

# **FINAL DESIGN REPORT FOR SAND CREEK RESTORATION**

## **Prepared For:**

**SR Land, LLC**  
20 Boulder Crescent, 2<sup>nd</sup> Floor  
Colorado Springs, CO 80903  
(719) 491-3024

## **Prepared By:**

**JR Engineering, LLC**  
5475 Tech Center Drive  
Colorado Springs, CO 80919  
(303) 267-6240  
Contact: Mike Bramlett, PE

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# Compare to TimberRidge

HEC-RAS Plan: PROP - Shear River: Sand Creek Reach: Reach 1-3

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Shear LOB (lb/sq ft)	Shear Chan (lb/sq ft)	Shear ROB (lb/sq ft)	Shear Total (lb/sq ft)
Reach 1-3	15504	5-YR	475.50	7230.74	7232.15	7232.07	7232.53	0.016370	6.28	115.60	114.47	0.99	1.02	1.27	0.53	1.03
Reach 1-3	15504	100-YR	1643.00	7230.74	7233.40	7233.23	7234.23	0.014852	9.52	267.70	128.61	1.06	2.01	2.31	1.16	1.92
Reach 1-3	15504	FIS	2600.00	7230.74	7234.15	7233.95	7235.26	0.014315	11.13	367.30	137.28	1.09	2.54	2.90	1.47	2.38
Reach 1-3	14904	5-YR	475.50	7220.33	7222.53	7222.53	7223.15	0.015138	8.48	102.93	81.19	1.04	0.81	1.95	1.07	1.19
Reach 1-3	14904	100-YR	1643.00	7220.33	7224.12	7224.12	7225.24	0.015348	12.47	255.18	110.31	1.15	1.56	3.50	2.08	2.20
Reach 1-3	14904	FIS	2600.00	7220.33	7224.97	7224.97	7226.39	0.015561	14.44	355.24	124.17	1.20	1.97	4.37	2.63	2.76
Reach 1-3	14528	5-YR	475.50	7213.99	7215.53	7215.61	7216.21	0.021955	8.39	100.88	114.80	1.19	0.79	2.11	1.08	1.20
Reach 1-3	14528	100-YR	1643.00	7213.99	7216.52	7216.81	7217.74	0.024976	12.46	258.81	176.42	1.38	1.62	3.95	2.34	2.28
Reach 1-3	14528	FIS	2600.00	7213.99	7217.49	7217.39	7218.40	0.021736	14.47	438.74	194.58	1.48	2.04	5.00	2.97	3.16
Reach 1-3	13756	5-YR	475.50	7200.47	7202.95	7202.95	7203.51	0.014115	8.80	109.75	85.26	1.01	0.76	2.03	1.25	1.13
Reach 1-3	13756	100-YR	1643.00	7200.47	7204.42	7204.42	7205.51	0.016804	13.27	249.53	104.59	1.20	1.93	3.93	2.81	2.48
Reach 1-3	13756	FIS	2600.00	7200.47	7205.23	7205.23	7206.63	0.017566	15.42	335.78	109.52	1.26	2.79	4.97	3.62	3.32
Reach 1-3	12767	5-YR	475.50	7180.91	7182.75	7183.26	7184.05	0.027997	10.13	64.28	65.67	1.37	0.42	2.97	1.71	1.70
Reach 1-3	12767	100-YR	1643.00	7180.91	7184.11	7184.66	7185.90	0.023649	13.76	234.27	173.88	1.39	1.72	4.52	2.86	1.98
Reach 1-3	12767	FIS	2600.00	7180.91	7184.67	7185.26	7186.67	0.023818	15.46	333.66	177.42	1.43	2.14	5.39	3.50	2.78
Reach 1-3	12070	5-YR	475.50	7168.31	7171.58	7171.58	7172.44	0.011246	9.53	93.95	58.63	0.95	0.69	2.16	1.01	1.09
Reach 1-3	12070	100-YR	1643.00	7168.31	7173.61	7173.61	7175.03	0.012023	13.76	233.04	73.72	1.07	1.72	3.81	2.28	2.81
Reach 1-3	12070	FIS	2600.00	7168.31	7174.66	7174.66	7176.52	0.012899	16.14	313.55	78.33	1.14	2.39	4.93	3.14	3.08
Reach 1-3	11206	5-YR	475.50	7151.03	7153.13	7153.76	7155.13	0.045693	13.37	60.33	66.59	1.76	1.78	5.10	2.68	2.57
Reach 1-3	11206	100-YR	1643.00	7151.03	7154.41	7154.48	7157.32	0.043587	18.69	178.32	118.16	1.88	3.44	8.33	4.11	4.08
Reach 1-3	11206	FIS	2600.00	7151.03	7155.08	7156.11	7158.31	0.041755	20.88	269.20	145.86	1.90	4.22	9.73	4.53	4.77
Reach 1-3	10925	5-YR	475.50	7148.00	7149.59	7149.60	7149.15	0.009001	5.32	112.74	104.89	0.78	0.60	1.60	0.80	0.88
Reach 1-3	10925	100-YR	1643.00	7148.00	7150.98	7150.75	7151.66	0.010242	6.61	248.49	129.57	0.84	1.22	2.60	1.22	1.22
Reach 1-3	10925	FIS	2600.00	7148.00	7151.60	7151.38	7152.56	0.010090	7.90	330.21	134.40	0.88	0.18	1.59	0.18	1.54
Reach 1-3	10797	5-YR	475.50	7145.39	7148.14	7147.91	7148.55	0.018364	5.17	93.64	117.85	0.78	0.29	1.55	0.52	1.40
Reach 1-3	10797	100-YR	1643.00	7145.39	7149.35	7149.14	7149.97	0.017191	7.00	284.94	156.61	1.00	2.74	1.61	1.94	1.94
Reach 1-3	10797	FIS	2600.00	7145.39	7149.94	7149.76	7150.80	0.019038	8.34	382.70	170.55	0.83	1.52	3.74	2.33	2.66
Reach 1-3	10713	5-YR	475.50	7144.30	7147.27	7147.27	7147.45	0.008697	3.75	155.78	145.09	0.54	0.80	0.39	0.58	0.58
Reach 1-3	10713	100-YR	1643.00	7144.30	7148.40	7148.77	7148.77	0.010588	5.59	371.61	212.30	0.61	0.53	1.71	1.13	1.15
Reach 1-3	10713	FIS	2600.00	7144.30	7149.03	7149.03	7149.50	0.010786	6.40	506.88	221.23	0.63	0.91	2.16	1.49	1.53
Reach 1-3	10617	5-YR	475.50	7143.44	7146.31	7146.31	7146.56	0.010761	4.07	138.59	194.63	0.58	0.19	1.01	0.14	0.48
Reach 1-3	10617	100-YR	1643.00	7143.44	7147.56	7147.56	7147.86	0.008825	5.16	414.87	235.18	0.55	0.74	1.51	0.72	0.97
Reach 1-3	10617	FIS	2600.00	7143.44	7148.24	7148.24	7148.60	0.008239	5.70	579.19	247.66	0.54	1.00	1.75	0.94	1.20
Reach 1-3	10543	5-YR	475.50	7142.46	7145.60	7145.60	7145.83	0.008151	3.97	142.32	166.60	0.58	0.06	0.74	0.33	0.43
Reach 1-3	10543	100-YR	1643.00	7142.46	7146.85	7146.85	7147.21	0.008072	5.50	392.22	213.49	0.59	0.63	1.36	0.80	0.92
Reach 1-3	10543	FIS	2600.00	7142.46	7147.52	7147.52	7147.97	0.008055	6.26	542.80	232.97	0.60	0.94	1.69	0.92	1.17
Reach 1-3	10455	5-YR	475.50	7142.32	7145.26	7145.26	7145.44	0.008278	3.72	161.66	191.49	0.53	0.10	0.79	0.40	0.43
Reach 1-3	10455	100-YR	1643.00	7142.32	7146.54	7146.54	7146.82	0.008016	5.09	434.26	241.43	0.53	0.69	1.39	0.73	0.90
Reach 1-3	10455	FIS	2600.00	7142.32	7147.22	7147.22	7147.57	0.008191	5.85	615.37	293.42	0.55	1.01	1.77	0.77	1.07
Reach 1-3	10411	5-YR	475.50	7141.35	7144.12	7144.12	7144.36	0.011186	4.08	139.45	174.91	0.59	0.18	1.04	0.25	0.55
Reach 1-3	10411	100-YR	1643.00	7141.35	7145.07	7145.07	7145.56	0.015961	6.44	338.27	230.86	0.73	1.00	2.41	1.05	1.46
Reach 1-3	10411	FIS	2600.00	7141.35	7145.55	7145.38	7146.21	0.018247	7.67	455.10	256.75	0.79	1.61	3.30	1.43	2.01
Reach 1-3	10339	5-YR	475.50	7140.02	7143.07	7142.74	7143.41	0.013384	4.71	116.26	212.79	0.68	0.02	1.23	0.11	0.45
Reach 1-3	10339	100-YR	1643.00	7140.02	7144.19	7144.19	7144.52	0.010483	5.58	444.11	347.80	0.61	0.48	1.69	0.69	0.83
Reach 1-3	10339	FIS	2600.00	7140.02	7144.65	7144.65	7145.04	0.011174	6.32	603.96	355.48	0.64	0.79	2.11	1.04	1.18
Reach 1-3	10211	5-YR	475.50	7138.76	7141.95	7141.95	7142.24	0.010900	4.33	115.42	204.67	0.61	0.12	1.04	0.20	0.70
Reach 1-3	10211	100-YR	1643.00	7138.76	7142.99	7143.40	7143.40	0.012565	6.05	403.46	344.68	0.67	0.80	1.99	0.56	0.92
Reach 1-3	10211	FIS	2600.00	7138.76	7143.52	7143.52	7143.95	0.011558	6.46	586.99	349.47	0.65	1.09	2.21	0.89	1.21
Reach 1-3	10113	5-YR	475.50	7137.89	7140.84	7140.52	7141.18	0.010687	4.68	109.20	218.30	0.69	0.94	0.04	0.33	0.33
Reach 1-3	10113	100-YR	1643.00	7137.89	7141.96	7142.33	7142.33	0.009466	5.75	420.00	304.10	0.64	0.46	1.46	0.66	0.81
Reach 1-3	10113	FIS	2600.00	7137.89	7142.51	7142.93	7142.93	0.009290	6.36	590.03	311.09	0.64	0.72	1.76	0.96	1.10
Reach 1-3	10014	5-YR	475.50	7136.24	7139.41	7139.41	7139.86	0.016594	5.40	88.60	134.88	0.79	0.25	1.51	0.45	1.45
Reach 1-3	10014	100-YR	1643.00	7136.24	7140.60	7140.60	7141.18	0.016511	7.03	335.31	274.27	0.78	0.60	2.56	0.95	1.26
Reach 1-3	10014	FIS	2600.00	7136.24	7141.03	7141.03	7141.75	0.018533	8.13	459.09	287.36	0.84	1.06	3.38	1.55	1.84
Reach 1-3	9955	5-YR	475.50	7135.86	7138.52	7138.52	7138.87	0.015806	4.88	120.43	254.30	0.73	0.25	1.35	0.11	0.47
Reach 1-3	9955	100-YR	1643.00	7135.86	7139.17	7139.33	7139.89	0.028362	8.03	298.12	286.86	0.99	1.27	3.56	1.33	1.84
Reach 1-3	9955	FIS	2600.00	7135.86	7139.58	7139.70	7140.40	0.027873	8.86	418.32	291.67	1.00	1.92	4.22	2.01	2.49
Reach 1-3	9943	5-YR	475.50	7135.80	7138.14	7138.25	7138.53	0.074404	5.18	103.24	251.71	0.82	0.07	5.73	0.69	1.90
Reach 1-3	9943	100-YR	1643.00	7135.80	7138.71	7138.84	7139.37	0.071473	6.53	260.99	294.12	0.85	2.11	8.03	3.11	3.95
Reach 1-3	9943	FIS	2600.00	7135.80	7139.04	7139.19	7139.92	0.064379	6.91	357.13	298.06	0.83	3.13	8.52	4.06	4.80
Reach 1-3	9926	5-YR	475.50	7131.59	7135.21	7133.84	7135.33	0.008203	2.77	180.81	92.26	0.31	0.27	1.29	0.27	1.00
Reach 1-3	9926	100-YR	1643.00	7131.59	7136.55	7135.46	7137.01	0.019995	5.73	324.87	123.84	0.51	1.61	4.80	1.45	3.25
Reach 1-3	9926	FIS	2600.00	7131.59	7135.54	7136.36	7138.13	0.158534	13.20	211.54	98.72	1.37	7.10	28.15	7.11	21.03
Reach 1-3	9913	5-YR	475.50	7131.58	7135.19	7135.19	7135.25	0.003170	2.03	247.27	111.15	0.20	0.09	0.64	0.08	0.43
Reach 1-3	9913	100-YR	1643.00	7131.58	7136.57	7136.57	7136.78	0.007808	4.01	477.91	246.24	0.33	0.66	2.22	0.37	0.94
Reach 1-3	9913	FIS	2600.00	7131.58	7137.24	7135.65	7137.50	0.008190	4.50	652.80	272.86	0.34	0.69	2.67	0.71	1.21
Reach 1-3	9910</															

HEC-RAS Plan: PROP - Shear River: Sand Creek Reach: Reach 1-3 (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Shear LOB (lb/sq ft)	Shear Chan (lb/sq ft)	Shear ROB (lb/sq ft)	Shear Total (lb/sq ft)
Reach 1-3	9772	100-YR	1643.00	7130.91	7134.76	7134.59	7135.36	0.012827	6.82	309.40	217.18	0.76	0.44	1.99	0.91	1.14
Reach 1-3	9772	FIS	2600.00	7130.91	7135.31	7135.21	7136.07	0.013706	7.91	440.73	254.17	0.80	0.75	2.60	1.31	1.48
Reach 1-3	9727	5-YR	475.50	7129.87	7133.00	7132.88	7133.37	0.013269	5.00	108.69	127.42	0.77		1.08	0.26	0.70
Reach 1-3	9727	100-YR	1643.00	7129.87	7134.18	7134.09	7134.76	0.013691	6.88	323.91	240.21	0.77	0.48	2.09	1.21	1.15
Reach 1-3	9727	FIS	2600.00	7129.87	7134.69	7134.60	7135.42	0.014980	7.99	448.53	247.47	0.82	0.97	2.76	1.74	1.69
Reach 1-3	9636	5-YR	475.50	7129.38	7132.05		7132.23	0.010624	3.85	160.79	196.39	0.58	0.04	0.90	0.39	0.54
Reach 1-3	9636	100-YR	1643.00	7129.38	7132.75	7132.73	7133.24	0.020262	6.65	340.25	322.37	0.81	0.47	2.59	1.61	1.33
Reach 1-3	9636	FIS	2600.00	7129.38	7133.12	7133.12	7133.76	0.022893	7.77	459.34	326.27	0.88	1.04	3.45	2.31	2.01
Reach 1-3	9626	5-YR	475.50	7129.34	7131.74	7131.74	7132.02	0.055418	4.50	116.69	213.48	0.71	0.09	4.31	0.88	2.07
Reach 1-3	9626	100-YR	1643.00	7129.34	7132.48	7132.48	7132.96	0.042216	5.35	314.86	331.57	0.67	1.07	5.21	2.58	2.50
Reach 1-3	9626	FIS	2600.00	7129.34	7132.80	7132.83	7133.45	0.043402	5.98	421.17	335.20	0.69	1.93	6.22	3.49	3.39
Reach 1-3	9614	5-YR	475.50	7126.48	7128.29	7128.87	7130.21	0.756662	11.11	42.81	62.44	2.36		32.13		32.13
Reach 1-3	9614	100-YR	1643.00	7126.48	7129.32	7130.02	7131.67	0.325667	13.01	148.42	159.10	1.79	6.89	32.99	9.42	18.88
Reach 1-3	9614	FIS	2600.00	7126.48	7129.78	7130.51	7132.22	0.260819	13.75	224.96	172.90	1.67	11.58	33.90	14.14	21.10
Reach 1-3	9600	5-YR	475.50	7123.43	7126.83	7125.69	7126.95	0.010102	2.87	174.17	104.67	0.33	0.34	1.43	0.36	1.04
Reach 1-3	9600	100-YR	1643.00	7123.43	7128.10	7127.21	7128.50	0.018383	5.18	333.97	148.39	0.48	1.35	4.04	1.36	2.57
Reach 1-3	9600	FIS	2600.00	7123.43	7127.31	7127.99	7128.45	0.0138781	12.05	228.19	120.85	1.28	6.78	23.77	7.08	16.26
Reach 1-3	9587	5-YR	475.50	7123.38	7126.81		7126.87	0.002964	1.91	264.62	150.53	0.19	0.11	0.57	0.10	0.32
Reach 1-3	9587	100-YR	1643.00	7123.38	7128.12		7128.31	0.005905	3.38	489.18	227.72	0.28	0.59	1.60	0.42	0.91
Reach 1-3	9587	FIS	2600.00	7123.38	7128.61	7127.23	7128.95	0.008524	4.35	597.88	294.28	0.34	1.03	2.57	0.30	1.07
Reach 1-3	9584	5-YR	475.50	7124.71	7126.73		7126.85	0.021540	2.68	177.47	152.36	0.44		1.56		1.56
Reach 1-3	9584	100-YR	1643.00	7124.71	7128.01		7128.28	0.022448	4.11	400.37	238.30	0.49	0.21	3.01	0.21	2.86
Reach 1-3	9584	FIS	2600.00	7124.71	7128.49		7128.91	0.027993	5.24	508.56	300.61	0.57	0.68	4.57	0.29	2.95
Reach 1-3	9558	5-YR	475.50	7122.44	7126.18		7126.34	0.016056	3.33	146.97	115.42	0.41	0.32	2.00	0.44	1.41
Reach 1-3	9558	100-YR	1643.00	7122.44	7127.44		7127.75	0.016736	4.70	371.96	295.93	0.46	0.96	3.40	0.70	1.43
Reach 1-3	9558	FIS	2600.00	7122.44	7127.96		7128.34	0.016007	5.06	523.20	322.31	0.46	1.18	3.76	0.99	1.62
Reach 1-3	9498	5-YR	475.50	7122.10	7125.02	7124.75	7125.36	0.016415	4.70	109.35	140.37	0.73		1.32	0.19	0.85
Reach 1-3	9498	100-YR	1643.00	7122.10	7126.13	7126.04	7126.68	0.017277	6.67	321.77	250.79	0.76	0.83	2.57	0.99	1.46
Reach 1-3	9498	FIS	2600.00	7122.10	7126.70	7126.54	7127.32	0.016220	7.33	461.69	257.21	0.75	1.28	2.99	1.33	1.81
Reach 1-3	9389	5-YR	475.50	7120.61	7122.59	7122.59	7122.95	0.031049	4.99	103.88	140.21	0.80	0.74	2.37	0.46	1.43
Reach 1-3	9389	100-YR	1643.00	7120.61	7123.50	7123.50	7124.28	0.029989	7.11	237.08	156.54	0.86	2.24	3.98	1.73	2.83
Reach 1-3	9389	FIS	2600.00	7120.61	7124.07	7124.07	7125.10	0.027349	7.95	328.93	168.18	0.85	2.83	4.60	2.19	3.32
Reach 1-3	9256	5-YR	475.50	7118.36	7120.57	7119.98	7120.64	0.004675	2.13	226.93	204.92	0.35	0.11	0.34	0.13	0.32
Reach 1-3	9256	100-YR	1643.00	7118.36	7121.97	7120.73	7122.13	0.003727	3.20	530.77	227.33	0.35	0.27	0.60	0.25	0.54
Reach 1-3	9256	FIS	2600.00	7118.36	7123.40	7121.18	7123.55	0.001959	3.11	871.00	249.11	0.27	0.23	0.49	0.23	0.43
Reach 1-3	9243	5-YR	475.50	7119.00	7119.73	7119.73	7120.04	0.131026	4.49	105.74	169.55	0.98	0.97	5.33	1.47	5.10
Reach 1-3	9243	100-YR	1643.00	7119.00	7121.68		7121.87	0.010410	3.19	486.97	215.43	0.35	0.73	1.69	1.03	1.47
Reach 1-3	9243	FIS	2600.00	7119.00	7123.26		7123.43	0.004158	2.76	846.78	241.54	0.24	0.57	1.09	0.53	0.91
Reach 1-3	9216	5-YR	475.50	7114.00	7118.78	7114.56	7118.78	0.000013	0.47	1052.11	240.55	0.04	0.00	0.00	0.00	0.00
Reach 1-3	9216	100-YR	1643.00	7114.00	7121.80		7121.82	0.000027	0.95	1831.41	273.88	0.06	0.01	0.01	0.01	0.01
Reach 1-3	9216	FIS	2600.00	7114.00	7123.36		7123.38	0.000036	1.23	2269.84	293.30	0.07	0.01	0.02	0.01	0.02
Reach 1-3	9080	5-YR	480.20	7114.00	7118.78		7118.78	0.000019	0.52	957.29	220.94	0.04	0.00	0.01	0.00	0.00
Reach 1-3	9080	100-YR	1665.90	7114.00	7121.80		7121.81	0.000040	1.06	1668.02	251.65	0.07	0.01	0.02	0.01	0.02
Reach 1-3	9080	FIS	2600.00	7114.00	7123.35		7123.37	0.000051	1.34	2071.57	268.30	0.08	0.01	0.03	0.02	0.02
Reach 1-3	9029	5-YR	480.20	7117.75	7118.70		7118.77	0.002892	2.13	226.62	242.19	0.39	0.09	0.16	0.09	0.16
Reach 1-3	9029	100-YR	1665.90	7117.75	7121.76		7121.80	0.000249	1.69	1010.66	273.00	0.15	0.03	0.06	0.03	0.06
Reach 1-3	9029	FIS	2600.00	7117.75	7123.31		7123.36	0.000196	1.86	1453.61	298.54	0.14	0.03	0.07	0.04	0.06
Reach 1-3	8989	5-YR	480.20	7117.73	7118.27	7118.27	7118.51	0.022429	4.01	120.22	242.59	1.00	0.37	0.70	0.34	0.69
Reach 1-3	8989	100-YR	1665.90	7117.73	7121.75		7121.79	0.000242	1.66	1031.42	281.20	0.15	0.03	0.06	0.03	0.06
Reach 1-3	8989	FIS	2600.00	7117.73	7123.31		7123.36	0.000187	1.82	1479.78	298.80	0.14	0.03	0.06	0.03	0.06
Reach 1-3	8983	5-YR	480.20	7103.78	7110.88	7106.04	7110.99	0.000554	2.73	175.79	24.84	0.18		0.16		0.16
Reach 1-3	8983	100-YR	1665.90	7103.78	7121.66		7121.78	0.001301	2.82	616.96	281.94	0.30	0.05	0.20	0.05	0.17
Reach 1-3	8983	FIS	2600.00	7103.78	7123.26		7123.35	0.000577	2.55	1077.59	297.43	0.22	0.07	0.14	0.07	0.12
Reach 1-3	8956	5-YR	480.20	7103.78	7110.86	7106.04	7110.98	0.000558	2.74	175.39	24.84	0.18		0.16		0.16
Reach 1-3	8956	100-YR	1665.90	7103.78	7121.62	7108.97	7121.75	0.001377	2.87	605.26	281.55	0.31	0.05	0.21	0.05	0.17
Reach 1-3	8956	FIS	2600.00	7103.78	7123.24	7110.78	7123.33	0.000585	2.56	1072.80	297.27	0.22	0.07	0.14	0.07	0.12
Reach 1-3	8919		Culvert													
Reach 1-3	8888	5-YR	480.20	7103.58	7106.85	7106.85	7108.50	0.011981	10.23	46.63	47.00	1.00	2.44	2.44	2.44	2.44
Reach 1-3	8888	100-YR	1665.90	7103.58	7111.09	7111.09	7114.85	0.008998	15.44	107.17	47.20	0.99	4.22	4.22	4.22	4.22
Reach 1-3	8888	FIS	2600.00	7103.58	7113.66	7113.66	7118.74	0.008208	17.94	143.89	81.95	1.00	5.16	5.16	5.16	5.16
Reach 1-3	8886	5-YR	480.20	7102.02	7103.70	7104.94	7108.16	0.079386	16.86	28.36	46.86	2.30	8.34	8.29	8.07	8.29
Reach 1-3	8886	100-YR	1665.90	7102.02	7106.35	7108.71	7114.39	0.040339	22.63	73.30	46.98	1.92	10.91	10.89	10.74	10.88
Reach 1-3	8886	FIS	2600.00	7102.02	7108.03	7111.02	7118.20	0.033014	25.46	101.67	47.06	1.83	12.38	12.36	12.22	12.35
Reach 1-3	8852	5-YR	480.20	7102.13	7104.81	7103.23	7104.86	0.000628	1.96	278.57	168.13	0.22	0.03	0.10	0.00	0.06
Reach 1-3	8852	100-YR	1665.90	7102.13	7103.11	7104.69	7111.37	0.326797	23.06	72.23	77.70	4.22		18.90		18.90
Reach 1-3	8852	FIS	2600.00	7102.13	7103.38	7105.22	7115.40	0.349217	27.81	93.49	79.77	4.53		25.45		25.45
Reach 1-3	8850	5-YR	480.20	7103.55	7104.69		7104.85	0.007027	3.32	150.29	169.55	0.56	0.30	0.48	0.14	0.39
Reach 1-3	8850	100-YR	1665.90	7103.55	7104.33	7105.25	7109.93	0.438719	20.19	90.03	167.20	4.12	9.20	20.36	5.28	14.70
Reach 1-3	8850	FIS	2600.00	7103.55	7104.43	7105.75	7113.84									

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Shear LOB (lb/sq ft)	Shear Chan (lb/sq ft)	Shear ROB (lb/sq ft)	Shear Total (lb/sq ft)
Reach 1-3	7534	5-YR	512.38	7085.85	7088.93		7089.15	0.014175	3.76	136.48	184.38	0.75	0.03	0.69	0.04	0.65
Reach 1-3	7534	100-YR	1763.93	7085.85	7090.02		7090.41	0.013491	5.12	362.02	214.80	0.66	0.47	1.56	0.80	1.41
Reach 1-3	7534	FIS	2600.00	7085.85	7090.50		7091.01	0.013776	5.85	467.43	219.56	0.67	0.69	2.01	1.16	1.82
Reach 1-3	7485	5-YR	512.38	7085.30	7088.30		7088.55	0.010959	4.37	157.25	205.91	0.61	0.25	1.06	0.31	0.52
Reach 1-3	7485	100-YR	1763.93	7085.30	7089.32		7089.76	0.013244	6.28	374.94	218.10	0.69	1.09	2.12	1.16	1.41
Reach 1-3	7485	FIS	2600.00	7085.30	7089.83		7090.36	0.013173	6.95	487.29	224.23	0.69	1.45	2.53	1.52	1.78
Reach 1-3	7455	5-YR	512.38	7085.01	7088.15		7088.32	0.004929	3.68	185.15	232.10	0.49	0.17	0.54	0.18	0.27
Reach 1-3	7455	100-YR	1763.93	7085.01	7089.00		7089.46	0.008375	6.14	367.76	251.31	0.67	0.70	1.35	0.69	0.87
Reach 1-3	7455	FIS	2600.00	7085.01	7089.34		7090.01	0.010264	7.36	445.18	259.08	0.76	1.05	1.87	1.04	1.25
Reach 1-3	7445	5-YR	512.38	7085.12	7087.88	7087.88	7088.20	0.029482	4.89	135.27	239.63	0.69	0.65	2.86	0.46	1.18
Reach 1-3	7445	100-YR	1763.93	7085.12	7088.67	7088.67	7089.28	0.038885	7.37	308.27	259.65	0.85	2.63	5.67	2.40	3.31
Reach 1-3	7445	FIS	2600.00	7085.12	7089.03	7089.03	7089.81	0.040836	8.32	392.06	268.88	0.89	3.57	6.88	3.33	4.29
Reach 1-3	7430	5-YR	512.38	7081.82	7083.68	7084.44	7086.72	0.695591	13.99	36.63	51.63	2.93		30.50		30.50
Reach 1-3	7430	100-YR	1763.93	7081.82	7085.07	7085.91	7087.99	0.179042	14.18	138.78	121.87	1.76	8.57	22.18	2.05	12.65
Reach 1-3	7430	FIS	2600.00	7081.82	7085.60	7086.65	7088.58	0.143870	14.87	208.91	140.43	1.65	9.72	22.55	5.56	13.29
Reach 1-3	7422	5-YR	512.38	7080.12	7082.05	7082.68	7084.27	0.138369	11.96	42.85	52.69	2.34		6.95		6.95
Reach 1-3	7422	100-YR	1763.93	7080.12	7083.25	7084.41	7086.98	0.075843	15.66	117.29	75.48	1.99	2.00	8.97	1.73	7.29
Reach 1-3	7422	FIS	2600.00	7080.12	7083.89	7085.12	7087.78	0.056082	16.34	177.08	105.29	1.80	2.65	8.86	1.92	5.84
Reach 1-3	7409	5-YR	512.38	7080.12	7083.50	7081.64	7083.61	0.001246	2.71	212.24	112.44	0.27	0.05	0.23	0.05	0.14
Reach 1-3	7409	100-YR	1763.93	7080.12	7082.45	7083.68	7086.05	0.067594	15.23	115.80	55.81	1.86		8.36		8.36
Reach 1-3	7409	FIS	2600.00	7080.12	7083.15	7084.49	7087.10	0.051945	16.19	174.09	104.34	1.71	1.21	8.57	1.28	5.27
Reach 1-3	7406	5-YR	512.38	7081.53	7083.06	7083.06	7083.56	0.033673	5.84	97.36	104.85	0.85	0.56	3.06	0.73	1.95
Reach 1-3	7406	100-YR	1763.93	7081.53	7084.22	7084.41	7085.19	0.034244	8.70	243.17	173.02	0.95	1.31	5.59	2.58	3.00
Reach 1-3	7406	FIS	2600.00	7081.53	7084.18	7084.91	7086.40	0.079828	13.15	236.47	169.98	1.44	2.96	12.84	5.88	6.92
Reach 1-3	7351	5-YR	512.38	7079.22	7082.24		7082.51	0.010699	4.36	139.79	138.31	0.59	0.19	1.10	0.34	0.67
Reach 1-3	7351	100-YR	1763.93	7079.22	7083.34	7083.23	7083.94	0.015970	7.08	343.17	240.45	0.75	0.65	2.74	1.14	1.42
Reach 1-3	7351	FIS	2600.00	7079.22	7083.79	7083.71	7084.49	0.016806	7.94	459.15	267.29	0.78	0.96	3.34	1.62	1.80
Reach 1-3	7279	5-YR	512.38	7078.10	7081.41		7081.67	0.012541	4.38	143.09	166.36	0.61	0.08	1.22	0.39	0.67
Reach 1-3	7279	100-YR	1763.93	7078.10	7082.59		7082.93	0.010907	5.70	440.59	292.60	0.60	0.66	1.86	0.87	1.02
Reach 1-3	7279	FIS	2600.00	7078.10	7083.05		7083.45	0.010862	6.26	576.74	296.89	0.61	0.94	2.16	1.16	1.31
Reach 1-3	7213	5-YR	512.38	7077.30	7080.96		7081.15	0.005269	3.75	181.06	204.61	0.49	0.09	0.59	0.17	0.29
Reach 1-3	7213	100-YR	1763.93	7077.30	7082.07		7082.39	0.006921	5.50	489.44	308.65	0.57	0.45	1.25	0.59	0.68
Reach 1-3	7213	FIS	2600.00	7077.30	7082.49		7082.88	0.007815	6.30	618.38	312.68	0.61	0.69	1.61	0.85	0.96
Reach 1-3	7167	5-YR	512.38	7077.47	7080.66		7080.86	0.007315	3.78	172.36	216.88	0.49	0.14	0.83	0.16	0.36
Reach 1-3	7167	100-YR	1763.93	7077.47	7081.55		7081.96	0.012378	6.15	424.34	324.35	0.66	0.84	2.09	0.66	1.01
Reach 1-3	7167	FIS	2600.00	7077.47	7081.98		7082.43	0.012256	6.68	563.79	328.35	0.66	1.13	2.39	0.97	1.31
Reach 1-3	7102	5-YR	512.38	7076.78	7079.61	7079.54	7080.06	0.023497	5.48	109.57	167.22	0.83	0.38	1.98		1.13
Reach 1-3	7102	100-YR	1763.93	7076.78	7080.59	7080.59	7081.10	0.015620	6.76	371.75	328.79	0.78	1.06	2.26	0.65	1.10
Reach 1-3	7102	FIS	2600.00	7076.78	7080.86	7080.86	7081.54	0.017429	7.76	461.73	331.71	0.85	1.46	2.81	1.01	1.51
Reach 1-3	7093	5-YR	512.38	7076.86	7079.48	7079.48	7079.70	0.040238	4.11	154.76	305.84	0.61	0.69	3.47	0.64	1.27
Reach 1-3	7093	100-YR	1763.93	7076.86	7079.74	7080.02	7080.72	0.144097	8.70	235.74	322.35	1.19	4.21	14.72	4.57	6.56
Reach 1-3	7093	FIS	2600.00	7076.86	7079.98	7080.30	7081.14	0.129189	9.00	312.65	329.68	1.15	5.41	15.07	5.95	7.63
Reach 1-3	7073	5-YR	512.38	7072.92	7074.63	7075.25	7077.05	0.995374	12.50	41.00	61.59	2.70		41.06		41.06
Reach 1-3	7073	100-YR	1763.93	7072.92	7076.42	7076.91	7077.96	0.126848	10.22	191.74	137.24	1.18	4.81	18.15	2.44	11.00
Reach 1-3	7073	FIS	2600.00	7072.92	7076.96	7077.68	7078.67	0.113894	11.14	274.25	167.12	1.16	6.28	20.11	4.77	11.61
Reach 1-3	7066	5-YR	512.38	7072.86	7076.07	7074.20	7076.16	0.005663	2.48	228.37	148.68	0.26	0.18	1.00	0.10	0.53
Reach 1-3	7066	100-YR	1763.93	7072.86	7077.22	7076.22	7077.52	0.014342	4.92	464.22	273.65	0.43	0.80	3.52	0.83	1.50
Reach 1-3	7066	FIS	2600.00	7072.86	7077.67	7076.99	7078.06	0.017164	5.77	597.00	308.37	0.48	1.34	4.67	1.26	2.06
Reach 1-3	7061	5-YR	512.38	7074.14	7075.57	7075.57	7076.08	0.012979	5.77	95.39	115.56	0.89	0.16	1.06	0.14	0.67
Reach 1-3	7061	100-YR	1763.93	7074.14	7076.77	7076.77	7077.43	0.009219	7.50	330.83	274.11	0.84	0.41	1.44	0.49	0.69
Reach 1-3	7061	FIS	2600.00	7074.14	7077.21	7077.21	7077.96	0.009236	8.35	460.12	309.39	0.86	0.61	1.69	0.64	0.86
Reach 1-3	7044	5-YR	512.38	7071.83	7074.31	7074.67	7075.57	0.067823	9.00	56.92	63.50	1.68		3.74		3.74
Reach 1-3	7044	100-YR	1763.93	7071.83	7076.40	7075.95	7076.61	0.006258	4.62	576.03	376.82	0.48	0.42	1.12	0.50	0.60
Reach 1-3	7044	FIS	2600.00	7071.83	7076.96	7076.25	7077.18	0.005422	4.77	787.36	381.83	0.45	0.54	1.16	0.61	0.70
Reach 1-3	6941	5-YR	512.38	7070.47	7074.02	7073.61	7074.37	0.009299	4.74	113.43	101.64	0.65	0.12	0.93	0.08	0.64
Reach 1-3	6941	100-YR	1763.93	7070.47	7075.77		7076.06	0.005179	5.18	511.69	293.36	0.50	0.51	1.08	0.38	0.56
Reach 1-3	6941	FIS	2600.00	7070.47	7076.34		7076.67	0.005176	5.67	679.95	298.34	0.50	0.66	1.26	0.56	0.73
Reach 1-3	6868	5-YR	512.38	7069.50	7073.14		7073.58	0.012344	5.35	96.45	70.32	0.78	0.13	1.11		1.04
Reach 1-3	6868	100-YR	1763.93	7069.50	7074.74	7074.74	7075.49	0.011840	7.49	320.61	238.94	0.76	0.85	2.22	0.46	0.99
Reach 1-3	6868	FIS	2600.00	7069.50	7075.26	7075.21	7076.10	0.012147	8.30	446.34	243.17	0.77	1.16	2.67	0.86	1.38
Reach 1-3	6769	5-YR	512.38	7068.73	7072.13		7072.47	0.009672	4.68	118.99	119.46	0.64	0.11	0.98	0.14	0.60
Reach 1-3	6769	100-YR	1763.93	7068.73	7073.53	7073.21	7074.13	0.011292	6.87	328.26	167.72	0.69	0.90	2.12	0.88	1.37
Reach 1-3	6769	FIS	2600.00	7068.73	7074.14		7074.89	0.011904	7.83	437.81	191.70	0.72	1.31	2.69	1.08	1.69
Reach 1-3	6673	5-YR	512.38	7067.90	7071.19		7071.49	0.010309	4.44	121.66	160.38	0.60	0.17	1.08	0.10	0.75
Reach 1-3	6673	100-YR	1763.93	7067.90	7072.85	7072.19	7073.19	0.007137	5.36	420.22	195.21	0.52	0.73	1.48	0.66	0.95
Reach 1-3	6673	FIS	2600.00	7067.90	7073.45		7073.88	0.007520	6.07	539.48	200.58	0.54	0.98	1.83	0.95	1.25
Reach 1-3	6588	5-YR	512.38	7067.13	7070.15		7070.50	0.013207	4.77	113.70	101.07	0.66	0.21	1.31	0.13	0.92
Reach 1-3	6588	100-YR	1763.93	7067.13	7071.36	7071.31	7072.23	0.019877	7.98	265.84	156.21	0.84	1.58	3.46	0.68	2.10
Reach 1-3	6588	FIS	2600.00	7067.13												

HEC-RAS Plan: PROP - Shear River: Sand Creek Reach: Reach 1-3 (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W. S. Elev (ft)	Crit W. S. (ft)	E. G. Elev (ft)	E. G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Shear LOB (lb/sq ft)	Shear Chan (lb/sq ft)	Shear ROB (lb/sq ft)	Shear Total (lb/sq ft)
Reach 1-3	5047	100-YR	1880.40	7042.80	7046.87	7046.72	7047.59	0.018391	7.40	292.14	151.86	0.80	1.64	3.04	0.52	2.20
Reach 1-3	5047	FIS	2600.00	7042.80	7047.20	7047.13	7048.18	0.022166	8.70	341.97	156.96	0.89	2.38	4.11	0.84	3.00
Reach 1-3	4948	5-YR	533.15	7041.66	7044.83		7045.11	0.010093	4.36	138.23	162.94	0.58	0.18	1.10	0.09	0.53
Reach 1-3	4948	100-YR	1880.40	7041.66	7046.26		7046.49	0.006084	4.75	578.76	339.84	0.47	0.60	1.20	0.48	0.64
Reach 1-3	4948	FIS	2600.00	7041.66	7046.64		7046.91	0.006423	5.23	709.10	342.87	0.49	0.77	1.42	0.66	0.83
Reach 1-3	4855	5-YR	533.15	7040.34	7044.13		7044.45	0.008687	4.54	122.99	100.22	0.60	0.10	0.93	0.15	0.66
Reach 1-3	4855	100-YR	1880.40	7040.34	7045.39	7045.29	7045.92	0.011040	6.76	421.14	326.27	0.69	0.88	2.04	0.53	0.89
Reach 1-3	4855	FIS	2600.00	7040.34	7045.75		7046.33	0.011347	7.32	541.59	329.78	0.70	1.12	2.35	0.80	1.16
Reach 1-3	4782	5-YR	533.15	7040.04	7043.59		7043.86	0.007174	4.19	141.44	137.41	0.54	0.14	0.83	0.05	0.46
Reach 1-3	4782	100-YR	1880.40	7040.04	7044.69	7044.57	7045.15	0.010364	6.42	448.51	334.43	0.66	0.82	1.90	0.54	0.86
Reach 1-3	4782	FIS	2600.00	7040.04	7045.05	7044.87	7045.55	0.010822	6.99	566.75	337.30	0.68	1.07	2.22	0.79	1.13
Reach 1-3	4714	5-YR	533.15	7039.78	7042.77		7043.16	0.015233	5.04	109.08	94.37	0.71	0.14	1.46	0.15	1.09
Reach 1-3	4714	100-YR	1880.40	7039.78	7043.90		7044.35	0.013749	6.46	432.84	330.19	0.69	0.79	2.28	0.83	1.12
Reach 1-3	4714	FIS	2600.00	7039.78	7044.41		7044.80	0.010539	6.26	600.03	334.07	0.62	0.92	2.08	0.96	1.18
Reach 1-3	4632	5-YR	533.15	7039.10	7042.01		7042.21	0.009113	3.97	176.05	198.73	0.58	0.08	0.81	0.41	0.50
Reach 1-3	4632	100-YR	1880.40	7039.10	7043.52		7043.71	0.005156	4.37	604.43	316.07	0.45	0.45	0.93	0.55	0.61
Reach 1-3	4632	FIS	2600.00	7039.10	7044.09		7044.29	0.004444	4.50	785.02	321.62	0.42	0.52	0.96	0.63	0.68
Reach 1-3	4582	5-YR	533.15	7038.10	7041.73		7041.87	0.004826	3.38	208.99	196.25	0.45	0.04	0.52	0.27	0.32
Reach 1-3	4582	100-YR	1880.40	7038.10	7043.32		7043.49	0.003796	4.17	640.90	298.93	0.40	0.34	0.78	0.47	0.51
Reach 1-3	4582	FIS	2600.00	7038.10	7043.90		7044.09	0.003496	4.39	817.94	304.85	0.39	0.43	0.84	0.56	0.58
Reach 1-3	4534	5-YR	533.15	7038.20	7041.55		7041.64	0.003897	2.84	248.74	226.04	0.36	0.06	0.46	0.24	0.27
Reach 1-3	4534	100-YR	1880.40	7038.20	7043.18		7043.32	0.002994	3.56	694.46	282.77	0.33	0.31	0.66	0.45	0.46
Reach 1-3	4534	FIS	2600.00	7038.20	7043.77		7043.93	0.002931	3.87	862.63	288.50	0.34	0.39	0.75	0.54	0.54
Reach 1-3	4296	5-YR	512.29	7036.56	7039.40	7039.40	7039.98	0.017573	7.46	106.45	91.61	0.91	0.54	2.25	1.11	1.27
Reach 1-3	4296	100-YR	1848.80	7036.56	7041.11	7041.11	7041.96	0.015516	9.95	309.42	170.17	0.90	0.79	3.60	2.06	1.75
Reach 1-3	4296	FIS	2600.00	7036.56	7041.60	7041.60	7042.57	0.016050	10.90	394.30	179.57	0.93	1.27	4.20	2.42	2.19
Reach 1-3	4084	5-YR	512.29	7033.29	7037.49	7034.23	7037.49	0.000039	0.62	834.01	266.74	0.06	0.00	0.01	0.00	0.01
Reach 1-3	4084	100-YR	1848.80	7033.29	7039.49	7035.10	7039.52	0.000096	1.32	1527.52	365.16	0.10	0.01	0.03	0.01	0.03
Reach 1-3	4084	FIS	2600.00	7033.29	7040.66	7035.43	7040.69	0.000091	1.45	1956.49	374.03	0.10	0.01	0.04	0.02	0.03
Reach 1-3	3846	5-YR	512.29	7033.20	7036.87	7036.87	7037.40	0.017706	5.86	87.35	166.03	1.01		1.17		1.17
Reach 1-3	3846	100-YR	1848.80	7033.20	7038.22	7038.22	7039.33	0.013956	8.45	218.78	233.23	1.01		1.91		1.91
Reach 1-3	3846	FIS	2600.00	7033.20	7039.80		7040.54	0.004486	6.89	377.33	317.58	0.63		1.06		1.06
Reach 1-3	3842	5-YR	512.29	7014.12	7014.94	7017.12	7035.26	0.129803	36.17	14.28	17.50	7.03	0.68	6.67	0.57	6.13
Reach 1-3	3842	100-YR	1848.80	7014.12	7033.28	7021.19	7033.74	0.000045	5.52	399.11	35.16	0.22	0.01	0.05	0.00	0.02
Reach 1-3	3842	FIS	2600.00	7014.12	7039.98		7040.47	0.000032	5.69	570.89	493.19	0.20	0.01	0.05	0.01	0.02
Reach 1-3	3816	5-YR	512.29	7014.12	7015.43	7017.95	7031.98	0.057072	32.64	15.80	12.18	5.03	0.31	4.66		3.85
Reach 1-3	3816	100-YR	1848.80	7014.12	7032.63	7023.13	7033.68	0.000107	8.27	245.34	14.52	0.34	0.01	0.12	0.00	0.03
Reach 1-3	3816	FIS	2600.00	7014.12	7039.28	7025.41	7040.40	0.000076	8.53	344.92	95.24	0.30	0.01	0.12	0.00	0.03
Reach 1-3	3744			Culvert												
Reach 1-3	3719	5-YR	512.29	7013.40	7015.26	7017.22	7023.46	0.017733	22.99	22.50	12.25	2.97	0.13	2.05		1.58
Reach 1-3	3719	100-YR	1848.80	7013.40	7019.05	7022.41	7030.53	0.005622	27.20	69.96	12.75	2.02	0.13	1.98	0.00	1.05
Reach 1-3	3719	FIS	2600.00	7013.40	7024.68	7024.68	7030.35	0.001107	19.13	143.82	13.49	1.00	0.05	0.78	0.00	0.29
Reach 1-3	3711	5-YR	512.29	7002.83	7004.08	7006.66	7022.22	0.066442	34.17	15.06	12.12	5.39	0.24	5.18		4.30
Reach 1-3	3711	100-YR	1848.80	7002.83	7021.33	7011.85	7022.39	0.000108	8.30	238.31	13.77	0.34	0.01	0.12	0.00	0.03
Reach 1-3	3711	FIS	2600.00	7002.83	7027.64	7014.13	7028.81	0.000080	8.69	327.20	14.38	0.31	0.01	0.12	0.00	0.03
Reach 1-3	3676			Culvert												
Reach 1-3	3667	5-YR	512.29	7002.61	7004.27	7006.44	7014.59	0.025959	25.77	20.00	12.16	3.53	0.12	2.68		2.11
Reach 1-3	3667	100-YR	1848.80	7002.61	7008.18	7011.61	7020.04	0.005929	27.64	68.28	12.53	2.07	0.10	2.06	0.00	1.09
Reach 1-3	3667	FIS	2600.00	7002.61	7013.91	7013.91	7019.58	0.001106	19.14	141.63	13.08	1.00	0.04	0.78	0.00	0.28
Reach 1-3	3662	5-YR	512.29	7001.15	7002.32	7003.93	7014.10	0.451689	27.53	18.61	22.17	5.30		23.37		23.37
Reach 1-3	3662	100-YR	1848.80	7001.15	7003.89	7007.04	7019.57	0.177607	31.76	58.20	63.20	3.73		22.93		22.93
Reach 1-3	3662	FIS	2600.00	7001.15	7005.03	7008.44	7018.76	0.092660	29.73	87.54	78.23	2.85	0.35	17.65	0.32	16.64
Reach 1-3	3629	5-YR	512.29	7001.51	7005.00	7003.02	7005.05	0.000825	1.93	265.09	463.34	0.20		0.15		0.15
Reach 1-3	3629	100-YR	1848.80	7001.51	7011.50	7004.41	7011.57	0.000215	2.16	856.79	631.19	0.12		0.13		0.13
Reach 1-3	3629	FIS	2600.00	7001.51	7012.47	7005.04	7012.48	0.000022	0.73	5019.20	640.28	0.04	0.01	0.01	0.01	0.01
Reach 1-3	3625	5-YR	512.29	7003.41	7005.00		7005.05	0.001316	2.25	425.11	463.76	0.32	0.07	0.13	0.06	0.08
Reach 1-3	3625	100-YR	1848.80	7003.41	7011.55		7011.55	0.000016	0.76	4303.02	631.62	0.05	0.01	0.01	0.01	0.01
Reach 1-3	3625	FIS	2600.00	7003.41	7012.47		7012.48	0.000022	0.93	4892.07	640.26	0.05	0.01	0.01	0.01	0.01
Reach 1-3	3618	5-YR	512.29	7002.58	7004.98		7005.04	0.001701	3.06	430.63	457.91	0.35	0.10	0.25	0.08	0.10
Reach 1-3	3618	100-YR	1848.80	7002.58	7011.55		7011.55	0.000020	0.82	4257.09	622.19	0.05	0.01	0.01	0.01	0.01
Reach 1-3	3618	FIS	2600.00	7002.58	7012.47		7012.48	0.000027	1.00	4837.77	630.95	0.06	0.01	0.02	0.01	0.01
Reach 1-3	3485	5-YR	512.29	7002.22	7004.78		7004.84	0.001575	3.07	426.89	433.07	0.34	0.09	0.24	0.08	0.10
Reach 1-3	3485	100-YR	1848.80	7002.22	7011.54		7011.55	0.000019	0.81	4323.96	620.53	0.05	0.01			

HEC-RAS Plan: PROP - Shear River: Sand Creek Reach: Reach 1-3 (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Shear LOB (lb/sq ft)	Shear Chan (lb/sq ft)	Shear ROB (lb/sq ft)	Shear Total (lb/sq ft)
Reach 1-3	2246	5-YR	398.70	6993.16	6995.47		6995.55	0.007248	2.73	189.89	233.72	0.48	0.10	0.45	0.33	0.37
Reach 1-3	2246	100-YR	1562.40	6993.16	6996.63		6996.80	0.006503	3.84	488.72	281.21	0.46	0.32	0.87	0.67	0.70
Reach 1-3	2246	FIS	2600.00	6993.16	6997.46		6997.67	0.005141	4.14	732.67	301.74	0.42	0.39	0.95	0.75	0.78
Reach 1-3	2181	5-YR	398.70	6992.99	6994.81		6994.94	0.015439	3.44	141.60	196.64	0.74		0.65	0.72	0.69
Reach 1-3	2181	100-YR	1562.40	6992.99	6996.23		6996.41	0.006454	3.78	463.03	253.91	0.46	0.26	0.84	0.72	0.73
Reach 1-3	2181	FIS	2600.00	6992.99	6997.16		6997.37	0.004687	4.02	713.14	280.52	0.41	0.32	0.88	0.73	0.74
Reach 1-3	2112	5-YR	398.70	6992.58	6994.25		6994.32	0.005522	2.49	189.38	165.50	0.35	0.37	0.54	0.35	0.39
Reach 1-3	2112	100-YR	1562.40	6992.58	6995.91		6996.05	0.003969	3.41	512.96	225.20	0.33	0.51	0.80	0.52	0.56
Reach 1-3	2112	FIS	2600.00	6992.58	6996.90		6997.09	0.003359	3.75	746.87	240.30	0.32	0.55	0.89	0.62	0.65
Reach 1-3	2046	5-YR	398.70	6991.97	6993.65		6993.90	0.006871	4.91	124.24	114.24	0.68	0.43	0.71	0.37	0.47
Reach 1-3	2046	100-YR	1562.40	6991.97	6995.33		6995.73	0.005230	6.81	362.33	166.62	0.66	0.72	1.08	0.59	0.71
Reach 1-3	2046	FIS	2600.00	6991.97	6996.32		6996.80	0.004637	7.64	542.14	194.56	0.65	0.83	1.24	0.69	0.81
Reach 1-3	1993	5-YR	398.70	6991.29	6993.36		6993.52	0.006017	4.61	140.92	106.59	0.62	0.19	0.63	0.50	0.49
Reach 1-3	1993	100-YR	1562.40	6991.29	6995.06		6995.42	0.005932	7.19	357.93	150.12	0.68	0.56	1.22	0.87	0.88
Reach 1-3	1993	FIS	2600.00	6991.29	6996.08		6996.53	0.005323	8.10	523.89	173.01	0.68	0.68	1.42	1.00	1.00
Reach 1-3	1929	5-YR	398.70	6991.32	6993.09		6993.24	0.003442	3.47	145.97	110.40	0.48	0.14	0.35	0.23	0.28
Reach 1-3	1929	100-YR	1562.40	6991.32	6994.68		6995.10	0.004151	5.99	343.88	137.27	0.59	0.37	0.84	0.57	0.65
Reach 1-3	1929	FIS	2600.00	6991.32	6995.64		6996.22	0.004246	7.19	481.96	152.80	0.62	0.50	1.11	0.74	0.83
Reach 1-3	1884	5-YR	398.70	6991.07	6992.68		6992.97	0.010106	5.71	113.55	101.92	0.81	0.75	0.98	0.60	0.70
Reach 1-3	1884	100-YR	1562.40	6991.07	6994.13		6994.79	0.010382	8.98	275.84	122.31	0.92	1.34	1.94	1.37	1.46
Reach 1-3	1884	FIS	2600.00	6991.07	6995.02		6995.90	0.009870	10.42	390.70	134.25	0.93	1.61	2.39	1.70	1.79
Reach 1-3	1834	5-YR	398.70	6990.69	6992.33		6992.57	0.006123	4.23	117.76	111.41	0.62	0.20	0.55	0.26	0.40
Reach 1-3	1834	100-YR	1562.40	6990.69	6993.55		6994.30	0.009141	7.78	261.45	126.55	0.84	0.64	1.51	0.98	1.17
Reach 1-3	1834	FIS	2600.00	6990.69	6994.25	6994.12	6995.38	0.010347	9.68	354.19	136.06	0.93	0.95	2.17	1.46	1.67
Reach 1-3	1804	5-YR	398.70	6990.58	6992.05		6992.33	0.009181	5.18	109.93	112.32	0.76	0.42	0.82	0.47	0.56
Reach 1-3	1804	100-YR	1562.40	6990.58	6993.19	6993.08	6993.96	0.012176	8.81	246.28	127.37	0.97	1.10	1.96	1.41	1.47
Reach 1-3	1804	FIS	2600.00	6990.58	6993.97	6993.81	6994.99	0.011343	10.15	350.67	137.38	0.98	1.36	2.38	1.79	1.80
Reach 1-3	1707	5-YR	480.40	6989.35	6990.79	6990.79	6991.28	0.012597	6.15	94.90	100.66	0.96	0.56	1.01	0.47	0.74
Reach 1-3	1707	100-YR	1585.20	6989.35	6992.01	6992.01	6992.90	0.010246	8.68	237.51	133.63	0.97	0.93	1.60	0.85	1.14
Reach 1-3	1707	FIS	2600.00	6989.35	6992.61	6992.61	6993.89	0.011525	10.61	320.97	145.48	1.06	1.14	2.23	1.33	1.58
Reach 1-3	1663	5-YR	480.40	6987.76	6988.60	6989.10	6990.07	0.064971	10.05	52.00	77.73	2.00	1.56	3.17	1.41	2.71
Reach 1-3	1663	100-YR	1585.20	6987.76	6989.54	6990.26	6991.90	0.040217	13.37	144.14	118.24	1.80	1.90	4.32	2.06	3.06
Reach 1-3	1663	FIS	2600.00	6987.76	6990.14	6990.99	6992.88	0.032855	14.78	220.18	132.07	1.71	2.44	4.78	2.30	3.41
Reach 1-3	1622	5-YR	480.40	6986.76	6987.79	6987.86	6988.24	0.024467	5.39	89.16	139.48	1.19		0.98		0.98
Reach 1-3	1622	100-YR	1585.20	6986.76	6988.21	6988.71	6989.90	0.049243	10.41	152.82	154.72	1.82	0.44	3.12	0.32	3.03
Reach 1-3	1622	FIS	2600.00	6986.76	6988.52	6989.31	6991.17	0.054804	13.08	200.87	160.24	2.01	1.01	4.52	0.86	4.28
Reach 1-3	1411	5-YR	480.40	6982.00	6983.34	6983.37	6983.78	0.018379	5.34	90.34	119.39	1.06	0.18	0.90	0.09	0.87
Reach 1-3	1411	100-YR	1585.20	6982.00	6984.33	6984.35	6985.19	0.012411	7.56	219.52	139.83	1.00	0.56	1.37	0.49	1.21
Reach 1-3	1411	FIS	2600.00	6982.00	6990.04	6985.00	6990.11	0.000175	2.35	1397.28	286.43	0.15	0.03	0.08	0.04	0.05

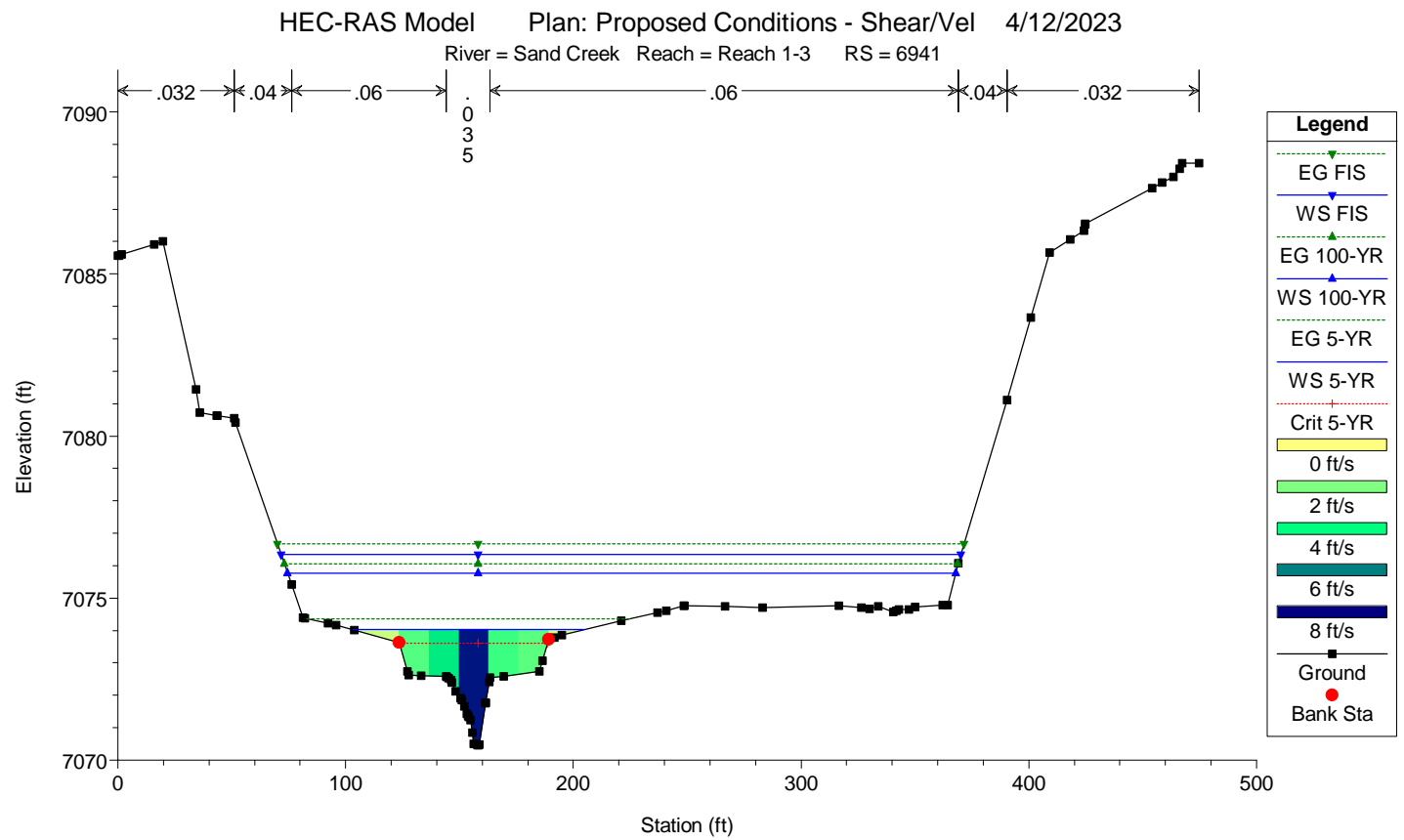
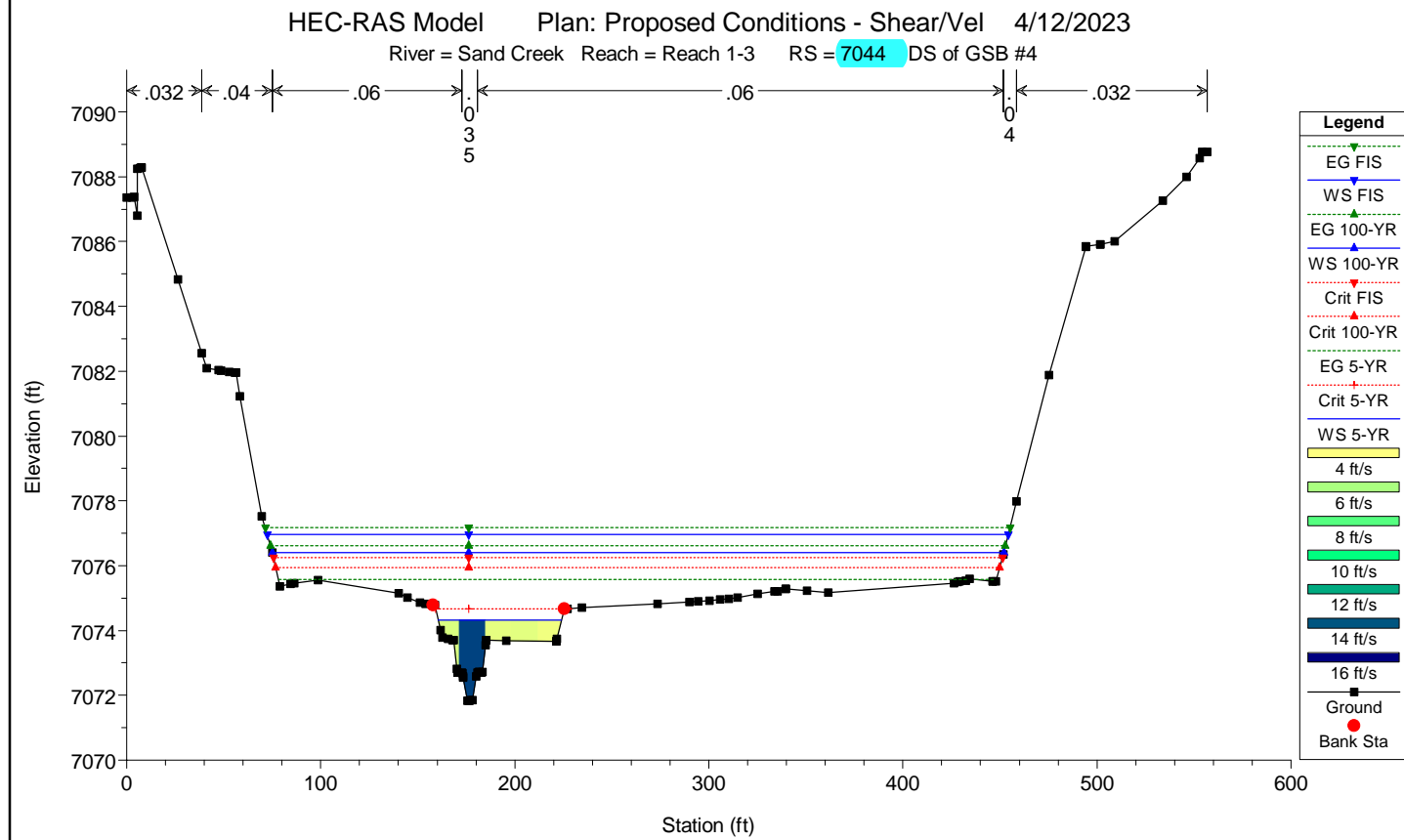
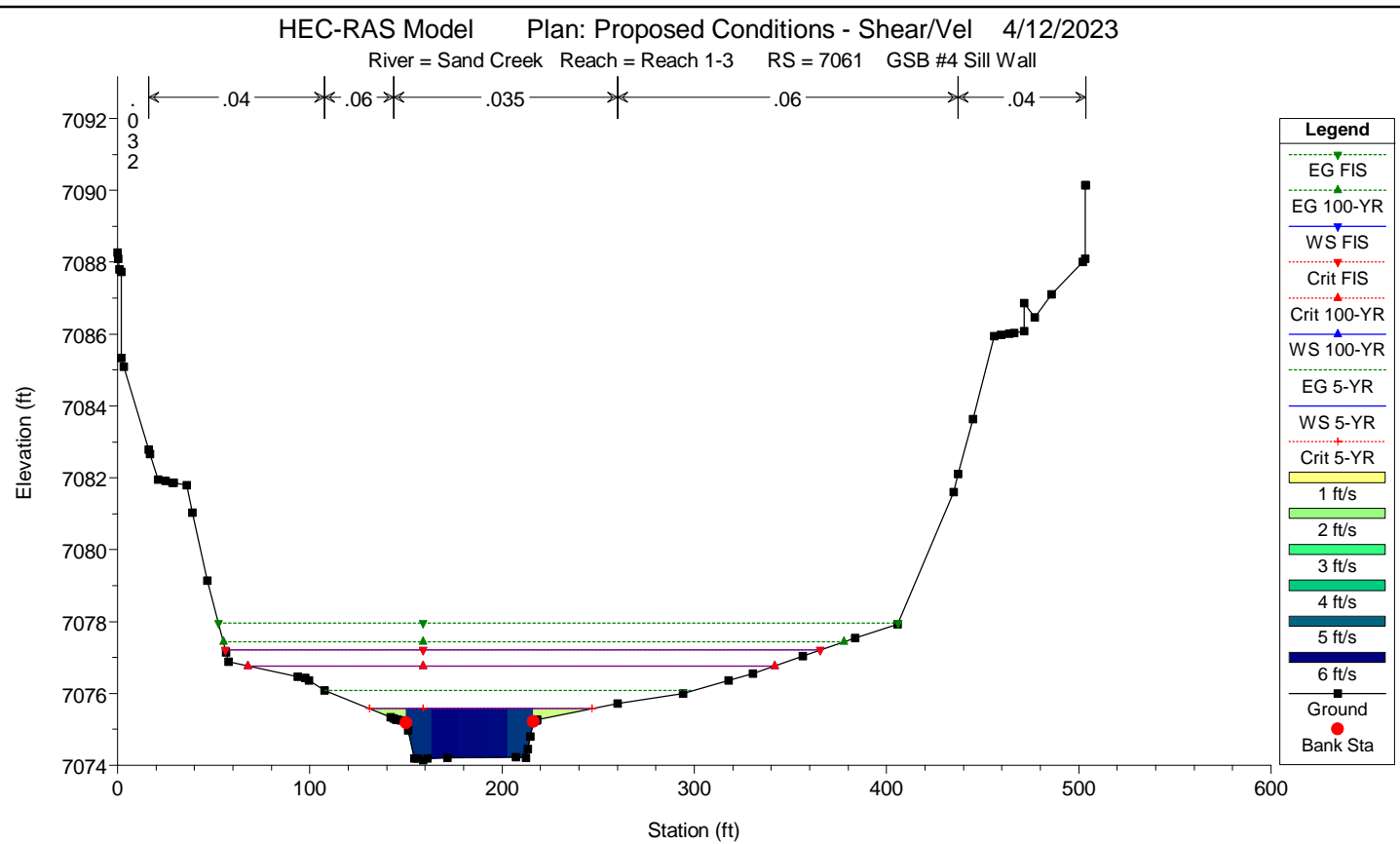
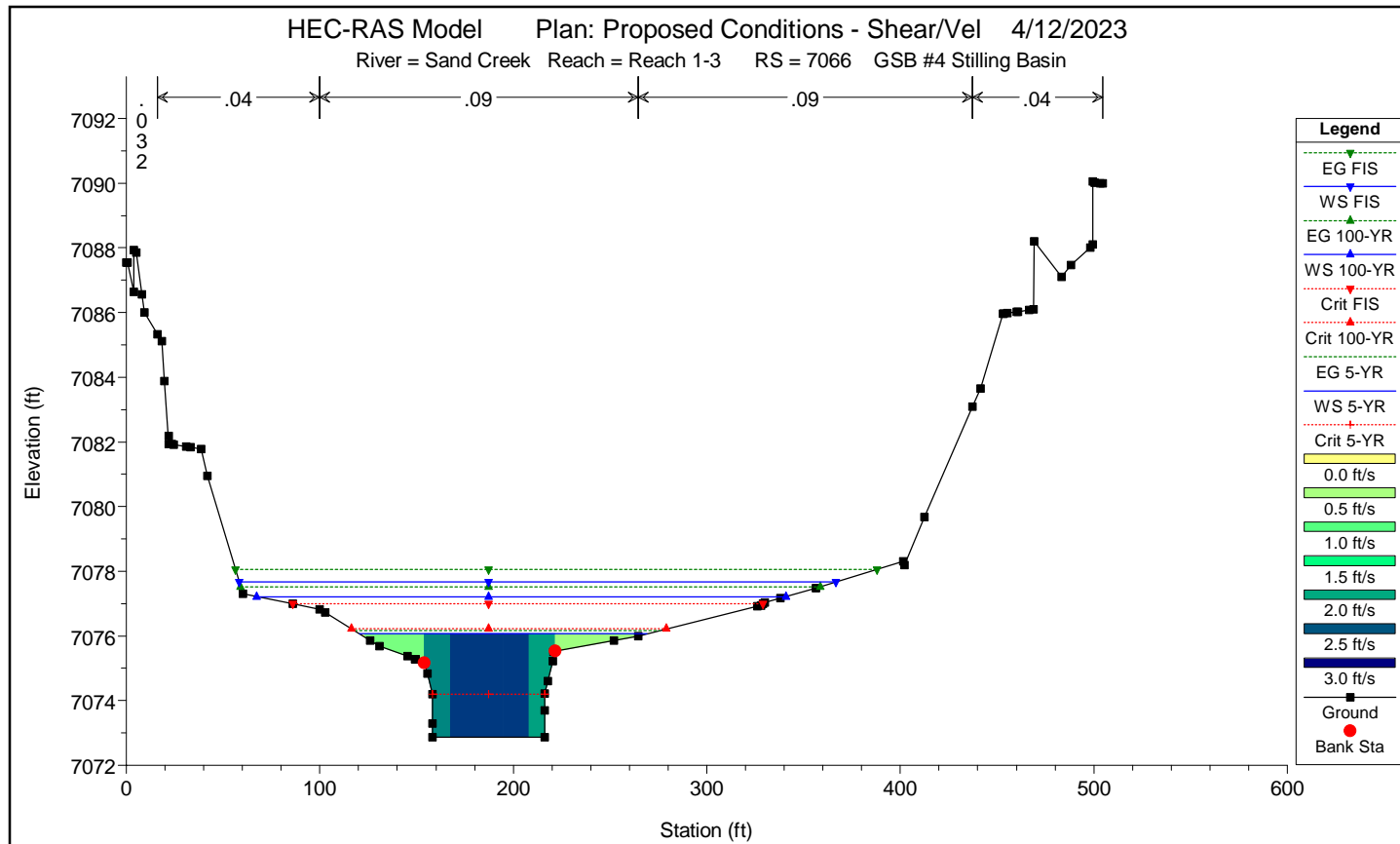
HEC-RAS Plan: PROP - Shear River: Sand Creek Reach: Reach 1-3 (Continued)

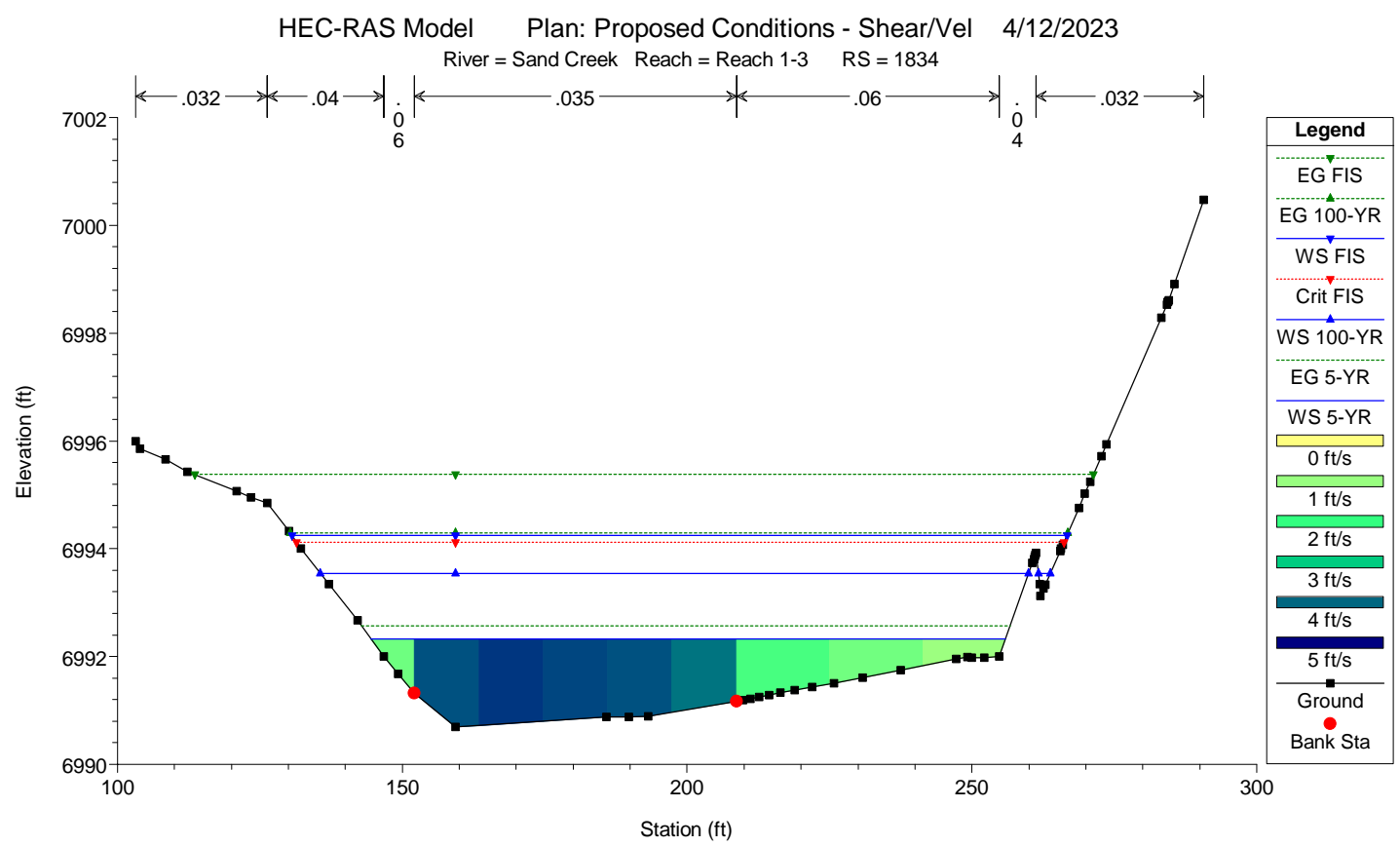
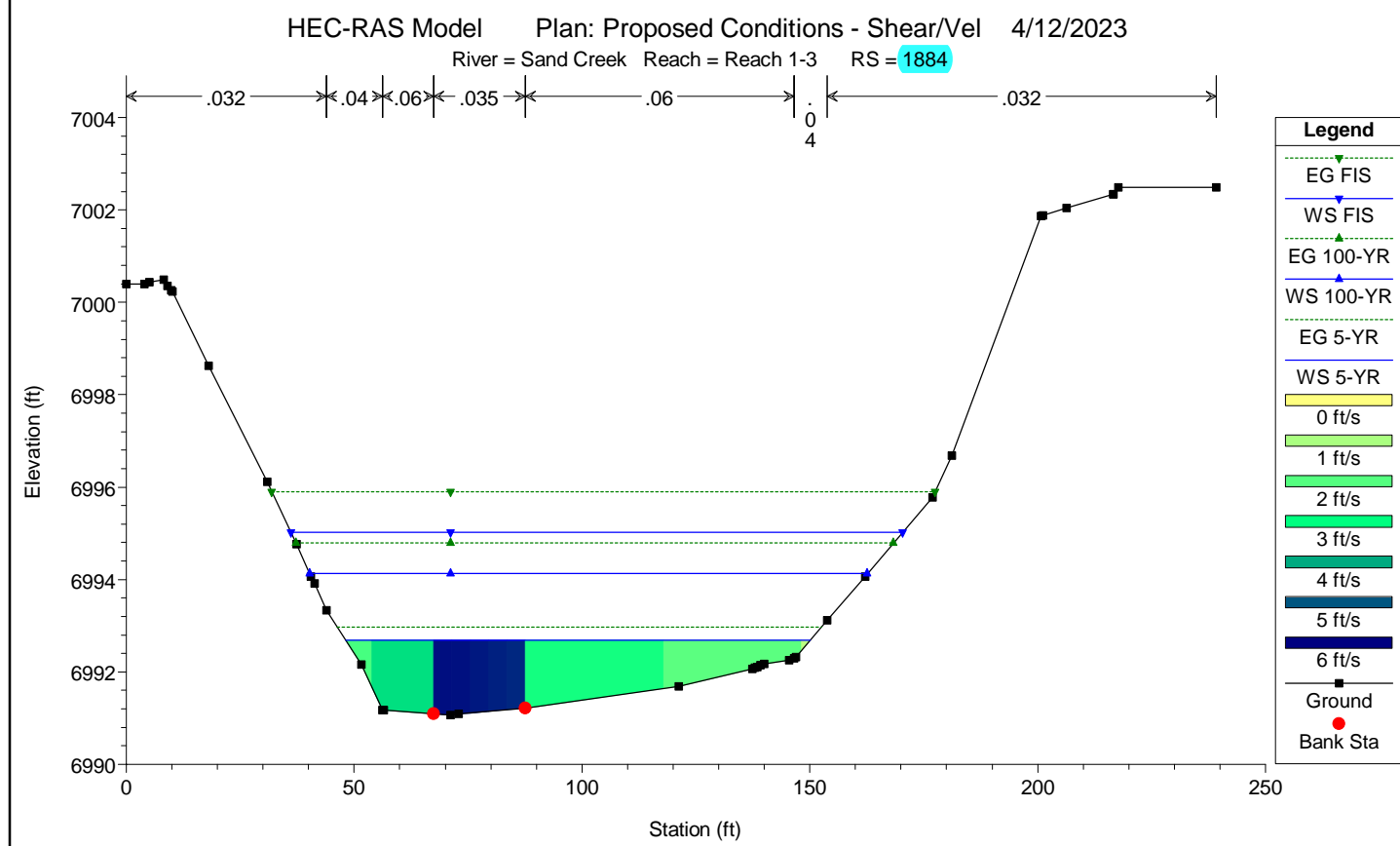
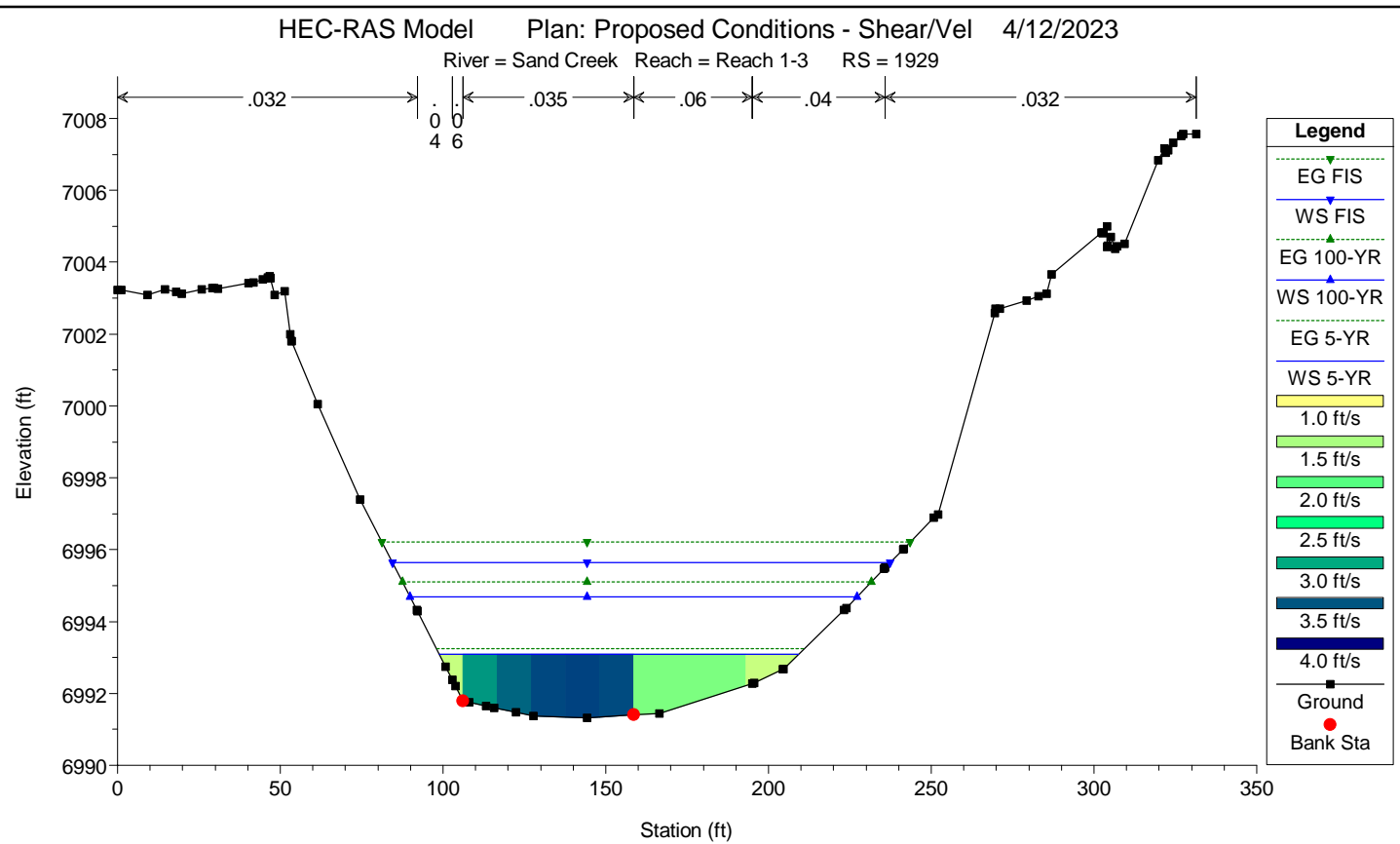
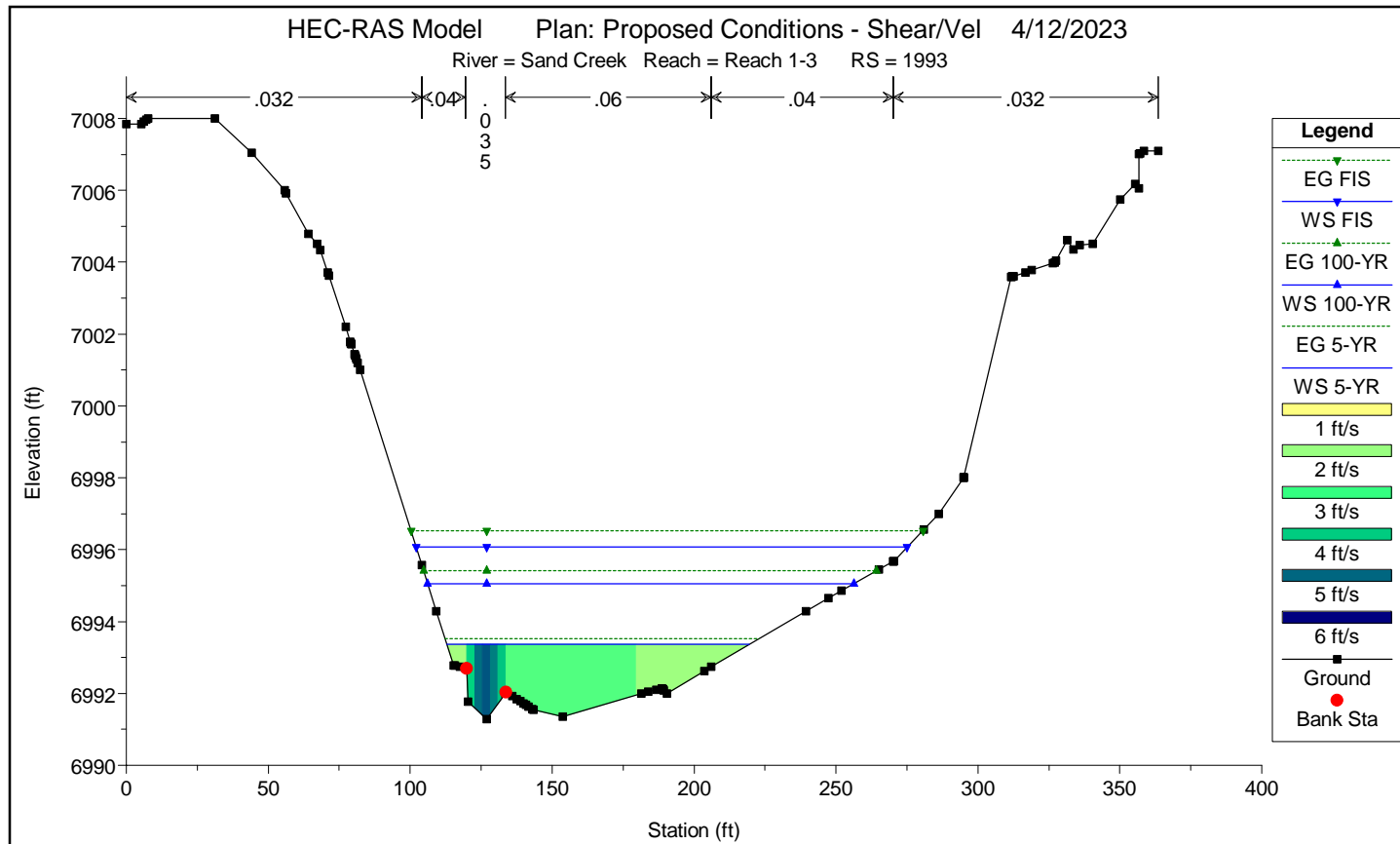
Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W. S. Elev (ft)	Crit W. S. (ft)	E.G. Elev (ft)	E. G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Shear LOB (lb/sq ft)	Shear Chan (lb/sq ft)	Shear ROB (lb/sq ft)	Shear Total (lb/sq ft)
Reach 1-3	7534	5-YR	512.38	7085.85	7088.93		7089.15	0.014175	3.76	136.48	184.38	0.75	0.03	0.69	0.04	0.65
Reach 1-3	7534	100-YR	1763.93	7085.85	7090.02		7090.41	0.013491	5.12	362.02	214.80	0.66	0.47	1.56	0.80	1.41
Reach 1-3	7534	FIS	2600.00	7085.85	7090.50		7091.01	0.013776	5.85	467.43	219.56	0.67	0.69	2.01	1.16	1.82
Reach 1-3	7485	5-YR	512.38	7085.30	7088.30		7088.55	0.010959	4.37	157.25	205.91	0.61	0.25	1.06	0.31	0.52
Reach 1-3	7485	100-YR	1763.93	7085.30	7089.32		7089.76	0.013244	6.28	374.94	218.10	0.69	1.09	2.12	1.16	1.41
Reach 1-3	7485	FIS	2600.00	7085.30	7089.83		7090.36	0.013173	6.95	487.29	224.23	0.69	1.45	2.53	1.52	1.78
Reach 1-3	7455	5-YR	512.38	7085.01	7088.15		7088.32	0.004929	3.68	185.15	232.10	0.49	0.17	0.54	0.18	0.27
Reach 1-3	7455	100-YR	1763.93	7085.01	7089.00		7089.46	0.008375	6.14	367.76	251.31	0.67	0.70	1.35	0.69	0.87
Reach 1-3	7455	FIS	2600.00	7085.01	7089.34		7090.01	0.010264	7.36	445.18	259.08	0.76	1.05	1.87	1.04	1.25
Reach 1-3	7445	5-YR	512.38	7085.12	7087.88	7087.88	7088.20	0.029482	4.89	135.27	239.63	0.69	0.65	2.86	0.46	1.18
Reach 1-3	7445	100-YR	1763.93	7085.12	7088.67	7088.67	7089.28	0.038885	7.37	308.27	259.65	0.85	2.63	5.67	2.40	3.31
Reach 1-3	7445	FIS	2600.00	7085.12	7089.03	7089.03	7089.81	0.040836	8.32	392.06	268.88	0.89	3.57	6.88	3.33	4.29
Reach 1-3	7430	5-YR	512.38	7081.82	7083.68	7084.44	7086.72	0.695591	13.99	36.63	51.63	2.93		30.50		30.50
Reach 1-3	7430	100-YR	1763.93	7081.82	7085.07	7085.91	7087.99	0.179042	14.18	138.78	121.87	1.76	8.57	22.18	2.05	12.65
Reach 1-3	7430	FIS	2600.00	7081.82	7085.60	7086.65	7088.58	0.143870	14.87	208.91	140.43	1.65	9.72	22.55	5.56	13.29
Reach 1-3	7422	5-YR	512.38	7080.12	7082.05	7082.68	7084.27	0.138369	11.96	42.85	52.69	2.34		6.95		6.95
Reach 1-3	7422	100-YR	1763.93	7080.12	7083.25	7084.41	7086.98	0.075843	15.66	117.29	75.48	1.99	2.00	8.97	1.73	7.29
Reach 1-3	7422	FIS	2600.00	7080.12	7083.89	7085.12	7087.78	0.056082	16.34	177.08	105.29	1.80	2.65	8.86	1.92	5.84
Reach 1-3	7409	5-YR	512.38	7080.12	7083.50	7081.64	7083.61	0.001246	2.71	212.24	112.44	0.27	0.05	0.23	0.05	0.14
Reach 1-3	7409	100-YR	1763.93	7080.12	7082.45	7083.68	7086.05	0.067594	15.23	115.80	55.81	1.86		8.36		8.36
Reach 1-3	7409	FIS	2600.00	7080.12	7083.15	7084.49	7087.10	0.051945	16.19	174.09	104.34	1.71	1.21	8.57	1.28	5.27
Reach 1-3	7406	5-YR	512.38	7081.53	7083.06	7083.06	7083.56	0.033673	5.84	97.36	104.85	0.85	0.56	3.06	0.73	1.95
Reach 1-3	7406	100-YR	1763.93	7081.53	7084.22	7084.41	7085.19	0.034244	8.70	243.17	173.02	0.95	1.31	5.59	2.58	3.00
Reach 1-3	7406	FIS	2600.00	7081.53	7084.18	7084.91	7086.40	0.079828	13.15	236.47	169.98	1.44	2.96	12.84	5.88	6.92
Reach 1-3	7351	5-YR	512.38	7079.22	7082.24		7082.51	0.010699	4.36	139.79	138.31	0.59	0.19	1.10	0.34	0.67
Reach 1-3	7351	100-YR	1763.93	7079.22	7083.34	7083.23	7083.94	0.015670	7.08	343.17	240.45	0.75	0.65	2.74	1.14	1.42
Reach 1-3	7351	FIS	2600.00	7079.22	7083.79	7083.71	7084.49	0.016806	7.94	459.15	267.29	0.78	0.96	3.34	1.62	1.80
Reach 1-3	7279	5-YR	512.38	7078.10	7081.41		7081.67	0.012541	4.38	143.09	166.36	0.61	0.08	1.22	0.39	0.67
Reach 1-3	7279	100-YR	1763.93	7078.10	7082.59		7082.93	0.010907	5.70	440.59	292.60	0.60	0.66	1.86	0.87	1.02
Reach 1-3	7279	FIS	2600.00	7078.10	7083.05		7083.45	0.010862	6.26	576.74	296.89	0.61	0.94	2.16	1.16	1.31
Reach 1-3	7213	5-YR	512.38	7077.30	7080.96		7081.15	0.005269	3.75	181.06	204.61	0.49	0.09	0.59	0.17	0.29
Reach 1-3	7213	100-YR	1763.93	7077.30	7082.07		7082.39	0.006921	5.50	489.44	308.65	0.57	0.45	1.25	0.59	0.68
Reach 1-3	7213	FIS	2600.00	7077.30	7082.49		7082.88	0.007815	6.30	618.38	312.68	0.61	0.69	1.61	0.85	0.96
Reach 1-3	7167	5-YR	512.38	7077.47	7080.66		7080.86	0.007315	3.78	172.36	216.88	0.49	0.14	0.83	0.16	0.36
Reach 1-3	7167	100-YR	1763.93	7077.47	7081.55		7081.96	0.012378	6.15	424.34	324.35	0.66	0.84	2.09	0.66	1.01
Reach 1-3	7167	FIS	2600.00	7077.47	7081.98		7082.43	0.012256	6.68	563.79	328.35	0.66	1.13	2.39	0.97	1.31
Reach 1-3	7102	5-YR	512.38	7076.78	7079.61	7079.54	7080.06	0.023497	5.48	109.57	167.22	0.83	0.38	1.98		1.13
Reach 1-3	7102	100-YR	1763.93	7076.78	7080.59	7080.59	7081.10	0.015620	6.76	371.75	328.79	0.78	1.06	2.26	0.65	1.10
Reach 1-3	7102	FIS	2600.00	7076.78	7080.86	7080.86	7081.54	0.017429	7.76	461.73	331.71	0.85	1.46	2.81	1.01	1.51
Reach 1-3	7093	5-YR	512.38	7076.86	7079.48	7079.48	7079.70	0.040238	4.11	154.76	305.84	0.61	0.69	3.47	0.64	1.27
Reach 1-3	7093	100-YR	1763.93	7076.86	7079.74	7080.02	7080.72	0.144097	8.70	235.74	322.35	1.19	4.21	14.72	4.67	6.56
Reach 1-3	7093	FIS	2600.00	7076.86	7079.98	7080.30	7081.14	0.129189	9.00	312.65	329.68	1.15	5.41	15.07	5.95	7.63
Reach 1-3	7073	5-YR	512.38	7072.92	7074.63	7075.25	7075.05	0.995374	12.50	41.00	61.59	2.70		41.06		41.06
Reach 1-3	7073	100-YR	1763.93	7072.92	7076.42	7076.91	7077.96	0.126848	10.22	191.74	137.24	1.18	4.81	18.15	2.44	11.00
Reach 1-3	7073	FIS	2600.00	7072.92	7076.96	7077.68	7078.67	0.113894	11.14	274.25	167.12	1.16	6.28	20.11	4.77	11.61
Reach 1-3	7066	5-YR	512.38	7072.86	7076.07	7074.20	7076.16	0.005663	2.48	228.37	148.68	0.26	0.18	1.00	0.10	0.53
Reach 1-3	7066	100-YR	1763.93	7072.86	7077.22	7076.22	7077.52	0.014342	4.92	464.22	273.65	0.43	0.80	3.52	0.83	1.50
Reach 1-3	7066	FIS	2600.00	7072.86	7077.67	7076.99	7078.06	0.017164	5.77	597.00	308.37	0.48	1.34	4.67	1.26	2.06
Reach 1-3	7061	5-YR	512.38	7074.14	7075.57	7075.57	7076.08	0.012979	5.77	95.39	115.56	0.89	0.16	1.06	0.14	0.67
Reach 1-3	7061	100-YR	1763.93	7074.14	7076.77	7076.77	7077.43	0.009219	7.50	330.83	274.11	0.84	0.41	1.44	0.49	0.69
Reach 1-3	7061	FIS	2600.00	7074.14	7077.21	7077.21	7077.96	0.009236	8.35	460.12	309.39	0.86	0.61	1.69	0.64	0.86
Reach 1-3	7044	5-YR	512.38	7071.83	7074.31	7074.67	7075.57	0.067823	9.00	56.92	63.50	1.68		3.74		3.74
Reach 1-3	7044	100-YR	1763.93	7071.83	7076.40	7075.95	7076.61	0.006258	4.62	576.03	376.82	0.48	0.42	1.12	0.50	0.60
Reach 1-3	7044	FIS	2600.00	7071.83	7076.96	7076.25	7077.18	0.005422	4.77	787.36	381.83	0.45	0.54	1.16	0.61	0.70
Reach 1-3	6941	5-YR	512.38	7070.47	7074.02	7073.61	7074.37	0.009299	4.74	113.43	101.64	0.65	0.12	0.93	0.08	0.64
Reach 1-3	6941	100-YR	1763.93	7070.47	7075.77		7076.06	0.005179	5.18	511.69	293.36	0.50	0.51	1.08	0.38	0.56
Reach 1-3	6941	FIS	2600.00	7070.47	7076.34		7076.67	0.005176	5.67	679.95	298.34	0.50	0.66	1.26	0.56	0.73
Reach 1-3	6868	5-YR	512.38	7069.50	7073.14		7073.58	0.012344	5.35	96.45	70.32	0.78	0.13	1.11		1.04
Reach 1-3	6868	100-YR	1763.93	7069.50	7074.74	7074.74	7075.49	0.011840	7.49	320.61	238.94	0.76	0.85	2.22	0.46	0.99
Reach 1-3	6868	FIS	2600.00	7069.50	7075.26	7075.21	7076.10	0.012147	8.30	446.34	243.17	0.77	1.16	2.67	0.86	1.38
Reach 1-3	6769	5-YR	512.38	7068.73	7072.13		7072.47	0.009672	4.68	118.99	119.46	0.64	0.11	0.98	0.14	0.60
Reach 1-3	6769	100-YR	1763.93	7068.73	7073.53	7073.21	7074.13	0.011292	6.87	328.26	167.72	0.69	0.90	2.12	0.88	1.37
Reach 1-3	6769	FIS	2600.00	7068.73	7074.14		7074.89	0.011904	7.83	437.81	191.70	0.72	1.31	2.69	1.08	1.69
Reach 1-3	6673	5-YR	512.38	7067.90	7071.19		7071.49	0.010309	4.44	121.66	160.38	0.60	0.17	1.08	0.10	0.75
Reach 1-3	6673	100-YR	1763.93	7067.90	7072.85	7072.19	7073.19	0.007137	5.36	420.22	195.21	0.52	0.73	1.48	0.66	0.95
Reach 1-3	6673	FIS	2600.00	7067.90	7073.45		7073.88	0.007520	6.07	539.48	200.58	0.54	0.98	1.83	0.95	1.25
Reach 1-3	6588	5-YR	512.38	7067.13	7070.15		7070.50	0.013207	4.77	113.70	101.07	0.66	0.21	1.31	0.13	0.92
Reach 1-3	6588	100-YR	1763.93	7067.13	7071.36	7071.31	7072.23	0.019877	7.98	265.84	156.21	0.84	1.58	3.46	0.88	2.10
Reach 1-3	6588															

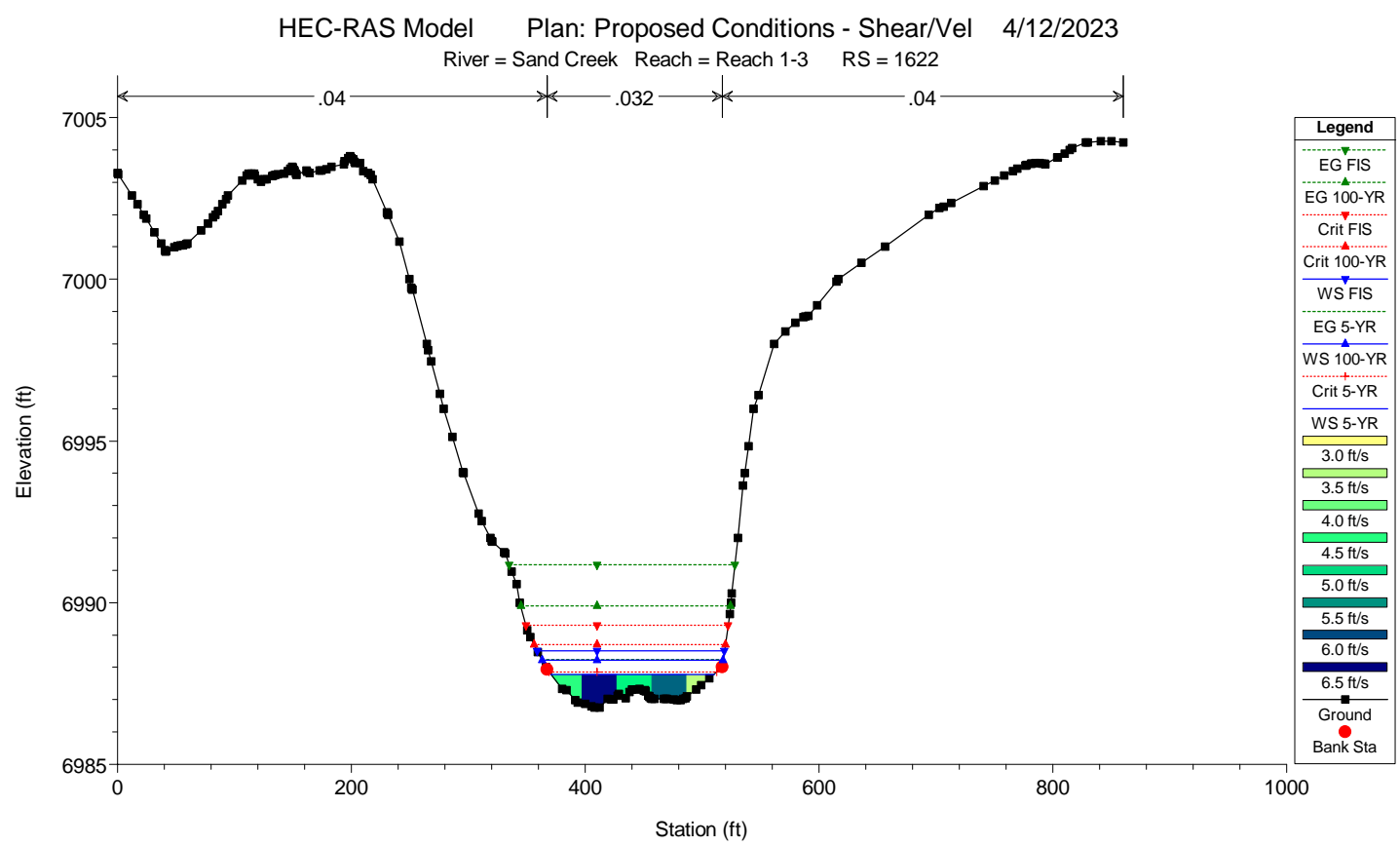
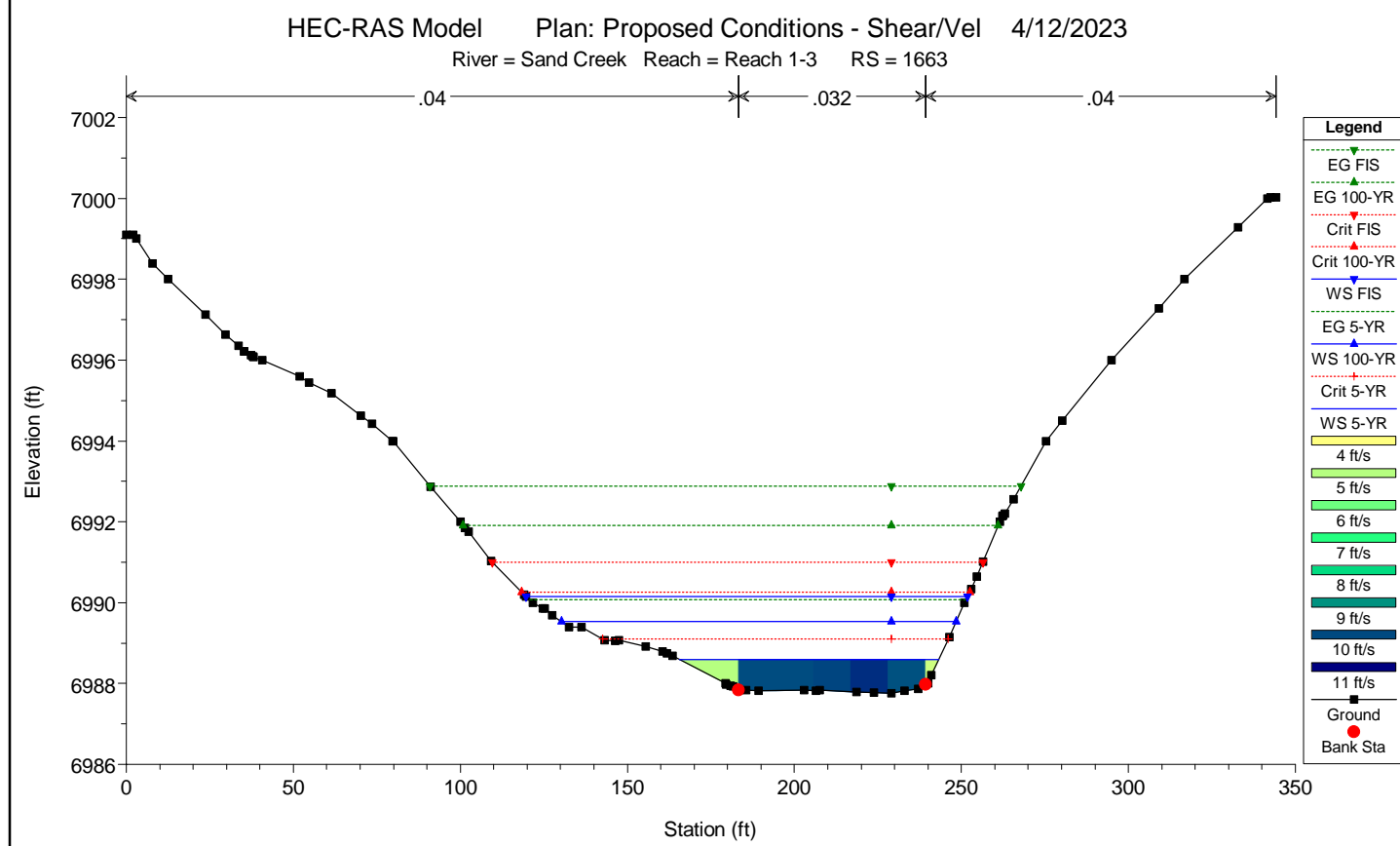
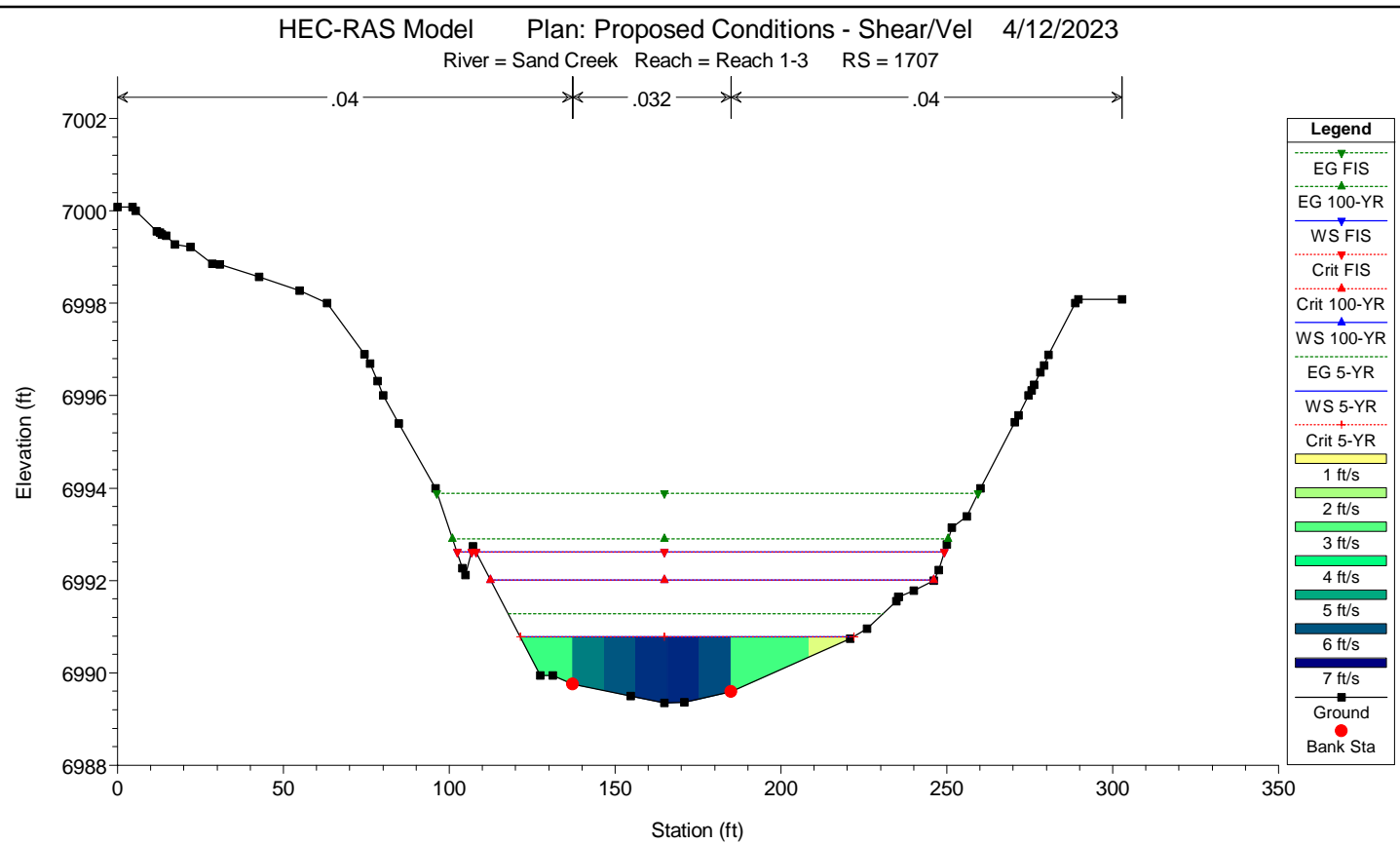
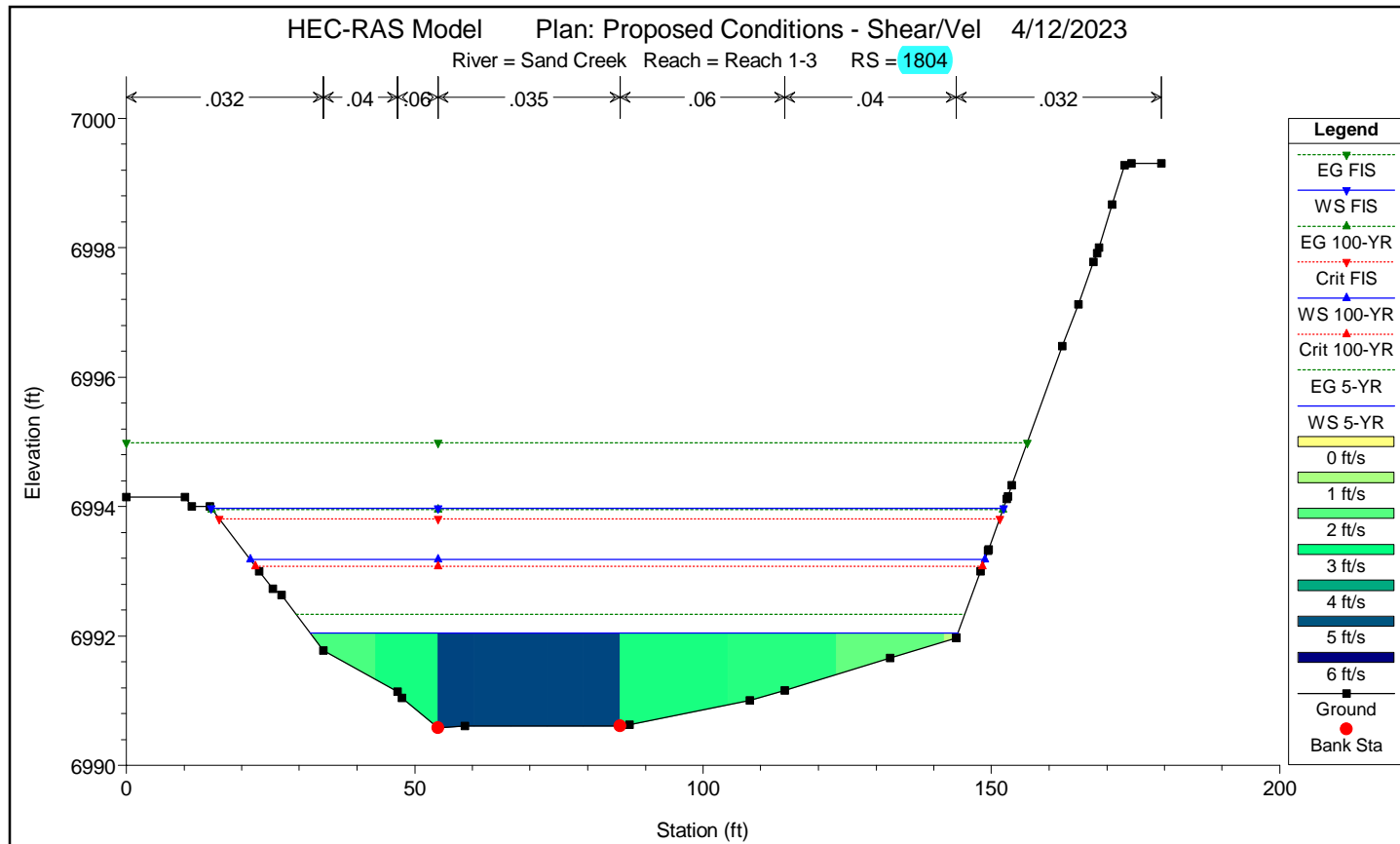
HEC-RAS Plan: PROP - Shear River: Sand Creek Reach: Reach 1-3 (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Shear LOB (lb/sq ft)	Shear Chan (lb/sq ft)	Shear ROB (lb/sq ft)	Shear Total (lb/sq ft)
Reach 1-3	2246	5-YR	398.70	6993.16	6995.47		6995.55	0.007248	2.73	189.89	233.72	0.48	0.10	0.45	0.33	0.37
Reach 1-3	2246	100-YR	1562.40	6993.16	6996.63		6996.80	0.006503	3.84	488.72	281.21	0.46	0.32	0.87	0.67	0.70
Reach 1-3	2246	FIS	2600.00	6993.16	6997.46		6997.67	0.005141	4.14	732.67	301.74	0.42	0.39	0.95	0.75	0.78
Reach 1-3	2181	5-YR	398.70	6992.99	6994.81		6994.94	0.015439	3.44	141.60	196.64	0.74		0.65	0.72	0.69
Reach 1-3	2181	100-YR	1562.40	6992.99	6996.23		6996.41	0.006454	3.78	463.03	253.91	0.46	0.26	0.84	0.72	0.73
Reach 1-3	2181	FIS	2600.00	6992.99	6997.16		6997.37	0.004687	4.02	713.14	280.52	0.41	0.32	0.88	0.73	0.74
Reach 1-3	2112	5-YR	398.70	6992.58	6994.25		6994.32	0.005522	2.49	189.38	165.50	0.35	0.37	0.54	0.35	0.39
Reach 1-3	2112	100-YR	1562.40	6992.58	6995.91		6996.05	0.003969	3.41	512.96	225.20	0.33	0.51	0.80	0.52	0.56
Reach 1-3	2112	FIS	2600.00	6992.58	6996.90		6997.09	0.003359	3.75	746.87	240.30	0.32	0.55	0.89	0.62	0.65
Reach 1-3	2046	5-YR	398.70	6991.97	6993.65		6993.90	0.006971	4.91	124.24	114.24	0.68	0.43	0.71	0.37	0.47
Reach 1-3	2046	100-YR	1562.40	6991.97	6995.33		6995.73	0.005230	6.81	362.33	166.62	0.66	0.72	1.08	0.59	0.71
Reach 1-3	2046	FIS	2600.00	6991.97	6996.32		6996.80	0.004637	7.64	542.14	194.56	0.65	0.83	1.24	0.69	0.81
Reach 1-3	1993	5-YR	398.70	6991.29	6993.36		6993.52	0.006017	4.61	140.92	106.59	0.62	0.19	0.63	0.50	0.49
Reach 1-3	1993	100-YR	1562.40	6991.29	6995.06		6995.42	0.005932	7.19	357.93	150.12	0.68	0.56	1.22	0.87	0.88
Reach 1-3	1993	FIS	2600.00	6991.29	6996.08		6996.53	0.005323	8.10	523.89	173.01	0.68	0.68	1.42	1.00	1.00
Reach 1-3	1929	5-YR	398.70	6991.32	6993.09		6993.24	0.003442	3.47	145.97	110.40	0.48	0.14	0.35	0.23	0.28
Reach 1-3	1929	100-YR	1562.40	6991.32	6994.68		6995.10	0.004151	5.99	343.88	137.27	0.59	0.37	0.84	0.57	0.65
Reach 1-3	1929	FIS	2600.00	6991.32	6995.64		6996.22	0.004246	7.19	481.96	152.80	0.62	0.50	1.11	0.74	0.83
Reach 1-3	1884	5-YR	398.70	6991.07	6992.68		6992.97	0.010106	5.71	113.55	101.92	0.81	0.75	0.98	0.60	0.70
Reach 1-3	1884	100-YR	1562.40	6991.07	6994.13		6994.79	0.010382	8.98	275.84	122.31	0.92	1.34	1.94	1.37	1.46
Reach 1-3	1884	FIS	2600.00	6991.07	6995.02		6995.90	0.009870	10.42	390.70	134.25	0.93	1.61	2.39	1.70	1.79
Reach 1-3	1834	5-YR	398.70	6990.69	6992.33		6992.57	0.006123	4.23	117.76	111.41	0.62	0.20	0.55	0.26	0.40
Reach 1-3	1834	100-YR	1562.40	6990.69	6993.55		6994.30	0.009141	7.78	261.45	126.55	0.84	0.64	1.51	0.98	1.17
Reach 1-3	1834	FIS	2600.00	6990.69	6994.25	6994.12	6995.38	0.010347	9.68	354.19	136.06	0.93	0.95	2.17	1.46	1.67
Reach 1-3	1804	5-YR	398.70	6990.58	6992.05		6992.33	0.009181	5.18	109.93	112.32	0.76	0.42	0.82	0.47	0.56
Reach 1-3	1804	100-YR	1562.40	6990.58	6993.19	6993.08	6993.96	0.012176	8.81	246.28	127.37	0.97	1.10	1.96	1.41	1.47
Reach 1-3	1804	FIS	2600.00	6990.58	6993.97	6993.81	6994.99	0.011343	10.15	350.67	137.38	0.98	1.36	2.38	1.79	1.80
Reach 1-3	1707	5-YR	480.40	6989.35	6990.79	6990.79	6991.28	0.012597	6.15	94.90	100.66	0.96	0.56	1.01	0.47	0.74
Reach 1-3	1707	100-YR	1585.20	6989.35	6992.01	6992.01	6992.90	0.010246	8.68	237.51	133.63	0.97	0.93	1.60	0.85	1.14
Reach 1-3	1707	FIS	2600.00	6989.35	6992.61	6992.61	6993.89	0.011525	10.61	320.97	145.48	1.06	1.14	2.23	1.33	1.58
Reach 1-3	1663	5-YR	480.40	6987.76	6988.60	6989.10	6990.07	0.064971	10.05	52.00	77.73	2.00	1.56	3.17	1.41	2.71
Reach 1-3	1663	100-YR	1585.20	6987.76	6989.54	6990.26	6991.90	0.040217	13.37	144.14	118.24	1.80	1.90	4.32	2.06	3.06
Reach 1-3	1663	FIS	2600.00	6987.76	6990.14	6990.99	6992.88	0.032855	14.78	220.18	132.07	1.71	2.44	4.78	2.30	3.41
Reach 1-3	1622	5-YR	480.40	6986.76	6987.79	6987.86	6988.24	0.024467	5.39	89.16	139.48	1.19		0.98		0.98
Reach 1-3	1622	100-YR	1585.20	6986.76	6988.21	6988.71	6989.90	0.049243	10.41	152.82	154.72	1.82	0.44	3.12	0.32	3.03
Reach 1-3	1622	FIS	2600.00	6986.76	6988.52	6989.31	6991.17	0.054804	13.08	200.87	160.24	2.01	1.01	4.52	0.86	4.28
Reach 1-3	1411	5-YR	480.40	6982.00	6983.34	6983.37	6983.78	0.018379	5.34	90.34	119.39	1.06	0.18	0.90	0.09	0.87
Reach 1-3	1411	100-YR	1585.20	6982.00	6984.33	6984.35	6985.19	0.012411	7.56	219.52	139.83	1.00	0.56	1.37	0.49	1.21
Reach 1-3	1411	FIS	2600.00	6982.00	6990.04	6985.00	6990.11	0.000175	2.35	1397.28	286.43	0.15	0.03	0.08	0.04	0.05





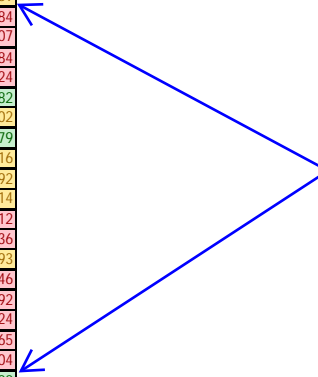




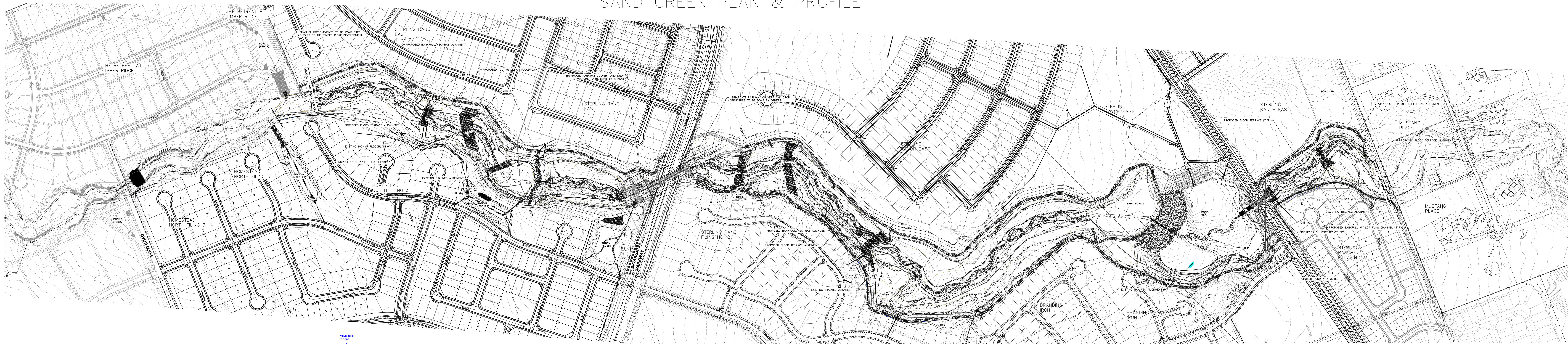
Subdivision: Sterling Ranch  
 Project Name: Sand Creek Channel Improvements  
 Project No.: 25188.04  
 Calculated By: DJV  
 Date: April 13, 2023

POINT #	FLOW DEPTH (FT)	SLOPE (FT/FT)	SHEAR (LB/FT^2)	
RS 9955	1	0.35	0.05	1.09
	2	0.93	0.12	6.96
	3	0.96	0.12	7.19
	4	0.8	0.03	1.50
RS 9943	1	0.3	0.05	0.94
	2	0.68	0.12	5.09
	3	0.82	0.12	6.14
	4	0.55	0.02	0.69
RS 9913	1	1.22	0.05	3.81
	2	0.8	0.03	1.50
	3	0.41	0.03	0.77
RS 9910	1	0.75	0.03	1.40
	2	0.49	0.03	0.92
RS 9626	1	0.57	0.12	4.27
	2	0.8	0.12	5.99
	3	0.98	0.02	1.22
RS 9600	1	1.33	0.12	9.96
RS 9587	1	0.75	0.08	3.74
RS 9584	1	0.78	0.08	3.89
RS 7445	1	1.09	0.13	8.84
	2	0.87	0.075	4.07
RS 7430	1	0.83	0.19	9.84
	2	0.68	0.1	4.24
RS 7406	1	0.33	0.04	0.82
	2	0.51	0.095	3.02
RS 7093	1	0.72	0.0175	0.79
RS 7073	1	0.61	0.083	3.16
RS 7061	1	0.55	0.085	2.92
	2	0.63	0.08	3.14
RS 6223	1	0.55	0.12	4.12
	2	1	0.15	9.36
	3	0.42	0.15	3.93
RS 6212	1	0.74	0.14	6.46
RS 6199	1	1.47	0.13	11.92
	2	0.56	0.15	5.24
RS 6184	1	1.19	0.13	9.65
	2	0.92	0.14	8.04
RS 2405	1	1.41	0.01	0.88
	2	0.9	0.01	0.56
	3	0.51	0.01	0.32
RS 2399	1	1.24	0.12	9.29
	2	0.73	0.047	2.14
	3	0.25	0.057	0.89
RS 2377	1	1.24	0.12	9.29
	2	0.73	0.047	2.14
	3	0.25	0.057	0.89

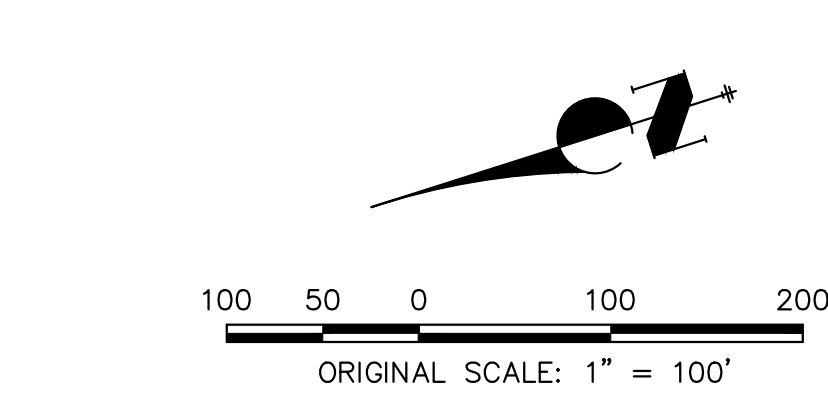
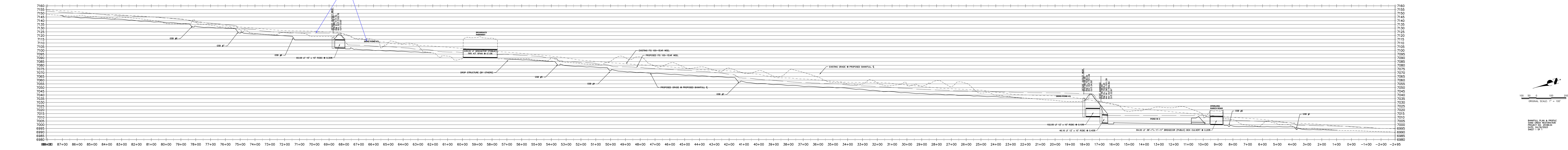
Should 2856 and 9256 be included?



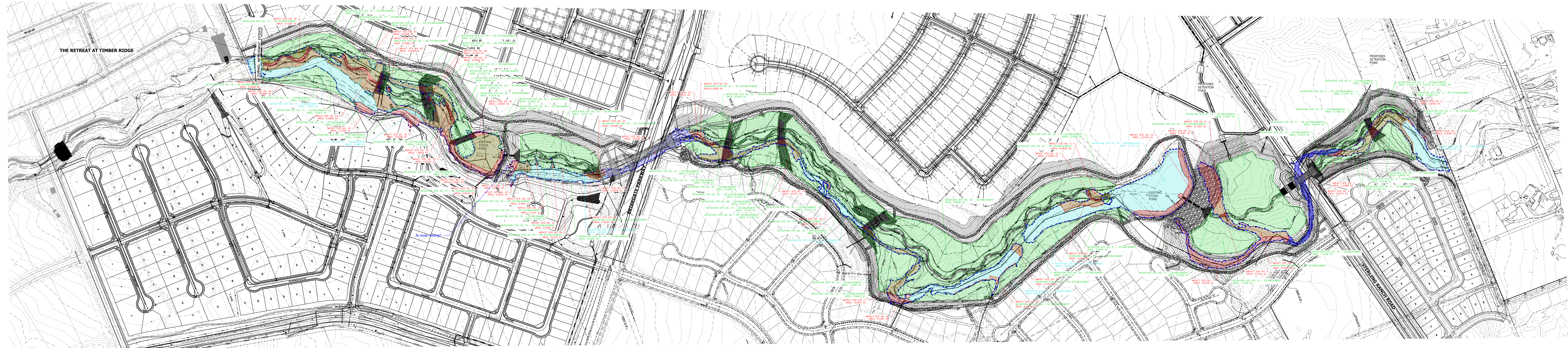
# SAND CREEK PLAN & PROFILE



**SAND CREEK MASTER BANKFULL ALIGNMENT PROFILE  
STA -2+95.01 TO 88+08.42**



# SAND CREEK RESTORATION – WETLANDS EXHIBIT



Sand Creek Wetlands Disturbances		
Category	Sq Ft	Acres
Total Existing Disturbances	706,000	16.20
Reach 1 Permanent Loss	54,000	1.236
Reach 2 Permanent Loss	200,000	4.582
Reach 3 Permanent Loss	286,000	6.568
Permanent Loss Total	480,000	10.986
Reach 1 Wetlands Preserved	180,000	4.113
Reach 2 Wetlands Preserved	180,000	4.113
Reach 3 Wetlands Preserved	180,000	4.113
Total Wetlands Preserved	540,000	12.339
Reach 1 Mitigation	117,000	2.659
Reach 2 Mitigation	170,000	3.844
Reach 3 Mitigation	480,000	11.079
Mitigation Total	767,000	17.382
Mitigation to Permanent Loss Ratio	1.57	

**FINAL GRADING TOTALS:**  
 REACH 1 – 30,764 CY CUT  
 32,587 CY FILL  
 26,162 CY NET  
 REACH 2 – 646,436 CY CUT  
 24,923 CY FILL  
 621,913 CY NET  
 REACH 3 – 129,591 CY CUT  
 3,462 CY FILL  
 126,229 CY NET  
**TOTAL – 806,891 CY CUT  
 32,587 CY FILL  
 774,304 CY NET**

**LEGEND**

- PERMANENT LOSSES FROM CHANNEL
- PERMANENT LOSSES FROM BRIDGE
- MITIGATION AREAS
- PRESERVED WETLANDS

Wetlands Impacts Summary	
Total Permanent Loss	480,000
Total Establishment	26,172
Total Enhancement	2,228
Total Preservation	2,313
Total Mitigation	487,796
Mitigation to Permanent Loss Ratio	1.02

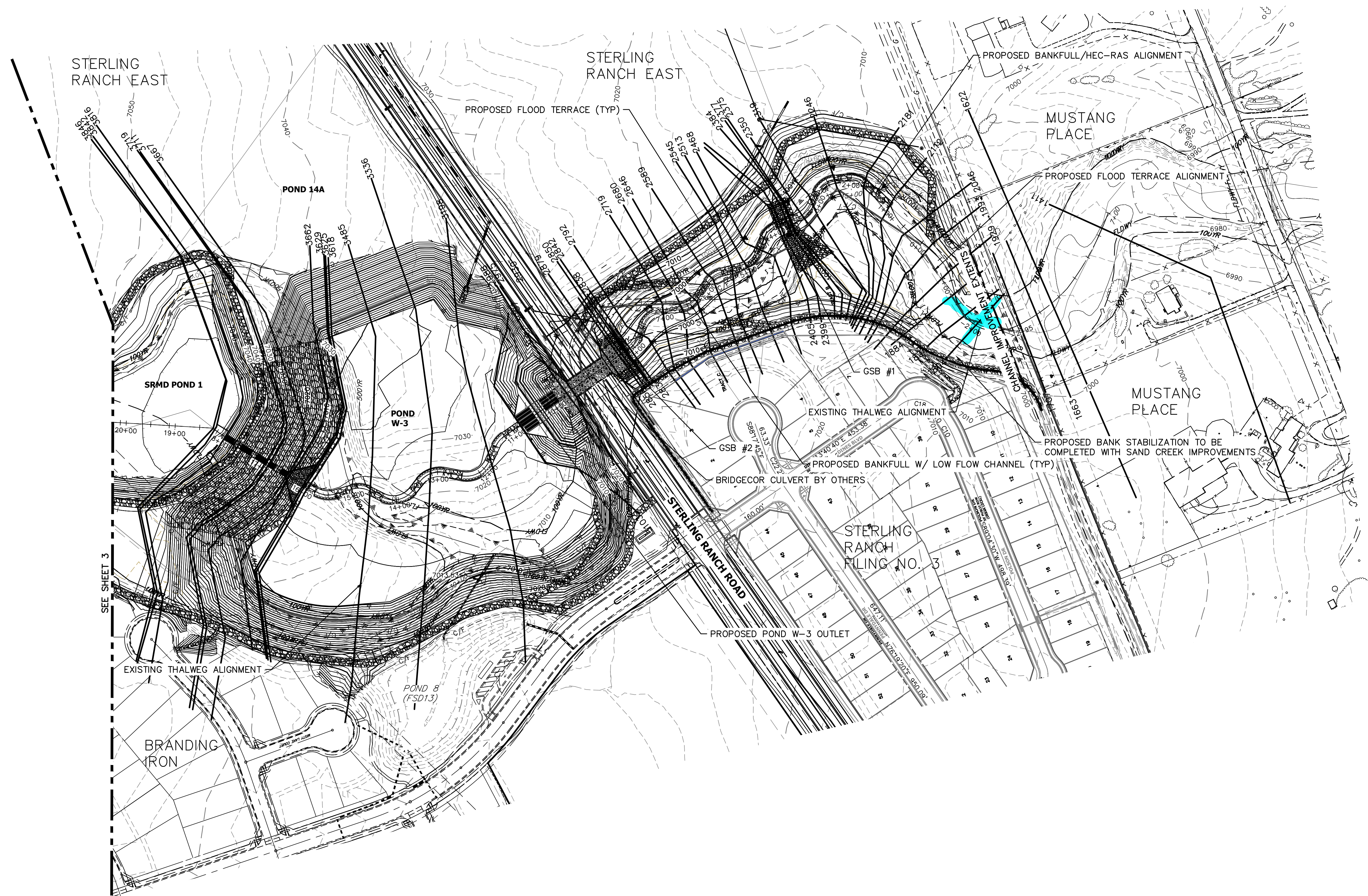
Permanent Impacts	Total Mitigation	Establishment
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4 0.0000	4 0.0000	4 0.0000
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6 0.0000	6 0.0000	6 0.0000
7 0.0000	7 0.0000	7 0.0000
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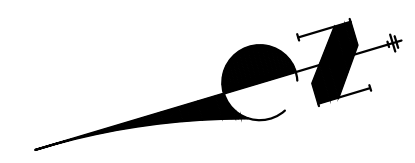
# SAND CREEK RESTORATION WORK MAP



SEE SHEET 3

## LEGEND

	HEC-RAS CROSS SECTION
	EXISTING CHANNEL C
	PROPOSED CHANNEL C
	100-YR FIS
	100-YR DESIGN WSEL
	100-YR EXISTING WSEL



100 50 0 100 200  
ORIGINAL SCALE: 1" = 100'

X:\25188\04\25188\04\HEC-RAS\HEC-RAS Base Files\2022-24-08-Sand Creek\HEC-RAS Work Map\_Angel Layout (5) - 4/13/2023 5:54:35 PM\_Vaughn.D