

APPENDIX A

**EVAPOTRANSPIRATION &
PRECIPITATION DATA FROM
WESLACO WEATHER STATION NO.1
2000 TO 2003 (JUNE, JULY, AUGUST)**

**Weslaco #1 Weather Station
01/01/90 - 01/01/03**

Date	ETo	Tmax (F)	Tmin (F)	RHmin (%)	Solar	Rain (in)	Wind	Wind
	PET (in)				(MJm2)		4am (mph)	4pm (mph)
6/1/2000	0.22	91	75	51	24.6	0	5.2	13.1
6/2/2000	0.24	92	76	46	27.2	0	4.6	10.6
6/3/2000	0.25	93	77	45	27.2	0	5.8	10.3
6/4/2000	0.27	93	76	40	29.4	0	5.8	10.4
6/5/2000	0.15	87	74	66	16.3	0.17	2.8	11.3
6/6/2000	0.12	83	72	65	14.6	0.27	2	8.9
6/7/2000	0.16	84	72	67	20.3	0	0.4	11
6/8/2000	0.2	89	70	58	24.8	0	2	11.5
6/9/2000	0.13	85	76	72	14.7	0.2	5.3	10
6/10/2000	0.09	81	74	80	9.4	1.23	4	8.5
6/11/2000	0.09	86	74	68	11.4	0.36	3.6	0.5
6/12/2000	0.2	88	74	61	25.3	0.01	4.3	11.3
6/13/2000	0.22	89	75	57	26.8	0	4.5	9.3
6/14/2000	0.18	87	76	62	19.3	0	6	10.2
6/15/2000	0.22	90	76	58	26.8	0	3.1	10.4
6/16/2000	0.22	91	76	60	25.4	0	5.2	11
6/17/2000	0.23	93	77	55	26.8	0	5.4	11.3
6/18/2000	0.16	89	77	63	15.8	0	6	11.2
6/19/2000	0.2	91	75	57	23.1	0	4.1	10.9
6/20/2000	0.24	91	76	56	27.1	0	5	11.4
6/21/2000	0.23	91	75	54	26.2	0	3.9	11
6/22/2000	0.24	92	76	50	27.1	0	4.8	11.2
6/23/2000	0.27	95	76	33	29	0	5.5	11.4
6/24/2000	0.26	94	74	40	29.2	0	4.1	10.2
6/25/2000	0.25	93	74	42	28.6	0	4.5	10.5
6/26/2000	0.25	93	76	48	28.2	0	3.3	12.8
6/27/2000	0.21	91	75	46	22.1	0	2	8.8
6/28/2000	0.26	94	74	33	28.3	0	3.6	10.3
6/29/2000	0.26	94	74	39	28.8	0	3.1	9.8
6/30/2000	0.25	93	75	49	28	0	2.2	11
7/1/2000	0.26	93	76	44	28.3	0	5	11.6
7/2/2000	0.27	93	78	43	28.6	0	5.5	11.7
7/3/2000	0.27	93	75	42	29.2	0	4.5	13.2
7/4/2000	0.26	95	75	33	27.5	0	4.7	10.8
7/5/2000	0.26	95	72	30	28.1	0	3.1	10.3
7/6/2000	0.25	94	73	44	27.6	0	3.6	12.1
7/7/2000	0.24	95	76	44	25.5	0	2.8	12.6
7/8/2000	0.25	96	75	38	27.4	0	2.9	13.9
7/9/2000	0.23	93	75	47	24.1	0	1.2	13.4

7/10/2000	0.26	93	77	46	27.4	0	5.1	11.7
7/11/2000	0.27	94	77	42	29	0	4.8	11.7
7/12/2000	0.28	96	78	43	29.1	0	6.7	11.1
7/13/2000	0.27	97	74	32	28.9	0	3.7	9.5
7/14/2000	0.27	99	74	27	29.2	0	3.4	7.7
7/15/2000	0.28	100	75	25	29.4	0	4.2	7.8
7/16/2000	0.28	98	77	28	28.8	0	7	10.2
7/17/2000	0.28	96	76	36	28.4	0	4	10.9
7/18/2000	0.26	97	75	36	27.3	0	2.4	10.7
7/19/2000	0.28	97	77	33	28.7	0	3.7	12.3
7/20/2000	0.29	97	79	25	29.1	0	4.8	10.5
7/21/2000	0.28	97	74	27	29.1	0	3.3	10.4
7/22/2000	0.27	97	75	35	28.8	0	2.7	9.5
7/23/2000	0.26	98	76	33	28	0	3.4	6.7
7/24/2000	0.23	97	77	37	22.9	0	2.1	12.8
7/25/2000	0.25	98	76	31	25.3	0	3.6	9.3
7/26/2000	0.23	97	78	38	21.3	0	5	10.4
7/27/2000	0.24	95	78	37	22.5	0	4.1	10.5
7/28/2000	0.25	93	75	42	25.8	0.1	1.1	11.2
7/29/2000	0.24	96	74	39	25.4	0	2.9	10.4
7/30/2000	0.24	97	77	33	23.9	0	3.3	10
7/31/2000	0.26	97	77	38	26.5	0	1.4	12.6
8/1/2000	0.24	95	77	41	26.9	0	1.3	12.9
8/2/2000	0.22	95	76	41	24.5	0	3.1	12.3
8/3/2000	0.17	92	77	54	16.6	0	2.6	9
8/4/2000	0.13	89	76	59	10.9	0	3	8.3
8/5/2000	0.24	96	75	40	27.1	0	2.1	12
8/6/2000	0.24	96	77	44	25.5	0	4.1	10.8
8/7/2000	0.24	96	77	44	24.8	0	4.1	13.2
8/8/2000	0.13	87	77	66	11.1	0.1	1.3	10.3
8/9/2000	0.21	94	74	41	23.6	0	1.1	13.4
8/10/2000	0.2	93	75	48	20.6	0	0	13.1
8/11/2000	0.21	94	74	41	22.4	0	0.8	10.9
8/12/2000	0.23	96	75	39	25.5	0	0.4	12.2
8/13/2000	0.24	96	73	34	26.9	0	0	13.2
8/14/2000	0.17	91	75	57	19.4	0.1	3.2	14.3
8/15/2000	0.1	81	73	85	11.9	0.3	6	13.6
8/16/2000	0.2	93	73	48	25.3	0	2.5	9
8/17/2000	0.24	97	76	30	27	0	2.4	7.4
8/18/2000	0.23	94	74	42	24.8	0.2	0.7	13.2
8/19/2000	0.21	92	74	45	21.8	0	1.7	13.4
8/20/2000	0.24	96	75	39	26	0	3.1	11.8
8/21/2000	0.2	95	76	42	19	0	2.7	11.9
8/22/2000	0.15	86	72	61	15.4	0.1	0.8	6.9
8/23/2000	0.13	89	74	61	15.6	0	0	4
8/24/2000	0.16	92	73	54	19.5	0.2	0	6.8
8/25/2000	0.16	91	75	53	16.8	1.7	0.3	13.5
8/26/2000	0.15	92	75	52	16.8	3.2	3.8	5.1

8/27/2000	0.21	94	75	47	23.2	19.6	2.4	12.7
8/28/2000	0.22	95	76	42	24.3	0	3	16.1
8/29/2000	0.21	95	78	45	21.6	0	3.8	12.3
8/30/2000	0.23	97	76	37	25	0	2.7	8.2
8/31/2000	0.24	99	76	33	25.2	0	2.5	10.3
6/1/2001	0.23	95	75	39	27.22	0	3.53	7.5
6/2/2001	0.25	95	74	37	28.05	0	2.22	10.02
6/3/2001	0.24	93	76	44	27.37	0	4.78	10.59
6/4/2001	0.21	91	76	51	24.87	0	4.62	13.82
6/5/2001	0.19	92	74	47	23.72	0	2.6	6.58
6/6/2001	0.22	96	76	39	26.98	0	3.46	9.42
6/7/2001	0.21	96	77	38	24.67	0	3.28	7.05
6/8/2001	0.2	94	72	41	25.5	1.89	2.95	3.89
6/9/2001	0.2	94	76	38	26.57	0	4.34	4.91
6/10/2001	0.22	96	76	36	28.5	0	2.47	6.27
6/11/2001	0.25	97	77	36	27.78	0	4.45	13.01
6/12/2001	0.27	97	79	38	28.27	0	4.41	11.59
6/13/2001	0.21	93	80	54	23.42	0	6.4	10.77
6/14/2001	0.27	96	81	43	26.26	0	7.73	13.21
6/15/2001	0.09	87	67	64	8.13	2.76	5.28	4.62
6/16/2001	0.17	89	72	48	25.56	0	2.16	7.67
6/17/2001	0.19	89	73	46	27.43	0	1.39	11.14
6/18/2001	0.2	90	73	41	28.71	0	1.39	8.44
6/19/2001	0.22	91	73	39	28.19	0	3.9	10.77
6/20/2001	0.22	92	74	40	28.49	0	3.03	11.35
6/21/2001	0.19	91	75	48	24.9	0	4.53	9.99
6/22/2001	0.23	94	74	39	28.8	0	3.88	8.12
6/23/2001	0.24	94	75	35	28.74	0	2.24	6.95
6/24/2001	0.22	91	74	45	27	0	2.93	14.67
6/25/2001	0.15	88	75	57	18.92	0	3.57	11.48
6/26/2001	0.21	92	74	39	26.39	0	3.96	12.53
6/27/2001	0.22	91	72	38	26.13	0	1.93	11.92
6/28/2001	0.2	91	73	41	24.02	0	3.06	8.89
6/29/2001	0.24	92	74	37	28.29	0	3.79	10.25
6/30/2001	0.23	93	77	39	25.44	0	4.32	10.07
7/1/2001	0.17	90	76	45	18.11	0	4.16	10.84
7/2/2001	0.08	78	70	68	11.22	0.16	1.71	8.98
7/3/2001	0.07	83	70	67	12.37	0.43	1.28	7.29
7/4/2001	0.13	89	73	53	19.55	0	1.65	7.23
7/5/2001	0.18	91	74	46	27.14	0	2.1	7.85
7/6/2001	0.23	93	75	37	28.75	0	3.14	8.74
7/7/2001	0.21	92	74	38	25.03	0	3.66	8.74
7/8/2001	0.23	93	74	39	28.11	0	3.22	10.6
7/9/2001	0.24	94	73	41	29.1	0	3.67	9.83
7/10/2001	0.23	95	74	37	28.83	0	3.6	7.91
7/11/2001	0.25	94	75	37	29.03	0	4.02	9.59
7/12/2001	0.23	94	76	40	28.44	0	3.33	8.63
7/13/2001	0.22	93	75	42	27.91	0	4.06	8.08

7/14/2001	0.25	95	78	34	28.66	0	4.51	7.84
7/15/2001	0.24	95	75	40	28.42	0	3.33	7.91
7/16/2001	0.24	95	76	41	27.46	0	4.08	8.96
7/17/2001	0.24	95	77	38	27.02	0	3.24	8.92
7/18/2001	0.25	96	76	35	27	0	3.17	9.4
7/19/2001	0.26	96	77	37	27.76	0	3.57	9.43
7/20/2001	0.27	95	78	35	28.37	0	4.15	11.46
7/21/2001	0.29	96	76	25	28.85	0	3.78	10.73
7/22/2001	0.27	97	74	31	29.03	0	2.9	8.42
7/23/2001	0.24	96	76	35	28.22	0	2.61	9.09
7/24/2001	0.22	93	75	42	25.11	0	2.37	11.65
7/25/2001	0.19	94	76	44	20.39	0	3.42	13.75
7/26/2001	0.24	96	78	39	25.1	0	5.75	11.18
7/27/2001	0.24	96	79	38	25.31	0.02	2.63	9.65
7/28/2001	0.24	96	78	39	25.59	0	3.67	9.82
7/29/2001	0.25	95	78	38	27.5	0	3.37	10.16
7/30/2001	0.28	95	79	33	28.06	0	4.95	11.06
7/31/2001	0.27	95	76	36	27.63	0	3.15	11.44
8/1/2001	0.22	95	77	39	21.97	0	2.9	11.54
8/2/2001	0.15	88	75	54	21.04	0.23	2.31	4.34
8/3/2001	0.08	84	75	66	10.49	0.01	2.39	6.49
8/4/2001	0.2	92	74	36	25.42	0	1.71	9.87
8/5/2001	0.2	92	72	38	26.48	0	1.26	10.77
8/6/2001	0.19	94	75	36	22.32	0	1.33	11.41
8/7/2001	0.21	93	75	40	23.2	0	2.12	9.08
8/8/2001	0.23	94	77	39	26.23	0	3.19	10.2
8/9/2001	0.23	94	76	36	25.68	0	2.8	10.02
8/10/2001	0.25	96	77	37	27.02	0	3.06	12.34
8/11/2001	0.25	94	77	35	25.31	0	3.94	10.6
8/12/2001	0.26	96	76	32	27.28	0	3.9	8.81
8/13/2001	0.25	98	77	26	25.5	0	3.6	9.26
8/14/2001	0.25	95	78	30	26.14	0	4.09	8.13
8/15/2001	0.27	97	76	30	26.14	0	4.21	8.76
8/16/2001	0.29	96	79	35	27.62	0	8.18	11.29
8/17/2001	0.26	97	78	32	24.41	0	5.36	9.12
8/18/2001	0.24	96	78	37	25.83	0	3.49	9.11
8/19/2001	0.27	97	77	32	27.09	0	3.45	8.83
8/20/2001	0.25	96	79	36	25.18	0	4.22	12.5
8/21/2001	0.24	96	78	37	24.7	0	3.92	11.61
8/22/2001	0.25	96	78	36	24.23	0	3.77	12.44
8/23/2001	0.23	96	76	35	23.55	0	2.69	10.91
8/24/2001	0.23	96	77	39	24.27	0	3.28	11.05
8/25/2001	0.23	95	78	41	24.95	0	2.91	9.16
8/26/2001	0.24	96	78	37	24.02	0	3.45	11.62
8/27/2001	0.17	88	75	46	19.02	0.01	4.39	9.23
8/28/2001	0.07	79	71	75	11.77	0.66	6.11	7.7
8/29/2001	0.06	85	71	68	9.59	0.54	6.55	2.55
8/30/2001	0.09	87	76	66	13.98	0.01	4.54	8.76

8/31/2001	0.11	88	72	63	13.8	0.41	4.82	6.67
6/1/2002	0.18	86	69	52	28.27	0	2	10.68
6/2/2002	0.16	87	71	54	24.39	0	1.42	10.41
6/3/2002	0.19	91	74	50	24.88	0	3.95	9.6
6/4/2002	0.21	90	77	49	24.08	0	6.32	11.69
6/5/2002	0.18	90	74	48	23.31	0	4.29	12.08
6/6/2002	0.14	88	74	56	20.89	0.08	1.15	5.59
6/7/2002	0.13	86	73	56	19.85	0.14	1.48	7.35
6/8/2002	0.2	91	73	49	28.13	0	3.39	9.73
6/9/2002	0.21	90	77	50	26.75	0	6.7	9.39
6/10/2002	0.2	91	75	50	23.55	0	6.42	11.09
6/11/2002	0.2	92	77	48	24.62	0	5.49	8.71
6/12/2002	0.23	94	75	43	27.01	0	3.29	10.39
6/13/2002	0.21	93	75	46	25.86	0	3.17	10.18
6/14/2002	0.21	92	73	39	27.1	0	2.27	9.34
6/15/2002	0.23	95	72	33	29.25	0	1.97	5.78
6/16/2002	0.28	95	74	31	29.5	0	5.27	10.36
6/17/2002	0.22	95	73	37	26.85	0	1.75	10.01
6/18/2002	0.22	95	76	40	24.55	0	3.13	8.11
6/19/2002	0.25	95	75	39	28.59	0	3.39	11.61
6/20/2002	0.26	94	76	41	28.11	0	4.59	13.32
6/21/2002	0.23	92	74	40	27.38	0	1.64	11.73
6/22/2002	0.2	91	72	42	25.29	0	1.03	10.51
6/23/2002	0.23	93	71	31	30.43	0	1.14	10.8
6/24/2002	0.23	94	72	32	26.73	0	3.21	6.16
6/25/2002	0.26	96	74	30	28.57	0	3.28	7.98
6/26/2002	0.25	97	76	34	27.01	0	3.38	8.2
6/27/2002	0.19	89	79	51	19.86	0	6.07	10.85
6/28/2002	0.19	93	76	45	21.04	0.18	4.08	9.55
6/29/2002	0.07	82	73	76	10.51	0.09	3.92	5.39
6/30/2002	0.06	82	72	79	12.21	0.36	4.42	6.95
7/1/2002	0.14	88	75	62	21.23	0	5.43	10.15
7/2/2002	0.19	89	77	56	24.85	0	5.33	10.8
7/3/2002	0.22	90	75	50	26.57	0.14	6.38	11
7/4/2002	0.18	90	73	55	23.23	0	4.91	10.29
7/5/2002	0.21	91	77	51	24.74	0	6.34	10.17
7/6/2002	0.2	93	77	47	25.08	0	3.67	12.93
7/7/2002	0.2	92	73	42	26.9	0	1.8	7.69
7/8/2002	0.13	88	74	54	17.23	0.06	1.75	10.94
7/9/2002	0.07	82	74	74	11.17	0.3	2.01	7.98
7/10/2002	0.18	90	74	49	25.04	0.02	4.35	8.84
7/11/2002	0.22	93	74	37	28.57	0	3.14	6.82
7/12/2002	0.22	94	73	36	28.64	0	2.31	6.99
7/13/2002	0.24	94	75	40	27.86	0	4.29	10.79
7/14/2002	0.2	92	77	49	23.88	0	4.19	10.88
7/15/2002	0.17	91	77	51	18.98	0.04	4.56	11.41
7/16/2002	0.13	84	75	61	14.44	0	9	9.87
7/17/2002	0.22	93	75	41	27.3	0	3.57	10.47

7/18/2002	0.22	95	76	38	27.06	0	3.88	10.75
7/19/2002	0.23	95	75	37	26.18	0	4.03	9.27
7/20/2002	0.23	94	74	43	27.22	0	4.09	8.8
7/21/2002	0.24	94	76	36	25.45	0	2.97	10.29
7/22/2002	0.22	94	75	36	22.58	0	3.4	11.61
7/23/2002	0.17	92	75	47	21.12	0.29	2.47	2.75
7/24/2002	0.18	95	75	36	21.83	0.03	1.94	12.41
7/25/2002	0.23	95	74	37	27.36	0	3.02	7.71
7/26/2002	0.24	94	76	40	27.42	0	3.42	10.15
7/27/2002	0.26	93	78	46	28.72	0	6.19	12.3
7/28/2002	0.27	94	79	39	27.02	0	6.9	12.83
7/29/2002	0.24	93	79	48	25.59	0.01	6.77	12.09
7/30/2002	0.26	95	78	38	26.12	0	6.1	10.4
7/31/2002	0.25	95	76	37	26.85	0	4.64	10.72
8/1/2002	0.25	95	78	40	28.2	0	5.64	10.72
8/2/2002	0.27	98	77	30	28.37	0	3.72	8.04
8/3/2002	0.25	97	75	32	26.97	0	2.75	9.61
8/4/2002	0.14	90	75	48	16.51	0.05	3.12	5.25
8/5/2002	0.18	91	74	44	23.9	0	1.3	11.25
8/6/2002	0.21	95	76	39	24.7	0	2.5	8.59
8/7/2002	0.24	98	76	27	27.28	0	3.72	6.1
8/8/2002	0.21	97	77	35	22.21	0	3.81	8.91
8/9/2002	0.18	94	77	43	20.19	0	1.85	7.16
8/10/2002	0.19	92	77	48	22.6	0	2.54	5.22
8/11/2002	0.14	92	76	47	15.77	0	1.06	8.06
8/12/2002	0.22	93	76	42	28.18	0.01	3.23	8.5
8/13/2002	0.24	94	78	43	26.43	0	5.04	10.96
8/14/2002	0.2	94	77	43	18.22	0.03	4.43	8.02
8/15/2002	0.24	94	76	44	24.86	0	6.01	11.27
8/16/2002	0.26	96	79	42	26.16	0	3.54	11.76
8/17/2002	0.25	95	80	37	24.29	0	4.2	10.05
8/18/2002	0.26	96	80	34	26.01	0	3.96	11.09
8/19/2002	0.24	96	79	40	24.14	0	4.61	9.77
8/20/2002	0.26	96	80	36	25.15	0	5.29	9.47
8/21/2002	0.23	96	79	39	23.04	0	3.41	10.78
8/22/2002	0.21	96	79	40	21.05	0	3.75	10.48
8/23/2002	0.21	96	77	36	21.79	0	2.55	7.93
8/24/2002	0.25	98	78	31	25.43	0	3.64	7.61
8/25/2002	0.27	99	79	28	25.45	0	4.11	8.25
8/26/2002	0.25	99	77	27	25.84	0	2.16	7.86
8/27/2002	0.27	99	79	30	25.68	0	3.38	9.21
8/28/2002	0.18	96	77	38	16.94	0.09	1.94	8.3
8/29/2002	0.18	94	76	33	21.71	0	0.64	13.93
8/30/2002	0.16	92	74	35	16.79	0	1.8	7.75
8/31/2002	0.18	94	74	34	21.02	0	0.95	9.3

Avg 0.22

0.13

APPENDIX B

**THE LOWER RIO GRANDE REHABILITATION PROJECT,
PROFILE OF THE 6.0 CANAL**

APPENDIX C

**HEC-RAS HYDRAULIC
INPUT & OUTPUT**

EXISTING CONDITIONS

I. DETAILED SUMMARY TABLES

Figure 1: Cross-Section Station & Location Map

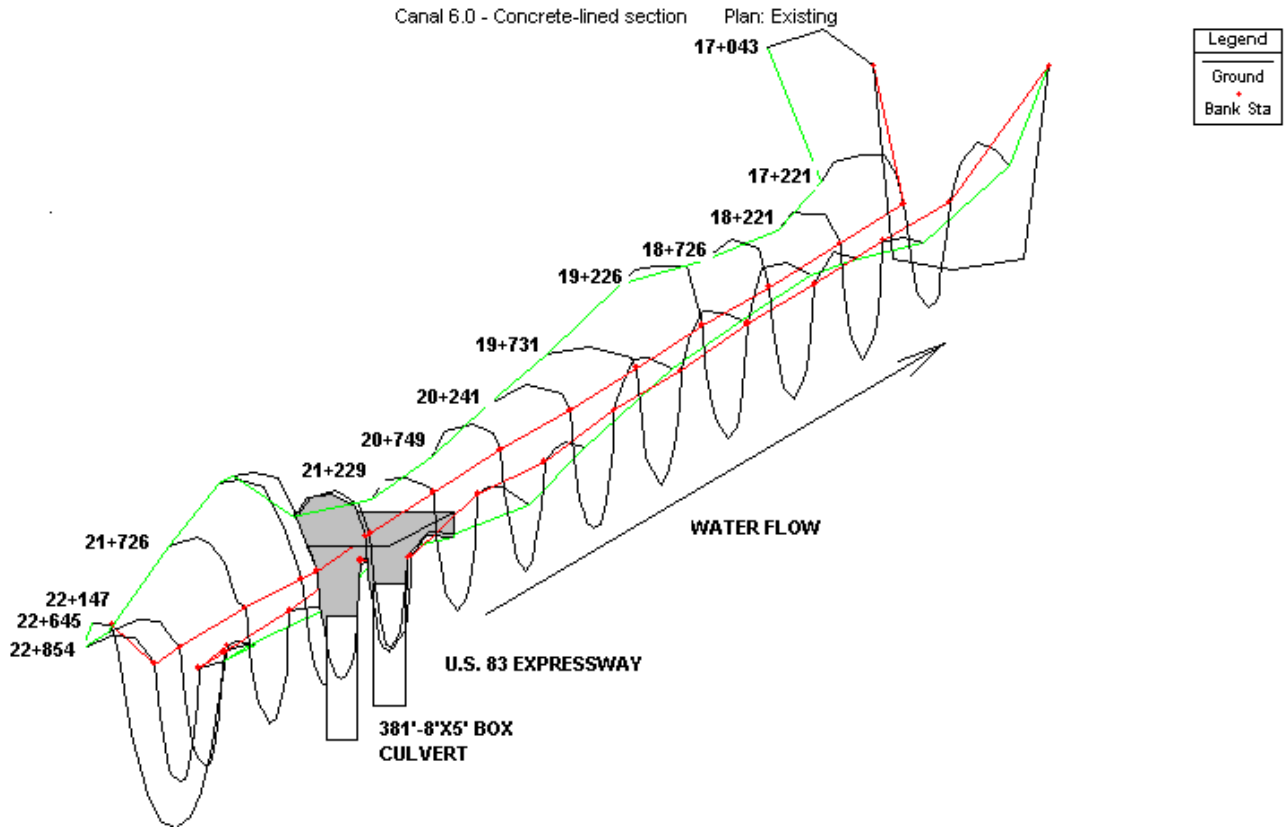


Table 1: HEC-RAS Output, Existing Concrete-Lined Section, Maximum Flow Rate (Q=50cfs)

River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Left Freeboard (ft)	Right Freeboard (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel. Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)
22+854	50	46.7	52.8	2.1	1.3	47.86	52.8	0.00003	0.5	111.8	26.2
22+834	50	48.5	52.8	0.5	0.3		52.8	0.00006	1.5	34.1	11.1
22+645	50	48.5	52.8	0.5	0.3		52.8	0.00007	1.5	33.9	11.1
22+147	50	48.4	52.7	0.4	0.3		52.8	0.00006	1.5	34.2	11.2
21+726	50	48.5	52.7	0.2	0.5	50.05	52.7	0.00006	1.5	34.6	11.2
21+255	Culvert										
21+229	50	48.3	52.7	0.3	-0.6		52.7	0.00006	1.4	35.7	13.6
20+749	50	48.2	52.6	0.3	0.2		52.7	0.00005	1.4	36.8	13.5
20+241	50	48.0	52.6	0.3	-0.2		52.6	0.00005	1.4	36.4	12.2
19+731	50	47.9	52.6	0.1	0.1		52.6	0.00004	1.3	39.5	11.5
19+226	50	48.0	52.6	0.1	0.0		52.6	0.00005	1.3	37.9	11.6
18+726	50	48.1	52.5	0.1	0.2		52.6	0.00005	1.3	37.4	11.7
18+221	50	47.9	52.5	-0.1	0.0		52.5	0.00005	1.3	38.5	11.6
17+713	50	47.7	52.5	0.0	0.1		52.5	0.00005	1.3	38.4	12.3
17+221	50	48.1	52.5	-0.1	-0.1		52.5	0.00005	1.4	36.6	12.1
17+043	50	49.0	52.5	4.8	4.8	49.67	52.5	0.00004	0.4	115.2	38.6

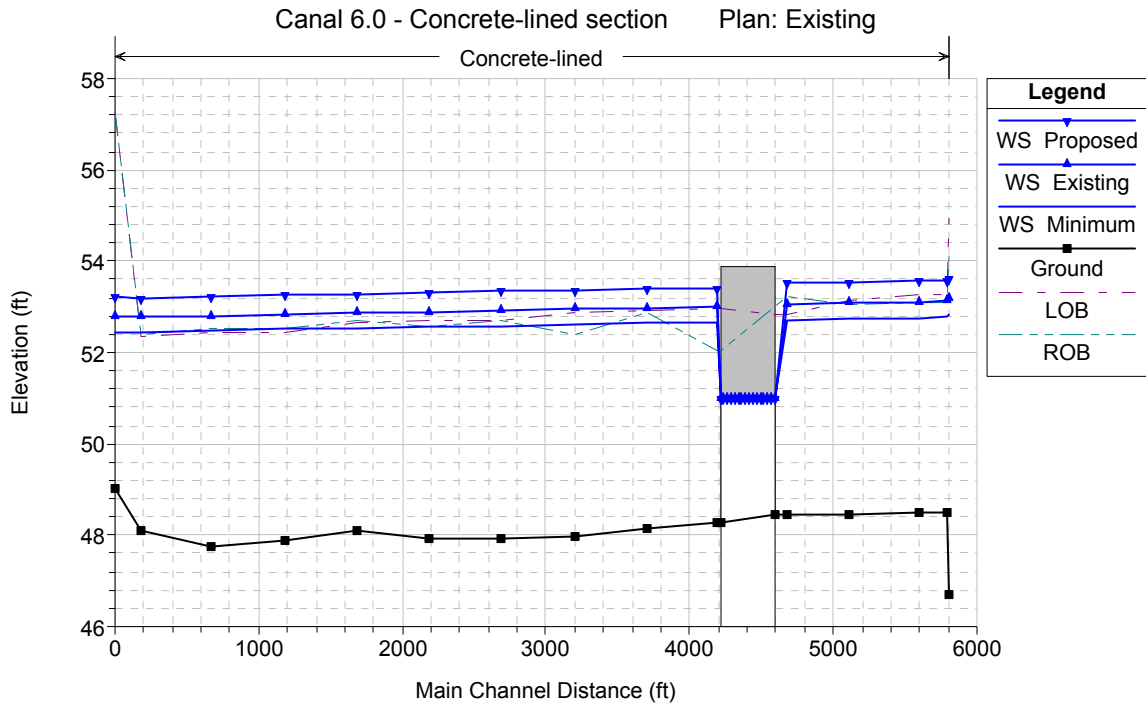
Table 2: HEC-RAS Output, Existing Concrete-Lined Section, Existing Flow Rate (Q=59cfs)

River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Left Freeboard (ft)	Right Freeboard (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel. Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)
22+854	59	46.7	53.2	1.8	0.9	48.0	53.2	0.00003	0.5	121.3	27.0
22+834	59	48.5	53.1	0.1	0.0		53.2	0.00007	1.6	38.0	12.1
22+645	59	48.5	53.1	0.2	0.0		53.2	0.00007	1.6	37.8	11.7
22+147	59	48.4	53.1	0.1	-0.1		53.1	0.00007	1.5	38.3	14.0
21+726	59	48.5	53.1	-0.2	0.2	50.2	53.1	0.00006	1.5	38.6	11.9
21+255	Culvert										
21+229	59	48.3	53.0	-0.1	-1.0		53.0	0.00006	1.5	40.9	22.8
20+749	59	48.2	53.0	-0.1	-0.1		53.0	0.00006	1.5	42.2	19.6
20+241	59	48.0	53.0	-0.1	-0.6		53.0	0.00005	1.5	41.0	15.8
19+731	59	47.9	52.9	-0.2	-0.2		53.0	0.00005	1.4	43.5	13.2
19+226	59	48.0	52.9	-0.2	-0.3		52.9	0.00005	1.4	42.0	12.9
18+726	59	48.1	52.9	-0.2	-0.2		52.9	0.00005	1.4	41.4	12.4
18+221	59	47.9	52.8	-0.4	-0.3		52.9	0.00005	1.4	42.6	13.3
17+713	59	47.7	52.8	-0.4	-0.3		52.8	0.00005	1.4	44.9	22.7
17+221	59	48.1	52.8	-0.5	-0.4		52.8	0.00005	1.5	40.8	13.3
17+043	59	49.0	52.8	4.5	4.5	49.7	52.8	0.00004	0.5	128.3	39.1

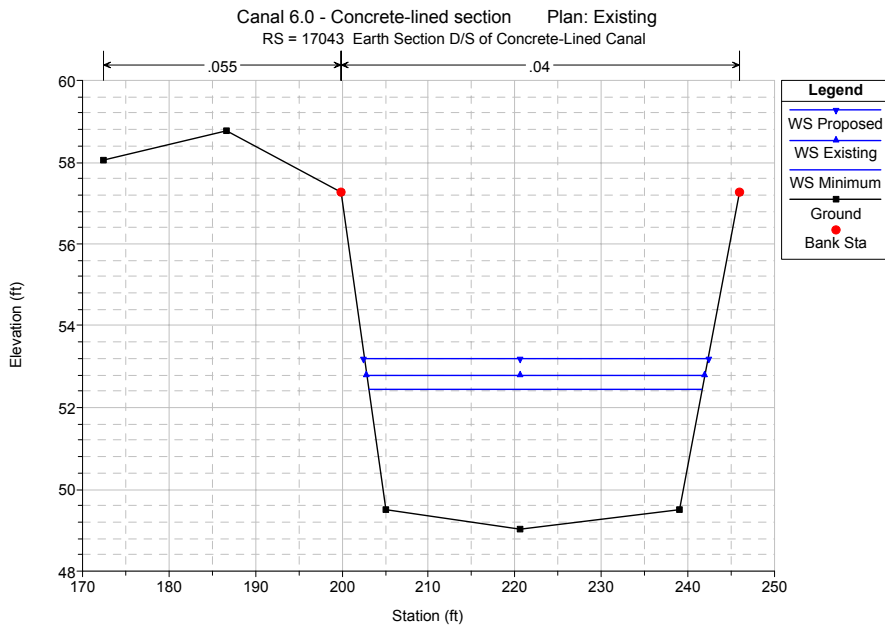
Table 3: HEC-RAS Output, Existing Concrete-Lined Section, Proposed Flow Rate (Q=71cfs)

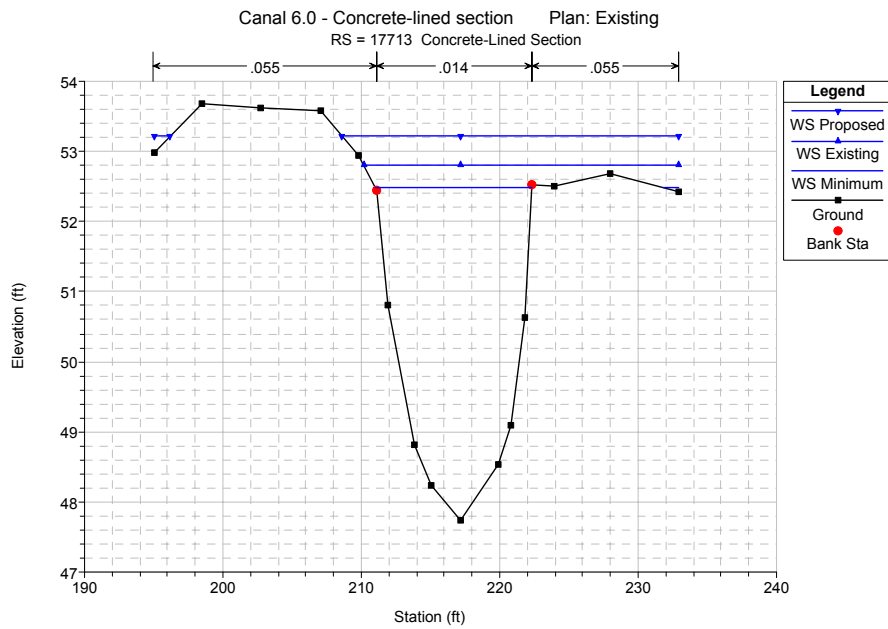
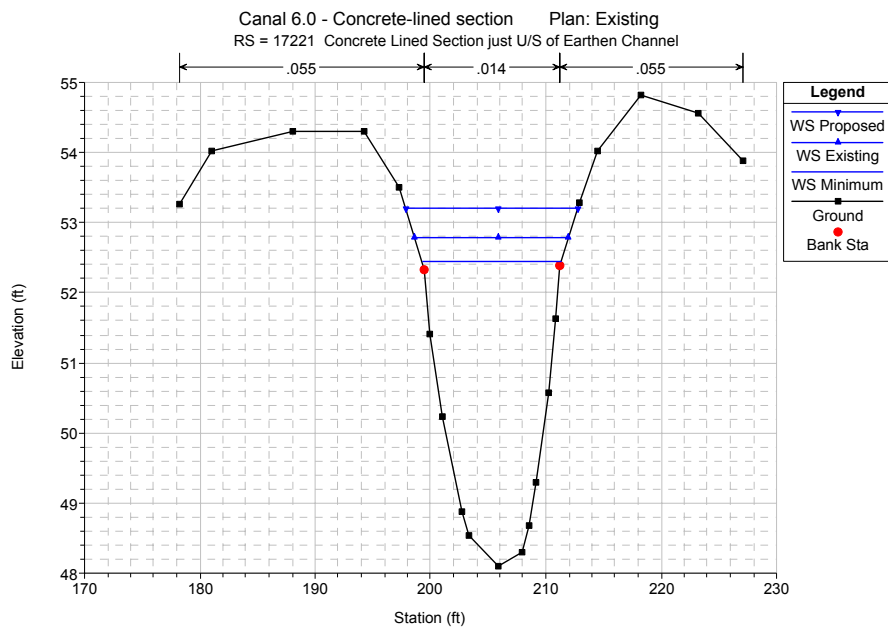
River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Left Freeboard (ft)	Right Freeboard (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel. Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)
22+854	71	46.7	53.6	1.3	0.5	48.1	53.6	0.00003	0.5	134.0	28.0
22+834	71	48.5	53.6	-0.3	-0.5		53.6	0.00006	1.6	45.8	20.2
22+645	71	48.5	53.6	-0.3	-0.5		53.6	0.00006	1.6	45.5	20.1
22+147	71	48.4	53.5	-0.4	-0.5		53.6	0.00006	1.6	48.7	26.5
21+726	71	48.5	53.5	-0.7	-0.3	50.4	53.6	0.00006	1.6	45.1	18.6
21+255	Culvert										
21+229	71	48.3	53.4	-0.5	-1.4		53.5	0.00006	1.6	50.8	23.9
20+749	71	48.2	53.4	-0.5	-0.5		53.4	0.00005	1.6	53.6	32.8
20+241	71	48.0	53.4	-0.5	-1.0		53.4	0.00005	1.6	50.4	25.7
19+731	71	47.9	53.3	-0.6	-0.6		53.4	0.00005	1.5	50.5	20.1
19+226	71	48.0	53.3	-0.6	-0.8		53.4	0.00005	1.5	48.3	22.3
18+726	71	48.1	53.3	-0.6	-0.6		53.3	0.00005	1.5	46.8	13.8
18+221	71	47.9	53.3	-0.8	-0.7		53.3	0.00005	1.5	48.6	15.9
17+713	71	47.7	53.2	-0.8	-0.7		53.3	0.00005	1.5	54.8	25.5
17+221	71	48.1	53.2	-0.9	-0.8		53.2	0.00005	1.6	46.7	14.9
17+043	71	49.0	53.21	4.06	4.06	49.8	53.2	0.000035	0.5	144.8	39.8

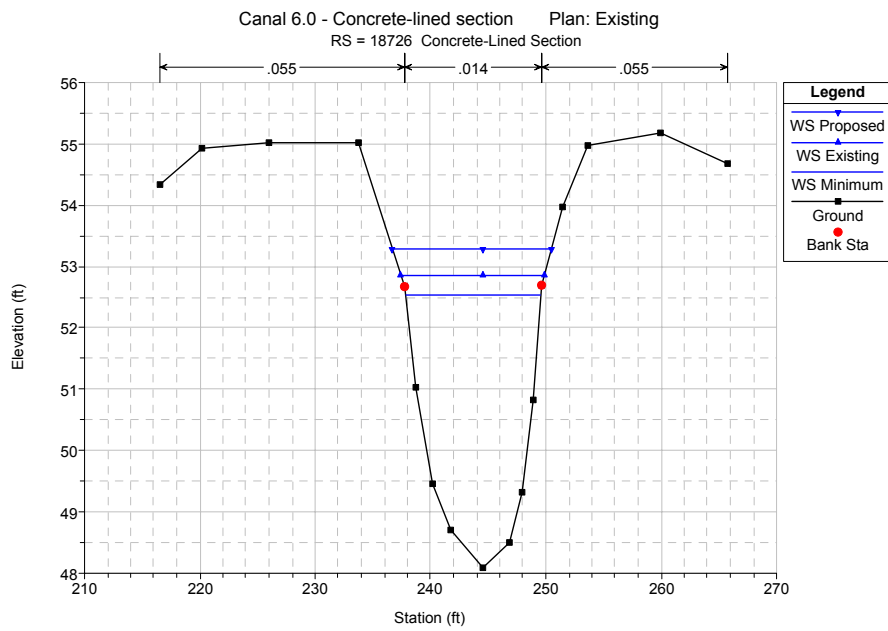
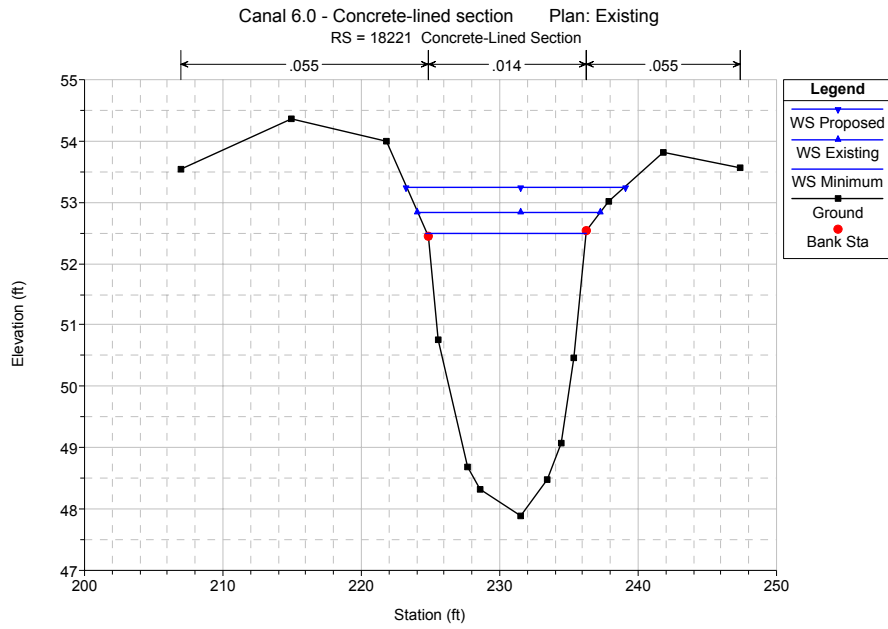
II. WATER SURFACE PROFILE

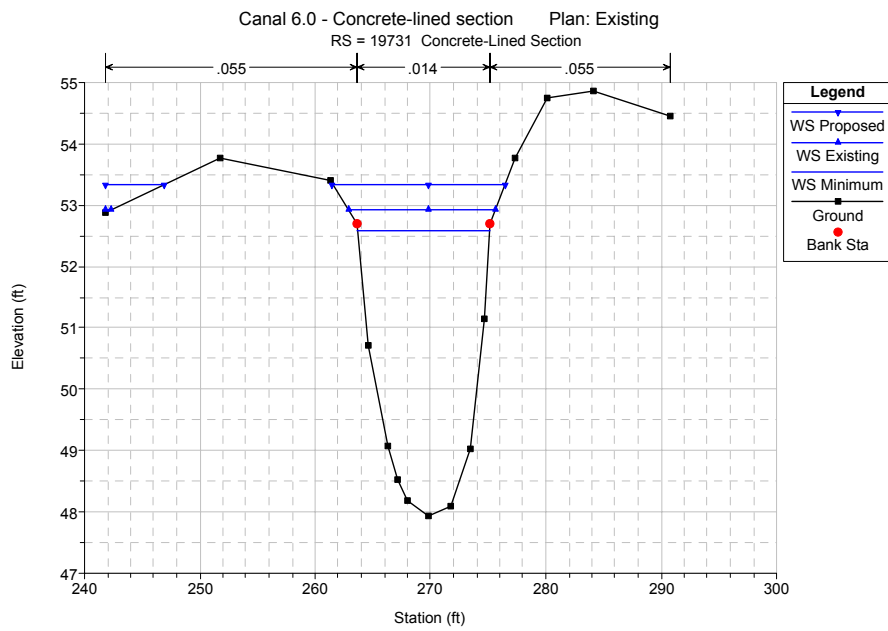
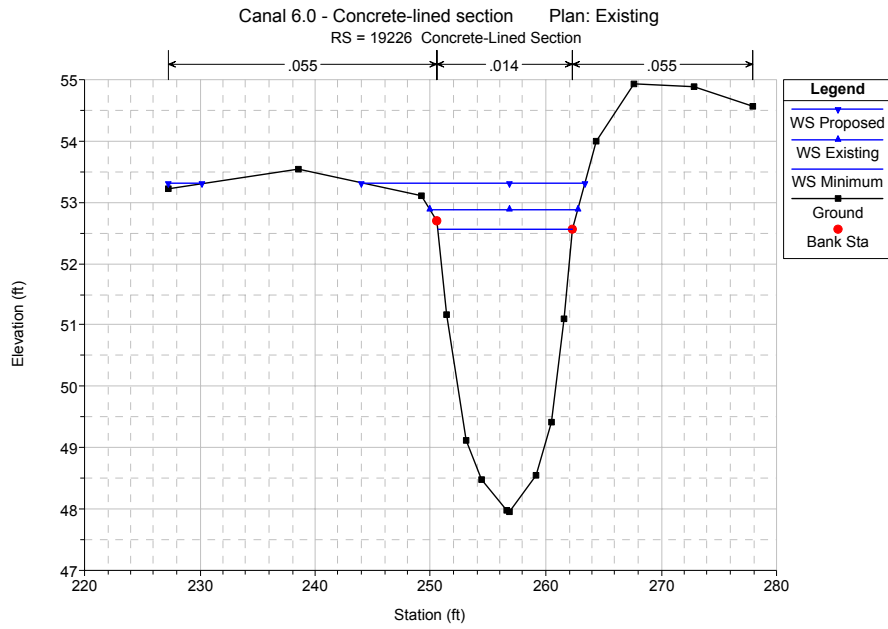


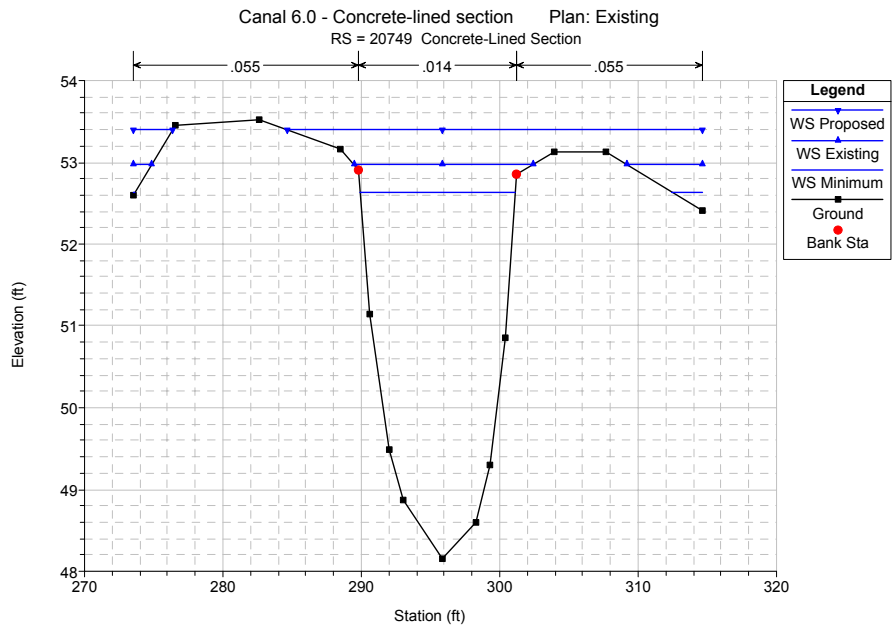
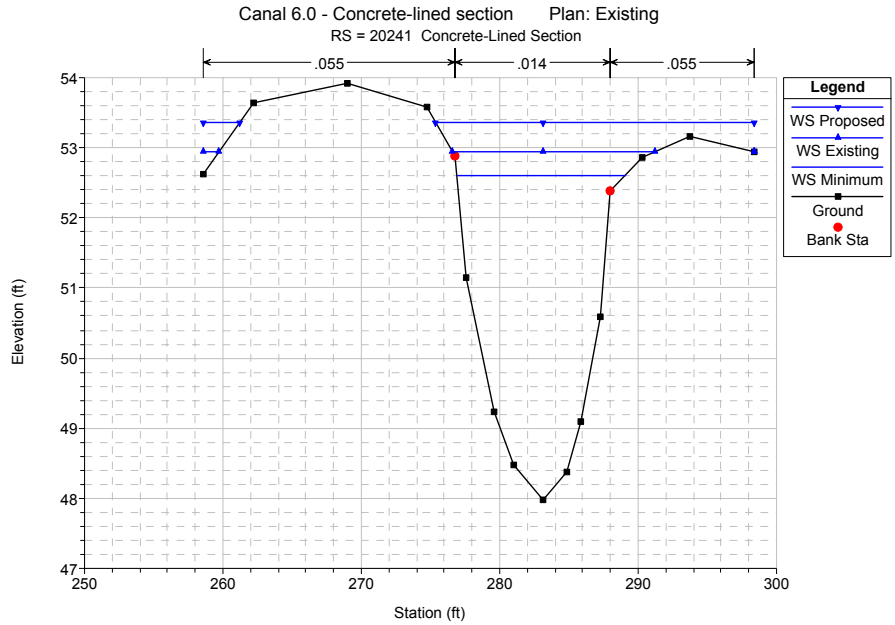
III. CROSS-SECTIONS

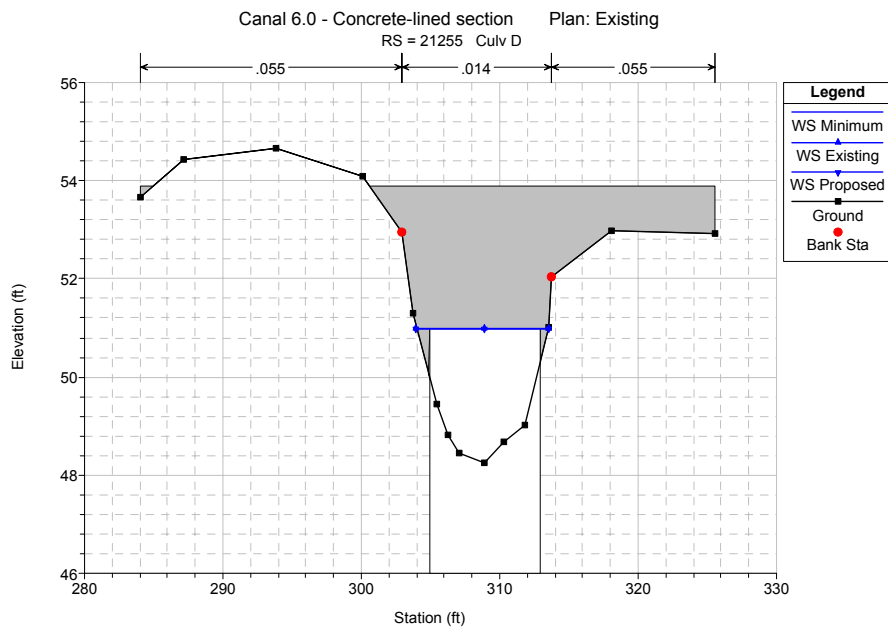
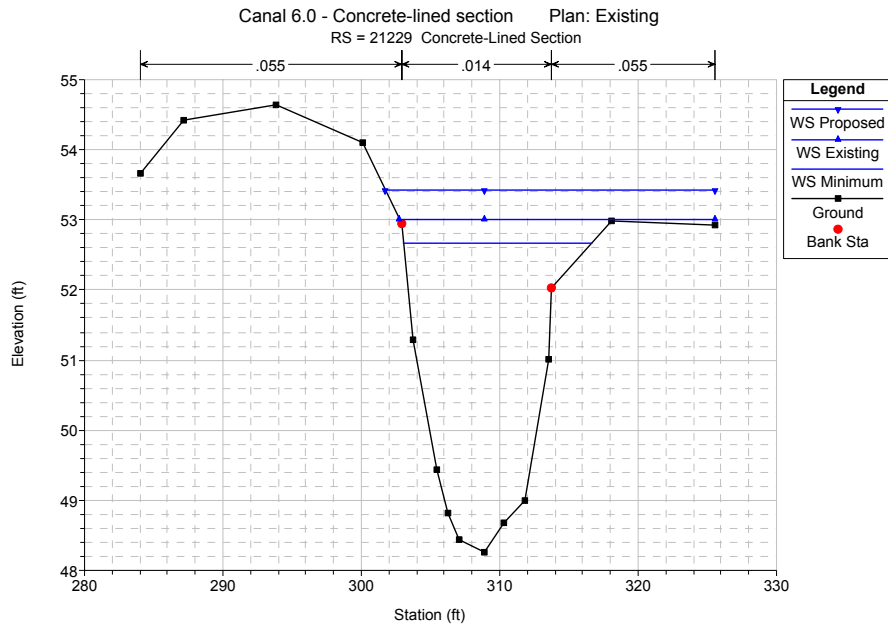


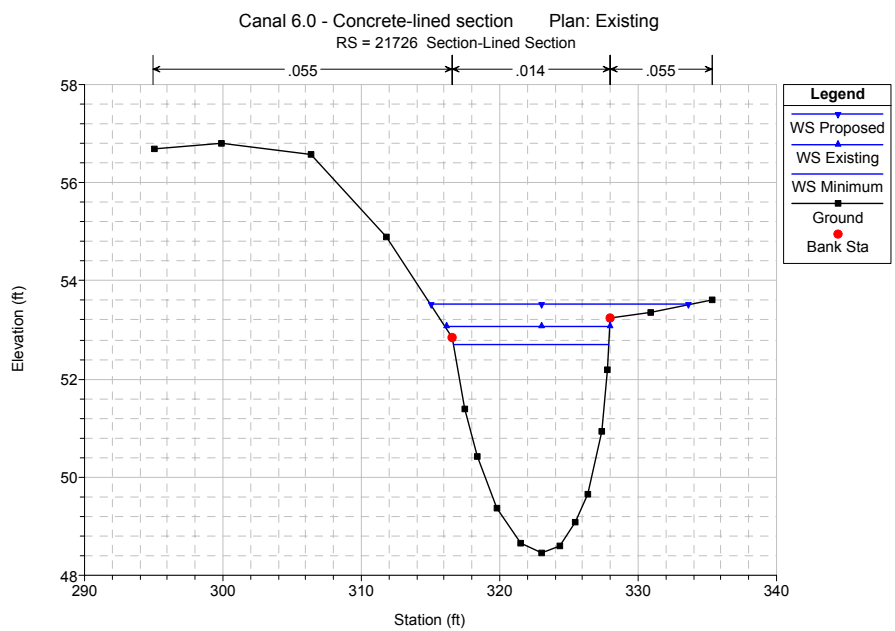
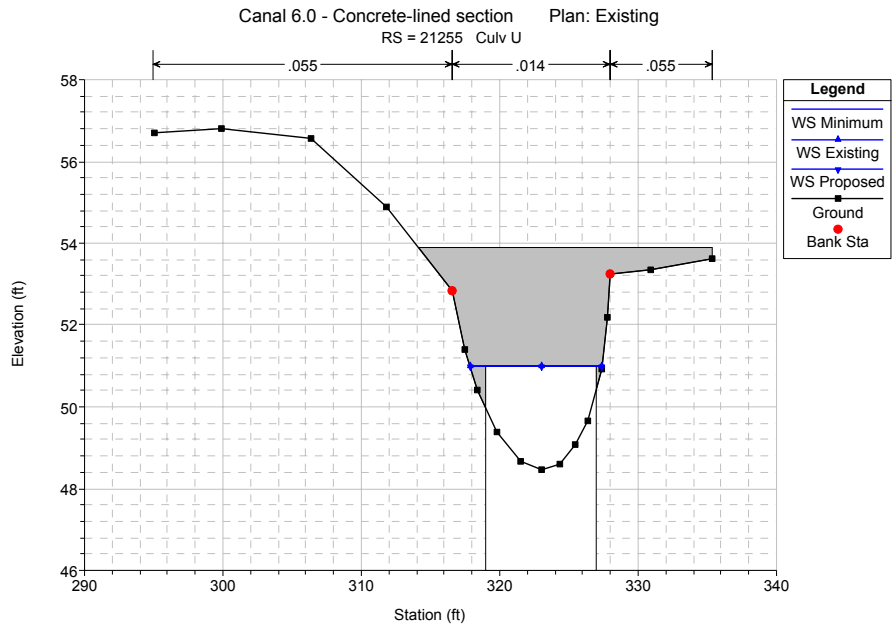


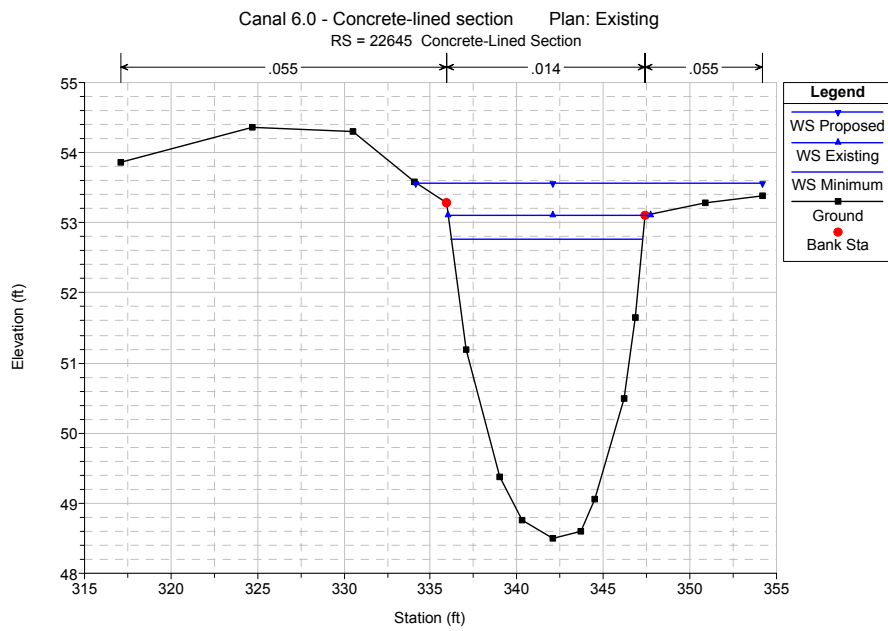
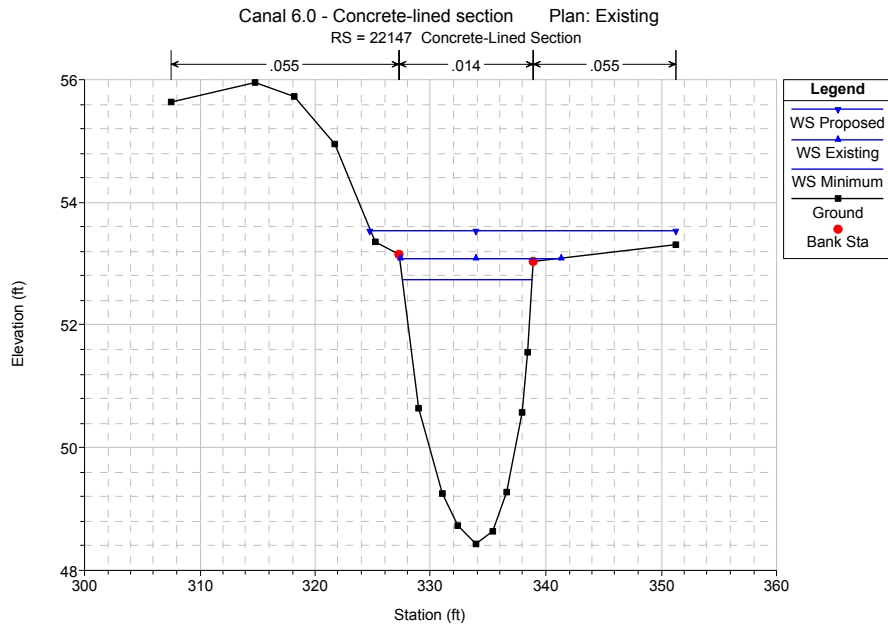


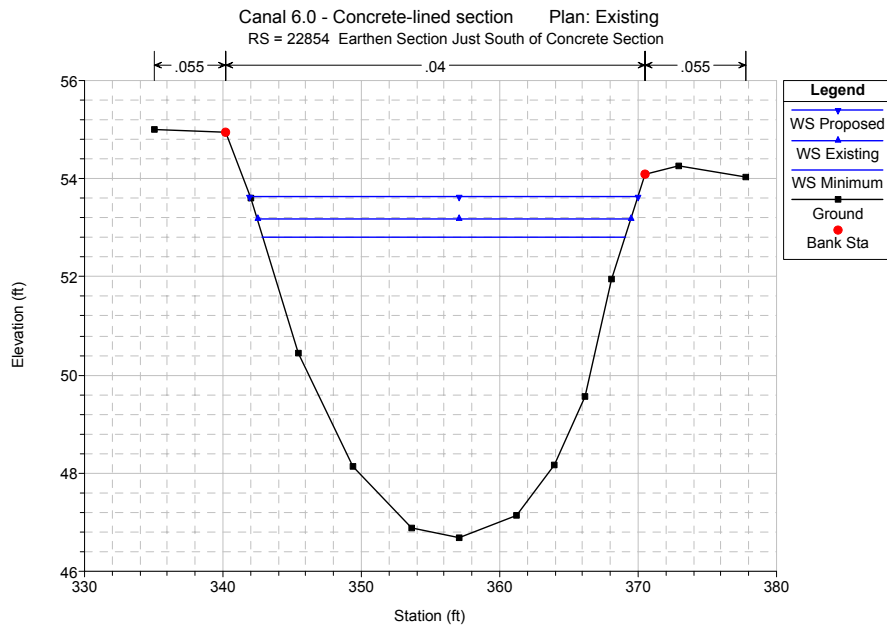
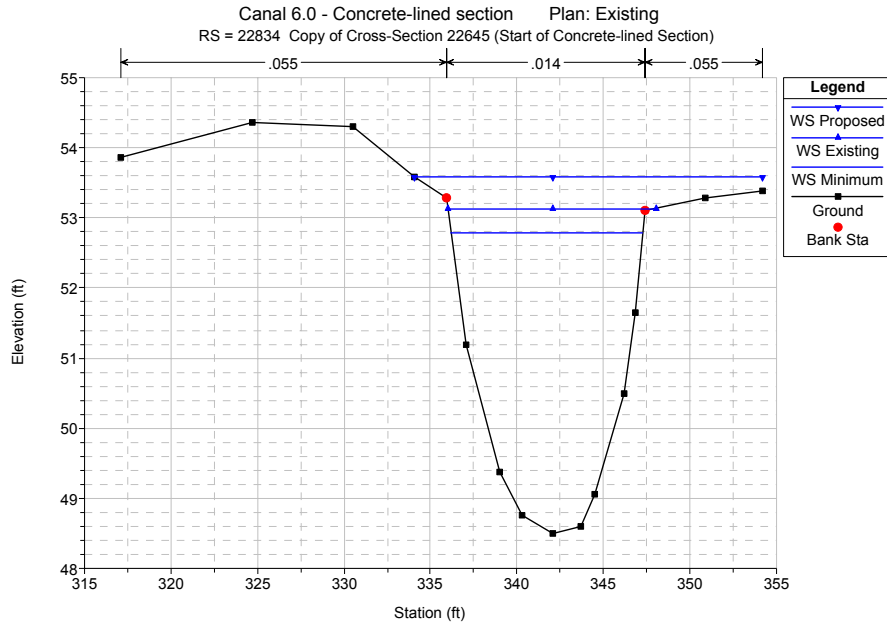












IV. HEC-RAS INPUT & OUTPUT

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X   X  XXXXXX   XXXX   XXXX   XX   XXXX
X   X X        X   X   X   X   X X   X
X   X X        X        X   X   X   X   X
XXXXXXXX XXXX   X        XXX XXXX   XXXXXX   XXXX
X   X X        X        X   X   X   X   X
X   X X        X   X   X   X   X   X   X
X   X XXXXXX   XXXX   X   X   X   X   XXXXXX
```

PROJECT DATA

Project Title: Canal 6.0 - Concrete-lined section
Project File : 6Lateral.prj
Run Date and Time: 6/11/2003 9:48:40 AM

Project in English units

Project Description:
Concrete-lined section of 6.0 Canal

PLAN DATA

Plan Title: Existing
Plan File : h:\JOBS\3011\Modeling\6Lateral.p01

Geometry Title: 6.0 Canal - Existing
Geometry File : h:\JOBS\3011\Modeling\6Lateral.g01

Flow Title : Flow Conditions
Flow File : h:\JOBS\3011\Modeling\6Lateral.f01

Plan Summary Information:

Number of:	Cross Sections =	15	Multiple Openings =	0
	Culverts =	1	Inline Weirs =	0
	Bridges =	0		

Computational Information

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

Computation Options

Critical depth computed only where necessary	
Conveyance Calculation Method:	At breaks in n values only
Friction Slope Method:	Average Conveyance
Computational Flow Regime:	Mixed Flow

GEOMETRY DATA

Geometry Title: 6.0 Canal - Existing
 Geometry File : h:\JOBS\3011\Modeling\6Lateral.g01

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 22854

INPUT

Description: Earthen Section Just South of Concrete Section

Station Elevation Data num= 14									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
335.1	55.011	340.2	54.933	342	53.603	345.5	50.438	349.4	48.124
353.6	46.889	357.1	46.679	361.2	47.137	363.9	48.164	366.2	49.565
368.1	51.958	370.5	54.087	372.9	54.276	377.8	54.044		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
335.1	.055	340.2	.04	370.5	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	340.2	370.5		22	20		.1	.3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 22834

INPUT

Description: Copy of Cross-Section 22645 (Start of Concrete-lined Section)

Station Elevation Data num= 16									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
317.1	53.87	324.7	54.356	330.5	54.307	334.1	53.575	335.9	53.275
337.1	51.187	339	49.383	340.3	48.767	342.1	48.496	343.7	48.607
344.5	49.064	346.2	50.498	346.8	51.643	347.4	53.097	350.9	53.279
354.2	53.383								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
317.1	.055	335.9	.014	347.4	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	335.9	347.4		189	189		.1	.3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 22645

INPUT

Description: Concrete-Lined Section

Station Elevation Data num= 16									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
317.1	53.87	324.7	54.356	330.5	54.307	334.1	53.575	335.9	53.275
337.1	51.187	339	49.383	340.3	48.767	342.1	48.496	343.7	48.607
344.5	49.064	346.2	50.498	346.8	51.643	347.4	53.097	350.9	53.279
354.2	53.383								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
317.1	.055	335.9	.014	347.4	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	335.9	347.4		498	498		.1	.3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 22147

INPUT

Description: Concrete-Lined Section

Station Elevation Data num= 16									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
307.5	55.639	314.8	55.953	318.2	55.721	321.7	54.952	325.2	53.354
327.3	53.141	329	50.645	331	49.248	332.4	48.74	333.9	48.441

335.4 48.632 336.6 49.267 338 50.571 338.4 51.564 338.9 53.03
 351.3 53.317

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 307.5 .055 327.3 .014 338.9 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 327.3 338.9 421 421 421 .1 .3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 21726

INPUT

Description: Section-Lined Section

Station Elevation Data num= 18
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 295 56.695 299.9 56.806 306.4 56.569 311.8 54.901 316.6 52.853
 317.5 51.385 318.4 50.41 319.8 49.369 321.5 48.663 323 48.458
 324.3 48.602 325.5 49.08 326.4 49.661 327.4 50.932 327.8 52.195
 328 53.234 330.9 53.361 335.4 53.615

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 295 .055 316.6 .014 328 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 316.6 328 497 497 497 .1 .3

CULVERT RIVER: Canal 6.0
 REACH: Concrete-lined RS: 21255

INPUT

Description:

Distance from Upstream XS = 90.5
 Deck/Roadway Width = 381
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num= 6
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 295 53.9 0 318.9 53.9 0 319 53.9 51
 327 53.9 51 327.1 53.9 0 335.4 53.9 0

Upstream Bridge Cross Section Data

Station Elevation Data num= 18
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 295 56.695 299.9 56.806 306.4 56.569 311.8 54.901 316.6 52.853
 317.5 51.385 318.4 50.41 319.8 49.369 321.5 48.663 323 48.458
 324.3 48.602 325.5 49.08 326.4 49.661 327.4 50.932 327.8 52.195
 328 53.234 330.9 53.361 335.4 53.615

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 295 .055 316.6 .014 328 .055

Bank Sta: Left Right Coeff Contr. Expan.
 316.6 328 .1 .3

Downstream Deck/Roadway Coordinates

num= 6
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 284 53.9 0 304.8 53.9 0 304.9 53.9 51
 312.9 53.9 51 313 53.9 0 325.6 53.9 0

Downstream Bridge Cross Section Data

Station Elevation Data num= 16
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 284 53.663 287.2 54.423 293.8 54.648 300.1 54.101 302.9 52.942
 303.7 51.299 305.5 49.442 306.3 48.819 307.1 48.446 308.9 48.257
 310.3 48.669 311.8 49.006 313.5 51.016 313.7 52.026 318.1 52.981
 325.6 52.929

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 284 .055 302.9 .014 313.7 .055

Bank Sta: Left Right Coeff Contr. Expan.
 302.9 313.7 .1 .3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name Shape Rise Span
 Culvert #1 Box 5 8
 FHWA Chart # 8 - flared wingwalls
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length n Value Entrance Loss Coef Exit Loss Coef
 90.5 381 .014 .5 1
 Upstream Elevation = 46
 Centerline Station = 323
 Downstream Elevation = 46
 Centerline Station = 308.9

CULVERT OUTPUT Profile #Existing
 Culvert ID : Culvert #1

Culv Q (cfs)	59.00	Culv Ful Lngh (ft)	381.00
# Barrels	1	Culv Vel US (ft/s)	1.48
Q Barrel (cfs)	59.00	Culv Vel DS (ft/s)	1.48
E.G. US. (ft)	53.09	Culv Inv El Up (ft)	46.00
W.S. US. (ft)	53.06	Culv Inv El Dn (ft)	46.00
E.G. DS (ft)	53.04	Culv Frctn Ls (ft)	0.04
W.S. DS (ft)	53.00	Culv Ext Lss (ft)	
Delta EG (ft)	0.06	Culv Ent Lss (ft)	0.02
Delta WS (ft)	0.06	Q Weir (cfs)	
E.G. IC (ft)	47.87	Weir Sta Lft (ft)	
E.G. OC (ft)	53.09	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	51.00	Weir Max Depth (ft)	
Culv WS Outlet (ft)	51.00	Weir Avg Depth (ft)	
Culv Nml Depth (ft)		Wr Flw Area (sq ft)	
Culv Crt Depth (ft)	1.19	Min El Weir Flow (ft)	53.91

CULVERT OUTPUT Profile #Proposed
 Culvert ID : Culvert #1

Culv Q (cfs)	71.00	Culv Ful Lngh (ft)	381.00
# Barrels	1	Culv Vel US (ft/s)	1.78
Q Barrel (cfs)	71.00	Culv Vel DS (ft/s)	1.78
E.G. US. (ft)	53.56	Culv Inv El Up (ft)	46.00
W.S. US. (ft)	53.51	Culv Inv El Dn (ft)	46.00
E.G. DS (ft)	53.46	Culv Frctn Ls (ft)	0.06
W.S. DS (ft)	53.42	Culv Ext Lss (ft)	0.01
Delta EG (ft)	0.09	Culv Ent Lss (ft)	0.02
Delta WS (ft)	0.09	Q Weir (cfs)	
E.G. IC (ft)	48.12	Weir Sta Lft (ft)	
E.G. OC (ft)	53.56	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	51.00	Weir Max Depth (ft)	
Culv WS Outlet (ft)	51.00	Weir Avg Depth (ft)	
Culv Nml Depth (ft)		Wr Flw Area (sq ft)	
Culv Crt Depth (ft)	1.35	Min El Weir Flow (ft)	53.91

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 21229

INPUT

Description: Concrete-Lined Section

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
284	53.663	287.2	54.423	293.8	54.648	300.1	54.101	302.9	52.942
303.7	51.299	305.5	49.442	306.3	48.819	307.1	48.446	308.9	48.257
310.3	48.669	311.8	49.006	313.5	51.016	313.7	52.026	318.1	52.981
325.6	52.929								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
284	.055	302.9	.014	313.7	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 302.9 313.7 480 480 480 .1 .3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 20749

INPUT

Description: Concrete-Lined Section

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
273.5	52.597	276.6	53.453	282.6	53.515	288.5	53.166	289.8	52.909
290.6	51.147	292	49.492	293	48.872	295.9	48.148	298.3	48.6
299.3	49.301	300.4	50.863	301.2	52.855	303.9	53.124	307.7	53.132
314.6	52.414								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
273.5	.055	289.8	.014	301.2	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 289.8 301.2 508 508 508 .1 .3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 20241

INPUT

Description: Concrete-Lined Section

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
258.6	52.625	262.2	53.636	269	53.92	274.7	53.572	276.8	52.874
277.6	51.144	279.6	49.236	281	48.472	283.1	47.977	284.8	48.379
285.9	49.098	287.3	50.583	288	52.38	290.3	52.862	293.7	53.163
298.4	52.945								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
258.6	.055	276.8	.014	288	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 276.8 288 510 510 510 .1 .3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 19731

INPUT

Description: Concrete-Lined Section

Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
241.8	52.878	251.8	53.773	261.3	53.399	263.6	52.696	264.6	50.71
266.3	49.075	267.2	48.516	268	48.174	269.8	47.933	271.7	48.102
273.4	49.02	274.7	51.142	275.2	52.709	277.3	53.761	280.1	54.745
284.1	54.874	290.8	54.443						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
241.8	.055	263.6	.014	275.2	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	263.6	275.2		506	506		.1	.3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 19226

INPUT

Description: Concrete-Lined Section

Station Elevation Data	num=	17							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
227.3	53.23	238.5	53.534	249.2	53.101	250.6	52.688	251.4	51.176
253.1	49.111	254.4	48.475	256.6	47.982	256.9	47.947	259.1	48.551
260.5	49.426	261.6	51.102	262.3	52.563	264.4	53.998	267.6	54.936
272.8	54.885	277.9	54.577						

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
227.3	.055	250.6	.014	262.3	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	250.6	262.3		500	500		.1	.3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 18726

INPUT

Description: Concrete-Lined Section

Station Elevation Data	num=	17							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
216.5	54.329	220.2	54.92	226	55.027	233.7	55.013	237.8	52.663
238.7	51.026	240.2	49.465	241.8	48.708	244.5	48.096	246.8	48.504
247.9	49.329	248.9	50.837	249.6	52.686	251.5	53.981	253.6	54.969
259.9	55.19	265.8	54.675						

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
216.5	.055	237.8	.014	249.6	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	237.8	249.6		505	505		.1	.3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 18221

INPUT

Description: Concrete-Lined Section

Station Elevation Data	num=	15							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
207	53.543	214.9	54.368	221.8	54.005	224.8	52.437	225.6	50.772
227.7	48.693	228.6	48.313	231.5	47.879	233.4	48.49	234.4	49.077
235.4	50.472	236.3	52.547	237.9	53.006	241.8	53.805	247.4	53.559

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
207	.055	224.8	.014	236.3	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	224.8	236.3		507	507		.1	.3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 17713

INPUT

Description: Concrete-Lined Section

Station Elevation Data	num=	17							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
195	52.991	198.5	53.676	202.7	53.63	207.1	53.582	209.8	52.95
211.1	52.452	211.9	50.805	213.8	48.813	215.1	48.232	217.2	47.742

219.9	48.531	220.8	49.089	221.8	50.625	222.3	52.525	223.9	52.496
228	52.681	232.9	52.419						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 195 .055 211.1 .014 222.3 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 211.1 222.3 492 492 493 .1 .3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 17221

INPUT
 Description: Concrete Lined Section just U/S of Earthen Channel
 Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
178.2	53.257	181	54.027	188	54.311	194.3	54.311	197.3	53.499
199.5	52.33	200	51.414	201	50.24	202.7	48.885	203.3	48.544
205.9	48.106	207.9	48.301	208.5	48.686	209.1	49.301	210.2	50.57
210.9	51.62	211.2	52.381	212.9	53.278	214.5	54.027	218.3	54.822
223.2	54.553	227.1	53.883						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 178.2 .055 199.5 .014 211.2 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 199.5 211.2 175 178 179 .1 .3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 17043

INPUT
 Description: Earth Section D/S of Concrete-Lined Canal
 Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
172.4	58.05	186.7	58.77	199.9	57.27	205	49.5	220.6	49.04
239	49.5	246	57.27						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 172.4 .055 199.9 .04 246 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 199.9 246 0 0 0 .1 .3

SUMMARY OF MANNING'S N VALUES

River: Canal 6.0

Reach	River Sta.	n1	n2	n3
Concrete-lined	22854	.055	.04	.055
Concrete-lined	22834	.055	.014	.055
Concrete-lined	22645	.055	.014	.055
Concrete-lined	22147	.055	.014	.055
Concrete-lined	21726	.055	.014	.055
Concrete-lined	21255	Culvert		
Concrete-lined	21229	.055	.014	.055
Concrete-lined	20749	.055	.014	.055
Concrete-lined	20241	.055	.014	.055
Concrete-lined	19731	.055	.014	.055
Concrete-lined	19226	.055	.014	.055
Concrete-lined	18726	.055	.014	.055
Concrete-lined	18221	.055	.014	.055
Concrete-lined	17713	.055	.014	.055
Concrete-lined	17221	.055	.014	.055
Concrete-lined	17043	.055	.04	.055

SUMMARY OF REACH LENGTHS

River: Canal 6.0

Reach	River Sta.	Left	Channel	Right
Concrete-lined	22854	22	20	17
Concrete-lined	22834	189	189	189
Concrete-lined	22645	498	498	498
Concrete-lined	22147	421	421	421
Concrete-lined	21726	497	497	497
Concrete-lined	21255	Culvert		
Concrete-lined	21229	480	480	480
Concrete-lined	20749	508	508	508
Concrete-lined	20241	510	510	510
Concrete-lined	19731	506	506	506
Concrete-lined	19226	500	500	500
Concrete-lined	18726	505	505	505
Concrete-lined	18221	507	507	507
Concrete-lined	17713	492	492	493
Concrete-lined	17221	175	178	179
Concrete-lined	17043	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Canal 6.0

Reach	River Sta.	Contr.	Expan.
Concrete-lined	22854	.1	.3
Concrete-lined	22834	.1	.3
Concrete-lined	22645	.1	.3
Concrete-lined	22147	.1	.3
Concrete-lined	21726	.1	.3
Concrete-lined	21255	Culvert	
Concrete-lined	21229	.1	.3
Concrete-lined	20749	.1	.3
Concrete-lined	20241	.1	.3
Concrete-lined	19731	.1	.3
Concrete-lined	19226	.1	.3
Concrete-lined	18726	.1	.3
Concrete-lined	18221	.1	.3
Concrete-lined	17713	.1	.3
Concrete-lined	17221	.1	.3
Concrete-lined	17043	.1	.3

APPENDIX D

**HEC-RAS HYDRAULIC
INPUT & OUTPUT**

PROPOSED CONDITIONS

I. DETAILED SUMMARY TABLES

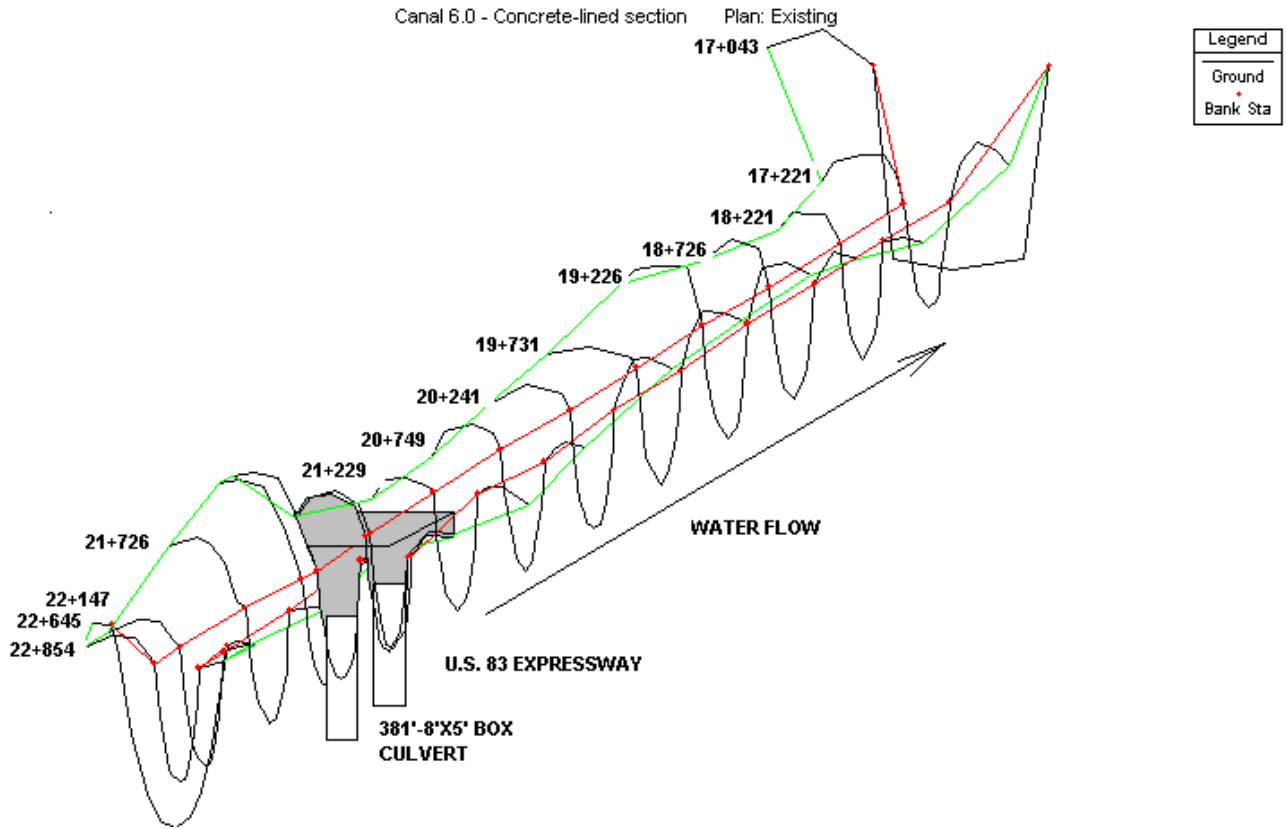


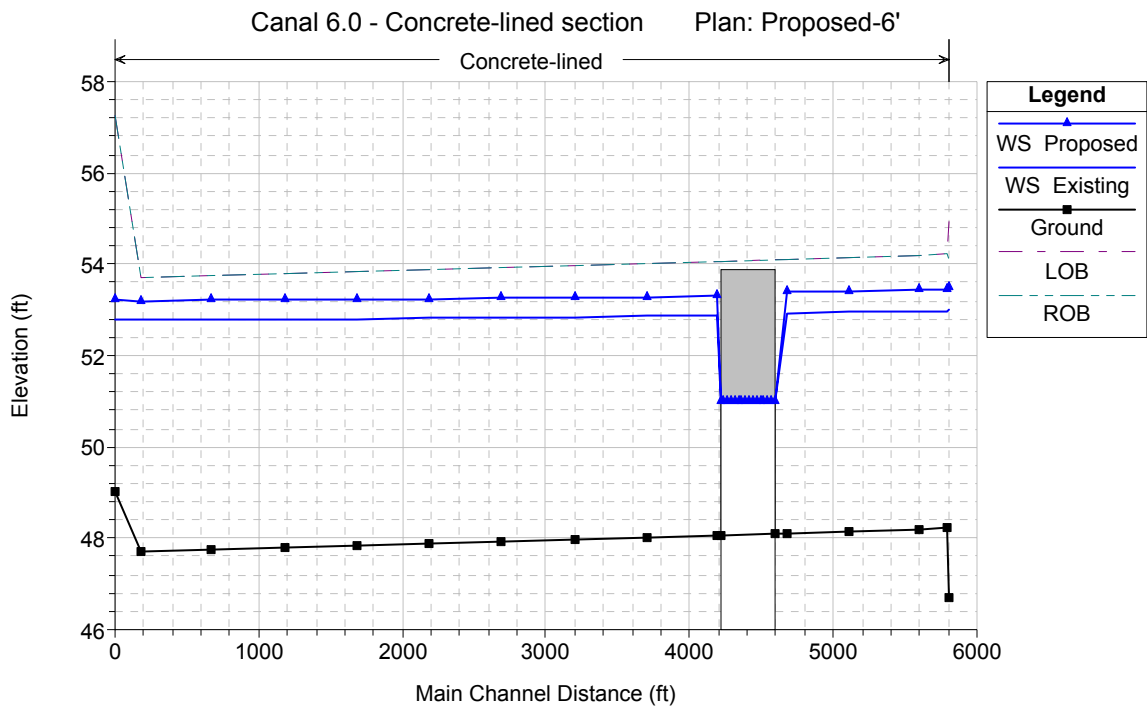
Table 1: HEC-RAS Output, Improved Concrete-Lined Section, Existing Flow Rate (Q=59cfs)

River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Left Freeboard (ft)	Right Freeboard (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel. Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)
22+854	59	46.7	53.0	1.9	1.1	48.0	53.0	0.00003	0.5	117.1	26.6
22+834	59	48.2	53.0	1.2	1.2		53.0	0.00004	1.4	41.7	13.5
22+645	59	48.2	53.0	1.2	1.2		53.0	0.00004	1.4	41.8	13.5
22+147	59	48.2	53.0	1.2	1.2		53.0	0.00004	1.4	42.1	13.6
21+726	59	48.1	52.9	1.2	1.2	49.8	53.0	0.00004	1.4	42.5	13.6
21+255	Culvert										
21+229	59	48.1	52.9	1.2	1.2		52.9	0.00004	1.4	42.2	13.6
20+749	59	48.0	52.9	1.2	1.2		52.9	0.00004	1.4	42.6	13.7
20+241	59	48.0	52.8	1.2	1.2		52.9	0.00004	1.4	43.0	13.7
19+731	59	47.9	52.8	1.1	1.1		52.9	0.00004	1.4	43.5	13.8
19+226	59	47.9	52.8	1.1	1.1		52.8	0.00004	1.4	43.8	13.8
18+726	59	47.9	52.8	1.0	1.0		52.8	0.00004	1.3	44.4	13.9
18+221	59	47.8	52.8	1.0	1.0		52.8	0.00003	1.3	45.0	14.0
17+713	59	47.8	52.8	1.0	1.0		52.8	0.00003	1.3	45.4	14.1
17+221	59	47.7	52.8	0.9	0.9		52.8	0.00003	1.3	46.0	14.2
17+043	59	49.0	52.8	4.5	4.5	49.7	52.8	0.00004	0.5	128.3	39.1

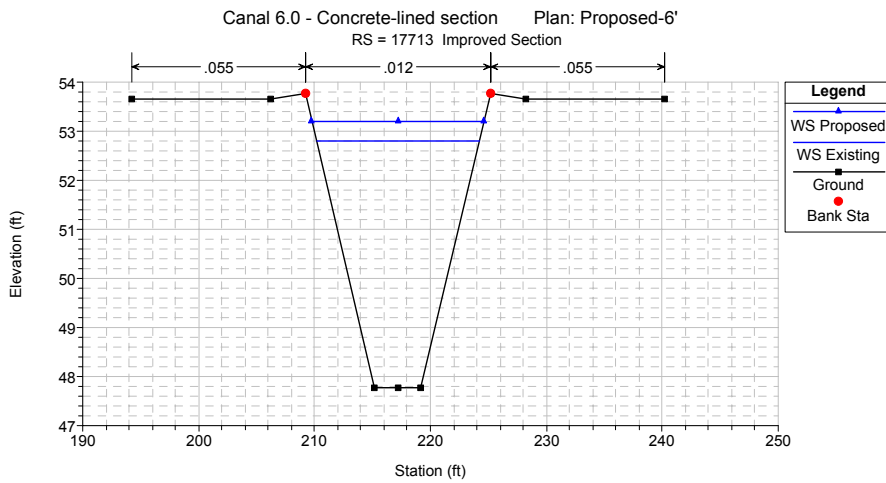
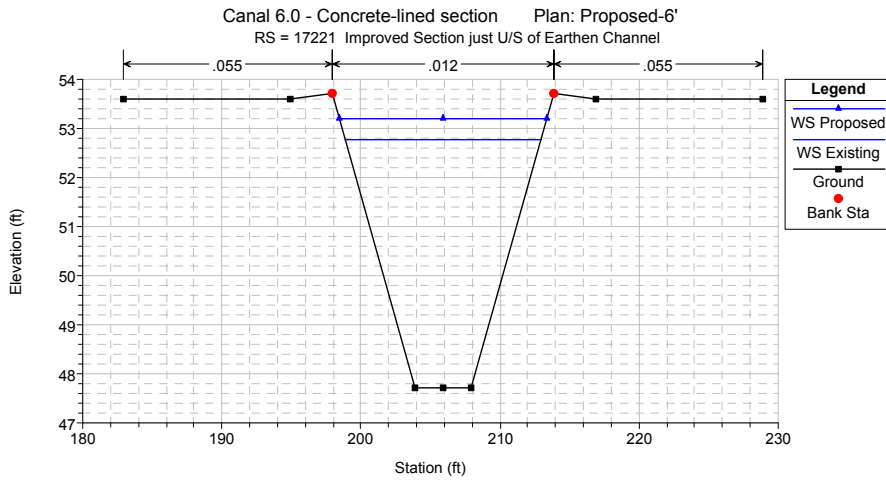
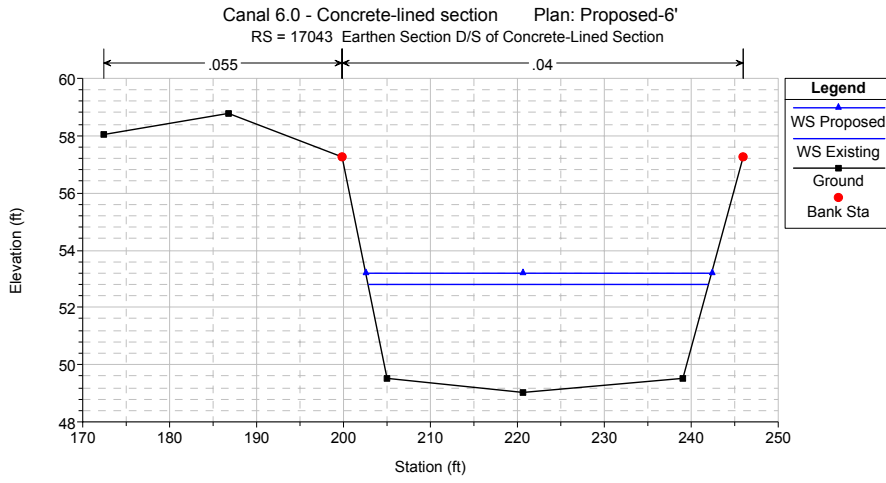
Table 2: HEC-RAS Output, Improved Concrete-Lined Section, Proposed Flow Rate (Q=71cfs)

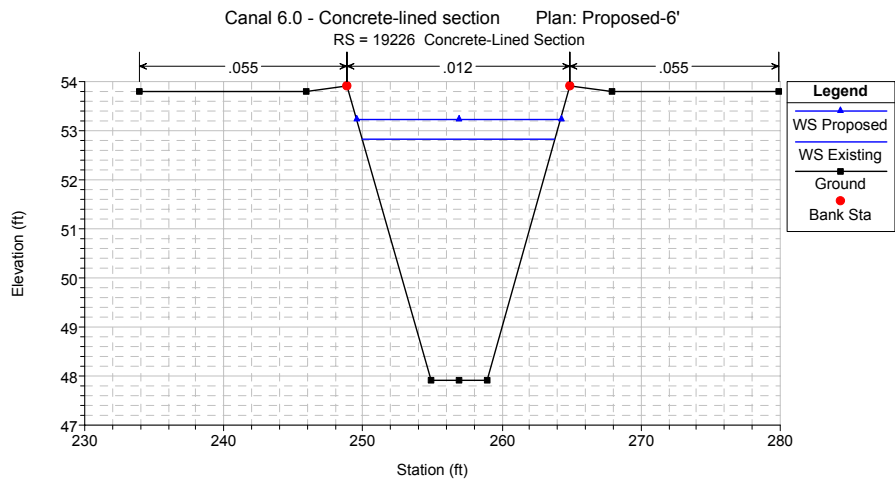
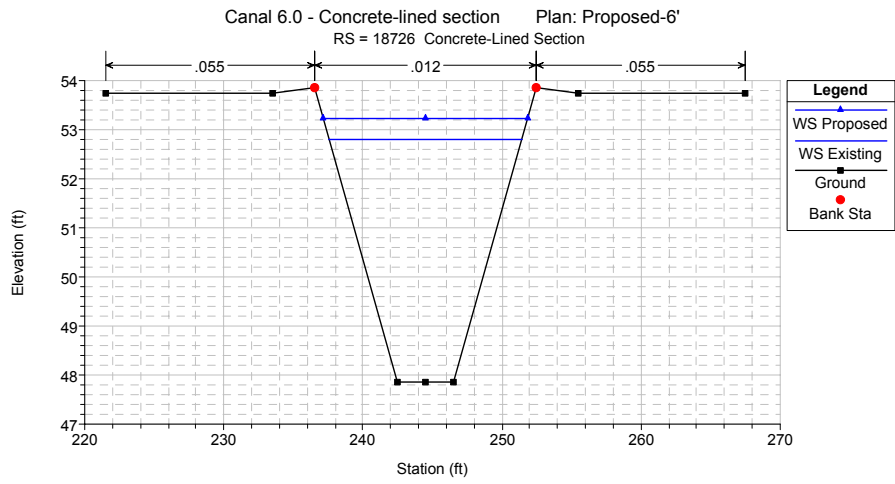
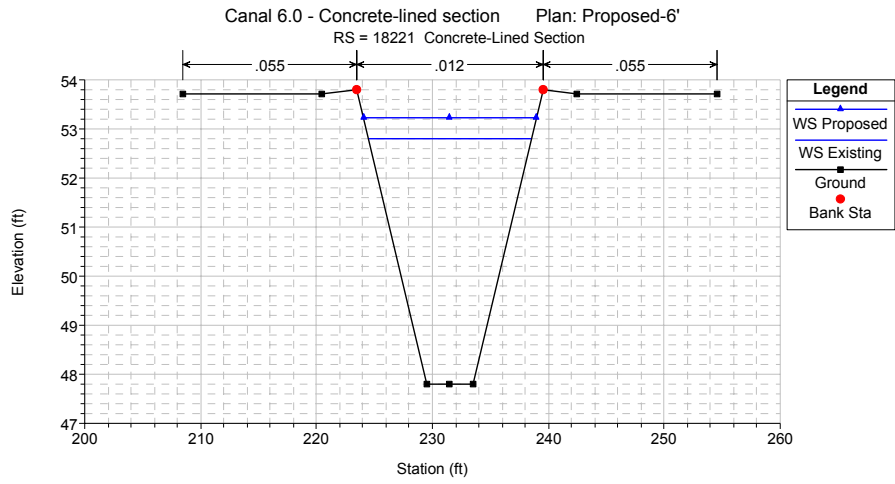
River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Left Freeboard (ft)	Right Freeboard (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel. Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)
22+854	71	46.7	53.5	1.5	0.6	48.1	53.5	0.00003	0.6	129.6	27.7
22+834	71	48.2	53.4	0.8	0.8		53.5	0.00004	1.5	48.2	14.4
22+645	71	48.2	53.4	0.8	0.8		53.5	0.00004	1.5	48.2	14.5
22+147	71	48.2	53.4	0.8	0.8		53.5	0.00004	1.5	48.6	14.5
21+726	71	48.1	53.4	0.7	0.7	49.9	53.4	0.00004	1.5	49.0	14.6
21+255	Culvert										
21+229	71	48.1	53.3	0.8	0.8		53.3	0.00004	1.5	48.1	14.4
20+749	71	48.0	53.3	0.8	0.8		53.3	0.00004	1.5	48.6	14.5
20+241	71	48.0	53.3	0.7	0.7		53.3	0.00004	1.5	49.0	14.6
19+731	71	47.9	53.3	0.7	0.7		53.3	0.00004	1.4	49.5	14.6
19+226	71	47.9	53.2	0.7	0.7		53.3	0.00004	1.4	49.9	14.7
18+726	71	47.9	53.2	0.6	0.6		53.3	0.00004	1.4	50.4	14.8
18+221	71	47.8	53.2	0.6	0.6		53.3	0.00004	1.4	51.0	14.8
17+713	71	47.8	53.2	0.6	0.6		53.2	0.00003	1.4	51.5	14.9
17+221	71	47.7	53.2	0.5	0.5		53.2	0.00003	1.4	52.1	15.0
17+043	71	49.0	53.2	4.1	4.1	49.8	53.2	0.00004	0.5	144.8	39.8

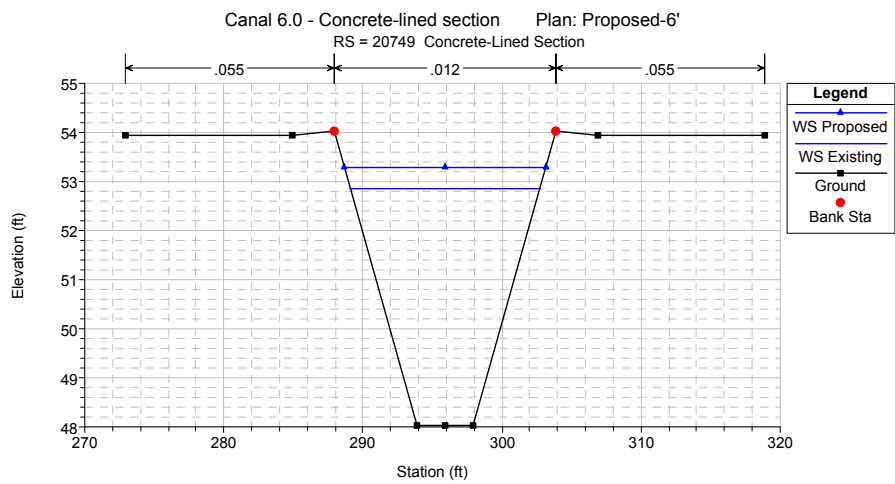
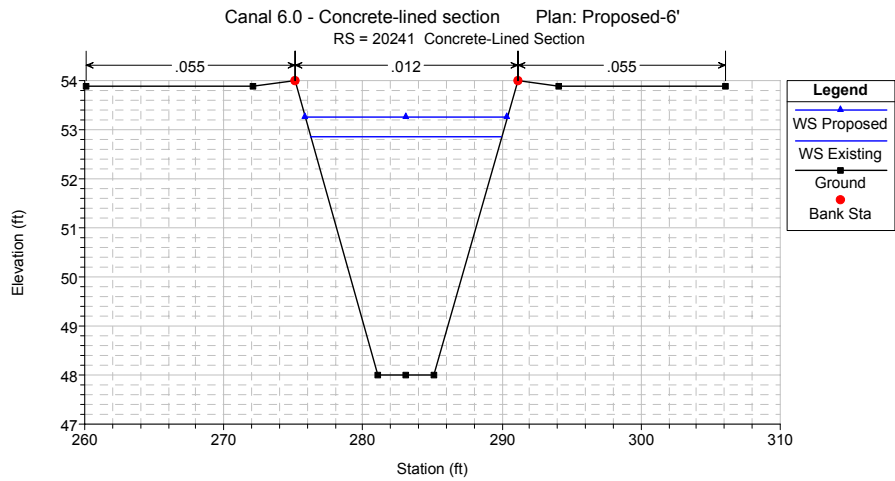
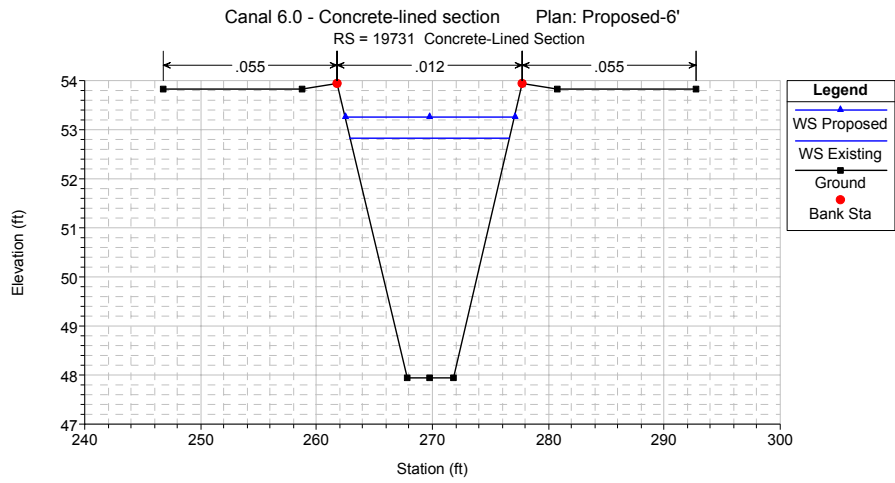
II. WATER SURFACE PROFILE

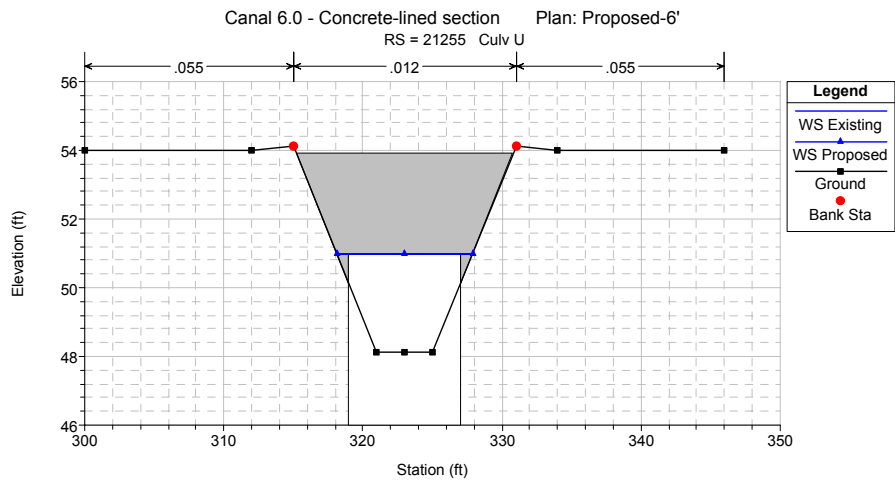
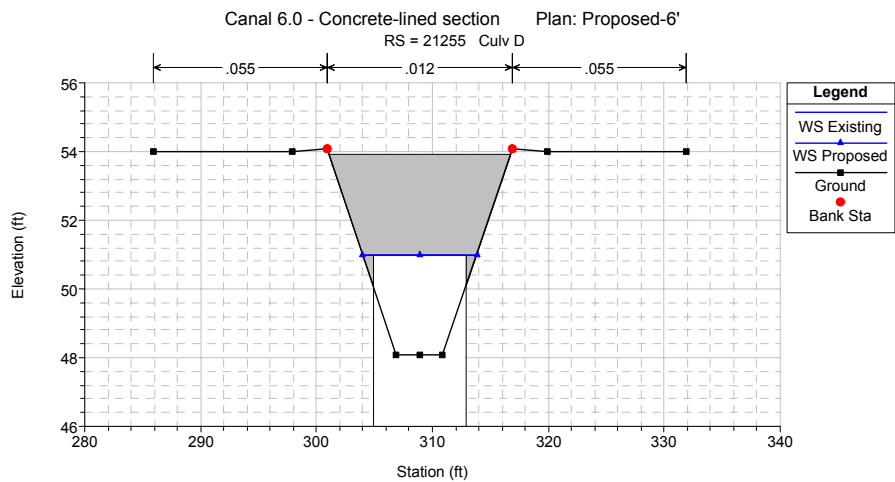
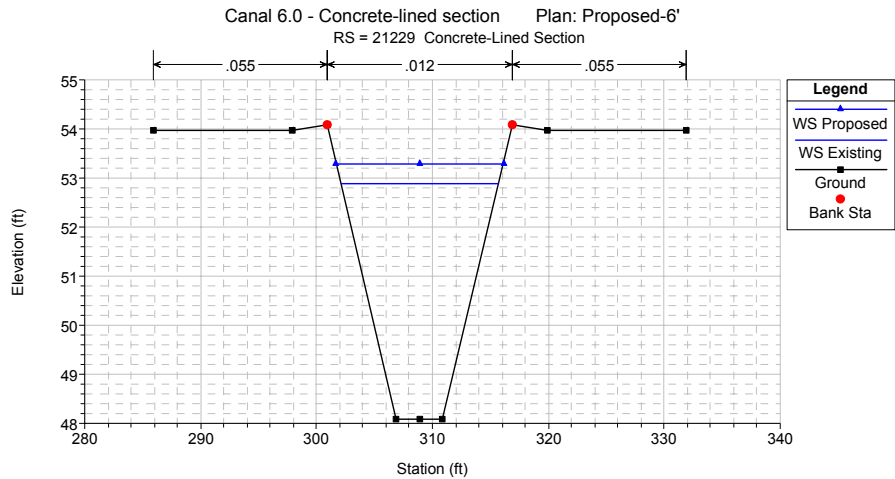


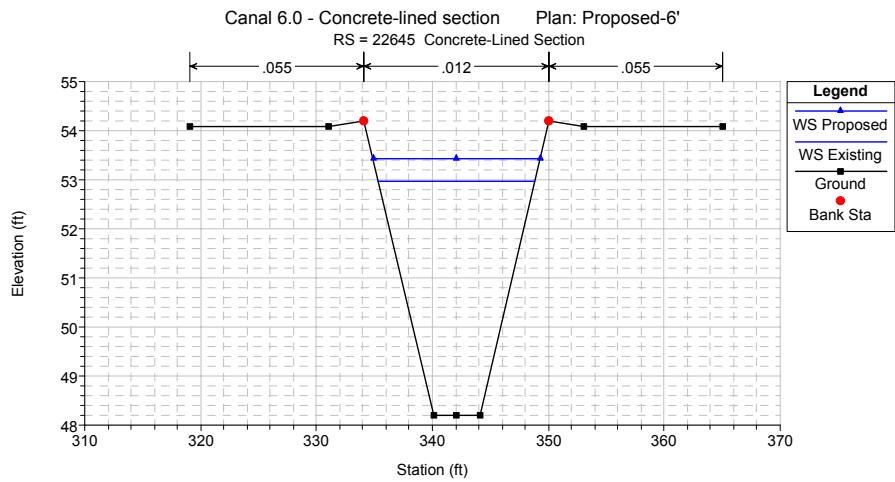
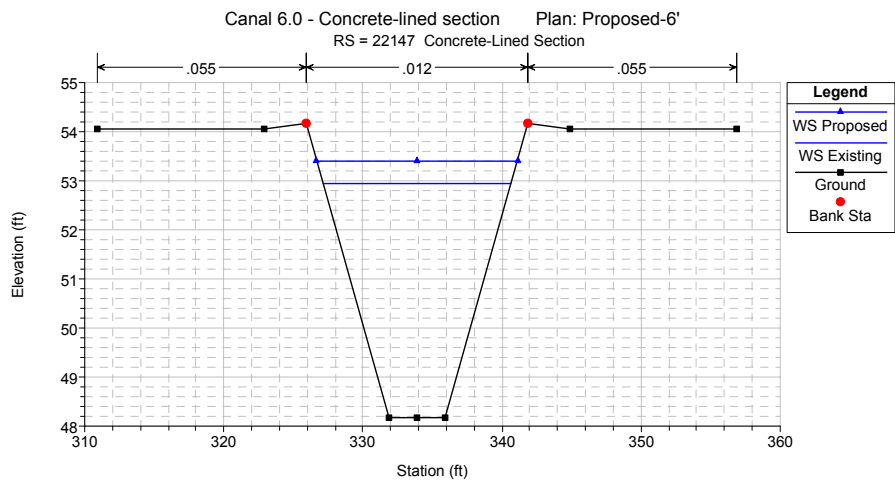
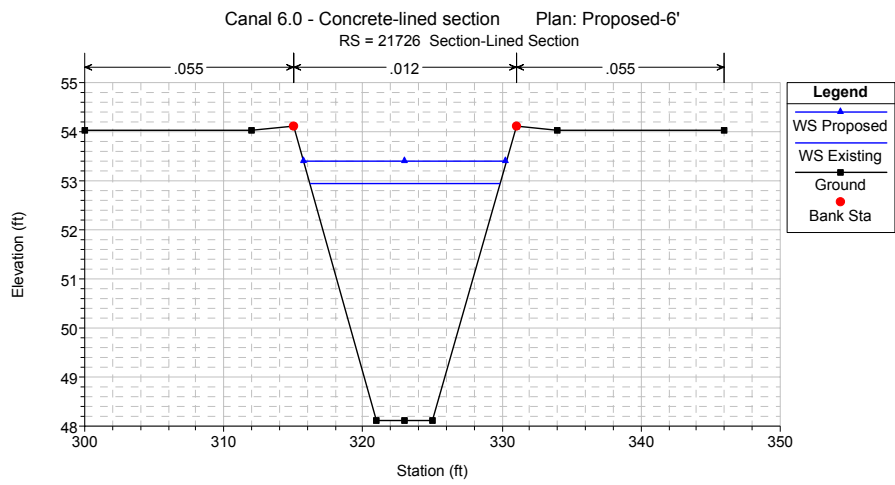
III. CROSS-SECTIONS

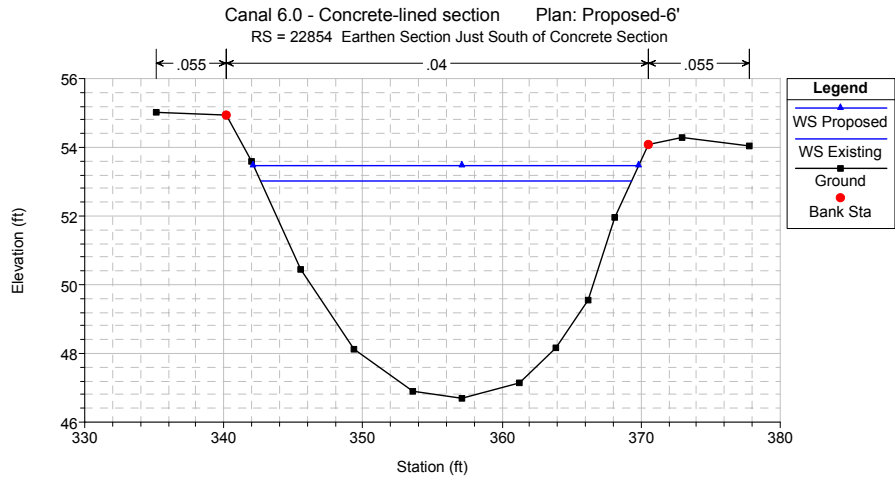
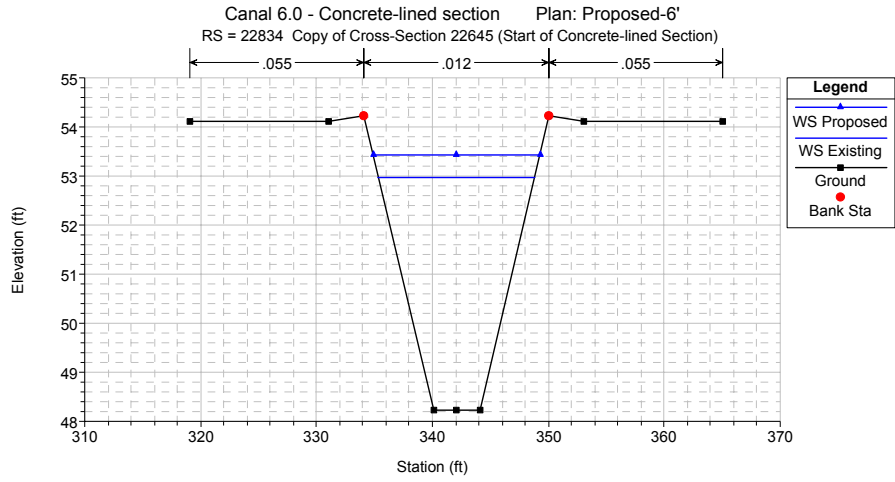












IV. HEC-RAS INPUT & OUTPUT

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

Project Title: Canal 6.0 - Concrete-lined section
Project File : 6Lateral.prj
Run Date and Time: 6/11/2003 9:58:55 AM

Project in English units

Project Description:

Concrete-lined section of 6.0 Canal

PLAN DATA

Plan Title: Proposed-6'
Plan File : h:\JOBS\3011\Modeling\6Lateral.p06

Geometry Title: 6.0 Canal - Pro-rg-6'
Geometry File : h:\JOBS\3011\Modeling\6Lateral.g02

Flow Title : Flow Conditions
Flow File : h:\JOBS\3011\Modeling\6Lateral.f01

Plan Summary Information:

Number of: Cross Sections	=	15	Multiple Openings	=	0
Culverts	=	1	Inline Weirs	=	0
Bridges	=	0			

Computational Information

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

Computation Options

Critical depth computed only where necessary	
Conveyance Calculation Method:	At breaks in n values only
Friction Slope Method:	Average Conveyance
Computational Flow Regime:	Mixed Flow

GEOMETRY DATA

Geometry Title: 6.0 Canal - Pro-rg-6'
 Geometry File : h:\JOBS\3011\Modeling\6Lateral.g02

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 22854

INPUT

Description: Earthen Section Just South of Concrete Section

Station Elevation Data num= 14									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
335.1	55.011	340.2	54.933	342	53.603	345.5	50.438	349.4	48.124
353.6	46.889	357.1	46.679	361.2	47.137	363.9	48.164	366.2	49.565
368.1	51.958	370.5	54.087	372.9	54.276	377.8	54.044		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
335.1	.055	340.2	.04	370.5	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	340.2	370.5		22	20		.1	.3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 22834

INPUT

Description: Copy of Cross-Section 22645 (Start of Concrete-lined Section)

Station Elevation Data num= 9									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
319.1	54.12	331.1	54.12	334.1	54.22	340.1	48.22	342.1	48.22
344.1	48.22	350.1	54.22	353.1	54.12	365.1	54.12		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
319.1	.055	334.1	.012	350.1	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	334.1	350.1		189	189		.1	.3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 22645

INPUT

Description: Concrete-Lined Section

Station Elevation Data num= 9									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
319.1	54.1	331.1	54.1	334.1	54.2	340.1	48.2	342.1	48.2
344.1	48.2	350.1	54.2	353.1	54.1	365.1	54.1		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
319.1	.055	334.1	.012	350.1	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	334.1	350.1		498	498		.1	.3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 22147

INPUT

Description: Concrete-Lined Section

Station Elevation Data num= 9									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
310.9	54.06	322.9	54.06	325.9	54.16	331.9	48.16	333.9	48.16
335.9	48.16	341.9	54.16	344.9	54.06	356.9	54.06		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
310.9	.055	325.9	.012	341.9	.055

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

325.9 341.9 421 421 421 .1 .3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 21726

INPUT

Description: Section-Lined Section

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
300	54.02	312	54.02	315	54.12	321	48.12	323	48.12
325	48.12	331	54.12	334	54.02	346	54.02		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
300	.055	315	.012	331	.055

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

Left	Right	Left	Channel	Right	Coeff	Contr.	Expan.
315	331	497	497	497	.1	.3	

CULVERT RIVER: Canal 6.0
 REACH: Concrete-lined RS: 21255

INPUT

Description:

Distance from Upstream XS = 90.5
 Deck/Roadway Width = 381
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates num= 6

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
295	53.9	0	318.9	53.9	0	319	53.9	51						
327	53.9	51	327.1	53.9	0	335.4	53.9	0						

Upstream Bridge Cross Section Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
300	54.02	312	54.02	315	54.12	321	48.12	323	48.12
325	48.12	331	54.12	334	54.02	346	54.02		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
300	.055	315	.012	331	.055

Bank Sta: Left Right Coeff Contr. Expan.

Left	Right	Coeff	Contr.	Expan.
315	331	.1	.3	

Downstream Deck/Roadway Coordinates num= 6

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
284	53.9	0	304.8	53.9	0	304.9	53.9	51						
312.9	53.9	51	313	53.9	0	325.6	53.9	0						

Downstream Bridge Cross Section Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
285.9	53.98	297.9	53.98	300.9	54.08	306.9	48.08	308.9	48.08
310.9	48.08	316.9	54.08	319.9	53.98	331.9	53.98		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
285.9	.055	300.9	.012	316.9	.055

Bank Sta: Left Right Coeff Contr. Expan.

Left	Right	Coeff	Contr.	Expan.
300.9	316.9	.1	.3	

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins =
 Energy head used in spillway design =
 Spillway height used in design =

Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name Shape Rise Span
 Culvert #1 Box 5 8
 FHWA Chart # 8 - flared wingwalls
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length n Value Entrance Loss Coef Exit Loss Coef
 90.5 381 .014 .5 1
 Upstream Elevation = 46
 Centerline Station = 323
 Downstream Elevation = 46
 Centerline Station = 308.9

CULVERT OUTPUT Profile #Existing
Culvert ID : Culvert #1

Culv Q (cfs)	59.00	Culv Ful Lngh (ft)	381.00
# Barrels	1	Culv Vel US (ft/s)	1.48
Q Barrel (cfs)	59.00	Culv Vel DS (ft/s)	1.48
E.G. US. (ft)	52.97	Culv Inv El Up (ft)	46.00
W.S. US. (ft)	52.94	Culv Inv El Dn (ft)	46.00
E.G. DS (ft)	52.90	Culv Frctn Ls (ft)	0.04
W.S. DS (ft)	52.87	Culv Ext Lss (ft)	0.00
Delta EG (ft)	0.06	Culv Ent Lss (ft)	0.02
Delta WS (ft)	0.06	Q Weir (cfs)	
E.G. IC (ft)	47.87	Weir Sta Lft (ft)	
E.G. OC (ft)	52.97	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	51.00	Weir Max Depth (ft)	
Culv WS Outlet (ft)	51.00	Weir Avg Depth (ft)	
Culv Nml Depth (ft)		Wr Flw Area (sq ft)	
Culv Crt Depth (ft)	1.19	Min El Weir Flow (ft)	53.91

CULVERT OUTPUT Profile #Proposed
Culvert ID : Culvert #1

Culv Q (cfs)	71.00	Culv Ful Lngh (ft)	381.00
# Barrels	1	Culv Vel US (ft/s)	1.78
Q Barrel (cfs)	71.00	Culv Vel DS (ft/s)	1.78
E.G. US. (ft)	53.43	Culv Inv El Up (ft)	46.00
W.S. US. (ft)	53.40	Culv Inv El Dn (ft)	46.00
E.G. DS (ft)	53.33	Culv Frctn Ls (ft)	0.06
W.S. DS (ft)	53.30	Culv Ext Lss (ft)	0.02
Delta EG (ft)	0.10	Culv Ent Lss (ft)	0.02
Delta WS (ft)	0.10	Q Weir (cfs)	
E.G. IC (ft)	48.12	Weir Sta Lft (ft)	
E.G. OC (ft)	53.43	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	51.00	Weir Max Depth (ft)	
Culv WS Outlet (ft)	51.00	Weir Avg Depth (ft)	
Culv Nml Depth (ft)		Wr Flw Area (sq ft)	
Culv Crt Depth (ft)	1.35	Min El Weir Flow (ft)	53.91

CROSS SECTION RIVER: Canal 6.0
REACH: Concrete-lined RS: 21229

INPUT

Description: Concrete-Lined Section

Station Elevation Data	num=	9							
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev									
285.9 53.98 297.9 53.98 300.9 54.08 306.9 48.08 308.9 48.08									
310.9 48.08 316.9 54.08 319.9 53.98 331.9 53.98									

Manning's n Values	num=	3			
Sta n Val Sta n Val Sta n Val					
285.9 .055 300.9 .012 316.9 .055					

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 300.9 316.9 480 480 480 .1 .3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 20749

INPUT

Description: Concrete-Lined Section

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
272.9	53.93	284.9	53.93	287.9	54.03	293.9	48.03	295.9	48.03
297.9	48.03	303.9	54.03	306.9	53.93	318.9	53.93		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
272.9	.055	287.9	.012	303.9	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 287.9 303.9 508 508 508 .1 .3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 20241

INPUT

Description: Concrete-Lined Section

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
260.1	53.89	272.1	53.89	275.1	53.99	281.1	47.99	283.1	47.99
285.1	47.99	291.1	53.99	294.1	53.89	306.1	53.89		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
260.1	.055	275.1	.012	291.1	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 275.1 291.1 510 510 510 .1 .3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 19731

INPUT

Description: Concrete-Lined Section

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
246.8	53.84	258.8	53.84	261.8	53.94	267.8	47.94	269.8	47.94
271.8	47.94	277.8	53.94	280.8	53.84	292.8	53.84		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
246.8	.055	261.8	.012	277.8	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 261.8 277.8 506 506 506 .1 .3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 19226

INPUT

Description: Concrete-Lined Section

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
233.9	53.8	245.9	53.8	248.9	53.9	254.9	47.9	256.9	47.9
258.9	47.9	264.9	53.9	267.9	53.8	279.9	53.8		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
233.9	.055	248.9	.012	264.9	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 248.9 264.9 500 500 500 .1 .3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 18726

INPUT

Description: Concrete-Lined Section

Station Elevation Data		num= 9							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
221.5	53.75	233.5	53.75	236.5	53.85	242.5	47.85	244.5	47.85
246.5	47.85	252.5	53.85	255.5	53.75	267.5	53.75		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
221.5	.055	236.5	.012	252.5	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	236.5	252.5		505	505		.1	.3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 18221

INPUT

Description: Concrete-Lined Section

Station Elevation Data		num= 9							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
208.5	53.7	220.5	53.7	223.5	53.8	229.5	47.8	231.5	47.8
233.5	47.8	239.5	53.8	242.5	53.7	254.5	53.7		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
208.5	.055	223.5	.012	239.5	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	223.5	239.5		507	507		.1	.3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 17713

INPUT

Description: Improved Section

Station Elevation Data		num= 9							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
194.2	53.66	206.2	53.66	209.2	53.76	215.2	47.76	217.2	47.76
219.2	47.76	225.2	53.76	228.2	53.66	240.2	53.66		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
194.2	.055	209.2	.012	225.2	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	209.2	225.2		492	492		.1	.3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 17221

INPUT

Description: Improved Section just U/S of Earthen Channel

Station Elevation Data		num= 9							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
182.9	53.61	194.9	53.61	197.9	53.71	203.9	47.71	205.9	47.71
207.9	47.71	213.9	53.71	216.9	53.61	228.9	53.61		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
182.9	.055	197.9	.012	213.9	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	197.9	213.9		175	178		.1	.3

CROSS SECTION RIVER: Canal 6.0
 REACH: Concrete-lined RS: 17043

INPUT

Description: Earthen Section D/S of Concrete-Lined Section

Station Elevation Data num= 7									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
172.4	58.05	186.7	58.77	199.9	57.27	205	49.5	220.6	49.04
239	49.5	246	57.27						

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
172.4	.055	199.9	.04	246	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	199.9	246		0	0		.1	.3

SUMMARY OF MANNING'S N VALUES

River: Canal 6.0

Reach	River Sta.	n1	n2	n3
Concrete-lined	22854	.055	.04	.055
Concrete-lined	22834	.055	.012	.055
Concrete-lined	22645	.055	.012	.055
Concrete-lined	22147	.055	.012	.055
Concrete-lined	21726	.055	.012	.055
Concrete-lined	21255	Culvert		
Concrete-lined	21229	.055	.012	.055
Concrete-lined	20749	.055	.012	.055
Concrete-lined	20241	.055	.012	.055
Concrete-lined	19731	.055	.012	.055
Concrete-lined	19226	.055	.012	.055
Concrete-lined	18726	.055	.012	.055
Concrete-lined	18221	.055	.012	.055
Concrete-lined	17713	.055	.012	.055
Concrete-lined	17221	.055	.012	.055
Concrete-lined	17043	.055	.04	.055

SUMMARY OF REACH LENGTHS

River: Canal 6.0

Reach	River Sta.	Left	Channel	Right
Concrete-lined	22854	22	20	17
Concrete-lined	22834	189	189	189
Concrete-lined	22645	498	498	498
Concrete-lined	22147	421	421	421
Concrete-lined	21726	497	497	497
Concrete-lined	21255	Culvert		
Concrete-lined	21229	480	480	480
Concrete-lined	20749	508	508	508
Concrete-lined	20241	510	510	510
Concrete-lined	19731	506	506	506
Concrete-lined	19226	500	500	500
Concrete-lined	18726	505	505	505
Concrete-lined	18221	507	507	507
Concrete-lined	17713	492	492	493
Concrete-lined	17221	175	178	179
Concrete-lined	17043	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Canal 6.0

Reach	River Sta.	Contr.	Expan.
Concrete-lined	22854	.1	.3
Concrete-lined	22834	.1	.3
Concrete-lined	22645	.1	.3
Concrete-lined	22147	.1	.3
Concrete-lined	21726	.1	.3
Concrete-lined	21255	Culvert	
Concrete-lined	21229	.1	.3
Concrete-lined	20749	.1	.3
Concrete-lined	20241	.1	.3
Concrete-lined	19731	.1	.3
Concrete-lined	19226	.1	.3
Concrete-lined	18726	.1	.3
Concrete-lined	18221	.1	.3
Concrete-lined	17713	.1	.3
Concrete-lined	17221	.1	.3
Concrete-lined	17043	.1	.3