



DATA BOOK

7: FLOOD RISK MAP



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Table 7.1 DISCHARGE DISTRIBUTION AND FLOOD AREA UNDER EXISTING CONDITION

Discharge Distribution

Location	Return Period in year as external force							Unit:m ³ /s
	1.05	2	5	10	20	50	100	
Villerias	284	540	768	924	1079	1256	1415	
Taisihuat	308	552	755	897	1040	1239	1405	
Moscoso	341	588	782	914	1046	1229	1386	
Aramuaca	284	424	520	583	649	739	822	
Pelota	124	169	203	292	346	406	449	
El Defirio	161	211	242	295	329	362	386	
La Canoa	161	211	242	295	329	362	386	
Vado Marin	136	174	197	218	233	252	268	
Ereguayquin	142	180	202	221	237	254	270	
Las Conchas	142	188	245	281	314	355	387	
SM0	138	174	196	215	230	300	263	

Inundated Area in km²

Area	Return period in year							100 remark
	1.05	2	5	10	20	50	100	
San Miguel	1.6	1.6	2.0	2.5	3.0	3.5	5.1	
Otomega	25.3	41.5	54.5	69.4	78.0	83.7	88.9	
Jocotal	22.2	25.6	29.7	31.0	32.0	33.0	34.6	
Usulután(1)	0.2	0.4	0.8	1.2	1.7	2.7	3.4	
Usulután(2)	5.1	14.1	16.7	19.0	20.0	22.0	23.5	
Total	54.3	83.1	103.7	123.1	134.7	144.9	155.4	

Table 7.2 FLOOD AREA FOR MASTER PLAN

Area	Flood Area							100	remark
	Return period in year								
	1.05	2	5	10	20	50	100	Unit:km ²	
San Miguel	1.6	1.6	1.8	2.1	2.6	3.1	3.7		
Olomega	0.0	0.0	4.6	7.6	10.0	55.4	59.1	excluding the lake(26.3K.m ²)	
Jocotal	0.0	0.0	0.7	2.8	10.2	3.8	15.7	excluding the lake(5.2K.m ²)	
Usulután(1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	upstream area	
Usulután(2)	6.6	6.6	6.6	6.6	6.6	6.6	25.9	downstream area	
Total	8.2	8.2	13.7	19.1	29.4	68.9	104.4		

Table 7.3 DISCHARGE DISTRIBUTION AND FLOOD AREA FOR ALT.1(USULUTAN IMPROVEMENT)

Discharge Distribution

Location	Return Period in year as external force						Unit:m ³ /s
	1.05	2	5	10	20	50	
Villerias	290	550	780	930	1090	1260	1420
Taisihuat	320	600	860	1040	1220	1430	1630
Moscoso	330	610	870	1050	1230	1450	1650
Aramuaca	360	660	940	1140	1350	1610	1840
Pelota	124	169	203	292	346	406	449
El Delirio	161	211	242	295	329	362	386
La Canoa	161	211	242	295	329	362	386
Vado Marin	136	174	197	218	233	252	268
Ereguayqui	142	180	202	221	237	254	270
Las Concha	150	190	250	290	320	360	390
SMO	150	190	250	290	320	360	390

Flood Area

Area	Return Period in year as external force						Unit:km ²
	1.05	2	5	10	20	50	
San Miguel	1.6	1.6	2.0	2.5	3.0	3.5	5.1
Olomega	25.3	41.5	54.5	69.4	78.0	83.7	88.9
Jocotal	22.2	25.6	29.7	31.0	32.0	33.0	34.6
Usulután(1)	0	0	0	0	0	0	0
Usulután(2)	1.7	2.4	4.2	4.7	5.1	5.5	6.1
Total	50.7	71.1	90.4	107.6	118.0	125.6	134.6

Table 7.4 DISCHARGE DISTRIBUTION AND FLOOD AREA
FOR ALT.1+2(JOCOTAL AND USULUTAN IMPROVEMENT)

Discharge Distribution

Location	Return Period in year as external force						Unit:m ³ /s
	1.05	2	5	10	20	50	
Villerias	290	550	780	930	1090	1260	1420
Taisihuat	320	600	860	1040	1220	1450	1630
Moscoso	330	610	870	1050	1230	1450	1650
Aramuaca	360	660	940	1140	1350	1610	1840
Pelota	124	169	203	292	346	406	449
El Delirio	161	211	242	295	329	362	386
La Canoa	161	211	242	295	329	362	386
Vado Mari	200	253	320	370	390	390	390
Ereguayqui	210	293	379	457	483	521	543
Las Concha	220	367	496	585	673	774	842
SMO	220	370	500	589	678	780	848

Flood Area

Area	Return Period in year as external force						Unit:km ²
	1.05	2	5	10	20	50	
San Miguel	1.6	1.6	2.0	2.5	3.0	3.5	5.1
Olomega	25.3	41.5	54.5	69.4	78.0	83.7	88.9
Jocotal	0.4	0.4	0.4	0.4	0.4	1.1	1.8
Usulután(1)	0	0	0	0	0	0	0
Usulután(2)	4.1	5.5	6.3	6.4	6.5	6.6	6.6
Total	31.4	49.0	63.2	78.7	87.9	94.8	102.4

Table 7.5 DISCHARGE DISTRIBUTION AND FLOOD AREA FOR ALT.3(LOMEGA IMPROVEMENT)

Location	Discharge Distribution						Unit:m ³ /s
	Return Period in year as external force						
	1.05	2	5	10	20	50	100
Villerias	290	550	780	930	1090	1260	1420
Taishuat	320	600	860	1040	1220	1430	1630
Moscoso	330	610	870	1050	1230	1450	1650
Aramuaca	360	660	940	1140	1350	1610	1840
Pelota	360	660	940	1150	1380	530	580
Div. Cha.	330	370	430	480	530	420	460
(Div. Dis.)	30	320	580	720	890	160	220
(Outlet)	60	70	100	100	130	280	330
Olo. Dra. Up.	330	370	430	480	530	490	550
Olo. Dra. Dn.	330	370	390	410	430	410	430
El Delirio	370	420	480	530	580	600	650
Jocotal	200	240	280	290	310	320	330
Vado Marin	200	240	280	290	310	320	330
Ereguayquin	200	240	270	290	300	310	330
Las Conchas	200	240	300	340	380	400	430
SM0	190	230	260	280	290	310	320

Area	Flood Area						Unit:km ²
	Return Period in year as external force						
	1.05	2	5	10	20	50	100
San Miguel	1.6	1.6	2.0	2.5	3.0	3.5	5.1
Olomega	0.0	9.2	14.0	15.5	17.5	55.4	59.1
Jocotal	27.8	29.3	30.8	32.4	33.8	34.2	35.5
Usulután(1)	0	0	0	0	0	0	0
Usulután(2)	2.4	4.1	4.3	4.7	4.7	5.1	5.1
Total	31.8	44.2	51.1	55.1	59.0	98.2	104.8

Table 7.6 DISCHARGE DISTRIBUTION AND FLOOD AREA
FOR ALT.1+2+3(LOMEGA,JOCOTAL AND USULUTAN IMPROVEMENT)

Discharge Distribution

Location	Return Period in year as external force						Unit:m ³ /s
	1.05	2	5	10	20	50	
Villerias	290	550	780	930	1090	1260	1420
Taisihuat	320	600	860	1040	1220	1430	1630
Moscoso	330	610	870	1050	1230	1450	1650
Aramuaca	360	660	940	1140	1350	1610	1840
Pelota	360	660	940	1150	1380	530	580
Div.Cha.	330	370	430	480	530	420	460
(Div. Dis.)	30	320	580	720	890	160	220
(Outlet)	60	70	100	100	130	280	330
Olo.Dra.Up.	330	370	430	480	530	490	550
Olo.Dra.Dn.	330	370	390	410	430	410	430
El Delirio	370	420	480	530	580	600	650
Jocotal	400	480	590	670	770	850	950
Vado Marin	390	390	446	480	510	490	500
Ereguayquin	410	450	480	500	520	550	570
Las Conchas	420	520	620	690	740	820	880
SMO	420	530	630	690	750	820	880

Flood Area

Area	Return Period in year as external force						Unit:km ²
	1.05	2	5	10	20	50	
San Miguel	1.6	1.6	2.0	2.5	3.0	3.5	5.1
Olomega	0.0	9.2	14.0	15.5	17.5	55.4	59.1
Jocotal	0.1	3.8	16.3	18.0	19.3	24.1	26.0
Usulután	6.2	6.3	6.3	6.6	6.4	6.5	6.6
Total	7.8	20.9	38.6	42.6	46.2	89.5	96.8

Table 7.7 METHODS FOR DISCHARGE CALCULATION

Existing	Case	Usulután Area	Jocotal Area	Olomega Area		San Miguel
				El Delirio- Diversion	Diversion- Aramuaca	
P/P	1995 Flood	MIKE11 Model				
	Without Project	MIKE11 Model				
	Without Inundation	Storage Function Model				
	Alternative 1	MIKE11 Model				
M/P	Alternative 1+2	Storage Function Model		MIKE11 Model		
	Alternative 3	MIKE11 Model		Diversion Model		Storage Function Model(*)
	Alternative 1+2+3	Storage Function Model		Diversion Model		Storage Function Model(*)
	M/P	Storage Function Model		Diversion Model		Storage Function Model(*)

Note:(*) For 50 year and 100 year flood simulation, the result of Without Project case was used.

Table 7.8 METHODS FOR WATER PROFILE CALCULATION

Existing	Case	Usulután Area	Jocotal Area	Olomega Area		San Miguel
				El Delirio- Diversion	Diversion- Aramuaca	
P/P	1995 Flood	MIKE11 Model				
	Without Project	MIKE11 Model				
	Alternative 1	MIKE11 Model				
	Alternative 1+2	Non-Uniform Flow Model		MIKE11 Model		Non-Uniform Flow Model
M/P	Alternative 3	MIKE11 Model		Diversion Model		Non-Uniform Flow Model
	Alternative 1+2+3	Non-Uniform Flow Model		Diversion Model		Non-Uniform Flow Model
	M/P	Non-Uniform Flow Model		Diversion Model		Non-Uniform Flow Model
	M/P	Non-Uniform Flow Model		Diversion Model		Non-Uniform Flow Model

Table 7.9 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(M/P) (1/9)

River Sta.	Q Total (m ³ /s)	M n Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # C
178	550	88.76	92.50		92.67	0.00075	1.81	303.98	106.61	0.34
178	780	88.76	93.45		93.64	0.000593	1.92	406.21	108.52	0.32
178	930	88.76	94.02		94.22	0.000536	1.99	468.00	109.63	0.31
178	1090	88.76	94.56		94.77	0.000503	2.07	527.39	110.68	0.30
178	1260	88.76	95.14		95.36	0.000563	2.11	597.57	132.79	0.32
178	1420	88.76	95.58		95.82	0.000557	2.16	657.81	140.14	0.32
177	550	86.66	91.81		92.16	0.001079	2.62	209.91	54.14	0.42
177	780	86.66	92.71		93.17	0.001176	2.99	260.70	58.62	0.45
177	930	86.66	93.25		93.76	0.001203	3.17	293.47	66.41	0.46
177	1090	86.66	93.76		94.33	0.001226	3.34	338.47	119.04	0.47
177	1260	86.66	94.31		94.89	0.001203	3.42	405.12	125.93	0.47
177	1420	86.66	94.75		95.35	0.001195	3.49	462.05	131.79	0.47
176	550	86.86	91.29		91.60	0.001143	2.46	223.88	67.94	0.43
176	780	86.86	92.22		92.59	0.001064	2.70	292.01	91.59	0.43
176	930	86.86	92.79		93.18	0.001038	2.79	354.28	130.19	0.43
176	1090	86.86	93.35		93.74	0.000977	2.82	436.06	160.93	0.42
176	1260	86.86	93.93		94.30	0.00095	2.78	539.93	191.76	0.42
176	1420	86.86	94.44		94.79	0.00082	2.72	639.55	197.20	0.39
175	550	85.74	90.66		90.91	0.000799	2.21	249.44	70.38	0.36
175	780	85.74	91.64		91.94	0.000752	2.43	345.51	121.30	0.36
175	930	85.74	92.25		92.56	0.000698	2.50	425.39	141.89	0.36
175	1090	85.74	92.85		93.16	0.000641	2.54	516.96	160.21	0.35
175	1260	85.74	93.47		93.77	0.000572	2.54	617.67	166.96	0.33
175	1420	85.74	94.02		94.32	0.000518	2.54	712.19	173.05	0.32
174	550	86.06	90.16		90.30	0.000505	1.65	332.35	98.83	0.29
174	780	86.06	91.23		91.39	0.000418	1.77	439.89	101.78	0.27
174	930	86.06	91.87		92.05	0.000383	1.84	506.19	103.55	0.27
174	1090	86.06	92.50		92.69	0.00036	1.91	571.60	105.32	0.26
174	1260	86.06	93.14		93.33	0.000341	1.97	639.07	107.13	0.26
174	1420	86.06	93.70		93.91	0.000327	2.03	700.50	108.74	0.25
173	550	84.35	89.64		89.87	0.000782	2.12	259.38	73.17	0.36
173	780	84.35	90.77		91.02	0.000689	2.25	353.49	108.49	0.35
173	930	84.35	91.45		91.71	0.000643	2.27	434.89	128.39	0.34
173	1090	84.35	92.12		92.37	0.000589	2.26	524.80	140.08	0.33
173	1260	84.35	92.81		93.05	0.000499	2.24	627.42	160.85	0.31
173	1420	84.35	93.42		93.66	0.000428	2.23	729.08	168.09	0.29
172	550	83.08	89.17		89.38	0.000647	2.06	269.00	82.89	0.33
172	780	83.08	90.38		90.61	0.000525	2.13	418.57	145.59	0.31
172	930	83.08	91.12		91.33	0.000451	2.11	532.16	162.46	0.29
172	1090	83.08	91.83		92.03	0.000396	2.10	653.43	178.72	0.28
172	1260	83.08	92.57		92.76	0.000344	2.06	791.34	195.53	0.26
172	1420	83.08	93.22		93.40	0.000305	2.04	923.19	209.76	0.25
171	550	83.29	88.80		88.91	0.000379	1.45	379.43	108.40	0.25
171	780	83.29	90.13		90.24	0.000275	1.47	529.09	115.33	0.22
171	930	83.29	90.90		91.01	0.00024	1.50	619.13	117.88	0.21

Table 7.9 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(M/P) (2/9)

River Sta.	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit WS. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # C
171	1090	83.29	91.63		91.75	0.000219	1.54	705.96	120.29	0.20
171	1260	83.29	92.38		92.50	0.000203	1.58	797.30	123.75	0.20
171	1420	83.29	93.04		93.17	0.000194	1.61	880.11	127.83	0.20
170	550	79.97	88.44		88.66	0.00069	2.05	268.69	59.73	0.31
170	780	79.97	89.78		90.03	0.000653	2.22	351.65	64.67	0.30
170	930	79.97	90.55		90.82	0.000639	2.31	402.46	66.82	0.30
170	1090	79.97	91.26		91.56	0.000642	2.42	450.90	68.24	0.30
170	1260	79.97	92.00		92.32	0.000641	2.51	501.85	69.69	0.30
170	1420	79.97	92.64		92.99	0.000691	2.59	547.34	73.72	0.30
169	550	81.56	88.37		88.44	0.000185	1.15	477.74	96.84	0.17
169	780	81.56	89.71		89.80	0.000197	1.27	613.50	104.86	0.17
169	930	81.56	90.49		90.58	0.000202	1.33	697.21	111.78	0.17
169	1090	81.56	91.22		91.32	0.00021	1.40	780.53	118.33	0.17
169	1260	81.56	91.96		92.07	0.000214	1.46	871.50	125.09	0.17
169	1420	81.56	92.61		92.72	0.000218	1.50	953.86	130.91	0.17
168	550	81.60	88.23		88.33	0.000195	1.40	392.08	72.99	0.19
168	780	81.60	89.56		89.68	0.00019	1.56	499.32	85.60	0.21
168	930	81.60	90.33		90.47	0.000188	1.64	567.81	93.77	0.21
168	1090	81.60	91.05		91.20	0.000189	1.69	643.81	111.60	0.22
168	1260	81.60	91.81		91.96	0.000185	1.72	732.62	126.34	0.22
168	1420	81.60	92.45		92.61	0.000184	1.75	821.03	153.07	0.23
167	550	80.73	88.05		88.17	0.000322	1.54	403.08	115.81	0.21
167	780	80.73	89.41		89.54	0.000299	1.63	565.24	123.02	0.20
167	930	80.73	90.19		90.32	0.000289	1.67	663.24	127.71	0.20
167	1090	80.73	90.92		91.05	0.000288	1.73	758.37	135.33	0.20
167	1260	80.73	91.67		91.81	0.000282	1.77	863.47	143.28	0.20
167	1420	80.73	92.32		92.46	0.000283	1.81	958.60	150.92	0.20
166.857*	550	80.62	88.00		88.13	0.000364	1.61	350.69	112.17	0.23
166.857*	780	80.62	89.36		89.50	0.000334	1.70	517.87	127.55	0.22
166.857*	930	80.62	90.15		90.29	0.000315	1.74	620.06	132.58	0.21
166.857*	1090	80.62	90.87		91.02	0.000305	1.78	717.39	134.77	0.21
166.857*	1260	80.62	91.63		91.78	0.000296	1.80	820.67	137.62	0.21
166.857*	1420	80.62	92.28		92.43	0.000292	1.83	910.71	140.12	0.20
166.714*	550	80.51	87.96		88.09	0.000415	1.64	335.52	68.32	0.24
166.714*	780	80.51	89.30		89.46	0.000454	1.78	464.55	129.80	0.24
166.714*	930	80.51	90.09		90.25	0.000419	1.80	570.82	137.75	0.23
166.714*	1090	80.51	90.82		90.98	0.000398	1.83	673.28	141.60	0.23
166.714*	1260	80.51	91.59		91.75	0.000371	1.84	782.50	144.46	0.22
166.714*	1420	80.51	92.24		92.40	0.000354	1.85	877.37	146.81	0.21
166.571*	550	80.40	87.91		88.05	0.000394	1.65	333.52	67.85	0.24
166.571*	780	80.40	89.25		89.41	0.000473	1.81	432.33	90.67	0.25
166.571*	930	80.40	90.03		90.20	0.000491	1.86	519.92	133.69	0.25
166.571*	1090	80.40	90.76		90.94	0.000487	1.89	623.53	148.16	0.24
166.571*	1260	80.40	91.53		91.70	0.000439	1.89	738.73	150.96	0.23
166.571*	1420	80.40	92.19		92.36	0.000409	1.90	838.54	153.25	0.22

Table 7.9 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(M/P) (3/9)

River Sta.	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # C
166.428*	550	80.29	87.87		88.01	0.000477	1.65	333.73	69.79	0.24
166.428*	780	80.29	89.20		89.36	0.000517	1.81	431.54	78.29	0.25
166.428*	930	80.29	89.97		90.15	0.000554	1.88	496.32	96.04	0.25
166.428*	1090	80.29	90.69		90.88	0.000575	1.94	578.40	138.03	0.25
166.428*	1260	80.29	91.46		91.65	0.00056	1.95	690.19	150.82	0.25
166.428*	1420	80.29	92.12		92.31	0.000524	1.95	793.17	159.45	0.24
166.285*	550	80.18	87.82		87.96	0.00049	1.64	336.19	70.49	0.24
166.285*	780	80.18	89.15		89.31	0.000525	1.79	436.19	80.11	0.24
166.285*	930	80.18	89.92		90.10	0.000531	1.86	499.89	84.98	0.24
166.285*	1090	80.18	90.64		90.83	0.00056	1.94	564.81	104.63	0.25
166.285*	1260	80.18	91.40		91.59	0.000574	1.98	652.55	131.32	0.25
166.285*	1420	80.18	92.06		92.25	0.00056	1.99	749.31	153.05	0.24
166.142*	550	80.07	86.39	85.93	87.73	0.005877	5.11	107.62	60.58	0.85
166.142*	780	80.07	87.53	86.93	89.05	0.006092	5.46	142.84	69.17	0.84
166.142*	930	80.07	88.30	87.52	89.84	0.005819	5.49	169.34	75.15	0.81
166.142*	1090	80.07	88.90	88.09	90.55	0.005871	5.69	191.62	79.50	0.81
166.142*	1260	80.07	89.68	88.62	91.32	0.005438	5.68	221.84	85.05	0.77
166.142*	1420	80.07	90.31	89.10	91.98	0.005218	5.72	248.08	89.23	0.75
166	610	79.96	85.35	85.35	87.01	0.007989	5.71	106.85	57.26	1.00
166	870	79.96	86.32	86.32	88.29	0.008329	6.22	139.80	62.21	1.00
166	1050	79.96	86.91	86.91	89.06	0.008545	6.50	161.63	66.04	1.01
166	1230	79.96	87.45	87.45	89.76	0.008717	6.74	182.57	70.13	1.01
166	1450	79.96	88.06	88.06	90.55	0.00869	6.99	207.54	74.35	1.00
166	1650	79.96	88.57	88.57	91.21	0.008696	7.20	229.31	77.87	1.00
165	610	79.00	85.18		85.34	0.000531	1.80	338.04	92.28	0.30
165	870	79.00	86.31		86.50	0.000461	1.96	444.27	95.88	0.29
165	1050	79.00	86.99		87.20	0.000493	2.05	511.79	108.30	0.30
165	1230	79.00	87.68		87.90	0.000451	2.09	588.47	113.17	0.29
165	1450	79.00	88.30		88.55	0.000445	2.20	659.85	116.32	0.29
165	1650	79.00	88.81		89.08	0.000444	2.29	719.77	118.91	0.30
164	610	79.16	84.85		85.05	0.000503	1.97	309.02	68.90	0.30
164	870	79.16	85.96		86.22	0.000516	2.24	387.60	72.13	0.31
164	1050	79.16	86.61		86.90	0.000533	2.42	434.71	74.00	0.32
164	1230	79.16	87.26		87.58	0.000665	2.51	490.12	93.76	0.35
164	1450	79.16	87.87		88.23	0.000667	2.64	548.45	97.19	0.36
164	1650	79.16	88.37		88.76	0.000676	2.76	597.33	99.97	0.36
163	610	78.23	83.72		84.46	0.00254	3.82	159.52	43.62	0.64
163	870	78.23	84.66		85.61	0.002581	4.30	202.09	46.44	0.66
163	1050	78.23	85.17		86.26	0.002718	4.63	233.07	72.92	0.68
163	1230	78.23	85.66		86.84	0.002705	4.85	271.65	82.66	0.69
163	1450	78.23	86.24		87.48	0.002716	5.02	321.80	90.90	0.70
163	1650	78.23	86.77		88.01	0.002701	5.07	371.90	99.95	0.70
162	610	77.76	83.97		84.02	0.00014	1.05	652.91	152.45	0.16
162	870	77.76	85.04		85.11	0.000143	1.21	826.96	191.22	0.17

Table 7.9 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(M/P) (49)

River Sta.	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit WS. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # C
162	1050	77.76	85.64		85.72	0.000146	1.30	961.85	239.01	0.17
162	1230	77.76	86.19		86.27	0.000148	1.38	1097.57	260.12	0.17
162	1450	77.76	86.80		86.89	0.000151	1.47	1264.98	289.49	0.18
162	1650	77.76	87.32		87.42	0.000152	1.54	1422.40	317.29	0.18
161	610	77.88	83.64		83.88	0.000578	2.13	286.51	63.65	0.32
161	870	77.88	84.64		84.95	0.000648	2.47	351.62	67.54	0.35
161	1050	77.88	85.17		85.55	0.000708	2.70	388.34	69.63	0.37
161	1230	77.88	85.66		86.09	0.000762	2.91	422.45	71.53	0.38
161	1450	77.88	86.20		86.70	0.000822	3.14	461.61	73.64	0.40
161	1650	77.88	86.65		87.22	0.000869	3.33	495.59	75.43	0.41
160	610	77.38	83.51		83.64	0.000585	1.64	371.88	120.03	0.30
160	870	77.38	84.56		84.71	0.000463	1.74	499.60	123.15	0.28
160	1050	77.38	85.12		85.29	0.000446	1.84	569.12	124.81	0.28
160	1230	77.38	85.63		85.82	0.000438	1.94	632.81	126.31	0.28
160	1450	77.38	86.19		86.41	0.000432	2.05	710.54	139.98	0.28
160	1650	77.38	86.68		86.91	0.000428	2.15	779.10	144.56	0.28
159	610	77.46	83.16		83.35	0.000526	1.95	313.31	70.56	0.29
159	870	77.46	84.18		84.44	0.000556	2.25	385.91	71.49	0.31
159	1050	77.46	84.69		85.01	0.00061	2.48	422.82	71.96	0.33
159	1230	77.46	85.15		85.52	0.000662	2.70	455.90	72.38	0.34
159	1450	77.46	85.66		86.10	0.000724	2.94	492.72	72.84	0.36
159	1650	77.46	86.08		86.59	0.000777	3.15	523.77	73.23	0.38
158	610	76.63	82.86		83.05	0.000525	1.97	309.31	71.64	0.30
158	870	76.63	83.85		84.11	0.000627	2.27	383.85	82.36	0.34
158	1050	76.63	84.33		84.64	0.000701	2.47	424.93	87.49	0.36
158	1230	76.63	84.76		85.12	0.000768	2.65	463.84	92.89	0.38
158	1450	76.63	85.23		85.65	0.00087	2.85	509.79	101.73	0.40
158	1650	76.63	85.63		86.09	0.00099	3.00	553.29	115.26	0.43
157	610	77.18	82.85		82.95	0.000336	1.45	421.37	113.37	0.24
157	870	77.18	83.86		83.99	0.000317	1.62	537.82	116.95	0.24
157	1050	77.18	84.35		84.51	0.000335	1.76	596.16	118.70	0.25
157	1230	77.18	84.79		84.98	0.000354	1.90	648.89	120.26	0.26
157	1450	77.18	85.28		85.49	0.000377	2.05	707.22	121.96	0.27
157	1650	77.18	85.67		85.91	0.000398	2.18	755.75	123.36	0.28
156	610	76.26	82.54		82.73	0.000493	1.98	341.45	142.41	0.29
156	870	76.26	83.58		83.79	0.000432	2.12	555.53	230.06	0.28
156	1050	76.26	84.09		84.31	0.00043	2.24	676.24	249.91	0.29
156	1230	76.26	84.54		84.77	0.000426	2.33	793.55	267.78	0.29
156	1450	76.26	85.04		85.28	0.000422	2.43	932.01	287.28	0.29
156	1650	76.26	85.45		85.70	0.000417	2.51	1054.03	301.70	0.29
155	610	75.36	82.28		82.44	0.000482	1.74	350.79	91.68	0.28
155	870	75.36	83.33		83.50	0.000546	1.80	484.38	133.30	0.30
155	1050	75.36	83.84		84.02	0.000524	1.90	551.99	134.92	0.30
155	1230	75.36	84.29		84.49	0.000516	2.01	612.87	136.35	0.30
155	1450	75.36	84.78		85.01	0.000517	2.13	679.86	137.92	0.31

Table 7.9 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(M/P) (5/9)

River Sta.	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Wdth (m)	Froude # C
155	1650	75.36	85.17		85.43	0.000524	2.24	735.01	139.19	0.31
154	610	74.87	81.81		82.11	0.000808	2.44	250.30	56.28	0.37
154	870	74.87	82.71		83.12	0.000924	2.84	332.62	137.55	0.40
154	1050	74.87	83.17		83.64	0.000978	3.07	401.19	156.92	0.42
154	1230	74.87	83.60		84.10	0.00101	3.24	471.45	173.29	0.43
154	1450	74.87	84.08		84.61	0.001031	3.41	558.06	191.55	0.44
154	1650	74.87	84.47		85.03	0.001042	3.53	636.51	206.71	0.44
153	610	74.89	81.51		81.67	0.000652	1.75	353.41	134.49	0.32
153	870	74.89	82.50		82.67	0.000536	1.81	521.44	215.41	0.30
153	1050	74.89	83.01		83.18	0.000486	1.88	636.65	237.27	0.29
153	1230	74.89	83.47		83.65	0.000451	1.94	750.21	257.00	0.29
153	1450	74.89	83.97		84.16	0.000423	2.01	885.29	278.65	0.28
153	1650	74.89	84.39		84.58	0.000406	2.08	1003.90	296.36	0.28
152	610	74.50	80.78		81.10	0.000918	2.51	243.24	58.54	0.39
152	870	74.50	81.71		82.12	0.001022	2.86	321.32	124.76	0.42
152	1050	74.50	82.19		82.66	0.001045	3.07	384.87	138.33	0.43
152	1230	74.50	82.63		83.14	0.001053	3.24	448.56	150.70	0.44
152	1450	74.50	83.11		83.67	0.001064	3.43	524.29	164.21	0.45
152	1650	74.50	83.50		84.10	0.001077	3.58	590.18	175.12	0.45
151	610	74.33	80.52		80.72	0.000674	2.03	329.29	125.70	0.33
151	870	74.33	81.48		81.70	0.000677	2.14	466.72	151.96	0.34
151	1050	74.33	82.00		82.23	0.000645	2.24	546.06	154.99	0.34
151	1230	74.33	82.46		82.71	0.000628	2.33	618.41	157.70	0.34
151	1450	74.33	82.93		83.23	0.000664	2.52	696.92	187.91	0.35
151	1650	74.33	83.31		83.64	0.000694	2.68	775.83	229.76	0.36
150	610	73.67	79.93		80.23	0.000842	2.44	250.30	68.45	0.38
150	870	73.67	80.75		81.16	0.000976	2.87	322.73	99.33	0.41
150	1050	73.67	81.20		81.69	0.00104	3.13	376.78	149.10	0.43
150	1230	73.67	81.62		82.16	0.001085	3.34	447.00	188.70	0.45
150	1450	73.67	82.07		82.66	0.001107	3.53	540.46	223.44	0.46
150	1650	73.67	82.48		83.07	0.001068	3.61	632.89	223.77	0.45
149	610	73.20	79.37		79.79	0.00114	2.87	232.77	150.87	0.44
149	870	73.20	80.31		80.73	0.00102	3.01	425.98	253.64	0.43
149	1050	73.20	80.87		81.24	0.000872	2.98	572.67	275.68	0.40
149	1230	73.20	81.36		81.70	0.000766	2.96	714.74	295.45	0.38
149	1450	73.20	81.87		82.19	0.000698	2.98	869.92	315.64	0.37
149	1650	73.20	82.32		82.63	0.000639	2.97	1016.00	333.53	0.36
148	610	72.59	79.16		79.33	0.000444	1.86	375.52	173.04	0.28
148	870	72.59	80.11		80.31	0.000414	2.04	555.69	203.44	0.28
148	1050	72.59	80.66		80.86	0.000402	2.14	670.02	216.80	0.28
148	1230	72.59	81.15		81.36	0.000393	2.23	778.87	228.79	0.28
148	1450	72.59	81.64		81.87	0.000398	2.35	894.70	240.90	0.28
148	1650	72.59	82.08		82.33	0.000394	2.44	1003.90	251.78	0.29
147	610	71.07	78.75		78.98	0.00054	2.17	319.06	128.40	0.31

Table 7.9 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(M/P) (6/9)

River Sta.	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit WS (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # C
147	870	71.07	79.67		79.95	0.000573	2.47	446.38	148.17	0.32
147	1050	71.07	80.19		80.51	0.000595	2.63	526.95	159.67	0.33
147	1230	71.07	80.66		81.00	0.000612	2.78	604.74	170.04	0.34
147	1450	71.07	81.12		81.50	0.000651	2.97	684.98	180.11	0.35
147	1650	71.07	81.55		81.95	0.000663	3.10	764.28	189.48	0.36
146	610	72.29	78.22		78.56	0.000992	2.56	252.71	109.41	0.41
146	870	72.29	79.14		79.52	0.000974	2.81	379.97	163.36	0.41
146	1050	72.29	79.69		80.07	0.000934	2.90	474.65	181.17	0.41
146	1230	72.29	80.19		80.58	0.000884	2.95	570.26	196.76	0.40
146	1450	72.29	80.66		81.06	0.00089	3.07	664.79	211.04	0.41
146	1650	72.29	81.12		81.52	0.000849	3.11	765.54	225.27	0.40
145	610	71.99	78.07		78.19	0.000303	1.56	449.51	169.38	0.23
145	870	71.99	79.01		79.15	0.000301	1.75	609.28	172.53	0.24
145	1050	71.99	79.55		79.71	0.000304	1.87	703.80	174.37	0.24
145	1230	71.99	80.05		80.22	0.000306	1.98	791.19	176.05	0.24
145	1450	71.99	80.49		80.69	0.000331	2.14	869.77	179.26	0.26
145	1650	71.99	80.94		81.16	0.000336	2.25	950.98	181.81	0.26
144	610	71.81	77.81		78.00	0.000574	1.91	323.02	108.93	0.31
144	870	71.81	78.73		78.95	0.00058	2.12	463.94	174.24	0.32
144	1050	71.81	79.28		79.52	0.000565	2.21	565.87	199.48	0.32
144	1230	71.81	79.79		80.03	0.000536	2.28	674.11	225.44	0.32
144	1450	71.81	80.23		80.49	0.000553	2.42	777.13	247.64	0.32
144	1650	71.81	80.69		80.97	0.000525	2.46	907.92	308.45	0.32
143	610	71.61	77.47		77.61	0.000602	1.71	359.87	124.99	0.31
143	870	71.61	78.44		78.61	0.00048	1.82	520.31	203.51	0.29
143	1050	71.61	79.02		79.19	0.000427	1.88	638.61	205.60	0.28
143	1230	71.61	79.55		79.73	0.000388	1.92	748.88	207.53	0.27
143	1450	71.61	79.98		80.18	0.000399	2.06	838.17	209.08	0.28
143	1650	71.61	80.46		80.67	0.000379	2.12	938.81	210.81	0.27
142	610	70.36	77.04		77.16	0.000695	1.52	401.51	173.89	0.32
142	870	70.36	78.19		78.28	0.000395	1.39	627.48	204.60	0.25
142	1050	70.36	78.82		78.92	0.00031	1.39	757.42	206.09	0.23
142	1230	70.36	79.38		79.49	0.000266	1.41	874.19	207.42	0.22
142	1450	70.36	79.81		79.93	0.000269	1.51	963.53	208.43	0.22
142	1650	70.36	80.31		80.43	0.000252	1.55	1066.81	210.47	0.22
141	610	70.19	76.44		76.68	0.00057	2.15	284.04	60.54	0.32
141	870	70.19	77.61		77.91	0.000587	2.42	369.06	92.46	0.33
141	1050	70.19	78.24		78.58	0.000593	2.60	437.20	119.47	0.34
141	1230	70.19	78.80		79.17	0.000598	2.74	507.49	134.18	0.34
141	1450	70.19	79.14		79.59	0.000696	3.04	554.86	147.28	0.37
141	1650	70.19	79.61		80.10	0.000706	3.18	629.14	165.75	0.38
140	610	70.31	76.10		76.31	0.000538	2.03	300.15	68.15	0.31
140	870	70.31	77.27		77.54	0.000537	2.27	382.81	79.10	0.32
140	1050	70.31	77.91		78.20	0.000545	2.43	450.94	121.11	0.32
140	1230	70.31	78.46		78.79	0.000545	2.56	522.44	135.43	0.33

Table 7.9 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(M/P) (7/9)

River Sta.	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # C
140	1450	70.31	78.73		79.14	0.000654	2.88	559.89	142.64	0.36
140	1650	70.31	79.20		79.65	0.000661	3.01	629.94	155.23	0.37
139	610	69.94	75.73		76.00	0.000716	2.31	264.02	60.02	0.35
139	870	69.94	76.84		77.17	0.001001	2.55	341.25	87.19	0.41
139	1050	69.94	77.49		77.84	0.00101	2.60	403.43	101.00	0.42
139	1230	69.94	78.09		78.44	0.000913	2.65	464.84	105.20	0.40
139	1450	69.94	78.26		78.72	0.001129	3.00	483.03	106.07	0.45
139	1650	69.94	78.74		79.23	0.001073	3.08	536.39	127.44	0.44
138	610	69.06	75.17		75.44	0.000916	2.28	267.06	76.48	0.39
138	870	69.06	76.21		76.52	0.000875	2.47	360.52	101.37	0.39
138	1050	69.06	76.91		77.23	0.000755	2.53	434.39	110.57	0.37
138	1230	69.06	77.57		77.90	0.000669	2.57	509.80	117.98	0.35
138	1450	69.06	77.54		78.01	0.000946	3.05	506.48	117.68	0.42
138	1650	69.06	78.07		78.56	0.00089	3.14	570.08	123.57	0.41
137	610	69.36	74.90		75.07	0.000659	1.84	332.26	102.46	0.33
137	870	69.36	75.99		76.18	0.000549	1.93	450.30	112.15	0.31
137	1050	69.36	76.74		76.94	0.000467	1.96	534.90	114.69	0.29
137	1230	69.36	77.43		77.63	0.000415	2.00	614.74	117.05	0.28
137	1450	69.36	77.33		77.62	0.000613	2.40	603.05	116.71	0.34
137	1650	69.36	77.88		78.19	0.000579	2.47	667.82	118.59	0.33
136	610	69.06	74.54		74.76	0.000656	2.11	288.44	71.27	0.34
136	870	69.06	75.62		75.90	0.000645	2.37	367.44	74.99	0.34
136	1050	69.06	76.35		76.66	0.000747	2.47	425.47	91.65	0.37
136	1230	69.06	77.05		77.36	0.000799	2.46	499.10	113.99	0.38
136	1450	69.06	76.70		77.21	0.001305	3.15	459.74	104.62	0.48
136	1650	69.06	77.29		77.79	0.00126	3.13	526.81	118.19	0.47
135	610	68.09	74.08		74.39	0.000701	2.46	249.39	51.56	0.34
135	870	68.09	75.06		75.50	0.000817	2.94	302.01	56.46	0.38
135	1050	68.09	75.68		76.20	0.000868	3.21	338.35	61.76	0.40
135	1230	68.09	76.29		76.88	0.000894	3.42	380.12	72.03	0.41
135	1450	68.09	73.43	73.43	75.71	0.006085	6.69	216.71	48.28	1.00
135	1650	68.09	73.86	73.86	76.32	0.005901	6.96	238.00	50.44	1.00
134	660	68.33	73.86	71.45	74.06	0.000563	1.98	333.53	84.45	0.31
134	940	68.33	74.87	72.01	75.12	0.00055	2.25	424.88	95.53	0.32
134	1150	68.33	75.51	72.39	75.81	0.000543	2.43	495.93	117.01	0.32
134	1380	68.33	76.14	72.77	76.48	0.00054	2.60	570.90	120.00	0.33
134	530	68.33	73.32	70.83	73.49	0.000565	1.83	289.38	79.99	0.31
134	580	68.33	73.53	70.98	73.71	0.000566	1.89	306.59	81.11	0.31
133	660	68.04	73.57	71.17	73.77	0.000566	1.98	333.77	83.76	0.31
133	940	68.04	74.59	71.72	74.84	0.000557	2.23	430.01	97.98	0.32
133	1150	68.04	75.24	72.10	75.53	0.00055	2.40	496.66	106.00	0.32
133	1380	68.04	75.87	72.49	76.20	0.000548	2.57	565.44	112.18	0.33
133	530	68.04	73.03	70.54	73.20	0.00056	1.83	290.13	79.96	0.31
133	580	68.04	73.25	70.69	73.43	0.000562	1.89	307.25	80.80	0.31

Table 7.9 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(M/P) (8/9)

River Sta.	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G Elev (m)	E.G Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # C
132	660	67.63	73.15	70.95	73.38	0.000694	2.14	307.90	78.17	0.34
132	940	67.63	74.16	71.52	74.45	0.000696	2.42	388.70	82.14	0.35
132	1150	67.63	74.80	71.91	75.15	0.000695	2.60	447.16	97.08	0.36
132	1380	67.63	75.42	72.31	75.82	0.000698	2.77	507.91	101.49	0.37
132	530	67.63	72.61	70.34	72.82	0.000694	1.99	266.85	76.07	0.34
132	580	67.63	72.83	70.42	73.04	0.000694	2.05	282.97	76.90	0.34
131	660	67.31	72.86	70.54	73.07	0.000603	2.02	327.10	81.93	0.32
131	940	67.31	73.87	71.10	74.14	0.000608	2.28	411.91	85.97	0.33
131	1150	67.31	74.52	71.47	74.83	0.000606	2.45	475.02	112.56	0.34
131	1380	67.31	75.15	71.86	75.49	0.000607	2.62	545.77	113.81	0.34
131	530	67.31	72.33	69.92	72.51	0.000599	1.87	283.97	79.79	0.32
131	580	67.31	72.54	70.07	72.73	0.000601	1.93	300.91	80.64	0.32
130	660	67.14	72.54	70.24	72.75	0.000618	2.03	324.38	81.81	0.33
130	940	67.14	73.55	70.80	73.82	0.000621	2.30	408.84	85.83	0.34
130	1150	67.14	74.20	71.18	74.51	0.000624	2.47	466.35	98.79	0.34
130	1380	67.14	74.82	71.56	75.17	0.000628	2.65	531.06	106.56	0.35
130	530	67.14	72.01	69.63	72.19	0.000616	1.88	281.46	79.69	0.32
130	580	67.14	72.22	69.78	72.41	0.000617	1.94	298.31	80.53	0.32
129	660	66.88	72.25	69.98	72.46	0.000633	2.05	321.96	81.70	0.33
129	940	66.88	73.25	70.53	73.52	0.000633	2.31	407.77	96.44	0.34
129	1150	66.88	73.91	70.91	74.22	0.000633	2.48	473.71	112.88	0.34
129	1380	66.88	74.53	71.29	74.88	0.000627	2.64	547.43	120.00	0.35
129	530	66.88	71.71	69.37	71.90	0.000632	1.90	279.16	79.58	0.32
129	580	66.88	71.93	69.52	72.12	0.000632	1.96	295.97	80.42	0.33
128	660	66.60	71.92	69.70	72.14	0.000652	2.07	319.15	81.77	0.33
128	940	66.60	72.93	70.26	73.20	0.000649	2.33	403.56	85.86	0.34
128	1150	66.60	73.58	70.64	73.89	0.000653	2.50	463.73	100.83	0.35
128	1380	66.60	74.20	71.02	74.56	0.00064	2.66	536.52	120.00	0.35
128	530	66.60	71.39	69.09	71.58	0.000654	1.92	276.29	79.62	0.33
128	580	66.60	71.60	69.24	71.80	0.000653	1.98	293.11	80.47	0.33
127	660	66.06	71.38	68.94	71.57	0.000526	1.89	348.82	87.05	0.30
127	940	66.06	72.40	69.51	72.63	0.000529	2.14	438.92	91.06	0.31
127	1150	66.06	73.04	69.87	73.31	0.00054	2.31	498.37	94.39	0.32
127	1380	66.06	73.68	70.23	73.98	0.000536	2.47	569.26	116.07	0.32
127	530	66.06	70.85	68.37	71.01	0.000524	1.75	302.88	84.94	0.30
127	580	66.06	71.06	68.51	71.23	0.000525	1.81	320.92	85.78	0.30
126	660	65.66	71.00	68.65	71.19	0.000557	1.93	341.86	87.74	0.31
126	940	65.66	72.02	69.20	72.26	0.000535	2.18	441.37	108.53	0.31
126	1150	65.66	72.66	69.57	72.93	0.000532	2.33	512.71	112.82	0.32
126	1380	65.66	73.30	69.93	73.61	0.000531	2.49	586.32	117.08	0.32
126	530	65.66	70.46	68.05	70.62	0.000573	1.80	295.15	85.56	0.31
126	580	65.66	70.67	68.20	70.85	0.000566	1.85	313.53	86.42	0.31
125	660	65.31	70.58	68.39	70.80	0.000668	2.09	316.49	81.63	0.34
125	940	65.31	71.61	68.95	71.88	0.000634	2.33	413.75	103.68	0.34
125	1150	65.31	72.26	69.33	72.57	0.000618	2.49	482.15	108.58	0.34

Table 7.9 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(M/P) (9/9)

River Sta.	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # C
125	1380	65.31	72.90	69.71	73.25	0.000601	2.64	554.08	114.31	0.34
125	530	65.31	70.03	67.81	70.22	0.000682	1.94	272.56	79.45	0.34
125	580	65.31	70.25	67.95	70.45	0.000675	2.00	289.88	80.32	0.34
124	660	64.90	70.24	67.26	70.40	0.00041	1.78	370.32	82.89	0.27
124	940	64.90	71.27	67.97	71.49	0.000433	2.06	459.64	96.88	0.28
124	1150	64.90	71.92	68.33	72.17	0.000448	2.23	526.87	108.73	0.29
124	1380	64.90	72.56	68.71	72.85	0.000461	2.40	598.39	114.32	0.30
124	530	64.90	69.70	66.94	69.84	0.000392	1.63	325.96	81.24	0.26
124	580	64.90	69.92	67.06	70.06	0.000399	1.69	343.50	81.89	0.26
123	660	64.42	69.77	67.48	69.98	0.000622	2.04	324.04	86.52	0.33
123	940	64.42	70.81	68.04	71.07	0.000558	2.25	445.58	120.00	0.32
123	1150	64.42	71.47	68.41	71.75	0.000538	2.40	523.79	120.00	0.32
123	1380	64.42	72.11	68.80	72.43	0.000525	2.55	601.34	120.00	0.32
123	530	64.42	69.24	66.91	69.42	0.000618	1.88	281.41	79.96	0.32
123	580	64.42	69.45	67.05	69.64	0.00062	1.95	298.18	80.80	0.32
122	660	64.01	69.30	67.08	69.51	0.000648	2.06	319.86	81.91	0.33
122	940	64.01	70.37	67.63	70.64	0.000616	2.29	412.47	98.33	0.34
122	1150	64.01	71.03	68.01	71.33	0.00061	2.45	479.78	105.83	0.34
122	1380	64.01	71.68	68.40	72.02	0.000591	2.60	550.93	112.52	0.34
122	530	64.01	68.77	66.50	68.96	0.000645	1.91	277.62	79.82	0.33
122	580	64.01	68.98	66.60	69.18	0.000646	1.97	294.29	80.65	0.33
121	660	62.87	68.96	66.75	69.18	0.000665	2.08	317.65	81.74	0.34
121	940	62.87	70.06	67.32	70.32	0.000617	2.29	418.61	113.03	0.33
121	1150	62.87	70.72	67.69	71.02	0.000594	2.43	495.01	116.24	0.33
121	1380	62.87	71.39	68.07	71.72	0.000568	2.57	573.41	118.66	0.33
121	530	62.87	68.44	66.17	68.63	0.000663	1.92	275.62	79.66	0.33
121	580	62.87	68.64	66.29	68.84	0.000663	1.98	292.23	80.48	0.33
120	660	62.44	68.47	65.75	68.67	0.000563	1.97	334.58	83.95	0.31
120	940	62.44	69.61	66.60	69.85	0.000516	2.16	452.61	114.22	0.31
120	1150	62.44	70.30	66.97	70.56	0.000503	2.30	531.89	117.83	0.31
120	1380	62.44	70.98	67.36	71.28	0.000488	2.43	613.90	120.00	0.31
120	530	62.44	67.96	65.36	68.12	0.000545	1.81	292.94	80.17	0.30
120	580	62.44	68.16	65.51	68.34	0.000552	1.87	309.38	80.99	0.31
119	660	63.00	68.10	66.12	68.35	0.000797	2.23	295.90	78.38	0.37
119	940	63.00	69.30	66.68	69.58	0.000634	2.37	423.18	119.60	0.34
119	1150	63.00	70.00	67.06	70.31	0.000588	2.49	506.90	119.60	0.34
119	1380	63.00	70.70	67.44	71.03	0.000553	2.62	590.62	119.60	0.33
119	530	63.00	67.60	65.50	67.82	0.000796	2.06	257.09	76.86	0.36
119	580	63.00	67.80	65.65	68.03	0.000795	2.13	272.53	77.47	0.36

Table 7.10 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(P/P) (1/9)

River Sta	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # C
178	550	88.76	92.84		92.98	0.000708	1.62	340.48	107.33	0.29
178	780	88.76	93.83		93.99	0.000592	1.74	447.62	109.26	0.27
178	930	88.76	94.42		94.59	0.000548	1.82	512.00	110.41	0.27
178	1090	88.76	95.00		95.18	0.000621	1.88	579.60	130.52	0.28
178	1260	88.76	95.51		95.70	0.00062	1.94	648.58	139.04	0.29
178	1420	88.76	95.94		96.15	0.000603	2.00	709.70	142.57	0.29
177	550	86.66	92.19		92.48	0.001124	2.38	230.64	56.01	0.38
177	780	86.66	93.13		93.51	0.001238	2.73	285.70	61.06	0.40
177	930	86.66	93.70		94.12	0.001265	2.89	330.79	116.19	0.41
177	1090	86.66	94.23		94.68	0.001271	3.00	395.62	124.92	0.42
177	1260	86.66	94.74		95.20	0.001271	3.09	460.92	131.68	0.42
177	1420	86.66	95.19		95.66	0.001255	3.14	521.19	137.62	0.42
176	550	86.86	91.66		91.91	0.001127	2.21	249.21	69.64	0.37
176	780	86.86	92.63		92.93	0.001057	2.44	334.10	117.38	0.37
176	930	86.86	93.21		93.52	0.001055	2.48	415.09	153.96	0.37
176	1090	86.86	93.78		94.08	0.001023	2.49	510.58	186.51	0.37
176	1260	86.86	94.34		94.62	0.000921	2.44	619.76	196.36	0.35
176	1420	86.86	94.85		95.11	0.000801	2.41	719.94	200.56	0.34
175	550	85.74	91.01		91.22	0.000819	2.01	277.78	90.81	0.32
175	780	85.74	92.03		92.27	0.000769	2.20	395.54	134.56	0.32
175	930	85.74	92.65		92.89	0.000717	2.25	484.23	155.32	0.31
175	1090	85.74	93.25		93.49	0.000653	2.28	580.88	164.53	0.30
175	1260	85.74	93.85		94.09	0.000591	2.29	682.89	171.19	0.29
175	1420	85.74	94.41		94.64	0.000541	2.30	786.29	203.47	0.28
174	550	86.06	90.48		90.60	0.00051	1.51	365.00	99.74	0.25
174	780	86.06	91.57		91.71	0.000448	1.64	474.68	102.71	0.24
174	930	86.06	92.21		92.36	0.000424	1.72	540.81	104.48	0.24
174	1090	86.06	92.83		92.99	0.000409	1.80	606.02	106.24	0.24
174	1260	86.06	93.45		93.63	0.000396	1.87	672.80	108.02	0.24
174	1420	86.06	94.01		94.20	0.000385	1.93	734.31	109.62	0.24
173	550	84.35	89.97		90.17	0.000817	1.94	284.16	75.34	0.32
173	780	84.35	91.10		91.31	0.000764	2.07	390.73	118.47	0.32
173	930	84.35	91.77		91.99	0.000715	2.09	476.71	133.96	0.31
173	1090	84.35	92.43		92.64	0.000654	2.09	568.83	146.81	0.30
173	1260	84.35	93.10		93.31	0.00055	2.09	675.76	166.06	0.28
173	1420	84.35	93.71		93.92	0.000478	2.08	777.68	169.92	0.27
172	550	83.08	89.46		89.65	0.000707	1.91	296.41	102.25	0.30
172	780	83.08	90.67		90.85	0.000576	1.96	460.84	152.08	0.28
172	930	83.08	91.40		91.57	0.0005	1.95	577.65	168.74	0.27
172	1090	83.08	92.10		92.27	0.000442	1.94	701.96	184.82	0.25
172	1260	83.08	92.83		92.99	0.000385	1.91	843.04	201.23	0.24
172	1420	83.08	93.48		93.63	0.000343	1.89	977.62	215.36	0.23
171	550	83.29	89.03		89.12	0.000434	1.36	404.66	111.72	0.23
171	780	83.29	90.34		90.44	0.000324	1.41	554.19	116.05	0.21
171	930	83.29	91.11		91.21	0.000289	1.44	643.78	118.57	0.20

Table 7.10 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(P/P) (2/9)

River Sta.	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # C
171	1090	83.29	91.83		91.94	0.000269	1.49	730.41	120.96	0.19
171	1260	83.29	92.58		92.70	0.000253	1.53	822.11	124.96	0.19
171	1420	83.29	93.23		93.36	0.000243	1.57	905.55	129.20	0.19
170	550	79.97	88.65		88.84	0.000766	1.96	280.94	60.48	0.29
170	780	79.97	89.97		90.20	0.000738	2.14	364.30	65.39	0.29
170	930	79.97	90.73		90.99	0.000725	2.24	414.87	67.18	0.29
170	1090	79.97	91.44		91.73	0.00073	2.35	463.13	68.59	0.29
170	1260	79.97	92.18		92.48	0.000728	2.45	514.10	70.04	0.29
170	1420	79.97	92.82		93.14	0.000801	2.53	560.19	75.73	0.30
169	550	81.56	88.54		88.60	0.000211	1.11	494.42	97.86	0.16
169	780	81.56	89.88		89.95	0.000222	1.24	630.60	105.83	0.16
169	930	81.56	90.65		90.73	0.000227	1.30	714.48	113.17	0.16
169	1090	81.56	91.36		91.46	0.000235	1.37	798.06	119.66	0.17
169	1260	81.56	92.11		92.21	0.000238	1.43	889.70	126.40	0.17
169	1420	81.56	92.75		92.86	0.000242	1.48	972.15	132.17	0.17
168	550	81.60	88.38		88.47	0.000243	1.36	403.28	74.66	0.19
168	780	81.60	89.70		89.82	0.000241	1.52	511.62	86.59	0.20
168	930	81.60	90.47		90.60	0.000241	1.60	580.93	101.17	0.21
168	1090	81.60	91.18		91.32	0.000242	1.66	658.17	113.71	0.22
168	1260	81.60	91.93		92.07	0.000237	1.69	748.58	129.31	0.22
168	1420	81.60	92.57		92.72	0.000235	1.71	839.46	155.35	0.22
167	550	80.73	88.18		88.29	0.000355	1.49	417.92	116.41	0.20
167	780	80.73	89.53		89.64	0.000328	1.58	579.68	123.68	0.19
167	930	80.73	90.30		90.42	0.000317	1.62	676.97	128.83	0.19
167	1090	80.73	91.02		91.14	0.000315	1.68	772.09	136.39	0.19
167	1260	80.73	91.77		91.90	0.000307	1.72	877.82	144.33	0.19
167	1420	80.73	92.41		92.55	0.000307	1.75	972.91	152.06	0.19
166.857*	550	80.62	88.12		88.25	0.000423	1.57	364.88	119.63	0.22
166.857*	780	80.62	89.47		89.61	0.000379	1.66	532.38	128.28	0.21
166.857*	930	80.62	90.25		90.38	0.000356	1.69	633.92	133.16	0.21
166.857*	1090	80.62	90.97		91.11	0.000342	1.73	730.66	135.05	0.20
166.857*	1260	80.62	91.73		91.87	0.00033	1.75	834.06	138.00	0.20
166.857*	1420	80.62	92.37		92.51	0.000324	1.78	923.57	140.47	0.20
166.714*	550	80.51	88.07		88.20	0.000481	1.60	343.40	69.25	0.23
166.714*	780	80.51	89.41		89.56	0.000507	1.74	478.61	132.50	0.23
166.714*	930	80.51	90.19		90.34	0.000461	1.76	584.50	138.53	0.22
166.714*	1090	80.51	90.92		91.07	0.000436	1.79	686.53	141.96	0.22
166.714*	1260	80.51	91.68		91.83	0.000404	1.79	795.91	144.79	0.21
166.714*	1420	80.51	92.33		92.48	0.000385	1.81	890.23	147.13	0.21
166.571*	550	80.40	88.02		88.15	0.000465	1.61	340.83	68.47	0.23
166.571*	780	80.40	89.35		89.51	0.00054	1.78	441.49	93.66	0.24
166.571*	930	80.40	90.12		90.29	0.000552	1.83	532.40	135.61	0.24
166.571*	1090	80.40	90.85		91.02	0.000533	1.86	636.69	148.59	0.24
166.571*	1260	80.40	91.62		91.78	0.000478	1.85	752.14	151.27	0.23
166.571*	1420	80.40	92.27		92.43	0.000444	1.86	851.40	153.54	0.22

Table 7.10 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(P/P) (3/9)

River Sta.	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # C
166.428*	550	80.29	87.97		88.10	0.000533	1.61	340.78	70.35	0.23
166.428*	780	80.29	89.29		89.45	0.000572	1.78	438.83	79.00	0.24
166.428*	930	80.29	90.06		90.23	0.000607	1.85	504.68	100.08	0.25
166.428*	1090	80.29	90.78		90.96	0.000619	1.91	589.91	141.57	0.25
166.428*	1260	80.29	91.55		91.73	0.000595	1.91	702.92	152.79	0.24
166.428*	1420	80.29	92.20		92.38	0.000554	1.91	805.91	159.86	0.23
166.285*	550	80.18	87.92		88.05	0.000538	1.60	342.89	71.25	0.23
166.285*	780	80.18	89.24		89.39	0.000576	1.76	443.19	80.66	0.24
166.285*	930	80.18	90.00		90.17	0.000582	1.84	506.67	85.54	0.24
166.285*	1090	80.18	90.71		90.90	0.000609	1.91	572.87	106.66	0.25
166.285*	1260	80.18	91.48		91.67	0.000617	1.95	663.07	138.10	0.25
166.285*	1420	80.18	92.13		92.32	0.000595	1.96	760.92	153.61	0.24
166.142*	550	80.07	86.67	85.93	87.82	0.005916	4.75	115.82	62.58	0.77
166.142*	780	80.07	87.79	86.93	89.14	0.0062	5.15	151.41	71.19	0.78
166.142*	930	80.07	88.50	87.52	89.91	0.006004	5.26	176.65	76.60	0.76
166.142*	1090	80.07	89.10	88.09	90.62	0.006068	5.48	198.98	80.89	0.77
166.142*	1260	80.07	89.85	88.62	91.39	0.005653	5.50	228.89	86.19	0.74
166.142*	1420	80.07	90.47	89.10	92.05	0.00545	5.57	254.73	90.27	0.73
166	610	79.96	85.35	85.35	87.01	0.009859	5.71	106.86	57.26	1.00
166	870	79.96	86.32	86.32	88.29	0.009966	6.22	139.80	62.21	1.00
166	1050	79.96	86.91	86.91	89.06	0.010061	6.50	161.63	66.04	1.01
166	1230	79.96	87.45	87.45	89.76	0.01014	6.74	182.57	70.13	1.01
166	1450	79.96	88.06	88.06	90.55	0.010009	6.99	207.54	74.35	1.00
166	1650	79.96	88.57	88.57	91.21	0.009944	7.20	229.31	77.87	1.00
165	610	79.00	85.55		85.69	0.000532	1.64	372.90	93.48	0.26
165	870	79.00	86.70		86.86	0.000493	1.80	482.05	97.89	0.26
165	1050	79.00	87.49		87.66	0.000501	1.85	566.89	112.20	0.26
165	1230	79.00	88.06		88.25	0.000495	1.95	632.04	115.10	0.27
165	1450	79.00	88.69		88.91	0.000495	2.05	705.77	118.31	0.27
165	1650	79.00	89.20		89.43	0.000502	2.15	766.35	120.88	0.27
164	610	79.16	85.21		85.38	0.000539	1.82	334.28	69.95	0.27
164	870	79.16	86.33		86.55	0.000575	2.10	414.36	73.20	0.28
164	1050	79.16	87.06		87.31	0.00074	2.23	471.14	92.62	0.32
164	1230	79.16	87.62		87.90	0.000745	2.35	524.25	95.78	0.32
164	1450	79.16	88.24		88.55	0.000756	2.48	584.45	99.24	0.33
164	1650	79.16	88.73		89.07	0.000777	2.60	633.52	101.98	0.33
163	610	78.23	84.23		84.80	0.00233	3.35	182.26	45.04	0.53
163	870	78.23	85.18		85.92	0.002529	3.83	233.46	73.14	0.56
163	1050	78.23	85.75		86.57	0.002511	4.04	279.23	83.55	0.57
163	1230	78.23	86.30		87.15	0.002558	4.18	326.92	91.86	0.58
163	1450	78.23	86.94		87.80	0.002548	4.24	389.62	102.97	0.58
163	1650	78.23	87.45		88.32	0.002397	4.30	444.10	108.64	0.57
162	610	77.76	84.38		84.42	0.00014	0.95	714.82	155.83	0.14
162	870	77.76	85.42		85.48	0.000148	1.10	910.34	230.49	0.15

Table 7.10 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(P/P) (4/9)

River Sta.	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # C
162	1050	77.76	86.04		86.10	0.000152	1.18	1059.37	254.36	0.15
162	1230	77.76	86.60		86.67	0.000154	1.25	1209.02	278.99	0.15
162	1450	77.76	87.24		87.31	0.000157	1.33	1397.66	313.08	0.16
162	1650	77.76	87.76		87.84	0.000157	1.39	1567.88	336.61	0.16
161	610	77.88	84.08		84.27	0.0006	1.94	314.40	65.34	0.28
161	870	77.88	85.04		85.31	0.000708	2.29	379.30	69.12	0.31
161	1050	77.88	85.60		85.92	0.000777	2.51	418.54	71.31	0.33
161	1230	77.88	86.11		86.48	0.000837	2.70	455.36	73.31	0.35
161	1450	77.88	86.68		87.12	0.000901	2.91	498.09	75.56	0.36
161	1650	77.88	87.15		87.64	0.000959	3.09	533.54	77.37	0.38
160	610	77.38	83.94		84.05	0.000522	1.44	424.43	121.32	0.25
160	870	77.38	84.94		85.07	0.000473	1.59	546.89	124.28	0.24
160	1050	77.38	85.52		85.66	0.000466	1.70	619.05	125.99	0.24
160	1230	77.38	86.04		86.21	0.000462	1.79	689.58	138.60	0.25
160	1450	77.38	86.64		86.82	0.000458	1.90	773.96	144.18	0.25
160	1650	77.38	87.12		87.32	0.000462	1.99	844.84	149.34	0.25
159	610	77.46	83.61		83.77	0.000527	1.77	345.44	70.97	0.26
159	870	77.46	84.55		84.78	0.000614	2.11	412.72	71.83	0.28
159	1050	77.46	85.08		85.36	0.000679	2.33	450.96	72.31	0.30
159	1230	77.46	85.56		85.89	0.000741	2.53	485.81	72.75	0.31
159	1450	77.46	86.10		86.49	0.00081	2.76	525.24	73.25	0.33
159	1650	77.46	86.53		86.98	0.000879	2.97	556.38	73.63	0.34
158	610	76.63	83.31		83.47	0.000538	1.78	342.40	74.59	0.27
158	870	76.63	84.18		84.41	0.000709	2.11	412.25	85.66	0.31
158	1050	76.63	84.68		84.95	0.000796	2.30	455.99	91.83	0.33
158	1230	76.63	85.12		85.43	0.000895	2.47	498.24	99.49	0.35
158	1450	76.63	85.61		85.97	0.001049	2.64	551.53	115.00	0.38
158	1650	76.63	86.02		86.41	0.001091	2.77	599.84	121.92	0.39
157	610	77.18	83.29		83.37	0.00032	1.29	471.98	114.94	0.20
157	870	77.18	84.17		84.29	0.000351	1.51	574.97	118.07	0.22
157	1050	77.18	84.67		84.81	0.000376	1.66	634.36	119.83	0.23
157	1230	77.18	85.12		85.28	0.000401	1.79	688.33	121.41	0.24
157	1450	77.18	85.61		85.80	0.00043	1.94	748.57	123.16	0.25
157	1650	77.18	86.02		86.24	0.000456	2.06	799.22	124.60	0.26
156	610	76.26	83.03		83.17	0.000442	1.72	434.54	208.29	0.24
156	870	76.26	83.93		84.08	0.000434	1.89	636.50	243.55	0.24
156	1050	76.26	84.44		84.60	0.000429	1.99	765.68	263.65	0.25
156	1230	76.26	84.90		85.07	0.000424	2.06	891.33	281.82	0.25
156	1450	76.26	85.40		85.58	0.000418	2.15	1038.48	299.90	0.25
156	1650	76.26	85.82		86.00	0.000413	2.21	1167.03	314.47	0.25
155	610	75.36	82.75		82.86	0.00064	1.50	406.49	131.42	0.27
155	870	75.36	83.65		83.79	0.000567	1.65	527.07	134.32	0.27
155	1050	75.36	84.16		84.32	0.000562	1.76	595.17	135.94	0.27
155	1230	75.36	84.61		84.78	0.000566	1.87	656.48	137.37	0.27
155	1450	75.36	85.09		85.29	0.00058	2.01	723.15	138.92	0.28

Table 7.10 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(P/P) (5/9)

River Sta.	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # C
155	1650	75.36	85.48		85.71	0.000596	2.12	778.34	140.18	0.29
154	610	74.87	82.22		82.47	0.000849	2.23	276.40	76.61	0.33
154	870	74.87	83.07		83.40	0.000974	2.60	384.59	152.84	0.36
154	1050	74.87	83.55		83.92	0.001016	2.77	462.83	171.37	0.37
154	1230	74.87	83.99		84.38	0.001036	2.91	542.09	188.32	0.38
154	1450	74.87	84.47		84.88	0.001052	3.04	636.67	206.74	0.38
154	1650	74.87	84.87		85.30	0.001058	3.14	722.21	222.09	0.39
153	610	74.89	81.92		82.03	0.000622	1.53	411.83	154.31	0.27
153	870	74.89	82.82		82.95	0.000532	1.64	592.58	229.15	0.26
153	1050	74.89	83.33		83.47	0.00049	1.70	715.84	251.19	0.25
153	1230	74.89	83.80		83.94	0.000461	1.76	836.88	271.09	0.25
153	1450	74.89	84.29		84.45	0.00044	1.83	976.65	292.39	0.25
153	1650	74.89	84.70		84.86	0.000427	1.89	1100.11	309.99	0.25
152	610	74.50	81.20		81.46	0.001004	2.27	269.46	70.36	0.35
152	870	74.50	82.07		82.41	0.00106	2.61	368.05	134.87	0.37
152	1050	74.50	82.57		82.95	0.001074	2.79	439.32	148.97	0.38
152	1230	74.50	83.03		83.43	0.001077	2.93	510.33	161.81	0.38
152	1450	74.50	83.50		83.94	0.001096	3.10	590.74	175.21	0.39
152	1650	74.50	83.90		84.37	0.00111	3.23	661.95	186.27	0.40
151	610	74.33	80.90		81.06	0.000713	1.79	380.66	140.70	0.30
151	870	74.33	81.82		81.99	0.000677	1.92	517.89	153.92	0.29
151	1050	74.33	82.34		82.52	0.000658	2.02	599.02	156.97	0.30
151	1230	74.33	82.79		83.00	0.000674	2.15	671.80	172.46	0.30
151	1450	74.33	83.24		83.50	0.000733	2.34	761.20	222.61	0.32
151	1650	74.33	83.64		83.91	0.000747	2.47	856.49	265.20	0.33
150	610	73.67	80.28		80.53	0.00091	2.25	277.81	87.89	0.34
150	870	73.67	81.09		81.44	0.001043	2.65	360.68	132.03	0.37
150	1050	73.67	81.57		81.97	0.001101	2.87	437.37	184.01	0.39
150	1230	73.67	82.01		82.44	0.001102	3.01	528.64	223.41	0.39
150	1450	73.67	82.48		82.91	0.00108	3.11	633.28	223.77	0.39
150	1650	73.67	82.91		83.34	0.001031	3.15	729.42	224.12	0.38
149	610	73.20	79.78		80.09	0.001114	2.52	301.40	202.04	0.37
149	870	73.20	80.73		80.99	0.000877	2.52	535.06	270.20	0.34
149	1050	73.20	81.28		81.52	0.000752	2.49	691.52	292.31	0.32
149	1230	73.20	81.79		82.01	0.000662	2.47	844.01	312.36	0.31
149	1450	73.20	82.29		82.49	0.000615	2.49	1004.08	332.11	0.30
149	1650	73.20	82.74		82.94	0.000566	2.49	1159.35	350.20	0.29
148	610	72.59	79.52		79.66	0.000437	1.66	440.23	185.76	0.24
148	870	72.59	80.48		80.63	0.00041	1.82	632.10	212.46	0.24
148	1050	72.59	81.04		81.19	0.000399	1.90	754.08	226.12	0.24
148	1230	72.59	81.54		81.70	0.000389	1.98	871.48	238.52	0.24
148	1450	72.59	82.03		82.21	0.000398	2.09	990.63	250.48	0.25
148	1650	72.59	82.49		82.67	0.000393	2.17	1107.11	261.65	0.25
147	610	71.07	79.12		79.30	0.000554	1.96	368.02	136.34	0.27

Table 7.10 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(P/P) (69)

River Sta.	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # C
147	870	71.07	80.05		80.28	0.000587	2.21	505.06	156.63	0.28
147	1050	71.07	80.60		80.84	0.000603	2.35	593.60	168.59	0.29
147	1230	71.07	81.10		81.35	0.000612	2.47	680.33	179.54	0.29
147	1450	71.07	81.55		81.84	0.000654	2.64	764.54	189.52	0.31
147	1650	71.07	82.00		82.30	0.000661	2.74	851.56	199.27	0.31
146	610	72.29	78.62		78.88	0.000974	2.28	301.91	137.85	0.35
146	870	72.29	79.58		79.85	0.000921	2.44	454.71	177.74	0.35
146	1050	72.29	80.15		80.42	0.000864	2.49	561.95	195.45	0.34
146	1230	72.29	80.68		80.95	0.000809	2.52	669.84	211.78	0.33
146	1450	72.29	81.13		81.41	0.000828	2.63	768.11	225.62	0.34
146	1650	72.29	81.60		81.88	0.00079	2.67	876.34	239.55	0.34
145	610	71.99	78.44		78.53	0.000302	1.40	511.66	170.61	0.20
145	870	71.99	79.39		79.51	0.000303	1.57	676.71	173.84	0.20
145	1050	71.99	79.96		80.09	0.000305	1.68	776.33	175.76	0.21
145	1230	71.99	80.49		80.62	0.000308	1.77	869.08	179.23	0.21
145	1450	71.99	80.91		81.07	0.00034	1.93	945.72	181.67	0.22
145	1650	71.99	81.37		81.54	0.000347	2.03	1029.06	183.87	0.23
144	610	71.81	78.19		78.34	0.000583	1.72	373.47	155.88	0.27
144	870	71.81	79.14		79.31	0.000575	1.88	538.99	192.49	0.28
144	1050	71.81	79.72		79.90	0.000543	1.95	658.98	222.00	0.27
144	1230	71.81	80.26		80.44	0.000511	2.00	785.63	249.38	0.27
144	1450	71.81	80.68		80.88	0.000535	2.13	902.32	306.50	0.28
144	1650	71.81	81.16		81.35	0.000493	2.15	1061.02	350.30	0.27
143	610	71.61	77.85		77.97	0.000554	1.51	409.85	141.94	0.26
143	870	71.61	78.85		78.98	0.00045	1.61	605.13	205.01	0.24
143	1050	71.61	79.46		79.59	0.000403	1.66	730.38	207.21	0.23
143	1230	71.61	80.02		80.15	0.00037	1.71	846.39	209.22	0.23
143	1450	71.61	80.42		80.57	0.000396	1.84	930.03	210.66	0.24
143	1650	71.61	80.91		81.07	0.00038	1.90	1033.44	212.43	0.24
142	610	70.36	77.47		77.55	0.000615	1.27	482.20	199.18	0.26
142	870	70.36	78.62		78.69	0.000349	1.22	716.01	205.62	0.21
142	1050	70.36	79.27		79.34	0.00029	1.24	849.44	207.14	0.19
142	1230	70.36	79.85		79.93	0.000258	1.27	969.97	208.50	0.19
142	1450	70.36	80.23		80.33	0.000277	1.38	1050.91	209.94	0.20
142	1650	70.36	80.73		80.83	0.000267	1.43	1156.32	213.43	0.20
141	610	70.19	76.90		77.09	0.000594	1.96	312.08	64.94	0.28
141	870	70.19	78.09		78.34	0.000601	2.21	419.95	114.83	0.29
141	1050	70.19	78.75		79.02	0.000605	2.35	500.53	132.14	0.29
141	1230	70.19	79.33		79.62	0.000609	2.47	583.50	154.66	0.30
141	1450	70.19	79.62		79.99	0.000725	2.76	630.79	166.13	0.33
141	1650	70.19	80.11		80.50	0.000724	2.87	716.82	180.55	0.33
140	610	70.31	76.54		76.72	0.000552	1.85	330.55	69.96	0.27
140	870	70.31	77.74		77.96	0.00056	2.08	431.45	117.64	0.28
140	1050	70.31	78.39		78.64	0.000559	2.21	513.19	133.59	0.28
140	1230	70.31	78.97		79.24	0.000558	2.32	595.09	149.10	0.29

Table 7.10 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(P/P) (7/9)

River Sta.	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # C
140	1450	70.31	79.18		79.52	0.000693	2.64	627.06	154.73	0.32
140	1650	70.31	79.67		80.04	0.000697	2.75	705.77	167.79	0.33
139	610	69.94	76.17		76.39	0.000759	2.09	291.25	63.68	0.31
139	870	69.94	77.32		77.58	0.001058	2.25	386.51	98.85	0.36
139	1050	69.94	78.01		78.28	0.000956	2.30	456.65	104.81	0.35
139	1230	69.94	78.61		78.89	0.000884	2.36	520.24	107.82	0.34
139	1450	69.94	78.70		79.08	0.001161	2.74	530.58	121.66	0.39
139	1650	69.94	79.20		79.60	0.001094	2.82	595.46	130.73	0.39
138	610	69.06	75.60		75.81	0.00093	2.03	302.06	88.55	0.34
138	870	69.06	76.69		76.94	0.000821	2.19	410.84	107.66	0.33
138	1050	69.06	77.46		77.71	0.000707	2.24	496.80	116.80	0.31
138	1230	69.06	78.10		78.36	0.000655	2.31	573.91	124.54	0.30
138	1450	69.06	77.95		78.34	0.000994	2.81	555.42	122.02	0.37
138	1650	69.06	78.47		78.89	0.000968	2.92	622.73	145.89	0.37
137	610	69.36	75.32		75.45	0.000628	1.62	375.99	106.87	0.28
137	870	69.36	76.47		76.62	0.000524	1.72	504.39	113.78	0.26
137	1050	69.36	77.28		77.44	0.000451	1.76	597.06	116.53	0.25
137	1230	69.36	77.94		78.11	0.000424	1.82	674.57	118.78	0.24
137	1450	69.36	77.68		77.94	0.000678	2.25	644.57	117.92	0.31
137	1650	69.36	78.22		78.50	0.000656	2.33	708.77	119.76	0.31
136	610	69.06	74.97		75.15	0.000658	1.91	319.33	72.87	0.29
136	870	69.06	76.11		76.34	0.000669	2.15	405.16	78.10	0.30
136	1050	69.06	76.91		77.15	0.000862	2.18	482.31	111.37	0.33
136	1230	69.06	77.59		77.84	0.000809	2.19	562.92	123.44	0.33
136	1450	69.06	77.04		77.47	0.001523	2.91	497.59	113.76	0.44
136	1650	69.06	77.62		78.05	0.001433	2.91	566.62	123.97	0.43
135	610	68.09	74.51		74.77	0.00074	2.27	271.65	53.69	0.31
135	870	68.09	75.55		75.92	0.00086	2.71	330.63	58.95	0.34
135	1050	68.09	76.21		76.65	0.000917	2.95	374.27	71.32	0.35
135	1230	68.09	76.85		77.34	0.00094	3.14	421.80	76.90	0.36
135	1450	68.09	73.51	73.43	75.71	0.007838	6.58	220.56	48.68	0.97
135	1650	68.09	73.86	73.86	76.32	0.008017	6.95	238.13	50.45	0.99
134	660	68.33	74.26	71.45	74.43	0.000565	1.80	368.78	88.89	0.27
134	940	68.33	75.34	72.01	75.55	0.000549	2.05	475.54	115.08	0.28
134	1150	68.33	76.01	72.39	76.26	0.000546	2.21	555.51	120.00	0.28
134	1380	68.33	76.67	72.77	76.94	0.000548	2.36	633.70	120.00	0.29
134	530	68.33	73.68	70.83	73.82	0.000568	1.66	318.98	82.66	0.27
134	580	68.33	73.91	70.98	74.07	0.000566	1.72	338.41	85.04	0.27
133	660	68.04	73.98	71.17	74.14	0.00057	1.79	371.16	94.88	0.27
133	940	68.04	75.06	71.72	75.27	0.000559	2.03	477.72	103.87	0.28
133	1150	68.04	75.74	72.10	75.98	0.000556	2.19	550.61	111.30	0.28
133	1380	68.04	76.39	72.49	76.66	0.000559	2.35	625.26	119.57	0.29
133	530	68.04	73.40	70.54	73.54	0.000568	1.66	319.35	81.39	0.27
133	580	68.04	73.63	70.69	73.78	0.00057	1.71	338.52	88.03	0.27

Table 7.10 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(P/P) (8/9)

River Sta.	Q Total (m ³ /s)	Min Ch El (m)	WS. Elev (m)	Crit WS. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # C
132	660	67.63	73.56	70.95	73.75	0.000697	1.94	340.41	79.79	0.30
132	940	67.63	74.63	71.52	74.88	0.000701	2.19	430.75	96.75	0.31
132	1150	67.63	75.30	71.91	75.59	0.000705	2.36	496.05	98.05	0.32
132	1380	67.63	75.95	72.31	76.27	0.000709	2.53	568.26	120.00	0.32
132	530	67.63	72.98	70.34	73.15	0.000694	1.80	295.02	77.52	0.29
132	580	67.63	73.21	70.42	73.39	0.000695	1.85	312.87	78.42	0.30
131	660	67.31	73.27	70.54	73.44	0.000609	1.83	360.63	83.55	0.28
131	940	67.31	74.34	71.10	74.56	0.000615	2.08	455.36	103.87	0.29
131	1150	67.31	75.02	71.47	75.27	0.000618	2.23	530.60	113.54	0.30
131	1380	67.31	75.66	71.86	75.94	0.000619	2.39	605.71	120.00	0.30
131	530	67.31	72.69	69.92	72.84	0.000605	1.69	313.10	81.24	0.28
131	580	67.31	72.92	70.07	73.07	0.000606	1.75	331.80	82.15	0.28
130	660	67.14	72.94	70.24	73.12	0.000625	1.85	357.63	83.42	0.28
130	940	67.14	74.01	70.80	74.24	0.000635	2.09	449.34	88.78	0.29
130	1150	67.14	74.68	71.18	74.94	0.000642	2.26	516.52	105.55	0.30
130	1380	67.14	75.32	71.56	75.62	0.000643	2.42	588.64	120.00	0.31
130	530	67.14	72.37	69.63	72.52	0.000621	1.71	310.39	81.13	0.28
130	580	67.14	72.60	69.78	72.75	0.000623	1.76	328.97	82.04	0.28
129	660	66.88	72.65	69.98	72.82	0.00064	1.86	354.94	83.29	0.29
129	940	66.88	73.71	70.53	73.94	0.000647	2.10	453.52	101.63	0.30
129	1150	66.88	74.38	70.91	74.64	0.000646	2.26	529.82	120.00	0.30
129	1380	66.88	75.03	71.29	75.32	0.000637	2.40	607.19	120.00	0.31
129	530	66.88	72.07	69.37	72.22	0.000636	1.72	307.91	81.01	0.28
129	580	66.88	72.30	69.52	72.46	0.000637	1.78	326.43	81.91	0.28
128	660	66.60	72.32	69.70	72.50	0.000658	1.88	351.94	83.38	0.29
128	940	66.60	73.38	70.26	73.61	0.000668	2.12	444.13	98.16	0.30
128	1150	66.60	74.05	70.64	74.31	0.000664	2.28	517.73	120.00	0.31
128	1380	66.60	74.69	71.02	74.99	0.000653	2.43	595.57	120.00	0.31
128	530	66.60	71.75	69.09	71.90	0.000657	1.74	304.97	81.07	0.29
128	580	66.60	71.97	69.24	72.14	0.000657	1.79	323.48	81.99	0.29
127	660	66.06	71.76	68.94	71.92	0.000541	1.73	382.05	88.55	0.27
127	940	66.06	72.82	69.51	73.01	0.000558	1.97	477.46	92.72	0.28
127	1150	66.06	73.48	69.87	73.71	0.000568	2.13	546.57	115.30	0.28
127	1380	66.06	74.14	70.23	74.40	0.000563	2.28	623.18	117.89	0.29
127	530	66.06	71.19	68.37	71.32	0.000536	1.60	332.26	86.30	0.26
127	580	66.06	71.42	68.51	71.56	0.000538	1.65	351.94	87.19	0.26
126	660	65.66	71.37	68.65	71.53	0.000568	1.77	375.21	93.35	0.27
126	940	65.66	72.42	69.20	72.62	0.00056	2.00	485.65	111.21	0.28
126	1150	65.66	73.08	69.57	73.31	0.000564	2.15	560.71	115.62	0.28
126	1380	65.66	73.74	69.93	74.00	0.000568	2.30	638.43	119.94	0.29
126	530	65.66	70.80	68.05	70.93	0.000577	1.63	324.40	86.93	0.27
126	580	65.66	71.02	68.20	71.17	0.000572	1.69	344.30	87.85	0.27
125	660	65.31	70.94	68.39	71.13	0.000689	1.90	346.71	85.63	0.30
125	940	65.31	72.00	68.95	72.23	0.000663	2.14	454.84	105.80	0.30
125	1150	65.31	72.66	69.33	72.93	0.00065	2.29	527.19	112.89	0.30

Table 7.10 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR MIDDLE REACH(P/P) (9/9)

River Sta	Q Total (m3/s)	Min Ch El (m)	WS. Elev (m)	Crit WS (m)	E.G Elev (m)	E.G Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # C
125	1380	65.31	73.32	69.71	73.62	0.000641	2.45	602.69	116.83	0.31
125	530	65.31	70.37	67.81	70.53	0.000692	1.77	299.87	80.81	0.29
125	580	65.31	70.60	67.95	70.77	0.000689	1.82	318.50	81.73	0.29
124	660	64.90	70.57	67.26	70.71	0.000447	1.66	398.01	83.90	0.24
124	940	64.90	71.62	67.97	71.81	0.00048	1.92	495.35	106.17	0.26
124	1150	64.90	72.28	68.33	72.50	0.000502	2.10	566.61	111.87	0.27
124	1380	64.90	72.93	68.71	73.18	0.00052	2.26	641.39	117.56	0.28
124	530	64.90	70.01	66.94	70.13	0.000422	1.51	351.45	82.19	0.23
124	580	64.90	70.24	67.06	70.36	0.000431	1.57	370.08	82.88	0.24
123	660	64.42	70.07	67.48	70.26	0.000658	1.89	356.83	120.00	0.29
123	940	64.42	71.14	68.04	71.35	0.000602	2.09	484.26	120.00	0.29
123	1150	64.42	71.79	68.41	72.04	0.000592	2.24	562.58	120.00	0.29
123	1380	64.42	72.44	68.80	72.72	0.000586	2.39	640.58	120.00	0.30
123	530	64.42	69.53	66.91	69.68	0.000659	1.74	304.74	81.12	0.29
123	580	64.42	69.75	67.05	69.91	0.000663	1.80	322.56	84.75	0.29
122	660	64.01	69.56	67.08	69.75	0.00072	1.93	341.80	82.97	0.30
122	940	64.01	70.64	67.63	70.88	0.000708	2.17	439.17	102.74	0.31
122	1150	64.01	71.29	68.01	71.56	0.000704	2.33	507.66	108.44	0.31
122	1380	64.01	71.94	68.40	72.25	0.000693	2.49	580.32	115.41	0.32
122	530	64.01	69.02	66.50	69.19	0.000709	1.78	297.65	80.82	0.30
122	580	64.01	69.24	66.60	69.41	0.000713	1.84	315.08	81.67	0.30
121	660	62.87	69.18	66.75	69.37	0.000766	1.97	335.53	82.60	0.31
121	940	62.87	70.27	67.32	70.51	0.000729	2.19	442.27	114.20	0.31
121	1150	62.87	70.93	67.69	71.20	0.000706	2.33	518.80	116.98	0.31
121	1380	62.87	71.59	68.07	71.89	0.000684	2.47	597.03	119.38	0.32
121	530	62.87	68.64	66.17	68.81	0.000755	1.81	292.11	80.48	0.30
121	580	62.87	68.85	66.29	69.03	0.000759	1.88	309.27	81.33	0.31
120	660	62.44	68.57	65.75	68.76	0.000709	1.92	343.97	94.02	0.30
120	940	62.44	69.71	66.60	69.93	0.00066	2.12	463.16	114.71	0.30
120	1150	62.44	70.38	66.97	70.64	0.000647	2.25	542.14	118.28	0.30
120	1380	62.44	71.07	67.36	71.35	0.000628	2.38	623.64	120.00	0.30
120	530	62.44	68.06	65.36	68.22	0.000682	1.76	301.04	80.57	0.29
120	580	62.44	68.26	65.51	68.43	0.000693	1.83	317.69	81.61	0.29
119	660	63.00	68.10	66.12	68.35	0.001084	2.23	295.90	78.38	0.37
119	940	63.00	69.30	66.68	69.58	0.000859	2.36	423.18	119.60	0.34
119	1150	63.00	70.00	67.06	70.30	0.000791	2.48	506.90	119.60	0.33
119	1380	63.00	70.70	67.44	71.03	0.000742	2.60	590.62	119.60	0.33
119	530	63.00	67.60	65.50	67.82	0.001084	2.06	257.09	76.86	0.36
119	580	63.00	67.80	65.65	68.03	0.001082	2.13	272.53	77.47	0.36

Table 7.11 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR LOWER REACH (1/13)

River Sta	Q Total (m3/s)	Min Ch E (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # C
58.5	480	15.88	21.64	21.01	22.77	0.0042	4.73	101.56	27.13	0.78
58.5	730	15.88	22.12	22.12	24.18	0.00678	6.36	114.81	27.75	1.00
58.5	800	15.88	22.43	22.43	24.56	0.00676	6.47	123.71	29.07	1.00
58.5	830	15.88	22.59	22.59	24.72	0.00672	6.47	128.24	30.07	1.00
58.5	860	15.88	22.74	22.74	24.87	0.00667	6.47	132.90	31.07	1.00
58.5	880	15.88	22.83	22.83	24.97	0.00667	6.49	135.65	31.64	1.00
58.5	910	15.88	22.96	22.96	25.12	0.00665	6.50	139.98	32.52	1.00
58	480	18.00	22.07	20.02	22.24	0.00065	1.84	261.51	80.22	0.32
58	730	18.00	23.13	20.63	23.36	0.00061	2.10	348.26	83.22	0.33
58	800	18.00	23.41	20.79	23.64	0.0006	2.16	371.19	83.99	0.33
58	830	18.00	23.52	20.85	23.77	0.0006	2.18	380.99	84.32	0.33
58	860	18.00	23.64	20.97	23.89	0.00059	2.20	390.78	84.65	0.33
58	880	18.00	23.72	21.06	23.97	0.00059	2.21	397.34	84.86	0.33
58	910	18.00	23.83	21.13	24.08	0.00059	2.24	406.98	85.18	0.33
57	480	17.81	21.71	19.75	21.88	0.00069	1.85	259.45	82.75	0.33
57	730	17.81	22.80	20.33	23.02	0.00062	2.07	352.57	86.93	0.33
57	800	17.81	23.09	20.48	23.32	0.0006	2.12	377.25	88.00	0.33
57	830	17.81	23.21	20.54	23.44	0.0006	2.14	387.84	88.46	0.33
57	860	17.81	23.33	20.61	23.56	0.00059	2.16	398.43	88.92	0.33
57	880	17.81	23.41	20.62	23.65	0.00059	2.17	405.56	89.22	0.32
57	910	17.81	23.52	20.82	23.77	0.00058	2.19	416.01	89.66	0.32
56	480	11.38	21.39	18.50	21.54	0.00051	1.75	273.61	69.98	0.28
56	730	11.38	22.48	19.20	22.70	0.00055	2.08	351.58	73.19	0.30
56	800	11.38	22.76	19.38	22.99	0.00056	2.15	372.09	74.01	0.31
56	830	11.38	22.87	19.45	23.12	0.00056	2.18	380.91	74.36	0.31
56	860	11.38	22.99	19.53	23.24	0.00056	2.21	389.76	74.71	0.31
56	880	11.38	23.07	19.58	23.32	0.00056	2.22	395.73	74.95	0.31
56	910	11.38	23.19	19.64	23.45	0.00056	2.25	404.44	75.29	0.31
55	480	14.04	21.04	18.85	21.20	0.00071	1.77	270.63	90.67	0.33
55	730	14.04	22.17	19.47	22.36	0.00059	1.94	375.58	95.16	0.31
55	800	14.04	22.46	19.61	22.66	0.00057	1.98	403.15	96.31	0.31
55	830	14.04	22.58	19.68	22.79	0.00056	2.00	415.08	96.80	0.31
55	860	14.04	22.71	19.75	22.91	0.00055	2.01	427.05	97.29	0.31
55	880	14.04	22.79	19.79	23.00	0.00054	2.02	435.16	97.62	0.31
55	910	14.04	22.91	19.84	23.12	0.00053	2.04	446.94	98.10	0.30
54	480	14.14	20.80	17.96	20.92	0.00039	1.53	313.65	85.42	0.25
54	730	14.14	21.95	18.56	22.11	0.00038	1.76	413.85	88.97	0.26
54	800	14.14	22.24	18.71	22.41	0.00038	1.82	439.91	89.87	0.26
54	830	14.14	22.36	18.78	22.54	0.00038	1.84	451.19	90.26	0.26
54	860	14.14	22.49	18.85	22.67	0.00038	1.86	462.53	90.65	0.26
54	880	14.14	22.57	18.90	22.75	0.00038	1.87	470.21	90.91	0.26
54	910	14.14	22.70	18.95	22.88	0.00038	1.89	481.33	91.29	0.26
53	480	13.55	20.64	17.25	20.75	0.00025	1.44	332.69	69.05	0.21
53	730	13.55	21.77	17.86	21.93	0.0003	1.77	411.67	71.73	0.24
53	800	13.55	22.05	18.01	22.22	0.00031	1.85	432.09	72.41	0.24

Table 7.11 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR LOWER REACH (2/13)

River Sta.	Q Total (m ³ /s)	Min Ch E (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude #	C
53	830	13.55	22.17	18.08	22.35	0.00032	1.88	440.97	72.71	0.24	
53	860	13.55	22.29	18.15	22.48	0.00032	1.91	449.90	73.00	0.25	
53	880	13.55	22.38	18.19	22.57	0.00032	1.93	455.97	73.20	0.25	
53	910	13.55	22.50	18.25	22.69	0.00033	1.96	464.73	73.48	0.25	
52	480	12.73	20.51	17.11	20.61	0.00031	1.38	347.84	92.40	0.23	
52	730	12.73	21.63	17.73	21.76	0.00032	1.61	453.78	96.87	0.24	
52	800	12.73	21.91	17.89	22.05	0.00032	1.66	481.46	98.00	0.24	
52	830	12.73	22.04	17.95	22.18	0.00032	1.68	493.57	98.49	0.24	
52	860	12.73	22.16	18.02	22.31	0.00031	1.70	505.78	98.99	0.24	
52	880	12.73	22.24	18.06	22.39	0.00031	1.71	514.12	99.32	0.24	
52	910	12.73	22.36	18.14	22.52	0.00031	1.73	526.12	99.80	0.24	
51	480	12.30	20.36	16.96	20.45	0.00028	1.33	359.77	95.28	0.22	
51	730	12.30	21.47	17.57	21.60	0.00029	1.56	468.74	99.75	0.23	
51	800	12.30	21.76	17.72	21.89	0.00029	1.61	497.24	100.89	0.23	
51	830	12.30	21.88	17.79	22.02	0.00029	1.63	509.75	101.39	0.23	
51	860	12.30	22.01	17.83	22.14	0.00029	1.65	522.39	101.88	0.23	
51	880	12.30	22.09	17.89	22.23	0.00029	1.66	531.05	102.22	0.23	
51	910	12.30	22.21	17.96	22.35	0.00029	1.67	543.46	102.71	0.23	
50	480	14.12	20.18	17.21	20.29	0.00037	1.45	331.37	94.78	0.25	
50	730	14.12	21.30	17.82	21.44	0.00035	1.66	439.81	99.25	0.25	
50	800	14.12	21.59	17.99	21.74	0.00035	1.71	468.20	100.39	0.25	
50	830	14.12	21.71	18.05	21.86	0.00035	1.73	480.72	100.89	0.25	
50	860	14.12	21.84	18.11	21.99	0.00034	1.74	493.41	101.39	0.25	
50	880	14.12	21.92	18.15	22.08	0.00034	1.75	502.12	101.74	0.25	
50	910	14.12	22.04	18.22	22.20	0.00034	1.77	514.56	102.22	0.25	
49	480	12.22	20.06	16.66	20.16	0.00022	1.41	349.47	82.71	0.20	
49	730	12.22	21.15	17.26	21.30	0.00026	1.73	446.58	94.55	0.23	
49	800	12.22	21.43	17.41	21.59	0.00026	1.80	473.22	96.89	0.23	
49	830	12.22	21.55	17.47	21.72	0.00027	1.83	485.14	97.65	0.23	
49	860	12.22	21.67	17.53	21.85	0.00027	1.86	497.28	98.41	0.23	
49	880	12.22	21.76	17.58	21.93	0.00027	1.88	505.67	98.93	0.23	
49	910	12.22	21.88	17.65	22.06	0.00027	1.90	517.64	99.67	0.23	
48	480	12.51	19.91	16.88	20.00	0.00032	1.32	362.57	105.20	0.23	
48	730	12.51	21.01	17.48	21.12	0.0003	1.52	480.61	109.61	0.23	
48	800	12.51	21.29	17.63	21.41	0.0003	1.56	511.57	110.74	0.23	
48	830	12.51	21.41	17.69	21.54	0.0003	1.58	525.38	111.24	0.23	
48	860	12.51	21.54	17.74	21.67	0.00029	1.59	539.42	111.75	0.23	
48	880	12.51	21.62	17.78	21.75	0.00029	1.60	549.13	112.10	0.23	
48	910	12.51	21.75	17.84	21.88	0.00029	1.62	562.90	112.59	0.23	
47	480	11.77	19.66	16.47	19.76	0.00024	1.42	365.38	100.61	0.21	
47	730	11.77	20.73	17.09	20.88	0.00027	1.72	475.46	104.35	0.23	
47	800	11.77	21.01	17.23	21.16	0.00027	1.79	504.37	105.31	0.23	
47	830	11.77	21.13	17.31	21.29	0.00027	1.81	517.42	105.74	0.23	
47	860	11.77	21.26	17.37	21.42	0.00027	1.84	530.75	106.18	0.23	
47	880	11.77	21.35	17.41	21.51	0.00027	1.85	540.02	106.49	0.23	
47	910	11.77	21.47	17.47	21.64	0.00027	1.87	553.05	106.91	0.23	

Table 7.11 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR LOWER REACH (3/13)

River Sta.	Q Total (m ³ /s)	Min Ch E (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # G
46	480	12.24	19.57	16.63	19.65	0.00021	1.34	441.94	122.51	0.20
46	730	12.24	20.64	17.28	20.75	0.00023	1.60	576.92	129.77	0.21
46	800	12.24	20.92	17.42	21.04	0.00023	1.66	613.11	132.33	0.21
46	830	12.24	21.04	17.49	21.16	0.00023	1.68	629.64	133.48	0.22
46	860	12.24	21.17	17.54	21.29	0.00023	1.70	646.65	134.65	0.22
46	880	12.24	21.26	17.58	21.38	0.00023	1.71	658.56	135.46	0.22
46	910	12.24	21.38	17.63	21.51	0.00023	1.73	675.31	136.43	0.22
45	480	12.39	19.39	16.33	19.48	0.00032	1.38	347.07	95.91	0.23
45	730	12.39	20.44	16.93	20.58	0.00033	1.62	450.67	100.07	0.24
45	800	12.39	20.72	17.08	20.86	0.00033	1.67	478.17	100.61	0.24
45	830	12.39	20.84	17.14	20.99	0.00033	1.69	490.74	100.86	0.24
45	860	12.39	20.97	17.21	21.12	0.00032	1.71	503.64	101.12	0.24
45	880	12.39	21.06	17.25	21.21	0.00032	1.72	512.68	101.30	0.24
45	910	12.39	21.18	17.31	21.34	0.00032	1.73	525.24	101.55	0.24
44	480	11.45	19.26	15.97	19.35	0.00026	1.29	378.21	100.00	0.21
44	730	11.45	20.31	16.58	20.43	0.00027	1.54	483.33	100.00	0.22
44	800	11.45	20.59	16.74	20.72	0.00027	1.60	510.69	100.00	0.22
44	830	11.45	20.71	16.80	20.84	0.00027	1.62	523.23	100.00	0.22
44	860	11.45	20.84	16.87	20.98	0.00027	1.64	536.10	100.00	0.22
44	880	11.45	20.93	16.90	21.07	0.00027	1.65	545.14	100.00	0.22
44	910	11.45	21.05	16.97	21.20	0.00027	1.67	557.59	100.00	0.22
43	480	11.41	19.11	15.85	19.20	0.00027	1.32	364.44	94.77	0.21
43	730	11.41	20.15	16.43	20.27	0.0003	1.57	465.07	98.93	0.23
43	800	11.41	20.42	16.59	20.55	0.0003	1.63	492.18	100.02	0.23
43	830	11.41	20.55	16.65	20.68	0.0003	1.64	504.85	100.53	0.23
43	860	11.41	20.68	16.72	20.82	0.0003	1.66	518.01	101.70	0.23
43	880	11.41	20.77	16.76	20.91	0.00029	1.67	527.39	101.89	0.23
43	910	11.41	20.90	16.82	21.04	0.00029	1.69	540.25	102.14	0.23
42	480	12.25	18.92	15.83	19.02	0.0003	1.36	353.57	96.38	0.23
42	730	12.25	19.95	16.42	20.08	0.00032	1.61	455.91	101.07	0.24
42	800	12.25	20.22	16.57	20.36	0.00032	1.66	483.43	101.62	0.24
42	830	12.25	20.35	16.63	20.49	0.00031	1.68	496.43	101.87	0.24
42	860	12.25	20.48	16.70	20.63	0.00031	1.70	509.95	102.14	0.24
42	880	12.25	20.58	16.74	20.73	0.0003	1.70	519.61	102.33	0.24
42	910	12.25	20.71	16.80	20.86	0.0003	1.72	532.73	102.58	0.24
41	480	11.62	18.77	15.53	18.86	0.00028	1.32	363.08	96.52	0.22
41	730	11.62	19.79	16.13	19.91	0.00031	1.58	463.29	100.59	0.23
41	800	11.62	20.06	16.28	20.19	0.00031	1.63	490.72	101.67	0.24
41	830	11.62	20.19	16.35	20.33	0.0003	1.65	503.90	102.19	0.24
41	860	11.62	20.32	16.41	20.46	0.0003	1.66	517.72	102.50	0.24
41	880	11.62	20.42	16.45	20.56	0.0003	1.67	527.84	105.00	0.23
41	910	11.62	20.55	16.51	20.69	0.00029	1.68	541.52	105.00	0.23
40	480	11.61	18.61	15.40	18.70	0.00028	1.32	363.59	96.72	0.22
40	730	11.61	19.61	16.00	19.74	0.00031	1.58	462.40	100.72	0.24
40	800	11.61	19.88	16.14	20.02	0.00031	1.63	489.73	101.80	0.24

Table 7.11 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR LOWER REACH (4/13)

River Sta.	Q Total (m ³ /s)	Min Ch E (m)	W.S. Elev (m)	Crit WS. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # C
40	830	11.61	20.01	16.21	20.15	0.00031	1.65	503.09	102.57	0.24
40	860	11.61	20.15	16.27	20.29	0.0003	1.66	517.41	104.14	0.24
40	880	11.61	20.25	16.31	20.39	0.0003	1.67	527.84	104.34	0.24
40	910	11.61	20.38	16.37	20.53	0.00029	1.68	541.72	104.60	0.23
39	480	11.24	18.44	15.28	18.53	0.00028	1.32	362.57	96.89	0.22
39	730	11.24	19.43	15.87	19.55	0.00031	1.59	459.65	100.82	0.24
39	800	11.24	19.69	16.01	19.83	0.00032	1.64	486.87	101.89	0.24
39	830	11.24	19.83	16.07	19.97	0.00031	1.66	500.44	102.42	0.24
39	860	11.24	19.97	16.15	20.11	0.00031	1.67	514.97	102.89	0.24
39	880	11.24	20.07	16.19	20.21	0.0003	1.67	525.72	103.78	0.24
39	910	11.24	20.21	16.25	20.35	0.00029	1.69	539.86	103.97	0.23
38	480	13.64	18.26	15.76	18.37	0.00041	1.48	324.63	97.44	0.26
38	730	13.64	19.22	16.33	19.38	0.00042	1.74	420.73	100.97	0.27
38	800	13.64	19.49	16.48	19.66	0.00041	1.79	448.80	105.00	0.27
38	830	13.64	19.63	16.54	19.80	0.0004	1.80	463.14	105.00	0.27
38	860	13.64	19.78	16.59	19.94	0.00039	1.80	478.54	105.00	0.27
38	880	13.64	19.89	16.69	20.05	0.00038	1.80	489.95	105.00	0.26
38	910	13.64	20.03	16.79	20.19	0.00037	1.81	504.71	105.00	0.26
37	480	12.79	18.09	15.42	18.19	0.00033	1.34	357.01	106.99	0.23
37	730	12.79	19.06	15.99	19.19	0.00034	1.58	462.41	110.39	0.25
37	800	12.79	19.34	16.13	19.47	0.00033	1.62	492.85	111.04	0.25
37	830	12.79	19.48	16.19	19.62	0.00032	1.63	508.59	111.37	0.24
37	860	12.79	19.63	16.25	19.77	0.00031	1.64	525.63	111.73	0.24
37	880	12.79	19.75	16.29	19.88	0.0003	1.63	538.35	112.00	0.24
37	910	12.79	19.89	16.35	20.03	0.0003	1.64	554.65	112.34	0.24
36	480	13.57	17.85	15.50	17.98	0.00048	1.56	308.54	96.66	0.28
36	730	13.57	18.81	16.08	18.98	0.00048	1.81	402.68	100.48	0.29
36	800	13.57	19.09	16.23	19.26	0.00047	1.86	430.85	101.59	0.29
36	830	13.57	19.24	16.29	19.41	0.00045	1.86	445.96	102.19	0.28
36	860	13.57	19.40	16.34	19.57	0.00044	1.86	462.48	102.83	0.28
36	880	13.57	19.52	16.38	19.69	0.00042	1.85	474.95	103.32	0.28
36	910	13.57	19.67	16.44	19.85	0.00041	1.85	490.66	103.92	0.27
35	480	11.68	17.64	15.07	17.75	0.00042	1.49	322.09	96.47	0.26
35	730	11.68	18.59	15.64	18.75	0.00044	1.76	415.47	100.14	0.28
35	800	11.68	18.87	15.79	19.04	0.00043	1.80	444.09	100.71	0.27
35	830	11.68	19.03	15.85	19.19	0.00041	1.81	459.81	101.02	0.27
35	860	11.68	19.20	15.91	19.36	0.00039	1.80	477.04	101.36	0.27
35	880	11.68	19.33	15.95	19.49	0.00038	1.80	490.09	101.62	0.26
35	910	11.68	19.49	16.02	19.65	0.00036	1.80	506.18	101.93	0.26
34	480	12.93	17.43	15.11	17.55	0.0005	1.58	304.01	96.27	0.28
34	730	12.93	18.37	15.68	18.54	0.00051	1.84	396.48	100.04	0.30
34	800	12.93	18.66	15.82	18.84	0.00049	1.88	425.92	101.21	0.29
34	830	12.93	18.83	15.88	19.01	0.00046	1.87	442.68	101.87	0.29
34	860	12.93	19.01	15.95	19.19	0.00044	1.86	461.19	102.59	0.28
34	880	12.93	19.15	15.99	19.32	0.00042	1.85	475.31	103.14	0.28
34	910	12.93	19.31	16.05	19.48	0.0004	1.85	492.45	103.80	0.27

Table 7.11 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR LOWER REACH (5/13)

River Sta.	Q Total (m3/s)	Min Ch E (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # G
33	480	13.22	17.19	15.04	17.33	0.00058	1.66	289.24	95.89	0.30
33	730	13.22	18.13	15.62	18.32	0.00057	1.91	381.51	99.66	0.31
33	800	13.22	18.44	15.76	18.63	0.00054	1.94	412.02	100.88	0.31
33	830	13.22	18.62	15.82	18.81	0.00051	1.93	429.97	101.59	0.30
33	860	13.22	18.81	15.88	19.00	0.00047	1.91	449.83	102.37	0.29
33	880	13.22	18.96	15.92	19.14	0.00045	1.89	465.04	102.96	0.28
33	910	13.22	19.13	15.98	19.32	0.00042	1.88	483.08	103.33	0.28
32	480	13.05	16.89	14.87	17.05	0.00064	1.77	271.41	87.17	0.32
32	730	13.05	17.82	15.43	18.03	0.00069	2.04	358.68	99.11	0.34
32	800	13.05	18.15	15.57	18.36	0.00063	2.04	391.43	100.38	0.33
32	830	13.05	18.35	15.63	18.56	0.00058	2.02	411.47	101.14	0.32
32	860	13.05	18.57	15.69	18.77	0.00053	1.98	433.55	101.98	0.31
32	880	13.05	18.73	15.73	18.92	0.00049	1.95	450.41	102.62	0.30
32	910	13.05	18.92	15.79	19.11	0.00046	1.94	469.87	103.34	0.29
31	480	12.92	16.61	14.74	16.78	0.00079	1.83	261.76	93.35	0.35
31	730	12.92	17.54	15.32	17.76	0.00073	2.09	349.57	95.21	0.35
31	800	12.92	17.90	15.46	18.12	0.00065	2.09	383.66	95.92	0.33
31	830	12.92	18.12	15.52	18.33	0.00059	2.05	405.00	96.37	0.32
31	860	12.92	18.36	15.58	18.56	0.00053	2.01	428.16	96.85	0.30
31	880	12.92	18.54	15.63	18.74	0.00049	1.97	445.69	97.21	0.29
31	910	12.92	18.74	15.69	18.93	0.00046	1.96	465.29	97.61	0.29
30	490	12.60	15.74	14.30	15.98	0.00099	2.13	229.57	76.67	0.39
30	760	12.60	16.67	14.87	16.99	0.00099	2.52	305.15	86.50	0.41
30	880	12.60	17.02	15.10	17.38	0.00099	2.67	335.90	88.14	0.42
30	960	12.60	17.23	15.25	17.62	0.00101	2.76	354.96	90.59	0.42
30	1050	12.60	17.46	15.41	17.88	0.00102	2.87	375.57	91.41	0.43
30	1120	12.60	17.63	15.53	18.07	0.00103	2.95	391.00	92.07	0.43
30	1200	12.60	17.81	15.66	18.28	0.00104	3.04	408.11	95.08	0.44
29	490	11.93	15.43	13.87	15.63	0.00081	1.94	252.37	83.64	0.36
29	760	11.93	16.37	14.41	16.63	0.00082	2.29	331.71	91.44	0.37
29	880	11.93	16.72	14.63	17.02	0.00083	2.43	366.55	102.60	0.38
29	960	11.93	16.93	14.77	17.25	0.00085	2.52	388.38	103.74	0.39
29	1050	11.93	17.15	14.92	17.50	0.00086	2.61	411.81	104.94	0.39
29	1120	11.93	17.32	15.03	17.68	0.00087	2.68	429.41	105.84	0.40
29	1200	11.93	17.50	15.16	17.89	0.00089	2.76	448.90	106.82	0.40
28	490	11.55	14.97	13.40	15.16	0.00084	1.98	247.86	82.76	0.36
28	760	11.55	15.88	13.95	16.16	0.00086	2.34	325.38	86.35	0.38
28	880	11.55	16.23	14.18	16.54	0.00087	2.47	362.12	120.60	0.39
28	960	11.55	16.44	14.32	16.77	0.00088	2.56	388.21	127.75	0.39
28	1050	11.55	16.66	14.48	17.01	0.00088	2.65	416.67	128.26	0.40
28	1120	11.55	16.82	14.60	17.19	0.00088	2.71	437.96	128.64	0.40
28	1200	11.55	17.01	14.73	17.39	0.00088	2.78	461.41	129.06	0.40
27	490	11.15	14.60	13.04	14.80	0.00084	1.99	249.63	102.30	0.37
27	760	11.15	15.52	13.60	15.79	0.00082	2.32	348.87	123.39	0.38
27	880	11.15	15.87	13.82	16.16	0.00082	2.43	392.77	125.37	0.38

Table 7.11 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR LOWER REACH (6/13)

River Sta.	Q Total (m ³ /s)	Min Ch E (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude #	C
27	960	11.15	16.08	13.97	16.39	0.00082	2.51	418.99	125.78	0.38	
27	1050	11.15	16.30	14.12	16.63	0.00082	2.59	447.15	126.22	0.39	
27	1120	11.15	16.47	14.24	16.81	0.00083	2.65	468.16	126.54	0.39	
27	1200	11.15	16.65	14.38	17.01	0.00083	2.72	491.35	127.81	0.39	
26	490	11.01	14.14	12.69	14.36	0.00096	2.09	234.92	80.27	0.39	
26	760	11.01	15.05	13.26	15.36	0.00096	2.46	314.48	118.51	0.40	
26	880	11.01	15.40	13.49	15.74	0.00094	2.58	361.12	140.00	0.41	
26	960	11.01	15.61	13.63	15.96	0.00094	2.66	390.06	140.00	0.41	
26	1050	11.01	15.83	13.79	16.21	0.00093	2.75	421.18	140.00	0.41	
26	1120	11.01	16.00	13.91	16.39	0.00093	2.81	444.36	140.00	0.41	
26	1200	11.01	16.18	14.04	16.59	0.00093	2.87	469.97	140.00	0.41	
25	490	10.55	13.78	12.14	13.95	0.00073	1.82	269.35	91.65	0.34	
25	760	10.55	14.71	12.66	14.94	0.00073	2.12	364.47	113.89	0.35	
25	880	10.55	15.06	12.87	15.31	0.00074	2.23	407.44	140.00	0.36	
25	960	10.55	15.27	13.01	15.54	0.00073	2.30	437.12	140.00	0.36	
25	1050	10.55	15.50	13.15	15.78	0.00073	2.37	468.98	140.00	0.36	
25	1120	10.55	15.67	13.27	15.97	0.00072	2.43	492.62	140.00	0.36	
25	1200	10.55	15.86	13.40	16.17	0.00072	2.49	518.69	140.00	0.37	
24	490	9.88	13.07	11.56	13.28	0.00087	2.00	246.90	89.85	0.37	
24	760	9.88	13.99	12.12	14.27	0.00086	2.36	335.42	111.33	0.39	
24	880	9.88	14.33	12.34	14.64	0.00087	2.49	373.55	112.02	0.39	
24	960	9.88	14.53	12.48	14.86	0.00087	2.57	396.71	112.44	0.40	
24	1050	9.88	14.75	12.64	15.11	0.00088	2.66	421.50	112.89	0.40	
24	1120	9.88	14.92	12.77	15.29	0.00089	2.73	440.04	115.40	0.40	
24	1200	9.88	15.10	12.91	15.49	0.00089	2.81	461.15	119.46	0.41	
23	490	9.04	12.44	10.91	12.65	0.00087	2.00	245.14	82.76	0.37	
23	760	9.04	13.35	11.47	13.63	0.00088	2.35	332.53	111.09	0.39	
23	880	9.04	13.69	11.69	14.00	0.00088	2.48	372.09	134.03	0.39	
23	960	9.04	13.89	11.84	14.22	0.00088	2.56	400.11	138.09	0.40	
23	1050	9.04	14.11	12.00	14.46	0.00088	2.65	430.33	140.00	0.40	
23	1120	9.04	14.27	12.12	14.64	0.00088	2.71	453.20	140.00	0.40	
23	1200	9.04	14.46	12.25	14.84	0.00088	2.78	478.61	140.00	0.40	
22	490	8.78	11.94	10.46	12.15	0.00092	2.03	241.02	82.68	0.38	
22	760	8.78	12.83	11.02	13.12	0.00094	2.40	319.69	120.34	0.40	
22	880	8.78	13.17	11.24	13.49	0.00093	2.53	364.70	133.01	0.40	
22	960	8.78	13.37	11.39	13.72	0.00092	2.61	391.95	134.21	0.41	
22	1050	8.78	13.59	11.54	13.96	0.00092	2.70	421.21	135.48	0.41	
22	1120	8.78	13.75	11.66	14.13	0.00092	2.76	443.40	136.44	0.41	
22	1200	8.78	13.93	11.79	14.33	0.00092	2.83	468.44	140.00	0.41	
21	490	8.14	11.32	9.74	11.51	0.00077	1.93	255.98	86.79	0.35	
21	760	8.14	12.20	10.29	12.46	0.00081	2.30	345.82	108.98	0.37	
21	880	8.14	12.54	10.50	12.84	0.00081	2.43	387.54	130.77	0.38	
21	960	8.14	12.75	10.64	13.06	0.00081	2.51	414.07	131.52	0.38	
21	1050	8.14	12.96	10.80	13.30	0.00082	2.60	442.44	132.33	0.39	
21	1120	8.14	13.12	10.91	13.47	0.00082	2.67	463.81	132.93	0.39	
21	1200	8.14	13.30	11.05	13.67	0.00083	2.74	487.47	133.59	0.39	

Table 7.11 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR LOWER REACH (7/13)

River Sta.	Q Total (m ³ /s)	Min Ch E (m)	WS. Elev (m)	Crit WS. Elev (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude #	C
20	490	7.76	10.98	9.45	11.17	0.0008	1.93	271.40	102.34	0.36	
20	760	7.76	11.85	10.01	12.10	0.00081	2.26	377.46	137.63	0.37	
20	890	7.76	12.20	10.23	12.48	0.00081	2.39	425.93	138.62	0.38	
20	970	7.76	12.41	10.41	12.70	0.00081	2.46	454.38	139.20	0.38	
20	1060	7.76	12.62	10.55	12.93	0.00082	2.54	484.60	139.81	0.38	
20	1130	7.76	12.79	10.66	13.10	0.00082	2.59	507.42	140.00	0.39	
20	1210	7.76	12.97	10.79	13.30	0.00081	2.66	532.58	140.00	0.39	
19	490	7.30	10.51	8.98	10.71	0.00087	2.00	246.37	95.55	0.37	
19	760	7.30	11.34	9.53	11.63	0.00093	2.39	332.29	112.06	0.40	
19	890	7.30	11.67	9.78	12.00	0.00095	2.55	370.61	117.06	0.41	
19	970	7.30	11.86	9.92	12.21	0.00096	2.64	394.12	129.98	0.41	
19	1060	7.30	12.07	10.07	12.44	0.00096	2.74	421.19	131.07	0.42	
19	1130	7.30	12.23	10.19	12.62	0.00096	2.80	441.99	131.91	0.42	
19	1210	7.30	12.40	10.33	12.81	0.00097	2.88	465.14	132.83	0.42	
18	490	6.88	10.14	8.55	10.31	0.00071	1.87	290.26	118.43	0.34	
18	760	6.88	10.95	9.10	11.19	0.00076	2.26	392.12	140.00	0.37	
18	890	6.88	11.29	9.36	11.56	0.00077	2.40	439.27	140.00	0.37	
18	970	6.88	11.48	9.53	11.77	0.00077	2.48	466.48	140.00	0.38	
18	1060	6.88	11.69	9.69	11.99	0.00078	2.56	495.66	140.00	0.38	
18	1130	6.88	11.85	9.80	12.17	0.00078	2.62	518.10	140.00	0.38	
18	1210	6.88	12.03	9.92	12.36	0.00078	2.69	542.86	140.00	0.38	
17	490	6.54	9.75	8.46	10.03	0.00119	2.37	223.61	124.19	0.44	
17	760	6.54	10.53	9.09	10.90	0.0012	2.77	323.31	131.29	0.45	
17	890	6.54	10.86	9.37	11.26	0.0012	2.93	367.50	136.55	0.46	
17	970	6.54	11.05	9.61	11.47	0.00119	3.01	393.51	137.76	0.46	
17	1060	6.54	11.25	9.72	11.69	0.00119	3.10	421.62	139.04	0.47	
17	1130	6.54	11.40	9.99	11.87	0.0012	3.18	442.78	140.00	0.47	
17	1210	6.54	11.58	10.12	12.06	0.00119	3.25	467.60	140.00	0.47	
16	490	6.09	9.14	7.78	9.35	0.00095	2.03	260.89	121.53	0.38	
16	760	6.09	9.91	8.35	10.19	0.001	2.40	358.49	129.25	0.41	
16	890	6.09	10.24	8.60	10.55	0.00102	2.54	400.90	131.19	0.41	
16	970	6.09	10.43	8.73	10.76	0.00102	2.62	425.92	132.86	0.42	
16	1060	6.09	10.63	8.88	10.98	0.00102	2.71	453.18	134.35	0.42	
16	1130	6.09	10.79	8.99	11.15	0.00102	2.78	473.82	135.37	0.42	
16	1210	6.09	10.96	9.13	11.34	0.00104	2.87	497.20	140.00	0.43	
14	490	5.48	8.50	7.16	8.69	0.00087	1.99	290.48	140.00	0.37	
14	760	5.48	9.27	7.85	9.51	0.00087	2.32	398.00	140.00	0.39	
14	890	5.48	9.59	8.07	9.86	0.00087	2.46	443.46	140.00	0.39	
14	970	5.48	9.78	8.19	10.07	0.00087	2.54	469.97	140.00	0.40	
14	1060	5.48	9.98	8.32	10.29	0.00087	2.62	498.67	140.00	0.40	
14	1130	5.48	10.14	8.42	10.46	0.00087	2.68	520.26	140.00	0.40	
14	1210	5.48	10.31	8.54	10.64	0.00087	2.75	544.22	140.00	0.40	
13	490	5.06	8.08	6.73	8.26	0.00086	1.98	294.29	140.00	0.37	
13	760	5.06	8.85	7.42	9.09	0.00085	2.31	402.24	140.00	0.38	
13	890	5.06	9.17	7.64	9.44	0.00085	2.44	447.63	140.00	0.39	

Table 7.11 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR LOWER REACH (8/13)

River Sta.	Q Total (m ³ /s)	Min Ch E (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude #	C
13	970	5.06	9.36	7.76	9.64	0.00086	2.52	474.07	140.00	0.39	
13	1060	5.06	9.56	7.90	9.86	0.00086	2.60	502.65	140.00	0.40	
13	1130	5.06	9.72	7.98	10.03	0.00086	2.67	524.13	140.00	0.40	
13	1210	5.06	9.89	8.09	10.22	0.00086	2.74	547.98	140.00	0.40	
12	490	4.78	7.76	6.45	7.96	0.00095	2.06	274.72	140.00	0.39	
12	760	4.78	8.53	7.10	8.79	0.00093	2.39	382.72	140.00	0.40	
12	890	4.78	8.85	7.34	9.14	0.00093	2.53	427.98	140.00	0.40	
12	970	4.78	9.04	7.51	9.35	0.00093	2.60	454.32	140.00	0.41	
12	1060	4.78	9.24	7.65	9.57	0.00093	2.69	482.77	140.00	0.41	
12	1130	4.78	9.40	7.75	9.73	0.00093	2.75	504.14	140.00	0.41	
12	1210	4.78	9.56	7.87	9.92	0.00093	2.82	527.85	140.00	0.42	
11	490	3.70	6.99	5.67	7.17	0.00082	1.93	292.67	140.00	0.36	
11	760	3.70	7.76	6.17	8.00	0.00084	2.28	400.37	140.00	0.38	
11	890	3.70	8.08	6.37	8.35	0.00085	2.42	445.09	140.00	0.39	
11	970	3.70	8.27	6.50	8.55	0.00085	2.51	471.03	140.00	0.39	
11	1060	3.70	8.47	6.64	8.77	0.00086	2.59	499.00	140.00	0.40	
11	1130	3.70	8.62	6.74	8.93	0.00086	2.66	519.98	140.00	0.40	
11	1210	3.70	8.78	6.86	9.11	0.00087	2.73	543.23	140.00	0.40	
10	490	2.75	6.63	5.19	6.79	0.00073	1.85	307.11	139.07	0.34	
10	760	2.75	7.38	5.67	7.60	0.00078	2.22	412.38	140.00	0.37	
10	890	2.75	7.69	5.88	7.94	0.0008	2.37	456.02	140.00	0.38	
10	970	2.75	7.87	6.00	8.14	0.00081	2.45	481.32	140.00	0.38	
10	1060	2.75	8.07	6.13	8.35	0.00082	2.55	508.60	140.00	0.39	
10	1130	2.75	8.21	6.23	8.51	0.00083	2.62	529.06	140.00	0.39	
10	1210	2.75	8.38	6.35	8.69	0.00084	2.69	551.75	140.00	0.39	
9	490	2.91	6.37	4.85	6.52	0.00064	1.78	325.01	140.00	0.32	
9	760	2.91	7.10	5.33	7.31	0.00072	2.17	426.96	140.00	0.35	
9	890	2.91	7.40	5.54	7.64	0.00074	2.32	469.21	140.00	0.36	
9	970	2.91	7.57	5.66	7.83	0.00076	2.41	493.74	140.00	0.37	
9	1060	2.91	7.76	5.79	8.04	0.00078	2.51	520.17	140.00	0.38	
9	1130	2.91	7.91	5.91	8.20	0.00079	2.58	540.03	140.00	0.38	
9	1210	2.91	8.06	6.04	8.37	0.0008	2.66	562.06	140.00	0.39	
8	490	2.55	5.79	4.63	6.05	0.00134	2.28	246.70	138.55	0.44	
8	760	2.55	6.46	5.33	6.80	0.0014	2.70	339.96	140.00	0.46	
8	890	2.55	6.74	5.61	7.11	0.00142	2.86	379.03	140.00	0.47	
8	970	2.55	6.90	5.75	7.30	0.00144	2.96	401.81	140.00	0.48	
8	1060	2.55	7.08	5.92	7.50	0.00145	3.06	426.42	140.00	0.48	
8	1130	2.55	7.21	6.02	7.65	0.00146	3.13	444.97	140.00	0.49	
8	1210	2.55	7.36	6.13	7.82	0.00146	3.22	465.63	140.00	0.49	
7	490	2.28	5.13	4.05	5.37	0.00124	2.24	253.87	140.00	0.44	
7	760	2.28	5.74	4.73	6.08	0.00137	2.69	339.09	140.00	0.48	
7	890	2.28	6.00	4.96	6.37	0.00141	2.88	374.98	140.00	0.49	
7	970	2.28	6.15	5.08	6.55	0.00143	2.98	396.10	140.00	0.50	
7	1060	2.28	6.31	5.21	6.74	0.00145	3.09	418.99	140.00	0.50	
7	1130	2.28	6.43	5.32	6.89	0.00147	3.17	436.45	140.00	0.51	
7	1210	2.28	6.58	5.42	7.05	0.00148	3.25	456.14	140.00	0.51	

Table 7.11 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR LOWER REACH (9/13)

River Sta.	Q Total (m3/s)	Min Ch E (m)	W.S. Elev (m)	Crit W.S. Elev (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude #	C
6	490	1.99	4.80		5.12	0.0018	2.52	274.36	206.80	0.52	
6	760	1.99	5.23		5.76	0.00243	3.27	379.48	256.20	0.62	
6	890	1.99	5.40		6.03	0.00273	3.60	421.63	257.88	0.66	
6	970	1.99	5.49		6.19	0.00292	3.80	445.06	258.81	0.69	
6	1060	1.99	5.58		6.37	0.00314	4.01	469.34	259.77	0.72	
6	1130	1.99	5.65		6.50	0.00332	4.18	486.47	260.44	0.74	
6	1210	1.99	5.72		6.65	0.00352	4.37	505.19	261.18	0.76	
5	490	1.22	4.52		4.53	0.00071	0.40	1228.65	1472.39	0.14	
5	760	1.22	5.02		5.03	0.00074	0.38	1980.84	1489.27	0.11	
5	890	1.22	5.24		5.24	0.00075	0.39	2295.95	1495.41	0.10	
5	970	1.22	5.36		5.37	0.00075	0.39	2479.38	1498.97	0.10	
5	1060	1.22	5.49		5.50	0.00076	0.40	2677.66	1502.82	0.09	
5	1130	1.22	5.59		5.60	0.00076	0.40	2823.09	1505.63	0.09	
5	1210	1.22	5.70		5.71	0.00076	0.40	2990.13	1508.85	0.09	
4	490	0.78	3.87		3.87	0.00107	0.32	1522.14	1632.04	0.11	
4	760	0.78	4.37		4.37	0.00105	0.32	2357.27	1710.46	0.09	
4	890	0.78	4.58		4.58	0.00104	0.33	2718.48	1745.30	0.08	
4	970	0.78	4.70		4.70	0.00103	0.33	2931.61	1765.54	0.08	
4	1060	0.78	4.83		4.84	0.00103	0.34	3164.14	1787.35	0.08	
4	1130	0.78	4.93		4.93	0.00103	0.34	3340.37	1803.71	0.08	
4	1210	0.78	5.04		5.04	0.00103	0.34	3537.20	1821.81	0.08	
3	490	0.69	3.52		3.52	0.00072	0.21	2284.59	1856.51	0.06	
3	760	0.69	4.03		4.03	0.00071	0.24	3227.58	1862.85	0.06	
3	890	0.69	4.24		4.24	0.00071	0.25	3618.27	1865.47	0.06	
3	970	0.69	4.36		4.36	0.00071	0.25	3844.89	1866.99	0.06	
3	1060	0.69	4.49		4.49	0.00071	0.26	4088.95	1868.62	0.06	
3	1130	0.69	4.59		4.59	0.00072	0.26	4271.84	1869.84	0.06	
3	1210	0.69	4.70		4.70	0.00072	0.27	4474.04	1871.19	0.06	
2	490	0.42	3.16		3.17	0.00078	0.23	2163.67	1859.73	0.07	
2	760	0.42	3.67		3.68	0.00079	0.24	3125.71	1900.00	0.06	
2	890	0.42	3.88		3.88	0.0008	0.25	3518.31	1900.00	0.06	
2	970	0.42	4.00		4.00	0.00081	0.26	3745.18	1900.00	0.06	
2	1060	0.42	4.13		4.13	0.00081	0.27	3988.71	1900.00	0.06	
2	1130	0.42	4.22		4.23	0.00082	0.27	4170.83	1900.00	0.06	
2	1210	0.42	4.33		4.33	0.00083	0.28	4371.71	1900.00	0.06	
1	490	0.38	2.78		2.78	0.001	0.21	2384.67	1528.70	0.05	
1	760	0.38	3.25		3.25	0.00115	0.24	3146.66	1698.65	0.06	
1	890	0.38	3.45		3.45	0.00121	0.26	3487.84	1781.01	0.06	
1	970	0.38	3.56		3.56	0.00124	0.26	3690.34	1803.33	0.06	
1	1060	0.38	3.68		3.68	0.00126	0.27	3909.00	1803.33	0.06	
1	1130	0.38	3.77		3.78	0.00128	0.28	4072.68	1803.33	0.06	
1	1210	0.38	3.87		3.88	0.0013	0.28	4253.15	1803.33	0.06	
0	490	-0.91	2.08		2.08	0.00167	0.26	1866.27	1500.00	0.08	
0	760	-0.91	2.46		2.47	0.00184	0.31	2436.57	1500.00	0.08	
0	890	-0.91	2.63		2.63	0.00189	0.33	2684.73	1500.00	0.08	

Table 7.11 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR LOWER REACH (10/13)

River Sta	Q Total (m ³ /s)	Min Ch E (m)	WS. Elev (m)	Crit W.S. (m)	E.G Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # G
0	970	-0.91	2.72		2.73	0.00192	0.34	2829.57	1500.00	0.08
0	1060	-0.91	2.83		2.84	0.00194	0.35	2988.74	1500.00	0.08
0	1130	-0.91	2.91		2.92	0.00195	0.36	3108.83	1500.00	0.08
0	1210	-0.91	3.00		3.00	0.00197	0.37	3240.88	1500.00	0.08
-3	490	-0.14	1.72		1.73	0.00114	0.37	1333.63	1073.59	0.11
-3	760	-0.14	2.00		2.01	0.00164	0.46	1640.83	1101.71	0.12
-3	890	-0.14	2.14		2.15	0.00181	0.50	1791.24	1115.22	0.13
-3	970	-0.14	2.22		2.23	0.00189	0.52	1881.85	1123.28	0.13
-3	1060	-0.14	2.31		2.33	0.00197	0.53	1986.15	1132.49	0.13
-3	1130	-0.14	2.38		2.40	0.00202	0.55	2066.71	1139.55	0.13
-3	1210	-0.14	2.46		2.48	0.00207	0.56	2158.12	1147.50	0.13
-4	490	-0.51	1.55		1.56	0.00089	0.34	1424.51	1400.00	0.11
-4	760	-0.51	1.73		1.74	0.00154	0.45	1680.04	1400.00	0.13
-4	890	-0.51	1.84		1.85	0.00178	0.49	1821.68	1400.00	0.14
-4	970	-0.51	1.90		1.91	0.0019	0.51	1913.06	1400.00	0.14
-4	1060	-0.51	1.98		1.99	0.00202	0.53	2018.95	1400.00	0.14
-4	1130	-0.51	2.04		2.05	0.00209	0.54	2102.69	1400.00	0.14
-4	1210	-0.51	2.10		2.12	0.00217	0.55	2199.39	1400.00	0.14
-5	490	-1.68	1.49	-1.25	1.50	0.00002	0.27	1788.17	565.00	0.05
-5	760	-1.68	1.61	-1.11	1.62	4.3E-05	0.41	1854.58	565.00	0.07
-5	890	-1.68	1.68	-1.05	1.69	5.5E-05	0.47	1892.79	565.00	0.08
-5	970	-1.68	1.72	-1.01	1.74	6.2E-05	0.51	1918.08	565.00	0.09
-5	1060	-1.68	1.78	-0.97	1.79	0.00007	0.54	1947.76	565.00	0.09
-5	1130	-1.68	1.82	-0.94	1.83	7.7E-05	0.57	1971.60	565.00	0.10
-5	1210	-1.68	1.87	-0.90	1.89	8.4E-05	0.61	1999.54	565.00	0.10
-6	490	-1.03	1.47	-0.50	1.48	8.4E-05	0.48	1022.43	410.00	0.10
-6	760	-1.03	1.56	-0.32	1.58	0.00018	0.72	1059.14	410.00	0.14
-6	890	-1.03	1.61	-0.25	1.65	0.00023	0.82	1080.58	410.00	0.16
-6	970	-1.03	1.65	-0.20	1.69	0.00026	0.89	1094.95	410.00	0.17
-6	1060	-1.03	1.69	-0.15	1.73	0.0003	0.95	1111.96	410.00	0.18
-6	1130	-1.03	1.72	-0.11	1.77	0.00033	1.00	1125.73	410.00	0.19
-6	1210	-1.03	1.76	-0.07	1.82	0.00036	1.06	1141.97	410.00	0.20
-7	490	-1.13	1.42	-0.59	1.43	8.3E-05	0.48	1017.76	400.00	0.10
-7	760	-1.13	1.45	-0.41	1.48	0.00019	0.74	1029.00	400.00	0.15
-7	890	-1.13	1.47	-0.33	1.50	0.00026	0.86	1036.06	400.00	0.17
-7	970	-1.13	1.48	-0.29	1.52	0.0003	0.93	1040.93	400.00	0.18
-7	1060	-1.13	1.49	-0.23	1.55	0.00035	1.01	1046.85	400.00	0.20
-7	1130	-1.13	1.51	-0.20	1.56	0.00039	1.07	1051.79	400.00	0.21
-7	1210	-1.13	1.52	-0.15	1.59	0.00044	1.14	1057.78	400.00	0.22
-8	490	-3.35	1.42	-2.92	1.42	5E-06	0.19	2610.76	550.00	0.03
-8	760	-3.35	1.45	-2.77	1.46	1.3E-05	0.29	2627.81	550.00	0.04
-8	890	-3.35	1.47	-2.70	1.48	1.7E-05	0.34	2638.48	550.00	0.05
-8	970	-3.35	1.49	-2.66	1.49	2.1E-05	0.37	2645.82	550.00	0.05
-8	1060	-3.35	1.50	-2.62	1.51	2.4E-05	0.40	2654.76	550.00	0.06
-8	1130	-3.35	1.52	-2.59	1.53	2.7E-05	0.42	2662.19	550.00	0.06
-8	1210	-3.35	1.53	-2.56	1.54	3.1E-05	0.45	2671.18	550.00	0.07

Table 7.11 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR LOWER REACH (11/13)

River Sta.	Q Total (m ³ /s)	Min Ch E (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude #	C
-9	490	-2.76	1.42	-2.18	1.42	0.00002	0.33	1493.02	360.00	0.05	
-9	760	-2.76	1.44	-1.98	1.45	4.8E-05	0.51	1500.54	360.00	0.08	
-9	890	-2.76	1.45	-1.90	1.47	6.5E-05	0.59	1505.26	360.00	0.09	
-9	970	-2.76	1.46	-1.85	1.48	7.6E-05	0.64	1508.51	360.00	0.10	
-9	1060	-2.76	1.47	-1.79	1.49	0.00009	0.70	1512.48	360.00	0.11	
-9	1130	-2.76	1.48	-1.75	1.51	0.00001	0.75	1515.79	360.00	0.12	
-9	1210	-2.76	1.49	-1.70	1.52	0.00012	0.80	1519.80	360.00	0.12	
-10	490	-2.30	1.40	-1.85	1.41	1.4E-05	0.26	1919.04	520.00	0.04	
-10	760	-2.30	1.41	-1.70	1.42	3.4E-05	0.40	1922.30	520.00	0.07	
-10	890	-2.30	1.41	-1.63	1.43	4.6E-05	0.46	1924.38	520.00	0.08	
-10	970	-2.30	1.42	-1.59	1.43	5.5E-05	0.50	1925.81	520.00	0.08	
-10	1060	-2.30	1.42	-1.55	1.44	6.5E-05	0.55	1927.57	520.00	0.09	
-10	1130	-2.30	1.42	-1.51	1.44	7.4E-05	0.59	1929.05	520.00	0.10	
-10	1210	-2.30	1.43	-1.48	1.45	8.5E-05	0.63	1930.84	520.00	0.10	
-11	490	-2.74	1.40	-2.30	1.41	9E-06	0.22	2206.59	535.00	0.03	
-11	760	-2.74	1.41	-2.15	1.41	2.2E-05	0.34	2208.77	535.00	0.05	
-11	890	-2.74	1.41	-2.08	1.42	0.00003	0.40	2210.15	535.00	0.06	
-11	970	-2.74	1.41	-2.04	1.42	3.6E-05	0.44	2211.11	535.00	0.07	
-11	1060	-2.74	1.41	-2.00	1.43	4.3E-05	0.48	2212.29	535.00	0.08	
-11	1130	-2.74	1.42	-1.97	1.43	4.9E-05	0.51	2213.27	535.00	0.08	
-11	1210	-2.74	1.42	-1.93	1.43	5.6E-05	0.55	2214.48	535.00	0.09	
-12	490	-6.11	1.40	-5.66	1.40	1E-06	0.12	3977.31	535.00	0.01	
-12	760	-6.11	1.41	-5.51	1.41	3E-06	0.19	3979.90	535.00	0.02	
-12	890	-6.11	1.41	-5.44	1.41	4E-06	0.22	3981.55	535.00	0.03	
-12	970	-6.11	1.41	-5.41	1.42	5E-06	0.24	3982.69	535.00	0.03	
-12	1060	-6.11	1.42	-5.36	1.42	6E-06	0.27	3984.09	535.00	0.03	
-12	1130	-6.11	1.42	-5.33	1.42	7E-06	0.28	3985.26	535.00	0.03	
-12	1210	-6.11	1.42	-5.29	1.43	8E-06	0.30	3986.70	535.00	0.04	
-13	490	-5.16	1.40	-4.64	1.40	3E-06	0.18	2757.81	425.00	0.02	
-13	760	-5.16	1.40	-4.46	1.41	8E-06	0.28	2758.83	425.00	0.03	
-13	890	-5.16	1.41	-4.38	1.41	1.1E-05	0.32	2759.48	425.00	0.04	
-13	970	-5.16	1.41	-4.34	1.41	1.3E-05	0.35	2759.93	425.00	0.04	
-13	1060	-5.16	1.41	-4.29	1.42	1.5E-05	0.38	2760.48	425.00	0.05	
-13	1130	-5.16	1.41	-4.25	1.42	1.7E-05	0.41	2760.94	425.00	0.05	
-13	1210	-5.16	1.41	-4.21	1.42	0.00002	0.44	2761.51	425.00	0.05	
-14	490	-13.24	1.40	-12.63	1.40	0	0.10	5085.12	360.00	0.01	
-14	760	-13.24	1.41	-12.43	1.41	1E-06	0.15	5086.20	360.00	0.01	
-14	890	-13.24	1.41	-12.34	1.41	1E-06	0.17	5086.89	360.00	0.01	
-14	970	-13.24	1.41	-12.29	1.41	1E-06	0.19	5087.37	360.00	0.02	
-14	1060	-13.24	1.41	-12.23	1.41	2E-06	0.21	5087.96	360.00	0.02	
-14	1130	-13.24	1.41	-12.19	1.41	2E-06	0.22	5088.45	360.00	0.02	
-14	1210	-13.24	1.41	-12.13	1.42	2E-06	0.24	5089.05	360.00	0.02	
-15	490	-12.98	1.40	-12.39	1.40	0	0.09	5214.25	375.00	0.01	
-15	760	-12.98	1.40	-12.19	1.41	1E-06	0.15	5215.34	375.00	0.01	
-15	890	-12.98	1.41	-12.11	1.41	1E-06	0.17	5216.03	375.00	0.01	

Table 7.11 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR LOWER REACH (12/13)

River Sta.	Q Total (m ³ /s)	Min Ch E (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude #	C
-15	970	-12.98	1.41	-12.06	1.41	1E-06	0.19	5216.51	375.00	0.02	
-15	1060	-12.98	1.41	-12.00	1.41	2E-06	0.20	5217.09	375.00	0.02	
-15	1130	-12.98	1.41	-11.96	1.41	2E-06	0.22	5217.59	375.00	0.02	
-15	1210	-12.98	1.41	-11.91	1.42	2E-06	0.23	5218.19	375.00	0.02	
-16	490	-20.57	1.40	-20.00	1.40	0	0.06	8349.14	400.00	0.00	
-16	760	-20.57	1.41	-19.80	1.41	0	0.09	8350.40	400.00	0.01	
-16	890	-20.57	1.41	-19.71	1.41	0	0.11	8351.19	400.00	0.01	
-16	970	-20.57	1.41	-19.67	1.41	0	0.12	8351.74	400.00	0.01	
-16	1060	-20.57	1.41	-19.61	1.41	0	0.13	8352.42	400.00	0.01	
-16	1130	-20.57	1.41	-19.56	1.41	0	0.14	8352.99	400.00	0.01	
-16	1210	-20.57	1.41	-19.52	1.41	0	0.14	8353.68	400.00	0.01	
-17	490	-9.88	1.40	-9.40	1.40	0	0.09	5309.64	480.00	0.01	
-17	760	-9.88	1.40	-9.23	1.41	1E-06	0.14	5310.94	480.00	0.01	
-17	890	-9.88	1.41	-9.16	1.41	1E-06	0.17	5311.76	480.00	0.02	
-17	970	-9.88	1.41	-9.11	1.41	2E-06	0.18	5312.33	480.00	0.02	
-17	1060	-9.88	1.41	-9.07	1.41	2E-06	0.20	5313.03	480.00	0.02	
-17	1130	-9.88	1.41	-9.02	1.41	2E-06	0.21	5313.62	480.00	0.02	
-17	1210	-9.88	1.41	-8.99	1.41	3E-06	0.23	5314.34	480.00	0.02	
-18	490	-4.59	1.40	-4.17	1.40	2E-06	0.14	3513.52	590.00	0.02	
-18	760	-4.59	1.40	-4.03	1.40	5E-06	0.22	3514.22	590.00	0.03	
-18	890	-4.59	1.40	-3.97	1.41	7E-06	0.25	3514.67	590.00	0.03	
-18	970	-4.59	1.40	-3.93	1.41	9E-06	0.28	3514.98	590.00	0.04	
-18	1060	-4.59	1.40	-3.90	1.41	0.00001	0.30	3515.36	590.00	0.04	
-18	1130	-4.59	1.40	-3.87	1.41	1.2E-05	0.32	3515.68	590.00	0.04	
-18	1210	-4.59	1.41	-3.83	1.41	1.4E-05	0.34	3516.07	590.00	0.04	
-19	490	-5.60	1.40	-5.21	1.40	1E-06	0.11	4518.78	650.00	0.01	
-19	760	-5.60	1.40	-5.07	1.40	3E-06	0.17	4518.97	650.00	0.02	
-19	890	-5.60	1.40	-5.02	1.40	4E-06	0.20	4519.09	650.00	0.02	
-19	970	-5.60	1.40	-4.99	1.40	4E-06	0.21	4519.17	650.00	0.03	
-19	1060	-5.60	1.40	-4.95	1.40	5E-06	0.23	4519.27	650.00	0.03	
-19	1130	-5.60	1.40	-4.92	1.40	6E-06	0.25	4519.36	650.00	0.03	
-19	1210	-5.60	1.40	-4.89	1.40	7E-06	0.27	4519.46	650.00	0.03	
-20	490	-7.02	1.40	-6.62	1.40	1E-06	0.09	5255.27	630.00	0.01	
-20	760	-7.02	1.40	-6.48	1.40	2E-06	0.14	5255.20	630.00	0.02	
-20	890	-7.02	1.40	-6.42	1.40	2E-06	0.17	5255.15	630.00	0.02	
-20	970	-7.02	1.40	-6.39	1.40	3E-06	0.18	5255.12	630.00	0.02	
-20	1060	-7.02	1.40	-6.35	1.40	3E-06	0.20	5255.08	630.00	0.02	
-20	1130	-7.02	1.40	-6.32	1.40	3E-06	0.22	5255.05	630.00	0.02	
-20	1210	-7.02	1.40	-6.29	1.40	4E-06	0.23	5255.01	630.00	0.03	
-21	490	-7.45	1.40	-7.23	1.40	0	0.04	13662.07	1550.00	0.00	
-21	760	-7.45	1.40	-7.16	1.40	0	0.06	13662.23	1550.00	0.01	
-21	890	-7.45	1.40	-7.12	1.40	0	0.07	13662.32	1550.00	0.01	
-21	970	-7.45	1.40	-7.11	1.40	0	0.07	13662.39	1550.00	0.01	
-21	1060	-7.45	1.40	-7.08	1.40	0	0.08	13662.47	1550.00	0.01	
-21	1130	-7.45	1.40	-7.07	1.40	0	0.08	13662.54	1550.00	0.01	
-21	1210	-7.45	1.40	-7.05	1.40	1E-06	0.09	13662.62	1550.00	0.01	

Table 7.11 RESULTS OF NON-UNIFORM FLOW CALCULATION FOR LOWER REACH (13/13)

River Sta.	Q Total (m3/s)	Min Ch E (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude #	C
-22	490	-8.46	1.40	-8.23	1.40	0	0.04	13732.46	1400.00	0.00	
-22	760	-8.46	1.40	-8.15	1.40	0	0.06	13732.50	1400.00	0.01	
-22	890	-8.46	1.40	-8.11	1.40	0	0.06	13732.52	1400.00	0.01	
-22	970	-8.46	1.40	-8.09	1.40	0	0.07	13732.54	1400.00	0.01	
-22	1060	-8.46	1.40	-8.07	1.40	0	0.08	13732.56	1400.00	0.01	
-22	1130	-8.46	1.40	-8.05	1.40	0	0.08	13732.58	1400.00	0.01	
-22	1210	-8.46	1.40	-8.03	1.40	0	0.09	13732.60	1400.00	0.01	
-23	490	-8.09	1.40	-7.92	1.40	0	0.02	22330.98	2360.00	0.00	
-23	760	-8.09	1.40	-7.87	1.40	0	0.03	22331.01	2360.00	0.00	
-23	890	-8.09	1.40	-7.84	1.40	0	0.04	22331.03	2360.00	0.00	
-23	970	-8.09	1.40	-7.83	1.40	0	0.04	22331.04	2360.00	0.00	
-23	1060	-8.09	1.40	-7.82	1.40	0	0.05	22331.06	2360.00	0.00	
-23	1130	-8.09	1.40	-7.80	1.40	0	0.05	22331.07	2360.00	0.01	
-23	1210	-8.09	1.40	-7.79	1.40	0	0.05	22331.09	2360.00	0.01	
-24	490	-12.36	1.40	-12.15	1.40	0	0.02	22000.79	1610.00	0.00	
-24	760	-12.36	1.40	-12.08	1.40	0	0.03	22000.78	1610.00	0.00	
-24	890	-12.36	1.40	-12.04	1.40	0	0.04	22000.77	1610.00	0.00	
-24	970	-12.36	1.40	-12.02	1.40	0	0.04	22000.77	1610.00	0.00	
-24	1060	-12.36	1.40	-12.00	1.40	0	0.05	22000.77	1610.00	0.00	
-24	1130	-12.36	1.40	-11.99	1.40	0	0.05	22000.76	1610.00	0.00	
-24	1210	-12.36	1.40	-11.97	1.40	0	0.05	22000.76	1610.00	0.00	
-25	490	-12.53	1.40	-12.35	1.40	0	0.02	27703.00	2000.00	0.00	
-25	760	-12.53	1.40	-12.28	1.40	0	0.03	27703.00	2000.00	0.00	
-25	890	-12.53	1.40	-12.26	1.40	0	0.03	27703.00	2000.00	0.00	
-25	970	-12.53	1.40	-12.24	1.40	0	0.04	27703.00	2000.00	0.00	
-25	1060	-12.53	1.40	-12.22	1.40	0	0.04	27703.00	2000.00	0.00	
-25	1130	-12.53	1.40	-12.21	1.40	0	0.04	27703.00	2000.00	0.00	
-25	1210	-12.53	1.40	-12.19	1.40	0	0.04	27703.00	2000.00	0.00	

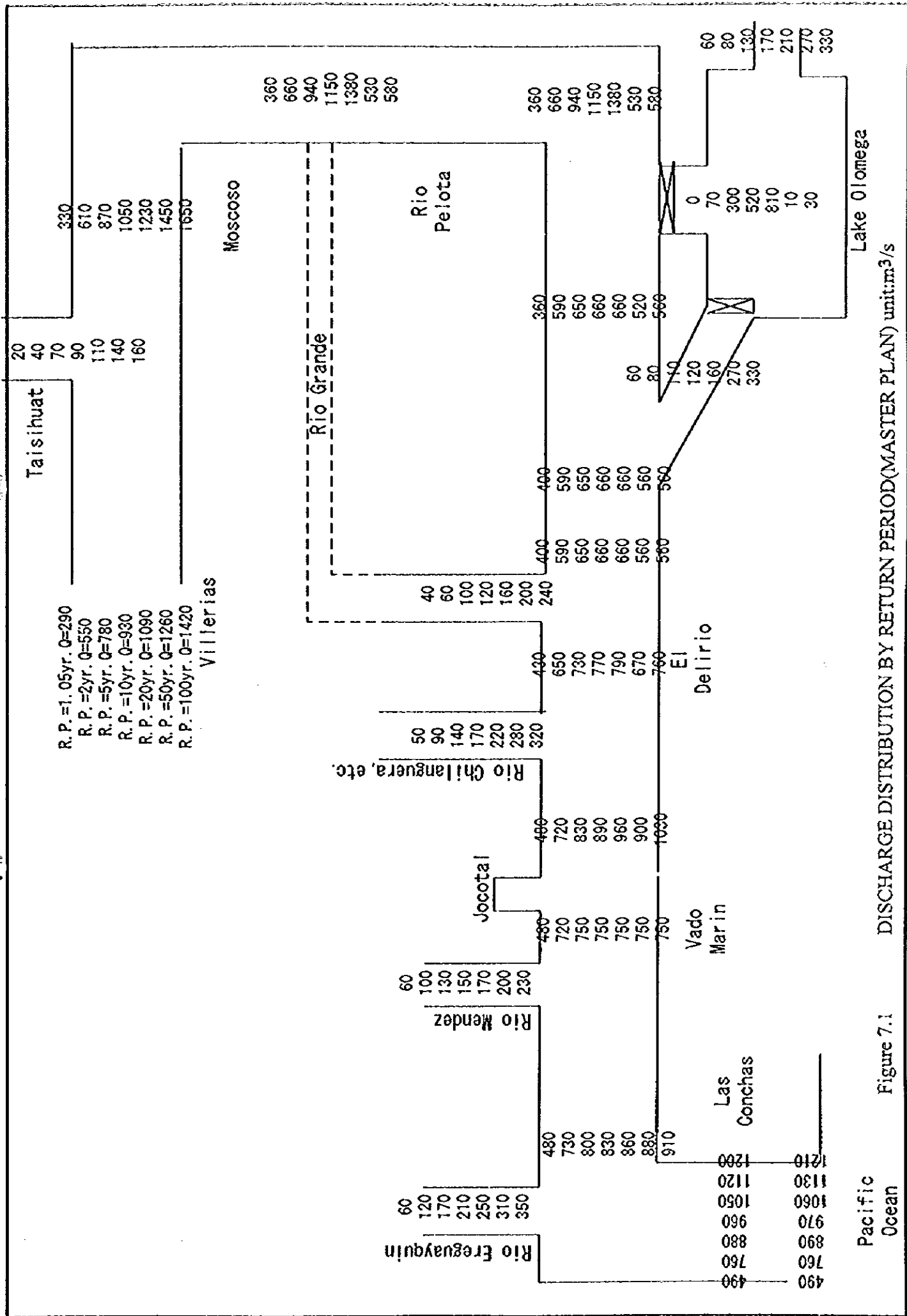


Figure 7.1 DISCHARGE DISTRIBUTION BY RETURN PERIOD(MASTER PLAN) unit:m³/s

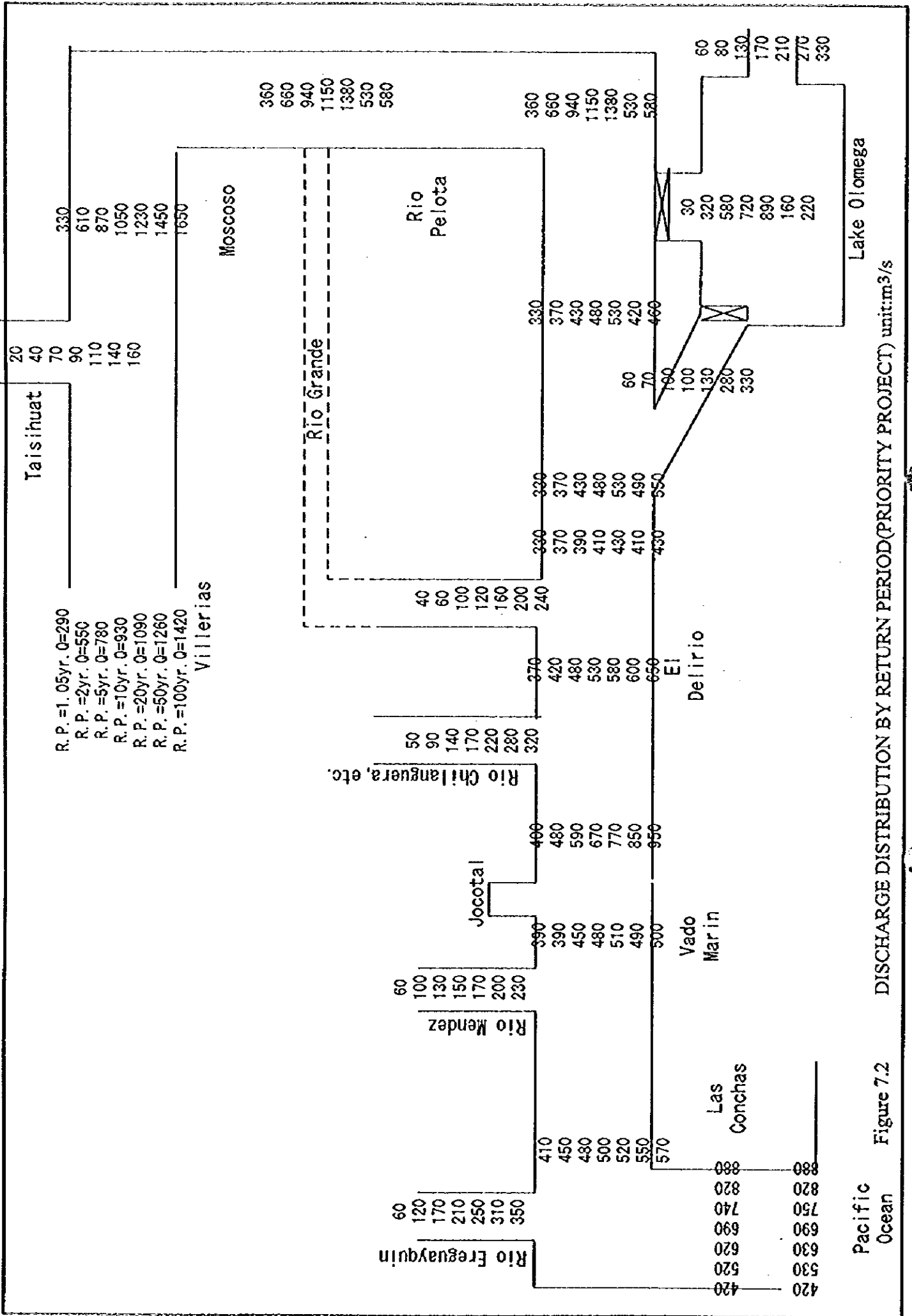


Figure 7.2 DISCHARGE DISTRIBUTION BY RETURN PERIOD(PRIORITY PROJECT) unit:m³/s

Pacific Ocean

Figure 7.3

CROSS SECTIONS OF LOWER REACH FOR M/P (1/10)

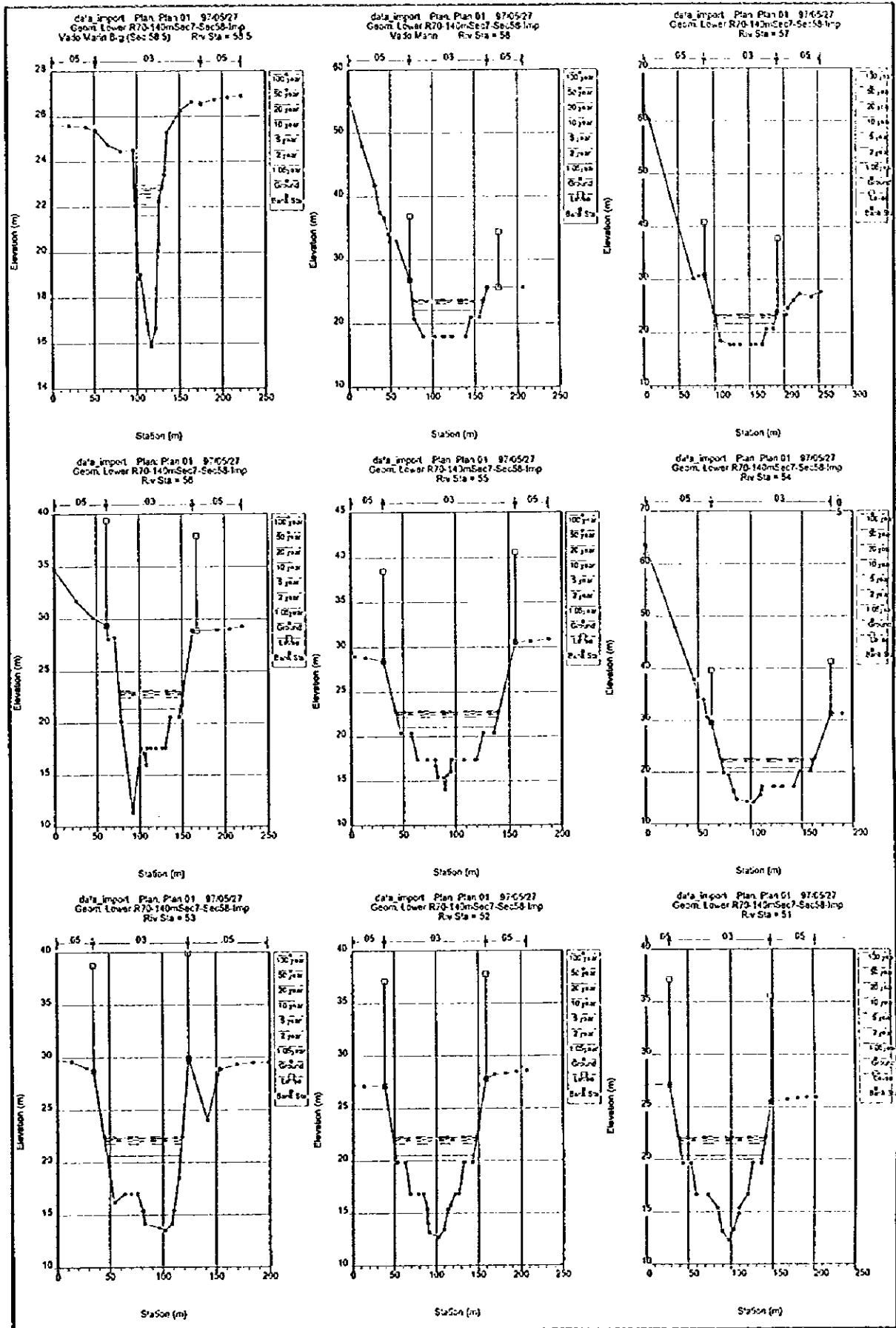


Figure 7.3

CROSS SECTIONS OF LOWER REACH FOR M/P (2/10)

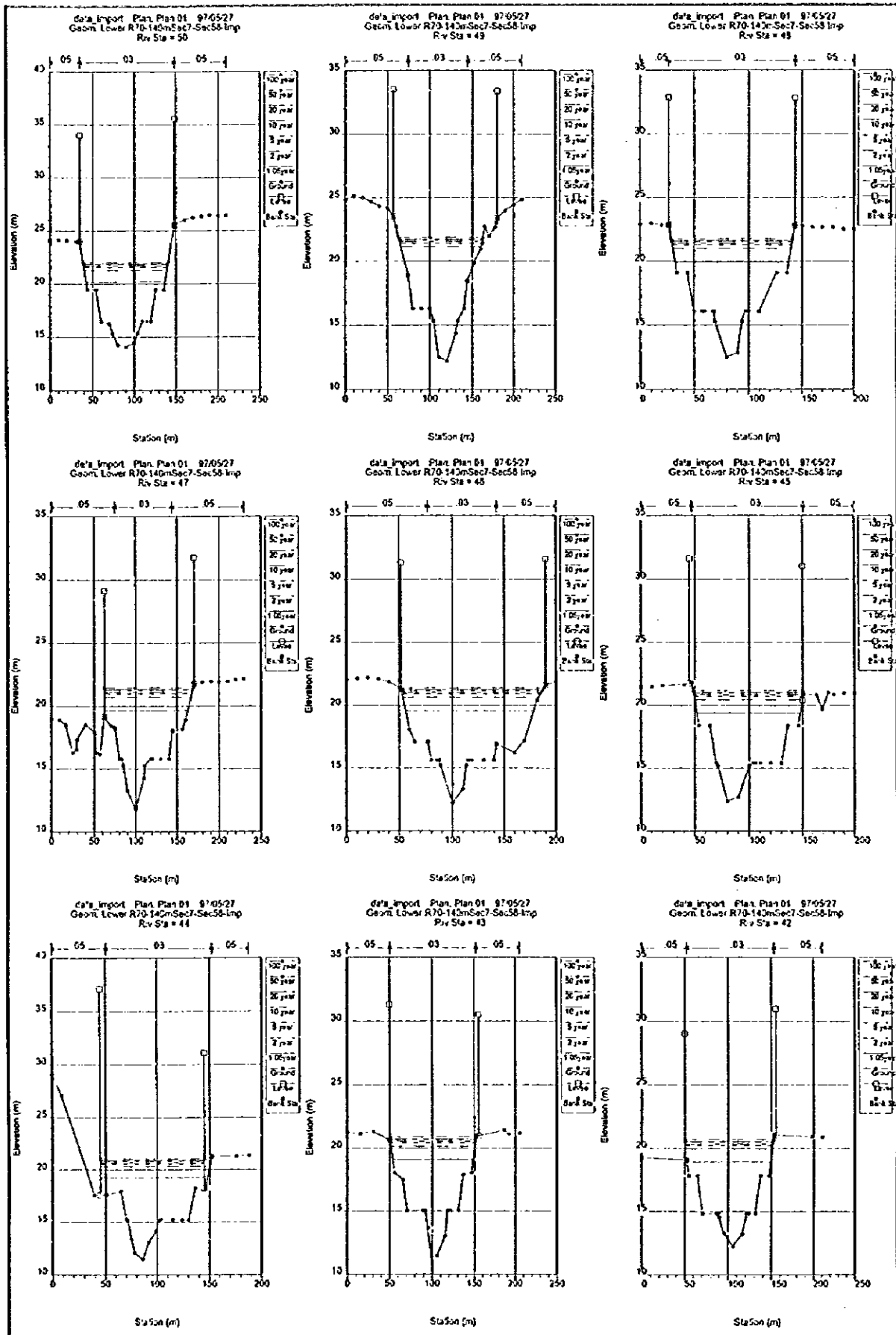


Figure 7.3

CROSS SECTIONS OF LOWER REACH FOR M/P (3/10)

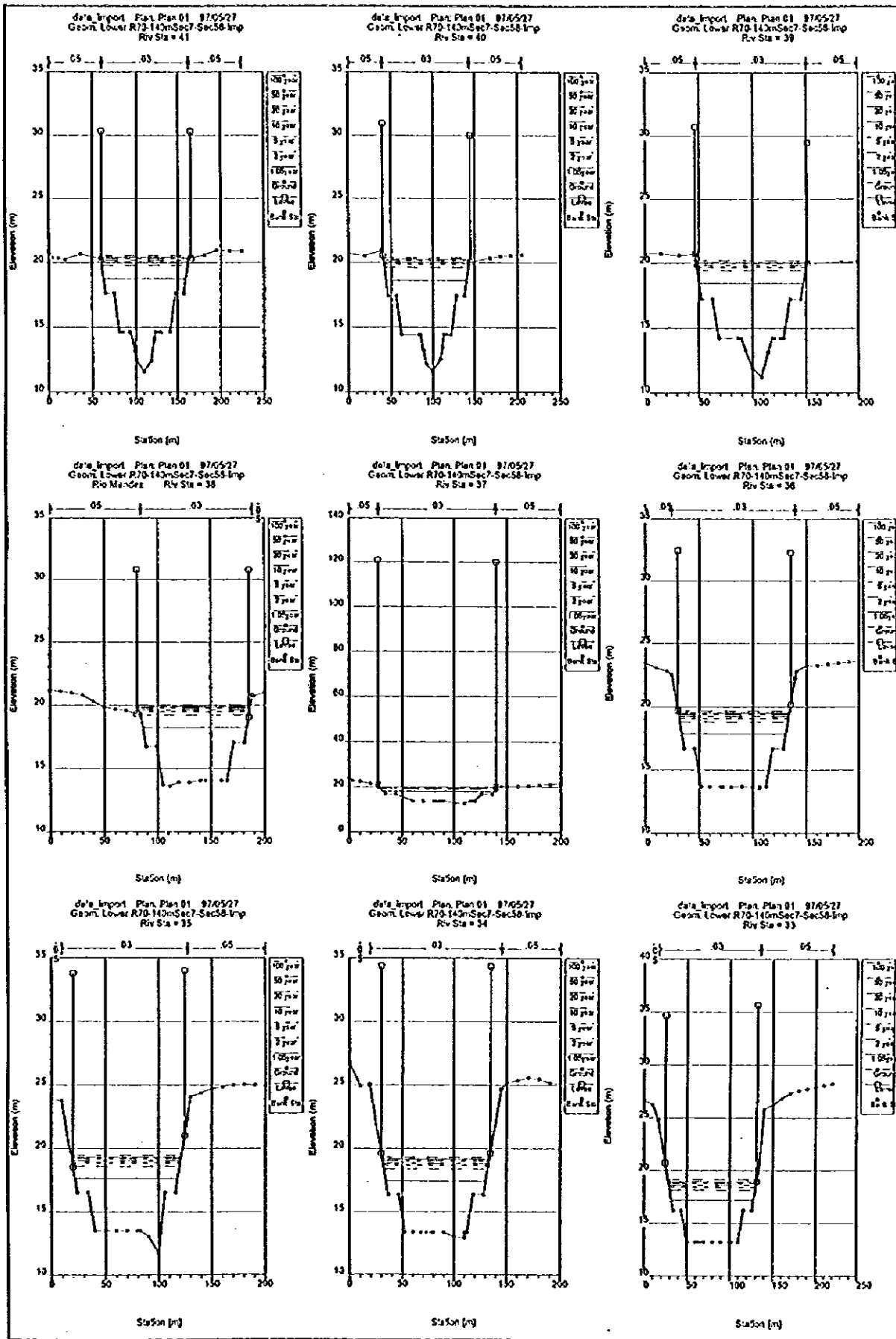


Figure 7.3

CROSS SECTIONS OF LOWER REACH FOR M/P (4/10)

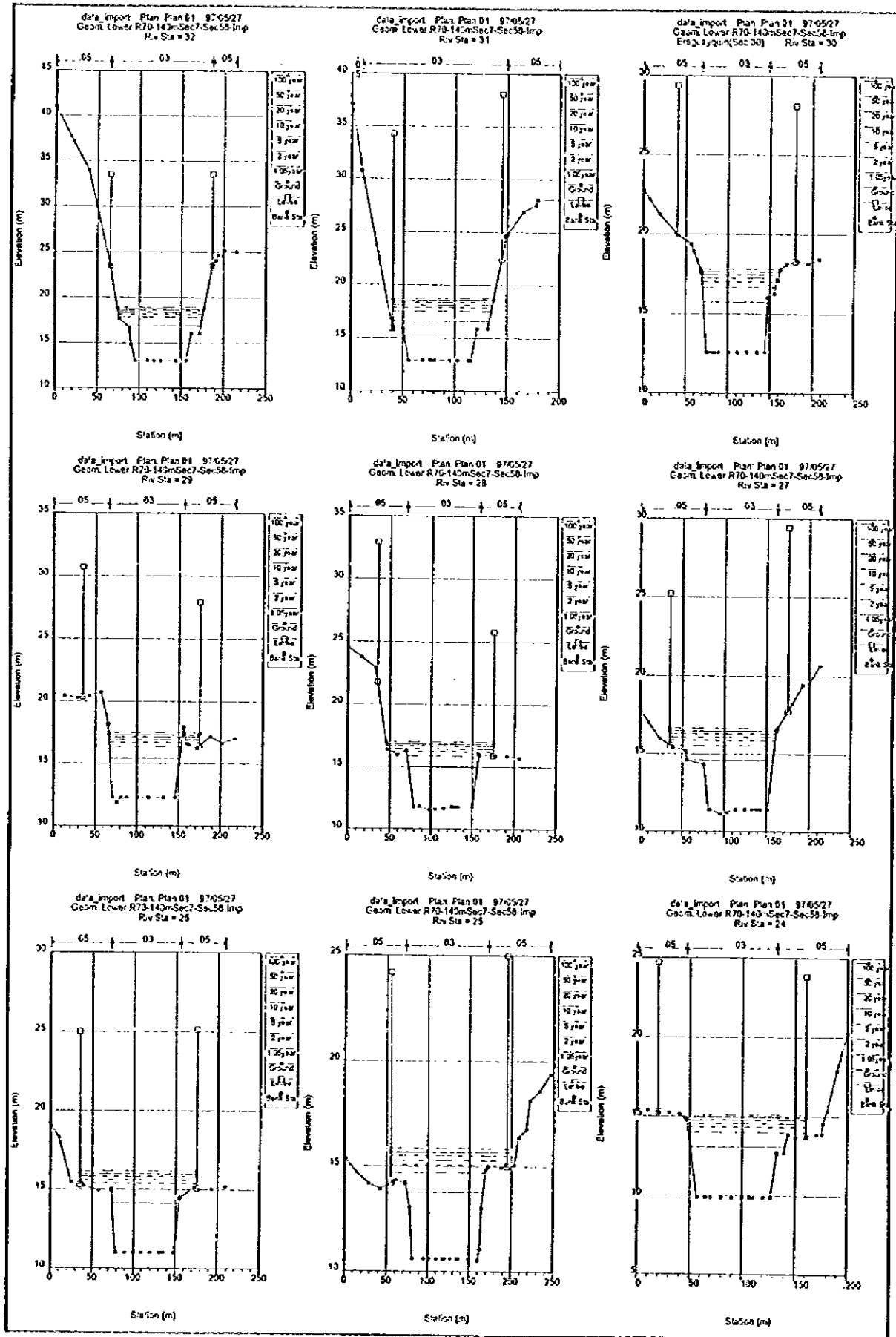


Figure 7.3

CROSS SECTIONS OF LOWER REACH FOR M/P (5/10)

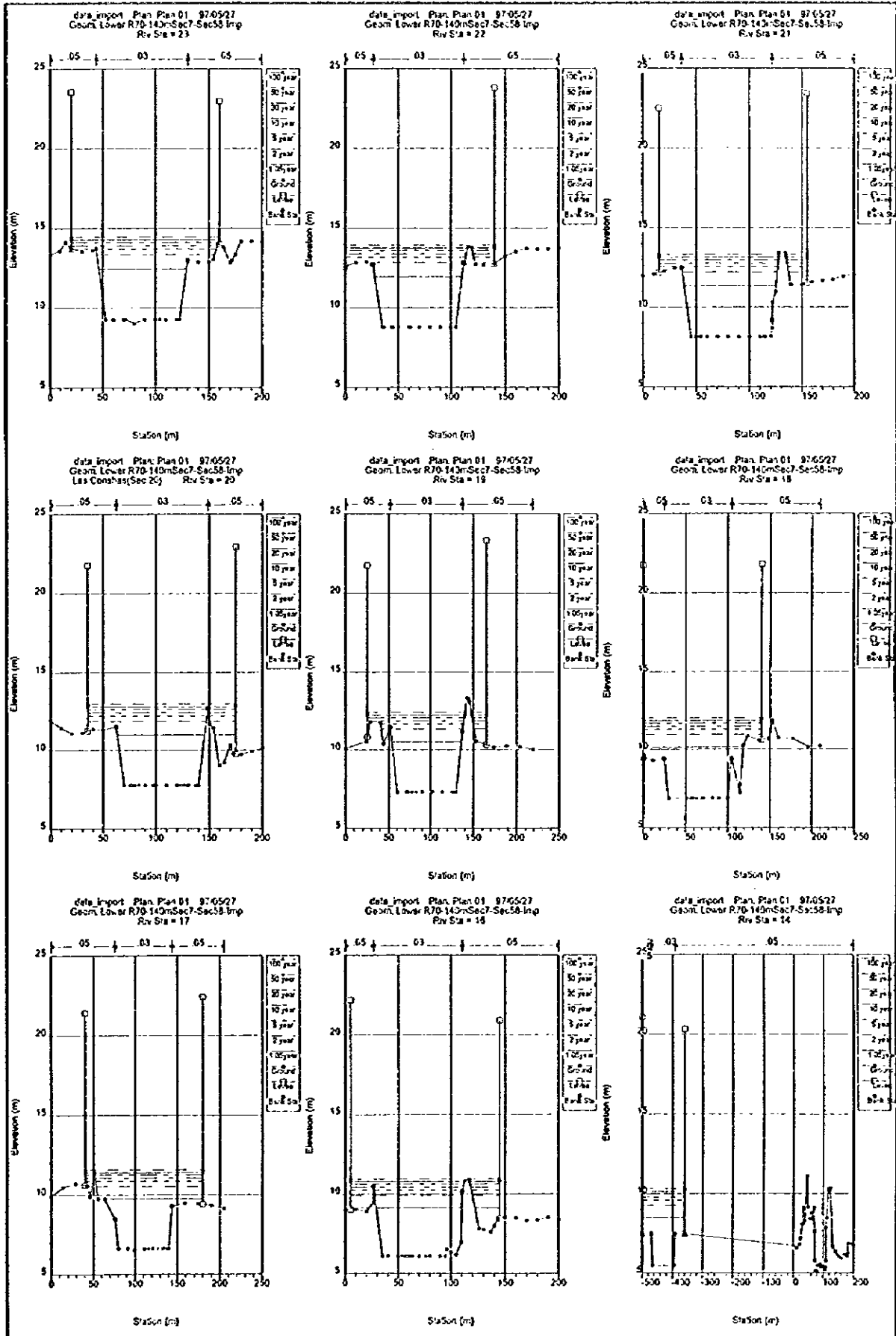


Figure 7.3

CROSS SECTIONS OF LOWER REACH FOR M/P (6/10)

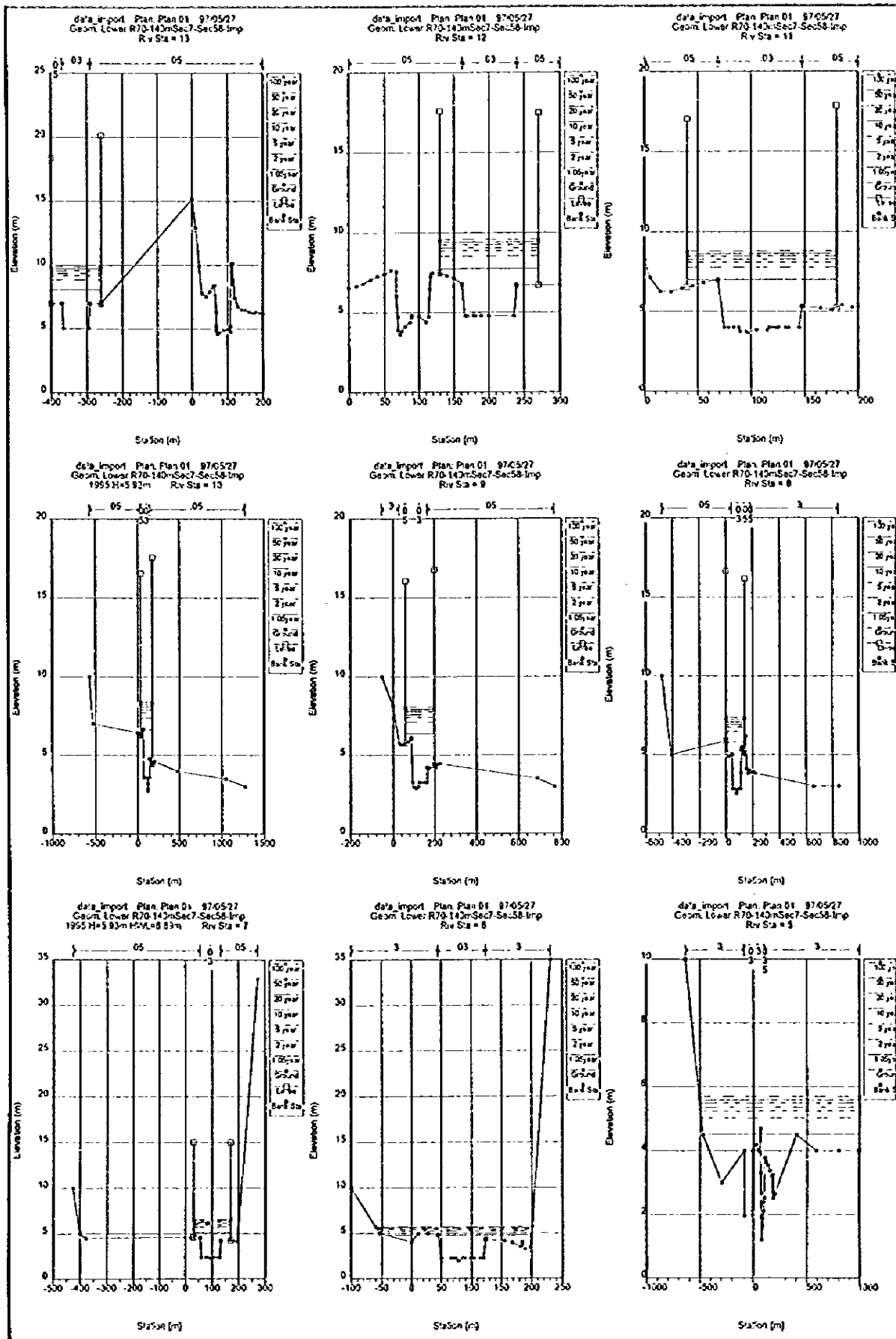


Figure 7.3

CROSS SECTIONS OF LOWER REACH FOR M/P (7/10)

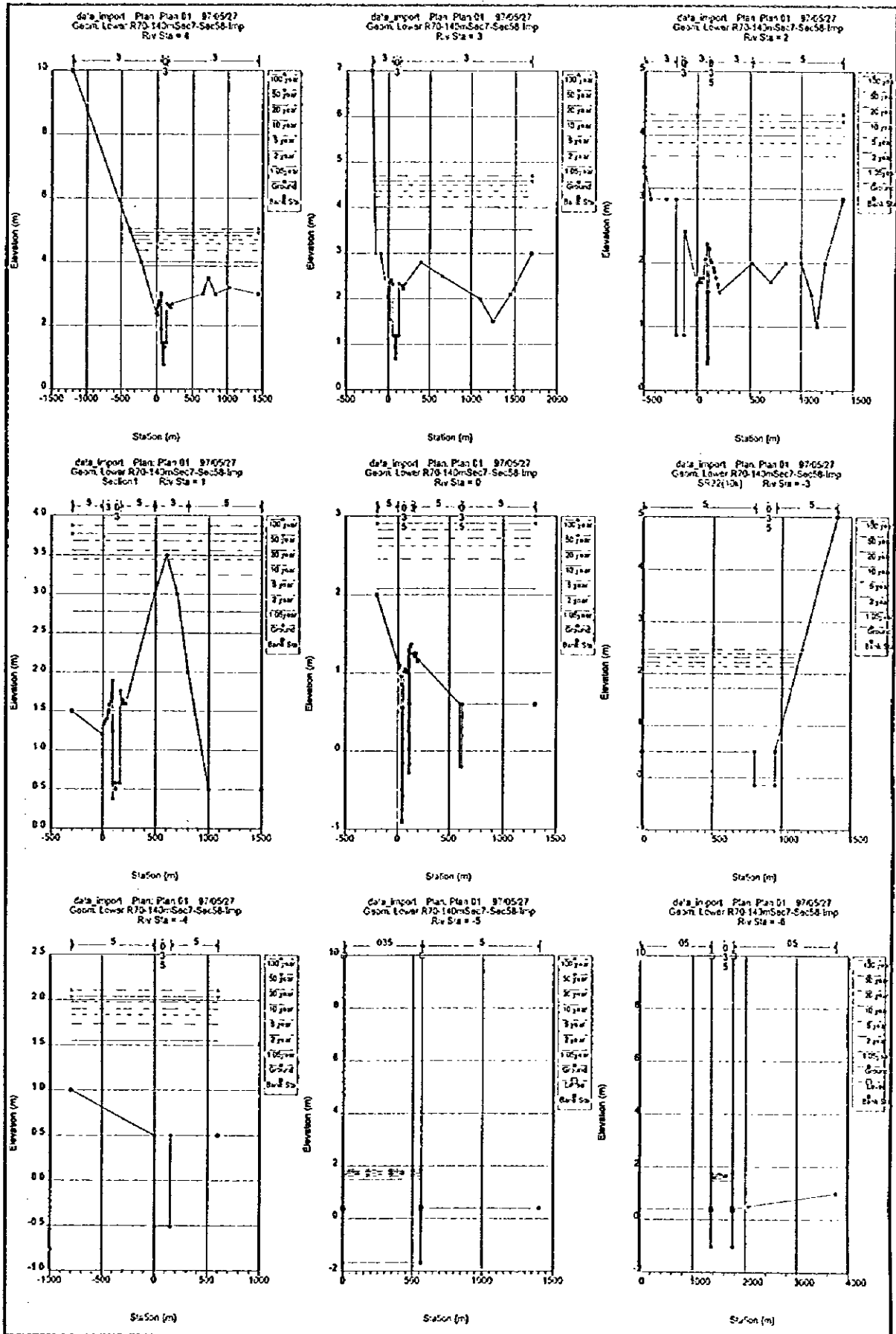


Figure 7.3

CROSS SECTIONS OF LOWER REACH FOR M/P (8/10)

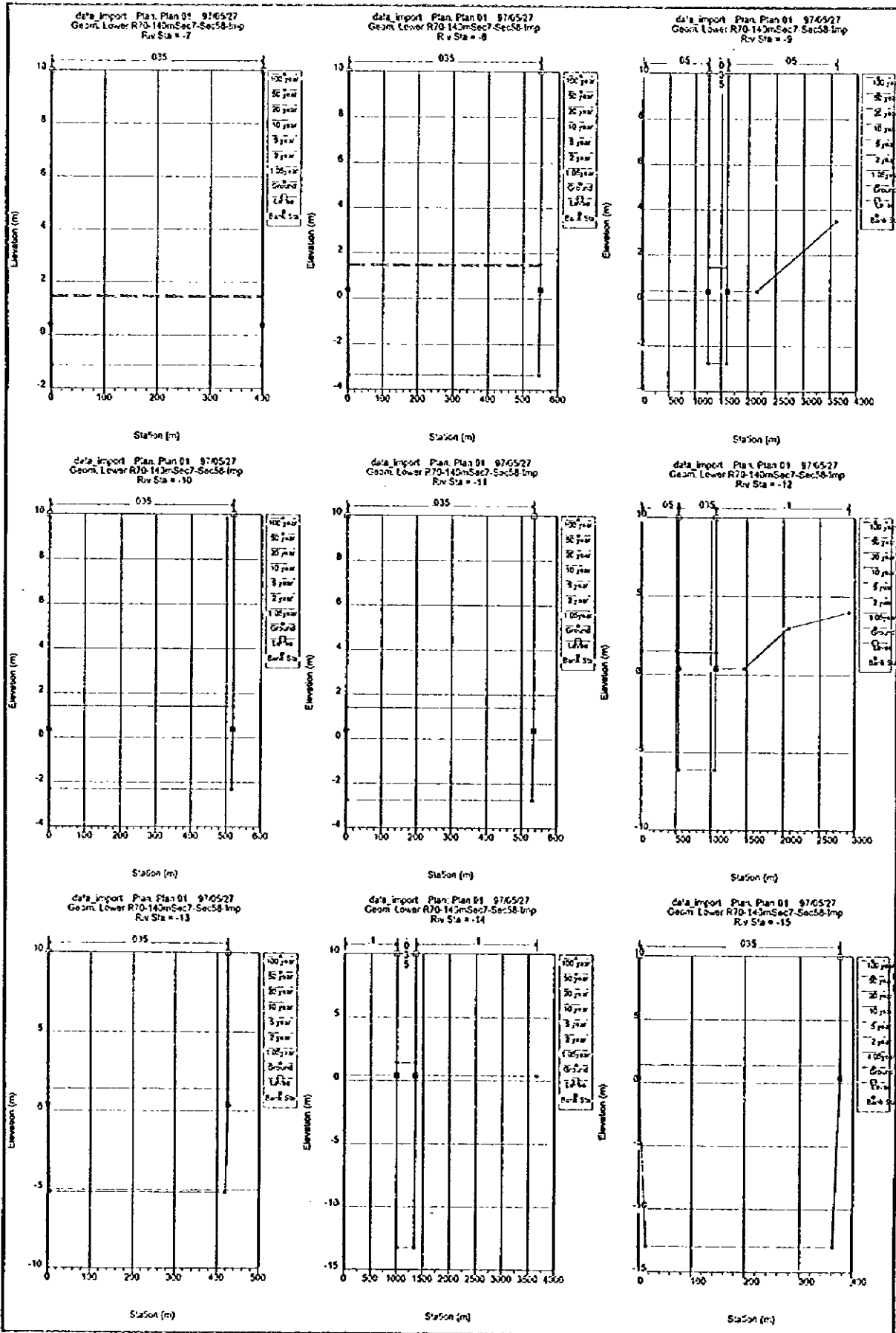


Figure 7.3

CROSS SECTIONS OF LOWER REACH FOR M/P (9/10)

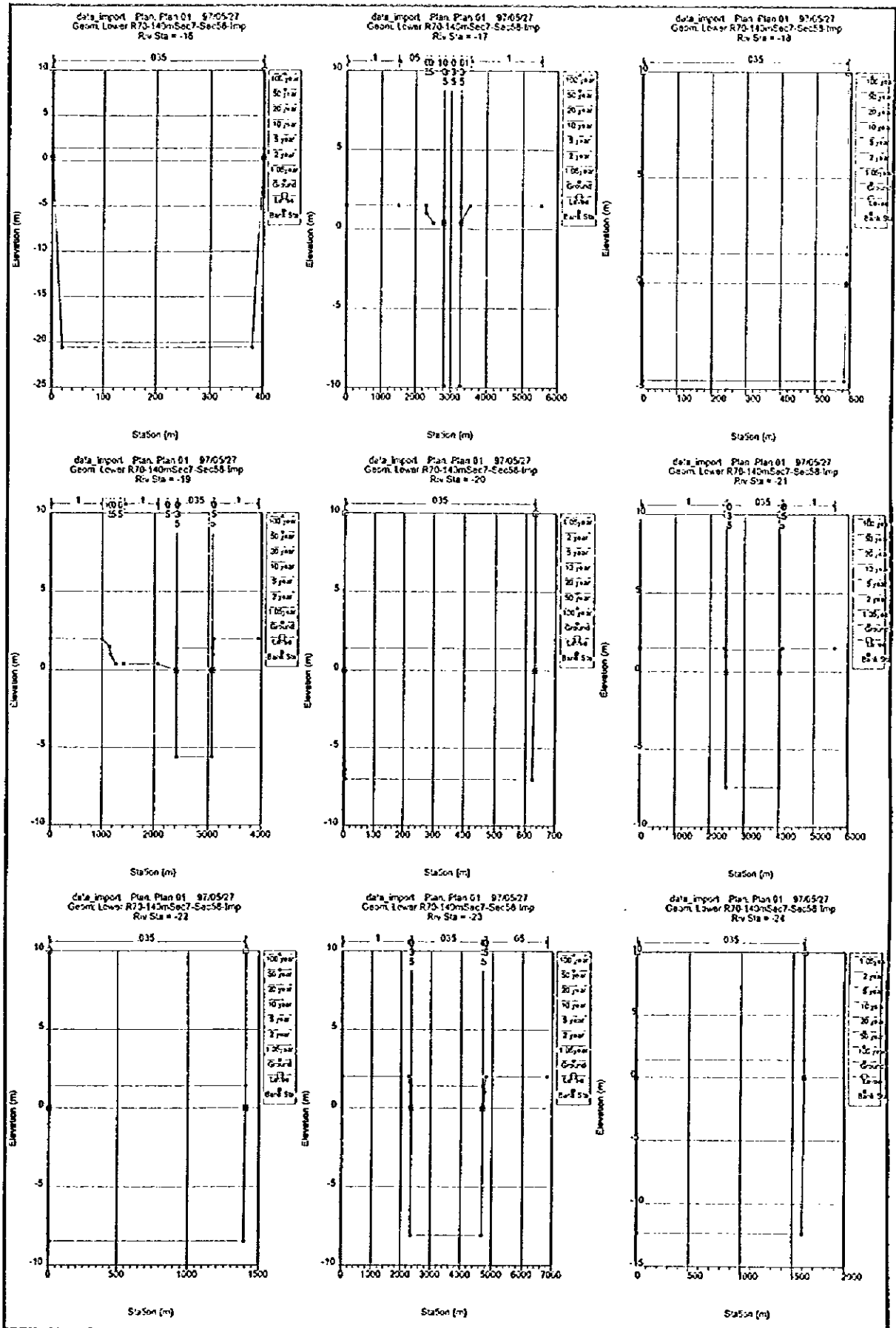


Figure 7.3

CROSS SECTIONS OF LOWER REACH FOR M/P (10/10)

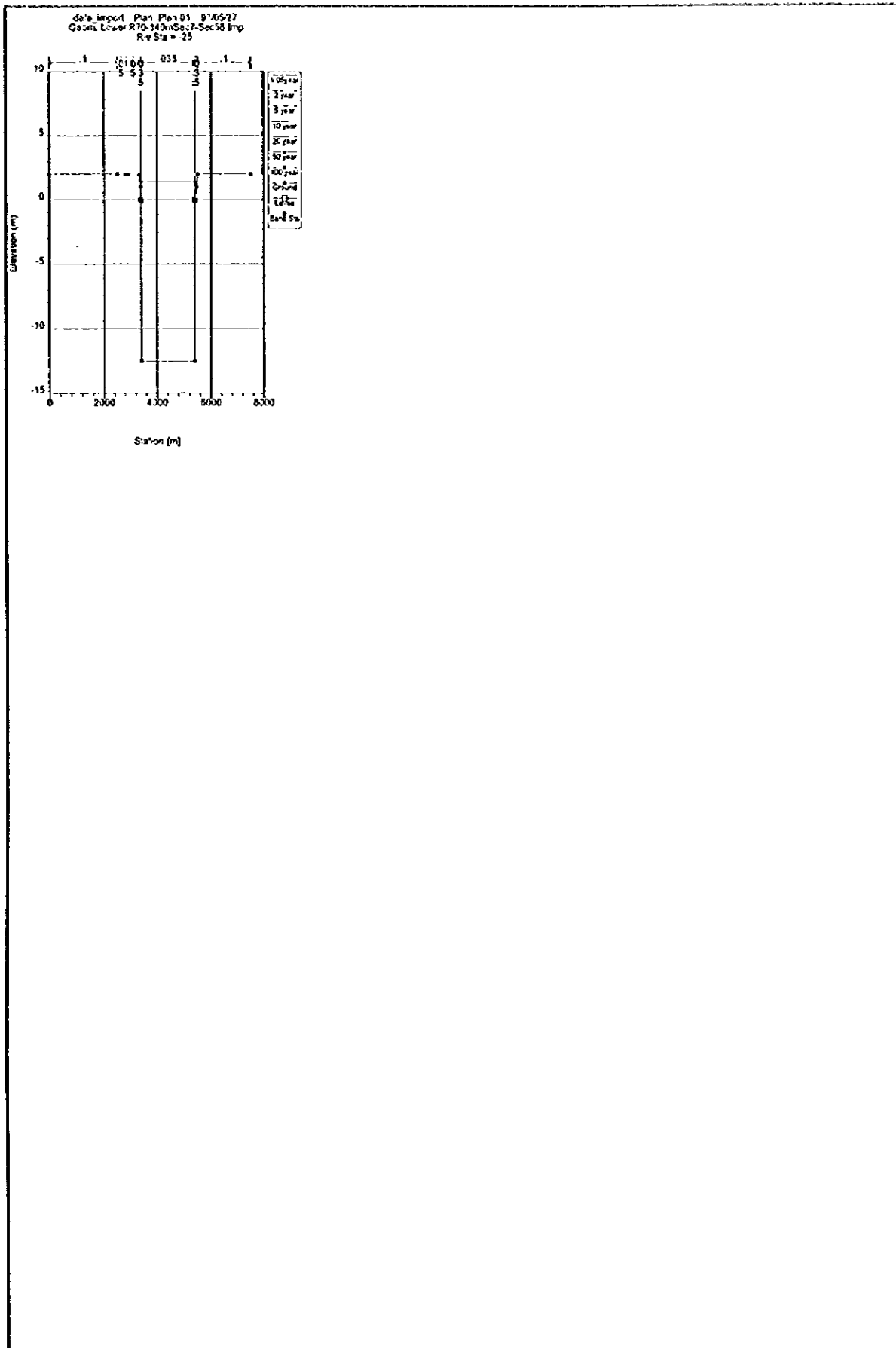


Figure 7.4

CROSS SECTIONS OF MIDDLE REACH FOR M/P (1/8)

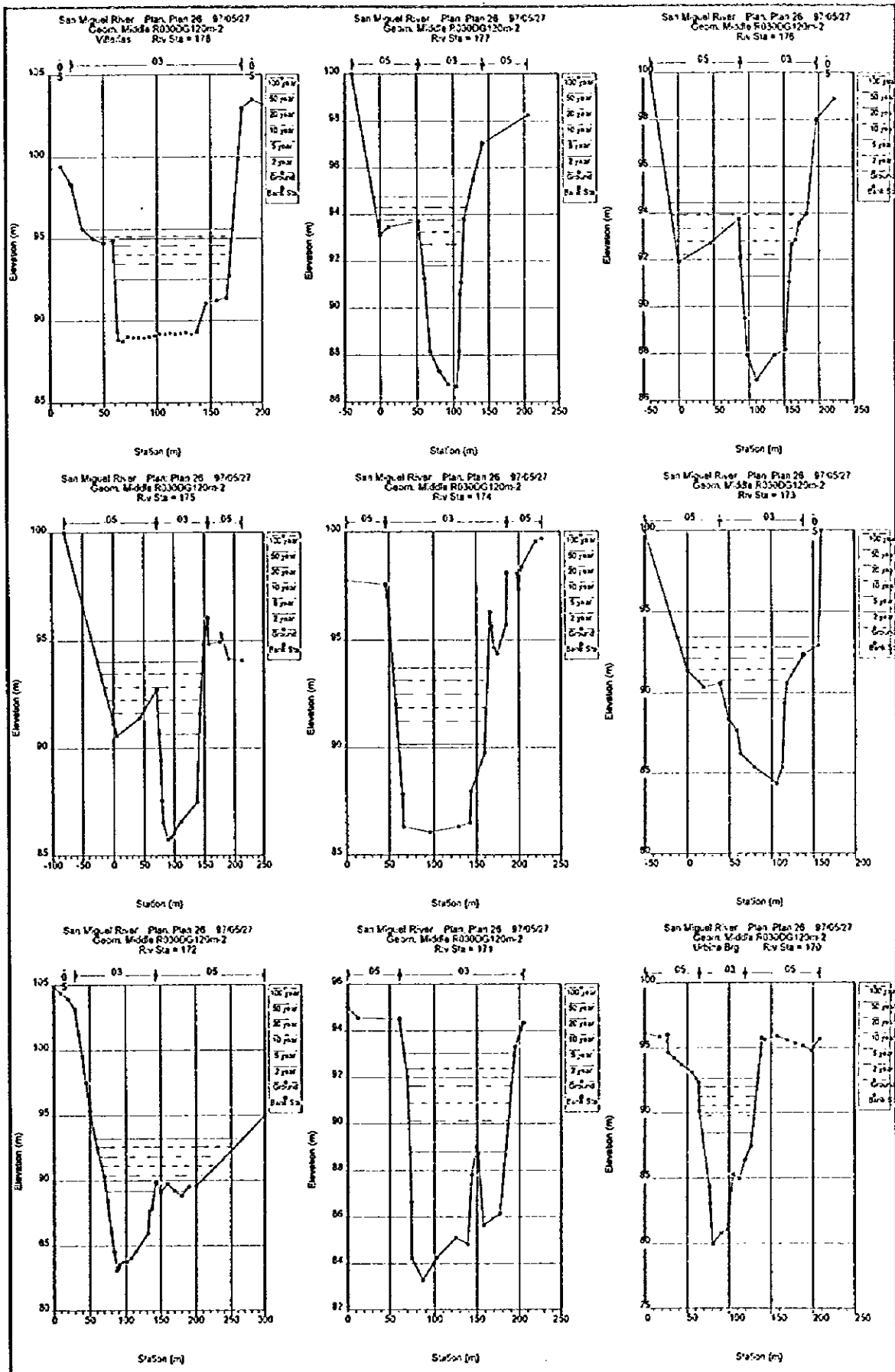


Figure 7.4

CROSS SECTIONS OF MIDDLE REACH FOR M/P (2/8)

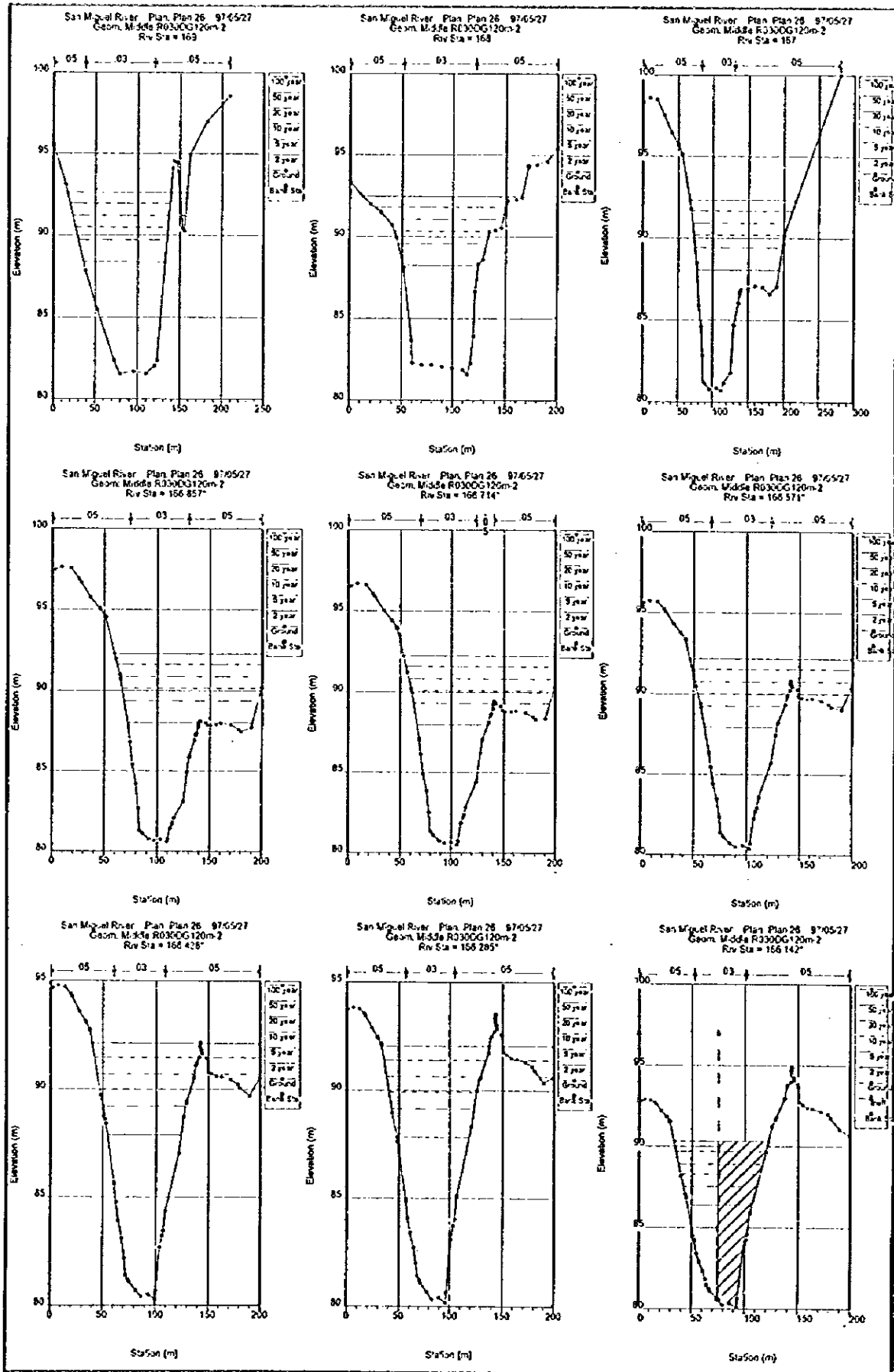


Figure 7.4

CROSS SECTIONS OF MIDDLE REACH FOR M/P (3/8)

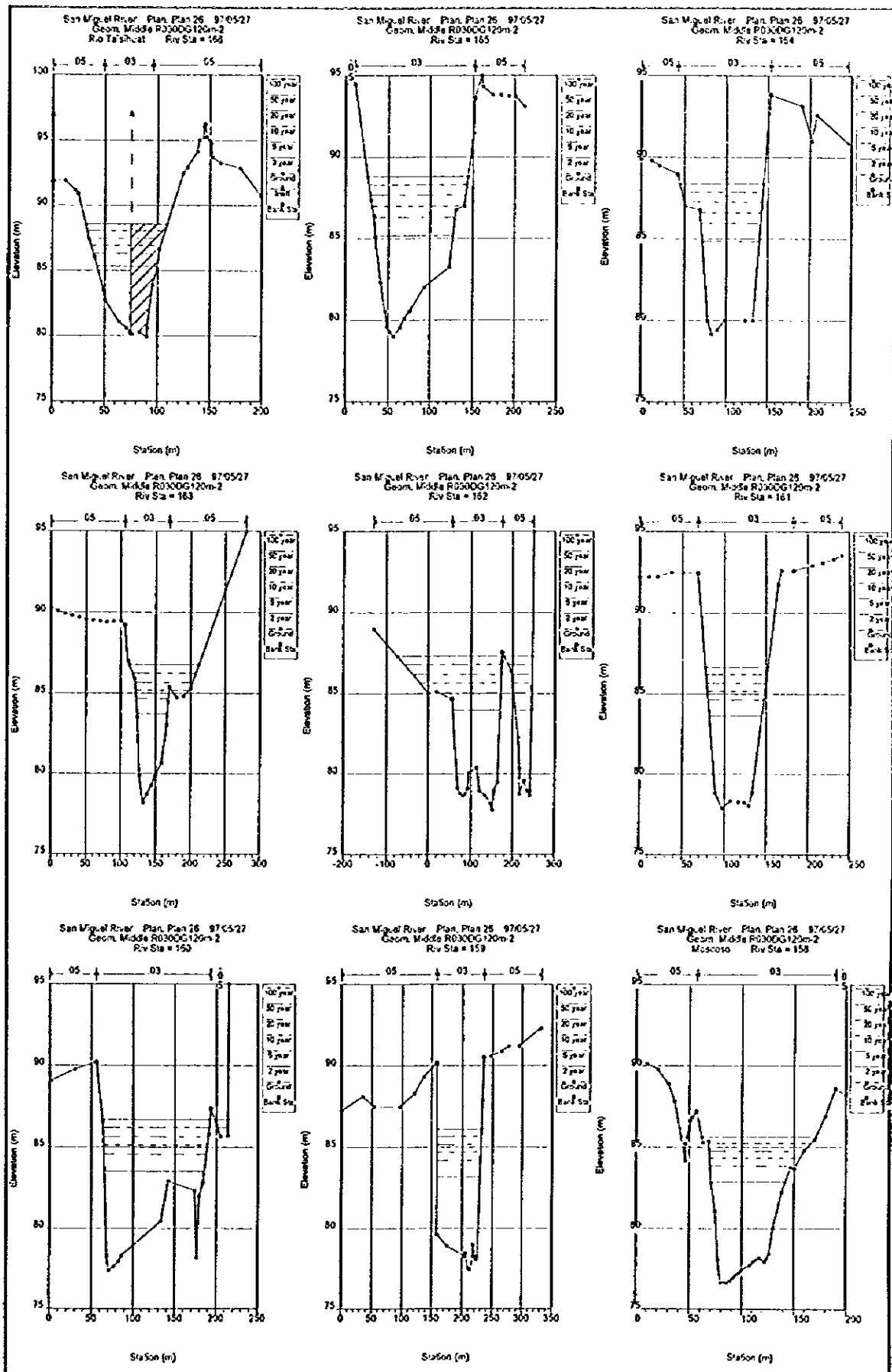


Figure 7.4

CROSS SECTIONS OF MIDDLE REACH FOR M/P (4/8)

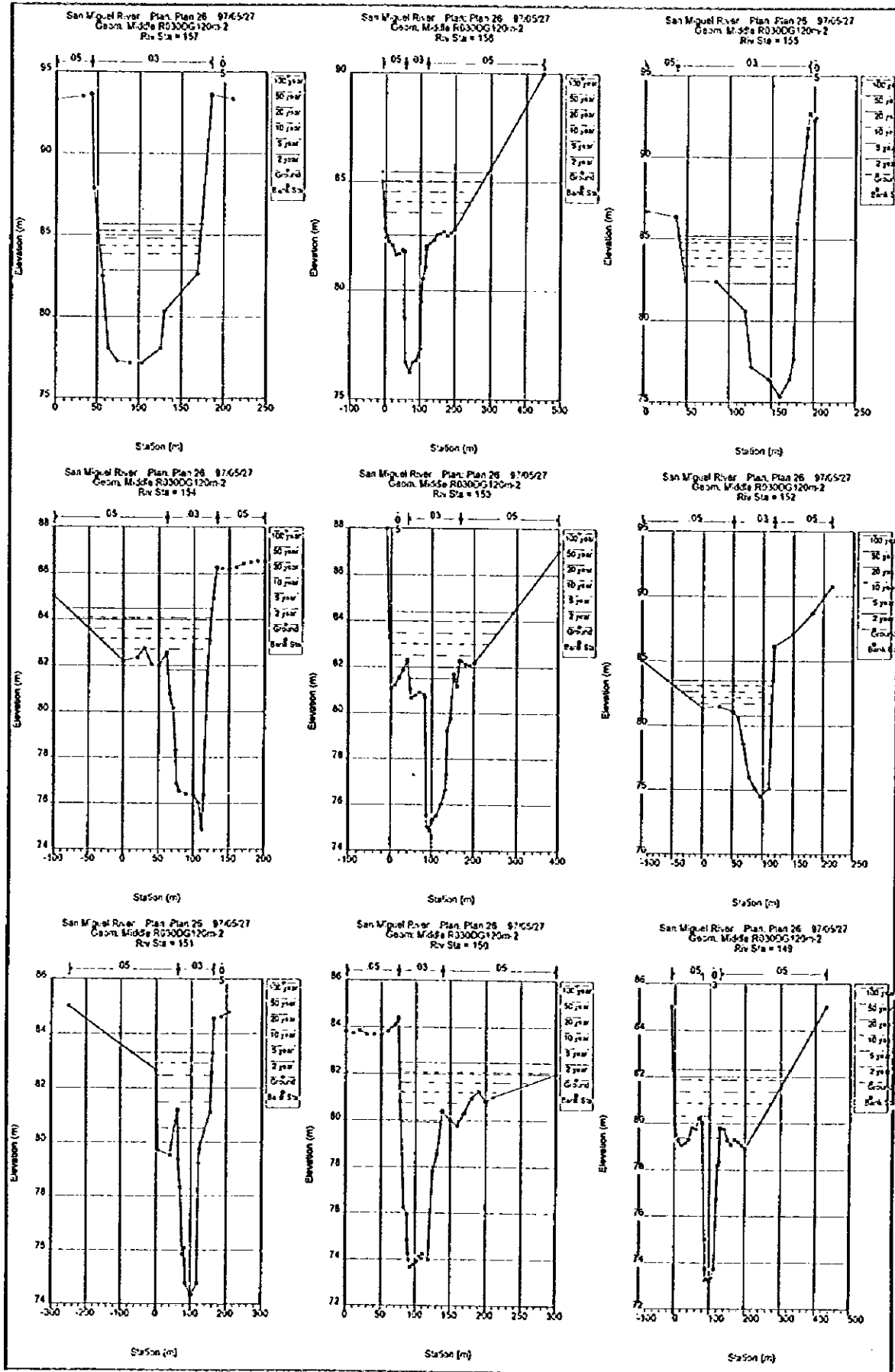


Figure 7.4

CROSS SECTIONS OF MIDDLE REACH FOR M/P (5/8)

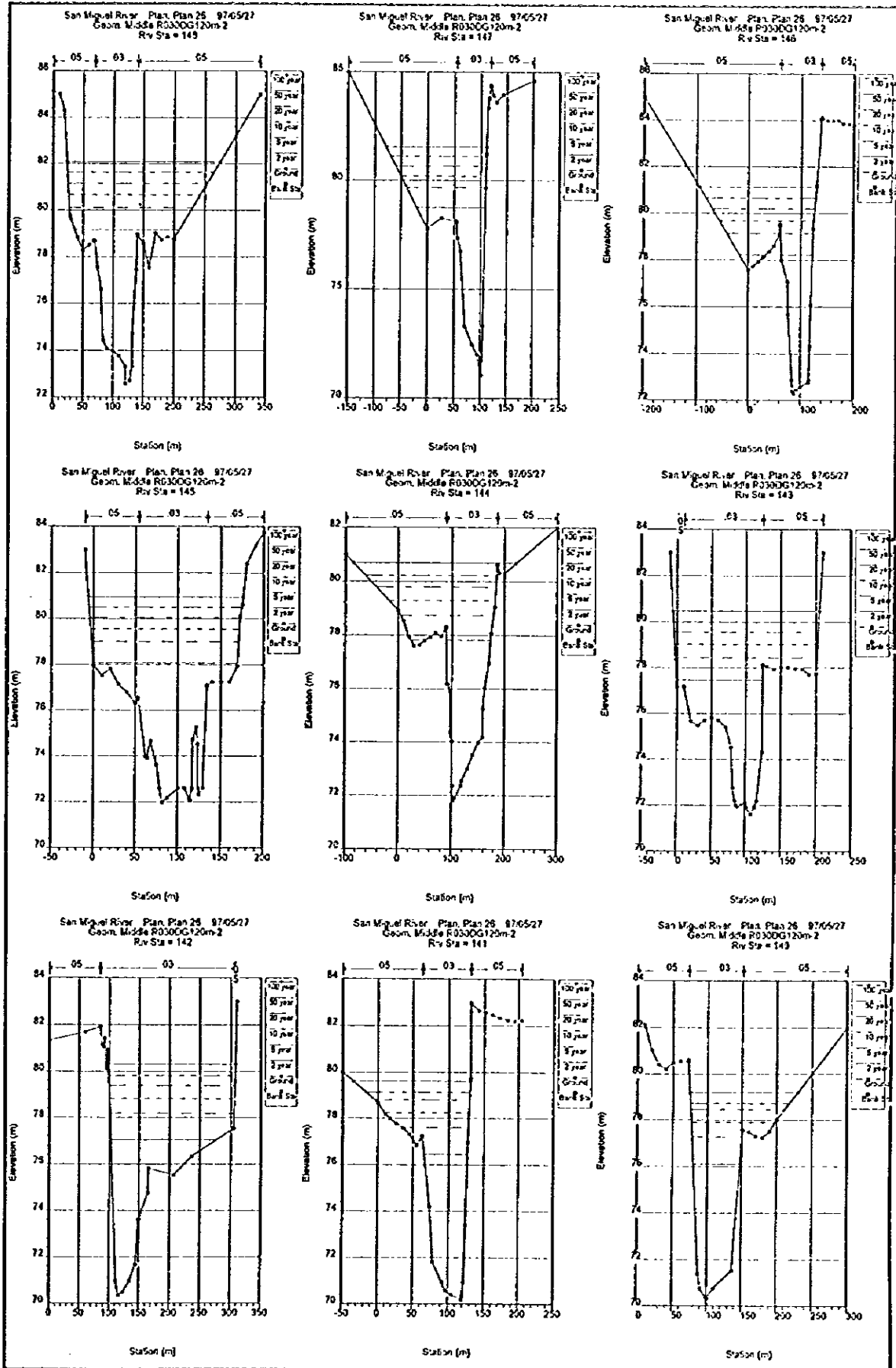


Figure 7.4

CROSS SECTIONS OF MIDDLE REACH FOR M/P (6/8)

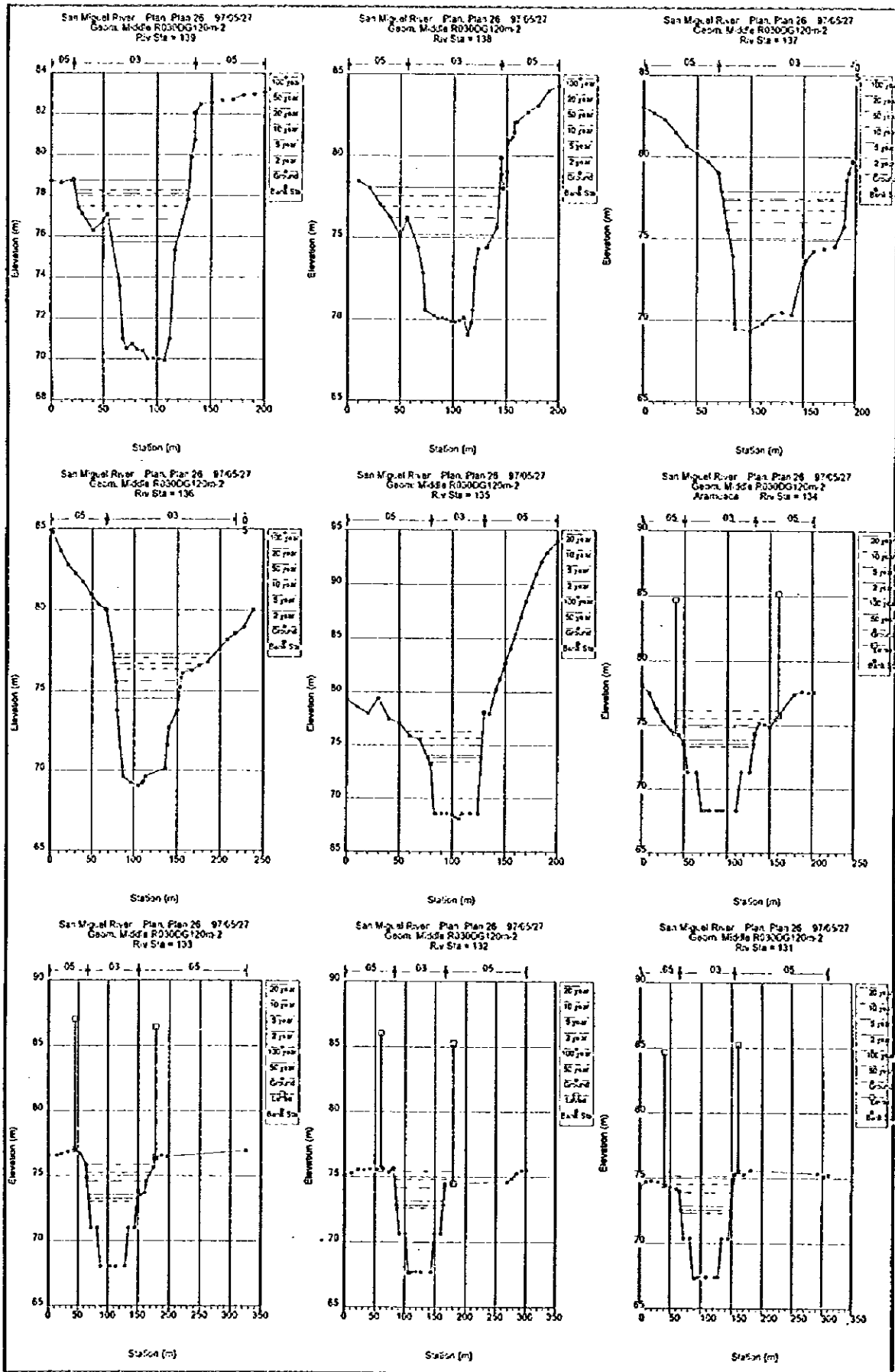


Figure 7.4

CROSS SECTIONS OF MIDDLE REACH FOR M/P (7/8)

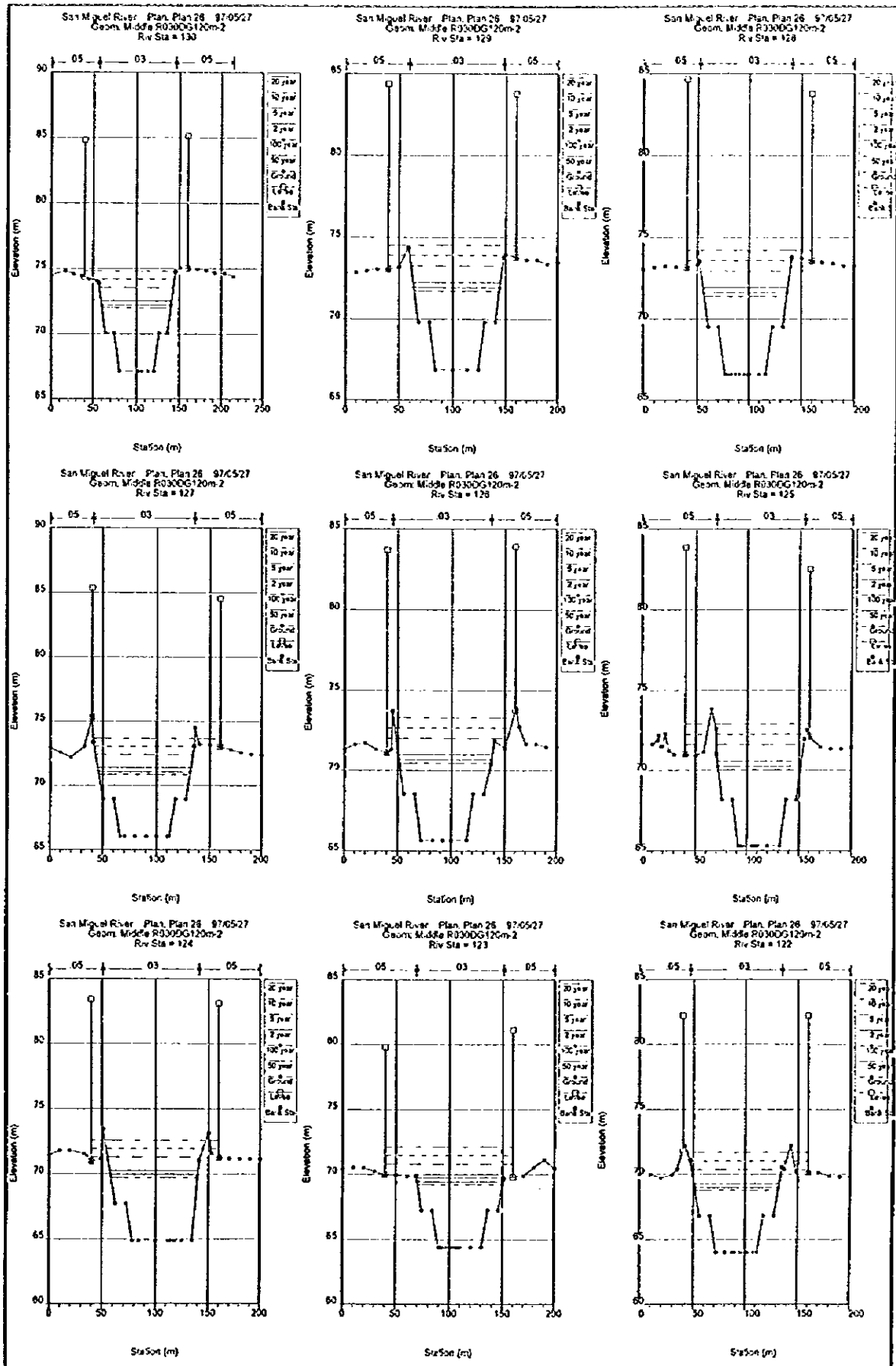


Figure 7.4

CROSS SECTIONS OF MIDDLE REACH FOR M/P (8/8)

