

STORM WATER MANAGEMENT REPORT

**Simsbury Town Hall
Hopmeadow Street
Simsbury, CT**

Prepared For:

The Town of Simsbury

Prepared By:

**F. A. Hesketh & Associates, Inc.
3 Creamery Brook
East Granby, CT 06026**



**F. A. Hesketh
& Associates, Inc.**

FAHA #19188

April 6, 2021



1. Introduction

This storm water management report has been prepared to demonstrate that the storm water management practices for the proposed reconstruction of the parking areas and driveways at the Town Hall property meet the design goals and requirements of the Town of Simsbury Stormwater and Zoning Regulations, attain the goal of the CT DEEP 2004 Stormwater Quality Manual (SWQM), follow sound engineering practices and protect adjacent landowners from adverse storm water impacts. Included in the reconstruction of the site parking, sidewalks and drives is the relocation of the main entrance drive to the north end of the property.

2. Water Quality Volume

In accordance with Chapter 7 of the 2004 CTDEEP Stormwater Quality Manual, and LID/BMP goals outlined in the Simsbury Stormwater Management regulations, two water quality bio-filter basins and three hydrodynamic structures have been included in the upgrades to the storm sewer system serving the property. Due to the lack of available undeveloped area on the property and the need to maximize parking spaces and driveway access to serve the needs of the public utilizing the Town Hall and Police Station, the area available for additional water quality features such as excavated basins or other LID design techniques is limited, and therefore the proposed combination of basins and hydrodynamic structures is the most feasible solution towards meeting WQV goals. The sizing calculations for the basins and hydrodynamic structures are included in Attachment 1.

3. Pipe to Pipe Design Analysis

The proposed development will employ a storm drain system, which is depicted on the Grading & Drainage Plan in the submittal set. The storm drains proposed to convey the runoff have been designed to handle the peak flow for a 25-year storm event. To design and analyze the system, a detailed, pipe to pipe analysis was conducted using Hydraflow Storm Sewers Extension (2008) for Windows software. This software uses the Rational Method and Manning's Formula to compute peak flow to each basin, and to calculate the capacity of individual pipes.

Input data includes the geometry and configuration of the storm drain system, catchment area of the inlet, weighted runoff coefficients, and time to inlet. The catchment areas are calculated based on proposed topography utilizing polyline delineations in AutoCAD. The catchment areas are depicted graphically on Sheet DA-1.

A weighted runoff coefficient is calculated based on percentages of landscaped and impervious areas within the catchment area.

Times to inlet were all assumed to be five minutes for catchment areas that are primarily paved. A Manning roughness coefficient of 0.013 was used for the culvert pipes analyzed. Rainfall intensity data was taken from NOAA Atlas 14 rates off

the NOAA website for the project area. A copy of the Rainfall Intensity Curve is attached.

The model calculates the capacity of the pipe and accounts for loss coefficients at inlet and outlet controls, whichever governs. Input data includes basin geometry, longitudinal slope, cross slope, and basin depression. State of CT DOT 'Type-C' basins or 'Type C-L' drains were modeled for the basin, as appropriate.

Results of analysis are attached and include summaries of system design based on CT DOT output formats. Program input and output data reports are presented in Attachment 1.

6. Summary

The analysis indicates that the proposed stormwater management system meets the design goals of incorporating Water Quality, LID and BMP practices outlined in the town stormwater regulations and CTDEEP requirements and ensures that there will be no negative impact to abutting properties or the Route 10 state drainage system for the 25-year design storm.

Attachment 1

Water Quality Sizing

Pipe to Pipe Design Analysis

Simsbury Town Hall - Simsbury , CT Water Quality Volume Size Calculations

August 26, 2020

Minimum-Recommended Water Quality Volume (WQV)

Watershed	Total Area (Ac)	Impervious Area - I (Ac)	Impervious (%)	Runoff (R)	Min. Rec. WQV (ac-ft)	Min. Rec. WQV (Cu.Ft.)
A (WQB#1)	0.30	0.12	39.9	0.4094	0.01017	443
B (WQB#2)	0.51	0.40	79.0	0.7611	0.03203	1,395

$$WQV = \frac{(1")(R)(A)}{12}$$

WQV = water quality volume (ac-ft)

R = volumetric runoff coefficient
0.05+0.009(I)

I = percent impervious cover

Provided Water Quality Volume

Water Quality Basins (Entire Basins)

Watershed	Elevations	Area	Avg. Area	Avg. Depth	Avg. Vol	Total Provided WQV (Cu. Ft.)
	(Ft.)	(Sq. Ft.)	(Sq. Ft.)	(FT)	(Cu. Ft.)	
A (WQB#1)	177.5	652	807	1.00	807	2,663
	178.5	961	1143	1.00	1143	
	179.5	1325	1427	0.50	714	
	180.0	1529				
	180.0	334	438	0.50	219	
B (WQB#2)	180.5	542	680	0.50	340	1,679
	181.0	817	1121	1.00	1121	
	182.0	1424				

TOTAL PROVIDED WATER QUALITY VOLUME (WQV) ***

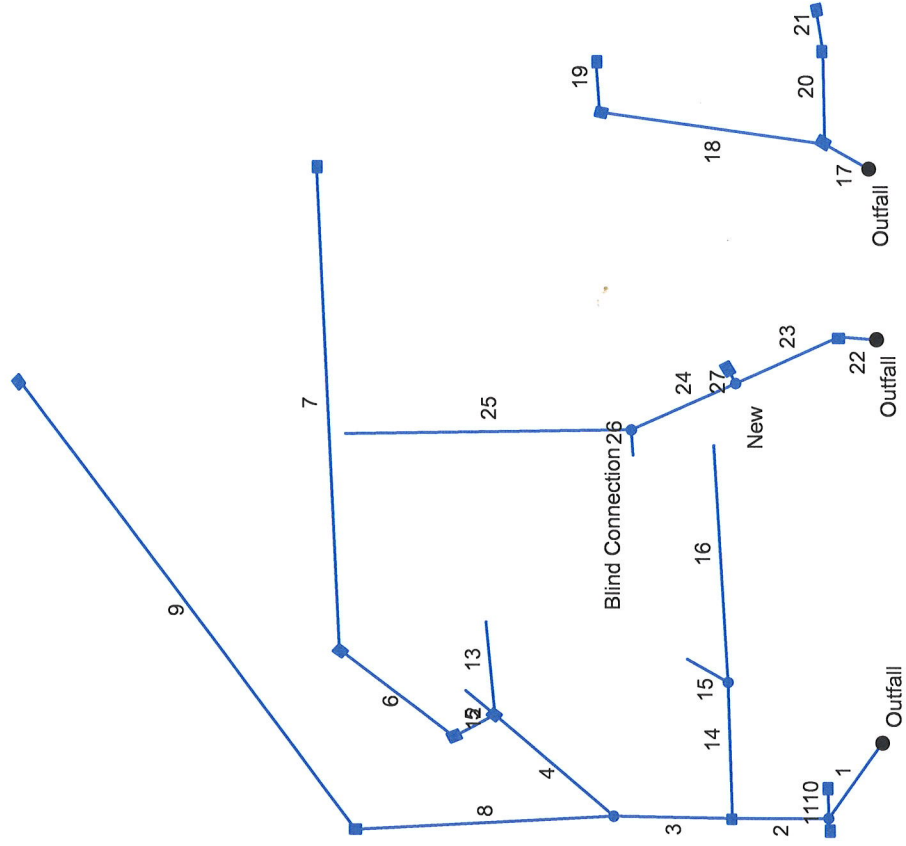
Watershed A = 2,663 Cu. Ft.

Watershed B = 1,679 Cu. Ft.

Stormceptor Areas For Sizing

cb	total	imper		
cb2	0	0		
cb3	5706	4603		
cb4	3219	4603		
cb4a	13325	0		
cb4b	34479	0		
cb5	14898	14259		
cb6	4859	793		
cb7	12026	4061		
cb8	15728	8229		
	104240	36548	% imper	35%
	2.39 ac			
cb9	26644	20421		
wq2	11008	8698		
	37652	29119	% imper	77%
	0.86 ac			
cb10	15947	12404		
cb10b	17306	7289		
cb11	3199	1620		
cb12	5266	2775		
wq2	11008	8698		
	52726	32786	% imper	62%
	1.21 ac			

Hydraflow Storm Sewers Plan



Storm Sewer Tabulation

Station	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)	
1	End	44	0.00	0.99	0.00	0.00	0.67	5.0	40.8	2.8	1.87	9.23	3.16	18	0.77	174.50	174.84	175.09	175.36	0.00	179.44	
2	1	46	0.00	0.90	0.00	0.00	0.59	5.0	40.2	2.8	1.66	22.76	4.19	18	4.70	175.17	177.33	175.53	177.82	179.44	182.63	
3	2	56	0.00	0.82	0.00	0.00	0.52	0.0	39.3	2.9	1.48	19.44	2.85	18	3.43	177.43	179.35	177.98	179.81	182.63	184.75	
4	3	74	0.00	0.42	0.00	0.00	0.38	5.0	7.7	7.4	2.81	5.20	4.24	15	0.65	179.35	179.83	180.01	180.50	184.75	183.43	
5	4	22	0.00	0.20	0.00	0.00	0.18	5.0	7.5	7.5	1.36	4.56	1.77	12	1.64	179.93	180.29	181.18	181.20	183.43	184.64	
6	5	68	0.00	0.20	0.00	0.00	0.18	5.0	6.8	7.8	1.41	7.66	2.68	12	4.63	180.29	183.44	181.27	183.94	184.64	190.34	
7	6	228	0.20	0.20	0.90	0.18	0.18	5.0	5.0	9.0	1.62	4.22	3.41	12	1.40	183.44	186.64	184.08	187.18	190.34	192.04	
8	3	123	0.17	0.40	0.35	0.06	0.14	15.0	36.2	3.0	0.42	8.10	1.61	12	5.17	179.35	185.71	179.97	185.99	184.75	190.91	
9	8	264	0.23	0.23	0.35	0.08	0.08	25.0	25.0	3.8	0.31	8.04	1.69	12	5.10	185.71	199.18	186.07	199.42	190.91	201.68	
10	1	14	0.05	0.05	0.90	0.05	0.05	5.0	5.0	9.0	0.40	3.56	1.94	12	1.00	175.17	175.31	175.54	175.58	179.44	180.00	
11	1	6	0.04	0.04	0.90	0.04	0.04	5.0	5.0	9.0	0.32	3.56	1.90	12	1.00	175.17	175.23	175.47	175.47	179.44	180.17	
12	4	18	0.11	0.11	0.90	0.10	0.10	5.0	5.0	9.0	0.89	2.63	4.62	6	22.06	180.08	184.05	180.96	184.51	183.43	184.05	RL
13	4	44	0.11	0.11	0.90	0.10	0.10	5.0	5.0	9.0	0.89	1.68	4.62	6	9.02	180.08	184.05	180.96	184.51	183.43	184.05	RL
14	2	64	0.00	0.08	0.00	0.00	0.07	0.0	7.0	7.8	0.56	2.62	4.48	8	4.72	178.93	181.96	179.14	182.31	182.63	184.05	RL
15	14	22	0.04	0.04	0.90	0.04	0.04	5.0	5.0	9.0	0.32	3.72	1.84	8	9.50	181.96	184.05	182.44	184.32	184.05	184.05	RL
16	14	112	0.04	0.04	0.90	0.04	0.04	5.0	5.0	9.0	0.32	1.65	1.84	8	1.87	181.96	184.05	182.44	184.32	184.05	184.05	RL
17	End	24	0.00	0.27	0.00	0.00	0.24	5.0	6.3	8.1	1.92	6.30	3.95	12	3.13	173.85	174.60	174.45	175.19	177.85	177.90	
18	17	108	0.00	0.18	0.00	0.00	0.15	5.0	5.2	8.8	1.37	5.72	2.79	12	2.58	174.60	177.39	175.39	177.89	177.90	181.83	
19	18	24	0.18	0.18	0.86	0.15	0.15	5.0	5.0	9.0	1.39	3.56	3.08	12	1.00	177.39	177.63	178.03	178.13	181.83	181.56	
20	17	44	0.03	0.09	0.90	0.03	0.08	5.0	5.5	8.6	0.70	5.26	1.89	12	1.05	174.60	175.06	175.42	175.42	177.90	178.38	
21	20	20	0.06	0.06	0.90	0.05	0.05	5.0	5.0	9.0	0.49	3.56	1.71	12	1.00	175.06	175.26	175.59	175.58	178.38	178.50	
22	End	18	0.00	0.28	0.00	0.00	0.17	5.0	15.9	5.0	0.85	5.37	2.93	12	2.28	174.16	174.57	174.56	174.96	177.06	177.27	

Project File: 2020-08-07.stm

Number of lines: 27

Run Date: 04-06-2021

NOTES: Intensity = 44.62 / (Inlet time + 4.00) ^ 0.73; Return period = 25 Yrs. ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station	Line	To Line	Len (ft)	Drng Area (ac)		Rknoff coeff (C)	Area x C		Tc (min)		Rain (l) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev (ft)		HGL Elev (ft)		Grnd / Rim Elev (ft)		Line ID
				Incr	Total		Incr	Total	Inlet	Syst					Size (in)	Slope (%)	Dn	Up	Dn	Up	Dn	Up	
23	22		54	0.00	0.28	0.00	0.00	0.17	0.0	15.1	5.2	0.87	7.96	3.22	12	5.00	174.72	177.42	175.08	177.82	177.27	182.95	
24	23		54	0.00	0.16	0.00	0.00	0.14	0.0	5.7	8.5	1.23	7.96	3.26	12	5.00	177.42	180.12	177.92	180.59	182.95	188.63	(2)
25	24		136	0.08	0.08	0.90	0.07	0.07	5.0	5.0	9.0	0.65	0.95	3.56	6	2.89	180.12	184.05	180.60	184.46	188.63	184.05	RL
26	24		12	0.08	0.08	0.90	0.07	0.07	5.0	5.0	9.0	0.65	3.18	3.81	6	32.08	180.20	184.05	180.60	184.46	188.63	184.05	RL
27	23		8	0.12	0.12	0.20	0.02	0.02	15.0	15.0	5.2	0.13	0.55	1.86	4	7.25	177.42	178.00	177.93	178.20	182.95	181.20	

Project File: 2020-08-07.stm

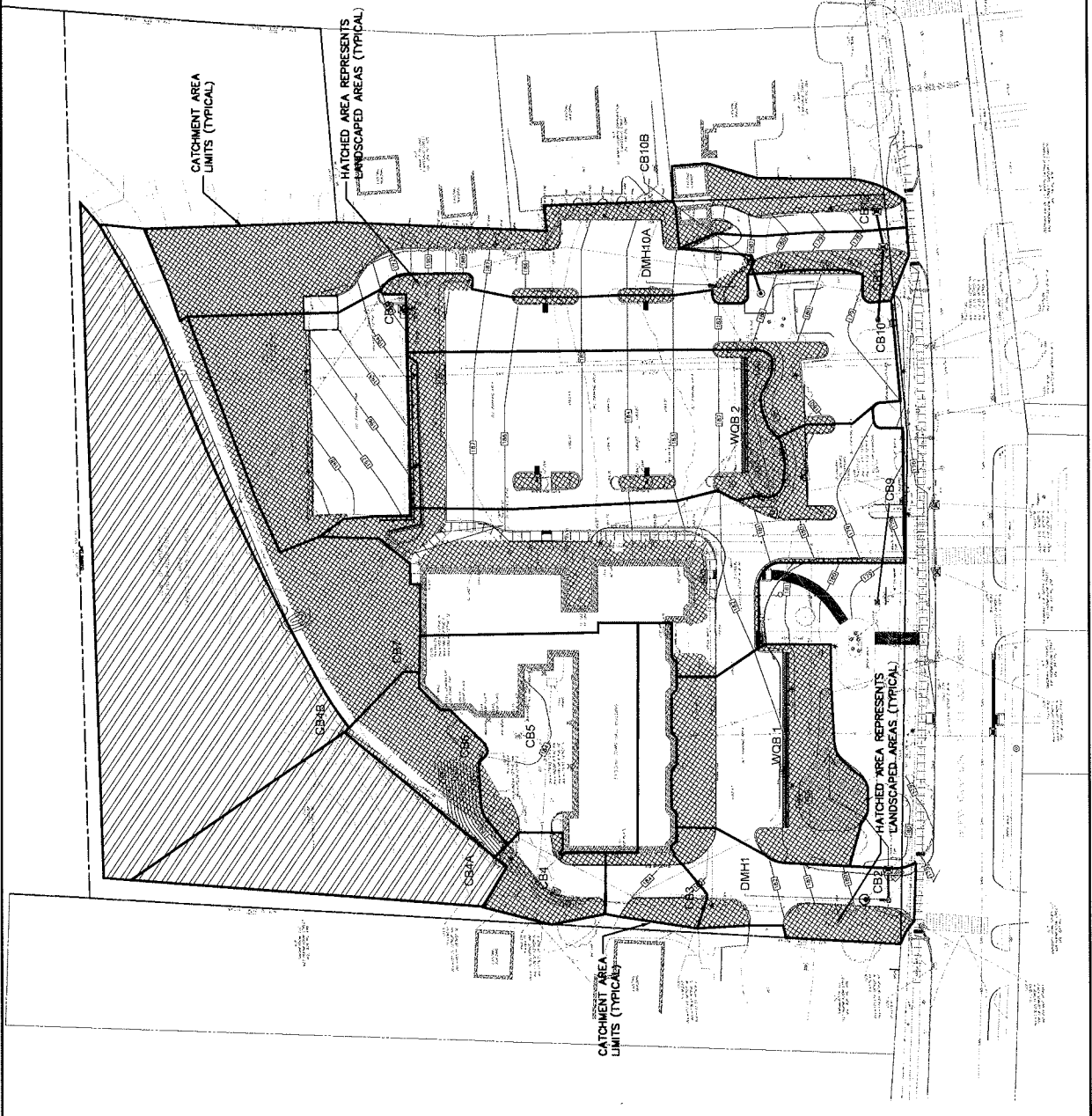
Number of lines: 27

Run Date: 04-06-2021

NOTES: Intensity = 44.62 / (inlet time + 4.00) ^ 0.73; Return period = 25 Yrs. ; c = cir e = ellip b = box

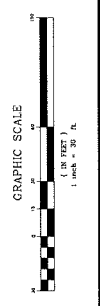
PIPE-TO-PIPE ANALYSIS PLAN
 TOWN OF SMSBURY
 933 HORNADOWN STREET
 SMSBURY, CONNECTICUT
 Scale: 1" = 20'
 Checked by: DWT
 Sheet No. 1 OF 1
 Date: 08/25/2020
 Project No. 19108

No. Date Description
 Revisions
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- LEGEND**
- ▣ PROPOSED CATCH BASIN
 - ▣ PROPOSED BRANCH MANHOLE
 - ▣ PROPOSED PLUMBED END SECTION
 - ▣ PROPOSED WATER GATE VALVE
 - ▣ PROPOSED SPOT GRADE
 - ▣ PROPOSED CONTOUR
 - ▣ PROPOSED MANHOLE
 - ▣ PROPOSED SEPARATOR STRUCTURE
 - ▣ PROPOSED CONSTRUCTION EXIT (CE)
 - ▣ PROPOSED MANHOLE CHECK DAM (HCD)
 - ▣ PROPOSED MANHOLE EROSION CONTROL (HEC)
 - ▣ PROPOSED RIPRAP PLUNGE POOL (RPP)
 - ▣ PROPOSED STURDY FENCE EROSION CONTROL (STFC)
- SOIL TYPE INDEX**
- M9 - Silt/loam, Shaker and Mopald soils
 - NON-CLAYEUS - Upland soils
 - 25 - Emerald fine sandy loam
 - JUG - Upland soils, smoothed

Catch Basin Number	Catch Basin Areas		Wooded Area (sq ft)
	Total Area (sq ft)	Impervious Area (sq ft)	
CB 2	6,933 (0.159 AC)	4,380 (0.100 AC)	2,553 (0.059 AC)
CB 3	5,706 (0.131 AC)	4,050 (0.093 AC)	1,656 (0.038 AC)
CB 4	13,216 (0.304 AC)	11,507 (0.264 AC)	1,709 (0.039 AC)
CB 4A	13,325 (0.305 AC)	0 (0.000 AC)	13,325 (0.304 AC)
CB 4B	13,325 (0.305 AC)	0 (0.000 AC)	13,325 (0.304 AC)
CB 4C	14,258 (0.327 AC)	14,258 (0.327 AC)	0 (0.000 AC)
CB 5	4,856 (0.112 AC)	0 (0.000 AC)	4,856 (0.112 AC)
CB 6	17,736 (0.405 AC)	17,736 (0.405 AC)	0 (0.000 AC)
CB 7	15,778 (0.361 AC)	8,229 (0.188 AC)	7,549 (0.173 AC)
CB 8	25,642 (0.589 AC)	25,642 (0.589 AC)	0 (0.000 AC)
CB 9	15,947 (0.365 AC)	13,404 (0.306 AC)	2,543 (0.058 AC)
CB 10	17,358 (0.397 AC)	7,289 (0.166 AC)	10,069 (0.231 AC)
CB 10B	17,358 (0.397 AC)	7,289 (0.166 AC)	10,069 (0.231 AC)
CB 11	5,266 (0.121 AC)	2,775 (0.063 AC)	2,491 (0.057 AC)
CB 12	13,001 (0.298 AC)	5,193 (0.118 AC)	7,808 (0.180 AC)
WOB 1	13,325 (0.304 AC)	0 (0.000 AC)	13,325 (0.304 AC)
WOB 2	13,325 (0.304 AC)	0 (0.000 AC)	13,325 (0.304 AC)



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)
1	End	44	-144	MH	0.00	0.00	0.00	5.0	174.50	0.77	174.84	18	Cir	0.013	1.00	179.44
2	1	46	54	Comb	0.00	0.00	0.00	5.0	175.17	4.70	177.33	18	Cir	0.013	1.50	182.63
3	2	56	1	MH	0.00	0.00	0.00	0.0	177.43	3.43	179.35	18	Cir	0.013	0.68	184.75
4	3	74	39	Comb	0.00	0.00	0.00	5.0	179.35	0.65	179.83	15	Cir	0.013	1.67	183.43
5	4	22	-68	Comb	0.00	0.00	0.00	5.0	179.93	1.64	180.29	12	Cir	0.013	1.38	184.64
6	5	68	65	Comb	0.00	0.00	0.00	5.0	180.29	4.63	183.44	12	Cir	0.013	1.21	190.34
7	6	228	50	Comb	0.00	0.20	0.90	5.0	183.44	1.40	186.64	12	Cir	0.013	1.00	192.04
8	3	123	-4	Comb	0.00	0.17	0.35	15.0	179.35	5.17	185.71	12	Cir	0.013	1.29	190.91
9	8	264	56	Comb	0.00	0.23	0.35	25.0	185.71	5.10	199.18	12	Cir	0.013	1.00	201.68
10	1	14	143	Comb	0.00	0.05	0.90	5.0	175.17	1.00	175.31	12	Cir	0.013	1.00	180.00
11	1	6	-37	Comb	0.00	0.04	0.90	5.0	175.17	1.00	175.23	12	Cir	0.013	1.00	180.17
12	4	18	-1	None	0.00	0.11	0.90	5.0	180.08	22.06	184.05	6	Cir	0.013	1.00	184.05
13	4	44	44	None	0.00	0.11	0.90	5.0	180.08	9.02	184.05	6	Cir	0.013	1.00	184.05
14	2	64	88	MH	0.00	0.00	0.00	0.0	178.93	4.72	181.96	8	Cir	0.013	0.88	184.05
15	14	22	-58	None	0.00	0.04	0.90	5.0	181.96	9.50	184.05	8	Cir	0.013	1.00	184.05
16	14	112	-2	None	0.00	0.04	0.90	5.0	181.96	1.87	184.05	8	Cir	0.013	1.00	184.05
17	End	24	-61	Comb	0.00	0.00	0.00	5.0	173.85	3.13	174.60	12	Cir	0.013	1.33	177.90
18	17	108	-21	Comb	0.00	0.00	0.00	5.0	174.60	2.58	177.39	12	Cir	0.013	1.47	181.83
19	18	24	78	Comb	0.00	0.18	0.86	5.0	177.39	1.00	177.63	12	Cir	0.013	1.00	181.56
20	17	44	60	Comb	0.00	0.03	0.90	5.0	174.60	1.05	175.06	12	Cir	0.009	0.50	178.38
21	20	20	-8	Comb	0.00	0.06	0.90	5.0	175.06	1.00	175.26	12	Cir	0.013	1.00	178.50
22	End	18	-86	Comb	0.00	0.00	0.00	5.0	174.16	2.28	174.57	12	Cir	0.013	0.79	177.27

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)
23	22	54	-28	MH	0.00	0.00	0.00	0.0	174.72	5.00	177.42	12	Cir	0.013	1.00	182.95
24	23	54	0	MH	0.00	0.00	0.00	0.0	177.42	5.00	180.12	12	Cir	0.013	0.95	188.63
25	24	136	23	None	0.00	0.08	0.90	5.0	180.12	2.89	184.05	6	Cir	0.013	1.00	184.05
26	24	12	-69	None	0.00	0.08	0.90	5.0	180.20	32.08	184.05	6	Cir	0.013	1.00	184.05
27	23	8	84	Comb	0.00	0.12	0.20	15.0	177.42	7.25	178.00	4	Cir	0.012	1.00	181.20
Project File: 2020-08-07.stm Number of lines: 27 Date: 04-06-2021																

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev. (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1		Manhole	179.44	Cir	4.00	4.00	18	Cir	174.84	18	Cir	175.17
2		Combination	182.63	Rect	4.00	4.00	18	Cir	177.33	18	Cir	175.17
3		Manhole	184.75	Cir	4.00	4.00	18	Cir	179.35	15	Cir	179.35
4		Combination	183.43	Rect	5.33	4.33	15	Cir	179.83	12	Cir	179.35
5		Combination	184.64	Rect	5.33	4.33	12	Cir	180.29	12	Cir	180.29
6		Combination	190.34	Rect	5.33	4.33	12	Cir	183.44	12	Cir	183.44
7		Combination	192.04	Rect	5.33	4.33	12	Cir	186.64	12	Cir	180.08
8		Combination	190.91	Rect	5.33	4.33	12	Cir	185.71	12	Cir	180.08
9		Combination	201.68	Rect	5.33	4.33	12	Cir	199.18	12	Cir	180.08
10		Combination	180.00	Rect	5.33	4.33	12	Cir	175.31	12	Cir	180.08
11		Combination	180.17	Rect	5.33	4.33	12	Cir	175.23	12	Cir	180.08
12		None	184.05	n/a	n/a	n/a	6	Cir	184.05	6	Cir	181.96
13		None	184.05	n/a	n/a	n/a	6	Cir	184.05	6	Cir	181.96
14		Manhole	184.05	Cir	4.00	4.00	8	Cir	181.96	8	Cir	181.96
15		None	184.05	n/a	n/a	n/a	8	Cir	184.05	8	Cir	174.60
16		None	184.05	n/a	n/a	n/a	8	Cir	184.05	12	Cir	174.60
17		Combination	177.90	Rect	5.33	4.33	12	Cir	174.60	12	Cir	174.60
18		Combination	181.83	Rect	5.33	4.33	12	Cir	177.39	12	Cir	177.39
19		Combination	181.56	Rect	5.33	4.33	12	Cir	177.63	12	Cir	177.39

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev. (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
20		Combination	178.38	Rect	5.33	4.33	12	Cir	175.06	12	Cir	175.06
21		Combination	178.50	Rect	5.33	4.33	12	Cir	175.26	12	Cir	174.72
22		Combination	177.27	Rect	5.33	4.33	12	Cir	174.57	12	Cir	177.42
23	New	Manhole	182.95	Cir	4.00	4.00	12	Cir	177.42	4	Cir	177.42
24	Blind Connection	Manhole	188.63	Cir	4.00	4.00	12	Cir	180.12	6	Cir	180.12
25		None	184.05	n/a	n/a	n/a	6	Cir	184.05	6	Cir	180.20
26		None	184.05	n/a	n/a	n/a	6	Cir	184.05	6	Cir	180.20
27		Combination	181.20	Rect	5.33	4.33	4	Cir	178.00	6	Cir	180.20

Storm Sewer Summary Report

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		1.87	18	Cir	44	174.50	174.84	0.773	175.09	175.36	n/a	175.36 j	End	Manhole
2		1.66	18	Cir	46	175.17	177.33	4.696	175.53	177.82	0.25	177.82	1	Combination
3		1.48	18	Cir	56	177.43	179.35	3.429	177.98	179.81	n/a	179.81 j	2	Manhole
4		2.81	15	Cir	74	179.35	179.83	0.649	180.01	180.50	0.45	180.96	3	Combination
5		1.36	12	Cir	22	179.93	180.29	1.636	181.18	181.20	0.07	181.27	4	Combination
6		1.41	12	Cir	68	180.29	183.44	4.632	181.27	183.94	n/a	183.94 j	5	Combination
7		1.62	12	Cir	228	183.44	186.64	1.404	184.08	187.18	n/a	187.18 j	6	Combination
8		0.42	12	Cir	123	179.35	185.71	5.171	179.97	185.99	n/a	185.99 j	3	Combination
9		0.31	12	Cir	264	185.71	199.18	5.102	186.07	199.42	n/a	199.42 j	8	Combination
10		0.40	12	Cir	14	175.17	175.31	1.000	175.54	175.58	n/a	175.67 j	1	Combination
11		0.32	12	Cir	6	175.17	175.23	1.000	175.47	175.47	n/a	175.55 j	1	Combination
12	RL	0.89	6	Cir	18	180.08	184.05	22.056	180.96	184.51	n/a	184.51 j	4	None
13	RL	0.89	6	Cir	44	180.08	184.05	9.023	180.96	184.51	n/a	184.51 j	4	None
14	RL	0.56	8	Cir	64	178.93	181.96	4.723	179.14	182.31	0.12	182.31	2	Manhole
15	RL	0.32	8	Cir	22	181.96	184.05	9.500	182.44	184.32	n/a	184.32 j	14	None
16	RL	0.32	8	Cir	112	181.96	184.05	1.866	182.44	184.32	n/a	184.32 j	14	None
17		1.92	12	Cir	24	173.85	174.60	3.125	174.45	175.19	n/a	175.19 j	End	Combination
18		1.37	12	Cir	108	174.60	177.39	2.583	175.39	177.89	n/a	177.89 j	17	Combination
19		1.39	12	Cir	24	177.39	177.63	1.000	178.03	178.13	n/a	178.13 j	18	Combination
20		0.70	12	Cir	44	174.60	175.06	1.045	175.42	175.42	n/a	175.48 j	17	Combination
21		0.49	12	Cir	20	175.06	175.26	1.000	175.59	175.58	0.08	175.66	20	Combination
22		0.85	12	Cir	18	174.16	174.57	2.278	174.56	174.96	n/a	174.96 j	End	Combination
23		0.87	12	Cir	54	174.72	177.42	5.000	175.08	177.82	n/a	177.82	22	Manhole

Project File: 2020-08-07.stm

Number of lines: 27

Run Date: 04-06-2021

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

Storm Sewer Summary Report

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
24	(2)	1.23	12	Cir	54	177.42	180.12	5.000	177.92	180.59	n/a	180.59 j	23	Manhole
25	RL	0.65	6	Cir	136	180.12	184.05	2.890	180.60	184.46	n/a	184.46 j	24	None
26	RL	0.65	6	Cir	12	180.20	184.05	32.083	180.60	184.46	n/a	184.46	24	None
27		0.13	4	Cir	8	177.42	178.00	7.250	177.93	178.20	n/a	178.20 j	23	Combination

Project File: 2020-08-07.stm
 Number of lines: 27
 Run Date: 04-06-2021

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



NOAA Atlas 14, Volume 10, Version 3
 Location name: Simsbury, Connecticut, USA*
 Latitude: 41.8805°, Longitude: -72.8009°
 Elevation: 185.86 ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite
 NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aeriels](#)

PF tabular

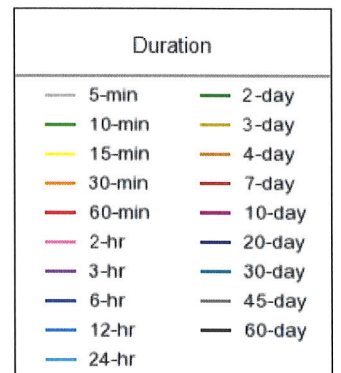
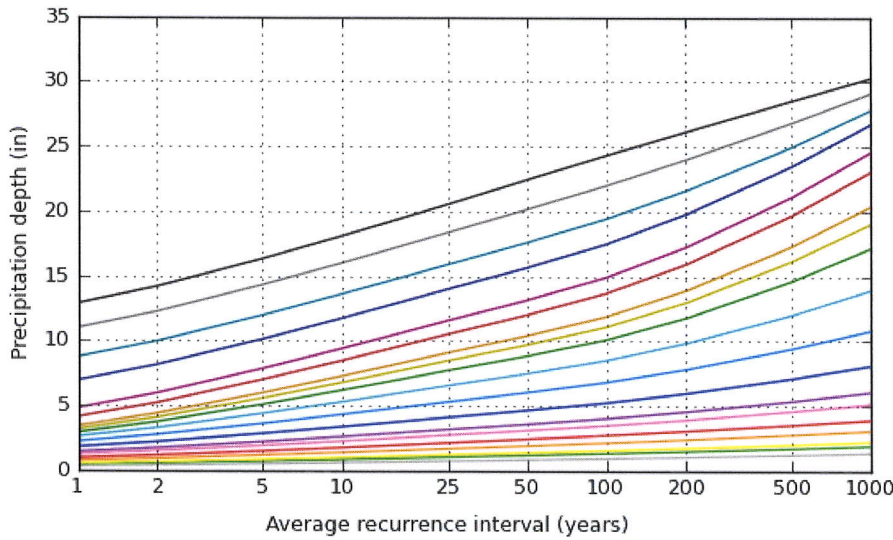
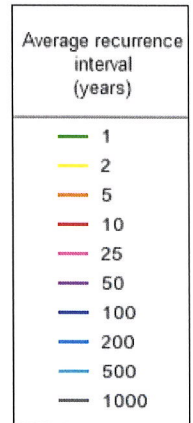
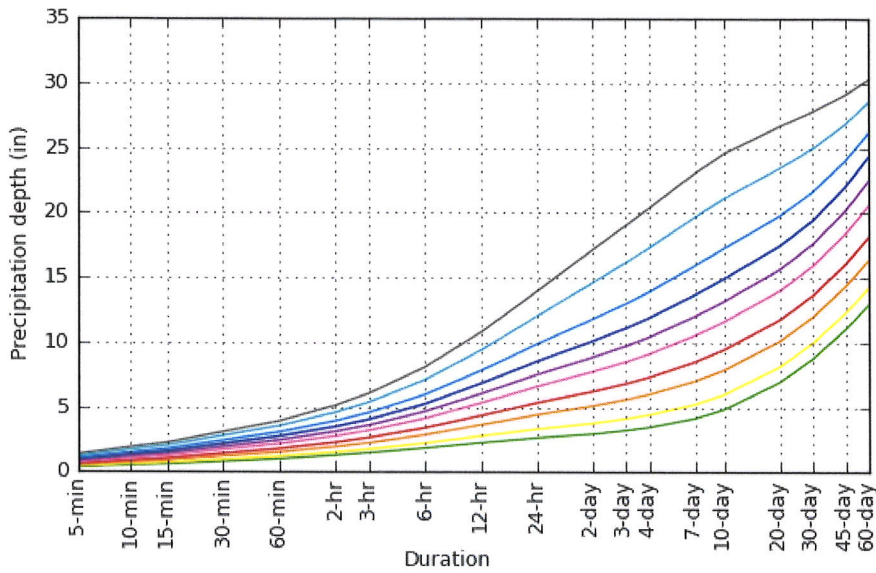
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.348 (0.268-0.450)	0.417 (0.320-0.539)	0.529 (0.405-0.686)	0.622 (0.474-0.811)	0.750 (0.554-1.02)	0.846 (0.614-1.18)	0.947 (0.668-1.37)	1.06 (0.711-1.58)	1.22 (0.788-1.88)	1.35 (0.853-2.13)
10-min	0.493 (0.379-0.637)	0.591 (0.454-0.763)	0.750 (0.575-0.973)	0.881 (0.671-1.15)	1.06 (0.785-1.45)	1.20 (0.868-1.67)	1.34 (0.946-1.95)	1.50 (1.01-2.24)	1.73 (1.12-2.67)	1.91 (1.21-3.02)
15-min	0.581 (0.446-0.749)	0.695 (0.534-0.898)	0.881 (0.675-1.14)	1.04 (0.789-1.35)	1.25 (0.923-1.71)	1.41 (1.02-1.97)	1.58 (1.11-2.29)	1.77 (1.18-2.63)	2.03 (1.31-3.14)	2.25 (1.42-3.55)
30-min	0.784 (0.603-1.01)	0.942 (0.723-1.22)	1.20 (0.919-1.56)	1.41 (1.08-1.84)	1.71 (1.26-2.33)	1.93 (1.40-2.70)	2.16 (1.52-3.14)	2.42 (1.62-3.60)	2.78 (1.80-4.30)	3.08 (1.95-4.86)
60-min	0.988 (0.760-1.27)	1.19 (0.913-1.54)	1.52 (1.16-1.97)	1.79 (1.36-2.34)	2.16 (1.60-2.96)	2.45 (1.77-3.42)	2.74 (1.93-3.98)	3.07 (2.06-4.57)	3.53 (2.29-5.46)	3.91 (2.47-6.18)
2-hr	1.27 (0.985-1.63)	1.53 (1.18-1.96)	1.94 (1.50-2.50)	2.28 (1.75-2.96)	2.76 (2.05-3.75)	3.11 (2.28-4.34)	3.49 (2.49-5.07)	3.93 (2.64-5.83)	4.58 (2.97-7.05)	5.13 (3.26-8.07)
3-hr	1.47 (1.14-1.87)	1.76 (1.37-2.25)	2.24 (1.73-2.88)	2.64 (2.03-3.41)	3.19 (2.39-4.33)	3.60 (2.64-5.01)	4.04 (2.90-5.88)	4.56 (3.08-6.75)	5.37 (3.49-8.24)	6.05 (3.85-9.49)
6-hr	1.84 (1.44-2.33)	2.23 (1.74-2.83)	2.87 (2.23-3.66)	3.40 (2.63-4.36)	4.13 (3.11-5.59)	4.66 (3.45-6.48)	5.25 (3.80-7.65)	5.98 (4.05-8.80)	7.11 (4.64-10.9)	8.10 (5.17-12.6)
12-hr	2.26 (1.78-2.84)	2.78 (2.19-3.51)	3.64 (2.85-4.61)	4.35 (3.39-5.54)	5.33 (4.04-7.18)	6.04 (4.51-8.38)	6.83 (4.99-9.94)	7.83 (5.32-11.5)	9.41 (6.16-14.3)	10.8 (6.91-16.8)
24-hr	2.63 (2.09-3.29)	3.31 (2.62-4.14)	4.41 (3.48-5.55)	5.32 (4.18-6.74)	6.58 (5.03-8.85)	7.50 (5.64-10.4)	8.52 (6.29-12.4)	9.86 (6.72-14.4)	12.0 (7.88-18.2)	13.9 (8.93-21.5)
2-day	2.95 (2.35-3.66)	3.77 (3.00-4.69)	5.11 (4.06-6.38)	6.22 (4.91-7.82)	7.75 (5.97-10.4)	8.85 (6.72-12.2)	10.1 (7.54-14.8)	11.8 (8.07-17.1)	14.6 (9.62-22.0)	17.2 (11.0-26.4)
3-day	3.21 (2.57-3.98)	4.11 (3.29-5.10)	5.59 (4.46-6.96)	6.81 (5.40-8.54)	8.50 (6.58-11.4)	9.72 (7.41-13.4)	11.1 (8.32-16.2)	13.0 (8.90-18.8)	16.2 (10.6-24.3)	19.0 (12.3-29.2)
4-day	3.46 (2.78-4.27)	4.42 (3.55-5.47)	6.00 (4.80-7.45)	7.31 (5.81-9.13)	9.11 (7.07-12.2)	10.4 (7.96-14.3)	11.9 (8.94-17.3)	13.9 (9.55-20.1)	17.3 (11.4-26.0)	20.4 (13.2-31.2)
7-day	4.14 (3.35-5.09)	5.24 (4.22-6.44)	7.02 (5.65-8.67)	8.50 (6.79-10.6)	10.5 (8.21-14.0)	12.0 (9.21-16.4)	13.7 (10.3-19.8)	15.9 (11.0-22.9)	19.7 (13.0-29.4)	23.0 (14.9-35.1)
10-day	4.83 (3.91-5.91)	5.98 (4.84-7.33)	7.87 (6.35-9.68)	9.43 (7.56-11.7)	11.6 (9.05-15.3)	13.1 (10.1-17.9)	14.9 (11.2-21.4)	17.3 (11.9-24.7)	21.1 (14.0-31.4)	24.5 (15.9-37.3)
20-day	6.97 (5.69-8.47)	8.17 (6.66-9.94)	10.1 (8.24-12.4)	11.8 (9.50-14.5)	14.0 (11.0-18.2)	15.7 (12.0-21.0)	17.5 (13.1-24.6)	19.8 (13.8-28.2)	23.5 (15.6-34.7)	26.7 (17.4-40.4)
30-day	8.77 (7.19-10.6)	9.99 (8.18-12.1)	12.0 (9.78-14.6)	13.6 (11.1-16.7)	15.9 (12.5-20.5)	17.6 (13.5-23.3)	19.4 (14.5-26.9)	21.6 (15.1-30.6)	25.0 (16.7-36.8)	27.8 (18.1-41.9)
45-day	11.0 (9.07-13.3)	12.3 (10.1-14.8)	14.3 (11.7-17.4)	16.0 (13.0-19.6)	18.4 (14.4-23.5)	20.2 (15.4-26.4)	22.0 (16.3-29.9)	24.0 (16.8-33.8)	26.8 (18.0-39.4)	29.1 (19.0-43.8)
60-day	12.9 (10.6-15.5)	14.2 (11.7-17.1)	16.3 (13.4-19.7)	18.1 (14.8-22.0)	20.6 (16.1-26.0)	22.4 (17.2-29.1)	24.3 (17.9-32.7)	26.2 (18.4-36.7)	28.5 (19.2-41.7)	30.3 (19.8-45.4)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

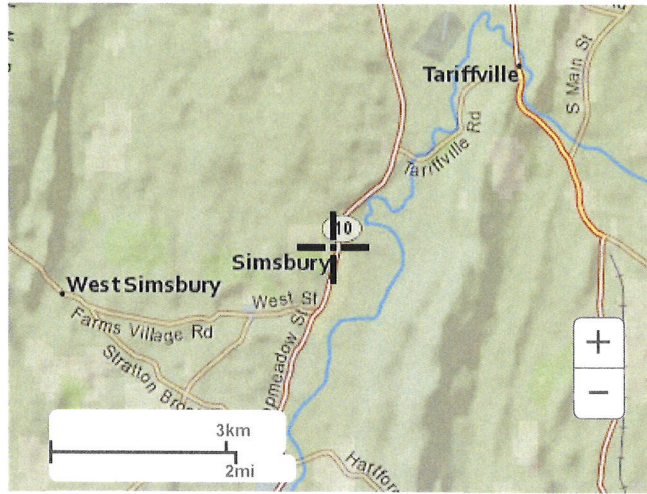
PDS-based depth-duration-frequency (DDF) curves
 Latitude: 41.8805°, Longitude: -72.8009°



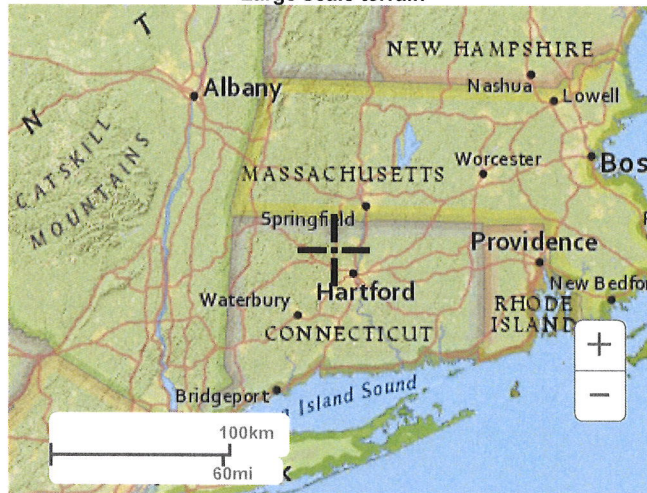
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Maps & aerials

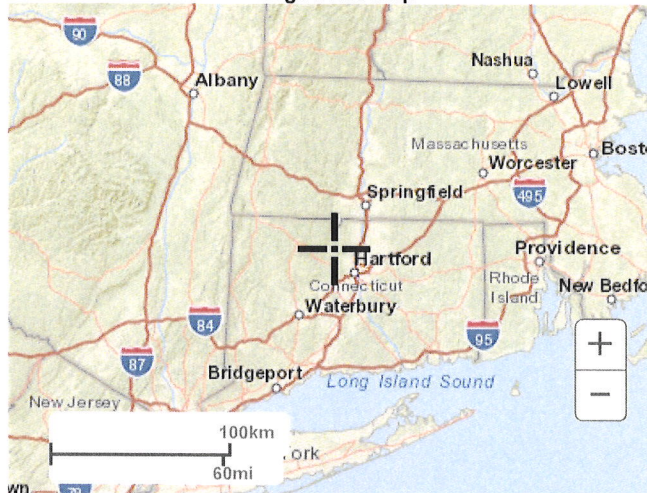
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial