From W/P 12/16/99

ELLIOT ROAD DETENTION BASINS AND OUTFALL CHANNEL

Contract FCD 98-44

Preliminary Floodplain Delineation West of Ellsworth Road

Prepared for :

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

Prepared by:

Wood, Patel & Associates, Inc.
1550 East Missouri, Suite 203
Phoenix, Arizona 85014
(602) 234-1344

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1.0 INTRODUCTION

Wood/Patel learned during the design evaluation process that the post basin/pipe flows would be concentrated along the selected alignment as shown in the East Mesa Area Drainage Master Plan, FCD #95-32, July 1998, by Dibble and Associates, in a way that might be construed as adversely impacting properties downstream of the outfall. In an attempt to mitigate this potential problem, several elements have been added to the plans. These elements include the postponing of the Crismon Road channel construction to reduce the interim flow at Elliot Road and Ellsworth Road and the addition of a distributary channel west of Ellsworth Road to direct the flows to their historical pathways. In this report, the ADMP selected outfall alignment is identified as the south branch of the historical drainage path and the splitter channel is identified as the north branch of the historical drainage path for the distributary outfall channel system.

This report is prepared as part of the Elliot Basin Outfall Channel Design project to show the impact of the interim conditions on the downstream areas of the outfall channel.

2.0 HYDROLOGY

The hydrologic model of the East Mesa ADMP for the existing conditions provided by FCDMC was used to generate the 100-year peak flow at the southeast corner of Ellsworth Road and Elliot Road. The hydrologic model names used for this analysis are SEMP100S.DAT and SEMP100N.DAT for the portions of the model south and north of the Superstition Freeway, respectively. The models were then modified to simulate the interim conditions.

Three different runoff events (2-yr, 5-yr and 100-yr) were evaluated to determine "interim" flows for the project. Please refer to Exhibits 1, 2 and 3 that depict sub-area boundaries and peak flows at key locations. The following modifications were incorporated into the interim model:

1. This project's proposed drainage facilities were accounted for in the model.

2. The existing condition model was modified to incorporate improvements made within the watershed for the Santa Rita Ranch Development. These include 100-year, 2-hr onsite detention and a collector channel along the south side of Guadalupe Road that intercepts offsite flows from the north (sub-basins 66b and 67c) and outfalls to the west along the SRP corridor 2 miles north of Elliot Road.

3. Only a portion of sub-basins 65a and 65b drain into the east detention basin. Therefore, these sub-basins were divided into two portions (65a1, 65a2 and 65b1, 65b2 respectively). No new sub-basins were created. These new flow distributions were modeled using diversions based on the percentage of each basin area split.

4. At Basin EA, the initial 30 cfs is diverted south into the Elliot Road channel. The remainder of the flow is diverted into the Basin with a maximum storage volume of 32 acre-feet.

5. There are two locations that impact this site where flows from the north side of the CAP canal are hard coded into the HEC-1 model. These flows are based on peak outflow from the CAP overchutes for the existing condition 100-year model. Sub-basin 58 is the contributing area for flows at these locations. In order to determine

flows from the CAP overchutes for different return events, the runoff from this area was calculated based on the precipitation values for these events. For simplicity, a ratio was calculated for the return event runoff (in inches) to the 100-year runoff (in inches). This ratio was then used to calculate the peak flow from the CAP overchutes for different return events.

Conclusion - Hydrology

Based on this analysis, the following hydrologic conclusions can be made:

1. The 100-year flow at Ellsworth Road and Elliot Road is reduced from 2268 cfs in the existing condition model to 2035 cfs in the interim model (see Exhibit 3).

2. The proposed east detention basin (EA) is ineffective in the interim model for events in excess of the 2-year storm. This is mainly due to the fact that the upstream ADMP drainage facilities (Siphon Draw basin and channels) are not in place and the watershed is essentially undeveloped. In this condition, the basin volume (32 acre-feet) is quickly exceeded.

3. The splitter structure at the west basin (WA) is designed to allow a large portion of the initial flow (up to 400cfs) to bypass the basin. In order to reduce the impact of this bypass flow on the interim outfall, the Crismon Road channel will not be constructed with this project. This will allow the flows that outlet from the Santa Rita Ranch and Mesquite Canyon channel to continue to the west toward Ellsworth Road north of Elliot Road in their historical path.

4. Essentially all of the reduction in flow in the interim model for events in excess of the 2-year storm is attributable to the phasing of the Crismon Road channel to postpone the connection with the Santa Rita Ranch and Mesquite Canyon channel until an outfall is available west of Ellsworth Road.

Summary of Flows Outfall Location West of Ellsworth Road		
Return Event	Existing Condition (cfs)	Interim Condition (cfs)
2-year	83	69
5-year	560	550
100-year	2268	2035

3.0 HYDRAULICS

The U.S. Army Corps of Engineer's HEC-RAS model, version 2.2, was used to generate the water surface profiles for the outfall areas. The starting water surface elevations were determined using slope-area method. Please note that these floodplain delineations are preliminary and not the final detailed results.

Topographic mapping for the study areas was the 2-foot contour map provided by the FCDMC.

Local deep depression areas were simulated by placing blocked obstructions within the cross sections to define ineffective flow regions in backwater or ponded areas with the cross section where appropriate. This prevents the HEC-RAS model from putting flow conveyance in areas of low ground near the ends of sections that are outside of the main wash flow path.

The study areas consists of three reaches: the east side along Ellsworth Road alignment south of Elliot Road (approximately 2,000 lf), the north branch of the distributary outfall channel (approximately 3,600 lf), and the south branch of the distributary outfall channel (approximately 3,200 lf).

The total 100-year inflow for the existing conditions at southeast corner of Elliot Road and Ellsworth Road is 2,268 cfs. The modeling purpose of the first reach (east side along Ellsworth Road alignment) is to determine the flow splits between north branch and south branch of the washes west of Ellsworth Road. Ellsworth Road was modeled as a broad-crested weir to account for split flows at depressions along the road. The peak flow values for each of the cross-sections of the HEC-RAS model were determined by trial-and-error method, i.e., first, a series of initial peak flows for all cross-sections were assumed, and the HEC-RAS model was executed, then the computed surface water elevations were used to calculate split flows, and a new flow series were again assigned to cross-sections of the HEC-RAS model. These steps were repeated until the sum of computed split flow and the flow remained at the downstream cross section of the HEC-RAS model was close to flow at the upstream cross section. The final results show that 600 cfs initial flows continue into south branch and 1,668 cfs excess flows breakout into north branch. The split flows computation and HEC-RAS modeling results are shown in Appendix A.

For the interim conditions, all the pipe flow (800 cfs) will be discharged into the south branch, and the remainder of the interim surface flow (1,235 cfs) will overflow into the north branch. This condition can be maintained by putting a dike on the east side of Ellsworth Road before the culvert crossing at Ellsworth Road. The flow in the south branch will split at the north diversion channel so that 500cfs continues to the south and 300cfs flows to the north. The total interim flows at the downstream end of the diversion channels will be approximately 500cfs to the south and 1,535cfs to the north. These flows are less than the existing condition flows of 600cfs to the north and 1,668cfs to the south.

The modeling results for the existing conditions of both north branch and south branch are included in Appendix B, and those for the interim conditions in Appendix C. The preliminary floodplain delineations for the existing and interim conditions are shown on Exhibit 4.

Conclusion - Hydraulics

Based on this analysis, the following hydraulic conclusions can be made:

1. The floodplain for the interim condition has been slightly reduced from the existing condition for both the north and south branches.

Appendix A

Split Flow Computation Table

HEC-RAS Model Results for Existing Conditions

East of Ellsworth Road

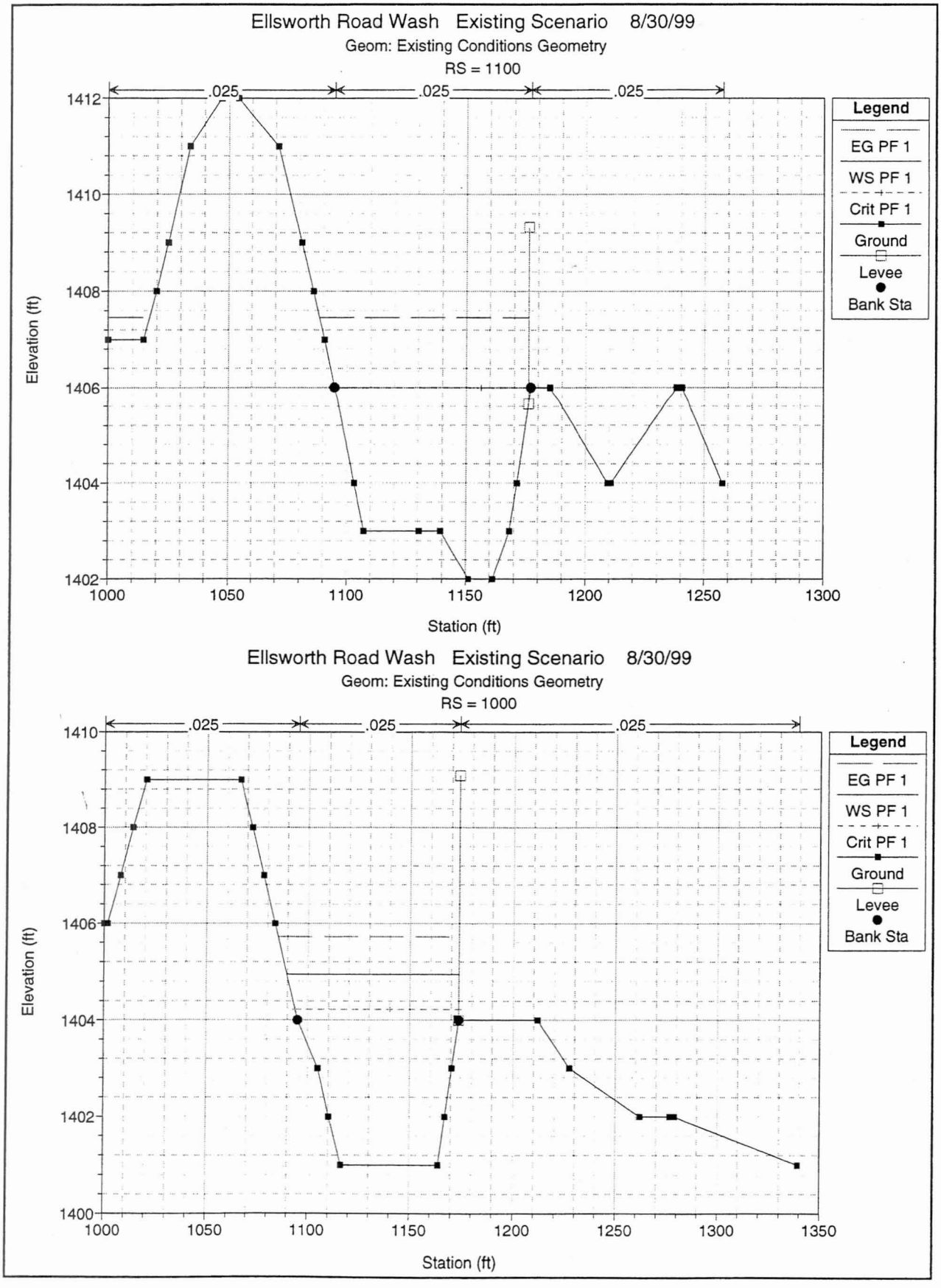
Table 1a

Split Flow Computation along Ellsworth Road (Existing Condition)

Station	Distance	Bank Elev.	WSEL	Head H	Coef. C	Length L	Weir Qi	Weir Q	Remaining Q	Q in Hec-Ras
	(ft)	(ft)	(ft)	(ft)		(ft)	(cfs/ft)	(cfs)	(cfs)	(cfs)
1100	1545.000	1406.00	1406.00	0.00	2.90	0	0.0		2268	2268
1000	1239.000	1404.00	1405.00	1.00	2.90	306	2.9	444	1824	1850
900	1026.000	1404.00	1404.85	0.85	2.90	213	2.3	551	1273	1300
800	857.000	1404.00	1404.80	0.80	2.90	169	2.1	367	906	900
700	693.000	1404.00	1404.55	0.55	2.90	164	1.2	267	639	700
600	554.000	1404.00	1403.90	0.00	2.90	118	0.0	70	569	600
500	469.000	1402.00	1402.45	0.45	2.90	70	0.9	30	539	500
400	332.000	1401.00	1401.35	0.35	2.90	137	0.6	101	438	400
300	210.000	1401.00	1401.30	0.30	2.90	122	0.5	66	372	350
200	115.000	1401.00	1400.80	0.00	2.90	57	0.0	14	359	300
100	0.000	1399.00	1399.60	0.60	2.90	86	1.3	58	300	300

HEC-RAS Plan: Existing River: E-Ellsworth Rd Reach: S.Elliot

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit 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
S.Elliot	1100	2268.00	1402.00	1406.00	1406.00	1407.46	0.006619	9.69	234.13	81.33	1.01
S.Elliot	1000	1850.00	1401.00	1404.94	1404.22	1405.73	0.002989	7.11	262.11	83.98	0.69
S.Elliot	900	1300.00	1401.00	1404.76	1403.47	1405.14	0.001474	4.94	265.73	89.03	0.49
S.Elliot	800	900.00	1401.00	1404.69	1403.01	1404.90	0.000822	3.64	248.93	83.58	0.36
S.Elliot	700	700.00	1401.00	1404.60	1402.85	1404.76	0.000692	3.25	216.24	74.86	0.33
S.Elliot	600	600.00	1402.00	1403.83	1403.83	1404.50	0.008101	6.56	91.49	67.15	0.99
S.Elliot	500	500.00	1401.00	1402.28	1402.61	1403.46	0.019228	8.74	57.82	56.42	1.47
S.Elliot	400	400.00	1396.00	1401.30	1397.90	1401.35	0.000159	1.78	225.73	65.94	0.16
S.Elliot	300	350.00	1397.00	1401.29	1398.79	1401.33	0.000137	1.69	270.21	133.47	0.15
S.Elliot	200	300.00	1399.00	1400.58	1400.58	1401.23	0.008624	6.47	46.35	36.13	1.01
S.Elliot	100	300.00	1397.00	1399.54	1399.09	1399.95	0.003001	5.17	60.96	37.26	0.64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Levee
Bank Sta
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1410
1408
1406
1404
1402
1000
1050
1100
1150
1200
1250
1300
Station (ft)
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Levee
Bank Sta
Elevation (ft)
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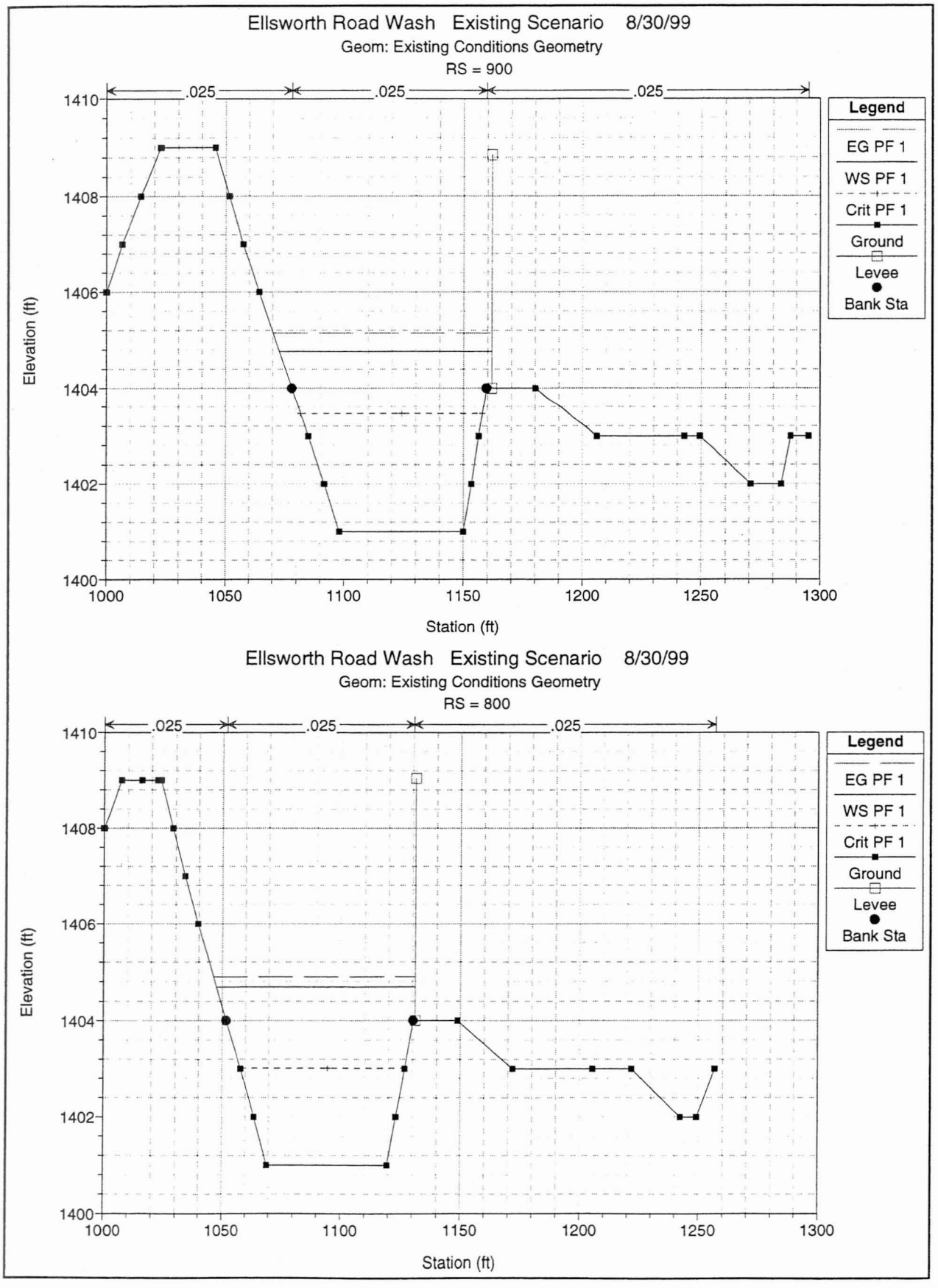
Station (ft)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1250
1300
Station (ft)
Legend
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WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
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Station (ft)
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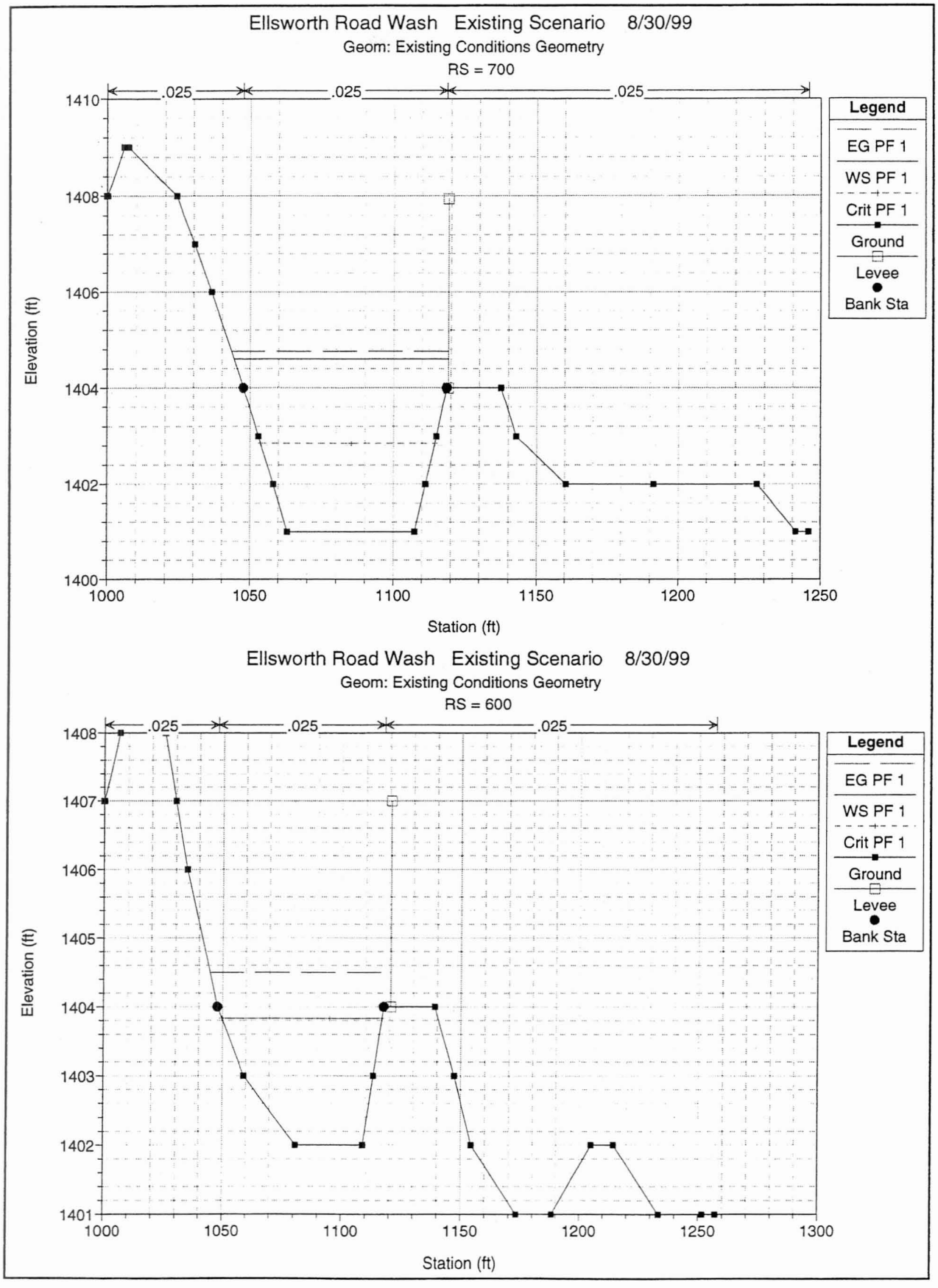
Bank Sta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Bank Sta
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1404
1402
1400
1000
1050
1100
1150
1200
1250
Station (ft)
Ellsworth Road Wash Existing Scenario 8/30/99
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Levee
Bank Sta
Elevation (ft)
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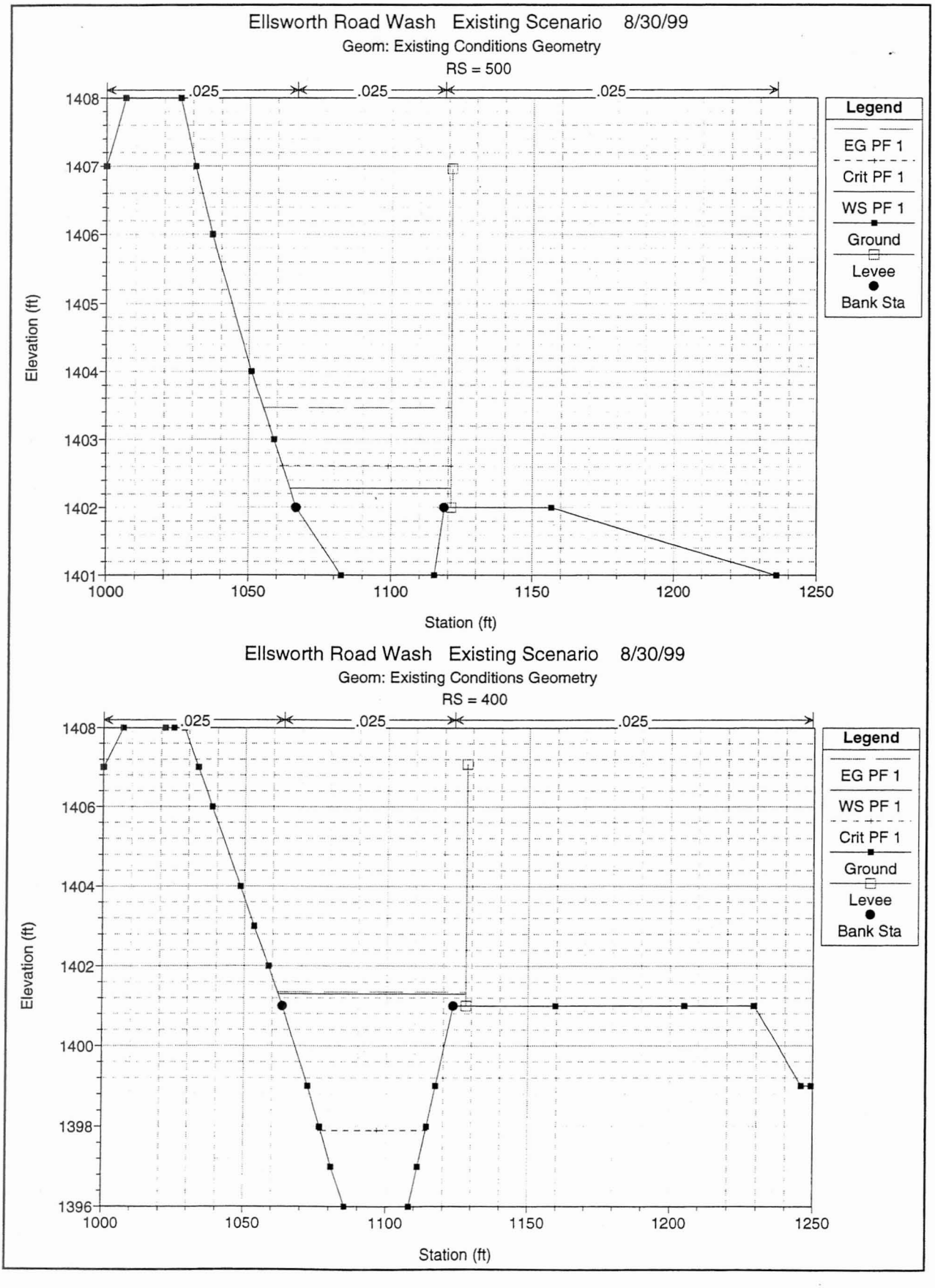
Station (ft)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Levee
Bank Sta
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Station (ft)
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1405
1404
1403
1402
1401
1000
1050
1100
1150
1200
1250
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Geom: Existing Conditions Geometry
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.025
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Ground
Levee
Bank Sta
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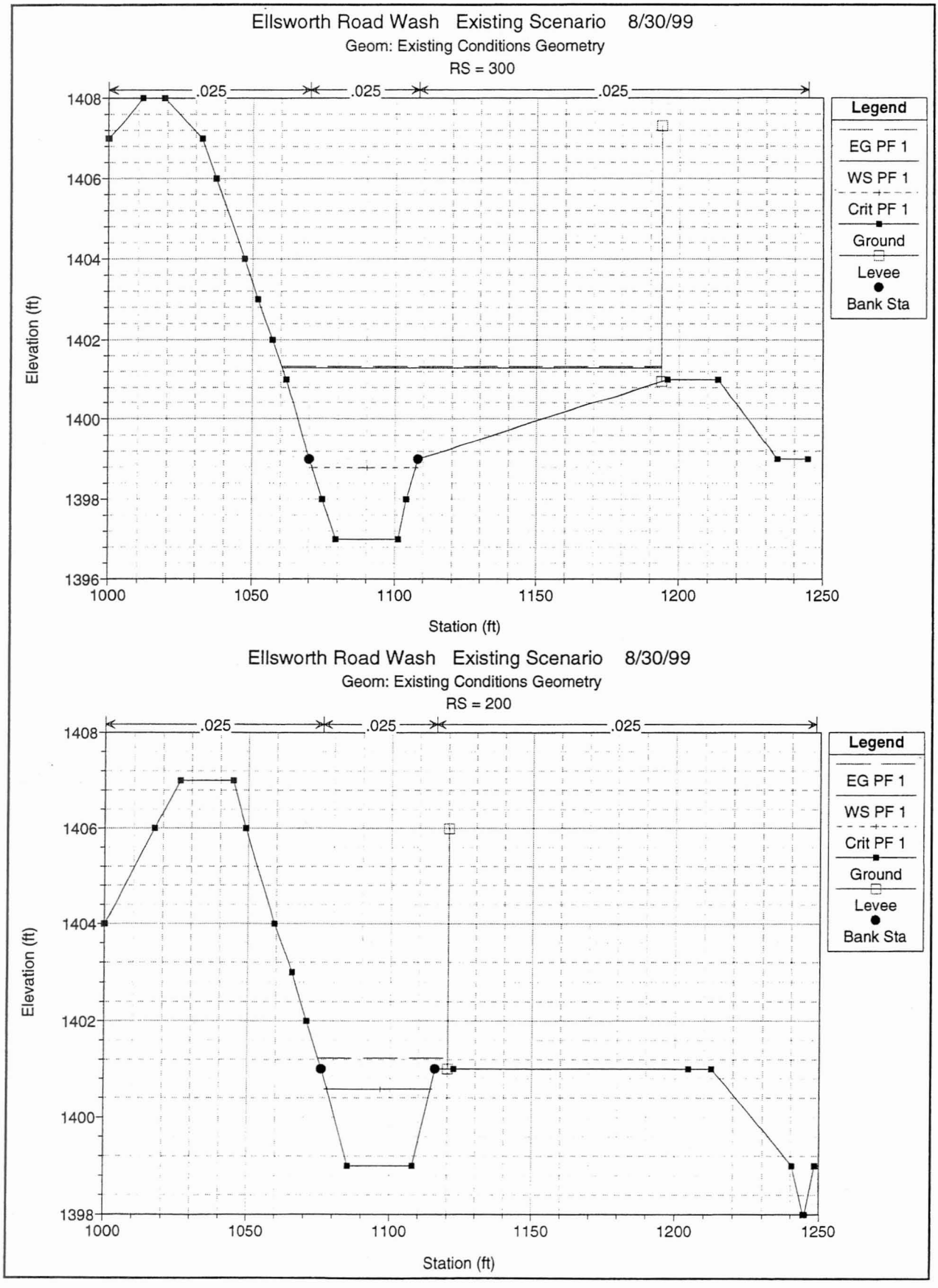
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Levee
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1402
1400
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1150
1200
1250
Station (ft)
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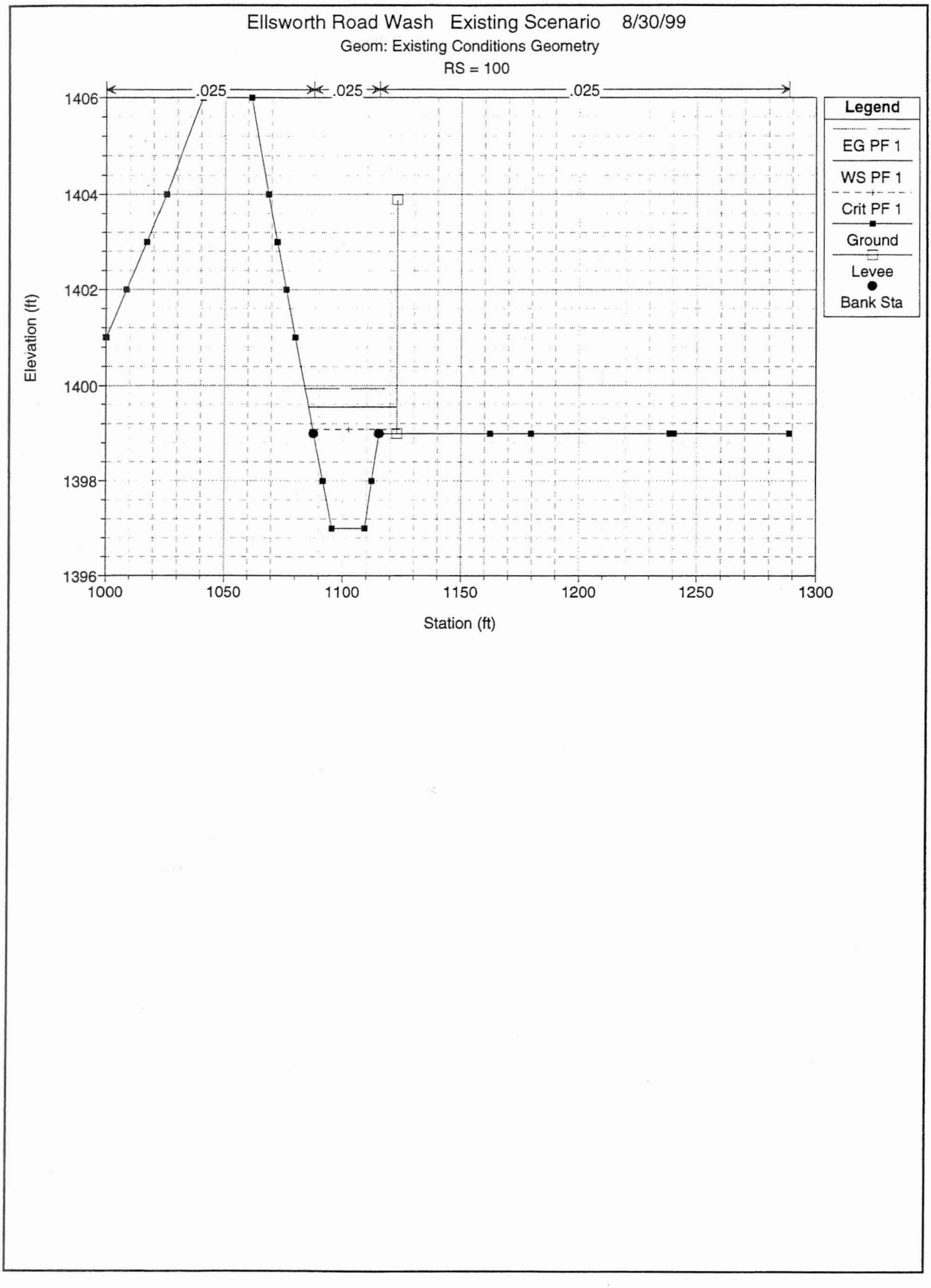
Station (ft)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Elevation (ft)
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1100
1150
1200
1250
1300
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta

Appendix B

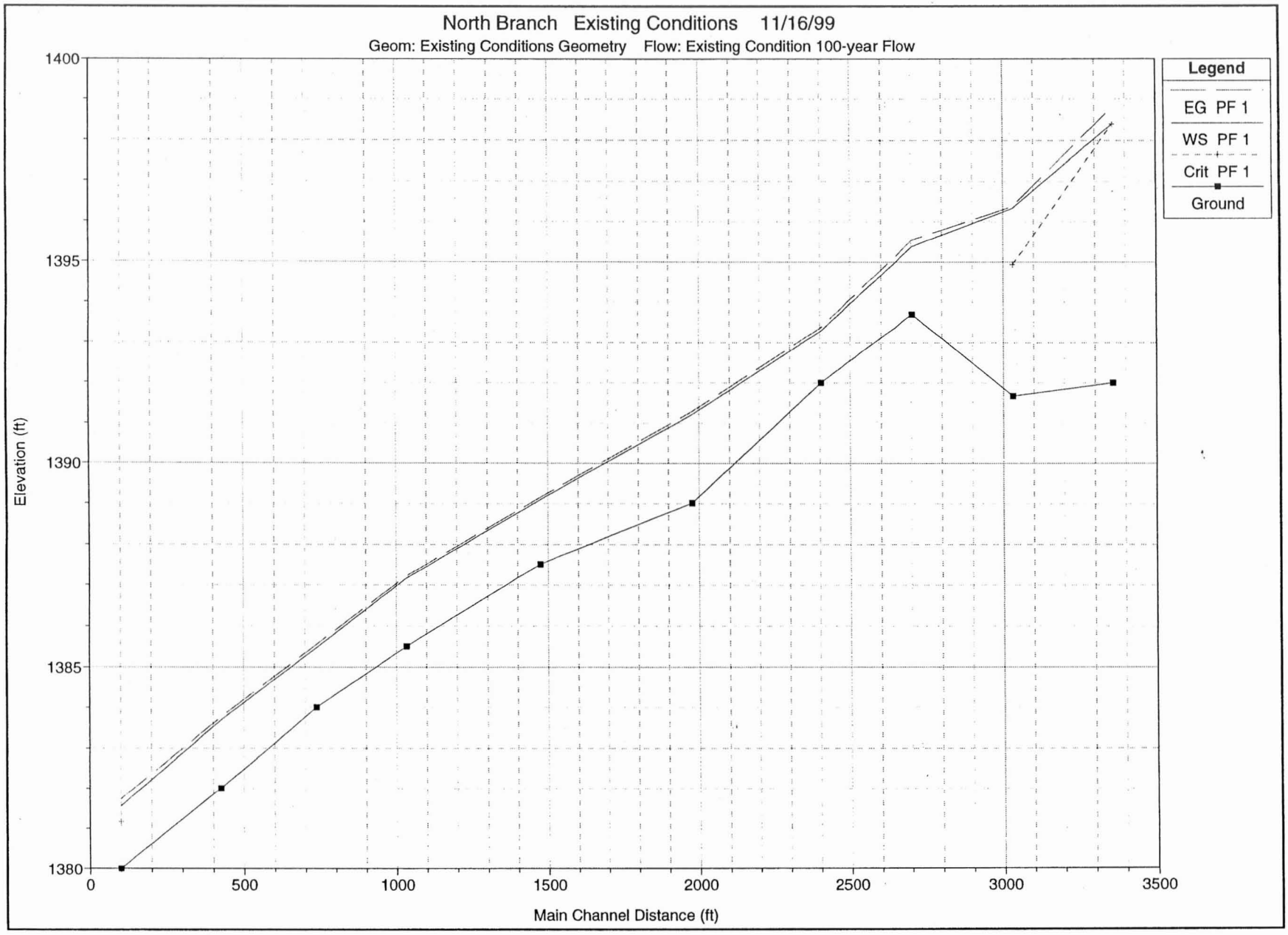
HEC-RAS Model Results for Existing Conditions

North Branch

South Branch

HEC-RAS Plan: Existing River: N-Branch Reach: W-Ellsworth

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit 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
W-Ellsworth	100	1668.00	1380.00	1381.56	1381.17	1381.73	0.008006	3.68	514.10	493.35	0.55
W-Ellsworth	200	1668.00	1382.00	1383.68		1383.76	0.004788	2.21	761.72	812.79	0.40
W-Ellsworth	300	1668.00	1384.00	1385.47		1385.55	0.006870	2.30	725.04	940.71	0.46
W-Ellsworth	400	1668.00	1385.51	1387.16		1387.22	0.004671	1.97	848.76	1044.38	0.38
W-Ellsworth	450	1668.00	1387.51	1389.09		1389.15	0.004170	1.96	848.88	959.56	0.37
W-Ellsworth	500	1668.00	1389.02	1391.21		1391.28	0.004321	2.17	769.94	771.62	0.38
W-Ellsworth	600	1668.00	1392.00	1393.29		1393.38	0.005815	2.41	691.43	737.30	0.44
W-Ellsworth	700	1668.00	1393.71	1395.39		1395.55	0.009013	3.21	518.93	499.77	0.56
W-Ellsworth	800	1668.00	1393.89	1396.34	1394.94	1396.39	0.001164	1.98	999.00	656.75	0.23
W-Ellsworth	900	1668.00	1397.02	1398.41	1398.41	1398.82	0.017859	5.41	360.28	469.32	0.82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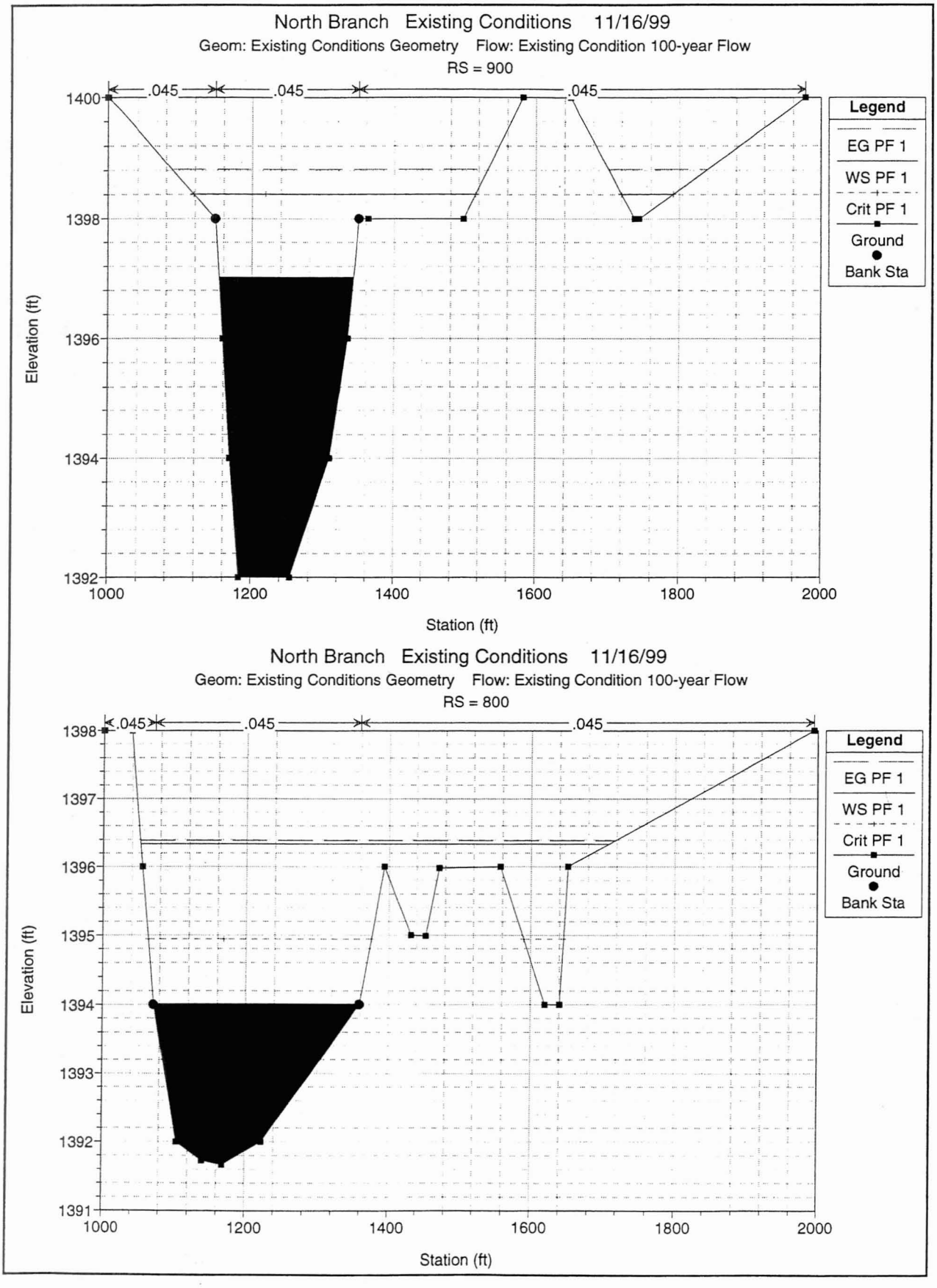
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1800
2000
Station (ft)
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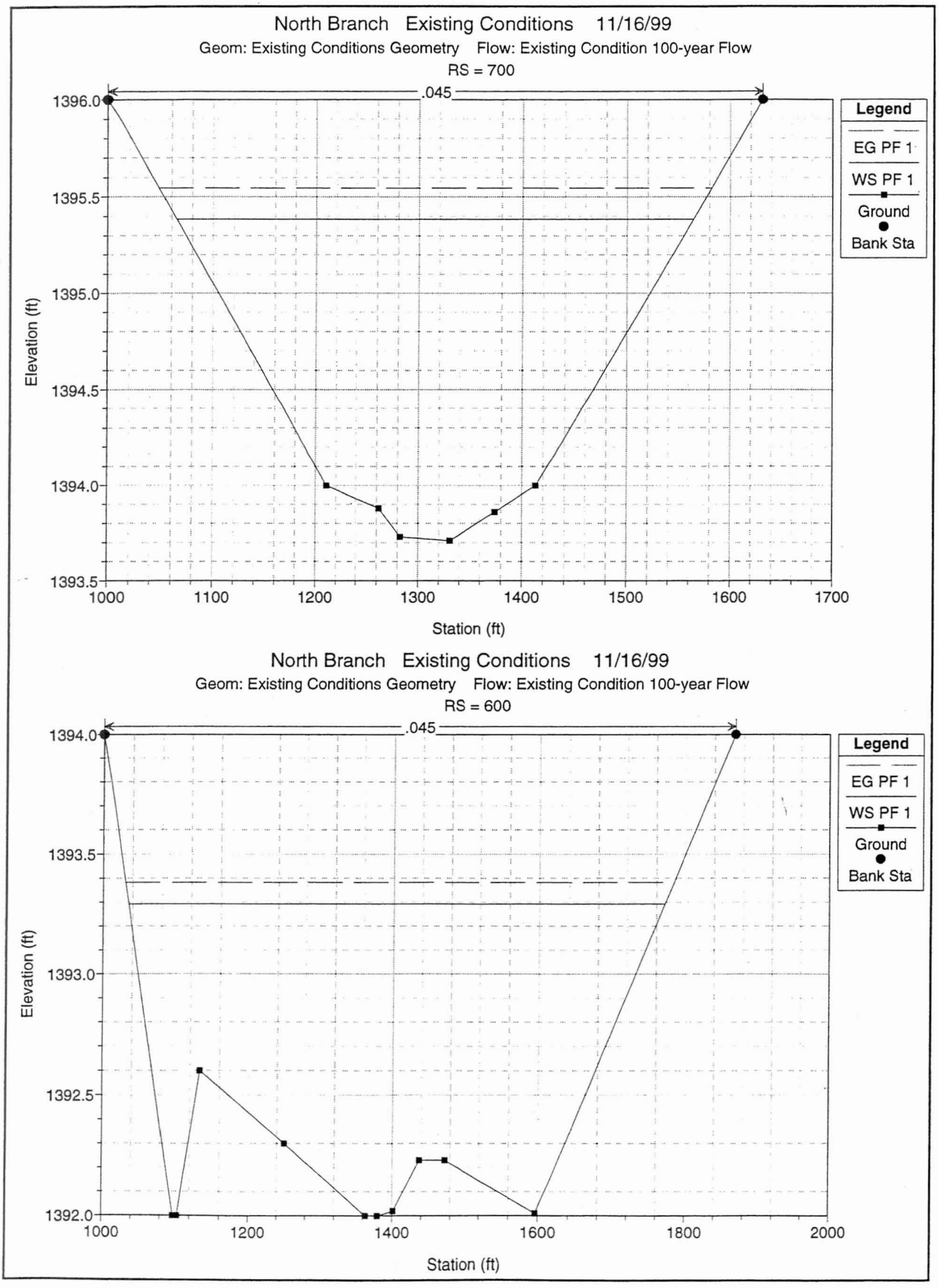
Station (ft)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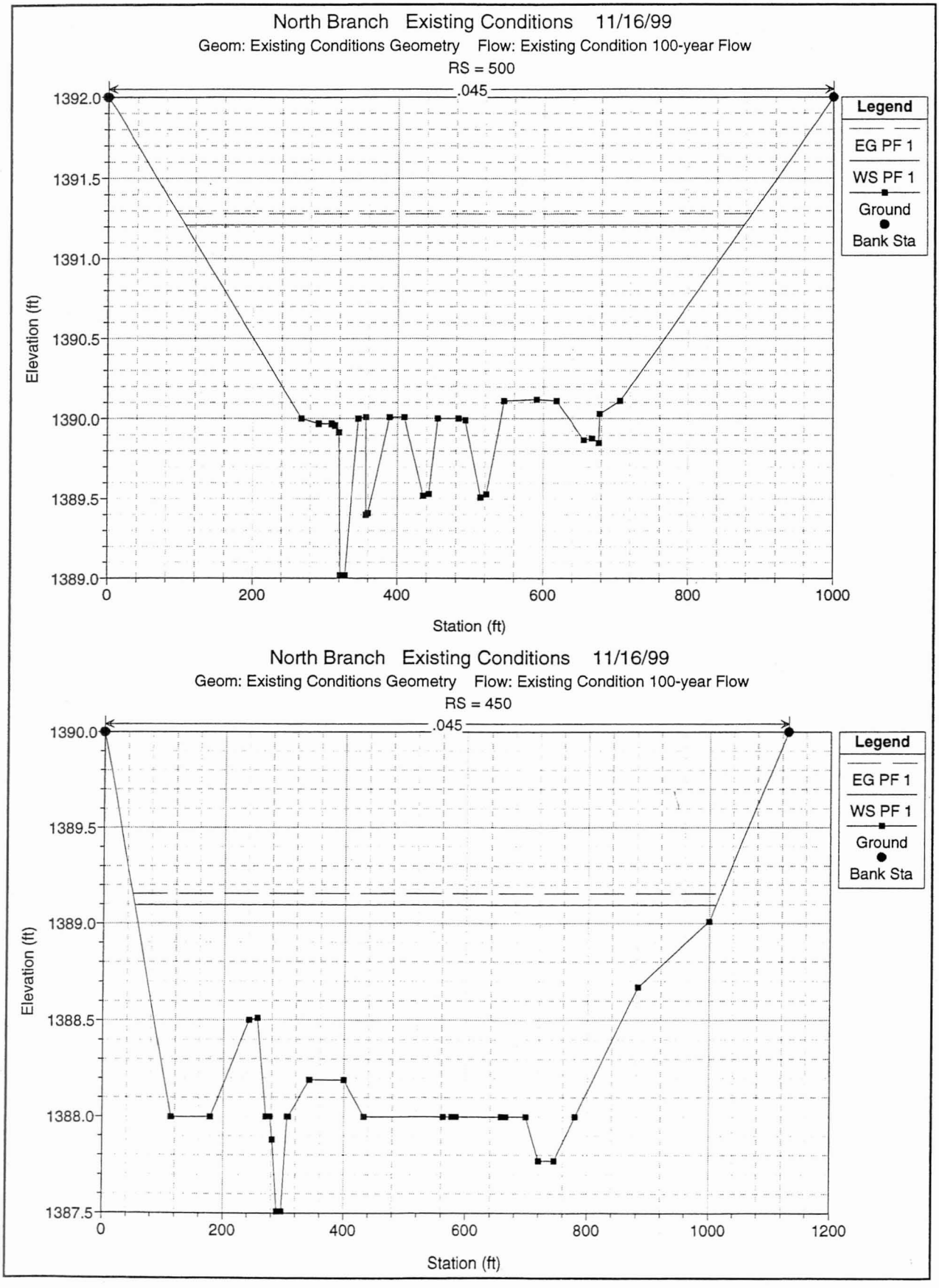
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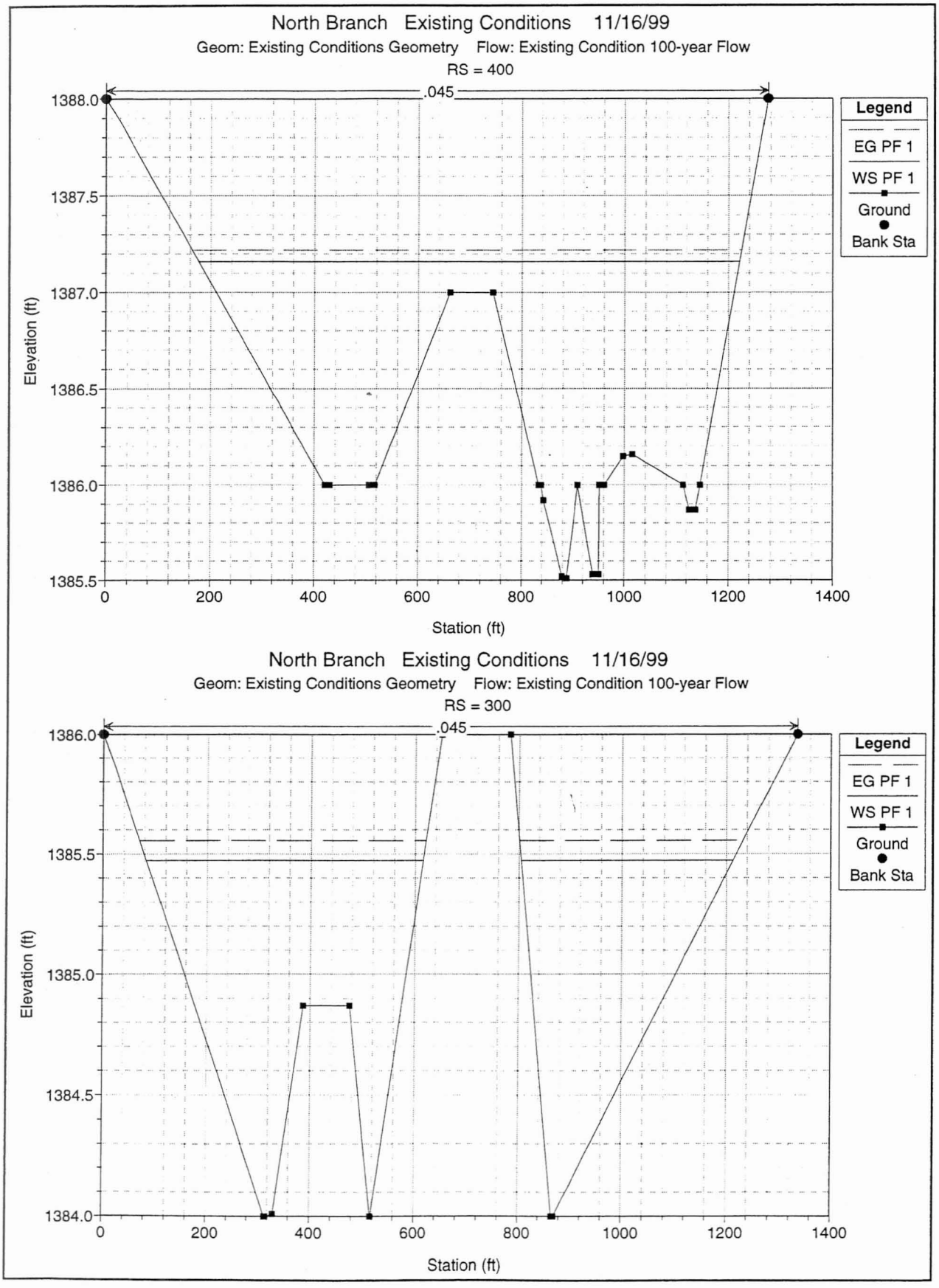
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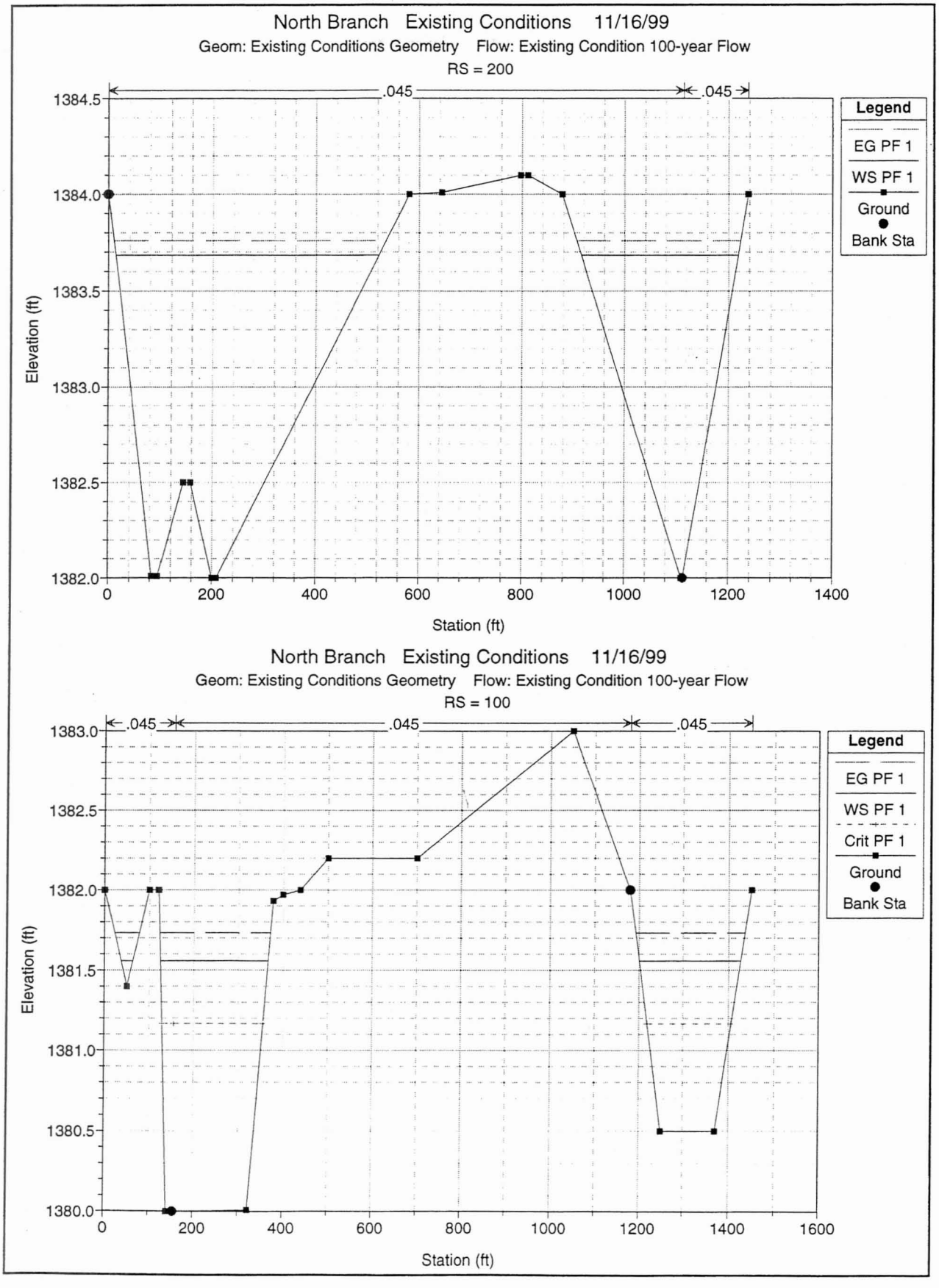
Station (ft)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Bank Sta
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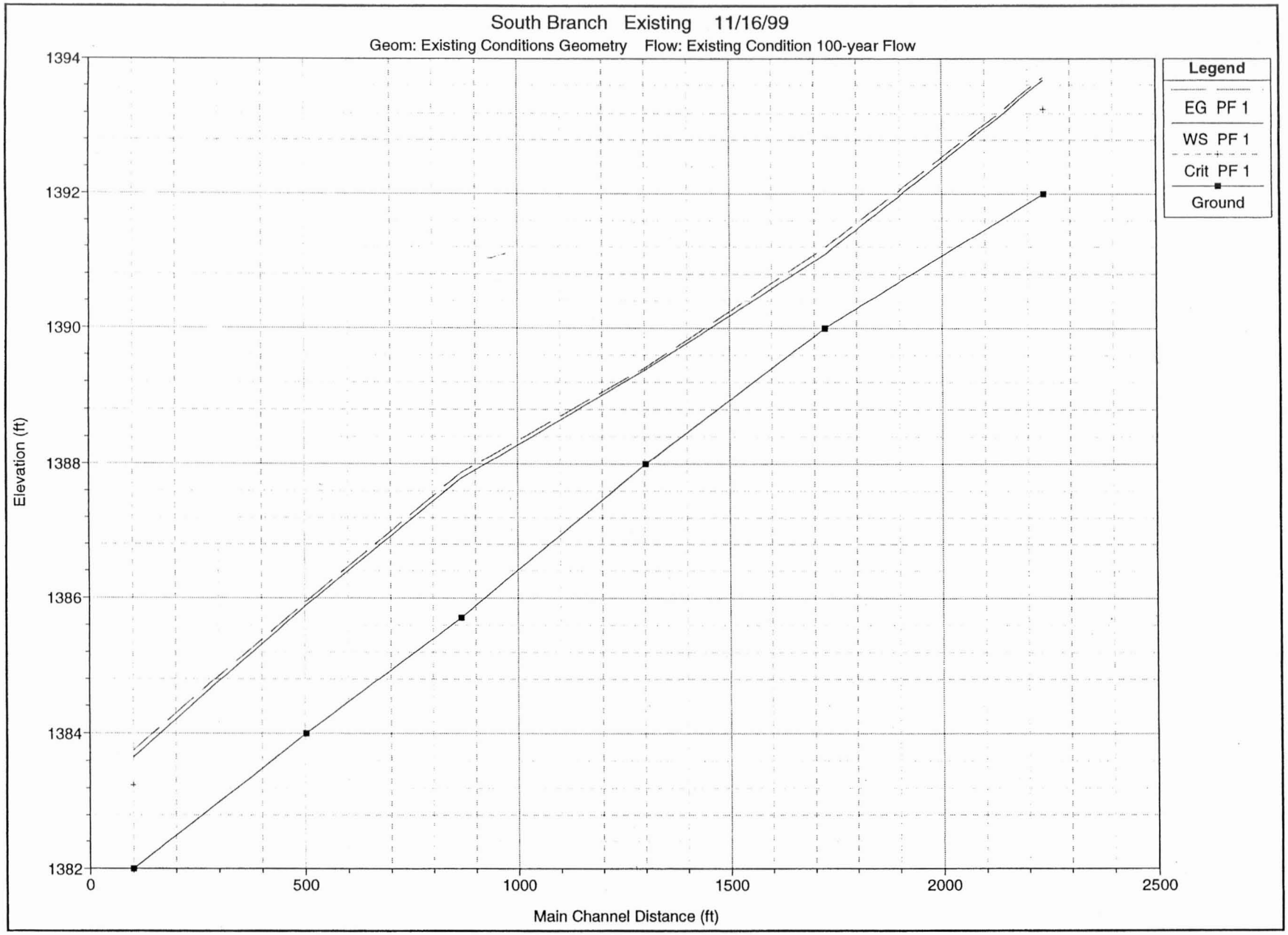
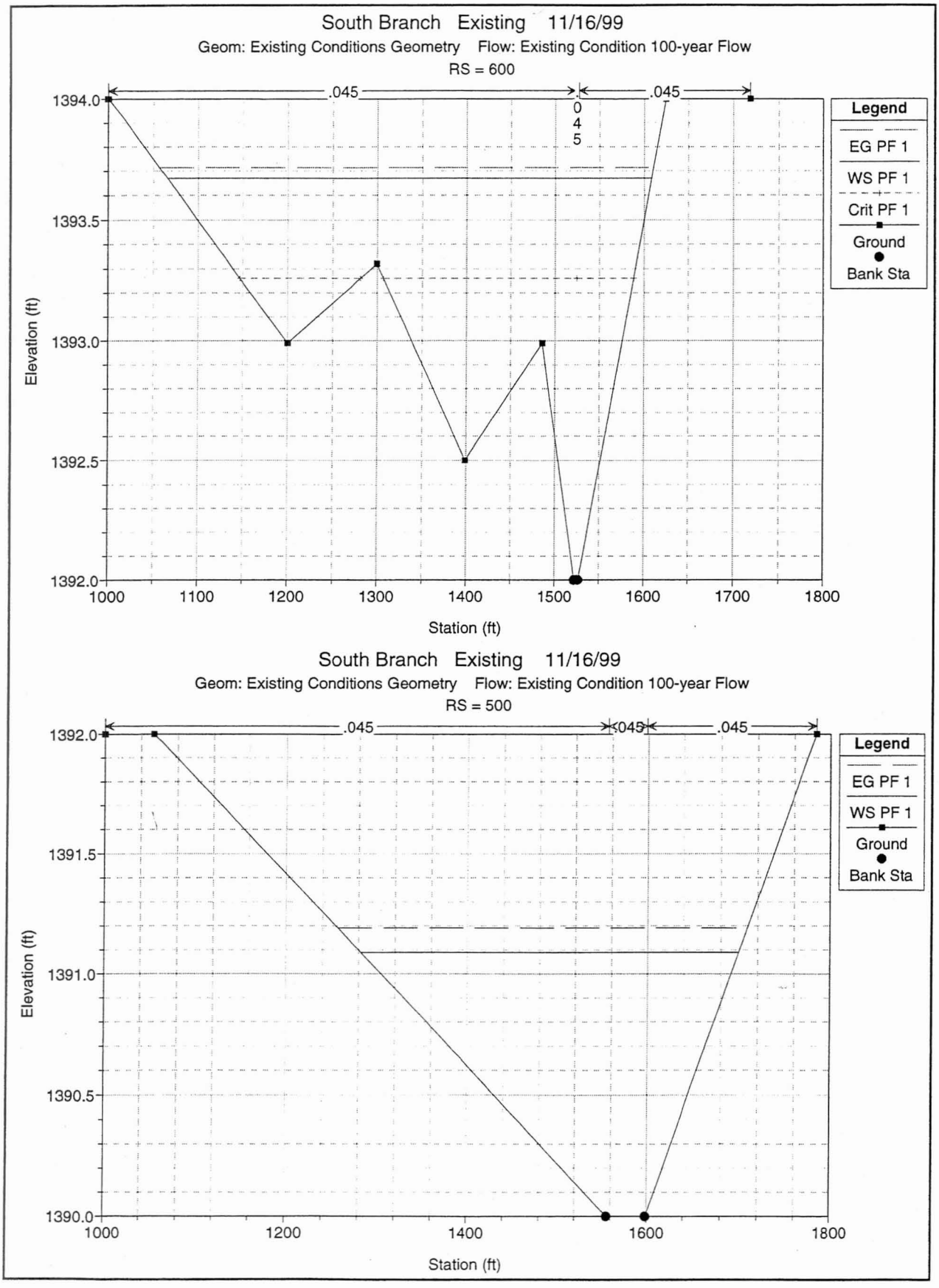
1384.0
1383.5
1383.0
1382.5
1382.0
0
200
400
600
800
1000
1200
1400
Station (ft)
North Branch Existing Conditions 11/16/99
Geom: Existing Conditions Geometry Flow: Existing Condition 100-year Flow
RS = 100
.045
.045
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1383.0
1382.5
1382.0
1381.5
1381.0
1380.5
1380.0
0
200
400
600
800
1000
1200
1400
1600
Station (ft)

HEC-RAS Plan: Existing River: S-Branch Reach: W-Ellsworth

Reach	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)	
W-Ellsworth	100	600.00	1382.00	1383.65	1383.24	1383.75	0.007009	3.86	246.86	413.81	0.53
W-Ellsworth	200	600.00	1384.00	1385.89		1385.94	0.004362	3.33	341.45	507.15	0.43
W-Ellsworth	300	600.00	1385.71	1387.78		1387.87	0.005736	3.88	281.71	381.44	0.49
W-Ellsworth	400	600.00	1388.00	1389.38		1389.41	0.002392	2.00	442.64	600.24	0.30
W-Ellsworth	500	600.00	1390.00	1391.09		1391.19	0.009599	3.43	250.59	417.11	0.58
W-Ellsworth	600	600.00	1392.00	1393.67	1393.26	1393.71	0.003840	2.88	372.25	543.32	0.39


South Branch Existing 11/16/99
Geom: Existing Conditions Geometry Flow: Existing Condition 100-year Flow
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Elevation (ft)
1394
1392
1390
1388
1386
1384
1382
0
500
1000
1500
2000
2500
Main Channel Distance (ft)


South Branch Existing 11/16/99
Geom: Existing Conditions Geometry Flow: Existing Condition 100-year Flow
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.045
.045
0
4
5
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1394.0
1393.5
1393.0
1392.5
1392.0
1000
1100
1200
1300
1400
1500
1600
1700
1800
Station (ft)
South Branch Existing 11/16/99
Geom: Existing Conditions Geometry Flow: Existing Condition 100-year Flow
RS = 500
.045
.045
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
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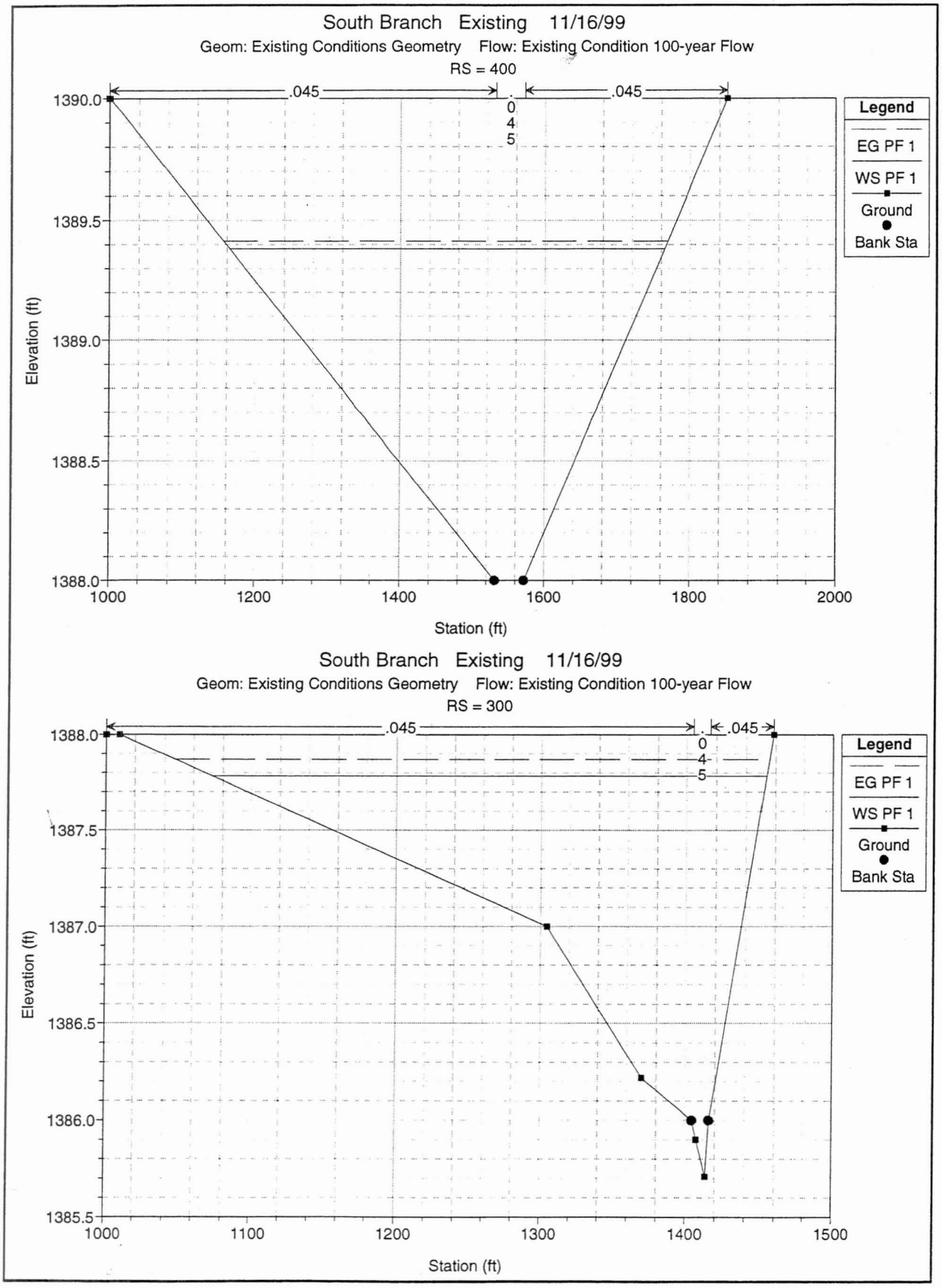
1391.5
1391.0
1390.5
1390.0
1000
1200
1400
1600
1800
Station (ft)


South Branch Existing 11/16/99
Geom: Existing Conditions Geometry Flow: Existing Condition 100-year Flow
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.045
0
4
5
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1390.0
1389.5
1389.0
1388.5
1388.0
1000
1200
1400
1600
1800
2000
Station (ft)
South Branch Existing 11/16/99
Geom: Existing Conditions Geometry Flow: Existing Condition 100-year Flow
RS = 300
.045
.045
0
4
5
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1388.0
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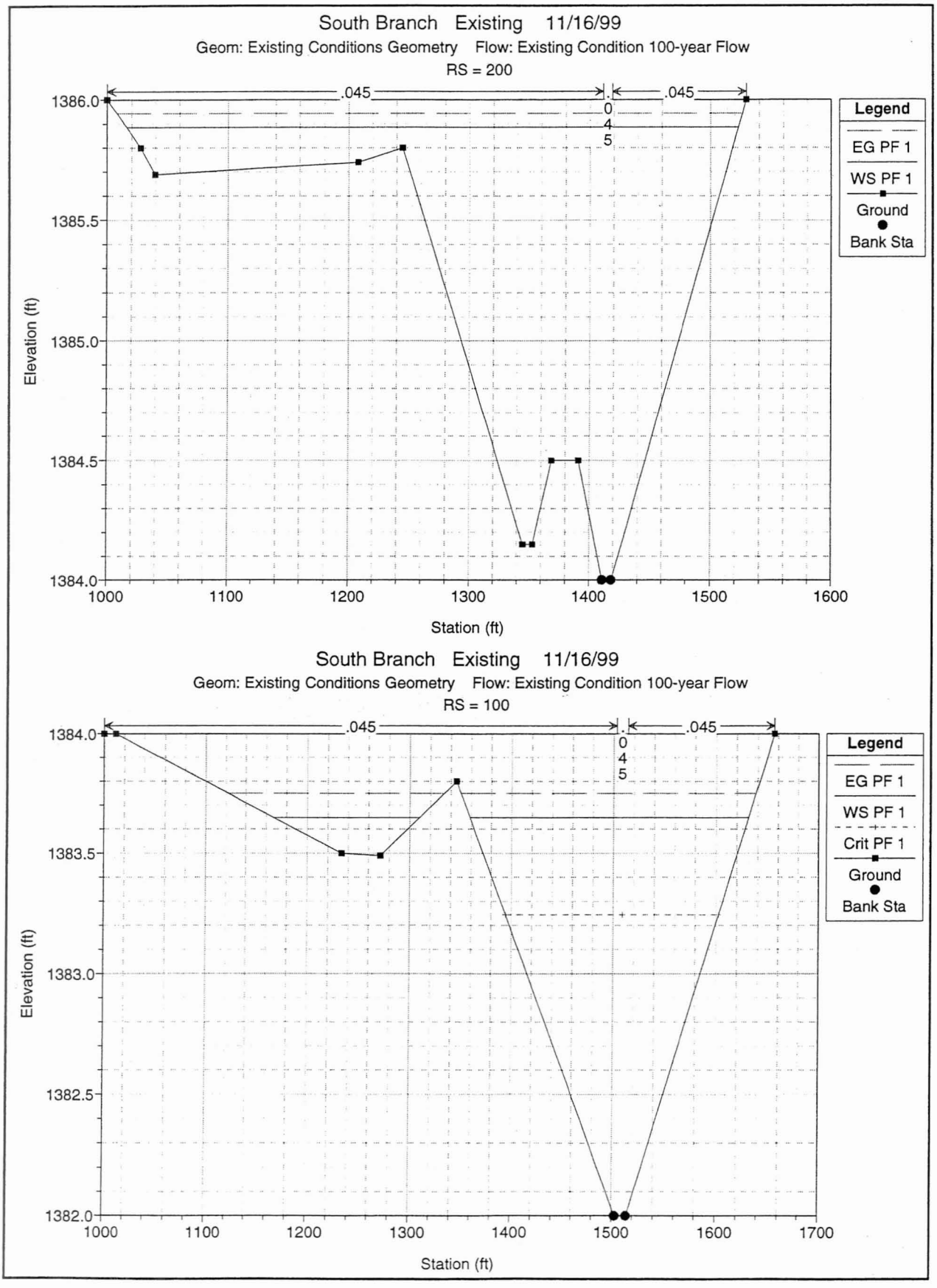
1387.0
1386.5
1386.0
1385.5
1000
1100
1200
1300
1400
1500
Station (ft)


South Branch Existing 11/16/99
Geom: Existing Conditions Geometry Flow: Existing Condition 100-year Flow
RS = 200
.045
.045
0
4
5
1386.0
1385.5
1385.0
1384.5
1384.0
Elevation (ft)
1000
1100
1200
1300
1400
1500
1600
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
South Branch Existing 11/16/99
Geom: Existing Conditions Geometry Flow: Existing Condition 100-year Flow
RS = 100
.045
.045
0
4
5
1384.0
1383.5
1383.0
1382.5
1382.0
Elevation (ft)
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

Appendix C

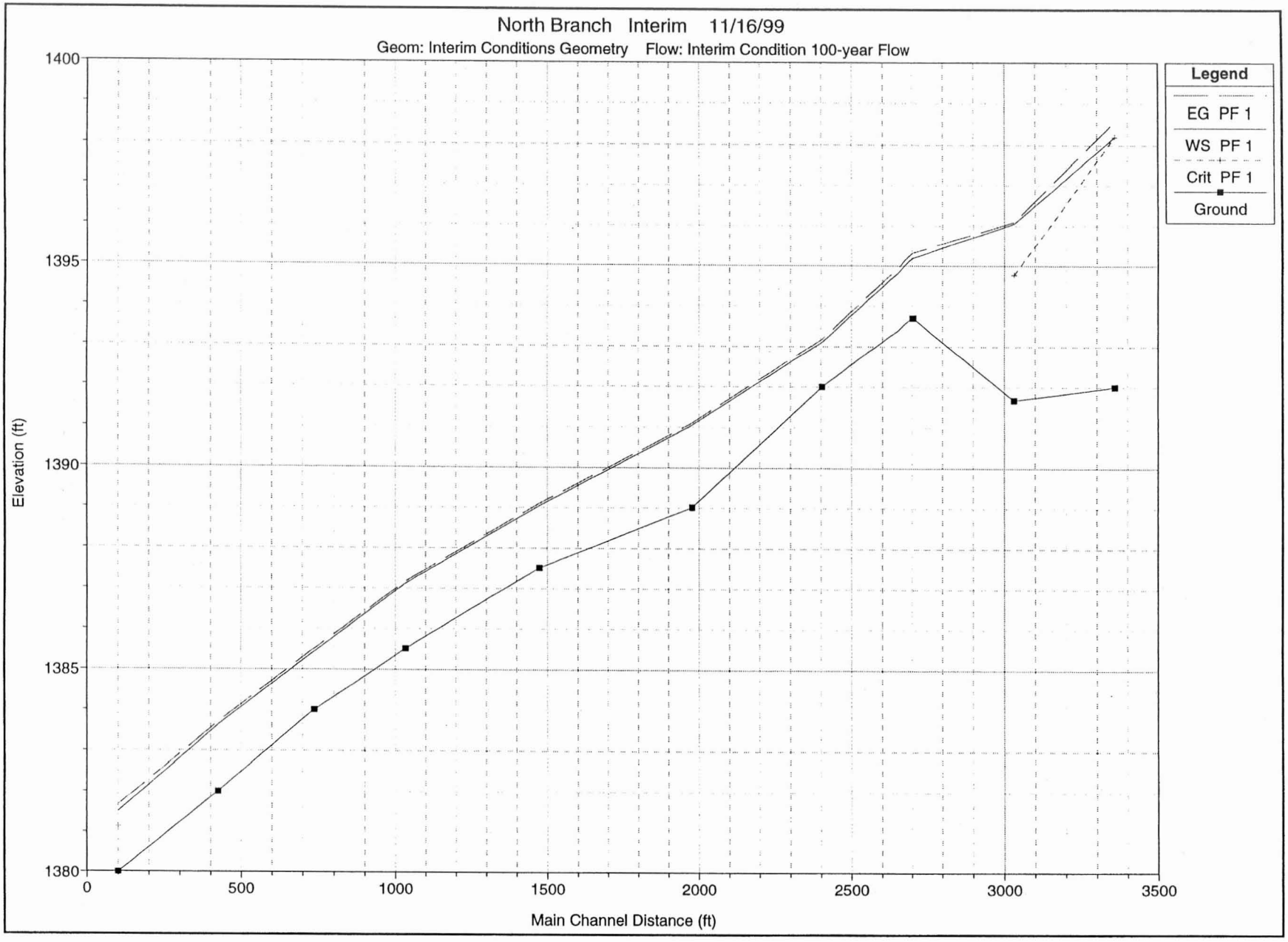
HEC-RAS Model Results for Interim Conditions

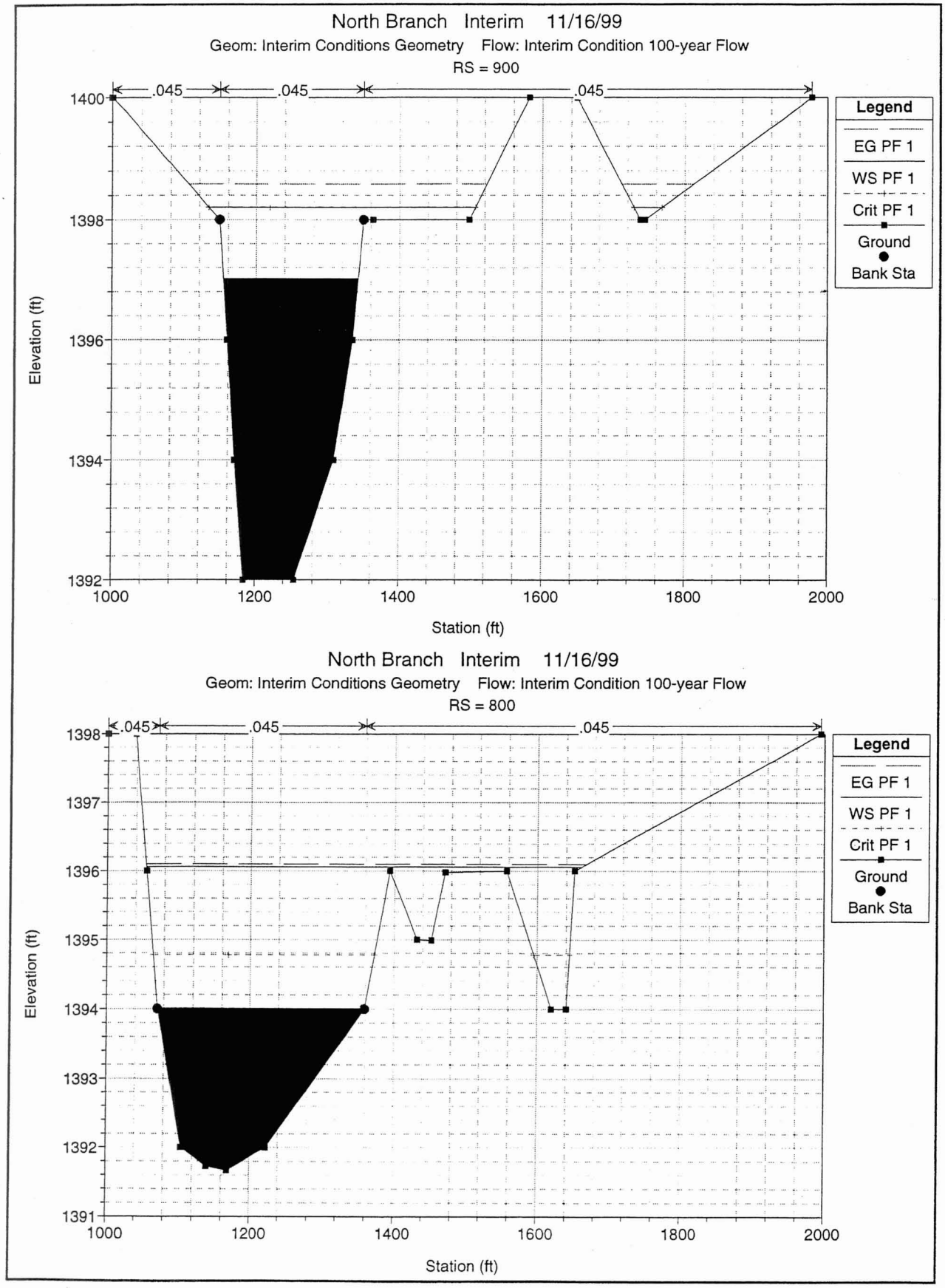
North Branch

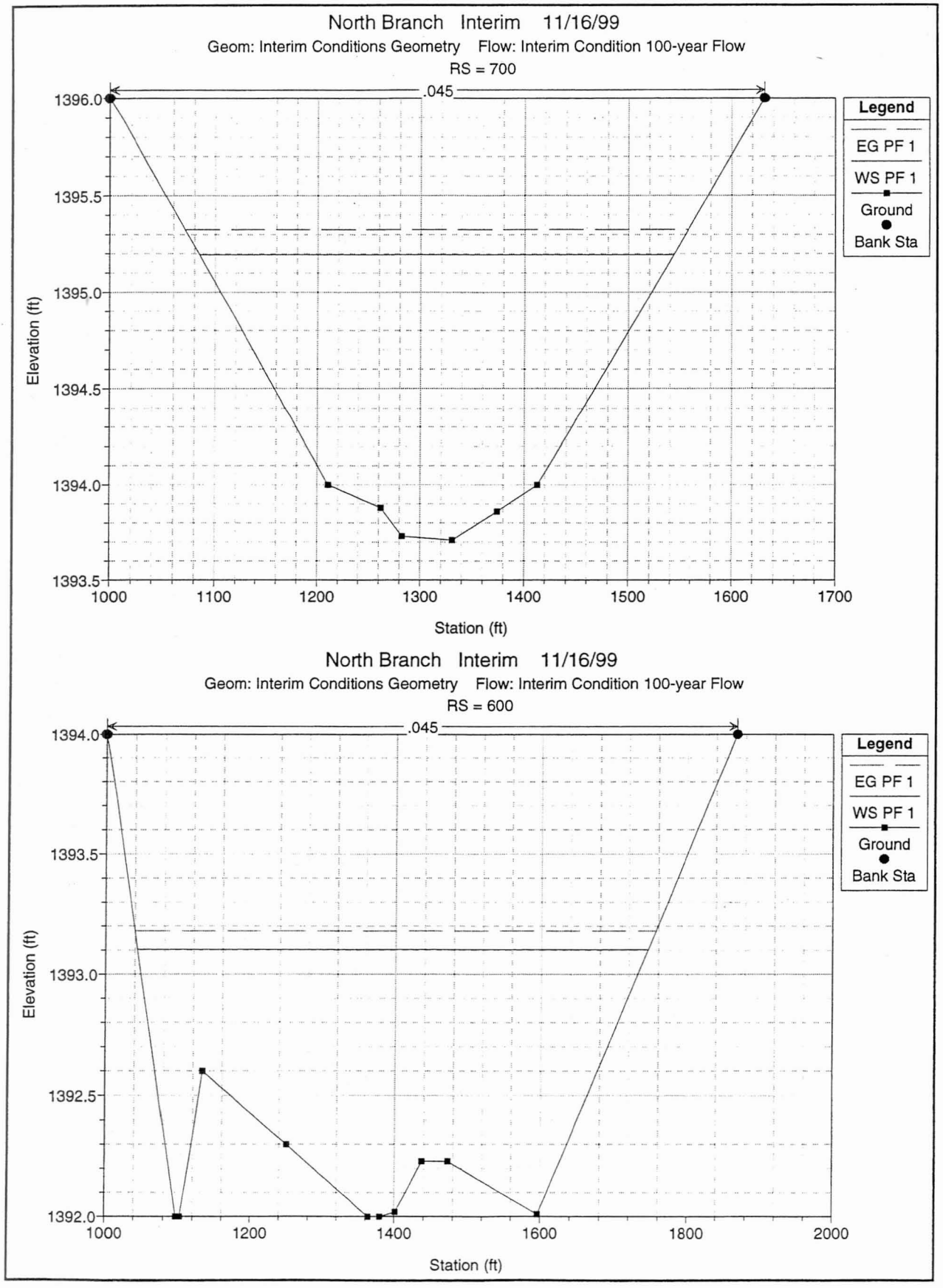
South Branch

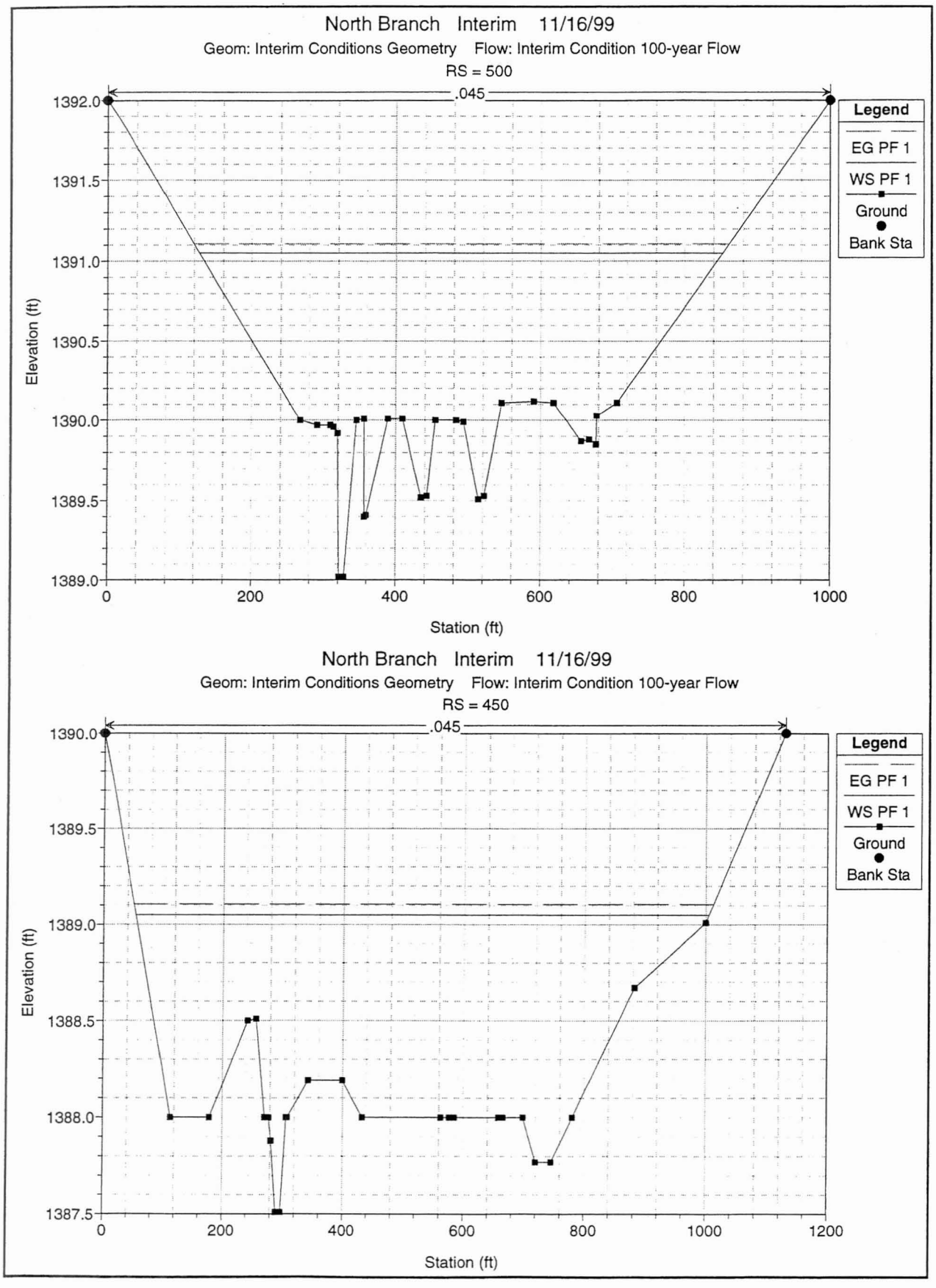
HEC-RAS Plan: Interim River: N-Branch Reach: W-Ellsworth

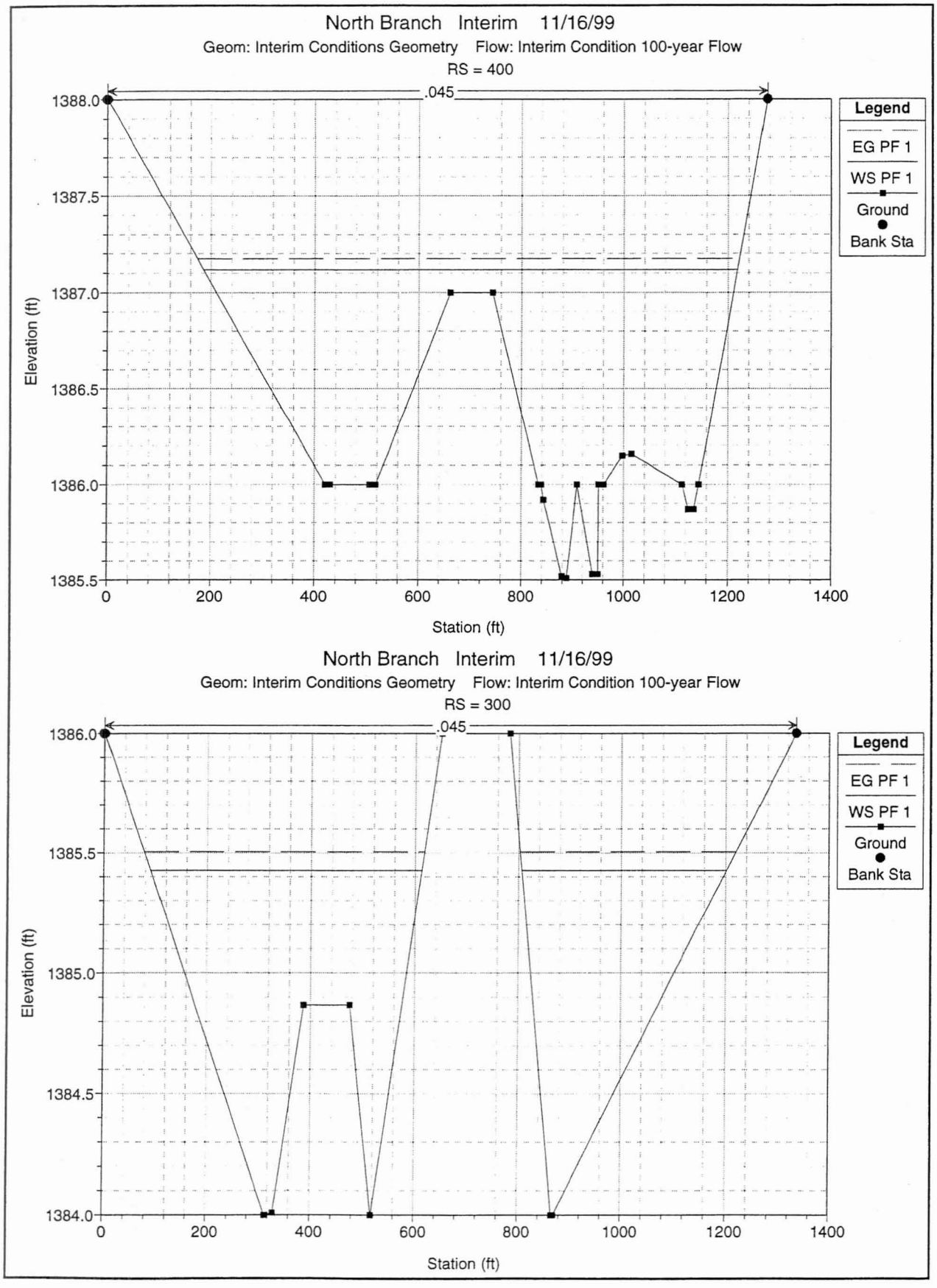
Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
W-Ellsworth	100	1535.00	1380.00	1381.49	1381.12	1381.66	0.008011	3.59	483.86	474.33	0.55
W-Ellsworth	200	1535.00	1382.00	1383.63		1383.70	0.004825	2.17	714.31	788.70	0.40
W-Ellsworth	300	1535.00	1384.00	1385.43		1385.50	0.006910	2.25	681.72	917.48	0.46
W-Ellsworth	400	1535.00	1385.51	1387.12		1387.17	0.004671	1.91	803.76	1032.42	0.38
W-Ellsworth	450	1535.00	1387.51	1389.05		1389.11	0.004156	1.91	805.50	951.02	0.36
W-Ellsworth	500	1235.00	1389.02	1391.05		1391.11	0.003843	1.90	649.53	725.09	0.35
W-Ellsworth	600	1235.00	1392.00	1393.10		1393.18	0.006198	2.22	555.50	702.33	0.44
W-Ellsworth	700	1235.00	1393.71	1395.20		1395.32	0.008408	2.89	427.54	458.80	0.53
W-Ellsworth	800	1235.00	1393.89	1396.06	1394.78	1396.10	0.001072	1.74	824.13	607.06	0.21
W-Ellsworth	900	1235.00	1397.02	1398.21	1398.21	1398.59	0.019321	5.05	271.04	413.08	0.83

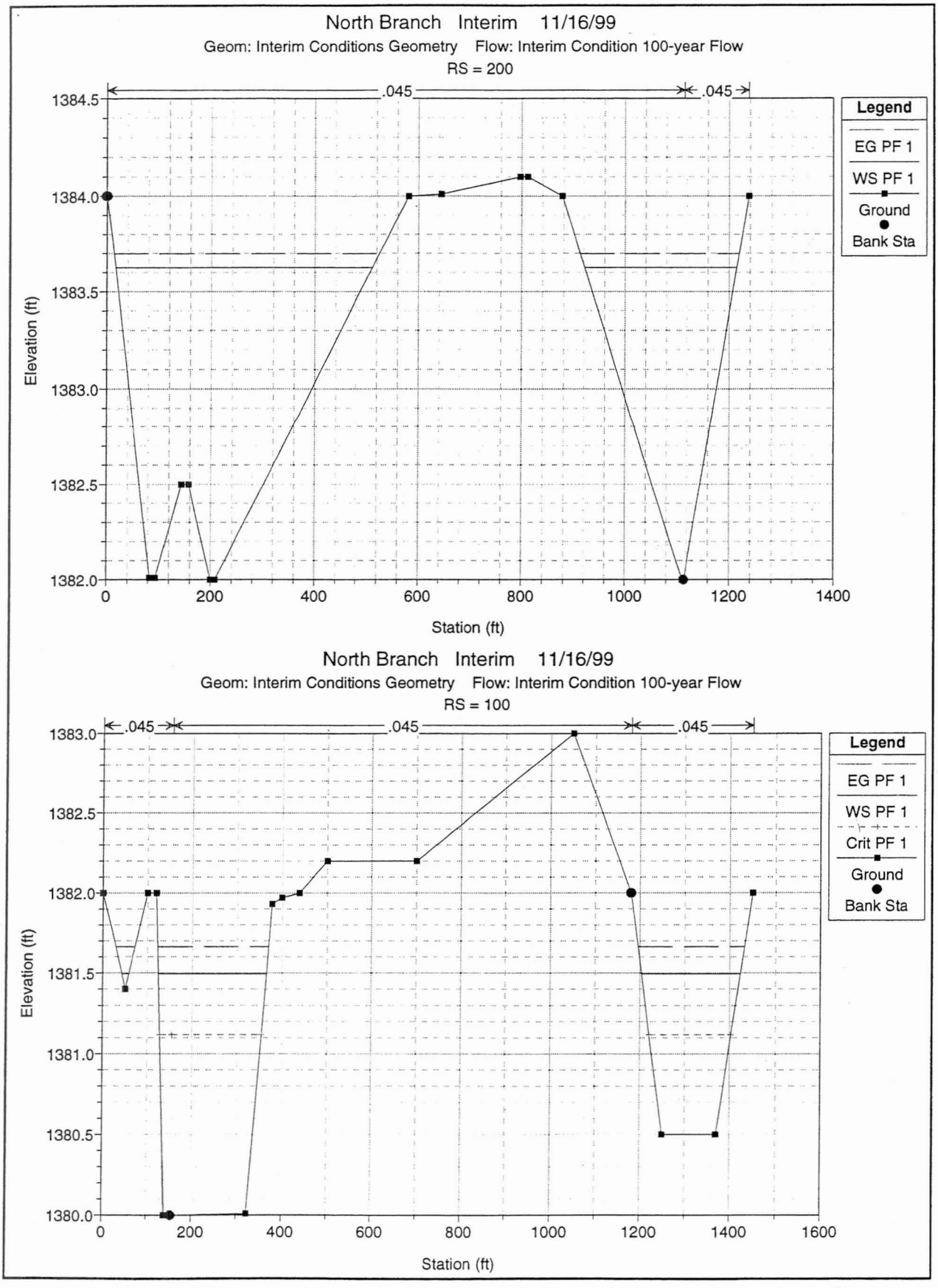

North Branch Interim 11/16/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Elevation (ft)
1400
1395
1390
1385
1380
0
500
1000
1500
2000
2500
3000
3500
Main Channel Distance (ft)


North Branch Interim 11/16/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
RS = 900
.045
.045
.045
1400
1398
1396
1394
1392
1000
1200
1400
1600
1800
2000
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
North Branch Interim 11/16/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
RS = 800
.045
.045
.045
1398
1397
1396
1395
1394
1393
1392
1391
1000
1200
1400
1600
1800
2000
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta


North Branch Interim 11/16/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
RS = 700
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
North Branch Interim 11/16/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
RS = 600
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

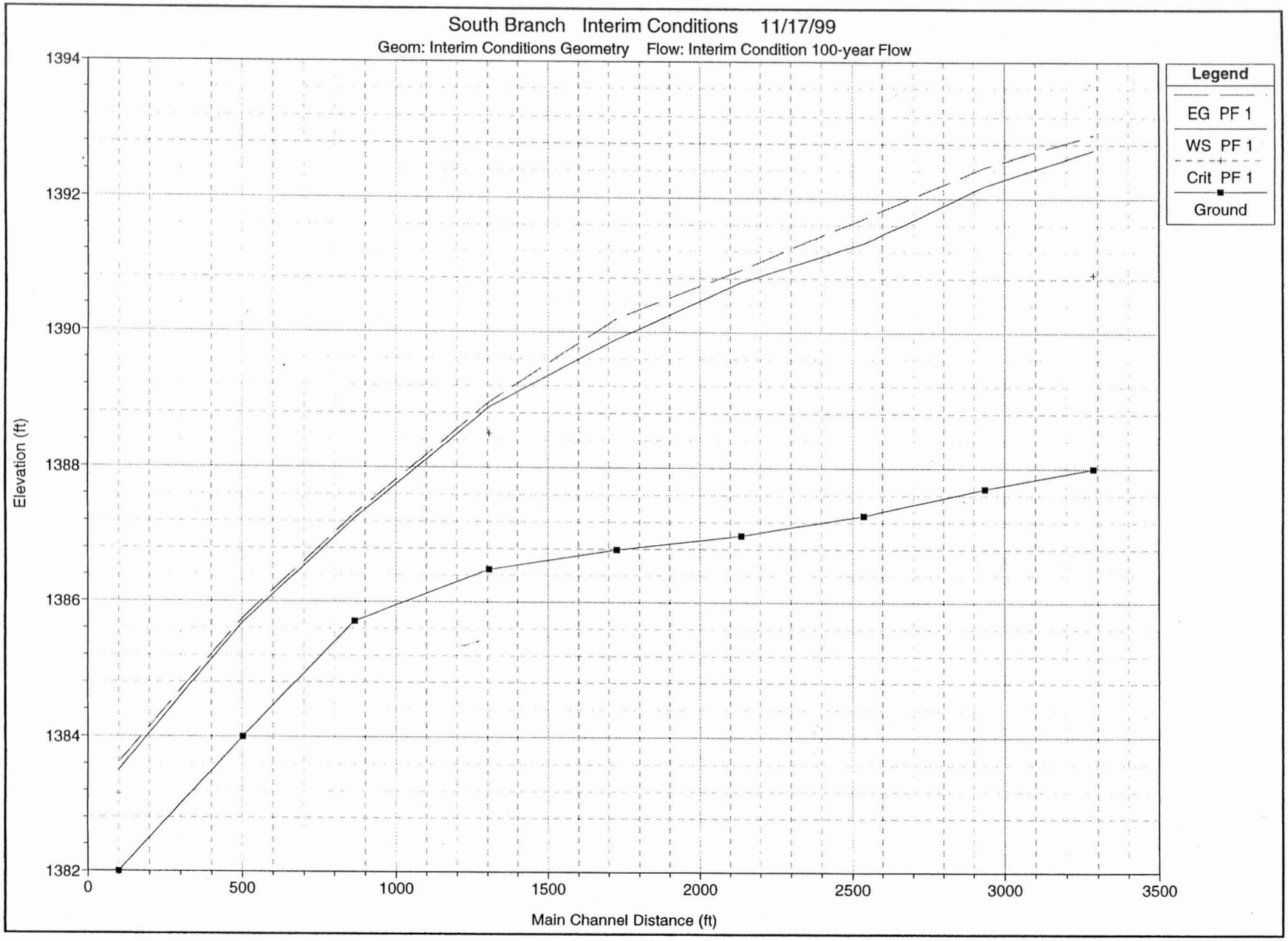

North Branch Interim 11/16/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
RS = 500
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
North Branch Interim 11/16/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
RS = 450
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

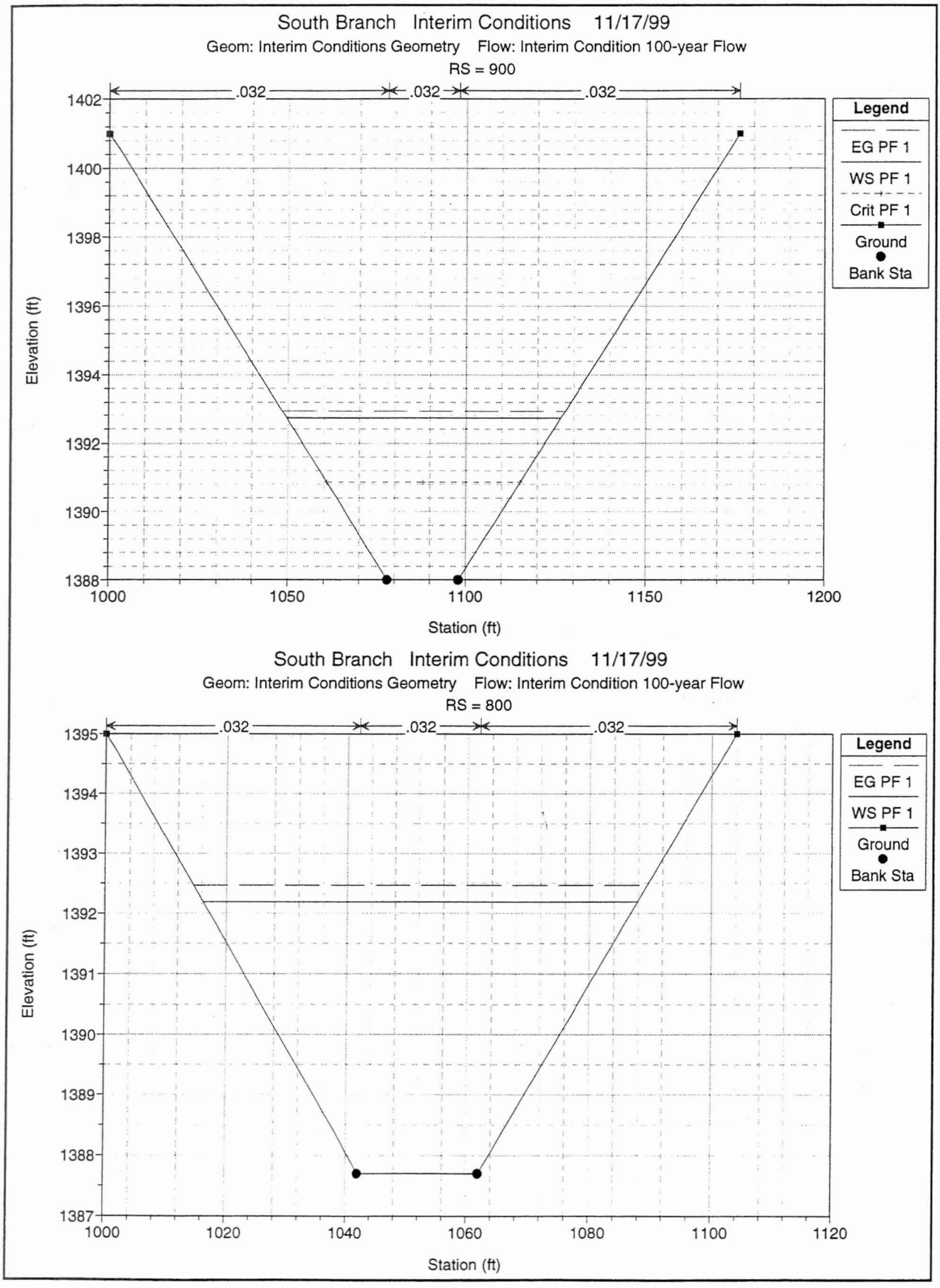

North Branch Interim 11/16/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
RS = 400
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
North Branch Interim 11/16/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
RS = 300
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


North Branch Interim 11/16/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
RS = 200
.045
.045
1384.5
1384.0
1383.5
1383.0
1382.5
1382.0
Elevation (ft)
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
North Branch Interim 11/16/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
RS = 100
.045
.045
.045
1383.0
1382.5
1382.0
1381.5
1381.0
1380.5
1380.0
Elevation (ft)
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

HEC-RAS Plan: Interim River: S-Branch Reach: W-Ellsworth

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit 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
W-Ellsworth	100	500.00	1382.00	1383.50	1383.15	1383.61	0.008002	3.88	195.57	291.22	0.56
W-Ellsworth	200	500.00	1384.00	1385.68		1385.75	0.003699	2.84	251.48	259.87	0.39
W-Ellsworth	300	500.00	1385.71	1387.24		1387.31	0.004765	2.33	251.28	325.28	0.40
W-Ellsworth	400	500.00	1386.49	1388.88	1388.50	1388.96	0.003019	3.25	300.79	427.28	0.37
W-Ellsworth	500	500.00	1386.79	1389.89		1390.20	0.002612	5.05	121.23	58.12	0.51
W-Ellsworth	600	500.00	1387.00	1390.74		1390.92	0.001230	3.93	158.92	64.92	0.36
W-Ellsworth	700	800.00	1387.30	1391.32		1391.70	0.002387	5.74	174.90	66.94	0.50
W-Ellsworth	800	800.00	1387.70	1392.19		1392.47	0.001522	4.93	205.91	71.68	0.41
W-Ellsworth	900	800.00	1388.00	1392.72	1390.86	1392.94	0.001190	4.50	227.73	76.59	0.37


South Branch Interim Conditions 11/17/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Elevation (ft)
1394
1392
1390
1388
1386
1384
1382
0
500
1000
1500
2000
2500
3000
3500
Main Channel Distance (ft)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Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
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.032
.032
.032
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1402
1400
1398
1396
1394
1392
1390
1388
1000
1050
1100
1150
1200
Station (ft)
South Branch Interim Conditions 11/17/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
RS = 800
.032
.032
.032
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1395
1394
1393
1392
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1390
1389
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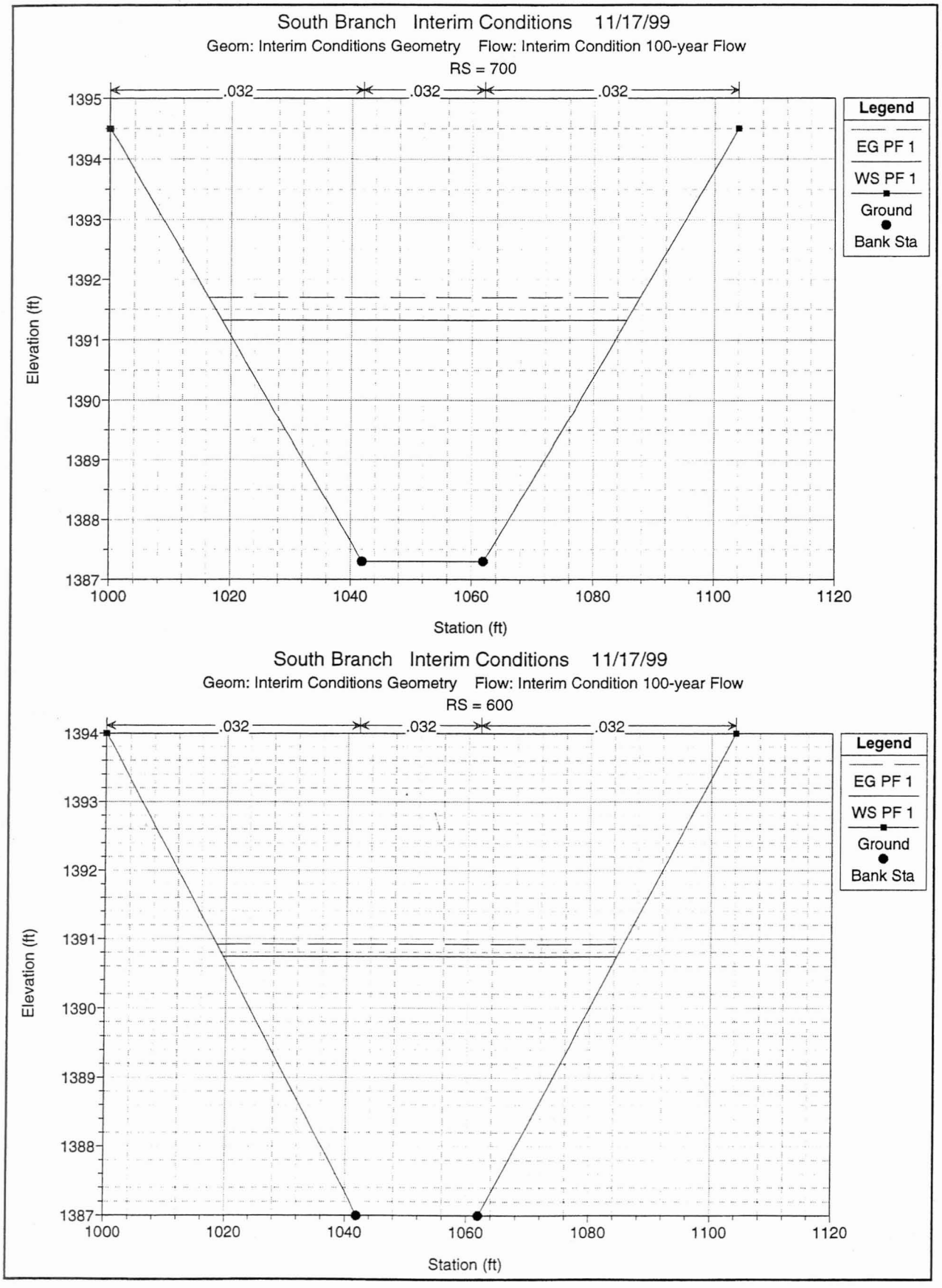
1020
1040
1060
1080
1100
1120
Station (ft)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Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
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.032
.032
.032
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1395
1394
1393
1392
1391
1390
1389
1388
1387
1000
1020
1040
1060
1080
1100
1120
Station (ft)
South Branch Interim Conditions 11/17/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
RS = 600
.032
.032
.032
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1394
1393
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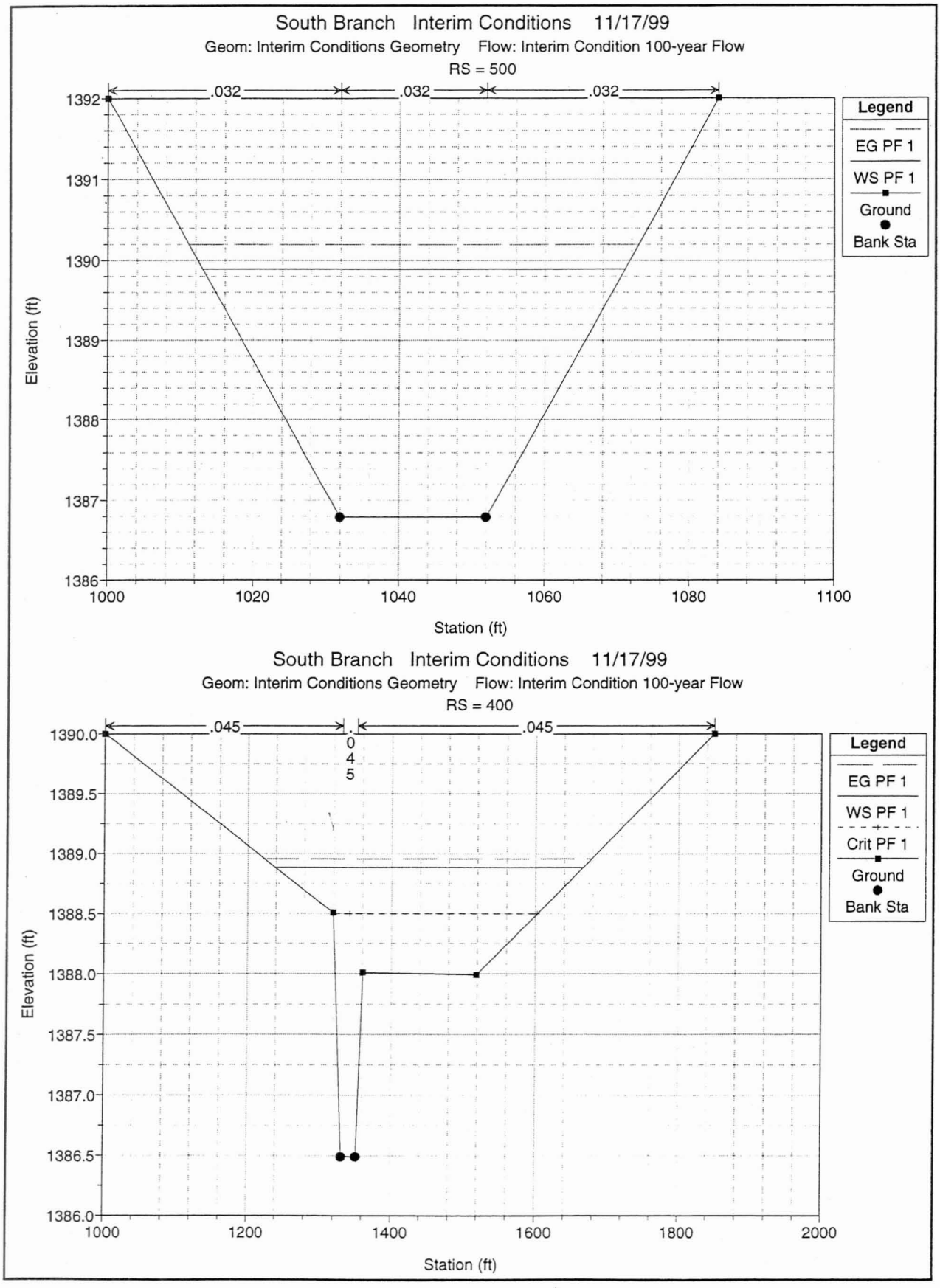
1390
1389
1388
1387
1000
1020
1040
1060
1080
1100
1120
Station (ft)


South Branch Interim Conditions 11/17/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
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.032
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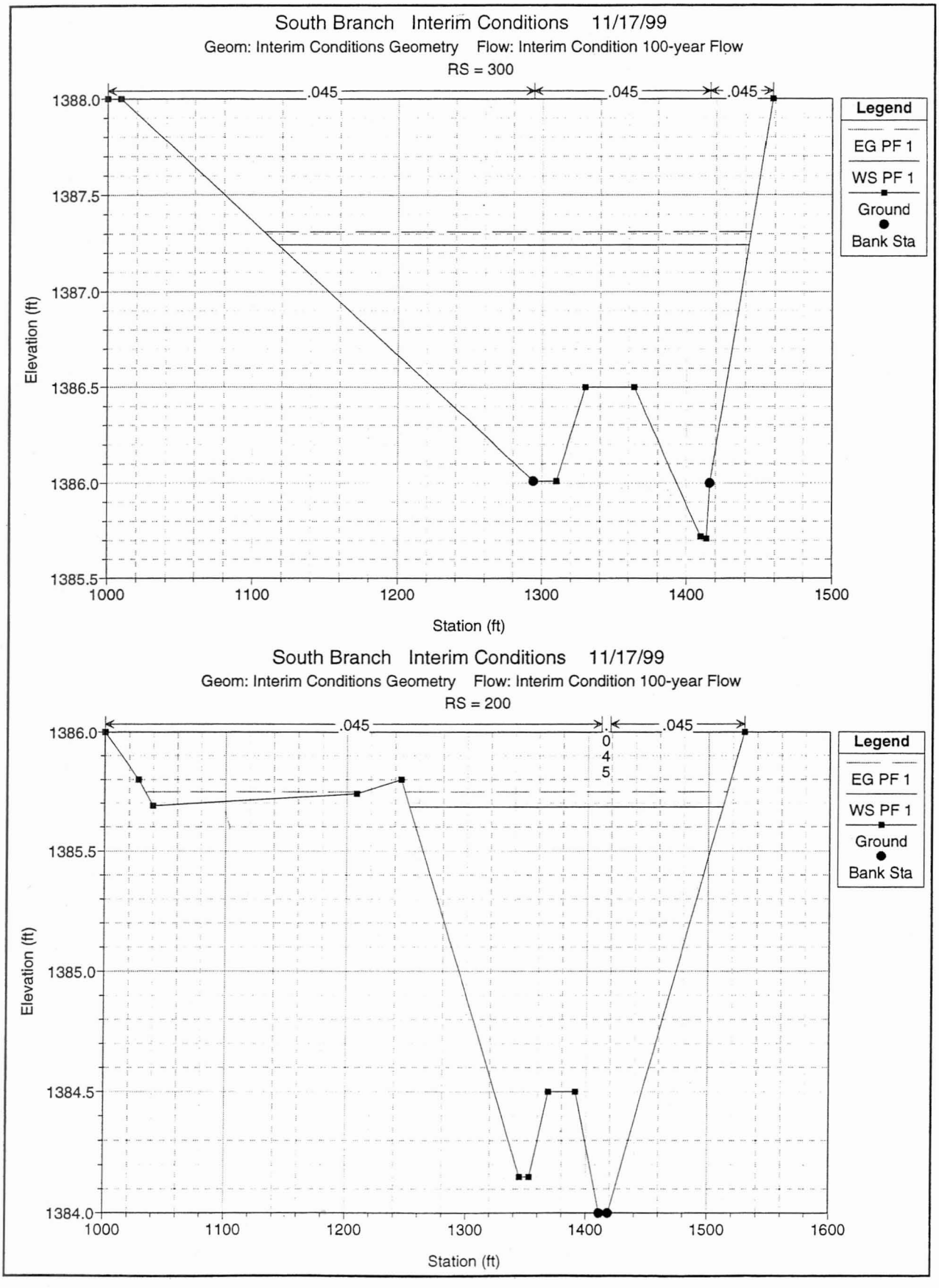
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1392
1391
1390
1389
1388
1387
1386
1000
1020
1040
1060
1080
1100
Station (ft)
South Branch Interim Conditions 11/17/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
RS = 400
.045
.045
0
4
5
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1390.0
1389.5
1389.0
1388.5
1388.0
1387.5
1387.0
1386.5
1386.0
1000
1200
1400
1600
1800
2000
Station (ft)


South Branch Interim Conditions 11/17/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
RS = 300
.045
.045
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1388.0
1387.5
1387.0
1386.5
1386.0
1385.5
1000
1100
1200
1300
1400
1500
Station (ft)
South Branch Interim Conditions 11/17/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
RS = 200
.045
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
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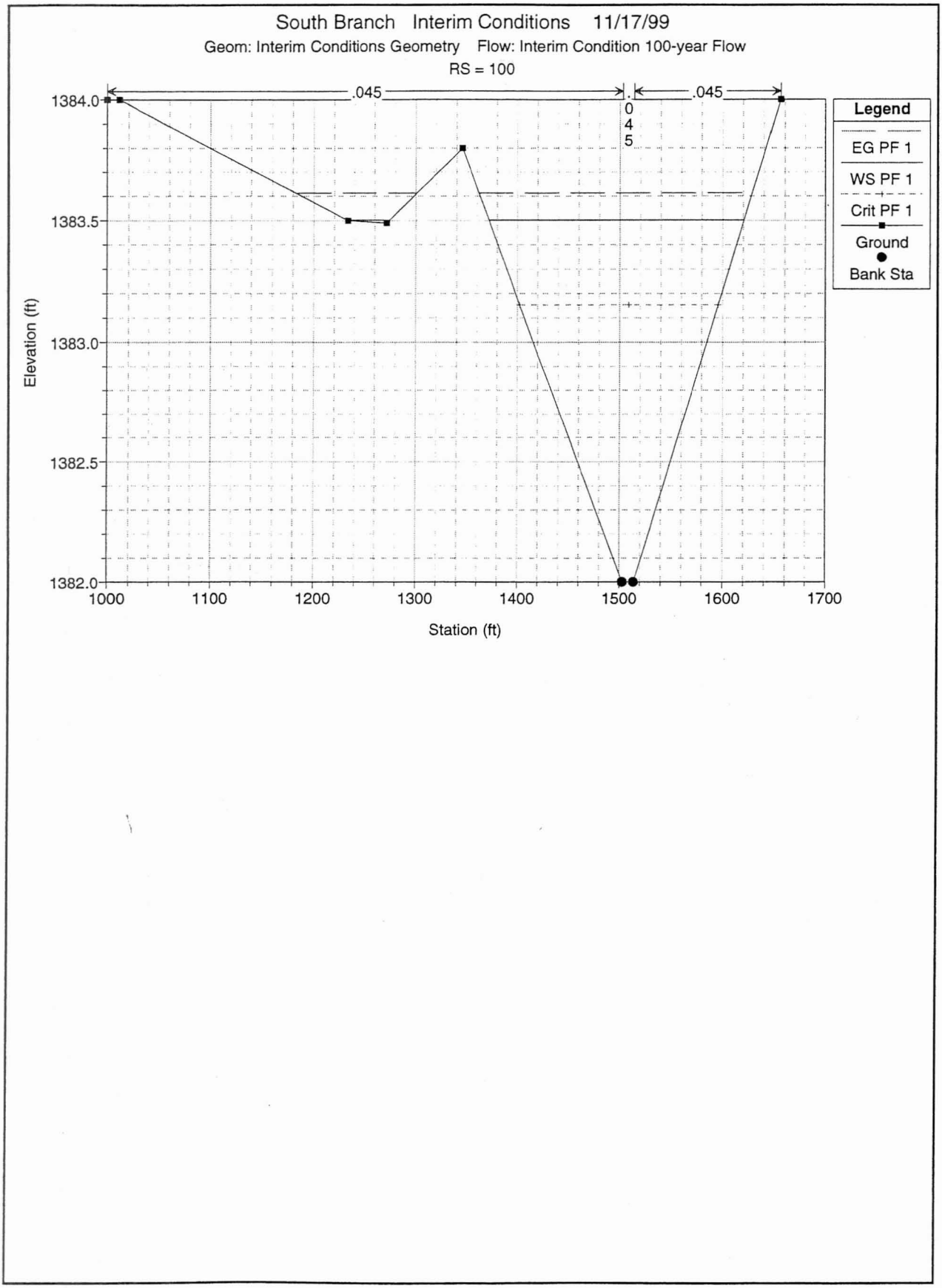
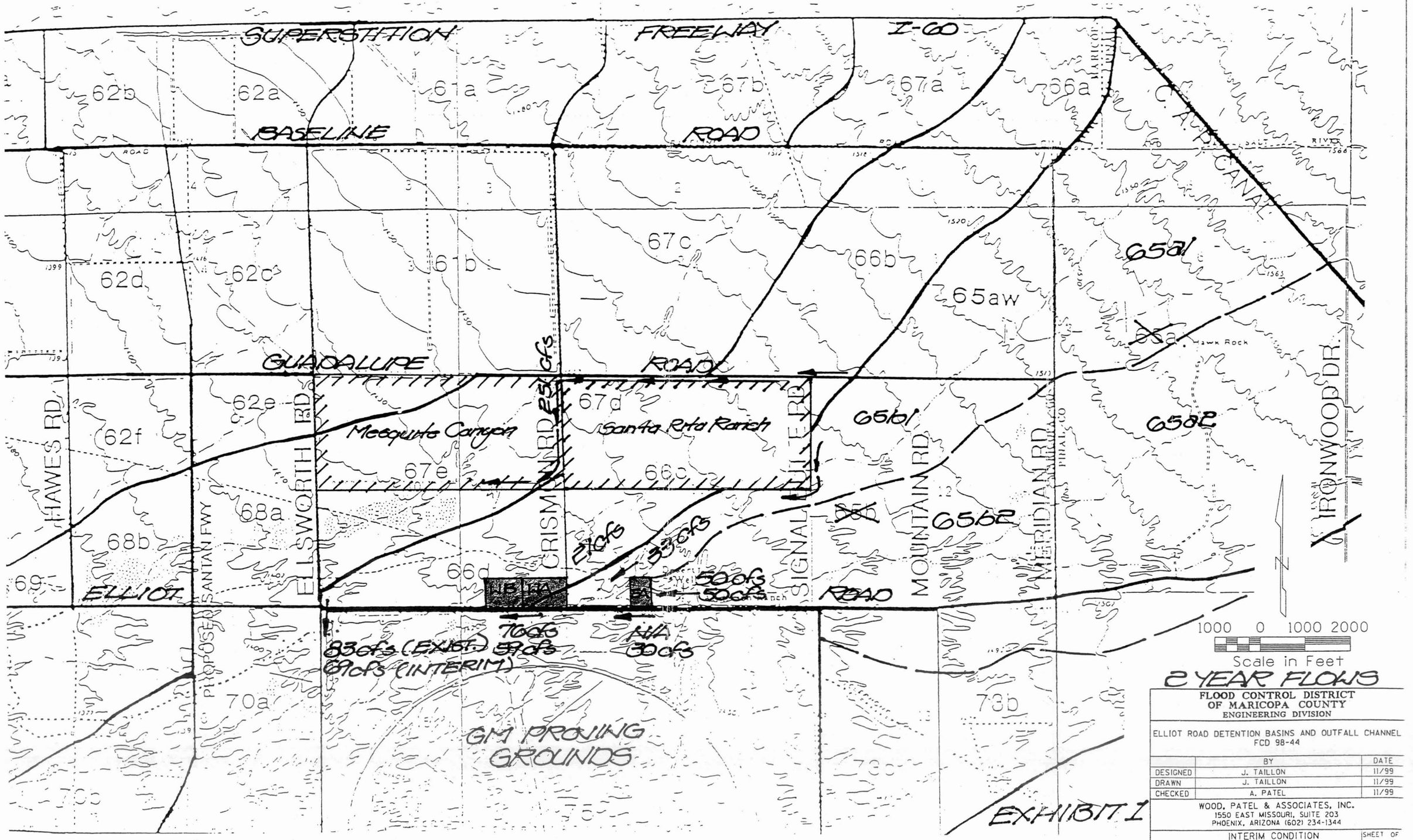
1385.0
1384.5
1384.0
1000
1100
1200
1300
1400
1500
1600
Station (ft)


South Branch Interim Conditions 11/17/99
Geom: Interim Conditions Geometry Flow: Interim Condition 100-year Flow
RS = 100
.045
.045
0
4
5
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1384.0
1383.5
1383.0
1382.5
1382.0
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

ELLIOT ROAD DETENTION BASINS AND OUTFALL CHANNEL
FCD 98-44

	BY	DATE
DESIGNED	J. TAILLON	11/99
DRAWN	J. TAILLON	11/99
CHECKED	A. PATEL	11/99

WOOD, PATEL & ASSOCIATES, INC.
1550 EAST MISSOURI, SUITE 203
PHOENIX, ARIZONA (602) 234-1344

INTERIM CONDITION HYDROLOGY

SHEET OF 1 1

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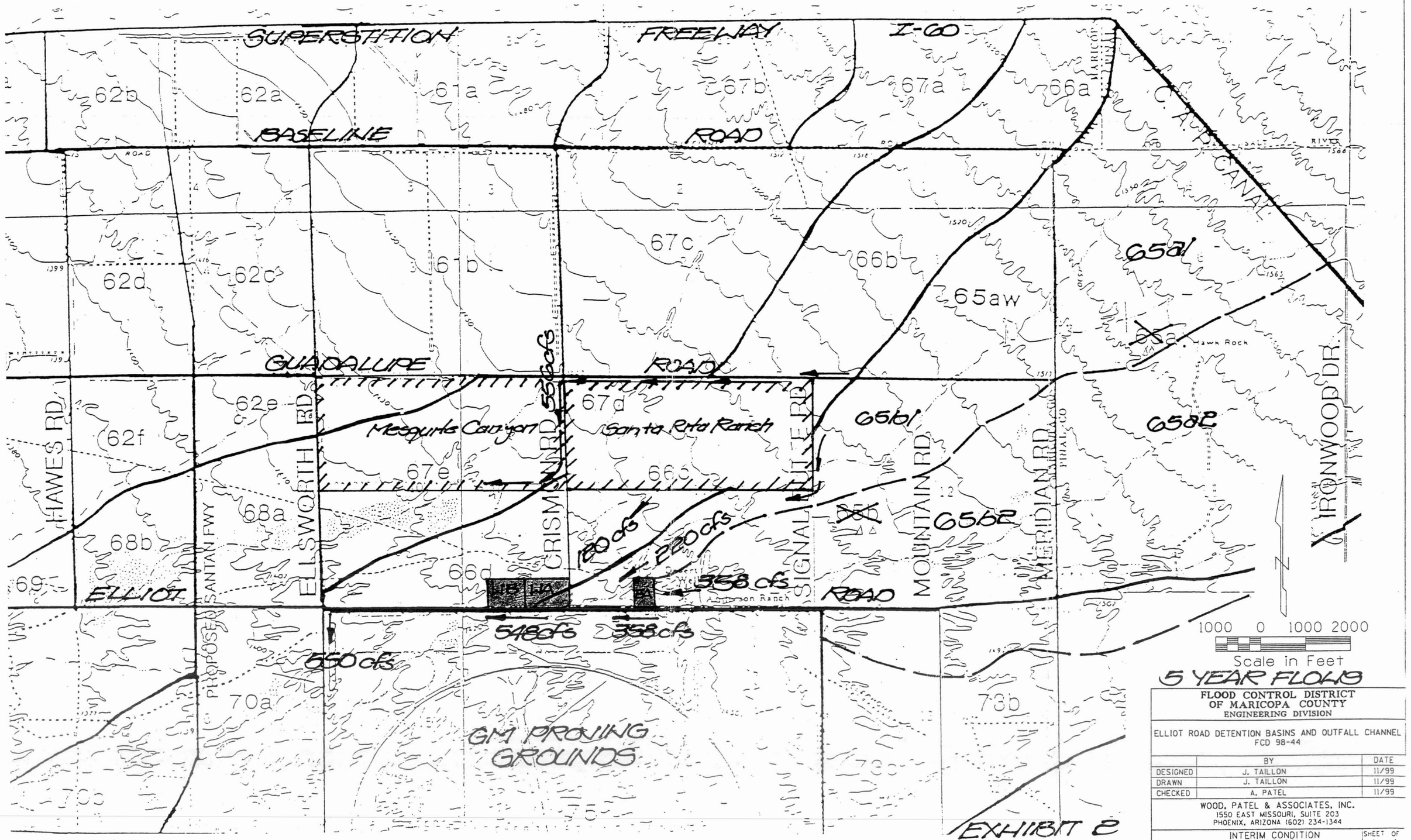

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

ELLIOT ROAD DETENTION BASINS AND OUTFALL CHANNEL
FCD 98-44

	BY	DATE
DESIGNED	J. TAILLON	11/99
DRAWN	J. TAILLON	11/99
CHECKED	A. PATEL	11/99

WOOD, PATEL & ASSOCIATES, INC.
1550 EAST MISSOURI, SUITE 203
PHOENIX, ARIZONA (602) 234-1344

INTERIM CONDITION HYDROLOGY

SHEET OF 1 1

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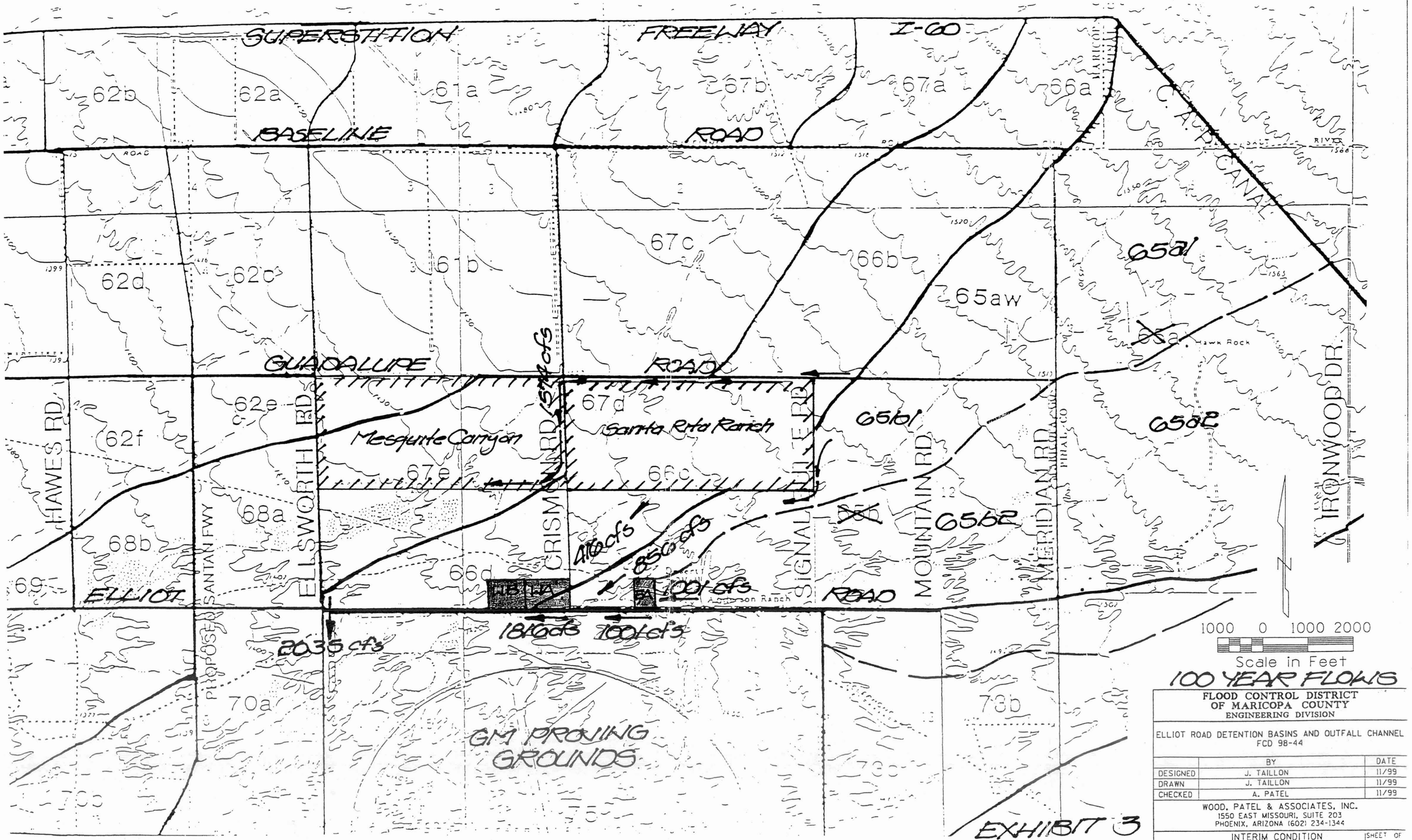

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ENGINEERING DIVISION

ELLIOT ROAD DETENTION BASINS AND OUTFALL CHANNEL
FCD 98-44

	BY	DATE
DESIGNED	J. TAILLON	11/99
DRAWN	J. TAILLON	11/99
CHECKED	A. PATEL	11/99

WOOD, PATEL & ASSOCIATES, INC.
1550 EAST MISSOURI, SUITE 203
PHOENIX, ARIZONA (602) 234-1344

INTERIM CONDITION
HYDROLOGY

SHEET OF
1 1

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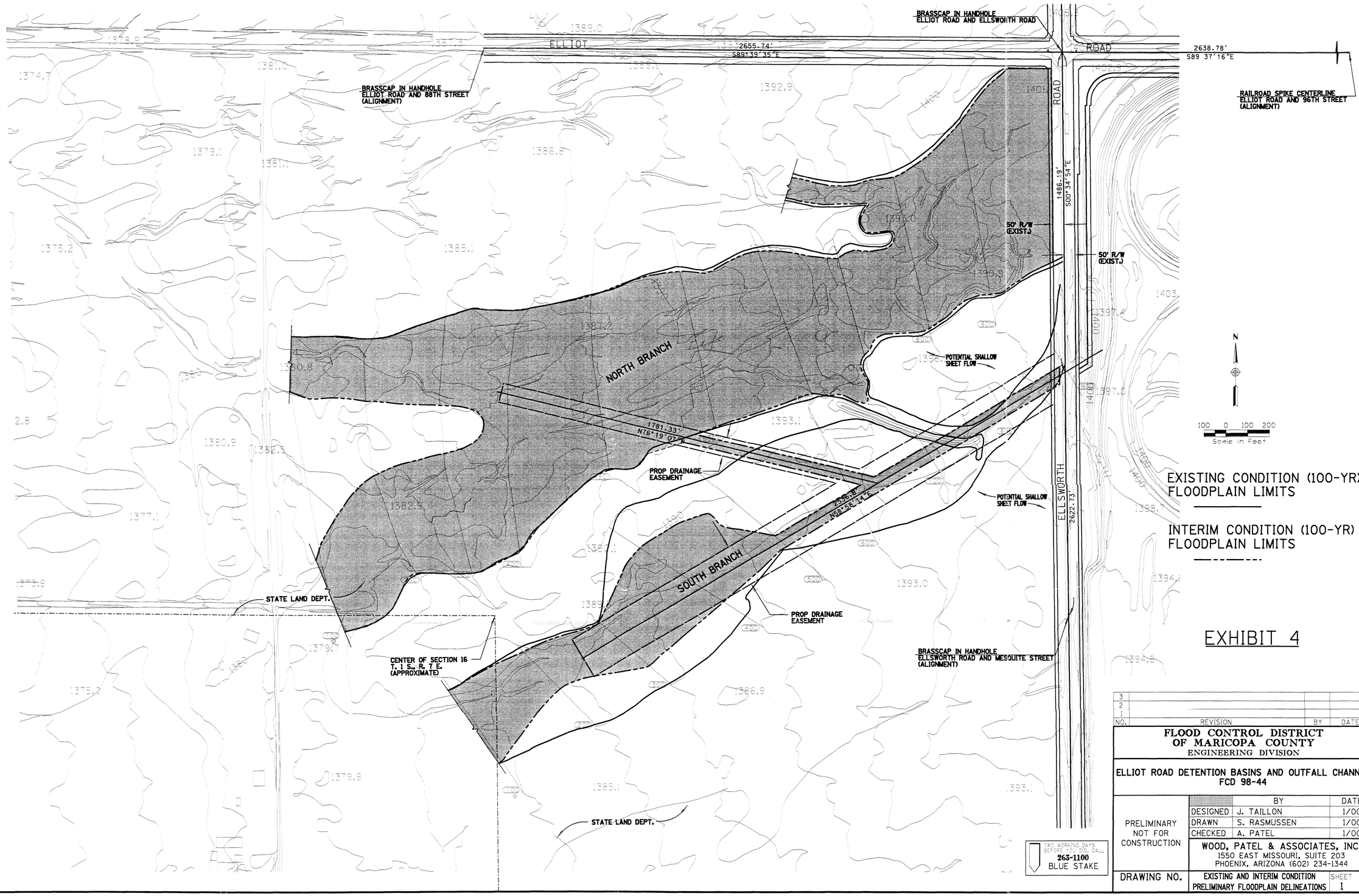

EXHIBIT 4

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

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

ELLIOT ROAD DETENTION BASINS AND OUTFALL CHANNEL FCD 98-44

PRELIMINARY
NOT FOR
CONSTRUCTION

	BY	DATE
DESIGNED	J. TAILLON	1/00
DRAWN	S. RASMUSSEN	1/00
CHECKED	A. PATEL	1/00

WOOD, PATEL & ASSOCIATES, INC.
1550 EAST MISSOURI, SUITE 203
PHOENIX, ARIZONA (602) 234-1344

DRAWING NO.

EXISTING AND INTERIM CONDITION
PRELIMINARY FLOODPLAIN DELINEATIONS

SHEET 1 OF 1

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PCN