SITE ENGINEERING REPORT

0, 1, 4, 6, 10, 17, 19, 25, 29, 31 & 33, 37 & 41 Division Street
&
Discontinued portion of Division Street
&
0, 75, 79, 99, 100, 101, 102, 107, 113 Clinton Avenue
&
Parcel N-1 Washington Boulevard
Stamford, CT

Prepared For
CP VIII 100 Clinton, LLC

Prepared by
Redniss & Mead, Inc.
22 First Street
Stamford, CT
(203) 327-0500

Issued on
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Revised on
September 28, 2022

Ted Milone, P.E., LEED AP BD+C
CT #22563

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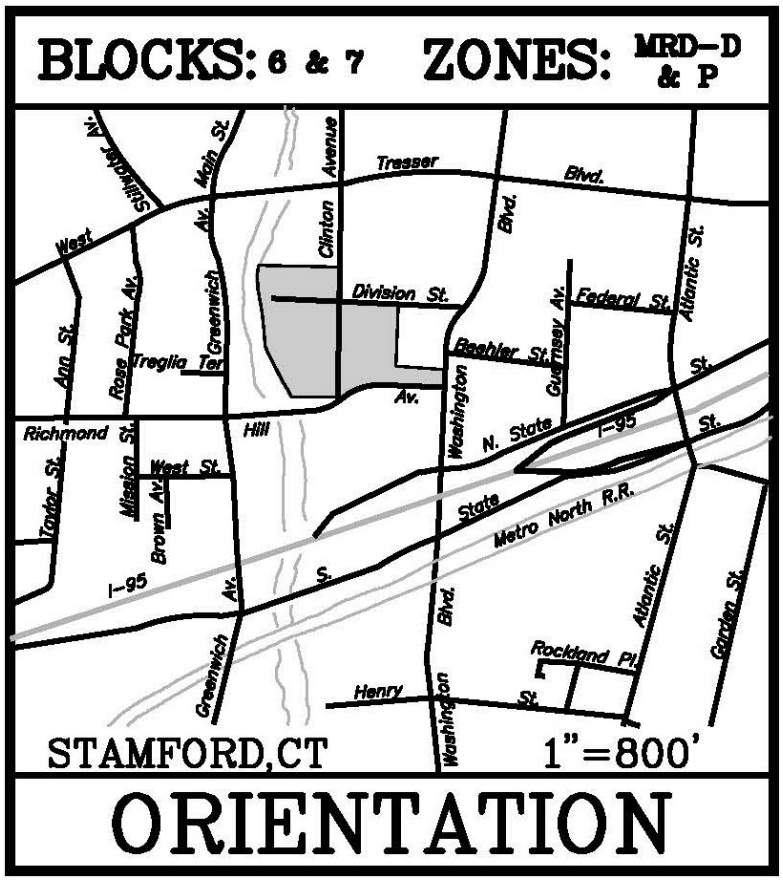
Appendices


BLOCKS: 6 & 7
ZONES: MRD–D & P
Stillwater Av.
Main St.
Avenue
Tresser
Blvd.
West
Av.
Clinton
Blvd.
Atlantic St.
Division St.
Federal St.
Ann St.
Rose Park Av.
Greenwich
Treglia Ter
Bechler St.
Gurnsey Av.
Av.
Washington
St.
Richmond St.
Hill
N. State
I–95
St.
Taylor St.
Mission St.
West St.
Brown Av.
State
Metro North R.R.
I–95
Av.
S.
Blvd.
Atlantic St.
Garden St.
Rockland Pl.
Greenwich
Henry
St.
Washington
STAMFORD, CT
1"=800'
ORIENTATION

Narrative

Project Description:

CP VIII 100 Clinton, LLC, is seeking Final Site Plan approval and Coastal Site Plan Review in conjunction with two proposed developments referenced as Block A and Block B on Clinton Avenue in Stamford, Connecticut. Block A is development located at 29, 31, 31, 33, 37, 41 Division Street; 0, 100, 102, Clinton Avenue; and Parcel N-1 Washington Boulevard. Block B is development located at 0, 1, 4, 6, 10, 17, 19, 25, 33, 37 & 41 Division Street; 75, 79, 99, 101, 102, 107, and 113 Clinton Avenue. Both parcels total 4.6± acres of land comprising of approximately 57,123 square feet[1] for Block A and approximately 133,121 square feet[2] for Block B. Properties will be consolidated prior to a Building Permit request. The properties exist within the MRD-D and P Zoning Districts in Stamford's Downtown Neighborhood. This Site Engineering Report reflects the Site Civil Plan set (SE-1 through SE-9), dated September 28, 2022, prepared by Redniss & Mead, Inc.

The properties do not lie within a drinking water supply watershed. Block A does not lie within the FEMA flood hazard area and the majority of Block B lies within FEMA Zone X, but a portion along the Rippowam River lies within the FEMA flood hazard AE elevation 11 flood zone as shown on the Flood Insurance Rate Map 09001C0516G, effective May 24, 2018. Reference is also made to "Letter of Map Revision Based on Fill Determination Document (Removal)", LOMR-F Case No. 19-01-0070A, dated November 30, 2018. The properties will be served by public water and sewers.

Block B was created based on a partnership between the City of Stamford and RBS Americas Property Corp. (RBS) (Zoning Board Approval 216-26). The partnership included both parties funding the relocating of the City drainage system on the discontinued portion of Division Street. The pipe was moved to the north onto property formally owned by RBS which was then granted to 69 Clinton Avenue. The pipe relocation and new 42" outfall was designed to account for the future full development of Block A and B without any stormwater mitigation. Refer to 'Site Engineering Report' issued on April 11, 2016 and 'Division Street Pipe Relocation & 69 Clinton Avenue Drainage Report' issued on February 19, 2016 with last issuance on April 4, 2018, prepared by this office found in Appendix I.

Existing Conditions:

Historically Block A and B were developed with residential dwelling units, driveways and other hardscape consisting of approximately 1.00 acres of impervious coverage on Block A and 1.80 acres on Block B as depicted on the Existing Drainage Basin Map found in Appendix A. Currently, a large parking lot encompasses the vast majority of Block A with approximately 1.24 acres of impervious coverage since the removal of the residential dwellings. Block B is currently undeveloped with no impervious coverage. Slopes across the properties vary from 0.5 to 25%.

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[1] This excludes parcel N-1 which consists of approximately 9,708 square feet and will be landscaped and maintained as "park."

[2] This includes the portion of Division Street between Clinton Avenue to the mean high water line for the River Walk extension consisting of 13,738± square feet.

2016 Zoning Board Approval 216-26:

In August 2016, the City of Stamford and RBS filed Zoning Board applications and obtained Special Exception, General Development Plan and Coastal Site Plan Review (CSPR) for the development of two residential buildings consisting of 456 units and 567 parking spaces. June 2018, CSPR 1052 and EPB Permit No 1811 were obtained to allow for the Division Street pipe relocation associated with the discontinuance of Division Street. As part of the RBS partnership with the City of Stamford the relocated Division Street outfall was increased in size from 36" RCP to 42" RCP which accommodate for the future full buildout of Block A and B.

Drainage Patterns & Conveyance Systems

Block A flows mainly northwest towards the intersection of Clinton Avenue and Division Street with a small portion of the southern property sheet flowing onto Richmond Hill Avenue. Block B flows either towards the east onto Clinton Avenue or west into the Rippowan River. Block A grades ranging from elevation 14 to 29 (NAVD-88) and Block B flows mainly in a westerly direction towards the Rippowan River from elevation 5.5 to 18 with a small portion of the property flowing towards Clinton Avenue.

There is an existing 36" RCP drainage system flowing west on Division Street, connected to a junction box at the intersection of Clinton Avenue and Division Street. Flow from the junction box flows north towards another junction box located along the southern portion of 69 Clinton Avenue. At this junction box the runoff flows towards the west discharging into the Rippowan River via a 42" RCP. The outlet protection was designed in conformance to the ConnDOT Manual. Refer to the Clinton Avenue Storm Sewer Exhibit in Appendix B.

Soils

The USDA Natural Resources Conservation Service's Web Soil Survey indicates the soils on the subject parcel to be primarily Urban Land within Hydrologic Soils Group D. Soil testing, consisting of a series of deep test pits and saturated hydraulic conductivity tests, was performed on-site to identify any sub-grade restrictive soil conditions and to confirm the hydrologic soil classification. A total of eleven (11) deep test pits were performed. Mottling was encountered as high as 34" below grade in test pit #9 and ledge was encountered in that same test pit at 54" below grade. No other test pits contained ledge and none of the eleven contained standing ground water. On site investigation within the development envelope determined the soils are consistent with the USDA Web Soil Survey.

Saturated hydraulic conductivity was not performed on Block A based on soils encountered including tight soils and ledge. It was determined infiltration practices are not viable on this property. Saturated hydraulic conductivity testing was performed on Block B using a Turf-Tec Infiltrometer in three locations within the footprint of the proposed infiltration system. Observed infiltration rates ranged from a 7±" drop in 1 hour to 1-11/16" inches in 1 hour. Test pit and saturated hydraulic 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 redevelopment of the Block A and B to construct two new residential apartment complexes. The development of Block A will consist of a seven (7) story building, with 176 residential units and 164 parking spaces. The parking structure will include one (1) at grade and one (1) level above. The development of Block B will consist of a seven (7) story building, with 295 residential units and 289 parking spaces. There are two (2) levels of parking with one (1) at grade and one (1) above grade. Both parking structures will be wrapped with residential units, two (2) levels of residential units at Block B and one (1) level at Block A, and capped with a podium and more residential units on the third floor. Four (4) additional levels of apartments will be located above the podium; however, most of the dwelling units will be located along the Clinton Avenue frontage. On the Mill River Façade of Block B, three (3) outdoor terraces will separate finger-like projections of residential units. Similarly on Block A, a large outdoor terrace will be located in the middle of the U-shaped building and will be landscaped.

The proposed improvements result in an increase in impervious coverage of 28,578 *SQ.FT.* when compared to historic conditions and an increase of 6,730 *SQ.FT* from the 2016 Zoning Board approval. This report focuses on three points of concern which includes runoff towards Point of Concern 1 (the 42" RCP outfall located at 69 Clinton Avenue Richmond Hill Avenue), Point of Concern 2 (direct discharge to the Rippowan River), and Point of Concern 3 (the storm sewer located within Richmond Hill Avenue) as depicted on the Proposed Drainage Basin Exhibit in Appendix B.

Stormwater Management System

The design approach chosen is to provide the required water quality volume (WQV) via infiltration BMP's. This has been accomplished by proposing stormwater management systems including a lined filtration system beneath the Block A building and an infiltration system underneath the Block B building (see "Proposed Stormwater Treatment Practices").

Methodology & General Design Criteria

The peak rates of runoff have been mitigated to the greatest extent practical (see "Hydrologic Analysis of Peak Rates of Runoff"). The stormwater mitigation systems have been designed for Type III, 24-hour storm events with storm rainfall amounts, and distributions 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 more than 1/2 an acre of disturbance within 500 feet of tidal wetlands making it ineligible for a drainage exemption and required to therefore must comply with Standards 1 through 5 of the Stamford Drainage Manual. To comply with Standard 1, this project must retain 50% of the 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 property lines, constraining flood hazard area requirements, easements, and preserving existing vegetation. LID techniques include development within areas already developed, 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.

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 (WQV) via subsurface filtration and infiltration systems. The WQV requirement was to provide 50% of the WQV since the existing site coverage exceeds 40% DCIA for both blocks. These systems are described in detail below. Reference is also made to Appendix D which includes information on water quality volumes, BMP volume, and system drawdown time.

- **Filt#1** is located in below the garage slab of the Block A building. It will consist of two (2) rows of seventeen (17) 4'x8'x2' concrete galleries atop a 2' thick sand/stone filter and will collect and treat stormwater runoff generated from 50,072± SQ.FT. of the Block A building roof. The BMP is designed to treat 2,650± CU.FT. of stormwater through the sand and stone media. Due to the nature of the existing soils infiltration was not recommended to treat the runoff. The filtration system will exfiltrate through a 4" pipe. The water quality volume is the volume below the high overflow outlet.
- **Infil #1** shall be located below the garage slab of the Block B building. It will consist of twenty-seven (27) 8'x8'x5' Retain-It units with 6" of clean washed crushed stone on all sides and below. The system will collect, treat, and infiltrate stormwater runoff generated from the roof of the building and the rooftop courtyards totaling 85,898± SQ.FT. of impervious coverage. It shall be noted that portions of the rooftop courtyard are to be constructed as a green roof with 12"+ of soil. The BMP is designed to store 7,982± CU.FT. of stormwater.
- **Block A** will also contain a green roof system of approximately 4,000± SQ.FT. with a minimum soil depth of 8" providing 792 cubic feet of storage.
- **Block B** will also contain a green roof system of approximately 2,800± SQ.FT. with a minimum soil depth of 8" and 1,000± SQ.FT. with a minimum soil depth of 4" providing a total of 653 cubic feet of storage.

Summaries of the Water Quality Volumes required and provided by the stormwater practices are provided in the tables below:

Block A Standard I (Retention and Treatment) Calculations *				
Drainage Area (Subcatchment ID)	Total Area (SF)	Impervious Area (SF)	WQV Required (CF)	WQV Provided (CF)
Block A (14S)	50,072	50,072	1,982.02	2,650 CF
Clinton Ave. East Basin (15S)	5,805	3,498	143.27	-
Richmond Hill Ave. East Basin (20S)	10,954	4,373	186.81	-
Block A Green Roof	-	-	-	792 CF
TOTAL	66,831	57,943	2,312.10	**3,442 CF**
* WQV requirement for Block A is reduced by 50% because the existing site exceeds 40% DCIA				

Block B Standard I (Retention and Treatment) Calculations *				
Drainage Area (Subcatchment ID)	Total Area (SF)	Impervious Area (SF)	WQV Required (CF)	WQV Provided (CF)
Clinton Avenue North Basin (16S)	4,361	1,735	74.15	-
Clinton Avenue West Basin (17S)	2,446	2,446	96.82	-
Block B (18S)	85,898	85,898	3,400.13	-
Rippowam River Basin (19S)	40,185	2,576	180.32	-
Richmond Hill Ave. West Basin (21S)	231	231	9.14	7,982 CF
Block B Green Roof	-	-	-	653 CF
TOTAL	133,121	92,886	3,760.56	**8,635 CF**
* WQV requirement for Block B is reduced by 50% because the existing site exceeds 40% DCIA				

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. 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.

42" RCP Outfall Peak Flow (cfs) (Point of Concern 1)			
Return Period (years)	Existing (Link 1L)	2016 Approved (Link 5L)	Proposed (Link 9L)
1	**6.11**	**9.65**	**6.76**
2	**7.70**	**11.75**	**8.99**
5	**10.30**	**15.20**	**12.06**
10	**12.43**	**18.03**	**17.59**
25	**15.34**	**21.94**	**22.03**
50	**17.52**	**24.87**	**25.01**

Overland Flow Directly Tributary to Rippowam River Peak Flow (cfs) (Point of Concern 2)			
Return Period (years)	Existing (Link 2L)	2016 Approved (Link 6L)	Proposed (Link 10L)
1	**4.57**	**1.53**	**1.43**
2	**5.88**	**2.15**	**2.00**
5	**8.02**	**3.24**	**2.97**
10	**9.78**	**4.16**	**3.80**
25	**12.19**	**5.46**	**4.95**
50	**13.98**	**6.43**	**5.81**

Richmond Hill Avenue Storm Sewer Peak Flow (cfs) (Point of Concern 3)			
Return Period (years)	Existing (Link 3L)	2016 Approved (Link 7L)	Proposed (Link 11L)
1	**0.54**	**0.55**	**0.54**
2	**0.71**	**0.73**	**0.71**
5	**0.99**	**1.02**	**0.99**
10	**1.23**	**1.27**	**1.23**
25	**1.55**	**1.60**	**1.55**
50	**1.79**	**1.86**	**1.78**

Combined Site Peak Flow (cfs) (Points of Concern 1, 2, and 3)			
Return Period (years)	Existing (Link 4L)	2016 Approved (Link 8L)	Proposed (Link 12L)
1	**11.22**	**11.73**	**8.52**
2	**14.28**	**14.63**	**11.62**
5	**19.31**	**19.46**	**15.38**
10	**23.43**	**23.46**	**22.35**
25	**29.08**	**29.00**	**28.46**
50	**33.29**	**33.15**	**32.54**

Hydraulic Grade Line (HGL) Analysis:

HGL analysis was performed comparing the future development HGL analysis within the 'Division Street Pipe Relocation & 69 Clinton Avenue' Drainage Report last issued on April 4, 2018 (Appendix I), with the current development. It should be noted the 2018 model has been updated to include as-built conditions of the installed piping network, using current standard 50-year rainfall data instead of the previously studied 25-year storm event. The HGL analysis software used to prepare the report in Appendix G is Stormwater Studio 2021 software Version 3.0.0.29. A summary of the HGL analysis is tabulated below:

Clinton Avenue HGL Analysis - NOAA Atlas 14 50-Year Storm Event					
Structure	Elevation (ft)	As-Built HGL with Approved Areas & Updated Rainfall Data (ft)	Proposed HGL (ft)	Change (ft)	Proposed Freeboard (ft)
JB#1	**13.65**	**7.80**	**8.21**	**0.41**	**5.44**
JB#2A	**13.38**	**8.42**	**9.03**	**0.61**	**4.35**
JB#2A	**13.10**	**8.25**	**8.65**	**0.40**	**4.45**
JB#3	**12.30**	**9.61**	**9.63**	**0.02**	**2.67**
JB#4	**12.82**	**9.74**	**9.79**	**0.05**	**3.03**
CB#2	**12.33**	**10.32**	**10.34**	**0.02**	**1.99**
MH#2	**13.30**	**10.05**	**9.65**	**-0.40**	**3.65**

The HGL analysis demonstrates the runoff within the piping network is self-contained with at least 2-feet of freeboard. As such, the proposed development will not result in adverse impacts to the City-owned infrastructure within Clinton Avenue and on property of 69 Clinton Avenue.

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 is to retain 50% of the WQV. The proposed Stormwater Treatment Practice (subsurface infiltration and filtration) treats more than the required WQV, however, infiltration within Block A is limited due to restrictive soil conditions and treatment practices include filtration through sand/stone media. It shall be noted, however, that the infiltration system in Block B has been sized to infiltrate more than 100% of the water quality volume for that site. See "Proposed Conditions" for a detailed description of the systems, their required WQV's, and provided storage volumes.
B. This report along with the soils data information found on Sheet SE-5 provides documentation on the site constraints and how water quality treatment is provided.
C. The proposed development has been designed within areas previously developed and avoids encroachments within the FEMA 100-year flood hazard area. To prevent impacts to the Rippowam River and City owned drainage systems a detailed Sediment & Erosion Control Plan was prepared.
D. Noted
E. The project does not propose parking lots open to air. Any interior drains located within the parking garage shall pass through an oil/grit separator prior to discharging into the sanitary sewers. Interior systems shall be designed by the project Plumbing Engineer.
F. The proposed development is proposed within areas previously developed which will limit the amount of clearing that will be necessary to employ the development. Improvements along the Rippowan River have been avoided minimizing the potential impacts to the river. The use of non-structural practices with the Downtown Stamford is limited.

Standard 2: Peak Flow Control

A. Stream Channel Protection was provided February 2020 with the installation of the 42" outfall as part of the Division Street pipe relocation. The design considered the full buildout of Block A and Block B. The outfall was designed pursuant ConnDOT Drainage Manual. Refer to 2018 Drainage Report for further information. For the above stated reason, a waiver is being requested with respect to Standard 2: Peak Flow Control of the Stormwater Drainage Manual.
B. Conveyance Protection is designed to adequately pass flows leading to, from and through it up to and including the 50-year design storm event as required in section 3 of the Stormwater Drainage Manual. Refer to the HydroCAD model found in Appendix E.
C. Peak Rates Control at the Rippowan River are controlled from the 1-year, 2-year, 5-year, 10-year, 25-year and 50-year, 24-hour storm events. Reference is made to the HydroCAD report found in Appendix E.
D. Emergency Outlets have been sized to pass the post-development peak runoff from the 100-year, 24-hour storm.

E. A hydraulic grade line analysis was performed with a starting tailwater of 5.5 (NAVD-88) at the 42" outfall. The analysis demonstrates the system is self-contained and the proposed filtration and infiltration systems are free flowing.

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 point, hay bale inlet/outlet 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 (EPB). A draft maintenance agreement has been prepared and is included in Appendix F.
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.

Standard 5: Stormwater Management Report

A. This document and its associated appendices serve as the required Stormwater Management Report.
B. 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.

Conclusion:

As noted above, 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.

Sanitary Sewer Summary

The sanitary flow from Block A and Block B buildings will be collected and piped directly 30" RCP sanitary main within Clinton Avenue. The 30" main flows northerly into a 36" main within Tresser Boulevard flowing east. Drains, if any, located within the covered portion of the parking structure will be collected via a series of drains and piped into an oil/grit separator prior to discharging into the sanitary sewer system. Little or no flow will be generated from these drains. Refer to the Sanitary Infrastructure Exhibit in Appendix F for surrounding sanitary sewer system along with the proposed connection points.

Historically, multi-family homes were located on the individual properties that comprise Block A and Block B. Using Health Department records and CT Health Code guidelines, the historical flow from the buildings we were able to research are estimated to be 14,700 GPD (assuming 150 GPD per bedroom). Using a peak factor of 4, the peak sewage flow is 58,800 GPD (0.091 cfs).

Under proposed conditions for Block A and Block B, the developer is seeking permission to construct 471 units consisting of 51 studio apartments, 216 one-bedroom apartments, 203 two-bedroom apartments, and 1 three-bedroom apartment. The development will also include 4 dog washing stations (two per building). Under the CT Health Code guidelines, the proposal would result in a total average daily sewage flow of 102,400 GPD (this assumes 150 GPD per bedroom, or two people per room totaling 101,400 GPD and 250 GPD per dog washing station totaling 1,000 GPD). Using a peak factor of 4, the peak sewage flow is 409,600 GPD (0.634 cfs). Please refer to Appendix F for attached calculations.

Redniss & Mead retained New England Pipe Cleaning Company (NEPCCO) to perform a sewer flow-monitoring program of the 36" pipe at the intersection of Tresser Boulevard and Atlantic Street (EX. MH "F" depicted on the Sanitary Sewer Connection Exhibit). The metering program was conducted for a one-month period from July 25, 2006, to August 29, 2006. The City Engineer approved the metering location. The metering report shows that the existing sanitary sewer system in the area has ample capacity to accept discharge from the proposed project.

Based on the NEPCCo Metering Report, the peak existing sewage flow in the 36" pipe is 5,141 GPM (11.45 cfs, 8/27/06). This does not include the now existing sewage flow from the 75 Tresser Boulevard development of 61,500 GPD (0.095 cfs), or the proposed sewage flow from the Atlantic Station Phase I and Phase II sewage flow of 145,284 GPD (0.225 cfs), True North sewage flow of 57,300 GPD (0.089cfs), or Lennar sewage flow of 107,264 GPD (0.166 cfs) or Zoning Board approval # 220-43 (677/707 Washington Boulevard) seqgae flow of 85,688 GPD (0.133 cfs). These projects have a total combined average daily flow of 457,036 GPD (0.707 cfs). Using a peak factor of 4, the peak rate of sewage flow of these projects is 1,828,144 GPD (2.83 cfs). Therefore, under existing conditions, the peak rate of existing sewage flow including previously constructed or approved projects is assumed to be 5,459 GPM (14.28 cfs). Under proposed conditions, total peak flow into the 36" pipe is 5,743 GPM (14.91 cfs). The existing 36" RCP sanitary main with a maximum pipe capacity of 32.54 cfs will be at 45.8% of its capacity.

On March 10, 2016, a visual observation was made on the 30" pipe and there was minimal evidence of flow in the sewer line (approximately 1"). Based on meeting with the WPCA the flow has been significantly reduced in this system due to rerouting of sewage tributary from Richmond Hill Avenue. Below find observed flows:

Time	Depth of Flow at MH#1	Depth of Flow at MH#2
9:10	0.75 in	1.00 in
9:30	1.00 in	1.15 in
3:20	1.00 in	0.75 in
3:50	1.25 in	1.50 in

The maximum capacity of the 30" sanitary pipe is 10.46 cfs. The proposed development using a peak factor of 4 the total proposed peak flow is 0.634 cfs. The proposed peak sewage flow from the development represents 6.1% of the maximum capacity of the main. The Clinton Avenue city owned sewer system has more than adequate capacity to accommodate the proposed development.

Based on the above information, the sanitary sewer system has sufficient capacity to accommodate the proposed development, and with proper implementation of the design drawings, the proposed development will not adversely impact the existing sanitary sewer system.

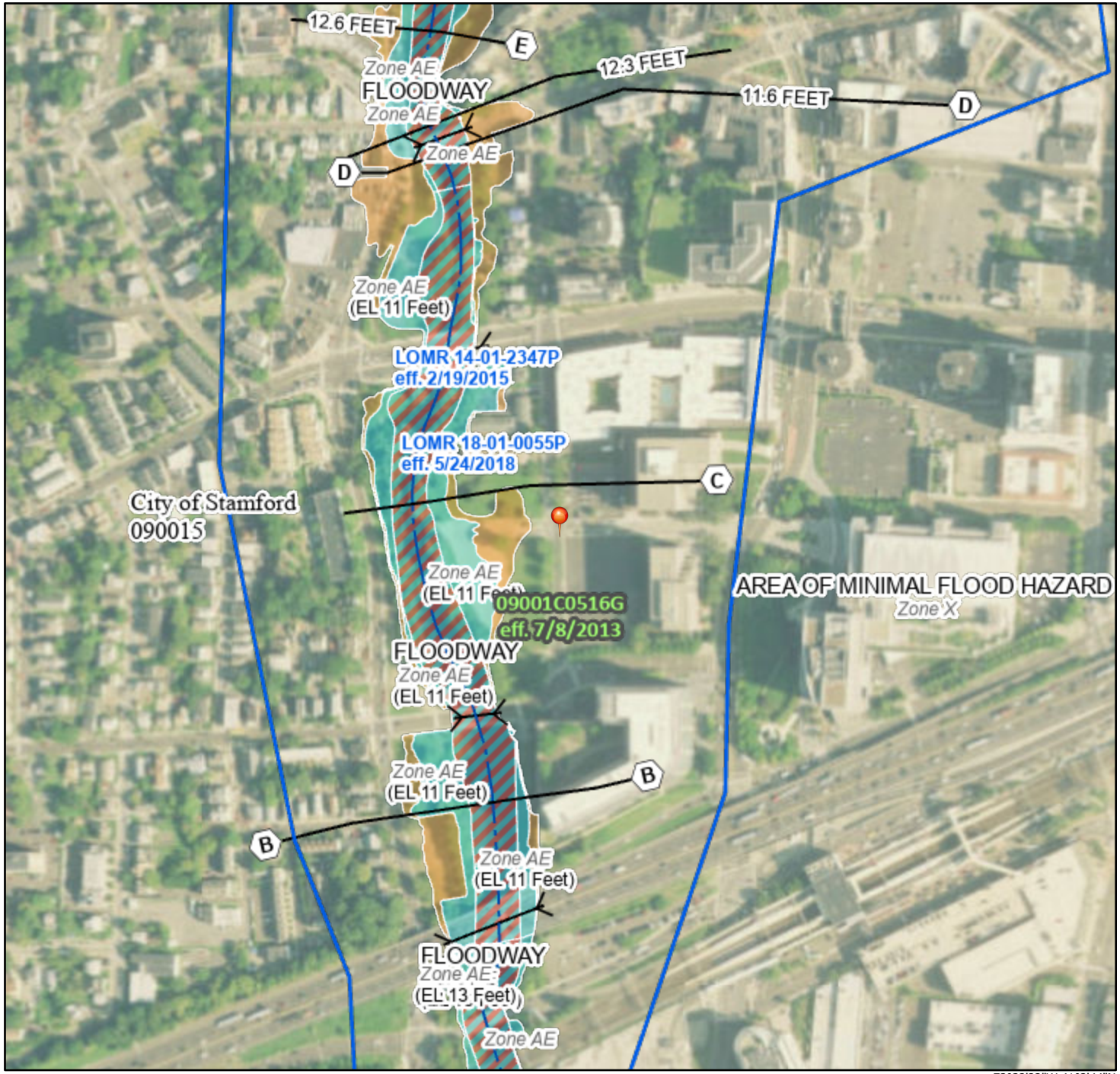
Appendix A

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

National Flood Hazard Layer FIRMette

FEMA

73°32'59"W 41°3'11"N



73°32'22"W 41°2'44"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 / B / 17.5 Cross Sections with 1% Annual Chance / 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

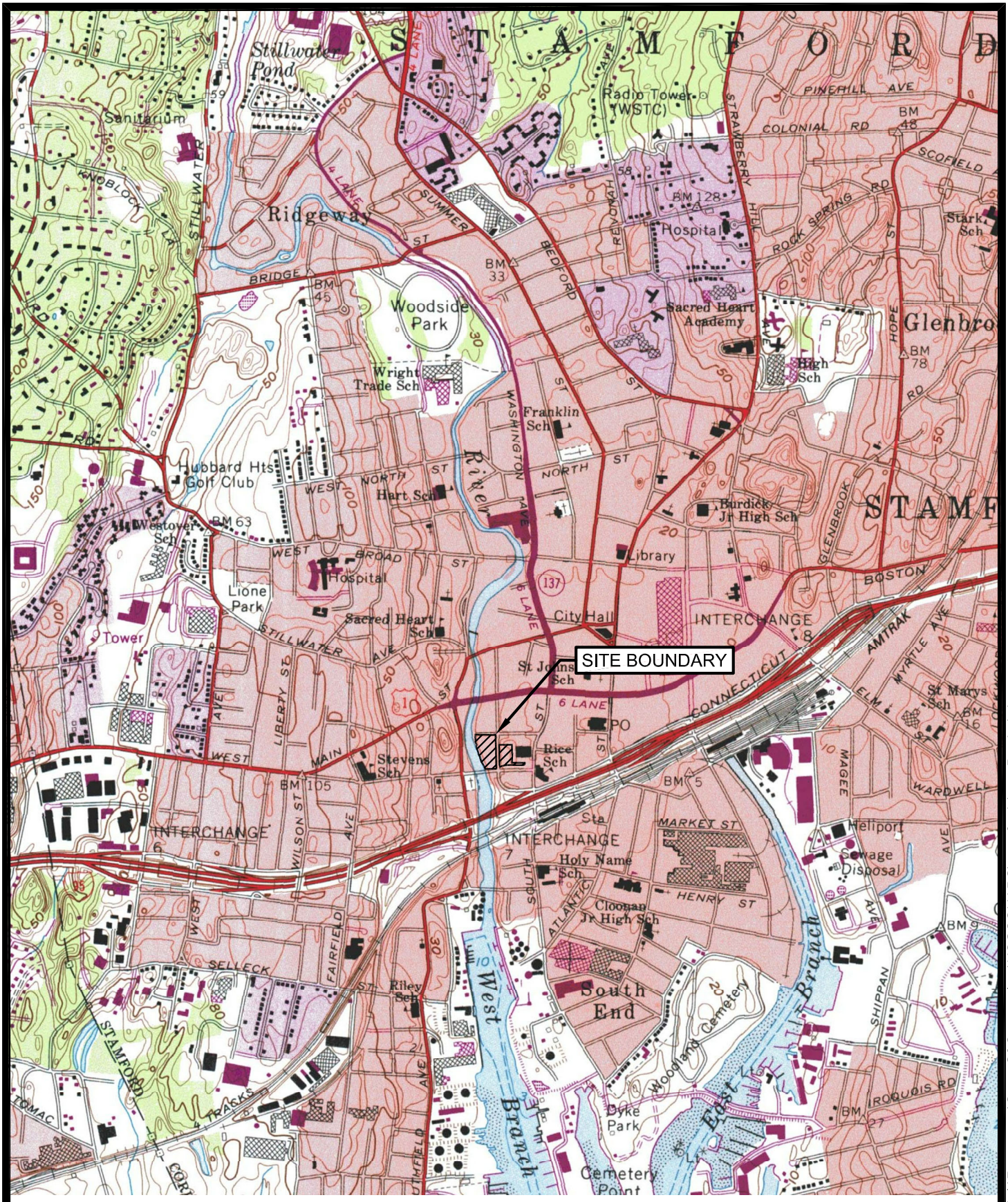
N

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 8/25/2022 at 9:02 AM 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 QUADRANGLE MAP

NAME: STAMFORD NO.:113

100 CLINTON AVENUE, STAMFORD, CT

COMM. NO.: 6685 DATE: 09/12/2022 SCALE: 1"=2,000'

REDNISS & MEAD

8/25/2022 10:03 AM I:\Resources\State Of Connecticut\USGSQUADS\stamford (new Border).dwg

NOAA Atlas 14, Volume 10, Version 3
Location name: Stamford, Connecticut, USA*
Latitude: 41.0494°, Longitude: -73.5446°
Elevation: 13.26 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** (0.281-0.465)	**0.425** (0.327-0.542)	**0.524** (0.402-0.671)	**0.605** (0.462-0.779)	**0.718** (0.531-0.954)	**0.803** (0.582-1.09)	**0.891** (0.628-1.24)	**0.987** (0.663-1.40)	**1.12** (0.726-1.64)	**1.23** (0.778-1.83)
10-min	**0.517** (0.398-0.659)	**0.602** (0.463-0.768)	**0.741** (0.569-0.948)	**0.857** (0.654-1.10)	**1.02** (0.752-1.35)	**1.14** (0.825-1.54)	**1.26** (0.889-1.76)	**1.40** (0.940-1.99)	**1.59** (1.03-2.33)	**1.74** (1.10-2.59)
15-min	**0.608** (0.468-0.775)	**0.708** (0.545-0.904)	**0.872** (0.669-1.12)	**1.01** (0.770-1.30)	**1.20** (0.885-1.59)	**1.34** (0.970-1.81)	**1.49** (1.05-2.07)	**1.65** (1.11-2.34)	**1.87** (1.21-2.74)	**2.05** (1.30-3.05)
30-min	**0.850** (0.655-1.08)	**0.992** (0.763-1.26)	**1.22** (0.938-1.57)	**1.42** (1.08-1.82)	**1.68** (1.24-2.23)	**1.88** (1.36-2.54)	**2.09** (1.47-2.90)	**2.31** (1.55-3.28)	**2.61** (1.69-3.82)	**2.85** (1.80-4.24)
60-min	**1.09** (0.841-1.39)	**1.27** (0.981-1.63)	**1.57** (1.21-2.01)	**1.82** (1.39-2.34)	**2.16** (1.60-2.87)	**2.42** (1.75-3.27)	**2.69** (1.89-3.73)	**2.97** (1.99-4.22)	**3.35** (2.17-4.90)	**3.64** (2.31-5.43)
2-hr	**1.42** (1.10-1.79)	**1.67** (1.29-2.11)	**2.07** (1.60-2.64)	**2.41** (1.85-3.08)	**2.88** (2.14-3.81)	**3.24** (2.36-4.35)	**3.60** (2.55-4.98)	**4.00** (2.70-5.65)	**4.55** (2.96-6.62)	**4.99** (3.17-7.39)
3-hr	**1.63** (1.27-2.06)	**1.93** (1.50-2.44)	**2.42** (1.87-3.06)	**2.82** (2.17-3.59)	**3.37** (2.52-4.45)	**3.79** (2.78-5.09)	**4.23** (3.01-5.84)	**4.71** (3.18-6.63)	**5.39** (3.51-7.81)	**5.94** (3.78-8.75)
6-hr	**2.06** (1.61-2.58)	**2.44** (1.91-3.07)	**3.08** (2.40-3.88)	**3.61** (2.80-4.56)	**4.34** (3.26-5.69)	**4.88** (3.60-6.52)	**5.46** (3.91-7.51)	**6.11** (4.14-8.54)	**7.03** (4.59-10.1)	**7.80** (4.97-11.4)
12-hr	**2.53** (1.99-3.15)	**3.03** (2.38-3.77)	**3.84** (3.01-4.80)	**4.51** (3.52-5.66)	**5.44** (4.11-7.09)	**6.13** (4.54-8.14)	**6.86** (4.95-9.41)	**7.71** (5.25-10.7)	**8.93** (5.85-12.8)	**9.95** (6.37-14.5)
24-hr	**2.96** (2.35-3.66)	**3.58** (2.84-4.43)	**4.60** (3.63-5.71)	**5.44** (4.27-6.79)	**6.60** (5.02-8.57)	**7.47** (5.57-9.87)	**8.39** (6.09-11.5)	**9.48** (6.47-13.1)	**11.1** (7.29-15.8)	**12.5** (7.99-18.0)
2-day	**3.31** (2.64-4.06)	**4.07** (3.24-5.00)	**5.31** (4.22-6.55)	**6.34** (5.01-7.86)	**7.76** (5.95-10.0)	**8.82** (6.63-11.6)	**9.95** (7.29-13.6)	**11.3** (7.76-15.5)	**13.4** (8.84-18.9)	**15.2** (9.78-21.8)
3-day	**3.57** (2.86-4.37)	**4.40** (3.53-5.40)	**5.77** (4.60-7.09)	**6.90** (5.47-8.51)	**8.45** (6.50-10.9)	**9.60** (7.24-12.6)	**10.8** (7.97-14.8)	**12.4** (8.49-16.9)	**14.7** (9.67-20.6)	**16.6** (10.7-23.8)
4-day	**3.83** (3.07-4.67)	**4.70** (3.77-5.75)	**6.13** (4.91-7.52)	**7.32** (5.82-9.02)	**8.96** (6.91-11.5)	**10.2** (7.69-13.3)	**11.5** (8.45-15.6)	**13.1** (8.99-17.8)	**15.5** (10.2-21.7)	**17.5** (11.3-25.0)
7-day	**4.56** (3.68-5.54)	**5.51** (4.44-6.70)	**7.06** (5.68-8.61)	**8.35** (6.67-10.2)	**10.1** (7.83-12.9)	**11.5** (8.68-14.9)	**12.9** (9.48-17.3)	**14.5** (10.0-19.7)	**17.0** (11.3-23.8)	**19.2** (12.4-27.2)
10-day	**5.28** (4.28-6.39)	**6.28** (5.08-7.60)	**7.91** (6.38-9.61)	**9.27** (7.43-11.3)	**11.1** (8.63-14.1)	**12.5** (9.51-16.2)	**14.0** (10.3-18.7)	**15.7** (10.9-21.2)	**18.2** (12.1-25.3)	**20.3** (13.2-28.7)
20-day	**7.44** (6.07-8.94)	**8.56** (6.98-10.3)	**10.4** (8.44-12.5)	**11.9** (9.62-14.4)	**14.0** (10.9-17.5)	**15.6** (11.9-19.9)	**17.2** (12.7-22.6)	**19.0** (13.2-25.4)	**21.4** (14.3-29.5)	**23.3** (15.2-32.7)
30-day	**9.23** (7.56-11.0)	**10.4** (8.54-12.5)	**12.4** (10.1-14.9)	**14.1** (11.4-17.0)	**16.3** (12.7-20.3)	**18.1** (13.7-22.8)	**19.8** (14.5-25.7)	**21.6** (15.1-28.8)	**24.0** (16.1-32.9)	**25.8** (16.8-36.0)
45-day	**11.4** (9.40-13.6)	**12.8** (10.5-15.2)	**14.9** (12.2-17.8)	**16.7** (13.6-20.1)	**19.2** (15.0-23.7)	**21.1** (16.1-26.4)	**22.9** (16.8-29.5)	**24.8** (17.4-32.8)	**27.1** (18.2-37.0)	**28.8** (18.8-40.0)
60-day	**13.3** (10.9-15.8)	**14.7** (12.1-17.5)	**17.0** (13.9-20.2)	**18.9** (15.4-22.6)	**21.5** (16.8-26.4)	**23.5** (18.0-29.4)	**25.5** (18.7-32.6)	**27.4** (19.2-36.2)	**29.7** (20.0-40.4)	**31.4** (20.5-43.5)

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

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

Please refer to NOAA Atlas 14 document for more information.

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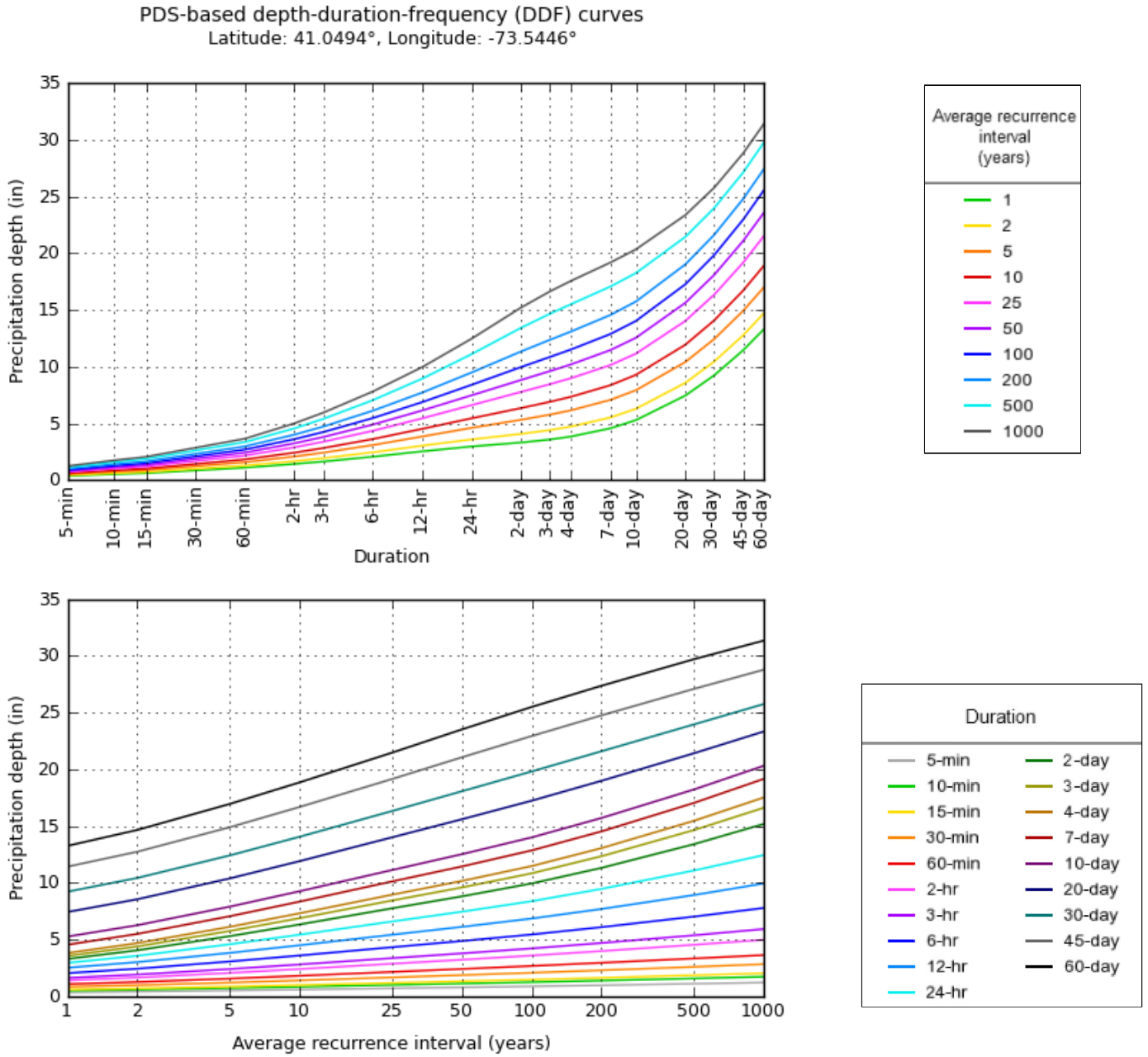
PF graphical



NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Thu Aug 25 14:04:56 2022

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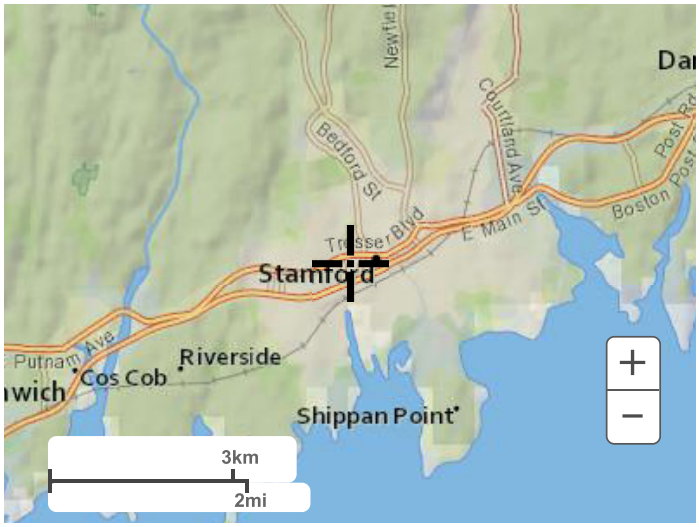
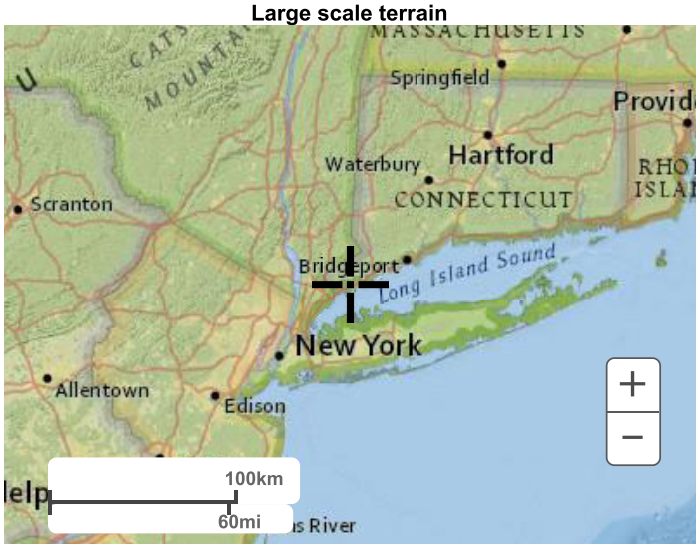
Maps & aerials

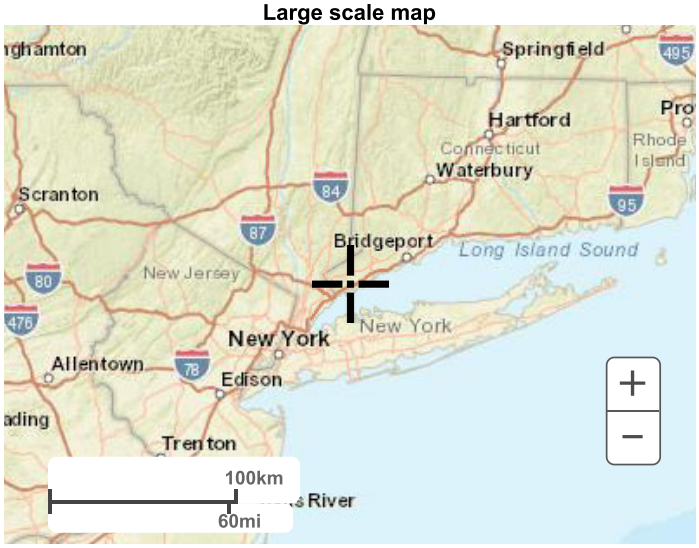
Small scale terrain



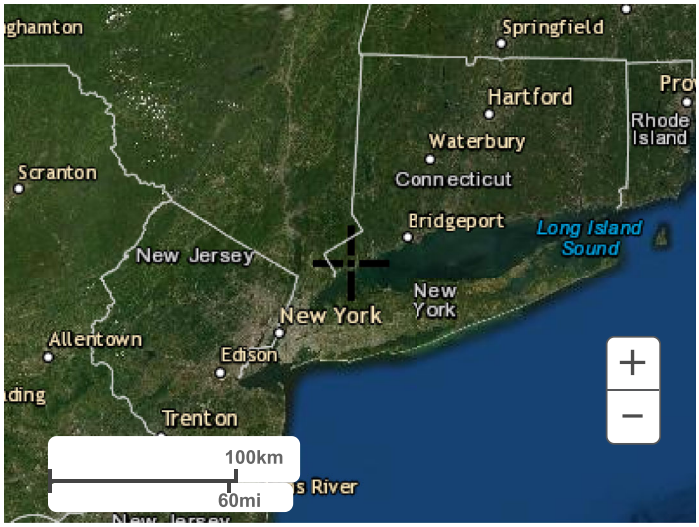
Large scale terrain



Large scale map



Large scale aerial



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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

United States Department of Agriculture

NRCS

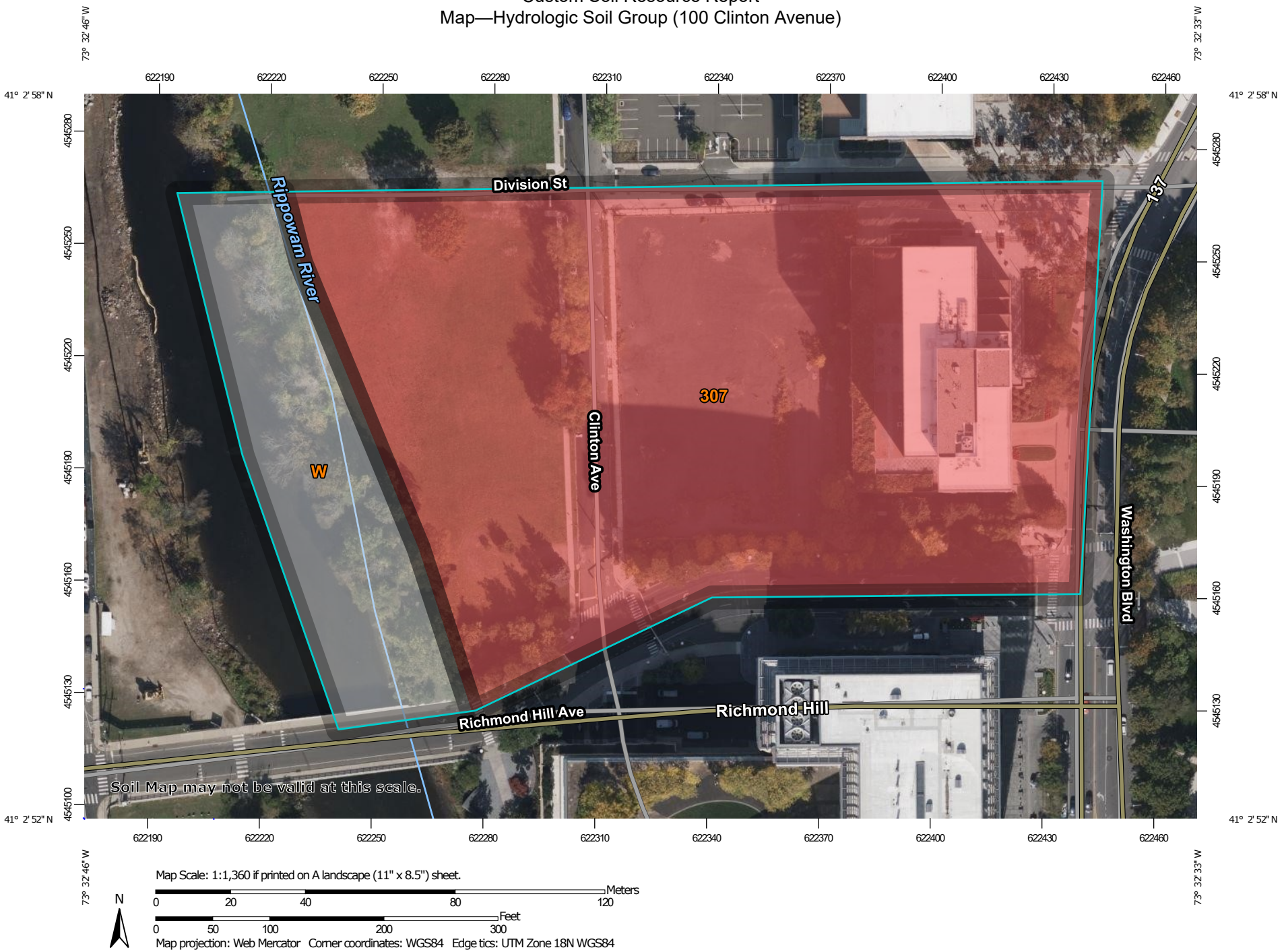
Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for State of Connecticut

August 25, 2022

Custom Soil Resource Report
Map—Hydrologic Soil Group (100 Clinton Avenue)



Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
307	Urban land	5.7	82.3%
W	Water	1.2	17.7%
Totals for Area of Interest		**6.9**	**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.

State of Connecticut

307—Urban land

Map Unit Setting

National map unit symbol: 9lmh
Elevation: 0 to 2,000 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Typical profile

H - 0 to 6 inches: material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Udorthents, wet substratum

Percent of map unit: 10 percent
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Unnamed, undisturbed soils

Percent of map unit: 10 percent
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Table—Hydrologic Soil Group (100 Clinton Avenue)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
307	Urban land	D	5.7	82.3%
W	Water		1.2	17.7%
Totals for Area of Interest			**6.9**	**100.0%**

Rating Options—Hydrologic Soil Group (100 Clinton Avenue)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix B

Existing On-Site Drainage Basin Exhibit
2016 Zoning Board Approved On-Site Drainage Basin Exhibit
Proposed On-Site Drainage Basin Exhibit
Existing Off-Site Drainage Basin Exhibit
Proposed Off-Site Drainage Basin Exhibit
Clinton Avenue Storm Sewer Exhibit

POINT OF CONCERN 1

EXISTING CLINTON AVENUE WEST BASIN (SUBCATCHMENT 2)
47,337 SF
CN: 91.99
TC: 5 MIN

POINT OF CONCERN 2

EXISTING RIPPOWAM RIVER BASIN (SUBCATCHMENT 3)
84,872 SF
CN: 89.94
TC: 5 MIN

EXISTING CLINTON AVENUE EAST BASIN (SUBCATCHMENT 1)
56,506 SF
CN: 92.55
TC: 5 MIN

EXISTING RICHMOND HILL AVENUE BASIN (SUBCATCHMENT 4)
10,325 SF
CN: 87.43
TC: 5 MIN

EXISTING RICHMOND HILL AVENUE WEST BASIN (SUBCATCHMENT 5)
912 SF
CN: 84.28
TC: 5 MIN

POINT OF CONCERN 3

CLINTON AVENUE

DIVISION STREET

PRESENT WASHINGTON BOULEVARD

RICHMOND HILL AVENUE

RIPPOWAM RIVER (FLOW) EBB (TIDAL) FLOOD

NOTE: LIMIT OF IMPERVIOUS AREAS DEPICTED WITHIN THE CLINTON AVENUE EAST, CLINTON AVENUE WEST, AND RIPPOWAM RIVER BASINS HAS BEEN TRANSCRIBED FROM HISTORICAL TAX ASSESSOR MAPS, AERIAL IMAGERY, AND GIS DATA.

EXISTING DRAINAGE BASIN EXHIBIT

100 CLINTON AVENUE
STAMFORD, CT

NORTH - CCS - NAD '27'

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:
7258	09/16/2022
	SCALE: 1" = 60'

9/16/2022 2:32 PM H:\Jobfiles2\7000\7200\7258\DWG\7258 Master DBs.DWG

POINT OF CONCERN 1

2016 ZB APPROVED CLINTON AVENUE NORTH BASIN (SUBCATCHMENT 8)
2,419 SF
CN: 84.99
TC: 5 MIN

2016 ZB APPROVED CLINTON AVENUE EAST BASIN (SUBCATCHMENT 7)
5,817 SF
CN: 92.90
TC: 5 MIN

2016 ZB APPROVED BLOCK B INFIL BASIN (SUBCATCHMENT 10)
81,572 SF
CN: 98
TC: 5 MIN

POINT OF CONCERN 2

2016 ZB APPROVED BLOCK A BASIN (SUBCATCHMENT 6)
49,654 SF
CN: 98
TC: 5 MIN

2016 ZB APPROVED CLINTON AVENUE WEST BASIN (SUBCATCHMENT 9)
3,406 SF
CN: 98
TC: 5 MIN

2016 ZB APPROVED RIPPOWAM RIVER BASIN (SUBCATCHMENT 11)
45,370 SF
CN: 80.09
TC: 5 MIN

2016 ZB APPROVED RICHMOND HILL AVENUE EAST BASIN (SUBCATCHMENT 12)
11,360 SF
CN: 86.75
TC: 5 MIN

2016 ZB APPROVED RICHMOND HILL AVENUE WEST BASIN (SUBCATCHMENT 13)
354 SF
CN: 87.78
TC: 5 MIN

POINT OF CONCERN 3

DIVISION STREET

CLINTON AVENUE

PRESENT WASHINGTON BOULEVARD

RICHMOND HILL AVENUE

RIPPOWAM RIVER

NOTE: COVERAGE AREAS DEPICTED HEREON REPRESENT THE PROPOSED BUILDINGS AND WALKWAYS THAT WERE APPROVED UNDER THE 2016 PIPE RELOCATION APPLICATION.

2016 ZB APPROVED ON-SITE DRAINAGE BASIN EXHIBIT

100 CLINTON AVENUE
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:
7258	09/16/2022
	SCALE: 1" = 60'

PROPOSED CLINTON AVENUE NORTH BASIN (SUBCATCHMENT 16)
4,361 SF
CN: 87.16
TC: 5 MIN

PROPOSED CLINTON AVENUE EAST BASIN (SUBCATCHMENT 15)
5,805 SF
CN: 90.85
TC: 5 MIN

POINT OF CONCERN 1

PROPOSED BLOCK B INFIL BASIN (SUBCATCHMENT 18)
85,898 SF
CN: 98
TC: 5 MIN

PROPOSED BLOCK A FILTRATION BASIN (SUBCATCHMENT 14)
50,072 SF
CN: 98
TC: 5 MIN

POINT OF CONCERN 2

PROPOSED RIPPOWAM RIVER BASIN (SUBCATCHMENT 19)
40,185 SF
CN: 81.15
TC: 5 MIN

PROPOSED CLINTON AVENUE WEST BASIN (SUBCATCHMENT 17)
2,446 SF
CN: 98
TC: 5 MIN

PROPOSED RICHMOND HILL AVENUE EAST BASIN (SUBCATCHMENT 20)
10,954 SF
CN: 87.19
TC: 5 MIN

PROPOSED RICHMOND HILL AVENUE WEST BASIN (SUBCATCHMENT 21)
231 SF
CN: 98
TC: 5 MIN

POINT OF CONCERN 3

DIVISION STREET

CLINTON AVENUE

PRESENT WASHINGTON BOULEVARD

RICHMOND HILL AVENUE

RIPPOWAM RIVER

PROPOPSED ON-SITE DRAINAGE BASIN EXHIBIT

100 CLINTON AVENUE
STAMFORD, CT

REDNISS & MEAD

LAND SURVEYING
CIVIL ENGINEERING
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PERMITTING

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Tel: 203.327.0500 | Fax: 203.357.1118
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COMM. NO.:	DATE:
7258	09/16/2022
	SCALE: 1" = 60'

PR.JB#3
PR.JB#1
(CONDOS)
OGS#1
JB#1
JB#2A
JB#2
EX.MH#2
O-1
(POINT OF
CONCERN 1)
PR.JB#1
JB#3
JB#4
MH#2
DIVISION STREET
CB#2
EX.CB#2
PR.JB#4
PR.JB#4
PRESENT WASHINGTON BOULEVARD
POINT OF
CONCERN 2
RIPPOWAM RIVER
RICHMOND HILL AVENUE
POINT OF
CONCERN 3
NORTH 42° 04' 00" EAST - 500.00'

EXISTING OFF-SITE DRAINAGE BASIN EXHIBIT

100 CLINTON AVENUE
STAMFORD, CT

NOTE: DRAINAGE BASINS DEPICTED HEREON REPRESENT THE "PROPOSED DRAINAGE BASIN MAP" DATED 03/26/2018 THAT WAS INCLUDED IN THE APPROVED PIPE RELOCATION APPLICATION.

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:
7258	09/16/2022
	SCALE: 1" = 100'

NORTH - CCS - NAD '27

POINT OF CONCERN 1

AS-BUILT CONDO BASIN
18,562 SF
CN: 97.21
TC: 5 MIN

PROPOSED CLINTON AVENUE NORTH BASIN
4,361 SF
CN: 87.16
TC: 5 MIN

DIVISION

PROPOSED BLOCK B INFIL BASIN
85,898 SF
CN: 898
TC: 5 MIN

POINT OF CONCERN 2

PROPOSED BLOCK A DETENTION BASIN
50,072 SF
CN: 98
TC: 5 MIN

CLINTON AVENUE

PROPOSED CB#2 BASIN
10,252 SF
CN: 87.43
TC: 5 MIN

RIPPOWAM RIVER

RICHMOND HILL AVENUE

POINT OF CONCERN 3

NOTE: THE DRAINAGE BASINS DEPICTED HEREON REFLECT THE PROPOSED SITE IMPROVEMENTS AND PROPOSED GRADING. ALL OTHER OFFSITE BASINS WHICH ARE TO REMAIN UNAFFECTED BY THE PROPOSED IMPROVEMENTS HAVE BEEN TRANSFERRED OVER TO THE PROPOSED HYDROCAD AND STORMWATER STUDIO MODELS.

PROPOPSED OFF-SITE DRAINAGE BASIN EXHIBIT

100 CLINTON AVENUE

STAMFORD, CT

REDNISS & MEAD

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7258	09/16/2022
	SCALE: 1" = 80'

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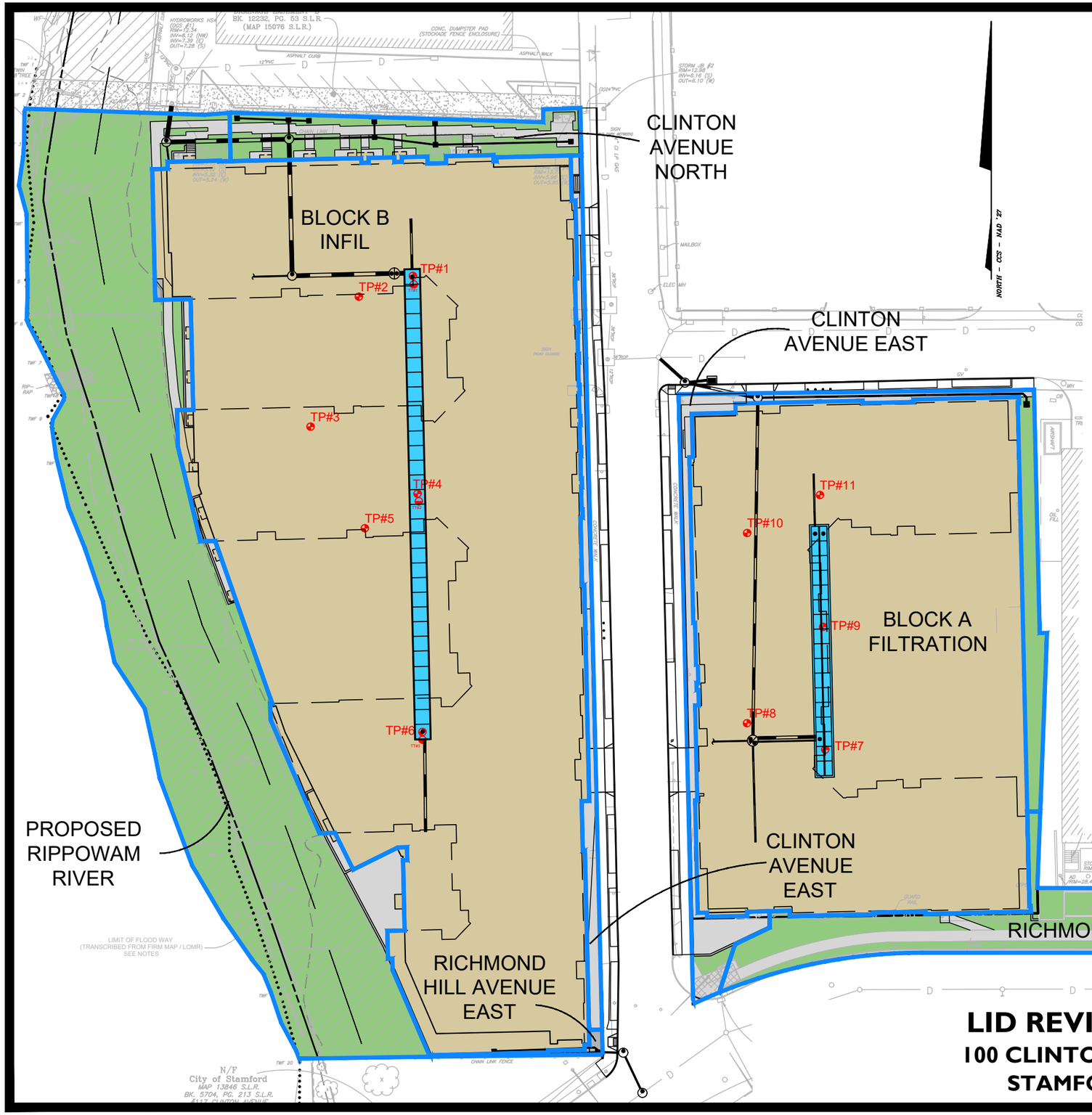
Appendix C

LID Review Map



Block A Standard 1 (Retention and Treatment) Calculations *

Drainage Area (Subcatchment ID)	Total Area (SF)	Impervious Area (SF)	WQV Required (CF)	WQV Provided (CF)
Block A (14S)	50,072	50,072	1,982.02	2,650 CF
Clinton Ave. East Basin (15S)	5,805	3,498	143.27	-
Richmond Hill Ave. East Basin (20S)	10,954	4,373	186.81	-
Block A Green Roof	-	-	-	792 CF
TOTAL	66,831	57,943	2,312.10	**3,442 CF**

* WQV requirement for Block A is reduced by 50% because the existing site exceeds 40% DCIA

Block B Standard 1 (Retention and Treatment) Calculations *

Drainage Area (Subcatchment ID)	Total Area (SF)	Impervious Area (SF)	WQV Required (CF)	WQV Provided (CF)
Clinton Avenue North Basin (16S)	4,361	1,735	74.15	-
Clinton Avenue West Basin (17S)	2,446	2,446	96.82	-
Block B (18S)	85,898	85,898	3,400.13	-
Rippowam River Basin (19S)	40,185	2,576	180.32	-
Richmond Hill Ave. West Basin (21S)	231	231	9.14	7,982 CF
Block B Green Roof	-	-	-	653 CF
TOTAL	133,121	92,886	3,760.56	**8,635 CF**

* WQV requirement for Block B is reduced by 50% because the existing site exceeds 40% DCIA

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

LID REVIEW MAP
100 CLINTON AVENUE
STAMFORD, CT

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COMM. NO.:	DATE:
7258	09/16/2022
	SCALE: 1"=60'

9/16/2022 4:03 PM H:\Jobfiles2\7000\7200\7258\DWG\7258 Master 2 (2022-09-13).dwg

Appendix D

Water Quality Volume Calculations
BMP Volume Calculations
Draw Down Calculations
Hydraulic Grade Line Analysis

Water Quality Volume Calculations

Project: *100 Clinton Avenue*	**Project #:** *7258*	**Date:** *9/16/2022*
Location: *Stamford, CT*	**By:** *SPC*	**Checked:** *TM*

100 Clinton Avenue (Block A) - WQV Calculations

Block A Basin to Filter (14S)		
Area=	1.149	acres
Impervious Area=	1.149	acres
I=	1.000	[a]
R=	0.950	[b]
WQV=	0.091	ac. ft. [c]
WQV Required=	**1982.02**	**ft.^{3} [d]**

Clinton Avenue East Basin (15S)		
Area=	0.133	acres
Impervious Area=	0.080	acres
I=	0.603	[a]
R=	0.592	[b]
WQV=	0.007	ac. ft. [c]
WQV Required=	**143.27**	**ft.^{3} [d]**

Richmond Hill Avenue East Basin (20S)		
Area=	0.251	acres
Impervious Area=	0.100	acres
I=	0.399	[a]
R=	0.409	[b]
WQV=	0.009	ac. ft. [c]
WQV Required=	**186.81**	**ft.^{3} [d]**

[a] I=Percent Impervious Coverage

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

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

[d] Required WQV is reduced to 50% for sites with existing DCIA equal to or exceeding 40% per the City of Stamford Stormwater Drainage Manual

Water Quality Volume Calculations

Project: *100 Clinton Avenue*	**Project #:** *7258*	**Date:** *9/16/2022*
Location: *Stamford, CT*	**By:** *SPC*	**Checked:** *TM*

100 Clinton Avenue (Block A) - WQV Calculations

COMBINED BLOCK A WQV		
Area=	1.534	acres
Impervious Area=	1.330	acres
I=	0.867	[a]
R=	0.830	[b]
WQV=	0.106	ac. ft. [c]
WQV Required=	**2312.09**	**ft.^{3} [d]**
WQV Provided=	**2650.00**	**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] Required WQV is reduced to 50% for sites with existing DCIA equal to or exceeding 40% per the City of Stamford Stormwater Drainage Manual

Water Quality Volume Calculations

Project: *100 Clinton Avenue*	**Project #:** *7258*	**Date:** *9/16/2022*
Location: *Stamford, CT*	**By:** *SPC*	**Checked:** *TM*

100 Clinton Avenue (Block B) - WQV Calculations

Clinton Aveneue North Basin (16S)		
Area=	0.100	acres
Impervious Area=	0.040	acres
I=	0.398	[a]
R=	0.408	[b]
WQV=	0.003	ac. ft. [c]
WQV Required=	**74.15**	**ft.^{3} [d]**

Clinton Avenue West Basin (17S)		
Area=	0.056	acres
Impervious Area=	0.056	acres
I=	1.000	[a]
R=	0.950	[b]
WQV=	0.004	ac. ft. [c]
WQV Required=	**96.82**	**ft.^{3} [d]**

Block B Basin to Infil (18S)		
Area=	1.972	acres
Impervious Area=	1.972	acres
I=	1.000	[a]
R=	0.950	[b]
WQV=	0.156	ac. ft. [c]
WQV Required=	**3400.13**	**ft.^{3} [d]**

[a] I=Percent Impervious Coverage

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

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

[d] Required WQV is reduced to 50% for sites with existing DCIA equal to or exceeding 40% per the City of Stamford Stormwater Drainage Manual

Water Quality Volume Calculations

Project: *100 Clinton Avenue*	**Project #:** *7258*	**Date:** *9/16/2022*
Location: *Stamford, CT*	**By:** *SPC*	**Checked:** *TM*

100 Clinton Avenue (Block B) - WQV Calculations

Rippowam River Basin (19S)		
Area=	0.923	acres
Impervious Area=	0.059	acres
I=	0.064	[a]
R=	0.108	[b]
WQV=	0.008	ac. ft. [c]
WQV Required=	**180.32**	**ft.^{3} [d]**

Richmond Hill Ave West Basin (21S)		
Area=	0.005	acres
Impervious Area=	0.005	acres
I=	1.000	[a]
R=	0.950	[b]
WQV=	0.000	ac. ft. [c]
WQV Required=	**9.14**	**ft.^{3} [d]**

COMBINED BLOCK B WQV		
Area=	3.056	acres
Impervious Area=	2.132	acres
I=	0.698	[a]
R=	0.678	[b]
WQV=	0.173	ac. ft. [c]
WQV Required=	**3760.56**	**ft.^{3} [d]**
WQV Provided=	**7982.00**	**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

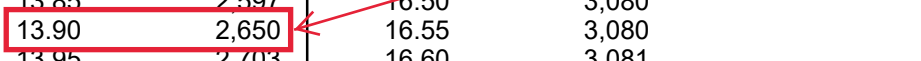
[c] WQV=(1"xRxA)/12; Water Quality Volume, Equation taken from 2004 Connecticut Stormwater Quality Manual section 7.4.1

[d] Required WQV is reduced to 50% for sites with existing DCIA equal to or exceeding 40% per the City of Stamford Stormwater Drainage Manual

Block A WQV

Stage-Area-Storage for Pond 2P: Block A Filtration

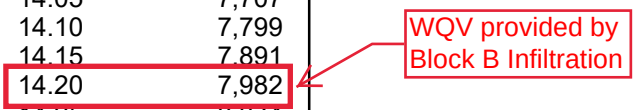
Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
9.50	0	12.15	956	14.80	3,047
9.55	1	12.20	986	14.85	3,048
9.60	2	12.25	1,016	14.90	3,049
9.65	3	12.30	1,046	14.95	3,050
9.70	4	12.35	1,076	15.00	3,051
9.75	5	12.40	1,106	15.05	3,052
9.80	6	12.45	1,136	15.10	3,053
9.85	7	12.50	1,166	15.15	3,054
9.90	8	12.55	1,219	15.20	3,055
9.95	9	12.60	1,272	15.25	3,056
10.00	10	12.65	1,325	15.30	3,057
10.05	10	12.70	1,378	15.35	3,058
10.10	11	12.75	1,431	15.40	3,059
10.15	12	12.80	1,484	15.45	3,060
10.20	13	12.85	1,537	15.50	3,061
10.25	14	12.90	1,590	15.55	3,061
10.30	43	12.95	1,643	15.60	3,062
10.35	71	13.00	1,696	15.65	3,063
10.40	99	13.05	1,749	15.70	3,064
10.45	127	13.10	1,802	15.75	3,065
10.50	156	13.15	1,855	15.80	3,066
10.55	184	13.20	1,908	15.85	3,067
10.60	212	13.25	1,961	15.90	3,068
10.65	240	13.30	2,014	15.95	3,069
10.70	268	13.35	2,067	16.00	3,070
10.75	297	13.40	2,120	16.05	3,071
10.80	325	13.45	2,173	16.10	3,072
10.85	353	13.50	2,226	16.15	3,073
10.90	382	13.55	2,279	16.20	3,074
10.95	410	13.60	2,332	16.25	3,075
11.00	438	13.65	2,385	16.30	3,076
11.05	459	13.70	2,438	16.35	3,077
11.10	481	13.75	2,491	16.40	3,078
11.15	502	13.80	2,544	16.45	3,079
11.20	524	13.85	2,597	16.50	3,080
11.25	545	13.90	2,650	16.55	3,080
11.30	567	13.95	2,703	16.60	3,081
11.35	588	14.00	2,756	16.65	3,082
11.40	609	14.05	2,809	16.70	3,083
11.45	631	14.10	2,860	16.75	3,084
11.50	652	14.15	2,907	16.80	3,085
11.55	674	14.20	2,954	16.85	3,086
11.60	695	14.25	3,000	16.90	3,087
11.65	717	14.30	3,008	16.95	3,088
11.70	738	14.35	3,016	17.00	**3,089**
11.75	759	14.40	3,025		
11.80	781	14.45	3,033		
11.85	802	14.50	3,042		
11.90	824	14.55	3,042		
11.95	845	14.60	3,043		
12.00	867	14.65	3,044		
12.05	896	14.70	3,045		
12.10	926	14.75	3,046		



Block B WQV

Stage-Area-Storage for Pond 14P: Block B Infil

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
9.35	0	12.00	3,950	14.65	8,807
9.40	46	12.05	4,041	14.70	8,899
9.45	93	12.10	4,133	14.75	8,991
9.50	139	12.15	4,225	14.80	9,082
9.55	185	12.20	4,316	14.85	9,174
9.60	231	12.25	4,408	14.90	9,266
9.65	278	12.30	4,500	14.95	9,357
9.70	324	12.35	4,591	15.00	9,449
9.75	370	12.40	4,683	15.05	9,541
9.80	416	12.45	4,775	15.10	9,632
9.85	463	12.50	4,866	15.15	9,724
9.90	509	12.55	4,958	15.20	9,815
9.95	555	12.60	5,050	15.25	9,907
10.00	601	12.65	5,141	15.30	9,999
10.05	648	12.70	5,233	15.35	10,090
10.10	694	12.75	5,325	15.40	10,096
10.15	740	12.80	5,416	15.45	10,101
10.20	786	12.85	5,508	15.50	10,106
10.25	833	12.90	5,599	15.55	10,112
10.30	879	12.95	5,691	15.60	10,117
10.35	925	13.00	5,783	15.65	10,122
10.40	1,017	13.05	5,874	15.70	10,128
10.45	1,109	13.10	5,966	15.75	10,133
10.50	1,200	13.15	6,058	15.80	10,138
10.55	1,292	13.20	6,149	15.85	10,143
10.60	1,383	13.25	6,241	15.90	10,149
10.65	1,475	13.30	6,333	15.95	10,154
10.70	1,567	13.35	6,424	16.00	**10,159**
10.75	1,658	13.40	6,516	16.05	**10,161**
10.80	1,750	13.45	6,608	16.10	10,161
10.85	1,842	13.50	6,699	16.15	10,161
10.90	1,933	13.55	6,791	16.20	10,161
10.95	2,025	13.60	6,883	16.25	10,161
11.00	2,117	13.65	6,974	16.30	10,161
11.05	2,208	13.70	7,066	16.35	10,161
11.10	2,300	13.75	7,158	16.40	10,161
11.15	2,392	13.80	7,249	16.45	10,161
11.20	2,483	13.85	7,341	16.50	10,161
11.25	2,575	13.90	7,433		
11.30	2,667	13.95	7,524		
11.35	2,758	14.00	7,616		
11.40	2,850	14.05	7,707		
11.45	2,942	14.10	7,799		
11.50	3,033	14.15	7,891		
11.55	3,125	14.20	7,982		
11.60	3,217	14.25	8,074		
11.65	3,308	14.30	8,166		
11.70	3,400	14.35	8,257		
11.75	3,491	14.40	8,349		
11.80	3,583	14.45	8,441		
11.85	3,675	14.50	8,532		
11.90	3,766	14.55	8,624		
11.95	3,858	14.60	8,716		



72-Hour Draw Down Calculations

Project: *100 Clinton Avenue*	**Project #:** *7258*	**Date:** *9/16/2022*
Location: *Stamford, CT 06903*	**By:** *SPC*	**Checked:** *TM*

Draw Down Calculation

Block B Infil (Pond 14P)		
Surface Area of Infiltration System (SA)	2,313	ft^2
Volume of Storage of Infiltration System (VS)	7,982	ft^3
Infiltration Rate (IR)	0.81	in/hr^c
Theoretical Water Column Height (WCH)	41.41	in^a
Time of Draw Down	**50.97**	**hr^b**

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

[b] Time of Draw Down = WCH/IR

[c] Infiltration Rate (IR) taken from Table 5-1 of the Stamford Drainage Manual for loam within NRCS Hydraulic Soil Group B

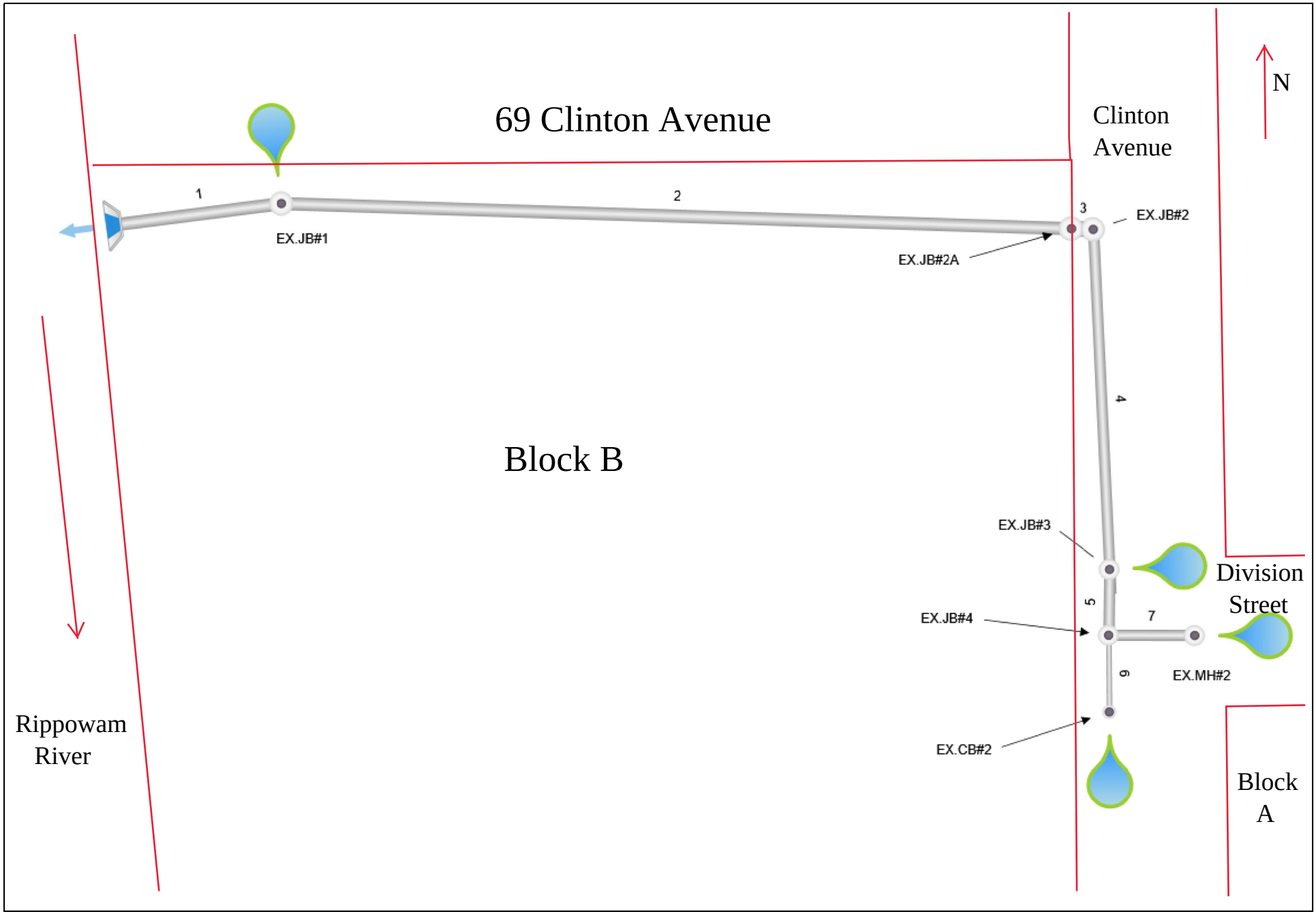
[d] Infiltration Rate (IR) taken from applicable rate of TT#1 (Turf-Tec Infiltration Test)

Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Division Street As-Built Storm Model

09-06-2022



Project File: Division Street Proposed Model.sws

As-Built Conditions with Approved Areas HGL Analysis

StormCAD Report

Project Name: Division Street As-Built Storm Model (Approved Areas with Updated Rainfall)

Stormwater Studio 2022 v 3.0.0.29

09-16-2022

Line No.	Inlet ID	Grnd/Rim Elev Up (ft)	HGL Up (ft)	Invert Up (ft)	Inlet ID DownStr	Grnd/Rim Elev Dn (ft)	HGL Dn (ft)	Invert Dn (ft)	Line Length (ft)	Line Slope (ft/ft)	Line Size (in)	n-value Pipe	Flow Rate (cfs)	Capac. Full (cfs)	Vel Ave (ft/s)	Known Q (cfs)	Runoff Coeff (C)	Drain Area (ac)
1	EX.JB#1	13.65	7.77	5.23	....	9.00	7.28	5.15	43.08	0.0018	42	0.013	48.54	42.90	7.19	0.00	0.83	0.706
2	EX.JB#2A	13.38	8.39	5.96	EX.JB#1	13.65	7.81	5.32	210.29	0.003	42	0.013	45.66	55.50	6.32	0.00	0.00	0.000
3	EX.JB#2	13.10	8.23	6.30	EX.JB#2A	13.38	8.21	5.96	5.88	0.0578	24(2b)	0.011	45.66	128.53	7.31	0.00	0.00	0.000
4	EX.JB#3	12.30	9.61	6.41	EX.JB#2	13.10	9.16	6.16	96.73	0.0026	36	0.013	45.66	34.08	6.46	0.00	0.84	0.391
5	EX.JB#4	12.82	9.74	6.45	EX.JB#3	12.30	9.66	6.45	18.70	0.00	36	0.013	44.03	0.00	6.23	0.00	0.98	2.582
6	EX.CB#2	12.33	10.32	9.34	EX.JB#4	12.82	10.27	8.82	21.80	0.0239	12	0.013	1.68	5.50	2.14	0.00	0.95	0.183
7	EX.MH#2	13.30	10.05	7.40	EX.JB#4	12.82	10.05	6.79	22.93	0.0265	36	0.013	30.73	108.62	4.50	0.00	0.87	7.159

Note: Reference is made to "Division Street Pipe Relocation & 69 Clinton Avenue Drainage Report" prepared by Redniss & Mead, Inc.; last issued on April 4, 2018. Reference is also made to correspondence from Redniss & Mead, Inc. to Louis Casolo, P.E. on September 5, 2019 and September 18, 2019 as part of the Division Street Pipe Relocation. The model which was used for these approvals has been converted to Stormwater Studios software and has been updated to reflect as-built conditions for the pipe network and NOAA Atlas 14 precipitation intensities as required by the City of Stamford Drainage Manual. The results of this updated model are demonstrated in the table above.

Notes: IDF File = Stamford IDF Curve Information.idf, Return Period = 50-yrs. Pipe travel time suppressed.

Proposed Conditions HGL Analysis

StormCAD Report

Project Name: Division Street As-Built Storm Model (Proposed Flows)

Stormwater Studio 2022 v 3.0.0.29

09-16-2022

Line No.	Inlet ID	Grnd/Rim Elev Up (ft)	HGL Up (ft)	Invert Up (ft)	Inlet ID DownStr	Grnd/Rim Elev Dn (ft)	HGL Dn (ft)	Invert Dn (ft)	Line Length (ft)	Line Slope (ft/ft)	Line Size (in)	n-value Pipe	Flow Rate (cfs)	Capac. Full (cfs)	Vel Ave (ft/s)	Known Q (cfs)	Runoff Coeff (C)	Drain Area (ac)
1	EX.JB#1	13.65	8.21 [1]	5.23	....	9.00	7.61	5.15	43.08	0.0018	42	0.013	64.48	42.90	8.16	18.22	0.00	0.000
2	EX.JB#2A	13.38	9.03	5.96	EX.JB#1	13.65	8.69	5.32	210.29	0.003	42	0.013	46.26	55.50	5.02	0.00	0.00	0.000
3	EX.JB#2	13.10	8.65	6.30	EX.JB#2A	13.38	8.60	5.96	5.88	0.0578	24(2b)	0.011	46.26	128.53	7.36	0.00	0.00	0.000
4	EX.JB#3	12.30	9.63	6.41	EX.JB#2	13.10	9.16	6.16	96.73	0.0026	36	0.013	46.26	34.08	6.55	0.00	0.84	0.391
5	EX.JB#4	12.82	9.79	6.45	EX.JB#3	12.30	9.71	6.45	18.70	0.00	36	0.013	43.08	0.00	6.10	0.00	0.00	0.000
6	EX.CB#2	12.33	10.34	9.34	EX.JB#4	12.82	10.28	8.82	21.80	0.0239	12	0.013	1.84	5.50	2.34	1.84	0.00	0.000
7	EX.MH#2	13.30	9.65 [2]	7.40	EX.JB#4	12.82	9.84	6.79	22.93	0.0265	36	0.013	41.24	108.62	6.54	41.24	0.00	0.000

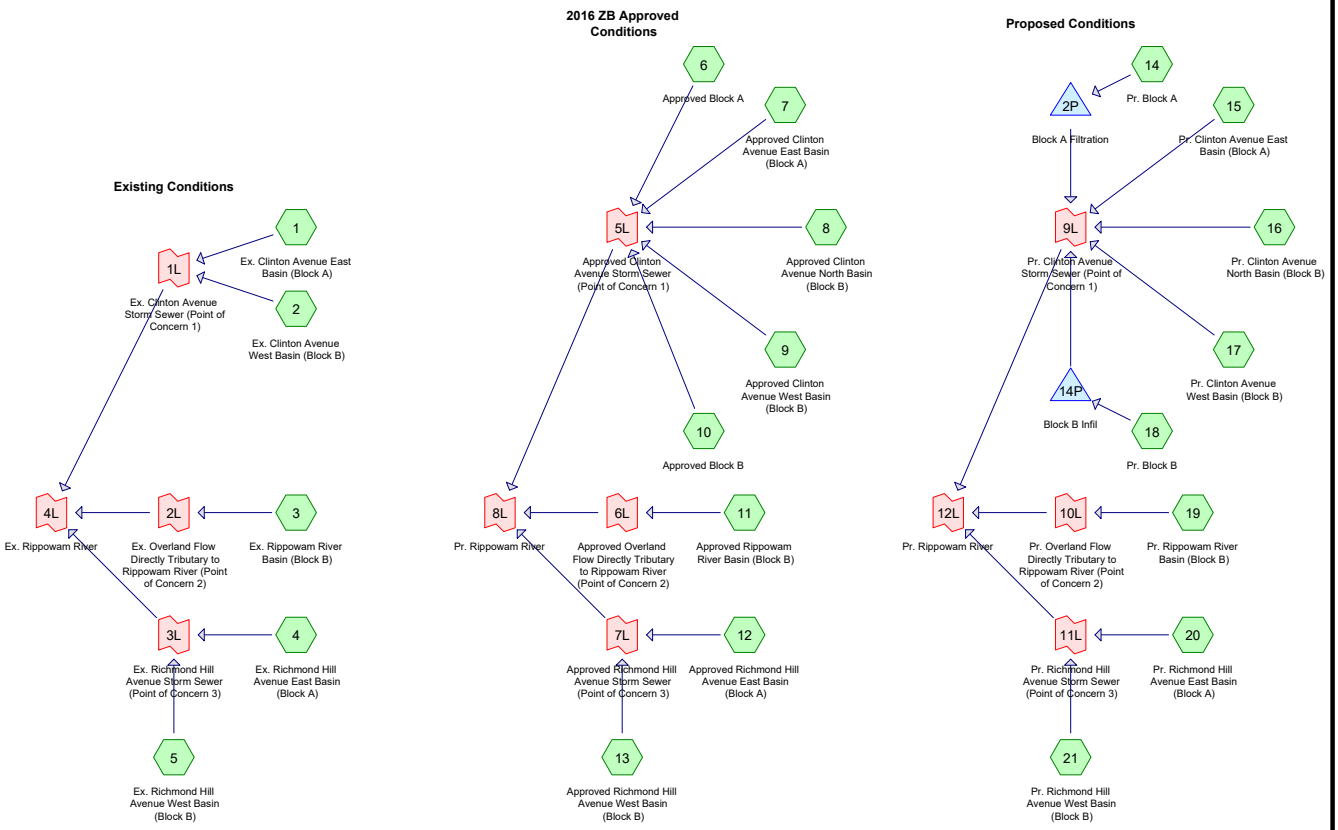
1) Tailwater elevation applied to Block B Infiltration System (Pond 14P in attached On-Site HydroCAD model)
2) Tailwater elevation applied to Block A Filtration System (Pond 14P in attached On-Site HydroCAD model)

Notes: IDF File = Stamford IDF Curve Information.idf, Return Period = 50-yrs. Pipe travel time suppressed.

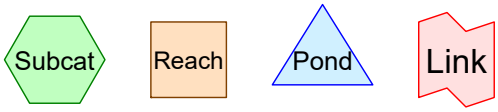
Project File: Division Street Proposed Model.sws

Appendix E

On-Site HydroCAD Report
Off-Site HydroCAD Report



NOTE: TAILWATER APPLIED TO ALL STORM EVENTS IS BASED ON THE 50-YEAR TAILWATER OBTAINED FROM THE HYDRAULIC GRADE LINE ANALYSIS FOUND IN APPENDIX D



Routing Diagram for 7258 HydroCAD On-Site
Prepared by HP Inc., Printed 9/16/2022

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year	Type III 24-hr		Default	24.00	1	2.96	2
2	2-Year	Type III 24-hr		Default	24.00	1	3.58	2
3	5-Year	Type III 24-hr		Default	24.00	1	4.60	2
4	10-Year	Type III 24-hr		Default	24.00	1	5.44	2
5	25-Year	Type III 24-hr		Default	24.00	1	6.60	2
6	50-Year	Type III 24-hr		Default	24.00	1	7.47	2
7	100-Year	Type III 24-hr		Default	24.00	1	8.39	2

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

Subcatchment 1: Ex. Clinton Avenue East Runoff Area=56,506 sf 69.70% Impervious Runoff Depth>2.17"
Tc=5.0 min CN=92.55 Runoff=3.35 cfs 10,228 cf

Subcatchment 2: Ex. Clinton Avenue West Runoff Area=47,337 sf 66.62% Impervious Runoff Depth>2.12"
Tc=5.0 min CN=91.99 Runoff=2.75 cfs 8,365 cf

Subcatchment 3: Ex. Rippowam River Runoff Area=84,872 sf 55.21% Impervious Runoff Depth>1.94"
Tc=5.0 min CN=89.94 Runoff=4.57 cfs 13,725 cf

Subcatchment 4: Ex. Richmond Hill Runoff Area=10,325 sf 41.26% Impervious Runoff Depth>1.74"
Tc=5.0 min CN=87.43 Runoff=0.50 cfs 1,494 cf

Subcatchment 5: Ex. Richmond Hill Avenue Runoff Area=912 sf 23.79% Impervious Runoff Depth>1.50"
Tc=5.0 min CN=84.28 Runoff=0.04 cfs 114 cf

Subcatchment 6: Approved Block A Runoff Area=49,654 sf 100.00% Impervious Runoff Depth>2.73"
Tc=5.0 min CN=98.00 Runoff=3.39 cfs 11,282 cf

Subcatchment 7: Approved Clinton Avenue Runoff Area=5,817 sf 71.65% Impervious Runoff Depth>2.20"
Tc=5.0 min CN=92.90 Runoff=0.35 cfs 1,069 cf

Subcatchment 8: Approved Clinton Avenue Runoff Area=2,419 sf 27.70% Impervious Runoff Depth>1.55"
Tc=5.0 min CN=84.99 Runoff=0.10 cfs 313 cf

Subcatchment 9: Approved Clinton Runoff Area=3,406 sf 100.00% Impervious Runoff Depth>2.73"
Tc=5.0 min CN=98.00 Runoff=0.23 cfs 774 cf

Subcatchment 10: Approved Block B Runoff Area=81,572 sf 100.00% Impervious Runoff Depth>2.73"
Tc=5.0 min CN=98.00 Runoff=5.57 cfs 18,534 cf

Subcatchment 11: Approved Rippowam Runoff Area=45,370 sf 0.48% Impervious Runoff Depth>1.22"
Tc=5.0 min CN=80.09 Runoff=1.53 cfs 4,628 cf

Subcatchment 12: Approved Richmond Runoff Area=11,360 sf 37.50% Impervious Runoff Depth>1.68"
Tc=5.0 min CN=86.75 Runoff=0.53 cfs 1,594 cf

Subcatchment 13: Approved Richmond Hill Runoff Area=354 sf 43.22% Impervious Runoff Depth>1.76"
Tc=5.0 min CN=87.78 Runoff=0.02 cfs 52 cf

Subcatchment 14: Pr. Block A Runoff Area=50,072 sf 100.00% Impervious Runoff Depth>2.73"
Tc=5.0 min CN=98.00 Runoff=3.42 cfs 11,377 cf

Subcatchment 15: Pr. Clinton Avenue East Runoff Area=5,805 sf 60.26% Impervious Runoff Depth>2.02"
Tc=5.0 min CN=90.85 Runoff=0.32 cfs 977 cf

Subcatchment 16: Pr. Clinton Avenue North Runoff Area=4,361 sf 39.78% Impervious Runoff Depth>1.71"
Tc=5.0 min CN=87.16 Runoff=0.21 cfs 623 cf

Subcatchment 17: Pr. Clinton Avenue Runoff Area=2,446 sf 100.00% Impervious Runoff Depth>2.73"
Tc=5.0 min CN=98.00 Runoff=0.17 cfs 556 cf

Subcatchment 18: Pr. Block B Runoff Area=85,898 sf 100.00% Impervious Runoff Depth>2.73"
Tc=5.0 min CN=98.00 Runoff=5.87 cfs 19,517 cf

Subcatchment 19: Pr. Rippowam River Runoff Area=40,185 sf 6.41% Impervious Runoff Depth>1.29"
Tc=5.0 min CN=81.15 Runoff=1.43 cfs 4,323 cf

Subcatchment 20: Pr. Richmond Hill Runoff Area=10,954 sf 39.92% Impervious Runoff Depth>1.72"
Tc=5.0 min CN=87.19 Runoff=0.53 cfs 1,568 cf

Subcatchment 21: Pr. Richmond Hill Avenue Runoff Area=231 sf 100.00% Impervious Runoff Depth>2.73"
Tc=5.0 min CN=98.00 Runoff=0.02 cfs 52 cf

Pond 2P: Block A Filtration Peak Elev=13.11' Storage=1,809 cf Inflow=3.42 cfs 11,377 cf
Outflow=1.48 cfs 11,309 cf

Pond 14P: Block B Infil Peak Elev=14.71' Storage=8,913 cf Inflow=5.87 cfs 19,517 cf
Outflow=4.75 cfs 11,497 cf

Link 1L: Ex. Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=6.11 cfs 18,593 cf
Primary=6.11 cfs 18,593 cf

Link 2L: Ex. Overland Flow Directly Tributary to Rippowam River (Point of Inflow=4.57 cfs 13,725 cf
Primary=4.57 cfs 13,725 cf

Link 3L: Ex. Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=0.54 cfs 1,608 cf
Primary=0.54 cfs 1,608 cf

Link 4L: Ex. Rippowam River Inflow=11.22 cfs 33,925 cf
Primary=11.22 cfs 33,925 cf

Link 5L: Approved Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=9.65 cfs 31,971 cf
Primary=9.65 cfs 31,971 cf

Link 6L: Approved Overland Flow Directly Tributary to Rippowam River Inflow=1.53 cfs 4,628 cf
Primary=1.53 cfs 4,628 cf

Link 7L: Approved Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=0.55 cfs 1,646 cf
Primary=0.55 cfs 1,646 cf

Link 8L: Pr. Rippowam River Inflow=11.73 cfs 38,245 cf
Primary=11.73 cfs 38,245 cf

Link 9L: Pr. Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=6.76 cfs 24,962 cf
Primary=6.76 cfs 24,962 cf

Link 10L: Pr. Overland Flow Directly Tributary to Rippowam River (Point of Inflow=1.43 cfs 4,323 cf
Primary=1.43 cfs 4,323 cf

Link 11L: Pr. Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=0.54 cfs 1,620 cf
Primary=0.54 cfs 1,620 cf

Link 12L: Pr. Rippowam River

Inflow=8.52 cfs 30,905 cf
Primary=8.52 cfs 30,905 cf

Total Runoff Area = 599,856 sf Runoff Volume = 111,163 cf Average Runoff Depth = 2.22"
30.45% Pervious = 182,677 sf 69.55% Impervious = 417,179 sf

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

Subcatchment 1: Ex. Clinton Avenue East Runoff Area=56,506 sf 69.70% Impervious Runoff Depth>2.77"
Tc=5.0 min CN=92.55 Runoff=4.22 cfs 13,021 cf

Subcatchment 2: Ex. Clinton Avenue West Runoff Area=47,337 sf 66.62% Impervious Runoff Depth>2.71"
Tc=5.0 min CN=91.99 Runoff=3.48 cfs 10,691 cf

Subcatchment 3: Ex. Rippowam River Runoff Area=84,872 sf 55.21% Impervious Runoff Depth>2.52"
Tc=5.0 min CN=89.94 Runoff=5.88 cfs 17,789 cf

Subcatchment 4: Ex. Richmond Hill Runoff Area=10,325 sf 41.26% Impervious Runoff Depth>2.29"
Tc=5.0 min CN=87.43 Runoff=0.66 cfs 1,970 cf

Subcatchment 5: Ex. Richmond Hill Avenue Runoff Area=912 sf 23.79% Impervious Runoff Depth>2.03"
Tc=5.0 min CN=84.28 Runoff=0.05 cfs 154 cf

Subcatchment 6: Approved Block A Runoff Area=49,654 sf 100.00% Impervious Runoff Depth>3.34"
Tc=5.0 min CN=98.00 Runoff=4.12 cfs 13,836 cf

Subcatchment 7: Approved Clinton Avenue Runoff Area=5,817 sf 71.65% Impervious Runoff Depth>2.80"
Tc=5.0 min CN=92.90 Runoff=0.44 cfs 1,357 cf

Subcatchment 8: Approved Clinton Avenue Runoff Area=2,419 sf 27.70% Impervious Runoff Depth>2.08"
Tc=5.0 min CN=84.99 Runoff=0.14 cfs 420 cf

Subcatchment 9: Approved Clinton Runoff Area=3,406 sf 100.00% Impervious Runoff Depth>3.34"
Tc=5.0 min CN=98.00 Runoff=0.28 cfs 949 cf

Subcatchment 10: Approved Block B Runoff Area=81,572 sf 100.00% Impervious Runoff Depth>3.34"
Tc=5.0 min CN=98.00 Runoff=6.77 cfs 22,731 cf

Subcatchment 11: Approved Rippowam Runoff Area=45,370 sf 0.48% Impervious Runoff Depth>1.70"
Tc=5.0 min CN=80.09 Runoff=2.15 cfs 6,445 cf

Subcatchment 12: Approved Richmond Runoff Area=11,360 sf 37.50% Impervious Runoff Depth>2.23"
Tc=5.0 min CN=86.75 Runoff=0.71 cfs 2,112 cf

Subcatchment 13: Approved Richmond Hill Runoff Area=354 sf 43.22% Impervious Runoff Depth>2.32"
Tc=5.0 min CN=87.78 Runoff=0.02 cfs 68 cf

Subcatchment 14: Pr. Block A Runoff Area=50,072 sf 100.00% Impervious Runoff Depth>3.34"
Tc=5.0 min CN=98.00 Runoff=4.16 cfs 13,953 cf

Subcatchment 15: Pr. Clinton Avenue East Runoff Area=5,805 sf 60.26% Impervious Runoff Depth>2.60"
Tc=5.0 min CN=90.85 Runoff=0.41 cfs 1,258 cf

Subcatchment 16: Pr. Clinton Avenue North Runoff Area=4,361 sf 39.78% Impervious Runoff Depth>2.27"
Tc=5.0 min CN=87.16 Runoff=0.28 cfs 824 cf

Subcatchment 17: Pr. Clinton Avenue Runoff Area=2,446 sf 100.00% Impervious Runoff Depth>3.34"
Tc=5.0 min CN=98.00 Runoff=0.20 cfs 682 cf

Subcatchment 18: Pr. Block B Runoff Area=85,898 sf 100.00% Impervious Runoff Depth>3.34"
Tc=5.0 min CN=98.00 Runoff=7.13 cfs 23,936 cf

Subcatchment 19: Pr. Rippowam River Runoff Area=40,185 sf 6.41% Impervious Runoff Depth>1.78"
Tc=5.0 min CN=81.15 Runoff=2.00 cfs 5,970 cf

Subcatchment 20: Pr. Richmond Hill Runoff Area=10,954 sf 39.92% Impervious Runoff Depth>2.27"
Tc=5.0 min CN=87.19 Runoff=0.69 cfs 2,071 cf

Subcatchment 21: Pr. Richmond Hill Avenue Runoff Area=231 sf 100.00% Impervious Runoff Depth>3.34"
Tc=5.0 min CN=98.00 Runoff=0.02 cfs 64 cf

Pond 2P: Block A Filtration Peak Elev=13.66' Storage=2,396 cf Inflow=4.16 cfs 13,953 cf
Outflow=1.62 cfs 13,879 cf

Pond 14P: Block B Infil Peak Elev=14.83' Storage=9,131 cf Inflow=7.13 cfs 23,936 cf
Outflow=6.65 cfs 15,912 cf

Link 1L: Ex. Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=7.70 cfs 23,712 cf
Primary=7.70 cfs 23,712 cf

Link 2L: Ex. Overland Flow Directly Tributary to Rippowam River (Point of Inflow=5.88 cfs 17,789 cf
Primary=5.88 cfs 17,789 cf

Link 3L: Ex. Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=0.71 cfs 2,124 cf
Primary=0.71 cfs 2,124 cf

Link 4L: Ex. Rippowam River Inflow=14.28 cfs 43,624 cf
Primary=14.28 cfs 43,624 cf

Link 5L: Approved Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=11.75 cfs 39,293 cf
Primary=11.75 cfs 39,293 cf

Link 6L: Approved Overland Flow Directly Tributary to Rippowam River Inflow=2.15 cfs 6,445 cf
Primary=2.15 cfs 6,445 cf

Link 7L: Approved Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=0.73 cfs 2,180 cf
Primary=0.73 cfs 2,180 cf

Link 8L: Pr. Rippowam River Inflow=14.63 cfs 47,919 cf
Primary=14.63 cfs 47,919 cf

Link 9L: Pr. Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=8.99 cfs 32,554 cf
Primary=8.99 cfs 32,554 cf

Link 10L: Pr. Overland Flow Directly Tributary to Rippowam River (Point of Inflow=2.00 cfs 5,970 cf
Primary=2.00 cfs 5,970 cf

Link 11L: Pr. Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=0.71 cfs 2,135 cf
Primary=0.71 cfs 2,135 cf

Link 12L: Pr. Rippowam River

Inflow=11.62 cfs 40,660 cf
Primary=11.62 cfs 40,660 cf

Total Runoff Area = 599,856 sf Runoff Volume = 140,301 cf Average Runoff Depth = 2.81"
30.45% Pervious = 182,677 sf 69.55% Impervious = 417,179 sf

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

Subcatchment 1: Ex. Clinton Avenue East Runoff Area=56,506 sf 69.70% Impervious Runoff Depth>3.75"
Tc=5.0 min CN=92.55 Runoff=5.63 cfs 17,680 cf

Subcatchment 2: Ex. Clinton Avenue West Runoff Area=47,337 sf 66.62% Impervious Runoff Depth>3.70"
Tc=5.0 min CN=91.99 Runoff=4.67 cfs 14,577 cf

Subcatchment 3: Ex. Rippowam River Runoff Area=84,872 sf 55.21% Impervious Runoff Depth>3.48"
Tc=5.0 min CN=89.94 Runoff=8.02 cfs 24,631 cf

Subcatchment 4: Ex. Richmond Hill Runoff Area=10,325 sf 41.26% Impervious Runoff Depth>3.23"
Tc=5.0 min CN=87.43 Runoff=0.92 cfs 2,780 cf

Subcatchment 5: Ex. Richmond Hill Avenue Runoff Area=912 sf 23.79% Impervious Runoff Depth>2.93"
Tc=5.0 min CN=84.28 Runoff=0.07 cfs 223 cf

Subcatchment 6: Approved Block A Runoff Area=49,654 sf 100.00% Impervious Runoff Depth>4.36"
Tc=5.0 min CN=98.00 Runoff=5.32 cfs 18,044 cf

Subcatchment 7: Approved Clinton Avenue Runoff Area=5,817 sf 71.65% Impervious Runoff Depth>3.79"
Tc=5.0 min CN=92.90 Runoff=0.58 cfs 1,838 cf

Subcatchment 8: Approved Clinton Avenue Runoff Area=2,419 sf 27.70% Impervious Runoff Depth>3.00"
Tc=5.0 min CN=84.99 Runoff=0.20 cfs 604 cf

Subcatchment 9: Approved Clinton Runoff Area=3,406 sf 100.00% Impervious Runoff Depth>4.36"
Tc=5.0 min CN=98.00 Runoff=0.36 cfs 1,238 cf

Subcatchment 10: Approved Block B Runoff Area=81,572 sf 100.00% Impervious Runoff Depth>4.36"
Tc=5.0 min CN=98.00 Runoff=8.73 cfs 29,643 cf

Subcatchment 11: Approved Rippowam Runoff Area=45,370 sf 0.48% Impervious Runoff Depth>2.55"
Tc=5.0 min CN=80.09 Runoff=3.24 cfs 9,650 cf

Subcatchment 12: Approved Richmond Runoff Area=11,360 sf 37.50% Impervious Runoff Depth>3.17"
Tc=5.0 min CN=86.75 Runoff=0.99 cfs 2,996 cf

Subcatchment 13: Approved Richmond Hill Runoff Area=354 sf 43.22% Impervious Runoff Depth>3.27"
Tc=5.0 min CN=87.78 Runoff=0.03 cfs 96 cf

Subcatchment 14: Pr. Block A Runoff Area=50,072 sf 100.00% Impervious Runoff Depth>4.36"
Tc=5.0 min CN=98.00 Runoff=5.36 cfs 18,196 cf

Subcatchment 15: Pr. Clinton Avenue East Runoff Area=5,805 sf 60.26% Impervious Runoff Depth>3.58"
Tc=5.0 min CN=90.85 Runoff=0.56 cfs 1,730 cf

Subcatchment 16: Pr. Clinton Avenue North Runoff Area=4,361 sf 39.78% Impervious Runoff Depth>3.20"
Tc=5.0 min CN=87.16 Runoff=0.39 cfs 1,165 cf

Subcatchment 17: Pr. Clinton Avenue Runoff Area=2,446 sf 100.00% Impervious Runoff Depth>4.36"
Tc=5.0 min CN=98.00 Runoff=0.26 cfs 889 cf

Subcatchment 18: Pr. Block B Runoff Area=85,898 sf 100.00% Impervious Runoff Depth>4.36"
Tc=5.0 min CN=98.00 Runoff=9.20 cfs 31,216 cf

Subcatchment 19: Pr. Rippowam River Runoff Area=40,185 sf 6.41% Impervious Runoff Depth>2.65"
Tc=5.0 min CN=81.15 Runoff=2.97 cfs 8,859 cf

Subcatchment 20: Pr. Richmond Hill Runoff Area=10,954 sf 39.92% Impervious Runoff Depth>3.21"
Tc=5.0 min CN=87.19 Runoff=0.97 cfs 2,928 cf

Subcatchment 21: Pr. Richmond Hill Avenue Runoff Area=231 sf 100.00% Impervious Runoff Depth>4.36"
Tc=5.0 min CN=98.00 Runoff=0.02 cfs 84 cf

Pond 2P: Block A Filtration Peak Elev=14.16' Storage=2,915 cf Inflow=5.36 cfs 18,196 cf
Outflow=3.46 cfs 18,113 cf

Pond 14P: Block B Infil Peak Elev=14.94' Storage=9,337 cf Inflow=9.20 cfs 31,216 cf
Outflow=8.71 cfs 23,184 cf

Link 1L: Ex. Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=10.30 cfs 32,257 cf
Primary=10.30 cfs 32,257 cf

Link 2L: Ex. Overland Flow Directly Tributary to Rippowam River (Point of Inflow=8.02 cfs 24,631 cf
Primary=8.02 cfs 24,631 cf

Link 3L: Ex. Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=0.99 cfs 3,003 cf
Primary=0.99 cfs 3,003 cf

Link 4L: Ex. Rippowam River Inflow=19.31 cfs 59,891 cf
Primary=19.31 cfs 59,891 cf

Link 5L: Approved Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=15.20 cfs 51,368 cf
Primary=15.20 cfs 51,368 cf

Link 6L: Approved Overland Flow Directly Tributary to Rippowam River Inflow=3.24 cfs 9,650 cf
Primary=3.24 cfs 9,650 cf

Link 7L: Approved Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=1.02 cfs 3,093 cf
Primary=1.02 cfs 3,093 cf

Link 8L: Pr. Rippowam River Inflow=19.46 cfs 64,110 cf
Primary=19.46 cfs 64,110 cf

Link 9L: Pr. Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=12.06 cfs 45,081 cf
Primary=12.06 cfs 45,081 cf

Link 10L: Pr. Overland Flow Directly Tributary to Rippowam River (Point of Inflow=2.97 cfs 8,859 cf
Primary=2.97 cfs 8,859 cf

Link 11L: Pr. Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=0.99 cfs 3,012 cf
Primary=0.99 cfs 3,012 cf

Link 12L: Pr. Rippowam River

Inflow=15.38 cfs 56,952 cf
Primary=15.38 cfs 56,952 cf

Total Runoff Area = 599,856 sf Runoff Volume = 189,068 cf Average Runoff Depth = 3.78"
30.45% Pervious = 182,677 sf 69.55% Impervious = 417,179 sf

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

Subcatchment 1: Ex. Clinton Avenue East Runoff Area=56,506 sf 69.70% Impervious Runoff Depth>4.58"
Tc=5.0 min CN=92.55 Runoff=6.79 cfs 21,552 cf

Subcatchment 2: Ex. Clinton Avenue West Runoff Area=47,337 sf 66.62% Impervious Runoff Depth>4.52"
Tc=5.0 min CN=91.99 Runoff=5.64 cfs 17,811 cf

Subcatchment 3: Ex. Rippowam River Runoff Area=84,872 sf 55.21% Impervious Runoff Depth>4.29"
Tc=5.0 min CN=89.94 Runoff=9.78 cfs 30,355 cf

Subcatchment 4: Ex. Richmond Hill Runoff Area=10,325 sf 41.26% Impervious Runoff Depth>4.02"
Tc=5.0 min CN=87.43 Runoff=1.13 cfs 3,463 cf

Subcatchment 5: Ex. Richmond Hill Avenue Runoff Area=912 sf 23.79% Impervious Runoff Depth>3.70"
Tc=5.0 min CN=84.28 Runoff=0.09 cfs 281 cf

Subcatchment 6: Approved Block A Runoff Area=49,654 sf 100.00% Impervious Runoff Depth>5.20"
Tc=5.0 min CN=98.00 Runoff=6.30 cfs 21,512 cf

Subcatchment 7: Approved Clinton Avenue Runoff Area=5,817 sf 71.65% Impervious Runoff Depth>4.62"
Tc=5.0 min CN=92.90 Runoff=0.70 cfs 2,238 cf

Subcatchment 8: Approved Clinton Avenue Runoff Area=2,419 sf 27.70% Impervious Runoff Depth>3.77"
Tc=5.0 min CN=84.99 Runoff=0.25 cfs 760 cf

Subcatchment 9: Approved Clinton Runoff Area=3,406 sf 100.00% Impervious Runoff Depth>5.20"
Tc=5.0 min CN=98.00 Runoff=0.43 cfs 1,476 cf

Subcatchment 10: Approved Block B Runoff Area=81,572 sf 100.00% Impervious Runoff Depth>5.20"
Tc=5.0 min CN=98.00 Runoff=10.35 cfs 35,341 cf

Subcatchment 11: Approved Rippowam Runoff Area=45,370 sf 0.48% Impervious Runoff Depth>3.29"
Tc=5.0 min CN=80.09 Runoff=4.16 cfs 12,422 cf

Subcatchment 12: Approved Richmond Runoff Area=11,360 sf 37.50% Impervious Runoff Depth>3.95"
Tc=5.0 min CN=86.75 Runoff=1.23 cfs 3,743 cf

Subcatchment 13: Approved Richmond Hill Runoff Area=354 sf 43.22% Impervious Runoff Depth>4.06"
Tc=5.0 min CN=87.78 Runoff=0.04 cfs 120 cf

Subcatchment 14: Pr. Block A Runoff Area=50,072 sf 100.00% Impervious Runoff Depth>5.20"
Tc=5.0 min CN=98.00 Runoff=6.35 cfs 21,694 cf

Subcatchment 15: Pr. Clinton Avenue East Runoff Area=5,805 sf 60.26% Impervious Runoff Depth>4.39"
Tc=5.0 min CN=90.85 Runoff=0.68 cfs 2,124 cf

Subcatchment 16: Pr. Clinton Avenue North Runoff Area=4,361 sf 39.78% Impervious Runoff Depth>4.00"
Tc=5.0 min CN=87.16 Runoff=0.48 cfs 1,452 cf

Subcatchment 17: Pr. Clinton Avenue Runoff Area=2,446 sf 100.00% Impervious Runoff Depth>5.20"
Tc=5.0 min CN=98.00 Runoff=0.31 cfs 1,060 cf

Subcatchment 18: Pr. Block B Runoff Area=85,898 sf 100.00% Impervious Runoff Depth>5.20"
Tc=5.0 min CN=98.00 Runoff=10.90 cfs 37,215 cf

Subcatchment 19: Pr. Rippowam River Runoff Area=40,185 sf 6.41% Impervious Runoff Depth>3.39"
Tc=5.0 min CN=81.15 Runoff=3.80 cfs 11,348 cf

Subcatchment 20: Pr. Richmond Hill Runoff Area=10,954 sf 39.92% Impervious Runoff Depth>4.00"
Tc=5.0 min CN=87.19 Runoff=1.20 cfs 3,651 cf

Subcatchment 21: Pr. Richmond Hill Avenue Runoff Area=231 sf 100.00% Impervious Runoff Depth>5.20"
Tc=5.0 min CN=98.00 Runoff=0.03 cfs 100 cf

Pond 2P: Block A Filtration Peak Elev=14.36' Storage=3,018 cf Inflow=6.35 cfs 21,694 cf
Outflow=5.87 cfs 21,603 cf

Pond 14P: Block B Infil Peak Elev=15.02' Storage=9,491 cf Inflow=10.90 cfs 37,215 cf
Outflow=10.38 cfs 29,177 cf

Link 1L: Ex. Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=12.43 cfs 39,364 cf
Primary=12.43 cfs 39,364 cf

Link 2L: Ex. Overland Flow Directly Tributary to Rippowam River (Point of Inflow=9.78 cfs 30,355 cf
Primary=9.78 cfs 30,355 cf

Link 3L: Ex. Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=1.23 cfs 3,744 cf
Primary=1.23 cfs 3,744 cf

Link 4L: Ex. Rippowam River Inflow=23.43 cfs 73,463 cf
Primary=23.43 cfs 73,463 cf

Link 5L: Approved Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=18.03 cfs 61,327 cf
Primary=18.03 cfs 61,327 cf

Link 6L: Approved Overland Flow Directly Tributary to Rippowam River Inflow=4.16 cfs 12,422 cf
Primary=4.16 cfs 12,422 cf

Link 7L: Approved Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=1.27 cfs 3,863 cf
Primary=1.27 cfs 3,863 cf

Link 8L: Pr. Rippowam River Inflow=23.46 cfs 77,612 cf
Primary=23.46 cfs 77,612 cf

Link 9L: Pr. Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=17.59 cfs 55,416 cf
Primary=17.59 cfs 55,416 cf

Link 10L: Pr. Overland Flow Directly Tributary to Rippowam River (Point of Inflow=3.80 cfs 11,348 cf
Primary=3.80 cfs 11,348 cf

Link 11L: Pr. Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=1.23 cfs 3,751 cf
Primary=1.23 cfs 3,751 cf

Link 12L: Pr. Rippowam River

Inflow=22.35 cfs 70,515 cf
Primary=22.35 cfs 70,515 cf

Total Runoff Area = 599,856 sf Runoff Volume = 229,718 cf Average Runoff Depth = 4.60"
30.45% Pervious = 182,677 sf 69.55% Impervious = 417,179 sf

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

Subcatchment 1: Ex. Clinton Avenue East Runoff Area=56,506 sf 69.70% Impervious Runoff Depth>5.72"
Tc=5.0 min CN=92.55 Runoff=8.37 cfs 26,931 cf

Subcatchment 2: Ex. Clinton Avenue West Runoff Area=47,337 sf 66.62% Impervious Runoff Depth>5.65"
Tc=5.0 min CN=91.99 Runoff=6.97 cfs 22,307 cf

Subcatchment 3: Ex. Rippowam River Runoff Area=84,872 sf 55.21% Impervious Runoff Depth>5.42"
Tc=5.0 min CN=89.94 Runoff=12.19 cfs 38,337 cf

Subcatchment 4: Ex. Richmond Hill Runoff Area=10,325 sf 41.26% Impervious Runoff Depth>5.14"
Tc=5.0 min CN=87.43 Runoff=1.43 cfs 4,420 cf

Subcatchment 5: Ex. Richmond Hill Avenue Runoff Area=912 sf 23.79% Impervious Runoff Depth>4.79"
Tc=5.0 min CN=84.28 Runoff=0.12 cfs 364 cf

Subcatchment 6: Approved Block A Runoff Area=49,654 sf 100.00% Impervious Runoff Depth>6.36"
Tc=5.0 min CN=98.00 Runoff=7.65 cfs 26,304 cf

Subcatchment 7: Approved Clinton Avenue Runoff Area=5,817 sf 71.65% Impervious Runoff Depth>5.76"
Tc=5.0 min CN=92.90 Runoff=0.87 cfs 2,792 cf

Subcatchment 8: Approved Clinton Avenue Runoff Area=2,419 sf 27.70% Impervious Runoff Depth>4.87"
Tc=5.0 min CN=84.99 Runoff=0.32 cfs 981 cf

Subcatchment 9: Approved Clinton Runoff Area=3,406 sf 100.00% Impervious Runoff Depth>6.36"
Tc=5.0 min CN=98.00 Runoff=0.53 cfs 1,804 cf

Subcatchment 10: Approved Block B Runoff Area=81,572 sf 100.00% Impervious Runoff Depth>6.36"
Tc=5.0 min CN=98.00 Runoff=12.57 cfs 43,212 cf

Subcatchment 11: Approved Rippowam Runoff Area=45,370 sf 0.48% Impervious Runoff Depth>4.33"
Tc=5.0 min CN=80.09 Runoff=5.46 cfs 16,380 cf

Subcatchment 12: Approved Richmond Runoff Area=11,360 sf 37.50% Impervious Runoff Depth>5.06"
Tc=5.0 min CN=86.75 Runoff=1.55 cfs 4,791 cf

Subcatchment 13: Approved Richmond Hill Runoff Area=354 sf 43.22% Impervious Runoff Depth>5.18"
Tc=5.0 min CN=87.78 Runoff=0.05 cfs 153 cf

Subcatchment 14: Pr. Block A Runoff Area=50,072 sf 100.00% Impervious Runoff Depth>6.36"
Tc=5.0 min CN=98.00 Runoff=7.72 cfs 26,525 cf

Subcatchment 15: Pr. Clinton Avenue East Runoff Area=5,805 sf 60.26% Impervious Runoff Depth>5.52"
Tc=5.0 min CN=90.85 Runoff=0.84 cfs 2,672 cf

Subcatchment 16: Pr. Clinton Avenue North Runoff Area=4,361 sf 39.78% Impervious Runoff Depth>5.11"
Tc=5.0 min CN=87.16 Runoff=0.60 cfs 1,856 cf

Subcatchment 17: Pr. Clinton Avenue Runoff Area=2,446 sf 100.00% Impervious Runoff Depth>6.36"
Tc=5.0 min CN=98.00 Runoff=0.38 cfs 1,296 cf

Subcatchment 18: Pr. Block B Runoff Area=85,898 sf 100.00% Impervious Runoff Depth>6.36"
Tc=5.0 min CN=98.00 Runoff=13.24 cfs 45,504 cf

Subcatchment 19: Pr. Rippowam River Runoff Area=40,185 sf 6.41% Impervious Runoff Depth>4.45"
Tc=5.0 min CN=81.15 Runoff=4.95 cfs 14,890 cf

Subcatchment 20: Pr. Richmond Hill Runoff Area=10,954 sf 39.92% Impervious Runoff Depth>5.11"
Tc=5.0 min CN=87.19 Runoff=1.51 cfs 4,665 cf

Subcatchment 21: Pr. Richmond Hill Avenue Runoff Area=231 sf 100.00% Impervious Runoff Depth>6.36"
Tc=5.0 min CN=98.00 Runoff=0.04 cfs 122 cf

Pond 2P: Block A Filtration Peak Elev=14.48' Storage=3,039 cf Inflow=7.72 cfs 26,525 cf
Outflow=7.71 cfs 26,425 cf

Pond 14P: Block B Infil Peak Elev=15.13' Storage=9,689 cf Inflow=13.24 cfs 45,504 cf
Outflow=12.68 cfs 37,457 cf

Link 1L: Ex. Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=15.34 cfs 49,237 cf
Primary=15.34 cfs 49,237 cf

Link 2L: Ex. Overland Flow Directly Tributary to Rippowam River (Point of Inflow=12.19 cfs 38,337 cf
Primary=12.19 cfs 38,337 cf

Link 3L: Ex. Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=1.55 cfs 4,784 cf
Primary=1.55 cfs 4,784 cf

Link 4L: Ex. Rippowam River Inflow=29.08 cfs 92,358 cf
Primary=29.08 cfs 92,358 cf

Link 5L: Approved Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=21.94 cfs 75,093 cf
Primary=21.94 cfs 75,093 cf

Link 6L: Approved Overland Flow Directly Tributary to Rippowam River Inflow=5.46 cfs 16,380 cf
Primary=5.46 cfs 16,380 cf

Link 7L: Approved Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=1.60 cfs 4,944 cf
Primary=1.60 cfs 4,944 cf

Link 8L: Pr. Rippowam River Inflow=29.00 cfs 96,418 cf
Primary=29.00 cfs 96,418 cf

Link 9L: Pr. Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=22.03 cfs 69,706 cf
Primary=22.03 cfs 69,706 cf

Link 10L: Pr. Overland Flow Directly Tributary to Rippowam River (Point of Inflow=4.95 cfs 14,890 cf
Primary=4.95 cfs 14,890 cf

Link 11L: Pr. Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=1.55 cfs 4,787 cf
Primary=1.55 cfs 4,787 cf

Link 12L: Pr. Rippowam River

Inflow=28.46 cfs 89,384 cf
Primary=28.46 cfs 89,384 cf

Total Runoff Area = 599,856 sf Runoff Volume = 286,307 cf Average Runoff Depth = 5.73"
30.45% Pervious = 182,677 sf 69.55% Impervious = 417,179 sf

Summary for Subcatchment 1: Ex. Clinton Avenue East Basin (Block A)

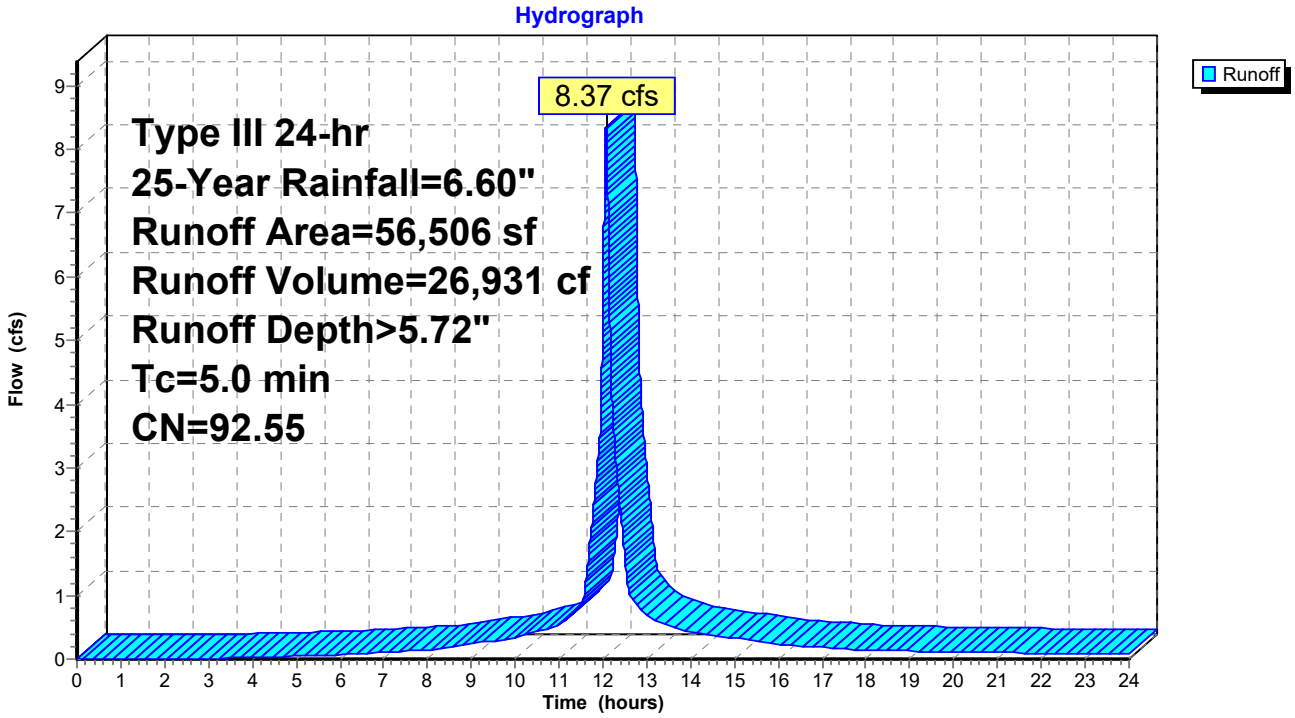
Runoff = 8.37 cfs @ 12.07 hrs, Volume= 26,931 cf, Depth> 5.72"
Routed to Link 1L : Ex. Clinton Avenue Storm Sewer (Point of Concern 1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
17,124	80.00	>75% Grass cover, Good, HSG D
39,382	98.00	Paved parking, HSG D
56,506	92.55	Weighted Average
17,124		30.30% Pervious Area
39,382		69.70% Impervious Area

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

Subcatchment 1: Ex. Clinton Avenue East Basin (Block A)



Summary for Subcatchment 2: Ex. Clinton Avenue West Basin (Block B)

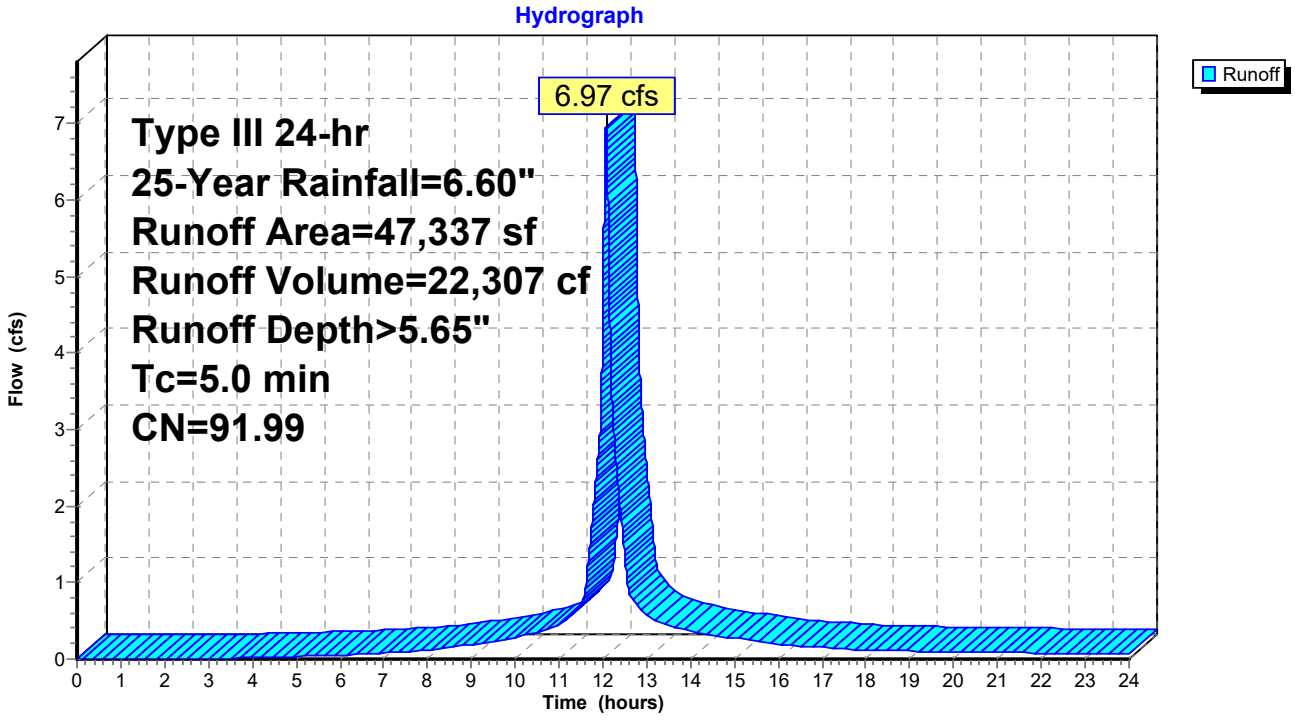
Runoff = 6.97 cfs @ 12.07 hrs, Volume= 22,307 cf, Depth> 5.65"
Routed to Link 1L : Ex. Clinton Avenue Storm Sewer (Point of Concern 1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
15,803	80.00	>75% Grass cover, Good, HSG D
31,534	98.00	Paved parking, HSG D
47,337	91.99	Weighted Average
15,803		33.38% Pervious Area
31,534		66.62% Impervious Area

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

Subcatchment 2: Ex. Clinton Avenue West Basin (Block B)



Summary for Subcatchment 3: Ex. Rippowam River Basin (Block B)

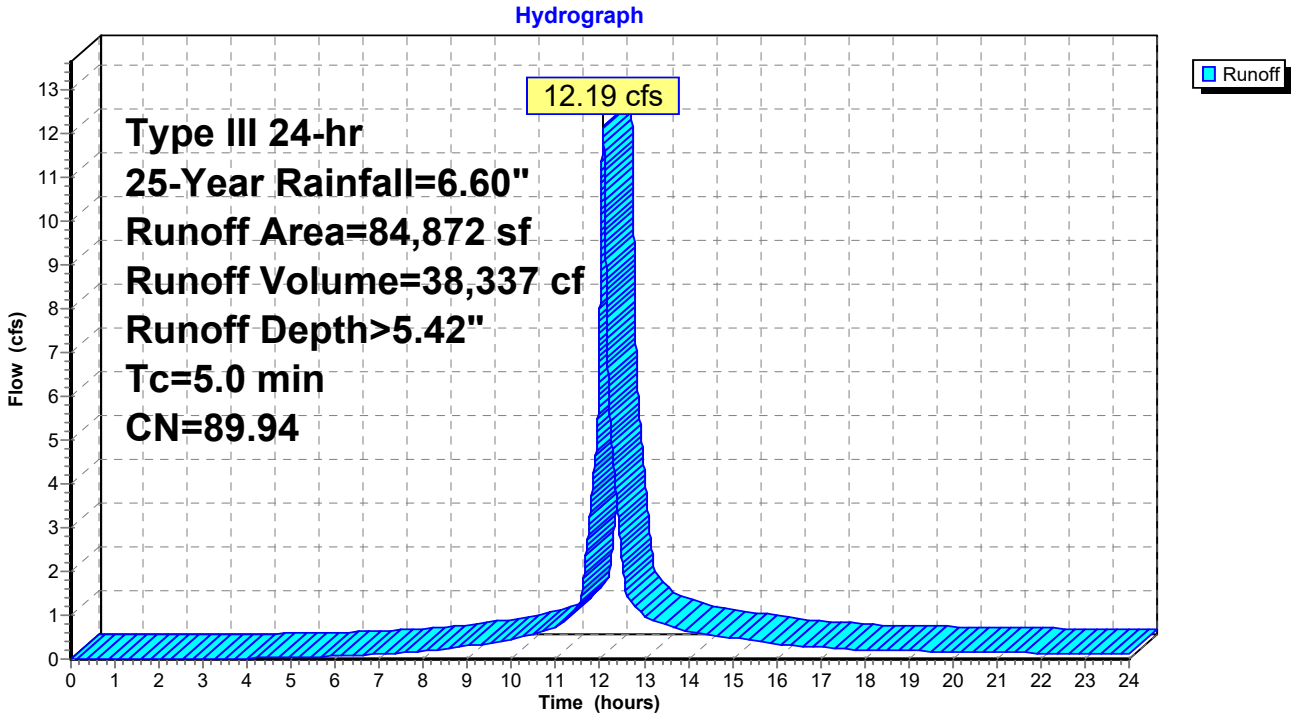
Runoff = 12.19 cfs @ 12.07 hrs, Volume= 38,337 cf, Depth> 5.42"
Routed to Link 2L : Ex. Overland Flow Directly Tributary to Rippowam River (Point of Concern 2)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
38,014	80.00	>75% Grass cover, Good, HSG D
46,858	98.00	Paved parking, HSG D
84,872	89.94	Weighted Average
38,014		44.79% Pervious Area
46,858		55.21% Impervious Area

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

Subcatchment 3: Ex. Rippowam River Basin (Block B)



Summary for Subcatchment 4: Ex. Richmond Hill Avenue East Basin (Block A)

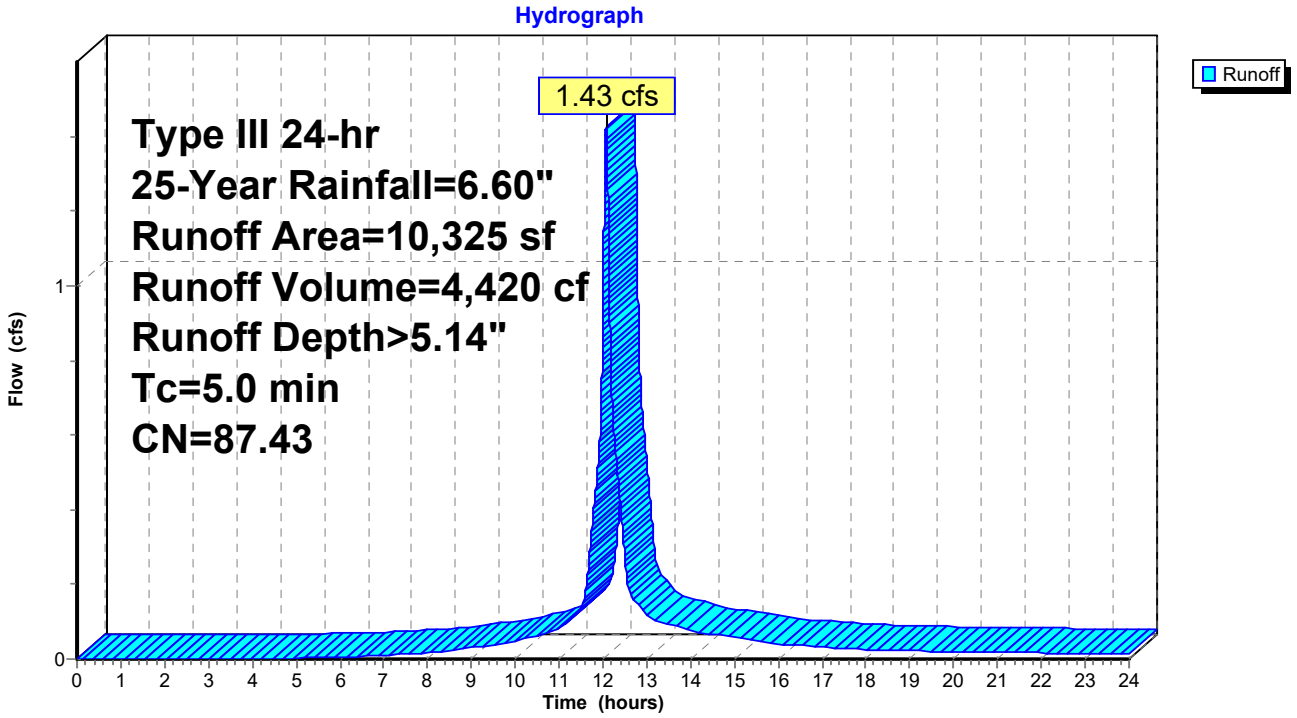
Runoff = 1.43 cfs @ 12.07 hrs, Volume= 4,420 cf, Depth> 5.14"
Routed to Link 3L : Ex. Richmond Hill Avenue Storm Sewer (Point of Concern 3)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
6,065	80.00	>75% Grass cover, Good, HSG D
4,260	98.00	Paved parking, HSG D
10,325	87.43	Weighted Average
6,065		58.74% Pervious Area
4,260		41.26% Impervious Area

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

Subcatchment 4: Ex. Richmond Hill Avenue East Basin (Block A)



Summary for Subcatchment 5: Ex. Richmond Hill Avenue West Basin (Block B)

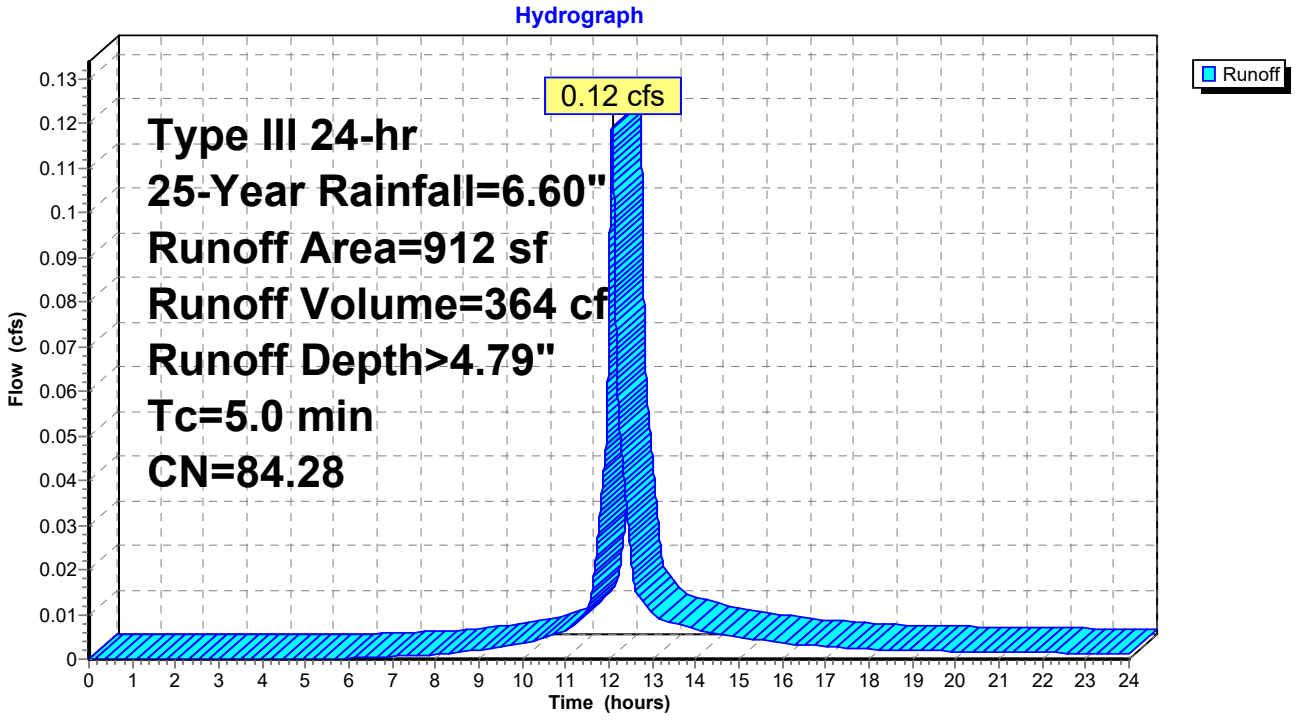
Runoff = 0.12 cfs @ 12.07 hrs, Volume= 364 cf, Depth> 4.79"
Routed to Link 3L : Ex. Richmond Hill Avenue Storm Sewer (Point of Concern 3)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
695	80.00	>75% Grass cover, Good, HSG D
217	98.00	Paved parking, HSG D
912	84.28	Weighted Average
695		76.21% Pervious Area
217		23.79% Impervious Area

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

Subcatchment 5: Ex. Richmond Hill Avenue West Basin (Block B)



Summary for Subcatchment 6: Approved Block A

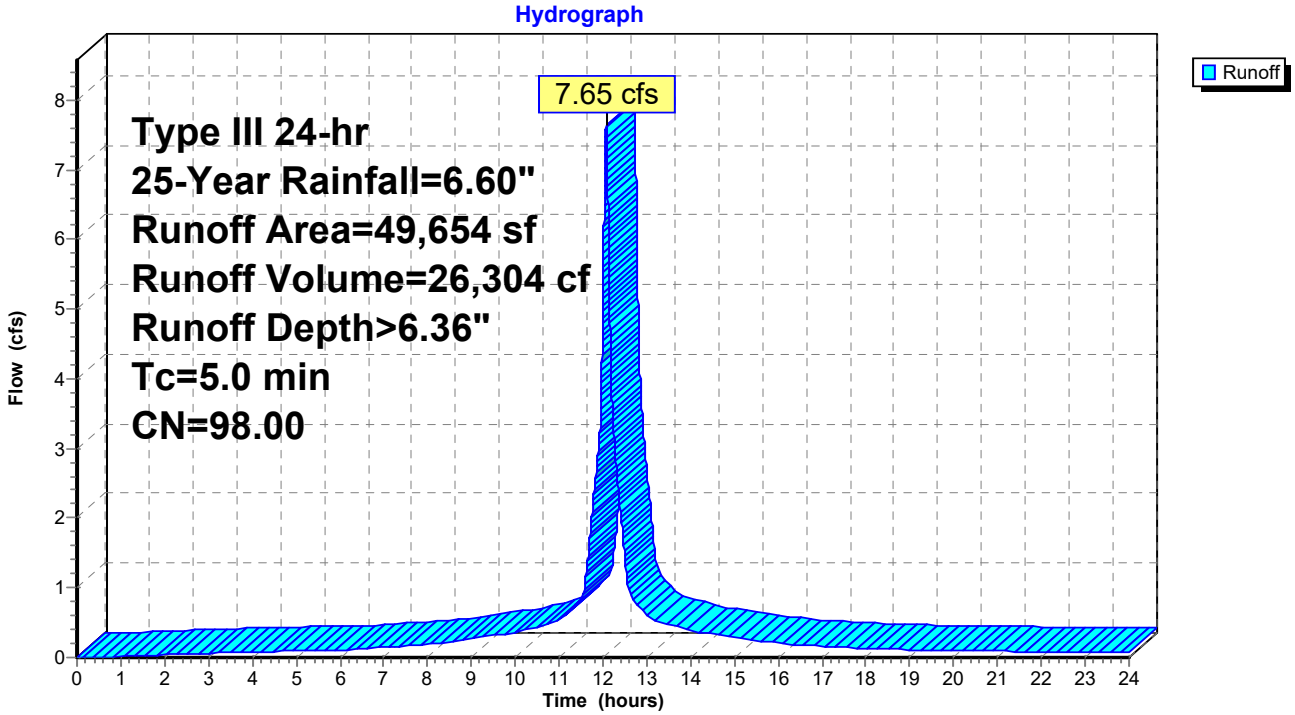
Runoff = 7.65 cfs @ 12.07 hrs, Volume= 26,304 cf, Depth> 6.36"
Routed to Link 5L : Approved Clinton Avenue Storm Sewer (Point of Concern 1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
49,654	98.00	Paved parking, HSG D
49,654		100.00% Impervious Area

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

Subcatchment 6: Approved Block A



Summary for Subcatchment 7: Approved Clinton Avenue East Basin (Block A)

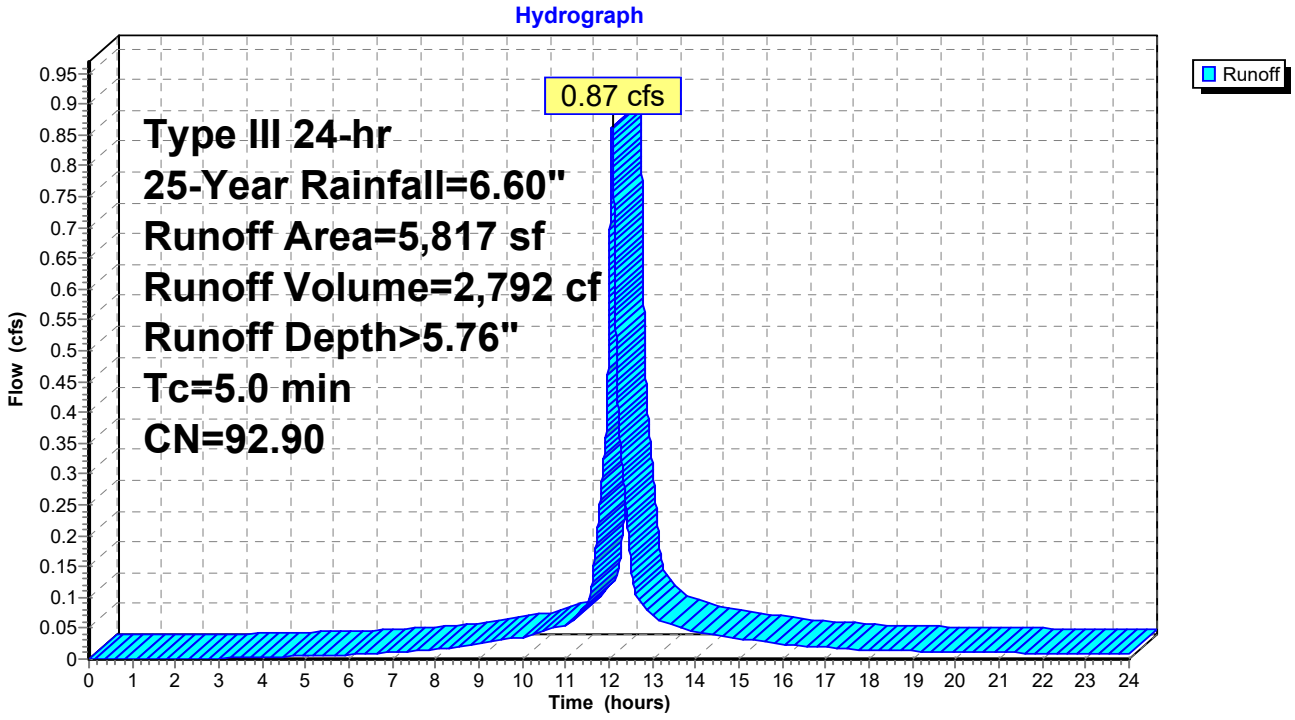
Runoff = 0.87 cfs @ 12.07 hrs, Volume= 2,792 cf, Depth> 5.76"
Routed to Link 5L : Approved Clinton Avenue Storm Sewer (Point of Concern 1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
1,649	80.00	>75% Grass cover, Good, HSG D
4,168	98.00	Paved parking, HSG D
5,817	92.90	Weighted Average
1,649		28.35% Pervious Area
4,168		71.65% Impervious Area

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

Subcatchment 7: Approved Clinton Avenue East Basin (Block A)



Summary for Subcatchment 8: Approved Clinton Avenue North Basin (Block B)

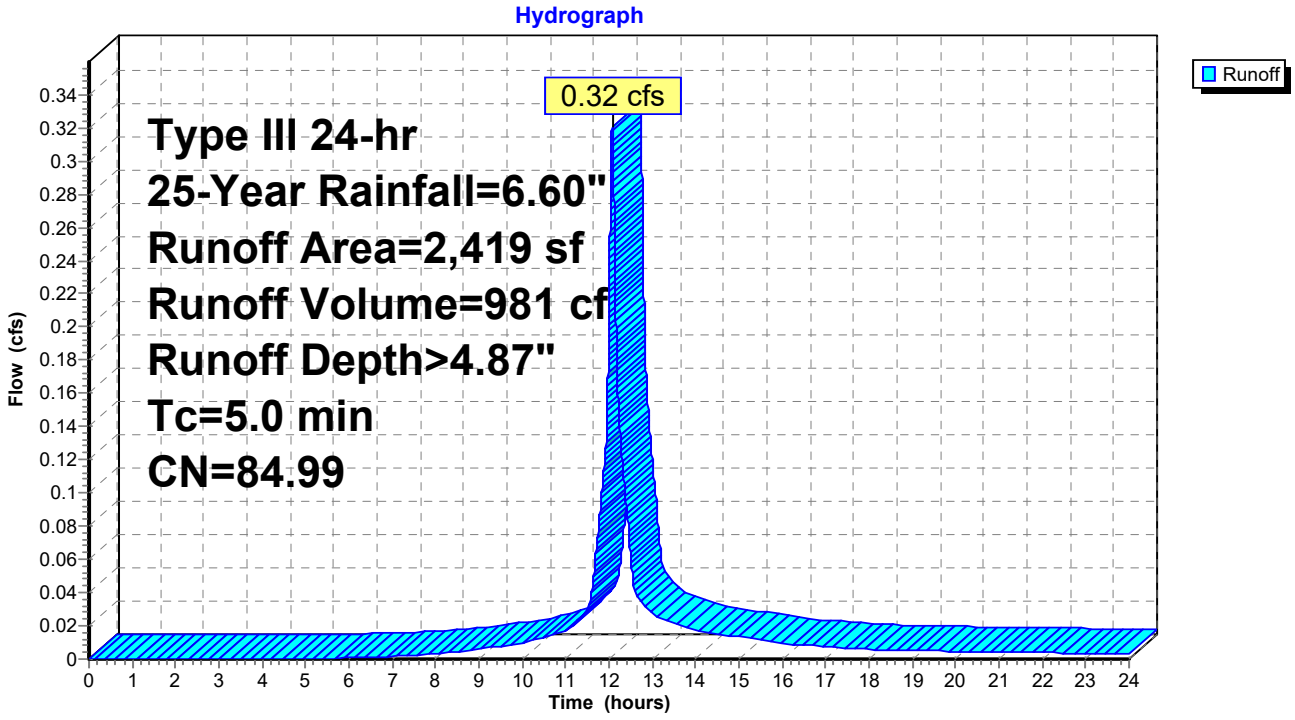
Runoff = 0.32 cfs @ 12.07 hrs, Volume= 981 cf, Depth> 4.87"
Routed to Link 5L : Approved Clinton Avenue Storm Sewer (Point of Concern 1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
1,749	80.00	>75% Grass cover, Good, HSG D
670	98.00	Paved parking, HSG D
2,419	84.99	Weighted Average
1,749		72.30% Pervious Area
670		27.70% Impervious Area

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

Subcatchment 8: Approved Clinton Avenue North Basin (Block B)



Summary for Subcatchment 9: Approved Clinton Avenue West Basin (Block B)

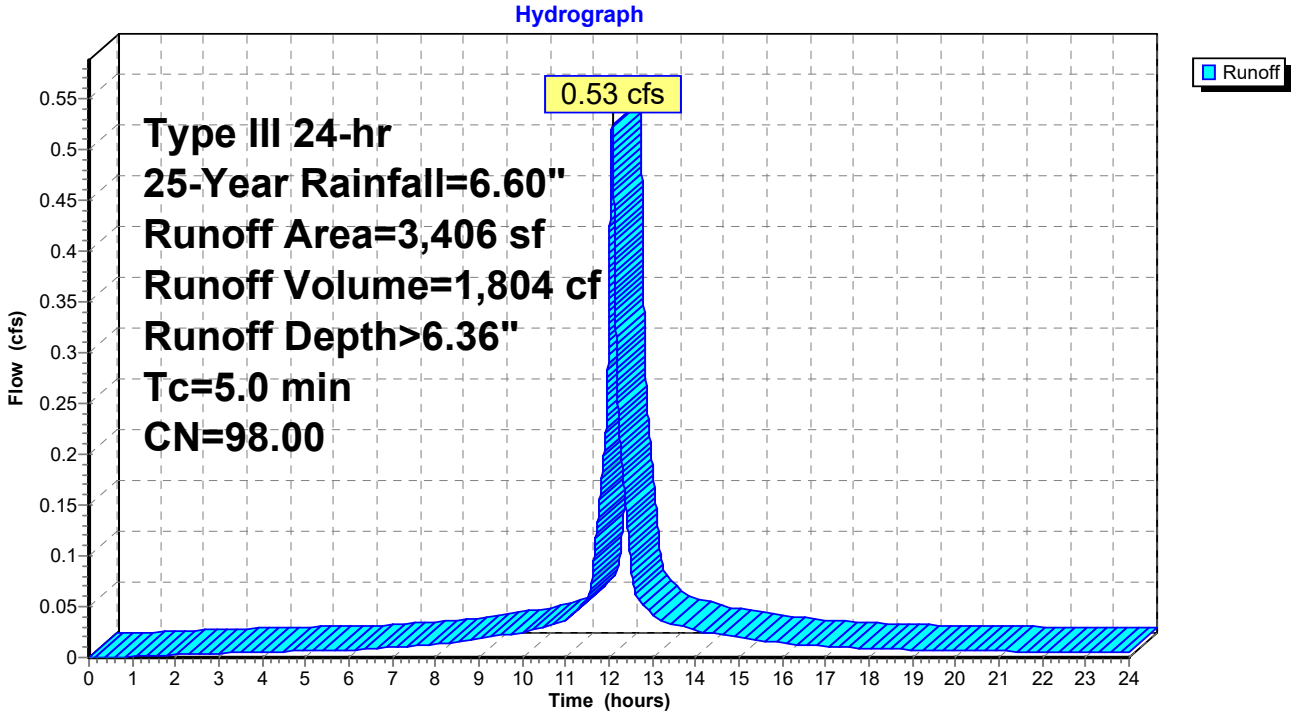
Runoff = 0.53 cfs @ 12.07 hrs, Volume= 1,804 cf, Depth> 6.36"
Routed to Link 5L : Approved Clinton Avenue Storm Sewer (Point of Concern 1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
3,406	98.00	Paved parking, HSG D
3,406		100.00% Impervious Area

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

Subcatchment 9: Approved Clinton Avenue West Basin (Block B)



Summary for Subcatchment 10: Approved Block B

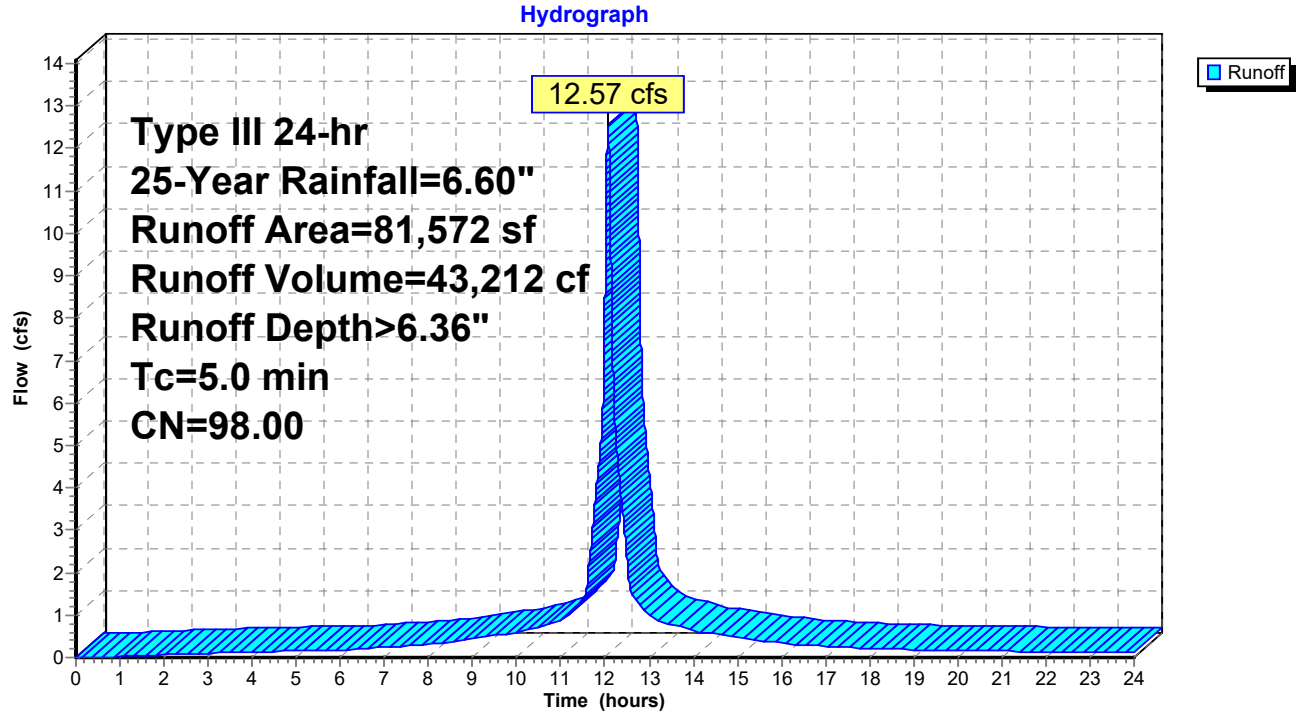
Runoff = 12.57 cfs @ 12.07 hrs, Volume= 43,212 cf, Depth> 6.36"
Routed to Link 5L : Approved Clinton Avenue Storm Sewer (Point of Concern 1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
81,572	98.00	Paved parking, HSG D
81,572		100.00% Impervious Area

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

Subcatchment 10: Approved Block B



Summary for Subcatchment 11: Approved Rippowam River Basin (Block B)

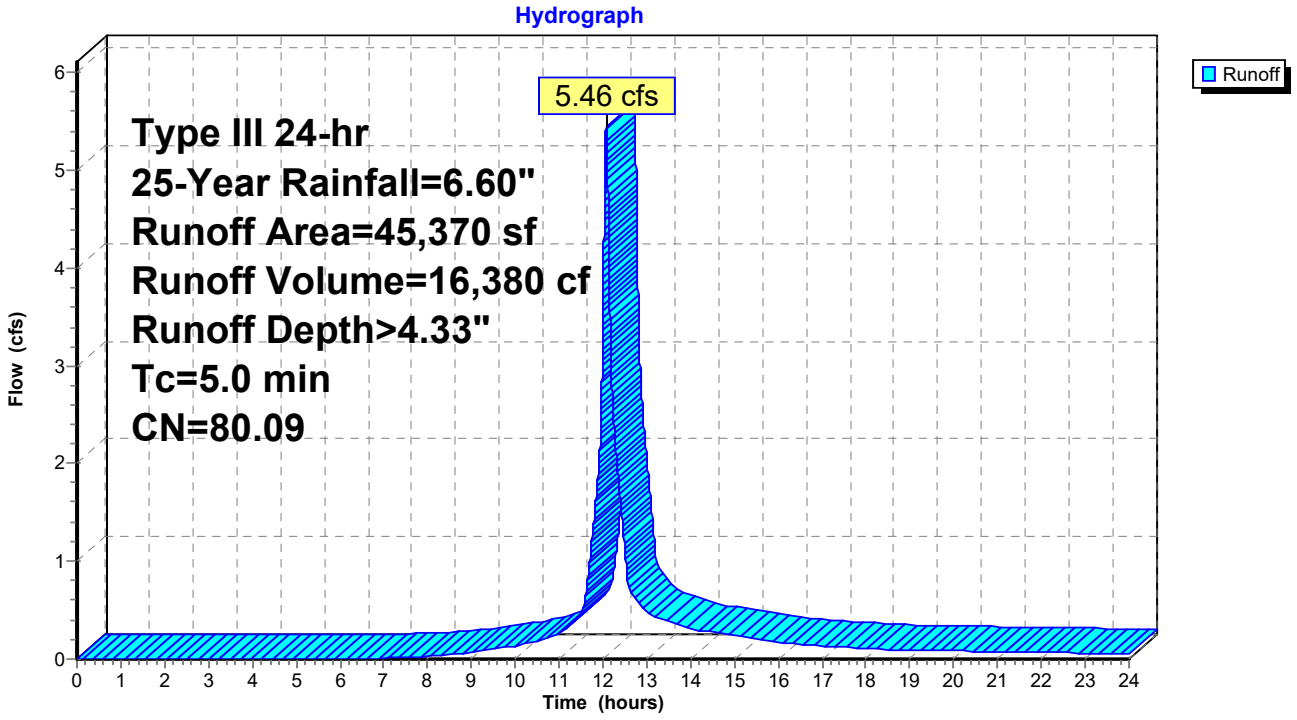
Runoff = 5.46 cfs @ 12.07 hrs, Volume= 16,380 cf, Depth> 4.33"
Routed to Link 6L : Approved Overland Flow Directly Tributary to Rippowam River (Point of Concern 2)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
45,154	80.00	>75% Grass cover, Good, HSG D
216	98.00	Paved parking, HSG D
45,370	80.09	Weighted Average
45,154		99.52% Pervious Area
216		0.48% Impervious Area

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

Subcatchment 11: Approved Rippowam River Basin (Block B)



Summary for Subcatchment 12: Approved Richmond Hill Avenue East Basin (Block A)

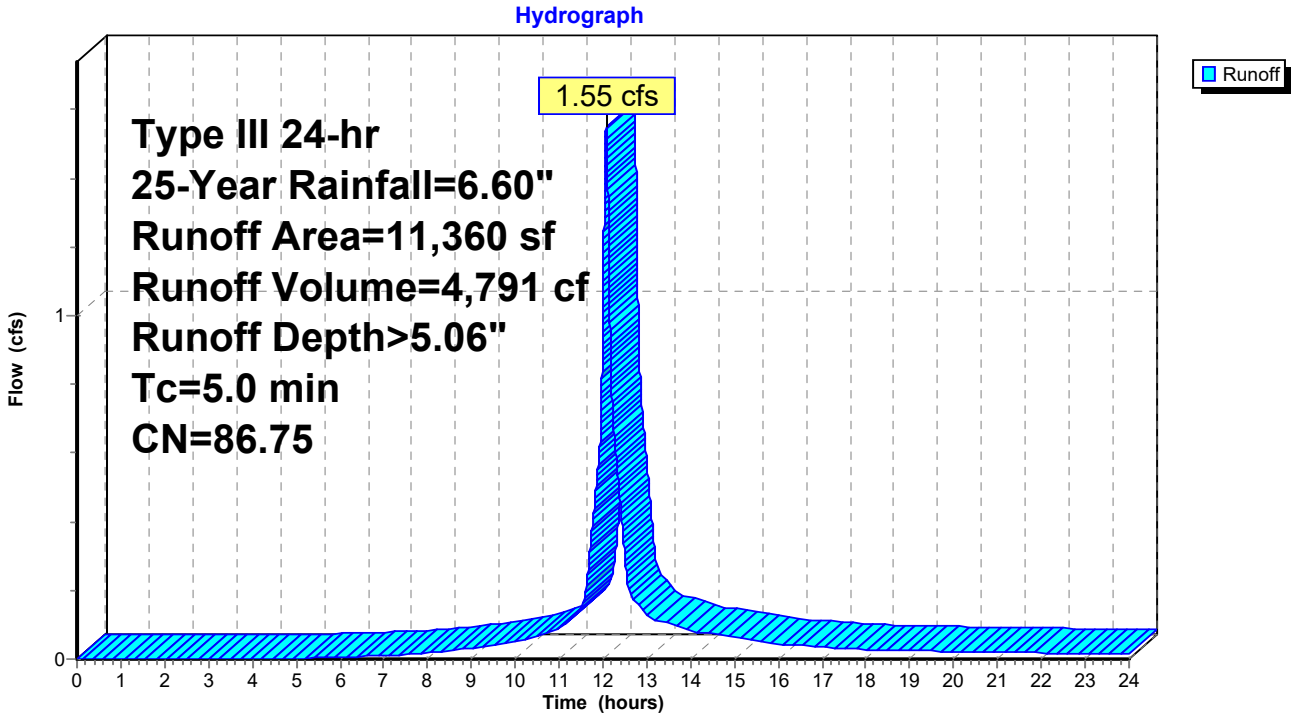
Runoff = 1.55 cfs @ 12.07 hrs, Volume= 4,791 cf, Depth> 5.06"
Routed to Link 7L : Approved Richmond Hill Avenue Storm Sewer (Point of Concern 3)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
7,100	80.00	>75% Grass cover, Good, HSG D
4,260	98.00	Paved parking, HSG D
11,360	86.75	Weighted Average
7,100		62.50% Pervious Area
4,260		37.50% Impervious Area

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

Subcatchment 12: Approved Richmond Hill Avenue East Basin (Block A)



Summary for Subcatchment 13: Approved Richmond Hill Avenue West Basin (Block B)

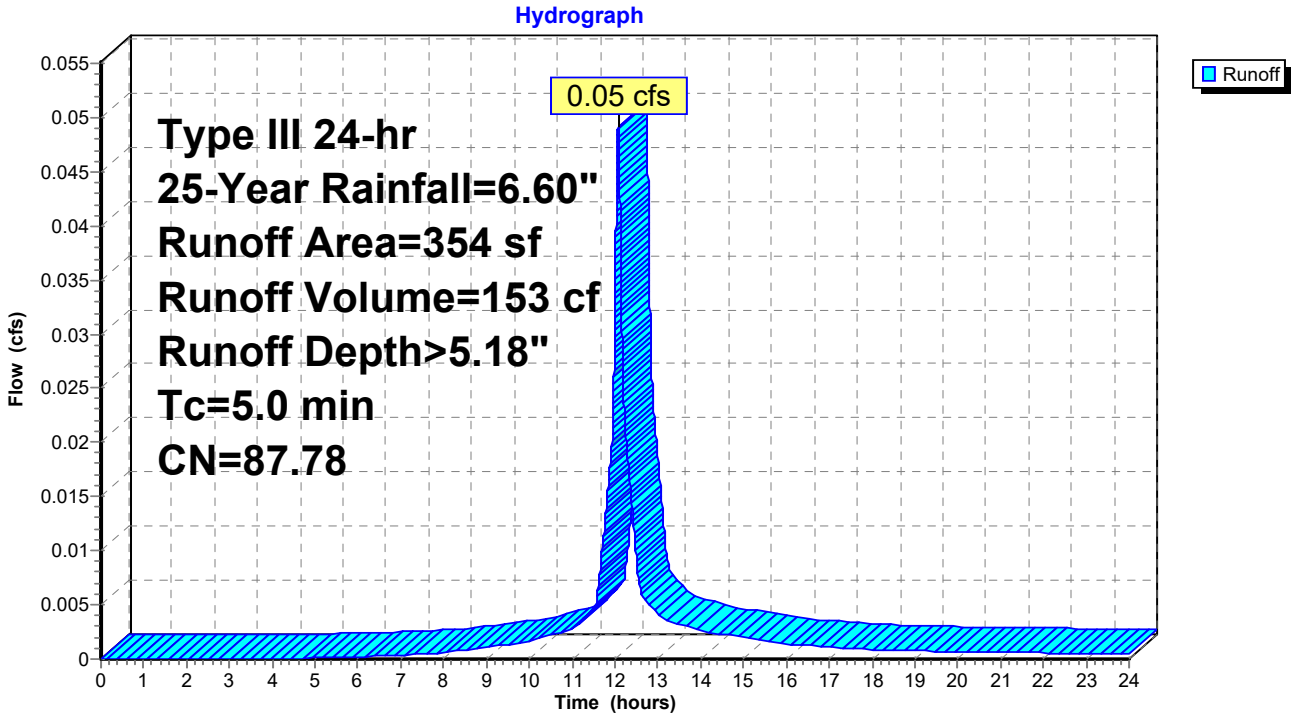
Runoff = 0.05 cfs @ 12.07 hrs, Volume= 153 cf, Depth> 5.18"
Routed to Link 7L : Approved Richmond Hill Avenue Storm Sewer (Point of Concern 3)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
153	98.00	Paved parking, HSG D
201	80.00	>75% Grass cover, Good, HSG D
354	87.78	Weighted Average
201		56.78% Pervious Area
153		43.22% Impervious Area

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

Subcatchment 13: Approved Richmond Hill Avenue West Basin (Block B)



Summary for Subcatchment 14: Pr. Block A

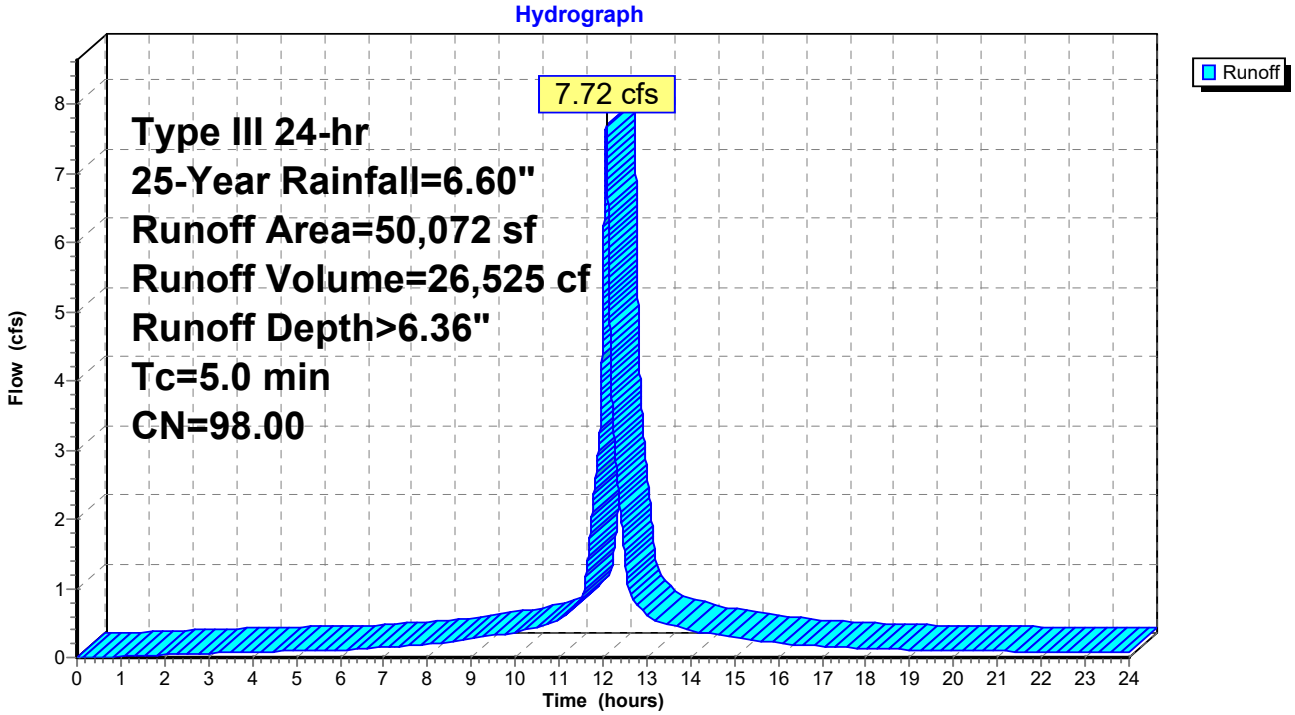
Runoff = 7.72 cfs @ 12.07 hrs, Volume= 26,525 cf, Depth> 6.36"
Routed to Pond 2P : Block A Filtration

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
50,072	98.00	Paved parking, HSG D
50,072		100.00% Impervious Area

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

Subcatchment 14: Pr. Block A



Summary for Subcatchment 15: Pr. Clinton Avenue East Basin (Block A)

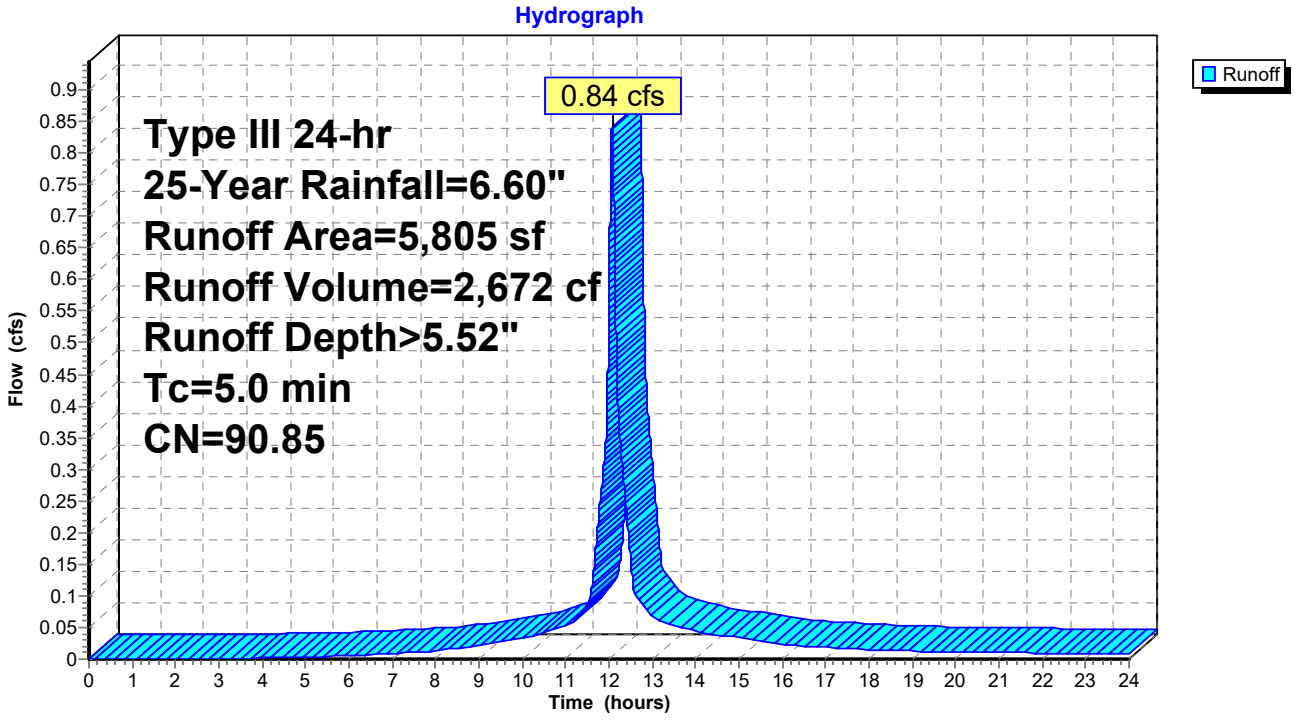
Runoff = 0.84 cfs @ 12.07 hrs, Volume= 2,672 cf, Depth> 5.52"
Routed to Link 9L : Pr. Clinton Avenue Storm Sewer (Point of Concern 1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
2,307	80.00	>75% Grass cover, Good, HSG D
3,498	98.00	Paved parking, HSG D
5,805	90.85	Weighted Average
2,307		39.74% Pervious Area
3,498		60.26% Impervious Area

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

Subcatchment 15: Pr. Clinton Avenue East Basin (Block A)



Summary for Subcatchment 16: Pr. Clinton Avenue North Basin (Block B)

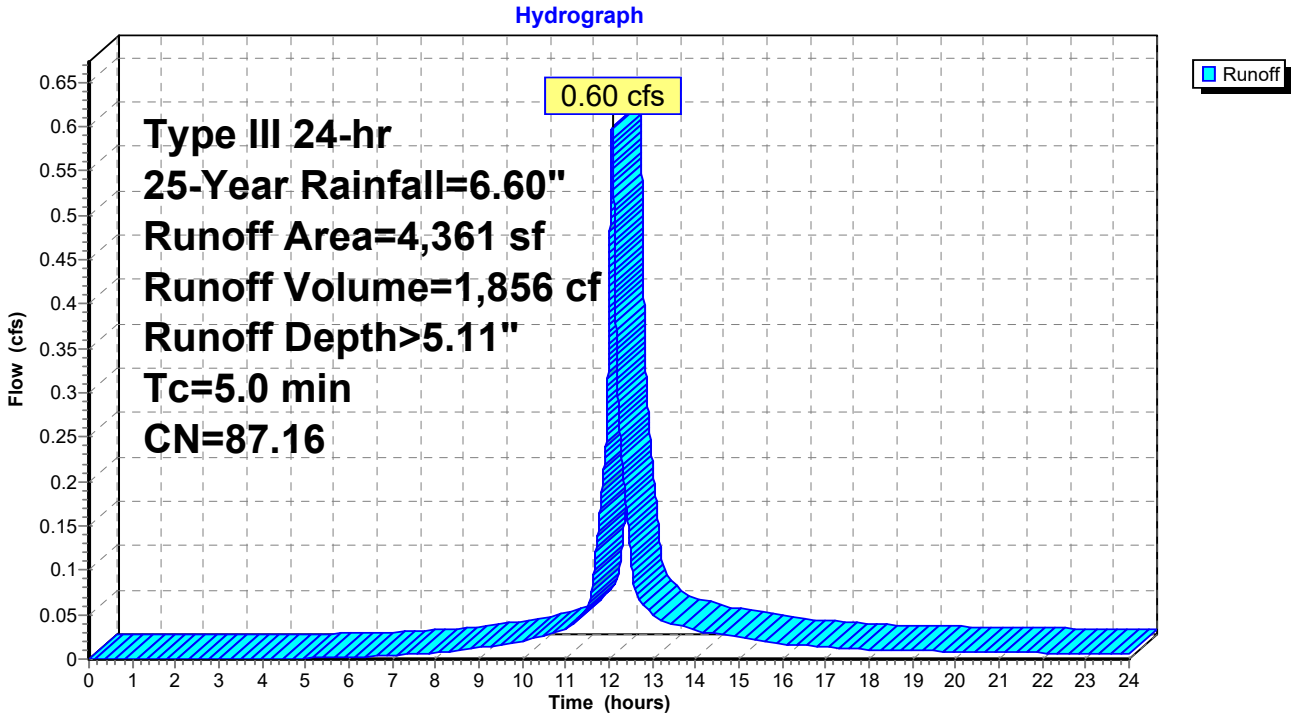
Runoff = 0.60 cfs @ 12.07 hrs, Volume= 1,856 cf, Depth> 5.11"
Routed to Link 9L : Pr. Clinton Avenue Storm Sewer (Point of Concern 1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
2,626	80.00	>75% Grass cover, Good, HSG D
1,735	98.00	Paved parking, HSG D
4,361	87.16	Weighted Average
2,626		60.22% Pervious Area
1,735		39.78% Impervious Area

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

Subcatchment 16: Pr. Clinton Avenue North Basin (Block B)



Summary for Subcatchment 17: Pr. Clinton Avenue West Basin (Block B)

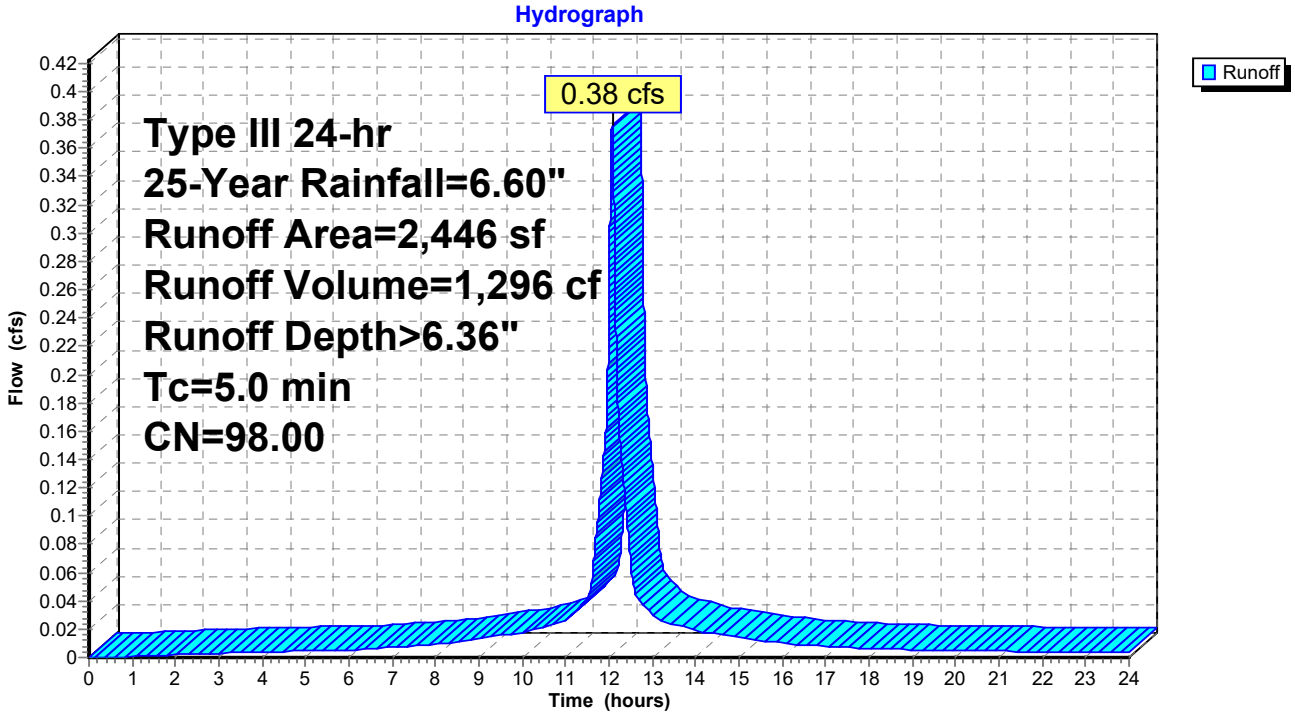
Runoff = 0.38 cfs @ 12.07 hrs, Volume= 1,296 cf, Depth> 6.36"
Routed to Link 9L : Pr. Clinton Avenue Storm Sewer (Point of Concern 1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
2,446	98.00	Paved parking, HSG D
2,446		100.00% Impervious Area

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

Subcatchment 17: Pr. Clinton Avenue West Basin (Block B)



Summary for Subcatchment 18: Pr. Block B

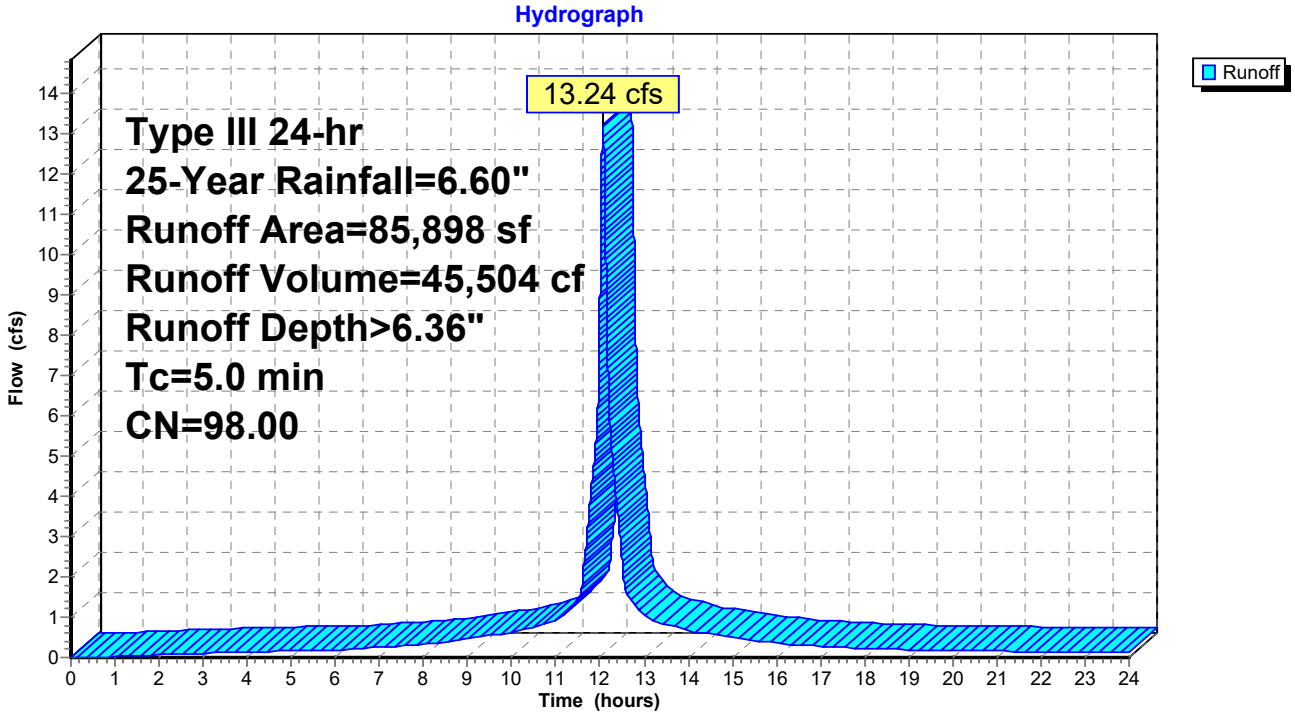
Runoff = 13.24 cfs @ 12.07 hrs, Volume= 45,504 cf, Depth> 6.36"
Routed to Pond 14P : Block B Infil

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
85,898	98.00	Paved parking, HSG D
85,898		100.00% Impervious Area

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

Subcatchment 18: Pr. Block B



Summary for Subcatchment 19: Pr. Rippowam River Basin (Block B)

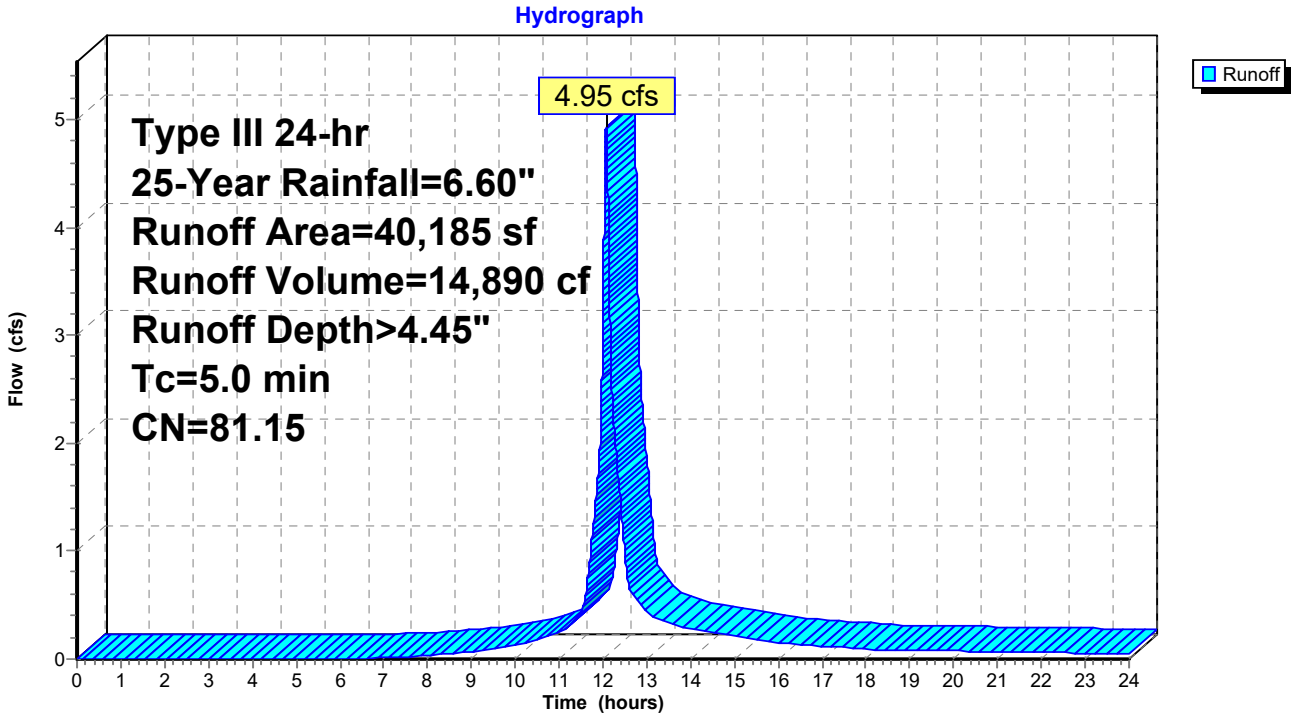
Runoff = 4.95 cfs @ 12.07 hrs, Volume= 14,890 cf, Depth> 4.45"
Routed to Link 10L : Pr. Overland Flow Directly Tributary to Rippowam River (Point of Concern 2)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
37,609	80.00	>75% Grass cover, Good, HSG D
2,576	98.00	Paved parking, HSG D
40,185	81.15	Weighted Average
37,609		93.59% Pervious Area
2,576		6.41% Impervious Area

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

Subcatchment 19: Pr. Rippowam River Basin (Block B)



Summary for Subcatchment 20: Pr. Richmond Hill Avenue East Basin (Block A)

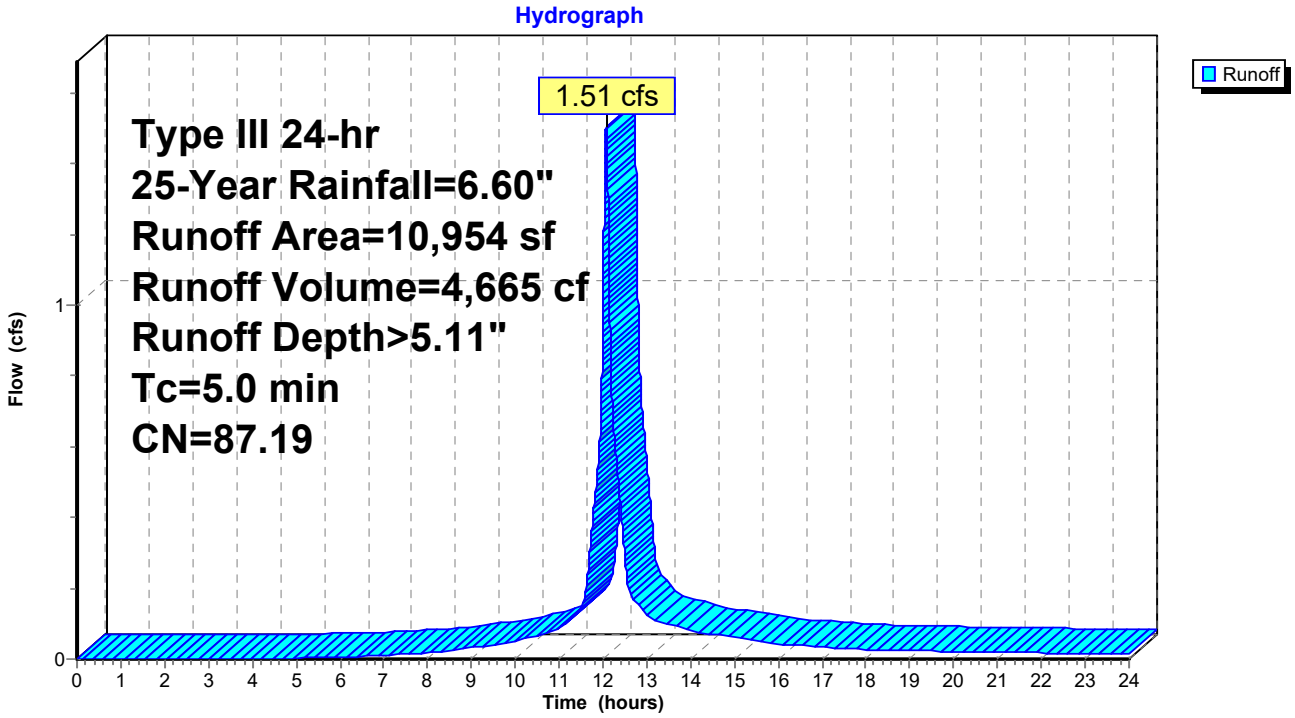
Runoff = 1.51 cfs @ 12.07 hrs, Volume= 4,665 cf, Depth> 5.11"
Routed to Link 11L : Pr. Richmond Hill Avenue Storm Sewer (Point of Concern 3)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
6,581	80.00	>75% Grass cover, Good, HSG D
4,373	98.00	Paved parking, HSG D
10,954	87.19	Weighted Average
6,581		60.08% Pervious Area
4,373		39.92% Impervious Area

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

Subcatchment 20: Pr. Richmond Hill Avenue East Basin (Block A)



Summary for Subcatchment 21: Pr. Richmond Hill Avenue West Basin (Block B)

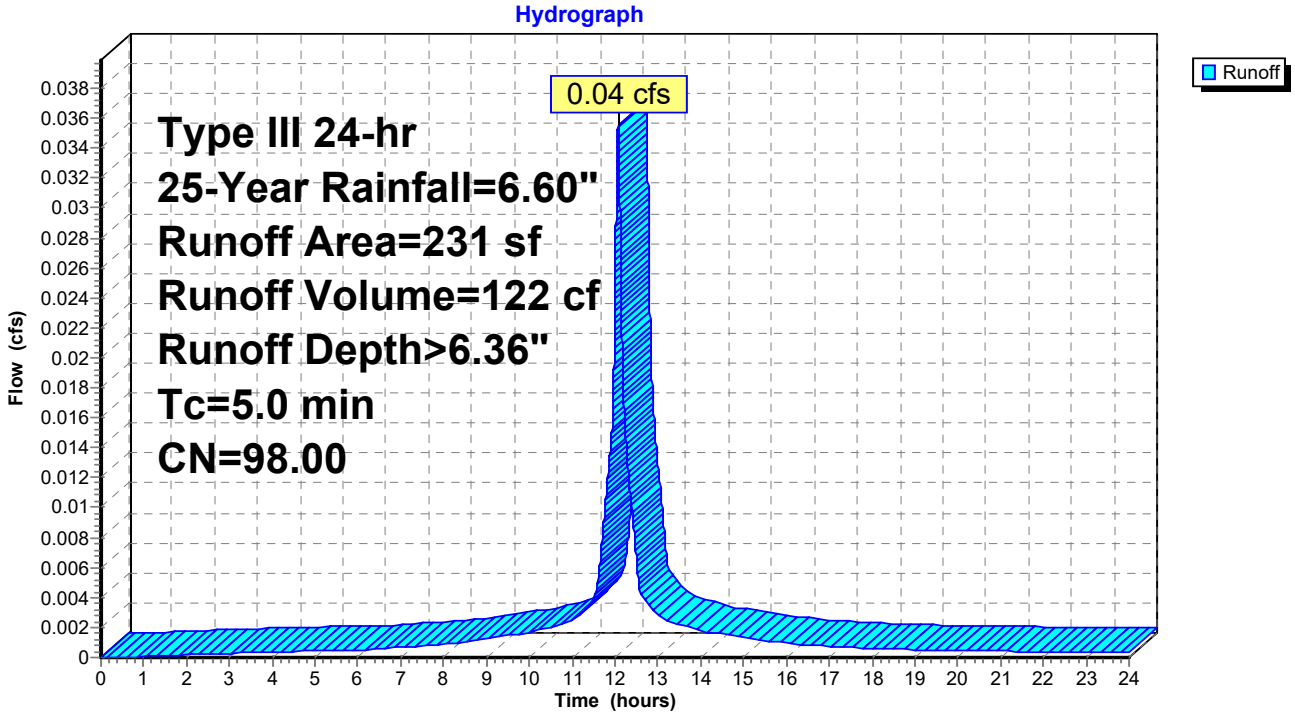
Runoff = 0.04 cfs @ 12.07 hrs, Volume= 122 cf, Depth> 6.36"
Routed to Link 11L : Pr. Richmond Hill Avenue Storm Sewer (Point of Concern 3)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 25-Year Rainfall=6.60"

Area (sf)	CN	Description
231	98.00	Paved parking, HSG D
231		100.00% Impervious Area

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

Subcatchment 21: Pr. Richmond Hill Avenue West Basin (Block B)



Summary for Pond 2P: Block A Filtration

Inflow Area = 50,072 sf,100.00% Impervious, Inflow Depth > 6.36" for 25-Year event
Inflow = 7.72 cfs @ 12.07 hrs, Volume= 26,525 cf
Outflow = 7.71 cfs @ 12.07 hrs, Volume= 26,425 cf, Atten= 0%, Lag= 0.1 min
Primary = 7.71 cfs @ 12.07 hrs, Volume= 26,425 cf
Routed to Link 9L : Pr. Clinton Avenue Storm Sewer (Point of Concern 1)

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs / 2
Peak Elev= 14.48' @ 12.07 hrs Surf.Area= 2,833 sf Storage= 3,039 cf

Plug-Flow detention time= 14.9 min calculated for 26,425 cf (100% of inflow)
Center-of-Mass det. time= 12.3 min (754.7 - 742.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	12.00'	587 cf	**10.50'W x 138.00'L x 2.50'H Field A** 3,623 cf Overall - 2,154 cf Embedded = 1,468 cf x 40.0% Voids
#2A	12.50'	1,540 cf	**Concrete Galley 4x8x2** x 34 Inside #1 Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf 34 Chambers in 2 Rows
#3	10.25'	819 cf	**Sand/Stone Filter (Prismatic)**Listed below (Recalc)
#4	9.50'	143 cf	**MMH#2 (Prismatic)**Listed below (Recalc)
		3,089 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
10.25	1,365	0.0	0	0
11.00	1,365	40.0	410	410
12.00	1,365	30.0	410	819

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.50	19	0	0
17.00	19	143	143

Device	Routing	Invert	Outlet Devices
#1	Primary	7.70'	**15.0" Round MH#4 TO EX.MH.** L= 16.0' Ke= 0.500 Inlet / Outlet Invert= 7.70' / 7.50' S= 0.0125 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Device 1	8.10'	**15.0" Round MH#5 TO MH#4** L= 36.0' Ke= 0.500 Inlet / Outlet Invert= 8.10' / 7.80' S= 0.0083 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#3	Device 2	9.70'	**15.0" Round MMH#2 TO MH#5** L= 182.0' Ke= 0.500 Inlet / Outlet Invert= 9.70' / 8.20' S= 0.0082 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#4	Device 3	13.90'	**4' Weir with 6" Knotch, C= 3.27** Offset (feet) 0.00 0.01 0.49 0.50 4.50 4.51 4.99 5.00 Height (feet) 1.08 0.50 0.50 0.00 0.00 0.50 0.50 1.08
#5	Device 4	12.85'	**18.0" Round FILT#1 TO MMH#2** L= 32.0' Ke= 0.500

			Inlet / Outlet Invert= 12.50' / 12.85' S= -0.0109 '/' Cc= 0.900
			n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#6	Device 3	10.25'	**6.0" Round FILT#1 UD TO MMH#2** L= 36.0' Ke= 0.500
			Inlet / Outlet Invert= 10.25' / 9.80' S= 0.0125 '/' Cc= 0.900
			n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=7.70 cfs @ 12.07 hrs HW=14.48' TW=9.65' (Fixed TW Elev= 9.65')
- **1=MH#4 TO EX.MH.** (Passes 7.70 cfs of 12.99 cfs potential flow)
  - **2=MH#5 TO MH#4** (Passes 7.70 cfs of 12.99 cfs potential flow)
    - **3=MMH#2 TO MH#5** (Passes 7.70 cfs of 10.81 cfs potential flow)
      - **4=4' Weir with 6" Knotch** (Weir Controls 5.90 cfs @ 2.44 fps)
        - **5=FILT#1 TO MMH#2** (Passes 5.90 cfs of 6.49 cfs potential flow)
      - **6=FILT#1 UD TO MMH#2** (Barrel Controls 1.81 cfs @ 9.20 fps)

Pond 2P: Block A Filtration - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x8x2 (Concrete Galley, UCPI 24" Low Profile Galley or equivalent)
Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf
Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf

48.0" Wide + 6.0" Spacing = 54.0" C-C Row Spacing

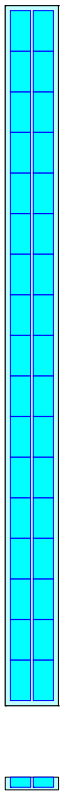
17 Chambers/Row x 8.00' Long = 136.00' Row Length +12.0" End Stone x 2 = 138.00' Base Length
2 Rows x 48.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 10.50' Base Width
6.0" Stone Base + 24.0" Chamber Height = 2.50' Field Height

34 Chambers x 45.3 cf = 1,540.2 cf Chamber Storage
34 Chambers x 63.4 cf = 2,154.2 cf Displacement

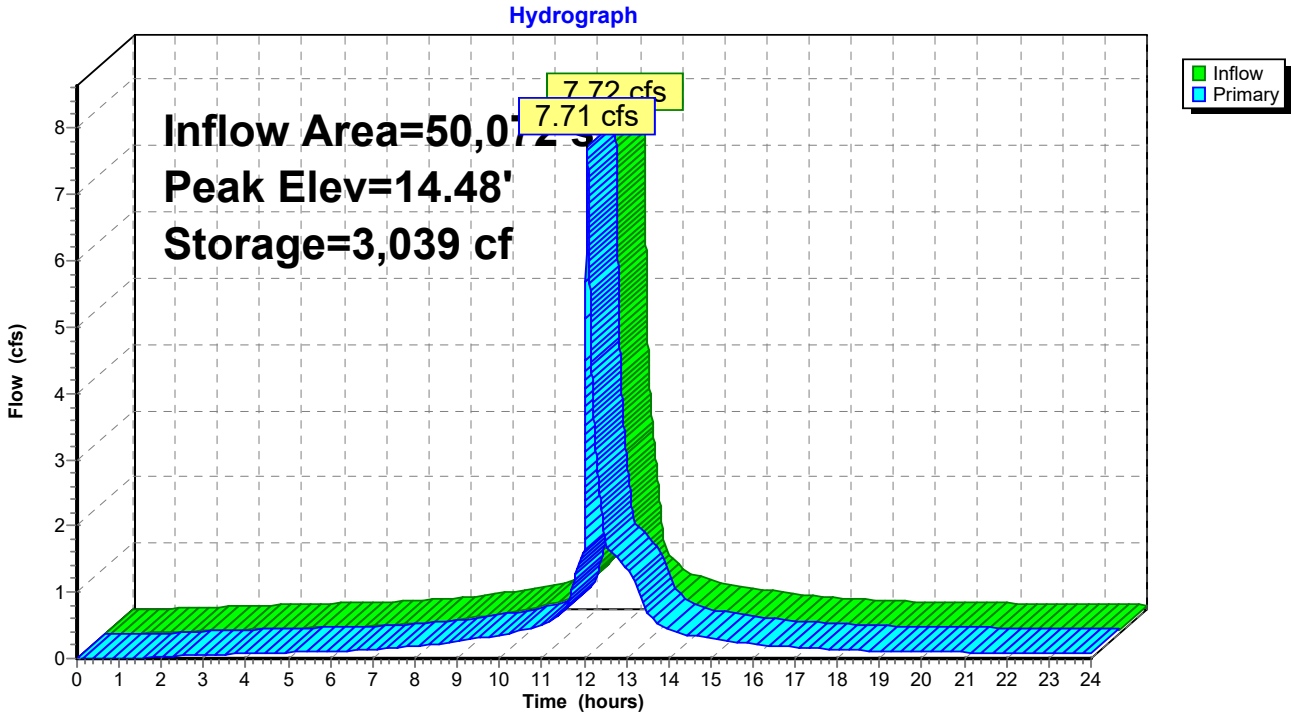
3,622.5 cf Field - 2,154.2 cf Chambers = 1,468.3 cf Stone x 40.0% Voids = 587.3 cf Stone Storage

Chamber Storage + Stone Storage = 2,127.5 cf = 0.049 af
Overall Storage Efficiency = 58.7%
Overall System Size = 138.00' x 10.50' x 2.50'

34 Chambers
134.2 cy Field
54.4 cy Stone



Pond 2P: Block A Filtration



Stage-Area-Storage for Pond 2P: Block A Filtration

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
9.50	0	12.15	956	14.80	3,047
9.55	1	12.20	986	14.85	3,048
9.60	2	12.25	1,016	14.90	3,049
9.65	3	12.30	1,046	14.95	3,050
9.70	4	12.35	1,076	15.00	3,051
9.75	5	12.40	1,106	15.05	3,052
9.80	6	12.45	1,136	15.10	3,053
9.85	7	12.50	1,166	15.15	3,054
9.90	8	12.55	1,219	15.20	3,055
9.95	9	12.60	1,272	15.25	3,056
10.00	10	12.65	1,325	15.30	3,057
10.05	10	12.70	1,378	15.35	3,058
10.10	11	12.75	1,431	15.40	3,059
10.15	12	12.80	1,484	15.45	3,060
10.20	13	12.85	1,537	15.50	3,061
10.25	14	12.90	1,590	15.55	3,061
10.30	43	12.95	1,643	15.60	3,062
10.35	71	13.00	1,696	15.65	3,063
10.40	99	13.05	1,749	15.70	3,064
10.45	127	13.10	1,802	15.75	3,065
10.50	156	13.15	1,855	15.80	3,066
10.55	184	13.20	1,908	15.85	3,067
10.60	212	13.25	1,961	15.90	3,068
10.65	240	13.30	2,014	15.95	3,069
10.70	268	13.35	2,067	16.00	3,070
10.75	297	13.40	2,120	16.05	3,071
10.80	325	13.45	2,173	16.10	3,072
10.85	353	13.50	2,226	16.15	3,073
10.90	382	13.55	2,279	16.20	3,074
10.95	410	13.60	2,332	16.25	3,075
11.00	438	13.65	2,385	16.30	3,076
11.05	459	13.70	2,438	16.35	3,077
11.10	481	13.75	2,491	16.40	3,078
11.15	502	13.80	2,544	16.45	3,079
11.20	524	13.85	2,597	16.50	3,080
11.25	545	13.90	2,650	16.55	3,080
11.30	567	13.95	2,703	16.60	3,081
11.35	588	14.00	2,756	16.65	3,082
11.40	609	14.05	2,809	16.70	3,083
11.45	631	14.10	2,860	16.75	3,084
11.50	652	14.15	2,907	16.80	3,085
11.55	674	14.20	2,954	16.85	3,086
11.60	695	14.25	3,000	16.90	3,087
11.65	717	14.30	3,008	16.95	3,088
11.70	738	14.35	3,016	17.00	**3,089**
11.75	759	14.40	3,025		
11.80	781	14.45	3,033		
11.85	802	14.50	3,042		
11.90	824	14.55	3,042		
11.95	845	14.60	3,043		
12.00	867	14.65	3,044		
12.05	896	14.70	3,045		
12.10	926	14.75	3,046		

Summary for Pond 14P: Block B Infil

Inflow Area = 85,898 sf,100.00% Impervious, Inflow Depth > 6.36" for 25-Year event
Inflow = 13.24 cfs @ 12.07 hrs, Volume= 45,504 cf
Outflow = 12.68 cfs @ 12.09 hrs, Volume= 37,457 cf, Atten= 4%, Lag= 1.2 min
Primary = 12.68 cfs @ 12.09 hrs, Volume= 37,457 cf
Routed to Link 9L : Pr. Clinton Avenue Storm Sewer (Point of Concern 1)

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs / 2
Peak Elev= 15.13' @ 12.09 hrs Surf.Area= 2,313 sf Storage= 9,689 cf

Plug-Flow detention time= 138.6 min calculated for 37,455 cf (82% of inflow)
Center-of-Mass det. time= 66.6 min (808.9 - 742.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.35'	1,526 cf	**9.00'W x 257.00'L x 6.67'H Field A** 15,420 cf Overall - 11,605 cf Embedded = 3,815 cf x 40.0% Voids
#2A	10.35'	8,635 cf	**retain_it retain_it 5.0'** x 32 Inside #1 Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf 1 Rows adjusted for 685.7 cf perimeter wall
		10,161 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	6.90'	**24.0" Round MH#1 TO JB#1** L= 18.0' Ke= 0.500 Inlet / Outlet Invert= 6.90' / 5.90' S= 0.0556 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	8.40'	**24.0" Round MH#2 TO MH#1** L= 62.0' Ke= 0.500 Inlet / Outlet Invert= 8.40' / 7.00' S= 0.0226 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#3	Device 2	11.45'	**24.0" Round MH#3 TO MH#2** L= 70.0' Ke= 0.500 Inlet / Outlet Invert= 11.45' / 10.75' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#4	Device 3	12.05'	**24.0" Round MMH#1 TO MH#3** L= 51.0' Ke= 0.500 Inlet / Outlet Invert= 12.05' / 11.55' S= 0.0098 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#5	Device 4	14.20'	**4' Weir with 6" Knotch, C= 3.27** Offset (feet) 0.00 0.01 0.49 0.50 4.50 4.51 4.99 5.00 Height (feet) 2.30 0.50 0.50 0.00 0.00 0.50 0.50 2.30
#6	Device 5	10.45'	**24.0" Round INFIL#1 TO MMH#1** L= 3.0' Ke= 0.500 Inlet / Outlet Invert= 10.35' / 10.45' S= -0.0333 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=12.68 cfs @ 12.09 hrs HW=15.13' TW=8.21' (Fixed TW Elev= 8.21')
- **1=MH#1 TO JB#1** (Passes 12.68 cfs of 39.79 cfs potential flow)
  - **2=MH#2 TO MH#1** (Passes 12.68 cfs of 36.21 cfs potential flow)
    - **3=MH#3 TO MH#2** (Passes 12.68 cfs of 24.77 cfs potential flow)
      - **4=MMH#1 TO MH#3** (Passes 12.68 cfs of 21.82 cfs potential flow)
        - **5=4' Weir with 6" Knotch** (Weir Controls 12.68 cfs @ 3.05 fps)
          - **6=INFIL#1 TO MMH#1** (Passes 12.68 cfs of 14.59 cfs potential flow)

Pond 14P: Block B Infil - Chamber Wizard Field A

Chamber Model = retain_it retain_it 5.0' (retain-it®)
Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf
Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf
1 Rows adjusted for 685.7 cf perimeter wall

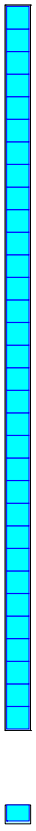
32 Chambers/Row x 8.00' Long = 256.00' Row Length +6.0" End Stone x 2 = 257.00' Base Length
1 Rows x 96.0" Wide + 6.0" Side Stone x 2 = 9.00' Base Width
12.0" Stone Base + 68.0" Chamber Height = 6.67' Field Height

10.4 cf Sidewall x 32 x 2 + 10.4 cf Endwall x 1 x 2 = 685.7 cf Perimeter Wall
32 Chambers x 291.3 cf - 685.7 cf Perimeter wall = 8,635.2 cf Chamber Storage
32 Chambers x 362.7 cf = 11,605.3 cf Displacement

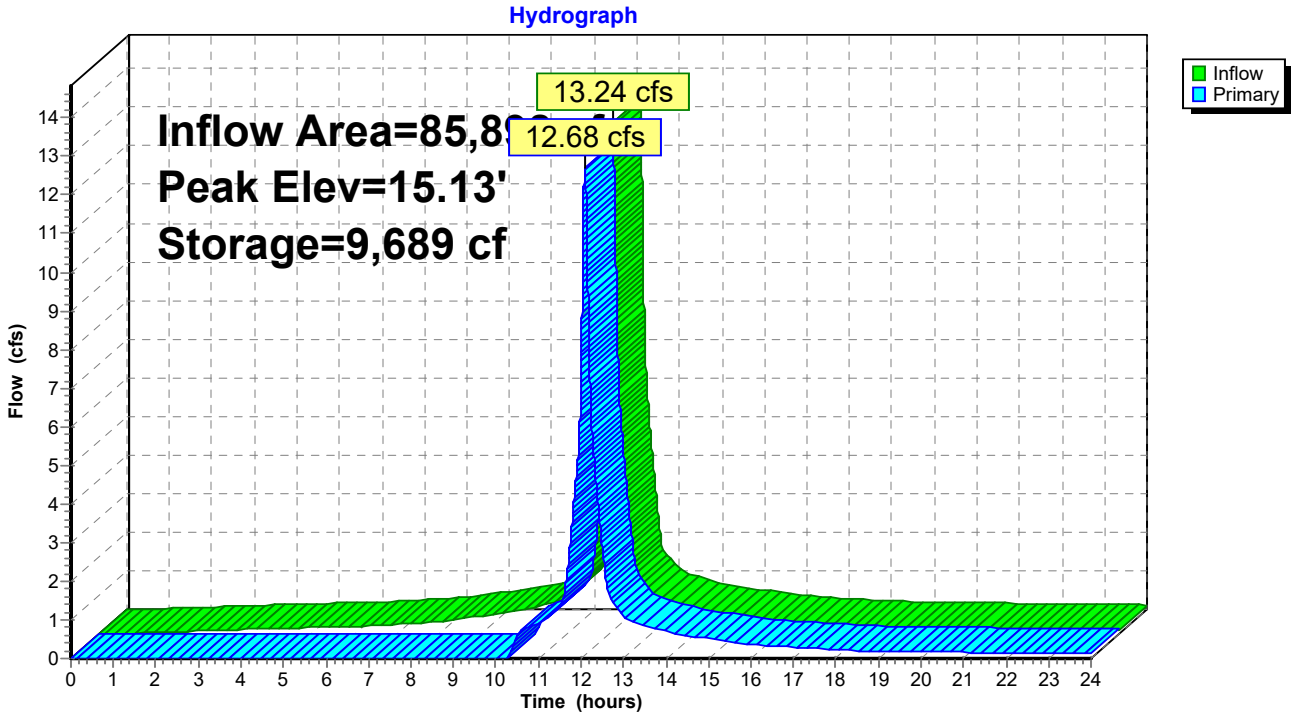
15,420.0 cf Field - 11,605.3 cf Chambers = 3,814.7 cf Stone x 40.0% Voids = 1,525.9 cf Stone Storage

Chamber Storage + Stone Storage = 10,161.1 cf = 0.233 af
Overall Storage Efficiency = 65.9%
Overall System Size = 257.00' x 9.00' x 6.67'

32 Chambers
571.1 cy Field
141.3 cy Stone



Pond 14P: Block B Infil



Stage-Area-Storage for Pond 14P: Block B Infil

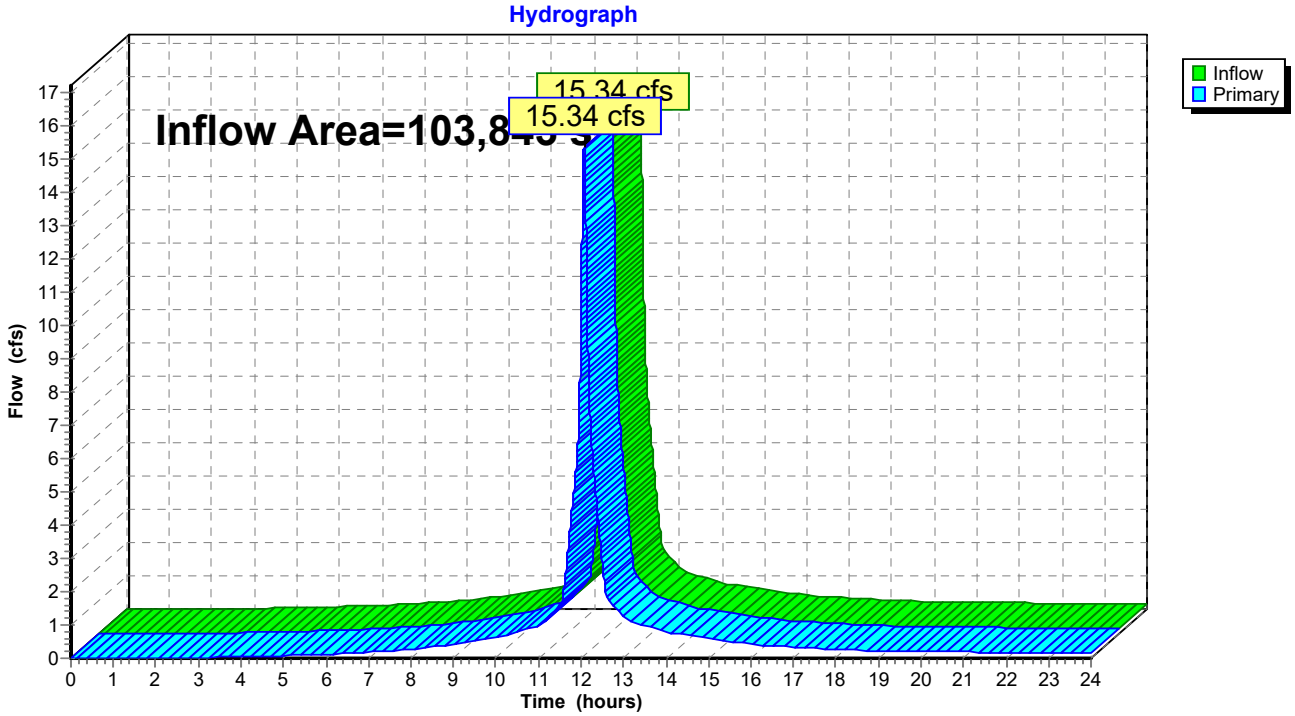
Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
9.35	0	12.00	3,950	14.65	8,807
9.40	46	12.05	4,041	14.70	8,899
9.45	93	12.10	4,133	14.75	8,991
9.50	139	12.15	4,225	14.80	9,082
9.55	185	12.20	4,316	14.85	9,174
9.60	231	12.25	4,408	14.90	9,266
9.65	278	12.30	4,500	14.95	9,357
9.70	324	12.35	4,591	15.00	9,449
9.75	370	12.40	4,683	15.05	9,541
9.80	416	12.45	4,775	15.10	9,632
9.85	463	12.50	4,866	15.15	9,724
9.90	509	12.55	4,958	15.20	9,815
9.95	555	12.60	5,050	15.25	9,907
10.00	601	12.65	5,141	15.30	9,999
10.05	648	12.70	5,233	15.35	10,090
10.10	694	12.75	5,325	15.40	10,096
10.15	740	12.80	5,416	15.45	10,101
10.20	786	12.85	5,508	15.50	10,106
10.25	833	12.90	5,599	15.55	10,112
10.30	879	12.95	5,691	15.60	10,117
10.35	925	13.00	5,783	15.65	10,122
10.40	1,017	13.05	5,874	15.70	10,128
10.45	1,109	13.10	5,966	15.75	10,133
10.50	1,200	13.15	6,058	15.80	10,138
10.55	1,292	13.20	6,149	15.85	10,143
10.60	1,383	13.25	6,241	15.90	10,149
10.65	1,475	13.30	6,333	15.95	10,154
10.70	1,567	13.35	6,424	16.00	**10,159**
10.75	1,658	13.40	6,516	16.05	**10,161**
10.80	1,750	13.45	6,608	16.10	10,161
10.85	1,842	13.50	6,699	16.15	10,161
10.90	1,933	13.55	6,791	16.20	10,161
10.95	2,025	13.60	6,883	16.25	10,161
11.00	2,117	13.65	6,974	16.30	10,161
11.05	2,208	13.70	7,066	16.35	10,161
11.10	2,300	13.75	7,158	16.40	10,161
11.15	2,392	13.80	7,249	16.45	10,161
11.20	2,483	13.85	7,341	16.50	10,161
11.25	2,575	13.90	7,433		
11.30	2,667	13.95	7,524		
11.35	2,758	14.00	7,616		
11.40	2,850	14.05	7,707		
11.45	2,942	14.10	7,799		
11.50	3,033	14.15	7,891		
11.55	3,125	14.20	7,982		
11.60	3,217	14.25	8,074		
11.65	3,308	14.30	8,166		
11.70	3,400	14.35	8,257		
11.75	3,491	14.40	8,349		
11.80	3,583	14.45	8,441		
11.85	3,675	14.50	8,532		
11.90	3,766	14.55	8,624		
11.95	3,858	14.60	8,716		

Summary for Link 1L: Ex. Clinton Avenue Storm Sewer (Point of Concern 1)

Inflow Area = 103,843 sf, 68.29% Impervious, Inflow Depth > 5.69" for 25-Year event
Inflow = 15.34 cfs @ 12.07 hrs, Volume= 49,237 cf
Primary = 15.34 cfs @ 12.07 hrs, Volume= 49,237 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Ex. Rippowam River

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

Link 1L: Ex. Clinton Avenue Storm Sewer (Point of Concern 1)

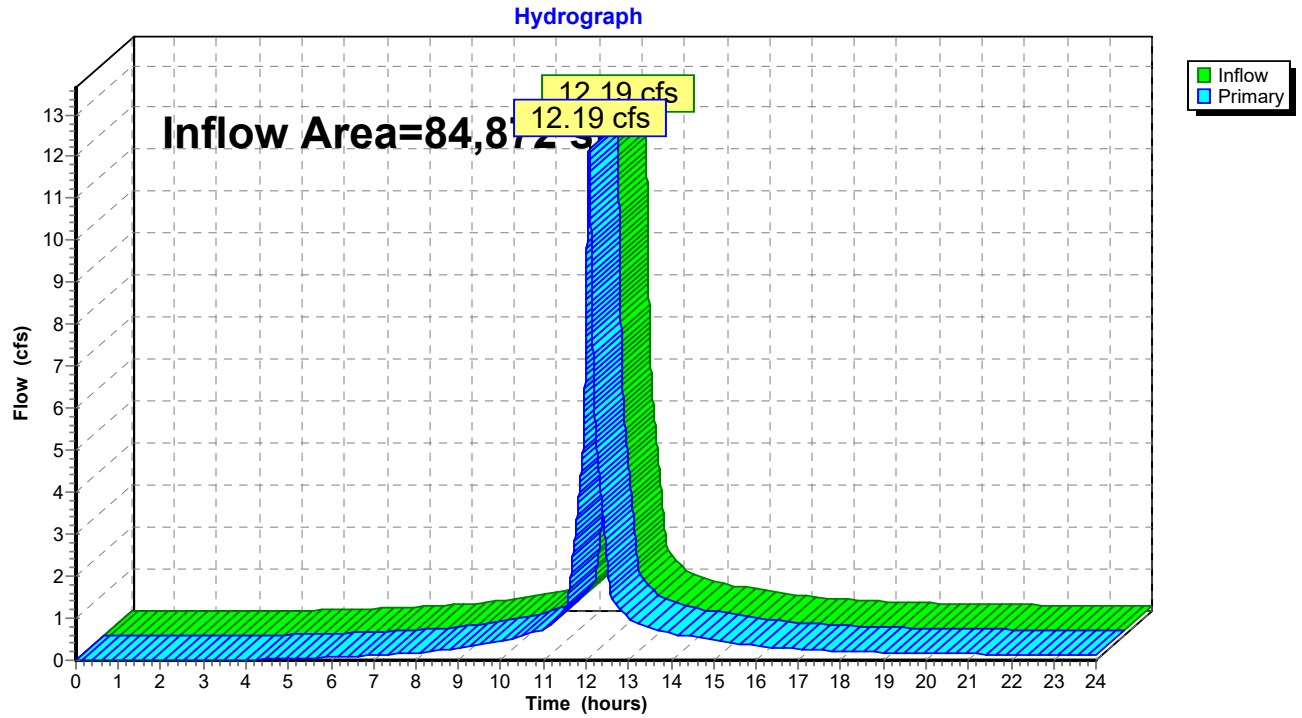


Summary for Link 2L: Ex. Overland Flow Directly Tributary to Rippowam River (Point of Concern 2)

Inflow Area = 84,872 sf, 55.21% Impervious, Inflow Depth > 5.42" for 25-Year event
Inflow = 12.19 cfs @ 12.07 hrs, Volume= 38,337 cf
Primary = 12.19 cfs @ 12.07 hrs, Volume= 38,337 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Ex. Rippowam River

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

Link 2L: Ex. Overland Flow Directly Tributary to Rippowam River (Point of Concern 2)

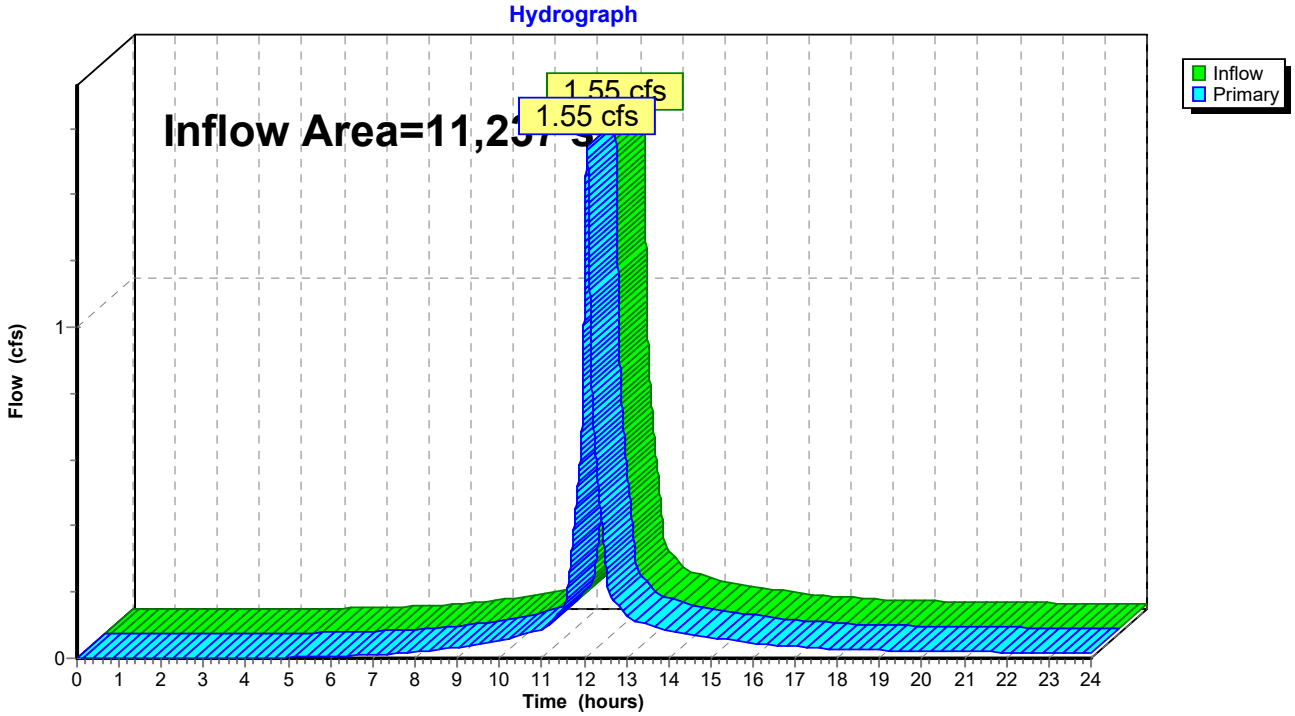


Summary for Link 3L: Ex. Richmond Hill Avenue Storm Sewer (Point of Concern 3)

Inflow Area = 11,237 sf, 39.84% Impervious, Inflow Depth > 5.11" for 25-Year event
Inflow = 1.55 cfs @ 12.07 hrs, Volume= 4,784 cf
Primary = 1.55 cfs @ 12.07 hrs, Volume= 4,784 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Ex. Rippowam River

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

Link 3L: Ex. Richmond Hill Avenue Storm Sewer (Point of Concern 3)

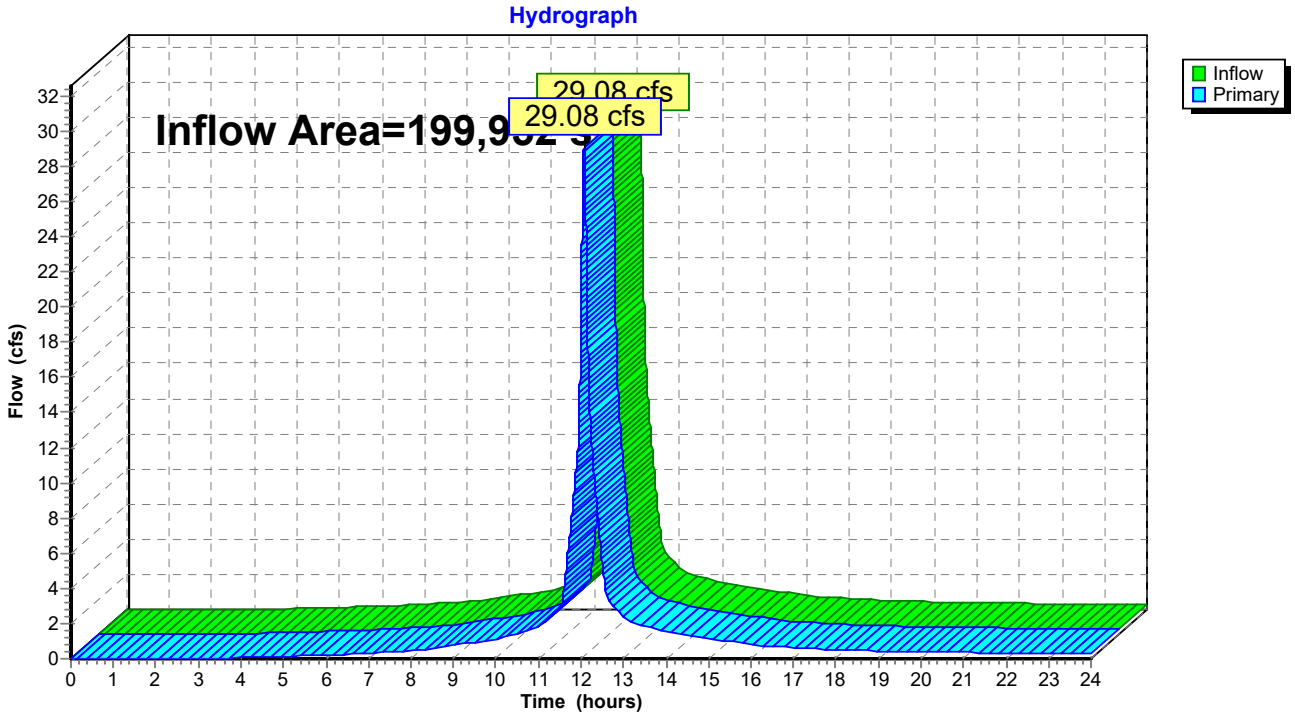


Summary for Link 4L: Ex. Rippowam River

Inflow Area = 199,952 sf, 61.14% Impervious, Inflow Depth > 5.54" for 25-Year event
Inflow = 29.08 cfs @ 12.07 hrs, Volume= 92,358 cf
Primary = 29.08 cfs @ 12.07 hrs, Volume= 92,358 cf, Atten= 0%, Lag= 0.0 min

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

Link 4L: Ex. Rippowam River

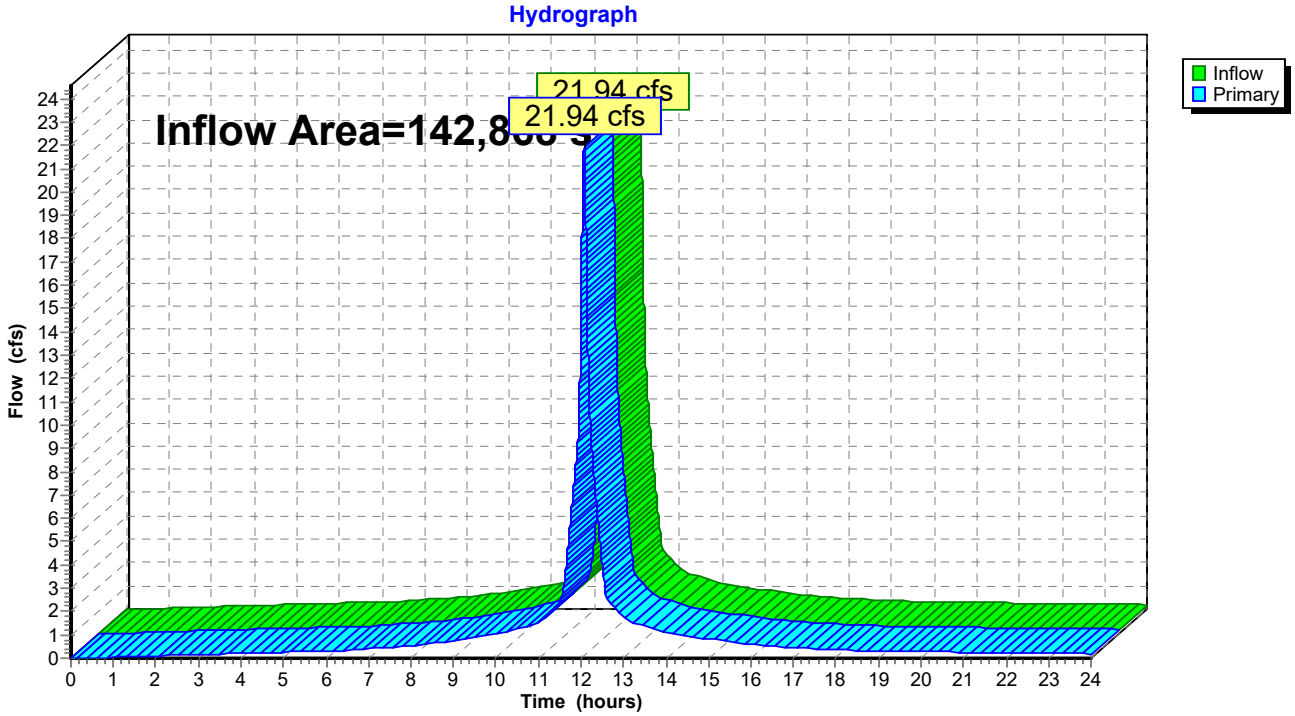


Summary for Link 5L: Approved Clinton Avenue Storm Sewer (Point of Concern 1)

Inflow Area = 142,868 sf, 97.62% Impervious, Inflow Depth > 6.31" for 25-Year event
Inflow = 21.94 cfs @ 12.07 hrs, Volume= 75,093 cf
Primary = 21.94 cfs @ 12.07 hrs, Volume= 75,093 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 8L : Pr. Rippowam River

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

Link 5L: Approved Clinton Avenue Storm Sewer (Point of Concern 1)

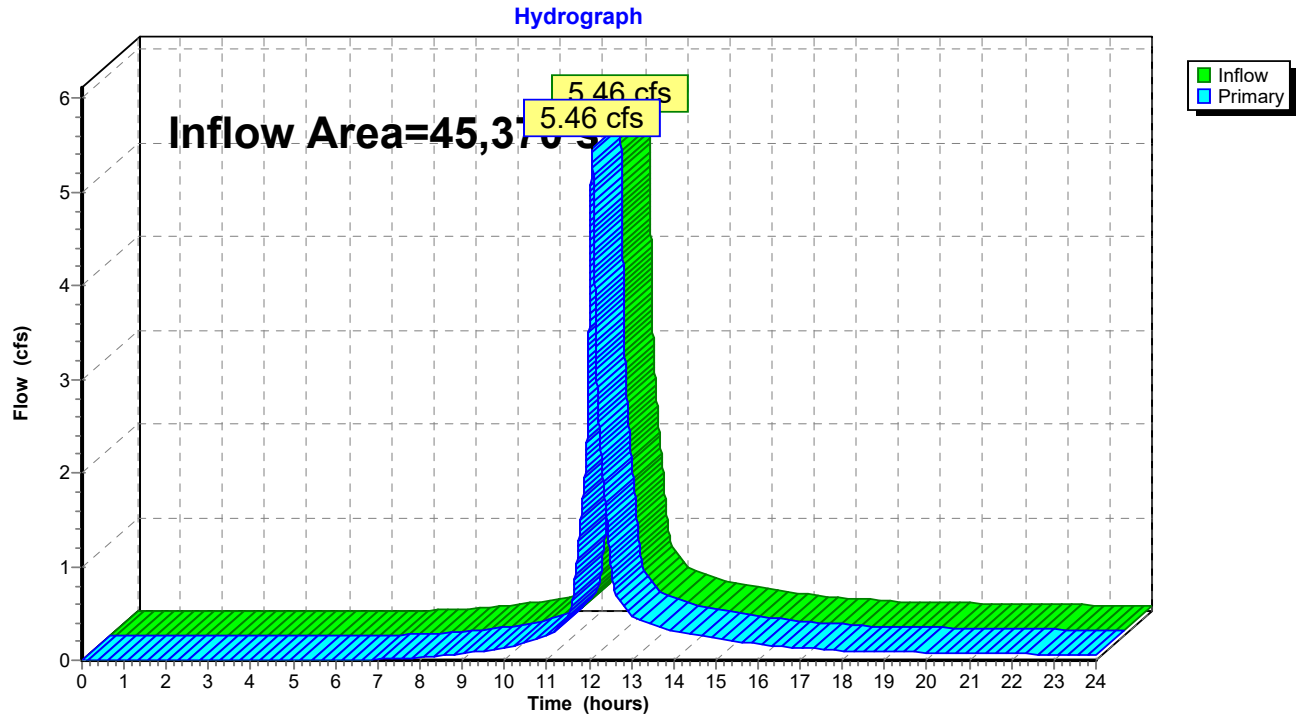


Summary for Link 6L: Approved Overland Flow Directly Tributary to Rippowam River (Point of Concern

Inflow Area = 45,370 sf, 0.48% Impervious, Inflow Depth > 4.33" for 25-Year event
Inflow = 5.46 cfs @ 12.07 hrs, Volume= 16,380 cf
Primary = 5.46 cfs @ 12.07 hrs, Volume= 16,380 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 8L : Pr. Rippowam River

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

Link 6L: Approved Overland Flow Directly Tributary to Rippowam River (Point of Concern 2)

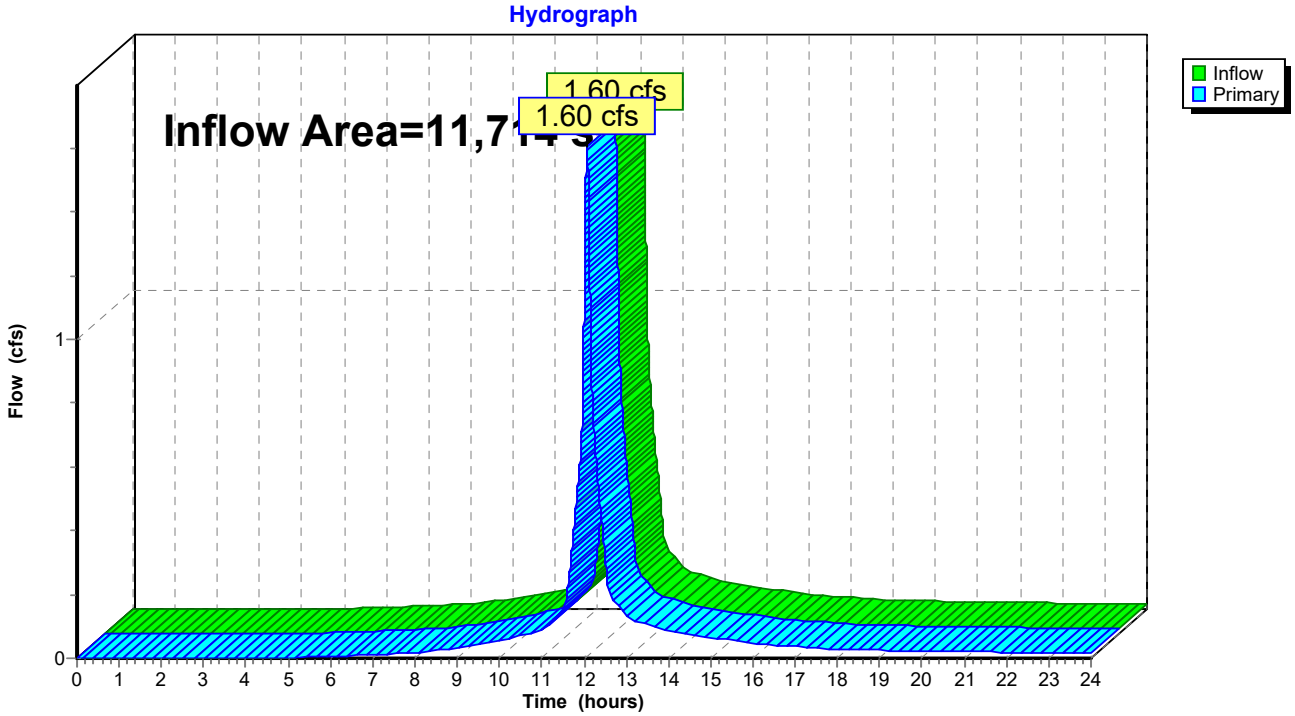


Summary for Link 7L: Approved Richmond Hill Avenue Storm Sewer (Point of Concern 3)

Inflow Area = 11,714 sf, 37.67% Impervious, Inflow Depth > 5.06" for 25-Year event
Inflow = 1.60 cfs @ 12.07 hrs, Volume= 4,944 cf
Primary = 1.60 cfs @ 12.07 hrs, Volume= 4,944 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 8L : Pr. Rippowam River

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

Link 7L: Approved Richmond Hill Avenue Storm Sewer (Point of Concern 3)

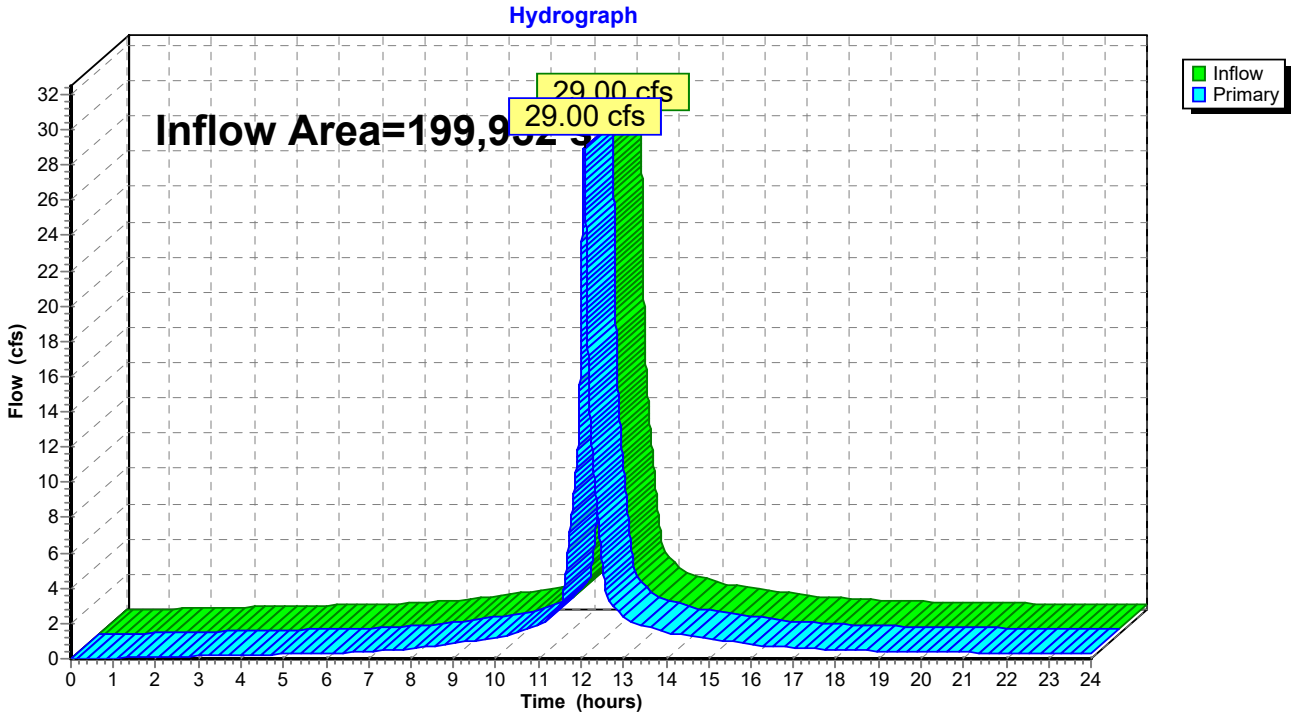


Summary for Link 8L: Pr. Rippowam River

Inflow Area = 199,952 sf, 72.07% Impervious, Inflow Depth > 5.79" for 25-Year event
Inflow = 29.00 cfs @ 12.07 hrs, Volume= 96,418 cf
Primary = 29.00 cfs @ 12.07 hrs, Volume= 96,418 cf, Atten= 0%, Lag= 0.0 min

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

Link 8L: Pr. Rippowam River

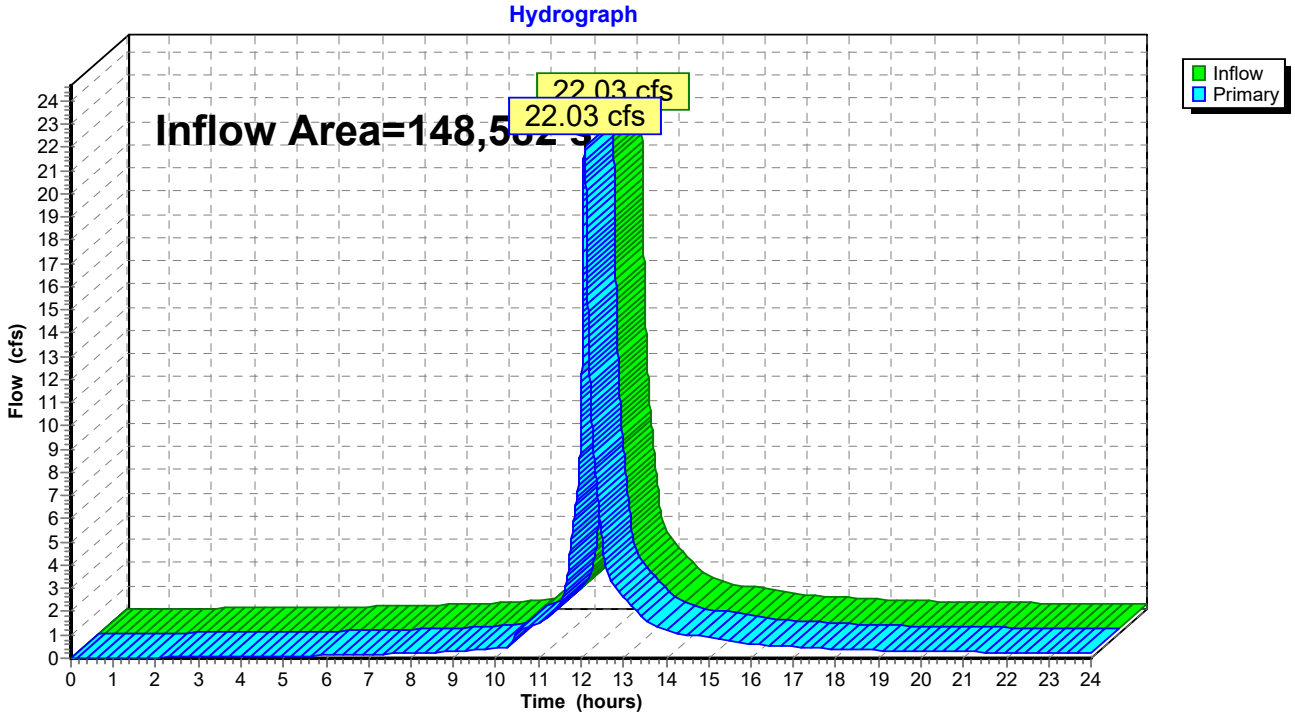


Summary for Link 9L: Pr. Clinton Avenue Storm Sewer (Point of Concern 1)

Inflow Area = 148,582 sf, 96.68% Impervious, Inflow Depth > 5.63" for 25-Year event
Inflow = 22.03 cfs @ 12.08 hrs, Volume= 69,706 cf
Primary = 22.03 cfs @ 12.08 hrs, Volume= 69,706 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : Pr. Rippowam River

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

Link 9L: Pr. Clinton Avenue Storm Sewer (Point of Concern 1)

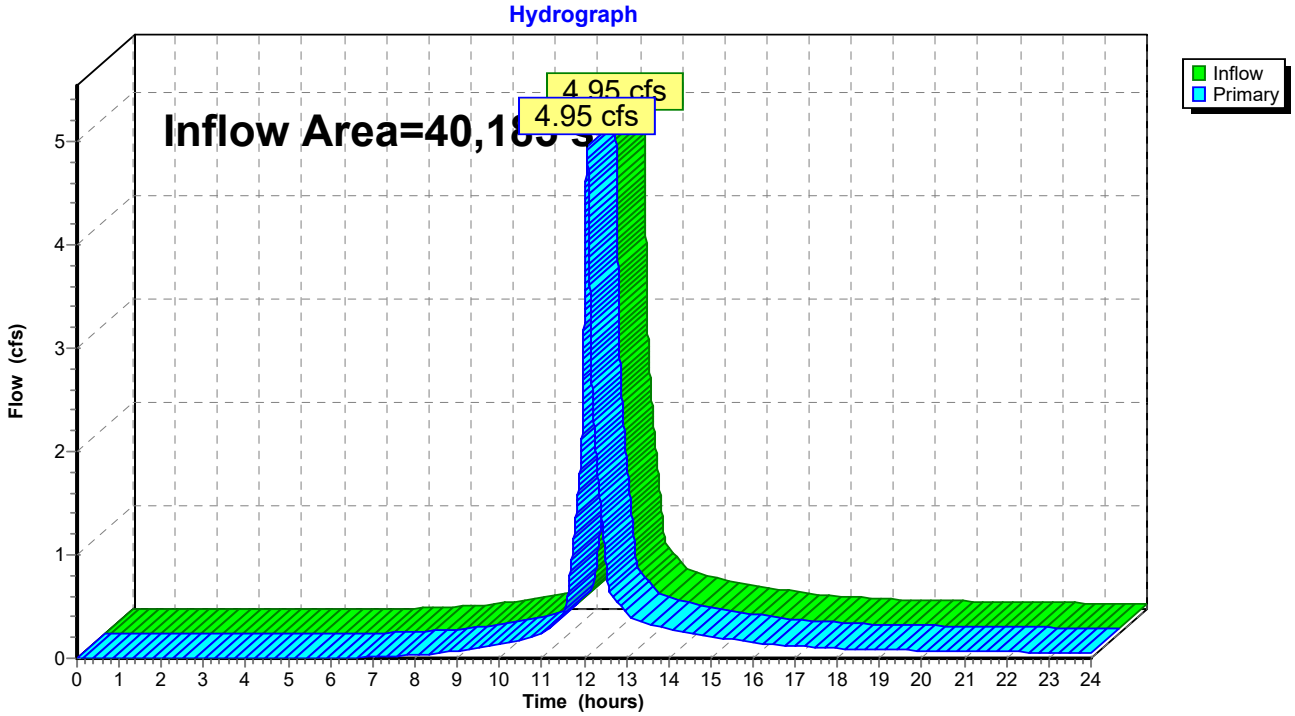


Summary for Link 10L: Pr. Overland Flow Directly Tributary to Rippowam River (Point of Concern 2)

Inflow Area = 40,185 sf, 6.41% Impervious, Inflow Depth > 4.45" for 25-Year event
Inflow = 4.95 cfs @ 12.07 hrs, Volume= 14,890 cf
Primary = 4.95 cfs @ 12.07 hrs, Volume= 14,890 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : Pr. Rippowam River

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

Link 10L: Pr. Overland Flow Directly Tributary to Rippowam River (Point of Concern 2)

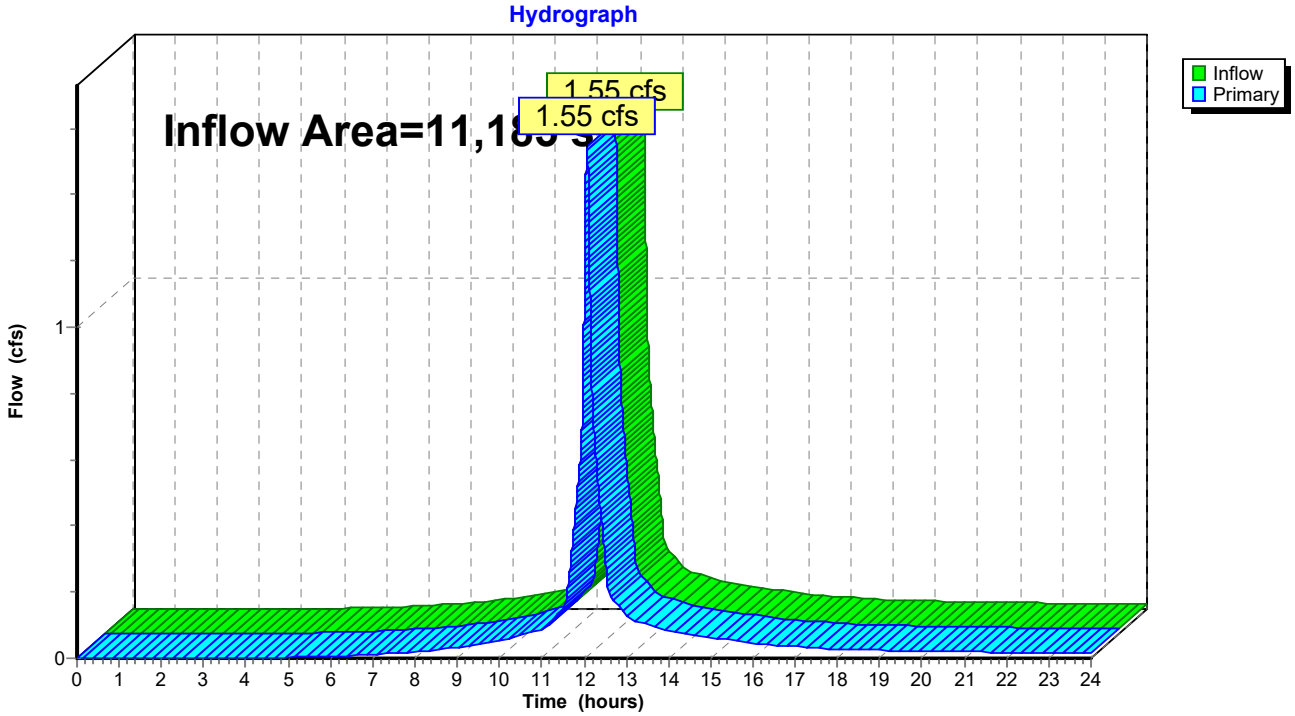


Summary for Link 11L: Pr. Richmond Hill Avenue Storm Sewer (Point of Concern 3)

Inflow Area = 11,185 sf, 41.16% Impervious, Inflow Depth > 5.14" for 25-Year event
Inflow = 1.55 cfs @ 12.07 hrs, Volume= 4,787 cf
Primary = 1.55 cfs @ 12.07 hrs, Volume= 4,787 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : Pr. Rippowam River

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

Link 11L: Pr. Richmond Hill Avenue Storm Sewer (Point of Concern 3)

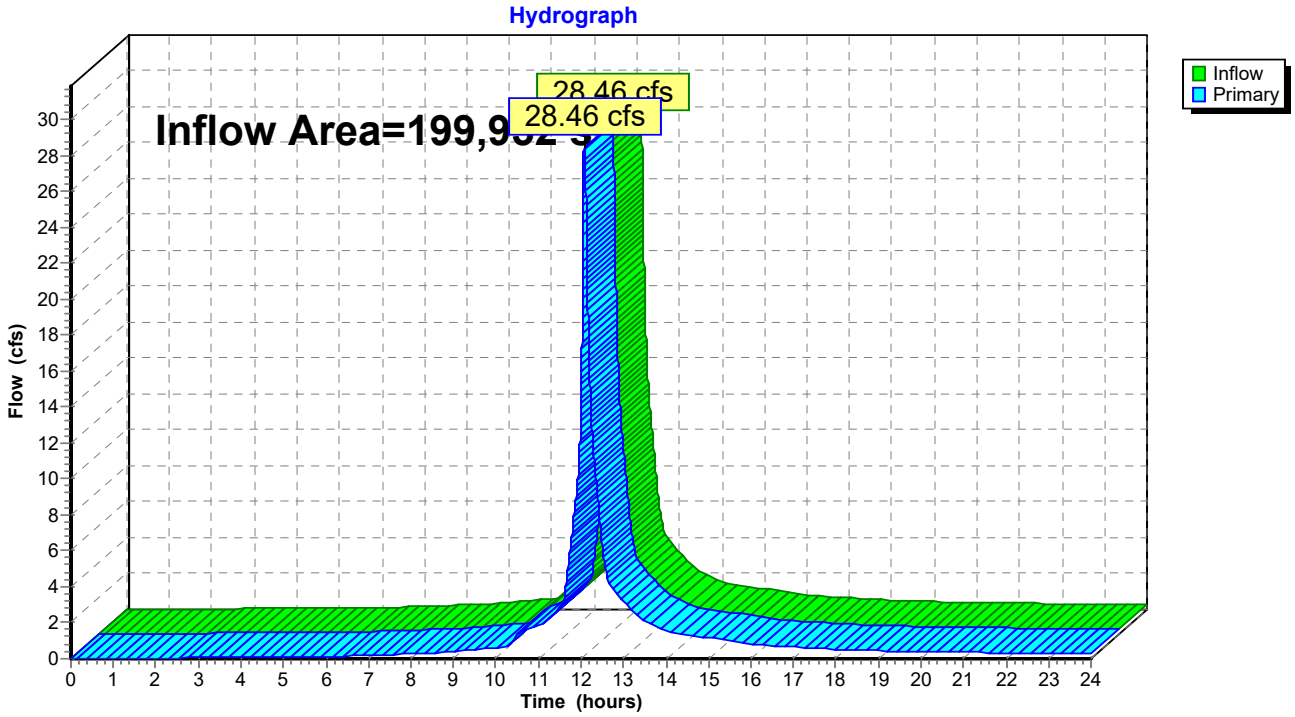


Summary for Link 12L: Pr. Rippowam River

Inflow Area = 199,952 sf, 75.43% Impervious, Inflow Depth > 5.36" for 25-Year event
Inflow = 28.46 cfs @ 12.08 hrs, Volume= 89,384 cf
Primary = 28.46 cfs @ 12.08 hrs, Volume= 89,384 cf, Atten= 0%, Lag= 0.0 min

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

Link 12L: Pr. Rippowam River



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

Subcatchment 1: Ex. Clinton Avenue East Runoff Area=56,506 sf 69.70% Impervious Runoff Depth>6.58"
Tc=5.0 min CN=92.55 Runoff=9.55 cfs 30,980 cf

Subcatchment 2: Ex. Clinton Avenue West Runoff Area=47,337 sf 66.62% Impervious Runoff Depth>6.51"
Tc=5.0 min CN=91.99 Runoff=7.96 cfs 25,693 cf

Subcatchment 3: Ex. Rippowam River Runoff Area=84,872 sf 55.21% Impervious Runoff Depth>6.27"
Tc=5.0 min CN=89.94 Runoff=13.98 cfs 44,363 cf

Subcatchment 4: Ex. Richmond Hill Runoff Area=10,325 sf 41.26% Impervious Runoff Depth>5.98"
Tc=5.0 min CN=87.43 Runoff=1.65 cfs 5,145 cf

Subcatchment 5: Ex. Richmond Hill Avenue Runoff Area=912 sf 23.79% Impervious Runoff Depth>5.62"
Tc=5.0 min CN=84.28 Runoff=0.14 cfs 427 cf

Subcatchment 6: Approved Block A Runoff Area=49,654 sf 100.00% Impervious Runoff Depth>7.23"
Tc=5.0 min CN=98.00 Runoff=8.67 cfs 29,899 cf

Subcatchment 7: Approved Clinton Avenue Runoff Area=5,817 sf 71.65% Impervious Runoff Depth>6.62"
Tc=5.0 min CN=92.90 Runoff=0.99 cfs 3,209 cf

Subcatchment 8: Approved Clinton Avenue Runoff Area=2,419 sf 27.70% Impervious Runoff Depth>5.70"
Tc=5.0 min CN=84.99 Runoff=0.37 cfs 1,148 cf

Subcatchment 9: Approved Clinton Runoff Area=3,406 sf 100.00% Impervious Runoff Depth>7.23"
Tc=5.0 min CN=98.00 Runoff=0.59 cfs 2,051 cf

Subcatchment 10: Approved Block B Runoff Area=81,572 sf 100.00% Impervious Runoff Depth>7.23"
Tc=5.0 min CN=98.00 Runoff=14.24 cfs 49,118 cf

Subcatchment 11: Approved Rippowam Runoff Area=45,370 sf 0.48% Impervious Runoff Depth>5.14"
Tc=5.0 min CN=80.09 Runoff=6.43 cfs 19,417 cf

Subcatchment 12: Approved Richmond Runoff Area=11,360 sf 37.50% Impervious Runoff Depth>5.90"
Tc=5.0 min CN=86.75 Runoff=1.80 cfs 5,586 cf

Subcatchment 13: Approved Richmond Hill Runoff Area=354 sf 43.22% Impervious Runoff Depth>6.02"
Tc=5.0 min CN=87.78 Runoff=0.06 cfs 178 cf

Subcatchment 14: Pr. Block A Runoff Area=50,072 sf 100.00% Impervious Runoff Depth>7.23"
Tc=5.0 min CN=98.00 Runoff=8.74 cfs 30,150 cf

Subcatchment 15: Pr. Clinton Avenue East Runoff Area=5,805 sf 60.26% Impervious Runoff Depth>6.38"
Tc=5.0 min CN=90.85 Runoff=0.97 cfs 3,086 cf

Subcatchment 16: Pr. Clinton Avenue North Runoff Area=4,361 sf 39.78% Impervious Runoff Depth>5.95"
Tc=5.0 min CN=87.16 Runoff=0.69 cfs 2,162 cf

Subcatchment 17: Pr. Clinton Avenue Runoff Area=2,446 sf 100.00% Impervious Runoff Depth>7.23"
Tc=5.0 min CN=98.00 Runoff=0.43 cfs 1,473 cf

Subcatchment 18: Pr. Block B Runoff Area=85,898 sf 100.00% Impervious Runoff Depth>7.23"
Tc=5.0 min CN=98.00 Runoff=15.00 cfs 51,722 cf

Subcatchment 19: Pr. Rippowam River Runoff Area=40,185 sf 6.41% Impervious Runoff Depth>5.26"
Tc=5.0 min CN=81.15 Runoff=5.81 cfs 17,602 cf

Subcatchment 20: Pr. Richmond Hill Runoff Area=10,954 sf 39.92% Impervious Runoff Depth>5.95"
Tc=5.0 min CN=87.19 Runoff=1.74 cfs 5,433 cf

Subcatchment 21: Pr. Richmond Hill Avenue Runoff Area=231 sf 100.00% Impervious Runoff Depth>7.23"
Tc=5.0 min CN=98.00 Runoff=0.04 cfs 139 cf

Pond 2P: Block A Filtration Peak Elev=14.57' Storage=3,043 cf Inflow=8.74 cfs 30,150 cf
Outflow=8.74 cfs 30,045 cf

Pond 14P: Block B Infil Peak Elev=15.21' Storage=9,829 cf Inflow=15.00 cfs 51,722 cf
Outflow=14.41 cfs 43,669 cf

Link 1L: Ex. Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=17.52 cfs 56,672 cf
Primary=17.52 cfs 56,672 cf

Link 2L: Ex. Overland Flow Directly Tributary to Rippowam River (Point of Inflow=13.98 cfs 44,363 cf
Primary=13.98 cfs 44,363 cf

Link 3L: Ex. Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=1.79 cfs 5,572 cf
Primary=1.79 cfs 5,572 cf

Link 4L: Ex. Rippowam River Inflow=33.29 cfs 106,607 cf
Primary=33.29 cfs 106,607 cf

Link 5L: Approved Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=24.87 cfs 85,425 cf
Primary=24.87 cfs 85,425 cf

Link 6L: Approved Overland Flow Directly Tributary to Rippowam River Inflow=6.43 cfs 19,417 cf
Primary=6.43 cfs 19,417 cf

Link 7L: Approved Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=1.86 cfs 5,764 cf
Primary=1.86 cfs 5,764 cf

Link 8L: Pr. Rippowam River Inflow=33.15 cfs 110,605 cf
Primary=33.15 cfs 110,605 cf

Link 9L: Pr. Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=25.01 cfs 80,434 cf
Primary=25.01 cfs 80,434 cf

Link 10L: Pr. Overland Flow Directly Tributary to Rippowam River (Point of Inflow=5.81 cfs 17,602 cf
Primary=5.81 cfs 17,602 cf

Link 11L: Pr. Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=1.78 cfs 5,572 cf
Primary=1.78 cfs 5,572 cf

Link 12L: Pr. Rippowam River Inflow=32.54 cfs 103,609 cf
Primary=32.54 cfs 103,609 cf

Total Runoff Area = 599,856 sf Runoff Volume = 328,980 cf Average Runoff Depth = 6.58"
30.45% Pervious = 182,677 sf 69.55% Impervious = 417,179 sf

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

Subcatchment 1: Ex. Clinton Avenue East Runoff Area=56,506 sf 69.70% Impervious Runoff Depth>7.49"
Tc=5.0 min CN=92.55 Runoff=10.80 cfs 35,271 cf

Subcatchment 2: Ex. Clinton Avenue West Runoff Area=47,337 sf 66.62% Impervious Runoff Depth>7.42"
Tc=5.0 min CN=91.99 Runoff=9.01 cfs 29,282 cf

Subcatchment 3: Ex. Rippowam River Runoff Area=84,872 sf 55.21% Impervious Runoff Depth>7.18"
Tc=5.0 min CN=89.94 Runoff=15.87 cfs 50,761 cf

Subcatchment 4: Ex. Richmond Hill Runoff Area=10,325 sf 41.26% Impervious Runoff Depth>6.88"
Tc=5.0 min CN=87.43 Runoff=1.88 cfs 5,916 cf

Subcatchment 5: Ex. Richmond Hill Avenue Runoff Area=912 sf 23.79% Impervious Runoff Depth>6.50"
Tc=5.0 min CN=84.28 Runoff=0.16 cfs 494 cf

Subcatchment 6: Approved Block A Runoff Area=49,654 sf 100.00% Impervious Runoff Depth>8.14"
Tc=5.0 min CN=98.00 Runoff=9.74 cfs 33,700 cf

Subcatchment 7: Approved Clinton Avenue Runoff Area=5,817 sf 71.65% Impervious Runoff Depth>7.53"
Tc=5.0 min CN=92.90 Runoff=1.11 cfs 3,651 cf

Subcatchment 8: Approved Clinton Avenue Runoff Area=2,419 sf 27.70% Impervious Runoff Depth>6.58"
Tc=5.0 min CN=84.99 Runoff=0.43 cfs 1,327 cf

Subcatchment 9: Approved Clinton Runoff Area=3,406 sf 100.00% Impervious Runoff Depth>8.14"
Tc=5.0 min CN=98.00 Runoff=0.67 cfs 2,312 cf

Subcatchment 10: Approved Block B Runoff Area=81,572 sf 100.00% Impervious Runoff Depth>8.14"
Tc=5.0 min CN=98.00 Runoff=16.01 cfs 55,363 cf

Subcatchment 11: Approved Rippowam Runoff Area=45,370 sf 0.48% Impervious Runoff Depth>6.00"
Tc=5.0 min CN=80.09 Runoff=7.47 cfs 22,674 cf

Subcatchment 12: Approved Richmond Runoff Area=11,360 sf 37.50% Impervious Runoff Depth>6.79"
Tc=5.0 min CN=86.75 Runoff=2.05 cfs 6,432 cf

Subcatchment 13: Approved Richmond Hill Runoff Area=354 sf 43.22% Impervious Runoff Depth>6.92"
Tc=5.0 min CN=87.78 Runoff=0.06 cfs 204 cf

Subcatchment 14: Pr. Block A Runoff Area=50,072 sf 100.00% Impervious Runoff Depth>8.14"
Tc=5.0 min CN=98.00 Runoff=9.82 cfs 33,984 cf

Subcatchment 15: Pr. Clinton Avenue East Runoff Area=5,805 sf 60.26% Impervious Runoff Depth>7.29"
Tc=5.0 min CN=90.85 Runoff=1.09 cfs 3,525 cf

Subcatchment 16: Pr. Clinton Avenue North Runoff Area=4,361 sf 39.78% Impervious Runoff Depth>6.84"
Tc=5.0 min CN=87.16 Runoff=0.79 cfs 2,487 cf

Subcatchment 17: Pr. Clinton Avenue Runoff Area=2,446 sf 100.00% Impervious Runoff Depth>8.14"
Tc=5.0 min CN=98.00 Runoff=0.48 cfs 1,660 cf

Subcatchment 18: Pr. Block B Runoff Area=85,898 sf 100.00% Impervious Runoff Depth>8.14"
Tc=5.0 min CN=98.00 Runoff=16.85 cfs 58,299 cf

Subcatchment 19: Pr. Rippowam River Runoff Area=40,185 sf 6.41% Impervious Runoff Depth>6.12"
Tc=5.0 min CN=81.15 Runoff=6.73 cfs 20,507 cf

Subcatchment 20: Pr. Richmond Hill Runoff Area=10,954 sf 39.92% Impervious Runoff Depth>6.85"
Tc=5.0 min CN=87.19 Runoff=1.99 cfs 6,250 cf

Subcatchment 21: Pr. Richmond Hill Avenue Runoff Area=231 sf 100.00% Impervious Runoff Depth>8.14"
Tc=5.0 min CN=98.00 Runoff=0.05 cfs 157 cf

Pond 2P: Block A Filtration Peak Elev=14.77' Storage=3,047 cf Inflow=9.82 cfs 33,984 cf
Outflow=9.82 cfs 33,874 cf

Pond 14P: Block B Infil Peak Elev=15.30' Storage=10,006 cf Inflow=16.85 cfs 58,299 cf
Outflow=15.89 cfs 50,239 cf

Link 1L: Ex. Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=19.81 cfs 64,553 cf
Primary=19.81 cfs 64,553 cf

Link 2L: Ex. Overland Flow Directly Tributary to Rippowam River (Point of Inflow=15.87 cfs 50,761 cf
Primary=15.87 cfs 50,761 cf

Link 3L: Ex. Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=2.04 cfs 6,410 cf
Primary=2.04 cfs 6,410 cf

Link 4L: Ex. Rippowam River Inflow=37.73 cfs 121,724 cf
Primary=37.73 cfs 121,724 cf

Link 5L: Approved Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=27.96 cfs 96,354 cf
Primary=27.96 cfs 96,354 cf

Link 6L: Approved Overland Flow Directly Tributary to Rippowam River Inflow=7.47 cfs 22,674 cf
Primary=7.47 cfs 22,674 cf

Link 7L: Approved Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=2.12 cfs 6,636 cf
Primary=2.12 cfs 6,636 cf

Link 8L: Pr. Rippowam River Inflow=37.55 cfs 125,664 cf
Primary=37.55 cfs 125,664 cf

Link 9L: Pr. Clinton Avenue Storm Sewer (Point of Concern 1) Inflow=27.88 cfs 91,784 cf
Primary=27.88 cfs 91,784 cf

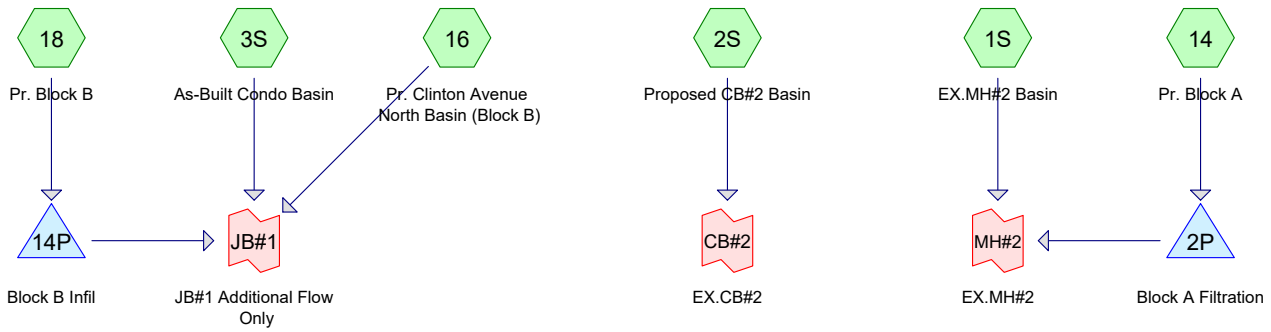
Link 10L: Pr. Overland Flow Directly Tributary to Rippowam River (Point of Inflow=6.73 cfs 20,507 cf
Primary=6.73 cfs 20,507 cf

Link 11L: Pr. Richmond Hill Avenue Storm Sewer (Point of Concern 3) Inflow=2.04 cfs 6,407 cf
Primary=2.04 cfs 6,407 cf

Link 12L: Pr. Rippowam River Inflow=36.60 cfs 118,699 cf
Primary=36.60 cfs 118,699 cf

Total Runoff Area = 599,856 sf Runoff Volume = 374,258 cf Average Runoff Depth = 7.49"
30.45% Pervious = 182,677 sf 69.55% Impervious = 417,179 sf

HYDROCAD MODEL: TO DRAINAGE STRUCTURES RELATED TO
ATTACHED PROPOSED HYDRAULIC GRADE LINE ANALYSIS



Subcat Reach Pond Link

Routing Diagram for 7258 HydroCAD Off-Site
Prepared by HP Inc., Printed 9/16/2022

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

Subcatchment 1S: EX.MH#2 Basin Runoff Area=7.159 ac 0.00% Impervious Runoff Depth>6.96"
Tc=18.0 min CN=95.90 Runoff=37.03 cfs 180,933 cf

Subcatchment 2S: Proposed CB#2 Basin Runoff Area=10,591 sf 92.13% Impervious Runoff Depth>7.06"
Tc=5.0 min CN=96.58 Runoff=1.84 cfs 6,228 cf

Subcatchment 3S: As-Built Condo Basin Runoff Area=18,562 sf 95.60% Impervious Runoff Depth>7.13"
Tc=5.0 min CN=97.21 Runoff=3.23 cfs 11,031 cf

Subcatchment 14: Pr. Block A Runoff Area=50,072 sf 100.00% Impervious Runoff Depth>7.23"
Tc=5.0 min CN=98.00 Runoff=8.74 cfs 30,150 cf

Subcatchment 16: Pr. Clinton Avenue North Runoff Area=4,361 sf 39.78% Impervious Runoff Depth>5.95"
Tc=5.0 min CN=87.16 Runoff=0.69 cfs 2,162 cf

Subcatchment 18: Pr. Block B Runoff Area=85,898 sf 100.00% Impervious Runoff Depth>7.23"
Tc=5.0 min CN=98.00 Runoff=15.00 cfs 51,722 cf

Pond 2P: Block A Filtration Peak Elev=14.57' Storage=3,043 cf Inflow=8.74 cfs 30,150 cf
Outflow=8.74 cfs 30,045 cf

Pond 14P: Block B Infil Peak Elev=15.21' Storage=9,829 cf Inflow=15.00 cfs 51,722 cf
Outflow=14.41 cfs 43,669 cf

Link CB#2: EX.CB#2 Inflow=1.84 cfs 6,228 cf
Primary=1.84 cfs 6,228 cf

Link JB#1: JB#1 Additional Flow Only Inflow=18.22 cfs 56,862 cf
Primary=18.22 cfs 56,862 cf

Link MH#2: EX.MH#2 Inflow=41.24 cfs 210,978 cf
Primary=41.24 cfs 210,978 cf

Total Runoff Area = 481,330 sf Runoff Volume = 282,226 cf Average Runoff Depth = 7.04"
65.68% Pervious = 316,123 sf 34.32% Impervious = 165,207 sf

Summary for Subcatchment 1S: EX.MH#2 Basin

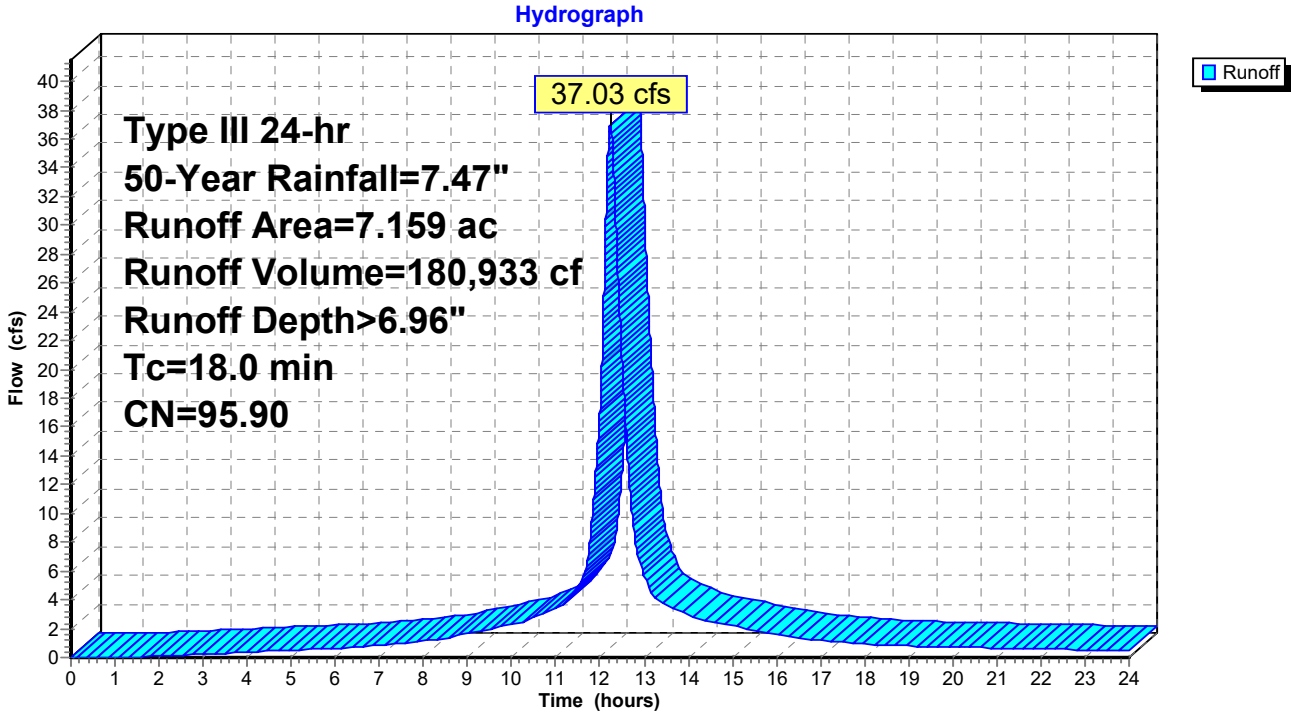
Runoff = 37.03 cfs @ 12.24 hrs, Volume= 180,933 cf, Depth> 6.96"
Routed to Link MH#2 : EX.MH#2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 50-Year Rainfall=7.47"

	Area (ac)	CN	Description
*	7.159	95.90	Approved MH#2 Area and Converted Rational Runoff Coefficient
	7.159		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0					**Direct Entry, Approved MH#2 TC**

Subcatchment 1S: EX.MH#2 Basin



Summary for Subcatchment 2S: Proposed CB#2 Basin

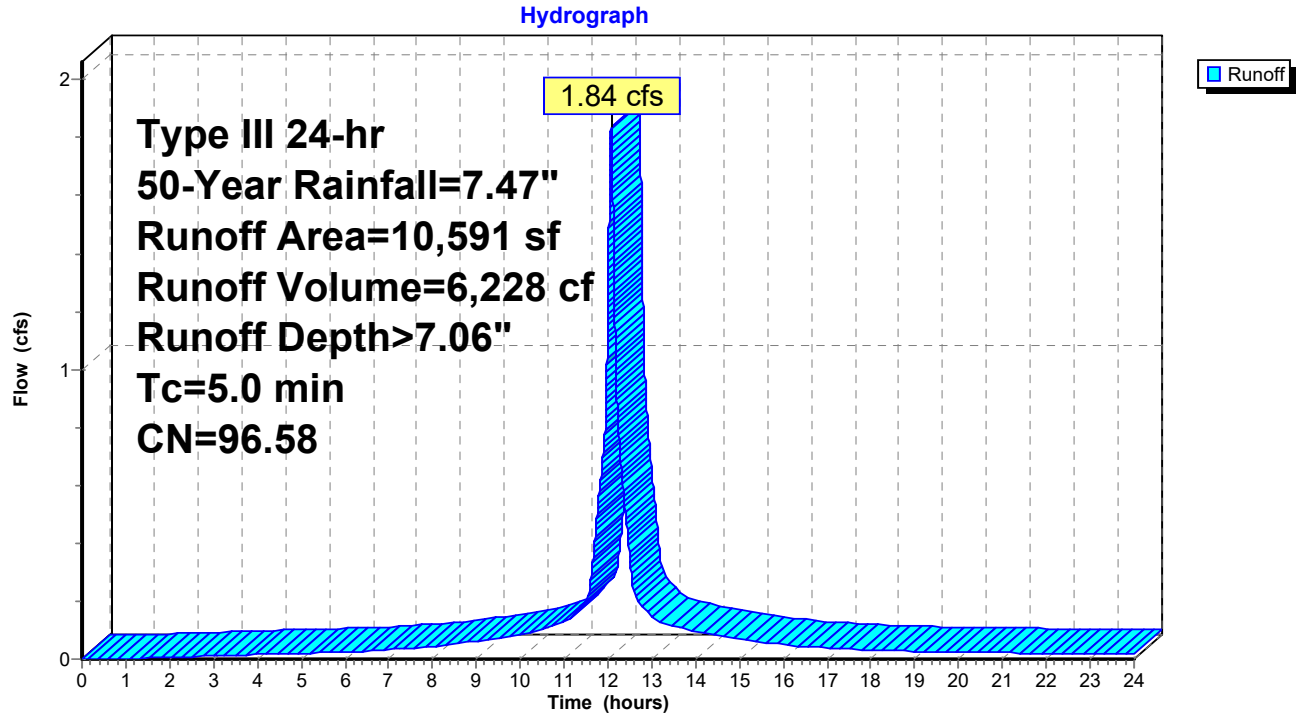
Runoff = 1.84 cfs @ 12.07 hrs, Volume= 6,228 cf, Depth> 7.06"
Routed to Link CB#2 : EX.CB#2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 50-Year Rainfall=7.47"

	Area (sf)	CN	Description
*	542	80.00	>75% Grass cover, Good, HSG D (Off-site)
*	292	80.00	>75% Grass cover, Good, HSG D (On-site)
*	8,121	98.00	Paved parking, HSG D (Off-site)
*	1,636	98.00	Paved parking, HSG D (On-site)
	10,591	96.58	Weighted Average
	834		7.87% Pervious Area
	9,757		92.13% Impervious Area

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

Subcatchment 2S: Proposed CB#2 Basin



Summary for Subcatchment 3S: As-Built Condo Basin

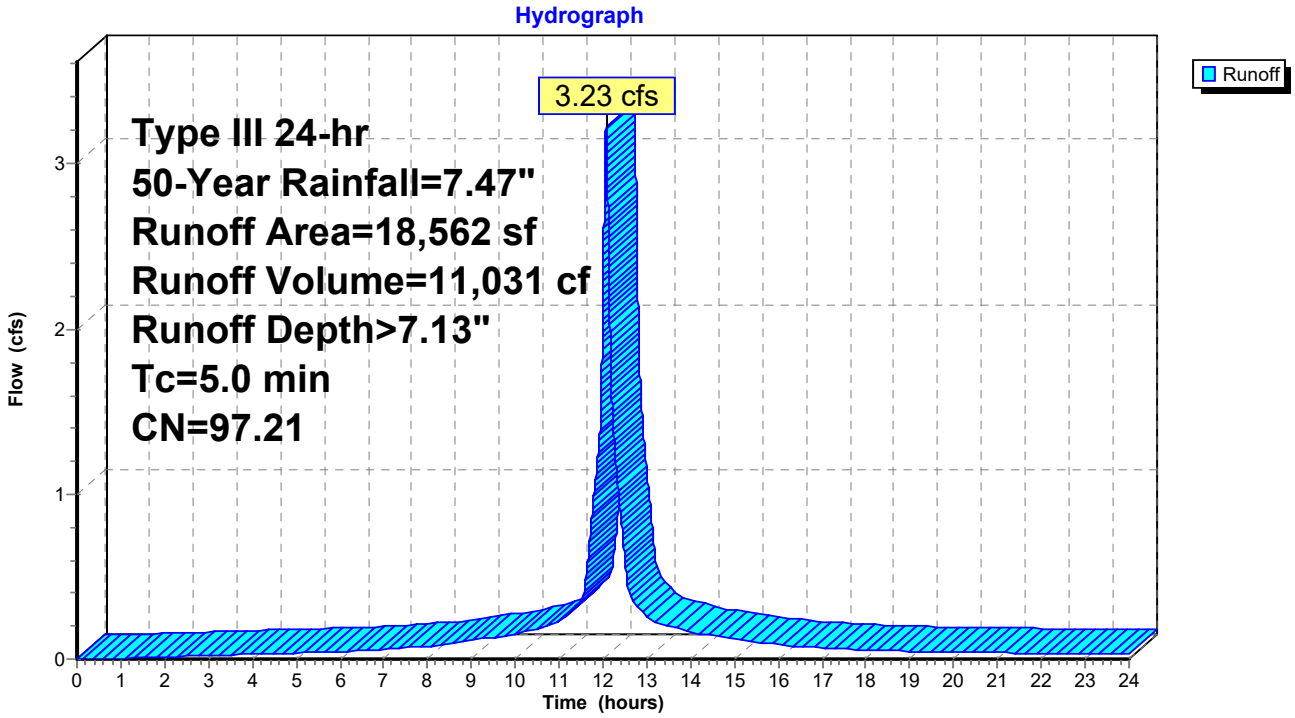
Runoff = 3.23 cfs @ 12.07 hrs, Volume= 11,031 cf, Depth> 7.13"
Routed to Link JB#1 : JB#1 Additional Flow Only

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 50-Year Rainfall=7.47"

Area (sf)	CN	Description
817	80.00	>75% Grass cover, Good, HSG D
17,745	98.00	Paved parking, HSG D
18,562	97.21	Weighted Average
817		4.40% Pervious Area
17,745		95.60% Impervious Area

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

Subcatchment 3S: As-Built Condo Basin



Summary for Subcatchment 14: Pr. Block A

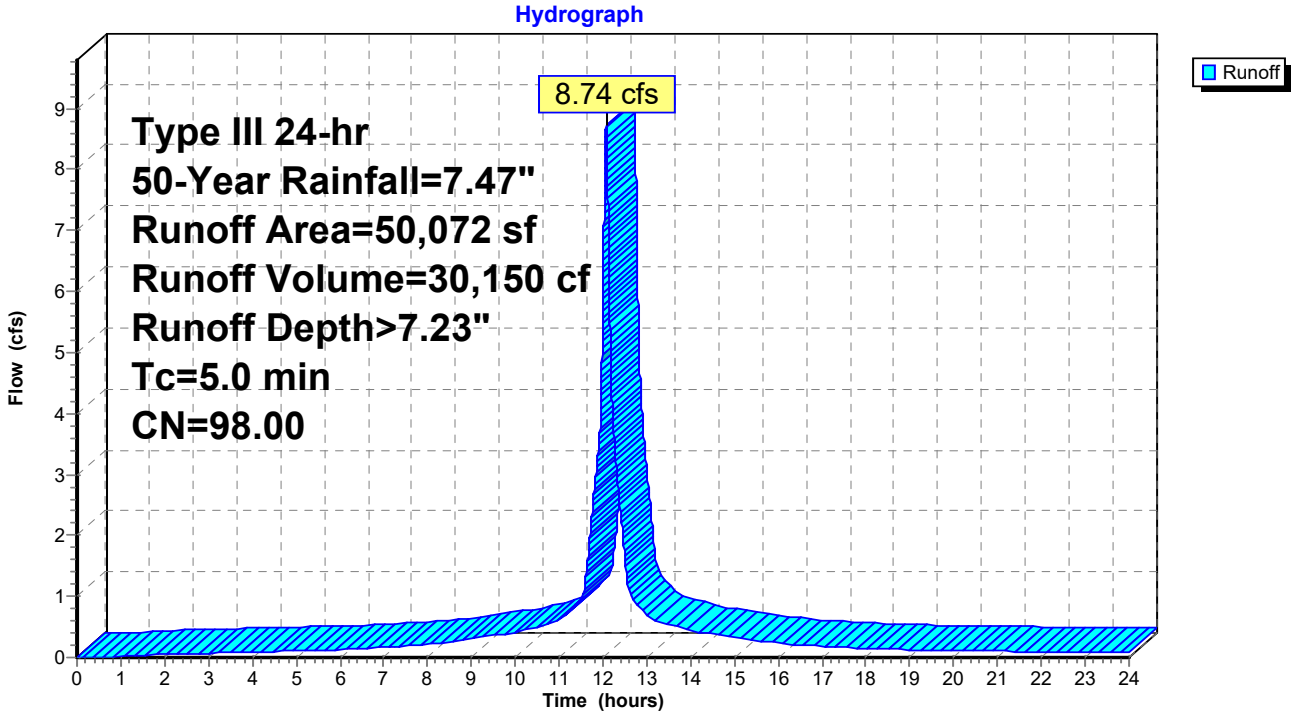
Runoff = 8.74 cfs @ 12.07 hrs, Volume= 30,150 cf, Depth> 7.23"
Routed to Pond 2P : Block A Filtration

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 50-Year Rainfall=7.47"

Area (sf)	CN	Description
50,072	98.00	Paved parking, HSG D
50,072		100.00% Impervious Area

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

Subcatchment 14: Pr. Block A



Summary for Subcatchment 16: Pr. Clinton Avenue North Basin (Block B)

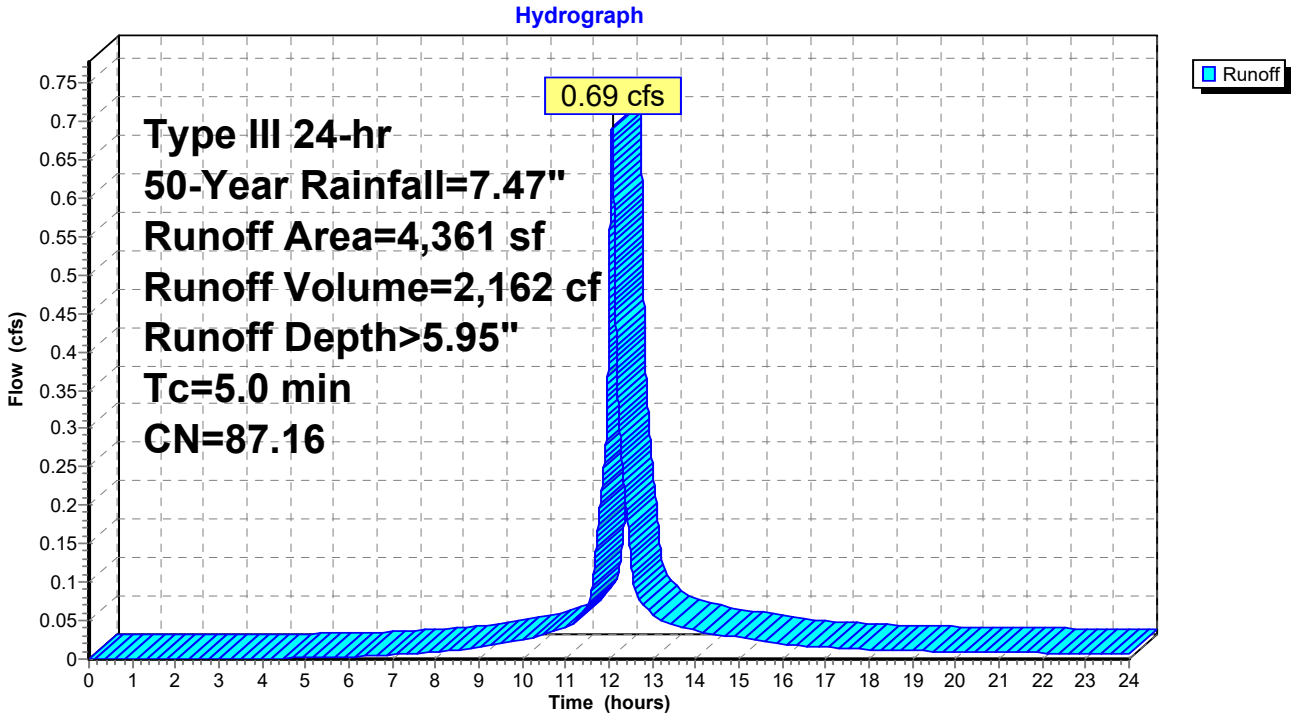
Runoff = 0.69 cfs @ 12.07 hrs, Volume= 2,162 cf, Depth> 5.95"
Routed to Link JB#1 : JB#1 Additional Flow Only

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 50-Year Rainfall=7.47"

Area (sf)	CN	Description
2,626	80.00	>75% Grass cover, Good, HSG D
1,735	98.00	Paved parking, HSG D
4,361	87.16	Weighted Average
2,626		60.22% Pervious Area
1,735		39.78% Impervious Area

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

Subcatchment 16: Pr. Clinton Avenue North Basin (Block B)



Summary for Subcatchment 18: Pr. Block B

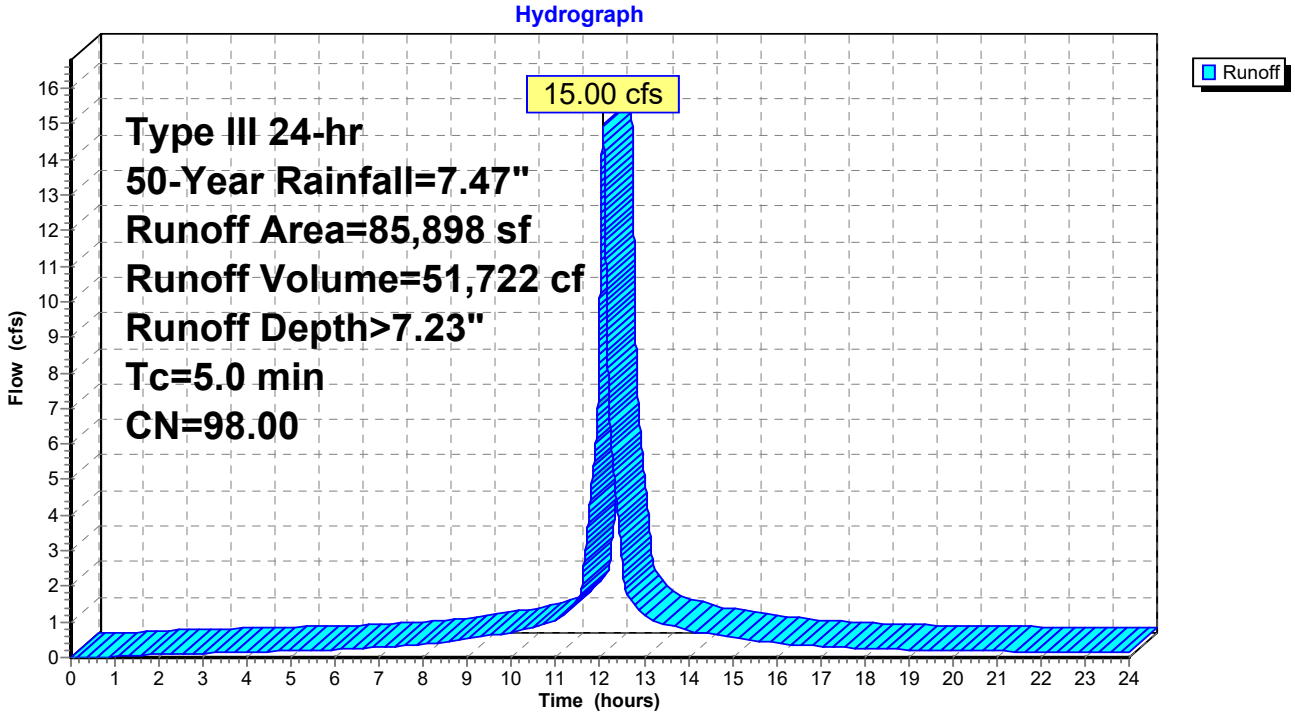
Runoff = 15.00 cfs @ 12.07 hrs, Volume= 51,722 cf, Depth> 7.23"
Routed to Pond 14P : Block B Infil

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs
Type III 24-hr 50-Year Rainfall=7.47"

Area (sf)	CN	Description
85,898	98.00	Paved parking, HSG D
85,898		100.00% Impervious Area

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

Subcatchment 18: Pr. Block B



Summary for Pond 2P: Block A Filtration

Inflow Area = 50,072 sf,100.00% Impervious, Inflow Depth > 7.23" for 50-Year event
Inflow = 8.74 cfs @ 12.07 hrs, Volume= 30,150 cf
Outflow = 8.74 cfs @ 12.07 hrs, Volume= 30,045 cf, Atten= 0%, Lag= 0.0 min
Primary = 8.74 cfs @ 12.07 hrs, Volume= 30,045 cf
Routed to Link MH#2 : EX.MH#2

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs / 2
Peak Elev= 14.57' @ 12.07 hrs Surf.Area= 2,833 sf Storage= 3,043 cf

Plug-Flow detention time= 14.2 min calculated for 30,044 cf (100% of inflow)
Center-of-Mass det. time= 11.8 min (752.5 - 740.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	12.00'	587 cf	**10.50'W x 138.00'L x 2.50'H Field A** 3,623 cf Overall - 2,154 cf Embedded = 1,468 cf x 40.0% Voids
#2A	12.50'	1,540 cf	**Concrete Galley 4x8x2** x 34 Inside #1 Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf 34 Chambers in 2 Rows
#3	10.25'	819 cf	**Sand/Stone Filter (Prismatic)**Listed below (Recalc)
#4	9.50'	143 cf	**MMH#2 (Prismatic)**Listed below (Recalc)
		3,089 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
10.25	1,365	0.0	0	0
11.00	1,365	40.0	410	410
12.00	1,365	30.0	410	819

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.50	19	0	0
17.00	19	143	143

Device	Routing	Invert	Outlet Devices
#1	Primary	7.70'	**15.0" Round MH#4 TO EX.MH.** L= 16.0' Ke= 0.500 Inlet / Outlet Invert= 7.70' / 7.50' S= 0.0125 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Device 1	8.10'	**15.0" Round MH#5 TO MH#4** L= 36.0' Ke= 0.500 Inlet / Outlet Invert= 8.10' / 7.80' S= 0.0083 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#3	Device 2	9.70'	**15.0" Round MMH#2 TO MH#5** L= 182.0' Ke= 0.500 Inlet / Outlet Invert= 9.70' / 8.20' S= 0.0082 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#4	Device 3	13.90'	**4' Weir with 6" Knotch, C= 3.27** Offset (feet) 0.00 0.01 0.49 0.50 4.50 4.51 4.99 5.00 Height (feet) 1.08 0.50 0.50 0.00 0.00 0.50 0.50 1.08
#5	Device 4	12.85'	**18.0" Round FILT#1 TO MMH#2** L= 32.0' Ke= 0.500

			Inlet / Outlet Invert= 12.50' / 12.85' S= -0.0109 '/' Cc= 0.900
			n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#6	Device 3	10.25'	**6.0" Round FILT#1 UD TO MMH#2** L= 36.0' Ke= 0.500
			Inlet / Outlet Invert= 10.25' / 9.80' S= 0.0125 '/' Cc= 0.900
			n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=8.79 cfs @ 12.07 hrs HW=14.57' TW=9.64' (Fixed TW Elev= 9.64')
- **1=MH#4 TO EX.MH.** (Passes 8.79 cfs of 13.12 cfs potential flow)
  - **2=MH#5 TO MH#4** (Passes 8.79 cfs of 13.12 cfs potential flow)
    - **3=MMH#2 TO MH#5** (Passes 8.79 cfs of 10.92 cfs potential flow)
      - **4=4' Weir with 6" Knotch** (Passes 6.96 cfs of 7.40 cfs potential flow)
        - **5=FILT#1 TO MMH#2** (Inlet Controls 6.96 cfs @ 3.94 fps)
      - **6=FILT#1 UD TO MMH#2** (Barrel Controls 1.82 cfs @ 9.29 fps)

Pond 2P: Block A Filtration - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x8x2 (Concrete Galley, UCPI 24" Low Profile Galley or equivalent)
Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf
Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf

48.0" Wide + 6.0" Spacing = 54.0" C-C Row Spacing

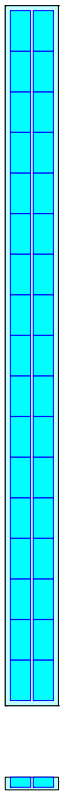
17 Chambers/Row x 8.00' Long = 136.00' Row Length +12.0" End Stone x 2 = 138.00' Base Length
2 Rows x 48.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 10.50' Base Width
6.0" Stone Base + 24.0" Chamber Height = 2.50' Field Height

34 Chambers x 45.3 cf = 1,540.2 cf Chamber Storage
34 Chambers x 63.4 cf = 2,154.2 cf Displacement

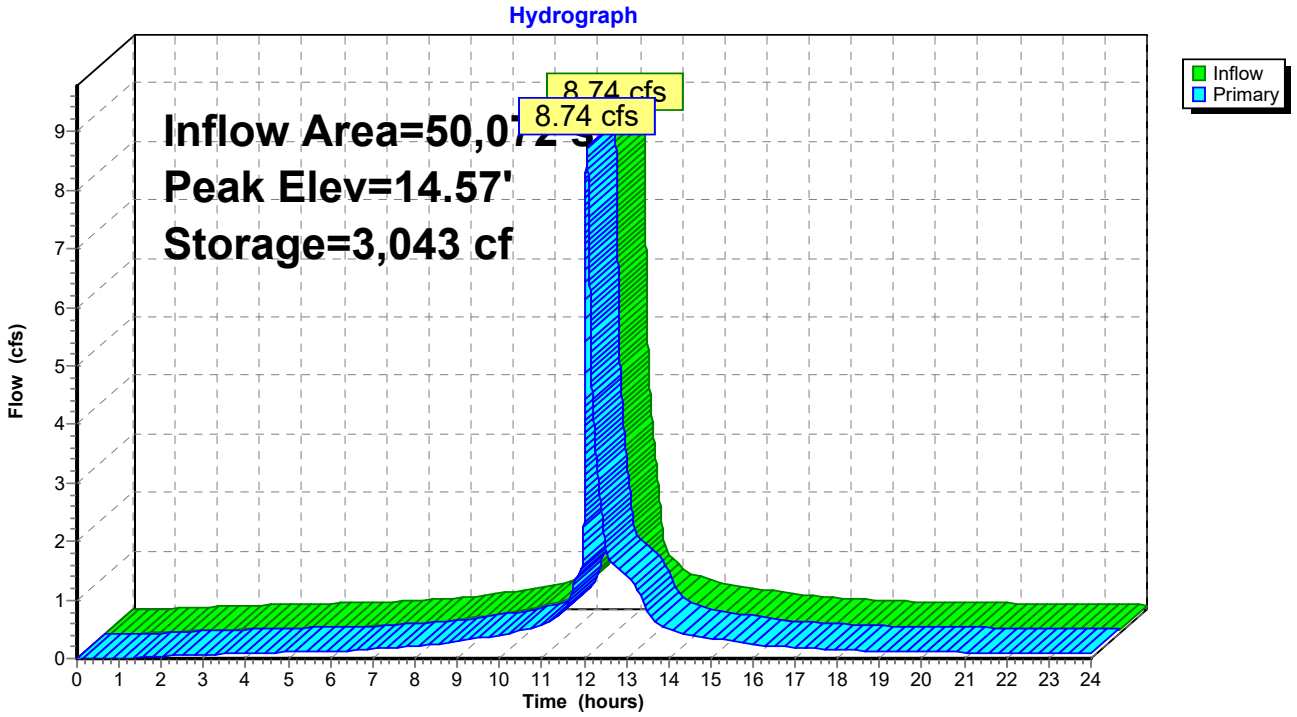
3,622.5 cf Field - 2,154.2 cf Chambers = 1,468.3 cf Stone x 40.0% Voids = 587.3 cf Stone Storage

Chamber Storage + Stone Storage = 2,127.5 cf = 0.049 af
Overall Storage Efficiency = 58.7%
Overall System Size = 138.00' x 10.50' x 2.50'

34 Chambers
134.2 cy Field
54.4 cy Stone



Pond 2P: Block A Filtration



Stage-Area-Storage for Pond 2P: Block A Filtration

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
9.50	0	12.15	956	14.80	3,047
9.55	1	12.20	986	14.85	3,048
9.60	2	12.25	1,016	14.90	3,049
9.65	3	12.30	1,046	14.95	3,050
9.70	4	12.35	1,076	15.00	3,051
9.75	5	12.40	1,106	15.05	3,052
9.80	6	12.45	1,136	15.10	3,053
9.85	7	12.50	1,166	15.15	3,054
9.90	8	12.55	1,219	15.20	3,055
9.95	9	12.60	1,272	15.25	3,056
10.00	10	12.65	1,325	15.30	3,057
10.05	10	12.70	1,378	15.35	3,058
10.10	11	12.75	1,431	15.40	3,059
10.15	12	12.80	1,484	15.45	3,060
10.20	13	12.85	1,537	15.50	3,061
10.25	14	12.90	1,590	15.55	3,061
10.30	43	12.95	1,643	15.60	3,062
10.35	71	13.00	1,696	15.65	3,063
10.40	99	13.05	1,749	15.70	3,064
10.45	127	13.10	1,802	15.75	3,065
10.50	156	13.15	1,855	15.80	3,066
10.55	184	13.20	1,908	15.85	3,067
10.60	212	13.25	1,961	15.90	3,068
10.65	240	13.30	2,014	15.95	3,069
10.70	268	13.35	2,067	16.00	3,070
10.75	297	13.40	2,120	16.05	3,071
10.80	325	13.45	2,173	16.10	3,072
10.85	353	13.50	2,226	16.15	3,073
10.90	382	13.55	2,279	16.20	3,074
10.95	410	13.60	2,332	16.25	3,075
11.00	438	13.65	2,385	16.30	3,076
11.05	459	13.70	2,438	16.35	3,077
11.10	481	13.75	2,491	16.40	3,078
11.15	502	13.80	2,544	16.45	3,079
11.20	524	13.85	2,597	16.50	3,080
11.25	545	13.90	2,650	16.55	3,080
11.30	567	13.95	2,703	16.60	3,081
11.35	588	14.00	2,756	16.65	3,082
11.40	609	14.05	2,809	16.70	3,083
11.45	631	14.10	2,860	16.75	3,084
11.50	652	14.15	2,907	16.80	3,085
11.55	674	14.20	2,954	16.85	3,086
11.60	695	14.25	3,000	16.90	3,087
11.65	717	14.30	3,008	16.95	3,088
11.70	738	14.35	3,016	17.00	**3,089**
11.75	759	14.40	3,025		
11.80	781	14.45	3,033		
11.85	802	14.50	3,042		
11.90	824	14.55	3,042		
11.95	845	14.60	3,043		
12.00	867	14.65	3,044		
12.05	896	14.70	3,045		
12.10	926	14.75	3,046		

Summary for Pond 14P: Block B Infil

Inflow Area = 85,898 sf,100.00% Impervious, Inflow Depth > 7.23" for 50-Year event
Inflow = 15.00 cfs @ 12.07 hrs, Volume= 51,722 cf
Outflow = 14.41 cfs @ 12.09 hrs, Volume= 43,669 cf, Atten= 4%, Lag= 1.2 min
Primary = 14.41 cfs @ 12.09 hrs, Volume= 43,669 cf
Routed to Link JB#1 : JB#1 Additional Flow Only

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.001 hrs / 2
Peak Elev= 15.21' @ 12.09 hrs Surf.Area= 2,313 sf Storage= 9,829 cf

Plug-Flow detention time= 129.3 min calculated for 43,667 cf (84% of inflow)
Center-of-Mass det. time= 62.4 min (803.1 - 740.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.35'	1,526 cf	**9.00'W x 257.00'L x 6.67'H Field A** 15,420 cf Overall - 11,605 cf Embedded = 3,815 cf x 40.0% Voids
#2A	10.35'	8,635 cf	**retain_it retain_it 5.0'** x 32 Inside #1 Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf 1 Rows adjusted for 685.7 cf perimeter wall
		10,161 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	6.90'	**24.0" Round MH#1 TO JB#1** L= 18.0' Ke= 0.500 Inlet / Outlet Invert= 6.90' / 5.90' S= 0.0556 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	8.40'	**24.0" Round MH#2 TO MH#1** L= 62.0' Ke= 0.500 Inlet / Outlet Invert= 8.40' / 7.00' S= 0.0226 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#3	Device 2	11.45'	**24.0" Round MH#3 TO MH#2** L= 70.0' Ke= 0.500 Inlet / Outlet Invert= 11.45' / 10.75' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#4	Device 3	12.05'	**24.0" Round MMH#1 TO MH#3** L= 51.0' Ke= 0.500 Inlet / Outlet Invert= 12.05' / 11.55' S= 0.0098 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#5	Device 4	14.20'	**4' Weir with 6" Knotch, C= 3.27** Offset (feet) 0.00 0.01 0.49 0.50 4.50 4.51 4.99 5.00 Height (feet) 2.30 0.50 0.50 0.00 0.00 0.50 0.50 2.30
#6	Device 5	10.45'	**24.0" Round INFIL#1 TO MMH#1** L= 3.0' Ke= 0.500 Inlet / Outlet Invert= 10.35' / 10.45' S= -0.0333 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=14.41 cfs @ 12.09 hrs HW=15.21' TW=8.18' (Fixed TW Elev= 8.18')
- **1=MH#1 TO JB#1** (Passes 14.41 cfs of 40.10 cfs potential flow)
  - **2=MH#2 TO MH#1** (Passes 14.41 cfs of 36.45 cfs potential flow)
    - **3=MH#3 TO MH#2** (Passes 14.41 cfs of 25.12 cfs potential flow)
      - **4=MMH#1 TO MH#3** (Passes 14.41 cfs of 22.22 cfs potential flow)
        - **5=4' Weir with 6" Knotch** (Weir Controls 14.41 cfs @ 3.17 fps)
          - **6=INFIL#1 TO MMH#1** (Passes 14.41 cfs of 15.18 cfs potential flow)

Pond 14P: Block B Infil - Chamber Wizard Field A

Chamber Model = retain_it retain_it 5.0' (retain-it®)
Inside= 84.0"W x 60.0"H => 36.41 sf x 8.00'L = 291.3 cf
Outside= 96.0"W x 68.0"H => 45.33 sf x 8.00'L = 362.7 cf
1 Rows adjusted for 685.7 cf perimeter wall

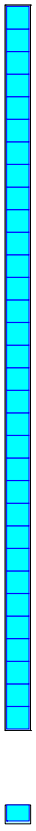
32 Chambers/Row x 8.00' Long = 256.00' Row Length +6.0" End Stone x 2 = 257.00' Base Length
1 Rows x 96.0" Wide + 6.0" Side Stone x 2 = 9.00' Base Width
12.0" Stone Base + 68.0" Chamber Height = 6.67' Field Height

10.4 cf Sidewall x 32 x 2 + 10.4 cf Endwall x 1 x 2 = 685.7 cf Perimeter Wall
32 Chambers x 291.3 cf - 685.7 cf Perimeter wall = 8,635.2 cf Chamber Storage
32 Chambers x 362.7 cf = 11,605.3 cf Displacement

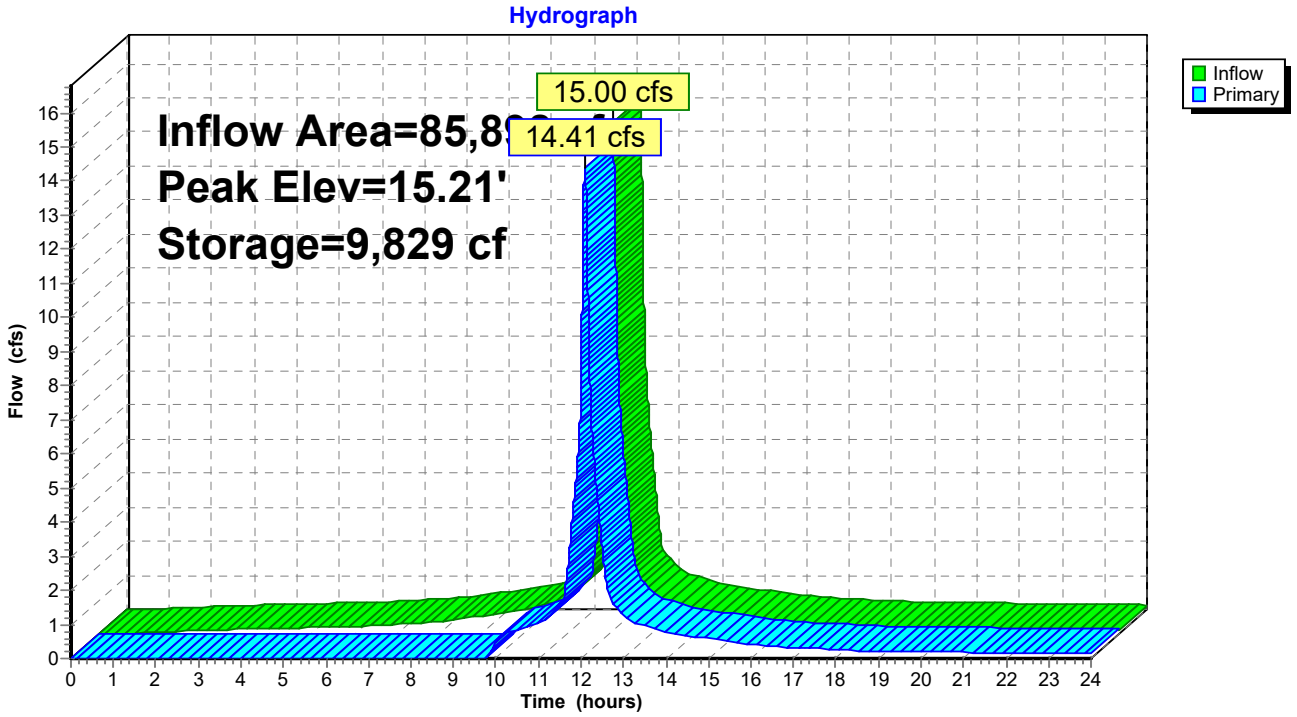
15,420.0 cf Field - 11,605.3 cf Chambers = 3,814.7 cf Stone x 40.0% Voids = 1,525.9 cf Stone Storage

Chamber Storage + Stone Storage = 10,161.1 cf = 0.233 af
Overall Storage Efficiency = 65.9%
Overall System Size = 257.00' x 9.00' x 6.67'

32 Chambers
571.1 cy Field
141.3 cy Stone



Pond 14P: Block B Infil



Stage-Area-Storage for Pond 14P: Block B Infil

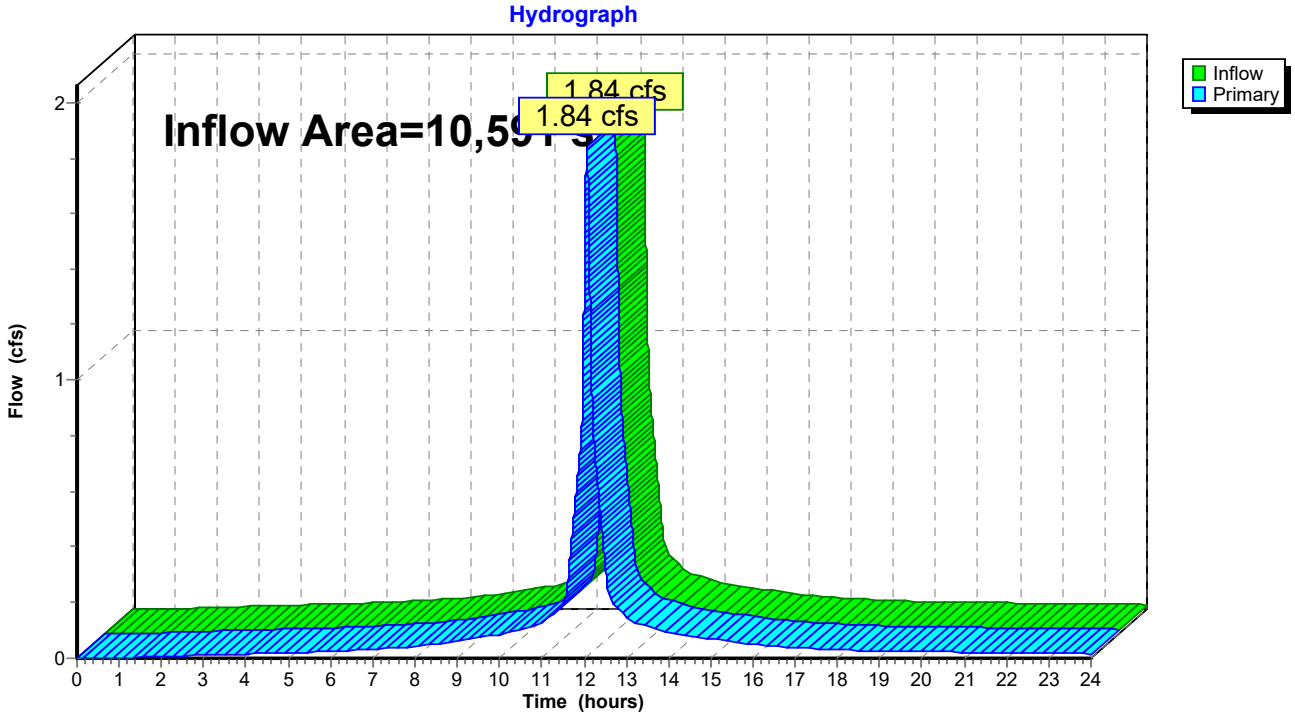
Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
9.35	0	12.00	3,950	14.65	8,807
9.40	46	12.05	4,041	14.70	8,899
9.45	93	12.10	4,133	14.75	8,991
9.50	139	12.15	4,225	14.80	9,082
9.55	185	12.20	4,316	14.85	9,174
9.60	231	12.25	4,408	14.90	9,266
9.65	278	12.30	4,500	14.95	9,357
9.70	324	12.35	4,591	15.00	9,449
9.75	370	12.40	4,683	15.05	9,541
9.80	416	12.45	4,775	15.10	9,632
9.85	463	12.50	4,866	15.15	9,724
9.90	509	12.55	4,958	15.20	9,815
9.95	555	12.60	5,050	15.25	9,907
10.00	601	12.65	5,141	15.30	9,999
10.05	648	12.70	5,233	15.35	10,090
10.10	694	12.75	5,325	15.40	10,096
10.15	740	12.80	5,416	15.45	10,101
10.20	786	12.85	5,508	15.50	10,106
10.25	833	12.90	5,599	15.55	10,112
10.30	879	12.95	5,691	15.60	10,117
10.35	925	13.00	5,783	15.65	10,122
10.40	1,017	13.05	5,874	15.70	10,128
10.45	1,109	13.10	5,966	15.75	10,133
10.50	1,200	13.15	6,058	15.80	10,138
10.55	1,292	13.20	6,149	15.85	10,143
10.60	1,383	13.25	6,241	15.90	10,149
10.65	1,475	13.30	6,333	15.95	10,154
10.70	1,567	13.35	6,424	16.00	**10,159**
10.75	1,658	13.40	6,516	16.05	**10,161**
10.80	1,750	13.45	6,608	16.10	10,161
10.85	1,842	13.50	6,699	16.15	10,161
10.90	1,933	13.55	6,791	16.20	10,161
10.95	2,025	13.60	6,883	16.25	10,161
11.00	2,117	13.65	6,974	16.30	10,161
11.05	2,208	13.70	7,066	16.35	10,161
11.10	2,300	13.75	7,158	16.40	10,161
11.15	2,392	13.80	7,249	16.45	10,161
11.20	2,483	13.85	7,341	16.50	10,161
11.25	2,575	13.90	7,433		
11.30	2,667	13.95	7,524		
11.35	2,758	14.00	7,616		
11.40	2,850	14.05	7,707		
11.45	2,942	14.10	7,799		
11.50	3,033	14.15	7,891		
11.55	3,125	14.20	7,982		
11.60	3,217	14.25	8,074		
11.65	3,308	14.30	8,166		
11.70	3,400	14.35	8,257		
11.75	3,491	14.40	8,349		
11.80	3,583	14.45	8,441		
11.85	3,675	14.50	8,532		
11.90	3,766	14.55	8,624		
11.95	3,858	14.60	8,716		

Summary for Link CB#2: EX.CB#2

Inflow Area = 10,591 sf, 92.13% Impervious, Inflow Depth > 7.06" for 50-Year event
Inflow = 1.84 cfs @ 12.07 hrs, Volume= 6,228 cf
Primary = 1.84 cfs @ 12.07 hrs, Volume= 6,228 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node JB#3

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

Link CB#2: EX.CB#2

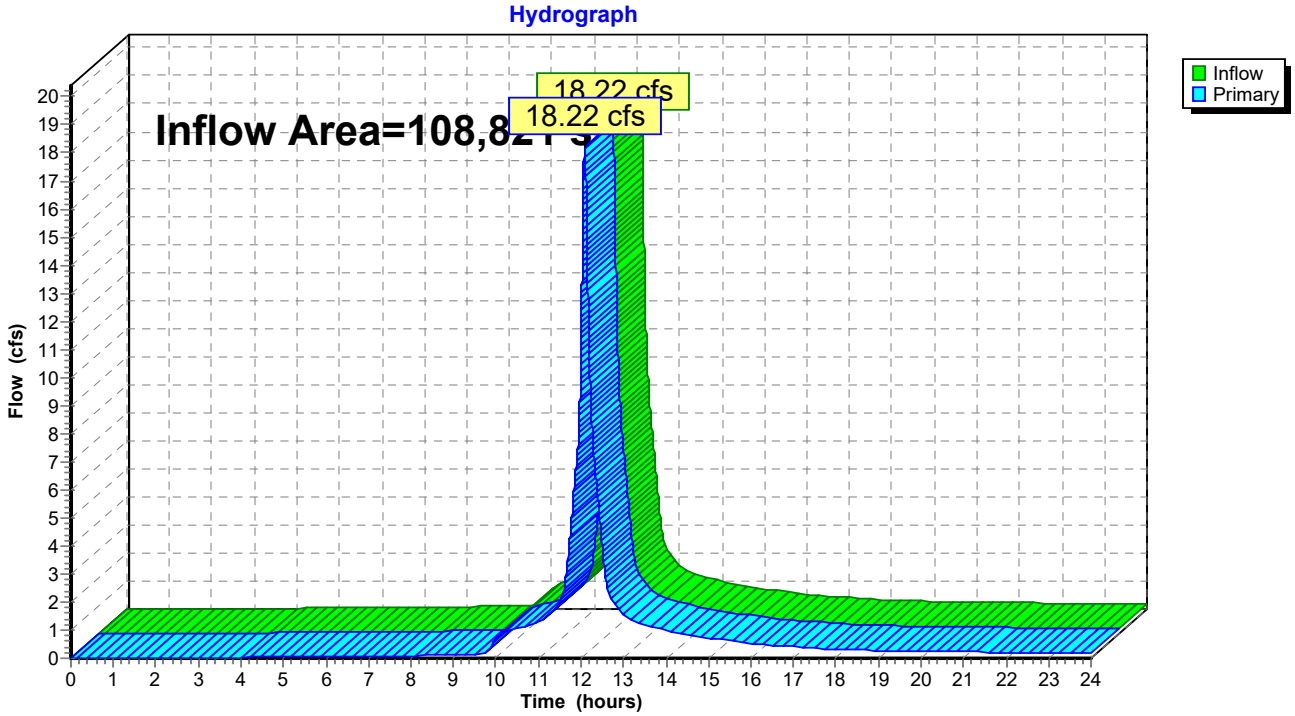


Summary for Link JB#1: JB#1 Additional Flow Only

Inflow Area = 108,821 sf, 96.84% Impervious, Inflow Depth > 6.27" for 50-Year event
Inflow = 18.22 cfs @ 12.09 hrs, Volume= 56,862 cf
Primary = 18.22 cfs @ 12.09 hrs, Volume= 56,862 cf, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node JB1

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

Link JB#1: JB#1 Additional Flow Only

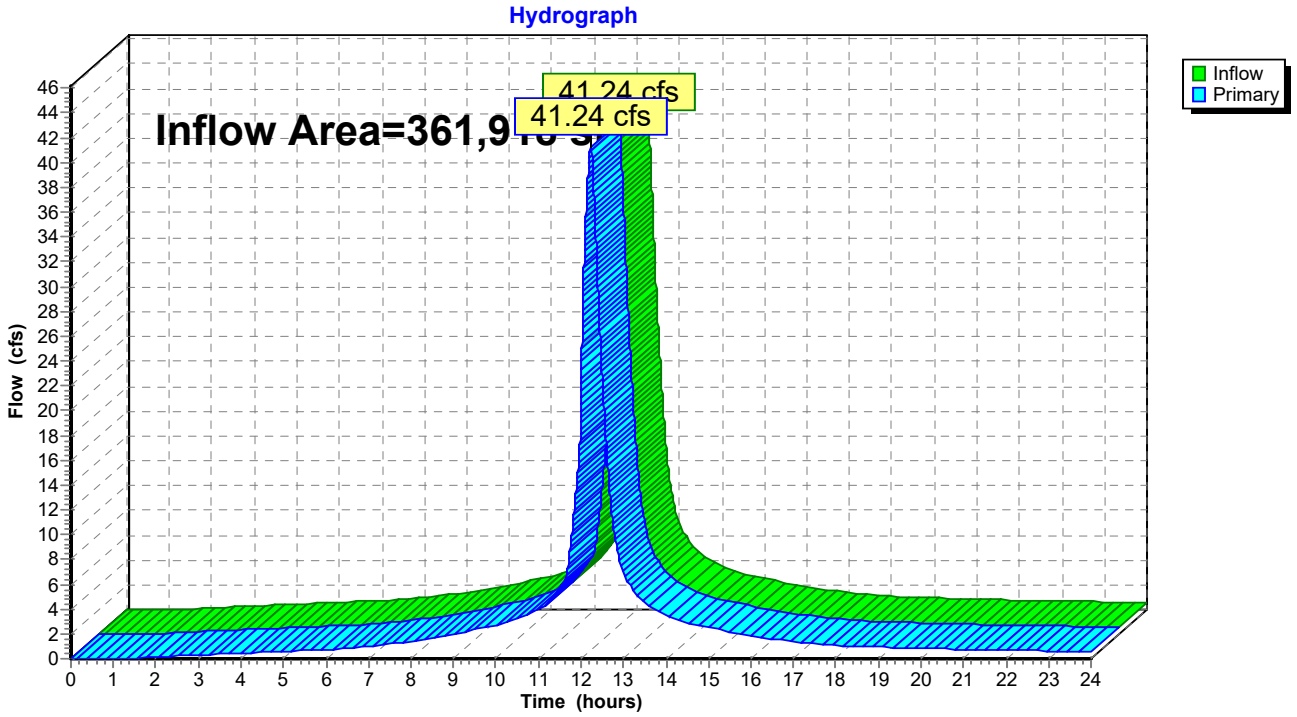


Summary for Link MH#2: EX.MH#2

Inflow Area = 361,918 sf, 13.84% Impervious, Inflow Depth > 7.00" for 50-Year event
Inflow = 41.24 cfs @ 12.22 hrs, Volume= 210,978 cf
Primary = 41.24 cfs @ 12.22 hrs, Volume= 210,978 cf, Atten= 0%, Lag= 0.0 min

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

Link MH#2: EX.MH#2



Appendix F

Sanitary Sewer Flow Calculations
Sanitary Infrastructure Exhibit

Proposed On-Site Sanitary Sewer Flow Estimates

Project: *100 Clinton Avenue*	**Project #:** *7258*	**Date:** *9/16/2022*
Location: *Stamford, CT*	**By:** *SPC*	**Checked:** *TM*

Potential Proposed Flow Generated By Block A Residential					
Usage	Unit	# of Units	# of Bedrooms	Design Flow (GPD / Unit)[1]	Total Flow (GPD)
Residential	Studio	33	33	150	4950
	1 Bedroom	88	88	150	13200
	2 Bedroom	55	110	150	16500
Proposed Sanitary Flow Rate (GPD)					**34,650**

Potential Proposed Flow Generated By Block B Residential					
Usage	Unit	# of Units	# of Bedrooms	Design Flow (GPD / Unit)[1]	Total Flow (GPD)
Residential	Studio	18	18	150	2700
	1 Bedroom	128	128	150	19200
	2 Bedroom	148	296	150	44400
	3 Bedroom	1	3	150	450
Proposed Sanitary Flow Rate (GPD)					**66,750**

Potential Proposed Flow Generated By Amenity Spaces				
Usage	Location	Amenity Units	Design Flow (GPD / Unit)[1]	Total Flow (GPD)
Dog Spa	Block B	4 Stations	250	1000
Proposed Sanitary Flow Rate (GPD)				**1,000**

Potential Proposed Flow Generated By Both Sites	
Proposed Sanitary Flow Rate (GPD)	102,400
Proposed Sanitary Flow Rate (CFS)	0.158
Peaking Factor	4
Total Proposed Peak Flow (GPD)	**409,600**
Total Proposed Peak Flow (CFS)	**0.634**

[1] Per State of CT Public Health Code

CLINTON COURT–A CONDOMINIUM BK. 1792, PG. 70 & BK. 12232, PG. 18 S.L.R.
MAP 10201 S.L.R.
#69 Clinton Avenue

ASPHALT CURB

CHAIN LINK FENCE

30"RCP

6"CI

EX.SAN MH
RIM=14.11
INV=3.79 (N)
INV=3.83 (S)
INV=5.71 (W)

42" DAN – S2O – HARON

CONCRETE WA
CONCRETE CU
WV

EX.SAN MH
RIM=13.20
INV=3.95 (N)
INV=3.97 (S)
INV=5.88 (W)

EX.SAN MH
RIM=13.22
INV=3.98 (N)
INV=4.00 (S)
INV=5.42 (W)

30" RCP

APPLICANT AND THEIR CONTRACTOR SHALL COORDINATE AND SCHEDULE THE SEWER LATERAL CONNECTION WITH WPCA'S COLLECTION SYSTEM SUPERVISOR (203-977-5768) AT LEAST 3 WORKING DAYS IN ADVANCE. WPCA PERSONNEL MUST BE ON-SITE TO WITNESS AND PHOTOGRAPH THE SEWER LATERAL CONNECTION TO THE SANITARY CONVEYANCE SYSTEM. THE WORK SHALL OCCUR BETWEEN THE HOURS OF 7:30 AM AND 2:00 PM MONDAY THROUGH FRIDAY EXCEPT HOLIDAYS. (TYP.)

PROPOSED SANITARY
CHIMNEY CONNECTION
SANITARY LATERAL INVERT=9.25
SANITARY MAIN INVERT=4.30±

31 LF OF 10" PVCP @ 0.019 FPF

CONCRETE WALK

MAP 13846 S.L.R.
50 FT. WIDE RIGHT OF WAY

CLINTON AVENUE

PROPOSED SANITARY
CHIMNEY CONNECTION
SANITARY LATERAL INVERT=10.45
SANITARY MAIN INVERT=4.30±

EX.SAN MH
RIM=15.92
INV=4.25 (S)
INV=4.22 (N)

30" RCP

MH
CB
TRENCH DRAIN
concrete drive
ASPHALT
OIL FILL
28.7
29.2
29.7
CONC. &
STORM MH RIM=22.50

STONE RET. WALL

TWF 16
TWF 17
TWF 18
TWF 20
TWF 21
TWF 22

WATER
2009
.4)

N/F
y of Stamford
AP 13846 S.L.R.
5704, PG. 213 S.L.R.
7 CLINTON AVENUE

100 YEAR FLOOD LINE
ZONE AE (EL 11)
SEE NOTES

BRIDGE ABUTMENT

CATV MH

BRIDGE

RICHMOND HILL AVE

PARCEL RH–1A, MAP 13846 S.L.R.
50 FT. WIDE RIGHT OF WAY

SAN. MH–3

SAN. MH–2
RIM=20.00

SAN. MH–1
RIM=18.81
INV=10.12(N)–15"PVC
OUT=10.10(W)–15"PVC

EX.SAN. MH
RIM=16.51
FLOW=4.62

EX.SAN. MH
RIM=14.65
OUT=4.56

SANITARY INFRASTRUCTURE EXHIBIT

CLINTON AVENUE

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:
7258	09/16/2022
	SCALE: 1" = 50'

9/16/2022 12:17 PM H:\Jobfiles2\7000\7200\7258\DWG\7258 Master 2 Report Exhibits (2022-09-13).dwg

Appendix G

Draft Operation and Maintenance Agreement

Block 6 & 7

AGREEMENT COVENANT

AGREEMENT made this _____ by and between CP VIII 100 Clinton, 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 two (2) 7-story residential buildings 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 and filtration 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

DCIA Tracking Spreadsheets
Checklist for Stormwater Management Report

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	100 Clinton Avenue Block A
Project Address	
Project Applicant	CP VIII 100 Clinton, LLC
Date of Submittal	16-Sep-22
Tax Account Number	TBD

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?	66,831	ft^2
3. What is the total area of land disturbance for this project?	57,056	ft^2
4. Does project site drain to High Quality Waters, a Direct Waterfront, or within 500 ft. of Tidal Wetlands? (Yes/No)	Yes	
5. What is the current ***DCIA*** for the site?	43,642	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?	57,943	ft^2

Part 3: Water Quality Target Total		
Does Standard 1 apply based on information above?	Yes	
Water Quality Volume (WQV)	4624.2	ft^3
Standard 1 requirement	Retain 1/2 WQV on-site	
Required retention volume	2312.1	ft^3
Provided retention volume for proposed development	3,442.0	ft^3

Part 4: Proposed DCIA Tracking		
Pre-development ***total impervious area***	43,642	ft^2
Current ***DCIA***	43,642	ft^2
Proposed-development ***total impervious area***	57,943	ft^2
Proposed-development ***DCIA*** (after stormwater management)	7,871	ft^2
Net change in ***DCIA*** from pre-development to proposed-development	-35,771	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.

Engineer's Signature _____ Date 2022-09-16 Engineer's Seal _____

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	100 Clinton Avenue Block B
Project Address	
Project Applicant	CP VIII 100 Clinton, LLC
Date of Submittal	16-Sep-22
Tax Account Number	TBD

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?	133,121	ft^2
3. What is the total area of land disturbance for this project?	86,995	ft^2
4. Does project site drain to High Quality Waters, a Direct Waterfront, or within 500 ft. of Tidal Wetlands? (Yes/No)	Yes	
5. What is the current ***DCIA*** for the site?	78,609	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?	92,886	ft^2

Part 3: Water Quality Target Total

Does Standard 1 apply based on information above?	Yes	
Water Quality Volume (WQV)	7521.1	ft^3
Standard 1 requirement	Retain 1/2 WQV on-site	
Required retention volume	3760.6	ft^3
Provided retention volume for proposed development	8,635.0	ft^3

Part 4: Proposed DCIA Tracking

Pre-development ***total impervious area***	78,609	ft^2
Current ***DCIA***	78,609	ft^2
Proposed-development ***total impervious area***	92,886	ft^2
Proposed-development ***DCIA*** (after stormwater management)	6,988	ft^2
Net change in ***DCIA*** from pre-development to proposed-development	-71,621	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.

Engineer's Signature _____ Date 2022-09-16 Engineer's Seal _____

STATE OF CONNECTICUT
THEODORO MILONE
No. 22003
LICENSED
PROFESSIONAL ENGINEER

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

CHECKLISTS

Project Name: 100 Clinton Avenue

Project Address 100 Clinton Avenue, Stamford, CT 06903

Property Owner(s) CP VIII 100 Clinton, LLC

Tax Account Number(s) TBD

Engineer's Signature _____ Date: 09/16/2022

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
N/A	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
	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 WAIVER REQUESTED
✔	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

	Stream channel protection, Standard 2A	WAIVER REQUESTED
✔	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)	
✔	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	
✔	Outlet protection calculations, based on conveyance protection (i.e. riprap, energy dissipater)	PROVIDED 2018

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O. Hydrologic and Hydraulic Model, Existing and Proposed

✔	Drainage routing diagram
✔	Summary
✔	Storage pond input

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

✔	Downstream analysis, Standard 2E

III. Supporting Mapping (as appendix to Project Report)

Q. Pre-Development Drainage Basin Area Mapping

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

R. Post-Development Drainage Basin Area Mapping

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

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

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

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V. Proposed LID Review Map

	Applying under "Lite" Stormwater Management - Proposed LID Review Map 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

Appendix I

Division Street Pipe Relocation & 69 Clinton Avenue Drainage Report

Site Engineering Report

Prepared For
"RBS Americas Property Corp."
Stamford, CT

Prepared by
Redniss & Mead, Inc.
22 First Street
Stamford, CT
(203) 327-0500

Issued on
April 11, 2016

Teodoro Milone, P.E.
CT #22563

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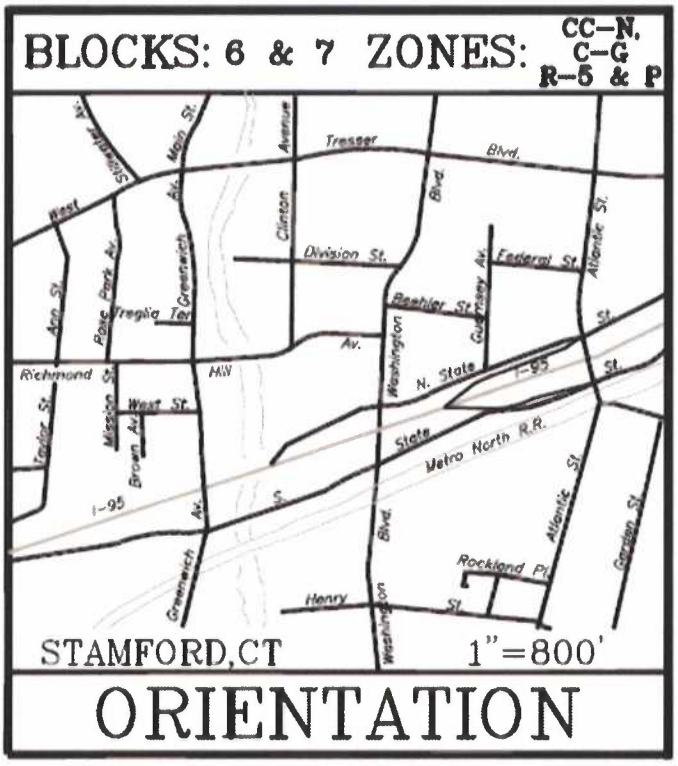
APPENDIX



REDNISS & MEAD

DRAINAGE SUMMARY

RBS Americas Property Corp. (RBS), is seeking General Development Plan approval in connection with a development proposed along the east side of the Mill River in Stamford. The site is made up of multiple properties which include 75, 79, 99, 101, 107, 113 Clinton Avenue and 0, 1, 4, 6, 10, 17, 19, 25 Division Street (the "West Property" – Block B) and 0, 100, 102 Clinton Avenue and 29, 31, 37, 41 Division Street and a parcel known as N-1 on map 13846 recorded on the Stamford Land Records (the "East Property" – Block A). Block A is approximately 57,123 square feet[1] and is improved with two (2) vacant multi-family structures as well as the former Domus facility which is currently vacant. All of these structures will be removed in connection with the proposed development. Block B is approximately 133,362 square feet[2] and is currently vacant. Block B assumes Division Street will be discontinued and land swaps with the City of Stamford will occur. All properties will be consolidated prior to a Building Permit request.

The development of Block A will consist of a seven (7) story building, with 161 residential units and 263 parking spaces. The parking structure will include one (1) level below grade and two (2) levels above. It will be entirely screened from view by seven (7) levels of residential units wrapping the southern, western and northern edges and the Stamford Towers garage to the east.

The development of Block B will consist of a seven (7) story building, with 295 residential units and 304 parking spaces. There are three (3) levels of parking at and above grade. The parking structure will be wrapped with three (3) levels of residential units and capped with a podium. Four (4) additional levels of apartments will be located above the podium; however, most of the dwelling units will be located along the Clinton Avenue frontage. On the Mill River Façade, three (3) outdoor terraces will separate finger-like projections of residential units. This means approximately 50% of the Mill River façade will be limited to three (3) stories. Additional amenity space will be provided on the ground floor and will likely include a fitness room and resident lobby. The proposed building would span over the western portion of Division Street to be abandoned. The process of discontinuing this portion of Division Street has commenced with the City of Stamford.

The northwest portion of Block A lies partially in Flood Hazard Area X. Block B lies within Special Flood Hazard Area AE (EL 12.2– 13.1) as depicted on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map Community Panel No. 09001c 0516 G. Map Revised July 8, 2013. Reference is also made to FEMA Flood Insurance Study of the City of Stamford Map No. 321P for Flood Profile Elevations of the Rippowam River (lower reach).

The Mill River Collaborative is currently seeking approvals to expand the River Walk from Main Street to Richmond Hill Avenue on the east side of the river, and Main Street to the cemetery south of Richmond Hill on the west side of the river (the "River Walk"). Along with providing a public access along the river the project will remove properties from the Flood Hazard Area. The Flood Hazard Area will be confined to the river and the public River Walk area. Once the project is completed, the Mill River Collaborative and/or the City of Stamford will make applications with FEMA to remove portions of properties landward of the River Walk out of the Flood Hazard Area. The River Walk expansion project must be completed prior to June 15,

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[1] This excludes parcel N-1 which consists of approximately 9,708 square feet and will be landscaped and maintained as "park."

[2] This includes the portion of Division Street between Clinton Avenue to the mean high water line for the River Walk extension consisting of 13,738± square feet.

2018 according to the Mill River Collaborative. We anticipate that the project will be completed, and the site of the proposed development will be removed from the Flood Hazard Area.

During the pre-application review process, the City of Stamford Engineering Bureau requested that the existing 36" RCP storm drain within Division Street and beneath the proposed building on Block B be relocated. This pipe discharges directly into the Rippowam River. The pipe and outfall is proposed to be relocated approximately 150' to the north. Refer to the Site Engineering Report produced by Redniss & Mead, Inc., last dated February 29, 2016, for information with respect to this pipe relocation. Refer to the Proposed Drainage Infrastructure Exhibit for further information.

Currently, three buildings, associated driveways and a parking lot to be removed are located within Block A. A large portion of runoff from Block A flows onto Clinton Avenue or Division Street and enters the city owned infrastructure. Refer to Existing Drainage Basin Map for further information. It is proposed to collect runoff generated from roofs, decks, courtyards and planters and pipe it into the City and/or State owned storm drainage facilities within Division Street. Refer to Proposed Drainage Basin Map and Proposed Drainage Infrastructure Exhibit location for further information.

Block B is predominantly pervious with the exception of the portion of Division Street to be discontinued. A large portion of runoff from Block B flows directly into the Rippowan River. A portion of the RBS property along with the portion of Division Street to be discontinued enters city owned infrastructure. Refer to Existing Drainage Basin Map for further information. It is proposed to collect runoff generated from roofs, decks, courtyards and planters and pipe it into the City and/or State owned storm drainage facilities within Division Street or within the proposed pipe relocation junction box to be located on the property at 69 Clinton Avenue. Refer to Proposed Drainage Basin Map and Proposed Drainage Infrastructure location for further information.

A hydraulic grade line (HGL) analysis using StormCad V8i was performed for a 25-year storm recurrence interval to verify that there is no measurable impact to the City owned infrastructure. To evaluate the impacts, if any, to the city owned drainage system the existing drainage system was studied to a manhole located at the intersection of Clinton Avenue and Division Street (EX.MH#2 – Refer to Proposed Drainage Infrastructure for manhole location). The Coastal Jurisdiction Line (CJL) of 5.50 NAVD-88 was used as the starting tail water elevation of the system. The peak rate of runoff during a 25-year storm recurrence was calculated to be 45.75 cfs at the existing 36" outfall. The peak rate of runoff during a 25-year storm recurrence was calculated to be 58.38 cfs at the proposed 42" outfall. The proposed flow at the 42" pipe outfall includes runoff from 69 Clinton Avenue. The drainage system for 69 Clinton Avenue currently discharges into the Rippowan River via an existing 18" outfall. This outfall will be eliminated as part of the Mill River Collaborative River Walk project.

A summary of the HGL analysis for a 25-year storm recurrence interval is tabulated below:

Hydraulic Grade Line Analysis

25-Year Storm Event			
Structure	Pre-Construction (ft)	Post-Construction (ft)	Change in WSEL (inches)
Ex. CB#1	9.90	Structure Eliminated	-
Ex. CB#2	9.97	10.06	+1.1"
Ex. CB#3	9.13	Structure Eliminated	-
Ex. CB#4	8.97	Structure Eliminated	-
Ex. CB#5	7.06	Structure Eliminated	-
Ex. CB#6	7.17	Structure Eliminated	-
Ex. MH#1**	7.45	Structure Eliminated	-
Ex. MH#2	9.44	9.32	-1.4"
Ex. MH#3	6.44	Structure Eliminated	-
Ex. MH#4	5.52	Structure Eliminated	-
Pr. JB#1	New Structure	5.67	-
Pr. JB#2	New Structure	6.95	-
Pr. JB#3	New Structure	7.97	-1.93
Pr. JB#4**	New Structure	8.12	+8.0" **
Outlet	5.50*	5.50*	0"

*Using Coastal Jurisdiction Line (CJL) as storm tail water elevation.
**Pr. JB#4 replaces Ex. MH#1
**Pr.JB#3 replaces Ex. CB#1

The proposed development will result in a decrease in the water surface elevation within existing MH#2. Based on this, it is our opinion that there will be no adverse impact to the city owned drainage system.

Drains within the covered parking garages will be collected and piped into an oil/grit separator prior to discharging into the sanitary sewer system. The oil/grit separator will be designed by the mechanical engineer. Little to no flow will be generated from these drains as they are within the covered parking structure.

Conclusion:

Based on the above information and with proper implementation of the design drawings and proper sediment and erosion controls, the proposed development will not adversely impact adjacent or downstream properties or City owned drainage facilities.

SANITARY SEWER SUMMARY

Existing sanitary sewer facilities in the vicinity of Block A and B consist of a 30" RCP main on Clinton Avenue flowing north towards Tresser Boulevard. There is currently a 6" and 8" abandoned sanitary main within the western portion of Division Street (road to be discontinued). The 30" main discharges into a 36" 36" main within Tresser Boulevard flowing east. Refer to Sanitary Sewer Infrastructure Exhibit location for further information. The sanitary sewer at EX. MH "F" will be at 38% of its capacity at the intersection of Atlantic Street and Tresser Boulevard. This included the impending Atlantic Station Phase I project. Refer to Site Engineering Report prepared for the Atlantic Station project, by Redniss & Mead, Inc., last dated June 8, 2015 for further information.

Historically, multi-family homes were located on many of the properties that comprise the proposed development. Only three remain today as the rest have been demolished. Using Health Department records and CT Health Code guidelines, the historical flow from the buildings we were able to research are estimated to be 14,700 GPD (assuming 150 GPD per bedroom). Using a peak factor of 4, the peak sewage flow is 58,800 GPD (0.091 cfs). Please refer to Appendix 5 for attached calculations.

The sanitary flow from the proposed development will be collected in multiple locations along the Clinton Avenue property frontage. One sewer connection is proposed for Block A and two for Block B. The covered parking areas will be collected via drains and piped into an oil/grit separator prior to discharging into the sanitary sewer. Little or no flow will be generated from these drains. The oil/grit separator will be designed by the Mechanical Engineer.

The developer is proposing to construct 456 bedrooms. This consists of 261 one bedroom apartments, 189 two bedroom apartments, and 6 three bedroom apartments. Under the CT Health Code guidelines, the proposal would result in a total average daily sewage flow of 98,550 GPD (this assumes 150 GPD per bedroom, or two people per room). Using a peak factor of 4, the peak sewage flow is 394,200 GPD (0.610 cfs). Please refer to Appendix 5 for attached calculations.

On March 10, 2016 a visual observation was made on the 30" pipe and there was minimal evidence of flow in the sewer line (approximately 1"). Based on meeting with the WPCA the flow has been significantly reduced in this system due to rerouting of sewage tributary from Richmond Hill Avenue. Below find observed flows:

Time	Depth of Flow at MH#1	Depth of Flow at MH#2
9:10	0.75 in	1.00 in
9:30	1.00 in	1.15 in
3:20	1.00 in	0.75 in
3:50	1.25 in	1.50 in

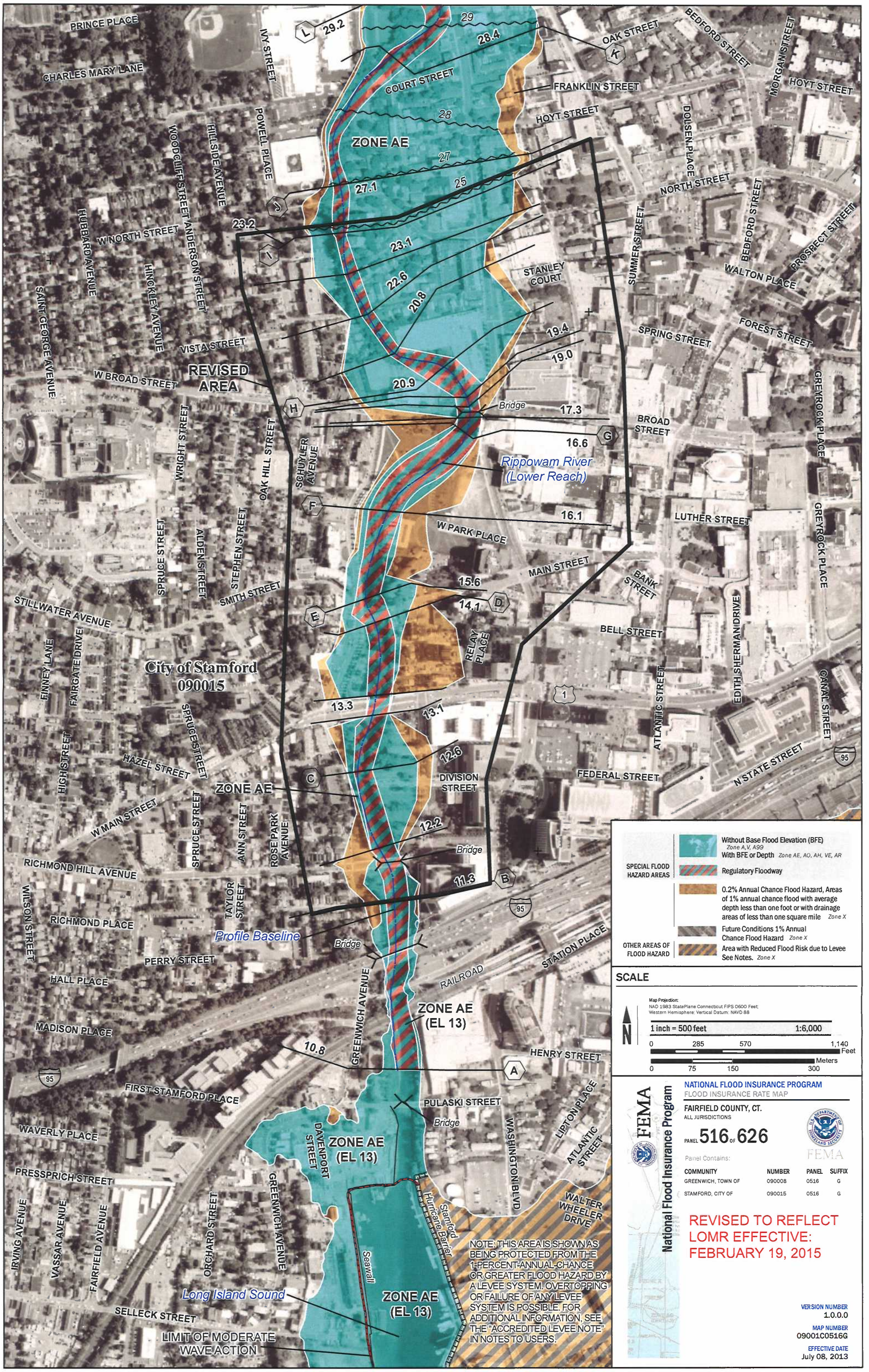
The maximum capacity of the 30" sanitary pipe is 10.46 cfs. The proposed development using a peak factor of 4 the total proposed peak flow is 0.610 cfs. The proposed peak sewage flow from the development represents 5.8% of the maximum capacity of the main. The Clinton Avenue city owned sewer system has more than adequate capacity to accommodate the proposed development. The 36" main within Tresser Boulevard at the intersection of Tresser Boulevard and Atlantic Street has a capacity of 32.54 cfs and is at 38% capacity with

the build out of Atlantic Station Phase 1. Considering the RBS project the sanitary sewer at EX. MH "F" at the intersection of Atlantic Boulevard & Tresser Boulevard will be at 38% of its capacity.

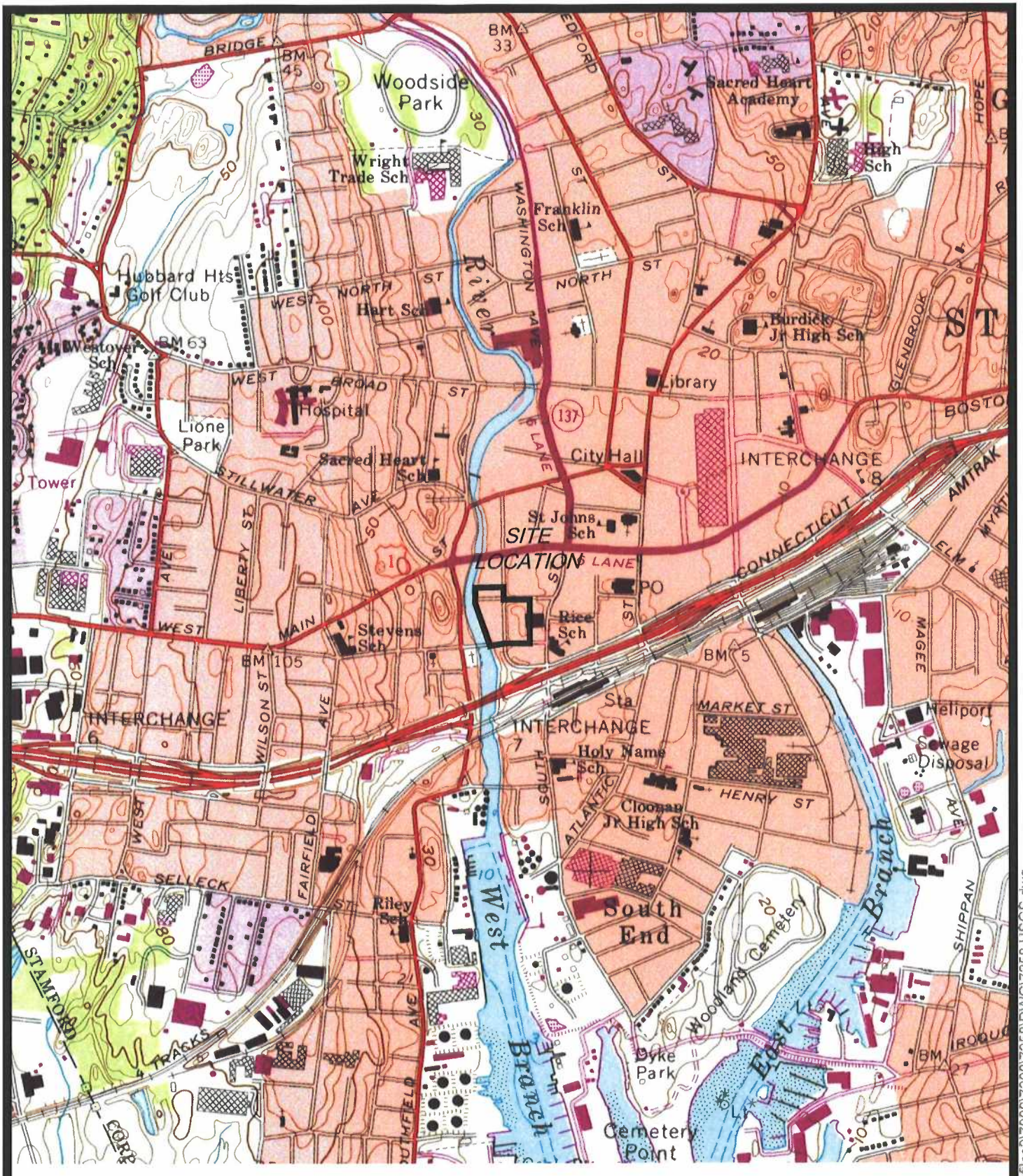
The City of Stamford Water Pollution Control Authority previously upgraded the Wastewater Treatment Facility (WWTF). The WWTF upgrade was designed for an average daily flow of 24 MGD and a peak average flow of 30 MGD. The current average daily flow usage provided by the Water Pollution Control Authority is 18 MGD (provided by WPCA on November 14, 2013). The WWTF can accommodate an additional sewer capacity of 6 MGD. The proposed development would result in a peak sewage flow of 0.394 MGD.

Based on the above information, the sanitary sewer system has sufficient capacity to accommodate the proposed development, and with proper implementation of the design drawings, the proposed development will not adversely impact the existing sanitary sewer system.

Appendix I


PRINCE PLACE
CHARLES MARY LANE
IVY STREET
L
29.2
29
28.4
COURT STREET
OAK STREET
K
BEDFORD STREET
MORGAN STREET
HOYT STREET
FRANKLIN STREET
HOYT STREET
28
ZONE AE
27
27.1
25
POWELL PLACE
WOODCLIFF STREET ANDERSON STREET
HILLSIDE AVENUE
J
23.2
23.1
DOLSEN PLACE
NORTH STREET
BEDFORD STREET
PROSPECT STREET
SUMMER STREET
HUBBARD AVENUE
W NORTH STREET
I
22.6
20.8
STANLEY COURT
WALTON PLACE
HINCKLEY AVENUE
SAINT GEORGE AVENUE
19.4
SPRING STREET
FOREST STREET
VISTA STREET
19.0
REVISED AREA
W BROAD STREET
20.9
H
Bridge
17.3
BROAD STREET
WRIGHT STREET
OAK HILL STREET
SCHUYLER AVENUE
16.6
G
GREYROCK PLACE
Rippowam River (Lower Reach)
F
16.1
W PARK PLACE
LUTHER STREET
SPRUCE STREET
ALDEN STREET
STEPHEN STREET
MAIN STREET
BANK STREET
15.6
14.1
D
E
SMITH STREET
STILLWATER AVENUE
EDITH SHERMAN DRIVE
FINNEY LANE
FAIRGATE DRIVE
RELAY PLACE
BELL STREET
City of Stamford
090015
13.3
13.1
1
ATLANTIC STREET
CANAL STREET
SPRUCE STREET
HIGH STREET
HAZEL STREET
12.6
C
DIVISION STREET
FEDERAL STREET
N STATE STREET
95
ZONE AE
W MAIN STREET
SPRUCE STREET
ANN STREET
ROSE PARK AVENUE
12.2
Bridge
RICHMOND HILL AVENUE
11.3
B
TAYLOR STREET
WILSON STREET
RICHMOND PLACE
Profile Baseline
Bridge
PERRY STREET
HALL PLACE
RAILROAD
STATION PLACE
GREENWICH AVENUE
ZONE AE (EL 13)
MADISON PLACE
10.8
HENRY STREET
A
95
FIRST STAMFORD PLACE
PULASKI STREET
Bridge
LIPTON PLACE
WASHINGTON BLVD
ATLANTIC STREET
WAVERLY PLACE
DAVENPORT STREET
ZONE AE (EL 13)
PRESSPRICH STREET
GREENWICH AVENUE
Hurricane Barrier
Stamford
Seawall
WALTER WHEELER DRIVE
IRVING AVENUE
VASSAR AVENUE
FAIRFIELD AVENUE
ORCHARD STREET
NOTE: THIS AREA IS SHOWN AS BEING PROTECTED FROM THE 1-PERCENT-ANNUAL-CHANCE OR GREATER FLOOD HAZARD BY A LEVEE SYSTEM. OVERTOPPING OR FAILURE OF ANY LEVEE SYSTEM IS POSSIBLE. FOR ADDITIONAL INFORMATION, SEE THE "ACCREDITED LEVEE NOTE" IN NOTES TO USERS.
Long Island Sound
ZONE AE (EL 13)
SELLECK STREET
LIMIT OF MODERATE WAVE ACTION
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
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
OTHER AREAS OF FLOOD HAZARD
Area with Reduced Flood Risk due to Levee See Notes. Zone X
SCALE
Map Projection:
NAD 1983 StatePlane Connecticut FIPS 0600 Feet
Western Hemisphere; Vertical Datum: NAVD 88
1 inch = 500 feet 1:6,000
0 285 570 1,140 Feet
0 75 150 300 Meters
N
FEMA
National Flood Insurance Program
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
FAIRFIELD COUNTY, CT.
ALL JURISDICTIONS
PANEL 516 OF 626
Panel Contains:
COMMUNITY NUMBER PANEL SUFFIX
GREENWICH, TOWN OF 090008 0516 G
STAMFORD, CITY OF 090015 0516 G
REVISED TO REFLECT LOMR EFFECTIVE: FEBRUARY 19, 2015
VERSION NUMBER
1.0.0.0
MAP NUMBER
09001C0516G
EFFECTIVE DATE
July 08, 2013

Appendix 2



SITE VICINITY MAP
STAMFORD QUADRANGLE
ATLANTIC STATION
STAMFORD, CT

REDNISS & MEAD

COMM. NO.: 7258 DATE: 4/15/2016 SCALE: 1"=2000'

4/15/2016 4:38 PM H:\Jobfiles2\7000\7200\7258\DWG\7258 USGS.dwg

Appendix 3

CLINTON AVENUE

WASHINGTON BOULEVARD

DIVISION STREET

RICHMOND HILL AVE

EX.CB#1

EX.CB#5

EX.CB#3

EX.MH#2

EX.MH#4

36" RCP

EX.CB#6

EX.CB#4

OUTLET

EX.MH#3

EX.CB#2

EX.MH#2

EX.MH#1

24" RCP

12" TILE

10" TILE

EXISTING DRAINAGE BASIN MAP

DIVISION STREET

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COMM. NO.:	DATE:
7258	2/19/2016
	SCALE: 1"=130'

Curve Number Value Worksheet

Project: *RBS*	**Project #:** *7258*	**Date:** *3/31/2016*
Location: *Clinton Ave, Division St, Richmond Hill Ave*	**By:** *DCD*	**Checked:** *TM*

Existing Conditions

	Soils Hydrologic Group	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN	Area		Product of CN x Area
				Square Feet	Acres	
EX.MH#2	D	Impervious	98	221245	5.079	497.750
	D	Lawn (Good)	61	93150	2.138	130.444
			Totals	**314395**	**7.218**	**628.195**
EX.CB#1	D	Impervious	98	11870	0.272	26.705
	D	Lawn (Good)	61	5040	0.116	7.058
			Totals	**16910**	**0.388**	**33.763**
EX.CB#2	B	Impervious	98	4720	0.108	10.619
	B	Lawn (Good)	61	1040	0.024	1.456
			Totals	**5760**	**0.132**	**12.075**

$$CN(weighted) = \frac{total\_product}{total\_area}$$

"A" Weighted CN	**87.0**
"B" Weighted CN	**87.0**
"C" Weighted CN	**91.3**

Curve Number Value Worksheet

Project: *RBS*	**Project #:** *7258*	**Date:** *3/31/2016*	
Location: *Clinton Ave, Division St, Richmond Hill Ave*	**By:** *DCD*	**Checked:** *TM*	

Existing Conditions

	Soils Hydrologic Group	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN	Area		Product of CN x Area
				Square Feet	Acres	
EX.CB#5	D	Impervious	98	2550	0.059	5.737
	D	Lawn (Good)	61	12455	0.286	17.442
			Totals	**15005**	**0.344**	**23.178**
EX.CB#6	D	Impervious	98	1710	0.039	3.847
	D	Lawn (Good)	61	0	0.000	0.000
			Totals	**1710**	**0.039**	**3.847**
EX.CB#3	B	Impervious	98	4730	0.109	10.641
	B	Lawn (Good)	61	14030	0.322	19.647
			Totals	**18760**	**0.431**	**30.289**

$$CN(weighted) = \frac{total\_product}{total\_area}$$

"A" Weighted CN	**67.3**
"B" Weighted CN	**98.0**
"C" Weighted CN	**70.3**

Curve Number Value Worksheet

Project: *RBS*	**Project #:** *7258*	**Date:** *3/31/2016*
Location: *Clinton Ave, Division St, Richmond Hill Ave*	**By:** *DCD*	**Checked:** *TM*

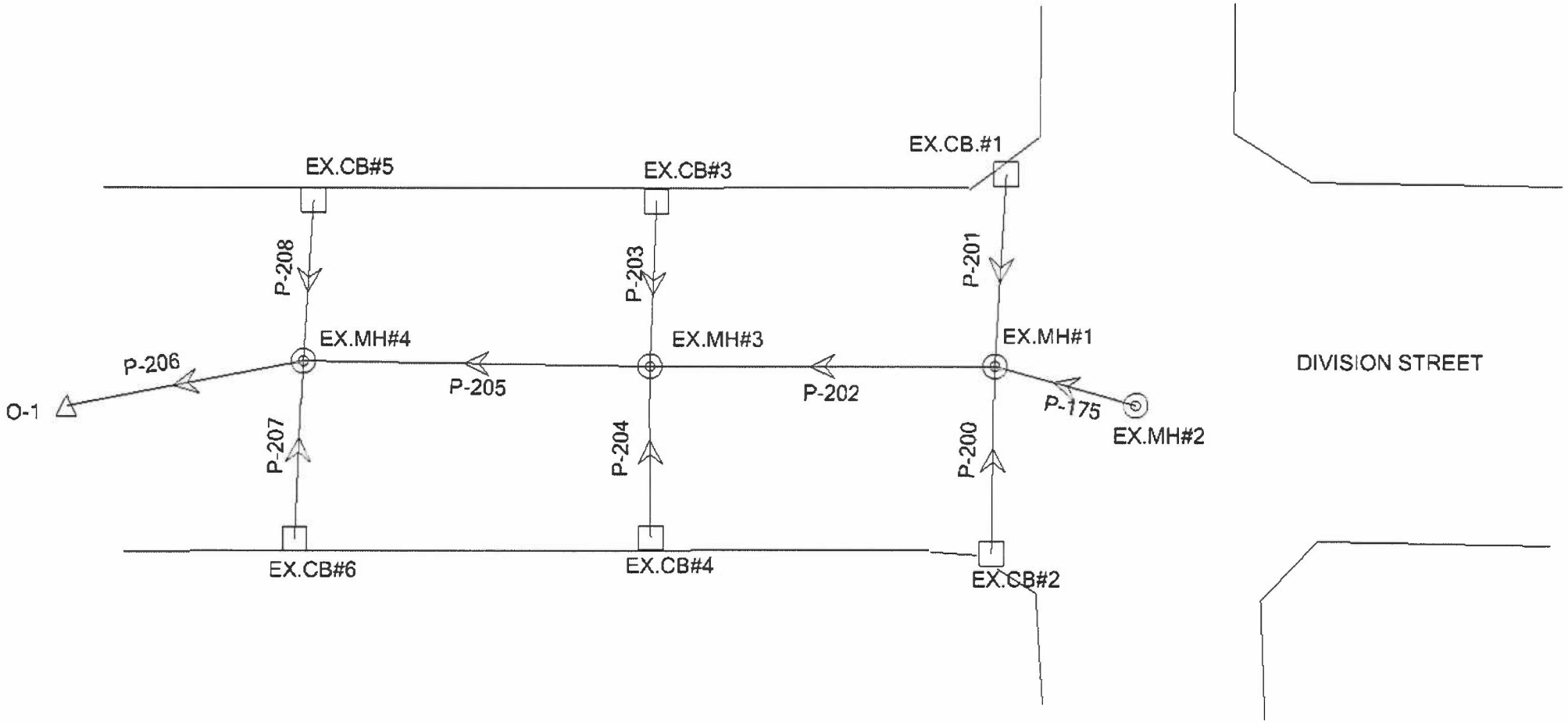
Existing Conditions

	Soils Hydrologic Group	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN	Area		Product of CN x Area
				Square Feet	Acres	
EX.CB#4	D	Impervious	98	2685	0.062	6.041
	D	Lawn (Good)	61	9215	0.212	12.904
			Totals	**11900**	**0.273**	**18.945**

"A" Weighted CN 69.3

$$CN(weighted) = \frac{total\_product}{total\_area}$$

StormCAD Schematic Depicting Existing Hydraulic Grade Analysis for RBS Drainage Basin



Existing Conditions
FlexTable: Catchment Table
RBS

Outflow Element	Area (User Defined) (acres)	Runoff Coefficient (Rational)	Catchment CA (acres)	Time of Concentration (min)	Catchment Rational Flow (ft^3/s)
EX.CB.#1	0.388	0.980	0.338	5.000	2.59
EX.MH#1	0.000	0.980	0.000	5.000	0.00
EX.CB#2	0.132	0.913	0.098	5.000	1.70
EX.MH#2	8.082	0.871	7.039	18.000	39.17
EX.CB#5	0.344	0.673	0.232	8.400	1.52
EX.CB#6	0.039	0.980	0.038	5.000	0.29
EX.CB#3	0.431	0.703	0.302	18.600	1.11
EX.CB#4	0.273	0.693	0.268	17.700	0.28

Existing Conditions
FlexTable: Catch Basin Table
RBS

Label	Flow (Total Out) (ft³/s)	Elevation (Ground) (ft)	Hydraulic Grade Line (Out) (ft)	Is Overflowing?	Elevation (Invert) (ft)	Inlet C	Local CA (acres)
EX.CB.#1	2.59	11.80	9.86	False	9.17	0.980	0.338
EX.CB#2	1.70	12.33	10.13	False	9.57	0.913	0.222
EX.CB#3	1.11	10.96	9.02	False	8.58	0.703	0.202
EX.CB#4	0.28	11.99	8.76	False	8.54	0.693	0.051
EX.CB#5	1.52	9.38	7.06	False	6.54	0.673	0.232
EX.CB#6	0.29	9.55	7.17	False	6.95	0.980	0.038

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Existing Conditions
FlexTable: Manhole Table
RBS

Label	Flow (Total Out) (ft^3/s)	Elevation (Ground) (ft)	Is Overflowing?	Hydraulic Grade Line (Out) (ft)	Elevation (Invert) (ft)
EX.MH#2	39.17	13.30	False	9.44	7.40
EX.MH#1	42.27	12.82	False	8.05	4.55
EX.MH#3	43.39	11.43	False	7.52	4.27
EX.MH#4	44.78	9.99	False	5.50	3.32

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Existing Conditions
FlexTable: Outfall Table
RBS

Label	Elevation (Ground) (ft)	Elevation (Invert) (ft)	Elevation (User Defined Tailwater) (ft)	Hydraulic Grade (ft)	Flow (Total Out) (ft³/s)
O-1	6.00	3.08	5.50	5.50	44.76

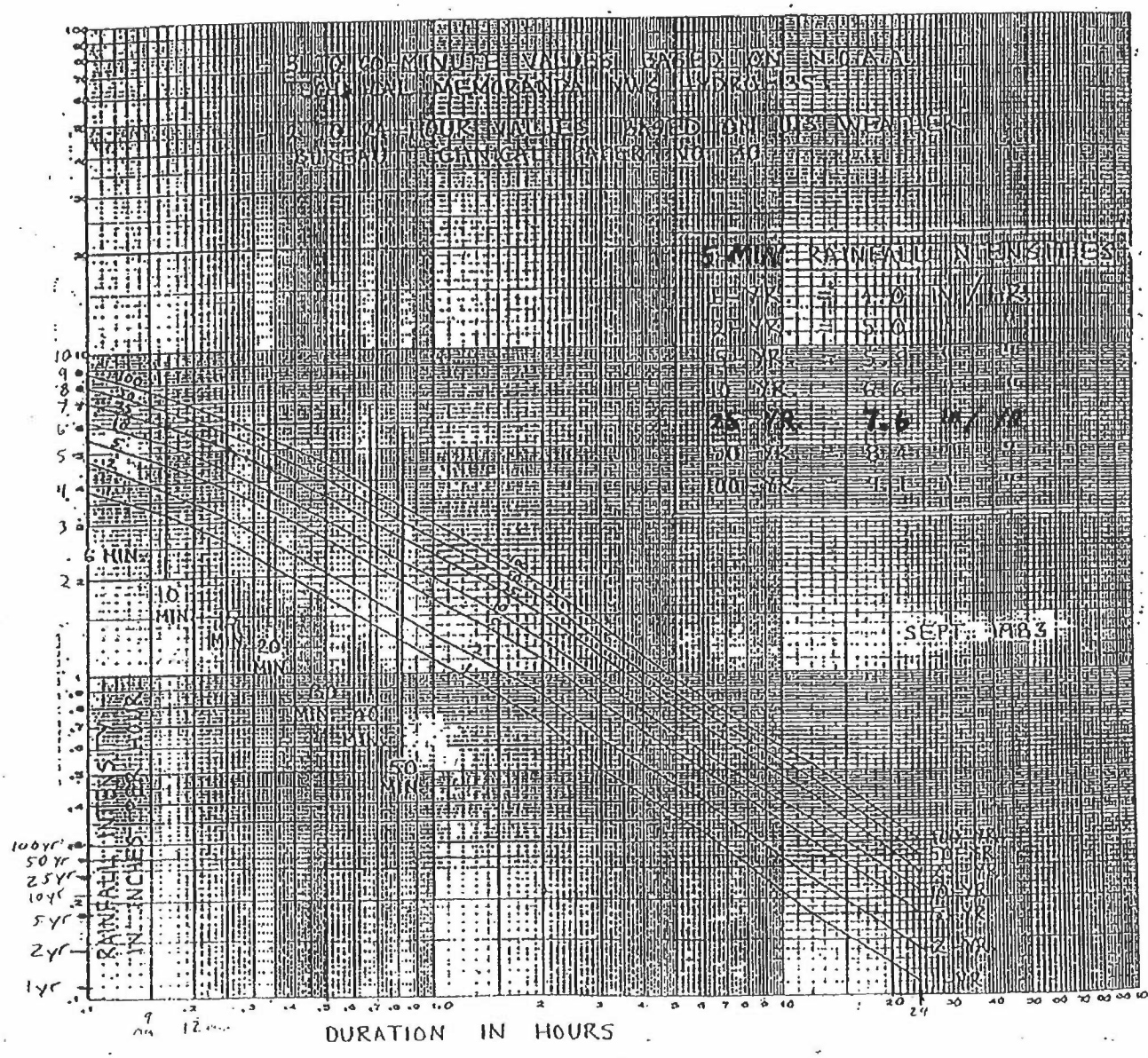
Existing Conditions
FlexTable: Conduit Table
RBS

Label	Start Node	Stop Node	Elevation Ground (Start) (ft)	Hydraulic Grade Line (In) (ft)	Invert (Start) (ft)	Elevation Ground (Stop) (ft)	Hydraulic Grade Line (Out) (ft)	Invert (Stop) (ft)	Length (User Defined) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Manning's n	Flow (ft^3/s)	Capacity (Full Flow) (ft^3/s)	Velocity (ft/s)
P-175	EX.MH#2	EX.MH#1	13.30	9.44	7.40	12.82	8.38	6.82	25.0	0.023	36.0	0.013	39.17	101.59	13.44
P-202	EX.MH#1	EX.MH#3	12.82	8.05	4.55	11.43	7.52	4.43	133.0	0.001	36.0	0.013	42.27	20.03	5.98
P-201	EX.CB.#1	EX.MH#1	11.80	9.86	9.17	12.82	9.19	8.67	25.0	0.020	12.0	0.013	2.59	5.04	6.46
P-200	EX.CB#2	EX.MH#1	12.33	10.13	9.57	12.82	8.05	6.92	22.0	0.120	12.0	0.013	1.70	12.36	11.05
P-205	EX.MH#3	EX.MH#4	11.43	7.52	4.27	9.99	6.35	3.34	117.0	0.008	36.0	0.013	43.39	59.46	9.18
P-203	EX.CB#3	EX.MH#3	10.96	9.02	8.58	11.43	7.45	7.23	12.6	0.107	12.0	0.013	1.11	11.66	9.37
P-204	EX.CB#4	EX.MH#3	11.99	8.76	8.54	11.43	7.52	6.88	12.7	0.131	12.0	0.013	0.28	12.88	6.69
P-206	EX.MH#4	O-1	9.99	5.50	3.32	6.00	5.50	3.08	27.3	0.009	36.0	0.013	44.78	62.53	9.62
P-208	EX.CB#5	EX.MH#4	9.38	7.06	6.54	9.99	5.50	4.79	15.0	0.117	12.0	0.013	1.52	12.17	10.56
P-207	EX.CB#6	EX.MH#4	9.55	7.17	6.95	9.99	6.69	6.54	14.0	0.029	12.0	0.013	0.29	6.10	4.00

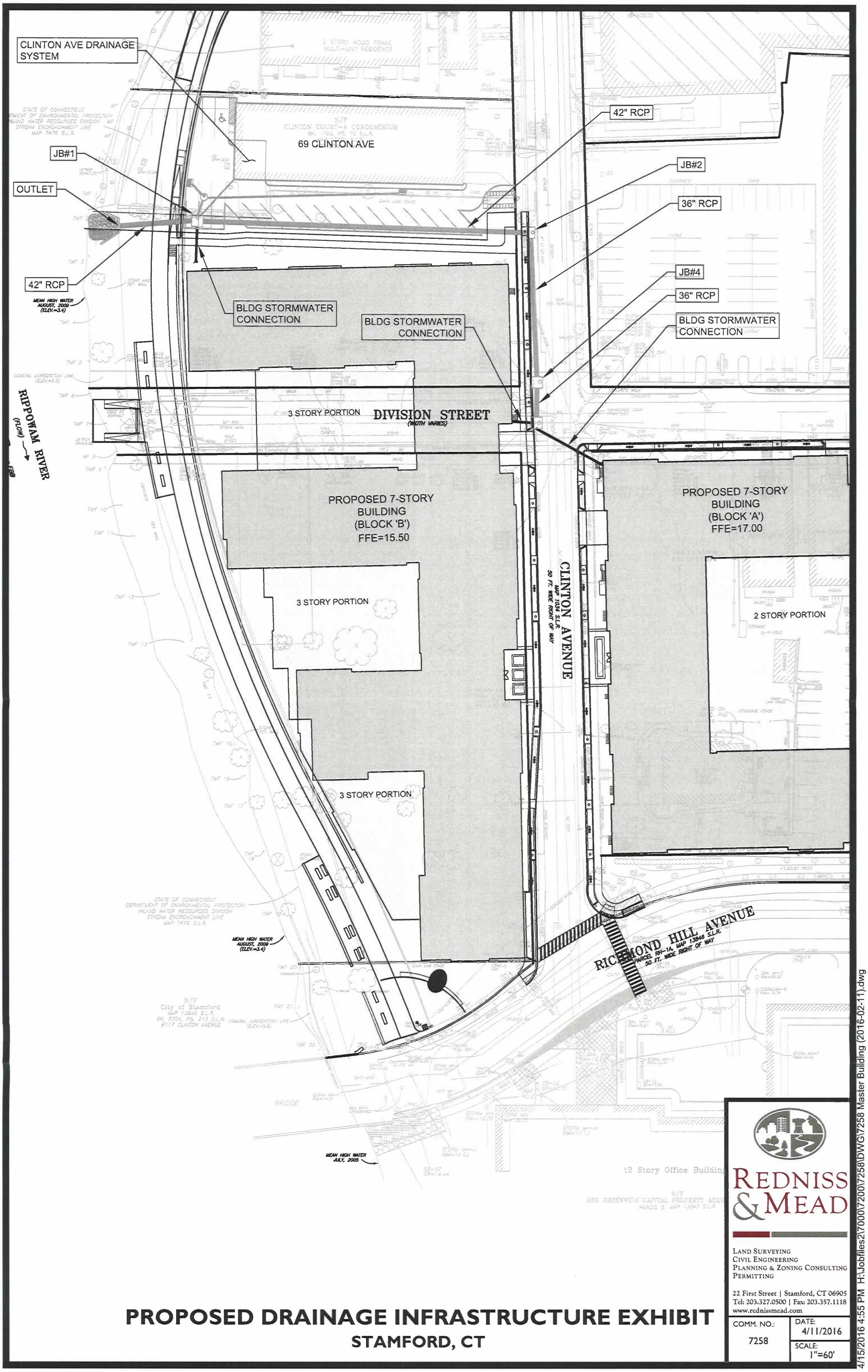
RAINFALL INTENSITY - DURATION CURVES

FOR

STAMFORD, CONNECTICUT



Appendix 4



PROPOSED DRAINAGE INFRASTRUCTURE EXHIBIT

STAMFORD, CT

REDNISS & MEAD

LAND SURVEYING
CIVIL ENGINEERING
PLANNING & ZONING CONSULTING
PERMITTING

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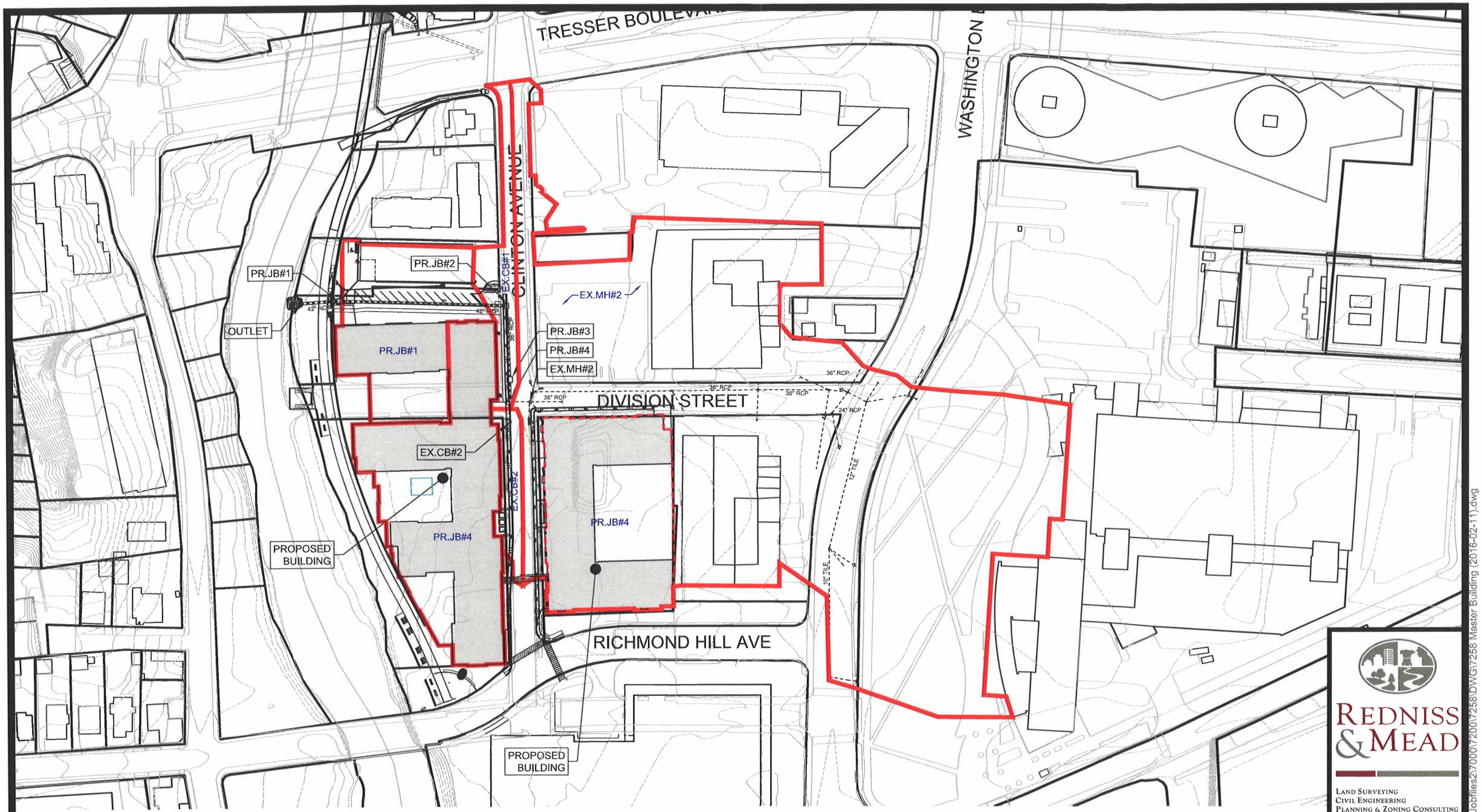
COMM. NO.:	DATE:
7258	4/11/2016
	SCALE: 1"=60'



PROPOSED DRAINAGE BASIN MAP

DIVISION STREET

STAMFORD, CT

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COMM. NO.:	DATE:
7258	4/11/2016
	SCALE: 1"=130'

4/15/2016 3:40 PM H:\Jobfiles2\7000\7200\7258\DWG\7258 Master Building (2016-02-11).dwg

Curve Number Value Worksheet

Project: *RBS*	**Project #:** *7258*	**Date:** *3/31/2016*
Location: *Clinton Ave, Division St, Richmond Hill Ave*	**By:** *DCD*	**Checked:** *TM*

Proposed Conditions

	Soils Hydrologic Group	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN	Area		Product of CN x Area
				Square Feet	Acres	
EX.MH#2	D	Impervious	98	220780	5.068	496.704
	D	Lawn (Good)	61	89775	2.061	125.718
			Totals	**310555**	**7.129**	**622.422**
JB#3	D	Impervious	98	11415	0.262	25.681
	D	Lawn (Good)	61	2700	0.062	3.781
			Totals	**14115**	**0.324**	**29.462**
EX.CB#2	B	Impervious	98	7280	0.167	16.378
	B	Lawn (Good)	61	635	0.015	0.889
			Totals	**7915**	**0.182**	**17.268**

0.873

$$CN(weighted) = \frac{total\_product}{total\_area}$$

"A" Weighted CN	**87.3**
"B" Weighted CN	**90.9**
"C" Weighted CN	**95.0**

Curve Number Value Worksheet

Project: *RBS*	**Project #:** *7258*	**Date:** *3/31/2016*
Location: *Clinton Ave, Division St, Richmond Hill Ave*	**By:** *DCD*	**Checked:** *TM*

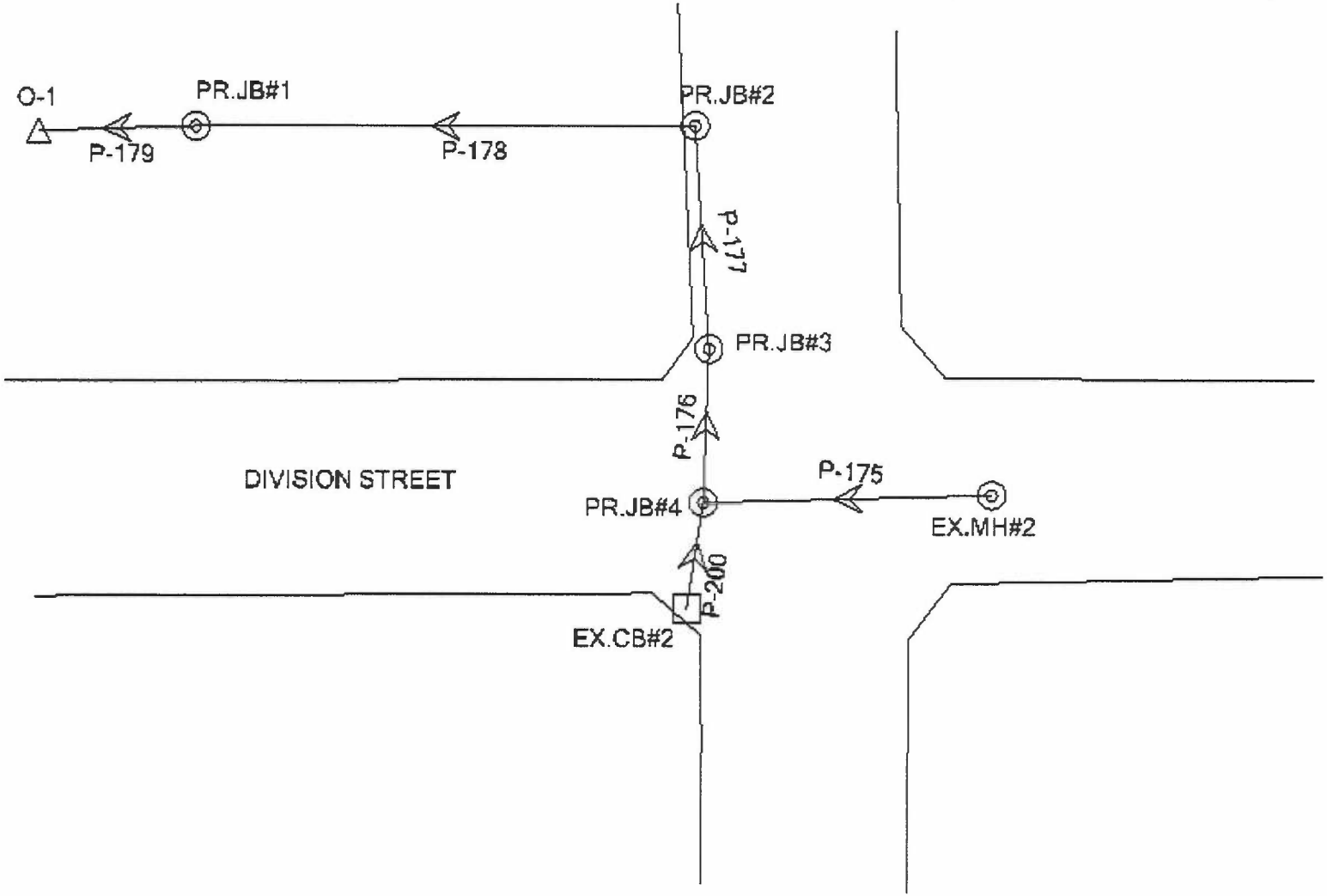
Proposed Conditions

	Soils Hydrologic Group	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN	Area		Product of CN x Area
				Square Feet	Acres	
PR.JB#1	D	Impervious	98	35500.0	0.815	79.867
	D	Lawn (Good)	61	5374.0	0.123	7.526
			Totals	**40874.0**	**0.938**	**87.392**
PR.JB#4	D	Impervious	98	112451.0	2.582	252.989
	D	Lawn (Good)	61	0.0	0.000	0.000
			Totals	**112451.0**	**2.582**	**252.989**

$$CN(weighted) = \frac{total\_product}{total\_area}$$

"A" Weighted CN	**93.1**
"B" Weighted CN	**98.0**

STORMCAD Schematic Depicting Proposed Hydraulic Grade Line Analysis for RBS Drainage Basin



Proposed Conditions
FlexTable: Catchment Table
RBS

Outflow Element	Area (User Defined) (acres)	Runoff Coefficient (Rational)	Catchment CA (acres)	Time of Concentration (min)	Catchment Rational Flow (ft^3/s)
PR.JB#3	0.383	0.909	0.348	5.000	2.67
PR.JB#4	3.008	0.980	2.948	5.000	22.58
EX.CB#2	0.183	0.950	0.174	5.000	1.33
EX.MH#2	7.159	0.873	6.250	18.000	34.77
PR.JB#1	0.938	0.931	0.873	5.000	6.69

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Proposed Conditions
FlexTable: Catch Basin Table
RBS

Label	Flow (Total Out) (ft^3/s)	Elevation (Ground) (ft)	Hydraulic Grade Line (Out) (ft)	Is Overflowing?	Elevation (Invert) (ft)	Inlet C	Local CA (acres)
EX.CB#2	1.33	12.33	10.06	False	9.57	0.950	0.174

Proposed Conditions
FlexTable: Manhole Table
RBS

Label	Flow (Total Out) (ft^3/s)	Elevation (Ground) (ft)	Is Overflowing?	Hydraulic Grade Line (Out) (ft)	Elevation (Invert) (ft)
EX.MH#2	34.77	13.30	False	9.32	7.40
PR.JB#4	52.13	12.82	False	8.12	5.42
PR.JB#3	54.03	12.50	False	7.97	5.22
PR.JB#2	53.91	13.20	False	6.95	4.65
PR.JB#1	58.45	13.65	False	5.67	3.25

Proposed Conditions
FlexTable: Outfall Table
RBS

Label	Elevation (Ground) (ft)	Elevation (Invert) (ft)	Elevation (User Defined Tailwater) (ft)	Hydraulic Grade (ft)	Flow (Total Out) (ft^3/s)
O-1	6.00	3.00	5.50	5.50	58.38

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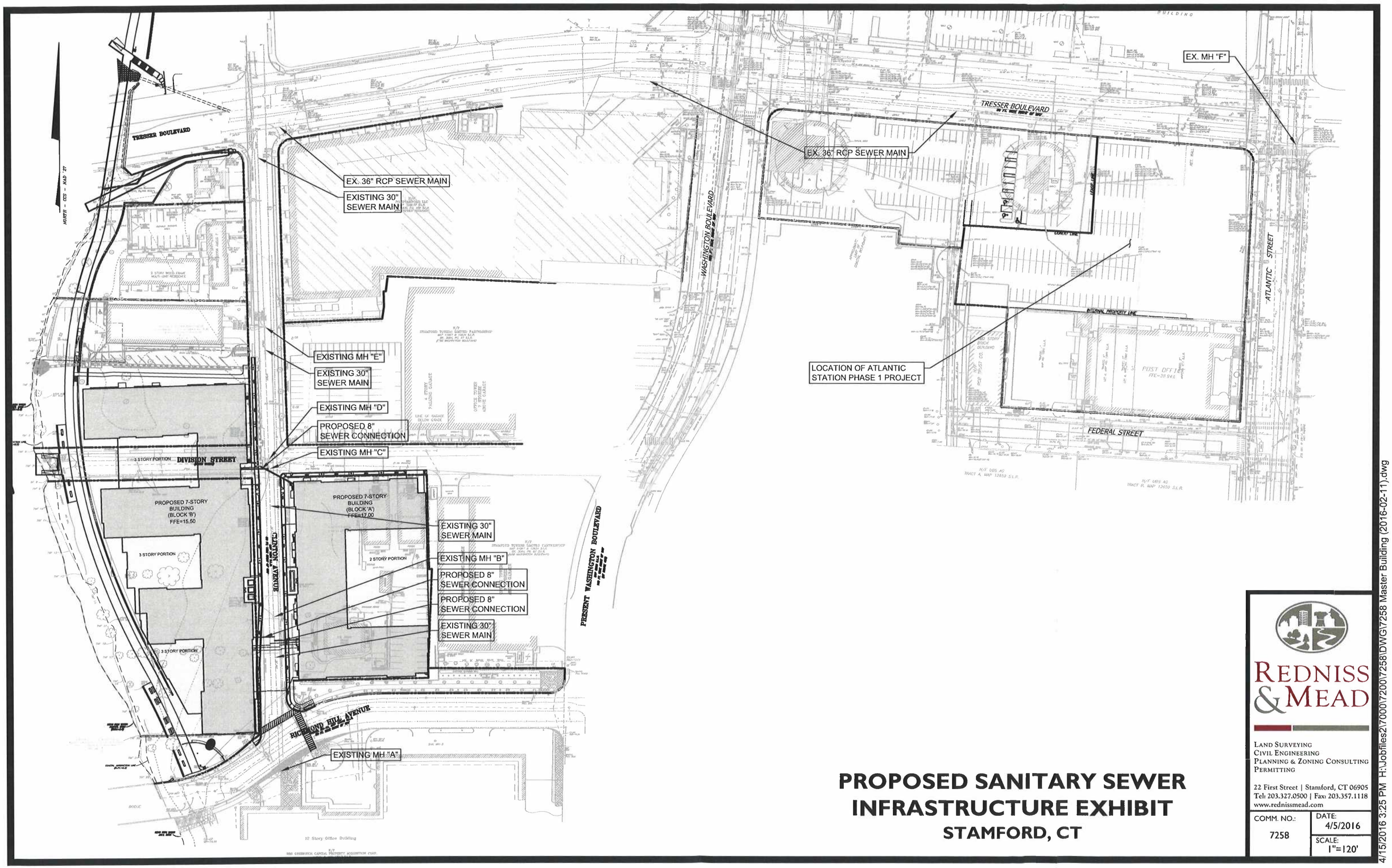
Proposed Conditions
FlexTable: Conduit Table
RBS

Label	Start Node	Stop Node	Elevation Ground (Start) (ft)	Hydraulic Grade Line (In) (ft)	Invert (Start) (ft)	Elevation Ground (Stop) (ft)	Hydraulic Grade Line (Out) (ft)	Invert (Stop) (ft)	Length (User Defined) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Manning's n	Flow (ft^3/s)	Capacity (Full Flow) (ft^3/s)	Velocity (ft/s)
P-175	EX.MH#2	PR.JB#4	13.30	9.32	7.40	12.82	8.27	6.82	25.0	0.023	36.0	0.013	34.77	101.59	13.02
P-176	PR.JB#4	PR.JB#3	12.82	8.12	5.42	12.50	7.97	5.30	25.0	0.005	36.0	0.013	52.13	46.21	7.37
P-177	PR.JB#3	PR.JB#2	12.50	7.97	5.22	13.20	7.14	4.75	95.0	0.005	36.0	0.013	54.03	46.91	7.64
P-178	PR.JB#2	PR.JB#1	13.20	6.95	4.65	13.65	5.70	3.45	233.0	0.005	42.0	0.013	53.91	72.20	8.23
P-179	PR.JB#1	O-1	13.65	5.67	3.25	6.00	5.50	3.00	50.0	0.005	42.0	0.013	58.45	71.14	8.25
P-200	EX.CB#2	PR.JB#4	12.33	10.06	9.57	12.82	8.12	5.82	22.0	0.170	12.0	0.013	1.33	14.71	11.63

Appendix 5



PROPOSED SANITARY SEWER INFRASTRUCTURE EXHIBIT

STAMFORD, CT

REDNISS & MEAD

LAND SURVEYING
CIVIL ENGINEERING
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Tel: 203.327.0500 | Fax: 203.357.1118
www.rednissmead.com

COMM. NO.:	DATE:
7258	4/5/2016
	SCALE: 1"=120'

4/15/2016 3:25 PM H:\Jobfiles2\7000\7200\7258\DWG\7258 Master Building (2016-02-11).dwg

Sanitary Sewage Analysis

Project:	*RBS*	**Project #:**	*7258*	**Date:**	*3/8/2016*
Location:	*Clinton Ave, Division St, Richmond Hill*	**By:**	*DCD*	**Checked:**	*TM*

Existing Sanitary Sewer Flows

Source	Bedrooms	Expected Flow (Gal/bed)	Generated Flows (Gal/Day)	ADF Factor	Peak Generated Flow (Gal/day)	Peak Generated Flows (cfs)
17 Division	12	150	1,800	4	7,200	0.011
99 Clinton	5	150	750	4	3,000	0.005
41 Division	24	150	3,600	4	14,400	0.022
37 Division	12	150	1,800	4	7,200	0.011
31 Division	0	150	0	4	0	0.000
29 Division	12	150	1,800	4	7,200	0.011
25 Division	20	150	3,000	4	12,000	0.019
1 Division	13	150	1,950	4	7,800	0.012
TOTAL	98		14,700		58,800	0.091

Notes:
1. Estimated GPD Sewage Flows obtained from the CT Public Health Code

Pipe (in)	Slope (FPF)	Maximum Pipe Capacity (cfs)	
30	0.0017*	16.91	Ex. MH "A" to Ex. MH "B" **
30	0.0011*	13.60	Ex. MH "B" to Ex. MH "C" **
30	0.0029*	22.09	Ex. MH "C" to Ex. MH "D" **
30	0.00065*	10.46	Ex. MH "D" to Ex. MH "E" **

*Information obtained from Topographic & Property Survey prepared by R&M.
**Refer to sanitary exhibit prepared by R&M for location of manholes

Sanitary Sewage Analysis

Project:	*RBS*	**Project #:**	*7258*	**Date:**	*3/8/2016*
Location:	*Clinton Ave, Division St, Richmond Hill*	**By:**	*DCD*	**Checked:**	*TM*

Proposed Sanitary Sewer Flows

Source	Units	# of Bedrooms	Bedrooms	Expected Flow (Gal/bed)	Generated Flows (Gal/Day)	ADF Factor	Peak Generated Flow (Gal/day)	Peak Generated Flows (cfs)
BLOCK A								
1 Bedroom	89	1	89	150	13,350	4	53,400	0.083
2 Bedroom	72	2	144	150	21,600	4	86,400	0.134
Sub-total:	*161*		*233*		*34,950*		*139,800*	*0.216*
BLOCK B								
1 Bedroom	172	1	172	150	25,800	4	103,200	0.160
2 Bedroom	117	2	234	150	35,100	4	140,400	0.217
3 Bedroom	6	3	18	150	2,700	4	10,800	0.017
Sub-total:	*295*		*424*		*63,600*		*254,400*	*0.394*
TOTAL	456		657		98,550		394,200	0.610

Notes:

1. Estimated GPD Sewage Flows obtained from the CT Public Health Code

Pipe (in)	Slope (FPF)	Maximum Pipe Capacity (cfs)	
30	0.0017*	16.91	Ex. MH "A" to Ex. MH "B" **
30	0.0011*	13.60	Ex. MH "B" to Ex. MH "C" **
30	0.0029*	22.09	Ex. MH "C" to Ex. MH "D" **
30	0.00065*	10.46	Ex. MH "D" to Ex. MH "E" **

*Information obtained from Topographic & Property Survey prepared by R&M.

**Refer to sanitary exhibit prepared by R&M for location of manholes

Division Street Pipe Relocation & 69 Clinton Avenue
Drainage Report

Prepared For
"RBS Americas Property Corp."
Stamford, CT

Prepared by
Redniss & Mead, Inc.
22 First Street
Stamford, CT
(203) 327-0500

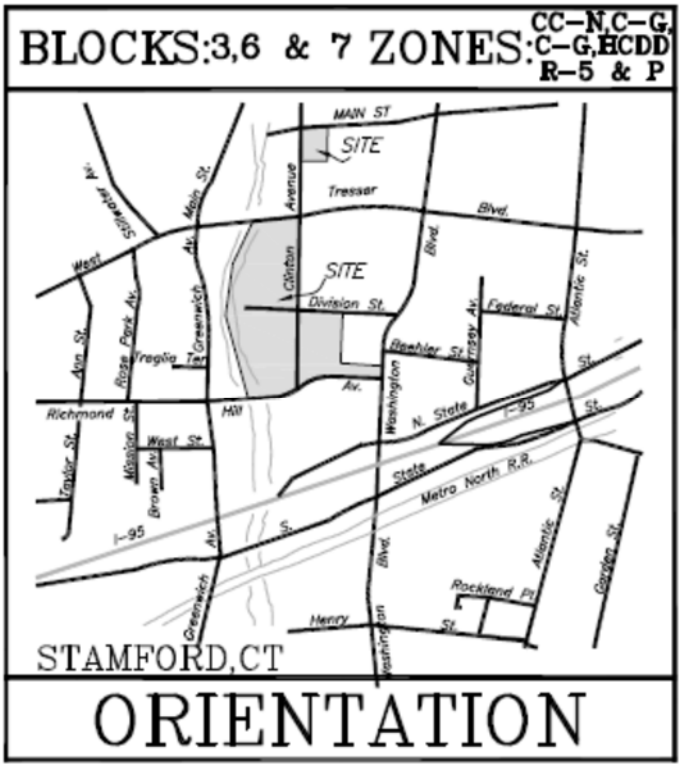
Last Issued on

April 4, 2018
February 29, 2016
February 19, 2016

Teodoro Milone, P.E.
CT #22563

TABLE OF CONTENTS

APPENDIX


BLOCKS:3,6 & 7 ZONES:CC–N,C–G,
C–G,HCDD
R–5 & P
MAIN ST
SITE
Tresser
Blvd.
SITE
Division St.
Federal St.
Richmond St.
West St.
N. State
I–95
Metro North R.R.
Rockland Pl.
Henry St.
STAMFORD,CT
ORIENTATION

DRAINAGE SUMMARY NARRATIVE

RBS Americas Property Corp. (RBS) and the City of Stamford have obtained General Development Plan, Special Exception, and Coastal Site Plan Approval (Zoning Board Approval 216-26) for the development of two residential buildings consisting of 456 units and 567 parking spaces as well as associated site improvements. Also, approximately 35,693 square feet along the river will be dedicated as public access space to facilitate the expansion of Mill River Park. As part of the Mill River Public Access Park Plan, land from 69 Clinton Court will be required adjacent to the Rippowan River. This report focuses on the Division Street pipe relocation and drainage improvements on 69 Clinton Court and reflects the latest site plan, last dated April 4, 2018 (SEM-1 through SEM-4).

The RBS approved development is located on the east side of the Mill River and generally consists of 75, 79, 99, 101, 107, 113 Clinton Avenue and 0, 1, 4, 6, 10, 17, 19, 25 Division Street (the "West Property") and 0, 100, 102 Clinton Avenue and 29, 31, 37, 41 Division Street and a parcel known as N-1 on map 13846 recorded on the Stamford Land Records (the "East Property"). The West Property is approximately 129,471 square feet[1] and is currently vacant. The East Property is approximately 57,123 square feet[2] and is also currently vacant.

To accommodate a seven (7) story building on the West Property the proposed building would span over the western portion of Division Street which was recently approved to be discontinued. A 36" RCP drainage system exists within Division Street which discharges directly into the Rippowan River. During the pre-application review process the City of Stamford Engineering Bureau has requested the existing 36" RCP underneath Division Street spanning underneath the proposed building on the West Property be relocated. The 36" outfall to the river will also be abandoned as part of the Division Street pipe relocation.

The City of Stamford is also proposing improvements on 69 Clinton Court which includes reconfiguring the parking lot and other site elements to accommodate a Riverwalk on the property. To accommodate the parking lot reconfiguration RBS will give land to 69 Clinton Court. There is an existing drainage system on 69 Clinton Court with an 18" outlet pipe which discharges directly into the Rippowam River. There are no water quality measures for the existing parking lot. The 18" outfall to the river will be abandoned as part of the Division Street pipe relocation.

The RBS West Property and 69 Clinton Avenue adjoin the Rippowam River to the west. Regulated tidal wetlands were identified by Land-Tech Consultants, Inc., on July 30, 2009 and July 16, 2015. The properties lie partially within the 100-year floodplain of the Rippowam River (AE-12.2 – 13.1) as depicted on the Federal Emergency Management Agency - Flood Insurance Map Community No. 09001C0516G Panel 516 of 626 revised to reflect LOMR case number 14-01-2347P with effective date February 19, 2015. The property is not located within the drinking water supply watershed. A 25-foot regulated upland from the top of Rippowan River bank was established on the site plans.

---

[1] This includes the portion of Division Street between Clinton Avenue and the eastern border of the River Walk extension consisting of 10,756± square feet.

[2] This excludes parcel N-1 which consists of approximately 9,708 square feet and will be landscaped and maintained as "park."

The 36" RCP storm pipe located within the western portion of Division Street discharges directly into the Rippowan River. This report considered the effects of the pipe relocation from the outfall to the 36" storm pipe located within the intersection of Clinton Avenue and Division Street (EXMH#2). A hydraulic grade line (HGL) analysis using StormCad V8i was performed for a 25-year storm recurrence interval to verify that there is no measurable impact to the City owned infrastructure. The HGL analysis was studied for the existing 36" pipe within Division Street and for a 42" proposed pipe being relocated south of 69 Clinton Avenue. The proposed HGL analysis factors in the proposed "future" development of RBS properties and improvements at 69 Clinton Avenue. However, the areas on RBS property will remain pervious until the time of development. The HGL uses the Coastal Jurisdiction Line (CJL) as the starting tail water elevation of the system. The existing flow at the 36" outfall was calculated to be 45.75 cfs using a 25-year storm recurrence. The proposed flow at the 42" pipe outfall was calculated to be 55.67 cfs during a 25-year storm recurrence. The actual increase to the Rippowam River is less than noted since the RBS properties under existing conditions are allowed to sheet flow into the river and are therefore not included within the existing pipe flow to the river.

A summary of the HGL analysis for a 25-year storm recurrence interval is tabulated below:

Hydraulic Grade Line Analysis

25-Year Storm Event				
Structure	Elevation (ft)	Pre-Construction WSEL (ft)	Post-Construction WSEL (ft)	Change in WSEL (ft)
Ex. CB#1	11.80	9.86	Structure Eliminated	-
Ex. CB#2	12.33	10.13	10.06	-0.07
Ex. CB#3	10.96	9.02	Structure Eliminated	-
Ex. CB#4	11.99	8.76	Structure Eliminated	-
Ex. CB#5	9.38	7.06	Structure Eliminated	-
Ex. CB#6	9.55	7.17	Structure Eliminated	-
Ex. MH#1**	12.82	8.05	Structure Eliminated	-
Ex. MH#2	13.30	9.44	9.32	-0.12
Ex. MH#3	11.43	7.52	Structure Eliminated	-
Ex. MH#4	9.99	5.50	Structure Eliminated	-
Pr. JB#1	10.40	New Structure	7.89	-
Pr. JB#2	13.10	New Structure	8.73	-
Pr. JB#3	12.30	New Structure	9.43	-
Pr. JB#4**	12.82	New Structure	9.55	-
Outlet	6.00	5.50*	5.50*	0.00

*Using Coastal Jurisdiction Line (CJL) as storm tailwater elevation

**Pr.JB#4 replaces Ex.MH#1

The pipe relocation will not result in an adverse impact to the HGL within the city owned system.

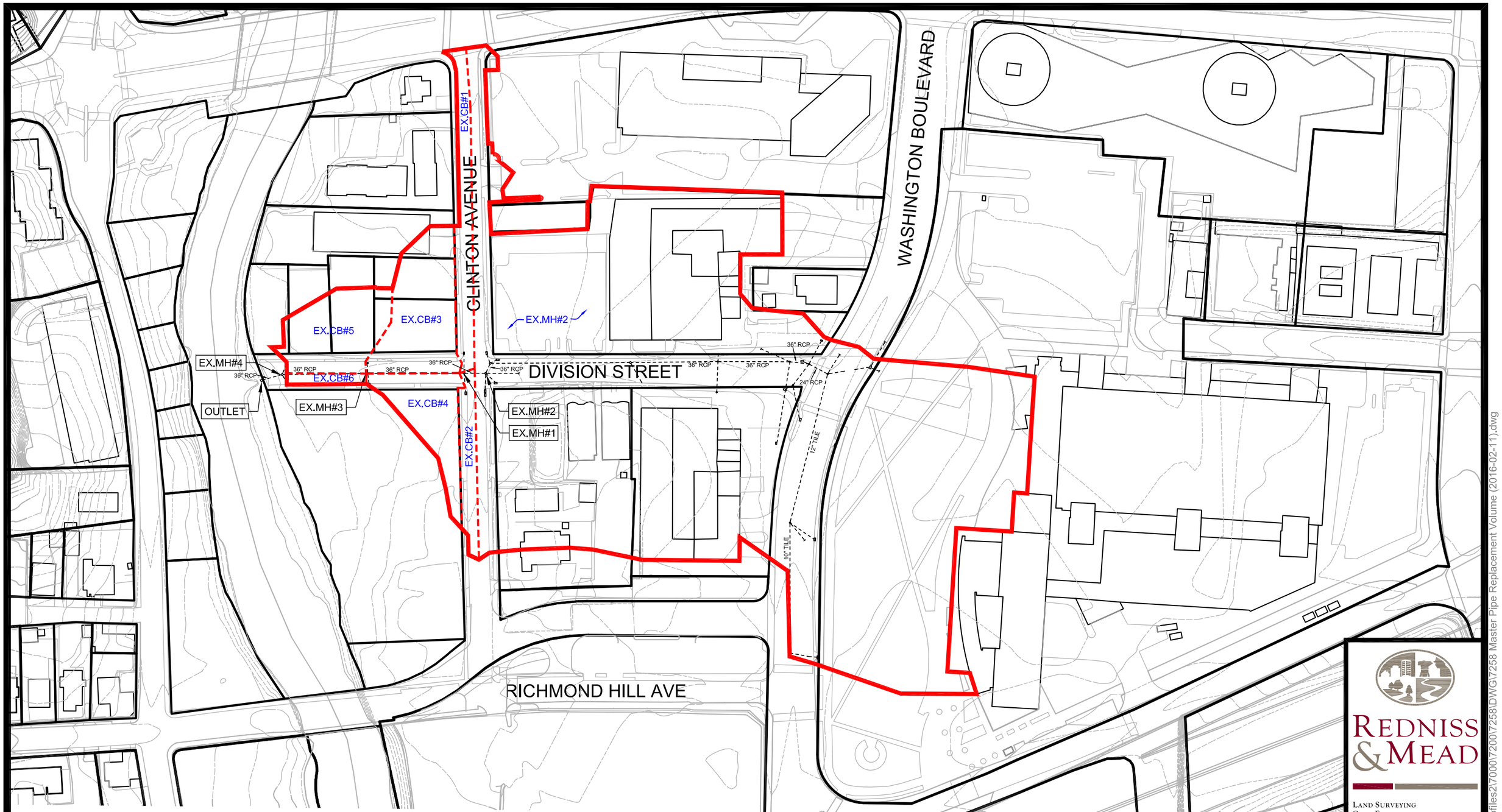
The 42" outlet protection was designed in conformance to the ConnDOT Drainage Manual latest edition which will help minimize signs of erosion. The outlet protection was slightly modified to minimize grading along the river bank. The proposed outfall will be located landward of the CJL. The proposed drainage system will consist of standard catch basins with 2-foot sumps and bell traps, pipes, and manholes. Water quality will also significantly improve with the installation of an oil/grit separator for the surface parking located on 69 Clinton Avenue. The oil/grit separator will separate and trap debris, sediment, and oil and grease from stormwater runoff. The unit will remove 93% of the total suspended solids. Refer to Appendix 4 for oil/grit separator sizing calculations.

Pursuant to the Zoning Regulations Flood Prone Area Regulations Section 7.1.B, Definitions no. 46, the RBS West Property and 69 Clinton Court are located within the tidally influenced floodplain. As a result, the improvements do not need to comply with Section 7.1.D.g, No Increase in the base Flood Elevation (Equal Conveyance) and Section 7.1.D.h, Compensatory Storage. A portion of the 42" pipe outfall, headwall and riprap, are located within the rivers floodway. These improvements are proposed to be implemented by removing existing soils with the headwall being flush with existing grade. There is no fill being proposed within the rivers floodway. The mapped floodplain in this portion of the Rippowam River is dictated by coastal flooding and elevations of floodwaters in Long Island Sound. As such, HEC-RAS modeling would show no impact and therefore the improvements located within the floodway will not result in any (0.00 ft) increase in flood levels during the occurrence of the base flood discharge and therefore complies with The Provisions to Designated Regulatory Floodways, Section 7.2.a., Encroachments.

Conclusion:

Based on the above information and with proper implementation of the design drawings and proper sediment and erosion controls, the proposed pipe relocation and improvements on 69 Clinton Avenue will not adversely impact adjacent or downstream properties or City owned drainage facilities. Water quality will be significantly improved with an appropriately sized outlet protection and the installation of the oil/grit separator. Furthermore, the improvements will have no impact to the base flood elevation or the rivers water surface elevation.

Appendix I



EXISTING DRAINAGE BASIN MAP

DIVISION STREET

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COMM. NO.:	DATE:
7258	2/19/2016
	SCALE: 1"=130'

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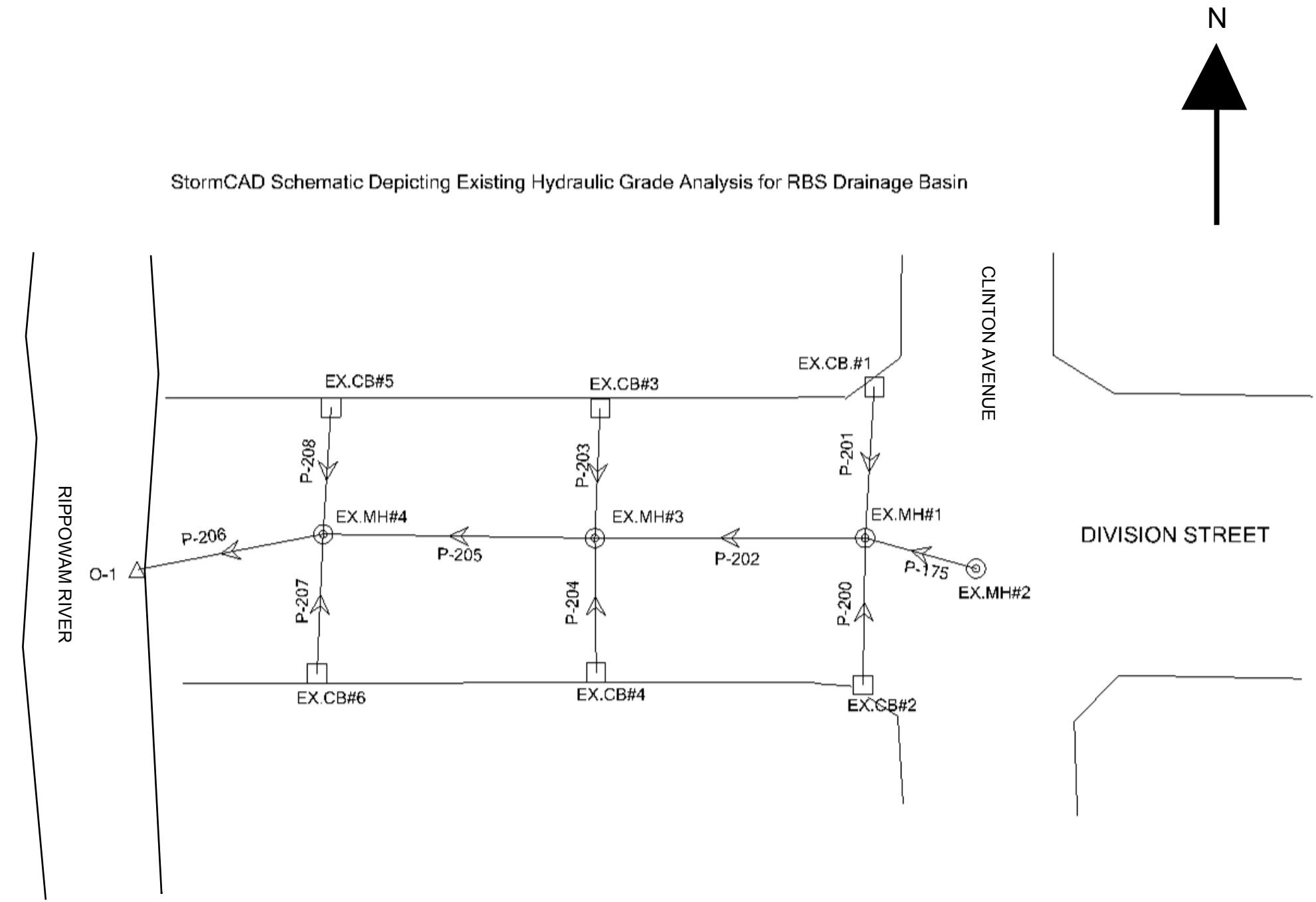
N
StormCAD Schematic Depicting Existing Hydraulic Grade Analysis for RBS Drainage Basin
RIPPOWAM RIVER
CLINTON AVENUE
DIVISION STREET
EX.CB#5
EX.CB#3
EX.CB.#1
P-208
P-203
P-201
EX.MH#4
EX.MH#3
EX.MH#1
P-206
P-205
P-202
P-175
O-1
EX.MH#2
P-207
P-204
P-200
EX.CB#6
EX.CB#4
EX.CB#2

Existing Conditions
FlexTable: Catchment Table
RBS

Outflow Element	Area (User Defined) (acres)	Runoff Coefficient (Rational)	Catchment CA (acres)	Time of Concentration (min)	Catchment Rational Flow (ft^3/s)
EX.CB.#1	0.388	0.980	0.380	5.000	2.91
EX.MH#1	0.000	0.980	0.000	5.000	0.00
EX.CB#2	0.132	0.913	0.121	5.000	0.92
EX.MH#2	8.082	0.871	7.039	18.000	39.17
EX.CB#5	0.344	0.673	0.232	8.400	1.52
EX.CB#6	0.039	0.980	0.038	5.000	0.29
EX.CB#3	0.431	0.703	0.303	18.600	1.67
EX.CB#4	0.273	0.693	0.189	17.700	1.06

27 Siemon Company Drive Suite 200 W Watertown, CT 06795 USA
+1-203-755-1666

Existing Conditions
FlexTable: Catch Basin Table
RBS

Label	Flow (Total Out) (ft^3/s)	Elevation (Ground) (ft)	Hydraulic Grade Line (Out) (ft)	Is Overflowing?	Elevation (Invert) (ft)	Inlet C	Local CA (acres)
EX.CB.#1	2.91	11.80	9.90	False	9.17	0.980	0.380
EX.CB#2	0.92	12.33	9.97	False	9.57	0.913	0.121
EX.CB#3	1.67	10.96	9.13	False	8.58	0.703	0.303
EX.CB#4	1.06	11.99	8.97	False	8.54	0.693	0.189
EX.CB#5	1.52	9.38	7.06	False	6.54	0.673	0.232
EX.CB#6	0.29	9.55	7.17	False	6.95	0.980	0.038

Existing Conditions
FlexTable: Manhole Table
RBS

Label	Flow (Total Out) (ft^3/s)	Elevation (Ground) (ft)	Is Overflowing?	Hydraulic Grade Line (Out) (ft)	Elevation (Invert) (ft)
EX.MH#2	39.17	13.30	False	9.44	7.40
EX.MH#1	41.94	12.82	False	7.45	4.55
EX.MH#3	44.39	11.43	False	6.44	4.27
EX.MH#4	45.78	9.99	False	5.52	3.32

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Existing Conditions
FlexTable: Conduit Table
RBS

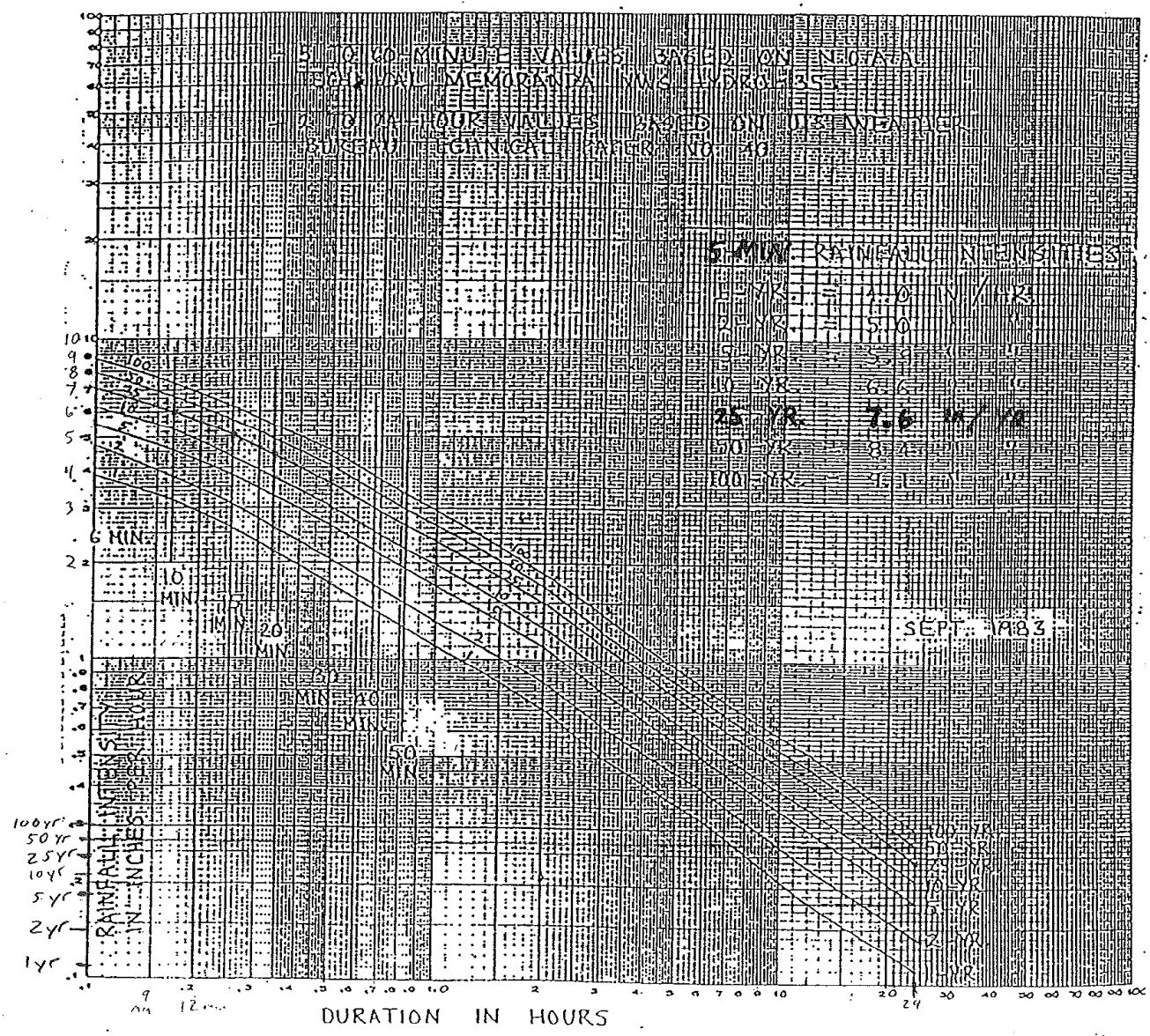
Label	Start Node	Stop Node	Elevation Ground (Start) (ft)	Hydraulic Grade Line (In) (ft)	Invert (Start) (ft)	Elevation Ground (Stop) (ft)	Hydraulic Grade Line (Out) (ft)	Invert (Stop) (ft)	Length (User Defined) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Manning's n	Flow (ft^3/s)	Capacity (Full Flow) (ft^3/s)	Velocity (ft/s)
P-175	EX.MH#2	EX.MH#1	13.30	9.44	7.40	12.82	8.38	6.82	25.0	0.023	36.0	0.013	39.17	101.59	13.44
P-202	EX.MH#1	EX.MH#3	12.82	7.45	4.55	11.43	6.54	4.43	133.0	0.001	36.0	0.013	41.94	20.03	5.93
P-201	EX.CB.#1	EX.MH#1	11.80	9.90	9.17	12.82	9.23	8.67	25.0	0.020	12.0	0.013	2.91	5.04	6.65
P-200	EX.CB#2	EX.MH#1	12.33	9.97	9.57	12.82	7.45	6.92	22.0	0.120	12.0	0.013	0.92	12.36	9.23
P-205	EX.MH#3	EX.MH#4	11.43	6.44	4.27	9.99	5.52	3.34	117.0	0.008	36.0	0.013	44.39	59.46	9.22
P-203	EX.CB#3	EX.MH#3	10.96	9.13	8.58	11.43	7.51	7.23	12.6	0.107	12.0	0.013	1.67	11.66	10.55
P-204	EX.CB#4	EX.MH#3	11.99	8.97	8.54	11.43	7.09	6.88	12.7	0.131	12.0	0.013	1.06	12.88	9.89
P-206	EX.MH#4	O-1	9.99	5.52	3.32	6.00	5.50	3.08	27.3	0.009	36.0	0.013	45.78	62.53	9.66
P-208	EX.CB#5	EX.MH#4	9.38	7.06	6.54	9.99	5.52	4.79	15.0	0.117	12.0	0.013	1.52	12.17	10.56
P-207	EX.CB#6	EX.MH#4	9.55	7.17	6.95	9.99	6.69	6.54	14.0	0.029	12.0	0.013	0.29	6.10	4.00

Existing Conditions
FlexTable: Outfall Table
RBS

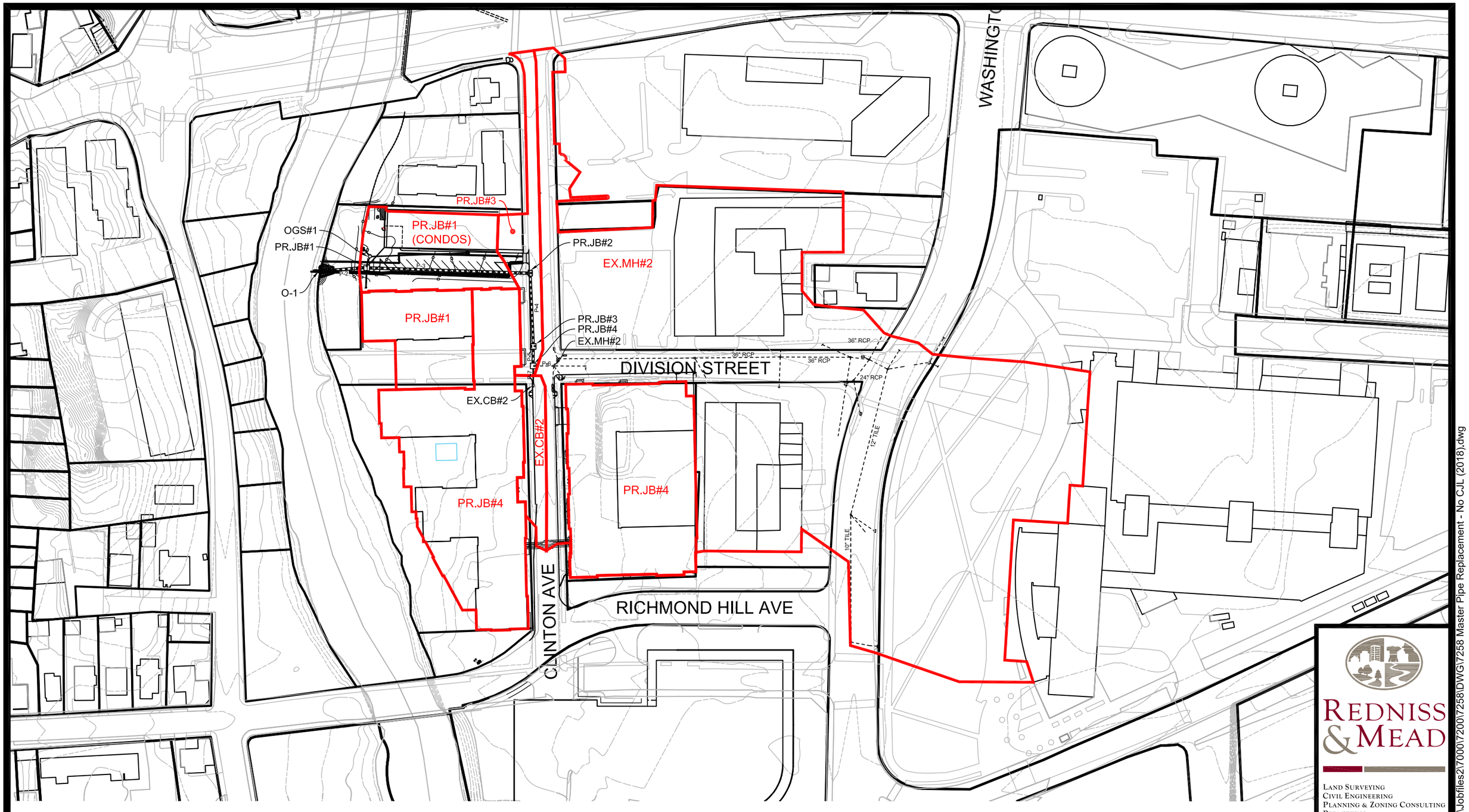
Label	Elevation (Ground) (ft)	Elevation (Invert) (ft)	Elevation (User Defined Tailwater) (ft)	Hydraulic Grade (ft)	Flow (Total Out) (ft^3/s)
O-1	6.00	3.08	5.50	5.50	45.75

Tailwater equivalent to CJL. CJL = 6.60 (NGVD-29) = 5.50 (NAVD-88)

RAINFALL INTENSITY - DURATION CURVES
FOR
STAMFORD, CONNECTICUT



Appendix 2



PROPOSED DRAINAGE BASIN MAP

DIVISION STREET

STAMFORD, CT

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COMM. NO.:	DATE:
7258	03/26/2018
	SCALE: 1"=130'

3/22/2018 4:33 PM H:\Jobfiles2\7000\7200\7258\DWG\7258 Master Pipe Replacement - No CJL (2018).dwg

Proposed Pipe Relocation
FlexTable: Catchment Table
RBS

Label	Area (User Defined) (acres)	Runoff Coefficient (Rational)	Catchment CA (acres)	Time of Concentration (min)	Catchment Rational Flow (ft^3/s)
Condos	0.523	0.786	0.411	5.000	3.15
EX.CB#2	0.183	0.950	0.174	5.000	1.33
EX.MH#2	7.159	0.873	6.250	18.000	34.77
PR.JB#1	0.442	0.950	0.420	5.000	3.22
PR.JB#3	0.391	0.844	0.330	5.000	2.53
PR.JB#4	2.582	0.980	2.530	5.000	19.38

Proposed Pipe Relocation
FlexTable: Conduit Table
RBS

Label	Start Node	Elevation Ground (Start) (ft)	Hydraulic Grade Line (In) (ft)	Invert (Start) (ft)	Stop Node	Elevation Ground (Stop) (ft)	Hydraulic Grade Line (Out) (ft)	Invert (Stop) (ft)	Length (User Defined) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Material	Manning's n	Flow (ft^3/s)	Capacity (Full Flow) (ft^3/s)	Velocity (ft/s)
P-2	PR.JB#1	13.65	7.89	5.27	O-1	9.00	7.49	5.15	43.0	0.003	42.0	<None>	0.013	55.74	53.15	6.26
P-3	PR.JB#2	13.10	8.73	6.10	PR.JB#1	13.65	7.89	5.42	225.0	0.003	42.0	Concrete	0.013	51.49	55.31	6.53
P-4	PR.JB#3	12.30	9.43	6.49	PR.JB#2	13.10	8.73	6.20	97.0	0.003	36.0	Concrete	0.013	51.61	36.47	7.30
P-5	PR.JB#4	12.82	9.55	6.70	PR.JB#3	12.30	9.43	6.64	20.0	0.003	36.0	Concrete	0.013	49.80	36.53	7.05
P-6	EX.MH#2	13.30	9.32	7.40	PR.JB#4	12.82	9.55	6.82	25.0	0.023	36.0	Concrete	0.013	34.77	101.59	13.02
P-7	EX.CB#2	12.33	10.06	9.57	PR.JB#4	12.82	9.55	8.00	22.0	0.071	12.0	Concrete	0.013	1.33	9.52	8.54

Proposed Pipe Relocation
FlexTable: Catch Basin Table
RBS

Label	Elevation (Ground) (ft)	Hydraulic Grade Line (Out) (ft)	Elevation (Invert) (ft)	Is Overflowing?	Flow (Total Out) (ft^3/s)
EX.CB#2	12.33	10.06	9.57	False	1.33

Proposed Pipe Relocation
FlexTable: Manhole Table
RBS

Label	Elevation (Ground) (ft)	Hydraulic Grade Line (Out) (ft)	Elevation (Invert) (ft)	Is Overflowing?	Flow (Total Out) (ft^3/s)
EX.MH#2	13.30	9.32	7.40	False	34.77
PR.JB#1	13.65	7.89	5.27	False	55.74
PR.JB#2	13.10	8.73	6.10	False	51.49
PR.JB#3	12.30	9.43	6.49	False	51.61
PR.JB#4	12.82	9.55	6.70	False	49.80

Proposed Pipe Relocation
FlexTable: Outfall Table
RBS

Label	Elevation (Ground) (ft)	Elevation (Invert) (ft)	Elevation (User Defined Tailwater) (ft)	Hydraulic Grade (ft)	Flow (Total Out) (ft^3/s)
O-1	9.00	5.15	5.50	7.49	55.67

Tailwater equivalent to CJL. CJL = 6.60 (NGVD-29) = 5.50 (NAVD-88)

Appendix 3

OUTLET PROTECTION - OUTLET VELOCITY ≤ 14 feet/sec

DISCHARGE (cfs)	OUTLET PIPE DIAMETER OR SPAN (in)									
	12	15	18	24	30	36	42	48	54	60
0-5	***10***	***10***		***USE***						
5.5	12	11								
6		12	***12***			***MINIMUM***				
7		14	13	**12**						
8			15	13						
8.5			16	14				***LENGTH***		
9				14						
10				15	***14***					
11				16	15					
12				17	15	***14***			***OUTLINED***	
13				18	16	15				
14					17	15	***14***			
16		***USE***			18	16	15	***14***		
18						18	16	15		
20						19	17	16		
22						20	18	16		
24							19	17	***16***	
26							20	18	17	***16***
28			***PREFORMED***				21	19	17	16
30							21	19	18	17
32							22	20	18	17
35								21	19	18
40								23	21	19
45								25	23	21
48					***SCOUR***			26	24	22
50									24	22
55									26	23
60									27	25
63									28	26
65										26
75							***HOLE***			29
80										30

Table 11-13.1 - Length - L_a (feet)
Type B or C Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum L_a to be used for a given pipe diameter or span.
2. Rounding and interpolating are acceptable.

PER STORMCAD MODEL, PROPOSED FLOW AT OUTLET = 55.62 cfs

OUTLET PROTECTION
OUTLET VELOCITY > 14 feet/sec or Length of Apron exceeds limits shown on Tables 11-12.1 and 11-13.1

Preformed Scour Hole										
(See Figure 11-15)	PIPE DIAMETER OR SPAN (in)									
	12	15	18	24	30	36	42	48	54	60
Type 1										
B	5	6	8	10	13	15	18	20	23	25
C	6	8	9	12	15	18	21	24	27	30
d	Depends on riprap type(see Figure 11-15)									
$2S_p$	2.0	2.6	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
$3S_p$	3.0	3.9	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0
$F = 0.5\ S_p$	0.5	0.625	0.75	1	1.25	1.5	1.75	2	2.25	2.5
Type 2										
B	8	10	12	16	20	24	28	32	36	40
C	9	11	14	18	23	27	32	36	41	45
d	Depends on riprap size (see Figure 11-15)									
$2S_p$	2.0	2.6	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
$3S_p$	3.0	3.9	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0
$F = S_p$	1.0	1.3	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0

Table 11-14.1 - Dimensions of Preformed Scour Hole (Feet)

TYPE	OUTLET VELOCITY mps (fps)	TAILWATER DEPTH	COMMENT
Type A Riprap Apron	≤ 4.27 (14)	≤ ½ pipe rise (minimum condition)	Outlet has no well-defined channel downstream
Type B Riprap Apron	≤ 4.27 (14)	≥ ½ pipe rise (maximum condition)	Outlet has no well-defined channel downstream
Type C Riprap Apron	≤ 4.27 (14)	all	Outlet has a well-defined channel downstream
Preformed Scour Hole	≥ 4.27 (14)	all	May be used for lower exit velocities as dictated by Tables 8-6 and 8-7
Structurally Lined Energy Dissipaters	≥ 4.27 (14)	all	See HEC-14 To be used only with prior approval from Hydraulics and Drainage Section.

Table 11-15 Summary of Outlet Protection Types and Selection Criteria

A. If the outlet velocity, tailwater depth and site conditions indicate that a Type A, B or C Riprap Apron may be used, check Tables 11-12 and 11-13 to see if a Riprap Apron can be used based on the pipe size and discharge.

B. If a Riprap Apron is adequate, Tables 11-12 and 11-13 will specify the length of apron required. Proceed to **Step 6**.

C. If the Tables do not show an apron length, this indicates that the designer should proceed to **Step 7,** using a preformed scour hole design instead of a riprap apron.

For example, a project has two outlets.

Outlet No.1 is a 450-mm (18-inch) RCP with an outlet velocity of 2.74 mps (9 fps) and a design discharge of 0.275 cms (9.7 cfs) that outlets onto a flat area with a tailwater depth (TW) less than 200 mm (8 in).

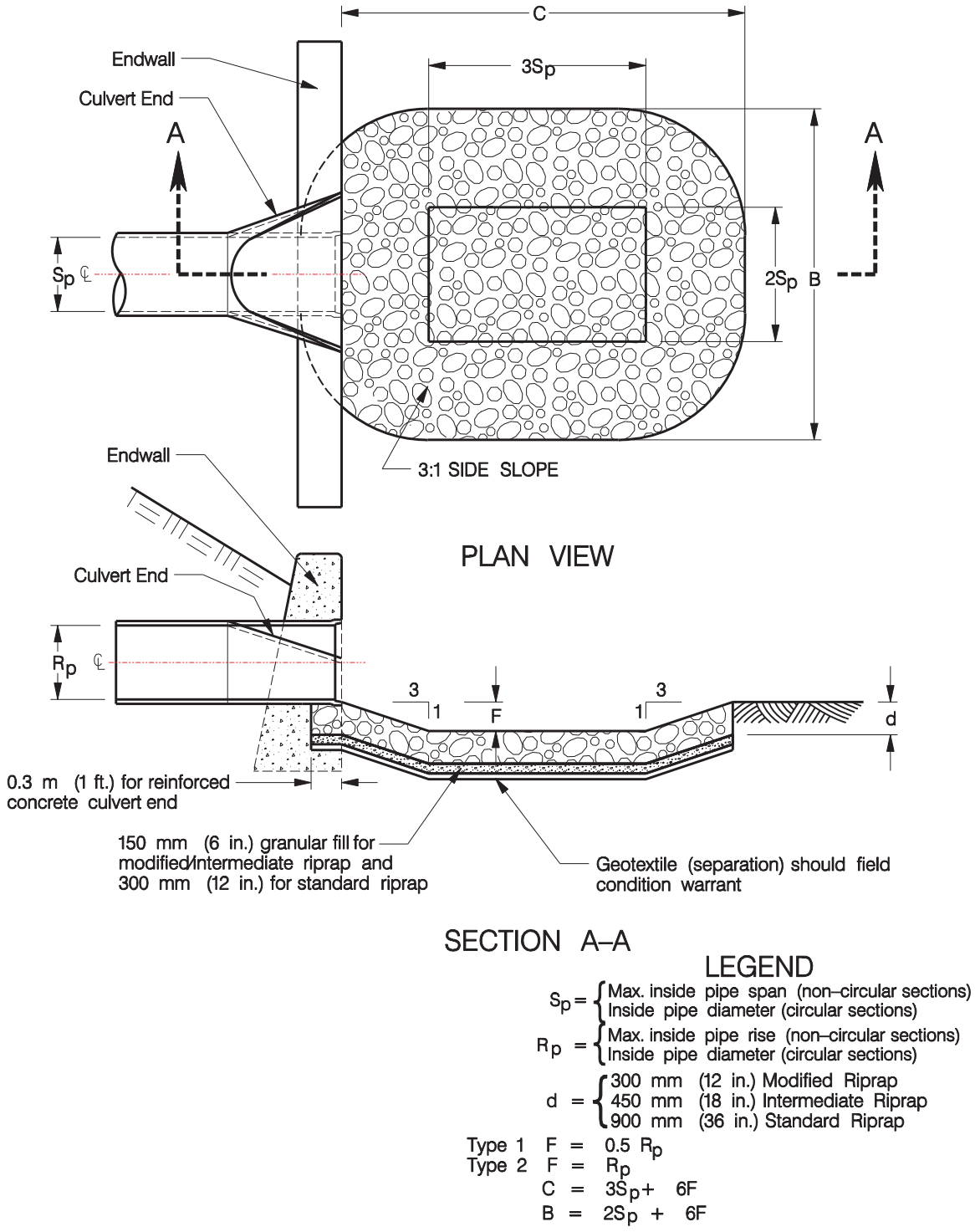

Figure 11-15 Preformed Scour Hole Type 1 and Type 2

Appendix 4

Brief Stormceptor Sizing Report - Clinton Ave

Project Information & Location			
Project Name	Clinton Ave	**Project Number**	7258
City	Stamford	**State/ Province**	Connecticut
Country	United States of America	**Date**	3/28/2018
Designer Information		**EOR Information (optional)**	
Name	Jeremy Forsyth	**Name**	
Company	Redniss & Mead	**Company**	
Phone #	203-327-0500	**Phone #**	
Email	j.forsyth@rednissmead.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	
Target TSS Removal (%)	80
TSS Removal (%) Provided	93
Recommended Stormceptor Model	OSR 065

The recommended Stormceptor Model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
OSR Model	**% TSS Removal Provided**
OSR 065	93
OSR 140	96
OSR 250	98
OSR 390	99
OSR 560	99
OSR 780	99
OSR 1125	100
StormceptorMAX	Custom

Stormceptor®

Rinker MATERIALS™

Sizing Details

Drainage Area	
Total Area (acres)	0.20
Imperviousness %	100.0

Rainfall	
Station Name	BRIDGEPORT SIKORSKY AP
State/Province	Connecticut
Station ID #	0806
Years of Records	58
Latitude	41°9'30"N
Longitude	73°7'44"W

Water Quality Objective	
TSS Removal (%)	80.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Particle Size Distribution (PSD)
The selected PSD defines TSS removal

OK-110

Particle Diameter (microns)	Distribution %	Specific Gravity
1.0	0.0	2.65
53.0	3.0	2.65
75.0	15.0	2.65
88.0	25.0	2.65
106.0	41.0	2.65
125.0	15.0	2.65
150.0	1.0	2.65
212.0	0.0	2.65

Notes

• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
• Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
• For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

For Stormceptor Specifications and Drawings Please Visit:
http://www.imbriumsystems.com/technical-specifications