

DRAINAGE CALUCULATIONS

SAM'S MART

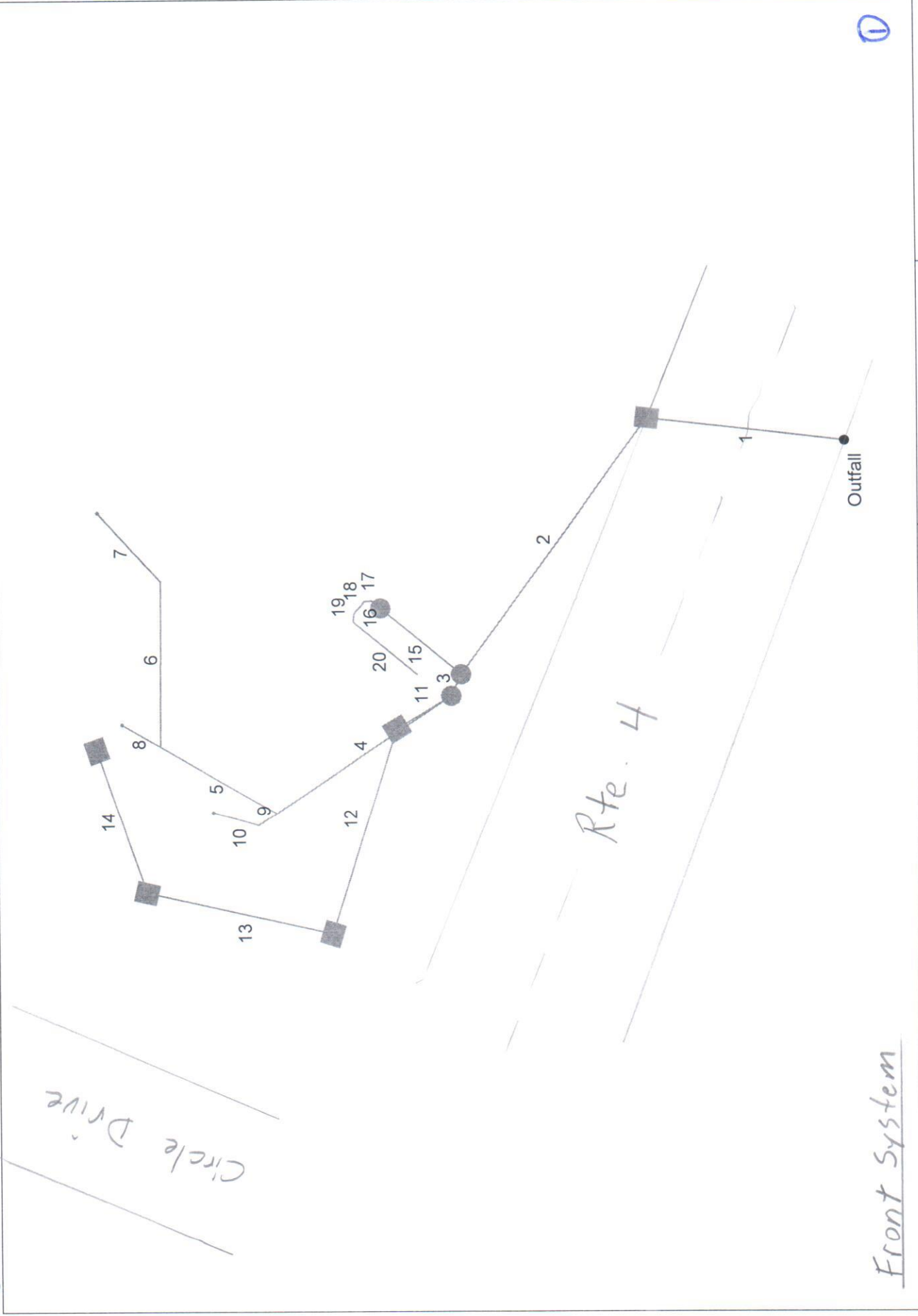
**861 NEW HARWINTON ROAD
TORRINGTON, CONNECTICUT**

JUNE 8, 2022

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Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



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Project File: Sams Mar FRT 083121.stm	Number of lines: 20	Date: 10/3/2022
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Storm Sewer Inventory Report

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	42.000	-83.279	Comb	0.00	0.00	0.98	5.0	929.00	2.38	930.00	15	Cir	0.013	1.34	933.70	Pipe - 1EX
2	1	67.000	-60.429	Comb	0.00	0.16	0.98	5.0	931.00	2.00	932.34	15	Cir	0.013	1.50	937.40	Pipe - 2EX
3	2	5.000	-11.407	MH	0.00	0.00	0.00	0.0	932.44	3.20	932.60	15	Cir	0.012	0.61	938.80	Pipe - 2
4	3	44.480	31.349	None	0.00	0.00	0.00	0.0	933.00	7.19	936.20	6	Cir	0.012	0.92	938.50	Pipe - 7
5	4	28.155	63.831	None	0.00	0.02	0.98	5.0	936.20	1.07	936.50	6	Cir	0.012	0.89	938.50	Pipe - 10
6	5	35.203	60.346	None	0.00	0.00	0.00	0.0	936.50	1.14	936.90	6	Cir	0.012	0.73	938.30	Pipe - 12
7	6	19.865	-42.870	Genr	0.00	0.02	0.98	5.0	936.90	1.01	937.10	6	Cir	0.012	1.00	938.59	Pipe - 13
8	5	9.444	0.000	Genr	0.00	0.01	0.98	5.0	936.50	1.06	936.60	6	Cir	0.012	1.00	938.50	Pipe - 11
9	4	4.657	0.036	None	0.00	0.00	0.00	0.0	936.20	2.15	936.30	6	Cir	0.012	0.80	938.50	Pipe - 8
10	9	9.827	50.206	Genr	0.00	0.01	0.98	5.0	936.30	2.04	936.50	6	Cir	0.012	1.00	938.50	Pipe - 9
11	3	13.561	34.040	DrGrt	0.00	0.00	0.00	0.0	932.62	1.18	932.78	15	Cir	0.012	1.06	937.50	Pipe - 3
12	11	45.537	-41.322	DrGrt	0.00	0.02	0.98	5.0	932.81	1.03	933.28	12	Cir	0.012	1.50	937.50	Pipe - 4
13	12	40.000	85.187	DrGrt	0.00	0.02	0.98	5.0	933.34	1.57	933.97	12	Cir	0.012	1.31	937.90	Pipe - 5
14	13	32.000	57.962	DrGrt	0.00	0.02	0.98	5.0	934.02	1.44	934.48	12	Cir	0.012	1.00	937.83	Pipe - 6
15	2	22.108	93.528	MH	0.00	0.00	0.00	0.0	932.65	0.72	932.81	8	Cir	0.012	0.15	937.64	Pipe - 19
16	15	2.438	-0.212	None	0.00	0.00	0.00	0.0	932.95	2.05	933.00	8	Cir	0.012	0.73	933.76	Pipe - 18
17	16	1.423	-43.258	None	0.00	0.00	0.00	0.0	933.00	2.11	933.03	8	Cir	0.012	0.75	933.80	Pipe - 17
18	17	3.555	-45.354	None	0.00	0.00	0.00	0.0	933.03	3.09	933.14	8	Cir	0.012	0.63	933.87	Pipe - 16
19	18	1.702	-35.325	None	0.00	0.00	0.00	0.0	933.14	2.94	933.19	8	Cir	0.012	0.86	933.55	Pipe - 15
20	19	17.551	-55.857	None	0.20	0.00	0.00	0.0	933.19	2.91	933.70	8	Cir	0.012	1.00	938.80	Pipe - 14

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Storm Sewer Tabulation

Station	Line	To Line	Len (ft)	Drng Area		Rnoff coeff	Area x C		Tc		Rain (l)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
				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		42.000	0.00	0.28	0.98	0.00	0.27	5.0	6.2	6.9	2.09	9.96	2.98	15	2.38	929.00	930.00	929.91	930.58	933.70	933.70	Pipe - 1EX
2	1		67.000	0.16	0.28	0.98	0.16	0.27	5.0	6.0	7.0	2.11	9.13	4.92	15	2.00	931.00	932.34	931.41	932.92	933.70	937.40	Pipe - 2EX
3	2		5.000	0.00	0.12	0.00	0.00	0.12	0.0	6.0	7.0	0.82	12.51	2.38	15	3.20	932.44	932.60	932.92	932.95	937.40	938.80	Pipe - 2
4	3		44.480	0.00	0.06	0.00	0.00	0.06	0.0	5.7	7.0	0.41	1.63	4.98	6	7.19	933.00	936.20	933.17	936.53	938.80	938.50	Pipe - 7
5	4		28.155	0.02	0.05	0.98	0.02	0.05	5.0	5.5	7.1	0.35	0.63	2.70	6	1.07	936.20	936.50	936.53	936.80	938.50	938.50	Pipe - 10
6	5		35.203	0.00	0.02	0.00	0.00	0.02	0.0	5.2	7.2	0.14	0.65	1.63	6	1.14	936.50	936.90	936.80	937.09	938.50	938.30	Pipe - 12
7	6		19.865	0.02	0.02	0.98	0.02	0.02	5.0	5.0	7.2	0.14	0.61	2.12	6	1.01	936.90	937.10	937.09	937.29	938.30	938.59	Pipe - 13
8	5		9.444	0.01	0.01	0.98	0.01	0.01	5.0	5.0	7.2	0.07	0.63	1.16	6	1.06	936.50	936.60	936.80	936.73	938.50	938.50	Pipe - 11
9	4		4.657	0.00	0.01	0.00	0.00	0.01	0.0	5.1	7.2	0.07	0.89	1.13	6	2.15	936.20	936.30	936.53	936.43	938.50	938.50	Pipe - 8
10	9		9.827	0.01	0.01	0.98	0.01	0.01	5.0	5.0	7.2	0.07	0.87	1.74	6	2.04	936.30	936.50	936.43	936.63	938.50	938.50	Pipe - 9
11	3		13.561	0.00	0.06	0.00	0.00	0.06	0.0	5.9	7.0	0.41	7.60	1.96	15	1.18	932.62	932.78	932.95	933.03	938.80	937.50	Pipe - 3
12	11		45.537	0.02	0.06	0.98	0.02	0.06	5.0	5.6	7.1	0.42	3.92	2.86	12	1.03	932.81	933.28	933.03	933.55	937.50	937.50	Pipe - 4
13	12		40.000	0.02	0.04	0.98	0.02	0.04	5.0	5.3	7.1	0.28	4.84	2.31	12	1.57	933.34	933.97	933.55	934.19	937.50	937.90	Pipe - 5
14	13		32.000	0.02	0.02	0.98	0.02	0.02	5.0	5.0	7.2	0.14	4.63	1.74	12	1.44	934.02	934.48	934.19	934.63	937.90	937.83	Pipe - 6
15	2		22.108	0.00	0.00	0.00	0.00	0.00	0.0	0.2	0.0	0.20	1.11	1.85	8	0.72	932.65	932.81	932.92	933.02	937.40	937.64	Pipe - 19
16	15		2.438	0.00	0.00	0.00	0.00	0.00	0.0	0.2	0.0	0.20	1.87	2.84	8	2.05	932.95	933.00	933.10	933.21	937.64	933.76	Pipe - 18
17	16		1.423	0.00	0.00	0.00	0.00	0.00	0.0	0.2	0.0	0.20	1.90	2.19	8	2.11	933.00	933.03	933.21	933.24	933.76	933.80	Pipe - 17
18	17		3.555	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	0.20	2.30	2.19	8	3.09	933.03	933.14	933.24	933.35	933.80	933.87	Pipe - 16
19	18		1.702	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	0.20	2.24	2.19	8	2.94	933.14	933.19	933.35	933.40	933.87	933.55	Pipe - 15
20	19		17.551	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.20	2.23	2.19	8	2.91	933.19	933.70	933.40	933.91	933.55	938.80	Pipe - 14

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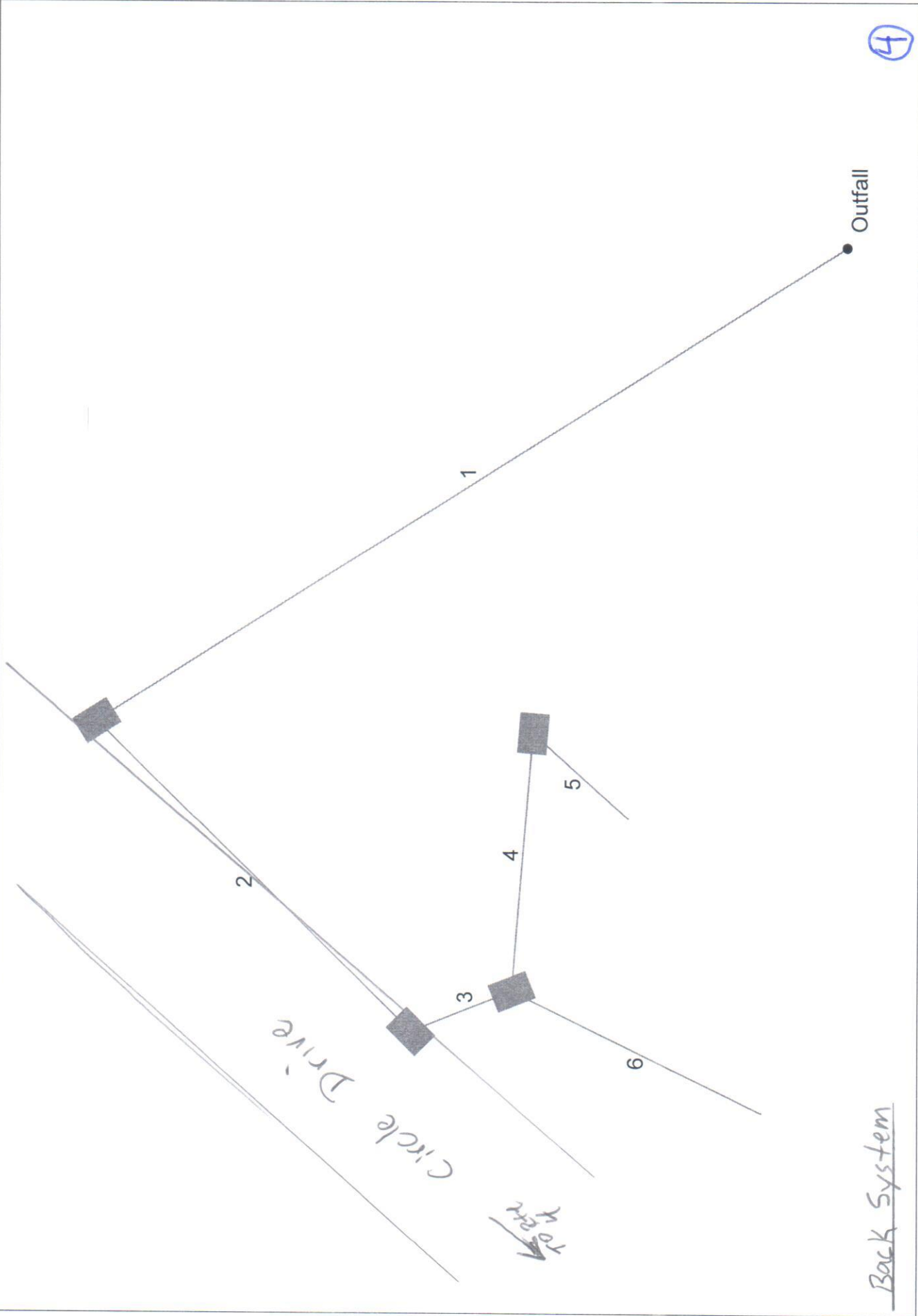
Project File: Sams Mar FRT 083121.stm

Number of lines: 20

Run Date: 10/3/2022

NOTES: intensity = 88.24 / (inlet time + 15.50) ^ 0.83 ; Return period = Yrs. 10 ; c = cir e = ellip b = box

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Back System

Project File: Sams Mar BCK 060822.stm

Number of lines: 6

Date: 10/3/2022

Storm Sewer Inventory Report

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 EI Dn (ft)	Line Slope (%)	Invert EI Up (ft)	Line Size (in)	Line Shape	N Value (n)		J-Loss Coeff (K)	Inlet/ Rim EI (ft)
1	End	118.931	-122.388	DrGrt	0.00	0.00	0.00	0.0	930.00	3.41	934.05	24	Cir	0.013	1.50	939.25	Pipe - 20 EX
2	1	59.334	-102.942	DrGrt	0.00	0.00	0.00	0.0	934.02	3.57	936.14	12	Cir	0.013	1.40	938.89	Pipe - 21 EX
3	2	14.648	-66.477	DrGrt	0.00	0.02	0.98	5.0	936.14	1.09	936.30	8	Cir	0.012	1.37	938.40	Pipe - 22
4	3	34.904	-63.659	DrGrt	0.00	0.00	0.00	0.0	936.30	1.00	936.65	6	Cir	0.012	1.50	938.00	Pipe - 23
5	4	17.211	127.515	Genr	0.00	0.03	0.98	5.0	936.65	2.03	937.00	6	Cir	0.012	1.00	938.52	Pipe - 24
6	3	37.128	47.583	Genr	0.00	0.02	0.98	5.0	936.30	1.89	937.00	6	Cir	0.012	1.00	938.35	Pipe - 25

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Storm Sewer Tabulation

Station Line	To Line	Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (l) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
			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)	Dn (ft)	
1	End	118.931	0.00	0.07	0.00	0.00	0.07	0.0	5.9	7.0	0.48	41.74	1.28	24	3.41	930.00	934.05	931.12	934.29	0.00	939.25	Pipe - 20 EX
2	1	59.334	0.00	0.07	0.00	0.00	0.07	0.0	5.5	7.1	0.49	6.73	2.74	12	3.57	934.02	936.14	934.29	936.43	939.25	938.89	Pipe - 21 EX
3	2	14.648	0.02	0.07	0.98	0.02	0.07	5.0	5.4	7.1	0.49	1.37	3.12	8	1.09	936.14	936.30	936.43	936.63	938.89	938.40	Pipe - 22
4	3	34.904	0.00	0.03	0.00	0.00	0.03	0.0	5.1	7.2	0.21	0.61	1.98	6	1.00	936.30	936.65	936.63	936.88	938.40	938.00	Pipe - 23
5	4	17.211	0.03	0.03	0.98	0.03	0.03	5.0	5.0	7.2	0.21	0.87	2.40	6	2.03	936.65	937.00	936.88	937.23	938.00	938.52	Pipe - 24
6	3	37.128	0.02	0.02	0.98	0.02	0.02	5.0	5.0	7.2	0.14	0.83	1.58	6	1.89	936.30	937.00	936.63	937.19	938.40	938.35	Pipe - 25

Project File: Sams Mar BCK 060822.stm
 Run Date: 10/3/2022
 Number of lines: 6

NOTES: Intensity = 88.24 / (Inlet time + 15.50) ^ 0.83 ; Return period = Yrs. 10 ; c = cir e = ellip b = box

Stormwater Management Plan
 861 New Harwinton Road, Torrington, Connecticut

The Owner shall maintain a log showing each item to be inspected, dates and times of inspection, names any outside contractors used to service stormwater facilities, and the inspector's name.

Stormwater Item	Activity	Schedule
Catch Basins and Yard Drains	1) Inspect catch basins to ensure grates and outlet pipes are not obstructed. Ensure hoods are in place over outlet pipes. 2) Monitor for sediment accumulation in catch basin sumps. When sediment is 1/2 the sump depth, sumps shall be cleaned with a vacuum truck and disposed of sediment in accordance with State and Federal regulations.	monthly inspection Annually – after each snow and ice season but before the spring rain season
Diversion Manhole	1) Remove cover and inspect for sediment accumulation	Annually – after each snow and ice season but before the spring rain season
Oil/Water Separator	1) Remove covers and inspect for oil and grease accumulation. 2) Inspect outlet baffle tee and confirm that it is in place and not obstructed. Repair immediately as needed. 3) Pump out water, oils, grease, and sludge. cleaned with a vacuum truck and disposed of contents in accordance with State and Federal regulations.	Quarterly Quarterly Annually – after each snow and ice season but before the spring rain season



WATER QUALITY VOLUME/FLOW ANALYSIS

Project:	Sam's Mart		
Project #:	20-132		
Address:	861 New Harwinton Rd, Torrington		
Date:	6/8/2022		
Basin ID	Oil/Water Separator		
Inflow Description	Front Parking Lot (less canopy area)		
	Catchment	Area (Acres)	Percent
	Impervious	0.14	100%
	Pervious	0	0%
	Total	0.14	100%
$WQV = \frac{(1'')(R)(A)}{12}$ <p>Where: WQV* = Water Quality Volume Storage Area (Ac-Ft) 1" = The First 1" of Rainfall (First Flush) R = Volumetric Runoff Coefficient = 0.05 + 0.009(I) I = Percent Impervious Cover Within Catchment A = Total Catchment Area (Acres) * See 2004 Connecticut Stormwater Quality Manual, Section 7.4</p>			
$WQF = (qu)(A)(Q)$ <p>Where: WQF = Water Quality Flow (cfs) q_u = Unit Peak Discharge (cfs/mi²/in) A = Drainage Area (mi²) Q = Runoff Depth (watershed inches) = [WQV_{acre-feet} x (12 in/foot)]/A_{ac-ft} CN = Curve No. P = 1" I_a = Initial Abstraction</p>			
A (Acres)=	0.14	q_u = 675	I_a = 0.041
R=	0.95	A (sq.mi) = 0.0002	I_a/P = 0.041
		Q_(in) = 0.95	
WQV Required (Ac-Ft)	0.011		
WQV Required (Cu-Ft)	482.79		
WQF (cfs)	0.14		