

**APPENDIX O:  
PREFERRED ALTERNATIVE SOLUTIONS**

# County of Simcoe - Web Map



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**BARRIE CITYWIDE MINOR AND MAJOR STORMWATER MODEL DEVELOPMENT  
SOPHIA CREEK WATERSHED  
SWM POND SP03**

**Wet Pond Characteristics:**

Side Slope: 5 :1  
 Top Elevation: 275.00 m  
 Bottom Elev: 272.00 m  
 Permanent Pool: m  
 Stage 0.1 m

SWMF SP03 - STAGE/VOLUME TABLE							
Pond Geometry				Pond Volume (m <sup>3</sup> )			
Elevation (m)	Depth (m)	Area (m <sup>2</sup> )	Avg. Area (m)	Dead	Accum. Dead	Live	Accum. Live
252.32	0	0	0			0	0
252.60	0.28	3675	1837.50			514.50	515
252.70	0.38	4988	4331.25			433.12	948
<b>252.80</b>	0.48	6300	5643.75			564.37	1512
252.90	0.58	6473	6386.25			638.63	2151
253.00	0.68	6645	6558.76			655.88	2807
253.10	0.78	6818	6731.27			673.13	3480
253.20	0.88	6990	6903.78			690.38	4170
253.30	0.98	7163	7076.29			707.63	4878
253.40	1.08	7335	7248.80			724.88	5603
253.50	1.18	7508	7421.31			742.13	6345
253.60	1.28	7680	7593.82			759.38	7104
253.70	1.38	7853	7766.33			776.63	7881
253.80	1.48	8025	7938.84			793.88	8675
253.90	1.58	8198	8111.35			811.14	9486
254.00	1.68	8370	8283.86			828.39	10314
254.10	1.78	8543	8456.37			845.64	11160
254.20	1.88	8715	8628.88			862.89	12023
254.30	1.98	8888	8801.39			880.14	12903
254.40	2.08	9060	8973.90			897.39	13800
254.50	2.18	9233	9146.41			914.64	14715
254.60	2.28	9405	9318.92			931.89	15647
254.70	2.38	9578	9491.43			949.14	16596
254.80	2.48	9750	9663.94			966.39	17562
254.90	2.58	9923	9836.45			983.65	18546
255.00	2.68	10095	10008.96			1000.90	19547
255.10	2.78	10268	10181.47			1018.15	20565
255.20	2.88	10440	10353.98			1035.40	21600
255.30	2.98	10613	10526.49			1052.65	22653
<b>255.35</b>	3.03	10699	10655.87			532.79	23186

**BARRIE CITYWIDE MINOR AND MAJOR STORMWATER MODEL DEVELOPMENT**  
**SOPHIA CREEK WATERSHED**  
**SWM POND SP03**

<b>Orifice #1:</b>		<b>Overflow Weir:</b>	Weir 1	Weir 2	
Diameter:	825	Length of Weir	1	8	m
Area:	0.5346	Weir Sill Elevation	253.90	254.35	m
C:	0.63	Weir constant K	1.6	1.6	
Invert:	252.32	Side Slope (H:V)	0	6	:1

Elevation (m)	Orifice #1		Weir #1		Weir #1		Total Discharge (m <sup>3</sup> /s)	Live Volume (ha.m)
	Head (m)	Discharge (m <sup>3</sup> /s)	Head (m)	Discharge (m <sup>3</sup> /s)	Head (m)	Discharge (m <sup>3</sup> /s)		
252.32	0.000	0.000	0	0.000	0	0.000	0.000	0.000
252.60	0.000	0.000	0	0.000	0	0.000	0.000	0.051
252.70	0.000	0.000	0	0.000	0	0.000	0.000	0.095
252.80	0.067	0.388	0	0.000	0	0.000	0.388	0.151
252.90	0.167	0.611	0	0.000	0	0.000	0.611	0.215
253.00	0.267	0.772	0	0.000	0	0.000	0.772	0.281
253.10	0.367	0.904	0	0.000	0	0.000	0.904	0.348
253.20	0.467	1.020	0	0.000	0	0.000	1.020	0.417
253.30	0.567	1.124	0	0.000	0	0.000	1.124	0.488
253.40	0.667	1.219	0	0.000	0	0.000	1.219	0.560
253.50	0.767	1.307	0	0.000	0	0.000	1.307	0.634
253.60	0.867	1.389	0	0.000	0	0.000	1.389	0.710
253.70	0.967	1.467	0	0.000	0	0.000	1.467	0.788
253.80	1.067	1.541	0	0.000	0	0.000	1.541	0.867
253.90	1.167	1.612	0	0.000	0	0.000	1.612	0.949
254.00	1.267	1.679	0.1	0.051	0	0.000	1.730	1.031
254.10	1.367	1.744	0.2	0.143	0	0.000	1.888	1.116
254.20	1.467	1.807	0.3	0.263	0	0.000	2.070	1.202
254.30	1.567	1.868	0.4	0.405	0	0.000	2.272	1.290
254.40	1.667	1.926	0.5	0.566	0.05	0.148	2.640	1.380
254.50	1.767	1.983	0.6	0.744	0.15	0.827	3.554	1.471
254.60	1.867	2.039	0.7	0.937	0.25	1.900	4.876	1.565
254.70	1.967	2.092	0.8	1.145	0.35	3.346	6.583	1.660
254.80	2.067	2.145	0.9	1.366	0.45	5.168	8.679	1.756
254.90	2.167	2.196	1	1.600	0.55	7.375	11.171	1.855
255.00	2.267	2.246	1.1	1.846	0.65	9.978	14.070	1.955
255.10	2.367	2.295	1.2	2.103	0.75	12.990	17.389	2.056
255.20	2.467	2.343	1.3	2.372	0.85	16.426	21.140	2.160
255.30	2.567	2.390	1.4	2.650	0.95	20.297	25.337	2.265
255.35	2.618	2.413	1.45	2.794	1	22.400	27.607	2.319

**Daniel Twigger - Re: 115172 - SP03 Information**

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**From:** David Marshall  
**To:** Twigger, Daniel  
**Date:** 3/6/2017 2:43 PM  
**Subject:** Re: 115172 - SP03 Information  
**Attachments:** 115172 - Proposed SSD Sophia Creek SP03.xls; SP03 and SP01.pdf

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**Updated as per additional modelling from November 2016 - Alternative 2 with expanded SP03 (Retrofit SP03)**

**See Previous Email for original SSD and Concept Drawing from Skelton Brumwell**

>>> David Marshall 3/6/2017 12:32 PM >>>  
Requested information for SP03:

**SSD Table Attached** (source: CCTA Design)

**Concept Plan Attached** (source: CCTA Design).

**Water Levels:**

2-year (SCS 24 hr): **253.720**

5-year (SCS 24 hr): **254.352**

10-year (SCS 24 hr): **254.574**

25-year (SCS 24 hr): **254.779**

50-year (SCS 24 hr): **254.904**

100-year (SCS 6 hr): **255.015**

Regional (Hazel): **254.907**

\*\*\*\*Range of water levels from SSD are from 252.32 to 255.35. All water levels are within this range and are interpolated.





**BARRIE CITYWIDE MINOR AND MAJOR STORMWATER MODEL DEVELOPMENT**  
**SOPHIA CREEK WATERSHED**  
**SWM POND SP01 RETROFIT**

**Wet Pond Characteristics:**

Side Slope: 4 :1  
 Top Elevation: 250.80 m  
 Bottom Elev: 248.50 m  
 Permanent Pool: - m  
 Stage 0.05 m

Stormwater Management Pond								
Pond Geometry				Pond Volume (m <sup>3</sup> )				Total Discharge (m <sup>3</sup> /s)
Elevation (m)	Depth (m)	Area (m <sup>2</sup> )	Avg. Area (m)	Dead	Accum. Dead	Live	Accum. Live	
248.50	0	0	0			0	0	0
248.70	0.20	3,974	3,477			173.86	397	3
248.95	0.45	8,942	8,445			422.24	2012	6
249.15	0.65	12,916	12,419			620.94	4198	9
249.30	0.80	14,290	14,195			709.73	6278	12
249.45	0.95	14,861	14,766			738.28	8464	15
249.60	1.10	15,432	15,337			766.83	10736	18
249.70	1.20	15,812	15,717			785.86	12299	21
249.80	1.30	16,193	16,098			804.90	13899	24
249.90	1.40	16,574	16,479			823.93	15537	27
250.00	1.50	16,955	16,859			842.97	17214	30
250.45	1.95	18,668	18,572			928.62	25229	33
250.50	2.00	18,858	18,763			938.14	26167	36
250.60	2.10	19,239	19,143			957.17	28071	39
250.80	2.30	20,000	19,905			995.24	31995	43.5

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 1

E.G. US. (m)	248.73	Element	Inside BR US	Inside BR DS
W.S. US. (m)	248.70	E.G. Elev (m)	248.72	248.68
Q Total (m3/s)	3.00	W.S. Elev (m)	248.68	248.65
Q Bridge (m3/s)	3.00	Crit W.S. (m)	248.42	248.30
Q Weir (m3/s)		Max Chl Dpth (m)	0.68	0.77
Weir Sta Lft (m)		Vel Total (m/s)	0.85	0.72
Weir Sta Rgt (m)		Flow Area (m2)	3.55	4.16
Weir Submerg		Froude # Chl	0.38	0.30
Weir Max Depth (m)		Specif Force (m3)	1.26	1.55
Min El Weir Flow (m)	250.86	Hydr Depth (m)	0.51	0.58
Min El Prs (m)	250.20	W.P. Total (m)	7.23	7.52
Delta EG (m)	0.07	Conv. Total (m3/s)	55.2	70.0
Delta WS (m)	0.06	Top Width (m)	6.96	7.20
BR Open Area (m2)	16.26	Frctn Loss (m)	0.04	0.01
BR Open Vel (m/s)	0.85	C & E Loss (m)	0.00	0.00
Coef of Q		Shear Total (N/m2)	14.23	9.95
Br Sel Method	Energy only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 2

E.G. US. (m)	249.02	Element	Inside BR US	Inside BR DS
W.S. US. (m)	248.96	E.G. Elev (m)	249.01	248.95
Q Total (m3/s)	6.00	W.S. Elev (m)	248.94	248.90
Q Bridge (m3/s)	6.00	Crit W.S. (m)	248.59	248.47
Q Weir (m3/s)		Max Chl Dpth (m)	0.94	1.02
Weir Sta Lft (m)		Vel Total (m/s)	1.10	0.99
Weir Sta Rgt (m)		Flow Area (m2)	5.44	6.05
Weir Submerg		Froude # Chl	0.42	0.36
Weir Max Depth (m)		Specif Force (m3)	2.84	3.22
Min El Weir Flow (m)	250.86	Hydr Depth (m)	0.71	0.77
Min El Prs (m)	250.20	W.P. Total (m)	8.09	8.36
Delta EG (m)	0.08	Conv. Total (m3/s)	104.5	122.1
Delta WS (m)	0.07	Top Width (m)	7.64	7.86
BR Open Area (m2)	16.26	Frctn Loss (m)	0.05	0.01
BR Open Vel (m/s)	1.10	C & E Loss (m)	0.01	0.00
Coef of Q		Shear Total (N/m2)	21.76	17.16
Br Sel Method	Energy only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 3

E.G. US. (m)	249.23	Element	Inside BR US	Inside BR DS
W.S. US. (m)	249.15	E.G. Elev (m)	249.22	249.16
Q Total (m3/s)	9.00	W.S. Elev (m)	249.13	249.08
Q Bridge (m3/s)	9.00	Crit W.S. (m)	248.73	248.61
Q Weir (m3/s)		Max Chl Dpth (m)	1.13	1.20
Weir Sta Lft (m)		Vel Total (m/s)	1.30	1.20
Weir Sta Rgt (m)		Flow Area (m2)	6.92	7.51
Weir Submerg		Froude # Chl	0.45	0.35
Weir Max Depth (m)		Specif Force (m3)	4.51	4.93
Min El Weir Flow (m)	250.86	Hydr Depth (m)	0.85	0.90
Min El Prs (m)	250.20	W.P. Total (m)	8.71	8.95
Delta EG (m)	0.09	Conv. Total (m3/s)	148.3	166.9
Delta WS (m)	0.09	Top Width (m)	8.14	8.31
BR Open Area (m2)	16.26	Frctn Loss (m)	0.05	0.02
BR Open Vel (m/s)	1.30	C & E Loss (m)	0.01	0.00

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 3 (Continued)

Coef of Q		Shear Total (N/m2)	28.68	23.91
Br Sel Method	Energy only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 4

E.G. US. (m)	249.41	Element	Inside BR US	Inside BR DS
W.S. US. (m)	249.31	E.G. Elev (m)	249.40	249.33
Q Total (m3/s)	12.00	W.S. Elev (m)	249.29	249.23
Q Bridge (m3/s)	12.00	Crit W.S. (m)	248.86	248.73
Q Weir (m3/s)		Max Chl Dpth (m)	1.29	1.35
Weir Sta Lft (m)		Vel Total (m/s)	1.46	1.36
Weir Sta Rgt (m)		Flow Area (m2)	8.23	8.79
Weir Submerg		Froude # Chl	0.41	0.37
Weir Max Depth (m)		Specif Force (m3)	6.29	6.74
Min El Weir Flow (m)	250.86	Hydr Depth (m)	0.97	1.03
Min El Prs (m)	250.20	W.P. Total (m)	9.19	9.39
Delta EG (m)	0.10	Conv. Total (m3/s)	191.0	210.4
Delta WS (m)	0.10	Top Width (m)	8.45	8.56
BR Open Area (m2)	16.26	Frctn Loss (m)	0.06	0.02
BR Open Vel (m/s)	1.46	C & E Loss (m)	0.01	0.00
Coef of Q		Shear Total (N/m2)	34.65	29.88
Br Sel Method	Energy only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 5

E.G. US. (m)	249.57	Element	Inside BR US	Inside BR DS
W.S. US. (m)	249.44	E.G. Elev (m)	249.55	249.48
Q Total (m3/s)	15.00	W.S. Elev (m)	249.42	249.36
Q Bridge (m3/s)	15.00	Crit W.S. (m)	248.96	248.84
Q Weir (m3/s)		Max Chl Dpth (m)	1.42	1.48
Weir Sta Lft (m)		Vel Total (m/s)	1.60	1.51
Weir Sta Rgt (m)		Flow Area (m2)	9.37	9.90
Weir Submerg		Froude # Chl	0.43	0.40
Weir Max Depth (m)		Specif Force (m3)	8.13	8.59
Min El Weir Flow (m)	250.86	Hydr Depth (m)	1.08	1.12
Min El Prs (m)	250.20	W.P. Total (m)	9.59	9.81
Delta EG (m)	0.11	Conv. Total (m3/s)	230.7	249.3
Delta WS (m)	0.11	Top Width (m)	8.67	8.81
BR Open Area (m2)	16.26	Frctn Loss (m)	0.07	0.02
BR Open Vel (m/s)	1.60	C & E Loss (m)	0.01	0.00
Coef of Q		Shear Total (N/m2)	40.52	35.87
Br Sel Method	Energy only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 6

E.G. US. (m)	249.72	Element	Inside BR US	Inside BR DS
W.S. US. (m)	249.58	E.G. Elev (m)	249.70	249.63
Q Total (m3/s)	18.00	W.S. Elev (m)	249.55	249.49
Q Bridge (m3/s)	18.00	Crit W.S. (m)	249.07	248.95
Q Weir (m3/s)		Max Chl Dpth (m)	1.55	1.61
Weir Sta Lft (m)		Vel Total (m/s)	1.71	1.63
Weir Sta Rgt (m)		Flow Area (m2)	10.55	11.07
Weir Submerg		Froude # Chl	0.44	0.41
Weir Max Depth (m)		Specif Force (m3)	10.14	10.62
Min El Weir Flow (m)	250.86	Hydr Depth (m)	1.17	1.21
Min El Prs (m)	250.20	W.P. Total (m)	10.10	10.31

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 6 (Continued)

Delta EG (m)	0.11	Conv. Total (m3/s)	271.5	290.5
Delta WS (m)	0.11	Top Width (m)	9.02	9.14
BR Open Area (m2)	16.26	Frctn Loss (m)	0.07	0.02
BR Open Vel (m/s)	1.71	C & E Loss (m)	0.01	0.00
Coef of Q		Shear Total (N/m2)	45.03	40.47
Br Sel Method	Energy only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 7

E.G. US. (m)	249.85	Element	Inside BR US	Inside BR DS
W.S. US. (m)	249.69	E.G. Elev (m)	249.83	249.75
Q Total (m3/s)	21.00	W.S. Elev (m)	249.66	249.59
Q Bridge (m3/s)	21.00	Crit W.S. (m)	249.16	249.04
Q Weir (m3/s)		Max Chl Dpth (m)	1.66	1.71
Weir Sta Lft (m)		Vel Total (m/s)	1.83	1.75
Weir Sta Rgt (m)		Flow Area (m2)	11.50	11.98
Weir Submerg		Froude # Chl	0.45	0.43
Weir Max Depth (m)		Specif Force (m3)	12.07	12.53
Min El Weir Flow (m)	250.86	Hydr Depth (m)	1.26	1.31
Min El Prs (m)	250.20	W.P. Total (m)	10.40	10.51
Delta EG (m)	0.12	Conv. Total (m3/s)	307.4	327.0
Delta WS (m)	0.12	Top Width (m)	9.14	9.14
BR Open Area (m2)	16.26	Frctn Loss (m)	0.07	0.02
BR Open Vel (m/s)	1.83	C & E Loss (m)	0.01	0.00
Coef of Q		Shear Total (N/m2)	50.61	46.12
Br Sel Method	Energy only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 8

E.G. US. (m)	249.97	Element	Inside BR US	Inside BR DS
W.S. US. (m)	249.79	E.G. Elev (m)	249.95	249.86
Q Total (m3/s)	24.00	W.S. Elev (m)	249.76	249.69
Q Bridge (m3/s)	24.00	Crit W.S. (m)	249.25	249.13
Q Weir (m3/s)		Max Chl Dpth (m)	1.76	1.81
Weir Sta Lft (m)		Vel Total (m/s)	1.94	1.87
Weir Sta Rgt (m)		Flow Area (m2)	12.40	12.85
Weir Submerg		Froude # Chl	0.47	0.44
Weir Max Depth (m)		Specif Force (m3)	14.07	14.52
Min El Weir Flow (m)	250.86	Hydr Depth (m)	1.36	1.41
Min El Prs (m)	250.20	W.P. Total (m)	10.60	10.69
Delta EG (m)	0.13	Conv. Total (m3/s)	344.2	362.9
Delta WS (m)	0.13	Top Width (m)	9.14	9.14
BR Open Area (m2)	16.26	Frctn Loss (m)	0.08	0.03
BR Open Vel (m/s)	1.94	C & E Loss (m)	0.01	0.00
Coef of Q		Shear Total (N/m2)	55.80	51.52
Br Sel Method	Energy only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 9

E.G. US. (m)	250.09	Element	Inside BR US	Inside BR DS
W.S. US. (m)	249.90	E.G. Elev (m)	250.06	249.97
Q Total (m3/s)	27.00	W.S. Elev (m)	249.85	249.77
Q Bridge (m3/s)	27.00	Crit W.S. (m)	249.33	249.21
Q Weir (m3/s)		Max Chl Dpth (m)	1.85	1.89
Weir Sta Lft (m)		Vel Total (m/s)	2.04	1.98
Weir Sta Rgt (m)		Flow Area (m2)	13.24	13.66

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 9 (Continued)

Weir Submerg		Froude # Chl	0.48	0.46
Weir Max Depth (m)		Specif Force (m3)	16.14	16.57
Min El Weir Flow (m)	250.86	Hydr Depth (m)	1.47	1.50
Min El Prs (m)	250.20	W.P. Total (m)	10.85	10.88
Delta EG (m)	0.14	Conv. Total (m3/s)	378.0	397.4
Delta WS (m)	0.15	Top Width (m)	8.98	9.13
BR Open Area (m2)	16.26	Frctn Loss (m)	0.08	0.03
BR Open Vel (m/s)	2.04	C & E Loss (m)	0.01	0.00
Coef of Q		Shear Total (N/m2)	61.06	56.85
Br Sel Method	Energy only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 10

E.G. US. (m)	250.19	Element	Inside BR US	Inside BR DS
W.S. US. (m)	249.98	E.G. Elev (m)	250.16	250.07
Q Total (m3/s)	30.00	W.S. Elev (m)	249.92	249.84
Q Bridge (m3/s)	30.00	Crit W.S. (m)	249.41	249.29
Q Weir (m3/s)		Max Chl Dpth (m)	1.92	1.96
Weir Sta Lft (m)		Vel Total (m/s)	2.16	2.10
Weir Sta Rgt (m)		Flow Area (m2)	13.90	14.26
Weir Submerg		Froude # Chl	0.50	0.48
Weir Max Depth (m)		Specif Force (m3)	18.13	18.49
Min El Weir Flow (m)	250.86	Hydr Depth (m)	1.57	1.59
Min El Prs (m)	250.20	W.P. Total (m)	11.06	11.06
Delta EG (m)	0.16	Conv. Total (m3/s)	404.7	422.2
Delta WS (m)	0.16	Top Width (m)	8.83	9.00
BR Open Area (m2)	16.26	Frctn Loss (m)	0.09	0.03
BR Open Vel (m/s)	2.16	C & E Loss (m)	0.01	0.01
Coef of Q		Shear Total (N/m2)	67.72	63.80
Br Sel Method	Energy only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 11

E.G. US. (m)	250.59	Element	Inside BR US	Inside BR DS
W.S. US. (m)	250.44	E.G. Elev (m)	250.59	250.13
Q Total (m3/s)	33.00	W.S. Elev (m)	250.20	249.90
Q Bridge (m3/s)	33.00	Crit W.S. (m)	249.49	249.37
Q Weir (m3/s)		Max Chl Dpth (m)	2.20	2.02
Weir Sta Lft (m)		Vel Total (m/s)	2.03	2.23
Weir Sta Rgt (m)		Flow Area (m2)	16.26	14.77
Weir Submerg		Froude # Chl	0.44	0.50
Weir Max Depth (m)		Specif Force (m3)	22.52	20.39
Min El Weir Flow (m)	250.86	Hydr Depth (m)	13241.84	1.66
Min El Prs (m)	250.20	W.P. Total (m)	20.12	11.22
Delta EG (m)	0.46	Conv. Total (m3/s)	352.7	443.2
Delta WS (m)	0.54	Top Width (m)		8.88
BR Open Area (m2)	16.26	Frctn Loss (m)		
BR Open Vel (m/s)	2.03	C & E Loss (m)		
Coef of Q		Shear Total (N/m2)	69.39	71.52
Br Sel Method	Press Only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 12

E.G. US. (m)	250.67	Element	Inside BR US	Inside BR DS
W.S. US. (m)	250.50	E.G. Elev (m)	250.67	250.21
Q Total (m3/s)	36.00	W.S. Elev (m)	250.20	249.96
Q Bridge (m3/s)	36.00	Crit W.S. (m)	249.56	249.44
Q Weir (m3/s)		Max Chl Dpth (m)	2.20	2.08
Weir Sta Lft (m)		Vel Total (m/s)	2.21	2.35
Weir Sta Rgt (m)		Flow Area (m2)	16.26	15.34
Weir Submerg		Froude # Chl	0.48	0.52
Weir Max Depth (m)		Specif Force (m3)	23.81	22.46
Min El Weir Flow (m)	250.86	Hydr Depth (m)	13241.84	1.75
Min El Prs (m)	250.20	W.P. Total (m)	20.12	11.41
Delta EG (m)	0.45	Conv. Total (m3/s)	352.7	467.0
Delta WS (m)	0.54	Top Width (m)		8.75
BR Open Area (m2)	16.26	Frctn Loss (m)		
BR Open Vel (m/s)	2.21	C & E Loss (m)		
Coef of Q		Shear Total (N/m2)	82.58	78.34
Br Sel Method	Press Only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 13

E.G. US. (m)	250.76	Element	Inside BR US	Inside BR DS
W.S. US. (m)	250.58	E.G. Elev (m)	250.76	250.29
Q Total (m3/s)	39.00	W.S. Elev (m)	250.20	250.02
Q Bridge (m3/s)	39.00	Crit W.S. (m)	249.63	249.51
Q Weir (m3/s)		Max Chl Dpth (m)	2.20	2.14
Weir Sta Lft (m)		Vel Total (m/s)	2.40	2.47
Weir Sta Rgt (m)		Flow Area (m2)	16.26	15.80
Weir Submerg		Froude # Chl	0.52	0.54
Weir Max Depth (m)		Specif Force (m3)	25.22	24.49
Min El Weir Flow (m)	250.86	Hydr Depth (m)	13241.84	1.83
Min El Prs (m)	250.20	W.P. Total (m)	20.12	11.56
Delta EG (m)	0.47	Conv. Total (m3/s)	352.7	486.6
Delta WS (m)	0.57	Top Width (m)		8.65
BR Open Area (m2)	16.26	Frctn Loss (m)		
BR Open Vel (m/s)	2.40	C & E Loss (m)		
Coef of Q		Shear Total (N/m2)	96.92	86.13
Br Sel Method	Press Only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 14

E.G. US. (m)	250.63	Element	Inside BR US	Inside BR DS
W.S. US. (m)	250.37	E.G. Elev (m)	250.58	250.42
Q Total (m3/s)	42.00	W.S. Elev (m)	250.24	250.08
Q Bridge (m3/s)	42.00	Crit W.S. (m)	249.70	249.57
Q Weir (m3/s)		Max Chl Dpth (m)	2.24	2.20
Weir Sta Lft (m)		Vel Total (m/s)	2.58	2.57
Weir Sta Rgt (m)		Flow Area (m2)	16.26	16.35
Weir Submerg		Froude # Chl	0.55	0.55
Weir Max Depth (m)		Specif Force (m3)	27.37	26.71
Min El Weir Flow (m)	250.86	Hydr Depth (m)		1.92
Min El Prs (m)	250.20	W.P. Total (m)	20.12	11.74
Delta EG (m)	0.27	Conv. Total (m3/s)	352.7	509.9
Delta WS (m)	0.31	Top Width (m)		8.52
BR Open Area (m2)	16.26	Frctn Loss (m)	0.16	0.03
BR Open Vel (m/s)	2.58	C & E Loss (m)	0.00	0.02

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 14 (Continued)

Coef of Q		Shear Total (N/m2)	112.40	92.66
Br Sel Method	Energy only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 15

E.G. US. (m)	250.75	Element	Inside BR US	Inside BR DS
W.S. US. (m)	250.48	E.G. Elev (m)	250.68	250.49
Q Total (m3/s)	45.00	W.S. Elev (m)	250.29	250.13
Q Bridge (m3/s)	45.00	Crit W.S. (m)	249.75	249.63
Q Weir (m3/s)		Max Chl Dpth (m)	2.29	2.25
Weir Sta Lft (m)		Vel Total (m/s)	2.77	2.69
Weir Sta Rgt (m)		Flow Area (m2)	16.26	16.74
Weir Submerg		Froude # Chl	0.58	0.57
Weir Max Depth (m)		Specif Force (m3)	29.87	28.80
Min El Weir Flow (m)	250.86	Hydr Depth (m)		1.99
Min El Prs (m)	250.20	W.P. Total (m)	20.12	11.87
Delta EG (m)	0.31	Conv. Total (m3/s)	352.7	526.2
Delta WS (m)	0.37	Top Width (m)		8.43
BR Open Area (m2)	16.26	Frctn Loss (m)	0.18	0.04
BR Open Vel (m/s)	2.77	C & E Loss (m)	0.01	0.02
Coef of Q		Shear Total (N/m2)	129.03	101.13
Br Sel Method	Energy only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 16

E.G. US. (m)	250.87	Element	Inside BR US	Inside BR DS
W.S. US. (m)	250.60	E.G. Elev (m)	250.78	250.57
Q Total (m3/s)	48.00	W.S. Elev (m)	250.34	250.17
Q Bridge (m3/s)	48.00	Crit W.S. (m)	249.81	249.69
Q Weir (m3/s)		Max Chl Dpth (m)	2.34	2.29
Weir Sta Lft (m)		Vel Total (m/s)	2.95	2.81
Weir Sta Rgt (m)		Flow Area (m2)	16.26	17.09
Weir Submerg		Froude # Chl	0.62	0.59
Weir Max Depth (m)		Specif Force (m3)	32.42	30.91
Min El Weir Flow (m)	250.86	Hydr Depth (m)		2.05
Min El Prs (m)	250.20	W.P. Total (m)	20.12	11.99
Delta EG (m)	0.36	Conv. Total (m3/s)	352.7	541.1
Delta WS (m)	0.44	Top Width (m)		8.34
BR Open Area (m2)	16.26	Frctn Loss (m)	0.19	0.04
BR Open Vel (m/s)	2.95	C & E Loss (m)	0.02	0.03
Coef of Q		Shear Total (N/m2)	146.81	110.00
Br Sel Method	Energy only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 17

E.G. US. (m)	251.15	Element	Inside BR US	Inside BR DS
W.S. US. (m)	251.11	E.G. Elev (m)	251.01	250.66
Q Total (m3/s)	51.00	W.S. Elev (m)	250.51	250.22
Q Bridge (m3/s)	51.00	Crit W.S. (m)	249.86	249.75
Q Weir (m3/s)		Max Chl Dpth (m)	2.51	2.34
Weir Sta Lft (m)		Vel Total (m/s)	3.14	2.94
Weir Sta Rgt (m)		Flow Area (m2)	16.26	17.36
Weir Submerg		Froude # Chl	0.63	0.61
Weir Max Depth (m)		Specif Force (m3)	36.99	33.37
Min El Weir Flow (m)	250.86	Hydr Depth (m)		
Min El Prs (m)	250.20	W.P. Total (m)	20.12	20.36

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 17 (Continued)

Delta EG (m)	0.58	Conv. Total (m3/s)	352.7	390.1
Delta WS (m)	0.90	Top Width (m)		
BR Open Area (m2)	16.26	Frctn Loss (m)	0.32	0.05
BR Open Vel (m/s)	3.14	C & E Loss (m)	0.03	0.04
Coef of Q		Shear Total (N/m2)	165.74	142.87
Br Sel Method	Energy only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 18

E.G. US. (m)	251.30	Element	Inside BR US	Inside BR DS
W.S. US. (m)	251.27	E.G. Elev (m)	251.14	250.75
Q Total (m3/s)	54.00	W.S. Elev (m)	250.58	250.25
Q Bridge (m3/s)	54.00	Crit W.S. (m)	249.91	249.80
Q Weir (m3/s)		Max Chl Dpth (m)	2.58	2.37
Weir Sta Lft (m)		Vel Total (m/s)	3.32	3.11
Weir Sta Rgt (m)		Flow Area (m2)	16.26	17.36
Weir Submerg		Froude # Chl	0.66	0.64
Weir Max Depth (m)		Specif Force (m3)	40.08	35.80
Min EI Weir Flow (m)	250.86	Hydr Depth (m)		
Min EI Prs (m)	250.20	W.P. Total (m)	20.12	20.36
Delta EG (m)	0.66	Conv. Total (m3/s)	352.7	390.1
Delta WS (m)	1.02	Top Width (m)		
BR Open Area (m2)	16.26	Frctn Loss (m)	0.36	0.06
BR Open Vel (m/s)	3.32	C & E Loss (m)	0.03	0.05
Coef of Q		Shear Total (N/m2)	185.81	160.18
Br Sel Method	Energy only	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 19

E.G. US. (m)	250.86	Element	Inside BR US	Inside BR DS
W.S. US. (m)	250.41	E.G. Elev (m)	250.86	250.86
Q Total (m3/s)	57.00	W.S. Elev (m)	250.41	250.41
Q Bridge (m3/s)	43.54	Crit W.S. (m)	249.97	249.85
Q Weir (m3/s)	13.46	Max Chl Dpth (m)	2.41	2.53
Weir Sta Lft (m)	1.61	Vel Total (m/s)	0.00	0.00
Weir Sta Rgt (m)	59.00	Flow Area (m2)		
Weir Submerg	0.00	Froude # Chl	0.72	0.66
Weir Max Depth (m)	0.21	Specif Force (m3)	39.39	40.37
Min EI Weir Flow (m)	250.86	Hydr Depth (m)		
Min EI Prs (m)	250.20	W.P. Total (m)	20.12	20.36
Delta EG (m)	0.16	Conv. Total (m3/s)		
Delta WS (m)	0.11	Top Width (m)		
BR Open Area (m2)	16.26	Frctn Loss (m)		
BR Open Vel (m/s)	2.68	C & E Loss (m)		
Coef of Q		Shear Total (N/m2)		
Br Sel Method	Press/Weir	Power Total (N/m s)	0.00	-1516.29

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 20

E.G. US. (m)	250.89	Element	Inside BR US	Inside BR DS
W.S. US. (m)	250.36	E.G. Elev (m)	250.89	250.89
Q Total (m3/s)	60.00	W.S. Elev (m)	250.36	250.36
Q Bridge (m3/s)	43.22	Crit W.S. (m)	250.01	249.91
Q Weir (m3/s)	16.78	Max Chl Dpth (m)	2.36	2.48
Weir Sta Lft (m)	1.36	Vel Total (m/s)	0.00	0.00
Weir Sta Rgt (m)	59.61	Flow Area (m2)		

Plan: SWMF Sophia 1 RS: 1584 Profile: PF 20 (Continued)

Weir Submerg	0.00	Froude # Chl	0.77	0.70
Weir Max Depth (m)	0.24	Specif Force (m3)	40.91	41.70
Min El Weir Flow (m)	250.86	Hydr Depth (m)		
Min El Prs (m)	250.20	W.P. Total (m)	20.12	20.36
Delta EG (m)	0.12	Conv. Total (m3/s)		
Delta WS (m)	0.03	Top Width (m)		
BR Open Area (m2)	16.26	Frctn Loss (m)		
BR Open Vel (m/s)	2.66	C & E Loss (m)		
Coef of Q		Shear Total (N/m2)		
Br Sel Method	Press/Weir	Power Total (N/m s)	0.00	-1516.29



## Existing Conditions Hydrologic Model Results Summary

Point of Interest / Culvert Crossing	Peak Flow (m <sup>3</sup> /s) – SCS 6 Hour Design Storms				
	1:5 Year	1:10 Year	1:25 Year	1:50 Year	1:100 Year
Howard Crescent	3.7	5.0	6.8	8.3	9.8
Grove Street (A)	5.7	7.6	10.4	12.8	15.0
St. Vincent Street	6.9	9.3	12.5	15.4	18.0
Ottaway Avenue/Rose Street	4.7	7.7	11.3	14.1	17.0
Laurie Crescent	5.4	8.5	12.4	15.4	18.7
Bothwell Crescent	15.0	21.2	30.4	37.3	44.4
Grove Street (C)	16.3	22.7	32.5	39.9	47.4
Parkdale Street	16.2	22.6	32.3	39.8	47.3
Davidson Street/Gunn Street	16.9	23.5	33.6	41.3	49.1
Wellington Street/Berczy Street	18.3	25.2	36.0	44.3	52.4
Peel Street (Trunk Storm Sewer)	19.2	26.4	37.5	46.3	54.9

Point of Interest / Culvert Crossing	Peak Flow (m <sup>3</sup> /s) – Chicago 4 Hour Design Storms				
	1:5 Year	1:10 Year	1:25 Year	1:50 Year	1:100 Year
Howard Crescent	2.8	3.6	4.8	5.7	6.9
Grove Street (A)	4.2	5.5	7.4	8.8	10.7
St. Vincent Street	5.1	6.7	8.9	10.7	12.8
Ottaway Avenue/Rose Street	3.2	4.6	7.3	9.2	11.2
Laurie Crescent	3.7	5.3	8.2	10.2	12.5
Bothwell Crescent	10.8	14.5	20.5	25.2	30.2
Grove Street (C)	11.8	15.7	22.0	27.0	32.4
Parkdale Street	11.8	15.7	22.0	26.9	32.4
Davidson Street/Gunn Street	12.3	16.4	22.8	28.0	33.6
Wellington Street/Berczy Street	13.4	17.9	24.6	30.1	36.2
Peel Street (Trunk Storm Sewer)	14.1	18.8	25.7	31.5	37.8

Point of Interest / Culvert Crossing	Peak Flow (m <sup>3</sup> /s)			
	1:100 Year SCS	Timmins	Hurricane Hazel	Regulatory Storm
Howard Crescent	9.8	4.8	6.5	9.8
Grove Street (A)	15.0	7.0	9.4	15.0
St. Vincent Street	18.0	8.7	11.7	18.0
Ottaway Avenue/Rose Street	17.0	8.3	11.4	17.0
Laurie Crescent	18.7	10.3	13.8	18.7
Bothwell Crescent	44.4	23.0	30.6	44.4
Grove Street (C)	47.4	24.6	32.8	47.4
Parkdale Street	47.3	25.0	33.3	47.3
Davidson Street/Gunn Street	49.1	26.1	34.8	49.1
Wellington Street/Berczy Street	52.4	28.5	37.9	52.4
Peel Street (Trunk Storm Sewer)	54.9	30.3	40.6	54.9

Note: Regulatory Storm – 100 Year 6 Hour SCS Design Storm

## Existing Conditions Hydrologic Model Results Summary

Point of Interest / Culvert Crossing	Peak Flow (m <sup>3</sup> /s) – SCS 12 Hour Design Storms				
	1:5 Year	1:10 Year	1:25 Year	1:50 Year	1:100 Year
Howard Crescent	3.5	4.6	6.3	7.5	8.9
Grove Street (A)	5.4	7.1	9.6	11.3	13.6
St. Vincent Street	6.5	8.6	11.5	13.7	16.3
Ottaway Avenue/Rose Street	4.1	7.0	10.4	12.8	15.2
Laurie Crescent	4.8	7.7	11.2	14.1	16.8
Bothwell Crescent	14.0	19.3	27.4	33.8	40.0
Grove Street (C)	15.2	20.7	29.4	36.2	42.6
Parkdale Street	15.1	20.7	29.2	36.0	42.5
Davidson Street/Gunn Street	15.8	21.5	30.3	37.4	44.2
Wellington Street/Berczy Street	17.1	23.1	32.4	40.1	47.4
Peel Street (Trunk Storm Sewer)	18.0	24.3	33.8	41.8	49.6

Point of Interest / Culvert Crossing	Peak Flow (m <sup>3</sup> /s) – SCS 24 Hour Design Storms				
	1:5 Year	1:10 Year	1:25 Year	1:50 Year	1:100 Year
Howard Crescent	3.7	4.9	6.7	8.0	9.5
Grove Street (A)	5.7	7.6	10.2	12.0	14.4
St. Vincent Street	6.9	9.2	12.3	14.5	17.2
Ottaway Avenue/Rose Street	4.8	7.7	11.2	14.0	16.3
Laurie Crescent	5.5	8.4	12.3	15.4	18.1
Bothwell Crescent	15.0	20.9	29.5	36.1	42.6
Grove Street (C)	16.3	22.5	31.7	38.6	45.5
Parkdale Street	16.1	22.3	31.4	38.5	45.4
Davidson Street/Gunn Street	16.9	23.2	32.6	39.9	47.2
Wellington Street/Berczy Street	18.4	24.9	34.9	42.8	50.7
Peel Street (Trunk Storm Sewer)	19.3	26.1	36.5	44.8	53.0

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\*\*\*\*\* SUMMARY OUTPUT \*\*\*\*\*

Input filename: C:\Program Files (x86)\VH Suite 3.0\VO2\vo1n.dat  
 Output filename: C:\Users\dtwiggger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\Scenario.ou  
 Summary filename: C:\Users\dtwiggger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\Scenario.sum

DATE: 09/29/2016 TIME: 10:00:46

USER:

**EXISTING CONDITIONS HYDROLOGIC MODEL RESULTS**

COMMENTS:

\*\*\*\*\*  
 \*\* SIMULATION NUMBER: 1 \*\* **1:2 Year Chicago Design Storm**  
 \*\*\*\*\*

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R. V. mm	R. C.	Qbase cms
START @ 0.00 hrs								
-----								
READ STORM								
[ Ptot= 36.95 mm ]								
fname : C:\Users\dtwiggger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\dc48ef45-2ee5-4cc7-9c0								
remark: * City of Barrie - 2 yr Chicago (4hr) + 15%								
** CALIB STANDHYD [I%=28.2; S%= 2.00]	0100	1 2.0	31.13	1.26	1.47	14.45	0.39	0.000
CHANNEL[ 2 : 0100]	0302	1 2.0	31.13	1.25	1.50	14.45	n/a	0.000
** CALIB STANDHYD [I%=24.8; S%= 2.00]	0105	1 2.0	9.01	0.50	1.33	16.59	0.45	0.000
** CALIB STANDHYD [I%=25.4; S%= 2.00]	0110	1 2.0	12.37	0.53	1.40	14.76	0.40	0.000
CHANNEL[ 2 : 0110]	0303	1 2.0	12.37	0.51	1.43	14.76	n/a	0.000
ADD [0105 + 0302]	0802	3 2.0	40.14	1.58	1.50	14.93	n/a	0.000
ADD [0802 + 0303]	0802	1 2.0	52.51	2.08	1.47	14.89	n/a	0.000
PIPE [ 2 : 0802]	0400	1 2.0	52.51	2.08	1.47	14.89	n/a	0.000
** CALIB STANDHYD [I%=39.4; S%= 2.00]	0113	1 2.0	9.41	0.70	1.37	18.88	0.51	0.000
CHANNEL[ 2 : 0113]	0301	1 2.0	9.41	0.60	1.40	18.88	n/a	0.000
** CALIB STANDHYD [I%=27.5; S%= 2.00]	0118	1 2.0	4.11	0.22	1.37	14.32	0.39	0.000
RESRVR [ 2 : 0118 ] {ST= 0.00 ha.m }	0600	1 2.0	4.11	0.19	1.43	14.36	n/a	0.000
CHANNEL[ 2 : 0600]	0300	1 2.0	4.11	0.15	1.53	14.35	n/a	0.000
** CALIB STANDHYD [I%=22.9; S%= 2.00]	0101	1 2.0	8.68	0.39	1.37	12.11	0.33	0.000
ADD [0101 + 0300]	0801	3 2.0	12.79	0.50	1.37	12.83	n/a	0.000

*	CHANNEL[ 2 : 0801]	0304	1 2.0	12.79	0.42	1.43	12.82	n/a	0.000
**	CALIB STANDHYD [I%=27.1; S%= 2.00]	0123	1 2.0	22.81	0.91	1.47	15.50	0.42	0.000
*	ADD [0123 + 0301]	0800	3 2.0	32.22	1.49	1.43	16.48	n/a	0.000
*	ADD [0800 + 0304]	0800	1 2.0	45.01	1.91	1.43	15.44	n/a	0.000
*	ADD [0800 + 0400]	0800	3 2.0	97.52	3.97	1.47	15.15	n/a	0.000
*	RESRVR [ 2 : 0800 ] {ST= 0.55 ha.m }	0601	1 2.0	97.52	1.64	2.03	14.86	n/a	0.000
*	PIPE [ 2 : 0601]	0403	1 2.0	97.52	1.64	2.07	14.86	n/a	0.000
*	CHANNEL[ 2 : 0403]	0317	1 2.0	97.52	1.59	2.17	14.85	n/a	0.000
**	CALIB STANDHYD [I%=22.0; S%= 2.00]	0102	1 2.0	19.41	0.79	1.40	16.20	0.44	0.000
*	ADD [0102 + 0317]	0803	3 2.0	116.93	1.92	2.10	15.08	n/a	0.000
**	CALIB STANDHYD [I%=37.1; S%= 2.00]	0103	1 2.0	35.79	2.34	1.43	20.81	0.56	0.000
**	CALIB STANDHYD [I%=20.7; S%= 2.00]	0104	1 2.0	5.22	0.25	1.37	17.54	0.47	0.000
**	CALIB STANDHYD [I%=21.1; S%= 2.00]	0106	1 2.0	13.71	0.54	1.40	15.16	0.41	0.000
*	CALIB STANDHYD [I%=18.1; S%= 2.00]	0107	1 5.0	8.53	0.38	1.33	16.69	0.45	0.000
*	CALIB STANDHYD [I%=24.4; S%= 2.00]	0108	1 2.0	58.75	1.82	1.53	13.74	0.37	0.000
*	CHANNEL[ 2 : 0108]	0307	1 2.0	58.75	1.76	1.60	13.74	n/a	0.000
*	CALIB STANDHYD [I%= 3.0; S%= 2.00]	0109	1 2.0	13.70	0.50	1.57	13.94	0.38	0.000
*	ADD [0109 + 0307]	0806	3 2.0	72.45	2.25	1.60	13.78	n/a	0.000
*	CHANNEL[ 2 : 0806]	0308	1 2.0	72.45	2.24	1.60	13.78	n/a	0.000
*	ADD [0107 + 0308]	0807	3 2.0	80.98	2.54	1.60	14.09	n/a	0.000
*	CHANNEL[ 2 : 0807]	0306	1 2.0	80.98	2.52	1.63	14.09	n/a	0.000
*	ADD [0106 + 0306]	0804	3 2.0	94.69	2.95	1.63	14.24	n/a	0.000
*	CHANNEL[ 2 : 0804]	0305	1 2.0	94.69	2.84	1.67	14.24	n/a	0.000
*	ADD [0104 + 0305]	0093	3 2.0	99.91	3.03	1.67	14.42	n/a	0.000
*	ADD [0103 + 0093]	0805	3 2.0	135.70	4.83	1.60	16.10	n/a	0.000
*	CHANNEL[ 2 : 0805]	0312	1 2.0	135.70	4.71	1.63	16.10	n/a	0.000
*	ADD [0312 + 0803]	0094	3 2.0	252.63	6.21	1.67	15.63	n/a	0.000
*	CHANNEL[ 2 : 0094]	0309	1 2.0	252.63	6.21	1.67	15.63	n/a	0.000
*	CALIB STANDHYD [I%=22.2; S%= 2.00]	0111	1 2.0	3.57	0.16	1.37	16.46	0.45	0.000
*	ADD [0111 + 0309]	0808	3 2.0	256.20	6.32	1.67	15.64	n/a	0.000
*	CHANNEL[ 2 : 0808]	0310	1 2.0	256.20	6.32	1.70	15.64	n/a	0.000
*	CALIB STANDHYD [I%=23.9; S%= 2.00]	0112	1 2.0	16.90	0.76	1.43	17.76	0.48	0.000
*	ADD [0112 + 0310]	0809	3 2.0	273.10	6.93	1.67	15.77	n/a	0.000
*	CHANNEL[ 2 : 0809]	0311	1 2.0	273.10	6.76	1.77	15.77	n/a	0.000
*	CALIB STANDHYD [I%=17.3; S%= 2.00]	0114	1 2.0	4.95	0.21	1.40	16.40	0.44	0.000
*	ADD [0114 + 0311]	0810	3 2.0	278.05	6.91	1.73	15.78	n/a	0.000

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* CHANNEL[ 2 : 0810] 0313 1 2.0 278.05 6.91 1.77 15.78 n/a 0.000
* CALI B STANDHYD [I%=28.8: S%= 2.00] 0115 1 2.0 12.66 0.59 1.43 15.75 0.43 0.000
* ADD [0115 + 0313] 0811 3 2.0 290.71 7.26 1.73 15.78 n/a 0.000
* CHANNEL[ 2 : 0811] 0314 1 2.0 290.71 7.25 1.77 15.78 n/a 0.000
* CALI B STANDHYD [I%=25.5: S%= 2.00] 0116 1 2.0 26.63 1.24 1.40 15.42 0.42 0.000
* ADD [0116 + 0314] 0812 3 2.0 317.34 7.94 1.73 15.75 n/a 0.000
* PIPE [ 2 : 0812] 0401 1 2.0 317.34 7.94 1.73 15.75 n/a 0.000
* CALI B STANDHYD [I%=25.1: S%= 2.00] 0117 1 2.0 27.32 1.10 1.40 12.10 0.33 0.000
* ADD [0117 + 0401] 0813 3 2.0 344.66 8.45 1.70 15.46 n/a 0.000
* CHANNEL[ 2 : 0813] 0315 1 2.0 344.66 8.43 1.73 15.46 n/a 0.000
* CALI B STANDHYD [I%=26.9: S%= 2.00] 0119 1 2.0 16.91 0.69 1.43 13.30 0.36 0.000
* ADD [0119 + 0315] 0814 3 2.0 361.57 8.80 1.73 15.36 n/a 0.000
* PIPE [ 2 : 0814] 0402 1 2.0 361.57 8.81 1.73 15.36 n/a 0.000
* CALI B STANDHYD [I%=20.9: S%= 2.00] 0120 1 2.0 17.04 0.60 1.40 10.98 0.30 0.000
* CHANNEL[ 2 : 0120] 0316 1 2.0 17.04 0.58 1.43 10.98 n/a 0.000
* CALI B STANDHYD [I%=14.6: S%= 2.00] 0121 1 2.0 1.39 0.05 1.33 7.97 0.22 0.000
* CALI B STANDHYD [I%=26.5: S%= 2.00] 0122 1 2.0 3.13 0.18 1.33 12.36 0.33 0.000
* ADD [0121 + 0122] 0815 3 2.0 4.52 0.23 1.33 11.00 n/a 0.000
* ADD [0815 + 0316] 0815 1 2.0 21.56 0.71 1.37 10.99 n/a 0.000
* ADD [0815 + 0402] 0815 3 2.0 383.13 9.17 1.73 15.11 n/a 0.000
* PIPE [ 2 : 0815] 0404 1 2.0 383.13 9.17 1.73 15.11 n/a 0.000
* CALI B STANDHYD [I%=33.4: S%= 2.00] 0124 1 2.0 21.61 1.30 1.37 14.88 0.40 0.000
* ADD [0124 + 0404] 0816 3 2.0 404.74 9.61 1.70 15.10 n/a 0.000
* DUHYD MAJOR SYSTEM: 0500 1 2.0 404.74 9.61 1.70 15.10 n/a 0.000
* MINOR SYSTEM: 0500 2 2.0 304.99 8.74 1.70 15.10 n/a 0.000
* 0500 3 2.0 99.74 0.87 1.17 15.10 n/a 0.000
* PIPE [ 2 : 0500] 0405 1 2.0 304.99 8.74 1.73 15.10 n/a 0.000
* CALI B STANDHYD [I%=44.1: S%= 2.00] 0125 1 2.0 18.74 1.28 1.43 18.67 0.51 0.000
* ADD [0125 + 0405] 0817 3 2.0 323.73 9.41 1.70 15.31 n/a 0.000
* PIPE [ 2 : 0500] 0408 1 2.0 99.74 0.87 1.53 15.10 n/a 0.000
* CALI B STANDHYD [I%=32.1: S%= 2.00] 0126 1 2.0 22.26 1.35 1.37 13.99 0.38 0.000
* ADD [0126 + 0408] 0820 3 2.0 122.00 2.22 1.37 14.90 n/a 0.000
* PIPE [ 2 : 0820] 0406 1 2.0 122.00 2.22 1.37 14.90 n/a 0.000
* CALI B STANDHYD [I%=27.4: S%= 2.00] 0127 1 2.0 9.98 0.49 1.37 12.24 0.33 0.000
* ADD [0127 + 0406] 0818 3 2.0 131.98 2.70 1.37 14.70 n/a 0.000
* PIPE [ 2 : 0818] 0407 1 2.0 131.98 2.65 1.40 14.70 n/a 0.000
* CALI B STANDHYD [I%=45.4: S%= 2.00] 0128 1 2.0 14.87 1.30 1.37 19.55 0.53 0.000

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* ADD [0128 + 0407] 0819 3 2.0 146.85 3.89 1.37 15.19 n/a 0.000
*****
** SIMULATION NUMBER: 2 ** 1:5 Year Chicago Design Storm
*****
W/E COMMAND HYD ID DT AREA Opeak Tpeak R.V. R.C. Obase
mi n ha cms hrs mm cms
START @ 0.00 hrs
READ STORM 10.0
[ Ptot= 50.52 mm ]
fname : C:\Users\dtwi gger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\A780b9b3-7787-4bbe-812
remark: * Ci ty of Barrie - 5 yr Chicago (4hr) + 15%
** CALI B STANDHYD 0100 1 2.0 31.13 1.90 1.43 22.20 0.44 0.000
* CHANNEL[ 2 : 0100] 0302 1 2.0 31.13 1.88 1.47 22.20 n/a 0.000
** CALI B STANDHYD 0105 1 2.0 9.01 0.76 1.33 26.06 0.52 0.000
* CALI B STANDHYD 0110 1 2.0 12.37 0.80 1.40 23.03 0.46 0.000
* CHANNEL[ 2 : 0110] 0303 1 2.0 12.37 0.77 1.43 23.03 n/a 0.000
* ADD [0105 + 0302] 0802 3 2.0 40.14 2.48 1.47 23.07 n/a 0.000
* ADD [0802 + 0303] 0802 1 2.0 52.51 3.25 1.47 23.06 n/a 0.000
* PIPE [ 2 : 0802] 0400 1 2.0 52.51 3.25 1.47 23.06 n/a 0.000
** CALI B STANDHYD 0113 1 2.0 9.41 1.04 1.37 28.32 0.56 0.000
* CHANNEL[ 2 : 0113] 0301 1 2.0 9.41 0.92 1.43 28.31 n/a 0.000
** CALI B STANDHYD 0118 1 2.0 4.11 0.32 1.33 22.10 0.44 0.000
* RESRVR [ 2 : 0118] 0600 1 2.0 4.11 0.21 1.47 22.12 n/a 0.000
{ST= 0.01 ha.m }
* CHANNEL[ 2 : 0600] 0300 1 2.0 4.11 0.20 1.67 22.09 n/a 0.000
** CALI B STANDHYD 0101 1 2.0 8.68 0.57 1.33 18.90 0.37 0.000
* ADD [0101 + 0300] 0801 3 2.0 12.79 0.69 1.33 19.93 n/a 0.000
* CHANNEL[ 2 : 0801] 0304 1 2.0 12.79 0.59 1.40 19.92 n/a 0.000
** CALI B STANDHYD 0123 1 2.0 22.81 1.42 1.43 24.22 0.48 0.000
* ADD [0123 + 0301] 0800 3 2.0 32.22 2.34 1.43 25.41 n/a 0.000
* ADD [0800 + 0304] 0800 1 2.0 45.01 2.91 1.43 23.85 n/a 0.000
* ADD [0800 + 0400] 0800 3 2.0 97.52 6.15 1.43 23.43 n/a 0.000
* RESRVR [ 2 : 0800] 0601 1 2.0 97.52 3.16 1.90 23.14 n/a 0.000
{ST= 0.76 ha.m }
* PIPE [ 2 : 0601] 0403 1 2.0 97.52 3.16 1.90 23.14 n/a 0.000
* CHANNEL[ 2 : 0403] 0317 1 2.0 97.52 3.06 2.00 23.13 n/a 0.000
** CALI B STANDHYD 0102 1 2.0 19.41 1.30 1.43 25.79 0.51 0.000
* ADD [0102 + 0317] 0803 3 2.0 116.93 3.70 1.93 23.57 n/a 0.000
** CALI B STANDHYD 0103 1 2.0 35.79 3.52 1.43 31.47 0.62 0.000
* CALI B STANDHYD 0104 1 2.0 5.22 0.42 1.37 27.72 0.55 0.000
* CALI B STANDHYD 0106 1 2.0 13.71 0.87 1.43 24.05 0.48 0.000

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* * * * * [I%=21.1:S%= 2.00]
* * CALI B STANDHYD 0107 1 5.0 8.53 0.63 1.33 26.62 0.53 0.000
* * [I%=18.1:S%= 2.00]
* * * * * CALI B STANDHYD 0108 1 2.0 58.75 2.87 1.53 21.43 0.42 0.000
* * [I%=24.4:S%= 2.00]
* * CHANNEL[ 2 : 0108] 0307 1 2.0 58.75 2.80 1.57 21.43 n/a 0.000
* * * * * CALI B STANDHYD 0109 1 2.0 13.70 0.95 1.50 23.38 0.46 0.000
* * [I%= 3.0:S%= 2.00]
* * ADD [0109 + 0307] 0806 3 2.0 72.45 3.70 1.53 21.80 n/a 0.000
* * CHANNEL[ 2 : 0806] 0308 1 2.0 72.45 3.69 1.57 21.80 n/a 0.000
* * ADD [0107 + 0308] 0807 3 2.0 80.98 4.23 1.57 22.31 n/a 0.000
* * CHANNEL[ 2 : 0807] 0306 1 2.0 80.98 4.20 1.60 22.31 n/a 0.000
* * ADD [0106 + 0306] 0804 3 2.0 94.69 4.99 1.57 22.56 n/a 0.000
* * CHANNEL[ 2 : 0804] 0305 1 2.0 94.69 4.79 1.63 22.56 n/a 0.000
* * ADD [0104 + 0305] 0093 3 2.0 99.91 5.10 1.63 22.83 n/a 0.000
* * ADD [0103 + 0093] 0805 3 2.0 135.70 7.90 1.57 25.11 n/a 0.000
* * CHANNEL[ 2 : 0805] 0312 1 2.0 135.70 7.70 1.60 25.11 n/a 0.000
* * ADD [0312 + 0803] 0094 3 2.0 252.63 10.61 1.70 24.40 n/a 0.000
* * CHANNEL[ 2 : 0094] 0309 1 2.0 252.63 10.62 1.70 24.40 n/a 0.000
* * * * * CALI B STANDHYD 0111 1 2.0 3.57 0.26 1.40 26.03 0.52 0.000
* * [I%=22.2:S%= 2.00]
* * ADD [0111 + 0309] 0808 3 2.0 256.20 10.79 1.70 24.42 n/a 0.000
* * CHANNEL[ 2 : 0808] 0310 1 2.0 256.20 10.79 1.70 24.42 n/a 0.000
* * * * * CALI B STANDHYD 0112 1 2.0 16.90 1.25 1.43 27.86 0.55 0.000
* * [I%=23.9:S%= 2.00]
* * ADD [0112 + 0310] 0809 3 2.0 273.10 11.76 1.67 24.63 n/a 0.000
* * CHANNEL[ 2 : 0809] 0311 1 2.0 273.10 11.54 1.73 24.63 n/a 0.000
* * * * * CALI B STANDHYD 0114 1 2.0 4.95 0.35 1.50 26.26 0.52 0.000
* * [I%=17.3:S%= 2.00]
* * ADD [0114 + 0311] 0810 3 2.0 278.05 11.78 1.73 24.66 n/a 0.000
* * CHANNEL[ 2 : 0810] 0313 1 2.0 278.05 11.77 1.73 24.66 n/a 0.000
* * * * * CALI B STANDHYD 0115 1 2.0 12.66 0.88 1.40 24.25 0.48 0.000
* * [I%=28.8:S%= 2.00]
* * ADD [0115 + 0313] 0811 3 2.0 290.71 12.31 1.73 24.64 n/a 0.000
* * CHANNEL[ 2 : 0811] 0314 1 2.0 290.71 12.30 1.73 24.64 n/a 0.000
* * * * * CALI B STANDHYD 0116 1 2.0 26.63 1.87 1.37 24.10 0.48 0.000
* * [I%=25.5:S%= 2.00]
* * ADD [0116 + 0314] 0812 3 2.0 317.34 13.39 1.73 24.60 n/a 0.000
* * PIPE [ 2 : 0812] 0401 1 2.0 317.34 13.39 1.73 24.60 n/a 0.000
* * * * * CALI B STANDHYD 0117 1 2.0 27.32 1.57 1.40 18.49 0.37 0.000
* * [I%=25.1:S%= 2.00]
* * ADD [0117 + 0401] 0813 3 2.0 344.66 14.22 1.70 24.11 n/a 0.000
* * CHANNEL[ 2 : 0813] 0315 1 2.0 344.66 14.10 1.77 24.11 n/a 0.000
* * * * * CALI B STANDHYD 0119 1 2.0 16.91 1.01 1.40 20.44 0.40 0.000
* * [I%=26.9:S%= 2.00]
* * ADD [0119 + 0315] 0814 3 2.0 361.57 14.65 1.73 23.94 n/a 0.000
* * PIPE [ 2 : 0814] 0402 1 2.0 361.57 14.65 1.77 23.94 n/a 0.000

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* * * * * CALI B STANDHYD 0120 1 2.0 17.04 0.88 1.37 17.09 0.34 0.000
* * [I%=20.9:S%= 2.00]
* * CHANNEL[ 2 : 0120] 0316 1 2.0 17.04 0.85 1.40 17.09 n/a 0.000
* * * * * CALI B STANDHYD 0121 1 2.0 1.39 0.06 1.33 12.68 0.25 0.000
* * [I%=14.6:S%= 2.00]
* * * * * CALI B STANDHYD 0122 1 2.0 3.13 0.25 1.33 18.74 0.37 0.000
* * [I%=26.5:S%= 2.00]
* * ADD [0121 + 0122] 0815 3 2.0 4.52 0.31 1.33 16.88 n/a 0.000
* * ADD [0815 + 0316] 0815 1 2.0 21.56 1.09 1.37 17.05 n/a 0.000
* * ADD [0815 + 0402] 0815 3 2.0 383.13 15.22 1.73 23.55 n/a 0.000
* * PIPE [ 2 : 0815] 0404 1 2.0 383.13 15.21 1.77 23.55 n/a 0.000
* * * * * CALI B STANDHYD 0124 1 2.0 21.61 1.91 1.37 22.21 0.44 0.000
* * [I%=33.4:S%= 2.00]
* * ADD [0124 + 0404] 0816 3 2.0 404.74 15.85 1.73 23.48 n/a 0.000
* * DUHYD 0500 1 2.0 404.74 15.85 1.73 23.48 n/a 0.000
* * MAJOR SYSTEM: 0500 2 2.0 334.35 14.98 1.73 23.48 n/a 0.000
* * MINOR SYSTEM: 0500 3 2.0 70.38 0.87 1.03 23.48 n/a 0.000
* * PIPE [ 2 : 0500] 0405 1 2.0 334.35 14.98 1.77 23.48 n/a 0.000
* * * * * CALI B STANDHYD 0125 1 2.0 18.74 1.85 1.40 27.38 0.54 0.000
* * [I%=44.1:S%= 2.00]
* * ADD [0125 + 0405] 0817 3 2.0 353.09 15.80 1.73 23.69 n/a 0.000
* * PIPE [ 2 : 0500] 0408 1 2.0 70.38 0.87 1.37 23.48 n/a 0.000
* * * * * CALI B STANDHYD 0126 1 2.0 22.26 1.93 1.33 20.87 0.41 0.000
* * [I%=32.1:S%= 2.00]
* * ADD [0126 + 0408] 0820 3 2.0 92.64 2.80 1.33 22.85 n/a 0.000
* * PIPE [ 2 : 0820] 0406 1 2.0 92.64 2.75 1.37 22.85 n/a 0.000
* * * * * CALI B STANDHYD 0127 1 2.0 9.98 0.68 1.37 18.45 0.37 0.000
* * [I%=27.4:S%= 2.00]
* * ADD [0127 + 0406] 0818 3 2.0 102.62 3.43 1.37 22.42 n/a 0.000
* * PIPE [ 2 : 0818] 0407 1 2.0 102.62 3.37 1.37 22.42 n/a 0.000
* * * * * CALI B STANDHYD 0128 1 2.0 14.87 1.84 1.37 28.69 0.57 0.000
* * [I%=45.4:S%= 2.00]
* * ADD [0128 + 0407] 0819 3 2.0 117.49 5.21 1.37 23.22 n/a 0.000

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\*\* SIMULATI ON NUMBER: 3 \*\* **1:10 Year Chicago Design Storm**  
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W/E COMMAND	HYD ID	DT min	AREA ha	Opeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
START @ 0.00 hrs								
-----								
READ STORM		10.0						
[ Ptot= 59.69 mm ]								
fname : C:\Users\dtwi gger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\def0ee31-d85f-455f-975								
remark: * City of Barrie - 10 yr Chicago (4hr) + 15%								
** CALI B STANDHYD [I%=28.2:S%= 2.00]	0100	1 2.0	31.13	2.40	1.40	27.92	0.47	0.000
CHANNEL[ 2 : 0100]	0302	1 2.0	31.13	2.39	1.43	27.91	n/a	0.000
** CALI B STANDHYD [I%=24.8:S%= 2.00]	0105	1 2.0	9.01	0.94	1.33	32.98	0.55	0.000
** CALI B STANDHYD [I%=25.4:S%= 2.00]	0110	1 2.0	12.37	1.02	1.40	29.15	0.49	0.000
CHANNEL[ 2 : 0110]	0303	1 2.0	12.37	0.99	1.43	29.15	n/a	0.000
ADD [0105 + 0302]	0802	3 2.0	40.14	3.18	1.43	29.05	n/a	0.000



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* [I%=44.1; S%= 2.00]
* ADD [0125 + 0405] 0817 3 2.0 365.47 21.32 1.70 29.84 n/a 0.000
* PIPE [ 2 : 0500] 0408 1 2.0 58.01 0.87 1.03 29.63 n/a 0.000
** CALI B STANDHYD [I%=32.1; S%= 2.00]
* ADD [0126 + 0408] 0820 3 2.0 80.27 3.26 1.33 28.59 n/a 0.000
* PIPE [ 2 : 0820] 0406 1 2.0 80.27 3.22 1.37 28.59 n/a 0.000
** CALI B STANDHYD [I%=27.4; S%= 2.00]
* ADD [0127 + 0406] 0818 3 2.0 90.25 4.04 1.37 27.98 n/a 0.000
* PIPE [ 2 : 0818] 0407 1 2.0 90.25 3.96 1.37 27.98 n/a 0.000
** CALI B STANDHYD [I%=45.4; S%= 2.00]
* ADD [0128 + 0407] 0819 3 2.0 105.12 6.17 1.37 29.00 n/a 0.000

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\*\*\*\*\*  
\*\* SIMULATION NUMBER: 4 \*\* **1:25 Year Chicago Design Storm**  
\*\*\*\*\*

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W/E COMMAND HYD ID DT AREA Qpeak Tpeak R.V. R.C. Qbase
mi n ha cms hrs mm cms

START @ 0.00 hrs
READ STORM 10.0
[ Ptot= 71.24 mm ]
fname : C:\Users\dtwi gger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\c30c094f-4cd4-4ea4-93c
remark: * City of Barrie - 25 yr Chicago (4hr) + 15%
** CALI B STANDHYD [I%=28.2; S%= 2.00]
* CHANNEL[ 2 : 0100] 0302 1 2.0 31.13 3.10 1.43 35.55 n/a 0.000
** CALI B STANDHYD [I%=24.8; S%= 2.00]
* CALI B STANDHYD 0105 1 2.0 9.01 1.27 1.37 42.13 0.59 0.000
** CALI B STANDHYD [I%=25.4; S%= 2.00]
* CHANNEL[ 2 : 0110] 0303 1 2.0 12.37 1.28 1.43 37.31 n/a 0.000
* ADD [0105 + 0302] 0802 3 2.0 40.14 4.20 1.43 37.03 n/a 0.000
* ADD [0802 + 0303] 0802 1 2.0 52.51 5.48 1.43 37.09 n/a 0.000
* PIPE [ 2 : 0802] 0400 1 2.0 52.51 5.48 1.43 37.09 n/a 0.000
** CALI B STANDHYD [I%=39.4; S%= 2.00]
* CHANNEL[ 2 : 0113] 0301 1 2.0 9.41 1.43 1.40 44.05 n/a 0.000
** CALI B STANDHYD [I%=27.5; S%= 2.00]
* RESRVR [ 2 : 0118] {ST= 0.02 ha.m }
* CHANNEL[ 2 : 0600] 0300 1 2.0 4.11 0.28 1.73 35.58 n/a 0.000
** CALI B STANDHYD [I%=22.9; S%= 2.00]
* ADD [0101 + 0300] 0801 3 2.0 12.79 1.02 1.33 32.38 n/a 0.000
* CHANNEL[ 2 : 0801] 0304 1 2.0 12.79 0.89 1.40 32.37 n/a 0.000
** CALI B STANDHYD [I%=27.1; S%= 2.00]
* ADD [0123 + 0301] 0800 3 2.0 32.22 3.75 1.40 40.61 n/a 0.000
* ADD [0800 + 0304] 0800 1 2.0 45.01 4.65 1.40 38.27 n/a 0.000

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* ADD [0800 + 0400] 0800 3 2.0 97.52 10.09 1.43 37.63 n/a 0.000
* RESRVR [ 2 : 0800] {ST= 0.99 ha.m }
* PIPE [ 2 : 0601] 0403 1 2.0 97.52 7.32 1.70 37.34 n/a 0.000
* CHANNEL[ 2 : 0403] 0317 1 2.0 97.52 6.84 1.80 37.34 n/a 0.000
** CALI B STANDHYD [I%=22.0; S%= 2.00]
* ADD [0102 + 0317] 0803 3 2.0 116.93 8.21 1.77 38.13 n/a 0.000
** CALI B STANDHYD [I%=37.1; S%= 2.00]
* CALI B STANDHYD 0103 1 2.0 35.79 5.69 1.43 48.98 0.69 0.000
** CALI B STANDHYD [I%=20.7; S%= 2.00]
* CALI B STANDHYD 0104 1 2.0 5.22 0.74 1.37 44.78 0.63 0.000
** CALI B STANDHYD [I%=21.1; S%= 2.00]
* CALI B STANDHYD 0106 1 2.0 13.71 1.44 1.40 39.33 0.55 0.000
* CALI B STANDHYD [I%=18.1; S%= 2.00]
* CALI B STANDHYD 0107 1 5.0 8.53 1.08 1.50 43.37 0.61 0.000
* CALI B STANDHYD [I%=24.4; S%= 2.00]
* CHANNEL[ 2 : 0108] 0307 1 2.0 58.75 4.79 1.57 34.80 n/a 0.000
* CALI B STANDHYD [I%= 3.0; S%= 2.00]
* ADD [0109 + 0307] 0806 3 2.0 72.45 6.43 1.53 35.71 n/a 0.000
* CHANNEL[ 2 : 0806] 0308 1 2.0 72.45 6.42 1.53 35.71 n/a 0.000
* ADD [0107 + 0308] 0807 3 2.0 80.98 7.43 1.53 36.52 n/a 0.000
* CHANNEL[ 2 : 0807] 0306 1 2.0 80.98 7.36 1.53 36.52 n/a 0.000
* ADD [0106 + 0306] 0804 3 2.0 94.69 8.78 1.53 36.92 n/a 0.000
* CHANNEL[ 2 : 0804] 0305 1 2.0 94.69 8.35 1.60 36.92 n/a 0.000
* ADD [0104 + 0305] 0093 3 2.0 99.91 8.89 1.60 37.33 n/a 0.000
* ADD [0103 + 0093] 0805 3 2.0 135.70 13.51 1.53 40.41 n/a 0.000
* CHANNEL[ 2 : 0805] 0312 1 2.0 135.70 13.19 1.57 40.41 n/a 0.000
* ADD [0312 + 0803] 0094 3 2.0 252.63 20.23 1.67 39.35 n/a 0.000
* CHANNEL[ 2 : 0094] 0309 1 2.0 252.63 20.23 1.70 39.35 n/a 0.000
* CALI B STANDHYD [I%=22.2; S%= 2.00]
* ADD [0111 + 0309] 0808 3 2.0 256.20 20.51 1.70 39.39 n/a 0.000
* CHANNEL[ 2 : 0808] 0310 1 2.0 256.20 20.49 1.70 39.39 n/a 0.000
* CALI B STANDHYD [I%=23.9; S%= 2.00]
* ADD [0112 + 0310] 0809 3 2.0 273.10 21.99 1.70 39.73 n/a 0.000
* CHANNEL[ 2 : 0809] 0311 1 2.0 273.10 21.60 1.73 39.72 n/a 0.000
* CALI B STANDHYD [I%=17.3; S%= 2.00]
* ADD [0114 + 0311] 0810 3 2.0 278.05 21.97 1.73 39.78 n/a 0.000
* CHANNEL[ 2 : 0810] 0313 1 2.0 278.05 21.97 1.73 39.78 n/a 0.000
* CALI B STANDHYD [I%=28.8; S%= 2.00]
* ADD [0115 + 0313] 0811 3 2.0 290.71 22.84 1.73 39.74 n/a 0.000
* CHANNEL[ 2 : 0811] 0314 1 2.0 290.71 22.81 1.73 39.74 n/a 0.000

```

```

* * CALI B STANDHYD 0116 1 2.0 26.63 3.17 1.40 39.00 0.55 0.000
  [I%=25.5: S%= 2.00]
*
* ADD [0116 + 0314] 0812 3 2.0 317.34 24.57 1.73 39.68 n/a 0.000
*
* PIPE [ 2 : 0812] 0401 1 2.0 317.34 24.57 1.73 39.68 n/a 0.000
*
* * CALI B STANDHYD 0117 1 2.0 27.32 2.46 1.37 29.62 0.42 0.000
  [I%=25.1: S%= 2.00]
*
* ADD [0117 + 0401] 0813 3 2.0 344.66 25.85 1.73 38.88 n/a 0.000
*
* CHANNEL[ 2 : 0813] 0315 1 2.0 344.66 25.72 1.77 38.88 n/a 0.000
*
* * CALI B STANDHYD 0119 1 2.0 16.91 1.60 1.40 32.82 0.46 0.000
  [I%=26.9: S%= 2.00]
*
* ADD [0119 + 0315] 0814 3 2.0 361.57 26.64 1.73 38.60 n/a 0.000
*
* PIPE [ 2 : 0814] 0402 1 2.0 361.57 26.63 1.77 38.60 n/a 0.000
*
* * CALI B STANDHYD 0120 1 2.0 17.04 1.37 1.37 27.91 0.39 0.000
  [I%=20.9: S%= 2.00]
*
* CHANNEL[ 2 : 0120] 0316 1 2.0 17.04 1.37 1.40 27.91 n/a 0.000
*
* * CALI B STANDHYD 0121 1 2.0 1.39 0.09 1.33 21.28 0.30 0.000
  [I%=14.6: S%= 2.00]
*
* * CALI B STANDHYD 0122 1 2.0 3.13 0.38 1.33 29.81 0.42 0.000
  [I%=26.5: S%= 2.00]
*
* ADD [0121 + 0122] 0815 3 2.0 4.52 0.48 1.33 27.18 n/a 0.000
*
* ADD [0815 + 0316] 0815 1 2.0 21.56 1.77 1.37 27.76 n/a 0.000
*
* ADD [0815 + 0402] 0815 3 2.0 383.13 27.60 1.73 37.99 n/a 0.000
*
* PIPE [ 2 : 0815] 0404 1 2.0 383.13 27.58 1.77 37.99 n/a 0.000
*
* * CALI B STANDHYD 0124 1 2.0 21.61 2.82 1.37 34.65 0.49 0.000
  [I%=33.4: S%= 2.00]
*
* ADD [0124 + 0404] 0816 3 2.0 404.74 28.63 1.73 37.81 n/a 0.000
*
* DUHYD 0500 1 2.0 404.74 28.63 1.73 37.81 n/a 0.000
  MAJOR SYSTEM: 0500 2 2.0 357.56 27.76 1.73 37.81 n/a 0.000
  MINOR SYSTEM: 0500 3 2.0 47.18 0.87 0.83 37.81 n/a 0.000
*
* PIPE [ 2 : 0500] 0405 1 2.0 357.56 27.73 1.73 37.81 n/a 0.000
*
* ** CALI B STANDHYD 0125 1 2.0 18.74 2.81 1.40 41.78 0.59 0.000
  [I%=44.1: S%= 2.00]
*
* ADD [0125 + 0405] 0817 3 2.0 376.30 28.98 1.73 38.01 n/a 0.000
*
* PIPE [ 2 : 0500] 0408 1 2.0 47.18 0.87 0.93 37.81 n/a 0.000
*
* ** CALI B STANDHYD 0126 1 2.0 22.26 2.96 1.33 32.57 0.46 0.000
  [I%=32.1: S%= 2.00]
*
* ADD [0126 + 0408] 0820 3 2.0 69.44 3.82 1.33 36.13 n/a 0.000
*
* PIPE [ 2 : 0820] 0406 1 2.0 69.44 3.79 1.37 36.13 n/a 0.000
*
* ** CALI B STANDHYD 0127 1 2.0 9.98 1.01 1.37 29.15 0.41 0.000
  [I%=27.4: S%= 2.00]
*
* ADD [0127 + 0406] 0818 3 2.0 79.42 4.80 1.37 35.25 n/a 0.000
*
* PIPE [ 2 : 0818] 0407 1 2.0 79.42 4.69 1.37 35.25 n/a 0.000
*
* ** CALI B STANDHYD 0128 1 2.0 14.87 2.79 1.33 43.76 0.61 0.000
  [I%=45.4: S%= 2.00]
*
* ADD [0128 + 0407] 0819 3 2.0 94.29 7.43 1.37 36.59 n/a 0.000

```

\*\*\*\*\*  
\*\* SIMULATION NUMBER: 5 \*\* **1:50 Year Chicago Design Storm**  
\*\*\*\*\*

W/E COMMAND	HYD ID	DT min	AREA ha	Opeak cms	Tpeak hrs	R. V. mm	R. C.	Qbase cms
-------------	--------	--------	---------	-----------	-----------	----------	-------	-----------

```

START @ 0.00 hrs
-----
READ STORM [ Ptot= 79.45 mm ] 10.0
fname : C:\Users\dtwigger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\751284ce-ac28-47ed-abd
remark: * City of Barrile - 50 yr Chicago (4hr) + 15%
*
* ** CALI B STANDHYD 0100 1 2.0 31.13 3.73 1.43 41.25 0.52 0.000
  [I%=28.2: S%= 2.00]
*
* CHANNEL[ 2 : 0100] 0302 1 2.0 31.13 3.70 1.43 41.25 n/a 0.000
*
* ** CALI B STANDHYD 0105 1 2.0 9.01 1.48 1.37 48.87 0.62 0.000
  [I%=24.8: S%= 2.00]
*
* ** CALI B STANDHYD 0110 1 2.0 12.37 1.52 1.40 43.38 0.55 0.000
  [I%=25.4: S%= 2.00]
*
* CHANNEL[ 2 : 0110] 0303 1 2.0 12.37 1.49 1.43 43.38 n/a 0.000
*
* ADD [0105 + 0302] 0802 3 2.0 40.14 5.01 1.43 42.96 n/a 0.000
*
* ADD [0802 + 0303] 0802 1 2.0 52.51 6.49 1.43 43.06 n/a 0.000
*
* PIPE [ 2 : 0802] 0400 1 2.0 52.51 6.49 1.43 43.06 n/a 0.000
*
* ** CALI B STANDHYD 0113 1 2.0 9.41 1.81 1.33 50.63 0.64 0.000
  [I%=39.4: S%= 2.00]
*
* CHANNEL[ 2 : 0113] 0301 1 2.0 9.41 1.64 1.40 50.62 n/a 0.000
*
* ** CALI B STANDHYD 0118 1 2.0 4.11 0.59 1.33 41.27 0.52 0.000
  [I%=27.5: S%= 2.00]
*
* RESRVR [ 2 : 0118] 0600 1 2.0 4.11 0.33 1.60 41.32 n/a 0.000
  {ST= 0.03 ha.m }
*
* CHANNEL[ 2 : 0600] 0300 1 2.0 4.11 0.32 1.73 41.29 n/a 0.000
*
* ** CALI B STANDHYD 0101 1 2.0 8.68 1.01 1.33 36.03 0.45 0.000
  [I%=22.9: S%= 2.00]
*
* ADD [0101 + 0300] 0801 3 2.0 12.79 1.18 1.37 37.72 n/a 0.000
*
* CHANNEL[ 2 : 0801] 0304 1 2.0 12.79 1.05 1.40 37.72 n/a 0.000
*
* ** CALI B STANDHYD 0123 1 2.0 22.81 2.76 1.43 45.53 0.57 0.000
  [I%=27.1: S%= 2.00]
*
* ADD [0123 + 0301] 0800 3 2.0 32.22 4.35 1.40 47.02 n/a 0.000
*
* ADD [0800 + 0304] 0800 1 2.0 45.01 5.40 1.40 44.37 n/a 0.000
*
* ADD [0800 + 0400] 0800 3 2.0 97.52 11.86 1.43 43.67 n/a 0.000
*
* RESRVR [ 2 : 0800] 0601 1 2.0 97.52 9.18 1.63 43.38 n/a 0.000
  {ST= 1.05 ha.m }
*
* PIPE [ 2 : 0601] 0403 1 2.0 97.52 9.17 1.63 43.38 n/a 0.000
*
* CHANNEL[ 2 : 0403] 0317 1 2.0 97.52 8.49 1.77 43.38 n/a 0.000
*
* ** CALI B STANDHYD 0102 1 2.0 19.41 2.75 1.40 48.90 0.62 0.000
  [I%=22.0: S%= 2.00]
*
* ADD [0102 + 0317] 0803 3 2.0 116.93 10.21 1.73 44.29 n/a 0.000
*
* ** CALI B STANDHYD 0103 1 2.0 35.79 6.58 1.43 56.20 0.71 0.000
  [I%=37.1: S%= 2.00]
*
* ** CALI B STANDHYD 0104 1 2.0 5.22 0.87 1.37 51.88 0.65 0.000
  [I%=20.7: S%= 2.00]
*
* ** CALI B STANDHYD 0106 1 2.0 13.71 1.80 1.40 45.79 0.58 0.000
  [I%=21.1: S%= 2.00]
*
* ** CALI B STANDHYD 0107 1 5.0 8.53 1.28 1.50 50.37 0.63 0.000
  [I%=18.1: S%= 2.00]
*
* ** CALI B STANDHYD 0108 1 2.0 58.75 5.73 1.47 40.53 0.51 0.000
  [I%=24.4: S%= 2.00]
*
* CHANNEL[ 2 : 0108] 0307 1 2.0 58.75 5.67 1.57 40.53 n/a 0.000

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* * CALI B STANDHYD 0109 1 2.0 13.70 2.23 1.43 46.46 0.58 0.000
* [I%= 3.0; S%= 2.00]
* * ADD [0109 + 0307] 0806 3 2.0 72.45 7.65 1.50 41.65 n/a 0.000
* * CHANNEL [ 2 : 0806] 0308 1 2.0 72.45 7.63 1.50 41.65 n/a 0.000
* * ADD [0107 + 0308] 0807 3 2.0 80.98 8.91 1.50 42.57 n/a 0.000
* * CHANNEL [ 2 : 0807] 0306 1 2.0 80.98 8.84 1.53 42.57 n/a 0.000
* * ADD [0106 + 0306] 0804 3 2.0 94.69 10.54 1.53 43.03 n/a 0.000
* * CHANNEL [ 2 : 0804] 0305 1 2.0 94.69 10.02 1.57 43.03 n/a 0.000
* * ADD [0104 + 0305] 0093 3 2.0 99.91 10.70 1.57 43.50 n/a 0.000
* * ADD [0103 + 0093] 0805 3 2.0 135.70 16.28 1.53 46.85 n/a 0.000
* * CHANNEL [ 2 : 0805] 0312 1 2.0 135.70 15.87 1.57 46.85 n/a 0.000
* * ADD [0312 + 0803] 0094 3 2.0 252.63 24.79 1.67 45.66 n/a 0.000
* * CHANNEL [ 2 : 0094] 0309 1 2.0 252.63 24.80 1.67 45.66 n/a 0.000
* ** CALI B STANDHYD 0111 1 2.0 3.57 0.55 1.37 49.08 0.62 0.000
* [I%=22.2; S%= 2.00]
* * ADD [0111 + 0309] 0808 3 2.0 256.20 25.15 1.67 45.71 n/a 0.000
* * CHANNEL [ 2 : 0808] 0310 1 2.0 256.20 25.16 1.67 45.71 n/a 0.000
* ** CALI B STANDHYD 0112 1 2.0 16.90 2.59 1.40 51.84 0.65 0.000
* [I%=23.9; S%= 2.00]
* * ADD [0112 + 0310] 0809 3 2.0 273.10 27.01 1.67 46.09 n/a 0.000
* * CHANNEL [ 2 : 0809] 0311 1 2.0 273.10 26.43 1.70 46.09 n/a 0.000
* * CALI B STANDHYD 0114 1 2.0 4.95 0.76 1.43 49.90 0.63 0.000
* [I%=17.3; S%= 2.00]
* * ADD [0114 + 0311] 0810 3 2.0 278.05 26.90 1.70 46.16 n/a 0.000
* * CHANNEL [ 2 : 0810] 0313 1 2.0 278.05 26.90 1.70 46.16 n/a 0.000
* * CALI B STANDHYD 0115 1 2.0 12.66 1.70 1.43 44.93 0.57 0.000
* [I%=28.8; S%= 2.00]
* * ADD [0115 + 0313] 0811 3 2.0 290.71 27.98 1.70 46.11 n/a 0.000
* * CHANNEL [ 2 : 0811] 0314 1 2.0 290.71 27.90 1.70 46.11 n/a 0.000
* * CALI B STANDHYD 0116 1 2.0 26.63 3.70 1.40 45.31 0.57 0.000
* [I%=25.5; S%= 2.00]
* * ADD [0116 + 0314] 0812 3 2.0 317.34 30.11 1.70 46.04 n/a 0.000
* * PIPE [ 2 : 0812] 0401 1 2.0 317.34 30.11 1.70 46.04 n/a 0.000
* * CALI B STANDHYD 0117 1 2.0 27.32 2.82 1.37 34.42 0.43 0.000
* [I%=25.1; S%= 2.00]
* * ADD [0117 + 0401] 0813 3 2.0 344.66 31.72 1.70 45.12 n/a 0.000
* * CHANNEL [ 2 : 0813] 0315 1 2.0 344.66 31.48 1.73 45.12 n/a 0.000
* * CALI B STANDHYD 0119 1 2.0 16.91 1.92 1.40 38.14 0.48 0.000
* [I%=26.9; S%= 2.00]
* * ADD [0119 + 0315] 0814 3 2.0 361.57 32.59 1.73 44.79 n/a 0.000
* * PIPE [ 2 : 0814] 0402 1 2.0 361.57 32.60 1.73 44.79 n/a 0.000
* * CALI B STANDHYD 0120 1 2.0 17.04 1.62 1.37 32.62 0.41 0.000
* [I%=20.9; S%= 2.00]
* * CHANNEL [ 2 : 0120] 0316 1 2.0 17.04 1.60 1.40 32.62 n/a 0.000
* * CALI B STANDHYD 0121 1 2.0 1.39 0.11 1.33 25.10 0.32 0.000
* [I%=14.6; S%= 2.00]
* * CALI B STANDHYD 0122 1 2.0 3.13 0.44 1.33 34.57 0.44 0.000

```

```

* [I%=26.5; S%= 2.00]
* * ADD [0121 + 0122] 0815 3 2.0 4.52 0.55 1.33 31.65 n/a 0.000
* * ADD [0815 + 0316] 0815 1 2.0 21.56 2.06 1.37 32.42 n/a 0.000
* * ADD [0815 + 0402] 0815 3 2.0 383.13 33.74 1.73 44.10 n/a 0.000
* * PIPE [ 2 : 0815] 0404 1 2.0 383.13 33.74 1.73 44.10 n/a 0.000
* * CALI B STANDHYD 0124 1 2.0 21.61 3.29 1.33 39.93 0.50 0.000
* [I%=33.4; S%= 2.00]
* * ADD [0124 + 0404] 0816 3 2.0 404.74 34.91 1.73 43.87 n/a 0.000
* * DUHYD 0500 1 2.0 404.74 34.91 1.73 43.87 n/a 0.000
* MAJOR SYSTEM: 0500 2 2.0 363.15 34.04 1.73 43.87 n/a 0.000
* MINOR SYSTEM: 0500 3 2.0 41.58 0.87 0.77 43.87 n/a 0.000
* * PIPE [ 2 : 0500] 0405 1 2.0 363.15 34.03 1.73 43.87 n/a 0.000
* ** CALI B STANDHYD 0125 1 2.0 18.74 3.21 1.40 47.80 0.60 0.000
* [I%=44.1; S%= 2.00]
* * ADD [0125 + 0405] 0817 3 2.0 381.89 35.44 1.73 44.07 n/a 0.000
* * PIPE [ 2 : 0500] 0408 1 2.0 41.58 0.87 1.07 43.87 n/a 0.000
* ** CALI B STANDHYD 0126 1 2.0 22.26 3.36 1.33 37.56 0.47 0.000
* [I%=32.1; S%= 2.00]
* * ADD [0126 + 0408] 0820 3 2.0 63.84 4.23 1.33 41.67 n/a 0.000
* * PIPE [ 2 : 0820] 0406 1 2.0 63.84 4.18 1.37 41.67 n/a 0.000
* ** CALI B STANDHYD 0127 1 2.0 9.98 1.17 1.33 33.74 0.42 0.000
* [I%=27.4; S%= 2.00]
* * ADD [0127 + 0406] 0818 3 2.0 73.82 5.32 1.37 40.60 n/a 0.000
* * PIPE [ 2 : 0818] 0407 1 2.0 73.82 5.25 1.37 40.60 n/a 0.000
* ** CALI B STANDHYD 0128 1 2.0 14.87 3.18 1.33 50.03 0.63 0.000
* [I%=45.4; S%= 2.00]
* * ADD [0128 + 0407] 0819 3 2.0 88.69 8.36 1.37 42.18 n/a 0.000
*
* *****
* ** SIMULATION NUMBER: 6 ** 1:100 Year Chicago Design Storm
* *****
* W/E COMMAND HYD ID DT AREA Opeak Tpeak R.V. R.C. Qbase
* mi n ha cms hrs mm cms
*
* START @ 0.00 hrs
* -----
* READ STORM 10.0
* [ Ptot= 87.58 mm ]
* fname : C:\Users\dtwigger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\61f17da7-3bc2-4428-98b
* remark: * City of Barrile - 100 yr Chicago (4hr) + 15%
*
* ** CALI B STANDHYD 0100 1 2.0 31.13 4.28 1.43 47.08 0.54 0.000
* [I%=28.2; S%= 2.00]
* * CHANNEL [ 2 : 0100] 0302 1 2.0 31.13 4.25 1.43 47.08 n/a 0.000
* ** CALI B STANDHYD 0105 1 2.0 9.01 1.70 1.37 55.70 0.64 0.000
* [I%=24.8; S%= 2.00]
* ** CALI B STANDHYD 0110 1 2.0 12.37 1.84 1.40 49.58 0.57 0.000
* [I%=25.4; S%= 2.00]
* * CHANNEL [ 2 : 0110] 0303 1 2.0 12.37 1.79 1.43 49.58 n/a 0.000
* * ADD [0105 + 0302] 0802 3 2.0 40.14 5.77 1.43 49.01 n/a 0.000
* * ADD [0802 + 0303] 0802 1 2.0 52.51 7.56 1.43 49.15 n/a 0.000
* * PIPE [ 2 : 0802] 0400 1 2.0 52.51 7.55 1.43 49.15 n/a 0.000
* ** CALI B STANDHYD 0113 1 2.0 9.41 2.04 1.33 57.28 0.65 0.000
* [I%=39.4; S%= 2.00]
* * CHANNEL [ 2 : 0113] 0301 1 2.0 9.41 1.87 1.40 57.27 n/a 0.000

```

```

** CALI B STANDHYD 0118 1 2.0 4.11 0.67 1.37 47.13 0.54 0.000
  [I%=27.5: S%= 2.00]
*
RESRVR [ 2 : 0118] 0600 1 2.0 4.11 0.37 1.63 47.18 n/a 0.000
{ST= 0.03 ha.m }
*
CHANNEL[ 2 : 0600] 0300 1 2.0 4.11 0.35 1.77 47.15 n/a 0.000
** CALI B STANDHYD 0101 1 2.0 8.68 1.15 1.33 41.35 0.47 0.000
  [I%=22.9: S%= 2.00]
*
ADD [0101 + 0300] 0801 3 2.0 12.79 1.34 1.37 43.22 n/a 0.000
*
CHANNEL[ 2 : 0801] 0304 1 2.0 12.79 1.20 1.40 43.21 n/a 0.000
** CALI B STANDHYD 0123 1 2.0 22.81 3.33 1.43 51.98 0.59 0.000
  [I%=27.1: S%= 2.00]
*
ADD [0123 + 0301] 0800 3 2.0 32.22 5.11 1.43 53.52 n/a 0.000
*
ADD [0800 + 0304] 0800 1 2.0 45.01 6.30 1.43 50.59 n/a 0.000
*
ADD [0800 + 0400] 0800 3 2.0 97.52 13.85 1.43 49.81 n/a 0.000
*
RESRVR [ 2 : 0800] 0601 1 2.0 97.52 11.19 1.60 49.52 n/a 0.000
{ST= 1.12 ha.m }
*
PIPE [ 2 : 0601] 0403 1 2.0 97.52 11.18 1.63 49.52 n/a 0.000
*
CHANNEL[ 2 : 0403] 0317 1 2.0 97.52 10.34 1.73 49.52 n/a 0.000
** CALI B STANDHYD 0102 1 2.0 19.41 3.20 1.40 55.81 0.64 0.000
  [I%=22.0: S%= 2.00]
*
ADD [0102 + 0317] 0803 3 2.0 116.93 12.48 1.70 50.57 n/a 0.000
** CALI B STANDHYD 0103 1 2.0 35.79 7.38 1.40 63.46 0.72 0.000
  [I%=37.1: S%= 2.00]
*
** CALI B STANDHYD 0104 1 2.0 5.22 1.09 1.37 59.04 0.67 0.000
  [I%=20.7: S%= 2.00]
** CALI B STANDHYD 0106 1 2.0 13.71 2.10 1.40 52.36 0.60 0.000
  [I%=21.1: S%= 2.00]
*
CALI B STANDHYD 0107 1 5.0 8.53 1.50 1.50 57.44 0.66 0.000
  [I%=18.1: S%= 2.00]
*
CALI B STANDHYD 0108 1 2.0 58.75 7.01 1.47 46.39 0.53 0.000
  [I%=24.4: S%= 2.00]
*
CHANNEL[ 2 : 0108] 0307 1 2.0 58.75 6.91 1.53 46.39 n/a 0.000
*
CALI B STANDHYD 0109 1 2.0 13.70 2.64 1.43 53.39 0.61 0.000
  [I%= 3.0: S%= 2.00]
*
ADD [0109 + 0307] 0806 3 2.0 72.45 9.26 1.50 47.71 n/a 0.000
*
CHANNEL[ 2 : 0806] 0308 1 2.0 72.45 9.24 1.50 47.71 n/a 0.000
*
ADD [0107 + 0308] 0807 3 2.0 80.98 10.75 1.50 48.74 n/a 0.000
*
CHANNEL[ 2 : 0807] 0306 1 2.0 80.98 10.65 1.53 48.74 n/a 0.000
*
ADD [0106 + 0306] 0804 3 2.0 94.69 12.67 1.50 49.26 n/a 0.000
*
CHANNEL[ 2 : 0804] 0305 1 2.0 94.69 12.03 1.57 49.26 n/a 0.000
*
ADD [0104 + 0305] 0093 3 2.0 99.91 12.80 1.57 49.77 n/a 0.000
*
ADD [0103 + 0093] 0805 3 2.0 135.70 19.02 1.53 53.38 n/a 0.000
*
CHANNEL[ 2 : 0805] 0312 1 2.0 135.70 18.52 1.57 53.38 n/a 0.000
*
ADD [0312 + 0803] 0094 3 2.0 252.63 29.84 1.63 52.08 n/a 0.000
*
CHANNEL[ 2 : 0094] 0309 1 2.0 252.63 29.81 1.63 52.08 n/a 0.000
** CALI B STANDHYD 0111 1 2.0 3.57 0.63 1.37 55.97 0.64 0.000
  [I%=22.2: S%= 2.00]
*
ADD [0111 + 0309] 0808 3 2.0 256.20 30.24 1.63 52.13 n/a 0.000

```

```

CHANNEL[ 2 : 0808] 0310 1 2.0 256.20 30.18 1.67 52.13 n/a 0.000
** CALI B STANDHYD 0112 1 2.0 16.90 3.00 1.40 58.95 0.67 0.000
  [I%=23.9: S%= 2.00]
*
ADD [0112 + 0310] 0809 3 2.0 273.10 32.43 1.63 52.55 n/a 0.000
*
CHANNEL[ 2 : 0809] 0311 1 2.0 273.10 31.83 1.70 52.55 n/a 0.000
** CALI B STANDHYD 0114 1 2.0 4.95 0.90 1.43 56.95 0.65 0.000
  [I%=17.3: S%= 2.00]
*
ADD [0114 + 0311] 0810 3 2.0 278.05 32.37 1.70 52.63 n/a 0.000
*
CHANNEL[ 2 : 0810] 0313 1 2.0 278.05 32.40 1.70 52.63 n/a 0.000
*
CALI B STANDHYD 0115 1 2.0 12.66 1.99 1.40 51.20 0.58 0.000
  [I%=28.8: S%= 2.00]
*
ADD [0115 + 0313] 0811 3 2.0 290.71 33.63 1.67 52.57 n/a 0.000
*
CHANNEL[ 2 : 0811] 0314 1 2.0 290.71 33.61 1.70 52.57 n/a 0.000
** CALI B STANDHYD 0116 1 2.0 26.63 4.22 1.40 51.73 0.59 0.000
  [I%=25.5: S%= 2.00]
*
ADD [0116 + 0314] 0812 3 2.0 317.34 36.17 1.70 52.50 n/a 0.000
*
PIPE [ 2 : 0812] 0401 1 2.0 317.34 36.20 1.70 52.50 n/a 0.000
** CALI B STANDHYD 0117 1 2.0 27.32 3.30 1.37 39.36 0.45 0.000
  [I%=25.1: S%= 2.00]
*
ADD [0117 + 0401] 0813 3 2.0 344.66 38.15 1.67 51.46 n/a 0.000
*
CHANNEL[ 2 : 0813] 0315 1 2.0 344.66 37.85 1.70 51.46 n/a 0.000
*
CALI B STANDHYD 0119 1 2.0 16.91 2.17 1.40 43.60 0.50 0.000
  [I%=26.9: S%= 2.00]
*
ADD [0119 + 0315] 0814 3 2.0 361.57 39.19 1.70 51.09 n/a 0.000
*
PIPE [ 2 : 0814] 0402 1 2.0 361.57 39.17 1.70 51.09 n/a 0.000
** CALI B STANDHYD 0120 1 2.0 17.04 1.85 1.37 37.48 0.43 0.000
  [I%=20.9: S%= 2.00]
*
CHANNEL[ 2 : 0120] 0316 1 2.0 17.04 1.82 1.40 37.48 n/a 0.000
*
CALI B STANDHYD 0121 1 2.0 1.39 0.13 1.33 29.08 0.33 0.000
  [I%=14.6: S%= 2.00]
*
CALI B STANDHYD 0122 1 2.0 3.13 0.51 1.33 39.46 0.45 0.000
  [I%=26.5: S%= 2.00]
*
ADD [0121 + 0122] 0815 3 2.0 4.52 0.63 1.33 36.26 n/a 0.000
*
ADD [0815 + 0316] 0815 1 2.0 21.56 2.35 1.37 37.23 n/a 0.000
*
ADD [0815 + 0402] 0815 3 2.0 383.13 40.59 1.70 50.31 n/a 0.000
*
PIPE [ 2 : 0815] 0404 1 2.0 383.13 40.51 1.73 50.31 n/a 0.000
** CALI B STANDHYD 0124 1 2.0 21.61 3.71 1.33 45.32 0.52 0.000
  [I%=33.4: S%= 2.00]
*
ADD [0124 + 0404] 0816 3 2.0 404.74 41.95 1.70 50.04 n/a 0.000
*
DUHYD 0500 1 2.0 404.74 41.95 1.70 50.04 n/a 0.000
  MAJOR SYSTEM: 0500 2 2.0 367.81 41.08 1.70 50.04 n/a 0.000
  MINOR SYSTEM: 0500 3 2.0 36.93 0.87 0.73 50.04 n/a 0.000
*
PIPE [ 2 : 0500] 0405 1 2.0 367.81 41.06 1.73 50.04 n/a 0.000
** CALI B STANDHYD 0125 1 2.0 18.74 3.72 1.37 53.89 0.62 0.000
  [I%=44.1: S%= 2.00]
*
ADD [0125 + 0405] 0817 3 2.0 386.55 42.63 1.70 50.23 n/a 0.000
*
PIPE [ 2 : 0500] 0408 1 2.0 36.93 0.87 0.83 50.04 n/a 0.000
** CALI B STANDHYD 0126 1 2.0 22.26 3.77 1.33 42.66 0.49 0.000
  [I%=32.1: S%= 2.00]

```

```

*   ADD [0126 + 0408] 0820 3 2.0 59.19 4.64 1.33 47.27 n/a 0.000
*   PIPE [ 2 : 0820] 0406 1 2.0 59.19 4.60 1.37 47.26 n/a 0.000
**  CALI B STANDHYD 0127 1 2.0 9.98 1.37 1.33 38.47 0.44 0.000
*   [I%=27.4; S%= 2.00]
*   ADD [0127 + 0406] 0818 3 2.0 69.17 5.94 1.37 46.00 n/a 0.000
*   PIPE [ 2 : 0818] 0407 1 2.0 69.17 5.85 1.37 46.00 n/a 0.000
**  CALI B STANDHYD 0128 1 2.0 14.87 3.58 1.33 56.38 0.64 0.000
*   [I%=45.4; S%= 2.00]
*   ADD [0128 + 0407] 0819 3 2.0 84.04 9.36 1.37 47.83 n/a 0.000

```

\*\*\*\*\*  
**\*\* SIMULATION NUMBER: 7 \*\* 1:2 Year 6 Hour SCS Design Storm**  
 \*\*\*\*\*

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R. V. mm	R. C.	Qbase cms
START @ 0.00 hrs								
-----								
READ STORM		15.0						
[ Ptot= 42.30 mm ]								
fname : C:\Users\dtwigger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\Fd87eff8-a95f-40b7-aea								
remark: 2yr/6hr Barrie Wpcc +15% SCS								
** CALI B STANDHYD	0100	1 2.0	31.13	1.38	3.33	17.40	0.41	0.000
[I%=28.2; S%= 2.00]								
CHANNEL[ 2 : 0100]	0302	1 2.0	31.13	1.38	3.37	17.40	n/a	0.000
** CALI B STANDHYD	0105	1 2.0	9.01	0.54	3.27	20.20	0.48	0.000
[I%=24.8; S%= 2.00]								
** CALI B STANDHYD	0110	1 2.0	12.37	0.59	3.33	17.90	0.42	0.000
[I%=25.4; S%= 2.00]								
CHANNEL[ 2 : 0110]	0303	1 2.0	12.37	0.58	3.37	17.90	n/a	0.000
ADD [0105 + 0302]	0802	3 2.0	40.14	1.80	3.30	18.03	n/a	0.000
ADD [0802 + 0303]	0802	1 2.0	52.51	2.37	3.33	18.00	n/a	0.000
PIPE [ 2 : 0802]	0400	1 2.0	52.51	2.37	3.33	18.00	n/a	0.000
** CALI B STANDHYD	0113	1 2.0	9.41	0.70	3.27	22.50	0.53	0.000
[I%=39.4; S%= 2.00]								
CHANNEL[ 2 : 0113]	0301	1 2.0	9.41	0.64	3.30	22.50	n/a	0.000
** CALI B STANDHYD	0118	1 2.0	4.11	0.22	3.27	17.28	0.41	0.000
[I%=27.5; S%= 2.00]								
RESRVR [ 2 : 0118]	0600	1 2.0	4.11	0.19	3.33	17.28	n/a	0.000
{ST= 0.00 ha.m }								
CHANNEL[ 2 : 0600]	0300	1 2.0	4.11	0.17	3.43	17.27	n/a	0.000
** CALI B STANDHYD	0101	1 2.0	8.68	0.39	3.27	14.67	0.35	0.000
[I%=22.9; S%= 2.00]								
ADD [0101 + 0300]	0801	3 2.0	12.79	0.53	3.27	15.51	n/a	0.000
CHANNEL[ 2 : 0801]	0304	1 2.0	12.79	0.48	3.33	15.50	n/a	0.000
** CALI B STANDHYD	0123	1 2.0	22.81	1.04	3.37	18.81	0.44	0.000
[I%=27.1; S%= 2.00]								
ADD [0123 + 0301]	0800	3 2.0	32.22	1.67	3.33	19.89	n/a	0.000
ADD [0800 + 0304]	0800	1 2.0	45.01	2.15	3.33	18.64	n/a	0.000
ADD [0800 + 0400]	0800	3 2.0	97.52	4.52	3.33	18.29	n/a	0.000
RESRVR [ 2 : 0800]	0601	1 2.0	97.52	2.15	3.80	18.00	n/a	0.000
{ST= 0.63 ha.m }								
PIPE [ 2 : 0601]	0403	1 2.0	97.52	2.15	3.80	18.00	n/a	0.000
CHANNEL[ 2 : 0403]	0317	1 2.0	97.52	2.09	3.90	18.00	n/a	0.000

```

* ** CALI B STANDHYD 0102 1 2.0 19.41 1.00 3.33 19.85 0.47 0.000
*   [I%=22.0; S%= 2.00]
*   ADD [0102 + 0317] 0803 3 2.0 116.93 2.51 3.83 18.31 n/a 0.000
* ** CALI B STANDHYD 0103 1 2.0 35.79 2.51 3.33 24.92 0.59 0.000
*   [I%=37.1; S%= 2.00]
* ** CALI B STANDHYD 0104 1 2.0 5.22 0.33 3.30 21.43 0.51 0.000
*   [I%=20.7; S%= 2.00]
* ** CALI B STANDHYD 0106 1 2.0 13.71 0.64 3.30 18.54 0.44 0.000
*   [I%=21.1; S%= 2.00]
* ** CALI B STANDHYD 0107 1 5.0 8.53 0.47 3.25 20.47 0.48 0.000
*   [I%=18.1; S%= 2.00]
* ** CALI B STANDHYD 0108 1 2.0 58.75 2.13 3.43 16.66 0.39 0.000
*   [I%=24.4; S%= 2.00]
* CHANNEL[ 2 : 0108] 0307 1 2.0 58.75 2.09 3.47 16.66 n/a 0.000
* ** CALI B STANDHYD 0109 1 2.0 13.70 0.71 3.40 17.52 0.41 0.000
*   [I%= 3.0; S%= 2.00]
* ADD [0109 + 0307] 0806 3 2.0 72.45 2.77 3.43 16.82 n/a 0.000
* CHANNEL[ 2 : 0806] 0308 1 2.0 72.45 2.76 3.47 16.82 n/a 0.000
* ADD [0107 + 0308] 0807 3 2.0 80.98 3.14 3.47 17.20 n/a 0.000
* CHANNEL[ 2 : 0807] 0306 1 2.0 80.98 3.12 3.47 17.20 n/a 0.000
* ADD [0106 + 0306] 0804 3 2.0 94.69 3.66 3.47 17.40 n/a 0.000
* CHANNEL[ 2 : 0804] 0305 1 2.0 94.69 3.55 3.53 17.40 n/a 0.000
* ADD [0104 + 0305] 0093 3 2.0 99.91 3.77 3.50 17.61 n/a 0.000
* ADD [0103 + 0093] 0805 3 2.0 135.70 5.82 3.40 19.53 n/a 0.000
* CHANNEL[ 2 : 0805] 0312 1 2.0 135.70 5.69 3.47 19.53 n/a 0.000
* ADD [0312 + 0803] 0094 3 2.0 252.63 7.69 3.53 18.97 n/a 0.000
* CHANNEL[ 2 : 0094] 0309 1 2.0 252.63 7.69 3.53 18.97 n/a 0.000
* ** CALI B STANDHYD 0111 1 2.0 3.57 0.20 3.30 20.11 0.48 0.000
*   [I%=22.2; S%= 2.00]
* ADD [0111 + 0309] 0808 3 2.0 256.20 7.82 3.53 18.98 n/a 0.000
* CHANNEL[ 2 : 0808] 0310 1 2.0 256.20 7.82 3.53 18.98 n/a 0.000
* ** CALI B STANDHYD 0112 1 2.0 16.90 0.97 3.33 21.62 0.51 0.000
*   [I%=23.9; S%= 2.00]
* ADD [0112 + 0310] 0809 3 2.0 273.10 8.58 3.50 19.15 n/a 0.000
* CHANNEL[ 2 : 0809] 0311 1 2.0 273.10 8.41 3.57 19.15 n/a 0.000
* ** CALI B STANDHYD 0114 1 2.0 4.95 0.27 3.30 20.16 0.48 0.000
*   [I%=17.3; S%= 2.00]
* ADD [0114 + 0311] 0810 3 2.0 278.05 8.59 3.57 19.16 n/a 0.000
* CHANNEL[ 2 : 0810] 0313 1 2.0 278.05 8.59 3.57 19.16 n/a 0.000
* ** CALI B STANDHYD 0115 1 2.0 12.66 0.64 3.33 18.98 0.45 0.000
*   [I%=28.8; S%= 2.00]
* ADD [0115 + 0313] 0811 3 2.0 290.71 9.01 3.57 19.16 n/a 0.000
* CHANNEL[ 2 : 0811] 0314 1 2.0 290.71 9.00 3.57 19.16 n/a 0.000
* ** CALI B STANDHYD 0116 1 2.0 26.63 1.36 3.30 18.72 0.44 0.000
*   [I%=25.5; S%= 2.00]
* ADD [0116 + 0314] 0812 3 2.0 317.34 9.84 3.57 19.12 n/a 0.000
* PIPE [ 2 : 0812] 0401 1 2.0 317.34 9.85 3.57 19.12 n/a 0.000
* ** CALI B STANDHYD 0117 1 2.0 27.32 1.10 3.30 14.52 0.34 0.000

```

```

* [I%=25.1;S%= 2.00]
* ADD [0117 + 0401] 0813 3 2.0 344.66 10.49 3.53 18.75 n/a 0.000
* CHANNEL [ 2 : 0813] 0315 1 2.0 344.66 10.46 3.57 18.75 n/a 0.000
* ** CALI B STANDHYD
* [I%=26.9;S%= 2.00] 0119 1 2.0 16.91 0.73 3.30 16.01 0.38 0.000
* ADD [0119 + 0315] 0814 3 2.0 361.57 10.92 3.53 18.63 n/a 0.000
* PIPE [ 2 : 0814] 0402 1 2.0 361.57 10.92 3.53 18.63 n/a 0.000
* ** CALI B STANDHYD
* [I%=20.9;S%= 2.00] 0120 1 2.0 17.04 0.62 3.30 13.29 0.31 0.000
* CHANNEL [ 2 : 0120] 0316 1 2.0 17.04 0.60 3.33 13.29 n/a 0.000
* ** CALI B STANDHYD
* [I%=14.6;S%= 2.00] 0121 1 2.0 1.39 0.04 3.23 9.73 0.23 0.000
* ** CALI B STANDHYD
* [I%=26.5;S%= 2.00] 0122 1 2.0 3.13 0.16 3.23 14.79 0.35 0.000
* ADD [0121 + 0122] 0815 3 2.0 4.52 0.20 3.23 13.23 n/a 0.000
* ADD [0815 + 0316] 0815 1 2.0 21.56 0.77 3.27 13.28 n/a 0.000
* ADD [0815 + 0402] 0815 3 2.0 383.13 11.37 3.53 18.32 n/a 0.000
* PIPE [ 2 : 0815] 0404 1 2.0 383.13 11.36 3.57 18.32 n/a 0.000
* ** CALI B STANDHYD
* [I%=33.4;S%= 2.00] 0124 1 2.0 21.61 1.24 3.27 17.68 0.42 0.000
* ADD [0124 + 0404] 0816 3 2.0 404.74 11.90 3.53 18.29 n/a 0.000
* DUHYD 0500 1 2.0 404.74 11.90 3.53 18.29 n/a 0.000
* MAJOR SYSTEM: 0500 2 2.0 305.79 11.03 3.53 18.29 n/a 0.000
* MINOR SYSTEM: 0500 3 2.0 98.94 0.87 2.50 18.29 n/a 0.000
* PIPE [ 2 : 0500] 0405 1 2.0 305.79 11.03 3.53 18.29 n/a 0.000
* ** CALI B STANDHYD
* [I%=44.1;S%= 2.00] 0125 1 2.0 18.74 1.31 3.30 22.03 0.52 0.000
* ADD [0125 + 0405] 0817 3 2.0 324.53 11.79 3.50 18.51 n/a 0.000
* PIPE [ 2 : 0500] 0408 1 2.0 98.94 0.87 2.93 18.29 n/a 0.000
* ** CALI B STANDHYD
* [I%=32.1;S%= 2.00] 0126 1 2.0 22.26 1.26 3.27 16.62 0.39 0.000
* ADD [0126 + 0408] 0820 3 2.0 121.20 2.13 3.27 17.98 n/a 0.000
* PIPE [ 2 : 0820] 0406 1 2.0 121.20 2.13 3.27 17.98 n/a 0.000
* ** CALI B STANDHYD
* [I%=27.4;S%= 2.00] 0127 1 2.0 9.98 0.46 3.27 14.61 0.35 0.000
* ADD [0127 + 0406] 0818 3 2.0 131.18 2.59 3.27 17.73 n/a 0.000
* PIPE [ 2 : 0818] 0407 1 2.0 131.18 2.56 3.30 17.73 n/a 0.000
* ** CALI B STANDHYD
* [I%=45.4;S%= 2.00] 0128 1 2.0 14.87 1.27 3.27 23.08 0.55 0.000
* ADD [0128 + 0407] 0819 3 2.0 146.05 3.81 3.27 18.27 n/a 0.000

```

\*\*\*\*\*  
**\*\* SIMULATION NUMBER: 8 \*\***  
\*\*\*\*\*

**1:2 Year 12 Hour SCS Design Storm**

```

W/E COMMAND      HYD ID  DT  AREA  *  Qpeak  Tpeak  R. V.  R. C.  Qbase
                min   ha   '  cms   hrs   mm
START @ 0.00 hrs
-----
READ STORM              15.0
[ Ptot= 46.69 mm ]
fname : C:\Users\dtwi gger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\95346834-7c01-4b85-b75
remark: 2yr/12hr Barri e Wpcc +15% SCS
* ** CALI B STANDHYD  0100 1 2.0 31.13 1.32 6.33 19.92 0.43 0.000

```

```

* [I%=28.2;S%= 2.00]
* CHANNEL [ 2 : 0100] 0302 1 2.0 31.13 1.31 6.37 19.92 n/a 0.000
* ** CALI B STANDHYD
* [I%=24.8;S%= 2.00] 0105 1 2.0 9.01 0.53 6.27 23.29 0.50 0.000
* ** CALI B STANDHYD
* [I%=25.4;S%= 2.00] 0110 1 2.0 12.37 0.57 6.33 20.60 0.44 0.000
* CHANNEL [ 2 : 0110] 0303 1 2.0 12.37 0.56 6.37 20.60 n/a 0.000
* ADD [0105 + 0302] 0802 3 2.0 40.14 1.73 6.33 20.68 n/a 0.000
* ADD [0802 + 0303] 0802 1 2.0 52.51 2.28 6.33 20.66 n/a 0.000
* PIPE [ 2 : 0802] 0400 1 2.0 52.51 2.28 6.33 20.66 n/a 0.000
* ** CALI B STANDHYD
* [I%=39.4;S%= 2.00] 0113 1 2.0 9.41 0.66 6.27 25.57 0.55 0.000
* CHANNEL [ 2 : 0113] 0301 1 2.0 9.41 0.61 6.30 25.57 n/a 0.000
* ** CALI B STANDHYD
* [I%=27.5;S%= 2.00] 0118 1 2.0 4.11 0.21 6.27 19.81 0.42 0.000
* RESRVR [ 2 : 0118]
* {ST= 0.00 ha.m } 0600 1 2.0 4.11 0.19 6.33 19.87 n/a 0.000
* CHANNEL [ 2 : 0600] 0300 1 2.0 4.11 0.17 6.43 19.85 n/a 0.000
* ** CALI B STANDHYD
* [I%=22.9;S%= 2.00] 0101 1 2.0 8.68 0.37 6.27 16.89 0.36 0.000
* ADD [0101 + 0300] 0801 3 2.0 12.79 0.51 6.27 17.84 n/a 0.000
* CHANNEL [ 2 : 0801] 0304 1 2.0 12.79 0.46 6.33 17.84 n/a 0.000
* ** CALI B STANDHYD
* [I%=27.1;S%= 2.00] 0123 1 2.0 22.81 1.01 6.37 21.66 0.46 0.000
* ADD [0123 + 0301] 0800 3 2.0 32.22 1.60 6.33 22.80 n/a 0.000
* ADD [0800 + 0304] 0800 1 2.0 45.01 2.07 6.33 21.39 n/a 0.000
* ADD [0800 + 0400] 0800 3 2.0 97.52 4.35 6.33 21.00 n/a 0.000
* RESRVR [ 2 : 0800]
* {ST= 0.62 ha.m } 0601 1 2.0 97.52 2.07 6.80 20.70 n/a 0.000
* PIPE [ 2 : 0601] 0403 1 2.0 97.52 2.07 6.83 20.70 n/a 0.000
* CHANNEL [ 2 : 0403] 0317 1 2.0 97.52 2.01 6.90 20.70 n/a 0.000
* ** CALI B STANDHYD
* [I%=22.0;S%= 2.00] 0102 1 2.0 19.41 1.00 6.33 22.97 0.49 0.000
* ADD [0102 + 0317] 0803 3 2.0 116.93 2.43 6.83 21.08 n/a 0.000
* ** CALI B STANDHYD
* [I%=37.1;S%= 2.00] 0103 1 2.0 35.79 2.35 6.33 28.38 0.61 0.000
* ** CALI B STANDHYD
* [I%=20.7;S%= 2.00] 0104 1 2.0 5.22 0.33 6.30 24.75 0.53 0.000
* ** CALI B STANDHYD
* [I%=21.1;S%= 2.00] 0106 1 2.0 13.71 0.64 6.33 21.44 0.46 0.000
* ** CALI B STANDHYD
* [I%=18.1;S%= 2.00] 0107 1 5.0 8.53 0.47 6.25 23.71 0.51 0.000
* ** CALI B STANDHYD
* [I%=24.4;S%= 2.00] 0108 1 2.0 58.75 2.06 6.43 19.16 0.41 0.000
* CHANNEL [ 2 : 0108] 0307 1 2.0 58.75 2.02 6.47 19.16 n/a 0.000
* ** CALI B STANDHYD
* [I%= 3.0;S%= 2.00] 0109 1 2.0 13.70 0.71 6.40 20.60 0.44 0.000
* ADD [0109 + 0307] 0806 3 2.0 72.45 2.69 6.43 19.43 n/a 0.000
* CHANNEL [ 2 : 0806] 0308 1 2.0 72.45 2.68 6.47 19.43 n/a 0.000
* ADD [0107 + 0308] 0807 3 2.0 80.98 3.06 6.47 19.88 n/a 0.000

```

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* CHANNEL[ 2 : 0807] 0306 1 2.0 80.98 3.04 6.47 19.88 n/a 0.000
* ADD [0106 + 0306] 0804 3 2.0 94.69 3.60 6.47 20.11 n/a 0.000
* CHANNEL[ 2 : 0804] 0305 1 2.0 94.69 3.49 6.53 20.11 n/a 0.000
* ADD [0104 + 0305] 0093 3 2.0 99.91 3.71 6.50 20.35 n/a 0.000
* ADD [0103 + 0093] 0805 3 2.0 135.70 5.65 6.40 22.47 n/a 0.000
* CHANNEL[ 2 : 0805] 0312 1 2.0 135.70 5.53 6.47 22.47 n/a 0.000
* ADD [0312 + 0803] 0094 3 2.0 252.63 7.51 6.53 21.83 n/a 0.000
* CHANNEL[ 2 : 0094] 0309 1 2.0 252.63 7.51 6.53 21.83 n/a 0.000
* * CALI B STANDHYD 0111 1 2.0 3.57 0.19 6.30 23.23 0.50 0.000
  [I%=22.2: S%= 2.00]
* ADD [0111 + 0309] 0808 3 2.0 256.20 7.64 6.53 21.85 n/a 0.000
* CHANNEL[ 2 : 0808] 0310 1 2.0 256.20 7.64 6.53 21.85 n/a 0.000
* * CALI B STANDHYD 0112 1 2.0 16.90 0.95 6.33 24.91 0.53 0.000
  [I%=23.9: S%= 2.00]
* ADD [0112 + 0310] 0809 3 2.0 273.10 8.39 6.50 22.04 n/a 0.000
* CHANNEL[ 2 : 0809] 0311 1 2.0 273.10 8.22 6.57 22.04 n/a 0.000
* * CALI B STANDHYD 0114 1 2.0 4.95 0.27 6.30 23.37 0.50 0.000
  [I%=17.3: S%= 2.00]
* ADD [0114 + 0311] 0810 3 2.0 278.05 8.40 6.57 22.06 n/a 0.000
* CHANNEL[ 2 : 0810] 0313 1 2.0 278.05 8.40 6.57 22.06 n/a 0.000
* * CALI B STANDHYD 0115 1 2.0 12.66 0.61 6.33 21.75 0.47 0.000
  [I%=28.8: S%= 2.00]
* ADD [0115 + 0313] 0811 3 2.0 290.71 8.82 6.57 22.05 n/a 0.000
* CHANNEL[ 2 : 0811] 0314 1 2.0 290.71 8.81 6.57 22.05 n/a 0.000
* * CALI B STANDHYD 0116 1 2.0 26.63 1.32 6.30 21.55 0.46 0.000
  [I%=25.5: S%= 2.00]
* ADD [0116 + 0314] 0812 3 2.0 317.34 9.65 6.57 22.00 n/a 0.000
* PIPE [ 2 : 0812] 0401 1 2.0 317.34 9.65 6.57 22.00 n/a 0.000
* * CALI B STANDHYD 0117 1 2.0 27.32 1.04 6.30 16.61 0.36 0.000
  [I%=25.1: S%= 2.00]
* ADD [0117 + 0401] 0813 3 2.0 344.66 10.28 6.53 21.58 n/a 0.000
* CHANNEL[ 2 : 0813] 0315 1 2.0 344.66 10.26 6.57 21.58 n/a 0.000
* * CALI B STANDHYD 0119 1 2.0 16.91 0.69 6.30 18.34 0.39 0.000
  [I%=26.9: S%= 2.00]
* ADD [0119 + 0315] 0814 3 2.0 361.57 10.69 6.53 21.42 n/a 0.000
* PIPE [ 2 : 0814] 0402 1 2.0 361.57 10.70 6.57 21.42 n/a 0.000
* * CALI B STANDHYD 0120 1 2.0 17.04 0.59 6.30 15.28 0.33 0.000
  [I%=20.9: S%= 2.00]
* CHANNEL[ 2 : 0120] 0316 1 2.0 17.04 0.58 6.33 15.28 n/a 0.000
* * CALI B STANDHYD 0121 1 2.0 1.39 0.04 6.23 11.27 0.24 0.000
  [I%=14.6: S%= 2.00]
* * CALI B STANDHYD 0122 1 2.0 3.13 0.16 6.23 16.87 0.36 0.000
  [I%=26.5: S%= 2.00]
* ADD [0121 + 0122] 0815 3 2.0 4.52 0.20 6.23 15.14 n/a 0.000
* ADD [0815 + 0316] 0815 1 2.0 21.56 0.73 6.27 15.25 n/a 0.000
* ADD [0815 + 0402] 0815 3 2.0 383.13 11.14 6.53 21.08 n/a 0.000
* PIPE [ 2 : 0815] 0404 1 2.0 383.13 11.13 6.57 21.08 n/a 0.000

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```

* * CALI B STANDHYD 0124 1 2.0 21.61 1.17 6.27 20.07 0.43 0.000
  [I%=33.4: S%= 2.00]
* ADD [0124 + 0404] 0816 3 2.0 404.74 11.65 6.53 21.02 n/a 0.000
* DUHYD 0500 1 2.0 404.74 11.65 6.53 21.02 n/a 0.000
  MAJOR SYSTEM: 0500 2 2.0 270.63 10.78 6.53 21.02 n/a 0.000
  MINOR SYSTEM: 0500 3 2.0 134.11 0.87 5.10 21.02 n/a 0.000
* PIPE [ 2 : 0500] 0405 1 2.0 270.63 10.77 6.57 21.02 n/a 0.000
* ** CALI B STANDHYD 0125 1 2.0 18.74 1.21 6.30 24.86 0.53 0.000
  [I%=44.1: S%= 2.00]
* ADD [0125 + 0405] 0817 3 2.0 289.37 11.47 6.50 21.27 n/a 0.000
* PIPE [ 2 : 0500] 0408 1 2.0 134.11 0.87 5.53 21.02 n/a 0.000
* ** CALI B STANDHYD 0126 1 2.0 22.26 1.19 6.27 18.86 0.40 0.000
  [I%=32.1: S%= 2.00]
* ADD [0126 + 0408] 0820 3 2.0 156.37 2.06 6.27 20.71 n/a 0.000
* PIPE [ 2 : 0820] 0406 1 2.0 156.37 2.06 6.27 20.71 n/a 0.000
* ** CALI B STANDHYD 0127 1 2.0 9.98 0.43 6.27 16.63 0.36 0.000
  [I%=27.4: S%= 2.00]
* ADD [0127 + 0406] 0818 3 2.0 166.35 2.49 6.27 20.47 n/a 0.000
* PIPE [ 2 : 0818] 0407 1 2.0 166.35 2.46 6.30 20.47 n/a 0.000
* ** CALI B STANDHYD 0128 1 2.0 14.87 1.20 6.27 26.04 0.56 0.000
  [I%=45.4: S%= 2.00]
* ADD [0128 + 0407] 0819 3 2.0 181.22 3.64 6.27 20.93 n/a 0.000

```

\*\*\*\*\*  
**1:2 Year 24 Hour SCS Design Storm**  
\*\*\*\*\*

\*\* SIMULATION NUMBER: 9 \*\*

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V mm	R.C.	Qbase cms
-------------	--------	--------	---------	-----------	-----------	--------	------	-----------

START @ 0.00 hrs

-----  
READ STORM 15.0

[ Ptot= 55.00 mm ]

fname : C:\Users\dtwi gger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\5a5e6e16c-58bd-4d00-855

remark: 2yr/24hr Barrie Wpcc +15% SCS

```

* ** CALI B STANDHYD 0100 1 2.0 31.13 1.36 12.33 24.95 0.45 0.000
  [I%=28.2: S%= 2.00]
* CHANNEL[ 2 : 0100] 0302 1 2.0 31.13 1.36 12.37 24.95 n/a 0.000
* ** CALI B STANDHYD 0105 1 2.0 9.01 0.58 12.27 29.40 0.53 0.000
  [I%=24.8: S%= 2.00]
* ** CALI B STANDHYD 0110 1 2.0 12.37 0.60 12.33 25.98 0.47 0.000
  [I%=25.4: S%= 2.00]
* CHANNEL[ 2 : 0110] 0303 1 2.0 12.37 0.59 12.37 25.98 n/a 0.000
* ADD [0105 + 0302] 0802 3 2.0 40.14 1.82 12.33 25.95 n/a 0.000
* ADD [0802 + 0303] 0802 1 2.0 52.51 2.41 12.33 25.96 n/a 0.000
* PIPE [ 2 : 0802] 0400 1 2.0 52.51 2.40 12.33 25.96 n/a 0.000
* ** CALI B STANDHYD 0113 1 2.0 9.41 0.67 12.27 31.60 0.57 0.000
  [I%=39.4: S%= 2.00]
* CHANNEL[ 2 : 0113] 0301 1 2.0 9.41 0.62 12.30 31.60 n/a 0.000
* ** CALI B STANDHYD 0118 1 2.0 4.11 0.22 12.27 24.87 0.45 0.000
  [I%=27.5: S%= 2.00]
* RESRVR [ 2 : 0118] 0600 1 2.0 4.11 0.19 12.33 24.92 n/a 0.000
  {ST= 0.00 ha.m }
* CHANNEL[ 2 : 0600] 0300 1 2.0 4.11 0.17 12.43 24.91 n/a 0.000

```

**	CALIB STANDHYD	0101	1	2.0	8.68	0.39	12.27	21.34	0.39	0.000
*	[I%=22.9; S%= 2.00]									
*	ADD [0101 + 0300]	0801	3	2.0	12.79	0.53	12.27	22.49	n/a	0.000
*	CHANNEL[ 2 : 0801]	0304	1	2.0	12.79	0.49	12.33	22.48	n/a	0.000
**	CALIB STANDHYD	0123	1	2.0	22.81	1.08	12.37	27.32	0.50	0.000
*	[I%=27.1; S%= 2.00]									
*	ADD [0123 + 0301]	0800	3	2.0	32.22	1.69	12.33	28.57	n/a	0.000
*	ADD [0800 + 0304]	0800	1	2.0	45.01	2.18	12.33	26.84	n/a	0.000
*	ADD [0800 + 0400]	0800	3	2.0	97.52	4.58	12.33	26.36	n/a	0.000
*	RESRVR [ 2 : 0800]	0601	1	2.0	97.52	2.25	12.80	26.07	n/a	0.000
*	{ST= 0.65 ha.m }									
*	PIPE [ 2 : 0601]	0403	1	2.0	97.52	2.25	12.80	26.07	n/a	0.000
*	CHANNEL[ 2 : 0403]	0317	1	2.0	97.52	2.18	12.90	26.07	n/a	0.000
**	CALIB STANDHYD	0102	1	2.0	19.41	1.07	12.33	29.17	0.53	0.000
*	[I%=22.0; S%= 2.00]									
*	ADD [0102 + 0317]	0803	3	2.0	116.93	2.63	12.80	26.59	n/a	0.000
**	CALIB STANDHYD	0103	1	2.0	35.79	2.43	12.33	35.16	0.64	0.000
*	[I%=37.1; S%= 2.00]									
**	CALIB STANDHYD	0104	1	2.0	5.22	0.35	12.30	31.29	0.57	0.000
*	[I%=20.7; S%= 2.00]									
**	CALIB STANDHYD	0106	1	2.0	13.71	0.68	12.33	27.21	0.49	0.000
*	[I%=21.1; S%= 2.00]									
*	CALIB STANDHYD	0107	1	5.0	8.53	0.50	12.25	30.11	0.55	0.000
*	[I%=18.1; S%= 2.00]									
**	CALIB STANDHYD	0108	1	2.0	58.75	2.15	12.43	24.18	0.44	0.000
*	[I%=24.4; S%= 2.00]									
*	CHANNEL[ 2 : 0108]	0307	1	2.0	58.75	2.11	12.47	24.18	n/a	0.000
**	CALIB STANDHYD	0109	1	2.0	13.70	0.79	12.37	26.74	0.49	0.000
*	[I%= 3.0; S%= 2.00]									
*	ADD [0109 + 0307]	0806	3	2.0	72.45	2.85	12.43	24.66	n/a	0.000
*	CHANNEL[ 2 : 0806]	0308	1	2.0	72.45	2.84	12.47	24.66	n/a	0.000
*	ADD [0107 + 0308]	0807	3	2.0	80.98	3.25	12.47	25.24	n/a	0.000
*	CHANNEL[ 2 : 0807]	0306	1	2.0	80.98	3.23	12.47	25.24	n/a	0.000
*	ADD [0106 + 0306]	0804	3	2.0	94.69	3.83	12.47	25.52	n/a	0.000
*	CHANNEL[ 2 : 0804]	0305	1	2.0	94.69	3.72	12.50	25.52	n/a	0.000
*	ADD [0104 + 0305]	0093	3	2.0	99.91	3.96	12.50	25.82	n/a	0.000
*	ADD [0103 + 0093]	0805	3	2.0	135.70	5.99	12.43	28.28	n/a	0.000
*	CHANNEL[ 2 : 0805]	0312	1	2.0	135.70	5.87	12.47	28.28	n/a	0.000
*	ADD [0312 + 0803]	0094	3	2.0	252.63	8.04	12.53	27.50	n/a	0.000
*	CHANNEL[ 2 : 0094]	0309	1	2.0	252.63	8.04	12.53	27.50	n/a	0.000
*	CALIB STANDHYD	0111	1	2.0	3.57	0.21	12.30	29.41	0.53	0.000
*	[I%=22.2; S%= 2.00]									
*	ADD [0111 + 0309]	0808	3	2.0	256.20	8.19	12.53	27.52	n/a	0.000
*	CHANNEL[ 2 : 0808]	0310	1	2.0	256.20	8.18	12.53	27.52	n/a	0.000
*	CALIB STANDHYD	0112	1	2.0	16.90	1.01	12.33	31.40	0.57	0.000
*	[I%=23.9; S%= 2.00]									
*	ADD [0112 + 0310]	0809	3	2.0	273.10	8.97	12.53	27.76	n/a	0.000
*	CHANNEL[ 2 : 0809]	0311	1	2.0	273.10	8.79	12.57	27.76	n/a	0.000

*	CALIB STANDHYD	0114	1	2.0	4.95	0.29	12.30	29.73	0.54	0.000
*	[I%=17.3; S%= 2.00]									
*	ADD [0114 + 0311]	0810	3	2.0	278.05	8.99	12.57	27.80	n/a	0.000
*	CHANNEL[ 2 : 0810]	0313	1	2.0	278.05	8.98	12.57	27.80	n/a	0.000
**	CALIB STANDHYD	0115	1	2.0	12.66	0.65	12.33	27.25	0.50	0.000
*	[I%=28.8; S%= 2.00]									
*	ADD [0115 + 0313]	0811	3	2.0	290.71	9.42	12.57	27.78	n/a	0.000
*	CHANNEL[ 2 : 0811]	0314	1	2.0	290.71	9.41	12.57	27.78	n/a	0.000
*	CALIB STANDHYD	0116	1	2.0	26.63	1.43	12.30	27.18	0.49	0.000
*	[I%=25.5; S%= 2.00]									
*	ADD [0116 + 0314]	0812	3	2.0	317.34	10.29	12.53	27.73	n/a	0.000
*	PIPE [ 2 : 0812]	0401	1	2.0	317.34	10.29	12.57	27.73	n/a	0.000
**	CALIB STANDHYD	0117	1	2.0	27.32	1.08	12.30	20.77	0.38	0.000
*	[I%=25.1; S%= 2.00]									
*	ADD [0117 + 0401]	0813	3	2.0	344.66	10.98	12.53	27.17	n/a	0.000
*	CHANNEL[ 2 : 0813]	0315	1	2.0	344.66	10.95	12.57	27.17	n/a	0.000
*	CALIB STANDHYD	0119	1	2.0	16.91	0.71	12.30	22.98	0.42	0.000
*	[I%=26.9; S%= 2.00]									
*	ADD [0119 + 0315]	0814	3	2.0	361.57	11.43	12.53	26.98	n/a	0.000
*	PIPE [ 2 : 0814]	0402	1	2.0	361.57	11.43	12.53	26.98	n/a	0.000
*	CALIB STANDHYD	0120	1	2.0	17.04	0.62	12.30	19.30	0.35	0.000
*	[I%=20.9; S%= 2.00]									
*	CHANNEL[ 2 : 0120]	0316	1	2.0	17.04	0.61	12.33	19.30	n/a	0.000
**	CALIB STANDHYD	0121	1	2.0	1.39	0.04	12.23	14.41	0.26	0.000
*	[I%=14.6; S%= 2.00]									
**	CALIB STANDHYD	0122	1	2.0	3.13	0.16	12.23	21.01	0.38	0.000
*	[I%=26.5; S%= 2.00]									
*	ADD [0121 + 0122]	0815	3	2.0	4.52	0.20	12.23	18.98	n/a	0.000
*	ADD [0815 + 0316]	0815	1	2.0	21.56	0.76	12.27	19.23	n/a	0.000
*	ADD [0815 + 0402]	0815	3	2.0	383.13	11.93	12.53	26.54	n/a	0.000
*	PIPE [ 2 : 0815]	0404	1	2.0	383.13	11.91	12.53	26.54	n/a	0.000
*	CALIB STANDHYD	0124	1	2.0	21.61	1.19	12.27	24.79	0.45	0.000
*	[I%=33.4; S%= 2.00]									
*	ADD [0124 + 0404]	0816	3	2.0	404.74	12.48	12.53	26.45	n/a	0.000
*	DUHYD MAJOR SYSTEM:	0500	1	2.0	404.74	12.48	12.53	26.45	n/a	0.000
*	MINOR SYSTEM:	0500	2	2.0	229.83	11.61	12.53	26.45	n/a	0.000
*		0500	3	2.0	174.90	0.87	10.93	26.45	n/a	0.000
*	PIPE [ 2 : 0500]	0405	1	2.0	229.83	11.60	12.53	26.45	n/a	0.000
**	CALIB STANDHYD	0125	1	2.0	18.74	1.22	12.30	30.39	0.55	0.000
*	[I%=44.1; S%= 2.00]									
*	ADD [0125 + 0405]	0817	3	2.0	248.57	12.33	12.50	26.75	n/a	0.000
*	PIPE [ 2 : 0500]	0408	1	2.0	174.90	0.87	11.33	26.45	n/a	0.000
**	CALIB STANDHYD	0126	1	2.0	22.26	1.22	12.27	23.29	0.42	0.000
*	[I%=32.1; S%= 2.00]									
*	ADD [0126 + 0408]	0820	3	2.0	197.16	2.08	12.27	26.09	n/a	0.000
*	PIPE [ 2 : 0820]	0406	1	2.0	197.16	2.08	12.27	26.09	n/a	0.000
**	CALIB STANDHYD	0127	1	2.0	9.98	0.44	12.27	20.64	0.38	0.000
*	[I%=27.4; S%= 2.00]									
*	ADD [0127 + 0406]	0818	3	2.0	207.14	2.52	12.27	25.83	n/a	0.000

```

* PIPE [ 2 : 0818] 0407 1 2.0 207.14 2.50 12.30 25.83 n/a 0.000
** CALI B STANDHYD 0128 1 2.0 14.87 1.19 12.27 31.85 0.58 0.000
[1%=45.4; S%= 2.00]
*
* ADD [0128 + 0407] 0819 3 2.0 222.01 3.66 12.27 26.23 n/a 0.000

```

\*\*\*\*\*  
**\*\* SIMULATION NUMBER: 10 \*\* 1:5 Year 6 Hour SCS Design Storm**  
 \*\*\*\*\*

```

W/E COMMAND HYD ID DT AREA Qpeak Tpeak R.V. R.C. Qbase
mi n ha cms hrs mm

```

```

START @ 0.00 hrs
-----
READ STORM 15.0
[ Ptot= 59.50 mm ]
fname : C:\Users\dtwigger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\fe28f0f5-464a-4b49-8d6
remark: 5yr/6hr Barrie Wpcc +15% SCS

```

```

** CALI B STANDHYD 0100 1 2.0 31.13 2.32 3.33 27.79 0.47 0.000
[1%=28.2; S%= 2.00]
*
* CHANNEL[ 2 : 0100] 0302 1 2.0 31.13 2.30 3.33 27.79 n/a 0.000
** CALI B STANDHYD 0105 1 2.0 9.01 0.98 3.27 32.83 0.55 0.000
[1%=24.8; S%= 2.00]
*
** CALI B STANDHYD 0110 1 2.0 12.37 1.03 3.30 29.01 0.49 0.000
[1%=25.4; S%= 2.00]
*
* CHANNEL[ 2 : 0110] 0303 1 2.0 12.37 1.01 3.33 29.01 n/a 0.000
*
* ADD [0105 + 0302] 0802 3 2.0 40.14 3.14 3.30 28.92 n/a 0.000
*
* ADD [0802 + 0303] 0802 1 2.0 52.51 4.13 3.33 28.94 n/a 0.000
*
* PIPE [ 2 : 0802] 0400 1 2.0 52.51 4.13 3.33 28.94 n/a 0.000
** CALI B STANDHYD 0113 1 2.0 9.41 1.16 3.27 34.97 0.59 0.000
[1%=39.4; S%= 2.00]
*
* CHANNEL[ 2 : 0113] 0301 1 2.0 9.41 1.09 3.30 34.97 n/a 0.000
** CALI B STANDHYD 0118 1 2.0 4.11 0.37 3.27 27.72 0.47 0.000
[1%=27.5; S%= 2.00]
*
* RESRVR [ 2 : 0118] 0600 1 2.0 4.11 0.24 3.40 27.73 n/a 0.000
{ST= 0.01 ha.m }
*
* CHANNEL[ 2 : 0600] 0300 1 2.0 4.11 0.23 3.53 27.70 n/a 0.000
** CALI B STANDHYD 0101 1 2.0 8.68 0.63 3.27 23.88 0.40 0.000
[1%=22.9; S%= 2.00]
*
* ADD [0101 + 0300] 0801 3 2.0 12.79 0.81 3.27 25.10 n/a 0.000
*
* CHANNEL[ 2 : 0801] 0304 1 2.0 12.79 0.74 3.30 25.10 n/a 0.000
** CALI B STANDHYD 0123 1 2.0 22.81 1.87 3.33 30.50 0.51 0.000
[1%=27.1; S%= 2.00]
*
* ADD [0123 + 0301] 0800 3 2.0 32.22 2.93 3.33 31.81 n/a 0.000
*
* ADD [0800 + 0304] 0800 1 2.0 45.01 3.67 3.33 29.90 n/a 0.000
*
* ADD [0800 + 0400] 0800 3 2.0 97.52 7.80 3.33 29.39 n/a 0.000
*
* RESRVR [ 2 : 0800] 0601 1 2.0 97.52 4.72 3.60 29.09 n/a 0.000
{ST= 0.90 ha.m }
*
* PIPE [ 2 : 0601] 0403 1 2.0 97.52 4.72 3.63 29.09 n/a 0.000
*
* CHANNEL[ 2 : 0403] 0317 1 2.0 97.52 4.48 3.70 29.09 n/a 0.000
** CALI B STANDHYD 0102 1 2.0 19.41 1.80 3.33 32.65 0.55 0.000
[1%=22.0; S%= 2.00]
*
* ADD [0102 + 0317] 0803 3 2.0 116.93 5.39 3.67 29.68 n/a 0.000
** CALI B STANDHYD 0103 1 2.0 35.79 4.18 3.33 38.92 0.65 0.000
[1%=37.1; S%= 2.00]

```

```

** CALI B STANDHYD 0104 1 2.0 5.22 0.59 3.27 34.94 0.59 0.000
[1%=20.7; S%= 2.00]
*
** CALI B STANDHYD 0106 1 2.0 13.71 1.18 3.33 30.47 0.51 0.000
[1%=21.1; S%= 2.00]
*
* CALI B STANDHYD 0107 1 5.0 8.53 0.93 3.25 33.70 0.57 0.000
[1%=18.1; S%= 2.00]
*
* CALI B STANDHYD 0108 1 2.0 58.75 3.78 3.37 27.02 0.45 0.000
[1%=24.4; S%= 2.00]
*
* CHANNEL[ 2 : 0108] 0307 1 2.0 58.75 3.70 3.43 27.02 n/a 0.000
*
* CALI B STANDHYD 0109 1 2.0 13.70 1.41 3.33 30.21 0.51 0.000
[1%= 3.0; S%= 2.00]
*
* ADD [0109 + 0307] 0806 3 2.0 72.45 5.01 3.40 27.62 n/a 0.000
*
* CHANNEL[ 2 : 0806] 0308 1 2.0 72.45 5.00 3.40 27.62 n/a 0.000
*
* ADD [0107 + 0308] 0807 3 2.0 80.98 5.74 3.40 28.26 n/a 0.000
*
* CHANNEL[ 2 : 0807] 0306 1 2.0 80.98 5.70 3.40 28.26 n/a 0.000
*
* ADD [0106 + 0306] 0804 3 2.0 94.69 6.78 3.40 28.58 n/a 0.000
*
* CHANNEL[ 2 : 0804] 0305 1 2.0 94.69 6.50 3.47 28.58 n/a 0.000
*
* ADD [0104 + 0305] 0093 3 2.0 99.91 6.92 3.43 28.91 n/a 0.000
*
* ADD [0103 + 0093] 0805 3 2.0 135.70 10.63 3.40 31.55 n/a 0.000
*
* CHANNEL[ 2 : 0805] 0312 1 2.0 135.70 10.37 3.43 31.55 n/a 0.000
*
* ADD [0312 + 0803] 0094 3 2.0 252.63 14.74 3.50 30.68 n/a 0.000
*
* CHANNEL[ 2 : 0094] 0309 1 2.0 252.63 14.74 3.50 30.68 n/a 0.000
*
* CALI B STANDHYD 0111 1 2.0 3.57 0.36 3.30 32.88 0.55 0.000
[1%=22.2; S%= 2.00]
*
* ADD [0111 + 0309] 0808 3 2.0 256.20 14.99 3.50 30.71 n/a 0.000
*
* CHANNEL[ 2 : 0808] 0310 1 2.0 256.20 14.97 3.50 30.71 n/a 0.000
*
* CALI B STANDHYD 0112 1 2.0 16.90 1.70 3.33 35.02 0.59 0.000
[1%=23.9; S%= 2.00]
*
* ADD [0112 + 0310] 0809 3 2.0 273.10 16.30 3.50 30.98 n/a 0.000
*
* CHANNEL[ 2 : 0809] 0311 1 2.0 273.10 15.87 3.53 30.98 n/a 0.000
*
* CALI B STANDHYD 0114 1 2.0 4.95 0.53 3.30 33.30 0.56 0.000
[1%=17.3; S%= 2.00]
*
* ADD [0114 + 0311] 0810 3 2.0 278.05 16.18 3.53 31.02 n/a 0.000
*
* CHANNEL[ 2 : 0810] 0313 1 2.0 278.05 16.17 3.53 31.02 n/a 0.000
*
* CALI B STANDHYD 0115 1 2.0 12.66 1.08 3.30 30.35 0.51 0.000
[1%=28.8; S%= 2.00]
*
* ADD [0115 + 0313] 0811 3 2.0 290.71 16.90 3.53 30.99 n/a 0.000
*
* CHANNEL[ 2 : 0811] 0314 1 2.0 290.71 16.86 3.57 30.99 n/a 0.000
*
* CALI B STANDHYD 0116 1 2.0 26.63 2.35 3.30 30.35 0.51 0.000
[1%=25.5; S%= 2.00]
*
* ADD [0116 + 0314] 0812 3 2.0 317.34 18.33 3.53 30.94 n/a 0.000
*
* PIPE [ 2 : 0812] 0401 1 2.0 317.34 18.33 3.53 30.94 n/a 0.000
*
* CALI B STANDHYD 0117 1 2.0 27.32 1.80 3.30 23.13 0.39 0.000
[1%=25.1; S%= 2.00]
*
* ADD [0117 + 0401] 0813 3 2.0 344.66 19.40 3.53 30.32 n/a 0.000
*
* CHANNEL[ 2 : 0813] 0315 1 2.0 344.66 19.24 3.57 30.32 n/a 0.000
*
* CALI B STANDHYD 0119 1 2.0 16.91 1.19 3.33 25.61 0.43 0.000
[1%=26.9; S%= 2.00]

```

```

* ADD [0119 + 0315] 0814 3 2.0 361.57 19.99 3.57 30.10 n/a 0.000
* PIPE [ 2 : 0814] 0402 1 2.0 361.57 20.00 3.57 30.10 n/a 0.000
* ** CALI B STANDHYD 0120 1 2.0 17.04 1.04 3.30 21.59 0.36 0.000
  [I%=20.9; S%= 2.00]
* CHANNEL[ 2 : 0120] 0316 1 2.0 17.04 1.03 3.33 21.59 n/a 0.000
* ** CALI B STANDHYD 0121 1 2.0 1.39 0.07 3.23 16.22 0.27 0.000
  [I%=14.6; S%= 2.00]
* ** CALI B STANDHYD 0122 1 2.0 3.13 0.26 3.23 23.36 0.39 0.000
  [I%=26.5; S%= 2.00]
* ADD [0121 + 0122] 0815 3 2.0 4.52 0.32 3.23 21.16 n/a 0.000
* ADD [0815 + 0316] 0815 1 2.0 21.56 1.29 3.27 21.50 n/a 0.000
* ADD [0815 + 0402] 0815 3 2.0 383.13 20.75 3.57 29.62 n/a 0.000
* PIPE [ 2 : 0815] 0404 1 2.0 383.13 20.75 3.57 29.62 n/a 0.000
* ** CALI B STANDHYD 0124 1 2.0 21.61 1.97 3.27 27.43 0.46 0.000
  [I%=33.4; S%= 2.00]
* ADD [0124 + 0404] 0816 3 2.0 404.74 21.52 3.57 29.50 n/a 0.000
* DUHYD 0500 1 2.0 404.74 21.52 3.57 29.50 n/a 0.000
  MAJOR SYSTEM: 0500 2 2.0 336.20 20.65 3.57 29.50 n/a 0.000
  MINOR SYSTEM: 0500 3 2.0 68.54 0.87 2.07 29.50 n/a 0.000
* PIPE [ 2 : 0500] 0405 1 2.0 336.20 20.64 3.57 29.50 n/a 0.000
* ** CALI B STANDHYD 0125 1 2.0 18.74 2.04 3.30 33.48 0.56 0.000
  [I%=44.1; S%= 2.00]
* ADD [0125 + 0405] 0817 3 2.0 354.94 21.61 3.57 29.71 n/a 0.000
* PIPE [ 2 : 0500] 0408 1 2.0 68.54 0.87 2.47 29.50 n/a 0.000
* ** CALI B STANDHYD 0126 1 2.0 22.26 1.97 3.27 25.78 0.43 0.000
  [I%=32.1; S%= 2.00]
* ADD [0126 + 0408] 0820 3 2.0 90.80 2.83 3.27 28.59 n/a 0.000
* PIPE [ 2 : 0820] 0406 1 2.0 90.80 2.83 3.27 28.59 n/a 0.000
* ** CALI B STANDHYD 0127 1 2.0 9.98 0.73 3.27 22.92 0.39 0.000
  [I%=27.4; S%= 2.00]
* ADD [0127 + 0406] 0818 3 2.0 100.78 3.56 3.27 28.02 n/a 0.000
* PIPE [ 2 : 0818] 0407 1 2.0 100.78 3.51 3.30 28.02 n/a 0.000
* ** CALI B STANDHYD 0128 1 2.0 14.87 1.96 3.27 35.07 0.59 0.000
  [I%=45.4; S%= 2.00]
* ADD [0128 + 0407] 0819 3 2.0 115.65 5.45 3.27 28.93 n/a 0.000

```

\*\*\*\*\*  
**1:5 Year 12 Hour SCS Design Storm**  
 \*\*\*\*\*

W/E COMMAND HYD ID DT AREA \* Qpeak Tpeak R. V. R. C. Qbase  
 min ha \* cms hrs mm cms

START @ 0.00 hrs

READ STORM 15.0

[ Ptot= 64.31 mm ]  
 fname : C:\Users\dtwi gger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\cd5b1e2c-2029-4ef0-acc  
 remark: 5yr/12hr Barrie Wpcc +15% SCS

```

* ** CALI B STANDHYD 0100 1 2.0 31.13 2.16 6.33 30.91 0.48 0.000
  [I%=28.2; S%= 2.00]
* CHANNEL[ 2 : 0100] 0302 1 2.0 31.13 2.14 6.37 30.91 n/a 0.000
* ** CALI B STANDHYD 0105 1 2.0 9.01 0.93 6.27 36.59 0.57 0.000
  [I%=24.8; S%= 2.00]
* ** CALI B STANDHYD 0110 1 2.0 12.37 0.97 6.30 32.35 0.50 0.000
  [I%=25.4; S%= 2.00]

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* CHANNEL[ 2 : 0110] 0303 1 2.0 12.37 0.95 6.33 32.35 n/a 0.000
* ADD [0105 + 0302] 0802 3 2.0 40.14 2.94 6.30 32.19 n/a 0.000
* ADD [0802 + 0303] 0802 1 2.0 52.51 3.87 6.33 32.23 n/a 0.000
* PIPE [ 2 : 0802] 0400 1 2.0 52.51 3.88 6.33 32.23 n/a 0.000
* ** CALI B STANDHYD 0113 1 2.0 9.41 1.04 6.27 38.65 0.60 0.000
  [I%=39.4; S%= 2.00]
* CHANNEL[ 2 : 0113] 0301 1 2.0 9.41 0.97 6.30 38.64 n/a 0.000
* ** CALI B STANDHYD 0118 1 2.0 4.11 0.35 6.27 30.86 0.48 0.000
  [I%=27.5; S%= 2.00]
* RESRVR [ 2 : 0118] 0600 1 2.0 4.11 0.24 6.40 30.94 n/a 0.000
  {ST= 0.01 ha.m }
* CHANNEL[ 2 : 0600] 0300 1 2.0 4.11 0.22 6.53 30.92 n/a 0.000
* ** CALI B STANDHYD 0101 1 2.0 8.68 0.60 6.27 26.68 0.41 0.000
  [I%=22.9; S%= 2.00]
* ADD [0101 + 0300] 0801 3 2.0 12.79 0.78 6.27 28.04 n/a 0.000
* CHANNEL[ 2 : 0801] 0304 1 2.0 12.79 0.72 6.33 28.03 n/a 0.000
* ** CALI B STANDHYD 0123 1 2.0 22.81 1.70 6.33 34.00 0.53 0.000
  [I%=27.1; S%= 2.00]
* ADD [0123 + 0301] 0800 3 2.0 32.22 2.66 6.33 35.36 n/a 0.000
* ADD [0800 + 0304] 0800 1 2.0 45.01 3.38 6.33 33.28 n/a 0.000
* ADD [0800 + 0400] 0800 3 2.0 97.52 7.26 6.33 32.71 n/a 0.000
* RESRVR [ 2 : 0800] 0601 1 2.0 97.52 4.11 6.67 32.42 n/a 0.000
  {ST= 0.88 ha.m }
* PIPE [ 2 : 0601] 0403 1 2.0 97.52 4.11 6.67 32.42 n/a 0.000
* CHANNEL[ 2 : 0403] 0317 1 2.0 97.52 3.96 6.77 32.42 n/a 0.000
* ** CALI B STANDHYD 0102 1 2.0 19.41 1.71 6.33 36.45 0.57 0.000
  [I%=22.0; S%= 2.00]
* ADD [0102 + 0317] 0803 3 2.0 116.93 4.77 6.70 33.09 n/a 0.000
* ** CALI B STANDHYD 0103 1 2.0 35.79 3.88 6.33 43.00 0.67 0.000
  [I%=37.1; S%= 2.00]
* ** CALI B STANDHYD 0104 1 2.0 5.22 0.57 6.30 38.93 0.61 0.000
  [I%=20.7; S%= 2.00]
* ** CALI B STANDHYD 0106 1 2.0 13.71 1.12 6.33 34.04 0.53 0.000
  [I%=21.1; S%= 2.00]
* ** CALI B STANDHYD 0107 1 5.0 8.53 0.88 6.25 37.61 0.58 0.000
  [I%=18.1; S%= 2.00]
* ** CALI B STANDHYD 0108 1 2.0 58.75 3.58 6.40 30.14 0.47 0.000
  [I%=24.4; S%= 2.00]
* CHANNEL[ 2 : 0108] 0307 1 2.0 58.75 3.51 6.43 30.14 n/a 0.000
* ** CALI B STANDHYD 0109 1 2.0 13.70 1.30 6.37 34.00 0.53 0.000
  [I%= 3.0; S%= 2.00]
* ADD [0109 + 0307] 0806 3 2.0 72.45 4.71 6.40 30.87 n/a 0.000
* CHANNEL[ 2 : 0806] 0308 1 2.0 72.45 4.70 6.43 30.87 n/a 0.000
* ADD [0107 + 0308] 0807 3 2.0 80.98 5.36 6.43 31.58 n/a 0.000
* CHANNEL[ 2 : 0807] 0306 1 2.0 80.98 5.35 6.43 31.58 n/a 0.000
* ADD [0106 + 0306] 0804 3 2.0 94.69 6.33 6.43 31.94 n/a 0.000
* CHANNEL[ 2 : 0804] 0305 1 2.0 94.69 6.10 6.47 31.94 n/a 0.000
* ADD [0104 + 0305] 0093 3 2.0 99.91 6.49 6.47 32.30 n/a 0.000

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* ADD [0103 + 0093] 0805 3 2.0 135.70 9.86 6.40 35.12 n/a 0.000
* CHANNEL [ 2 : 0805] 0312 1 2.0 135.70 9.62 6.43 35.12 n/a 0.000
* ADD [0312 + 0803] 0094 3 2.0 252.63 13.74 6.50 34.18 n/a 0.000
* CHANNEL [ 2 : 0094] 0309 1 2.0 252.63 13.73 6.50 34.18 n/a 0.000
* CALI B STANDHYD [1%=22.2: S%= 2.00] 0111 1 2.0 3.57 0.34 6.30 36.67 0.57 0.000
* ADD [0111 + 0309] 0808 3 2.0 256.20 13.96 6.50 34.22 n/a 0.000
* CHANNEL [ 2 : 0808] 0310 1 2.0 256.20 13.92 6.50 34.22 n/a 0.000
* CALI B STANDHYD [1%=23.9: S%= 2.00] 0112 1 2.0 16.90 1.60 6.33 38.98 0.61 0.000
* ADD [0112 + 0310] 0809 3 2.0 273.10 15.17 6.50 34.51 n/a 0.000
* CHANNEL [ 2 : 0809] 0311 1 2.0 273.10 14.80 6.57 34.51 n/a 0.000
* CALI B STANDHYD [1%=17.3: S%= 2.00] 0114 1 2.0 4.95 0.50 6.30 37.19 0.58 0.000
* ADD [0114 + 0311] 0810 3 2.0 278.05 15.07 6.53 34.56 n/a 0.000
* CHANNEL [ 2 : 0810] 0313 1 2.0 278.05 15.08 6.57 34.56 n/a 0.000
* CALI B STANDHYD [1%=28.8: S%= 2.00] 0115 1 2.0 12.66 1.02 6.33 33.74 0.52 0.000
* ADD [0115 + 0313] 0811 3 2.0 290.71 15.76 6.53 34.52 n/a 0.000
* CHANNEL [ 2 : 0811] 0314 1 2.0 290.71 15.75 6.57 34.52 n/a 0.000
* CALI B STANDHYD [1%=25.5: S%= 2.00] 0116 1 2.0 26.63 2.26 6.30 33.84 0.53 0.000
* ADD [0116 + 0314] 0812 3 2.0 317.34 17.14 6.53 34.46 n/a 0.000
* PIPE [ 2 : 0812] 0401 1 2.0 317.34 17.14 6.53 34.46 n/a 0.000
* CALI B STANDHYD [1%=25.1: S%= 2.00] 0117 1 2.0 27.32 1.68 6.30 25.73 0.40 0.000
* ADD [0117 + 0401] 0813 3 2.0 344.66 18.16 6.53 33.77 n/a 0.000
* CHANNEL [ 2 : 0813] 0315 1 2.0 344.66 18.02 6.57 33.77 n/a 0.000
* CALI B STANDHYD [1%=26.9: S%= 2.00] 0119 1 2.0 16.91 1.11 6.33 28.51 0.44 0.000
* ADD [0119 + 0315] 0814 3 2.0 361.57 18.74 6.57 33.53 n/a 0.000
* PIPE [ 2 : 0814] 0402 1 2.0 361.57 18.74 6.57 33.53 n/a 0.000
* CALI B STANDHYD [1%=20.9: S%= 2.00] 0120 1 2.0 17.04 0.98 6.30 24.12 0.38 0.000
* CHANNEL [ 2 : 0120] 0316 1 2.0 17.04 0.97 6.33 24.12 n/a 0.000
* CALI B STANDHYD [1%=14.6: S%= 2.00] 0121 1 2.0 1.39 0.06 6.23 18.23 0.28 0.000
* CALI B STANDHYD [1%=26.5: S%= 2.00] 0122 1 2.0 3.13 0.24 6.23 25.95 0.40 0.000
* ADD [0121 + 0122] 0815 3 2.0 4.52 0.30 6.23 23.57 n/a 0.000
* ADD [0815 + 0316] 0815 1 2.0 21.56 1.21 6.30 24.00 n/a 0.000
* ADD [0815 + 0402] 0815 3 2.0 383.13 19.47 6.57 32.99 n/a 0.000
* PIPE [ 2 : 0815] 0404 1 2.0 383.13 19.47 6.57 32.99 n/a 0.000
* CALI B STANDHYD [1%=33.4: S%= 2.00] 0124 1 2.0 21.61 1.83 6.27 30.34 0.47 0.000
* ADD [0124 + 0404] 0816 3 2.0 404.74 20.20 6.57 32.85 n/a 0.000
* DUHYD 0500 1 2.0 404.74 20.20 6.57 32.85 n/a 0.000
* MAJOR SYSTEM: 0500 2 2.0 307.56 19.33 6.57 32.85 n/a 0.000
* MINOR SYSTEM: 0500 3 2.0 97.17 0.87 4.47 32.85 n/a 0.000

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* PIPE [ 2 : 0500] 0405 1 2.0 307.56 19.33 6.57 32.85 n/a 0.000
** CALI B STANDHYD [1%=44.1: S%= 2.00] 0125 1 2.0 18.74 1.85 6.30 36.84 0.57 0.000
* ADD [0125 + 0405] 0817 3 2.0 326.30 20.27 6.53 33.08 n/a 0.000
* PIPE [ 2 : 0500] 0408 1 2.0 97.17 0.87 4.83 32.85 n/a 0.000
** CALI B STANDHYD [1%=32.1: S%= 2.00] 0126 1 2.0 22.26 1.82 6.27 28.51 0.44 0.000
* ADD [0126 + 0408] 0820 3 2.0 119.43 2.69 6.27 32.04 n/a 0.000
* PIPE [ 2 : 0820] 0406 1 2.0 119.43 2.68 6.27 32.04 n/a 0.000
** CALI B STANDHYD [1%=27.4: S%= 2.00] 0127 1 2.0 9.98 0.67 6.27 25.42 0.40 0.000
* ADD [0127 + 0406] 0818 3 2.0 129.41 3.35 6.27 31.53 n/a 0.000
* PIPE [ 2 : 0818] 0407 1 2.0 129.41 3.31 6.30 31.53 n/a 0.000
** CALI B STANDHYD [1%=45.4: S%= 2.00] 0128 1 2.0 14.87 1.78 6.27 38.59 0.60 0.000
* ADD [0128 + 0407] 0819 3 2.0 144.28 5.07 6.27 32.26 n/a 0.000
*****
** SIMULATION NUMBER: 12 **
*****
1:5 Year 24 Hour SCS Design Storm
W/E COMMAND HYD ID DT AREA Opeak Tpeak R. V. R. C. Qbase
mi n ha cms hrs mm cms
START @ 0.00 hrs
-----
READ STORM 15.0
[ Ptot= 76.01 mm ]
fname : C:\Users\dtwigger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\d435a3a6-b591-4239-b51
remark: 5yr/24hr Barrie Wpcc +15% SCS
** CALI B STANDHYD [1%=28.2: S%= 2.00] 0100 1 2.0 31.13 2.27 12.33 38.84 0.51 0.000
* CHANNEL [ 2 : 0100] 0302 1 2.0 31.13 2.25 12.37 38.84 n/a 0.000
** CALI B STANDHYD [1%=24.8: S%= 2.00] 0105 1 2.0 9.01 0.98 12.27 46.02 0.61 0.000
** CALI B STANDHYD [1%=25.4: S%= 2.00] 0110 1 2.0 12.37 1.03 12.30 40.81 0.54 0.000
* CHANNEL [ 2 : 0110] 0303 1 2.0 12.37 1.01 12.33 40.81 n/a 0.000
* ADD [0105 + 0302] 0802 3 2.0 40.14 3.09 12.30 40.45 n/a 0.000
* ADD [0802 + 0303] 0802 1 2.0 52.51 4.09 12.33 40.54 n/a 0.000
* PIPE [ 2 : 0802] 0400 1 2.0 52.51 4.09 12.33 40.54 n/a 0.000
** CALI B STANDHYD [1%=39.4: S%= 2.00] 0113 1 2.0 9.41 1.08 12.27 47.85 0.63 0.000
* CHANNEL [ 2 : 0113] 0301 1 2.0 9.41 1.00 12.30 47.85 n/a 0.000
** CALI B STANDHYD [1%=27.5: S%= 2.00] 0118 1 2.0 4.11 0.37 12.27 38.84 0.51 0.000
* RESRVR [ 2 : 0118] 0600 1 2.0 4.11 0.24 12.43 38.88 n/a 0.000
{ST= 0.01 ha.m }
* CHANNEL [ 2 : 0600] 0300 1 2.0 4.11 0.23 12.57 38.86 n/a 0.000
** CALI B STANDHYD [1%=22.9: S%= 2.00] 0101 1 2.0 8.68 0.66 12.27 33.84 0.45 0.000
* ADD [0101 + 0300] 0801 3 2.0 12.79 0.83 12.27 35.45 n/a 0.000
* CHANNEL [ 2 : 0801] 0304 1 2.0 12.79 0.78 12.33 35.44 n/a 0.000
** CALI B STANDHYD [1%=27.1: S%= 2.00] 0123 1 2.0 22.81 1.86 12.33 42.84 0.56 0.000

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*	ADD [0123 + 0301]	0800	3	2.0	32.22	2.85	12.33	44.31	n/a	0.000
*	ADD [0800 + 0304]	0800	1	2.0	45.01	3.63	12.33	41.79	n/a	0.000
*	ADD [0800 + 0400]	0800	3	2.0	97.52	7.72	12.33	41.11	n/a	0.000
*	RESRVR [ 2 : 0800 ] {ST= 0.91 ha.m }	0601	1	2.0	97.52	4.83	12.60	40.82	n/a	0.000
*	PIPE [ 2 : 0601]	0403	1	2.0	97.52	4.82	12.60	40.82	n/a	0.000
*	CHANNEL[ 2 : 0403]	0317	1	2.0	97.52	4.56	12.70	40.82	n/a	0.000
**	CALI B STANDHYD [I%=22.0: S%= 2.00]	0102	1	2.0	19.41	1.83	12.33	46.01	0.61	0.000
*	ADD [0102 + 0317]	0803	3	2.0	116.93	5.47	12.67	41.68	n/a	0.000
**	CALI B STANDHYD [I%=37.1: S%= 2.00]	0103	1	2.0	35.79	4.01	12.33	53.16	0.70	0.000
**	CALI B STANDHYD [I%=20.7: S%= 2.00]	0104	1	2.0	5.22	0.60	12.30	48.89	0.64	0.000
**	CALI B STANDHYD [I%=21.1: S%= 2.00]	0106	1	2.0	13.71	1.19	12.33	43.06	0.57	0.000
*	CALI B STANDHYD [I%=18.1: S%= 2.00]	0107	1	5.0	8.53	0.94	12.25	47.42	0.62	0.000
*	CALI B STANDHYD [I%=24.4: S%= 2.00]	0108	1	2.0	58.75	3.80	12.40	38.10	0.50	0.000
*	CHANNEL[ 2 : 0108]	0307	1	2.0	58.75	3.73	12.43	38.10	n/a	0.000
*	CALI B STANDHYD [I%= 3.0: S%= 2.00]	0109	1	2.0	13.70	1.41	12.33	43.57	0.57	0.000
*	ADD [0109 + 0307]	0806	3	2.0	72.45	5.02	12.40	39.13	n/a	0.000
*	CHANNEL[ 2 : 0806]	0308	1	2.0	72.45	5.01	12.43	39.13	n/a	0.000
*	ADD [0107 + 0308]	0807	3	2.0	80.98	5.72	12.40	40.00	n/a	0.000
*	CHANNEL[ 2 : 0807]	0306	1	2.0	80.98	5.70	12.43	40.00	n/a	0.000
*	ADD [0106 + 0306]	0804	3	2.0	94.69	6.75	12.43	40.45	n/a	0.000
*	CHANNEL[ 2 : 0804]	0305	1	2.0	94.69	6.51	12.47	40.44	n/a	0.000
*	ADD [0104 + 0305]	0093	3	2.0	99.91	6.92	12.47	40.89	n/a	0.000
*	ADD [0103 + 0093]	0805	3	2.0	135.70	10.44	12.40	44.12	n/a	0.000
*	CHANNEL[ 2 : 0805]	0312	1	2.0	135.70	10.19	12.43	44.12	n/a	0.000
*	ADD [0312 + 0803]	0094	3	2.0	252.63	14.73	12.50	42.99	n/a	0.000
*	CHANNEL[ 2 : 0094]	0309	1	2.0	252.63	14.73	12.50	42.99	n/a	0.000
**	CALI B STANDHYD [I%=22.2: S%= 2.00]	0111	1	2.0	3.57	0.36	12.30	46.20	0.61	0.000
*	ADD [0111 + 0309]	0808	3	2.0	256.20	14.97	12.50	43.04	n/a	0.000
*	CHANNEL[ 2 : 0808]	0310	1	2.0	256.20	14.94	12.50	43.04	n/a	0.000
*	CALI B STANDHYD [I%=23.9: S%= 2.00]	0112	1	2.0	16.90	1.70	12.33	48.87	0.64	0.000
*	ADD [0112 + 0310]	0809	3	2.0	273.10	16.26	12.50	43.40	n/a	0.000
*	CHANNEL[ 2 : 0809]	0311	1	2.0	273.10	15.86	12.57	43.40	n/a	0.000
*	CALI B STANDHYD [I%=17.3: S%= 2.00]	0114	1	2.0	4.95	0.54	12.30	46.96	0.62	0.000
*	ADD [0114 + 0311]	0810	3	2.0	278.05	16.15	12.53	43.46	n/a	0.000
*	CHANNEL[ 2 : 0810]	0313	1	2.0	278.05	16.16	12.57	43.46	n/a	0.000
*	CALI B STANDHYD [I%=28.8: S%= 2.00]	0115	1	2.0	12.66	1.07	12.33	42.32	0.56	0.000

*	ADD [0115 + 0313]	0811	3	2.0	290.71	16.89	12.53	43.41	n/a	0.000
*	CHANNEL[ 2 : 0811]	0314	1	2.0	290.71	16.87	12.57	43.41	n/a	0.000
**	CALI B STANDHYD [I%=25.5: S%= 2.00]	0116	1	2.0	26.63	2.39	12.30	42.64	0.56	0.000
*	ADD [0116 + 0314]	0812	3	2.0	317.34	18.37	12.53	43.35	n/a	0.000
*	PIPE [ 2 : 0812]	0401	1	2.0	317.34	18.37	12.53	43.35	n/a	0.000
**	CALI B STANDHYD [I%=25.1: S%= 2.00]	0117	1	2.0	27.32	1.78	12.30	32.38	0.43	0.000
*	ADD [0117 + 0401]	0813	3	2.0	344.66	19.46	12.53	42.48	n/a	0.000
*	CHANNEL[ 2 : 0813]	0315	1	2.0	344.66	19.31	12.57	42.48	n/a	0.000
**	CALI B STANDHYD [I%=26.9: S%= 2.00]	0119	1	2.0	16.91	1.16	12.33	35.89	0.47	0.000
*	ADD [0119 + 0315]	0814	3	2.0	361.57	20.07	12.57	42.17	n/a	0.000
*	PIPE [ 2 : 0814]	0402	1	2.0	361.57	20.08	12.57	42.17	n/a	0.000
**	CALI B STANDHYD [I%=20.9: S%= 2.00]	0120	1	2.0	17.04	1.03	12.30	30.62	0.40	0.000
*	CHANNEL[ 2 : 0120]	0316	1	2.0	17.04	1.02	12.33	30.62	n/a	0.000
**	CALI B STANDHYD [I%=14.6: S%= 2.00]	0121	1	2.0	1.39	0.07	12.23	23.47	0.31	0.000
**	CALI B STANDHYD [I%=26.5: S%= 2.00]	0122	1	2.0	3.13	0.25	12.23	32.55	0.43	0.000
*	ADD [0121 + 0122]	0815	3	2.0	4.52	0.32	12.23	29.75	n/a	0.000
*	ADD [0815 + 0316]	0815	1	2.0	21.56	1.27	12.30	30.44	n/a	0.000
*	ADD [0815 + 0402]	0815	3	2.0	383.13	20.88	12.53	41.51	n/a	0.000
*	PIPE [ 2 : 0815]	0404	1	2.0	383.13	20.88	12.57	41.51	n/a	0.000
**	CALI B STANDHYD [I%=33.4: S%= 2.00]	0124	1	2.0	21.61	1.87	12.27	37.69	0.50	0.000
*	ADD [0124 + 0404]	0816	3	2.0	404.74	21.64	12.57	41.31	n/a	0.000
*	DUHYD	0500	1	2.0	404.74	21.64	12.57	41.31	n/a	0.000
*	MAJOR SYSTEM:	0500	2	2.0	267.61	20.77	12.57	41.31	n/a	0.000
*	MINOR SYSTEM:	0500	3	2.0	137.13	0.87	9.83	41.31	n/a	0.000
*	PIPE [ 2 : 0500]	0405	1	2.0	267.61	20.78	12.57	41.31	n/a	0.000
**	CALI B STANDHYD [I%=44.1: S%= 2.00]	0125	1	2.0	18.74	1.88	12.30	45.25	0.60	0.000
*	ADD [0125 + 0405]	0817	3	2.0	286.35	21.77	12.53	41.56	n/a	0.000
*	PIPE [ 2 : 0500]	0408	1	2.0	137.13	0.87	10.27	41.31	n/a	0.000
**	CALI B STANDHYD [I%=32.1: S%= 2.00]	0126	1	2.0	22.26	1.87	12.27	35.44	0.47	0.000
*	ADD [0126 + 0408]	0820	3	2.0	159.39	2.74	12.27	40.49	n/a	0.000
*	PIPE [ 2 : 0820]	0406	1	2.0	159.39	2.73	12.27	40.49	n/a	0.000
**	CALI B STANDHYD [I%=27.4: S%= 2.00]	0127	1	2.0	9.98	0.70	12.27	31.79	0.42	0.000
*	ADD [0127 + 0406]	0818	3	2.0	169.37	3.43	12.27	39.97	n/a	0.000
*	PIPE [ 2 : 0818]	0407	1	2.0	169.37	3.39	12.30	39.97	n/a	0.000
**	CALI B STANDHYD [I%=45.4: S%= 2.00]	0128	1	2.0	14.87	1.82	12.27	47.38	0.62	0.000
*	ADD [0128 + 0407]	0819	3	2.0	184.24	5.17	12.27	40.57	n/a	0.000

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\*\* SIMULATION NUMBER: 13 \*\*

**1:10 Year 6 Hour SCS Design Storm**

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W/E COMMAND HYD ID DT AREA Qpeak Tpeak R. V. R. C. Qbase  
mi n ha cms hrs mm

START @ 0.00 hrs

READ STORM

[Plot = 70.80 mm]

Fname : C:\Users\dtwi gger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\18481e3d-6d75-48f9-814

remark: 10yr/6hr Barri e Wpcc +15% SCS

**	CALI B STANDHYD [I%=28.2; S%= 2.00]	0100	1	2.0	31.13	3.06	3.33	35.26	0.50	0.000
*	CHANNEL[ 2 : 0100]	0302	1	2.0	31.13	3.03	3.37	35.26	n/a	0.000
**	CALI B STANDHYD [I%=24.8; S%= 2.00]	0105	1	2.0	9.01	1.33	3.27	41.77	0.59	0.000
*	CALI B STANDHYD [I%=25.4; S%= 2.00]	0110	1	2.0	12.37	1.39	3.30	36.99	0.52	0.000
*	CHANNEL[ 2 : 0110]	0303	1	2.0	12.37	1.37	3.33	36.99	n/a	0.000
*	ADD [0105 + 0302]	0802	3	2.0	40.14	4.17	3.30	36.72	n/a	0.000
*	ADD [0802 + 0303]	0802	1	2.0	52.51	5.50	3.33	36.78	n/a	0.000
*	PIPE [ 2 : 0802]	0400	1	2.0	52.51	5.50	3.33	36.78	n/a	0.000
**	CALI B STANDHYD [I%=39.4; S%= 2.00]	0113	1	2.0	9.41	1.46	3.27	43.71	0.62	0.000
*	CHANNEL[ 2 : 0113]	0301	1	2.0	9.41	1.38	3.30	43.71	n/a	0.000
**	CALI B STANDHYD [I%=27.5; S%= 2.00]	0118	1	2.0	4.11	0.49	3.27	35.23	0.50	0.000
*	RESRVR [ 2 : 0118] {ST= 0.02 ha.m }	0600	1	2.0	4.11	0.29	3.43	35.27	n/a	0.000
*	CHANNEL[ 2 : 0600]	0300	1	2.0	4.11	0.28	3.57	35.24	n/a	0.000
**	CALI B STANDHYD [I%=22.9; S%= 2.00]	0101	1	2.0	8.68	0.84	3.27	30.59	0.43	0.000
*	ADD [0101 + 0300]	0801	3	2.0	12.79	1.05	3.27	32.09	n/a	0.000
*	CHANNEL[ 2 : 0801]	0304	1	2.0	12.79	0.97	3.30	32.08	n/a	0.000
**	CALI B STANDHYD [I%=27.1; S%= 2.00]	0123	1	2.0	22.81	2.51	3.33	38.86	0.55	0.000
*	ADD [0123 + 0301]	0800	3	2.0	32.22	3.86	3.33	40.27	n/a	0.000
*	ADD [0800 + 0304]	0800	1	2.0	45.01	4.81	3.33	37.95	n/a	0.000
*	ADD [0800 + 0400]	0800	3	2.0	97.52	10.31	3.33	37.32	n/a	0.000
*	RESRVR [ 2 : 0800] {ST= 1.00 ha.m }	0601	1	2.0	97.52	7.73	3.50	37.03	n/a	0.000
*	PIPE [ 2 : 0601]	0403	1	2.0	97.52	7.73	3.50	37.03	n/a	0.000
*	CHANNEL[ 2 : 0403]	0317	1	2.0	97.52	7.08	3.60	37.03	n/a	0.000
**	CALI B STANDHYD [I%=22.0; S%= 2.00]	0102	1	2.0	19.41	2.47	3.33	41.71	0.59	0.000
*	ADD [0102 + 0317]	0803	3	2.0	116.93	8.45	3.57	37.80	n/a	0.000
**	CALI B STANDHYD [I%=37.1; S%= 2.00]	0103	1	2.0	35.79	5.44	3.30	48.60	0.69	0.000
*	CALI B STANDHYD [I%=20.7; S%= 2.00]	0104	1	2.0	5.22	0.80	3.27	44.41	0.63	0.000
**	CALI B STANDHYD [I%=21.1; S%= 2.00]	0106	1	2.0	13.71	1.61	3.33	38.99	0.55	0.000
*	CALI B STANDHYD [I%=18.1; S%= 2.00]	0107	1	5.0	8.53	1.22	3.25	43.01	0.61	0.000

*	CALI B STANDHYD [I%=24.4; S%= 2.00]	0108	1	2.0	58.75	5.07	3.37	34.50	0.49	0.000
*	CHANNEL[ 2 : 0108]	0307	1	2.0	58.75	4.97	3.40	34.50	n/a	0.000
**	CALI B STANDHYD [I%= 3.0; S%= 2.00]	0109	1	2.0	13.70	1.90	3.33	39.26	0.55	0.000
*	ADD [0109 + 0307]	0806	3	2.0	72.45	6.72	3.40	35.40	n/a	0.000
*	CHANNEL[ 2 : 0806]	0308	1	2.0	72.45	6.71	3.40	35.40	n/a	0.000
*	ADD [0107 + 0308]	0807	3	2.0	80.98	7.69	3.40	36.20	n/a	0.000
*	CHANNEL[ 2 : 0807]	0306	1	2.0	80.98	7.65	3.40	36.20	n/a	0.000
*	ADD [0106 + 0306]	0804	3	2.0	94.69	9.11	3.40	36.60	n/a	0.000
*	CHANNEL[ 2 : 0804]	0305	1	2.0	94.69	8.71	3.43	36.60	n/a	0.000
*	ADD [0104 + 0305]	0093	3	2.0	99.91	9.26	3.43	37.01	n/a	0.000
*	ADD [0103 + 0093]	0805	3	2.0	135.70	13.88	3.37	40.07	n/a	0.000
*	CHANNEL[ 2 : 0805]	0312	1	2.0	135.70	13.52	3.43	40.07	n/a	0.000
*	ADD [0312 + 0803]	0094	3	2.0	252.63	20.93	3.50	39.02	n/a	0.000
*	CHANNEL[ 2 : 0094]	0309	1	2.0	252.63	20.87	3.50	39.02	n/a	0.000
*	CALI B STANDHYD [I%=22.2; S%= 2.00]	0111	1	2.0	3.57	0.49	3.30	41.91	0.59	0.000
*	ADD [0111 + 0309]	0808	3	2.0	256.20	21.17	3.50	39.06	n/a	0.000
*	CHANNEL[ 2 : 0808]	0310	1	2.0	256.20	21.10	3.53	39.06	n/a	0.000
*	CALI B STANDHYD [I%=23.9; S%= 2.00]	0112	1	2.0	16.90	2.29	3.33	44.42	0.63	0.000
*	ADD [0112 + 0310]	0809	3	2.0	273.10	22.73	3.50	39.39	n/a	0.000
*	CHANNEL[ 2 : 0809]	0311	1	2.0	273.10	22.19	3.57	39.39	n/a	0.000
*	CALI B STANDHYD [I%=17.3; S%= 2.00]	0114	1	2.0	4.95	0.68	3.27	42.57	0.60	0.000
*	ADD [0114 + 0311]	0810	3	2.0	278.05	22.57	3.53	39.45	n/a	0.000
*	CHANNEL[ 2 : 0810]	0313	1	2.0	278.05	22.57	3.57	39.45	n/a	0.000
*	CALI B STANDHYD [I%=28.8; S%= 2.00]	0115	1	2.0	12.66	1.43	3.30	38.45	0.54	0.000
*	ADD [0115 + 0313]	0811	3	2.0	290.71	23.46	3.53	39.41	n/a	0.000
*	CHANNEL[ 2 : 0811]	0314	1	2.0	290.71	23.43	3.57	39.41	n/a	0.000
*	CALI B STANDHYD [I%=25.5; S%= 2.00]	0116	1	2.0	26.63	3.17	3.30	38.67	0.55	0.000
*	ADD [0116 + 0314]	0812	3	2.0	317.34	25.20	3.53	39.34	n/a	0.000
*	PIPE [ 2 : 0812]	0401	1	2.0	317.34	25.19	3.53	39.34	n/a	0.000
*	CALI B STANDHYD [I%=25.1; S%= 2.00]	0117	1	2.0	27.32	2.33	3.30	29.37	0.41	0.000
*	ADD [0117 + 0401]	0813	3	2.0	344.66	26.59	3.53	38.55	n/a	0.000
*	CHANNEL[ 2 : 0813]	0315	1	2.0	344.66	26.41	3.57	38.55	n/a	0.000
*	CALI B STANDHYD [I%=26.9; S%= 2.00]	0119	1	2.0	16.91	1.56	3.30	32.55	0.46	0.000
*	ADD [0119 + 0315]	0814	3	2.0	361.57	27.34	3.57	38.27	n/a	0.000
*	PIPE [ 2 : 0814]	0402	1	2.0	361.57	27.35	3.57	38.27	n/a	0.000
*	CALI B STANDHYD [I%=20.9; S%= 2.00]	0120	1	2.0	17.04	1.37	3.27	27.67	0.39	0.000
*	CHANNEL[ 2 : 0120]	0316	1	2.0	17.04	1.37	3.30	27.67	n/a	0.000

*	CALI B STANDHYD	0121	1	2.0	1.39	0.09	3.23	21.08	0.30	0.000
	[I%=14.6: S%= 2.00]									
*	CALI B STANDHYD	0122	1	2.0	3.13	0.33	3.23	29.56	0.42	0.000
	[I%=26.5: S%= 2.00]									
*	ADD [0121 + 0122]	0815	3	2.0	4.52	0.42	3.23	26.95	n/a	0.000
*	ADD [0815 + 0316]	0815	1	2.0	21.56	1.75	3.27	27.52	n/a	0.000
*	ADD [0815 + 0402]	0815	3	2.0	383.13	28.30	3.57	37.67	n/a	0.000
*	PIPE [ 2 : 0815]	0404	1	2.0	383.13	28.30	3.57	37.67	n/a	0.000
*	CALI B STANDHYD	0124	1	2.0	21.61	2.61	3.27	34.37	0.49	0.000
	[I%=33.4: S%= 2.00]									
*	ADD [0124 + 0404]	0816	3	2.0	404.74	29.24	3.57	37.49	n/a	0.000
*	DUHYD	0500	1	2.0	404.74	29.24	3.57	37.49	n/a	0.000
	MAJOR SYSTEM:	0500	2	2.0	347.99	28.37	3.57	37.49	n/a	0.000
	MINOR SYSTEM:	0500	3	2.0	56.74	0.87	1.90	37.49	n/a	0.000
*	PIPE [ 2 : 0500]	0405	1	2.0	347.99	28.36	3.57	37.49	n/a	0.000
**	CALI B STANDHYD	0125	1	2.0	18.74	2.57	3.30	41.47	0.59	0.000
	[I%=44.1: S%= 2.00]									
*	ADD [0125 + 0405]	0817	3	2.0	366.73	29.51	3.53	37.69	n/a	0.000
*	PIPE [ 2 : 0500]	0408	1	2.0	56.74	0.87	2.33	37.49	n/a	0.000
*	CALI B STANDHYD	0126	1	2.0	22.26	2.49	3.23	32.31	0.46	0.000
	[I%=32.1: S%= 2.00]									
*	ADD [0126 + 0408]	0820	3	2.0	79.00	3.35	3.23	36.03	n/a	0.000
*	PIPE [ 2 : 0820]	0406	1	2.0	79.00	3.35	3.27	36.03	n/a	0.000
**	CALI B STANDHYD	0127	1	2.0	9.98	0.93	3.27	28.91	0.41	0.000
	[I%=27.4: S%= 2.00]									
*	ADD [0127 + 0406]	0818	3	2.0	88.98	4.28	3.27	35.23	n/a	0.000
*	PIPE [ 2 : 0818]	0407	1	2.0	88.98	4.21	3.27	35.23	n/a	0.000
**	CALI B STANDHYD	0128	1	2.0	14.87	2.45	3.27	43.43	0.61	0.000
	[I%=45.4: S%= 2.00]									
*	ADD [0128 + 0407]	0819	3	2.0	103.85	6.66	3.27	36.41	n/a	0.000

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 \*\* SIMULATION NUMBER: 14 \*\* **1:10 Year 12 Hour SCS Design Storm**  
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W/E	COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R. V. mm	R. C.	Qbase cms	
	START @ 0.00 hrs									
	READ STORM			15.0						
	[ Ptot= 76.00 mm ]									
	rname : C:\Users\dtwigger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\F140697a-c991-4115-bcc									
	remark: 10yr/12hr Barrie Wpcc +15% SCS									
**	CALI B STANDHYD	0100	1	2.0	31.13	2.83	6.33	38.83	0.51	0.000
	[I%=28.2: S%= 2.00]									
*	CHANNEL[ 2 : 0100]	0302	1	2.0	31.13	2.81	6.37	38.83	n/a	0.000
**	CALI B STANDHYD	0105	1	2.0	9.01	1.19	6.27	46.01	0.61	0.000
	[I%=24.8: S%= 2.00]									
**	CALI B STANDHYD	0110	1	2.0	12.37	1.25	6.30	40.81	0.54	0.000
	[I%=25.4: S%= 2.00]									
*	CHANNEL[ 2 : 0110]	0303	1	2.0	12.37	1.23	6.33	40.80	n/a	0.000
*	ADD [0105 + 0302]	0802	3	2.0	40.14	3.82	6.30	40.45	n/a	0.000
*	ADD [0802 + 0303]	0802	1	2.0	52.51	5.04	6.33	40.53	n/a	0.000
*	PIPE [ 2 : 0802]	0400	1	2.0	52.51	5.04	6.33	40.53	n/a	0.000

**	CALI B STANDHYD	0113	1	2.0	9.41	1.35	6.27	47.85	0.63	0.000
	[I%=39.4: S%= 2.00]									
*	CHANNEL[ 2 : 0113]	0301	1	2.0	9.41	1.26	6.30	47.84	n/a	0.000
**	CALI B STANDHYD	0118	1	2.0	4.11	0.45	6.27	38.83	0.51	0.000
	[I%=27.5: S%= 2.00]									
*	RESRVR [ 2 : 0118]	0600	1	2.0	4.11	0.28	6.43	38.95	n/a	0.000
	{ST= 0.02 ha.m }									
*	CHANNEL[ 2 : 0600]	0300	1	2.0	4.11	0.26	6.57	38.92	n/a	0.000
**	CALI B STANDHYD	0101	1	2.0	8.68	0.79	6.27	33.83	0.45	0.000
	[I%=22.9: S%= 2.00]									
*	ADD [0101 + 0300]	0801	3	2.0	12.79	0.99	6.27	35.47	n/a	0.000
*	CHANNEL[ 2 : 0801]	0304	1	2.0	12.79	0.91	6.30	35.46	n/a	0.000
**	CALI B STANDHYD	0123	1	2.0	22.81	2.26	6.33	42.84	0.56	0.000
	[I%=27.1: S%= 2.00]									
*	ADD [0123 + 0301]	0800	3	2.0	32.22	3.50	6.33	44.30	n/a	0.000
*	ADD [0800 + 0304]	0800	1	2.0	45.01	4.40	6.33	41.79	n/a	0.000
*	ADD [0800 + 0400]	0800	3	2.0	97.52	9.44	6.33	41.11	n/a	0.000
*	RESRVR [ 2 : 0800]	0601	1	2.0	97.52	6.95	6.53	40.82	n/a	0.000
	{ST= 0.98 ha.m }									
*	PIPE [ 2 : 0601]	0403	1	2.0	97.52	6.97	6.53	40.82	n/a	0.000
*	CHANNEL[ 2 : 0403]	0317	1	2.0	97.52	6.43	6.63	40.82	n/a	0.000
**	CALI B STANDHYD	0102	1	2.0	19.41	2.31	6.33	46.00	0.61	0.000
	[I%=22.0: S%= 2.00]									
*	ADD [0102 + 0317]	0803	3	2.0	116.93	7.67	6.60	41.68	n/a	0.000
**	CALI B STANDHYD	0103	1	2.0	35.79	4.84	6.30	53.15	0.70	0.000
	[I%=37.1: S%= 2.00]									
**	CALI B STANDHYD	0104	1	2.0	5.22	0.72	6.27	48.88	0.64	0.000
	[I%=20.7: S%= 2.00]									
**	CALI B STANDHYD	0106	1	2.0	13.71	1.50	6.33	43.05	0.57	0.000
	[I%=21.1: S%= 2.00]									
*	CALI B STANDHYD	0107	1	5.0	8.53	1.14	6.25	47.41	0.62	0.000
	[I%=18.1: S%= 2.00]									
*	CALI B STANDHYD	0108	1	2.0	58.75	4.71	6.37	38.09	0.50	0.000
	[I%=24.4: S%= 2.00]									
*	CHANNEL[ 2 : 0108]	0307	1	2.0	58.75	4.62	6.43	38.09	n/a	0.000
**	CALI B STANDHYD	0109	1	2.0	13.70	1.78	6.33	43.56	0.57	0.000
	[I%= 3.0: S%= 2.00]									
*	ADD [0109 + 0307]	0806	3	2.0	72.45	6.24	6.40	39.13	n/a	0.000
*	CHANNEL[ 2 : 0806]	0308	1	2.0	72.45	6.23	6.40	39.13	n/a	0.000
*	ADD [0107 + 0308]	0807	3	2.0	80.98	7.15	6.40	40.00	n/a	0.000
*	CHANNEL[ 2 : 0807]	0306	1	2.0	80.98	7.11	6.40	40.00	n/a	0.000
*	ADD [0106 + 0306]	0804	3	2.0	94.69	8.48	6.40	40.44	n/a	0.000
*	CHANNEL[ 2 : 0804]	0305	1	2.0	94.69	8.11	6.43	40.44	n/a	0.000
*	ADD [0104 + 0305]	0093	3	2.0	99.91	8.65	6.43	40.88	n/a	0.000
*	ADD [0103 + 0093]	0805	3	2.0	135.70	12.78	6.37	44.12	n/a	0.000
*	CHANNEL[ 2 : 0805]	0312	1	2.0	135.70	12.51	6.43	44.12	n/a	0.000
*	ADD [0312 + 0803]	0094	3	2.0	252.63	19.12	6.50	42.99	n/a	0.000
*	CHANNEL[ 2 : 0094]	0309	1	2.0	252.63	19.08	6.53	42.99	n/a	0.000
*	CALI B STANDHYD	0111	1	2.0	3.57	0.45	6.30	46.19	0.61	0.000



*	PIPE	[ 2 : 0601]	0403	1	2.0	97.52	7.66	12.50	51.34	n/a	0.000
*	CHANNEL	[ 2 : 0403]	0317	1	2.0	97.52	7.05	12.60	51.34	n/a	0.000
**	CALI B STANDHYD	[1%=22.0: S%= 2.00]	0102	1	2.0	19.41	2.45	12.33	57.84	0.64	0.000
*	ADD	[0102 + 0317]	0803	3	2.0	116.93	8.40	12.57	52.42	n/a	0.000
**	CALI B STANDHYD	[1%=37.1: S%= 2.00]	0103	1	2.0	35.79	5.01	12.30	65.59	0.73	0.000
**	CALI B STANDHYD	[1%=20.7: S%= 2.00]	0104	1	2.0	5.22	0.76	12.27	61.13	0.68	0.000
**	CALI B STANDHYD	[1%=21.1: S%= 2.00]	0106	1	2.0	13.71	1.60	12.33	54.30	0.60	0.000
*	CALI B STANDHYD	[1%=18.1: S%= 2.00]	0107	1	5.0	8.53	1.21	12.25	59.52	0.66	0.000
*	CALI B STANDHYD	[1%=24.4: S%= 2.00]	0108	1	2.0	58.75	5.00	12.37	48.12	0.54	0.000
*	CHANNEL	[ 2 : 0108]	0307	1	2.0	58.75	4.91	12.43	48.12	n/a	0.000
*	CALI B STANDHYD	[1%= 3.0: S%= 2.00]	0109	1	2.0	13.70	1.90	12.30	55.43	0.62	0.000
*	ADD	[0109 + 0307]	0806	3	2.0	72.45	6.62	12.40	49.50	n/a	0.000
*	CHANNEL	[ 2 : 0806]	0308	1	2.0	72.45	6.62	12.40	49.50	n/a	0.000
*	ADD	[0107 + 0308]	0807	3	2.0	80.98	7.59	12.40	50.55	n/a	0.000
*	CHANNEL	[ 2 : 0807]	0306	1	2.0	80.98	7.55	12.40	50.55	n/a	0.000
*	ADD	[0106 + 0306]	0804	3	2.0	94.69	9.01	12.40	51.10	n/a	0.000
*	CHANNEL	[ 2 : 0804]	0305	1	2.0	94.69	8.64	12.43	51.09	n/a	0.000
*	ADD	[0104 + 0305]	0093	3	2.0	99.91	9.21	12.43	51.62	n/a	0.000
*	ADD	[0103 + 0093]	0805	3	2.0	135.70	13.52	12.37	55.30	n/a	0.000
*	CHANNEL	[ 2 : 0805]	0312	1	2.0	135.70	13.23	12.43	55.30	n/a	0.000
*	ADD	[0312 + 0803]	0094	3	2.0	252.63	20.71	12.50	53.97	n/a	0.000
*	CHANNEL	[ 2 : 0094]	0309	1	2.0	252.63	20.64	12.50	53.97	n/a	0.000
*	CALI B STANDHYD	[1%=22.2: S%= 2.00]	0111	1	2.0	3.57	0.48	12.30	57.99	0.64	0.000
*	ADD	[0111 + 0309]	0808	3	2.0	256.20	20.94	12.50	54.02	n/a	0.000
*	CHANNEL	[ 2 : 0808]	0310	1	2.0	256.20	20.89	12.53	54.02	n/a	0.000
**	CALI B STANDHYD	[1%=23.9: S%= 2.00]	0112	1	2.0	16.90	2.25	12.33	61.04	0.68	0.000
*	ADD	[0112 + 0310]	0809	3	2.0	273.10	22.45	12.50	54.46	n/a	0.000
*	CHANNEL	[ 2 : 0809]	0311	1	2.0	273.10	21.94	12.57	54.46	n/a	0.000
*	CALI B STANDHYD	[1%=17.3: S%= 2.00]	0114	1	2.0	4.95	0.69	12.30	59.01	0.66	0.000
*	ADD	[0114 + 0311]	0810	3	2.0	278.05	22.29	12.53	54.54	n/a	0.000
*	CHANNEL	[ 2 : 0810]	0313	1	2.0	278.05	22.31	12.57	54.54	n/a	0.000
*	CALI B STANDHYD	[1%=28.8: S%= 2.00]	0115	1	2.0	12.66	1.39	12.30	53.04	0.59	0.000
*	ADD	[0115 + 0313]	0811	3	2.0	290.71	23.17	12.53	54.47	n/a	0.000
*	CHANNEL	[ 2 : 0811]	0314	1	2.0	290.71	23.15	12.57	54.47	n/a	0.000
*	CALI B STANDHYD	[1%=25.5: S%= 2.00]	0116	1	2.0	26.63	3.13	12.30	53.63	0.60	0.000
*	ADD	[0116 + 0314]	0812	3	2.0	317.34	24.89	12.53	54.40	n/a	0.000

*	PIPE	[ 2 : 0812]	0401	1	2.0	317.34	24.88	12.53	54.40	n/a	0.000
*	CALI B STANDHYD	[1%=25.1: S%= 2.00]	0117	1	2.0	27.32	2.26	12.30	40.83	0.45	0.000
*	ADD	[0117 + 0401]	0813	3	2.0	344.66	26.29	12.53	53.33	n/a	0.000
*	CHANNEL	[ 2 : 0813]	0315	1	2.0	344.66	26.12	12.57	53.33	n/a	0.000
*	CALI B STANDHYD	[1%=26.9: S%= 2.00]	0119	1	2.0	16.91	1.52	12.30	45.21	0.50	0.000
*	ADD	[0119 + 0315]	0814	3	2.0	361.57	27.05	12.57	52.95	n/a	0.000
*	PIPE	[ 2 : 0814]	0402	1	2.0	361.57	27.07	12.57	52.95	n/a	0.000
*	CALI B STANDHYD	[1%=20.9: S%= 2.00]	0120	1	2.0	17.04	1.37	12.30	38.93	0.43	0.000
*	CHANNEL	[ 2 : 0120]	0316	1	2.0	17.04	1.37	12.33	38.93	n/a	0.000
*	CALI B STANDHYD	[1%=14.6: S%= 2.00]	0121	1	2.0	1.39	0.09	12.27	30.27	0.34	0.000
*	CALI B STANDHYD	[1%=26.5: S%= 2.00]	0122	1	2.0	3.13	0.32	12.23	40.92	0.45	0.000
*	ADD	[0121 + 0122]	0815	3	2.0	4.52	0.41	12.23	37.64	n/a	0.000
*	ADD	[0815 + 0316]	0815	1	2.0	21.56	1.71	12.30	38.66	n/a	0.000
*	ADD	[0815 + 0402]	0815	3	2.0	383.13	28.06	12.53	52.14	n/a	0.000
*	PIPE	[ 2 : 0815]	0404	1	2.0	383.13	28.06	12.57	52.14	n/a	0.000
*	CALI B STANDHYD	[1%=33.4: S%= 2.00]	0124	1	2.0	21.61	2.39	12.27	46.92	0.52	0.000
*	ADD	[0124 + 0404]	0816	3	2.0	404.74	29.00	12.53	51.86	n/a	0.000
*	DUHYD	0500	1	2.0	404.74	29.00	12.53	51.86	n/a	0.000	
*	MAJOR SYSTEM:	0500	2	2.0	287.39	28.13	12.53	51.86	n/a	0.000	
*	MINOR SYSTEM:	0500	3	2.0	117.34	0.87	9.03	51.86	n/a	0.000	
*	PIPE	[ 2 : 0500]	0405	1	2.0	287.39	28.15	12.57	51.86	n/a	0.000
**	CALI B STANDHYD	[1%=44.1: S%= 2.00]	0125	1	2.0	18.74	2.40	12.30	55.68	0.62	0.000
*	ADD	[0125 + 0405]	0817	3	2.0	306.13	29.27	12.53	52.10	n/a	0.000
*	PIPE	[ 2 : 0500]	0408	1	2.0	117.34	0.87	9.47	51.86	n/a	0.000
**	CALI B STANDHYD	[1%=32.1: S%= 2.00]	0126	1	2.0	22.26	2.38	12.27	44.17	0.49	0.000
*	ADD	[0126 + 0408]	0820	3	2.0	139.60	3.25	12.27	50.64	n/a	0.000
*	PIPE	[ 2 : 0820]	0406	1	2.0	139.60	3.23	12.27	50.64	n/a	0.000
**	CALI B STANDHYD	[1%=27.4: S%= 2.00]	0127	1	2.0	9.98	0.89	12.27	39.87	0.44	0.000
*	ADD	[0127 + 0406]	0818	3	2.0	149.58	4.12	12.27	49.92	n/a	0.000
*	PIPE	[ 2 : 0818]	0407	1	2.0	149.58	4.07	12.30	49.92	n/a	0.000
**	CALI B STANDHYD	[1%=45.4: S%= 2.00]	0128	1	2.0	14.87	2.29	12.27	58.24	0.65	0.000
*	ADD	[0128 + 0407]	0819	3	2.0	164.45	6.31	12.27	50.67	n/a	0.000

```

*****
** SIMULATION NUMBER: 16 **
*****
W/E COMMAND          HYD ID   DT   AREA   Qpeak  Tpeak   R. V.  R. C.   Qbase
                    mi n      ha   cms    hrs    mm      cm/s
START @ 0.00 hrs
-----
READ STORM              15.0
[ Ptot= 85.20 mm ]

```

fname : C:\Users\dtwi gger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\6095f82d-cb6a-4938-a98  
remark: 25yr/6hr Barrie Wpcc +15% SCS

**	CALI B STANDHYD	0100	1	2.0	31.13	4.09	3.30	45.35	0.53	0.000
*	[I%=28.2: S%= 2.00]									
*	CHANNEL[ 2 : 0100]	0302	1	2.0	31.13	4.08	3.33	45.35	n/a	0.000
**	CALI B STANDHYD	0105	1	2.0	9.01	1.74	3.27	53.68	0.63	0.000
*	[I%=24.8: S%= 2.00]									
**	CALI B STANDHYD	0110	1	2.0	12.37	1.81	3.30	47.75	0.56	0.000
*	[I%=25.4: S%= 2.00]									
*	CHANNEL[ 2 : 0110]	0303	1	2.0	12.37	1.77	3.33	47.75	n/a	0.000
*	ADD [0105 + 0302]	0802	3	2.0	40.14	5.64	3.30	47.22	n/a	0.000
*	ADD [0802 + 0303]	0802	1	2.0	52.51	7.41	3.30	47.35	n/a	0.000
*	PIPE [ 2 : 0802]	0400	1	2.0	52.51	7.41	3.30	47.35	n/a	0.000
**	CALI B STANDHYD	0113	1	2.0	9.41	1.92	3.27	55.32	0.65	0.000
*	[I%=39.4: S%= 2.00]									
*	CHANNEL[ 2 : 0113]	0301	1	2.0	9.41	1.81	3.30	55.31	n/a	0.000
**	CALI B STANDHYD	0118	1	2.0	4.11	0.63	3.27	45.39	0.53	0.000
*	[I%=27.5: S%= 2.00]									
*	RESRVR [ 2 : 0118]	0600	1	2.0	4.11	0.36	3.47	45.41	n/a	0.000
*	{ST= 0.03 ha.m }									
*	CHANNEL[ 2 : 0600]	0300	1	2.0	4.11	0.34	3.57	45.39	n/a	0.000
**	CALI B STANDHYD	0101	1	2.0	8.68	1.14	3.27	39.77	0.47	0.000
*	[I%=22.9: S%= 2.00]									
*	ADD [0101 + 0300]	0801	3	2.0	12.79	1.38	3.27	41.58	n/a	0.000
*	CHANNEL[ 2 : 0801]	0304	1	2.0	12.79	1.28	3.30	41.57	n/a	0.000
**	CALI B STANDHYD	0123	1	2.0	22.81	3.27	3.33	50.07	0.59	0.000
*	[I%=27.4: S%= 2.00]									
*	ADD [0123 + 0301]	0800	3	2.0	32.22	5.07	3.30	51.60	n/a	0.000
*	ADD [0800 + 0304]	0800	1	2.0	45.01	6.36	3.30	48.75	n/a	0.000
*	ADD [0800 + 0400]	0800	3	2.0	97.52	13.76	3.30	47.99	n/a	0.000
*	RESRVR [ 2 : 0800]	0601	1	2.0	97.52	11.33	3.43	47.70	n/a	0.000
*	{ST= 1.12 ha.m }									
*	PIPE [ 2 : 0601]	0403	1	2.0	97.52	11.32	3.43	47.70	n/a	0.000
*	CHANNEL[ 2 : 0403]	0317	1	2.0	97.52	10.41	3.53	47.70	n/a	0.000
**	CALI B STANDHYD	0102	1	2.0	19.41	3.37	3.30	53.77	0.63	0.000
*	[I%=22.0: S%= 2.00]									
*	ADD [0102 + 0317]	0803	3	2.0	116.93	12.41	3.50	48.71	n/a	0.000
**	CALI B STANDHYD	0103	1	2.0	35.79	7.00	3.30	61.32	0.72	0.000
*	[I%=37.1: S%= 2.00]									
**	CALI B STANDHYD	0104	1	2.0	5.22	1.06	3.27	56.93	0.67	0.000
*	[I%=20.7: S%= 2.00]									
**	CALI B STANDHYD	0106	1	2.0	13.71	2.20	3.30	50.42	0.59	0.000
*	[I%=21.1: S%= 2.00]									
*	CALI B STANDHYD	0107	1	5.0	8.53	1.62	3.25	55.36	0.65	0.000
*	[I%=18.1: S%= 2.00]									
*	CALI B STANDHYD	0108	1	2.0	58.75	6.96	3.37	44.65	0.52	0.000
*	[I%=24.4: S%= 2.00]									
*	CHANNEL[ 2 : 0108]	0307	1	2.0	58.75	6.84	3.40	44.65	n/a	0.000
*	CALI B STANDHYD	0109	1	2.0	13.70	2.66	3.30	51.34	0.60	0.000
*	[I%= 3.0: S%= 2.00]									
*	ADD [0109 + 0307]	0806	3	2.0	72.45	9.13	3.37	45.92	n/a	0.000

*	CHANNEL[ 2 : 0806]	0308	1	2.0	72.45	9.07	3.40	45.92	n/a	0.000
*	ADD [0107 + 0308]	0807	3	2.0	80.98	10.44	3.37	46.91	n/a	0.000
*	CHANNEL[ 2 : 0807]	0306	1	2.0	80.98	10.39	3.40	46.91	n/a	0.000
*	ADD [0106 + 0306]	0804	3	2.0	94.69	12.34	3.37	47.41	n/a	0.000
*	CHANNEL[ 2 : 0804]	0305	1	2.0	94.69	11.82	3.43	47.41	n/a	0.000
*	ADD [0104 + 0305]	0093	3	2.0	99.91	12.53	3.43	47.91	n/a	0.000
*	ADD [0103 + 0093]	0805	3	2.0	135.70	18.69	3.37	51.45	n/a	0.000
*	CHANNEL[ 2 : 0805]	0312	1	2.0	135.70	18.16	3.40	51.45	n/a	0.000
*	ADD [0312 + 0803]	0094	3	2.0	252.63	29.91	3.47	50.18	n/a	0.000
*	CHANNEL[ 2 : 0094]	0309	1	2.0	252.63	29.91	3.47	50.18	n/a	0.000
**	CALI B STANDHYD	0111	1	2.0	3.57	0.64	3.30	53.93	0.63	0.000
*	[I%=22.2: S%= 2.00]									
*	ADD [0111 + 0309]	0808	3	2.0	256.20	30.34	3.47	50.23	n/a	0.000
*	CHANNEL[ 2 : 0808]	0310	1	2.0	256.20	30.24	3.47	50.23	n/a	0.000
**	CALI B STANDHYD	0112	1	2.0	16.90	3.14	3.30	56.86	0.67	0.000
*	[I%=23.9: S%= 2.00]									
*	ADD [0112 + 0310]	0809	3	2.0	273.10	32.52	3.47	50.64	n/a	0.000
*	CHANNEL[ 2 : 0809]	0311	1	2.0	273.10	31.76	3.50	50.64	n/a	0.000
*	CALI B STANDHYD	0114	1	2.0	4.95	0.95	3.27	54.87	0.64	0.000
*	[I%=17.3: S%= 2.00]									
*	ADD [0114 + 0311]	0810	3	2.0	278.05	32.29	3.50	50.72	n/a	0.000
*	CHANNEL[ 2 : 0810]	0313	1	2.0	278.05	32.29	3.50	50.72	n/a	0.000
*	CALI B STANDHYD	0115	1	2.0	12.66	1.92	3.30	49.34	0.58	0.000
*	[I%=28.8: S%= 2.00]									
*	ADD [0115 + 0313]	0811	3	2.0	290.71	33.55	3.50	50.66	n/a	0.000
*	CHANNEL[ 2 : 0811]	0314	1	2.0	290.71	33.41	3.50	50.66	n/a	0.000
*	CALI B STANDHYD	0116	1	2.0	26.63	4.34	3.30	49.83	0.58	0.000
*	[I%=25.5: S%= 2.00]									
*	ADD [0116 + 0314]	0812	3	2.0	317.34	35.95	3.50	50.59	n/a	0.000
*	PIPE [ 2 : 0812]	0401	1	2.0	317.34	35.95	3.50	50.59	n/a	0.000
*	CALI B STANDHYD	0117	1	2.0	27.32	3.19	3.27	37.90	0.44	0.000
*	[I%=25.1: S%= 2.00]									
*	ADD [0117 + 0401]	0813	3	2.0	344.66	37.83	3.50	49.58	n/a	0.000
*	CHANNEL[ 2 : 0813]	0315	1	2.0	344.66	37.47	3.53	49.58	n/a	0.000
*	CALI B STANDHYD	0119	1	2.0	16.91	2.10	3.30	41.98	0.49	0.000
*	[I%=26.9: S%= 2.00]									
*	ADD [0119 + 0315]	0814	3	2.0	361.57	38.77	3.53	49.23	n/a	0.000
*	PIPE [ 2 : 0814]	0402	1	2.0	361.57	38.80	3.53	49.23	n/a	0.000
*	CALI B STANDHYD	0120	1	2.0	17.04	1.86	3.27	36.04	0.42	0.000
*	[I%=20.9: S%= 2.00]									
*	CHANNEL[ 2 : 0120]	0316	1	2.0	17.04	1.84	3.30	36.04	n/a	0.000
*	CALI B STANDHYD	0121	1	2.0	1.39	0.12	3.27	27.89	0.33	0.000
*	[I%=14.6: S%= 2.00]									
*	CALI B STANDHYD	0122	1	2.0	3.13	0.43	3.23	38.01	0.45	0.000
*	[I%=26.5: S%= 2.00]									
*	ADD [0121 + 0122]	0815	3	2.0	4.52	0.56	3.23	34.89	n/a	0.000
*	ADD [0815 + 0316]	0815	1	2.0	21.56	2.32	3.27	35.80	n/a	0.000

```

*
* ADD [0815 + 0402] 0815 3 2.0 383.13 40.12 3.53 48.47 n/a 0.000
* PIPE [ 2 : 0815] 0404 1 2.0 383.13 40.12 3.53 48.47 n/a 0.000
* CALI B STANDHYD [1%=33.4; S%= 2.00] 0124 1 2.0 21.61 3.33 3.27 43.72 0.51 0.000
*
* ADD [0124 + 0404] 0816 3 2.0 404.74 41.44 3.53 48.22 n/a 0.000
* DUHYD MAJOR SYSTEM: 0500 1 2.0 404.74 41.44 3.53 48.22 n/a 0.000
  MI NOR SYSTEM: 0500 2 2.0 358.45 40.57 3.53 48.22 n/a 0.000
  0500 3 2.0 46.29 0.87 1.67 48.22 n/a 0.000
* PIPE [ 2 : 0500] 0405 1 2.0 358.45 40.54 3.53 48.22 n/a 0.000
** CALI B STANDHYD [1%=44.1; S%= 2.00] 0125 1 2.0 18.74 3.32 3.30 52.09 0.61 0.000
*
* ADD [0125 + 0405] 0817 3 2.0 377.19 42.07 3.53 48.41 n/a 0.000
* PIPE [ 2 : 0500] 0408 1 2.0 46.29 0.87 2.10 48.22 n/a 0.000
** CALI B STANDHYD [1%=32.1; S%= 2.00] 0126 1 2.0 22.26 3.27 3.23 41.15 0.48 0.000
*
* ADD [0126 + 0408] 0820 3 2.0 68.55 4.14 3.23 45.92 n/a 0.000
* PIPE [ 2 : 0820] 0406 1 2.0 68.55 4.14 3.27 45.92 n/a 0.000
** CALI B STANDHYD [1%=27.4; S%= 2.00] 0127 1 2.0 9.98 1.22 3.27 37.07 0.44 0.000
*
* ADD [0127 + 0406] 0818 3 2.0 78.53 5.36 3.27 44.80 n/a 0.000
* PIPE [ 2 : 0818] 0407 1 2.0 78.53 5.27 3.27 44.80 n/a 0.000
** CALI B STANDHYD [1%=45.4; S%= 2.00] 0128 1 2.0 14.87 3.09 3.27 54.51 0.64 0.000
*
* ADD [0128 + 0407] 0819 3 2.0 93.40 8.36 3.27 46.34 n/a 0.000

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\*\*\*\*\*  
\*\* SIMULATION NUMBER: 17 \*\* **1:25 Year 12 Hour SCS Design Storm**  
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W/E COMMAND HYD ID DT AREA * Qpeak Tpeak R. V. R. C. Qbase
mi n ha * cms hrs mm
START @ 0.00 hrs
READ STORM 15.0
[ Ptot= 90.69 mm ]
fname : C:\Users\dtwi gger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\9b41bce2-1146-4441-aa5
remark: 25yr/12hr Barrie Wpcc +15% SCS
** CALI B STANDHYD [1%=28.2; S%= 2.00] 0100 1 2.0 31.13 3.78 6.33 49.35 0.54 0.000
*
* CHANNEL [ 2 : 0100] 0302 1 2.0 31.13 3.75 6.37 49.35 n/a 0.000
** CALI B STANDHYD [1%=24.8; S%= 2.00] 0105 1 2.0 9.01 1.61 6.27 58.35 0.64 0.000
*
** CALI B STANDHYD [1%=25.4; S%= 2.00] 0110 1 2.0 12.37 1.69 6.30 52.00 0.57 0.000
*
* CHANNEL [ 2 : 0110] 0303 1 2.0 12.37 1.66 6.33 52.00 n/a 0.000
*
* ADD [0105 + 0302] 0802 3 2.0 40.14 5.12 6.30 51.37 n/a 0.000
*
* ADD [0802 + 0303] 0802 1 2.0 52.51 6.76 6.33 51.52 n/a 0.000
*
* PIPE [ 2 : 0802] 0400 1 2.0 52.51 6.77 6.33 51.52 n/a 0.000
** CALI B STANDHYD [1%=39.4; S%= 2.00] 0113 1 2.0 9.41 1.70 6.27 59.86 0.66 0.000
*
* CHANNEL [ 2 : 0113] 0301 1 2.0 9.41 1.61 6.30 59.85 n/a 0.000
** CALI B STANDHYD [1%=27.5; S%= 2.00] 0118 1 2.0 4.11 0.58 6.27 49.42 0.54 0.000
*
* RESRVR [ 2 : 0118] 0600 1 2.0 4.11 0.34 6.47 49.47 n/a 0.000

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{ST= 0.03 ha.m }
*
* CHANNEL [ 2 : 0600] 0300 1 2.0 4.11 0.32 6.57 49.44 n/a 0.000
** CALI B STANDHYD [1%=22.9; S%= 2.00] 0101 1 2.0 8.68 1.06 6.27 43.44 0.48 0.000
*
* ADD [0101 + 0300] 0801 3 2.0 12.79 1.29 6.27 45.37 n/a 0.000
*
* CHANNEL [ 2 : 0801] 0304 1 2.0 12.79 1.19 6.30 45.36 n/a 0.000
** CALI B STANDHYD [1%=27.1; S%= 2.00] 0123 1 2.0 22.81 3.05 6.33 54.49 0.60 0.000
*
* ADD [0123 + 0301] 0800 3 2.0 32.22 4.62 6.33 56.05 n/a 0.000
*
* ADD [0800 + 0304] 0800 1 2.0 45.01 5.80 6.33 53.02 n/a 0.000
*
* ADD [0800 + 0400] 0800 3 2.0 97.52 12.57 6.33 52.21 n/a 0.000
RESRVR [ 2 : 0800] 0601 1 2.0 97.52 10.38 6.47 51.92 n/a 0.000
{ST= 1.09 ha.m }
*
* PIPE [ 2 : 0601] 0403 1 2.0 97.52 10.40 6.47 51.92 n/a 0.000
*
* CHANNEL [ 2 : 0403] 0317 1 2.0 97.52 9.50 6.57 51.92 n/a 0.000
** CALI B STANDHYD [1%=22.0; S%= 2.00] 0102 1 2.0 19.41 3.10 6.30 58.49 0.64 0.000
*
* ADD [0102 + 0317] 0803 3 2.0 116.93 11.25 6.53 53.01 n/a 0.000
*
** CALI B STANDHYD [1%=37.1; S%= 2.00] 0103 1 2.0 35.79 6.35 6.30 66.27 0.73 0.000
*
** CALI B STANDHYD [1%=20.7; S%= 2.00] 0104 1 2.0 5.22 0.97 6.27 61.81 0.68 0.000
*
** CALI B STANDHYD [1%=21.1; S%= 2.00] 0106 1 2.0 13.71 1.98 6.33 54.92 0.61 0.000
*
* CALI B STANDHYD [1%=18.1; S%= 2.00] 0107 1 5.0 8.53 1.49 6.25 60.18 0.66 0.000
*
* CALI B STANDHYD [1%=24.4; S%= 2.00] 0108 1 2.0 58.75 6.38 6.37 48.68 0.54 0.000
*
* CHANNEL [ 2 : 0108] 0307 1 2.0 58.75 6.27 6.40 48.68 n/a 0.000
*
* CALI B STANDHYD [1%= 3.0; S%= 2.00] 0109 1 2.0 13.70 2.36 6.30 56.08 0.62 0.000
*
* ADD [0109 + 0307] 0806 3 2.0 72.45 8.41 6.37 50.08 n/a 0.000
*
* CHANNEL [ 2 : 0806] 0308 1 2.0 72.45 8.40 6.40 50.08 n/a 0.000
*
* ADD [0107 + 0308] 0807 3 2.0 80.98 9.59 6.40 51.14 n/a 0.000
*
* CHANNEL [ 2 : 0807] 0306 1 2.0 80.98 9.56 6.40 51.14 n/a 0.000
*
* ADD [0106 + 0306] 0804 3 2.0 94.69 11.36 6.40 51.68 n/a 0.000
*
* CHANNEL [ 2 : 0804] 0305 1 2.0 94.69 10.89 6.43 51.68 n/a 0.000
*
* ADD [0104 + 0305] 0093 3 2.0 99.91 11.55 6.43 52.21 n/a 0.000
*
* ADD [0103 + 0093] 0805 3 2.0 135.70 16.99 6.37 55.92 n/a 0.000
*
* CHANNEL [ 2 : 0805] 0312 1 2.0 135.70 16.53 6.43 55.92 n/a 0.000
*
* ADD [0312 + 0803] 0094 3 2.0 252.63 27.09 6.47 54.57 n/a 0.000
*
* CHANNEL [ 2 : 0094] 0309 1 2.0 252.63 27.02 6.50 54.57 n/a 0.000
*
** CALI B STANDHYD [1%=22.2; S%= 2.00] 0111 1 2.0 3.57 0.59 6.30 58.64 0.65 0.000
*
* ADD [0111 + 0309] 0808 3 2.0 256.20 27.41 6.47 54.63 n/a 0.000
*
* CHANNEL [ 2 : 0808] 0310 1 2.0 256.20 27.41 6.50 54.63 n/a 0.000
** CALI B STANDHYD [1%=23.9; S%= 2.00] 0112 1 2.0 16.90 2.77 6.33 61.70 0.68 0.000
*

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*   ADD [0112 + 0310] 0809 3 2.0 273.10 29.39 6.47 55.07 n/a 0.000
*   CHANNEL [ 2 : 0809] 0311 1 2.0 273.10 28.74 6.53 55.07 n/a 0.000
*   ** CALI B STANDHYD 0114 1 2.0 4.95 0.87 6.27 59.68 0.66 0.000
*   [I%=17.3; S%= 2.00]
*   ADD [0114 + 0311] 0810 3 2.0 278.05 29.17 6.53 55.15 n/a 0.000
*   CHANNEL [ 2 : 0810] 0313 1 2.0 278.05 29.19 6.53 55.15 n/a 0.000
*   ** CALI B STANDHYD 0115 1 2.0 12.66 1.78 6.30 53.64 0.59 0.000
*   [I%=28.8; S%= 2.00]
*   ADD [0115 + 0313] 0811 3 2.0 290.71 30.26 6.53 55.08 n/a 0.000
*   CHANNEL [ 2 : 0811] 0314 1 2.0 290.71 30.25 6.53 55.08 n/a 0.000
*   ** CALI B STANDHYD 0116 1 2.0 26.63 3.99 6.30 54.23 0.60 0.000
*   [I%=25.5; S%= 2.00]
*   ADD [0116 + 0314] 0812 3 2.0 317.34 32.37 6.53 55.01 n/a 0.000
*   PIPE [ 2 : 0812] 0401 1 2.0 317.34 32.39 6.53 55.01 n/a 0.000
*   ** CALI B STANDHYD 0117 1 2.0 27.32 2.86 6.30 41.30 0.46 0.000
*   [I%=25.1; S%= 2.00]
*   ADD [0117 + 0401] 0813 3 2.0 344.66 34.13 6.50 53.92 n/a 0.000
*   CHANNEL [ 2 : 0813] 0315 1 2.0 344.66 33.84 6.53 53.92 n/a 0.000
*   ** CALI B STANDHYD 0119 1 2.0 16.91 1.92 6.30 45.73 0.50 0.000
*   [I%=26.9; S%= 2.00]
*   ADD [0119 + 0315] 0814 3 2.0 361.57 35.05 6.53 53.54 n/a 0.000
*   PIPE [ 2 : 0814] 0402 1 2.0 361.57 35.04 6.53 53.54 n/a 0.000
*   ** CALI B STANDHYD 0120 1 2.0 17.04 1.72 6.27 39.39 0.43 0.000
*   [I%=20.9; S%= 2.00]
*   CHANNEL [ 2 : 0120] 0316 1 2.0 17.04 1.70 6.30 39.39 n/a 0.000
*   ** CALI B STANDHYD 0121 1 2.0 1.39 0.12 6.27 30.65 0.34 0.000
*   [I%=14.6; S%= 2.00]
*   ** CALI B STANDHYD 0122 1 2.0 3.13 0.40 6.23 41.38 0.46 0.000
*   [I%=26.5; S%= 2.00]
*   ADD [0121 + 0122] 0815 3 2.0 4.52 0.51 6.23 38.08 n/a 0.000
*   ADD [0815 + 0316] 0815 1 2.0 21.56 2.14 6.27 39.12 n/a 0.000
*   ADD [0815 + 0402] 0815 3 2.0 383.13 36.27 6.53 52.73 n/a 0.000
*   PIPE [ 2 : 0815] 0404 1 2.0 383.13 36.18 6.53 52.73 n/a 0.000
*   ** CALI B STANDHYD 0124 1 2.0 21.61 3.04 6.27 47.43 0.52 0.000
*   [I%=33.4; S%= 2.00]
*   ADD [0124 + 0404] 0816 3 2.0 404.74 37.39 6.53 52.45 n/a 0.000
*   DUHYD 0500 1 2.0 404.74 37.39 6.53 52.45 n/a 0.000
*   MAJOR SYSTEM: 0500 2 2.0 337.77 36.52 6.53 52.45 n/a 0.000
*   MINOR SYSTEM: 0500 3 2.0 66.96 0.87 3.47 52.45 n/a 0.000
*   PIPE [ 2 : 0500] 0405 1 2.0 337.77 36.48 6.57 52.45 n/a 0.000
*   ** CALI B STANDHYD 0125 1 2.0 18.74 2.95 6.30 56.26 0.62 0.000
*   [I%=44.1; S%= 2.00]
*   ADD [0125 + 0405] 0817 3 2.0 356.51 37.88 6.53 52.65 n/a 0.000
*   PIPE [ 2 : 0500] 0408 1 2.0 66.96 0.87 3.83 52.45 n/a 0.000
*   ** CALI B STANDHYD 0126 1 2.0 22.26 2.98 6.23 44.65 0.49 0.000
*   [I%=32.1; S%= 2.00]
*   ADD [0126 + 0408] 0820 3 2.0 89.22 3.85 6.23 50.50 n/a 0.000
*   PIPE [ 2 : 0820] 0406 1 2.0 89.22 3.86 6.27 50.50 n/a 0.000
*   ** CALI B STANDHYD 0127 1 2.0 9.98 1.12 6.27 40.32 0.44 0.000

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*   [I%=27.4; S%= 2.00]
*   ADD [0127 + 0406] 0818 3 2.0 99.20 4.97 6.27 49.48 n/a 0.000
*   PIPE [ 2 : 0818] 0407 1 2.0 99.20 4.88 6.27 49.48 n/a 0.000
*   ** CALI B STANDHYD 0128 1 2.0 14.87 2.81 6.27 58.84 0.65 0.000
*   [I%=45.4; S%= 2.00]
*   ADD [0128 + 0407] 0819 3 2.0 114.07 7.68 6.27 50.70 n/a 0.000

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\*\*\*\*\*  
**\*\* SIMULATION NUMBER: 18 \*\***  
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**1:25 Year 24 Hour SCS Design Storm**

W/E COMMAND	HYD ID	DT mi n	AREA ha	Qpeak cms	Tpeak hrs	R. V. mm	R. C.	Qbase cms
START @ 0.00 hrs								
READ STORM [ Ptot=107.47 mm ] fname : C:\Users\dtwigger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\92040bdd-132b-4ef4-89a remark: 25yr/24hr Barrie Wpcc +15% SCS								
** CALI B STANDHYD [I%=28.2; S%= 2.00]	0100	1 2.0	31.13	3.99	12.33	62.01	0.58	0.000
CHANNEL [ 2 : 0100]	0302	1 2.0	31.13	3.96	12.37	62.01	n/a	0.000
** CALI B STANDHYD [I%=24.8; S%= 2.00]	0105	1 2.0	9.01	1.69	12.27	72.94	0.68	0.000
** CALI B STANDHYD [I%=25.4; S%= 2.00]	0110	1 2.0	12.37	1.79	12.30	65.39	0.61	0.000
CHANNEL [ 2 : 0110]	0303	1 2.0	12.37	1.76	12.33	65.39	n/a	0.000
ADD [0105 + 0302]	0802	3 2.0	40.14	5.40	12.30	64.46	n/a	0.000
ADD [0802 + 0303]	0802	1 2.0	52.51	7.15	12.33	64.68	n/a	0.000
PIPE [ 2 : 0802]	0400	1 2.0	52.51	7.15	12.33	64.68	n/a	0.000
** CALI B STANDHYD [I%=39.4; S%= 2.00]	0113	1 2.0	9.41	1.76	12.27	74.06	0.69	0.000
CHANNEL [ 2 : 0113]	0301	1 2.0	9.41	1.66	12.30	74.06	n/a	0.000
** CALI B STANDHYD [I%=27.5; S%= 2.00]	0118	1 2.0	4.11	0.62	12.27	62.16	0.58	0.000
RESRVR [ 2 : 0118] {ST= 0.03 ha.m }	0600	1 2.0	4.11	0.35	12.47	62.17	n/a	0.000
CHANNEL [ 2 : 0600]	0300	1 2.0	4.11	0.34	12.57	62.14	n/a	0.000
** CALI B STANDHYD [I%=22.9; S%= 2.00]	0101	1 2.0	8.68	1.13	12.27	55.12	0.51	0.000
ADD [0101 + 0300]	0801	3 2.0	12.79	1.37	12.27	57.38	n/a	0.000
CHANNEL [ 2 : 0801]	0304	1 2.0	12.79	1.27	12.30	57.37	n/a	0.000
** CALI B STANDHYD [I%=27.1; S%= 2.00]	0123	1 2.0	22.81	3.23	12.33	68.37	0.64	0.000
ADD [0123 + 0301]	0800	3 2.0	32.22	4.86	12.33	70.03	n/a	0.000
ADD [0800 + 0304]	0800	1 2.0	45.01	6.12	12.33	66.43	n/a	0.000
ADD [0800 + 0400]	0800	3 2.0	97.52	13.27	12.33	65.49	n/a	0.000
RESRVR [ 2 : 0800] {ST= 1.12 ha.m }	0601	1 2.0	97.52	11.24	12.43	65.20	n/a	0.000
PIPE [ 2 : 0601]	0403	1 2.0	97.52	11.22	12.47	65.20	n/a	0.000
CHANNEL [ 2 : 0403]	0317	1 2.0	97.52	10.36	12.53	65.20	n/a	0.000
** CALI B STANDHYD [I%=22.0; S%= 2.00]	0102	1 2.0	19.41	3.28	12.30	73.25	0.68	0.000
ADD [0102 + 0317]	0803	3 2.0	116.93	12.26	12.50	66.53	n/a	0.000

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* ** CALI B STANDHYD 0103 1 2.0 35.79 6.56 12.30 81.60 0.76 0.000
  [I%=37.1: S%= 2.00]
* ** CALI B STANDHYD 0104 1 2.0 5.22 1.02 12.27 76.99 0.72 0.000
  [I%=20.7: S%= 2.00]
* ** CALI B STANDHYD 0106 1 2.0 13.71 2.10 12.33 69.04 0.64 0.000
  [I%=21.1: S%= 2.00]
* ** CALI B STANDHYD 0107 1 5.0 8.53 1.58 12.25 75.21 0.70 0.000
  [I%=18.1: S%= 2.00]
* ** CALI B STANDHYD 0108 1 2.0 58.75 6.79 12.37 61.42 0.57 0.000
  [I%=24.4: S%= 2.00]
* CHANNEL[ 2 : 0108] 0307 1 2.0 58.75 6.68 12.40 61.42 n/a 0.000
* ** CALI B STANDHYD 0109 1 2.0 13.70 2.51 12.30 70.89 0.66 0.000
  [I%= 3.0: S%= 2.00]
* ADD [0109 + 0307] 0806 3 2.0 72.45 8.93 12.37 63.21 n/a 0.000
* CHANNEL[ 2 : 0806] 0308 1 2.0 72.45 8.92 12.40 63.21 n/a 0.000
* ADD [0107 + 0308] 0807 3 2.0 80.98 10.17 12.40 64.47 n/a 0.000
* CHANNEL[ 2 : 0807] 0306 1 2.0 80.98 10.15 12.40 64.47 n/a 0.000
* ADD [0106 + 0306] 0804 3 2.0 94.69 12.06 12.40 65.13 n/a 0.000
* CHANNEL[ 2 : 0804] 0305 1 2.0 94.69 11.58 12.43 65.13 n/a 0.000
* ADD [0104 + 0305] 0093 3 2.0 99.91 12.26 12.43 65.75 n/a 0.000
* ADD [0103 + 0093] 0805 3 2.0 135.70 17.93 12.37 69.93 n/a 0.000
* CHANNEL[ 2 : 0805] 0312 1 2.0 135.70 17.45 12.40 69.93 n/a 0.000
* ADD [0312 + 0803] 0094 3 2.0 252.63 29.16 12.47 68.36 n/a 0.000
* CHANNEL[ 2 : 0094] 0309 1 2.0 252.63 29.12 12.47 68.36 n/a 0.000
* ** CALI B STANDHYD 0111 1 2.0 3.57 0.62 12.30 73.35 0.68 0.000
  [I%=22.2: S%= 2.00]
* ADD [0111 + 0309] 0808 3 2.0 256.20 29.54 12.47 68.43 n/a 0.000
* CHANNEL[ 2 : 0808] 0310 1 2.0 256.20 29.42 12.50 68.43 n/a 0.000
* ** CALI B STANDHYD 0112 1 2.0 16.90 2.90 12.33 76.80 0.71 0.000
  [I%=23.9: S%= 2.00]
* ADD [0112 + 0310] 0809 3 2.0 273.10 31.69 12.47 68.94 n/a 0.000
* CHANNEL[ 2 : 0809] 0311 1 2.0 273.10 30.90 12.50 68.94 n/a 0.000
* ** CALI B STANDHYD 0114 1 2.0 4.95 0.92 12.27 74.66 0.69 0.000
  [I%=17.3: S%= 2.00]
* ADD [0114 + 0311] 0810 3 2.0 278.05 31.41 12.50 69.05 n/a 0.000
* CHANNEL[ 2 : 0810] 0313 1 2.0 278.05 31.38 12.50 69.05 n/a 0.000
* ** CALI B STANDHYD 0115 1 2.0 12.66 1.87 12.30 67.15 0.62 0.000
  [I%=28.8: S%= 2.00]
* ADD [0115 + 0313] 0811 3 2.0 290.71 32.63 12.50 68.96 n/a 0.000
* CHANNEL[ 2 : 0811] 0314 1 2.0 290.71 32.54 12.53 68.96 n/a 0.000
* ** CALI B STANDHYD 0116 1 2.0 26.63 4.22 12.30 68.06 0.63 0.000
  [I%=25.5: S%= 2.00]
* ADD [0116 + 0314] 0812 3 2.0 317.34 34.91 12.50 68.89 n/a 0.000
* PIPE [ 2 : 0812] 0401 1 2.0 317.34 34.90 12.50 68.89 n/a 0.000
* ** CALI B STANDHYD 0117 1 2.0 27.32 3.02 12.30 52.16 0.49 0.000
  [I%=25.1: S%= 2.00]
* ADD [0117 + 0401] 0813 3 2.0 344.66 36.88 12.50 67.56 n/a 0.000
* CHANNEL[ 2 : 0813] 0315 1 2.0 344.66 36.53 12.53 67.56 n/a 0.000

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* ** CALI B STANDHYD 0119 1 2.0 16.91 2.03 12.30 57.65 0.54 0.000
  [I%=26.9: S%= 2.00]
* ADD [0119 + 0315] 0814 3 2.0 361.57 37.82 12.53 67.10 n/a 0.000
* PIPE [ 2 : 0814] 0402 1 2.0 361.57 37.84 12.53 67.10 n/a 0.000
* ** CALI B STANDHYD 0120 1 2.0 17.04 1.83 12.30 50.13 0.47 0.000
  [I%=20.9: S%= 2.00]
* CHANNEL[ 2 : 0120] 0316 1 2.0 17.04 1.81 12.30 50.13 n/a 0.000
* ** CALI B STANDHYD 0121 1 2.0 1.39 0.13 12.27 39.59 0.37 0.000
  [I%=14.6: S%= 2.00]
* ** CALI B STANDHYD 0122 1 2.0 3.13 0.42 12.23 52.13 0.49 0.000
  [I%=26.5: S%= 2.00]
* ADD [0121 + 0122] 0815 3 2.0 4.52 0.54 12.23 48.27 n/a 0.000
* ADD [0815 + 0316] 0815 1 2.0 21.56 2.28 12.30 49.74 n/a 0.000
* ADD [0815 + 0402] 0815 3 2.0 383.13 39.16 12.53 66.12 n/a 0.000
* PIPE [ 2 : 0815] 0404 1 2.0 383.13 39.13 12.53 66.12 n/a 0.000
* ** CALI B STANDHYD 0124 1 2.0 21.61 3.15 12.27 59.15 0.55 0.000
  [I%=33.4: S%= 2.00]
* ADD [0124 + 0404] 0816 3 2.0 404.74 40.40 12.53 65.75 n/a 0.000
* DUHYD 0500 1 2.0 404.74 40.40 12.53 65.75 n/a 0.000
  MAJOR SYSTEM: 0500 2 2.0 307.23 39.53 12.53 65.75 n/a 0.000
  MINOR SYSTEM: 0500 3 2.0 97.51 0.87 8.33 65.75 n/a 0.000
* PIPE [ 2 : 0500] 0405 1 2.0 307.23 39.49 12.53 65.75 n/a 0.000
* ** CALI B STANDHYD 0125 1 2.0 18.74 3.03 12.30 69.33 0.65 0.000
  [I%=44.1: S%= 2.00]
* ADD [0125 + 0405] 0817 3 2.0 325.97 40.97 12.53 65.96 n/a 0.000
* PIPE [ 2 : 0500] 0408 1 2.0 97.51 0.87 8.40 65.75 n/a 0.000
* ** CALI B STANDHYD 0126 1 2.0 22.26 3.09 12.23 55.78 0.52 0.000
  [I%=32.1: S%= 2.00]
* ADD [0126 + 0408] 0820 3 2.0 119.77 3.96 12.23 63.90 n/a 0.000
* PIPE [ 2 : 0820] 0406 1 2.0 119.77 3.97 12.27 63.90 n/a 0.000
* ** CALI B STANDHYD 0127 1 2.0 9.98 1.17 12.27 50.70 0.47 0.000
  [I%=27.4: S%= 2.00]
* ADD [0127 + 0406] 0818 3 2.0 129.75 5.13 12.27 62.88 n/a 0.000
* PIPE [ 2 : 0818] 0407 1 2.0 129.75 5.03 12.27 62.88 n/a 0.000
* ** CALI B STANDHYD 0128 1 2.0 14.87 2.88 12.27 72.41 0.67 0.000
  [I%=45.4: S%= 2.00]
* ADD [0128 + 0407] 0819 3 2.0 144.62 7.91 12.27 63.86 n/a 0.000
*
*****
** SIMULATION NUMBER: 19 ** 1:50 Year 6 Hour SCS Design Storm
*****
W/E COMMAND HYD ID DT AREA Qpeak Tpeak R. V. R. C. Qbase
mi n ha cms hrs mm cms
START @ 0.00 hrs
-----
READ STORM 15.0
[ Ptot= 95.90 mm ]
fname : C:\Users\dtwigger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\40bdcde-ee7f-4ed4-9d8
remark: 50yr/6hr Barrie Wpcc +15% SCS
* ** CALI B STANDHYD 0100 1 2.0 31.13 4.83 3.30 53.22 0.55 0.000
  [I%=28.2: S%= 2.00]
* CHANNEL[ 2 : 0100] 0302 1 2.0 31.13 4.81 3.33 53.22 n/a 0.000
* ** CALI B STANDHYD 0105 1 2.0 9.01 2.15 3.27 62.83 0.66 0.000

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*		[I%=24.8;S%= 2.00]																		
**	CALI B STANDHYD	0110	1	2.0	12.37	2.24	3.30	56.09	0.58	0.000										
*		[I%=25.4;S%= 2.00]																		
*	CHANNEL[ 2 : 0110]	0303	1	2.0	12.37	2.20	3.30	56.09	n/a	0.000										
*	ADD [0105 + 0302]	0802	3	2.0	40.14	6.73	3.30	55.37	n/a	0.000										
*	ADD [0802 + 0303]	0802	1	2.0	52.51	8.93	3.30	55.54	n/a	0.000										
*	PIPE [ 2 : 0802]	0400	1	2.0	52.51	8.93	3.30	55.54	n/a	0.000										
**	CALI B STANDHYD	0113	1	2.0	9.41	2.22	3.27	64.22	0.67	0.000										
*		[I%=39.4;S%= 2.00]																		
*	CHANNEL[ 2 : 0113]	0301	1	2.0	9.41	2.09	3.30	64.21	n/a	0.000										
**	CALI B STANDHYD	0118	1	2.0	4.11	0.74	3.27	53.31	0.56	0.000										
*		[I%=27.5;S%= 2.00]																		
*	RESRVR [ 2 : 0118]	0600	1	2.0	4.11	0.41	3.47	53.35	n/a	0.000										
*		{ST= 0.04 ha.m }																		
*	CHANNEL[ 2 : 0600]	0300	1	2.0	4.11	0.39	3.60	53.33	n/a	0.000										
*	CALI B STANDHYD	0101	1	2.0	8.68	1.42	3.27	46.99	0.49	0.000										
*		[I%=22.9;S%= 2.00]																		
*	ADD [0101 + 0300]	0801	3	2.0	12.79	1.69	3.27	49.03	n/a	0.000										
*	CHANNEL[ 2 : 0801]	0304	1	2.0	12.79	1.57	3.30	49.02	n/a	0.000										
*	CALI B STANDHYD	0123	1	2.0	22.81	4.04	3.30	58.74	0.61	0.000										
*		[I%=27.1;S%= 2.00]																		
*	ADD [0123 + 0301]	0800	3	2.0	32.22	6.13	3.30	60.34	n/a	0.000										
*	ADD [0800 + 0304]	0800	1	2.0	45.01	7.70	3.30	57.12	n/a	0.000										
*	ADD [0800 + 0400]	0800	3	2.0	97.52	16.63	3.30	56.27	n/a	0.000										
*	RESRVR [ 2 : 0800]	0601	1	2.0	97.52	14.12	3.40	55.98	n/a	0.000										
*		{ST= 1.22 ha.m }																		
*	PIPE [ 2 : 0601]	0403	1	2.0	97.52	14.09	3.43	55.98	n/a	0.000										
*	CHANNEL[ 2 : 0403]	0317	1	2.0	97.52	12.86	3.50	55.98	n/a	0.000										
**	CALI B STANDHYD	0102	1	2.0	19.41	4.03	3.30	63.03	0.66	0.000										
*		[I%=22.0;S%= 2.00]																		
*	ADD [0102 + 0317]	0803	3	2.0	116.93	15.43	3.47	57.15	n/a	0.000										
**	CALI B STANDHYD	0103	1	2.0	35.79	8.46	3.30	70.99	0.74	0.000										
*		[I%=37.1;S%= 2.00]																		
**	CALI B STANDHYD	0104	1	2.0	5.22	1.26	3.27	66.48	0.69	0.000										
*		[I%=20.7;S%= 2.00]																		
**	CALI B STANDHYD	0106	1	2.0	13.71	2.64	3.30	59.25	0.62	0.000										
*		[I%=21.1;S%= 2.00]																		
*	CALI B STANDHYD	0107	1	5.0	8.53	1.93	3.25	64.80	0.68	0.000										
*		[I%=18.1;S%= 2.00]																		
*	CALI B STANDHYD	0108	1	2.0	58.75	8.49	3.37	52.56	0.55	0.000										
*		[I%=24.4;S%= 2.00]																		
*	CHANNEL[ 2 : 0108]	0307	1	2.0	58.75	8.35	3.37	52.56	n/a	0.000										
*	CALI B STANDHYD	0109	1	2.0	13.70	3.20	3.30	60.63	0.63	0.000										
*		[I%= 3.0;S%= 2.00]																		
*	ADD [0109 + 0307]	0806	3	2.0	72.45	11.24	3.37	54.09	n/a	0.000										
*	CHANNEL[ 2 : 0806]	0308	1	2.0	72.45	11.23	3.37	54.09	n/a	0.000										
*	ADD [0107 + 0308]	0807	3	2.0	80.98	12.86	3.37	55.21	n/a	0.000										
*	CHANNEL[ 2 : 0807]	0306	1	2.0	80.98	12.79	3.37	55.21	n/a	0.000										
*	ADD [0106 + 0306]	0804	3	2.0	94.69	15.21	3.37	55.80	n/a	0.000										

*	CHANNEL[ 2 : 0804]	0305	1	2.0	94.69	14.44	3.40	55.80	n/a	0.000										
*	ADD [0104 + 0305]	0093	3	2.0	99.91	15.39	3.40	56.35	n/a	0.000										
*	ADD [0103 + 0093]	0805	3	2.0	135.70	22.82	3.37	60.22	n/a	0.000										
*	CHANNEL[ 2 : 0805]	0312	1	2.0	135.70	21.98	3.40	60.21	n/a	0.000										
*	ADD [0312 + 0803]	0094	3	2.0	252.63	36.92	3.43	58.80	n/a	0.000										
*	CHANNEL[ 2 : 0094]	0309	1	2.0	252.63	36.85	3.47	58.80	n/a	0.000										
**	CALI B STANDHYD	0111	1	2.0	3.57	0.79	3.27	63.16	0.66	0.000										
*		[I%=22.2;S%= 2.00]																		
*	ADD [0111 + 0309]	0808	3	2.0	256.20	37.33	3.43	58.86	n/a	0.000										
*	CHANNEL[ 2 : 0808]	0310	1	2.0	256.20	37.32	3.47	58.86	n/a	0.000										
**	CALI B STANDHYD	0112	1	2.0	16.90	3.69	3.30	66.35	0.69	0.000										
*		[I%=23.9;S%= 2.00]																		
*	ADD [0112 + 0310]	0809	3	2.0	273.10	39.92	3.47	59.32	n/a	0.000										
*	CHANNEL[ 2 : 0809]	0311	1	2.0	273.10	39.17	3.50	59.32	n/a	0.000										
*	CALI B STANDHYD	0114	1	2.0	4.95	1.14	3.27	64.28	0.67	0.000										
*		[I%=17.3;S%= 2.00]																		
*	ADD [0114 + 0311]	0810	3	2.0	278.05	39.78	3.50	59.41	n/a	0.000										
*	CHANNEL[ 2 : 0810]	0313	1	2.0	278.05	39.82	3.50	59.41	n/a	0.000										
*	CALI B STANDHYD	0115	1	2.0	12.66	2.27	3.30	57.77	0.60	0.000										
*		[I%=28.8;S%= 2.00]																		
*	ADD [0115 + 0313]	0811	3	2.0	290.71	41.32	3.50	59.34	n/a	0.000										
*	CHANNEL[ 2 : 0811]	0314	1	2.0	290.71	41.32	3.50	59.34	n/a	0.000										
**	CALI B STANDHYD	0116	1	2.0	26.63	5.17	3.30	58.47	0.61	0.000										
*		[I%=25.5;S%= 2.00]																		
*	ADD [0116 + 0314]	0812	3	2.0	317.34	44.31	3.50	59.26	n/a	0.000										
*	PIPE [ 2 : 0812]	0401	1	2.0	317.34	44.35	3.50	59.26	n/a	0.000										
*	CALI B STANDHYD	0117	1	2.0	27.32	3.78	3.27	44.60	0.47	0.000										
*		[I%=25.1;S%= 2.00]																		
*	ADD [0117 + 0401]	0813	3	2.0	344.66	46.74	3.47	58.10	n/a	0.000										
*	CHANNEL[ 2 : 0813]	0315	1	2.0	344.66	46.31	3.50	58.10	n/a	0.000										
*	CALI B STANDHYD	0119	1	2.0	16.91	2.58	3.30													

*	DUHYD	0500	1	2.0	404.74	51.33	3.50	56.52	n/a	0.000
	MAJOR SYSTEM:	0500	2	2.0	364.25	50.46	3.50	56.52	n/a	0.000
	MINOR SYSTEM:	0500	3	2.0	40.49	0.87	1.53	56.52	n/a	0.000
*	PIPE [ 2 : 0500]	0405	1	2.0	364.25	50.37	3.53	56.52	n/a	0.000
**	CALIB STANDHYD [I%=44.1; S%= 2.00]	0125	1	2.0	18.74	3.87	3.30	60.26	0.63	0.000
*	ADD [0125 + 0405]	0817	3	2.0	382.99	52.31	3.50	56.70	n/a	0.000
*	PIPE [ 2 : 0500]	0408	1	2.0	40.49	0.87	1.90	56.52	n/a	0.000
**	CALIB STANDHYD [I%=32.1; S%= 2.00]	0126	1	2.0	22.26	3.91	3.23	48.04	0.50	0.000
*	ADD [0126 + 0408]	0820	3	2.0	62.75	4.78	3.23	53.51	n/a	0.000
*	PIPE [ 2 : 0820]	0406	1	2.0	62.75	4.78	3.27	53.51	n/a	0.000
**	CALIB STANDHYD [I%=27.4; S%= 2.00]	0127	1	2.0	9.98	1.44	3.27	43.48	0.45	0.000
*	ADD [0127 + 0406]	0818	3	2.0	72.73	6.22	3.27	52.13	n/a	0.000
*	PIPE [ 2 : 0818]	0407	1	2.0	72.73	6.11	3.27	52.13	n/a	0.000
**	CALIB STANDHYD [I%=45.4; S%= 2.00]	0128	1	2.0	14.87	3.65	3.23	63.01	0.66	0.000
*	ADD [0128 + 0407]	0819	3	2.0	87.60	9.73	3.27	53.98	n/a	0.000

\*\*\*\*\*  
 \*\* SIMULATION NUMBER: 20 \*\*  
 \*\*\*\*\*

**1:50 Year 12 Hour SCS Design Storm**

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R. V. mm	R. C.	Qbase cms
START @ 0.00 hrs								
READ STORM								
[ Ptot=101.69 mm ]								
[ Pname : C:\Users\dtwigger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\3783cd06-ef6b-4635-abd								
remark: 50yr/12hr BarriE Wpcc +15% SCS								
**	CALIB STANDHYD [I%=28.2; S%= 2.00]	0100	1	2.0	31.13	4.43	6.30	57.58 0.57 0.000
*	CHANNEL[ 2 : 0100]	0302	1	2.0	31.13	4.42	6.33	57.58 n/a 0.000
**	CALIB STANDHYD [I%=24.8; S%= 2.00]	0105	1	2.0	9.01	1.89	6.27	67.86 0.67 0.000
**	CALIB STANDHYD [I%=25.4; S%= 2.00]	0110	1	2.0	12.37	1.98	6.30	60.71 0.60 0.000
*	CHANNEL[ 2 : 0110]	0303	1	2.0	12.37	1.93	6.33	60.71 n/a 0.000
*	ADD [0105 + 0302]	0802	3	2.0	40.14	6.11	6.30	59.89 n/a 0.000
*	ADD [0802 + 0303]	0802	1	2.0	52.51	8.04	6.30	60.08 n/a 0.000
*	PIPE [ 2 : 0802]	0400	1	2.0	52.51	8.04	6.30	60.08 n/a 0.000
**	CALIB STANDHYD [I%=39.4; S%= 2.00]	0113	1	2.0	9.41	2.03	6.27	69.12 0.68 0.000
*	CHANNEL[ 2 : 0113]	0301	1	2.0	9.41	1.93	6.30	69.11 n/a 0.000
**	CALIB STANDHYD [I%=27.5; S%= 2.00]	0118	1	2.0	4.11	0.71	6.27	57.70 0.57 0.000
*	RESRVR [ 2 : 0118] {ST= 0.04 ha.m }	0600	1	2.0	4.11	0.39	6.43	57.71 n/a 0.000
*	CHANNEL[ 2 : 0600]	0300	1	2.0	4.11	0.37	6.57	57.68 n/a 0.000
**	CALIB STANDHYD [I%=22.9; S%= 2.00]	0101	1	2.0	8.68	1.26	6.27	51.02 0.50 0.000
*	ADD [0101 + 0300]	0801	3	2.0	12.79	1.51	6.27	53.16 n/a 0.000

*	CHANNEL[ 2 : 0801]	0304	1	2.0	12.79	1.41	6.30	53.15 n/a 0.000
**	CALIB STANDHYD [I%=27.1; S%= 2.00]	0123	1	2.0	22.81	3.69	6.33	63.52 0.62 0.000
*	ADD [0123 + 0301]	0800	3	2.0	32.22	5.61	6.30	65.16 n/a 0.000
*	ADD [0800 + 0304]	0800	1	2.0	45.01	7.02	6.30	61.75 n/a 0.000
*	ADD [0800 + 0400]	0800	3	2.0	97.52	15.05	6.30	60.85 n/a 0.000
*	RESRVR [ 2 : 0800] {ST= 1.17 ha.m }	0601	1	2.0	97.52	12.82	6.43	60.56 n/a 0.000
*	PIPE [ 2 : 0601]	0403	1	2.0	97.52	12.85	6.43	60.56 n/a 0.000
*	CHANNEL[ 2 : 0403]	0317	1	2.0	97.52	11.84	6.53	60.56 n/a 0.000
**	CALIB STANDHYD [I%=22.0; S%= 2.00]	0102	1	2.0	19.41	3.67	6.30	68.11 0.67 0.000
*	ADD [0102 + 0317]	0803	3	2.0	116.93	14.14	6.50	61.81 n/a 0.000
**	CALIB STANDHYD [I%=37.1; S%= 2.00]	0103	1	2.0	35.79	7.40	6.30	76.28 0.75 0.000
**	CALIB STANDHYD [I%=20.7; S%= 2.00]	0104	1	2.0	5.22	1.15	6.27	71.72 0.71 0.000
**	CALIB STANDHYD [I%=21.1; S%= 2.00]	0106	1	2.0	13.71	2.41	6.30	64.12 0.63 0.000
*	CALIB STANDHYD [I%=18.1; S%= 2.00]	0107	1	5.0	8.53	1.76	6.25	69.99 0.69 0.000
*	CALIB STANDHYD [I%=24.4; S%= 2.00]	0108	1	2.0	58.75	7.61	6.37	56.96 0.56 0.000
*	CHANNEL[ 2 : 0108]	0307	1	2.0	58.75	7.50	6.40	56.96 n/a 0.000
**	CALIB STANDHYD [I%= 3.0; S%= 2.00]	0109	1	2.0	13.70	2.92	6.30	65.74 0.65 0.000
*	ADD [0109 + 0307]	0806	3	2.0	72.45	9.97	6.37	58.62 n/a 0.000
*	CHANNEL[ 2 : 0806]	0308	1	2.0	72.45	9.91	6.37	58.62 n/a 0.000
*	ADD [0107 + 0308]	0807	3	2.0	80.98	11.40	6.37	59.81 n/a 0.000
*	CHANNEL[ 2 : 0807]	0306	1	2.0	80.98	11.34	6.40	59.81 n/a 0.000
*	ADD [0106 + 0306]	0804	3	2.0	94.69	13.49	6.37	60.44 n/a 0.000
*	CHANNEL[ 2 : 0804]	0305	1	2.0	94.69	12.92	6.43	60.43 n/a 0.000
*	ADD [0104 + 0305]	0093	3	2.0	99.91	13.69	6.40	61.02 n/a 0.000
*	ADD [0103 + 0093]	0805	3	2.0	135.70	20.26	6.37	65.05 n/a 0.000
*	CHANNEL[ 2 : 0805]	0312	1	2.0	135.70	19.61	6.40	65.05 n/a 0.000
*	ADD [0312 + 0803]	0094	3	2.0	252.63	33.36	6.47	63.55 n/a 0.000
*	CHANNEL[ 2 : 0094]	0309	1	2.0	252.63	33.39	6.47	63.55 n/a 0.000
**	CALIB STANDHYD [I%=22.2; S%= 2.00]	0111	1	2.0	3.57	0.72	6.27	68.23 0.67 0.000
*	ADD [0111 + 0309]	0808	3	2.0	256.20	33.83	6.47	63.62 n/a 0.000
*	CHANNEL[ 2 : 0808]	0310	1	2.0	256.20	33.79	6.47	63.62 n/a 0.000
**	CALIB STANDHYD [I%=23.9; S%= 2.00]	0112	1	2.0	16.90	3.35	6.30	71.56 0.70 0.000
*	ADD [0112 + 0310]	0809	3	2.0	273.10	36.17	6.47	64.11 n/a 0.000
*	CHANNEL[ 2 : 0809]	0311	1	2.0	273.10	35.45	6.50	64.11 n/a 0.000
*	CALIB STANDHYD [I%=17.3; S%= 2.00]	0114	1	2.0	4.95	1.04	6.27	69.45 0.68 0.000
*	ADD [0114 + 0311]	0810	3	2.0	278.05	36.01	6.50	64.20 n/a 0.000

*	CHANNEL [ 2 : 0810]	0313	1	2.0	278.05	36.03	6.50	64.20	n/a	0.000
**	CALI B STANDHYD [I%=28.8: S%= 2.00]	0115	1	2.0	12.66	2.07	6.30	62.43	0.61	0.000
*	ADD [0115 + 0313]	0811	3	2.0	290.71	37.40	6.50	64.12	n/a	0.000
*	CHANNEL [ 2 : 0811]	0314	1	2.0	290.71	37.33	6.50	64.12	n/a	0.000
**	CALI B STANDHYD [I%=25.5: S%= 2.00]	0116	1	2.0	26.63	4.72	6.30	63.24	0.62	0.000
*	ADD [0116 + 0314]	0812	3	2.0	317.34	40.08	6.50	64.05	n/a	0.000
*	PIPE [ 2 : 0812]	0401	1	2.0	317.34	40.11	6.50	64.05	n/a	0.000
**	CALI B STANDHYD [I%=25.1: S%= 2.00]	0117	1	2.0	27.32	3.45	6.27	48.35	0.48	0.000
*	ADD [0117 + 0401]	0813	3	2.0	344.66	42.21	6.47	62.81	n/a	0.000
*	CHANNEL [ 2 : 0813]	0315	1	2.0	344.66	41.77	6.53	62.81	n/a	0.000
**	CALI B STANDHYD [I%=26.9: S%= 2.00]	0119	1	2.0	16.91	2.35	6.30	53.47	0.53	0.000
*	ADD [0119 + 0315]	0814	3	2.0	361.57	43.30	6.50	62.37	n/a	0.000
*	PIPE [ 2 : 0814]	0402	1	2.0	361.57	43.26	6.50	62.37	n/a	0.000
**	CALI B STANDHYD [I%=20.9: S%= 2.00]	0120	1	2.0	17.04	2.04	6.30	46.35	0.46	0.000
*	CHANNEL [ 2 : 0120]	0316	1	2.0	17.04	2.02	6.30	46.35	n/a	0.000
**	CALI B STANDHYD [I%=14.6: S%= 2.00]	0121	1	2.0	1.39	0.15	6.27	36.43	0.36	0.000
**	CALI B STANDHYD [I%=26.5: S%= 2.00]	0122	1	2.0	3.13	0.47	6.23	48.36	0.48	0.000
*	ADD [0121 + 0122]	0815	3	2.0	4.52	0.61	6.23	44.68	n/a	0.000
*	ADD [0815 + 0316]	0815	1	2.0	21.56	2.54	6.30	46.00	n/a	0.000
*	ADD [0815 + 0402]	0815	3	2.0	383.13	44.90	6.50	61.45	n/a	0.000
*	PIPE [ 2 : 0815]	0404	1	2.0	383.13	44.82	6.53	61.45	n/a	0.000
**	CALI B STANDHYD [I%=33.4: S%= 2.00]	0124	1	2.0	21.61	3.54	6.27	55.05	0.54	0.000
*	ADD [0124 + 0404]	0816	3	2.0	404.74	46.30	6.50	61.11	n/a	0.000
*	DUHYD MAJOR SYSTEM:	0500	1	2.0	404.74	46.30	6.50	61.11	n/a	0.000
*	MINOR SYSTEM:	0500	2	2.0	345.37	45.43	6.50	61.11	n/a	0.000
*	PIPE [ 2 : 0500]	0405	1	2.0	345.37	45.44	6.53	61.11	n/a	0.000
**	CALI B STANDHYD [I%=44.1: S%= 2.00]	0125	1	2.0	18.74	3.49	6.30	64.77	0.64	0.000
*	ADD [0125 + 0405]	0817	3	2.0	364.11	47.06	6.50	61.29	n/a	0.000
*	PIPE [ 2 : 0500]	0408	1	2.0	59.36	0.87	3.13	61.11	n/a	0.000
**	CALI B STANDHYD [I%=32.1: S%= 2.00]	0126	1	2.0	22.26	3.46	6.23	51.88	0.51	0.000
*	ADD [0126 + 0408]	0820	3	2.0	81.62	4.33	6.23	58.59	n/a	0.000
*	PIPE [ 2 : 0820]	0406	1	2.0	81.62	4.34	6.27	58.59	n/a	0.000
**	CALI B STANDHYD [I%=27.4: S%= 2.00]	0127	1	2.0	9.98	1.31	6.27	47.06	0.46	0.000
*	ADD [0127 + 0406]	0818	3	2.0	91.60	5.65	6.27	57.33	n/a	0.000
*	PIPE [ 2 : 0818]	0407	1	2.0	91.60	5.54	6.27	57.33	n/a	0.000
**	CALI B STANDHYD [I%=45.4: S%= 2.00]	0128	1	2.0	14.87	3.25	6.27	67.69	0.67	0.000

ADD [0128 + 0407] 0819 3 2.0 106.47 8.78 6.27 58.78 n/a 0.000

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**1:50 Year 24 Hour SCS Design Storm**  
 \*\*\*\*\*  
 \*\* SIMULATION NUMBER: 21 \*\*  
 \*\*\*\*\*

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R. V. mm	R. C.	Qbase cms
START @ 0.00 hrs								
-----								
READ STORM 15.0								
[ Ptot=120.63 mm ]								
fname : C:\Users\dtwigger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\e46a97e2-08a7-4d5b-949								
remark: 50yr/24hr Barrie Wpcc +15% SCS								
**	CALI B STANDHYD [I%=28.2: S%= 2.00]	0100	1	2.0	31.13	4.83	12.30	72.31 0.60 0.000
*	CHANNEL [ 2 : 0100]	0302	1	2.0	31.13	4.81	12.33	72.31 n/a 0.000
**	CALI B STANDHYD [I%=24.8: S%= 2.00]	0105	1	2.0	9.01	1.99	12.27	84.65 0.70 0.000
**	CALI B STANDHYD [I%=25.4: S%= 2.00]	0110	1	2.0	12.37	2.17	12.30	76.26 0.63 0.000
*	CHANNEL [ 2 : 0110]	0303	1	2.0	12.37	2.13	12.30	76.26 n/a 0.000
*	ADD [0105 + 0302]	0802	3	2.0	40.14	6.61	12.30	75.08 n/a 0.000
*	ADD [0802 + 0303]	0802	1	2.0	52.51	8.74	12.30	75.36 n/a 0.000
*	PIPE [ 2 : 0802]	0400	1	2.0	52.51	8.74	12.30	75.36 n/a 0.000
**	CALI B STANDHYD [I%=39.4: S%= 2.00]	0113	1	2.0	9.41	2.10	12.27	85.48 0.71 0.000
*	CHANNEL [ 2 : 0113]	0301	1	2.0	9.41	2.00	12.30	85.48 n/a 0.000
**	CALI B STANDHYD [I%=27.5: S%= 2.00]	0118	1	2.0	4.11	0.75	12.27	72.53 0.60 0.000
*	RESRVR [ 2 : 0118] {ST= 0.04 ha.m }	0600	1	2.0	4.11	0.41	12.43	72.60 n/a 0.000
*	CHANNEL [ 2 : 0600]	0300	1	2.0	4.11	0.39	12.57	72.57 n/a 0.000
*	CALI B STANDHYD [I%=22.9: S%= 2.00]	0101	1	2.0	8.68	1.39	12.27	64.71 0.54 0.000
*	ADD [0101 + 0300]	0801	3	2.0	12.79	1.66	12.27	67.23 n/a 0.000
*	CHANNEL [ 2 : 0801]	0304	1	2.0	12.79	1.55	12.30	67.23 n/a 0.000
**	CALI B STANDHYD [I%=27.1: S%= 2.00]	0123	1	2.0	22.81	3.89	12.30	79.58 0.66 0.000
*	ADD [0123 + 0301]	0800	3	2.0	32.22	5.89	12.30	81.30 n/a 0.000
*	ADD [0800 + 0304]	0800	1	2.0	45.01	7.44	12.30	77.30 n/a 0.000
*	ADD [0800 + 0400]	0800	3	2.0	97.52	16.18	12.30	76.26 n/a 0.000
*	RESRVR [ 2 : 0800] {ST= 1.21 ha.m }	0601	1	2.0	97.52	14.00	12.40	75.97 n/a 0.000
*	PIPE [ 2 : 0601]	0403	1	2.0	97.52	13.96	12.40	75.96 n/a 0.000
*	CHANNEL [ 2 : 0403]	0317	1	2.0	97.52	12.87	12.50	75.96 n/a 0.000
**	CALI B STANDHYD [I%=22.0: S%= 2.00]	0102	1	2.0	19.41	3.87	12.30	85.08 0.71 0.000
*	ADD [0102 + 0317]	0803	3	2.0	116.93	15.37	12.47	77.48 n/a 0.000
**	CALI B STANDHYD [I%=37.1: S%= 2.00]	0103	1	2.0	35.79	7.63	12.30	93.82 0.78 0.000
**	CALI B STANDHYD [I%=20.7: S%= 2.00]	0104	1	2.0	5.22	1.20	12.27	89.11 0.74 0.000
**	CALI B STANDHYD [I%=21.1: S%= 2.00]	0106	1	2.0	13.71	2.55	12.30	80.43 0.67 0.000

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* * CALI B STANDHYD 0107 1 5.0 8.53 1.85 12.25 87.23 0.72 0.000
  [I%=18.1: S%= 2.00]
* * CALI B STANDHYD 0108 1 2.0 58.75 8.09 12.37 71.81 0.60 0.000
  [I%=24.4: S%= 2.00]
* * CHANNEL[ 2 : 0108] 0307 1 2.0 58.75 7.97 12.40 71.81 n/a 0.000
* * CALI B STANDHYD 0109 1 2.0 13.70 3.07 12.30 82.77 0.69 0.000
  [I%= 3.0: S%= 2.00]
* * ADD [0109 + 0307] 0806 3 2.0 72.45 10.56 12.37 73.88 n/a 0.000
* * CHANNEL[ 2 : 0806] 0308 1 2.0 72.45 10.50 12.37 73.88 n/a 0.000
* * ADD [0107 + 0308] 0807 3 2.0 80.98 12.06 12.37 75.28 n/a 0.000
* * CHANNEL[ 2 : 0807] 0306 1 2.0 80.98 11.98 12.40 75.28 n/a 0.000
* * ADD [0106 + 0306] 0804 3 2.0 94.69 14.29 12.37 76.03 n/a 0.000
* * CHANNEL[ 2 : 0804] 0305 1 2.0 94.69 13.68 12.43 76.03 n/a 0.000
* * ADD [0104 + 0305] 0093 3 2.0 99.91 14.51 12.40 76.71 n/a 0.000
* * ADD [0103 + 0093] 0805 3 2.0 135.70 21.30 12.37 81.22 n/a 0.000
* * CHANNEL[ 2 : 0805] 0312 1 2.0 135.70 20.60 12.40 81.22 n/a 0.000
* * ADD [0312 + 0803] 0094 3 2.0 252.63 35.65 12.43 79.49 n/a 0.000
* * CHANNEL[ 2 : 0094] 0309 1 2.0 252.63 35.63 12.47 79.49 n/a 0.000
* ** CALI B STANDHYD 0111 1 2.0 3.57 0.76 12.27 85.15 0.71 0.000
  [I%=22.2: S%= 2.00]
* * ADD [0111 + 0309] 0808 3 2.0 256.20 36.08 12.47 79.57 n/a 0.000
* * CHANNEL[ 2 : 0808] 0310 1 2.0 256.20 36.05 12.47 79.57 n/a 0.000
* ** CALI B STANDHYD 0112 1 2.0 16.90 3.54 12.30 88.86 0.74 0.000
  [I%=23.9: S%= 2.00]
* * ADD [0112 + 0310] 0809 3 2.0 273.10 38.58 12.47 80.14 n/a 0.000
* * CHANNEL[ 2 : 0809] 0311 1 2.0 273.10 37.90 12.50 80.14 n/a 0.000
* * CALI B STANDHYD 0114 1 2.0 4.95 1.09 12.27 86.66 0.72 0.000
  [I%=17.3: S%= 2.00]
* * ADD [0114 + 0311] 0810 3 2.0 278.05 38.48 12.50 80.26 n/a 0.000
* * CHANNEL[ 2 : 0810] 0313 1 2.0 278.05 38.51 12.50 80.26 n/a 0.000
* * CALI B STANDHYD 0115 1 2.0 12.66 2.17 12.30 78.09 0.65 0.000
  [I%=28.8: S%= 2.00]
* * ADD [0115 + 0313] 0811 3 2.0 290.71 39.95 12.50 80.16 n/a 0.000
* * CHANNEL[ 2 : 0811] 0314 1 2.0 290.71 39.94 12.50 80.16 n/a 0.000
* * CALI B STANDHYD 0116 1 2.0 26.63 4.99 12.30 79.24 0.66 0.000
  [I%=25.5: S%= 2.00]
* * ADD [0116 + 0314] 0812 3 2.0 317.34 42.85 12.47 80.09 n/a 0.000
* * PIPE [ 2 : 0812] 0401 1 2.0 317.34 42.86 12.50 80.09 n/a 0.000
* * CALI B STANDHYD 0117 1 2.0 27.32 3.64 12.27 61.11 0.51 0.000
  [I%=25.1: S%= 2.00]
* * ADD [0117 + 0401] 0813 3 2.0 344.66 45.27 12.47 78.58 n/a 0.000
* * CHANNEL[ 2 : 0813] 0315 1 2.0 344.66 44.84 12.50 78.58 n/a 0.000
* * CALI B STANDHYD 0119 1 2.0 16.91 2.49 12.30 67.40 0.56 0.000
  [I%=26.9: S%= 2.00]
* * ADD [0119 + 0315] 0814 3 2.0 361.57 46.46 12.50 78.06 n/a 0.000
* * PIPE [ 2 : 0814] 0402 1 2.0 361.57 46.46 12.50 78.06 n/a 0.000
* * CALI B STANDHYD 0120 1 2.0 17.04 2.19 12.30 58.99 0.49 0.000

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  [I%=20.9: S%= 2.00]
* * CHANNEL[ 2 : 0120] 0316 1 2.0 17.04 2.16 12.30 58.99 n/a 0.000
* * CALI B STANDHYD 0121 1 2.0 1.39 0.16 12.27 47.08 0.39 0.000
  [I%=14.6: S%= 2.00]
* * CALI B STANDHYD 0122 1 2.0 3.13 0.49 12.23 60.98 0.51 0.000
  [I%=26.5: S%= 2.00]
* * ADD [0121 + 0122] 0815 3 2.0 4.52 0.65 12.23 56.69 n/a 0.000
* * ADD [0815 + 0316] 0815 1 2.0 21.56 2.72 12.30 58.51 n/a 0.000
* * ADD [0815 + 0402] 0815 3 2.0 383.13 48.23 12.50 76.96 n/a 0.000
* * PIPE [ 2 : 0815] 0404 1 2.0 383.13 48.13 12.50 76.96 n/a 0.000
* * CALI B STANDHYD 0124 1 2.0 21.61 3.68 12.27 68.72 0.57 0.000
  [I%=33.4: S%= 2.00]
* * ADD [0124 + 0404] 0816 3 2.0 404.74 49.79 12.50 76.52 n/a 0.000
* * DUHYD MAJOR SYSTEM: 0500 1 2.0 404.74 49.79 12.50 76.52 n/a 0.000
  MINOR SYSTEM: 0500 2 2.0 318.44 48.92 12.50 76.52 n/a 0.000
  0500 3 2.0 86.29 0.87 7.17 76.52 n/a 0.000
* * PIPE [ 2 : 0500] 0405 1 2.0 318.44 48.82 12.50 76.52 n/a 0.000
* ** CALI B STANDHYD 0125 1 2.0 18.74 3.59 12.30 79.88 0.66 0.000
  [I%=44.1: S%= 2.00]
* * ADD [0125 + 0405] 0817 3 2.0 337.18 50.69 12.50 76.71 n/a 0.000
* * PIPE [ 2 : 0500] 0408 1 2.0 86.29 0.87 7.50 76.52 n/a 0.000
* ** CALI B STANDHYD 0126 1 2.0 22.26 3.60 12.27 64.88 0.54 0.000
  [I%=32.1: S%= 2.00]
* * ADD [0126 + 0408] 0820 3 2.0 108.55 4.47 12.27 74.13 n/a 0.000
* * PIPE [ 2 : 0820] 0406 1 2.0 108.55 4.47 12.27 74.13 n/a 0.000
* ** CALI B STANDHYD 0127 1 2.0 9.98 1.37 12.27 59.25 0.49 0.000
  [I%=27.4: S%= 2.00]
* * ADD [0127 + 0406] 0818 3 2.0 118.53 5.85 12.27 72.88 n/a 0.000
* * PIPE [ 2 : 0818] 0407 1 2.0 118.53 5.73 12.27 72.88 n/a 0.000
* ** CALI B STANDHYD 0128 1 2.0 14.87 3.34 12.27 83.35 0.69 0.000
  [I%=45.4: S%= 2.00]
* * ADD [0128 + 0407] 0819 3 2.0 133.40 9.06 12.27 74.05 n/a 0.000

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** SIMULATION NUMBER: 22 **
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### 1:100 Year 6 Hour SCS Design Storm

W/E COMMAND	HYD	ID	DT mi n	AREA ha	Opeak cms	Tpeak hrs	R. V. mm	R. C.	Qbase cms
START @ 0.00 hrs	-----								
READ STORM				15.0					
[ Ptot=106.50 mm ]									
fname : C:\Users\dtwi gger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\3d3b1b89-e8c4-4a46-b00									
remark: 100yr/6hr Barrie Wpc +15% SCS									
** CALI B STANDHYD	0100	1	2.0	31.13	5.81	3.30	61.26	0.58	0.000
[I%=28.2: S%= 2.00]									
CHANNEL[ 2 : 0100]	0302	1	2.0	31.13	5.78	3.33	61.26	n/a	0.000
** CALI B STANDHYD	0105	1	2.0	9.01	2.50	3.27	72.08	0.68	0.000
[I%=24.8: S%= 2.00]									
** CALI B STANDHYD	0110	1	2.0	12.37	2.62	3.30	64.60	0.61	0.000
[I%=25.4: S%= 2.00]									
CHANNEL[ 2 : 0110]	0303	1	2.0	12.37	2.58	3.30	64.60	n/a	0.000
ADD [0105 + 0302]	0802	3	2.0	40.14	8.03	3.30	63.69	n/a	0.000

*	ADD [0802 + 0303]	0802	1	2.0	52.51	10.61	3.30	63.90	n/a	0.000
*	PIPE [ 2 : 0802]	0400	1	2.0	52.51	10.61	3.30	63.90	n/a	0.000
**	CALIB STANDHYD [1%=39.4; S%= 2.00]	0113	1	2.0	9.41	2.55	3.27	73.23	0.69	0.000
*	CHANNEL[ 2 : 0113]	0301	1	2.0	9.41	2.41	3.27	73.22	n/a	0.000
**	CALIB STANDHYD [1%=27.5; S%= 2.00]	0118	1	2.0	4.11	0.89	3.27	61.40	0.58	0.000
*	RESRVR [ 2 : 0118] {ST= 0.05 ha.m }	0600	1	2.0	4.11	0.47	3.47	61.50	n/a	0.000
*	CHANNEL[ 2 : 0600]	0300	1	2.0	4.11	0.45	3.57	61.48	n/a	0.000
*	CALIB STANDHYD [1%=22.9; S%= 2.00]	0101	1	2.0	8.68	1.67	3.27	54.42	0.51	0.000
*	ADD [0101 + 0300]	0801	3	2.0	12.79	1.96	3.27	56.69	n/a	0.000
*	CHANNEL[ 2 : 0801]	0304	1	2.0	12.79	1.83	3.30	56.68	n/a	0.000
*	CALIB STANDHYD [1%=27.4; S%= 2.00]	0123	1	2.0	22.81	4.73	3.30	67.55	0.63	0.000
*	ADD [0123 + 0301]	0800	3	2.0	32.22	7.13	3.30	69.21	n/a	0.000
*	ADD [0800 + 0304]	0800	1	2.0	45.01	8.96	3.30	65.65	n/a	0.000
*	ADD [0800 + 0400]	0800	3	2.0	97.52	19.57	3.30	64.71	n/a	0.000
*	RESRVR [ 2 : 0800] {ST= 1.31 ha.m }	0601	1	2.0	97.52	16.99	3.40	64.42	n/a	0.000
*	PIPE [ 2 : 0601]	0403	1	2.0	97.52	16.99	3.40	64.42	n/a	0.000
*	CHANNEL[ 2 : 0403]	0317	1	2.0	97.52	15.55	3.50	64.42	n/a	0.000
**	CALIB STANDHYD [1%=22.0; S%= 2.00]	0102	1	2.0	19.41	4.70	3.30	72.38	0.68	0.000
*	ADD [0102 + 0317]	0803	3	2.0	116.93	18.68	3.47	65.74	n/a	0.000
**	CALIB STANDHYD [1%=37.1; S%= 2.00]	0103	1	2.0	35.79	9.73	3.30	80.70	0.76	0.000
**	CALIB STANDHYD [1%=20.7; S%= 2.00]	0104	1	2.0	5.22	1.52	3.27	76.10	0.71	0.000
**	CALIB STANDHYD [1%=21.1; S%= 2.00]	0106	1	2.0	13.71	3.09	3.30	68.21	0.64	0.000
*	CALIB STANDHYD [1%=18.1; S%= 2.00]	0107	1	5.0	8.53	2.53	3.25	74.33	0.70	0.000
*	CALIB STANDHYD [1%=24.4; S%= 2.00]	0108	1	2.0	58.75	9.97	3.37	60.67	0.57	0.000
*	CHANNEL[ 2 : 0108]	0307	1	2.0	58.75	9.83	3.37	60.67	n/a	0.000
**	CALIB STANDHYD [1%= 3.0; S%= 2.00]	0109	1	2.0	13.70	3.75	3.30	70.02	0.66	0.000
*	ADD [0109 + 0307]	0806	3	2.0	72.45	13.18	3.37	62.43	n/a	0.000
*	CHANNEL[ 2 : 0806]	0308	1	2.0	72.45	13.17	3.37	62.43	n/a	0.000
*	ADD [0107 + 0308]	0807	3	2.0	80.98	15.00	3.33	63.68	n/a	0.000
*	CHANNEL[ 2 : 0807]	0306	1	2.0	80.98	14.95	3.37	63.68	n/a	0.000
*	ADD [0106 + 0306]	0804	3	2.0	94.69	17.77	3.37	64.34	n/a	0.000
*	CHANNEL[ 2 : 0804]	0305	1	2.0	94.69	16.93	3.40	64.34	n/a	0.000
*	ADD [0104 + 0305]	0093	3	2.0	99.91	17.95	3.40	64.95	n/a	0.000
*	ADD [0103 + 0093]	0805	3	2.0	135.70	26.72	3.33	69.11	n/a	0.000
*	CHANNEL[ 2 : 0805]	0312	1	2.0	135.70	25.51	3.40	69.11	n/a	0.000
*	ADD [0312 + 0803]	0094	3	2.0	252.63	43.88	3.43	67.55	n/a	0.000

*	CHANNEL[ 2 : 0094]	0309	1	2.0	252.63	43.77	3.43	67.55	n/a	0.000
**	CALIB STANDHYD [1%=22.2; S%= 2.00]	0111	1	2.0	3.57	0.92	3.27	72.49	0.68	0.000
*	ADD [0111 + 0309]	0808	3	2.0	256.20	44.39	3.43	67.62	n/a	0.000
*	CHANNEL[ 2 : 0808]	0310	1	2.0	256.20	44.28	3.47	67.62	n/a	0.000
**	CALIB STANDHYD [1%=23.9; S%= 2.00]	0112	1	2.0	16.90	4.29	3.30	75.92	0.71	0.000
*	ADD [0112 + 0310]	0809	3	2.0	273.10	47.43	3.43	68.13	n/a	0.000
*	CHANNEL[ 2 : 0809]	0311	1	2.0	273.10	46.57	3.47	68.13	n/a	0.000
*	CALIB STANDHYD [1%=17.3; S%= 2.00]	0114	1	2.0	4.95	1.38	3.27	73.78	0.69	0.000
*	ADD [0114 + 0311]	0810	3	2.0	278.05	47.30	3.47	68.23	n/a	0.000
*	CHANNEL[ 2 : 0810]	0313	1	2.0	278.05	47.26	3.47	68.23	n/a	0.000
**	CALIB STANDHYD [1%=28.8; S%= 2.00]	0115	1	2.0	12.66	2.60	3.30	66.35	0.62	0.000
*	ADD [0115 + 0313]	0811	3	2.0	290.71	49.11	3.47	68.15	n/a	0.000
*	CHANNEL[ 2 : 0811]	0314	1	2.0	290.71	48.94	3.50	68.15	n/a	0.000
*	CALIB STANDHYD [1%=25.5; S%= 2.00]	0116	1	2.0	26.63	6.27	3.27	67.25	0.63	0.000
*	ADD [0116 + 0314]	0812	3	2.0	317.34	52.44	3.47	68.07	n/a	0.000
*	PIPE [ 2 : 0812]	0401	1	2.0	317.34	52.42	3.47	68.07	n/a	0.000
**	CALIB STANDHYD [1%=25.1; S%= 2.00]	0117	1	2.0	27.32	4.40	3.27	51.52	0.48	0.000
*	ADD [0117 + 0401]	0813	3	2.0	344.66	55.33	3.47	66.76	n/a	0.000
*	CHANNEL[ 2 : 0813]	0315	1	2.0	344.66	54.85	3.50	66.76	n/a	0.000
**	CALIB STANDHYD [1%=26.9; S%= 2.00]	0119	1	2.0	16.91	2.98	3.30	56.94	0.53	0.000
*	ADD [0119 + 0315]	0814	3	2.0	361.57	56.77	3.50	66.30	n/a	0.000
*	PIPE [ 2 : 0814]	0402	1	2.0	361.57	56.81	3.50	66.30	n/a	0.000
*	CALIB STANDHYD [1%=20.9; S%= 2.00]	0120	1	2.0	17.04	2.71	3.27	49.49	0.46	0.000
*	CHANNEL[ 2 : 0120]	0316	1	2.0	17.04	2.70	3.30	49.49	n/a	0.000
**	CALIB STANDHYD [1%=14.6; S%= 2.00]	0121	1	2.0	1.39	0.19	3.27	39.05	0.37	0.000
**	CALIB STANDHYD [1%=26.5; S%= 2.00]	0122	1	2.0	3.13	0.59	3.23	51.49	0.48	0.000
*	ADD [0121 + 0122]	0815	3	2.0	4.52	0.77	3.23	47.66	n/a	0.000
*	ADD [0815 + 0316]	0815	1	2.0	21.56	3.37	3.27	49.10	n/a	0.000
*	ADD [0815 + 0402]	0815	3	2.0	383.13	58.84	3.50	65.33	n/a	0.000
*	PIPE [ 2 : 0815]	0404	1	2.0	383.13	58.84	3.50	65.33	n/a	0.000
*	CALIB STANDHYD [1%=33.4; S%= 2.00]	0124	1	2.0	21.61	4.56	3.27	58.46	0.55	0.000
*	ADD [0124 + 0404]	0816	3	2.0	404.74	60.68	3.50	64.97	n/a	0.000
*	DUHYD MAJOR SYSTEM: MINOR SYSTEM:	0500 0500 0500	1 2 3	2.0 2.0 2.0	404.74 368.81 35.93	60.68 59.81 0.87	3.50 3.50 1.40	64.97 64.97 64.97	n/a n/a n/a	0.000 0.000 0.000
*	PIPE [ 2 : 0500]	0405	1	2.0	368.81	59.77	3.50	64.97	n/a	0.000
**	CALIB STANDHYD [1%=44.1; S%= 2.00]	0125	1	2.0	18.74	4.44	3.30	68.56	0.64	0.000

*	ADD [0125 + 0405]	0817	3	2.0	387.55	62.00	3.50	65.14	n/a	0.000
*	PIPE [ 2 : 0500]	0408	1	2.0	35.93	0.87	1.80	64.97	n/a	0.000
**	CALIB STANDHYD [I%=32.1: S%= 2.00]	0126	1	2.0	22.26	4.50	3.23	55.12	0.52	0.000
*	ADD [0126 + 0408]	0820	3	2.0	58.19	5.36	3.23	61.20	n/a	0.000
*	PIPE [ 2 : 0820]	0406	1	2.0	58.19	5.36	3.27	61.20	n/a	0.000
**	CALIB STANDHYD [I%=27.4: S%= 2.00]	0127	1	2.0	9.98	1.69	3.27	50.09	0.47	0.000
*	ADD [0127 + 0406]	0818	3	2.0	68.17	7.05	3.27	59.57	n/a	0.000
*	PIPE [ 2 : 0818]	0407	1	2.0	68.17	6.95	3.27	59.57	n/a	0.000
**	CALIB STANDHYD [I%=45.4: S%= 2.00]	0128	1	2.0	14.87	4.17	3.23	71.62	0.67	0.000
*	ADD [0128 + 0407]	0819	3	2.0	83.04	11.08	3.27	61.73	n/a	0.000

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**\*\* SIMULATION NUMBER: 23 \*\* 1:100 Year 12 Hour SCS Design Storm**  
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W/E COMMAND	HYD ID	DT mi n	AREA ha	Qpeak cms	Tpeak hrs	R. V. mm	R. C.	Qbase cms		
START @ 0.00 hrs										
READ STORM										
[ Ptot=112.51 mm ] 15.0										
fname : C:\Users\dtwigger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\6db0f576-2e1e-44aa-b69										
remark: 100yr/12hr Barrie Wpcc +15% SCS										
**	CALIB STANDHYD [I%=28.2: S%= 2.00]	0100	1	2.0	31.13	5.07	6.30	65.91	0.59	0.000
*	CHANNEL [ 2 : 0100]	0302	1	2.0	31.13	5.06	6.33	65.91	n/a	0.000
**	CALIB STANDHYD [I%=24.8: S%= 2.00]	0105	1	2.0	9.01	2.26	6.27	77.40	0.69	0.000
**	CALIB STANDHYD [I%=25.4: S%= 2.00]	0110	1	2.0	12.37	2.38	6.30	69.52	0.62	0.000
*	CHANNEL [ 2 : 0110]	0303	1	2.0	12.37	2.34	6.30	69.52	n/a	0.000
*	ADD [0105 + 0302]	0802	3	2.0	40.14	7.07	6.30	68.49	n/a	0.000
*	ADD [0802 + 0303]	0802	1	2.0	52.51	9.41	6.30	68.73	n/a	0.000
*	PIPE [ 2 : 0802]	0400	1	2.0	52.51	9.41	6.30	68.73	n/a	0.000
**	CALIB STANDHYD [I%=39.4: S%= 2.00]	0113	1	2.0	9.41	2.30	6.27	78.41	0.70	0.000
*	CHANNEL [ 2 : 0113]	0301	1	2.0	9.41	2.17	6.30	78.40	n/a	0.000
**	CALIB STANDHYD [I%=27.5: S%= 2.00]	0118	1	2.0	4.11	0.78	6.27	66.09	0.59	0.000
*	RESRVR [ 2 : 0118] {ST= 0.04 ha.m }	0600	1	2.0	4.11	0.43	6.47	66.14	n/a	0.000
*	CHANNEL [ 2 : 0600]	0300	1	2.0	4.11	0.41	6.60	66.11	n/a	0.000
**	CALIB STANDHYD [I%=22.9: S%= 2.00]	0101	1	2.0	8.68	1.52	6.27	58.74	0.52	0.000
*	ADD [0101 + 0300]	0801	3	2.0	12.79	1.80	6.27	61.11	n/a	0.000
*	CHANNEL [ 2 : 0801]	0304	1	2.0	12.79	1.67	6.30	61.11	n/a	0.000
**	CALIB STANDHYD [I%=27.1: S%= 2.00]	0123	1	2.0	22.81	4.28	6.30	72.63	0.65	0.000
*	ADD [0123 + 0301]	0800	3	2.0	32.22	6.45	6.30	74.31	n/a	0.000
*	ADD [0800 + 0304]	0800	1	2.0	45.01	8.12	6.30	70.56	n/a	0.000

*	ADD [0800 + 0400]	0800	3	2.0	97.52	17.53	6.30	69.58	n/a	0.000
*	RESRVR [ 2 : 0800] {ST= 1.25 ha.m }	0601	1	2.0	97.52	15.24	6.40	69.28	n/a	0.000
*	PIPE [ 2 : 0601]	0403	1	2.0	97.52	15.23	6.40	69.28	n/a	0.000
*	CHANNEL [ 2 : 0403]	0317	1	2.0	97.52	13.96	6.50	69.28	n/a	0.000
**	CALIB STANDHYD [I%=22.0: S%= 2.00]	0102	1	2.0	19.41	4.26	6.30	77.75	0.69	0.000
*	ADD [0102 + 0317]	0803	3	2.0	116.93	16.76	6.47	70.69	n/a	0.000
**	CALIB STANDHYD [I%=37.1: S%= 2.00]	0103	1	2.0	35.79	8.71	6.30	86.26	0.77	0.000
**	CALIB STANDHYD [I%=20.7: S%= 2.00]	0104	1	2.0	5.22	1.32	6.27	81.61	0.73	0.000
**	CALIB STANDHYD [I%=21.1: S%= 2.00]	0106	1	2.0	13.71	2.80	6.30	73.37	0.65	0.000
*	CALIB STANDHYD [I%=18.1: S%= 2.00]	0107	1	5.0	8.53	2.04	6.25	79.79	0.71	0.000
*	CALIB STANDHYD [I%=24.4: S%= 2.00]	0108	1	2.0	58.75	9.04	6.37	65.36	0.58	0.000
*	CHANNEL [ 2 : 0108]	0307	1	2.0	58.75	8.89	6.37	65.36	n/a	0.000
*	CALIB STANDHYD [I%= 3.0: S%= 2.00]	0109	1	2.0	13.70	3.39	6.30	75.41	0.67	0.000
*	ADD [0109 + 0307]	0806	3	2.0	72.45	11.92	6.37	67.26	n/a	0.000
*	CHANNEL [ 2 : 0806]	0308	1	2.0	72.45	11.92	6.37	67.26	n/a	0.000
*	ADD [0107 + 0308]	0807	3	2.0	80.98	13.63	6.37	68.57	n/a	0.000
*	CHANNEL [ 2 : 0807]	0306	1	2.0	80.98	13.58	6.37	68.57	n/a	0.000
*	ADD [0106 + 0306]	0804	3	2.0	94.69	16.14	6.37	69.27	n/a	0.000
*	CHANNEL [ 2 : 0804]	0305	1	2.0	94.69	15.34	6.40	69.27	n/a	0.000
*	ADD [0104 + 0305]	0093	3	2.0	99.91	16.34	6.40	69.91	n/a	0.000
*	ADD [0103 + 0093]	0805	3	2.0	135.70	24.02	6.37	74.22	n/a	0.000
*	CHANNEL [ 2 : 0805]	0312	1	2.0	135.70	23.10	6.40	74.22	n/a	0.000
*	ADD [0312 + 0803]	0094	3	2.0	252.63	39.47	6.43	72.59	n/a	0.000
*	CHANNEL [ 2 : 0094]	0309	1	2.0	252.63	39.39	6.43	72.59	n/a	0.000
**	CALIB STANDHYD [I%=22.2: S%= 2.00]	0111	1	2.0	3.57	0.83	6.27	77.84	0.69	0.000
*	ADD [0111 + 0309]	0808	3	2.0	256.20	39.95	6.43	72.66	n/a	0.000
*	CHANNEL [ 2 : 0808]	0310	1	2.0	256.20	39.82	6.47	72.66	n/a	0.000
**	CALIB STANDHYD [I%=23.9: S%= 2.00]	0112	1	2.0	16.90	3.87	6.30	81.40	0.72	0.000
*	ADD [0112 + 0310]	0809	3	2.0	273.10	42.61	6.43	73.20	n/a	0.000
*	CHANNEL [ 2 : 0809]	0311	1	2.0	273.10	41.78	6.50	73.20	n/a	0.000
*	CALIB STANDHYD [I%=17.3: S%= 2.00]	0114	1	2.0	4.95	1.20	6.27	79.23	0.70	0.000
*	ADD [0114 + 0311]	0810	3	2.0	278.05	42.48	6.47	73.31	n/a	0.000
*	CHANNEL [ 2 : 0810]	0313	1	2.0	278.05	42.47	6.50	73.31	n/a	0.000
**	CALIB STANDHYD [I%=28.8: S%= 2.00]	0115	1	2.0	12.66	2.39	6.30	71.30	0.63	0.000
*	ADD [0115 + 0313]	0811	3	2.0	290.71	44.19	6.47	73.22	n/a	0.000
*	CHANNEL [ 2 : 0811]	0314	1	2.0	290.71	44.10	6.50	73.22	n/a	0.000

*	CALIB STANDBYD	0116	1	2.0	26.63	5.48	6.30	72.31	0.64	0.000
*	[1%=25.5: S%= 2.00]									
*	ADD [0116 + 0314]	0812	3	2.0	317.34	47.44	6.47	73.14	n/a	0.000
*	PIPE [ 2 : 0812]	0401	1	2.0	317.34	47.41	6.47	73.14	n/a	0.000
*	CALIB STANDBYD	0117	1	2.0	27.32	3.99	6.27	55.55	0.49	0.000
*	[1%=25.1: S%= 2.00]									
*	ADD [0117 + 0401]	0813	3	2.0	344.66	50.08	6.47	71.75	n/a	0.000
*	CHANNEL [ 2 : 0813]	0315	1	2.0	344.66	49.63	6.50	71.75	n/a	0.000
*	CALIB STANDBYD	0119	1	2.0	16.91	2.73	6.30	61.34	0.55	0.000
*	[1%=26.9: S%= 2.00]									
*	ADD [0119 + 0315]	0814	3	2.0	361.57	51.40	6.50	71.26	n/a	0.000
*	PIPE [ 2 : 0814]	0402	1	2.0	361.57	51.42	6.50	71.26	n/a	0.000
*	CALIB STANDBYD	0120	1	2.0	17.04	2.47	6.27	53.48	0.48	0.000
*	[1%=20.9: S%= 2.00]									
*	CHANNEL [ 2 : 0120]	0316	1	2.0	17.04	2.46	6.30	53.48	n/a	0.000
*	CALIB STANDBYD	0121	1	2.0	1.39	0.17	6.27	42.41	0.38	0.000
*	[1%=14.6: S%= 2.00]									
*	CALIB STANDBYD	0122	1	2.0	3.13	0.54	6.23	55.47	0.49	0.000
*	[1%=26.5: S%= 2.00]									
*	ADD [0121 + 0122]	0815	3	2.0	4.52	0.71	6.23	51.45	n/a	0.000
*	ADD [0815 + 0316]	0815	1	2.0	21.56	3.07	6.30	53.05	n/a	0.000
*	ADD [0815 + 0402]	0815	3	2.0	383.13	53.29	6.50	70.24	n/a	0.000
*	PIPE [ 2 : 0815]	0404	1	2.0	383.13	53.27	6.50	70.24	n/a	0.000
*	CALIB STANDBYD	0124	1	2.0	21.61	4.05	6.27	62.77	0.56	0.000
*	[1%=33.4: S%= 2.00]									
*	ADD [0124 + 0404]	0816	3	2.0	404.74	55.08	6.50	69.84	n/a	0.000
*	DUHYD	0500	1	2.0	404.74	55.08	6.50	69.84	n/a	0.000
*	MAJOR SYSTEM:	0500	2	2.0	351.31	54.21	6.50	69.84	n/a	0.000
*	MINOR SYSTEM:	0500	3	2.0	53.43	0.87	2.73	69.84	n/a	0.000
*	PIPE [ 2 : 0500]	0405	1	2.0	351.31	54.18	6.50	69.84	n/a	0.000
**	CALIB STANDBYD	0125	1	2.0	18.74	3.98	6.30	73.34	0.65	0.000
*	[1%=44.1: S%= 2.00]									
*	ADD [0125 + 0405]	0817	3	2.0	370.05	56.22	6.50	70.02	n/a	0.000
*	PIPE [ 2 : 0500]	0408	1	2.0	53.43	0.87	3.10	69.84	n/a	0.000
**	CALIB STANDBYD	0126	1	2.0	22.26	4.07	6.23	59.22	0.53	0.000
*	[1%=32.1: S%= 2.00]									
*	ADD [0126 + 0408]	0820	3	2.0	75.69	4.94	6.23	66.72	n/a	0.000
*	PIPE [ 2 : 0820]	0406	1	2.0	75.69	4.94	6.27	66.72	n/a	0.000
**	CALIB STANDBYD	0127	1	2.0	9.98	1.55	6.27	53.94	0.48	0.000
*	[1%=27.4: S%= 2.00]									
*	ADD [0127 + 0406]	0818	3	2.0	85.67	6.49	6.27	65.23	n/a	0.000
*	PIPE [ 2 : 0818]	0407	1	2.0	85.67	6.37	6.27	65.23	n/a	0.000
**	CALIB STANDBYD	0128	1	2.0	14.87	3.75	6.23	76.57	0.68	0.000
*	[1%=45.4: S%= 2.00]									
*	ADD [0128 + 0407]	0819	3	2.0	100.54	10.09	6.27	66.90	n/a	0.000

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 \*\* SIMULATION NUMBER: 24 \*\* **1:100 Year 24 Hour SCS Design Storm**  
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W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R. V. mm	R. C.	Qbase cms
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START @ 0.00 hrs									
-----									
READ STORM	15.0								
[ Ptot=133.60 mm ]									
fname : C:\Users\dtwi gger\AppData\Local\Temp\0e0b4131-aec9-4f63-9ef0-93267f4318f1\97894565-b6f8-469d-831									
remark: 100yr/24hr Barri e Wpcc +15% SCS									
** CALIB STANDBYD	0100	1	2.0	31.13	5.34	12.30	82.75	0.62	0.000
[1%=28.2: S%= 2.00]									
** CHANNEL [ 2 : 0100]	0302	1	2.0	31.13	5.33	12.33	82.75	n/a	0.000
** CALIB STANDBYD	0105	1	2.0	9.01	2.37	12.27	96.39	0.72	0.000
[1%=24.8: S%= 2.00]									
** CALIB STANDBYD	0110	1	2.0	12.37	2.52	12.30	87.22	0.65	0.000
[1%=25.4: S%= 2.00]									
** CHANNEL [ 2 : 0110]	0303	1	2.0	12.37	2.48	12.30	87.22	n/a	0.000
** ADD [0105 + 0302]	0802	3	2.0	40.14	7.43	12.30	85.81	n/a	0.000
** ADD [0802 + 0303]	0802	1	2.0	52.51	9.91	12.30	86.15	n/a	0.000
** PIPE [ 2 : 0802]	0400	1	2.0	52.51	9.91	12.30	86.15	n/a	0.000
** CALIB STANDBYD	0113	1	2.0	9.41	2.37	12.27	96.94	0.73	0.000
[1%=39.4: S%= 2.00]									
** CHANNEL [ 2 : 0113]	0301	1	2.0	9.41	2.24	12.30	96.93	n/a	0.000
** CALIB STANDBYD	0118	1	2.0	4.11	0.87	12.27	83.03	0.62	0.000
[1%=27.5: S%= 2.00]									
** RESRVR [ 2 : 0118]	0600	1	2.0	4.11	0.47	12.47	83.04	n/a	0.000
{ST= 0.05 ha.m }									
** CHANNEL [ 2 : 0600]	0300	1	2.0	4.11	0.45	12.57	83.02	n/a	0.000
** CALIB STANDBYD	0101	1	2.0	8.68	1.62	12.27	74.48	0.56	0.000
[1%=22.9: S%= 2.00]									
** ADD [0101 + 0300]	0801	3	2.0	12.79	1.92	12.27	77.22	n/a	0.000
** CHANNEL [ 2 : 0801]	0304	1	2.0	12.79	1.80	12.30	77.22	n/a	0.000
** CALIB STANDBYD	0123	1	2.0	22.81	4.52	12.30	90.87	0.68	0.000
[1%=27.1: S%= 2.00]									
** ADD [0123 + 0301]	0800	3	2.0	32.22	6.76	12.30	92.64	n/a	0.000
** ADD [0800 + 0304]	0800	1	2.0	45.01	8.56	12.30	88.26	n/a	0.000
** ADD [0800 + 0400]	0800	3	2.0	97.52	18.47	12.30	87.12	n/a	0.000
** RESRVR [ 2 : 0800]	0601	1	2.0	97.52	16.26	12.40	86.83	n/a	0.000
{ST= 1.29 ha.m }									
** PIPE [ 2 : 0601]	0403	1	2.0	97.52	16.26	12.40	86.83	n/a	0.000
** CHANNEL [ 2 : 0403]	0317	1	2.0	97.52	15.07	12.50	86.83	n/a	0.000
** CALIB STANDBYD	0102	1	2.0	19.41	4.47	12.30	96.93	0.73	0.000
[1%=22.0: S%= 2.00]									
** ADD [0102 + 0317]	0803	3	2.0	116.93	18.09	12.47	88.50	n/a	0.000
** CALIB STANDBYD	0103	1	2.0	35.79	8.97	12.30	105.99	0.79	0.000
[1%=37.1: S%= 2.00]									
** CALIB STANDBYD	0104	1	2.0	5.22	1.43	12.27	101.21	0.76	0.000
[1%=20.7: S%= 2.00]									
** CALIB STANDBYD	0106	1	2.0	13.71	2.96	12.30	91.88	0.69	0.000
[1%=21.1: S%= 2.00]									
** CALIB STANDBYD	0107	1	5.0	8.53	2.14	12.25	99.25	0.74	0.000
[1%=18.1: S%= 2.00]									
** CALIB STANDBYD	0108	1	2.0	58.75	9.60	12.33	82.33	0.62	0.000
[1%=24.4: S%= 2.00]									
** CHANNEL [ 2 : 0108]	0307	1	2.0	58.75	9.47	12.37	82.33	n/a	0.000



Sophia V03.txt

=====

```
V V I SSSSS U U A L
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
W I SSSSS UUUUU A A LLLLL

000 TTTT TTTT H H Y Y M M 000 TM
0 0 T T H H Y Y M M 0 0
0 0 T T H H Y Y M M 0 0
000 T T H H Y Y M M 000
```

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\*\*\*\*\* SUMMARY OUTPUT \*\*\*\*\*

Input filename: C:\Program Files (x86)\VH Suite 3.0\V02\voinput.dat  
 Output filename:  
 C:\Users\dtwigger\AppData\Local\Temp\d846c32c-cd4c-4d16-a4af-12b9c07c7f74\Scenario.out  
 Summary filename:  
 C:\Users\dtwigger\AppData\Local\Temp\d846c32c-cd4c-4d16-a4af-12b9c07c7f74\Scenario.summary

DATE: 10/08/2016 TIME: 09:49:01  
 USER:

COMMENTS: **EXISTING CONDITIONS HYDROLOGIC MODEL RESULTS**

\*\*\*\*\*  
 \*\* SIMULATION NUMBER: 25 \*\* **Hurricane Hazel Storm Event**  
 \*\*\*\*\*

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
START @ 0.00 hrs								
READ STORM [ Ptot=212.00 mm ]		12.0						
fname : C:\Users\dtwigger\AppData\Local\Temp\d846c32c-cd4c-4d16-a4af-12b9c07c7f74\162f41c1-4e62-4af4-8f92-fd remark: * REGIONAL DESIGN STORM - HAZEL								

```
** CALIB STANDHYD 0100 1 2.0 31.13 3.55 10.07 149.95 0.71 0.000
[1%=28.2: S%= 2.00]
* CHANNEL[ 2 : 0100] 0302 1 2.0 31.13 3.55 10.10 149.95 n/a 0.000
** CALIB STANDHYD 0105 1 2.0 9.01 1.20 10.00 169.83 0.80 0.000
Page 1
```

Sophia V03.txt

```
* [1%=24.8: S%= 2.00]
** CALIB STANDHYD 0110 1 2.0 12.37 1.50 10.03 157.08 0.74 0.000
[1%=25.4: S%= 2.00]
* CHANNEL[ 2 : 0110] 0303 1 2.0 12.37 1.50 10.07 157.08 n/a 0.000
* ADD [0105 + 0302] 0802 3 2.0 40.14 4.73 10.03 154.41 n/a 0.000
* ADD [0802 + 0303] 0802 1 2.0 52.51 6.23 10.03 155.04 n/a 0.000
* PIPE [ 2 : 0802] 0400 1 2.0 52.51 6.23 10.03 155.04 n/a 0.000
** CALIB STANDHYD 0113 1 2.0 9.41 1.22 10.00 168.94 0.80 0.000
[1%=39.4: S%= 2.00]
* CHANNEL[ 2 : 0113] 0301 1 2.0 9.41 1.21 10.03 168.93 n/a 0.000
** CALIB STANDHYD 0118 1 2.0 4.11 0.49 10.00 150.58 0.71 0.000
[1%=27.5: S%= 2.00]
* RESRVR [ 2 : 0118] 0600 1 2.0 4.11 0.42 10.30 150.66 n/a 0.000
{ST= 0.04 ha.m }
* CHANNEL[ 2 : 0600] 0300 1 2.0 4.11 0.42 10.43 150.64 n/a 0.000
* CALIB STANDHYD 0101 1 2.0 8.68 0.97 10.00 138.40 0.65 0.000
[1%=22.9: S%= 2.00]
* ADD [0101 + 0300] 0801 3 2.0 12.79 1.35 10.03 142.34 n/a 0.000
* CHANNEL[ 2 : 0801] 0304 1 2.0 12.79 1.34 10.07 142.33 n/a 0.000
* CALIB STANDHYD 0123 1 2.0 22.81 2.79 10.07 162.24 0.77 0.000
[1%=27.1: S%= 2.00]
* ADD [0123 + 0301] 0800 3 2.0 32.22 4.00 10.07 164.19 n/a 0.000
* ADD [0800 + 0304] 0800 1 2.0 45.01 5.34 10.07 157.98 n/a 0.000
* ADD [0800 + 0400] 0800 3 2.0 97.52 11.57 10.07 156.40 n/a 0.000
* RESRVR [ 2 : 0800] 0601 1 2.0 97.52 11.45 10.13 156.11 n/a 0.000
{ST= 1.13 ha.m }
* PIPE [ 2 : 0601] 0403 1 2.0 97.52 11.45 10.13 156.11 n/a 0.000
* CHANNEL[ 2 : 0403] 0317 1 2.0 97.52 11.35 10.20 156.11 n/a 0.000
** CALIB STANDHYD 0102 1 2.0 19.41 2.54 10.03 170.86 0.81 0.000
[1%=22.0: S%= 2.00]
* ADD [0102 + 0317] 0803 3 2.0 116.93 13.78 10.17 158.56 n/a 0.000
** CALIB STANDHYD 0103 1 2.0 35.79 4.79 10.03 181.25 0.85 0.000
[1%=37.1: S%= 2.00]
** CALIB STANDHYD 0104 1 2.0 5.22 0.71 10.00 176.22 0.83 0.000
[1%=20.7: S%= 2.00]
** CALIB STANDHYD 0106 1 2.0 13.71 1.74 10.03 164.05 0.77 0.000
[1%=21.1: S%= 2.00]
```

Sophia V03.txt

*	CALIB STANDHYD	0107	1	5.0	8.53	1.16	10.00	173.89	0.82	0.000
*	[I%=18.1: S%= 2.00]									
*	CALIB STANDHYD	0108	1	2.0	58.75	6.54	10.13	150.03	0.71	0.000
*	[I%=24.4: S%= 2.00]									
*	CHANNEL[ 2 : 0108]	0307	1	2.0	58.75	6.53	10.17	150.03	n/a	0.000
*	CALIB STANDHYD	0109	1	2.0	13.70	1.85	10.00	168.87	0.80	0.000
*	[I%= 3.0: S%= 2.00]									
*	ADD [0109 + 0307]	0806	3	2.0	72.45	8.31	10.10	153.59	n/a	0.000
*	CHANNEL[ 2 : 0806]	0308	1	2.0	72.45	8.31	10.13	153.59	n/a	0.000
*	ADD [0107 + 0308]	0807	3	2.0	80.98	9.40	10.10	155.73	n/a	0.000
*	CHANNEL[ 2 : 0807]	0306	1	2.0	80.98	9.40	10.13	155.73	n/a	0.000
*	ADD [0106 + 0306]	0804	3	2.0	94.69	11.12	10.10	156.93	n/a	0.000
*	CHANNEL[ 2 : 0804]	0305	1	2.0	94.69	11.06	10.17	156.93	n/a	0.000
*	ADD [0104 + 0305]	0093	3	2.0	99.91	11.72	10.13	157.94	n/a	0.000
*	ADD [0103 + 0093]	0805	3	2.0	135.70	16.46	10.10	164.09	n/a	0.000
*	CHANNEL[ 2 : 0805]	0312	1	2.0	135.70	16.41	10.13	164.09	n/a	0.000
*	ADD [0312 + 0803]	0094	3	2.0	252.63	30.16	10.17	161.53	n/a	0.000
*	CHANNEL[ 2 : 0094]	0309	1	2.0	252.63	30.17	10.17	161.53	n/a	0.000
**	CALIB STANDHYD	0111	1	2.0	3.57	0.47	10.00	170.75	0.81	0.000
*	[I%=22.2: S%= 2.00]									
*	ADD [0111 + 0309]	0808	3	2.0	256.20	30.61	10.17	161.66	n/a	0.000
*	CHANNEL[ 2 : 0808]	0310	1	2.0	256.20	30.62	10.17	161.66	n/a	0.000
**	CALIB STANDHYD	0112	1	2.0	16.90	2.24	10.03	175.69	0.83	0.000
*	[I%=23.9: S%= 2.00]									
*	ADD [0112 + 0310]	0809	3	2.0	273.10	32.79	10.17	162.52	n/a	0.000
*	CHANNEL[ 2 : 0809]	0311	1	2.0	273.10	32.70	10.20	162.52	n/a	0.000
*	CALIB STANDHYD	0114	1	2.0	4.95	0.67	10.00	173.20	0.82	0.000
*	[I%=17.3: S%= 2.00]									
*	ADD [0114 + 0311]	0810	3	2.0	278.05	33.31	10.20	162.71	n/a	0.000
*	CHANNEL[ 2 : 0810]	0313	1	2.0	278.05	33.32	10.20	162.71	n/a	0.000
*	CALIB STANDHYD	0115	1	2.0	12.66	1.54	10.03	159.21	0.75	0.000
*	[I%=28.8: S%= 2.00]									
*	ADD [0115 + 0313]	0811	3	2.0	290.71	34.80	10.20	162.56	n/a	0.000
*	CHANNEL[ 2 : 0811]	0314	1	2.0	290.71	34.80	10.20	162.56	n/a	0.000
*	CALIB STANDHYD	0116	1	2.0	26.63	3.35	10.03	161.71	0.76	0.000
*	[I%=25.5: S%= 2.00]									

Sophia V03.txt

*	ADD [0116 + 0314]	0812	3	2.0	317.34	37.94	10.20	162.49	n/a	0.000
*	PIPE [ 2 : 0812]	0401	1	2.0	317.34	37.94	10.20	162.49	n/a	0.000
*	CALIB STANDHYD	0117	1	2.0	27.32	2.79	10.03	130.61	0.62	0.000
*	[I%=25.1: S%= 2.00]									
*	ADD [0117 + 0401]	0813	3	2.0	344.66	40.61	10.17	159.96	n/a	0.000
*	CHANNEL[ 2 : 0813]	0315	1	2.0	344.66	40.58	10.20	159.96	n/a	0.000
*	CALIB STANDHYD	0119	1	2.0	16.91	1.85	10.07	141.88	0.67	0.000
*	[I%=26.9: S%= 2.00]									
*	ADD [0119 + 0315]	0814	3	2.0	361.57	42.37	10.20	159.12	n/a	0.000
*	PIPE [ 2 : 0814]	0402	1	2.0	361.57	42.37	10.20	159.12	n/a	0.000
*	CALIB STANDHYD	0120	1	2.0	17.04	1.74	10.03	128.29	0.61	0.000
*	[I%=20.9: S%= 2.00]									
*	CHANNEL[ 2 : 0120]	0316	1	2.0	17.04	1.74	10.07	128.29	n/a	0.000
*	CALIB STANDHYD	0121	1	2.0	1.39	0.13	10.00	107.80	0.51	0.000
*	[I%=14.6: S%= 2.00]									
*	CALIB STANDHYD	0122	1	2.0	3.13	0.33	10.00	129.72	0.61	0.000
*	[I%=26.5: S%= 2.00]									
*	ADD [0121 + 0122]	0815	3	2.0	4.52	0.46	10.00	122.97	n/a	0.000
*	ADD [0815 + 0316]	0815	1	2.0	21.56	2.18	10.03	127.17	n/a	0.000
*	ADD [0815 + 0402]	0815	3	2.0	383.13	44.46	10.20	157.32	n/a	0.000
*	PIPE [ 2 : 0815]	0404	1	2.0	383.13	44.46	10.20	157.32	n/a	0.000
*	CALIB STANDHYD	0124	1	2.0	21.61	2.39	10.00	141.62	0.67	0.000
*	[I%=33.4: S%= 2.00]									
*	ADD [0124 + 0404]	0816	3	2.0	404.74	46.65	10.20	156.48	n/a	0.000
*	DUHYD	0500	1	2.0	404.74	46.65	10.20	156.48	n/a	0.000
*	MAJOR SYSTEM:	0500	2	2.0	376.09	45.78	10.20	156.48	n/a	0.000
*	MI NOR SYSTEM:	0500	3	2.0	28.65	0.87	1.17	156.48	n/a	0.000
*	PIPE [ 2 : 0500]	0405	1	2.0	376.09	45.78	10.20	156.48	n/a	0.000
**	CALIB STANDHYD	0125	1	2.0	18.74	2.22	10.03	158.29	0.75	0.000
*	[I%=44.1: S%= 2.00]									
*	ADD [0125 + 0405]	0817	3	2.0	394.83	47.88	10.17	156.57	n/a	0.000
*	PIPE [ 2 : 0500]	0408	1	2.0	28.65	0.87	1.60	156.48	n/a	0.000
**	CALIB STANDHYD	0126	1	2.0	22.26	2.36	10.00	134.94	0.64	0.000
*	[I%=32.1: S%= 2.00]									
*	ADD [0126 + 0408]	0820	3	2.0	50.91	3.23	10.00	147.06	n/a	0.000
*	PIPE [ 2 : 0820]	0406	1	2.0	50.91	3.23	10.03	147.06	n/a	0.000

Sophia V03.txt

```

** CALI B STANDHYD 0127 1 2.0 9.98 0.99 10.03 125.99 0.59 0.000
[1%=27.4: S%= 2.00]
*
* ADD [0127 + 0406] 0818 3 2.0 60.89 4.21 10.03 143.61 n/a 0.000
*
* PIPE [ 2 : 0818] 0407 1 2.0 60.89 4.21 10.03 143.61 n/a 0.000
*
** CALI B STANDHYD 0128 1 2.0 14.87 1.87 10.00 163.90 0.77 0.000
[1%=45.4: S%= 2.00]
*
* ADD [0128 + 0407] 0819 3 2.0 75.76 6.07 10.03 147.59 n/a 0.000

```

\*\*\*\*\*  
**\*\* SIMULATION NUMBER: 26 \*\* Timmins Storm Event**  
 \*\*\*\*\*

```

W/E COMMAND          HYD ID  DT   AREA   Qpeak Tpeak  R. V.  R. C.  Qbase
                   mi n    ha     cms   hrs   mm    C.

```

START @ 0.00 hrs

```

-----
READ STORM          15.0
[ Ptot=193.00 mm ]
fname :

```

C:\Users\dtwigger\AppData\Local\Temp\d846c32c-cd4c-4d16-a4af-12b9c07c7f74\d4dcf4f1-41c6-4663-b2a3-e1

remark: \* Timmins Storm

```

** CALI B STANDHYD 0100 1 2.0 31.13 2.61 7.03 133.17 0.69 0.000
[1%=28.2: S%= 2.00]
*
* CHANNEL[ 2 : 0100] 0302 1 2.0 31.13 2.61 7.07 133.17 n/a 0.000
*
** CALI B STANDHYD 0105 1 2.0 9.01 0.92 7.00 151.76 0.79 0.000
[1%=24.8: S%= 2.00]
*
** CALI B STANDHYD 0110 1 2.0 12.37 1.12 7.03 139.73 0.72 0.000
[1%=25.4: S%= 2.00]
*
* CHANNEL[ 2 : 0110] 0303 1 2.0 12.37 1.12 7.03 139.73 n/a 0.000
*
* ADD [0105 + 0302] 0802 3 2.0 40.14 3.52 7.03 137.34 n/a 0.000
*
* ADD [0802 + 0303] 0802 1 2.0 52.51 4.63 7.03 137.90 n/a 0.000
*
* PIPE [ 2 : 0802] 0400 1 2.0 52.51 4.63 7.03 137.90 n/a 0.000
*
** CALI B STANDHYD 0113 1 2.0 9.41 0.93 7.00 151.17 0.78 0.000
[1%=39.4: S%= 2.00]
*
* CHANNEL[ 2 : 0113] 0301 1 2.0 9.41 0.93 7.03 151.16 n/a 0.000
*
** CALI B STANDHYD 0118 1 2.0 4.11 0.36 7.00 133.72 0.69 0.000
[1%=27.5: S%= 2.00]
*
* RESRVR [ 2 : 0118] 0600 1 2.0 4.11 0.31 7.17 133.72 n/a 0.000
{ST= 0.02 ha.m }
*
* CHANNEL[ 2 : 0600] 0300 1 2.0 4.11 0.31 7.27 133.69 n/a 0.000
*
** CALI B STANDHYD 0101 1 2.0 8.68 0.70 7.00 122.31 0.63 0.000
[1%=22.9: S%= 2.00]

```

```

*
* ADD [0101 + 0300] 0801 3 2.0 12.79 0.99 7.00 125.97 n/a 0.000
*
* CHANNEL[ 2 : 0801] 0304 1 2.0 12.79 0.98 7.03 125.96 n/a 0.000
*
** CALI B STANDHYD 0123 1 2.0 22.81 2.10 7.03 144.58 0.75 0.000
[1%=27.1: S%= 2.00]
*
* ADD [0123 + 0301] 0800 3 2.0 32.22 3.02 7.03 146.50 n/a 0.000
*
* ADD [0800 + 0304] 0800 1 2.0 45.01 4.01 7.03 140.66 n/a 0.000
*
* ADD [0800 + 0400] 0800 3 2.0 97.52 8.64 7.03 139.18 n/a 0.000
*
* RESRVR [ 2 : 0800] 0601 1 2.0 97.52 8.52 7.10 138.89 n/a 0.000
{ST= 1.03 ha.m }
*
* PIPE [ 2 : 0601] 0403 1 2.0 97.52 8.52 7.10 138.89 n/a 0.000
*
* CHANNEL[ 2 : 0403] 0317 1 2.0 97.52 8.44 7.17 138.89 n/a 0.000
*
** CALI B STANDHYD 0102 1 2.0 19.41 1.94 7.03 152.68 0.79 0.000
[1%=22.0: S%= 2.00]
*
* ADD [0102 + 0317] 0803 3 2.0 116.93 10.28 7.13 141.18 n/a 0.000
*
** CALI B STANDHYD 0103 1 2.0 35.79 3.74 7.00 162.83 0.84 0.000
[1%=37.1: S%= 2.00]
*
** CALI B STANDHYD 0104 1 2.0 5.22 0.55 7.00 157.84 0.82 0.000
[1%=20.7: S%= 2.00]
*
** CALI B STANDHYD 0106 1 2.0 13.71 1.31 7.03 146.22 0.76 0.000
[1%=21.1: S%= 2.00]
*
* CALI B STANDHYD 0107 1 5.0 8.53 0.89 7.00 155.58 0.81 0.000
[1%=18.1: S%= 2.00]
*
* CALI B STANDHYD 0108 1 2.0 58.75 4.78 7.10 133.13 0.69 0.000
[1%=24.4: S%= 2.00]
*
* CHANNEL[ 2 : 0108] 0307 1 2.0 58.75 4.77 7.13 133.13 n/a 0.000
*
* CALI B STANDHYD 0109 1 2.0 13.70 1.42 7.00 150.63 0.78 0.000
[1%= 3.0: S%= 2.00]
*
* ADD [0109 + 0307] 0806 3 2.0 72.45 6.15 7.07 136.44 n/a 0.000
*
* CHANNEL[ 2 : 0806] 0308 1 2.0 72.45 6.15 7.10 136.44 n/a 0.000
*
* ADD [0107 + 0308] 0807 3 2.0 80.98 6.98 7.07 138.45 n/a 0.000
*
* CHANNEL[ 2 : 0807] 0306 1 2.0 80.98 6.97 7.07 138.45 n/a 0.000
*
* ADD [0106 + 0306] 0804 3 2.0 94.69 8.28 7.07 139.58 n/a 0.000
*
* CHANNEL[ 2 : 0804] 0305 1 2.0 94.69 8.22 7.13 139.58 n/a 0.000
*
* ADD [0104 + 0305] 0093 3 2.0 99.91 8.73 7.10 140.53 n/a 0.000
*
* ADD [0103 + 0093] 0805 3 2.0 135.70 12.44 7.07 146.41 n/a 0.000
*
* CHANNEL[ 2 : 0805] 0312 1 2.0 135.70 12.37 7.07 146.41 n/a 0.000

```

Sophi a V03. txt

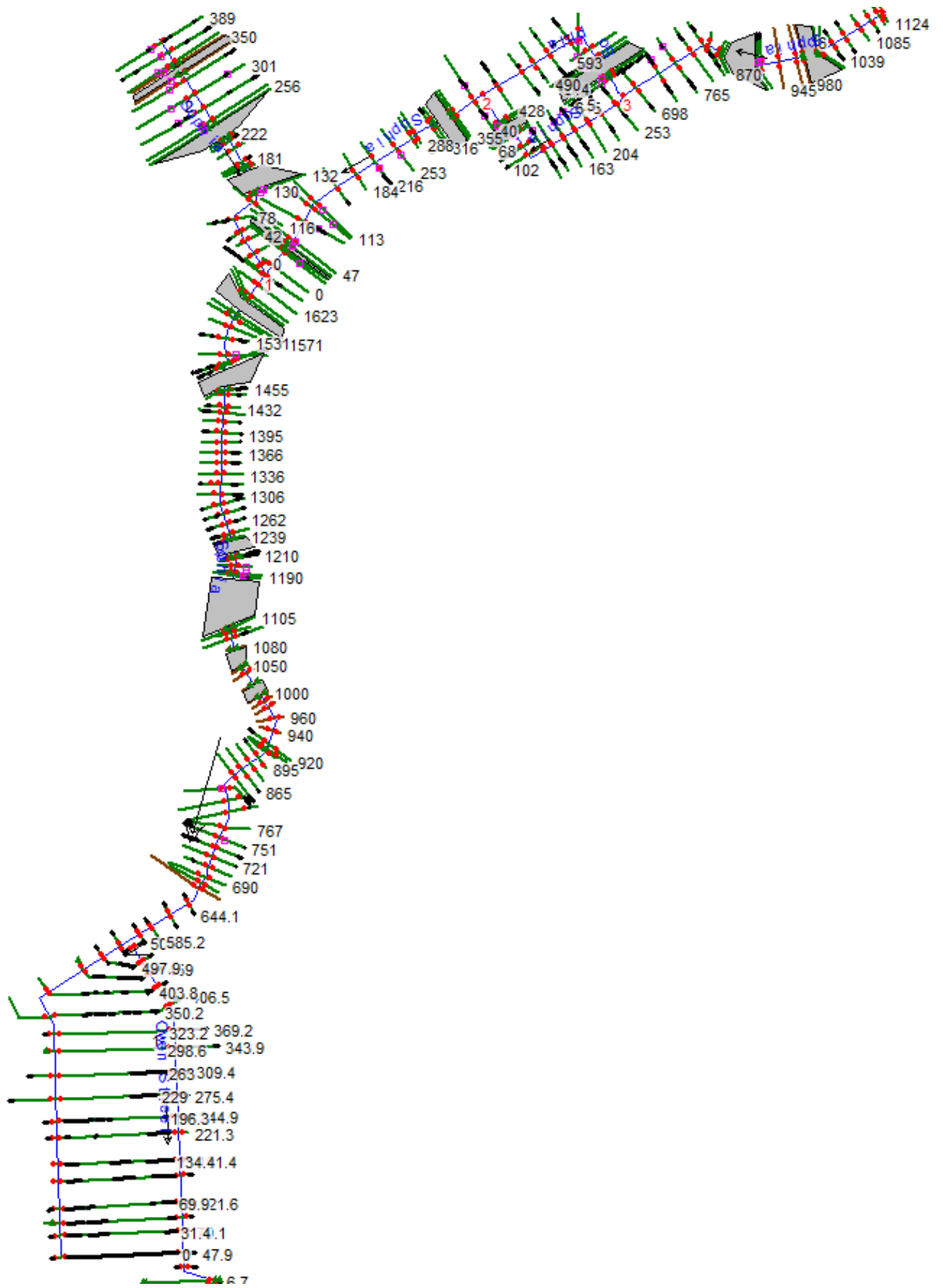
*	ADD [0312 + 0803]	0094	3	2.0	252.63	22.64	7.10	143.99	n/a	0.000
*	CHANNEL[ 2 : 0094]	0309	1	2.0	252.63	22.61	7.10	143.99	n/a	0.000
*	CALI B STANDHYD [I%=22.2: S%= 2.00]	0111	1	2.0	3.57	0.36	7.00	152.60	0.79	0.000
*	ADD [0111 + 0309]	0808	3	2.0	256.20	22.96	7.10	144.11	n/a	0.000
*	CHANNEL[ 2 : 0808]	0310	1	2.0	256.20	22.94	7.10	144.11	n/a	0.000
*	CALI B STANDHYD [I%=23.9: S%= 2.00]	0112	1	2.0	16.90	1.73	7.03	157.36	0.82	0.000
*	ADD [0112 + 0310]	0809	3	2.0	273.10	24.65	7.10	144.93	n/a	0.000
*	CHANNEL[ 2 : 0809]	0311	1	2.0	273.10	24.51	7.17	144.93	n/a	0.000
*	CALI B STANDHYD [I%=17.3: S%= 2.00]	0114	1	2.0	4.95	0.52	7.00	154.90	0.80	0.000
*	ADD [0114 + 0311]	0810	3	2.0	278.05	24.99	7.13	145.11	n/a	0.000
*	CHANNEL[ 2 : 0810]	0313	1	2.0	278.05	24.99	7.13	145.11	n/a	0.000
*	CALI B STANDHYD [I%=28.8: S%= 2.00]	0115	1	2.0	12.66	1.15	7.03	141.82	0.73	0.000
*	ADD [0115 + 0313]	0811	3	2.0	290.71	26.10	7.13	144.96	n/a	0.000
*	CHANNEL[ 2 : 0811]	0314	1	2.0	290.71	26.07	7.13	144.96	n/a	0.000
*	CALI B STANDHYD [I%=25.5: S%= 2.00]	0116	1	2.0	26.63	2.52	7.00	144.08	0.75	0.000
*	ADD [0116 + 0314]	0812	3	2.0	317.34	28.46	7.13	144.89	n/a	0.000
*	PIPE [ 2 : 0812]	0401	1	2.0	317.34	28.47	7.13	144.89	n/a	0.000
*	CALI B STANDHYD [I%=25.1: S%= 2.00]	0117	1	2.0	27.32	1.98	7.03	115.33	0.60	0.000
*	ADD [0117 + 0401]	0813	3	2.0	344.66	30.37	7.13	142.55	n/a	0.000
*	CHANNEL[ 2 : 0813]	0315	1	2.0	344.66	30.28	7.17	142.54	n/a	0.000
*	CALI B STANDHYD [I%=26.9: S%= 2.00]	0119	1	2.0	16.91	1.34	7.03	125.66	0.65	0.000
*	ADD [0119 + 0315]	0814	3	2.0	361.57	31.58	7.13	141.76	n/a	0.000
*	PIPE [ 2 : 0814]	0402	1	2.0	361.57	31.57	7.17	141.76	n/a	0.000
*	CALI B STANDHYD [I%=20.9: S%= 2.00]	0120	1	2.0	17.04	1.23	7.03	113.02	0.59	0.000
*	CHANNEL[ 2 : 0120]	0316	1	2.0	17.04	1.23	7.03	113.02	n/a	0.000
*	CALI B STANDHYD [I%=14.6: S%= 2.00]	0121	1	2.0	1.39	0.09	7.00	94.15	0.49	0.000
*	CALI B STANDHYD	0122	1	2.0	3.13	0.24	7.00	114.59	0.59	0.000

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*	[I%=26.5: S%= 2.00]									
*	ADD [0121 + 0122]	0815	3	2.0	4.52	0.32	7.00	108.30	n/a	0.000
*	ADD [0815 + 0316]	0815	1	2.0	21.56	1.55	7.00	112.03	n/a	0.000
*	ADD [0815 + 0402]	0815	3	2.0	383.13	33.03	7.13	140.08	n/a	0.000
*	PIPE [ 2 : 0815]	0404	1	2.0	383.13	33.01	7.17	140.08	n/a	0.000
*	CALI B STANDHYD [I%=33.4: S%= 2.00]	0124	1	2.0	21.61	1.75	7.00	125.74	0.65	0.000
*	ADD [0124 + 0404]	0816	3	2.0	404.74	34.56	7.13	139.32	n/a	0.000
*	DUHYD	0500	1	2.0	404.74	34.56	7.13	139.32	n/a	0.000
*	MAJOR SYSTEM:	0500	2	2.0	372.02	33.69	7.13	139.32	n/a	0.000
*	MINOR SYSTEM:	0500	3	2.0	32.72	0.87	0.53	139.32	n/a	0.000
*	PIPE [ 2 : 0500]	0405	1	2.0	372.02	33.67	7.13	139.32	n/a	0.000
*	CALI B STANDHYD [I%=44.1: S%= 2.00]	0125	1	2.0	18.74	1.67	7.00	141.43	0.73	0.000
*	ADD [0125 + 0405]	0817	3	2.0	390.76	35.26	7.13	139.42	n/a	0.000
*	PIPE [ 2 : 0500]	0408	1	2.0	32.72	0.87	0.63	139.32	n/a	0.000
*	CALI B STANDHYD [I%=32.1: S%= 2.00]	0126	1	2.0	22.26	1.72	7.00	119.60	0.62	0.000
*	ADD [0126 + 0408]	0820	3	2.0	54.98	2.58	7.00	131.33	n/a	0.000
*	PIPE [ 2 : 0820]	0406	1	2.0	54.98	2.58	7.00	131.33	n/a	0.000
*	CALI B STANDHYD [I%=27.4: S%= 2.00]	0127	1	2.0	9.98	0.70	7.00	111.26	0.58	0.000
*	ADD [0127 + 0406]	0818	3	2.0	64.96	3.28	7.00	128.25	n/a	0.000
*	PIPE [ 2 : 0818]	0407	1	2.0	64.96	3.28	7.03	128.25	n/a	0.000
*	CALI B STANDHYD [I%=45.4: S%= 2.00]	0128	1	2.0	14.87	1.42	7.00	146.66	0.76	0.000
*	ADD [0128 + 0407]	0819	3	2.0	79.83	4.68	7.00	131.68	n/a	0.000

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# Improvement Alternative 3B With Flow Reduction - HEC RAS Results Summary

HEC-RAS Plan: PR04

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Sophia	6	1124	10 YR	4.97	258.50	259.41	259.41	259.67	0.022814	2.26	2.20	4.27	1.01
Sophia	6	1124	25 YR	6.84	258.50	259.56	259.56	259.84	0.021800	2.36	2.89	5.12	1.00
Sophia	6	1124	50 YR	8.35	258.50	259.66	259.66	259.96	0.021475	2.43	3.43	5.86	1.01
Sophia	6	1124	100 YR	9.83	258.50	259.74	259.74	260.06	0.020326	2.52	3.94	6.91	1.00
Sophia	6	1118	10 YR	4.97	258.13	259.22		259.39	0.013835	1.79	2.77	5.05	0.77
Sophia	6	1118	25 YR	6.84	258.13	259.35		259.55	0.015446	1.98	3.46	6.02	0.83
Sophia	6	1118	50 YR	8.35	258.13	259.43	259.35	259.65	0.016448	2.11	3.96	6.58	0.87
Sophia	6	1118	100 YR	9.83	258.13	259.50	259.43	259.75	0.017137	2.21	4.45	7.19	0.90
Sophia	6	1104	10 YR	4.97	258.14	259.07	258.95	259.20	0.012024	1.59	3.13	6.66	0.74
Sophia	6	1104	25 YR	6.84	258.14	259.20	259.07	259.34	0.011404	1.66	4.12	7.94	0.74
Sophia	6	1104	50 YR	8.35	258.14	259.29	259.16	259.44	0.010896	1.71	4.88	8.73	0.73
Sophia	6	1104	100 YR	9.83	258.14	259.38	259.22	259.53	0.010515	1.74	5.64	9.59	0.73
Sophia	6	1085	10 YR	4.97	257.86	258.64	258.64	258.88	0.023331	2.17	2.29	4.85	1.01
Sophia	6	1085	25 YR	6.84	257.86	258.77	258.77	259.04	0.022315	2.31	2.97	5.58	1.01
Sophia	6	1085	50 YR	8.35	257.86	258.86	258.86	259.15	0.021705	2.38	3.50	6.16	1.01
Sophia	6	1085	100 YR	9.83	257.86	258.94	258.94	259.24	0.021206	2.45	4.02	6.70	1.01
Sophia	6	1060	10 YR	4.97	257.20	258.34		258.42	0.005853	1.20	4.16	7.84	0.52
Sophia	6	1060	25 YR	6.84	257.20	258.47		258.56	0.006245	1.32	5.18	8.90	0.55
Sophia	6	1060	50 YR	8.35	257.20	258.54		258.64	0.006764	1.42	5.87	9.60	0.58
Sophia	6	1060	100 YR	9.83	257.20	258.60		258.72	0.007412	1.53	6.47	12.42	0.61
Sophia	6	1039	10 YR	4.97	257.05	258.07		258.22	0.015157	1.73	2.87	6.24	0.82
Sophia	6	1039	25 YR	6.84	257.05	258.24	258.11	258.38	0.011256	1.67	4.36	12.22	0.73
Sophia	6	1039	50 YR	8.35	257.05	258.33	258.22	258.47	0.010064	1.69	5.57	14.94	0.70
Sophia	6	1039	100 YR	9.83	257.05	258.42		258.55	0.008490	1.64	7.05	16.81	0.65
Sophia	6	1017	10 YR	4.97	256.64	257.99		258.04	0.003724	1.05	4.87	11.27	0.43
Sophia	6	1017	25 YR	6.84	256.64	258.19		258.24	0.002653	1.01	7.72	15.88	0.37
Sophia	6	1017	50 YR	8.35	256.64	258.29		258.34	0.002695	1.07	9.31	19.14	0.38
Sophia	6	1017	100 YR	9.83	256.64	258.38		258.43	0.002647	1.10	11.22	23.28	0.38
Sophia	6	1013	10 YR	4.97	256.41	257.62	257.62	257.88	0.028869	2.29	2.18	4.04	0.99
Sophia	6	1013	25 YR	6.84	256.41	257.76	257.76	258.06	0.027548	2.46	2.78	4.93	1.01
Sophia	6	1013	50 YR	8.35	256.41	257.88	257.88	258.17	0.025324	2.38	3.50	6.01	1.00
Sophia	6	1013	100 YR	9.83	256.41	257.98	257.98	258.27	0.023374	2.36	4.20	8.83	0.98
Sophia	6	1000											
Sophia	6	980		Culvert									
Sophia	6	980	10 YR	4.97	255.92	256.63	256.58	256.82	0.014951	1.92	2.59	5.54	0.85
Sophia	6	980	25 YR	6.84	255.92	256.74	256.69	256.98	0.015095	2.18	3.13	6.09	0.88
Sophia	6	980	50 YR	8.35	255.92	256.81	256.77	257.10	0.015435	2.38	3.51	6.48	0.91
Sophia	6	980	100 YR	9.83	255.92	256.88	256.84	257.21	0.015661	2.55	3.85	6.84	0.93
Sophia	6	970	10 YR	4.97	255.75	256.49		256.65	0.013836	1.78	2.80	5.69	0.81
Sophia	6	970	25 YR	6.84	255.75	256.59	256.53	256.80	0.015494	2.01	3.40	6.21	0.87
Sophia	6	970	50 YR	8.35	255.75	256.66	256.61	256.90	0.016430	2.17	3.85	6.57	0.90
Sophia	6	970	100 YR	9.83	255.75	256.74	256.69	257.00	0.016580	2.27	4.33	6.94	0.92
Sophia	6	945	10 YR	4.97	255.37	256.07	256.03	256.26	0.017641	1.94	2.56	5.48	0.91
Sophia	6	945	25 YR	6.84	255.37	256.23		256.42	0.014538	1.97	3.48	6.29	0.84
Sophia	6	945	50 YR	8.35	255.37	256.37		256.55	0.011358	1.89	4.42	7.02	0.76
Sophia	6	945	100 YR	9.83	255.37	256.50		256.67	0.008969	1.81	5.44	7.74	0.69
Sophia	6	920	10 YR	4.97	255.00	255.87	255.86	255.97	0.006998	1.38	3.61	6.42	0.59
Sophia	6	920	25 YR	6.84	255.00	256.11	255.78	256.20	0.004735	1.30	5.28	7.66	0.50
Sophia	6	920	50 YR	8.35	255.00	256.29	255.86	256.37	0.003679	1.24	6.72	8.59	0.45
Sophia	6	920	100 YR	9.83	255.00	256.45	255.94	256.52	0.003030	1.20	8.16	9.43	0.41
Sophia	6	914	10 YR	4.97	254.91	255.85	255.57	255.92	0.005049	1.21	4.10	6.95	0.50
Sophia	6	914	25 YR	6.84	254.91	256.10	255.69	256.16	0.003131	1.15	5.95	8.31	0.42
Sophia	6	914	50 YR	8.35	254.91	256.28	255.78	256.34	0.002338	1.14	7.31	9.30	0.37
Sophia	6	914	100 YR	9.83	254.91	256.44	255.85	256.50	0.001943	1.15	8.53	10.18	0.35
Sophia	6	911											
Sophia	6	815		Culvert									
Sophia	6	815	10 YR	4.97	254.10	255.00		255.19	0.014106	1.95	2.55	4.05	0.79
Sophia	6	815	25 YR	6.84	254.10	255.16		255.38	0.015019	2.10	3.25	4.95	0.83
Sophia	6	815	50 YR	8.35	254.10	255.28		255.51	0.014857	2.15	3.89	5.75	0.83
Sophia	6	815	100 YR	9.83	254.10	255.35	255.26	255.61	0.016070	2.27	4.33	6.31	0.87
Sophia	6	794	10 YR	4.97	253.89	254.85		254.96	0.007538	1.46	3.41	5.53	0.59
Sophia	6	794	25 YR	6.84	253.89	255.01		255.13	0.008034	1.58	4.33	6.58	0.62
Sophia	6	794	50 YR	8.35	253.89	255.11		255.25	0.008787	1.63	5.11	8.05	0.65
Sophia	6	794	100 YR	9.83	253.89	255.17		255.33	0.009461	1.75	5.66	10.52	0.68
Sophia	6	765	10 YR	4.97	253.95	254.61	254.49	254.72	0.009160	1.46	3.40	6.70	0.65
Sophia	6	765	25 YR	6.84	253.95	254.76	254.58	254.88	0.009680	1.48	4.63	9.51	0.68
Sophia	6	765	50 YR	8.35	253.95	254.88	254.68	254.98	0.009495	1.40	5.94	13.13	0.67

## HEC-RAS Plan: PR04 (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Sophia	6	765	100 YR	9.83	253.95	254.96	254.75	255.06	0.008375	1.39	7.09	14.55	0.63
Sophia	6	737	10 YR	4.97	253.59	254.47	254.15	254.53	0.004640	1.10	4.51	8.12	0.47
Sophia	6	737	25 YR	6.84	253.59	254.59	254.25	254.67	0.005354	1.23	5.59	9.65	0.51
Sophia	6	737	50 YR	8.35	253.59	254.69	254.35	254.77	0.005746	1.26	6.60	11.57	0.53
Sophia	6	737	100 YR	9.83	253.59	254.76	254.44	254.85	0.006506	1.30	7.56	14.04	0.57
Sophia	6	698	10 YR	9.11	252.92	254.14		254.25	0.009434	1.48	6.25	15.20	0.67
Sophia	6	698	25 YR	12.34	252.92	254.27		254.39	0.008487	1.55	8.44	18.60	0.65
Sophia	6	698	50 YR	15.21	252.92	254.36		254.48	0.008213	1.61	10.23	21.56	0.65
Sophia	6	698	100 YR	17.77	252.92	254.42		254.56	0.007755	1.67	11.84	28.43	0.64
Sophia	4	645	10 YR	6.99	252.48	253.80	253.35	253.89	0.004419	1.30	5.35	6.84	0.47
Sophia	4	645	25 YR	8.35	252.48	253.94	253.44	254.03	0.004557	1.31	6.40	8.51	0.48
Sophia	4	645	50 YR	9.48	252.48	254.03	253.52	254.12	0.005010	1.32	7.17	10.22	0.50
Sophia	4	645	100 YR	10.68	252.48	254.10	253.59	254.19	0.005362	1.34	7.97	11.83	0.52
Sophia	4	639	10 YR	6.99	252.37	253.58	253.48	253.80	0.016989	2.09	3.34	5.19	0.83
Sophia	4	639	25 YR	8.35	252.37	253.79	253.58	253.97	0.009741	1.86	4.50	6.77	0.66
Sophia	4	639	50 YR	9.48	252.37	253.84	253.65	254.04	0.010294	1.99	4.77	7.23	0.69
Sophia	4	639	100 YR	10.68	252.37	253.74	253.70	254.07	0.019257	2.51	4.25	6.42	0.92
Sophia	4	625		Culvert									
Sophia	4	614	10 YR	6.99	252.27	253.46	253.34	253.71	0.015032	2.23	3.13	6.33	0.79
Sophia	4	614	25 YR	8.35	252.27	253.54	253.43	253.84	0.015620	2.43	3.44	7.01	0.82
Sophia	4	614	50 YR	9.48	252.27	253.68	253.50	253.85	0.014211	1.85	5.11	9.15	0.79
Sophia	4	614	100 YR	10.68	252.27	253.76	253.57	253.93	0.012394	1.79	6.04	12.62	0.75
Sophia	4	608	10 YR	6.99	252.19	253.46	253.16	253.58	0.009528	1.52	4.60	8.75	0.65
Sophia	4	608	25 YR	8.35	252.19	253.57	253.27	253.68	0.007777	1.49	5.79	11.78	0.60
Sophia	4	608	50 YR	9.48	252.19	253.66	253.36	253.76	0.007025	1.46	6.87	13.52	0.58
Sophia	4	608	100 YR	10.68	252.19	253.75	253.46	253.84	0.006629	1.41	8.20	16.66	0.57
Sophia	4	593	10 YR	6.99	252.19	253.26	252.99	253.42	0.010380	1.81	3.87	5.37	0.68
Sophia	4	593	25 YR	8.35	252.19	253.37	253.10	253.54	0.010502	1.85	4.51	6.21	0.69
Sophia	4	593	50 YR	9.48	252.19	253.45	253.20	253.63	0.010489	1.88	5.03	6.82	0.70
Sophia	4	593	100 YR	10.68	252.19	253.52	253.28	253.71	0.010535	1.92	5.56	7.41	0.71
Sophia	4	567	10 YR	6.99	251.95	253.14	252.68	253.22	0.004690	1.28	5.45	7.31	0.47
Sophia	4	567	25 YR	8.35	251.95	253.25	252.76	253.34	0.004654	1.32	6.33	8.17	0.48
Sophia	4	567	50 YR	9.48	251.95	253.34	252.83	253.43	0.004642	1.35	7.02	8.80	0.48
Sophia	4	567	100 YR	10.68	251.95	253.41	252.92	253.51	0.004670	1.39	7.71	9.38	0.49
Sophia	4	550	10 YR	6.99	252.04	252.89		253.09	0.012059	1.98	3.53	4.82	0.74
Sophia	4	550	25 YR	8.35	252.04	252.97		253.20	0.013929	2.11	3.96	5.57	0.80
Sophia	4	550	50 YR	9.48	252.04	253.04		253.28	0.015095	2.18	4.35	6.28	0.84
Sophia	4	550	100 YR	10.68	252.04	253.10	252.99	253.36	0.015879	2.24	4.76	6.93	0.86
Sophia	4	515	10 YR	6.99	251.71	252.89		252.93	0.001506	0.85	8.35	14.58	0.29
Sophia	4	515	25 YR	8.35	251.71	252.98		253.02	0.001614	0.92	9.81	18.60	0.30
Sophia	4	515	50 YR	9.48	251.71	253.05		253.09	0.001654	0.95	11.19	20.86	0.31
Sophia	4	515	100 YR	10.68	251.71	253.11		253.16	0.001700	0.99	12.62	22.04	0.31
Sophia	4	490	10 YR	6.99	251.68	252.82		252.87	0.003323	0.97	7.24	14.03	0.40
Sophia	4	490	25 YR	8.35	251.68	252.92		252.97	0.002858	0.99	8.87	19.96	0.38
Sophia	4	490	50 YR	9.48	251.68	252.99		253.04	0.002513	0.99	10.62	25.95	0.37
Sophia	4	490	100 YR	10.68	251.68	253.06		253.11	0.002249	1.00	12.55	29.85	0.35
Sophia	4	469	10 YR	6.99	251.62	252.67		252.77	0.007205	1.39	5.67	13.46	0.59
Sophia	4	469	25 YR	8.35	251.62	252.80		252.88	0.005613	1.27	7.84	19.99	0.53
Sophia	4	469	50 YR	9.48	251.62	252.91		252.97	0.003915	1.19	10.11	24.49	0.45
Sophia	4	469	100 YR	10.68	251.62	253.00		253.05	0.003019	1.13	12.85	34.86	0.40
Sophia	4	428	10 YR	6.99	251.38	252.56		252.60	0.002234	0.89	8.17	17.12	0.34
Sophia	4	428	25 YR	8.35	251.38	252.73		252.76	0.001409	0.82	11.78	24.36	0.28
Sophia	4	428	50 YR	9.48	251.38	252.86		252.89	0.001035	0.77	15.35	34.64	0.25
Sophia	4	428	100 YR	10.68	251.38	252.96		252.98	0.000876	0.75	19.16	40.95	0.23
Sophia	2	389	10 YR	4.54	252.90	253.44	253.36	253.56	0.012225	1.52	2.99	7.14	0.75
Sophia	2	389	25 YR	8.08	252.90	253.64	253.54	253.80	0.012136	1.79	4.50	8.32	0.78
Sophia	2	389	50 YR	11.21	252.90	253.79	253.67	253.98	0.011531	1.93	5.80	9.21	0.78
Sophia	2	389	100 YR	14.49	252.90	253.99	253.78	254.16	0.008518	1.86	7.79	10.43	0.69
Sophia	2	372	10 YR	4.54	252.69	253.25	253.15	253.36	0.010845	1.46	3.11	7.25	0.71
Sophia	2	372	25 YR	8.08	252.69	253.44	253.32	253.60	0.011379	1.75	4.61	8.40	0.76
Sophia	2	372	50 YR	11.21	252.69	253.63	253.46	253.79	0.009126	1.78	6.31	9.50	0.70
Sophia	2	372	100 YR	14.49	252.69	253.91	253.58	254.03	0.005433	1.58	9.18	11.20	0.56
Sophia	2	356	10 YR	4.54	252.47	252.93	252.93	253.11	0.021860	1.86	2.44	6.67	0.98
Sophia	2	356	25 YR	8.08	252.47	253.12	253.11	253.35	0.019797	2.14	3.78	7.79	0.98
Sophia	2	356	50 YR	11.21	252.47	253.56	253.24	253.67	0.005057	1.43	7.82	10.44	0.53

HEC-RAS Plan: PR04 (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Sophia	2	356	100 YR	14.49	252.47	253.87	253.36	253.96	0.003001	1.27	11.39	12.64	0.42
Sophia	2	350	10 YR	4.54	251.65	252.70	252.13	252.73	0.001282	0.73	6.23	7.97	0.26
Sophia	2	350	25 YR	8.08	251.65	253.20	252.33	253.23	0.000901	0.75	10.73	9.92	0.23
Sophia	2	350	50 YR	11.21	251.65	253.59	252.47	253.62	0.000714	0.76	14.85	11.42	0.21
Sophia	2	350	100 YR	14.49	251.65	253.89	252.60	253.92	0.000620	0.79	18.58	13.81	0.20
Sophia	2	344		Culvert									
Sophia	2	335	10 YR	4.54	251.52	252.07	252.00	252.21	0.013043	1.64	2.77	6.10	0.78
Sophia	2	335	25 YR	8.08	251.52	252.30	252.19	252.48	0.012192	1.91	4.23	6.99	0.78
Sophia	2	335	50 YR	11.21	251.52	252.59	252.34	252.74	0.007241	1.75	6.42	8.14	0.63
Sophia	2	335	100 YR	14.49	251.52	252.82	252.46	252.97	0.005667	1.72	8.44	9.07	0.57
Sophia	2	325	10 YR	4.54	251.36	251.96	251.86	252.08	0.011255	1.56	2.91	6.17	0.73
Sophia	2	325	25 YR	8.08	251.36	252.10	252.06	252.33	0.016704	2.13	3.80	6.77	0.91
Sophia	2	325	50 YR	11.21	251.36	252.54	252.20	252.66	0.005269	1.54	7.26	8.74	0.54
Sophia	2	325	100 YR	14.49	251.36	252.79	252.33	252.91	0.004145	1.52	9.55	9.82	0.49
Sophia	2	301	10 YR	4.54	250.98	251.50	251.50	251.70	0.023096	1.99	2.28	5.85	1.02
Sophia	2	301	25 YR	8.08	250.98	251.92	251.70	252.04	0.007312	1.55	5.23	8.17	0.62
Sophia	2	301	50 YR	11.21	250.98	252.52	251.84	252.57	0.001772	1.00	11.20	11.52	0.32
Sophia	2	301	100 YR	14.49	250.98	252.78	251.96	252.83	0.001492	1.01	14.33	13.07	0.30
Sophia	2	277	10 YR	4.54	250.50	251.36	251.09	251.42	0.004724	1.14	3.98	7.07	0.49
Sophia	2	277	25 YR	8.08	250.50	251.89	251.30	251.94	0.001893	0.94	8.56	10.09	0.33
Sophia	2	277	50 YR	11.21	250.50	252.52	251.44	252.54	0.000681	0.70	15.98	13.64	0.21
Sophia	2	277	100 YR	14.49	250.50	252.77	251.57	252.80	0.000651	0.74	19.85	19.36	0.21
Sophia	2	256	10 YR	4.54	250.25	251.35	250.76	251.37	0.001133	0.66	6.89	9.57	0.25
Sophia	2	256	25 YR	8.08	250.25	251.89	250.96	251.91	0.000650	0.62	12.94	12.82	0.20
Sophia	2	256	50 YR	11.21	250.25	252.52	251.10	252.53	0.000293	0.51	22.20	16.59	0.14
Sophia	2	256	100 YR	14.49	250.25	252.77	251.22	252.79	0.000275	0.55	26.64	17.81	0.14
Sophia	2	248	10 YR	4.54	250.15	251.34	250.67	251.36	0.000801	0.58	7.82	10.14	0.21
Sophia	2	248	25 YR	8.08	250.15	251.88	250.86	251.90	0.000481	0.57	14.15	13.40	0.17
Sophia	2	248	50 YR	11.21	250.15	252.51	251.00	252.53	0.000235	0.47	23.86	17.09	0.13
Sophia	2	248	100 YR	14.49	250.15	252.77	251.12	252.79	0.000224	0.51	28.43	18.60	0.13
Sophia	2	241		Culvert									
Sophia	2	222	10 YR	4.54	250.02	251.21	250.60	251.23	0.001097	0.66	6.91	9.37	0.24
Sophia	2	222	25 YR	8.08	250.02	251.62	250.80	251.65	0.000905	0.72	11.30	11.86	0.23
Sophia	2	222	50 YR	11.21	250.02	252.03	250.94	252.05	0.000619	0.67	17.93	26.69	0.20
Sophia	2	222	100 YR	14.49	250.02	252.38	251.08	252.40	0.000396	0.60	29.33	35.42	0.16
Sophia	2	217	10 YR	4.54	250.00	251.21		251.22	0.000674	0.54	8.36	10.54	0.19
Sophia	2	217	25 YR	8.08	250.00	251.62		251.64	0.000613	0.61	13.26	13.03	0.19
Sophia	2	217	50 YR	11.21	250.00	252.03		252.05	0.000434	0.58	20.55	27.15	0.17
Sophia	2	217	100 YR	14.49	250.00	252.38		252.39	0.000298	0.54	32.03	35.79	0.14
Sophia	2	203	10 YR	4.54	249.92	251.20		251.21	0.000851	0.60	7.58	9.77	0.22
Sophia	2	203	25 YR	8.08	249.92	251.61		251.63	0.000758	0.66	12.16	12.27	0.21
Sophia	2	203	50 YR	11.21	249.92	252.02		252.04	0.000508	0.62	19.97	27.62	0.18
Sophia	2	203	100 YR	14.49	249.92	252.37		252.39	0.000331	0.56	31.68	35.97	0.15
Sophia	2	181	10 YR	4.54	249.81	251.18		251.20	0.000618	0.53	8.54	10.34	0.19
Sophia	2	181	25 YR	8.08	249.81	251.60		251.62	0.000588	0.60	13.37	12.84	0.19
Sophia	2	181	50 YR	11.21	249.81	252.01		252.03	0.000427	0.58	19.78	25.00	0.17
Sophia	2	181	100 YR	14.49	249.81	252.37		252.38	0.000303	0.55	31.32	39.46	0.14
Sophia	2	174	10 YR	4.54	249.78	251.18		251.19	0.000458	0.47	9.58	11.04	0.16
Sophia	2	174	25 YR	8.08	249.78	251.60		251.61	0.000458	0.55	14.71	13.55	0.17
Sophia	2	174	50 YR	11.21	249.78	252.01		252.03	0.000345	0.54	21.25	25.21	0.15
Sophia	2	174	100 YR	14.49	249.78	252.37		252.38	0.000255	0.52	32.61	40.27	0.13
Sophia	2	170	10 YR	5.33	249.76	251.13	250.45	251.18	0.002405	0.97	5.51	6.37	0.33
Sophia	2	170	25 YR	9.00	249.76	251.54	250.75	251.60	0.002189	1.06	8.47	8.18	0.33
Sophia	2	170	50 YR	11.97	249.76	251.96	250.94	252.01	0.001258	0.99	12.06	10.99	0.27
Sophia	2	170	100 YR	15.35	249.76	252.34	251.10	252.37	0.001002	0.83	22.41	40.02	0.24
Sophia	2	142		Culvert									
Sophia	2	132	10 YR	5.33	249.68	251.02	250.56	251.08	0.002618	1.03	5.19	6.94	0.37
Sophia	2	132	25 YR	9.00	249.68	251.24	250.79	251.34	0.003546	1.34	6.71	8.03	0.44
Sophia	2	132	50 YR	11.97	249.68	251.39	250.93	251.51	0.004147	1.54	7.76	8.74	0.49
Sophia	2	132	100 YR	15.35	249.68	251.51	251.06	251.67	0.004784	1.75	8.78	9.69	0.53
Sophia	2	130	10 YR	5.33	249.67	251.01	250.50	251.07	0.002998	1.07	5.00	6.33	0.38
Sophia	2	130	25 YR	9.00	249.67	251.23	250.75	251.33	0.004263	1.40	6.45	7.08	0.47
Sophia	2	130	50 YR	11.97	249.67	251.37	250.92	251.50	0.005046	1.60	7.46	7.54	0.51
Sophia	2	130	100 YR	15.35	249.67	251.49	251.07	251.66	0.006000	1.83	8.40	7.94	0.57

HEC-RAS Plan: PR04 (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Sophia	2	116	10 YR	5.33	249.64	250.99		251.03	0.002029	0.87	6.12	8.49	0.33
Sophia	2	116	25 YR	9.00	249.64	251.21		251.27	0.002636	1.12	8.22	13.90	0.38
Sophia	2	116	50 YR	11.97	249.64	251.36		251.43	0.002676	1.22	11.69	31.11	0.39
Sophia	2	116	100 YR	15.35	249.64	251.50		251.58	0.002488	1.27	17.36	48.23	0.38
Sophia	2	78	10 YR	5.33	249.56	250.94		250.97	0.001185	0.72	7.49	10.90	0.26
Sophia	2	78	25 YR	9.00	249.56	251.14		251.19	0.001628	0.97	9.90	13.33	0.31
Sophia	2	78	50 YR	11.97	249.56	251.28		251.34	0.001831	1.11	11.91	15.07	0.33
Sophia	2	78	100 YR	15.35	249.56	251.42		251.49	0.002036	1.25	14.03	16.71	0.35
Sophia	2	57	10 YR	5.33	249.52	250.90		250.94	0.001502	0.84	6.35	7.50	0.29
Sophia	2	57	25 YR	9.00	249.52	251.07		251.14	0.002446	1.19	7.62	7.67	0.37
Sophia	2	57	50 YR	11.97	249.52	251.19		251.29	0.003106	1.43	8.51	7.79	0.42
Sophia	2	57	100 YR	15.35	249.52	251.28		251.43	0.003954	1.68	9.26	7.88	0.48
Sophia	2	42	10 YR	5.33	249.49	250.90		250.92	0.000633	0.61	8.93	9.34	0.19
Sophia	2	42	25 YR	9.00	249.49	251.07		251.11	0.001105	0.88	10.53	9.61	0.26
Sophia	2	42	50 YR	11.97	249.49	251.19		251.25	0.001444	1.06	11.67	9.80	0.30
Sophia	2	42	100 YR	15.35	249.49	251.29		251.37	0.001871	1.26	12.66	9.96	0.34
Sophia	2	20	10 YR	5.33	249.45	250.84		250.89	0.002717	0.98	5.45	7.87	0.37
Sophia	2	20	25 YR	9.00	249.45	250.96		251.06	0.004946	1.41	6.43	9.24	0.51
Sophia	2	20	50 YR	11.97	249.45	251.03		251.18	0.006570	1.71	7.12	10.19	0.60
Sophia	2	20	100 YR	15.35	249.45	251.02		251.27	0.011223	2.22	7.02	10.06	0.78
Sophia	2	0	10 YR	5.33	249.41	250.84		250.86	0.000676	0.67	9.70	17.71	0.21
Sophia	2	0	25 YR	9.00	249.41	250.95		251.00	0.001280	0.98	11.93	21.40	0.29
Sophia	2	0	50 YR	11.97	249.41	251.03		251.09	0.001726	1.19	13.57	22.23	0.34
Sophia	2	0	100 YR	15.35	249.41	251.01		251.12	0.003003	1.55	13.21	22.03	0.45
Sophia	5	253	10 YR	2.12	253.44	253.86		253.90	0.006519	1.02	3.51	21.79	0.54
Sophia	5	253	25 YR	3.97	253.44	254.02		254.04	0.003498	0.95	7.36	26.27	0.42
Sophia	5	253	50 YR	5.73	253.44	254.10		254.13	0.003366	1.04	9.76	28.45	0.42
Sophia	5	253	100 YR	7.10	253.44	254.16		254.19	0.003316	1.09	11.41	29.32	0.43
Sophia	5	227	10 YR	2.12	253.32	253.80		253.81	0.001843	0.59	5.65	24.04	0.29
Sophia	5	227	25 YR	3.97	253.32	253.98		253.99	0.001181	0.60	10.87	30.16	0.25
Sophia	5	227	50 YR	5.73	253.32	254.06		254.08	0.001332	0.70	13.43	30.72	0.27
Sophia	5	227	100 YR	7.10	253.32	254.12		254.13	0.001440	0.77	15.13	31.15	0.29
Sophia	5	204	10 YR	2.12	253.17	253.78		253.79	0.000466	0.37	8.80	26.37	0.16
Sophia	5	204	25 YR	3.97	253.17	253.97		253.97	0.000467	0.44	13.94	29.41	0.16
Sophia	5	204	50 YR	5.73	253.17	254.05		254.06	0.000626	0.55	16.35	30.53	0.19
Sophia	5	204	100 YR	7.10	253.17	254.10		254.11	0.000729	0.62	17.96	30.74	0.21
Sophia	5	182	10 YR	2.12	253.11	253.77	253.49	253.77	0.000670	0.44	8.24	25.18	0.19
Sophia	5	182	25 YR	3.97	253.11	253.95	253.59	253.96	0.000643	0.52	13.36	30.00	0.19
Sophia	5	182	50 YR	5.73	253.11	254.03	253.63	254.04	0.000776	0.61	16.67	32.92	0.21
Sophia	5	182	100 YR	7.10	253.11	254.08	253.68	254.09	0.000899	0.68	18.32	33.11	0.23
Sophia	5	163	10 YR	2.12	252.93	253.75	253.34	253.76	0.000686	0.52	6.61	22.01	0.20
Sophia	5	163	25 YR	3.97	252.93	253.93	253.51	253.95	0.000751	0.63	11.59	32.17	0.21
Sophia	5	163	50 YR	5.73	252.93	254.01	253.59	254.03	0.000749	0.66	17.58	44.41	0.22
Sophia	5	163	100 YR	7.10	252.93	254.06	253.70	254.08	0.000849	0.73	19.72	44.57	0.23
Sophia	5	143	10 YR	2.12	253.02	253.53	253.53	253.70	0.019217	1.90	1.26	4.28	0.94
Sophia	5	143	25 YR	3.97	253.02	253.79	253.79	253.90	0.008308	1.72	4.25	21.57	0.67
Sophia	5	143	50 YR	5.73	253.02	253.86	253.86	253.98	0.008749	1.89	6.16	31.97	0.70
Sophia	5	143	100 YR	7.10	253.02	253.91	253.91	254.03	0.008573	1.96	7.99	39.82	0.70
Sophia	5	130	10 YR	2.12	252.78	253.27	253.27	253.43	0.021443	1.77	1.26	4.59	0.96
Sophia	5	130	25 YR	3.97	252.78	253.46	253.46	253.65	0.016142	2.04	2.31	8.34	0.89
Sophia	5	130	50 YR	5.73	252.78	253.65	253.65	253.77	0.007785	1.75	5.76	24.68	0.65
Sophia	5	130	100 YR	7.10	252.78	253.69	253.69	253.83	0.008553	1.90	6.79	25.66	0.69
Sophia	5	102	10 YR	2.12	252.20	252.63		252.66	0.004317	0.81	2.62	7.38	0.44
Sophia	5	102	25 YR	3.97	252.20	252.89		252.92	0.002734	0.84	4.72	8.93	0.37
Sophia	5	102	50 YR	5.73	252.20	253.14		253.17	0.001744	0.80	7.19	10.46	0.31
Sophia	5	102	100 YR	7.10	252.20	253.27		253.30	0.001658	0.83	8.53	11.20	0.30
Sophia	5	87	10 YR	2.12	251.90	252.63		252.63	0.000665	0.43	4.99	9.05	0.18
Sophia	5	87	25 YR	3.97	251.90	252.88		252.90	0.000731	0.53	7.52	10.60	0.20
Sophia	5	87	50 YR	5.73	251.90	253.14		253.15	0.000618	0.55	10.43	12.13	0.19
Sophia	5	87	100 YR	7.10	251.90	253.26		253.28	0.000646	0.59	11.98	12.88	0.20
Sophia	5	68	10 YR	2.12	251.80	252.61	252.09	252.62	0.000572	0.41	5.17	8.79	0.17
Sophia	5	68	25 YR	3.97	251.80	252.87	252.22	252.88	0.000682	0.52	7.61	10.32	0.19
Sophia	5	68	50 YR	5.73	251.80	253.13	252.32	253.14	0.000595	0.55	10.47	11.87	0.19
Sophia	5	68	100 YR	7.10	251.80	253.25	252.40	253.27	0.000632	0.59	11.98	12.61	0.19
Sophia	5	64	10 YR	2.12	251.78	252.61	252.08	252.62	0.000543	0.43	4.92	8.52	0.17

HEC-RAS Plan: PR04 (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Sophia	5	64	25 YR	3.97	251.78	252.86	252.22	252.88	0.000642	0.58	6.81	10.03	0.20
Sophia	5	64	50 YR	5.73	251.78	253.11	252.33	253.14	0.000592	0.66	8.70	11.55	0.20
Sophia	5	64	100 YR	7.10	251.78	253.25	252.40	253.27	0.000675	0.61	11.65	12.34	0.20
Sophia	5	57		Culvert									
Sophia	5	40	10 YR	2.12	251.67	252.58	251.93	252.59	0.000237	0.31	6.78	10.33	0.12
Sophia	5	40	25 YR	3.97	251.67	252.76	252.05	252.78	0.000402	0.47	8.41	11.41	0.16
Sophia	5	40	50 YR	5.73	251.67	252.90	252.14	252.91	0.000542	0.60	9.60	12.20	0.18
Sophia	5	40	100 YR	7.10	251.67	253.00	252.21	253.02	0.000616	0.68	10.50	12.80	0.20
Sophia	5	37	10 YR	2.12	251.65	252.58		252.59	0.000256	0.30	7.00	10.31	0.12
Sophia	5	37	25 YR	3.97	251.65	252.76		252.77	0.000449	0.44	8.97	11.40	0.16
Sophia	5	37	50 YR	5.73	251.65	252.89		252.91	0.000603	0.54	10.52	12.19	0.19
Sophia	5	37	100 YR	7.10	251.65	252.99		253.01	0.000679	0.60	11.77	12.79	0.20
Sophia	3	389	10 YR	9.27	251.35	252.46	251.95	252.51	0.002109	0.97	9.54	11.91	0.35
Sophia	3	389	25 YR	12.53	251.35	252.63	252.07	252.69	0.002081	1.08	11.82	16.82	0.35
Sophia	3	389	50 YR	15.39	251.35	252.76	252.16	252.82	0.002043	1.16	14.23	21.81	0.36
Sophia	3	389	100 YR	17.95	251.35	252.85	252.24	252.92	0.002045	1.23	16.45	26.49	0.36
Sophia	3	355	10 YR	9.27	251.20	252.05	252.05	252.33	0.020542	2.34	3.96	7.21	1.01
Sophia	3	355	25 YR	12.53	251.20	252.19	252.19	252.50	0.019682	2.50	5.02	8.05	1.01
Sophia	3	355	50 YR	15.39	251.20	252.29	252.29	252.64	0.019183	2.61	5.90	8.68	1.01
Sophia	3	355	100 YR	17.95	251.20	252.43	252.38	252.75	0.015454	2.50	7.17	9.52	0.92
Sophia	3	350	10 YR	9.27	251.12	251.92	251.81	252.08	0.011260	1.81	5.11	8.81	0.76
Sophia	3	350	25 YR	12.53	251.12	252.15	251.93	252.30	0.007245	1.71	7.34	10.22	0.63
Sophia	3	350	50 YR	15.39	251.12	252.33	252.02	252.48	0.005619	1.68	9.16	11.29	0.57
Sophia	3	350	100 YR	17.95	251.12	252.48	252.10	252.62	0.004581	1.68	10.71	12.18	0.53
Sophia	3	340		Culvert									
Sophia	3	321	10 YR	9.27	250.78	251.81	251.49	251.89	0.003866	1.26	7.37	10.62	0.46
Sophia	3	321	25 YR	12.53	250.78	251.96	251.60	252.06	0.004050	1.42	8.80	11.19	0.48
Sophia	3	321	50 YR	15.39	250.78	252.06	251.68	252.18	0.004324	1.56	9.84	11.69	0.51
Sophia	3	321	100 YR	17.95	250.78	252.14	251.76	252.28	0.004647	1.69	10.65	12.16	0.53
Sophia	3	316	10 YR	9.27	250.77	251.76		251.86	0.005655	1.41	6.59	9.87	0.55
Sophia	3	316	25 YR	12.53	250.77	251.91		252.03	0.005918	1.55	8.09	10.85	0.57
Sophia	3	316	50 YR	15.39	250.77	252.01		252.15	0.006211	1.66	9.27	11.60	0.59
Sophia	3	316	100 YR	17.95	250.77	252.09		252.25	0.006459	1.75	10.25	12.18	0.61
Sophia	3	288	10 YR	9.27	250.53	251.65		251.72	0.004037	1.23	7.52	10.68	0.47
Sophia	3	288	25 YR	12.53	250.53	251.78		251.88	0.004324	1.39	9.03	11.23	0.49
Sophia	3	288	50 YR	15.39	250.53	251.88		252.00	0.004629	1.52	10.32	16.95	0.52
Sophia	3	288	100 YR	17.95	250.53	251.96		252.09	0.004845	1.61	11.74	21.16	0.54
Sophia	3	281	10 YR	9.27	250.62	251.61		251.69	0.004470	1.27	7.29	10.73	0.49
Sophia	3	281	25 YR	12.53	250.62	251.75		251.85	0.004952	1.42	8.85	11.93	0.53
Sophia	3	281	50 YR	15.39	250.62	251.84		251.96	0.005279	1.54	10.00	12.46	0.55
Sophia	3	281	100 YR	17.95	250.62	251.92		252.05	0.005623	1.64	10.93	12.94	0.57
Sophia	3	253	10 YR	9.27	250.23	251.54	251.01	251.59	0.002698	1.02	9.08	12.67	0.38
Sophia	3	253	25 YR	12.53	250.23	251.66	251.16	251.73	0.003170	1.17	10.73	13.77	0.42
Sophia	3	253	50 YR	15.39	250.23	251.75	251.26	251.84	0.003431	1.29	11.97	14.05	0.44
Sophia	3	253	100 YR	17.95	250.23	251.82	251.35	251.92	0.003679	1.39	12.93	15.11	0.46
Sophia	3	216	10 YR	9.27	250.17	251.47	250.90	251.51	0.001758	0.79	11.78	17.85	0.31
Sophia	3	216	25 YR	12.53	250.17	251.59	251.02	251.64	0.001943	0.90	13.98	18.74	0.33
Sophia	3	216	50 YR	15.39	250.17	251.68	251.11	251.73	0.002082	0.99	15.61	19.31	0.35
Sophia	3	216	100 YR	17.95	250.17	251.75	251.19	251.80	0.002162	1.05	17.91	31.95	0.36
Sophia	3	184	10 YR	9.27	250.02	251.43		251.46	0.001185	0.79	11.86	17.46	0.26
Sophia	3	184	25 YR	12.53	250.02	251.54		251.58	0.001466	0.94	14.17	24.84	0.30
Sophia	3	184	50 YR	15.39	250.02	251.61		251.67	0.001679	1.06	16.23	27.92	0.32
Sophia	3	184	100 YR	17.95	250.02	251.67		251.74	0.001864	1.15	17.98	31.03	0.34
Sophia	3	151	10 YR	9.27	250.08	251.37		251.41	0.002083	0.89	10.44	14.87	0.34
Sophia	3	151	25 YR	12.53	250.08	251.46		251.51	0.002893	1.06	11.84	16.55	0.40
Sophia	3	151	50 YR	15.39	250.08	251.52		251.59	0.003326	1.19	12.99	20.55	0.43
Sophia	3	151	100 YR	17.95	250.08	251.56		251.65	0.003767	1.31	13.94	22.70	0.46
Sophia	3	113	10 YR	9.27	250.02	251.34	250.60	251.36	0.000663	0.61	16.27	26.70	0.20
Sophia	3	113	25 YR	12.53	250.02	251.42	250.70	251.45	0.000924	0.75	18.61	37.66	0.24
Sophia	3	113	50 YR	15.39	250.02	251.47	250.79	251.51	0.001131	0.86	21.22	50.49	0.27
Sophia	3	113	100 YR	17.95	250.02	251.51	250.85	251.56	0.001334	0.96	23.30	57.94	0.29
Sophia	3	102	10 YR	9.27	250.02	251.33	250.71	251.35	0.000951	0.70	14.72	37.44	0.24
Sophia	3	102	25 YR	12.53	250.02	251.40	250.83	251.43	0.001273	0.85	17.68	45.05	0.28
Sophia	3	102	50 YR	15.39	250.02	251.45	250.91	251.50	0.001532	0.97	20.62	63.83	0.31
Sophia	3	102	100 YR	17.95	250.02	251.50	250.96	251.54	0.001513	0.99	29.33	108.37	0.31

HEC-RAS Plan: PR04 (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Sophia	3	79	10 YR	9.27	250.23	251.27	250.96	251.32	0.002515	0.93	12.65	45.65	0.37
Sophia	3	79	25 YR	12.53	250.23	251.33	251.05	251.39	0.003205	1.12	15.53	54.88	0.42
Sophia	3	79	50 YR	15.39	250.23	251.37	251.14	251.44	0.003721	1.25	18.11	64.42	0.46
Sophia	3	79	100 YR	17.95	250.23	251.41	251.22	251.48	0.004039	1.34	20.32	66.08	0.48
Sophia	3	47	10 YR	9.27	250.23	251.14	251.11	251.18	0.007651	1.22	14.40	81.87	0.60
Sophia	3	47	25 YR	12.53	250.23	251.20	251.14	251.24	0.006243	1.21	19.68	85.56	0.55
Sophia	3	47	50 YR	15.39	250.23	251.24	251.17	251.28	0.006066	1.26	23.12	87.46	0.55
Sophia	3	47	100 YR	17.95	250.23	251.27	251.19	251.31	0.006545	1.34	25.24	90.88	0.58
Sophia	3	40	10 YR	9.27	249.95	251.02	251.02	251.09	0.011672	1.49	10.98	56.55	0.71
Sophia	3	40	25 YR	12.53	249.95	251.06	251.06	251.14	0.014039	1.69	12.99	57.38	0.79
Sophia	3	40	50 YR	15.39	249.95	251.09	251.09	251.18	0.014654	1.77	14.93	57.91	0.81
Sophia	3	40	100 YR	17.95	249.95	251.13	251.10	251.22	0.012782	1.74	17.74	73.65	0.77
Sophia	3	35		Culvert									
Sophia	3	30	10 YR	9.27	249.82	250.97	250.90	251.00	0.005617	1.08	14.71	58.33	0.49
Sophia	3	30	25 YR	12.53	249.82	251.08	250.93	251.10	0.003564	0.99	21.45	63.79	0.40
Sophia	3	30	50 YR	15.39	249.82	251.15	250.95	251.18	0.002960	0.97	26.48	67.45	0.38
Sophia	3	30	100 YR	17.95	249.82	251.19	250.99	251.22	0.003072	1.03	29.15	70.23	0.39
Sophia	3	27	10 YR	9.27	249.88	250.96	250.82	250.99	0.002344	0.98	17.84	61.26	0.36
Sophia	3	27	25 YR	12.53	249.88	251.07	250.88	251.10	0.001838	0.95	25.01	64.95	0.32
Sophia	3	27	50 YR	15.39	249.88	251.15	250.92	251.17	0.001702	0.97	30.07	67.30	0.32
Sophia	3	27	100 YR	17.95	249.88	251.18	250.95	251.21	0.001855	1.04	32.63	68.67	0.33
Sophia	3	0	10 YR	9.27	249.73	250.81		250.89	0.005491	1.41	9.36	32.49	0.53
Sophia	3	0	25 YR	12.53	249.73	250.94		251.02	0.004722	1.40	15.35	59.71	0.50
Sophia	3	0	50 YR	15.39	249.73	251.05		251.11	0.003557	1.27	22.26	64.95	0.44
Sophia	3	0	100 YR	17.95	249.73	251.08		251.14	0.004043	1.36	24.04	66.14	0.47
Sophia	1	1640	10 YR	15.34	249.38	250.69		250.80	0.004619	1.57	15.04	49.40	0.52
Sophia	1	1640	25 YR	21.89	249.38	250.80		250.93	0.005160	1.78	20.84	57.26	0.56
Sophia	1	1640	50 YR	27.34	249.38	250.88		251.01	0.005542	1.94	25.42	66.04	0.59
Sophia	1	1640	100 YR	29.40	249.38	250.90		251.04	0.005655	1.98	27.13	68.97	0.60
Sophia	1	1623	10 YR	15.34	249.19	250.61	250.49	250.71	0.005239	1.59	15.86	62.12	0.54
Sophia	1	1623	25 YR	21.89	249.19	250.74	250.65	250.84	0.004594	1.63	24.82	72.47	0.52
Sophia	1	1623	50 YR	27.34	249.19	250.82	250.71	250.92	0.004553	1.71	30.88	80.05	0.52
Sophia	1	1623	100 YR	29.40	249.19	250.85	250.74	250.94	0.004392	1.71	33.37	81.36	0.52
Sophia	1	1604	10 YR	15.34	249.07	250.41	250.41	250.58	0.008653	1.98	11.65	42.91	0.69
Sophia	1	1604	25 YR	21.89	249.07	250.52	250.52	250.70	0.009780	2.19	16.68	51.03	0.74
Sophia	1	1604	50 YR	27.34	249.07	250.60	250.60	250.79	0.009513	2.25	21.58	61.32	0.74
Sophia	1	1604	100 YR	29.40	249.07	250.62	250.62	250.81	0.010044	2.33	22.57	62.78	0.76
Sophia	1	1597	10 YR	15.34	248.00	249.48	248.98	249.60	0.003803	1.54	9.98	9.25	0.47
Sophia	1	1597	25 YR	21.89	248.00	249.77	249.19	249.92	0.003698	1.71	12.80	10.72	0.48
Sophia	1	1597	50 YR	27.34	248.00	249.99	249.34	250.16	0.003447	1.83	14.94	12.40	0.48
Sophia	1	1597	100 YR	29.40	248.00	250.38	249.40	250.51	0.001848	1.56	18.82	34.86	0.36
Sophia	1	1584		Bridge									
Sophia	1	1571	10 YR	15.34	247.88	249.38	248.86	249.49	0.003678	1.52	10.11	9.31	0.46
Sophia	1	1571	25 YR	21.89	247.88	249.65	249.07	249.80	0.004050	1.70	12.86	10.72	0.50
Sophia	1	1571	50 YR	27.34	247.88	249.85	249.23	250.02	0.003944	1.82	15.03	12.79	0.50
Sophia	1	1571	100 YR	29.40	247.88	249.91	249.28	250.09	0.003952	1.87	15.69	14.16	0.50
Sophia	1	1563	10 YR	15.34	247.86	249.35		249.45	0.003824	1.38	11.13	12.74	0.47
Sophia	1	1563	25 YR	21.89	247.86	249.63		249.74	0.004029	1.44	15.15	16.91	0.49
Sophia	1	1563	50 YR	27.34	247.86	249.83		249.94	0.003807	1.45	18.88	20.66	0.48
Sophia	1	1563	100 YR	29.40	247.86	249.89		250.00	0.003785	1.46	20.19	22.39	0.48
Sophia	1	1549	10 YR	15.34	247.82	249.19		249.37	0.006908	1.86	8.26	11.11	0.62
Sophia	1	1549	25 YR	21.89	247.82	249.47		249.66	0.005839	1.96	12.30	16.23	0.59
Sophia	1	1549	50 YR	27.34	247.82	249.68		249.87	0.004912	1.97	16.01	18.62	0.56
Sophia	1	1549	100 YR	29.40	247.82	249.74		249.93	0.004797	2.00	17.11	19.25	0.55
Sophia	1	1531	10 YR	15.34	247.77	249.12		249.24	0.005946	1.52	10.10	14.15	0.57
Sophia	1	1531	25 YR	21.89	247.77	249.44		249.55	0.004030	1.46	15.00	16.64	0.49
Sophia	1	1531	50 YR	27.34	247.77	249.67		249.77	0.003264	1.43	19.16	19.63	0.45
Sophia	1	1531	100 YR	29.40	247.77	249.73		249.84	0.003133	1.45	20.40	20.38	0.45
Sophia	1	1508	10 YR	15.34	247.70	249.06	248.61	249.14	0.002681	1.27	13.99	23.93	0.41
Sophia	1	1508	25 YR	21.89	247.70	249.41	248.80	249.48	0.001601	1.20	23.71	30.29	0.33
Sophia	1	1508	50 YR	27.34	247.70	249.66	248.93	249.72	0.001249	1.18	31.34	32.78	0.30
Sophia	1	1508	100 YR	29.40	247.70	249.72	248.99	249.78	0.001223	1.20	33.48	33.47	0.30
Sophia	1	1496	10 YR	15.34	247.67	249.02		249.10	0.003684	1.27	12.09	15.44	0.46
Sophia	1	1496	25 YR	21.89	247.67	249.38		249.45	0.002536	1.19	18.34	19.42	0.39

HEC-RAS Plan: PR04 (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Sophia	1	1496	50 YR	27.34	247.67	249.63		249.70	0.002080	1.17	24.00	27.23	0.36
Sophia	1	1496	100 YR	29.40	247.67	249.69		249.76	0.002123	1.17	25.83	29.19	0.37
Sophia	1	1490	10 YR	16.63	247.65	249.01	248.31	249.08	0.002170	1.17	14.23	13.21	0.35
Sophia	1	1490	25 YR	23.36	247.65	249.36	248.48	249.44	0.001757	1.24	18.81	17.02	0.33
Sophia	1	1490	50 YR	29.07	247.65	249.61	248.63	249.68	0.002090	1.21	24.11	20.49	0.35
Sophia	1	1490	100 YR	31.25	247.65	249.67	248.69	249.74	0.002151	1.23	25.40	21.46	0.36
Sophia	1	1473		Culvert									
Sophia	1	1455	10 YR	16.63	247.21	248.62	247.89	248.69	0.002099	1.22	13.58	9.87	0.33
Sophia	1	1455	25 YR	23.36	247.21	248.84	248.06	248.95	0.002638	1.48	15.77	9.94	0.38
Sophia	1	1455	50 YR	29.07	247.21	248.96	248.19	249.11	0.003269	1.71	17.03	10.08	0.42
Sophia	1	1455	100 YR	31.25	247.21	249.00	248.24	249.16	0.003575	1.80	17.37	10.15	0.44
Sophia	1	1449	10 YR	16.63	247.15	248.41		248.60	0.008483	1.95	8.55	10.61	0.69
Sophia	1	1449	25 YR	23.36	247.15	248.61	248.38	248.84	0.008831	2.17	10.82	17.68	0.72
Sophia	1	1449	50 YR	29.07	247.15	248.75	248.52	249.01	0.008452	2.30	13.71	22.36	0.72
Sophia	1	1449	100 YR	31.25	247.15	248.80	248.58	249.07	0.007967	2.31	15.03	23.12	0.70
Sophia	1	1432	10 YR	16.63	246.98	248.29		248.46	0.007254	1.84	9.04	10.82	0.64
Sophia	1	1432	25 YR	23.36	246.98	248.47		248.70	0.008086	2.10	11.14	12.15	0.69
Sophia	1	1432	50 YR	29.07	246.98	248.61		248.87	0.007996	2.27	13.10	16.90	0.70
Sophia	1	1432	100 YR	31.25	246.98	248.67		248.94	0.007685	2.30	14.13	18.89	0.69
Sophia	1	1423	10 YR	16.63	246.90	248.26		248.39	0.004865	1.59	10.65	13.12	0.54
Sophia	1	1423	25 YR	23.36	246.90	248.45		248.62	0.005119	1.82	13.26	14.63	0.56
Sophia	1	1423	50 YR	29.07	246.90	248.60		248.79	0.005131	1.98	15.42	15.75	0.58
Sophia	1	1423	100 YR	31.25	246.90	248.65		248.86	0.005089	2.03	16.43	18.37	0.58
Sophia	1	1410	10 YR	16.63	246.85	248.21		248.33	0.004557	1.55	10.96	13.37	0.52
Sophia	1	1410	25 YR	23.36	246.85	248.39		248.55	0.004822	1.79	13.66	16.44	0.55
Sophia	1	1410	50 YR	29.07	246.85	248.53		248.72	0.004850	1.95	16.20	20.00	0.56
Sophia	1	1410	100 YR	31.25	246.85	248.59		248.79	0.004729	1.98	17.50	22.93	0.56
Sophia	1	1395	10 YR	16.63	246.80	248.13		248.25	0.004996	1.59	10.59	13.95	0.54
Sophia	1	1395	25 YR	23.36	246.80	248.31		248.48	0.005154	1.83	13.33	16.11	0.57
Sophia	1	1395	50 YR	29.07	246.80	248.45		248.65	0.005058	1.97	15.78	17.37	0.57
Sophia	1	1395	100 YR	31.25	246.80	248.52		248.72	0.004831	2.00	16.94	17.94	0.57
Sophia	1	1381	10 YR	16.63	246.75	248.05		248.18	0.005235	1.61	10.58	14.44	0.55
Sophia	1	1381	25 YR	23.36	246.75	248.23		248.40	0.005265	1.83	13.61	18.30	0.57
Sophia	1	1381	50 YR	29.07	246.75	248.39		248.57	0.004931	1.95	16.64	20.49	0.57
Sophia	1	1381	100 YR	31.25	246.75	248.46		248.65	0.004559	1.95	18.18	21.22	0.55
Sophia	1	1366	10 YR	16.63	246.69	247.95		248.09	0.006253	1.70	10.11	16.18	0.60
Sophia	1	1366	25 YR	23.36	246.69	248.15		248.32	0.005759	1.87	13.75	20.46	0.60
Sophia	1	1366	50 YR	29.07	246.69	248.32		248.50	0.004947	1.93	17.60	24.28	0.57
Sophia	1	1366	100 YR	31.25	246.69	248.40		248.58	0.004409	1.91	19.71	26.40	0.54
Sophia	1	1351	10 YR	16.63	246.62	247.86		248.00	0.006180	1.69	10.21	18.22	0.60
Sophia	1	1351	25 YR	23.36	246.62	248.08		248.23	0.004975	1.78	15.54	28.91	0.56
Sophia	1	1351	50 YR	29.07	246.62	248.29		248.42	0.003558	1.70	22.01	31.52	0.49
Sophia	1	1351	100 YR	31.25	246.62	248.39		248.50	0.002998	1.64	25.05	32.11	0.45
Sophia	1	1336	10 YR	16.63	246.47	247.82		247.92	0.003718	1.42	13.59	23.91	0.47
Sophia	1	1336	25 YR	23.36	246.47	248.06		248.16	0.002929	1.47	19.84	28.02	0.44
Sophia	1	1336	50 YR	29.07	246.47	248.27		248.37	0.002292	1.46	26.15	30.64	0.40
Sophia	1	1336	100 YR	31.25	246.47	248.37		248.46	0.001996	1.42	29.16	31.31	0.37
Sophia	1	1321	10 YR	16.63	246.42	247.85		247.87	0.000801	0.81	27.18	29.11	0.23
Sophia	1	1321	25 YR	23.36	246.42	248.09		248.12	0.000796	0.91	34.34	30.23	0.24
Sophia	1	1321	50 YR	29.07	246.42	248.30		248.33	0.000744	0.96	40.78	31.12	0.24
Sophia	1	1321	100 YR	31.25	246.42	248.39		248.43	0.000700	0.97	43.73	31.54	0.23
Sophia	1	1306	10 YR	16.63	246.39	247.75		247.84	0.003314	1.39	13.25	20.17	0.45
Sophia	1	1306	25 YR	23.36	246.39	247.98		248.09	0.002869	1.49	18.29	22.29	0.44
Sophia	1	1306	50 YR	29.07	246.39	248.20		248.31	0.002364	1.51	23.27	23.88	0.41
Sophia	1	1306	100 YR	31.25	246.39	248.30		248.40	0.002103	1.50	25.72	24.78	0.39
Sophia	1	1292	10 YR	16.63	246.36	247.71		247.79	0.003383	1.32	13.69	24.65	0.45
Sophia	1	1292	25 YR	23.36	246.36	247.96		248.05	0.002533	1.35	20.74	30.49	0.41
Sophia	1	1292	50 YR	29.07	246.36	248.19		248.27	0.001869	1.31	28.15	33.52	0.36
Sophia	1	1292	100 YR	31.25	246.36	248.30		248.37	0.001592	1.27	31.75	34.52	0.34
Sophia	1	1277	10 YR	16.63	246.34	247.65		247.74	0.003194	1.36	13.77	19.64	0.44
Sophia	1	1277	25 YR	23.36	246.34	247.91		248.01	0.002622	1.44	19.05	21.47	0.42
Sophia	1	1277	50 YR	29.07	246.34	248.14		248.24	0.002115	1.46	24.14	22.64	0.39
Sophia	1	1277	100 YR	31.25	246.34	248.25		248.34	0.001869	1.44	26.60	23.18	0.37
Sophia	1	1262	10 YR	16.63	246.31	247.50		247.67	0.007127	1.81	9.59	16.08	0.64
Sophia	1	1262	25 YR	23.36	246.31	247.80		247.95	0.004839	1.76	14.79	18.34	0.55

HEC-RAS Plan: PR04 (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Sophia	1	1262	50 YR	29.07	246.31	248.06		248.19	0.003313	1.69	19.62	18.81	0.47
Sophia	1	1262	100 YR	31.25	246.31	248.18		248.30	0.002782	1.64	21.88	19.05	0.44
Sophia	1	1247	10 YR	16.63	246.12	247.36		247.55	0.008638	1.94	8.59	10.90	0.70
Sophia	1	1247	25 YR	23.36	246.12	247.70		247.87	0.005367	1.84	13.27	16.50	0.57
Sophia	1	1247	50 YR	29.07	246.12	248.00		248.14	0.003378	1.72	19.02	21.52	0.48
Sophia	1	1247	100 YR	31.25	246.12	248.13		248.26	0.002715	1.64	22.01	22.75	0.43
Sophia	1	1239	10 YR	16.63	246.00	247.34	246.68	247.43	0.002438	1.29	12.94	9.79	0.36
Sophia	1	1239	25 YR	23.36	246.00	247.69	246.85	247.79	0.002393	1.43	16.31	9.87	0.36
Sophia	1	1239	50 YR	29.07	246.00	247.98	246.99	248.10	0.002331	1.50	19.34	10.85	0.36
Sophia	1	1239	100 YR	31.25	246.00	248.12	247.03	248.23	0.002168	1.50	20.78	11.55	0.35
Sophia	1	1234		Culvert									
Sophia	1	1213	10 YR	16.63	245.64	246.74	246.74	247.09	0.016847	2.70	6.69	10.69	0.96
Sophia	1	1213	25 YR	23.36	245.64	246.93	246.93	247.35	0.016778	2.99	8.47	11.47	0.98
Sophia	1	1213	50 YR	29.07	245.64	247.07	247.07	247.55	0.016772	3.19	9.84	12.05	1.00
Sophia	1	1213	100 YR	31.25	245.64	247.12	247.12	247.62	0.016563	3.25	10.39	12.28	1.00
Sophia	1	1210	10 YR	16.63	245.50	246.55	246.55	246.86	0.017643	2.71	7.38	11.50	0.99
Sophia	1	1210	25 YR	23.36	245.50	246.73	246.72	247.09	0.016832	2.91	9.62	12.45	0.99
Sophia	1	1210	50 YR	29.07	245.50	246.84	246.84	247.26	0.017861	3.15	11.04	13.01	1.03
Sophia	1	1210	100 YR	31.25	245.50	246.90	246.89	247.32	0.017259	3.17	11.78	13.30	1.02
Sophia	1	1199	10 YR	16.63	245.25	246.58	246.28	246.69	0.003912	1.53	12.88	18.14	0.49
Sophia	1	1199	25 YR	23.36	245.25	246.81	246.43	246.93	0.003547	1.67	17.14	19.62	0.48
Sophia	1	1199	50 YR	29.07	245.25	246.94	246.54	247.09	0.003722	1.83	19.77	20.40	0.50
Sophia	1	1199	100 YR	31.25	245.25	247.00	246.58	247.15	0.003653	1.86	20.99	20.75	0.50
Sophia	1	1190	10 YR	16.63	245.10	246.27	246.27	246.61	0.017264	2.56	6.68	11.30	0.97
Sophia	1	1190	25 YR	23.36	245.10	246.46	246.46	246.85	0.015017	2.78	9.16	15.85	0.94
Sophia	1	1190	50 YR	29.07	245.10	246.64	246.64	247.01	0.011661	2.77	12.45	20.11	0.85
Sophia	1	1190	100 YR	31.25	245.10	246.84	246.68	247.10	0.006768	2.36	16.78	22.91	0.67
Sophia	1	1186	10 YR	17.48	244.69	246.05	245.80	246.17	0.003808	1.53	11.42	11.36	0.48
Sophia	1	1186	25 YR	24.34	244.69	246.40	245.78	246.53	0.002890	1.58	15.43	12.87	0.43
Sophia	1	1186	50 YR	30.20	244.69	246.68	245.92	246.81	0.002398	1.63	18.58	13.33	0.41
Sophia	1	1186	100 YR	32.96	244.69	246.90	245.98	247.02	0.001882	1.57	21.06	14.60	0.37
Sophia	1	1179		Culvert									
Sophia	1	1105	10 YR	17.48	244.28	245.48	245.18	245.64	0.006109	1.82	9.60	10.75	0.60
Sophia	1	1105	25 YR	24.34	244.28	245.75	245.37	245.95	0.005201	1.95	12.50	11.84	0.57
Sophia	1	1105	50 YR	30.20	244.28	245.98	245.50	246.19	0.004617	2.02	14.98	13.96	0.55
Sophia	1	1105	100 YR	32.96	244.28	246.03	245.57	246.26	0.004894	2.12	15.54	17.82	0.57
Sophia	1	1099	10 YR	17.48	244.28	245.39		245.59	0.008605	2.00	8.74	10.44	0.70
Sophia	1	1099	25 YR	24.34	244.28	245.72		245.92	0.006134	1.96	12.39	11.70	0.61
Sophia	1	1099	50 YR	30.20	244.28	245.96		246.16	0.005257	1.97	15.36	12.84	0.57
Sophia	1	1099	100 YR	32.96	244.28	246.01		246.23	0.005538	2.06	16.02	14.91	0.59
Sophia	1	1091	10 YR	19.08	244.09	245.36		245.53	0.006130	1.83	10.43	11.01	0.60
Sophia	1	1091	25 YR	26.10	244.09	245.70		245.87	0.004629	1.81	14.44	12.48	0.54
Sophia	1	1091	50 YR	32.25	244.09	245.95		246.12	0.003778	1.82	18.40	20.70	0.50
Sophia	1	1091	100 YR	36.06	244.09	245.99		246.18	0.004272	1.97	19.21	20.98	0.53
Sophia	1	1080	10 YR	19.08	243.86	245.30	244.81	245.43	0.003499	1.57	12.18	11.08	0.47
Sophia	1	1080	25 YR	26.10	243.86	245.65	244.99	245.79	0.002781	1.63	16.06	17.13	0.43
Sophia	1	1080	50 YR	32.25	243.86	245.91	245.13	246.04	0.002463	1.62	22.34	23.39	0.40
Sophia	1	1080	100 YR	36.06	243.86	245.95	245.21	246.10	0.002857	1.76	23.13	23.50	0.43
Sophia	1	1065		Culvert									
Sophia	1	1050	10 YR	19.08	243.20	244.31	244.15	244.57	0.010661	2.25	8.49	9.55	0.76
Sophia	1	1050	25 YR	26.10	243.20	244.65	244.34	244.90	0.007724	2.21	11.80	10.39	0.66
Sophia	1	1050	50 YR	32.25	243.20	245.01	244.49	245.23	0.004924	2.07	15.55	11.58	0.54
Sophia	1	1050	100 YR	36.06	243.20	245.27	244.57	245.46	0.003746	1.93	18.87	12.56	0.48
Sophia	1	1040	10 YR	19.08	242.90	244.32		244.44	0.003998	1.57	12.14	11.61	0.49
Sophia	1	1040	25 YR	26.10	242.90	244.66		244.79	0.003214	1.60	16.38	13.60	0.45
Sophia	1	1040	50 YR	32.25	242.90	245.03		245.14	0.002055	1.51	22.15	17.73	0.38
Sophia	1	1040	100 YR	36.06	242.90	245.29		245.39	0.001525	1.44	27.14	20.64	0.33
Sophia	1	1020	10 YR	19.08	242.80	244.24	243.75	244.37	0.003529	1.54	12.40	11.72	0.47
Sophia	1	1020	25 YR	26.10	242.80	244.60	243.93	244.73	0.002678	1.59	16.44	13.81	0.42
Sophia	1	1020	50 YR	32.25	242.80	244.98	244.07	245.10	0.001878	1.55	20.76	17.10	0.37
Sophia	1	1020	100 YR	36.06	242.80	245.24	244.14	245.36	0.001505	1.52	23.73	19.35	0.34
Sophia	1	1010		Culvert									
Sophia	1	1000	10 YR	19.08	242.70	243.65	243.65	244.01	0.018680	2.69	7.09	9.78	1.01

HEC-RAS Plan: PR04 (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Sophia	1	1000	25 YR	26.10	242.70	243.84	243.84	244.26	0.017342	2.89	9.04	10.54	0.99
Sophia	1	1000	50 YR	32.25	242.70	243.97	243.97	244.45	0.016884	3.06	10.52	11.04	1.00
Sophia	1	1000	100 YR	36.06	242.70	244.05	244.05	244.56	0.016798	3.19	11.31	11.32	1.00
Sophia	1	990	10 YR	19.08	241.95	242.95	242.90	243.27	0.014948	2.49	7.68	10.07	0.91
Sophia	1	990	25 YR	26.10	241.95	243.13	243.08	243.51	0.014996	2.75	9.51	10.69	0.93
Sophia	1	990	50 YR	32.25	241.95	243.27	243.22	243.71	0.014985	2.93	11.02	11.21	0.94
Sophia	1	990	100 YR	36.06	241.95	243.35	243.30	243.81	0.015005	3.02	11.92	11.53	0.95
Sophia	1	980	10 YR	19.08	241.80	242.80	242.75	243.12	0.014962	2.49	7.67	10.07	0.91
Sophia	1	980	25 YR	26.10	241.80	242.98	242.93	243.36	0.014994	2.75	9.51	10.69	0.93
Sophia	1	980	50 YR	32.25	241.80	243.12	243.07	243.56	0.014974	2.93	11.02	11.21	0.94
Sophia	1	980	100 YR	36.06	241.80	243.20	243.15	243.66	0.015009	3.02	11.92	11.53	0.95
Sophia	1	960	10 YR	19.08	241.50	242.50	242.45	242.82	0.015230	2.50	7.63	10.05	0.92
Sophia	1	960	25 YR	26.10	241.50	242.68	242.63	243.07	0.014872	2.74	9.53	10.70	0.93
Sophia	1	960	50 YR	32.25	241.50	242.83	242.77	243.26	0.014470	2.89	11.16	11.26	0.93
Sophia	1	960	100 YR	36.06	241.50	242.93	242.85	243.37	0.013880	2.94	12.26	11.65	0.92
Sophia	1	940	10 YR	19.08	241.20	242.27		242.54	0.015899	2.28	8.38	10.31	0.81
Sophia	1	940	25 YR	26.10	241.20	242.47		242.79	0.011259	2.49	10.50	11.03	0.81
Sophia	1	940	50 YR	32.25	241.20	242.64		242.98	0.010790	2.60	12.38	11.69	0.81
Sophia	1	940	100 YR	36.06	241.20	242.76		243.11	0.009928	2.61	13.84	12.23	0.78
Sophia	1	920	10 YR	19.08	240.90	242.06		242.31	0.010396	2.23	8.56	9.99	0.77
Sophia	1	920	25 YR	26.10	240.90	242.23		242.56	0.011630	2.55	10.25	10.60	0.83
Sophia	1	920	50 YR	32.25	240.90	242.32	242.24	242.74	0.013763	2.87	11.23	10.97	0.91
Sophia	1	920	100 YR	36.06	240.90	242.35	242.33	242.84	0.015806	3.11	11.58	11.09	0.97
Sophia	1	913	10 YR	19.08	240.80	242.01	241.86	242.24	0.010652	2.13	8.97	11.62	0.77
Sophia	1	913	25 YR	26.10	240.80	242.18	242.04	242.46	0.011103	2.34	11.18	12.97	0.80
Sophia	1	913	50 YR	32.25	240.80	242.28	242.17	242.62	0.013037	2.59	12.44	13.94	0.88
Sophia	1	913	100 YR	36.06	240.80	242.30	242.26	242.71	0.015194	2.82	12.79	14.24	0.95
Sophia	1	909	10 YR	19.08	240.80	241.82	241.82	242.17	0.018763	2.61	7.31	10.65	1.01
Sophia	1	909	25 YR	26.10	240.80	242.02	242.02	242.40	0.018128	2.73	9.58	12.74	1.00
Sophia	1	909	50 YR	32.25	240.80	242.16	242.16	242.56	0.017067	2.80	11.64	18.72	0.99
Sophia	1	909	100 YR	36.06	240.80	242.24	242.24	242.65	0.015742	2.84	13.33	22.54	0.96
Sophia	1	895	10 YR	19.08	240.40	241.65		241.88	0.011145	2.15	8.86	11.61	0.79
Sophia	1	895	25 YR	26.10	240.40	241.82		242.11	0.011200	2.38	11.09	14.66	0.81
Sophia	1	895	50 YR	32.25	240.40	241.97	241.82	242.29	0.010195	2.48	13.79	20.59	0.79
Sophia	1	895	100 YR	36.06	240.40	242.02	241.90	242.37	0.011082	2.65	14.74	22.00	0.83
Sophia	1	880	10 YR	19.08	240.30	241.36	241.32	241.68	0.015820	2.48	7.68	10.65	0.93
Sophia	1	880	25 YR	26.10	240.30	241.57	241.51	241.91	0.014746	2.59	10.09	12.46	0.92
Sophia	1	880	50 YR	32.25	240.30	241.67	241.66	242.08	0.016963	2.83	11.38	13.60	0.99
Sophia	1	880	100 YR	36.06	240.30	241.77	241.77	242.17	0.015272	2.83	13.38	24.95	0.95
Sophia	1	865	10 YR	19.08	240.00	241.17		241.45	0.013351	2.34	8.14	10.79	0.86
Sophia	1	865	25 YR	26.10	240.00	241.29	241.26	241.68	0.015826	2.75	9.56	12.61	0.95
Sophia	1	865	50 YR	32.25	240.00	241.44	241.44	241.85	0.014058	2.84	12.67	24.16	0.92
Sophia	1	865	100 YR	36.06	240.00	241.53	241.53	241.94	0.013087	2.88	14.86	26.34	0.90
Sophia	1	850	10 YR	19.08	239.60	241.12		241.29	0.006011	1.84	10.80	15.85	0.60
Sophia	1	850	25 YR	26.10	239.60	241.22	240.98	241.48	0.008189	2.27	12.57	19.07	0.71
Sophia	1	850	50 YR	32.25	239.60	241.32	241.15	241.64	0.009342	2.53	14.55	21.32	0.76
Sophia	1	850	100 YR	36.06	239.60	241.37	241.24	241.73	0.010072	2.68	15.70	22.36	0.80
Sophia	1	826	10 YR	19.08	239.40	241.12	240.76	241.15	0.001935	1.05	36.33	53.24	0.34
Sophia	1	826	25 YR	26.10	239.40	241.25	240.90	241.29	0.002240	1.19	43.40	54.53	0.37
Sophia	1	826	50 YR	32.25	239.40	241.38	240.91	241.43	0.002246	1.23	50.79	56.12	0.37
Sophia	1	826	100 YR	36.06	239.40	241.46	240.95	241.50	0.002302	1.25	54.85	57.16	0.38
Sophia	1	808	10 YR	19.08	238.95	241.08		241.12	0.001431	1.05	34.95	60.08	0.30
Sophia	1	808	25 YR	26.10	238.95	241.20		241.25	0.001813	1.23	42.32	64.00	0.34
Sophia	1	808	50 YR	32.25	238.95	241.33		241.39	0.001895	1.30	51.02	70.65	0.35
Sophia	1	808	100 YR	36.06	238.95	241.40		241.46	0.001922	1.34	56.07	72.47	0.36
Sophia	1	791	10 YR	19.08	238.80	241.03		241.09	0.001660	1.21	28.77	49.25	0.33
Sophia	1	791	25 YR	26.10	238.80	241.13		241.22	0.002357	1.48	33.63	53.00	0.39
Sophia	1	791	50 YR	32.25	238.80	241.25		241.35	0.002549	1.59	40.36	57.30	0.41
Sophia	1	791	100 YR	36.06	238.80	241.31		241.42	0.002676	1.66	44.13	59.58	0.42
Sophia	1	767	10 YR	19.08	238.50	241.03		241.06	0.000633	0.91	36.98	45.33	0.21
Sophia	1	767	25 YR	26.10	238.50	241.12		241.17	0.000970	1.16	41.20	49.82	0.27
Sophia	1	767	50 YR	32.25	238.50	241.23		241.30	0.001167	1.32	47.32	59.57	0.30
Sophia	1	767	100 YR	36.06	238.50	241.29		241.37	0.001269	1.41	50.99	61.41	0.31
Sophia	1	751	10 YR	19.08	238.30	241.04	239.63	241.05	0.000260	0.63	54.75	45.03	0.14
Sophia	1	751	25 YR	26.10	238.30	241.13	239.82	241.15	0.000407	0.82	58.99	46.48	0.18
Sophia	1	751	50 YR	32.25	238.30	241.24	239.96	241.28	0.000524	0.96	64.62	55.13	0.20

HEC-RAS Plan: PR04 (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Sophia	1	751	100 YR	36.06	238.30	241.30	240.04	241.34	0.000595	1.04	68.17	61.76	0.22
Sophia	1	736	10 YR	19.08	238.05	241.03		241.05	0.000230	0.67	61.71	39.65	0.13
Sophia	1	736	25 YR	26.10	238.05	241.12		241.15	0.000371	0.87	65.37	40.58	0.17
Sophia	1	736	50 YR	32.25	238.05	241.24		241.27	0.000481	1.02	70.10	43.28	0.20
Sophia	1	736	100 YR	36.06	238.05	241.30		241.33	0.000559	1.11	72.76	46.24	0.21
Sophia	1	721	10 YR	19.08	237.90	241.03		241.04	0.000130	0.48	71.37	50.51	0.10
Sophia	1	721	25 YR	26.10	237.90	241.13		241.14	0.000208	0.62	76.05	51.36	0.13
Sophia	1	721	50 YR	32.25	237.90	241.24		241.26	0.000264	0.72	82.05	52.83	0.15
Sophia	1	721	100 YR	36.06	237.90	241.30		241.32	0.000300	0.78	85.29	53.97	0.16
Sophia	1	706	10 YR	19.08	237.75	241.03		241.04	0.000095	0.49	75.35	47.50	0.09
Sophia	1	706	25 YR	26.10	237.75	241.12		241.14	0.000156	0.64	80.44	59.47	0.12
Sophia	1	706	50 YR	32.25	237.75	241.24		241.26	0.000202	0.74	87.40	61.99	0.13
Sophia	1	706	100 YR	36.06	237.75	241.30		241.32	0.000231	0.81	91.12	62.20	0.14
Sophia	1	690	10 YR	19.08	237.45	241.03		241.04	0.000099	0.43	56.97	60.26	0.09
Sophia	1	690	25 YR	26.10	237.45	241.12		241.13	0.000161	0.57	62.55	64.61	0.11
Sophia	1	690	50 YR	32.25	237.45	241.23		241.25	0.000206	0.66	70.16	69.34	0.13
Sophia	1	690	100 YR	36.06	237.45	241.29		241.32	0.000234	0.71	74.34	71.07	0.14
Sophia	1	680	10 YR	9.08	237.30	241.03		241.04	0.000046	0.28	43.23	59.05	0.06
Sophia	1	680	25 YR	13.10	237.30	241.12		241.13	0.000083	0.38	48.79	63.28	0.07
Sophia	1	680	50 YR	19.25	237.30	241.24		241.25	0.000148	0.52	56.21	68.75	0.10
Sophia	1	680	100 YR	23.06	237.30	241.30		241.31	0.000192	0.60	60.25	68.92	0.11
Sophia	1	671.2	10 YR	9.08	240.60	240.91	240.91	241.02	0.002333	1.65	9.29	47.88	0.97
Sophia	1	671.2	25 YR	13.10	240.60	240.98	240.98	241.12	0.002176	1.83	12.89	55.03	0.97
Sophia	1	671.2	50 YR	19.25	240.60	241.07	241.07	241.23	0.002108	2.07	17.83	60.99	0.99
Sophia	1	671.2	100 YR	23.06	240.60	241.12	241.12	241.29	0.001996	2.17	21.01	63.59	0.98
Sophia	1	644.1	10 YR	9.08	239.61	240.10	240.10	240.30	0.002986	2.21	5.89	15.34	1.13
Sophia	1	644.1	25 YR	13.10	239.61	240.21	240.21	240.47	0.002716	2.49	7.60	15.66	1.13
Sophia	1	644.1	50 YR	19.25	239.61	240.36	240.36	240.69	0.002405	2.80	10.03	16.10	1.11
Sophia	1	644.1	100 YR	23.06	239.61	240.44	240.44	240.82	0.002388	3.00	11.27	16.37	1.13
Sophia	1	612.2	10 YR	9.08	238.57	238.97	238.97	239.16	0.003086	2.16	6.64	19.16	1.14
Sophia	1	612.2	25 YR	13.10	238.57	239.08	239.08	239.31	0.002748	2.41	8.66	19.48	1.12
Sophia	1	612.2	50 YR	19.25	238.57	239.21	239.21	239.51	0.002599	2.76	11.23	19.88	1.14
Sophia	1	612.2	100 YR	23.06	238.57	239.28	239.28	239.62	0.002500	2.93	12.74	20.11	1.14
Sophia	1	585.2	10 YR	9.08	238.04	238.53	238.53	238.72	0.002799	2.16	6.05	16.53	1.10
Sophia	1	585.2	25 YR	13.10	238.04	238.63	238.63	238.88	0.002590	2.44	7.85	16.84	1.10
Sophia	1	585.2	50 YR	19.25	238.04	238.78	238.78	239.10	0.002382	2.77	10.32	17.27	1.10
Sophia	1	585.2	100 YR	23.06	238.04	238.86	238.86	239.22	0.002294	2.94	11.73	17.50	1.10
Sophia	1	559.7	10 YR	9.08	237.69	238.21	238.21	238.40	0.002342	2.09	6.25	17.65	1.02
Sophia	1	559.7	25 YR	13.10	237.69	238.31	238.31	238.55	0.002239	2.36	8.15	18.24	1.03
Sophia	1	559.7	50 YR	19.25	237.69	238.46	238.46	238.76	0.002083	2.68	10.86	19.05	1.04
Sophia	1	559.7	100 YR	23.06	237.69	238.50	238.50	238.88	0.002416	3.00	11.68	19.29	1.13
Sophia	1	545		Lat Struct									
Sophia	1	527.4	10 YR	9.08	237.10	237.55	237.55	237.70	0.002339	1.96	8.36	28.80	1.00
Sophia	1	527.4	25 YR	13.10	237.10	237.63	237.63	237.82	0.002412	2.26	10.67	28.80	1.05
Sophia	1	527.4	50 YR	19.25	237.10	237.74	237.74	237.99	0.002413	2.60	13.82	28.80	1.09
Sophia	1	527.4	100 YR	23.06	237.10	237.81	237.81	238.08	0.002405	2.77	15.59	28.80	1.11
Sophia	1	497.9	10 YR	9.08	236.32	236.42	236.42	236.55	0.016487	1.14	5.60	20.64	1.83
Sophia	1	497.9	25 YR	13.10	236.32	236.50	236.50	236.65	0.015096	1.78	7.67	27.92	1.97
Sophia	1	497.9	50 YR	19.25	236.32	236.58	236.58	236.79	0.015412	2.73	9.82	30.35	2.21
Sophia	1	497.9	100 YR	23.06	236.32	236.61	236.61	236.88	0.015928	3.18	10.88	31.14	2.32
Sophia	1	464.6	10 YR	9.08	236.05	235.99	235.84	236.05	0.006598		8.24	20.05	0.00
Sophia	1	464.6	25 YR	13.10	236.05	236.00	235.93	236.12	0.012002		8.58	20.05	0.00
Sophia	1	464.6	50 YR	19.25	236.05	236.16	236.03	236.29	0.009002	0.87	12.05	27.82	1.36
Sophia	1	464.6	100 YR	23.06	236.05	236.18	236.10	236.35	0.011210	1.13	12.73	32.68	1.58
Sophia	1	403.8	10 YR	9.08	235.78	235.26	235.26	235.35	0.023912		6.89	41.02	0.00
Sophia	1	403.8	25 YR	13.10	235.78	235.37	235.37	235.42	0.010458		13.00	64.81	0.00
Sophia	1	403.8	50 YR	19.25	235.78	235.38	235.38	235.48	0.020673		13.46	65.41	0.00
Sophia	1	403.8	100 YR	23.06	235.78	235.43	235.42	235.52	0.016110		17.27	79.14	0.00
Sophia	1	350.2	10 YR	9.08	234.42	234.93	234.93	235.05	0.002346	1.66	9.55	52.40	0.97
Sophia	1	350.2	25 YR	13.10	234.42	234.97	234.97	235.14	0.002955	2.03	11.89	58.52	1.11
Sophia	1	350.2	50 YR	19.25	234.42	235.10	235.10	235.23	0.001777	1.94	22.41	92.21	0.90
Sophia	1	350.2	100 YR	23.06	234.42	235.13	235.13	235.29	0.001910	2.10	25.43	94.56	0.95
Sophia	1	323.2	10 YR	9.08	234.04	234.42	234.42	234.50	0.002378	1.57	11.97	62.13	0.96
Sophia	1	323.2	25 YR	13.10	234.04	234.46	234.46	234.58	0.002860	1.90	14.74	67.33	1.07
Sophia	1	323.2	50 YR	19.25	234.04	234.55	234.55	234.70	0.002743	2.18	21.24	87.64	1.09

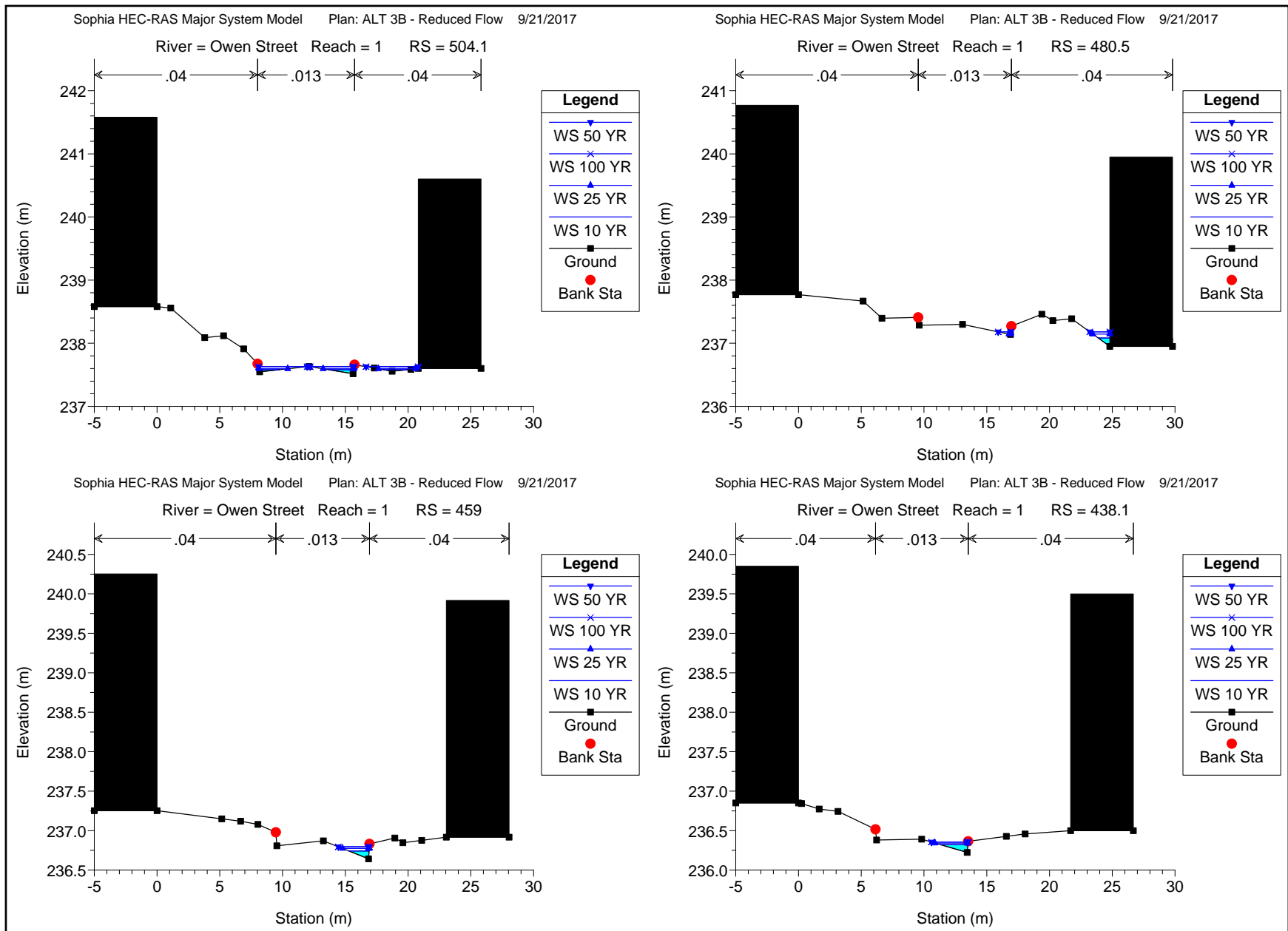
HEC-RAS Plan: PR04 (Continued)

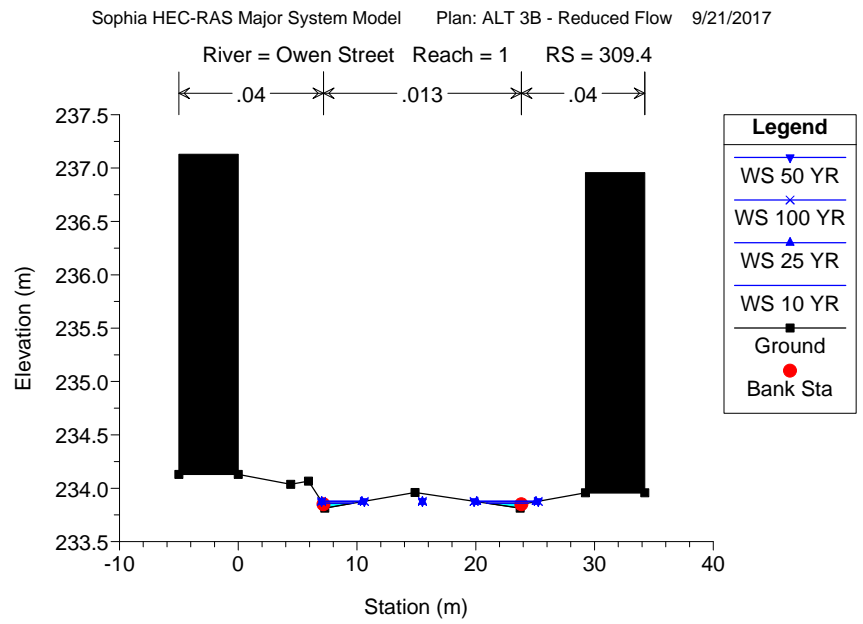
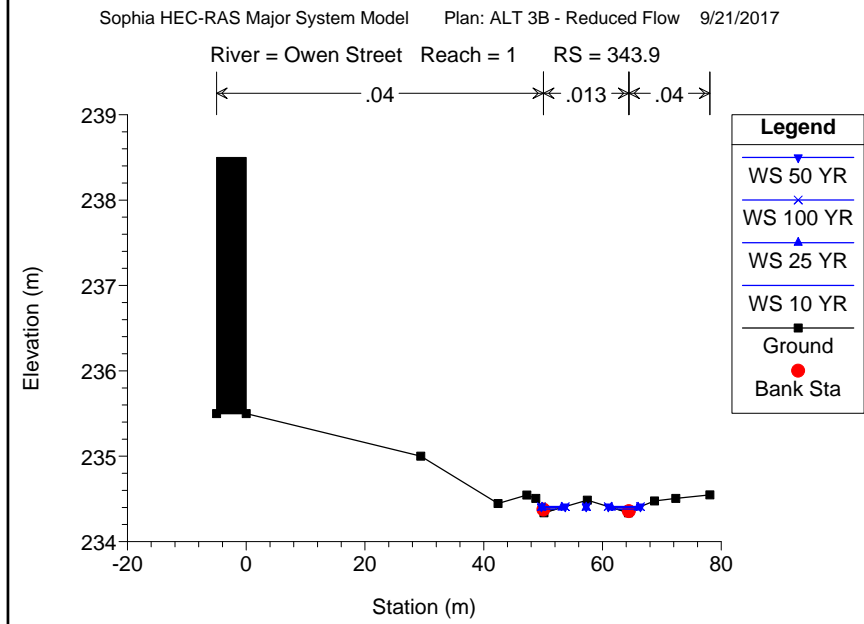
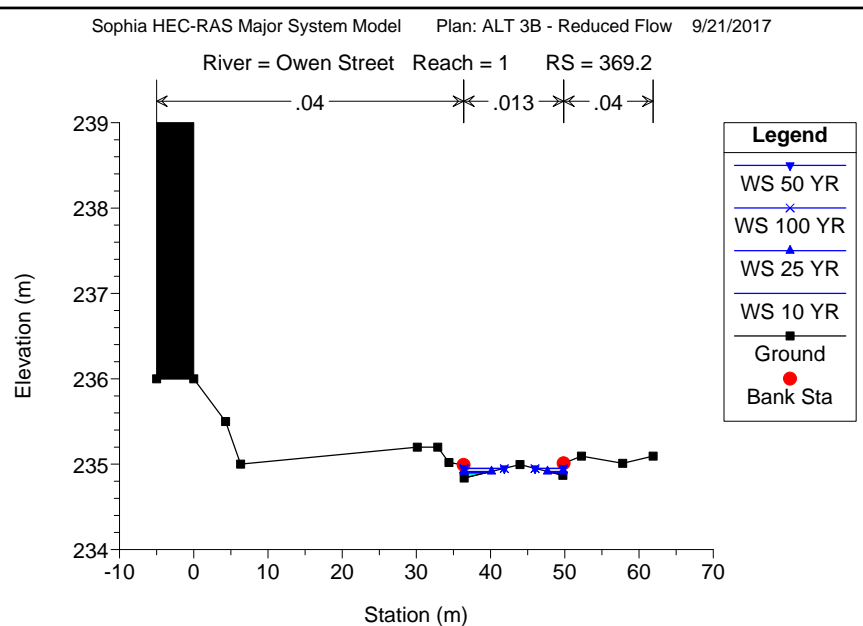
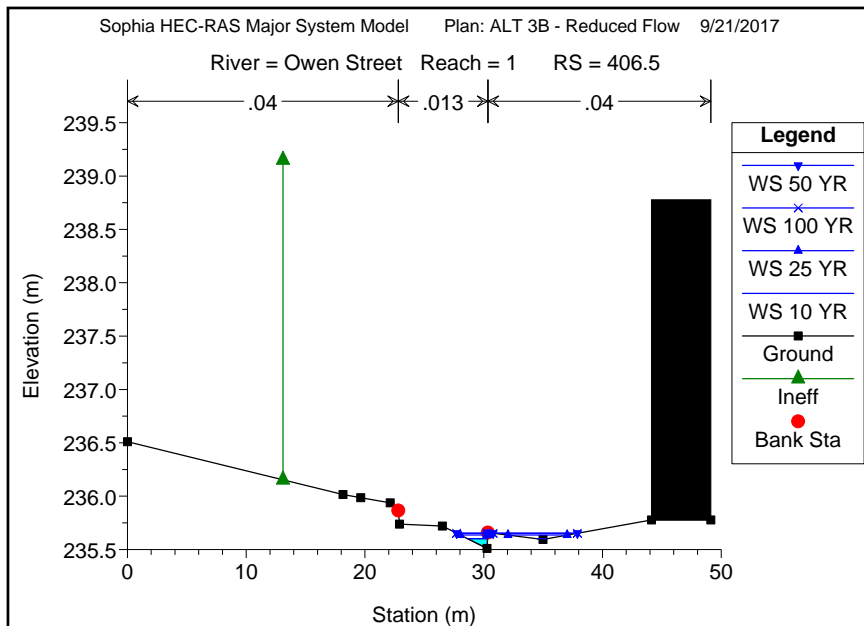
River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Sophia	1	323.2	100 YR	23.06	234.04	234.60	234.60	234.76	0.002407	2.22	26.64	108.08	1.05
Sophia	1	298.6	10 YR	9.08	233.66	234.06	234.06	234.14	0.001792	1.52	12.97	84.03	0.86
Sophia	1	298.6	25 YR	13.10	233.66	234.11	234.11	234.21	0.001869	1.72	17.62	96.25	0.90
Sophia	1	298.6	50 YR	19.25	233.66	234.18	234.18	234.30	0.001907	1.95	24.70	112.33	0.93
Sophia	1	298.6	100 YR	23.06	233.66	234.22	234.22	234.35	0.001859	2.04	29.09	119.01	0.93
Sophia	1	263	10 YR	9.08	233.18	233.42	233.42	233.53	0.007961	2.03	8.66	57.90	1.61
Sophia	1	263	25 YR	13.10	233.18	233.52	233.52	233.61	0.003465	1.84	17.14	109.17	1.15
Sophia	1	263	50 YR	19.25	233.18	233.67	233.67	233.72	0.001260	1.50	34.38	120.45	0.75
Sophia	1	263	100 YR	23.06	233.18	233.77	233.77	233.81	0.000695	1.30	47.48	122.57	0.58
Sophia	1	229	10 YR	9.08	232.72	233.36	233.36	233.37	0.000143	0.61	35.58	88.55	0.26
Sophia	1	229	25 YR	13.10	232.72	233.50	233.50	233.52	0.000121	0.65	48.72	111.03	0.25
Sophia	1	229	50 YR	19.25	232.72	233.69	233.69	233.70	0.000100	0.70	71.91	133.99	0.24
Sophia	1	229	100 YR	23.06	232.72	233.79	233.79	233.80	0.000093	0.72	85.26	141.83	0.23
Sophia	1	196.3	10 YR	9.08	232.67	233.16	233.16	233.34	0.001988	1.93	6.09	20.78	0.94
Sophia	1	196.3	25 YR	13.10	232.67	233.27	233.27	233.49	0.001801	2.14	8.59	26.25	0.93
Sophia	1	196.3	50 YR	19.25	232.67	233.39	233.39	233.67	0.001835	2.47	11.97	30.14	0.97
Sophia	1	196.3	100 YR	23.06	232.67	233.49	233.49	233.76	0.001604	2.52	15.00	34.30	0.93
Sophia	1	173	10 YR	9.08	231.82	232.35	232.35	232.54	0.002085	2.00	5.89	17.39	0.97
Sophia	1	173	25 YR	13.10	231.82	232.45	232.45	232.69	0.001996	2.27	7.75	17.53	0.98
Sophia	1	173	50 YR	19.25	231.82	232.59	232.59	232.90	0.001979	2.62	10.20	18.68	1.02
Sophia	1	173	100 YR	23.06	231.82	232.67	232.67	233.02	0.001899	2.78	11.80	19.78	1.02
Sophia	1	134.4	10 YR	9.08	230.30	230.75	230.75	230.94	0.002143	1.99	5.70	17.33	0.97
Sophia	1	134.4	25 YR	13.10	230.30	230.85	230.85	231.10	0.002172	2.29	7.42	19.18	1.02
Sophia	1	134.4	50 YR	19.25	230.30	231.01	231.01	231.29	0.001834	2.51	10.59	20.27	0.97
Sophia	1	134.4	100 YR	23.06	230.30	231.08	231.08	231.40	0.001806	2.67	12.11	20.27	0.98
Sophia	1	109.4	10 YR	9.08	229.32	229.81	229.81	229.98	0.002106	1.95	6.60	21.47	0.96
Sophia	1	109.4	25 YR	13.10	229.32	229.90	229.90	230.12	0.002045	2.21	8.69	21.64	0.98
Sophia	1	109.4	50 YR	19.25	229.32	230.02	230.02	230.30	0.002049	2.55	11.33	21.64	1.02
Sophia	1	109.4	100 YR	23.06	229.32	230.11	230.11	230.41	0.001916	2.67	13.20	26.77	1.01
Sophia	1	69.9	10 YR	9.08	227.68	227.66	227.66	227.72	0.022260		8.42	53.93	0.00
Sophia	1	69.9	25 YR	13.10	227.68	227.68	227.68	227.77	0.026489	0.33	9.96	54.46	1.60
Sophia	1	69.9	50 YR	19.25	227.68	227.74	227.74	227.85	0.023442	1.04	13.11	59.40	2.04
Sophia	1	69.9	100 YR	23.06	227.68	227.77	227.77	227.89	0.021556	1.33	15.08	63.24	2.10
Sophia	1	49.2	10 YR	9.08	227.16	227.09	227.09	227.17	0.026782		7.29	48.19	0.00
Sophia	1	49.2	25 YR	13.10	227.16	227.14	227.14	227.24	0.025802		9.42	52.74	0.00
Sophia	1	49.2	50 YR	19.25	227.16	227.20	227.20	227.32	0.024576	0.80	12.42	62.17	1.95
Sophia	1	49.2	100 YR	23.06	227.16	227.24	227.24	227.36	0.021251	1.29	14.91	75.17	2.08
Sophia	1	31.4	10 YR	9.08	226.53	226.78	226.78	226.87	0.005472	1.79	10.75	65.48	1.36
Sophia	1	31.4	25 YR	13.10	226.53	226.83	226.83	226.95	0.004801	2.00	14.33	70.31	1.33
Sophia	1	31.4	50 YR	19.25	226.53	226.90	226.90	227.04	0.004598	2.29	18.89	76.05	1.35
Sophia	1	31.4	100 YR	23.06	226.53	226.94	226.94	227.10	0.004139	2.38	22.21	79.95	1.31
Sophia	1	0	10 YR	9.08	225.95	226.36	226.33	226.48	0.002050	1.67	7.51	24.79	0.92
Sophia	1	0	25 YR	13.10	225.95	226.44	226.41	226.60	0.002048	1.93	9.50	24.79	0.96
Sophia	1	0	50 YR	19.25	225.95	226.54	226.52	226.76	0.002048	2.24	12.13	24.79	0.99
Sophia	1	0	100 YR	23.06	225.95	226.60	226.58	226.86	0.002047	2.41	13.59	24.79	1.01
Owen Street	1	504.1	10 YR	0.05	237.52	237.58	237.58	237.59	0.006356	0.52	0.12	5.58	1.05
Owen Street	1	504.1	25 YR	0.12	237.52	237.60	237.60	237.62	0.009172	0.73	0.21	7.66	1.31
Owen Street	1	504.1	50 YR	0.17	237.52	237.63	237.63	237.64	0.001603	0.40	0.54	11.55	0.59
Owen Street	1	504.1	100 YR	0.17	237.52	237.63	237.63	237.64	0.001603	0.40	0.54	11.55	0.59
Owen Street	1	480.5	10 YR	0.05	237.14	237.08	237.08	237.12	0.047605		0.06	0.92	0.00
Owen Street	1	480.5	25 YR	0.12	237.14	237.14	237.14	237.19	0.036755	0.28	0.13	1.47	1.73
Owen Street	1	480.5	50 YR	0.17	237.14	237.18	237.18	237.21	0.022495	0.85	0.20	2.60	1.90
Owen Street	1	480.5	100 YR	0.17	237.14	237.18	237.18	237.21	0.022495	0.85	0.20	2.60	1.90
Owen Street	1	459	10 YR	0.05	236.64	236.74	236.74	236.76	0.003816	0.63	0.08	1.61	0.89
Owen Street	1	459	25 YR	0.12	236.64	236.77	236.77	236.81	0.004966	0.86	0.14	2.12	1.07
Owen Street	1	459	50 YR	0.17	236.64	236.80	236.80	236.83	0.004171	0.87	0.19	2.47	1.00
Owen Street	1	459	100 YR	0.17	236.64	236.80	236.80	236.83	0.004171	0.87	0.19	2.47	1.00
Owen Street	1	438.1	10 YR	0.05	236.22	236.32	236.32	236.33	0.002017	0.46	0.11	2.20	0.66
Owen Street	1	438.1	25 YR	0.12	236.22	236.34	236.34	236.37	0.004384	0.76	0.16	2.64	1.00
Owen Street	1	438.1	50 YR	0.17	236.22	236.36	236.36	236.39	0.004800	0.86	0.19	2.92	1.06
Owen Street	1	438.1	100 YR	0.17	236.22	236.36	236.36	236.39	0.004800	0.86	0.19	2.92	1.06
Owen Street	1	406.5	10 YR	0.05	235.51	235.60	235.60	235.62	0.004537	0.65	0.08	2.50	0.97
Owen Street	1	406.5	25 YR	0.12	235.51	235.64	235.64	235.66	0.003908	0.74	0.25	7.31	0.95
Owen Street	1	406.5	50 YR	0.17	235.51	235.65	235.65	235.68	0.003151	0.73	0.40	9.76	0.87
Owen Street	1	406.5	100 YR	0.17	235.51	235.65	235.65	235.68	0.003151	0.73	0.40	9.76	0.87

HEC-RAS Plan: PR04 (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Owen Street	1	369.2	10 YR	0.05	234.84	234.90	234.90	234.91	0.004356	0.44	0.11	4.38	0.87
Owen Street	1	369.2	25 YR	0.12	234.84	234.91	234.91	234.93	0.006440	0.63	0.19	5.82	1.11
Owen Street	1	369.2	50 YR	0.17	234.84	234.95	234.95	234.96	0.001170	0.35	0.46	9.26	0.51
Owen Street	1	369.2	100 YR	0.17	234.84	234.95	234.95	234.96	0.001170	0.35	0.46	9.26	0.51
Owen Street	1	343.9	10 YR	0.05	234.34	234.38	234.38	234.39	0.008720	0.55	0.10	5.10	1.20
Owen Street	1	343.9	25 YR	0.12	234.34	234.40	234.40	234.42	0.006599	0.61	0.22	7.82	1.12
Owen Street	1	343.9	50 YR	0.17	234.34	234.41	234.41	234.43	0.005026	0.60	0.32	9.41	1.00
Owen Street	1	343.9	100 YR	0.17	234.34	234.41	234.41	234.43	0.005026	0.60	0.32	9.41	1.00
Owen Street	1	309.4	10 YR	0.05	233.81	233.86	233.86	233.87	0.003649	0.38	0.13	6.10	0.79
Owen Street	1	309.4	25 YR	0.12	233.81	233.87	233.87	233.89	0.005383	0.55	0.23	8.37	1.01
Owen Street	1	309.4	50 YR	0.17	233.81	233.88	233.88	233.90	0.007329	0.67	0.26	9.01	1.19
Owen Street	1	309.4	100 YR	0.17	233.81	233.88	233.88	233.90	0.007329	0.67	0.26	9.01	1.19
Owen Street	1	275.4	10 YR	0.05	233.55	233.61	233.61	233.62	0.006571	0.56	0.09	4.00	1.09
Owen Street	1	275.4	25 YR	0.12	233.55	233.65	233.65	233.66	0.001439	0.39	0.36	8.39	0.56
Owen Street	1	275.4	50 YR	0.17	233.55	233.65	233.65	233.66	0.002721	0.54	0.36	8.39	0.77
Owen Street	1	275.4	100 YR	0.17	233.55	233.65	233.65	233.66	0.002721	0.54	0.36	8.39	0.77
Owen Street	1	244.9	10 YR	0.05	233.24	233.31	233.31	233.34	0.006325	0.69	0.07	1.87	1.11
Owen Street	1	244.9	25 YR	0.12	233.24	233.36	233.36	233.38	0.003350	0.68	0.18	2.92	0.87
Owen Street	1	244.9	50 YR	0.17	233.24	233.37	233.37	233.40	0.004429	0.81	0.20	3.12	1.02
Owen Street	1	244.9	100 YR	0.17	233.24	233.37	233.37	233.40	0.004429	0.81	0.20	3.12	1.02
Owen Street	1	221.3	10 YR	0.05	233.03	233.12	233.12	233.13	0.002390	0.47	0.11	2.32	0.71
Owen Street	1	221.3	25 YR	0.12	233.03	233.14	233.14	233.17	0.004391	0.74	0.16	2.88	0.99
Owen Street	1	221.3	50 YR	0.17	233.03	233.15	233.15	233.19	0.005260	0.86	0.19	3.14	1.10
Owen Street	1	221.3	100 YR	0.17	233.03	233.15	233.15	233.19	0.005260	0.86	0.19	3.14	1.10
Owen Street	1	181.4	10 YR	0.05	232.32	232.39	232.39	232.42	0.008302	0.75	0.07	1.88	1.26
Owen Street	1	181.4	25 YR	0.12	232.32	232.43	232.43	232.46	0.005345	0.79	0.15	2.84	1.09
Owen Street	1	181.4	50 YR	0.17	232.32	232.45	232.45	232.48	0.004310	0.79	0.21	3.33	1.00
Owen Street	1	181.4	100 YR	0.17	232.32	232.45	232.45	232.48	0.004310	0.79	0.21	3.33	1.00
Owen Street	1	159.8	10 YR	0.05	231.84	231.94	231.94	231.95	0.002603	0.50	0.10	2.11	0.74
Owen Street	1	159.8	25 YR	0.12	231.84	231.96	231.96	231.99	0.004384	0.76	0.16	2.66	1.00
Owen Street	1	159.8	50 YR	0.17	231.84	231.97	231.97	232.01	0.005477	0.90	0.18	3.01	1.13
Owen Street	1	159.8	100 YR	0.17	231.84	231.97	231.97	232.01	0.005477	0.90	0.18	3.01	1.13
Owen Street	1	121.6	10 YR	0.05	230.54	230.60	230.60	230.61	0.005721	0.48	0.10	4.31	0.99
Owen Street	1	121.6	25 YR	0.12	230.54	230.64	230.64	230.64	0.001895	0.39	0.31	7.67	0.62
Owen Street	1	121.6	50 YR	0.17	230.54	230.64	230.64	230.65	0.003583	0.54	0.31	7.67	0.86
Owen Street	1	121.6	100 YR	0.17	230.54	230.64	230.64	230.65	0.003583	0.54	0.31	7.67	0.86
Owen Street	1	98.9	10 YR	0.05	228.55	228.61	228.61	228.63	0.007190	0.61	0.08	2.83	1.13
Owen Street	1	98.9	25 YR	0.12	228.55	228.64	228.64	228.66	0.005106	0.66	0.18	4.19	1.02
Owen Street	1	98.9	50 YR	0.17	228.55	228.66	228.66	228.68	0.004057	0.66	0.28	9.71	0.93
Owen Street	1	98.9	100 YR	0.17	228.55	228.66	228.66	228.68	0.004057	0.66	0.28	9.71	0.93
Owen Street	1	79.1	10 YR	0.05	227.22	227.28	227.28	227.29	0.005648	0.52	0.10	3.54	1.00
Owen Street	1	79.1	25 YR	0.12	227.22	227.31	227.31	227.32	0.002818	0.50	0.24	5.60	0.76
Owen Street	1	79.1	50 YR	0.17	227.22	227.31	227.31	227.33	0.003725	0.60	0.28	6.18	0.88
Owen Street	1	79.1	100 YR	0.17	227.22	227.31	227.31	227.33	0.003725	0.60	0.28	6.18	0.88
Owen Street	1	47.9	10 YR	0.05	225.60	225.66	225.66	225.67	0.006145	0.52	0.10	3.73	1.03
Owen Street	1	47.9	25 YR	0.12	225.60	225.70	225.70	225.71	0.001700	0.40	0.31	7.99	0.60
Owen Street	1	47.9	50 YR	0.17	225.60	225.70	225.70	225.71	0.003215	0.55	0.31	7.99	0.82
Owen Street	1	47.9	100 YR	0.17	225.60	225.70	225.70	225.71	0.003215	0.55	0.31	7.99	0.82
Owen Street	1	26.8	10 YR	0.05	224.59	224.66	224.66	224.68	0.006905	0.65	0.08	2.31	1.15
Owen Street	1	26.8	25 YR	0.12	224.59	224.69	224.69	224.71	0.003513	0.63	0.19	3.64	0.88
Owen Street	1	26.8	50 YR	0.17	224.59	224.70	224.70	224.73	0.004389	0.74	0.22	3.94	1.00
Owen Street	1	26.8	100 YR	0.17	224.59	224.70	224.70	224.73	0.004389	0.74	0.22	3.94	1.00
Owen Street	1	6.7	10 YR	0.05	224.06	224.10	224.10	224.12	0.009266	0.53	0.09	4.84	1.22
Owen Street	1	6.7	25 YR	0.12	224.06	224.12	224.12	224.14	0.007063	0.60	0.20	7.07	1.14
Owen Street	1	6.7	50 YR	0.17	224.06	224.13	224.13	224.15	0.006113	0.61	0.27	8.19	1.08
Owen Street	1	6.7	100 YR	0.17	224.06	224.13	224.13	224.15	0.006113	0.61	0.27	8.19	1.08
Owen Street	1	0	10 YR	0.05	223.75	223.83	223.81	223.84	0.001362	0.32	0.15	3.96	0.52
Owen Street	1	0	25 YR	0.12	223.75	223.86	223.86	223.87	0.001362	0.40	0.30	5.50	0.55
Owen Street	1	0	50 YR	0.17	223.75	223.88	223.86	223.89	0.001360	0.44	0.38	6.20	0.56
Owen Street	1	0	100 YR	0.17	223.75	223.88	223.86	223.89	0.001360	0.44	0.38	6.20	0.56

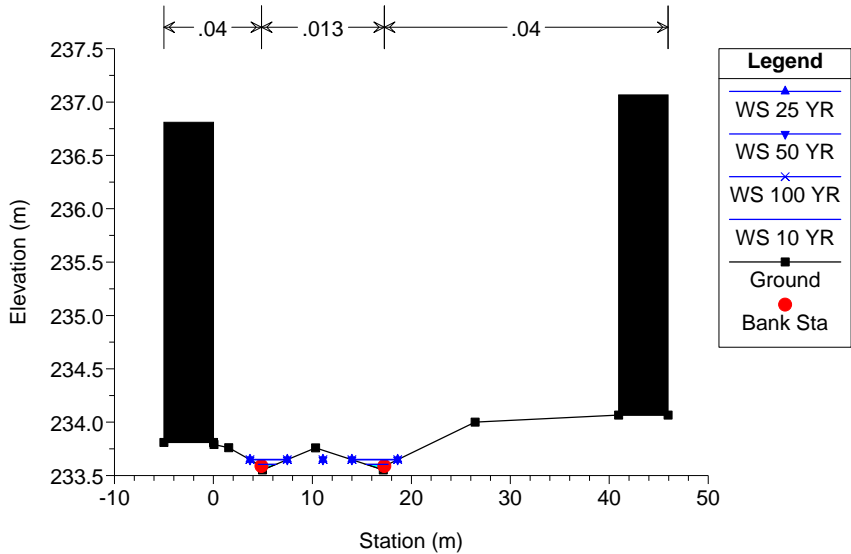
# Improvement Alternative 3B With Flow Reduction - HEC RAS Results Summary





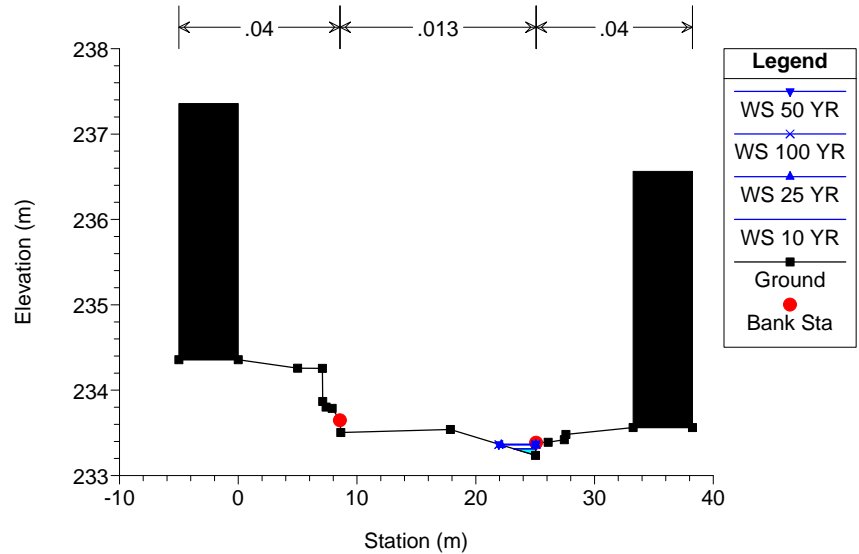
Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

River = Owen Street Reach = 1 RS = 275.4



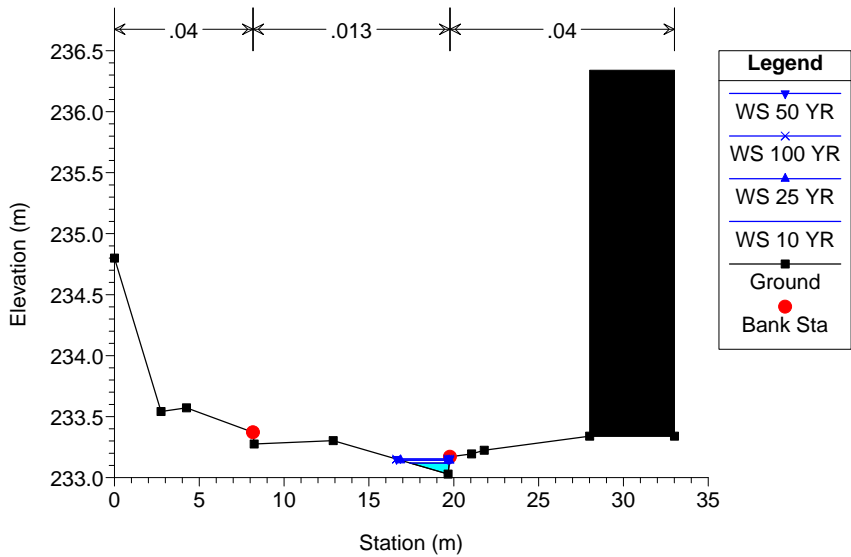
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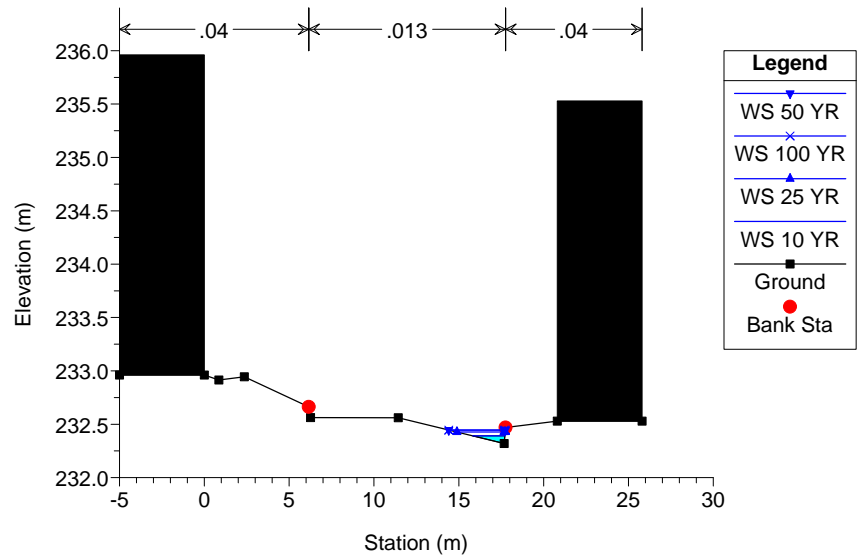
Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

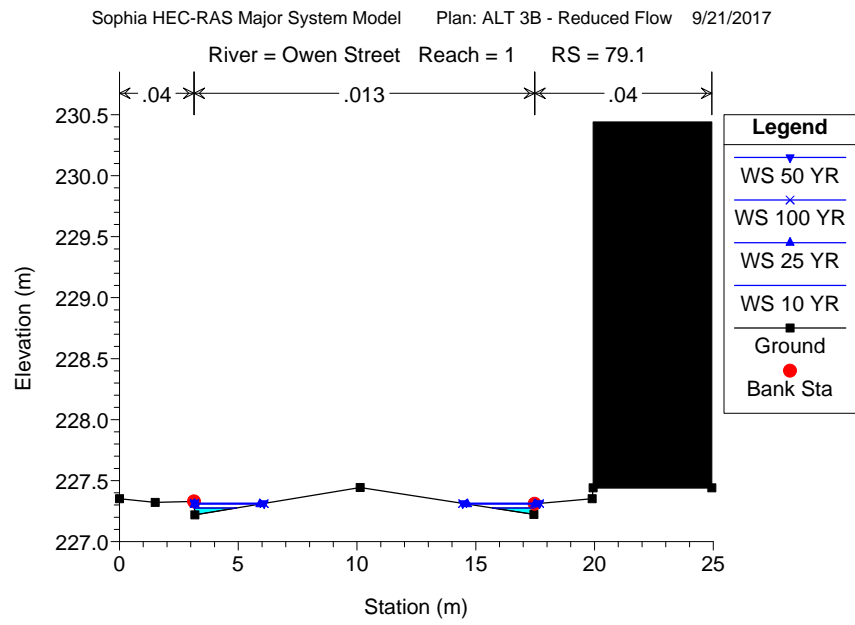
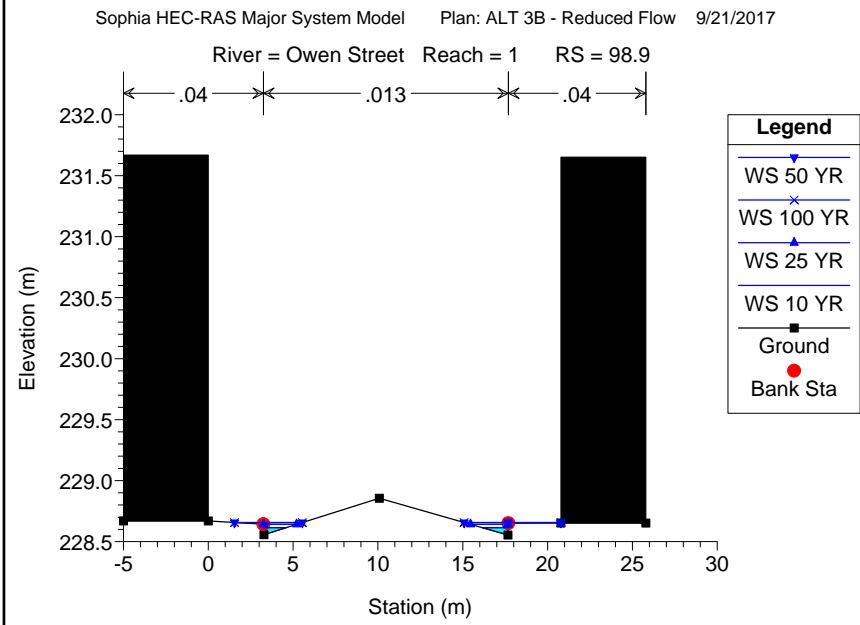
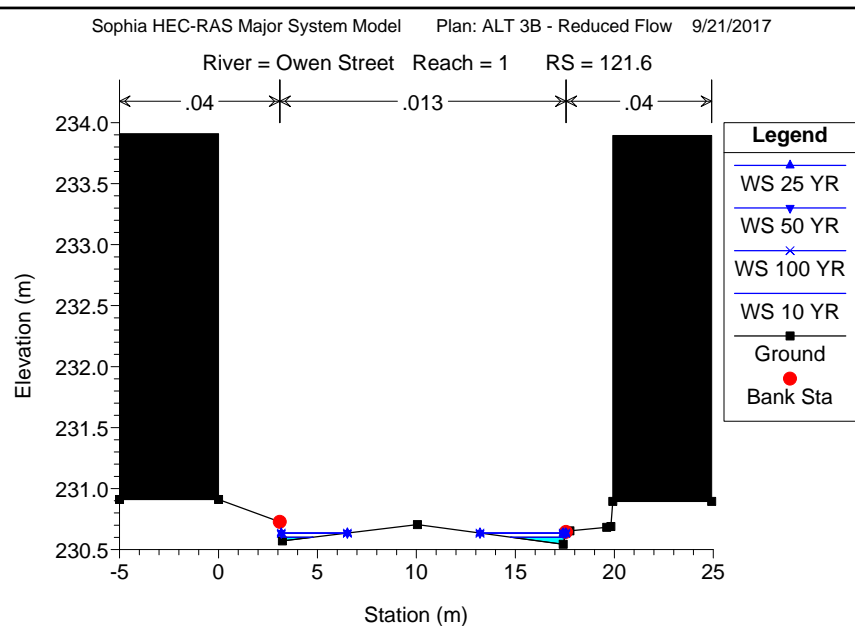
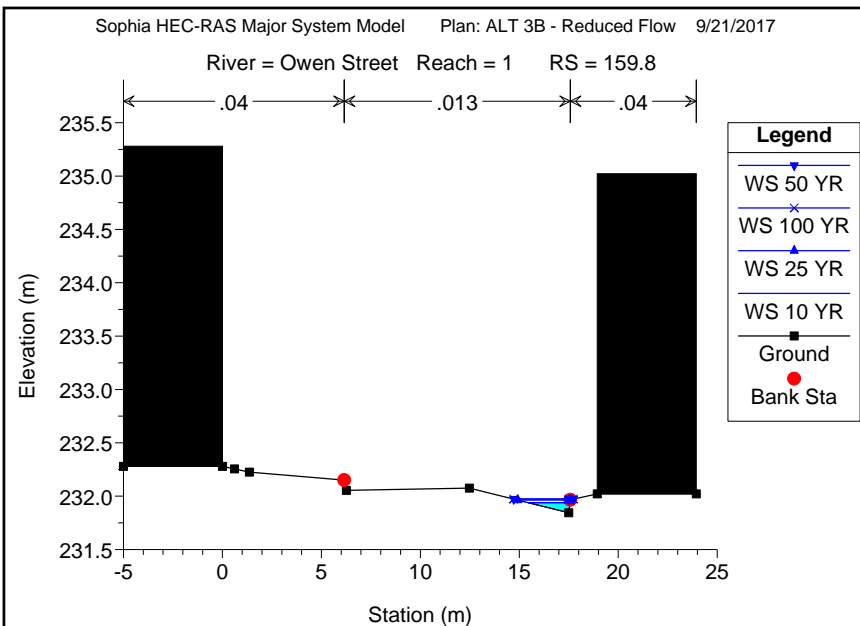
River = Owen Street Reach = 1 RS = 221.3



Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

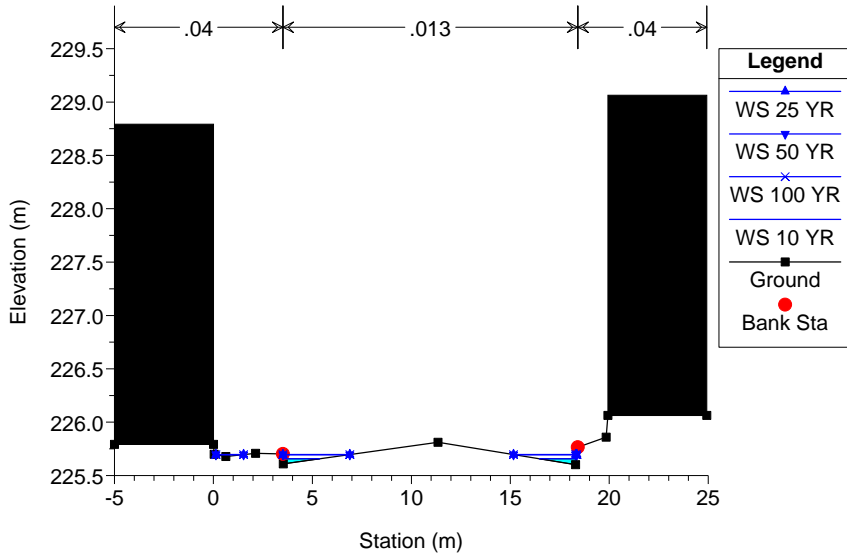
River = Owen Street Reach = 1 RS = 181.4





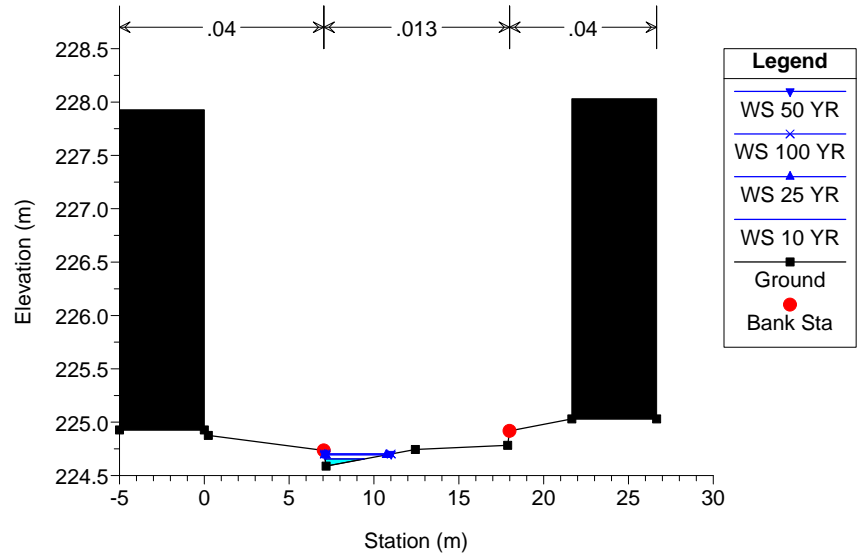
Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

River = Owen Street Reach = 1 RS = 47.9



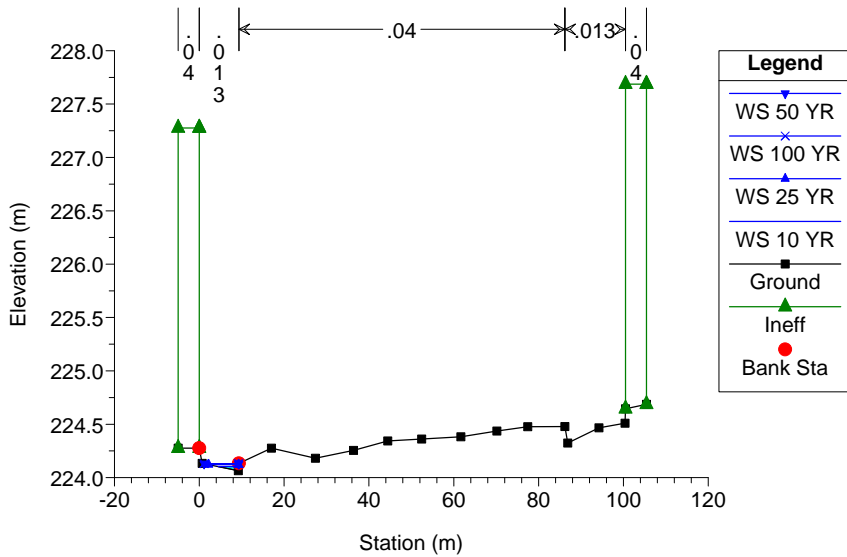
Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

River = Owen Street Reach = 1 RS = 26.8



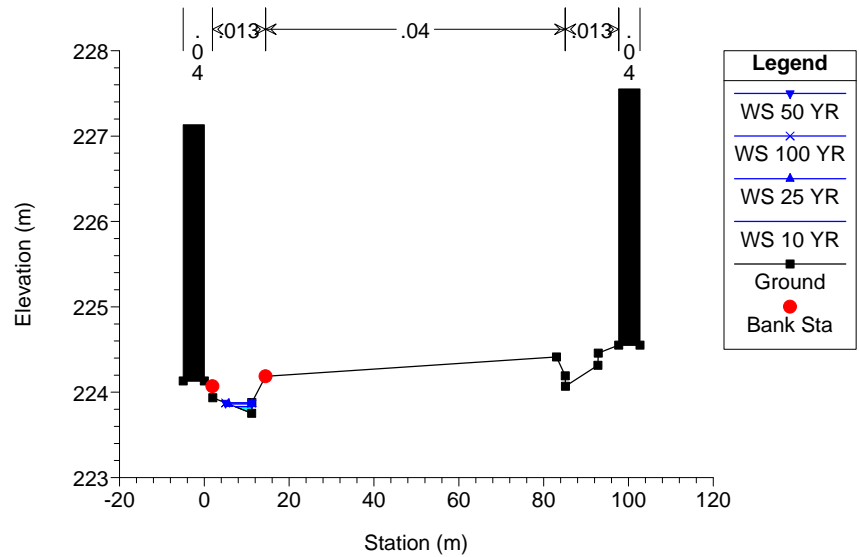
Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

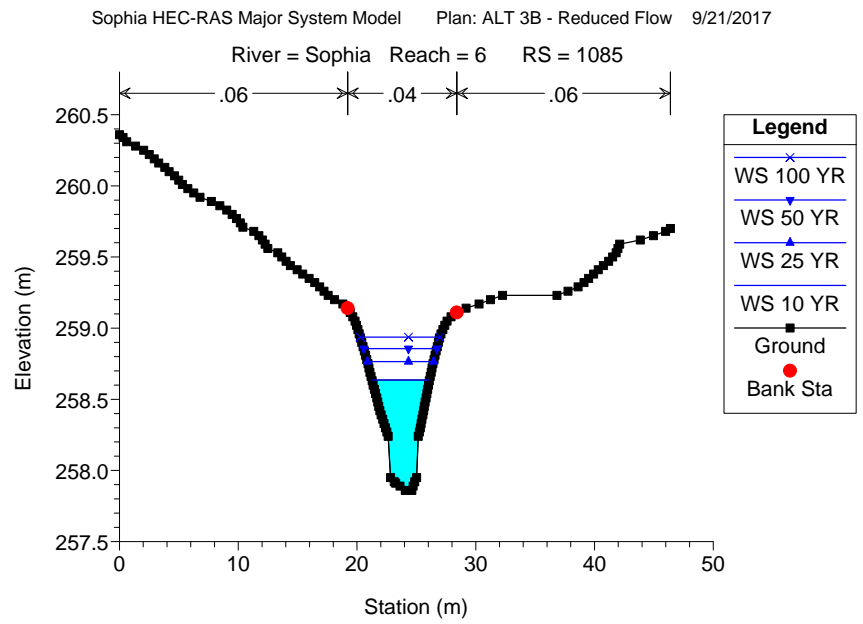
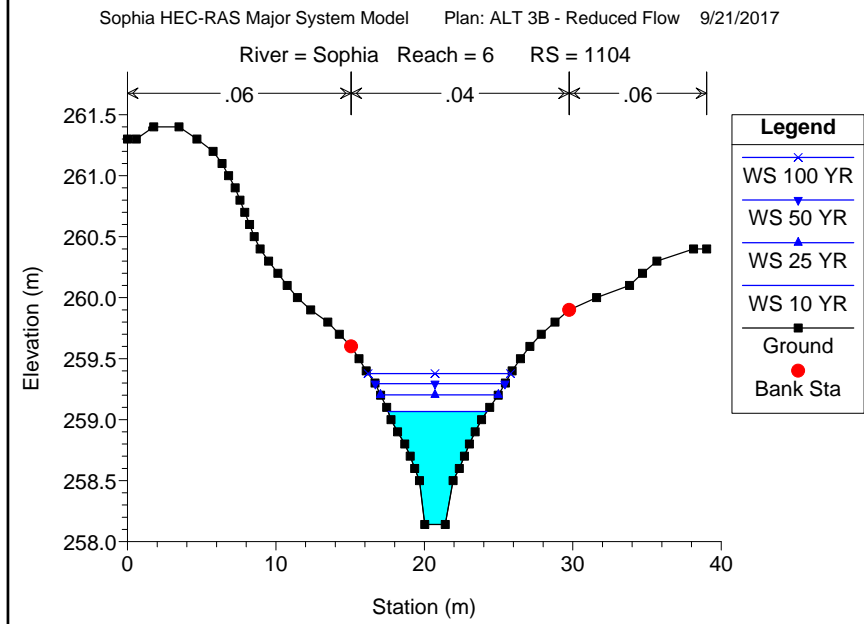
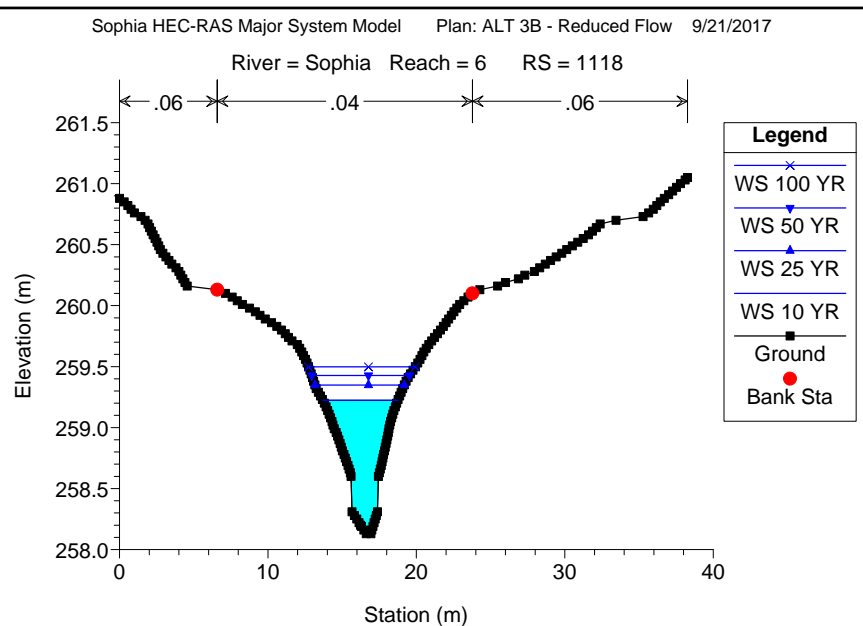
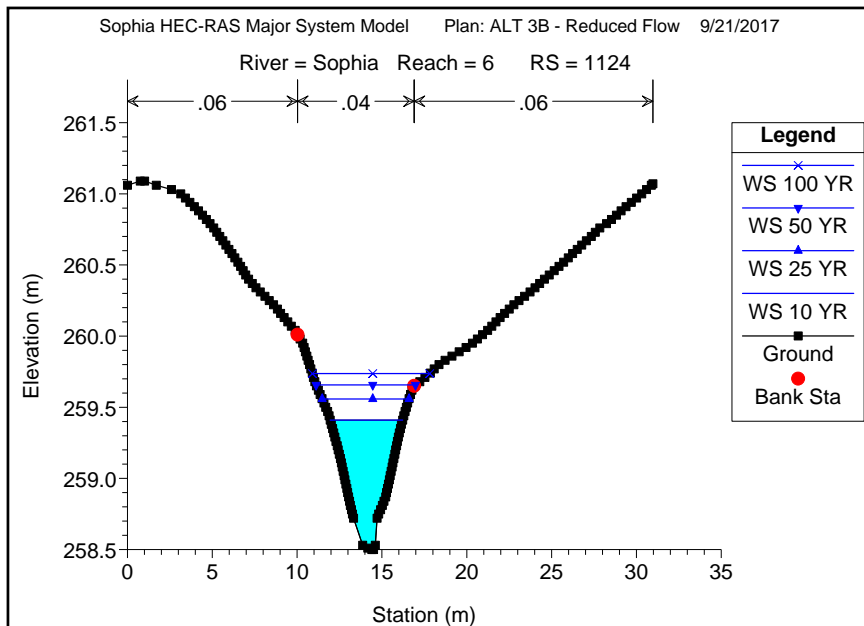
River = Owen Street Reach = 1 RS = 6.7

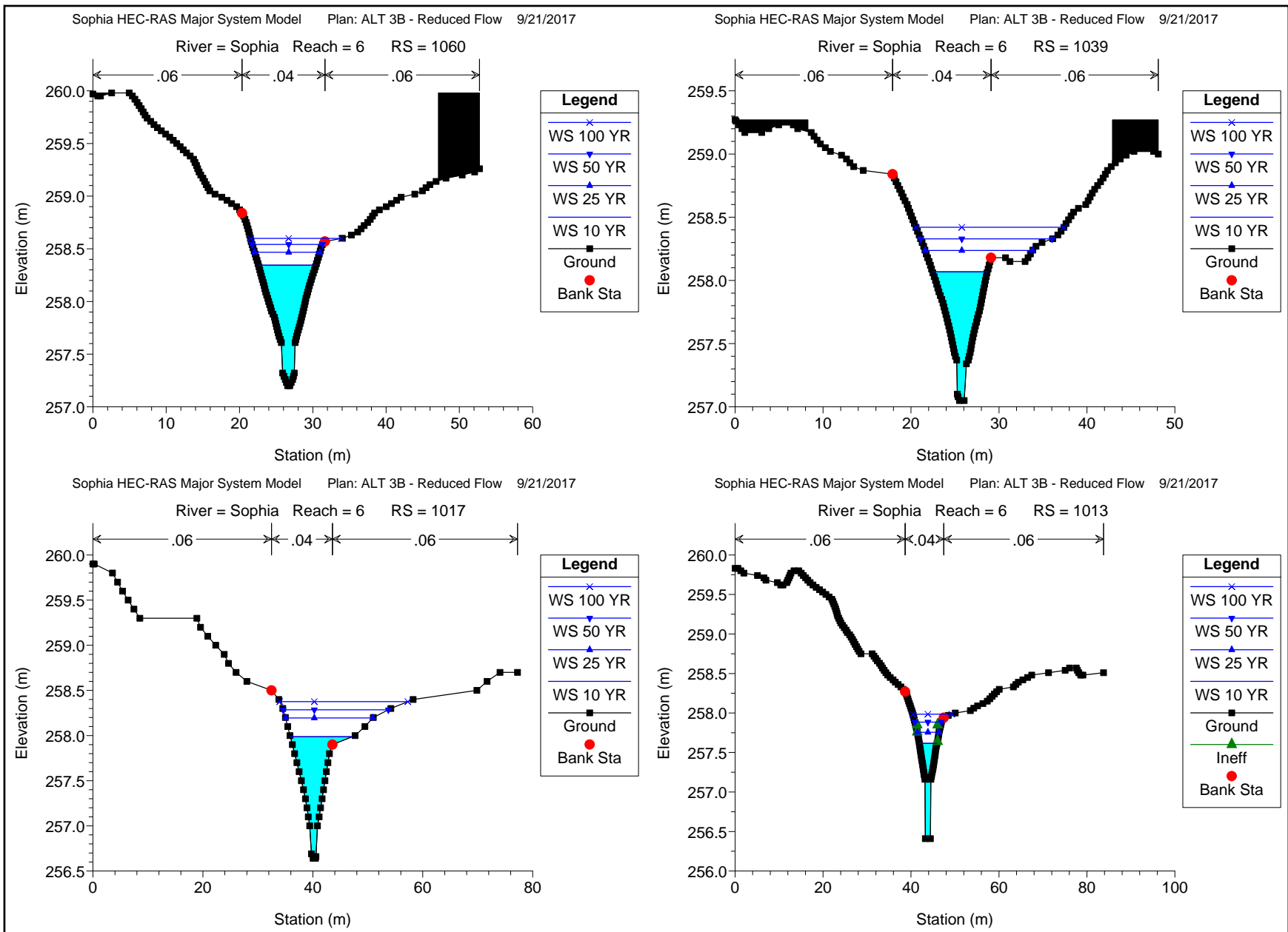


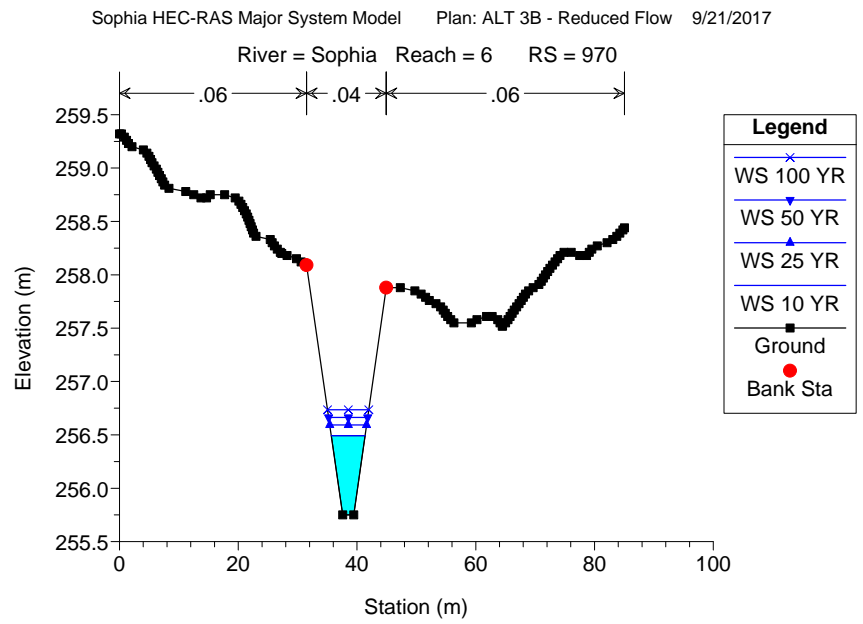
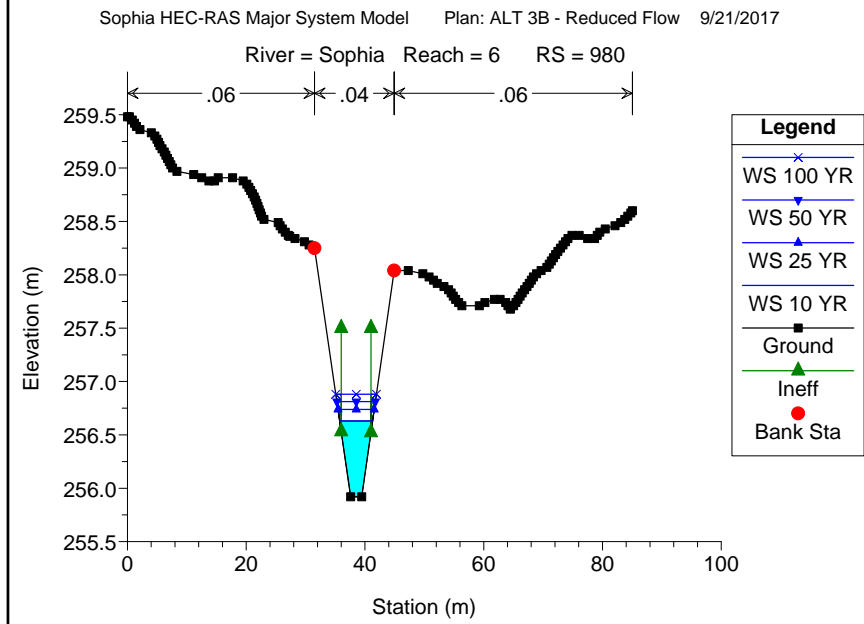
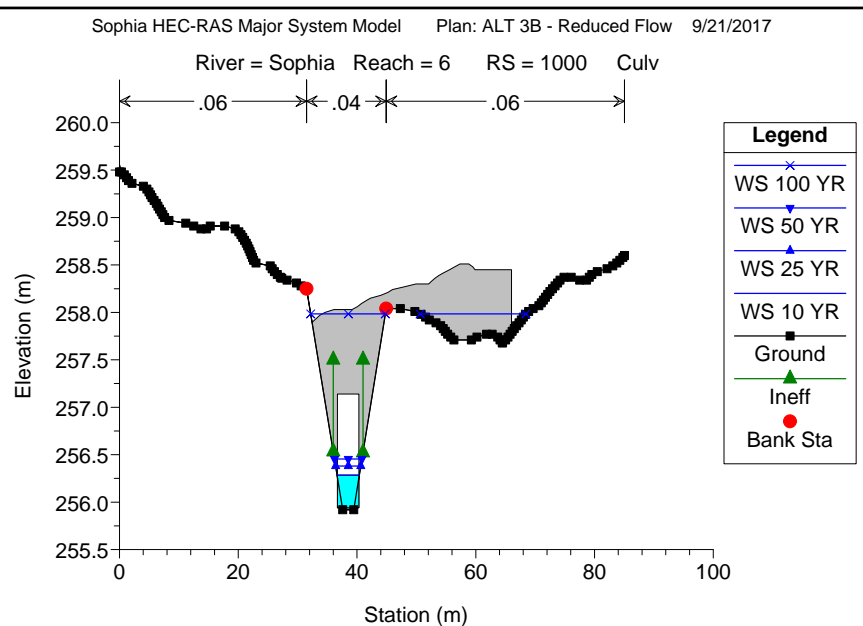
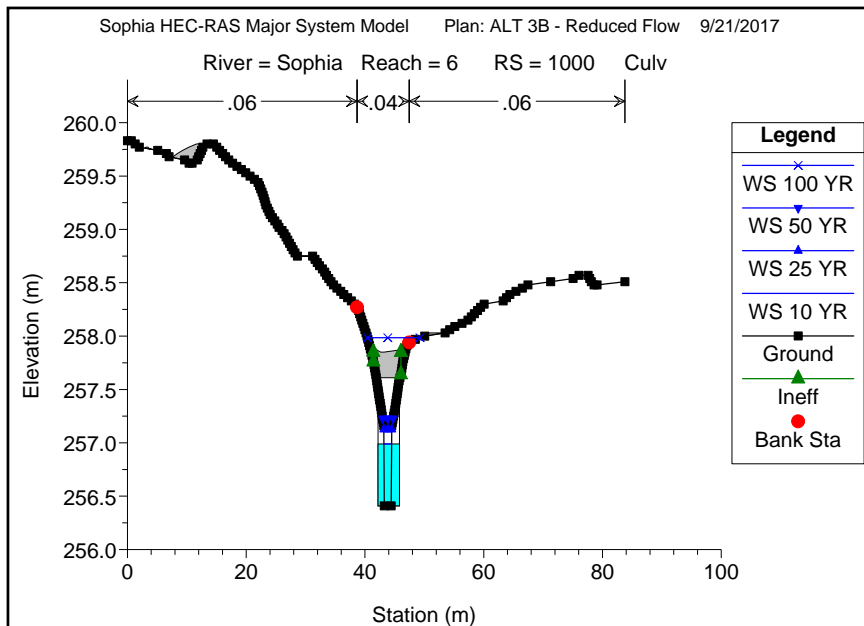
Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

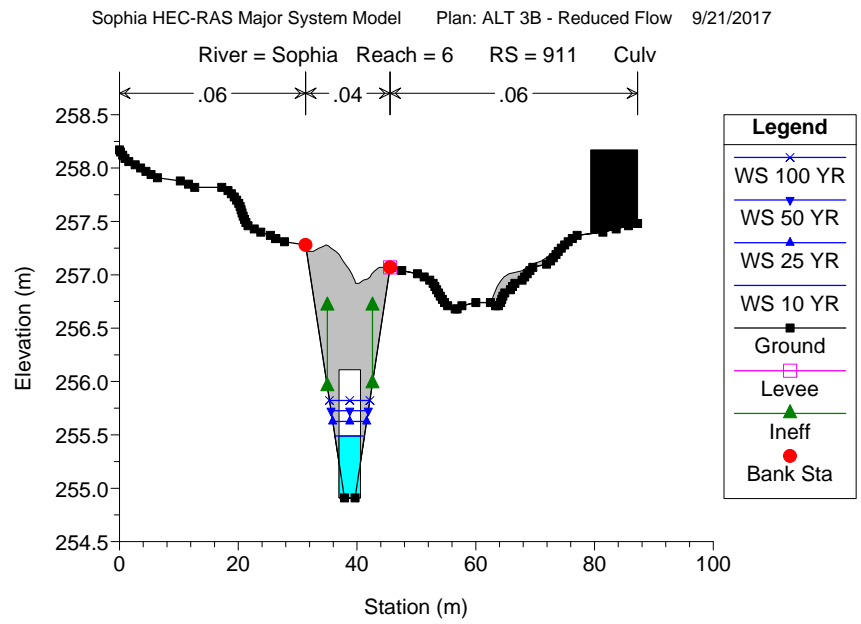
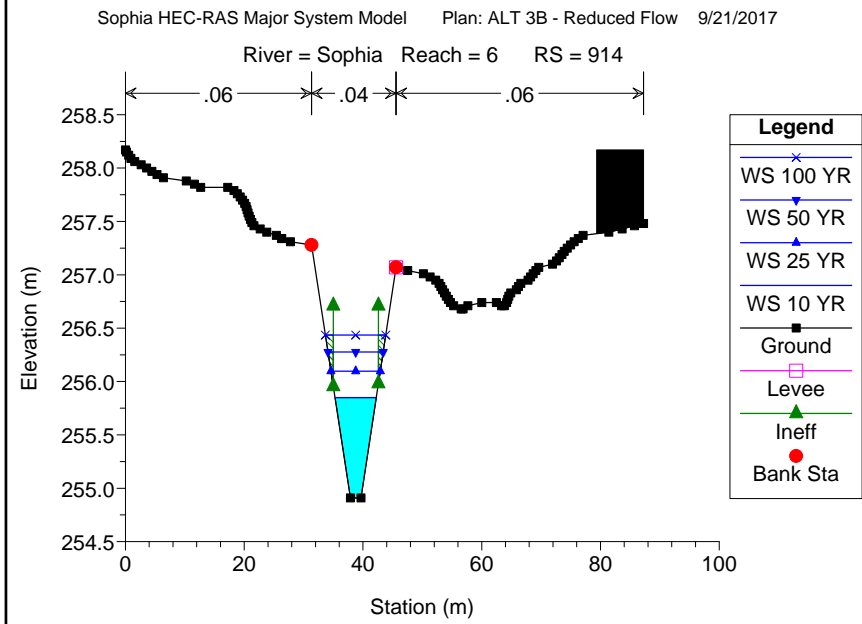
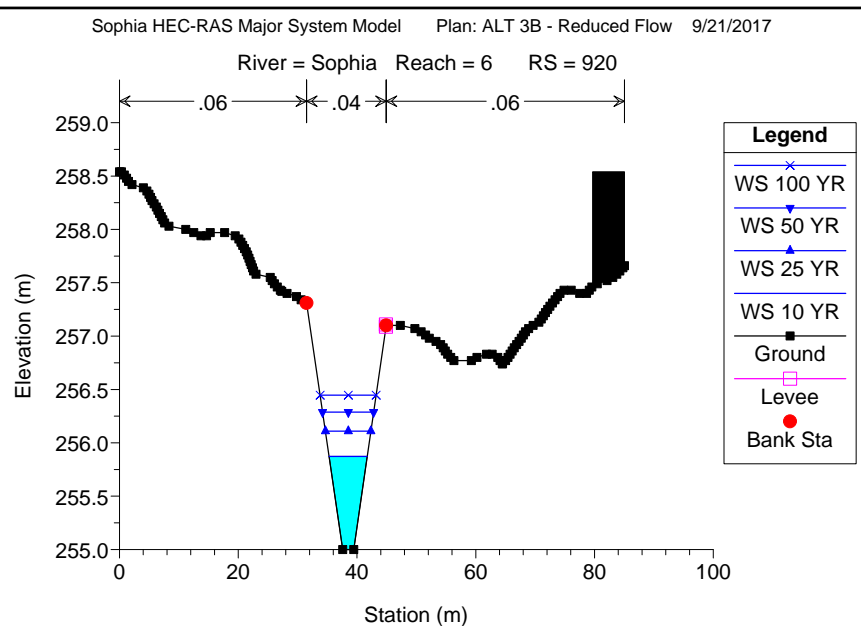
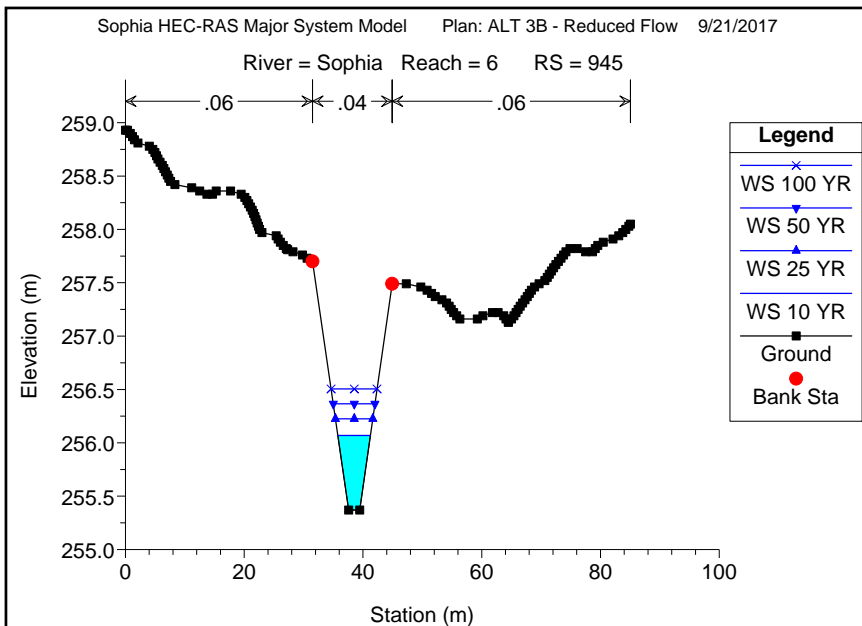
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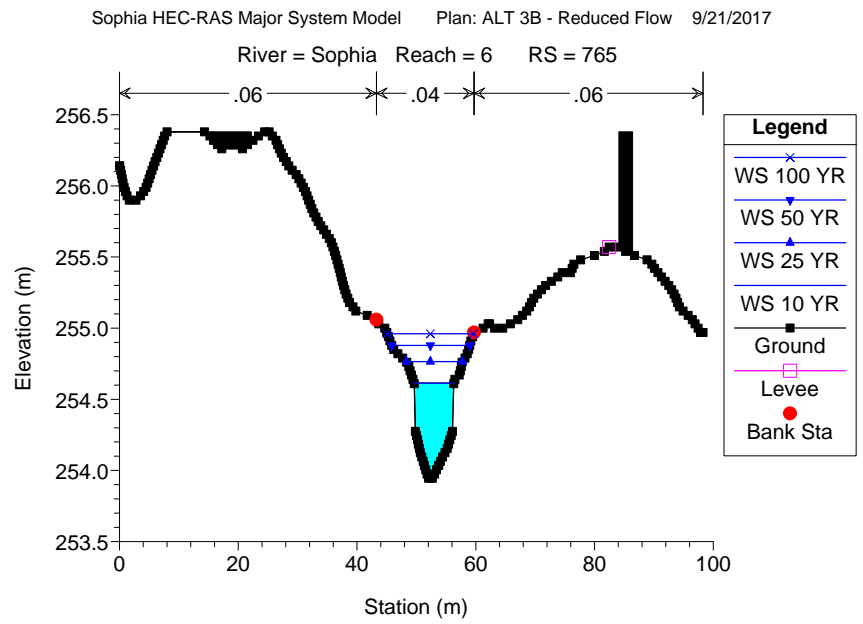
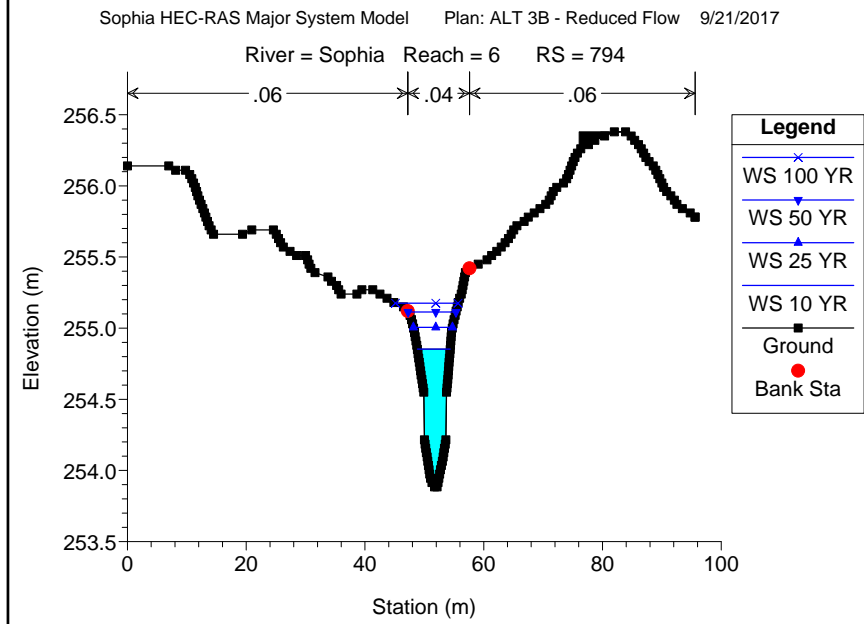
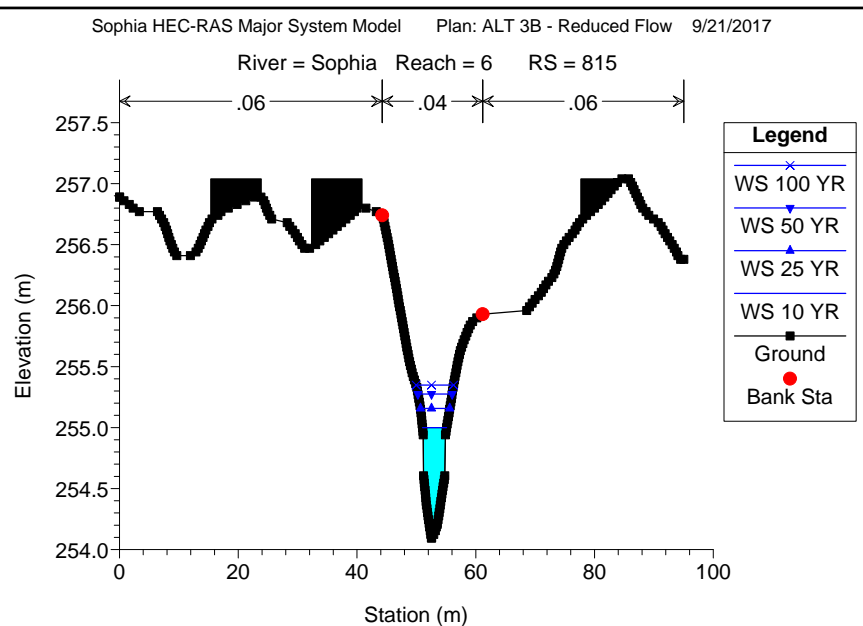
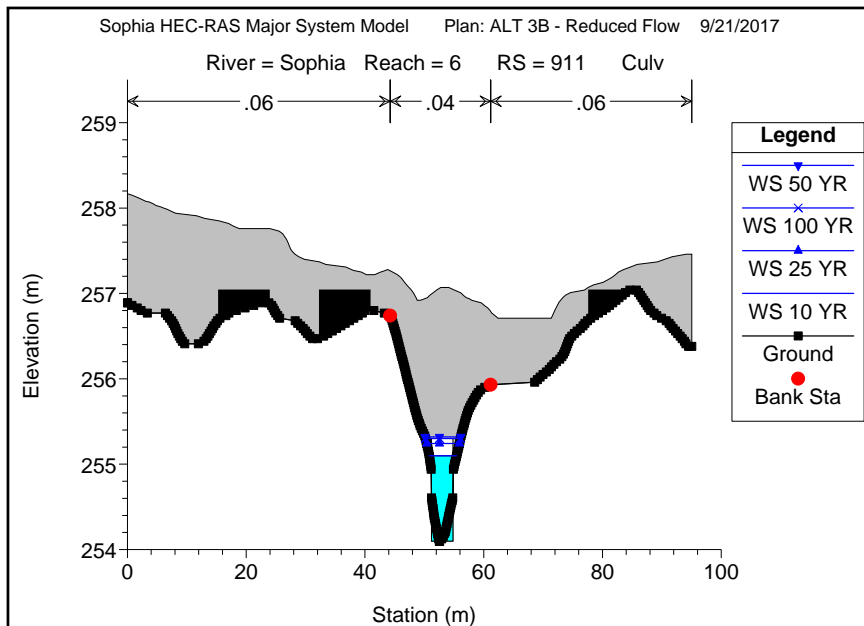


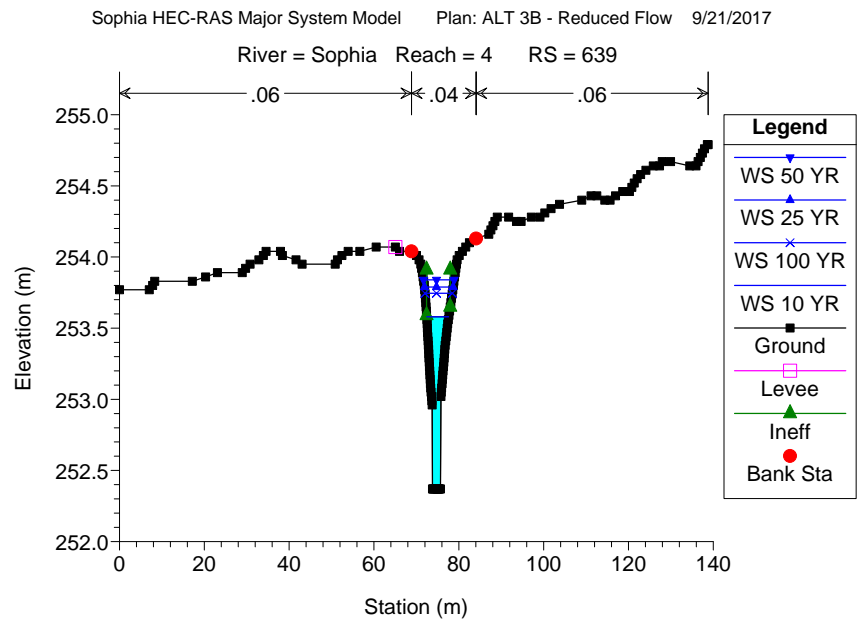
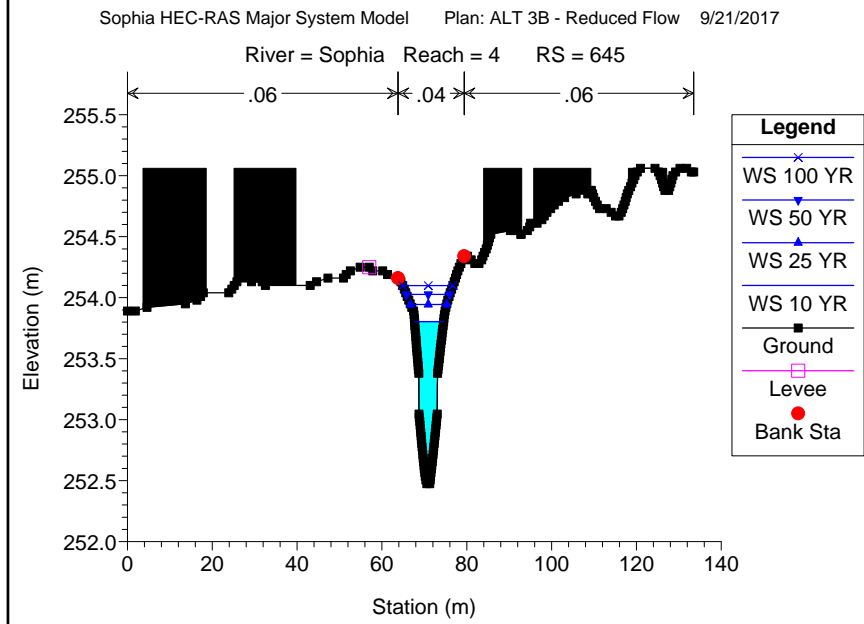
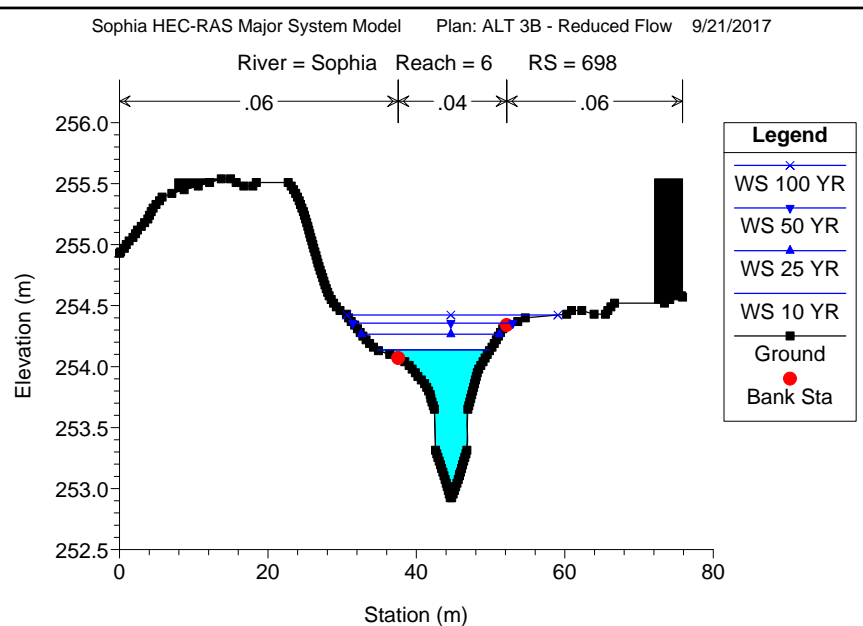
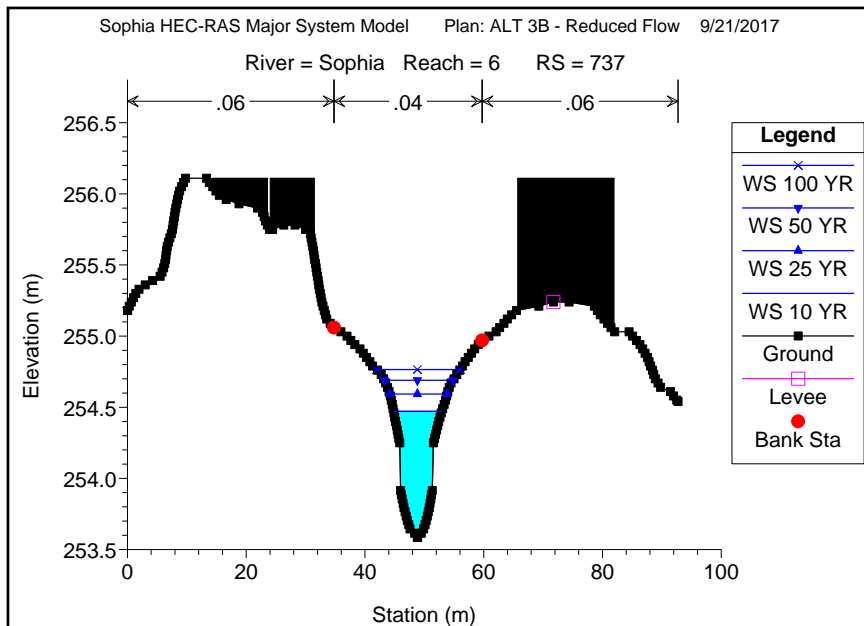


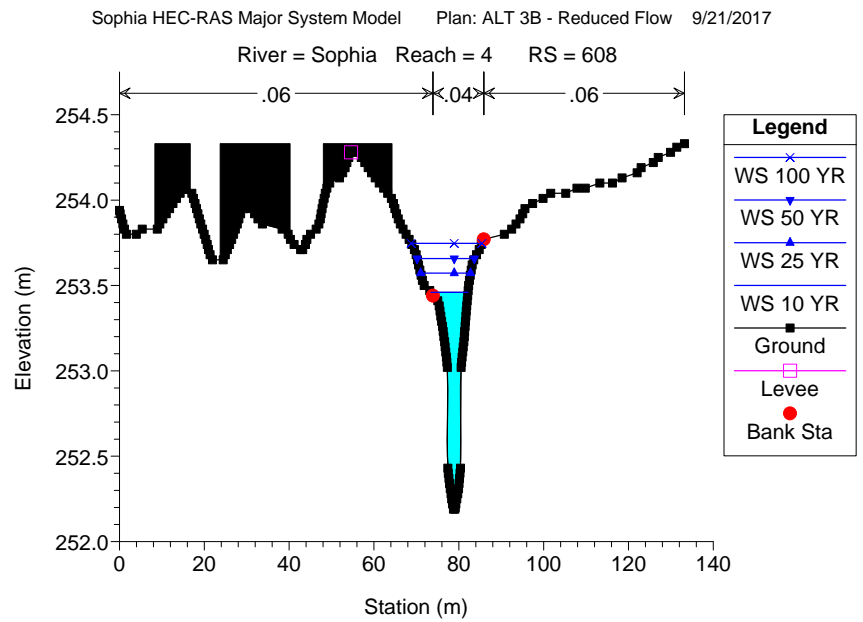
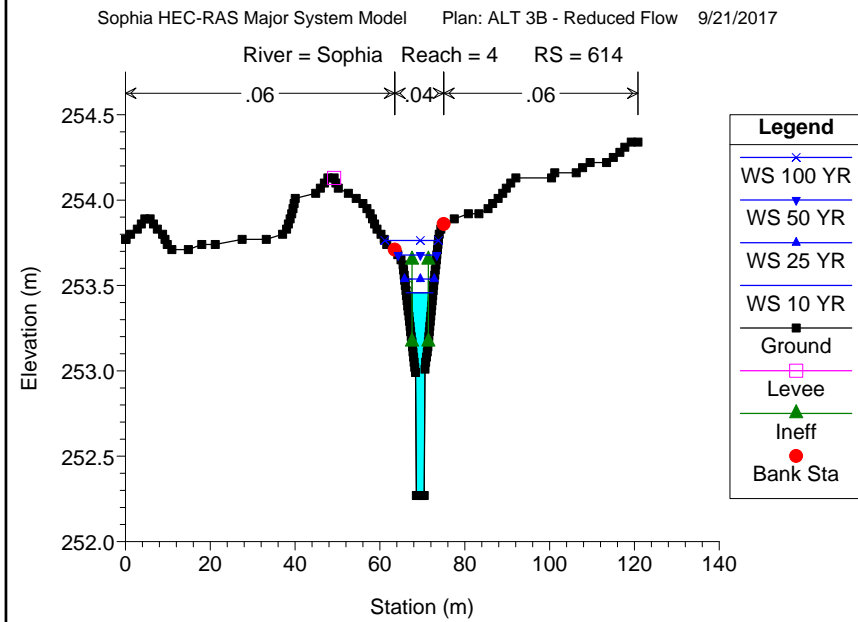
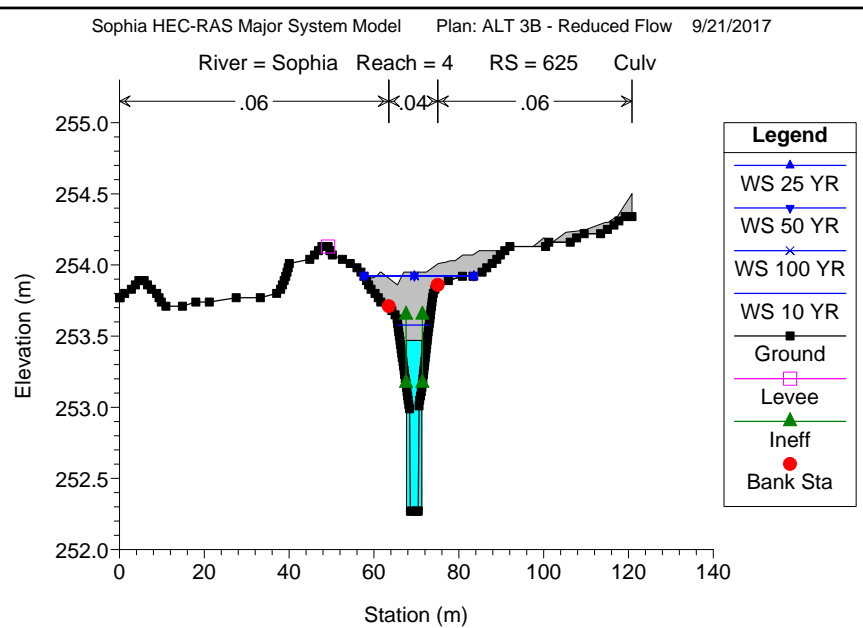
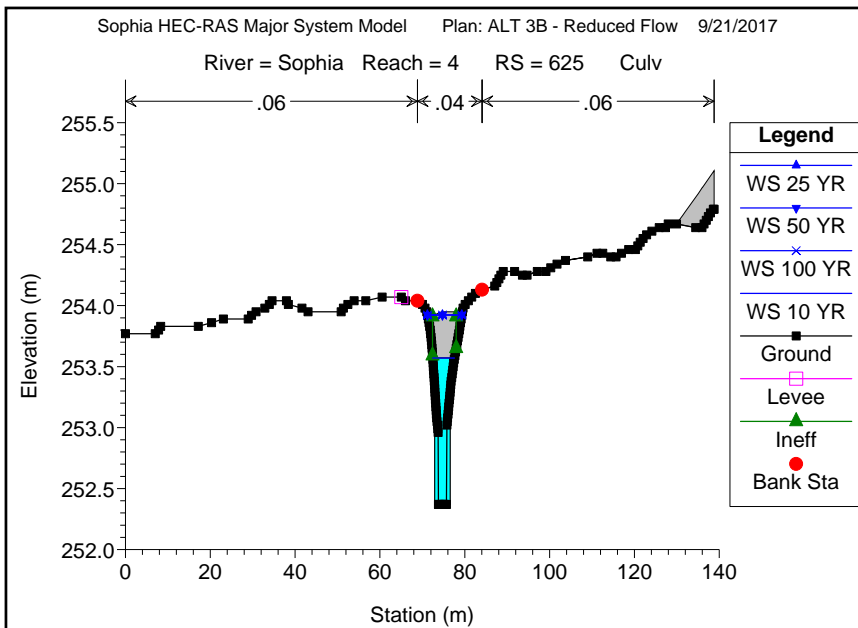


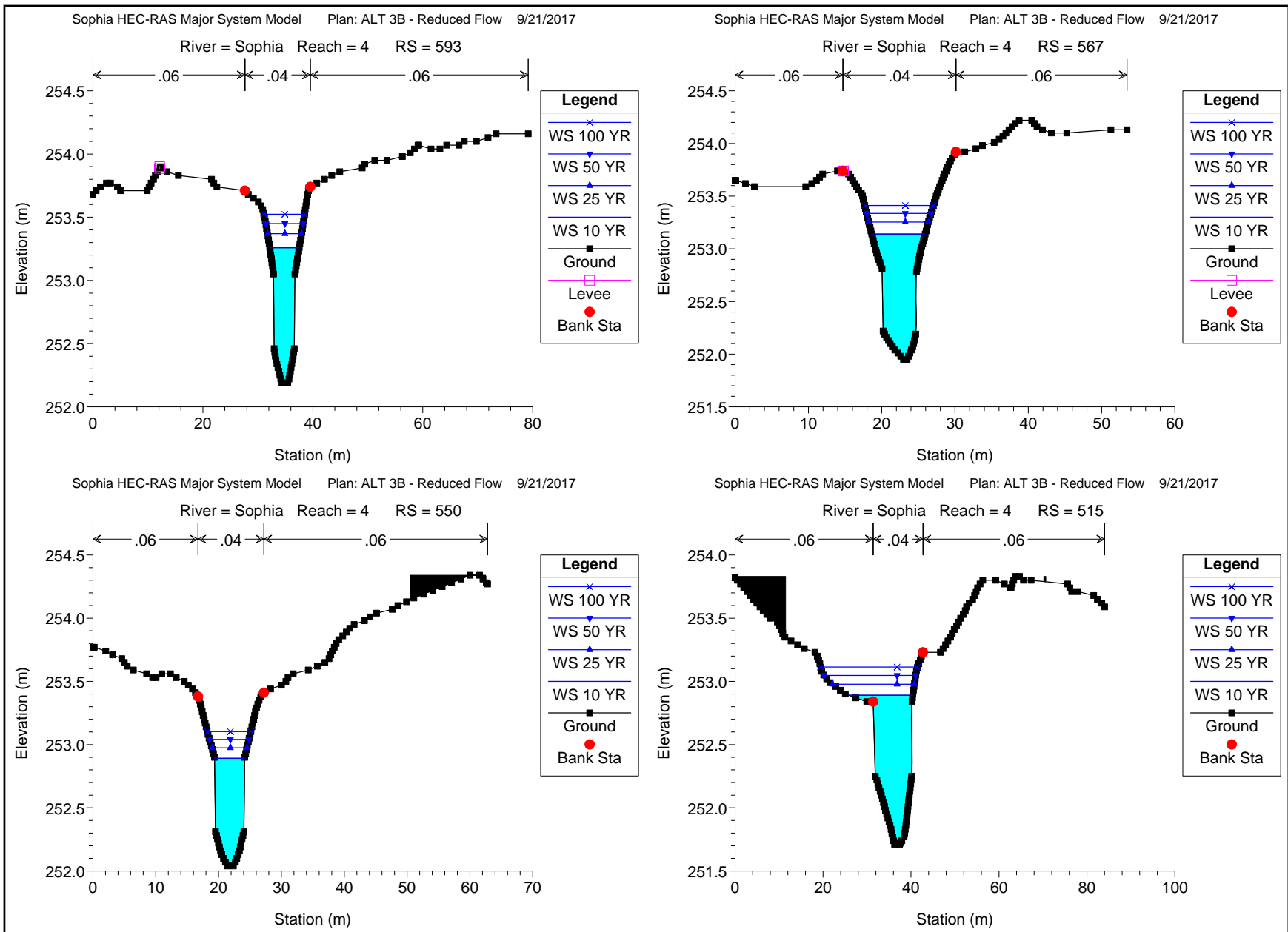


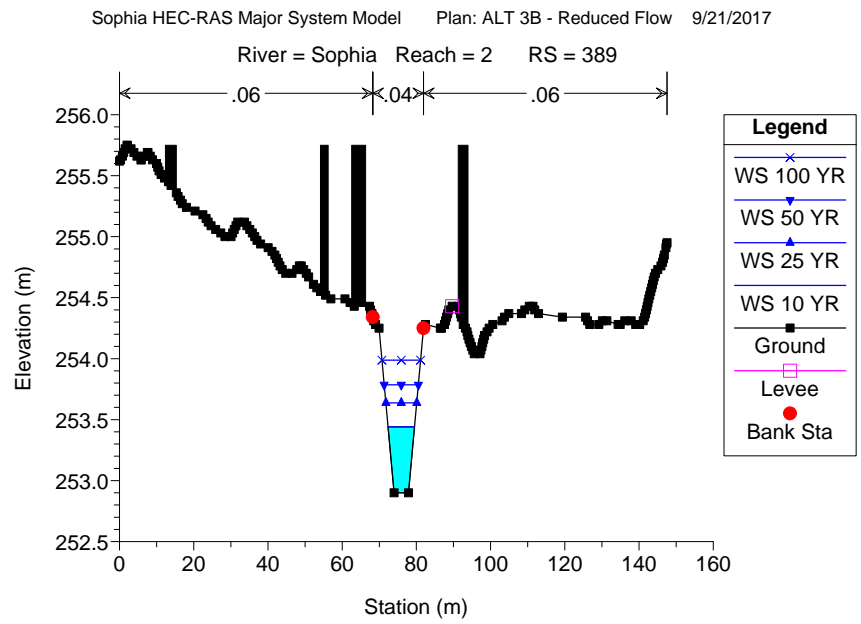
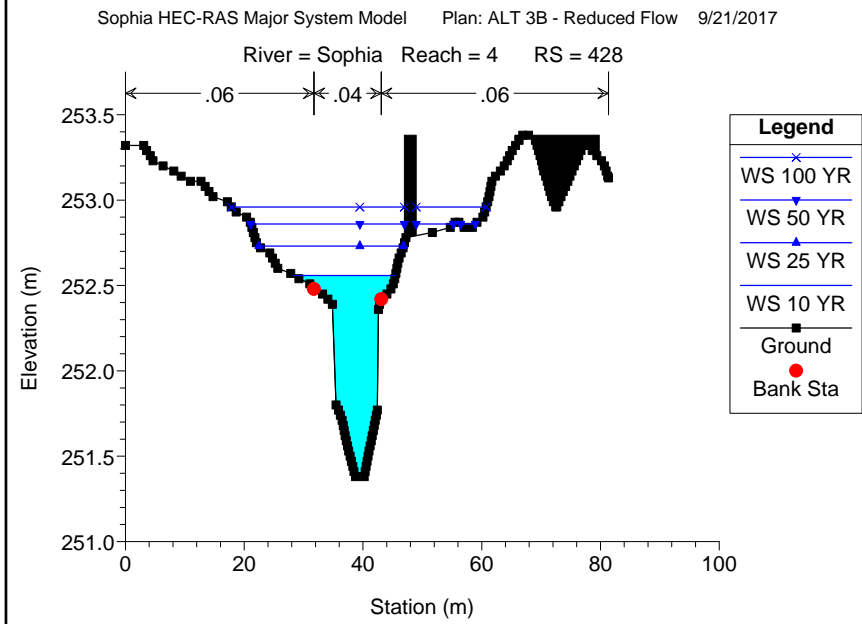
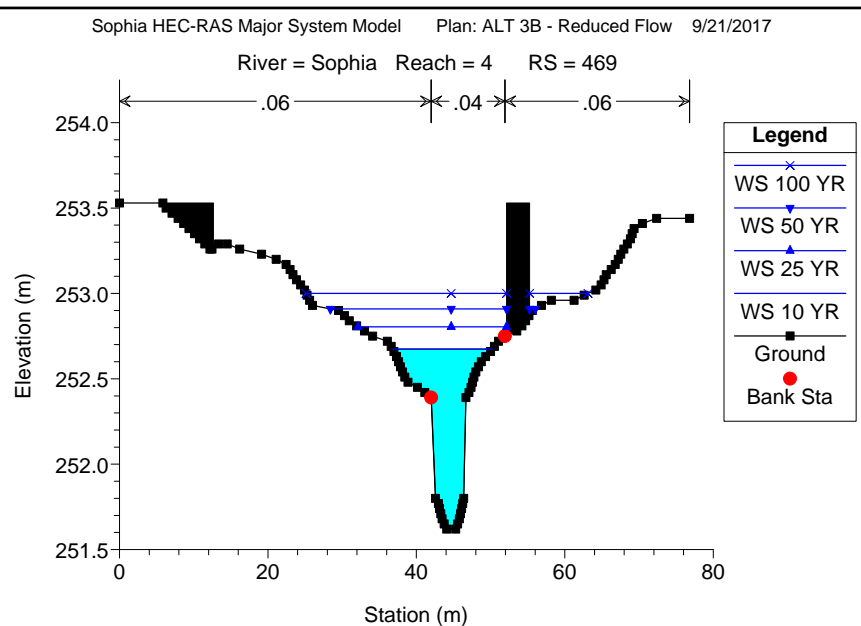
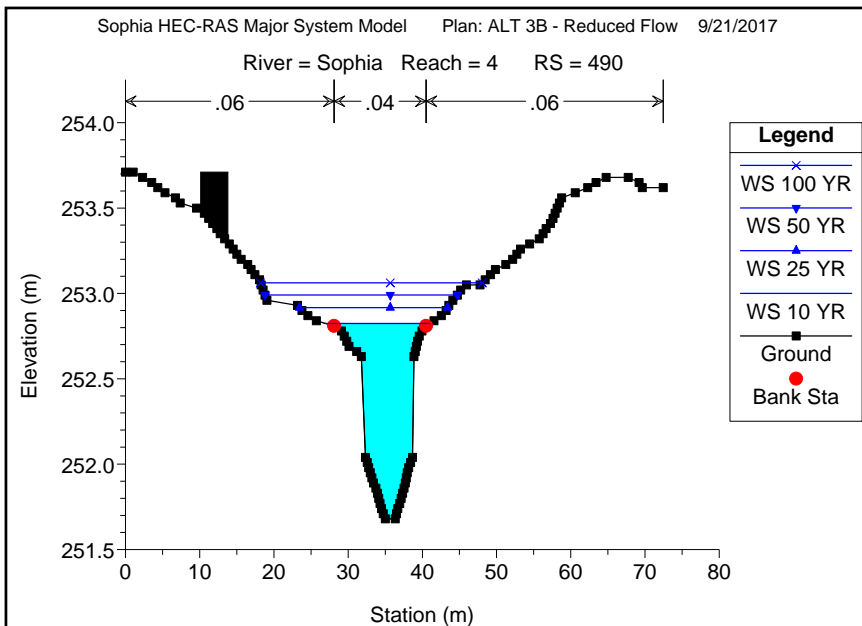


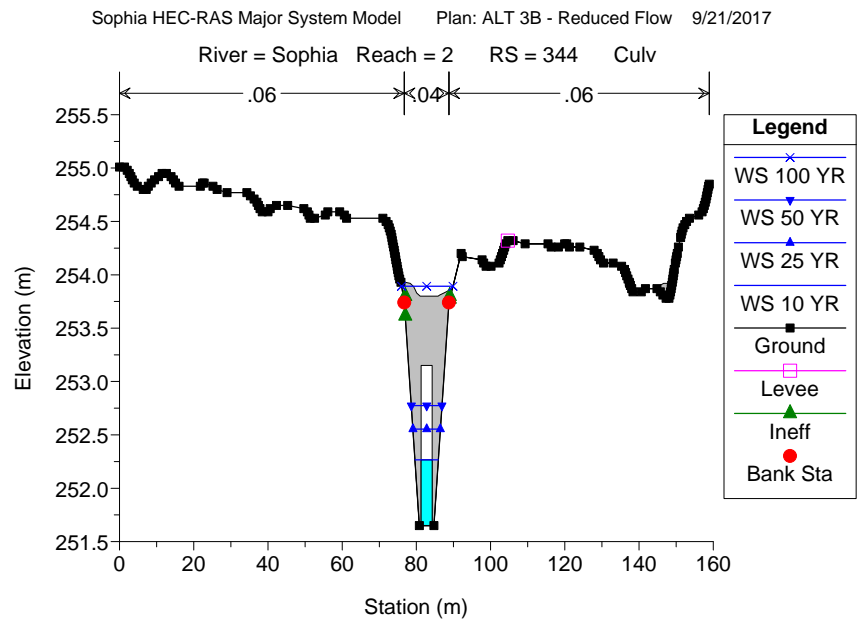
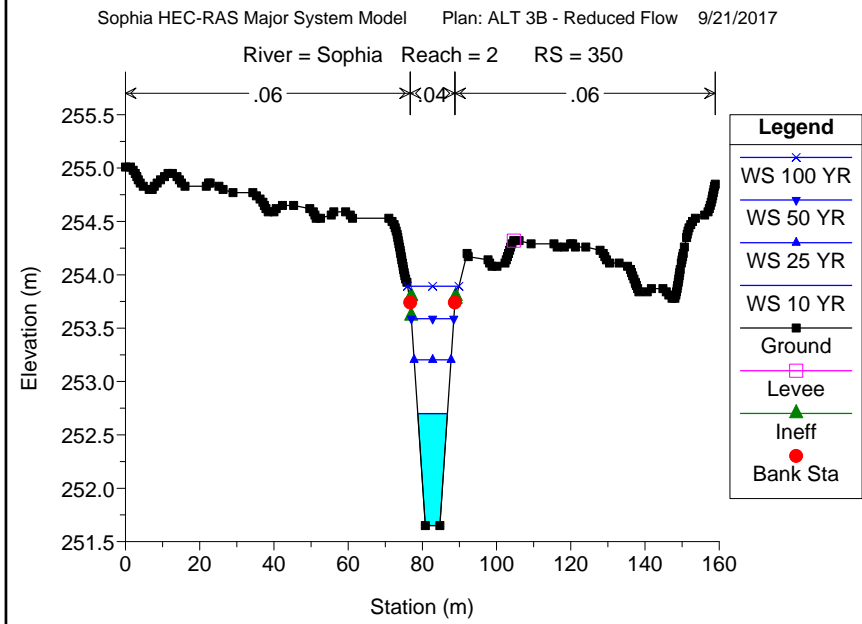
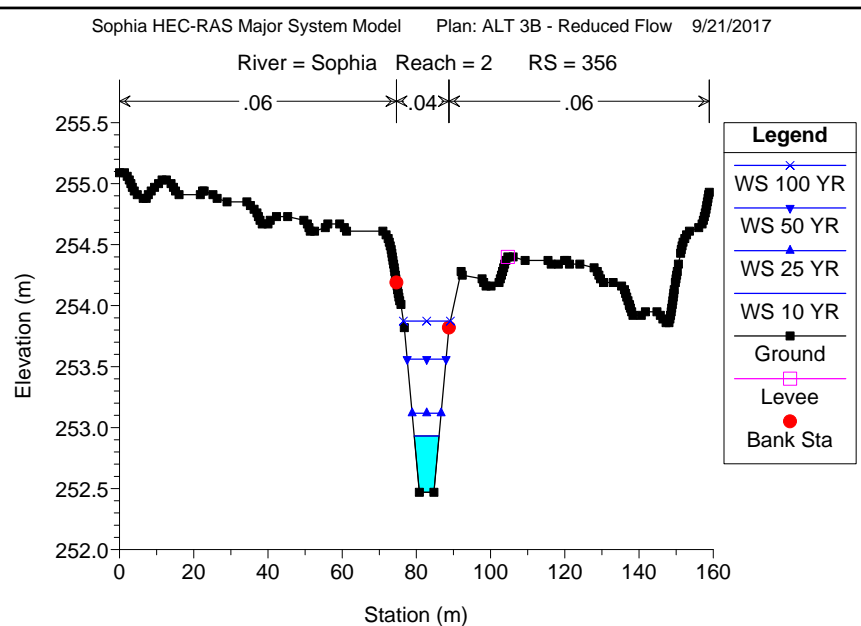
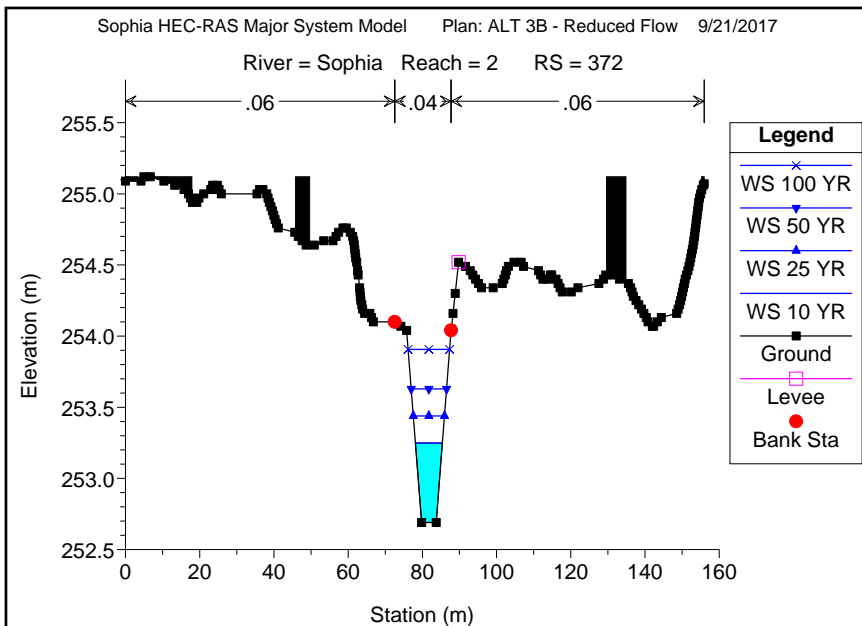


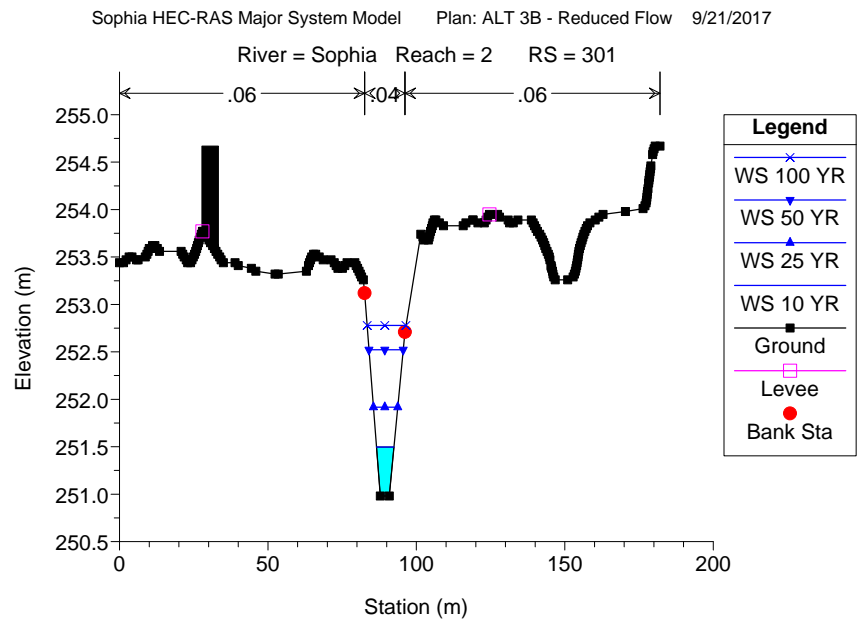
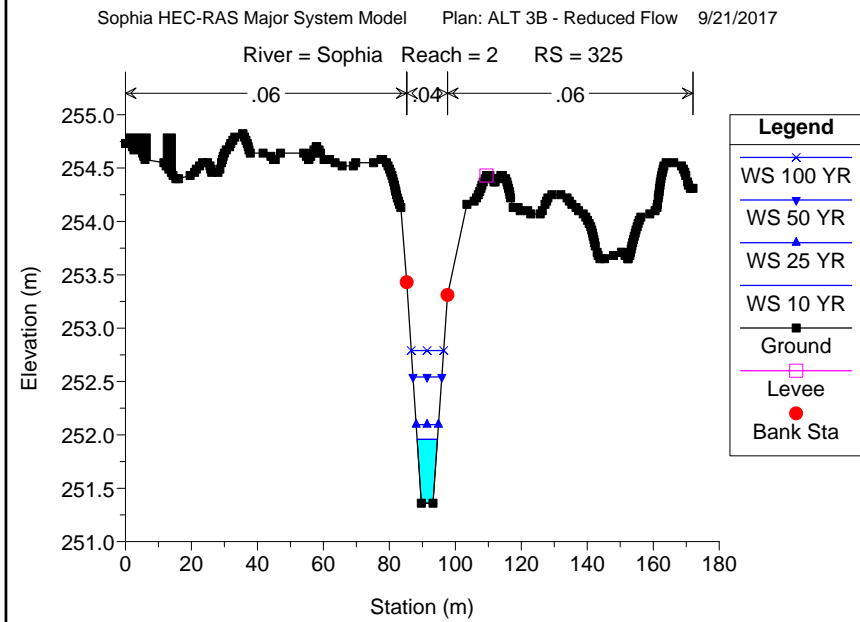
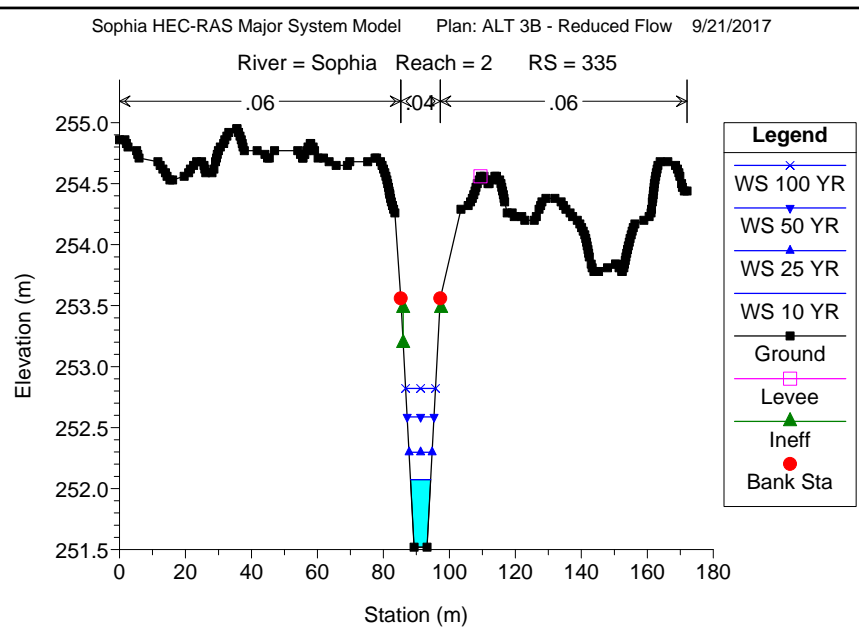
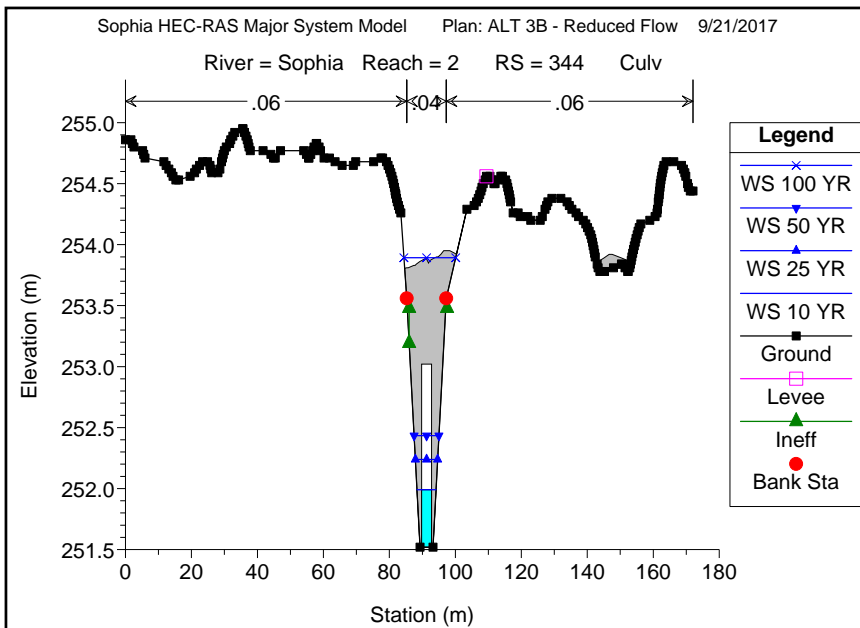


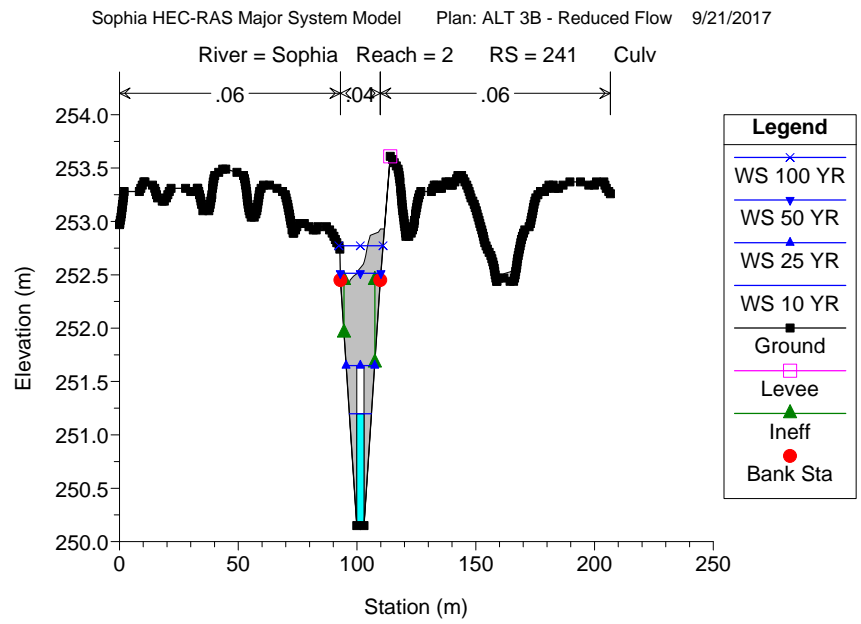
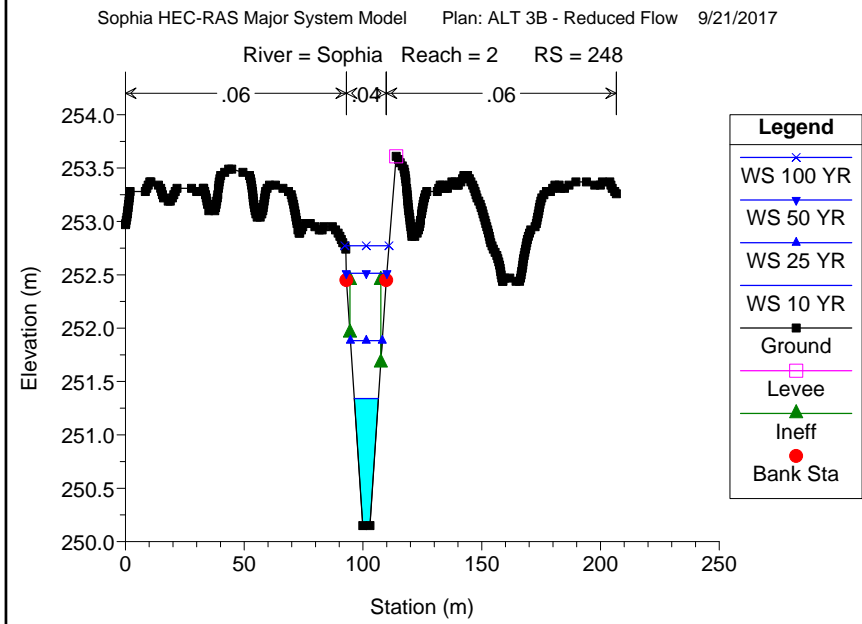
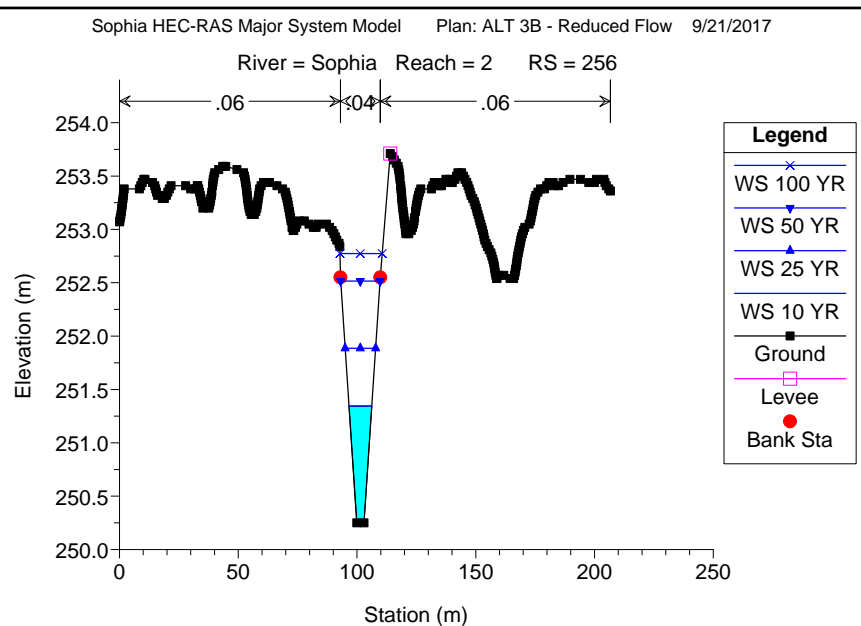
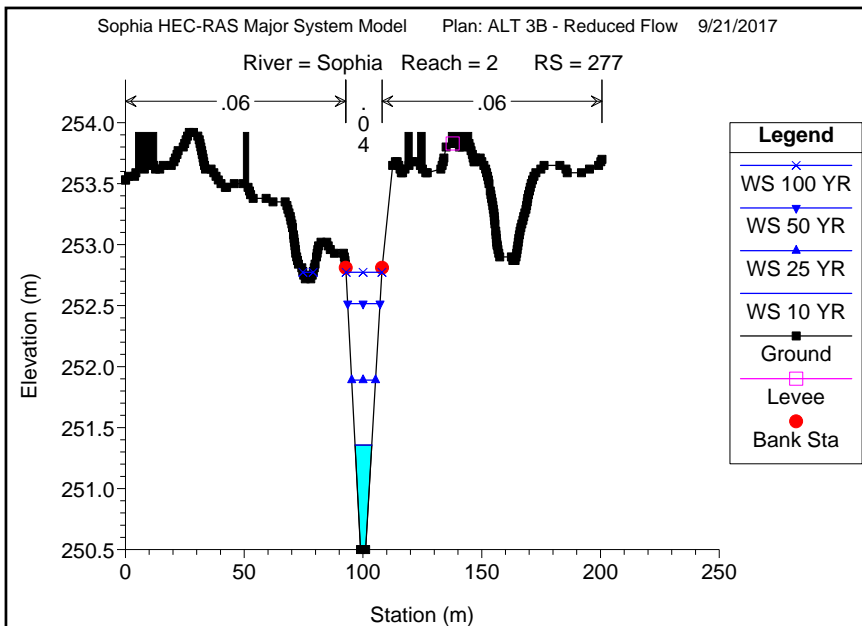


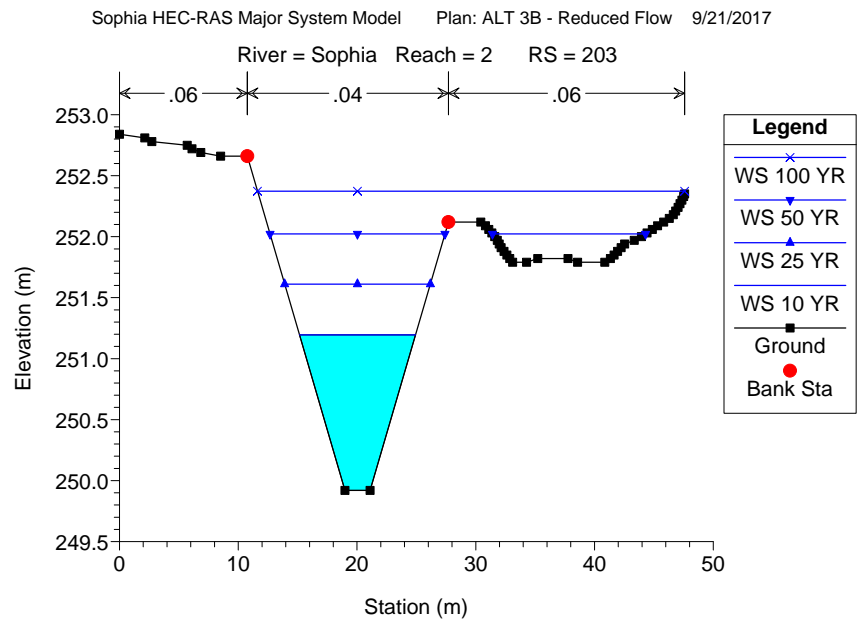
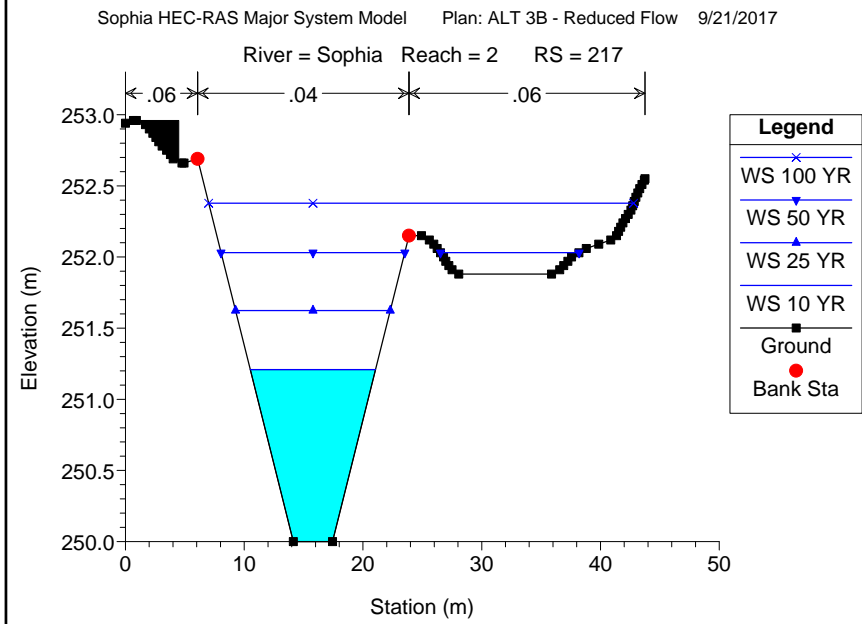
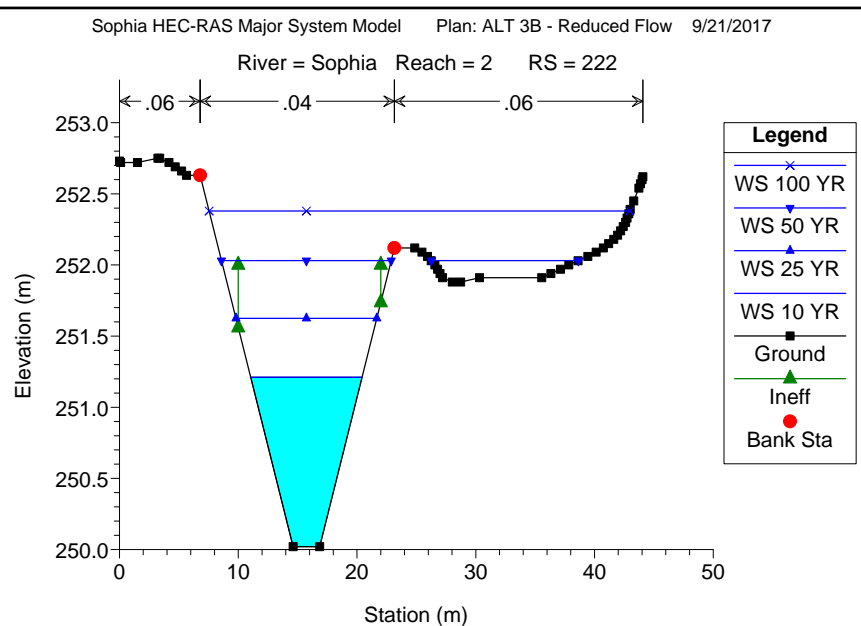
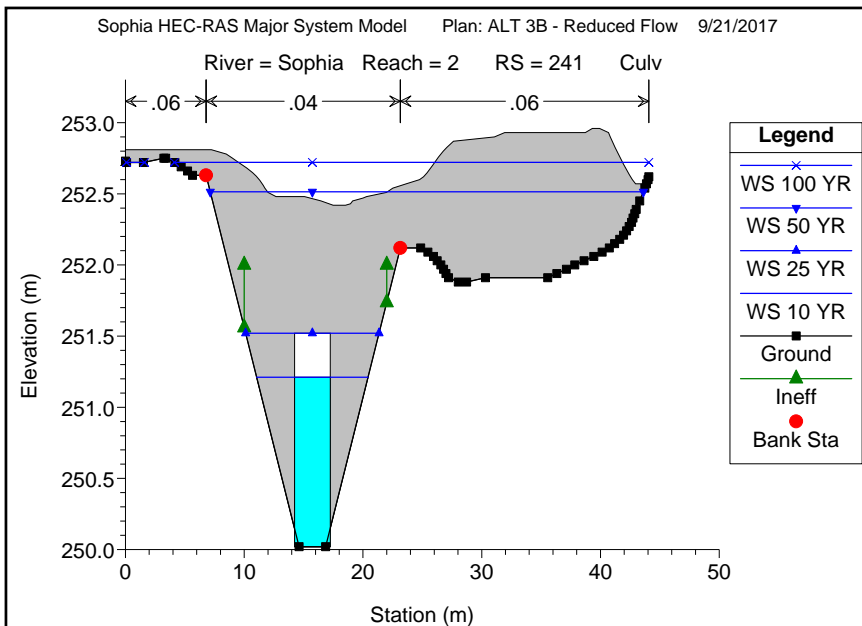


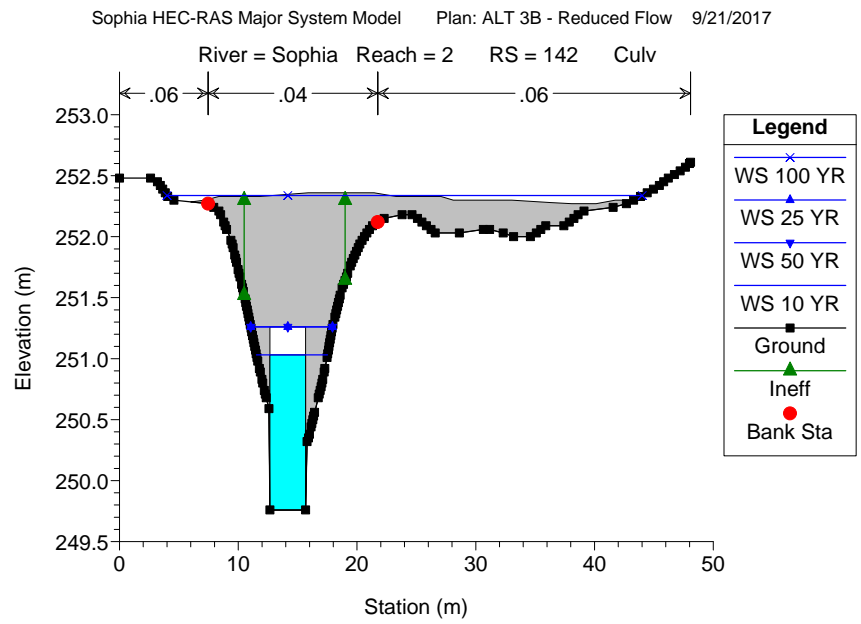
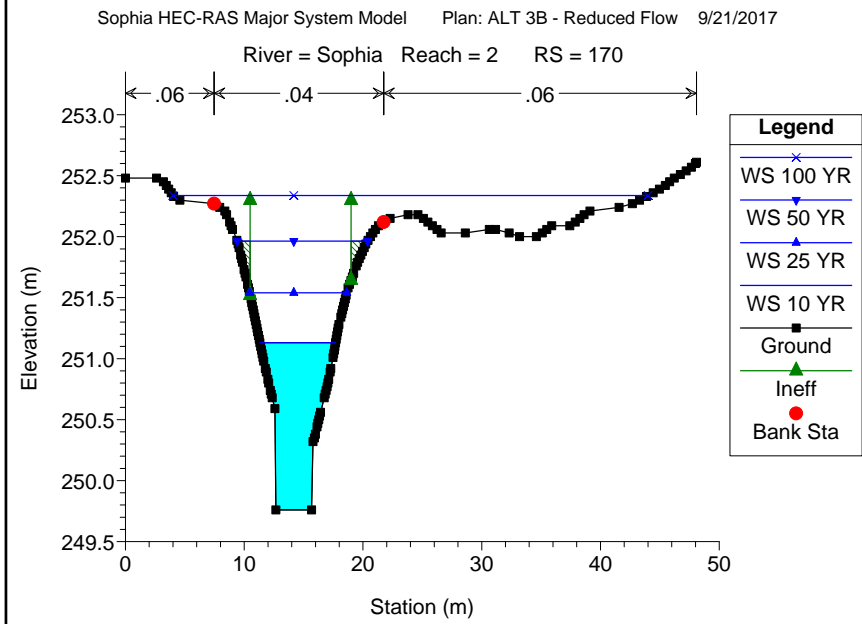
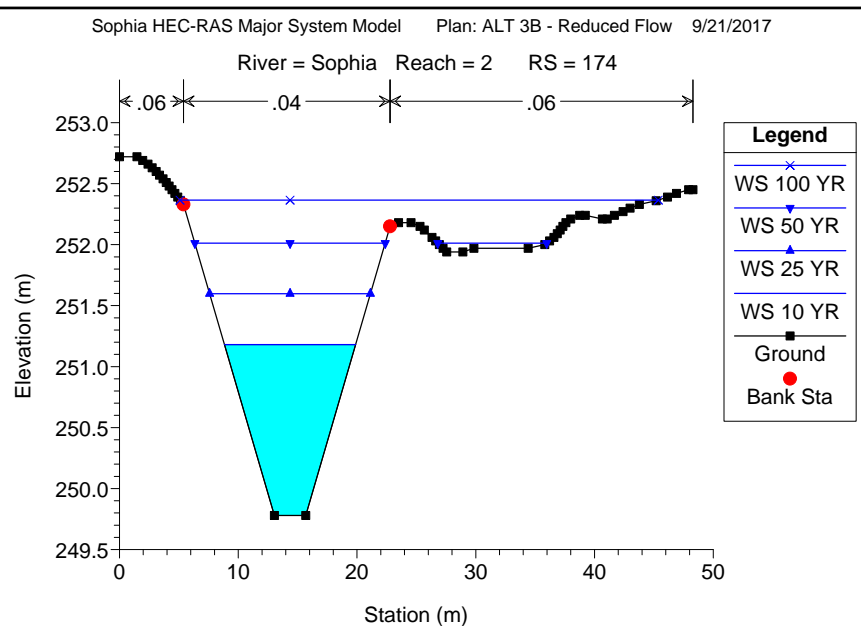
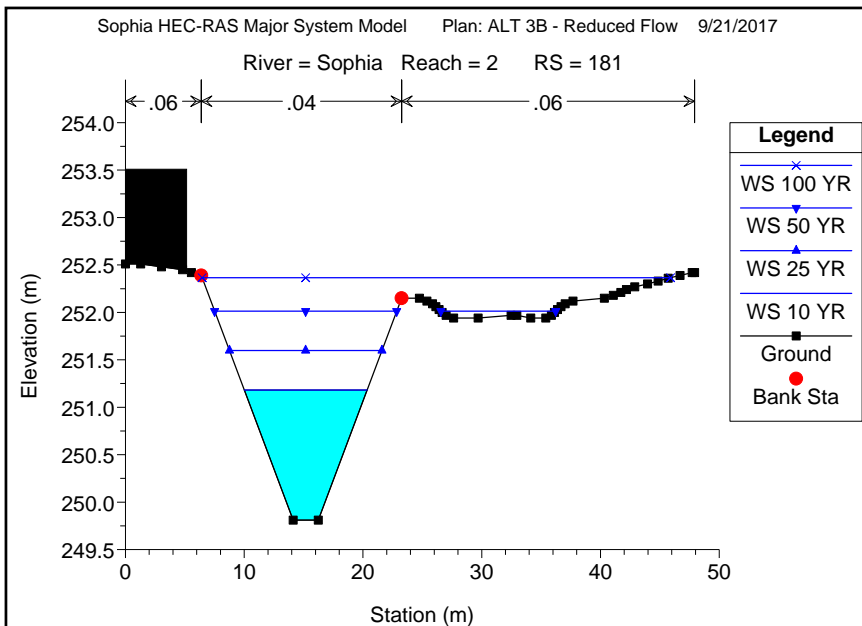


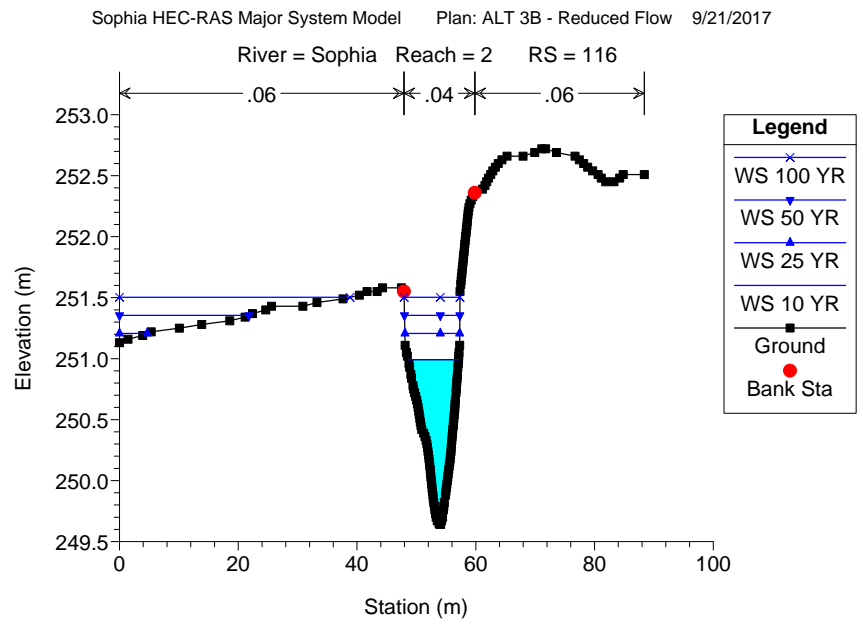
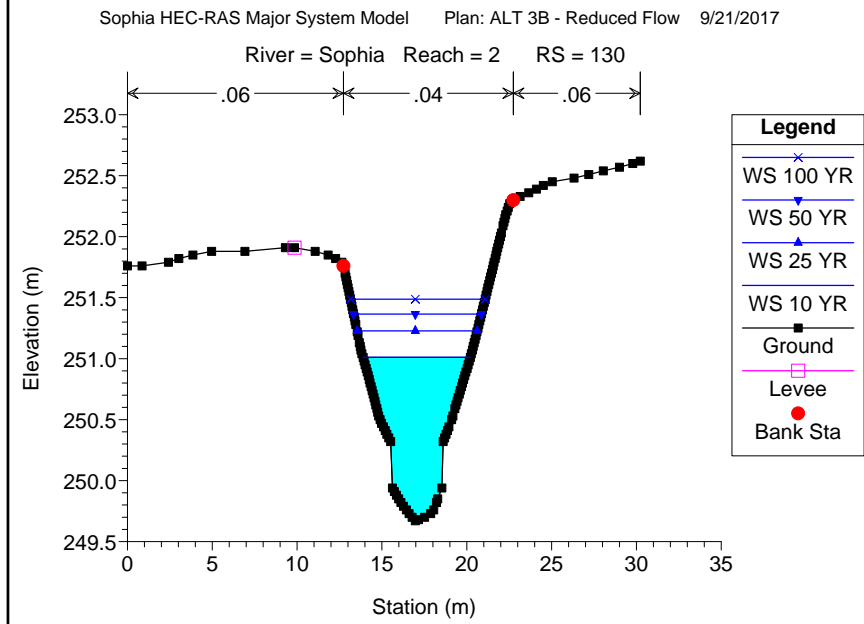
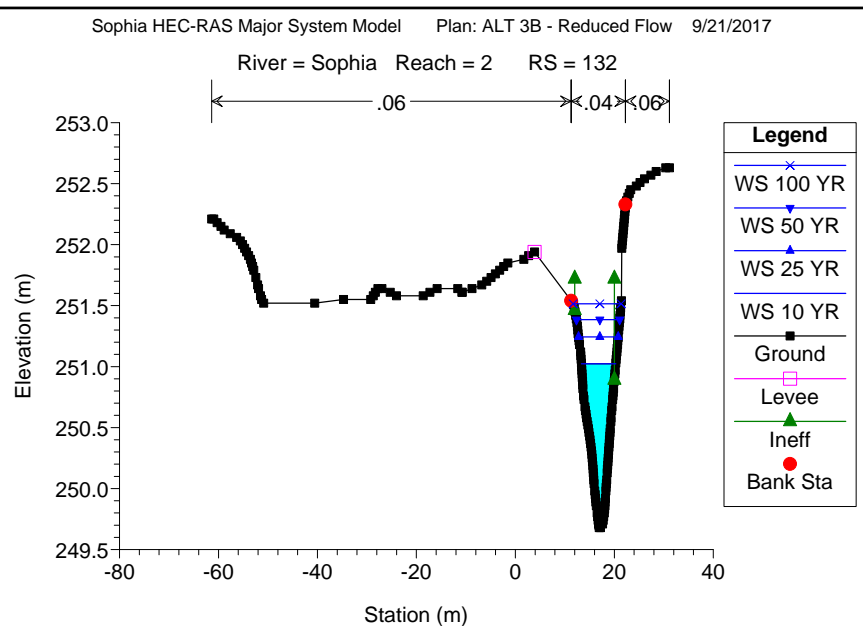
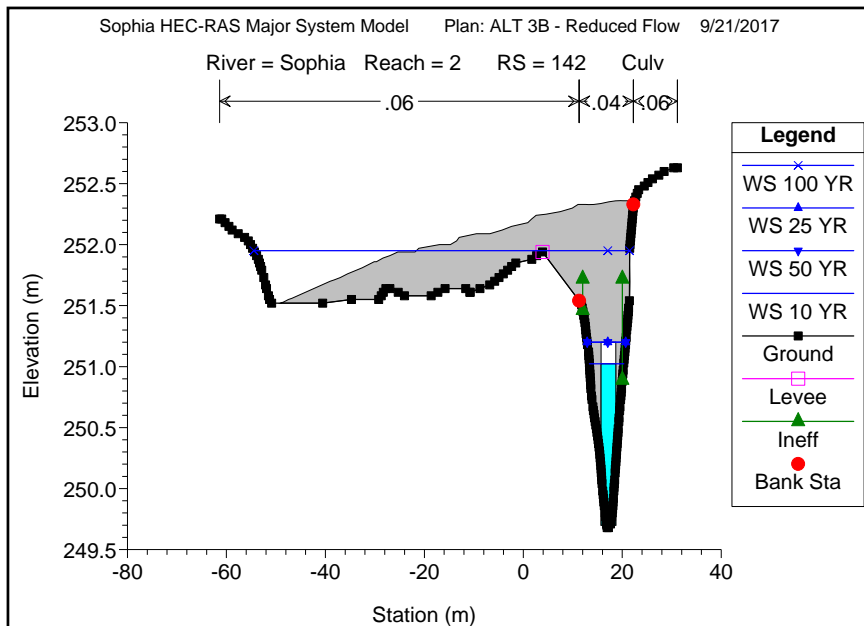


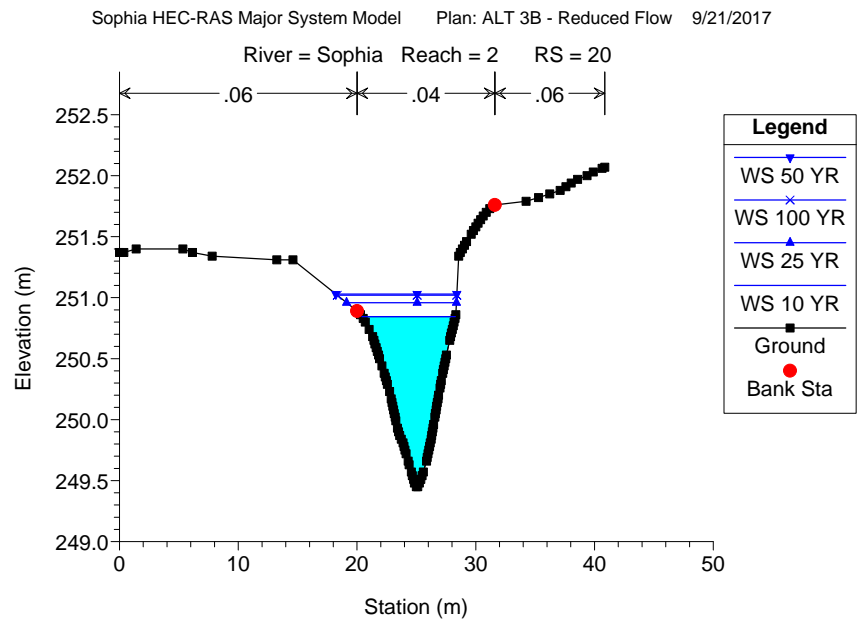
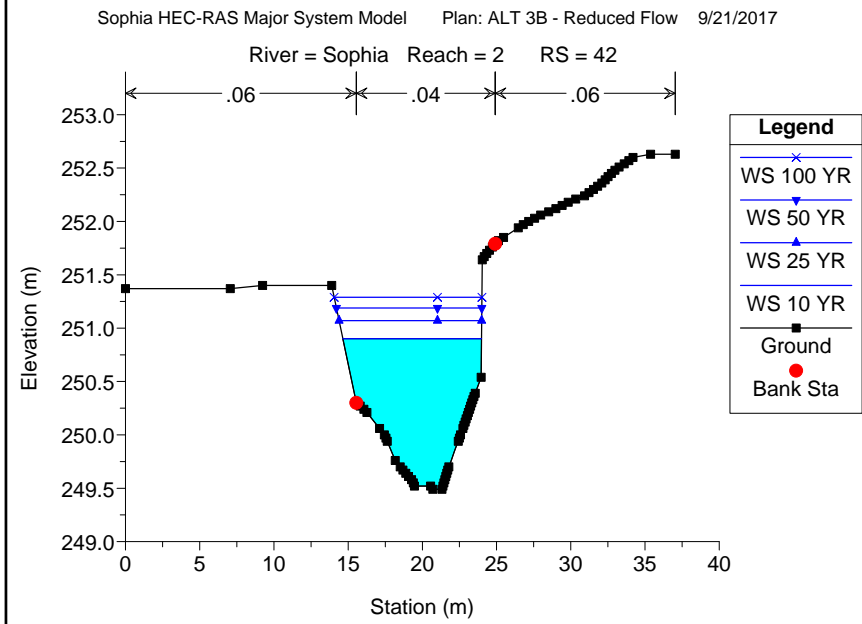
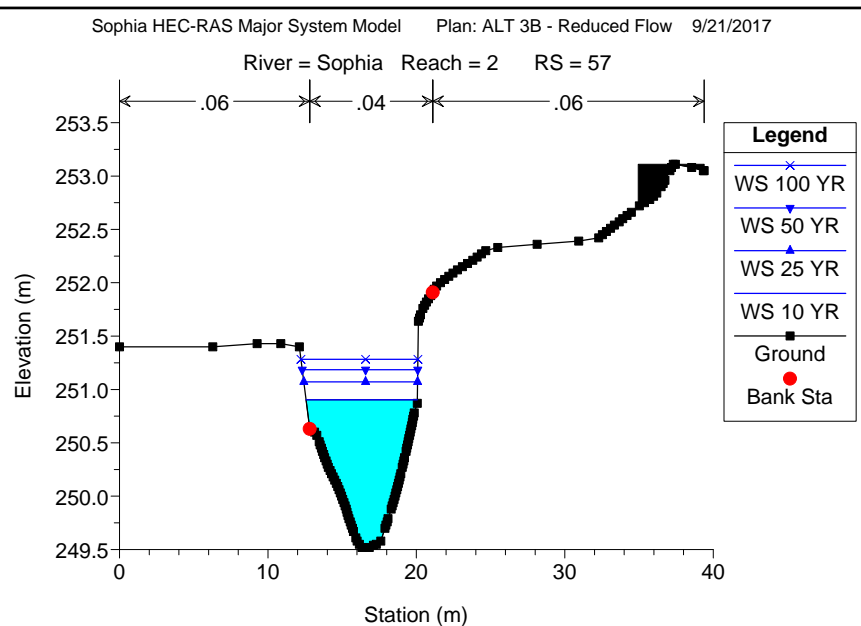
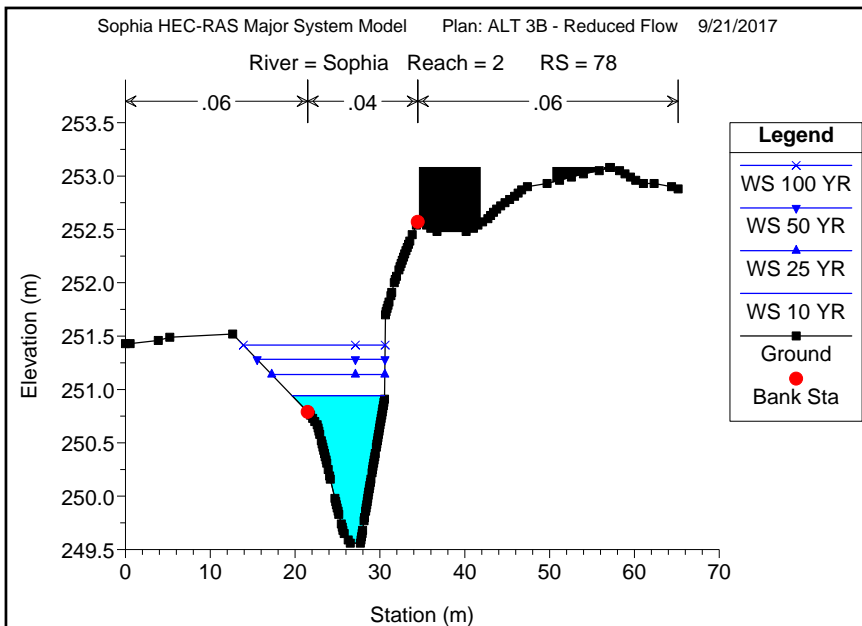


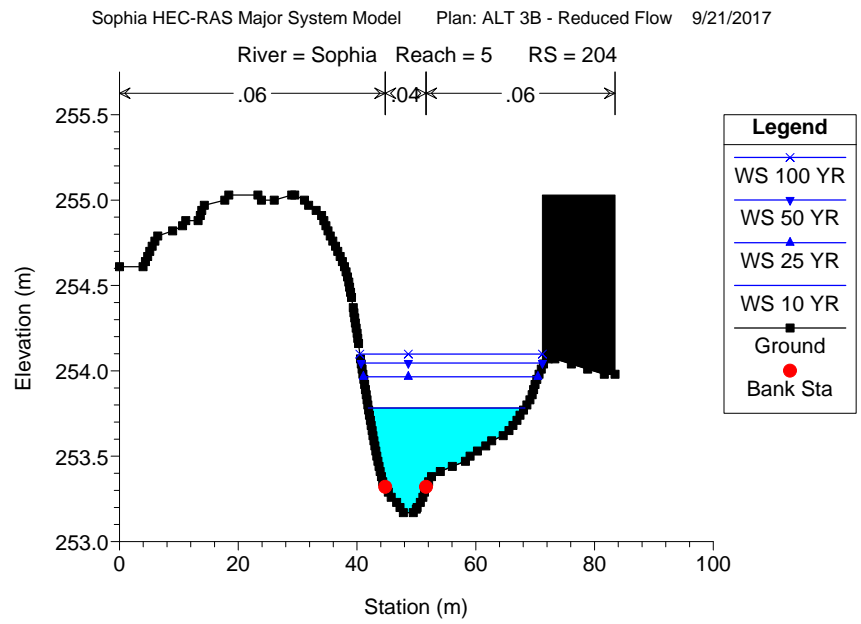
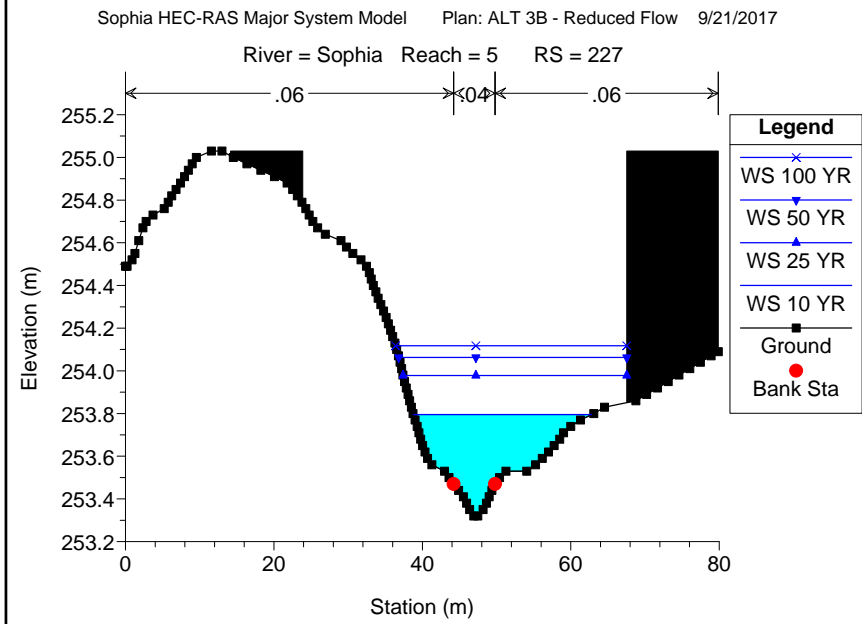
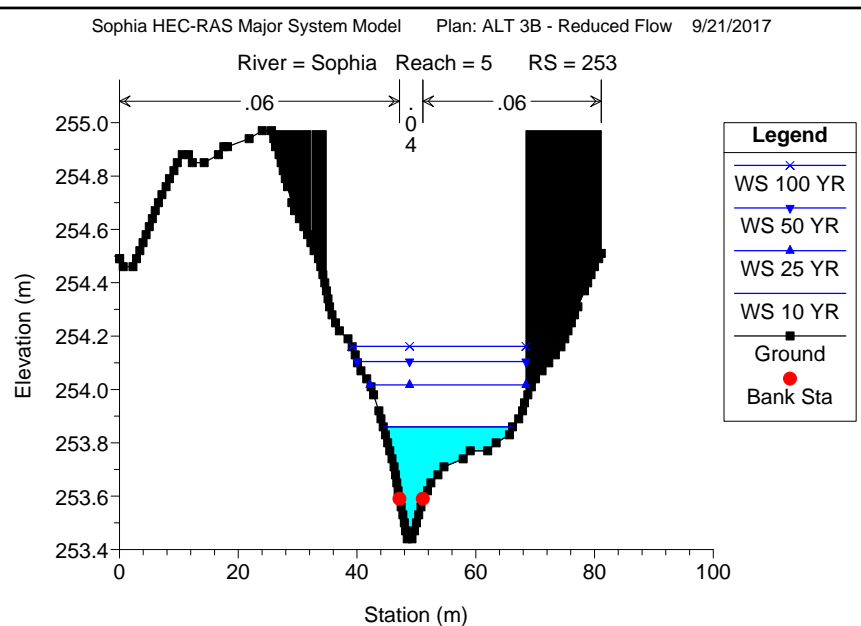
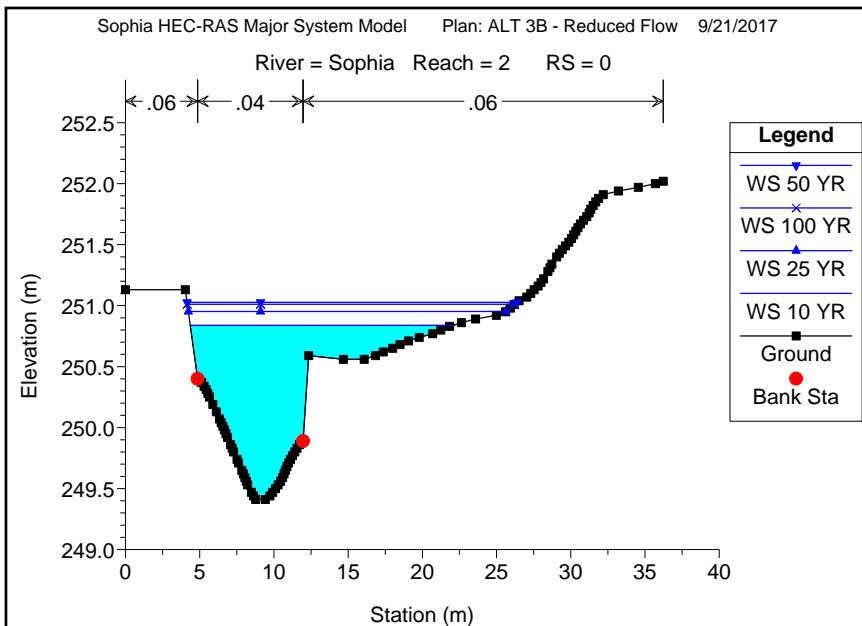


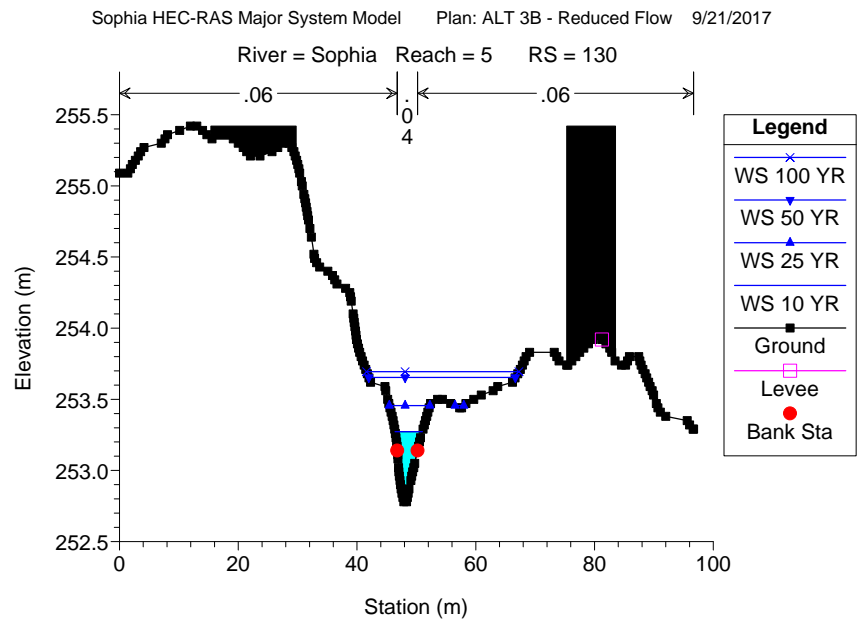
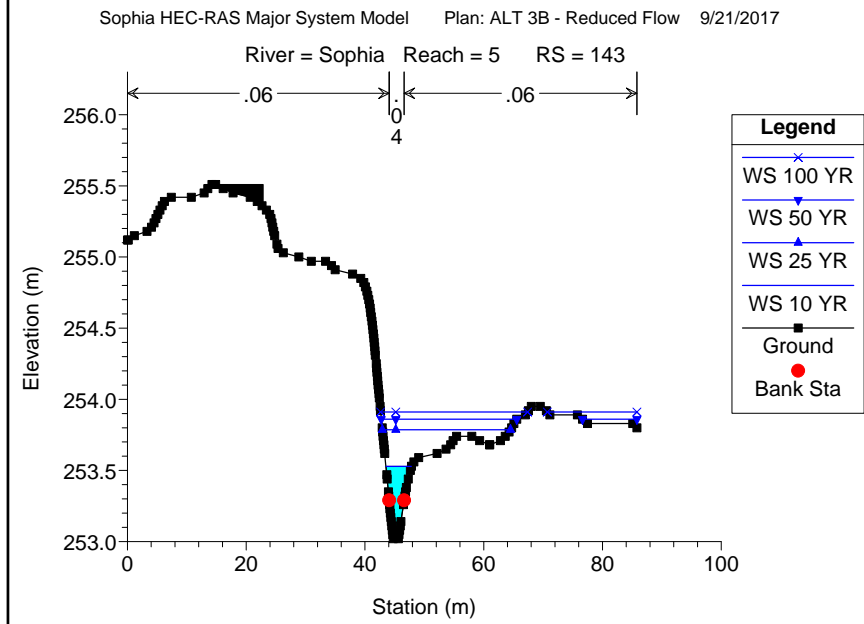
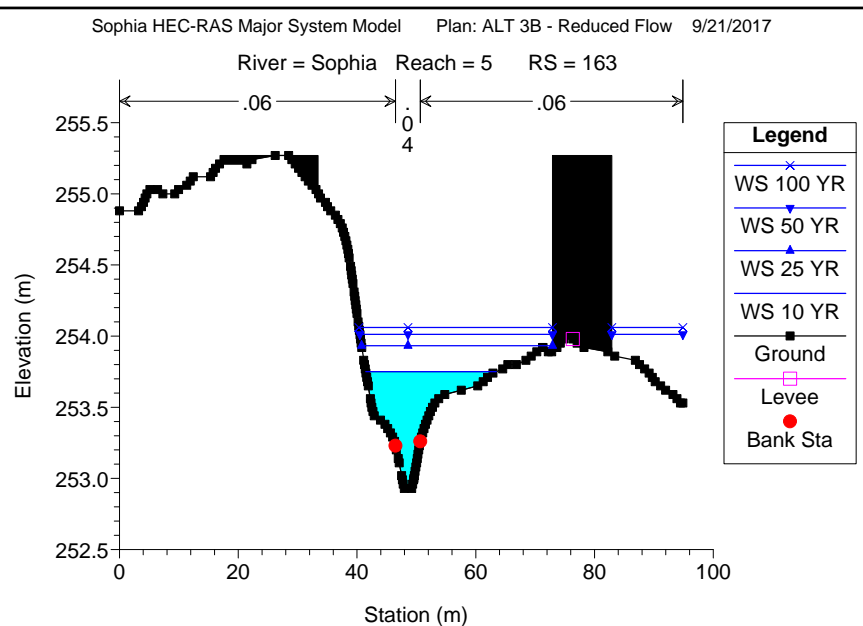
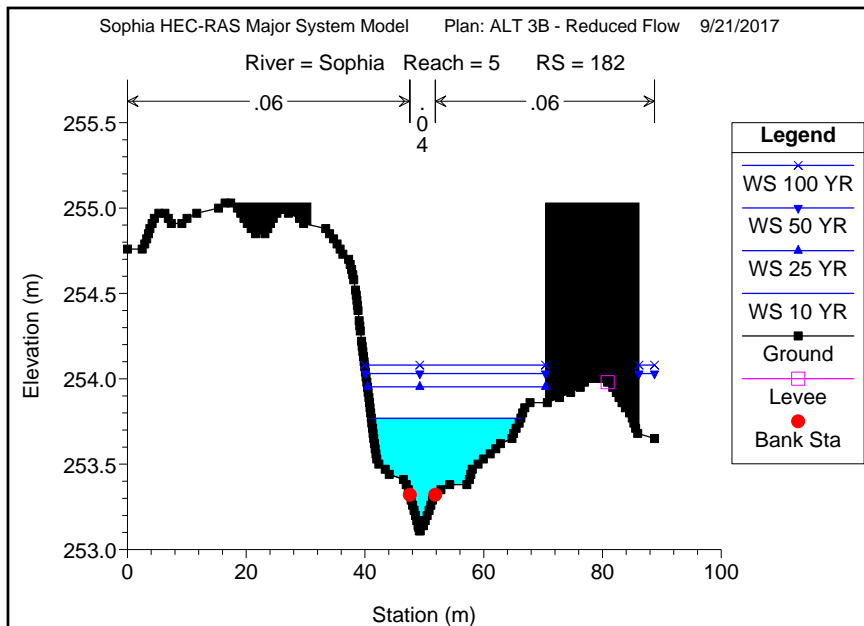


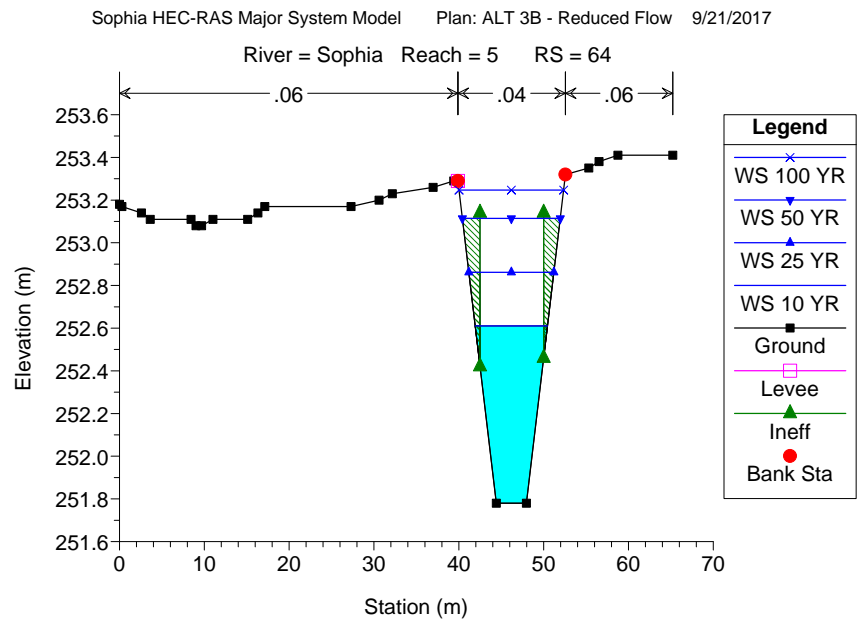
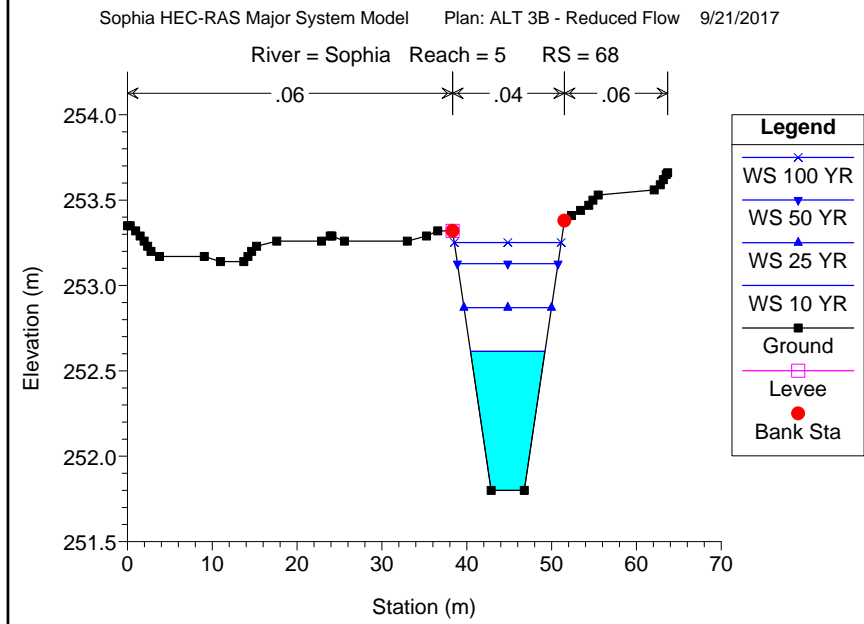
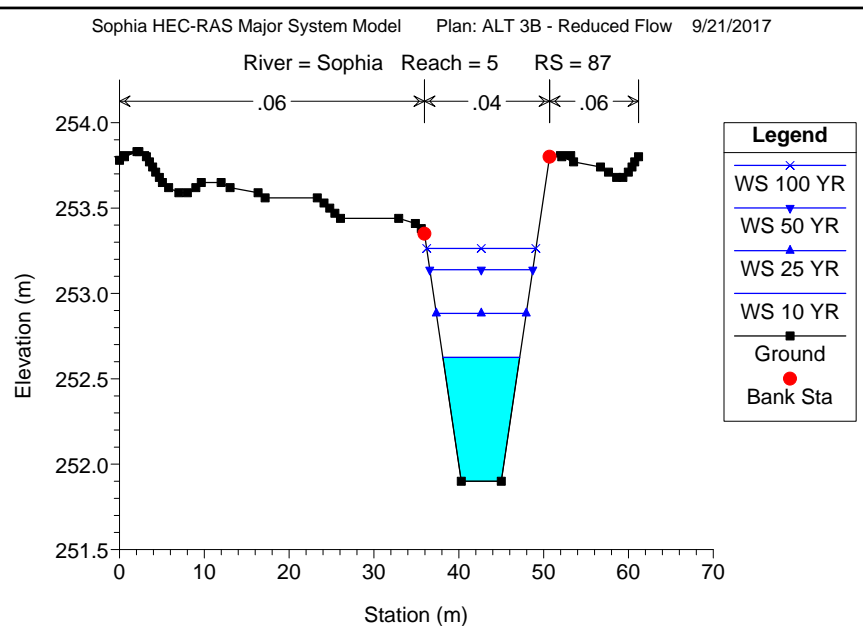
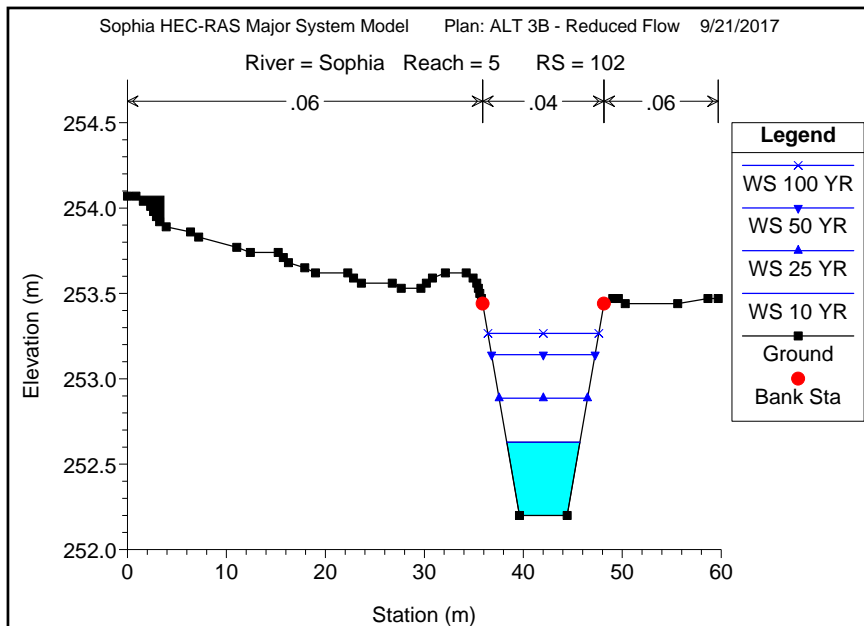


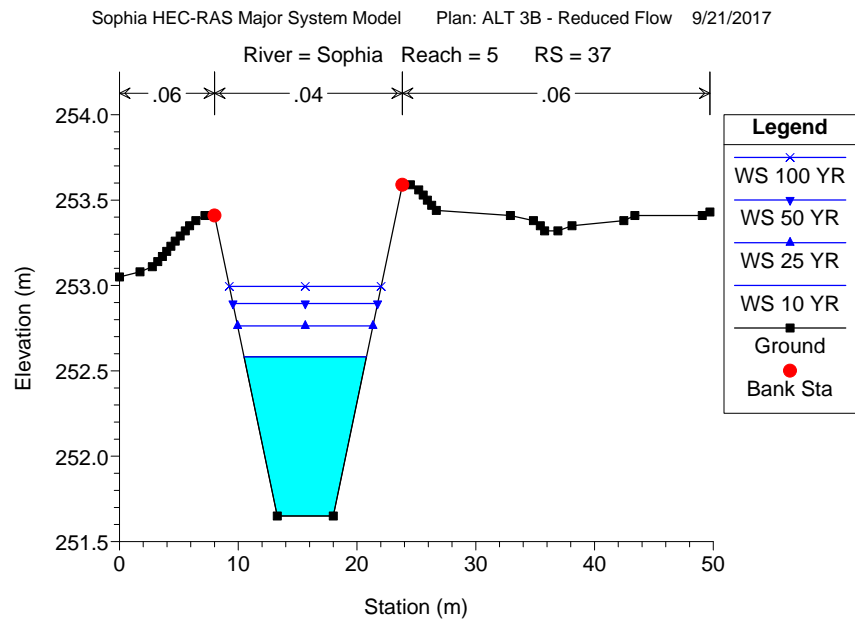
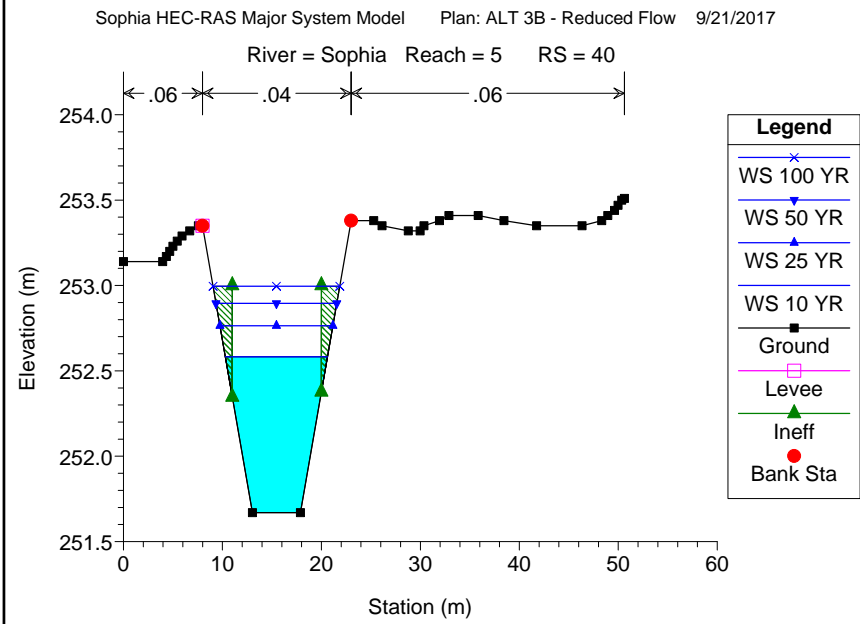
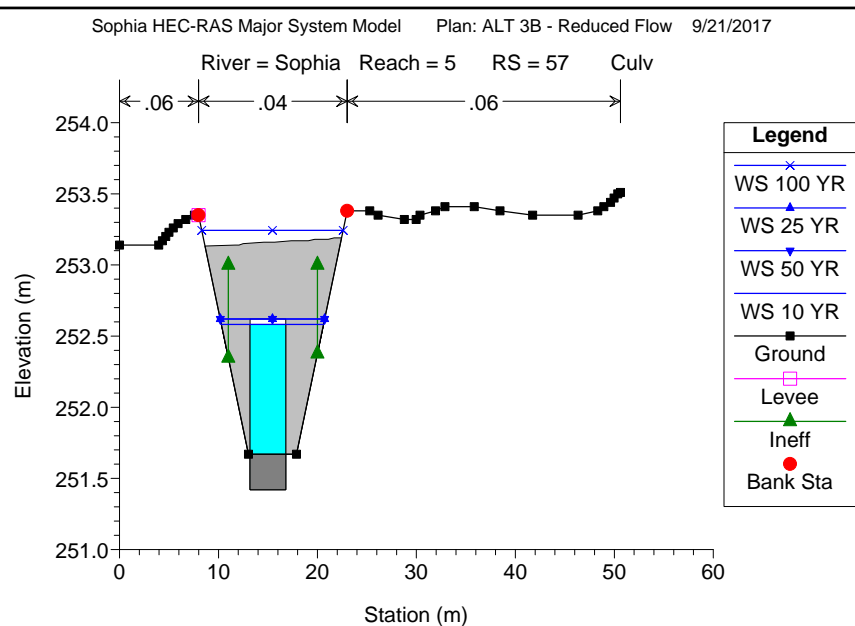
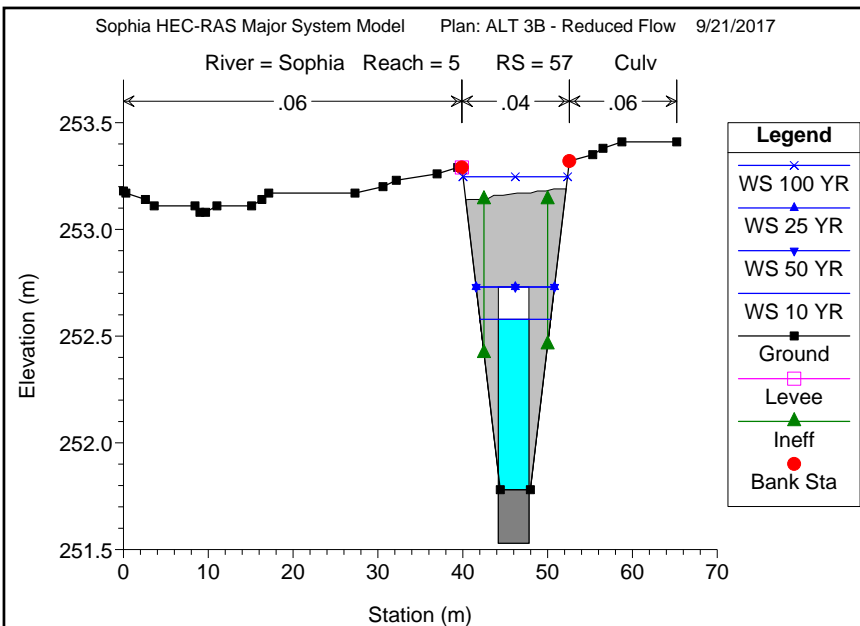


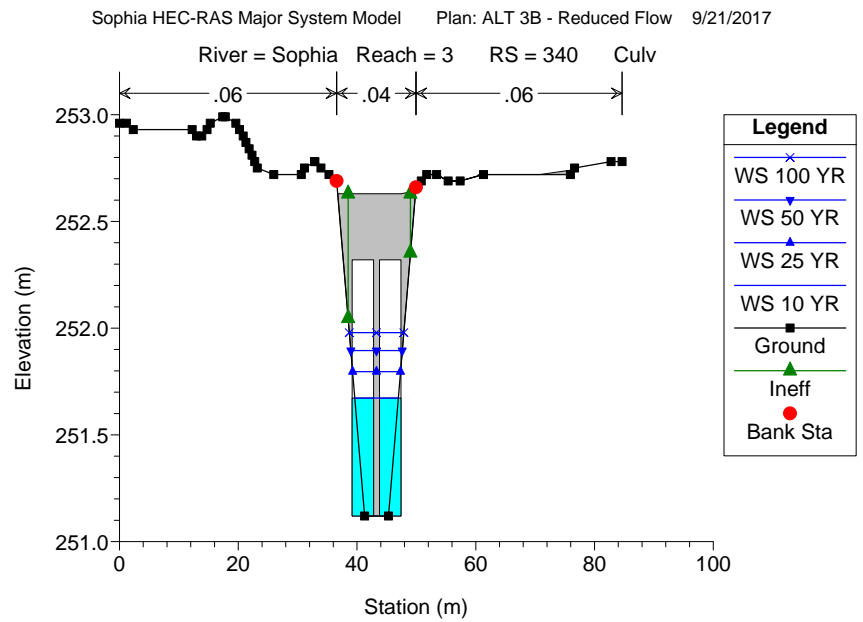
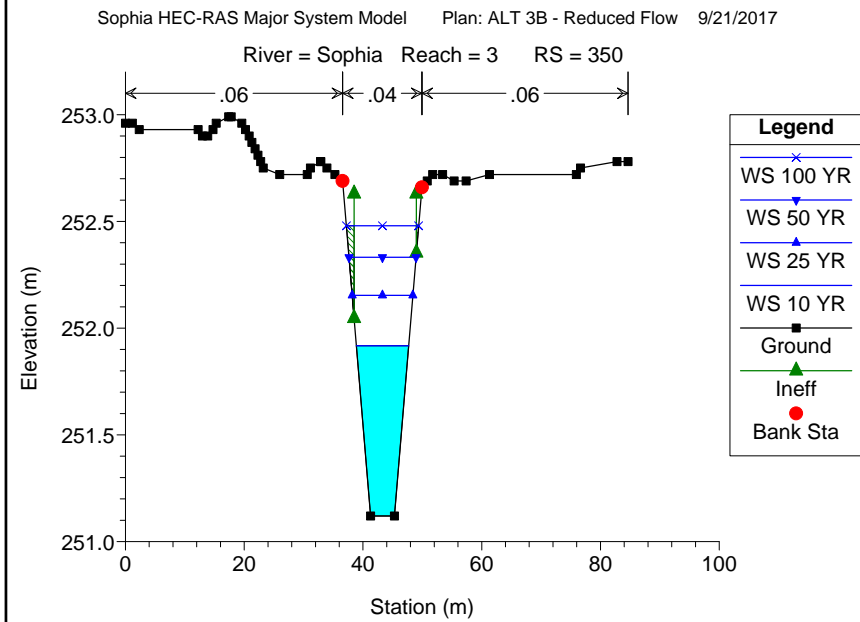
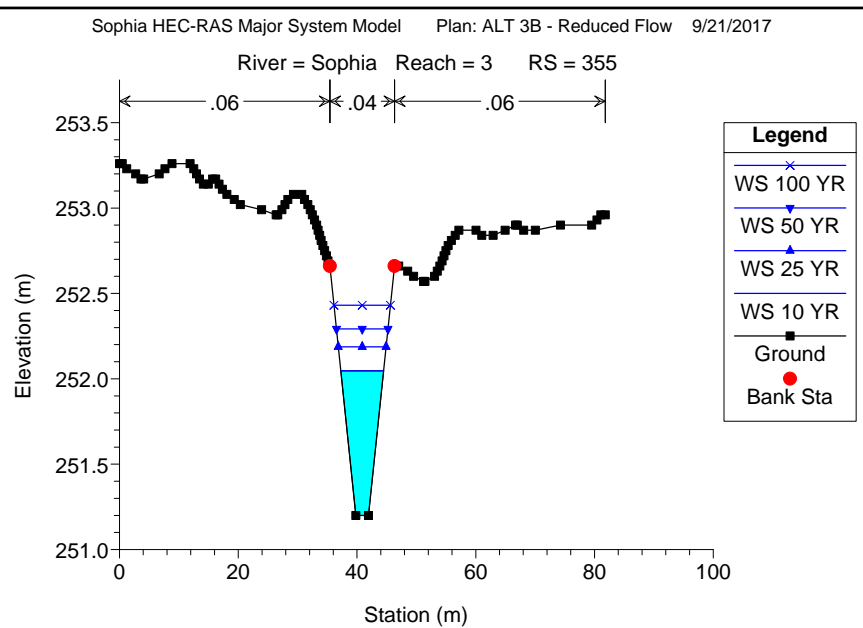
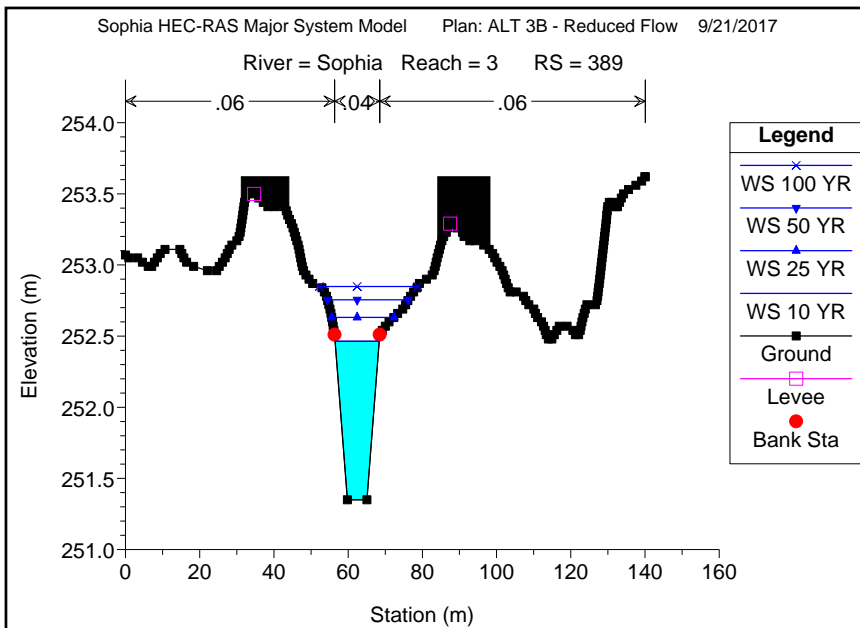


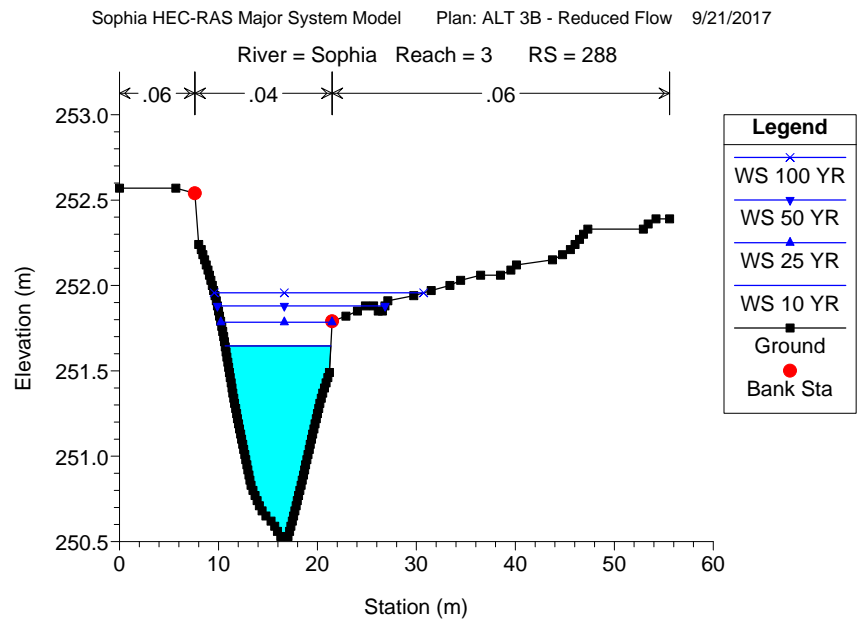
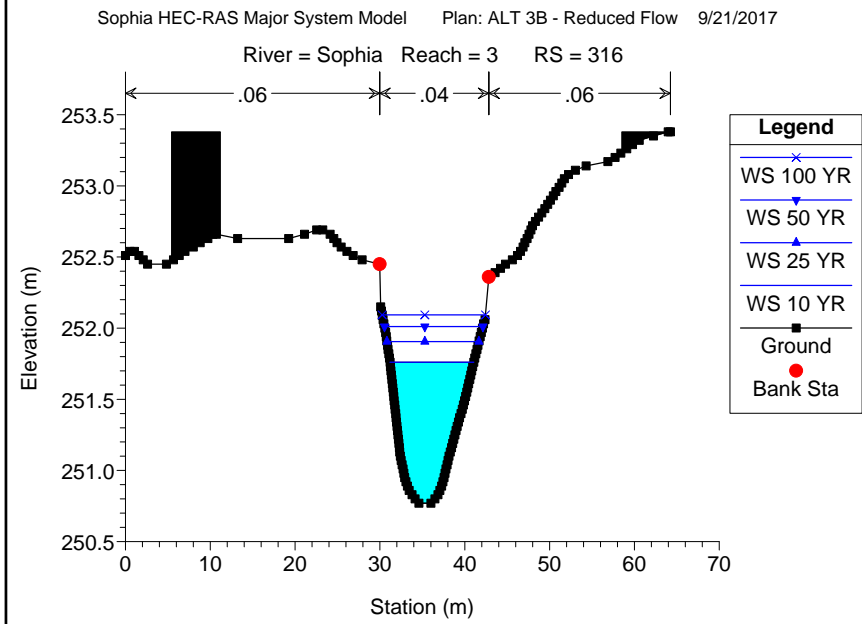
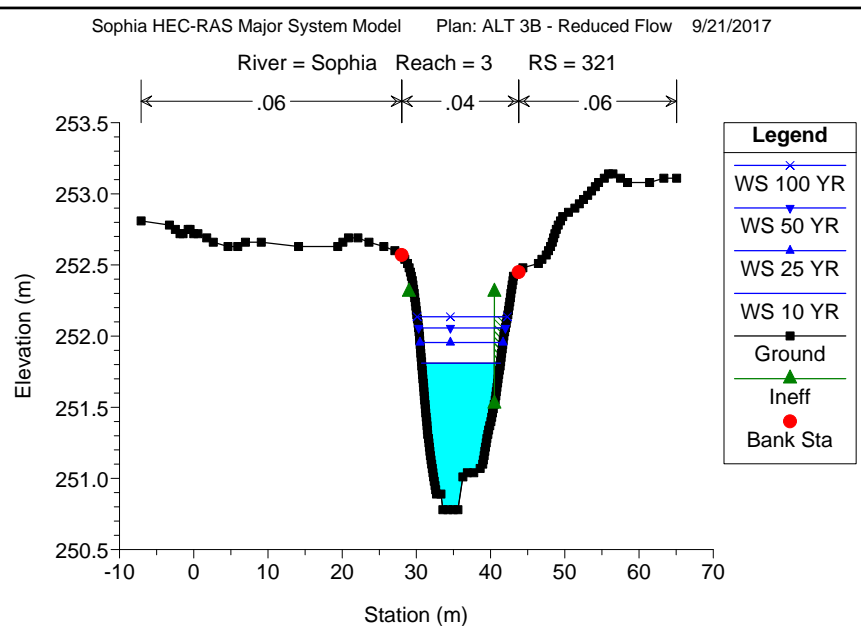
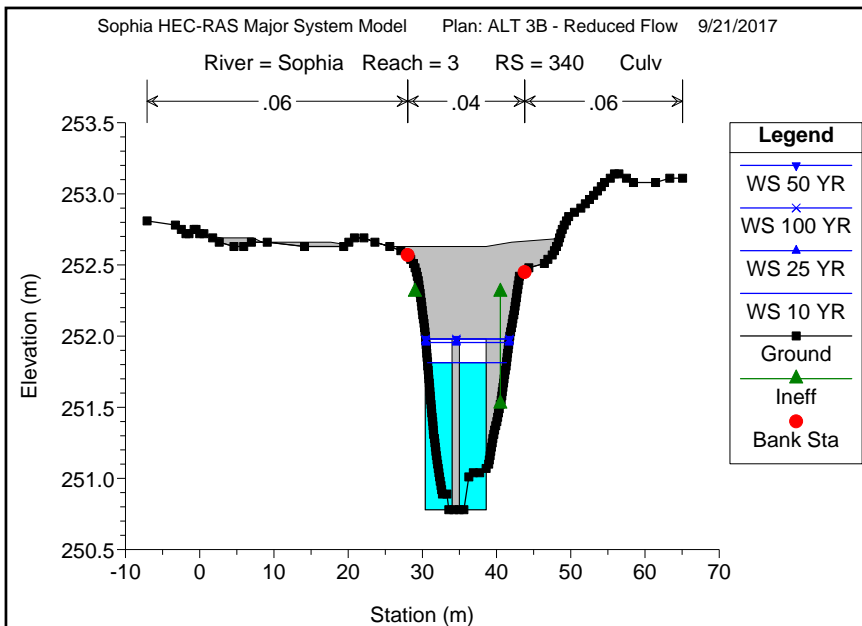


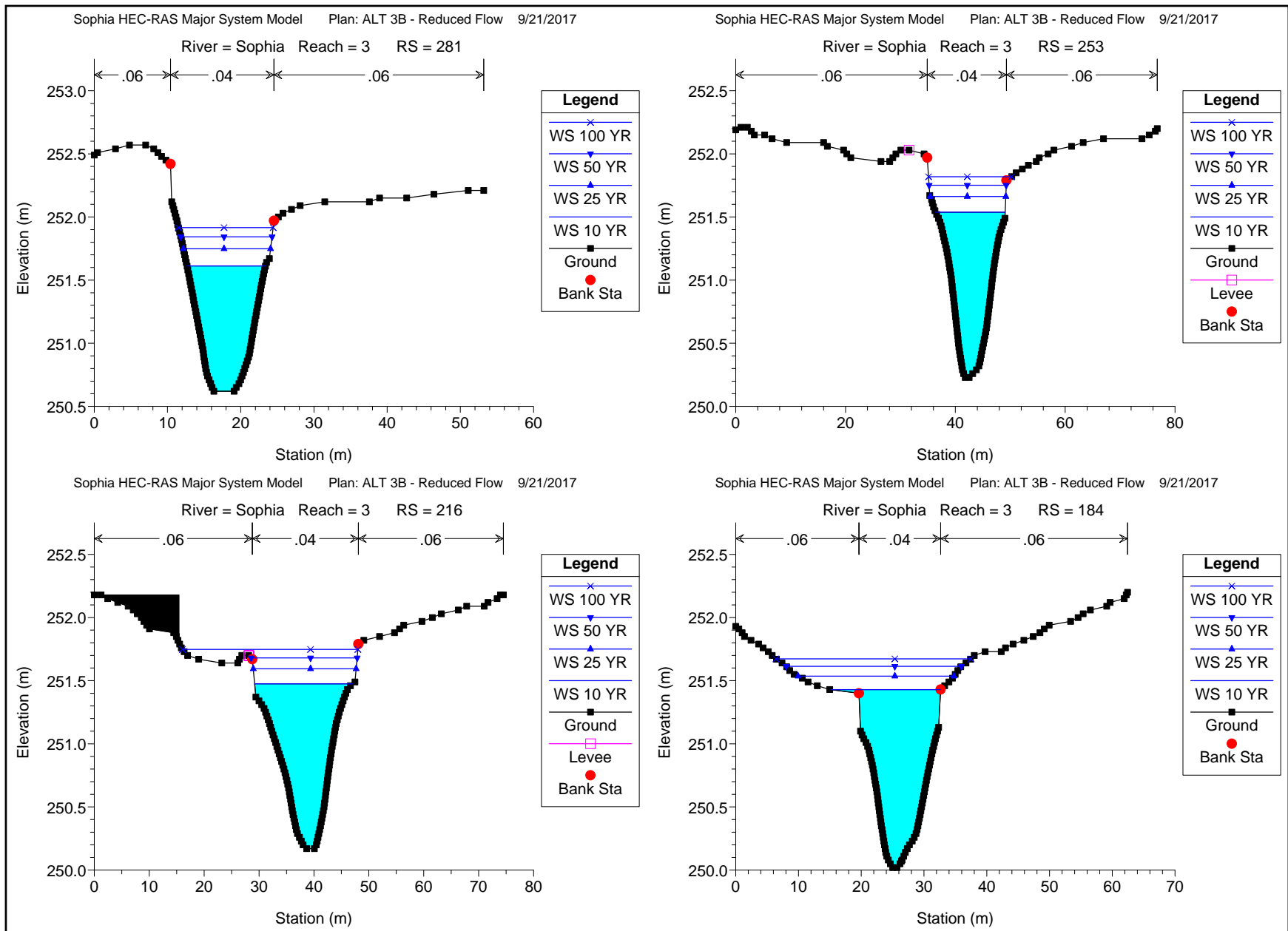


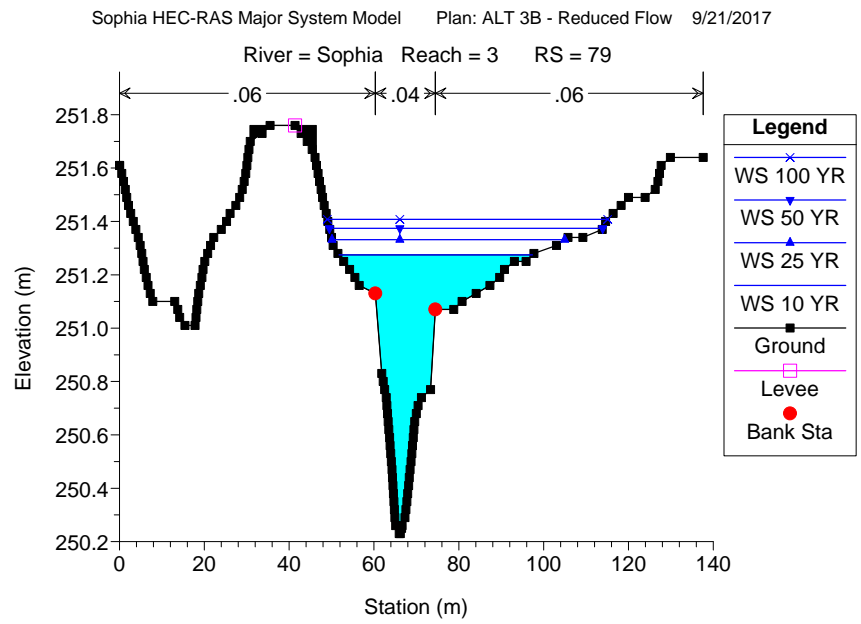
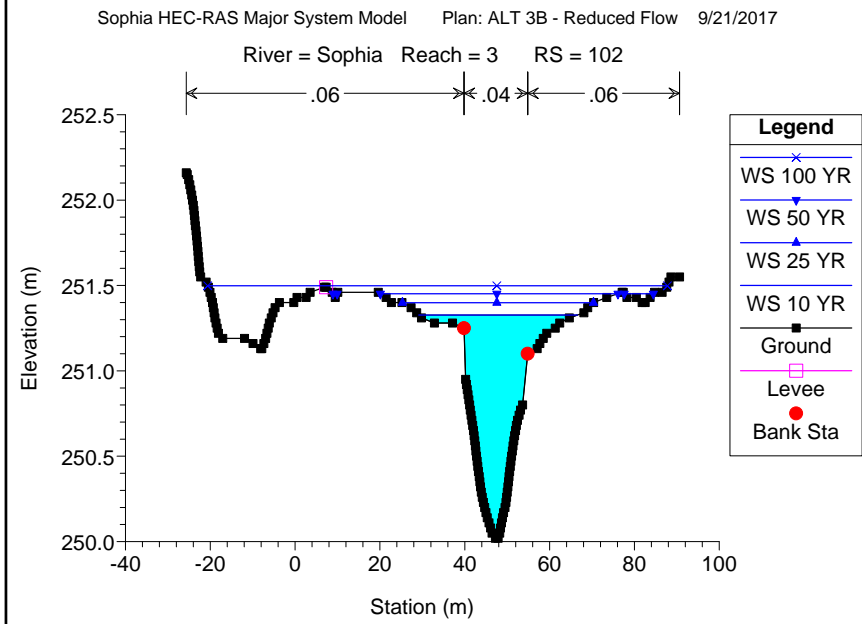
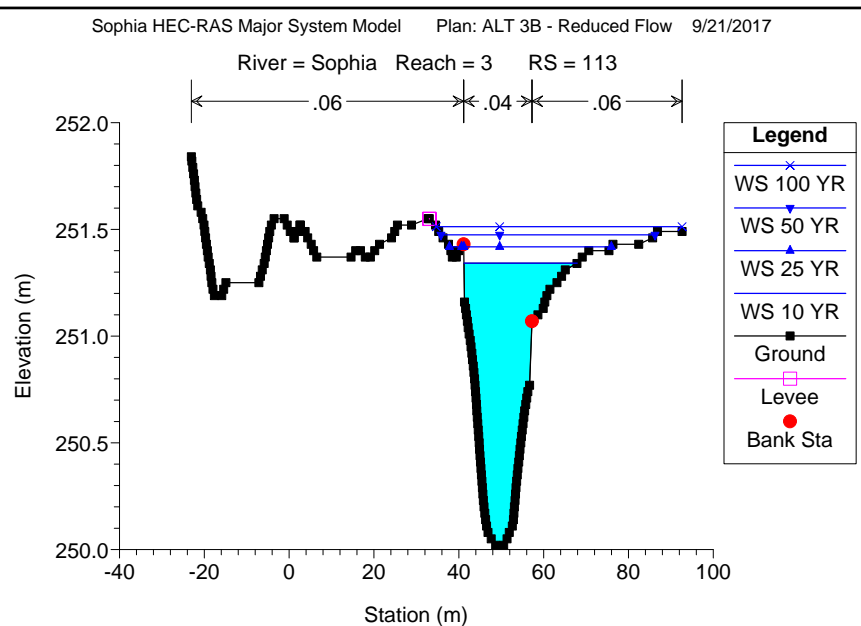
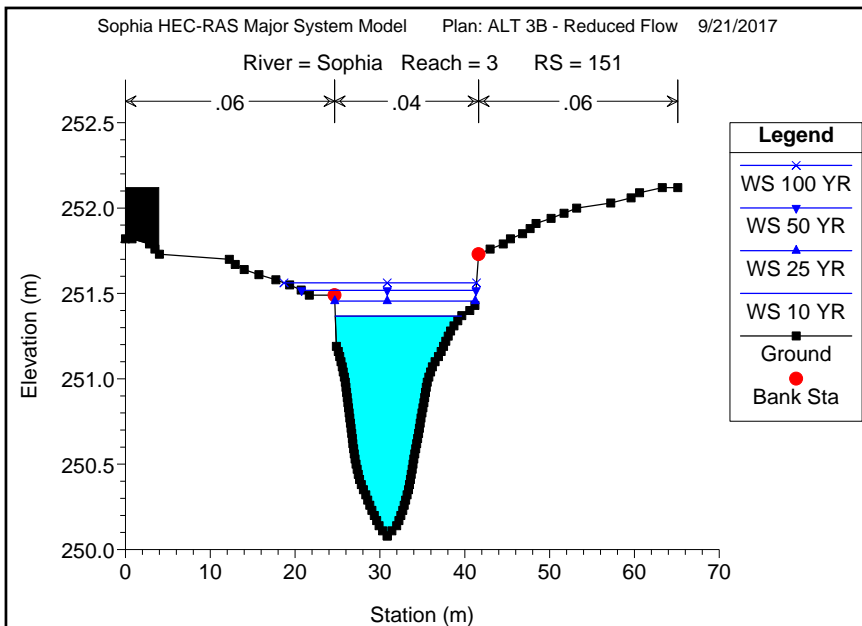


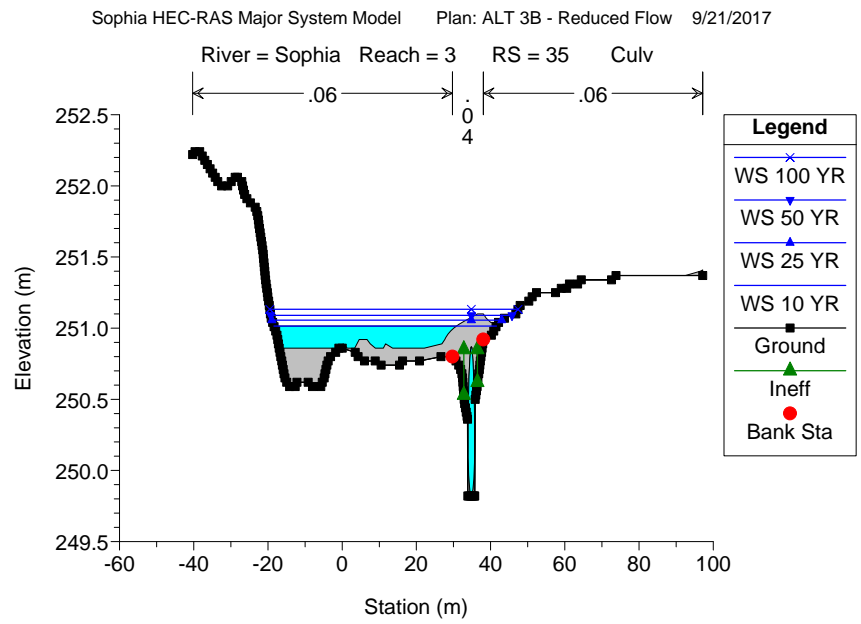
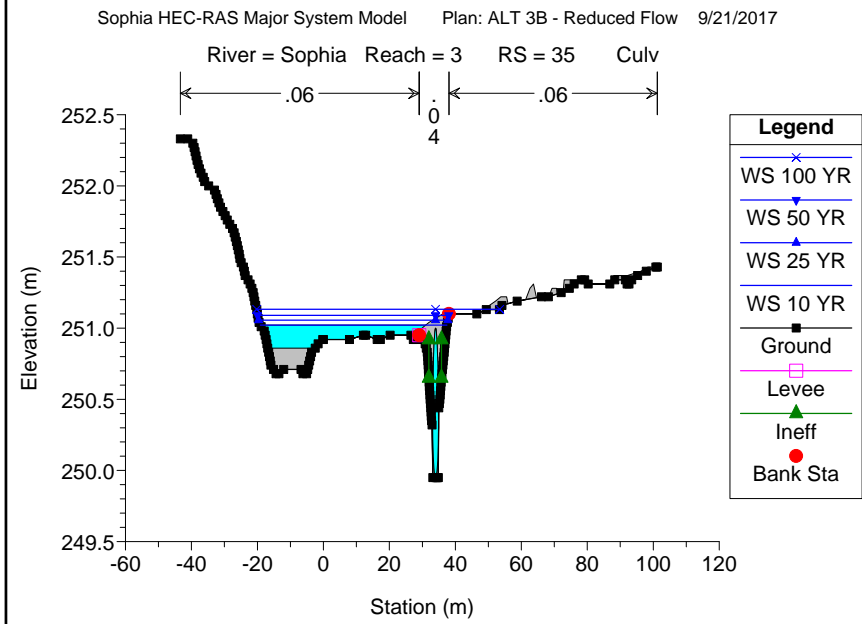
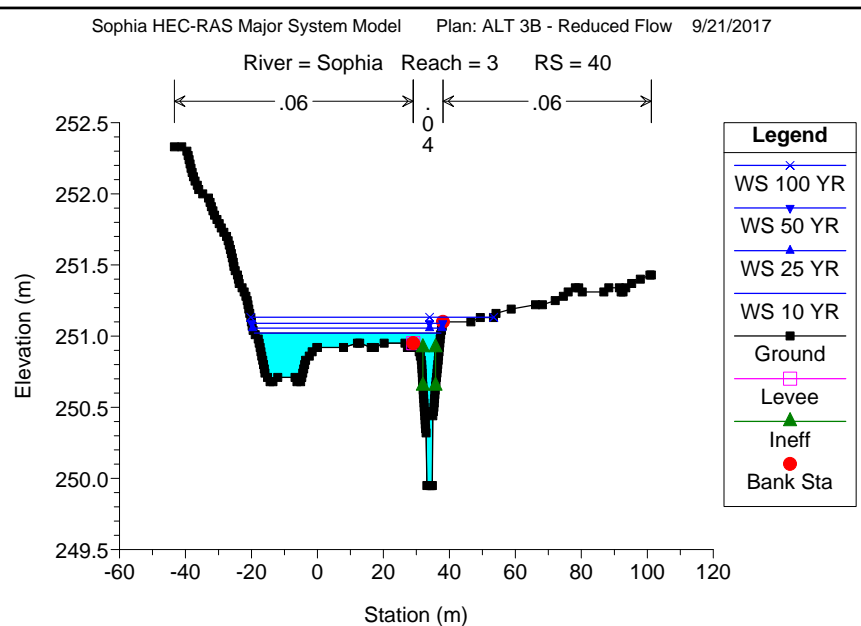
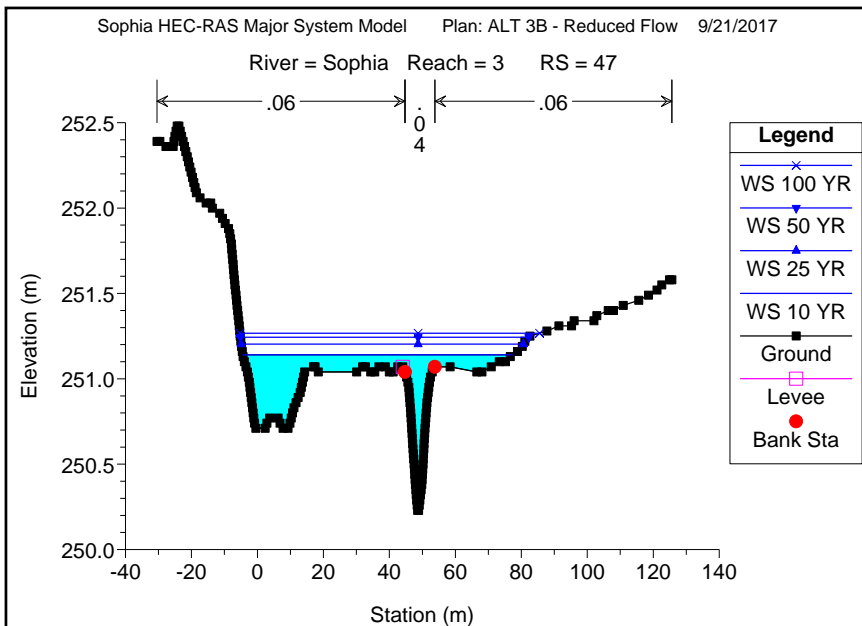


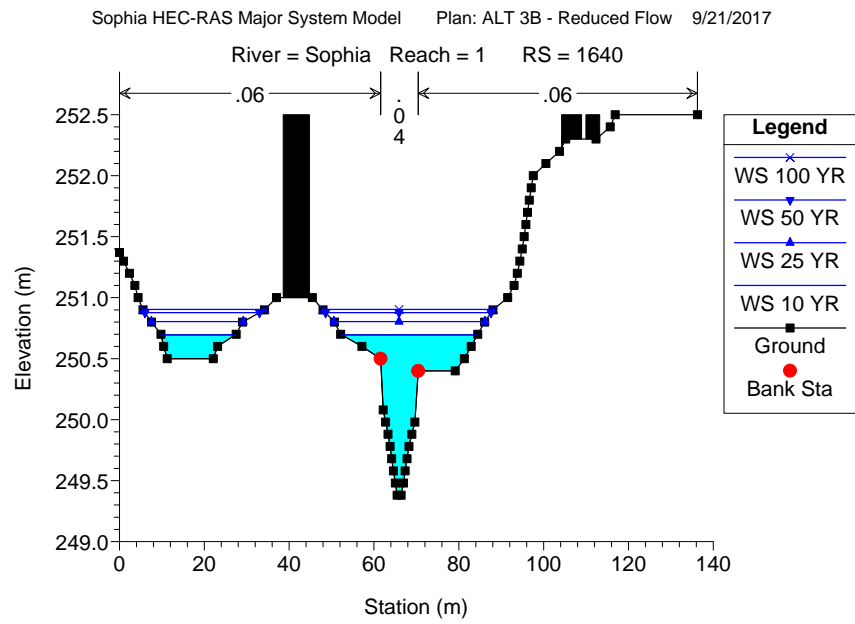
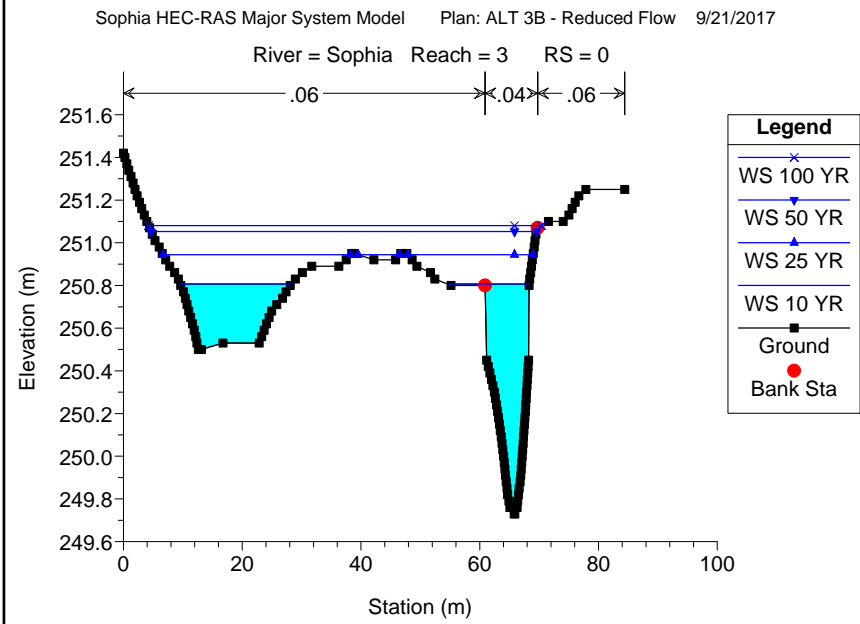
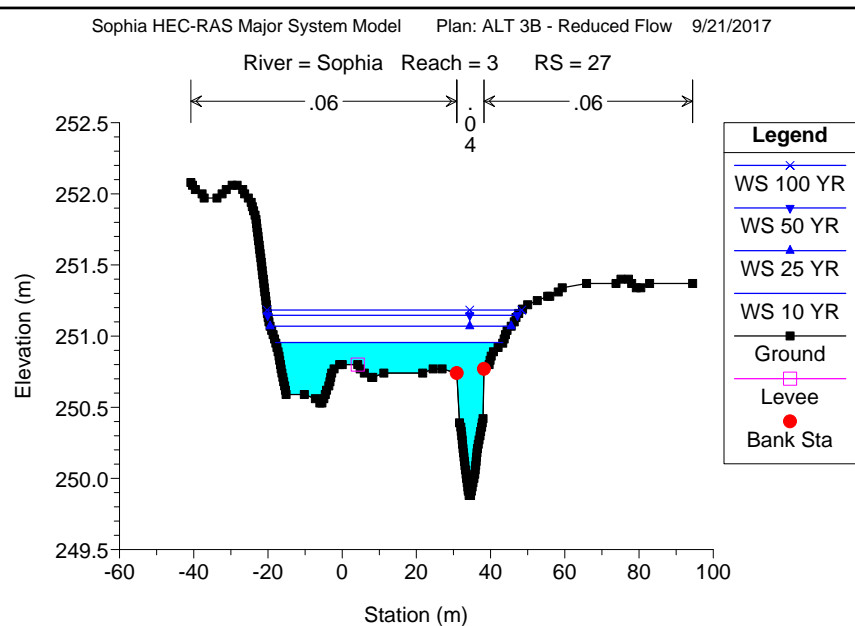
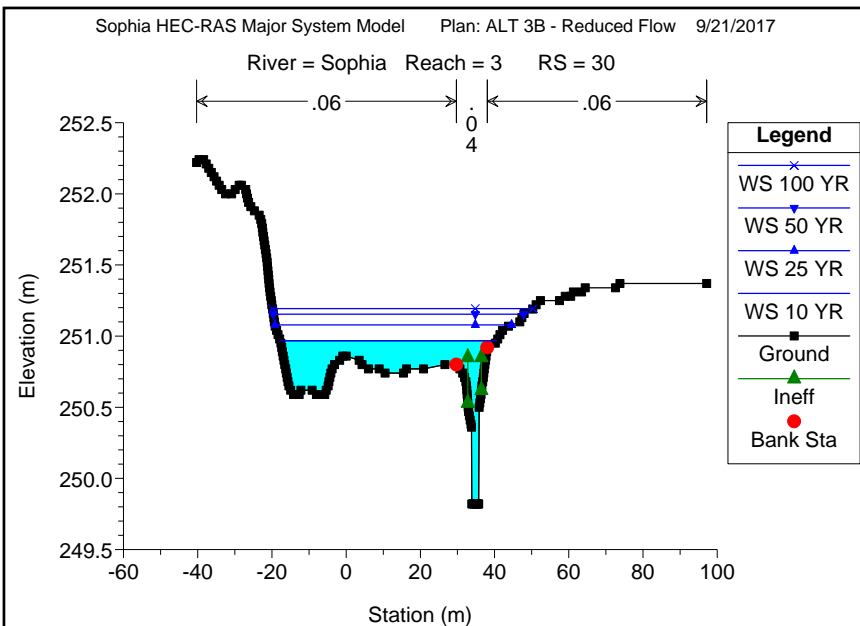


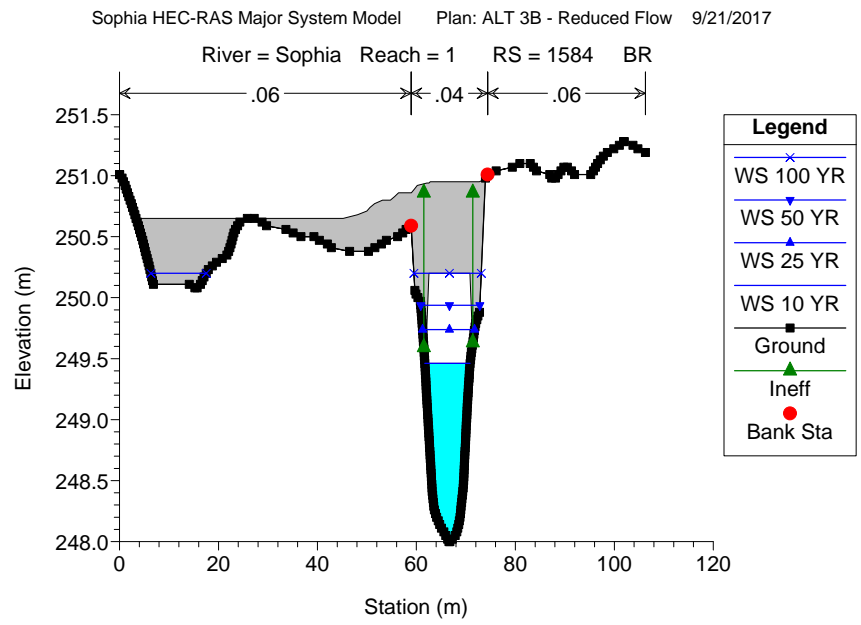
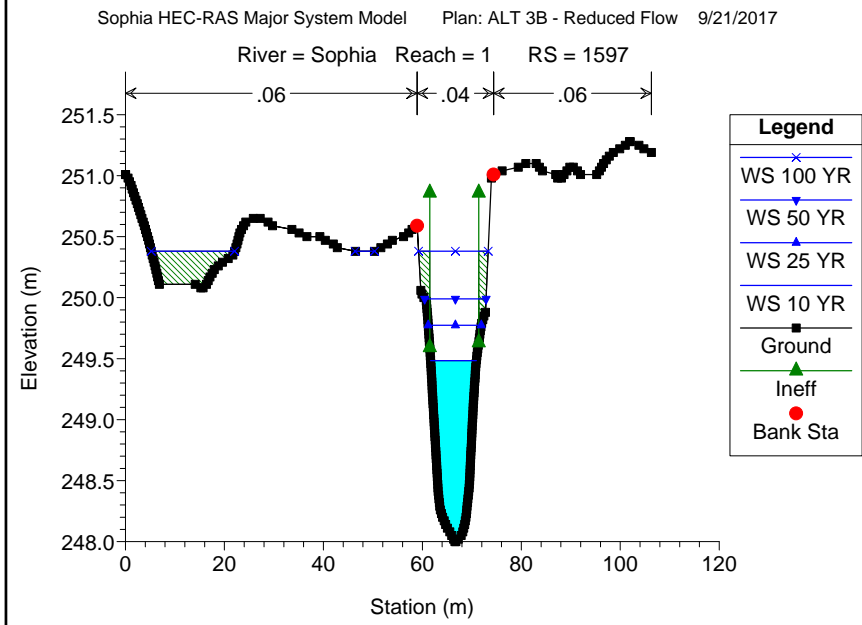
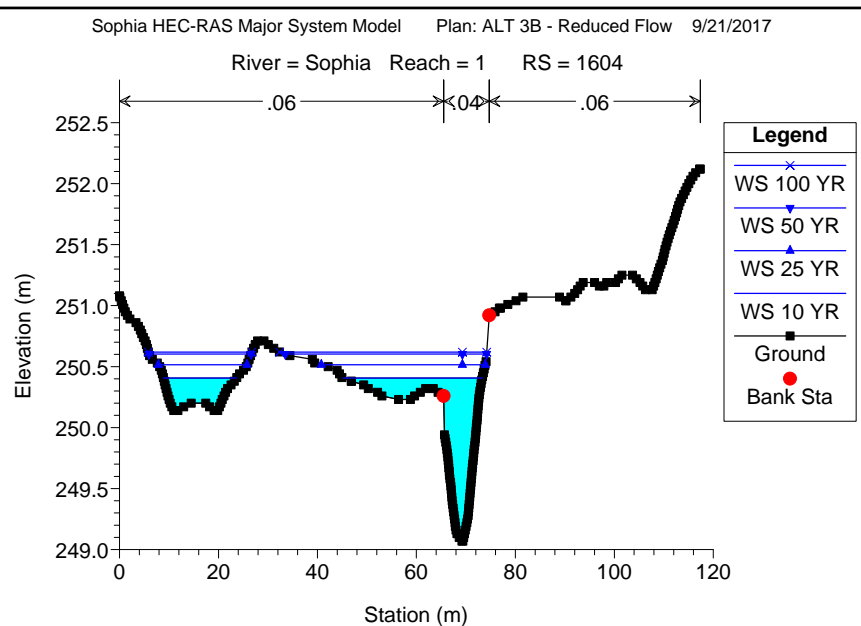
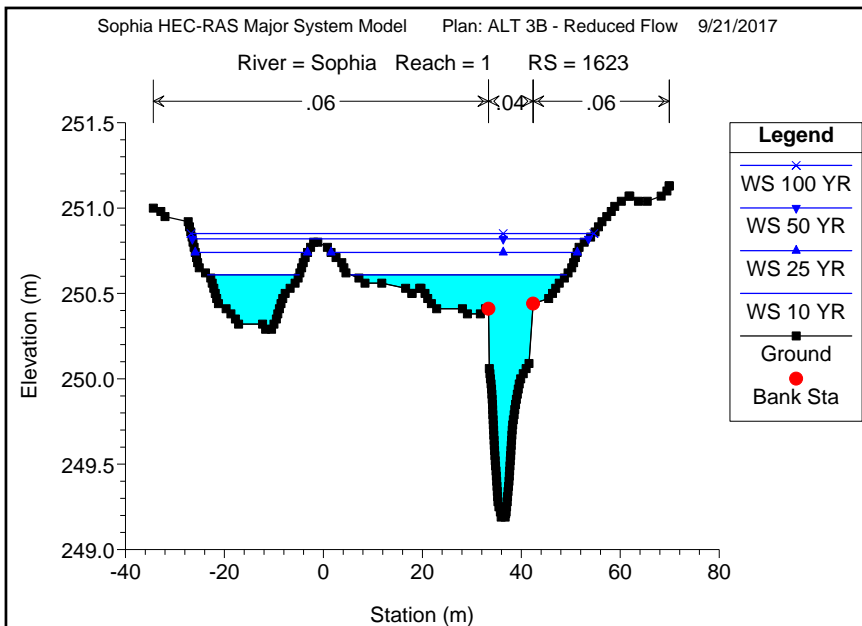


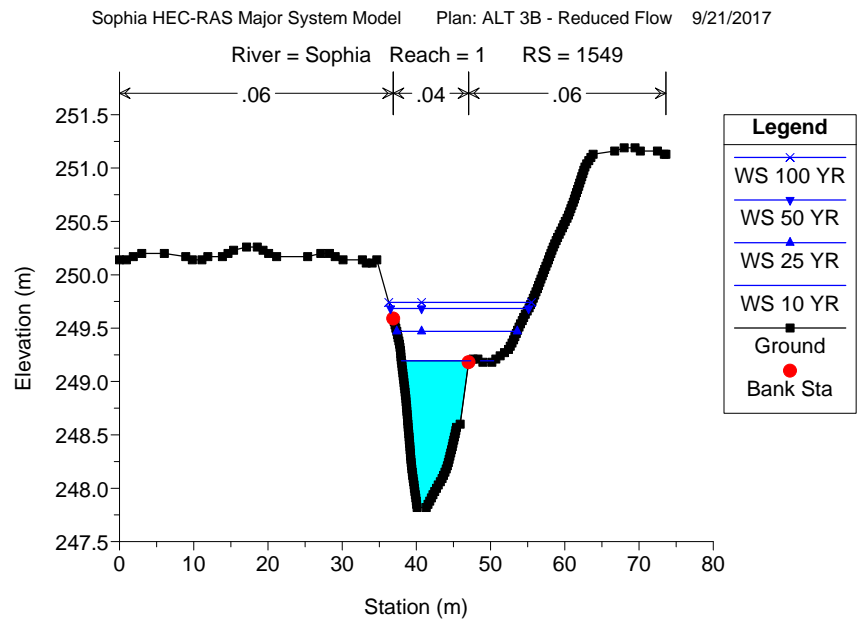
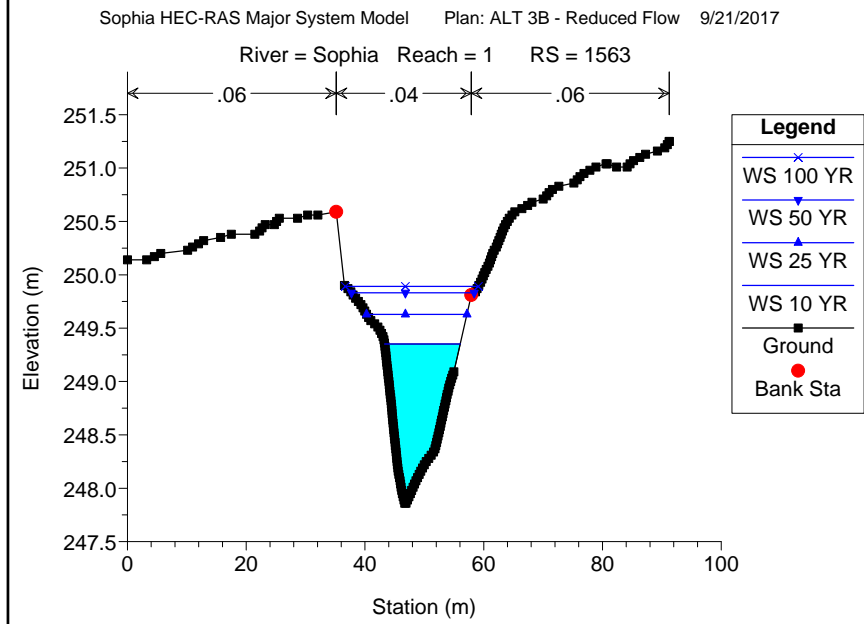
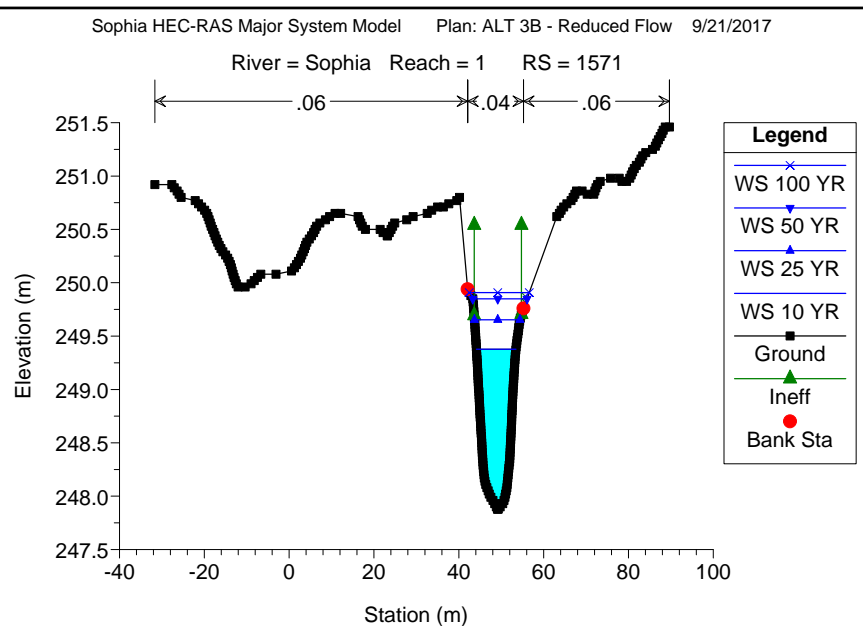
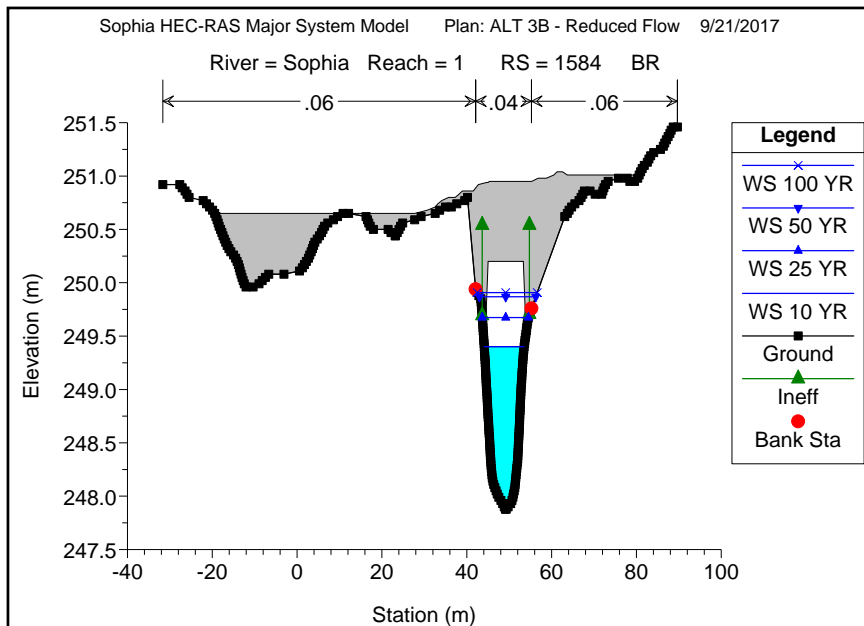


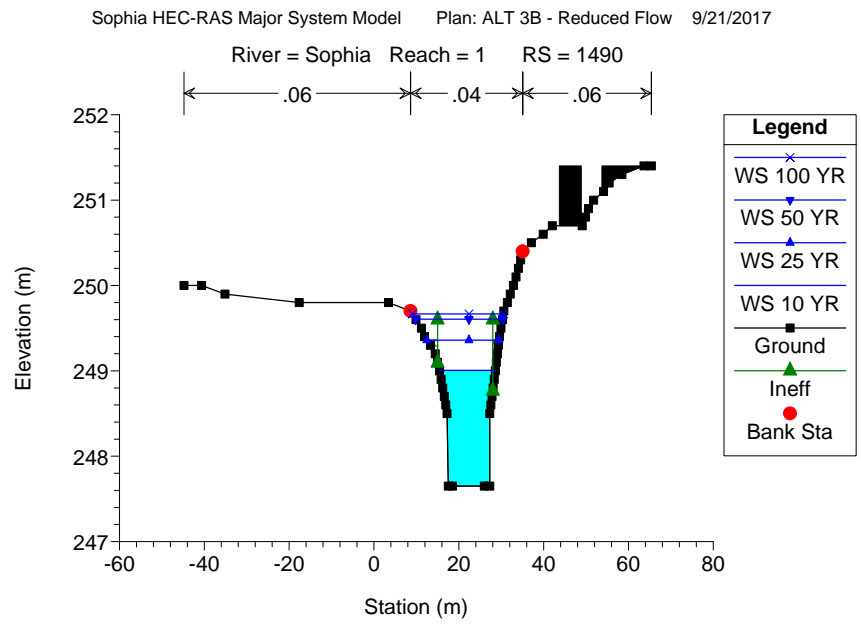
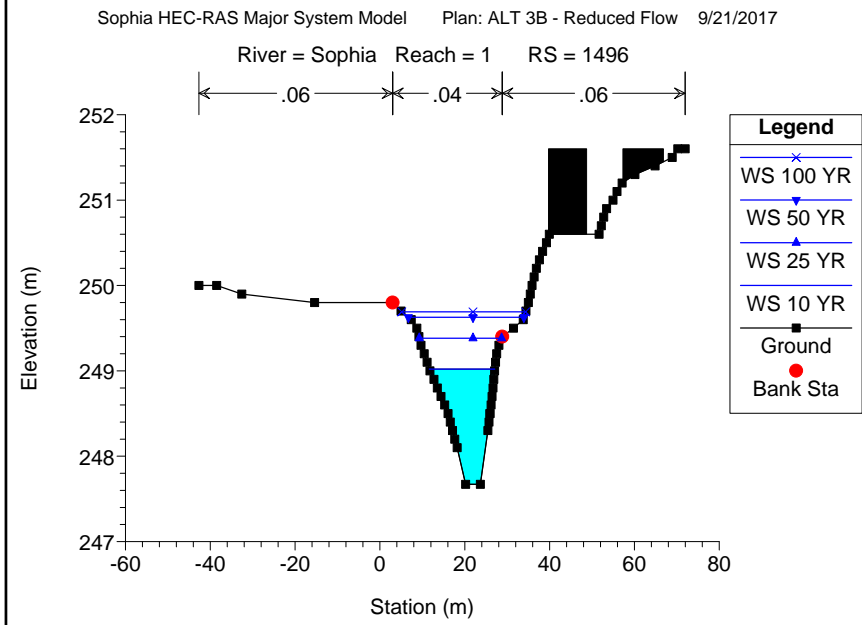
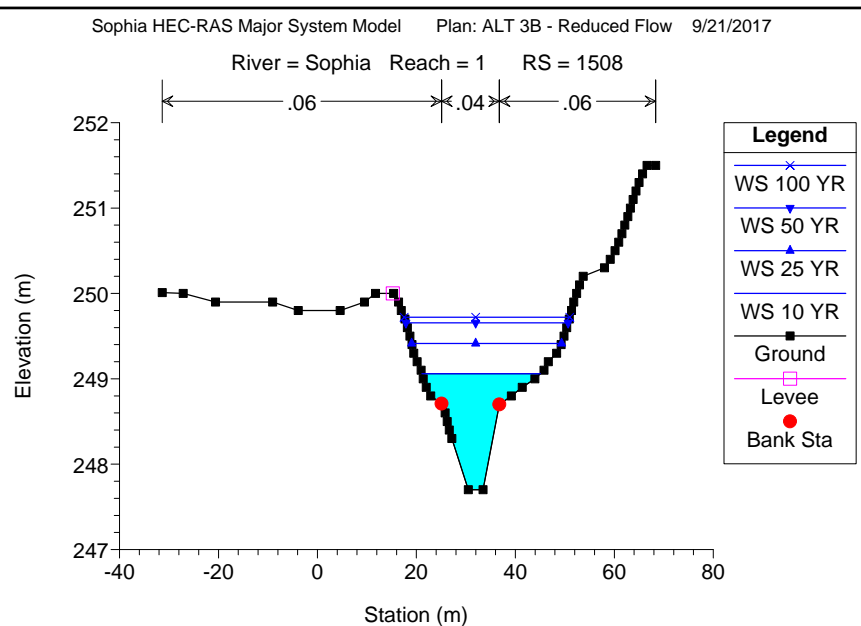
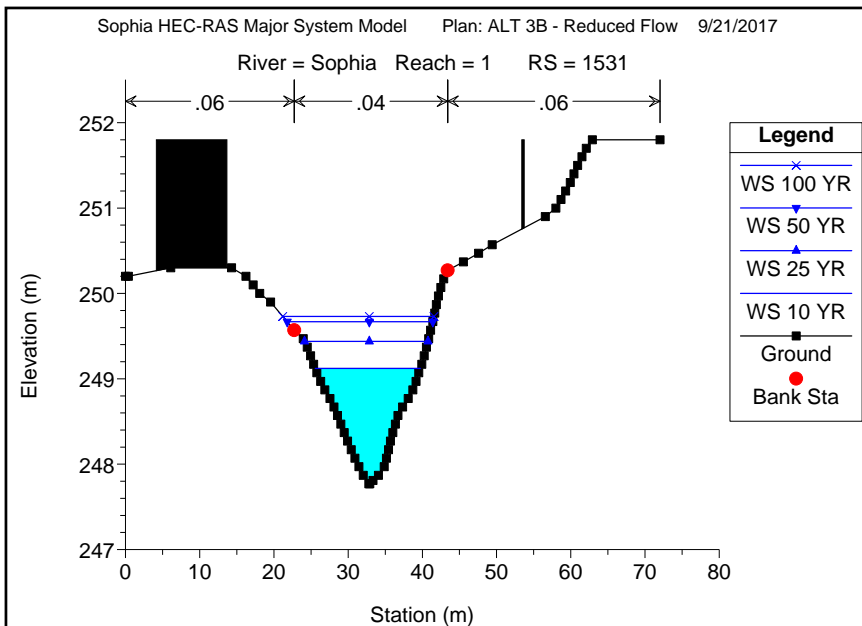


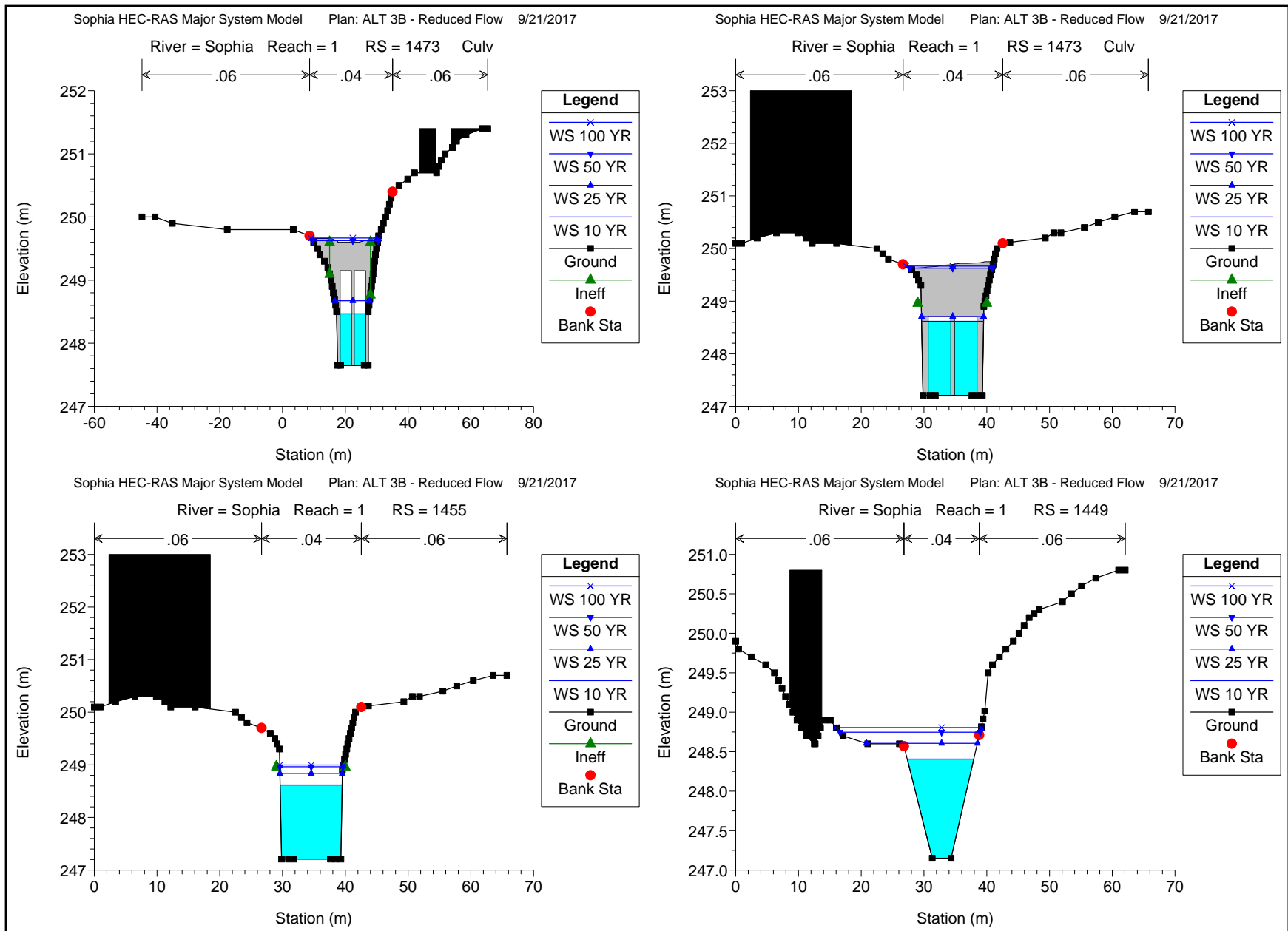


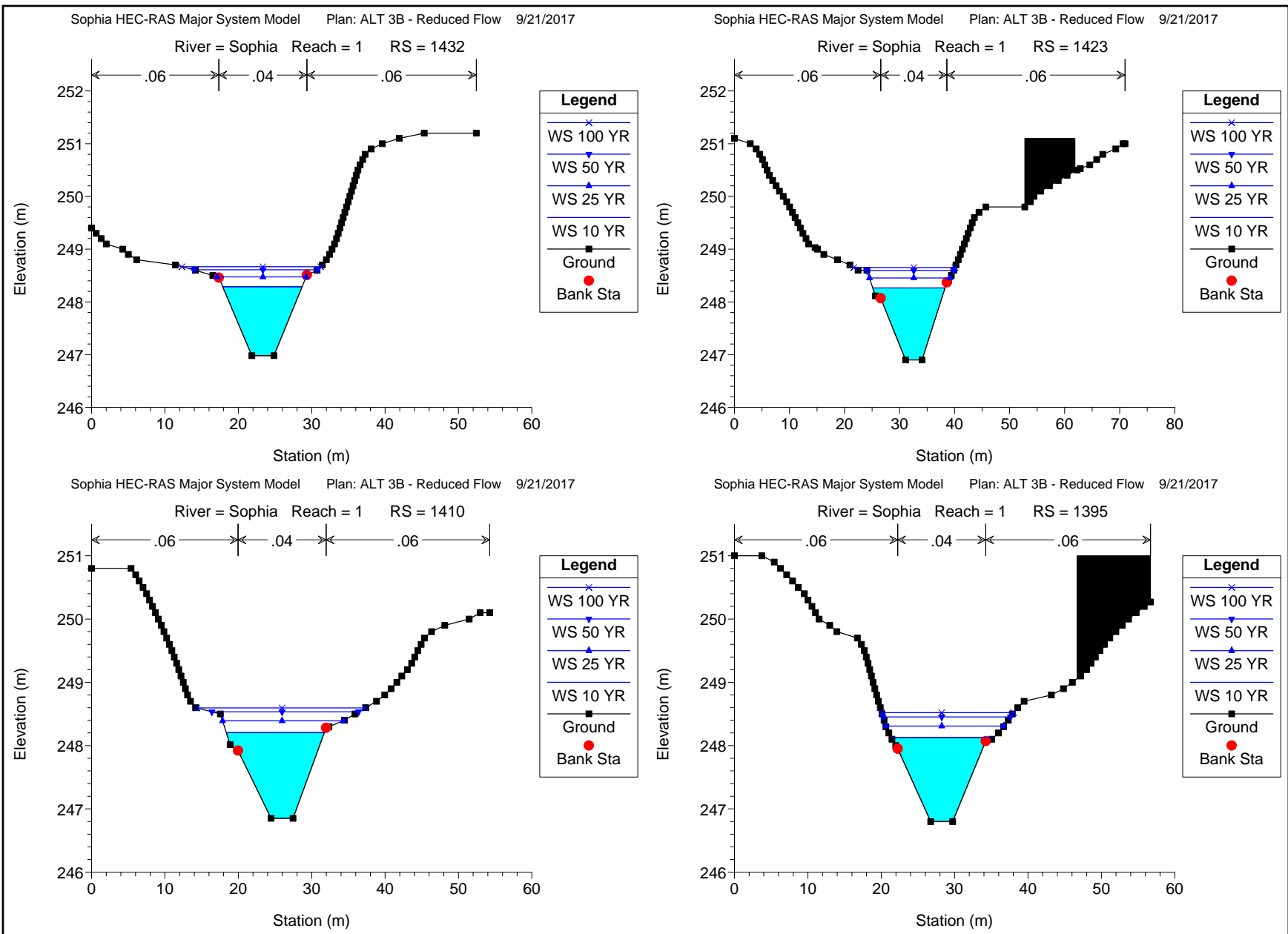


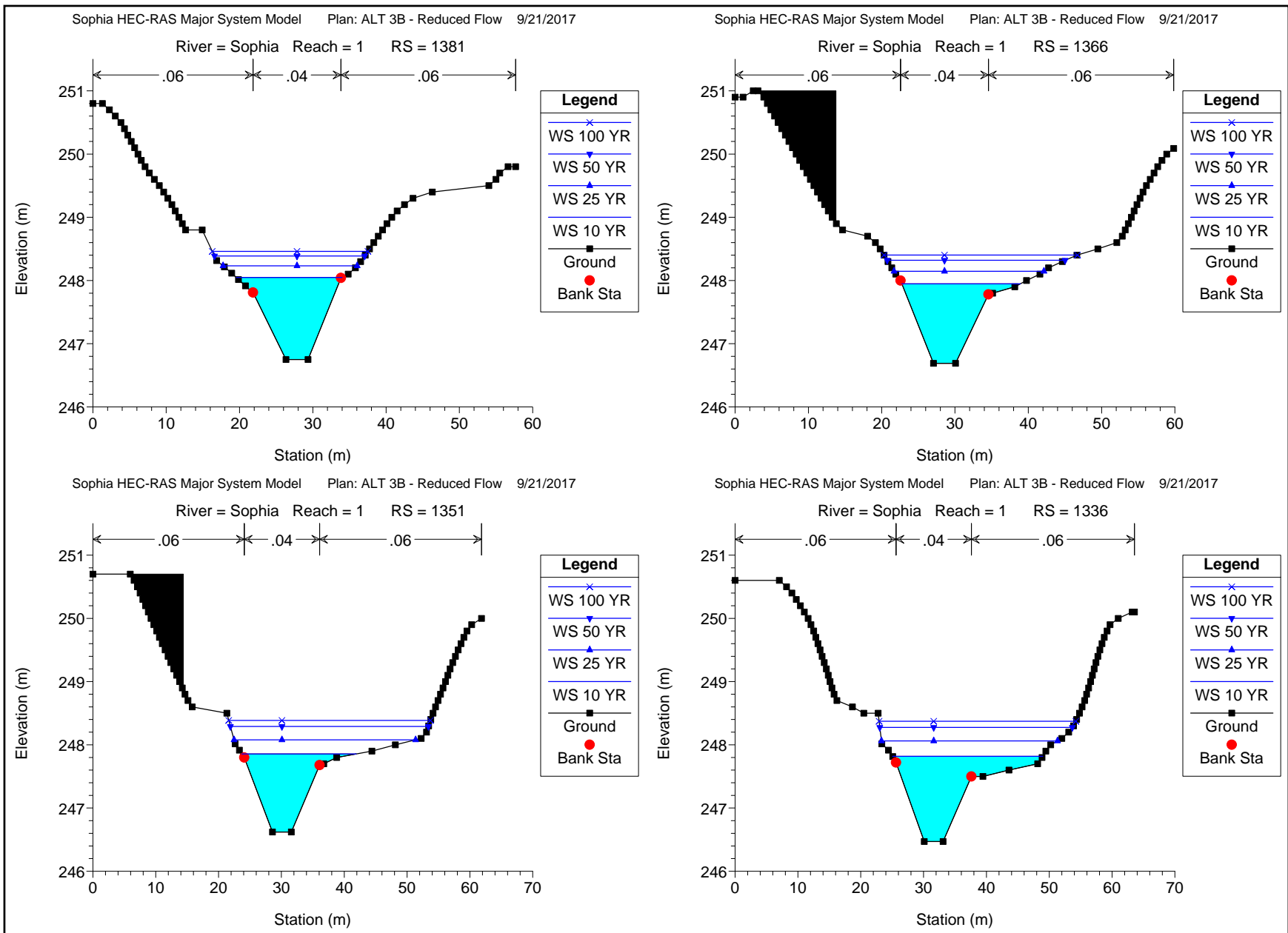


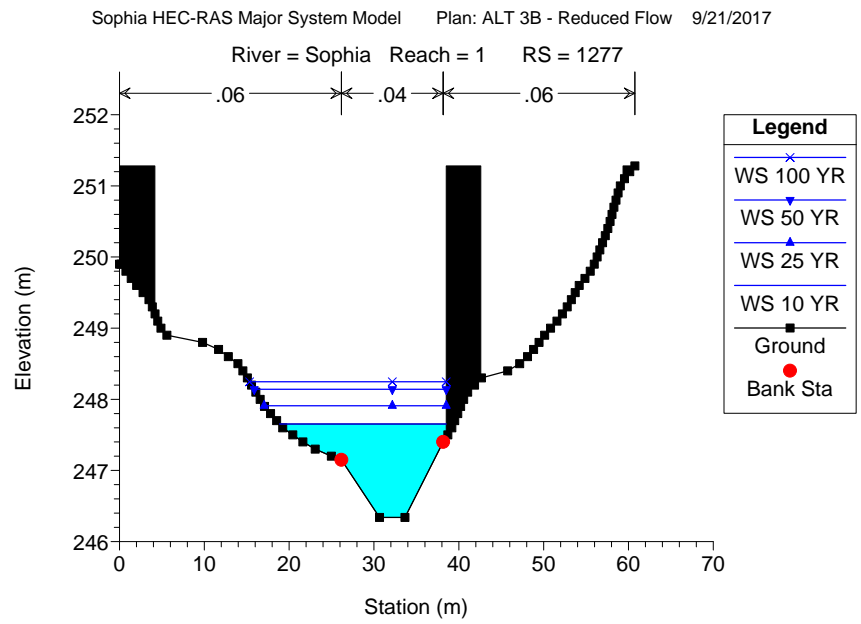
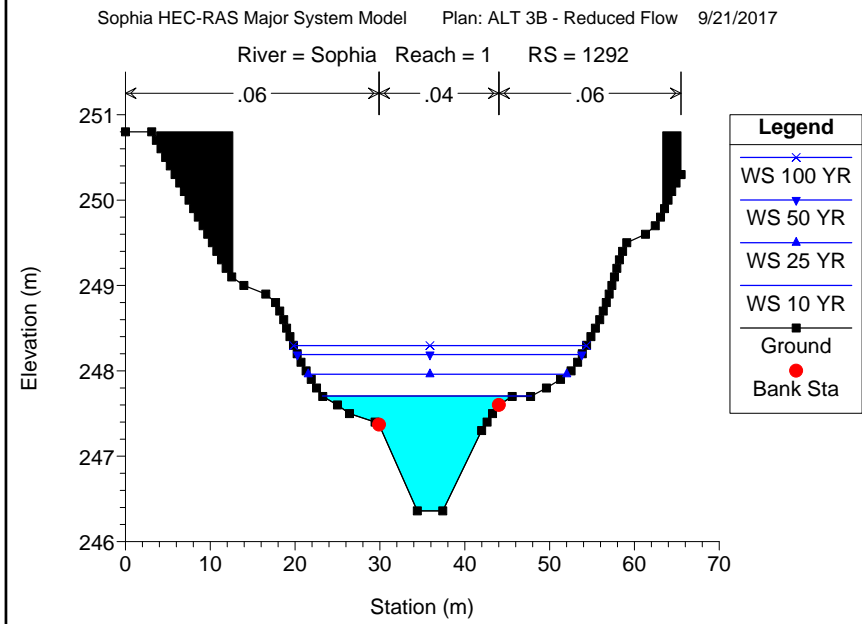
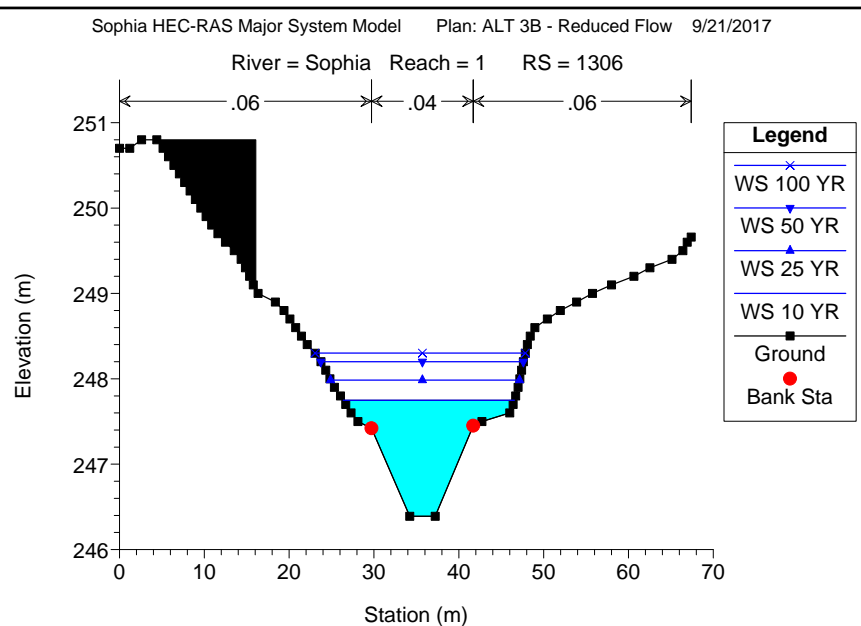
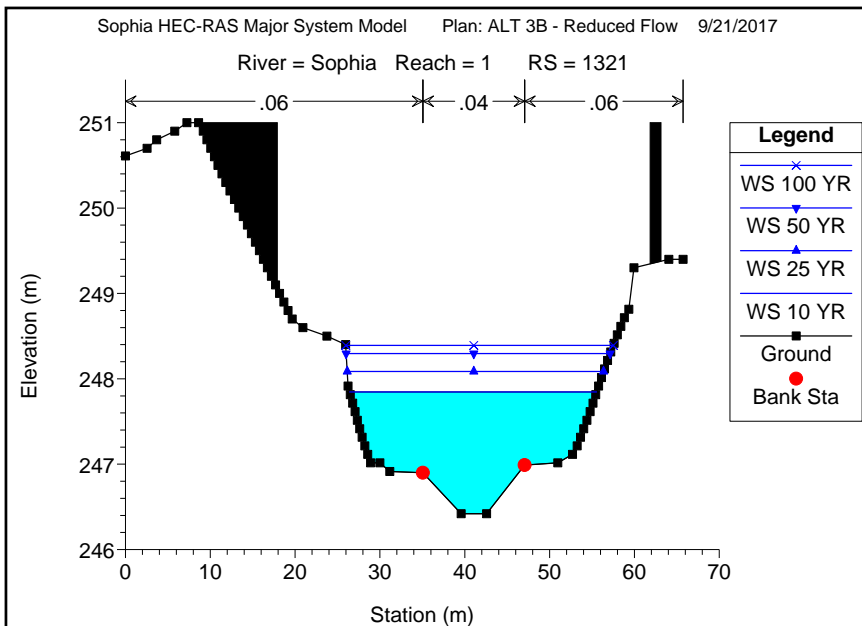


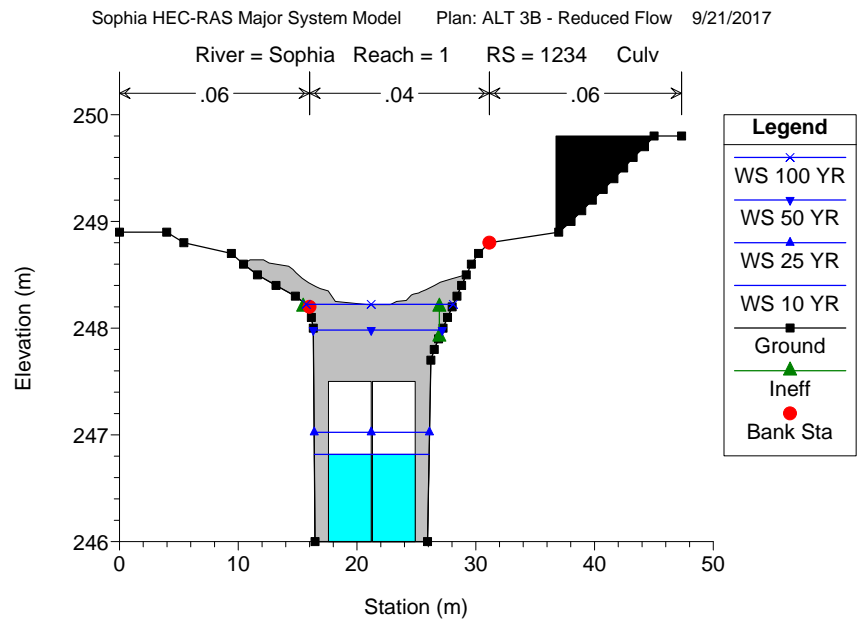
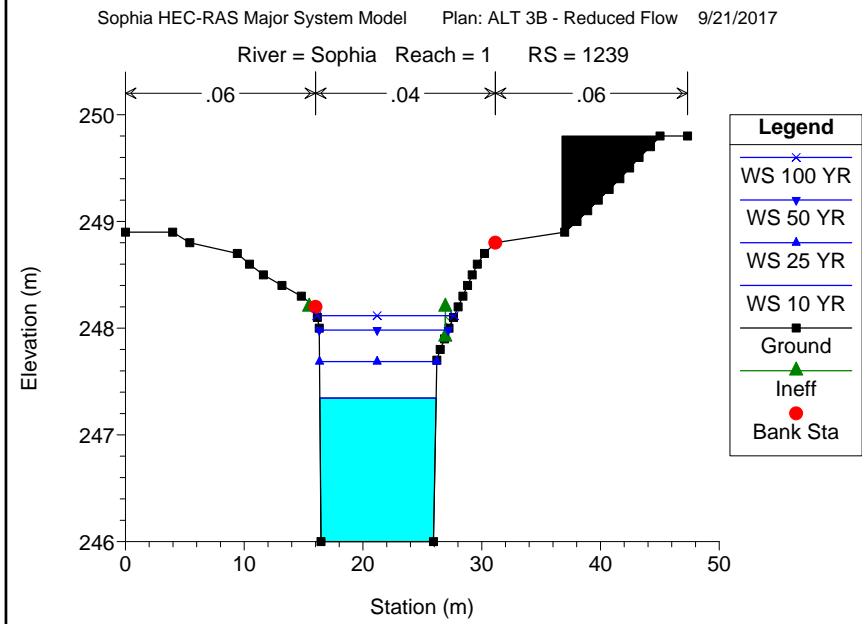
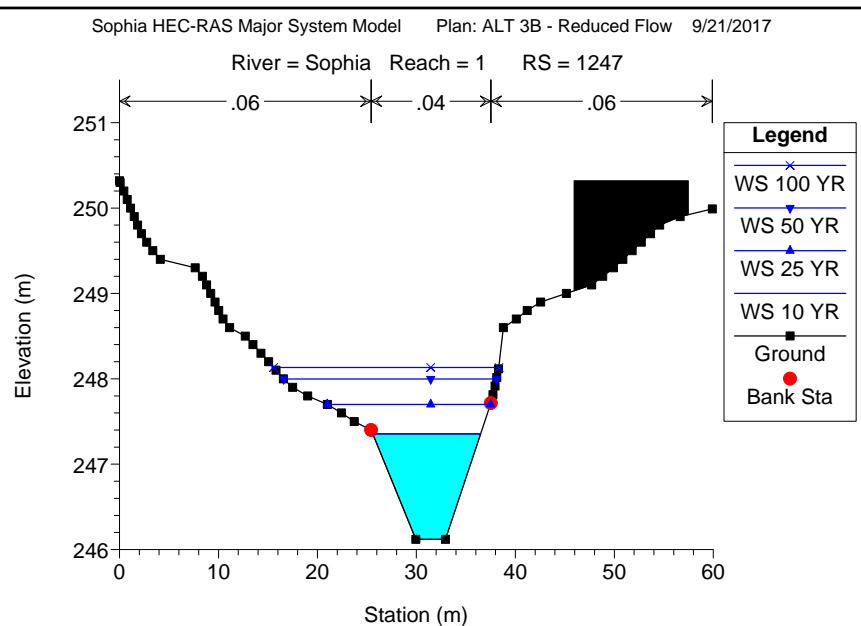
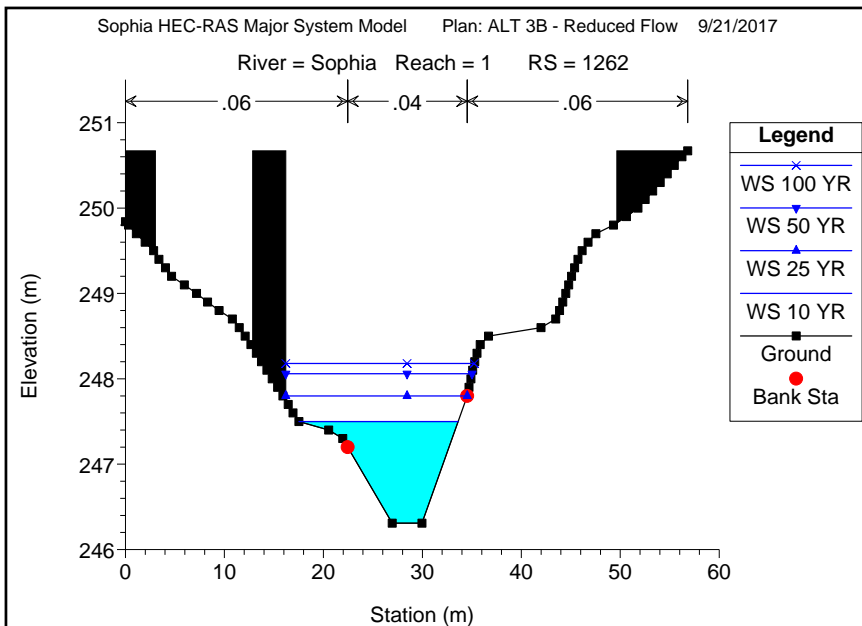


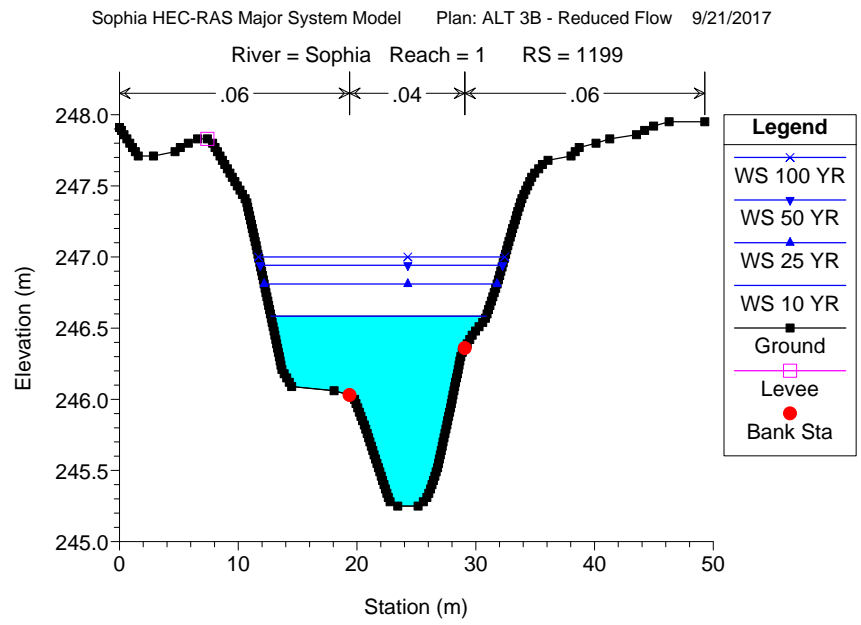
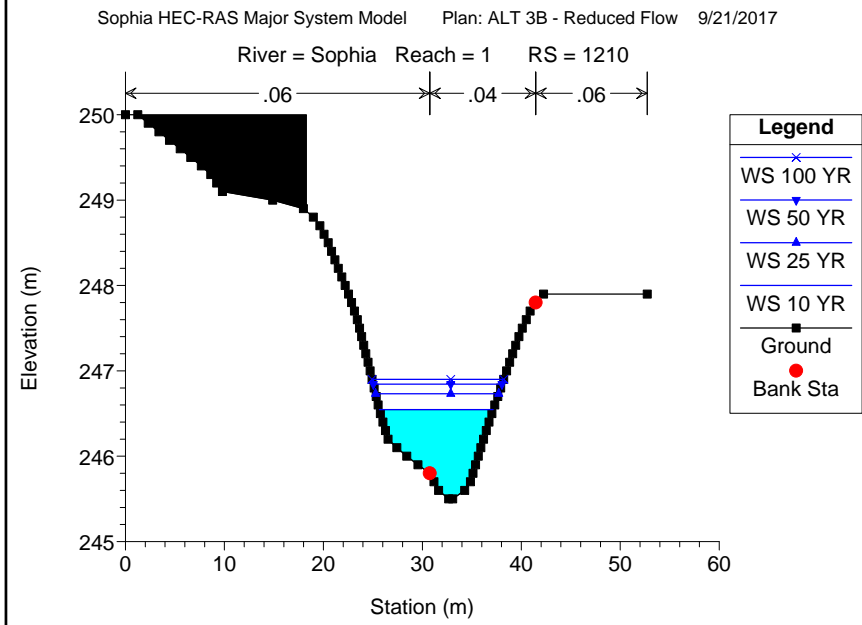
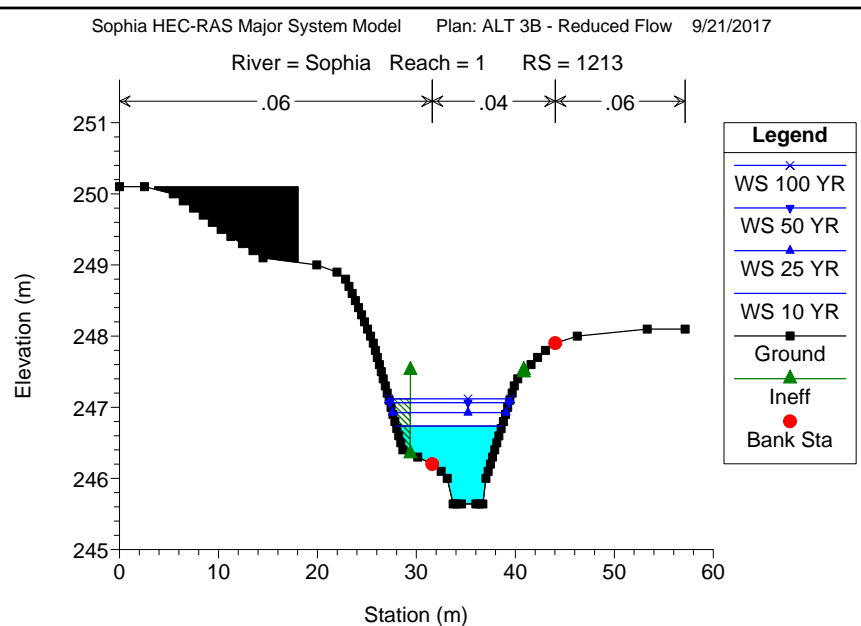
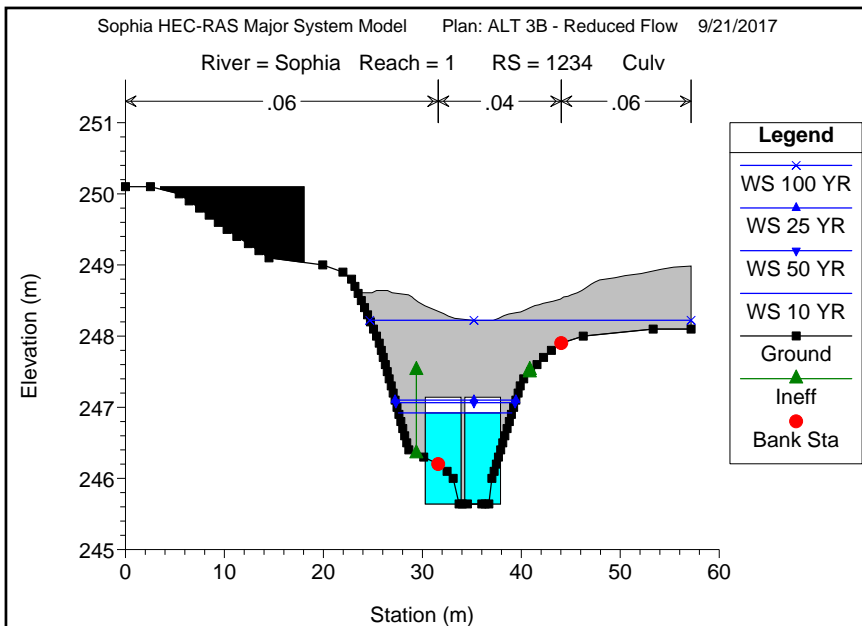


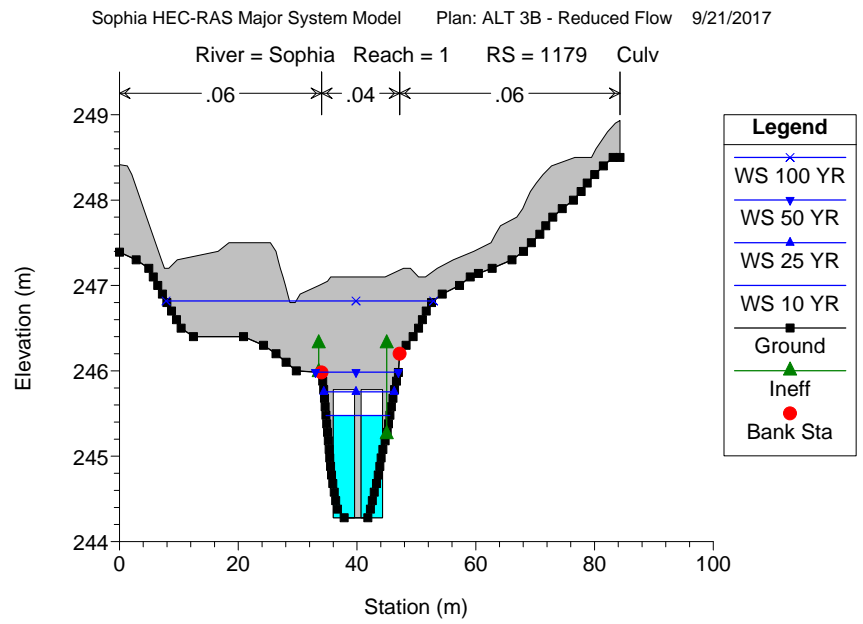
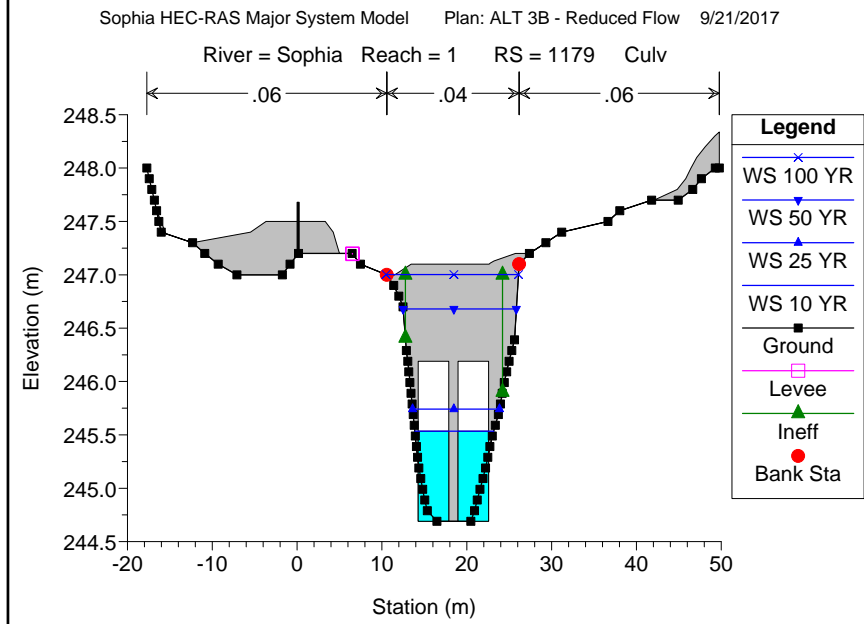
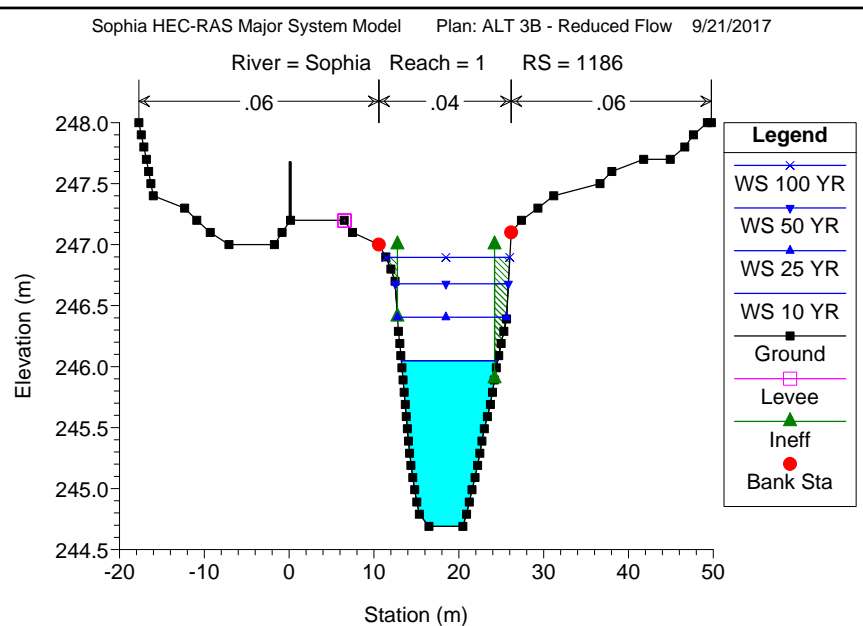
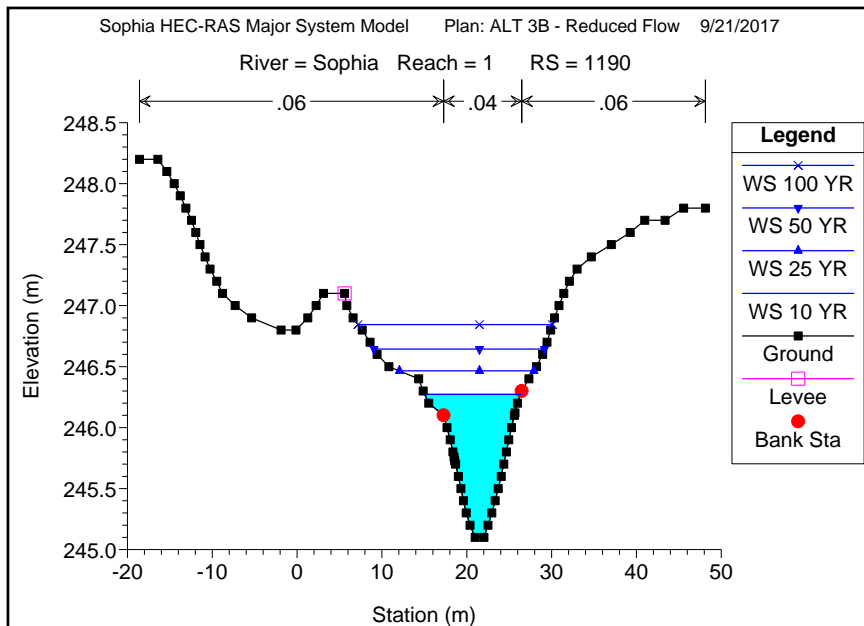


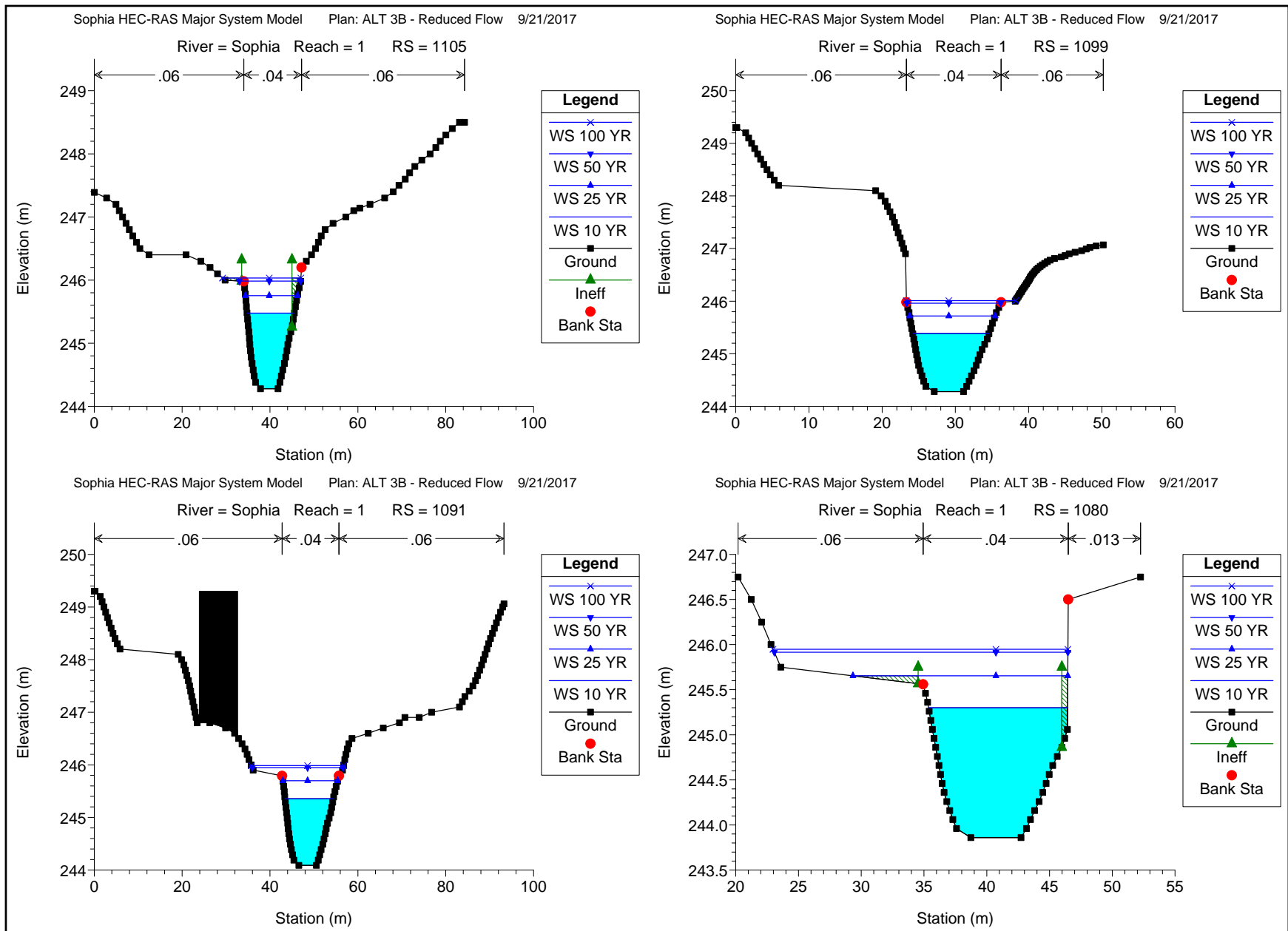


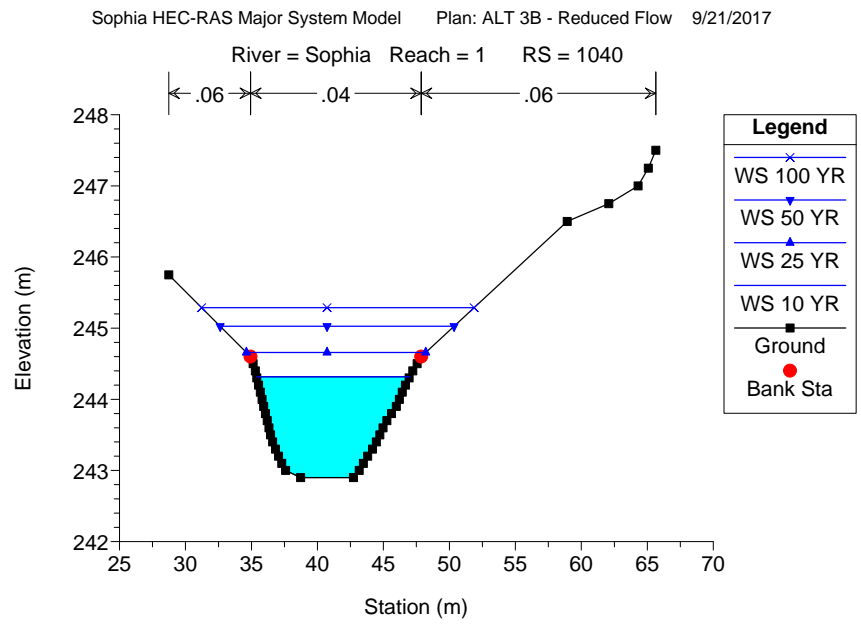
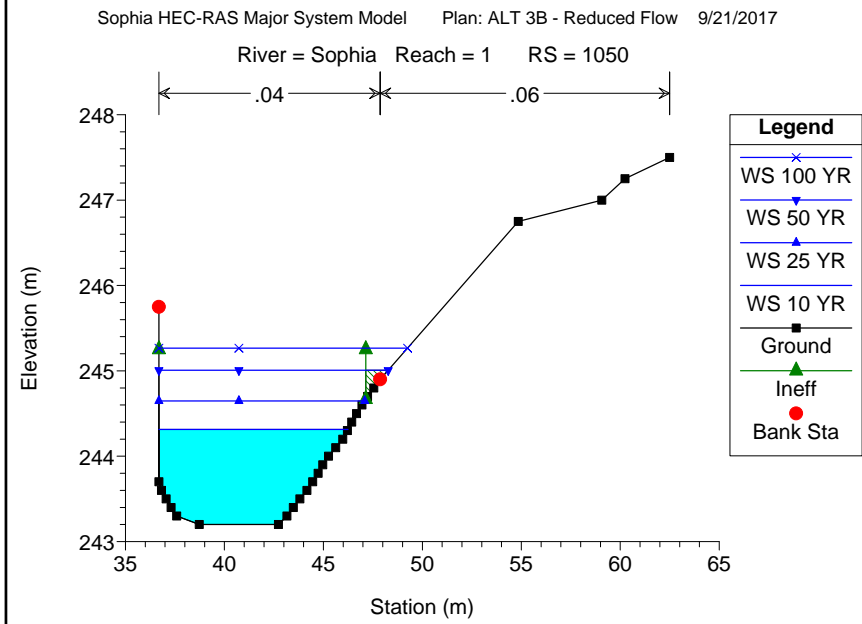
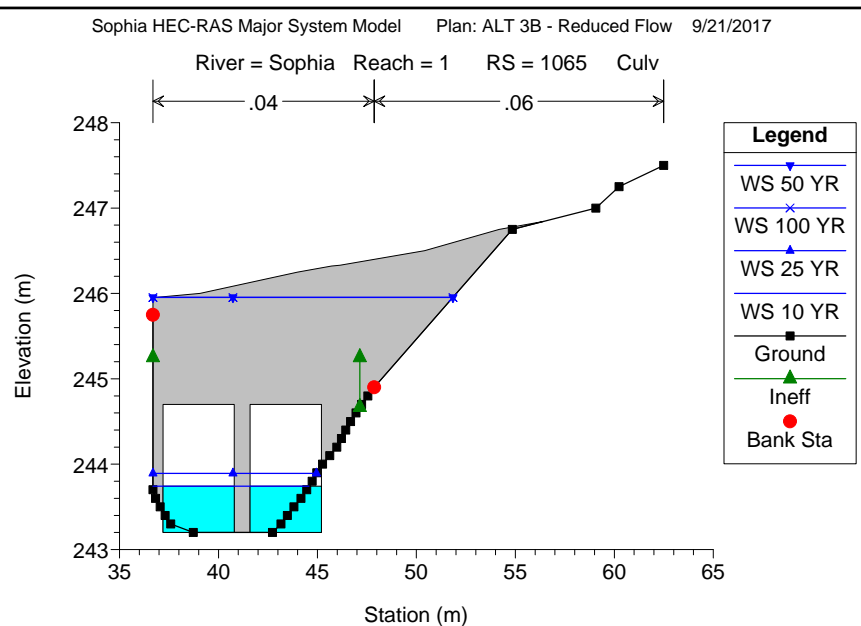
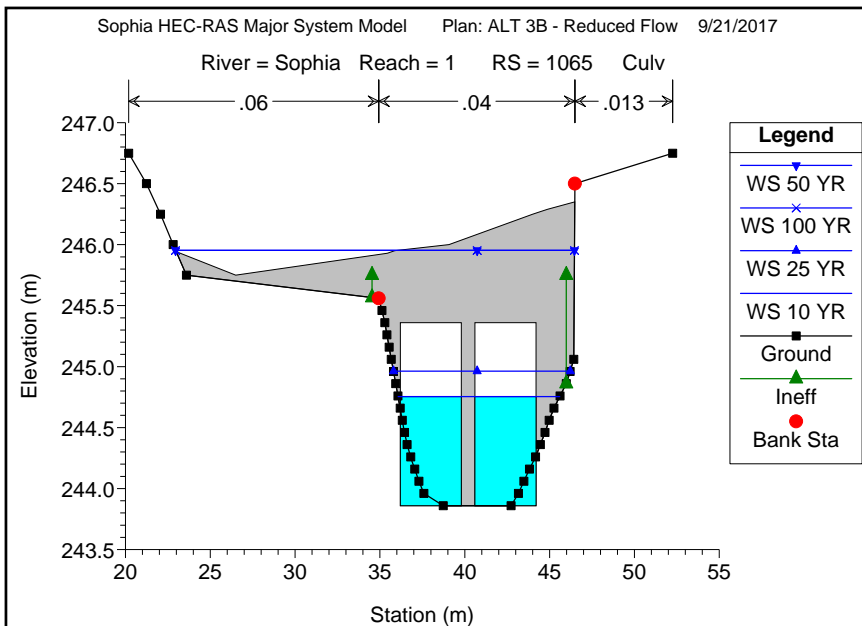






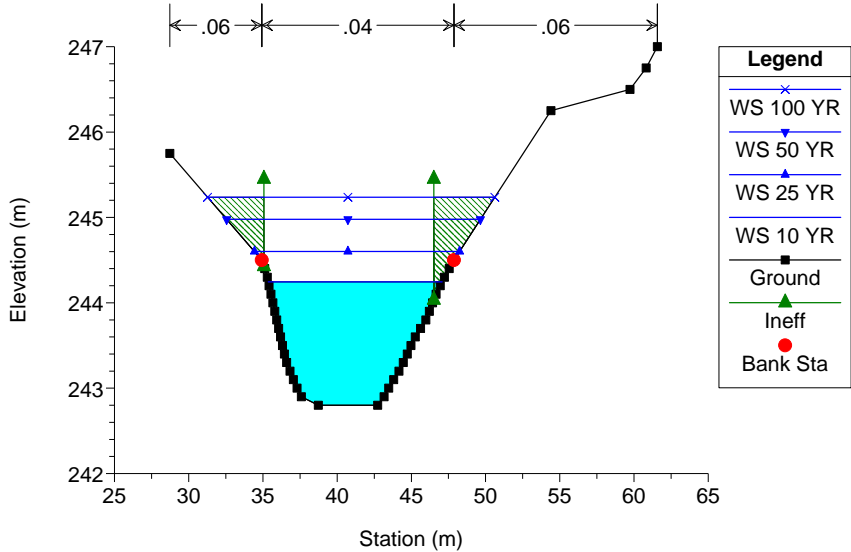






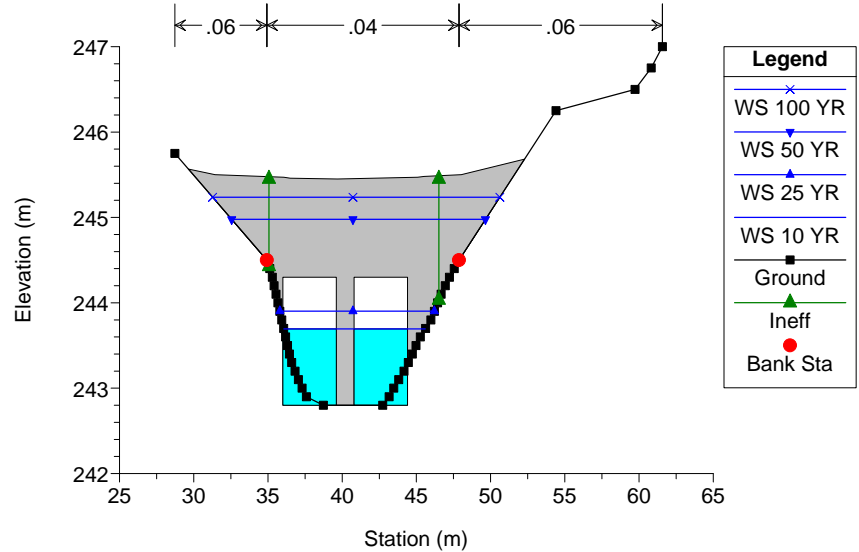
Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

River = Sophia Reach = 1 RS = 1020



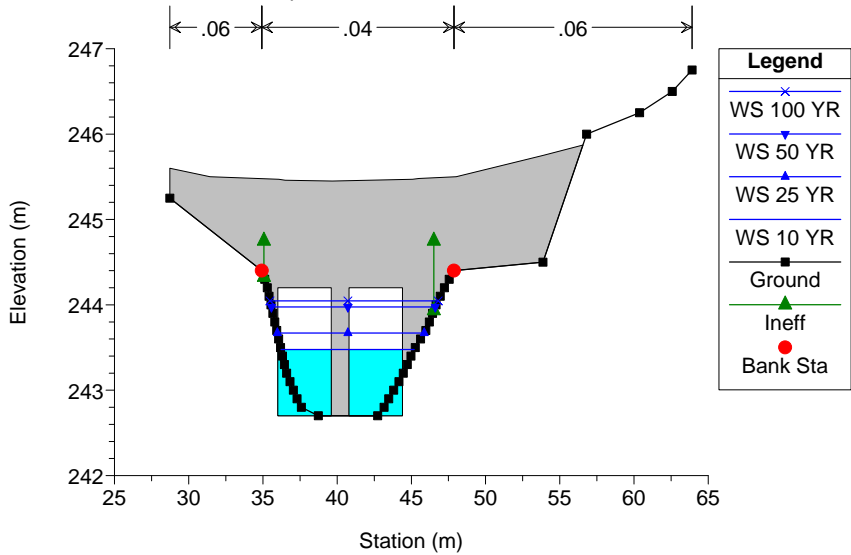
Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

River = Sophia Reach = 1 RS = 1010 Culv



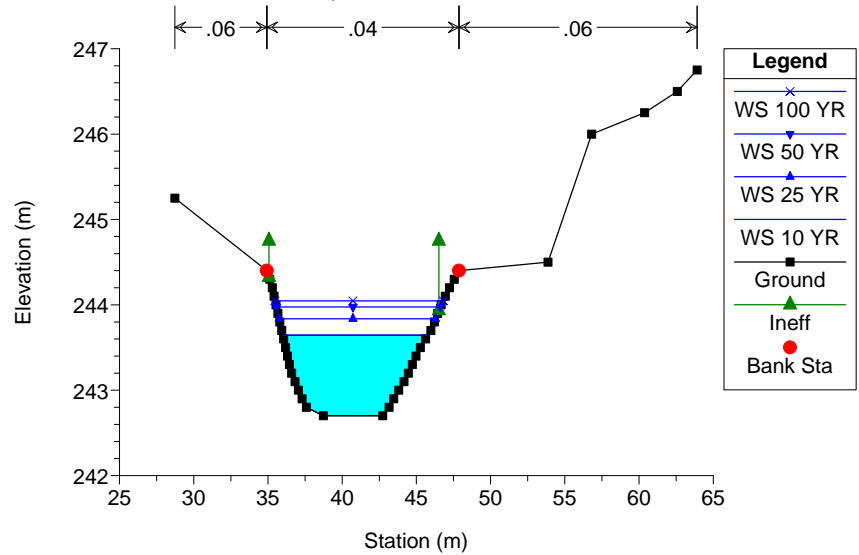
Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

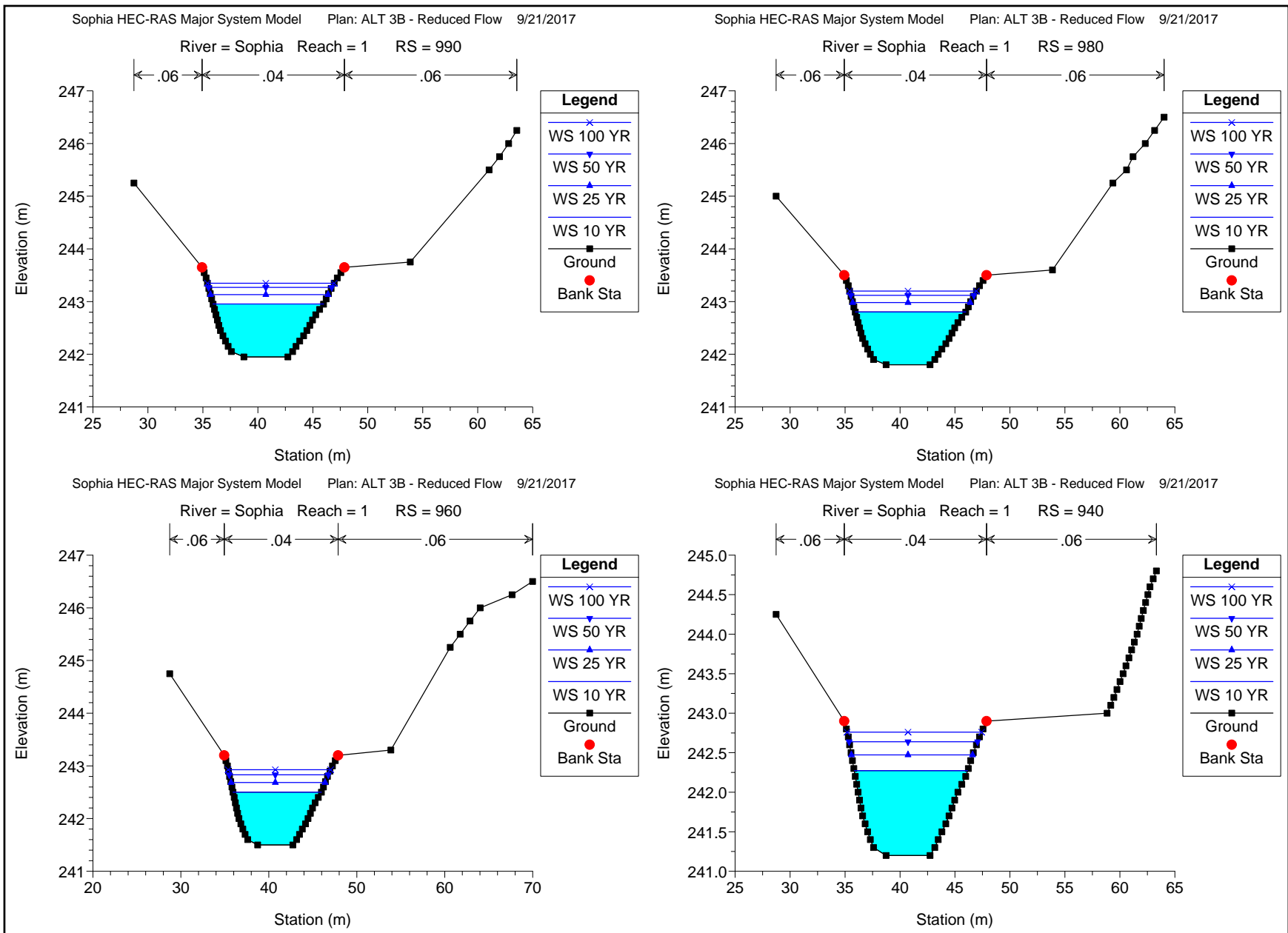
River = Sophia Reach = 1 RS = 1010 Culv

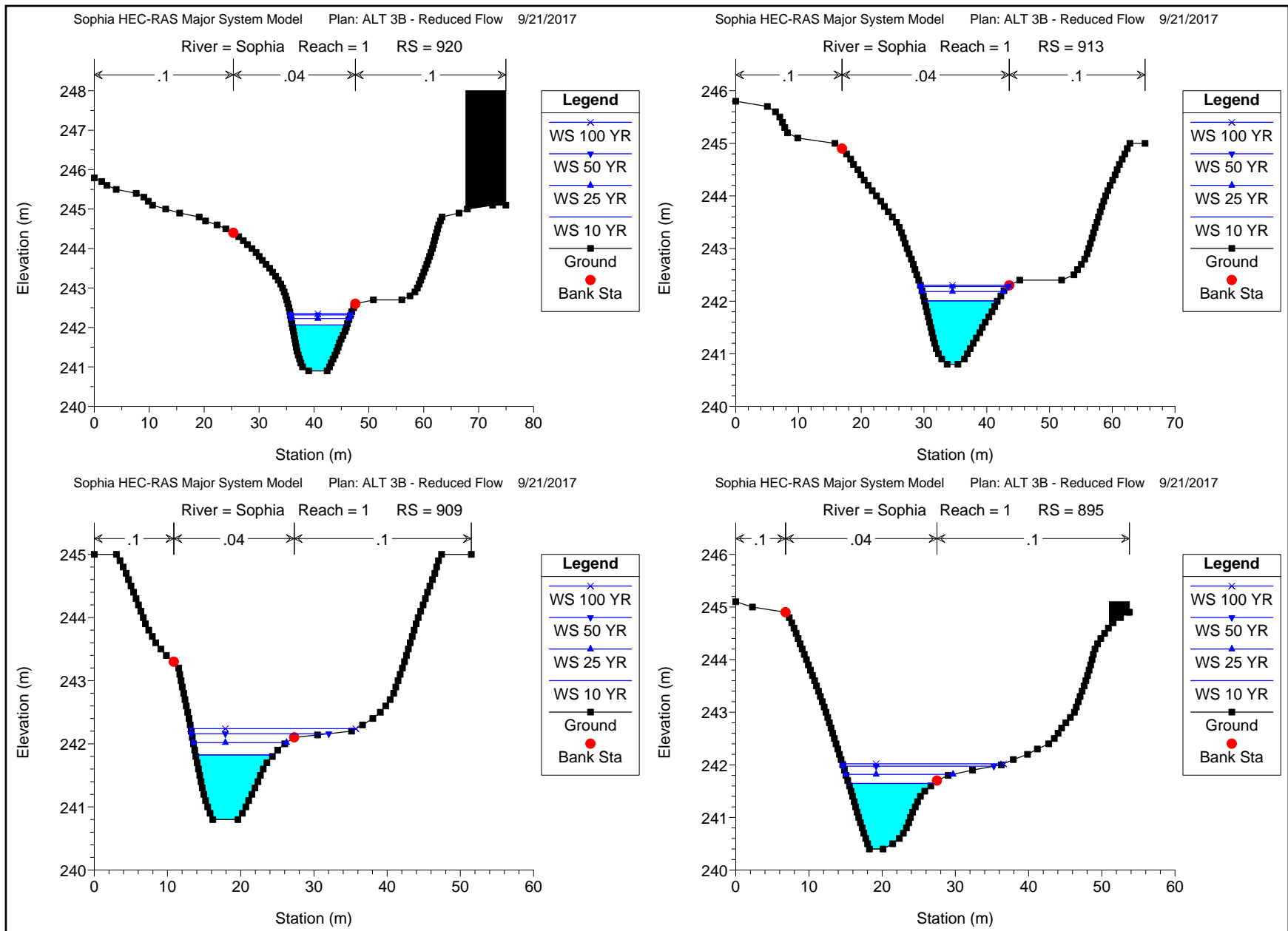


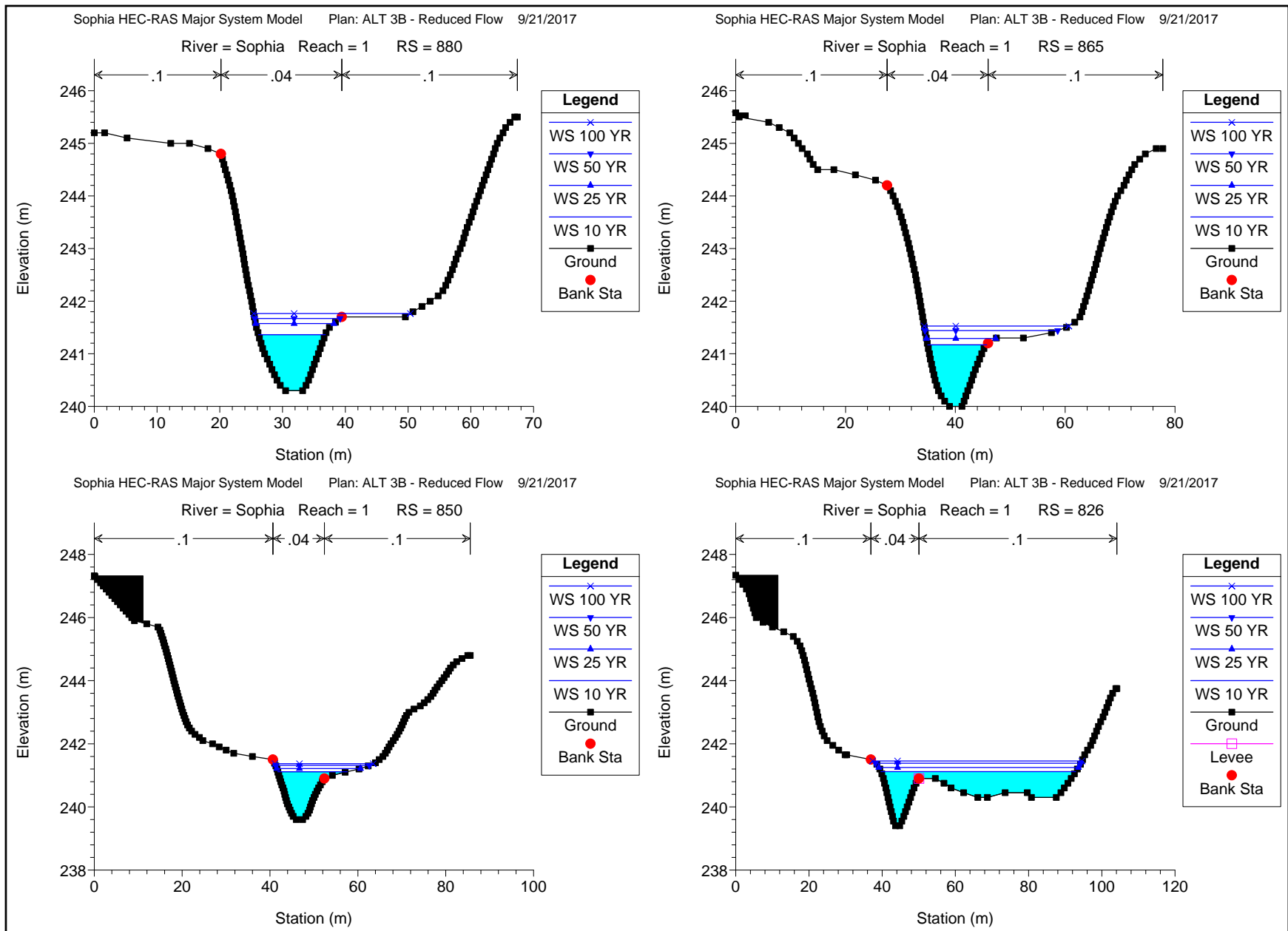
Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

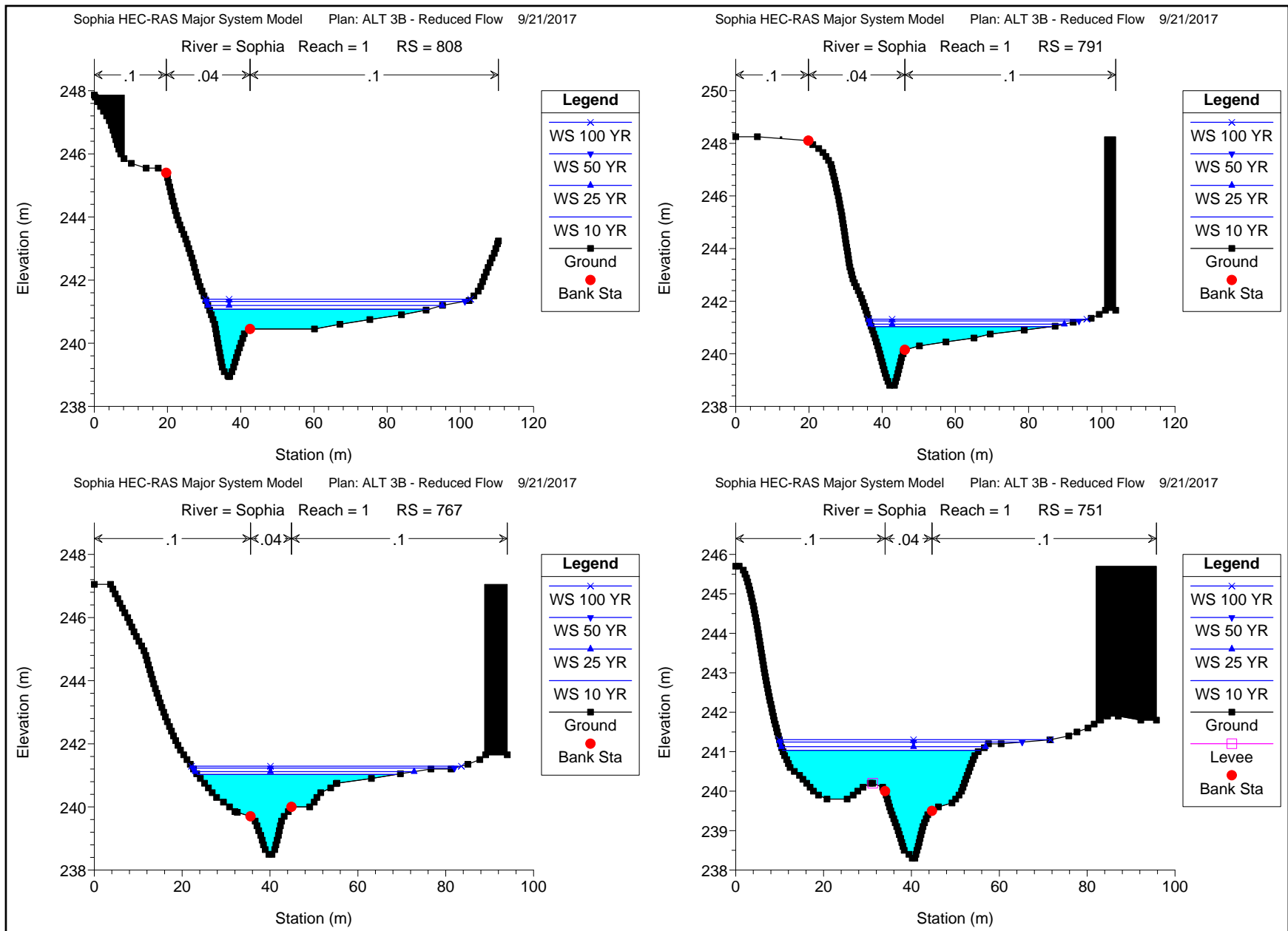
River = Sophia Reach = 1 RS = 1000

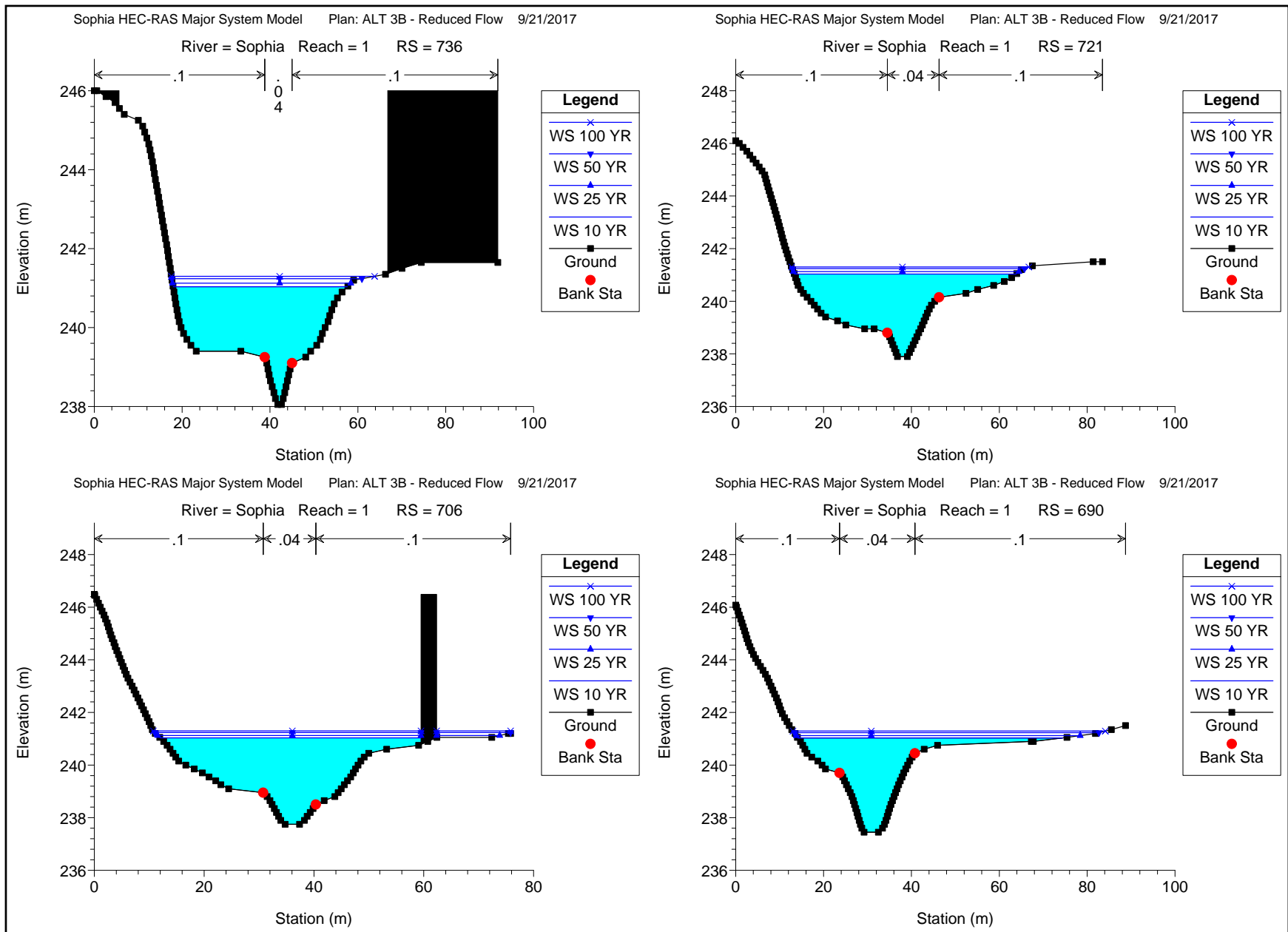


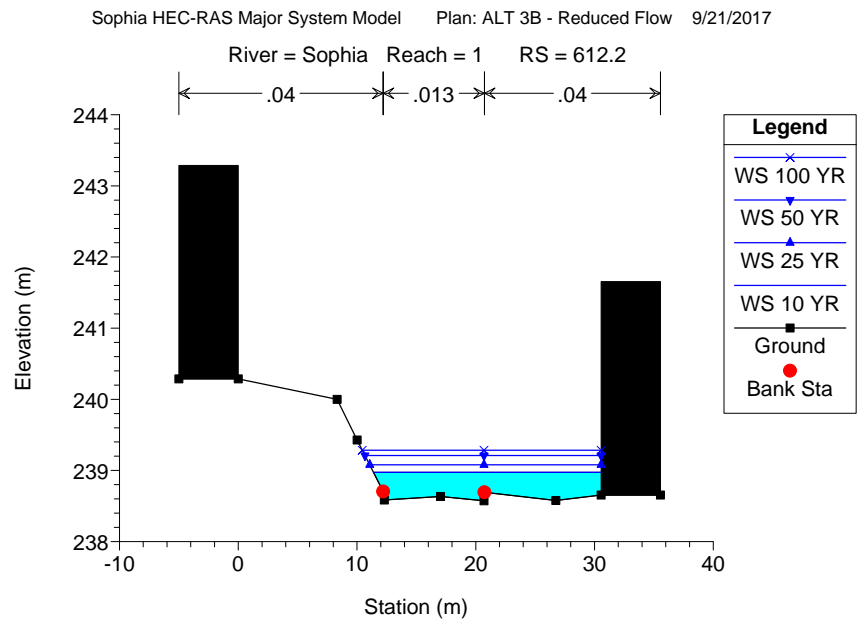
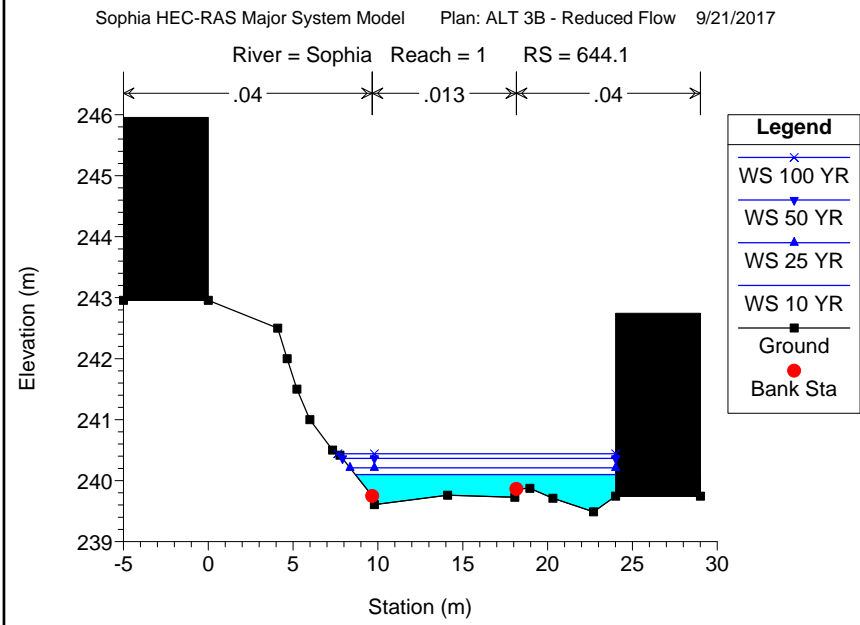
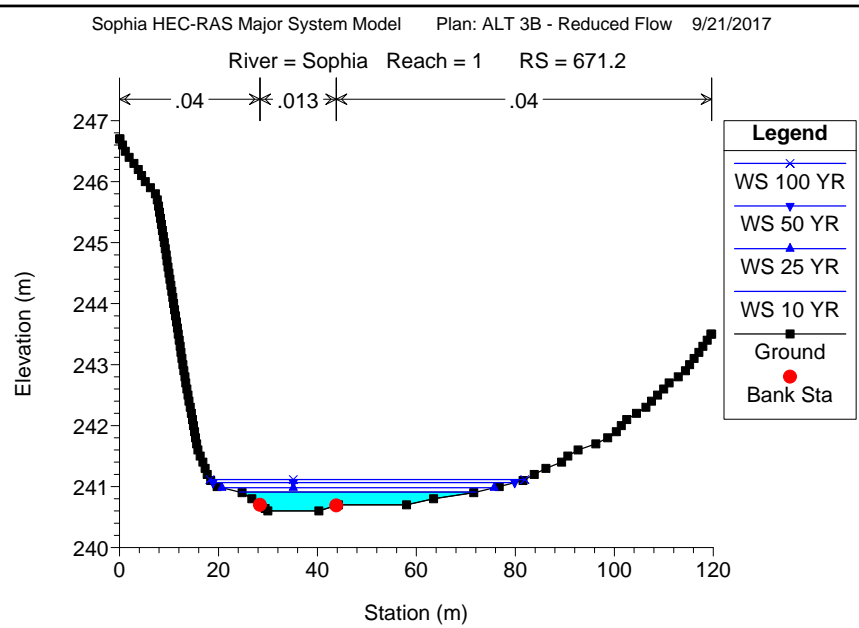
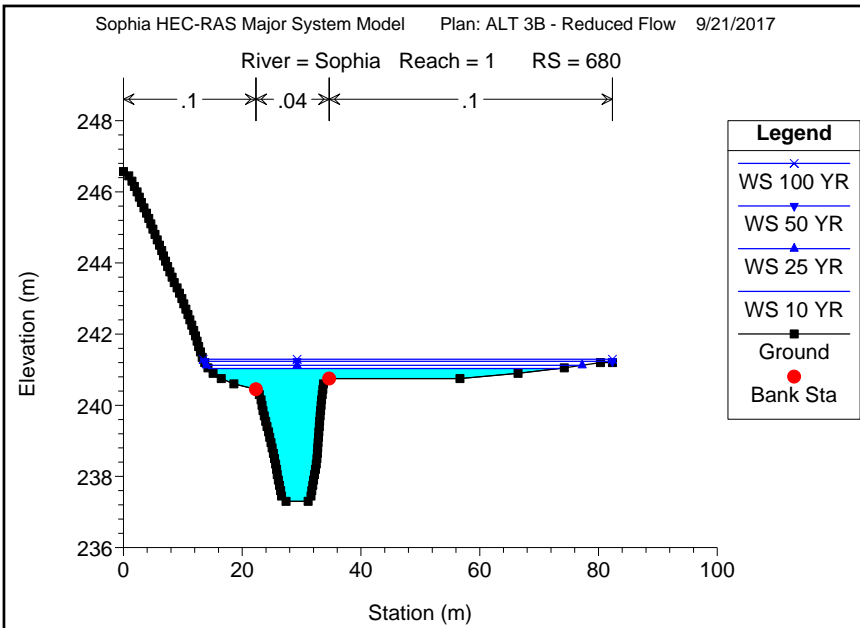


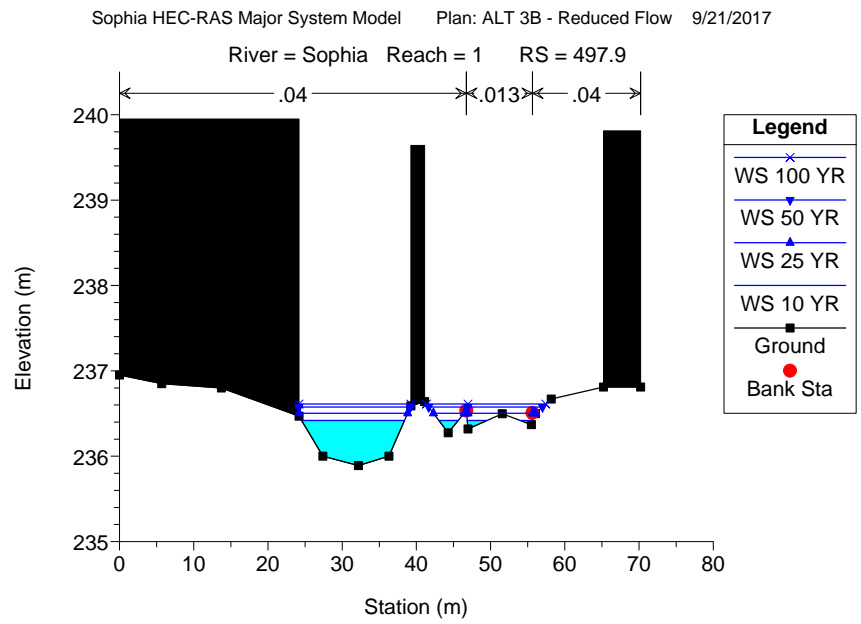
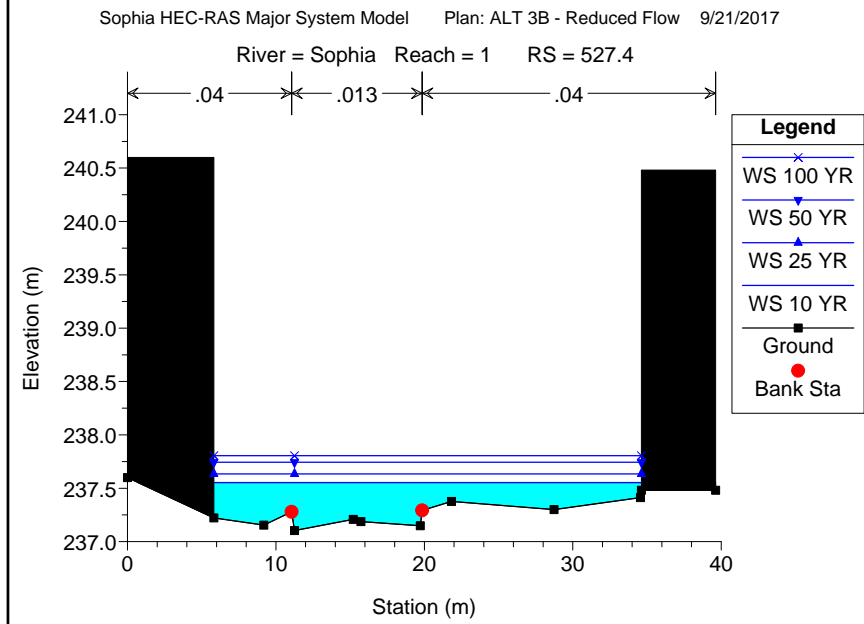
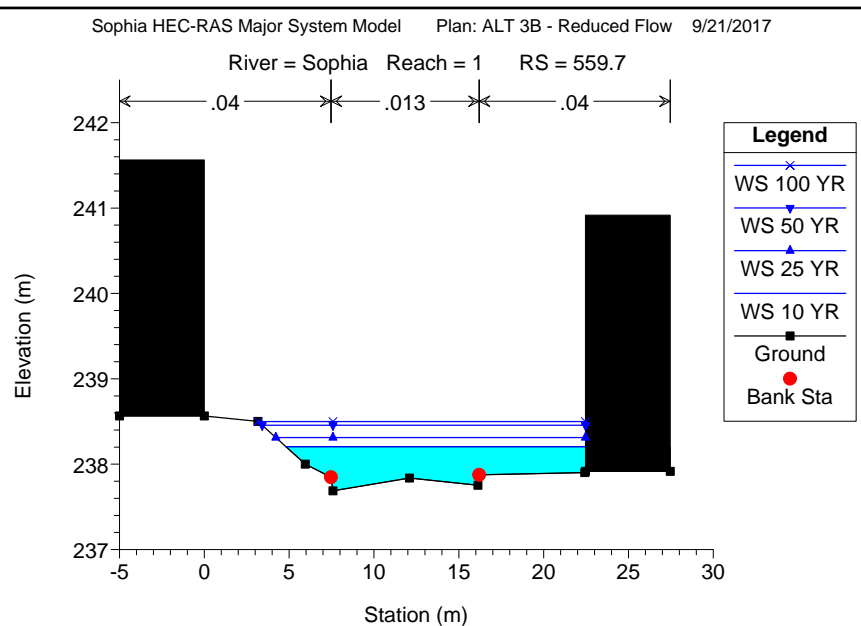
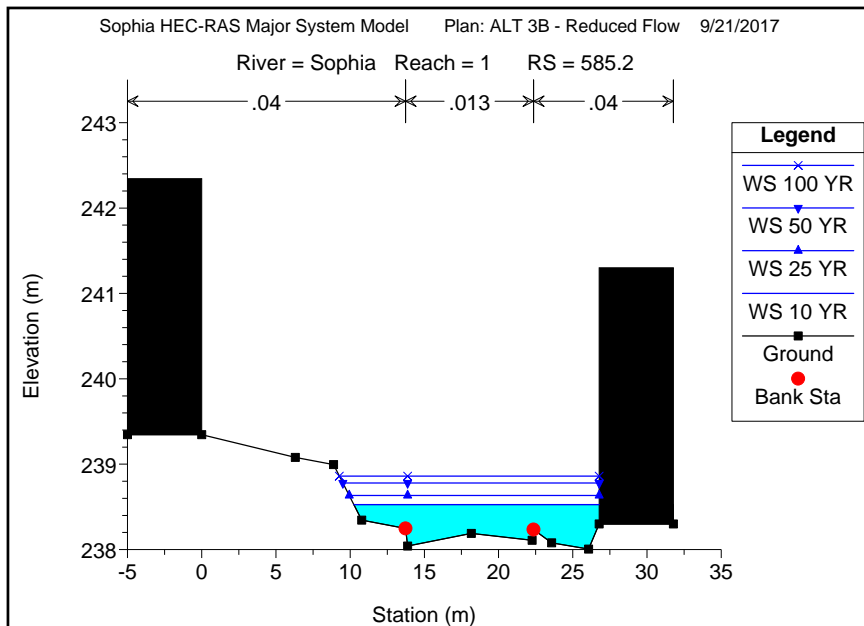


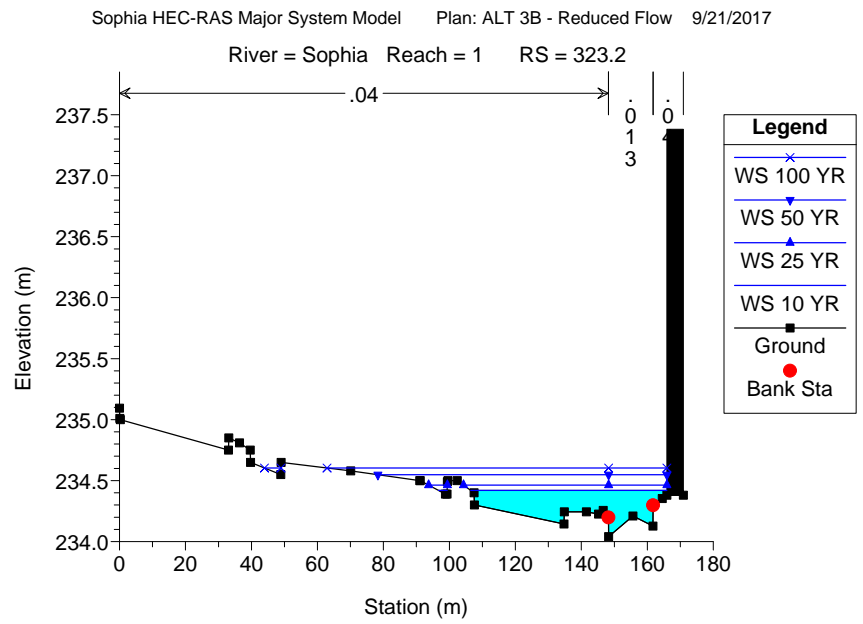
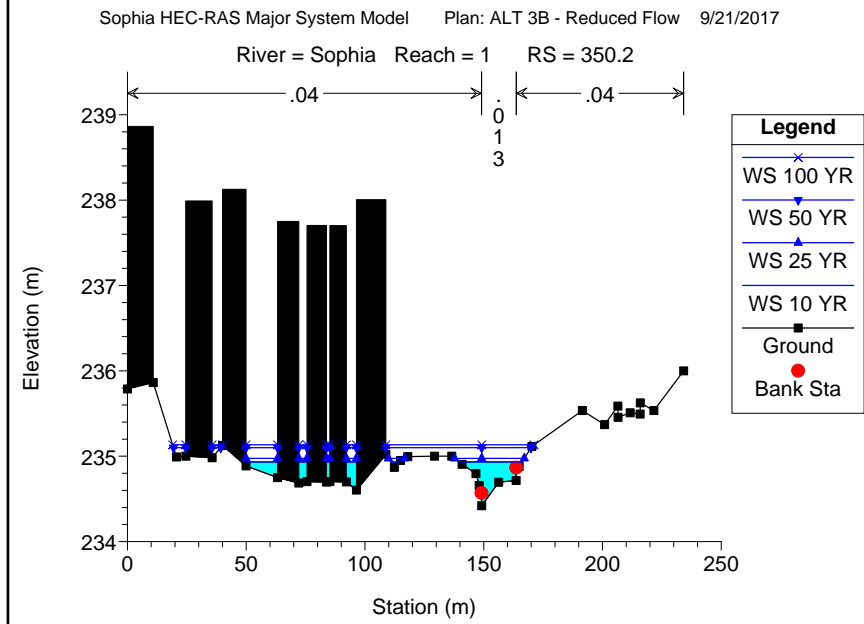
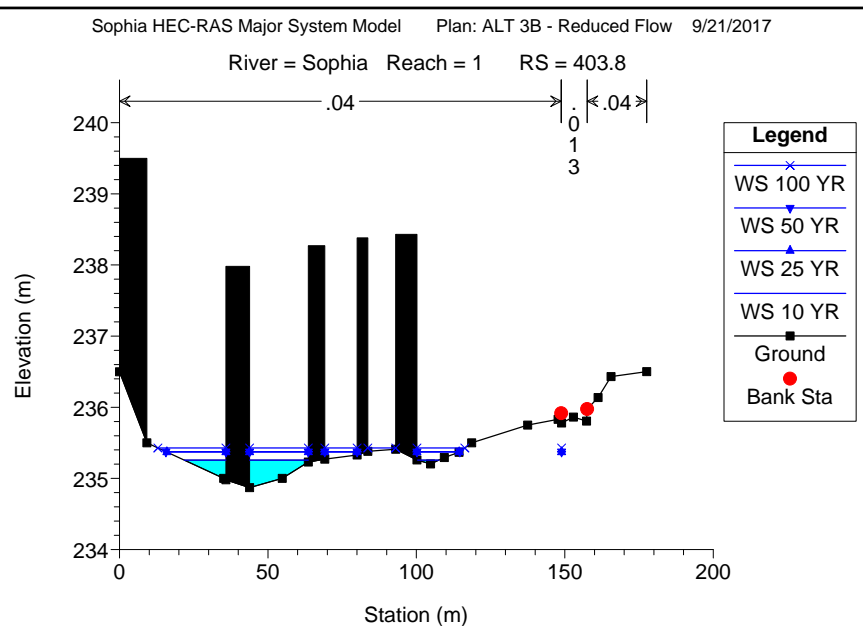
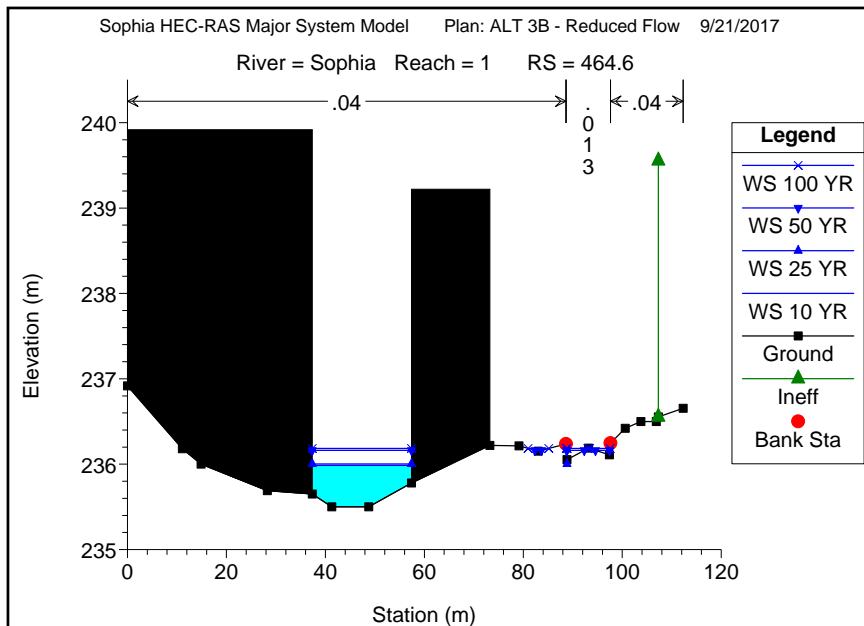


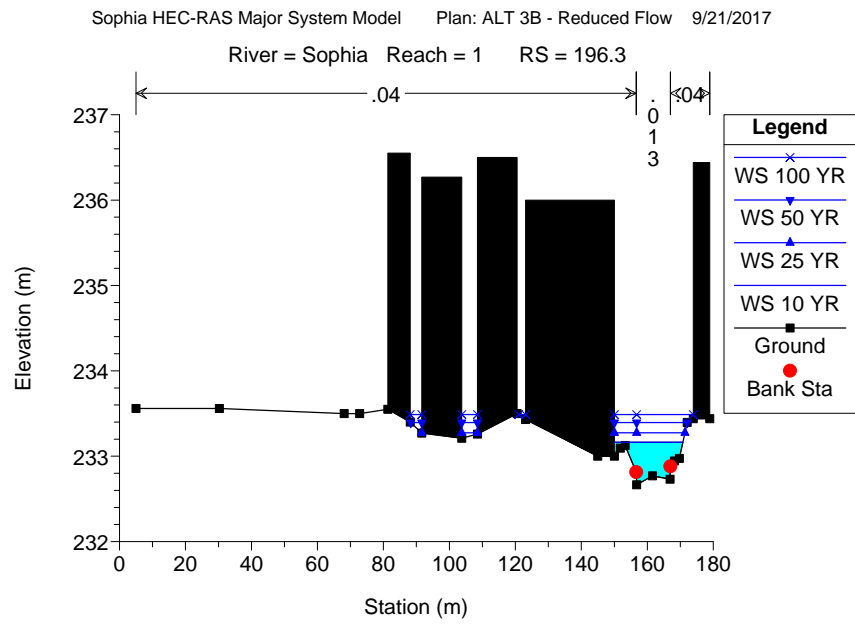
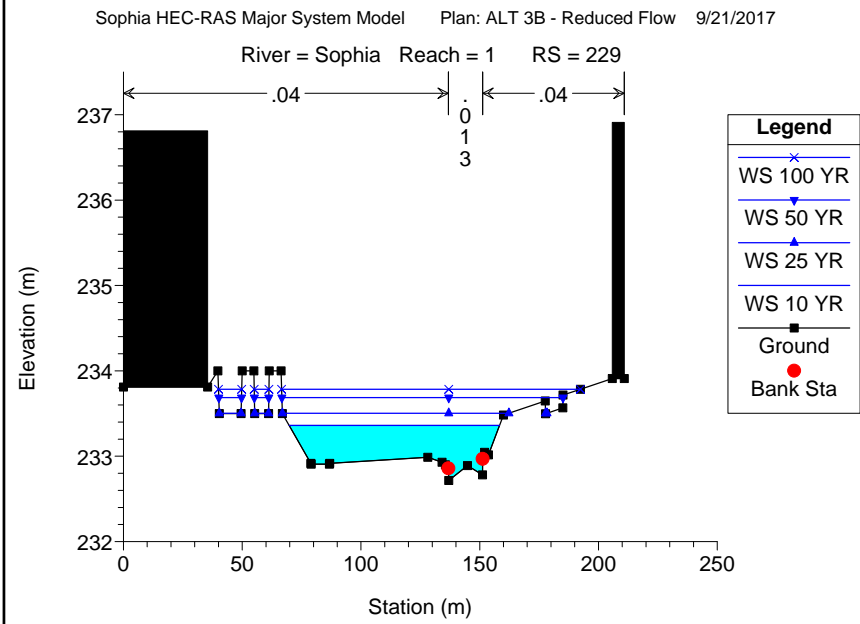
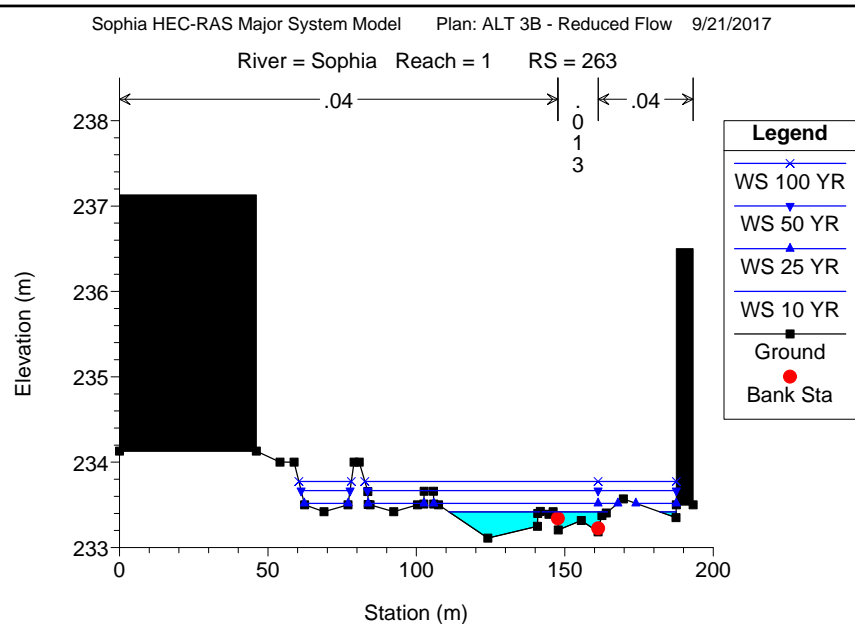
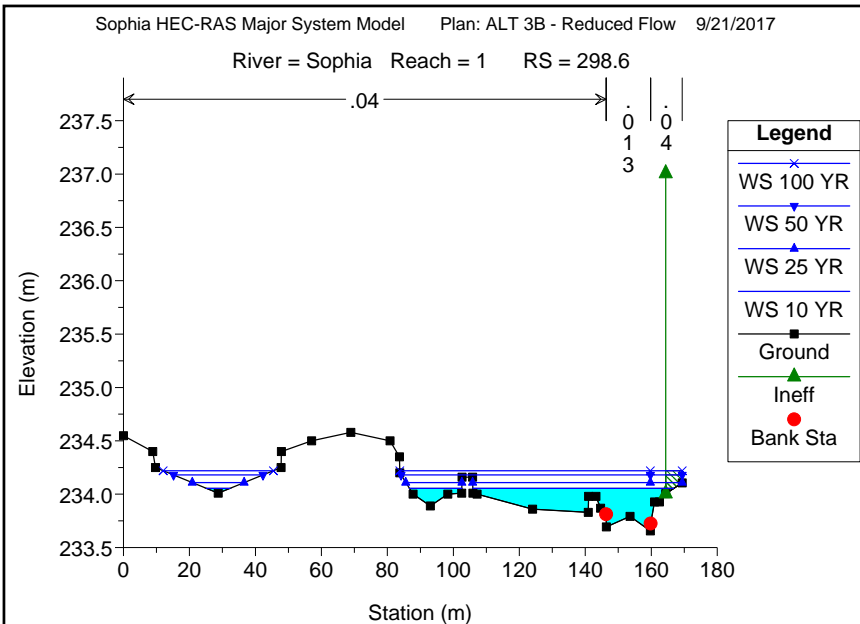






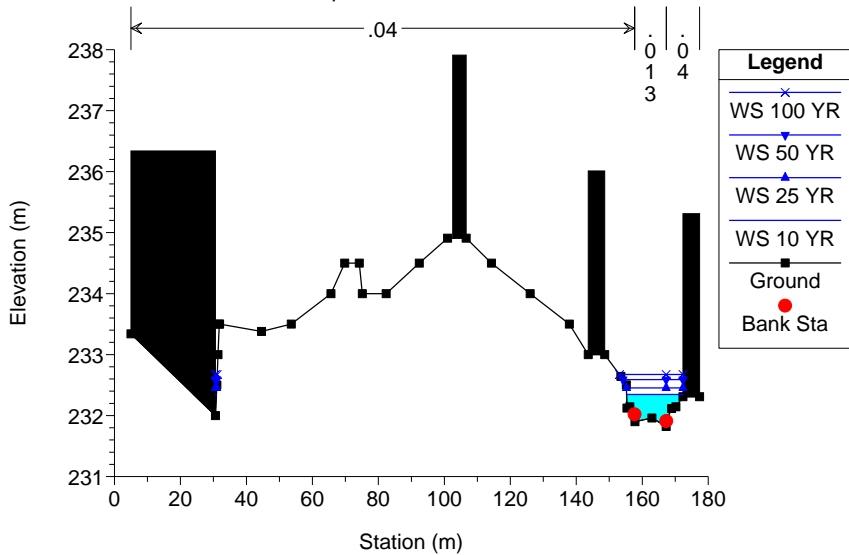






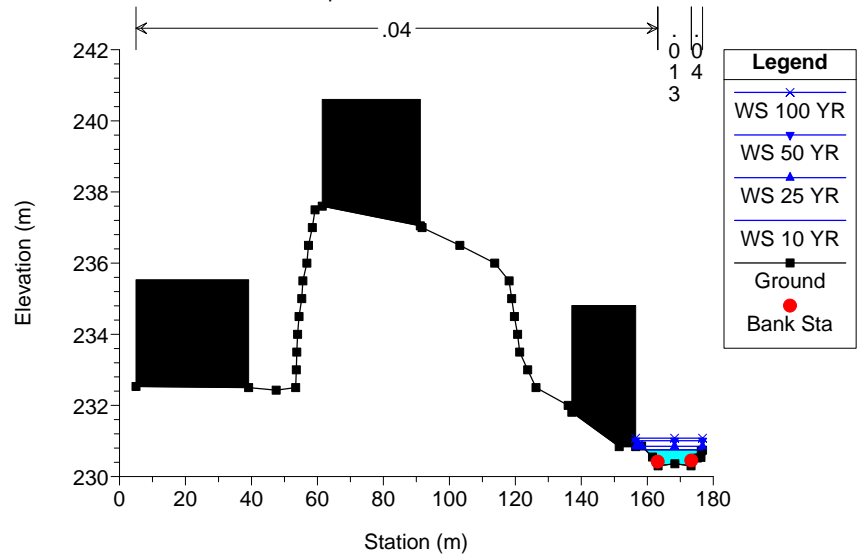
Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

River = Sophia Reach = 1 RS = 173



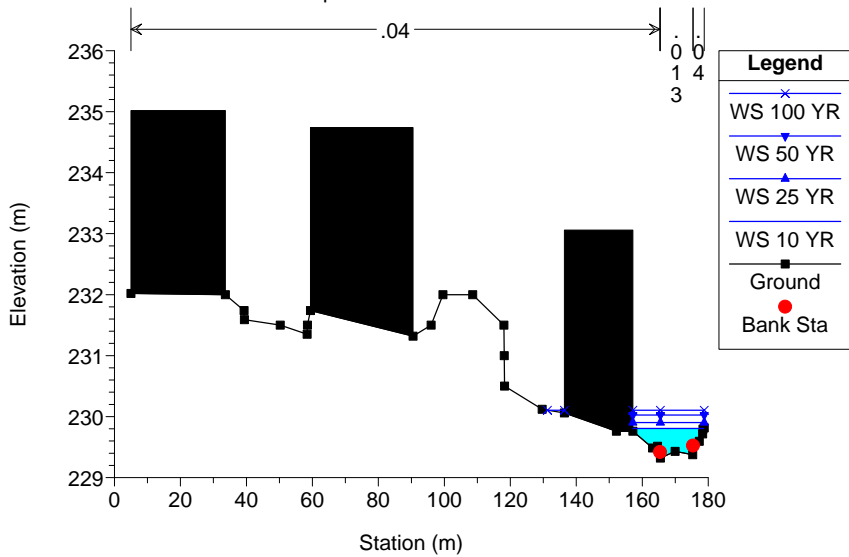
Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

River = Sophia Reach = 1 RS = 134.4



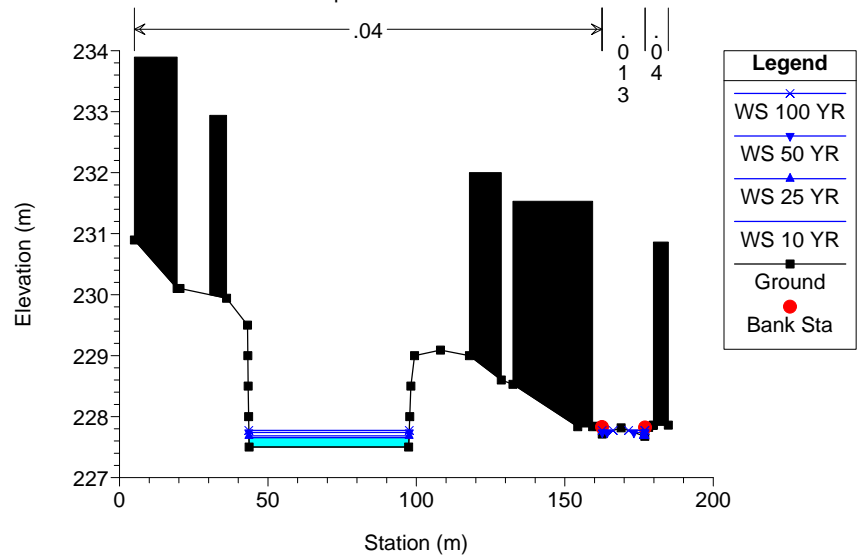
Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

River = Sophia Reach = 1 RS = 109.4



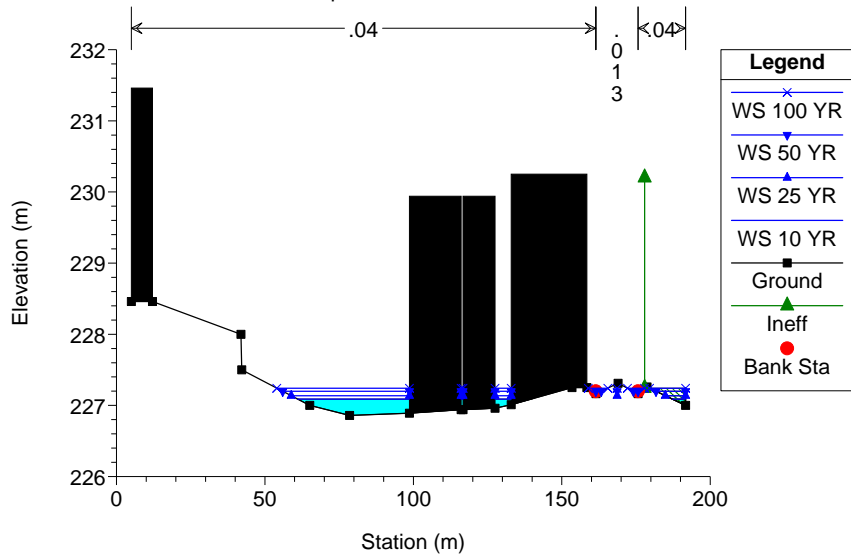
Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

River = Sophia Reach = 1 RS = 69.9



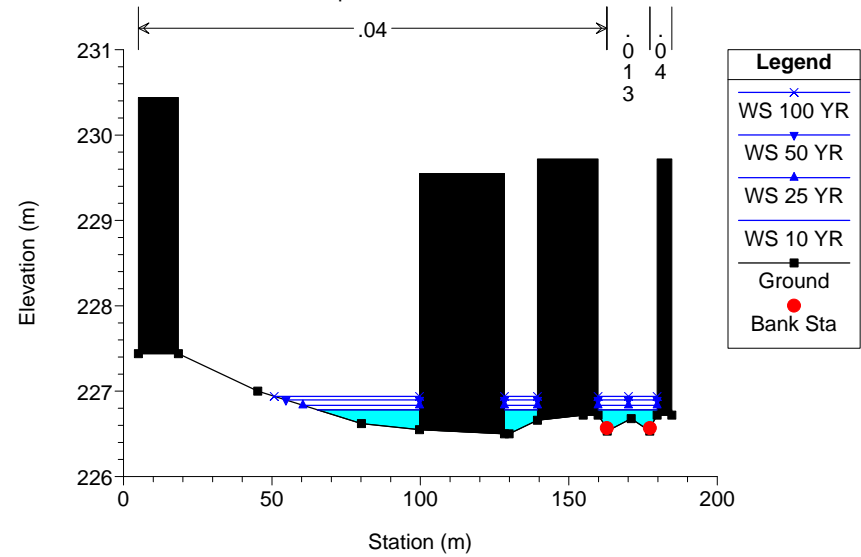
Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

River = Sophia Reach = 1 RS = 49.2



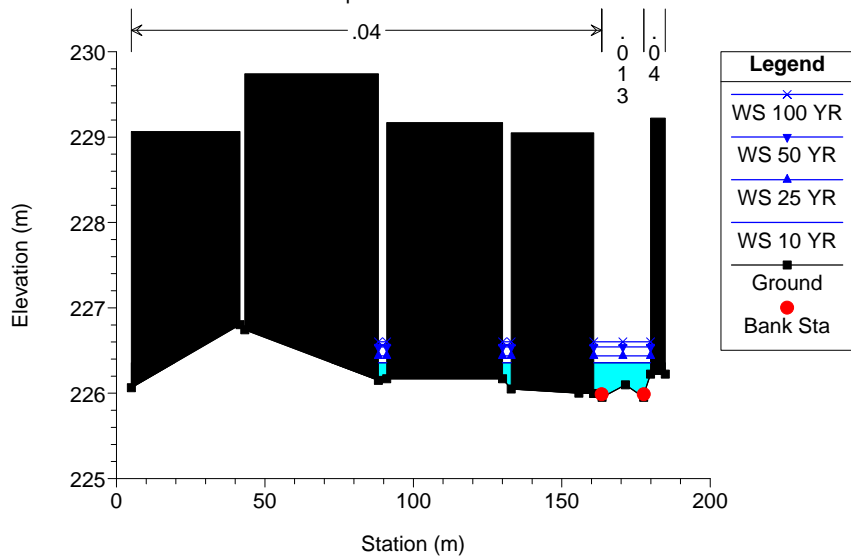
Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

River = Sophia Reach = 1 RS = 31.4

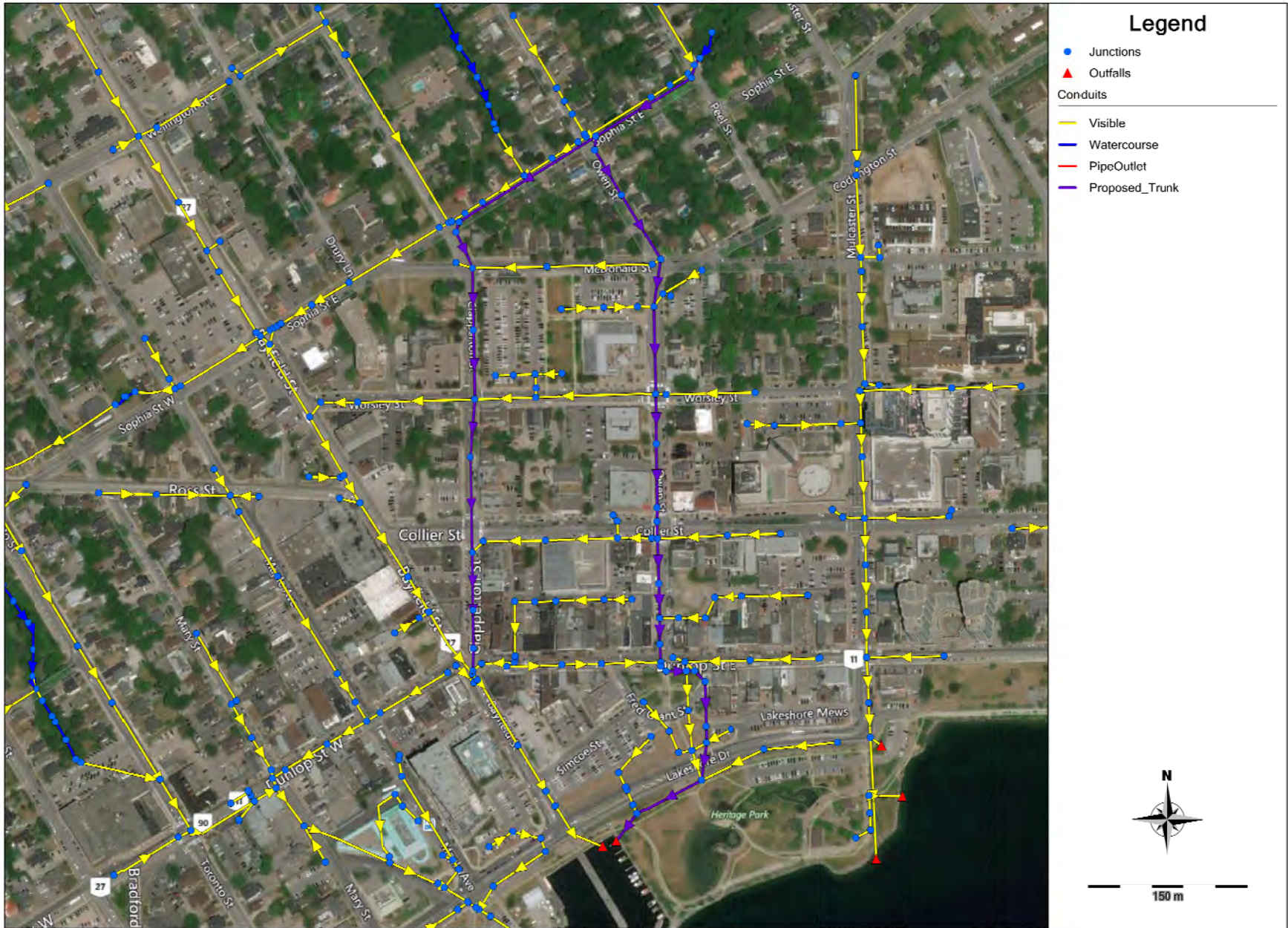


Sophia HEC-RAS Major System Model Plan: ALT 3B - Reduced Flow 9/21/2017

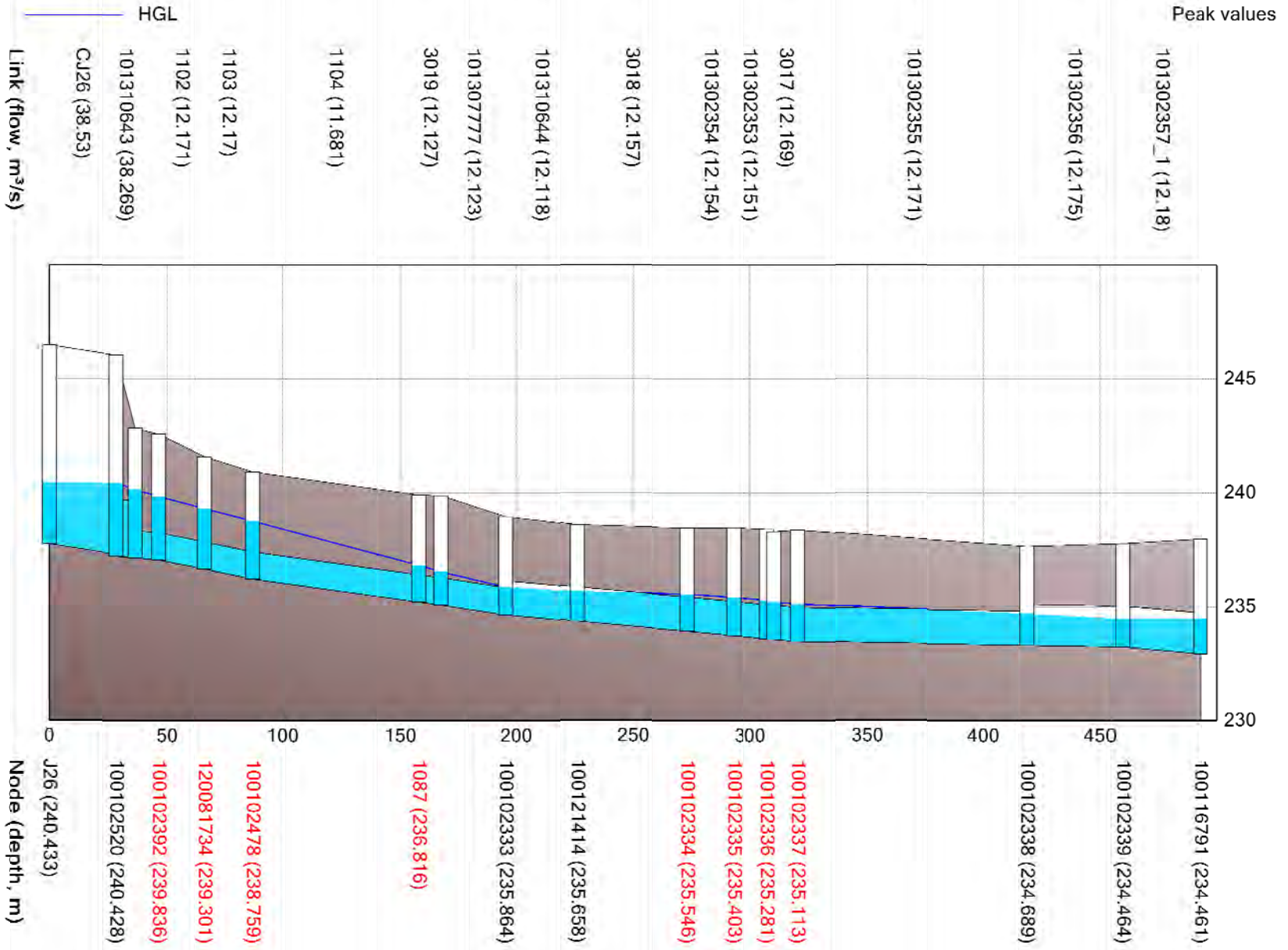
River = Sophia Reach = 1 RS = 0



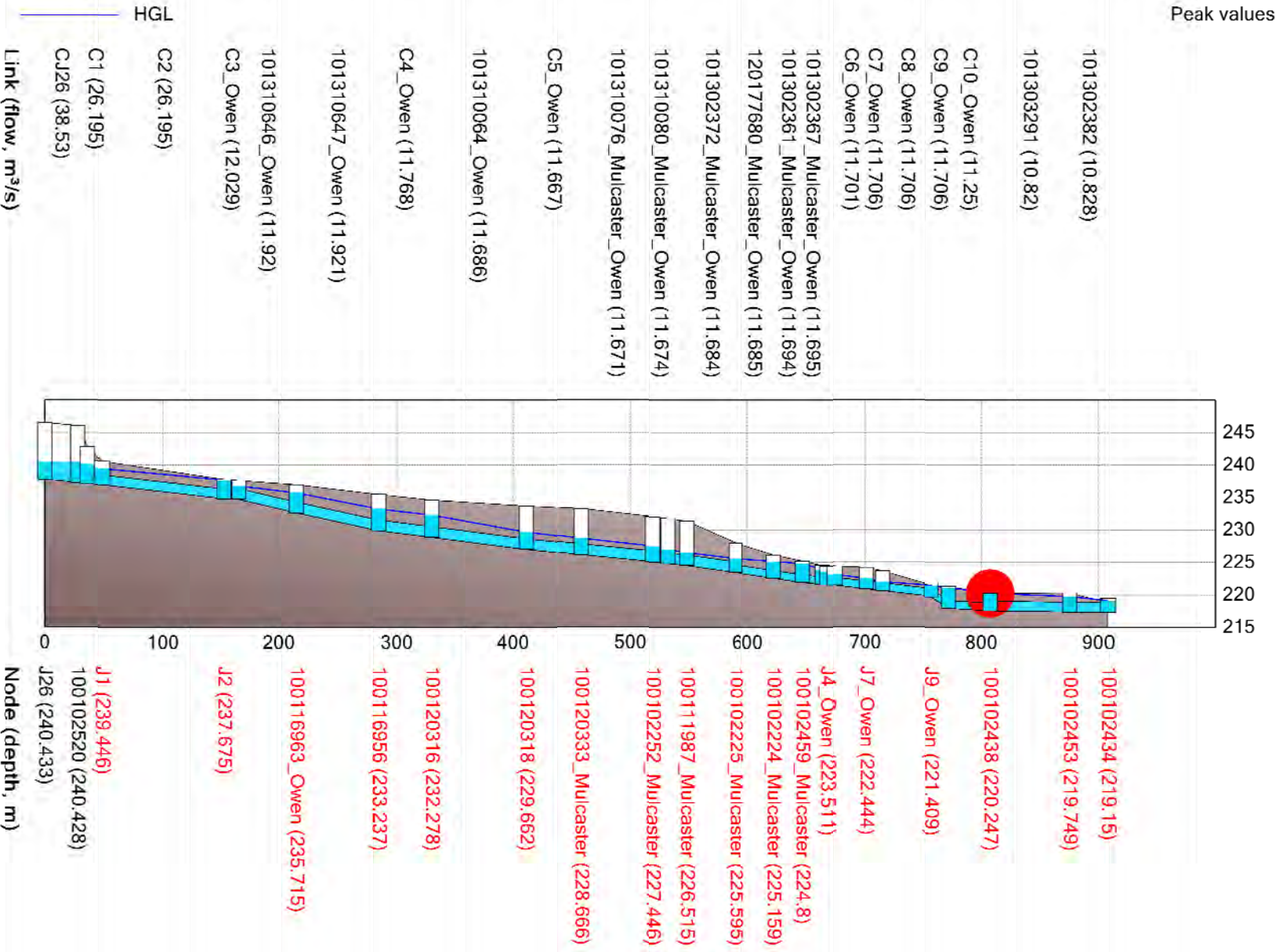
Preferred Alternative - Clapperton and Owen Street Trunk Plan View



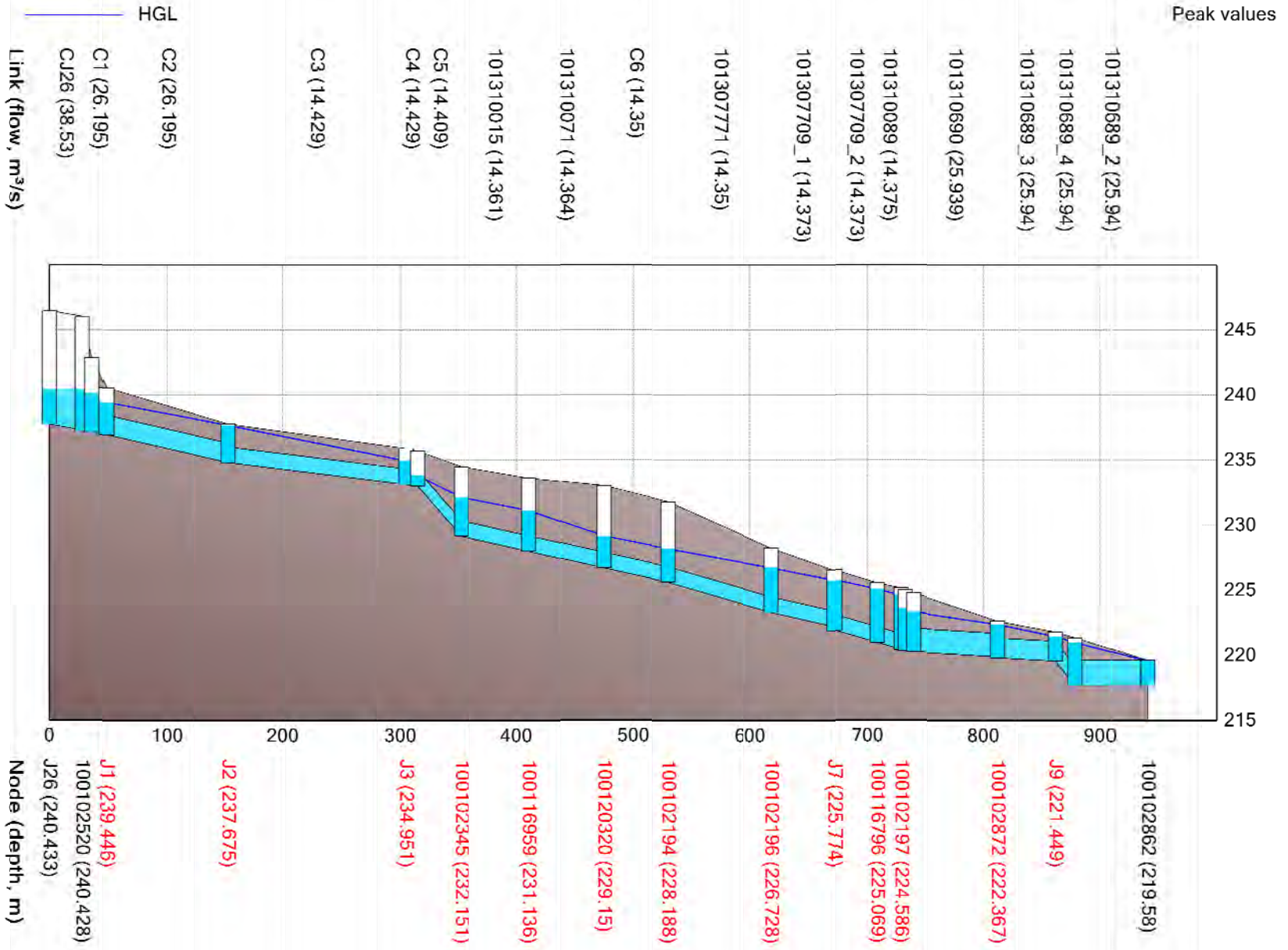
Preferred Alternative - Sophia Street Trunk PCSWMM Model Results



Preferred Alternative - Owen Street Trunk PCSWMM Model Results



# Preferred Alternative - Clapperton Street Trunk PCSWMM Model Results



**SOPHIA CREEK WATERSHED AND MULCASTER DRAINAGE AREA EA UPDATE  
MAJOR OVERLAND FLOW ROUTE DEFICIENCY SUMMARY  
SEPTEMBER 2017**

Link	Max Flow m <sup>3</sup> /s	Max Velocity m/s	Max Depth m	Depth Velocity Product	Velocity > 1.7 m/s	Depth > 0.3 m	Product > 0.4 m <sup>2</sup> /s
101300068-S	27.262	2.25	0.752	1.692	Yes	Yes	Yes
101302005-S	1.564	2.22	0.1175	0.26085	Yes	-	-
101302006-S	1.613	1.94	0.141	0.27354	Yes	-	-
101302308-S	1.479	2.02	0.1175	0.23735	Yes	-	-
101302309-S	1.782	2.3	0.141	0.3243	Yes	-	-
101302317-S	3.655	0.74	0.4935	0.36519	-	Yes	-
101302353-S	24.895	2.29	0.705	1.61445	Yes	Yes	Yes
101302354-S	23.941	1.99	0.752	1.49648	Yes	Yes	Yes
101302355-S	28.7	1.7	0.987	1.6779	-	Yes	Yes
101302356-S	26.337	1.21	1.222	1.47862	-	Yes	Yes
101302357-S	21.008	1.27	0.9635	1.223645	-	Yes	Yes
101302361-S	0.762	1.87	0.094	0.17578	Yes	-	-
101302363-S	2.308	2.06	0.1645	0.33887	Yes	-	-
101302364-S	4.023	1.59	0.2585	0.411015	-	-	Yes
101302365-S	4.18	1.55	0.376	0.5828	-	Yes	Yes
101302378-S	0.694	0.29	0.329	0.09541	-	Yes	-
101302380-S	1.6	1.97	0.141	0.27777	Yes	-	-
101302390-S	5.855	1.14	0.3995	0.45543	-	Yes	Yes
101302391-S	5.434	1.83	0.282	0.51606	Yes	-	Yes
101302398-S	0.928	1.72	0.094	0.16168	Yes	-	-
101302422-S	0	0	0.329	0	-	Yes	-
101302435-S	0.509	2.05	0.0705	0.144525	Yes	-	-
101302488-S	0.965	1.74	0.1175	0.20445	Yes	-	-
101302666-S	4.09	0.82	0.3995	0.32759	-	Yes	-
101302668-S	0.91	1.84	0.188	0.34592	Yes	-	-
101302693-S	3.493	1.73	0.235	0.40655	Yes	-	Yes
101302694-S	4.452	0.75	0.423	0.31725	-	Yes	-
101302757-S	1.605	0.33	0.517	0.17061	-	Yes	-
101302760-S	6.602	0.97	0.47	0.4559	-	Yes	Yes
101302763-S	4.088	1.14	0.3055	0.34827	-	Yes	-
101302765-S	3.634	2.08	0.2115	0.43992	Yes	-	Yes
101302766-S	2.609	0.23	0.752	0.17296	-	Yes	-
101302767-S	2.207	0.49	0.658	0.32242	-	Yes	-
101302768-S	0.757	0.35	0.8695	0.304325	-	Yes	-
101302773-S	3.944	0.57	0.4935	0.281295	-	Yes	-
101302774-S	3.625	0.99	0.3055	0.302445	-	Yes	-
101302775-S	1.882	0.26	0.611	0.15886	-	Yes	-
101302791-S	7.657	1.23	0.47	0.5781	-	Yes	Yes
101302795-S	2.087	0.63	0.5405	0.340515	-	Yes	-
101302796-S	2.657	0.7	0.376	0.2632	-	Yes	-
101302798-S	0.52	0.32	0.329	0.10528	-	Yes	-
101302810-S	1.217	0.38	0.893	0.33934	-	Yes	-
101302811-S	1.741	0.97	0.752	0.72944	-	Yes	Yes
101302834-S	1.403	2.31	0.1175	0.271425	Yes	-	-
101305426-S	1.846	0.83	0.47	0.3901	-	Yes	-
101305576-S	10.463	1.05	0.987	1.03635	-	Yes	Yes
101305686-S	9.038	1.43	0.4465	0.638495	-	Yes	Yes
101305688-S	4.424	0.93	0.376	0.34968	-	Yes	-
101305890-S	0	0	0.329	0	-	Yes	-
101306611-S	2.279	2.56	0.3995	1.02272	Yes	Yes	Yes

**SOPHIA CREEK WATERSHED AND MULCASTER DRAINAGE AREA EA UPDATE  
MAJOR OVERLAND FLOW ROUTE DEFICIENCY SUMMARY  
SEPTEMBER 2017**

Link	Max Flow m <sup>3</sup> /s	Max Velocity m/s	Max Depth m	Depth Velocity Product	Velocity > 1.7 m/s	Depth > 0.3 m	Product > 0.4 m <sup>2</sup> /s
101306631-S	1.305	3.07	0.141	0.43287	Yes	-	Yes
101306908-S	3.466	1.6	0.376	0.6016	-	Yes	Yes
101306912-S	0.259	0.17	0.6345	0.107865	-	Yes	-
101306913-S	0.244	0.14	0.3055	0.04277	-	Yes	-
101307599-S	0.082	0.09	0.376	0.03384	-	Yes	-
101307600-S	0.569	0.41	0.47	0.1927	-	Yes	-
101307633-S	2.529	1.97	0.188	0.37036	Yes	-	-
101307634-S	2.812	2.16	0.188	0.40608	Yes	-	Yes
101307636-S	2.652	2.32	0.4935	1.14492	Yes	Yes	Yes
101307641-S	2.973	0.7	0.47	0.329	-	Yes	-
101307658-S	4.738	0.26	1.4335	0.37271	-	Yes	-
101307659-S	0.364	0.14	0.8225	0.11515	-	Yes	-
101307710-S	15.994	2.88	0.4465	1.28592	Yes	Yes	Yes
101307714-S	0.83	0.11	0.564	0.06204	-	Yes	-
101307715-S	0.768	0.16	0.4465	0.07144	-	Yes	-
101307720-S	0.875	1.89	0.094	0.17766	Yes	-	-
101307724-S	1.07	1.71	0.1175	0.200925	Yes	-	-
101307768-S	0.831	1.99	0.094	0.18706	Yes	-	-
101307774-S	1.53	0.54	0.705	0.3807	-	Yes	-
101307775-S	2.065	0.57	0.7285	0.415245	-	Yes	Yes
101307776-S	2.694	0.78	0.6815	0.53157	-	Yes	Yes
101307777-S	21.211	2.58	0.47	1.2126	Yes	Yes	Yes
101307778-S	3.154	1.18	0.611	0.72098	-	Yes	Yes
101307779-S	17.92	1.53	0.9635	1.474155	-	Yes	Yes
101308915-S	1.398	0.46	0.329	0.15134	-	Yes	-
101309433-S	4.352	1.27	0.3055	0.387985	-	Yes	-
101309435-S	4.806	2.11	0.2585	0.545435	Yes	-	Yes
101309436-S	5.404	2.09	0.2585	0.540265	Yes	-	Yes
101309437-S	8.174	1.31	0.4465	0.584915	-	Yes	Yes
101309438-S	8.037	1.65	0.376	0.6204	-	Yes	Yes
101309440-S	4.841	3.41	0.188	0.64108	Yes	-	Yes
101310000-S	2.098	2.48	0.141	0.34968	Yes	-	-
101310008-2-S	10.191	1.28	0.5405	0.69184	-	Yes	Yes
101310008-S	0.905	0.4	0.3995	0.1598	-	Yes	-
101310017-S	0	0	0.3995	0	-	Yes	-
101310031-S	2.249	1.72	0.188	0.32336	Yes	-	-
101310039-S	2.379	3.37	0.2585	0.871145	Yes	-	Yes
101310044-S	2.569	2.19	0.1645	0.360255	Yes	-	-
101310045-S	2.346	2.67	0.141	0.37647	Yes	-	-
101310047-S	2.14	1.93	0.1645	0.317485	Yes	-	-
101310062-S	1.255	0.46	0.3055	0.14053	-	Yes	-
101310069-S	0.664	0.51	0.3525	0.179775	-	Yes	-
101310221-S	5.084	1.09	0.3995	0.435455	-	Yes	Yes
101310222-S	2.293	0.91	0.3055	0.278005	-	Yes	-
101310370-S	1.292	0.58	0.4465	0.25897	-	Yes	-
101310379-S	3.439	2.64	0.188	0.49632	Yes	-	Yes
101310380-S	3.004	2.37	0.188	0.44556	Yes	-	Yes
101310381-S	3.812	2.51	0.188	0.47188	Yes	-	Yes
101310382-S	1.519	3.51	0.094	0.32994	Yes	-	-
101310384-S	4.062	0.96	0.3525	0.3384	-	Yes	-

**SOPHIA CREEK WATERSHED AND MULCASTER DRAINAGE AREA EA UPDATE  
MAJOR OVERLAND FLOW ROUTE DEFICIENCY SUMMARY  
SEPTEMBER 2017**

Link	Max Flow m <sup>3</sup> /s	Max Velocity m/s	Max Depth m	Depth Velocity Product	Velocity > 1.7 m/s	Depth > 0.3 m	Product > 0.4 m <sup>2</sup> /s
101310385-S	0.988	1.98	0.094	0.18612	Yes	-	-
101310386-S	1.172	2.12	0.1175	0.2491	Yes	-	-
101310387-S	2.016	2.45	0.141	0.34545	Yes	-	-
101310388-S	1.827	2.11	0.141	0.29751	Yes	-	-
101310389-S	6.365	0.99	0.47	0.4653	-	Yes	Yes
101310390-S	1.116	1.72	0.1175	0.2021	Yes	-	-
101310391-S	0	0	0.3525	0	-	Yes	-
101310392-S	8.202	1.35	0.4465	0.602775	-	Yes	Yes
101310393-S	2.977	0.81	0.6345	0.513945	-	Yes	Yes
101310394-S	1.775	1.12	0.329	0.36848	-	Yes	-
101310395-S	5.55	0.64	0.5875	0.376	-	Yes	-
101310396-S	4.556	3.79	0.1645	0.623455	Yes	-	Yes
101310397-S	4.415	2.96	0.188	0.55648	Yes	-	Yes
101310398-S	1.225	1.9	0.141	0.2679	Yes	-	-
101310406-S	0.294	0.1	0.376	0.0376	-	Yes	-
101310615-S	1.171	2.35	0.094	0.2209	Yes	-	-
101310617-S	1.652	2.1	0.141	0.2961	Yes	-	-
101310619-S	1.568	1.58	0.2585	0.40843	-	-	Yes
101310655-S	1.178	1.85	0.1175	0.217375	Yes	-	-
101310656-S	1.822	1.95	0.141	0.27495	Yes	-	-
101310657-S	2.509	2.04	0.188	0.38352	Yes	-	-
101310658-S	2.314	2.15	0.1645	0.353675	Yes	-	-
101310679-S	1.476	1.87	0.141	0.26367	Yes	-	-
101310680-S	1.857	1.93	0.141	0.27213	Yes	-	-
101310682-S	2.056	0.92	0.3995	0.36754	-	Yes	-
101310699-S	0.869	2.07	0.094	0.19458	Yes	-	-
101310700-S	0.626	1.92	0.094	0.18048	Yes	-	-
101310701-S	1.089	2.19	0.094	0.20586	Yes	-	-
101310866-S	1.591	2.72	0.1175	0.3196	Yes	-	-
101310896_1-S	5.808	1.19	0.376	0.44744	-	Yes	Yes
101310896_2-S	4.278	1.69	0.2585	0.436865	-	-	Yes
101408031-S	0.592	2.22	0.0705	0.15651	Yes	-	-
101412839-S	0.901	1.95	0.094	0.1833	Yes	-	-
1102-S	17.686	3.93	0.3525	1.385325	Yes	Yes	Yes
1103-S	21.512	3.34	0.4465	1.49131	Yes	Yes	Yes
120080979-S	1.848	2.86	0.1175	0.33605	Yes	-	-
120080980-S	1.867	2.71	0.1175	0.318425	Yes	-	-



**C.C. Tatham & Associates Ltd.**  
 Consulting Engineers  
 Collingwood Bracebridge Orillia Barrie

PROJECT:	Sophia Creek Watershed and Mulcaster Drainage Area EA Update
FILE NUMBER:	115172
DATE:	September 20, 2017
DESIGNED BY:	Amanda West
CHECKED BY:	Daniel Twigger
SUBJECT:	Preliminary Construction Cost Estimates

**IMPROVEMENT ALTERNATIVES 2A, 3B, 4A & 4C IMPLEMENTED IN COMBINATION**

**1 - SWMF SP03 RETROFIT**

Item No.	Description	Unit	Estimated Quantity	Estimated Unit Price	Estimated Amount
1	SWMF SP03 Retrofit	m <sup>3</sup>	11,400	\$46	\$524,047
2	Property Acquisition Costs	LS	-	-	\$650,000
<b>Total Preliminary Estimated Construction Cost</b>					<b>\$1,174,047</b>

**2 - SWMF SP01 CREATION**

Item No.	Description	Unit	Estimated Quantity	Estimated Unit Price	Estimated Amount
1	SWMF SP01 Creation	m <sup>3</sup>	32,000	\$57	\$1,818,061
2	Bothwell Crescent Improvements	m	20	\$57,743	\$1,154,855
3	Watercourse Improvements	m	85	\$815	\$69,275
4	Property Acquisition Costs	LS	-	-	\$217,000
<b>Total Preliminary Estimated Construction Cost</b>					<b>\$3,259,191</b>

**3 - CULVERT IMPROVEMENTS**

Item No.	Description	Unit	Estimated Quantity	Estimated Unit Price	Estimated Amount
1	Howard Crescent - 3600 mm x 1200 mm Conc. Box Culvert	m	30	\$16,140	\$484,192
2	Lay Street - 3600 mm x 1200 mm Conc. Box Culvert	m	45	\$16,319	\$734,356
3	Grove Street (A) - 3600 mm x 1200 mm Conc. Box Culvert	m	20	\$19,202	\$384,032
4	Grove Street (B) - 3600 mm x 1200 mm Conc. Box Culvert	m	25	\$17,330	\$433,258
5	St. Vincent Street - Twin 3600 mm x 1200 mm Conc. Box Culvert	m	60	\$14,558	\$873,456
6	Ottaway Avenue - 3000 mm x 1500 mm Conc. Box Culvert	m	30	\$15,135	\$454,037
7	Rose Street - 3000 mm x 1500 mm Conc. Box Culvert	m	30	\$16,306	\$489,167
8	Laurie Crescent - 3000 mm x 1500 mm Conc. Box Culvert	m	40	\$17,917	\$716,695
10	Grove Street (C) - Twin 3600 mm x 1500 mm Conc. Box Culvert	m	35	\$26,815	\$938,534
11	Parkdale Crescent - Twin 3600 mm x 1500 mm Conc. Box Culvert	m	25	\$27,241	\$681,014
12	Davidson Street/Gunn Street - Twin 3600 mm x 1500 mm Conc. Box C	m	75	\$24,509	\$1,838,171
13	Davidson Street/Gunn Street - Property Acquisition	LS	-	-	\$286,000
14	Berczy Street - Twin 3600 mm x 1500 mm Conc. Box Culvert	m	30	\$27,271	\$818,117
15	Wellington Street - Twin 3600 mm x 1500 mm Conc. Box Culvert	m	25	\$30,123	\$753,081
16	Howard Crescent to Lay Street - Channel Improvements	m	70	\$1,407	\$98,493
17	Downstream of Lay Street - Channel Improvements	m	45	\$2,429	\$109,308
18	Upstream/Downstream of Grove Street (B) - Channel Improvements	m	105	\$1,234	\$129,552
19	Upstream/Downstream of Grove Street (B) - Property Acquisition	LS	-	-	\$466,000
20	Ottaway Avenue to Laurie Crescent - Channel Improvements	m	270	\$1,064	\$287,207
21	Ottaway Avenue to Laurie Crescent - Property Acquisition	LS	-	-	\$743,000
22	Grove Street to Parkdale Crescent - Channel Improvements	m	240	\$338	\$81,082
23	Berczy Street to Queen Street - Channel Improvements	m	145	\$3,532	\$512,146
24	Berczy Street to Queen Street - Property Acquisition	LS	-	-	\$1,670,000
<b>Total Preliminary Estimated Construction Cost</b>					<b>\$13,980,896</b>



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PROJECT:	Sophia Creek Watershed and Mulcaster Drainage Area EA Update
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SUBJECT:	Preliminary Construction Cost Estimates

**IMPROVEMENT ALTERNATIVES 2A, 3B, 4A & 4C IMPLEMENTED IN COMBINATION**

**4 - TRUNK STORM SEWER**

Item No.	Description	Unit	Estimated Quantity	Estimated Unit Price	Estimated Amount
1	Owen and Clapperton Street Trunk Storm Sewers	m	1460	\$9,046	\$13,206,668

**5 - GENERAL RECOMMENDATIONS**

Item No.	Description	Unit	Estimated Quantity	Estimated Unit Price	Estimated Amount
1	Owen Street Diversion	LS	-	-	\$69,902
2	New Storm Sewer (where Absent/Required)	LS	-	-	\$4,780,994
3	Storm Sewer Upsizing	LS	-	-	\$1,198,630
<b>Total Preliminary Estimated Construction Cost</b>					<b>\$6,049,526</b>

**TOTAL**

ALT	Description	Unit	Estimated Quantity	Estimated Unit Price	Estimated Amount
2A	SWMF SP01 Creation	LS	-	-	\$4,433,238
3B	Culvert Improvements	LS	-	-	\$13,980,896
4A/4C	Trunk Storm Sewer	m	1460	\$9,046	\$13,206,668
General	General Recommendations	LS	-	-	\$6,049,526
<b>Total Preliminary Estimated Construction Cost</b>					<b>\$37,670,327</b>

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2016

IMPROVEMENT ALTERNATIVE 2A  
 OTTAWAY AVENUE/CURRIE STREET SWMF (SWMF SP03)

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>SWMF</b>				
1.01	Remove Existing Pond Outlet Structure	L.S.	1	\$30,000.00	\$30,000.00
1.02	Earth Excavation and Grading	m <sup>3</sup>	11,400	\$12.00	\$136,800.00
1.03	Strip, Screen and Stockpile Topsoil	m <sup>2</sup>	6,500	\$7.00	\$45,500.00
1.04	Grubbing	ha	1	\$10,500.00	\$8,400.00
1.05	Place Screened Topsoil (from stockpile) and seed	m <sup>2</sup>	6,500	\$4.00	\$26,000.00
1.06	Outlet Structure	LS	-	-	\$35,000.00
1.07	Overflow Spillway c/w MacMat	m <sup>2</sup>	120	\$40.00	\$4,800.00
1.08	Off-site Disposal of Excess Fill	m <sup>3</sup>	11,400	\$11.00	\$35,001.00
				<b>Subtotal SWMF</b>	<b>\$321,501.00</b>
<b>2</b>	<b>Property Acquisition</b>				
2.01	Property Acquisition	LS	-	-	\$650,000.00
				<b>Subtotal Property Acquisition</b>	<b>\$650,000.00</b>
				<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>	<b>\$971,501.00</b>
				<b>CONSTRUCTION CONTINGENCY (25%)</b>	<b>\$80,375.25</b>
				<b>ENGINEERING DESIGN FEE (13%)</b>	<b>\$41,795.13</b>
				<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>	<b>\$32,150.10</b>
				<b>UTILITIES / SERVICES RELOCATION COST (15%)</b>	<b>\$48,225.15</b>
				<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>	<b>\$1,174,046.63</b>

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2016

IMPROVEMENT ALTERNATIVE 2A  
 MACMORRISON PARK (SWMF SP01)

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>SWMF</b>				
1.01	Earth Excavation and Grading	m <sup>3</sup>	32,000	\$12.00	\$384,000.00
1.02	Grubbing	ha	2.5	\$10,500.00	\$26,250.00
1.03	Strip, Screen and Stockpile Topsoil	m <sup>2</sup>	20,000	\$7.00	\$140,000.00
1.04	Place Screened Topsoil (from stockpile) and seed	m <sup>2</sup>	20,000	\$4.00	\$80,000.00
1.05	Excavate and Grade Low Flow Channel	m	375	\$125.00	\$46,875.00
1.06	Relocate Playground Equipment	LS	-	-	\$25,000.00
1.07	Remove Asphalt Parking	m <sup>2</sup>	900	\$6.50	\$5,850.00
1.08	Remove Granular Base	m <sup>2</sup>	900	\$6.00	\$5,400.00
1.09	Remove Baseball Diamond Equipment	LS	-	-	\$50,000.00
1.10	Off-site Disposal of Excess Fill	m <sup>3</sup>	32,000	\$11.00	\$352,000.00
				<b>Subtotal SWMF</b>	<b>\$1,115,375.00</b>
<b>2</b>	<b>Bothwell Crescent Improvements</b>				
2.01	Remove Existing Culvert	m	20	\$85.00	\$1,700.00
2.02	Remove Asphalt	m <sup>2</sup>	200	\$6.50	\$1,300.00
2.03	Remove Granular Road Base	m <sup>2</sup>	200	\$6.00	\$1,200.00
2.04	Remove Existing Concrete Curb and Gutter	m	50	\$23.00	\$1,150.00
2.05	Quick Span Culvert (7.93 m span)	m	20	\$30,700.00	\$614,000.00
2.06	Concrete Distribution Slab	LS	-	-	\$20,000.00
2.07	Concrete Wingwalls	LS	-	-	\$50,000.00
2.08	Granular 'B' (450 mm)	m <sup>2</sup>	200	\$17.50	\$3,500.00
2.09	Granular 'A' (150 mm)	m <sup>2</sup>	200	\$8.50	\$1,700.00
2.10	100 mm HL8 Base Course Asphalt	m <sup>2</sup>	200	\$39.50	\$7,900.00
2.11	40 mm HL3 Surface Course Asphalt	m <sup>2</sup>	200	\$11.50	\$2,300.00
2.12	Concrete Curb and Gutter	m	50	\$75.00	\$3,750.00
				<b>Subtotal Bothwell Crescent Improvements</b>	<b>\$708,500.00</b>
<b>3</b>	<b>Watercourse Improvements</b>				
3.01	Watercourse Improvements	m	85	\$500.00	\$42,500.00
				<b>Subtotal Watercourse Improvements</b>	<b>\$42,500.00</b>
<b>4</b>	<b>Property Acquisition</b>				
4.01	Property Acquisition	LS	-	-	\$217,000.00
				<b>Subtotal Property Acquisition</b>	<b>\$217,000.00</b>
<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>					<b>\$2,083,375.00</b>
CONSTRUCTION CONTINGENCY (25%)					\$466,593.75
ENGINEERING DESIGN FEE (13%)					\$242,628.75
CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)					\$186,637.50
UTILITIES / SERVICES RELOCATION COST (15%)					\$279,956.25
<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>					<b>\$3,259,191.25</b>

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2016

IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
 (CULVERT IMPROVEMENTS - DESIGN FLOOD FREQUENCY CRITERIA)

CHANNEL IMPROVEMENTS - HOWARD TO LAY

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
1	<b>Channel Improvements</b>				
1.01	Excavation and Grading	cu.m	1,250	\$20.00	\$25,000.00
1.02	Grubbing	ha	0.2	\$10,500.00	\$2,100.00
1.03	Channel Reinstatement (Topsoil/Seed and Coir Cloth)	m <sup>2</sup>	2,050	\$6.50	\$13,325.00
1.04	Demolish Building and Remove Debris	ea	1	\$20,000.00	\$20,000.00
				<b>Subtotal Channel Improvements</b>	<b>\$60,425.00</b>
				<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>	<b>\$60,425.00</b>
				<b>CONSTRUCTION CONTINGENCY (25%)</b>	<b>\$15,106.25</b>
				<b>ENGINEERING DESIGN FEE (13%)</b>	<b>\$7,855.25</b>
				<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>	<b>\$6,042.50</b>
				<b>UTILITY / SERVICES RELOCATION COST (15%)</b>	<b>\$9,063.75</b>
				<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>	<b>\$98,492.75</b>

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2016

IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
 (CULVERT IMPROVEMENTS - DESIGN FLOOD FREQUENCY CRITERIA)

CHANNEL IMPROVEMENTS - DOWNSTREAM OF LAY STREET

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
1	<b>Channel Improvements</b>				
1.01	Excavation and Grading	cu.m	900	\$20.00	\$18,000.00
1.02	Grubbing	ha	0.1	\$10,500.00	\$1,260.00
1.03	Channel Reinstatement (Topsoil/Seed and Coir Cloth)	m <sup>2</sup>	1,200	\$6.50	\$7,800.00
1.04	Demolish Building and Remove Debris	ea	2	\$20,000.00	\$40,000.00
				<b>Subtotal Channel Improvements</b>	<b>\$67,060.00</b>
				<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>	<b>\$67,060.00</b>
				<b>CONSTRUCTION CONTINGENCY (25%)</b>	<b>\$16,765.00</b>
				<b>ENGINEERING DESIGN FEE (13%)</b>	<b>\$8,717.80</b>
				<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>	<b>\$6,706.00</b>
				<b>UTILITY / SERVICES RELOCATION COST (15%)</b>	<b>\$10,059.00</b>
				<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>	<b>\$109,307.80</b>

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2016

IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
 (CULVERT IMPROVEMENTS - DESIGN FLOOD FREQUENCY CRITERIA)

CHANNEL IMPROVEMENTS - UPSTREAM / DOWNSTREAM OF GROVE STREET

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Channel Improvements</b>				
1.01	Excavation and Grading	cu.m	1,370	\$20.00	\$27,400.00
1.02	Grubbing	ha	0.2	\$10,500.00	\$1,680.00
1.03	Channel Reinstatement (Topsoil/Seed and Coir Cloth)	m <sup>2</sup>	1,600	\$6.50	\$10,400.00
1.04	Demolish Building and Remove Debris	ea	2	\$20,000.00	\$40,000.00
				<b>Subtotal Channel Improvements</b>	<b>\$79,480.00</b>
<b>2</b>	<b>Property Acquisition</b>				
2.01	Property Acquisition	LS	-	-	\$466,000.00
				<b>Subtotal Property Acquisition</b>	<b>\$466,000.00</b>
				<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>	<b>\$545,480.00</b>
				CONSTRUCTION CONTINGENCY (25%)	\$19,870.00
				ENGINEERING DESIGN FEE (13%)	\$10,332.40
				CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)	\$7,948.00
				UTILITY / SERVICES RELOCATION COST (15%)	\$11,922.00
				<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>	<b>\$595,552.40</b>

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2016

IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
 (CULVERT IMPROVEMENTS - DESIGN FLOOD FREQUENCY CRITERIA)

CHANNEL IMPROVEMENTS - OTTAWAY AVENUE TO LAURIE CRESCENT

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Channel Improvements</b>				
1.01	Excavation and Grading	cu.m	4,300	\$20.00	\$86,000.00
1.02	Grubbing	ha	0.4	\$10,500.00	\$4,200.00
1.03	Channel Reinstatement (Topsoil/Seed and Coir Cloth)	m <sup>2</sup>	4,000	\$6.50	\$26,000.00
1.04	Demolish Building and Remove Debris	ea	3	\$20,000.00	\$60,000.00
				<b>Subtotal Channel Improvements</b>	<b>\$176,200.00</b>
<b>2</b>	<b>Property Acquisition</b>				
2.01	Property Acquisition	LS	-	-	\$743,000.00
				<b>Subtotal Property Acquisition</b>	<b>\$743,000.00</b>
				<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>	<b>\$919,200.00</b>
				CONSTRUCTION CONTINGENCY (25%)	\$44,050.00
				ENGINEERING DESIGN FEE (13%)	\$22,906.00
				CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)	\$17,620.00
				UTILITY / SERVICES RELOCATION COST (15%)	\$26,430.00
				<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>	<b>\$1,030,206.00</b>

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2016

IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
 (CULVERT IMPROVEMENTS - DESIGN FLOOD FREQUENCY CRITERIA)

CHANNEL IMPROVEMENTS - GROVE STREET TO PARKDALE CRESCENT

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
1	Channel Improvements				
1.01	Excavation and Grading	cu.m	1,400	\$20.00	\$28,000.00
1.02	Grubbing	ha	0.3	\$10,500.00	\$3,024.00
1.03	Channel Reinstatement (Topsoil/Seed and Coir Cloth)	m <sup>2</sup>	2,880	\$6.50	\$18,720.00
				Subtotal Channel Improvements	\$49,744.00
				TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE	\$49,744.00
				CONSTRUCTION CONTINGENCY (25%)	\$12,436.00
				ENGINEERING DESIGN FEE (13%)	\$6,466.72
				CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)	\$4,974.40
				UTILITY / SERVICES RELOCATION COST (15%)	\$7,461.60
				TOTAL PRELIMINARY PROJECT COST ESTIMATE	\$81,082.72

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2016

IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
 (CULVERT IMPROVEMENTS - DESIGN FLOOD FREQUENCY CRITERIA)

CHANNEL IMPROVEMENTS - BERCZY STREET TO QUEEN STREET

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Channel Improvements</b>				
1.01	Excavation and Grading	cu.m	2,400	\$20.00	\$48,000.00
1.02	Armour Stone Reinforcement	m	290	\$400.00	\$116,000.00
1.03	Grubbing	ha	0.4	\$10,500.00	\$4,200.00
1.04	Channel Reinstatement (Topsoil/Seed and Coir Cloth)	m <sup>2</sup>	4,000	\$6.50	\$26,000.00
1.05	Demolish Building and Remove Debris	ea	6	\$20,000.00	\$120,000.00
				<b>Subtotal Channel Improvements</b>	<b>\$314,200.00</b>
<b>2</b>	<b>Property Acquisition</b>				
2.01	Property Acquisition	LS	-	-	\$1,670,000.00
				<b>Subtotal Property Acquisition</b>	<b>\$1,670,000.00</b>
				<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>	<b>\$1,984,200.00</b>
				CONSTRUCTION CONTINGENCY (25%)	\$78,550.00
				ENGINEERING DESIGN FEE (13%)	\$40,846.00
				CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)	\$31,420.00
				UTILITY / SERVICES RELOCATION COST (15%)	\$47,130.00
				<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>	<b>\$2,182,146.00</b>

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2016

IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
 (CULVERT IMPROVEMENTS - DESIGN FLOOD FREQUENCY CRITERIA)

ST. VINCENT STREET

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Culvert Improvements</b>				
1.01	Remove Existing Culvert	m	60	\$500.00	\$30,000.00
1.02	Remove Concrete Wingwalls	LS	-	-	\$15,000.00
1.03	Remove Asphalt	m <sup>2</sup>	350	\$6.50	\$2,275.00
1.04	Remove Granular Road Base	m <sup>2</sup>	350	\$6.00	\$2,100.00
1.05	Remove Existing Concrete Curb and Gutter	m	50	\$23.00	\$1,150.00
1.06	Remove Existing Sidewalk	m <sup>2</sup>	75	\$16.50	\$1,237.50
1.07	1200 mm x 3600 mm Conc. Box	m	60	\$6,240.00	\$374,400.00
1.08	Concrete Distribution Slab	LS	-	-	\$20,000.00
1.09	Concrete Wingwalls	LS	-	-	\$50,000.00
1.10	Granular 'B' (450 mm)	m <sup>2</sup>	350	\$17.50	\$6,125.00
1.11	Granular 'A' (150 mm)	m <sup>2</sup>	350	\$8.50	\$2,975.00
1.12	100 mm HL8 Base Course Asphalt	m <sup>2</sup>	350	\$39.50	\$13,825.00
1.13	40 mm HL3 Surface Course Asphalt	m <sup>2</sup>	350	\$11.50	\$4,025.00
1.14	Concrete Curb and Gutter	m	50	\$75.00	\$3,750.00
1.15	Concrete Sidewalk	m <sup>2</sup>	75	\$80.00	\$6,000.00
1.16	Reinstate Grassed Boulevard	m <sup>2</sup>	250	\$12.00	\$3,000.00
				<b>Subtotal Culvert Improvements</b>	<b>\$535,862.50</b>
				<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>	<b>\$535,862.50</b>
				<b>CONSTRUCTION CONTINGENCY (25%)</b>	<b>\$133,965.63</b>
				<b>ENGINEERING DESIGN FEE (13%)</b>	<b>\$69,662.13</b>
				<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>	<b>\$53,586.25</b>
				<b>UTILITIES / SERVICES RELOCATION COST (15%)</b>	<b>\$80,379.38</b>
				<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>	<b>\$873,455.88</b>

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IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
 (CULVERT IMPROVEMENTS - DESIGN FLOOD FREQUENCY CRITERIA)

GROVE STREET (B)

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Culvert Improvements</b>				
1.01	Remove Existing Culvert	m	25	\$80.00	\$2,000.00
1.02	Remove Asphalt	m <sup>2</sup>	270	\$6.50	\$1,755.00
1.03	Remove Granular Road Base	m <sup>2</sup>	270	\$6.00	\$1,620.00
1.04	Remove Existing Concrete Curb and Gutter	m	50	\$23.00	\$1,150.00
1.05	Remove Existing Sidewalk	m <sup>2</sup>	75	\$16.50	\$1,237.50
1.06	1200 mm x 3600 mm Conc. Box	m	25	\$6,240.00	\$156,000.00
1.07	Concrete Distribution Slab	LS	-	-	\$20,000.00
1.08	Concrete Wingwalls	LS	-	-	\$50,000.00
1.09	Granular 'B' (450 mm)	m <sup>2</sup>	270	\$17.50	\$4,725.00
1.10	Granular 'A' (150 mm)	m <sup>2</sup>	270	\$8.50	\$2,295.00
1.11	100 mm HL8 Base Course Asphalt	m <sup>2</sup>	270	\$39.50	\$10,665.00
1.12	40 mm HL3 Surface Course Asphalt	m <sup>2</sup>	270	\$11.50	\$3,105.00
1.13	Concrete Curb and Gutter	m	50	\$75.00	\$3,750.00
1.14	Concrete Sidewalk	m <sup>2</sup>	75	\$80.00	\$6,000.00
1.15	Reinstate Grassed Boulevard	m <sup>2</sup>	125	\$12.00	\$1,500.00
					<b>Subtotal Culvert Improvements</b>
					<b>\$265,802.50</b>
					<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>
					<b>\$265,802.50</b>
					<b>CONSTRUCTION CONTINGENCY (25%)</b>
					<b>\$66,450.63</b>
					<b>ENGINEERING DESIGN FEE (13%)</b>
					<b>\$34,554.33</b>
					<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>
					<b>\$26,580.25</b>
					<b>UTILITIES / SERVICES RELOCATION COST (15%)</b>
					<b>\$39,870.38</b>
					<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>
					<b>\$433,258.08</b>

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IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
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GROVE STREET (A)

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Culvert Improvements</b>				
1.01	Remove Existing Culvert	m	20	\$150.00	\$3,000.00
1.02	Remove Asphalt	m <sup>2</sup>	270	\$6.50	\$1,755.00
1.03	Remove Granular Road Base	m <sup>2</sup>	270	\$6.00	\$1,620.00
1.04	Remove Existing Concrete Curb and Gutter	m	50	\$23.00	\$1,150.00
1.05	Remove Existing Sidewalk	m <sup>2</sup>	75	\$16.50	\$1,237.50
1.06	1200 mm x 3600 mm Conc. Box	m	20	\$6,240.00	\$124,800.00
1.07	Concrete Distribution Slab	LS	-	-	\$20,000.00
1.08	Concrete Wingwalls	LS	-	-	\$50,000.00
1.09	Granular 'B' (450 mm)	m <sup>2</sup>	270	\$17.50	\$4,725.00
1.10	Granular 'A' (150 mm)	m <sup>2</sup>	270	\$8.50	\$2,295.00
1.11	100 mm HL8 Base Course Asphalt	m <sup>2</sup>	270	\$39.50	\$10,665.00
1.12	40 mm HL3 Surface Course Asphalt	m <sup>2</sup>	270	\$11.50	\$3,105.00
1.13	Concrete Curb and Gutter	m	50	\$75.00	\$3,750.00
1.14	Concrete Sidewalk	m <sup>2</sup>	75	\$80.00	\$6,000.00
1.15	Reinstate Grassed Boulevard	m <sup>2</sup>	125	\$12.00	\$1,500.00
					<b>Subtotal Culvert Improvements</b>
					<b>\$235,602.50</b>
					<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>
					<b>\$235,602.50</b>
					<b>CONSTRUCTION CONTINGENCY (25%)</b>
					<b>\$58,900.63</b>
					<b>ENGINEERING DESIGN FEE (13%)</b>
					<b>\$30,628.33</b>
					<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>
					<b>\$23,560.25</b>
					<b>UTILITIES / SERVICES RELOCATION COST (15%)</b>
					<b>\$35,340.38</b>
					<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>
					<b>\$384,032.08</b>

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LAY STREET

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Culvert Improvements</b>				
1.01	Remove Existing Culvert	m	105	\$150.00	\$15,750.00
1.02	Remove Asphalt	m <sup>2</sup>	700	\$6.50	\$4,550.00
1.03	Remove Granular Road Base	m <sup>2</sup>	700	\$6.00	\$4,200.00
1.04	Remove Existing Concrete Curb and Gutter	m	80	\$23.00	\$1,840.00
1.05	Remove Existing Sidewalk	m <sup>2</sup>	90	\$16.50	\$1,485.00
1.06	1200 mm x 3600 mm Conc. Box	m	45	\$6,240.00	\$280,800.00
1.07	Concrete Distribution Slab	LS	-	-	\$20,000.00
1.08	Concrete Wingwalls	LS	-	-	\$50,000.00
1.09	Granular 'B' (450 mm)	m <sup>2</sup>	700	\$17.50	\$12,250.00
1.10	Granular 'A' (150 mm)	m <sup>2</sup>	700	\$8.50	\$5,950.00
1.11	100 mm HL8 Base Course Asphalt	m <sup>2</sup>	700	\$39.50	\$27,650.00
1.12	40 mm HL3 Surface Course Asphalt	m <sup>2</sup>	700	\$11.50	\$8,050.00
1.13	Concrete Curb and Gutter	m	80	\$75.00	\$6,000.00
1.14	Concrete Sidewalk	m <sup>2</sup>	90	\$80.00	\$7,200.00
1.15	Reinstate Grassed Boulevard	m <sup>2</sup>	400	\$12.00	\$4,800.00
					<b>Subtotal Culvert Improvements</b>
					<b>\$450,525.00</b>
					<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>
					<b>\$450,525.00</b>
					<b>CONSTRUCTION CONTINGENCY (25%)</b>
					<b>\$112,631.25</b>
					<b>ENGINEERING DESIGN FEE (13%)</b>
					<b>\$58,568.25</b>
					<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>
					<b>\$45,052.50</b>
					<b>UTILITIES / SERVICES RELOCATION COST (15%)</b>
					<b>\$67,578.75</b>
					<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>
					<b>\$734,355.75</b>

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IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
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HOWARD CRESCENT

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Culvert Improvements</b>				
1.01	Remove Existing Culvert	m	40	\$150.00	\$6,000.00
1.02	Remove Asphalt	m <sup>2</sup>	300	\$6.50	\$1,950.00
1.03	Remove Granular Road Base	m <sup>2</sup>	300	\$6.00	\$1,800.00
1.04	Remove Existing Concrete Curb and Gutter	m	50	\$23.00	\$1,150.00
1.05	1200 mm x 3600 mm Conc. Box	m	30	\$6,240.00	\$187,200.00
1.06	Concrete Distribution Slab	LS	-	-	\$20,000.00
1.07	Concrete Wingwalls	LS	-	-	\$50,000.00
1.08	Granular 'B' (450 mm)	m <sup>2</sup>	300	\$17.50	\$5,250.00
1.09	Granular 'A' (150 mm)	m <sup>2</sup>	300	\$8.50	\$2,550.00
1.10	100 mm HL8 Base Course Asphalt	m <sup>2</sup>	300	\$39.50	\$11,850.00
1.11	40 mm HL3 Surface Course Asphalt	m <sup>2</sup>	300	\$11.50	\$3,450.00
1.12	Concrete Curb and Gutter	m	50	\$75.00	\$3,750.00
1.13	Reinstate Grassed Boulevard	m <sup>2</sup>	175	\$12.00	\$2,100.00
					<b>Subtotal Culvert Improvements</b>
					<b>\$297,050.00</b>
					<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>
					<b>\$297,050.00</b>
					<b>CONSTRUCTION CONTINGENCY (25%)</b>
					<b>\$74,262.50</b>
					<b>ENGINEERING DESIGN FEE (13%)</b>
					<b>\$38,616.50</b>
					<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>
					<b>\$29,705.00</b>
					<b>UTILITIES / SERVICES RELOCATION COST (15%)</b>
					<b>\$44,557.50</b>
					<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>
					<b>\$484,191.50</b>

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IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
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OTTAWAY AVENUE

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Culvert Improvements</b>				
1.01	Remove Existing Culvert	m	50	\$85.00	\$4,250.00
1.02	Remove Asphalt	m <sup>2</sup>	200	\$6.50	\$1,300.00
1.03	Remove Granular Road Base	m <sup>2</sup>	200	\$6.00	\$1,200.00
1.04	Remove Existing Concrete Curb and Gutter	m	50	\$23.00	\$1,150.00
1.05	1500 mm x 3000 mm Conc. Box	m	30	\$5,980.00	\$179,400.00
1.06	Concrete Distribution Slab	LS	-	-	\$20,000.00
1.07	Concrete Wingwalls	LS	-	-	\$50,000.00
1.08	Granular 'B' (450 mm)	m <sup>2</sup>	200	\$17.50	\$3,500.00
1.09	Granular 'A' (150 mm)	m <sup>2</sup>	200	\$8.50	\$1,700.00
1.10	100 mm HL8 Base Course Asphalt	m <sup>2</sup>	200	\$39.50	\$7,900.00
1.11	40 mm HL3 Surface Course Asphalt	m <sup>2</sup>	200	\$11.50	\$2,300.00
1.12	Concrete Curb and Gutter	m	50	\$75.00	\$3,750.00
1.13	Reinstate Grassed Boulevard	m <sup>2</sup>	175	\$12.00	\$2,100.00
					<b>Subtotal Culvert Improvements</b>
					<b>\$278,550.00</b>
					<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>
					<b>\$278,550.00</b>
					<b>CONSTRUCTION CONTINGENCY (25%)</b>
					<b>\$69,637.50</b>
					<b>ENGINEERING DESIGN FEE (13%)</b>
					<b>\$36,211.50</b>
					<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>
					<b>\$27,855.00</b>
					<b>UTILITIES / SERVICES RELOCATION COST (15%)</b>
					<b>\$41,782.50</b>
					<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>
					<b>\$454,036.50</b>

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IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
 (CULVERT IMPROVEMENTS - DESIGN FLOOD FREQUENCY CRITERIA)

ROSE STREET

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Culvert Improvements</b>				
1.01	Remove Existing Culvert	m	120	\$85.00	\$10,200.00
1.02	Remove Asphalt	m <sup>2</sup>	270	\$6.50	\$1,755.00
1.03	Remove Granular Road Base	m <sup>2</sup>	270	\$6.00	\$1,620.00
1.04	Remove Existing Concrete Curb and Gutter	m	50	\$23.00	\$1,150.00
1.05	Remove Existing Sidewalk	m <sup>2</sup>	75	\$16.50	\$1,237.50
1.06	1500 mm × 3000 mm Conc. Box	m	30	\$5,980.00	\$179,400.00
1.07	Concrete Distribution Slab	LS	-	-	\$20,000.00
1.08	Concrete Wingwalls	LS	-	-	\$50,000.00
1.09	Granular 'B' (450 mm)	m <sup>2</sup>	270	\$17.50	\$4,725.00
1.10	Granular 'A' (150 mm)	m <sup>2</sup>	270	\$8.50	\$2,295.00
1.11	100 mm HL8 Base Course Asphalt	m <sup>2</sup>	270	\$39.50	\$10,665.00
1.12	40 mm HL3 Surface Course Asphalt	m <sup>2</sup>	270	\$11.50	\$3,105.00
1.13	Concrete Curb and Gutter	m	50	\$75.00	\$3,750.00
1.14	Concrete Sidewalk	m <sup>2</sup>	75	\$80.00	\$6,000.00
1.15	Reinstate Grassed Boulevard	m <sup>2</sup>	350	\$12.00	\$4,200.00
					<b>Subtotal Culvert Improvements</b>
					<b>\$300,102.50</b>
					<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>
					<b>\$300,102.50</b>
					<b>CONSTRUCTION CONTINGENCY (25%)</b>
					<b>\$75,025.63</b>
					<b>ENGINEERING DESIGN FEE (13%)</b>
					<b>\$39,013.33</b>
					<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>
					<b>\$30,010.25</b>
					<b>UTILITIES / SERVICES RELOCATION COST (15%)</b>
					<b>\$45,015.38</b>
					<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>
					<b>\$489,167.08</b>

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Laurie Crescent

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Culvert Improvements</b>				
1.01	Remove Existing Culvert	m	40	\$85.00	\$3,400.00
1.02	Remove Asphalt	m <sup>2</sup>	340	\$6.50	\$2,210.00
1.03	Remove Granular Road Base	m <sup>2</sup>	340	\$6.00	\$2,040.00
1.04	Remove Existing Concrete Curb and Gutter	m	50	\$23.00	\$1,150.00
1.05	Remove Existing Sidewalk	m <sup>2</sup>	40	\$16.50	\$660.00
1.06	1500 mm x 3000 mm Conc. Box	m	40	\$5,980.00	\$239,200.00
1.07	Concrete Distribution Slab	LS	-	-	\$20,000.00
1.08	Concrete Wingwalls	LS	-	-	\$50,000.00
1.09	Granular 'B' (450 mm)	m <sup>2</sup>	340	\$17.50	\$5,950.00
1.10	Granular 'A' (150 mm)	m <sup>2</sup>	340	\$8.50	\$2,890.00
1.11	100 mm HL8 Base Course Asphalt	m <sup>2</sup>	340	\$39.50	\$13,430.00
1.12	40 mm HL3 Surface Course Asphalt	m <sup>2</sup>	340	\$11.50	\$3,910.00
1.13	Concrete Curb and Gutter	m	50	\$75.00	\$3,750.00
1.14	Concrete Sidewalk	m <sup>2</sup>	40	\$80.00	\$3,200.00
1.15	Reinstate Grassed Boulevard	m <sup>2</sup>	450	\$12.00	\$5,400.00
					<b>Subtotal Culvert Improvements</b>
					<b>\$357,190.00</b>
<b>2</b>	<b>Watercourse Improvements</b>				
2.01	Watercourse Improvements	m	165	\$500.00	\$82,500.00
					<b>Subtotal Watercourse Improvements</b>
					<b>\$82,500.00</b>
					<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>
					<b>\$439,690.00</b>
					<b>CONSTRUCTION CONTINGENCY (25%)</b>
					<b>\$109,922.50</b>
					<b>ENGINEERING DESIGN FEE (13%)</b>
					<b>\$57,159.70</b>
					<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>
					<b>\$43,969.00</b>
					<b>UTILITIES / SERVICES RELOCATION COST (15%)</b>
					<b>\$65,953.50</b>
					<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>
					<b>\$716,694.70</b>

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WELLINGTON STREET

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Culvert Improvements</b>				
1.01	Remove Existing Culvert	m	85	\$500.00	\$42,500.00
1.02	Remove Asphalt	m <sup>2</sup>	250	\$6.50	\$1,625.00
1.03	Remove Granular Road Base	m <sup>2</sup>	250	\$6.00	\$1,500.00
1.04	Remove Existing Concrete Curb and Gutter	m	50	\$23.00	\$1,150.00
1.05	Remove Existing Sidewalk	m <sup>2</sup>	75	\$16.50	\$1,237.50
1.06	Twin 1500 mm x 3600 mm Conc. Box	m	25	\$12,480.00	\$312,000.00
1.07	Concrete Distribution Slab	LS	-	-	\$20,000.00
1.08	Concrete Wingwalls	LS	-	-	\$50,000.00
1.09	Granular 'B' (450 mm)	m <sup>2</sup>	250	\$17.50	\$4,375.00
1.10	Granular 'A' (150 mm)	m <sup>2</sup>	250	\$8.50	\$2,125.00
1.11	100 mm HL8 Base Course Asphalt	m <sup>2</sup>	250	\$39.50	\$9,875.00
1.12	40 mm HL3 Surface Course Asphalt	m <sup>2</sup>	250	\$11.50	\$2,875.00
1.13	Concrete Curb and Gutter	m	50	\$75.00	\$3,750.00
1.14	Concrete Sidewalk	m <sup>2</sup>	75	\$80.00	\$6,000.00
1.15	Reinstate Grassed Boulevard	m <sup>2</sup>	250	\$12.00	\$3,000.00
					<b>Subtotal Culvert Improvements</b>
					<b>\$462,012.50</b>
					<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>
					<b>\$462,012.50</b>
					<b>CONSTRUCTION CONTINGENCY (25%)</b>
					<b>\$115,503.13</b>
					<b>ENGINEERING DESIGN FEE (13%)</b>
					<b>\$60,061.63</b>
					<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>
					<b>\$46,201.25</b>
					<b>UTILITIES / SERVICES RELOCATION COST (15%)</b>
					<b>\$69,301.88</b>
					<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>
					<b>\$753,080.38</b>

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IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
 (CULVERT IMPROVEMENTS - DESIGN FLOOD FREQUENCY CRITERIA)

BERCZY STREET

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Culvert Improvements</b>				
1.01	Remove Existing Culvert	m	40	\$500.00	\$20,000.00
1.02	Remove Asphalt	m <sup>2</sup>	250	\$6.50	\$1,625.00
1.03	Remove Granular Road Base	m <sup>2</sup>	250	\$6.00	\$1,500.00
1.04	Remove Existing Concrete Curb and Gutter	m	50	\$23.00	\$1,150.00
1.05	Remove Existing Sidewalk	m <sup>2</sup>	75	\$16.50	\$1,237.50
1.06	Twin 1500 mm x 3600 mm Conc. Box	m	30	\$12,480.00	\$374,400.00
1.07	Concrete Distribution Slab	LS	-	-	\$20,000.00
1.08	Concrete Wingwalls	LS	-	-	\$50,000.00
1.09	Granular 'B' (450 mm)	m <sup>2</sup>	250	\$17.50	\$4,375.00
1.10	Granular 'A' (150 mm)	m <sup>2</sup>	250	\$8.50	\$2,125.00
1.11	100 mm HL8 Base Course Asphalt	m <sup>2</sup>	250	\$39.50	\$9,875.00
1.12	40 mm HL3 Surface Course Asphalt	m <sup>2</sup>	250	\$11.50	\$2,875.00
1.13	Concrete Curb and Gutter	m	50	\$75.00	\$3,750.00
1.14	Concrete Sidewalk	m <sup>2</sup>	75	\$80.00	\$6,000.00
1.15	Reinstate Grassed Boulevard	m <sup>2</sup>	250	\$12.00	\$3,000.00
					<b>Subtotal Culvert Improvements</b>
					<b>\$501,912.50</b>
					<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>
					<b>\$501,912.50</b>
					<b>CONSTRUCTION CONTINGENCY (25%)</b>
					<b>\$125,478.13</b>
					<b>ENGINEERING DESIGN FEE (13%)</b>
					<b>\$65,248.63</b>
					<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>
					<b>\$50,191.25</b>
					<b>UTILITIES / SERVICES RELOCATION COST (15%)</b>
					<b>\$75,286.88</b>
					<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>
					<b>\$818,117.38</b>

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2016

IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
 (CULVERT IMPROVEMENTS - DESIGN FLOOD FREQUENCY CRITERIA)

DAVIDSON/GUNN STREET

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Culvert Improvements</b>				
1.01	Remove Existing Culvert	m	75	\$500.00	\$37,500.00
1.02	Remove Asphalt	m <sup>2</sup>	650	\$6.50	\$4,225.00
1.03	Remove Granular Road Base	m <sup>2</sup>	650	\$6.00	\$3,900.00
1.04	Remove Existing Concrete Curb and Gutter	m	100	\$23.00	\$2,300.00
1.05	Remove Existing Sidewalk	m <sup>2</sup>	75	\$16.50	\$1,237.50
1.06	Twin 3600 mm x 1500 Conc. Box	m	75	\$12,480.00	\$936,000.00
1.07	Concrete Distribution Slab	LS	-	-	\$20,000.00
1.08	Concrete Wingwalls	LS	-	-	\$50,000.00
1.09	Granular 'B' (450 mm)	m <sup>2</sup>	650	\$17.50	\$11,375.00
1.10	Granular 'A' (150 mm)	m <sup>2</sup>	650	\$8.50	\$5,525.00
1.11	100 mm HL8 Base Course Asphalt	m <sup>2</sup>	650	\$39.50	\$25,675.00
1.12	40 mm HL3 Surface Course Asphalt	m <sup>2</sup>	650	\$11.50	\$7,475.00
1.13	Concrete Curb and Gutter	m	100	\$75.00	\$7,500.00
1.14	Concrete Sidewalk	m <sup>2</sup>	75	\$80.00	\$6,000.00
1.15	Reinstate Grassed Boulevard	m <sup>2</sup>	750	\$12.00	\$9,000.00
					<b>Subtotal Culvert Improvements</b>
					<b>\$1,127,712.50</b>
<b>2</b>	<b>Property Acquisition</b>				
2.01	Property Acquisition	LS	-	-	\$286,000.00
					<b>Subtotal Property Acquisition</b>
					<b>\$286,000.00</b>
					<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>
					<b>\$1,413,712.50</b>
					<b>CONSTRUCTION CONTINGENCY (25%)</b>
					<b>\$281,928.13</b>
					<b>ENGINEERING DESIGN FEE (13%)</b>
					<b>\$146,602.63</b>
					<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>
					<b>\$112,771.25</b>
					<b>UTILITIES / SERVICES RELOCATION COST (15%)</b>
					<b>\$169,156.88</b>
					<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>
					<b>\$2,124,171.38</b>

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2016

IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
 (CULVERT IMPROVEMENTS - DESIGN FLOOD FREQUENCY CRITERIA)

PARKDALE CRESCENT

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Culvert Improvements</b>				
1.01	Remove Existing Culvert	m	40	\$250.00	\$10,000.00
1.02	Remove Asphalt	m <sup>2</sup>	200	\$6.50	\$1,300.00
1.03	Remove Granular Road Base	m <sup>2</sup>	200	\$6.00	\$1,200.00
1.04	Remove Existing Concrete Curb and Gutter	m	50	\$23.00	\$1,150.00
1.05	Twin 3600 mm x 1500 Conc. Box	m	25	\$12,480.00	\$312,000.00
1.06	Concrete Distribution Slab	LS	-	-	\$20,000.00
1.07	Concrete Wingwalls	LS	-	-	\$50,000.00
1.08	Granular 'B' (450 mm)	m <sup>2</sup>	200	\$17.50	\$3,500.00
1.09	Granular 'A' (150 mm)	m <sup>2</sup>	200	\$8.50	\$1,700.00
1.10	100 mm HL8 Base Course Asphalt	m <sup>2</sup>	200	\$39.50	\$7,900.00
1.11	40 mm HL3 Surface Course Asphalt	m <sup>2</sup>	200	\$11.50	\$2,300.00
1.12	Concrete Curb and Gutter	m	50	\$75.00	\$3,750.00
1.13	Reinstate Grassed Boulevard	m <sup>2</sup>	250	\$12.00	\$3,000.00
				<b>Subtotal Culvert Improvements</b>	<b>\$417,800.00</b>
				<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>	<b>\$417,800.00</b>
				<b>CONSTRUCTION CONTINGENCY (25%)</b>	<b>\$104,450.00</b>
				<b>ENGINEERING DESIGN FEE (13%)</b>	<b>\$54,314.00</b>
				<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>	<b>\$41,780.00</b>
				<b>UTILITIES / SERVICES RELOCATION COST (15%)</b>	<b>\$62,670.00</b>
				<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>	<b>\$681,014.00</b>

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2016

IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
 (CULVERT IMPROVEMENTS - DESIGN FLOOD FREQUENCY CRITERIA)

GROVE STREET (C)

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Culvert Improvements</b>				
1.01	Remove Existing Culvert	m	105	\$100.00	\$10,500.00
1.02	Remove Asphalt	m <sup>2</sup>	300	\$6.50	\$1,950.00
1.03	Remove Granular Road Base	m <sup>2</sup>	300	\$6.00	\$1,800.00
1.04	Remove Existing Concrete Curb and Gutter	m	50	\$23.00	\$1,150.00
1.05	Remove Existing Sidewalk	m <sup>2</sup>	75	\$16.50	\$1,237.50
1.06	Twin 3600 mm x 1500 Conc. Box	m	35	\$12,480.00	\$436,800.00
1.07	Concrete Distribution Slab	LS	-	-	\$35,000.00
1.08	Concrete Wingwalls	LS	-	-	\$50,000.00
1.09	Granular 'B' (450 mm)	m <sup>2</sup>	300	\$17.50	\$5,250.00
1.10	Granular 'A' (150 mm)	m <sup>2</sup>	300	\$8.50	\$2,550.00
1.11	100 mm HL8 Base Course Asphalt	m <sup>2</sup>	300	\$39.50	\$11,850.00
1.12	40 mm HL3 Surface Course Asphalt	m <sup>2</sup>	300	\$11.50	\$3,450.00
1.13	Concrete Curb and Gutter	m	50	\$75.00	\$3,750.00
1.14	Concrete Sidewalk	m <sup>2</sup>	75	\$80.00	\$6,000.00
1.15	Reinstate Grassed Boulevard	m <sup>2</sup>	375	\$12.00	\$4,500.00
					<b>Subtotal Culvert Improvements</b>
					<b>\$575,787.50</b>
					<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>
					<b>\$575,787.50</b>
					<b>CONSTRUCTION CONTINGENCY (25%)</b>
					<b>\$143,946.88</b>
					<b>ENGINEERING DESIGN FEE (13%)</b>
					<b>\$74,852.38</b>
					<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>
					<b>\$57,578.75</b>
					<b>UTILITIES / SERVICES RELOCATION COST (15%)</b>
					<b>\$86,368.13</b>
					<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>
					<b>\$938,533.63</b>

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
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IMPROVEMENT ALTERNATIVE 2A & 3B IMPLEMENTED IN COMBINATION  
 (CULVERT IMPROVEMENTS - DESIGN FLOOD FREQUENCY CRITERIA)

BOTHWELL CRESCENT

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Culvert Improvements</b>				
1.01	Remove Existing Culvert	m	20	\$85.00	\$1,700.00
1.02	Remove Asphalt	m <sup>2</sup>	200	\$6.50	\$1,300.00
1.03	Remove Granular Road Base	m <sup>2</sup>	200	\$6.00	\$1,200.00
1.04	Remove Existing Concrete Curb and Gutter	m	50	\$23.00	\$1,150.00
1.05	Quick Span Culvert (7.93 m span)	m	20	\$30,700.00	\$614,000.00
1.06	Concrete Distribution Slab	LS	-	-	\$20,000.00
1.07	Concrete Wingwalls	LS	-	-	\$50,000.00
1.08	Granular 'B' (450 mm)	m <sup>2</sup>	200	\$17.50	\$3,500.00
1.09	Granular 'A' (150 mm)	m <sup>2</sup>	200	\$8.50	\$1,700.00
1.10	100 mm HL8 Base Course Asphalt	m <sup>2</sup>	200	\$39.50	\$7,900.00
1.11	40 mm HL3 Surface Course Asphalt	m <sup>2</sup>	200	\$11.50	\$2,300.00
1.12	Concrete Curb and Gutter	m	50	\$75.00	\$3,750.00
1.13	Reinstate Grassed Boulevard	m <sup>2</sup>	150	\$12.00	\$1,800.00
				<b>Subtotal Culvert Improvements</b>	<b>\$710,300.00</b>
<b>2</b>	<b>Watercourse Improvements</b>				
2.01	Watercourse Improvements	m	85	\$500.00	\$42,500.00
				<b>Subtotal Watercourse Improvements</b>	<b>\$42,500.00</b>
				<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>	<b>\$752,800.00</b>
				<b>CONSTRUCTION CONTINGENCY (25%)</b>	<b>\$188,200.00</b>
				<b>ENGINEERING DESIGN FEE (13%)</b>	<b>\$97,864.00</b>
				<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>	<b>\$75,280.00</b>
				<b>UTILITIES / SERVICES RELOCATION COST (15%)</b>	<b>\$112,920.00</b>
				<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>	<b>\$1,227,064.00</b>

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2017

IMPROVEMENT ALTERNATIVE - OWEN STREET DIVERSION  
 5 YEAR SCS 6 HOUR STORM SEWER CAPACITY

RENEWAL WORKS

Conduit	Original Diameter (m)	New Diameter (m)	Length (m)	Replacement Price	5 Year Sewer Price	Price Difference
101305890	0.2	0.45	79	\$15,821	\$25,710	\$9,888
101307774	0.3	0.45	14	\$3,606	\$4,687	\$1,082
101307775	0.3	0.45	14	\$3,488	\$4,535	\$1,046
101307776	0.3	0.45	22	\$5,497	\$7,146	\$1,649
101307778	0.375	0.45	3	\$859	\$1,015	\$156
101310031	0.675	0.45	14	\$7,007	\$4,554	(\$2,452)
<b>Subtotal Renewal Works</b>						<b>\$11,370</b>

NEW WORKS

Reference Conduit	Description	Unit	Quantity	Unit Price	Total
101310030	Remove Existing Storm Sewer	m	47	\$65	\$3,055
101305890_US	450 mm Dia. Storm Sewer	m	88	\$325	\$28,460
<b>Subtotal New Works</b>					<b>\$31,515</b>

TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE      \$42,885

CONSTRUCTION CONTINGENCY (25%)      \$10,721

ENGINEERING DESIGN FEE (13%)      \$5,575

CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)      \$4,288

UTILITIES / SERVICES RELOCATION COST (15%)      \$6,433

TOTAL PRELIMINARY PROJECT COST ESTIMATE      \$69,902

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2017

IMPROVEMENT ALTERNATIVE - NEW STORM SEWER (WHERE ABSENT/REQUIRED)

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
1.01	Storm Sewer	m	5,575	\$275.00	\$1,533,125.00
1.02	1200 mm Dia. Catch Basin Maintenance Hole	ea	140	\$6,000.00	\$840,000.00
1.03	600 mm x 600 mm Single Catchbasin & Lead	ea	140	\$4,000.00	\$560,000.00
Subtotal Storm Sewer and Drainage Works					\$2,933,125.00
TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE					\$2,933,125.00
CONSTRUCTION CONTINGENCY (25%)					\$733,281.25
ENGINEERING DESIGN FEE (13%)					\$381,306.25
CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)					\$293,312.50
UTILITIES / SERVICES RELOCATION COST (15%)					\$439,968.75
TOTAL PRELIMINARY PROJECT COST ESTIMATE					\$4,780,993.75

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2017

IMPROVEMENT ALTERNATIVE - STORM SEWER UPSIZING  
 5 YEAR SCS 6 HOUR STORM SEWER CAPACITY

Conduit	Original Diameter (m)	New Diameter (m)	Length (m)	Replacement Price	5 Year Sewer Price	Price Difference
101301928	0.3	0.375	47.216	\$11,804	\$12,984	\$1,180
101302005	0.45	0.525	74.962	\$24,363	\$26,237	\$1,874
101302006	0.45	0.525	79.733	\$25,913	\$27,907	\$1,993
101302011	0.45	0.525	78.423	\$25,487	\$27,448	\$1,961
101302012	0.45	0.525	77.533	\$25,198	\$27,137	\$1,938
101302017	0.3	0.375	91.669	\$22,917	\$25,209	\$2,292
101302021	0.6	0.75	92.395	\$36,958	\$55,437	\$18,479
101302031	0.45	0.525	92.857	\$30,179	\$32,500	\$2,321
101302184	0.375	0.45	41.752	\$11,482	\$13,569	\$2,088
101302224	0.45	0.525	5.27	\$1,713	\$1,845	\$132
101302229	0.45	0.525	91.466	\$29,726	\$32,013	\$2,287
101302231	0.6	0.75	33.301	\$13,320	\$19,981	\$6,660
101302232	0.6	0.75	100.09	\$40,036	\$60,054	\$20,018
101302233	0.6	0.75	97.364	\$38,946	\$58,418	\$19,473
101302234	0.525	0.75	52.035	\$18,212	\$31,221	\$13,009
101302235	0.525	0.75	27.526	\$9,634	\$16,516	\$6,882
101302236	0.525	0.75	26.965	\$9,438	\$16,179	\$6,741
101302237	0.45	0.6	57.673	\$18,744	\$23,069	\$4,325
101302239	0.45	0.6	31.597	\$10,269	\$12,639	\$2,370
101302241	0.3	0.375	43.633	\$10,908	\$11,999	\$1,091
101302306	0.375	0.45	45.862	\$12,612	\$14,905	\$2,293
101302310	0.375	0.45	35.101	\$9,653	\$11,408	\$1,755
101302313	0.825	0.9	27.317	\$19,122	\$22,537	\$3,415
101302315	0.675	0.75	46.595	\$23,298	\$27,957	\$4,660
101302316	0.675	0.75	40.586	\$20,293	\$24,352	\$4,059
101302317	0.675	0.75	75.028	\$37,514	\$45,017	\$7,503
101302320	0.45	0.525	76.092	\$24,730	\$26,632	\$1,902
101302321	0.45	0.525	73.569	\$23,910	\$25,749	\$1,839
101302361	0.3	0.375	25.184	\$6,296	\$6,926	\$630
101302370	0.375	0.525	47.641	\$13,101	\$16,674	\$3,573
101302372	0.3	0.375	41.846	\$10,462	\$11,508	\$1,046
101302380	0.3	0.45	98.458	\$24,615	\$31,999	\$7,384
101302456	0.525	0.75	8.509	\$2,978	\$5,105	\$2,127
101302674	0.375	0.45	105.424	\$28,992	\$34,263	\$5,271
101302675	0.375	0.45	101.394	\$27,883	\$32,953	\$5,070
101302696	0.525	0.6	79.295	\$27,753	\$31,718	\$3,965
101302697	0.525	0.6	89.535	\$31,337	\$35,814	\$4,477
101302698	0.3	0.375	56.693	\$14,173	\$15,591	\$1,417
101302699	0.3	0.375	50.373	\$12,593	\$13,853	\$1,259
101302701	0.45	0.525	81.919	\$26,624	\$28,672	\$2,048
101302702	0.375	0.525	90.086	\$24,774	\$31,530	\$6,756
101302703	0.375	0.45	93.988	\$25,847	\$30,546	\$4,699
101302704	0.375	0.45	56.367	\$15,501	\$18,319	\$2,818
101302707	0.375	0.45	45.647	\$12,553	\$14,835	\$2,282
101302740	0.45	0.9	77.136	\$25,069	\$63,637	\$38,568
101302754	0.375	0.45	54.699	\$15,042	\$17,777	\$2,735
101302755	0.375	0.45	67.357	\$18,523	\$21,891	\$3,368
101302756	0.3	0.375	43.528	\$10,882	\$11,970	\$1,088
101302759	0.25	0.45	16.743	\$3,767	\$5,441	\$1,674
101302769	0.45	0.525	80.723	\$26,235	\$28,253	\$2,018
101302773	0.675	0.75	94.878	\$47,439	\$56,927	\$9,488
101302774	0.675	0.75	76.108	\$38,054	\$45,665	\$7,611
101302776	0.375	0.525	93.6	\$25,740	\$32,760	\$7,020
101302778	0.525	0.9	96.995	\$33,948	\$80,021	\$46,073

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2017

IMPROVEMENT ALTERNATIVE - STORM SEWER UPSIZING  
 5 YEAR SCS 6 HOUR STORM SEWER CAPACITY

Conduit	Original Diameter (m)	New Diameter (m)	Length (m)	Replacement Price	5 Year Sewer Price	Price Difference
101302834	0.525	0.6	22.848	\$7,997	\$9,139	\$1,142
101305202	0.3	0.45	27.143	\$6,786	\$8,821	\$2,036
101305204	0.3	0.3	10.425	\$2,606	\$2,606	\$0
101305206	0.45	0.675	55.512	\$18,041	\$27,756	\$9,715
101305208	0.375	0.45	12.798	\$3,519	\$4,159	\$640
101305714	0.45	0.6	68.36	\$22,217	\$27,344	\$5,127
101305717	0.25	0.3	15.803	\$3,556	\$3,951	\$395
101305718	0.25	0.3	16.068	\$3,615	\$4,017	\$402
101305719	0.25	0.3	31.851	\$7,166	\$7,963	\$796
101305738	0.525	0.675	13.284	\$4,649	\$6,642	\$1,993
101306248	0.375	0.525	13.471	\$3,705	\$4,715	\$1,010
101306680	0.6	0.9	17.656	\$7,062	\$14,566	\$7,504
101306681	0.6	0.9	54.369	\$21,748	\$44,854	\$23,107
101306912	0.2	0.45	25.681	\$5,136	\$8,346	\$3,210
101307642	0.45	0.9	112.194	\$36,463	\$92,560	\$56,097
101307643	0.45	0.9	102.551	\$33,329	\$84,605	\$51,276
101307674	0.375	0.525	101.532	\$27,921	\$35,536	\$7,615
101307690	0.3	0.375	81.841	\$20,460	\$22,506	\$2,046
101307691	0.3	0.375	26.049	\$6,512	\$7,163	\$651
101307692	0.3	0.375	40.76	\$10,190	\$11,209	\$1,019
101307693	0.3	0.375	39.422	\$9,856	\$10,841	\$986
101307694	0.35	0.375	15.23	\$4,188	\$4,188	\$0
101307695	0.35	0.375	9.004	\$2,476	\$2,476	\$0
101307720	0.3	0.375	61.58	\$15,395	\$16,935	\$1,540
101308350	0.3	0.375	79.519	\$19,880	\$21,868	\$1,988
101309679	0.375	0.675	70.771	\$19,462	\$35,386	\$15,923
101309994	0.3	0.375	75.127	\$18,782	\$20,660	\$1,878
101310002	0.3	0.375	60.614	\$15,154	\$16,669	\$1,515
101310003	0.3	0.375	54.357	\$13,589	\$14,948	\$1,359
101310039	0.6	0.675	15.058	\$6,023	\$7,529	\$1,506
101310041	0.375	0.6	39.241	\$10,791	\$15,696	\$4,905
101310042	0.45	0.6	81.164	\$26,378	\$32,466	\$6,087
101310043	0.525	0.6	72.291	\$25,302	\$28,916	\$3,615
101310045	0.6	0.675	81.701	\$32,680	\$40,851	\$8,170
101310048	0.525	0.6	112.307	\$39,307	\$44,923	\$5,615
101310049	0.3	0.375	73.937	\$18,484	\$20,333	\$1,848
101310053	0.3	0.375	74.728	\$18,682	\$20,550	\$1,868
101310070	0.975	1.05	109.762	\$104,274	\$115,250	\$10,976
101310072	0.975	1.35	17.217	\$16,356	\$30,130	\$13,774
101310073	0.975	1.05	34.317	\$32,601	\$36,033	\$3,432
101310112	0.3	0.375	29.118	\$7,280	\$8,007	\$728
101310114	0.3	0.525	70.418	\$17,605	\$24,646	\$7,042
101310223	0.525	0.75	11.838	\$4,143	\$7,103	\$2,960
101310377	0.525	0.6	101.066	\$35,373	\$40,426	\$5,053
101310378	0.6	0.675	93.163	\$37,265	\$46,582	\$9,316
101310387	0.525	0.6	21.678	\$7,587	\$8,671	\$1,084
101310394	0.45	0.525	78.287	\$25,443	\$27,400	\$1,957
101310615	0.525	0.6	52.934	\$18,527	\$21,174	\$2,647
101310617	0.525	0.6	66.708	\$23,348	\$26,683	\$3,335
101310619	0.525	0.6	16.885	\$5,910	\$6,754	\$844
101310655	0.3	0.45	78.07	\$19,518	\$25,373	\$5,855
101310656	0.3	0.45	79.066	\$19,767	\$25,696	\$5,930
101310657	0.3	0.45	52.776	\$13,194	\$17,152	\$3,958
101310658	0.3	0.45	59.832	\$14,958	\$19,445	\$4,487

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2017

IMPROVEMENT ALTERNATIVE - STORM SEWER UPSIZING  
 5 YEAR SCS 6 HOUR STORM SEWER CAPACITY

Conduit	Original Diameter (m)	New Diameter (m)	Length (m)	Replacement Price	5 Year Sewer Price	Price Difference
101310666	0.35	0.375	11.341	\$3,119	\$3,119	\$0
101310680	0.3	0.525	31.505	\$7,876	\$11,027	\$3,151
101310681	0.3	0.525	106.805	\$26,701	\$37,382	\$10,681
101310872	0.525	0.675	30.49	\$10,672	\$15,245	\$4,574
101310898	0.375	0.45	39.42	\$10,841	\$12,812	\$1,971
101311471	0.25	0.3	86.722	\$19,512	\$21,681	\$2,168
101311472	0.25	0.375	73.896	\$16,627	\$20,321	\$3,695
101412838	0.25	0.45	67.24	\$15,129	\$21,853	\$6,724
101412839	0.25	0.45	66.872	\$15,046	\$21,733	\$6,687
120177680	0.3	0.375	32.941	\$8,235	\$9,059	\$824
120179307	0.25	0.3	15.888	\$3,575	\$3,972	\$397
101305837_1	0.15	0.2	37.4	\$5,610	\$7,480	\$1,870
101305837_2	0.15	0.2	7.7	\$1,155	\$1,540	\$385
101310896_1	1.2	1.35	86.95	\$117,383	\$152,163	\$34,780
101310896_2	1.2	1.35	49.11	\$66,299	\$85,943	\$19,644
101406330_1	0.25	0.375	1.96	\$441	\$539	\$98
101406330_2	0.25	0.375	14.82	\$3,335	\$4,076	\$741
<b>TOTALS:</b>			<b>7,038</b>	<b>\$2,420,372</b>	<b>\$3,155,728</b>	<b>\$ 735,356</b>

TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE \$735,355.85

CONSTRUCTION CONTINGENCY (25%) \$183,838.96

ENGINEERING DESIGN FEE (13%) \$95,596.26

CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%) \$73,535.59

UTILITIES / SERVICES RELOCATION COST (15%) \$110,303.38

TOTAL PRELIMINARY PROJECT COST ESTIMATE \$1,198,630.04

SOPHIA CREEK WATERSHED & MULCASTER DRAINAGE AREA EA UPDATE  
 PRELIMINARY CONSTRUCTION COST ESTIMATE  
 SEPTEMBER 2017

IMPROVEMENT ALTERNATIVE 2A, 4A & 4C IMPLEMENTED IN COMBINATION  
 (OWEN AND CLAPPERTON STREET TRUNK STORM SEWERS)

ITEM No.	DESCRIPTION	UNIT	EST. QTY.	ESTIMATED UNIT PRICE	ESTIMATED AMOUNT
<b>1</b>	<b>Storm Sewer and Drainage Works</b>				
1.01	6000 mm x 2500 mm Precast Reinforced Concrete Box Culvert	m	8	\$13,850.00	\$110,800.00
1.02	3600 mm x 1800 mm Precast Reinforced Concrete Box Culvert	m	12	\$9,750.00	\$117,000.00
1.03	3000 mm x 1500 mm Precast Reinforced Concrete Box Culvert	m	105	\$7,980.00	\$837,900.00
1.04	2400 mm x 1200 mm Precast Reinforced Concrete Box Culvert	m	800	\$5,220.00	\$4,176,000.00
1.05	1650 mm Dia. Concrete Storm Sewer	m	435	\$2,530.00	\$1,100,550.00
1.06	2400 mm x 1500 mm Precast Reinforced Concrete Box Culvert	m	100	\$5,630.00	\$563,000.00
1.07	Storm Sewer Connection	ea	20	\$3,500.00	\$70,000.00
1.08	Maintenance Access Port	ea	24	\$5,000.00	\$120,000.00
1.09	3000 mm Dia. Maintenance Hole	ea	10	\$24,000.00	\$240,000.00
1.10	Custom Trunk Storm Sewer Maintenance Hole	ea	1	\$125,000.00	\$125,000.00
1.11	Trunk Storm Sewer Inlet Alterations	LS	-	-	\$150,000.00
1.12	Trunk Storm Sewer Outlet Works	LS	-	-	\$25,000.00
	<b>Subtotal Storm Sewer and Drainage Works</b>				<b>\$7,635,250.00</b>
<b>2</b>	<b>Sanitary Sewer Relocation</b>				
2.01	Relocated Existing Sanitary Sewer	m	500	\$850.00	\$425,000.00
2.02	Sanitary Maintenance Holes	ea	6	\$7,000.00	\$42,000.00
	<b>Subtotal Sanitary Sewer Relocation</b>				<b>\$467,000.00</b>
	<b>TOTAL PRELIMINARY CONSTRUCTION COST ESTIMATE</b>				<b>\$8,102,250.00</b>
				<b>CONSTRUCTION CONTINGENCY (25%)</b>	<b>\$2,025,562.50</b>
				<b>ENGINEERING DESIGN FEE (13%)</b>	<b>\$1,053,292.50</b>
				<b>CONTRACT ADMINISTRATION / CONSTRUCTION INSPECTION (10%)</b>	<b>\$810,225.00</b>
				<b>UTILITIES / SERVICES RELOCATION COST (15%)</b>	<b>\$1,215,337.50</b>
	<b>TOTAL PRELIMINARY PROJECT COST ESTIMATE</b>				<b>\$13,206,667.50</b>