SITE ENGINEERING REPORT

1 Walton Place & 80 Prospect Street

Prepared For

Walton Place LLC & 80 Prospect Street Partners LLC

Prepared by

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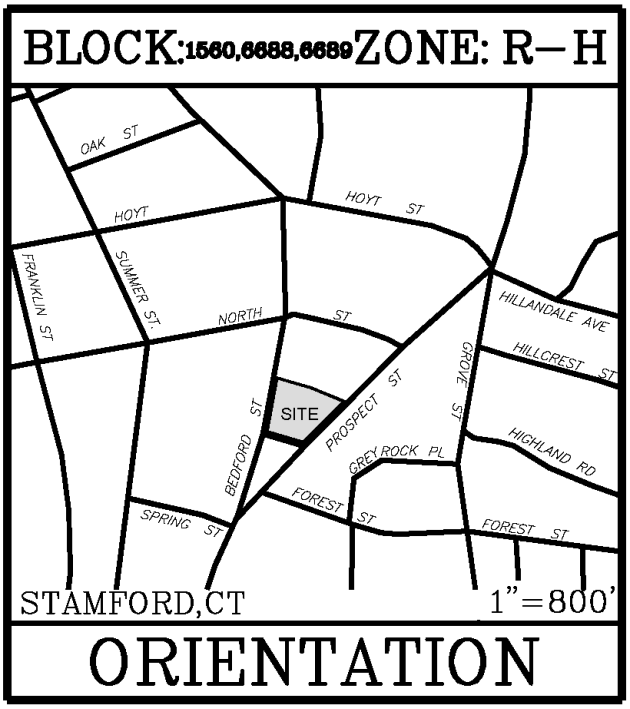
22 First Street
Stamford, CT
(203) 327-0500

Issued on
July 19, 2022

Bret D. Holzwarth
CT Lic. No. 27812

Table of Contents

Appendices


BLOCK:1560,6688,6689 ZONE: R–H
OAK ST
HOYT
HOYT ST
FRANKLIN ST
SUMMER ST.
NORTH ST
HILLANDALE AVE
HILLCREST ST
GROVE ST
SITE
PROSPECT ST
BEDFORD ST
GREY ROCK PL
HIGHLAND RD
FOREST ST
SPRING ST
FOREST ST
STAMFORD,CT
1"=800'
ORIENTATION

Narrative

Project Description:

The applicant, Walton Place LLC & 80 Prospect Street Partners LLC, is proposing to construct a 15-story residential building on 1 Walton Place & 80 Prospect Street. Other improvements include townhouses, a roof deck, courtyard, amenity space, and associated hardscape & landscaping. The main portion of the existing church building shall remain and be renovated. The properties total 1.95± acres and are currently located within the R-H zoning district. It is proposed to change the zone to RH-D. Reference is made to site drawings prepared by this office, dated July 19, 2022.

Existing Conditions:

The properties are currently developed with a church, retail building, parking lots, walkways and landscaping. The existing landscape includes trees, shrubs, and manicured lawns. Site elevations range from elevation 22± on the south side of the property to elevation 30± at the northwestern part of the property. The site has slopes ranging from 1-5%. The property does not lie within the drinking water supply watershed or a regulatory 100-year floodplain as established by the Federal Emergency Management Agency (FEMA) on "Flood Insurance Rate Maps" (FIRM) for Fairfield County, Community No. 09001C0516G, Panel 516 of 626, effective date July 8, 2013 (Appendix A).

Drainage Patterns & Conveyance Systems

Under existing conditions, runoff generated from the site either sheet flows into Bedford Street to the west or is tributary to Prospect Street to the southeast. Runoff tributary to Prospect Street either sheet flows off of the property or is collected by on-site catch basins and piped through a City-owned 60" reinforced concrete pipe. This pipe runs through the site from north to south in a drainage easement. The tributary area of this pipe is approximately 88 acres. Impervious surfaces cover approximately 74% of total site area. Refer to Appendix B for existing and proposed on-site drainage basin maps.

Soils

The USDA Natural Resources Conservation Service's Websoil Survey indicates the soils on the subject parcel to be primarily Urban Land within Hydrologic Soils Group D. Soil testing was performed on-site to identify any subgrade restrictive soil conditions and to confirm the hydrologic soil classification. A total of eight (8) deep test pits were performed. Mottling was observed in two test pits at depths of 52-60" below grade. Ledge was encountered in five test pits at depths ranging between 24-81" below grade, with the shallowest ledge encountered closer to Bedford Street. Three saturated hydraulic conductivity tests were conducted in areas with substantial depth to restrictive soil conditions to verify that the in-situ soil can adequately infiltrate stormwater. The observed infiltration rates ranged between 14-24" per hour. Test pit and conductivity test results can be reviewed on site plan sheet SE-5. The location of each test is depicted on the Proposed LID Map (Appendix C).

Proposed Conditions:

The project includes the construction of a 15-story residential building, townhouses, amenity areas, courtyard, and associated driveway, landscaped areas, sidewalks. The existing retail building and the rear portion of the existing church is proposed to be demolished. The project will result in an increase in impervious area of approximately 6,018± SF.

City Pipe Relocation

As part of proposed improvements, the existing City-owned 60" reinforced concrete pipe must be rerouted to make way for the proposed building. Several routes have been vetted, each with their own challenges. The proposed routing depicted on sheet SE-3A relocates the pipe to the east in Prospect Street and reconnects at the intersection of Prospect and Walton Place. This route adds approximately 117LF of pipe length, requires a gas main relocation and significant work within the roadway. The alternate option routes the pipe system underneath the proposed building, as shown on sheet SE-3B. This route adds 83LF of pipe length and requires no roadway construction. The pipe will transition to a 4'x5' box culvert for the section below the building. The crossing is at the thinnest section of building, avoiding column lines with access structures located outside of the building footprint on both ends. The design team has developed a design that displaces the building load away from the pipe. The drainage easement shall be amended in either scenario. This alternate route is being reviewed by the Stamford Engineering Bureau.

Methodology & General Design Criteria

All drainage systems have been designed for Type III, 24-hour storm events. The project site is south of the Merritt Parkway and therefore has been designed to adequately accommodate peak runoff for all storms up to and including the 50-year design storm. The 24-hour design storm rainfall amounts, and distributions were obtained from the latest NOAA Atlas 14 Point Precipitation Frequency Estimates and storm distributions (Appendix A).

Project Classification

The proposed development is classified as a redevelopment project with more than ½ an acre of disturbance and directly connected impervious area greater than 40%, therefore must comply with Standards 1 through 5 of the Stamford Drainage Manual. To comply with Standard 1, this project must provide at least ½ Water Quality Volume (WQV) via non-structural practices OR infiltration best management practices (BMP's).

Proposed LID Techniques

Low impact development and site planning techniques were used to the maximum extent practicable given the existing constraints of this site. The site is in an urban area with limited space for LID practices due to setback requirements from existing and proposed buildings and existing infrastructure.

LID techniques include development within areas already developed, removing surface parking, limiting the amount of disturbance around the proposed improvements and minimizing impervious surfaces where possible. The limit of disturbance for the proposed development has been set to allow for the proposed

development, while aiming to minimize impact to adjacent trees and vegetation. The section of lawn and trees along Bedford Street shall remain undisturbed.

Proposed Stormwater Treatment Practices

The design approach chosen to satisfy Standard 1 of the Stamford Drainage Manual is to provide the required water quality volume (½ WQV) via a subsurface infiltration system and two crushed stone reservoir systems located beneath synthetic turf and porous pavers. Each system is described in detail below.

Infiltration #1 consists of six (6) – 4.5 foot tall Retain-It units located south of the new building near Prospect Street. Stormwater runoff generated from the courtyard roof areas of the new building will be captured and treated in the subsurface infiltration system which will overflow into a meter structure consisting of a low flow orifice and overflow weir. The meter structure outlets into Storm Manhole #5 before discharging into the relocated 60" storm pipe.

Stone reservoir system #1 (SR#1) is located beneath the synthetic turf in the ground-level courtyard and consists of a 21" minimum thick layer of crushed stone. Stormwater from a portion of the courtyard is tributary to SR#1 via sheet flow, and a portion of the existing church roof will be piped through roof leaders into a perforated pipe within the crushed stone system. The bottom of the crushed stone layer will be sloped at 0.5% towards a 6" perforated PVC pipe which outlets to a metering structure and eventually discharges into Storm Manhole #5.

Stone reservoir system #2 (SR#2) is beneath porous pavers in the drop-off loop off of Walton Place. The system collects runoff from the drop-off loop and nearby sidewalks and consists of a 12" minimum thick layer of crushed stone. Two trench drains capture overflow from the system and discharge into an existing storm manhole located in the sidewalk on the eastern side of the drop-off loop.

A summary of the Water Quality required and provided by the stormwater practices is provided below:

Standard 1 (Retention and Treatment) Calculations					
Drainage Area ID	Total Area (SF)	Impervious Area (SF)	1/2" WQV (CF)	Retention Volume Required	Retention Volume Provided
Bedford	15,691	7,463	313	N/A	0
Prospect Bypass	48,975	41,893	1,673	N/A	0
Inf#1	9,314	9,314	369	369	853
SR#1	6,716	5,728	229	229	1,051
SR#2	4,098	4,098	162	162	871
TOTAL	**84,794**	**68,496**	**2,745**	**2,745**	**2,775**

Infiltration BMP's have been designed in accordance with the requirements of the Stamford Stormwater Manual.

Hydrologic Analysis of Peak Rates of Runoff

Hydrologic models have been prepared utilizing the SCS Runoff Curve Number Method from NRCS TR-55 to analyze the pre- and post-development rainfall runoff rates and volumes. Watershed areas, curve numbers (CN), and times of concentration (TC) were calculated for each contributing watershed. A time of concentration (TC) of 5 minutes was assumed for all basins as they are largely impervious with short runoff lengths. The pre-development drainage basin boundaries and the post-development drainage basin boundaries are shown in Appendix B. The results of the HydroCad model used to analyze the pre- and post-development watershed conditions are presented in Appendix E.

A comparison of the pre- and post-development peak discharge rates is provided in the tables below.

Bedford Street Peak Flow Rates			
Storm Event	Existing (cfs)	Proposed (cfs)	Δ (cfs)
1-Year	1.16	0.80	-0.36
2-Year	1.50	1.04	-0.46
5-Year	2.06	1.44	-0.62
10-Year	2.52	1.76	-0.76
25-Year	3.16	2.21	-0.95
50-Year	3.63	2.54	-1.09

Prospect Street Peak Flow Rates			
Storm Event	Existing (cfs)	Proposed (cfs)	Δ (cfs)
1-Year	3.99	3.40	-0.59
2-Year	4.93	4.34	-0.59
5-Year	6.47	5.66	-0.81
10-Year	7.73	7.28	-0.45
25-Year	9.46	9.31	-0.15
50-Year	10.75	10.61	-0.14

Overall Site Peak Flow Rates			
Storm Event	Existing (cfs)	Proposed (cfs)	Δ (cfs)
1-Year	5.14	4.20	-0.94
2-Year	6.43	5.38	-1.05
5-Year	8.53	7.09	-1.44
10-Year	10.25	8.95	-1.30
25-Year	12.61	11.52	-1.09
50-Year	14.38	13.08	-1.30

Comparison of the peak discharge rates for pre- and post-development watershed conditions demonstrates that the peak rate of runoff from the proposed development will be decreased in both basins. Therefore, the proposed development will not adversely impact the downstream or adjacent properties or receiving water bodies or courses.

Compliance with Stormwater Management Standards

The project site will be designed to meet the Stamford Stormwater Management Standards to the maximum extent practicable as summarized below:

Standard 1: Runoff and Pollutant Reduction

A. The runoff and pollutant reduction requirements for this project are to retain ½ of the WQV on-site using Non-Structural Practices or Infiltration BMP's. The proposed Stormwater Treatment Practices include a subsurface infiltration system and two crushed stone reservoir systems located beneath synthetic turf and porous pavers. See "Proposed LID & Stormwater Treatment Practices" for a detailed description of each system, its required WQV and provided storage volume.
B. Not Applicable. Stormwater systems retain ½ WQV for the site.
C. Land disturbance has been maintained to areas currently developed. With proper sediment and erosion controls and permanent stabilization of surfaces the development will not result in future site erosion.
D. Noted
E. There will not be a parking lot serving six or more parking spaces under proposed improvements. Interior garage drains will be piped to an oil/grit separator and discharge into the sanitary sewer system. Such design shall be prepared by the plumbing engineer prior to a Building permit request.
F. The proposed development is proposed within areas previously developed which will in turn limit the amount of clearing and grading that will be necessary to employ the development while, minimizing the potential impact of erosive soils on the downstream drainage system. Steep slopes, although not significant on this project, are avoided/outside the limits of construction.

Standard 2: Peak Flow Control

A. Stream channel protection is not required for this project as the subject development does not discharge directly or indirectly into a water body or watercourse.
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 the HydroCAD model found in Appendix E.
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. Reference is made to the HydroCAD report found in Appendix E.

D. All proposed structural BMP's are equipped with a high-bypass "emergency outlet" sized to safely pass the post-development peak runoff from the 100-year, 24-hour storm event. Furthermore, the proposed storm pipe connections into the City storm system have adequate capacity to pass the flow tributary to them in the 100-year storm event. Refer to the pipe conveyance calculations included in Appendix D.
E. Noted.

Standard 3: Construction Erosion and Sediment Control

A. Site plan sheet SE-4 depicts erosion control measures to be implemented to control construction related impacts. Sediment and erosion controls such as silt fencing, stone tracking pads at construction zone entrance/exit points, hay bale & insert catch basin protection, and tree protection are proposed.

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-route 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 or downstream properties or City-owned drainage facilities.

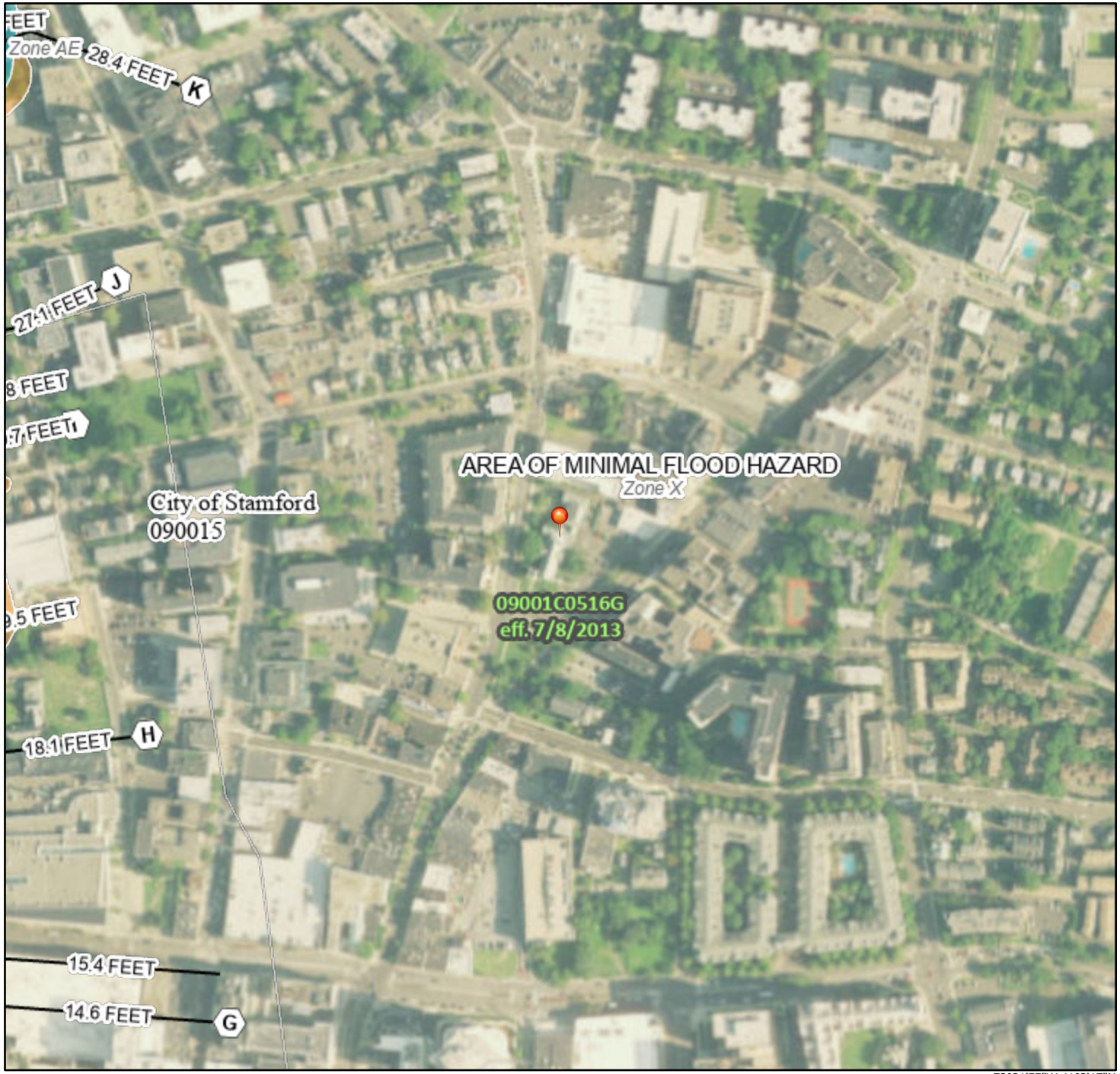
Appendix A

FEMA Flood Insurance Map
USGS Quadrangle Map – Site Vicinity Map
NOAA Atlas 14 Volume 10 – Precipitation Frequency
City of Stamford Rainfall Intensity – Duration Curves
NRCS Websoil Survey

National Flood Hazard Layer FIRMette

FEMA

73°32'33"W 41°3'44"N



73°31'55"W 41°3'17"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

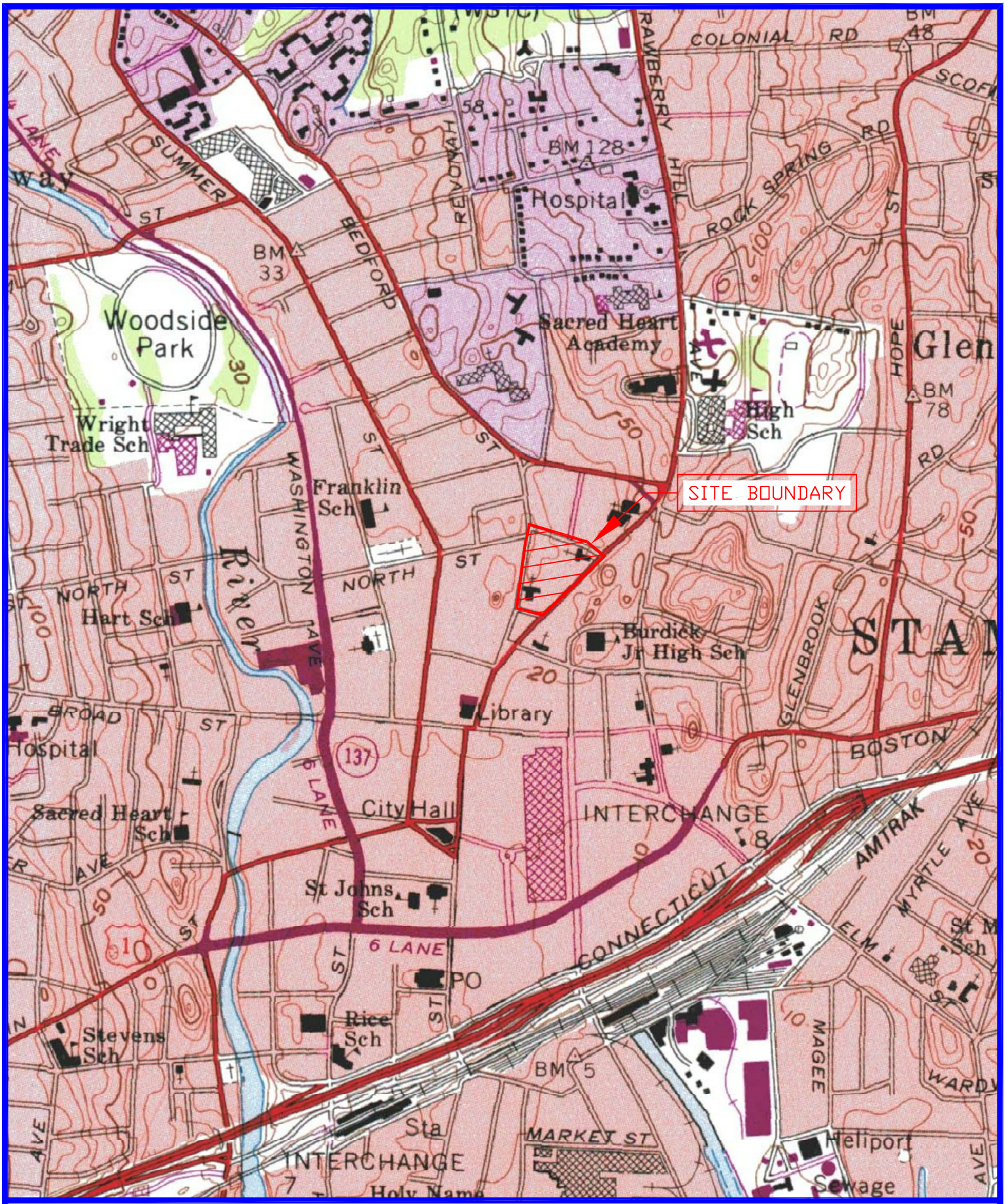
N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/14/2022 at 1:25 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



USGS MAP – 1 WALTON PLACE & 80 PROSPECT ST.

Redniss & Mead
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COMM. NO.:	DATE:
5756	07/01/2022
	SCALE: 1"=1000'

CALS

NOAA Atlas 14, Volume 10, Version 3
Location name: Stamford, Connecticut, USA*
Latitude: 41.0584°, Longitude: -73.5373°
Elevation: 25.97 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_&_aerials

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	**0.365** (0.282-0.464)	**0.425** (0.328-0.541)	**0.523** (0.402-0.668)	**0.605** (0.462-0.776)	**0.717** (0.531-0.952)	**0.802** (0.582-1.08)	**0.889** (0.627-1.24)	**0.984** (0.662-1.40)	**1.12** (0.724-1.64)	**1.23** (0.775-1.83)
10-min	**0.517** (0.399-0.658)	**0.602** (0.464-0.767)	**0.741** (0.569-0.947)	**0.856** (0.654-1.10)	**1.01** (0.752-1.35)	**1.14** (0.824-1.53)	**1.26** (0.888-1.75)	**1.40** (0.938-1.98)	**1.58** (1.03-2.32)	**1.74** (1.10-2.59)
15-min	**0.608** (0.469-0.774)	**0.708** (0.546-0.902)	**0.872** (0.670-1.11)	**1.01** (0.769-1.29)	**1.19** (0.885-1.59)	**1.34** (0.969-1.81)	**1.48** (1.05-2.06)	**1.64** (1.10-2.33)	**1.86** (1.21-2.73)	**2.04** (1.29-3.04)
30-min	**0.851** (0.656-1.08)	**0.992** (0.764-1.26)	**1.22** (0.939-1.56)	**1.41** (1.08-1.81)	**1.68** (1.24-2.22)	**1.88** (1.36-2.53)	**2.08** (1.46-2.89)	**2.30** (1.55-3.27)	**2.60** (1.69-3.81)	**2.84** (1.80-4.23)
60-min	**1.09** (0.843-1.39)	**1.27** (0.983-1.62)	**1.57** (1.21-2.01)	**1.82** (1.39-2.33)	**2.16** (1.60-2.86)	**2.42** (1.75-3.26)	**2.68** (1.88-3.72)	**2.96** (1.99-4.21)	**3.34** (2.16-4.89)	**3.63** (2.30-5.41)
2-hr	**1.41** (1.10-1.79)	**1.66** (1.29-2.11)	**2.07** (1.60-2.63)	**2.41** (1.86-3.08)	**2.88** (2.15-3.80)	**3.24** (2.36-4.34)	**3.60** (2.55-4.98)	**4.00** (2.70-5.65)	**4.56** (2.96-6.63)	**5.00** (3.18-7.41)
3-hr	**1.63** (1.27-2.05)	**1.93** (1.50-2.43)	**2.42** (1.87-3.05)	**2.82** (2.18-3.58)	**3.38** (2.52-4.44)	**3.80** (2.78-5.09)	**4.23** (3.01-5.85)	**4.72** (3.19-6.64)	**5.40** (3.52-7.83)	**5.96** (3.79-8.79)
6-hr	**2.05** (1.61-2.57)	**2.44** (1.92-3.06)	**3.08** (2.41-3.87)	**3.61** (2.81-4.56)	**4.34** (3.27-5.69)	**4.89** (3.61-6.52)	**5.47** (3.92-7.52)	**6.12** (4.15-8.56)	**7.05** (4.61-10.2)	**7.82** (4.99-11.5)
12-hr	**2.53** (2.00-3.15)	**3.03** (2.39-3.77)	**3.84** (3.02-4.80)	**4.52** (3.53-5.66)	**5.44** (4.12-7.09)	**6.14** (4.56-8.14)	**6.87** (4.96-9.42)	**7.72** (5.26-10.7)	**8.95** (5.86-12.8)	**9.97** (6.38-14.5)
24-hr	**2.97** (2.36-3.66)	**3.59** (2.85-4.44)	**4.61** (3.65-5.71)	**5.45** (4.29-6.79)	**6.61** (5.04-8.57)	**7.48** (5.59-9.88)	**8.40** (6.11-11.5)	**9.49** (6.49-13.1)	**11.1** (7.30-15.8)	**12.5** (8.01-18.0)
2-day	**3.31** (2.65-4.07)	**4.08** (3.26-5.01)	**5.32** (4.24-6.56)	**6.36** (5.04-7.87)	**7.78** (5.98-10.0)	**8.84** (6.65-11.6)	**9.98** (7.32-13.6)	**11.4** (7.79-15.6)	**13.4** (8.86-19.0)	**15.2** (9.81-21.9)
3-day	**3.58** (2.88-4.37)	**4.42** (3.54-5.40)	**5.78** (4.62-7.09)	**6.92** (5.50-8.52)	**8.48** (6.53-10.9)	**9.63** (7.28-12.6)	**10.9** (8.01-14.8)	**12.4** (8.52-16.9)	**14.7** (9.71-20.7)	**16.7** (10.8-23.8)
4-day	**3.83** (3.09-4.67)	**4.71** (3.79-5.75)	**6.15** (4.93-7.52)	**7.35** (5.86-9.03)	**8.99** (6.94-11.5)	**10.2** (7.73-13.3)	**11.5** (8.49-15.6)	**13.1** (9.03-17.9)	**15.5** (10.3-21.8)	**17.6** (11.4-25.1)
7-day	**4.57** (3.70-5.54)	**5.53** (4.47-6.70)	**7.09** (5.71-8.62)	**8.39** (6.72-10.2)	**10.2** (7.88-12.9)	**11.5** (8.73-14.9)	**12.9** (9.53-17.4)	**14.6** (10.1-19.8)	**17.1** (11.4-23.9)	**19.3** (12.5-27.3)
10-day	**5.29** (4.30-6.39)	**6.30** (5.11-7.61)	**7.94** (6.43-9.63)	**9.31** (7.48-11.3)	**11.2** (8.69-14.1)	**12.6** (9.57-16.2)	**14.1** (10.4-18.8)	**15.8** (11.0-21.3)	**18.3** (12.2-25.5)	**20.4** (13.2-28.9)
20-day	**7.47** (6.11-8.95)	**8.60** (7.03-10.3)	**10.4** (8.50-12.6)	**12.0** (9.69-14.5)	**14.1** (11.0-17.6)	**15.7** (11.9-19.9)	**17.3** (12.7-22.7)	**19.1** (13.3-25.6)	**21.5** (14.4-29.7)	**23.5** (15.3-32.9)
30-day	**9.26** (7.61-11.1)	**10.5** (8.60-12.5)	**12.5** (10.2-15.0)	**14.1** (11.5-17.0)	**16.4** (12.8-20.4)	**18.2** (13.9-22.9)	**19.9** (14.6-25.8)	**21.7** (15.2-28.9)	**24.1** (16.2-33.1)	**25.9** (16.9-36.2)
45-day	**11.5** (9.46-13.6)	**12.8** (10.5-15.2)	**15.0** (12.3-17.9)	**16.8** (13.7-20.1)	**19.2** (15.1-23.7)	**21.2** (16.2-26.5)	**23.1** (16.9-29.6)	**24.9** (17.5-33.0)	**27.2** (18.3-37.2)	**29.0** (18.9-40.3)
60-day	**13.3** (11.0-15.8)	**14.7** (12.2-17.5)	**17.0** (14.0-20.3)	**18.9** (15.5-22.6)	**21.6** (16.9-26.5)	**23.6** (18.1-29.5)	**25.6** (18.8-32.7)	**27.5** (19.4-36.4)	**29.9** (20.1-40.7)	**31.5** (20.6-43.7)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

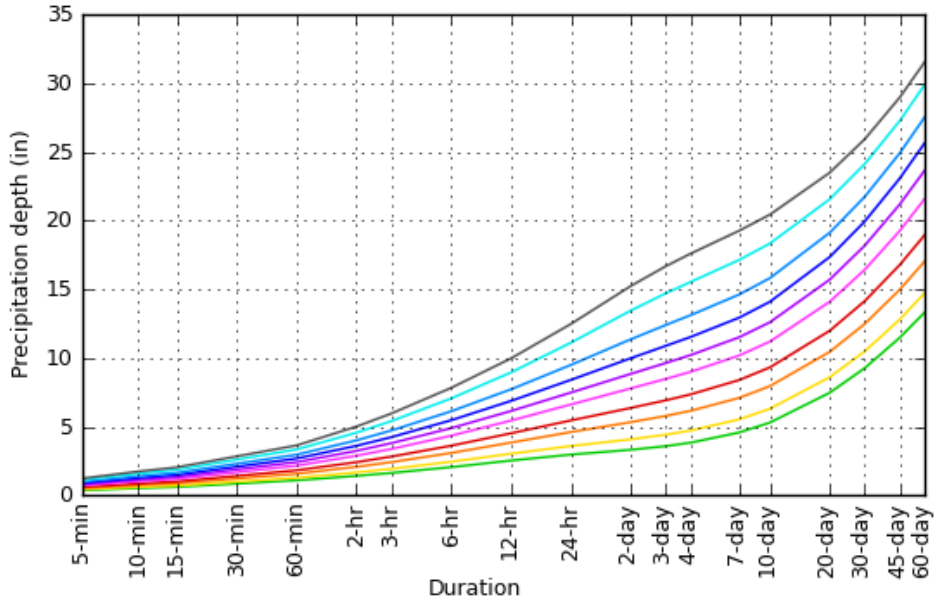
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

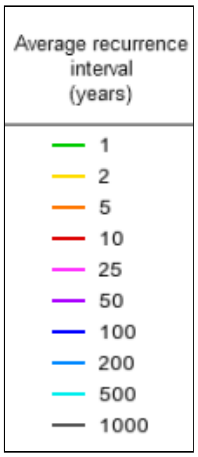
Please refer to NOAA Atlas 14 document for more information.

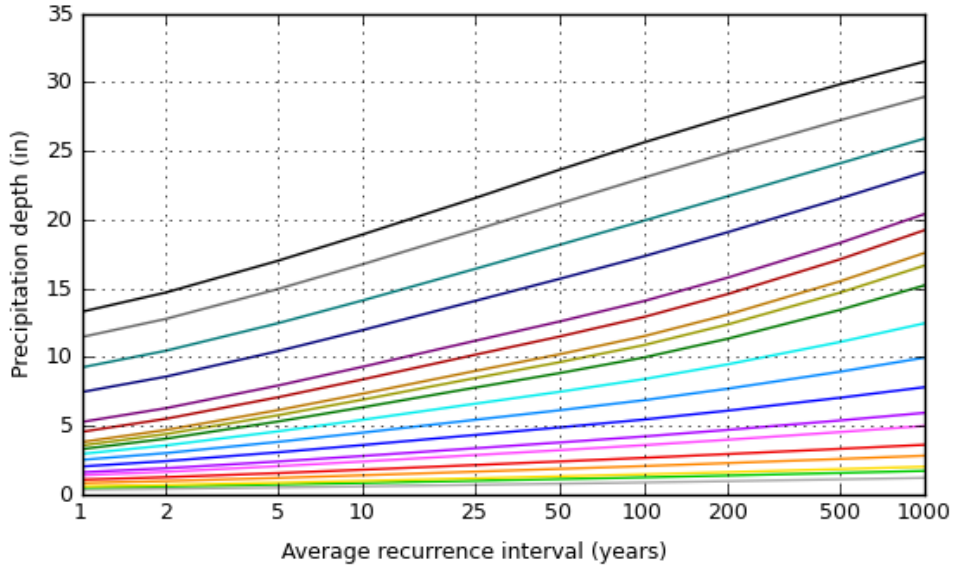
Back to Top

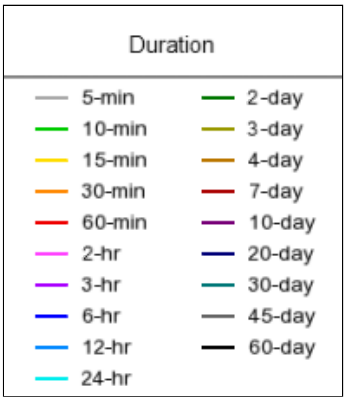
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 41.0584°, Longitude: -73.5373°









NOAA Atlas 14, Volume 10, Version 3

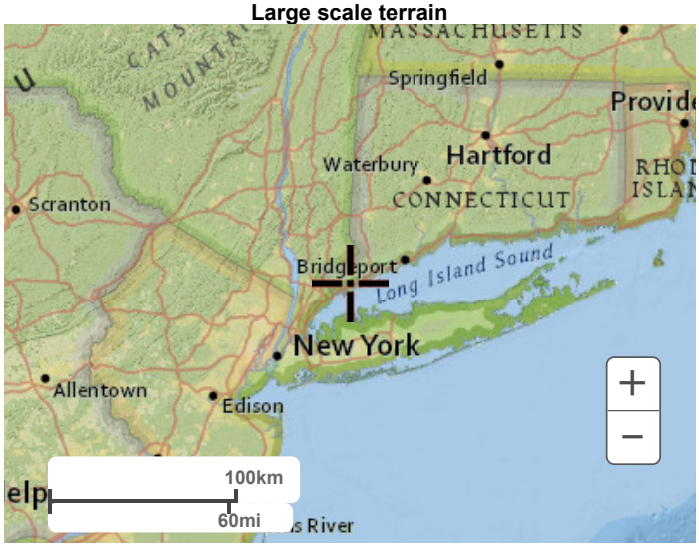
Created (GMT): Tue Jun 14 17:31:03 2022

Back to Top

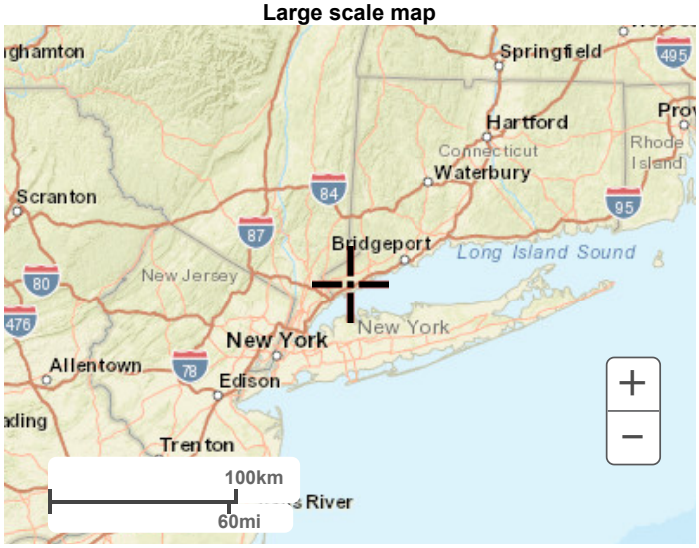
Maps & aerials

Small scale terrain

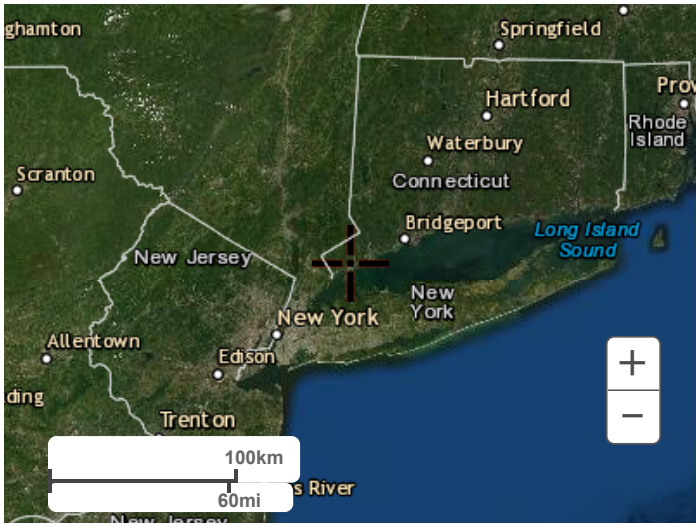
Large scale terrain



Large scale map



Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,710 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
307	Urban land	6.5	100.0%
Totals for Area of Interest		**6.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
307	Urban land	D	6.5	100.0%
Totals for Area of Interest			**6.5**	**100.0%**

Rating Options—Hydrologic Soil Group

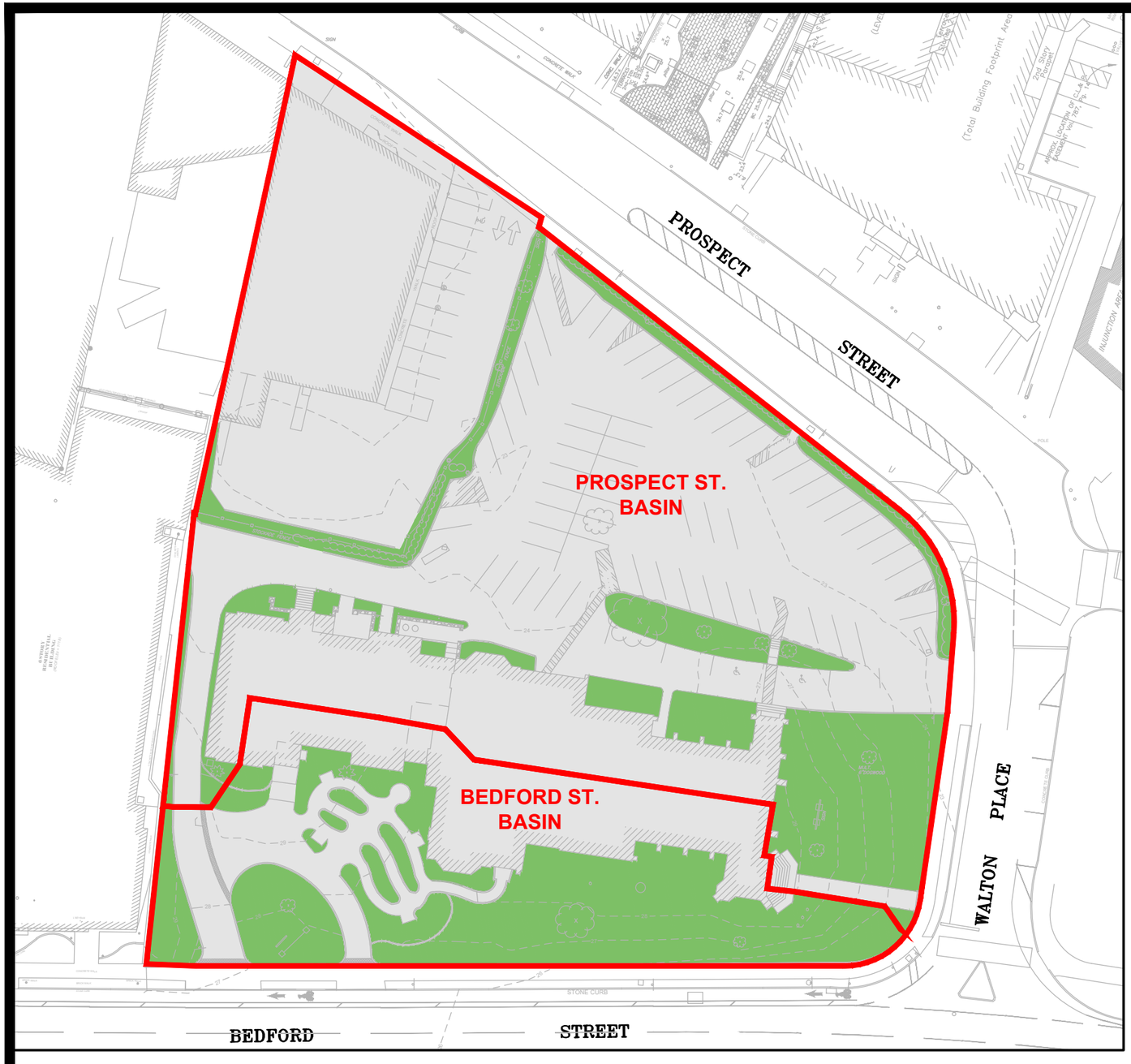
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix B

Existing On-Site Drainage Basin Map
Proposed On-Site Drainage Basin Maps



EXISTING DRAINAGE BASINS						
Drainage Area ID	Total Area (SF)	Impervious Area (SF)	CN	TC	Runoff Volume (CF)*	Runoff (CFS)*
Bedford	22,313	10,996	88.9	5	7,785	2.52
Prospect	62,481	51,482	94.8	5	25,217	7.73
TOTAL	**84,794**	**62,478**	**-**	**-**	**33,002**	**10.25**

*10-YEAR STORM EVENT, PRIOR TO STORAGE / TREATMENT

EXISTING DRAINAGE BASIN MAP

1 WALTON PLACE & 80 PROSPECT STREET

STAMFORD, CT

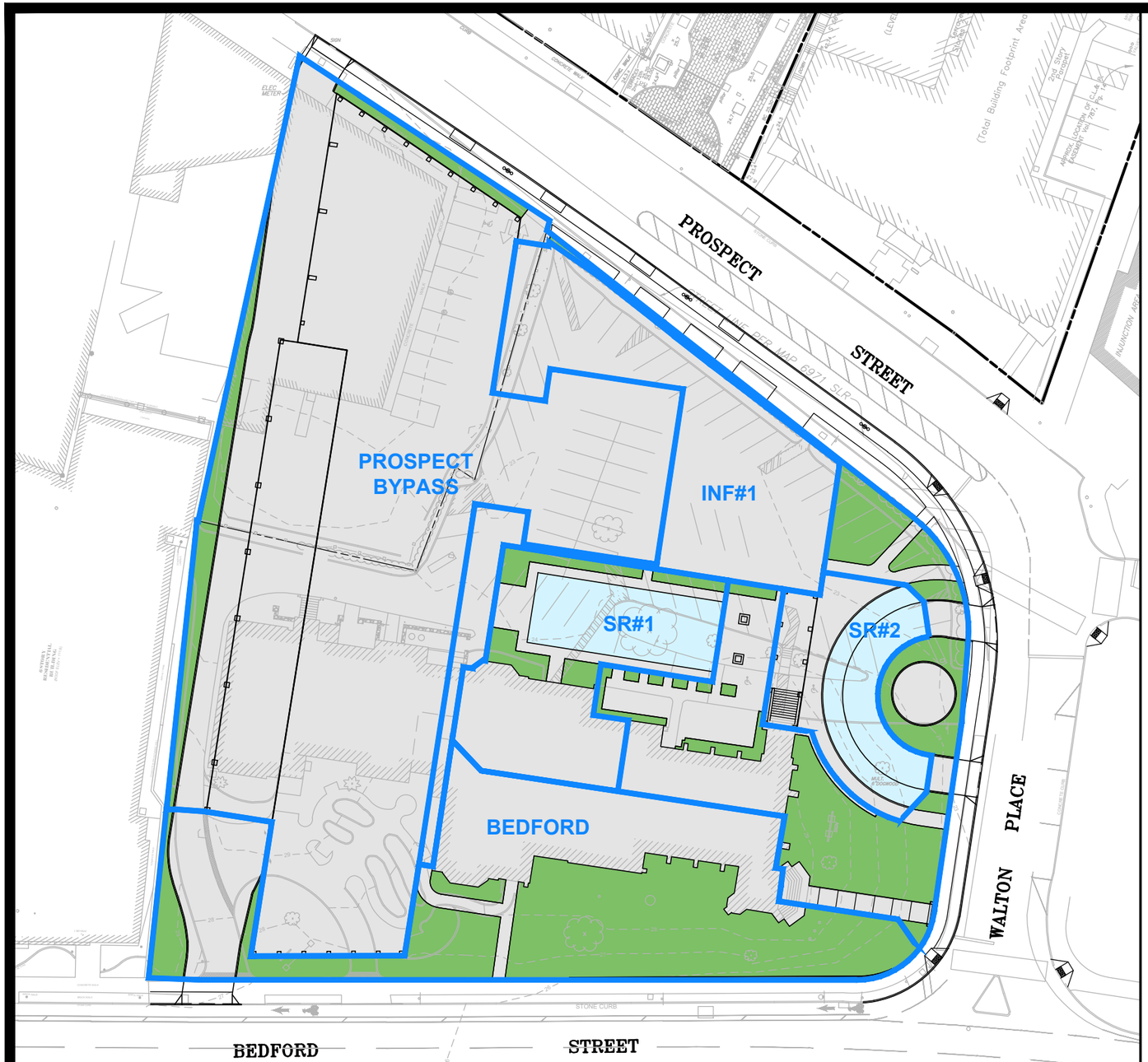
REDNISS & MEAD

LAND SURVEYING
CIVIL ENGINEERING
PLANNING & ZONING CONSULTING
PERMITTING

22 First Street | Stamford, CT 06905
Tel: 203.327.0500 | Fax: 203.357.1118
www.rednissmead.com

COMM. NO.:	DATE:
5756	08/19/2022
	SCALE: 1"=50'

7/14/2022 3:54 PM G:\JOBFILES\5000\5700\5756\DWG\5756 Master 6 - Drainage.dwg



PROPOSED DRAINAGE BASINS						
Drainage Area ID	Total Area (SF)	Impervious Area (SF)	CN	TC	Runoff Volume (CF)*	Runoff (CFS)*
Bedford	15,691	7,463	88.6	5	5,432	1.76
Prospect Bypass	48,975	41,893	95.4	5	20,029	6.09
Inf#1	9,314	9,314	98.0	5	4,043	1.18
SR#1	6,716	5,728	95.4	5	2,744	0.84
SR#2	4,098	4,098	98.0	5	1,779	0.52
TOTAL	**84,794**	**68,496**	**-**	**-**	**34,027**	**10.39**

*10-YEAR STORM EVENT, PRIOR TO STORAGE / TREATMENT

PROPOSED DRAINAGE BASIN MAP
1 WALTON PLACE & 80 PROSPECT STREET
STAMFORD, CT

REDNISS & MEAD
LAND SURVEYING
CIVIL ENGINEERING
PLANNING & ZONING CONSULTING
PERMITTING
22 First Street | Stamford, CT 06905
Tel: 203.327.0500 | Fax: 203.357.1118
www.rednissmead.com

COMM. NO.: 5756
DATE: 08/19/2022
SCALE: 1"=50'

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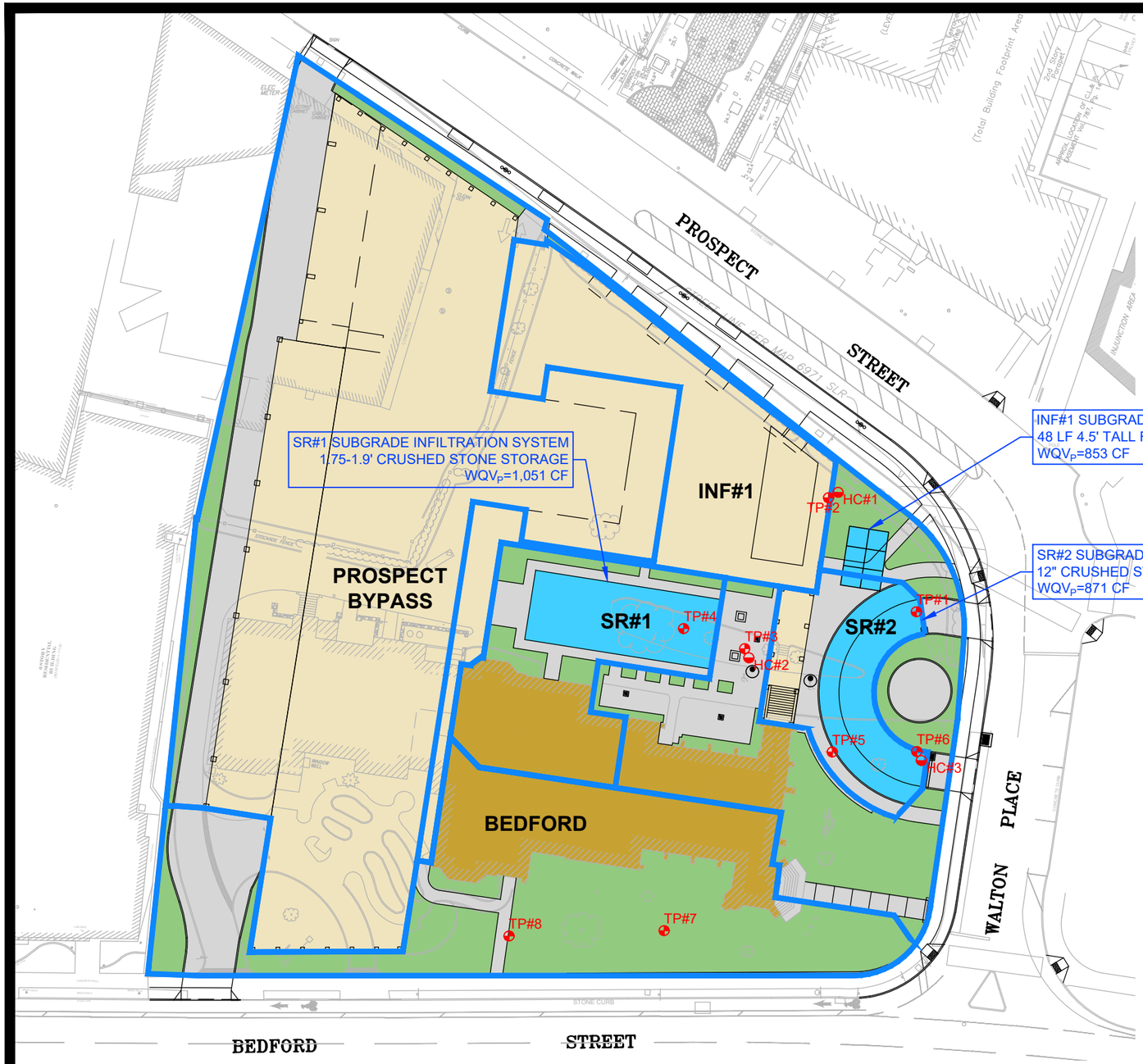
Appendix C

LID Review Map



COLOR	DESCRIPTION
	BUILDINGS
	BUILDING ADDITION
	PAVEMENT, SIDEWALK, OTHER IMPERVIOUS SURFACE
	LAWN
	STORMWATER BMP
	TEST PIT
	INFILTRATION TEST

LID SUMMARY TABLE

Drainage Area ID	Total Area (SF)	Impervious Area	% Impervious	1/2" WQV (CF)	Retention Volume Required	Retention Volume Provided
Bedford	15,691	7,463	48%	313	313	
Prospect Bypass	48,975	41,893	86%	1673	1,673	
Inf#1	9,314	9,314	100%	369	369	853
SR#1	6,716	5,728	85%	229	229	1,051
SR#2	4,098	4,098	100%	162	162	871
TOTAL	**84,794**	**68,496**	**-**	**2745**	**2,745**	**2,775**

LID REVIEW MAP

1 WALTON PLACE & 80 PROSPECT STREET

STAMFORD, CT

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COMM. NO.:	DATE:
5756	08/19/2022
	SCALE: 1"=50'

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Appendix D

Water Quality Volume Calculations
BMP Volume Calculations
72-Hour Drawdown Calculations
Conveyance Calculations

Water Quality Volume Calculations

Project: *1 Walton Place & 80 Prospect Street*	**Project #:** *5756*	**Date:** *7/19/2022*
Location: *Stamford, CT*	**By:** *AS*	**Checked:** *BDH*

Full Site

Area=	1.947	acres
Impervious Area=	1.572	acres
I=	0.808	[a]
R=	0.777	[b]
WQV=	0.126	ac. ft. [c]

WQV=	**5490.5 ft.^{3}**	
1/2 WQV=	**2745.3 ft.^{3}**	[d]
WQV PROVIDED=	**2775.0 ft.^{3}**	

[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] Per standard Drainage Manual, since the site DCIA exceeds 40% the required storage is half of the calculated WQV.

Stage-Area-Storage for Pond 9P: Inf#1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
16.25	0	18.90	870
16.30	16	18.95	886
16.35	33	19.00	903
16.40	49	19.05	919
16.45	66	19.10	935
16.50	82	19.15	952
16.55	98	19.20	968
16.60	115	19.25	985
16.65	131	19.30	1,001
16.70	148	19.35	1,017
16.75	164	19.40	1,034
16.80	181	19.45	1,050
16.85	197	19.50	1,067
16.90	213	19.55	1,083
16.95	230	19.60	1,100
17.00	246	19.65	1,116
17.05	263	19.70	1,132
17.10	279	19.75	1,149
17.15	295	19.80	1,165
17.20	312	19.85	1,182
17.25	328	19.90	1,198
17.30	345	19.95	1,214
17.35	361	20.00	1,231
17.40	377	20.05	1,247
17.45	394	20.10	1,264
17.50	410	20.15	1,280
17.55	427	20.20	1,296
17.60	443	20.25	1,313
17.65	460	20.30	1,329
17.70	476	20.35	1,346
17.75	492	20.40	1,362
17.80	509	20.45	1,379
17.85	525	20.50	1,395
17.90	542	20.55	1,411
17.95	558	20.60	1,428
18.00	574	20.65	1,444
18.05	591	20.70	1,461
18.10	607	20.75	1,477
18.15	624	20.80	1,477
18.20	640	20.85	1,477
18.25	656	20.90	1,477
18.30	673	20.95	1,477
18.35	689	21.00	1,477
18.40	706	21.05	1,477
18.45	722	21.10	1,477
18.50	738	21.15	1,477
18.55	755	21.20	1,477
18.60	771	21.25	1,477
18.65	788	21.30	1,477
18.70	804	21.35	1,477
18.75	821	21.40	**1,477**
18.80	837		
18.85	853		

Stage-Area-Storage for Pond 6P: SR#1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
21.60	0	0
21.62	286	1
21.64	572	5
21.66	858	10
21.68	1,143	18
21.70	1,429	29
21.72	1,715	41
21.74	**2,001**	56
21.76	**2,144**	73
21.78	2,144	90
21.80	2,144	107
21.82	2,144	124
21.84	2,144	142
21.86	2,144	159
21.88	2,144	176
21.90	2,144	193
21.92	2,144	210
21.94	2,144	227
21.96	2,144	244
21.98	2,144	262
22.00	2,144	279
22.02	2,144	296
22.04	2,144	313
22.06	2,144	330
22.08	2,144	347
22.10	2,144	364
22.12	2,144	382
22.14	2,144	399
22.16	2,144	416
22.18	2,144	433
22.20	2,144	450
22.22	2,144	467
22.24	2,144	485
22.26	2,144	502
22.28	2,144	519
22.30	2,144	536
22.32	2,144	553
22.34	2,144	570
22.36	2,144	587
22.38	2,144	605
22.40	2,144	622
22.42	2,144	639
22.44	2,144	656
22.46	2,144	673
22.48	2,144	690
22.50	2,144	708
22.52	2,144	725
22.54	2,144	742
22.56	2,144	759
22.58	2,144	776
22.60	2,144	793
22.62	2,144	810
22.64	2,144	828
22.66	2,144	845
22.68	2,144	862
22.70	2,144	879
22.72	2,144	896
22.74	2,144	913
22.76	2,144	930
22.78	2,144	948
22.80	2,144	965
22.82	2,144	982
22.84	2,144	999
22.86	2,144	1,016
22.88	2,144	1,033
22.90	2,144	1,051
22.92	2,144	1,068
22.94	2,144	1,085
22.96	2,144	1,102
22.98	2,144	1,119
23.00	2,144	1,136
23.02	2,144	1,153
23.04	2,144	1,171
23.06	2,144	1,188
23.08	2,144	1,205
23.10	2,144	1,222
23.12	2,144	1,239
23.14	2,144	1,256
23.16	2,144	1,274
23.18	2,144	1,291
23.20	2,144	1,308
23.22	2,144	1,325
23.24	2,144	1,342
23.26	2,144	1,359
23.28	2,144	1,376
23.30	2,144	1,394
23.32	2,144	1,411
23.34	2,144	1,428
23.36	2,144	1,445
23.38	2,144	1,462
23.40	2,144	1,479
23.42	2,144	1,497
23.44	2,144	1,514
23.46	2,144	1,531
23.48	2,144	1,548
23.50	2,144	**1,565**

WQV Provided:
1,051 CF @ 22.90

Stage-Area-Storage for Pond 7P: SR#2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
21.50	0	22.03	462	22.56	871
21.51	9	22.04	470	22.57	871
21.52	17	22.05	479	22.58	871
21.53	26	22.06	488	22.59	871
21.54	35	22.07	497	22.60	871
21.55	44	22.08	505	22.61	871
21.56	52	22.09	514	22.62	871
21.57	61	22.10	523	22.63	871
21.58	70	22.11	531	22.64	871
21.59	78	22.12	540	22.65	871
21.60	87	22.13	549	22.66	871
21.61	96	22.14	558	22.67	871
21.62	105	22.15	566	22.68	871
21.63	113	22.16	575	22.69	871
21.64	122	22.17	584	22.70	871
21.65	131	22.18	592	22.71	871
21.66	139	22.19	601	22.72	871
21.67	148	22.20	610	22.73	871
21.68	157	22.21	619	22.74	871
21.69	166	22.22	627	22.75	871
21.70	174	22.23	636	22.76	871
21.71	183	22.24	645	22.77	871
21.72	192	22.25	653	22.78	871
21.73	200	22.26	662	22.79	871
21.74	209	22.27	671	22.80	871
21.75	218	22.28	680	22.81	871
21.76	227	22.29	688		
21.77	235	22.30	697		
21.78	244	22.31	706		
21.79	253	22.32	714		
21.80	261	22.33	723		
21.81	270	22.34	732		
21.82	279	22.35	741		
21.83	287	22.36	749		
21.84	296	22.37	758		
21.85	305	22.38	767		
21.86	314	22.39	775		
21.87	322	22.40	784		
21.88	331	22.41	793		
21.89	340	22.42	802		
21.90	348	22.43	810		
21.91	357	22.44	819		
21.92	366	22.45	828		
21.93	375	22.46	836		
21.94	383	22.47	845		
21.95	392	22.48	854		
21.96	401	22.49	862		
21.97	409	22.50	**871**		
21.98	418	22.51	871		
21.99	427	22.52	871		
22.00	436	22.53	871		
22.01	444	22.54	871		
22.02	453	22.55	871		

WQV Provided:
871 CF @ 22.80

72-HOUR DRAW DOWN CALCULATIONS

Project:	*1 Walton Place & 80 Prospect Street*	**Project #:**	*5756*	**Date:**	*8/19/2022*
Location:	*Stamford, CT*	**By:**	*JTF*	**Checked:**	*BDH*

INFIL#1		
Surface Area of Infiltration System (SA)	384	ft^2
Volume of Storage of Infiltration System (VS)	1,477	ft^3
Infiltration Rate (IR)	12.00	in/hr^c
Theoretical Water Column Height	46.16	in^a
Time of Draw Down	**3.85**	**hr^b**

SR#1		
Surface Area of Infiltration System (SA)	2,144	ft^2
Volume of Storage of Infiltration System (VS)	1,565	ft^3
Infiltration Rate (IR)	7.19	in/hr^d
Theoretical Water Column Height	8.76	in^a
Time of Draw Down	**1.22**	**hr^b**

SR#2		
Surface Area of Infiltration System (SA)	2,178	ft^2
Volume of Storage of Infiltration System (VS)	871	ft^3
Infiltration Rate (IR)	10.81	in/hr^e
Theoretical Water Column Height	4.80	in^a
Time of Draw Down	**0.44**	**hr^b**

[a] Theoretical Water Column Height (WCH) = VS/SA*12

[b] Time of Draw Down = WCH/IR

[c] Infiltration Rate (IR) Taken From The Results of Hydraulic Conductivity Test #1 and reduced by a factor of 2

[d] Infiltration Rate (IR) Taken From The Results of Hydraulic Conductivity Test #2 and reduced by a factor of 2

[e] Infiltration Rate (IR) Taken From The Results of Hydraulic Conductivity Test #3 and reduced by a factor of 2

HYDRAULIC DATA FOR RATIONAL METHOD

Project:	*1 Walton Pl. & 80 Prospect St.*			**Project #:** *5756*		**Date:**	7/22/2022
Location:	*Stamford, CT*			**By:** *JTF*		**Checked:**	*BDH*

100-Year Storm Conveyance Calculations

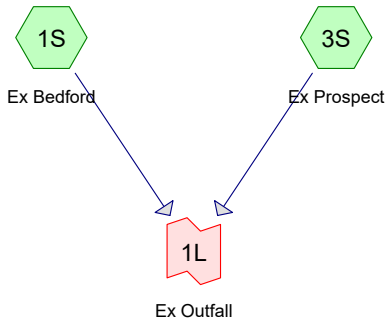
Pipe Section	Q in system (cfs)*	Pipe Size (in)	Pipe Length (ft)	Roughness coefficient	Material	Slope (ft/ft)	Q_{full} (cfs)	Q_{system} / Q_{full} (%)
MMH#1 to MH#5	1.73	12	12	0.011	PVC	0.021	6.12	28.3%

*100-Year flow rates obtained from HydroCAD Model

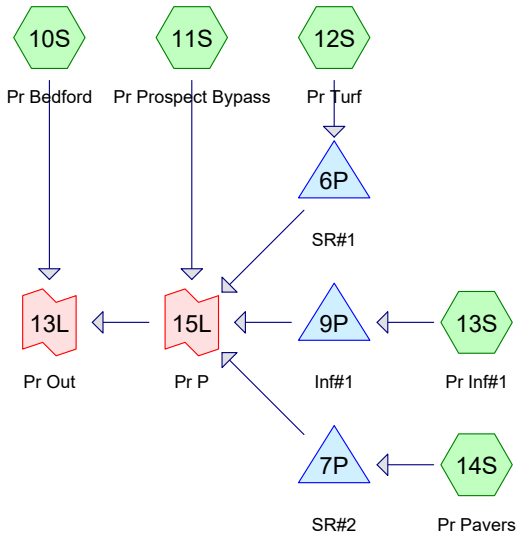
Appendix E

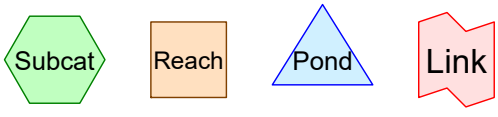
HydroCAD Report

Existing Conditions



Proposed Conditions





Routing Diagram for 5756 Hydrocad 2022-05-09
Prepared by HP Inc., Printed 7/13/2022

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Ex Bedford	Runoff Area=22,313 sf 49.28% Impervious Runoff Depth>1.86" Tc=5.0 min CN=88.87 Runoff=1.16 cfs 3,459 cf
Subcatchment 3S: Ex Prospect	Runoff Area=62,481 sf 82.40% Impervious Runoff Depth>2.40" Tc=5.0 min CN=94.83 Runoff=3.99 cfs 12,503 cf
Subcatchment 10S: Pr Bedford	Runoff Area=15,691 sf 47.56% Impervious Runoff Depth>1.84" Tc=5.0 min CN=88.56 Runoff=0.80 cfs 2,400 cf
Subcatchment 11S: Pr Prospect Bypass	Runoff Area=48,975 sf 85.54% Impervious Runoff Depth>2.46" Tc=5.0 min CN=95.40 Runoff=3.17 cfs 10,034 cf
Subcatchment 12S: Pr Turf	Runoff Area=6,716 sf 85.29% Impervious Runoff Depth>2.45" Tc=5.0 min CN=95.35 Runoff=0.43 cfs 1,373 cf
Subcatchment 13S: Pr Inf#1	Runoff Area=9,314 sf 100.00% Impervious Runoff Depth>2.74" Tc=5.0 min CN=98.00 Runoff=0.64 cfs 2,124 cf
Subcatchment 14S: Pr Pavers	Runoff Area=4,098 sf 100.00% Impervious Runoff Depth>2.74" Tc=5.0 min CN=98.00 Runoff=0.28 cfs 935 cf
Pond 6P: SR#1	Peak Elev=22.92' Storage=1,070 cf Inflow=0.43 cfs 1,373 cf Outflow=0.02 cfs 316 cf
Pond 7P: SR#2	Peak Elev=22.80' Storage=871 cf Inflow=0.28 cfs 935 cf Outflow=0.00 cfs 63 cf
Pond 9P: Inf#1	Peak Elev=19.37' Storage=1,025 cf Inflow=0.64 cfs 2,124 cf Outflow=0.37 cfs 1,257 cf
Link 1L: Ex Outfall	Inflow=5.14 cfs 15,963 cf Primary=5.14 cfs 15,963 cf
Link 13L: Pr Out	Inflow=4.20 cfs 14,070 cf Primary=4.20 cfs 14,070 cf
Link 15L: Pr P	Inflow=3.40 cfs 11,671 cf Primary=3.40 cfs 11,671 cf

Total Runoff Area = 169,588 sf Runoff Volume = 32,828 cf Average Runoff Depth = 2.32"
22.77% Pervious = 38,614 sf 77.23% Impervious = 130,974 sf

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Ex Bedford	Runoff Area=22,313 sf 49.28% Impervious Runoff Depth>2.43" Tc=5.0 min CN=88.87 Runoff=1.50 cfs 4,512 cf
Subcatchment 3S: Ex Prospect	Runoff Area=62,481 sf 82.40% Impervious Runoff Depth>3.01" Tc=5.0 min CN=94.83 Runoff=4.93 cfs 15,660 cf
Subcatchment 10S: Pr Bedford	Runoff Area=15,691 sf 47.56% Impervious Runoff Depth>2.40" Tc=5.0 min CN=88.56 Runoff=1.04 cfs 3,137 cf
Subcatchment 11S: Pr Prospect Bypass	Runoff Area=48,975 sf 85.54% Impervious Runoff Depth>3.07" Tc=5.0 min CN=95.40 Runoff=3.91 cfs 12,519 cf
Subcatchment 12S: Pr Turf	Runoff Area=6,716 sf 85.29% Impervious Runoff Depth>3.06" Tc=5.0 min CN=95.35 Runoff=0.54 cfs 1,714 cf
Subcatchment 13S: Pr Inf#1	Runoff Area=9,314 sf 100.00% Impervious Runoff Depth>3.35" Tc=5.0 min CN=98.00 Runoff=0.77 cfs 2,603 cf
Subcatchment 14S: Pr Pavers	Runoff Area=4,098 sf 100.00% Impervious Runoff Depth>3.35" Tc=5.0 min CN=98.00 Runoff=0.34 cfs 1,145 cf
Pond 6P: SR#1	Peak Elev=22.96' Storage=1,098 cf Inflow=0.54 cfs 1,714 cf Outflow=0.07 cfs 656 cf
Pond 7P: SR#2	Peak Elev=22.80' Storage=871 cf Inflow=0.34 cfs 1,145 cf Outflow=0.02 cfs 274 cf
Pond 9P: Inf#1	Peak Elev=19.65' Storage=1,115 cf Inflow=0.77 cfs 2,603 cf Outflow=0.50 cfs 1,735 cf
Link 1L: Ex Outfall	Inflow=6.43 cfs 20,172 cf Primary=6.43 cfs 20,172 cf
Link 13L: Pr Out	Inflow=5.38 cfs 18,320 cf Primary=5.38 cfs 18,320 cf
Link 15L: Pr P	Inflow=4.34 cfs 15,183 cf Primary=4.34 cfs 15,183 cf

Total Runoff Area = 169,588 sf Runoff Volume = 41,290 cf Average Runoff Depth = 2.92"
22.77% Pervious = 38,614 sf 77.23% Impervious = 130,974 sf

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Ex Bedford	Runoff Area=22,313 sf 49.28% Impervious Runoff Depth>3.38" Tc=5.0 min CN=88.87 Runoff=2.06 cfs 6,292 cf
Subcatchment 3S: Ex Prospect	Runoff Area=62,481 sf 82.40% Impervious Runoff Depth>4.01" Tc=5.0 min CN=94.83 Runoff=6.47 cfs 20,890 cf
Subcatchment 10S: Pr Bedford	Runoff Area=15,691 sf 47.56% Impervious Runoff Depth>3.35" Tc=5.0 min CN=88.56 Runoff=1.44 cfs 4,384 cf
Subcatchment 11S: Pr Prospect Bypass	Runoff Area=48,975 sf 85.54% Impervious Runoff Depth>4.07" Tc=5.0 min CN=95.40 Runoff=5.11 cfs 16,630 cf
Subcatchment 12S: Pr Turf	Runoff Area=6,716 sf 85.29% Impervious Runoff Depth>4.07" Tc=5.0 min CN=95.35 Runoff=0.70 cfs 2,278 cf
Subcatchment 13S: Pr Inf#1	Runoff Area=9,314 sf 100.00% Impervious Runoff Depth>4.37" Tc=5.0 min CN=98.00 Runoff=1.00 cfs 3,393 cf
Subcatchment 14S: Pr Pavers	Runoff Area=4,098 sf 100.00% Impervious Runoff Depth>4.37" Tc=5.0 min CN=98.00 Runoff=0.44 cfs 1,493 cf
Pond 6P: SR#1	Peak Elev=23.05' Storage=1,180 cf Inflow=0.70 cfs 2,278 cf Outflow=0.30 cfs 1,217 cf
Pond 7P: SR#2	Peak Elev=22.80' Storage=871 cf Inflow=0.44 cfs 1,493 cf Outflow=0.19 cfs 621 cf
Pond 9P: Inf#1	Peak Elev=19.97' Storage=1,222 cf Inflow=1.00 cfs 3,393 cf Outflow=0.63 cfs 2,522 cf
Link 1L: Ex Outfall	Inflow=8.53 cfs 27,182 cf Primary=8.53 cfs 27,182 cf
Link 13L: Pr Out	Inflow=7.09 cfs 25,376 cf Primary=7.09 cfs 25,376 cf
Link 15L: Pr P	Inflow=5.66 cfs 20,992 cf Primary=5.66 cfs 20,992 cf

Total Runoff Area = 169,588 sf Runoff Volume = 55,359 cf Average Runoff Depth = 3.92"
22.77% Pervious = 38,614 sf 77.23% Impervious = 130,974 sf

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Ex Bedford	Runoff Area=22,313 sf 49.28% Impervious Runoff Depth>4.19" Tc=5.0 min CN=88.87 Runoff=2.52 cfs 7,785 cf
Subcatchment 3S: Ex Prospect	Runoff Area=62,481 sf 82.40% Impervious Runoff Depth>4.84" Tc=5.0 min CN=94.83 Runoff=7.73 cfs 25,217 cf
Subcatchment 10S: Pr Bedford	Runoff Area=15,691 sf 47.56% Impervious Runoff Depth>4.15" Tc=5.0 min CN=88.56 Runoff=1.76 cfs 5,432 cf
Subcatchment 11S: Pr Prospect Bypass	Runoff Area=48,975 sf 85.54% Impervious Runoff Depth>4.91" Tc=5.0 min CN=95.40 Runoff=6.09 cfs 20,029 cf
Subcatchment 12S: Pr Turf	Runoff Area=6,716 sf 85.29% Impervious Runoff Depth>4.90" Tc=5.0 min CN=95.35 Runoff=0.84 cfs 2,744 cf
Subcatchment 13S: Pr Inf#1	Runoff Area=9,314 sf 100.00% Impervious Runoff Depth>5.21" Tc=5.0 min CN=98.00 Runoff=1.18 cfs 4,043 cf
Subcatchment 14S: Pr Pavers	Runoff Area=4,098 sf 100.00% Impervious Runoff Depth>5.21" Tc=5.0 min CN=98.00 Runoff=0.52 cfs 1,779 cf
Pond 6P: SR#1	Peak Elev=23.16' Storage=1,274 cf Inflow=0.84 cfs 2,744 cf Outflow=0.48 cfs 1,683 cf
Pond 7P: SR#2	Peak Elev=22.80' Storage=871 cf Inflow=0.52 cfs 1,779 cf Outflow=0.52 cfs 908 cf
Pond 9P: Inf#1	Peak Elev=20.24' Storage=1,309 cf Inflow=1.18 cfs 4,043 cf Outflow=0.71 cfs 3,171 cf
Link 1L: Ex Outfall	Inflow=10.25 cfs 33,002 cf Primary=10.25 cfs 33,002 cf
Link 13L: Pr Out	Inflow=8.95 cfs 31,222 cf Primary=8.95 cfs 31,222 cf
Link 15L: Pr P	Inflow=7.28 cfs 25,791 cf Primary=7.28 cfs 25,791 cf

Total Runoff Area = 169,588 sf Runoff Volume = 67,029 cf Average Runoff Depth = 4.74"
22.77% Pervious = 38,614 sf 77.23% Impervious = 130,974 sf

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Ex Bedford Runoff Area=22,313 sf 49.28% Impervious Runoff Depth>5.31"
Tc=5.0 min CN=88.87 Runoff=3.16 cfs 9,872 cf

Subcatchment 3S: Ex Prospect Runoff Area=62,481 sf 82.40% Impervious Runoff Depth>5.99"
Tc=5.0 min CN=94.83 Runoff=9.46 cfs 31,210 cf

Subcatchment 10S: Pr Bedford Runoff Area=15,691 sf 47.56% Impervious Runoff Depth>5.27"
Tc=5.0 min CN=88.56 Runoff=2.21 cfs 6,897 cf

Subcatchment 11S: Pr Prospect Bypass Runoff Area=48,975 sf 85.54% Impervious Runoff Depth>6.06"
Tc=5.0 min CN=95.40 Runoff=7.45 cfs 24,733 cf

Subcatchment 12S: Pr Turf Runoff Area=6,716 sf 85.29% Impervious Runoff Depth>6.05"
Tc=5.0 min CN=95.35 Runoff=1.02 cfs 3,389 cf

Subcatchment 13S: Pr Inf#1 Runoff Area=9,314 sf 100.00% Impervious Runoff Depth>6.37"
Tc=5.0 min CN=98.00 Runoff=1.44 cfs 4,942 cf

Subcatchment 14S: Pr Pavers Runoff Area=4,098 sf 100.00% Impervious Runoff Depth>6.37"
Tc=5.0 min CN=98.00 Runoff=0.63 cfs 2,174 cf

Pond 6P: SR#1 Peak Elev=23.31' Storage=1,406 cf Inflow=1.02 cfs 3,389 cf
Outflow=0.61 cfs 2,326 cf

Pond 7P: SR#2 Peak Elev=22.80' Storage=871 cf Inflow=0.63 cfs 2,174 cf
Outflow=0.63 cfs 1,303 cf

Pond 9P: Inf#1 Peak Elev=20.56' Storage=1,415 cf Inflow=1.44 cfs 4,942 cf
Outflow=1.02 cfs 4,068 cf

Link 1L: Ex Outfall Inflow=12.61 cfs 41,082 cf
Primary=12.61 cfs 41,082 cf

Link 13L: Pr Out Inflow=11.52 cfs 39,327 cf
Primary=11.52 cfs 39,327 cf

Link 15L: Pr P Inflow=9.31 cfs 32,431 cf
Primary=9.31 cfs 32,431 cf

Total Runoff Area = 169,588 sf Runoff Volume = 83,217 cf Average Runoff Depth = 5.89"
22.77% Pervious = 38,614 sf 77.23% Impervious = 130,974 sf

Summary for Subcatchment 1S: Ex Bedford

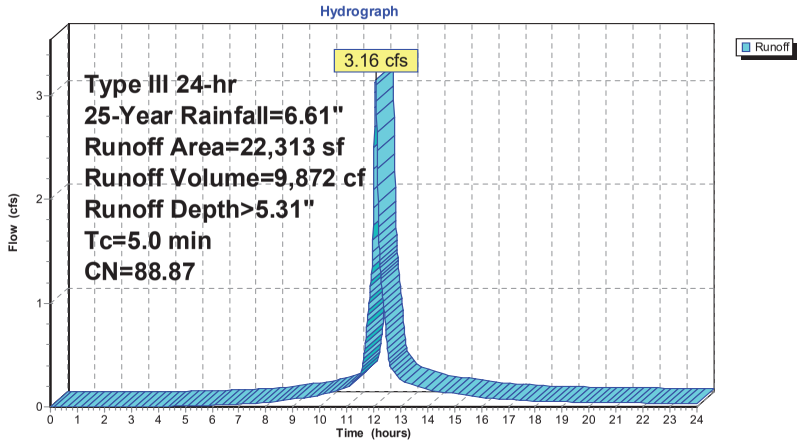
Runoff = 3.16 cfs @ 12.07 hrs, Volume= 9,872 cf, Depth> 5.31"
Routed to Link 1L : Ex Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.61"

	Area (sf)	CN	Description
*	10,996	98.00	Impervious
	11,317	80.00	>75% Grass cover, Good, HSG D
	22,313	88.87	Weighted Average
	11,317		50.72% Pervious Area
	10,996		49.28% Impervious Area

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

Subcatchment 1S: Ex Bedford



Summary for Subcatchment 3S: Ex Prospect

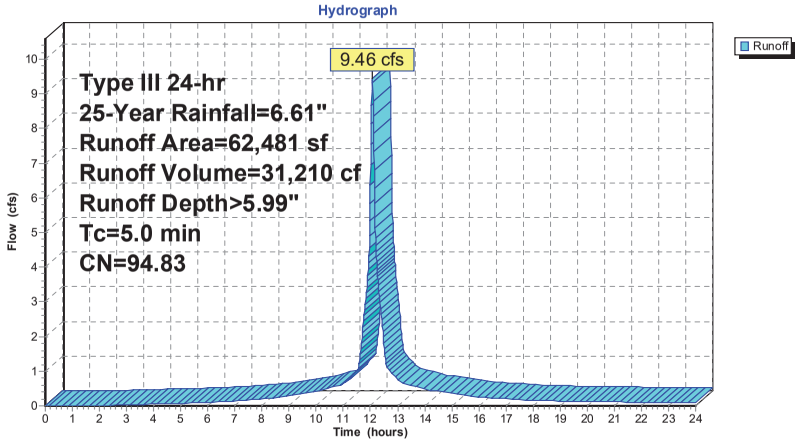
Runoff = 9.46 cfs @ 12.07 hrs, Volume= 31,210 cf, Depth> 5.99"
Routed to Link 1L : Ex Outfall

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.61"

	Area (sf)	CN	Description
*	51,482	98.00	Impervious
	10,999	80.00	>75% Grass cover, Good, HSG D
	62,481	94.83	Weighted Average
	10,999		17.60% Pervious Area
	51,482		82.40% Impervious Area

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

Subcatchment 3S: Ex Prospect



Summary for Subcatchment 10S: Pr Bedford

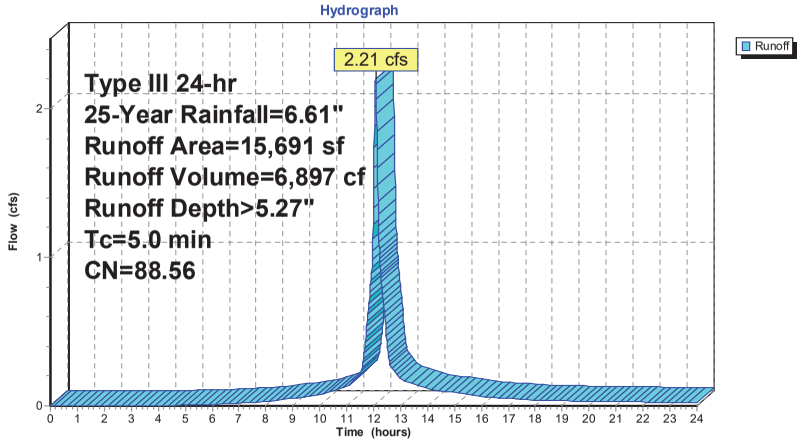
Runoff = 2.21 cfs @ 12.07 hrs, Volume= 6,897 cf, Depth> 5.27"
Routed to Link 13L : Pr Out

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.61"

	Area (sf)	CN	Description
*	7,463	98.00	Impervious
	8,228	80.00	>75% Grass cover, Good, HSG D
	15,691	88.56	Weighted Average
	8,228		52.44% Pervious Area
	7,463		47.56% Impervious Area

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

Subcatchment 10S: Pr Bedford



Summary for Subcatchment 11S: Pr Prospect Bypass

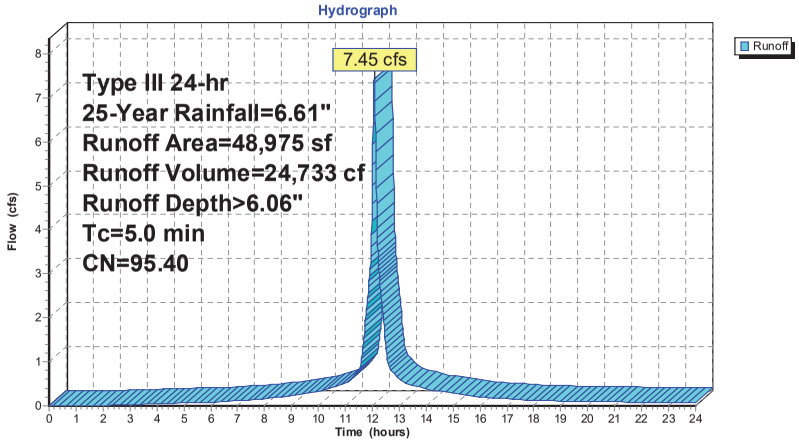
Runoff = 7.45 cfs @ 12.07 hrs, Volume= 24,733 cf, Depth> 6.06"
Routed to Link 15L : Pr P

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.61"

	Area (sf)	CN	Description
*	41,893	98.00	Impervious
	7,082	80.00	>75% Grass cover, Good, HSG D
	48,975	95.40	Weighted Average
	7,082		14.46% Pervious Area
	41,893		85.54% Impervious Area

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

Subcatchment 11S: Pr Prospect Bypass



Summary for Subcatchment 12S: Pr Turf

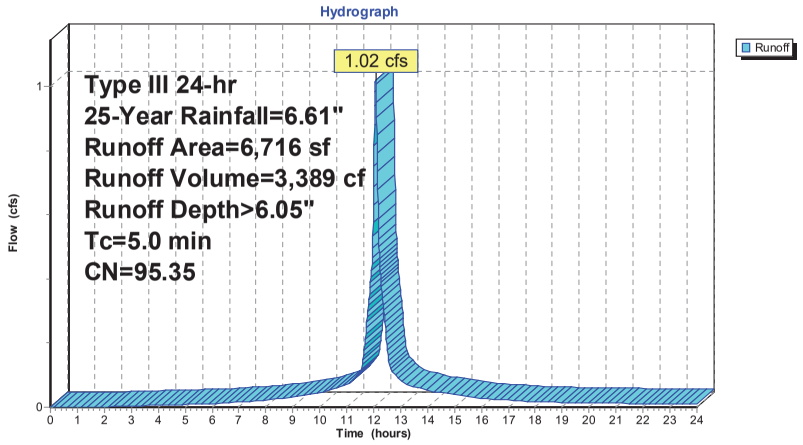
Runoff = 1.02 cfs @ 12.07 hrs, Volume= 3,389 cf, Depth> 6.05"
Routed to Pond 6P : SR#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.61"

	Area (sf)	CN	Description
*	3,584	98.00	Impervious
*	2,144	98.00	Turf
	988	80.00	>75% Grass cover, Good, HSG D
	6,716	95.35	Weighted Average
	988		14.71% Pervious Area
	5,728		85.29% Impervious Area

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

Subcatchment 12S: Pr Turf



Summary for Subcatchment 13S: Pr Inf#1

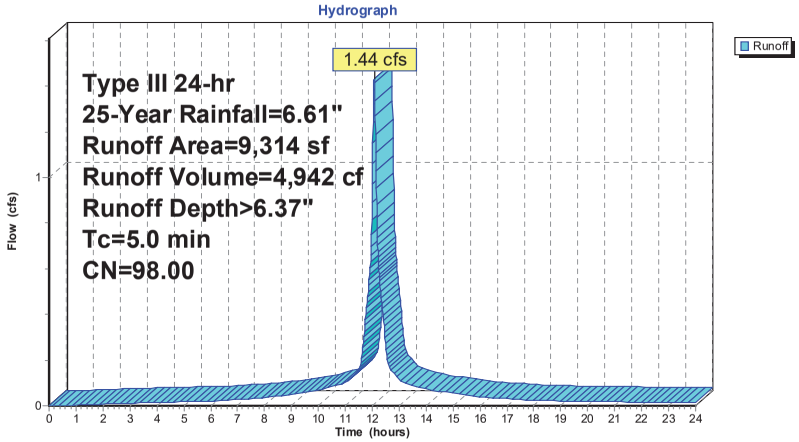
Runoff = 1.44 cfs @ 12.07 hrs, Volume= 4,942 cf, Depth> 6.37"
Routed to Pond 9P : Inf#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.61"

	Area (sf)	CN	Description
*	9,314	98.00	Impervious
	9,314		100.00% Impervious Area

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

Subcatchment 13S: Pr Inf#1



Summary for Subcatchment 14S: Pr Pavers

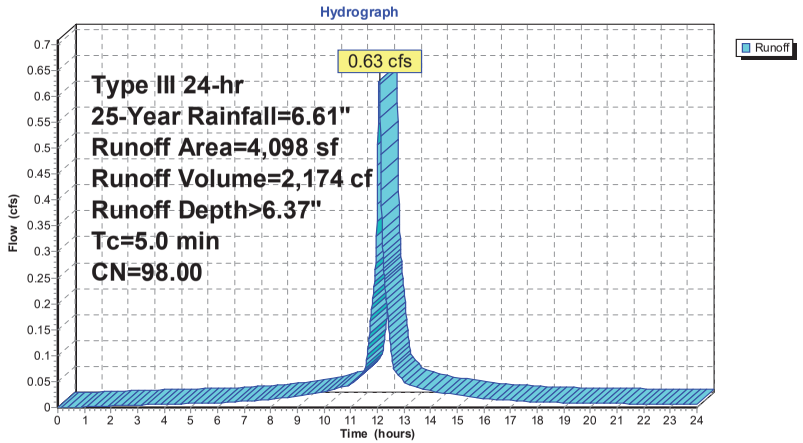
Runoff = 0.63 cfs @ 12.07 hrs, Volume= 2,174 cf, Depth> 6.37"
Routed to Pond 7P : SR#2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.61"

	Area (sf)	CN	Description
*	1,920	98.00	Impervious
*	2,178	98.00	Porous Pavers
	4,098	98.00	Weighted Average
	4,098		100.00% Impervious Area

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

Subcatchment 14S: Pr Pavers



Summary for Pond 6P: SR#1

Inflow Area = 6,716 sf, 85.29% Impervious, Inflow Depth > 6.05" for 25-Year event
Inflow = 1.02 cfs @ 12.07 hrs, Volume= 3,389 cf
Outflow = 0.61 cfs @ 12.16 hrs, Volume= 2,326 cf, Atten= 40%, Lag= 5.7 min
Primary = 0.61 cfs @ 12.16 hrs, Volume= 2,326 cf
Routed to Link 15L : Pr P

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 23.31' @ 12.16 hrs Surf.Area= 2,144 sf Storage= 1,406 cf

Plug-Flow detention time= 181.6 min calculated for 2,325 cf (69% of inflow)
Center-of-Mass det. time= 86.9 min (845.1 - 758.2)

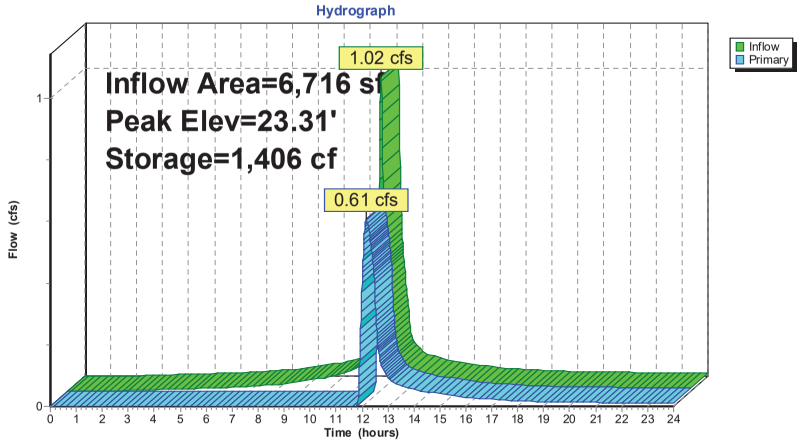
Volume	Invert	Avail.Storage	Storage Description
#1	21.60'	1,565 cf	**Crushed Stone (Prismatic)**Listed below (Recalc) 3,913 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
21.60	0	0	0
21.75	2,144	161	161
23.50	2,144	3,752	3,913

Device	Routing	Invert	Outlet Devices
#1	Primary	22.90'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.61 cfs @ 12.16 hrs HW=23.31' (Free Discharge)
↳**1=Orifice/Grate** (Orifice Controls 0.61 cfs @ 3.10 fps)

Pond 6P: SR#1



Stage-Area-Storage for Pond 6P: SR#1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
21.60	0	0	22.66	2,144	845
21.62	286	1	22.68	2,144	862
21.64	572	5	22.70	2,144	879
21.66	858	10	22.72	2,144	896
21.68	1,143	18	22.74	2,144	913
21.70	1,429	29	22.76	2,144	930
21.72	1,715	41	22.78	2,144	948
21.74	**2,001**	56	22.80	2,144	965
21.76	**2,144**	73	22.82	2,144	982
21.78	2,144	90	22.84	2,144	999
21.80	2,144	107	22.86	2,144	1,016
21.82	2,144	124	22.88	2,144	1,033
21.84	2,144	142	22.90	2,144	1,051
21.86	2,144	159	22.92	2,144	1,068
21.88	2,144	176	22.94	2,144	1,085
21.90	2,144	193	22.96	2,144	1,102
21.92	2,144	210	22.98	2,144	1,119
21.94	2,144	227	23.00	2,144	1,136
21.96	2,144	244	23.02	2,144	1,153
21.98	2,144	262	23.04	2,144	1,171
22.00	2,144	279	23.06	2,144	1,188
22.02	2,144	296	23.08	2,144	1,205
22.04	2,144	313	23.10	2,144	1,222
22.06	2,144	330	23.12	2,144	1,239
22.08	2,144	347	23.14	2,144	1,256
22.10	2,144	364	23.16	2,144	1,274
22.12	2,144	382	23.18	2,144	1,291
22.14	2,144	399	23.20	2,144	1,308
22.16	2,144	416	23.22	2,144	1,325
22.18	2,144	433	23.24	2,144	1,342
22.20	2,144	450	23.26	2,144	1,359
22.22	2,144	467	23.28	2,144	1,376
22.24	2,144	485	23.30	2,144	1,394
22.26	2,144	502	23.32	2,144	1,411
22.28	2,144	519	23.34	2,144	1,428
22.30	2,144	536	23.36	2,144	1,445
22.32	2,144	553	23.38	2,144	1,462
22.34	2,144	570	23.40	2,144	1,479
22.36	2,144	587	23.42	2,144	1,497
22.38	2,144	605	23.44	2,144	1,514
22.40	2,144	622	23.46	2,144	1,531
22.42	2,144	639	23.48	2,144	1,548
22.44	2,144	656	23.50	2,144	**1,565**
22.46	2,144	673			
22.48	2,144	690			
22.50	2,144	708			
22.52	2,144	725			
22.54	2,144	742			
22.56	2,144	759			
22.58	2,144	776			
22.60	2,144	793			
22.62	2,144	810			
22.64	2,144	828			

Summary for Pond 7P: SR#2

[92] Warning: Device #1 is above defined storage

Inflow Area = 4,098 sf,100.00% Impervious, Inflow Depth > 6.37" for 25-Year event
Inflow = 0.63 cfs @ 12.07 hrs, Volume= 2,174 cf
Outflow = 0.63 cfs @ 12.07 hrs, Volume= 1,303 cf, Atten= 0%, Lag= 0.3 min
Primary = 0.63 cfs @ 12.07 hrs, Volume= 1,303 cf
Routed to Link 15L : Pr P

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 22.80' @ 11.99 hrs Surf.Area= 4,356 sf Storage= 871 cf

Plug-Flow detention time= 219.0 min calculated for 1,303 cf (60% of inflow)
Center-of-Mass det. time= 107.0 min (849.3 - 742.4)

Volume	Invert	Avail.Storage	Storage Description
#1	21.50'	871 cf	**Stone Reservoir (Prismatic)**Listed below (Recalc) 2,178 cf Overall x 40.0% Voids
#2	22.50'	0 cf	**Paver (Prismatic)**Listed below (Recalc) 653 cf Overall x 0.0% Voids
		871 cf	Total Available Storage

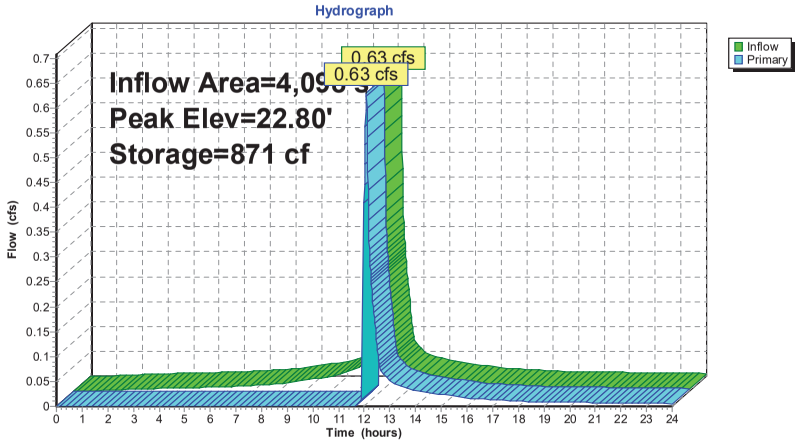
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
21.50	2,178	0	0
22.50	2,178	2,178	2,178

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.50	2,178	0	0
22.80	2,178	653	653

Device	Routing	Invert	Outlet Devices
#0	Primary	22.80'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	22.80'	**14.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 2.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.00 cfs @ 12.07 hrs HW=22.80' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: SR#2



Stage-Area-Storage for Pond 7P: SR#2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
21.50	0	22.03	462	22.56	871
21.51	9	22.04	470	22.57	871
21.52	17	22.05	479	22.58	871
21.53	26	22.06	488	22.59	871
21.54	35	22.07	497	22.60	871
21.55	44	22.08	505	22.61	871
21.56	52	22.09	514	22.62	871
21.57	61	22.10	523	22.63	871
21.58	70	22.11	531	22.64	871
21.59	78	22.12	540	22.65	871
21.60	87	22.13	549	22.66	871
21.61	96	22.14	558	22.67	871
21.62	105	22.15	566	22.68	871
21.63	113	22.16	575	22.69	871
21.64	122	22.17	584	22.70	871
21.65	131	22.18	592	22.71	871
21.66	139	22.19	601	22.72	871
21.67	148	22.20	610	22.73	871
21.68	157	22.21	619	22.74	871
21.69	166	22.22	627	22.75	871
21.70	174	22.23	636	22.76	871
21.71	183	22.24	645	22.77	871
21.72	192	22.25	653	22.78	871
21.73	200	22.26	662	22.79	871
21.74	209	22.27	671	22.80	871
21.75	218	22.28	680	22.81	871
21.76	227	22.29	688		
21.77	235	22.30	697		
21.78	244	22.31	706		
21.79	253	22.32	714		
21.80	261	22.33	723		
21.81	270	22.34	732		
21.82	279	22.35	741		
21.83	287	22.36	749		
21.84	296	22.37	758		
21.85	305	22.38	767		
21.86	314	22.39	775		
21.87	322	22.40	784		
21.88	331	22.41	793		
21.89	340	22.42	802		
21.90	348	22.43	810		
21.91	357	22.44	819		
21.92	366	22.45	828		
21.93	375	22.46	836		
21.94	383	22.47	845		
21.95	392	22.48	854		
21.96	401	22.49	862		
21.97	409	22.50	**871**		
21.98	418	22.51	871		
21.99	427	22.52	871		
22.00	436	22.53	871		
22.01	444	22.54	871		
22.02	453	22.55	871		

Summary for Pond 9P: Inf#1

Inflow Area = 9,314 sf,100.00% Impervious, Inflow Depth > 6.37" for 25-Year event
Inflow = 1.44 cfs @ 12.07 hrs, Volume= 4,942 cf
Outflow = 1.02 cfs @ 12.14 hrs, Volume= 4,068 cf, Atten= 29%, Lag= 4.4 min
Primary = 1.02 cfs @ 12.14 hrs, Volume= 4,068 cf
Routed to Link 15L : Pr P

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 20.56' @ 12.14 hrs Surf.Area= 384 sf Storage= 1,415 cf

Plug-Flow detention time= 142.9 min calculated for 4,066 cf (82% of inflow)
Center-of-Mass det. time= 71.1 min (813.5 - 742.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	16.25'	0 cf	**24.00'W x 16.00'L x 5.17'H Field A** 1,984 cf Overall - 1,984 cf Embedded = 0 cf x 40.0% Voids
#2A	16.25'	1,477 cf	**retain_it retain_it 4.5'** x 6 Inside #1 Inside= 84.0"W x 54.0"H => 32.64 sf x 8.00'L = 261.1 cf Outside= 96.0"W x 62.0"H => 41.33 sf x 8.00'L = 330.7 cf 3 Rows adjusted for 89.7 cf perimeter wall
		1,477 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	18.85'	**5.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	20.50'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.00 cfs @ 12.14 hrs HW=20.56' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.80 cfs @ 5.90 fps)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.19 cfs @ 0.80 fps)

Pond 9P: Inf#1 - Chamber Wizard Field A

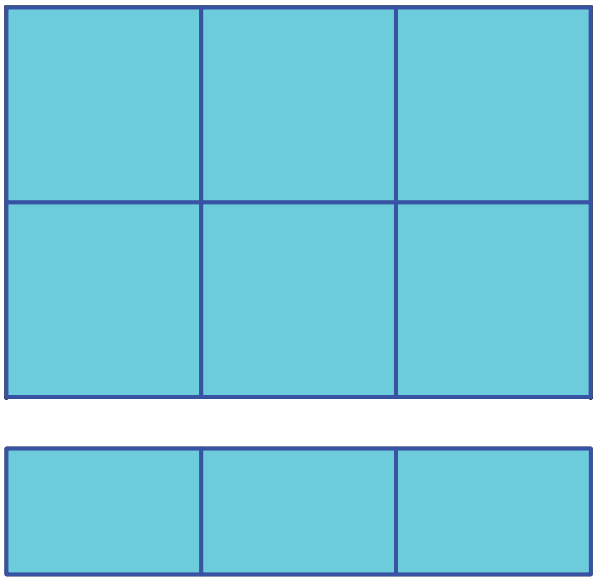
Chamber Model = retain_it retain_it 4.5' (retain-it®)
Inside= 84.0"W x 54.0"H => 32.64 sf x 8.00'L = 261.1 cf
Outside= 96.0"W x 62.0"H => 41.33 sf x 8.00'L = 330.7 cf
3 Rows adjusted for 89.7 cf perimeter wall

2 Chambers/Row x 8.00' Long = 16.00' Row Length
3 Rows x 96.0" Wide = 24.00' Base Width
62.0" Chamber Height = 5.17' Field Height

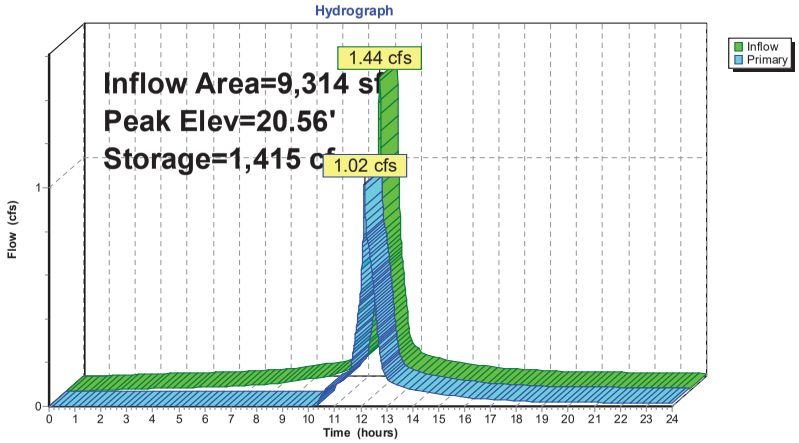
9.0 cf Sidewall x 2 x 2 + 9.0 cf Endwall x 3 x 2 = 89.7 cf Perimeter Wall
6 Chambers x 261.1 cf - 89.7 cf Perimeter wall = 1,477.0 cf Chamber Storage
6 Chambers x 330.7 cf = 1,984.0 cf Displacement

Chamber Storage = 1,477.0 cf = 0.034 af
Overall Storage Efficiency = 74.4%
Overall System Size = 16.00' x 24.00' x 5.17'

6 Chambers
73.5 cy Field



Pond 9P: Inf#1



Stage-Area-Storage for Pond 9P: Inf#1

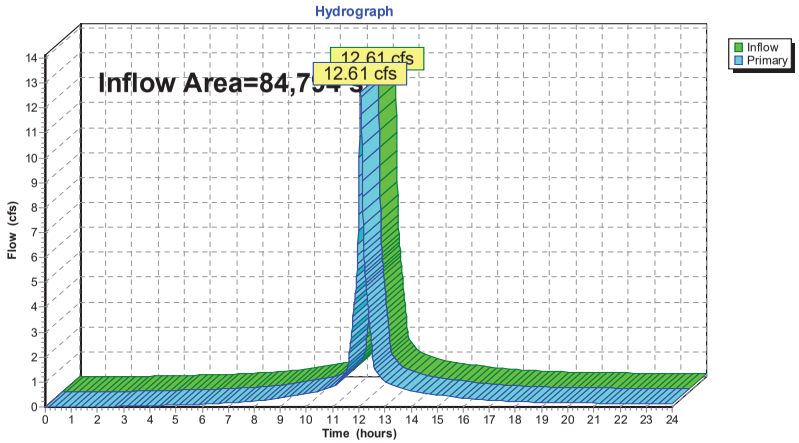
Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
16.25	0	18.90	870
16.30	16	18.95	886
16.35	33	19.00	903
16.40	49	19.05	919
16.45	66	19.10	935
16.50	82	19.15	952
16.55	98	19.20	968
16.60	115	19.25	985
16.65	131	19.30	1,001
16.70	148	19.35	1,017
16.75	164	19.40	1,034
16.80	181	19.45	1,050
16.85	197	19.50	1,067
16.90	213	19.55	1,083
16.95	230	19.60	1,100
17.00	246	19.65	1,116
17.05	263	19.70	1,132
17.10	279	19.75	1,149
17.15	295	19.80	1,165
17.20	312	19.85	1,182
17.25	328	19.90	1,198
17.30	345	19.95	1,214
17.35	361	20.00	1,231
17.40	377	20.05	1,247
17.45	394	20.10	1,264
17.50	410	20.15	1,280
17.55	427	20.20	1,296
17.60	443	20.25	1,313
17.65	460	20.30	1,329
17.70	476	20.35	1,346
17.75	492	20.40	1,362
17.80	509	20.45	1,379
17.85	525	20.50	1,395
17.90	542	20.55	1,411
17.95	558	20.60	1,428
18.00	574	20.65	1,444
18.05	591	20.70	1,461
18.10	607	20.75	1,477
18.15	624	20.80	1,477
18.20	640	20.85	1,477
18.25	656	20.90	1,477
18.30	673	20.95	1,477
18.35	689	21.00	1,477
18.40	706	21.05	1,477
18.45	722	21.10	1,477
18.50	738	21.15	1,477
18.55	755	21.20	1,477
18.60	771	21.25	1,477
18.65	788	21.30	1,477
18.70	804	21.35	1,477
18.75	821	21.40	**1,477**
18.80	837		
18.85	853		

Summary for Link 1L: Ex Outfall

Inflow Area = 84,794 sf, 73.68% Impervious, Inflow Depth > 5.81" for 25-Year event
Inflow = 12.61 cfs @ 12.07 hrs, Volume= 41,082 cf
Primary = 12.61 cfs @ 12.07 hrs, Volume= 41,082 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 1L: Ex Outfall

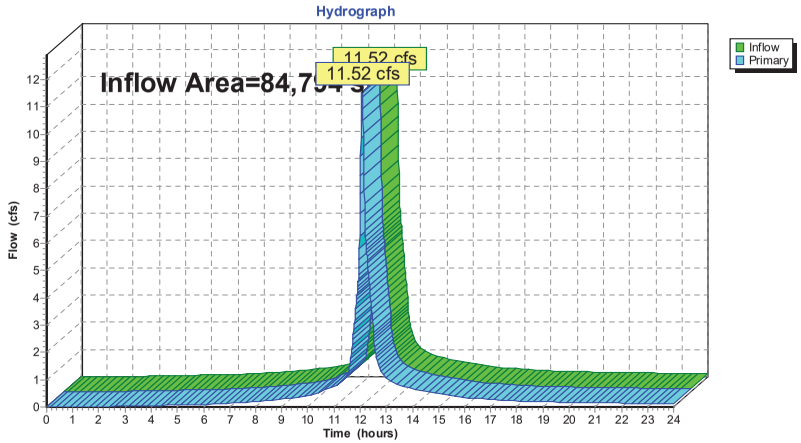


Summary for Link 13L: Pr Out

Inflow Area = 84,794 sf, 80.78% Impervious, Inflow Depth > 5.57" for 25-Year event
Inflow = 11.52 cfs @ 12.07 hrs, Volume= 39,327 cf
Primary = 11.52 cfs @ 12.07 hrs, Volume= 39,327 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 13L: Pr Out

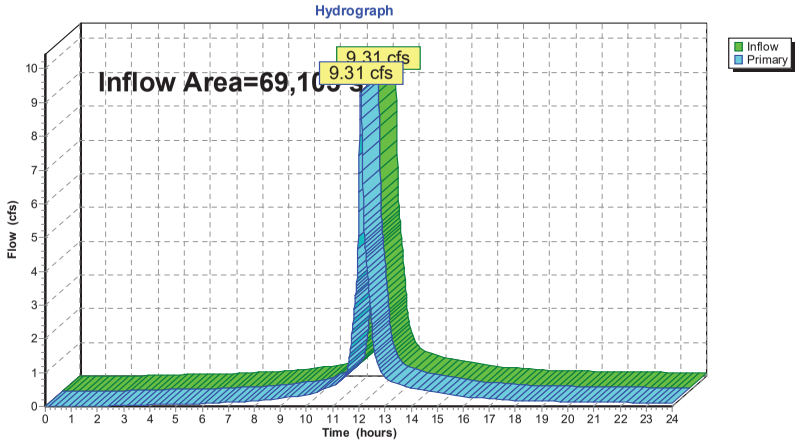


Summary for Link 15L: Pr P

Inflow Area = 69,103 sf, 88.32% Impervious, Inflow Depth > 5.63" for 25-Year event
Inflow = 9.31 cfs @ 12.07 hrs, Volume= 32,431 cf
Primary = 9.31 cfs @ 12.07 hrs, Volume= 32,431 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 13L : Pr Out

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 15L: Pr P



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Ex Bedford Runoff Area=22,313 sf 49.28% Impervious Runoff Depth>6.16"
Tc=5.0 min CN=88.87 Runoff=3.63 cfs 11,450 cf

Subcatchment 3S: Ex Prospect Runoff Area=62,481 sf 82.40% Impervious Runoff Depth>6.86"
Tc=5.0 min CN=94.83 Runoff=10.75 cfs 35,712 cf

Subcatchment 10S: Pr Bedford Runoff Area=15,691 sf 47.56% Impervious Runoff Depth>6.12"
Tc=5.0 min CN=88.56 Runoff=2.54 cfs 8,004 cf

Subcatchment 11S: Pr Prospect Bypass Runoff Area=48,975 sf 85.54% Impervious Runoff Depth>6.93"
Tc=5.0 min CN=95.40 Runoff=8.45 cfs 28,267 cf

Subcatchment 12S: Pr Turf Runoff Area=6,716 sf 85.29% Impervious Runoff Depth>6.92"
Tc=5.0 min CN=95.35 Runoff=1.16 cfs 3,873 cf

Subcatchment 13S: Pr Inf#1 Runoff Area=9,314 sf 100.00% Impervious Runoff Depth>7.24"
Tc=5.0 min CN=98.00 Runoff=1.63 cfs 5,616 cf

Subcatchment 14S: Pr Pavers Runoff Area=4,098 sf 100.00% Impervious Runoff Depth>7.24"
Tc=5.0 min CN=98.00 Runoff=0.72 cfs 2,471 cf

Pond 6P: SR#1 Peak Elev=23.40' Storage=1,484 cf Inflow=1.16 cfs 3,873 cf
Outflow=0.67 cfs 2,810 cf

Pond 7P: SR#2 Peak Elev=22.80' Storage=871 cf Inflow=0.72 cfs 2,471 cf
Outflow=0.71 cfs 1,600 cf

Pond 9P: Inf#1 Peak Elev=20.63' Storage=1,437 cf Inflow=1.63 cfs 5,616 cf
Outflow=1.42 cfs 4,741 cf

Link 1L: Ex Outfall Inflow=14.38 cfs 47,162 cf
Primary=14.38 cfs 47,162 cf

Link 13L: Pr Out Inflow=13.08 cfs 45,421 cf
Primary=13.08 cfs 45,421 cf

Link 15L: Pr P Inflow=10.61 cfs 37,417 cf
Primary=10.61 cfs 37,417 cf

Total Runoff Area = 169,588 sf Runoff Volume = 95,394 cf Average Runoff Depth = 6.75"
22.77% Pervious = 38,614 sf 77.23% Impervious = 130,974 sf

Appendix F

DCIA Tracking Spreadsheet

Directly Connected Impervious Area Tracking Worksheet
City of Stamford Drainage Manual

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

Part 1: General Information

Project Name	Walton Place
Project Address	1 Walton Place & 80 Prospect Street
Project Applicant	Walton Place LLC & 80 Prospect Street Partners LLC
Date of Submittal	7-19-2022
Tax Account Number	002-6688, 002-6689 & 004-1560

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?	84,796	ft^2
3. What is the total area of land disturbance for this project?	67,347	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 current ***DCIA*** for the site?	62,478	ft^2
6. Will the proposed development increase ***DCIA*** (without consideration of proposed stormwater management)? (Yes/No)	Yes	
7. What is the proposed-development ***total impervious area*** for the site?	68,496	ft^2

Part 3: Water Quality Target Total

Does Standard 1 apply based on information above?	**Yes**	
Water Quality Volume (WQV)	**5490.5**	ft^3
Standard 1 requirement	**Retain 1/2 WQV on-site**	
Required retention volume	**2745.3**	ft^3
Provided retention volume for proposed development	2,775.0	ft^3

Part 4: Proposed DCIA Tracking

Pre-development ***total impervious area***	62,478	ft^2
Current ***DCIA***	**62,478**	ft^2
Proposed-development ***total impervious area***	**68,496**	ft^2
Proposed-development ***DCIA*** (after stormwater management)	49,356	ft^2
Net change in ***DCIA*** from pre-development to proposed-development	**-13,122**	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 pre-development to post-development		ft^2

Certification Statement

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

PROFESSIONAL ENGINEER
BRET D. HOLZWARTH
No. 27812
LICENSED
STATE OF CONNECTICUT

Engineer's Signature _____ Date 7/19/2022 Engineer's Seal _____

Appendix G

Operation and Maintenance Agreement

Block _____

AGREEMENT COVENANT

AGREEMENT made this _____ by and between Walton Place LLC & 80 Prospect Street Partners LLC 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 a 15-story residential building, townhouses, and associated hardscape & landscaping improvements 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 infiltration systems 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

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: Walton Place

Project Address 1 Walton Place & 80 Prospect Street, Stamford, CT

Property Owner(s) Walton Place LLC & 80 Prospect Street Partners LLC

Tax Account Number(s) 002-6688, 002-6689, & 004-1560

Engineer's Signature _____ Date: 07/19/2022

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
	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.
	Show and label any Conservation Easement Areas
	Show and label Connecticut Coastal Jurisdiction Line (CJL)
	Show and label existing steep slopes (25% and greater)

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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

	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

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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
N/A	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

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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)

	Applying under "Lite" Stormwater Management: Skip to Section N

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

N/A		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
N/A		Inlet analysis
N/A		Gutter flow (Site by site basis as requested by Engineering Bureau)
	✔	Storm sewers and culverts (velocities, capacity, hydraulics)
N/A		Hydraulic grade line required when pipe is flowing at full capacity 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
N/A		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)

N/A	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 NOT 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