

STORMWATER MANAGEMENT REPORT

102½ – 116 Avenue 'E' Development
Block 467, Lots 10 -14
City of Bayonne
Hudson County, NJ

September 12, 2025

Prepared for:

102-116 Ave E Bayonne, LLC
148 East 5th Street, Bldg 7A
Bayonne, NJ 07002

Prepared by:

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 9/12/25

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INTRODUCTION

102-116 Ave E Bayonne, LLC proposes to construct a 6-story, multi-family residential building on Lots 10 through 14 of Block 467198 in the City of Bayonne. The project is located in the 102½ -116 Avenue E Redevelopment Plan (RDP) area. This report details the stormwater runoff related to the proposed development and addresses compliance with the applicable stormwater management requirements.

EXISTING CONDITIONS

The property is located on at the **easterly side of Avenue 'E' opposite the block bounded by East 5th Street and Sisson Court**. The site is 18,600 square feet (0.427 acres) in size and is currently occupied by 2 buildings, all scheduled to be demolished and replaced with a single new building which will occupy nearly the entire site. A significant portion of the property is paved. There are landscaped areas toward the rear of the site. The most northerly lot consists of a gravel parking area, which is densely compacted, striped and contains wheel stops. The ground cover consists of the following:

- 25% rooftop
- 37% concrete and asphalt
- 27% gravel parking
- 11% landscaping

The site is situated in a combined sewer service area of Bayonne with a 36" **combined sewer** in the center of Avenue 'E'.

As shown on the **most recent "preliminary"** F.E.M.A. Flood Insurance Rate Maps, the project is located in Zone X, outside the 100-year floodplain. Elevations on the property range from 11.4 to 14.2 in the NAVD8 datum

PROPOSED DEVELOPMENT

The subject development involves demolition and removal of the existing buildings and construction of a new 6-story, residential building. The first and second floor will consist of mechanical parking, utility rooms and amenity space. The living units will occupy the remaining floors. Approximately 4,400 square feet of green roof will be provided on the roof. A total of 105 residential units are proposed.

The proposed building will have no setback along the front and rear property lines. On the north side a **5 foot setback is proposed**. On the south side a **6.3' setback is proposed**. Both side yard areas will be landscaped.

Vehicular access to the parking will be provided from a single two-way driveway.

All of the proposed rooftop drainage will be directed to a proposed detention cistern under the garage entry aisle. A control structure will regulate stormwater discharge into an existing manhole on the combined sewer main in the center of the Avenue E.

STORMWATER MANAGEMENT

As stated in the Residential Improvement Standards (RSIS) N.J.A.C. 5:21-7.5, storm water design shall comply with the New Jersey Department of Environmental Protection (NJDEP) Stormwater Management Rules (N.J.A.C. 7:8). The NJDEP regulations for quantity control, quality treatment and groundwater recharge stipulated in N.J.A.C. 7:8 only apply if the

project is a “major development”. The NJDEP rules define major development as a project that either increases impervious area by 1/4-acre or entails an acre of disturbance. The City of Bayonne Stormwater Ordinance (Chapter 30) defines a major development as one that ultimately disturbs one or more acres of land.

The subject project will result in a disturbance of approximately 0.51 acres (including off-site improvements) and a 0.16 acre (7,000 sq. ft.) increase in impervious surface. Therefore, under both the NJDEP rules and the municipal ordinance, the project is not a major development. However, the Redevelopment Plan requires stormwater design to meet the quantity reduction as though the project was a major development. The requirements of a major development are met by reducing the peak rate of runoff from the site to 50%, 75% and 80% of existing conditions for the 2-year, 10-year and 100-year design storms, respectively.

Runoff Quantity

Calculations have been prepared using the SCS Method and basin routing calculations are based on the TR-20 method. Rainfall intensities were taken from NOAA partial duration rainfall data at Newark Airport, using the upper bound limits for each design storm and duration (see Appendix). A NOAA 24-hour, Curve D rainfall distribution is assumed. The Time of Concentration (Tc) for existing and proposed conditions is less than 6 minutes. For this analysis, a minimum Tc of 6 minutes was used. Runoff rates and volumes and basin routings were computed using Hydrocad version 10.0 software.

The existing site contains an approximate area of 0.427 acres. Information obtained from SSURGO soil survey data classifies the site soils as previously disturbed urban land consisting primarily of sandy loam. Although no Hydrologic Soil Group (HSG) rating is provided for this soil, sandy loam is typically categorized at HSG “C”. The soil immediately adjacent to the site to the east is classified as Laguardia artifactual coarse sandy loam, with a HSG rating of “C”. For the purposes of this stormwater analysis, a HSG value of “C” is assumed for both per- and post-construction conditions.

Based on information contained in the USDA publication *Urban Hydrology for Small Watersheds* (TR-55), Curve Numbers for various types of ground cover are as follows:

- Roof, concrete, pavement CN=98
- Grass/landscaping (HSG C) CN=74
- Gravel parking (HSG C) CN=89

Based on the foregoing, the peak rates of runoff for the three design storms under existing conditions are tabulated below. The table also indicated the allowable peak runoff rates for proposed conditions with the required rate reductions.

Existing Site Peak Run-Off Rates				
STORM	24-HOUR RAINFALL (inches)	EXISTING PEAK (cfs)	REQUIRED REDUCTIONS (%)	ALLOWABLE RUNOFF RATES (cfs)
2-year	3.58	1.2	50%	0.6
10-year	5.44	1.9	75%	1.4
100-year	9.07	3.3	80%	2.6

The proposed detention system will consist of a cistern with a storage capacity of 1,600 cubic feet. All roof runoff will be directed to this cistern. A control structure will regulate discharge from the design storms. This control structure uses a combination of low flow and high stage orifices to regulate discharge rates. An overflow weir is proposed in the event rainfall exceeds the 100-year design storm or one of the control orifices is blocked.

Approximately 4,400 square feet of roof will contain 6" deep green roof trays. The effective Curve Number for the green roof area has been determined using methodology prescribed in Chapter 9.4 of the NJDEP Best Management Practices Manual. Using this method results in a different CN for each design storm as indicated below. Calculations for the green roof CN's are included in the Appendix.

Green Roof Curve Numbers:

2-year storm	CN=80
10-year storm	CN=82
100-year storm	CN=84

Runoff from the two landscaped side yards will not pass through the detention system. The runoff from these areas has been calculated separately, and the associated runoff hydrographs have been combined with the computed detention basin discharge hydrographs. The resulting combined hydrographs represent the peak runoff rates under proposed conditions. These rates are tabulated as follows and compared to the allowable rate listed above. As shown, the peak runoff from each of the design storms is less than the allowable rate. Detention basin routing calculations and total site runoff calculations are included in the Appendix.

Proposed Development Peak Runoff Rates			
STORM	24-HOUR RAINFALL (inches)	PROPOSED PEAK RUNOFF (cfs)	ALLOWABLE PEAK RUNOFF (cfs)
2-year	3.58	0.55	0.6
10-year	5.44	1.33	1.4
100-year	9.07	2.54	2.6

Stormwater Quality

As stated above, this project does not meet the definition of major development, although peak rate reductions are required in the redevelopment plan. However, all site runoff will originate from roof and landscaped areas, which are considered clean under the stormwater ordinance. Therefore, no water quality measures are required.

Ground Water Recharge

As stated above, this project does not meet the definition of major development, so ground water recharge standards are not applicable. Also, since the project is located in the Metropolitan Planning Area (PA-1), groundwater recharge would not be required even if the stormwater ordinance was applicable.

CONCLUSION

As stated above, the affective Redevelopment Plan requires storm quantity reductions as if the project is a major development. A detention system in combination with green roof has been designed to achieve the required peak rate reductions in accordance with the ordinance. The proposed detention will also help reduce total discharges from the city combined sewer system and reduce the burden on the local storm collection network. In addition permeable pavers are proposed along the public sidewalk area to further reduce storm runoff. Since the permeable pavers are within the subject property, the benefits of this treatment are not included in the site runoff calculations; however, the permeable pavers will still provide a benefit to the neighborhood.

APPENDIX A

NOAA Rainfall Rates

Green Roof Runoff Rates

NOAA Atlas 14, Volume 2, Version 3 NEWARK

WSO AIRPORT

Station ID: 28-6026

Location name: Newark, New Jersey, USA*

Latitude: 40.7158°, Longitude: -74.1694°

Elevation:

Elevation (station metadata): 7 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

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	0.332 (0.304-0.365)	0.396 (0.363-0.435)	0.469 (0.429-0.516)	0.522 (0.476-0.573)	0.590 (0.536-0.647)	0.636 (0.575-0.698)	0.682 (0.613-0.749)	0.724 (0.646-0.795)	0.776 (0.685-0.856)	0.814 (0.714-0.901)
10-min	0.529 (0.484-0.580)	0.633 (0.580-0.695)	0.750 (0.685-0.824)	0.834 (0.759-0.915)	0.935 (0.848-1.03)	1.01 (0.909-1.11)	1.08 (0.968-1.18)	1.14 (1.02-1.25)	1.22 (1.08-1.35)	1.27 (1.12-1.41)
15-min	0.660 (0.604-0.724)	0.793 (0.726-0.870)	0.946 (0.863-1.04)	1.05 (0.957-1.15)	1.18 (1.07-1.30)	1.27 (1.15-1.40)	1.36 (1.22-1.49)	1.44 (1.28-1.58)	1.54 (1.36-1.69)	1.60 (1.40-1.77)
30-min	0.903 (0.827-0.991)	1.09 (1.00-1.20)	1.34 (1.22-1.47)	1.52 (1.38-1.67)	1.74 (1.58-1.91)	1.91 (1.72-2.09)	2.07 (1.86-2.27)	2.22 (1.98-2.44)	2.42 (2.14-2.67)	2.57 (2.25-2.84)
60-min	1.12 (1.03-1.23)	1.37 (1.25-1.50)	1.71 (1.56-1.88)	1.97 (1.80-2.16)	2.31 (2.10-2.54)	2.58 (2.33-2.83)	2.84 (2.55-3.12)	3.11 (2.77-3.41)	3.47 (3.06-3.82)	3.74 (3.27-4.13)
2-hr	1.38 (1.26-1.52)	1.68 (1.53-1.85)	2.13 (1.93-2.35)	2.47 (2.24-2.73)	2.96 (2.66-3.26)	3.35 (3.00-3.69)	3.76 (3.34-4.14)	4.18 (3.69-4.61)	4.78 (4.17-5.27)	5.25 (4.53-5.81)
3-hr	1.54 (1.40-1.69)	1.87 (1.71-2.06)	2.37 (2.16-2.61)	2.76 (2.51-3.04)	3.30 (2.98-3.63)	3.75 (3.36-4.12)	4.20 (3.75-4.62)	4.68 (4.14-5.15)	5.35 (4.67-5.89)	5.88 (5.08-6.49)
6-hr	1.98 (1.81-2.18)	2.40 (2.20-2.64)	3.03 (2.77-3.33)	3.55 (3.22-3.88)	4.28 (3.85-4.68)	4.88 (4.37-5.34)	5.53 (4.91-6.04)	6.22 (5.47-6.80)	7.21 (6.24-7.90)	8.02 (6.87-8.81)
12-hr	2.43 (2.22-2.67)	2.95 (2.70-3.24)	3.75 (3.42-4.11)	4.41 (4.01-4.83)	5.39 (4.85-5.87)	6.22 (5.56-6.76)	7.11 (6.29-7.73)	8.10 (7.08-8.81)	9.55 (8.18-10.4)	10.8 (9.09-11.7)
24-hr	2.72 (2.52-2.96)	3.30 (3.06-3.58)	4.23 (3.91-4.59)	5.02 (4.63-5.44)	6.21 (5.69-6.72)	7.25 (6.59-7.83)	8.39 (7.56-9.07)	9.67 (8.61-10.5)	11.6 (10.1-12.6)	13.2 (11.4-14.4)
2-day	3.19 (2.94-3.48)	3.86 (3.56-4.21)	4.93 (4.54-5.37)	5.83 (5.35-6.34)	7.15 (6.53-7.78)	8.28 (7.51-9.00)	9.51 (8.55-10.4)	10.9 (9.66-11.9)	12.8 (11.2-14.1)	14.5 (12.5-16.0)
3-day	3.37 (3.12-3.67)	4.08 (3.77-4.44)	5.19 (4.79-5.65)	6.12 (5.63-6.64)	7.47 (6.83-8.10)	8.61 (7.82-9.34)	9.84 (8.87-10.7)	11.2 (9.98-12.2)	13.1 (11.6-14.4)	14.8 (12.8-16.3)
4-day	3.56 (3.29-3.86)	4.30 (3.98-4.67)	5.46 (5.04-5.92)	6.41 (5.90-6.94)	7.78 (7.13-8.43)	8.93 (8.13-9.68)	10.2 (9.18-11.0)	11.5 (10.3-12.5)	13.4 (11.9-14.7)	15.1 (13.1-16.5)
7-day	4.18 (3.88-4.50)	5.01 (4.66-5.41)	6.24 (5.79-6.73)	7.25 (6.71-7.81)	8.70 (8.01-9.37)	9.90 (9.07-10.7)	11.2 (10.2-12.1)	12.6 (11.3-13.6)	14.5 (12.9-15.8)	16.1 (14.1-17.7)
10-day	4.75 (4.43-5.10)	5.67 (5.30-6.09)	6.95 (6.48-7.46)	8.00 (7.44-8.59)	9.49 (8.79-10.2)	10.7 (9.87-11.5)	12.0 (11.0-12.9)	13.4 (12.1-14.4)	15.3 (13.7-16.6)	16.8 (14.9-18.4)
20-day	6.40 (6.01-6.81)	7.59 (7.13-8.09)	9.07 (8.51-9.65)	10.2 (9.58-10.9)	11.8 (11.0-12.5)	13.0 (12.1-13.9)	14.3 (13.2-15.2)	15.5 (14.3-16.6)	17.2 (15.7-18.4)	18.5 (16.7-19.9)
30-day	8.00 (7.56-8.46)	9.44 (8.93-9.98)	11.0 (10.4-11.7)	12.3 (11.6-13.0)	13.9 (13.1-14.7)	15.1 (14.2-16.0)	16.3 (15.2-17.2)	17.4 (16.2-18.5)	18.9 (17.5-20.1)	20.0 (18.4-21.4)
45-day	10.2 (9.65-10.7)	12.0 (11.3-12.6)	13.8 (13.1-14.5)	15.2 (14.4-16.0)	17.0 (16.1-17.9)	18.3 (17.3-19.3)	19.6 (18.4-20.7)	20.9 (19.5-22.1)	22.4 (20.9-23.8)	23.6 (21.9-25.1)
60-day	12.2 (11.6-12.8)	14.3 (13.6-15.0)	16.3 (15.5-17.2)	17.8 (16.9-18.8)	19.8 (18.7-20.8)	21.1 (20.0-22.3)	22.4 (21.2-23.6)	23.7 (22.3-25.0)	25.1 (23.6-26.6)	26.2 (24.5-27.7)

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

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

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

Green Roof Summary and CN Values

Project: 102-116 Avenue 'E', Bayonne, NJ
 Proj. No. PN25107

Date: 9/8/25

storm	Hudson Co. 24- hr rainfall (in)	G.R. area (sf)	G.R. growing media		Eff. Stor. vol. (CF)	Normal runoff		Reduced Runoff (cf)	Reduced depth (in)	CN (from graph)
			depth (in)	Porosity		depth (in)	Vol. (CF)			
6" Extensive green roof										
2-yr	3.58	19,000	6	28%	2660	3.35	5298	2638	1.67	80
10-yr	5.44	19,000	6	28%	2660	5.20	8237	5577	3.52	82
100-yr	9.07	19,000	6	28%	2660	8.83	13980	11320	7.15	84

APPENDIX B

SSURGO Soils Survey Report



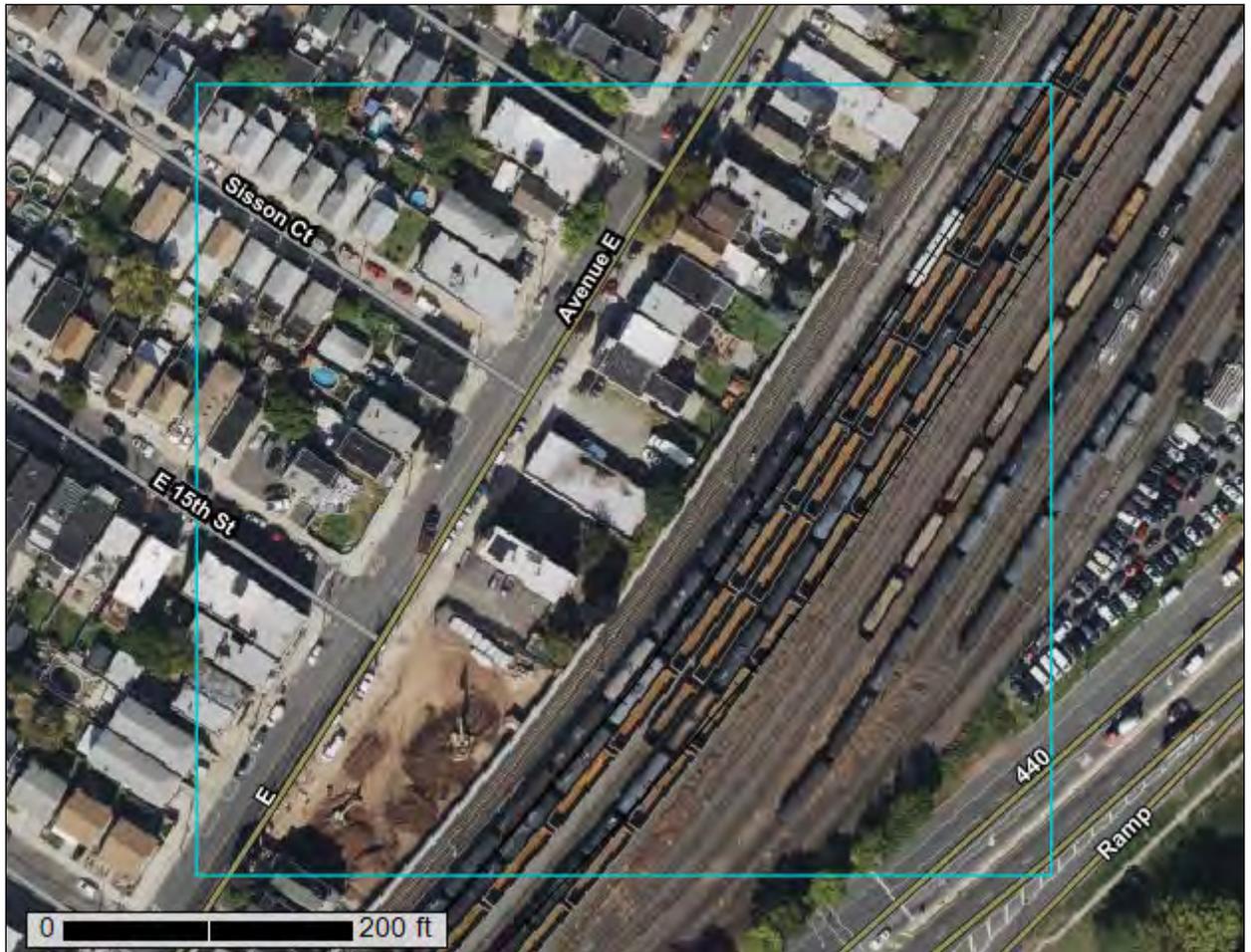
United States
Department of
Agriculture

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 Hudson County, New Jersey



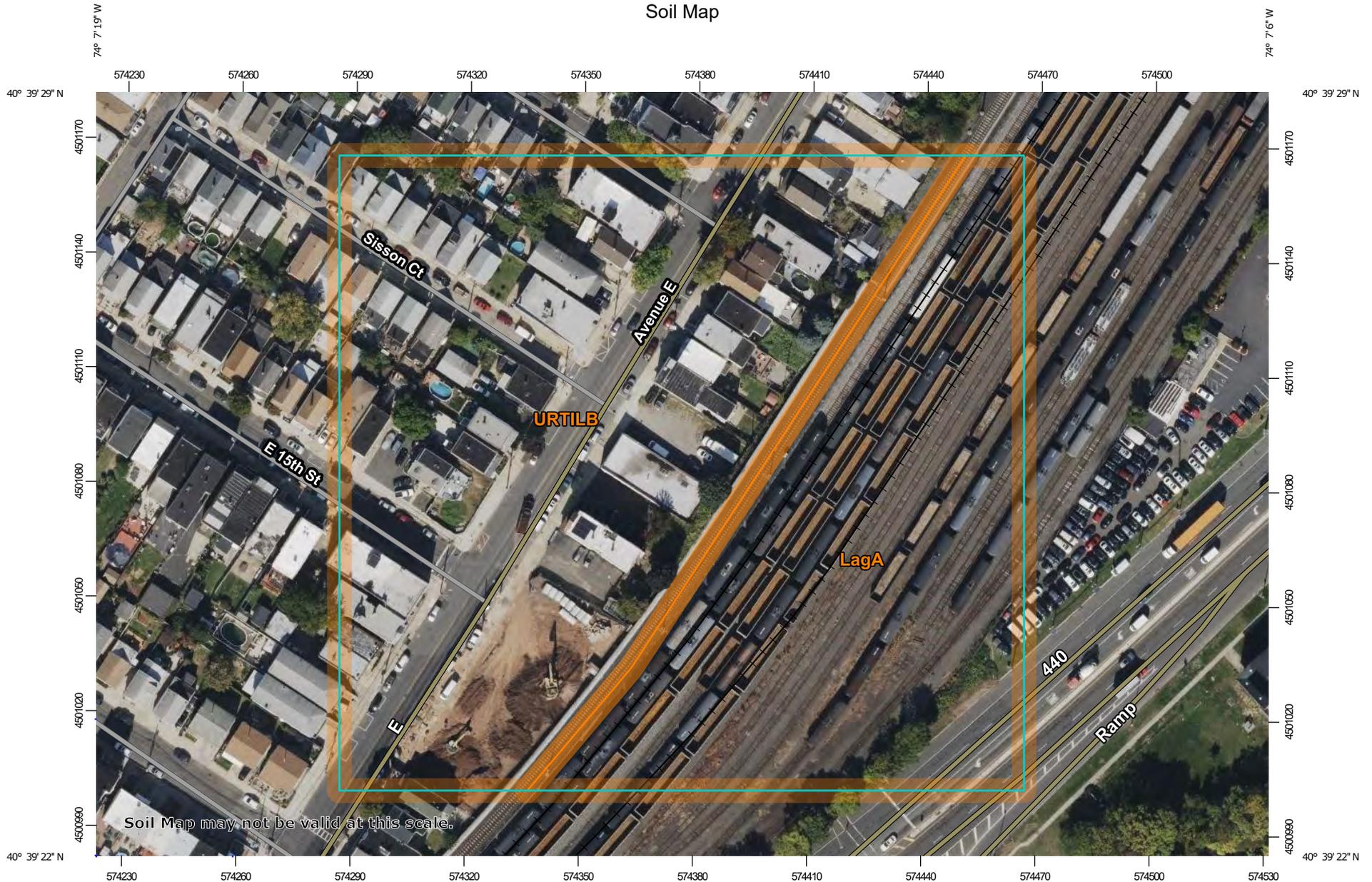
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Soil Map

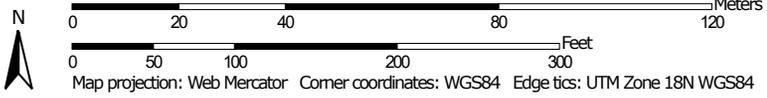
The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Soil Map may not be valid at this scale.

Map Scale: 1:1,410 if printed on A landscape (11" x 8.5") sheet.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Hudson County, New Jersey
 Survey Area Data: Version 14, Sep 3, 2024

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

Date(s) aerial images were photographed: Oct 9, 2022—Oct 16, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
LagA	Laguardia artifactual coarse sandy loam, 0 to 3 percent slopes	2.9	39.1%
URTILB	Urban land, till substratum, 0 to 8 percent slopes	4.5	60.9%
Totals for Area of Interest		7.4	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

Custom Soil Resource Report

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.

Hudson County, New Jersey

LagA—Laguardia artifactual coarse sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2p6p6
Elevation: 0 to 90 feet
Mean annual precipitation: 40 to 52 inches
Mean annual air temperature: 47 to 62 degrees F
Frost-free period: 216 to 234 days
Farmland classification: Not prime farmland

Map Unit Composition

Laguardia and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Laguardia

Setting

Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, base slope, crest, dip, rise, talf
Down-slope shape: Concave, convex, linear
Across-slope shape: Concave, linear, convex
Parent material: Loamy-skeletal human-transported material

Typical profile

^Au - 0 to 8 inches: cobbly-artifactual coarse sandy loam
^BCu - 8 to 26 inches: very cobbly-artifactual coarse sandy loam
^Cu - 26 to 79 inches: very cobbly-artifactual coarse sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 19 percent
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: F149BY100NY - Urban Site Complex
Hydric soil rating: No

Minor Components

Ebbets

Percent of map unit: 6 percent

Custom Soil Resource Report

Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, base slope, crest, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Hydric soil rating: No

Centralpark

Percent of map unit: 5 percent
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Greenbelt

Percent of map unit: 5 percent
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, base slope, crest, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Hydric soil rating: No

Fragmental, mixed, mesic typic udorthents

Percent of map unit: 2 percent
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Base slope, riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Secaucus

Percent of map unit: 2 percent
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Dip, talf
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

URTILB—Urban land, till substratum, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2qjwr
Elevation: 0 to 520 feet
Mean annual precipitation: 30 to 56 inches
Mean annual air temperature: 47 to 63 degrees F
Frost-free period: 179 to 217 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land, till substratum: 90 percent
Minor components: 10 percent

Custom Soil Resource Report

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land, Till Substratum

Setting

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Asphalt over human-transported material

Typical profile

M - 0 to 15 inches: material

2^C - 15 to 79 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 8 percent

Depth to restrictive feature: 0 inches to manufactured layer

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Calcium carbonate, maximum content: 10 percent

Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydric soil rating: Unranked

Minor Components

Greenbelt

Percent of map unit: 10 percent

Landform position (two-dimensional): Summit, backslope, footslope

Landform position (three-dimensional): Side slope, base slope, crest, talf

Down-slope shape: Convex, linear

Across-slope shape: Convex, linear

Hydric soil rating: No

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
LagA	Laguardia artifactual coarse sandy loam, 0 to 3 percent slopes	C	2.9	39.1%
URTILB	Urban land, till substratum, 0 to 8 percent slopes		4.5	60.9%
Totals for Area of Interest			7.4	100.0%

Rating Options—Hydrologic Soil Group

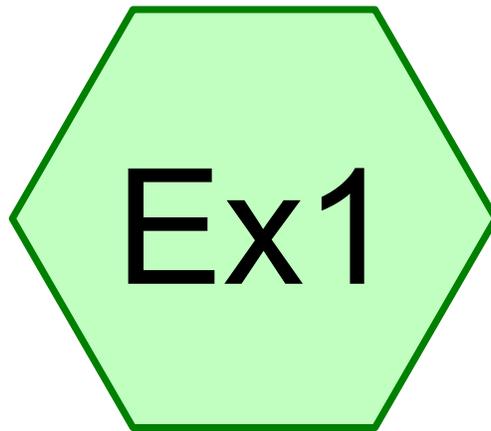
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

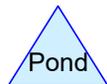
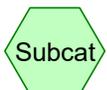
Tie-break Rule: Higher

APPENDIX C

Existing Conditions Runoff



Existing



Summary for Subcatchment Ex1: Existing

Runoff = 1.19 cfs @ 12.11 hrs, Volume= 0.100 af, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
 NOAA 24-hr D 2-yr Rainfall=3.58"

	Area (sf)	CN	Description
*	11,600	98	Roof, pavt, conc.
*	5,030	89	gravel parking
*	1,970	74	lawn, landscaping, HSG C
	18,600	93	Weighted Average
	7,000		37.63% Pervious Area
	11,600		62.37% Impervious Area

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

Summary for Subcatchment Ex1: Existing

Runoff = 1.90 cfs @ 12.11 hrs, Volume= 0.165 af, Depth> 4.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
 NOAA 24-hr D 10-yr Rainfall=5.44"

	Area (sf)	CN	Description
*	11,600	98	Roof, pavt, conc.
*	5,030	89	gravel parking
*	1,970	74	lawn, landscaping, HSG C
	18,600	93	Weighted Average
	7,000		37.63% Pervious Area
	11,600		62.37% Impervious Area

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

Summary for Subcatchment Ex1: Existing

Runoff = 3.27 cfs @ 12.11 hrs, Volume= 0.293 af, Depth> 8.22"

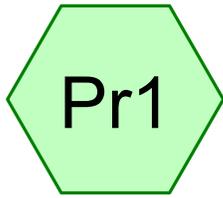
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
 NOAA 24-hr D 100-yr Rainfall=9.07"

	Area (sf)	CN	Description
*	11,600	98	Roof, pavt, conc.
*	5,030	89	gravel parking
*	1,970	74	lawn, landscaping, HSG C
	18,600	93	Weighted Average
	7,000		37.63% Pervious Area
	11,600		62.37% Impervious Area

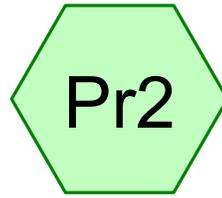
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

APPENDIX D

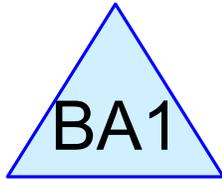
Proposed Conditions Runoff



Proposed Bldg



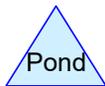
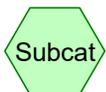
Undetained



cistern



Total



Routing Diagram for C25107-2025-09-08-C cistern detention

Prepared by Chisvette Engineering

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C25107-2025-09-08-C cistern detention 2-yr

NOAA 24-hr D 2-yr Rainfall=3.58"

Prepared by Chisvette Engineering

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Summary for Subcatchment Pr1: Proposed Bldg

Runoff = 1.15 cfs @ 12.11 hrs, Volume= 0.098 af, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-yr Rainfall=3.58"

	Area (sf)	CN	Description
*	13,117	98	black roof & conc
*	4,400	84	6" green roof
	17,517	94	Weighted Average
	4,400		25.12% Pervious Area
	13,117		74.88% Impervious Area

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

Summary for Subcatchment Pr2: Undetained

Runoff = 0.03 cfs @ 12.12 hrs, Volume= 0.003 af, Depth> 1.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 2-yr Rainfall=3.58"

	Area (sf)	CN	Description
*	1,083	74	>75% Grass cover, Good, HSG B
	1,083		100.00% Pervious Area

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

Summary for Pond BA1: cistern

Inflow Area = 0.402 ac, 74.88% Impervious, Inflow Depth > 2.91" for 2-yr event

Inflow = 1.15 cfs @ 12.11 hrs, Volume= 0.098 af

Outflow = 0.53 cfs @ 12.29 hrs, Volume= 0.098 af, Atten= 53%, Lag= 11.1 min

Primary = 0.53 cfs @ 12.29 hrs, Volume= 0.098 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs

Peak Elev= 7.28' @ 12.29 hrs Surf.Area= 410 sf Storage= 692 cf

Plug-Flow detention time= 10.7 min calculated for 0.097 af (100% of inflow)

Center-of-Mass det. time= 10.5 min (798.4 - 787.8)

C25107-2025-09-08-C cistern detention 2-yr

NOAA 24-hr D 2-yr Rainfall=3.58"

Prepared by Chisvette Engineering

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Volume	Invert	Avail.Storage	Storage Description
#1	5.50'	45 cf	manhole (Prismatic) Listed below (Recalc)
#2	5.60'	1,600 cf	10.00'W x 40.00'L x 4.00'H Cistern
		1,645 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
5.50	10	0	0
10.00	10	45	45

Device	Routing	Invert	Outlet Devices
#1	Primary	5.50'	4.0" Vert. Orifice/Grate C= 0.600
#2	Primary	7.75'	8.0" Vert. Orifice/Grate C= 0.600
#3	Primary	9.08'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.53 cfs @ 12.29 hrs HW=7.28' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.53 cfs @ 6.11 fps)

2=Orifice/Grate (Controls 0.00 cfs)

3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link P-Tot: Total

Inflow Area = 0.427 ac, 70.52% Impervious, Inflow Depth > 2.82" for 2-yr event
 Inflow = 0.55 cfs @ 12.27 hrs, Volume= 0.100 af
 Primary = 0.55 cfs @ 12.27 hrs, Volume= 0.100 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs

Summary for Subcatchment Ex1: Existing

Runoff = 1.90 cfs @ 12.11 hrs, Volume= 0.165 af, Depth> 4.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-yr Rainfall=5.44"

	Area (sf)	CN	Description
*	11,600	98	Roof, pavt, conc.
*	5,030	89	gravel parking
*	1,970	74	lawn, landscaping, HSG C
	18,600	93	Weighted Average
	7,000		37.63% Pervious Area
	11,600		62.37% Impervious Area

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

Summary for Subcatchment Pr1: Proposed Bldg

Runoff = 1.81 cfs @ 12.11 hrs, Volume= 0.159 af, Depth> 4.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-yr Rainfall=5.44"

	Area (sf)	CN	Description
*	13,117	98	black roof & conc
*	4,400	82	6" green roof
	17,517	94	Weighted Average
	4,400		25.12% Pervious Area
	13,117		74.88% Impervious Area

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

Summary for Subcatchment Pr2: Undetained

Runoff = 0.07 cfs @ 12.12 hrs, Volume= 0.006 af, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
NOAA 24-hr D 10-yr Rainfall=5.44"

	Area (sf)	CN	Description
*	1,083	74	>75% Grass cover, Good, HSG B
	1,083		100.00% Pervious Area

C25107-2025-09-08-C cistern detention 10-yr

NOAA 24-hr D 10-yr Rainfall=5.44"

Prepared by Chisvette Engineering

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

Summary for Pond BA1: cistern

Inflow Area = 0.402 ac, 74.88% Impervious, Inflow Depth > 4.74" for 10-yr event
 Inflow = 1.81 cfs @ 12.11 hrs, Volume= 0.159 af
 Outflow = 1.28 cfs @ 12.22 hrs, Volume= 0.159 af, Atten= 29%, Lag= 6.8 min
 Primary = 1.28 cfs @ 12.22 hrs, Volume= 0.159 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
 Peak Elev= 8.25' @ 12.23 hrs Surf.Area= 410 sf Storage= 1,086 cf

Plug-Flow detention time= 12.4 min calculated for 0.159 af (100% of inflow)
 Center-of-Mass det. time= 12.3 min (786.4 - 774.2)

Volume	Invert	Avail.Storage	Storage Description
#1	5.50'	45 cf	manhole (Prismatic) Listed below (Recalc)
#2	5.60'	1,600 cf	10.00'W x 40.00'L x 4.00'H Cistern
		1,645 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
5.50	10	0	0
10.00	10	45	45

Device	Routing	Invert	Outlet Devices
#1	Primary	5.50'	4.0" Vert. Orifice/Grate C= 0.600
#2	Primary	7.75'	8.0" Vert. Orifice/Grate C= 0.600
#3	Primary	9.08'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.20 cfs @ 12.22 hrs HW=8.18' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 0.67 cfs @ 7.64 fps)
- 2=Orifice/Grate (Orifice Controls 0.53 cfs @ 2.24 fps)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link P-Tot: (new Link)

Inflow Area = 0.427 ac, 70.52% Impervious, Inflow Depth > 4.62" for 10-yr event
 Inflow = 1.33 cfs @ 12.22 hrs, Volume= 0.164 af
 Primary = 1.33 cfs @ 12.22 hrs, Volume= 0.164 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs

Summary for Subcatchment Ex1: Existing

Runoff = 3.27 cfs @ 12.11 hrs, Volume= 0.293 af, Depth> 8.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
 NOAA 24-hr D 100-yr Rainfall=9.07"

Area (sf)	CN	Description
* 11,600	98	Roof, pavt, conc.
* 5,030	89	gravel parking
* 1,970	74	lawn, landscaping, HSG C
18,600	93	Weighted Average
7,000		37.63% Pervious Area
11,600		62.37% Impervious Area

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

Summary for Subcatchment Pr1: Proposed Bldg

Runoff = 3.10 cfs @ 12.11 hrs, Volume= 0.280 af, Depth> 8.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
 NOAA 24-hr D 100-yr Rainfall=9.07"

Area (sf)	CN	Description
* 13,117	98	black roof & conc
* 4,400	84	6" green roof
17,517	94	Weighted Average
4,400		25.12% Pervious Area
13,117		74.88% Impervious Area

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

Summary for Subcatchment Pr2: Undetained

Runoff = 0.15 cfs @ 12.11 hrs, Volume= 0.012 af, Depth> 5.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
 NOAA 24-hr D 100-yr Rainfall=9.07"

Area (sf)	CN	Description
* 1,083	74	>75% Grass cover, Good, HSG B
1,083		100.00% Pervious Area

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

Summary for Pond BA1: cistern

Inflow Area = 0.402 ac, 74.88% Impervious, Inflow Depth > 8.34" for 100-yr event
 Inflow = 3.10 cfs @ 12.11 hrs, Volume= 0.280 af
 Outflow = 2.42 cfs @ 12.20 hrs, Volume= 0.280 af, Atten= 22%, Lag= 5.3 min
 Primary = 2.42 cfs @ 12.20 hrs, Volume= 0.280 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
 Peak Elev= 9.05' @ 12.20 hrs Surf.Area= 407 sf Storage= 1,470 cf

Plug-Flow detention time= 8.3 min calculated for 0.278 af (100% of inflow)
 Center-of-Mass det. time= 8.2 min (768.5 - 760.3)

Volume	Invert	Avail.Storage	Storage Description
#1	5.60'	1,634 cf	48.0" Round Pipe Storage x 2 L= 65.0' S= 0.0050 '/'
#2	5.50'	45 cf	25 (Prismatic) Listed below (Recalc)
		1,679 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
5.50	10	0	0
10.00	10	45	45

Device	Routing	Invert	Outlet Devices
#1	Primary	5.50'	4.0" Vert. Orifice/Grate C= 0.600
#2	Primary	7.75'	8.0" Vert. Orifice/Grate C= 0.600
#3	Primary	9.08'	5.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=2.41 cfs @ 12.20 hrs HW=9.04' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 0.77 cfs @ 8.84 fps)
- 2=Orifice/Grate (Orifice Controls 1.64 cfs @ 4.70 fps)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link P-Tot: (new Link)

Inflow Area = 0.427 ac, 70.52% Impervious, Inflow Depth > 8.20" for 100-yr event
 Inflow = 2.54 cfs @ 12.19 hrs, Volume= 0.292 af
 Primary = 2.54 cfs @ 12.19 hrs, Volume= 0.292 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs