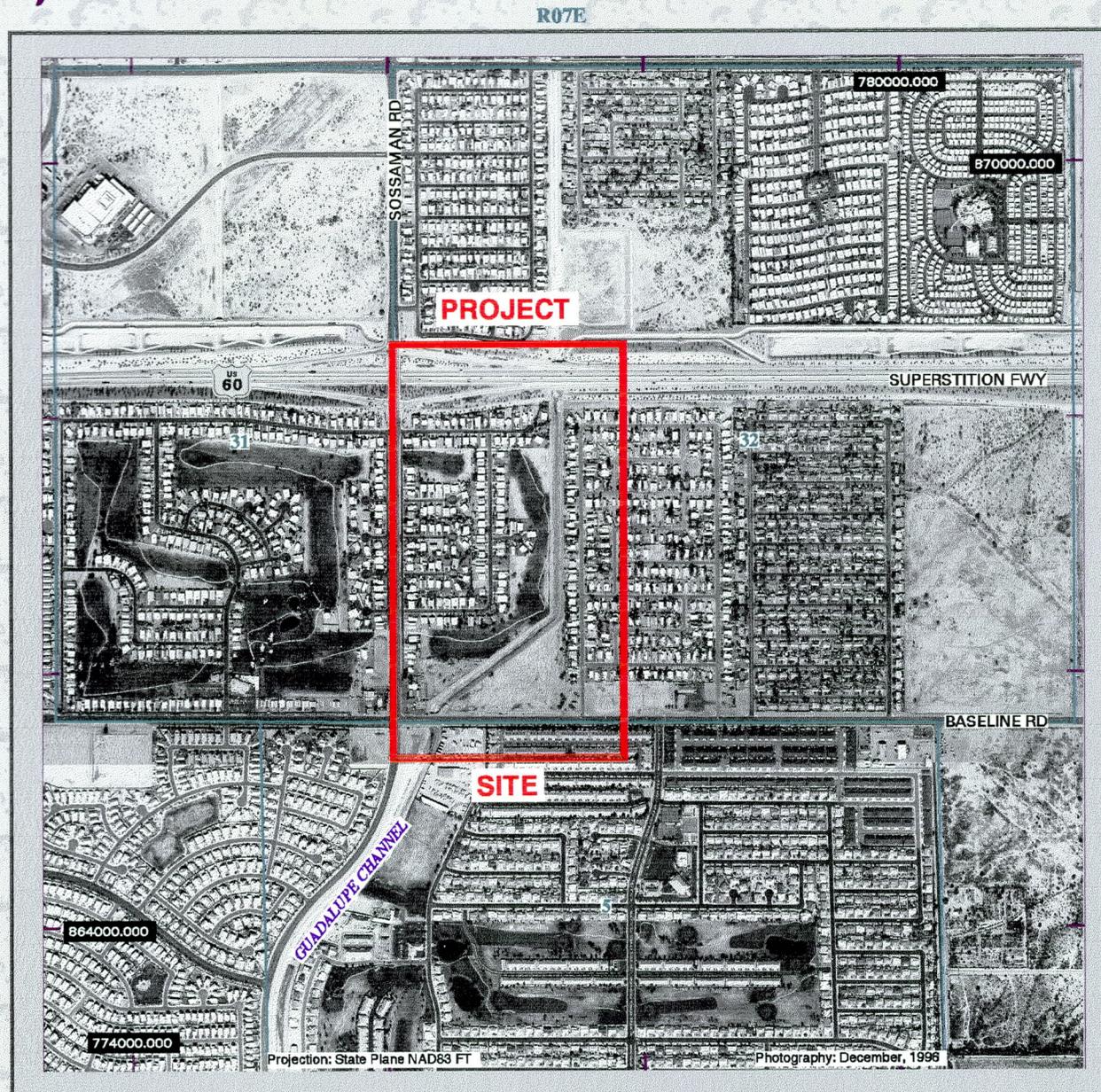


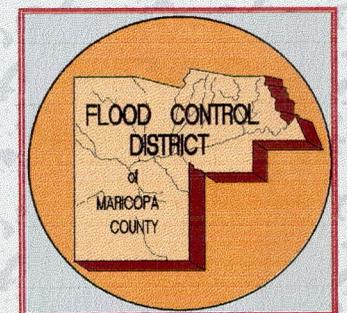
SOSSAMAN CHANNEL U.S. 60 TO BASELINE RD DESIGN REPORT

AUGUST, 1997

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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION
PROJECT No. **108010**



SOSSAMAN CHANNEL, U.S. 60 TO Baseline Road

DESIGN REPORT



MARCH 1998

Prepared For:
Flood Control District of Maricopa County
2801 West Durango
Phoenix, Arizona 85009
Michael S. Enggood, P.E.
Chief Engineer & General Manager

Prepared by:
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Flood Control District of Maricopa County



Jeffrey R. Riddle

FCD Project No. 108010

SOSSAMAN CHANNEL, U.S. 60 TO Baseline Road
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Sossaman Channel Design Report

US 60 TO BASELINE ROAD

1.0 Project Description

1.1 General Description

The Sossaman channel drains an area of east Mesa, which is roughly bounded by the Central Arizona Project Canal to the north, Ellsworth road to the east, and Sossaman Road on the west. The watershed consists of mostly residential and light business developments, with some undeveloped areas interspersed throughout. In general, the land slopes from the northeast to the southwest, and runoff, beginning as sheetflow, rapidly becomes channeled with flows passing into the Sossaman Channel, the Guadalupe Channel, the East Maricopa Floodway, and ultimately the Gila River. Most reaches of these drainageways have been improved to ensure acceptable levels of protection for surrounding residential and business areas. This segment has not yet been improved.

1.2 Location

The project is located in east Mesa, in Section 32, Township 1 North, Range 7 East of the Gila and Salt Base and Meridian. The project extends between US Highway 60 (the Superstition Freeway) and Baseline Road and is just east of Sossaman Road.

1.3 Purpose

The purpose of this report is to evaluate existing channel conditions, and present a design for the unimproved reach which will provide an acceptable level of protection to surrounding residential and business areas, based upon the best available information and current design standards.

1.4 Field Conditions

Existing Channel Conditions

The existing channel is an earth trapezoid, approximately 15 to 25 feet wide at the bottom, 70 wide at the top, 5 to 10 feet deep with 3:1 side slopes. The channel is approximately 2,840 feet long, and has a fall over that length of approximately 21 feet. The channel alignment has two significant bends each of approximately 125 degrees. One is located approximately 1,200 feet from the downstream end and the other is located at the downstream end.

Field investigation made in January of 1997 showed that the channel had eroded in some locations, and silted in at others. There appeared to be a general lack of flow capacity for the channel segment immediately below the Superstition Freeway box culverts, near the north end of the reach. Sedimentation there had made the channel roughly 5' deep. About halfway down the channel at the major bend, the channel had deepened due to erosion and scour. Some dumped riprap, which had been placed along the embankment, had failed and was found scattered along the channel bottom. Near the south end of the reach, water was standing in the channel, suggesting an adverse grade. It hadn't rained in several days, indicating that the channel bottom was nearly impervious.

The HECRAS model for the Existing condition shows the following problems.

1. At construction stations 11+00 to 15+00 the channel has 0 feet to less than 1 foot of freeboard.
2. Erosive velocities are in the range of 5 fps. The existing channel velocities exceed 15 fps.

The condition of the existing study reach combined with hydraulic analysis (see HECRAS model Existing condition, Appendix I), indicate that the channel will not safely contain 100-year flows due to highly erosive flow velocities and erodible embankments. Therefore, under current conditions the study reach is a hazard to surrounding properties.

Additional Existing Drainage Features

- 1) Near the north end of the reach, at about station 10+20, a 36" RCP drains into the channel from the east. This pipe drains the eastbound embankment of the superstition freeway. The pipe is located above the area proposed for construction, therefore, no replacement will be required.
- 2) A shotcrete-lined spillway drains into the channel near station 37+95. This spillway drains local runoff from the small drainage area from the east embankment of the Sossaman channel to 78th street. The proposed channel includes a catch basin to intercept this drainage.
- 3) Two 52-inch RGRCP's drain into the channel near station 39+00. The pipes are located below any proposed structures and therefore will not need replacement.

1.5 Rights-of-way

A temporary construction easement is required at the bend in the channel at approximately station 27+00.

All other land required for this project is currently owned by the Flood Control District of Maricopa County. Therefore, no conflicts are anticipated. Design plans will be forwarded to ADOT, the City of Mesa, and the various utilities involved to ensure their

understanding of the project and to incorporate any comments they may have regarding the proposed design.

1.6 Utility Conflicts

Utility companies and municipalities were contacted early in the study process in order to obtain information regarding utilities they control within the study area. The impact of utility conflicts for this project is minimal. The following list describes those utilities currently identified, which are affected by the project:

- 1) Two City of Mesa water main lines which cross under the channel have been identified. The first is an 8" DIP that runs east to west near station 13+95. As-built plans show the pipe needs to be lowered for this project. This work has been included in the plans. The second pipe is an 8" PVC pipe that runs southeast to northwest near station 39+10. This pipe is under existing channel lining that is not being disturbed. There will be no conflict.
- 2) A 2" ABS gas service line runs north to south along the east embankment of the channel from about station 18+80 to 26+80. No conflicts are anticipated.
- 3) A 2" to 3" underground cable TV line run north to south along the east edge of the channel right-of-way. No conflicts are anticipated.
- 4) SRP has three power lines in the area. The first is a 12KV overhead line, which runs just within the east edge of the right-of-way, and does not conflict with channel improvements. However, caution should be used and is noted on the plans. The second is an underground line, which crosses under the channel from east to west near station 19+30. Potholing shows that this line needs to be lowered prior to construction. The third line runs southeast to northwest under the channel near station 10+90. It too should be potholed.
- 5) ADOT has both power and irrigation lines that run under the channel near station 10+20. These lines are outside the limits of this project.
- 6) No conflicts are anticipated with any US West lines.

2.0 Study Methodology

2.1 Hydrologic Analysis

The original design discharge information for the Sossaman Channel was generated in the late 1980's and early 1990's in a regional hydrological study entitled, "East Maricopa Area Drainage Master Study". Since that study was completed, ADOT has extended US

Highway 60 through the area and constructed a basin north of the study reach. This has had the effect of reducing the 100-year design discharge to 1800 cfs (see report by Kimley-Horn, FCD 94-10).

No additional hydrologic analysis was done for this project.

2.2 Hydraulic Analysis

The Corp of Engineers computer model, HECRAS, was used to hydraulically model flows within the study reach for the existing channel (see Appendix I). HECRAS was also used to model the proposed channel improvements (see Appendix II).

A subcritical flow regime was the goal for the proposed design because supercritical flow is discouraged in an urbanized area, and supercritical flow is not recommended in channels with bends, especially if other than a vertical wall is used. For the subcritical flow channel, the Froude number would be kept under 0.86, and flow velocities would:

- 1) Be kept above 3 fps for the 10-year discharge (estimated as 720 cfs, or 40% of the 100-year discharge), and,
- 2) Would not exceed the pre-project velocity at the Baseline Box culvert outlet.

2.3 Design Alternatives

The design discharge of 1800 cfs was applied to numerous hydraulic design alternatives to determine the most efficient, safe, and cost effective design. Among those designs that looked most promising, the following are noted:

- 1) Earth lined trapezoidal channel.

This section had 4:1 side slopes and required low flow velocities to maintain the channel bed and embankment integrity. This channel would require expensive maintenance, which would not solve the existing maintenance problem. For this reason, an earth-lining alternative was not considered further.

- 2) Concrete lined rectangular channel with one drop.

A 32-foot wide channel with 8-foot vertical walls was evaluated as an alternate. The advantages to this design are as follows:

1. This design leaves a strip of land 26 feet wide between the right-of-way and the access road that can be used for a landscape buffer.
2. An access road is provided on each side of the channel without requiring any additional right-of-way.

3. Graffiti on the channel walls will not be seen easily.

The disadvantage to this design is a higher construction cost than for a trapezoidal section and the flow regime is supercritical except at the outlet. The estimated construction cost for this alternate is \$1,690,489.50 (see Figure 1).

3. Concrete lined trapezoidal channel with several sloping drops.

The estimated construction cost for this alternate is \$1,169,413.50 (see Figure 2). This design was selected since it was much less costly than the above rectangular section. This design is further described below.

2.4 Proposed Improvements

The proposed improved channel section is a trapezoidal section having a bottom width of 24 feet and 2:1 side slopes. The height of the Channel varies from a minimum of 8 feet to a maximum of 12 feet. There are five sloping drop structures with a minimum drop of 3 feet and a maximum drop of 4 feet. A complete set of construction plans for the channel is in Appendix III.

3.0 Construction Cost Estimate

The estimated construction cost for the recommended trapezoidal design is \$1,169,413.50 and is shown in Figure 2.

The estimated construction cost for a rectangular section design is \$1,690,489.50 and is shown in Figure 1.

4.0 Construction Special Provisions

A complete set of construction special provisions is included in this report as Appendix IV.

5.0 Supplementary General Conditions

A complete set of supplementary general conditions is included in this report as Appendix V.

6.0 Coordinate Geometry

The Coordinate Geometry calculations (COGO) are included in this report as Appendix VI.



APPENDIX I

HECRAS

EXISTING CHANNEL

Model: Existing

Existing Condition

11-03-97

HEC-RAS Plan: Plan 01 Reach: Basline-US60 11/3/97

River Sta.	Q Total (cfs)	Min Chl El (ft)	W.S. Elev (ft)	Grit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
2500	1800.00	1400.50	1406.27	1404.90	1407.17	0.003400	7.60	236.81	52.74	0.63
2300	1800.00	1399.90	1404.90	1404.68	1406.15	0.007744	8.98	200.44	66.86	0.91
2900	1800.00	1397.20	1402.87	1402.02	1403.70	0.004508	7.30	246.45	74.71	0.71
2500	1800.00	1394.80	1399.71	1399.71	1401.11	0.009565	9.49	189.67	68.38	1.00
2200	1800.00	1391.40	1397.26	1396.65	1398.24	0.005538	7.96	226.26	70.29	0.78
1900	1800.00	1390.00	1395.66	1394.95	1396.65	0.005121	7.97	225.95	65.83	0.76
1765	1800.00	1388.00	1394.15	1394.15	1395.84	0.009152	10.42	172.80	51.44	1.00
1300	1800.00	1380.30	1385.04	1386.29	1388.96	0.025714	15.88	113.33	38.69	1.64
1000	1800.00	1379.80	1385.42	1385.31	1386.99	0.008327	10.03	179.44	52.86	0.96
800	1800.00	1379.30	1384.88	1383.80	1385.68	0.003774	7.14	252.01	68.75	0.66
625	1800.00	1379.40	1384.41	1382.99	1385.06	0.002855	6.45	279.11	70.11	0.57
560	1800.00	1378.26	1383.79	1382.23	1384.82	0.002764	8.14	221.12	55.16	0.75
515	Culvert									
480	1800.00	1377.70	1382.53	1381.66	1383.88	0.004326	9.31	193.30	64.15	0.75
420	1800.00	1377.46	1382.07	1381.12	1382.96	0.004146	7.58	237.49	63.05	0.69
220	1800.00	1377.31	1380.97	1380.97	1382.52	0.003383	10.01	179.77	58.29	1.00

HEC-RAS Version 1.2 April 1996
 U.S. Army Corp of Engineers
 Hydrologic Engineering Center
 609 Second Street, Suite D
 Davis, California 95616-4687
 (916) 756-1104

```

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

Project Title: existing
 Project File : existing.prj
 Run Date and Time: 11/3/97 2:19:00 PM

Project in English units

GEOMETRY DATA

Geometry Title: existing geometry
 Geometry File : c:\rph\sossaman\hecras\existing.g01

CROSS SECTION INPUT Reach: Basline-US60 River Station: 3500
 Description: x-sectn

Station Elevation Data, num = 8

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
981	1408.3	985.9	1408.4	986	1407.5	1000	1400.5	1030	1400.6
1045	1408.2	1048	1408.2	1071	1406.6				

Manning's n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
981	.045	986	.03	1045	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	986	1045		200	200	200	.1 .3

CROSS SECTION INPUT Reach: Basline-US60 River Station: 3300
 Description: x-sect

Station Elevation Data, num = 8

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
938	1407.3	942	1406.7	952	1406.1	985	1400.1
1027	1405.2	1043	1405.6	1048	1405.2	1000	1399.9

Manning's n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
938	.045	952	.03	1027	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	952	1027		400	400		.1	.3

CROSS SECTION INPUT Reach: Basline-US60 River Station: 2900
Description: x-sectn

Station Elevation Data, num = 6

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
948	1403	965	1403	1000	1397.2	1015	1397.6	1043	1403.4
1064	1403								

Manning's n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
948	.045	965	.03	1043	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	965	1043		400	400		.1	.3

CROSS SECTION INPUT Reach: Basline-US60 River Station: 2500
Description: x-sectn

Station Elevation Data, num = 6

Sta.	Elev.								
941	1400.5	957	1400.4	988	1395.2	1000	1394.8	1033	1400.3
1054	1400.4								

Manning's n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
941	.045	957	.03	1033	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	957	1033		300	300		.1	.3

CROSS SECTION INPUT Reach: Basline-US60 River Station: 2200
Description: x-sectn

Station Elevation Data, num = 6

Sta.	Elev.								
936	1398.2	953	1398.4	991	1391.7	1000	1391.4	1033	1397.9
1054	1398.7								

Manning's n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
936	.045	953	.03	1033	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	953	1033		300	300		.1	.3

CROSS SECTION INPUT Reach: Basline-US60 River Station: 1900
Description: x-sectn

Station Elevation Data, num = 7

Sta.	Elev.								
------	-------	------	-------	------	-------	------	-------	------	-------

940	1397.3	960	1397.4	993	1390	1000	1390	1007	1390
1038	1396.6	1060	1397.9						

Manning's n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
940	.045	960	.03	1038	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	960	1038		90	110	135	.1	.3

CROSS SECTION INPUT Reach: Basline-US60 River Station: 1765
Description: x-sectn

Station Elevation Data, num = 8

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
957	1397.2	970	1397	1000	1388	1010	1389	1030	1394
1036	1395	1060	1396	1090	1396.5				

Manning's n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
957	.045	970	.03	1060	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	970	1060		455	465	482	.1	.3

CROSS SECTION INPUT Reach: Basline-US60 River Station: 1300
Description: x-sectn

Station Elevation Data, num = 7

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
946	1393	957	1392.7	992	1381	1000	1380.3	1008	1381.3
1040	1392.6	1066	1392						

Manning's n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
946	.045	957	.03	1040	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	957	1040		300	300	300	.1	.3

CROSS SECTION INPUT Reach: Basline-US60 River Station: 1000
Description: x-sectn

Station Elevation Data, num = 7

Sta.	Elev.								
942	1390.9	954	1390.1	992	1380.5	1000	1379.8	1010	1380.6
1039	1389.7	1062	1389.5						

Manning's n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
942	.045	954	.03	1039	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	954	1039		200	200	200	.1	.3

CROSS SECTION INPUT Reach: Basline-US60 River Station: 800
Description: x-sectn

Station Elevation Data, num = 7

Sta.	Elev.								
934	1389.1	947	1388	988	1379.7	1000	1379.3	1015	1379.8
1042	1388.3	1060	1388.1						

Manning's n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
934	.045	947	.03	1042	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	947	1042		187	175		.1	.3

CROSS SECTION INPUT Reach: Basline-US60 River Station: 625
Description: Before contraction

Station Elevation Data, num = 9

Sta.	Elev.								
935	1388.5	951	1388	975	1383	988	1379.6	1000	1379.4
1036	1380	1039	1385.7	1042	1387.2	1056	1387.7		

Manning's n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
935	.045	951	.03	1042	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	951	1042		93	72		.1	.3

CROSS SECTION INPUT Reach: Basline-US60 River Station: 550
Description: upstream of Box

Station Elevation Data, num = 9

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
966	1387.2	976.5	1378.26	992.5	1378.26	994.5	1378.26	1000	1378.26
1022	1378.26	1027	1387	1028	1387.02	1038	1387.2		

Manning's n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
966	.045	966	.03	1028	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	966	1028		70	70		.3	.5

Ineffective Flow Areas, num = 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
966	980	1387.2	1020	1038	1387.2

CULVERT INPUT Reach: Basline-US60 River Station: 515
Description: 4-8' x 10' RCBC

Distance from Upstream XS = 0
 Deck/Roadway Width = 70
 Weir Coefficient = 2.6
 Bridge Deck/Roadway Skew =

Upstream Deck/Roadway Coordinates, num = 4

Sta.	Hi Cord	Lo Cord	Sta.	Hi Cord	Lo Cord	Sta.	Hi Cord	Lo Cord
944	1387.2	1377	990	1387.2	1377	1020	1387.2	1377

1055 1387.2 1377
 Downstream Deck/Roadway Coordinates, num = 4
 Sta. Hi Cord Lo Cord Sta. Hi Cord Lo Cord Sta. Hi Cord Lo Cord

 944 1387.2 1377 990 1387.2 1377 1020 1387.2 1377
 1055 1387.2 1377
 Elevation at which weir flow begins =
 Maximum allowable submergence for weir flow = .95
 Submergence criteria :Broad Crested

Number of Culverts = 1

Culvert Name Shape Rise Span
 Culvert #1 Box 8 10
 FHWA Chart # 8 - flared wingwalls
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
 Culvert Length n Value Entrance Loss Coef Exit Loss Coef
 70 .018 .3 .5

Number of Barrels = 4
 Upstream Elevation = 1378.26
 Centerline Stations

Sta. Sta. Sta. Sta.
 985 995 1005 1015

Downstream Elevation = 1377.72
 Centerline Stations

Sta. Sta. Sta. Sta.
 985 995 1005 1015

CROSS SECTION INPUT Reach: Basline-US60 River Station: 480
 Description: Third, culvert outlet

Station Elevation Data, num = 6
 Sta. Elev. Sta. Elev. Sta. Elev. Sta. Elev. Sta. Elev.
 944.31 1388.18 954.31 1387.98 980 1377.7 1020 1377.7 1045.69 1387.98
 1055.69 1388.18

Manning's n Values, num = 3
 Sta. Value Sta. Value Sta. Value
 944.31 .045 954.31 .03 1045.69 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 954.31 1045.69 135 163 191 .3 .5

Ineffective Flow Areas, num = 2
 Sta L Sta R Elev Sta L Sta R Elev

 944.31 980 1387.2 1020 1055.69 1387.2

CROSS SECTION INPUT Reach: Basline-US60 River Station: 320
 Description: second cross section

Station Elevation Data, num = 6
 Sta. Elev. Sta. Elev. Sta. Elev. Sta. Elev. Sta. Elev.
 944.95 1387.68 954.95 1387.48 980 1377.46 1020 1377.46 1045.05 1387.48
 1055.05 1387.68

Manning's n Values, num = 3
 Sta. Value Sta. Value Sta. Value

944.95 .045 954.95 .03 1045.05 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
954.95 1045.05 100 100 100 .1 .3

CROSS SECTION INPUT Reach: Basline-US60 River Station: 220
Description: Beginning

Station Elevation Data, num = 6

Sta. Elev. Sta. Elev. Sta. Elev. Sta. Elev. Sta. Elev.
945.35 1387.37 955.35 1387.17 980 1377.31 1020 1377.31 1044.65 1387.17
1054.65 1387.37

Manning's n Values, num = 3

Sta. Value Sta. Value Sta. Value
945.35 .018 955.35 .018 1044.65 .018

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
955.35 1044.65 0 0 0 .1 .3

SUMMARY OF MANNING'S N VALUES

* Reach * River Sta. * n1 * n2 * n3 *

Basline-US60 3500 * .045* .03* .045*
Basline-US60 3300 * .045* .03* .045*
Basline-US60 2900 * .045* .03* .045*
Basline-US60 2500 * .045* .03* .045*
Basline-US60 2200 * .045* .03* .045*
Basline-US60 1900 * .045* .03* .045*
Basline-US60 1765 * .045* .03* .045*
Basline-US60 1300 * .045* .03* .045*
Basline-US60 1000 * .045* .03* .045*
Basline-US60 800 * .045* .03* .045*
Basline-US60 625 * .045* .03* .045*
Basline-US60 550 * .045* .03* .045*
Basline-US60 515 * Culvert* * *
Basline-US60 480 * .045* .03* .045*
Basline-US60 320 * .045* .03* .045*
Basline-US60 220 * .018* .018* .018*

SUMMARY OF REACH LENGTHS

* Reach * River Sta. * Left * Channel* Right *
Basline-US60 3500 * 200* 200* 200*
Basline-US60 3300 * 400* 400* 400*
Basline-US60 2900 * 400* 400* 400*
Basline-US60 2500 * 300* 300* 300*
Basline-US60 2200 * 300* 300* 300*
Basline-US60 1900 * 90* 110* 135*

Baseline-US60	1765	*	455*	465*	482*
Baseline-US60	1300	*	300*	300*	300*
Baseline-US60	1000	*	200*	200*	200*
Baseline-US60	800	*	187*	175*	162*
Baseline-US60	625	*	93*	72*	41*
Baseline-US60	550	*	70*	70*	70*
Baseline-US60	515	*	Culvert*	*	*
Baseline-US60	480	*	135*	163*	191*
Baseline-US60	320	*	100*	100*	100*
Baseline-US60	220	*	0*	0*	0*

Profile Output Table - Standard Table 1

* River Sta.	* Q Total	*Min Ch El	*W.S. Elev	*Crit W.S.	*E.G. Elev	*E.G. Slope
* Vel Chnl	*Flow Area	*Top Width	*Froude #	* Chl		
	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)
(ft/s)	(sq ft)	(ft)				
3500	1800.00	1400.50	1406.27	1404.90	1407.17	0.003400
7.60	236.81	52.74	0.63			
3300	1800.00	1399.90	1404.90	1404.68	1406.15	0.007744
8.98	200.44	66.86	0.91			
2900	1800.00	1397.20	1402.87	1402.02	1403.70	0.004508
7.30	246.45	74.71	0.71			
2500	1800.00	1394.80	1399.71	1399.71	1401.11	0.009565
9.49	189.67	68.38	1.00			
2200	1800.00	1391.40	1397.26	1396.65	1398.24	0.005538
7.96	226.26	70.29	0.78			
1900	1800.00	1390.00	1395.66	1394.95	1396.65	0.005121
7.97	225.95	65.83	0.76			
1765	1800.00	1388.00	1394.15	1394.15	1395.84	0.009152
10.42	172.80	51.44	1.00			
1300	1800.00	1380.30	1385.04	1386.29	1388.96	0.025714
15.88	113.33	38.69	1.64			
1000	1800.00	1379.80	1385.42	1385.31	1386.99	0.008327
10.03	179.44	52.86	0.96			
800	1800.00	1379.30	1384.88	1383.80	1385.68	0.003774
7.14	252.01	68.75	0.66			
625	1800.00	1379.40	1384.41	1382.99	1385.06	0.002855
6.45	279.11	70.11	0.57			
550	1800.00	1378.26	1383.79	1382.23	1384.82	0.002764
8.14	221.12	55.16	0.75			
515	Culvert					
480	1800.00	1377.70	1382.53	1381.66	1383.88	0.004326
9.31	193.30	64.15	0.75			
320	1800.00	1377.46	1382.07	1381.12	1382.96	0.004146
7.58	237.49	63.05	0.69			
220	1800.00	1377.31	1380.97	1380.97	1382.52	0.003383
10.01	179.77	58.29	1.00			

ERRORS WARNINGS AND NOTES

Errors Warnings and Notes for Plan : Plan 01

Summary for Profiles:1

Reach: Basline-US60 Riv Sta: 320 Profile: 1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Reach: Basline-US60 Riv Sta: 515 Profile: 1

Note - During the backwater through the culvert the solution went to critical depth. The program then assumed critical depth at the inlet.

Reach: Basline-US60 Riv Sta: 1000 Profile: 1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning - The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Reach: Basline-US60 Riv Sta: 1300 Profile: 1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning - The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Note - Program found supercritical flow starting at this cross section.

Reach: Basline-US60 Riv Sta: 1765 Profile: 1

Warning - The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning - The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning - During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Reach: Basline-US60 Riv Sta: 1900 Profile: 1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross

sections.

Reach: Basline-US60 Riv Sta: 2200 Profile: 1

Warning - The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Reach: Basline-US60 Riv Sta: 2500 Profile: 1

Warning - The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning - The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning - During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Reach: Basline-US60 Riv Sta: 2900 Profile: 1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning - The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Reach: Basline-US60 Riv Sta: 3300 Profile: 1

Warning - The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Reach: Basline-US60 Riv Sta: 3500 Profile: 1

Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning - The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Elevation at which weir flow begins =
 Maximum allowable submergence for weir flow = .95
 Submergence criteria :Broad Crested

Number of Culverts = 1

Culvert Name Shape Rise Span
 Culvert #1 Box 8 10
 FHWA Chart # 8 - flared wingwalls
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
 Culvert Length n Value Entrance Loss Coef Exit Loss Coef
 70 .018 .3 .5

Number of Barrels = 4
 Upstream Elevation = 1378.26

Centerline Stations
 Sta. Sta. Sta. Sta.
 985 995 1005 1015

Downstream Elevation = 1377.72

Centerline Stations
 Sta. Sta. Sta. Sta.
 985 995 1005 1015

CROSS SECTION INPUT Reach: Basline-US60 River Station: 480
 Description: Third, culvert outlet

Station Elevation Data, num = 6
 Sta. Elev. Sta. Elev. Sta. Elev. Sta. Elev. Sta. Elev.
 944.31 1388.18 954.31 1387.98 980 1377.7 1020 1377.7 1045.69 1387.98
 1055.69 1388.18

Manning's n Values, num = 3
 Sta. Value Sta. Value Sta. Value
 944.31 .045 954.31 .03 1045.69 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 954.31 1045.69 135 163 191 .3 .5

Ineffective Flow Areas, num = 2
 Sta L Sta R Elev Sta L Sta R Elev

 944.31 980 1387.2 1020 1055.69 1387.2

CROSS SECTION INPUT Reach: Basline-US60 River Station: 320
 Description: second cross section

Station Elevation Data, num = 6
 Sta. Elev. Sta. Elev. Sta. Elev. Sta. Elev. Sta. Elev.
 944.95 1387.68 954.95 1387.48 980 1377.46 1020 1377.46 1045.05 1387.48
 1055.05 1387.68

Manning's n Values, num = 3
 Sta. Value Sta. Value Sta. Value
 944.95 .045 954.95 .03 1045.05 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 954.95 1045.05 100 100 100 .1 .3

CROSS SECTION INPUT Reach: Basline-US60 River Station: 220

Description: Beginning

Station Elevation Data, num = 6

Sta.	Elev.	Sta.	Elev.	Sta.	Elev.	Sta.	Elev.
945.35	1387.37	955.35	1387.17	980	1377.31	1020	1377.31
1054.65	1387.37					1044.65	1387.17

Manning's n Values, num = 3

Sta.	Value	Sta.	Value	Sta.	Value
945.35	.018	955.35	.018	1044.65	.018

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	955.35	1044.65		0	0		.1	.3

SUMMARY OF MANNING'S N VALUES

* Reach	* River Sta.	* n1	* n2	* n3
Basline-US60	724.9	* .045*	.016*	.045*
Basline-US60	675	* .045*	.016*	.045*
Basline-US60	625	* .045*	.016*	.045*
Basline-US60	550	* .045*	.016*	.045*
Basline-US60	515	* Culvert*	*	*
Basline-US60	480	* .045*	.03*	.045*
Basline-US60	320	* .045*	.03*	.045*
Basline-US60	220	* .018*	.018*	.018*

SUMMARY OF REACH LENGTHS

* Reach	* River Sta.	* Left	* Channel	* Right
Basline-US60	724.9	* 49.9*	49.9*	49.9*
Basline-US60	675	* 50*	50*	50*
Basline-US60	625	* 93*	72*	41*
Basline-US60	550	* 70*	70*	70*
Basline-US60	515	* Culvert*	*	*
Basline-US60	480	* 135*	163*	191*
Basline-US60	320	* 100*	100*	100*
Basline-US60	220	* 0*	0*	0*

Profile Output Table - Standard Table 1

* River Sta.	* Q Total	*Min Ch El	*W.S. Elev	*Crit W.S.	*E.G. Elev	*E.G. Slope
* Vel Chnl	*Flow Area	*Top Width	*Froude	# Chl		
	(cfs)	(ft)	(ft)		(ft)	(ft/ft)
(ft/s)	(sq ft)	(ft)				


```

* 724.9 * 1800.00 * 1379.60 * 1383.91 * 1383.51 * 1385.29 * 0.002100
* 9.45 * 190.56 * 50.12 * 0.85 *
* 675 * 1800.00 * 1379.50 * 1383.78 * 1383.41 * 1385.18 * 0.002151
* 9.52 * 189.10 * 50.12 * 0.86 *
* 625 * 1800.00 * 1379.40 * 1384.18 * 1382.99 * 1384.91 * 0.000964
* 6.84 * 263.05 * 68.88 * 0.62 *
* 550 * 1800.00 * 1378.26 * 1383.79 * 1382.23 * 1384.82 * 0.000786
* 8.14 * 221.12 * 55.16 * 0.75 *
* 515 * Culvert * * * *
* * * * *
* 480 * 1800.00 * 1377.70 * 1382.53 * 1381.66 * 1383.88 * 0.004326
* 9.31 * 193.30 * 64.15 * 0.75 *
* 320 * 1800.00 * 1377.46 * 1382.07 * 1381.12 * 1382.96 * 0.004146
* 7.58 * 237.49 * 63.05 * 0.69 *
* 220 * 1800.00 * 1377.31 * 1380.97 * 1380.97 * 1382.52 * 0.003383
* 10.01 * 179.77 * 58.29 * 1.00 *

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ERRORS WARNINGS AND NOTES

Errors Warnings and Notes for Plan : Plan 01

Summary for Profiles:1

Reach: Basline-US60 Riv Sta: 320 Profile: 1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m).
This may indicate the need for additional cross sections.

Reach: Basline-US60 Riv Sta: 515 Profile: 1

Note - During the backwater through the culvert the solution went to critical depth. The program then assumed critical depth at the inlet.

Reach: Basline-US60 Riv Sta: 675 Profile: 1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m).
This may indicate the need for additional cross sections.

Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.



APPENDIX II

HECRAS

NEW TRAPEZOIDAL CHANNEL

SOSSAMAN ROAD CHANNEL

HECRAS STATION	PLAN STATION	CHANNEL ELEV	HGL ELEV	E. G. ELEV
3470	1030	1,400.50	1,404.89	1406.68
3446	1054	1,397.50	1,400.96	1406.25
3235	1265	1,397.24	1,403.26	1404.47
3200	1300	1,397.20	1,402.29	1404.2
3176	1324	1,394.20	1,397.61	1403.04
3000	1500	1,393.98	1,399.84	1401.12
2850	1650	1,393.80	1,398.87	1400.77
2818	1682	1,389.80	1,392.86	1400.07
2600	1900	1,389.55	1,395.67	1396.89
2400	2100	1,389.31	1,395.33	1396.61
2200	2300	1,389.07	1,394.21	1396.17
2171	2329	1,385.42	1,388.53	1395.53
2000	2500	1,385.21	1,389.19	1392.81
1900	2600	1,385.09	1,391.07	1392.28
1680	2820	1,384.84	1,390.64	1391.96
1564	2936	1,384.70	1,389.77	1391.67
1532	2968	1,380.70	1,383.75	1390.97
1400	3100	1,380.53	1,384.27	1388.54
1200	3300	1,380.29	1,386.30	1387.49
1000	3500	1,380.05	1,385.95	1387.21
884	3616	1,379.91	1,385.71	1387.03
780	3720	1,379.75	1,384.84	1386.72
683	3817	1,379.66	1,383.90	1386.31
630	3870	1,379.60	1,384.70	1385.29

HEC-RAS Plan: Plan 07 River: Baseline-US60 Reach: Baseline-US60

Reach	River Sta	Q Total (cfs)	Min Chl El (ft)	W.S. Elev (ft)	Grd W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Baseline-US60	3470	1800.00	1400.50	1404.89	1404.89	1406.68	0.002621	10.75	167.50	47.24	1.01
Baseline-US60	3445	1800.00	1397.50	1400.96	1402.59	1406.25	0.011262	18.45	97.54	36.50	1.99
Baseline-US60	3235	1800.00	1397.24	1403.26	1402.33	1404.47	0.001364	8.84	203.68	46.44	0.74
Baseline-US60	3200	1800.00	1397.20	1402.29	1402.29	1404.20	0.002607	11.11	162.01	42.82	1.01
Baseline-US60	3176	1800.00	1394.20	1397.61	1399.27	1403.04	0.011795	18.69	96.31	36.67	2.03
Baseline-US60	3000	1800.00	1393.98	1399.84	1399.05	1401.12	0.001490	9.08	198.20	46.48	0.78
Baseline-US60	2850	1800.00	1393.80	1398.87	1398.87	1400.77	0.002602	11.06	162.73	43.32	1.01
Baseline-US60	2918	1800.00	1389.80	1392.86	1394.88	1400.07	0.017870	21.55	83.54	35.19	2.46
Baseline-US60	2600	1800.00	1389.55	1395.67	1394.69	1396.89	0.001343	8.89	202.56	44.93	0.74
Baseline-US60	2400	1800.00	1389.31	1395.33	1394.45	1396.61	0.001428	9.08	198.19	44.58	0.76
Baseline-US60	2200	1800.00	1389.07	1394.21	1394.21	1396.17	0.002607	11.23	160.33	41.44	1.01
Baseline-US60	2171	1800.00	1385.42	1388.53	1390.51	1395.53	0.017014	21.24	84.75	35.11	2.41
Baseline-US60	2000	1800.00	1385.21	1389.19	1390.28	1392.81	0.006546	15.26	117.94	38.97	1.55
Baseline-US60	1900	1800.00	1385.09	1391.07	1390.16	1392.28	0.001378	8.83	203.76	46.96	0.75
Baseline-US60	1830	1800.00	1384.84	1390.64	1389.91	1391.96	0.001553	9.22	195.31	46.23	0.79
Baseline-US60	1964	1800.00	1384.70	1389.77	1389.77	1391.67	0.002599	11.06	162.80	43.33	1.01
Baseline-US60	1532	1800.00	1380.70	1383.75	1385.77	1390.97	0.017924	21.55	83.52	35.26	2.47
Baseline-US60	1400	1800.00	1380.53	1384.27	1385.60	1388.54	0.008313	16.57	108.60	38.00	1.73
Baseline-US60	1200	1800.00	1380.29	1386.30	1385.36	1387.49	0.001352	8.77	205.14	47.08	0.74
Baseline-US60	1000	1800.00	1380.05	1385.95	1385.12	1387.21	0.001451	9.00	200.06	46.64	0.77
Baseline-US60	984	1800.00	1379.91	1385.71	1384.98	1387.03	0.001555	9.22	195.19	46.22	0.79
Baseline-US60	760	1800.00	1379.75	1384.84	1384.84	1386.72	0.002572	11.02	163.39	43.38	1.00
Baseline-US60	683	1800.00	1379.66	1383.90	1384.46	1386.31	0.004320	12.47	144.39	48.18	1.27
Baseline-US60	530	1800.00	1379.60	1384.70	1383.10	1385.29	0.000721	6.18	291.05	71.10	0.54
Baseline-US60	550	1800.00	1378.26	1384.38	1382.22	1385.22	0.000561	7.36	244.71	56.19	0.52
Baseline-US60	535	Culvert									
Baseline-US60	480	1800.00	1377.70	1381.43	1381.66	1383.69	0.002913	12.06	149.26	58.65	0.52
Baseline-US60	320	1800.00	1377.46	1380.39	1381.12	1383.00	0.005778	12.96	138.85	54.67	1.43
Baseline-US60	220	1800.00	1377.31	1380.66	1380.96	1382.58	0.003636	11.11	162.08	56.75	1.16

HEC-RAS Version 2.1 October 1997
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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PROJECT DATA

Project Title: Sossaman Channel #4 ver 2.1
Project File : soz2.prj
Run Date and Time: 3/18/98 8:48:43 AM

Project in English units

Project Description:
modified Kofi's model to reflect Jeff's plans

PLAN DATA

Plan Title: Plan 05
Plan File : s:\eng\sossaman\hecras\soz2.p05

Geometry Title: 24 bottom width geometry and raised
Geometry File : s:\ENG\SOSSAMAN\HECRAS\soz2.g07

Flow Title : existing
Flow File : s:\ENG\SOSSAMAN\HECRAS\soz2.f01

Plan Summary Information:

Number of: Cross Sections = 28 Multiple Openings = 0
Culverts = 1 Inline Weirs = 0
Bridges = 0

Computational Information

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

Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: existing
 Flow File : s:\ENG\SOSSAMAN\HECRAS\soz2.f01

Flow Data (cfs)

River	Reach	RS	PF#1
Basline-US60	Basline-US60	3470	1800
Basline-US60	Basline-US60	3468	1800
Basline-US60	Basline-US60	220	1800

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Basline-US60	Basline-US60	PF#1	Normal S = .0022	Critical

GEOMETRY DATA

Geometry Title: 24 bottom width geometry and raised
 Geometry File : s:\ENG\SOSSAMAN\HECRAS\soz2.g07

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 3470

INPUT

Description: xsectn 3470, top of reach, existing channel

Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
981	1408.3	985.9	1408.4	986	1407.5	1000	1400.5	1030	1400.6
1045	1408.2	1048	1408.2	1071	1406.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
981	.016	986	.016	1045	.016

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

986	1045	24	24	24	.1	.3
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CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 3446

INPUT

Description: xsectn 3446, bottom of first drop

Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1405.98	6	1405.98	22	1397.98	46	1397.5
68	1405.98						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.016	6	.016	62	.016

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

6	62	211	211	211	.3	.5
---	----	-----	-----	-----	----	----

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 3235

INPUT

Description: xsectn 3235

Station Elevation Data num= 6

Sta	Elev								
0	1405.72	6	1405.72	22	1397.72	46	1397.24	62	1405.72
68	1405.72								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.016	6	.016	62	.016

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	6	62	35	35	35	.3	.5		

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 3200

INPUT

Description: xsectn 3200, Crest of 3ft Drop (2)

Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1405.68	6	1405.68	22	1397.68	46	1397.2	62	1405.68
68	1405.68								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.016	6	.016	62	.016

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	6	62	24	24	24	.3	.5		

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 3176

INPUT

Description: xsectn 3176, bottom Of 3' drop (2)

Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1404.98	24	1406.7	48	1394.68	72	1394.2	96	1406.2
99	1406.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.016	24	.016	96	.016

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	24	96	176	176	176	.1	.3		

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 3000

INPUT

Description: xsectn 3000

Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1402.46	16	1394.46	40	1393.98	56	1401.98

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .016 0 .016 56 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 0 56 150 150 150 .1 .3

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 2850

INPUT

Description: xsectn 2850, crest of 4' drop (3)

Station Elevation Data num= 4
 Sta Elev Sta Elev Sta Elev Sta Elev
 0 1402.28 16 1394.28 40 1393.8 56 1401.8

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .016 0 .016 56 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 0 56 32 32 32 .1 .3

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 2818

INPUT

Description: xsect 2818, bottom of 4' drop (3)

Station Elevation Data num= 6
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 1400.58 24 1402.48 48 1390.28 72 1389.8 96 1401.8
 99 1401.9

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .016 24 .016 96 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 24 96 218 218 218 .1 .3

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 2600

INPUT

Description: xsectn 2600

Station Elevation Data num= 6
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 0 1398.77 12 1398.77 28 1390.03 52 1389.55 68 1398.77
 89 1398.77

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .016 12 .016 68 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 12 68 200 200 200 .1 .3

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 2400

INPUT

Description: xsectn 2400

Station Elevation Data num= 6

Sta	Elev								
0	1398.53	12	1398.53	28	1389.79	52	1389.31	68	1398.53
89	1398.53								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.016	12	.016	68	.016

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	12	68	200	200	200	.1	.3		

CROSS SECTION RIVER: Basline-US60
REACH: Basline-US60 RS: 2200

INPUT

Description: xsectn 2200, Crest of 3.65 ft Drop (4)

Station Elevation Data num= 6

Sta	Elev								
0	1398.29	12	1398.29	28	1389.55	52	1389.07	68	1398.29
89	1398.29								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.016	12	.016	68	.016

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	12	68	29	29	29	.1	.3		

CROSS SECTION RIVER: Basline-US60
REACH: Basline-US60 RS: 2171

INPUT

Description: xsectn 2173, Toe of 3.65 ft Drop (4)

Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1393.9	12	1393.9	28	1385.9	52	1385.42	68	1393.9
89	1393.9								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.016	12	.016	68	.016

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	12	68	171	171	171	.1	.3		

CROSS SECTION RIVER: Basline-US60
REACH: Basline-US60 RS: 2000

INPUT

Description: xsectn 2000

Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1393.69	16	1385.69	40	1385.21	56	1393.21

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

0 .016 0 .016 56 .016

Bank Sta:	Left	Right	Lengths:			Left Channel	Right	Coeff	Contr.	Expan.
	0	56	100	100	100		.1	.3		

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 1900

INPUT

Description: xsectn 1900, upstream end of bend

Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1393.57	16	1385.57	40	1385.09	56	1393.09

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.016	0	.016	56	.016

Bank Sta:	Left	Right	Lengths:			Left Channel	Right	Coeff	Contr.	Expan.
	0	56	247	213	191		.1	.3		

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 1680

INPUT

Description: xsectn 1680, downstream end of bend

Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1393.32	16	1385.32	40	1384.84	56	1392.84

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.016	0	.016	56	.016

Bank Sta:	Left	Right	Lengths:			Left Channel	Right	Coeff	Contr.	Expan.
	0	56	116.01	116.01	116.01		.1	.3		

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 1564

INPUT

Description: xsectn 1564, crest of 4' drop (5)

Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1393.18	16	1385.18	40	1384.7	56	1392.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.016	0	.016	56	.016

Bank Sta:	Left	Right	Lengths:			Left Channel	Right	Coeff	Contr.	Expan.
	0	56	32	32	32		.1	.3		

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 1532

INPUT

Description: xsectn 1532, bottom of 4' drop (5)

Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

0 1393.18 24 1381.18 48 1380.7 72 1392.7

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .016 0 .016 72 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 0 72 132 132 132 .1 .3

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 1400

INPUT

Description: xsectn 1400

Station Elevation Data num= 4
 Sta Elev Sta Elev Sta Elev Sta Elev
 0 1389.01 16 1381.01 40 1380.53 56 1388.53

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .016 0 .016 56 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 0 56 200 200 200 .1 .3

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 1200

INPUT

Description: xsectn 1200

Station Elevation Data num= 4
 Sta Elev Sta Elev Sta Elev Sta Elev
 0 1388.77 16 1380.77 40 1380.29 56 1388.29

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .016 0 .016 56 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 0 56 200 200 200 .1 .3

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 1000

INPUT

Description: xsectn 1000

Station Elevation Data num= 4
 Sta Elev Sta Elev Sta Elev Sta Elev
 0 1388.53 16 1380.53 40 1380.05 56 1388.05

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .016 0 .016 56 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 0 56 116 116 116 .1 .3

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 884

INPUT

Description: xsectn 884

Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1388.39	16	1380.39	40	1379.91	56	1387.91

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.016	0	.016	56	.016

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	0	56	124	124	124		.1	.3	

CROSS SECTION RIVER: Basline-US60

REACH: Basline-US60 RS: 760

INPUT

Description: xsectn 760

Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1388.23	16	1380.23	40	1379.75	56	1387.75

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.016	0	.016	56	.016

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	0	56	77	77	77		.3	.5	

CROSS SECTION RIVER: Basline-US60

REACH: Basline-US60 RS: 683

INPUT

Description: xsectn 683

Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
935	1388.7	963.8	1388.2	978.8	1383.2	988	1380.14	1012	1379.66
1031	1385.9	1033	1387.4	1056	1387.9				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
935	.016	963.8	.016	1033	.016

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	963.8	1033	53	53	53		.1	.3	

CROSS SECTION RIVER: Basline-US60

REACH: Basline-US60 RS: 630

INPUT

Description: xsectn 630, Before contraction

Station Elevation Data num= 9

Sta	Elev								
935	1388.6	951	1388.1	975	1383.1	988	1379.6	1000	1379.6
1036	1380.1	1039	1385.8	1042	1387.3	1056	1387.8		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
935	.016	951	.016	1042	.016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
951 1042 98 80 46 .1 .3

CROSS SECTION RIVER: Basline-US60
REACH: Basline-US60 RS: 550

INPUT

Description: xsectn 550, upstream of Box

Station Elevation Data num= 9

Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
966 1387.2 976.5 1378.26 992.5 1378.26 994.5 1378.26 1000 1378.26
1022 1378.26 1027 1387 1028 1387.02 1038 1387.2

Manning's n Values num= 3

Sta n Val Sta n Val Sta n Val
966 .016 966 .016 1028 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
966 1028 70 70 70 .3 .5

Ineffective Flow num= 2

Sta L Sta R Elev Sta L Sta R Elev
966 980 1387.2 1020 1038 1387.2

CULVERT RIVER: Basline-US60
REACH: Basline-US60 RS: 515

INPUT

Description: 4-8' x 10' RCBC

Distance from Upstream XS = 0

Deck/Roadway Width = 70

Weir Coefficient = 2.6

Bridge Deck/Roadway Skew =

Upstream Deck/Roadway Coordinates

num= 4

Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
944 1387.2 1377 990 1387.2 1377 1020 1387.2 1377
1055 1387.2 1377

Upstream Bridge Cross Section Data

Station Elevation Data num= 9

Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
966 1387.2 976.5 1378.26 992.5 1378.26 994.5 1378.26 1000 1378.26
1022 1378.26 1027 1387 1028 1387.02 1038 1387.2

Manning's n Values num= 3

Sta n Val Sta n Val Sta n Val
966 .016 966 .016 1028 .016

Bank Sta: Left Right Coeff Contr. Expan.
966 1028 .3 .5

Ineffective Flow num= 2

Sta L Sta R Elev Sta L Sta R Elev
966 980 1387.2 1020 1038 1387.2

Downstream Deck/Roadway Coordinates

num= 4

Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
944 1387.2 1377 990 1387.2 1377 1020 1387.2 1377
1055 1387.2 1377

Downstream Bridge Cross Section Data

Station Elevation Data num= 6
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 944.31 1388.18 954.31 1387.98 980 1377.7 1020 1377.7 1045.69 1387.98
 1055.69 1388.18

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 944.31 .016 954.31 .016 1045.69 .016

Bank Sta: Left Right Coeff Contr. Expan.
 954.31 1045.69 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 944.31 980 1387.2 1020 1055.69 1387.2

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

Number of Culverts = 1

Culvert Name Shape Rise Span
 Culvert #1 Box 8 10
 FHWA Chart # 8 - flared wingwalls
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length n Value Entrance Loss Coef Exit Loss Coef
 0 70 .018 .5 1

Number of Barrels = 4
 Upstream Elevation = 1378.26

Centerline Stations
 Sta. Sta. Sta. Sta.
 985 995 1005 1015

Downstream Elevation = 1377.72
 Centerline Stations

Sta. Sta. Sta. Sta.
 985 995 1005 1015

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 480

INPUT

Description: xsectn 480, Culvert outlet
 Station Elevation Data num= 6
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 944.31 1388.18 954.31 1387.98 980 1377.7 1020 1377.7 1045.69 1387.98
 1055.69 1388.18

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 944.31 .016 954.31 .016 1045.69 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 954.31 1045.69 135 163 191 .1 .3

Ineffective Flow num= 2

Sta L Sta R Elev Sta L Sta R Elev
 944.31 980 1387.2 1020 1055.69 1387.2

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 320

INPUT

Description: xsectn 320, second cross section

Station Elevation Data num= 6

Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 944.95 1387.68 954.95 1387.48 980 1377.46 1020 1377.46 1045.05 1387.48
 1055.05 1387.68

Manning's n Values num= 3

Sta n Val Sta n Val Sta n Val
 944.95 .016 954.95 .016 1045.05 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 954.95 1045.05 100 100 100 .1 .3

CROSS SECTION RIVER: Basline-US60
 REACH: Basline-US60 RS: 220

INPUT

Description: xsectn 220, Beginning

Station Elevation Data num= 6

Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 945.35 1387.37 955.35 1387.17 980 1377.31 1020 1377.31 1044.65 1387.17
 1054.65 1387.37

Manning's n Values num= 3

Sta n Val Sta n Val Sta n Val
 945.35 .016 955.35 .016 1044.65 .016

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 955.35 1044.65 0 0 0 .1 .3

SUMMARY OF MANNING'S N VALUES

River: Basline-US60

Reach	River Sta.	n1	n2	n3
Basline-US60	3470	.016	.016	.016
Basline-US60	3446	.016	.016	.016
Basline-US60	3235	.016	.016	.016
Basline-US60	3200	.016	.016	.016
Basline-US60	3176	.016	.016	.016
Basline-US60	3000	.016	.016	.016
Basline-US60	2850	.016	.016	.016
Basline-US60	2818	.016	.016	.016
Basline-US60	2600	.016	.016	.016
Basline-US60	2400	.016	.016	.016
Basline-US60	2200	.016	.016	.016
Basline-US60	2171	.016	.016	.016
Basline-US60	2000	.016	.016	.016
Basline-US60	1900	.016	.016	.016
Basline-US60	1680	.016	.016	.016

Basline-US60	1564	.016	.016	.016
Basline-US60	1532	.016	.016	.016
Basline-US60	1400	.016	.016	.016
Basline-US60	1200	.016	.016	.016
Basline-US60	1000	.016	.016	.016
Basline-US60	884	.016	.016	.016
Basline-US60	760	.016	.016	.016
Basline-US60	683	.016	.016	.016
Basline-US60	630	.016	.016	.016
Basline-US60	550	.016	.016	.016
Basline-US60	515	Culvert		
Basline-US60	480	.016	.016	.016
Basline-US60	320	.016	.016	.016
Basline-US60	220	.016	.016	.016

SUMMARY OF REACH LENGTHS

River: Basline-US60

Reach	River Sta.	Left	Channel	Right
Basline-US60	3470	24	24	24
Basline-US60	3446	211	211	211
Basline-US60	3235	35	35	35
Basline-US60	3200	24	24	24
Basline-US60	3176	176	176	176
Basline-US60	3000	150	150	150
Basline-US60	2850	32	32	32
Basline-US60	2818	218	218	218
Basline-US60	2600	200	200	200
Basline-US60	2400	200	200	200
Basline-US60	2200	29	29	29
Basline-US60	2171	171	171	171
Basline-US60	2000	100	100	100
Basline-US60	1900	247	213	191
Basline-US60	1680	116.01	116.01	116.01
Basline-US60	1564	32	32	32
Basline-US60	1532	132	132	132
Basline-US60	1400	200	200	200
Basline-US60	1200	200	200	200
Basline-US60	1000	116	116	116
Basline-US60	884	124	124	124
Basline-US60	760	77	77	77
Basline-US60	683	53	53	53
Basline-US60	630	98	80	46
Basline-US60	550	70	70	70
Basline-US60	515	Culvert		
Basline-US60	480	135	163	191
Basline-US60	320	100	100	100
Basline-US60	220	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Basline-US60

Reach	River Sta.	Contr.	Expan.
Basline-US60	3470	.1	.3
Basline-US60	3446	.3	.5
Basline-US60	3235	.3	.5
Basline-US60	3200	.3	.5
Basline-US60	3176	.1	.3
Basline-US60	3000	.1	.3
Basline-US60	2850	.1	.3
Basline-US60	2818	.1	.3
Basline-US60	2600	.1	.3
Basline-US60	2400	.1	.3
Basline-US60	2200	.1	.3
Basline-US60	2171	.1	.3
Basline-US60	2000	.1	.3
Basline-US60	1900	.1	.3
Basline-US60	1680	.1	.3
Basline-US60	1564	.1	.3
Basline-US60	1532	.1	.3
Basline-US60	1400	.1	.3
Basline-US60	1200	.1	.3
Basline-US60	1000	.1	.3
Basline-US60	884	.1	.3
Basline-US60	760	.3	.5
Basline-US60	683	.1	.3
Basline-US60	630	.1	.3
Basline-US60	550	.3	.5
Basline-US60	515	Culvert	
Basline-US60	480	.1	.3
Basline-US60	320	.1	.3
Basline-US60	220	.1	.3

ERRORS WARNINGS AND NOTES

Errors Warnings and Notes for Plan : Plan 07

River: Basline-US60 Reach: Basline-US60 RS: 3470 Profile: PF#1

Warning - The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning - The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.

Warning - During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Basline-US60 Reach: Basline-US60 RS: 3446 Profile: PF#1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

River: Basline-US60 Reach: Basline-US60 RS: 3235 Profile: PF#1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Note - Hydraulic jump has occurred between this cross section and the previous upstream section.

River: Basline-US60 Reach: Basline-US60 RS: 3200 Profile: PF#1

Warning - The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning - The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning - During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Basline-US60 Reach: Basline-US60 RS: 3176 Profile: PF#1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1

.4.

This may indicate the need for additional cross sections.

Warning - The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Note - Program found supercritical flow starting at this cross section.

River: Basline-US60 Reach: Basline-US60 RS: 3000 Profile: PF#1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Note - Hydraulic jump has occurred between this cross section and the previous upstream section.

River: Basline-US60 Reach: Basline-US60 RS: 2850 Profile: PF#1

Warning - The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1

.4.

This may indicate the need for additional cross sections.

Warning - The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning - During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Basline-US60 Reach: Basline-US60 RS: 2818 Profile: PF#1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1

.4.

This may indicate the need for additional cross sections.

Note - Program found supercritical flow starting at this cross section.

River: Basline-US60 Reach: Basline-US60 RS: 2600 Profile: PF#1

Note - Hydraulic jump has occurred between this cross section and the previous upstream section.

River: Basline-US60 Reach: Basline-US60 RS: 2400 Profile: PF#1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

River: Basline-US60 Reach: Basline-US60 RS: 2200 Profile: PF#1

Warning - The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning - The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning - During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Basline-US60 Reach: Basline-US60 RS: 2171 Profile: PF#1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1

.4.

This may indicate the need for additional cross sections.

Note - Program found supercritical flow starting at this cross section.

River: Basline-US60 Reach: Basline-US60 RS: 2000 Profile: PF#1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1

.4.

This may indicate the need for additional cross sections.

Warning - The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate

the need for additional cross sections.

River: Basline-US60 Reach: Basline-US60 RS: 1900 Profile: PF#1

Note - Hydraulic jump has occurred between this cross section and the previous upstream section.

River: Basline-US60 Reach: Basline-US60 RS: 1680 Profile: PF#1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

River: Basline-US60 Reach: Basline-US60 RS: 1564 Profile: PF#1

Warning - The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning - The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate

the need for additional cross sections.

Warning - During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: Basline-US60 Reach: Basline-US60 RS: 1532 Profile: PF#1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1

.4.

This may indicate the need for additional cross sections.

Note - Program found supercritical flow starting at this cross section.

River: Basline-US60 Reach: Basline-US60 RS: 1400 Profile: PF#1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1

.4.

This may indicate the need for additional cross sections.

Warning - The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate

the need for additional cross sections.

River: Basline-US60 Reach: Basline-US60 RS: 1200 Profile: PF#1

Note - Hydraulic jump has occurred between this cross section and the previous upstream section.

River: Basline-US60 Reach: Basline-US60 RS: 884 Profile: PF#1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

River: Basline-US60 Reach: Basline-US60 RS: 760 Profile: PF#1

Warning - The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.

Warning - During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The

soz2.rep

program defaulted to critical depth.

River: Basline-US60 Reach: Basline-US60 RS: 683 Profile: PF#1

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Note - Program found supercritical flow starting at this cross section.

River: Basline-US60 Reach: Basline-US60 RS: 630 Profile: PF#1

Note - Hydraulic jump has occurred between this cross section and the previous upstream section.

River: Basline-US60 Reach: Basline-US60 RS: 515 Profile: PF#1 Culv: Culvert #1

Note - The flow in the culvert is entirely supercritical.

River: Basline-US60 Reach: Basline-US60 RS: 320 Profile: PF#1

Warning - The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

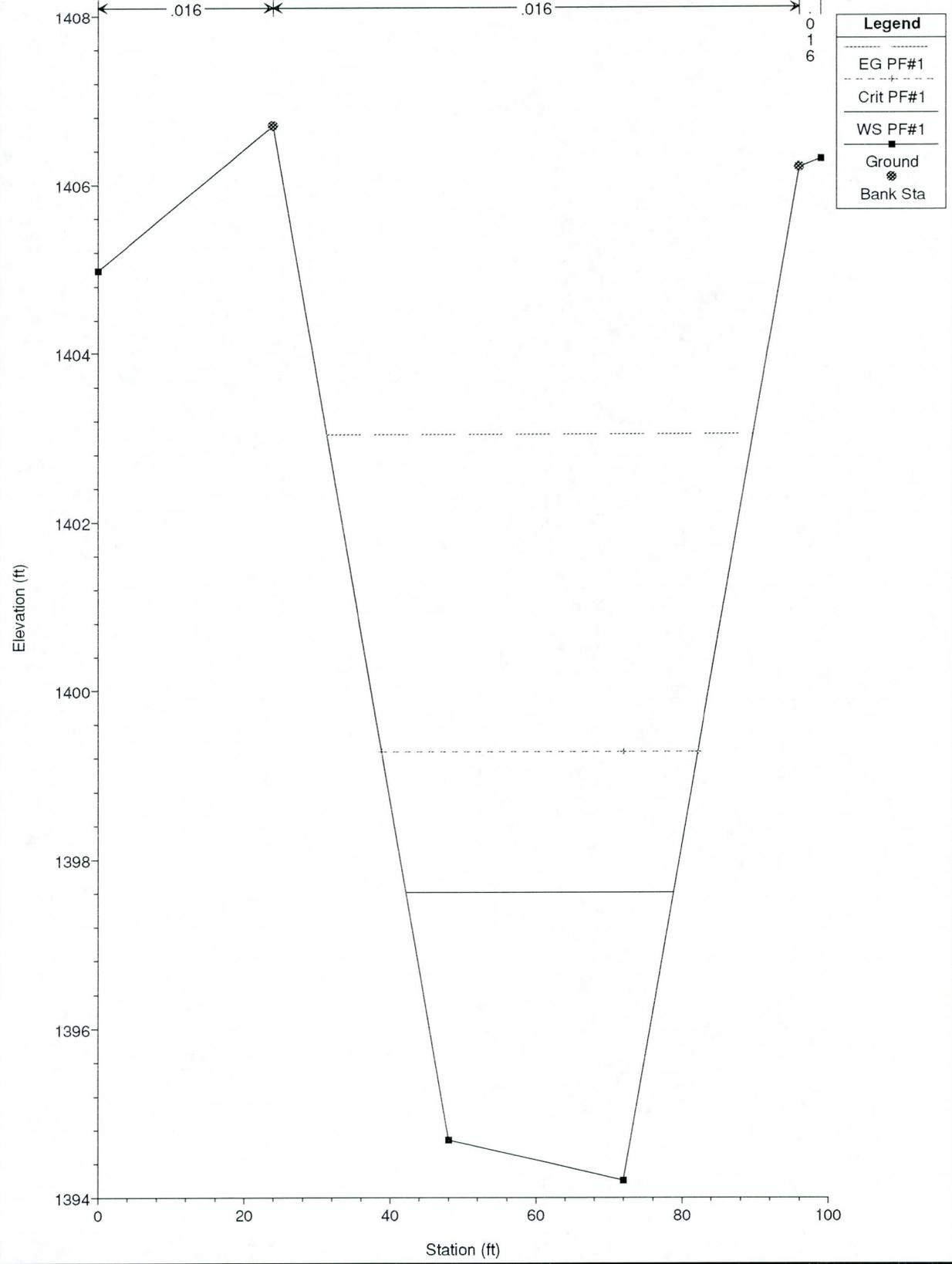
River: Basline-US60 Reach: Basline-US60 RS: 220 Profile: PF#1

Warning - The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.

Warning - The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 3176, bottom of 3' drop (2)



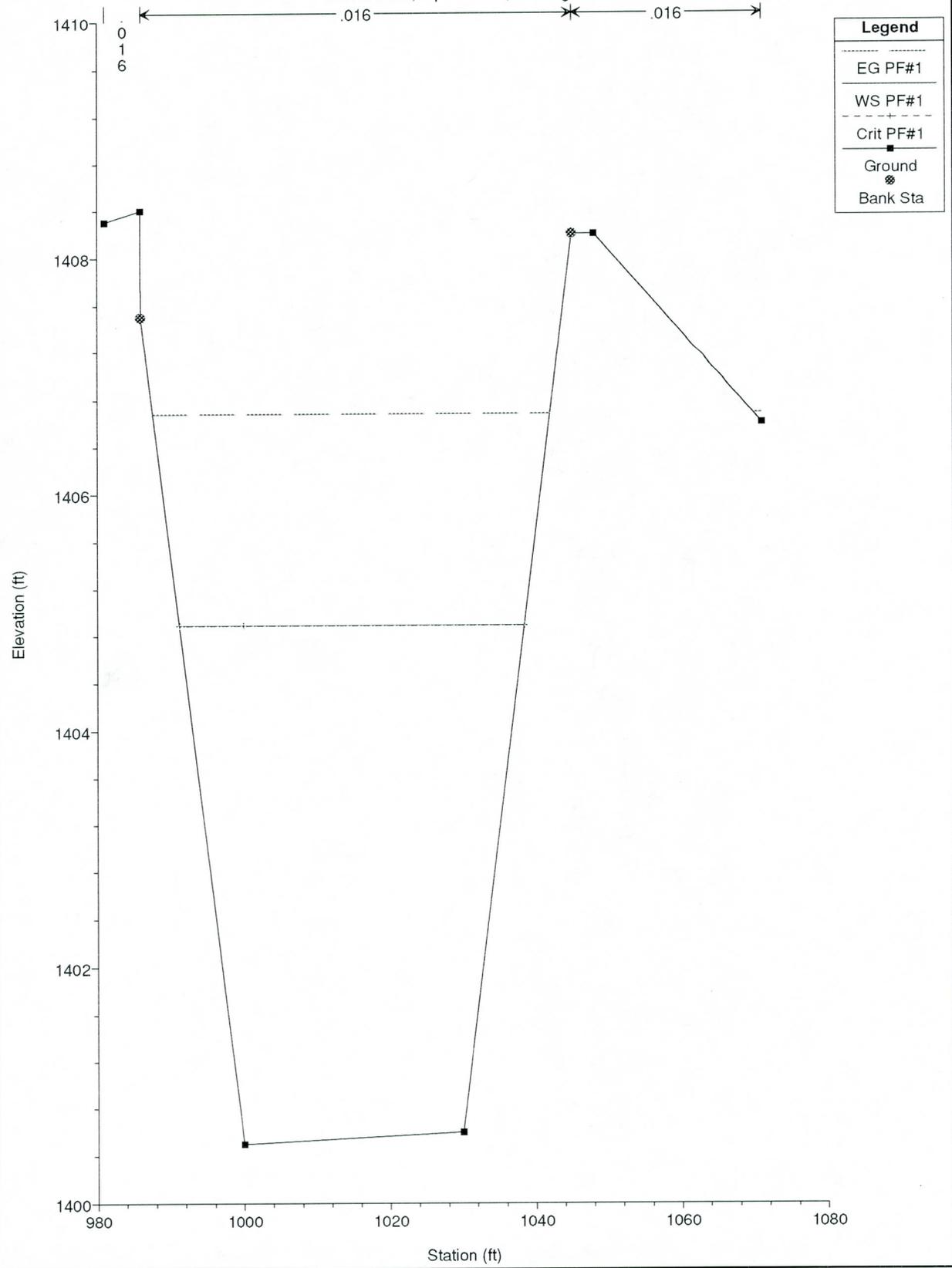
Legend	
---	EG PF#1
- - -	Crit PF#1
—	WS PF#1
■	Ground
◆	Bank Sta

Elevation (ft)

Station (ft)

Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

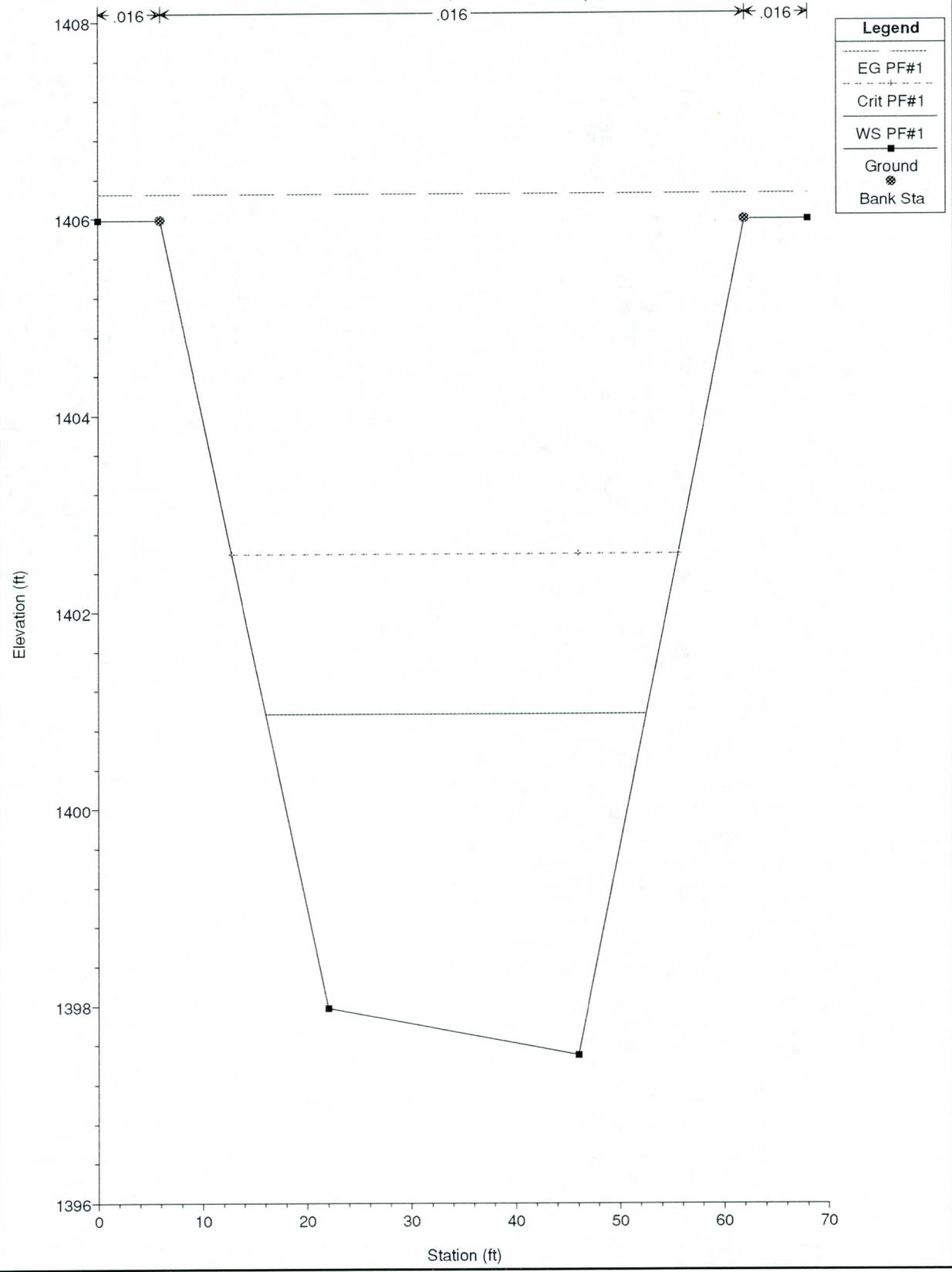
xsectn 3470, top of reach, existing channel



Legend	
-----	EG PF#1
-----	WS PF#1
-----	Crit PF#1
■	Bank Sta
⊗	Ground

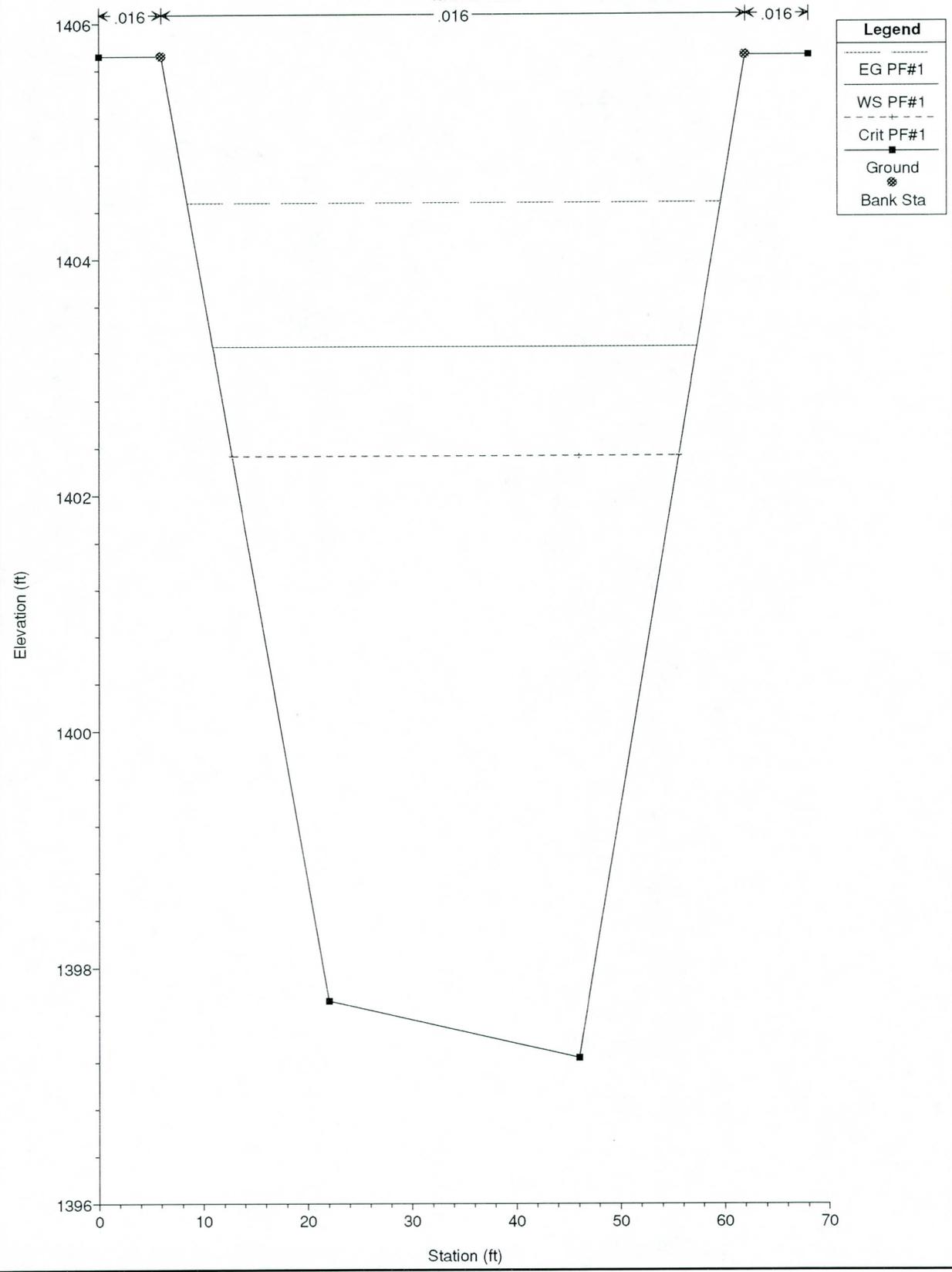
Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 3446, bottom of first drop



Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

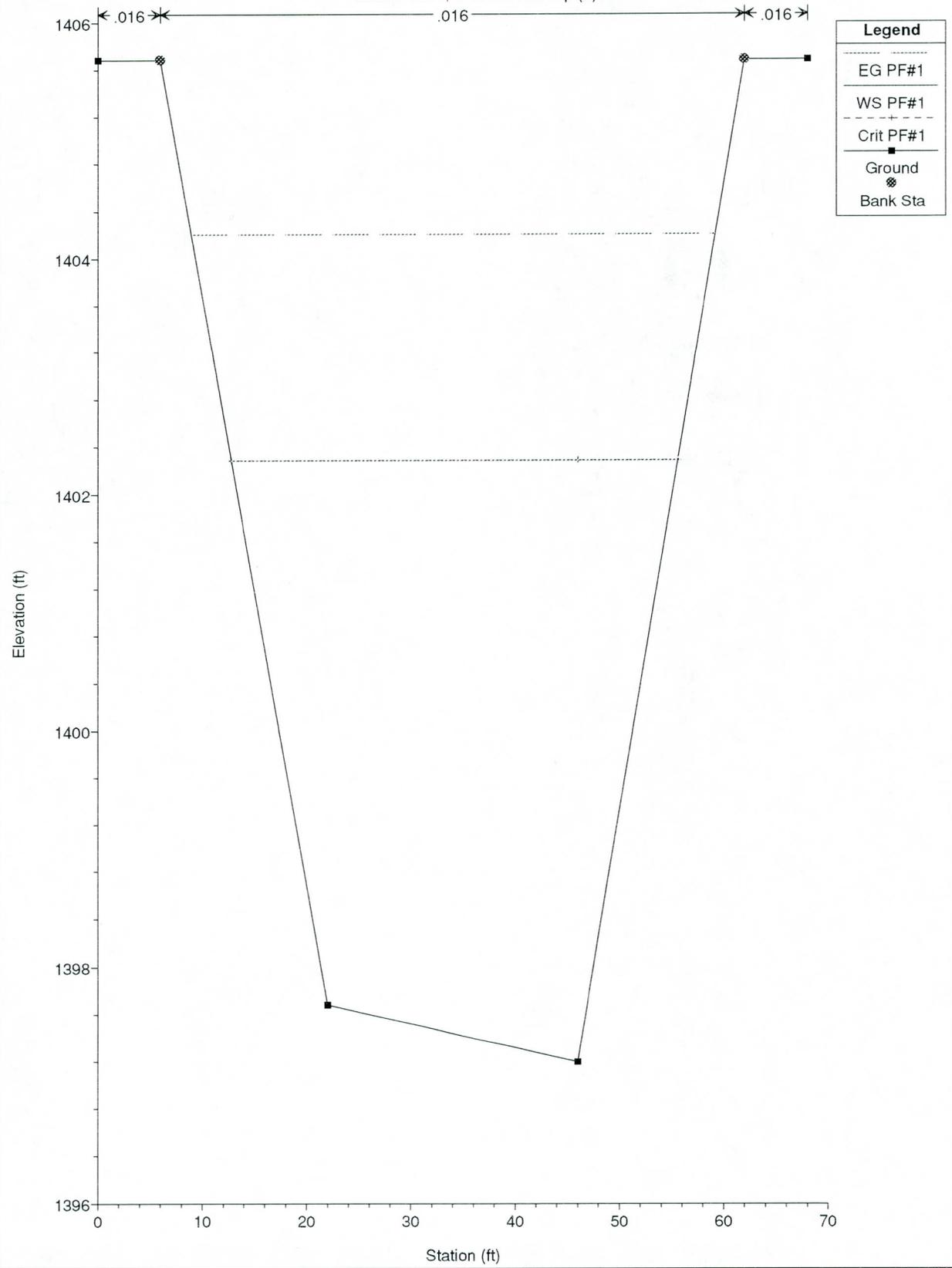
xsectn 3235



Legend	
-----	EG PF#1
-----	WS PF#1
-----	Crit PF#1
■	Ground
◆	Bank Sta

Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

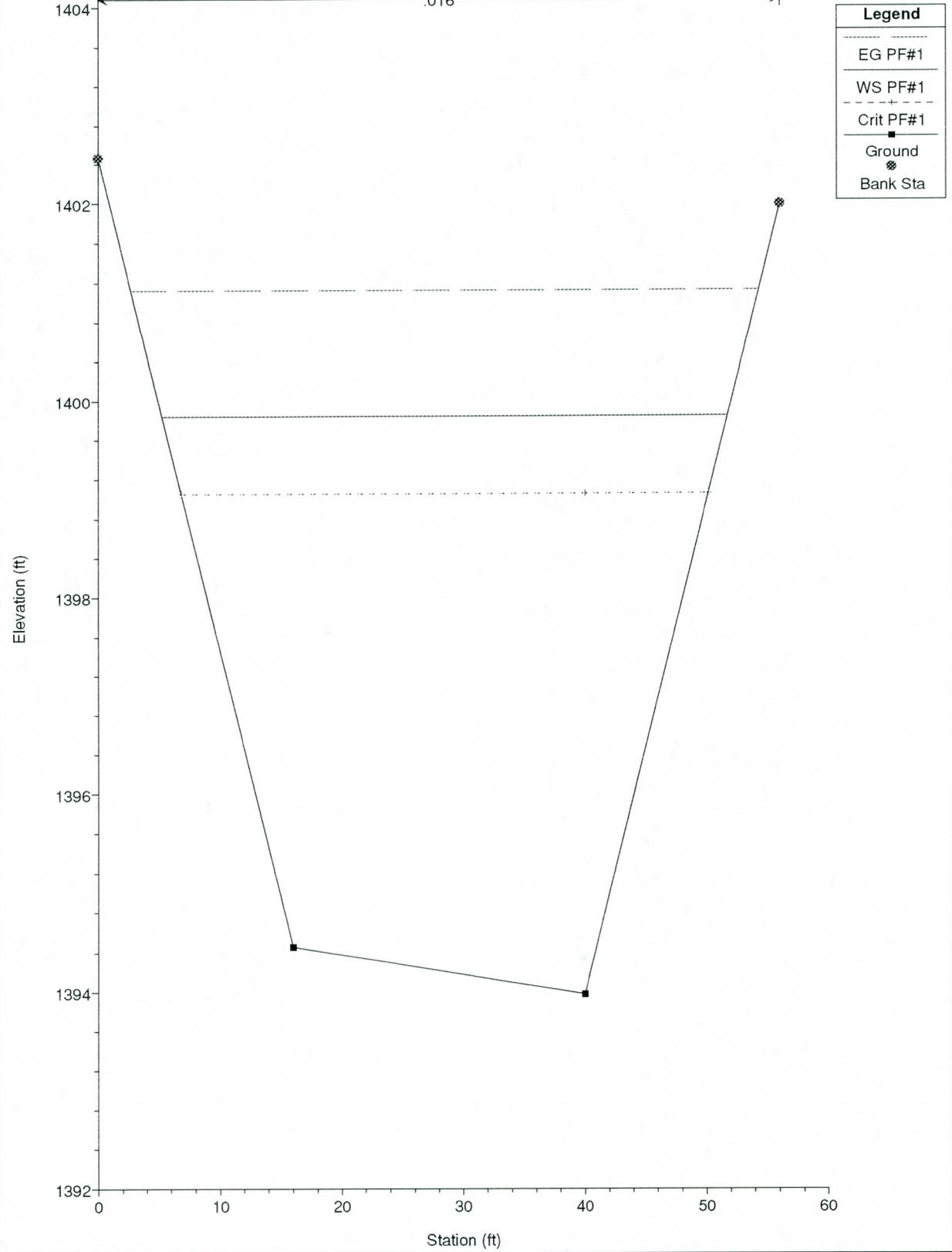
xsectn 3200, Crest of 3ft Drop (2)



Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 3000

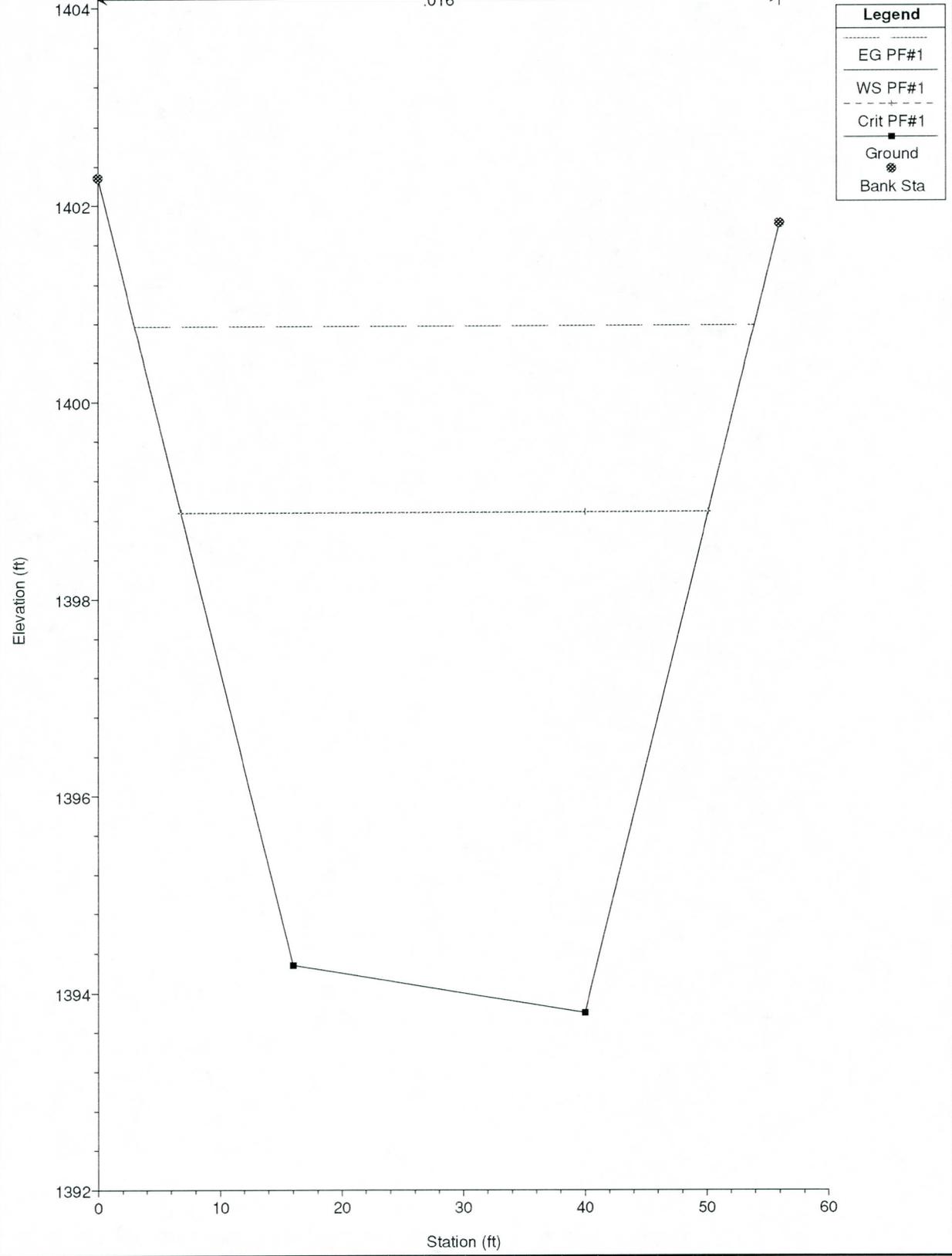
.016



Legend	
-----	EG PF#1
- - - - -	WS PF#1
- . - . -	Crit PF#1
■	Bank Sta
◆	Ground

Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

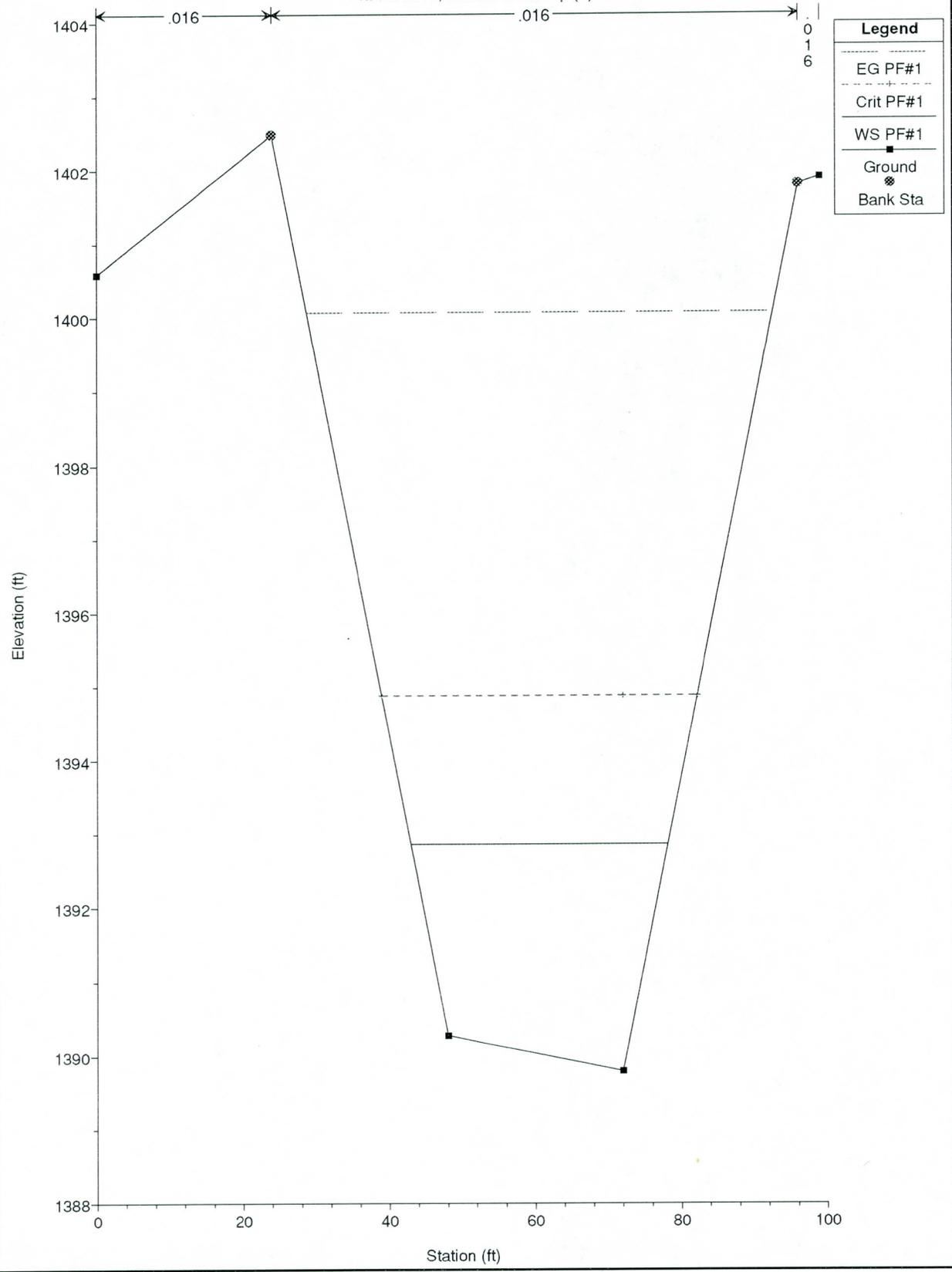
xsectn 2850, crest of 4' drop (3)



Legend	
-----	EG PF#1
- - - - -	WS PF#1
-----	Crit PF#1
■	Ground
◆	Bank Sta

Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

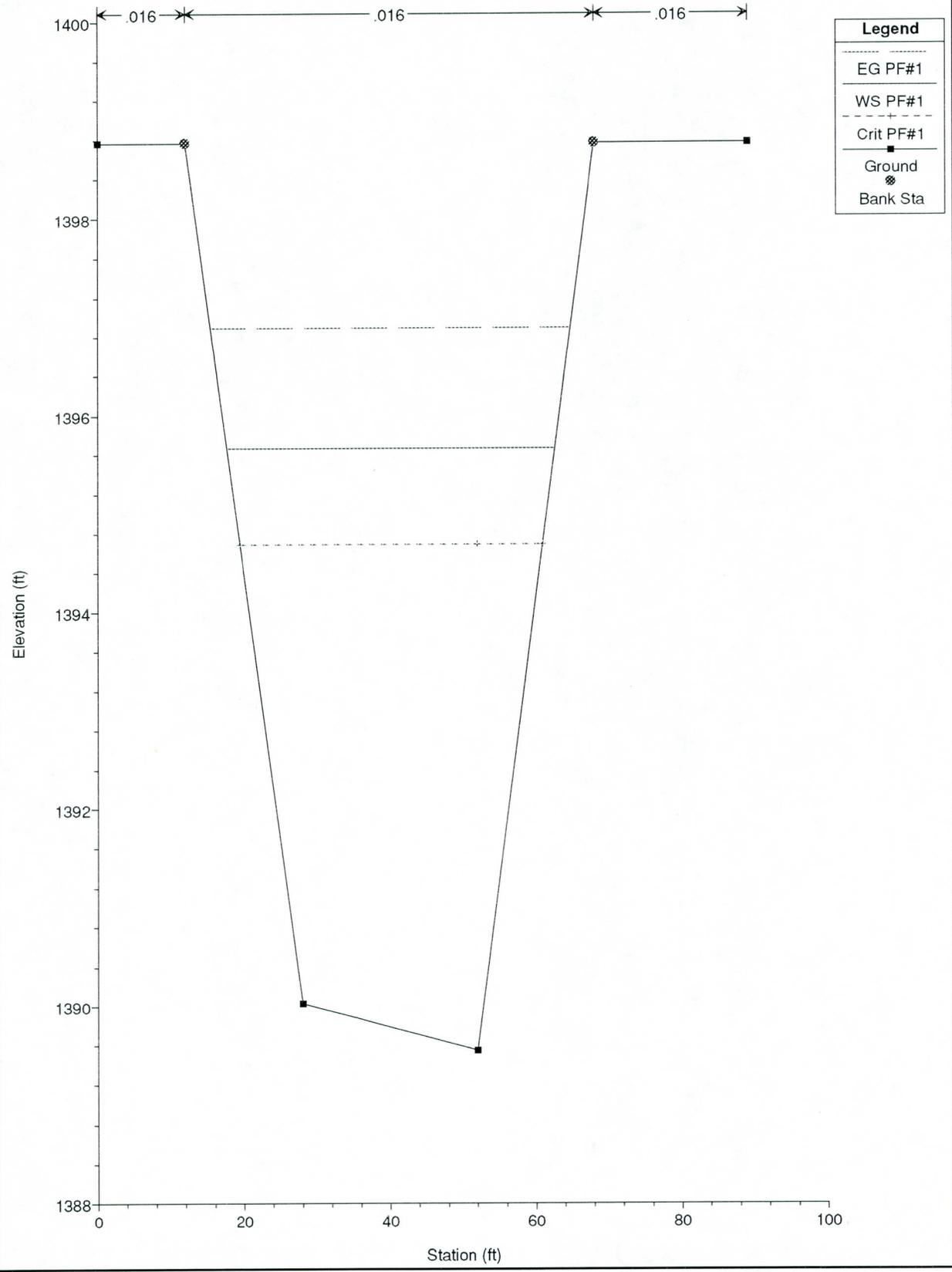
xsect 2818, bottom of 4' drop (3)



Legend	
---	EG PF#1
- - -	Crit PF#1
---	WS PF#1
■	Ground
*	Bank Sta

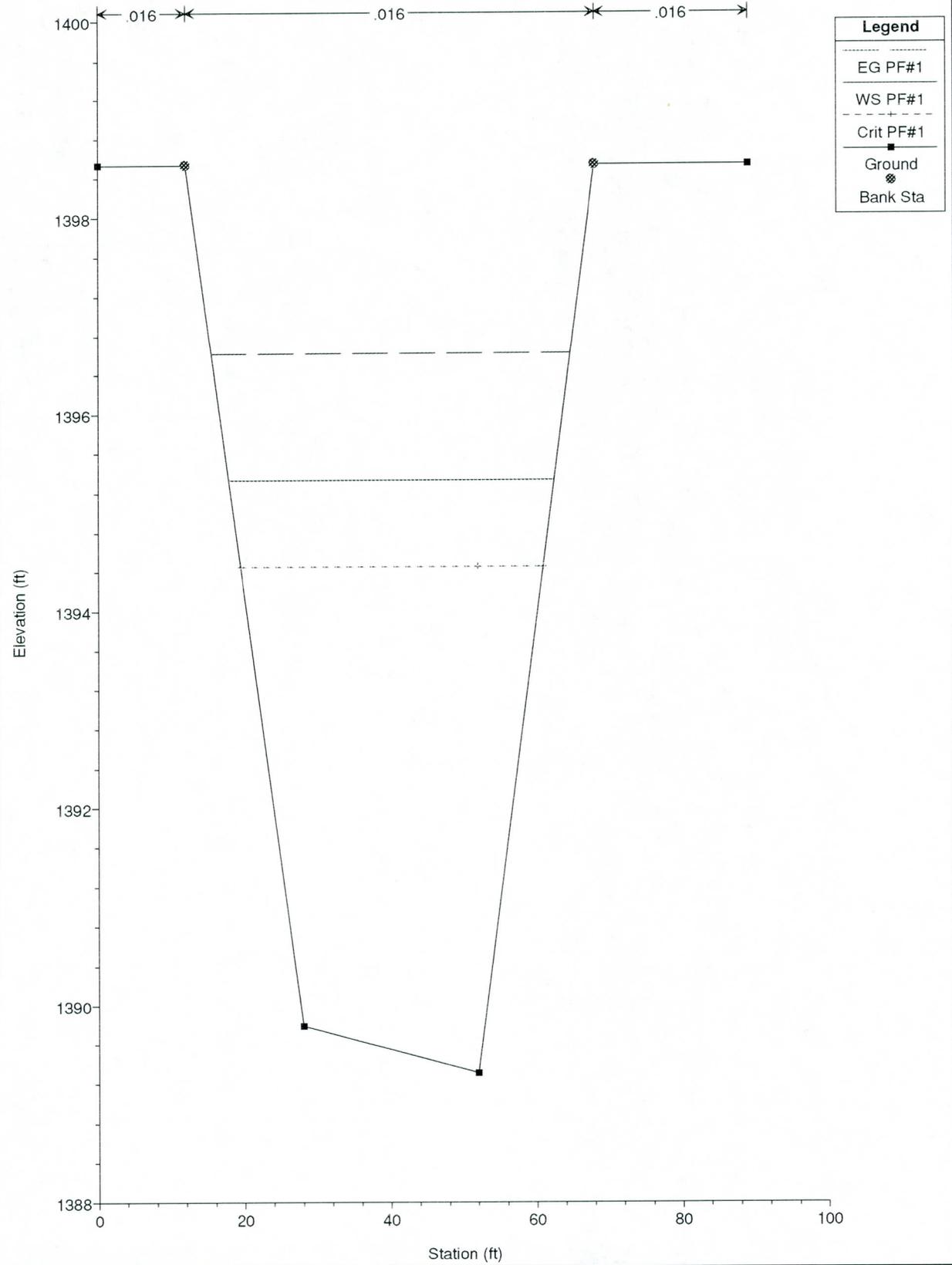
Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 2600



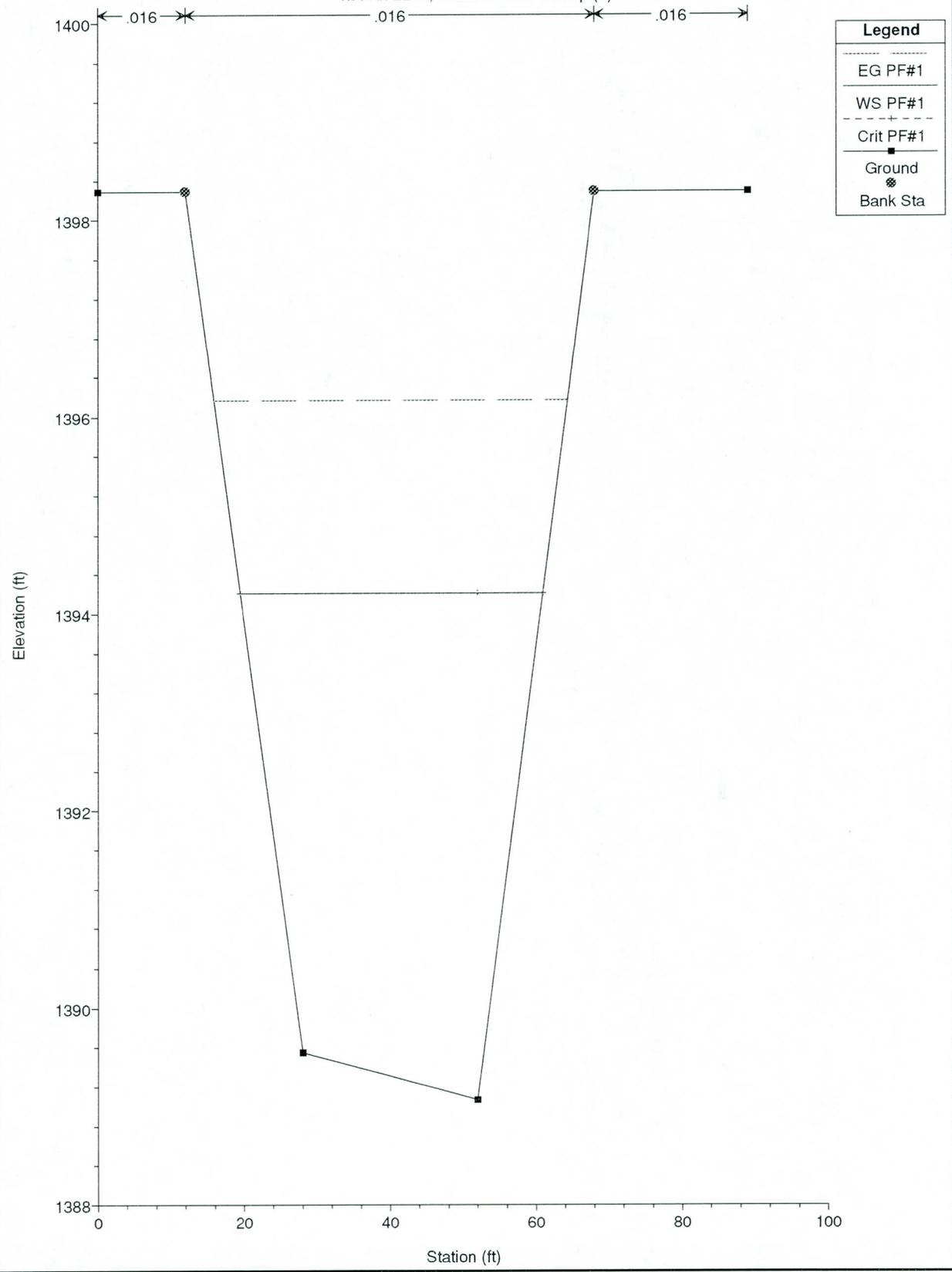
Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 2400



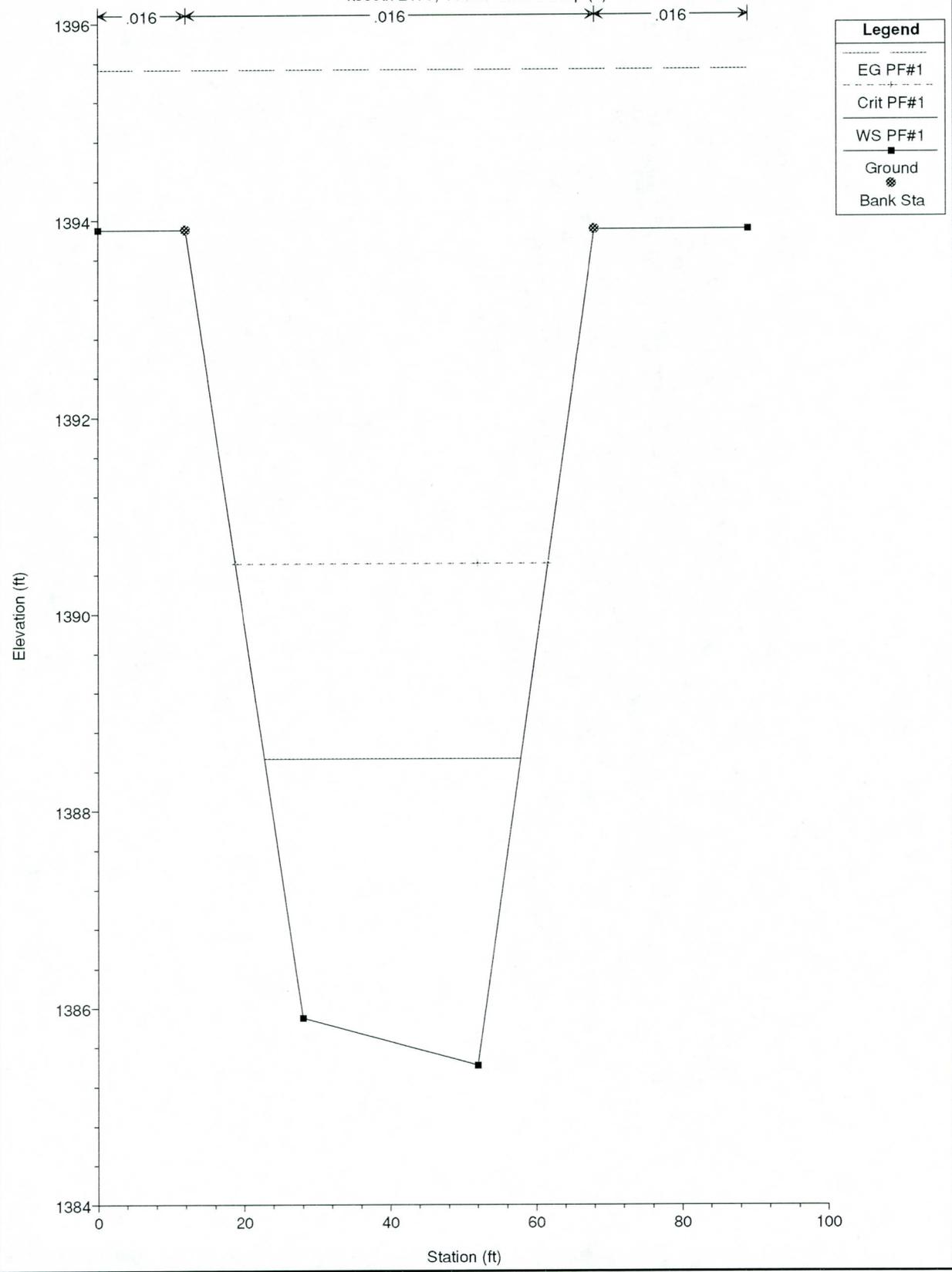
Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 2200, Crest of 3.65 ft Drop (4)



Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

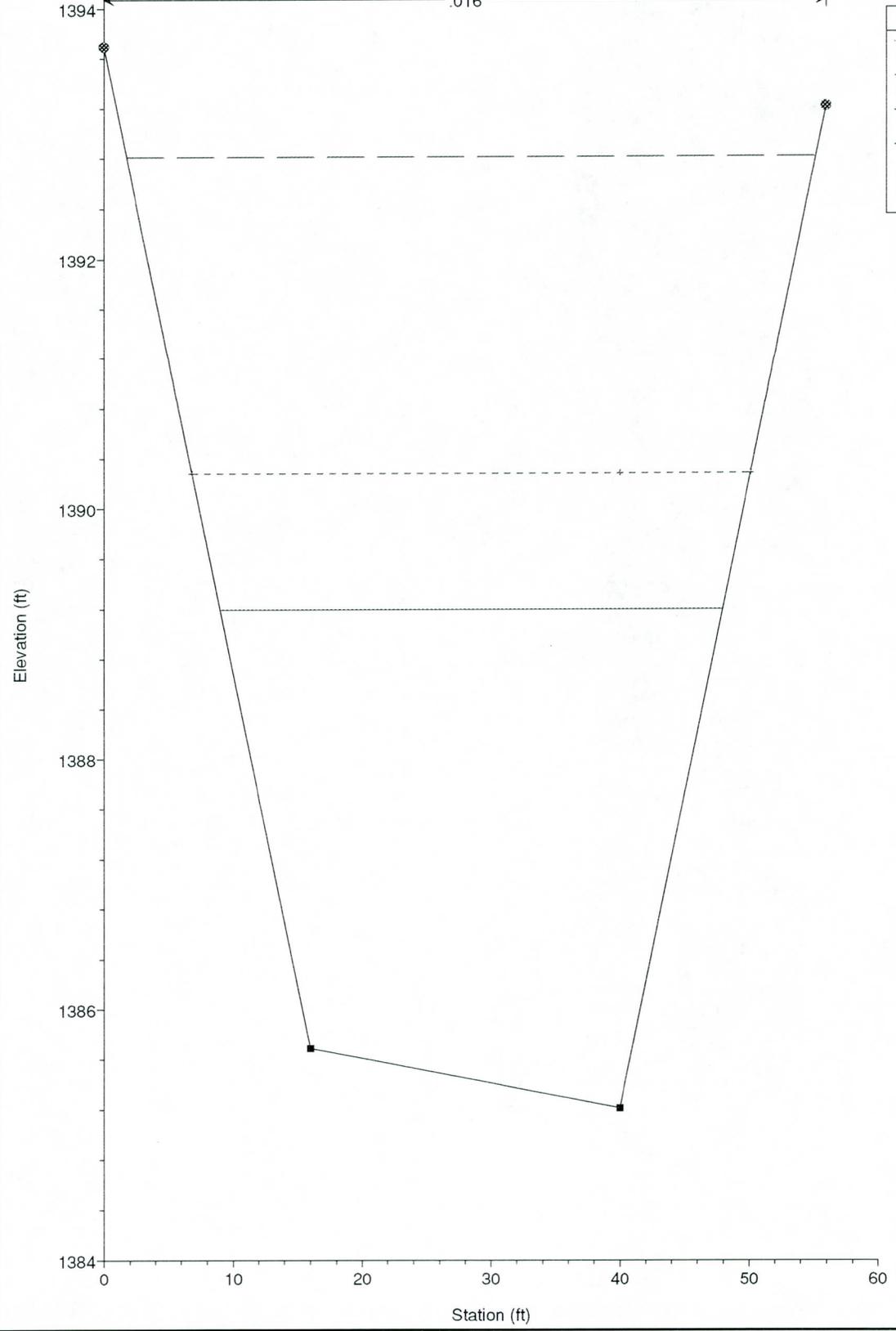
xsectn 2173, Toe of 3.65 ft Drop (4)



Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 2000

.016

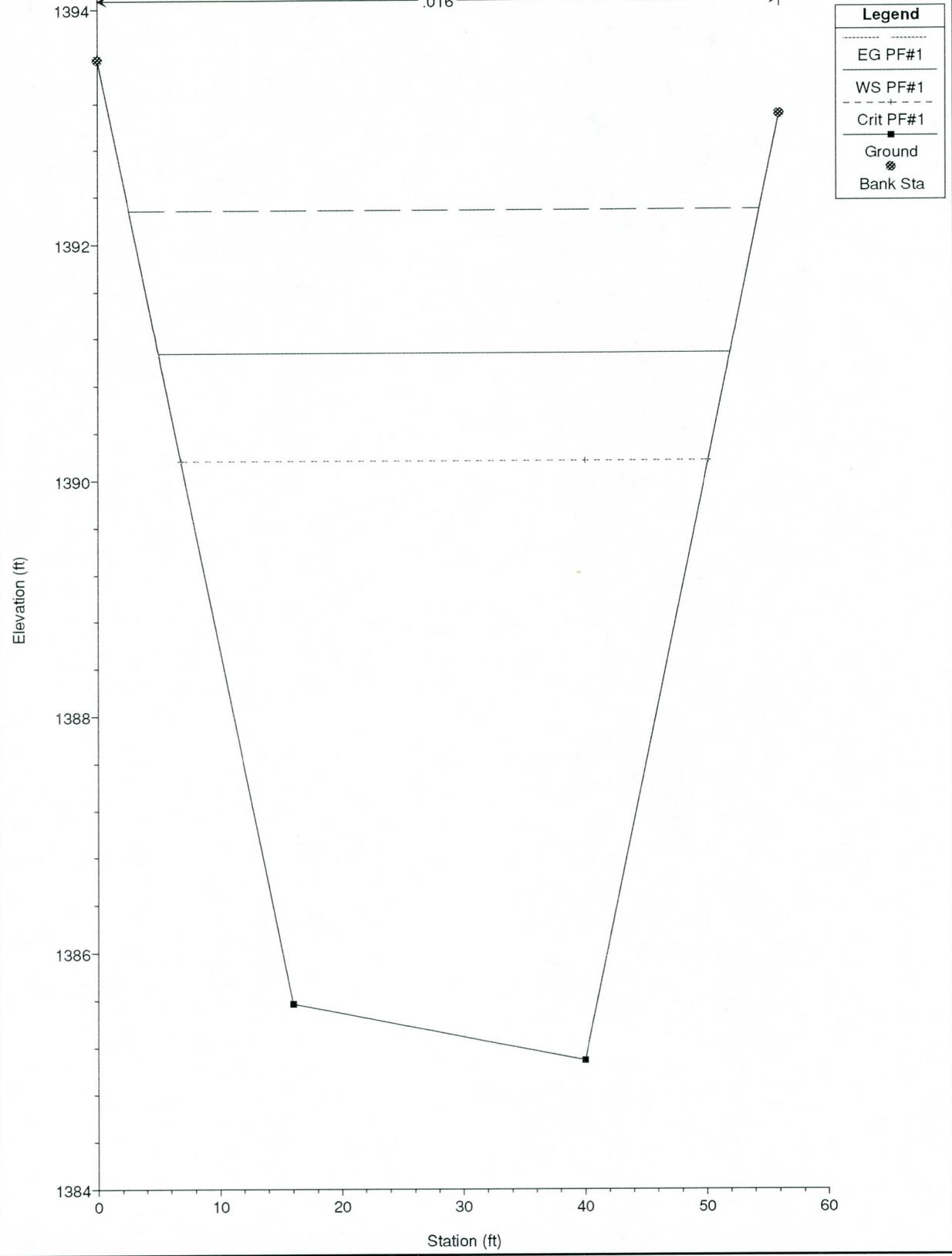


Legend	
EG PF#1	-----
Crit PF#1	- - - - -
WS PF#1	_____
Ground	_____
Bank Sta	⊗

Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 1900, upstream end of bend

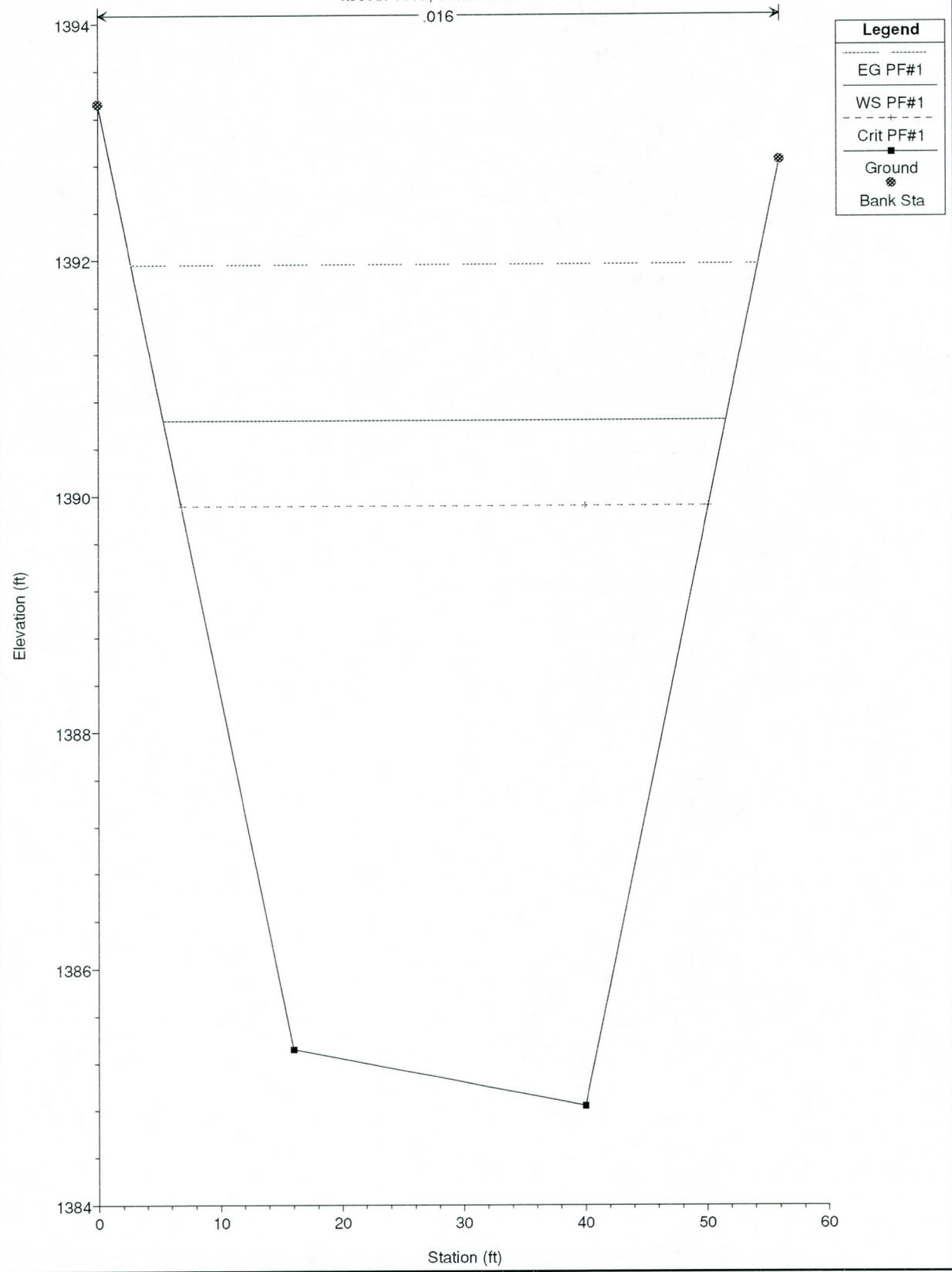
.016



Legend	
---	EG PF#1
---	WS PF#1
---	Crit PF#1
—	Ground
■	Bank Sta
◆	Bank Sta

Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

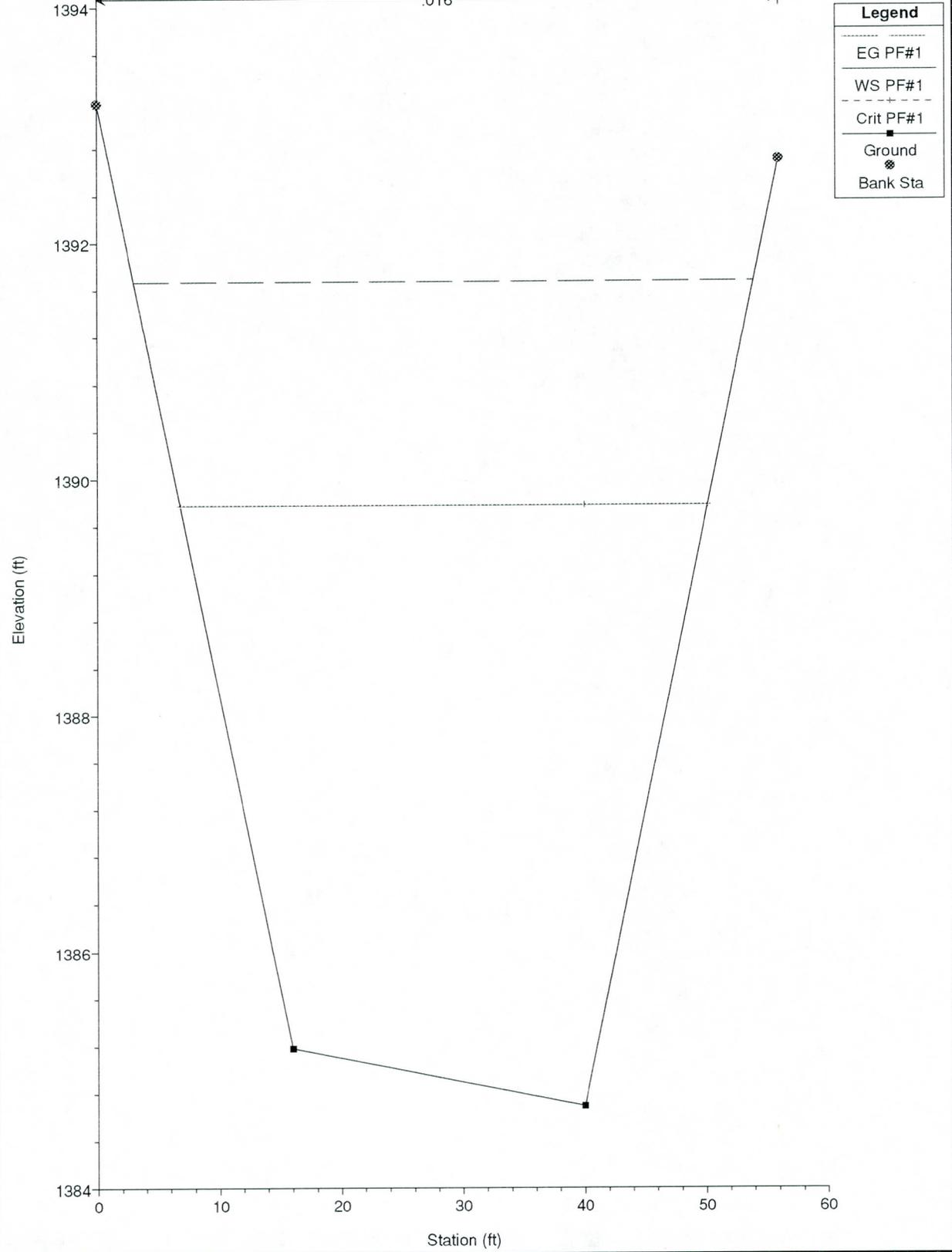
xsectn 1680, downstream end of bend



Legend	
---	EG PF#1
- - - -	WS PF#1
· · · · ·	Crit PF#1
■	Ground
⊗	Bank Sta

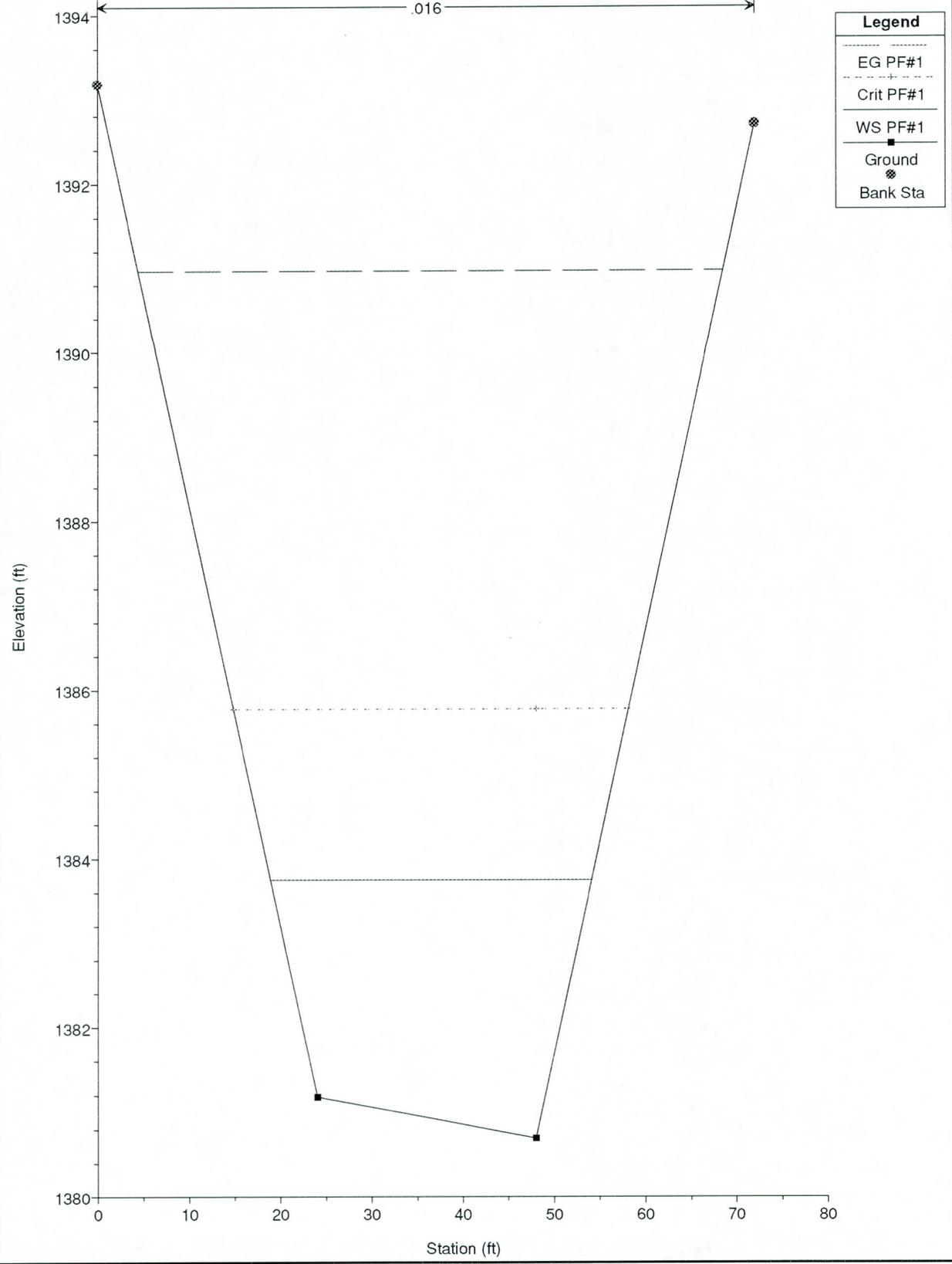
Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 1564, crest of 4' drop (5)



Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

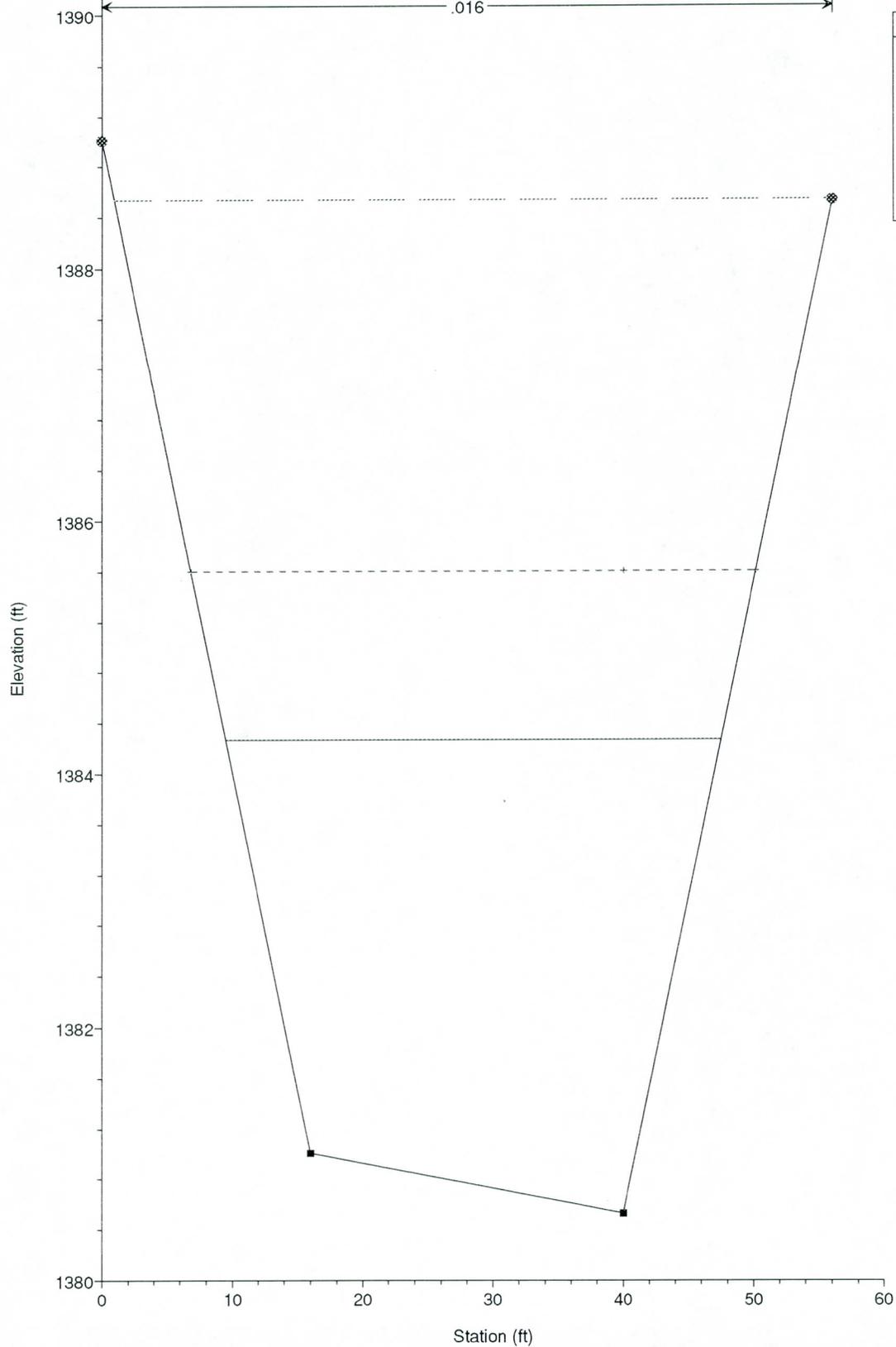
xsectn 1532, bottom of 4' drop (5)



Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 1400

.016

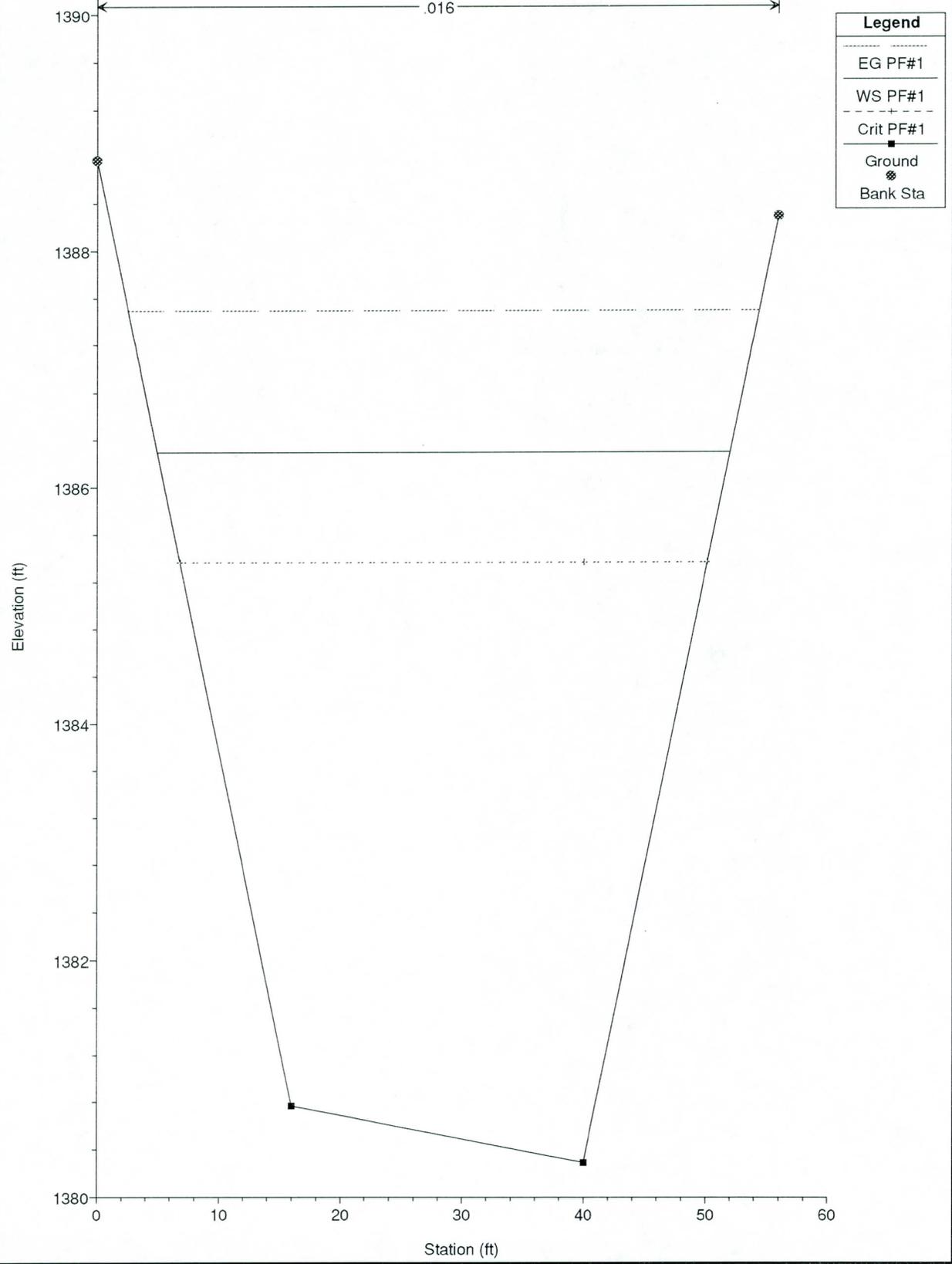


Legend	
EG PF#1	-----
Crit PF#1	- - - - -
WS PF#1	_____
Ground	_____
Bank Sta	◆

Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 1200

.016

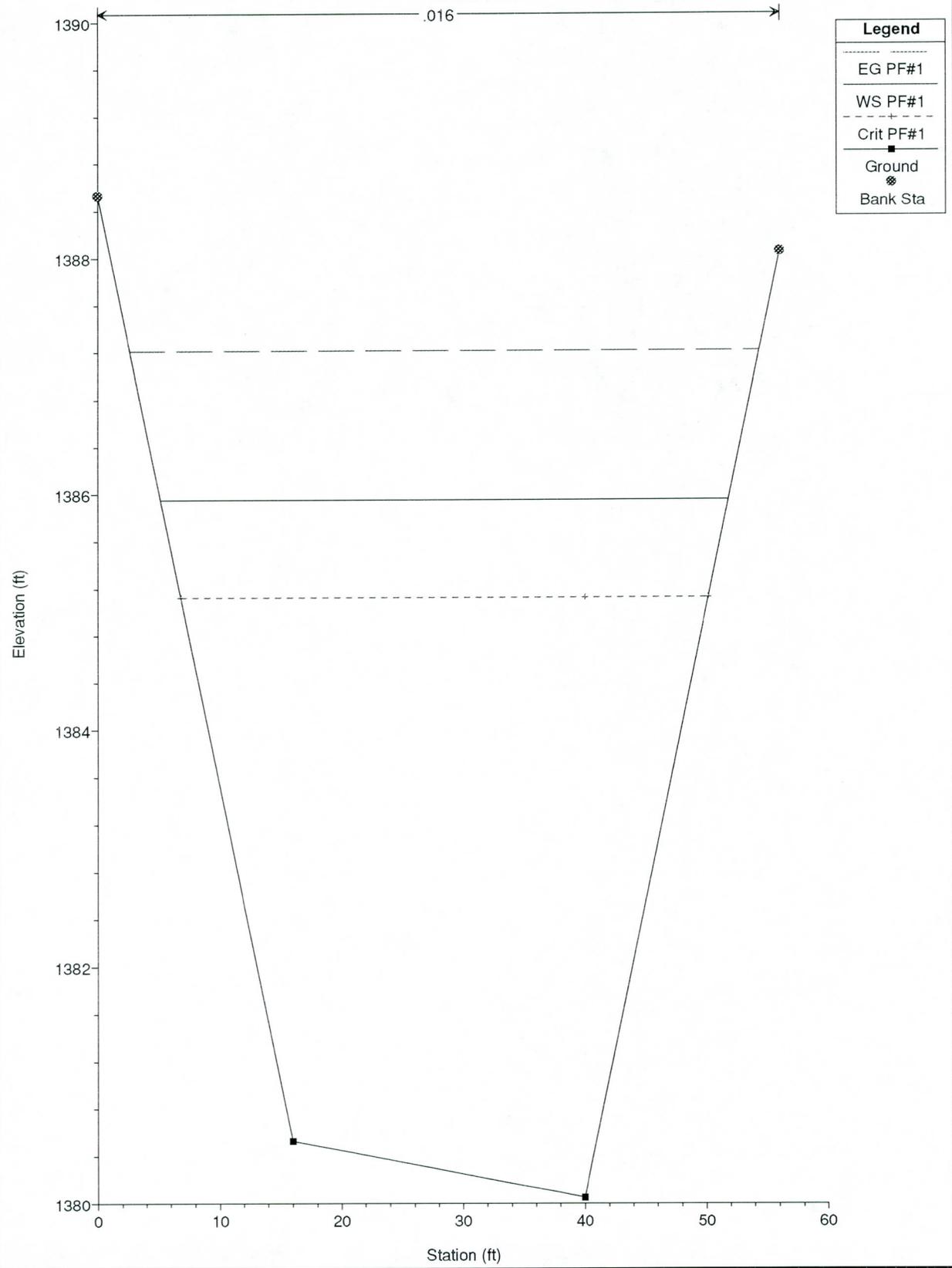


Legend	
-----	EG PF#1
- - - - -	WS PF#1
- + - + -	Crit PF#1
■	Ground
⊗	Bank Sta

Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

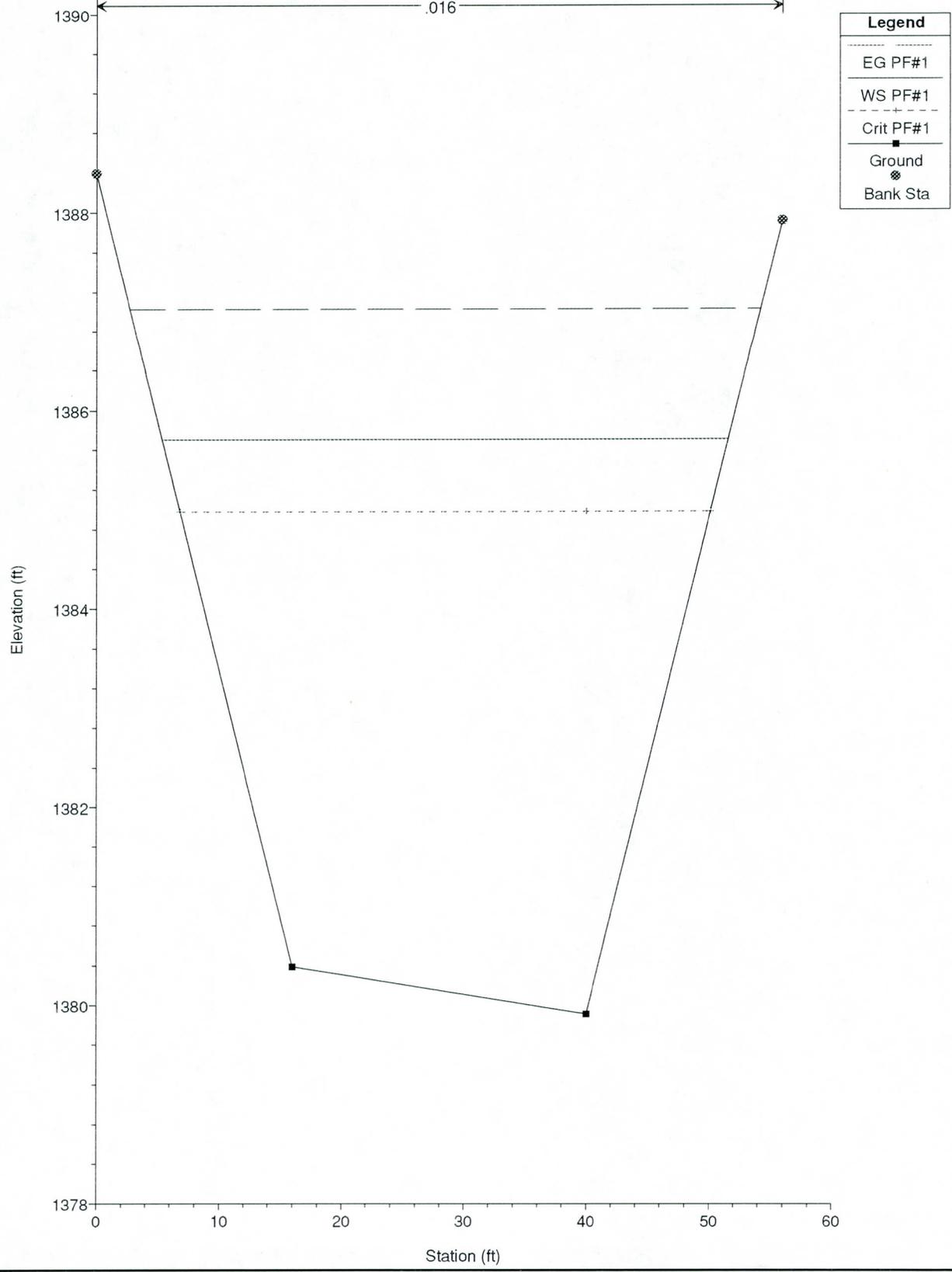
xsectn 1000

.016



Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 884
.016

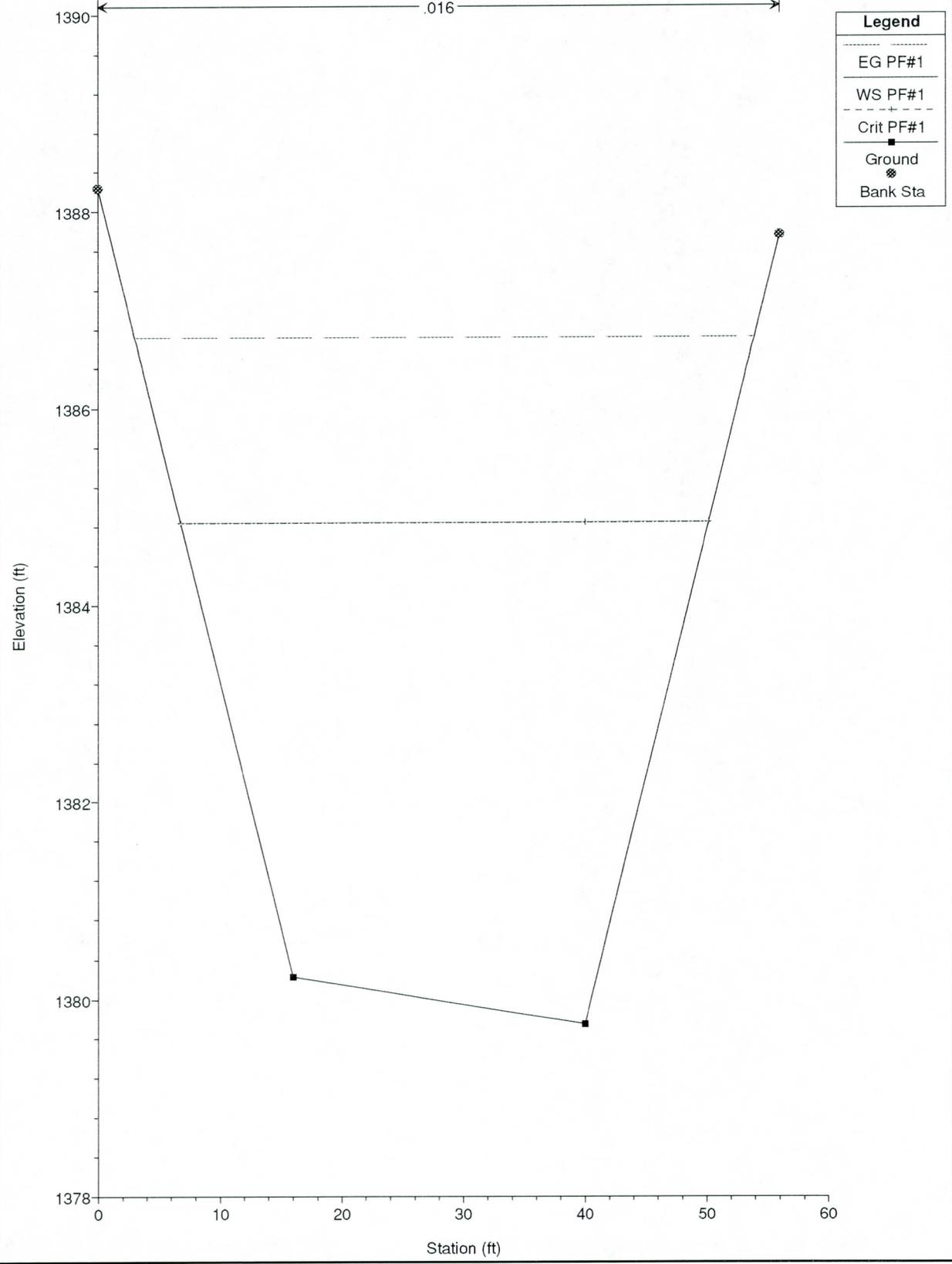


Legend	
---	EG PF#1
...	WS PF#1
- . -	Crit PF#1
■	Ground
⊗	Bank Sta

Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 760

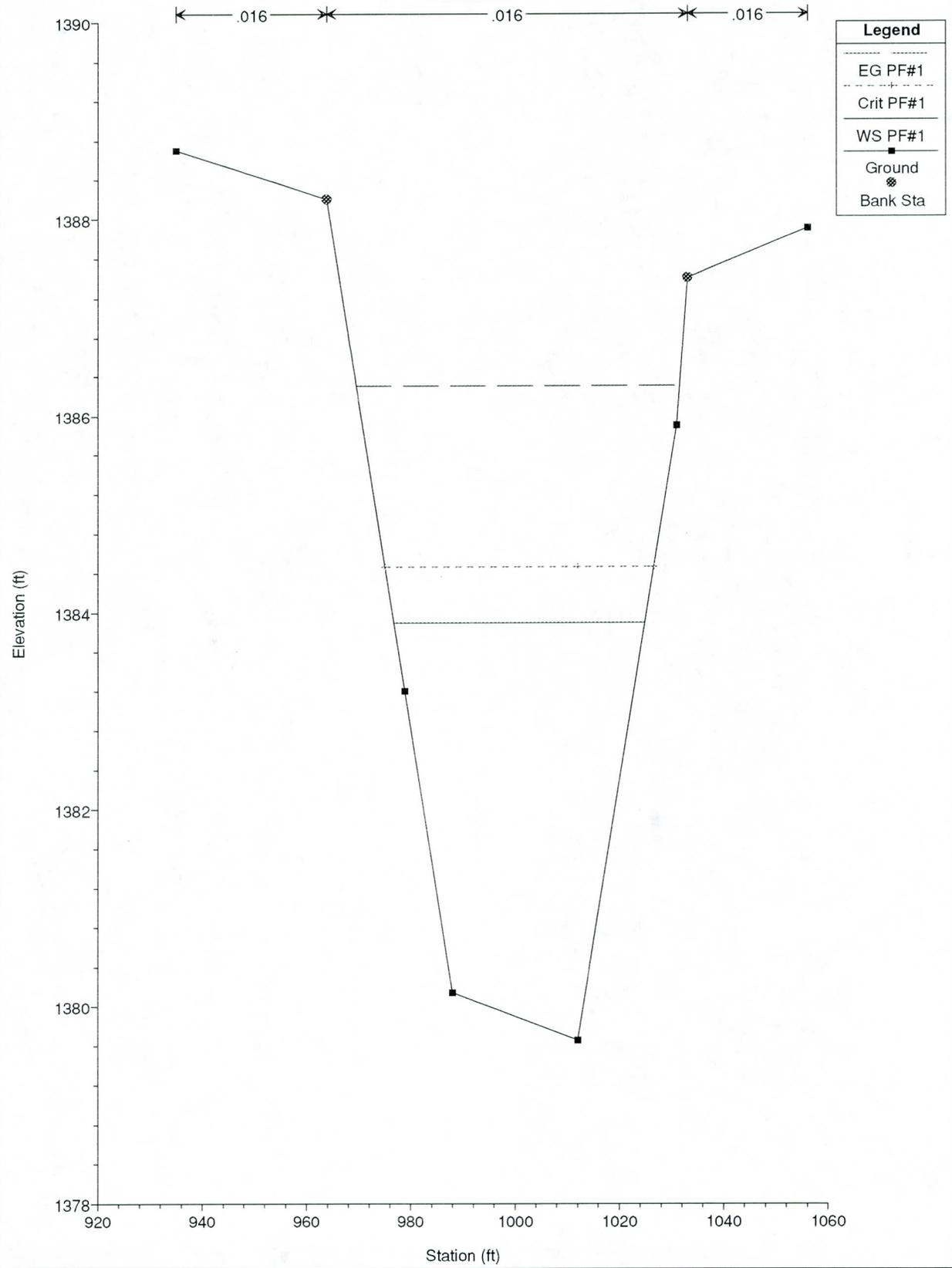
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Legend	
-----	EG PF#1
-----	WS PF#1
-----	Crit PF#1
■	Ground
◆	Bank Sta

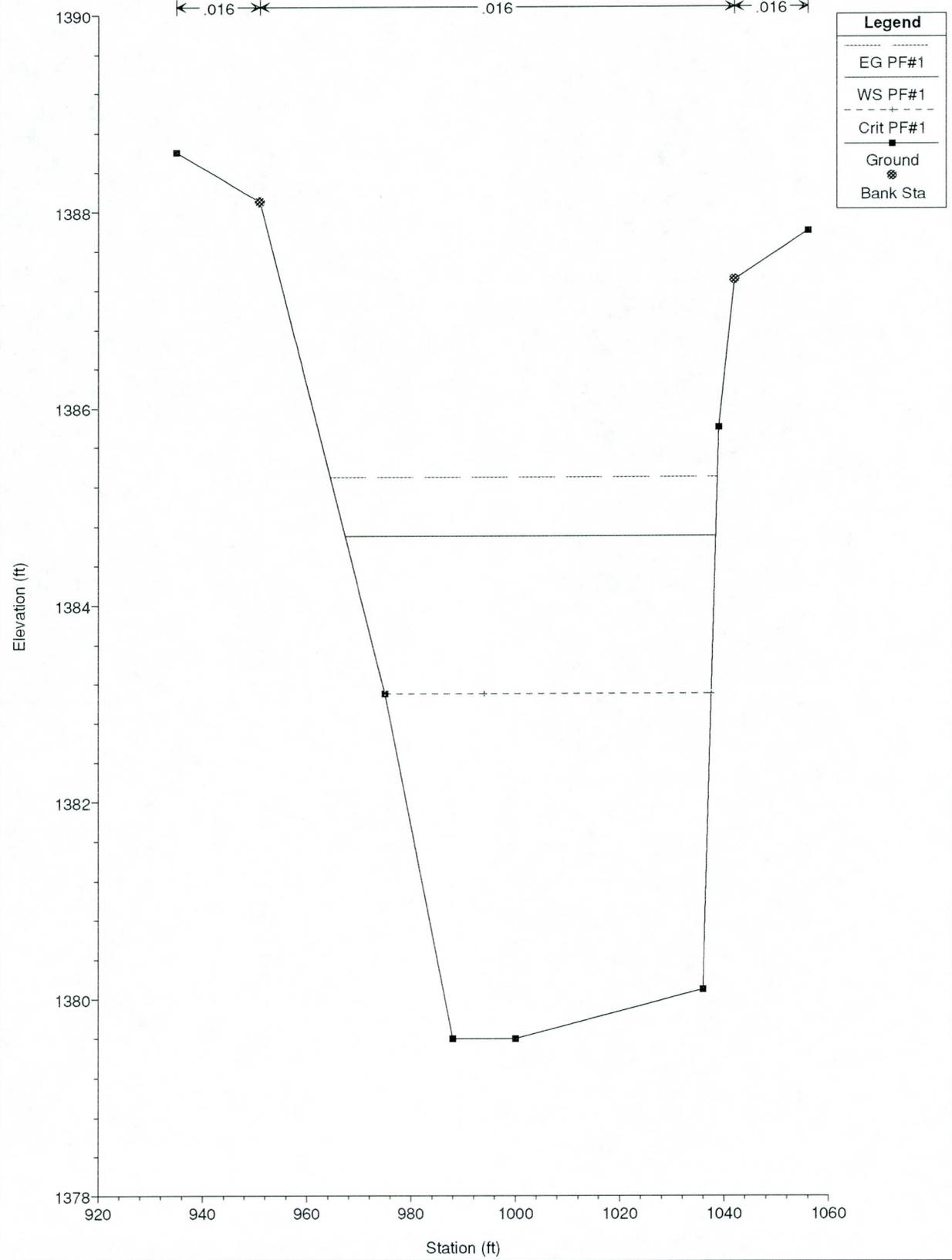
Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 683



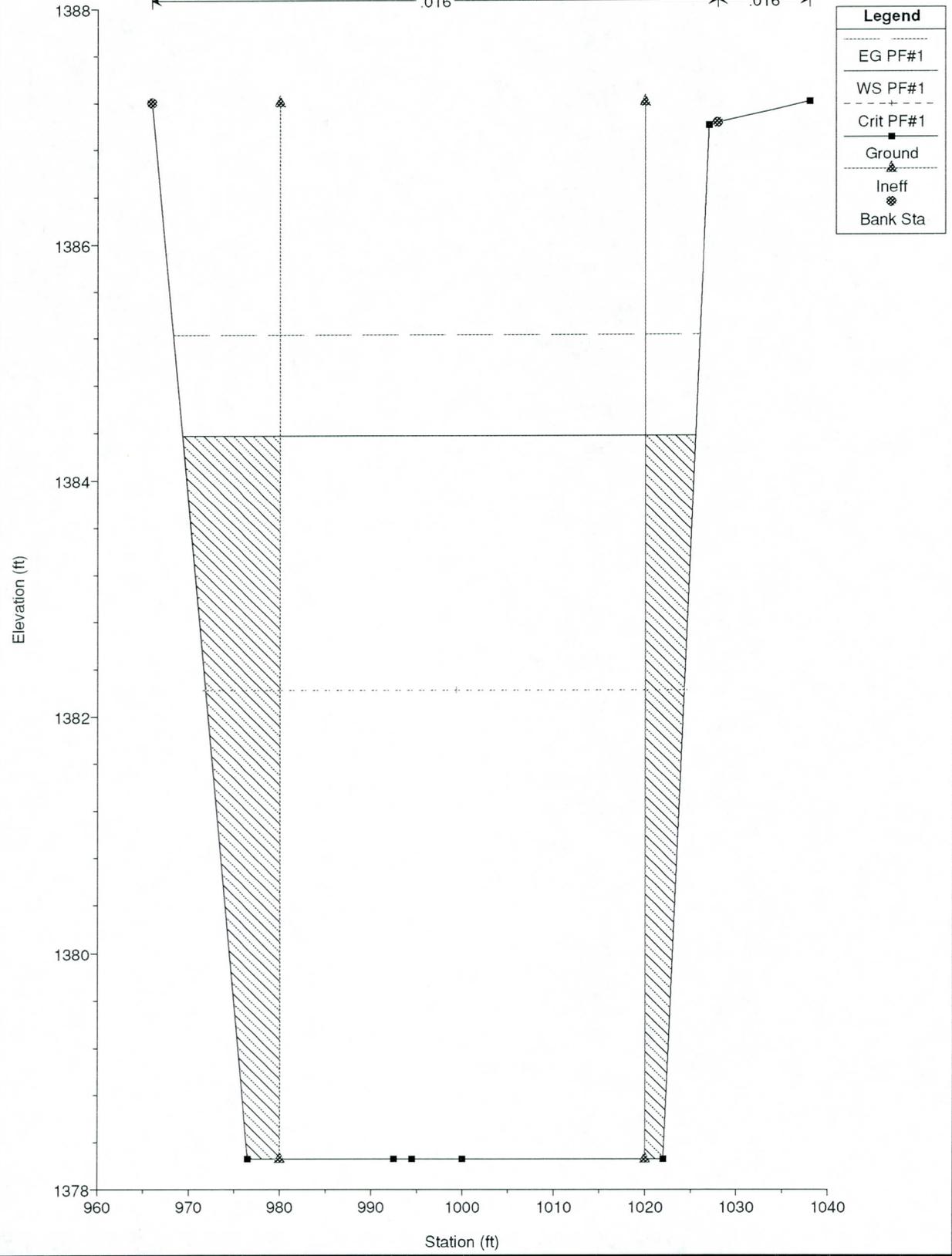
Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 630, Before contraction



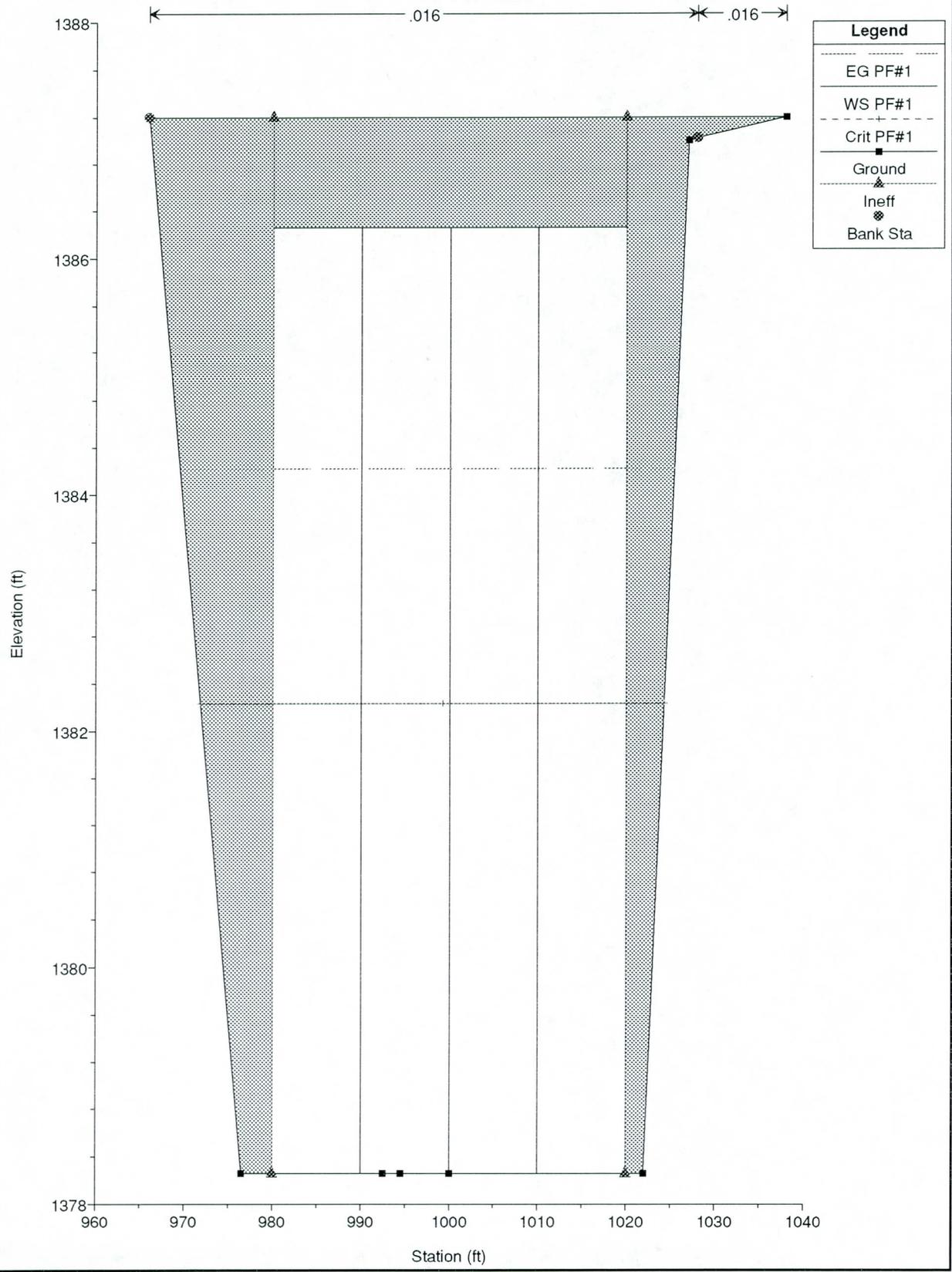
Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 550, upstream of Box



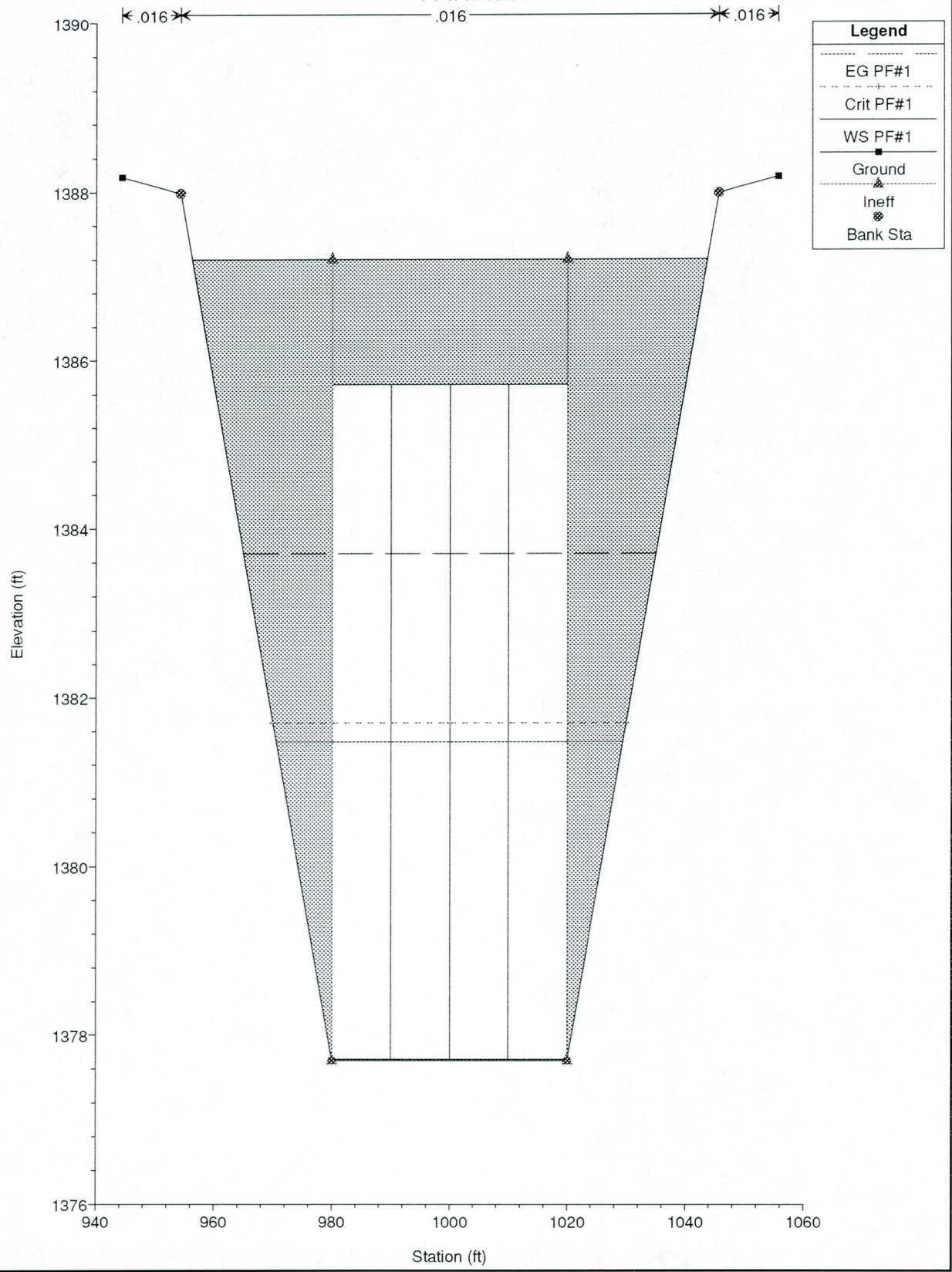
Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

4-8' x 10' RCBC



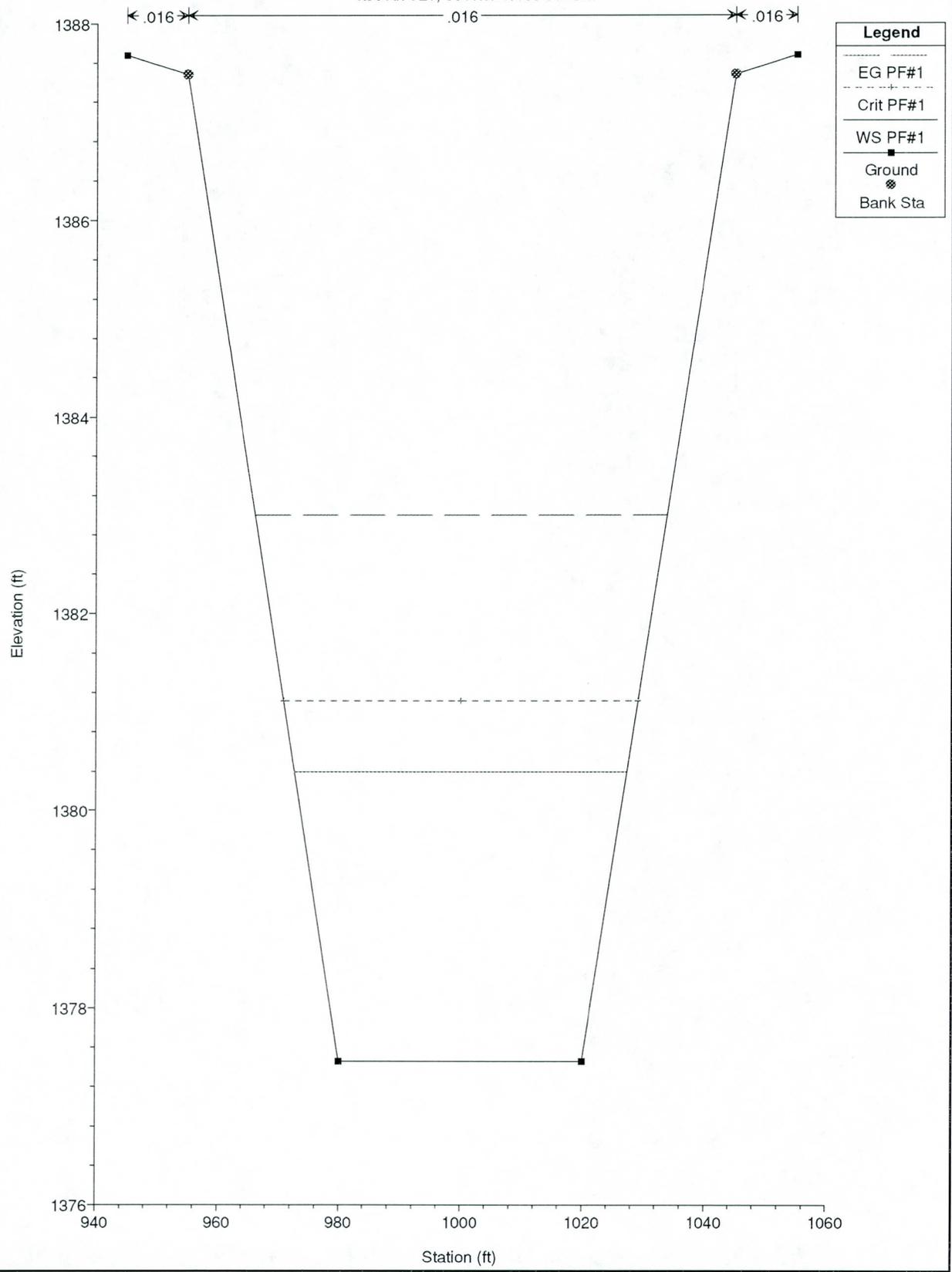
Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

4-8' x 10' RCBC



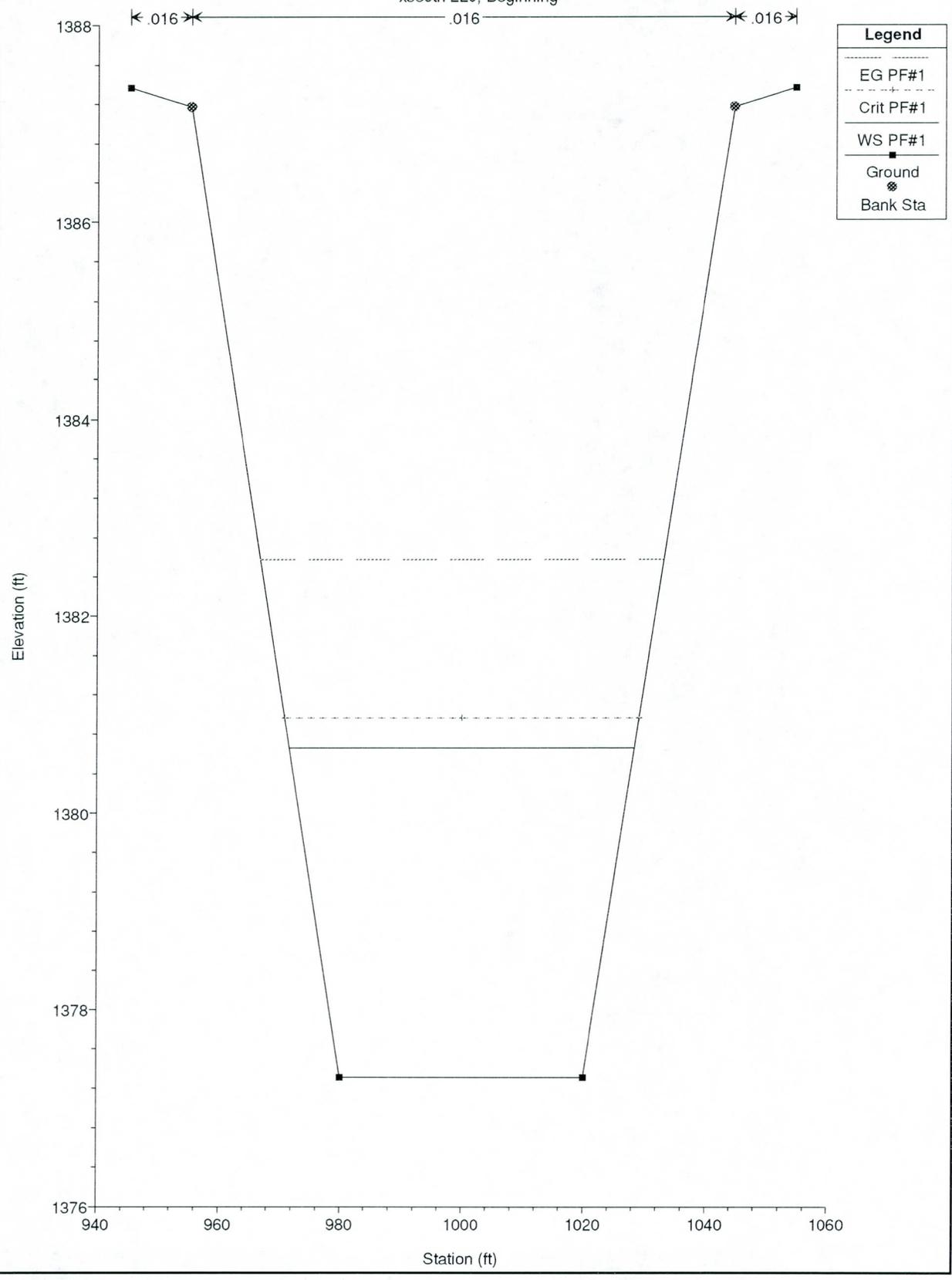
Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 320, second cross section



Sossaman Channel #4 ver 2.1 1) Plan 07 3/18/98

xsectn 220, Beginning





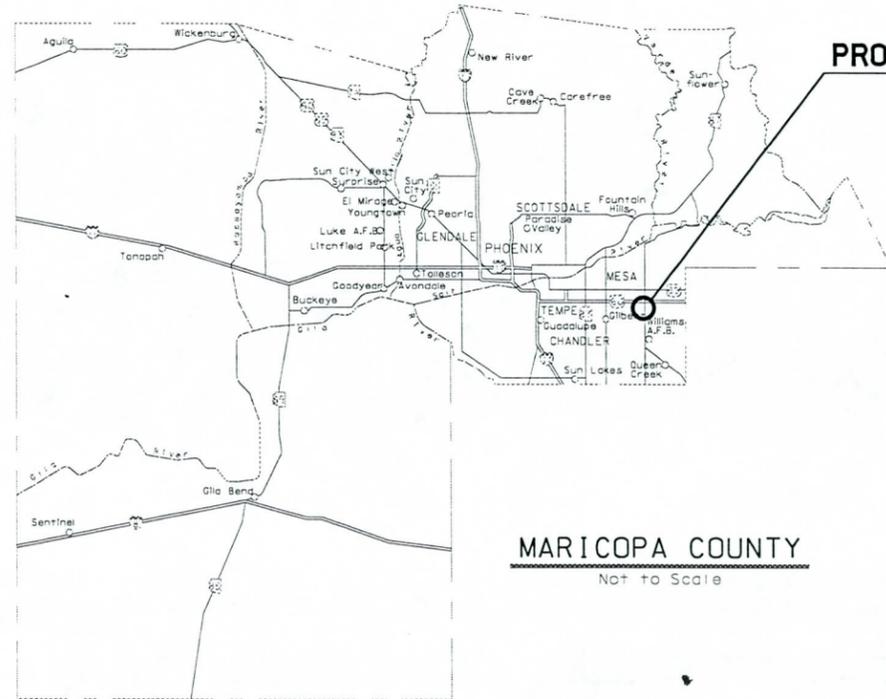
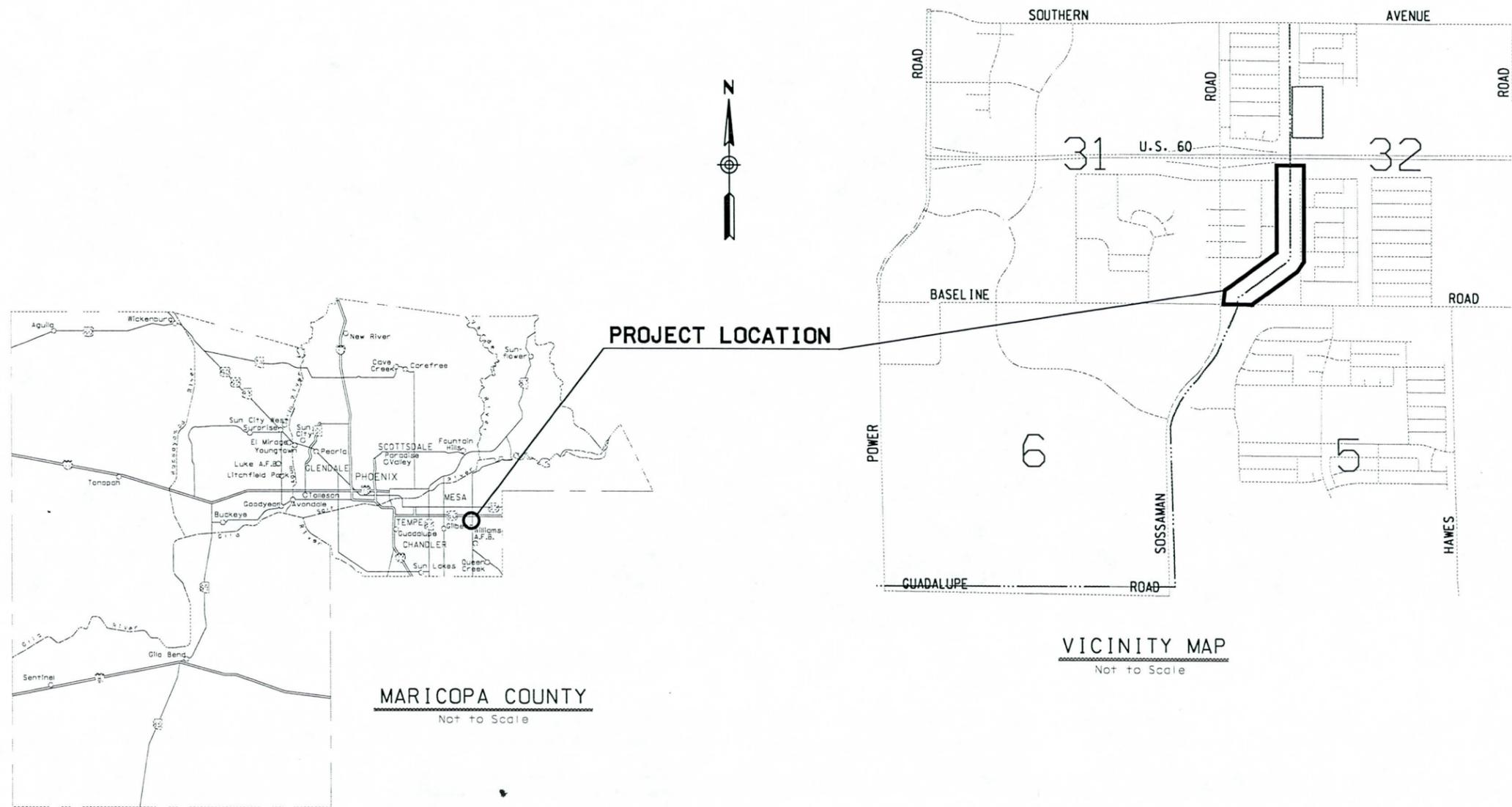
APPENDIX III

CONSTRUCTION PLANS



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PLANS FOR THE CONSTRUCTION OF:
SOSSAMAN ROAD CHANNEL
U.S. 60 TO BASELINE ROAD
FCD PROJECT NO. 108010



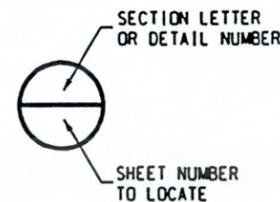
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY	
ISSUED FOR PUBLIC BIDDING BY:	
CHIEF ENGINEER AND GENERAL MANAGER	DATE
BOARD OF DIRECTORS OF THE FLOOD CONTROL DISTRICT	
JAN BREWER - CHAIRMAN	
DISTRICT 1	FULTON BROCK
DISTRICT 2	DON STAPLEY
DISTRICT 3	ANDY KUNASEK
DISTRICT 4	JAN BREWER
DISTRICT 5	MARY ROSE WILCOX



**PRELIMINARY
NOT FOR
CONSTRUCTION**

LEGEND

- BENCHMARK
- EXIST. SURVEY MONUMENT
- EXIST. SURVEY MONUMENT
- EXIST. & PROPOSED COMBINED CURB & GUTTER - MAG DET. 220 TYPE "A"
- EXIST. CONCRETE SIDEWALK - COP STD. DET. P-1230
- EXISTING DITCH
- EXISTING IRRIGATION LINE (NOTE - PRIVATE, SALT RIVER OR R.I.D.)
- EXISTING IRRIGATION STRUCTURE
- EXISTING IRRIGATION STANDPIPE
- EXISTING WATER LINE / SIZE
- EXISTING WATER METER & BOX
- EXISTING FIRE HYDRANT
- NEW OR RELOCATED FIRE HYDRANT BY CONTRACTOR
- EXISTING WATER VALVE OPERATING NUT ELEVATION
- EXISTING SEWER LINE / SIZE
- EXISTING MANHOLE
- NEW MANHOLE
- CATCH BASIN, GUTTER INLET (LENGTH TO SCALE)
- CATCH BASIN, CURB INLET (LENGTH TO SCALE)
- CATCH BASIN, CURB & GUTTER INLET (LENGTH TO SCALE)
- EXISTING STORM DRAIN / SIZE
- NEW PIPE FOR STORM DRAIN OR IRRIGATION LINE
- EXISTING UNDERGROUND CABLE TELEVISION
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELEPHONE DUCTS (SPECIFY NUMBER)
- EXISTING GAS LINE / SIZE
- EXISTING UNDERGROUND TELEPHONE CABLE
- EXISTING STREET SIGN
- EXISTING TRAFFIC SIGN
- EXISTING UTILITY POLE
- EXISTING WIRE FENCE
- EXISTING WOOD FENCE
- EXISTING CHAIN LINK FENCE
- MAIL BOX
- DOWN ANCHOR
- STREET LIGHT
- EASEMENT LINE
- EXISTING OR NEW R/W LINE
- PAVEMENT CENTER LINE AND/OR MONUMENT LINE (C AND / OR M)
- BORING HOLE / NUMBER (SEE SPECIAL PROVISIONS)
- STATIONING FOR HECRAS COMPUTER HYDRAULIC MODEL
- RECORDED MEASUREMENT
- FIELD MEASURED
- CALCULATED MEASUREMENT



STRUCTURAL NOTES:

1. ALL CONSTRUCTION SHALL CONFORM TO MAG STANDARDS DETAILS, SPECIFICATIONS, DATED 1992, INCLUDING ALL REVISIONS THRU 1997.
2. DESIGN IS IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DIVISION 1, 15TH EDITION, 1992.
3. REINFORCING STEEL SHALL CONFORM TO ASTM SPECIFICATION A615, GRADE 60.
4. STRESSES - $f_s = 24,000$ PSI - GRADE 60 REINFORCING STEEL.
5. ALL REINFORCING STEEL PLACEMENT DIMENSIONS SHALL BE TO CENTER OF BARS UNLESS OTHERWISE NOTED.
6. ALL REINFORCING STEEL SHALL HAVE 2" CLEAR COVER UNLESS OTHERWISE NOTED.
7. STRUCTURAL STEEL SHALL CONFORM TO ASTM SPECIFICATION A36.
8. ALL WELDING SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN WELDING SOCIETY, STRUCTURAL WELDING CODE, REVISED 1996.
9. DIMENSIONS SHALL NOT BE SCALED FROM DRAWINGS.
10. CHAMFER ALL EXPOSED CORNERS $\frac{3}{4}$ " UNLESS OTHERWISE NOTED.
11. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3,000 PSI MAG. CLASS A.

GENERAL NOTES:

1. ALL CONSTRUCTION TO BE PERFORMED ACCORDING TO APPLICABLE MAG STANDARD DETAILS AND MAG SPECIFICATIONS, DATED 1992, INCLUDING ALL REVISIONS THROUGH 1996 AND THE CITY OF PHOENIX ADDITIONS AND DELETIONS THROUGH 1997.
2. FACILITIES WHICH ARE NOT SPECIFICALLY LOCATED WITH ACTUAL HORIZONTAL AND VERTICAL CONTROLS ARE APPROXIMATE AND TO THE BEST AVAILABLE INFORMATION.
3. EXISTING UTILITIES AND OTHER FACILITIES HAVE BEEN PLACED ON THE PLANS FROM FIELD SURVEYS, EXISTING MAPS AND OTHER CURRENT PLANS WITHIN THE AREA OF THIS PROJECT. THE CONTRACTOR WILL DETERMINE THE EXACT LOCATION AND/OR ELEVATION OF EXISTING UTILITIES WHICH PERTAIN TO AND AFFECT THE CONSTRUCTION OF THIS PROJECT.
4. TWO (2) WORKING DAYS PRIOR TO EXCAVATING, THE CONTRACTOR SHALL CALL FOR BLUE STAKES AT THE BLUE STAKE CENTER (PHONE: 602-263-1100).
5. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION.
6. THE FLOOD CONTROL DISTRICT OR CITY OF MESA IS NOT RESPONSIBLE FOR LIABILITY ACCRUED DUE TO DELAYS AND/OR DAMAGE TO UTILITIES IN CONJUNCTION WITH THIS CONSTRUCTION.
7. ANY WORK PERFORMED WITHOUT THE APPROVAL OF THE FLOOD CONTROL DISTRICT AND/OR THE ENGINEER AND ALL WORK AND MATERIALS NOT IN CONFORMANCE WITH THE SPECIFICATIONS IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
8. THE ENGINEER WILL DETERMINE THE NUMBER AND LOCATION OF THE REQUIRED COMPACTION TESTS FOR STRUCTURE BACKFILL.
9. TRAFFIC CONTROL SHALL BE MAINTAINED IN ACCORDANCE WITH M.A.G. SPECIFICATION 401, PART VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (1988 EDITION INCLUDING REVISION 3 DATED SEPTEMBER 3, 1993).
10. NO JOB WILL BE CONSIDERED COMPLETED UNTIL CURBS, PAVEMENT AND SIDEWALKS HAVE BEEN SWEEPED CLEAN OF ALL DIRT AND DEBRIS.
11. PRIOR TO FINAL APPROVAL AND ACCEPTANCE OF THE WORK, THE CONTRACTOR WILL BE REQUIRED TO CLEAN ADJACENT (OFF-PROJECT) ROADWAYS USED DURING THE COURSE OF CONSTRUCTION.

INDEX OF SHEETS

SHEET NO.	TITLE
1	COVER SHEET, & VICINITY MAP
2	GENERAL NOTES & INDEX OF SHEET
3	TYPICAL SECTIONS
4	QUANTITY SUMMARY
5	GEOMETRIC LAYOUT
6-9	PLAN AND PROFILES
10	MISCELLANEOUS DETAILS
11-14	CHANNEL CROSS SECTIONS

0.00 = 1.800 CFS

UTILITY NOTIFICATION

PHONE NO.	COMPANY	CONTACT
371-6965	APS	STEVE GOODMAN
236-6163	SRP ELECTRIC	SCOTT HELBING
236-5799	SRP IRRIGATION	SUSAN ORTEGA
352-5862	COX CABLE	CARL MCKAY
484-5306	SOUTHWEST GAS	PRESTON FORD
831-4636	U.S. WEST	DON IVEY
255-7541	ADOT	BILL BRISCOE
644-2518	CITY OF MESA	DIANA WELLS

PROJECT BENCHMARKS

INTERSECTION OF SOSSAMAN & BASELINE RD
 FD BC IN HH
 S/W CORNER SECTION 32 T1N, R7E
 ELEV = 1385.98

NO.	REVISION	BY	DATE
3			
2			
1			

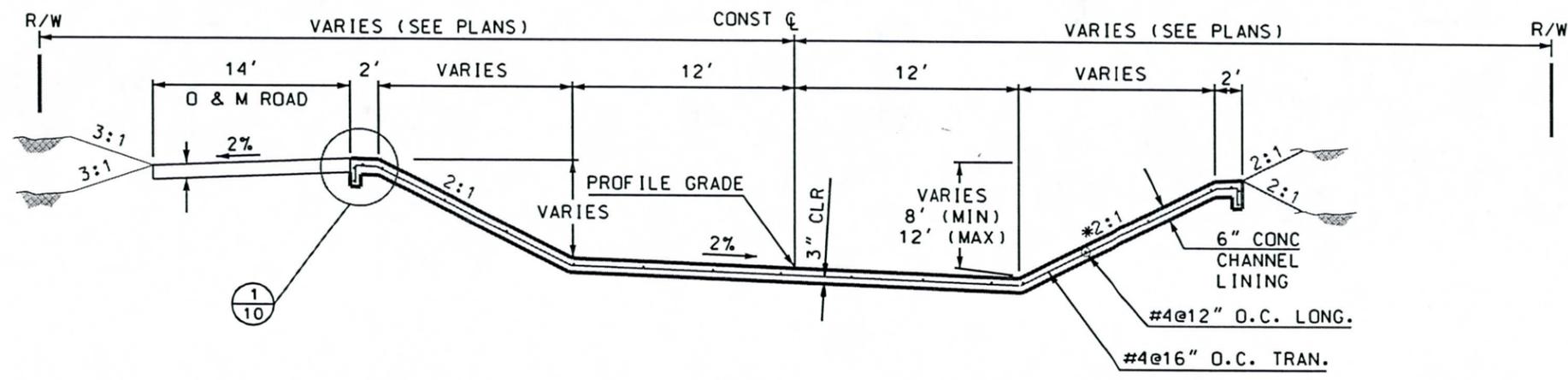
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

SOSSAMAN ROAD CHANNEL
U.S. 60 TO BASELINE ROAD
PROJECT NO. 108010

	BY	DATE
DESIGNED	JRR	12/22/97
DRAWN	FC	12/22/97
CHECKED	MAL	2/98

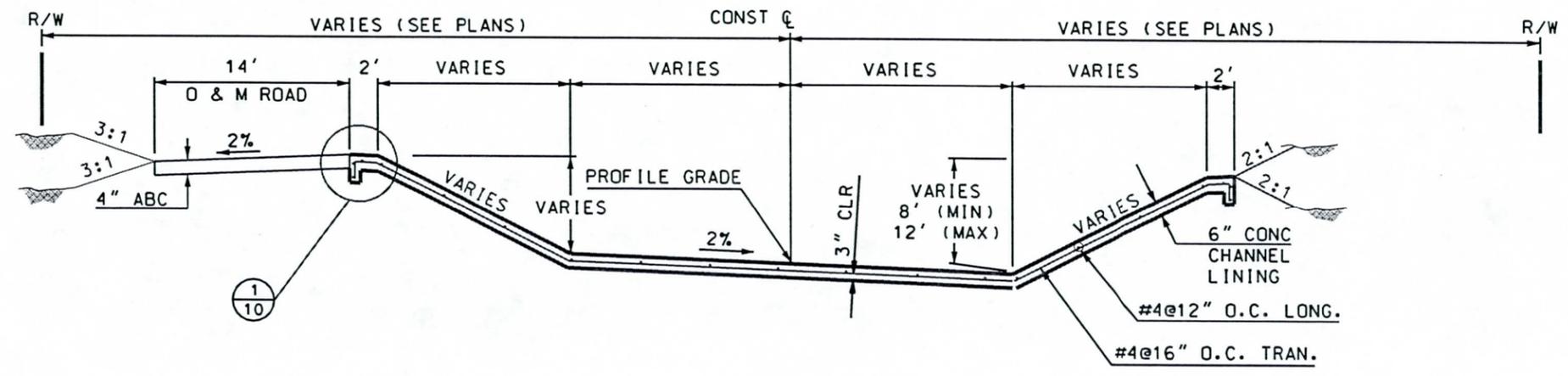
GENERAL NOTES SHEET OF 2 14

ES:DCN 11/25/97 10:42 EC



TYPICAL SECTION
 STA 11+30 TO STA 37+70
 NTS

* 1.75:1 FROM STA 23+29
 TO STA 29+36



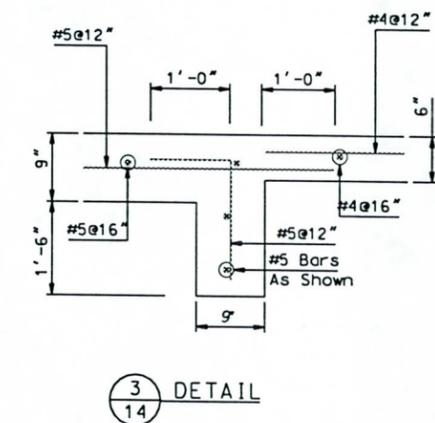
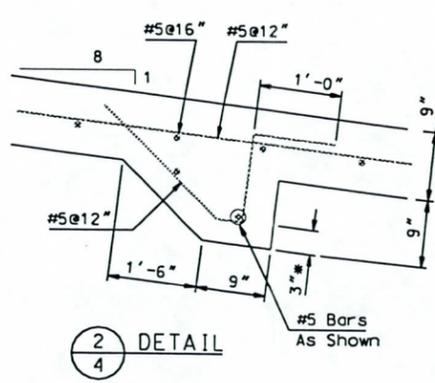
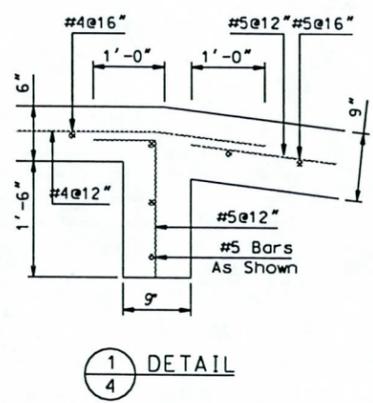
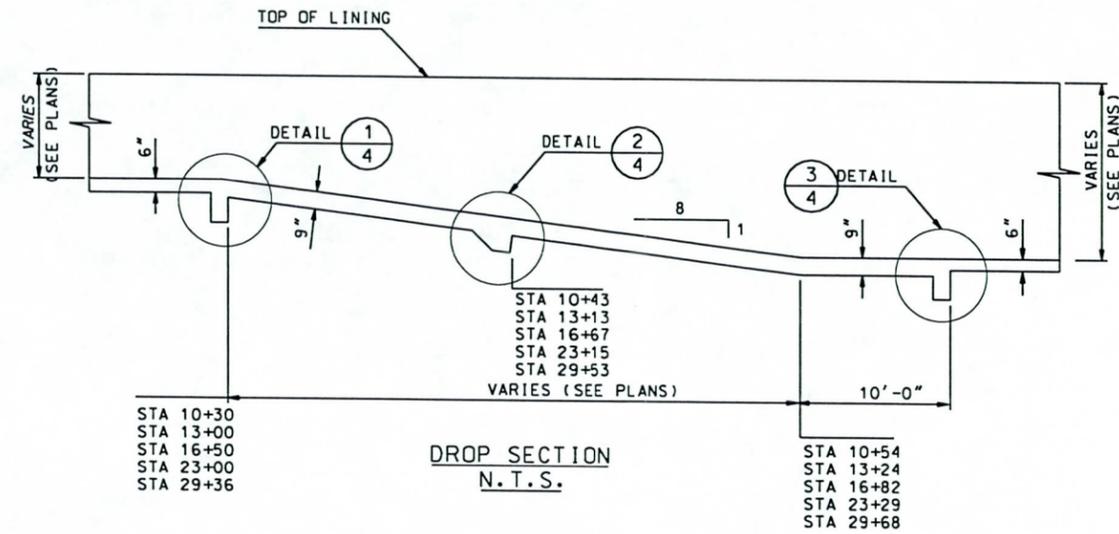
TYPICAL SECTION
 STA 10+30 TO STA 11+30
 STA 37+70 TO STA 38+70
 NTS

3			
2			
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NO.	REVISION	BY	DATE
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION			
SOSSAMAN ROAD CHANNEL U.S. 60 TO BASELINE ROAD PROJECT NO. 108010			
		BY	DATE
DESIGNED		JRR	03/02/98
DRAWN		FC	03/02/98
CHECKED		MAL	03/02/98
TYPICAL SECTIONS			SHEET OF 3 14

E:\projects\108010\soffman\soffman.dgn - trap / not th.dgn

SUMMARY OF ESTIMATED QUANTITIES

ITEM NUMBER	ITEM DESCRIPTION	UNIT	SHEET NUMBER					TOTAL
			6	7	8	9		
105-1	Partnering	LS						1
107-1	NPDES/SWPPP Permits	LS						1
107-2	Project Signs Allowance	LS						1
202-1	Mobilization	LS						1
215-1	Earthwork For Open Channels	CY						22.000
310-1	Aggregate Base Course (Maintenance Road)	TONS	243	221	253	228		945
350-1	Removal of Existing Improvements	LS						1
401-1	Traffic Control	LS						1
420-1	Chain Link Fence	LF	1,540	1,400	1,600	1,140		5,680
420-2	14' Gate	EA	1			2		3
505-1	Concrete Channel Lining	CY	1,068	995	1,137	739		3,939
505-2	Concrete Catch Basin	EA				1		1
610-1	Water Line Replacement (8 inch)	LF	125					125
618-1	24 Inch RGRCP	LF				40		40

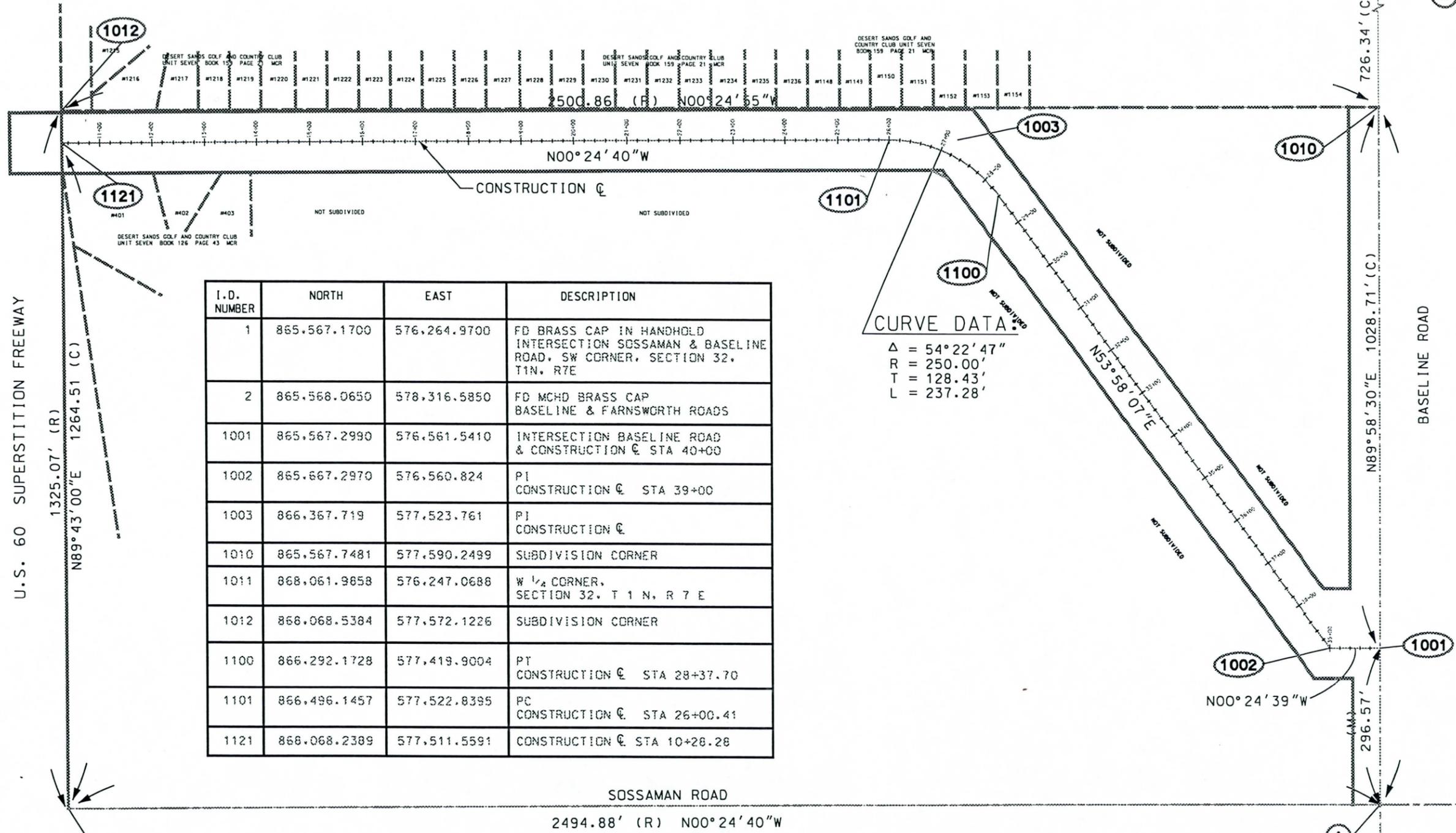


PRELIMINARY
NOT FOR
CONSTRUCTION

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2			
1			
NO.	REVISION	BY	DATE
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION			
SOSSAMAN ROAD CHANNEL U.S. 60 TO BASELINE ROAD PROJECT NO. 108010			
	DESIGNED	JRR	03/02/98
	DRAWN	JG	03/02/98
	CHECKED	MAL	03/02/98
	BY		DATE
QUANTITY SUMMARY & DETAIL SHEET			SHEET OF 4 14

U.S. 60 SUPERSTITION FREEWAY

1325.07' (R)
N89°43'00"E 1264.51' (C)

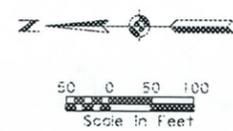


I.D. NUMBER	NORTH	EAST	DESCRIPTION
1	865,567.1700	576,264.9700	FD BRASS CAP IN HANDHOLD INTERSECTION SOSSAMAN & BASELINE ROAD, SW CORNER, SECTION 32, T1N, R7E
2	865,568.0650	578,316.5850	FD MCHD BRASS CAP BASELINE & FARNSWORTH ROADS
1001	865,567.2990	576,561.5410	INTERSECTION BASELINE ROAD & CONSTRUCTION C STA 40+00
1002	865,667.2970	576,560.824	PI CONSTRUCTION C STA 39+00
1003	866,367.719	577,523.761	PI CONSTRUCTION C
1010	865,567.7481	577,590.2499	SUBDIVISION CORNER
1011	868,061.9858	576,247.0688	W 1/2 CORNER, SECTION 32, T 1 N, R 7 E
1012	868,068.5384	577,572.1226	SUBDIVISION CORNER
1100	866,292.1728	577,419.9004	PT CONSTRUCTION C STA 28+37.70
1101	866,496.1457	577,522.8395	PC CONSTRUCTION C STA 26+00.41
1121	868,068.2389	577,511.5591	CONSTRUCTION C STA 10+26.28

CURVE DATA
 $\Delta = 54^\circ 22' 47''$
 $R = 250.00'$
 $T = 128.43'$
 $L = 237.28'$

TWO WORKING DAYS BEFORE YOU DIG, CALL 263-1100 BLUE STAKE

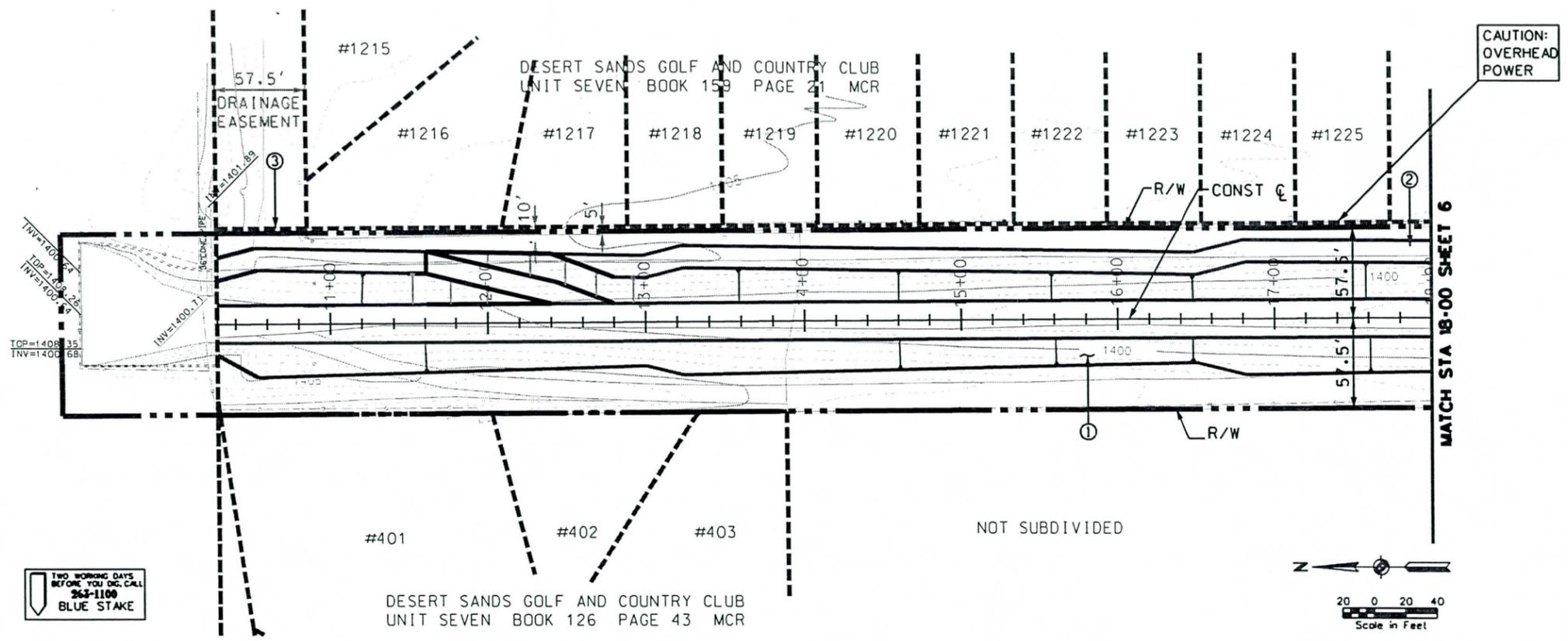
(R) = RECORDED
 (M) = MEASURED
 (C) = CALCULATED



PRELIMINARY NOT FOR CONSTRUCTION

3			
2			
1			
NO.	REVISION	BY	DATE
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION SOSSAMAN ROAD CHANNEL U.S. 60 TO BASELINE ROAD PROJECT NO. 108010			
	DESIGNED	JRR	11/06/97
	DRAWN	FC	11/06/97
	CHECKED	MAL	03/02/98
	BY		DATE
	1568 JEFFREY R. RIDOLE		
GEOMETRIC LAYOUT			SHEET OF 5 14

U.S. 60
(SUPERSTITION FREEWAY)



TWO WORKING DAYS
BEFORE YOU DIG, CALL
800-1100
BLUE STAKE

DESERT SANDS GOLF AND COUNTRY CLUB
UNIT SEVEN BOOK 126 PAGE 43 MCR

CAUTION:
OVERHEAD
POWER

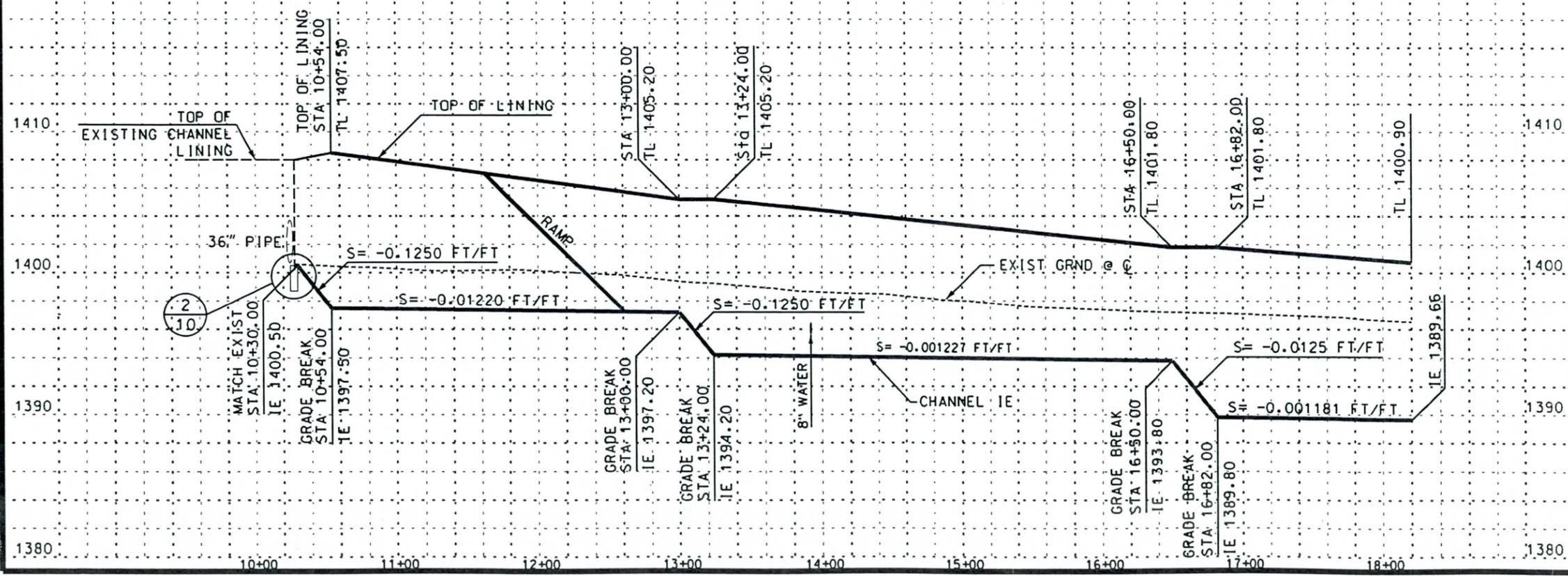
REMOVE

○ CONSTRUCT ○

① STA 10+30 TO STA 18+00 CONSTRUCT
1,068 CY OF CONCRETE CHANNEL.

② STA 10+30 TO STA 18+00 LT
CONSTRUCT 243 TONS ABC.

③ STA 10+30, LT CONSTRUCT 14'
GATE PER MAG DETAIL 160.



NO.	REVISION	BY	DATE
3			
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**FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ENGINEERING DIVISION**

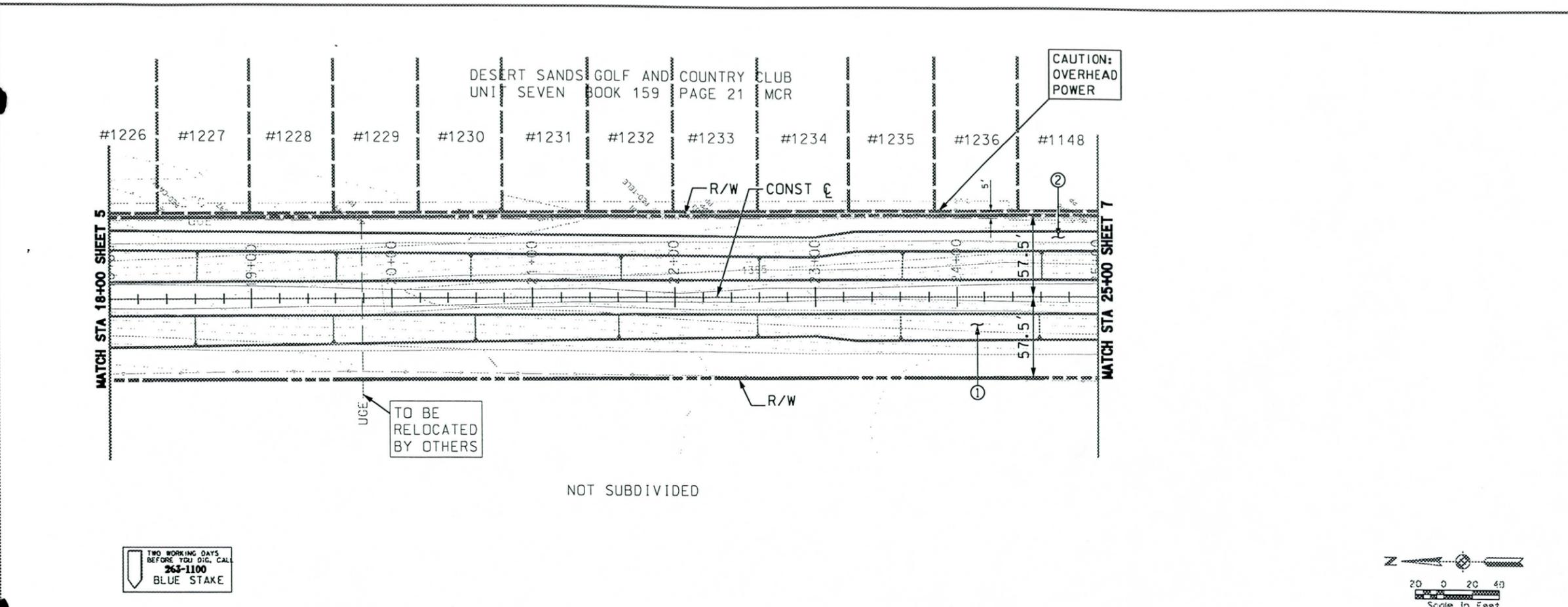
**SOSSAMAN ROAD CHANNEL
U.S. 60 TO BASELINE ROAD
PROJECT NO. 108010**

	BY	DATE
DESIGNED	JRR	03/02/98
DRAWN	FC	03/02/98
CHECKED	MAL	03/02/98

PLAN AND PROFILE

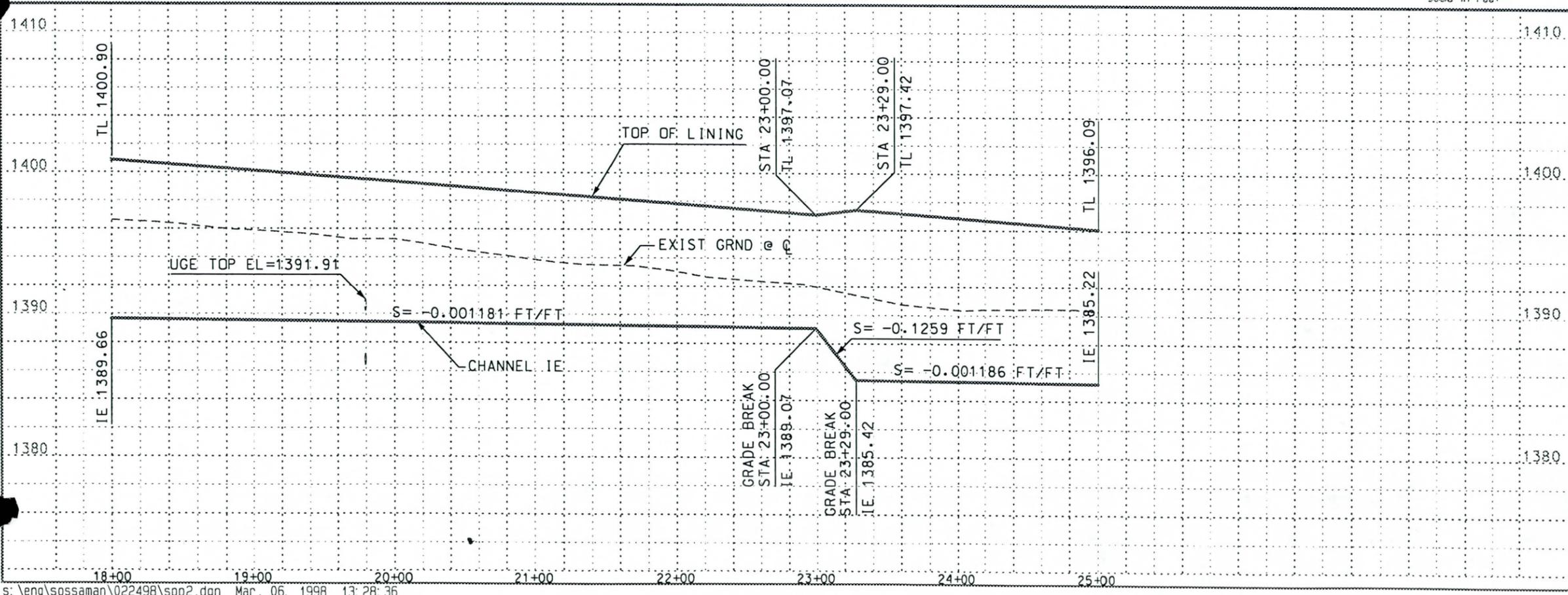
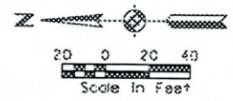
STA 10+28.28 TO STA 18+00

SHEET OF
6 14



NOT SUBDIVIDED

TWO WORKING DAYS BEFORE YOU DIG. CALL 262-1100 BLUE STAKE



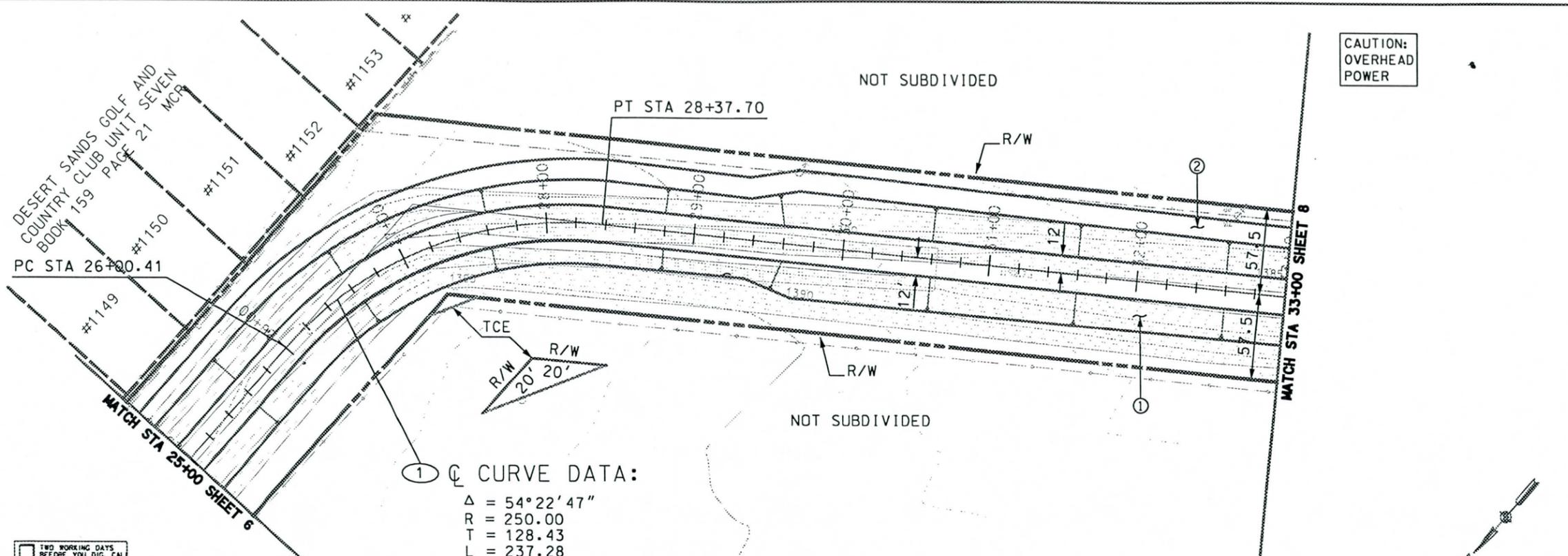
REMOVE

1

CONSTRUCT

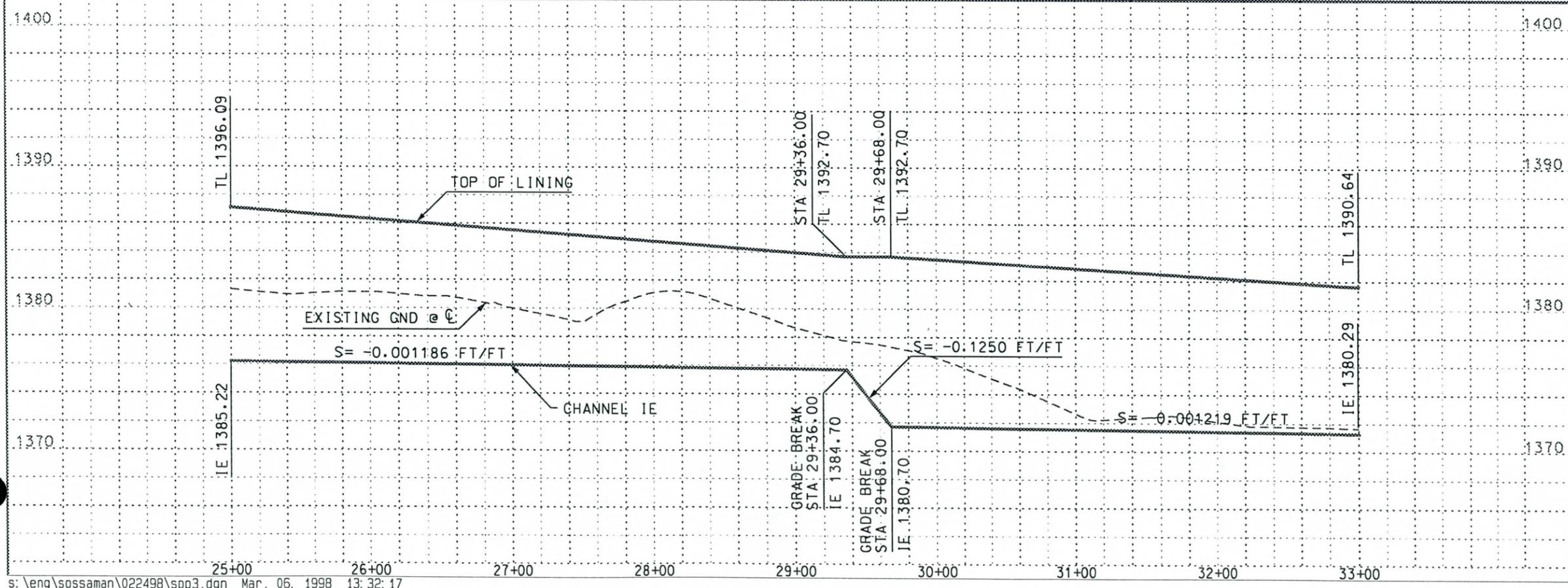
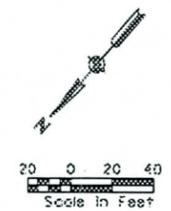
- ① STA 18+00 TO STA 25+00 CONSTRUCT 995 CY CONCRETE CHANNEL.
- ② STA 18+00 TO STA 25+00, LT CONSTRUCT 221 TONS ABC.

3			
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NO.	REVISION	BY	DATE
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION			
SOSSAMAN ROAD CHANNEL U.S. 60 TO BASELINE ROAD PROJECT NO. 108010			
		BY	DATE
DESIGNED	JRR		03/02/98
DRAWN	FC		03/02/98
CHECKED	MAL		03/02/98
PLAN AND PROFILE			SHEET OF 7 14



① CURVE DATA:
 $\Delta = 54^{\circ}22'47''$
 $R = 250.00$
 $T = 128.43$
 $L = 237.28$

TWO WORKING DAYS
 BEFORE YOU DIG, CALL
 263-1100
 BLUE STAKE



REMOVE

①

○ CONSTRUCT ○

- ① STA 25+00 TO STA 33+00 CONSTRUCT 1,137 CY OF CONCRETE CHANNEL.
- ② STA 25+00 TO STA 33+00 LT & RT CONSTRUCT 253 TONS ABC.

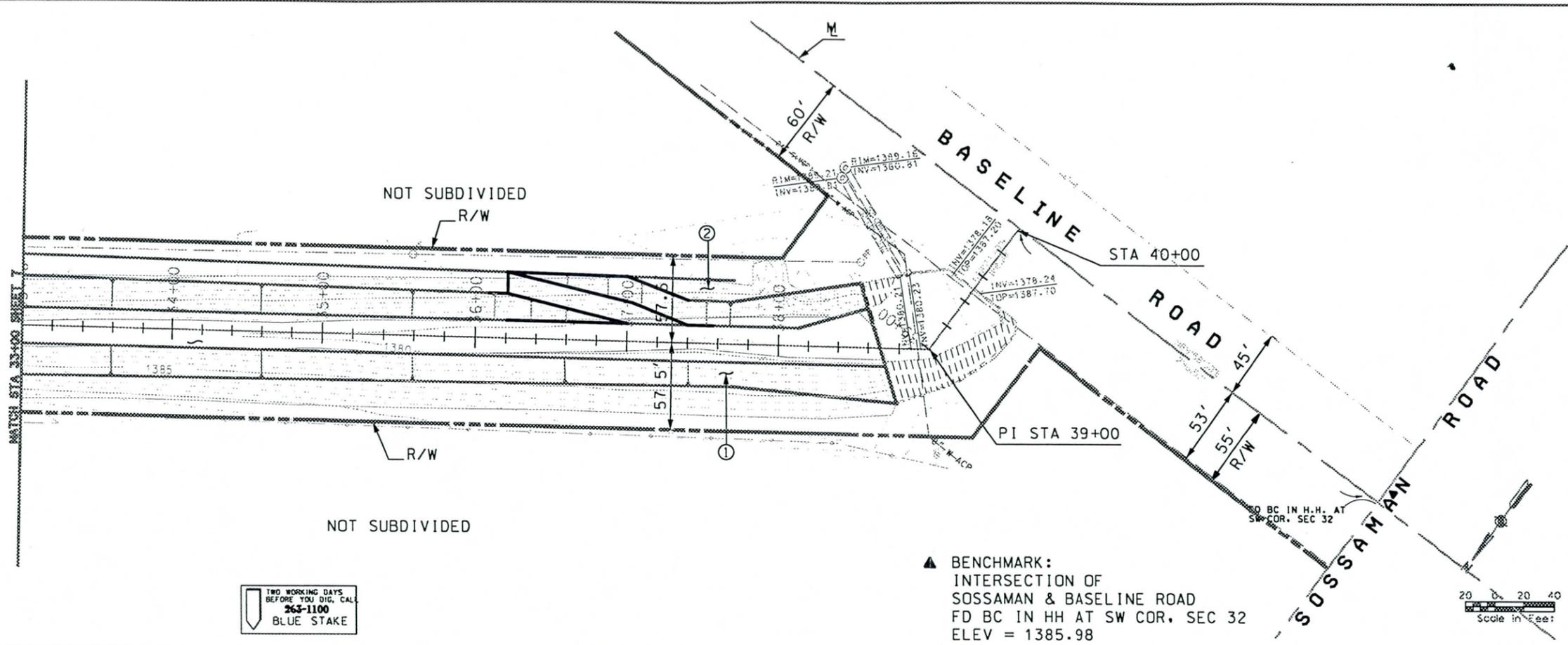
NO.	REVISION	BY	DATE
3			
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FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ENGINEERING DIVISION

SOSSAMAN ROAD CHANNEL
 U.S. 60 TO BASELINE ROAD
 PROJECT NO. 108010

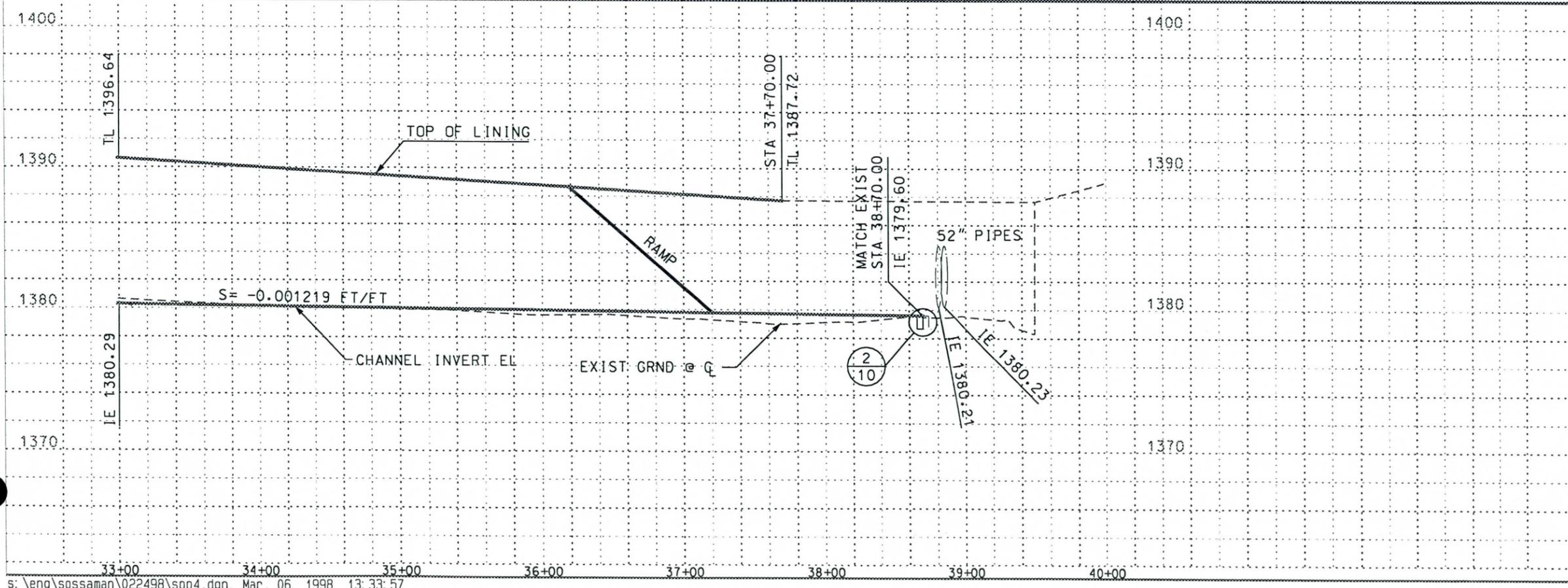
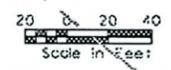
	BY	DATE
DESIGNED	JRR	03/02/98
DRAWN	FC	03/02/98
CHECKED	MAL	03/02/98

PLAN AND PROFILE SHEET OF
 STA 25+00 TO STA 33+00 8 14



TWO WORKING DAYS
BEFORE YOU DIG, CALL
263-1100
BLUE STAKE

▲ BENCHMARK:
INTERSECTION OF
SOSSAMAN & BASELINE ROAD
FD BC IN HH AT SW COR. SEC 32
ELEV = 1385.98



REMOVE

CONSTRUCT

- ① STA 33+00 TO STA 38+70 CONSTRUCT 739 CY CONCRETE CHANNEL.
- ② STA 33+00 TO STA 39+50, LT CONSTRUCT 228 TONS ABC.

NO.	REVISION	BY	DATE
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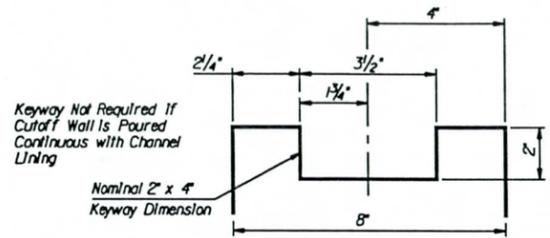
FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ENGINEERING DIVISION

SOSSAMAN ROAD CHANNEL
U.S. 60 TO BASELINE ROAD
PROJECT NO. 108010

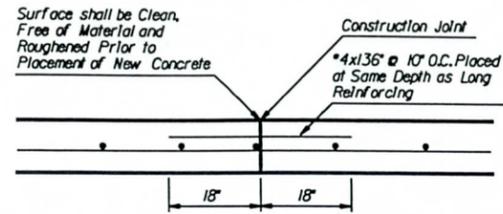
	BY	DATE
DESIGNED	JRR	03/02/98
DRAWN	FC	03/02/98
CHECKED	MAL	03/02/98



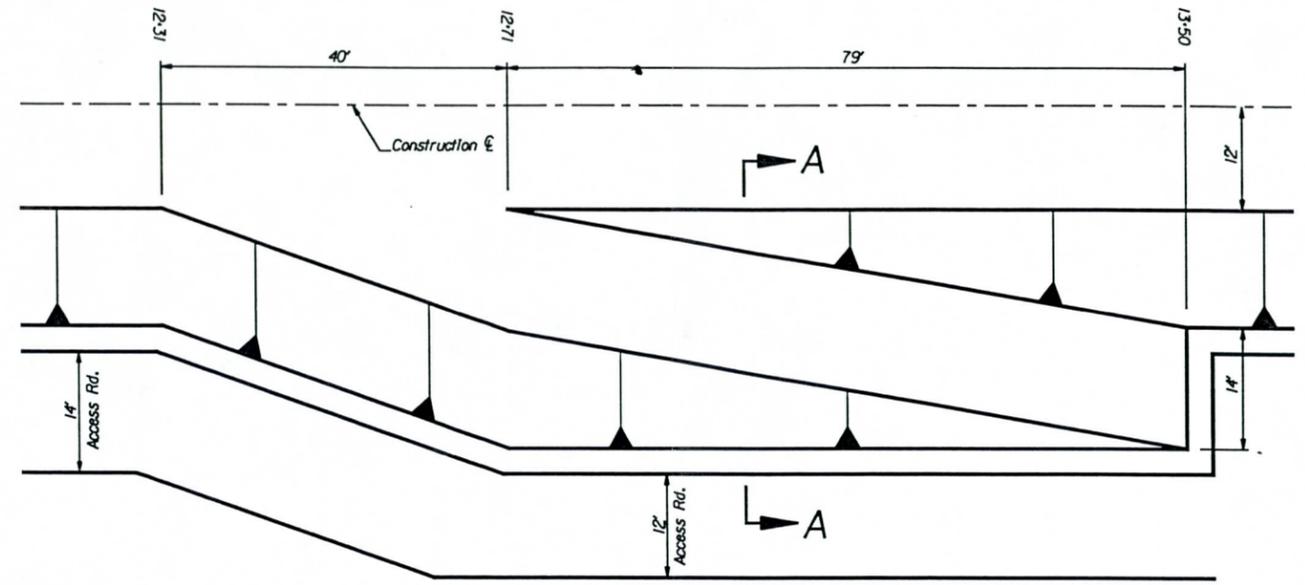
PLAN AND PROFILE SHEET OF
STA 33+00 TO STA 40+00 9 14



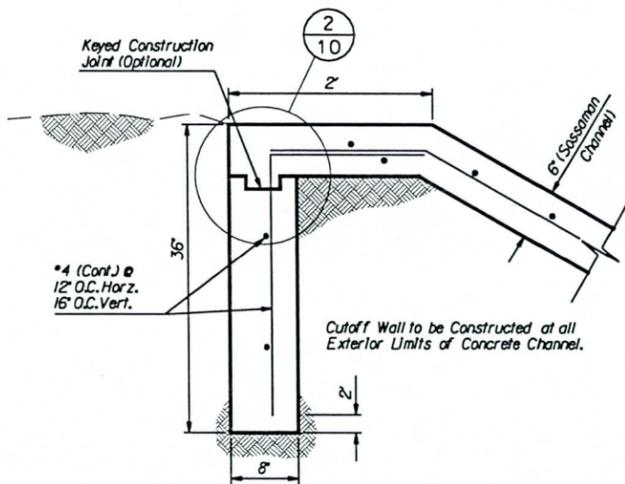
KEYED CONSTRUCTION JOINT DETAIL (2/10)



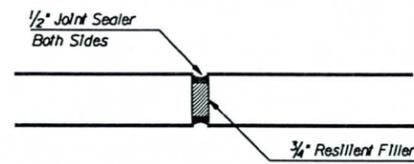
TYPICAL CONSTRUCTION JOINT DETAIL FOR SOSSAMAN CHANNEL LINING



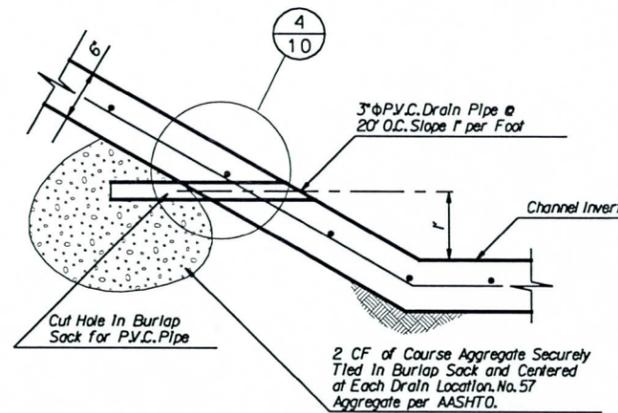
ACCESS RAMP DETAIL



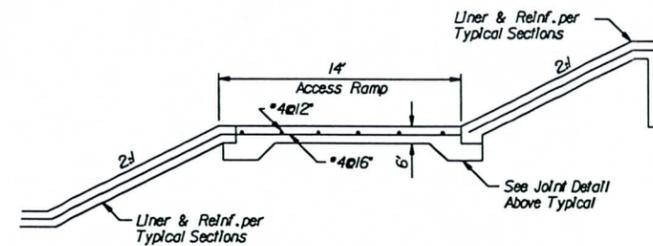
CUTOFF WALL DETAIL 1 (1/10)



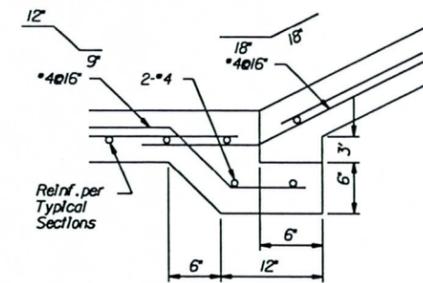
VERTICAL EXPANSION JOINT



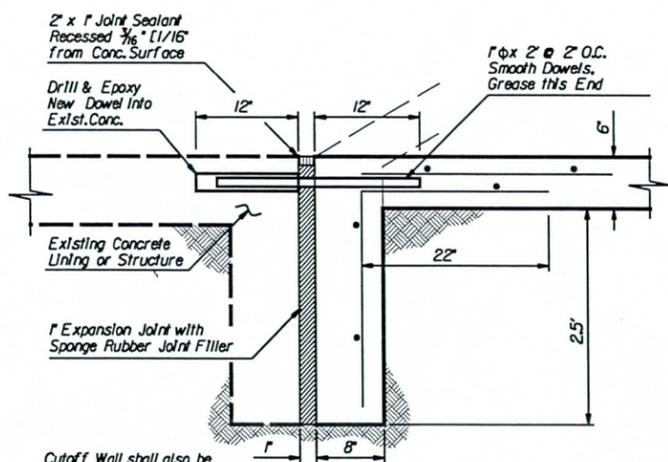
WEEP-HOLE DETAIL FOR CONCRETE CHANNEL



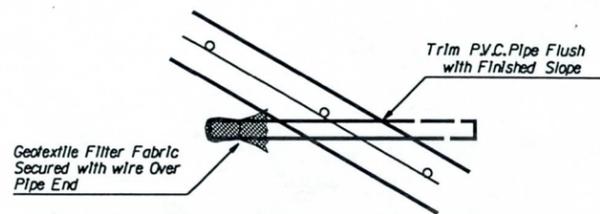
SECTION A-A



JOINT DETAIL



CUTOFF WALL DETAIL 2 (3/10)



WEEP-HOLE PIPE DETAIL (4/10)

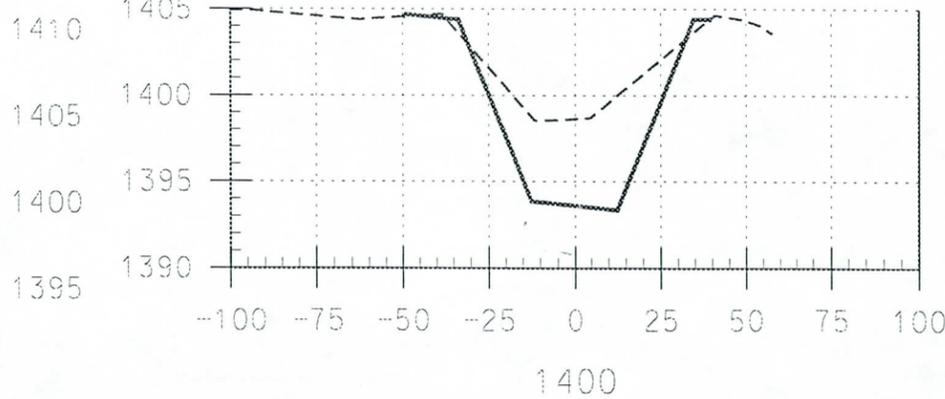
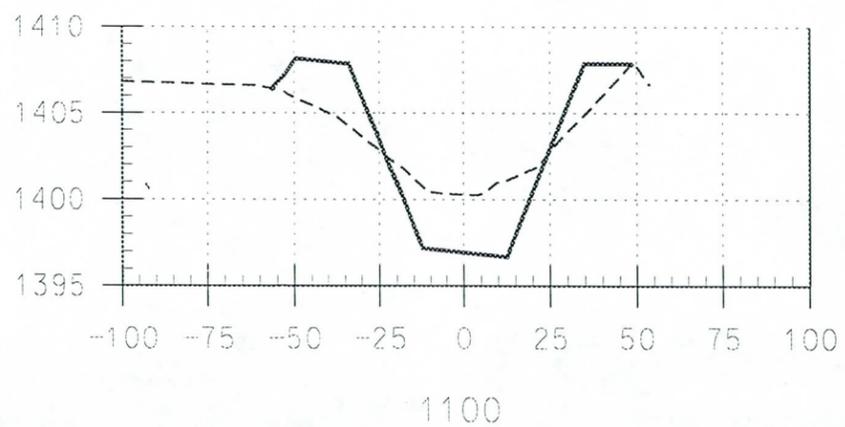
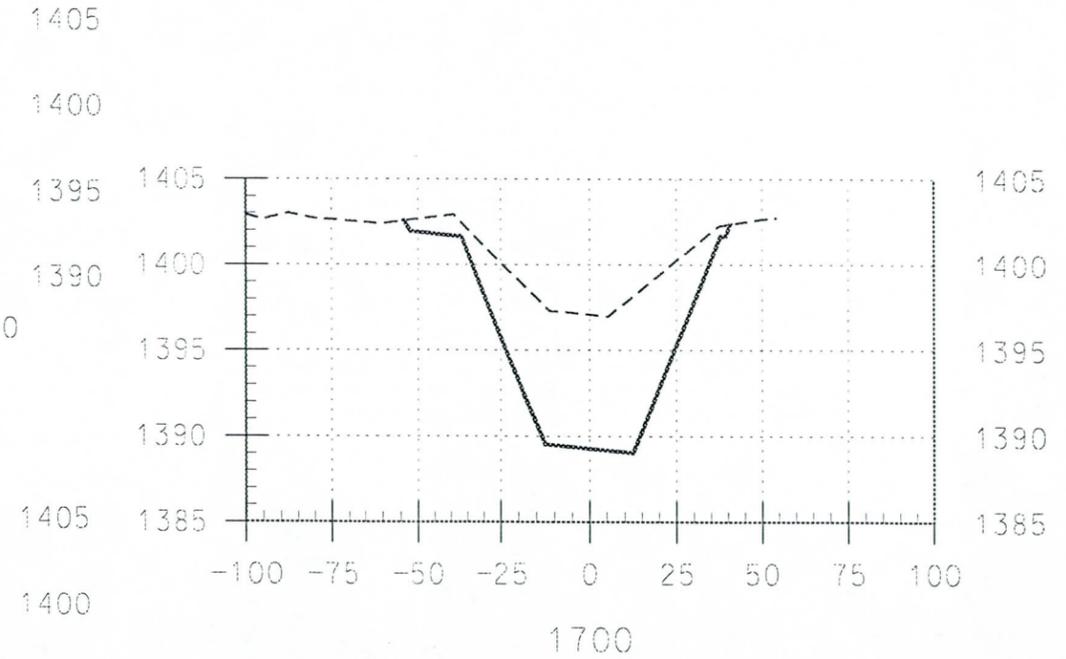
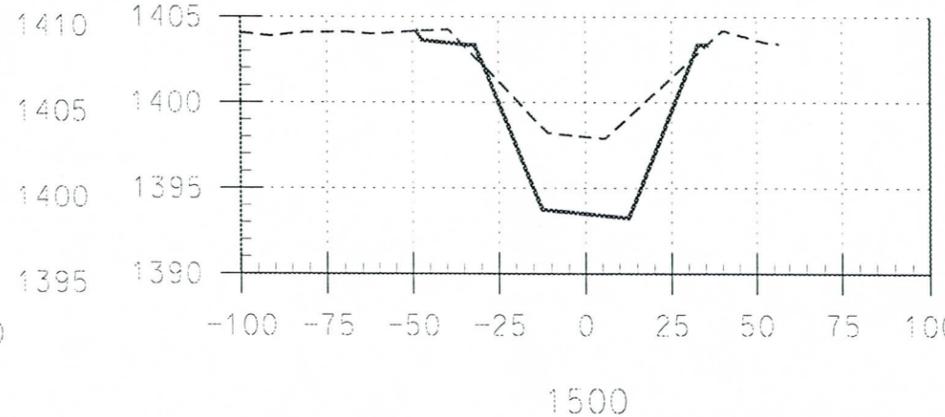
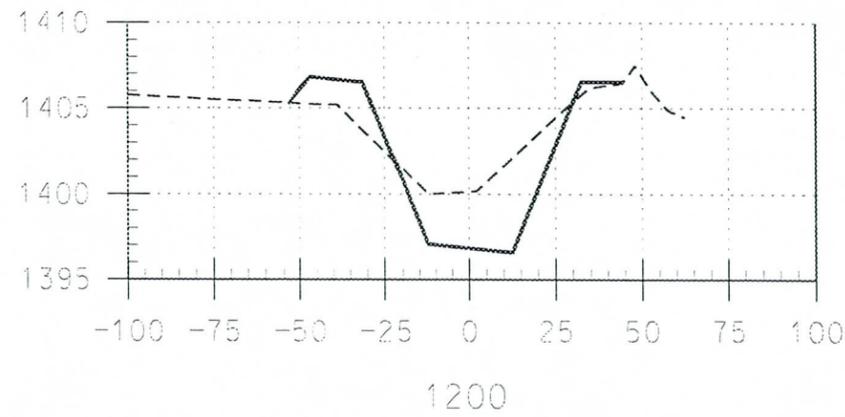
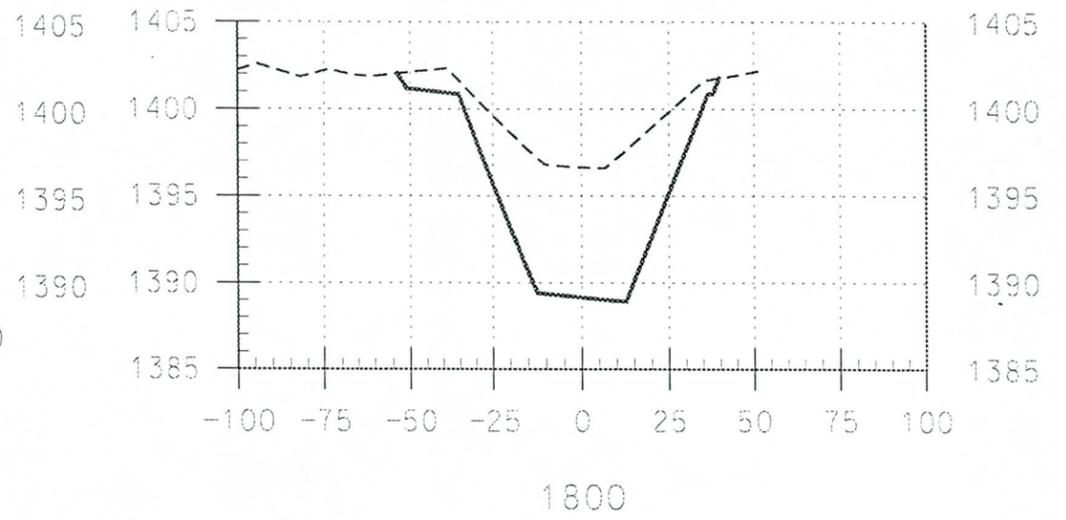
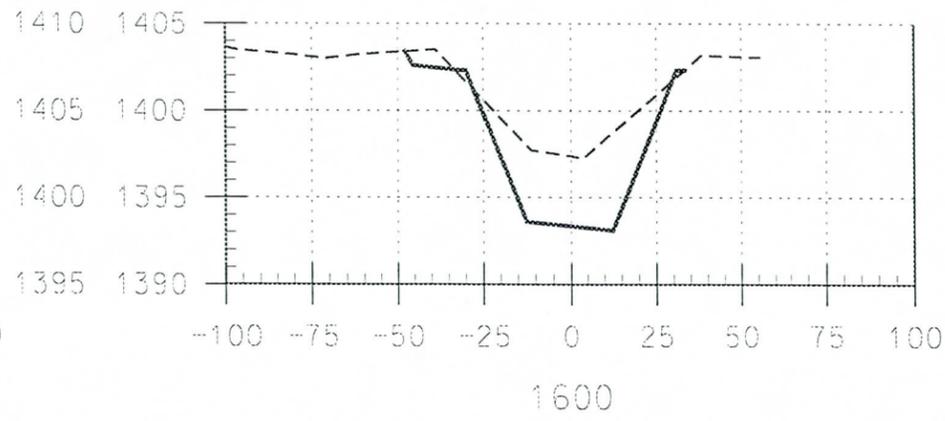
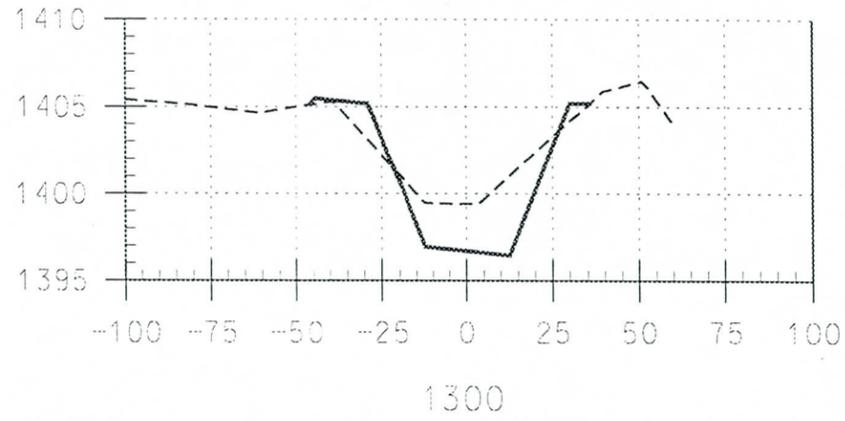
PRELIMINARY NOT FOR CONSTRUCTION

NO.	REVISION	BY	DATE
3			
2			
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION
SOSSAMAN ROAD CHANNEL
U.S. 60 TO BASELINE ROAD
PROJECT NO. 108010

DESIGNED	BY	DATE
JRR		12/22/97
DRAWN	JG	2/22/97
CHECKED	MAL	

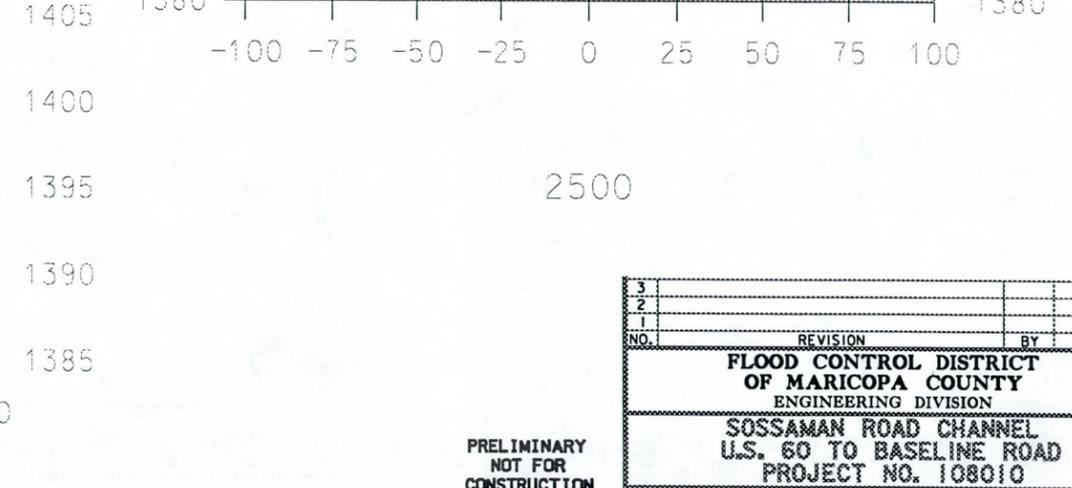
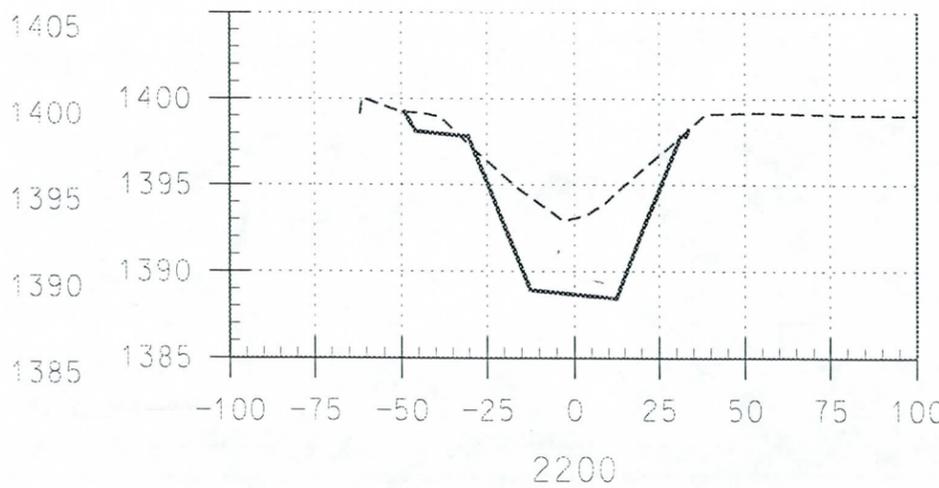
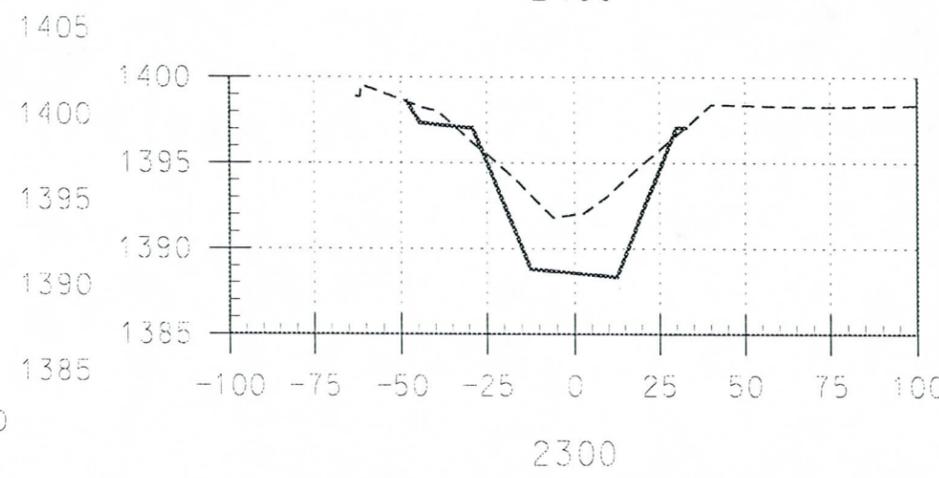
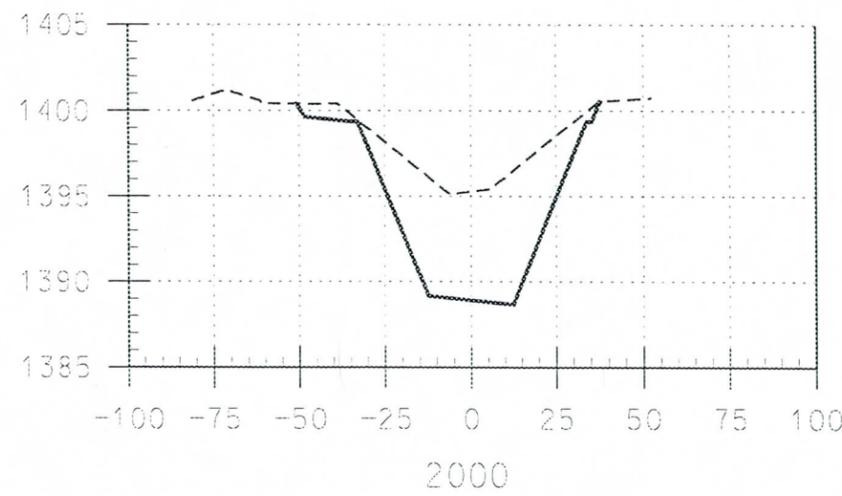
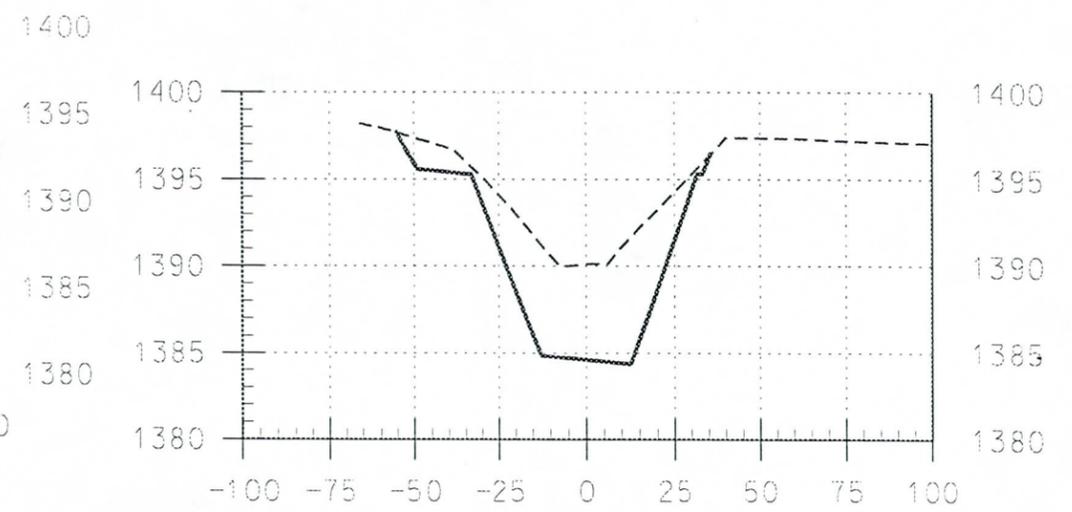
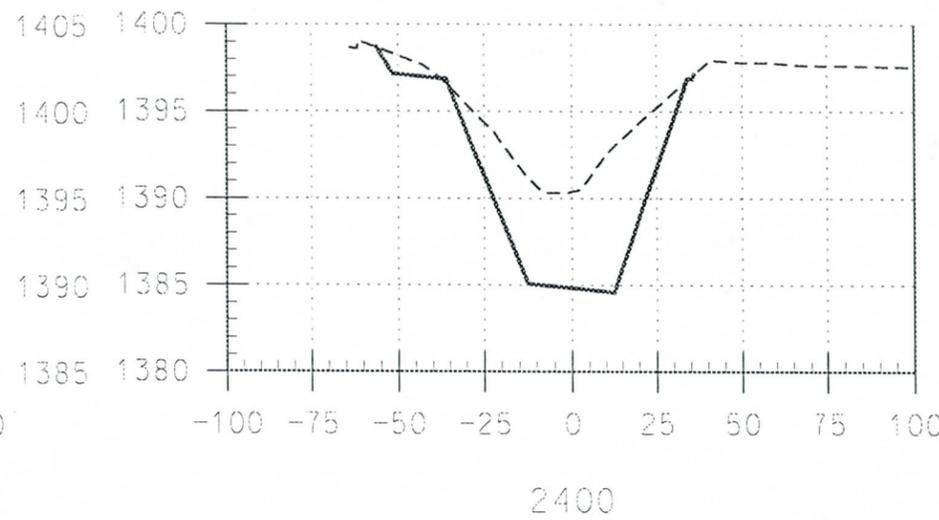
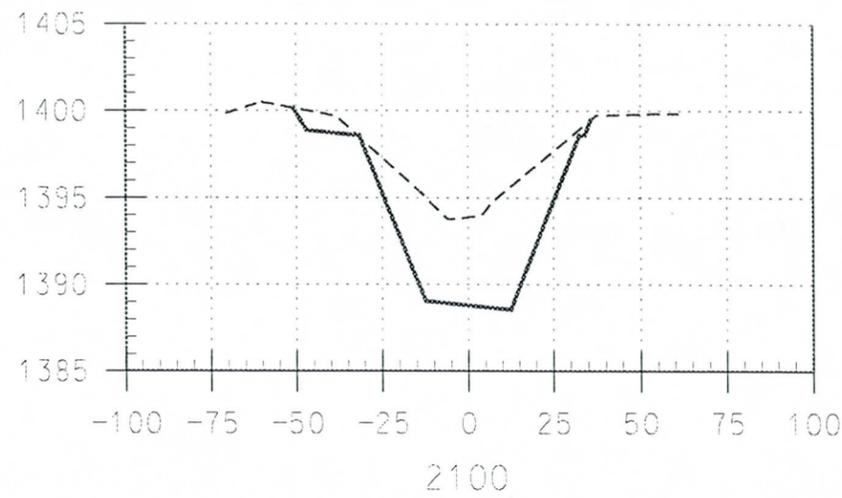
DETAIL SHEET SHEET OF 10 14



PRELIMINARY
NOT FOR
CONSTRUCTION

Proposed Channel ———
Existing Channel - - - - -

3			
2			
1			
NO.	REVISION	BY	DATE
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION			
SOSSAMAN ROAD CHANNEL U.S. 60 TO BASELINE ROAD PROJECT NO. 108010			
	DESIGNED	JRR	12/22/97
	DRAWN	FC	12/22/97
	CHECKED	MAL	03/02/98
		BY	DATE
			
CROSS SECTIONS STA 11+00 TO STA 18+00			SHEET OF 11 14



Proposed Channel —————
Existing Channel - - - - -

PRELIMINARY
NOT FOR
CONSTRUCTION

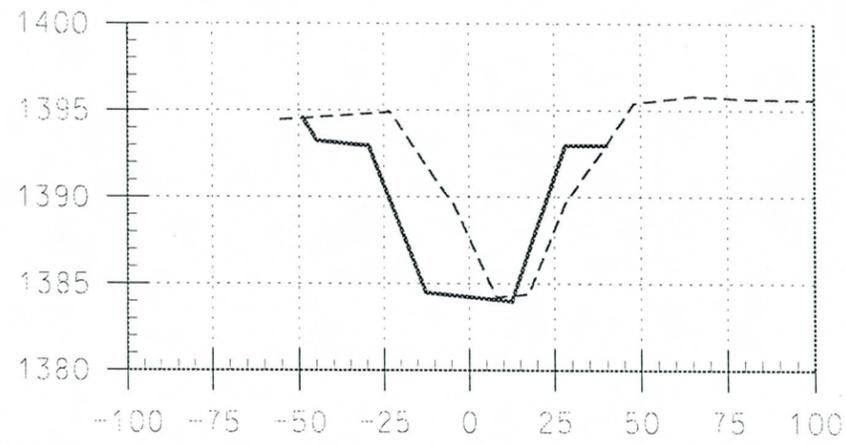
NO.	REVISION	BY	DATE
3			
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**FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ENGINEERING DIVISION**

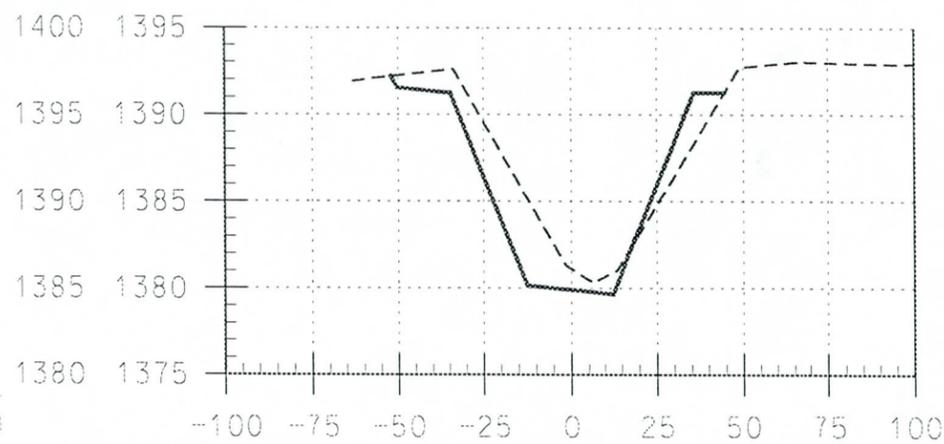
**SOSSAMAN ROAD CHANNEL
U.S. 60 TO BASELINE ROAD
PROJECT NO. 108010**

DESIGNED	BY	DATE
JRR		12/22/97
DRAWN	FC	12/22/97
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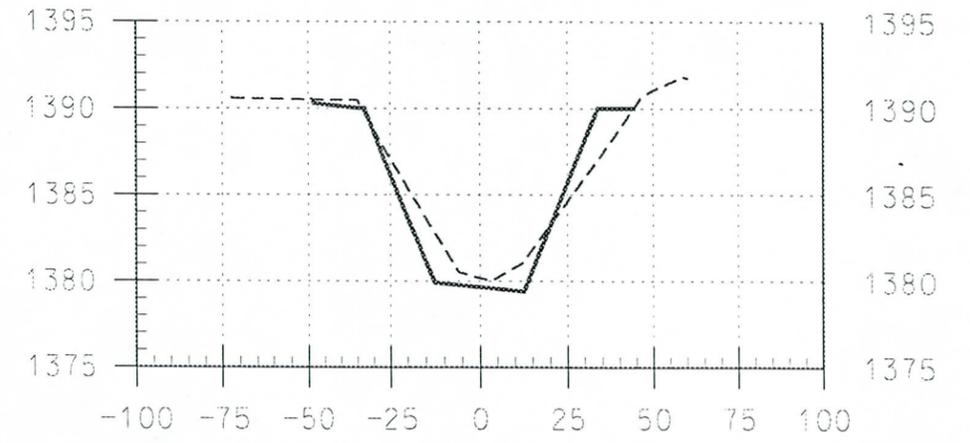
**CROSS SECTIONS
STA 19+00 TO STA 26+00** SHEET OF 12 14



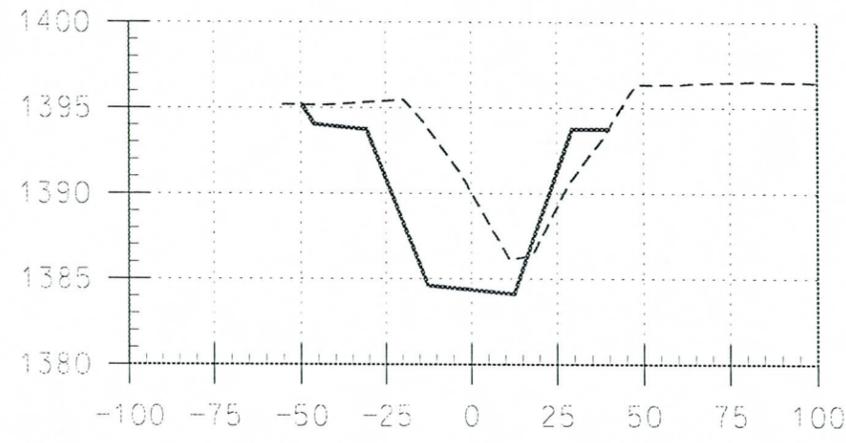
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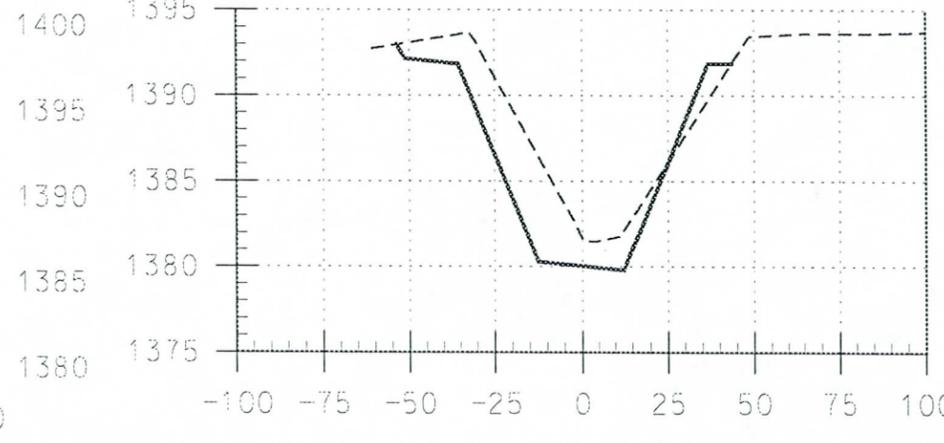
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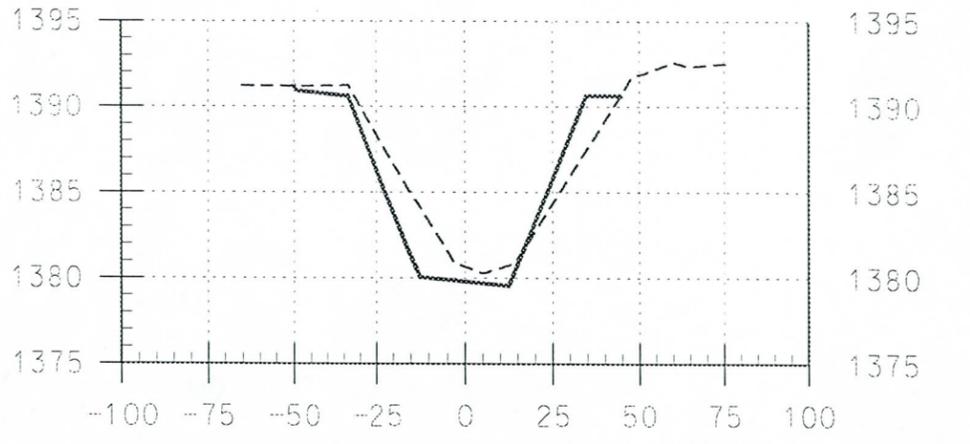
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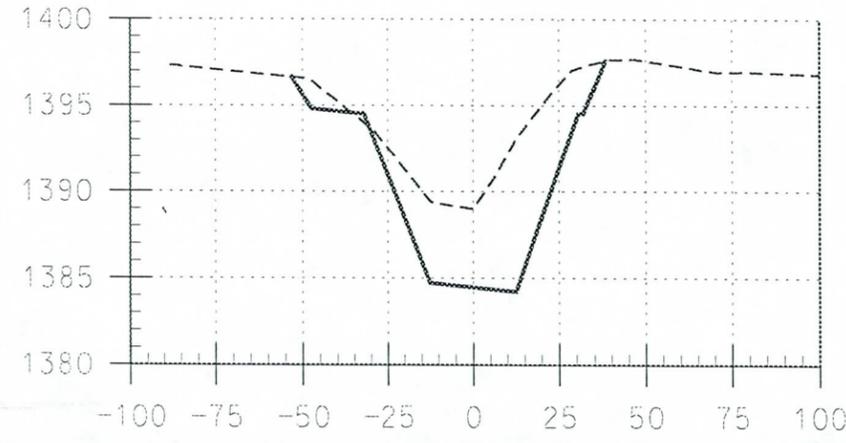
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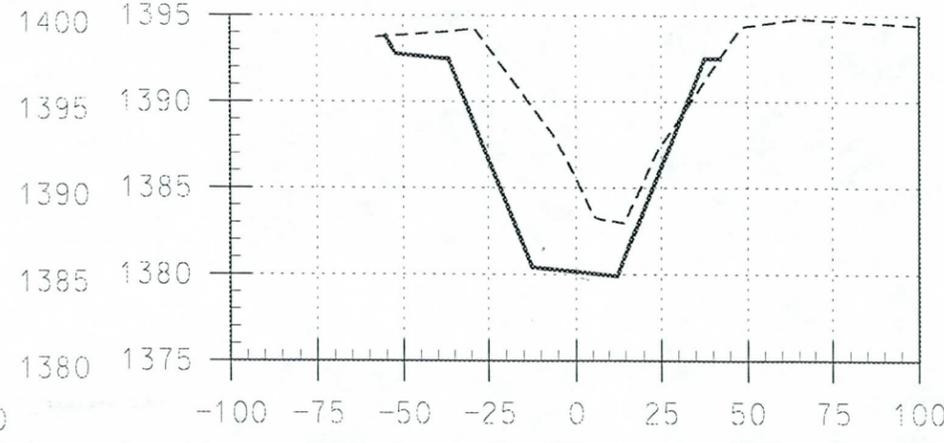
3100



3300



2700

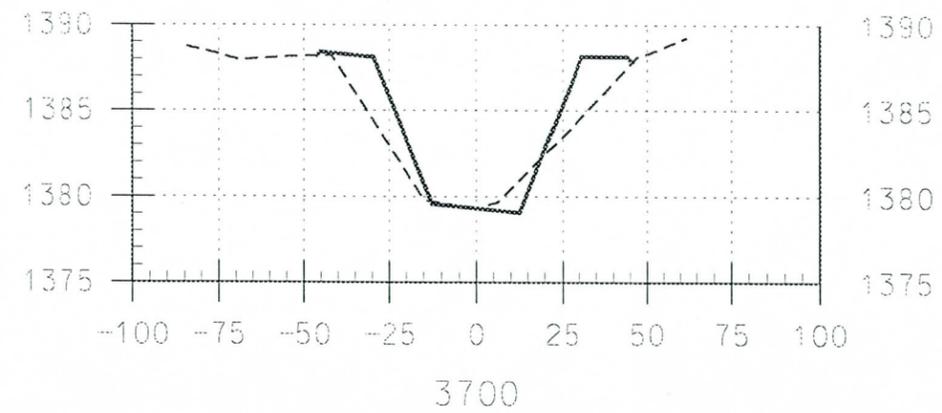
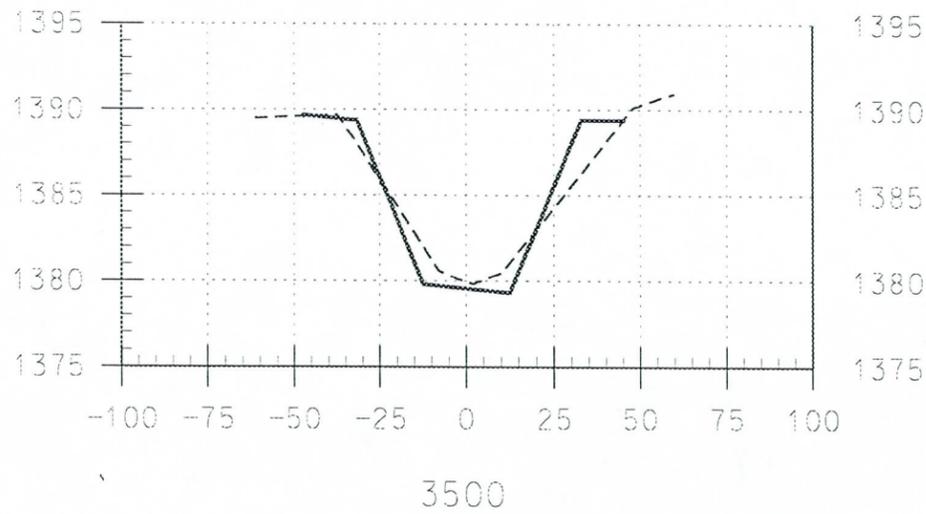
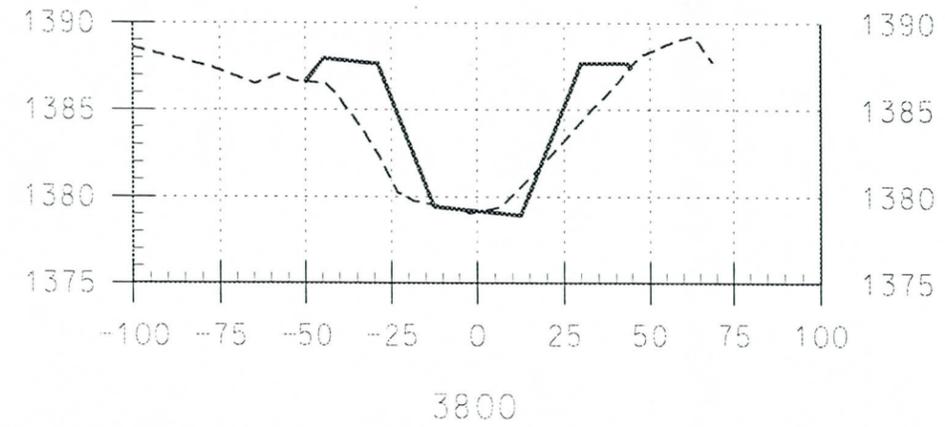
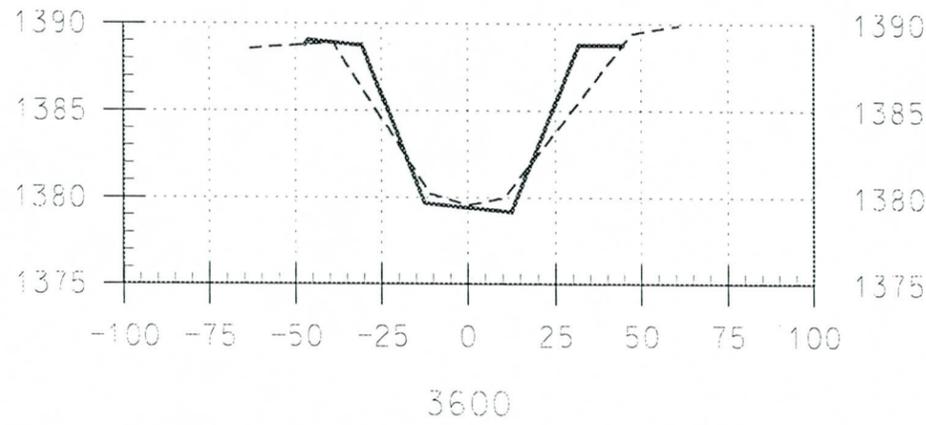


3000

Proposed Channel —————
Existing Channel - - - - -

PRELIMINARY
NOT FOR
CONSTRUCTION

3			
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1			
NO.	REVISION	BY	DATE
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION			
SOSSAMAN ROAD CHANNEL U.S. 60 TO BASELINE ROAD PROJECT NO. 108010			
	DESIGNED	JRR	12/22/97
	DRAWN	FC	12/22/97
	CHECKED	MAL	03/02/98
		BY	DATE
CROSS SECTIONS STA 27+00 TO STA 34+00			SHEET OF 13 14



PRELIMINARY
NOT FOR
CONSTRUCTION

Proposed Channel —————
Existing Channel - - - - -

3			
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NO.	REVISION	BY	DATE
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION			
SOSSAMAN ROAD CHANNEL U.S. 60 TO BASELINE ROAD PROJECT NO. 108010			
		BY	DATE
	DESIGNED	JRR	12/22/97
	DRAWN	FC	12/22/97
	CHECKED	MAL	03/02/98
CROSS SECTIONS STA 35+00 TO STA 38+00			SHEET OF 14 14



APPENDIX IV

CONSTRUCTION SPECIAL PROVISIONS

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
CONTRACT NO. FCD 98-04
PROJECT NO. 108010
SOSSAMAN CHANNEL, U.S. 60 TO BASELINE ROAD

SPECIAL PROVISIONS

SECTION 201 – CLEARING AND GRUBBING

Clearing and grubbing shall conform to Section 201 of the MAG Standard Specifications except as modified herein.

Subsection 201.5 – Payment

Replace this subsection with the following:

No payment will be made for clearing and grubbing as such; the cost thereof shall be included in the bid price for the construction or installation of the items to which said clearing and grubbing are incidental or appurtenant.

SECTION 202 – MOBILIZATION

Add this section.

Subsection 202.1 – Description

Add the following:

The work under this section shall consist of preparatory work and operations, including but not limited to, the movement of personnel, equipment, supplies and incidentals to the project site; the establishment of all offices, buildings and other facilities necessary for work on the project, and for all other work and operations that must be performed and costs incurred prior to beginning work on items on the project site.

Field Office:

This work shall consist of providing and maintaining a furnished Field Office for the exclusive use of and occupancy by the Engineer and the Engineer's staff.

The office shall be a building or mobile trailer erected at a location convenient to the project. The office may be in the same building or mobile trailer as office space of the contractor, provided that such office is separated from the area used by the Contractor by a wall or door with an adequate locking device and has at least two doors to the outside.

The Contractor shall obtain approval from the property owner upon site selection of the field office.

The Contractor may furnish equivalent facilities in an existing building provided such facilities and building are located to provide convenient service.

The field office shall be an approved and weatherproof building or mobile trailer providing a minimum of 300 square feet of clear floor space. Not including the toilet area. The structure shall have a minimum ceiling height of seven (7) feet and shall be provided with weatherproof doors

equipped with adequate locking devices. Windows shall also be provided with adequate locking devices. The Contractor shall also provide the following:

- a. Lighting – Electric Light, non-glare type luminaries to provide a minimum illumination level at desk level.
- b. Heating & Cooling – Adequate electrically powered equipment to maintain an ambient air temperature of 72 degrees F plus or minus 8 degrees.
- c. Telephone, answering, FAX machine, and copy machine – A telephone with an outside line for exclusive use of the Engineer. The Contractor will pay for the cost of the line and local calling charges. The District will pay for long distance charges made on this line.
- d. Toilet - A commode and wash sink in a separately enclosed room with the building or mobile trailer, properly ventilated and complying with applicable sanitary codes. Contractor shall provide water service.
- e. Maintenance – The Contractor shall maintain all facilities and furnished equipment in good working order.
- f. Fire Extinguisher – Two non-toxic, dry chemical, fire extinguishers meeting Underwriters Laboratories, Inc. approval for Class A, Class B, and Class C fires with a minimum rating of 2A: 2B: 10C.
- g. Electricity – Contractor shall provide electric power and pay for all electric service.
- h. Furnishings – Two office desks with drawers, two office chairs (padded, swivel type), one drafting table (adjustable height 3 feet by 6 feet), one conference table, eight folding chairs, one draftsman's stool, and a four drawer legal file cabinet.

The office shall be fully equipped and made available for the Engineer's use and occupancy prior to the start of any Contract work and not later than ten (10) days after the notice to proceed. The Engineer will notify the Contractor in writing, of the acceptability of the Field Office provided. The Contractor shall maintain the field office in operating condition until seven (7) days after acceptance of the Contract work.

All facilities shall be maintained in good operating condition and appearance by the Contractor for the designated period, after which all portable buildings or trailers, fencing, surfacing, and utilities shall be removed from the site, the areas cleaned and seeded if required and left in a neat and acceptable condition.

Subsection 202.2 – Payment

Payment shall be made on the basis of the lump sum price bid and shall be full compensation for supplying and furnishing all materials, facilities, and services and performing all work involved as specified herein. The lump sum price bid shall not exceed five (5) percent of the total project bid amount exclusive of mobilization. No additional payment will be made for occupancy and services during periods of contract extension of time due to engineering changes.

ITEM 202-1 – MOBILIZATION

SECTION 206 – STRUCTURE EXCAVATION AND BACKFILL

Structure excavation and backfill shall conform to Section 206 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 206.1 – Description

Add the following:

The work consists of the removal, placing and compaction of material around walls and other miscellaneous items to the lines designated on the plans or as directed by the Engineer. All backfill shall be compacted to not less than 95 percent of the maximum density as determined in accordance with ASTM D-698.

Subsection 206.5 – Payment

Replace this subsection with the following:

No separate payment will be made for structure excavation and backfill. The cost shall be considered as being included in the price bid for the construction or installation of the items to which such excavation and backfill are incidental or appurtenant.

SECTION 211 – FILL CONSTRUCTION

Fill construction shall conform to Section 211 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 211.1 – Description

Add the following:

The work consists of placing and compacting all material wherever necessary according to the construction drawings, beyond the limits of structure backfill.

Subsection 211.2 – Placement

Add the following:

Prior to placement of fill material, all loose soil, vegetation, any roadside or other debris, and existing structures within the proposed fill areas shall be completely removed. Depressions and ditches shall be cleaned of all loose or wet soils and widened to accommodate compaction equipment. Sloping surfaces shall be benched to provide a level surface for fill placement. All exposed subgrade surfaces shall be scarified to a depth of eight (8) inches, brought to the proper moisture content (+/- 2 % of optimum) and compacted to a density of 95 percent (ASTM D-698).

The fill shall be compacted in horizontal lifts to a minimum of 95 percent of the maximum density as determined in accordance with ASTM D-698 within a moisture content range of plus or minus 2 percent of optimum. The depth of the lifts shall not exceed eight (8) inches.

Subsection 211.6 – Payment

Replace this subsection with the following:

No Separate payment or measurement will be made for fill construction. The cost thereof shall be included in the bid price for the construction of the items to which fill is incidental or appurtenant.

SECTION 215 – EARTHWORK FOR OPEN CHANNELS

Earthwork shall conform to Section 215 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 215.1 – Description

Replace this subsection with the following:

Open channel for the purpose of this section shall mean concrete lined or unlined trapezoidal channels. The work in this section consists of excavation, fill, grading, and disposal of excavated and removed material for the construction of the channel. Excess material shall be the property of the Contractor and shall be removed from the site.

Subsection 215.5 Grading

Replace this subsection with the following:

Grading of lined channels and access roads shall conform to the following tolerances:

- A. A vertical tolerance of none above and one (1) inch below the specified grade will be allowed on:
 - 1. Channel bottom
 - 2. Channel side slopes in both cut and fill

- B. A vertical tolerance of none below and two (2) inches above the specified grade will be allowed on:
 - 1. Top surface of channel banks and access road in both cut and fill
 - 2. Channel bank and access road side slopes in fill

Regardless of the construction tolerances specified, excavation and grading shall be performed so the finished surfaces are in uniform planes with no abrupt breaks in the surface.

Construction tolerances specified above for grading are solely for purposes of field control.

Subsection 215.7 – Measurement

Add the following:

The quantity of earthwork for open channels used will be based upon the required excavation volumes for channel excavation from the existing ground line to channel subgrade within limits of dimensions shown on the plans. The Engineer will compute the excavation quantities by a method, which in his opinion is best suited to obtain an accurate determination.

Subsection 215.8 – Payment

Replace this subsection with the following:

Earthwork for open channels shall be paid for at the contract price bid per cubic yard. Such price shall include excavation, fill, backfill, compaction, grading, hauling, removal and disposal of excess excavated material and debris.

ITEM 215-1 – EARTHWORK FOR OPEN CHANNELS

SECTION 225 – WATERING

Watering shall conform to Section 215 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 225.1 Description

Add the Following:

The work under this section shall consist of furnishing and applying all water required for control of dust, for the safety and convenience of the traveling public, and for the reduction of the dust nuisance to adjacent properties.

The Contractor shall obtain the necessary permits under the County Air Pollution Statutes. It shall be the responsibility of the Contractor to keep the construction site moistened to prevent dust pollution to the air and adjacent properties.

Subsection 225.5 – Payment

Replace this subsection with the following:

No payment shall be made for the cost of watering. The cost of watering shall be included in the price bid for the construction operation to which such watering is incidental or appurtenant.

SECTION 301 – SUBGRADE PREPARATION

Subgrade preparation shall conform to Section 301 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 301.1 – Description

Add the following:

Subgrade preparation for the side slopes of the concrete lined channel shall include proof rolling of the soil.

Subsection 301.8 – Payment

Replace this subsection with the following:

No separate payment will be made for subgrade preparation. The cost thereof shall be considered as being included in the price bid for the construction or installation of items to which subgrade is incidental.

SECTION 310 – UNTREATED BASE

Untreated base shall conform to Section 310 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 310.1 – Payment

Replace this subsection with the following:

Aggregate base course and granular bedding material shall be measured in tons, within the limits of dimensions shown on the plans. Payment for aggregate base course shall be made on the basis of the price bid per ton. Price bid shall include all labor, materials, and equipment necessary to place aggregate base course in accordance with the plans.

ITEM 310-1 – AGGREGATE BASE COURSE

SECTION 350 – REMOVAL OF EXISTION IMPROVEMENTS

Removal of existing improvements shall conform to Section 350 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 350.1 – Description

Add the following:

The work includes removal and disposal of any obstacle to construction as shown on the plans. Holes, cavities and trenches resulting from the removal of improvements shall be backfilled to proposed finished grade in accordance with Sections 206 and 211. The project limits shall be cleared of all trash and debris.

The disposal of all waste material removed under this item shall be the responsibility of the Contractor. The Contractor shall provide documentation to the Engineer that all waste material has been properly disposed. Documentation shall include copies of permits, receipts, and landfill weigh tickets. Letters of acceptance from public agencies, businesses, or private property owners will be accepted as proof of proper disposal for clean fill.

If a Maricopa County landfill is selected for disposition of waste materials and/or debris, a Maricopa County Landfill Use Permit is required. Application for permit can be made at the Maricopa County Landfill Office, located at 2801 West Durango Street, Phoenix, Arizona 85009 (telephone (602) 506-7060). Charges will be levied on a volume basis for each load delivered to the landfill in accordance with the current fee schedule.

All collected material shall be disposed of at an approved landfill site and shall be subject to landfill fees so assessed, which will be included in the unit price bid for this item.

Subsection 350.4 – Payment

Replace this subsection with the following:

Payment for the removal of existing improvements shall be made on the basis of the lump sum price bid. Price bid shall include all labor, materials, removal, disposal, and equipment necessary to remove and dispose of the items.

ITEM 350-1 – REMOVAL OF EXISTING IMPROVEMENTS

SECTION 401 – TRAFFIC CONTROL

Traffic Control shall conform to Section 401 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 401.1 – Description

Add the following:

All traffic control shall conform to the Construction Specifications for this project, Part IV of the "Manual On Uniform Traffic Control Devices For Streets And Highways" (U.S. Department of Transportation, Federal Highway Division) and all revisions thereto, and the request of the Engineer.

It shall be the Contractor's responsibility to provide, erect and maintain, and remove after completion of the work all necessary signs, barricades, barriers, berms, lights, high level warning devices, delineators, and any other required devices, uniformed officers, and flagmen necessary to properly mark and control the construction area for safe and efficient movement of traffic.

Temporary traffic control devices shall be installed as required prior to the start of work. The approval of Contractor's traffic control method shall not relieve Contractor of his responsibility to protect the work, Contractor's personnel, or the general public.

Subsection 401.5 – General Traffic Regulations

Add the following:

A lane(s) closure for the convenience of the Contractor is not authorized, except as specified in these Special Provisions, without the prior approval of the Engineer and the City of Mesa (Name at XXX-XXXX)

Channelization, including "KEEP RIGHT" signs, shall be provided whenever traffic is moved across the street centerline, the existing center line is removed or opposing traffic is maintained in other than the normal traffic lanes.

All temporary traffic control devices shall be ballasted with sandbags or other approved ballast.

For construction diversions that require movement of traffic from the normal through lanes, temporary bypasses shall be utilized only during daylight hours and the normal traffic shall be restored during nighttime hours. Exceptions may be authorized by the Engineer under unusual conditions.

Access to all adjacent properties shall be maintained. When access cannot be maintained, Contractor shall notify the adjacent residents at least 48 hours in advance of the access closure. In no case shall the access be closed for more that four hours. Access for fire stations, hospitals, police stations, and schools shall be maintained at all times. The Contractor shall notify the City of Mesa police and fire departments of any road closures.

Contractor shall maintain or relocate all existing signal indications, warning signs, STOP, YIELD, and street name signs erect, clean and in full view of the intended traffic at all times. Portable signs should be used to supplement blocked or removed signs. In the event the Contractor removes any permanent signing which will not be reinstalled immediately, the Contractor shall store permanent signs in a secure location at the project site and request removal by County forces. Contractor will reset all permanent signing removed or relocated during construction at Contractor's expense. The Contractor is responsible for all costs incurred in replacing lost or damaged traffic control devices.

Rope, flagging, fencing, and woven plastic tape may be used between barricades and channeling devices to provide additional safely.

Contractor shall install deceleration sand berms in the blocked traffic path or at other hazardous sites in order to prevent vehicles from entering the construction and/or hazard areas. The deceleration sand berms shall be constructed of washed sand and shall be approximately five (5) feet high.

Advance Project Notification Signing shall be installed at least 14 days prior to the start of construction. The location for Advance Notification Signing shall be determined at the time of the Pre-Construction meeting. Signing shall be updated as restrictions change.

Construction shall not commence or proceed without an approved Traffic Control Plan. At the pre-construction conference, the Contractor shall submit for review his plan for the sequence of construction, any planned lane closures, signing for construction, and the traffic flow. A Traffic Control Plan (TCP) covering the signing and staging shall be submitted and approved prior to the start of each stage of construction. The Traffic Control Plans shall address all construction staging and special provision requirements, including any flagging to be used on the project.

At the time of the Pre-Construction conference, the Contractor shall designate an employee, other than the Project Superintendent, who is well qualified and experienced in construction traffic control and safety, to be available on the project site during all periods of construction to set up, maintain and coordinate safe barricading whenever construction restricts traffic. This individual shall be authorized to receive and fulfill instructions from the Engineer and shall supervise and direct the work. Instructions and information given by the Engineer to this individual shall be considered as having been given to the Contractor.

Subsection 401.7 – Payment

Payment for traffic control, including all mobilization, placing, flagging personnel, storing, removal and maintenance incidental to the approved traffic control plan, and uniformed police officer shall be made on the basis of the lump sum price bid.

ITEM 401-1 – TRAFFIC CONTROL

SECTION 420 – CHAIN LINK FENCE

Chain link fence shall conform to Section 420 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 420.1 – Description

Add the following:

The work under this section shall consist of furnishing all labor, materials, and equipment and constructing chain link fence at the location and in accordance with the details shown on the plans. Fence shall be of the type and size shown on the plans and shall be constructed in accordance with the requirements of these specifications.

Subsection 421.5 – Payment

Replace this subsection with the following:

Payment for chain link fence shall be made at the contract price bid per lineal foot. Price shall include all labor, materials, and equipment to install fence including all incidental fence installation costs.

Payment for gates shall be made at the contract price bid per each. Price shall include all labor, materials, and equipment to install gate including all incidental gate installation costs.

ITEM 420-1 – CHAIN LINE FENCE

ITEM 420-2 – 14 FOOT GATE

SECTION 505 – CONCRETE STRUCTURES

Concrete Structures shall conform to Section 505 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 505.1 – Description

Add the following:

The work under this section shall consist of furnishing all labor, materials and equipment for the construction of all cast-in-place concrete including but not limited to the retaining walls, cut-off walls, wing walls, and channel lining.

Mix designs shall additionally meet the requirements of Chapter 5, Section 5.3 of ACI STANDARD 318-89. The Contractor shall submit mix designs and certifications of conformance with the above requirements for the written approval of the Engineer.

Class "A" Concrete, $F_c=3,000$ psi, shall be used for all concrete structures and concrete lining.

Transit concrete mixers used on the project must carry current certification from ADOT of Arizona Rock Products Association.

The reinforcing steel shall conform to Section 727, Grade 60, of the MAG Standard Specifications.

Subsection 505.6 – Placing Concrete

Add the following:

Place concrete in accordance with ACI 301-89. Prior to placing concrete, remove loose soil and water from excavation and subgrade and debris and foreign material from forms. Obtain Engineer's approval of subgrade before placing reinforcing steel. Check reinforcing steel for proper placement and correct discrepancies. Before depositing new concrete on old concrete, clean surface using sandblast or bushhammer or mechanical means to obtain a $\frac{1}{4}$ - inch rough profile. Maximum vertical drop to final placement shall be 6 feet, when not guided with chutes or other devices to prevent segregation caused by impact with reinforcing. Do not use aluminum pipe or aluminum conveying devices.

Steps performed in preparation for placing concrete shall meet requirements and recommendations of ACI 304R-89 and ACI 304-89, except as modified herein. Ends of chutes, piping, hopper gates, and other points of concrete discharge throughout the conveying, hoisting, pumping, and placing system shall be designed and arranged for concrete to pass without becoming segregated. Do not use chutes longer than 50 feet. The minimum slopes of chutes shall be angled to allow concrete to readily flow without segregation. Conveyor belts shall be approved by Engineer; wiped clean with device that does not allow mortar to adhere to belt; and conveyor belts and chutes shall be covered.

Provide intermediate construction joints at maximum spacing of 30 feet. Should placement sequence result in cold joint, install water stop in joint.

Consolidate concrete with internal vibrators with minimum frequency of 8,000 cycles per minute and amplitude required to consolidate concrete in section being placed. Provide at least one standby vibrator in operable condition at placement site prior to placing concrete. Consolidation equipment shall not exceed a distance of 5 feet from point of placement. Vibrate concrete in vicinity of joints to obtain impervious concrete there.

When vibrating concrete, apply approved vibrator at points spaced not farther apart than vibrator's effective radius. Apply close enough to forms to vibrate surface effectively but not damage form surfaces. Vibrate until concrete becomes uniformly plastic. Vibrator must penetrate fresh placed concrete and into previous layer of fresh concrete below.

No concrete shall be placed until all form work, installation of items to be embedded, and preparation of surfaces involved in the placement have been approved.

All surfaces of forms and embedded materials shall be free from curing compound, dried mortar from previous placements, and other foreign substances before the adjacent or surrounding concrete placement is begun.

Subsection 505.6.1 - Joints

Add the following:

A construction joint is defined as a planned joint where two placements of concrete meet, across which development and maintenance of bond are required, and through which any reinforcement that may be present is not interrupted. Construction joints shall be located at the end of a day's pour or when concrete placement stops for more than 45 minutes. Reinforcing steel shall be continuous through construction joints for a minimum of 2'-0" beyond the end of pour unless noted otherwise on the plans. The end of the pour shall be a roughened surface.

After initial cleanup and at the last opportunity prior to placing concrete, concrete surface shall be thoroughly washed with water or air-water jets, and shall be uniformly surface dried. Elastomeric (mastic) sealant designated on the construction joint detail shall be Sikaflex 1-a as manufactured by Sika Corporation, Sanka Fe Springs, California, or an approved equal.

When concrete drainage channel lining and placing operations are stopped for the day, interrupted because of breakdown, or delayed by other causes, the edge of the fresh concrete lining shall be bulkheaded to a surface normal to the placement along transverse or longitudinal lines. Before placing operations are resumed, the surface of the hardened concrete shall be cleaned as specified for a construction joint.

Expansion Joints – Expansion joints shall be constructed between the channel lining and structures as shown on the drawings.

The surfaces of all joints shall be cleaned thoroughly of accretions of concrete or other foreign material by scraping, chipping, or other means approved by the Engineer. All concrete expansion joint surfaces shall be free of curing compound when adjoining concrete is placed. Sponge rubber filler shall be placed in all expansion joints. The Contractor shall furnish and place the sponge rubber filler in the joints between the concrete canal lining and structures as shown on the drawings.

The sponge rubber filler shall be cut to the size and shape of the joint surface. The filler shall be secured to the concrete in an approved manner, with copper nails embedded in the first-placed concrete in such a manner that the nails will protrude from the joint surface to be covered at approximately 12- inch centers, or by adhesive applied between the filler and the first-placed concrete.

Joints between adjoining portions of the filler material shall be sufficiently tight to prevent concrete from seeping through such joints. Where elastomeric (mastic) sealer material is required, the joint filler shall be set back from the edge of the joint to provide the proper recess for installing elastomeric (mastic) sealer. Elsewhere, unless otherwise shown on the drawings or directed, the edges of the sponge rubber filler shall be placed flush with the finished surface of the concrete or the bottom of chamfers.

Materials

Sponge rubber – Sponge rubber shall conform to Federal Specification HH-F-341F, type2, class A, sponge rubber: provided that the load required to compress the test specimen to 50 percent of its thickness before test shall be not less than 50 pounds per square inch nor greater than 150 pounds per square inch. Sponge rubber shall be stored in as cool a place as practicable, preferably at 70 degrees F or less and in no case shall the rubber be stored in the open, exposed to the direct rays of the sun.

Copper nails – Copper nails shall conform to Federal Specification FF-N-105B for common copper wire nails.

Adhesive – Adhesive for fastening the sponge rubber in place shall be a nonbituminous adhesive as recommended by the manufacturer of the filler material.

Elastomeric sealer – Elastomeric (mastic) sealer shall be Sikaflex 1-a as manufactured by Sika Corporation, Santa Fe Springs, California, or approved equal.

Subsection 505.8 – Curing

Add the following:

Moist cure methods shall be used for all exposed concrete surfaces. Curing compound shall not be used because of the adverse affects on the concrete color and the Graffiti Protector #GP-44.

Clear protective water based coating shall be applied to all exposed concrete surface areas that may be subject to graffiti vandalism. The coating shall be Duro-Wall Graffiti Protector #GP-44, produced by Dayton Superior, or approved equal. The coating shall be clear and contain no coloring.

Subsection 505.10 – Payment

Replace this subsection with the following:

Concrete channel lining shall be paid for at the contract unit price per cubic yard per Pay Item 505-1. Such payment shall be full compensation for the item complete in place, including cost of materials, labor, tools, equipment, concrete, rebar, ties, form work, bracing, shoring, excavation, removal of obstructions, backfilling, compaction, coating, testing, and performing all other work necessary to complete the items in accordance with the details shown in the plans.

ITEM 505-1 – CONCRETE CHANNEL LINING

SECTION 610 – WATER LINE CONSTRUCTION

The work under this section shall conform to Section 610 of the MAG Uniform Standard Specifications and the City of Phoenix Supplemental Specifications except as modified herein.

Subsection 610.1 – Description

Add the following:

This work consists of the relocation of an existing water line.

Subsection 610.3 – Materials

Add the following:

Type	DIP
Diameter	8-inch, CI outside diameter
Pressure Rating	350 (class 50)
Joints	Mechanical or push-on with restraining
Connecting pipe material	8-inch ACP

Subsection 610.14 – Testing

Add the following:

The new section of water lines shall be subject to hydrostatic testing, disinfection, and bacteriological testing prior to the shutdown and connection in accordance with Section 610.14 “TESTING”, of the COP Supplement and Section 611 DISINFECTING WATER MAINS”, of MAG Uniform Standard Specifications and COP Supplement. Once the connections are completed, line pressure shall be restored and the connections visually inspected for leaks before backfilling of the trench.

Testing methods and procedures shall be included with the material drawings submittals for approval from the Engineer as detailed in Section 758 of MAG Uniform Standard Specifications and the City of Phoenix Supplement.

Subsection 610.18 – Measurement and Payment

Replace this subsection with the following:

Payment for water line replacement will be made on the basis of the unit price bid per lineal foot. Price bid shall include all labor, materials, equipment, and incidental items necessary to install the water main.

ITEM 610-1 – WATER LINE RELOCATION (8- inch)

SECTION 618 – STORM DRAIN CONSTRUCTION

The work under this section shall conform to Section 618 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 618.1 – Description

Add the following:

This work consists of a storm drain pipe connecting a catch basin to the channel.

Subsection 618.2 – Materials

Add the following:

Concrete pipe, joints, gaskets, and testing shall be according to MAG Section 735 and as specified below.

Location	STA 38+00
Type	Rubber Gasket Reinforced Concrete Pipe (RGRCP), ASTM C 76
Class	III
Diameter	24 inch
Joints	Rubber Gasket Bell and Spigot

Subsection 618.5 – Measurement

Replace this subsection with the following:

Measurements will be made horizontally along the axis of the pipe rounded to the nearest foot including all fittings. Measurement shall extend from the outside face of the outlet to the inside face of the catch basin.

Subsection 618.6 – Payment

Replace this subsection with the following:

Payment for storm drain construction shall be made at the unit price bid per linear foot, and shall be full compensation for furnishing and installing the pipe and fittings complete in place, as specified, including excavation, backfilling, compaction, sheeting and bracing, testing and all incidental work not specifically covered in other pay items.

ITEM 618-1 - 24 INCH RGRCP



APPENDIX V

SUPPLEMENTARY GENERAL CONDITIONS

**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
SOSSAMAN ROAD CHANNEL, US-60 TO BASELINE ROAD
CONTRACT No. FCD 98-04
PROJECT No. 108010**

SUPPLEMENTARY GENERAL CONDITIONS

SPECIFICATIONS:

Except as otherwise amended by these Supplementary General Conditions and the Construction Special Provisions, construction of this project shall be in accordance with all applicable Maricopa Association of Governments (MAG) Uniform Standard Specifications and Uniform Standard Details, latest revision, supplemented by the City of Phoenix (COP) Supplemental Details and Uniform Standard Specifications, latest revision.

PRECEDENCE OF CONTRACT DOCUMENTS:

This Contract and its designated documents, whether taken separately or together, are to be interpreted according to full intent, meaning, and spirit, and shall be deemed to mutually explain each other and to be descriptive of any materials to be furnished and the work to be performed under this Contract. In cases of any difference or discrepancy between the Contract documents, the order of precedence shall be a) Addendum to the Invitation for Bid, b) the Contract form, c) Supplementary General Conditions, d) Construction Special Provisions, e) Project Plans, f) COP Supplements to the Uniform Standard Specifications and Details, and g) MAG Uniform Standard Specifications and Uniform Standard Details.

Subsection 101.2 - Definitions and Terms:

1. Change the definition of the phrase "Board of Supervisors" to being the Board of Directors acting under the authority of the laws of the State of Arizona and in their capacity of the Board of Directors of the Flood Control District of Maricopa County.
2. Change the definition of the phrase "Budget Project" to being a project financed by funds set aside in the annual budget or otherwise approved by the Flood Control District of Maricopa County Board of Directors.
3. Add to the definition of the phrase "Contract Documents", the phrase "Supplementary General Conditions".
4. Change the definition of the term "Engineer" to being the person appointed by the Flood Control District of Maricopa County Board of Directors to the office of Chief Engineer and General Manager of the Flood Control District of Maricopa County acting directly or through its authorized representative, the Chief of the Flood Control District of Maricopa County Construction and Maintenance Division.
5. Change the definition for the phrase "Notice of Award" to a letter from the Flood Control District of Maricopa County advising Contractor that it is the successful bidder and the Flood Control District of Maricopa County has accepted its proposal.
6. Change the definition of the term "Owner" to the Flood Control District of Maricopa County, acting through its legally constituted officials, officers, or employees.
7. Add the definition for Maricopa County Minority Business Office (MBO); the office responsible for administering the Maricopa County Minority and Women Owned Business Enterprise Program.
8. Add the definition for the Maricopa County Minority and Women-Owned Business Enterprise Program as being the Program adopted by the Board of Supervisors effective January 1, 1992.

Subsection 102.4 - Examination of the Plans, Special Provisions, and Site Work: Add the following:
The soil boring logs and geotechnical report are available for review at the Owner's office, and the Contractors are encouraged to do so. Existing moisture conditions shall be no basis for claim for additional monies or time extensions. The Contractor shall manipulate the existing soil as required to achieve stable soil conditions and the required densities, as well as safe and stable side slopes during construction activities.

Subsection 102.5 - Preparation of Bid: Add the following:
Bids, including the Bidding Schedule, must be legibly written in ink or typed, with all prices given in numerals. In case of a conflict between the unit bid price and the extension, the unit bid price shall govern.

It shall be the responsibility of prospective bidders to determine, prior to submission of a bid, if any addenda have been issued by the Flood Control District. This may be accomplished by calling 602-506-1501. Any addendum issued, if not already bound into the Special Provisions, **shall be attached and included as part of the Specifications** and any quantities on the Bidding Schedule requiring change shall be adjusted to the new figure by pen and ink. **Bids which do not have appropriate addenda attached, show appropriate changes to the Bidding Schedule, and acknowledge receipt of addenda in the Proposal shall be invalid.**

The bidder's Arizona State Contractor's License number and the classification under which it proposes to perform the work shall be shown on the proposal. An "A" **General Engineering** License is required for this contract. The two lowest bidders may be required to provide certification of prior satisfactory completion for similar construction and to furnish a copy of their license and the renewal certificate.

Subsection 102.6 - Subcontractors' List: Add the following:
A list of subcontractors to be employed on the project shall be submitted with the bid, on the form provided in the Proposal. Following Notice of Award, no change of the subcontractors named therein will be made unless first approved in writing by Owner.

Subsection 102.7 - Irregular Proposals: Add the following:
(F) If the Maricopa County Minority and Women-Owned Business Enterprises Assurances Affidavit is not completed and submitted.
(G) If any addenda are not acknowledged and attached..
(H) If Owner's bond forms are not used.
(I) If the entire specifications document is not returned
(J) If the Owner's provided Certificate of Insurance form is not used.

Subsection 103.6 - Contractor's Insurance: Add the following:
A statement from bidder's insurance carrier shall be included in the proposal certifying that it will furnish the specified kind and amounts of insurance to the bidder if it is awarded the contract; and that it will execute the form of Certificate of Insurance included in the documents. As required by law, the statement will be from an insurance carrier or carriers authorized to do business in the State of Arizona, or countersigned by an agent of the carrier authorized to do business in the State of Arizona. Concurrently with the execution of the contract, Contractor shall furnish a Certificate of Insurance, using the included Certificate, that names the additional insureds as set out in the Certificate. The Certificate shall also name the additional insureds as Certificate Holders. The types of insurance and the limits of liability shall be as indicated on the included form.

Subsection 104.1 - Work to be Done: Add the following sentence to 104.1.1:
All water for construction purposes, drinking water, lighting, temporary electric power, heat and telephone service shall be arranged and provided for as per requirements of the work by Contractor at his expense.

Add the following to 104.1.2:

Traffic control shall conform to the requirements established in the Special Provisions.

The project site is located in a developed residential area. **Both noise and dust control will be of paramount importance on this project.** The Contractor will abide by all **COM** requirements and all direction given by the Engineer regarding these two very important and sensitive issues. *City of Mezon*

No construction activities shall take place in Sossaman Channel during storm water flows or within ponded water. If flows occur within the watershed during construction, the Contractor shall remove all equipment to a location outside of the channel.

Subsection 104.2.3 - Changes:

The Owner may at any time, by written order, and without notice to the sureties, if any, make changes within the general scope of this contract in any one or more of the following:

- A) Drawings, designs, or specifications;
- B) Method or manner of performance of the work;
- C) Owner-furnished facilities, equipment, materials, services, or site;
- D) Directing acceleration in the performance of the work.

Any other written or oral order from the Owner that causes a change shall be treated as a change order under this section provided that the Contractor gives the Owner written notification within two work days after receipt of such direction stating:

- A) The date, nature, and circumstances of the conduct regarded as a change;
- B) The particular elements of the contract performance for which the Contractor is seeking an equitable adjustment under this section, including any price or schedule adjustments;
- C) The Contractor's estimate of the time by which the Owner must respond to the Contractor's notice to minimize cost, delay, or disruption of performance.

The Contractor shall diligently continue performance of this contract to the maximum extent possible in accordance with its provisions. Except as provided in this section, no order, statement, or conduct of the Owner shall be treated as a change or entitle the Contractor to an equitable adjustment. If any change under this section causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the work under this contract, the Owner shall make an equitable adjustment and modify the contract in writing.

The equitable adjustment shall not include increased costs or time extensions for delay resulting from the Contractor's failure to provide notice or to diligently continue performance. No proposal for the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.

Subsection 104.2.4 - Cost Estimates or Price Proposals:

The Contractor and any lower-tier subcontractors shall submit itemized cost estimates or price proposals for any owner-directed change order or Contractor-initiated claim.

Cost estimates or pricing proposals shall be itemized to include direct labor by man-hours, individual craft, hourly wage rate and verifiable labor burden. Other direct costs shall include rental and operator rates for rented or owned equipment, material trucking expenses and other costs clearly identified and directly allocable to contract performance. Material costs shall be itemized by item description, quantity(s) for each item, unit price per item, including applicable sales tax markup, and extended total price per item. The Contractor shall provide copies of material supplier quote sheets, invoices or purchase orders, as appropriate.

Lump sum cost estimates or price proposals shall be rejected and returned to the Contractor for itemization as described above. Failure of the Contractor to submit properly itemized cost estimates or price proposals shall not

constitute an excusable delay and result in a change order being unilaterally priced as the Owner's fair estimated price.

Subsection 104.2.6 - Value Engineering:

A) **General.** The Contractor is encouraged to voluntarily develop, prepare, and submit value engineering change proposals (VECPs). The Contractor shall share in any instant contract savings realized from accepted VECPs, in accordance with paragraph (f) below. The Owner reserves the right to make alterations to the contract, in accordance with procedures elsewhere within this contract. Such alterations will not be eligible for inclusion in any VECP.

B) **Definitions.**

Contractor's development and implementation costs means those costs the Contractor incurs on a VECP in developing, testing, preparing, and submitting the VECP as well as those costs incurred by the Contractor to make the changes required by the Owner's acceptance of the VECP.

Owner costs means those owner costs that result directly from developing and implementing the VECP, such as any net increases in the cost of testing, operations, maintenance, and logistical support. The term does not include the normal administrative costs of processing the VECP.

Instant contract savings means the estimated reduction in Contract cost of performance resulting from acceptance of the VECP, minus the allowable Contractor's development and implementation costs, minus subcontractors' development and implementation costs (see paragraph (g) below).

Value engineering change proposal (VECP) means a proposal that (1) requires a change to the contract; (2) results in reducing the contract price or estimated cost without impairing essential functions or characteristics; and (3) does not involve a change in deliverable end item quantities, schedule, or a change to the contract type.

C) **VECP Preparation.** As a minimum, the Contractor shall include in each VECP the information described in subparagraphs (1) through (7) below. If the proposed change affects contractually required schedule and cost reporting, it shall be revised to incorporate proposed VECP modifications. The VECP shall include the following:

- (1) A description of the difference between the existing contract requirement and that proposed, the comparative advantages and disadvantages of each, a justification when an item's function or characteristics are being altered, and the effects of the change on the end item's performance. All design changes must be submitted on 24"x 36" standard drawing sheets along with supporting calculations. Each drawing sheet and at least the content sheet of the calculations shall be sealed by an Engineer registered in the State of Arizona.
- (2) A list and analysis of the contract requirements that must be changed if the VECP is accepted, including any suggested specification revision.
- (3) A separate, detailed cost estimate for the affected portions of the existing contract requirements and the VECP. The cost reduction associated with the VECP shall take into account the Contractor's allowable development and implementation costs, including any amount attributable to subcontracts under paragraph (g) below.
- (4) A description and estimate of costs the Owner may incur implementing the VECP, such as test and evaluation and operating and support costs. This is an estimate based only on the Contractor's understanding of additional efforts to be expended by the Owner, should the VECP be accepted. The final cost will be determined by the Owner.

- (5) A prediction of any effects the proposed change would have on collateral costs to the agency, i.e., costs of operation or maintenance.
- (6) A statement of the time by which a contract modification accepting the VECP must be issued in order to achieve the maximum cost reduction, noting any effect on the contract completion time or delivery schedule.
- (7) Identification of any previous submissions of the VECP, including the dates submitted, the agencies and contract numbers involved and previous Owner actions, if known.

D) **Submission.** The Contractor shall submit VECPs to the Owner's Engineer.

E) **Owner Action.**

- (1) The Owner shall notify the Contractor of the status of the VECP within 15 calendar days after receipt from the Contractor. If additional time is required, the Owner shall notify the Contractor within the 15-day period and provide the reason for the delay and the expected date of the decision. The Owner will process VECPs expeditiously; however, it shall not be liable for any delay in acting upon a VECP.
- (2) If the VECP is not accepted, the Owner shall notify the Contractor in writing, explaining the reasons for rejection.
- (3) The Contractor may withdraw any VECP, in whole or in part, at any time before it is accepted by the Owner.
- (4) Any VECP may be accepted, in whole or in part, by the Owner's award of a change order to this contract, citing this subsection. The Owner may accept the VECP, even though an agreement on price reduction has not been reached, by issuing the Contractor a notice to proceed with the change. Until a notice to proceed is issued or a change order incorporates a VECP to this contract, the Contractor shall perform in accordance with the existing contract. The Owner's decision to accept or reject all or any part of any VECP shall be final and not subject to disputes or otherwise subject to litigation.

F) **Cost Sharing.**

- (1) **Rates.** The Owner's share of savings is determined by subtracting the Owner's costs from instant contract savings and multiplying the result by 50 percent. The Contractor's share shall be the remaining 50 percent.
- (2) **Payment.** Payment of any share due the Contractor for use of a VECP on this contract shall be authorized by a change order to this contract to accept the VECP, reduce the contract price or estimated cost by the amount of instant contract savings, and provide the Contractor's share of savings by adding the amount calculated to the contract price.

G) **Subcontracts.** The Contractor may include an appropriate value engineering clause in any subcontract. In computing any adjustment in this contract's price under paragraph (f) above, the Contractor's allowable development and implementation costs shall include any subcontractor's allowable development and implementation costs clearly resulting from a VECP accepted by the Owner under this contract, but shall exclude any value engineering incentive payments; provided that these payments shall not reduce the Owner's share of the savings resulting from the VECP.

105.1 - Authority of Engineer: Add the following:

105.1.1 - Engineer's Evaluation: Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to subsections 105.3.1 and 106.4, but such time shall not exceed 20 calendar days. Engineer will be the sole judge of acceptability. No "or-equal" or substitute will be ordered, installed or utilized without Engineer's prior written acceptance which will be evidenced by either a Change Order or an

approved Shop Drawing. Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any "or-equal" or substitute. Engineer will record time required by Engineer and Engineer's Consultants in evaluating substitutes proposed or submitted by Contractor pursuant to subparagraphs 105.3.1 and 106.4(B) and in making changes in the Contract Documents (or in the provisions of any other direct contract with Owner for work on the project) occasioned thereby. Whether or not Engineer accepts a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer and Engineer's Consultants for evaluating each such proposed substitute item.

105.3 - Conformity with Plans and Specifications: Add the following :

105.3.1 - Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence or procedure of construction is shown or indicated and expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence or procedure of construction acceptable to Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The procedure for review by Engineer will be similar to that provided in subparagraph 106.4(B).

Subsection 105.5 - Cooperation of Contractor: Add the following:

105.5.1 - Partnering

The Owner intends to encourage the foundation of a partnering relationship with the Contractor and its subcontractors. This partnering relationship will be structured to draw on the strength of each organization to identify and achieve reciprocal goals. The objectives are effective and efficient contract performance, intended to achieve completion within budget, on schedule, and in accordance with plans and specifications.

This partnering relationship will be bilateral in makeup. Any cost associated with effectuating partnering will be covered by the Bid Item. The partnering workshop shall be scheduled after award of the contract, and prior to the Notice to Proceed, and shall be facilitated by a third party competent in the fundamentals of partnering, and mutually acceptable to Contractor and Owner. In order to achieve the desired partnering relationships, the Contractor will need to encourage attendance by its major subcontractors on the project. Follow-up workshops will be held periodically throughout the duration of the contract as agreed to by the Contractor and Owner.

An integral aspect of partnering is the resolution of disputes in a timely, professional, and non-adversarial manner. Alternative dispute resolution (ADR) methodologies will be encouraged in place of the more formal dispute resolution procedures. ADR will assist in promoting and maintaining an amicable working relationship to preserve the partnering relationship. ADR in this context is intended to be a voluntary, non-binding procedure available for use by the parties to this contract to resolve any dispute that may arise during performance.

Payment for Partnering will be made on the basis of invoices of actual costs, and will be for a total amount not to exceed the amount shown in the bid schedule for the item.

ITEM 105-1 - PARTNERING

Subsection 105.6 - Cooperation with Utilities: Add the following:

An attempt has been made to determine the location of all underground utilities and drainage pipes, culverts, and structures; however, it shall be Contractor's responsibility to cooperate with the pertinent utility companies so that any obstructing utility installation(s) may be adjusted. Should Contractor's operations result in damage to any utility the location of which has been brought to its attention, he shall assume full responsibility for such damage. Contractor shall contact Arizona Blue Stake (telephone number 263-1100) a minimum of two (2) working days before beginning any underground work. In addition, Blue Stake notification(s) shall be maintained on a current basis.

The following phone numbers should put Contractor in contact with the proper personnel:

Flood Control District of Maricopa County,
Fred Fuller

602/506-1501 or 4728

City of Mesa
Peter Knudson

602/644-2514

Cox Communications
John Barnett

602/352-5860 x-156

Southwest Gas Company (SWG)
Dominique Mitchell

602/484-5306

US West Communications (USW)
Janis Cunningham

602/630-3552

Arizona Public Service (APS)
Steve Goodman

602/371-6965

Need to
add → SRP.

Subsection 105.8 - Construction Stakes, Lines, and Grades: Add the following:

- A. Engineer will furnish the project survey control line together with a Bench Mark which the construction contractor will use to set line and grade for all construction. All other surveying required for the project shall be the contractor's responsibility. Engineer will not set any construction stakes.
- B. Before any construction work is started, Engineer shall perform all base surveys and cross sections of existing conditions that may be required as a basis for quantity determination.
- C. The Contractor shall submit original construction surveyor's notes duly signed by a Registered Land Surveyor to the Engineer at the end of the project. Copies of the survey notes shall be submitted to the Engineer during construction as and when requested.
- D. As-Built plans sealed by an Engineer registered in the State of Arizona shall be provided by the Contractor to the Owner prior to project close out.

Subsection 106.1 - Source of Materials and Quality: Add the following:

Select Material, Aggregate Base, Mineral Aggregate, concrete, steel products and pipe shall be obtained from commercial sources. Contractor shall pay all royalties, or any other charges or expenses, incurred in connection with the securing and hauling of the material. Contractor will be required to furnish Engineer with a list of its proposed commercial sources prior to use, and shall present certificates stating that the material produced from any commercial sources is in accordance with the Uniform Standard Specifications and these Supplementary General Conditions.

Subsection 106.4 - Trade Names and Substitutions: Replace with the following:

Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function and quantity required. Unless the specification or description contains or is followed by words reading that no like, equivalent or "or-equal" item or no substitution is permitted, other items of material or equipment of other Suppliers may be accepted by Engineer under the following circumstances:

A) "Or-Equal": If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for acceptance of proposed substitute items.

B) Substitute Items: If in Engineer's sole discretion an item does not qualify as an "or-equal" item under subparagraph 106.4 (A), it will be considered a proposed substitute item. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. The procedure for review by Engineer will include the following and may be supplemented in the Special Provisions and as Engineer may decide is appropriate under the circumstances. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor. If Contractor wishes to furnish or use a substitute item of material or equipment, Contractor shall first make written application to Engineer for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified and be suited to the same use as that specified. The application will state the extent, if any, to which the evaluation and acceptance of the proposed substitute will prejudice contractor's achievement of completion on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for work on the project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which will be considered by Engineer in evaluating the proposed substitute. Engineer may require Contractor to furnish additional data about the proposed substitute.

C) Contractor's Expense: All data to be provided by Contractor in support of any proposed "or-equal" or substitute item will be at Contractor's expense.

Subsection 106.5 - Contractors Marshaling Yards: Add the following:

The Contractor shall obtain approval of the Engineer when using vacant property to park and service equipment and store materials for use. The Contractor will obtain prior written approval of the property owner for such use and submit a copy of the approval to the Engineer prior to use of the property.

Subsection 107.2 - Permits: Replace with the following:

Contractor shall obtain all permits and licenses, pay all charges, fees, taxes, and provide all notices necessary and incidental to the due and lawful prosecution of the work.

Add the following:

107.2.1 - NPDES Permit Requirements

A. This project is subject to the National Pollutant Discharge Elimination System (NPDES) Storm water requirements for construction sites under the Environmental Protection Agency (EPA) General Permit for Arizona. Under provisions of that permit, the contractor shall be designated as permittee, and shall take all necessary measures to assure compliance with the NPDES General Permit for Arizona as well as all other applicable Federal, State and local laws, ordinances, statutes, rules and regulations pertaining to storm water discharge. As the permittee, the contractor is responsible for preparing, in a manner acceptable to the EPA, all documents required by this regulation, including but not necessarily limited to:

1. Storm water Pollution Prevention Plan (SWPPP) for the project, including certification of compliance form. Contractor shall be required to develop, implement, update and revise the SWPPP, as necessary, in order to assure compliance with the EPA permit requirements. The SWPPP shall be retained on the project site at all times during construction.
 2. Notice of Intent (NOI) to assure compliance with the NPDES General Permit for Arizona, including certification of signatures.
 3. Notice of Termination (NOT) of coverage under NPDES General Permit for Arizona.
- B. Preliminary copies of the NOI and the SWPPP shall be submitted to Owner during the preconstruction meeting and shall be subject to review by Owner prior to implementation.
- C. Contractor shall submit the completed and duly signed NOI forms not less than forty-eight (48) hours prior to the initial start of construction on the project to the following agencies:

EPA Storm water Notice of Intent
P.O. Box 1215
Newington, VA 22122

A copy of the completed NOI form shall be submitted to the following:

Storm water Coordinator
Arizona Department of Environmental Quality
P.O. Box 600
Phoenix, AZ 85001-0600

Failure by the contractor (or subcontractors of any tier) to submit NOI's within the mandated time frame shall result in delay of the construction start date, and no claim for extension of time will be granted for such delay. A copy of the completed NOI shall be posted at the construction site.

- D. Inspections of all storm water pollution control devices on the project shall be performed by Contractor on a monthly basis and following each rainfall of 0.50 inches or more in a 24-hour period at the project site as required under provisions of the NPDES General Permit for Arizona. Contractor shall prepare reports on such inspections and retain the reports for a period of three years following the completion of the project. Inspection reports shall be submitted monthly to Owner along with progress payment requests. Additionally, contractor shall maintain all storm water pollution control devices on the project in proper working order, which shall include cleaning and/or repair during the duration of the project.
- E. Contractor warrants that its employees and subcontractors of any tier and their employees shall at all times comply with all applicable laws, ordinances, statutes, rules and regulations set forth by all federal, state and local governments and the Environmental Protection Agency in connection with NPDES Permitting requirements and laws and regulations pertaining to air, groundwater and surface water quality. Fines and penalties imposed by the EPA against Owner or the contractor, for contractor's failure to comply with any of the requirements of NPDES General Permit of Arizona, shall be borne by the contractor.
- F. Upon project completion, acceptance and demobilization, contractor shall submit its completed, duly executed NOT form to the EPA, with a copy to the Arizona Department of Environmental Quality (and the appropriate municipality), at the address listed in Section (B) above, thereby terminating all NPDES permit coverage for the project. Contractor shall then surrender to Owner copies of the SWPPP, inspection information and all

other documents prepared and maintained by the contractor in compliance of the NPDES General Permit. Contractor shall retain the originals of such documents for a period of three (3) years following the completion of the project.

- G. The Lump Sum price for the SWPPP shall include all material, labor, and all other costs relating to the preparation, installation and maintenance of the SWPPP during project construction, including assuring proper operation of the pollution control devices installed, and all maintenance, cleaning, and disposal costs associated with clean-up and repair following storm events, runoff or releases on the project. The Lump Sum price for the SWPPP shall be inclusive of all costs, and no additional claims shall be made by Contractor under any other specification provision of these documents, including Change Conditions. Payment for this bid item shall be upon final completion and acceptance of the project, as per Section 109.1.
- H. Copies of all required forms and guidance for preparing the SWPPP are available in the "Drainage Design Manual for Maricopa County, Volume III Erosion Control". The manual is available at the Flood Control District, 2801 West Durango Street, Phoenix, Arizona 85009.

Payment for NPDES/SWPPP permit requirements shall be made on the basis of lump sum for all work described in Subsection 107.2.1 for

ITEM 107-1 - NPDES/SWPPP PERMITS

Subsection 107.4 – Archeological Reports: Add the following:

Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the Contractor, or any person working on his behalf, shall be immediately reported to the Engineer. The Contractor shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Engineer. An evaluation of the discovery will be made by the Engineer and the Salt River Project and/or Bureau of Reclamation Archaeologist to determine appropriate actions to prevent the loss of significant cultural or scientific resources.

Subsection 107.5: Add the following:

The entire construction site shall be considered a "Hard Hat Area" and all personnel in the area will be required to wear a hard hat.

Subsection 107.5.2 - Compliance with the Arizona Communication Standard: Add the following:

Owner will provide Contractor with Material Safety Data Sheets (MSDS) for any products known to exist on the site that are deemed health hazards. Contractor will provide a copy of Owner-provided MSDS to all subcontractors.

Contractor will provide Owner and all subcontractors with MSDS for any products that have or are deemed health hazards that will be brought onto the site or created on the site by either Contractor or by any subcontractors.

Contractor will provide Owner with a statement certifying that all personnel (Contractor and subcontractor) employed by Contractor or by a subcontractor on the job site have received the required Hazard Communication Standard training.

Subsection 107.6.3 – Public Information and Notification: Add the following:

The Contractor shall employ a specialty public information service as a subcontractor to provide the community relations program for the project as described herein. The name and address of the public information subcontractor shall be submitted with the bid as specified in subsection 102.6 of the Supplementary general Conditions. Contractor shall work closely with his subcontractor in developing and carrying out the community relations program, but shall not expect to actually perform the work of providing the public information services.

Contractor shall submit a history of the subcontractor's qualifications and experience in public information services at the pre-construction conference for acceptance by the Engineer. The community relations program shall be designed to run the full length of calendar days in the contract for this project. the program will include but not be limited to:

1. Distributing a preconstruction information letter to all residents, business, etc. within an area bounded by Gold Dust Avenue, Mercer Lane, Tatum Blvd., and 44th Street.
2. Printing and distribution of public notices and/or newsletters.

The Contractor will use these or other means to inform the local citizens of necessary operations which create high noise levels, street closures, limited access, detour locations, haul route and material delivery routes, hours of construction and disruption of bus, trash, school bus and other delivery/pick-up routes.

The Contractor will be required to furnish a private line telephone to be used solely for receiving incoming calls from local citizens with questions or complaints concerning construction operations or procedures. The Contractor shall publish this phone number and maintain a 24-hour answering service. The answering service shall be operated by Contractor personnel during all hours that work is being performed on the job site. The Contractor shall maintain a log of incoming calls, responses, and action taken which shall be submitted to the Engineer weekly and/or upon request.

Prior to the start of work, the Contractor shall notify, by letter, all affected businesses and residents of construction plans and schedules within the geographic area identified above. In addition, all schools and emergency services which serve the geographic area will also be notified even though they may be located outside the geographic area described above. The letter shall contain, as a minimum, the following information:

1. Name of Contractor
2. 24-hour telephone complaint number
3. Brief description of the project
4. Name of Contractor project Superintendent
5. Name of Engineer
6. Name of area supervisor
7. Construction schedule including anticipated work hours
8. Traffic regulations including lane restrictions
9. City of Phoenix Street Transportation 24-hour phone number

The Contractor shall submit a Public Information and Notification Plan to the Engineer at the pre-construction meeting. No payments shall be made for this item until the Engineer approves the plan.

The plan and work which is eligible for reimbursement shall include: meetings with impacted businesses, schools, emergency services, residents, etc.; scheduling; preparation and distribution of newsletter at least bi-weekly; and maintaining a 24-hour telephone hot line for complaints.

The Contractor shall submit a final report/evaluation of the Public Information and Notification process performed for this project. This report shall be submitted before the Contractor receives final payment.

Payment will be based on invoices, and will be for a total amount not to exceed the amount shown in the bid schedule for the item, "PUBLIC INFORMATION AND NOTIFICATION ALLOWANCE", for work performed in notifying and coordinating with the local population impacted by this project. To cover the cost for administration and supervision, the General Contractor may add an amount equal to not more than 5 percent of the accumulated total invoiced billing for actual public information services provided by a Subcontractor. This cost for

administration and supervision will be considered included in the "PUBLIC INFORMATION AND NOTIFICATION ALLOWANCE".

ITEM 107-2 - PUBLIC INFORMATION AND NOTIFICATION ALLOWANCE

Subsection 107.6.4 - Project Signs:

Contractor shall provide and install two project information signs, one at each end of the project, before beginning construction to inform the public of the forthcoming project, construction dates, and suggested alternate travel routes. Project signs shall include the names of all agencies participating in the project. Signs shall be constructed in accordance with the "Project Sign Information" drawing to be provided to the Contractor at the pre-construction meeting. The signs shall be installed at the location(s) approved by the Engineer. The Contractor shall maintain the signs as necessary, and update the information as requested by the Engineer. Payment shall be made according to the allowance in the Bidding Schedule in installments of 50% upon installation, and the remaining 50% upon final payment for the work.

ITEM 107-3 - PROJECT SIGNS ALLOWANCE

Subsection 107.9 - Protection and Restoration of Property:

The Contractor will protect-in-place existing fence along the project right-of-way limits.

The construction Temporary Construction easement shall be restored in a clean and well graded manner at the completion of construction.

The ADOT and MCDOT improvements (wingwalls, concrete aprons, etc..) shall be protected-in-place during the construction. Any damages to any of the improvements outside of the rights-of-way will be the Contractor's responsibility.

Subsection 107.10 - Contractor's Responsibility for Work: Add the following:

Contractor is advised that the work will be subject to flows of water of varying amounts from Sossaman Channel. The Contractor shall manage the flows in Sossaman Channel to facilitate construction of the channel lining. Owner assumes no responsibility for notifying Contractor of any anticipated flows, nor for any damages incurred by Contractor to its equipment or to any of the Contractor's work as a result of any flows of water.

No construction activities shall take place in Sossaman Channel during storm water flows or within ponded water. If flows occur within the watershed during the construction, the Contractor shall remove all equipment to a location outside of the wash.

Subsection 108.1 - Notice to Proceed: Delete Paragraph (A) and replace with the following:

(A) Contractor shall commence work within seven (7) calendar days after the date of the Notice to Proceed and complete all work within one hundred fifty (150) calendar days beginning the day following the effective date specified in the Notice to Proceed.

Subsection 108.2 - Subletting of Contract: Add the following:

For this project, Contractor shall perform, with its own organization, work amounting to 50 percent or more of the total contract cost.

Subsection 108.4 - Contractor's Construction Schedule: Delete in its entirety and replace with the following:

Contractor shall submit a proposed work schedule to the Engineer for review before starting work, using the Primavera or other program that is acceptable to the Engineer. Weekly updates shall be submitted to the District's Construction Coordinator at the weekly coordination meeting.

Subsection 108.4.1 - Contractor's Billing Schedule: Add the following:

Contractor shall furnish the Engineer an Estimated Billing Schedule which shall include an estimated amount of each billing for the total project at the preconstruction conference, and thereafter at monthly intervals as agreed to between Contractor and Engineer.

Subsection 108.5 - Limitation of Operations: Add the following:

Should Contractor elect to perform any work after regular working hours, on weekends, or legal holidays, with or without written approval of Engineer, any charges incurred by Owner for inspection of the work, surveys or tests of materials will be deducted from monies due or to become due to Contractor.

Subsection 108.9 - Failure to Complete on Time: Add the following:

The actual cost per calendar day incurred by Owner for Consultant Administrative and Inspection Services on this project will be added to the daily charges as indicated by TABLE 108, LIQUIDATED DAMAGES, and will be deducted from monies due or to become due to Contractor for each and every calendar day that work shall remain incomplete after the time specified for the completion of the work in the proposal, or as adjusted by Engineer. Nothing contained in this provision shall prohibit Owner from deducting from monies due or to become due to Contractor for any other costs incurred by Owner directly attributable to the delay in completing this contract.

Subsection 109.2 - Scope of Payment: Add the following:

In addition to the contained provisions, the work under this section shall consist of preparatory work and operations, including but not limited to, the movement of personnel, equipment, supplies and incidentals to the project site; the establishment of all offices, buildings and other facilities necessary for work on the project, and for all other work operations that must be performed and costs incurred prior to beginning work on the various items on the project site.

Subsection 109.7 - Payment for Bond Issue and Budget Projects: Add the following:

- (A) To third paragraph, add: Payment or release of retained funds shall be made to the contractor within thirty (30) days following final payment to the contractor (reference (B) following), and contractor furnishing to Engineer satisfactory receipts for all labor and material billed and waivers of liens from any and all persons and subcontractors holding claims against the work. Additionally, Contractor shall furnish a completed Certificate of Performance to Engineer evidencing it has satisfactorily discharged all its duties in connection with the work to be performed under this Contract. The form of Certificate of Performance shall be provided to Contractor by the Engineer.
- (B) Delete second and third paragraphs and replace with: The final payment will be made to Contractor by Owner within thirty (30) days following receipt of Engineer's final estimate and receipt by Owner of Consent of Contractor's Surety to said final payment.

If payment will be longer than thirty (30) days as aforesaid, Owner will provide Contractor specific written findings for reasons justifying the delay in payment.

- (C) The Contractor's representative and the Engineer shall make a determination of the monthly pay quantities on the last Wednesday of each month. The monthly pay estimate shall then be signed by the Contractor and submitted to the Engineer on the first day of the next month.



APPENDIX VI

COORDINATE GEOMETRY

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STARTED 16:14:05 10-16-97

HIGHEST FIGURE NUMBER USED = 0
 HIGHEST POINT NUMBER USED = 1092
 HIGHEST PROFILE NUMBER USED = 0
 NUMBER OF DESCRIPTIONS = 207

START PROJECT *soossaman

PAGE RESET 1

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POINT	2	N	865568.0650,	E	578316.5850,	Z	.0000 FD-
B.C. MCHD							
3,865661.555,576512.508,1387.968*CPNT*							
POINT	3	N	865661.5550,	E	576512.5080,	Z	1387.9680 CPNT*
4,865605.556,576676.467,1389.162*SDMH							
POINT	4	N	865605.5560,	E	576676.4670,	Z	1389.1620 SDMH
5,865612.030,576674.024,1389.212*SDMH							
POINT	5	N	865612.0300,	E	576674.0240,	Z	1389.2120 SDMH
6,865641.080,576604.897,1380.210*INV							
POINT	6	N	865641.0800,	E	576604.8970,	Z	1380.2100 INV
7,865636.273,576600.844,1380.232*INV							
POINT	7	N	865636.2730,	E	576600.8440,	Z	1380.2320 INV
8,865708.959,576556.770,1387.576*FENCE BW							
POINT	8	N	865708.9590,	E	576556.7700,	Z	1387.5760 FENCE
BW							
9,865674.020,576532.762,1387.411*FENCE BW							
POINT	9	N	865674.0200,	E	576532.7620,	Z	1387.4110 FENCE
BW							
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POINT	10	N	865645.9360,	E	576523.0110,	Z	1387.5230 FENCE
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11,865625.667,576521.216,1387.488*FENCE BW							
POINT	11	N	865625.6670,	E	576521.2160,	Z	1387.4880 FENCE
BW							
12,865616.987,576526.647,1387.733*FENCE BW							
POINT	12	N	865616.9870,	E	576526.6470,	Z	1387.7330 FENCE
BW							

13,865617.143,576582.481,1387.681*FENCE BW
POINT 13 N 865617.1430, E 576582.4810, Z 1387.6810 FENCE
BW

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14,865633.212,576599.290,1387.229*FENCE BW
POINT 14 N 865633.2120, E 576599.2900, Z 1387.2290 FENCE
BW

15,865659.891,576622.772,1387.576*FENCE BW
POINT 15 N 865659.8910, E 576622.7720, Z 1387.5760 FENCE
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POINT 16 N 865721.6900, E 576502.2700, Z 1385.5540 FENCE
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POINT 69 N 866177.5150, E 577344.7870, Z 1394.1600 PP

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POINT 70 N 866000.4310, E 577105.2470, Z 1392.0880 PP

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POINT 71 N 865824.8790, E 576868.5040, Z 1389.8670 PP

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POINT 72 N 865648.8240, E 576631.0220, Z 1388.1340 PP

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POINT 73 N 865719.8160, E 576514.5440, Z 1388.3660 WV

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POINT 75 N 865617.4930, E 576540.4150, Z 1387.7100 HDWL

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POINT 76 N 865617.6610, E

576582.5000, Z

1387.6290 HDWL

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POINT	78	N	865633.6010,	E	576599.0790,	Z	1387.1690 HDWL
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POINT	95	N	865625.3860,	E	576589.9070,	Z	1379.8690 EOC
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POINT 142 N 867182.0710, E 577466.1770, Z 1401.6190 FENCE
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POINT 143 N 867242.1840, E 577465.1120, Z 1402.0800 FENCE
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POINT 343 N 866412.1770, E 577584.2070, Z 1397.8460 FENCE
CL

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POINT 344 N 866419.5690, E 577584.0450, Z 1397.9810 FENCE
WOOD

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POINT 345 N 866472.6200, E 577584.6580, Z 1397.9620 FENCE
END WOOD BEG

346,866533.094,577582.156,1398.058*PED-CATV
POINT 346 N 866533.0940, E 577582.1560, Z 1398.0580 PED-
CATV

347,866411.220,577590.313,1397.860*PED-CATV
POINT 347 N 866411.2200, E 577590.3130, Z 1397.8600 PED-
CATV

348,866418.298,577586.633,1397.928*TRANS

POINT 348 N 866418.2980, E

577586.6330, Z

1397.9280 TRANS

349,866414.605,577586.542,1398.001*TRANS

POINT 349 N 866414.6050, E

577586.5420, Z

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350,866414.486,577590.368,1398.017*TRANS

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 POINT 363 N 867017.5750, E 577580.0640, Z 1400.6720 FENCE
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 POINT 364 N 867018.1260, E 577581.4620, Z 1400.6740 FENCE
 WOOD-BEG

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1400.5700 FENCE

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POINT 372 N 867633.1480, E 577577.0860, Z 1404.1470 FENCE

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 POINT 385 N 867942.3900, E 577571.3920, Z 1406.5610 PP

 386,867888.046,577567.308,1405.485*PED-TELE
 POINT 386 N 867888.0460, E 577567.3080, Z 1405.4850 PED-
 TELE

 387,867746.644,577566.919,1405.537*PED-CATV
 POINT 387 N 867746.6440, E 577566.9190, Z 1405.5370 PED-
 CATV

 388,867703.908,577567.731,1405.297*PED-CATV
 POINT 388 N 867703.9080, E 577567.7310, Z 1405.2970 PED-
 CATV

 389,867687.130,577575.690,1403.953*PED-TELE
 POINT 389 N 867687.1300, E 577575.6900, Z 1403.9530 PED-
 TELE

 390,867669.572,577573.648,1404.278*PP
 POINT 390 N 867669.5720, E 577573.6480, Z 1404.2780 PP

 391,867632.515,577573.219,1404.217*PED-CATV
 POINT 391 N 867632.5150, E 577573.2190, Z 1404.2170 PED-
 CATV

 392,867504.407,577575.054,1403.332*PED-CATV
 POINT 392 N 867504.4070, E 577575.0540, Z 1403.3320 PED-
 CATV

 393,867396.497,577575.506,1402.646*PP
 POINT 393 N 867396.4970, E 577575.5060, Z 1402.6460 PP

 394,867382.938,577574.402,1402.627*PED-CATV
 POINT 394 N 867382.9380, E 577574.4020, Z 1402.6270 PED-
 CATV

 395,867326.048,577573.146,0.000*GPOST
 POINT 395 N 867326.0480, E 577573.1460, Z .0000 GPOST

 396,867248.490,577576.337,1401.810*PED-CATV
 POINT 396 N 867248.4900, E 577576.3370, Z 1401.8100 PED-
 CATV

 397,867207.650,577578.700,1401.623*PED-JT

POINT 397 N 867207.6500, E 577578.7000, Z 1401.6230 PED-
JT

398,867135.987,577575.141,1400.854*PED-CATV

POINT 398 N 867135.9870, E 577575.1410, Z 1400.8540 PED-
CATV

399,867123.394,577577.194,1400.615*PP

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 POINT 399 N 867123.3940, E 577577.1940, Z 1400.6150 PP
 400,867023.443,577577.273,1400.417*PED-CATV
 POINT 400 N 867023.4430, E 577577.2730, Z 1400.4170 PED-
 CATV
 401,866915.601,577578.650,1399.374*PED-TELE
 POINT 401 N 866915.6010, E 577578.6500, Z 1399.3740 PED-
 TELE
 402,866910.780,577581.583,1399.178*PED-JT
 POINT 402 N 866910.7800, E 577581.5830, Z 1399.1780 PED-
 JT
 403,866870.604,577578.900,1399.171*PP
 POINT 403 N 866870.6040, E 577578.9000, Z 1399.1710 PP
 404,866772.995,577580.478,1398.712*PED-TELE
 POINT 404 N 866772.9950, E 577580.4780, Z 1398.7120 PED-
 TELE
 405,866649.059,577581.037,1398.328*PED-TELE
 POINT 405 N 866649.0590, E 577581.0370, Z 1398.3280 PED-
 TELE
 406,866611.711,577580.956,1398.234*PP
 POINT 406 N 866611.7110, E 577580.9560, Z 1398.2340 PP
 464,868006.823,577486.678,0.000*GPOST
 POINT 464 N 868006.8230, E 577486.6780, Z .0000 GPOST
 465,868006.545,577537.564,0.000*GPOST
 POINT 465 N 868006.5450, E 577537.5640, Z .0000 GPOST
 466,868007.559,577564.208,0.000*GPOST
 POINT 466 N 868007.5590, E 577564.2080, Z .0000 GPOST
 467,867894.775,577454.815,1404.811*FENCE CL
 POINT 467 N 867894.7750, E 577454.8150, Z 1404.8110 FENCE
 CL
 468,867894.215,577450.716,1404.457*FENCE CL
 POINT 468 N 867894.2150, E 577450.7160, Z 1404.4570 FENCE
 CL
 469,867902.214,577449.291,1404.499*FENCE CL
 POINT 469 N 867902.2140, E 577449.2910, Z 1404.4990 FENCE
 CL
 470,867903.729,577458.939,1405.539*FENCE CL
 POINT 470 N 867903.7290, E 577458.9390, Z 1405.5390 FENCE
 CL

477,867943.166,577458.652,1405.704*FENCE CL
POINT 477 N 867943.1660, E 577458.6520, Z 1405.7040 FENCE
CL

478,867992.703,577458.334,1406.572*FENCE CL
POINT 478 N 867992.7030, E 577458.3340, Z 1406.5720 FENCE
CL

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479,868051.579,577457.688,1407.642*FENCE CL
POINT 479 N 868051.5790, E 577457.6880, Z 1407.6420 FENCE
CL

480,868069.665,577457.522,1406.952*FENCE CL
POINT 480 N 868069.6650, E 577457.5220, Z 1406.9520 FENCE
CL

481,868073.875,577482.042,1408.244*FENCE CL
POINT 481 N 868073.8750, E 577482.0420, Z 1408.2440 FENCE
CL

482,868156.413,577483.670,1408.251*FENCE CL
POINT 482 N 868156.4130, E 577483.6700, Z 1408.2510 FENCE
CL

483,868156.570,577571.178,1408.133*FENCE CL
POINT 483 N 868156.5700, E 577571.1780, Z 1408.1330 FENCE
CL

484,868079.662,577549.866,1408.341*FENCE CL
POINT 484 N 868079.6620, E 577549.8660, Z 1408.3410 FENCE
CL

485,868079.581,577608.342,1405.295*FENCE CL
POINT 485 N 868079.5810, E 577608.3420, Z 1405.2950 FENCE
CL

486,868079.519,577658.693,1407.130*FENCE CL
POINT 486 N 868079.5190, E 577658.6930, Z 1407.1300 FENCE
CL

503,868067.792,577545.492,1408.240*HDWL
POINT 503 N 868067.7920, E 577545.4920, Z 1408.2400 HDWL

504,868076.724,577545.492,1408.201*HDWL
POINT 504 N 868076.7240, E 577545.4920, Z 1408.2010 HDWL

505,868097.464,577547.980,1408.196*HDWL
POINT 505 N 868097.4640, E 577547.9800, Z 1408.1960 HDWL

506,868119.466,577559.061,1408.215*HDWL
POINT 506 N 868119.4660, E 577559.0610, Z 1408.2150 HDWL

507,868132.610,577560.916,1408.207*HDWL
POINT 507 N 868132.6100, E 577560.9160, Z 1408.2070 HDWL

508,868135.619,577561.345,1406.677*HDWL
POINT 508 N 868135.6190, E 577561.3450, Z 1406.6770 HDWL

509,868139.524,577561.951,1406.682*HDWL

POINT 509 N 868139.5240, E 577561.9510, Z 1406.6820 HDWL
510, 868142.559, 577562.340, 1408.201*HDWL
POINT 510 N 868142.5590, E 577562.3400, Z 1408.2010 HDWL

sossaman
 511,868155.307,577562.820,1408.207*HDWL
 POINT 511 N 868155.3070, E 577562.8200, Z 1408.2070 HDWL

512,868154.995,577485.719,1408.325*HDWL
 POINT 512 N 868154.9950, E 577485.7190, Z 1408.3250 HDWL

513,868155.575,577524.246,1408.261*CPNT*
 POINT 513 N 868155.5750, E 577524.2460, Z 1408.2610 CPNT*

514,868069.262,577485.961,1408.328*HDWL
 POINT 514 N 868069.2620, E 577485.9610, Z 1408.3280 HDWL

530,868010.812,577565.797,1406.340*BS-WATER
 POINT 530 N 868010.8120, E 577565.7970, Z 1406.3400 BS-
 WATER

531,867991.203,577566.221,1406.311*BS-WATER
 POINT 531 N 867991.2030, E 577566.2210, Z 1406.3110 BS-
 WATER

532,867965.479,577566.521,1406.162*BS-WATER
 POINT 532 N 867965.4790, E 577566.5210, Z 1406.1620 BS-
 WATER

533,867941.687,577566.803,1406.008*BS-WATER
 POINT 533 N 867941.6870, E 577566.8030, Z 1406.0080 BS-
 WATER

534,867918.144,577567.655,1405.630*BS-WATER
 POINT 534 N 867918.1440, E 577567.6550, Z 1405.6300 BS-
 WATER

535,867894.773,577567.949,1405.641*BS-WATER
 POINT 535 N 867894.7730, E 577567.9490, Z 1405.6410 BS-
 WATER

536,867871.146,577568.263,1405.638*BS-WATER
 POINT 536 N 867871.1460, E 577568.2630, Z 1405.6380 BS-
 WATER

537,867843.825,577568.628,1405.352*BS-WATER
 POINT 537 N 867843.8250, E 577568.6280, Z 1405.3520 BS-
 WATER

538,867814.766,577569.074,1405.455*BS-WATER
 POINT 538 N 867814.7660, E 577569.0740, Z 1405.4550 BS-
 WATER

539,867794.086,577569.485,1405.797*BS-WATER
 POINT 539 N 867794.0860, E 577569.4850, Z 1405.7970 BS-
 WATER

540,867777.559,577569.587,1405.636*BS-WATER
POINT 540 N 867777.5590, E 577569.5870, Z 1405.6360 BS-
WATER

541,867749.530,577569.612,1405.507*BS-WATER
POINT 541 N 867749.5300, E 577569.6120, Z 1405.5070 BS-
WATER

542,867717.055,577570.069,1405.035*BS-WATER

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 POINT 542 N 867717.0550, E 577570.0690, Z 1405.0350 BS-
 WATER
 543,867699.288,577569.779,1405.213*BS-WATER
 POINT 543 N 867699.2880, E 577569.7790, Z 1405.2130 BS-
 WATER
 544,867698.609,577543.167,1402.669*BS-WATER
 POINT 544 N 867698.6090, E 577543.1670, Z 1402.6690 BS-
 WATER
 545,867708.804,577489.561,1401.778*BS-WATER
 POINT 545 N 867708.8040, E 577489.5610, Z 1401.7780 BS-
 WATER
 546,867708.361,577475.122,1404.368*BS-WATER
 POINT 546 N 867708.3610, E 577475.1220, Z 1404.3680 BS-
 WATER
 547,867708.093,577458.667,1404.077*BS-WATER
 POINT 547 N 867708.0930, E 577458.6670, Z 1404.0770 BS-
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 548,867387.626,577578.700,1402.579*TRANS
 POINT 548 N 867387.6260, E 577578.7000, Z 1402.5790 TRANS
 549,867384.978,577578.665,1402.393*TRANS
 POINT 549 N 867384.9780, E 577578.6650, Z 1402.3930 TRANS
 1001,865567.299,576561.541,-99999*STA 5+00
 POINT 1001 N 865567.2990, E 576561.5410, Z -99999.0000 STA
 5+00
 1002,865667.297,576560.824,-99999*STA 6+00 ANG PNT
 POINT 1002 N 865667.2970, E 576560.8240, Z -99999.0000 STA
 6+00 ANG PNT
 1003,866367.719,577523.761,-99999*17+90.73 ANG PNT
 POINT 1003 N 866367.7190, E 577523.7610, Z -99999.0000
 17+90.73 ANG PNT
 1004,868167.756,577510.845,-99999*35+90.81 END SURVEY
 POINT 1004 N 868167.7560, E 577510.8450, Z -99999.0000
 35+90.81 END SURVEY
 1005,865617.576,576561.181,-99999*INTER S.HDWL&BASELIN
 POINT 1005 N 865617.5760, E 576561.1810, Z -99999.0000 INTER
 S.HDWL&BASELIN
 1006,868155.097,577510.936,-99999*INTER N.HDWL&BASELIN
 POINT 1006 N 868155.0970, E 577510.9360, Z -99999.0000 INTER
 N.HDWL&BASELIN

*** END OF BATCH INPUT HAS BEEN REACHED ***
NUMBER OF LINES IN BATCH INPUT IS 210

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str 1 865567.170 576264.970 1385.980 *CPNT
2,865568.065,578316.585,0.000*FD-B.C. MCHD
3,865661.555,576512.508,1387.968*CPNT*
4,865605.556,576676.467,1389.162*SDMH
5,865612.030,576674.024,1389.212*SDMH
6,865641.080,576604.897,1380.210*INV
7,865636.273,576600.844,1380.232*INV
8,865708.959,576556.770,1387.576*FENCE BW
9,865674.020,576532.762,1387.411*FENCE BW
10,865645.936,576523.011,1387.523*FENCE BW
11,865625.667,576521.216,1387.488*FENCE BW
12,865616.987,576526.647,1387.733*FENCE BW
13,865617.143,576582.481,1387.681*FENCE BW
14,865633.212,576599.290,1387.229*FENCE BW
15,865659.891,576622.772,1387.576*FENCE BW
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19,865822.346,576668.323,1389.206*FENCE CL
20,865857.189,576717.291,1389.365*FENCE CL
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22,865925.882,576813.696,1390.383*FENCE CL
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27,866057.369,576987.796,1392.324*FENCE CL
28,866092.993,577036.306,1392.359*FENCE CL
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31,866199.075,577181.675,1393.732*FENCE CL
32,866252.858,577255.252,1394.890*FENCE CL
33,866287.395,577302.652,1395.390*FENCE CL
34,866326.803,577356.695,1396.190*FENCE CL
35,866363.935,577407.540,1396.453*FENCE CL
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69,866177.515,577344.787,1394.160*PP
70,866000.431,577105.247,1392.088*PP
71,865824.879,576868.504,1389.867*PP
72,865648.824,576631.022,1388.134*PP
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75,865617.493,576540.415,1387.710*HDWL
76,865617.661,576582.500,1387.629*HDWL
77,865617.785,576582.642,1387.192*HDWL
78,865633.601,576599.079,1387.169*HDWL
79,865643.433,576607.488,1387.185*HDWL
80,865650.057,576605.010,1387.240*HDWL
85,865707.771,576557.061,1387.429*EOC
86,865673.528,576533.561,1387.329*EOC
87,865645.101,576524.737,1387.467*EOC
88,865625.885,576522.234,1387.602*EOC

89,865617.356,576527.327,1387.840*EOC
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91,865624.508,576531.503,1382.193*EOC
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143,867242.184,577465.112,1402.080*FENCE CL
144,867322.129,577463.545,1402.339*FENCE CL
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341,866357.050,577574.698,0.000*GPOST
342,866352.257,577584.067,1397.158*FENCE CL
343,866412.177,577584.207,1397.846*FENCE CL
344,866419.569,577584.045,1397.981*FENCE WOOD
345,866472.620,577584.658,1397.962*FENCE END WOOD BEG
346,866533.094,577582.156,1398.058*PED-CATV
347,866411.220,577590.313,1397.860*PED-CATV
348,866418.298,577586.633,1397.928*TRANS
349,866414.605,577586.542,1398.001*TRANS
350,866414.486,577590.368,1398.017*TRANS
351,868031.648,577467.456,1407.759*CPNT*
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366,867136.635,577579.263,1400.570*FENCE
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370,867504.426,577576.637,1403.352*FENCE
371,867569.923,577577.379,1403.906*FENCE
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383,868013.995,577568.475,1406.623*FH
384,867969.528,577571.392,1406.489*GUY
385,867942.390,577571.392,1406.561*PP
386,867888.046,577567.308,1405.485*PED-TELE
387,867746.644,577566.919,1405.537*PED-CATV
388,867703.908,577567.731,1405.297*PED-CATV
389,867687.130,577575.690,1403.953*PED-TELE
390,867669.572,577573.648,1404.278*PP
391,867632.515,577573.219,1404.217*PED-CATV
392,867504.407,577575.054,1403.332*PED-CATV
393,867396.497,577575.506,1402.646*PP
394,867382.938,577574.402,1402.627*PED-CATV
395,867326.048,577573.146,0.000*GPOST
396,867248.490,577576.337,1401.810*PED-CATV
397,867207.650,577578.700,1401.623*PED-JT
398,867135.987,577575.141,1400.854*PED-CATV
399,867123.394,577577.194,1400.615*PP
400,867023.443,577577.273,1400.417*PED-CATV
401,866915.601,577578.650,1399.374*PED-TELE
402,866910.780,577581.583,1399.178*PED-JT
403,866870.604,577578.900,1399.171*PP
404,866772.995,577580.478,1398.712*PED-TELE
405,866649.059,577581.037,1398.328*PED-TELE
406,866611.711,577580.956,1398.234*PP
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481,868073.875,577482.042,1408.244*FENCE CL
482,868156.413,577483.670,1408.251*FENCE CL
483,868156.570,577571.178,1408.133*FENCE CL
484,868079.662,577549.866,1408.341*FENCE CL
485,868079.581,577608.342,1405.295*FENCE CL

486,868079.519,577658.693,1407.130*FENCE CL
503,868067.792,577545.492,1408.240*HDWL
504,868076.724,577545.492,1408.201*HDWL
505,868097.464,577547.980,1408.196*HDWL
506,868119.466,577559.061,1408.215*HDWL
507,868132.610,577560.916,1408.207*HDWL
508,868135.619,577561.345,1406.677*HDWL
509,868139.524,577561.951,1406.682*HDWL
510,868142.559,577562.340,1408.201*HDWL
511,868155.307,577562.820,1408.207*HDWL
512,868154.995,577485.719,1408.325*HDWL
513,868155.575,577524.246,1408.261*CPNT*
514,868069.262,577485.961,1408.328*HDWL
530,868010.812,577565.797,1406.340*BS-WATER
531,867991.203,577566.221,1406.311*BS-WATER
532,867965.479,577566.521,1406.162*BS-WATER
533,867941.687,577566.803,1406.008*BS-WATER
534,867918.144,577567.655,1405.630*BS-WATER
535,867894.773,577567.949,1405.641*BS-WATER
536,867871.146,577568.263,1405.638*BS-WATER
537,867843.825,577568.628,1405.352*BS-WATER
538,867814.766,577569.074,1405.455*BS-WATER
539,867794.086,577569.485,1405.797*BS-WATER
540,867777.559,577569.587,1405.636*BS-WATER
541,867749.530,577569.612,1405.507*BS-WATER
542,867717.055,577570.069,1405.035*BS-WATER
543,867699.288,577569.779,1405.213*BS-WATER
544,867698.609,577543.167,1402.669*BS-WATER
545,867708.804,577489.561,1401.778*BS-WATER
546,867708.361,577475.122,1404.368*BS-WATER
547,867708.093,577458.667,1404.077*BS-WATER
548,867387.626,577578.700,1402.579*TRANS
549,867384.978,577578.665,1402.393*TRANS
1001,865567.299,576561.541,-99999*STA 5+00
1002,865667.297,576560.824,-99999*STA 6+00 ANG PNT
1003,866367.719,577523.761,-99999*17+90.73 ANG PNT
1004,868167.756,577510.845,-99999*35+90.81 END SURVEY
1005,865617.576,576561.181,-99999*INTER S.HDWL&BASELIN
1006,868155.097,577510.936,-99999*INTER N.HDWL&BASELIN
pa□

E START OF JOB ENCOUNTERED BEFORE END OF JOB
* JOB 1 1 1 sossaman

IS TERMINATED

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HIGHEST POINT NUMBER USED	=	1120
HIGHEST PROFILE NUMBER USED	=	0
NUMBER OF DESCRIPTIONS	=	207

soossaman
 *JOB 1 1 1 soossaman STARTED 12:17:15 10-20-97

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 HIGHEST POINT NUMBER USED = 1120
 HIGHEST PROFILE NUMBER USED = 0
 NUMBER OF DESCRIPTIONS = 207

START PROJECT * soossaman

PAGE RESET 14

LOCATE LINE 1010 1 2 1325.28
 POINT 1010 N 865567.7481, E 577590.2499

LOCATE BEARING 1011 1 N 00 24 40 W 2494.88
 POINT 1011 N 868061.9858, E 576247.0688

1012 1011 N 89 43 00 E 1325.07
 POINT 1012 N 868068.5384, E 577572.1226

INVERSE BEARINGS 1010 1012
 FROM 1010 TO 1012, N 00 24 55.110 W, 2500.8559

TANGENT OFFSET 1013 1012 1003 1004
 POINT 1013 N 868068.1038, E 577511.5600
 OFFSET = 60.5641 DISTANCE FROM 1003 = 1700.4286

INVERSE BEARINGS 1013 1012
 FROM 1013 TO 1012, N 89 35 19.991 E, 60.5641

1013 1004
 FROM 1013 TO 1004, N 00 24 40.009 W, 99.6548

LOCATE LINE 1014 1012 1010 57.50
 POINT 1014 N 868011.0399, E 577572.5394

1015 1014 1010 123.67
 POINT 1015 N 867887.3731, E 577573.4358

1016 1015 1010 79.68
 POINT 1016 N 867807.6952, E 577574.0133

1017 1016 1010 60.
 POINT 1017 N 867747.6968, E 577574.4482

1018 1017 1010 60.
 POINT 1018 N 867687.6984, E 577574.8831

1019 1018 1010 65.

sossaman					
POINT 1019	N	867622.7001,	E	577575.3543	
1020 1019 1010 60.					
POINT 1020	N	867562.7016,	E	577575.7892	
1021 1020 1010 60.					
POINT 1021	N	867502.7032,	E	577576.2241	
1022 1021 1010 60.					
POINT 1022	N	867442.7048,	E	577576.6590	
1023 1022 1010 60.					
POINT 1023	N	867382.7064,	E	577577.0939	
1024 1023 1010 60.					
POINT 1024	N	867322.7079,	E	577577.5288	
1025 1024 1010 60.					
POINT 1025	N	867262.7095,	E	577577.9637	
1026 1025 1010 65.					
POINT 1026	N	867197.7112,	E	577578.4349	
1027 1026 1010 60.					
POINT 1027	N	867137.7128,	E	577578.8698	
1028 1027 1010 60.					
POINT 1028	N	867077.7144,	E	577579.3047	
1029 1028 1010 60.					
POINT 1029	N	867017.7160,	E	577579.7396	
1030 1029 1010 60.					
POINT 1030	N	866957.7175,	E	577580.1745	
1031 1030 1010 60.					
POINT 1031	N	866897.7191,	E	577580.6094	
1032 1031 1010 60.					
POINT 1032	N	866837.7207,	E	577581.0443	
1033 1032 1010 65.					
POINT 1033	N	866772.7224,	E	577581.5155	
1034 1033 1010 60.					
POINT 1034	N	866712.7240,	E	577581.9504	
1035 1034 1010 60.					
POINT 1035	N	866652.7255,	E	577582.3853	

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LOCATE BEARING	1036	1014	N	89	43	00	E	30.29	
POINT	1036		N						868011.1897, E 577602.8290
1037	1036	N	89	43	00	E		127.20	
POINT	1037		N						868011.8187, E 577730.0274
1038	1036	S	39	29	10	E		142.62	
POINT	1038		N						867901.1186, E 577693.5198
1039	1015	S	78	22	26	E		108.	
POINT	1039		N						867865.6085, E 577679.2200
1040	1016	N	89	58	30	E		108.	
POINT	1040		N						867807.7423, E 577682.0133
1041	1017	N	89	58	30	E		108	
POINT	1041		N						867747.7439, E 577682.4482
LOCATE LINE	1042	1041						1040	-60.
POINT	1042		N						867687.7455, E 577682.8831
1043	1042	1041						-65.	
POINT	1043		N						867622.7472, E 577683.3543
1044	1043	1041						-60.	
POINT	1044		N						867562.7488, E 577683.7892
1045	1044	1041						-60.	
POINT	1045		N						867502.7503, E 577684.2241
1046	1045	1041						-60.	
POINT	1046		N						867442.7519, E 577684.6590
1047	1046	1041						-60.	
POINT	1047		N						867382.7535, E 577685.0939
1048	1047	1041						-60.	
POINT	1048		N						867322.7551, E 577685.5288
1049	1048	1041						-60.	
POINT	1049		N						867262.7566, E 577685.9637
1050	1049	1041						-65.	
POINT	1050		N						867197.7584, E 577686.4349
1051	1050	1041						-60.	
POINT	1051		N						867137.7599, E 577686.8698

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1052	1051	1041	-60.			
	POINT	1052		N	867077.7615,	577687.3047
1053	1052	1041	-60.			
	POINT	1053		N	867017.7631,	577687.7396
1054	1053	1041	-60.			
	POINT	1054		N	866957.7647,	577688.1745
1055	1054	1041	-60.			
	POINT	1055		N	866897.7662,	577688.6094
1056	1055	1041	-60.			
	POINT	1056		N	866837.7678,	577689.0443
1057	1056	1041	-65.			
	POINT	1057		N	866772.7695,	577689.5155
1058	1057	1041	-60.			
	POINT	1058		N	866712.7711,	577689.9504
1059	1058	1041	-60.			
	POINT	1059		N	866652.7727,	577690.3853

INVERSE BEARINGS 1035 1059						
	FROM	1035	TO	1059,	N 89 58 30.000 E,	108.0000
1034	1058					
	FROM	1034	TO	1058,	N 89 58 30.000 E,	108.0000
1033	1057					
	FROM	1033	TO	1057,	N 89 58 30.000 E,	108.0000
1032	1056					
	FROM	1032	TO	1056,	N 89 58 30.000 E,	108.0000
1031	1055					
	FROM	1031	TO	1055,	N 89 58 30.000 E,	108.0000
1030	1054					
	FROM	1030	TO	1054,	N 89 58 30.000 E,	108.0000
1029	1053					
	FROM	1029	TO	1053,	N 89 58 30.000 E,	108.0000
1028	1052					
	FROM	1028	TO	1052,	N 89 58 30.000 E,	108.0000
1027	1051					

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FROM	1027 TO	1051, N 89 58 30.000 E,		108.0000	
1026 1050					
FROM	1026 TO	1050, N 89 58 30.000 E,		108.0000	
1025 1049					
FROM	1025 TO	1049, N 89 58 30.000 E,		108.0000	
1024 1048					
FROM	1024 TO	1048, N 89 58 30.000 E,		108.0000	
1023 1047					
FROM	1023 TO	1047, N 89 58 30.000 E,		108.0000	
1022 1046					
FROM	1022 TO	1046, N 89 58 30.000 E,		108.0000	
1021 1045					
FROM	1021 TO	1045, N 89 58 30.000 E,		108.0000	
1020 1044					
FROM	1020 TO	1044, N 89 58 30.000 E,		108.0000	
1019 1043					
FROM	1019 TO	1043, N 89 58 30.000 E,		108.0000	
1018 1042					
FROM	1018 TO	1042, N 89 58 30.000 E,		108.0000	
1017 1041					
FROM	1017 TO	1041, N 89 58 30.000 E,		108.0000	
LOCATE LINE	1060 1035	1010 60.			
POINT	1060	N	866592.7271, E	577582.8202	
1061 1060 1010 60.					
POINT	1061	N	866532.7287, E	577583.2551	
1062 1061 1010 60.					
POINT	1062	N	866472.7303, E	577583.6900	
1063 1062 1010 60.					
POINT	1063	N	866412.7319, E	577584.1249	
1064 1063 1010 60.					
POINT	1064	N	866352.7334, E	577584.5598	
1065 1064 1010 60.					
POINT	1065	N	866292.7350, E	577584.9947	

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1066	1065	1010	60.					
POINT	1066			N	866232.7366,	E	577585.4296	
1067	1066	1010	60.					
POINT	1067			N	866172.7382,	E	577585.8645	
1068	1067	1010	60.					
POINT	1068			N	866112.7397,	E	577586.2994	
1069	1068	1010	60.					
POINT	1069			N	866052.7413,	E	577586.7343	
1070	1069	1010	60.					
POINT	1070			N	865992.7429,	E	577587.1692	
1071	1070	1010	60.					
POINT	1071			N	865932.7445,	E	577587.6042	
1072	1071	1010	60.					
POINT	1072			N	865872.7460,	E	577588.0391	
1073	1059	1040	-60.					
POINT	1073			N	866592.7742,	E	577690.8202	
1074	1073	1040	-60.					
POINT	1074			N	866532.7758,	E	577691.2551	
1075	1074	1040	-60.					
POINT	1075			N	866472.7774,	E	577691.6900	
1076	1075	1040	-60.					
POINT	1076			N	866412.7790,	E	577692.1249	
1077	1076	1040	-60.					
POINT	1077			N	866352.7806,	E	577692.5598	
1078	1077	1040	-60.					
POINT	1078			N	866292.7821,	E	577692.9947	
1079	1078	1040	-60.					
POINT	1079			N	866232.7837,	E	577693.4296	
1080	1079	1040	-60.					
POINT	1080			N	866172.7853,	E	577693.8645	
1081	1080	1040	-60.					
POINT	1081			N	866112.7869,	E	577694.2994	

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1082 1081 1040 -60.
POINT 1082 N 866052.7884, E 577694.7343

1083 1082 1040 -60.
POINT 1083 N 865992.7900, E 577695.1692

1084 1083 1040 -60.
POINT 1084 N 865932.7916, E 577695.6041

1085 1084 1040 -60.
POINT 1085 N 865872.7932, E 577696.0390

INVERSE BEARINGS 1060 1073

FROM 1060 TO 1073, N 89 58 30.000 E, 108.0000

1061 1074
FROM 1061 TO 1074, N 89 58 30.000 E, 108.0000

1062 1075
FROM 1062 TO 1075, N 89 58 30.000 E, 108.0000

1063 1076
FROM 1063 TO 1076, N 89 58 30.000 E, 108.0000

1064 1077
FROM 1064 TO 1077, N 89 58 30.000 E, 108.0000

1065 1078
FROM 1065 TO 1078, N 89 58 30.000 E, 108.0000

1066 1079
FROM 1066 TO 1079, N 89 58 30.000 E, 108.0000

1067 1080
FROM 1067 TO 1080, N 89 58 30.000 E, 108.0000

1068 1081
FROM 1068 TO 1081, N 89 58 30.000 E, 108.0000

1069 1082
FROM 1069 TO 1082, N 89 58 30.000 E, 108.0000

1070 1083
FROM 1070 TO 1083, N 89 58 30.000 E, 108.0000

1071 1084
FROM 1071 TO 1084, N 89 58 30.000 E, 108.0000

1072 1085

sossaman

FROM 1072 TO 1085, N 89 58 30.000 E, 108.0000
 LOCATE LINE 1086 1012 1011 109.35
 POINT 1086 N 868067.9976, E 577462.7739
 LOCATE BEARING 1087 1086 S 81 35 12 W 8.80
 POINT 1087 N 868066.7101, E 577454.0686
 1088 1086 S 81 35 12 W 707.11
 POINT 1088 N 867964.5381, E 576763.2736
 1089 1088 S 89 43 00 W 515.00
 POINT 1089 N 867961.9913, E 576248.2799
 INVERSE BEARINGS 1011 1089
 FROM 1011 TO 1089, S 00 41 38.152 E, 100.0018
 1089 1
 FROM 1089 TO 1, S 00 23 57.486 E, 2394.8795
 LOCATE BEARING 1090 1087 S 00 24 40 E 358.76
 POINT 1090 N 867707.9593, E 577456.6428
 1091 1090 S 89 43 00 W 118.24
 POINT 1091 N 867707.3746, E 577338.4042
 LOCATE LINE 1092 1087 1088 138.09
 POINT 1092 N 868046.5057, E 577317.4647
 1093 1087 1090 172.40
 POINT 1093 N 867894.3145, E 577455.3056
 1094 1093 1090 130.36
 POINT 1094 N 867763.9578, E 577456.2410
 LOCATE BEARING 1095 1092 S 29 20 20 W 190.17
 POINT 1095 N 867880.7274, E 577224.2863
 1096 1093 S 75 46 40 W 106.31
 POINT 1096 N 867868.1959, E 577352.2540
 1097 1094 N 57 43 00 W 129.62
 POINT 1097 N 867833.1887, E 577346.6580
 TANGENT OFFSET 1098 1090 1010 1012
 POINT 1098 N 867708.8153, E 577574.7301
 OFFSET = -118.0904 DISTANCE FROM 1010 = 2141.1234
 INVERSE BEARINGS 1090 1098

soossaman
FROM 1090 TO 1098, N 89 35 04.890 E, 118.0904

1098 1012
FROM 1098 TO 1012, N 00 24 55.110 W, 359.7325

TANGENT OFFSET 1099 1090 1003 1004
POINT 1099 N 867708.3719, E 577514.1413
OFFSET = -57.5000 DISTANCE FROM 1003 = 1340.6874

INVERSE BEARINGS 1090 1099
FROM 1090 TO 1099, N 89 35 19.991 E, 57.5000

1099 1003
FROM 1099 TO 1003, S 00 24 40.009 E, 1340.6874

*** END OF BATCH INPUT HAS BEEN REACHED ***
NUMBER OF LINES IN BATCH INPUT IS 135

Printer on
start project * sossaman
page reset 14
locate line 1010 1 2 1325.28
locate bearing 1011 1 n 00 24 40 w 2494.88
1012 1011 n 89 43 00 e 1325.07
inverse bearings 1010 1012
tangent offset 1013 1012 1003 1004
inverse bearings 1013 1012
1013 1004
locate line 1014 1012 1010 57.50
1015 1014 1010 123.67
1016 1015 1010 79.68
1017 1016 1010 60.
1018 1017 1010 60.
1019 1018 1010 65.
1020 1019 1010 60.
1021 1020 1010 60.
1022 1021 1010 60.
1023 1022 1010 60.
1024 1023 1010 60.
1025 1024 1010 60.
1026 1025 1010 65.
1027 1026 1010 60.
1028 1027 1010 60.
1029 1028 1010 60.
1030 1029 1010 60.
1031 1030 1010 60.
1032 1031 1010 60.
1033 1032 1010 65.
1034 1033 1010 60.
1035 1034 1010 60.
locate bearing 1036 1014 n 89 43 00 e 30.29
1037 1036 n 89 43 00 e 127.20
1038 1036 s 39 29 10 e 142.62
1039 1015 s 78 22 26 e 108.
1040 1016 n 89 58 30 e 108.
1041 1017 n 89 58 30 e 108
locate line 1042 1041 1040 -60.
1043 1042 1041 -65.
1044 1043 1041 -60.
1045 1044 1041 -60.
1046 1045 1041 -60.
1047 1046 1041 -60.
1048 1047 1041 -60.
1049 1048 1041 -60.
1050 1049 1041 -65.
1051 1050 1041 -60.
1052 1051 1041 -60.
1053 1052 1041 -60.
1054 1053 1041 -60.
1055 1054 1041 -60.
1056 1055 1041 -60.
1057 1056 1041 -65.
1058 1057 1041 -60.
1059 1058 1041 -60.
inverse bearings 1035 1059

1034 1058
1033 1057
1032 1056
1031 1055
1030 1054
1029 1053
1028 1052
1027 1051
1026 1050
1025 1049
1024 1048
1023 1047
1022 1046
1021 1045
1020 1044
1019 1043
1018 1042
1017 1041

Locate line 1060 1035 1010 60.

1061 1060 1010 60.
1062 1061 1010 60.
1063 1062 1010 60.
1064 1063 1010 60.
1065 1064 1010 60.
1066 1065 1010 60.
1067 1066 1010 60.
1068 1067 1010 60.
1069 1068 1010 60.
1070 1069 1010 60.
1071 1070 1010 60.
1072 1071 1010 60.
1073 1059 1040 -60.
1074 1073 1040 -60.
1075 1074 1040 -60.
1076 1075 1040 -60.
1077 1076 1040 -60.
1078 1077 1040 -60.
1079 1078 1040 -60.
1080 1079 1040 -60.
1081 1080 1040 -60.
1082 1081 1040 -60.
1083 1082 1040 -60.
1084 1083 1040 -60.
1085 1084 1040 -60.

Inverse bearings 1060 1073

1061 1074
1062 1075
1063 1076
1064 1077
1065 1078
1066 1079
1067 1080
1068 1081
1069 1082
1070 1083
1071 1084
1072 1085

Locate line 1086 1012 1011 109.35
Locate bearing 1087 1086 s 81 35 12 w 8.80
1088 1086 s 81 35 12 w 707.11
1089 1088 s 89 43 00 w 515.00
inverse bearings 1011 1089
1089 1
locate bearing 1090 1087 s 00 24 40 e 358.76
1091 1090 s 89 43 00 w 118.24
locate line 1092 1087 1088 138.09
1093 1087 1090 172.40
1094 1093 1090 130.36
locate bearing 1095 1092 s 29 20 20 w 190.17
1096 1093 s 75 46 40 w 106.31
1097 1094 n 57 43 00 w 129.62
tangent offset 1098 1090 1010 1012
inverse bearings 1090 1098
1098 1012
tangent offset 1099 1090 1003 1004
inverse bearings 1090 1099
1099 1003

E START OF JOB ENCOUNTERED BEFORE END OF JOB
* JOB 1 1 1 sossaman

IS TERMINATED

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HIGHEST POINT NUMBER USED = 1130
HIGHEST PROFILE NUMBER USED = 0

soossaman
NUMBER OF DESCRIPTIONS = 210

soossaman
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 HIGHEST POINT NUMBER USED = 1130
 HIGHEST PROFILE NUMBER USED = 0
 NUMBER OF DESCRIPTIONS = 210

START PROJECT * soossaman

PAGE RESET 24

LOCATE LINE 1100 1003 1002 128.43
 POINT 1100 N 866292.1728, E 577419.9004

1101 1003 1004 128.43
 POINT 1101 N 866496.1457, E 577522.8395

LOCATE ANGLE 1102 1002 1100 90 00 00 250.00
 POINT 1102 N 866494.3464, E 577272.8431

INVERSE BEARINGS 1102 1101
 FROM 1102 TO 1101, N 89 35 15.460 E, 250.0028

1102 1100
 FROM 1102 TO 1100, S 36 01 53.139 E, 250.0000

1002 1100
 FROM 1002 TO 1100, N 53 58 06.861 E, 1062.3003

1101 1004
 FROM 1101 TO 1004, N 00 24 40.009 W, 1671.6533

PARALLEL LINE 1103 1104 57.5 1004 1003
 POINT 1103 N 868167.3434, E 577453.3465
 POINT 1104 N 866367.3064, E 577466.2625

1105 1106 57.5 1003 1002
 POINT 1105 N 866414.2189, E 577489.9378
 POINT 1106 N 865713.7969, E 576527.0008

POINTS INTERSECT 1107 1103 1104 1105 1106
 POINT 1107 N 866396.8438, E 577466.0505

INVERSE BEARINGS 1102 1107
 FROM 1102 TO 1107, S 63 13 19.517 E, 216.4159

PARALLEL LINE 1108 1109 57.5 1002 1001
 POINT 1108 N 865666.8847, E 576503.3255
 POINT 1109 N 865566.8867, E 576504.0425

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POINTS INTERSECT 1110 1108 1109 1105 1106
 POINT 1110 N 865696.4219, E 576503.1137

1111 1 2 1108 1109
 POINT 1111 N 865567.2743, E 576504.0397

PARALLEL LINE 1112 1113 57.5 1001 1002
 POINT 1112 N 865567.7113, E 576619.0395
 POINT 1113 N 865667.7093, E 576618.3225

1114 1115 57.5 1002 1003
 POINT 1114 N 865620.7971, E 576594.6472
 POINT 1115 N 866321.2191, E 577557.5842

1116 1117 57.5 1003 1004
 POINT 1116 N 866368.1316, E 577581.2595
 POINT 1117 N 868168.1686, E 577568.3435

POINTS INTERSECT 1118 1 2 1112 1113
 POINT 1118 N 865567.3245, E 576619.0423

1119 1112 1113 1114 1115
 POINT 1119 N 865638.1721, E 576618.5343

1120 1114 1115 1116 1117
 POINT 1120 N 866338.5942, E 577581.4715

INVERSE BEARINGS 1111 1110
 FROM 1111 TO 1110, N 00 24 38.923 W, 129.1509

1110 1107
 FROM 1110 TO 1107, N 53 58 06.861 E, 1190.7301

1118 1119
 FROM 1118 TO 1119, N 00 24 38.923 W, 70.8495

1119 1120
 FROM 1119 TO 1120, N 53 58 06.861 E, 1190.7305

POINTS INTERSECT 1121 1003 1004 1011 1012
 POINT 1121 N 868068.2389, E 577511.5591

INVERSE BEARINGS 1011 1121
 FROM 1011 TO 1121, N 89 43 00.000 E, 1264.5058

1011 1121
 FROM 1011 TO 1121, N 89 43 00.000 E, 1264.5058

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1121 1012
 FROM 1121 TO 1012, N 89 43 00.000 E, 60.5642

1121 1101
 FROM 1121 TO 1101, S 00 24 40.009 E, 1572.1336

1100 1002
 FROM 1100 TO 1002, S 53 58 06.861 W, 1062.3003

1002 1001
 FROM 1002 TO 1001, S 00 24 38.923 E, 100.0006

LOCATE LINE 1122 1101 1121 1210.41
 POINT 1122 N 867706.5245, E 577514.1545 POT HOLE 1

LOCATE ANGLE 1123 1101 1122 90 00 00 40.00
 POINT 1123 N 867706.2375, E 577474.1556 POT HOLE 2

LOCATE LINE 1124 1101 1121 620.41
 POINT 1124 N 867116.5397, E 577518.3879 POT HOLE 3

LOCATE ANGLE 1125 1101 1124 90 00 00 45.00
 POINT 1125 N 867116.2168, E 577473.3891 POT HOLE 4

LOCATE LINE 1126 1002 1100 1.00
 POINT 1126 N 865667.8852, E 576561.6327

LOCATE ANGLE 1127 1100 1126 270 00 00 42.00
 POINT 1127 N 865701.8504, E 576536.9271 POT HOLE 5

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 E INVALID CHARACTER IN POSITION 1
 *** END OF BATCH INPUT HAS BEEN REACHED ***
 NUMBER OF LINES IN BATCH INPUT IS 42

SOS20.TXT

Printer on
Start project * sossaman
Page reset 24
Locate line 1100 1003 1002 128.43
1101 1003 1004 128.43
locate angle 1102 1002 1100 90 00 00 250.00
inverse bearings 1102 1101
1102 1100
1002 1100
1101 1004
parallel line 1103 1104 57.5 1004 1003
1105 1106 57.5 1003 1002
points intersect 1107 1103 1104 1105 1106
inverse bearings 1102 1107
parallel line 1108 1109 57.5 1002 1001
points intersect 1110 1108 1109 1105 1106
1111 1 2 1108 1109
parallel line 1112 1113 57.5 1001 1002
1114 1115 57.5 1002 1003
1116 1117 57.5 1003 1004
points intersect 1118 1 2 1112 1113
1119 1112 1113 1114 1115
1120 1114 1115 1116 1117
inverse bearings 1111 1110
1110 1107
1118 1119
1119 1120
points intersect 1121 1003 1004 1011 1012
inverse bearings 1011 1121
1011 1121
1121 1012
1121 1101
1100 1002
1002 1001
locate line 1122 1101 1121 1210.41
locate angle 1123 1101 1122 90 00 00 40.00
locate line 1124 1101 1121 620.41
locate angle 1125 1101 1124 90 00 00 45.00
locate line 1126 1002 1100 1.00
locate angle 1127 1100 1126 270 00 00 42.00

□