



February 11, 2025

Mr. Ryan Johnson
Town of Eagle
Public Works – Town Engineer
200 Broadway St
Eagle, CO 81631

RE: Haymeadow Filing 2 – Phase 2
Drainage Conformance Letter
HKS Project No. 240804

Dear Mr. Johnson:

This letter summarizes how the proposed drainage improvements associated with Haymeadow Filing 2 – Phase 2 (“Project”) conform to the provisions allowed by the Haymeadow Filing 1 master drainage report, prepared September 2018 by Alpine Engineering, Inc. (“Report”), Debris Flow and Flood Review report, prepared June 2013 by Hepworth-Pawlak Geotechnical (“Debris Flow Report”) and the Haymeadow – Sylvan Lake Road Extension Phase 1 prepared October 2024 by Harris Kocher Smith (“Phase 1”).

The Project is located north of Phase 1, limits of disturbance total acreage of 7.29 acres. The Project is bound by Haymeadow Filing 1 & Haymeadow Phase 1 to the south, Mt Hope Circle to the west, Haymeadow Filing 1 Tract OS-3 to the North, and Haymeadow Filing 1 Tract Z1 to the east. A copy of the vicinity map can be found in Appendix A for reference. The Project is proposed as an extension of the existing Mt Hope Circle of approximately 2,180 linear feet to a connection to the existing Red Peak Road, with no new private storm sewer pipes & inlets. The flows will all be directed via existing & proposed curb and gutter to existing storm infrastructure within Whitney Peak Road & Red Peak Road which are routed via existing infrastructure to the existing detention Ponds 1B & 1D, located southwest of the project. All major basins are tributary to the Brush Creek to the south.

As shown in the Report, sub basins B17, B18, B22, B24, D8a, D8b & D9 are within the limits of disturbance of the Project and were designed for the ultimate build out condition with C values of 0.26, 0.48, 0.46, 0.42, 0.55, 0.35 & 0.54, respectively, for the design event of a 25-year. The design runoff values for the 25-year storm event are stated as 0.61, 11.85, 0.11, 6.39, 0.86, 0.28 & 9.71 CFS, respectively. Excerpts from the Report can be found in Appendix B for reference.

The Project modifies the existing Basins B17, B18, B22, B24, D8a, D8b & D9 into proposed basins B17P, B18P, B22P, B24aP, B24bP, D8aP, D8bP & D9P. Rational calculations were done for the Project per Mile High Flood District (MHFD) standards and can be found in Appendix C. These calculations are summarized below in Table 1. Phase 1 incorporated the Project basin delineations of Basins D1P and D4P into the calculations of those runoff values for those basins. Information on Basins D1P & D4P can be for in the Phase 1 conformance letter.

TABLE 1							
PER REPORT				PROPOSED			
BASIN	C ₂₅	Q ₂₅ (CFS)	Q ₁₀₀ (CFS)	BASIN	C ₂₅	Q ₂₅ (CFS)	Q ₁₀₀ (CFS)
B17	0.26	0.61	0.95	B17P	0.38	0.49	0.91
B18	0.48	11.85	16.82	B18P	0.63	9.2	13.89
B22	0.46	0.11	0.15	B22P	0.33	0.02	0.05
B24	0.42	6.39	9.18	B24aP	0.53	4.46	7.15
				B24bP	0.71	0.98	1.42
D8a	0.55	0.86	1.19	D8aP	0.51	5.12	8.36
D8b	0.35	0.28	0.42	D8bP	0.73	1.14	1.64
D9	0.54	9.71	13.56	D9P	0.68	8.43	12.37

As shown in Table 1, the calculated C values and runoff produced by a 25-year storm event for the Project match or are less than the designed values in the Report and the Project conforms to the Report. Basins D8a & D8b, as proposed, have a higher runoff value than shown in the Report, inlet capacity calculations have shown that inlets have the capacity to capture the flow. Inlet capacity calculations can be found in Appendix C.

The Phase 1 conformance letter included to adjustments to existing drainage basin D involved with Filing 2 – Phase 2. The adjustments required for the existing outlet structure are outlined and included in Appendix B. No modifications are required to be made to existing pond 1B. Table 2 below summarizes the Pond basins existing and proposed conditions.

TABLE 2				
	POND 1B (EXISTING)	POND 1B (PROPOSED)	POND 1D (EXISTING)	POND 1D (PROPOSED)
TRIBUTARY AREA (AC)	19.40	19.48	10.20	18.79
IMPERVIOUSNESS	42%	45%	45%	45%

Haymeadow Filing 2 – Phase 4 includes the extension of Sylvan Lake Road to the east, over the Willow Corridor to the proposed roundabout with an extension south of Ouzel Lane to the existing Brush Creek Road. The basins within this Phase of Haymeadow are shown as shaded and will be further analyzed in the drainage reports analyzing Phase 4 and the Preliminary Plan of future Neighborhoods A2, B & C.

As the existing Basins the Project is conforming to, per the Report, are assuming a full build out condition, historic drainage patterns will not be conformed to. The assumed build out drainage patterns will be used for basins within the scope of the Report.

Basin D1P: Runoff from the northern crown of Sylvan Lake Road from the connection point of the Phase 1 Sylvan Lake Road extension to the highpoint of the road after crossing the Willow Corridor will be conveyed via proposed curb & gutter to the existing Inlet D1 in the existing Sylvan Lake Road. Per the Report, Inlet D1 was designed to capture 3.49 CFS. Basin D1P Produces a higher runoff value of 3.77 CFS than planned in the Report of 3.49 CFS. Inlet capacity calculations are provided in Appendix C showing the inlet has capacity for the proposed runoff value. The drainage patterns follow the assumed build out condition of the report.

Basin D4P: Runoff from south of the proposed Mt Hope Circle and north of the proposed Alley will sheet flow into the proposed alley and be conveyed via a central concrete drainage pan to the existing gutter in Whitney Peak Road to existing inlet D4, which routes the runoff to Pond 1D. The drainage patterns follow the assumed build out condition of the report.

Basin DX: Runoff from by the southern crown of Sylvan Lake Road after from the beginning point of Phase 1 to the high point following the crossing of the Willow Corridor will be conveyed to a roadside ditch proposed as part of Phase 1, which conveys the flows ultimately to Brush Creek. Historically, Basin DX sheet flows to Brush Creek, so the drainage pattern follows the historic pattern.

A drainage plan was designed to map the proposed adjustments to the existing basins throughout the site and their prospective drainage points. The drainage plan can be found in Appendix D.

Basins E1, F2, T3, T4, T5, U3, U4, U5, V1, Y2, W3, WC1, WC2, OS1, OS2, OS3 & OS4 are only shown preliminarily in the drainage plan, and will be further analyzed with Haymeadow Filing 2 – Phase 4 and the Preliminary Plan of future Neighborhoods A2, B & C.

Inlet capacity calculations for existing Inlets D8a & D8b are included in Appendix C.

Hydraulic Calculations were done using the Rational Method per MHFD standards and can be found in Appendix C for reference. For this Drainage Compliance Letter, the 25-year storm event has been analyzed, as the Report uses the 25-year storm event as their controlling, design event. In an emergency event the Project is graded to release excess water to the south, towards Brush Creek.

Capacity of the public, on-site inlets have been analyzed in the Report, and the calculations have been provided in Appendix B.

Capacity of the public, on-site storm pipes have been analyzed in the Report and the calculations have been included in Appendix B.



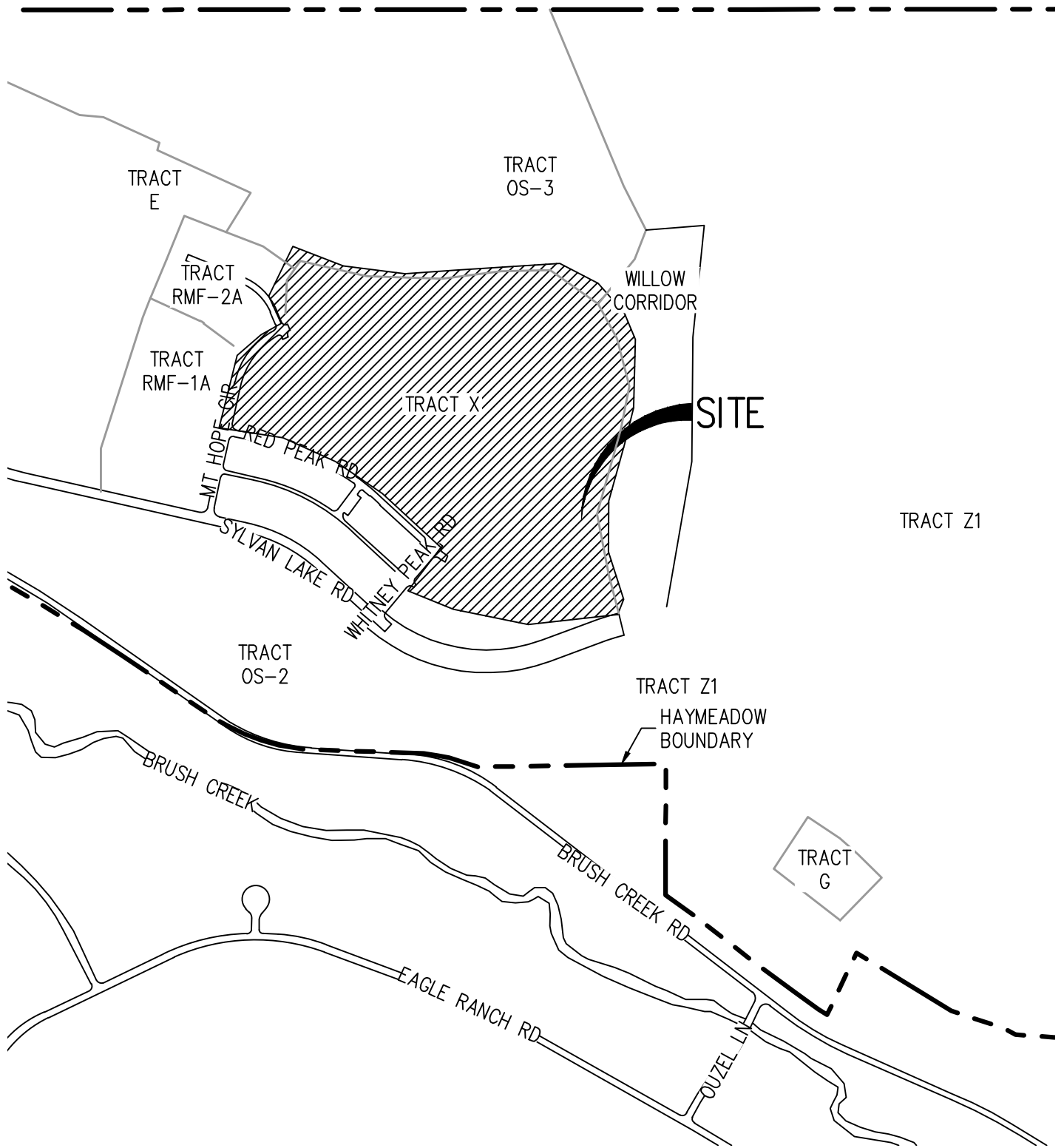
The proposed development is not anticipated to have adverse impacts on upstream and downstream properties.

Please contact me if you have any questions or require additional information.

Sincerely,
Rachel Patton, PE
On behalf of Harris Kocher Smith

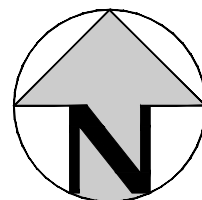
Appendix A – Vicinity Map

Plotted: TUE 02/11/25 9:42:59A By: Colton Hochevar Filepath: p:\2024\240804\engineering\ref\vicmap - phase 2.dwg Layout: layout1



VICINITY MAP

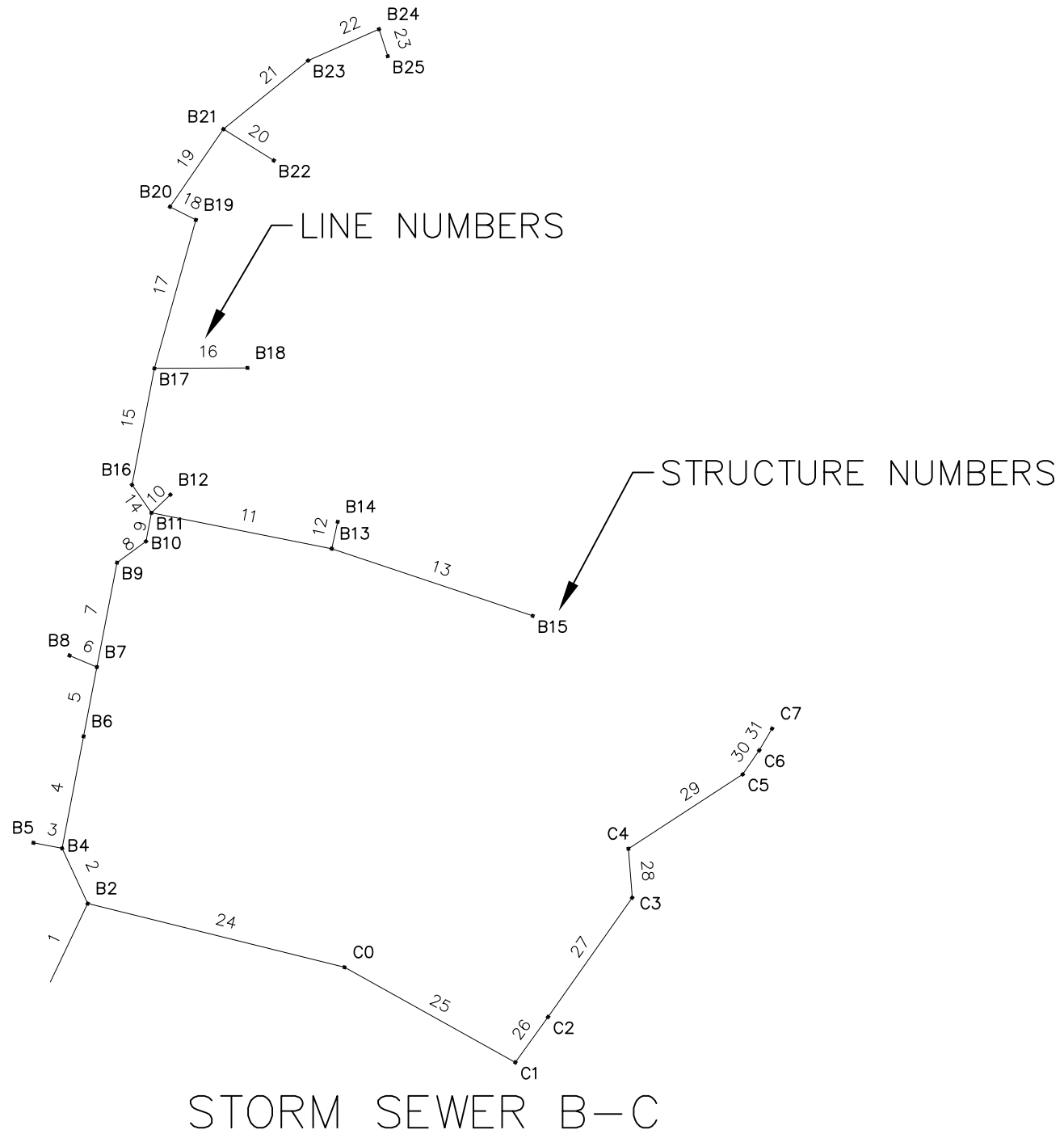
SCALE: 1"=1" = 500'



SCALE: 1" = 500'

Appendix B – Excerpts from Report & Phase 1

EXCERPT FROM MASTER DRAINAGE REPORT



EXCERPT FROM MASTER DRAINAGE REPORT

STORM RUN B

HAYMEADOW

DEVELOPED 25 & 100-YEAR WEIGHTED RUNOFF COEFFICIENTS

TYPE OF AREA	25-YEAR RCN	100-YEAR RCN
PAVEMENT	0.91	0.93
APARTMENTS	0.75	0.80
MULTIFAMILY	0.65	0.70
SINGLE FAMILY	0.55	0.60
GRASS	0.13	0.20

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EXCERPT FROM MASTER DRAINAGE REPORT

STORM RUN B HAYMEADOW RATIONAL METHOD SUMMARY

$$Q = C * I * A$$

BASIN	AREA (acres)	C ₂₅	I ₂₅	Q ₂₅ (cfs)	C ₁₀₀	I ₁₀₀	Q ₁₀₀ (cfs)
B2	0.64	0.60	3.25	1.25	0.65	4.12	1.71
B4	0.14	0.30	3.25	0.14	0.36	4.12	0.21
B5	0.19	0.54	3.25	0.33	0.58	4.12	0.46
B6	1.43	0.58	3.25	2.70	0.63	4.12	3.72
B7	0.12	0.55	3.25	0.21	0.60	4.12	0.30
B8	0.31	0.61	3.25	0.61	0.65	4.12	0.83
B9	0.05	0.75	3.25	0.12	0.78	4.12	0.16
B10	0.62	0.55	3.25	1.11	0.60	4.12	1.53
B11	0.30	0.65	3.25	0.63	0.70	4.12	0.87
B12	0.08	0.33	3.25	0.08	0.38	4.12	0.13
B13	0.13	0.67	3.25	0.28	0.71	4.12	0.38
B14	0.62	0.65	3.25	1.31	0.70	4.12	1.79
B15	0.27	0.65	3.25	0.57	0.70	4.12	0.78
B16	0.14	0.52	3.25	0.24	0.57	4.12	0.33
B17	0.72	0.26	3.25	0.61	0.32	4.12	0.95
B18	7.56	0.48	3.25	11.85	0.54	4.12	16.82
B19	0.14	0.63	3.25	0.29	0.67	4.12	0.39
B20	0.09	0.56	3.25	0.16	0.61	4.12	0.22
B21	0.07	0.46	3.25	0.11	0.51	4.12	0.15
B22	0.07	0.46	3.25	0.11	0.51	4.12	0.15
B23	0.99	0.36	3.25	1.14	0.41	4.12	1.69
B24	4.66	0.42	3.25	6.39	0.48	4.12	9.18
B25	0.06	0.65	3.25	0.13	0.69	4.12	0.17
TOTAL	19.40			30.38			42.89

EXCERPT FROM MASTER DRAINAGE REPORT

STORM RUN C

HAYMEADOW

DEVELOPED 25 & 100-YEAR WEIGHTED RUNOFF COEFFICIENTS

TYPE OF AREA	25-YEAR RCN	100-YEAR RCN
PAVEMENT	0.91	0.93
APARTMENTS	0.75	0.80
MULTIFAMILY	0.65	0.70
SINGLE FAMILY	0.55	0.60
GRASS	0.13	0.20

[illegible]

EXCERPT FROM MASTER DRAINAGE REPORT

STORM RUN C

HAYMEADOW

RATIONAL METHOD SUMMARY

$$Q = C * I * A$$

[illegible]

Storm Sewer Inventory Report

EXCERPT FROM MASTER DRAINAGE REPORT Page 1

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	70.167	-64.568	Comb	1.25	0.00	0.00	0.0	0.01	0.97	0.69	36	Cir	0.010	1.48	6.43	B1-B2
2	1	49.261	-50.274	Comb	0.14	0.00	0.00	0.0	0.89	0.97	1.37	24	Cir	0.010	1.43	5.78	B2-B4
3	2	23.502	-54.468	Comb	0.33	0.00	0.00	0.0	1.57	0.98	1.80	18	Cir	0.010	1.00	5.78	B4-B5
4	2	92.011	35.741	Comb	2.70	0.00	0.00	0.0	1.57	0.90	2.40	24	Cir	0.010	0.50	7.90	B4-B6
5	4	57.004	-0.006	Comb	0.21	0.00	0.00	0.0	2.60	1.77	3.61	24	Cir	0.010	1.91	9.11	B6-B7
6	5	24.027	-77.989	Comb	0.61	0.00	0.00	0.0	3.81	0.96	4.04	18	Cir	0.010	1.00	9.11	B7-B8
7	5	85.996	0.003	Comb	0.12	0.00	0.00	0.0	3.81	1.19	4.83	24	Cir	0.010	1.09	10.33	B7-B9
8	7	29.013	42.908	Comb	1.11	0.00	0.00	0.0	5.03	0.93	5.30	24	Cir	0.010	1.09	10.41	B9-B10
9	8	23.501	-42.922	Comb	0.63	0.00	0.00	0.0	5.50	0.94	5.72	24	Cir	0.010	1.71	10.41	B10-B11
10	9	21.153	35.493	Grate	0.08	0.00	0.00	0.0	5.92	0.85	6.10	18	Cir	0.010	1.00	10.50	B11-B12
11	9	148.534	90.381	Comb	0.28	0.00	0.00	0.0	5.92	1.82	8.62	18	Cir	0.010	1.75	14.12	B11-B13
12	11	22.244	-88.791	Grate	1.31	0.00	0.00	0.0	8.82	0.90	9.02	18	Cir	0.010	1.00	14.00	B13-B14
13	11	171.299	7.204	Comb	0.57	0.00	0.00	0.0	8.82	2.24	12.66	18	Cir	0.010	1.00	18.16	B13-B15
14	9	27.574	-45.718	Comb	0.24	0.00	0.00	0.0	5.92	0.94	6.18	24	Cir	0.010	1.14	11.29	B11-B16
15	14	95.750	45.731	Comb	0.61	0.00	0.00	0.0	6.38	0.98	7.32	24	Cir	0.010	1.74	12.76	B16-B17
16	15	75.243	78.799	Grate	11.85	0.00	0.00	0.0	7.52	1.24	8.45	18	Cir	0.010	1.00	13.58	B17-B18
17	15	124.542	4.718	Comb	0.29	0.00	0.00	0.0	7.52	2.32	10.41	18	Cir	0.010	1.48	15.91	B17-B19
18	17	23.504	-78.675	Comb	0.16	0.00	0.00	0.0	10.61	0.94	10.83	18	Cir	0.010	1.50	15.98	B19-B20
19	18	76.152	97.624	Comb	0.11	0.00	0.00	0.0	11.03	3.94	14.03	18	Cir	0.010	1.68	19.53	B20-B21
20	19	48.019	87.303	Grate	0.11	0.00	0.00	0.0	14.23	1.92	15.15	18	Cir	0.010	1.00	20.69	B21-B22
21	19	88.148	16.473	Comb	1.14	0.00	0.00	0.0	14.23	4.80	18.46	18	Cir	0.010	0.50	23.76	B21-B23
22	21	62.607	15.108	Comb	6.39	0.00	0.00	0.0	18.66	4.17	21.27	18	Cir	0.010	1.50	26.77	B23-B24
23	22	22.999	95.932	Comb	0.13	0.00	0.00	0.0	21.47	0.96	21.69	18	Cir	0.010	1.00	26.77	B24-B25
Project File: Storm-B-C.stm												Number of lines: 31				Date: 9/10/2018	

Storm Sewer Inventory Report

EXCERPT FROM MASTER DRAINAGE REPORT

Page 4

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
24	1	213.890	78.496	Comb	0.80	0.00	0.00	0.0	0.89	1.37	3.82	18	Cir	0.010	0.50	11.49	B2-C0
25	24	158.059	15.194	Comb	1.86	0.00	0.00	0.0	4.02	2.97	8.72	18	Cir	0.010	1.49	14.72	C0-C1
26	25	45.233	-83.356	Comb	0.11	0.00	0.00	0.0	8.92	1.88	9.77	18	Cir	0.010	0.50	15.50	C1-C2
27	26	118.047	-0.565	Comb	1.56	0.00	0.00	0.0	9.97	3.78	14.43	18	Cir	0.010	1.03	19.93	C2-C3
28	27	39.605	-39.681	Comb	0.29	0.00	0.00	0.0	14.63	0.96	15.01	18	Cir	0.010	1.35	20.32	C3-C4
29	28	110.258	61.420	Comb	0.68	0.00	0.00	0.0	15.21	1.56	16.93	18	Cir	0.010	0.65	22.43	C4-C5
30	29	23.540	-22.432	Comb	0.65	0.00	0.00	0.0	17.13	0.93	17.35	18	Cir	0.010	0.50	22.45	C5-C6
31	30	20.370	-3.939	Grate	1.20	0.00	0.00	0.0	17.55	0.88	17.73	18	Cir	0.010	1.00	22.80	C6-C7
Project File: Storm-B-C.stm												Number of lines: 31				Date: 9/10/2018	

Storm Sewer Summary Report

EXCERPT FROM MASTER DRAINAGE REPORT

Page 1

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	B1-B2	37.52	36	Cir	70.167	0.01	0.69	0.969	2.41	2.68	n/a	2.68 j	End	Combination
2	B2-B4	29.12	24	Cir	49.261	0.89	1.37	0.974	2.68	3.22	2.05	3.22	1	Combination
3	B4-B5	0.33	18	Cir	23.502	1.57	1.80	0.979	3.22	3.22	0.00	3.22	2	Combination
4	B4-B6	28.65	24	Cir	92.011	1.57	2.40	0.902	3.26	4.24	n/a	4.24	2	Combination
5	B6-B7	25.95	24	Cir	57.004	2.60	3.61	1.772	4.24	5.39	n/a	5.39	4	Combination
6	B7-B8	0.61	18	Cir	24.027	3.81	4.04	0.957	5.39	5.39	0.00	5.39	5	Combination
7	B7-B9	25.13	24	Cir	85.996	3.81	4.83	1.186	5.39	6.59	n/a	6.59	5	Combination
8	B9-B10	25.01	24	Cir	29.013	5.03	5.30	0.931	6.59	7.06	n/a	7.06	7	Combination
9	B10-B11	23.90	24	Cir	23.501	5.50	5.72	0.936	7.06	7.45	1.82	7.45	8	Combination
10	B11-B12	0.08	18	Cir	21.153	5.92	6.10	0.851	7.45	7.45	0.00	7.45	9	Grate
11	B11-B13	2.16	18	Cir	148.534	5.92	8.62	1.818	7.45	9.17	n/a	9.17 j	9	Combination
12	B13-B14	1.31	18	Cir	22.244	8.82	9.02	0.899	9.17	9.45	0.15	9.45	11	Grate
13	B13-B15	0.57	18	Cir	171.299	8.82	12.66	2.242	9.17	12.94	n/a	12.94 j	11	Combination
14	B11-B16	21.03	24	Cir	27.574	5.92	6.18	0.943	7.45	7.82	n/a	7.82	9	Combination
15	B16-B17	20.79	24	Cir	95.750	6.38	7.32	0.982	7.82	8.95	1.55	8.95	14	Combination
16	B17-B18	11.85	18	Cir	75.243	7.52	8.45	1.236	8.95	9.76	n/a	9.76 j	15	Grate
17	B17-B19	8.33	18	Cir	124.542	7.52	10.41	2.321	8.95	11.53	n/a	11.53 j	15	Combination
18	B19-B20	8.04	18	Cir	23.504	10.61	10.83	0.936	11.53	11.93	0.79	11.93	17	Combination
19	B20-B21	7.88	18	Cir	76.152	11.03	14.03	3.939	11.93	15.12	0.86	15.12	18	Combination
20	B21-B22	0.11	18	Cir	48.019	14.23	15.15	1.916	15.12	15.27	n/a	15.27 j	19	Grate
21	B21-B23	7.66	18	Cir	88.148	14.23	18.46	4.799	15.12	19.53	n/a	19.53	19	Combination
22	B23-B24	6.52	18	Cir	62.607	18.66	21.27	4.169	19.53	22.26	0.65	22.26	21	Combination
23	B24-B25	0.13	18	Cir	22.999	21.47	21.69	0.957	22.26	21.82	n/a	21.82	22	Combination
24	B2-C0	7.15	18	Cir	213.890	0.89	3.82	1.370	2.68	4.85	n/a	4.85 j	1	Combination

Project File: Storm-B-C.stm

Number of lines: 31

Run Date: 9/10/2018

NOTES: Return period = 25 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Summary Report

EXCERPT FROM MASTER DRAINAGE REPORT

Page 2

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	C0-C1	6.35	18	Cir	158.059	4.02	8.72	2.974	4.85	9.69	n/a	9.69	24	Combination
26	C1-C2	4.49	18	Cir	45.233	8.92	9.77	1.879	9.69	10.58	0.16	10.58	25	Combination
27	C2-C3	4.38	18	Cir	118.047	9.97	14.43	3.778	10.58	15.23	0.33	15.23	26	Combination
28	C3-C4	2.82	18	Cir	39.605	14.63	15.01	0.959	15.23	15.65	0.33	15.65	27	Combination
29	C4-C5	2.53	18	Cir	110.258	15.21	16.93	1.560	15.65	17.53	0.15	17.53	28	Combination
30	C5-C6	1.85	18	Cir	23.540	17.13	17.35	0.935	17.53	17.86	0.09	17.86	29	Combination
31	C6-C7	1.20	18	Cir	20.370	17.55	17.73	0.884	17.86	18.14	n/a	18.14	30	Grate

Project File: Storm-B-C.stm

Number of lines: 31

Run Date: 9/10/2018

NOTES: Return period = 25 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Tabulation

EXCERPT FROM MASTER DRAINAGE REPORT

Page 1

Station		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (I) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr (ac)	Total (ac)		Incr	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	70.167	0.00	0.00	0.00	0.00	0.00	0.0	8.2	0.0	37.52	85.35	6.86	36	0.97	0.01	0.69	2.41	2.68	3.00	6.43	B1-B2
2	1	49.261	0.00	0.00	0.00	0.00	0.00	0.0	8.1	0.0	29.12	29.02	9.71	24	0.97	0.89	1.37	2.68	3.22	6.43	5.78	B2-B4
3	2	23.502	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.33	13.51	0.19	18	0.98	1.57	1.80	3.22	3.22	5.78	5.78	B4-B5
4	2	92.011	0.00	0.00	0.00	0.00	0.00	0.0	7.9	0.0	28.65	27.93	9.80	24	0.90	1.57	2.40	3.26	4.24	5.78	7.90	B4-B6
5	4	57.004	0.00	0.00	0.00	0.00	0.00	0.0	7.8	0.0	25.95	39.14	9.09	24	1.77	2.60	3.61	4.24	5.39	7.90	9.11	B6-B7
6	5	24.027	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.61	13.36	0.35	18	0.96	3.81	4.04	5.39	5.39	9.11	9.11	B7-B8
7	5	85.996	0.00	0.00	0.00	0.00	0.00	0.0	7.7	0.0	25.13	32.02	8.99	24	1.19	3.81	4.83	5.39	6.59	9.11	10.33	B7-B9
8	7	29.013	0.00	0.00	0.00	0.00	0.00	0.0	7.6	0.0	25.01	28.36	9.01	24	0.93	5.03	5.30	6.59	7.06	10.33	10.41	B9-B10
9	8	23.501	0.00	0.00	0.00	0.00	0.00	0.0	7.6	0.0	23.90	28.45	8.68	24	0.94	5.50	5.72	7.06	7.45	10.41	10.41	B10-B11
10	9	21.153	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.08	12.59	0.05	18	0.85	5.92	6.10	7.45	7.45	10.41	10.50	B11-B12
11	9	148.534	0.00	0.00	0.00	0.00	0.00	0.0	1.3	0.0	2.16	18.41	2.43	18	1.82	5.92	8.62	7.45	9.17	10.41	14.12	B11-B13
12	11	22.244	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.31	12.94	3.63	18	0.90	8.82	9.02	9.17	9.45	14.12	14.00	B13-B14
13	11	171.299	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.57	20.44	2.15	18	2.24	8.82	12.66	9.17	12.94	14.12	18.16	B13-B15
14	9	27.574	0.00	0.00	0.00	0.00	0.00	0.0	1.8	0.0	21.03	28.55	7.89	24	0.94	5.92	6.18	7.45	7.82	10.41	11.29	B11-B16
15	14	95.750	0.00	0.00	0.00	0.00	0.00	0.0	1.6	0.0	20.79	29.13	8.07	24	0.98	6.38	7.32	7.82	8.95	11.29	12.76	B16-B17
16	15	75.243	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	11.85	15.18	7.03	18	1.24	7.52	8.45	8.95	9.76	12.76	13.58	B17-B18
17	15	124.542	0.00	0.00	0.00	0.00	0.00	0.0	1.2	0.0	8.33	20.80	5.35	18	2.32	7.52	10.41	8.95	11.53	12.76	15.91	B17-B19
18	17	23.504	0.00	0.00	0.00	0.00	0.00	0.0	1.1	0.0	8.04	13.21	6.45	18	0.94	10.61	10.83	11.53	11.93	15.91	15.98	B19-B20
19	18	76.152	0.00	0.00	0.00	0.00	0.00	0.0	0.9	0.0	7.88	27.10	6.44	18	3.94	11.03	14.03	11.93	15.12	15.98	19.53	B20-B21
20	19	48.019	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.11	18.90	0.86	18	1.92	14.23	15.15	15.12	15.27	19.53	20.69	B21-B22
21	19	88.148	0.00	0.00	0.00	0.00	0.00	0.0	0.6	0.0	7.66	29.91	6.36	18	4.80	14.23	18.46	15.12	19.53	19.53	23.76	B21-B23
22	21	62.607	0.00	0.00	0.00	0.00	0.00	0.0	0.4	0.0	6.52	27.87	5.71	18	4.17	18.66	21.27	19.53	22.26	23.76	26.77	B23-B24

Project File: Storm-B-C.stm

Number of lines: 31

Run Date: 9/10/2018

NOTES: Intensity = $102.61 / (\text{Inlet time} + 16.50)^{0.82}$; Return period = Yrs. 25 ; c = cir e = ellip b = box

Storm Sewer Tabulation

EXCERPT FROM MASTER DRAINAGE REPORT

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Station		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (I) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr (ac)	Total (ac)		Incr (min)	Total (min)	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	22	22.999	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.13	13.35	0.92	18	0.96	21.47	21.69	22.26	21.82	26.77	26.77	B24-B25
24	1	213.890	0.00	0.00	0.00	0.00	0.00	0.0	1.7	0.0	7.15	15.98	4.77	18	1.37	0.89	3.82	2.68	4.85	6.43	11.49	B2-C0
25	24	158.059	0.00	0.00	0.00	0.00	0.00	0.0	1.2	0.0	6.35	23.54	5.76	18	2.97	4.02	8.72	4.85	9.69	11.49	14.72	C0-C1
26	25	45.233	0.00	0.00	0.00	0.00	0.00	0.0	1.1	0.0	4.49	18.71	4.74	18	1.88	8.92	9.77	9.69	10.58	14.72	15.50	C1-C2
27	26	118.047	0.00	0.00	0.00	0.00	0.00	0.0	0.7	0.0	4.38	26.54	5.50	18	3.78	9.97	14.43	10.58	15.23	15.50	19.93	C2-C3
28	27	39.605	0.00	0.00	0.00	0.00	0.00	0.0	0.6	0.0	2.82	13.37	4.10	18	0.96	14.63	15.01	15.23	15.65	19.93	20.32	C3-C4
29	28	110.258	0.00	0.00	0.00	0.00	0.00	0.0	0.2	0.0	2.53	17.05	4.86	18	1.56	15.21	16.93	15.65	17.53	20.32	22.43	C4-C5
30	29	23.540	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	1.85	13.20	4.17	18	0.93	17.13	17.35	17.53	17.86	22.43	22.45	C5-C6
31	30	20.370	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.20	12.83	3.79	18	0.88	17.55	17.73	17.86	18.14	22.45	22.80	C6-C7
Project File: Storm-B-C.stm																Number of lines: 31				Run Date: 9/10/2018		
NOTES:Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82; Return period =Yrs. 25 ; c = cir e = ellip b = box																						

Inlet Report

EXCERPT FROM MASTER DRAINAGE REPORT

Page 1

Line No	Inlet ID	Q = CIA	Q carry	Q capt	Q Byp	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
		(cfs)	(cfs)	(cfs)	(cfs)		Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	B2	1.25*	0.00	1.25	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.20	6.87	0.20	6.87	0.0	Off
2	B4	0.14*	0.00	0.14	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.11	2.27	0.11	2.27	0.0	Off
3	B5	0.33*	0.00	0.33	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.13	3.25	0.13	3.25	0.0	Off
4	B6	2.70*	0.00	2.70	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.30	11.81	0.30	11.81	0.0	Off
5	B7	0.21*	0.00	0.21	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.12	2.85	0.12	2.85	0.0	Off
6	B8	0.61*	0.00	0.61	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.14	4.07	0.14	4.07	0.0	Off
7	B9	0.12*	0.00	0.12	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.10	2.08	0.10	2.08	0.0	Off
8	B10	1.11*	0.00	1.11	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.19	6.31	0.19	6.31	0.0	Off
9	B11	0.63*	0.00	0.63	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.14	4.17	0.14	4.17	0.0	Off
10	B12	0.08*	0.00	0.08	0.00	Grate	0.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.05	0.94	0.05	0.94	0.0	Off
11	B13	0.28*	0.00	0.28	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.13	3.25	0.13	3.25	0.0	Off
12	B14	1.31*	0.00	1.31	0.00	Grate	0.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.23	8.34	0.23	8.34	0.0	Off
13	B15	0.57*	0.00	0.57	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.14	3.87	0.14	3.87	0.0	Off
14	B16	0.24*	0.00	0.24	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.12	3.06	0.12	3.06	0.0	Off
15	B17	0.61*	0.00	0.61	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.14	4.07	0.14	4.07	0.0	Off
16	B18	11.85*	0.00	11.85	0.00	Grate	0.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.73	33.73	0.73	33.73	0.0	Off
17	B19	0.29*	0.00	0.29	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.13	3.25	0.13	3.25	0.0	Off
18	B20	0.16*	0.00	0.16	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.11	2.45	0.11	2.45	0.0	Off
19	B21	0.11*	0.00	0.11	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.10	1.98	0.10	1.98	0.0	Off
20	B22	0.11*	0.00	0.11	0.00	Grate	0.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.06	1.16	0.06	1.16	0.0	Off
21	B23	1.14*	0.00	1.14	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.19	6.43	0.19	6.43	0.0	Off
22	B24	6.39*	0.00	6.39	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.49	21.35	0.49	21.35	0.0	Off
23	B25	0.13*	0.00	0.13	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.10	2.18	0.10	2.18	0.0	Off

Project File: Storm-B-C.stm

Number of lines: 31

Run Date: 9/10/2018

NOTES: Inlet N-Values = 0.016; Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82; Return period = 25 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Inlet Report

EXCERPT FROM MASTER DRAINAGE REPORT

Page 2

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24	C0	0.80*	0.00	0.80	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.16	4.97	0.16	4.97	0.0	Off
25	C1	1.86*	0.00	1.86	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.24	9.10	0.24	9.10	0.0	Off
26	C2	0.11*	0.00	0.11	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.10	1.98	0.10	1.98	0.0	Off
27	C3	1.56*	0.00	1.56	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.22	8.04	0.22	8.04	0.0	Off
28	C4	0.29*	0.00	0.29	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.13	3.25	0.13	3.25	0.0	Off
29	C5	0.68*	0.00	0.68	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.15	4.41	0.15	4.41	0.0	Off
30	C6	0.65*	0.00	0.65	0.00	Comb	4.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.15	4.27	0.15	4.27	0.0	Off
31	C7	1.20*	0.00	1.20	0.00	Grate	0.0	0.00	4.12	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.22	7.91	0.22	7.91	0.0	Off

Project File: Storm-B-C.stm

Number of lines: 31

Run Date: 9/10/2018

NOTES: Inlet N-Values = 0.016; Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82; Return period = 25 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Hydraulic Grade Line Computations EXCERPT FROM MASTER DRAINAGE REPORT Page 1

Line	Size (in)	Q (cfs)	Downstream								Len (ft)	Upstream								Check		JL coeff (K)	Minor loss (ft)
			Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)		Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)		
1	36	37.52	0.01	2.41	2.40	4.98	6.19	0.88	3.29	0.000	70.167	0.69	2.68 j	1.99**	4.98	7.53	0.88	3.56	0.000	0.000	n/a	1.48	n/a
2	24	29.12	0.89	2.68	1.79	2.97	9.81	1.43	4.12	0.000	49.261	1.37	3.22	1.85**	3.03	9.60	1.43	4.65	0.000	0.000	n/a	1.43	2.05
3	18	0.33	1.57	3.22	1.50	1.77	0.19	0.00	3.22	0.001	23.502	1.80	3.22	1.42	1.73	0.19	0.00	3.22	0.001	0.001	0.000	1.00	0.00
4	24	28.65	1.57	3.26	1.69*	2.83	10.12	1.40	4.66	0.000	92.011	2.40	4.24	1.84**	3.02	9.48	1.40	5.64	0.000	0.000	n/a	0.50	n/a
5	24	25.95	2.60	4.24	1.64	2.76	9.42	1.20	5.44	0.000	57.004	3.61	5.39	1.78**	2.96	8.77	1.20	6.59	0.000	0.000	n/a	1.91	n/a
6	18	0.61	3.81	5.39	1.50	1.77	0.35	0.00	5.40	0.002	24.027	4.04	5.39	1.35	1.68	0.36	0.00	5.39	0.002	0.002	0.000	1.00	0.00
7	24	25.13	3.81	5.39	1.58	2.67	9.42	1.14	6.54	0.000	85.996	4.83	6.59	1.76**	2.93	8.57	1.14	7.74	0.000	0.000	n/a	1.09	n/a
8	24	25.01	5.03	6.59	1.56	2.64	9.49	1.13	7.73	0.000	29.013	5.30	7.06	1.76**	2.93	8.54	1.13	8.19	0.000	0.000	n/a	1.09	n/a
9	24	23.90	5.50	7.06	1.56	2.63	9.09	1.06	8.12	0.000	23.501	5.72	7.45	1.73**	2.89	8.27	1.06	8.51	0.000	0.000	n/a	1.71	1.82
10	18	0.08	5.92	7.45	1.50	1.77	0.05	0.00	7.45	0.000	21.153	6.10	7.45	1.35	1.68	0.05	0.00	7.45	0.000	0.000	0.000	1.00	0.00
11	18	2.16	5.92	7.45	1.50	0.59	1.22	0.02	7.47	0.025	148.53	48.62	9.17 j	0.55**	0.59	3.64	0.21	9.38	0.295	0.160	n/a	1.75	n/a
12	18	1.31	8.82	9.17	0.35	0.32	4.11	0.15	9.33	0.000	22.244	9.02	9.45	0.43**	0.42	3.15	0.15	9.60	0.000	0.000	n/a	1.00	0.15
13	18	0.57	8.82	9.17	0.35	0.23	1.79	0.10	9.27	0.000	171.299	12.66	12.94 j	0.28**	0.23	2.50	0.10	13.04	0.000	0.000	n/a	1.00	n/a
14	24	21.03	5.92	7.45	1.53	2.58	8.15	0.90	8.35	0.000	27.574	6.18	7.82	1.64**	2.76	7.62	0.90	8.72	0.000	0.000	n/a	1.14	n/a
15	24	20.79	6.38	7.82	1.44	2.42	8.58	0.89	8.71	0.000	95.750	7.32	8.95	1.63**	2.75	7.57	0.89	9.84	0.000	0.000	n/a	1.74	1.55
16	18	11.85	7.52	8.95	1.43	1.63	6.81	0.82	9.77	0.000	75.243	8.45	9.76 j	1.31**	1.63	7.25	0.82	10.57	0.000	0.000	n/a	1.00	n/a
17	18	8.33	7.52	8.95	1.43	1.41	4.79	0.54	9.49	0.000	124.542	10.41	11.53 j	1.12**	1.41	5.90	0.54	12.07	0.000	0.000	n/a	1.48	n/a
18	18	8.04	10.61	11.53	0.92	1.13	7.10	0.52	12.05	0.000	23.504	10.83	11.93	1.10**	1.39	5.80	0.52	12.45	0.000	0.000	n/a	1.50	0.79
19	18	7.88	11.03	11.93	0.90	1.10	7.14	0.51	12.44	0.000	76.152	14.03	15.12	1.09**	1.37	5.75	0.51	15.63	0.000	0.000	n/a	1.68	0.86
20	18	0.11	14.23	15.12	0.89	0.07	0.10	0.04	15.16	0.000	48.019	15.15	15.27 j	0.12**	0.07	1.63	0.04	15.31	0.000	0.000	n/a	1.00	n/a
21	18	7.66	14.23	15.12	0.89	1.09	7.04	0.50	15.62	0.000	88.148	18.46	19.53	1.07**	1.35	5.67	0.50	20.03	0.000	0.000	n/a	0.50	n/a
22	18	6.52	18.66	19.53	0.87	1.06	6.12	0.43	19.97	0.000	62.607	21.27	22.26	0.99**	1.23	5.29	0.43	22.69	0.000	0.000	n/a	1.50	0.65

Project File: Storm-B-C.stm

Number of lines: 31

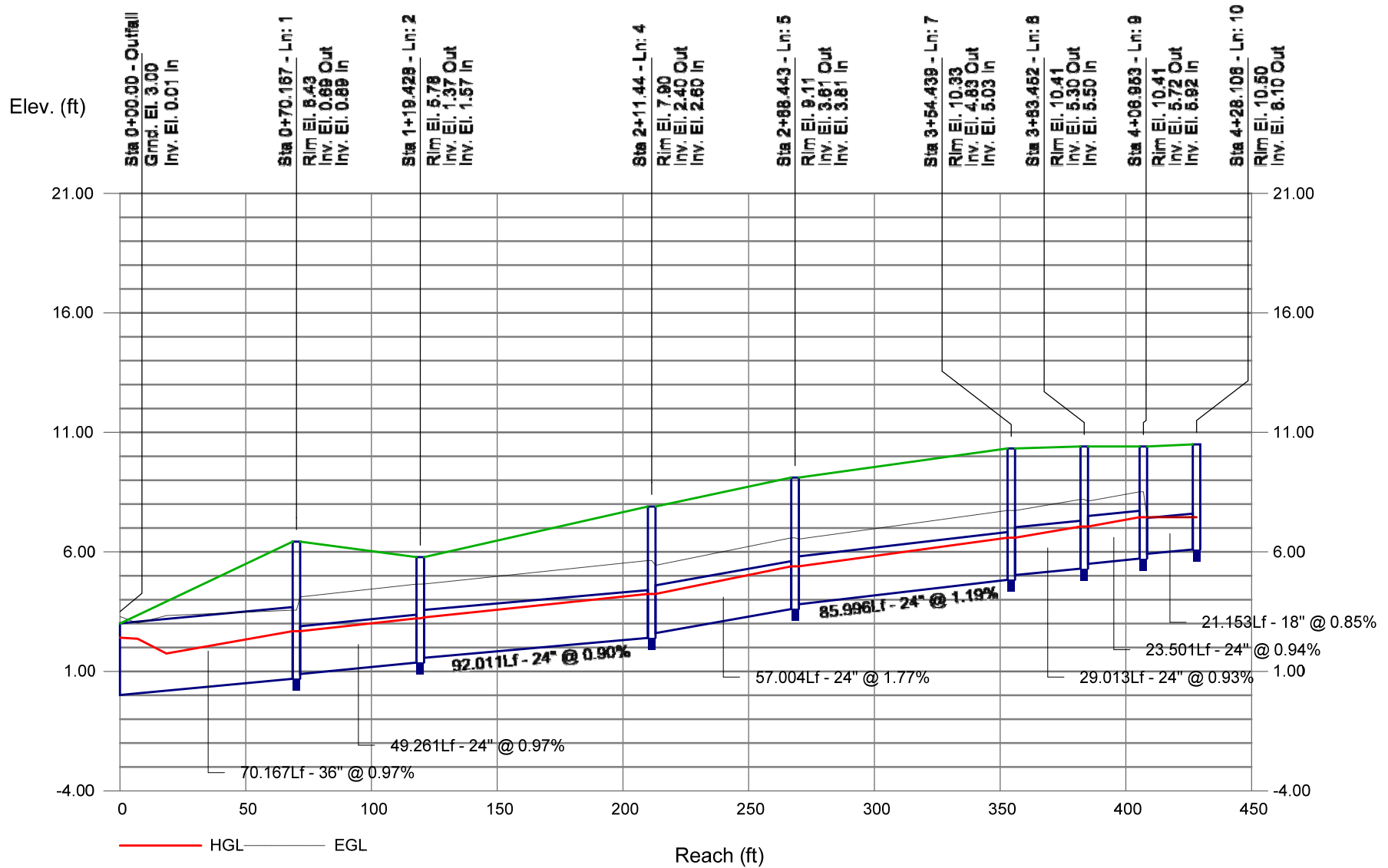
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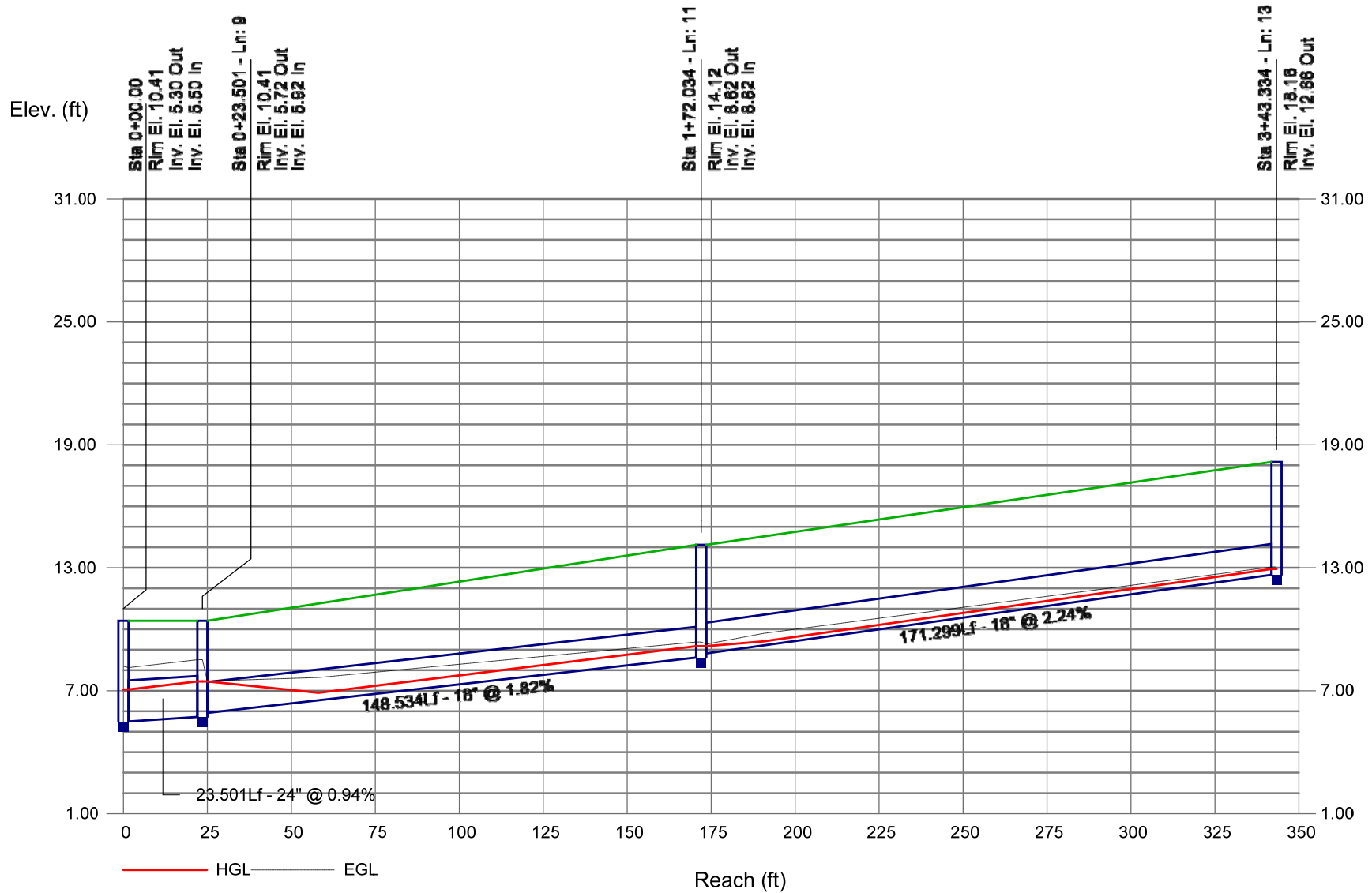
Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

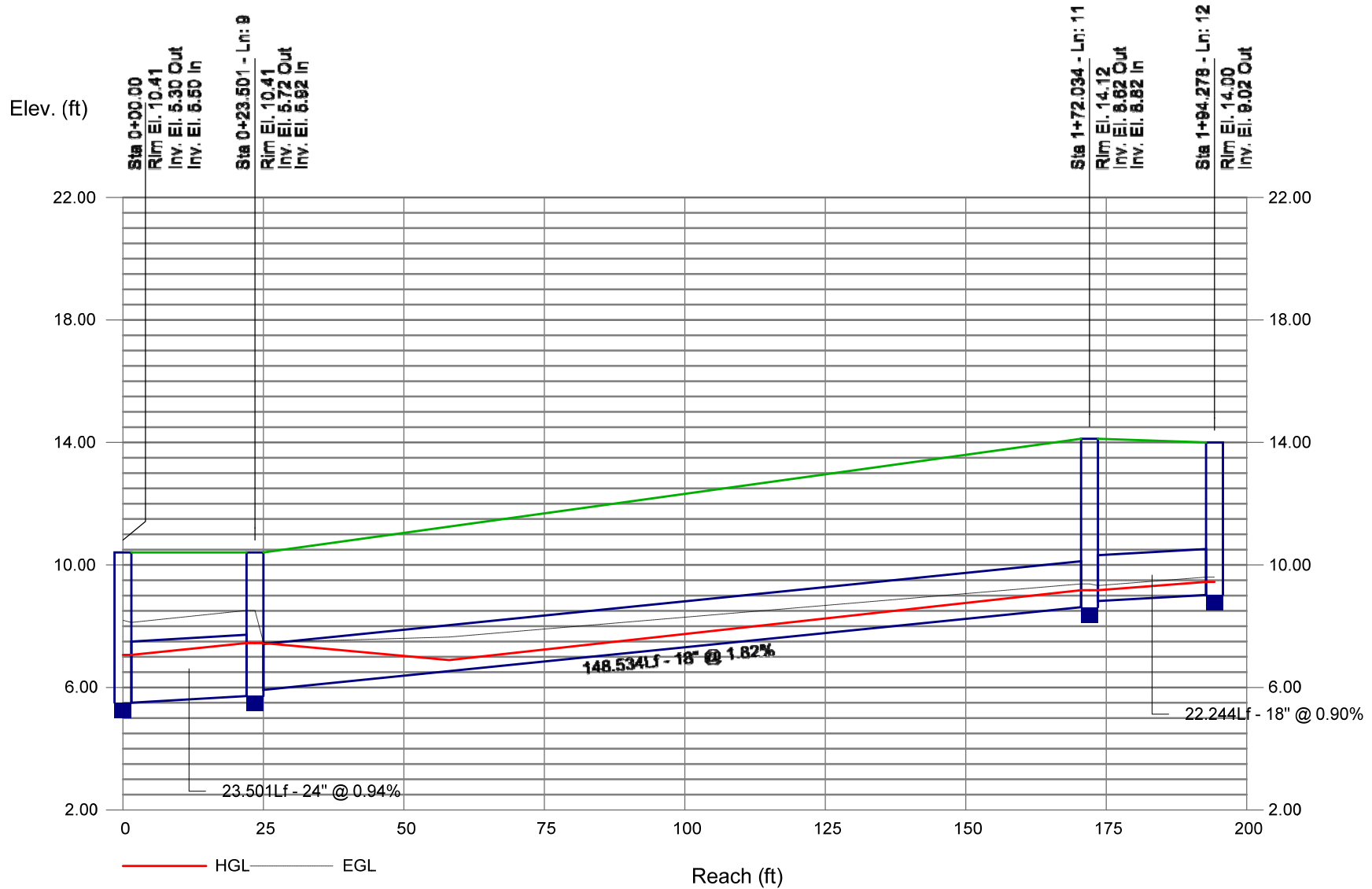
Hydraulic Grade Line Computations EXCERPT FROM MASTER DRAINAGE REPORT

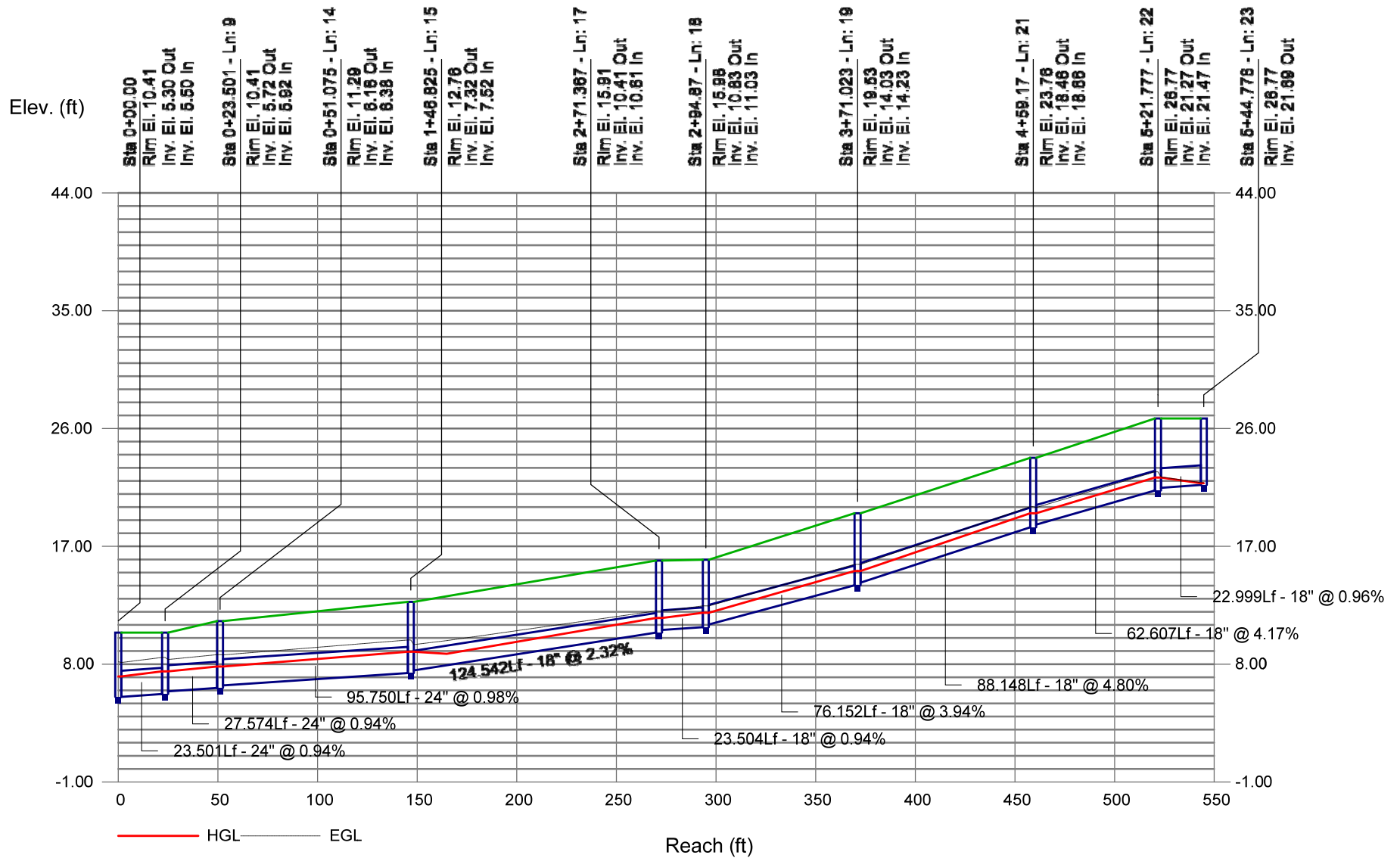
Page 4

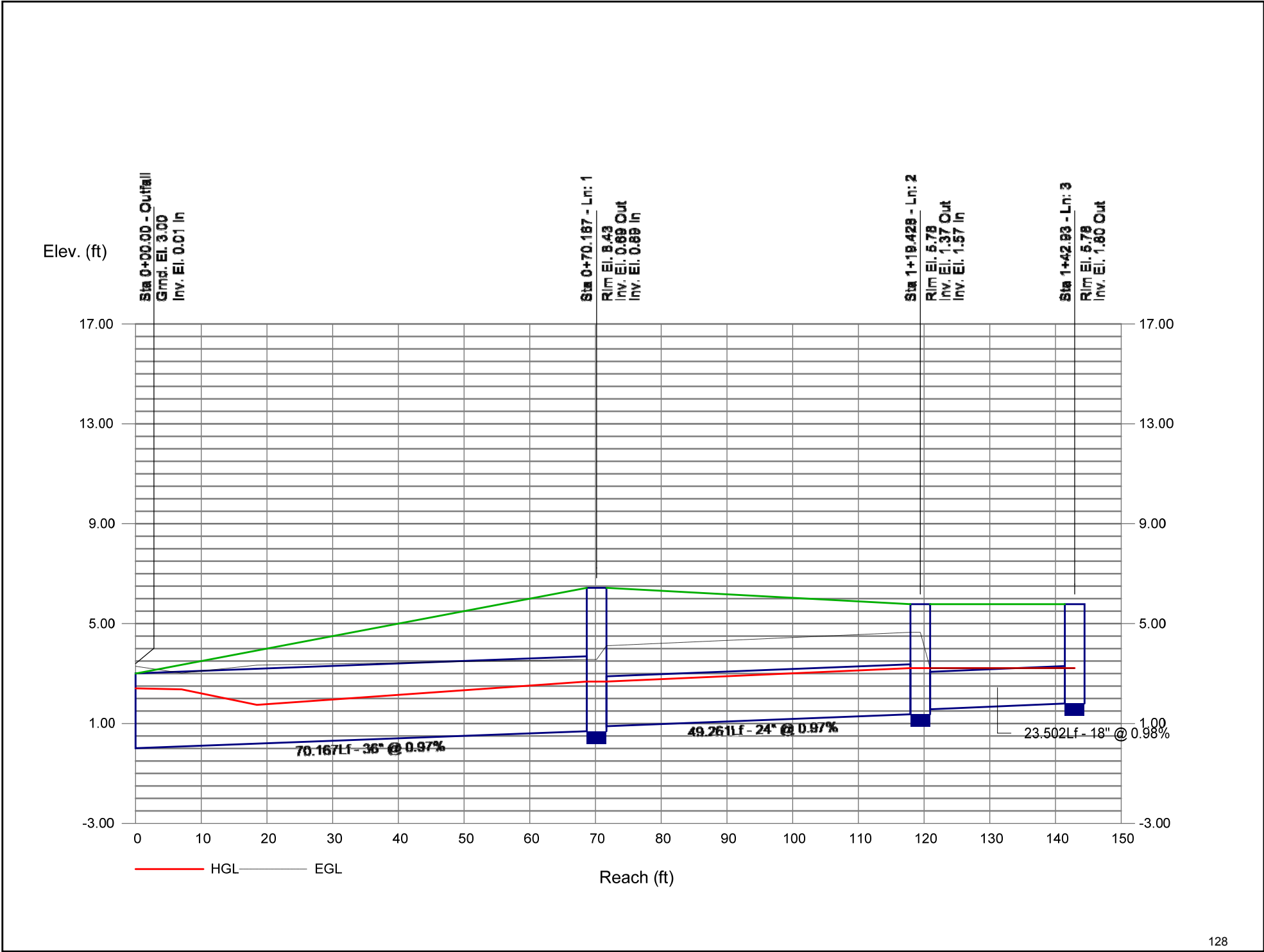
Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)		Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)		
	(in)	(cfs)									(ft)											(K)	(ft)
23	18	0.13	21.47	22.26	0.79	0.08	0.14	0.04	22.30	0.000	22.999	21.69	21.82	0.13**	0.08	1.70	0.04	21.87	0.000	0.000	n/a	1.00	n/a
24	18	7.15	0.89	2.68	1.50	1.30	4.05	0.25	2.94	0.274	213.89	03.82	4.85 j	1.03**	1.30	5.50	0.47	5.32	0.407	0.341	n/a	0.50	n/a
25	18	6.35	4.02	4.85	0.83	1.01	6.29	0.43	5.28	0.000	158.05	98.72	9.69	0.97**	1.21	5.23	0.43	10.12	0.000	0.000	n/a	1.49	n/a
26	18	4.49	8.92	9.69	0.77	0.92	4.89	0.33	10.02	0.000	45.233	9.77	10.58	0.81**	0.98	4.59	0.33	10.91	0.000	0.000	n/a	0.50	0.16
27	18	4.38	9.97	10.58	0.61	0.68	6.45	0.32	10.91	0.000	118.04	714.43	15.23	0.80**	0.96	4.56	0.32	15.55	0.000	0.000	n/a	1.03	0.33
28	18	2.82	14.63	15.23	0.60	0.66	4.25	0.24	15.47	0.000	39.605	15.01	15.65	0.64**	0.71	3.95	0.24	15.89	0.000	0.000	n/a	1.35	0.33
29	18	2.53	15.21	15.65	0.44	0.43	5.91	0.23	15.87	0.000	110.258	16.93	17.53	0.60**	0.66	3.82	0.23	17.76	0.000	0.000	n/a	0.65	0.15
30	18	1.85	17.13	17.53	0.40	0.38	4.86	0.19	17.72	0.000	23.540	17.35	17.86	0.51**	0.53	3.48	0.19	18.05	0.000	0.000	n/a	0.50	0.09
31	18	1.20	17.55	17.86	0.31	0.27	4.51	0.15	18.01	0.000	20.370	17.73	18.14	0.41**	0.39	3.07	0.15	18.29	0.000	0.000	n/a	1.00	n/a
Project File: Storm-B-C.stm														Number of lines: 31					Run Date: 9/10/2018				
Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box																							

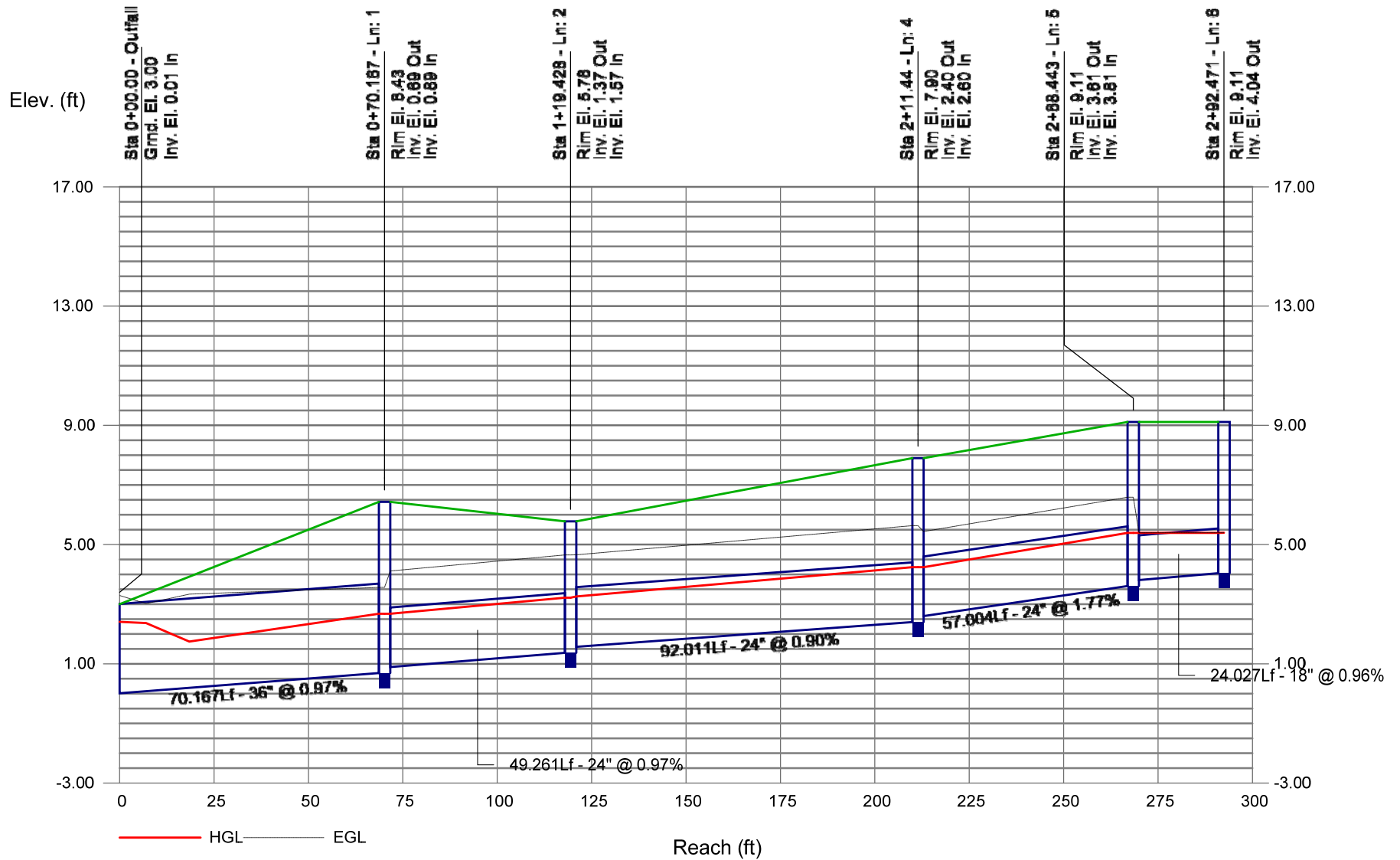


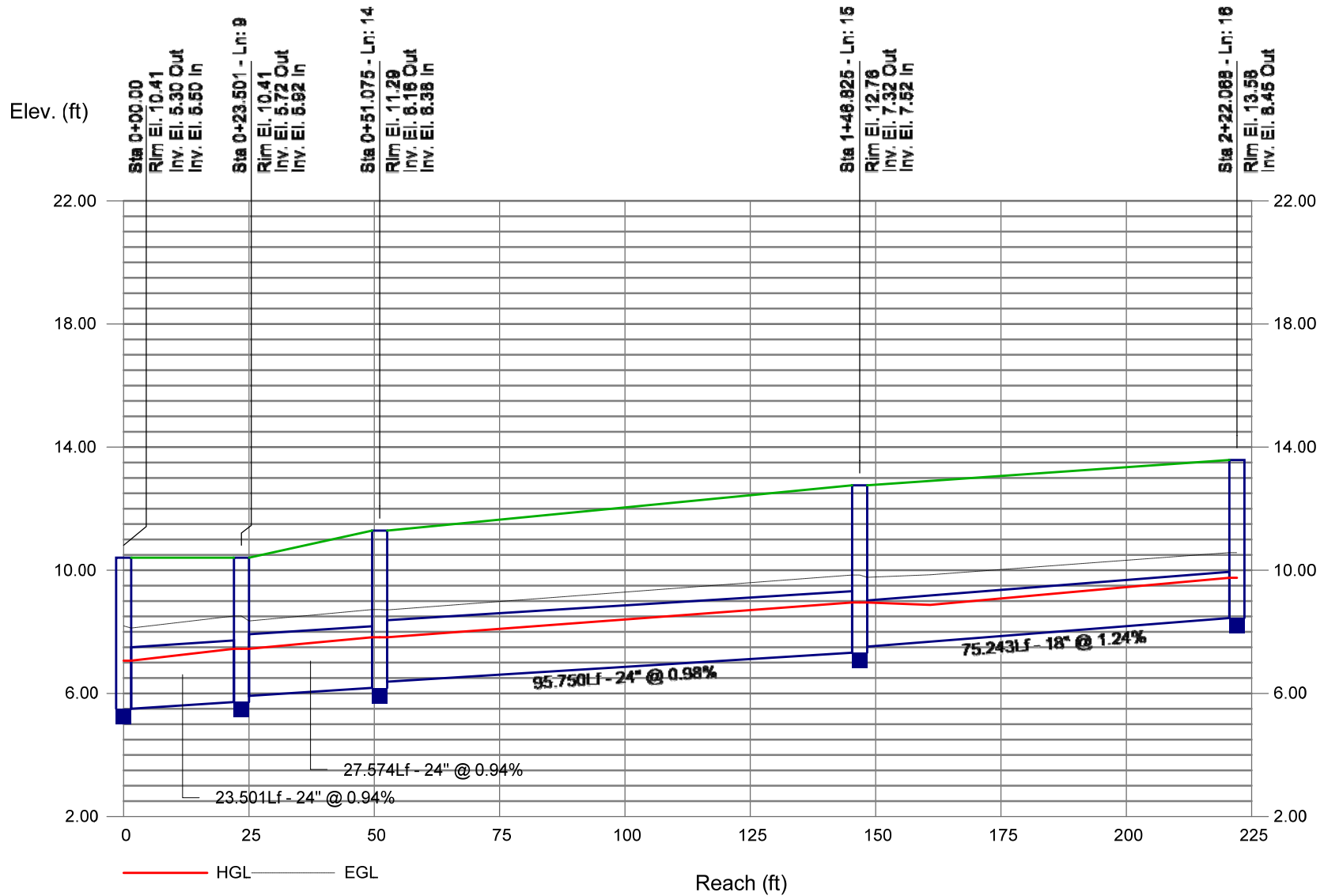


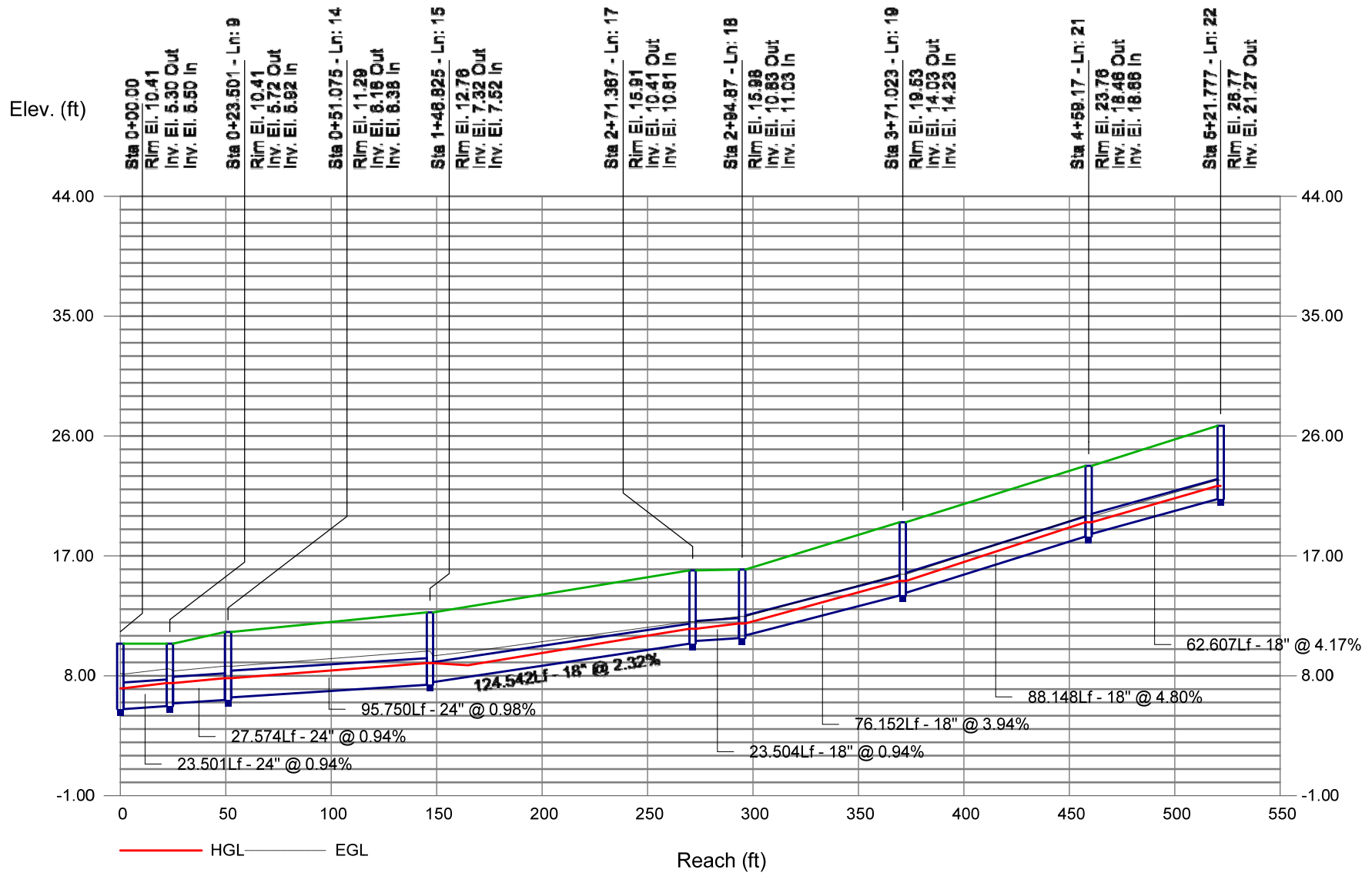


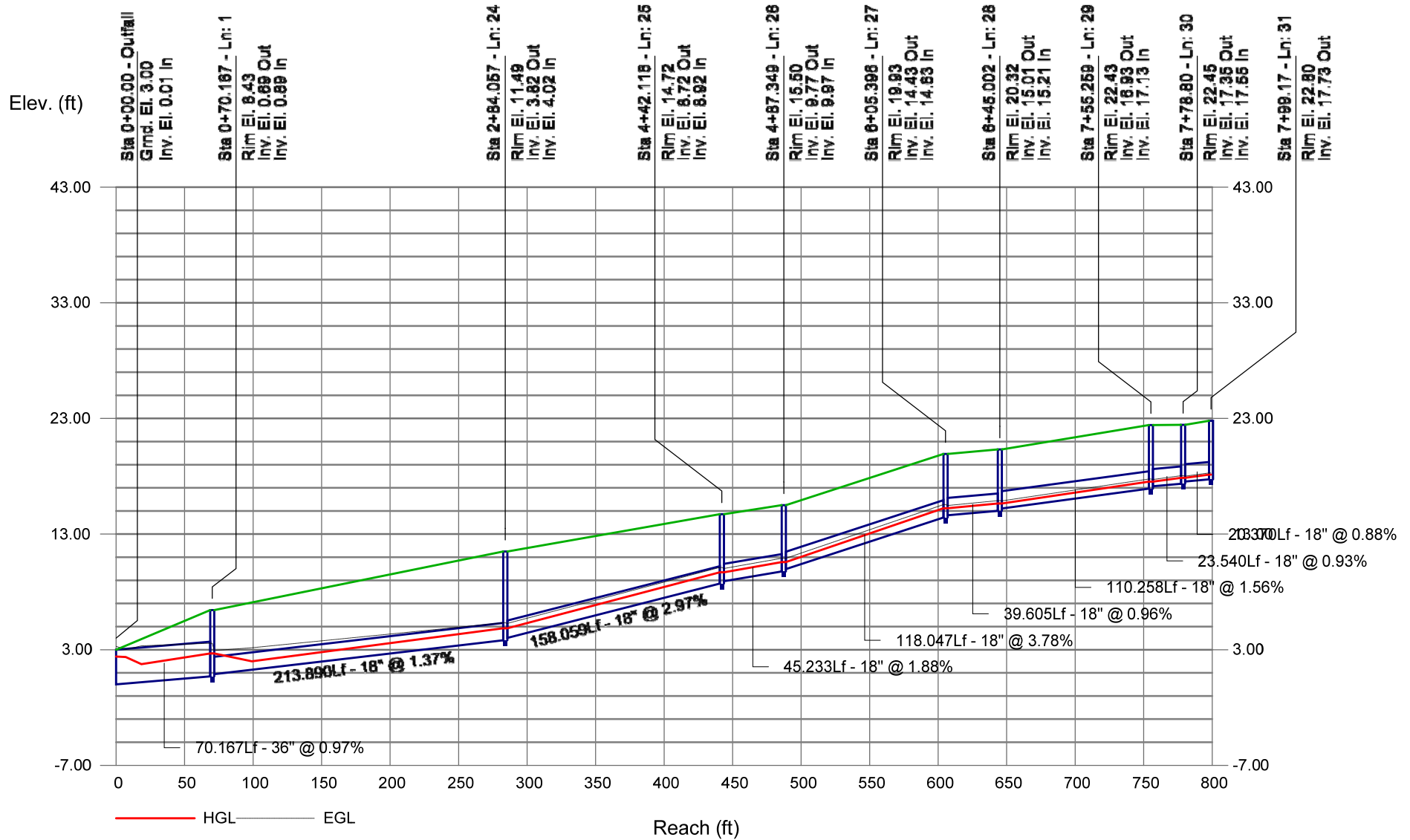




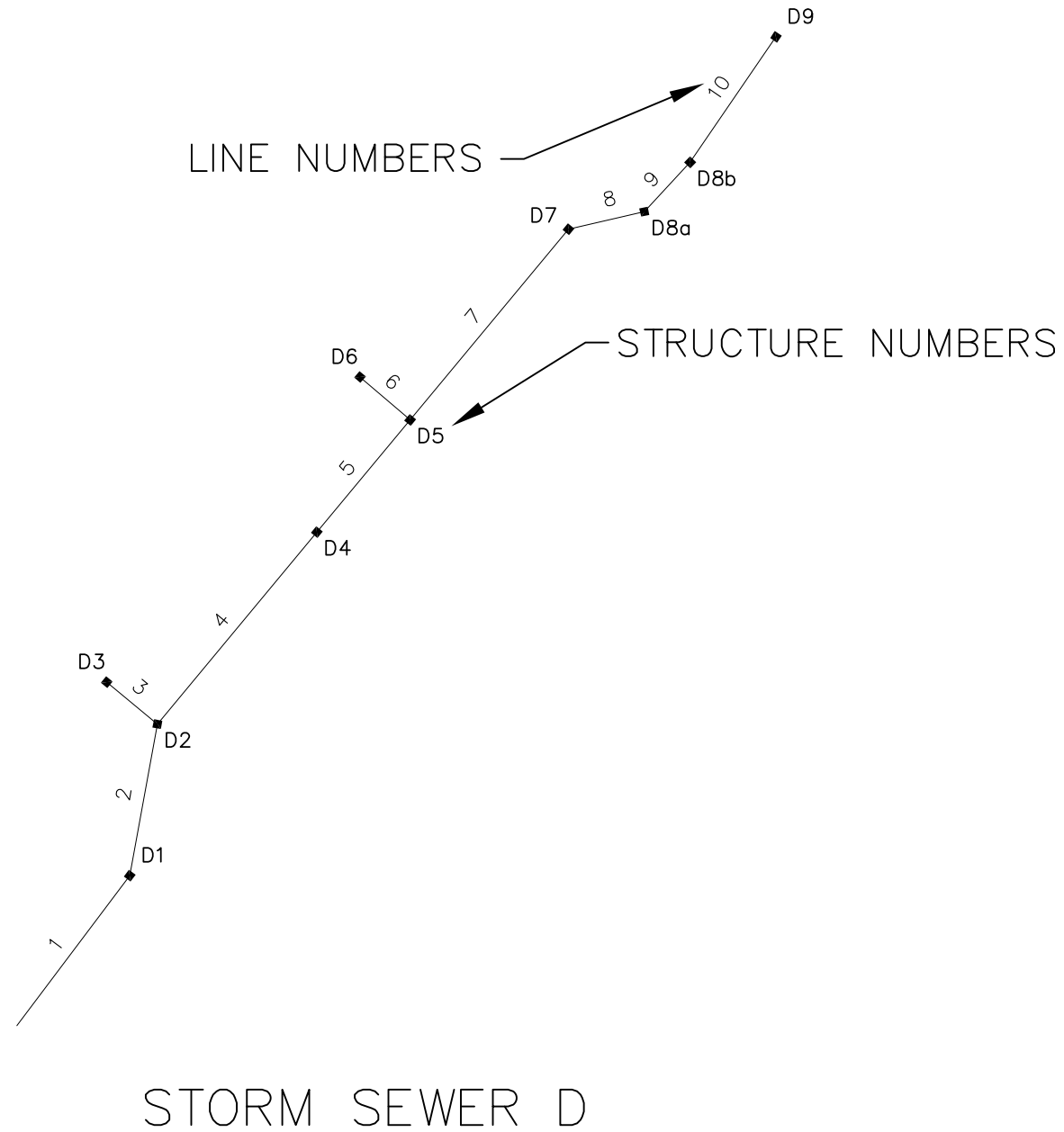








EXCERPT FROM MASTER DRAINAGE REPORT



EXCERPT FROM MASTER DRAINAGE REPORT

STORM RUN D

HAYMEADOW

DEVELOPED 25 & 100-YEAR WEIGHTED RUNOFF COEFFICIENTS

TYPE OF AREA	25-YEAR RCN	100-YEAR RCN
PAVEMENT	0.91	0.93
APARTMENTS	0.75	0.80
MULTIFAMILY	0.65	0.70
SINGLE FAMILY	0.55	0.60
GRASS	0.13	0.20

[illegible]

EXCERPT FROM MASTER DRAINAGE REPORT

STORM RUN D

HAYMEADOW

RATIONAL METHOD SUMMARY

$$Q = C * I * A$$

[illegible]

Storm Sewer Inventory Report **EXCERPT FROM MASTER DRAINAGE REPORT** Page 1

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	66.939	-53.046	Comb	3.49	0.00	0.00	0.0	15.00	2.82	16.89	24	Cir	0.010	0.76	22.39	D0-D1
2	1	54.884	-26.614	Comb	0.13	0.00	0.00	0.0	17.09	0.95	17.61	24	Cir	0.010	1.84	22.27	D1-D2
3	2	23.496	-60.642	Comb	0.13	0.00	0.00	0.0	17.81	0.94	18.03	18	Cir	0.010	1.00	22.27	D2-D3
4	2	89.000	29.361	Comb	2.99	0.00	0.00	0.0	17.81	2.65	20.17	18	Cir	0.010	0.50	25.67	D2-D4
5	4	52.057	-0.005	Comb	0.16	0.00	0.00	0.0	20.37	2.31	21.57	18	Cir	0.010	1.50	27.07	D4-D5
6	5	23.508	-89.252	Comb	0.13	0.00	0.00	0.0	21.77	0.94	21.99	18	Cir	0.010	1.00	27.07	D5-D6
7	5	88.336	0.000	Comb	0.06	0.00	0.00	0.0	21.77	1.32	22.94	18	Cir	0.010	0.99	28.44	D5-D7
8	7	27.758	37.308	Comb	0.86	0.00	0.00	0.0	23.14	3.64	24.15	18	Cir	0.010	0.92	29.65	D7-D8a
9	8	23.988	-34.208	Comb	0.28	0.00	0.00	0.0	24.35	0.92	24.57	18	Cir	0.010	0.50	29.75	D8a-D8b
10	9	54.213	-8.430	Grate	9.71	0.00	0.00	0.0	24.77	0.96	25.29	18	Cir	0.010	1.00	30.95	D8b-D9
Project File: Storm-D.stm												Number of lines: 10				Date: 9/10/2018	

Storm Sewer Summary Report **EXCERPT FROM MASTER DRAINAGE REPORT** Page 1

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	D0-D1	17.94	24	Cir	66.939	15.00	16.89	2.823	16.38	18.41	0.58	18.41	End	Combination
2	D1-D2	14.45	24	Cir	54.884	17.09	17.61	0.947	18.41	18.98	n/a	18.98	1	Combination
3	D2-D3	0.13	18	Cir	23.496	17.81	18.03	0.936	18.98	18.16	n/a	18.16	2	Combination
4	D2-D4	14.19	18	Cir	89.000	17.81	20.17	2.652	18.98	21.56	0.54	21.56	2	Combination
5	D4-D5	11.20	18	Cir	52.057	20.37	21.57	2.305	21.56	22.85	1.14	22.85	4	Combination
6	D5-D6	0.13	18	Cir	23.508	21.77	21.99	0.936	22.85	22.12	n/a	22.12	5	Combination
7	D5-D7	10.91	18	Cir	88.336	21.77	22.94	1.324	22.85	24.20	0.72	24.20	5	Combination
8	D7-D8a	10.85	18	Cir	27.758	23.14	24.15	3.639	24.20	25.41	n/a	25.41	7	Combination
9	D8a-D8b	9.99	18	Cir	23.988	24.35	24.57	0.917	25.41	25.79	n/a	25.79	8	Combination
10	D8b-D9	9.71	18	Cir	54.213	24.77	25.29	0.959	25.79	26.49	n/a	26.49	9	Grate

Project File: Storm-D.stm

Number of lines: 10

Run Date: 9/10/2018

NOTES: Return period = 25 Yrs.

Storm Sewer Tabulation

EXCERPT FROM MASTER DRAINAGE REPORT

Page 1

Station		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (I) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr (ac)	Total (ac)		Incr (min)	Total (min)	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	66.939	0.00	0.00	0.00	0.00	0.00	0.0	0.9	0.0	17.94	49.41	7.37	24	2.82	15.00	16.89	16.38	18.41	16.50	22.39	D0-D1
2	1	54.884	0.00	0.00	0.00	0.00	0.00	0.0	0.7	0.0	14.45	28.62	6.43	24	0.95	17.09	17.61	18.41	18.98	22.39	22.27	D1-D2
3	2	23.496	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.13	13.21	0.89	18	0.94	17.81	18.03	18.98	18.16	22.27	22.27	D2-D3
4	2	89.000	0.00	0.00	0.00	0.00	0.00	0.0	0.6	0.0	14.19	22.23	8.96	18	2.65	17.81	20.17	18.98	21.56	22.27	25.67	D2-D4
5	4	52.057	0.00	0.00	0.00	0.00	0.00	0.0	0.4	0.0	11.20	20.73	7.23	18	2.31	20.37	21.57	21.56	22.85	25.67	27.07	D4-D5
6	5	23.508	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.13	13.21	0.90	18	0.94	21.77	21.99	22.85	22.12	27.07	27.07	D5-D6
7	5	88.336	0.00	0.00	0.00	0.00	0.00	0.0	0.2	0.0	10.91	15.71	7.44	18	1.32	21.77	22.94	22.85	24.20	27.07	28.44	D5-D7
8	7	27.758	0.00	0.00	0.00	0.00	0.00	0.0	0.2	0.0	10.85	26.04	7.46	18	3.64	23.14	24.15	24.20	25.41	28.44	29.65	D7-D8a
9	8	23.988	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	9.99	13.07	6.99	18	0.92	24.35	24.57	25.41	25.79	29.65	29.75	D8a-D8b
10	9	54.213	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	9.71	13.37	7.00	18	0.96	24.77	25.29	25.79	26.49	29.75	30.95	D8b-D9
Project File: Storm-D.stm																Number of lines: 10				Run Date: 9/10/2018		
NOTES:Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82; Return period =Yrs. 25 ; c = cir e = ellip b = box																						

Inlet Report

EXCERPT FROM MASTER DRAINAGE REPORT

Page 1

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	D1	3.49*	0.00	3.49	0.00	Comb	4.0	0.00	4.11	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.34	14.10	0.34	14.10	0.0	Off
2	D2	0.13*	0.00	0.13	0.00	Comb	4.0	0.00	4.11	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.10	2.18	0.10	2.18	0.0	Off
3	D3	0.13*	0.00	0.13	0.00	Comb	4.0	0.00	4.11	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.10	2.18	0.10	2.18	0.0	Off
4	D4	2.99*	0.00	2.99	0.00	Comb	4.0	0.00	4.11	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.31	12.68	0.31	12.68	0.0	Off
5	D5	0.16*	0.00	0.16	0.00	Comb	4.0	0.00	4.11	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.11	2.45	0.11	2.45	0.0	Off
6	D6	0.13*	0.00	0.13	0.00	Comb	4.0	0.00	4.11	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.10	2.18	0.10	2.18	0.0	Off
7	D7	0.06*	0.00	0.06	0.00	Comb	4.0	0.00	4.11	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.07	1.47	0.07	1.47	0.0	Off
8	D8a	0.86*	0.00	0.86	0.00	Comb	4.0	0.00	4.11	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.16	5.24	0.16	5.24	0.0	Off
9	D8b	0.28*	0.00	0.28	0.00	Comb	4.0	0.00	4.11	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.13	3.25	0.13	3.25	0.0	Off
10	D9	9.71*	0.00	9.71	0.00	Grate	0.0	0.00	4.11	1.37	3.00	Sag	2.00	0.050	0.020	0.000	0.65	29.63	0.65	29.63	0.0	Off

Project File: Storm-D.stm

Number of lines: 10

Run Date: 9/10/2018

NOTES: Inlet N-Values = 0.016; Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82; Return period = 25 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Hydraulic Grade Line Computations EXCERPT FROM MASTER DRAINAGE REPORT

Page 1

Line	Size (in)	Q (cfs)	Downstream								Len (ft)	Upstream								Check		JL coeff (K)	Minor loss (ft)
			Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)		Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)		
1	24	17.94	15.00	16.38	1.38	2.31	7.76	0.76	17.14	0.000	66.939	16.89	18.41	1.52**	2.57	6.98	0.76	19.17	0.000	0.000	n/a	0.76	0.58
2	24	14.45	17.09	18.41	1.32	2.21	6.54	0.62	19.03	0.000	54.884	17.61	18.98	1.37**	2.29	6.31	0.62	19.60	0.000	0.000	n/a	1.84	n/a
3	18	0.13	17.81	18.98	1.17	0.08	0.09	0.04	19.02	0.000	23.496	18.03	18.16	0.13**	0.08	1.70	0.04	18.21	0.000	0.000	n/a	1.00	n/a
4	18	14.19	17.81	18.98	1.17	1.48	9.61	1.08	20.05	0.000	89.000	20.17	21.56	1.39**	1.71	8.32	1.08	22.63	0.000	0.000	n/a	0.50	0.54
5	18	11.20	20.37	21.56	1.19	1.50	7.48	0.76	22.31	0.000	52.057	21.57	22.85	1.28**	1.60	6.98	0.76	23.61	0.000	0.000	n/a	1.50	1.14
6	18	0.13	21.77	22.85	1.08	0.08	0.10	0.04	22.89	0.000	23.508	21.99	22.12	0.13**	0.08	1.70	0.04	22.17	0.000	0.000	n/a	1.00	n/a
7	18	10.91	21.77	22.85	1.08	1.36	8.02	0.73	23.58	0.000	88.336	22.94	24.20	1.26**	1.59	6.86	0.73	24.94	0.000	0.000	n/a	0.99	0.72
8	18	10.85	23.14	24.20	1.06	1.34	8.09	0.73	24.93	0.000	27.758	24.15	25.41	1.26**	1.59	6.84	0.73	26.14	0.000	0.000	n/a	0.92	n/a
9	18	9.99	24.35	25.41	1.06	1.34	7.47	0.66	26.07	0.000	23.988	24.57	25.79	1.22**	1.54	6.50	0.66	26.44	0.000	0.000	n/a	0.50	n/a
10	18	9.71	24.77	25.79	1.02	1.28	7.61	0.64	26.42	0.000	54.213	25.29	26.49	1.20**	1.52	6.40	0.64	27.13	0.000	0.000	n/a	1.00	n/a

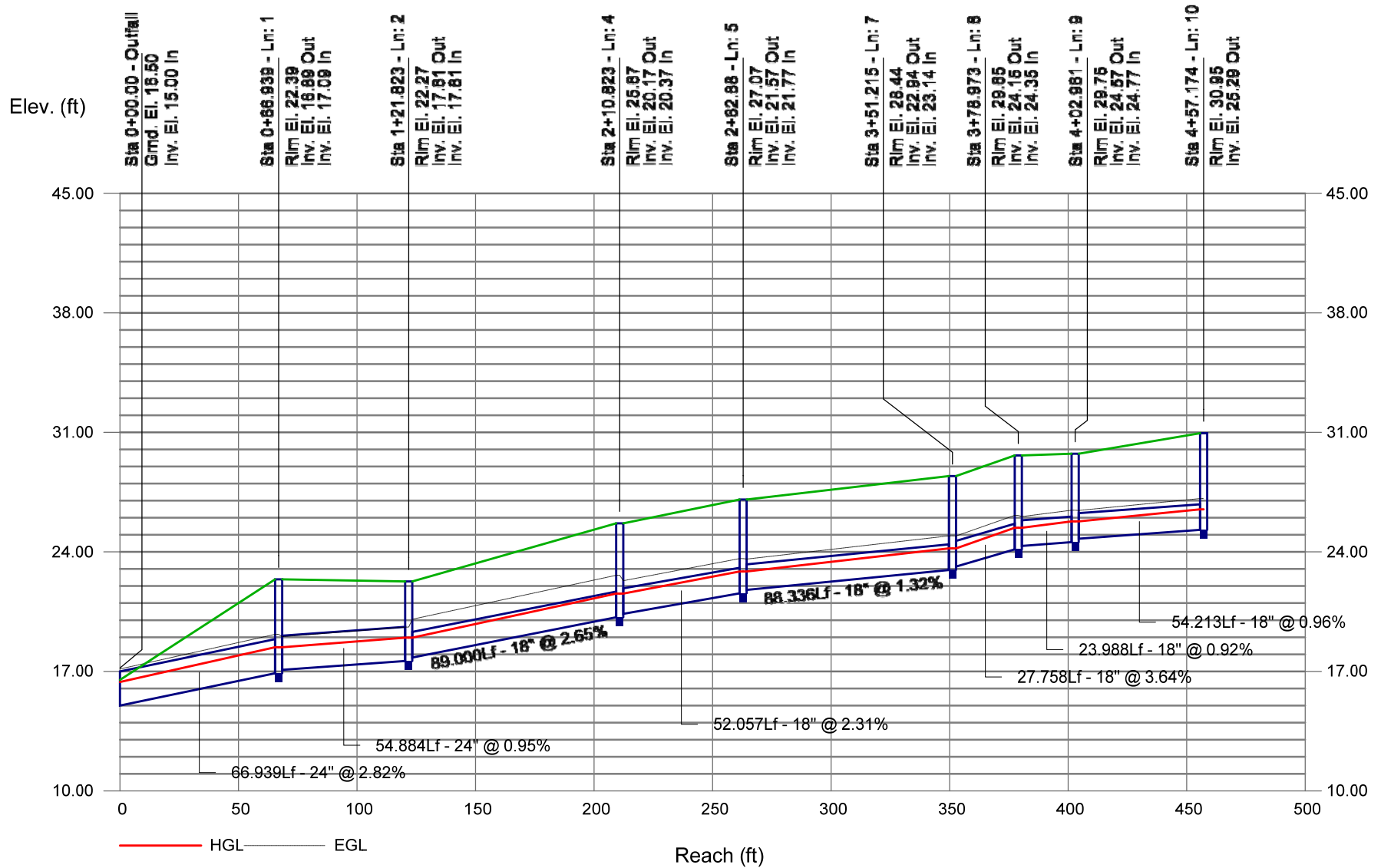
Project File: Storm-D.stm

Number of lines: 10

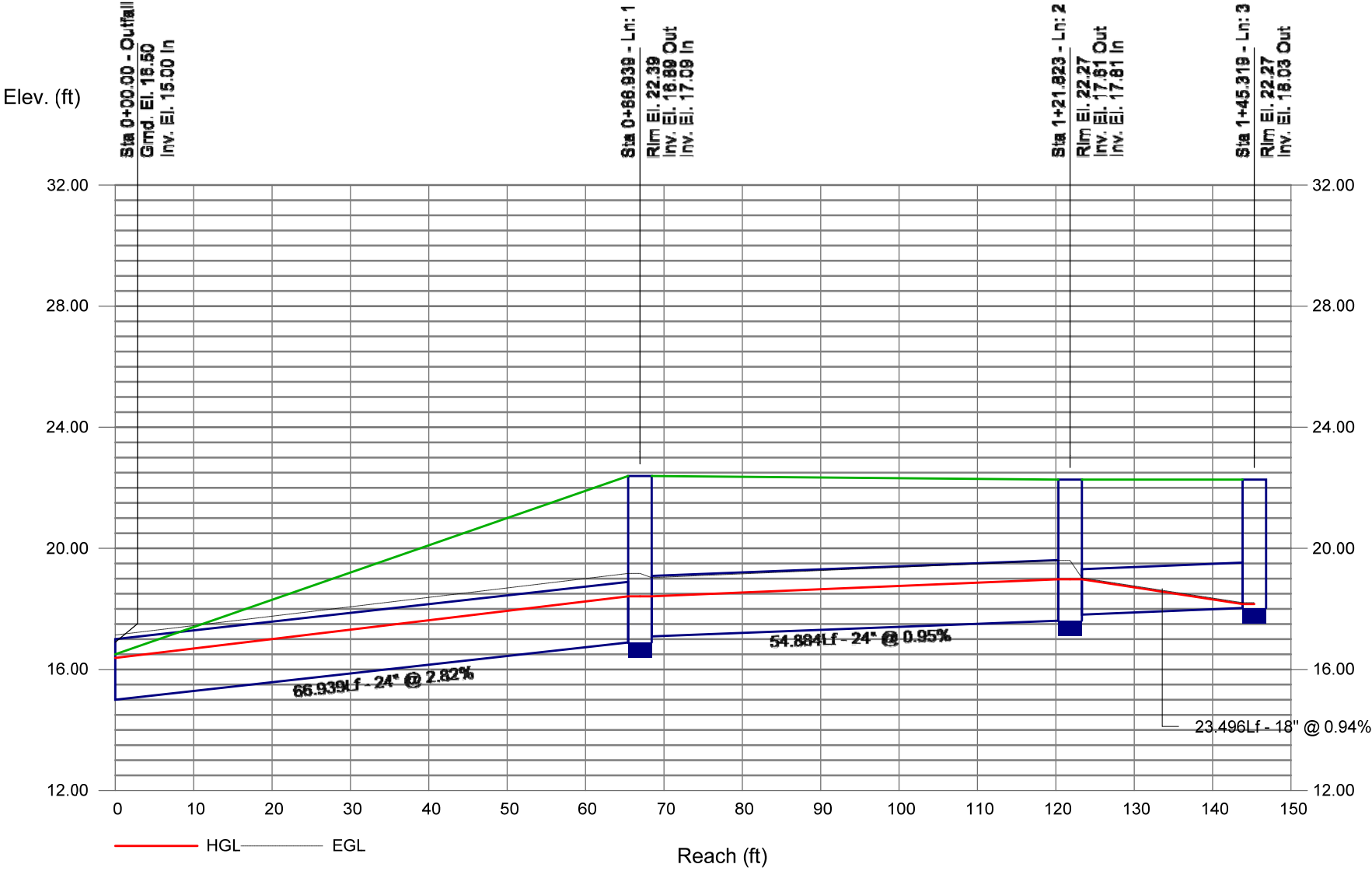
Run Date: 9/10/2018

Notes: ; ** Critical depth. ; c = cir e = ellip b = box

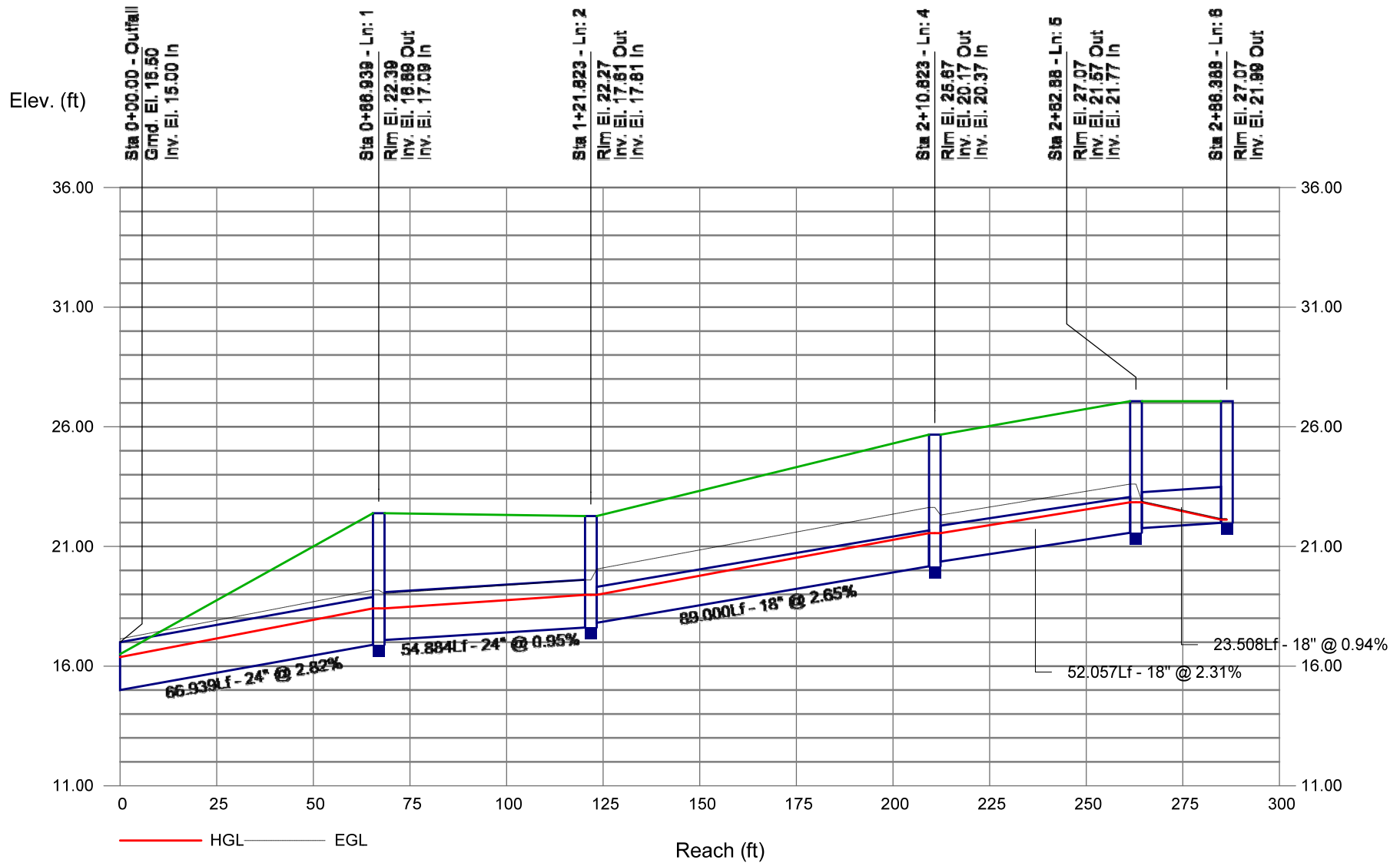
EXCERPT FROM MASTER DRAINAGE REPORT



EXCERPT FROM MASTER DRAINAGE REPORT



EXCERPT FROM MASTER DRAINAGE REPORT



EXCERPT FROM MASTER DRAINAGE REPORT

HAYMEADOW DETENTION PONDS - STORAGE VOLUME

Elevation	Area	Avg. Area	Depth	Volume	Cumulative Volume	Cumulative Volume	Cumulative Volume
	(ft ²)	(ft ²)	(ft)	(ft ³)	(ft ³)	(Ac-ft)	(Gallons)
POND 1A							
6686	6,796	6,796	0	0	0	0.000	0
6688	11,396	9,096	2	18,192	18,192	0.418	136,076
6690	15,654	13,525	2	27,050	45,242	1.039	338,410

Elevation	Area	Avg. Area	Depth	Volume	Cumulative Volume	Cumulative Volume	Cumulative Volume
	(ft ²)	(ft ²)	(ft)	(ft ³)	(ft ³)	(Ac-ft)	(Gallons)
POND 1B							
6696	9,042	9,042	0	0	0	0.000	0
6698	13,690	11,366	2	22,732	22,732	0.522	170,035
6700	18,630	16,160	2	32,320	55,052	1.264	411,789

Elevation	Area	Avg. Area	Depth	Volume	Cumulative Volume	Cumulative Volume	Cumulative Volume
	(ft ²)	(ft ²)	(ft)	(ft ³)	(ft ³)	(Ac-ft)	(Gallons)
POND 1D							
6711	6,134	6,134	0	0	0	0.000	0
6712	7,373	6,754	1	6,754	6,754	0.155	50,516
6714	10,020	8,697	2	17,393	24,147	0.554	180,616
6715	11,428	10,724	1	10,724	34,871	0.801	260,831

Pond Report **EXCERPT FROM MASTER DRAINAGE REPORT** 5

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 08 / 30 / 2018

Pond No. 1 - POND 1D

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 6711.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	6711.00	6,134	0	0
1.00	6712.00	7,373	6,754	6,754
3.00	6714.00	10,020	17,393	24,147
4.00	6715.00	11,428	10,724	34,871

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	6.00	0.00	0.00
Span (in)	= 12.00	6.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 6711.00	6711.00	0.00	0.00
Length (ft)	= 100.00	1.00	0.00	0.00
Slope (%)	= 0.50	0.02	0.00	n/a
N-Value	= .010	.010	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 8.00	0.00	0.00	0.00
Crest El. (ft)	= 6713.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	6711.00	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
0.10	675	6711.10	0.02 ic	0.02 ic	---	---	0.00	---	---	---	---	---	0.024
0.20	1,351	6711.20	0.09 ic	0.09 ic	---	---	0.00	---	---	---	---	---	0.088
0.30	2,026	6711.30	0.19 ic	0.18 ic	---	---	0.00	---	---	---	---	---	0.182
0.40	2,701	6711.40	0.31 ic	0.30 ic	---	---	0.00	---	---	---	---	---	0.299
0.50	3,377	6711.50	0.41 ic	0.41 ic	---	---	0.00	---	---	---	---	---	0.407
0.60	4,052	6711.60	0.48 ic	0.48 ic	---	---	0.00	---	---	---	---	---	0.480
0.70	4,727	6711.70	0.56 ic	0.55 ic	---	---	0.00	---	---	---	---	---	0.545
0.80	5,403	6711.80	0.61 ic	0.61 ic	---	---	0.00	---	---	---	---	---	0.605
0.90	6,078	6711.90	0.67 ic	0.66 ic	---	---	0.00	---	---	---	---	---	0.665
1.00	6,754	6712.00	0.72 ic	0.72 ic	---	---	0.00	---	---	---	---	---	0.716
1.20	8,493	6712.20	0.81 ic	0.81 ic	---	---	0.00	---	---	---	---	---	0.814
1.40	10,232	6712.40	0.91 ic	0.90 ic	---	---	0.00	---	---	---	---	---	0.905
1.60	11,971	6712.60	0.99 ic	0.99 ic	---	---	0.00	---	---	---	---	---	0.988
1.80	13,711	6712.80	1.07 ic	1.07 ic	---	---	0.00	---	---	---	---	---	1.065
2.00	15,450	6713.00	1.15 ic	1.14 ic	---	---	0.00	---	---	---	---	---	1.138
2.20	17,189	6713.20	3.26 oc	0.85 ic	---	---	2.40	---	---	---	---	---	3.255
2.40	18,929	6713.40	4.65 oc	0.28 ic	---	---	4.36 s	---	---	---	---	---	4.645
2.60	20,668	6713.60	4.96 oc	0.17 ic	---	---	4.78 s	---	---	---	---	---	4.958
2.80	22,407	6713.80	5.22 oc	0.12 ic	---	---	5.09 s	---	---	---	---	---	5.216
3.00	24,147	6714.00	5.45 oc	0.10 ic	---	---	5.33 s	---	---	---	---	---	5.428
3.10	25,219	6714.10	5.56 oc	0.09 ic	---	---	5.47 s	---	---	---	---	---	5.554
3.20	26,291	6714.20	5.67 oc	0.08 ic	---	---	5.56 s	---	---	---	---	---	5.634
3.30	27,364	6714.30	5.77 oc	0.07 ic	---	---	5.69 s	---	---	---	---	---	5.761
3.40	28,436	6714.40	5.87 oc	0.07 ic	---	---	5.79 s	---	---	---	---	---	5.859
3.50	29,509	6714.50	5.98 oc	0.06 ic	---	---	5.89 s	---	---	---	---	---	5.948
3.60	30,581	6714.60	6.07 oc	0.06 ic	---	---	5.97 s	---	---	---	---	---	6.023
3.70	31,653	6714.70	6.17 oc	0.05 ic	---	---	6.09 s	---	---	---	---	---	6.147
3.80	32,726	6714.80	6.27 oc	0.05 ic	---	---	6.18 s	---	---	---	---	---	6.230
3.90	33,798	6714.90	6.36 oc	0.05 ic	---	---	6.28 s	---	---	---	---	---	6.324
4.00	34,871	6715.00	6.46 oc	0.04 ic	---	---	6.30 s	---	---	---	---	---	6.345

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	6.172	2	724	19,391	-----	-----	-----	1D Developed
2	Reservoir	0.738	2	774	19,362	1	6712.04	7,138	POND 1D out
POND 1D.gpw					Return Period: 100 Year			Thursday, 08 / 30 / 2018	

EXCERPT FROM MASTER DRAINAGE REPORT

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

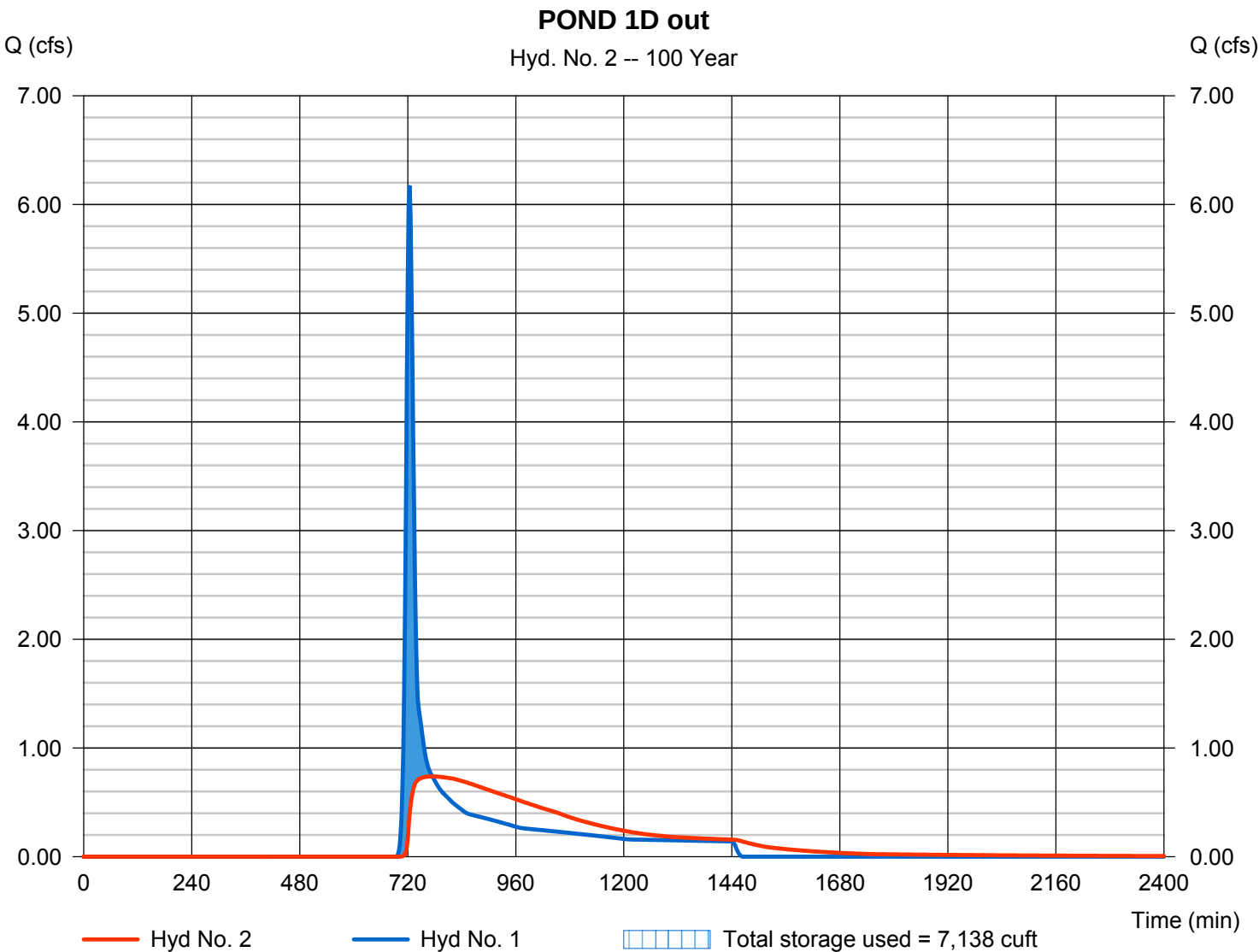
Thursday, 08 / 30 / 2018

Hyd. No. 2

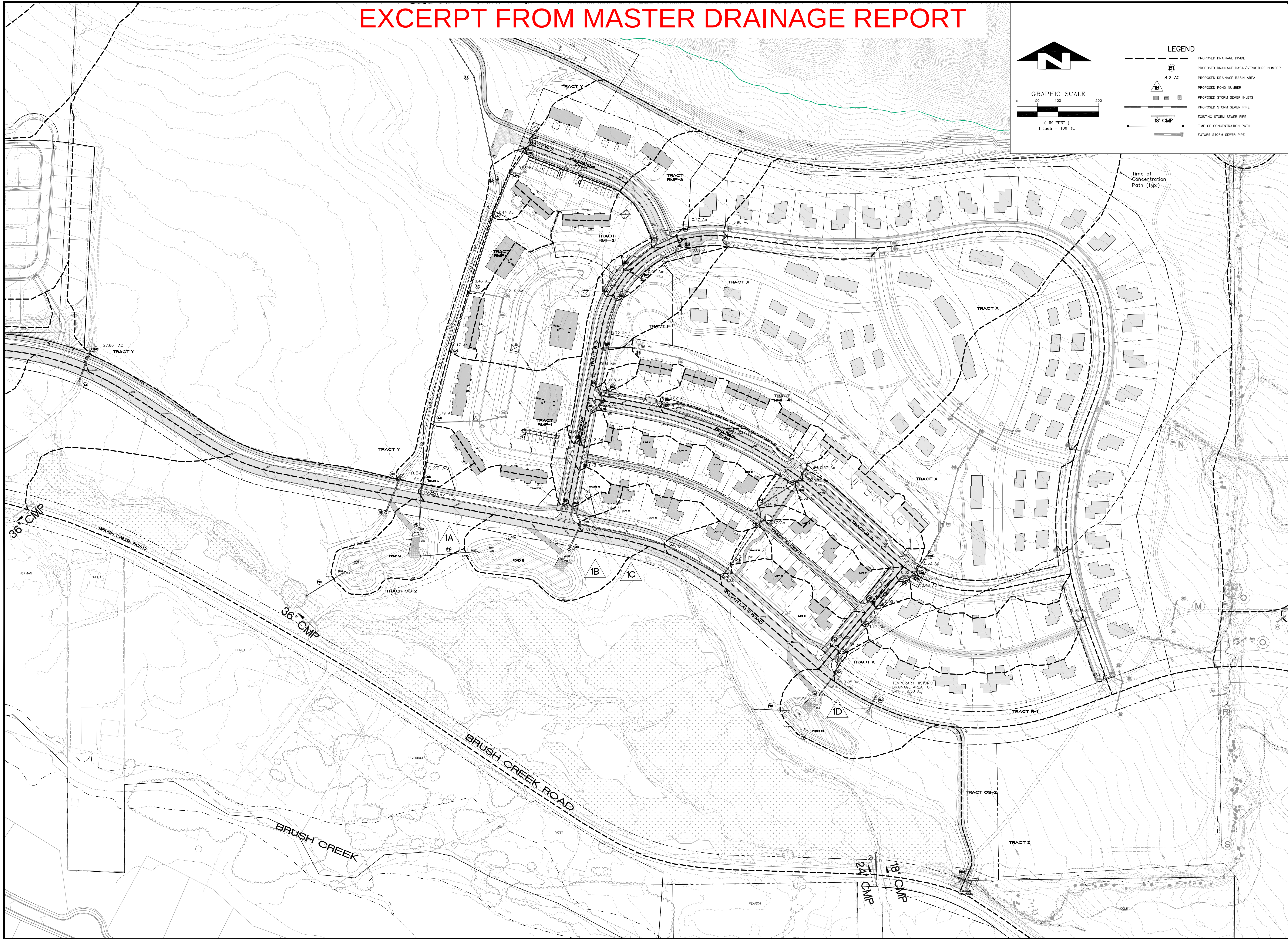
POND 1D out

Hydrograph type	= Reservoir	Peak discharge	= 0.738 cfs
Storm frequency	= 100 yrs	Time to peak	= 774 min
Time interval	= 2 min	Hyd. volume	= 19,362 cuft
Inflow hyd. No.	= 1 - 1D Developed	Max. Elevation	= 6712.04 ft
Reservoir name	= POND 1D	Max. Storage	= 7,138 cuft

Storage Indication method used.



EXCERPT FROM MASTER DRAINAGE REPORT



HAYMEADOW FILING 1

PHASE 1 DRAINAGE AREA MAP

DESIGNED	NO.	DATE	REVISIONS	BY
MW		09/14/2018	FOR AGENCY REVIEW	
RL				
RF				
CMW				
53480.5				
JOB NO.				
DATE		09/14/2018		

SHEET
7

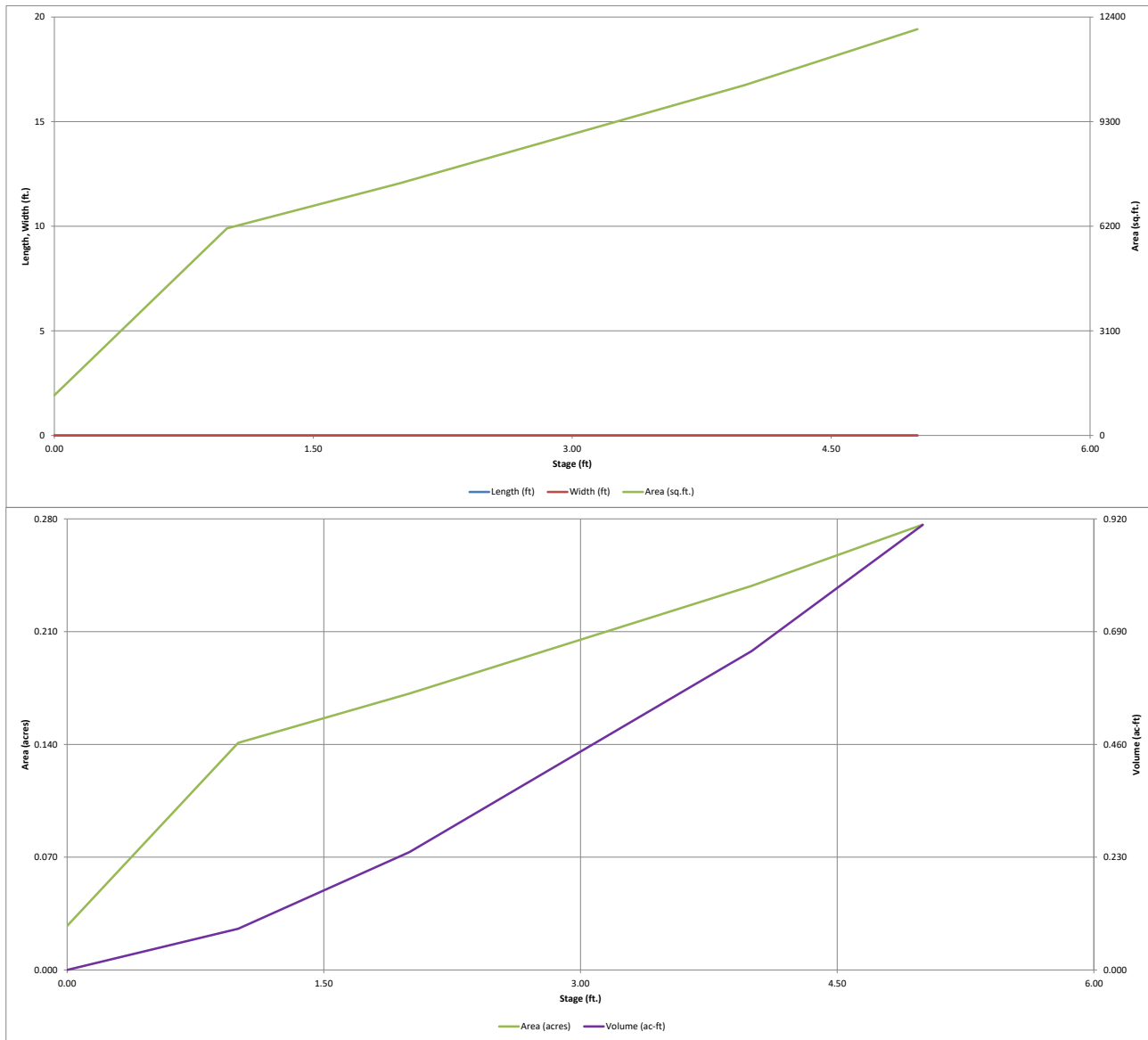


(SEAL)

EXISTING POND & OUTLET STRUCTURE MODELING WITHOUT MODIFICATIONS.

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)



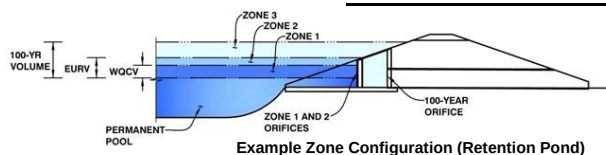
EXISTING POND & OUTLET STRUCTURE MODELING WITHOUT MODIFICATIONS.

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

Project:

Basin ID:



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.82	0.210	Filtration Media
Zone 2 (25-year)	3.72	0.373	Circular Orifice
Zone 3 (100-year)	4.37	0.158	Weir&Pipe (Restrict)
Total (all zones)		0.741	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth = 1.50 ft (distance below the filtration media surface)
Underdrain Orifice Diameter = 1.41 inches

Calculated Parameters for Underdrain

Underdrain Orifice Area = 0.0 ft²
Underdrain Orifice Centroid = 0.06 feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice = N/A ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate = N/A ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing = N/A inches
Orifice Plate: Orifice Area per Row = N/A inches

Calculated Parameters for Plate

WQ Orifice Area per Row = N/A ft²
Elliptical Half-Width = N/A feet
Elliptical Slot Centroid = N/A feet
Elliptical Slot Area = N/A ft²

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (optional)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Orifice Area (sq. inches)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Orifice Area (sq. inches)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

User Input: Vertical Orifice (Circular or Rectangular)

Invert of Vertical Orifice = 0.00 ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice = 3.00 ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter = N/A inches

Calculated Parameters for Vertical Orifice

Zone 2 Circular	Not Selected
Vertical Orifice Area =	N/A ft ²
Vertical Orifice Centroid =	N/A feet

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir (and No Outlet Pipe))

	Zone 3 Weir	Not Selected
Overflow Weir Front Edge Height, H _o =	3.00	N/A
Overflow Weir Front Edge Length =	2.00	N/A
Overflow Weir Grate Slope =	0.00	N/A
Horiz. Length of Weir Sides =	2.00	N/A
Overflow Grate Type =	Close Mesh Grate	N/A
Debris Clogging % =	0%	N/A

Calculated Parameters for Overflow Weir

Zone 3 Weir	Not Selected
Height of Grate Upper Edge, H _u =	N/A feet
Overflow Weir Slope Length =	N/A feet
Grate Open Area / 100-yr Orifice Area =	N/A
Overflow Grate Open Area w/o Debris =	3.16 ft ²
Overflow Grate Open Area w/ Debris =	3.16 ft ²

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Restrictor	Not Selected
Depth to Invert of Outlet Pipe =	1.50	N/A
Outlet Pipe Diameter =	18.00	N/A
Restrictor Plate Height Above Pipe Invert =		

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

Zone 3 Restrictor	Not Selected
Outlet Orifice Area =	N/A ft ²
Outlet Orifice Centroid =	N/A feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage = 5.00 ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length = 210.00 feet
Spillway End Slopes = 3.00 H:V
Freeboard above Max Water Surface = 0.63 feet

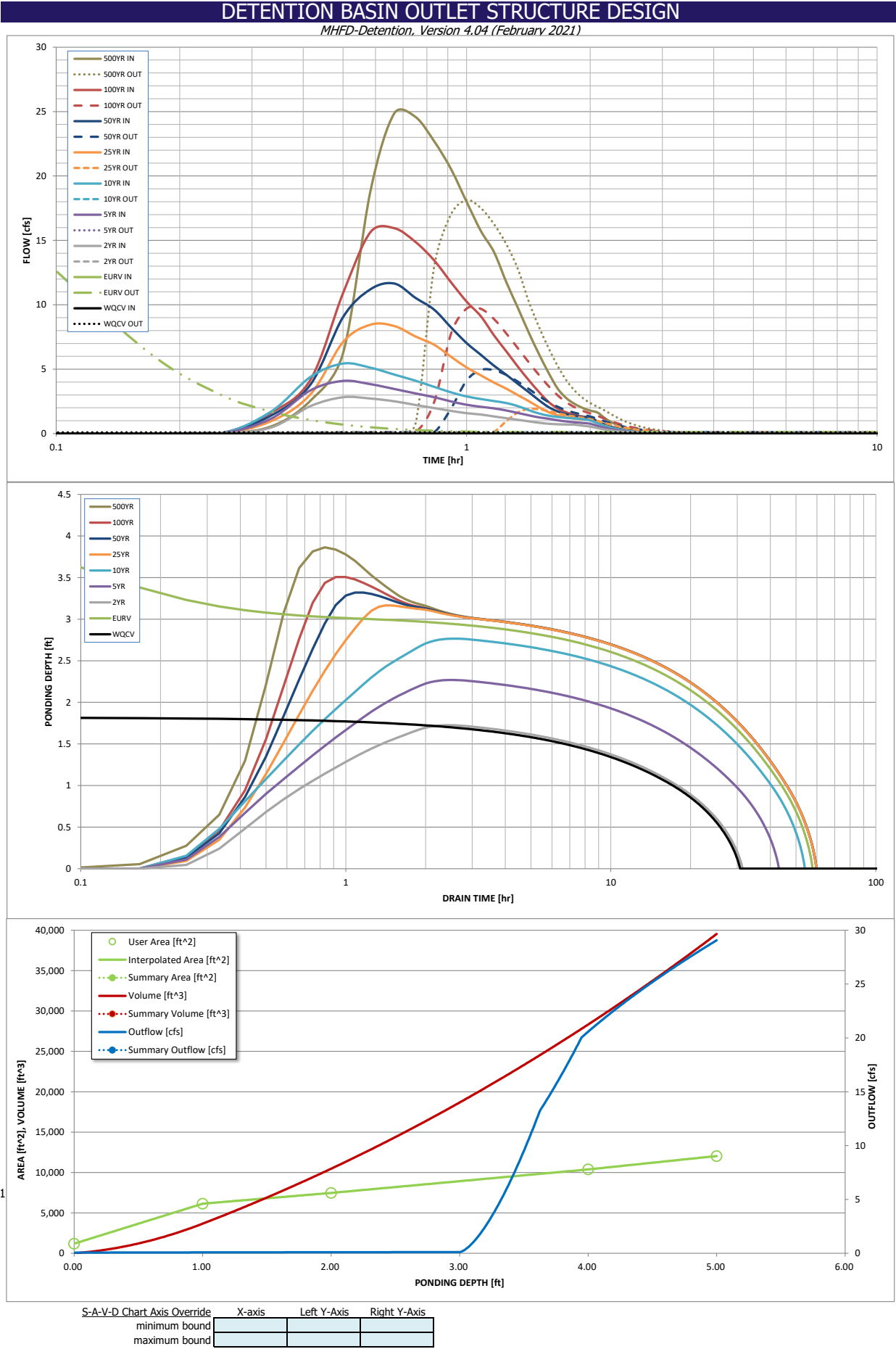
Calculated Parameters for Spillway

Spillway Design Flow Depth =	0.08 feet
Stage at Top of Freeboard =	5.71 feet
Basin Area at Top of Freeboard =	0.28 acres
Basin Volume at Top of Freeboard =	0.91 acre-ft

Routed Hydrograph Results

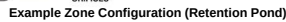
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period =	N/A	N/A	0.42	0.57	0.70	0.89	1.03	1.18	1.54
One-Hour Rainfall Depth (in) =	N/A	N/A	0.42	0.57	0.70	0.89	1.03	1.18	1.54
CUHP Runoff Volume (acre-ft) =	0.210	0.793	0.212	0.307	0.402	0.577	0.764	1.018	1.566
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.212	0.307	0.402	0.577	0.764	1.018	1.566
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.0	0.0	0.1	0.3	2.2	5.3	11.3
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A				0.8		2.8	
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.00	0.00	0.01	0.04	0.12	0.15	0.60
Peak Inflow Q (cfs) =	N/A	N/A	2.8	4.1	5.4	8.5	11.6	15.9	24.9
Peak Outflow Q (cfs) =	0.1	23.1	0.1	0.1	0.1	1.9	4.9	9.7	18.1
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	3.1	1.1	2.4	2.2	3.5	1.6
Structure Controlling Flow =	Filtration Media	Overflow Weir 1	Filtration Media	Filtration Media	Filtration Media	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1
Max Velocity through Grate 1 (fps) =	N/A	-0.04	N/A	N/A	N/A	0.0	0.0	0.0	0.0
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	30	54	30	41	52	57	56	54	52
Time to Drain 99% of Inflow Volume (hours) =	30	57	31	43	53	59	58	58	57
Maximum Ponding Depth (ft) =	1.82	4.58	1.73	2.27	2.77	3.17	3.32	3.51	3.86
Area at Maximum Ponding Depth (acres) =	0.17	0.26	0.16	0.18	0.20	0.21	0.22	0.22	0.23
Maximum Volume Stored (acre-ft) =	0.210	0.795	0.194	0.286	0.380	0.462	0.496	0.535	0.617



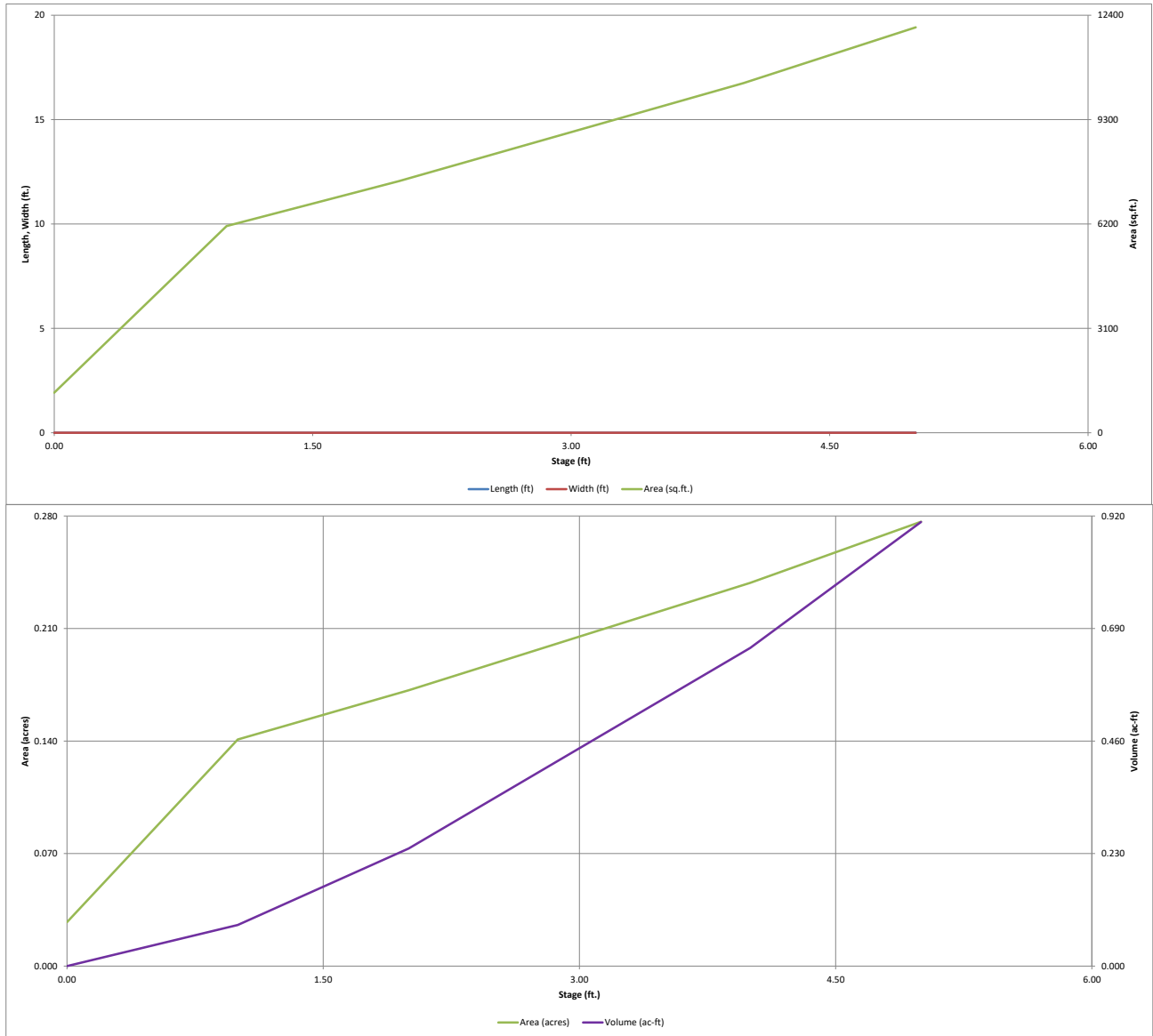
MHFD-Detention, Version 4.04 (February 2021)

Basin ID:



DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)

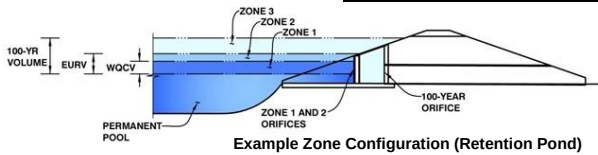


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

Project: _____

Basin ID: _____



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.82	0.210	Filtration Media
Zone 2 (25-year)	3.72	0.373	Circular Orifice
Zone 3 (100-year)	4.37	0.158	Weir&Pipe (Restrict)
Total (all zones)		0.741	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth = 1.50 ft (distance below the filtration media surface)
Underdrain Orifice Diameter = 1.41 inches

Calculated Parameters for Underdrain
Underdrain Orifice Area = 0.0 ft²
Underdrain Orifice Centroid = 0.06 feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice = N/A ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate = N/A ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing = N/A inches
Orifice Plate: Orifice Area per Row = N/A inches

Calculated Parameters for Plate
WQ Orifice Area per Row = N/A ft²
Elliptical Half-Width = N/A feet
Elliptical Slot Centroid = N/A feet
Elliptical Slot Area = N/A ft²

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (optional)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Orifice Area (sq. inches)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Orifice Area (sq. inches)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

User Input: Vertical Orifice (Circular or Rectangular)

Invert of Vertical Orifice = 0.00 ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice = 3.72 ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter = N/A inches

Calculated Parameters for Vertical Orifice
Zone 2 Circular Not Selected
Vertical Orifice Area = N/A ft²
Vertical Orifice Centroid = N/A feet

INCREASE INLET BOX HEIGHT FROM 3' TO 3.75'.

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir (and No Outlet Pipe))

Overflow Weir Front Edge Height, H_o = 3.75 ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length = 2.00 feet
Overflow Weir Grate Slope = 0.00 H:V
Horiz. Length of Weir Sides = 2.00 feet
Overflow Grate Type = Close Mesh Grate
Debris Clogging % = 0%

Calculated Parameters for Overflow Weir
Zone 3 Weir Not Selected
Height of Grate Upper Edge, H_u = 3.75 feet
Overflow Weir Slope Length = 2.00 feet
Grate Open Area / 100-yr Orifice Area = 13.09
Overflow Grate Open Area w/o Debris = 3.16 ft²
Overflow Grate Open Area w/ Debris = 3.16 ft²

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

Depth to Invert of Outlet Pipe = 1.50 ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter = 18.00 inches
Restrictor Plate Height Above Pipe Invert = 3.50 inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate
Zone 3 Restrictor Not Selected
Outlet Orifice Area = 0.24 ft²
Outlet Orifice Centroid = 0.17 feet
Half-Central Angle of Restrictor Plate on Pipe = 0.91 radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage = 5.00 ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length = 210.00 feet
Spillway End Slopes = 3.00 H:V
Freeboard above Max Water Surface = 0.63 feet

Calculated Parameters for Spillway
Spillway Design Flow Depth = 0.08 feet
Stage at Top of Freeboard = 5.71 feet
Basin Area at Top of Freeboard = 0.28 acres
Basin Volume at Top of Freeboard = 0.91 acre-ft

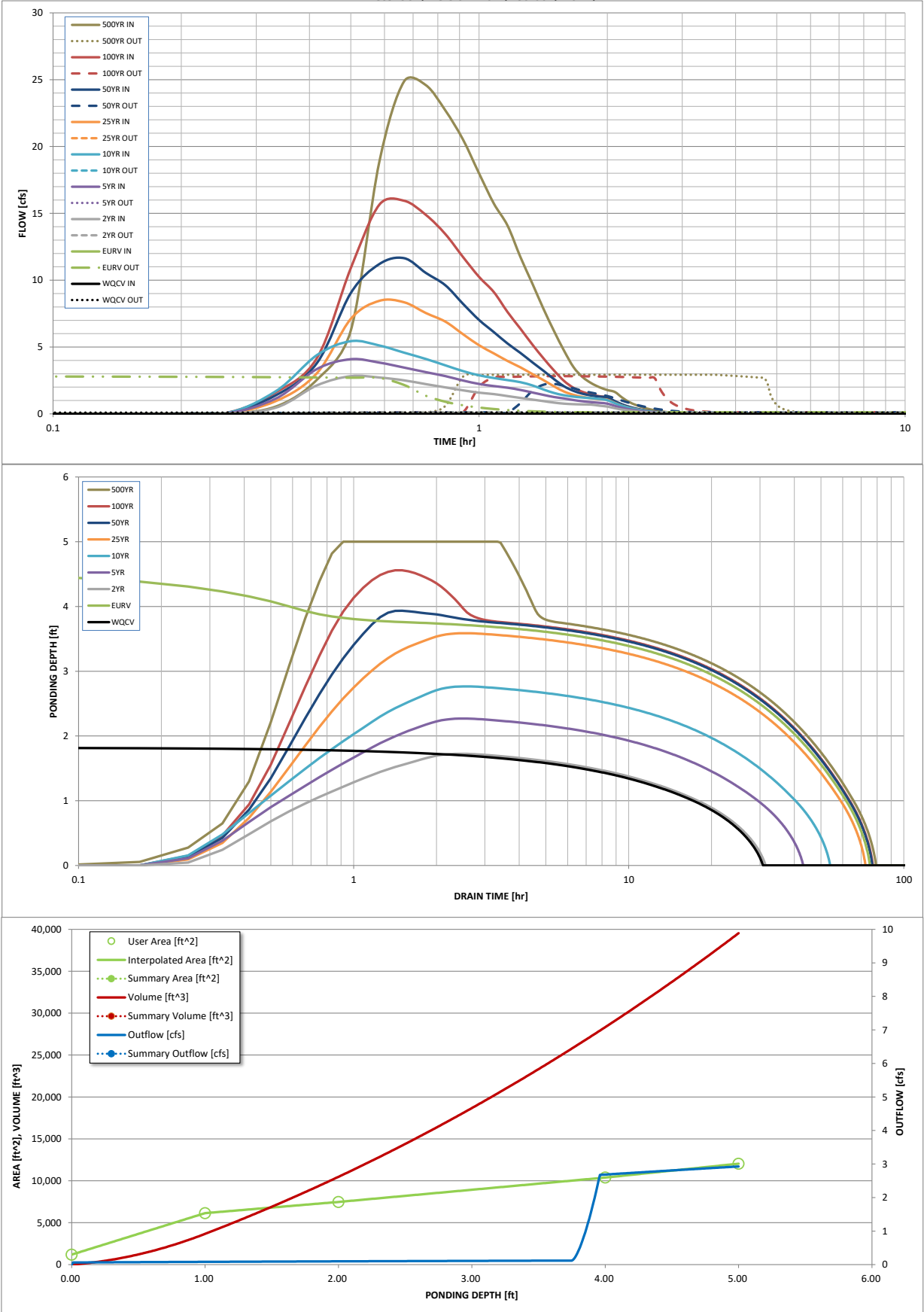
Routed Hydrograph Results

The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period =	N/A	N/A	0.42	0.57	0.70	0.89	1.03	1.18	1.54
One-Hour Rainfall Depth (in) =	0.210	0.793	0.212	0.307	0.402	0.577	0.764	1.018	1.566
CUHP Runoff Volume (acre-ft) =	N/A	N/A	0.212	0.307	0.402	0.577	0.764	1.018	1.566
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.0	0.0	0.1	0.3	2.2	5.3	11.3
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.0	0.0	0.1	0.3	2.2	5.3	11.3
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A	0.0	0.0	0.1	0.3	2.2	5.3	11.3
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.00	0.00	0.01	0.04	0.12	0.15	0.60
Peak Inflow Q (cfs) =	N/A	N/A	2.8	4.1	5.4	8.5	11.6	15.9	24.9
Peak Outflow Q (cfs) =	0.1	2.8	0.1	0.1	0.1	0.1	2.2	2.8	2.9
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	3.1	1.1	0.1	1.0	1.0	0.3
Structure Controlling Flow =	Filtration Media	Outlet Plate 1	Filtration Media	Filtration Media	Filtration Media	Filtration Media	Overflow Weir 1	Outlet Plate 1	N/A
Max Velocity through Grate 1 (fps) =	N/A	0.85	N/A	N/A	N/A	N/A	0.7	0.9	0.9
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	30	71	30	41	52	70	73	72	71
Time to Drain 99% of Inflow Volume (hours) =	30	74	31	43	53	72	76	75	77
Maximum Ponding Depth (ft) =	1.82	4.58	1.73	2.27	2.77	3.59	3.94	4.56	5.00
Area at Maximum Ponding Depth (acres) =	0.17	0.26	0.16	0.18	0.20	0.22	0.24	0.26	0.28
Maximum Volume Stored (acre-ft) =	0.210	0.795	0.194	0.286	0.380	0.553	0.634	0.787	0.908

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)



S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

EXCERPTS FROM HAYMEADOW FILING 1 CONSTRUCTION PLANS.

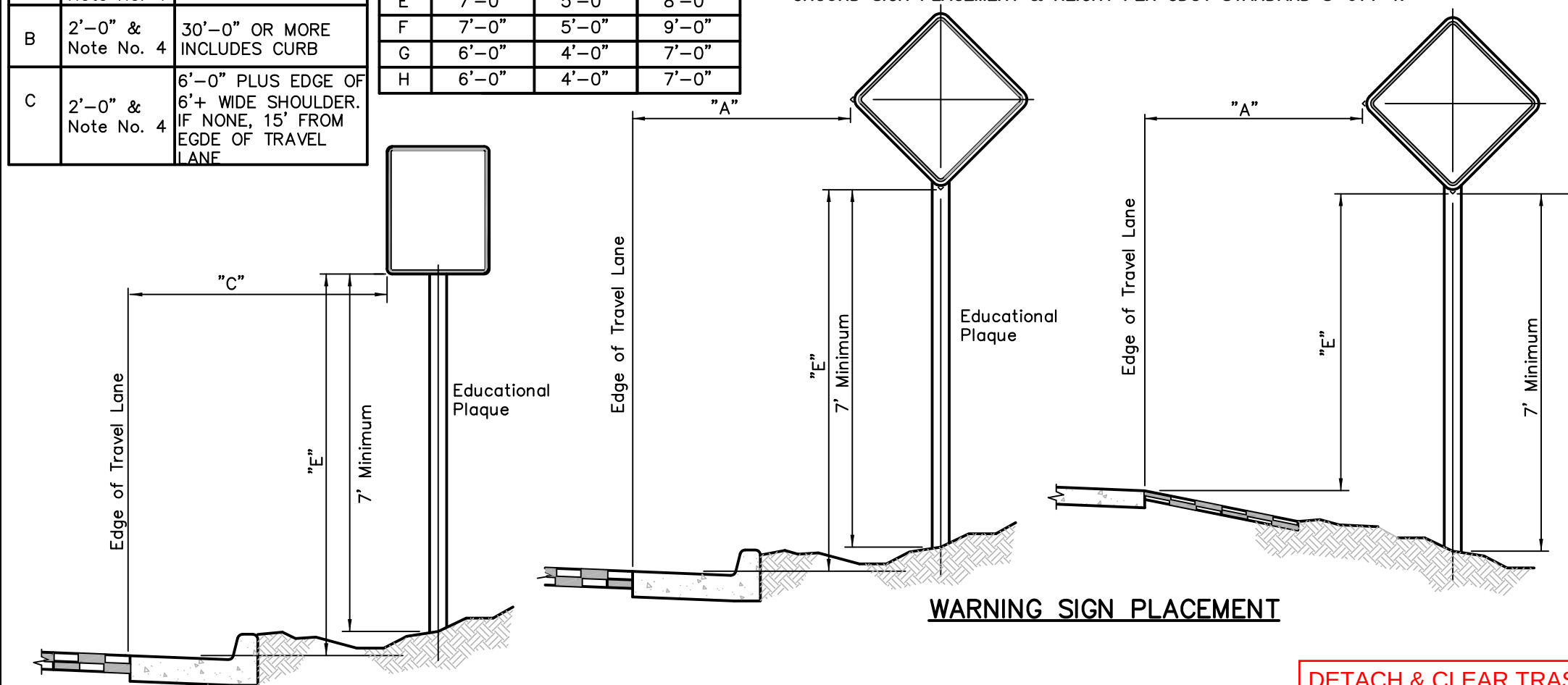
KEY	LATERAL PLACEMENT		KEY	VERTICAL PLACEMENT (MINIMUM)		
	MINIMUM	NORMAL		CONVENTIONAL	STREETS AND HIGHWAYS	MAXIMUM
A	2'-0" & Note No. 4	12'-0" PLUS CURB	D	7'-0"	5'-0"	8'-0"
B	2'-0" & Note No. 4	30'-0" OR MORE INCLUDES CURB	E	7'-0"	5'-0"	8'-0"
C	2'-0" & Note No. 4	6'-0" PLUS EDGE OF 6'-0" WIDE SHOULDER, IF NONE, 15' FROM EDGE OF TRAVEL LANE	F	7'-0"	5'-0"	9'-0"
			G	6'-0"	4'-0"	7'-0"
			H	6'-0"	4'-0"	7'-0"

KEY	LATERAL PLACEMENT		KEY	VERTICAL PLACEMENT (MINIMUM)		
	MINIMUM	NORMAL		CONVENTIONAL	STREETS AND HIGHWAYS	MAXIMUM
A	2'-0" & Note No. 4	12'-0" PLUS CURB	D	7'-0"	5'-0"	8'-0"
B	2'-0" & Note No. 4	30'-0" OR MORE INCLUDES CURB	E	7'-0"	5'-0"	8'-0"
C	2'-0" & Note No. 4	6'-0" PLUS EDGE OF 6'-0" WIDE SHOULDER, IF NONE, 15' FROM EDGE OF TRAVEL LANE	F	7'-0"	5'-0"	9'-0"
			G	6'-0"	4'-0"	7'-0"
			H	6'-0"	4'-0"	7'-0"

SEE GENERAL NOTES FOR SIGN LOCATION DETAILS.

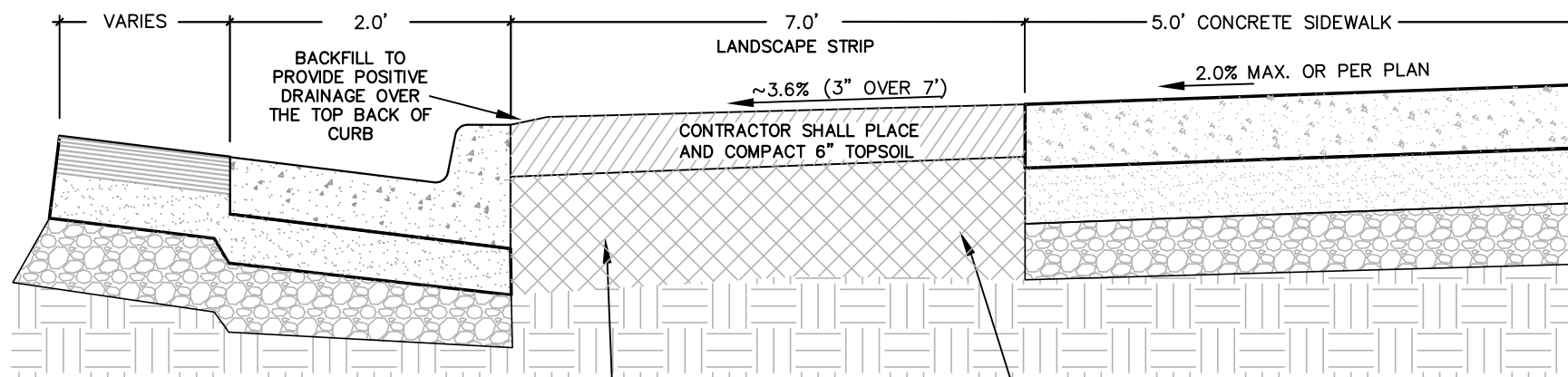
SIGNAGE AND SIGN POSTS SHALL CONFORM TO TOWN OF EAGLE PUBLIC WORKS MANUAL SECTION 3.03, & 2009 MUTCD WITH REVISIONS 1 AND 2, MAY 2012.

GROUND SIGN PLACEMENT & HEIGHT PER CDOT STANDARD S-614-1.



N.T.S. REGULATORY SIGN PLACEMENT

PROVIDE CONTRACTION JOINTS EVERY 10' (MAX)



GENERAL NOTES

1. USE CDOT CLASS B OR P CONCRETE
2. SEE TYPICAL ROAD SECTIONS FOR PAVEMENT SECTION (SHEET C2.11)

SUITABLE ON-SITE EMBANKMENT COMPACTED TO 95% STANDARD PROCTOR OR NEAR OPTIMUM MOISTURE CONTENT

SCAFFOLD 8'-12" DEPTH & COMPACT SUBGRADE TO 95% STANDARD PROCTOR OR NEAR OPTIMUM MOISTURE CONTENT

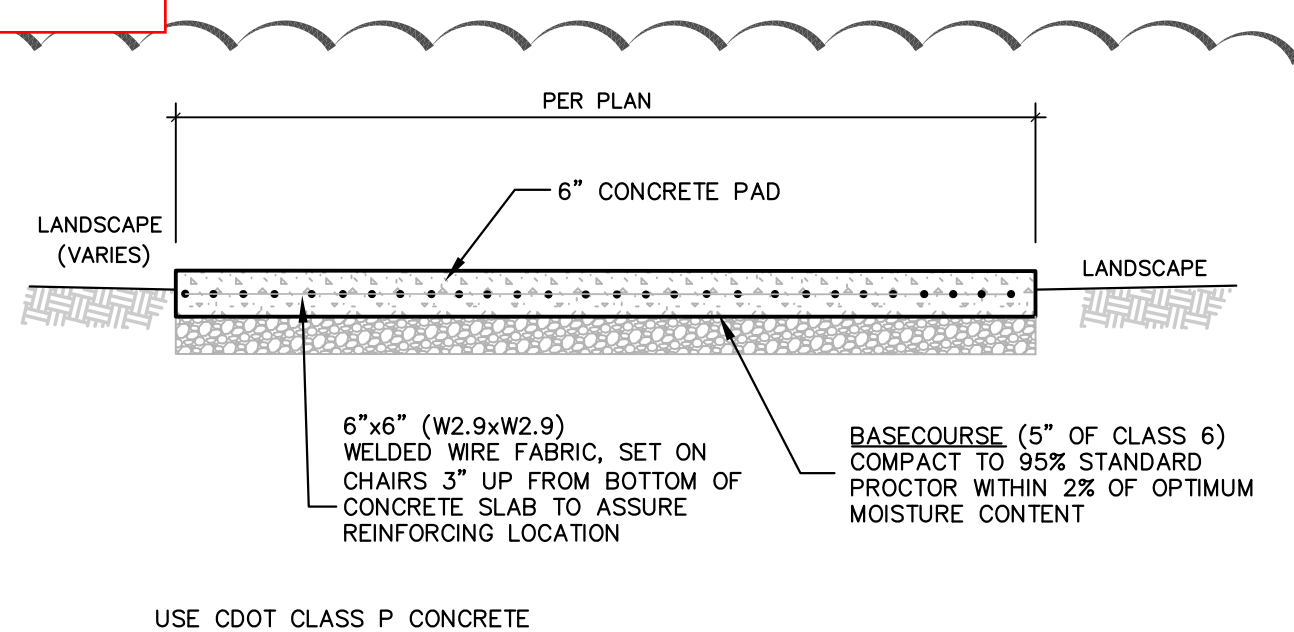
2' CURB AND GUTTER DETAIL WITH DETACHED SIDEWALK

Approved by the Town of Eagle Engineer

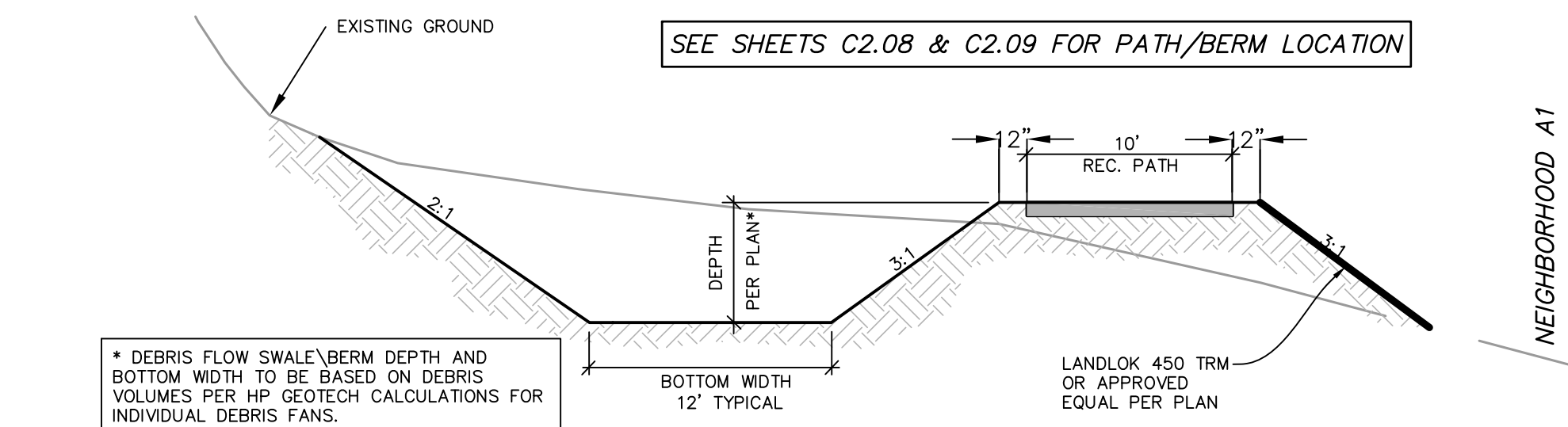
on the 26th of April, 2020



Signature



CONCRETE PAD SECTION



N.T.S.

A SIGN PLACEMENT

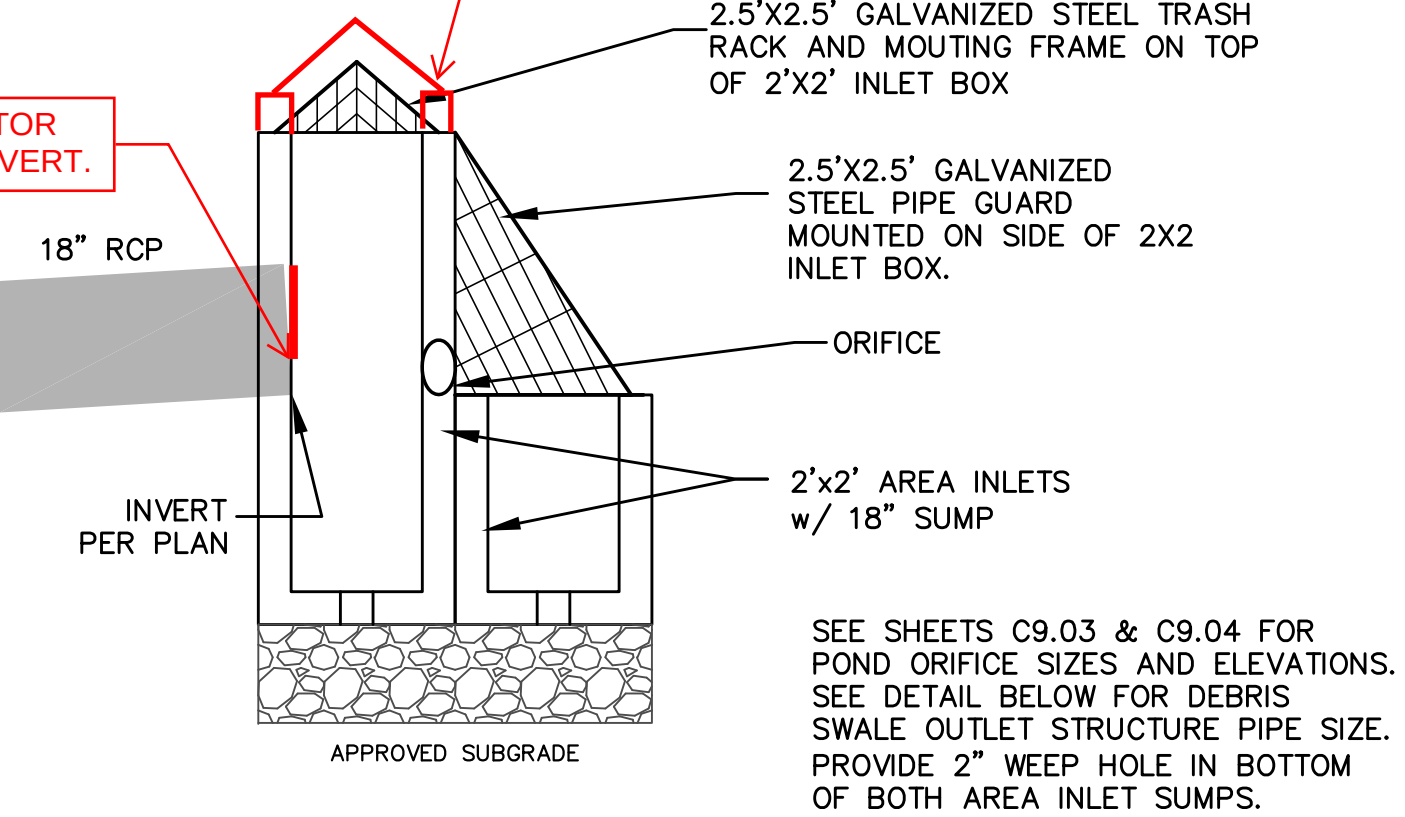


N.T.S.

BOLT ON STEEL RESTRICTOR PLATE 3.5" ABOVE PIPE INVERT.

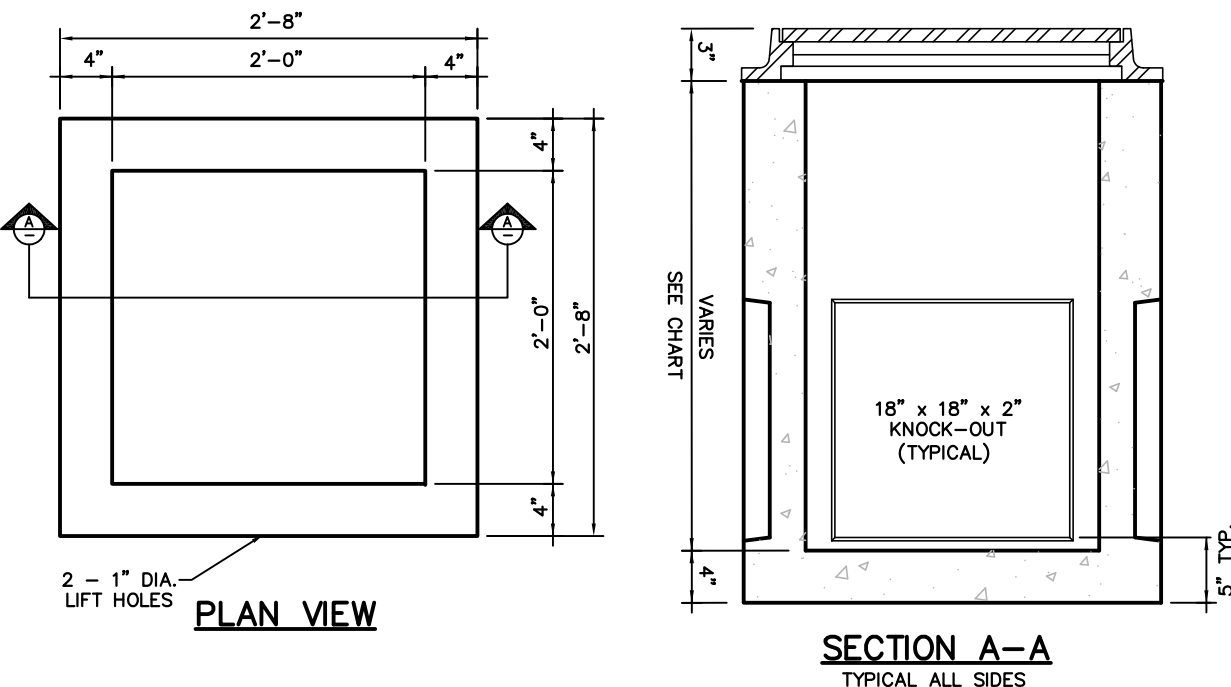
PROVIDE REMOVABLE GALVANIZED STEEL TRASH RACK AND PIPE GUARD (NO OVERFLOW GRATE) FOR RISERS IN PONDS 1A, 1B AND 1D.

OR APPROVED EQUAL



SEE SHEETS C9.03 & C9.04 FOR POND ORIFICE SIZES AND ELEVATIONS. SEE DETAIL BELOW FOR DEBRIS SWALE OUTLET STRUCTURE PIPE SIZE. PROVIDE 2" WEEP HOLE IN BOTTOM OF BOTH AREA INLET SUMPS.

TYPICAL SIDEWALK SECTION

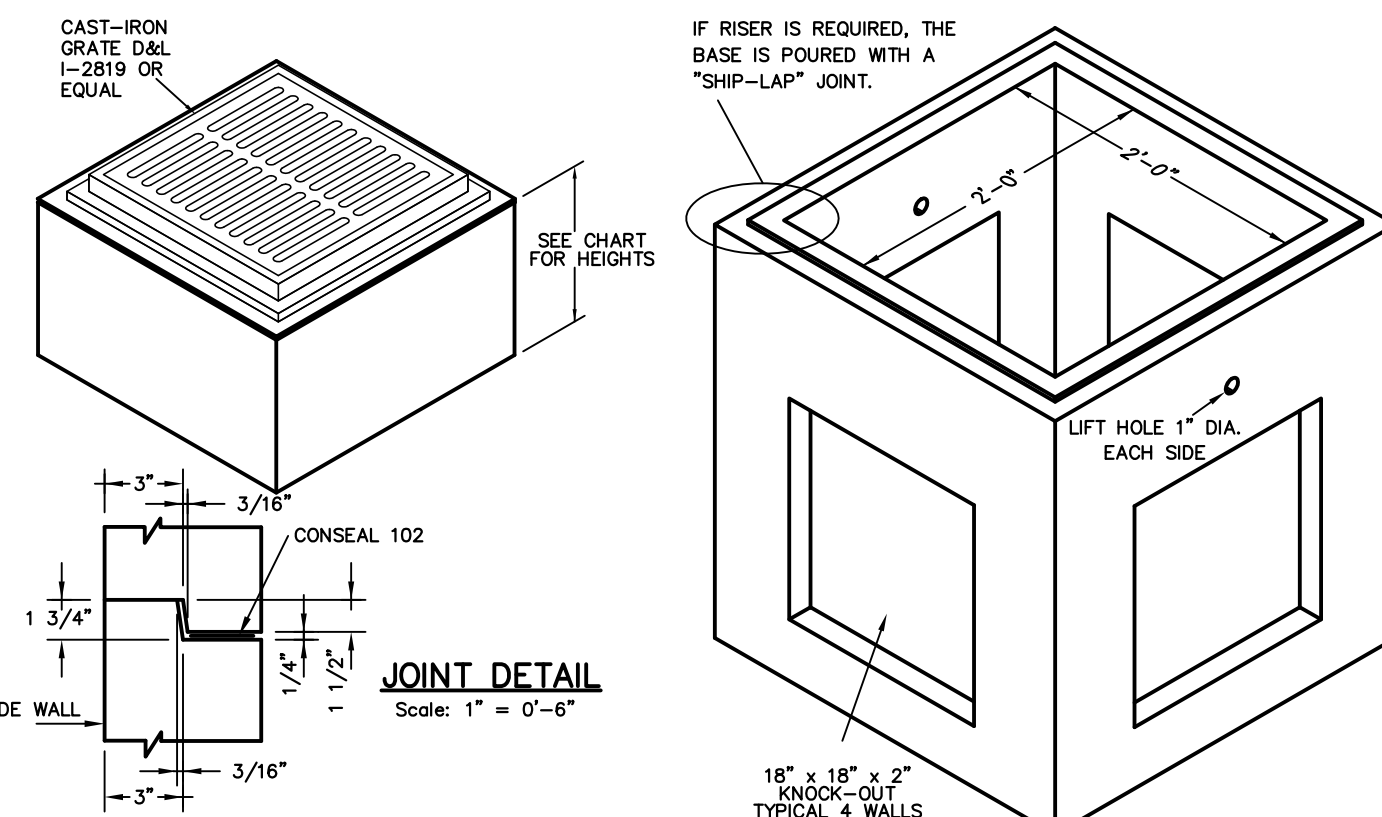


N.T.S.

C POOL PATH/DEBRIS FLOW MITIGATION BERM

RISER NUMBER	HT.	WT.
NO. 0200702	0'-2"	77
NO. 0200704	0'-4"	154
NO. 0200706	0'-6"	233
NO. 0200710	1'-0"	467
NO. 0200720	1'-6"	700
NO. 0200730	2'-0"	933
NO. 0200740	2'-6"	1,167
NO. 0200750	3'-0"	1,400
NO. 0200760	4'-0"	1,867

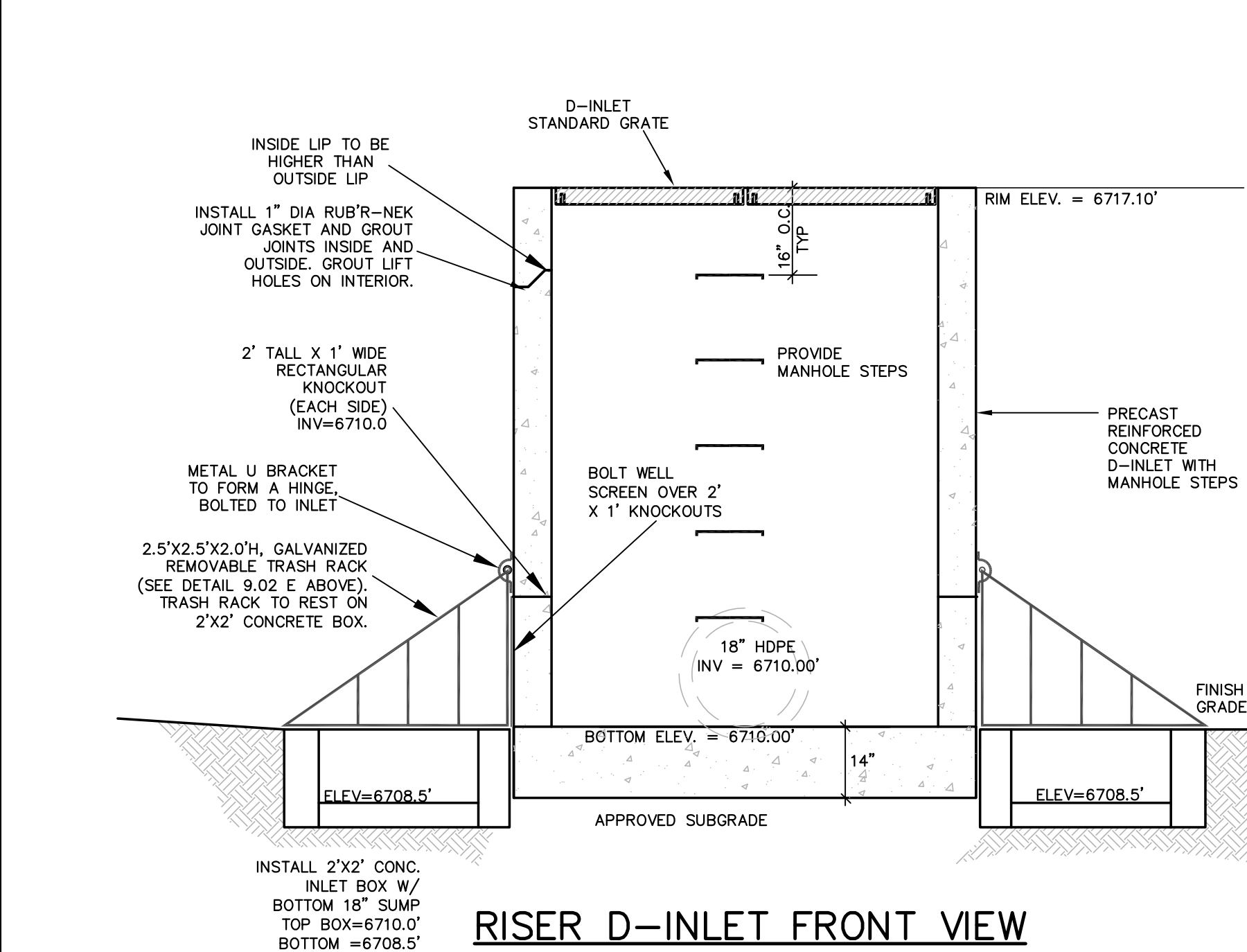
NOTES:
1. DESIGNED FOR AASHTO HS-20 LOADING.
2. DESIGNED ACCORDING TO ASTM C857-87 AND ASTM C858-83.
3. ALL INLET BOXES SHALL HAVE 12" SUMP BELOW OUTLET (TYPICAL)



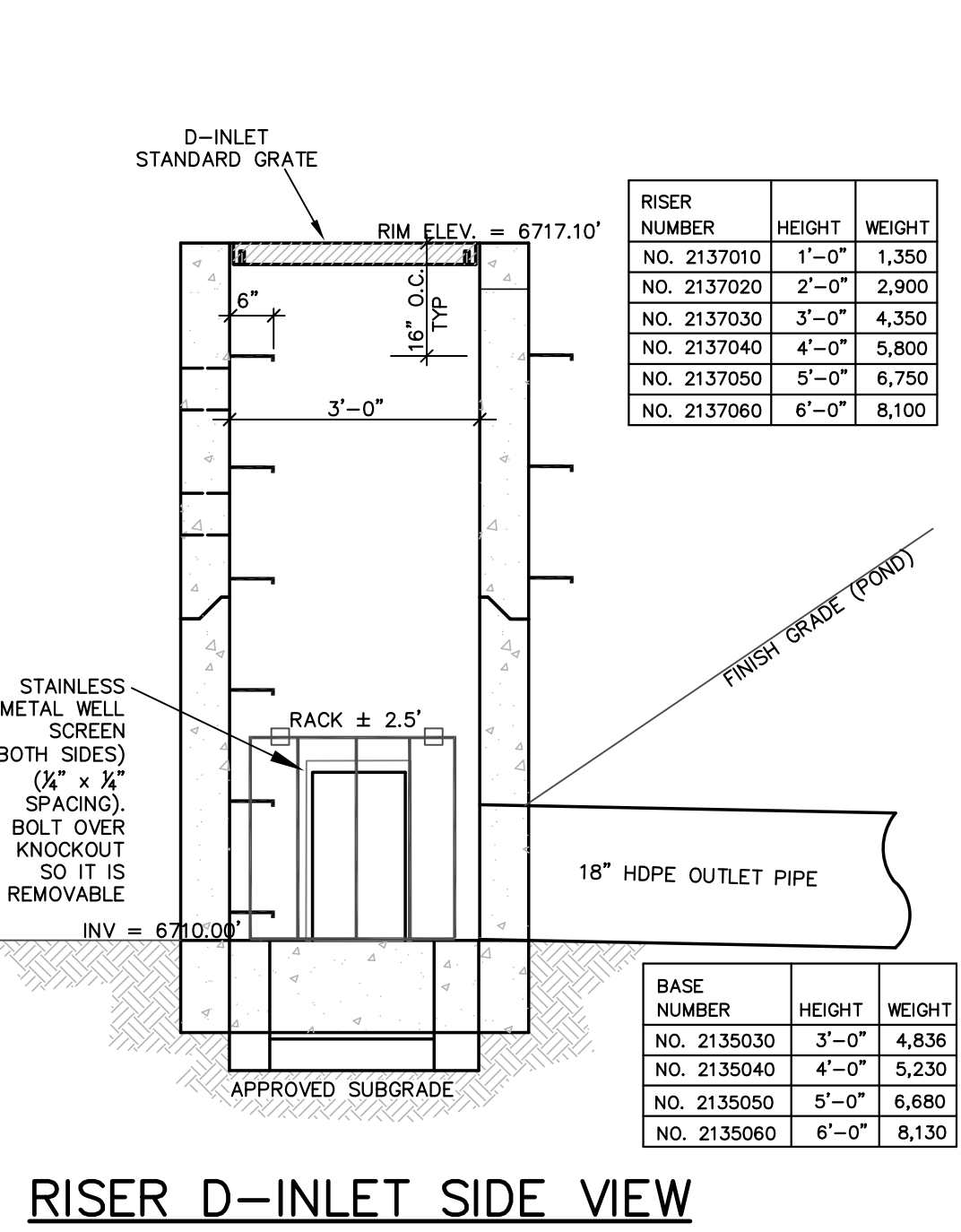
E TRASH RACK AND PIPE GUARD

F POND 1A, 1B, 1D RISER

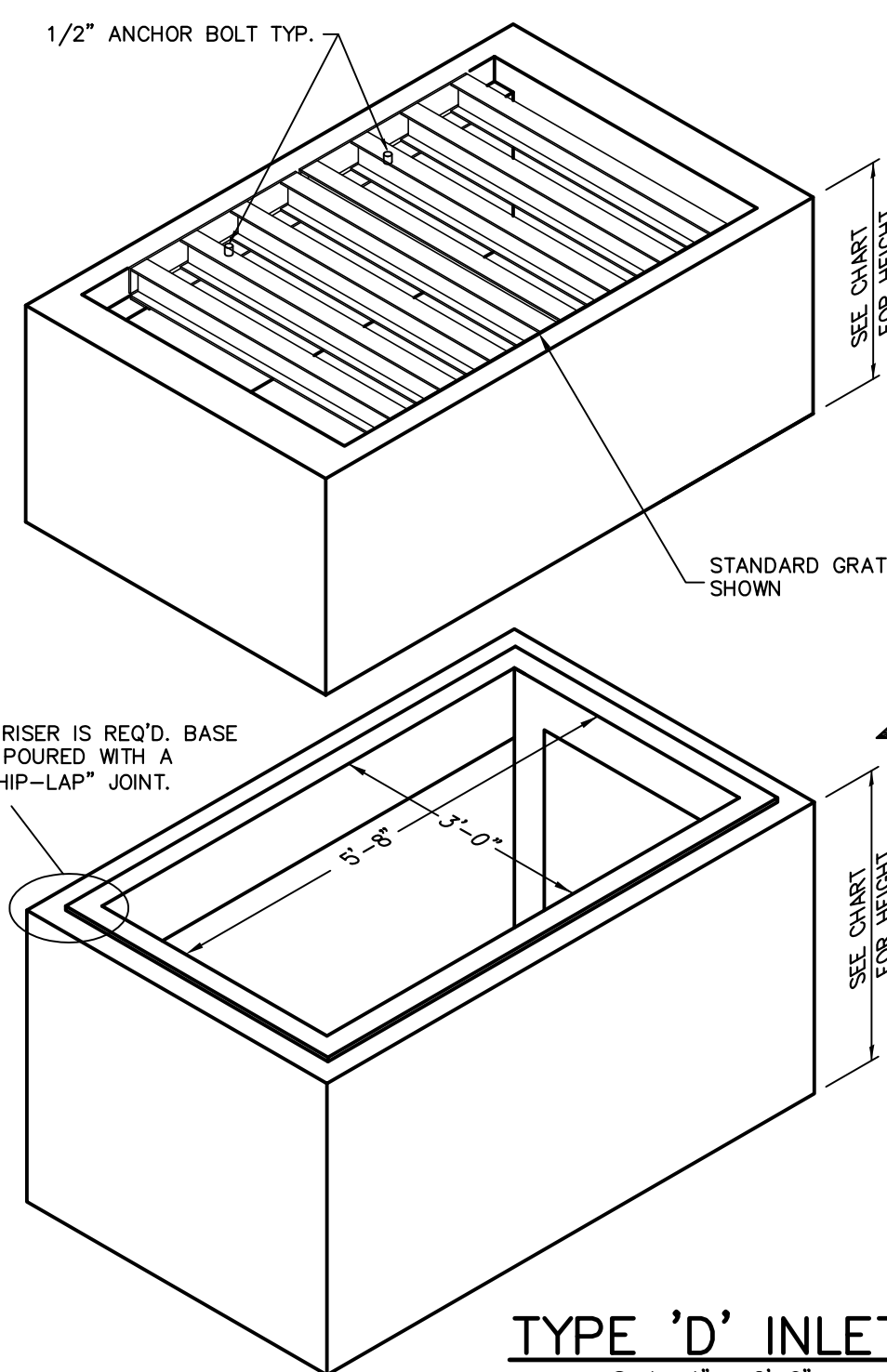
G 2'x2' INLET



RISER D-INLET FRONT VIEW

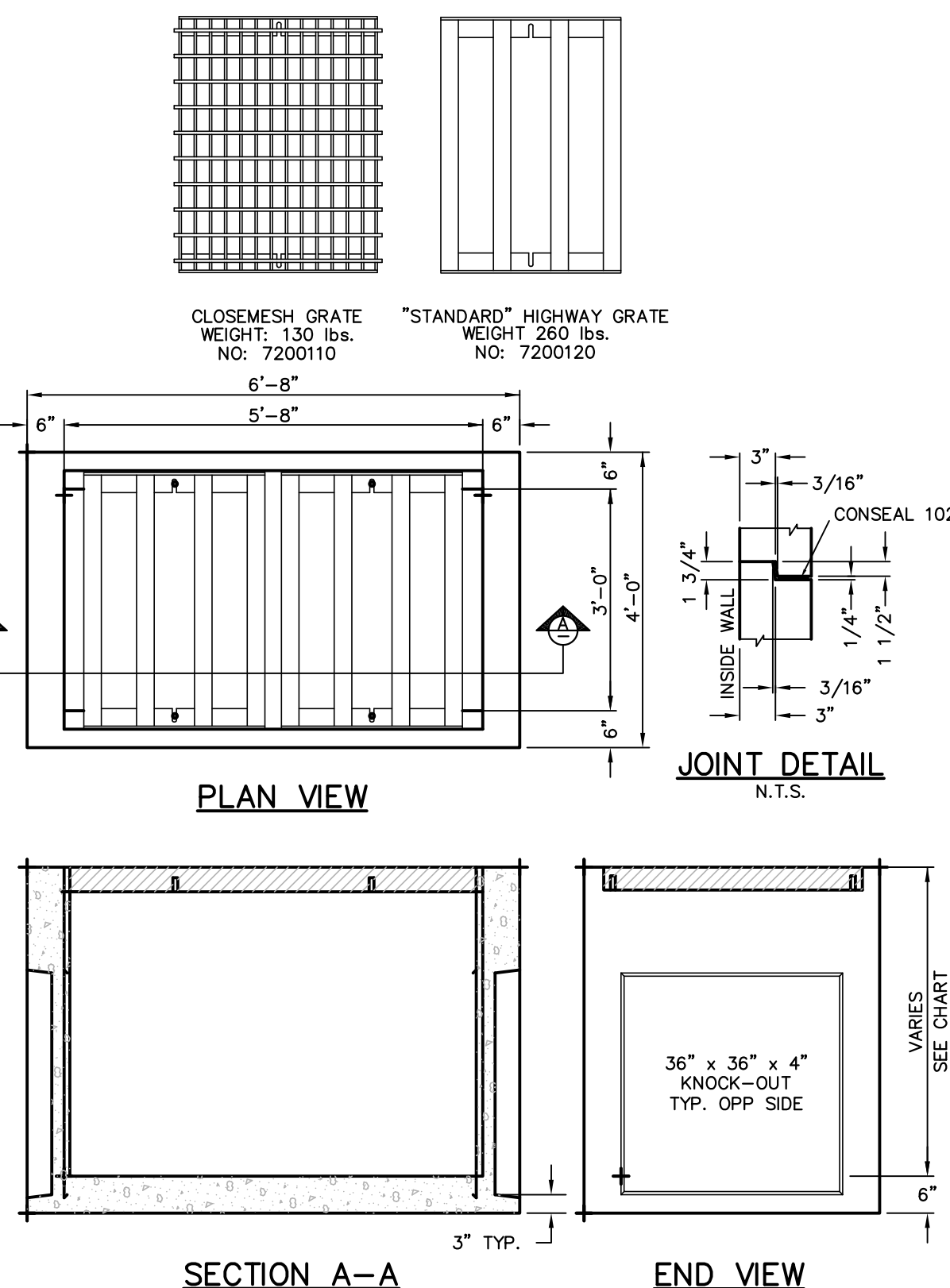


RISER D-INLET SIDE VIEW



TYPE 'D' INLET

NOTES:
1. DESIGNED FOR AASHTO HS-20 LOADING.
2. DESIGNED ACCORDING TO ASTM C857-87 AND ASTM C858-83.



PLAN VIEW

SECTION A-A

END VIEW

N.T.S.

D

DEBRIS SWALE OUTLET STRUCTURE

ALPINE ENGINEERING INC.
34510 HWY 6 UNIT A9 PO BOX 97
EDWARDS CO 81632 719.282.3373
WWW.ALPIENGINEERING.COM



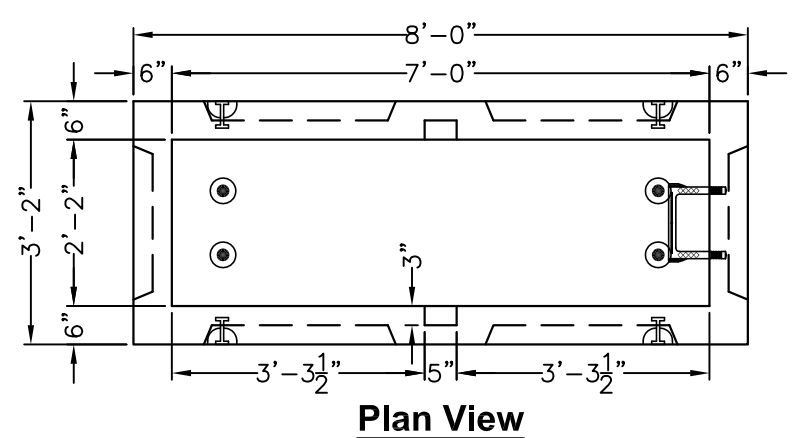
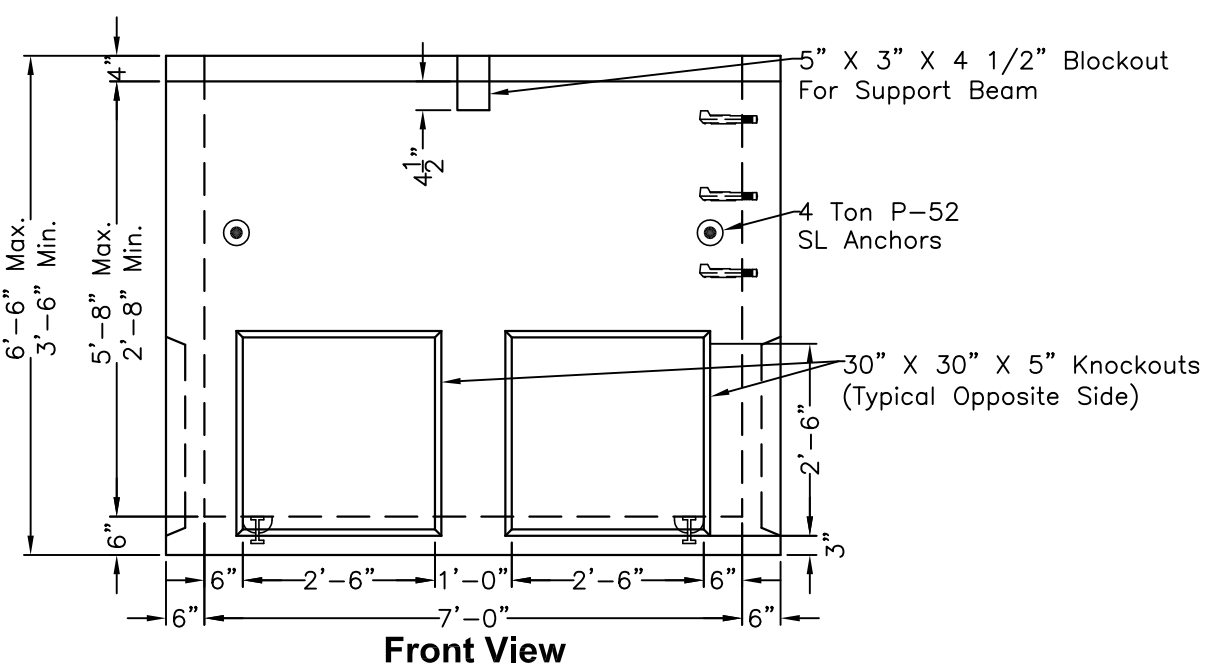
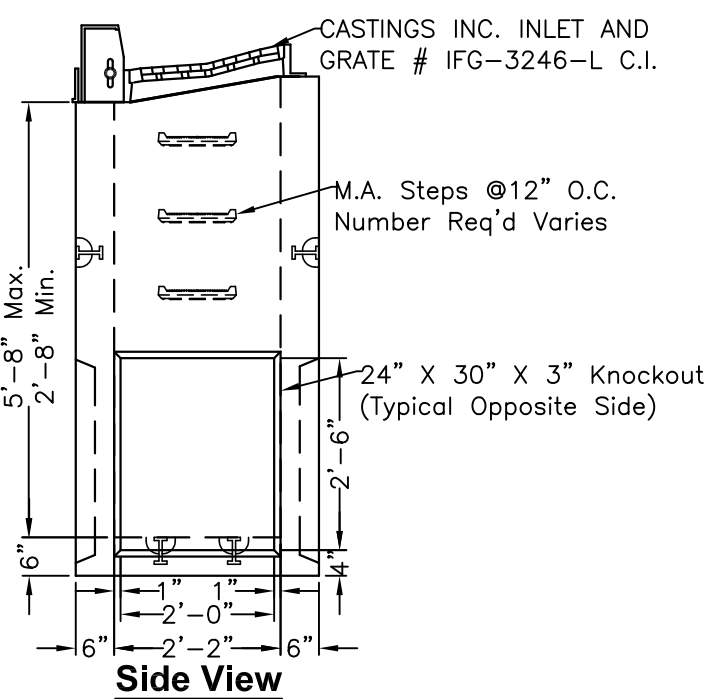
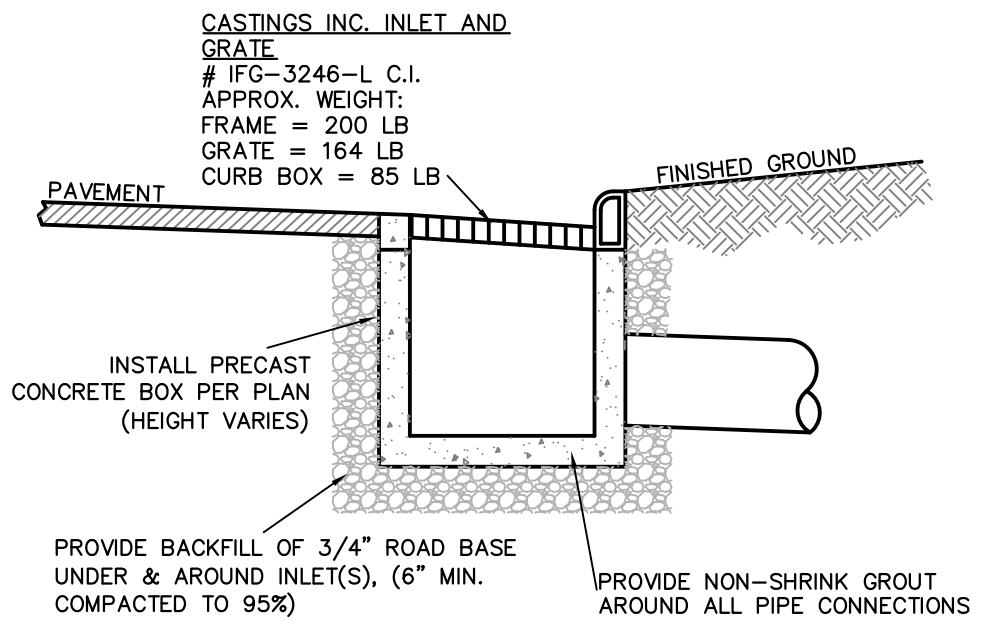
HAYMEADOW FILING 1
ROAD, GRADING, STORM DETAILS

NO.	DATE	REVISIONS	BY
1	04/08/2020	REVISION 5-OUZEL WATER CONNECT GLB	GLB
2	04/08/2020	REVISION 6-IRR. SYS. CONNECT	GLB

DESIGNED MW, RL	DATE	04/26/2019
DRAWN RF		
CHECKED MCW		
JOB NO. 53480.5		

SHEET C9.02

EXCERPTS FROM HAYMEADOW FILING 1 CONSTRUCTION PLANS.



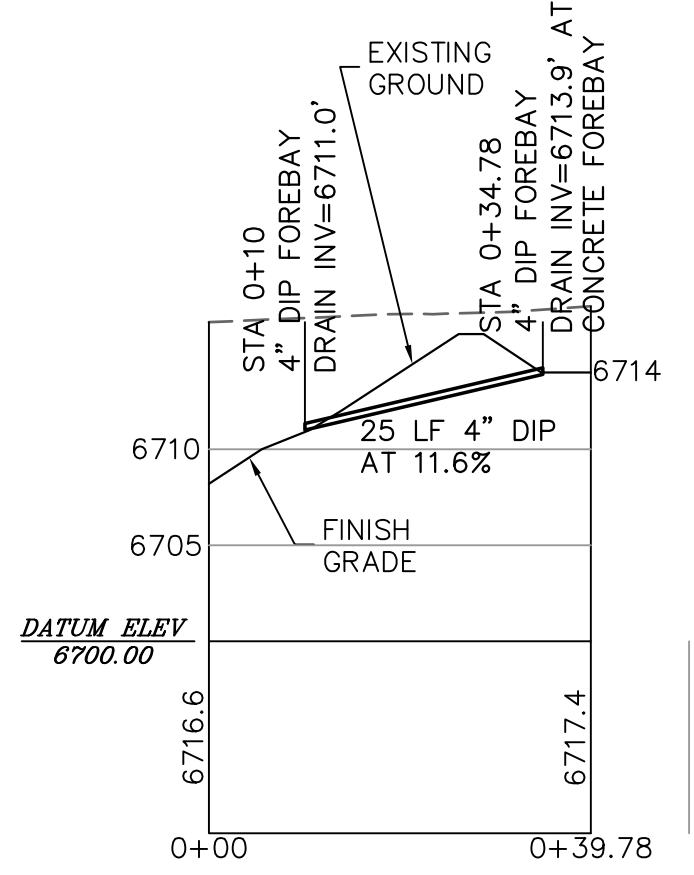
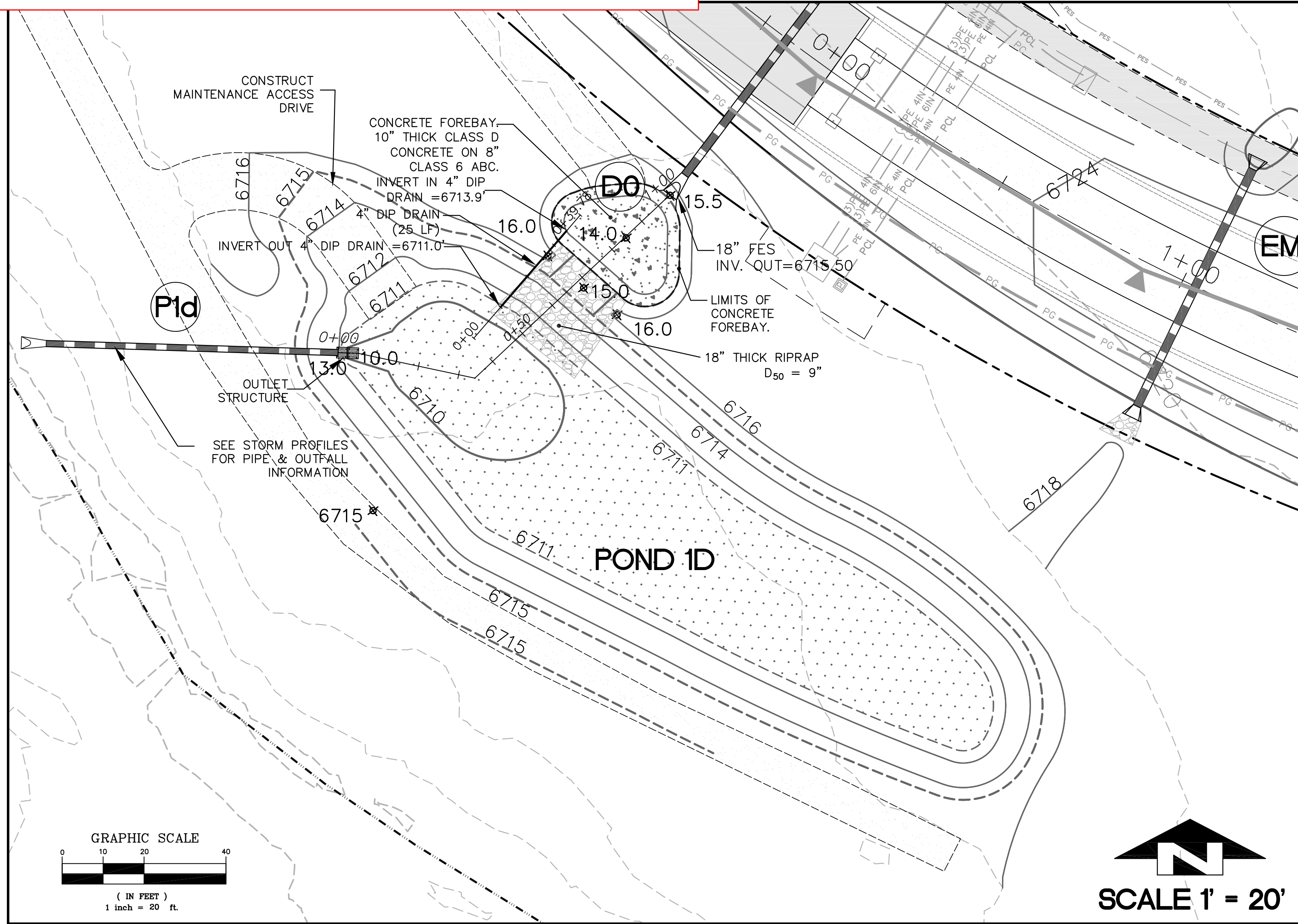
A 2' x 6' CURB INLET DETAIL (INLET B2)

Approved by the Town of Eagle Engineer

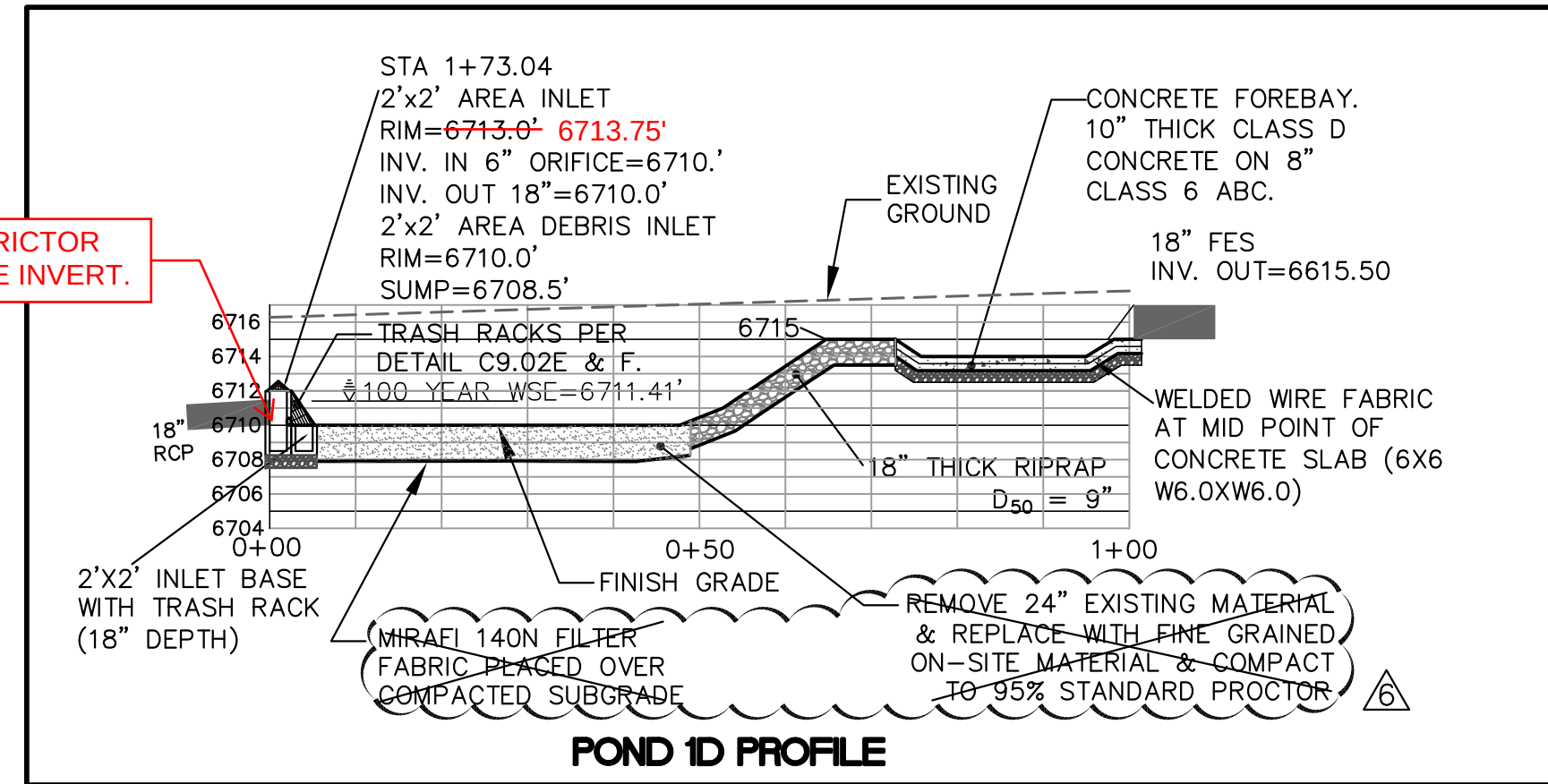
on the 26th of April, 2020



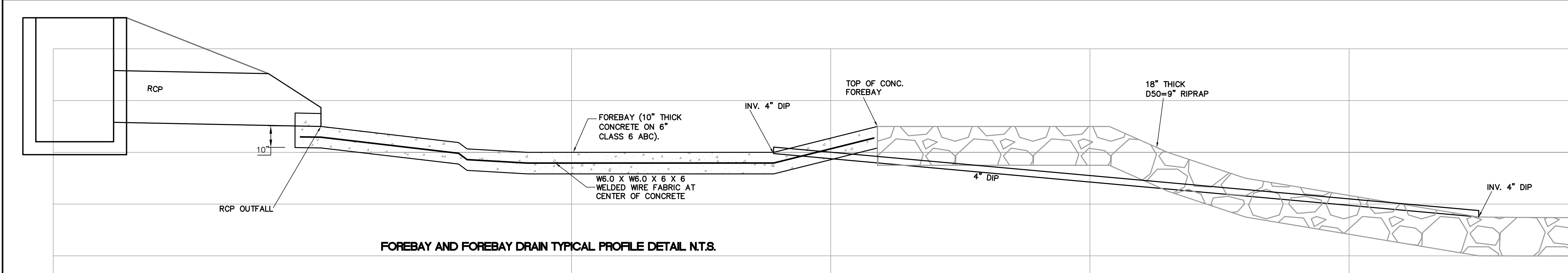
Signature



VERTICAL SCALE 1' = 10'
HORIZONTAL SCALE 1' = 20'



BOLT ON STEEL RESTRICTOR PLATE 3.5" ABOVE PIPE INVERT.



HAYMEADOW FILING 1

POND / STORM DETAILS

NO.	DATE	REVISIONS	BY
1/3	04/08/2020	REVISION 5-OUZEL WATER CONNECT GLB	GLB
2/6	04/08/2020	REVISION 6-IRR. SYS. CONNECT	GLB

DESIGNED MW, RL	NO.
DRAWN RF	NO.
CHECKED MCW	NO.
JOB NO. 53480.5	NO.
DATE 04/26/2019	NO.

SHEET C9.04

Appendix C – Hydraulic Calculations

Project Name:

Haymeadow Filing 2

Composite C-Value Computations

Post-Development

Project No:

240804

Date:

11/18/24

Revised:

Design by:

CLH

Checked by:

RCP

Hydrologic Soil Group:

C

BASIN	TOTAL AREA (ACRES)	ROOFS (90%)	DRIVES & WALKS (90%)	GARAGE & STREETS (100%)	MULTIFAMILY (75%)	SINGLE FAMILY (45%)	LANDSCAPE AREA (2%)	PERCENT IMPERVIOUS	C ₅ =	C ₂₅ =	C ₁₀₀ =
B17P	0.57	0.00	0.02	0.04	0.00	0.00	0.52	11%	0.12	0.38	0.53
B18P	7.65	0.00	0.25	0.00	3.97	2.15	1.28	55%	0.48	0.63	0.71
B22P	0.03	0.00	0.00	0.00	0.00	0.00	0.03	2%	0.05	0.33	0.49
B24aP	4.27	0.00	0.37	0.30	0.00	2.14	1.45	38%	0.35	0.53	0.64
B24bP	0.57	0.00	0.11	0.30	0.00	0.00	0.16	70%	0.61	0.71	0.77
D1P	3.34	0.00	0.31	0.52	0.00	1.54	0.97	45%	0.41	0.57	0.67
D4P	1.41	0.00	0.02	0.24	0.00	1.01	0.14	51%	0.45	0.60	0.69
D8aP	5.47	0.00	0.17	0.37	0.00	2.86	2.08	34%	0.31	0.51	0.62
D8bP	0.68	0.00	0.13	0.37	0.00	0.00	0.18	73%	0.63	0.73	0.78
D9P	6.15	0.00	0.07	0.00	4.78	0.67	0.63	64%	0.56	0.68	0.75
DX	1.11	0.00	0.03	0.50	0.00	0.46	0.12	66%	0.58	0.69	0.76
E1	0.29	0.00	0.01	0.00	0.00	0.00	0.28	6%	0.08	0.35	0.51
F2	0.09	0.00	0.03	0.04	0.00	0.00	0.03	64%	0.56	0.68	0.75
T3	0.84	0.00	0.20	0.34	0.00	0.00	0.29	63%	0.55	0.67	0.74
T4	1.37	0.00	0.18	0.40	0.00	0.00	0.79	42%	0.38	0.55	0.66
T5	0.26	0.00	0.00	0.00	0.00	0.00	0.26	2%	0.05	0.33	0.49
U3	0.26	0.00	0.00	0.10	0.00	0.00	0.15	41%	0.37	0.55	0.65
U4	0.41	0.00	0.06	0.19	0.00	0.00	0.16	61%	0.53	0.66	0.73
U5	1.03	0.00	0.00	0.00	0.00	0.00	1.03	2%	0.05	0.33	0.49
V1	0.41	0.00	0.00	0.22	0.00	0.00	0.18	56%	0.49	0.63	0.71
Y2	0.95	0.00	0.22	0.40	0.00	0.00	0.33	64%	0.56	0.67	0.74
W3	0.39	0.00	0.00	0.21	0.00	0.00	0.18	54%	0.48	0.62	0.71
WC1	2.13	0.00	0.18	0.00	0.00	0.00	1.96	9%	0.11	0.37	0.52
WC2	1.03	0.00	0.11	0.00	0.00	0.00	0.92	12%	0.13	0.38	0.53
OS1	0.29	0.00	0.03	0.00	0.00	0.00	0.26	11%	0.13	0.38	0.53
OS2	2.49	0.00	0.00	0.00	0.00	0.00	2.49	2%	0.05	0.33	0.49
OS3	0.37	0.00	0.01	0.03	0.00	0.00	0.33	11%	0.13	0.38	0.53
OS4	0.16	0.00	0.00	0.00	0.00	0.00	0.16	2%	0.05	0.33	0.49

Project Name: Haymeadow Filing 2

Project No: 240804

Date: 11/18/2024

Revised:

STANDARD FORM SF-2

TIME OF CONCENTRATION

Designed By: CLH

Checked By: RCP

SUB-BASIN DATA			INITIAL/OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK (URBANIZED BASINS)			FINAL
BASIN	AREA (AC)	C ₅	LENGTH (FT)	SLOPE %	Ti (MIN)	LENGTH (FT)	SLOPE %	C _v	VELOCITY (FPS)	Tt (MIN)	COMPOS. Tc (MIN)	TOTAL LENGTH	Tc = (L/180) + 10 (MIN)	Tc (MIN)
B17P	0.57	0.12	277	5.69	16.71	1	2.00	20.00	2.83	0.01	16.71	278	11.54	11.54
B18P	7.65	0.48	1165	4.57	23.21	1	2.00	10.00	1.41	0.01	23.22	1,166	16.48	16.48
B22P	0.03	0.05	95	5.23	10.80	1	2.00	10.00	1.41	0.01	10.81	96	10.53	10.53
B24aP	4.27	0.35	285	7.30	12.00	920	4.12	20.00	4.06	3.78	15.78	1,205	16.69	15.78
B24bP	0.57	0.61	42	0.98	5.83	945	4.05	20.00	4.02	3.91	9.74	987	15.48	9.74
D1P	3.34	0.41	456	2.84	19.18	546	2.19	20.00	2.96	3.07	22.26	1,002	15.57	15.57
D4P	1.41	0.45	268	1.90	15.73	433	2.74	20.00	3.31	2.18	17.91	701	13.89	13.89
D8aP	5.47	0.31	1196	3.81	31.99	238	2.19	20.00	2.96	1.34	33.33	1,434	17.97	17.97
D8bP	0.68	0.63	42	0.98	5.62	1123	3.15	20.00	3.55	5.27	10.89	1,165	16.47	10.89
D9P	6.15	0.56	878	4.04	18.31	1	2.00	10.00	1.41	0.01	18.32	879	14.88	14.88
DX	1.11	0.58	27	5.56	2.80	1152	2.97	10.00	1.72	11.14	13.94	1,179	16.55	13.94
E1	0.29	0.08	167	4.16	15.01	1	2.00	10.00	1.41	0.01	15.02	168	10.93	10.93
F2	0.09	0.56	47	3.55	4.46	52	2.50	10.00	1.58	0.55	5.01	99	10.55	5.01
T3	0.84	0.55	50	2.70	5.09	637	2.41	10.00	1.55	6.84	11.93	687	13.82	11.93
T4	1.37	0.38	90	4.06	7.85	606	2.50	10.00	1.58	6.39	14.24	696	13.87	13.87
T5	0.26	0.05	1348	3.98	44.54	1	2.00	10.00	1.41	0.01	44.55	1,349	17.49	17.49
U3	0.26	0.37	51	3.01	6.60	117	1.68	10.00	1.30	1.50	8.10	168	10.93	8.10
U4	0.41	0.53	86	3.73	6.23	99	1.77	10.00	1.33	1.24	7.47	185	11.03	7.47
U5	1.03	0.05	308	3.18	22.94	113	2.02	10.00	1.42	1.33	24.27	421	12.34	12.34
V1	0.41	0.49	76	4.85	5.74	460	3.25	10.00	1.80	4.25	10.00	536	12.98	10.00
Y2	0.95	0.56	115	4.17	6.64	900	2.63	10.00	1.62	9.25	15.89	1,015	15.64	15.64
W3	0.39	0.48	102	3.43	7.63	430	2.64	10.00	1.62	4.41	12.04	532	12.96	12.04
WC1	2.13	0.11	285	5.71	17.12	469	4.09	10.00	2.02	3.87	20.99	754	14.19	14.19
WC2	1.03	0.13	147	3.26	14.55	238	1.75	10.00	1.32	3.00	17.55	385	12.14	12.14
OS1	0.29	0.13	152	5.80	12.26	1	2.00	10.00	1.41	0.01	12.27	153	10.85	10.85
OS2	2.49	0.05	58	4.35	8.97	1	2.00	10.00	1.41	0.01	8.98	59	10.33	8.98
OS3	0.37	0.13	14	33.33	2.07	1	2.00	10.00	1.41	0.01	5.00	15	10.08	5.00
OS4	0.16	0.05	12	33.33	2.07	1	2.00	10.00	1.41	0.01	5.00	13	10.07	5.00

1-HR Rainfall

<u>Return</u> <u>Interval (YR)</u>	<u>1-hour</u> <u>Rainfall</u>
WQ	0.332
2	0.423
5	0.574
10	0.703
25	0.885
100	1.18

tc	WQ	2yr	5yr	10yr	25yr	100yr
5	1.126	1.435	1.947	2.384	3.002	4.002
6	1.070	1.364	1.851	2.267	2.853	3.804
7	1.021	1.300	1.765	2.161	2.721	3.627
8	0.976	1.243	1.687	2.066	2.601	3.468
9	0.935	1.191	1.617	1.980	2.493	3.324
10	0.898	1.144	1.553	1.902	2.394	3.192
11	0.864	1.101	1.494	1.830	2.304	3.072
12	0.833	1.062	1.441	1.765	2.221	2.962
13	0.805	1.025	1.391	1.704	2.145	2.860
14	0.778	0.992	1.346	1.648	2.075	2.766
15	0.754	0.960	1.303	1.596	2.009	2.679
16	0.731	0.931	1.264	1.548	1.948	2.598
17	0.709	0.904	1.227	1.502	1.891	2.522
18	0.689	0.878	1.192	1.460	1.838	2.451
19	0.671	0.855	1.160	1.420	1.788	2.384
20	0.653	0.832	1.129	1.383	1.741	2.321

Project Name: Haymeadow Filing 2
Project No: 240804
Date: 11/18/24
Revised: 01/00/00

STANDARD FORM SF-2
Post-Development
Rational Method Procedure

Designed By: CLH
Checked By: RCP
Design Storm: 5 YR

BASIN (s)	DESIGN POINT	DIRECT RUNOFF						TOTAL RUNOFF				STREET/INLET					STORM SEWER PIPE				TRAVEL TIME			CARRYOVER FLOWS					REMARKS
		AREA (AC)	RUNOFF COEFF	Tc (min)	C x A (AC)	I (IN/HR)	DIRECT RUNOFF, Q (CFS)	Tc (MAX)	Σ(C x A) (AC)	I (IN/HR)	TOTAL RUNOFF, Q (CFS)	SLOPE (%)	STREET FLOW (CFS)	INLET DESIGN FLOW (CFS)	STREET OR INLET INTERCEPTION (CFS)	CARRYOVER (CFS)	DESIGN FLOW (CFS)	PIPE SLOPE (%)	PIPE SIZE (IN)	QFULL (CFS)	LENGTH (FT)	VELOCITY (FPS)	Tt (min)	BYPASS RUNOFF, Q (CFS)	LENGTH (FT)	SLOPE (%)	VELOCITY (FPS)	Tt (min)	
B17P		0.57	0.12	11.54	0.07	1.46	0.10									0.1	2.85	24	49.65	64	2.5	0.42							
B18P		7.65	0.48	16.48	3.71	1.25	4.62									4.6	2.01	18	19.36	116	2.1	0.91							
B22P		0.03	0.05	10.53	0.00	1.52	0.00									0.0	2.07	18	19.65	202	2.2	1.56							
B24aP		4.27	0.35	15.78	1.49	1.27	1.89																						
B24bP		0.57	0.61	9.74	0.35	1.57	0.55																						
D1P		3.34	0.41	15.57	1.36	1.28	1.74																						
D4P		1.41	0.45	13.89	0.64	1.35	0.86																						
D8aP		5.47	0.31	17.97	1.71	1.19	2.04																						
D8bP		0.68	0.63	10.89	0.43	1.50	0.64																						
D9P		6.15	0.56	14.88	3.46	1.31	4.53																						
DX		1.11	0.58	13.94	0.64	1.35	0.87																						
E1		0.29	0.08	10.93	0.02	1.50	0.04																						
F2		0.09	0.56	5.01	0.05	1.95	0.10																						
T3		0.84	0.55	11.93	0.46	1.44	0.67																						
T4		1.37	0.38	13.87	0.52	1.35	0.71																						
T5		0.26	0.05	17.49	0.01	1.21	0.02																						
U3		0.26	0.37	8.10	0.10	1.68	0.16																						
U4		0.41	0.53	7.47	0.22	1.73	0.38																						
U5		1.03	0.05	12.34	0.05	1.42	0.08																						
V1		0.41	0.49	10.00	0.20	1.55	0.31																						
Y2		0.95	0.56	15.64	0.53	1.28	0.67																						
W3		0.39	0.48	12.04	0.19	1.44	0.27																						
WC1		2.13	0.11	14.19	0.24	1.34	0.32																						
WC2		1.03	0.13	12.14	0.13	1.43	0.19																						
OS1		0.29	0.13	10.85	0.04	1.50	0.05																						
OS2		2.49	0.05	8.98	0.13	1.62	0.21																						
OS3		0.37	0.13	5.00	0.05	1.95	0.09																						
OS4		0.16	0.05	5.00	0.01	1.95	0.02																						

Project Name: Haymeadow Filing 2
Project No: 240804
Date: 11/18/24
Revised: 01/00/00

STANDARD FORM SF-2
Post-Development
Rational Method Procedure

Designed By: CLH
Checked By: RCP
Design Storm: 25 YR

BASIN (s)	DESIGN POINT	DIRECT RUNOFF						TOTAL RUNOFF				STREET/INLET					STORM SEWER PIPE				TRAVEL TIME			CARRYOVER FLOWS					REMARKS
		AREA (AC)	RUNOFF COEFF	Tc (min)	C x A (AC)	I (IN/HR)	DIRECT RUNOFF, Q (CFS)	Tc (MAX)	Σ(C x A) (AC)	I (IN/HR)	TOTAL RUNOFF, Q (CFS)	SLOPE (%)	STREET FLOW (CFS)	INLET DESIGN FLOW (CFS)	STREET OR INLET INTERCEPTION (CFS)	CARRYOVER (CFS)	DESIGN FLOW (CFS)	PIPE SLOPE (%)	PIPE SIZE (IN)	QFULL (CFS)	LENGTH (FT)	VELOCITY (FPS)	Tt (min)	BYPASS RUNOFF, Q (CFS)	LENGTH (FT)	SLOPE (%)	VELOCITY (FPS)	Tt (min)	
B17P		0.57	0.38	11.54	0.22	2.26	0.49																						
B18P		7.65	0.63	16.48	4.79	1.92	9.20																						
B22P		0.03	0.33	10.53	0.01	2.35	0.02																						
B24aP		4.27	0.53	15.78	2.27	1.96	4.46																						
B24bP		0.57	0.71	9.74	0.41	2.42	0.98																						
D1P		3.34	0.57	15.57	1.91	1.97	3.77																						
D4P		1.41	0.60	13.89	0.85	2.08	1.77																						
D8aP		5.47	0.51	17.97	2.78	1.84	5.12																						
D8bP		0.68	0.73	10.89	0.49	2.31	1.14																						
D9P		6.15	0.68	14.88	4.18	2.02	8.43																						
DX		1.11	0.69	13.94	0.77	2.08	1.59																						
E1		0.29	0.35	10.93	0.10	2.31	0.24																						
F2		0.09	0.68	5.01	0.06	3.00	0.19																						
T3		0.84	0.67	11.93	0.56	2.23	1.26																						
T4		1.37	0.55	13.87	0.76	2.08	1.59																						
T5		0.26	0.33	17.49	0.09	1.86	0.16																						
U3		0.26	0.55	8.10	0.14	2.59	0.37																						
U4		0.41	0.66	7.47	0.27	2.66	0.72																						
U5		1.03	0.33	12.34	0.34	2.19	0.75																						
V1		0.41	0.63	10.00	0.26	2.39	0.61																						
Y2		0.95	0.67	15.64	0.64	1.97	1.26																						
W3		0.39	0.62	12.04	0.24	2.22	0.54																						
WC1		2.13	0.37	14.19	0.79	2.06	1.63																						
WC2		1.03	0.38	12.14	0.40	2.21	0.88																						
OS1		0.29	0.38	10.85	0.11	2.32	0.25																						
OS2		2.49	0.33	8.98	0.82	2.49	2.05																						
OS3		0.37	0.38	5.00	0.14	3.00	0.42																						
OS4		0.16	0.33	5.00	0.05	3.00	0.16																						

Project Name: Haymeadow Filing 2
Project No: 240804
Date: 11/18/24
Revised: 01/00/00

STANDARD FORM SF-2
Post-Development
Rational Method Procedure

Designed By: CLH
Checked By: RCP
Design Storm: 100 YR

BASIN (s)	DESIGN POINT	DIRECT RUNOFF						TOTAL RUNOFF				STREET/INLET					STORM SEWER PIPE				TRAVEL TIME		CARRYOVER FLOWS					REMARKS	
		AREA (AC)	RUNOFF COEFF	Tc (min)	C x A (AC)	I (IN/HR)	DIRECT RUNOFF, Q (CFS)	Tc (MAX)	Σ(C x A) (AC)	I (IN/HR)	TOTAL RUNOFF, Q (CFS)	SLOPE (%)	STREET FLOW (CFS)	INLET DESIGN FLOW (CFS)	STREET OR INLET INTERCEPTION (CFS)	CARRYOVER (CFS)	DESIGN FLOW (CFS)	PIPE SLOPE (%)	PIPE SIZE (IN)	80% OF QCAPACITY (CFS)	LENGTH (FT)	VELOCITY (FPS)	Tt (min)	BYPASS RUNOFF, Q (CFS)	LENGTH (FT)	SLOPE (%)	VELOCITY (FPS)		Tt (min)
B17P		0.57	0.53	11.54	0.30	3.01	0.91																						
B18P		7.65	0.71	16.48	5.42	2.56	13.89																						
B22P		0.03	0.49	10.53	0.01	3.13	0.05																						
B24aP		4.27	0.64	15.78	2.73	2.62	7.15																						
B24bP		0.57	0.77	9.74	0.44	3.22	1.42																						
D1P		3.34	0.67	15.57	2.24	2.63	5.89																						
D4P		1.41	0.69	13.89	0.98	2.78	2.71																						
D8aP		5.47	0.62	17.97	3.41	2.45	8.36																						
D8bP		0.68	0.78	10.89	0.53	3.08	1.64																						
D9P		6.15	0.75	14.88	4.60	2.69	12.37																						
DX		1.11	0.76	13.94	0.84	2.77	2.33																						
E1		0.29	0.51	10.93	0.15	3.08	0.46																						
F2		0.09	0.75	5.01	0.07	4.00	0.28																						
T3		0.84	0.74	11.93	0.62	2.97	1.85																						
T4		1.37	0.66	13.87	0.90	2.78	2.51																						
T5		0.26	0.49	17.49	0.13	2.49	0.32																						
U3		0.26	0.65	8.10	0.17	3.45	0.58																						
U4		0.41	0.73	7.47	0.30	3.55	1.06																						
U5		1.03	0.49	12.34	0.51	2.93	1.48																						
V1		0.41	0.71	10.00	0.29	3.19	0.92																						
Y2		0.95	0.74	15.64	0.70	2.63	1.85																						
W3		0.39	0.71	12.04	0.28	2.96	0.81																						
WC1		2.13	0.52	14.19	1.11	2.75	3.06																						
WC2		1.03	0.53	12.14	0.55	2.95	1.62																						
OS1		0.29	0.53	10.85	0.15	3.09	0.47																						
OS2		2.49	0.49	8.98	1.22	3.33	4.07																						
OS3		0.37	0.53	5.00	0.19	4.00	0.78																						
OS4		0.16	0.49	5.00	0.08	4.00	0.32																						

% FULL

DIRECT RUNOFF SUMMARY TABLE

BASIN	DESIGN POINT	AREA (AC)	Q ₂₅ (CFS)	Q ₁₀₀ (CFS)
B17P		0.57	0.49	0.91
B18P		7.65	9.20	13.89
B22P		0.03	0.02	0.05
B24aP		4.27	4.46	7.15
B24bP		0.57	0.98	1.42
D1P		3.34	3.77	5.89
D4P		1.41	1.77	2.71
D8aP		5.47	5.12	8.36
D8bP		0.68	1.14	1.64
D9P		6.15	8.43	12.37
DX		1.11	1.59	2.33
E1		0.29	0.24	0.46
F2		0.09	0.19	0.28
T3		0.84	1.26	1.85
T4		1.37	1.59	2.51
T5		0.26	0.16	0.32
U3		0.26	0.37	0.58
U4		0.41	0.72	1.06
U5		1.03	0.75	1.48
V1		0.41	0.61	0.92
Y2		0.95	1.26	1.85
W3		0.39	0.54	0.81
WC1		2.13	1.63	3.06
WC2		1.03	0.88	1.62
OS1		0.29	0.25	0.47
OS2		2.49	2.05	4.07
OS3		0.37	0.42	0.78
OS4		0.16	0.16	0.32

INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet D8a	Inlet D8b
Site Type (Urban or Rural)	RURAL	RURAL
Inlet Application (Street or Area)	STREET	STREET
Hydraulic Condition	In Sump	In Sump
Inlet Type	Denver No. 16 Combination	Denver No. 16 Combination

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	2.0	0.6
Major Q_{Known} (cfs)	5.1	1.1

Bypass (Carry-Over) Flow from Upstream

Inlets must be organized from upstream (left) to downstream (right) in order for byp

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)		
Percent Impervious		
NRCS Soil Type		

Watershed Profile

Overland Slope (ft/ft)		
Overland Length (ft)		
Channel Slope (ft/ft)		
Channel Length (ft)		

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)		
One-Hour Precipitation, P_1 (inches)		

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)		
One-Hour Precipitation, P_1 (inches)		

CALCULATED OUTPUT

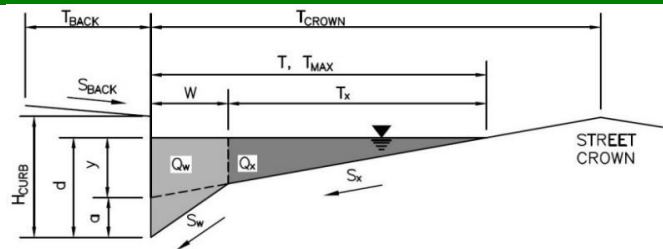
Minor Total Design Peak Flow, Q (cfs)	2.0	0.6
Major Total Design Peak Flow, Q (cfs)	5.1	1.1
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Inlet ID: Inlet D8a



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

Height of Curb at Gutter Flow Line

Distance from Curb Face to Street Crown

Gutter Width

Street Transverse Slope

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

Street Longitudinal Slope - Enter 0 for sump condition

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

Max. Allowable Spread for Minor & Major Storm

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Check boxes are not applicable in SUMP conditions

MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

$T_{BACK} =$ 0.0 ft
 $S_{BACK} =$ ft/ft
 $n_{BACK} =$ 0.013

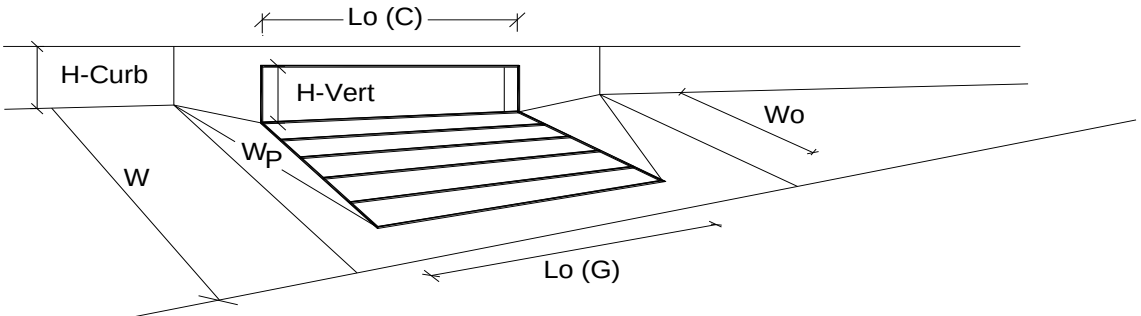
$H_{CURB} =$ 6.00 inches
 $T_{CROWN} =$ 12.5 ft
 $W =$ 2.00 ft
 $S_x =$ 0.030 ft/ft
 $S_w =$ 0.083 ft/ft
 $S_o =$ 0.000 ft/ft
 $n_{STREET} =$ 0.013

$T_{MAX} =$ 12.5 ft
 $d_{MAX} =$ 6.0 inches
☐ ☐

$Q_{allow} =$ SUMP SUMP cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



Design Information (Input)

Type of Inlet

Denver No. 16 Combination

Local Depression (additional to continuous gutter depression 'a' from above)

Number of Unit Inlets (Grate or Curb Opening)

Water Depth at Flowline (outside of local depression)

Grate Information

Length of a Unit Grate

Width of a Unit Grate

Open Area Ratio for a Grate (typical values 0.15-0.90)

Clogging Factor for a Single Grate (typical value 0.50 - 0.70)

Grate Weir Coefficient (typical value 2.15 - 3.60)

Grate Orifice Coefficient (typical value 0.60 - 0.80)

Curb Opening Information

Length of a Unit Curb Opening

Height of Vertical Curb Opening in Inches

Height of Curb Orifice Throat in Inches

Angle of Throat

Side Width for Depression Pan (typically the gutter width of 2 feet)

Clogging Factor for a Single Curb Opening (typical value 0.10)

Curb Opening Weir Coefficient (typical value 2.3-3.7)

Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)

Low Head Performance Reduction (Calculated)

Depth for Grate Midwidth

Depth for Curb Opening Weir Equation

Grated Inlet Performance Reduction Factor for Long Inlets

Curb Opening Performance Reduction Factor for Long Inlets

Combination Inlet Performance Reduction Factor for Long Inlets

Total Inlet Interception Capacity (assumes clogged condition)

Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)

Type = MINOR MAJOR
Denver No. 16 Combination

a_{local} = 2.00 2.00 inches

No = 2 2

Ponding Depth = 5.8 5.8 inches

L_o (G) = 3.00 3.00 feet

W_o = 1.73 1.73 feet

A_{ratio} = 0.31 0.31

C_f (G) = 0.50 0.50

C_w (G) = 3.60 3.60

C_o (G) = 0.60 0.60

L_o (C) = 3.00 3.00 feet

H_{vert} = 6.50 6.50 inches

H_{throat} = 5.25 5.25 inches

Theta = 0.00 0.00 degrees

W_p = 2.00 2.00 feet

C_f (C) = 0.10 0.10

C_w (C) = 3.70 3.70

C_o (C) = 0.66 0.66

d_{Grate} = 0.50 0.50 ft

d_{Curb} = 0.32 0.32 ft

RF_{Grate} = 0.68 0.68

RF_{Curb} = N/A N/A

$RF_{Combination}$ = 0.68 0.68

Q_a = 6.9 6.9 cfs

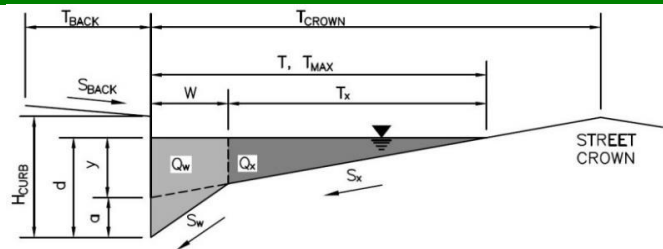
$Q_{PEAK REQUIRED}$ = 2.0 5.1 cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Inlet ID: Inlet D8b



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

Height of Curb at Gutter Flow Line

Distance from Curb Face to Street Crown

Gutter Width

Street Transverse Slope

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

Street Longitudinal Slope - Enter 0 for sump condition

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

$T_{BACK} = 0.0$ ft
 $S_{BACK} =$ ft/ft
 $n_{BACK} = 0.013$

$H_{CURB} = 6.00$ inches
 $T_{CROWN} = 12.5$ ft
 $W = 2.00$ ft
 $S_x = 0.030$ ft/ft
 $S_w = 0.083$ ft/ft
 $S_o = 0.000$ ft/ft
 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Check boxes are not applicable in SUMP conditions

	Minor Storm	Major Storm	
$T_{MAX} =$	12.5	12.5	ft
$d_{MAX} =$	6.0	6.0	inches
	☐	☐	

MINOR STORM Allowable Capacity is not applicable to Sump Condition

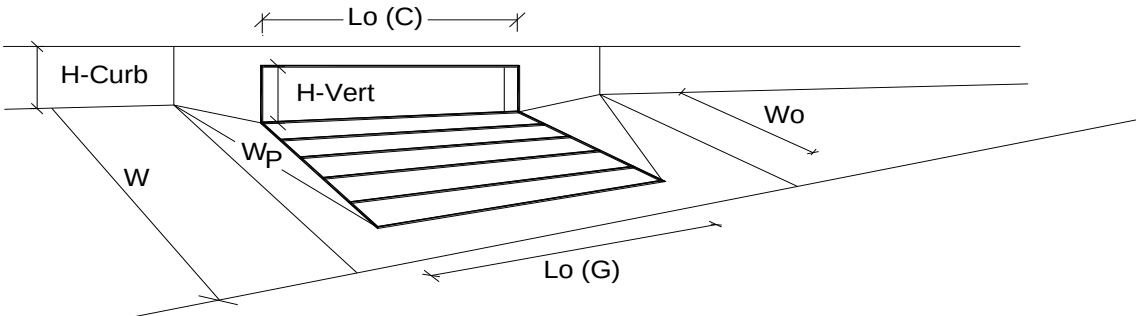
MAJOR STORM Allowable Capacity is not applicable to Sump Condition

$Q_{allow} =$

Minor Storm	Major Storm	
SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



Design Information (Input)

Type of Inlet

Denver No. 16 Combination

Local Depression (additional to continuous gutter depression 'a' from above)

Number of Unit Inlets (Grate or Curb Opening)

Water Depth at Flowline (outside of local depression)

Grate Information

Length of a Unit Grate

Width of a Unit Grate

Open Area Ratio for a Grate (typical values 0.15-0.90)

Clogging Factor for a Single Grate (typical value 0.50 - 0.70)

Grate Weir Coefficient (typical value 2.15 - 3.60)

Grate Orifice Coefficient (typical value 0.60 - 0.80)

Curb Opening Information

Length of a Unit Curb Opening

Height of Vertical Curb Opening in Inches

Height of Curb Orifice Throat in Inches

Angle of Throat

Side Width for Depression Pan (typically the gutter width of 2 feet)

Clogging Factor for a Single Curb Opening (typical value 0.10)

Curb Opening Weir Coefficient (typical value 2.3-3.7)

Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)

Low Head Performance Reduction (Calculated)

Depth for Grate Midwidth

Depth for Curb Opening Weir Equation

Grated Inlet Performance Reduction Factor for Long Inlets

Curb Opening Performance Reduction Factor for Long Inlets

Combination Inlet Performance Reduction Factor for Long Inlets

Total Inlet Interception Capacity (assumes clogged condition)

Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)

Type = MINOR MAJOR
Denver No. 16 Combination

a_{local} = 2.00 2.00 inches

No = 2 2

Ponding Depth = 5.8 5.8 inches

L_o (G) = 3.00 3.00 feet

W_o = 1.73 1.73 feet

A_{ratio} = 0.31 0.31

C_f (G) = 0.50 0.50

C_w (G) = 3.60 3.60

C_o (G) = 0.60 0.60

L_o (C) = 3.00 3.00 feet

H_{vert} = 6.50 6.50 inches

H_{throat} = 5.25 5.25 inches

Theta = 0.00 0.00 degrees

W_p = 2.00 2.00 feet

C_f (C) = 0.10 0.10

C_w (C) = 3.70 3.70

C_o (C) = 0.66 0.66

d_{Grate} = 0.50 0.50 ft

d_{Curb} = 0.32 0.32 ft

RF_{Grate} = 0.68 0.68

RF_{Curb} = N/A N/A

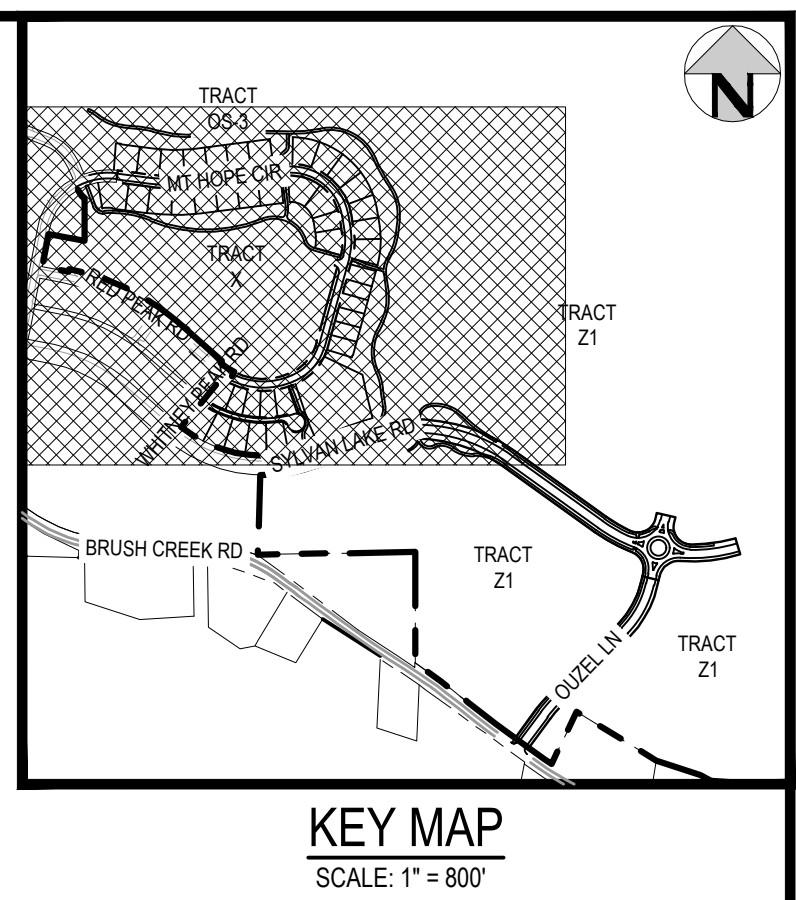
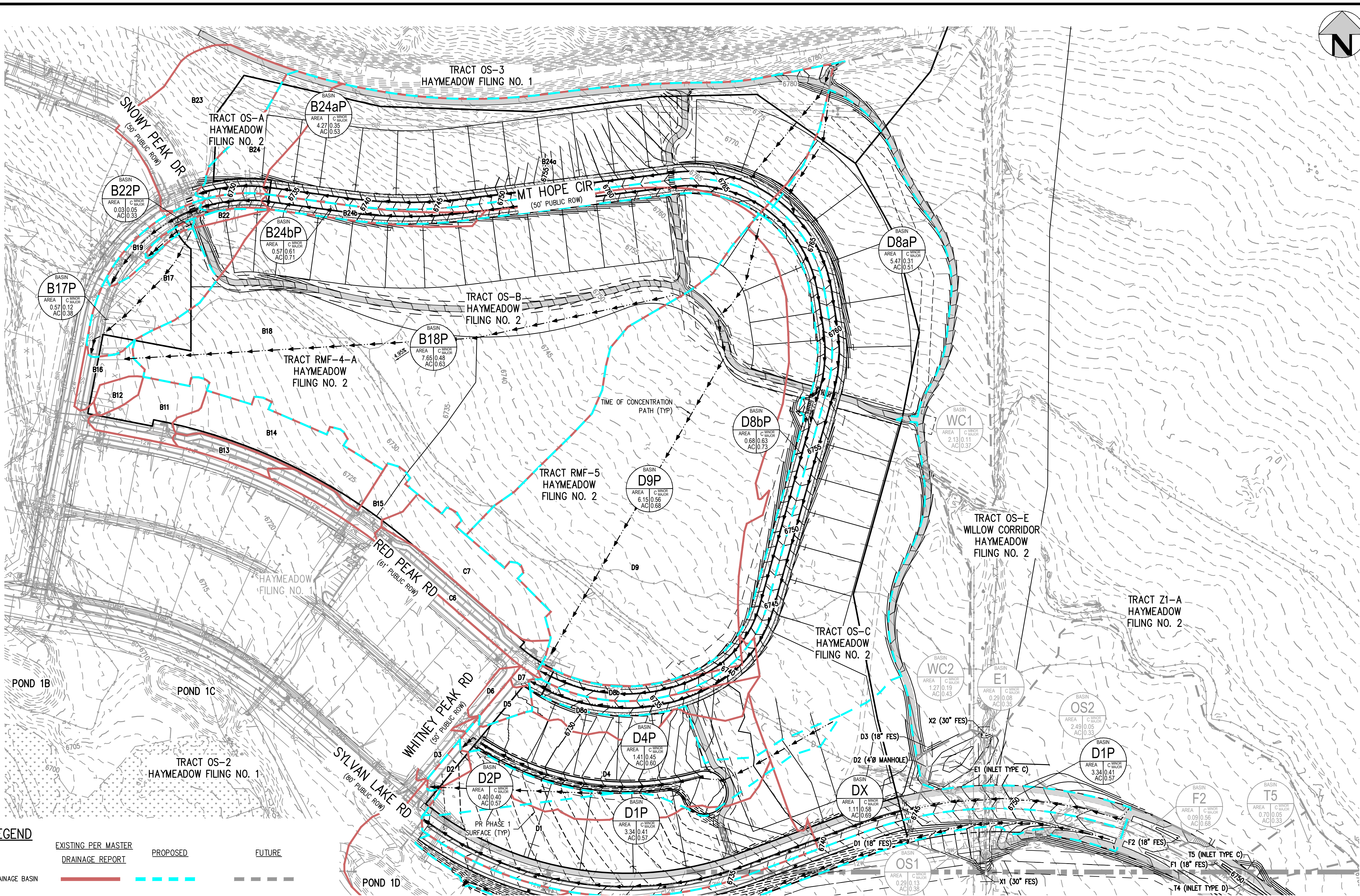
$RF_{Combination}$ = 0.68 0.68

Q_a = 6.9 6.9 cfs

$Q_{PEAK REQUIRED}$ = 0.6 1.1 cfs

Appendix D – Drainage Plan

FILES: P:\2024\240804\ENGINEERING\DRAINAGE\BASIN MAP - PHASE 2.DWG LAYOUT: LAYOUT1
5:00 PM 11/18/2024
PLOT: 11/18/2024 4:15:33 PM BY: COLTON HOCHEVAR
PLOT: 11/18/2024 4:15:33 PM BY: COLTON HOCHEVAR



LEGEND

EXISTING PER MASTER DRAINAGE REPORT PROPOSED FUTURE

DRAINAGE BASIN ———— ———— ————

BASIN LABEL D# BASIN DESIGNATION BASIN SIZE IN ACRES X-YR RATIONAL C COEFFICIENT XX-YR RATIONAL C COEFFICIENT

OS 1
AREA 1.23 C MAJOR 0.45 AC 0.67
BASIN DESIGN POINT



Know what's below.
Call before you dig.

80 0 80 160
SCALE: 1" = 80'

DESIGNED BY: CLH
CHECKED BY: RCP
DRAWN BY: CLH

ISSUE DATE: 11-18-2024

DATE	REVISION COMMENTS



HARRIS KOCHER SMITH
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Denver, Colorado 80203
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ABRIKA PROPERTIES

HAYMEADOW FILING 2
DRAINAGE PLAN

PROJECT #: 240804
SHEET NUMBER
1
1 OF 3

