
SITE ENGINEERING REPORT

Prepared For

Monday Properties
900 Long Ridge Road
Stamford, CT 06902

Prepared by

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22 First Street
Stamford, CT
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(revisions in bold and italicized)

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& MEAD**

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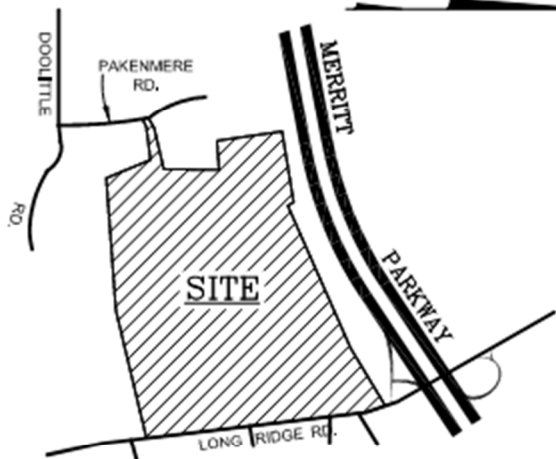
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- Appendix B: **Water Quality Volume Calculations, Total Suspended Solids /Oil Grit Separator Sizing**, Pond Sizing, Temporary Sediment Trap Calculations
- Appendix C: **HydroCAD Report**
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BLOCK: 375 ZONE: C-D
RA-1



STAMFORD, CT.

ORIENTATION

Narrative

Project Description:

The owner of 900 Long Ridge Road, Monday Properties, is seeking approval to construct four (4) multi-family residential buildings. Included with the development will be the demolition of the two (2) existing office buildings and one surface parking lot and the construction of four (4) multi-family residential buildings, parking and circulation around the buildings the reconfiguration of one existing parking lot and upgrades to the existing trail network in the eastern portion of the property. The size of the property is 36.5869 acres and is primarily located in the CD zone on the western side of Long Ridge Road. The property is served by public water supply and connected into the public sewer system on Oaklawn Avenue.

Existing Conditions:

900 Long Ridge Road is currently developed with two office buildings, parking garage, multiple surface parking lots, walks and patios and other improvements typical of a large office complex. The development is primarily located in the western portion of the property, while the eastern portion of the property is a mixture of meadow, woods and watercourses. A total of 9.0± acres of impervious, hardscape area exists on the property. Elevations range from elevation 220± at the western property boundary to elevation 90± at the eastern property boundary. Areas of steep slopes exist along the western property boundary and between the main entry drive and the meadow in the eastern portion of the site.

Stormwater runoff generally flows west to east on the property, via sheet flow, swales or conventional conveyance systems before discharging into a watercourse that runs north to the south through the property. Ultimately, all stormwater from the property discharges at the southeastern corner. The watercourse continues to travel in a southerly direction before crossing under Long Ridge Road in front of 800 Long Ridge Road and draining into the Rippowam River. A total of 542± acres of offsite area is tributary to the primary watercourse within the property.

There are two stormwater management practices that have been installed as part of an expansion in 1980. First was the creation of a stone lined swale and detention pond located in the northern portion of the site. This swale and detention pond collect runoff from the parking garage, a portion of the northern office building, drives and 2.5± acres of offsite area. The pond was designed to store 6 inches of stormwater before discharging through a 12" pipe into the main watercourse. The remaining area within the pond is used for detention purposes with a 50-foot-wide weir within an earthen berm. The swale is a stone lined swale with one (1) stone check dam. A site inspection was performed of both on May 24, 2023 and a report is included in Appendix E.

The second stormwater management practice consists of a grit separator with nearly 7,000 cubic feet of treatment. This unit is located in the central portion of the property and treats runoff from the two buildings, central parking areas and the majority of the main drive coming into the campus, in addition to 3.6± acres of offsite area. It discharges through a 24" pipe into the wetland just upstream of the culvert crossing under the main driveway.

Soil testing, consisting of a series of deep test pits, were performed on-site to identify any sub-grade restrictive soil conditions (ledge, groundwater, etc.) and to confirm the hydrologic soil classification. A total of 17 deep test pits were performed. Ledge was encountered in the majority of the test pits with depths ranging from 18” to 120”. Evidence of high seasonal groundwater was observed in three of the holes at depths ranging from 12” to 38”. The USDA Web Soil Survey classifies the on-site soils as hydraulic soil group class B and D. **Refer to the Drainage Basin maps in Appendix A for testpit locations and soil type classifications. Test pit locations are shown on site plan sheets SE-2B, 3B, & 4D and testpit results are shown on site plan sheet SE-7.**

Proposed Conditions:

General Design Criteria & Project Classification

The proposed development includes the construction of four (4) multi-family residential buildings, new parking areas and drives, the expansion of the existing western most parking area, and the installation of various walks and pathways throughout the site. The proposed improvements disturb **16.7±** acres of the property and will increase impervious coverage by **52,559±** sf when compared to existing site conditions. The additional coverage will increase the volume and peak rates of stormwater runoff without providing proper on-site mitigation. The proposed development is classified as a redevelopment project with more than ½ an acre of disturbance and directly connected impervious area being increased, therefore must comply with Standards I through 5 of the Stamford Drainage Manual. To comply with Standard I, this project must provide at least the Water Quality Volume (WQV) via non-structural practices OR infiltration best management practices (BMP's).

Proposed Stormwater Treatment Practices

To satisfy Standard I of the Stamford Drainage Manual, two stormwater detention ponds are designed to treat the water quality volume tributary to each. Additionally, three oil grit separators are proposed to provide further treatment. Each system is described in detail below.

- **A Micropool Extended Detention Basin** is located in the western portion of the property just north of Building B. It has been designed, per the 2004 Connecticut Stormwater Quality Manual (Page 11-PI-1) to treat the water quality volume tributary to it from portions of both parking lots located on the western side of the development. A total of 4,245 cubic feet of water quality treatment is provided within this pond (**2,598±** cubic feet required). This pond also provides peak flow attenuation. Refer to Appendix B for the HydroCAD model.
- **A Pocket Pond** is located in the central portion of the property, north of the existing grit separator. It too has been designed per the 2004 Connecticut Stormwater Quality Manual (Page 11-PI-1) to treat the water quality volume tributary to it from the roof of Building A, B and portions of C and D as well as parking and drives. A total of 38,508 cubic feet of water quality treatment is provided within this pond (**16,845±** cubic feet required). This pond also provides peak flow attenuation and has been

designed to ensure stream channel protection to the discharge of the existing 24” pipe entering the watercourse.

- **A Rain Garden is located near the entrance of the site, designed to treat runoff associated with the proposed five (5) space parking to the south of it. A total of 846 cubic feet of water quality treatment is provided within this pond (386 cubic feet required).**
- **Hydrodynamic Separators** are proposed in three locations. The first, a Contech Cascade CS-5 unit is proposed to be installed inline within the existing conveyance network to collect and treat the runoff from a portion of the western parking lot (Parking Area B). The southern half of this parking lot currently discharges to a swale along the southern property line and we are maintaining the flow to this swale, however providing the enhanced treatment. The second proposed unit is a Contech Vortech 16000, and is located to the east of Building A. This unit treats all the onsite runoff conveyed from the developed portion of the property to the proposed pocket pond and adds an additional level of treatment prior to entering the pond. The third proposed unit is a Contech Vortech 9000, and is located east of Building C. This unit treats all the onsite runoff conveyed to the existing swale and pond in the northern portion of the property. Currently, there is no water quality treatment provided in the swale and pond.

Compliance with Stormwater Management Standards

Standard 1. Runoff and Pollutant Reduction

- A. Due to soil conditions, the development will not retain the water quality volume onsite, however all treatment practices provide the requisite water quality volume treatment.
- B. Due to the soil conditions (shallow ledge and steep slopes) and the total required water quality volume for a campus of this size, it is not feasible to retain the water quality volume. This report shall serve as the required report detailing the measures taken to maximize runoff reduction from the development.
- C. The proposed development has been designed to minimize site disturbance by primarily staying within already disturbed limits of development. Silt fence and construction fence will be installed to limit disturbance outside of the intended areas. At the end of construction, all disturbed areas are required to be stabilized with grass seed or erosion control blankets/hay.
- D. Noted
- E. The proposed stormwater treatment practices provide a minimum removal rate of 80% of the average annual post-construction load of Total Suspended Solids (TSS) and floatable debris. See TSS Removal Rate calculations in Appendix B.
- F. The proposed development project will work within already disturbed and improved areas of the property which will minimize over compaction, and to the extent able, existing paved surfaces will remain as long as possible minimizing the potential impact of erosive soils on the downstream drainage systems. Additionally, natural areas are preserved and enhanced with this development. Work within steep slope areas has been minimized to the greatest extent practicable.

Standard 2. Peak Flow Control

- A. Stream channel protection has been provided for the discharge located in the center of property, where the majority of the onsite stormwater runoff is tributary. Given the existing land features and amount of offsite area tributary to the property, stream channel protection is not provided for the northern swale nor and discharge locations studied along the southern property line. Refer to Table 2 for further information regarding discharge to the existing 24" pipe.
- B. The proposed stormwater system is designed to adequately pass flows leading to, from and through it up to and including the 25-year design storm event as required in Section 3 of the Drainage Manual. Refer to pipe conveyance calculations in Appendix D.
- C. The post-development peak flow rates from the 1-year, 2-year, 5-year, 10-year, 25-year and 50-year, 24-hour storms are controlled to the corresponding pre-development peak discharge rates at various points of interest. Reference is made to the HydroCAD report found in Appendix C. Pre-development vs. post-development peak flow rates for both study points are tabulated below:

Table 1. Existing V.S. Proposed Peak Flows

Return Period (years)	Existing Peak Flow Rate (cfs)	Proposed Peak Flow Rate (cfs)	Change (cfs)	Percent Change (%)
1	35.34	31.12	-4.22	-11.9%
2	52.27	45.60	-6.67	-12.8%
5	82.38	75.39	-6.99	-8.5%
10	109.08	102.23	-6.85	-6.3%
25	147.50	141.18	-6.32	-4.3%
50	177.06	170.12	-6.94	-3.9%
100	208.78	200.48	-8.30	-4.0%

Table 2. Existing V.S. Proposed Peak Flows to 24" Discharge

Return Period (years)	Existing Peak Flow Rate (cfs)	Proposed Peak Flow Rate (cfs)	Change (cfs)	Percent Change (%)
1	16.56	11.75	-4.81	-29.0%
2	23.13	16.10	-7.03	-30.4%
5	34.42	27.68	-6.74	-19.6%
10	44.10	38.73	-5.37	-12.2%
25	57.68	53.61	-4.07	-7.1%
50	67.93	63.59	-4.34	-6.4%
100	78.80	73.43	-5.37	-6.8%

Table 3. Existing V.S. Proposed Peak Flows to Northern Swale

Return Period (years)	Existing Peak Flow Rate (cfs)	Proposed Peak Flow Rate (cfs)	Change (cfs)	Percent Change (%)
1	10.24	9.68	-0.56	-5.5%
2	14.06	13.31	-0.75	-5.3%
5	20.58	19.51	-1.07	-5.2%
10	26.16	24.82	-1.34	-5.1%
25	33.99	32.28	-1.71	-5.0%
50	39.92	37.94	-1.98	-5.0%
100	46.23	43.95	-2.28	-4.9%

- D. The outlets from both ponds **and the rain garden** have been designed to convey the runoff from the 100-year storm event. Refer to project HydroCAD report in Appendix C for information on each BMP's outlet and pipe conveyance calculations in Appendix B.
- E. The two detention ponds meet the requirements set for in Section 4.11 of the City of Stamford Drainage Manual. The outlet works have been designed to pass the 100-year storm event through a conveyance network and not overland. The overall watershed through the main watercourse on the property is 542 acres, making our property less than 7% of the overall watershed. It should be noted that the separation distances to ledge and groundwater may not be met for both ponds. The micropool extended detention basin is designed to use an existing ledge outcrop as a feature and wall of the pond. A pond liner **will be** used to ensure a minimum of 1 foot of stormwater remains in the pond at all times. The pocket pond has been designed with a wet pool up to 5 feet deep and, per the guidelines of the CT Stormwater Quality Manual, is anticipated to be within groundwater to ensure the water level stays constant. Test pits will be dug and testing performed during construction to ensure this is the case. A pond **liner** may be necessary at the completion of construction.

Standard 3: Construction Erosion and Sediment Control

- A. Site plan sheets SE-4A through SE-4D depicts erosion control measures to be implemented to control construction related impacts during the various construction phases. Sediment and erosion controls such as silt fencing, stone tracking pads at construction zone entrance/exit points, hay bale & insert catch basin protection, tree protection and sediment traps are proposed. It should be noted that due to the amount of disturbance anticipated, registration with CT DEEP for the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities will be required.

Standard 4: Operation and Maintenance

- A. A Standard City of Stamford Drainage Maintenance Agreement will be executed with the Environmental Protection Board. A draft maintenance agreement has been prepared and is included in **Appendix G**.
- B. The construction plans will include notes describing the long-term maintenance requirements for the site-specific drainage system(s) including routine and non-routine inspection and maintenance tasks to be undertaken after construction is completed as well as the schedule for implementing these tasks. This information will be added to the plan set prior to filing for a building permit.

Standard 5: Stormwater Management Report

- A. This document and its associated appendices serve as the required Stormwater Management Report.
- B. (See below)

Based on the above information, the proposed improvements are designed in accordance with the City of Stamford Stormwater Drainage Manual and will not adversely impact adjacent, downstream properties, City-owned drainage facilities, **or State-owned drainage facilities**.

Appendix A

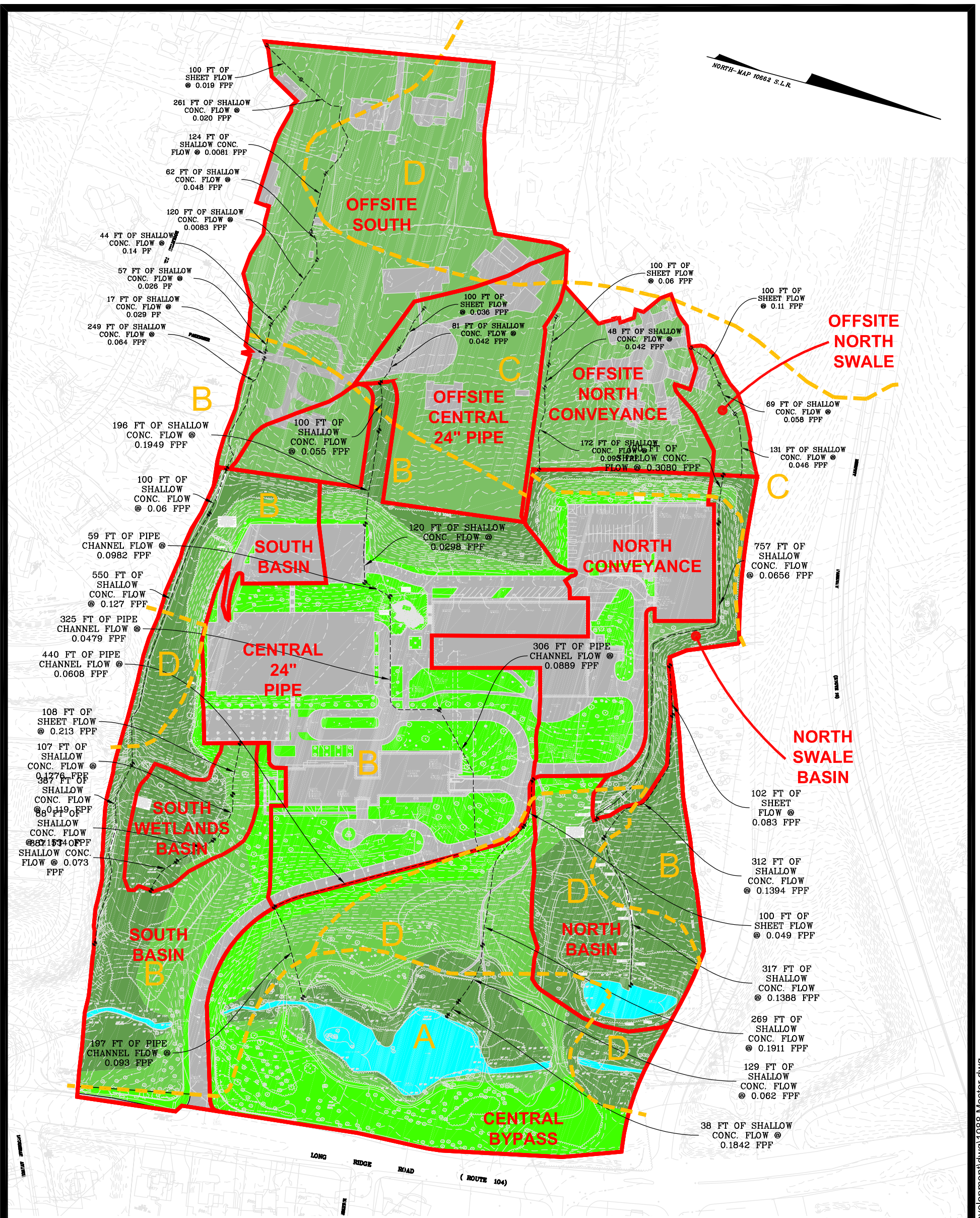
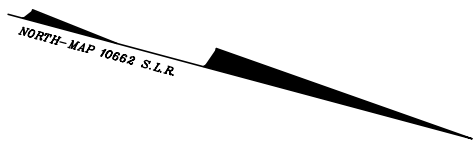
Existing *and Proposed Drainage Basin Maps*

Offsite Watershed Map

Existing Steep Slopes Exhibit

Proposed Steep Slopes Exhibit

OGS Treatment Map



LEGEND

DRAINAGE BASIN BOUNDARY	
SOIL CLASSIFICATION BOUNDARY	
LAWN AREA	
MEADOW AREA	
GENERAL PERVIOUS AREA	
WOODS AREA	
IMPERVIOUS AREA	
WATER	

EXISTING OFFSITE DRAINAGE BASIN MAP
900 LONG RIDGE ROAD
STAMFORD, CT

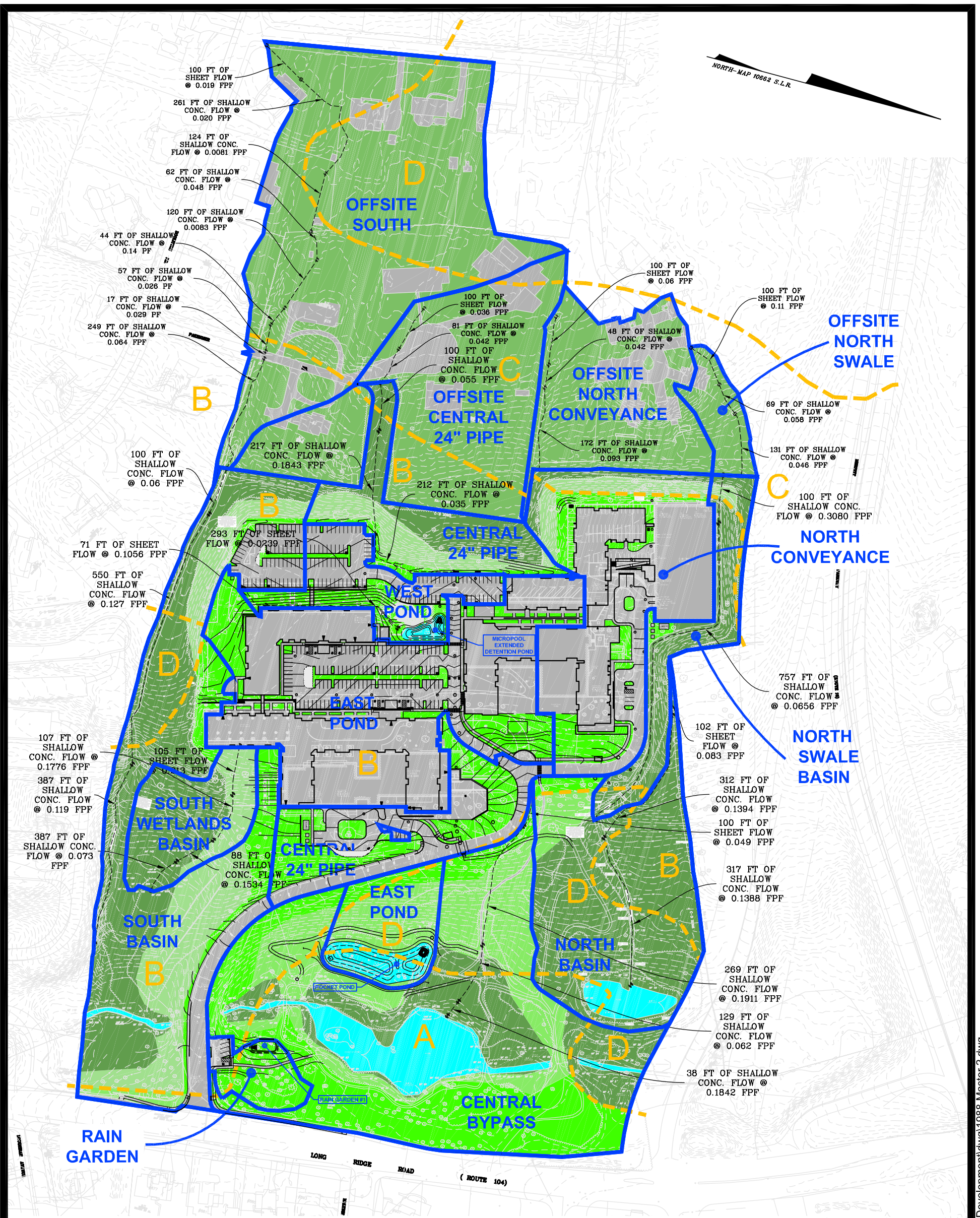
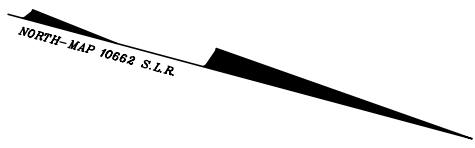
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LEGEND

DRAINAGE BASIN BOUNDARY	
SOIL CLASSIFICATION BOUNDARY	
LAWN AREA	
MEADOW AREA	
GENERAL PERVIOUS AREA	
WOODS AREA	
IMPERVIOUS AREA	
WATER	

PROPOSED DRAINAGE BASIN MAP
900 LONG RIDGE ROAD
STAMFORD, CT

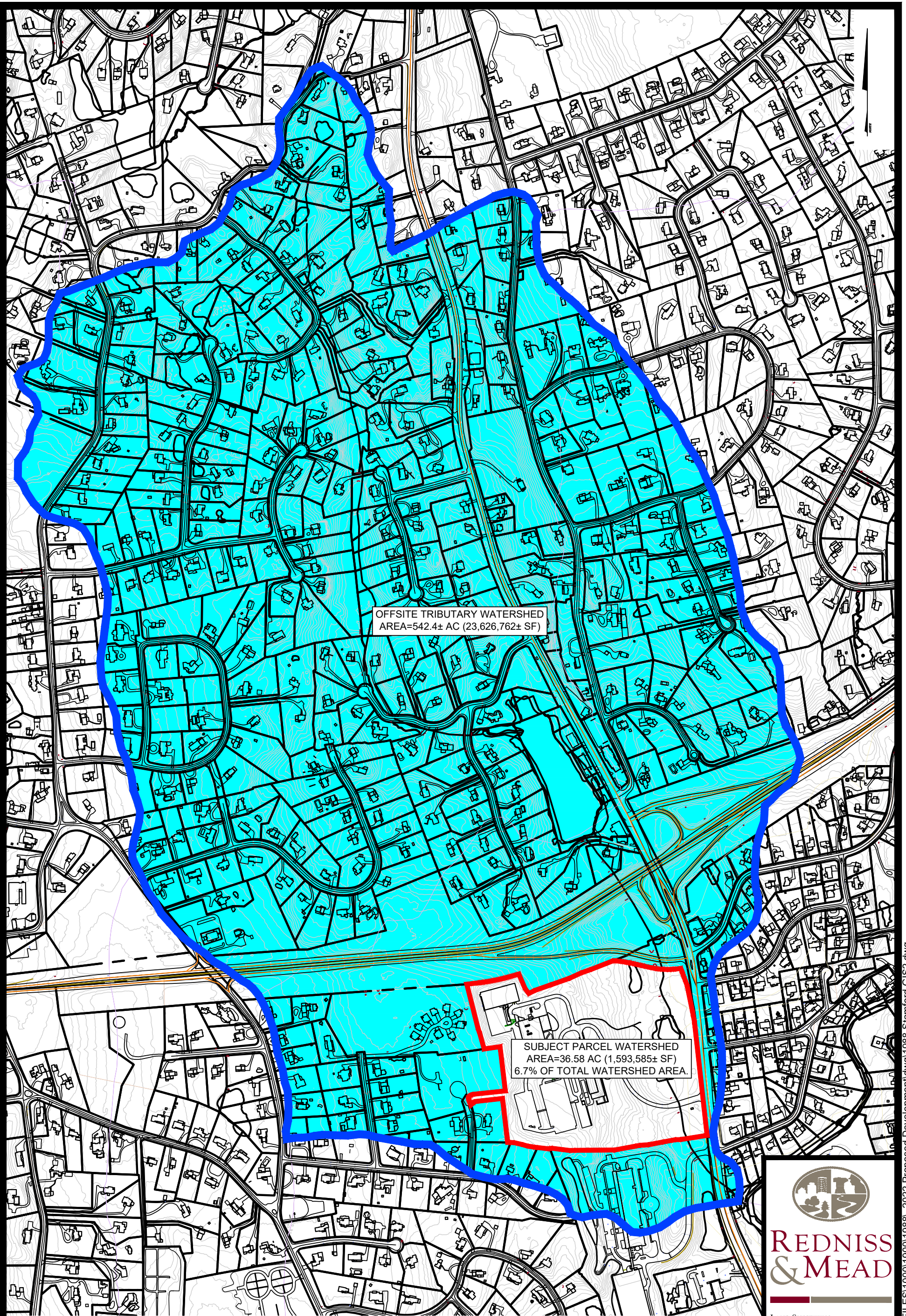
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OFFSITE TRIBUTARY WATERSHED
 AREA=542.4± AC (23,626,762± SF)

SUBJECT PARCEL WATERSHED
 AREA=36.58 AC (1,593,585± SF)
 6.7% OF TOTAL WATERSHED AREA.

APPENDIX A

OFFSITE WATERSHED MAP

**900 LONG RIDGE ROAD
 STAMFORD, CT**

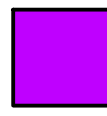


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SLOPES \geq 25%
AREA=293,187 SF



EXISTING STEEP SLOPES EXHIBIT

900 LONG RIDGE ROAD STAMFORD, CT



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PROPOSED STEEP SLOPES EXHIBIT
900 LONG RIDGE ROAD
STAMFORD, CT



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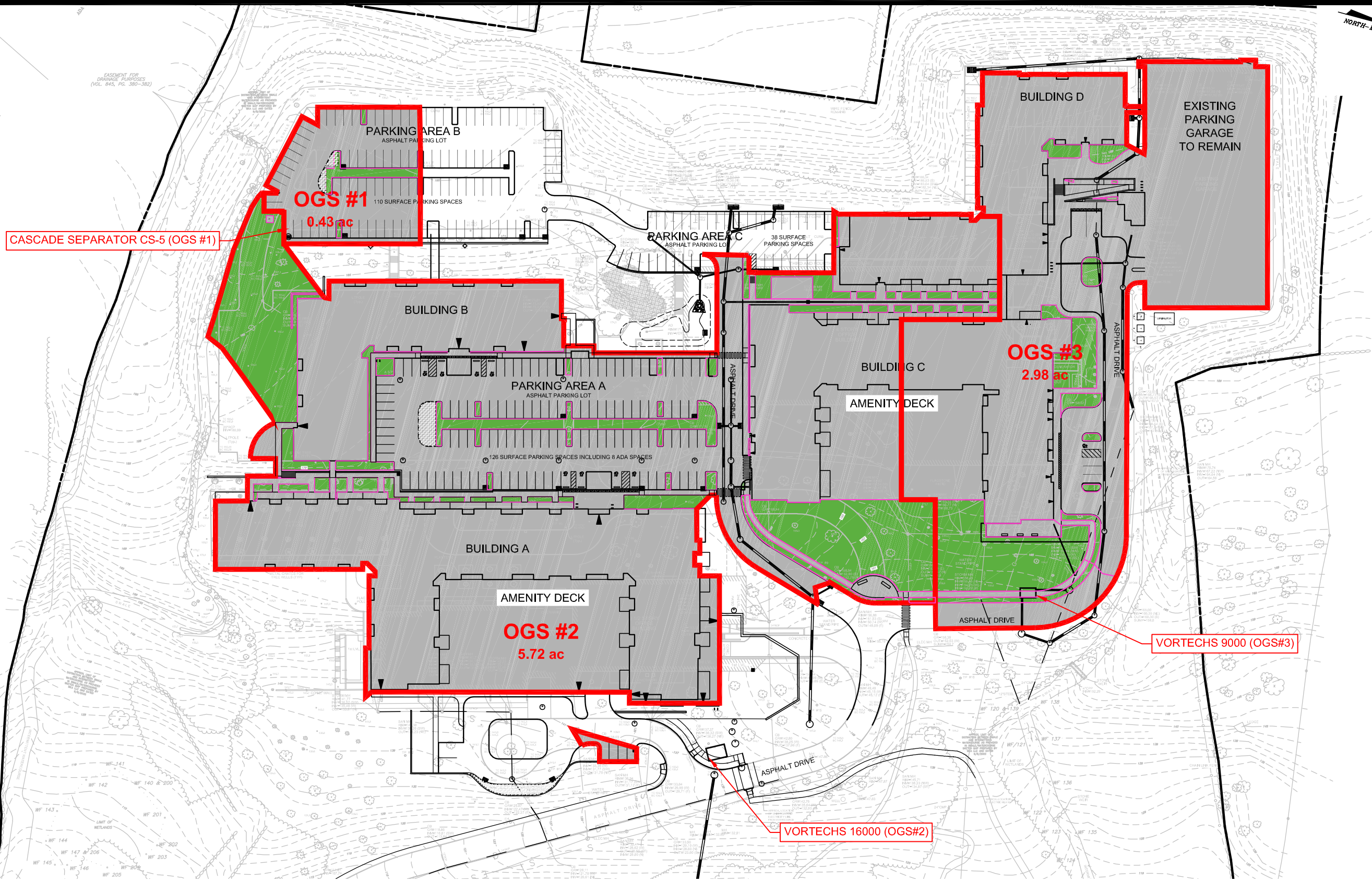
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NORTH MAP 10662 S.L.R.



CASCADE SEPARATOR CS-5 (OGS #1)

OGS #1
0.43 ac

OGS #2
5.72 ac

OGS #3
2.98 ac

VORTECHS 16000 (OGS#2)

VORTECHS 9000 (OGS#3)

PROPOSED WATERSHED MAP FOR OIL/GRIT SEPARATORS
900 LONG RIDGE ROAD
STAMFORD, CT



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Appendix B

Water Quality Volume Calculations
TSS/OGS Sizing
Pocket Pond and Micropool ED Pond Sizing
Temporary Sediment Trap Calculations

Water Quality Volume Calculations

Project: 900 Long Ridge Road	Project #: 1988	Date: 10/13/2023
Location: Stamford, CT	By: DML	Checked: DRG

Pocket Pond

East Pond Basin

Basin Area=	6.808	acres
Impervious Area=	4.778	acres
I=	0.702	^a
R=	0.682	^b
WQV=	0.387	ac. ft. ^c

WQV=	16,844.79	ft. ³
WQV PROVIDED=	38,508	ft.³ ^d
WQV 50% REQUIRED=	8,422.39	ft. ³ ^e
WQV 50% PROVIDED=	19,636	ft.³ ^f
WQV 10% REQUIRED=	842.24	ft. ³
WQV 10% PROVIDED=	4,488	ft.³ ^g

^a I=Percent Impervious Coverage

^b R=0.05+0.009(I); Volumetric runoff Coefficient, Equation taken from 2004 Connecticut Stormwater Quality Manual section 7.4.1

^c WQV=(1"xRxA)/12; Water Quality Volume, Equation taken from 2004 Connecticut Stormwater Quality Manual section 7.4.1

^d Provided by Pocket Pond High Overflow Devices at elevation 88.75' (Appendix C HydroCAD Report)

^e Table 11-P1-2 Water Quality Volume Distribution in Pond Designs from 2004 Connecticut Stormwater Quality Manual section 11.P1

^f WQV provided by Pocket Pond below 18" W x 10" H Orifice (lowest outlet) at elevation 87.00' (Appendix C HydroCAD Report)

^g WQV provided by Forebay (Appendix B Pocket Pond Sizing)

Water Quality Volume Calculations

Project: 900 Long Ridge Road	Project #: 1988	Date: 10/13/2023
Location: Stamford, CT	By: DML	Checked: DRG

Micropool Extended Detention Pond

West Pond Basin

Basin Area=	1.307	acres
Impervious Area=	0.723	acres
I=	0.553	^a
R=	0.548	^b
WQV=	0.060	ac. ft. ^c

WQV=	2,598.30	ft.³
WQV PROVIDED=	4,245.00	ft.³ ^d
WQV 20% REQUIRED=	519.66	ft.³
WQV 20% PROVIDED=	947.00	ft.³ ^e

^a I=Percent Impervious Coverage

^b R=0.05+0.009(I); Volumetric runoff Coefficient, Equation taken from 2004 Connecticut Stormwater Quality Manual section 7.4.1

^c WQV=(1"xRxA)/12; Water Quality Volume, Equation taken from 2004 Connecticut Stormwater Quality Manual section 7.4.1

^d Provided by Micropool below Overflow Area Drain at elevation 173.6' (Appendix C HydroCAD Report)

^e Provided by Micropool below 8" Orifice (lowest outlet) at elevation 172.0' (Appendix C HydroCAD Report)

Water Quality Volume Calculations

Project: 900 Long Ridge Road	Project #: 1988	Date: 10/13/2023
Location: Stamford, CT	By: DML	Checked: DRG

Rain Garden

Rain Garden Basin

Basin Area=	0.525	acres
Impervious Area=	0.089	acres
I=	0.170	^a
R=	0.203	^b
WQV=	0.009	ac. ft. ^c

WQV=	386.45 ft. ³	
WQV PROVIDED=	846.00 ft.³	^d

^a I=Percent Impervious Coverage

^b R=0.05+0.009(I); Volumetric runoff Coefficient, Equation taken from 2004 Connecticut Stormwater Quality Manual section 7.4.1

^c WQV=(1"xRxA)/12; Water Quality Volume, Equation taken from 2004 Connecticut Stormwater Quality Manual section 7.4.1

^d Provided by Micropool below Overflow Weir at elevation 86.75' (Appendix C HydroCAD Report)

Total Suspended Solids Removal (TSS)

Project: 900 Long Ridge Road	Project #: 1988	Date: 6/23/2023
Location: Stamford, CT	By: DML	Checked: DRG

Treatment Train - Pocket Pond

	A	B	C	D	E
	BMP ^a	TSS removal Rate ^a	Starting TSS Load ^b	Amount Removed (B x C)	Remaining Load (C - D)
1	Oil Grit Separator	25.0%	100.0%	25.0%	75.0%
2	Sediment Forebays	25.0%	75.0%	18.8%	56.3%
3	Wet Basins	80.0%	56.3%	45.0%	11.3%

^a Refer to Table 5-6 from February 2014 Town of Greenwich Drainage Manual section 5.6.3

^b Equal to the remaining load from the previous BMP

Note, additional treatment is realized via area drains with 2' sumps.

Total Suspended Solids Removal (TSS)

Project: <i>900 Long Ridge Road</i>	Project #: <i>1988</i>	Date: <i>6/23/2023</i>
Location: <i>Stamford, CT</i>	By: <i>DML</i>	Checked: <i>DRG</i>

Treatment Train - OGS#1

	A	B	C	D	E
	BMP ^a	TSS removal Rate ^a	Starting TSS Load ^b	Amount Removed (B x C)	Remaining Load (C - D)
1	Oil Grit Separator	25.0%	100.0%	25.0%	75.0%

^a Refer to Table 5-6 from February 2014 Town of Greenwich Drainage Manual section 5.6.3
^b Equal to the remaining load from the previous BMP
 Note, additional treatment is realized via area drains with 2' sumps.



Total Suspended Solids Removal (TSS)

Project: <i>900 Long Ridge Road</i>	Project #: <i>1988</i>	Date: <i>6/23/2023</i>
Location: <i>Stamford, CT</i>	By: <i>DML</i>	Checked: <i>DRG</i>

Treatment Train - OGS #3

	A	B	C	D	E
	BMP ^a	TSS removal Rate ^a	Starting TSS Load ^b	Amount Removed (B x C)	Remaining Load (C - D)
1	Oil Grit Separator	25.0%	100.0%	25.0%	75.0%

^a Refer to Table 5-6 from February 2014 Town of Greenwich Drainage Manual section 5.6.3
^b Equal to the remaining load from the previous BMP
 Note, additional treatment is realized via area drains with 2' sumps.

Total Suspended Solids Removal (TSS)

Project: <i>900 Long Ridge Road</i>	Project #: <i>1988</i>	Date: <i>6/23/2023</i>
Location: <i>Stamford, CT</i>	By: <i>DML</i>	Checked: <i>DRG</i>

Treatment Train - Micropool ED Pond

	A	B	C	D	E
	BMP ^a	TSS removal Rate ^a	Starting TSS Load ^b	Amount Removed (B x C)	Remaining Load (C - D)
1	Sediment Forebays	25.0%	100.0%	25.0%	75.0%
2	Wet Basins	80.0%	75.0%	60.0%	15.0%

^a Refer to Table 5-6 from February 2014 Town of Greenwich Drainage Manual section 5.6.3

^b Equal to the remaining load from the previous BMP

Note, additional treatment is realized via area drains with 2' sumps.

Total Suspended Solids Removal (TSS)

Project: <i>900 Long Ridge Road</i>	Project #: <i>1988</i>	Date: <i>10/13/2023</i>
Location: <i>Stamford, CT</i>	By: <i>DML</i>	Checked: <i>DRG</i>

Treatment Train - Rain Garden

	A BMP ^a	B TSS removal Rate ^a	C Starting TSS Load ^b	D Amount Removed (B x C)	E Remaining Load (C - D)
1	Bioretention - Rain Gardens, Tree Filters,	90.0%	100.0%	90.0%	10.0%

^a Refer to Table 5-6 from February 2014 Town of Greenwich Drainage Manual section 5.6.3

^b Equal to the remaining load from the previous BMP

Note, additional treatment is realized via area drains with 2' sumps.

**Estimated Net Annual Solids Load Reduction
Based on the Rational Rainfall Method**



**900 Long Ridge Rd
Stamford, CT
OGS #1**



AREA	0.43	acres	CASCADE MODEL	CS-5
WEIGHTED C	0.95			
TC	5.00	minutes	RAINFALL STATION	35

Rainfall Intensity ¹ (in/hr)	Percent Rainfall Volume ¹	Hydraulic Loading Rate (gpm/ft ²)	Removal Efficiency (%)	Incremental Removal (%)
0.08	41.6%	0.75	100.0	41.6
0.16	21.0%	1.49	100.0	21.0
0.24	11.1%	2.24	100.0	11.1
0.32	6.6%	2.99	100.0	6.6
0.40	3.6%	3.74	100.0	3.6
0.48	2.5%	4.48	100.0	2.5
0.56	1.8%	5.23	100.0	1.8
0.64	1.1%	5.98	100.0	1.1
0.72	1.4%	6.72	100.0	1.4
0.80	1.5%	7.47	100.0	1.5
1.00	1.7%	9.34	100.0	1.7
1.20	1.4%	11.21	100.0	1.4
1.40	1.4%	13.07	99.6	1.4
1.60	0.6%	14.94	97.9	0.6
1.80	0.7%	16.81	96.1	0.6
2.00	0.4%	18.68	94.3	0.3
3.00	1.3%	28.01	85.6	1.1
4.00	0.4%	37.35	76.8	0.3
				99.7
				Removal Efficiency Adjustment ² = 0.0%
				Predicted % Annual Rainfall Treated = 100.0%
				Predicted Net Annual Load Removal Efficiency = 99.7%

1 - Based on 14 years of 15-minute precipitation data from NCDC station 5445, Norfolk 2 SW, Litchfield County, CT

2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

**VORTECHS SYSTEM® ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON AN AVERAGE PARTICLE SIZE OF 50 MICRONS**



**900 LONG RIDGE ROAD
STAMFORD, CT
MODEL NAME VORTECHS 16000
SITE DESIGNATION OGS 2**

Design Ratio¹ =
$$\frac{(4.78 \text{ acres}) \times (0.9) \times (449 \text{ gpm/cfs})}{(113.1 \text{ sf})} = 17.1$$

Bypass occurs at an elevation of 135.4' (at approximately 37 gpm/sf)

Rainfall Intensity "/hr	Operating Rate² gpm/sf	Treated Flow cfs	% Total Rainfall Volume ³	Rmvl. Effcy⁴ (%)	Rel. Effcy (%)
0.02	0.3	0.09	9.7%	100.0%	9.7%
0.04	0.7	0.17	9.7%	100.0%	9.7%
0.06	1.0	0.26	9.8%	98.0%	9.6%
0.08	1.4	0.34	7.7%	98.0%	7.5%
0.10	1.7	0.43	8.0%	98.0%	7.9%
0.12	2.1	0.51	5.4%	97.0%	5.3%
0.14	2.4	0.60	4.7%	97.0%	4.5%
0.16	2.7	0.68	5.5%	97.0%	5.3%
0.18	3.1	0.77	3.5%	95.8%	3.3%
0.20	3.4	0.86	4.1%	95.8%	3.9%
0.25	4.3	1.07	6.5%	94.1%	6.1%
0.30	5.1	1.28	5.5%	92.6%	5.1%
0.35	6.0	1.50	4.0%	92.6%	3.7%
0.40	6.8	1.71	2.0%	91.2%	1.8%
0.45	7.7	1.92	2.1%	90.0%	1.9%
0.50	8.6	2.14	2.0%	88.3%	1.8%
0.75	12.8	3.21	5.1%	82.2%	4.2%
1.00	17.1	4.28	2.5%	74.0%	1.8%
1.50	25.7	6.41	1.8%	63.0%	1.1%
2.00	34.2	8.55	0.5%	52.4%	0.3%

94.6%

% rain falling at >2"/hr or bypassing treatment = 0.0%
Assumed removal efficiency for bypassed flows = 0.0%
Estimated reduction in efficiency⁵ = 6.5%
Predicted Net Annual Load Removal Efficiency = 88%

1 - Design Ratio = (Total Drainage Area) x (Runoff Coefficient) x (cfs to gpm conversion) / Grit Chamber Area

2 - Operating Rate (gpm/sf) = intensity ("/hr) x Design Ratio.

3 - Based on 10 years of hourly precipitation data from NCDC station 806, Bridgeport WSO ARPT, Fairfield County, CT

4 - Based on Contech Construction Products laboratory verified removal of an average particle size of 50 microns (see Technical Bulletin #1).

5- Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Calculated by: SZM 10/17/23



VORTECHS SYSTEM® FLOW CALCULATIONS

900 LONG RIDGE ROAD

STAMFORD, CT

MODEL NAME VORTECHS 16000

SITE DESIGNATION OGS 2

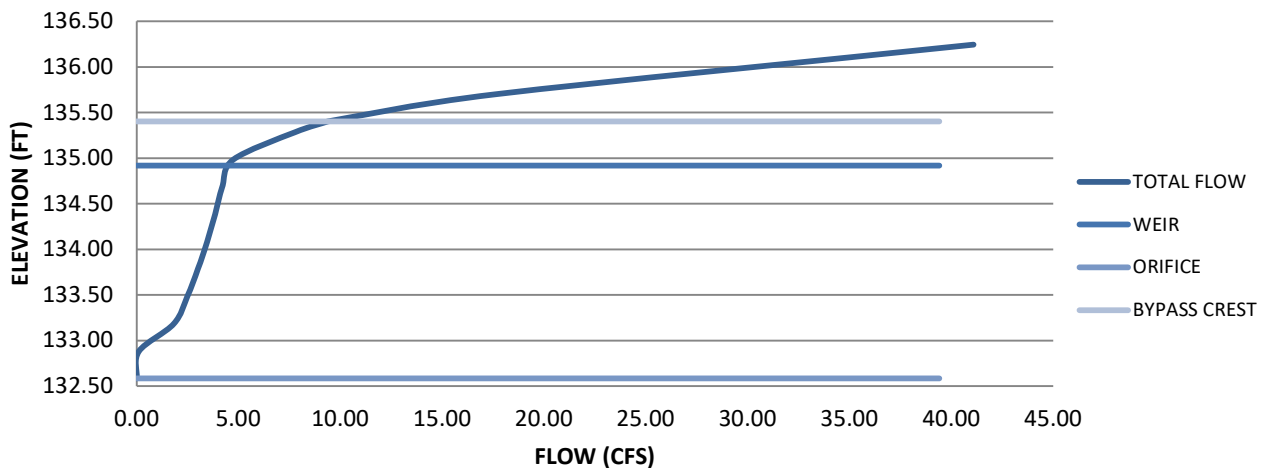
<u>Vortechs Orifice</u>		<u>Vortechs Weir</u>		<u>Bypass Weir</u>	
Cd = 0.56		Cd = 3.3		Cd = 3.3	
A (ft ²) = 0.69		Weir Crest Length (ft) = 4.00		Crest Length (ft) = 6	
Crest Elevation (ft) = 132.58		Crest Elevation (ft) = 134.92		Crest Elev. (ft) = 135.40	

Head (ft)	Elevation (ft)	Orifice Flow (cfs)	Weir Flow (cfs)	Bypass Flow (cfs)	Total Flow (cfs)
0.00	132.58	0.00	0.00	0.00	0.00
0.30	132.88	0.11	0.00	0.00	0.11
0.60	133.18	1.83	0.00	0.00	1.83
0.90	133.48	2.49	0.00	0.00	2.49
1.20	133.78	3.01	0.00	0.00	3.01
1.50	134.08	3.45	0.00	0.00	3.45
1.80	134.38	3.84	0.00	0.00	3.84
2.10	134.68	4.20	0.00	0.00	4.20
2.40	134.98	4.53	0.23	0.00	4.75
2.70	135.28	4.83	2.93	0.00	7.76
2.82	135.40	4.95	4.44	0.00	9.38
2.82	135.40	4.95	4.44	0.00	9.38
3.12	135.70	5.23	9.15	3.25	17.63
3.66	136.24	5.70	20.12	15.27	41.09

Calculated by: SZM

10/17/23

VORTECHS STAGE DISCHARGE CURVE



**VORTECHS SYSTEM® ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON AN AVERAGE PARTICLE SIZE OF 50 MICRONS**



**900 LONG RIDGE ROAD
STAMFORD, CT
MODEL NAME VORTECHS 9000
SITE DESIGNATION OGS 3**

Design Ratio¹ =
$$\frac{(2.67 \text{ acres}) \times (0.9) \times (449 \text{ gpm/cfs})}{(63.6 \text{ sf})} = 17$$

Bypass occurs at an elevation of 157.1' (at approximately 62 gpm/sf)

<u>Rainfall Intensity</u> "/hr	<u>Operating Rate</u> ² gpm/sf	<u>Treated Flow</u> cfs	<u>% Total Rainfall</u> Volume ³	<u>Rmvl. Effic</u> ⁴ (%)	<u>Rel. Effic</u> (%)
0.02	0.3	0.05	9.7%	100.0%	9.7%
0.04	0.7	0.10	9.7%	100.0%	9.7%
0.06	1.0	0.14	9.8%	98.0%	9.6%
0.08	1.4	0.19	7.7%	98.0%	7.5%
0.10	1.7	0.24	8.0%	98.0%	7.9%
0.12	2.0	0.29	5.4%	97.0%	5.3%
0.14	2.4	0.33	4.7%	97.0%	4.5%
0.16	2.7	0.38	5.5%	97.0%	5.3%
0.18	3.1	0.43	3.5%	95.8%	3.3%
0.20	3.4	0.48	4.1%	95.8%	3.9%
0.25	4.3	0.60	6.5%	94.1%	6.1%
0.30	5.1	0.71	5.5%	92.6%	5.1%
0.35	6.0	0.83	4.0%	92.6%	3.7%
0.40	6.8	0.95	2.0%	91.2%	1.8%
0.45	7.7	1.07	2.1%	90.0%	1.9%
0.50	8.5	1.19	2.0%	88.3%	1.8%
0.75	12.8	1.79	5.1%	82.2%	4.2%
1.00	17.0	2.38	2.5%	74.0%	1.8%
1.50	25.5	3.57	1.8%	63.0%	1.1%
2.00	34.0	4.76	0.5%	52.4%	0.3%

94.6%

% rain falling at >2"/hr or bypassing treatment = 0.0%
Assumed removal efficiency for bypassed flows = 0.0%
Estimated reduction in efficiency⁵ = 6.5%
Predicted Net Annual Load Removal Efficiency = 88%

1 - Design Ratio = (Total Drainage Area) x (Runoff Coefficient) x (cfs to gpm conversion) / Grit Chamber Area

2 - Operating Rate (gpm/sf) = intensity ("/hr) x Design Ratio.

3 - Based on 10 years of hourly precipitation data from NCDC station 806, Bridgeport WSO ARPT, Fairfield County, CT

4 - Based on Contech Construction Products laboratory verified removal of an average particle size of 50 microns (see Technical Bulletin #1).

5- Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Calculated by: DRA 5/31/2023



VORTECHS SYSTEM® FLOW CALCULATIONS

900 LONG RIDGE ROAD

STAMFORD, CT

MODEL NAME VORTECHS 9000

SITE DESIGNATION OGS 3

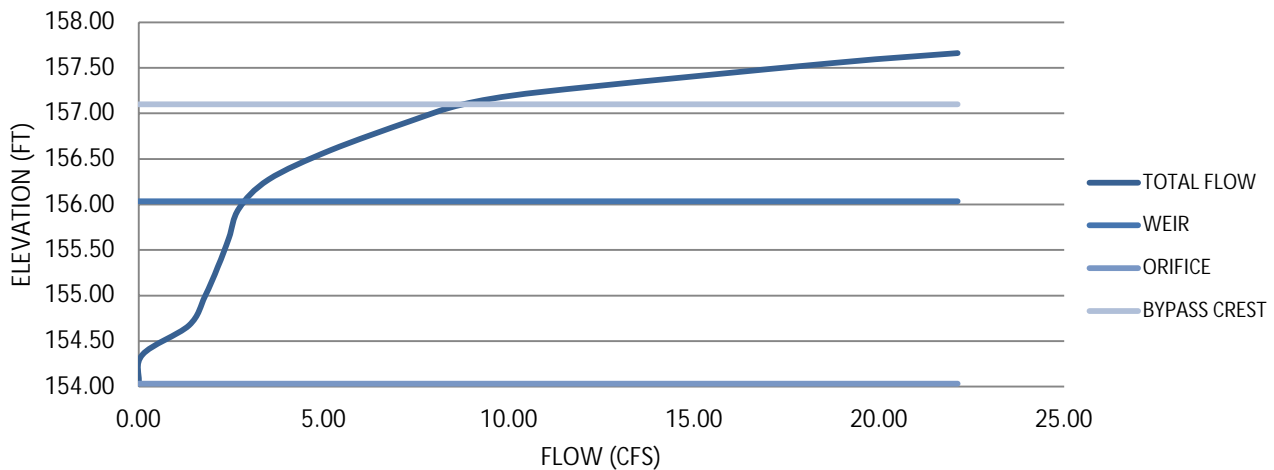
<u>Vortechs Orifice</u>		<u>Vortechs Weir</u>		<u>Bypass Weir</u>	
Cd = 0.56		Cd = 3.37		Cd = 3.3	
A (ft ²) = 0.46		Weir Crest Length (ft) = 1.42		Crest Length (ft) = 6	
Crest Elevation (ft) = 154.03		Crest Elevation (ft) = 156.03		Crest Elev. (ft) = 157.10	

Head (ft)	Elevation (ft)	Orifice Flow (cfs)	Weir Flow (cfs)	Bypass Flow (cfs)	Total Flow (cfs)
0.00	154.03	0.00	0.00	0.00	0.00
0.32	154.35	0.10	0.00	0.00	0.10
0.64	154.67	1.36	0.00	0.00	1.36
0.96	154.99	1.79	0.00	0.00	1.79
1.28	155.31	2.14	0.00	0.00	2.14
1.60	155.63	2.44	0.00	0.00	2.44
1.92	155.95	2.70	0.00	0.00	2.70
2.24	156.27	2.94	0.56	0.00	3.51
2.56	156.59	3.17	2.00	0.00	5.17
2.88	156.91	3.38	3.95	0.00	7.33
3.07	157.10	3.49	5.27	0.00	8.76
3.20	157.23	3.57	6.29	0.96	10.82
3.52	157.55	3.76	8.96	6.04	18.76
3.63	157.66	3.82	9.95	8.35	22.12

Calculated by: DRA

5/31/2023

VORTECHS STAGE DISCHARGE CURVE



Elevation-Volume Storage Calculations

Project: 900 Long Ridge Road	Project #: 1988	Date: 6/23/2023
Location: Stamford CT	By: DML	Checked: DRG

EAST POCKET POND STORAGE

FULL POND

Elevation (feet)	Δ Elevation (feet)	Area (ft ²)	Avg. Area (ft ²)	Δ Storage (ft ³)	Σ Storage (ft ³)	Σ Storage (ac-ft)
82	0	2,846	2,846	-	-	0
83	1	1,790	2,318	2,318	2,318	0.053
84	1	2,880	2,335	2,335	4,653	0.107
85	1	4,153	3,516	3,516	8,170	0.188
86	1	5,575	4,864	4,864	13,033	0.299
86.5	0.5	6,289	5,932	2,966	15,999	0.367
87	0.5	8,259	7,274	3,637	19,636	0.451
87.5	0.5	10,182	9,220	4,610	24,246	0.557
88	0.5	11,063	10,622	5,311	29,557	0.679
89	1	12,808	11,935	11,935	41,493	0.953
90	1	14,541	13,674	13,674	55,167	1.266
90.65	0.65	15,757	15,149	9,847	65,014	1.493

FOREBAY

Elevation (feet)	Δ Elevation (feet)	Area (ft ²)	Avg. Area (ft ²)	Δ Storage (ft ³)	Σ Storage (ft ³)	Σ Storage (ac-ft)
83	0	346.6	347	-	-	0
84	1	642.1	494	494	494	0.0113487
85	1	1,028.6	835	835	1,330	0.0305257
86	1	1,520.0	1,274	1,274	2,604	0.0597796
86.5	0.5	1,764.8	1,642	821	3,425	0.0786318
87	0.5	2,485.9	2,125	1,063	4,488	0.1030274
88	1	1,520.0	2,003	2,003	6,491	0.1490088
89	1	3,779	2,650	2,650	9,140	0.209833
90	1	4,512	4,146	4,146	13,286	0.3050006
91	1	5,301	4,907	4,907	18,192	0.4176383

Stage-Area-Storage for Pond 12P: Pr. Pocket Pond

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
82.00	0	84.60	6,763	87.20	21,480
82.05	116	84.65	6,938	87.25	21,941
82.10	232	84.70	7,114	87.30	22,402
82.15	348	84.75	7,290	87.35	22,863
82.20	464	84.80	7,466	87.40	23,324
82.25	580	84.85	7,642	87.45	23,785
82.30	695	84.90	7,817	87.50	24,246
82.35	811	84.95	7,993	87.55	24,707
82.40	927	85.00	8,169	87.60	25,168
82.45	1,043	85.05	8,345	87.65	25,629
82.50	1,159	85.10	8,521	87.70	26,090
82.55	1,275	85.15	8,697	87.75	26,551
82.60	1,391	85.20	8,873	87.80	27,012
82.65	1,507	85.25	9,049	87.85	27,473
82.70	1,623	85.30	9,225	87.90	27,934
82.75	1,739	85.35	9,401	87.95	28,395
82.80	1,854	85.40	9,577	88.00	28,856
82.85	1,970	85.45	9,753	88.05	29,317
82.90	2,086	85.50	9,929	88.10	29,778
82.95	2,202	85.55	10,105	88.15	30,239
83.00	2,318	85.60	10,281	88.20	30,700
83.05	2,435	85.65	10,457	88.25	31,161
83.10	2,551	85.70	10,633	88.30	31,622
83.15	2,668	85.75	10,809	88.35	32,083
83.20	2,785	85.80	10,985	88.40	32,544
83.25	2,902	85.85	11,161	88.45	33,005
83.30	3,018	85.90	11,337	88.50	33,466
83.35	3,135	85.95	11,513	88.55	33,927
83.40	3,252	86.00	11,689	88.60	34,388
83.45	3,369	86.05	11,865	88.65	34,849
83.50	3,486	86.10	12,041	88.70	35,310
83.55	3,602	86.15	12,217	88.75	35,771
83.60	3,719	86.20	12,393	88.80	36,232
83.65	3,836	86.25	12,569	88.85	36,693
83.70	3,953	86.30	12,745	88.90	37,154
83.75	4,069	86.35	12,921	88.95	37,615
83.80	4,186	86.40	13,097	89.00	38,076
83.85	4,303	86.45	13,273	89.05	38,537
83.90	4,420	86.50	13,449	89.10	38,998
83.95	4,536	86.55	13,625	89.15	39,459
84.00	4,653	86.60	13,801	89.20	39,920
84.05	4,770	86.65	13,977	89.25	40,381
84.10	4,887	86.70	14,153	89.30	40,842
84.15	5,004	86.75	14,329	89.35	41,303
84.20	5,121	86.80	14,505	89.40	41,764
84.25	5,238	86.85	14,681	89.45	42,225
84.30	5,355	86.90	14,857	89.50	42,686
84.35	5,472	86.95	15,033	89.55	43,147
84.40	5,589	87.00	15,209	89.60	43,608
84.45	5,706	87.05	15,385	89.65	44,069
84.50	5,823	87.10	15,561	89.70	44,530
84.55	5,940	87.15	15,737	89.75	44,991

Elevation-Volume Storage Calculations

Project: 900 Long Ridge Road

Project #: 1988

Date: 6/20/2023

Location: Stamford CT

By: DML

Checked: DRG

MICROPOOL EXTENDED DETENTION POND STORAGE

FULL POND

Elevation (feet)	Δ Elevation (feet)	Area (ft ²)	Avg. Area (ft ²)	Δ Storage (ft ³)	Σ Storage (ft ³)	Σ Storage (ac-ft)
171	0	606	606	-	-	0
172	1	1,288	947	947	947	0.0217401
173	1	2,188	1,738	1,738	2,685	0.0616414
174	1	3,013	2,600	2,600	5,285	0.1213372
175	1	4,048	3,531	3,531	8,816	0.2023875

FOREBAY

Elevation (feet)	Δ Elevation (feet)	Area (ft ²)	Avg. Area (ft ²)	Δ Storage (ft ³)	Σ Storage (ft ³)	Σ Storage (ac-ft)
171	0	177	177	-	-	0
172	1	508	342	342	342	0.0078535

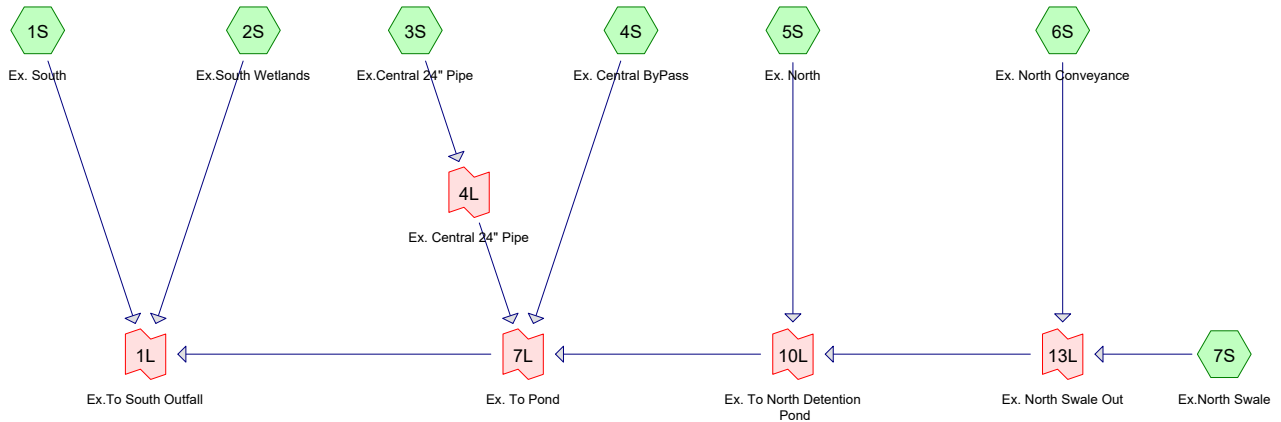
Stage-Area-Storage for Pond 13P: Pr. MicroPool ED Pond

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
171.00	0	173.60	4,245	176.20	8,816
171.05	47	173.65	4,375	176.25	8,816
171.10	95	173.70	4,505	176.30	8,816
171.15	142	173.75	4,635	176.35	8,816
171.20	189	173.80	4,765		
171.25	237	173.85	4,895		
171.30	284	173.90	5,025		
171.35	331	173.95	5,155		
171.40	379	174.00	5,285		
171.45	426	174.05	5,462		
171.50	474	174.10	5,638		
171.55	521	174.15	5,815		
171.60	568	174.20	5,991		
171.65	616	174.25	6,168		
171.70	663	174.30	6,344		
171.75	710	174.35	6,521		
171.80	758	174.40	6,697		
171.85	805	174.45	6,874		
171.90	852	174.50	7,051		
171.95	900	174.55	7,227		
172.00	947	174.60	7,404		
172.05	1,034	174.65	7,580		
172.10	1,121	174.70	7,757		
172.15	1,208	174.75	7,933		
172.20	1,295	174.80	8,110		
172.25	1,382	174.85	8,286		
172.30	1,468	174.90	8,463		
172.35	1,555	174.95	8,639		
172.40	1,642	175.00	8,816		
172.45	1,729	175.05	8,816		
172.50	1,816	175.10	8,816		
172.55	1,903	175.15	8,816		
172.60	1,990	175.20	8,816		
172.65	2,077	175.25	8,816		
172.70	2,164	175.30	8,816		
172.75	2,251	175.35	8,816		
172.80	2,337	175.40	8,816		
172.85	2,424	175.45	8,816		
172.90	2,511	175.50	8,816		
172.95	2,598	175.55	8,816		
173.00	2,685	175.60	8,816		
173.05	2,815	175.65	8,816		
173.10	2,945	175.70	8,816		
173.15	3,075	175.75	8,816		
173.20	3,205	175.80	8,816		
173.25	3,335	175.85	8,816		
173.30	3,465	175.90	8,816		
173.35	3,595	175.95	8,816		
173.40	3,725	176.00	8,816		
173.45	3,855	176.05	8,816		
173.50	3,985	176.10	8,816		
173.55	4,115	176.15	8,816		

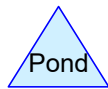
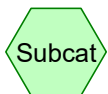
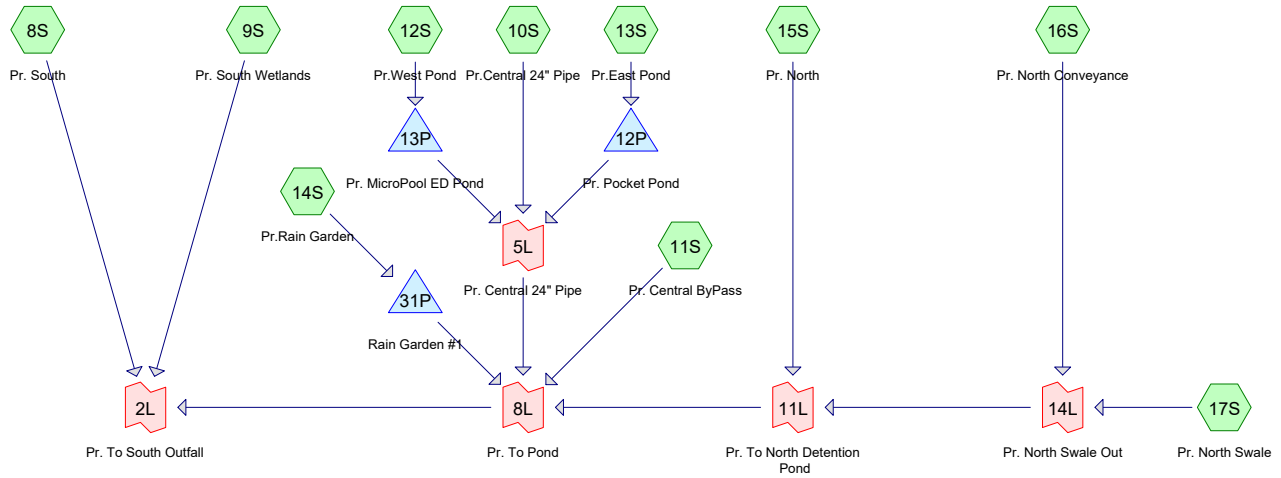
Appendix C

HydroCAD Report

EXISTING CONDITIONS



PROPOSED CONDITIONS



Routing Diagram for 1988 HydroCAD 2023-10-13
 Prepared by Redniss & Mead, Inc, Printed 10/12/2023
 HydroCAD® 10.20-3c s/n 08721 © 2023 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.001 hrs, 24001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex. South	Runoff Area=609,337 sf 15.57% Impervious Runoff Depth>0.88" Flow Length=2,071' Tc=26.8 min CN=73 Runoff=7.94 cfs 44,441 cf
Subcatchment2S: Ex.South Wetlands	Runoff Area=55,451 sf 0.00% Impervious Runoff Depth>0.41" Flow Length=385' Tc=5.5 min CN=62 Runoff=0.39 cfs 1,911 cf
Subcatchment3S: Ex.Central 24" Pipe	Runoff Area=602,842 sf 42.50% Impervious Runoff Depth>1.28" Flow Length=1,924' Tc=12.4 min CN=80 Runoff=16.56 cfs 64,117 cf
Subcatchment4S: Ex. Central ByPass	Runoff Area=415,307 sf 10.64% Impervious Runoff Depth>0.41" Flow Length=536' Tc=13.7 min CN=62 Runoff=2.24 cfs 14,263 cf
Subcatchment5S: Ex. North	Runoff Area=159,775 sf 7.18% Impervious Runoff Depth>0.88" Flow Length=731' Tc=24.4 min CN=73 Runoff=2.16 cfs 11,661 cf
Subcatchment6S: Ex. North Conveyance	Runoff Area=294,527 sf 47.83% Impervious Runoff Depth>1.54" Flow Length=424' Tc=14.4 min CN=84 Runoff=9.42 cfs 37,907 cf
Subcatchment7S: Ex.North Swale	Runoff Area=76,744 sf 1.70% Impervious Runoff Depth>0.60" Flow Length=1,170' Tc=11.4 min CN=67 Runoff=0.83 cfs 3,854 cf
Subcatchment8S: Pr. South	Runoff Area=612,257 sf 15.04% Impervious Runoff Depth>0.88" Flow Length=2,071' Tc=26.8 min CN=73 Runoff=7.98 cfs 44,654 cf
Subcatchment9S: Pr. South Wetlands	Runoff Area=54,807 sf 0.00% Impervious Runoff Depth>0.41" Flow Length=300' Tc=5.0 min CN=62 Runoff=0.39 cfs 1,889 cf
Subcatchment10S: Pr.Central 24" Pipe	Runoff Area=311,534 sf 22.75% Impervious Runoff Depth>0.88" Flow Length=710' Tc=17.2 min CN=73 Runoff=4.86 cfs 22,786 cf
Subcatchment11S: Pr. Central ByPass	Runoff Area=345,455 sf 13.29% Impervious Runoff Depth>0.41" Flow Length=536' Tc=13.7 min CN=62 Runoff=1.86 cfs 11,864 cf
Subcatchment12S: Pr.West Pond	Runoff Area=56,935 sf 60.58% Impervious Runoff Depth>1.48" Flow Length=364' Tc=5.8 min CN=83 Runoff=2.28 cfs 7,008 cf
Subcatchment13S: Pr.East Pond	Runoff Area=296,535 sf 74.50% Impervious Runoff Depth>2.02" Tc=5.0 min CN=90 Runoff=16.60 cfs 49,893 cf
Subcatchment14S: Pr.Rain Garden	Runoff Area=22,853 sf 16.99% Impervious Runoff Depth>0.32" Flow Length=124' Tc=5.9 min CN=59 Runoff=0.09 cfs 601 cf
Subcatchment15S: Pr. North	Runoff Area=159,775 sf 7.18% Impervious Runoff Depth>0.88" Flow Length=731' Tc=24.4 min CN=73 Runoff=2.16 cfs 11,661 cf
Subcatchment16S: Pr. North Conveyance	Runoff Area=277,093 sf 49.20% Impervious Runoff Depth>1.54" Flow Length=424' Tc=14.4 min CN=84 Runoff=8.87 cfs 35,663 cf

Subcatchment 17S: Pr. North Swale	Runoff Area=76,739 sf 2.20% Impervious Runoff Depth>0.60" Flow Length=1,170' Tc=11.4 min CN=67 Runoff=0.83 cfs 3,854 cf
Pond 12P: Pr. Pocket Pond	Peak Elev=88.35' Storage=33,766 cf Inflow=16.60 cfs 49,893 cf Outflow=5.77 cfs 48,857 cf
Pond 13P: Pr. MicroPool ED Pond	Peak Elev=172.82' Storage=2,378 cf Inflow=2.28 cfs 7,008 cf Outflow=1.18 cfs 6,852 cf
Pond 31P: Rain Garden #1	Peak Elev=86.50' Storage=601 cf Inflow=0.09 cfs 601 cf Outflow=0.00 cfs 0 cf
Link 1L: Ex.To South Outfall	Inflow=35.34 cfs 178,153 cf Primary=35.34 cfs 178,153 cf
Link 2L: Pr. To South Outfall	Inflow=31.12 cfs 188,080 cf Primary=31.12 cfs 188,080 cf
Link 4L: Ex. Central 24" Pipe	Inflow=16.56 cfs 64,117 cf Primary=16.56 cfs 64,117 cf
Link 5L: Pr. Central 24" Pipe	Inflow=11.75 cfs 78,496 cf Primary=11.75 cfs 78,496 cf
Link 7L: Ex. To Pond	Inflow=30.12 cfs 131,802 cf Primary=30.12 cfs 131,802 cf
Link 8L: Pr. To Pond	Inflow=24.60 cfs 141,537 cf Primary=24.60 cfs 141,537 cf
Link 10L: Ex. To North Detention Pond	Inflow=11.79 cfs 53,422 cf Primary=11.79 cfs 53,422 cf
Link 11L: Pr. To North Detention Pond	Inflow=11.23 cfs 51,178 cf Primary=11.23 cfs 51,178 cf
Link 13L: Ex. North Swale Out	Inflow=10.24 cfs 41,761 cf Primary=10.24 cfs 41,761 cf
Link 14L: Pr. North Swale Out	Inflow=9.68 cfs 39,517 cf Primary=9.68 cfs 39,517 cf

Total Runoff Area = 4,427,966 sf Runoff Volume = 368,026 cf Average Runoff Depth = 1.00"
73.65% Pervious = 3,261,413 sf 26.35% Impervious = 1,166,553 sf

Time span=0.00-24.00 hrs, dt=0.001 hrs, 24001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex. South	Runoff Area=609,337 sf 15.57% Impervious Runoff Depth>1.28" Flow Length=2,071' Tc=26.8 min CN=73 Runoff=12.04 cfs 64,960 cf
Subcatchment2S: Ex.South Wetlands	Runoff Area=55,451 sf 0.00% Impervious Runoff Depth>0.69" Flow Length=385' Tc=5.5 min CN=62 Runoff=0.83 cfs 3,191 cf
Subcatchment3S: Ex.Central 24" Pipe	Runoff Area=602,842 sf 42.50% Impervious Runoff Depth>1.76" Flow Length=1,924' Tc=12.4 min CN=80 Runoff=23.13 cfs 88,386 cf
Subcatchment4S: Ex. Central ByPass	Runoff Area=415,307 sf 10.64% Impervious Runoff Depth>0.69" Flow Length=536' Tc=13.7 min CN=62 Runoff=4.68 cfs 23,835 cf
Subcatchment5S: Ex. North	Runoff Area=159,775 sf 7.18% Impervious Runoff Depth>1.28" Flow Length=731' Tc=24.4 min CN=73 Runoff=3.29 cfs 17,044 cf
Subcatchment6S: Ex. North Conveyance	Runoff Area=294,527 sf 47.83% Impervious Runoff Depth>2.07" Flow Length=424' Tc=14.4 min CN=84 Runoff=12.64 cfs 50,759 cf
Subcatchment7S: Ex.North Swale	Runoff Area=76,744 sf 1.70% Impervious Runoff Depth>0.94" Flow Length=1,170' Tc=11.4 min CN=67 Runoff=1.44 cfs 6,000 cf
Subcatchment8S: Pr. South	Runoff Area=612,257 sf 15.04% Impervious Runoff Depth>1.28" Flow Length=2,071' Tc=26.8 min CN=73 Runoff=12.10 cfs 65,271 cf
Subcatchment9S: Pr. South Wetlands	Runoff Area=54,807 sf 0.00% Impervious Runoff Depth>0.69" Flow Length=300' Tc=5.0 min CN=62 Runoff=0.83 cfs 3,155 cf
Subcatchment10S: Pr.Central 24" Pipe	Runoff Area=311,534 sf 22.75% Impervious Runoff Depth>1.28" Flow Length=710' Tc=17.2 min CN=73 Runoff=7.41 cfs 33,299 cf
Subcatchment11S: Pr. Central ByPass	Runoff Area=345,455 sf 13.29% Impervious Runoff Depth>0.69" Flow Length=536' Tc=13.7 min CN=62 Runoff=3.90 cfs 19,826 cf
Subcatchment12S: Pr.West Pond	Runoff Area=56,935 sf 60.58% Impervious Runoff Depth>1.99" Flow Length=364' Tc=5.8 min CN=83 Runoff=3.08 cfs 9,449 cf
Subcatchment13S: Pr.East Pond	Runoff Area=296,535 sf 74.50% Impervious Runoff Depth>2.60" Tc=5.0 min CN=90 Runoff=21.16 cfs 64,146 cf
Subcatchment14S: Pr.Rain Garden	Runoff Area=22,853 sf 16.99% Impervious Runoff Depth>0.56" Flow Length=124' Tc=5.9 min CN=59 Runoff=0.23 cfs 1,062 cf
Subcatchment15S: Pr. North	Runoff Area=159,775 sf 7.18% Impervious Runoff Depth>1.28" Flow Length=731' Tc=24.4 min CN=73 Runoff=3.29 cfs 17,044 cf
Subcatchment16S: Pr. North Conveyance	Runoff Area=277,093 sf 49.20% Impervious Runoff Depth>2.07" Flow Length=424' Tc=14.4 min CN=84 Runoff=11.89 cfs 47,755 cf

Subcatchment 17S: Pr. North Swale	Runoff Area=76,739 sf 2.20% Impervious Runoff Depth>0.94" Flow Length=1,170' Tc=11.4 min CN=67 Runoff=1.44 cfs 6,000 cf
Pond 12P: Pr. Pocket Pond	Peak Elev=88.69' Storage=37,794 cf Inflow=21.16 cfs 64,146 cf Outflow=7.46 cfs 62,967 cf
Pond 13P: Pr. MicroPool ED Pond	Peak Elev=173.08' Storage=2,903 cf Inflow=3.08 cfs 9,449 cf Outflow=1.46 cfs 9,273 cf
Pond 31P: Rain Garden #1	Peak Elev=86.75' Storage=848 cf Inflow=0.23 cfs 1,062 cf Outflow=0.01 cfs 214 cf
Link 1L: Ex.To South Outfall	Inflow=52.27 cfs 254,176 cf Primary=52.27 cfs 254,176 cf
Link 2L: Pr. To South Outfall	Inflow=45.60 cfs 264,804 cf Primary=45.60 cfs 264,804 cf
Link 4L: Ex. Central 24" Pipe	Inflow=23.13 cfs 88,386 cf Primary=23.13 cfs 88,386 cf
Link 5L: Pr. Central 24" Pipe	Inflow=16.10 cfs 105,538 cf Primary=16.10 cfs 105,538 cf
Link 7L: Ex. To Pond	Inflow=43.83 cfs 186,024 cf Primary=43.83 cfs 186,024 cf
Link 8L: Pr. To Pond	Inflow=35.27 cfs 196,377 cf Primary=35.27 cfs 196,377 cf
Link 10L: Ex. To North Detention Pond	Inflow=16.50 cfs 73,804 cf Primary=16.50 cfs 73,804 cf
Link 11L: Pr. To North Detention Pond	Inflow=15.75 cfs 70,799 cf Primary=15.75 cfs 70,799 cf
Link 13L: Ex. North Swale Out	Inflow=14.06 cfs 56,759 cf Primary=14.06 cfs 56,759 cf
Link 14L: Pr. North Swale Out	Inflow=13.31 cfs 53,754 cf Primary=13.31 cfs 53,754 cf

Total Runoff Area = 4,427,966 sf Runoff Volume = 521,183 cf Average Runoff Depth = 1.41"
73.65% Pervious = 3,261,413 sf 26.35% Impervious = 1,166,553 sf

Time span=0.00-24.00 hrs, dt=0.001 hrs, 24001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex. South	Runoff Area=609,337 sf 15.57% Impervious Runoff Depth>2.01" Flow Length=2,071' Tc=26.8 min CN=73 Runoff=19.46 cfs 102,157 cf
Subcatchment2S: Ex.South Wetlands	Runoff Area=55,451 sf 0.00% Impervious Runoff Depth>1.24" Flow Length=385' Tc=5.5 min CN=62 Runoff=1.70 cfs 5,717 cf
Subcatchment3S: Ex.Central 24" Pipe	Runoff Area=602,842 sf 42.50% Impervious Runoff Depth>2.60" Flow Length=1,924' Tc=12.4 min CN=80 Runoff=34.42 cfs 130,636 cf
Subcatchment4S: Ex. Central ByPass	Runoff Area=415,307 sf 10.64% Impervious Runoff Depth>1.23" Flow Length=536' Tc=13.7 min CN=62 Runoff=9.67 cfs 42,711 cf
Subcatchment5S: Ex. North	Runoff Area=159,775 sf 7.18% Impervious Runoff Depth>2.01" Flow Length=731' Tc=24.4 min CN=73 Runoff=5.32 cfs 26,803 cf
Subcatchment6S: Ex. North Conveyance	Runoff Area=294,527 sf 47.83% Impervious Runoff Depth>2.96" Flow Length=424' Tc=14.4 min CN=84 Runoff=18.05 cfs 72,697 cf
Subcatchment7S: Ex.North Swale	Runoff Area=76,744 sf 1.70% Impervious Runoff Depth>1.57" Flow Length=1,170' Tc=11.4 min CN=67 Runoff=2.59 cfs 10,055 cf
Subcatchment8S: Pr. South	Runoff Area=612,257 sf 15.04% Impervious Runoff Depth>2.01" Flow Length=2,071' Tc=26.8 min CN=73 Runoff=19.56 cfs 102,647 cf
Subcatchment9S: Pr. South Wetlands	Runoff Area=54,807 sf 0.00% Impervious Runoff Depth>1.24" Flow Length=300' Tc=5.0 min CN=62 Runoff=1.71 cfs 5,651 cf
Subcatchment10S: Pr.Central 24" Pipe	Runoff Area=311,534 sf 22.75% Impervious Runoff Depth>2.02" Flow Length=710' Tc=17.2 min CN=73 Runoff=12.00 cfs 52,353 cf
Subcatchment11S: Pr. Central ByPass	Runoff Area=345,455 sf 13.29% Impervious Runoff Depth>1.23" Flow Length=536' Tc=13.7 min CN=62 Runoff=8.04 cfs 35,527 cf
Subcatchment12S: Pr.West Pond	Runoff Area=56,935 sf 60.58% Impervious Runoff Depth>2.87" Flow Length=364' Tc=5.8 min CN=83 Runoff=4.44 cfs 13,636 cf
Subcatchment13S: Pr.East Pond	Runoff Area=296,535 sf 74.50% Impervious Runoff Depth>3.56" Tc=5.0 min CN=90 Runoff=28.57 cfs 87,869 cf
Subcatchment14S: Pr.Rain Garden	Runoff Area=22,853 sf 16.99% Impervious Runoff Depth>1.05" Flow Length=124' Tc=5.9 min CN=59 Runoff=0.55 cfs 1,999 cf
Subcatchment15S: Pr. North	Runoff Area=159,775 sf 7.18% Impervious Runoff Depth>2.01" Flow Length=731' Tc=24.4 min CN=73 Runoff=5.32 cfs 26,803 cf
Subcatchment16S: Pr. North Conveyance	Runoff Area=277,093 sf 49.20% Impervious Runoff Depth>2.96" Flow Length=424' Tc=14.4 min CN=84 Runoff=16.98 cfs 68,394 cf

Subcatchment 17S: Pr. North Swale	Runoff Area=76,739 sf 2.20% Impervious Runoff Depth>1.57" Flow Length=1,170' Tc=11.4 min CN=67 Runoff=2.59 cfs 10,055 cf
Pond 12P: Pr. Pocket Pond	Peak Elev=89.02' Storage=41,710 cf Inflow=28.57 cfs 87,869 cf Outflow=14.06 cfs 86,460 cf
Pond 13P: Pr. MicroPool ED Pond	Peak Elev=173.49' Storage=3,949 cf Inflow=4.44 cfs 13,636 cf Outflow=1.80 cfs 13,427 cf
Pond 31P: Rain Garden #1	Peak Elev=86.76' Storage=855 cf Inflow=0.55 cfs 1,999 cf Outflow=0.09 cfs 1,151 cf
Link 1L: Ex.To South Outfall	Inflow=82.38 cfs 390,776 cf Primary=82.38 cfs 390,776 cf
Link 2L: Pr. To South Outfall	Inflow=75.39 cfs 402,467 cf Primary=75.39 cfs 402,467 cf
Link 4L: Ex. Central 24" Pipe	Inflow=34.42 cfs 130,636 cf Primary=34.42 cfs 130,636 cf
Link 5L: Pr. Central 24" Pipe	Inflow=27.68 cfs 152,240 cf Primary=27.68 cfs 152,240 cf
Link 7L: Ex. To Pond	Inflow=68.06 cfs 282,902 cf Primary=68.06 cfs 282,902 cf
Link 8L: Pr. To Pond	Inflow=59.17 cfs 294,169 cf Primary=59.17 cfs 294,169 cf
Link 10L: Ex. To North Detention Pond	Inflow=24.64 cfs 109,555 cf Primary=24.64 cfs 109,555 cf
Link 11L: Pr. To North Detention Pond	Inflow=23.58 cfs 105,251 cf Primary=23.58 cfs 105,251 cf
Link 13L: Ex. North Swale Out	Inflow=20.58 cfs 82,752 cf Primary=20.58 cfs 82,752 cf
Link 14L: Pr. North Swale Out	Inflow=19.51 cfs 78,449 cf Primary=19.51 cfs 78,449 cf

Total Runoff Area = 4,427,966 sf Runoff Volume = 795,709 cf Average Runoff Depth = 2.16"
73.65% Pervious = 3,261,413 sf 26.35% Impervious = 1,166,553 sf

Time span=0.00-24.00 hrs, dt=0.001 hrs, 24001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex. South	Runoff Area=609,337 sf 15.57% Impervious Runoff Depth>2.67" Flow Length=2,071' Tc=26.8 min CN=73 Runoff=26.07 cfs 135,616 cf
Subcatchment2S: Ex.South Wetlands	Runoff Area=55,451 sf 0.00% Impervious Runoff Depth>1.76" Flow Length=385' Tc=5.5 min CN=62 Runoff=2.53 cfs 8,133 cf
Subcatchment3S: Ex.Central 24" Pipe	Runoff Area=602,842 sf 42.50% Impervious Runoff Depth>3.33" Flow Length=1,924' Tc=12.4 min CN=80 Runoff=44.10 cfs 167,497 cf
Subcatchment4S: Ex. Central ByPass	Runoff Area=415,307 sf 10.64% Impervious Runoff Depth>1.76" Flow Length=536' Tc=13.7 min CN=62 Runoff=14.46 cfs 60,774 cf
Subcatchment5S: Ex. North	Runoff Area=159,775 sf 7.18% Impervious Runoff Depth>2.67" Flow Length=731' Tc=24.4 min CN=73 Runoff=7.14 cfs 35,580 cf
Subcatchment6S: Ex. North Conveyance	Runoff Area=294,527 sf 47.83% Impervious Runoff Depth>3.73" Flow Length=424' Tc=14.4 min CN=84 Runoff=22.61 cfs 91,556 cf
Subcatchment7S: Ex.North Swale	Runoff Area=76,744 sf 1.70% Impervious Runoff Depth>2.16" Flow Length=1,170' Tc=11.4 min CN=67 Runoff=3.65 cfs 13,817 cf
Subcatchment8S: Pr. South	Runoff Area=612,257 sf 15.04% Impervious Runoff Depth>2.67" Flow Length=2,071' Tc=26.8 min CN=73 Runoff=26.19 cfs 136,266 cf
Subcatchment9S: Pr. South Wetlands	Runoff Area=54,807 sf 0.00% Impervious Runoff Depth>1.76" Flow Length=300' Tc=5.0 min CN=62 Runoff=2.55 cfs 8,039 cf
Subcatchment10S: Pr.Central 24" Pipe	Runoff Area=311,534 sf 22.75% Impervious Runoff Depth>2.68" Flow Length=710' Tc=17.2 min CN=73 Runoff=16.07 cfs 69,490 cf
Subcatchment11S: Pr. Central ByPass	Runoff Area=345,455 sf 13.29% Impervious Runoff Depth>1.76" Flow Length=536' Tc=13.7 min CN=62 Runoff=12.03 cfs 50,552 cf
Subcatchment12S: Pr.West Pond	Runoff Area=56,935 sf 60.58% Impervious Runoff Depth>3.64" Flow Length=364' Tc=5.8 min CN=83 Runoff=5.58 cfs 17,247 cf
Subcatchment13S: Pr.East Pond	Runoff Area=296,535 sf 74.50% Impervious Runoff Depth>4.37" Tc=5.0 min CN=90 Runoff=34.70 cfs 107,892 cf
Subcatchment14S: Pr.Rain Garden	Runoff Area=22,853 sf 16.99% Impervious Runoff Depth>1.53" Flow Length=124' Tc=5.9 min CN=59 Runoff=0.87 cfs 2,916 cf
Subcatchment15S: Pr. North	Runoff Area=159,775 sf 7.18% Impervious Runoff Depth>2.67" Flow Length=731' Tc=24.4 min CN=73 Runoff=7.14 cfs 35,580 cf
Subcatchment16S: Pr. North Conveyance	Runoff Area=277,093 sf 49.20% Impervious Runoff Depth>3.73" Flow Length=424' Tc=14.4 min CN=84 Runoff=21.27 cfs 86,136 cf

Subcatchment 17S: Pr. North Swale	Runoff Area=76,739 sf 2.20% Impervious Runoff Depth>2.16" Flow Length=1,170' Tc=11.4 min CN=67 Runoff=3.64 cfs 13,816 cf
Pond 12P: Pr. Pocket Pond	Peak Elev=89.23' Storage=44,633 cf Inflow=34.70 cfs 107,892 cf Outflow=20.14 cfs 106,299 cf
Pond 13P: Pr. MicroPool ED Pond	Peak Elev=173.66' Storage=4,409 cf Inflow=5.58 cfs 17,247 cf Outflow=3.52 cfs 17,019 cf
Pond 31P: Rain Garden #1	Peak Elev=86.78' Storage=880 cf Inflow=0.87 cfs 2,916 cf Outflow=0.43 cfs 2,067 cf
Link 1L: Ex.To South Outfall	Inflow=109.08 cfs 512,972 cf Primary=109.08 cfs 512,972 cf
Link 2L: Pr. To South Outfall	Inflow=102.23 cfs 525,264 cf Primary=102.23 cfs 525,264 cf
Link 4L: Ex. Central 24" Pipe	Inflow=44.10 cfs 167,497 cf Primary=44.10 cfs 167,497 cf
Link 5L: Pr. Central 24" Pipe	Inflow=38.73 cfs 192,808 cf Primary=38.73 cfs 192,808 cf
Link 7L: Ex. To Pond	Inflow=89.36 cfs 369,224 cf Primary=89.36 cfs 369,224 cf
Link 8L: Pr. To Pond	Inflow=81.05 cfs 380,959 cf Primary=81.05 cfs 380,959 cf
Link 10L: Ex. To North Detention Pond	Inflow=31.67 cfs 140,953 cf Primary=31.67 cfs 140,953 cf
Link 11L: Pr. To North Detention Pond	Inflow=30.34 cfs 135,533 cf Primary=30.34 cfs 135,533 cf
Link 13L: Ex. North Swale Out	Inflow=26.16 cfs 105,373 cf Primary=26.16 cfs 105,373 cf
Link 14L: Pr. North Swale Out	Inflow=24.82 cfs 99,953 cf Primary=24.82 cfs 99,953 cf

Total Runoff Area = 4,427,966 sf Runoff Volume = 1,040,906 cf Average Runoff Depth = 2.82"
73.65% Pervious = 3,261,413 sf 26.35% Impervious = 1,166,553 sf

Time span=0.00-24.00 hrs, dt=0.001 hrs, 24001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex. South	Runoff Area=609,337 sf 15.57% Impervious Runoff Depth>3.63" Flow Length=2,071' Tc=26.8 min CN=73 Runoff=35.66 cfs 184,411 cf
Subcatchment2S: Ex.South Wetlands	Runoff Area=55,451 sf 0.00% Impervious Runoff Depth>2.56" Flow Length=385' Tc=5.5 min CN=62 Runoff=3.80 cfs 11,818 cf
Subcatchment3S: Ex.Central 24" Pipe	Runoff Area=602,842 sf 42.50% Impervious Runoff Depth>4.38" Flow Length=1,924' Tc=12.4 min CN=80 Runoff=57.68 cfs 220,077 cf
Subcatchment4S: Ex. Central ByPass	Runoff Area=415,307 sf 10.64% Impervious Runoff Depth>2.55" Flow Length=536' Tc=13.7 min CN=62 Runoff=21.78 cfs 88,331 cf
Subcatchment5S: Ex. North	Runoff Area=159,775 sf 7.18% Impervious Runoff Depth>3.63" Flow Length=731' Tc=24.4 min CN=73 Runoff=9.76 cfs 48,380 cf
Subcatchment6S: Ex. North Conveyance	Runoff Area=294,527 sf 47.83% Impervious Runoff Depth>4.81" Flow Length=424' Tc=14.4 min CN=84 Runoff=28.93 cfs 118,178 cf
Subcatchment7S: Ex.North Swale	Runoff Area=76,744 sf 1.70% Impervious Runoff Depth>3.04" Flow Length=1,170' Tc=11.4 min CN=67 Runoff=5.21 cfs 19,429 cf
Subcatchment8S: Pr. South	Runoff Area=612,257 sf 15.04% Impervious Runoff Depth>3.63" Flow Length=2,071' Tc=26.8 min CN=73 Runoff=35.83 cfs 185,294 cf
Subcatchment9S: Pr. South Wetlands	Runoff Area=54,807 sf 0.00% Impervious Runoff Depth>2.56" Flow Length=300' Tc=5.0 min CN=62 Runoff=3.82 cfs 11,682 cf
Subcatchment10S: Pr.Central 24" Pipe	Runoff Area=311,534 sf 22.75% Impervious Runoff Depth>3.64" Flow Length=710' Tc=17.2 min CN=73 Runoff=21.94 cfs 94,479 cf
Subcatchment11S: Pr. Central ByPass	Runoff Area=345,455 sf 13.29% Impervious Runoff Depth>2.55" Flow Length=536' Tc=13.7 min CN=62 Runoff=18.12 cfs 73,474 cf
Subcatchment12S: Pr.West Pond	Runoff Area=56,935 sf 60.58% Impervious Runoff Depth>4.71" Flow Length=364' Tc=5.8 min CN=83 Runoff=7.17 cfs 22,358 cf
Subcatchment13S: Pr.East Pond	Runoff Area=296,535 sf 74.50% Impervious Runoff Depth>5.50" Tc=5.0 min CN=90 Runoff=43.12 cfs 135,806 cf
Subcatchment14S: Pr.Rain Garden	Runoff Area=22,853 sf 16.99% Impervious Runoff Depth>2.28" Flow Length=124' Tc=5.9 min CN=59 Runoff=1.35 cfs 4,335 cf
Subcatchment15S: Pr. North	Runoff Area=159,775 sf 7.18% Impervious Runoff Depth>3.63" Flow Length=731' Tc=24.4 min CN=73 Runoff=9.76 cfs 48,380 cf
Subcatchment16S: Pr. North Conveyance	Runoff Area=277,093 sf 49.20% Impervious Runoff Depth>4.81" Flow Length=424' Tc=14.4 min CN=84 Runoff=27.22 cfs 111,182 cf

Subcatchment 17S: Pr. North Swale Runoff Area=76,739 sf 2.20% Impervious Runoff Depth>3.04"
Flow Length=1,170' Tc=11.4 min CN=67 Runoff=5.21 cfs 19,428 cf

Pond 12P: Pr. Pocket Pond Peak Elev=89.49' Storage=48,187 cf Inflow=43.12 cfs 135,806 cf
Outflow=28.47 cfs 133,994 cf

Pond 13P: Pr. MicroPool ED Pond Peak Elev=173.83' Storage=4,850 cf Inflow=7.17 cfs 22,358 cf
Outflow=5.31 cfs 22,104 cf

Pond 31P: Rain Garden #1 Peak Elev=86.82' Storage=915 cf Inflow=1.35 cfs 4,335 cf
Outflow=1.20 cfs 3,486 cf

Link 1L: Ex.To South Outfall Inflow=147.50 cfs 690,623 cf
Primary=147.50 cfs 690,623 cf

Link 2L: Pr. To South Outfall Inflow=141.18 cfs 703,504 cf
Primary=141.18 cfs 703,504 cf

Link 4L: Ex. Central 24" Pipe Inflow=57.68 cfs 220,077 cf
Primary=57.68 cfs 220,077 cf

Link 5L: Pr. Central 24" Pipe Inflow=53.61 cfs 250,577 cf
Primary=53.61 cfs 250,577 cf

Link 7L: Ex. To Pond Inflow=119.94 cfs 494,394 cf
Primary=119.94 cfs 494,394 cf

Link 8L: Pr. To Pond Inflow=112.41 cfs 506,527 cf
Primary=112.41 cfs 506,527 cf

Link 10L: Ex. To North Detention Pond Inflow=41.61 cfs 185,987 cf
Primary=41.61 cfs 185,987 cf

Link 11L: Pr. To North Detention Pond Inflow=39.90 cfs 178,990 cf
Primary=39.90 cfs 178,990 cf

Link 13L: Ex. North Swale Out Inflow=33.99 cfs 137,607 cf
Primary=33.99 cfs 137,607 cf

Link 14L: Pr. North Swale Out Inflow=32.28 cfs 130,610 cf
Primary=32.28 cfs 130,610 cf

Total Runoff Area = 4,427,966 sf Runoff Volume = 1,397,042 cf Average Runoff Depth = 3.79"
73.65% Pervious = 3,261,413 sf 26.35% Impervious = 1,166,553 sf

Summary for Subcatchment 1S: Ex. South

Runoff = 35.66 cfs @ 12.36 hrs, Volume= 184,411 cf, Depth> 3.63"
 Routed to Link 1L : Ex.To South Outfall

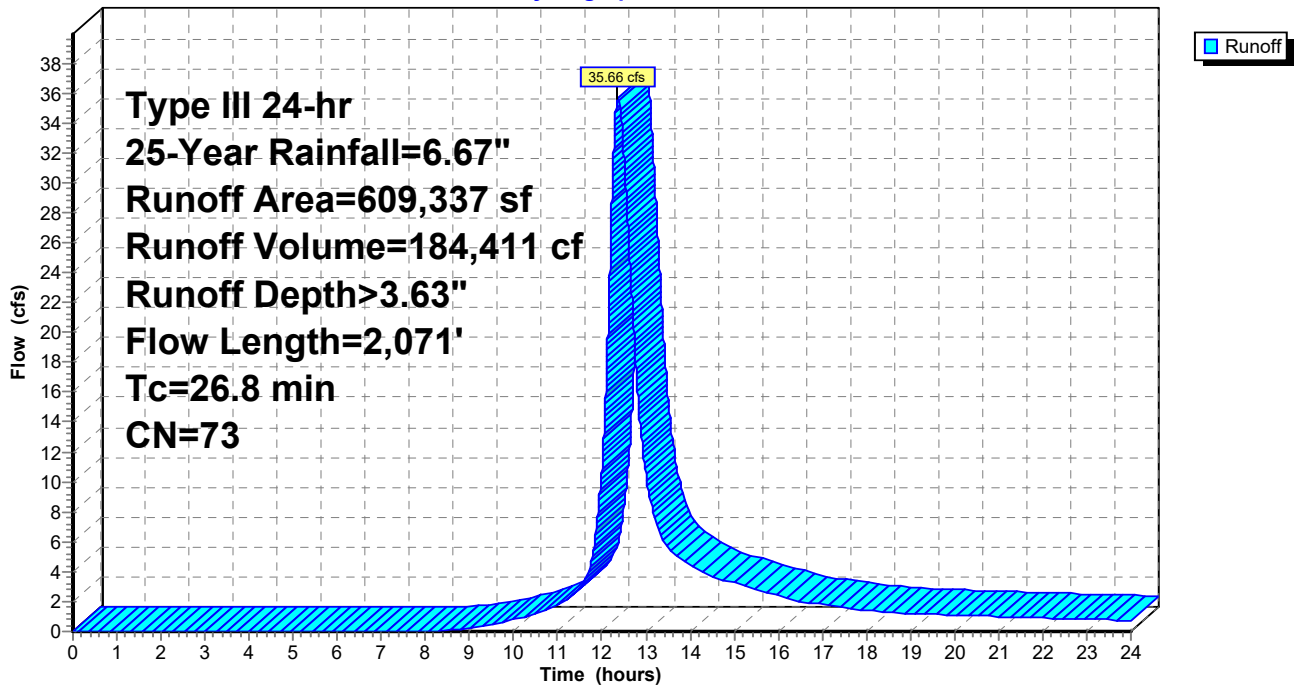
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

Area (sf)	CN	Description
5,651	49	50-75% Grass cover, Fair, HSG A
27,114	69	50-75% Grass cover, Fair, HSG B
99,283	60	Woods, Fair, HSG B
2,110	78	Meadow, non-grazed, HSG D
73,246	58	Meadow, non-grazed, HSG B
* 2,467	98	Impervious, HSG A
* 38,005	98	Impervious, HSG B
26,495	79	Woods, Fair, HSG D
1,904	98	Water Surface, HSG D
* 11,709	98	Offsite Impervious, HSG B
* 44,408	61	Offsite Pervious, Good, HSG B
* 21,250	98	Offsite Impervious, HSG C
* 123,737	74	Offsite Pervious, Good, HSG C
* 19,521	98	Offsite Impervious, HSG D
* 112,437	80	Offsite Pervious, HSG D
609,337	73	Weighted Average
514,481		84.43% Pervious Area
94,856		15.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0190	0.17		Sheet Flow, Offsite Grass: Short n= 0.150 P2= 3.45"
4.4	261	0.0200	0.99		Shallow Concentrated Flow, Offsite Short Grass Pasture Kv= 7.0 fps
3.3	124	0.0081	0.63		Shallow Concentrated Flow, Offsite Short Grass Pasture Kv= 7.0 fps
0.7	62	0.0480	1.53		Shallow Concentrated Flow, Offsite Short Grass Pasture Kv= 7.0 fps
3.1	120	0.0083	0.64		Shallow Concentrated Flow, Offsite Short Grass Pasture Kv= 7.0 fps
0.3	44	0.1400	2.62		Shallow Concentrated Flow, Offsite Short Grass Pasture Kv= 7.0 fps
0.8	57	0.0260	1.13		Shallow Concentrated Flow, Offsite Short Grass Pasture Kv= 7.0 fps
0.1	17	0.0290	3.46		Shallow Concentrated Flow, Offsite Paved Kv= 20.3 fps
1.1	249	0.0640	3.79		Shallow Concentrated Flow, Offsite Grassed Waterway Kv= 15.0 fps
0.5	100	0.0600	3.67		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
1.7	550	0.1272	5.35		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
1.2	387	0.1189	5.17		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
26.8	2,071	Total			

Subcatchment 1S: Ex. South

Hydrograph



Summary for Subcatchment 2S: Ex.South Wetlands

Runoff = 3.80 cfs @ 12.08 hrs, Volume= 11,818 cf, Depth> 2.56"
 Routed to Link 1L : Ex.To South Outfall

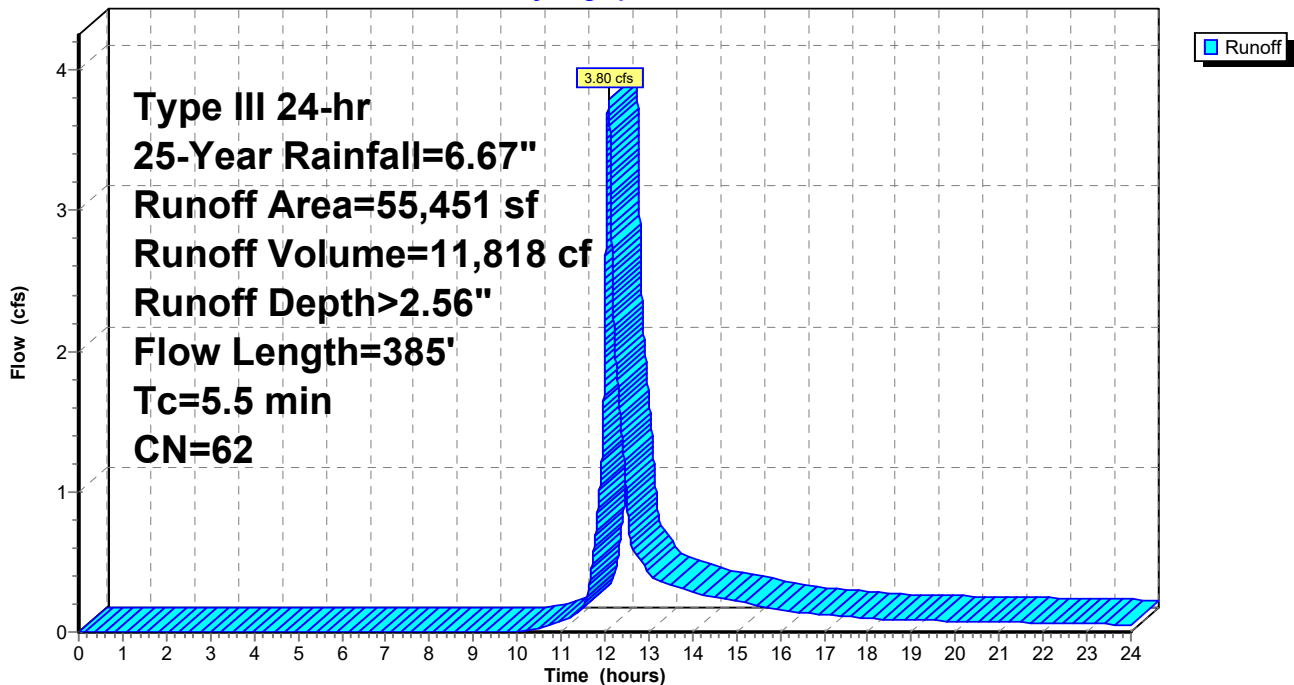
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

Area (sf)	CN	Description
16,612	58	Meadow, non-grazed, HSG B
30,928	60	Woods, Fair, HSG B
7,911	79	Woods, Fair, HSG D
55,451	62	Weighted Average
55,451		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	108	0.2130	0.46		Sheet Flow, Grass: Short n= 0.150 P2= 3.45"
0.6	107	0.1776	2.95		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	88	0.1534	1.96		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	82	0.0730	4.05		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
5.5	385	Total			

Subcatchment 2S: Ex.South Wetlands

Hydrograph



Summary for Subcatchment 3S: Ex.Central 24" Pipe

[47] Hint: Peak is 437% of capacity of segment #6

[47] Hint: Peak is 103% of capacity of segment #9

Runoff = 57.68 cfs @ 12.17 hrs, Volume= 220,077 cf, Depth> 4.38"
 Routed to Link 4L : Ex. Central 24" Pipe

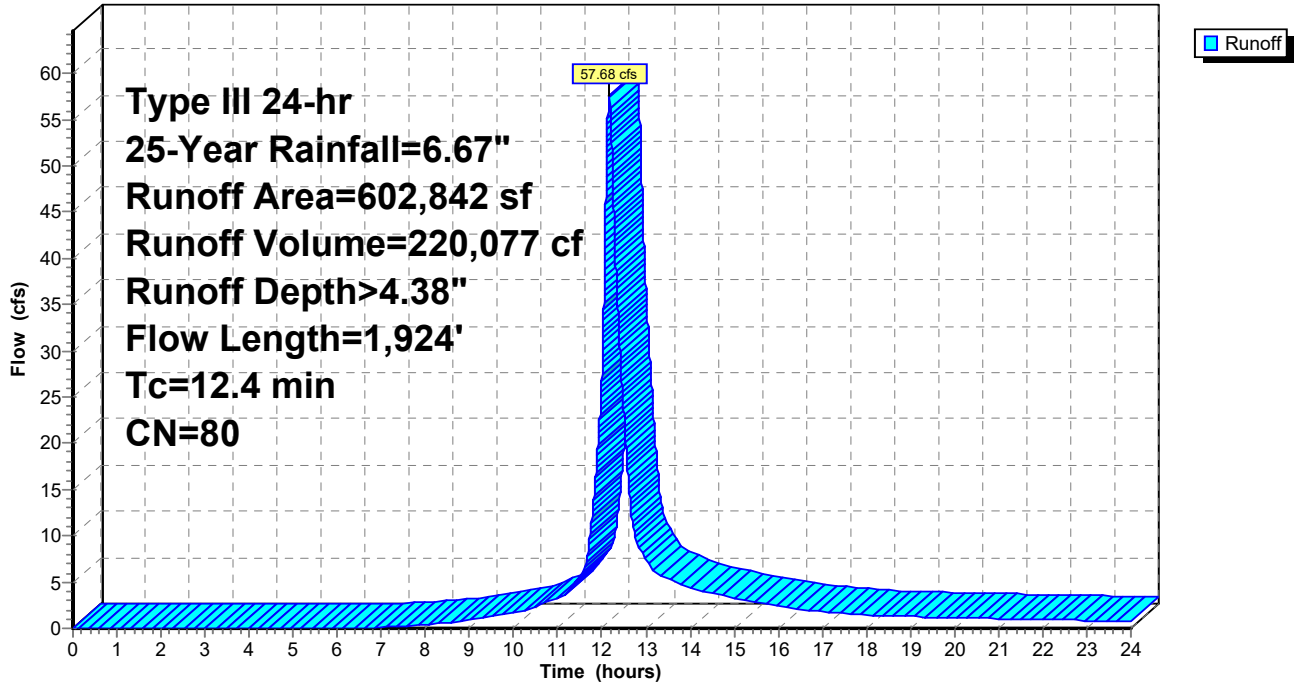
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

Area (sf)	CN	Description
37,023	60	Woods, Fair, HSG B
22,575	58	Meadow, non-grazed, HSG B
156,883	69	50-75% Grass cover, Fair, HSG B
* 230,998	98	Impervious, HSG B
* 44,031	61	Offsite Pervious, HSG B
* 25,185	98	Offsite Impervious, HSG C
* 86,147	74	Offsite Pervious, HSG C
602,842	80	Weighted Average
346,659		57.50% Pervious Area
256,183		42.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0360	0.22		Sheet Flow, Offsite Grass: Short n= 0.150 P2= 3.45"
0.3	81	0.0420	4.16		Shallow Concentrated Flow, Offsite Paved Kv= 20.3 fps
1.4	100	0.0600	1.22		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.5	196	0.1923	2.19		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.6	120	0.0298	3.50		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	59	0.0982	16.80	13.19	Pipe Channel, CMP_Round 12" 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
0.3	325	0.0479	18.63	58.51	Pipe Channel, RCP_Round 24" 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.011 Concrete pipe, straight & clean
0.2	306	0.0889	25.37	79.72	Pipe Channel, RCP_Round 24" 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.011 Concrete pipe, straight & clean
0.4	440	0.0608	17.76	55.78	Pipe Channel, RCP_Round 24" 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.1	197	0.0930	21.96	68.99	Pipe Channel, RCP_Round 24" 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
12.4	1,924	Total			

Subcatchment 3S: Ex.Central 24" Pipe

Hydrograph



Summary for Subcatchment 4S: Ex. Central ByPass

Runoff = 21.78 cfs @ 12.19 hrs, Volume= 88,331 cf, Depth> 2.55"
 Routed to Link 7L : Ex. To Pond

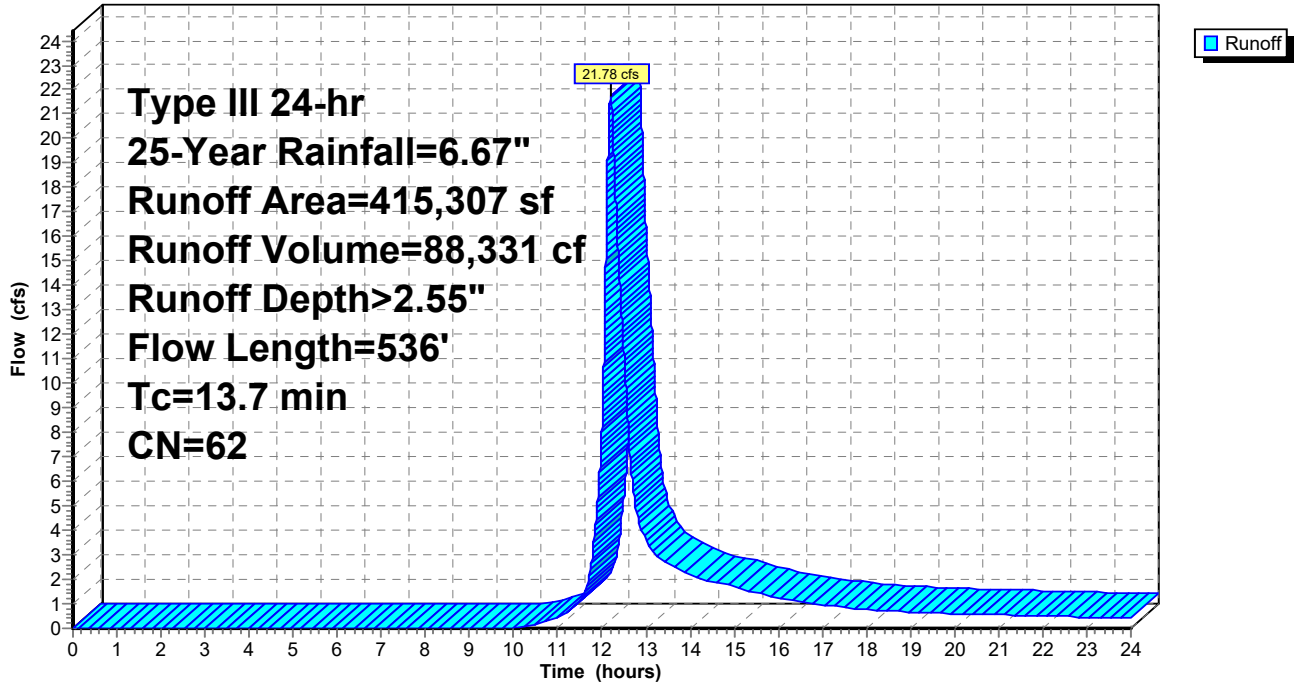
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

Area (sf)	CN	Description
110,546	49	50-75% Grass cover, Fair, HSG A
50,991	30	Meadow, non-grazed, HSG A
38,457	36	Woods, Fair, HSG A
33,170	69	50-75% Grass cover, Fair, HSG B
14,434	58	Meadow, non-grazed, HSG B
12,255	84	50-75% Grass cover, Fair, HSG D
65,547	78	Meadow, non-grazed, HSG D
45,705	79	Woods, Fair, HSG D
* 1,527	98	Impervious, HSG D
42,634	98	Water Surface, HSG D
41	98	Water Surface, HSG B
415,307	62	Weighted Average
371,105		89.36% Pervious Area
44,202		10.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0490	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.45"
2.1	269	0.1911	2.19		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.7	129	0.0620	1.24		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	38	0.1842	2.15		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.7	536	Total			

Subcatchment 4S: Ex. Central ByPass

Hydrograph



Summary for Subcatchment 5S: Ex. North

Runoff = 9.76 cfs @ 12.34 hrs, Volume= 48,380 cf, Depth> 3.63"
 Routed to Link 10L : Ex. To North Detention Pond

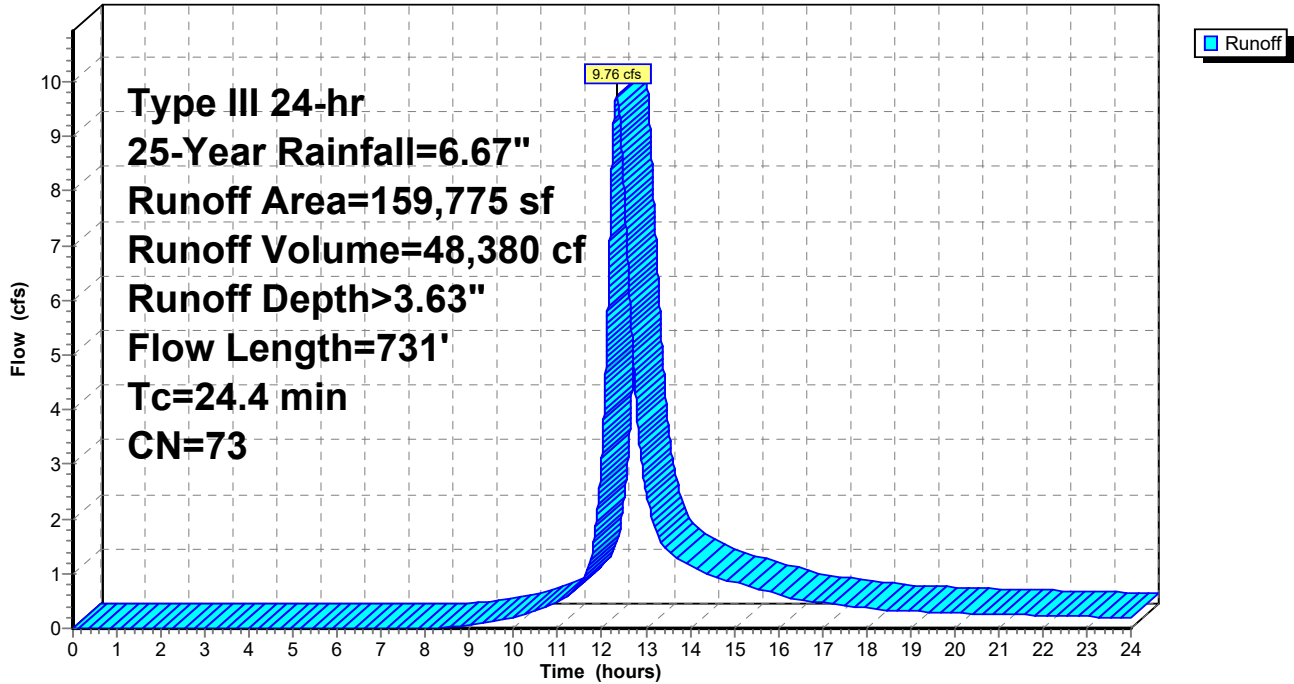
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

Area (sf)	CN	Description
6,335	36	Woods, Fair, HSG A
4,614	69	50-75% Grass cover, Fair, HSG B
47,495	60	Woods, Fair, HSG B
10,996	78	Meadow, non-grazed, HSG D
78,856	79	Woods, Fair, HSG D
* 447	98	Impervious, HSG D
* 159	98	Impervious. HSG B
10,873	98	Water Surface, HSG D
159,775	73	Weighted Average
148,296		92.82% Pervious Area
11,479		7.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.7	102	0.0833	0.08		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.45"
2.8	312	0.1394	1.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	317	0.1388	5.59		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
24.4	731	Total			

Subcatchment 5S: Ex. North

Hydrograph



Summary for Subcatchment 6S: Ex. North Conveyance

Runoff = 28.93 cfs @ 12.19 hrs, Volume= 118,178 cf, Depth> 4.81"
 Routed to Link 13L : Ex. North Swale Out

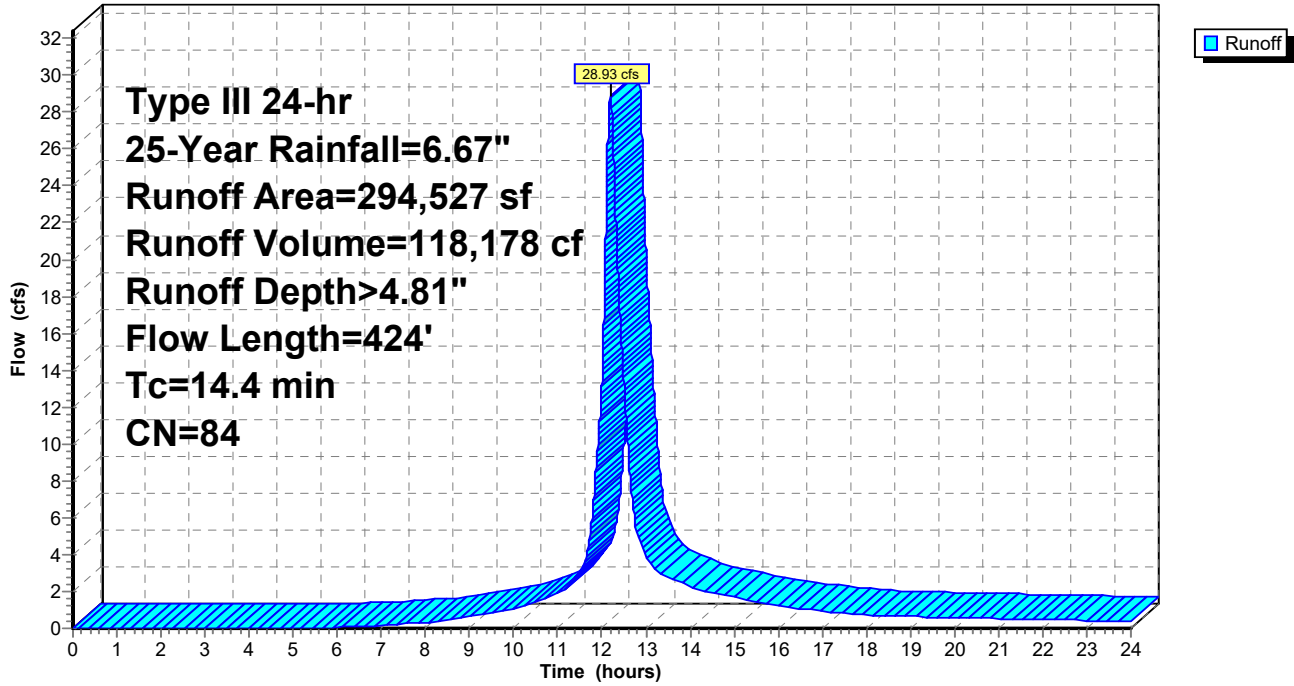
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

Area (sf)	CN	Description
6,257	73	Woods, Fair, HSG C
10,310	71	Meadow, non-grazed, HSG C
3,086	60	Woods, Fair, HSG B
4,641	58	Meadow, non-grazed, HSG B
42,939	69	50-75% Grass cover, Fair, HSG B
* 117,862	98	Impervious, HSG B
* 22,965	98	Offsite Impervious, HSG C
* 86,344	74	Offsite Pervious, HSG C
* 45	98	Offsite Impervious, HSG D
* 78	80	Offsite Pervious, HSG D
294,527	84	Weighted Average
153,655		52.17% Pervious Area
140,872		47.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0600	0.27		Sheet Flow, Offsite Grass: Short n= 0.150 P2= 3.45"
0.8	48	0.0420	1.02		Shallow Concentrated Flow, Offsite Woodland Kv= 5.0 fps
1.9	172	0.0930	1.52		Shallow Concentrated Flow, Offsite Woodland Kv= 5.0 fps
0.6	104	0.2880	2.68		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
5.0					Direct Entry,
14.4	424	Total			

Subcatchment 6S: Ex. North Conveyance

Hydrograph



Summary for Subcatchment 7S: Ex.North Swale

Runoff = 5.21 cfs @ 12.16 hrs, Volume= 19,429 cf, Depth> 3.04"
 Routed to Link 13L : Ex. North Swale Out

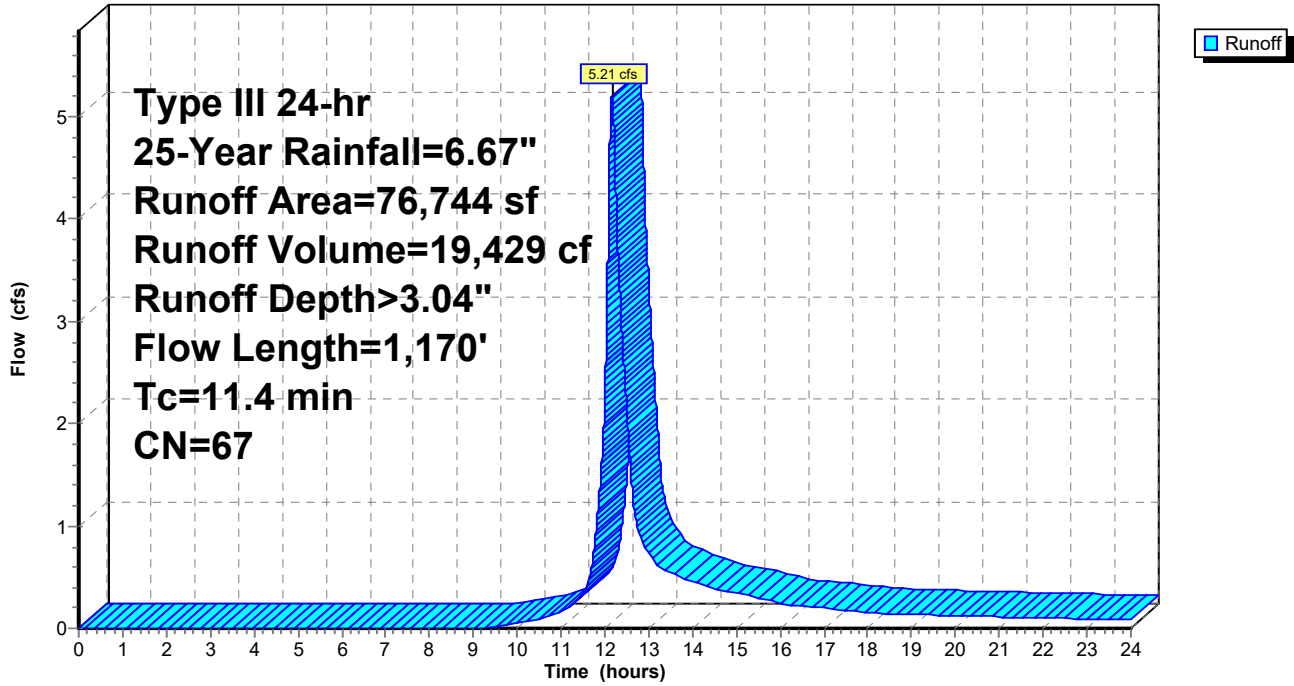
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

Area (sf)	CN	Description
3,345	69	50-75% Grass cover, Fair, HSG B
38,080	60	Woods, Fair, HSG B
1,854	71	Meadow, non-grazed, HSG C
6,228	73	Woods, Fair, HSG C
4,696	79	Woods, Fair, HSG D
* 1,301	98	Offsite Impervious, HSG C
* 21,240	74	Offsite Pervious, HSG C
76,744	67	Weighted Average
75,443		98.30% Pervious Area
1,301		1.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	100	0.1100	0.35		Sheet Flow, Offsite Grass: Short n= 0.150 P2= 3.45"
0.7	69	0.0580	1.69		Shallow Concentrated Flow, Offsite Short Grass Pasture Kv= 7.0 fps
2.0	131	0.0460	1.07		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.4	80	0.3750	3.06		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.5	790	0.0630	3.76		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
11.4	1,170	Total			

Subcatchment 7S: Ex.North Swale

Hydrograph



Summary for Subcatchment 8S: Pr. South

Runoff = 35.83 cfs @ 12.36 hrs, Volume= 185,294 cf, Depth> 3.63"
 Routed to Link 2L : Pr. To South Outfall

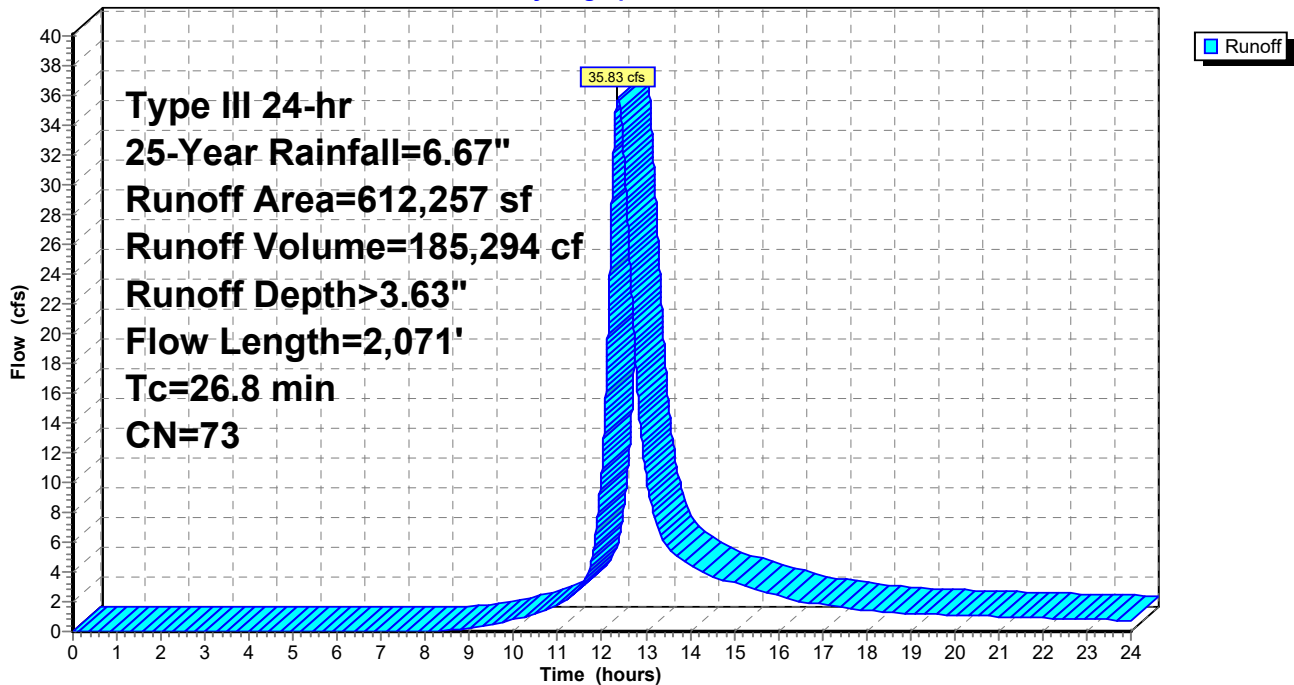
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

	Area (sf)	CN	Description
*	3,307	98	Impervious, HSG A
*	34,387	98	Impervious, HSG B
	4,821	49	50-75% Grass cover, Fair, HSG A
	11,906	69	50-75% Grass cover, Fair, HSG B
	22,741	61	>75% Grass cover, Good, HSG B
	72,383	58	Meadow, non-grazed, HSG B
	99,141	60	Woods, Fair, HSG B
	2,110	78	Meadow, non-grazed, HSG D
	26,495	79	Woods, Fair, HSG D
	1,904	98	Water Surface, HSG D
*	11,709	98	Offsite Impervious, HSG B
*	44,408	61	Offsite Pervious, HSG B
*	21,250	98	Offsite Impervious, HSG C
*	123,737	74	Offsite Pervious, HSG C
*	19,521	98	Offsite Impervious, HSG D
*	112,437	80	Offsite Pervious, HSG D
	612,257	73	Weighted Average
	520,179		84.96% Pervious Area
	92,078		15.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0190	0.17		Sheet Flow, Offsite Grass: Short n= 0.150 P2= 3.45"
4.4	261	0.0200	0.99		Shallow Concentrated Flow, Offsite Short Grass Pasture Kv= 7.0 fps
3.3	124	0.0080	0.63		Shallow Concentrated Flow, Offsite Short Grass Pasture Kv= 7.0 fps
0.7	62	0.0480	1.53		Shallow Concentrated Flow, Offsite Short Grass Pasture Kv= 7.0 fps
3.1	120	0.0083	0.64		Shallow Concentrated Flow, Offsite Short Grass Pasture Kv= 7.0 fps
0.3	44	0.1400	2.62		Shallow Concentrated Flow, Offsite Short Grass Pasture Kv= 7.0 fps
0.8	57	0.0260	1.13		Shallow Concentrated Flow, Offsite Short Grass Pasture Kv= 7.0 fps
0.1	17	0.0290	3.46		Shallow Concentrated Flow, Offsite Paved Kv= 20.3 fps
1.1	249	0.0640	3.79		Shallow Concentrated Flow, Offsite Grassed Waterway Kv= 15.0 fps
0.5	100	0.0600	3.67		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
1.7	550	0.1270	5.35		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
1.2	387	0.1190	5.17		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
26.8	2,071	Total			

Subcatchment 8S: Pr. South

Hydrograph



Summary for Subcatchment 9S: Pr. South Wetlands

Runoff = 3.82 cfs @ 12.08 hrs, Volume= 11,682 cf, Depth> 2.56"
 Routed to Link 2L : Pr. To South Outfall

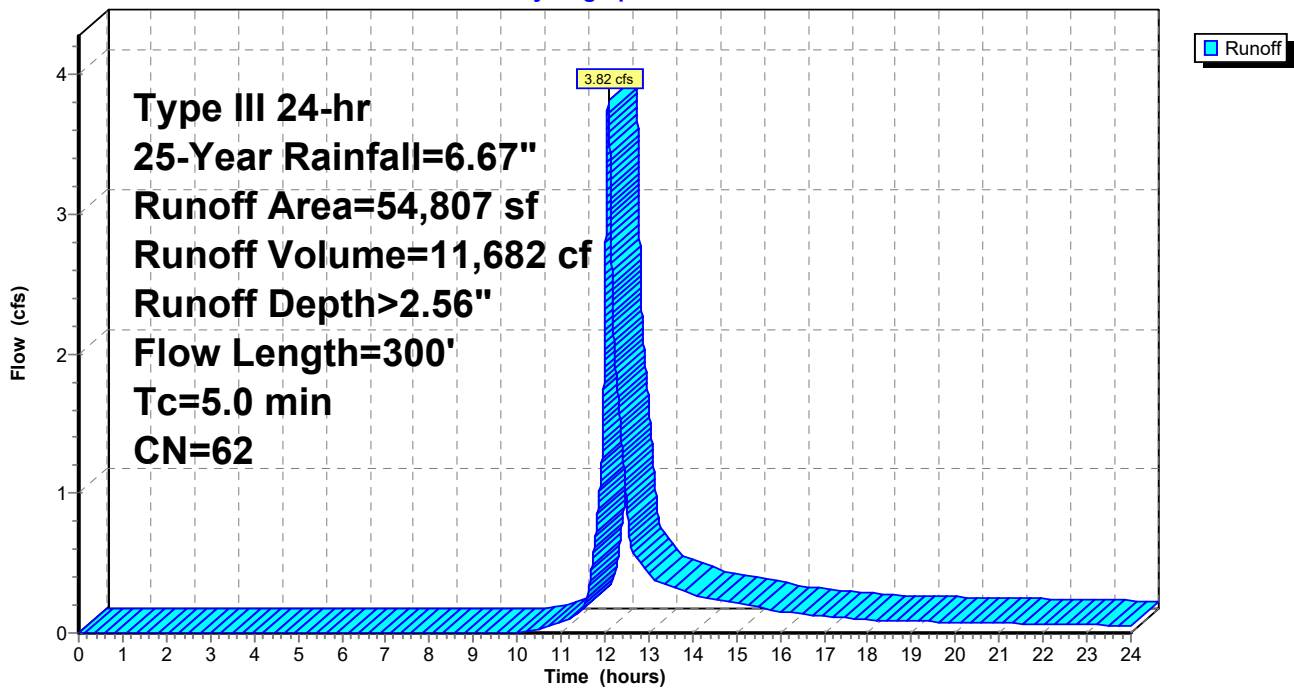
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

Area (sf)	CN	Description
15,963	58	Meadow, non-grazed, HSG B
30,933	60	Woods, Fair, HSG B
7,911	79	Woods, Fair, HSG D
54,807	62	Weighted Average
54,807		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	105	0.2255	0.47		Sheet Flow, Grass: Short n= 0.150 P2= 3.45"
0.6	107	0.1776	2.95		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	88	0.1534	1.96		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
5.0	300	Total			

Subcatchment 9S: Pr. South Wetlands

Hydrograph



Summary for Subcatchment 10S: Pr.Central 24" Pipe

Runoff = 21.94 cfs @ 12.23 hrs, Volume= 94,479 cf, Depth> 3.64"
 Routed to Link 5L : Pr. Central 24" Pipe

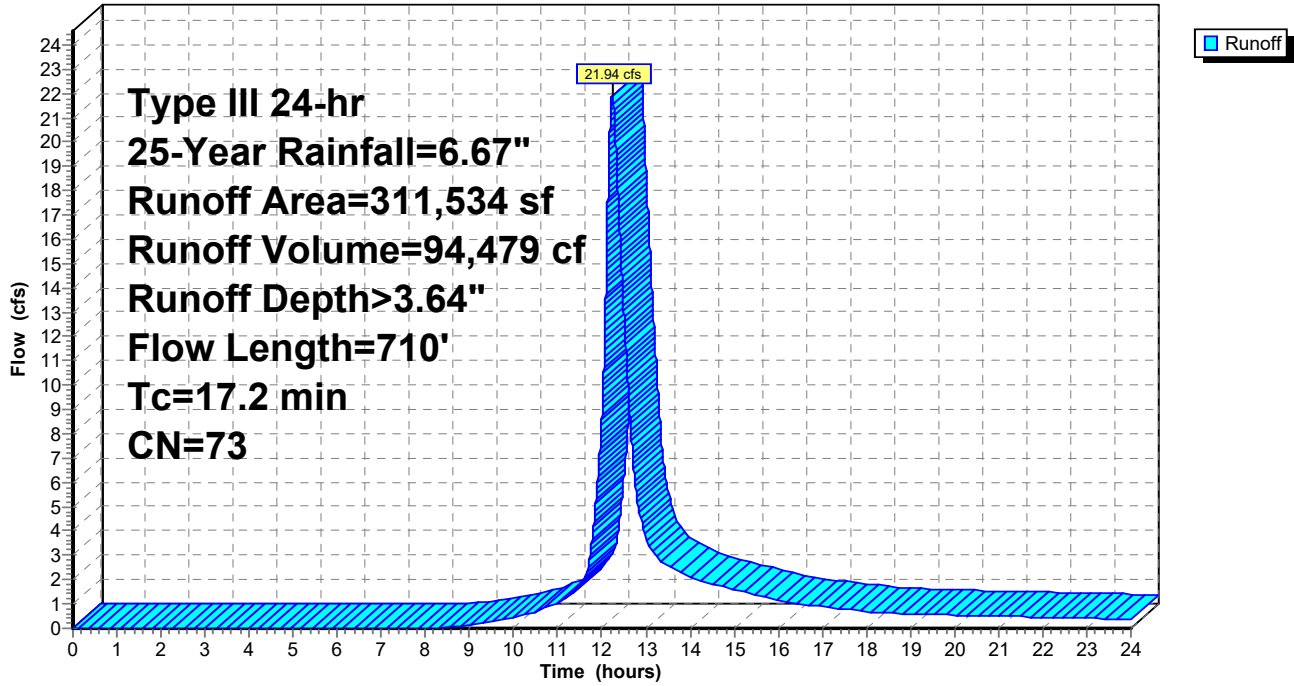
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

Area (sf)	CN	Description
37,208	60	Woods, Fair, HSG B
21,842	58	Meadow, non-grazed, HSG B
51,437	61	>75% Grass cover, Good, HSG B
* 45,684	98	Impervious, HSG B
* 44,031	61	Offsite Pervious, HSG B
* 25,185	98	Offsite Impervious, HSG C
* 86,147	74	Offsite Pervious, HSG C
311,534	73	Weighted Average
240,665		77.25% Pervious Area
70,869		22.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0360	0.22		Sheet Flow, Offsite Grass: Short n= 0.150 P2= 3.45"
0.3	81	0.0420	4.16		Shallow Concentrated Flow, Offsite Paved Kv= 20.3 fps
1.4	100	0.0600	1.22		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.7	217	0.1843	2.15		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.3	212	0.0350	2.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
5.0					Direct Entry,
17.2	710	Total			

Subcatchment 10S: Pr.Central 24" Pipe

Hydrograph



Summary for Subcatchment 11S: Pr. Central Bypass

Runoff = 18.12 cfs @ 12.19 hrs, Volume= 73,474 cf, Depth> 2.55"
 Routed to Link 8L : Pr. To Pond

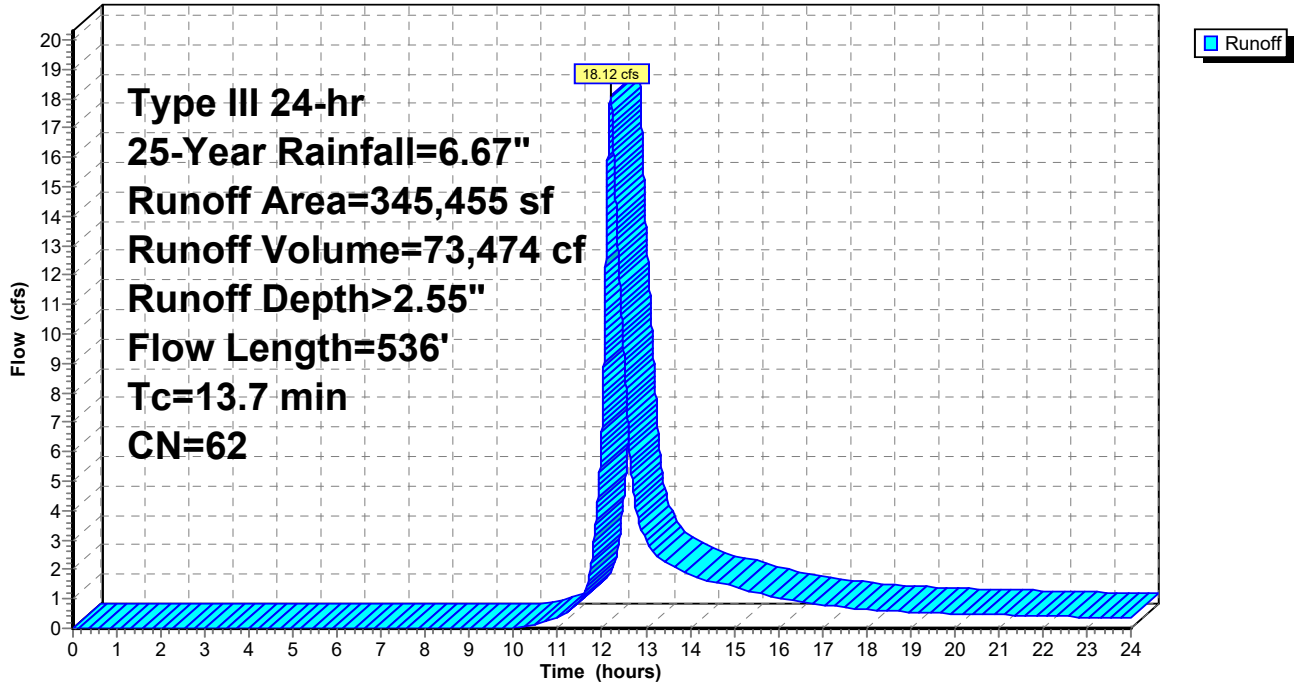
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

Area (sf)	CN	Description
92,132	49	50-75% Grass cover, Fair, HSG A
41,118	30	Meadow, non-grazed, HSG A
36,850	36	Woods, Fair, HSG A
22,736	69	50-75% Grass cover, Fair, HSG B
14,208	58	Meadow, non-grazed, HSG B
8,870	84	50-75% Grass cover, Fair, HSG D
38,596	78	Meadow, non-grazed, HSG D
45,032	79	Woods, Fair, HSG D
41	98	Water Surface, HSG B
43,022	98	Water Surface, HSG D
* 1,327	98	Impervious, HSG D
* 1,523	98	Impervious, HSG A
345,455	62	Weighted Average
299,542		86.71% Pervious Area
45,913		13.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0490	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.45"
2.1	269	0.1911	2.19		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.7	129	0.0620	1.24		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	38	0.1842	2.15		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
13.7	536	Total			

Subcatchment 11S: Pr. Central ByPass

Hydrograph



Summary for Subcatchment 12S: Pr.West Pond

Runoff = 7.17 cfs @ 12.08 hrs, Volume= 22,358 cf, Depth> 4.71"
 Routed to Pond 13P : Pr. MicroPool ED Pond

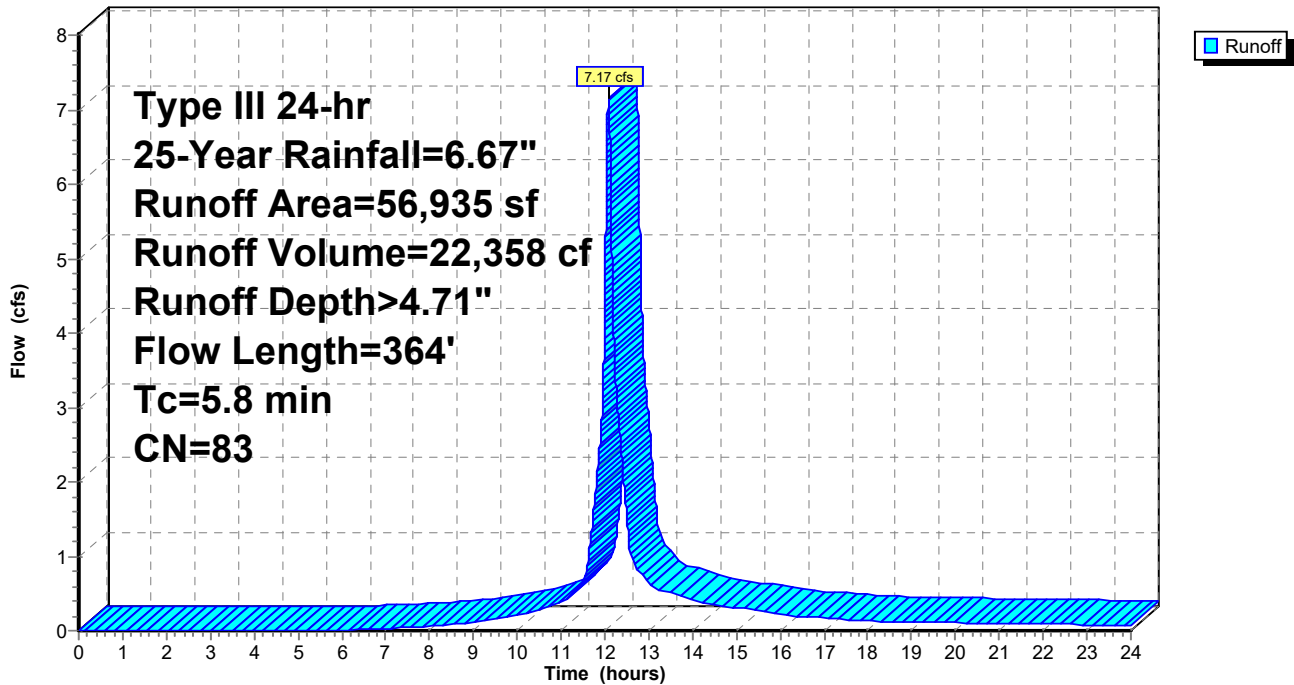
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

	Area (sf)	CN	Description
	22,442	61	>75% Grass cover, Good, HSG B
*	31,481	98	Impervious, HSG B
*	3,012	98	Water Surface, HSG B
	56,935	83	Weighted Average
	22,442		39.42% Pervious Area
	34,493		60.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	71	0.1056	0.32		Sheet Flow, Grass: Short n= 0.150 P2= 3.45"
2.1	293	0.0239	2.32		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
5.8	364	Total			

Subcatchment 12S: Pr.West Pond

Hydrograph



Summary for Subcatchment 13S: Pr.East Pond

Runoff = 43.12 cfs @ 12.07 hrs, Volume= 135,806 cf, Depth> 5.50"
 Routed to Pond 12P : Pr. Pocket Pond

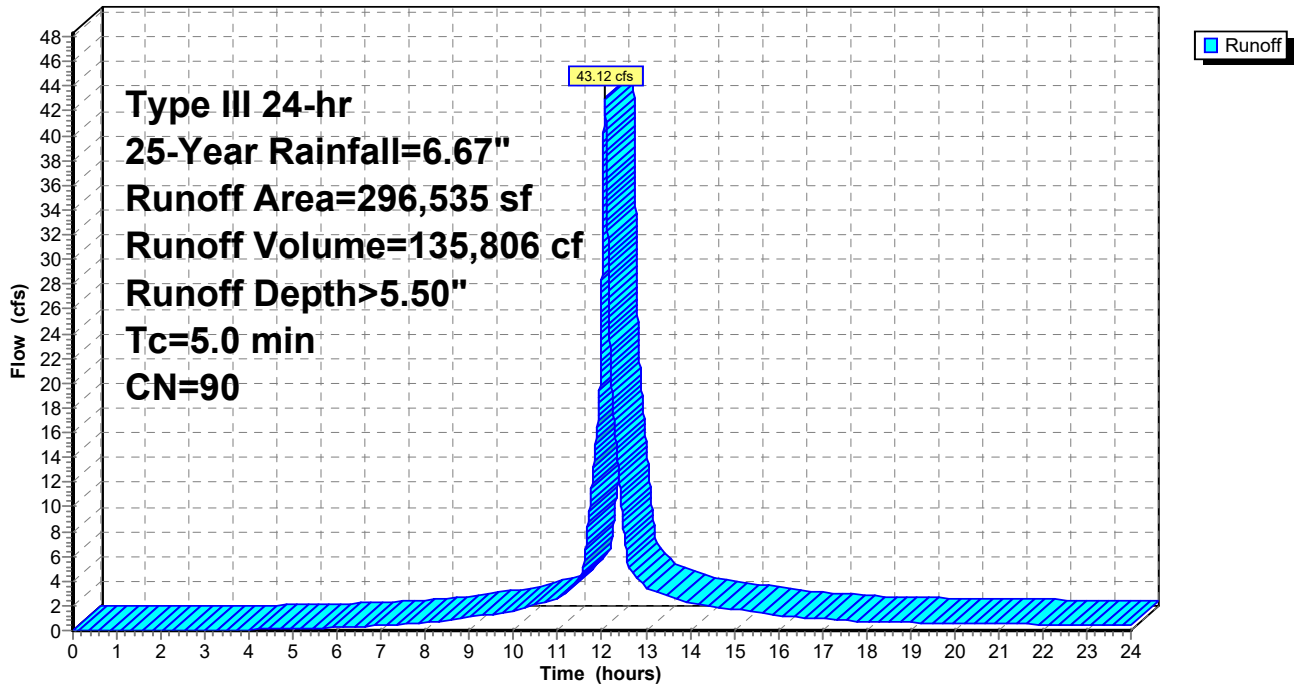
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

	Area (sf)	CN	Description
*	208,123	98	Impervious, HSG B
	45,569	61	>75% Grass cover, Good, HSG B
	3,517	80	>75% Grass cover, Good, HSG D
	26,518	78	Meadow, non-grazed, HSG D
	12,808	98	Water Surface, HSG B
	296,535	90	Weighted Average
	75,604		25.50% Pervious Area
	220,931		74.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 13S: Pr.East Pond

Hydrograph



Summary for Subcatchment 14S: Pr.Rain Garden

Runoff = 1.35 cfs @ 12.09 hrs, Volume= 4,335 cf, Depth> 2.28"
 Routed to Pond 31P : Rain Garden #1

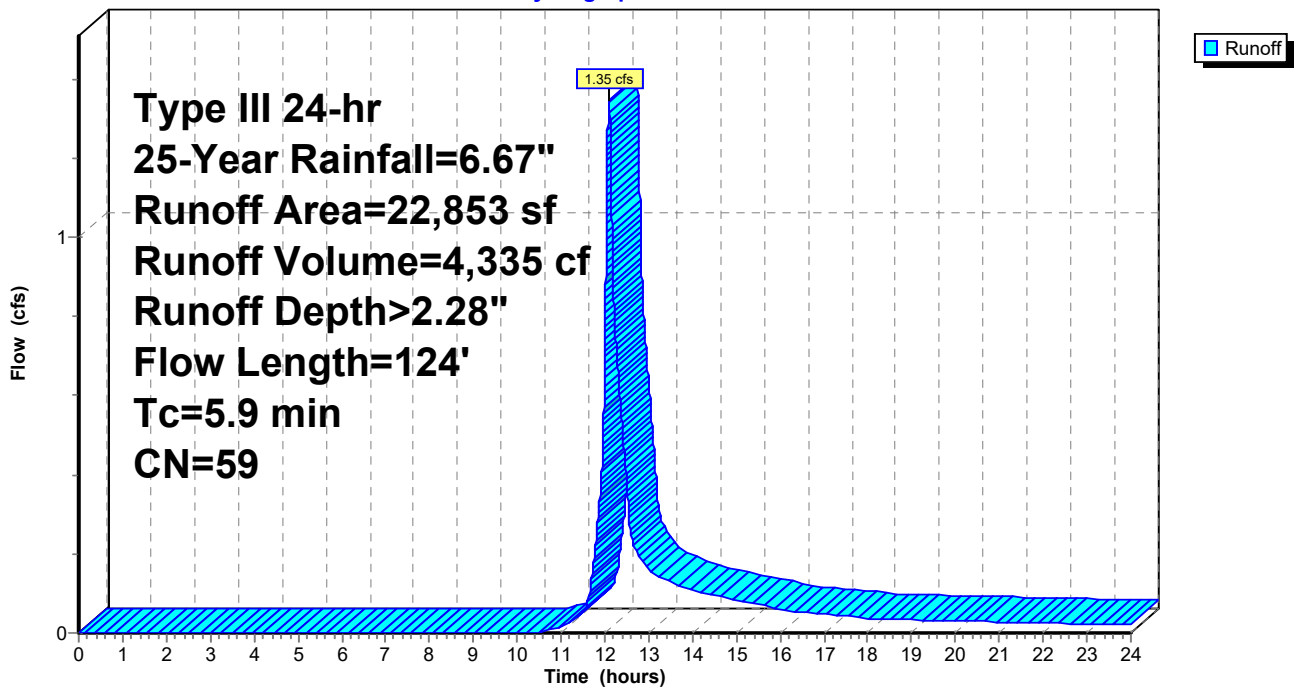
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

Area (sf)	CN	Description
16,744	49	50-75% Grass cover, Fair, HSG A
2,226	69	50-75% Grass cover, Fair, HSG B
* 586	98	Impervious, HSG A
* 3,297	98	Impervious, HSG B
22,853	59	Weighted Average
18,970		83.01% Pervious Area
3,883		16.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	100	0.0680	0.29		Sheet Flow, Grass: Short n= 0.150 P2= 3.45"
0.1	24	0.0900	6.09		Shallow Concentrated Flow, Paved Kv= 20.3 fps
5.9	124	Total			

Subcatchment 14S: Pr.Rain Garden

Hydrograph



Summary for Subcatchment 15S: Pr. North

Runoff = 9.76 cfs @ 12.34 hrs, Volume= 48,380 cf, Depth> 3.63"
 Routed to Link 11L : Pr. To North Detention Pond

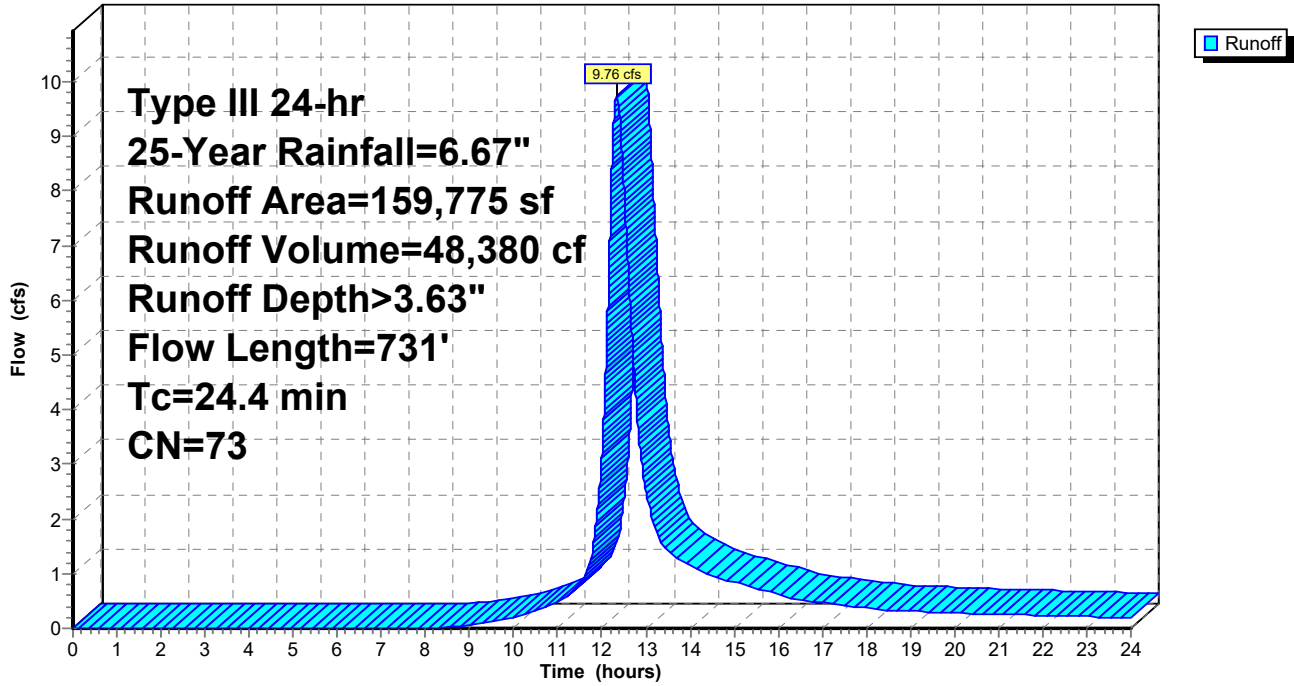
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

Area (sf)	CN	Description
6,335	36	Woods, Fair, HSG A
4,614	69	50-75% Grass cover, Fair, HSG B
47,495	60	Woods, Fair, HSG B
10,996	78	Meadow, non-grazed, HSG D
78,856	79	Woods, Fair, HSG D
* 10,873	98	Water Surface, HSG D
* 159	98	Impervious, HSG B
* 447	98	Impervious, HSG D
159,775	73	Weighted Average
148,296		92.82% Pervious Area
11,479		7.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.7	102	0.0833	0.08		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.45"
2.8	312	0.1394	1.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	317	0.1388	5.59		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
24.4	731	Total			

Subcatchment 15S: Pr. North

Hydrograph



Summary for Subcatchment 16S: Pr. North Conveyance

Runoff = 27.22 cfs @ 12.19 hrs, Volume= 111,182 cf, Depth> 4.81"
 Routed to Link 14L : Pr. North Swale Out

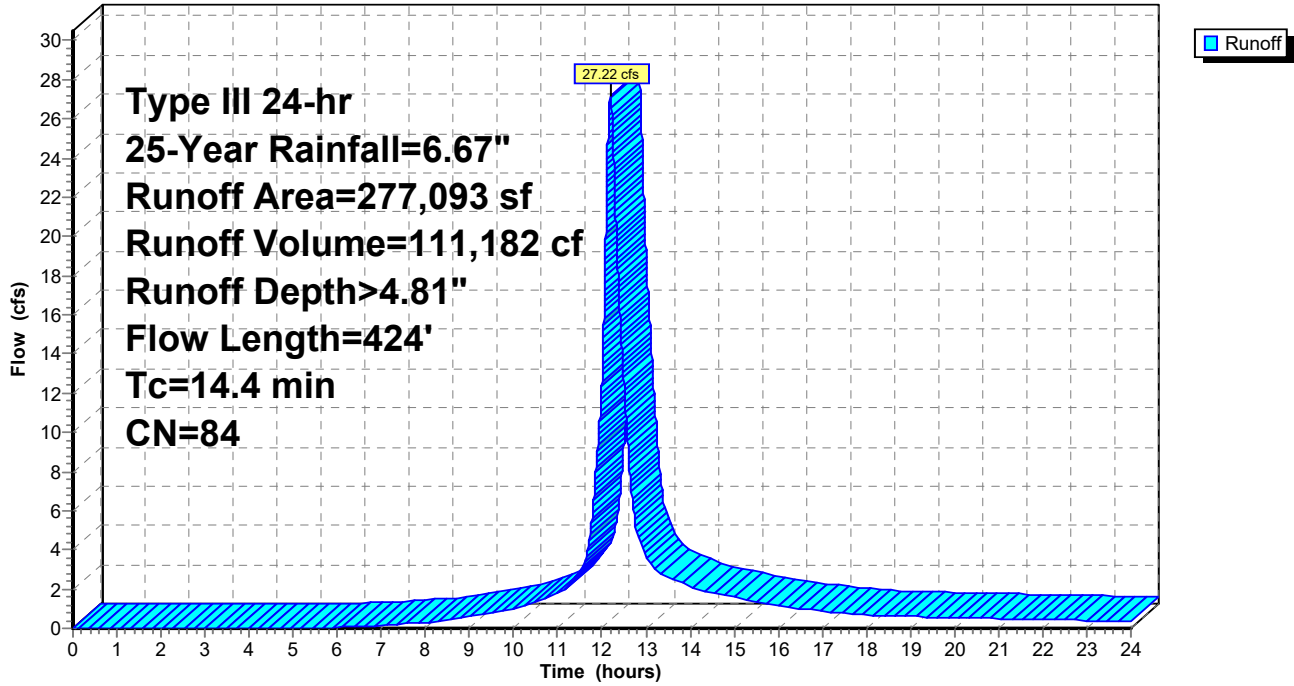
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

	Area (sf)	CN	Description
*	113,316	98	Impervious, HSG B
	30,051	61	>75% Grass cover, Good, HSG B
	4,641	58	Meadow, non-grazed, HSG B
	3,086	60	Woods, Fair, HSG B
	10,310	71	Meadow, non-grazed, HSG C
	6,257	73	Woods, Fair, HSG C
*	22,965	98	Offsite Impervious, HSG C
*	86,344	74	Offsite Pervious, HSG C
*	45	98	Offsite Impervious, HSG D
*	78	80	Offsite Pervious, HSG D
	277,093	84	Weighted Average
	140,767		50.80% Pervious Area
	136,326		49.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0600	0.27		Sheet Flow, Offsite Grass: Short n= 0.150 P2= 3.45"
0.8	48	0.0420	1.02		Shallow Concentrated Flow, Offsite Woodland Kv= 5.0 fps
1.9	172	0.0930	1.52		Shallow Concentrated Flow, Offsite Woodland Kv= 5.0 fps
0.6	104	0.2880	2.68		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
5.0					Direct Entry,
14.4	424	Total			

Subcatchment 16S: Pr. North Conveyance

Hydrograph



Summary for Subcatchment 17S: Pr. North Swale

Runoff = 5.21 cfs @ 12.16 hrs, Volume= 19,428 cf, Depth> 3.04"
 Routed to Link 14L : Pr. North Swale Out

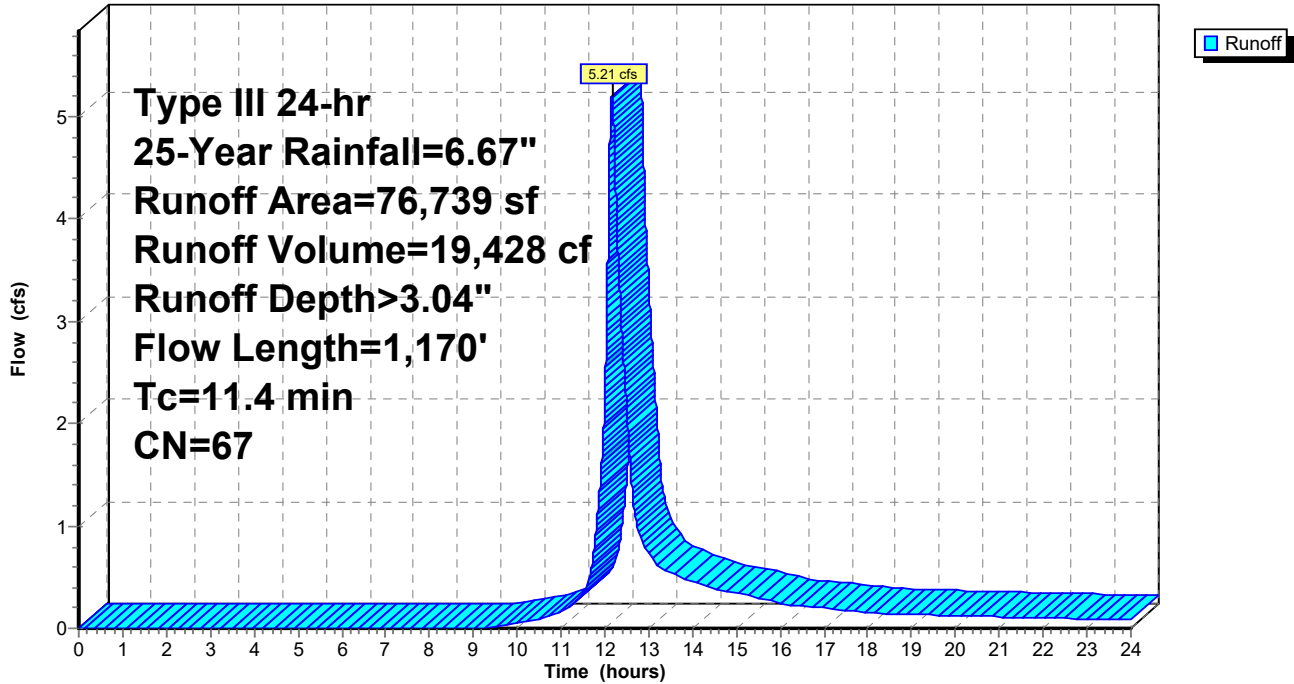
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
 Type III 24-hr 25-Year Rainfall=6.67"

Area (sf)	CN	Description
2,958	61	>75% Grass cover, Good, HSG B
38,080	60	Woods, Fair, HSG B
1,854	71	Meadow, non-grazed, HSG C
6,228	73	Woods, Fair, HSG C
4,691	79	Woods, Fair, HSG D
* 387	98	Impervious, HSG B
* 1,301	98	Offsite Impervious, HSG C
* 21,240	74	Offsite Pervious. HSG C
76,739	67	Weighted Average
75,051		97.80% Pervious Area
1,688		2.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	100	0.1100	0.35		Sheet Flow, Offsite Grass: Short n= 0.150 P2= 3.45"
0.7	69	0.0580	1.69		Shallow Concentrated Flow, Offsite Short Grass Pasture Kv= 7.0 fps
2.0	131	0.0460	1.07		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.4	80	0.3750	3.06		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.5	790	0.0630	3.76		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
11.4	1,170	Total			

Subcatchment 17S: Pr. North Swale

Hydrograph



Summary for Pond 12P: Pr. Pocket Pond

Inflow Area = 296,535 sf, 74.50% Impervious, Inflow Depth > 5.50" for 25-Year event
 Inflow = 43.12 cfs @ 12.07 hrs, Volume= 135,806 cf
 Outflow = 28.47 cfs @ 12.15 hrs, Volume= 133,994 cf, Atten= 34%, Lag= 4.8 min
 Primary = 28.47 cfs @ 12.15 hrs, Volume= 133,994 cf
 Routed to Link 5L : Pr. Central 24" Pipe

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs / 2
 Starting Elev= 87.00' Storage= 19,636 cf
 Peak Elev= 89.49' @ 12.15 hrs Storage= 48,187 cf (28,551 cf above start)

Plug-Flow detention time= 132.2 min calculated for 114,358 cf (84% of inflow)
 Center-of-Mass det. time= 30.0 min (810.0 - 779.9)

Volume	Invert	Avail.Storage	Storage Description
#1	82.00'	65,013 cf	Custom Stage Data Listed below

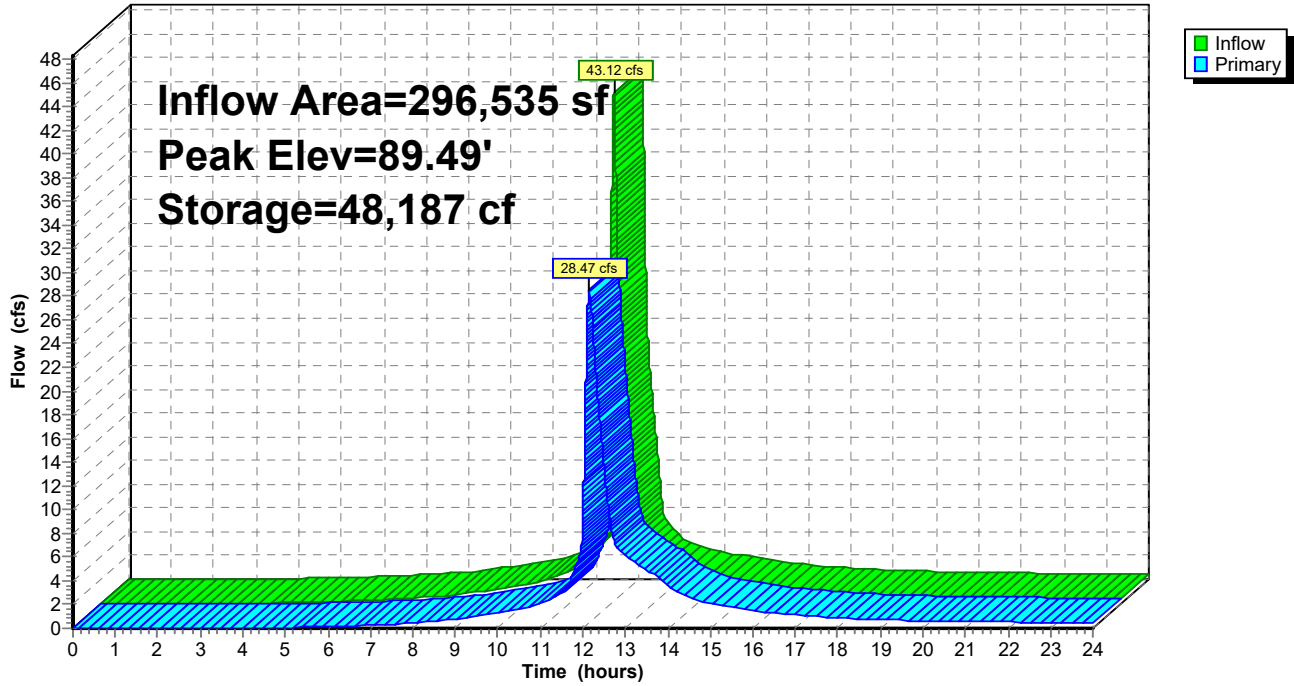
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
82.00	0	0
83.00	2,318	2,318
84.00	2,335	4,653
85.00	3,516	8,169
86.00	4,864	13,033
86.50	2,966	15,999
87.00	3,637	19,636
87.50	4,610	24,246
88.00	5,311	29,557
89.00	11,935	41,492
90.00	13,674	55,166
90.65	9,847	65,013

Device	Routing	Invert	Outlet Devices
#1	Device 3	87.00'	18.0" W x 10.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#2	Device 3	88.60'	30.0" W x 10.0" H Vert. Orifice/Grate X 3.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	85.00'	24.0" Round Culvert L= 75.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 85.00' / 83.50' S= 0.0200 '/ Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=28.53 cfs @ 12.15 hrs HW=89.49' (Free Discharge)
 ←3=Culvert (Passes 28.53 cfs of 35.32 cfs potential flow)
 ←1=Orifice/Grate (Orifice Controls 8.65 cfs @ 6.92 fps)
 ←2=Orifice/Grate (Orifice Controls 19.88 cfs @ 3.18 fps)

Pond 12P: Pr. Pocket Pond

Hydrograph



Stage-Area-Storage for Pond 12P: Pr. Pocket Pond

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
82.00	0	84.60	6,763	87.20	21,480
82.05	116	84.65	6,938	87.25	21,941
82.10	232	84.70	7,114	87.30	22,402
82.15	348	84.75	7,290	87.35	22,863
82.20	464	84.80	7,466	87.40	23,324
82.25	580	84.85	7,642	87.45	23,785
82.30	695	84.90	7,817	87.50	24,246
82.35	811	84.95	7,993	87.55	24,707
82.40	927	85.00	8,169	87.60	25,168
82.45	1,043	85.05	8,345	87.65	25,629
82.50	1,159	85.10	8,521	87.70	26,090
82.55	1,275	85.15	8,697	87.75	26,551
82.60	1,391	85.20	8,873	87.80	27,012
82.65	1,507	85.25	9,049	87.85	27,473
82.70	1,623	85.30	9,225	87.90	27,934
82.75	1,739	85.35	9,401	87.95	28,395
82.80	1,854	85.40	9,577	88.00	28,856
82.85	1,970	85.45	9,753	88.05	29,317
82.90	2,086	85.50	9,929	88.10	29,778
82.95	2,202	85.55	10,105	88.15	30,239
83.00	2,318	85.60	10,281	88.20	30,700
83.05	2,435	85.65	10,457	88.25	31,161
83.10	2,551	85.70	10,633	88.30	31,622
83.15	2,668	85.75	10,809	88.35	32,083
83.20	2,785	85.80	10,985	88.40	32,544
83.25	2,902	85.85	11,161	88.45	33,005
83.30	3,018	85.90	11,337	88.50	33,466
83.35	3,135	85.95	11,513	88.55	33,927
83.40	3,252	86.00	11,689	88.60	34,388
83.45	3,369	86.05	11,865	88.65	34,849
83.50	3,486	86.10	12,041	88.70	35,310
83.55	3,602	86.15	12,217	88.75	35,771
83.60	3,719	86.20	12,393	88.80	36,232
83.65	3,836	86.25	12,569	88.85	36,693
83.70	3,953	86.30	12,745	88.90	37,154
83.75	4,069	86.35	12,921	88.95	37,615
83.80	4,186	86.40	13,097	89.00	38,076
83.85	4,303	86.45	13,273	89.05	38,537
83.90	4,420	86.50	13,449	89.10	38,998
83.95	4,536	86.55	13,625	89.15	39,459
84.00	4,653	86.60	13,801	89.20	39,920
84.05	4,770	86.65	13,977	89.25	40,381
84.10	4,886	86.70	14,153	89.30	40,842
84.15	5,003	86.75	14,329	89.35	41,303
84.20	5,120	86.80	14,505	89.40	41,764
84.25	5,236	86.85	14,681	89.45	42,225
84.30	5,353	86.90	14,857	89.50	42,686
84.35	5,470	86.95	15,033	89.55	43,147
84.40	5,586	87.00	15,209	89.60	43,608
84.45	5,703	87.05	15,385	89.65	44,069
84.50	5,820	87.10	15,561	89.70	44,530
84.55	5,936	87.15	15,737	89.75	44,991

Stage-Area-Storage for Pond 12P: Pr. Pocket Pond (continued)

Elevation (feet)	Storage (cubic-feet)
89.80	52,431
89.85	53,115
89.90	53,799
89.95	54,482
90.00	55,166
90.05	55,923
90.10	56,681
90.15	57,438
90.20	58,196
90.25	58,953
90.30	59,711
90.35	60,468
90.40	61,226
90.45	61,983
90.50	62,741
90.55	63,498
90.60	64,256
90.65	65,013

Summary for Pond 13P: Pr. MicroPool ED Pond

Inflow Area = 56,935 sf, 60.58% Impervious, Inflow Depth > 4.71" for 25-Year event
 Inflow = 7.17 cfs @ 12.08 hrs, Volume= 22,358 cf
 Outflow = 5.31 cfs @ 12.15 hrs, Volume= 22,104 cf, Atten= 26%, Lag= 4.2 min
 Primary = 5.31 cfs @ 12.15 hrs, Volume= 22,104 cf
 Routed to Link 5L : Pr. Central 24" Pipe

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs / 2
 Starting Elev= 172.00' Storage= 947 cf
 Peak Elev= 173.83' @ 12.15 hrs Storage= 4,850 cf (3,903 cf above start)

Plug-Flow detention time= 60.7 min calculated for 21,157 cf (95% of inflow)
 Center-of-Mass det. time= 19.7 min (821.1 - 801.4)

Volume	Invert	Avail.Storage	Storage Description
#1	171.00'	8,816 cf	Custom Stage Data Listed below

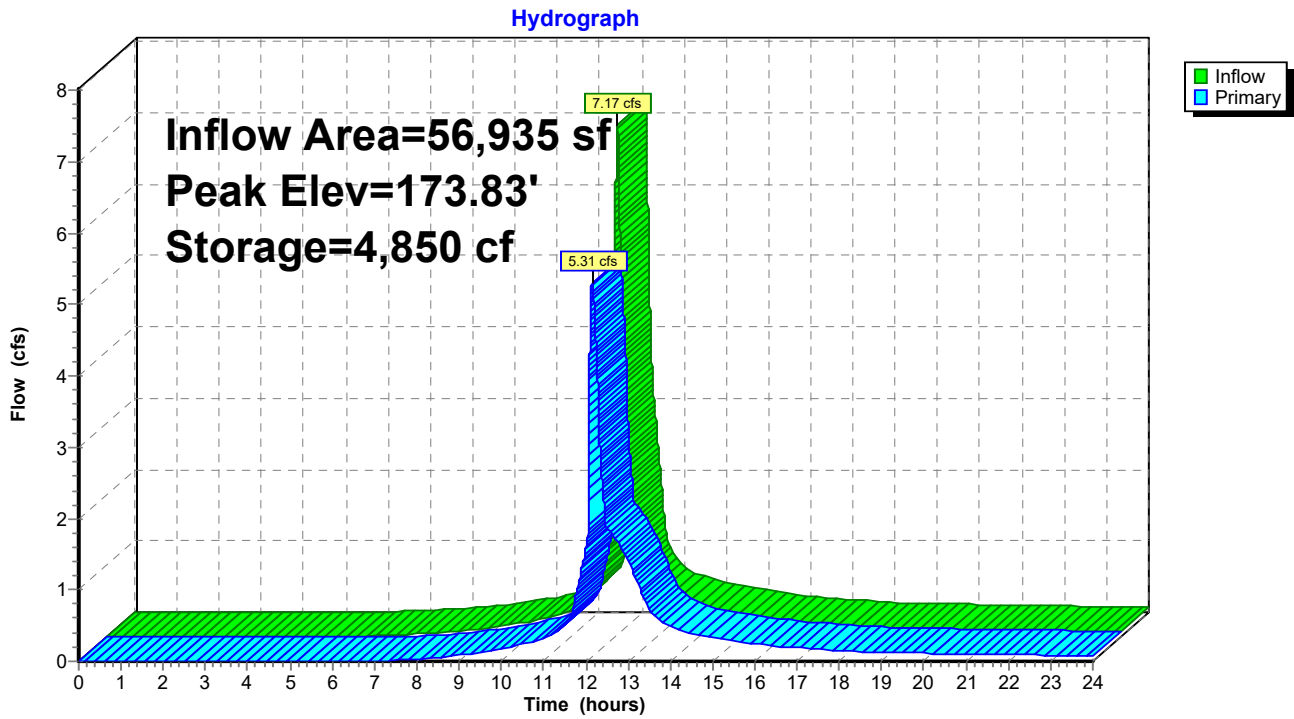
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
171.00	0	0
172.00	947	947
173.00	1,738	2,685
174.00	2,600	5,285
175.00	3,531	8,816

Device	Routing	Invert	Outlet Devices
#1	Primary	173.60'	Special & User-Defined Head (feet) 0.00 0.08 0.17 0.25 0.33 0.42 0.50 2.75 Disch. (cfs) 0.000 2.000 2.700 3.400 3.800 4.400 4.700 5.000
#2	Primary	172.00'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.31 cfs @ 12.15 hrs HW=173.83' (Free Discharge)

- 1=Special & User-Defined (Custom Controls 3.25 cfs)
- 2=Orifice/Grate (Orifice Controls 2.06 cfs @ 5.90 fps)

Pond 13P: Pr. MicroPool ED Pond



Stage-Area-Storage for Pond 13P: Pr. MicroPool ED Pond

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
171.00	0	173.60	4,245	176.20	8,816
171.05	47	173.65	4,375	176.25	8,816
171.10	95	173.70	4,505	176.30	8,816
171.15	142	173.75	4,635	176.35	8,816
171.20	189	173.80	4,765		
171.25	237	173.85	4,895		
171.30	284	173.90	5,025		
171.35	331	173.95	5,155		
171.40	379	174.00	5,285		
171.45	426	174.05	5,462		
171.50	474	174.10	5,638		
171.55	521	174.15	5,815		
171.60	568	174.20	5,991		
171.65	616	174.25	6,168		
171.70	663	174.30	6,344		
171.75	710	174.35	6,521		
171.80	758	174.40	6,697		
171.85	805	174.45	6,874		
171.90	852	174.50	7,051		
171.95	900	174.55	7,227		
172.00	947	174.60	7,404		
172.05	1,034	174.65	7,580		
172.10	1,121	174.70	7,757		
172.15	1,208	174.75	7,933		
172.20	1,295	174.80	8,110		
172.25	1,382	174.85	8,286		
172.30	1,468	174.90	8,463		
172.35	1,555	174.95	8,639		
172.40	1,642	175.00	8,816		
172.45	1,729	175.05	8,816		
172.50	1,816	175.10	8,816		
172.55	1,903	175.15	8,816		
172.60	1,990	175.20	8,816		
172.65	2,077	175.25	8,816		
172.70	2,164	175.30	8,816		
172.75	2,251	175.35	8,816		
172.80	2,337	175.40	8,816		
172.85	2,424	175.45	8,816		
172.90	2,511	175.50	8,816		
172.95	2,598	175.55	8,816		
173.00	2,685	175.60	8,816		
173.05	2,815	175.65	8,816		
173.10	2,945	175.70	8,816		
173.15	3,075	175.75	8,816		
173.20	3,205	175.80	8,816		
173.25	3,335	175.85	8,816		
173.30	3,465	175.90	8,816		
173.35	3,595	175.95	8,816		
173.40	3,725	176.00	8,816		
173.45	3,855	176.05	8,816		
173.50	3,985	176.10	8,816		
173.55	4,115	176.15	8,816		

Summary for Pond 31P: Rain Garden #1

Inflow Area = 22,853 sf, 16.99% Impervious, Inflow Depth > 2.28" for 25-Year event
 Inflow = 1.35 cfs @ 12.09 hrs, Volume= 4,335 cf
 Outflow = 1.20 cfs @ 12.14 hrs, Volume= 3,486 cf, Atten= 11%, Lag= 2.5 min
 Primary = 1.20 cfs @ 12.14 hrs, Volume= 3,486 cf
 Routed to Link 8L : Pr. To Pond

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs / 2
 Peak Elev= 86.82' @ 12.14 hrs Surf.Area= 1,061 sf Storage= 915 cf

Plug-Flow detention time= 115.9 min calculated for 3,486 cf (80% of inflow)
 Center-of-Mass det. time= 36.2 min (894.1 - 857.8)

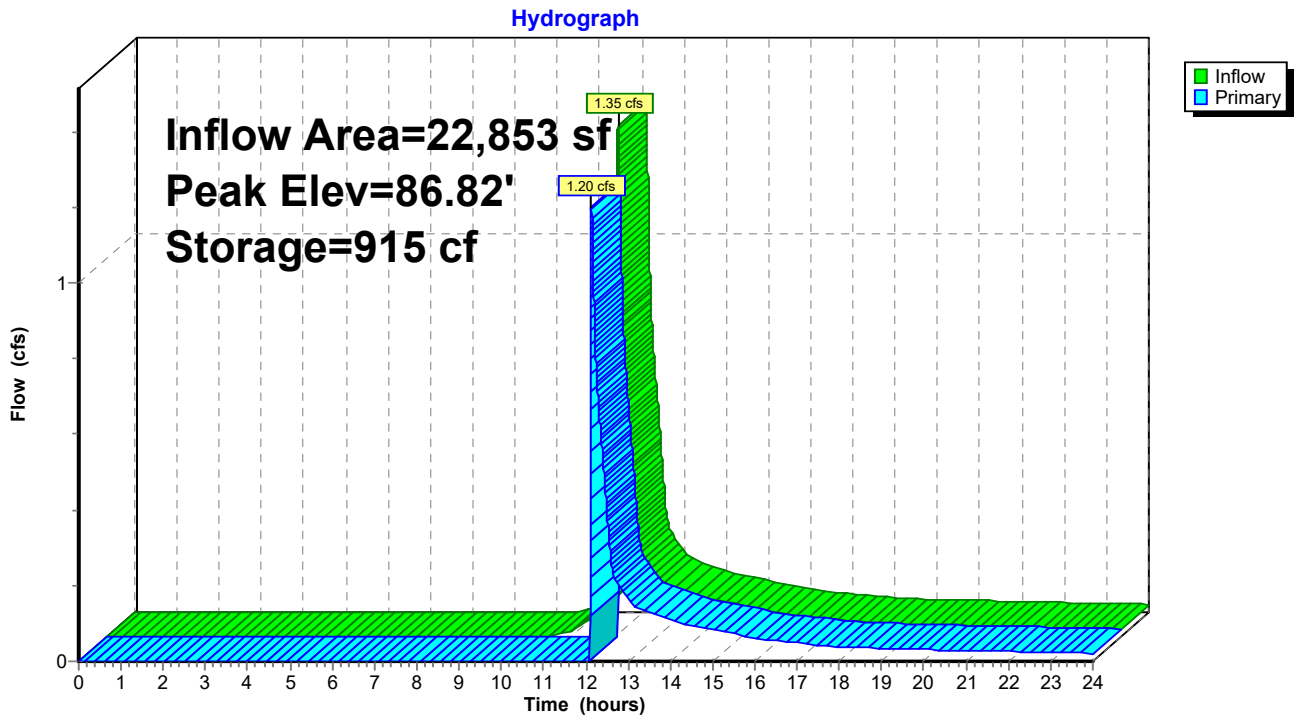
Volume	Invert	Avail.Storage	Storage Description
#1	84.50'	1,541 cf	Rain Garden (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
84.50	840	0.0	0	0
86.00	840	30.0	378	378
86.25	840	0.0	0	378
86.75	1,033	100.0	468	846
87.35	1,284	100.0	695	1,541

Device	Routing	Invert	Outlet Devices
#1	Primary	86.75'	30.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.18 cfs @ 12.14 hrs HW=86.82' (Free Discharge)
 ↑1=**Broad-Crested Rectangular Weir**(Weir Controls 1.18 cfs @ 0.60 fps)

Pond 31P: Rain Garden #1



Stage-Area-Storage for Pond 31P: Rain Garden #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
84.50	840	0	87.10	1,179	1,233
84.55	840	13	87.15	1,200	1,293
84.60	840	25	87.20	1,221	1,353
84.65	840	38	87.25	1,242	1,415
84.70	840	50	87.30	1,263	1,478
84.75	840	63	87.35	1,284	1,541
84.80	840	76			
84.85	840	88			
84.90	840	101			
84.95	840	113			
85.00	840	126			
85.05	840	139			
85.10	840	151			
85.15	840	164			
85.20	840	176			
85.25	840	189			
85.30	840	202			
85.35	840	214			
85.40	840	227			
85.45	840	239			
85.50	840	252			
85.55	840	265			
85.60	840	277			
85.65	840	290			
85.70	840	302			
85.75	840	315			
85.80	840	328			
85.85	840	340			
85.90	840	353			
85.95	840	365			
86.00	840	378			
86.05	840	378			
86.10	840	378			
86.15	840	378			
86.20	840	378			
86.25	840	378			
86.30	859	420			
86.35	879	464			
86.40	898	508			
86.45	917	554			
86.50	937	600			
86.55	956	647			
86.60	975	696			
86.65	994	745			
86.70	1,014	795			
86.75	1,033	846			
86.80	1,054	898			
86.85	1,075	952			
86.90	1,096	1,006			
86.95	1,117	1,061			
87.00	1,138	1,118			
87.05	1,159	1,175			

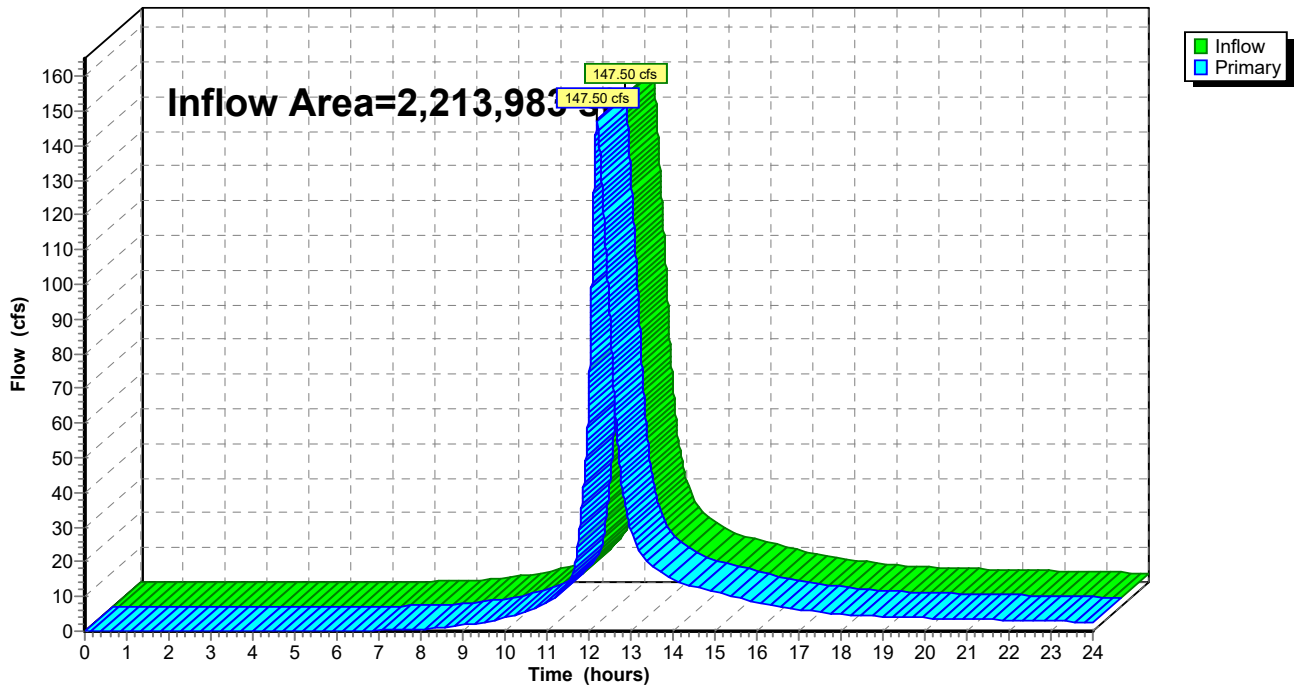
Summary for Link 1L: Ex.To South Outfall

Inflow Area = 2,213,983 sf, 24.79% Impervious, Inflow Depth > 3.74" for 25-Year event
Inflow = 147.50 cfs @ 12.19 hrs, Volume= 690,623 cf
Primary = 147.50 cfs @ 12.19 hrs, Volume= 690,623 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs

Link 1L: Ex.To South Outfall

Hydrograph



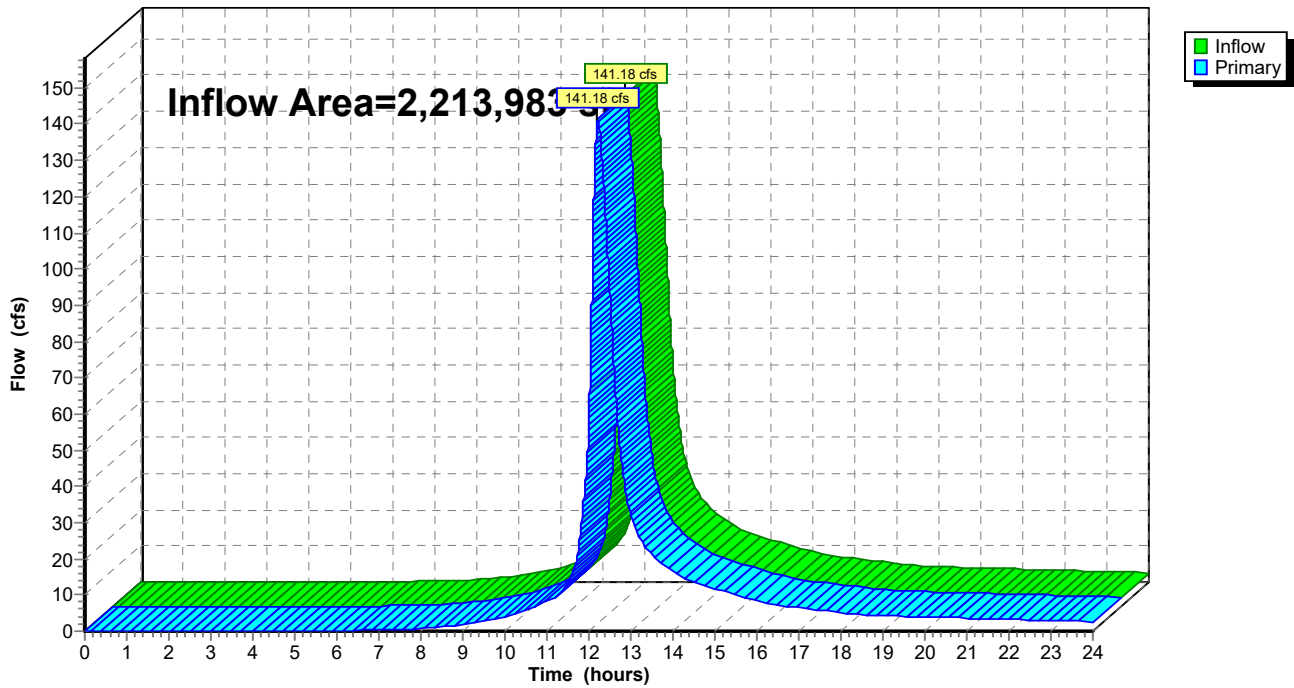
Summary for Link 2L: Pr. To South Outfall

Inflow Area = 2,213,983 sf, 27.90% Impervious, Inflow Depth > 3.81" for 25-Year event
Inflow = 141.18 cfs @ 12.21 hrs, Volume= 703,504 cf
Primary = 141.18 cfs @ 12.21 hrs, Volume= 703,504 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs

Link 2L: Pr. To South Outfall

Hydrograph



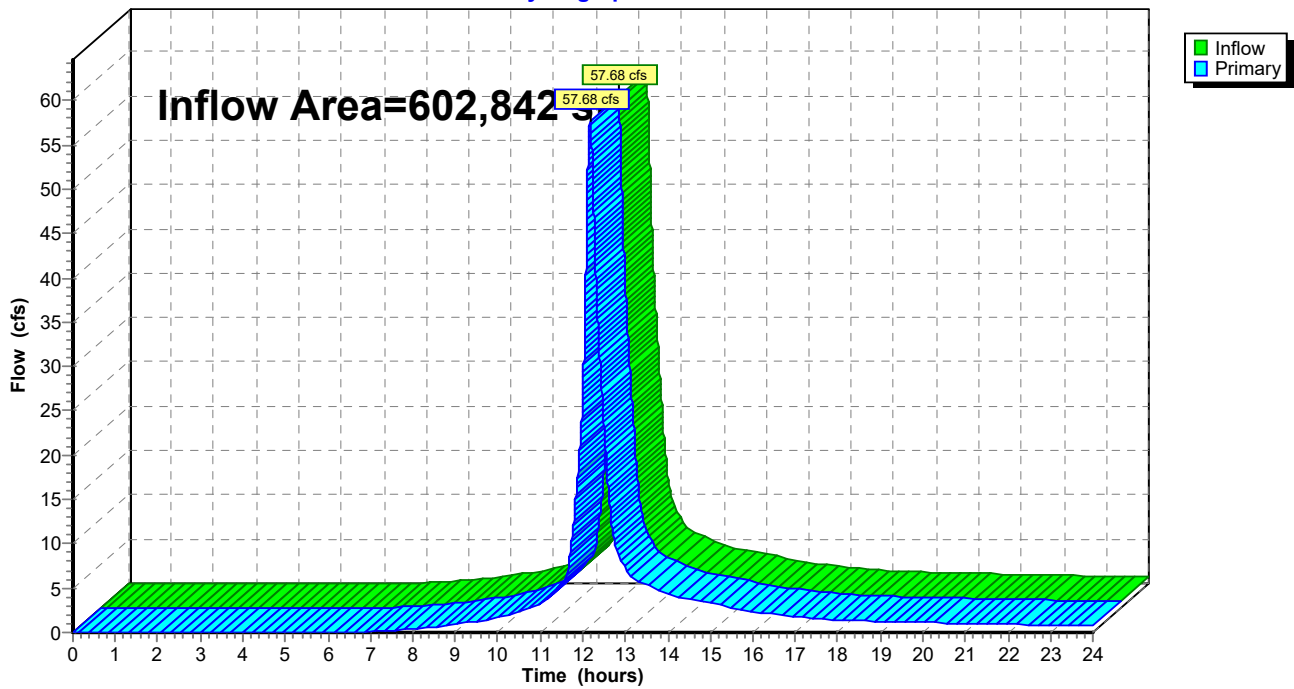
Summary for Link 4L: Ex. Central 24" Pipe

Inflow Area = 602,842 sf, 42.50% Impervious, Inflow Depth > 4.38" for 25-Year event
Inflow = 57.68 cfs @ 12.17 hrs, Volume= 220,077 cf
Primary = 57.68 cfs @ 12.17 hrs, Volume= 220,077 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 7L : Ex. To Pond

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs

Link 4L: Ex. Central 24" Pipe

Hydrograph



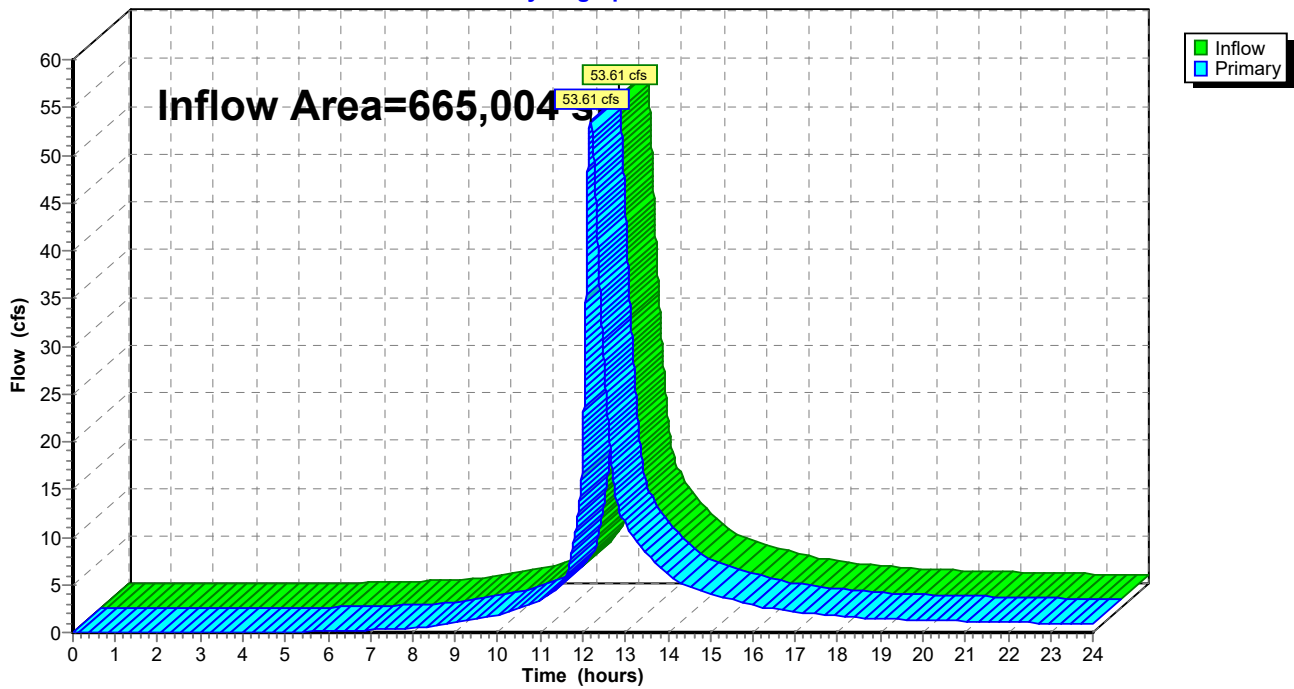
Summary for Link 5L: Pr. Central 24" Pipe

Inflow Area = 665,004 sf, 49.07% Impervious, Inflow Depth > 4.52" for 25-Year event
Inflow = 53.61 cfs @ 12.19 hrs, Volume= 250,577 cf
Primary = 53.61 cfs @ 12.19 hrs, Volume= 250,577 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 8L : Pr. To Pond

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs

Link 5L: Pr. Central 24" Pipe

Hydrograph



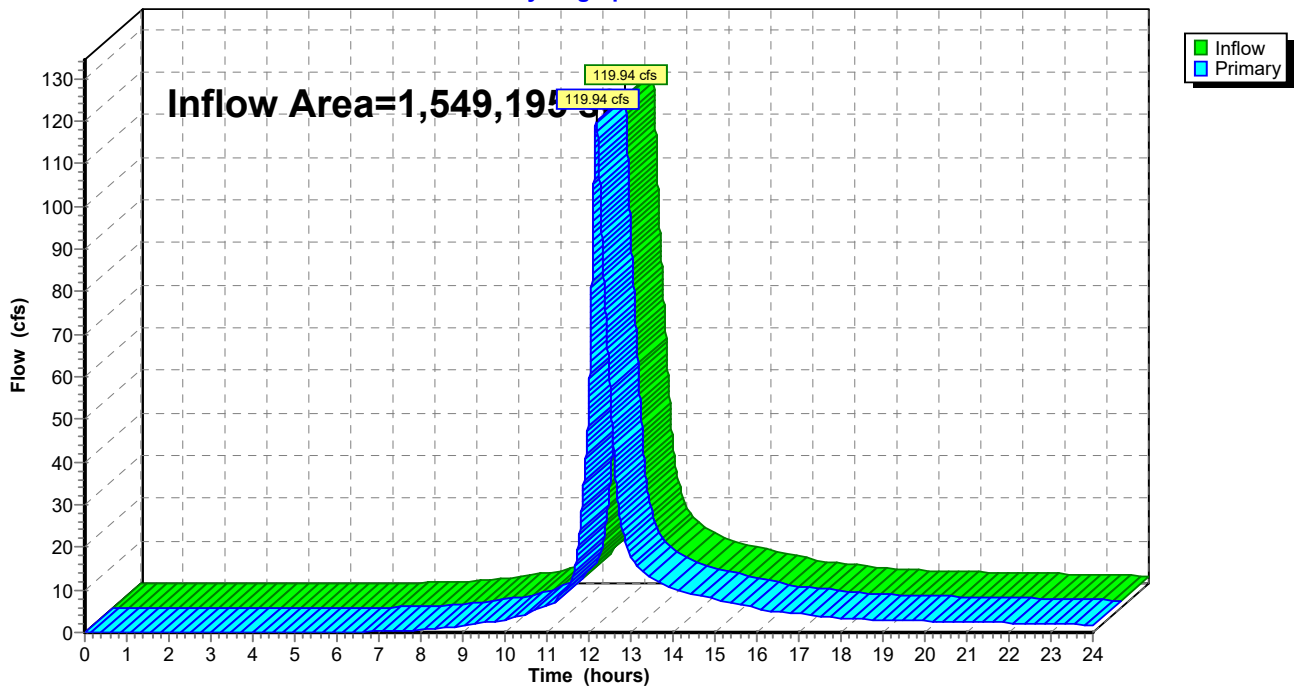
Summary for Link 7L: Ex. To Pond

Inflow Area = 1,549,195 sf, 29.31% Impervious, Inflow Depth > 3.83" for 25-Year event
Inflow = 119.94 cfs @ 12.18 hrs, Volume= 494,394 cf
Primary = 119.94 cfs @ 12.18 hrs, Volume= 494,394 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 1L : Ex.To South Outfall

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs

Link 7L: Ex. To Pond

Hydrograph



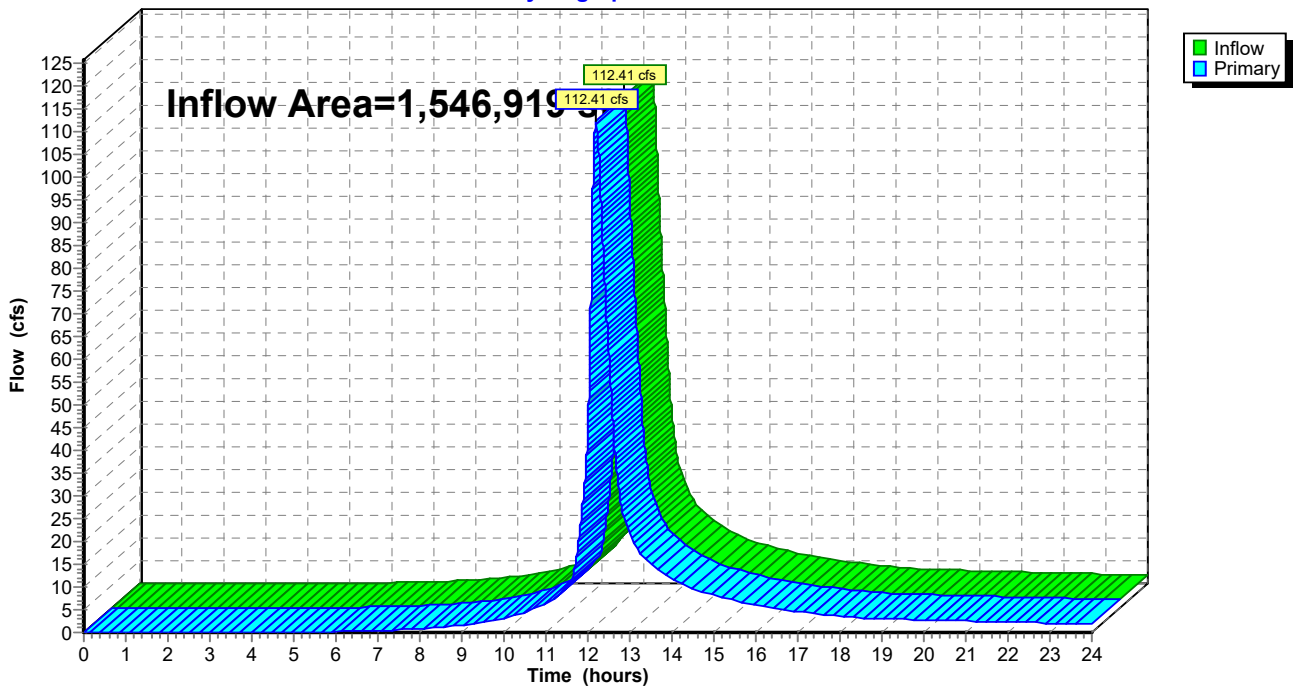
Summary for Link 8L: Pr. To Pond

Inflow Area = 1,546,919 sf, 33.98% Impervious, Inflow Depth > 3.93" for 25-Year event
Inflow = 112.41 cfs @ 12.19 hrs, Volume= 506,527 cf
Primary = 112.41 cfs @ 12.19 hrs, Volume= 506,527 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 2L : Pr. To South Outfall

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs

Link 8L: Pr. To Pond

Hydrograph



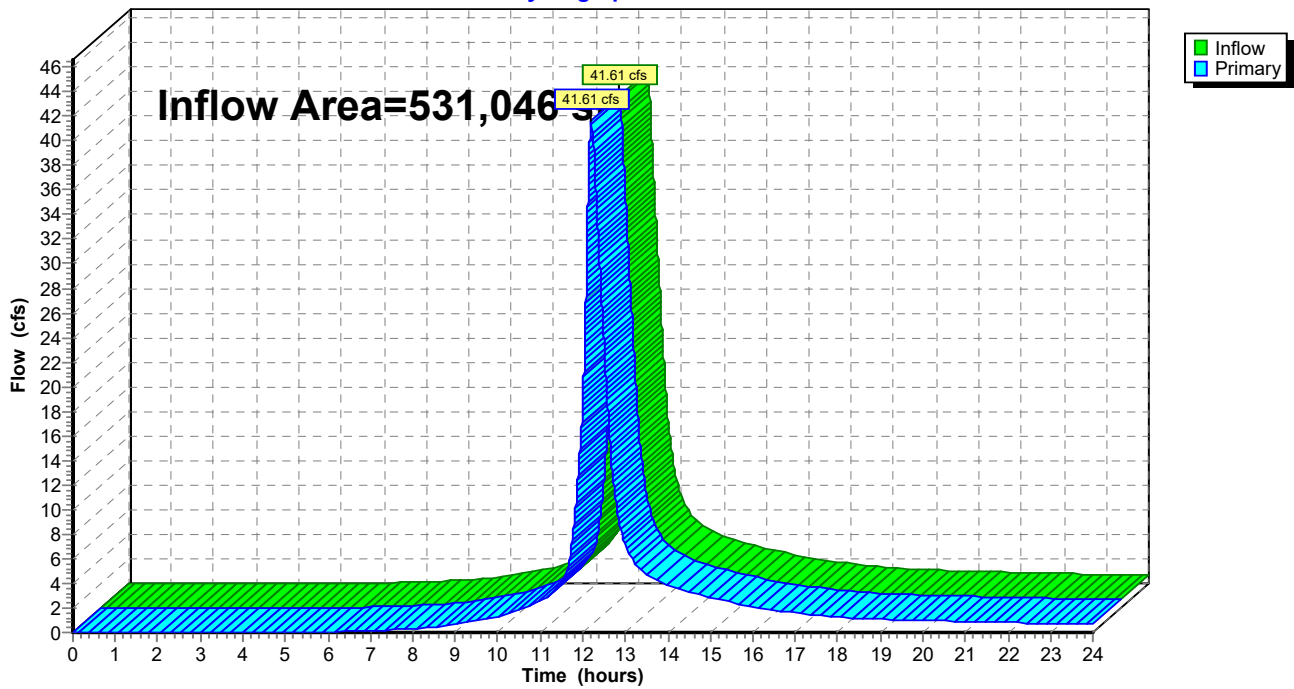
Summary for Link 10L: Ex. To North Detention Pond

Inflow Area = 531,046 sf, 28.93% Impervious, Inflow Depth > 4.20" for 25-Year event
Inflow = 41.61 cfs @ 12.21 hrs, Volume= 185,987 cf
Primary = 41.61 cfs @ 12.21 hrs, Volume= 185,987 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 7L : Ex. To Pond

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs

Link 10L: Ex. To North Detention Pond

Hydrograph



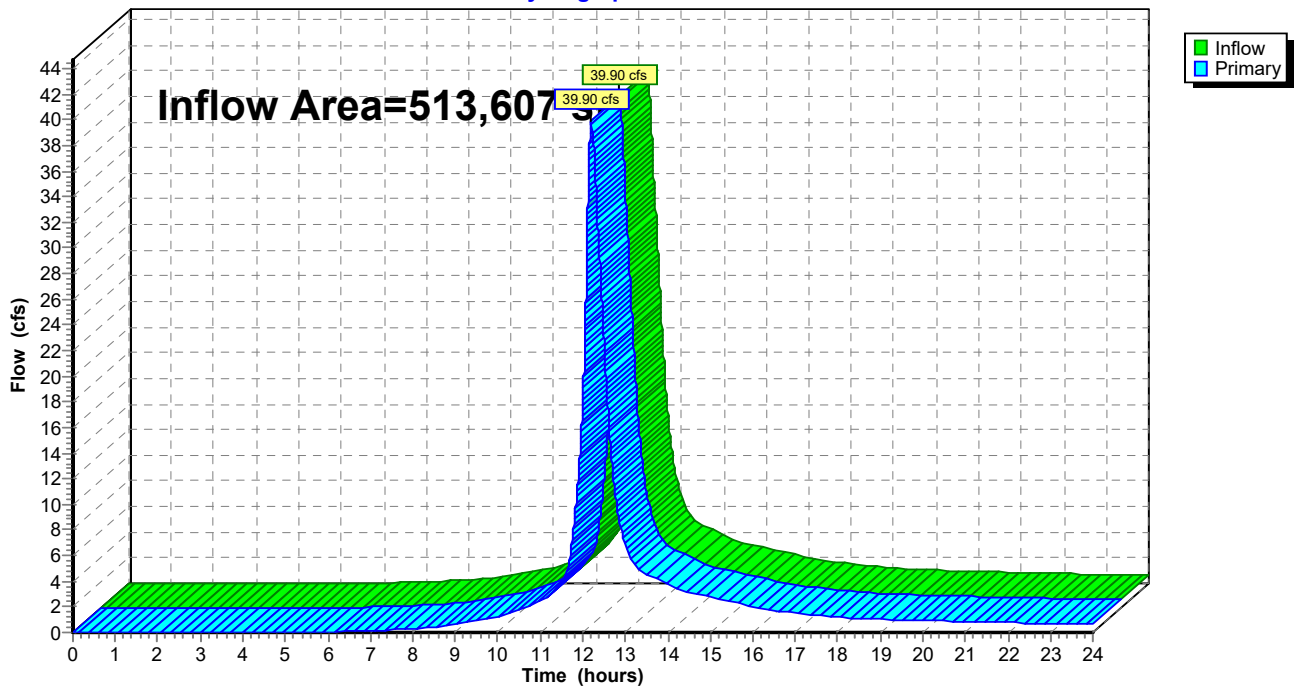
Summary for Link 11L: Pr. To North Detention Pond

Inflow Area = 513,607 sf, 29.11% Impervious, Inflow Depth > 4.18" for 25-Year event
Inflow = 39.90 cfs @ 12.21 hrs, Volume= 178,990 cf
Primary = 39.90 cfs @ 12.21 hrs, Volume= 178,990 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 8L : Pr. To Pond

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs

Link 11L: Pr. To North Detention Pond

Hydrograph



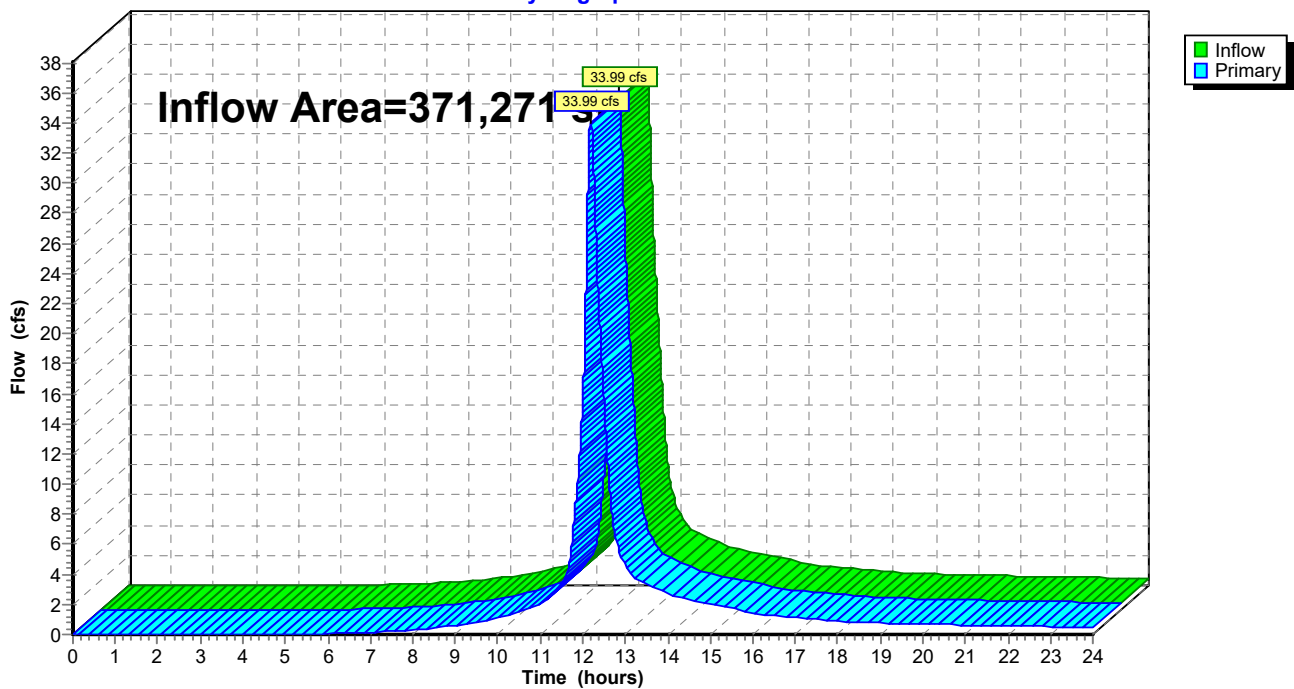
Summary for Link 13L: Ex. North Swale Out

Inflow Area = 371,271 sf, 38.29% Impervious, Inflow Depth > 4.45" for 25-Year event
Inflow = 33.99 cfs @ 12.19 hrs, Volume= 137,607 cf
Primary = 33.99 cfs @ 12.19 hrs, Volume= 137,607 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 10L : Ex. To North Detention Pond

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs

Link 13L: Ex. North Swale Out

Hydrograph



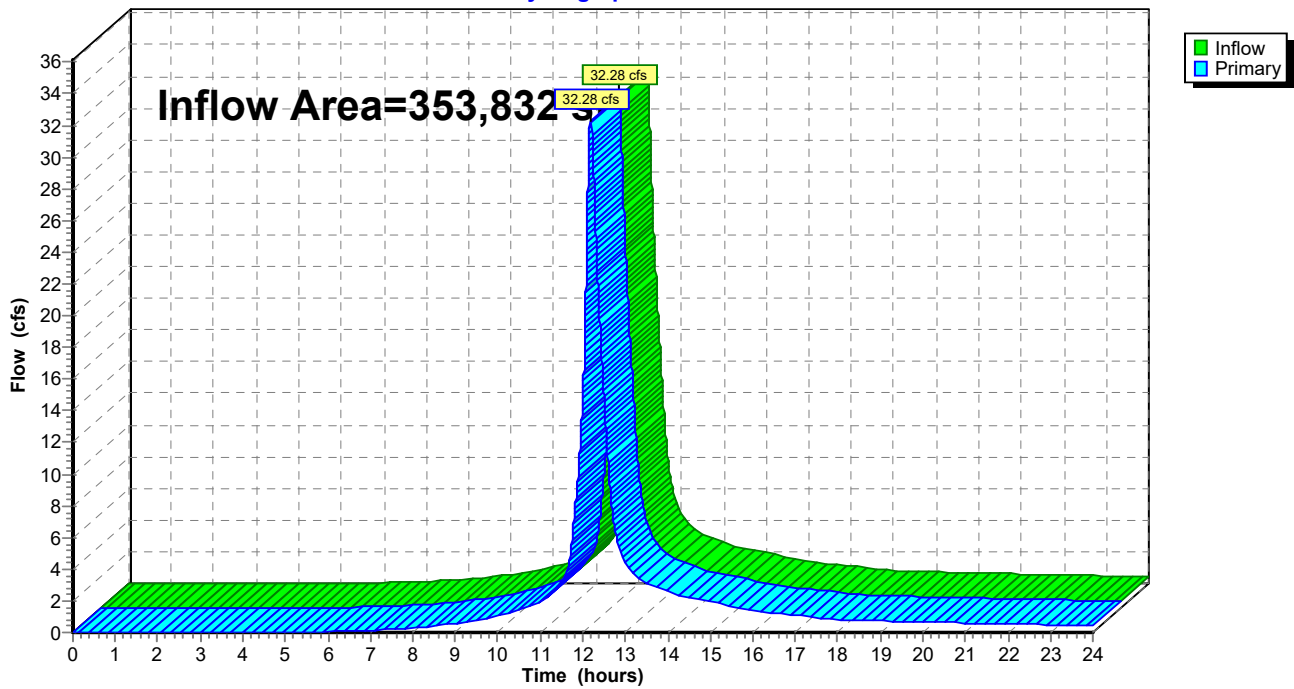
Summary for Link 14L: Pr. North Swale Out

Inflow Area = 353,832 sf, 39.01% Impervious, Inflow Depth > 4.43" for 25-Year event
Inflow = 32.28 cfs @ 12.19 hrs, Volume= 130,610 cf
Primary = 32.28 cfs @ 12.19 hrs, Volume= 130,610 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 11L : Pr. To North Detention Pond

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs

Link 14L: Pr. North Swale Out

Hydrograph



Time span=0.00-24.00 hrs, dt=0.001 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex. South Runoff Area=609,337 sf 15.57% Impervious Runoff Depth>4.38"
Flow Length=2,071' Tc=26.8 min CN=73 Runoff=43.05 cfs 222,440 cf

Subcatchment2S: Ex.South Wetlands Runoff Area=55,451 sf 0.00% Impervious Runoff Depth>3.20"
Flow Length=385' Tc=5.5 min CN=62 Runoff=4.81 cfs 14,787 cf

Subcatchment3S: Ex.Central 24" Pipe Runoff Area=602,842 sf 42.50% Impervious Runoff Depth>5.18"
Flow Length=1,924' Tc=12.4 min CN=80 Runoff=67.93 cfs 260,405 cf

Subcatchment4S: Ex. Central ByPass Runoff Area=415,307 sf 10.64% Impervious Runoff Depth>3.19"
Flow Length=536' Tc=13.7 min CN=62 Runoff=27.63 cfs 110,529 cf

Subcatchment5S: Ex. North Runoff Area=159,775 sf 7.18% Impervious Runoff Depth>4.38"
Flow Length=731' Tc=24.4 min CN=73 Runoff=11.77 cfs 58,356 cf

Subcatchment6S: Ex. North Conveyance Runoff Area=294,527 sf 47.83% Impervious Runoff Depth>5.64"
Flow Length=424' Tc=14.4 min CN=84 Runoff=33.68 cfs 138,445 cf

Subcatchment7S: Ex.North Swale Runoff Area=76,744 sf 1.70% Impervious Runoff Depth>3.73"
Flow Length=1,170' Tc=11.4 min CN=67 Runoff=6.44 cfs 23,876 cf

Subcatchment8S: Pr. South Runoff Area=612,257 sf 15.04% Impervious Runoff Depth>4.38"
Flow Length=2,071' Tc=26.8 min CN=73 Runoff=43.26 cfs 223,506 cf

Subcatchment9S: Pr. South Wetlands Runoff Area=54,807 sf 0.00% Impervious Runoff Depth>3.20"
Flow Length=300' Tc=5.0 min CN=62 Runoff=4.84 cfs 14,617 cf

Subcatchment10S: Pr.Central 24" Pipe Runoff Area=311,534 sf 22.75% Impervious Runoff Depth>4.39"
Flow Length=710' Tc=17.2 min CN=73 Runoff=26.47 cfs 113,954 cf

Subcatchment11S: Pr. Central ByPass Runoff Area=345,455 sf 13.29% Impervious Runoff Depth>3.19"
Flow Length=536' Tc=13.7 min CN=62 Runoff=22.98 cfs 91,939 cf

Subcatchment12S: Pr.West Pond Runoff Area=56,935 sf 60.58% Impervious Runoff Depth>5.53"
Flow Length=364' Tc=5.8 min CN=83 Runoff=8.37 cfs 26,255 cf

Subcatchment13S: Pr.East Pond Runoff Area=296,535 sf 74.50% Impervious Runoff Depth>6.35"
Tc=5.0 min CN=90 Runoff=49.39 cfs 156,874 cf

Subcatchment14S: Pr.Rain Garden Runoff Area=22,853 sf 16.99% Impervious Runoff Depth>2.88"
Flow Length=124' Tc=5.9 min CN=59 Runoff=1.74 cfs 5,491 cf

Subcatchment15S: Pr. North Runoff Area=159,775 sf 7.18% Impervious Runoff Depth>4.38"
Flow Length=731' Tc=24.4 min CN=73 Runoff=11.77 cfs 58,356 cf

Subcatchment16S: Pr. North Conveyance Runoff Area=277,093 sf 49.20% Impervious Runoff Depth>5.64"
Flow Length=424' Tc=14.4 min CN=84 Runoff=31.68 cfs 130,250 cf

1988 HydroCAD 2023-10-13

Prepared by Redniss & Mead, Inc

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Type III 24-hr 50-Year Rainfall=7.54"

Printed 10/12/2023

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Subcatchment 17S: Pr. North Swale	Runoff Area=76,739 sf 2.20% Impervious Runoff Depth>3.73" Flow Length=1,170' Tc=11.4 min CN=67 Runoff=6.44 cfs 23,875 cf
Pond 12P: Pr. Pocket Pond	Peak Elev=89.68' Storage=50,792 cf Inflow=49.39 cfs 156,874 cf Outflow=33.10 cfs 154,910 cf
Pond 13P: Pr. MicroPool ED Pond	Peak Elev=173.98' Storage=5,238 cf Inflow=8.37 cfs 26,255 cf Outflow=6.31 cfs 25,983 cf
Pond 31P: Rain Garden #1	Peak Elev=86.83' Storage=935 cf Inflow=1.74 cfs 5,491 cf Outflow=1.72 cfs 4,642 cf
Link 1L: Ex.To South Outfall	Inflow=177.06 cfs 828,838 cf Primary=177.06 cfs 828,838 cf
Link 2L: Pr. To South Outfall	Inflow=170.12 cfs 842,031 cf Primary=170.12 cfs 842,031 cf
Link 4L: Ex. Central 24" Pipe	Inflow=67.93 cfs 260,405 cf Primary=67.93 cfs 260,405 cf
Link 5L: Pr. Central 24" Pipe	Inflow=63.59 cfs 294,848 cf Primary=63.59 cfs 294,848 cf
Link 7L: Ex. To Pond	Inflow=143.44 cfs 591,611 cf Primary=143.44 cfs 591,611 cf
Link 8L: Pr. To Pond	Inflow=134.80 cfs 603,908 cf Primary=134.80 cfs 603,908 cf
Link 10L: Ex. To North Detention Pond	Inflow=49.15 cfs 220,677 cf Primary=49.15 cfs 220,677 cf
Link 11L: Pr. To North Detention Pond	Inflow=47.17 cfs 212,481 cf Primary=47.17 cfs 212,481 cf
Link 13L: Ex. North Swale Out	Inflow=39.92 cfs 162,322 cf Primary=39.92 cfs 162,322 cf
Link 14L: Pr. North Swale Out	Inflow=37.94 cfs 154,125 cf Primary=37.94 cfs 154,125 cf

Total Runoff Area = 4,427,966 sf Runoff Volume = 1,673,954 cf Average Runoff Depth = 4.54"
73.65% Pervious = 3,261,413 sf 26.35% Impervious = 1,166,553 sf

Time span=0.00-24.00 hrs, dt=0.001 hrs, 24001 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex. South	Runoff Area=609,337 sf 15.57% Impervious Runoff Depth>5.19" Flow Length=2,071' Tc=26.8 min CN=73 Runoff=50.98 cfs 263,646 cf
Subcatchment2S: Ex.South Wetlands	Runoff Area=55,451 sf 0.00% Impervious Runoff Depth>3.91" Flow Length=385' Tc=5.5 min CN=62 Runoff=5.93 cfs 18,074 cf
Subcatchment3S: Ex.Central 24" Pipe	Runoff Area=602,842 sf 42.50% Impervious Runoff Depth>6.04" Flow Length=1,924' Tc=12.4 min CN=80 Runoff=78.80 cfs 303,649 cf
Subcatchment4S: Ex. Central ByPass	Runoff Area=415,307 sf 10.64% Impervious Runoff Depth>3.90" Flow Length=536' Tc=13.7 min CN=62 Runoff=34.07 cfs 135,115 cf
Subcatchment5S: Ex. North	Runoff Area=159,775 sf 7.18% Impervious Runoff Depth>5.19" Flow Length=731' Tc=24.4 min CN=73 Runoff=13.93 cfs 69,165 cf
Subcatchment6S: Ex. North Conveyance	Runoff Area=294,527 sf 47.83% Impervious Runoff Depth>6.52" Flow Length=424' Tc=14.4 min CN=84 Runoff=38.68 cfs 160,076 cf
Subcatchment7S: Ex.North Swale	Runoff Area=76,744 sf 1.70% Impervious Runoff Depth>4.50" Flow Length=1,170' Tc=11.4 min CN=67 Runoff=7.78 cfs 28,748 cf
Subcatchment8S: Pr. South	Runoff Area=612,257 sf 15.04% Impervious Runoff Depth>5.19" Flow Length=2,071' Tc=26.8 min CN=73 Runoff=51.22 cfs 264,910 cf
Subcatchment9S: Pr. South Wetlands	Runoff Area=54,807 sf 0.00% Impervious Runoff Depth>3.91" Flow Length=300' Tc=5.0 min CN=62 Runoff=5.96 cfs 17,866 cf
Subcatchment10S: Pr.Central 24" Pipe	Runoff Area=311,534 sf 22.75% Impervious Runoff Depth>5.20" Flow Length=710' Tc=17.2 min CN=73 Runoff=31.34 cfs 135,055 cf
Subcatchment11S: Pr. Central ByPass	Runoff Area=345,455 sf 13.29% Impervious Runoff Depth>3.90" Flow Length=536' Tc=13.7 min CN=62 Runoff=28.34 cfs 112,389 cf
Subcatchment12S: Pr.West Pond	Runoff Area=56,935 sf 60.58% Impervious Runoff Depth>6.41" Flow Length=364' Tc=5.8 min CN=83 Runoff=9.62 cfs 30,419 cf
Subcatchment13S: Pr.East Pond	Runoff Area=296,535 sf 74.50% Impervious Runoff Depth>7.25" Tc=5.0 min CN=90 Runoff=56.00 cfs 179,237 cf
Subcatchment14S: Pr.Rain Garden	Runoff Area=22,853 sf 16.99% Impervious Runoff Depth>3.56" Flow Length=124' Tc=5.9 min CN=59 Runoff=2.17 cfs 6,781 cf
Subcatchment15S: Pr. North	Runoff Area=159,775 sf 7.18% Impervious Runoff Depth>5.19" Flow Length=731' Tc=24.4 min CN=73 Runoff=13.93 cfs 69,165 cf
Subcatchment16S: Pr. North Conveyance	Runoff Area=277,093 sf 49.20% Impervious Runoff Depth>6.52" Flow Length=424' Tc=14.4 min CN=84 Runoff=36.39 cfs 150,601 cf

Subcatchment 17S: Pr. North Swale Runoff Area=76,739 sf 2.20% Impervious Runoff Depth>4.50"
Flow Length=1,170' Tc=11.4 min CN=67 Runoff=7.78 cfs 28,746 cf

Pond 12P: Pr. Pocket Pond Peak Elev=89.89' Storage=53,606 cf Inflow=56.00 cfs 179,237 cf
Outflow=37.06 cfs 177,115 cf

Pond 13P: Pr. MicroPool ED Pond Peak Elev=174.12' Storage=5,703 cf Inflow=9.62 cfs 30,419 cf
Outflow=6.95 cfs 30,127 cf

Pond 31P: Rain Garden #1 Peak Elev=86.85' Storage=949 cf Inflow=2.17 cfs 6,781 cf
Outflow=2.16 cfs 5,931 cf

Link 1L: Ex.To South Outfall Inflow=208.78 cfs 978,473 cf
Primary=208.78 cfs 978,473 cf

Link 2L: Pr. To South Outfall Inflow=200.48 cfs 991,905 cf
Primary=200.48 cfs 991,905 cf

Link 4L: Ex. Central 24" Pipe Inflow=78.80 cfs 303,649 cf
Primary=78.80 cfs 303,649 cf

Link 5L: Pr. Central 24" Pipe Inflow=73.43 cfs 342,297 cf
Primary=73.43 cfs 342,297 cf

Link 7L: Ex. To Pond Inflow=168.61 cfs 696,752 cf
Primary=168.61 cfs 696,752 cf

Link 8L: Pr. To Pond Inflow=158.01 cfs 709,129 cf
Primary=158.01 cfs 709,129 cf

Link 10L: Ex. To North Detention Pond Inflow=57.18 cfs 257,989 cf
Primary=57.18 cfs 257,989 cf

Link 11L: Pr. To North Detention Pond Inflow=54.90 cfs 248,511 cf
Primary=54.90 cfs 248,511 cf

Link 13L: Ex. North Swale Out Inflow=46.23 cfs 188,824 cf
Primary=46.23 cfs 188,824 cf

Link 14L: Pr. North Swale Out Inflow=43.95 cfs 179,346 cf
Primary=43.95 cfs 179,346 cf

Total Runoff Area = 4,427,966 sf Runoff Volume = 1,973,642 cf Average Runoff Depth = 5.35"
73.65% Pervious = 3,261,413 sf 26.35% Impervious = 1,166,553 sf

Appendix D

***Conveyance Calculations
Energy Dissipator Sizing***

Conveyance Protection Calculations

Project: 900 Long Ridge Road	Project #: 1988	Date: 10/13/2023
Location: 900 Long Ridge Road, Stamford, CT	By: DML	Checked: DRG

25 Year Storm: Pocket Pond

Page 1 of 7

	Basin Description				Drainage Path							
	Acres	C	Description	AC	Length (ft)	ΔH	Slope (%)	Description				
	Time (min)	25yr. Rainfall Intensity (in/hr)	Q = ACI (cfs)									
Pipe From MH#6 to MH#5	4.788	0.95	Impervious	4.548								
	0.942	0.30	Pervious	0.283								
	5.730		Total	4.831					5	8.53	41.21	
	Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)	Flow Q is Tributary Area to MH#6			
	41.21	24	6	0.011	PVC	0.025	42.39	97.2%				
Pipe From MH#5 to MH#4		0.95	Impervious	0.000								
		0.30	Pervious	0.000								
	0.000		Total	0.000					5	8.53	41.21	
	Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)	Flow Q is Tributary Area to MH#6			
	41.21	24	19	0.011	PVC	0.026	43.23	95.3%				
Pipe From MH#4 to MH#3	4.788	0.95	Impervious	4.548								
	0.942	0.30	Pervious	0.283								
	5.730		Total	4.831					5	8.53	41.21	
	Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)	Flow Q is Tributary Area to MH#6			
	41.21	24	22	0.011	PVC	0.050	59.94	68.7%				



Conveyance Protection Calculations

Project: 900 Long Ridge Road	Project #: 1988	Date: 10/13/2023
Location: 900 Long Ridge Road, Stamford, CT	By: DML	Checked: DRG

25 Year Storm: Pocket Pond

Page 2 of 7

Pipe From MH#3 to MH#2	Basin Description				Drainage Path				Time (min)	25yr. Rainfall Intensity (in/hr)	Q = ACI (cfs)
	Acres	C	Description	AC	Length (ft)	ΔH	Slope (%)	Description			
		0.95	Impervious	0.000							
	0.30	Pervious	0.000								
	0.000		Total	0.000					5	8.53	41.21
	Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q_{full} (cfs)	Q_{system} / Q_{full} (%)	Flow Q is Tributary Area to MH#6		
	41.21	24	184	0.011	PVC	0.264	137.74	29.9%			

Pipe From MMH#1 to MH#1	Basin Description				Drainage Path				Time (min)	100yr. Rainfall Storm	Q = ACI (cfs)
	Acres	C	Description	AC	Length (ft)	ΔH	Slope (%)	Description			
		0.000	0.95	Impervious	0.000						
	0.000	0.30	Pervious	0.000							
	0.000		Total	0.000					-	-	37.06
	Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q_{full} (cfs)	Q_{system} / Q_{full} (%)	Flow Q is total Outflow of Pr.Pocket Pond in HydroCAD during 100 Year Storm		
	37.06	24	75	0.011	PVC	0.020	37.91	97.8%			



Conveyance Protection Calculations

Project:	900 Long Ridge Road	Project #:	1988	Date:	10/13/2023
Location:	900 Long Ridge Road, Stamford, CT	By:	DML	Checked:	DRG

25 Year Storm: Micropool ED Pond

Page 3 of 7

	Basin Description				Drainage Path				Time (min)	25yr. Rainfall Intensity (in/hr)	Q = ACI (cfs)	
	Acres	C	Description	AC	Length (ft)	ΔH	Slope (%)	Description				
	Pipe From MH#102 to MH#101	0.379	0.95	Impervious	0.361							
0.033		0.30	Pervious	0.010								
0.413			Total	0.370					5	8.53	3.16	
Q in system (cfs)		Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)	Flow Q is Tributary Area to MH#103			
3.16		12	62	0.011	PVC	0.088	12.52	25.2%				
Pipe From CB#101 to MH#101	0.184	0.95	Impervious	0.175								
		0.30	Pervious	0.000								
	0.184		Total	0.175					5	8.53	1.49	
	Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)	Flow Q is Tributary Area to CB#101			
	1.49	12	5	0.011	PVC	0.250	21.11	7.1%				
Pipe From MH#105 to MH#101	0.128	0.95	Impervious	0.122								
	0.008	0.30	Pervious	0.002								
	0.137		Total	0.124					5	8.53	1.06	
	Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)	Flow Q is Tributary Area to CB#102			
	1.06	12	34	0.011	PVC	0.080	11.94	8.9%				



Conveyance Protection Calculations

Project: 900 Long Ridge Road	Project #: 1988	Date: 10/13/2023
Location: 900 Long Ridge Road, Stamford, CT	By: DML	Checked: DRG

25 Year Storm: Micropool ED Pond

Page 4 of 7

	Basin Description				Drainage Path							
	Acres	C	Description	AC	Length (ft)	ΔH	Slope (%)	Description				
	Pipe From MH#101 to ED#2	0.000	0.95	Impervious	0.000							
0.000		0.30	Pervious	0.000								
0.000			Total	0.000					5	8.53	5.71	
Q in system (cfs)		Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)	Flow Q is sum of Flow to MH#101			
5.71		18	21	0.011	PVC	0.012	13.64	41.9%				

	Basin Description				Drainage Path							
	Acres	C	Description	AC	Length (ft)	ΔH	Slope (%)	Description				
	Pipe From CB#12 to MH#28A	0.000	0.95	Impervious	0.000							
0.000		0.30	Pervious	0.000								
0.000			Total	0.000					-	-	6.95	
Q in system (cfs)		Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)	Flow Q is total Outflow of Pr.MicroPool ED Pond in HydroCAD during 100 Year Storm			
6.95		18	15	0.011	PVC	0.020	17.60	39.5%				



Conveyance Protection Calculations

Project: 900 Long Ridge Road	Project #: 1988	Date: 10/13/2023
Location: 900 Long Ridge Road, Stamford, CT	By: DML	Checked: DRG

25 Year Storm: North Conveyance

Page 5 of 7

	Basin Description				Drainage Path							
	Acres	C	Description	AC	Length (ft)	ΔH	Slope (%)	Description				
	Time (min)	25yr. Rainfall Intensity (in/hr)	Q = ACI (cfs)									
Pipe From MH#210 to EX.MH#2	1.079	0.95	Impervious	1.025								
	0.000	0.30	Pervious	0.000								
	1.079		Total	1.025					5	8.53	8.74	
	Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)	Flow Q is Tributary Area from Ex. Garage Roof Area and a portion of Building D Roof Area			
	8.74	24	35	0.011	PVC	0.020	37.91	23.1%				
Pipe From EX.MH#2 to EX.MH#6	0.456	0.95	Impervious	0.433								
	0.059	0.30	Pervious	0.018								
	0.515		Total	0.451					5	8.53	3.85	
	Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)	Flow Q is sum of Ex. Garage Roof Area, a portion of Building D Roof Area, and tributary area to CBs that flow into EX.MH#6			
	12.59	24	110	0.012	RCP	0.048	53.84	23.4%				
Pipe From EX.MH#6 TO EX.MH#5	0.000	0.95	Impervious	0.000								
	0.000	0.30	Pervious	0.000								
	0.000		Total	0.000					0	0.00	0.00	
	Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)	Flow Q is sum of Ex. Garage Roof Area, a portion of Building D Roof Area, and tributary area to CBs that flow into EX.MH#6			
	12.59	24	61	0.011	PVC	0.005	18.96	66.4%				



Conveyance Protection Calculations

Project: 900 Long Ridge Road	Project #: 1988	Date: 10/13/2023
Location: 900 Long Ridge Road, Stamford, CT	By: DML	Checked: DRG

25 Year Storm: North Conveyance

Page 6 of 7

Pipe From EX.MH#5 TO MH#203	Basin Description				Drainage Path					25yr. Rainfall Intensity (in/hr)	Q = ACI (cfs)
	Acres	C	Description	AC	Length (ft)	ΔH	Slope (%)	Description			
	0.973	0.95	Impervious	0.924							
	0.031	0.30	Pervious	0.009							
	1.004		Total	0.933					5	8.53	7.96
	Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)	Flow Q is sum of all Tributary Area to EX.MH#6, Tributary Area to CBs that flow to EX.MH#5, and a portion of Building C roof/amenity areas.		
	20.55	24	9	0.011	PVC	0.037	51.57	39.9%			

Pipe From MH#203 to DMH#201	Basin Description				Drainage Path					25yr. Rainfall Intensity (in/hr)	Q = ACI (cfs)
	Acres	C	Description	AC	Length (ft)	ΔH	Slope (%)	Description			
	0.000	0.95	Impervious	0.000							
	0.000	0.30	Pervious	0.000							
	0.000		Total	0.000					0	0.00	0.00
	Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)	Flow Q is sum of all Tributary Area to EX.MH#6, Tributary Area to CBs that flow to EX.MH#5, and a portion of Building C roof/amenity areas.		
	20.55	24	50	0.020	CMP	0.035	27.58	74.5%			



Conveyance Protection Calculations

Project: 900 Long Ridge Road	Project #: 1988	Date: 10/13/2023
Location: 900 Long Ridge Road, Stamford, CT	By: DML	Checked: DRG

25 Year Storm: Rain Garden

Page 7 of 7

	Basin Description				Drainage Path				Time (min)	25yr. Rainfall Intensity (in/hr)	Q = ACI (cfs)
	Acres	C	Description	AC	Length (ft)	ΔH	Slope (%)	Description			
Pipe From CB#109 TO ED#3		0.95	Impervious	0.000							
		0.30	Pervious	0.000							
			Total	0.000					-	-	2.17
	Q in system (cfs)	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q _{full} (cfs)	Q _{system} / Q _{full} (%)	Flow Q is total Outflow of Pr.MicroPool ED Pond in HydroCAD during 100 Year Storm		
2.17	12	59	0.011	PVC	0.006	3.27	66.4%				

TYPE 2 PREFORMED SCOUR HOLE SIZING

Project: 900 Long Ridge Road	Project #: 1988	Date: 10/13/2023
Location: Stamford, CT	By: DML	Checked: DRG

ED#1: Pocket Pond

Flow (Q)	43.1 cfs	
Tail Water (TW)	89.83 ft	
Pipe Size (Sp)	2.00 ft	
d50=	0.01 ft	^a
Required RipRap	Modified	^b
Basin Depression (F)	2.00 ft	^c
Basin Length (C)	18 ft	^d
Basin Width (B)	16 ft	^e
Depression Length	6 ft	^f
Depression Width	4 ft	^g

^a $d50 = (0.0082 \times Sp^2 / Tw)(Q / Sp^{2.5})^{1.333}$ = Equation 11.35 from Section 11.13.6 of the Connecticut Department of Transportation Drainage Manual

^b From the table on Page 11.13-5 of the Connecticut Department of Transportation Drainage Manual

^c Basin Depression (F) = Sp = Equation 11.37 from Section 11.13.6 of the Connecticut Department of Transportation Drainage Manual

^d Basin Length (C) = 3Sp + 6F = Equation 11.37 from Section 11.13.6 of the Connecticut Department of Transportation Drainage Manual

^e Basin Width (B) = 2Sp + 6F = Equation 11.37 from Section 11.13.6 of the Connecticut Department of Transportation Drainage Manual

^f Depression Length = 3Sp = Equation from Page 11.13-19 of the Connecticut Department of Transportation Drainage Manual

^g Depression Width = 2Sp = Equation from Page 11.13-19 of the Connecticut Department of Transportation Drainage Manual

RIPRAP SIZING

Project: 900 Long Ridge Road	Project #: 1988	Date: 6/23/2023
Location: Stamford, CT	By: DML	Checked: DRG

ED#2: MicroPool Pond

Downstream channel	No
Tail Water (TW)	$TW < 0.5 R_p$
RipRap Type	A

Velocity	2.00 fps
Discharge (Q)	7.1 cfs
Pipe Diameter	18 in
Pipe Diameter (R_p)	2 ft
Inside Diameter (S_p)	2 ft
Length (L_a)	12 ft ^a
Riprap Specification	Modified ^b
Start Width (W1)	4.5 ft ^c
End Width (W2)	12.9 ft

^a From Table 11-12.1 from Page 11.13-7 and Table 11-13.1 from Page 11.13.9 of the Connecticut Department of Transportation Drainage Manual

^b From Table 11.11 on Page 11.13-2 of the Connecticut Department of Transportation Drainage Manual

^c $W1=3S_p$ and $W2=3S_p + 0.7L_a$ from Equation 11.33 from Page 11.13.3 of the Connecticut Department of Transportation Drainage Manual

RIPRAP SIZING

Project: 900 Long Ridge Road	Project #: 1988	Date: 10/13/2023
Location: Stamford, CT	By: DML	Checked: DRG

ED#3: Rain Garden

Downstream channel	No
Tail Water (TW)	$TW < 0.5 R_p$
RipRap Type	A

Velocity	2.00 fps
Discharge (Q)	1.4 cfs
Pipe Diameter	12 in
Pipe Diameter (R_p)	1 ft
Inside Diameter (S_p)	1 ft
Length (L_a)	10 ft ^a
Riprap Specification	Modified ^b
Start Width (W1)	3.0 ft ^c
End Width (W2)	10.0 ft

^a From Table 11-12.1 from Page 11.13-7 and Table 11-13.1 from Page 11.13.9 of the Connecticut Department of Transportation Drainage Manual

^b From Table 11.11 on Page 11.13-2 of the Connecticut Department of Transportation Drainage Manual

^c $W1=3S_p$ and $W2=3S_p + 0.7L_a$ from Equation 11.33 from Page 11.13.3 of the Connecticut Department of Transportation Drainage Manual

Appendix E

Site Observation Report for Northern Pond/Swale
Site Observation Report for Southern Headwalls and Watercourse

Site Observation Report for Northern Pond/ Swale

Monday Properties
900 Long Ridge Road, Stamford, CT
June 23, 2023

One of the existing stormwater management practices at 900 Long Ridge Road consists of a stoned lined swale and detention pond located in the northern portion of the site. A site visit was conducted on May 24, 2023, to observe how the existing swale and detention pond are currently performing. Both the swale and existing detention pond show signs of extreme overgrowth and little landscaping maintenance (Photos 9-10). Photos 1-3 show the existing 24” corrugated metal pipe with flow at the western end of the swale. The adjacent 12” reinforced concrete pipe was not located during this site visit. The stone lined swale and watercourse exhibits little to no signs of erosion as indicated by the original stones still in place and an abundance of vegetation. The stone weir wall was located (Photos 4-6) during this site visit and was noted as being filled with sediment. The detention pond was also observed with pictures being taken at upstream (Photo 14) and downstream (Photo 15) towards the mouth of the pond. Excessive sediment accumulation was noted. The existing detention pond was observed to be almost entirely filled with sediment. There was not a lot of visible water, but rather a meadow/grass combination growing inside the pond footprint (Photos 16-20). A clear, defined berm was observed on the eastern portion of the detention pond (Photos 21-22) and the outlet structure, a 12” reinforced concrete pipe, was located (Photo 23). There were no signs of erosion on the berm or at the outlet of the 12” pipe.

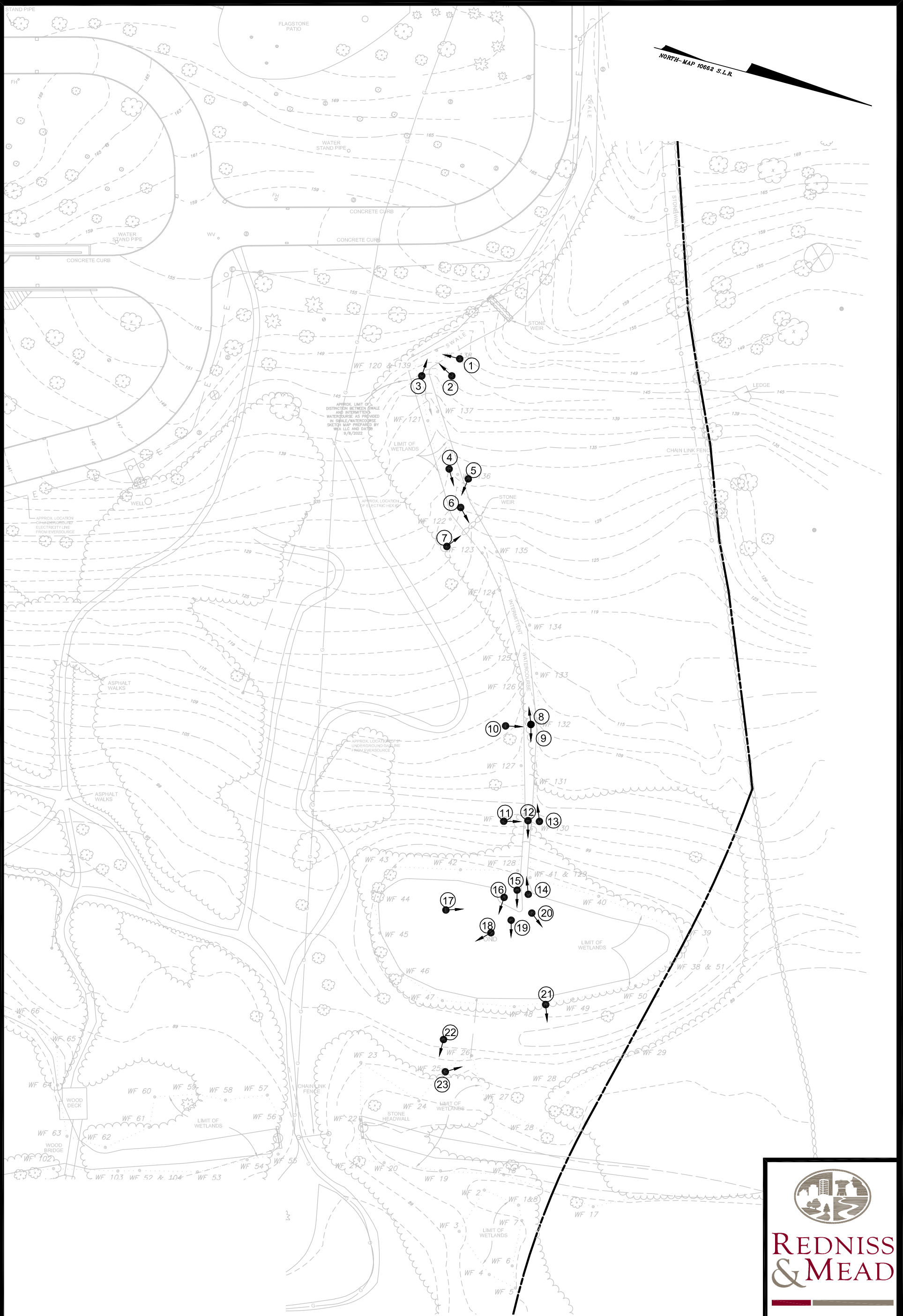


PHOTO EXHIBIT
900 LONG RIDGE ROAD
STAMFORD, CT


**REDNISS
 & MEAD**

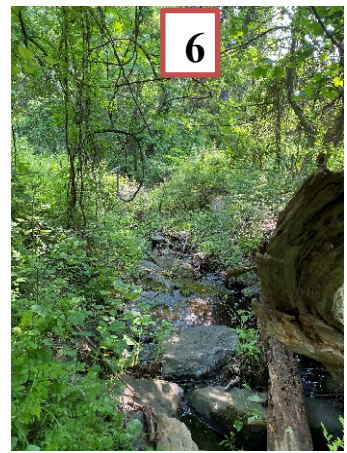
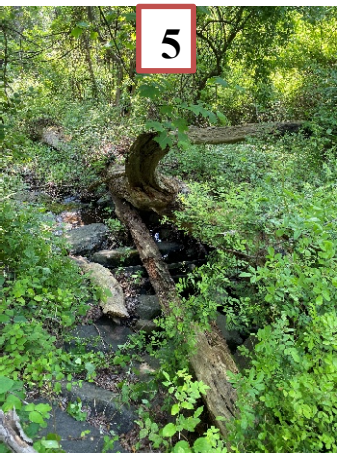
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COMM. NO. 1988	DATE 06/01/2023
SCALE: 1"=150'	

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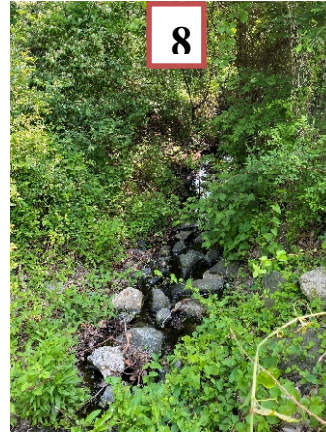
Site Photos of Northern Pond/Swale



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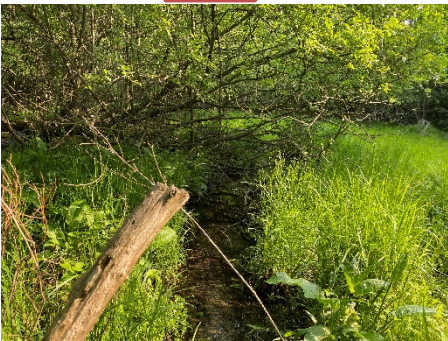
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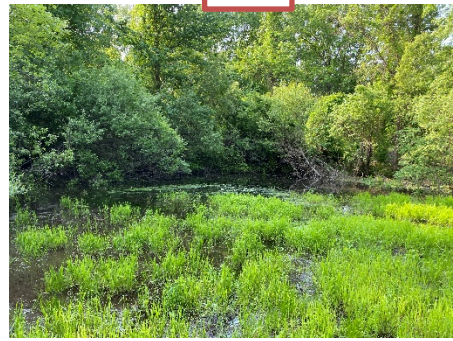
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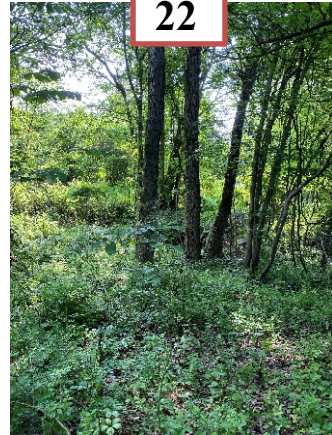
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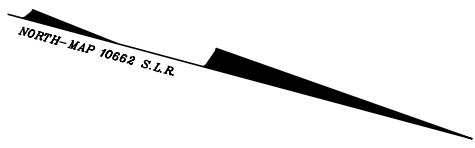
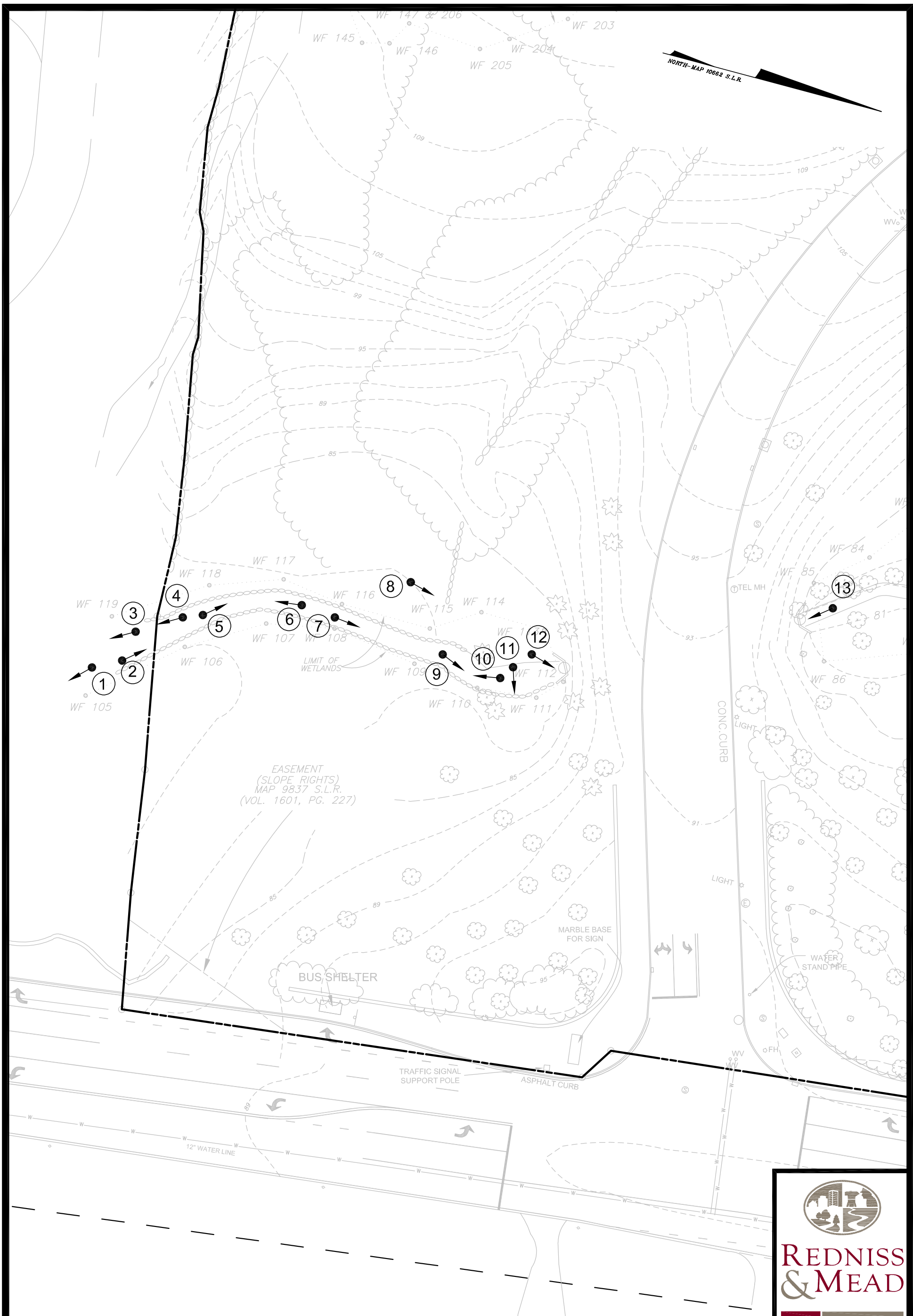
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Site Observation Report for Southern Headwall and Watercourse

Monday Properties
900 Long Ridge Road, Stamford, CT
October 13, 2023

A site visit was conducted on September 20, 2023 to observe the existing conditions of the southern headwalls and watercourse onsite. Photo 13 shows the conditions of the 60” reinforced concrete pipe headwall at the north side of the site driveway. The surrounding area consists of extreme overgrowth, but the headwall and the pipe run are in good condition. Photos 9, 10, 11, and 12 show the conditions of the southern 60” RCP headwall. Similarly, to the northern headwall, there is excess vegetation in the immediate surrounding area, however, the pipe and headwall themselves are free of debris & sediment and are in good condition. The remaining length of the watercourse was observed during the site visit. Pictures were taken upstream (Photos 6,7) and downstream (Photo 5) of the bend in the watercourse. Although there were fallen trees and vegetation, the large stone embankment did not show any signs of erosion or accumulation of sediment. Photos 3 and 4 were taken where the watercourse meets the property line. There is a constant downstream flow without any evidence of sediment deposition (Photo 2). Photo 1 shows the ellipse-shaped corrugated metal pipe and its headwall on 800 Long Ridge Road that receives the watercourse leaving 900 Long Ridge Road. Similar conditions of excessive vegetation and stone embankment exhibited.



**SOUTHERN HEADWALL AND WATERCOURSE
 PHOTO EXHIBIT
 900 LONG RIDGE ROAD
 STAMFORD, CT**



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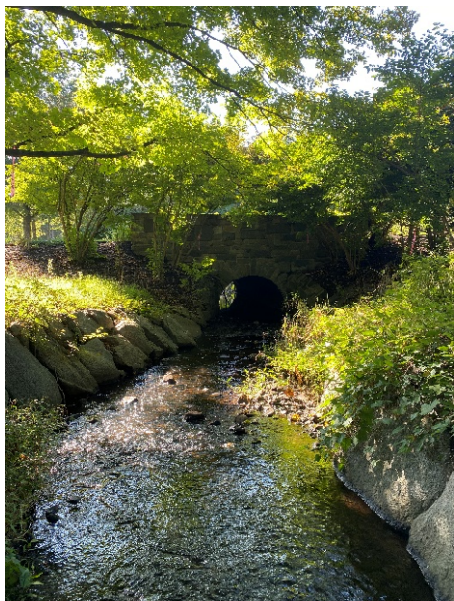
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Photo Exhibit

900 Long Ridge Road Existing Conditions
October 13, 2023

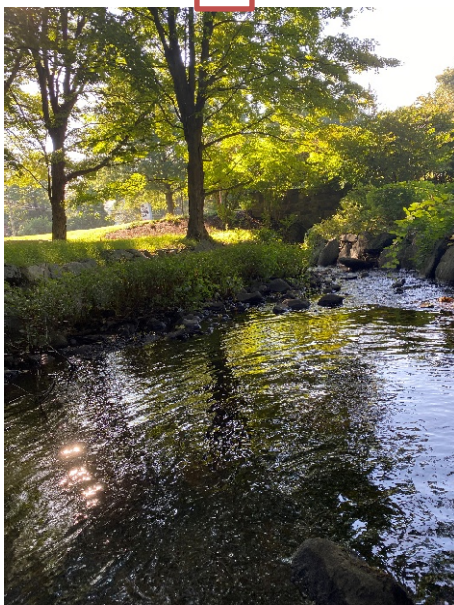
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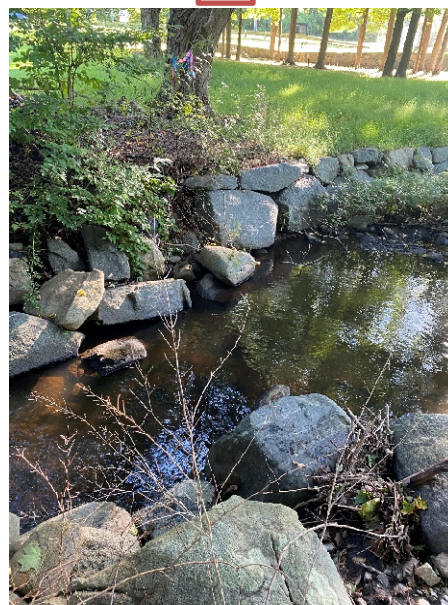
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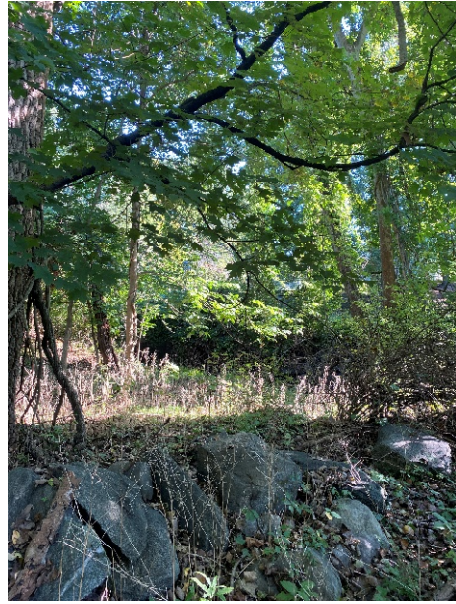
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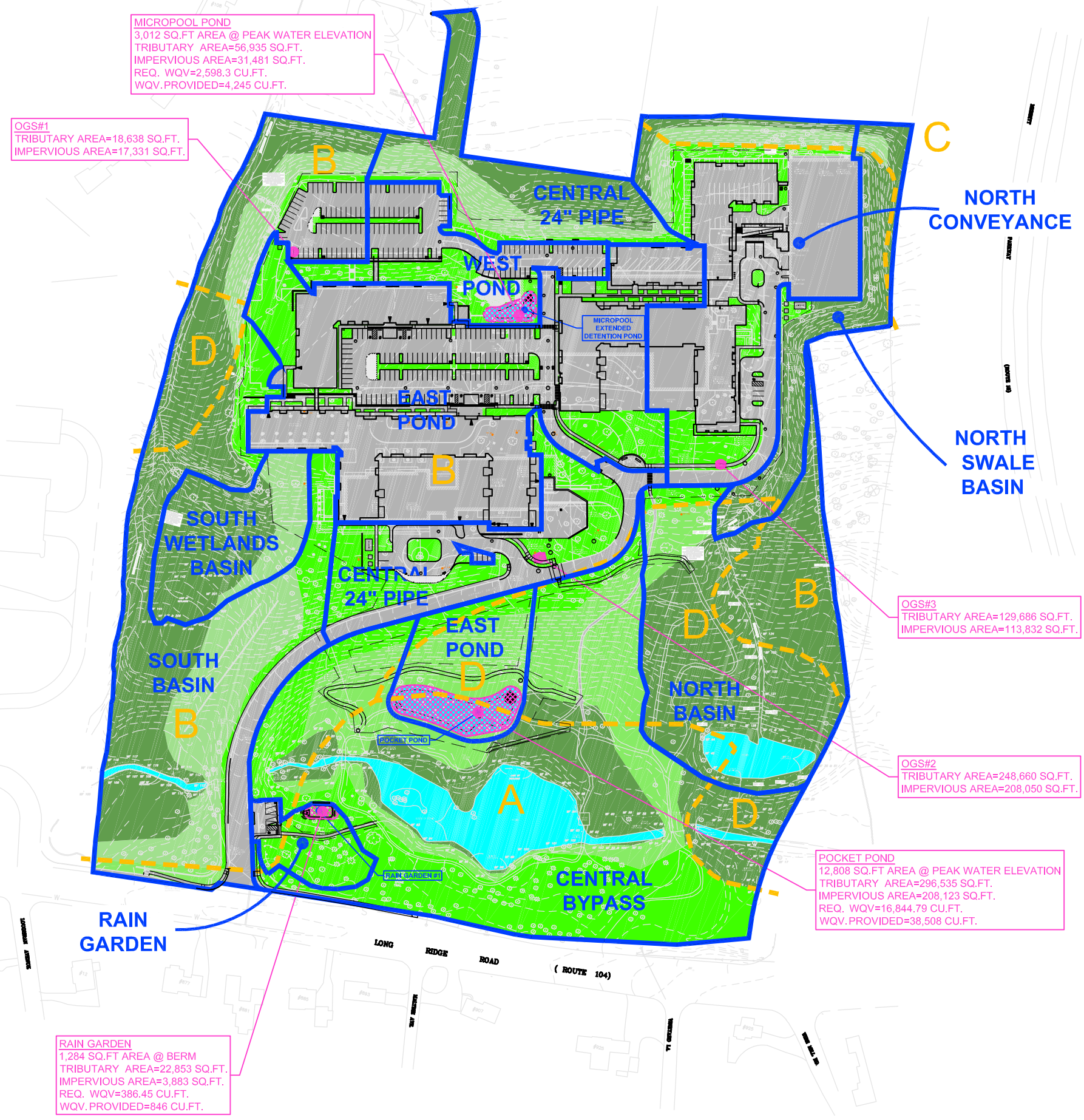


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







Appendix F


LID Review Map



LEGEND:

	BUILDINGS, ASPHALT PARKING, DRIVES & HARDSCAPE		LIMIT OF DISTURBANCE
	PERVIOUS		SOIL CLASSIFICATION BOUNDARY
	WATER	B	SOIL TYPE CLASSIFICATION
	STORMWATER BMP		

LID REVIEW MAP
900 LONG RIDGE ROAD
STAMFORD, CT



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COMM. NO.: 1988	DATE: 10/13/2023
	SCALE: 1"=200'

Appendix G

Operation and Maintenance Agreement

Block _____

AGREEMENT COVENANT

AGREEMENT made this _____ by and between _____ and the **CITY OF STAMFORD**, a municipal corporation lying within the County of Fairfield and State of Connecticut, acting herein by its duly authorized Mayor, Caroline Simmons (hereinafter referred to as the "City"), and the **ENVIRONMENTAL PROTECTION BOARD OF THE CITY OF STAMFORD**, acting herein by its duly authorized Chairman, Gary H. Stone (hereinafter referred to as the "EPB").

WITNESSETH:

WHEREAS, OWNER has commenced the planning and construction of _____ on a parcel of land owned by them and as more particularly described on Schedule "A", attached hereto and made a part hereof (the "Property").

WHEREAS, certain drainage facilities ("Drainage Facilities"), including but not limited to _____ as more particularly described on Schedule "B" attached (the "Construction Plans") shall be installed in connection with the aforesaid construction and in accordance with the Construction Plans and _____ issued therefore, (the "Permit") and;

WHEREAS, OWNER, the CITY and EPB share a joint concern that the Drainage Facilities be maintained in a functioning condition so as to avoid pollution of surface and groundwaters, flooding and/or improper drainage.

NOW, THEREFORE, in consideration of ten dollars and other good and valuable consideration receipt of which is hereby acknowledged by the OWNER, it is hereby agreed as follows:

- 1) OWNER shall clean the drainage facilities or cause such facilities to be cleaned by periodic removal of accumulated sediment and debris in a good and workman-like manner, at least two (2) times during every twelve (12) month period, which times shall be in the period between April and June and between October and December and more often as the City may determine to be necessary.
- 2) OWNER shall sweep, or cause to be swept, garage facilities, driveways and roadway surfaces located on the Property at least once per calendar quarter.
- 3) OWNER shall utilize only sand or calcium chloride in connection with the de-icing of areas within the Property meaning and intending that road salt (Sodium Chloride) shall not be used for said purpose.
- 4) OWNER shall repair or replace any defects or defective drainage facilities so as to maintain the drainage facilities, at all times, in a fully functional capacity.
- 5) OWNER shall file as-built drainage plans with the EPB immediately upon the completion of work. Said plans shall be prepared by a professional engineer/surveyor registered in the State of Connecticut.

- 6) OWNER grants the CITY and/or EPB, its agents, and employees, the right to enter the Property at all reasonable times upon twenty-four (24) hours notice to the OWNER for the purpose of inspecting the Property to determine if OWNER is complying with the requirements hereunder. A representative of the Owner shall have the right to accompany the City and/or EPB on their inspection of the Property.

- 7) If, after an inspection is made pursuant to Paragraph Six (6) hereof, the CITY and/or EPB determines that the owner has failed to comply with the aforesaid undertakings, then the CITY and/or EPB shall give written notice of said determination to the then OWNER of the Property which notice shall also specify the said failure. Said notice shall be sent by registered or certified mail to the last known address of said Owner. If the Owner disputes the claim, he shall give written notice thereof to City and/or EPB within ten (10) days of receipt of said notice, and the EPB shall hold a hearing as promptly as possible to decide the merits of the disputed claim. If the claim is not disputed within said ten (10) days, the OWNER shall have thirty (30) days from the receipt of said notice to correct said failure, unless it is impossible to cure said defect within said time, in which case, the necessary repairs shall be immediately commenced and diligently pursued to completion within a reasonable time.

- 8) If the said failure is not remedied within the time frame herein stated, the CITY and/or EPB may proceed to cure the same and charge the actual cost thereof to the OWNER of the Property.

- 9) OWNER agrees to reimburse the CITY and/or EPB for reasonable legal fees and court costs if it becomes necessary for the CITY and/or EPB to sue for reimbursement of sums expended by the CITY and/or EPB in performance of OWNER'S obligation.
- 10) OWNER agrees and covenants to indemnify and save harmless the CITY and the EPB against any and all claims, suits, actions or judgments arising out of the delay in the performance of any of their obligations pursuant to this Agreement.
- 11) OWNER agrees that this covenant and restriction shall apply to and run with the land. It shall be binding on all future owners, administrators, executors, successors and assigns.
- 12) The OWNER hereby represents to the CITY and EPB that he/she is the owner, in fee simple, of all of the property described in "Schedule A" attached hereto and made a part hereof.
- 13) OWNER agrees that this Agreement and restrictive covenant upon execution of the same, shall be recorded on the land records at the OWNER'S expense at the time that a permit is issued for the Property herein and while the OWNER is in title.
- 14) OWNER agrees not to assert the invalidity of this document.
- 15) OWNER agrees that nothing herein shall be construed to be a limitation upon the right of the EPB to assert and enforce any rights it may have under federal, state or City statute, ordinance or regulation.

16) This agreement shall be governed by the laws of the State of Connecticut.

IN WITNESS WHEREOF, the said parties hereto have hereunto set their hands and seals, the day and year first above written.

WITNESSED:

THE CITY OF STAMFORD

BY: _____

Caroline Simmons
Its duly authorized Mayor

THE ENVIRONMENTAL PROTECTION BOARD

BY: _____

Gary H. Stone
Its duly authorized Chairman

OWNER

BY: _____

(Owner's Name)

(Acknowledgement on the Following Page)

STATE OF CONNECTICUT}
} ss: STAMFORD Date: _____
COUNTY OF FAIRFIELD }

Personally appeared Caroline Simmons, Mayor of the City of Stamford,
signer and sealer of the foregoing Instrument, and acknowledged the same to
be his free act and deed and the free act and deed of said City, before me.

Commissioner of the Superior
Court or Notary Public

STATE OF CONNECTICUT}
} ss: STAMFORD Date: _____
COUNTY OF FAIRFIELD }

Personally appeared Gary H. Stone, Chairman of the Environmental
Protection Board of the City of Stamford, signer and sealer of the foregoing
Instrument, and acknowledged the same to be his free act and deed and the
free act and deed of said Commission, before me.

Commissioner of the Superior Court
or Notary Public

STATE OF CONNECTICUT}
} ss: STAMFORD Date: _____
COUNTY OF FAIRFIELD }

Personally appeared _____ signer and sealer of the foregoing instrument,
and acknowledged the same to be _____ free act and deed, before me.

Commissioner of the Superior Court
or Notary Public

SCHEDULE "A"

SCHEDULE "B"

Appendix H

DCIA Tracking Spreadsheets



Note to user: complete all cells of this color *only*

Part 1: General Information	
Project Name	900 Long Ridge
Project Address	900 Long Ridge Road, Stamford, CT
Project Applicant	David R. Ginter, P.E. , Redniss & Mead, Inc.
Date of Submittal	10/13/2023
Tax Account Number	003-5275

Part 2: Project Details	
1. What type of development is this? (choose from dropdown)	Redevelopment
2. What is the total area of the project site?	1,593,585 ft ²
3. What is the total area of land disturbance for this project?	730,852 ft ²
4. Does project site drain to High Quality Waters, a Direct Waterfront, or within 500 ft. of Tidal Wetlands? (Yes/No)	No
5. What is the <u>current</u> DCIA for the site?	446,917 ft ²
6. Will the proposed development increase DCIA (without consideration of proposed stormwater management)? (Yes/No)	Yes
7. What is the <u>proposed-development</u> total impervious area for the site?	515,684 ft ²

Part 3: Water Quality Target Total	
Does Standard 1 apply based on information above?	Yes
Water Quality Volume (WQV)	45316.2 ft ³
Standard 1 requirement	Retain WQV on-site
Required retention volume	45316.2 ft ³
Provided retention volume for proposed development	0.0 ft ³

Part 4: Proposed DCIA Tracking	
Pre-development total impervious area	446,917 ft ²
Current DCIA	446,917 ft ²
Proposed-development total impervious area	515,684 ft ²
Proposed-development DCIA (after stormwater management)	515,684 ft ²
Net change in DCIA from <u>pre-development</u> to <u>proposed-development</u>	68,767 ft ²

Part 5: Post-Development (As-Built Certified) DCIA Tracking	
Post-development (per as-built) total impervious area	ft ²
Post-development (per as-built) DCIA (after stormwater management)	ft ²
Net change in DCIA from <u>pre-development</u> to <u>post-development</u>	ft ²

Certification Statement

I hereby certify that the information contained in this worksheet is true and correct.

Engineer's Signature _____ Date 10/13/2023 Engineer's Seal _____

Appendix I

Checklist for Stormwater Management Report



City of Stamford
 Engineering Bureau
 888 Washington Boulevard, 7th Floor Stamford, CT 06901
 Phone 203-977-4189

CHECKLISTS

Project Name: _____

Project Address _____

Property Owner(s) _____

Tax Account Number(s) _____

Engineer's Signature _____ Date: _____

All checklists must be completed and submitted. Provide a brief explanation for any items not provided. Check boxes as completed or N/A as not applicable.

	Existing Conditions Plan
	Stormwater Management Report
	Stormwater Management Plan / Construction Plan
	Certificate of Occupancy

Checklist for Existing Conditions Plan

I. General Information

	Site address
	Orientation, block, zone, City, street name
	Applicant name and legal address
	Surveyor name, address, contact information
	North arrow, bar scale, horizontal and vertical datum
	24" x 36" sheet size unless otherwise approved
	Existing conditions survey shall be prepared in accordance with the Minimum Standards for Surveys and Maps in the State of Connecticut. The class of survey shall be A-2 and T-2 and shall be represented as such on the map. The base map shall be sealed and signed by a Professional Land Surveyor licensed in the State of Connecticut.
	Drawing scale shall be set at 1" = 20' or 1" = 40' when possible



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II. Existing Conditions Plan Elements

	Show and label all property boundaries with linear bearing / distances and curve information
	Required zoning setbacks
	Show and label monument information
	Show and label at least one permanent benchmark on the parcel with northing, easting and elevation
	Label adjacent property ownership information
	Existing contours based on NAVD 88 (no exceptions) at 2 foot contour interval or 1 foot contour interval when slope is flatter than 2 percent at a minimum of 20 ft. beyond the property boundaries of the subject parcel
	Show spot elevations at low points, high points, and where topography is flatter than 2 percent
	All buildings and structures (label current use and finished floor elevations)
	All pavement, parking, driveways, property access points
	All roadways, streets, and rights-of-way. Label streets as public or private with street name
	All patios, decks, walkways, sidewalks, curb ramps (both adjacent to and opposite and existing roadways or intersections)
	Show and label (size, material, inverts) all existing utilities (overhead and underground) within the right-of-way and the project site (label ownership) including but not limited to water, gas and electrical services, wells, storm sewers, sanitary sewers and subsurface sewerage disposal systems.
	Show and label existing conveyance systems (swales, ditches, storm drains) including dimensions, elevations, sizes, slopes, and direction of flow
	Show and label boundaries of all easements, both public and private, with type, owner, and width
	Show and label all other existing features and improvements (e.g. light poles, mature trees of 8" (dbh) diameter or greater, vegetation, walls with top and bottom elevations, fences, pavement markings)

III. Resource Areas

	Show and label limits of inland wetlands, tidal wetlands and any associated setbacks.
	Show and label existing natural site features including tree canopy, outcroppings, permanent and intermittent watercourses, waterbodies, streams
N/A	Show and label limits of floodplain and floodway along with FIRM references (Community Number, Panel, Suffix, and Date) including any effective Letters of Map Revision/Amendment, zone designation and elevation.
N/A	Show and label any Conservation Easement Areas
N/A	Show and label Connecticut Coastal Jurisdiction Line (CJL)
	Show and label existing steep slopes (25% and greater)



Checklist for Stormwater Management Report

I. Project Report

A. Applicant / Site Information

	Applicant name, legal address, contact information (email & phone)
	Engineers name, legal address, contact information (email & phone)
	Site address and legal description
	Current / proposed zoning and land use
	Site vicinity map (8.5" x 11")

B. Project Description and Purpose

	Project description including proposed project elements and anticipated construction schedule
--	---

C. Existing Conditions Description

	Site area, ground cover, vegetation, features (roads, buildings, utilities, etc.)
	Site topography, slopes, drainage patterns, conveyances systems (swales, storm drains, etc.), stormwater discharge locations
	Receiving waterbody information including stormwater impairments and TMDL information (See the most recent State of Connecticut Integrated Water Quality Report)
	Site soils information including soil types, hydrologic soil group, bedrock / outcroppings, groundwater elevation, significant geologic features
	Provide NRCS Soils Mapping
	Resource protection areas (wetlands, streams, lakes, etc.), buffers, floodplains, floodways

D. Summary of Applicable General Design Criteria

	Methodology, design storm frequency
	Hydrologic design criteria
	Hydraulic design criteria
	Flood hazard areas

N/A

	Applying under "Lite" Stormwater Management: Skip to Section I (Refer to Flow Chart on page vii of the City of Stamford Stormwater Drainage Manual)
--	---

E. Project Type in Accordance with Standard 1 Definitions

	Area of disturbance, receiving waterbody classification (High Quality, Tidal Wetlands, Direct Waterfront)
	Project type (development, redevelopment, linear development)
	Pollutant reduction standard per flowchart Section 2.4



F. Summary of LID Site Constraints

	Description of sensitive areas for protection
	Mature tree inventory, which shall include 8-inch (dbh) diameter trees or greater
	Steep slopes
	Ledge and bedrock depth
	Seasonal high groundwater elevation
	Pollutant hotspots
	Summary of infiltration rates

G. Summary of Proposed Stormwater Treatment Practices

	Proposed LID controls (i.e. minimize impervious, minimize DCIA, minimize disturbance, increase time of concentrations, other LID controls and strategies)
	Location, size, types
	Design criteria and references
	Stormwater treatment practice, drainage area characteristics / details

H. Summary of Compliance with Standards 1

	Required pollutant reduction criteria
	Provided pollutant reduction (WQV) by stormwater treatment practice
	Summary of compliance with Standard 1

I. Summary of Compliance with Standards 2, 3, and 4

	Description of proposed stormwater management system
	Pre-development site hydrology with delineation of each watershed area and sub-basin
	Post-development site hydrology with delineation of each watershed area and sub-basin
	Comparison table of pre- and post-development hydrology, peak flow, volume, and percent difference
	Summary table of watershed areas and sub-basin areas, time of concentration and runoff coefficients
	Summary table demonstrating the 2-year, 24-hour post development peak flow rate is less than or equal to the lowest of either: - The pre-development 1-year, 24-hour storm peak flow rate - 50 percent of the pre-development 2-year, 24-hour storm peak flow rate
	Conveyance protection, emergency outlet sizing
	Hydraulic grade line summary and tail water elevation used in analysis
	Construction erosion and sediment control description, Standard 3
	Operation and Maintenance, maintenance tasks and schedule on construction plans per Standard 4



J. Summary of Compliance with Applicable Drainage Facility Design Requirements

	Description of applicable design requirements and compliance
	Description of proposed drainage facilities and compliance

K. Stormwater Management Report

	Signed and stamped by professional engineer licensed in the State of Connecticut
	Drainage impact statement in accordance with Standard 5B.

II. **Supporting Calculations** (as appendix to Project Report)

	<u>Applying under "Lite" Stormwater Management: Skip to Section N</u>
--	--

L. Water Quality Volume / Water Quality Flow Calculations

	Calculations demonstrating the total Water Quality Volume generated by the post-development site and the required retention/treatment volume per Standard 1 in cubic feet.
	Calculations demonstrating the total Water Quality Volume retained/treated by each stormwater treatment practice and the total Water Quality Volume generated by the post-development contributing drainage area to each stormwater treatment practice

M. Stormwater Treatment Practice Sizing Calculations

	Calculations demonstrating how each stormwater treatment practice has been designed and sized in accordance with the Structural Stormwater BMP Design references in Appendix B. Calculations will vary by stormwater treatment practice, but a minimum, applicants shall provide calculations in accordance with design criteria from the Connecticut Stormwater Quality Manual.
--	--

N. Hydrologic and Hydraulic Design Calculations

	Stream channel protection, Standard 2A
	Conveyance protection, Standard 2B
	Peak flow control (1-year, 2-year, 5-year, 10-year, 25-year, and 50-year storms), Standard 2C
	Inlet analysis
	Gutter flow (Site by site basis as requested by Engineering Bureau)
	Storm sewers and culverts (velocities, capacity, hydraulics)
	Hydraulic grade line required when pipe is flowing at full capacity <ul style="list-style-type: none"> o Provide existing and proposed summary table o Provide existing and proposed mapping, label structures
	Detention facilities (outlet structure, stage/storage, freeboard)
	Emergency outlet sizing, safely pass the 100 year storm, Standard 2D
	Outlet protection calculations, based on conveyance protection (i.e. riprap, energy dissipater)



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O. Hydrologic and Hydraulic Model, Existing and Proposed

	Drainage routing diagram
	Summary
	Storage pond input

P. Downstream analysis (Site by site basis as required by the Engineering Bureau)

	Downstream analysis, Standard 2E
--	----------------------------------

III. Supporting Mapping (as appendix to Project Report)

Q. Pre-Development Drainage Basin Area Mapping

	11" x 17" or 8.5" x 11" sheet size
	Topography, drainage patterns, drainage area boundaries and sub basins, flow paths, times of concentration
	Locations of existing stormwater discharges
	Perennial and intermittent streams, wetlands, and floodplain / floodways
	NRCS soil types, locations, boring locations, infiltration testing locations
	Vegetation and groundcover
	Existing roads, buildings, driveways, parking areas, walks, patios, pools and other impervious surfaces, decks and other structures
	Location, size, type of existing structural stormwater controls, facilities and conveyance systems

R. Post-Development Drainage Basin Area Mapping

	11" x 17" or 8.5" x 11" sheet size
	Topography, drainage patterns, drainage area boundaries and sub basins, flow paths, times of concentration
	Locations of proposed stormwater discharges
	Perennial and intermittent streams, wetlands, and floodplain / floodways
	NRCS soil types, locations, boring locations, infiltration testing locations
	Vegetation, ground cover and proposed limits of clearing/disturbance
	Proposed, roads, buildings, driveways, parking areas, walks, patios, pools and other impervious surfaces, decks and other structures
	Location, size, type of proposed structural stormwater controls, facilities and conveyance systems

IV. DCIA Tracking Worksheet (as appendix to Project Report)

	DCIA Tracking Worksheet (Use form found in Appendix E)
--	--



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V. Proposed LID Review Map

	Applying under "Lite" Stormwater Management - Proposed LID Review Map <u>NOT</u> required.
--	---

A. General

	Site address
	Applicant name, legal address, contact information
	Engineers name, address, contact information
	North arrow, bar scale, horizontal and vertical datum
	Drawing scale shall be set at 1"=20' or 1"=40' when possible
	Signed and stamped by a Licensed Professional Engineer in the State of Connecticut
	11" x 17" or 24" x 36" sheet size unless otherwise approved
	Existing and proposed contours based on NAVD 88 at 2 foot contour interval or 1 foot contour interval when slope is flatter than 2 percent
	Locations of existing stormwater discharges
	Roads, buildings, driveways, parking areas, walks, patios, pools and other impervious surfaces, and decks and other structures
	Location, size, ownership of stormwater conveyance systems (swales, pipes, etc.)

B. LID Constraints:

	Boring / test pit locations
	Infiltration testing locations and results
	Vegetation and proposed limits of clearing / disturbance
	NRCS soils mapping
	Steep slopes
	Surface waters / Perennial and intermittent streams
	Resource protection areas and buffers, wetlands, floodplain / floodways
	Existing vegetation and mature trees, which shall include 8-inch (dbh) diameter trees or greater
	Poor soils (HSG C & D)
	Shallow bedrock / ledge
	Seasonal high groundwater elevation
	Other site constraints (e.g. brownfield caps)

C. Proposed Stormwater Treatment Measures:

	Location, size, type, limits, and WQV provided by each proposed stormwater treatment practices
	Drainage area to each proposed stormwater treatment practice (total area, impervious area, WQV)

D. Site Summary Table:

	Total site area, disturbed area, pre- and post-development impervious areas
	Required pollutant reduction volume (retention or detention)
	Provided pollutant reduction volume (retention or detention)



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Checklist for Stormwater Management Plan / Construction Plans

A. General

	Site orientation, address and legal description
	Applicant name, legal address, contact information
	Engineers name, address, contact information
	North arrow, bar scale, horizontal and vertical datum
	Drawing scale shall be set at 1"=20' or 1"=40' when possible
	Stamped by a Licensed Professional Engineer in the State of Connecticut
	24" x 36" sheet size unless otherwise approved

B. Site Development Plans

	City of Stamford Standard Notes
	As required by the Drainage Maintenance Agreement, provide a written narrative describing the nature of the proposed development activity and the program for operation and maintenance of drainage facilities and control measures throughout the life of the project.
	Existing and proposed contours based on NAVD 88 at 2 foot contour interval or 1 foot contour interval when slope is flatter than 2 percent
	All required spot elevations to clearly depict positive pitch
	Top and bottom elevation of all walls
	Roads, buildings, driveways, parking areas, walks, patios, pools and other impervious surfaces, and decks and other structures
	All utilities and easements
	Location, size, maintenance access, type of proposed structural stormwater controls and facilities with elevations and inverts
	Location, size, maintenance access, type of proposed non-structural stormwater controls and facilities with elevations and inverts
	Location, size, type of proposed stormwater infrastructure, inlets, manholes, infiltration and detentions systems, control structures with elevations and inverts
	Location, size, ownership of stormwater conveyance systems (swales, pipes, etc.) with elevations and inverts
	Identify roof leaders, curtain drains and foundation drains with elevations and inverts
	Proposed water quality treatment systems, size and model type
	Final stabilization measures which may include slope stabilization

C. Erosion and Sedimentation Control Plan

	Phasing and schedule
	Construction access and staging and stock pile areas
	Operation and maintenance of erosion and sedimentation controls
	Tree protection
	Downstream protection such as location of silt fencing
	Limit of disturbance
	Construction fencing



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D. Construction Details

	Standard City of Stamford details
	Infiltration system details
	Control structure details
	Water quality treatment details
	Infiltration testing results

Checklist for Certificate of Occupancy

	Final Improvement Location Survey
	Stormwater Management Certification Form
	Final DCIA Tracking Worksheet
	Standard City of Stamford Drainage Maintenance Agreement (Agreement Covenant)

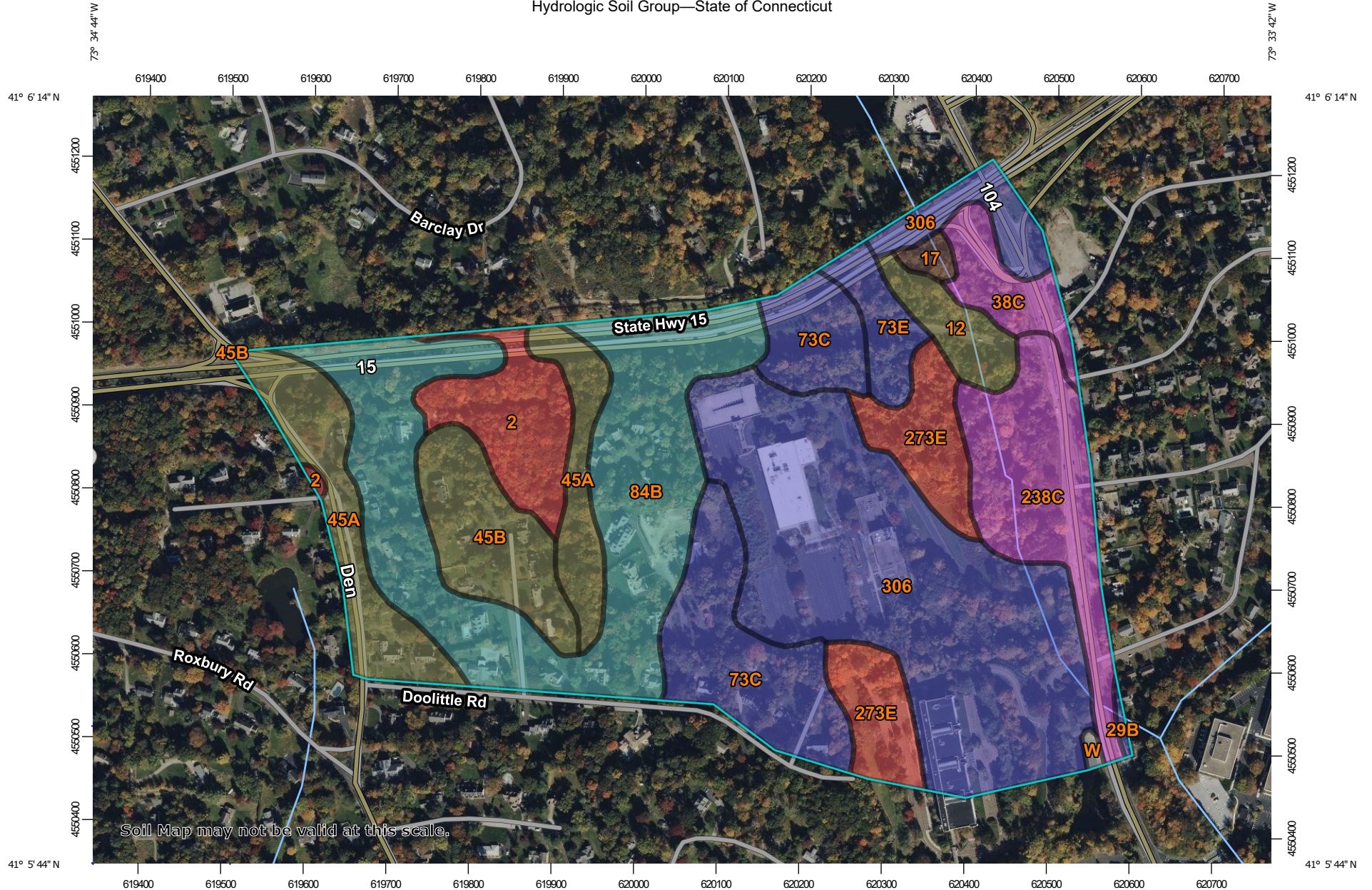
Other Certifications at the discretion of the Engineering Bureau and/or EPB

	Wall Certification
	Landscape Certification
	Landscape Maintenance Agreement
	Waiver Covering Storm Sewer Connection
	Waiver Covering Granite Block, Depressed Curb, and Driveway Aprons
	Flood Certification

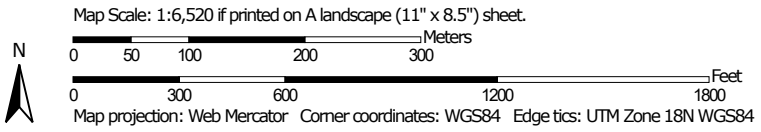
Appendix J

NRCS Websoil Survey
NOAA-Atlas 14 Volume 10-Precipitation Frequency

Hydrologic Soil Group—State of Connecticut



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons





 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available


Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
 Survey Area Data: Version 22, Sep 12, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 21, 2022—Oct 27, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2	Ridgebury fine sandy loam, 0 to 3 percent slopes	D	6.2	4.9%
12	Raypol silt loam	C/D	2.9	2.3%
17	Timakwa and Natchaug soils, 0 to 2 percent slopes	B/D	0.7	0.5%
29B	Agawam fine sandy loam, 3 to 8 percent slopes	B	0.2	0.2%
38C	Hinckley loamy sand, 3 to 15 percent slopes	A	3.4	2.7%
45A	Woodbridge fine sandy loam, 0 to 3 percent slopes	C/D	11.2	8.9%
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	C/D	6.8	5.4%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	B	12.9	10.2%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	B	2.7	2.2%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	C	26.4	21.0%
238C	Hinckley-Urban land complex, 3 to 15 percent slopes	A	10.4	8.3%
273E	Urban land-Charlton-Chatfield complex, rocky, 15 to 45 percent slopes	D	7.7	6.1%
306	Udorthents-Urban land complex	B	34.4	27.3%
W	Water		0.2	0.2%
Totals for Area of Interest			126.1	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



NOAA Atlas 14, Volume 10, Version 3
Location name: Stamford, Connecticut, USA*
Latitude: 41.0992°, Longitude: -73.5675°
Elevation: 152.67 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	0.367 (0.279-0.470)	0.426 (0.323-0.545)	0.522 (0.394-0.670)	0.602 (0.452-0.776)	0.711 (0.520-0.945)	0.794 (0.570-1.07)	0.880 (0.615-1.32)	0.973 (0.651-1.38)	1.10 (0.712-1.60)	1.21 (0.763-1.78)
10-min	0.520 (0.395-0.665)	0.603 (0.457-0.772)	0.739 (0.559-0.949)	0.852 (0.641-1.10)	1.01 (0.736-1.34)	1.13 (0.807-1.52)	1.25 (0.871-1.73)	1.38 (0.922-1.95)	1.56 (1.01-2.27)	1.71 (1.08-2.52)
15-min	0.612 (0.464-0.783)	0.710 (0.538-0.909)	0.870 (0.658-1.12)	1.00 (0.754-1.29)	1.19 (0.866-1.58)	1.32 (0.950-1.79)	1.47 (1.02-2.03)	1.62 (1.08-2.29)	1.84 (1.19-2.67)	2.01 (1.27-2.97)
30-min	0.858 (0.651-1.10)	0.995 (0.754-1.27)	1.22 (0.922-1.57)	1.41 (1.06-1.81)	1.66 (1.21-2.21)	1.86 (1.33-2.50)	2.06 (1.44-2.85)	2.27 (1.52-3.21)	2.56 (1.66-3.72)	2.80 (1.77-4.12)
60-min	1.10 (0.837-1.41)	1.28 (0.970-1.64)	1.57 (1.19-2.02)	1.81 (1.36-2.33)	2.14 (1.56-2.84)	2.39 (1.72-3.22)	2.65 (1.85-3.66)	2.92 (1.95-4.13)	3.29 (2.13-4.78)	3.58 (2.27-5.28)
2-hr	1.42 (1.09-1.81)	1.67 (1.27-2.12)	2.07 (1.58-2.64)	2.40 (1.82-3.08)	2.86 (2.10-3.78)	3.21 (2.32-4.30)	3.57 (2.51-4.92)	3.96 (2.66-5.56)	4.51 (2.92-6.50)	4.94 (3.14-7.25)
3-hr	1.64 (1.26-2.08)	1.94 (1.48-2.45)	2.42 (1.85-3.07)	2.81 (2.14-3.59)	3.36 (2.48-4.43)	3.77 (2.73-5.05)	4.20 (2.97-5.79)	4.68 (3.15-6.55)	5.35 (3.48-7.69)	5.90 (3.75-8.61)
6-hr	2.08 (1.61-2.61)	2.46 (1.90-3.10)	3.10 (2.38-3.91)	3.62 (2.77-4.59)	4.34 (3.23-5.69)	4.88 (3.56-6.50)	5.45 (3.88-7.48)	6.09 (4.12-8.48)	7.02 (4.58-10.0)	7.78 (4.96-11.3)
12-hr	2.58 (2.01-3.22)	3.07 (2.39-3.84)	3.88 (3.01-4.86)	4.55 (3.51-5.73)	5.47 (4.10-7.13)	6.16 (4.53-8.16)	6.89 (4.93-9.41)	7.73 (5.24-10.7)	8.94 (5.85-12.7)	9.95 (6.36-14.3)
24-hr	3.04 (2.38-3.77)	3.66 (2.86-4.54)	4.67 (3.65-5.82)	5.51 (4.28-6.89)	6.67 (5.03-8.65)	7.54 (5.58-9.94)	8.46 (6.11-11.5)	9.54 (6.50-13.1)	11.1 (7.31-15.7)	12.5 (8.01-17.9)
2-day	3.41 (2.69-4.20)	4.17 (3.29-5.14)	5.41 (4.26-6.69)	6.45 (5.04-8.00)	7.87 (5.98-10.2)	8.92 (6.66-11.7)	10.1 (7.33-13.7)	11.4 (7.81-15.6)	13.5 (8.90-18.9)	15.3 (9.85-21.7)
3-day	3.69 (2.93-4.53)	4.52 (3.58-5.56)	5.89 (4.65-7.25)	7.02 (5.51-8.68)	8.57 (6.54-11.0)	9.72 (7.29-12.7)	11.0 (8.03-14.9)	12.5 (8.55-17.0)	14.8 (9.76-20.6)	16.8 (10.8-23.7)
4-day	3.96 (3.15-4.84)	4.84 (3.84-5.92)	6.27 (4.97-7.71)	7.47 (5.88-9.21)	9.11 (6.97-11.7)	10.3 (7.75-13.5)	11.6 (8.53-15.7)	13.2 (9.08-17.9)	15.7 (10.3-21.8)	17.7 (11.4-25.0)
7-day	4.73 (3.79-5.76)	5.69 (4.55-6.94)	7.27 (5.79-8.87)	8.57 (6.79-10.5)	10.4 (7.96-13.2)	11.7 (8.81-15.2)	13.1 (9.63-17.6)	14.8 (10.2-20.0)	17.4 (11.5-24.0)	19.5 (12.6-27.4)
10-day	5.49 (4.41-6.66)	6.50 (5.22-7.89)	8.16 (6.53-9.94)	9.54 (7.59-11.7)	11.4 (8.81-14.5)	12.9 (9.70-16.6)	14.4 (10.5-19.1)	16.1 (11.1-21.6)	18.7 (12.4-25.7)	20.8 (13.5-29.1)
20-day	7.74 (6.26-9.32)	8.89 (7.18-10.7)	10.8 (8.67-13.0)	12.3 (9.87-15.0)	14.5 (11.2-18.1)	16.1 (12.2-20.4)	17.8 (13.0-23.2)	19.6 (13.6-26.0)	22.0 (14.7-30.1)	24.0 (15.6-33.3)
30-day	9.58 (7.79-11.5)	10.8 (8.79-13.0)	12.9 (10.4-15.5)	14.5 (11.7-17.6)	16.9 (13.1-21.0)	18.7 (14.1-23.5)	20.4 (14.9-26.4)	22.3 (15.5-29.5)	24.7 (16.5-33.6)	26.5 (17.3-36.7)
45-day	11.8 (9.67-14.1)	13.2 (10.8-15.8)	15.4 (12.5-18.5)	17.2 (13.9-20.7)	19.8 (15.4-24.4)	21.7 (16.5-27.2)	23.6 (17.3-30.3)	25.5 (17.9-33.6)	27.9 (18.7-37.8)	29.7 (19.4-40.9)
60-day	13.7 (11.2-16.3)	15.1 (12.4-18.1)	17.5 (14.3-20.9)	19.4 (15.8-23.3)	22.1 (17.3-27.2)	24.2 (18.4-30.2)	26.3 (19.2-33.4)	28.2 (19.8-37.0)	30.6 (20.6-41.3)	32.3 (21.1-44.4)

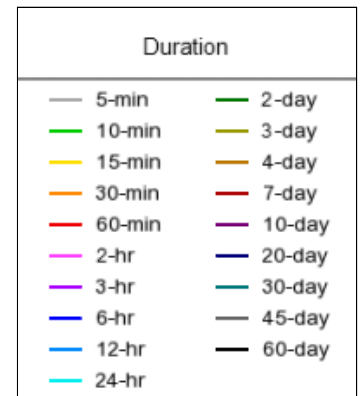
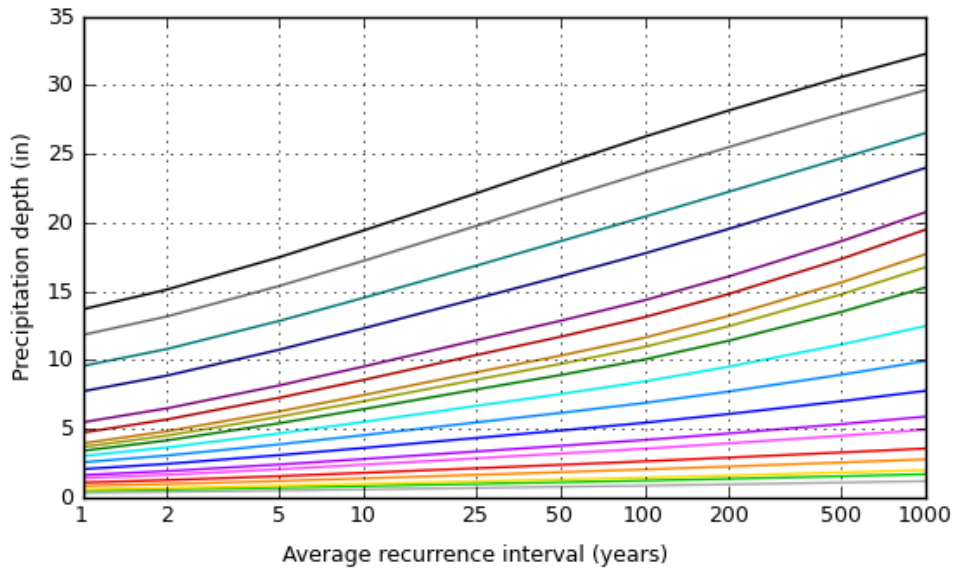
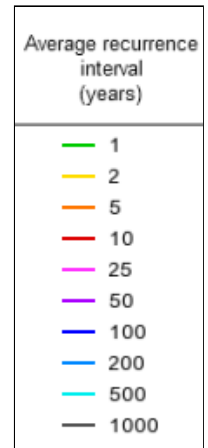
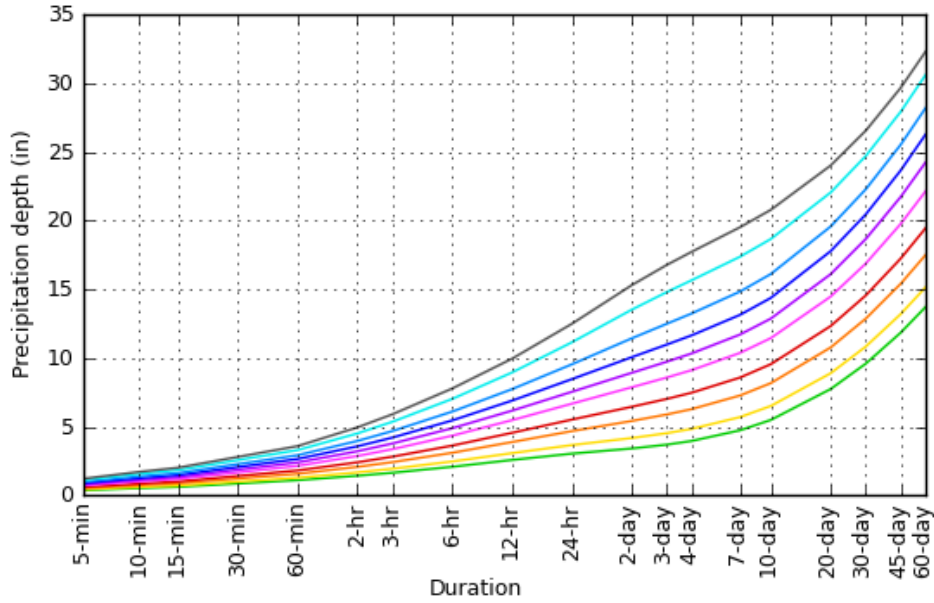
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average 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

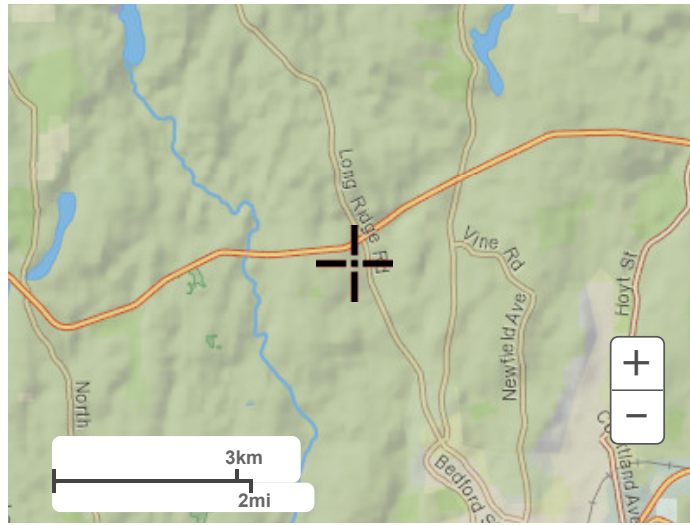
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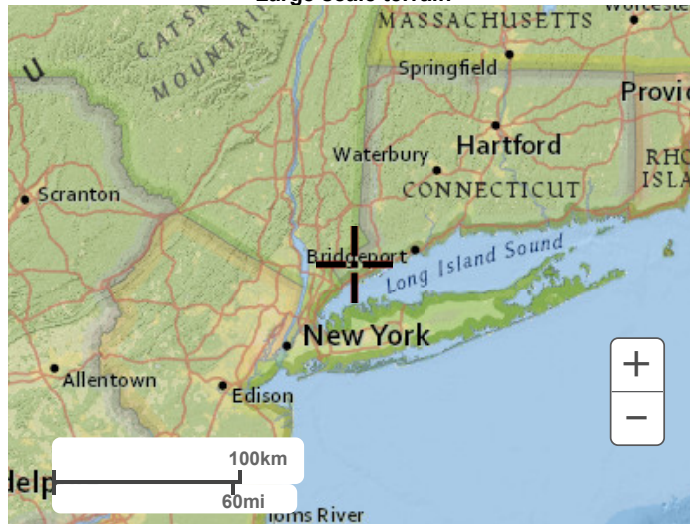
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Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial