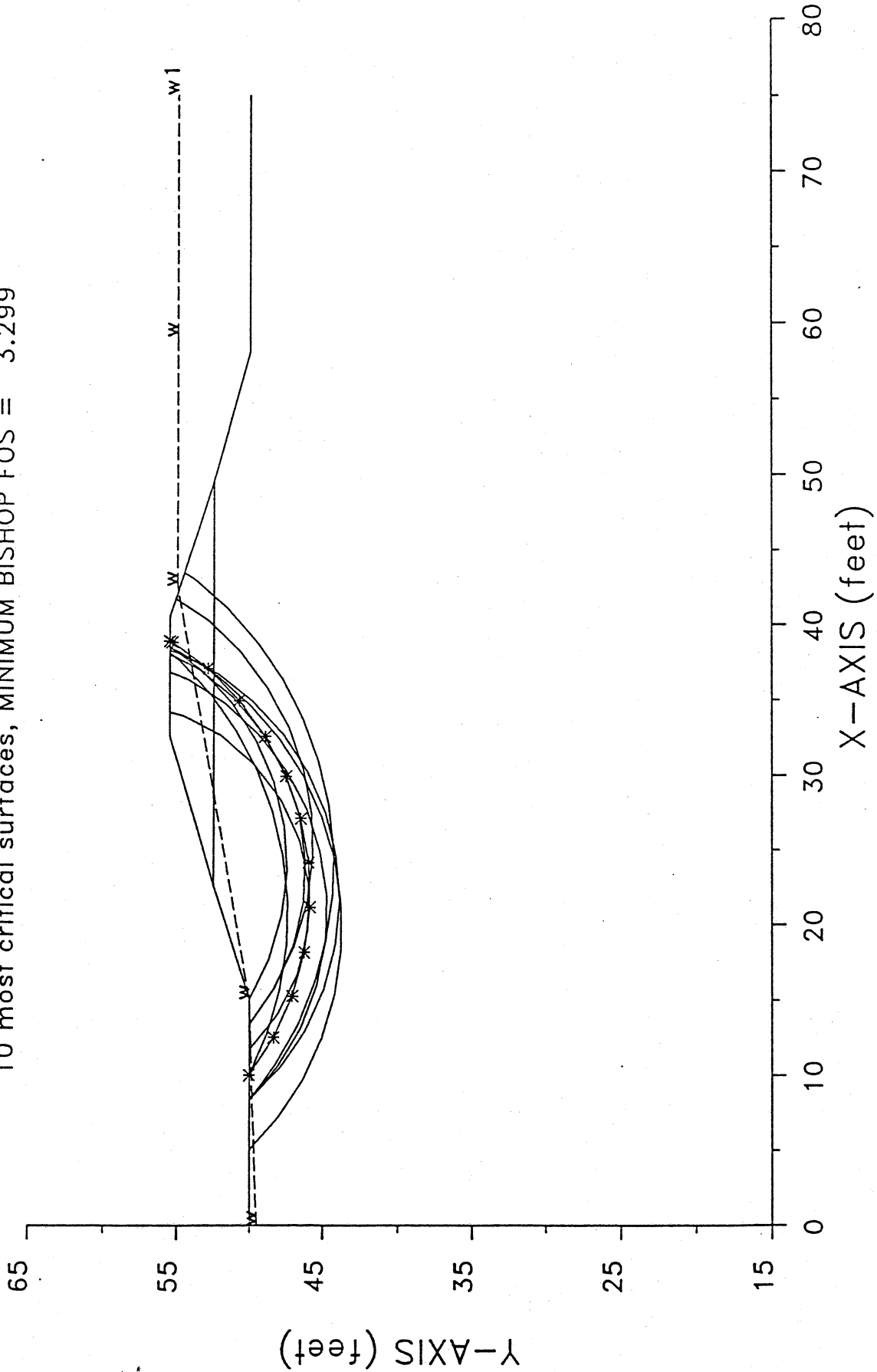
South Meadows Canals Cond 5 Case III

10 most critical surfaces, MINIMUM BISHOP FOS = 5.741



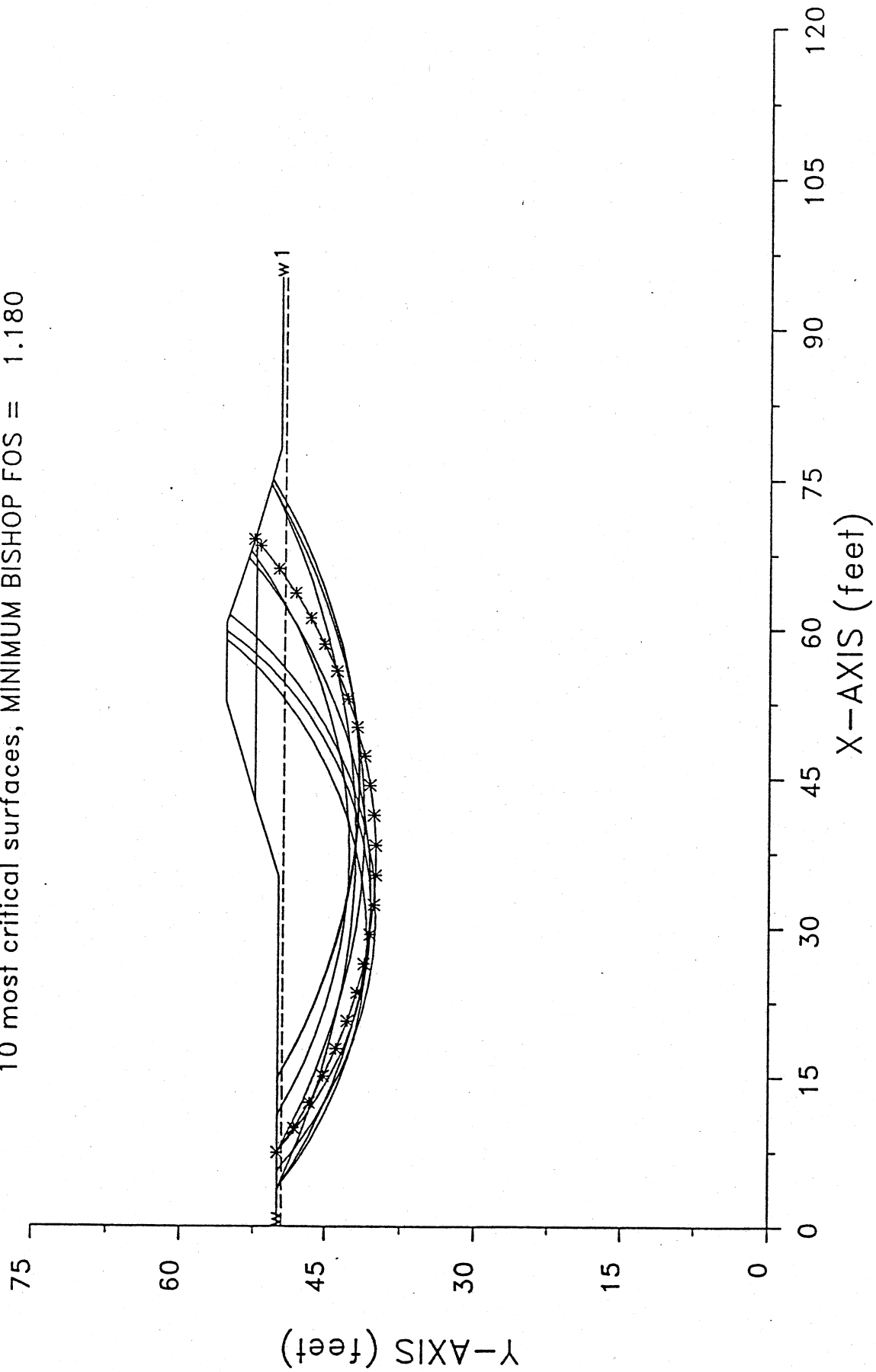
South Meadows Canals Cond 5 Case IV

10 most critical surfaces, MINIMUM BISHOP FOS = 3.299



South Meadows Canals Cond 5 Case VI

10 most critical surfaces, MINIMUM BISHOP FOS = 1.180



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 40+00, height 5.5 ft.
- Limiting foundation soil strength:
 Sta 40+00, depth 2.50 to Bottom
 strength $\phi =$ 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:

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

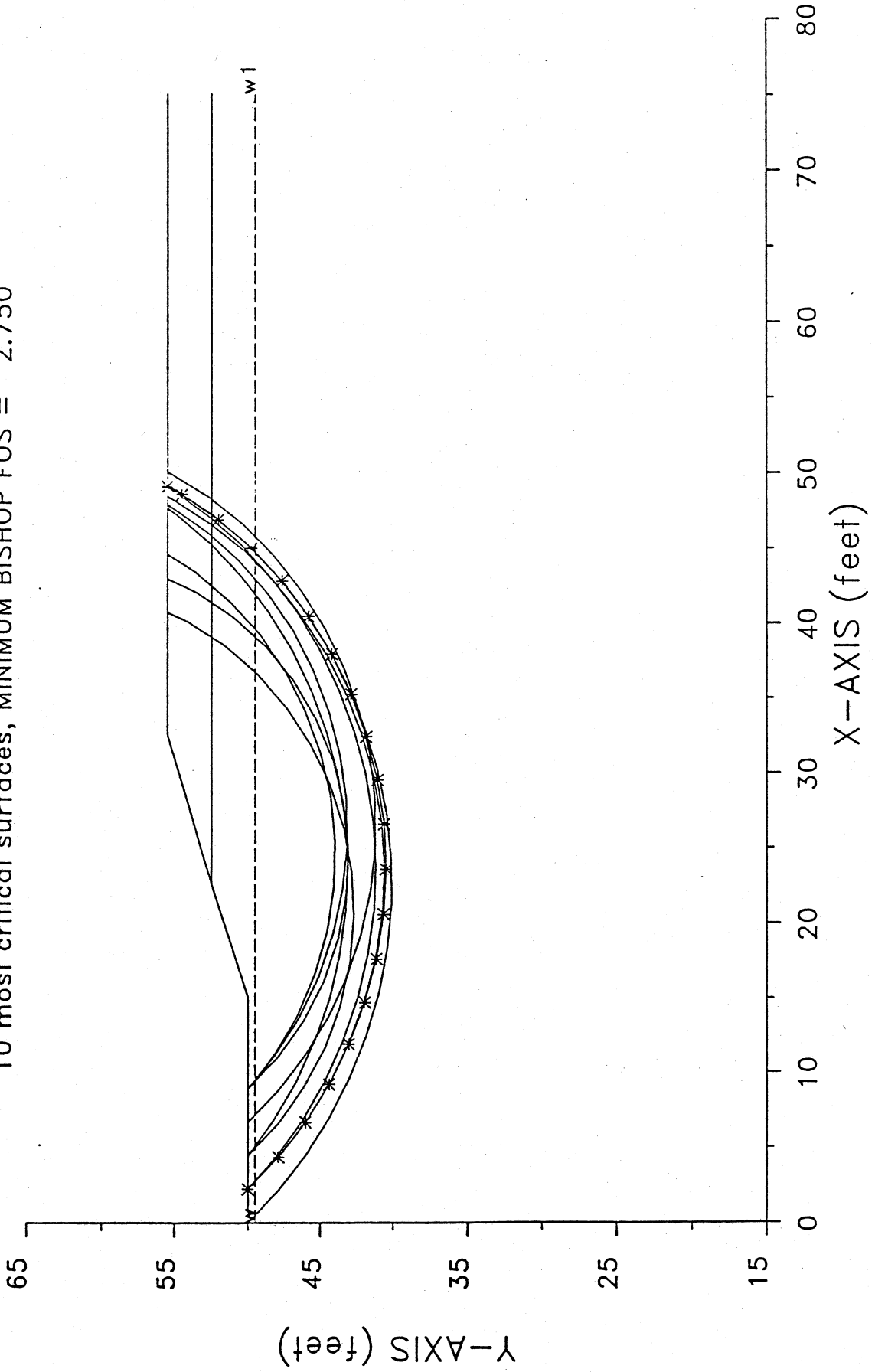
5. Was a seepage analysis for the foundation performed? Yes No
 Were uplift pressures at the embankment landside toe checked? Yes No
 Were seepage exit gradients checked for piping potential? Yes No

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

Note: Attach engineering analysis to support construction plans.

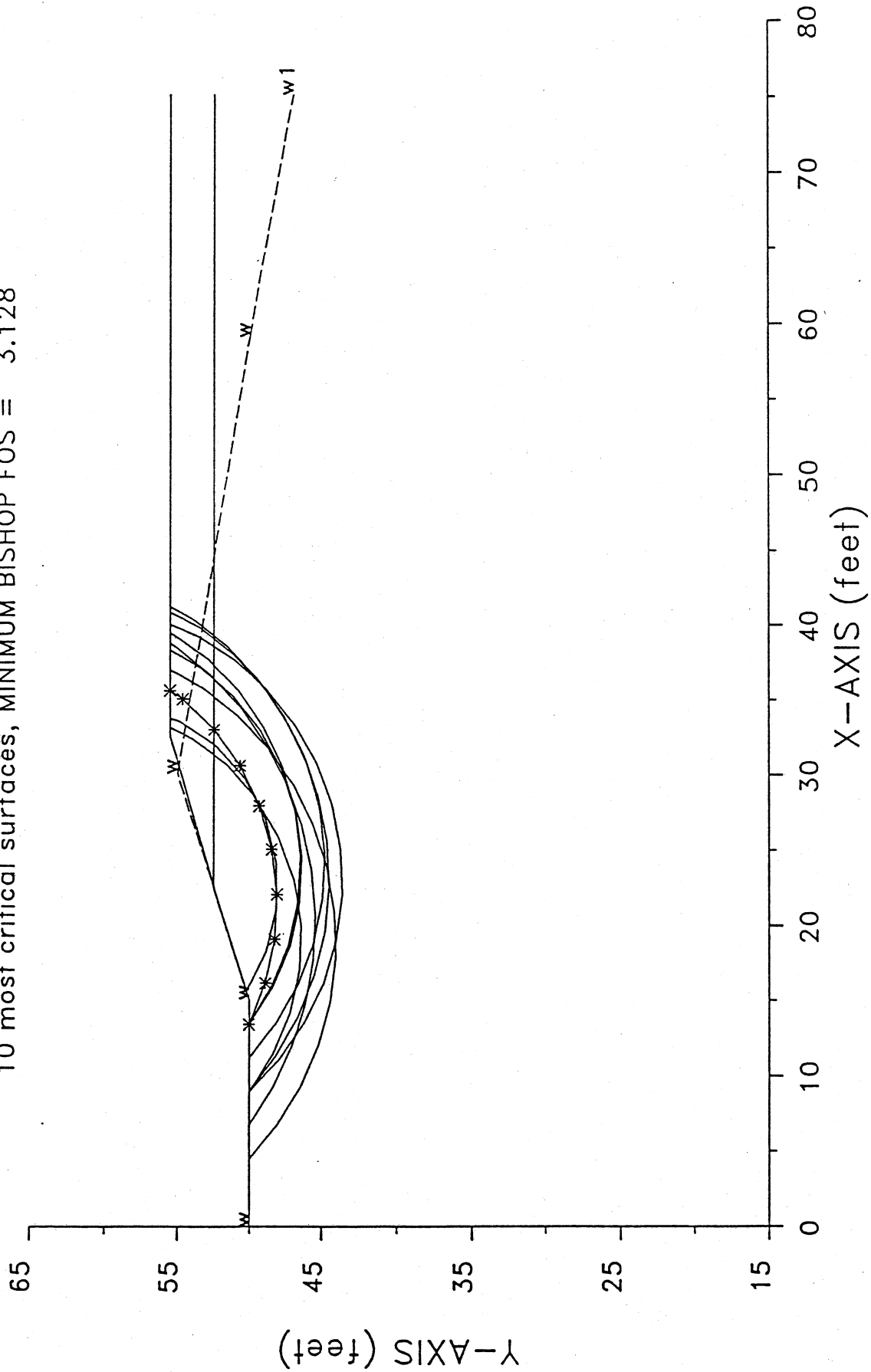
South Meadows Canals Cond 6 Case I

10 most critical surfaces, MINIMUM BISHOP FOS = 2.750



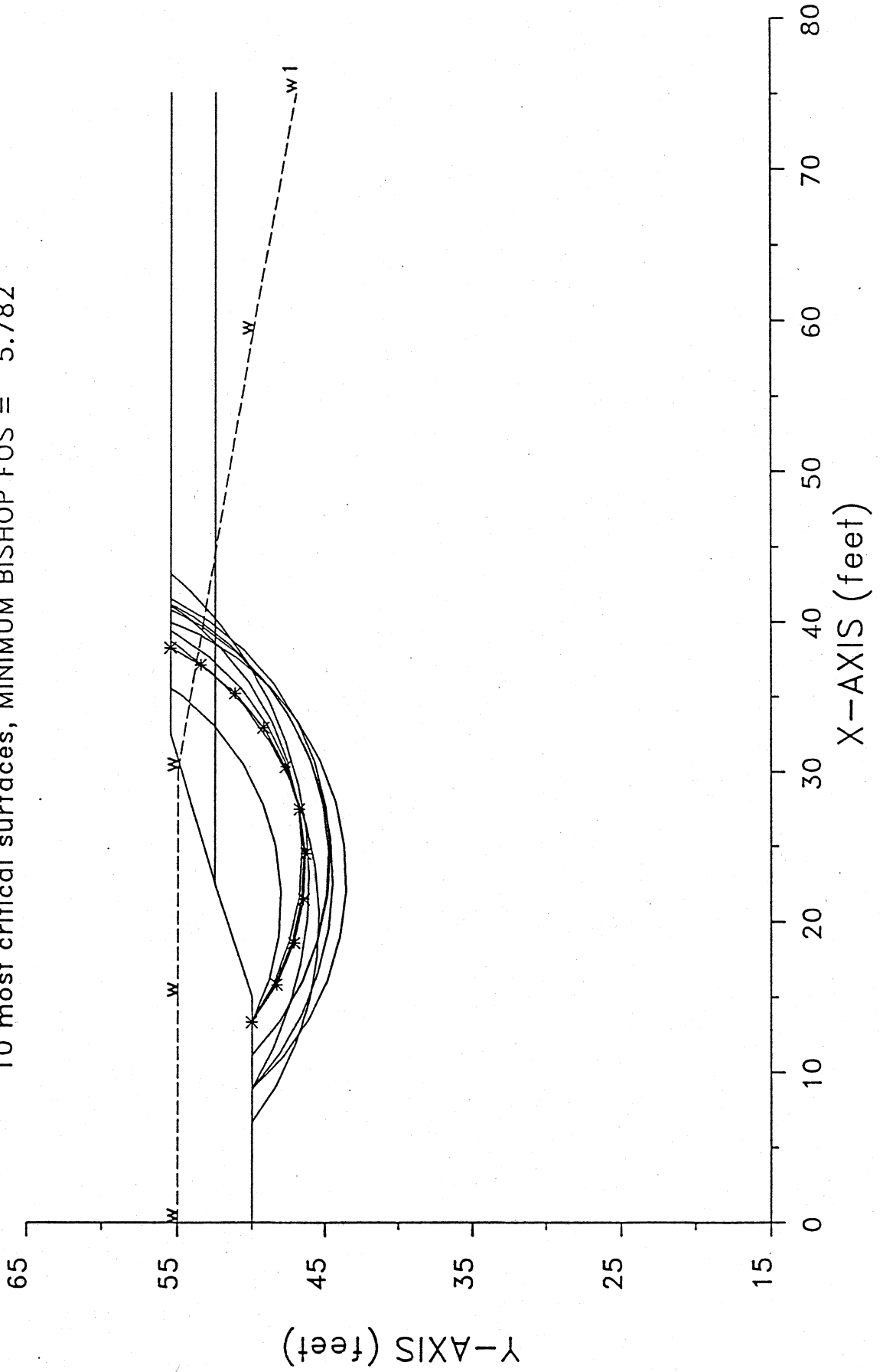
South Meadows Canals Cond 6 Case II

10 most critical surfaces, MINIMUM BISHOP FOS = 3.128



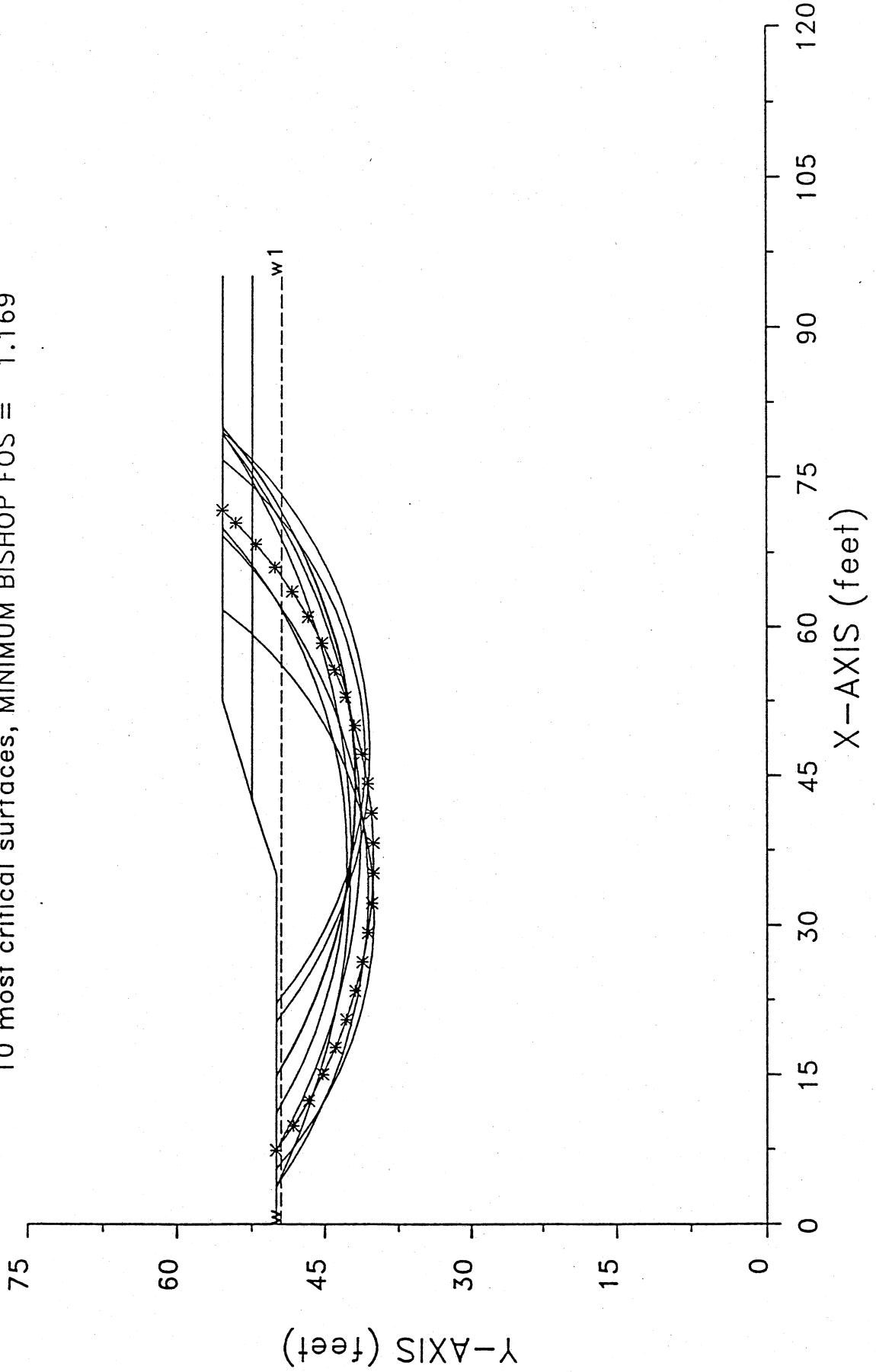
South Meadows Canals Cond 6 Case III

10 most critical surfaces, MINIMUM BISHOP FOS = 5.782



South Meadows Canals Cond 6 Case VI

10 most critical surfaces, MINIMUM BISHOP FOS = 1.169



1. Describe analysis submittal based on Code:

UBC (1988) or Other (specify) N/A

Stability analysis submitted provides for:

Overturning; Sliding; If not, explain N/A

3. Loading included in the analyses were:

Lateral earth @ $P_A =$ N/A psf; $P_p =$ _____ psf

Surcharge--Slope @ N/A, surface N/A psf

Wind @ $P_w =$ N/A psf

Seepage (Uplift) N/A Earthquake @ $P_{eq} =$ N/A %g

100-year significant wave height N/A ft.

100-year significant wave period _____ sec.

4. Summary of Stability Analysis Results: Factors of Safety. Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta _____	To _____	Sta _____	To _____
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5	<u>N/A</u>	_____	_____	_____
Dead & Soil	1.5	1.5	<u>N/A</u>	_____	_____	_____
Dead, Soil, Flood & Impact	1.5	1.5	<u>N/A</u>	_____	_____	_____
Dead, Soil & Seismic	1.3	1.3	<u>N/A</u>	_____	_____	_____

(Ref: FEMA 114 Sept 1986; COE EM 1110-2-2502)

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

5. Foundation bearing strength for each soil type:

<u>Bearing Pressure</u>	<u>Sustained Load</u>	<u>Short Term Load</u>
Computed design maximum	<u>N/A</u> psf	_____ psf
Maximum allowable	<u>N/A</u> psf	_____ psf

6. Foundation scour protection is, is not provided, (describe)

N/A

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. Yes No
2. The computed range of settlement is 0 ft. to 0.12 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. **N/A**

Note: Attach engineering analysis to support construction plans.

INTERIOR DRAINAGE

1. Specify size of each interior watershed
Draining to pressure conduit N/A
Draining to ponding area N/A
2. Relationships Established
Ponding elevation vs. storage Yes No
Ponding elevation vs. gravity flow Yes No
Differential head vs. gravity flow Yes No **N/A**
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 **N/A**
 - 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: N/A

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

INTERIOR DRAINAGE (Cont'd)

1. The length of levee system used to drive this seepage rate is N/A ft.

9. Will a pumping plant(s) be used for interior drainage? Yes No

If yes, include the number of pumping plants: N/A
 For each pumping plant, list:

	<u>Plant #1</u>	<u>Plant #2</u>
The number of pumps	_____	_____
The ponding storage capacity	_____	_____
The maximum pumping rate	_____	_____
The maximum pumping head	_____	_____
The pumping starting elevation	_____	_____
The pumping stopping elevation	_____	_____
Is the discharge facility protected?	_____	_____
Is there a flood warning plan?	_____	_____
How much time is available between warning and flooding?	_____	_____

Will the operations be automatic? Yes No

If the pumps are electric, are there backup power sources? Yes No

(Reference: U.S. Army Corps of Engineers EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Note: Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

OTHER DESIGN CRITERIA

The following items have been addressed as stated:

Liquifaction is is not a problem.

Hydrocompaction is is not a problem

Heave differential movement due to soils of high shrink/swell is is not a problem.

2. For each of these problems, state the basic facts and corrective action taken.

Although localized liquefaction could occur during a major earthquake,
it is highly unlikely that an earthquake and a flood would occur at the
same time.

If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?

Yes No

Note: Attach supporting documentation

The planned/installed works are in full compliance with NFIP regulations, Section 44 CFR Ch. 1. 65.10
 Yes No

OPERATIONAL PLAN AND CRITERIA

1. The operation plan incorporates all the provisions for closure devices as required in Section 65.10 (c) (1), of the NFIP regulations *N/A, no closure devices* Yes No

2. The operation plan incorporates all the provisions for interior drainage as required in Section 65.10 (c) (2), of the NFIP regulations Yes No

If no to either of the above, please explain.

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 essentially 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: $> \#200 = "23 \text{ to } 72$ 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

$> \#200 = "23 \text{ to } 72$

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 $c=1/2 \text{ Qu}$ 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 $c=Qu/2*(1-\tan(\text{PHI}))$

= 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

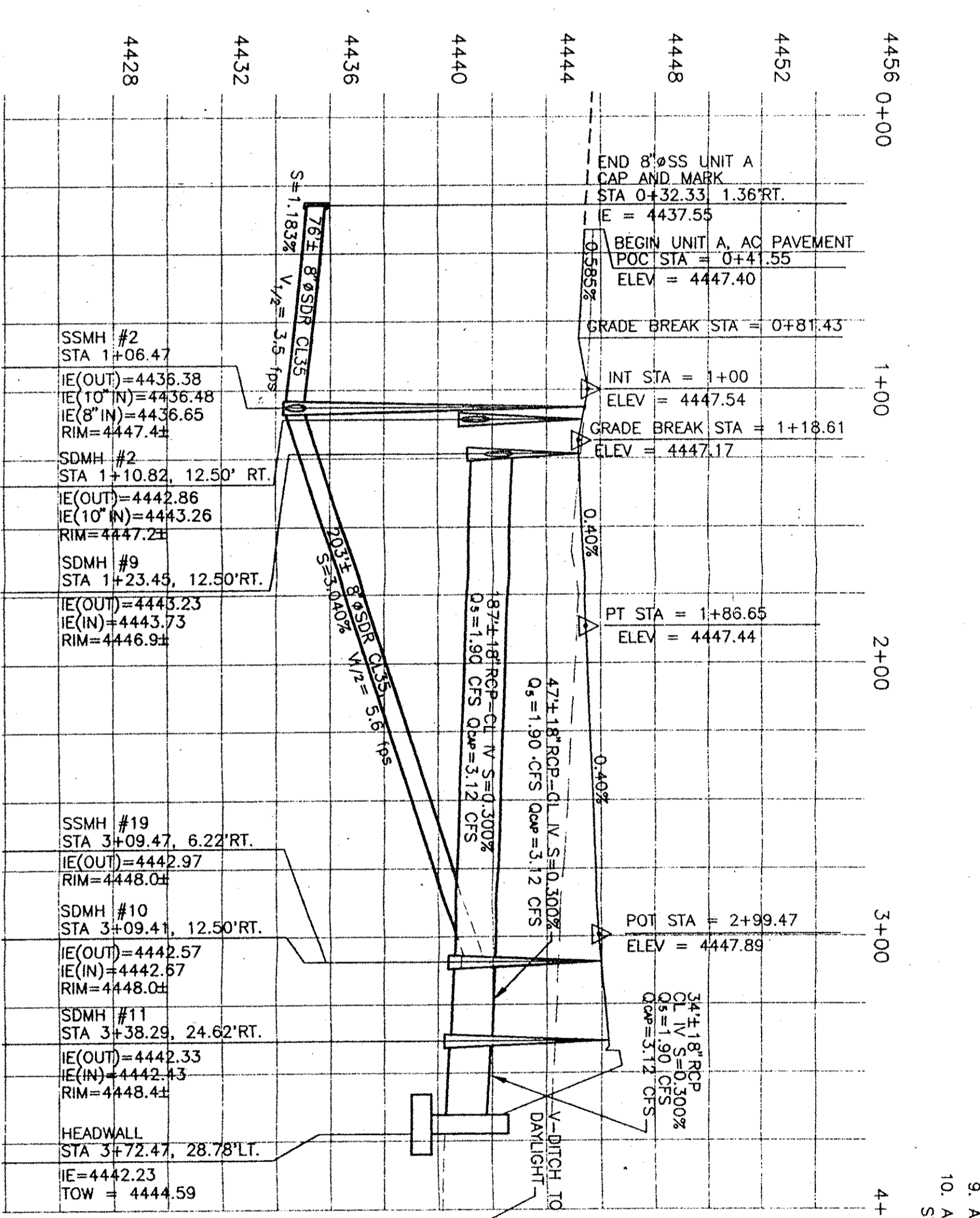
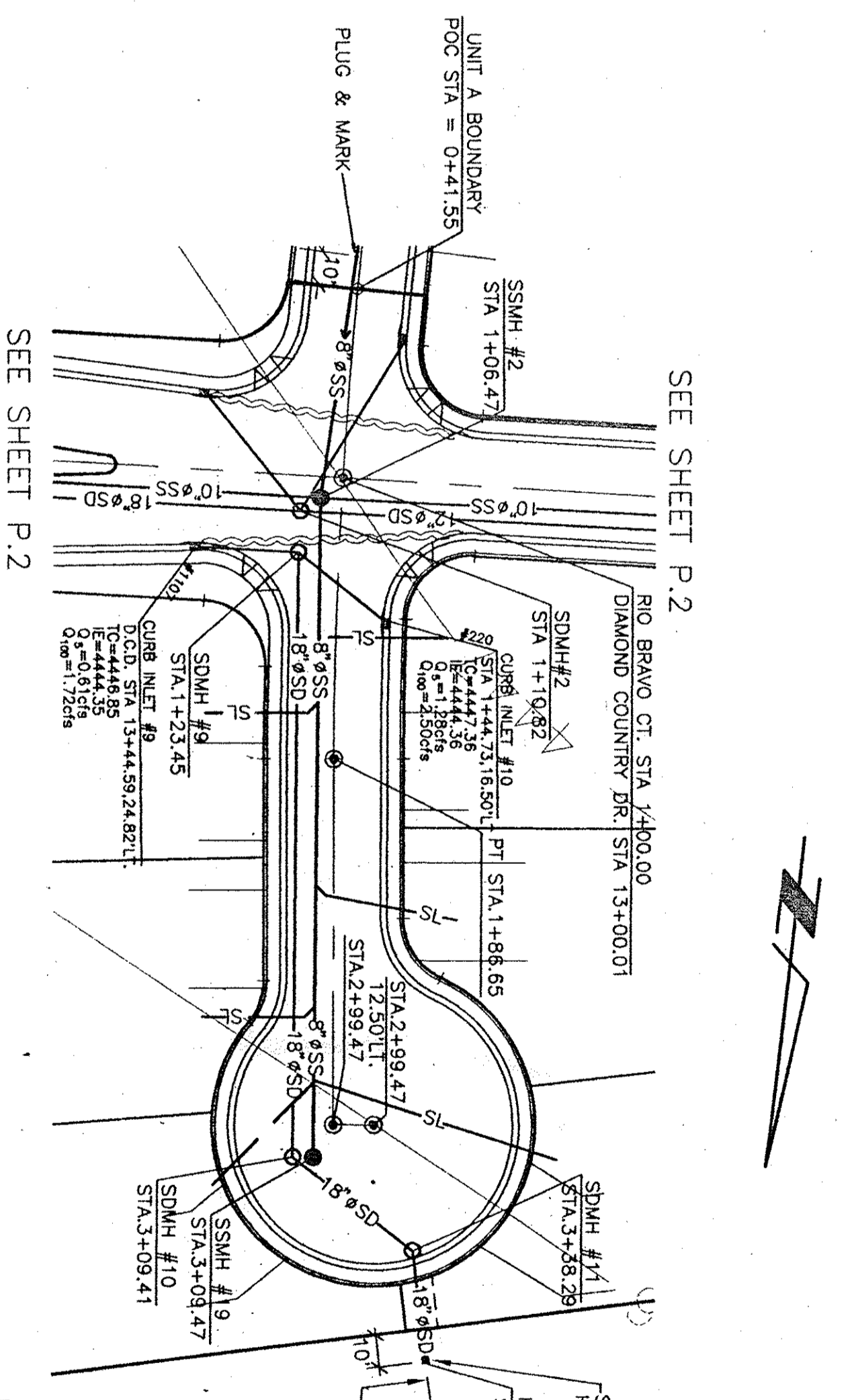
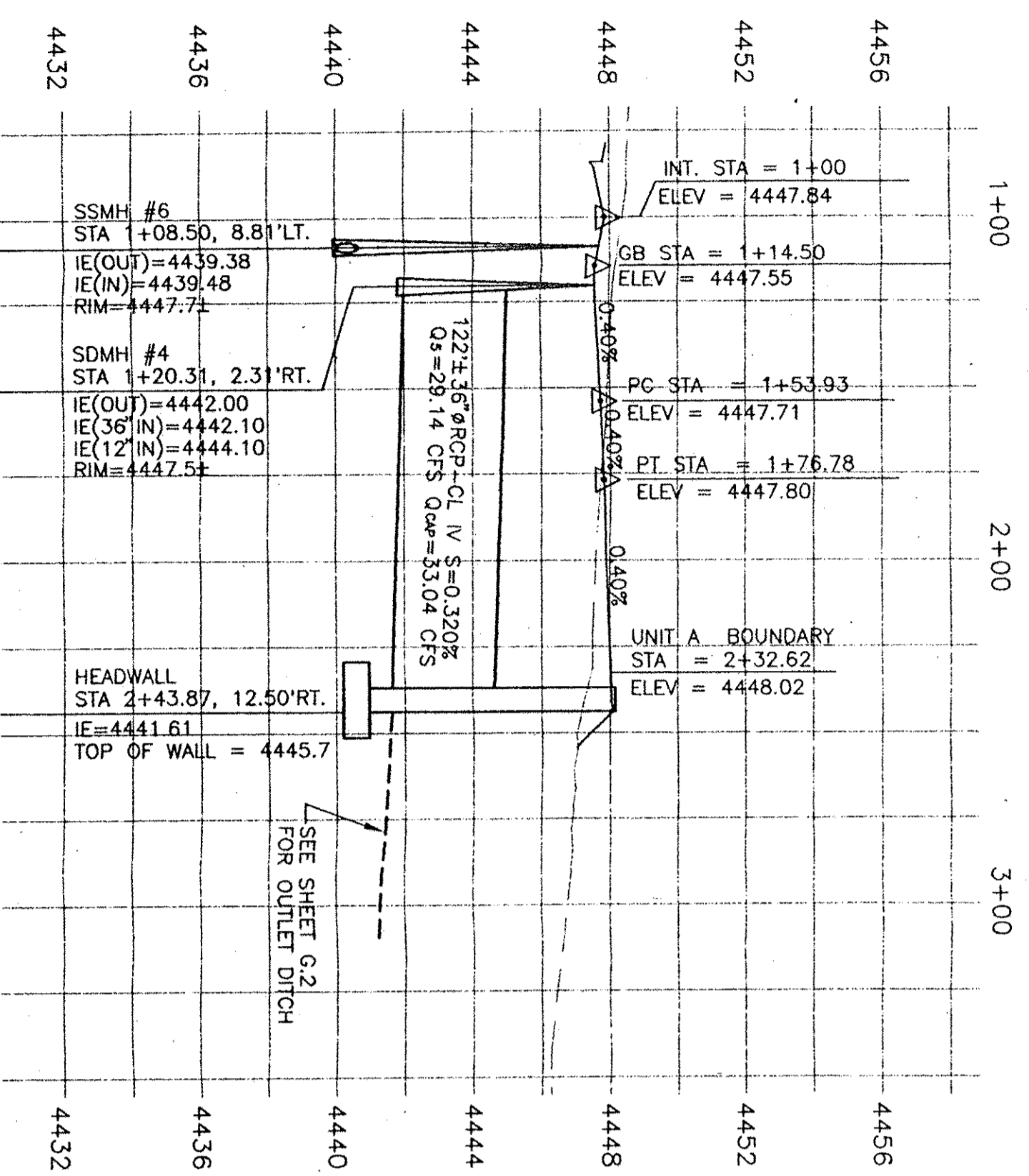
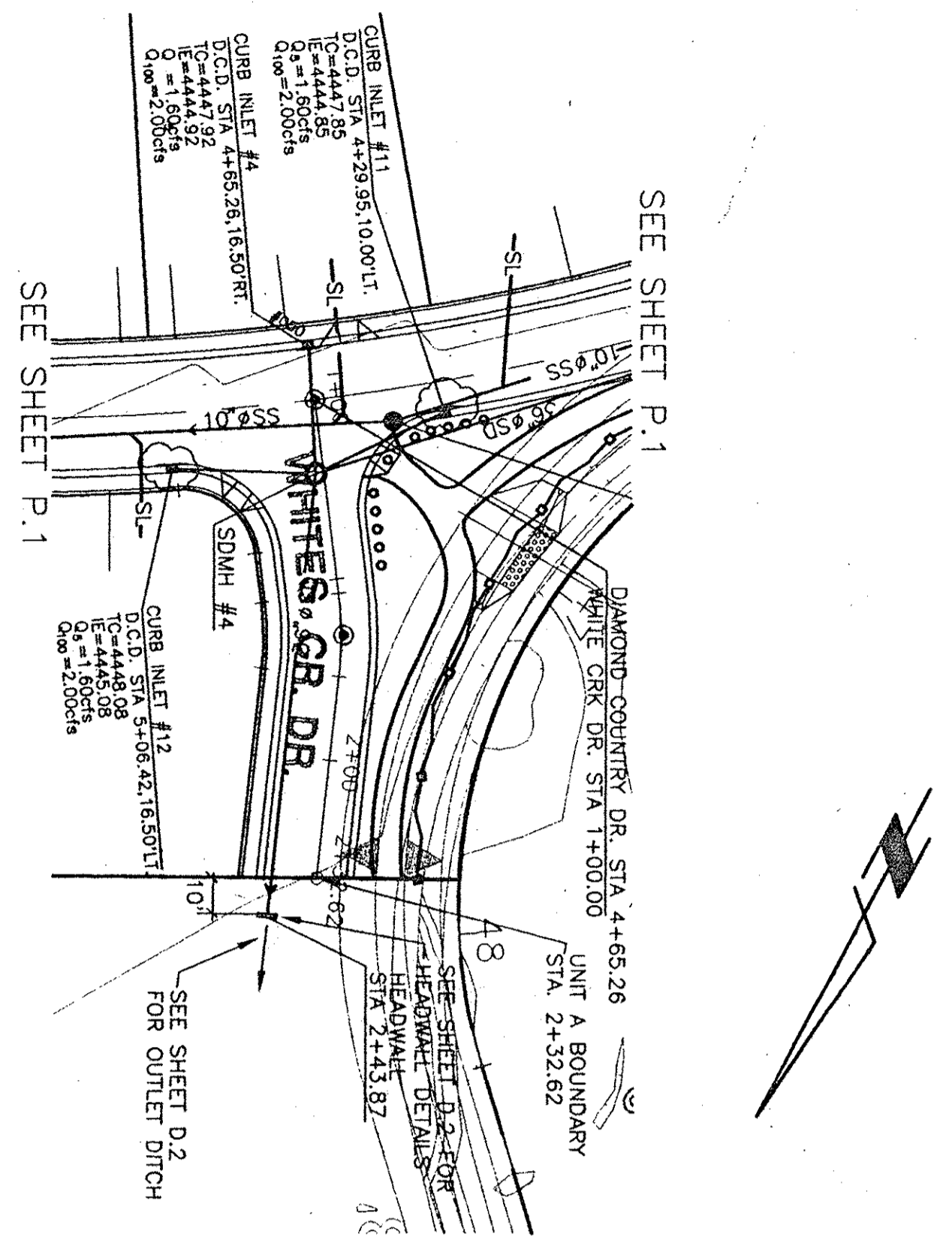
for Dry Unit Weights of GammaMin= 60 GammaMax= 135 lbs/cu.ft.

so: $e=(e\text{Max}-e\text{Min})/(\text{GammaMax}-\text{GammaMin})*(\text{GammaDry}-\text{GammaMin})+e\text{Min}$

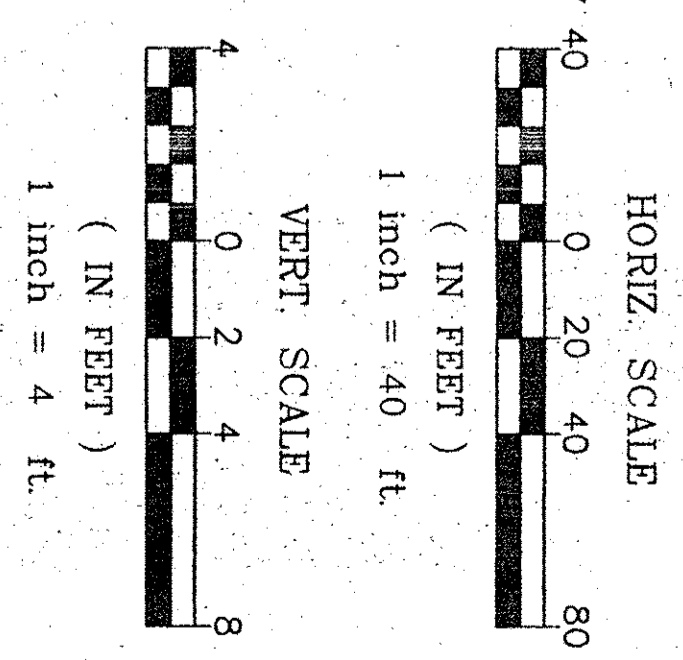
= 0.97

Saturated Unit Weight = GammaDry+(e/(1+e))*62.4

= 126 lbs/cu.ft.



- NOTES:
1. ALL STORM DRAIN LATERALS SHALL BE 12" R.C.P., CLASS IV, UNLESS INDICATED OTHERWISE WITH WATERRIGHT JOINTS.
 2. ALL SEWER STUBS SHALL BE 8" P.V.C. SDR-35.
 3. ALL SANITARY SEWER AND STORM DRAIN MANHOLES SHALL BE TYPE 1 - 48" UNLESS INDICATED OTHERWISE WITH WATERRIGHT JOINTS.
 4. MAINTAIN MINIMUM 10 FOOT HORIZONTAL SEPARATION BETWEEN WATER AND SANITARY SEWER MAINS OR 18 INCH VERTICAL SEPARATION AT CROSSINGS WITH SANITARY SEWER ON BOTTOM.
 5. ALL CONCRETE STORM DRAIN PIPE SHALL BE REINFORCED CONCRETE PIPE CLASS IV. JOINTS SHALL BE WATERTIGHT AND SHALL HAVE RUBBER GASKETS AS PER ASTM C443-79. PIPE SHALL BE BELL END/RUBBER GASKET.
 6. PLUG AND MARK ENDS OF ALL PIPE STUBS.
 7. SANITARY SEWER MAIN SHALL BE PVC SDR CLASS 35 WITH WATERRIGHT JOINTS.
 8. ALL TRENCHING FOR UTILITIES SHALL PROVIDE CLAY CUTOFF WALLS TO RESTRICT MIGRATION OF GROUND WATER AT 300 FOOT CENTERS.
 9. ALL MANHOLES TO BE CONSTRUCTED WATER TIGHT.
 10. ALL SANITARY SEWER MANHOLE LIDS IN AREAS INUNDAATED IN ANY STORM EVENT SHALL BE WATER TIGHT.

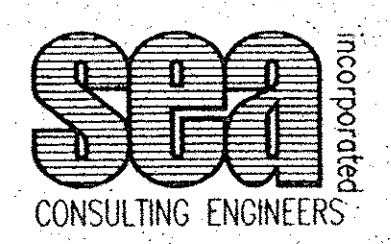


WHITES CREEK DRIVE

RIO BRAVO COURT

**PLAN/PROFILE SHEET
DOUBLE DIAMOND RANCH - VILLAGE 12-A**

RESIDENTIAL DEVELOPMENT
A PLANNED UNIT DEVELOPMENT
POR. SEC. 9, T.18 N., R. 20 E., M.D.M.
WASHOE COUNTY

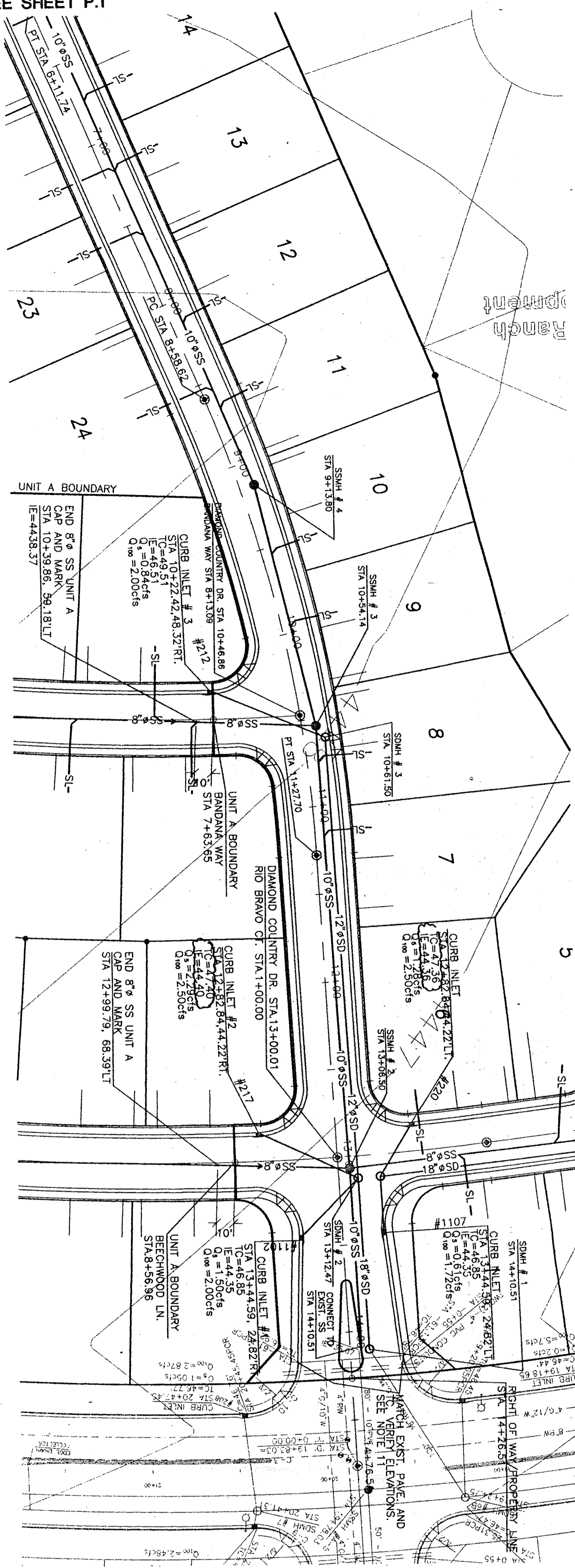


RENO/SPARKS, NEVADA
LAS VEGAS, NEVADA
PHOENIX, ARIZONA

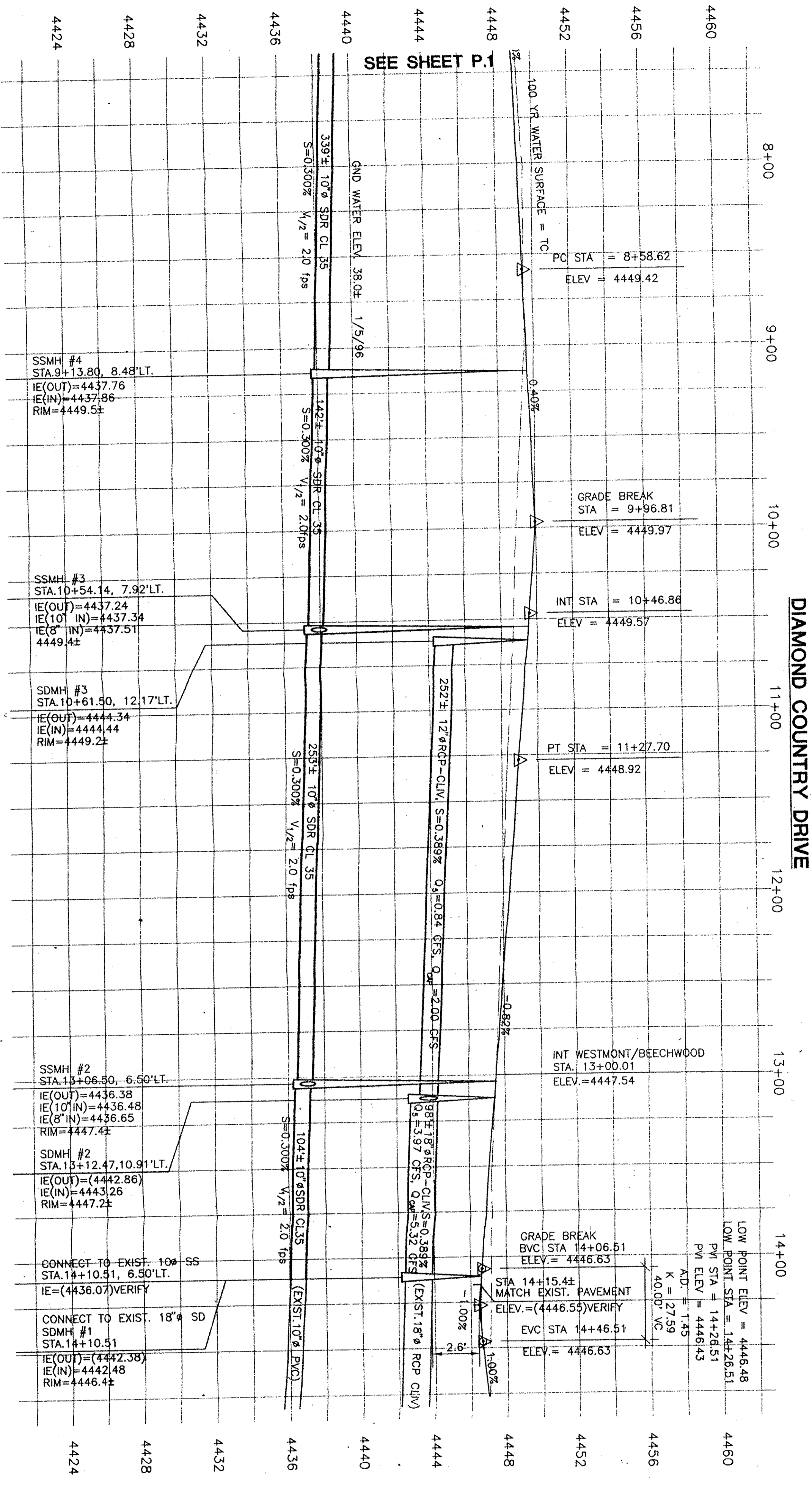
NO.	REVISIONS	DATE
1	ADD D'S 6/18/96	02

JOB NO. 2846-01-1	DESIGNED JAB
DRAWN	CHECKED
DATE APRIL, 1995	

SEE SHEET P.1

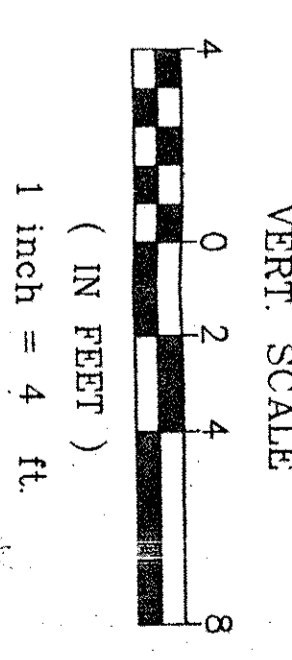
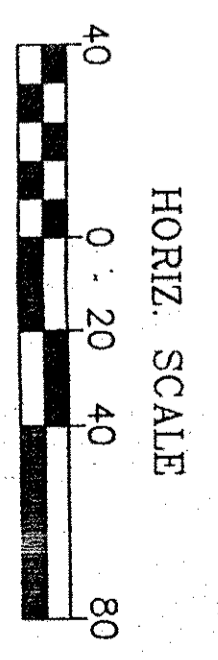


SEE SHEET P.3



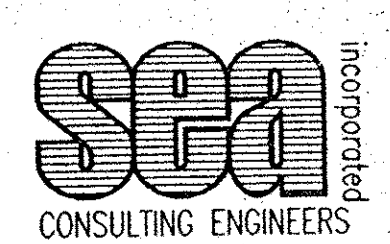
DIAMOND COUNTRY DRIVE

- NOTES:
1. ALL STORM DRAIN LATERALS SHALL BE 12" R.C.P., CLASS IV, UNLESS INDICATED OTHERWISE WITH WATERTIGHT JOINTS.
 2. ALL SEWER STUBS SHALL BE 8" P.V.C. SDR-35.
 3. ALL SANITARY SEWER AND STORM DRAIN MANHOLES SHALL BE TYPE I - 48" UNLESS INDICATED OTHERWISE WITH WATERTIGHT JOINTS.
 4. MAINTAIN MINIMUM 10 FOOT HORIZONTAL SEPARATION BETWEEN WATER AND SANITARY SEWER MAINS OR 18 INCH VERTICAL SEPARATION AT CROSSINGS WITH SANITARY SEWER ON BOTTOM.
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 6. PLUG AND MARK ENDS OF ALL PIPE STUBS.
 7. SANITARY SEWER MAIN SHALL BE PVC SDR CLASS 35 WITH WATERTIGHT JOINTS.
 8. ALL TRENCHING FOR UTILITIES SHALL PROVIDE CLAY CUTOFF WALLS TO RESTRICT MIGRATION OF GROUND WATER AT 300 FOOT CENTERS.
 9. ALL MANHOLES TO BE CONSTRUCTED WATER TIGHT.
 10. ALL SANITARY SEWER MANHOLE LIDS IN AREAS INDICATED IN ANY STORM EXIST. SHALL BE WATER TIGHT.
 11. SAWCUT EXIST. PAVEMENT 1' BACK TO PROVIDE STRAIGHT MATCHING EDGE.



PLAN/PROFILE SHEET
DOUBLE DIAMOND RANCH - VILLAGE 12-A

RESIDENTIAL DEVELOPMENT
A PLANNED UNIT DEVELOPMENT
POR. SEC. 9, T.18 N., R. 20 E., M.D.M.
WASHOE COUNTY

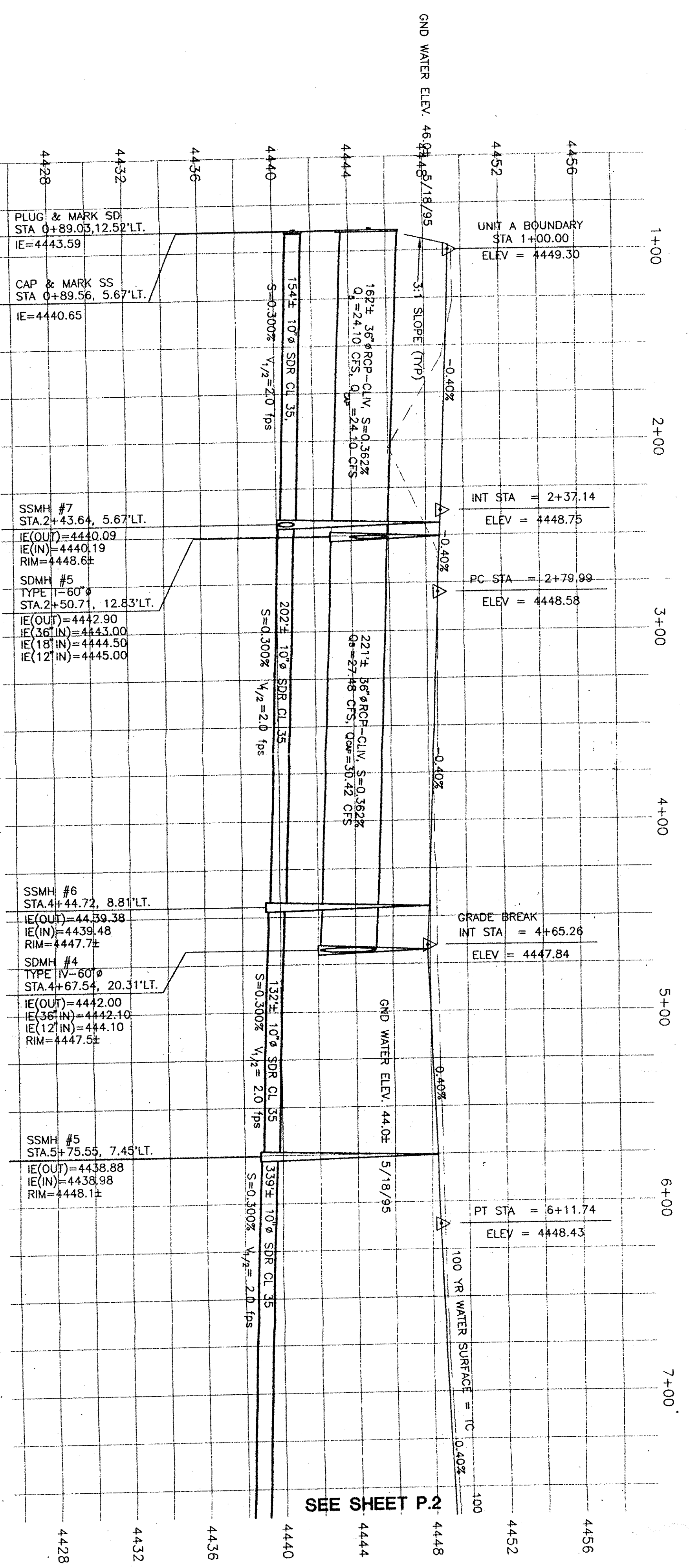
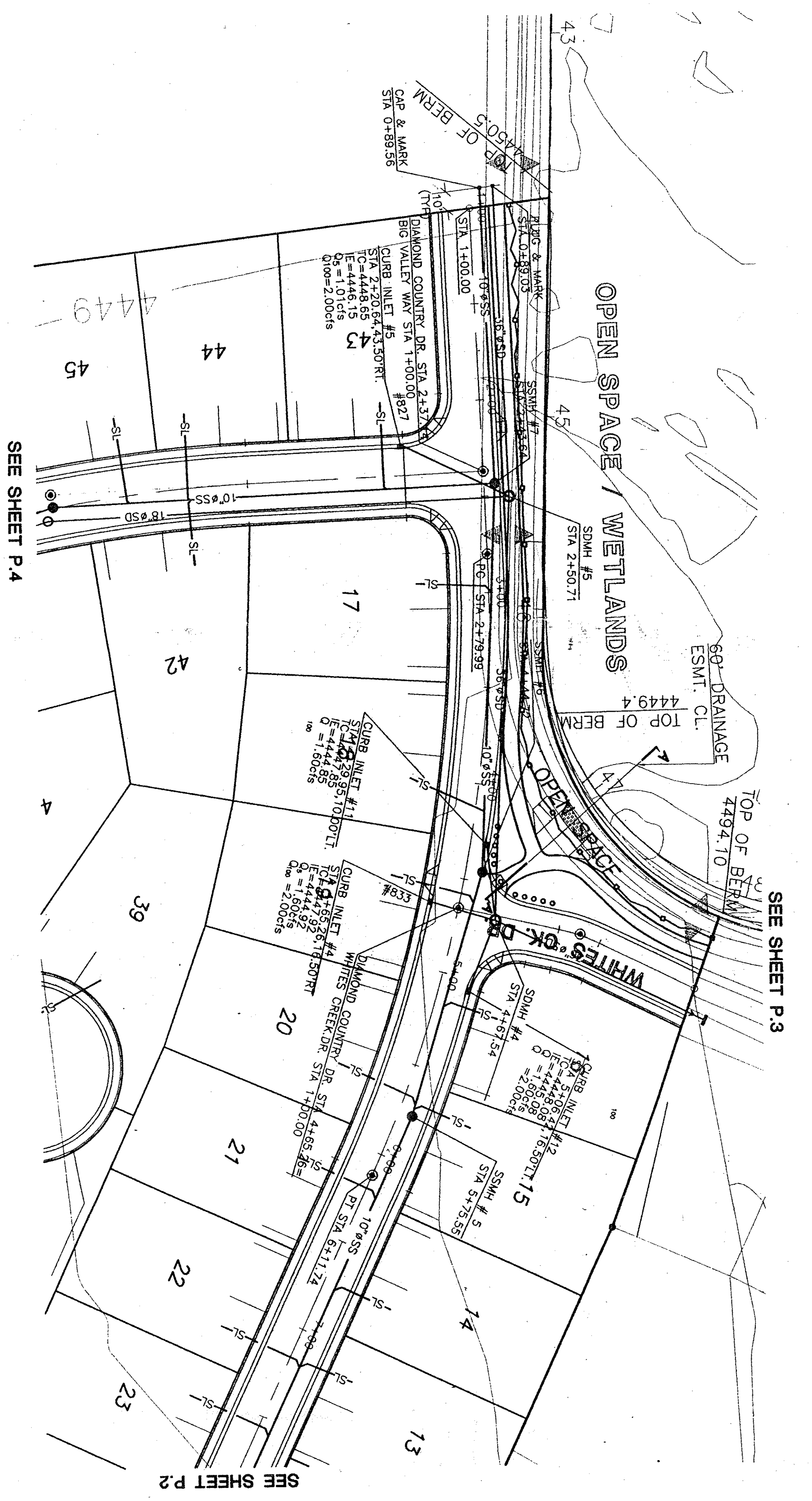


RENO/SPARKS, NEVADA
LAS VEGAS, NEVADA
PHOENIX, ARIZONA

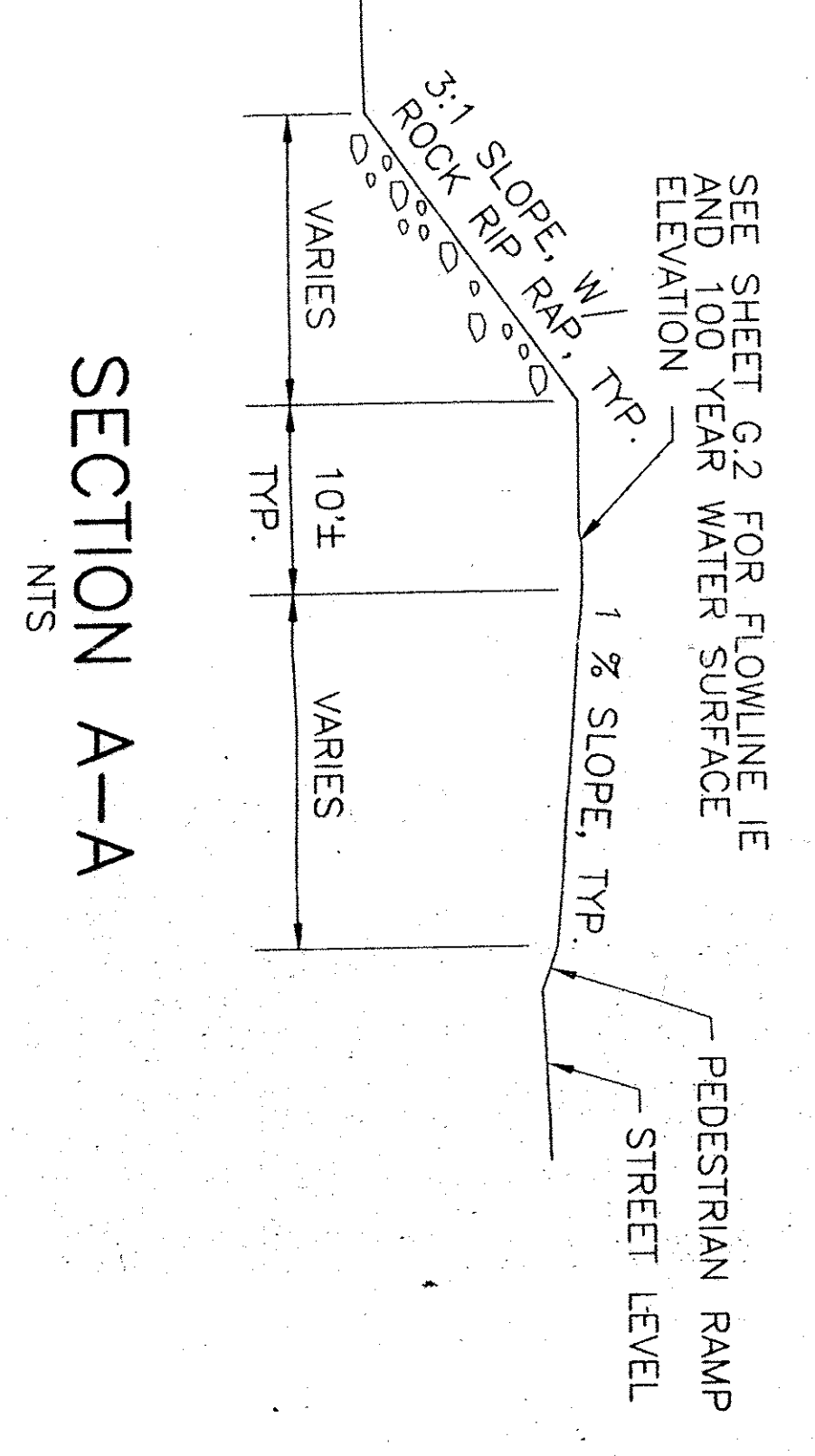
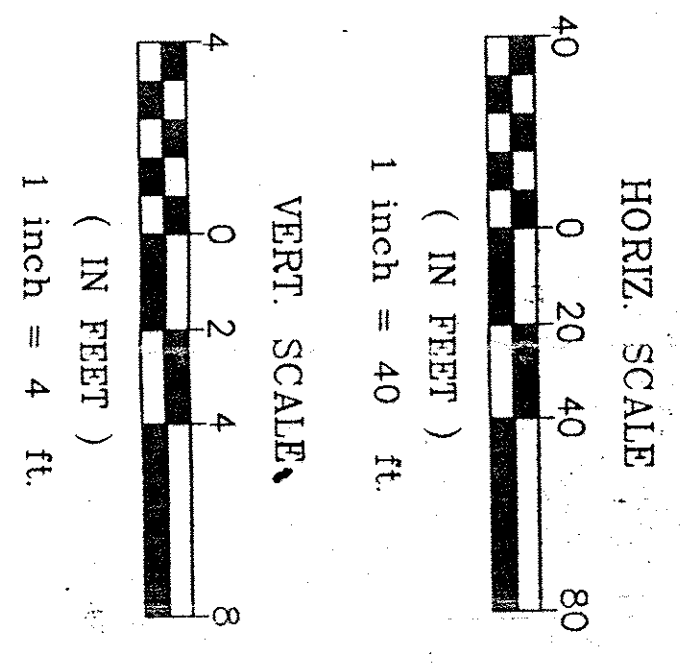
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DATE APRIL 1965
RENO

P.2

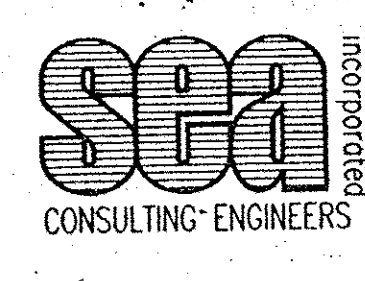
8 OF 14 SHEETS



- NOTES:
1. ALL STORM DRAIN LATERALS SHALL BE 12" R.C.P., CLASS IV, UNLESS INDICATED OTHERWISE WITH WATER TIGHT JOINTS.
 2. ALL SEWER STUBS SHALL BE 8" 3-V.C. SDR-35.
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 4. MAINTAIN MINIMUM 10 FOOT HORIZONTAL SEPARATION BETWEEN WATER AND SANITARY SEWER MAINS OR 18 INCH VERTICAL SEPARATION AT CROSSINGS WITH SANITARY SEWER ON BOTTOM.
 5. ALL CONCRETE STORM DRAIN PIPE SHALL BE REINFORCED CONCRETE PIPE CLASS IV. JOINTS SHALL BE WATER TIGHT AND SHALL HAVE RUBBER GASKETS AS PER ASTM C443-79. PIPE SHALL BE BELL END/RUBBER GASKET.
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 8. ALL TRENCHING FOR UTILITIES SHALL PROVIDE CLAY CUTOFF WALLS TO RESTRICT MIGRATION OF GROUND WATER AT 300 FOOT CENTERS.
 9. ALL MANHOLES TO BE CONSTRUCTED WATER TIGHT.
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PLAN/PROFILE SHEET
DOUBLE DIAMOND RANCH - VILLAGE 12-A
 RESIDENTIAL DEVELOPMENT
 A PLANNED UNIT DEVELOPMENT
 POR. SEC. 9, T.18 N., R. 20 E., M.D.M.
 WASHOE COUNTY
 NEVADA



RENO/SPARKS, NEVADA
 LAS VEGAS, NEVADA
 PHOENIX, ARIZONA

NO.	DESCRIPTION/DATE	BY
1	REV 0 5/14/95	JEB

REVISIONS

JOB NO. 2846-01-1
 ISSUED JAB
 DRAWN
 CHECKED
 DATE APRIL 1995

RENO

P.1
 7 of 14 SHEETS

NO.	DESCRIPTION/DATE	BY
1	ADD. D. STA. 6/18/96	J

RENO/SPARKS, NEVADA
LAS VEGAS, NEVADA
PHOENIX, ARIZONA



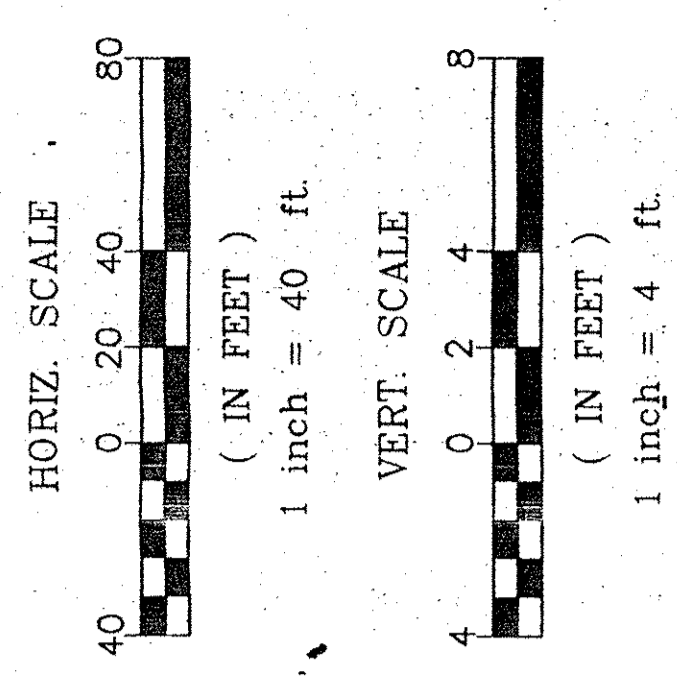
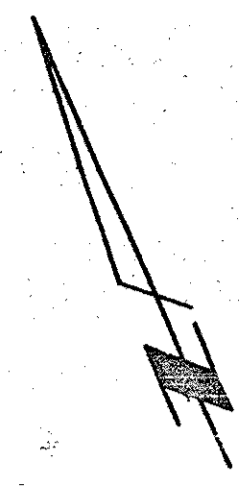
NEVADA

PLAN/PROFILE SHEET
DOUBLE DIAMOND RANCH - VILLAGE 12-A
RESIDENTIAL DEVELOPMENT
A PLANNED UNIT DEVELOPMENT
POR. SEC. 8, T. 18 N., R. 20 E., M.D.M.
WASHOE COUNTY

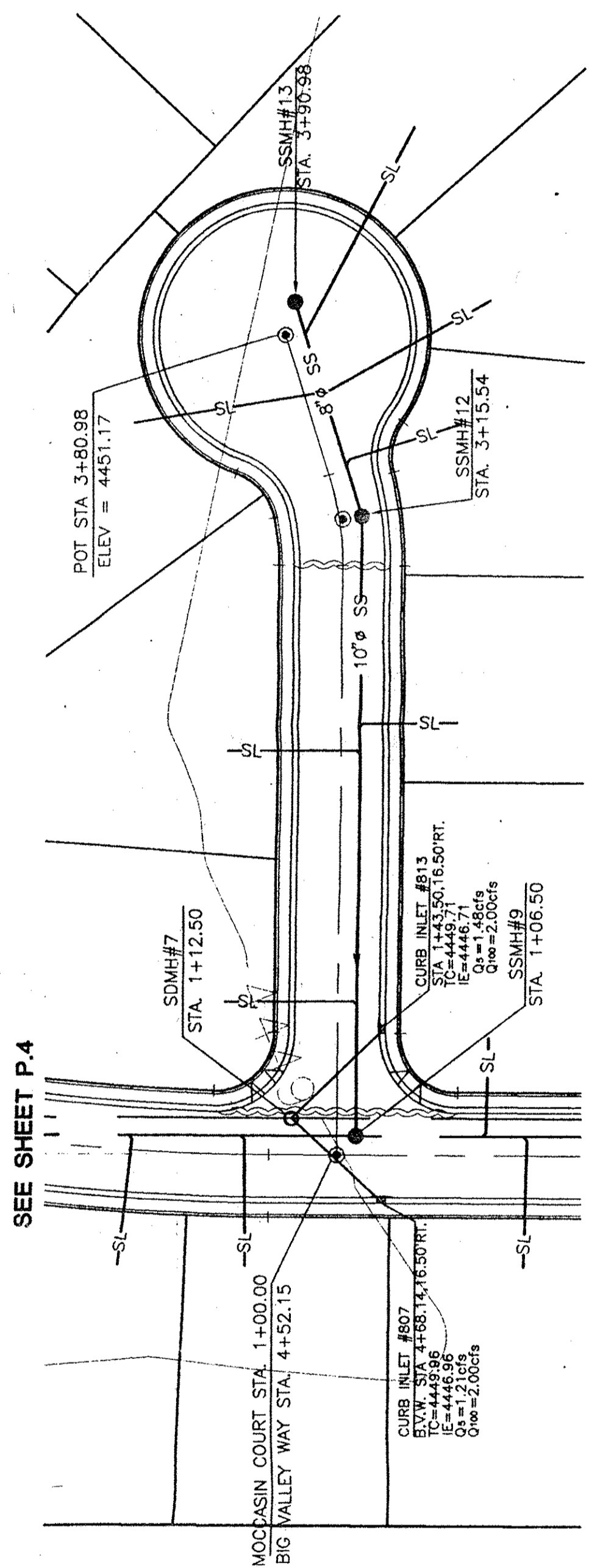
RENO
JOB NO. 2846-01-1
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CHECKED
DATE APRIL, 1996

P.5

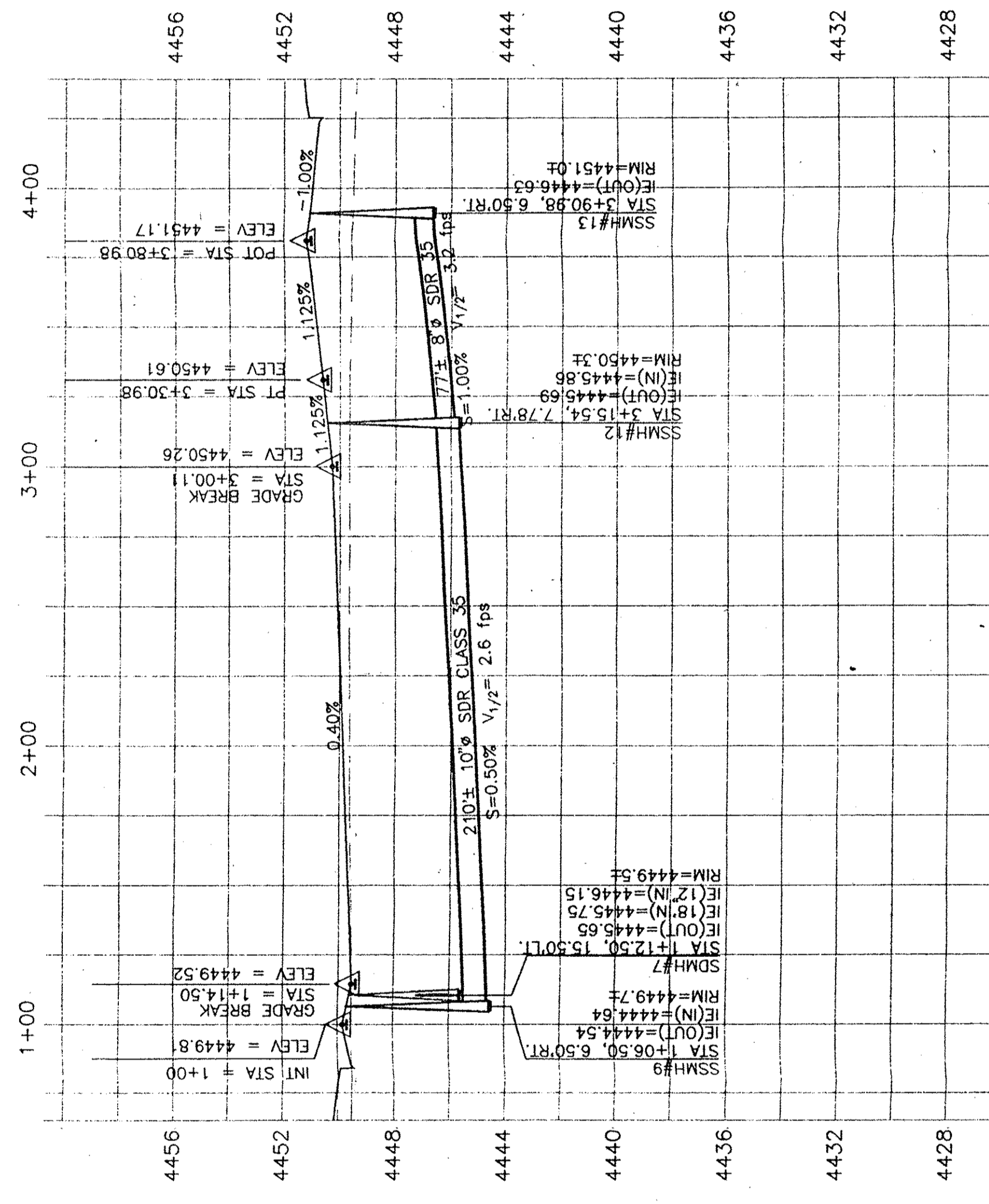
11 of 14 SHEETS



- NOTES:
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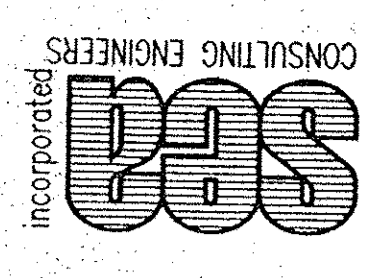


MOCASIN COURT



NO.	DESCRIPTION/DATE	BY
1	REV. TO CL. 6-18-98 JB	

RENO/SPARKS, NEVADA
LAS VEGAS, NEVADA
PHOENIX, ARIZONA



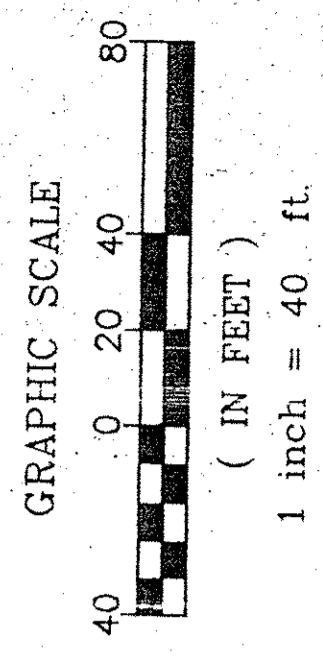
NEVADA

WASHOE

DOUBLE DIAMOND RANCH - VILLAGE 12-A
GRADING PLAN

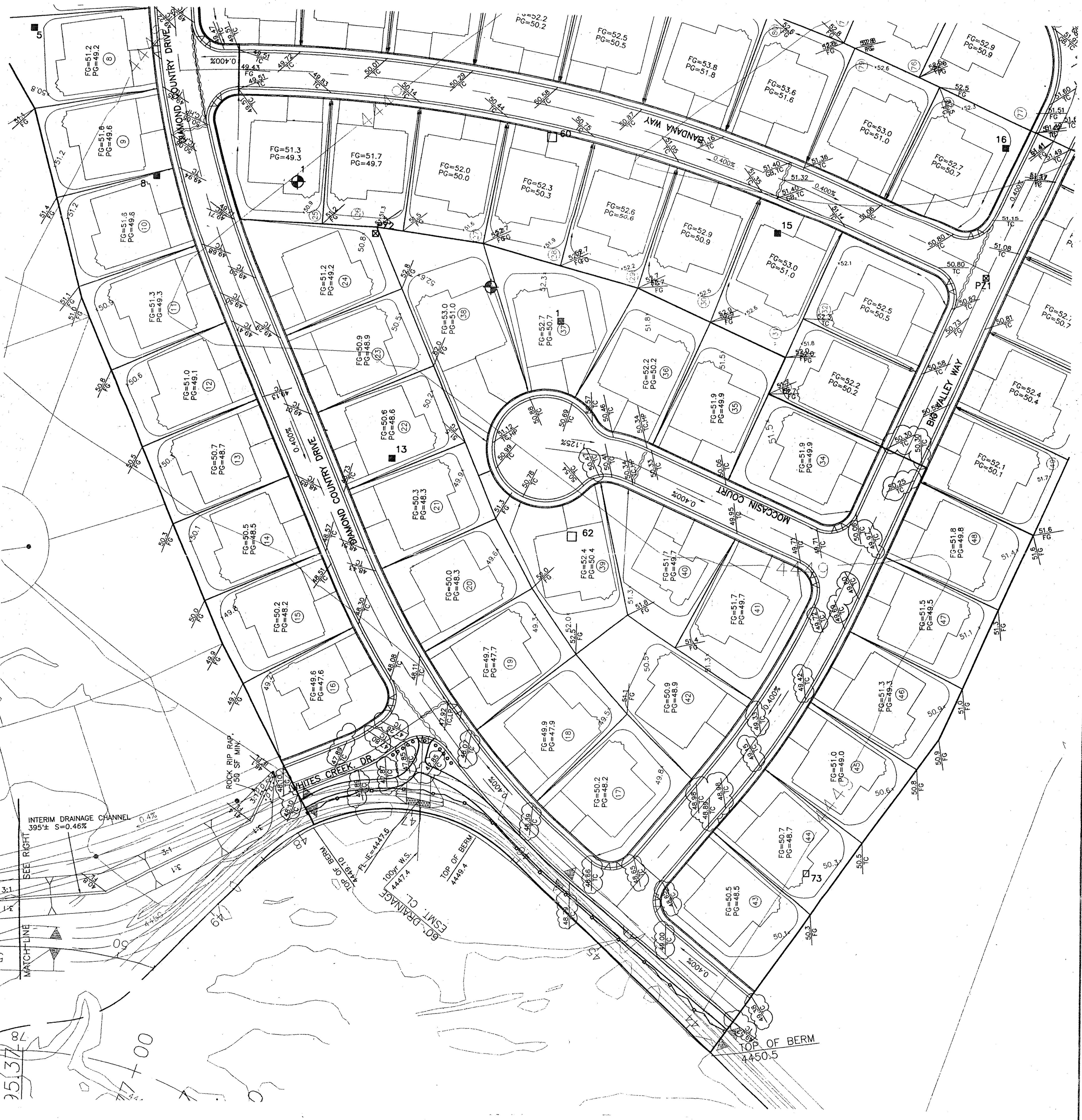
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DESIGNED JOB	
DRAWN	
CHECKED	
DATE	APRIL, 1996

G.2



IRREGULAR SHAPED LOTS

- LEGEND**
- TEST PIT 04-95
 - TEST PIT 11-95
 - TEST PIT 01-96
 - BORING



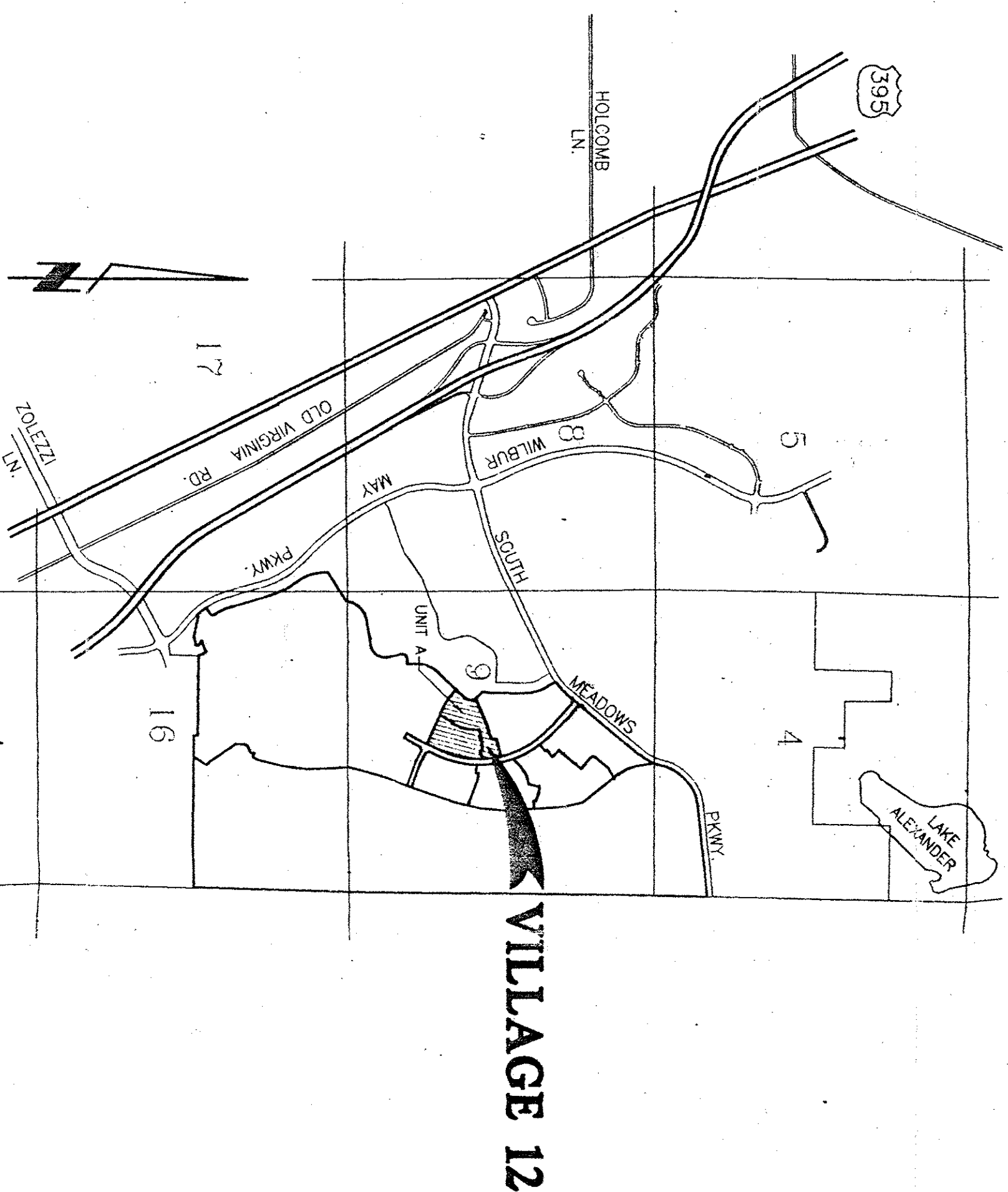
25/37
47+00

TOP OF BERM
4450.5

Double Diamond Ranch

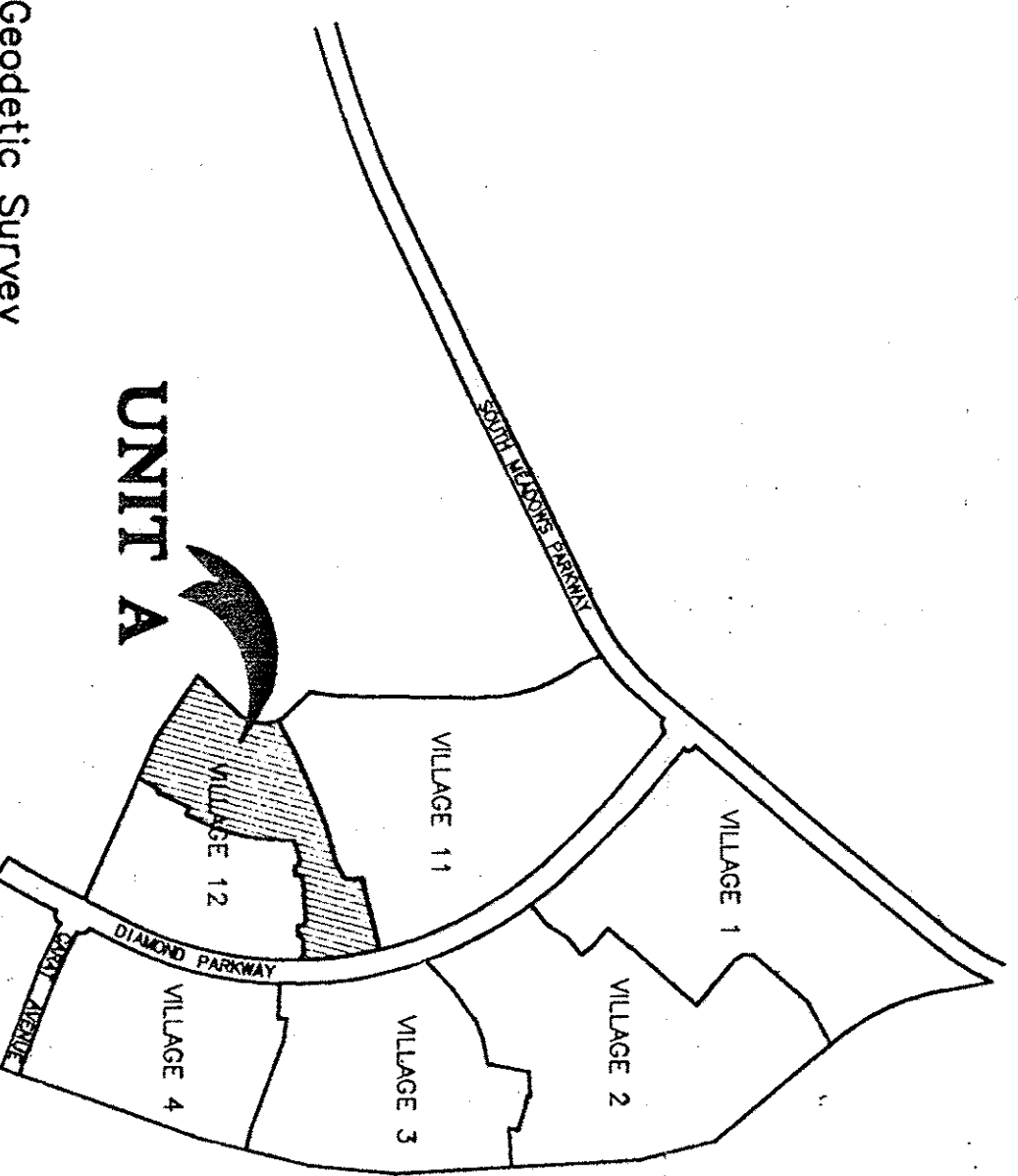
RESIDENTIAL DEVELOPMENT VILLAGE 12-A

A Planned Unit Development



VICINITY MAP

SCALE: 1" = 2000'



KEY MAP

SCALE: 1" = 800'

ABBREVIATIONS

AC	AGES
ASP	ASBESTOS CEMENT PIPE
BC	BEGUN CURVE
BO	BOUNDARY
BFC	BACK FACE OF CURB
BSW	BACK OF SIDEWALK
BVC	BEGIN VERTICAL CURVE
C	RUNOFF COEFFICIENT
CB	CATCH BASIN
CBE	CATCH BASIN INVERT ELEVATION
C & G	CURB AND GUTTER
CH	LONG CHORD
CI	CAST IRON
CL	CENTERLINE
CLP	CORRUGATED METAL PIPE
CONC	CONCRETE
DI	DROP INLET
EG	END CURVE
E. of ELEV	ELEVATION
EP	EDGE OF PAVEMENT
EVG	END VERTICAL CURVE
EX of EXIST	EXISTING
FI	FIRE HYDRANT
FB	FLAT BOTTOM
FTC	FRONT FACE OF CURB
FG	FINISH GRADE
FL	FLOW LINE
FPS	FEET PER SECOND
GB	GRADE BREAK
HORIZ	HORIZONTAL
HP	HIGH POINT
I	INTENSITY
IE	INVERT ELEVATION
IMP	IMPROVEMENT
INT	INTERSECTION
L	LENGTH
LP	LOW POINT
MH	MANHOLE
MOVC	MID-ORIGINATE VERTICAL CURVE
MO CORR	MID-ORIGINATE CORRECTION
NTS	NOT TO SCALE
OG	ORIGINAL GROUND
POC	POINT OF COMPOUND CURVATURE
P	POINT OF INTERSECTION
PL	PROPERTY LINE
PRC	POINT OF REVERSE CURVATURE
PVC	POINT OF REVERSE VERTICAL CURVE
PVC	POLYVINYL CHLORIDE
Q	FLOW RATE
R	RADIUS
(R)	RADIUS
RCP	REINFORCED CONCRETE PIPE
RET	RETURN
R/W	RIGHT OF WAY
S	SLOPE
SO	STORM DRAIN
SS	SANITARY SEWER
STA	STATION
STD	STANDARD
SW	SIDEWALK
T	TANGENT
TB	TOP OF BANK
TC	TOP OF CURB
ts	TIME OF CONCENTRATION
TO	TOP OF GRADE
TOE	TOP OF BANK
TP	TOP OF PAVEMENT
TV	TOP OF WALK OR WALL

BENCHMARK:

Basis of Elevations: U.S. Coast and Geodetic Survey and State Survey Station No. 12, elevation = 4448.287, on Mays Lane 1.4 miles East of Virginia Sta. #12.

INDEX OF SHEETS

SHEET NO.	DESCRIPTION OF SHEET	DESCRIPTION OF SHEET
1 OF 14	COVER SHEET	L-1 LANDSCAPE CONSTRUCTION LAYOUT PLAN
2 OF 14	PLAT SHEET 1 OF 2	L-2 LANDSCAPE CONSTRUCTION PLANTING PLAN
3 OF 14	PLAT SHEET 2 OF 2	L-3 LANDSCAPE CONSTRUCTION IRRIGATION PLAN
4 OF 14	UTILITY PLAN	CD-1 CONSTRUCTION DETAILS
5 OF 14	GRADING PLAN	CD-2 IRRIGATION DETAILS
6 OF 14	G-2 GRADING PLAN	DPP-1 PLANTING PLAN
7 OF 14	P-1 STREET IMPROVEMENTS	DPI-1 IRRIGATION PLAN
8 OF 14	P-2 STREET IMPROVEMENTS	DPP-4 PLANTING PLAN
9 OF 14	P-3 STREET IMPROVEMENTS	DPI-4 IRRIGATION PLAN
10 OF 14	P-4 WHITES CREEK DRIVE & BEECHWOOD COURT	
11 OF 14	P-5 STREET IMPROVEMENTS	
12 OF 14	E-A1 TRAFFIC DEVICE AND EMERGENCY ACCESS ROAD PLAN	
13 OF 14	D-1 DETAIL SHEET	
14 OF 14	D-2 DETAIL SHEET	

GENERAL NOTES

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THESE PLANS, THE PROJECT SPECIFICATIONS, GEOTECHNICAL INVESTIGATION BY SEA, INC. DATED JANUARY 1996, CITY OF RENO ORDINANCES AND POLICES, STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, DATED 1992, STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, UNIFORM BUILDING CODE, PUD DESIGN MANUAL AND OTHER CODES OR REGULATIONS THAT APPLY.
- LOCATIONS OF UNDERGROUND FACILITIES SHOWN ON THE PLANS ARE APPROXIMATE AND WERE NOT DETERMINED BY FIELD INVESTIGATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITY STRUCTURES, WHETHER SHOWN OR NOT, AND TO NOTIFY ALL UTILITY COMPANIES TO VERIFY IN THE FIELD THE LOCATIONS OF THEIR INSTALLATIONS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL PROTECT ALL UTILITY STRUCTURES FROM DAMAGE. THE EXPENSE OF REPAIR OR REPLACEMENT SHALL BE BORNE BY THE CONTRACTOR. THE CONTRACTOR SHALL REQUEST FIELD MARKING OF EXISTING UTILITIES AT LEAST 48 HOURS IN ADVANCE OF BEGINNING CONSTRUCTION BY CALLING CONSTRUCTION BY CALLING UNDERGROUND SERVICE ALERT AT (800)227-2800.
- AT LOCATIONS WHERE NEW UNDERGROUND FACILITIES CROSS EXISTING FACILITIES, THE CONTRACTOR SHALL EXPOSE THE EXISTING FACILITY AND VERIFY THAT SUFFICIENT HORIZONTAL AND VERTICAL CLEARANCE EXISTS FOR THE NEW FACILITY TO BE CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH THE PLANS. AT LOCATIONS WHERE NEW UNDERGROUND FACILITIES ARE TO BE CONNECTED TO EXISTING FACILITIES, THE CONTRACTOR SHALL EXPOSE THE EXISTING FACILITY AND VERIFY THAT THE CONNECTION CAN BE MADE AS SHOWN ON THE PLANS. THIS VERIFICATION SHALL BE DONE PRIOR TO ANY CONSTRUCTION. ANY CONFLICTS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION AS SOON AS THEY ARE DISCOVERED.
- TRAFFIC CONTROL CONSTRUCTION SIGNS AND BARRICADES SHALL CONFORM TO THE REQUIREMENTS OF THE M.U.T.C.D. MANUAL, 1988 EDITION, AND THE NEVADA TRAFFIC CONTROL MANUAL, LATEST EDITION.
- THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING IMPROVEMENTS AND DIMENSIONS PRIOR TO WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
- TOPOGRAPHIC INFORMATION SHOWN HEREON WAS OBTAINED FROM A 1' CONTOUR INTERVAL TOPOGRAPHIC MAP PREPARED FOR SOUTH MEADOWS PROPERTIES L.P. BY NEVADA AERIAL MAPPING, DATED SEPTEMBER 17, 1994, UPDATED FEBRUARY 1996.
- THESE PLANS, SHEET NOS. 1 THROUGH 14, AND SHEETS L-1 THROUGH L-3, CD-1, CD-2, DPP-1, DPP-4, DPI-1 AND DPI-4 HAVE BEEN PREPARED IN ACCORDANCE WITH THE APPROVED TENTATIVE MAP, CITY COUNCIL CONDITIONS OF APPROVAL AND CITY CODE.
- ALL SANITARY SEWERS, INCLUSIVE OF LATRINALS, SHALL BE CONSTRUCTED TO A DEPTH SUFFICIENT TO ALLOW FOR GRAVITY FLOW TO PUBLIC SANITARY SEWERS FROM ALL FLOORS OF RESIDENTIAL OR COMMERCIAL STRUCTURES, INCLUSIVE OF BASEMENT AREAS. ALTERNATIVE MEANS MAY BE APPROVED ON A CASE BY CASE BASIS, AND SHALL REQUIRE THE APPROVAL OF THE CITY ENGINEER PRIOR TO CONSTRUCTION.
- ALL DIMENSIONS ARE TO FRONT FACE OF CURB UNLESS OTHERWISE NOTED ON THE PLANS.
- WASHOE COUNTY DISTRICT HEALTH DEPARTMENT REQUIRES THAT A DUST CONTROL PERMIT BE OBTAINED BY THE CONTRACTOR BEFORE BEGINNING ANY LAND DISTURBING ACTIVITIES. THE CONTRACTOR SHALL COMPLY WITH THE EXISTING REGULATIONS PERTAINING TO DUST AND EROSION CONTROL AT ALL TIMES.
- DISTURBED AREAS WHERE CONSTRUCTION HAS CEASED FOR MORE THAN 30 DAYS SHALL BE TREATED WITH A DUST PALLIATIVE (HYDROMULCH, ETC.).

OWNER/DEVELOPER

DOUBLE DIAMOND RANCH LLC
2260 DOUGLAS BLVD, SUITE 280
ROSEVILLE, CA 95661
(916) 773-5000
(916) 773-5539 FAX

ENGINEER

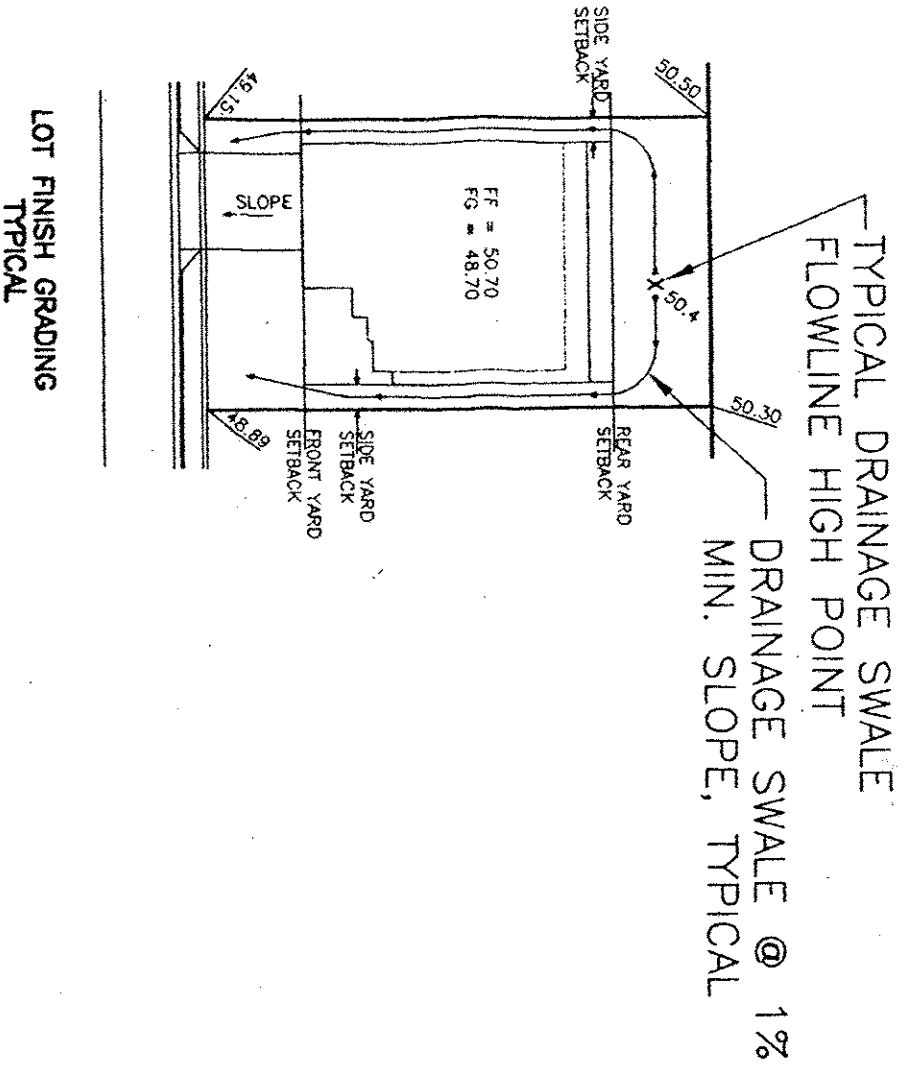
SEA, INCORPORATED
950 INDUSTRIAL WAY
SPARKS, NEVADA 89431
(702) 358-6931
(702) 358-6934 FAX

TWO DAYS BEFORE YOU DIG
CALL USA TOLL FREE
1-800-227-2600

GENERAL NOTES

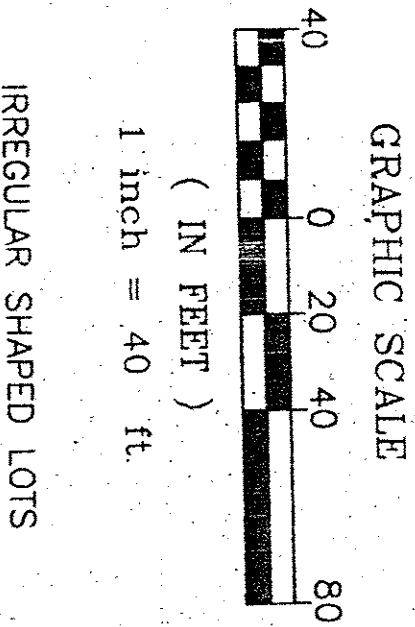
1. The Contractor shall comply with all existing regulations pertaining to dust and erosion control during construction (Washoe Co. Reg. Sec. 040.030).
2. The foundation contractor shall verify foundation dimensions to lot lines before placing concrete.
3. Street light locations shown are subject to change by SPPCo. during final design.
4. Yard setback dimensions shown are measured to the foundation wall.
5. Washoe County Health Department has issued a dust control permit to the developer for this project. Grading and other land disturbing activities shall be accomplished in accordance with the requirements and terms of the permit.
6. Disturbed areas where construction has ceased for more than 30 days shall be treated with a dust palliative.
7. Erosion control seeding shall be implemented on all slopes between 3:1 and 5:1 in accordance with Washoe-Storey Conservation District review and requirements. 12" thick rock rip-rap shall be implemented on all slopes steeper than 3:1.
8. The plan is based upon the foundation contractor setting footing forms to the referenced grades within 0.10 feet prior to concrete placement.
9. The design engineer shall be notified to resolve any apparent discrepancies discovered during construction. No changes or interpretations of the design or specifications shall be made without his approval.
10. Site grading shall be in accordance with these plans and the Geotechnical Investigation by SEA, Incorporated dated March, 1996. Among other things, the following is required:
 - A. Clear and grub site and prepare structural areas to receive fill or improvements. Dispose of trash, concrete, fences, and other deleterious material offsite.
 - B. Overexcavate any unsuitable materials from the influence of building pads and other structural areas.
11. Setbacks:

SETBACKS SHALL CONFORM TO DOUBLE DIAMOND RANCH PUD GUIDELINES.
12. Should any prehistoric or historic remains/artifacts be discovered during site development, work shall temporarily be halted at the specific site and the Department of Conservation and Natural Resources, Division of Historic Preservation and Archeology, shall be notified to record and photograph the site. The period of temporary delay shall be limited to a maximum of two (2) working days from the date of notification.
13. No materials of any kind shall be stockpiled or construction equipment parked on concrete or asphalt surfaces to be dedicated to the City of Reno.



LEGEND

□	TEST PIT 04-95
■	TEST PIT 11-95
▣	TEST PIT 01-96
⊕	BORING



Section 5

100
10-8-96

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 maintenancé 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 thirty (30) days from the date of this Agreement, the HOA shall establish and maintain an emergency reserve account (ERA) in the amount of ten thousand dollars (\$10,000.00). An account shall be established at Bank of America in the names of the HOA and the City of Reno. No funds shall be withdrawn from this account without the permission of the City of Reno.
- 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 City is not reimbursed pursuant to Paragraph 8, 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.

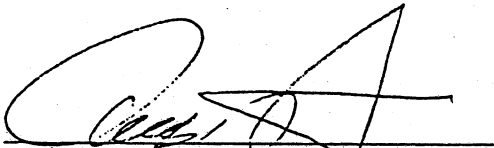
12. ACCESS RIGHTS FOR INSPECTION

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.

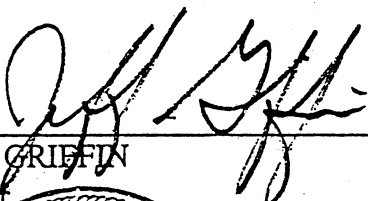
13.2. The City shall be furnished with a copy of the HOA's official budget year within 30 days of the beginning of the HOA's fiscal year.



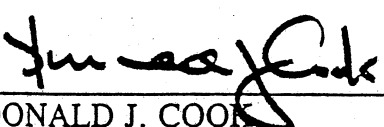
KREG D. ROWE, President
Double Diamond Ranch Master Association

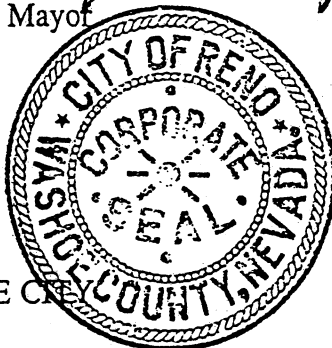
APPROVED THIS 8th DAY OF October, 1996.

CITY OF RENO

By: 
JEFF GRIFFIN
Mayor

ATTEST:


DONALD J. COOK
CITY CLERK AND CLERK OF THE COUNTY



APPROVED AS TO FORM ONLY

By: William Murano
WILLIAM MURANO
Chief Deputy City Attorney

Section 6



**SEA, INCORPORATED
CONSULTING ENGINEERS**

950 INDUSTRIAL WAY
SPARKS, NEVADA 89431-6092
(702) 358-6931
FAX: 358-6954

COPY

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Vice President

REMO U. OSMETTI
Secretary-Treasurer

ASSOCIATES

TERRENCE TOBEY, S.E., P.E.
Principal Engineer

RANDAL L. WALTER, AICP
Principal Planner

August 14, 1996
Project No. 2792-01-5

Mr. Bob Gottsacker, P.E.
Senior Civil Engineer
CITY OF RENO
Community Development - 1st Floor
Post Office Box 1900
Reno, Nevada 89505

**RE: Certification of Public Works Improvements
Double Diamond Channels
Reno, Nevada**

Dear Mr. Gottsacker:

This letter is a request for acceptance of the public improvements on the above referenced project. SEA, Incorporated, Consulting Engineers, the "project engineering" entity, has overseen the construction, inspection and testing of the work completed on this project.

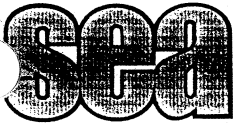
Sincerely,

Double Diamond Ranch LLC

Kraig Knudsen, Project Manager

The construction of public improvements have been completed and I, James G. Smith, P.E. certify that construction observation and testing as performed for this development was done in compliance with City standard inspection and testing policy and that to the best of my knowledge, information, and belief all work and materials incorporated therein conform to the requirements of the improvement plans of record, specifications, special provisions, statutes, applicable ordinances and policies of the City of Reno.

Attached are sepia-mylars of the "As-Built" Improvement Plans which will show all changes which were necessary and have been previously approved by your office.



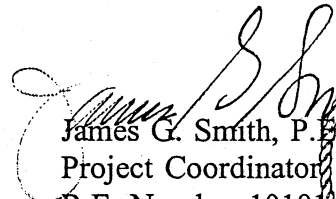
SEA, INCORPORATED
CONSULTING ENGINEERS

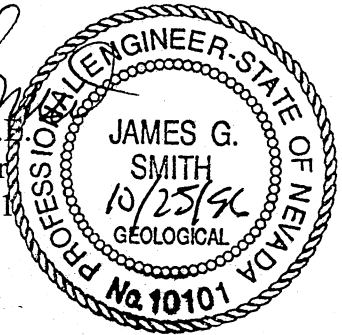
Mr. Bob Gottsacker, P.E.
Senior Civil Engineer
CITY OF RENO
Community Development - 1st Floor
August 14, 1996
Page 2


If there are any questions regarding this letter of certification, please contact the undersigned at SEA, Incorporated, 950 Industrial Way, Sparks, Nevada 89431, Telephone: (702) 358-6931. Your consideration in processing this matter is appreciated.

Sincerely,

SEA, INCORPORATED
Consulting Engineers


James G. Smith, P.E.
Project Coordinator
R.E. Number 10101




Arthur J. Sperber
Vice President

JGS:AJS:jwl
Enclosures

cc: Kraig Knudsen, Double Diamond Ranch LLC

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average .23 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.

1. This certification is in accordance with 44 CFR Ch. I, Section 65.2
2. I am licensed with an expertise in Geotechnical Engineering; Engineering Geology
[example: water resources (*hydrology, hydraulics, sediment transport, interior drainage*)* structural, geotechnical, land surveying.]
3. I have 20 years experience in the expertise listed above.
4. I have prepared reviewed the attached supporting data and analyses related to my expertise.
5. I have have not visited and physically viewed the project.
6. In my opinion, the following analyses and /or designs, is/are being certified:
Geotechnical Design of berms; quality control during construction
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 Review As-Built plans & Quality Control Records
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.

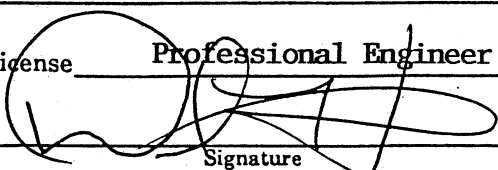
Name: Robert D. Hunter
(please print or type)

Title: Geological Engineer
(please print or type)

Registration No. 9343 Expiration Date: 6-97

State Nevada

Type of License Professional Engineer


Signature

10-25-96
Date

Seal
(Optional)

*Specify Subdiscipline

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



RENO/SPARKS... 950 INDUSTRIAL WAY - SPARKS, NV 89431-6092
 (702)358-6931 - FAX: 358-6954
 LAS VEGAS... 1100 GRIER DRIVE - LAS VEGAS, NV 89119
 (702)361-9050 - FAX: 361-0659
 PHOENIX... 2920 NORTH 24th AVENUE, #6 - PHOENIX, AZ
 85015-5948 - (602)257-4699 - FAX: 257-0106

Mr. Kraig Knudsen
 Double Diamond Ranch LLC
 501-A South Meadows Parkway
 Reno, Nevada 89502

FIELD DENSITY SURVEY
 Project Name: Double Diamond Construction
 Contractor: Peavine Construction
 Project No.: 2792-01-5

Test No.	Date Tested	LOCATION	*Elevation	In Place Dry Density lbs/cu.ft	In Place Moisture Content (%)	Optimum Moisture Content (%)	Maximum Dry Density lbs/cu.ft.	Relative Compaction (%)	Specified Relative Compaction (min.%)
		CHANNEL A - BERM							
		Station							
1	09-29-95	46+00 RT	2'BRG	81.4	12.5	32.0	84.1	97	95
2	09-29-95	45+00 RT	2'BRG	80.3	27.0	32.0	94.1	95	95
3	09-29-95	44+00 RT	2'BRG	81.2	26.8	32.0	84.1	97	95
4	09-29-95	42+00 RT	2'BRG	83.2	21.0	32.0	84.1	99	95
5	09-29-95	45+00 RT	1'BRG	80.0	24.6	32.0	84.1	95	95
6	09-29-95	41+00 RT	2'BRG	80.0	26.2	32.0	84.1	95	95
7	10-14-95	37+84 RT	7'BRG	102.1	14.3	14.9	107.9	95	95
8	10-14-95	37+00 RT	5.5'BRG	103.2	13.5	14.9	107.9	96	95
9	10-14-95	37+50 RT	4'BRG	102.3	14.7	14.9	107.9	95	95
10	10-14-95	37+00 RT	4'BRG	102.6	15.1	14.9	107.9	95	95
11	10-14-95	37+00 RT	2.5'BRG	104.1	14.4	14.9	107.9	96	95
12	10-14-95	37+50 RT	1'BRG	102.7	14.6	14.9	107.9	95	95
13	10-14-95	37+00 RT	RG	103.2	15.1	14.9	107.9	96	95
14	10-14-95	37+50 RT	RG	103.4	13.7	14.9	107.9	96	95
15	10-17-95	39+00 RT	5'BRG	95.6	20.0	23.7	98.1	97	95
16	10-17-95	37+50 RT	RG	94.3	18.2	23.7	98.1	96	95
17	10-17-95	36+75 RT	5'BRG	93.1	19.3	23.7	98.1	95	95
18	10-17-95	35+00 RT	5'BRG	93.2	18.7	23.7	98.1	95	95
19	10-18-95	38+00 RT	4'BRG	93.2	17.3	23.7	98.1	95	95
20	10-18-95	36+00 RT	4'BRG	95.7	19.4	23.7	98.1	98	95
21	10-18-95	34+00 RT	4'BRG	93.4	19.2	23.7	98.1	95	95
22	10-18-95	33+00 RT	4'BRG	101.9	13.5	14.9	107.9	95	95
23	10-18-95	30+00 RT	3'BRG	102.6	13.7	14.9	107.9	95	95
24	10-18-95	27+00 RT	3'BRG	90.7	22.7	24.1	95.9	95	95

No representation is made of the fill except as expressly set forth in this report.

*NOTE:
 RG = ROUGH GRADE
 BC = BASE COURSE
 SG = SUBGRADE
 FG = FINISH GRADE
 OG = ORIGINAL GRADE
 FIG = FOOTING GRADE
 PG = PAD GRADE
 FF = FINISH FLOOR
 (PREFIX 'B' = DEPTH BELOW REFERENCED LEVEL)

SEA, INCORPORATED - QUALITY CONTROL DIVISION

Form No. QCP-2.4(7/8)

James G. Smith
 James G. Smith, P.E.

cc:



RENO/SPARKS... 950 INDUSTRIAL WAY - SPARKS, NV 89431-6092
 (702)356-6931 - FAX: 358-6954
 LAS VEGAS... 1100 GRIER DRIVE - LAS VEGAS, NV 89119
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 PHOENIX... 2920 NORTH 24th AVENUE, #6 - PHOENIX, AZ
 85015-5948 - (602)257-4699 - FAX: 257-0106

Mr. Craig Knudsen
 Double Diamond Ranch LLC
 501-A South Meadows Parkway
 Reno, Nevada 89502

FIELD DENSITY SUMMARY
 Project Name: Double Diamond Channels
 Contractor: Peavine Construction
 Project No.: 2792-01-5

Test No.	Date Tested	LOCATION	*Elevation	In Place Dry Density lbs/cu.ft	In Place Moisture Content (%)	Optimum Moisture Content (%)	Maximum Dry Density lbs/cu.ft.	Relative Compaction (%)	Specified Relative Compaction (min. %)
		<u>CHANNEL A - BERM</u>							
		<u>Station</u>							
25	10-18-95	25+00 RT	3'BRG	94.0	18.7	24.1	95.9	98	95
26	10-18-95	23+00 RT	2'BRG	91.1	17.0	24.1	95.9	95	95
27	10-18-95	39+00 RT	3'BRG	92.2	15.2	24.1	95.9	96	95
28	10-18-95	36+00 RT	3'BRG	93.6	16.6	24.1	95.9	98	95
29	10-18-95	32+00 RT	RG	92.0	20.0	24.1	95.9	95	95
30	10-19-95	39+00 RT	2'BRG	94.7	18.3	20.8	99.6	95	95
31	10-19-95	36+00 RT	RG	95.3	19.2	20.8	99.6	96	95
32	10-19-95	32+00 RT	3'BRG	95.7	17.3	20.8	99.6	96	95
33	10-19-95	28+00 RT	3'BRG	97.3	18.1	21.2	101.1	96	95
34	10-19-95	25+00 RT	3'BRG	96.2	17.3	21.2	101.1	95	95
35	10-19-95	30+00 RT	3'BRG	97.4	17.6	21.2	101.1	96	95
36	10-19-95	21+00 RT	3'BRG	103.4	10.5	16.0	108.8	95	95
37	10-19-95	23+00 RT	3'BRG	105.8	15.3	16.0	108.8	97	95
38	10-19-95	30+00 RT	3'BRG	103.8	16.2	16.0	108.8	95	95
39	10-19-95	33+00 RT	3'BRG	104.2	14.5	16.0	108.8	96	95
40	10-19-95	28+00 RT	3'BRG	103.1	14.7	16.0	108.8	95	95
41	10-19-95	39+00 RT	3'BRG	103.8	15.0	16.0	108.8	95	95
42	10-20-95	38+00 RT	2'BRG	103.6	14.2	16.0	108.8	95	95
43	10-20-95	35+00 RT	2'BRG	102.8	11.6	16.0	108.8	95	95
44	10-20-95	33+00 RT	2'BRG	106.0	15.0	16.0	108.8	97	95
45	10-21-95	35+00 LT	6'BRG	104.9	8.9	16.0	108.8	96	95
46	10-21-95	34+00 LT	6'BRG	103.7	9.8	16.0	108.8	95	95
47	10-21-95	31+00 LT	5'BRG	105.0	13.5	15.0	108.8	97	95
48	10-21-95	28+00 LT	5'BRG	104.2	10.1	16.0	108.8	96	95

No representation is made of the fill except as expressly set forth in this report.

*NOTE: RG=ROUGH GRADE
 BC=BASE COURSE
 SG=SUBGRADE
 FG=FINISH GRADE
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 (PREFIX 'B'=DEPTH BELOW REFERENCED LEVEL)

Form No. QCP-2.4(7/88)

SEA, INCORPORATED - QUALITY CONTROL DIVISION

James G. Smith
 James G. Smith, P.E.