

**STORMWATER MANAGEMENT, WATER QUALITY
AND GROUNDWATER RECHARGE
ANALYSIS**

For

Mavis Tire Supply, LLC

Proposed Automotive Service and Retail Center

*Block 105, Lot 64.01
460 Prospect Avenue
Township of West Orange, Essex County, NJ*

Prepared by:



**DYNAMIC
ENGINEERING**

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A handwritten signature in black ink, appearing to read 'Rodman R. Ritchie', is positioned above a horizontal line.

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- Results of Test Pit Excavation and Infiltration Testing – Prepared by ECS
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1. Site Description & Project Overview

This Drainage Statement has been prepared to analyze the stormwater drainage conditions that would occur as a result of the redevelopment of Block 105, Lot 64.01, located in the Township of West Orange, Essex County, New Jersey. The analysis contained within this Drainage Statement is limited to the proposed area of disturbance. According to the Township of West Orange Zoning Map, the site is located in the (B-2) General Business District. The proposed property consists of 0.74 acres (+/-32,118 SF) and is located on Prospect Avenue (County Route #677), West Orange Township.

The site is currently developed with an existing realtor's office consisting of a two (2) story building, parking, sidewalks, lighting and other site amenities. The proposed project will replace the existing 3,338 SF (GFA) building east of Prospect Avenue to be redeveloped with an Automotive Service and Retail Center. The proposed building will include a total footprint of approximately 6,205 SF. The overall development will result in approximately 0.04 acres of new impervious surfaces and approximately 0.8 acres of land disturbance. Moreover, the proposed development will reduce existing motor vehicle surfaces by approximately 0.009 acres. Additional site improvements include modifications to the associated parking areas, landscaping, lighting, signage, and utilities as reflected on the accompanying Site Plan drawings.

2. Design Methodology

This report has been prepared to define and analyze the stormwater drainage conditions that would occur as a result of the development of the subject site. Based upon the fact that the proposed development will result in more than 0.5 acres of land disturbance, this project is classified as a "major development" as defined in Township of West Orange Land Use Ordinance § 25-29.2. However, based upon the fact that the proposed development will not result in more than one (1) acre of land disturbance, increase impervious coverage by more than ¼ acre, and increase motor vehicle surfaces by more than ¼ acre, this project is not classified as a "major development" as defined in NJAC 7:8. Although not defined as a major development, the proposed development has been designed to meet the stormwater runoff quantity, quality, and groundwater recharge standards, as set forth by the Township of West Orange Land Use Ordinance (§ 25-29) and NJAC 7:8.

The following documents and data were used in the support of the design of the project:

- ALTA/NSPS Land Title Survey, prepared by Dynamic Survey, LLC, dated 12/04/2024, last revised 12/17/2024
- Preliminary & Final Site Plans, prepped by our office, dated 07/16/2025, last revised 02/13/2026
- Test Pit Excavation and Infiltration Testing Report, prepared by ECS, dated 01/29/2025
- NRCS Soil Survey
- NJDEP Stormwater Management Best Management Practices Manual

The hydrology for the site was calculated using the NRCS Runoff Equation and Dimensionless Unit Hydrograph as noted in Part 630, Hydrology National Engineering Handbook. The following particular references were used:

- Curve Numbers were established via Chapter 9 – Hydrologic Soil-Cover Complexes
- Time of Concentrations were calculated in accordance with Chapter 15
- Rainfall Distributions are based on NOAA Type D rainfall distribution
- The Standard Unit Hydrograph was utilized
- The rainfall depths are based on Essex County NOAA Atlas 14 Data and adjusted per NJAC 7:8-5.7 Tables 5-5 and 5-6 as noted below:

Return Period	Current Adjusted Rainfall Depth (inches)	Projected Adjusted Rainfall Depth (inches)
2 Year Storm	3.47	4.09
10 Year Storm	5.38	6.37
100 Year Storm	9.18	11.52

Based upon the Essex County Soil Survey, the soil types native to the site include:

Soil Type	Soil Type Name	Hydrologic Soil Group
USBONB	Urban Land, Boonton Substratum	Unrated*

*When the hydrologic soil group (HSG) is unrated for a particular soil, the stormwater design shall assume HSG B for existing conditions and HSG D for proposed conditions for projects located outside the Coastal Plain.

Based on the methodology and data noted above a hydrologic evaluation of the NJDEP Water Quality, 2, 10, and 100-year storm events was prepared.

This report will address compliance with the following standards:

- West Orange Township Stormwater Control Standards (§ 25-29)

3. Existing Drainage Conditions

The area to be analyzed consists of approximately 0.637 acres and is comprised of the existing building, parking lot, and associated grassed areas within the limit of disturbance. In the existing condition, stormwater runoff is conveyed overland to five (5) separate inlets. The two yard inlets and two inlets within and surrounding the existing parking lot captures majority of the on-site runoff, ultimately discharging offsite through the existing 15" RCP stormwater line. The round inlet within the existing entrance on Blueberry Bend captures runoff from the adjacent properties, also ultimately discharging to the northeast offsite. The subject site has been

evaluated with the following drainage sub-watershed areas as depicted on the Existing Drainage Area Map included in the Appendix of this report.

Point of Analysis #1

Study Area 1A: This area consists of 0.637 acres which include roof, motor vehicle surfaces, impervious and grass areas. Under existing conditions, stormwater runoff generated by this area flows to the five (5) on-site inlets, as depicted on the Existing Inlet Area Map.

Existing Conditions Input Summary Table

Drainage Area Name	Drainage Area (acres)	Time of Concentration (minutes)	Curve Number (CN)
EDA 1 - Impervious	0.396 Ac	1.6	98
EDA 1 - Pervious	0.241 Ac	4.5	61

Existing Conditions Flow Summary Table

Drainage Area Name	Current Conditions	Adjusted	Rainfall	Projected Conditions	Adjusted	Rainfall
	Q ₂ (CFS)	Q ₁₀ (CFS)	Q ₁₀₀ (CFS)	Q ₂ (CFS)	Q ₁₀ (CFS)	Q ₁₀₀ (CFS)
POI #1	1.55	2.65	5.01	1.90	3.26	6.55

4. Proposed Drainage Conditions

The proposed development has been designed to generally maintain similar drainage patterns as the existing condition. As shown on the Proposed Drainage Area Map in the Appendix of this report, the majority of the stormwater runoff for the proposed development will be captured by the proposed inlets and yard drains and conveyed to the same offsite region as in the existing condition. Moreover, the proposed development will incorporate a small bio-retention basin to the west of the proposed building along the site frontage, and an underground pipe storage detention basin to the north of the proposed building along the northern property line for stormwater management. The basins are designed to detain stormwater runoff generated by the development to meet the stormwater management requirements. The proposed site conditions have been evaluated using the following drainage sub-watershed areas as depicted on the Proposed Drainage Area Map included in the Appendix of this report.

Point of Analysis #1

Uncontrolled: This area consists of 0.355 acres and includes motor vehicle surfaces, impervious and grass areas throughout the site. Under proposed conditions runoff generated by this area sheet flows into the proposed storm conveyance system and discharges in the same location under existing conditions.

Study Area Roof: This area consists of the entire 0.142 acres of roof area for the proposed building. Under proposed conditions the runoff generated by this area flows into a roof leader manifold and is discharged into the proposed 48" HDPE Underground Detention Basin to the north of the proposed building. The underground pipe storage provides detention for the runoff, slowing the rate of flow to the POI #1, the ultimate discharge point.

Bioretention Basin: This area consists of 0.140 acres towards the front of the site which includes motor vehicle surfaces, impervious and grass areas. Under proposed conditions runoff generated by this area flows overland into the proposed bioretention basin via a 4' wide curb cut.

Proposed Conditions Input Summary Table

Drainage Area Name	Drainage Area (acres)	Time of Concentration (minutes)	Curve Number (CN)
PDA-Roof Area Impervious	0.142	1	98
PDA-Bioretention Basin (Pervious)	0.050	5.1	80
PDA-Bioretention Basin (Impervious)	0.090	0.5	98
PDA-Uncontrolled (Pervious)	0.10	5.0	80
PDA-Uncontrolled (Impervious)	0.204	2.00	98

Proposed Conditions Flow Summary Table

Drainage Area Name	Current Conditions	Adjusted	Rainfall	Projected Conditions	Adjusted	Rainfall
	Q ₂ (CFS)	Q ₁₀ (CFS)	Q ₁₀₀ (CFS)	Q ₂ (CFS)	Q ₁₀ (CFS)	Q ₁₀₀ (CFS)
POI - MH	1.47	2.42	4.93	1.79	2.92	6.44

5. **Stormwater Management System Design**

A summary of each basin's water surface elevation (WSEL) and outflow rates for the Water Quality, 2-, 10-, and 100-year storm event for both current and projected conditions are provided below. These WSELs and outflows assume normal operating conditions for each basin. In addition, the emergency spillway water surface elevation and outflow for the projected 10-year storm event have been calculated assuming the outlet structure has failed and there is no storage below the emergency spillway. Routing calculations for the basins and emergency spillway calculations are included in the Appendix.

Bioretention Basin Summary Table

Storm Event (years)	Water Surface Elevation (ft)	Outflow (CFS)
Water Quality	622.86	0.00
Current – 2	623.15	0.27
Current – 10	623.29	0.48
Current – 100	623.54	0.85
Projected – 2	623.20	0.35
Projected – 10	623.36	0.58
Projected – 100	623.69	1.07

Underground Detention Basin Summary Table

Storm Event (years)	Water Surface Elevation (ft)	Outflow (CFS)
Water Quality	618.77	0.22
Current – 2	618.91	0.24
Current – 10	619.58	0.31
Current – 100	620.83	0.95
Projected – 2	619.13	0.26
Projected – 10	619.95	0.34
Projected – 100	621.44	1.36

6. Green Infrastructure Compliance

The basins noted above have been designed to comply with the stormwater runoff quantity, quality, and groundwater recharge requirements for the proposed development as applicable. The proposed basin has been designed in accordance with NJAC 7:8 and the New Jersey Stormwater Best Management Practices. The tables below summarize the design considerations for each basin, see the Site Plan details for additional information.

Small-Scale Bioretention Basins (Table 5-1 – Quantity, Quality, & Recharge)

Design Criteria	Required	Provided
Total Drainage Area	--	0.140 acres
Min. Storage Volume below 1 st Orifice	0.008 Ac-FT	0.008 Ac-FT
Depth of Soil Bed	18 in. Terrestrial Forested Community	18 in. Terrestrial Forested Community
Max. Contributory DA	2.5 acres	0.140 acres
Max. Drain Time	72 hours	N/A
Separation from SHWT	1 foot (Underdrain)	Underdrains are proposed SHWT Not encountered to depth elevation 615.0 (TP-05)
Design Permeability Rate	Min. = 0.5 in/hr Max. = 10 in/hr	<0.5 in/hr Underdrains are proposed
Max. Depth of WQ Storm	1.0 feet	0.86 feet

7. Water Quantity Control Compliance

The site has been designed to reduce peak flows for the 2-, 10- and 100-year storm events as compared to the pre-development conditions. The point of analysis has been identified on the Drainage Area Maps as previously described. Below is a summary table demonstrating compliance with the flow reduction requirements.

Point of Analysis #1			
Storm Event	Existing Peak Flow Rate (cfs)	Proposed Peak Flow Rate (cfs)	Percent Reduction
Current 2-year	1.55	1.52	1.9%
Current 10-year	2.65	2.49	6.0%
Current 100-year	5.01	4.89	2.4%
Projected 2-year	1.90	1.85	2.6%
Projected 10-year	3.26	3.00	8.0%
Projected 100-year	6.55	6.40	2.3%

8. Water Quality Compliance

In accordance with the West Orange Stormwater Control Ordinance, section 25-29.4.r.2(a), major developments are required to provide 80% TSS removal for the stormwater runoff from the net increase in motor vehicle surface. The project proposed a net decrease of motor vehicle surface of 0.009 acres (0.276 acres in the existing condition and 0.267 acres in the proposed condition) therefore water quality is not required, however, the proposed bioretention basin has been designed to treat 0.064 acres of motor vehicle surface in the proposed condition to 80% TSS removal. For reference, the project proposes a net increase in overall impervious area of 0.04 acres.

9. Groundwater Recharge Compliance

As determined by NJ GeoWeb Mapping, this project area falls within the Metropolitan Planning Area (PA1). Under existing conditions, the site is not covered in woody vegetation nor regrowth. In accordance with New Jersey Standard for Land Grading (revised 2017), non woody vegetated PA1 areas fall under the soil compaction exemption list as a "urban redevelopment" and is defined by NJDEP as "previously developed". Therefore, this project will not be subject to comply with ground water recharge requirements set forth in NJAC 7:8-5.4.

10. Storm Sewer Design

The proposed stormwater management collection system has been designed to have hydraulic capacity for the 25-year storm event. The Rational Method was used to determine inflow rates to each structure and Manning's Equation was used to establish pipe capacity. In accordance with the NJDEP BMP Manual Chapter 5, weighted runoff coefficients were computed for each drainage area based on land cover and hydrologic soil group. A minimum time of concentration

of six minutes was assumed for each area. Supporting calculations and the Inlet Drainage Area Map can be found in the appendix.

11. Soil Erosion and Sediment Control Compliance

The project has been designed to comply with the Standards for Soil Erosion and Sediment Control in New Jersey. Soil erosion control measures such as a stabilized construction entrance, inlet protection and silt fence are shown on the plans. In addition, the proposed basins and underground stormwater conveyance system discharge to existing stormwater infrastructure located on the site, therefore providing a stable point of discharge.

12. Conclusion

The proposed development has been designed with provisions for the safe and efficient control of stormwater runoff in a manner that will not adversely impact the existing drainage patterns, adjacent roadways, or adjacent parcels. In addition, the proposed development satisfies the runoff quality and groundwater recharge requirements set forth by the Township of West Orange Land Use Ordinance and reduces the peak flow rates to the point of analysis to the maximum extent practical and in line with the intent of the regulations through the use of the proposed green infrastructure and underground detention. With this stated, it is evident that the proposed development will not have a negative impact on the existing drainage conditions, water quality or groundwater recharge on-site or within the vicinity of the subject site.

APPENDIX

NRCS WEB SOIL SURVEY



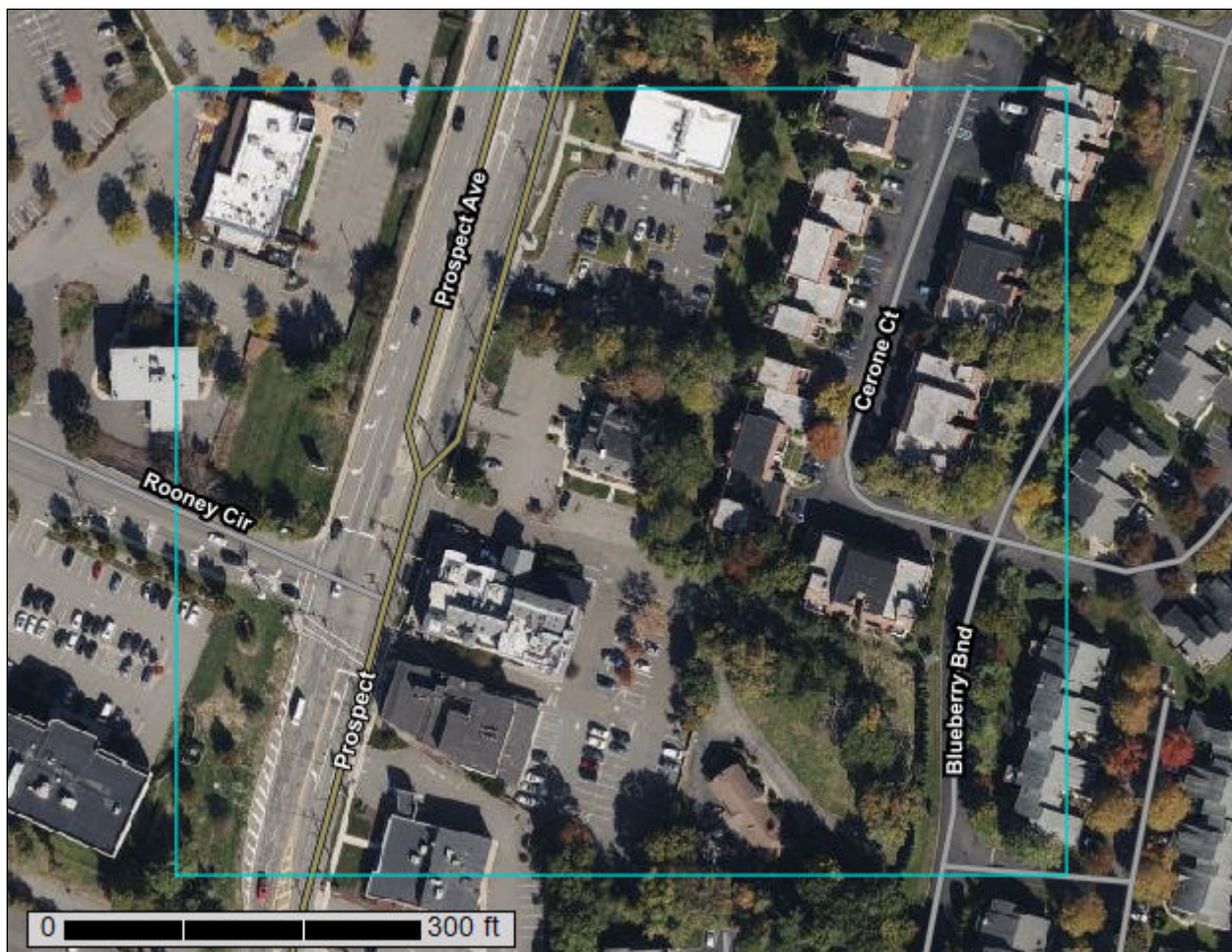
United States
Department of
Agriculture

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 **Essex County, New Jersey**



June 27, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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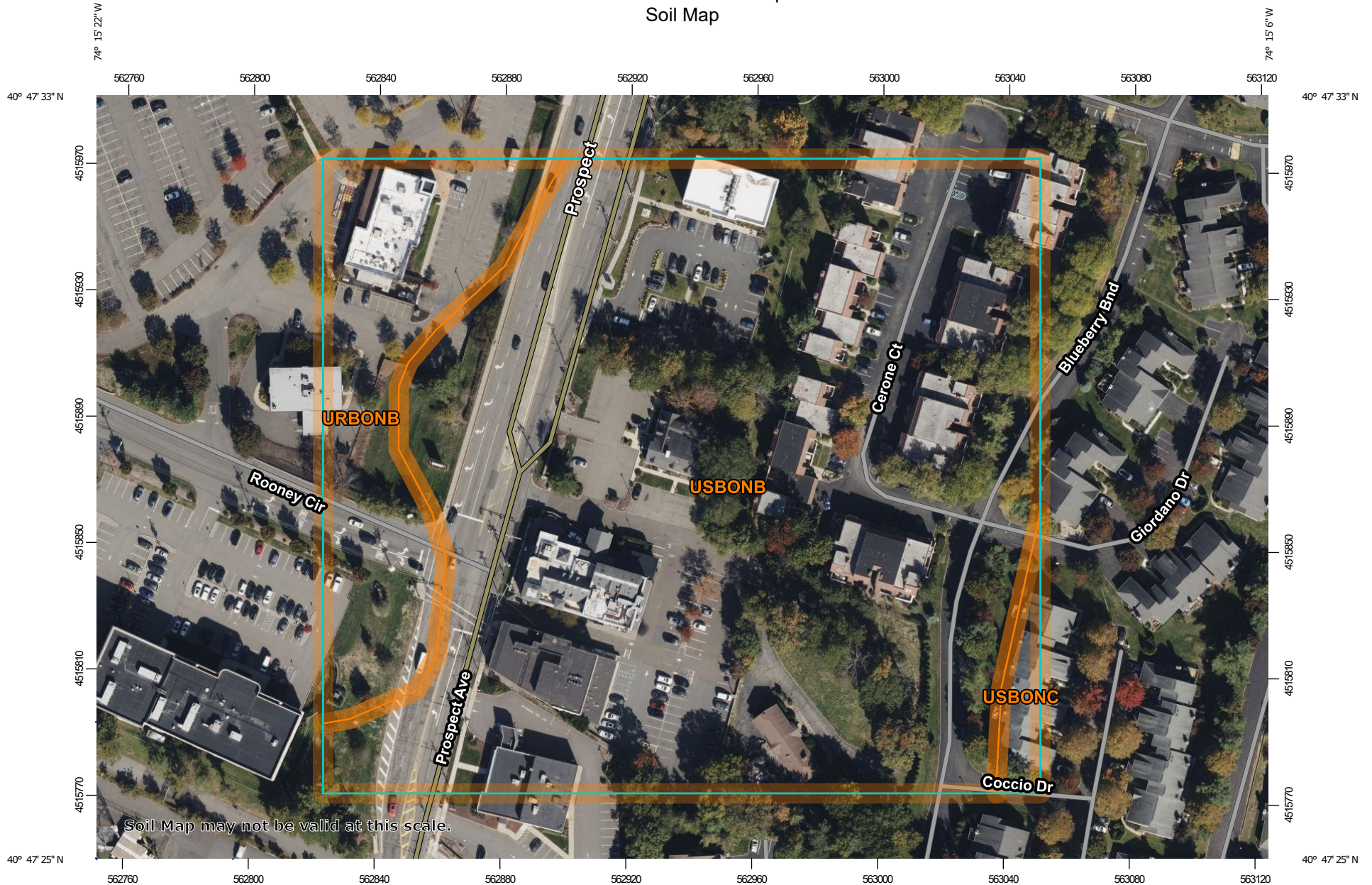
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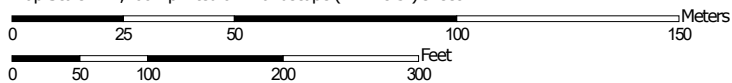
Soil Map

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



Map Scale: 1:1,700 if printed on A landscape (11" x 8.5") sheet.



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

Custom Soil Resource Report

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: Essex County, New Jersey
Survey Area Data: Version 20, 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 10, 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
URBONB	Urban land, Boonton substratum, 0 to 8 percent slopes	1.7	15.4%
USBONB	Urban land, Boonton substratum - Boonton complex, 0 to 8 percent slopes	9.4	82.9%
USBONC	Urban land, Boonton substratum - Boonton complex, 8 to 15 percent slopes	0.2	1.7%
Totals for Area of Interest		11.4	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.

Custom Soil Resource Report

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.

Essex County, New Jersey

URBONB—Urban land, Boonton substratum, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: w9cn
Elevation: 50 to 500 feet
Mean annual precipitation: 30 to 64 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 131 to 178 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land, boonton substratum: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land, Boonton Substratum

Setting

Landform: Ground moraines
Landform position (three-dimensional): Lower third of mountainflank
Down-slope shape: Linear, convex
Across-slope shape: Linear
Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Typical profile

H1 - 0 to 12 inches: material
H2 - 12 to 47 inches: silt loam
2CBt1 - 47 to 58 inches: loamy sand
2CBt2 - 58 to 72 inches: loamy sand

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

Udorthents, boonton substratum

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (three-dimensional): Lower third of mountainflank, upper third of mountainflank, center third of mountainflank
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Boonton

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (three-dimensional): Upper third of mountainflank, center third of mountainflank
Down-slope shape: Convex
Across-slope shape: Linear

Hydric soil rating: No

USBONB—Urban land, Boonton substratum - Boonton complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: w9c1

Elevation: 0 to 520 feet

Mean annual precipitation: 30 to 64 inches

Mean annual air temperature: 46 to 79 degrees F

Frost-free period: 131 to 213 days

Farmland classification: Not prime farmland

Map Unit Composition

Urban land, boonton substratum: 60 percent

Boonton and similar soils: 30 percent

Minor components: 10 percent

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

Description of Urban Land, Boonton Substratum

Setting

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Asphalt over supraglacial meltout till

Typical profile

M - 0 to 12 inches: material

2^C - 12 to 47 inches: gravelly sandy loam

3CBt1 - 47 to 58 inches: loamy sand

3CBt2 - 58 to 72 inches: loamy sand

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

Description of Boonton

Setting

Landform: Ground moraines

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Upper third of mountainflank, center third of mountainflank

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Red coarse-loamy till derived from sedimentary rock

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material

A - 2 to 4 inches: loam

Bt - 4 to 28 inches: sandy loam

Btx - 28 to 51 inches: sandy loam

BC - 51 to 72 inches: sandy loam

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: 20 to 39 inches to fragipan

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)

Depth to water table: About 28 to 59 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: B

Ecological site: F144AY037MA - Moist Dense Till Uplands

Hydric soil rating: No

Minor Components

Udorthents, boonton substratum

Percent of map unit: 10 percent

Landform: Ground moraines

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Lower third of mountainflank, upper third of mountainflank, center third of mountainflank

Down-slope shape: Convex

Across-slope shape: Convex, linear

Hydric soil rating: No

USBONC—Urban land, Boonton substratum - Boonton complex, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: w9c2

Elevation: 0 to 520 feet

Mean annual precipitation: 30 to 64 inches

Mean annual air temperature: 46 to 79 degrees F

Frost-free period: 131 to 213 days

Farmland classification: Not prime farmland

Map Unit Composition

Urban land, boonton substratum: 60 percent

Boonton and similar soils: 30 percent

Minor components: 10 percent

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

Description of Urban Land, Boonton Substratum

Setting

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Asphalt over supraglacial meltout till

Typical profile

M - 0 to 12 inches: material

2^C - 12 to 47 inches: gravelly sandy loam

3CBt1 - 47 to 58 inches: loamy sand

3CBt2 - 58 to 72 inches: loamy sand

Properties and qualities

Slope: 8 to 15 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

Description of Boonton

Setting

Landform: Ground moraines

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Upper third of mountainflank, center third of mountainflank

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Red coarse-loamy till derived from sedimentary rock

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material

A - 2 to 4 inches: loam

Bt - 4 to 28 inches: sandy loam

Btx - 28 to 51 inches: sandy loam

BC - 51 to 72 inches: sandy loam

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: 20 to 39 inches to fragipan

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)

Depth to water table: About 28 to 59 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Ecological site: F144AY037MA - Moist Dense Till Uplands

Hydric soil rating: No

Minor Components

Udorthents, boonton substratum

Percent of map unit: 10 percent

Landform: Ground moraines

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Lower third of mountainflank, upper third of mountainflank, center third of mountainflank

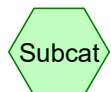
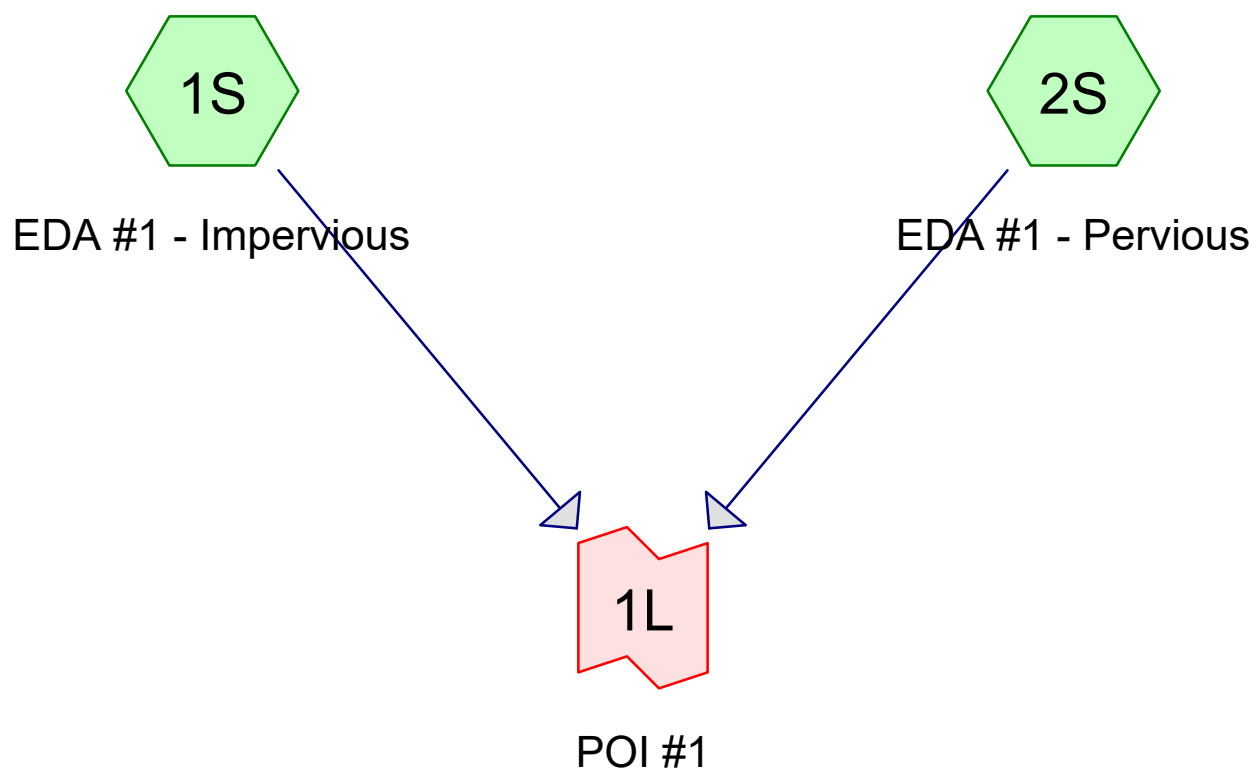
Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

**HYDROGRAPH SUMMARY REPORTS – EXISTING
AND PROPOSED CONDITIONS
CURRENT & PROJECTS 2, 10 & 100-YEAR STORM
EVENTS**

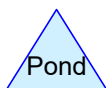
EXISTING



Subcat



Reach



Pond



Link

Routing Diagram for 2026-02 Proposed Conditions - AJH
Prepared by Dynamic Engineering, Printed 2/16/2026
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2026-02 Proposed Conditions - AJH

Prepared by Dynamic Engineering

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Page 2

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	2-Year-Current	NOAA 24-hr	D	Default	24.00	1	3.47	2	3.47
2	2-Year-Projected	NOAA 24-hr	D	Default	24.00	1	4.09	2	4.09
3	10-Year-Current	NOAA 24-hr	D	Default	24.00	1	5.38	2	3.47
4	10-Year-Projected	NOAA 24-hr	D	Default	24.00	1	6.37	2	4.09
5	100-Year-Current	NOAA 24-hr	D	Default	24.00	1	9.18	2	3.47
6	100-Year-Projected	NOAA 24-hr	D	Default	24.00	1	11.52	2	4.09

Summary for Subcatchment 1S: EDA #1 - Impervious

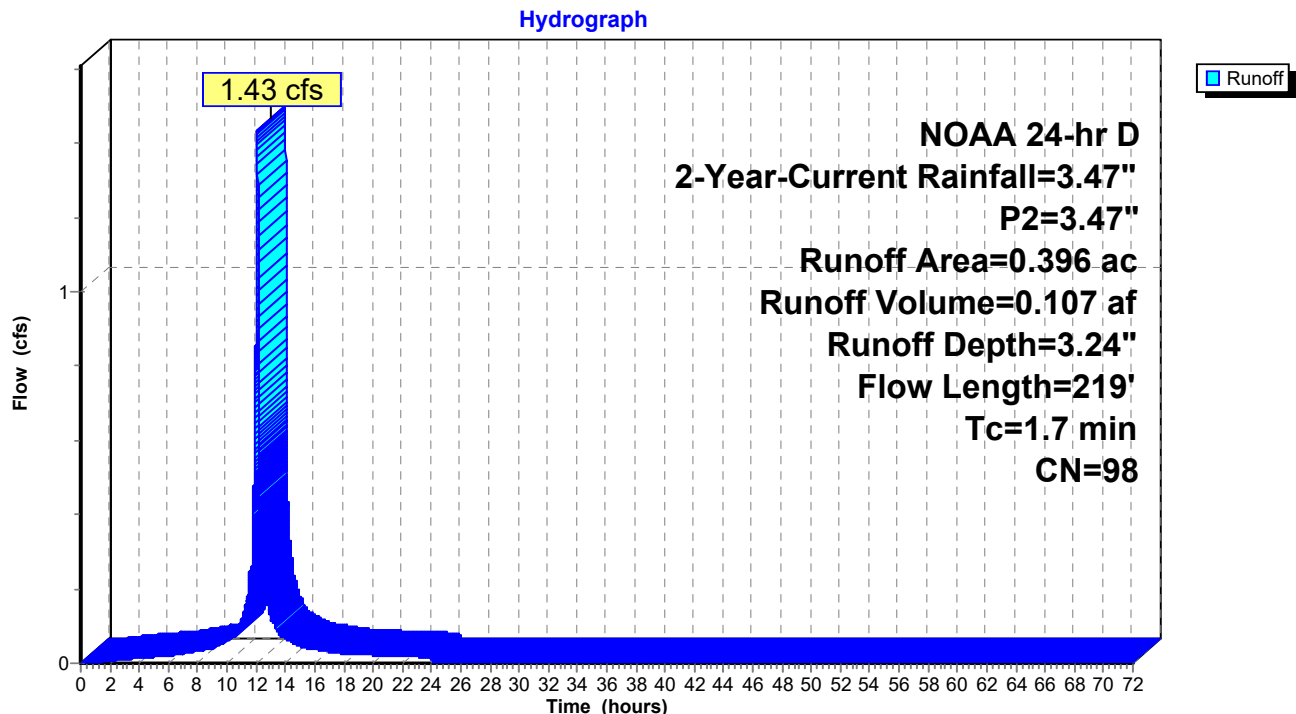
Runoff = 1.43 cfs @ 12.10 hrs, Volume= 0.107 af, Depth= 3.24"
 Routed to Link 1L : POI #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 2-Year-Current Rainfall=3.47", P2=3.47"

Area (ac)	CN	Description
* 0.396	98	Impervious Surfaces
0.396		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.09		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.47"
0.2	119	0.0400	10.53	12.92	Pipe Channel, B-C 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.7	219	Total			

Subcatchment 1S: EDA #1 - Impervious



Summary for Subcatchment 2S: EDA #1 - Pervious

Runoff = 0.13 cfs @ 12.13 hrs, Volume= 0.011 af, Depth= 0.56"
 Routed to Link 1L : POI #1

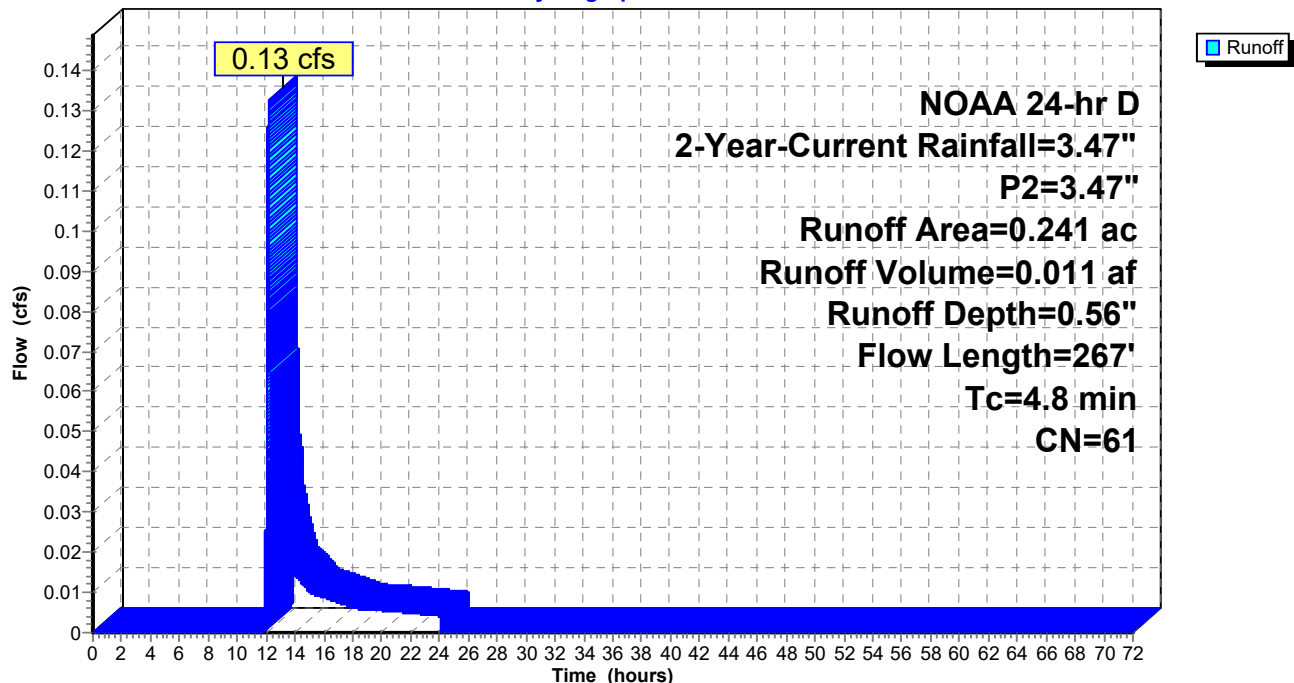
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 2-Year-Current Rainfall=3.47", P2=3.47"

Area (ac)	CN	Description
0.241	61	>75% Grass cover, Good, HSG B
0.241		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	34	0.0500	0.14		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.47"
0.5	124	0.0410	4.11		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.1	13	0.0030	2.69	2.11	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	96	0.0144	6.84	8.40	Pipe Channel, D-E 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
4.8	267	Total			

Subcatchment 2S: EDA #1 - Pervious

Hydrograph



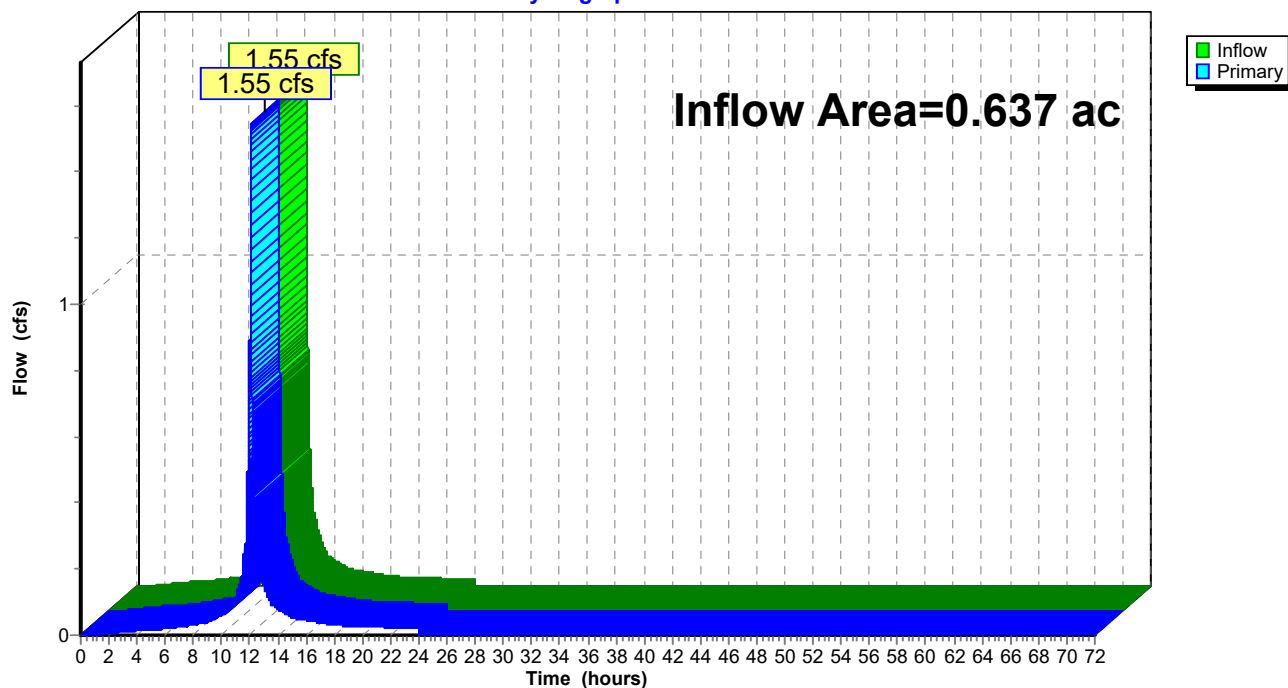
Summary for Link 1L: POI #1

Inflow Area = 0.637 ac, 62.17% Impervious, Inflow Depth = 2.22" for 2-Year-Current event
Inflow = 1.55 cfs @ 12.10 hrs, Volume= 0.118 af
Primary = 1.55 cfs @ 12.10 hrs, Volume= 0.118 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs

Link 1L: POI #1

Hydrograph



Summary for Subcatchment 1S: EDA #1 - Impervious

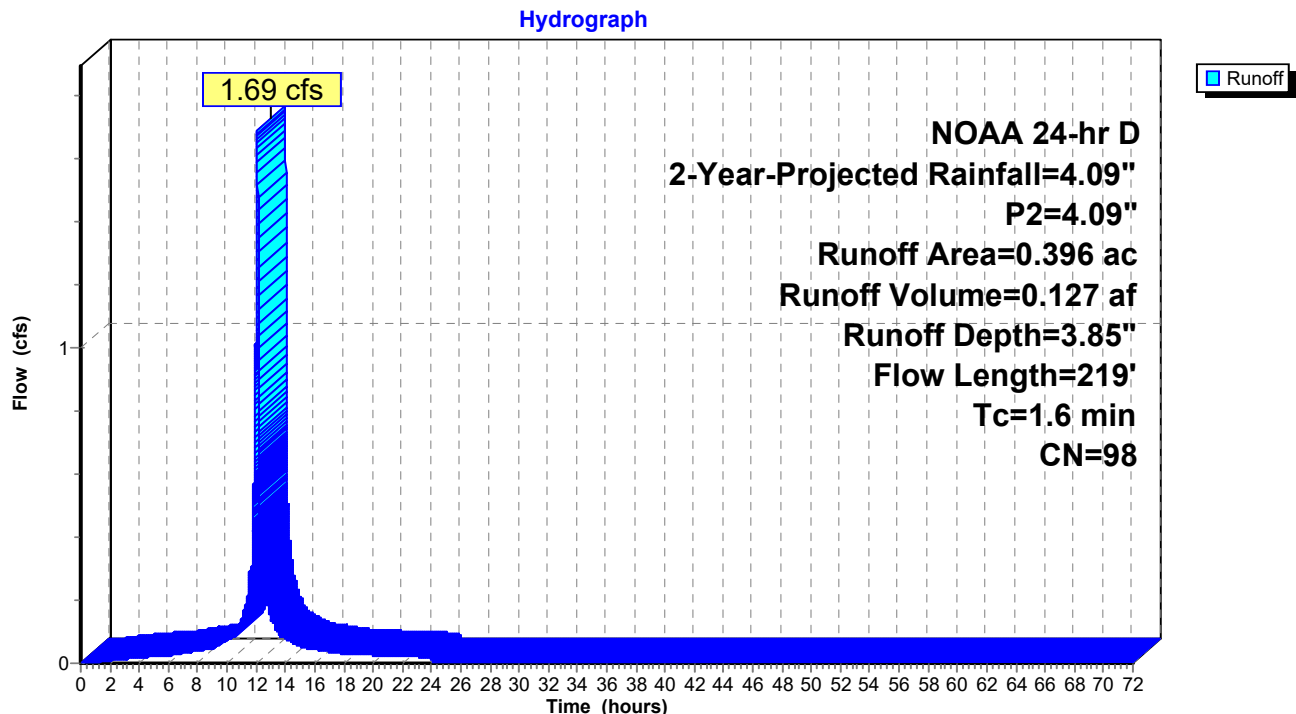
Runoff = 1.69 cfs @ 12.10 hrs, Volume= 0.127 af, Depth= 3.85"
 Routed to Link 1L : POI #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 2-Year-Projected Rainfall=4.09", P2=4.09"

Area (ac)	CN	Description
* 0.396	98	Impervious Surfaces
0.396		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0100	1.18		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 4.09"
0.2	119	0.0400	10.53	12.92	Pipe Channel, B-C 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.6	219	Total			

Subcatchment 1S: EDA #1 - Impervious



Summary for Subcatchment 2S: EDA #1 - Pervious

Runoff = 0.23 cfs @ 12.13 hrs, Volume= 0.017 af, Depth= 0.86"
 Routed to Link 1L : POI #1

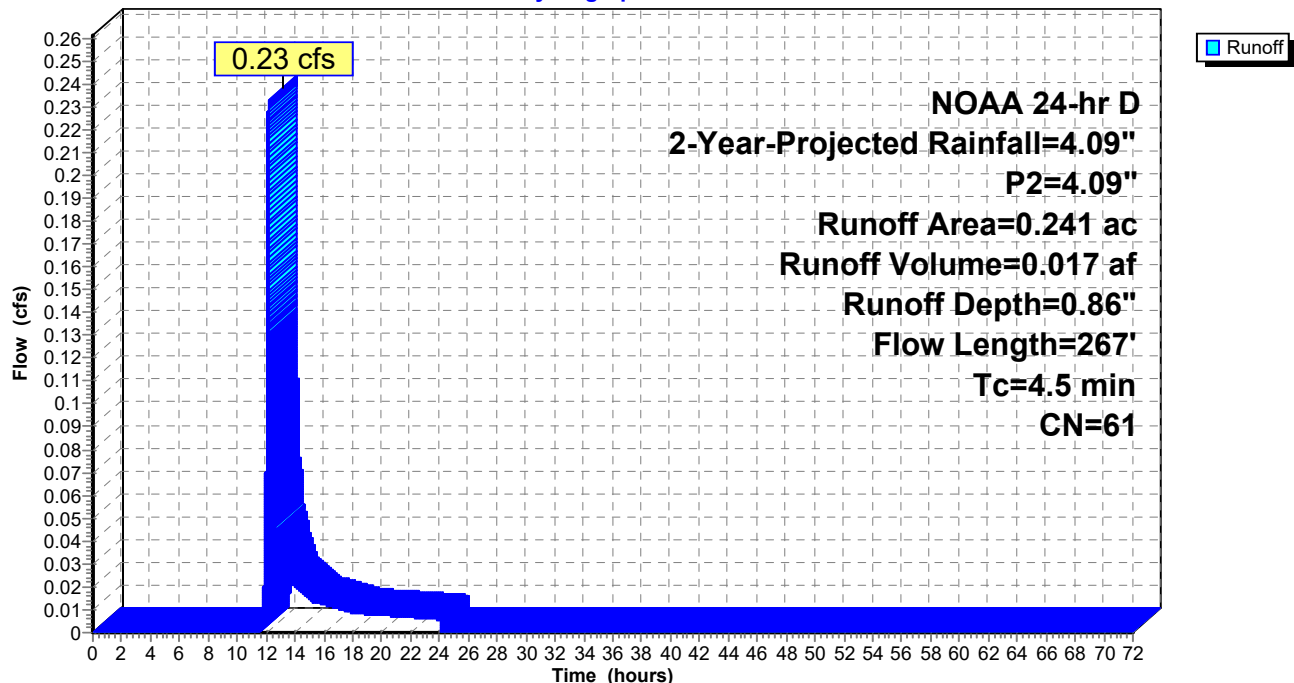
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 2-Year-Projected Rainfall=4.09", P2=4.09"

Area (ac)	CN	Description
0.241	61	>75% Grass cover, Good, HSG B
0.241		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	34	0.0500	0.15		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 4.09"
0.5	124	0.0410	4.11		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.1	13	0.0030	2.69	2.11	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	96	0.0144	6.84	8.40	Pipe Channel, D-E 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
4.5	267	Total			

Subcatchment 2S: EDA #1 - Pervious

Hydrograph



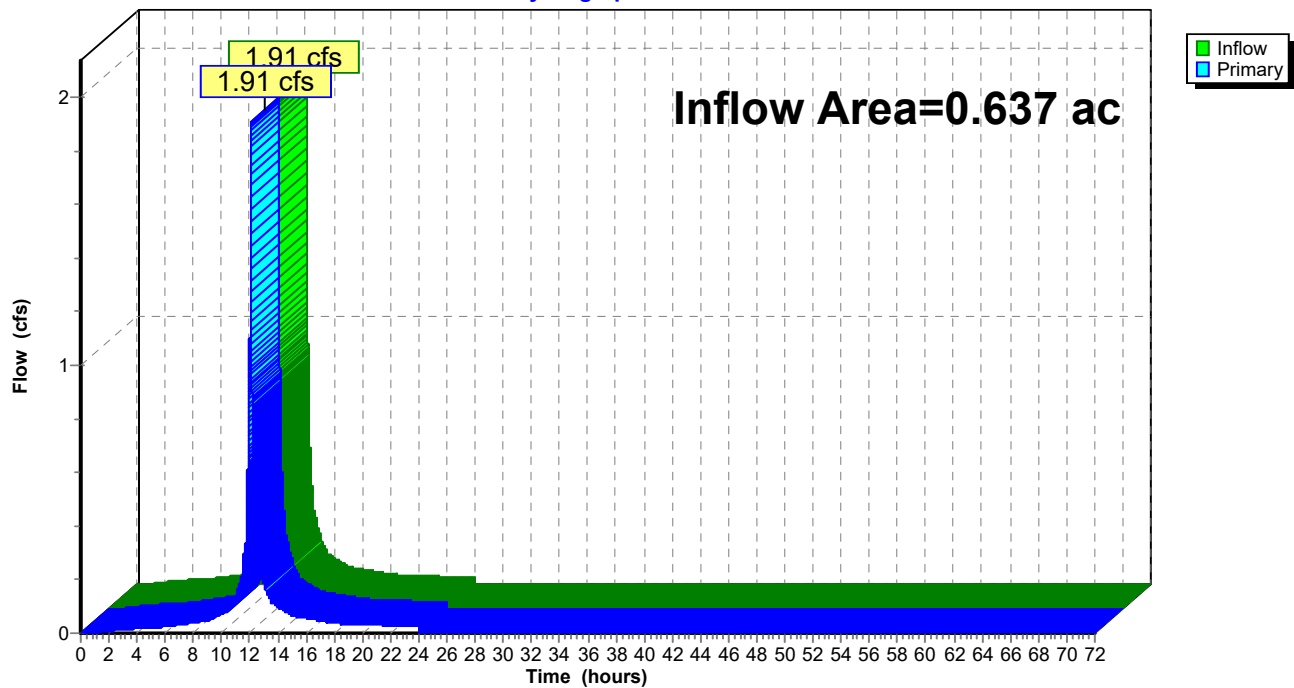
Summary for Link 1L: POI #1

Inflow Area = 0.637 ac, 62.17% Impervious, Inflow Depth = 2.72" for 2-Year-Projected event
Inflow = 1.91 cfs @ 12.10 hrs, Volume= 0.144 af
Primary = 1.91 cfs @ 12.10 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs

Link 1L: POI #1

Hydrograph



Summary for Subcatchment 1S: EDA #1 - Impervious

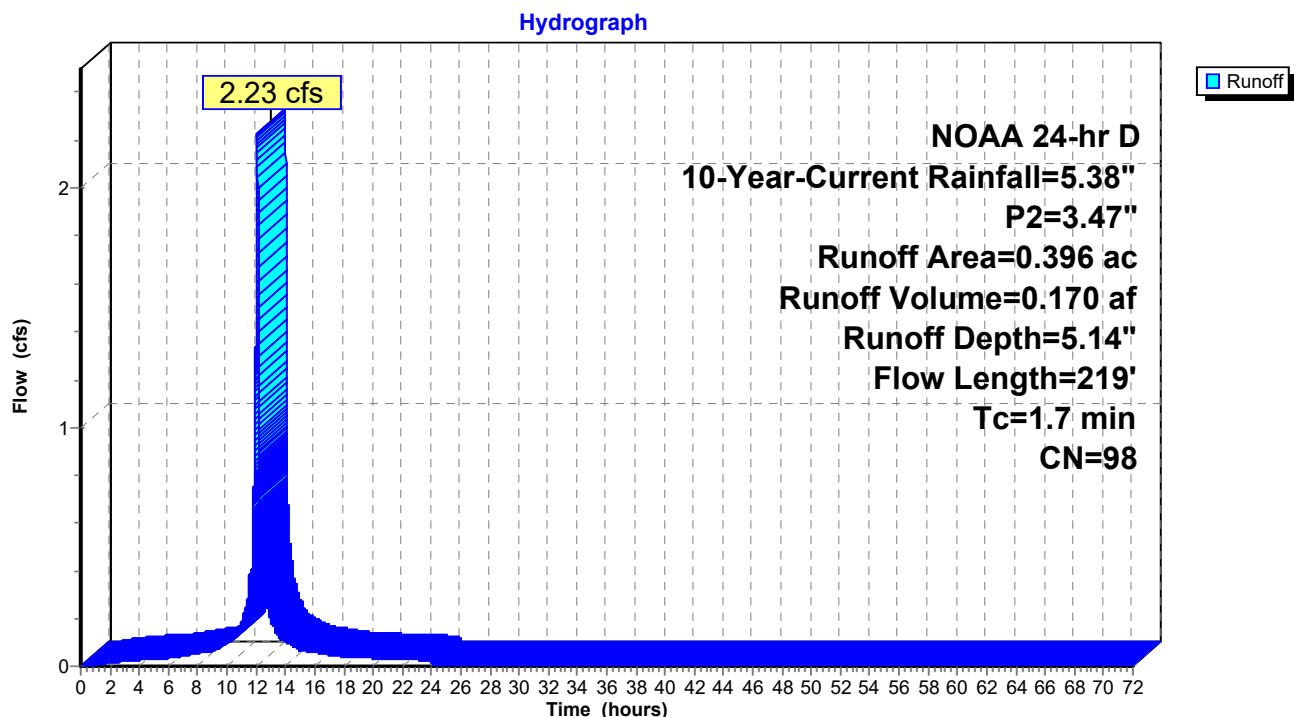
Runoff = 2.23 cfs @ 12.10 hrs, Volume= 0.170 af, Depth= 5.14"
 Routed to Link 1L : POI #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 10-Year-Current Rainfall=5.38", P2=3.47"

Area (ac)	CN	Description
* 0.396	98	Impervious Surfaces
0.396		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.09		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.47"
0.2	119	0.0400	10.53	12.92	Pipe Channel, B-C 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.7	219	Total			

Subcatchment 1S: EDA #1 - Impervious



Summary for Subcatchment 2S: EDA #1 - Pervious

Runoff = 0.46 cfs @ 12.12 hrs, Volume= 0.032 af, Depth= 1.60"
 Routed to Link 1L : POI #1

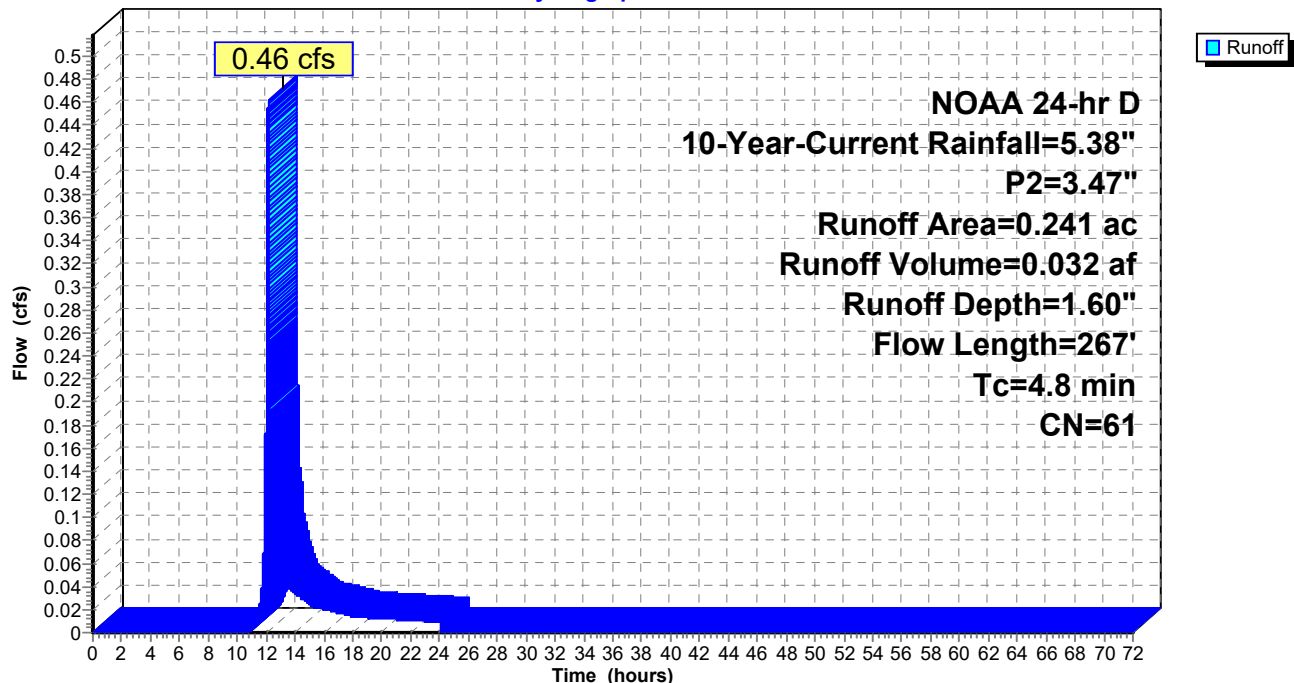
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 10-Year-Current Rainfall=5.38", P2=3.47"

Area (ac)	CN	Description
0.241	61	>75% Grass cover, Good, HSG B
0.241		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	34	0.0500	0.14		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.47"
0.5	124	0.0410	4.11		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.1	13	0.0030	2.69	2.11	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	96	0.0144	6.84	8.40	Pipe Channel, D-E 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
4.8	267	Total			

Subcatchment 2S: EDA #1 - Pervious

Hydrograph

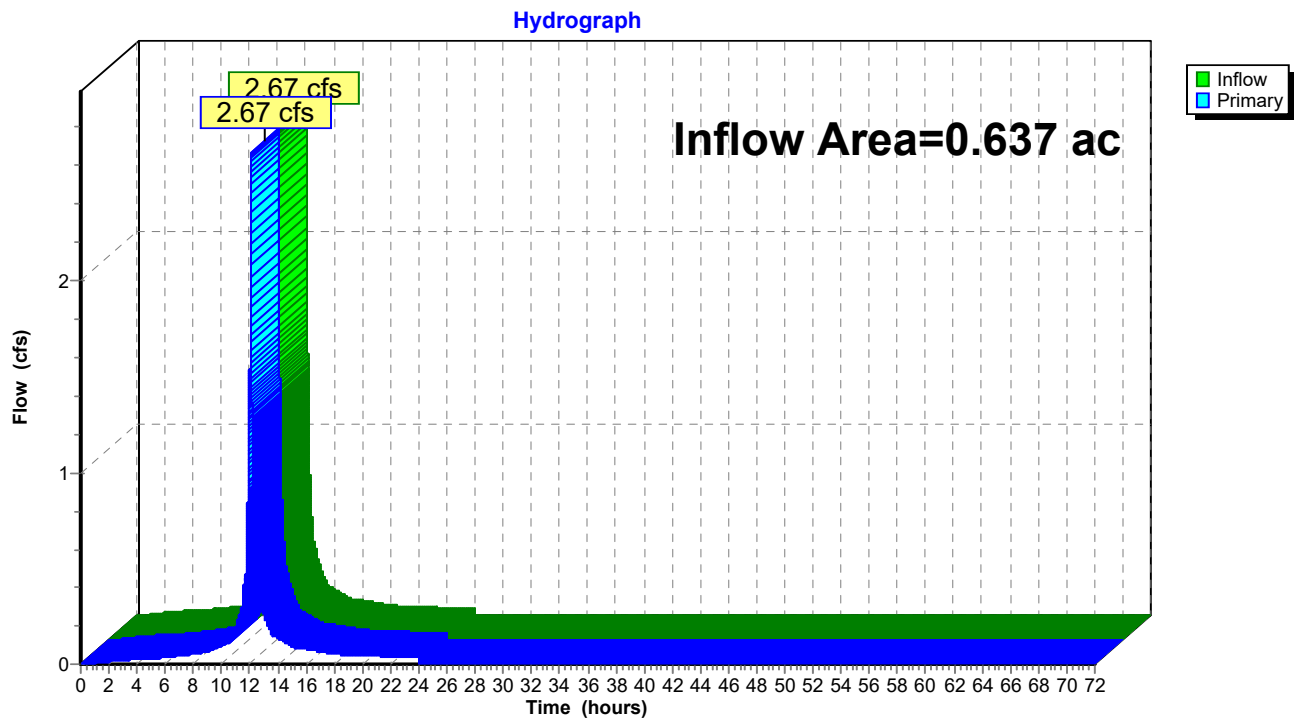


Summary for Link 1L: POI #1

Inflow Area = 0.637 ac, 62.17% Impervious, Inflow Depth = 3.80" for 10-Year-Current event
Inflow = 2.67 cfs @ 12.10 hrs, Volume= 0.202 af
Primary = 2.67 cfs @ 12.10 hrs, Volume= 0.202 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs

Link 1L: POI #1



Summary for Subcatchment 1S: EDA #1 - Impervious

Runoff = 2.65 cfs @ 12.10 hrs, Volume= 0.202 af, Depth= 6.13"
 Routed to Link 1L : POI #1

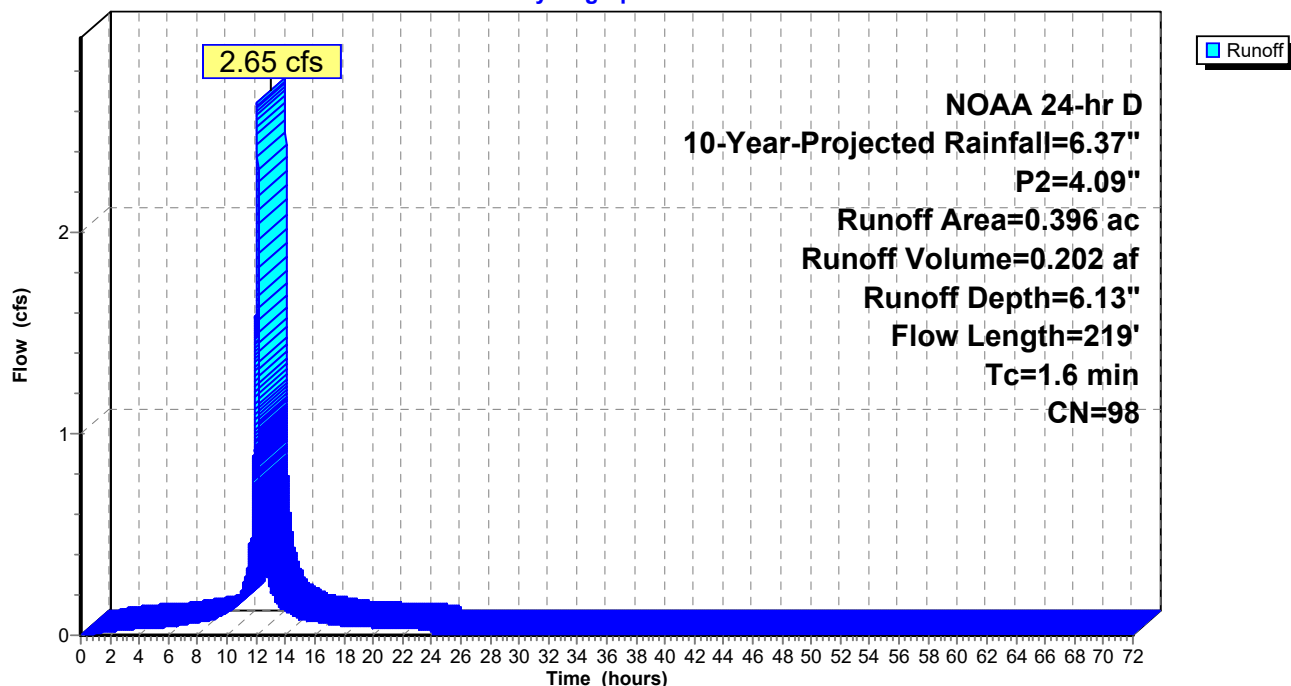
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 10-Year-Projected Rainfall=6.37", P2=4.09"

Area (ac)	CN	Description
* 0.396	98	Impervious Surfaces
0.396		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0100	1.18		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 4.09"
0.2	119	0.0400	10.53	12.92	Pipe Channel, B-C 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.6	219	Total			

Subcatchment 1S: EDA #1 - Impervious

Hydrograph



Summary for Subcatchment 2S: EDA #1 - Pervious

Runoff = 0.68 cfs @ 12.12 hrs, Volume= 0.045 af, Depth= 2.26"
 Routed to Link 1L : POI #1

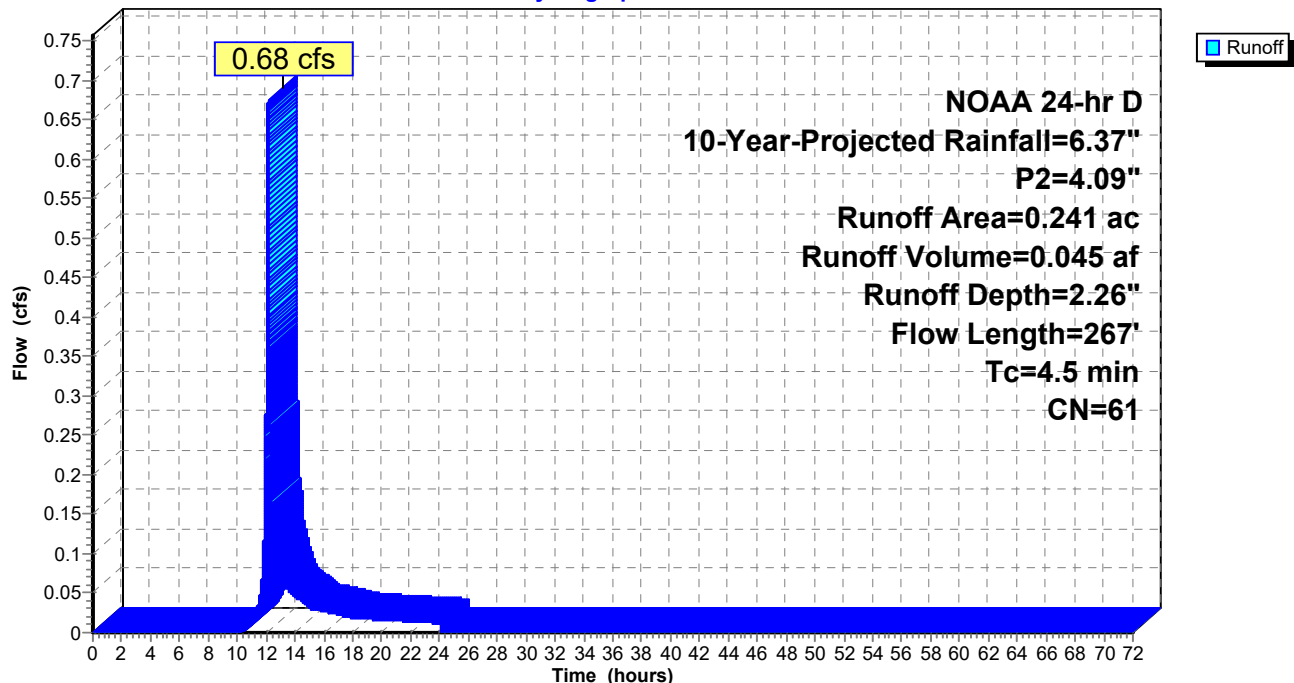
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 10-Year-Projected Rainfall=6.37", P2=4.09"

Area (ac)	CN	Description
0.241	61	>75% Grass cover, Good, HSG B
0.241		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	34	0.0500	0.15		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 4.09"
0.5	124	0.0410	4.11		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.1	13	0.0030	2.69	2.11	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	96	0.0144	6.84	8.40	Pipe Channel, D-E 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
4.5	267	Total			

Subcatchment 2S: EDA #1 - Pervious

Hydrograph



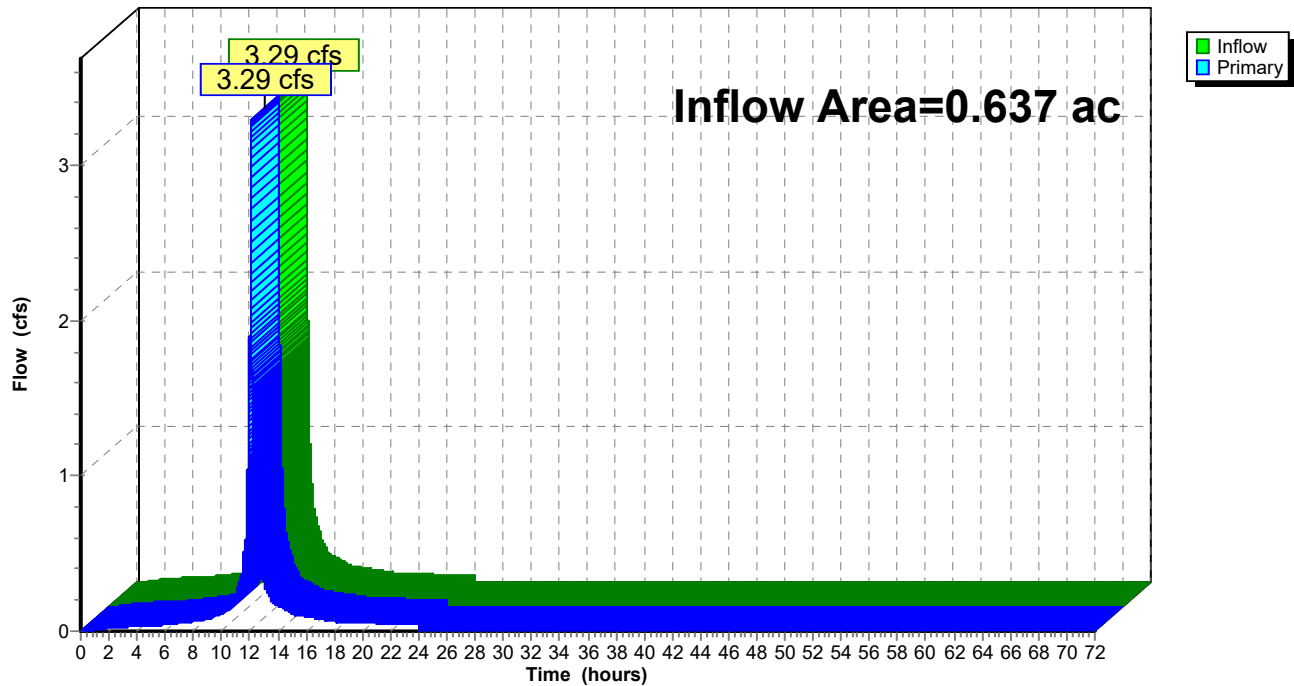
Summary for Link 1L: POI #1

Inflow Area = 0.637 ac, 62.17% Impervious, Inflow Depth = 4.67" for 10-Year-Projected event
Inflow = 3.29 cfs @ 12.10 hrs, Volume= 0.248 af
Primary = 3.29 cfs @ 12.10 hrs, Volume= 0.248 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs

Link 1L: POI #1

Hydrograph



Summary for Subcatchment 1S: EDA #1 - Impervious

Runoff = 3.82 cfs @ 12.10 hrs, Volume= 0.295 af, Depth= 8.94"
 Routed to Link 1L : POI #1

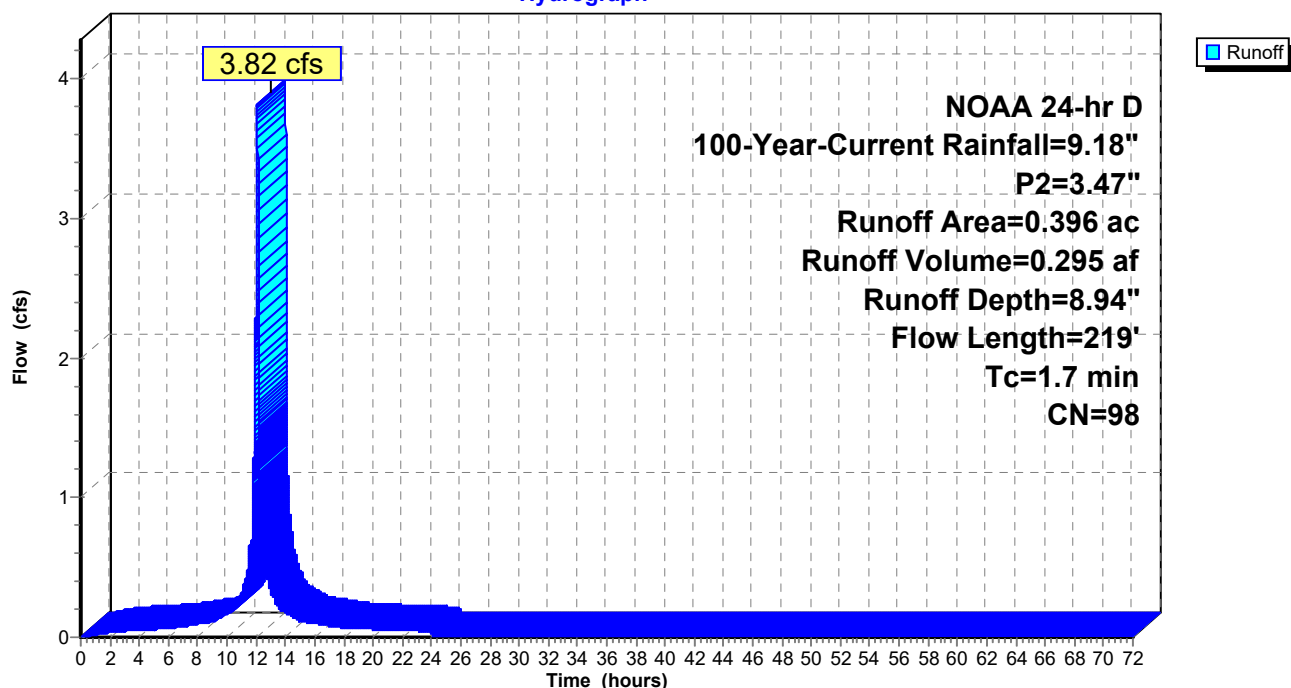
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 100-Year-Current Rainfall=9.18", P2=3.47"

Area (ac)	CN	Description
* 0.396	98	Impervious Surfaces
0.396		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.09		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.47"
0.2	119	0.0400	10.53	12.92	Pipe Channel, B-C 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.7	219	Total			

Subcatchment 1S: EDA #1 - Impervious

Hydrograph



Summary for Subcatchment 2S: EDA #1 - Pervious

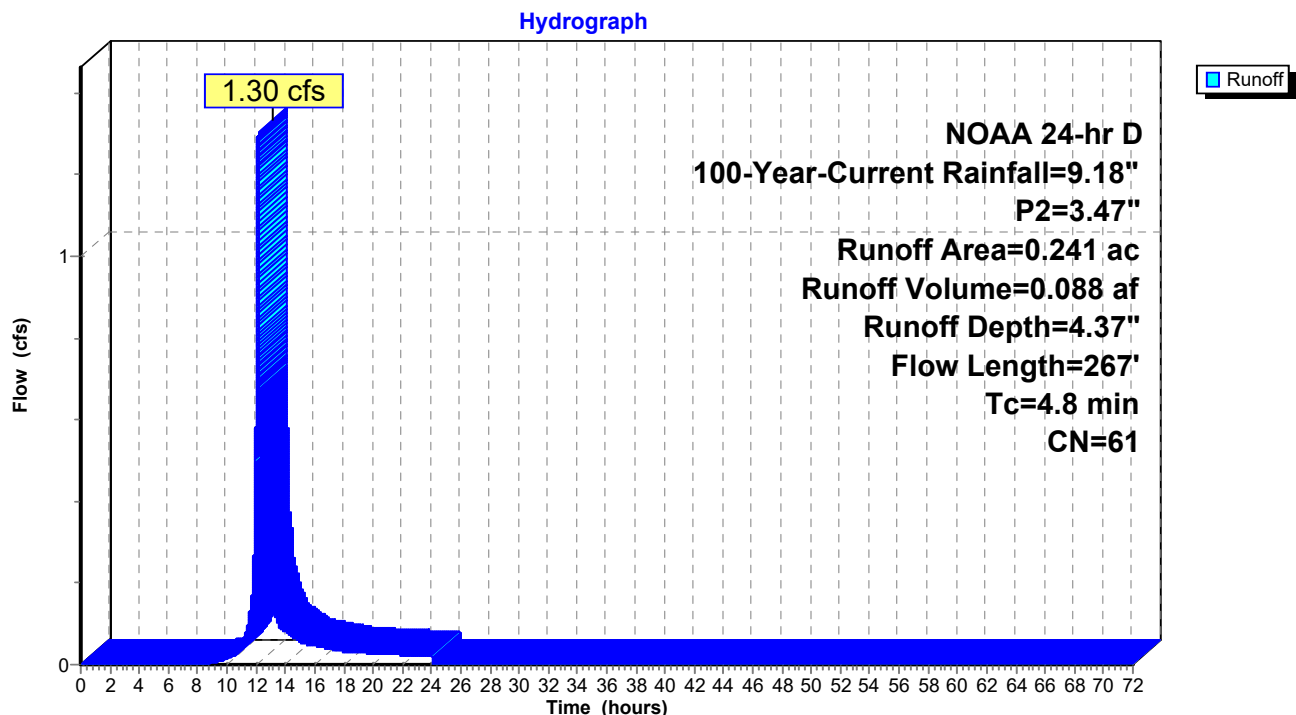
Runoff = 1.30 cfs @ 12.12 hrs, Volume= 0.088 af, Depth= 4.37"
 Routed to Link 1L : POI #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 100-Year-Current Rainfall=9.18", P2=3.47"

Area (ac)	CN	Description
0.241	61	>75% Grass cover, Good, HSG B
0.241		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	34	0.0500	0.14		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.47"
0.5	124	0.0410	4.11		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.1	13	0.0030	2.69	2.11	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	96	0.0144	6.84	8.40	Pipe Channel, D-E 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
4.8	267	Total			

Subcatchment 2S: EDA #1 - Pervious



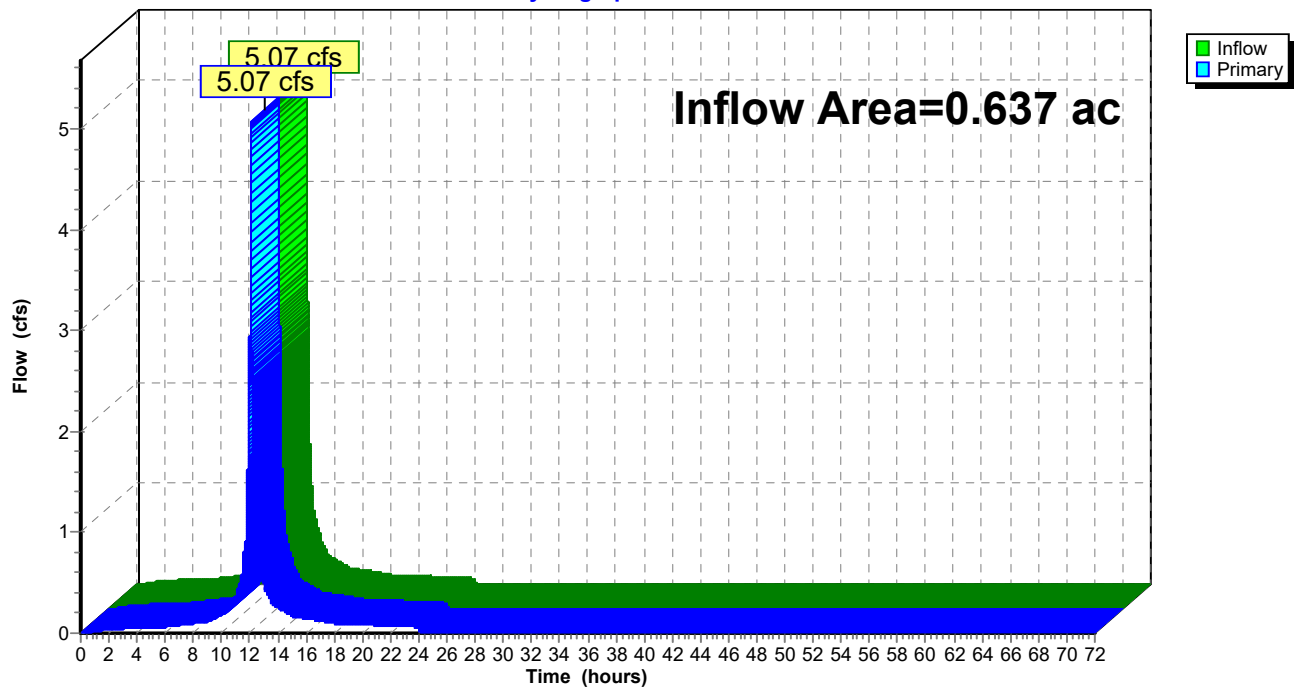
Summary for Link 1L: POI #1

Inflow Area = 0.637 ac, 62.17% Impervious, Inflow Depth = 7.21" for 100-Year-Current event
Inflow = 5.07 cfs @ 12.11 hrs, Volume= 0.383 af
Primary = 5.07 cfs @ 12.11 hrs, Volume= 0.383 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs

Link 1L: POI #1

Hydrograph



Summary for Subcatchment 1S: EDA #1 - Impervious

Runoff = 4.80 cfs @ 12.10 hrs, Volume= 0.372 af, Depth=11.28"
 Routed to Link 1L : POI #1

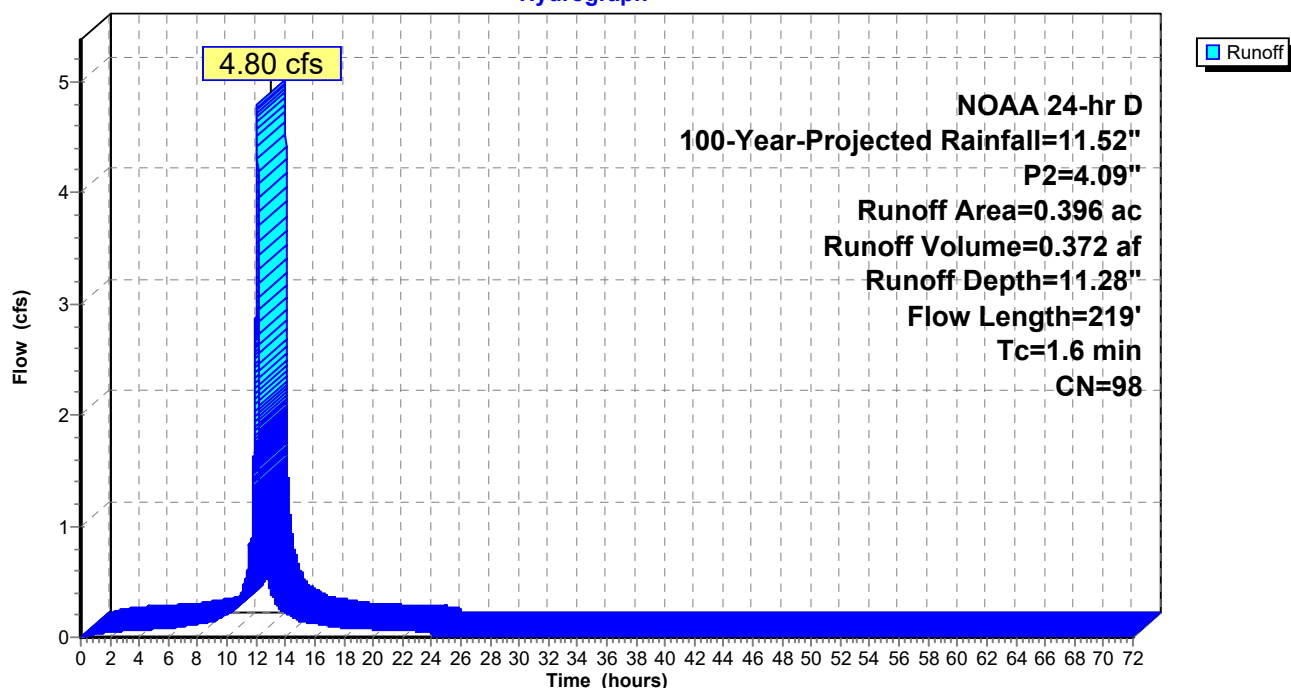
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 100-Year-Projected Rainfall=11.52", P2=4.09"

Area (ac)	CN	Description
* 0.396	98	Impervious Surfaces
0.396		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0100	1.18		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 4.09"
0.2	119	0.0400	10.53	12.92	Pipe Channel, B-C 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
1.6	219	Total			

Subcatchment 1S: EDA #1 - Impervious

Hydrograph



Summary for Subcatchment 2S: EDA #1 - Pervious

Runoff = 1.90 cfs @ 12.12 hrs, Volume= 0.127 af, Depth= 6.31"
 Routed to Link 1L : POI #1

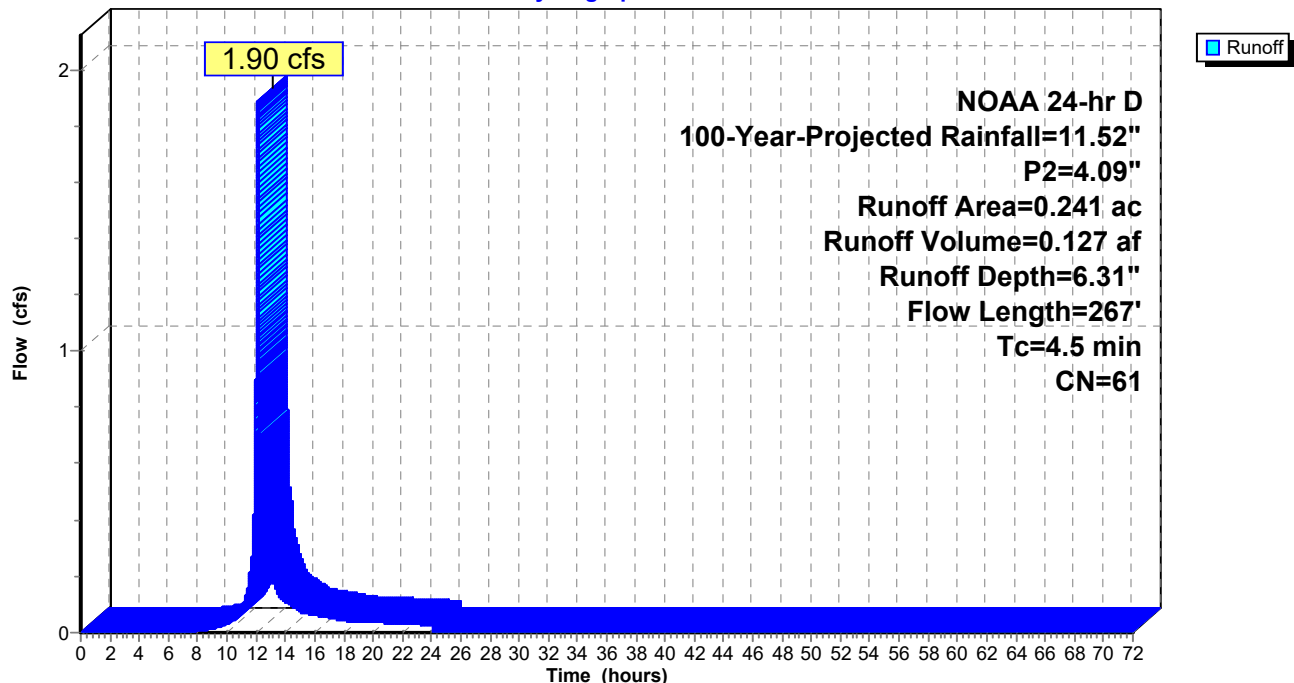
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 100-Year-Projected Rainfall=11.52", P2=4.09"

Area (ac)	CN	Description
0.241	61	>75% Grass cover, Good, HSG B
0.241		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	34	0.0500	0.15		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 4.09"
0.5	124	0.0410	4.11		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.1	13	0.0030	2.69	2.11	Pipe Channel, C-D 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012 Concrete pipe, finished
0.2	96	0.0144	6.84	8.40	Pipe Channel, D-E 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012 Concrete pipe, finished
4.5	267	Total			

Subcatchment 2S: EDA #1 - Pervious

Hydrograph



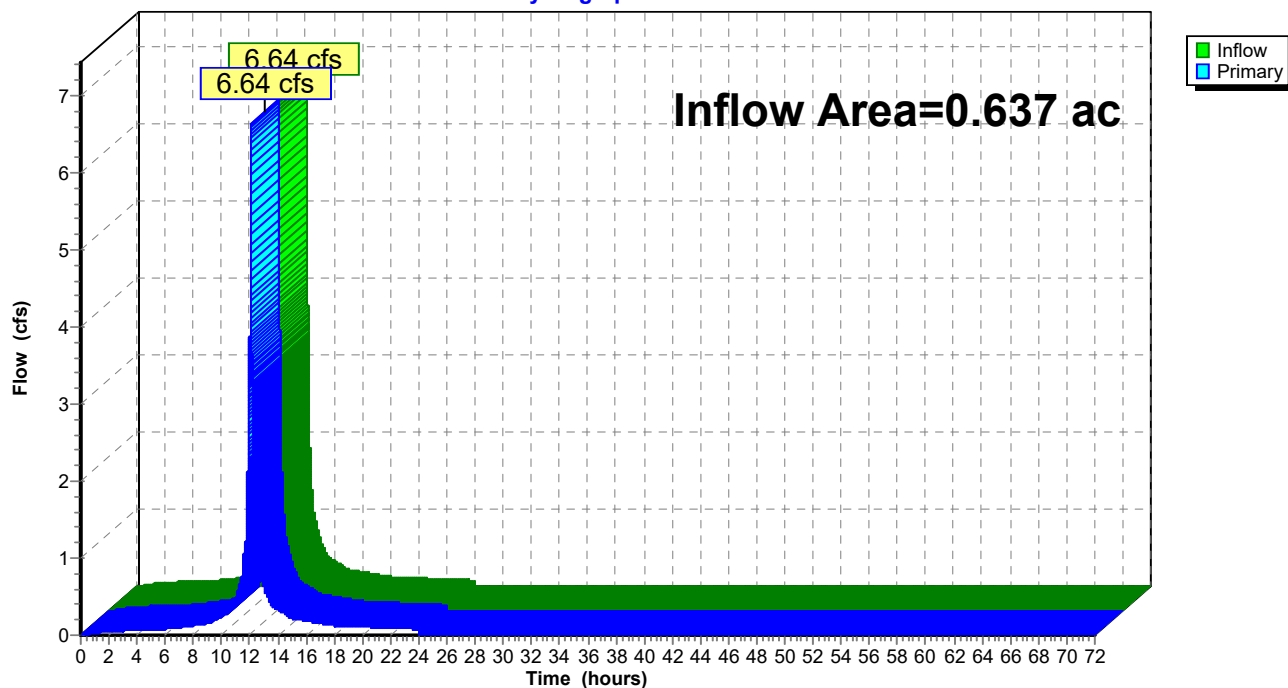
Summary for Link 1L: POI #1

Inflow Area = 0.637 ac, 62.17% Impervious, Inflow Depth = 9.40" for 100-Year-Projected event
Inflow = 6.64 cfs @ 12.10 hrs, Volume= 0.499 af
Primary = 6.64 cfs @ 12.10 hrs, Volume= 0.499 af, Atten= 0%, Lag= 0.0 min

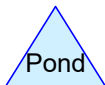
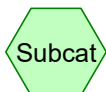
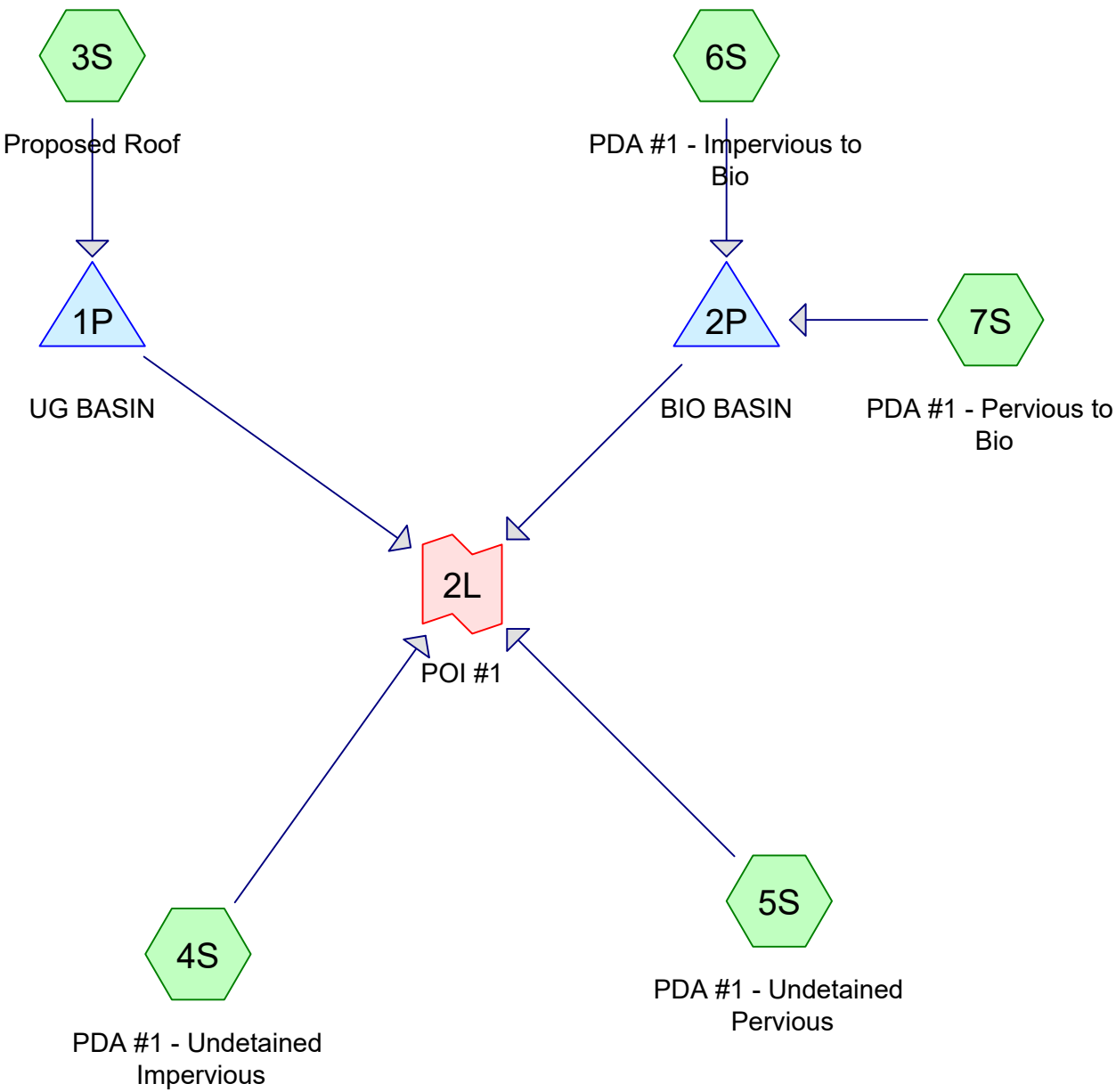
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs

Link 1L: POI #1

Hydrograph



PROPOSED



Summary for Subcatchment 3S: Proposed Roof

Runoff = 0.52 cfs @ 12.10 hrs, Volume= 0.038 af, Depth= 3.24"
 Routed to Pond 1P : UG BASIN

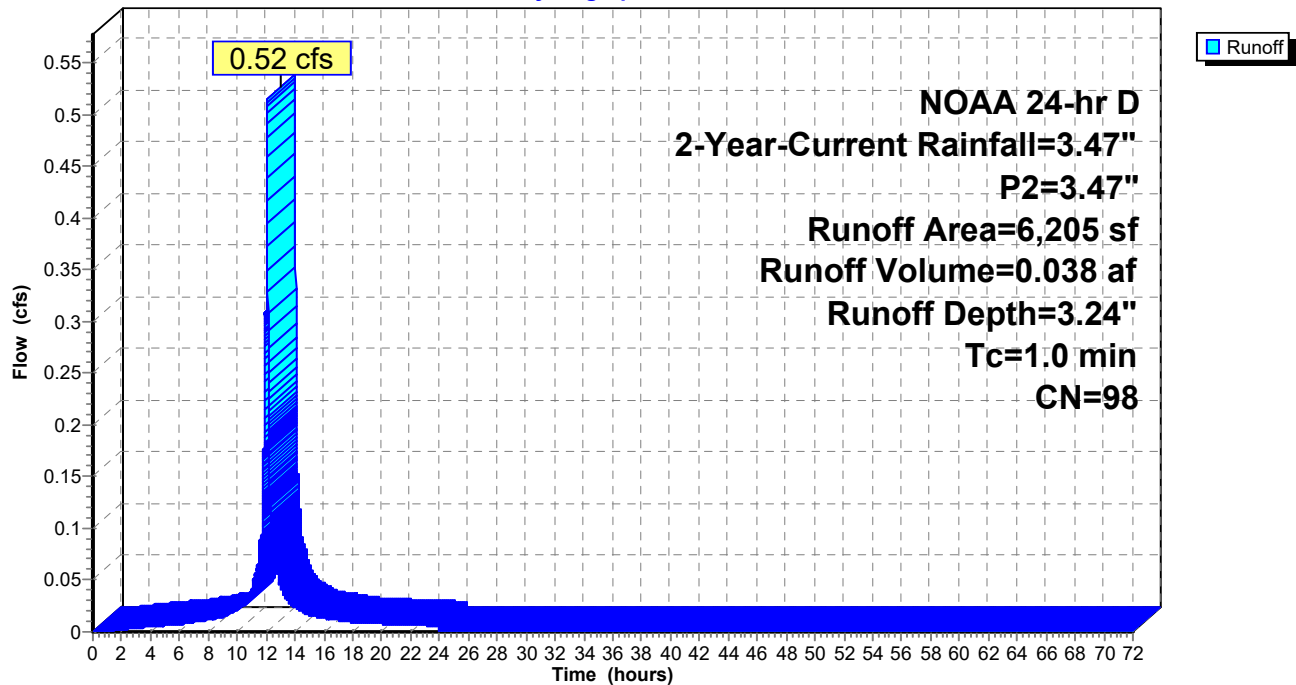
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 2-Year-Current Rainfall=3.47", P2=3.47"

Area (sf)	CN	Description
6,205	98	Roofs, HSG B
6,205		100.00% Impervious Area

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

Subcatchment 3S: Proposed Roof

Hydrograph



Summary for Subcatchment 4S: PDA #1 - Undetained Impervious

Runoff = 0.74 cfs @ 12.10 hrs, Volume= 0.055 af, Depth= 3.24"
 Routed to Link 2L : POI #1

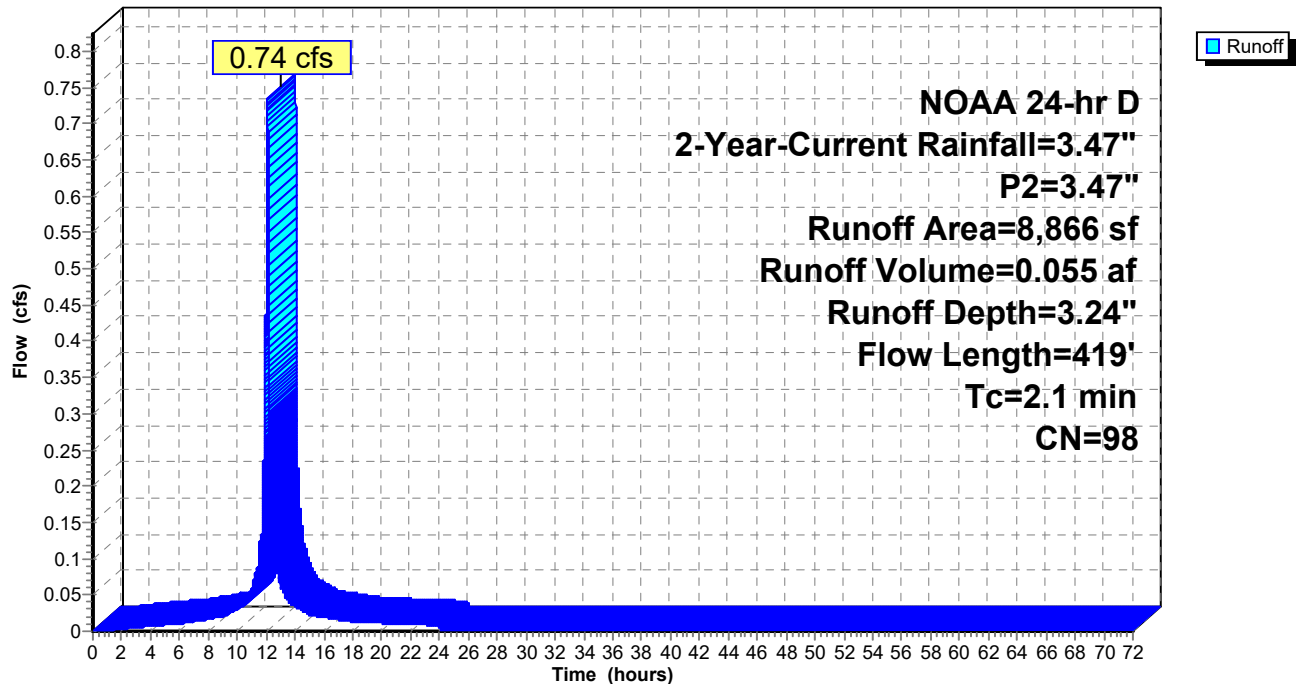
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 2-Year-Current Rainfall=3.47", P2=3.47"

Area (sf)	CN	Description
8,866	98	Paved parking, HSG D
8,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	93	0.0188	1.38		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.47"
1.0	326	0.0115	5.64	6.93	Pipe Channel, B-C 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
2.1	419	Total			

Subcatchment 4S: PDA #1 - Undetained Impervious

Hydrograph



Summary for Subcatchment 5S: PDA #1 - Undetained Pervious

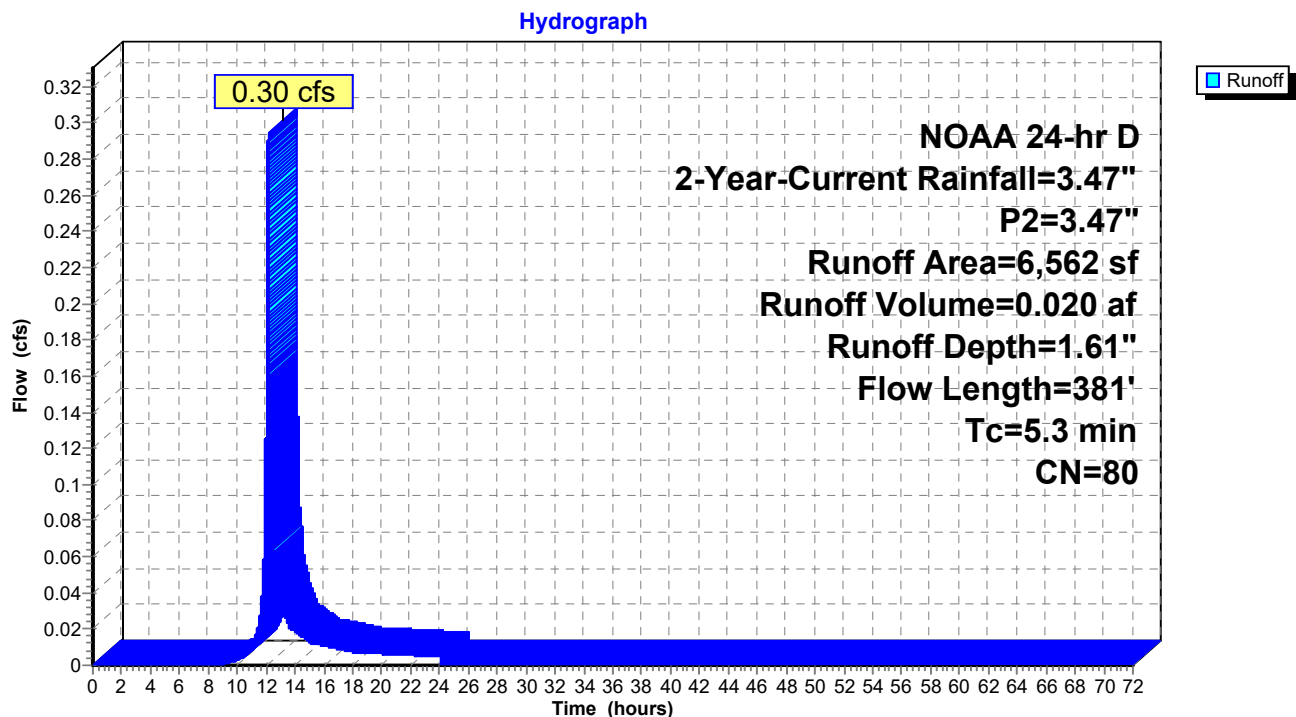
Runoff = 0.30 cfs @ 12.13 hrs, Volume= 0.020 af, Depth= 1.61"
 Routed to Link 2L : POI #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 2-Year-Current Rainfall=3.47", P2=3.47"

Area (sf)	CN	Description
6,562	80	>75% Grass cover, Good, HSG D
6,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	20	0.0200	0.09		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.47"
0.5	35	0.0200	1.16		Sheet Flow, B-C Smooth surfaces n= 0.011 P2= 3.47"
1.0	326	0.0115	5.64	6.93	Pipe Channel, C-D 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
5.3	381	Total			

Subcatchment 5S: PDA #1 - Undetained Pervious



Summary for Subcatchment 6S: PDA #1 - Impervious to Bio

Runoff = 0.33 cfs @ 12.10 hrs, Volume= 0.024 af, Depth= 3.24"
 Routed to Pond 2P : BIO BASIN

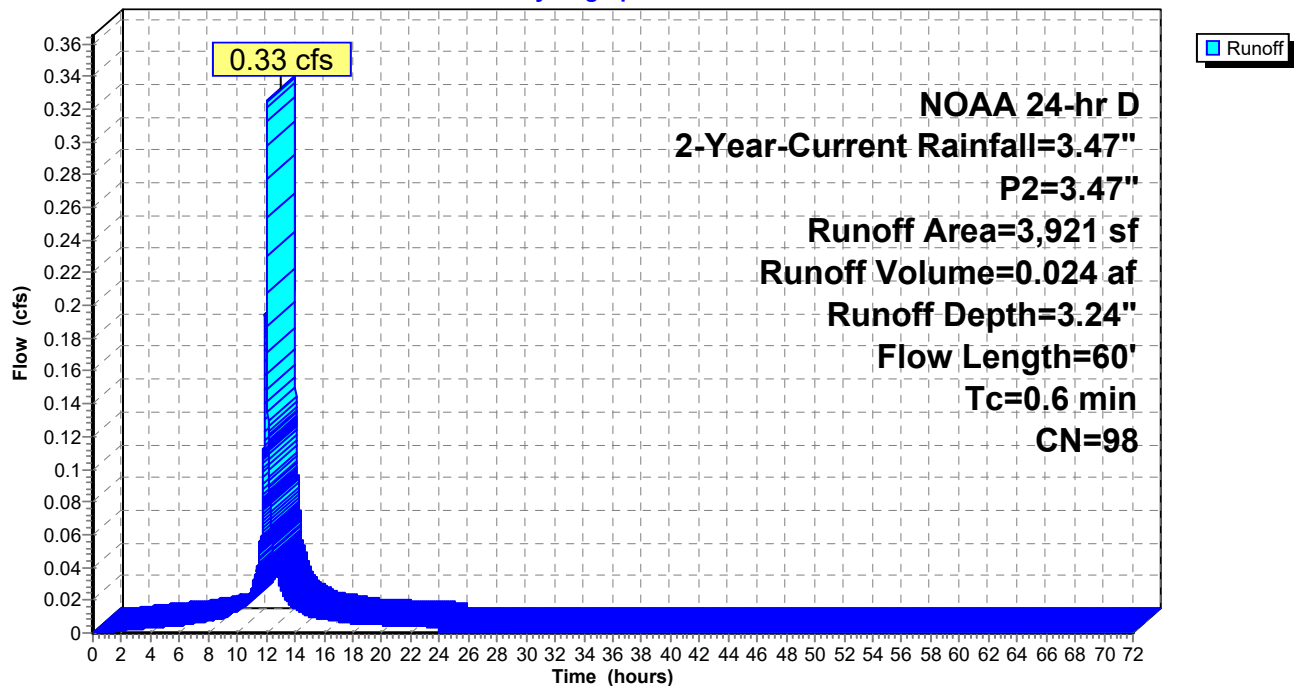
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 2-Year-Current Rainfall=3.47", P2=3.47"

Area (sf)	CN	Description
3,921	98	Paved parking, HSG B
3,921		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	42	0.0326	1.46		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.47"
0.1	18	0.1180	5.53		Shallow Concentrated Flow, B-C (RIP-RAP) Unpaved Kv= 16.1 fps
0.6	60	Total			

Subcatchment 6S: PDA #1 - Impervious to Bio

Hydrograph



Summary for Subcatchment 7S: PDA #1 - Pervious to Bio

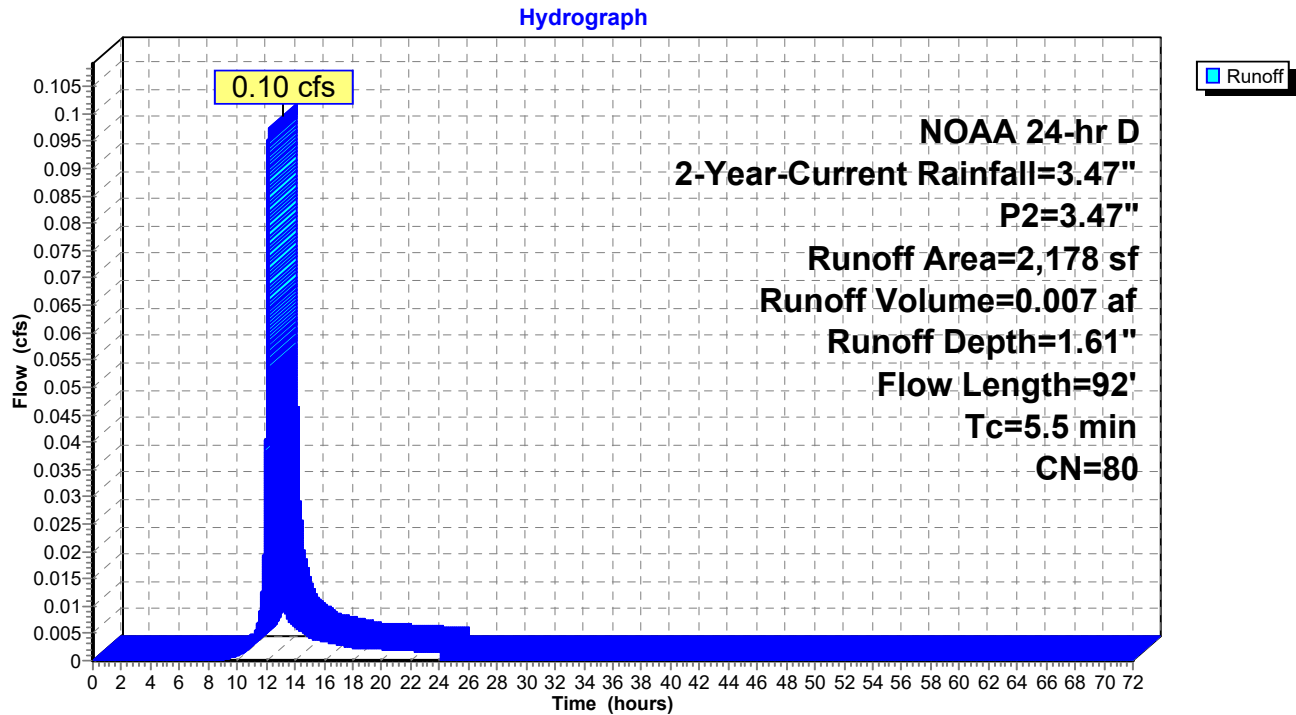
Runoff = 0.10 cfs @ 12.13 hrs, Volume= 0.007 af, Depth= 1.61"
 Routed to Pond 2P : BIO BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 2-Year-Current Rainfall=3.47", P2=3.47"

Area (sf)	CN	Description
2,178	80	>75% Grass cover, Good, HSG D
2,178		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	45	0.0450	0.14		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.47"
0.2	29	0.0148	2.47		Shallow Concentrated Flow, B-C
					Paved Kv= 20.3 fps
0.1	18	0.1180	5.53		Shallow Concentrated Flow, C-D (RIP-RAP)
					Unpaved Kv= 16.1 fps
5.5	92	Total			

Subcatchment 7S: PDA #1 - Pervious to Bio



Summary for Pond 1P: UG BASIN

Inflow Area = 0.142 ac, 100.00% Impervious, Inflow Depth = 3.24" for 2-Year-Current event
 Inflow = 0.52 cfs @ 12.10 hrs, Volume= 0.038 af
 Outflow = 0.24 cfs @ 12.12 hrs, Volume= 0.038 af, Atten= 53%, Lag= 1.2 min
 Primary = 0.24 cfs @ 12.12 hrs, Volume= 0.038 af
 Routed to Link 2L : POI #1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 Peak Elev= 618.91' @ 12.12 hrs Surf.Area= 0.006 ac Storage= 0.005 af

Plug-Flow detention time= 7.0 min calculated for 0.038 af (100% of inflow)
 Center-of-Mass det. time= 7.0 min (758.9 - 751.9)

Volume	Invert	Avail.Storage	Storage Description
#1	617.75'	0.020 af	48.0" Round Pipe Storage L= 70.0'

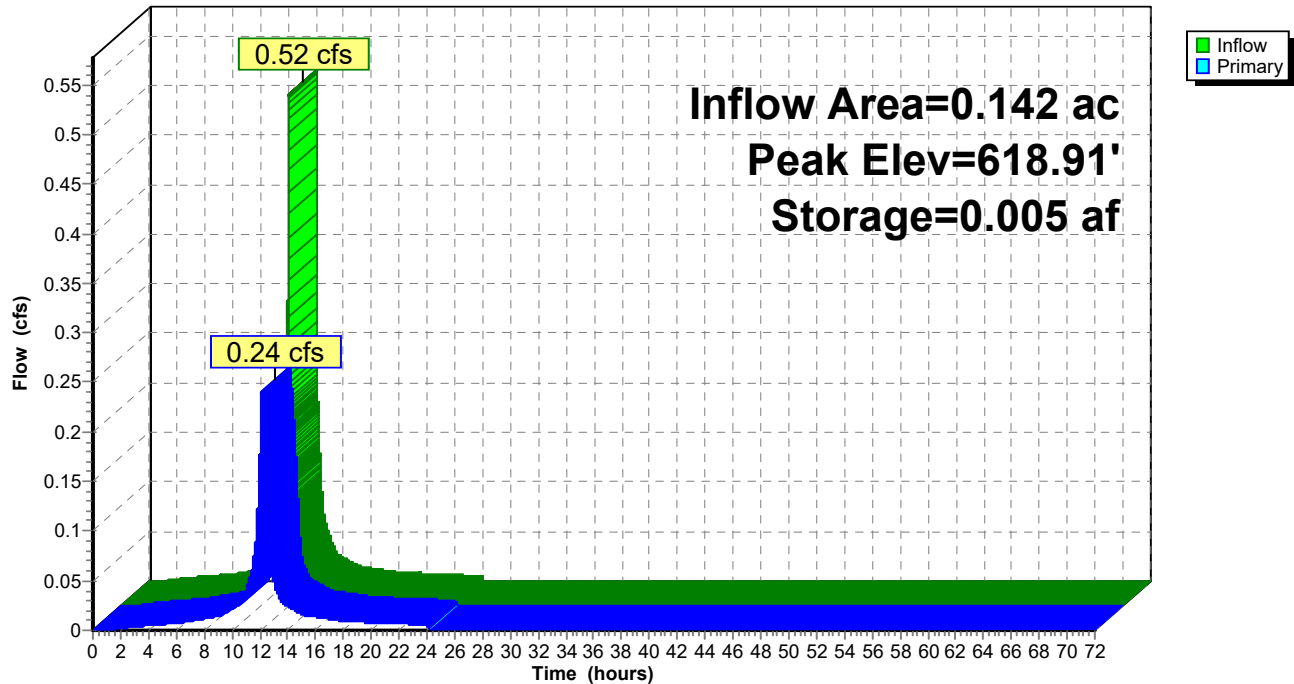
Device	Routing	Invert	Outlet Devices
#1	Primary	617.75'	15.0" Round RCP_Round 15" L= 15.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 617.75' / 617.55' S= 0.0133 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Device 1	617.75'	3.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	620.25'	6.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	621.45'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.24 cfs @ 12.12 hrs HW=618.91' (Free Discharge)

1=RCP_Round 15" (Passes 0.24 cfs of 4.44 cfs potential flow)
 2=Orifice (Orifice Controls 0.24 cfs @ 4.90 fps)
 3=Orifice (Controls 0.00 cfs)
 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond 1P: UG BASIN

Hydrograph



Summary for Pond 2P: BIO BASIN

Inflow Area = 0.140 ac, 64.29% Impervious, Inflow Depth = 2.66" for 2-Year-Current event
 Inflow = 0.42 cfs @ 12.10 hrs, Volume= 0.031 af
 Outflow = 0.27 cfs @ 12.11 hrs, Volume= 0.022 af, Atten= 35%, Lag= 0.6 min
 Primary = 0.27 cfs @ 12.11 hrs, Volume= 0.022 af
 Routed to Link 2L : POI #1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 Peak Elev= 623.15' @ 12.11 hrs Surf.Area= 633 sf Storage= 538 cf

Plug-Flow detention time= 198.9 min calculated for 0.022 af (72% of inflow)
 Center-of-Mass det. time= 97.3 min (870.0 - 772.7)

Volume	Invert	Avail.Storage	Storage Description
#1	622.00'	1,219 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
622.00	323	0	0
623.00	577	450	450
624.00	960	769	1,219

Device	Routing	Invert	Outlet Devices
#1	Primary	619.11'	15.0" Round Culvert L= 35.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 619.11' / 618.93' S= 0.0051 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	622.86'	0.6' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Device 1	623.70'	48.0" x 48.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.27 cfs @ 12.11 hrs HW=623.15' (Free Discharge)

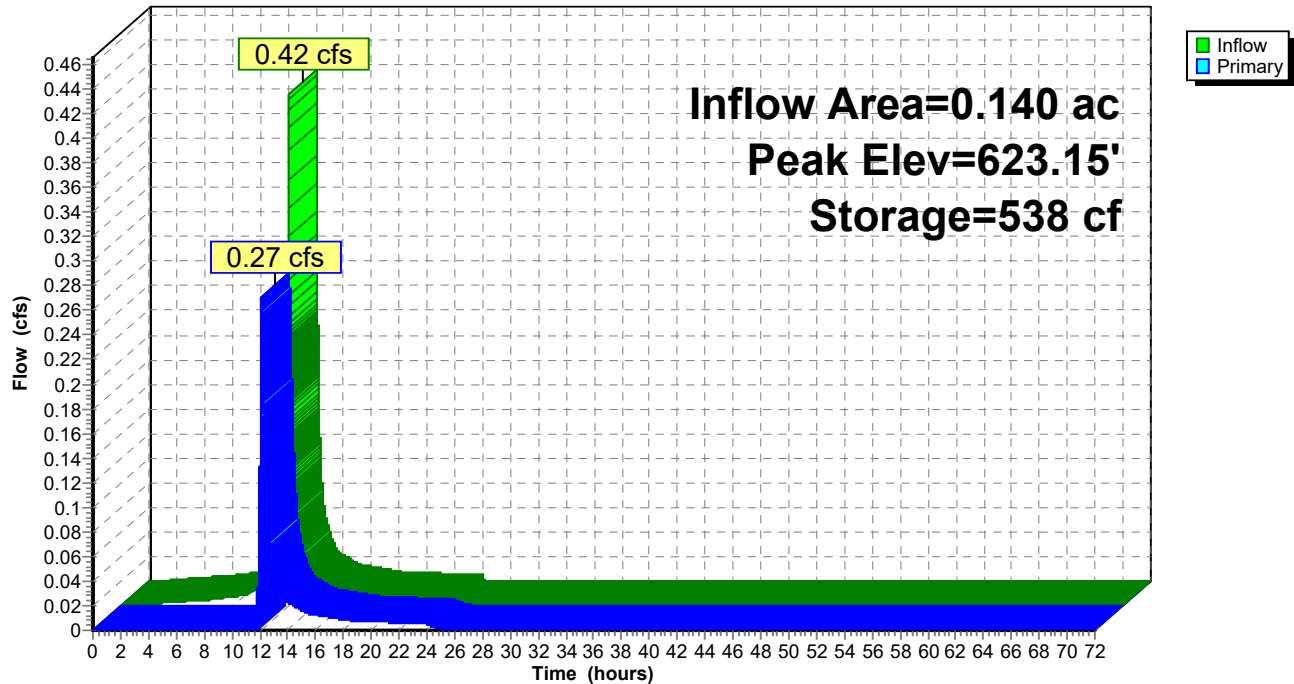
1=Culvert (Passes 0.27 cfs of 12.25 cfs potential flow)

2=Sharp-Crested Rectangular Weir (Weir Controls 0.27 cfs @ 1.75 fps)

3=Grate (Controls 0.00 cfs)

Pond 2P: BIO BASIN

Hydrograph

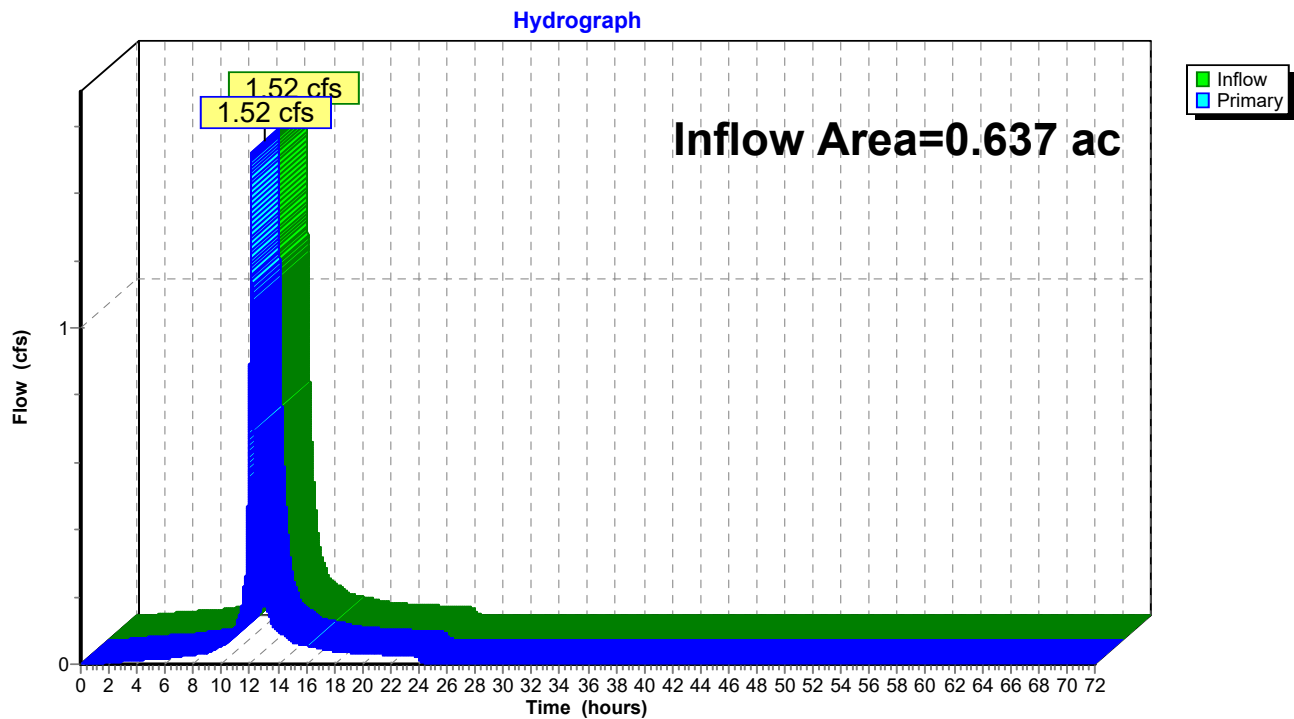


Summary for Link 2L: POI #1

Inflow Area = 0.637 ac, 68.48% Impervious, Inflow Depth = 2.56" for 2-Year-Current event
Inflow = 1.52 cfs @ 12.11 hrs, Volume= 0.136 af
Primary = 1.52 cfs @ 12.11 hrs, Volume= 0.136 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs

Link 2L: POI #1



Summary for Subcatchment 3S: Proposed Roof

Runoff = 0.61 cfs @ 12.10 hrs, Volume= 0.046 af, Depth= 3.85"
 Routed to Pond 1P : UG BASIN

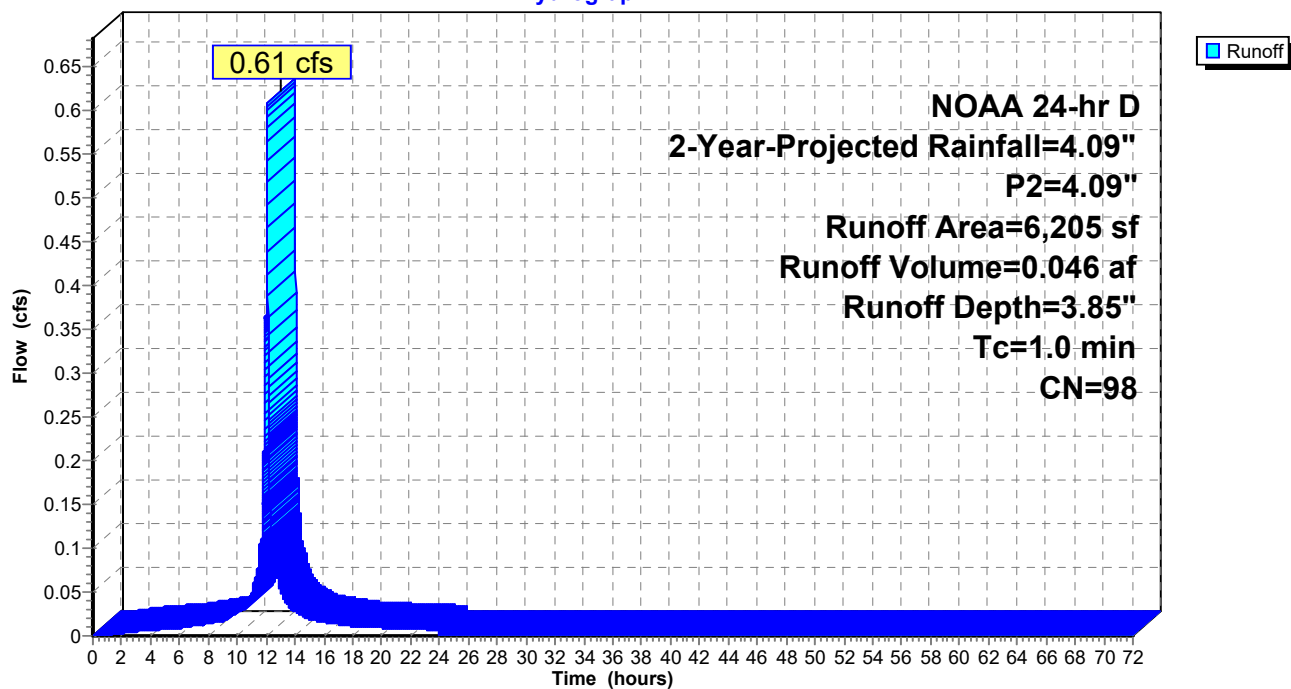
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 2-Year-Projected Rainfall=4.09", P2=4.09"

Area (sf)	CN	Description
6,205	98	Roofs, HSG B
6,205		100.00% Impervious Area

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

Subcatchment 3S: Proposed Roof

Hydrograph



Summary for Subcatchment 4S: PDA #1 - Undetained Impervious

Runoff = 0.87 cfs @ 12.10 hrs, Volume= 0.065 af, Depth= 3.85"
 Routed to Link 2L : POI #1

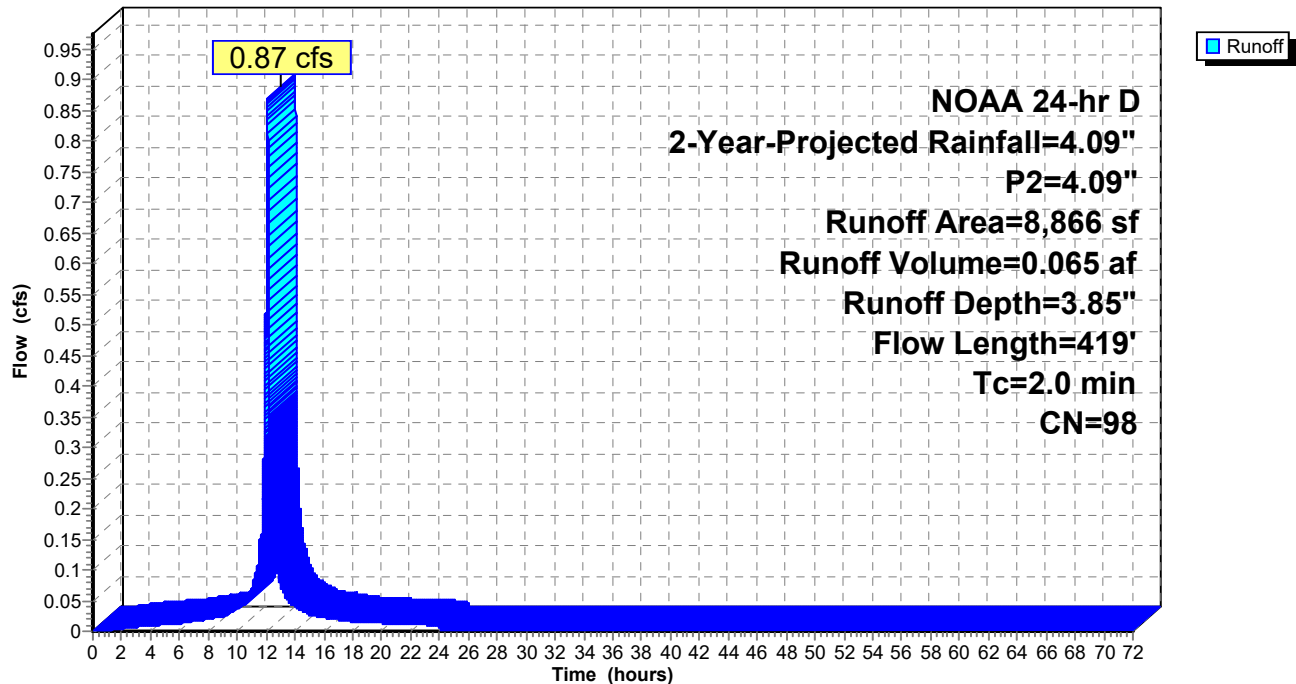
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 2-Year-Projected Rainfall=4.09", P2=4.09"

Area (sf)	CN	Description
8,866	98	Paved parking, HSG D
8,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	93	0.0188	1.50		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 4.09"
1.0	326	0.0115	5.64	6.93	Pipe Channel, B-C 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
2.0	419	Total			

Subcatchment 4S: PDA #1 - Undetained Impervious

Hydrograph



Summary for Subcatchment 5S: PDA #1 - Undetained Pervious

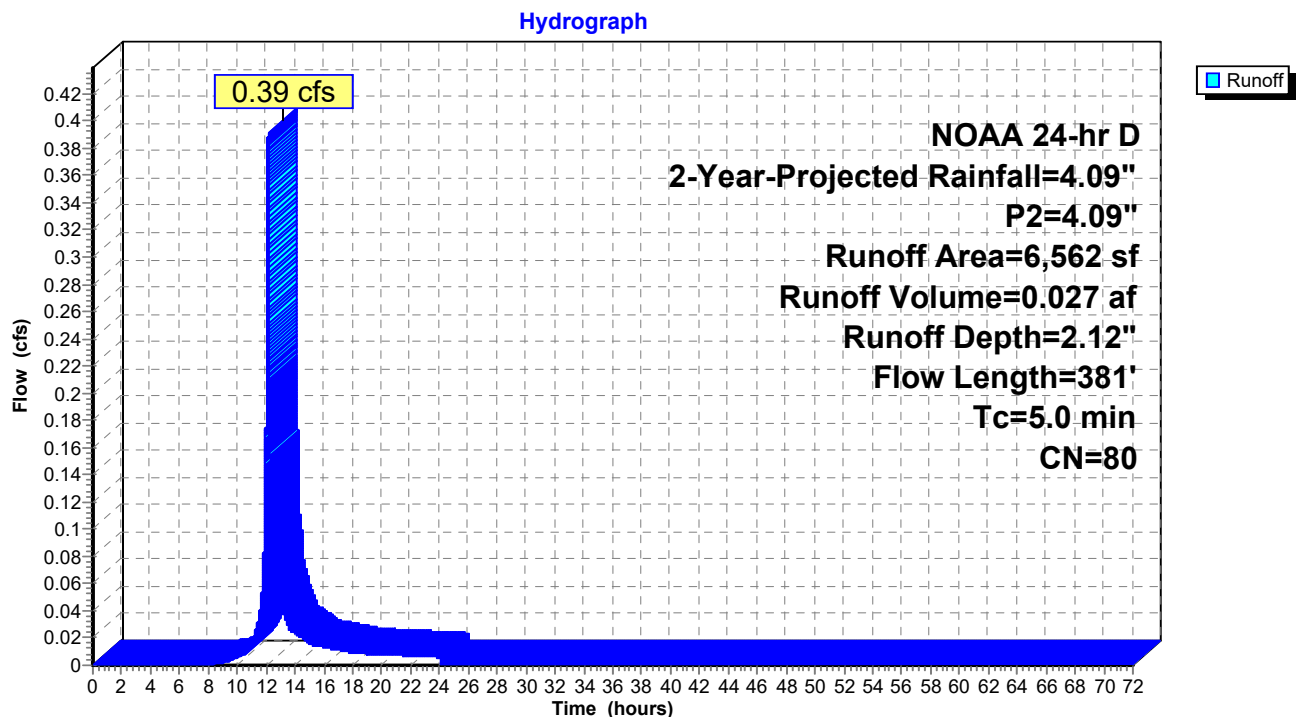
Runoff = 0.39 cfs @ 12.13 hrs, Volume= 0.027 af, Depth= 2.12"
 Routed to Link 2L : POI #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 2-Year-Projected Rainfall=4.09", P2=4.09"

Area (sf)	CN	Description
6,562	80	>75% Grass cover, Good, HSG D
6,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	20	0.0200	0.10		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 4.09"
0.5	35	0.0200	1.26		Sheet Flow, B-C Smooth surfaces n= 0.011 P2= 4.09"
1.0	326	0.0115	5.64	6.93	Pipe Channel, C-D 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
5.0	381	Total			

Subcatchment 5S: PDA #1 - Undetained Pervious



Summary for Subcatchment 6S: PDA #1 - Impervious to Bio

Runoff = 0.38 cfs @ 12.10 hrs, Volume= 0.029 af, Depth= 3.85"
 Routed to Pond 2P : BIO BASIN

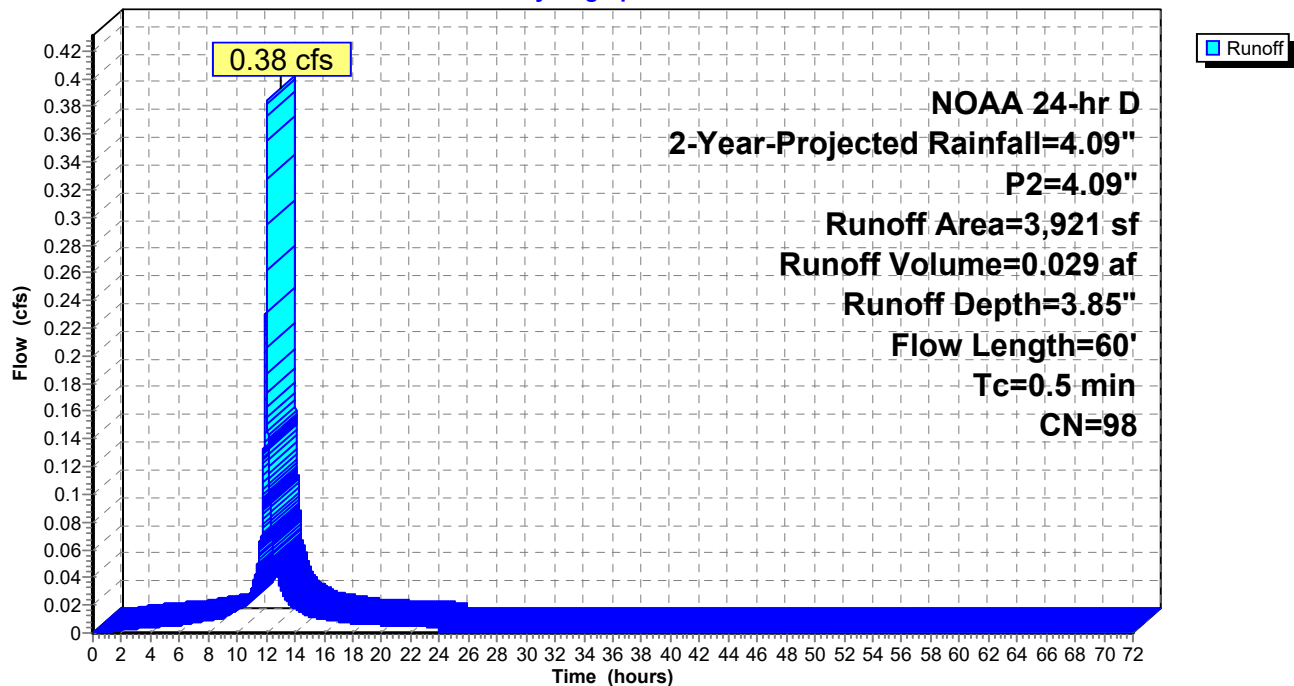
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 2-Year-Projected Rainfall=4.09", P2=4.09"

Area (sf)	CN	Description
3,921	98	Paved parking, HSG B
3,921		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	42	0.0326	1.59		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 4.09"
0.1	18	0.1180	5.53		Shallow Concentrated Flow, B-C (RIP-RAP) Unpaved Kv= 16.1 fps
0.5	60	Total			

Subcatchment 6S: PDA #1 - Impervious to Bio

Hydrograph



Summary for Subcatchment 7S: PDA #1 - Pervious to Bio

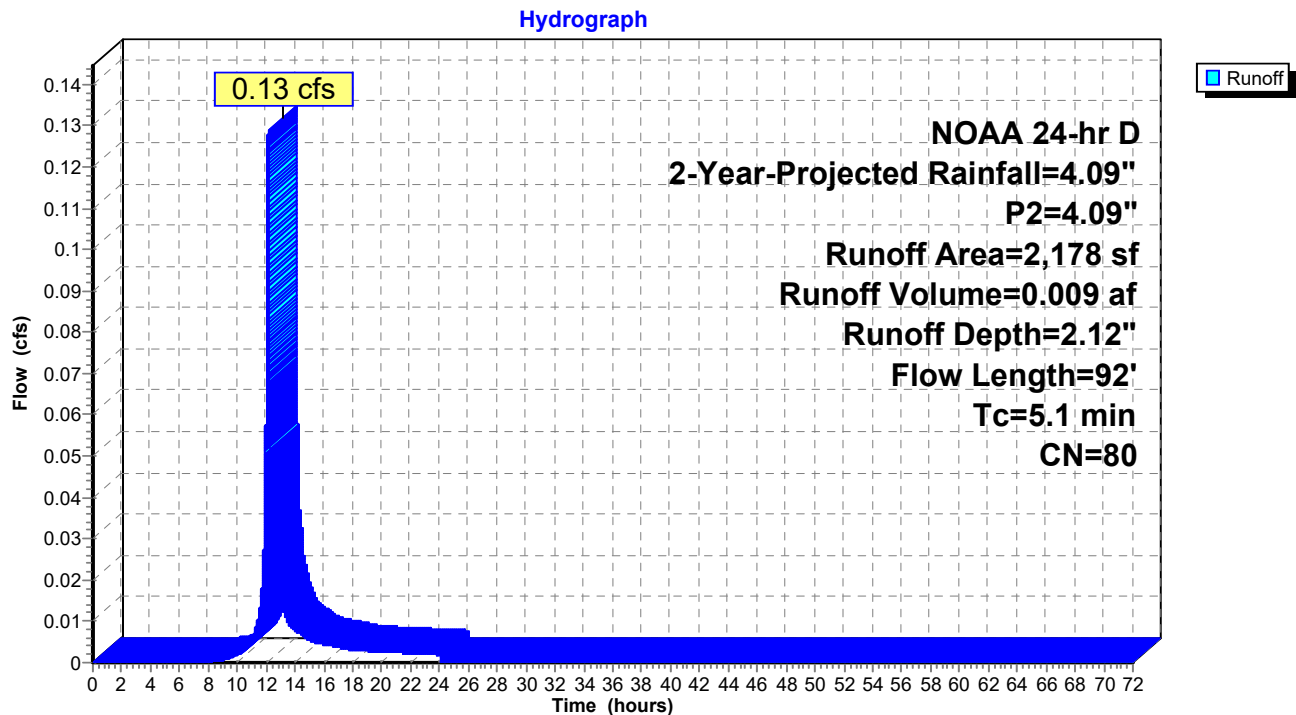
Runoff = 0.13 cfs @ 12.12 hrs, Volume= 0.009 af, Depth= 2.12"
 Routed to Pond 2P : BIO BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 2-Year-Projected Rainfall=4.09", P2=4.09"

Area (sf)	CN	Description
2,178	80	>75% Grass cover, Good, HSG D
2,178		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	45	0.0450	0.16		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 4.09"
0.2	29	0.0148	2.47		Shallow Concentrated Flow, B-C
					Paved Kv= 20.3 fps
0.1	18	0.1180	5.53		Shallow Concentrated Flow, C-D (RIP-RAP)
					Unpaved Kv= 16.1 fps
5.1	92	Total			

Subcatchment 7S: PDA #1 - Pervious to Bio



Summary for Pond 1P: UG BASIN

Inflow Area = 0.142 ac, 100.00% Impervious, Inflow Depth = 3.85" for 2-Year-Projected event
 Inflow = 0.61 cfs @ 12.10 hrs, Volume= 0.046 af
 Outflow = 0.26 cfs @ 12.12 hrs, Volume= 0.046 af, Atten= 57%, Lag= 1.3 min
 Primary = 0.26 cfs @ 12.12 hrs, Volume= 0.046 af
 Routed to Link 2L : POI #1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 Peak Elev= 619.13' @ 12.12 hrs Surf.Area= 0.006 ac Storage= 0.006 af

Plug-Flow detention time= 7.7 min calculated for 0.046 af (100% of inflow)
 Center-of-Mass det. time= 7.7 min (756.1 - 748.5)

Volume	Invert	Avail.Storage	Storage Description
#1	617.75'	0.020 af	48.0" Round Pipe Storage L= 70.0'

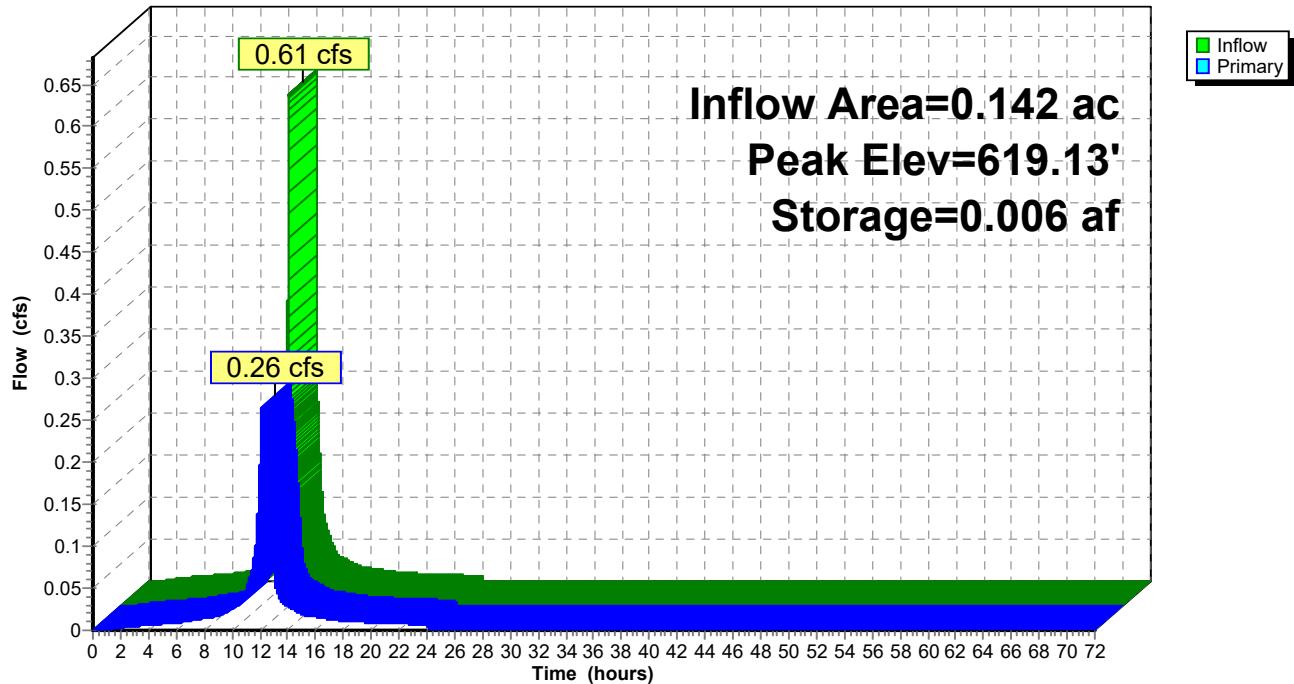
Device	Routing	Invert	Outlet Devices
#1	Primary	617.75'	15.0" Round RCP_Round 15" L= 15.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 617.75' / 617.55' S= 0.0133 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Device 1	617.75'	3.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	620.25'	6.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	621.45'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.26 cfs @ 12.12 hrs HW=619.13' (Free Discharge)

1=RCP_Round 15" (Passes 0.26 cfs of 5.56 cfs potential flow)
 2=Orifice (Orifice Controls 0.26 cfs @ 5.38 fps)
 3=Orifice (Controls 0.00 cfs)
 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond 1P: UG BASIN

Hydrograph



Summary for Pond 2P: BIO BASIN

Inflow Area = 0.140 ac, 64.29% Impervious, Inflow Depth = 3.23" for 2-Year-Projected event
 Inflow = 0.51 cfs @ 12.10 hrs, Volume= 0.038 af
 Outflow = 0.35 cfs @ 12.11 hrs, Volume= 0.029 af, Atten= 32%, Lag= 0.5 min
 Primary = 0.35 cfs @ 12.11 hrs, Volume= 0.029 af
 Routed to Link 2L : POI #1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 Peak Elev= 623.20' @ 12.11 hrs Surf.Area= 654 sf Storage= 574 cf

Plug-Flow detention time= 178.8 min calculated for 0.029 af (77% of inflow)
 Center-of-Mass det. time= 87.3 min (856.8 - 769.5)

Volume	Invert	Avail.Storage	Storage Description
#1	622.00'	1,219 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

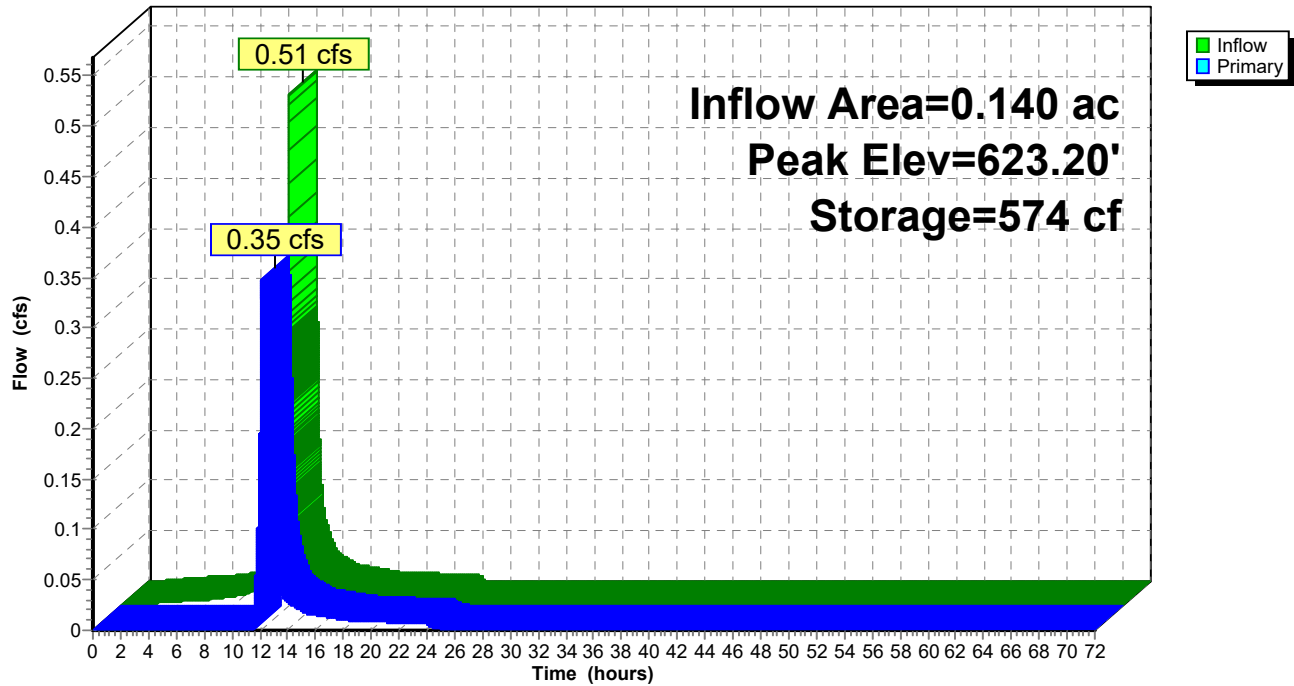
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
622.00	323	0	0
623.00	577	450	450
624.00	960	769	1,219

Device	Routing	Invert	Outlet Devices
#1	Primary	619.11'	15.0" Round Culvert L= 35.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 619.11' / 618.93' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	622.86'	0.6' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Device 1	623.70'	48.0" x 48.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.35 cfs @ 12.11 hrs HW=623.20' (Free Discharge)
 1=Culvert (Passes 0.35 cfs of 12.37 cfs potential flow)
 2=Sharp-Crested Rectangular Weir (Weir Controls 0.35 cfs @ 1.91 fps)
 3=Grate (Controls 0.00 cfs)

Pond 2P: BIO BASIN

Hydrograph

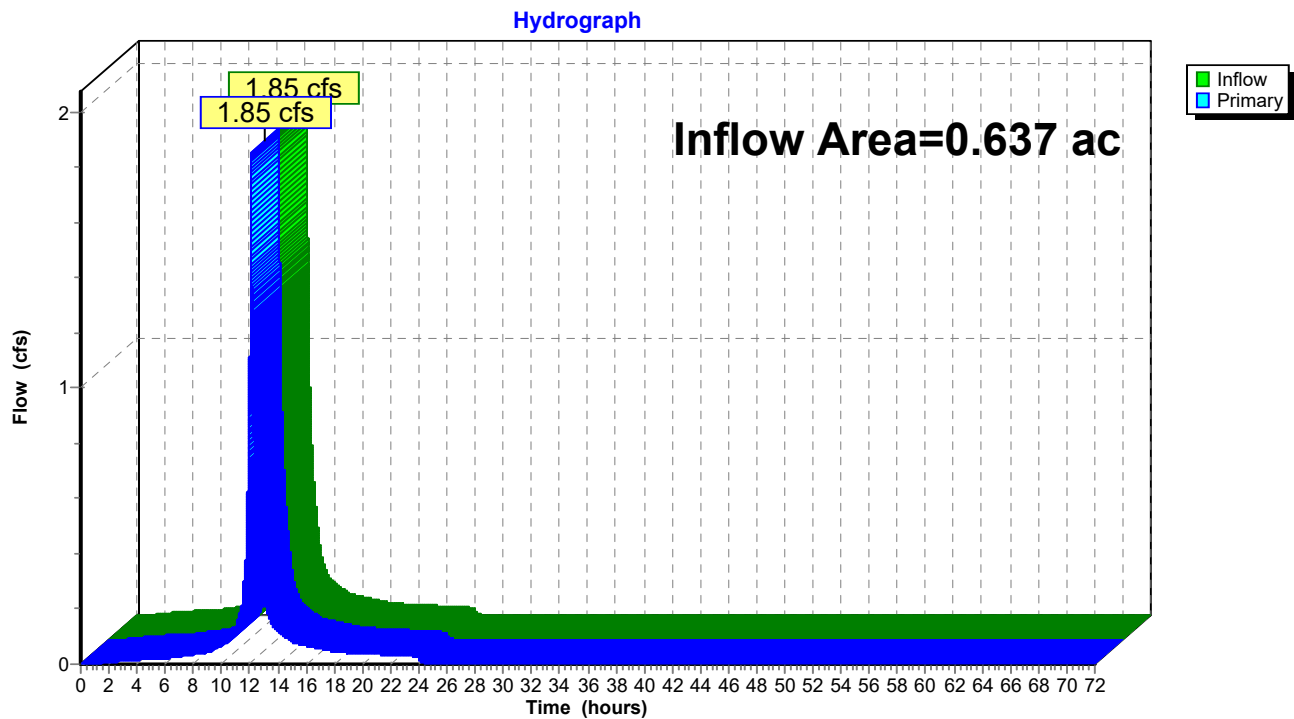


Summary for Link 2L: POI #1

Inflow Area = 0.637 ac, 68.48% Impervious, Inflow Depth = 3.15" for 2-Year-Projected event
Inflow = 1.85 cfs @ 12.11 hrs, Volume= 0.167 af
Primary = 1.85 cfs @ 12.11 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs

Link 2L: POI #1



Summary for Subcatchment 3S: Proposed Roof

Runoff = 0.80 cfs @ 12.10 hrs, Volume= 0.061 af, Depth= 5.14"
 Routed to Pond 1P : UG BASIN

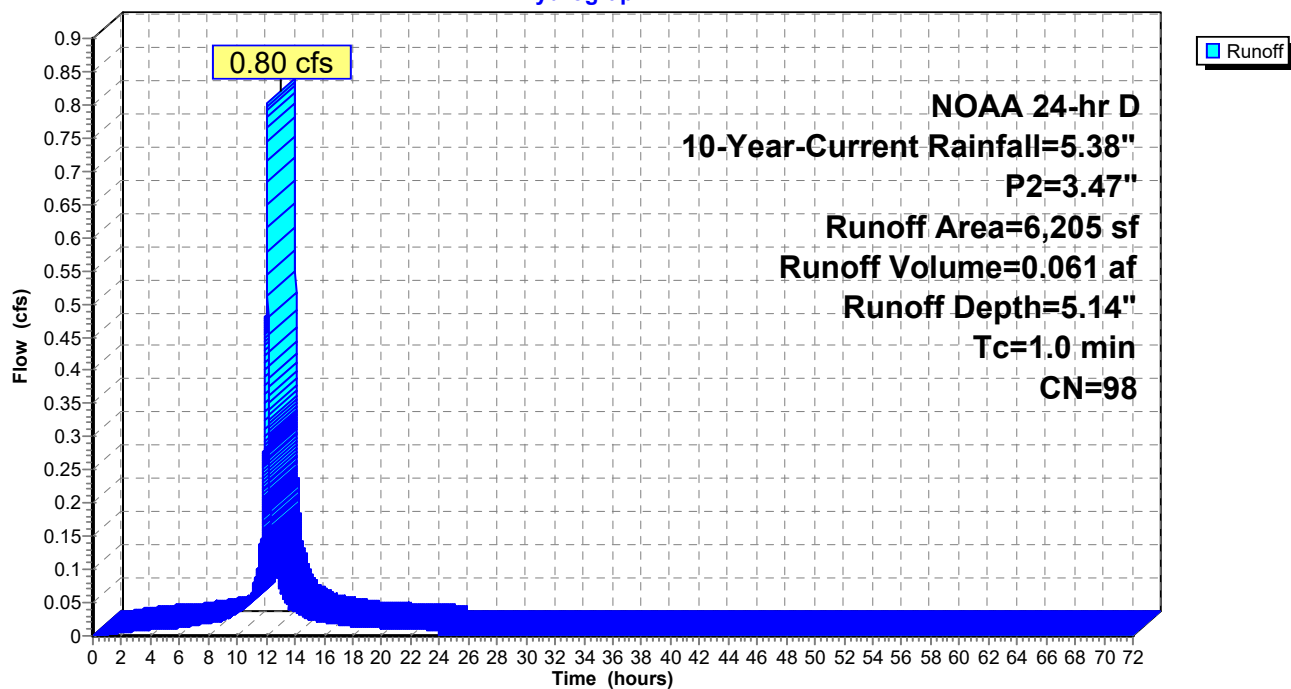
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 10-Year-Current Rainfall=5.38", P2=3.47"

Area (sf)	CN	Description
6,205	98	Roofs, HSG B
6,205		100.00% Impervious Area

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

Subcatchment 3S: Proposed Roof

Hydrograph



Summary for Subcatchment 4S: PDA #1 - Undetained Impervious

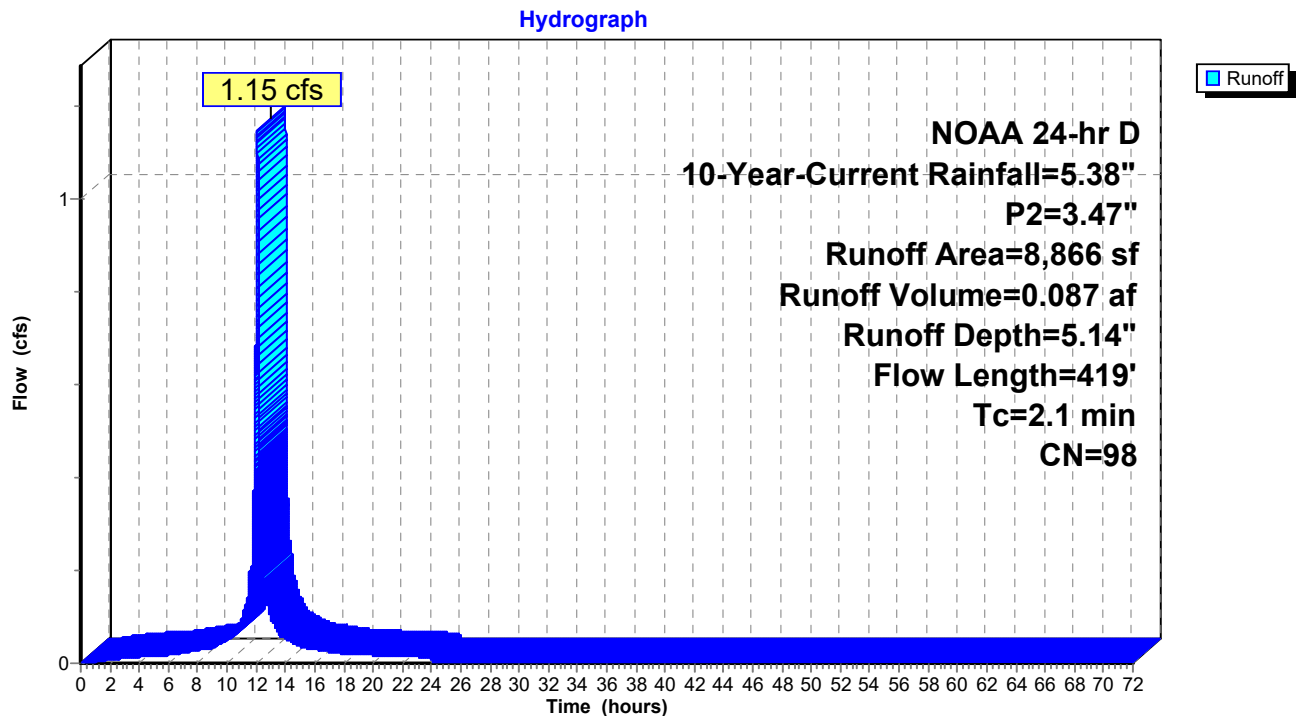
Runoff = 1.15 cfs @ 12.10 hrs, Volume= 0.087 af, Depth= 5.14"
 Routed to Link 2L : POI #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 10-Year-Current Rainfall=5.38", P2=3.47"

Area (sf)	CN	Description
8,866	98	Paved parking, HSG D
8,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	93	0.0188	1.38		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.47"
1.0	326	0.0115	5.64	6.93	Pipe Channel, B-C 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
2.1	419	Total			

Subcatchment 4S: PDA #1 - Undetained Impervious



Summary for Subcatchment 5S: PDA #1 - Undetained Pervious

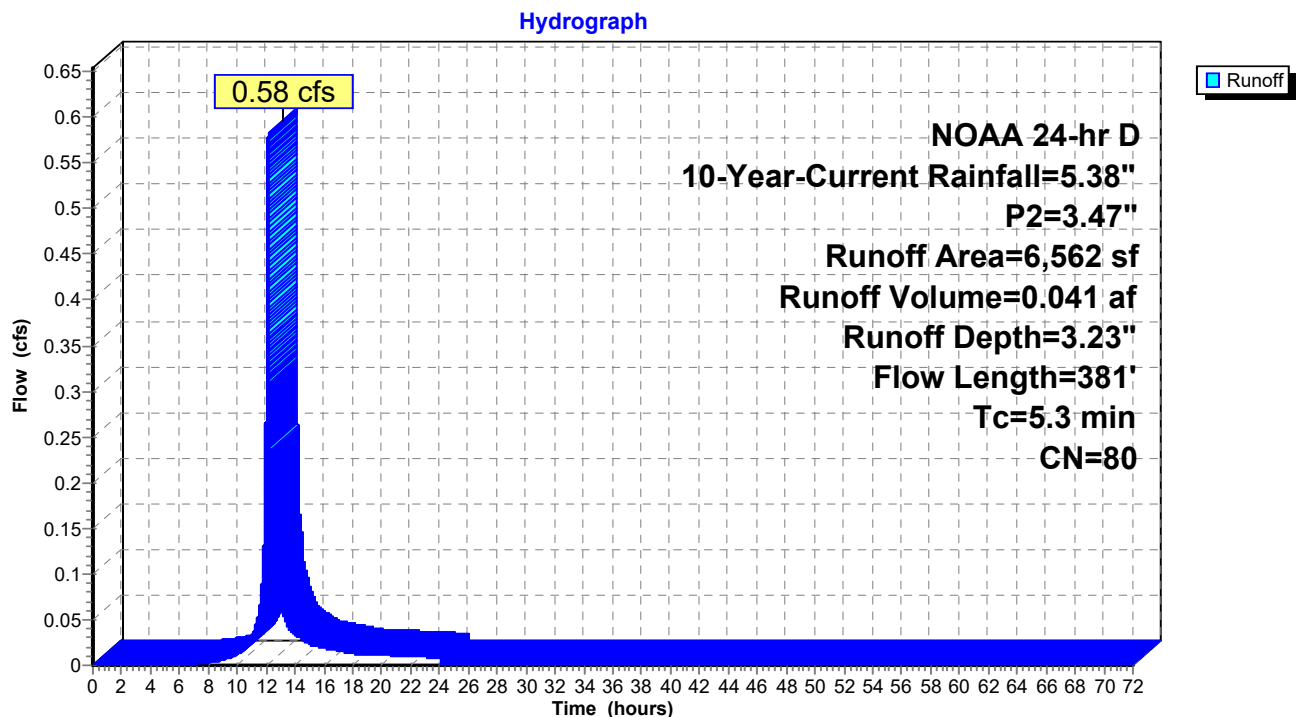
Runoff = 0.58 cfs @ 12.13 hrs, Volume= 0.041 af, Depth= 3.23"
 Routed to Link 2L : POI #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 10-Year-Current Rainfall=5.38", P2=3.47"

Area (sf)	CN	Description
6,562	80	>75% Grass cover, Good, HSG D
6,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	20	0.0200	0.09		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.47"
0.5	35	0.0200	1.16		Sheet Flow, B-C Smooth surfaces n= 0.011 P2= 3.47"
1.0	326	0.0115	5.64	6.93	Pipe Channel, C-D 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
5.3	381	Total			

Subcatchment 5S: PDA #1 - Undetained Pervious



Summary for Subcatchment 6S: PDA #1 - Impervious to Bio

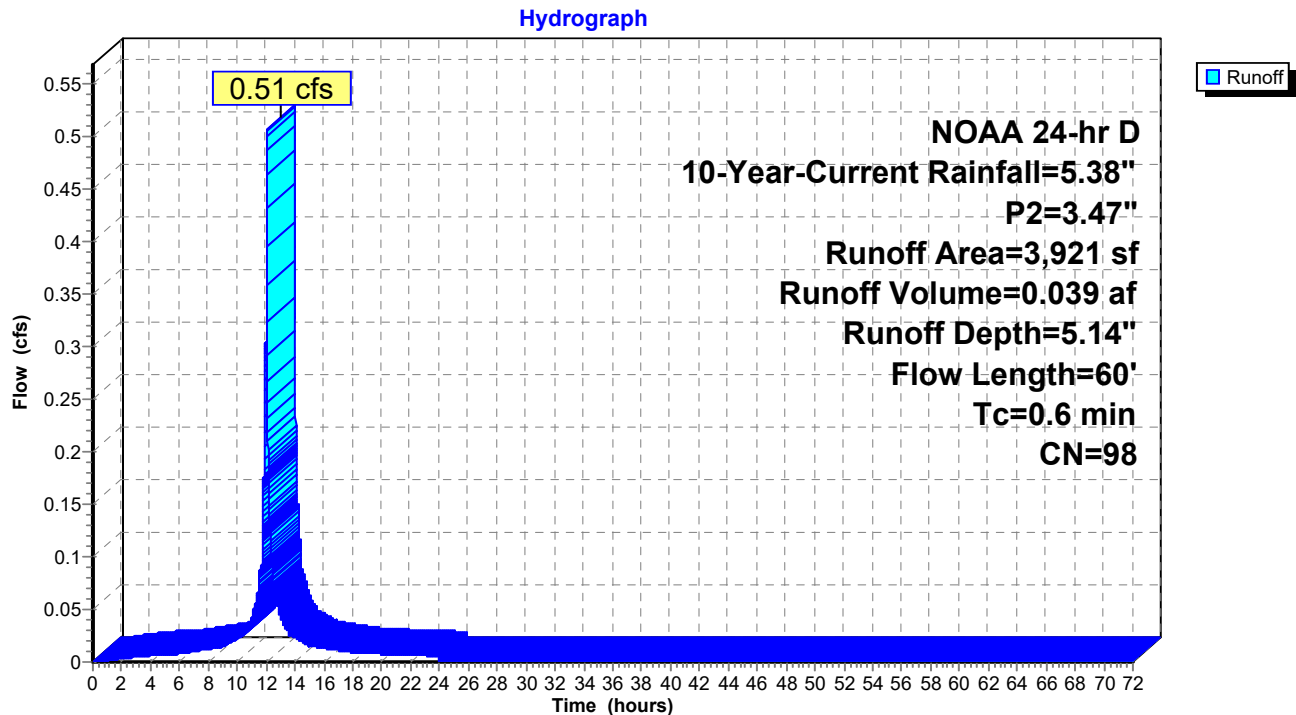
Runoff = 0.51 cfs @ 12.10 hrs, Volume= 0.039 af, Depth= 5.14"
 Routed to Pond 2P : BIO BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 10-Year-Current Rainfall=5.38", P2=3.47"

Area (sf)	CN	Description
3,921	98	Paved parking, HSG B
3,921		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	42	0.0326	1.46		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.47"
0.1	18	0.1180	5.53		Shallow Concentrated Flow, B-C (RIP-RAP) Unpaved Kv= 16.1 fps
0.6	60	Total			

Subcatchment 6S: PDA #1 - Impervious to Bio



Summary for Subcatchment 7S: PDA #1 - Pervious to Bio

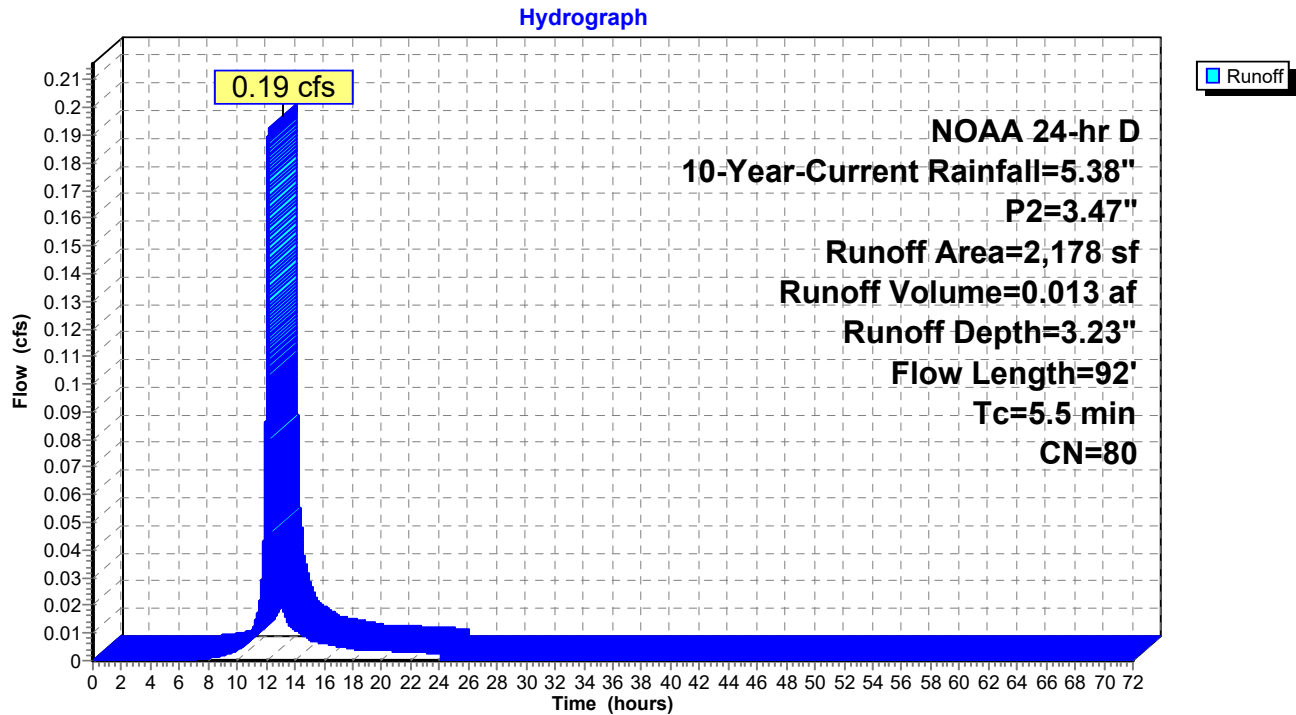
Runoff = 0.19 cfs @ 12.13 hrs, Volume= 0.013 af, Depth= 3.23"
 Routed to Pond 2P : BIO BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 10-Year-Current Rainfall=5.38", P2=3.47"

Area (sf)	CN	Description
2,178	80	>75% Grass cover, Good, HSG D
2,178		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	45	0.0450	0.14		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.47"
0.2	29	0.0148	2.47		Shallow Concentrated Flow, B-C
					Paved Kv= 20.3 fps
0.1	18	0.1180	5.53		Shallow Concentrated Flow, C-D (RIP-RAP)
					Unpaved Kv= 16.1 fps
5.5	92	Total			

Subcatchment 7S: PDA #1 - Pervious to Bio



Summary for Pond 1P: UG BASIN

Inflow Area = 0.142 ac, 100.00% Impervious, Inflow Depth = 5.14" for 10-Year-Current event
 Inflow = 0.80 cfs @ 12.10 hrs, Volume= 0.061 af
 Outflow = 0.31 cfs @ 12.13 hrs, Volume= 0.061 af, Atten= 62%, Lag= 1.7 min
 Primary = 0.31 cfs @ 12.13 hrs, Volume= 0.061 af
 Routed to Link 2L : POI #1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 Peak Elev= 619.58' @ 12.13 hrs Surf.Area= 0.006 ac Storage= 0.009 af

Plug-Flow detention time= 9.0 min calculated for 0.061 af (100% of inflow)
 Center-of-Mass det. time= 9.0 min (752.4 - 743.4)

Volume	Invert	Avail.Storage	Storage Description
#1	617.75'	0.020 af	48.0" Round Pipe Storage L= 70.0'

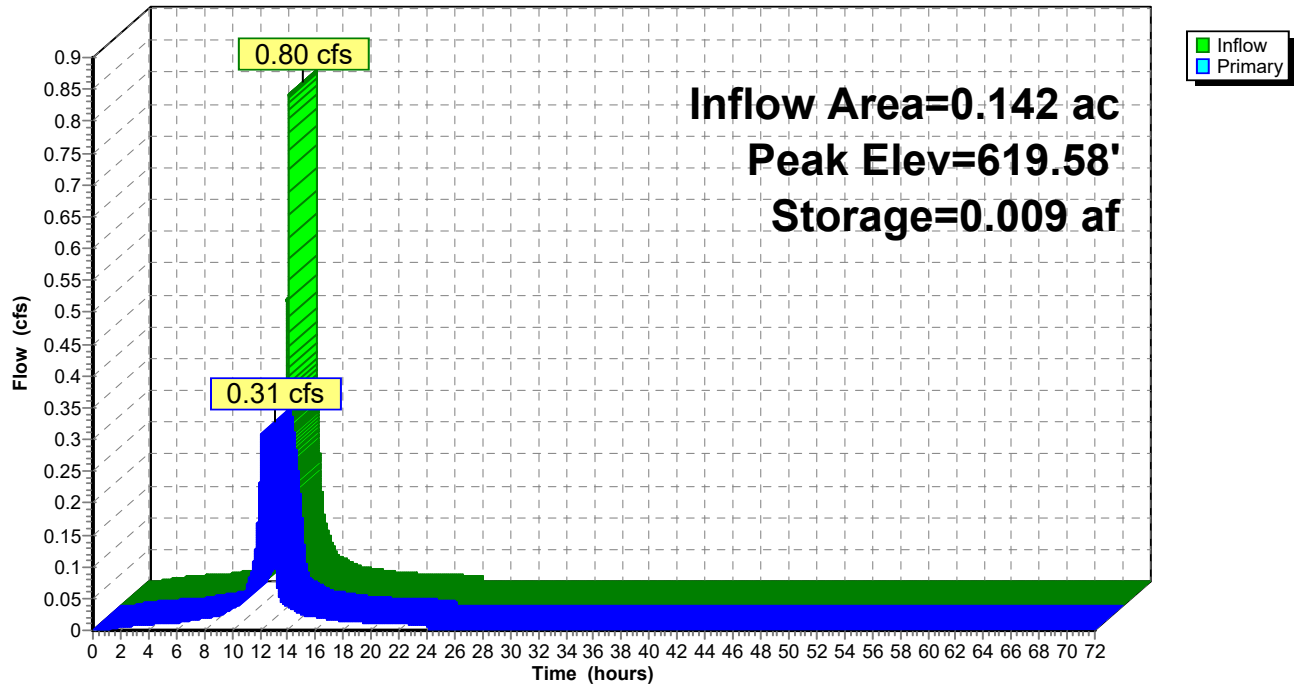
Device	Routing	Invert	Outlet Devices
#1	Primary	617.75'	15.0" Round RCP_Round 15" L= 15.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 617.75' / 617.55' S= 0.0133 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Device 1	617.75'	3.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	620.25'	6.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	621.45'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.31 cfs @ 12.13 hrs HW=619.58' (Free Discharge)

1=RCP_Round 15" (Passes 0.31 cfs of 7.36 cfs potential flow)
 2=Orifice (Orifice Controls 0.31 cfs @ 6.29 fps)
 3=Orifice (Controls 0.00 cfs)
 4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond 1P: UG BASIN

Hydrograph



Summary for Pond 2P: BIO BASIN

Inflow Area = 0.140 ac, 64.29% Impervious, Inflow Depth = 4.46" for 10-Year-Current event
 Inflow = 0.69 cfs @ 12.10 hrs, Volume= 0.052 af
 Outflow = 0.48 cfs @ 12.11 hrs, Volume= 0.043 af, Atten= 30%, Lag= 0.5 min
 Primary = 0.48 cfs @ 12.11 hrs, Volume= 0.043 af
 Routed to Link 2L : POI #1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 Peak Elev= 623.29' @ 12.11 hrs Surf.Area= 689 sf Storage= 636 cf

Plug-Flow detention time= 150.3 min calculated for 0.043 af (84% of inflow)
 Center-of-Mass det. time= 74.8 min (839.5 - 764.7)

Volume	Invert	Avail.Storage	Storage Description
#1	622.00'	1,219 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

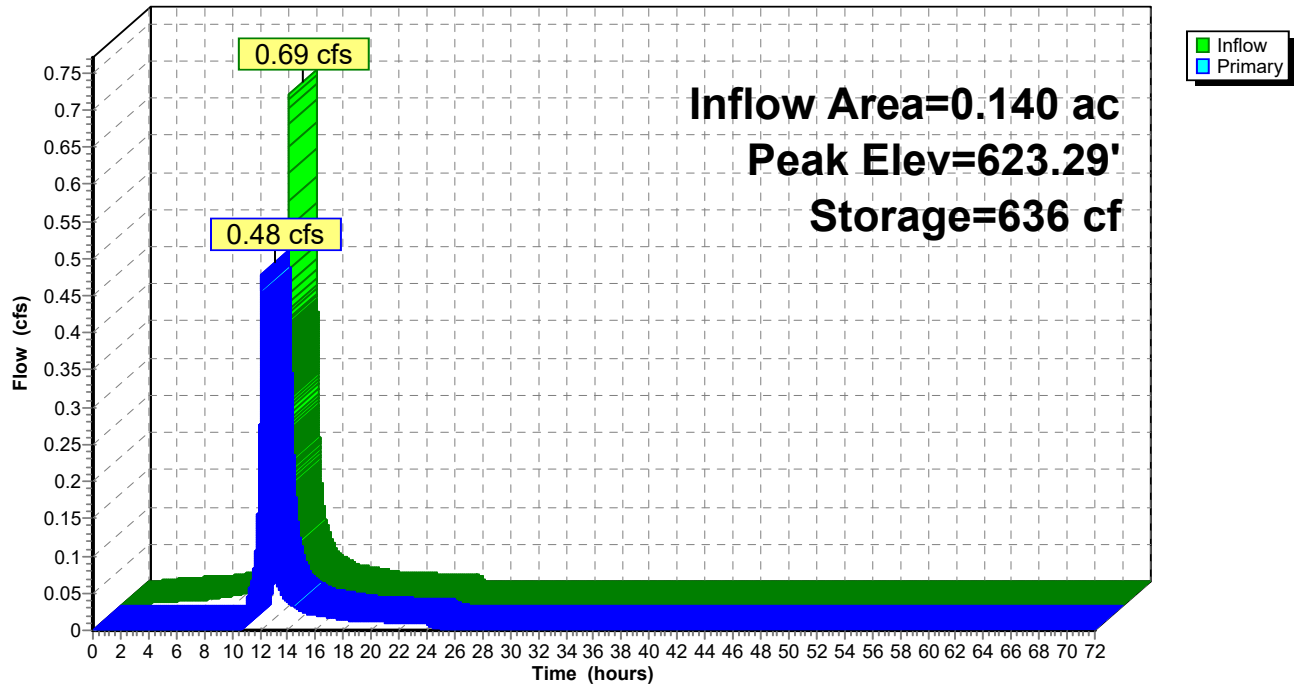
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
622.00	323	0	0
623.00	577	450	450
624.00	960	769	1,219

Device	Routing	Invert	Outlet Devices
#1	Primary	619.11'	15.0" Round Culvert L= 35.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 619.11' / 618.93' S= 0.0051 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	622.86'	0.6' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Device 1	623.70'	48.0" x 48.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.48 cfs @ 12.11 hrs HW=623.29' (Free Discharge)
 1=Culvert (Passes 0.48 cfs of 12.55 cfs potential flow)
 2=Sharp-Crested Rectangular Weir (Weir Controls 0.48 cfs @ 2.15 fps)
 3=Grate (Controls 0.00 cfs)

Pond 2P: BIO BASIN

Hydrograph

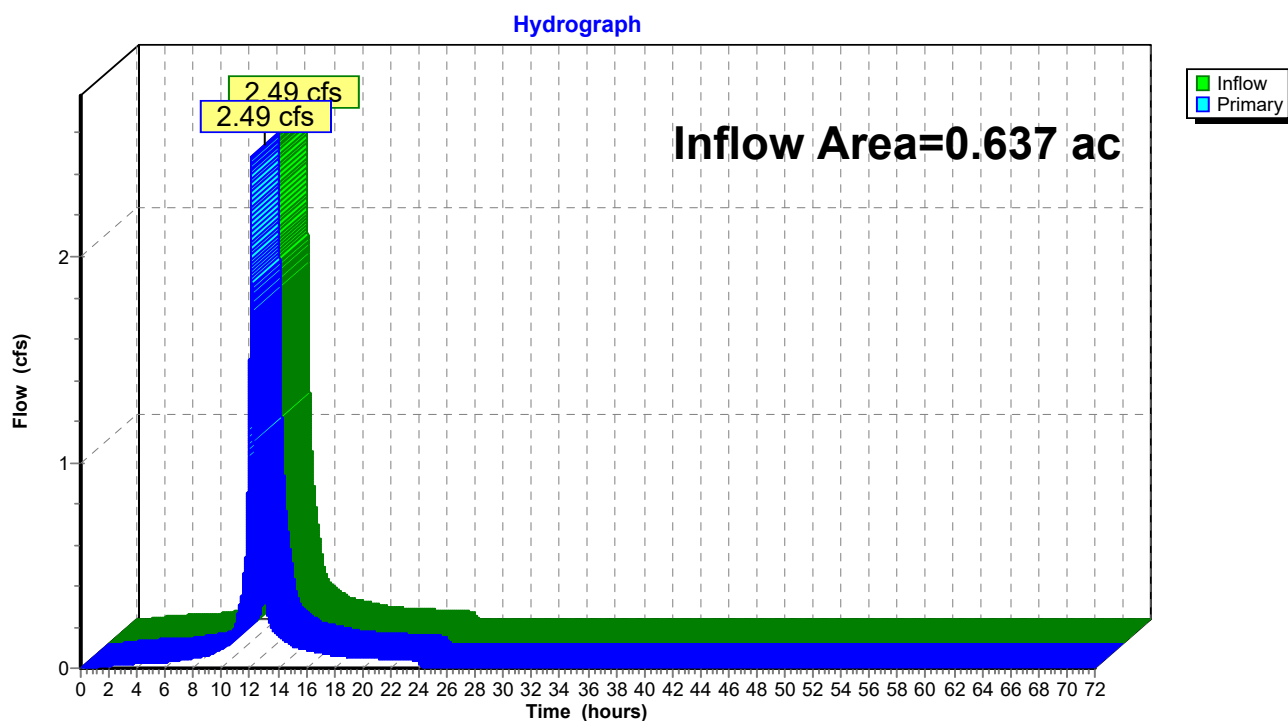


Summary for Link 2L: POI #1

Inflow Area = 0.637 ac, 68.48% Impervious, Inflow Depth = 4.38" for 10-Year-Current event
Inflow = 2.49 cfs @ 12.11 hrs, Volume= 0.232 af
Primary = 2.49 cfs @ 12.11 hrs, Volume= 0.232 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs

Link 2L: POI #1



Summary for Subcatchment 3S: Proposed Roof

Runoff = 0.95 cfs @ 12.10 hrs, Volume= 0.073 af, Depth= 6.13"
 Routed to Pond 1P : UG BASIN

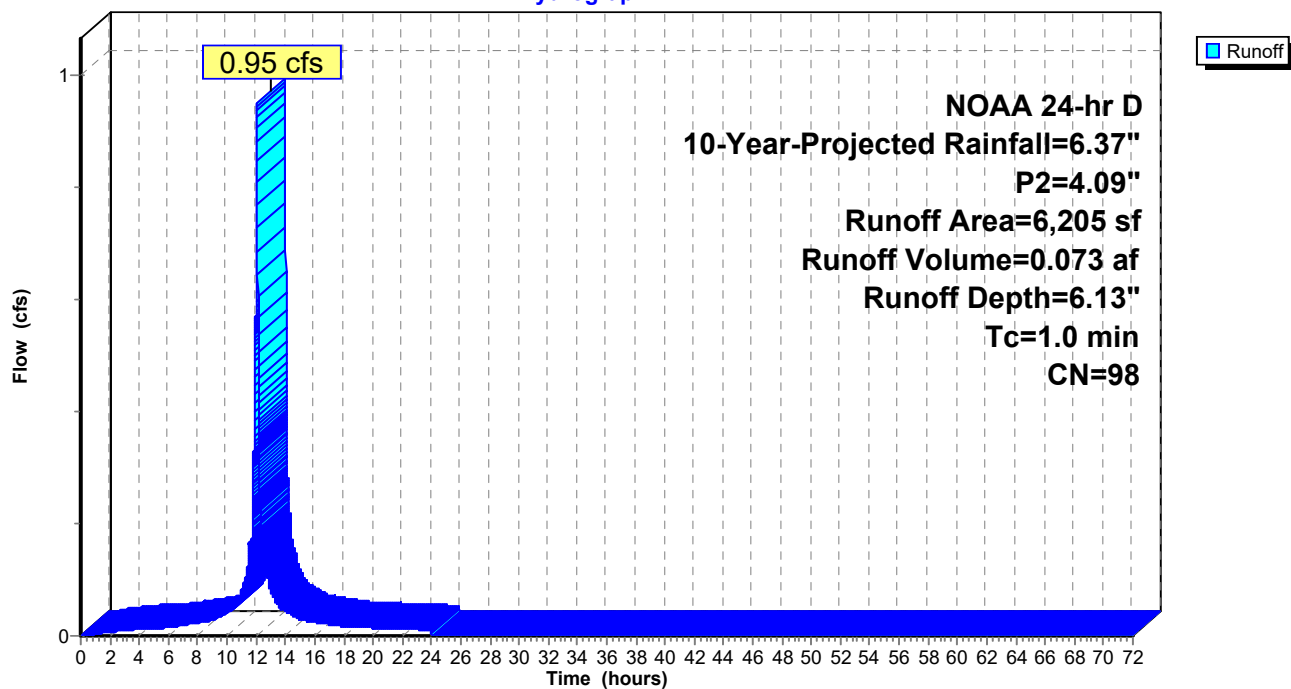
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 10-Year-Projected Rainfall=6.37", P2=4.09"

Area (sf)	CN	Description
6,205	98	Roofs, HSG B
6,205		100.00% Impervious Area

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

Subcatchment 3S: Proposed Roof

Hydrograph



Summary for Subcatchment 4S: PDA #1 - Undetained Impervious

Runoff = 1.36 cfs @ 12.10 hrs, Volume= 0.104 af, Depth= 6.13"
Routed to Link 2L : POI #1

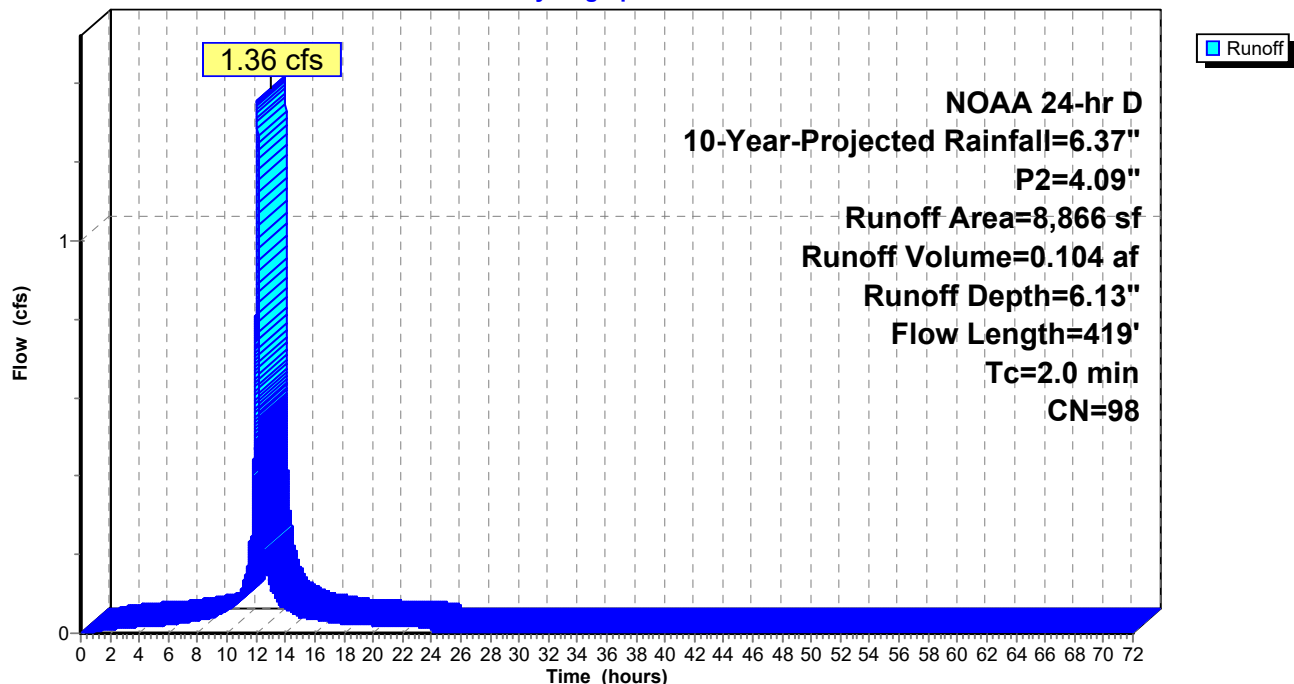
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
NOAA 24-hr D 10-Year-Projected Rainfall=6.37", P2=4.09"

Area (sf)	CN	Description
8,866	98	Paved parking, HSG D
8,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	93	0.0188	1.50		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 4.09"
1.0	326	0.0115	5.64	6.93	Pipe Channel, B-C 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
2.0	419	Total			

Subcatchment 4S: PDA #1 - Undetained Impervious

Hydrograph



Summary for Subcatchment 5S: PDA #1 - Undetained Pervious

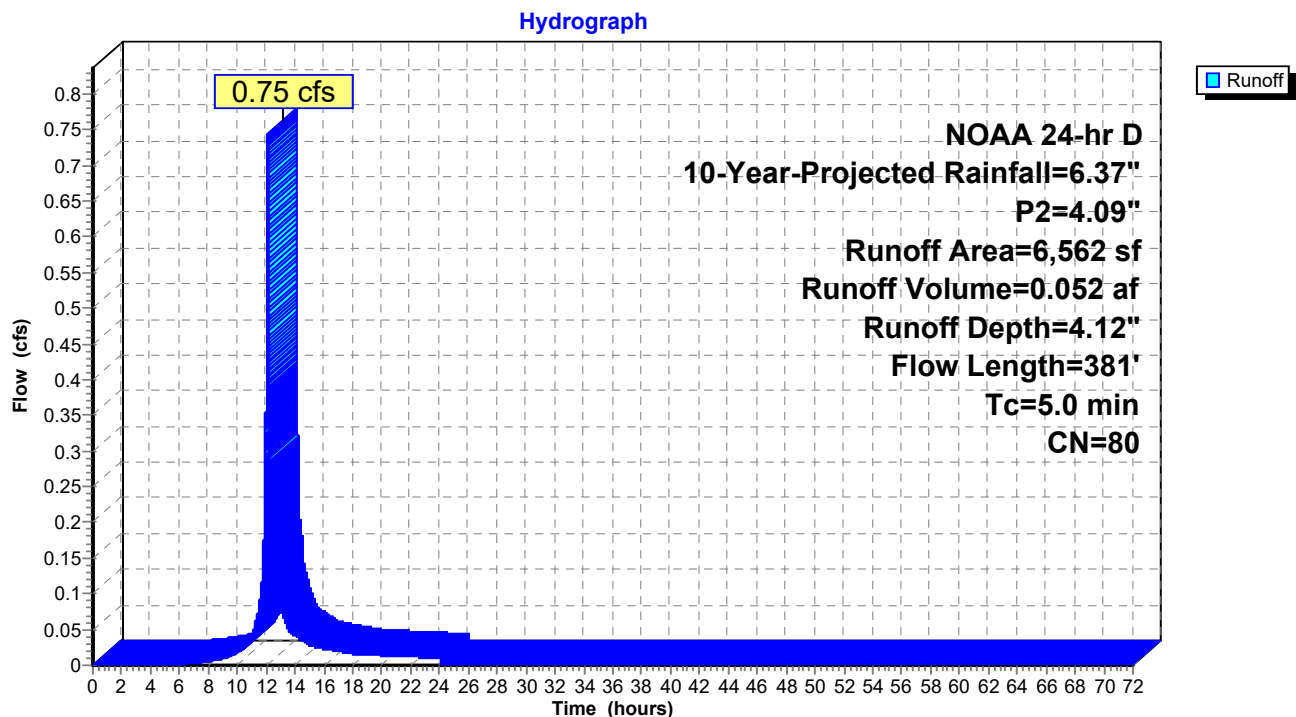
Runoff = 0.75 cfs @ 12.12 hrs, Volume= 0.052 af, Depth= 4.12"
 Routed to Link 2L : POI #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 10-Year-Projected Rainfall=6.37", P2=4.09"

Area (sf)	CN	Description
6,562	80	>75% Grass cover, Good, HSG D
6,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	20	0.0200	0.10		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 4.09"
0.5	35	0.0200	1.26		Sheet Flow, B-C Smooth surfaces n= 0.011 P2= 4.09"
1.0	326	0.0115	5.64	6.93	Pipe Channel, C-D 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
5.0	381	Total			

Subcatchment 5S: PDA #1 - Undetained Pervious



Summary for Subcatchment 6S: PDA #1 - Impervious to Bio

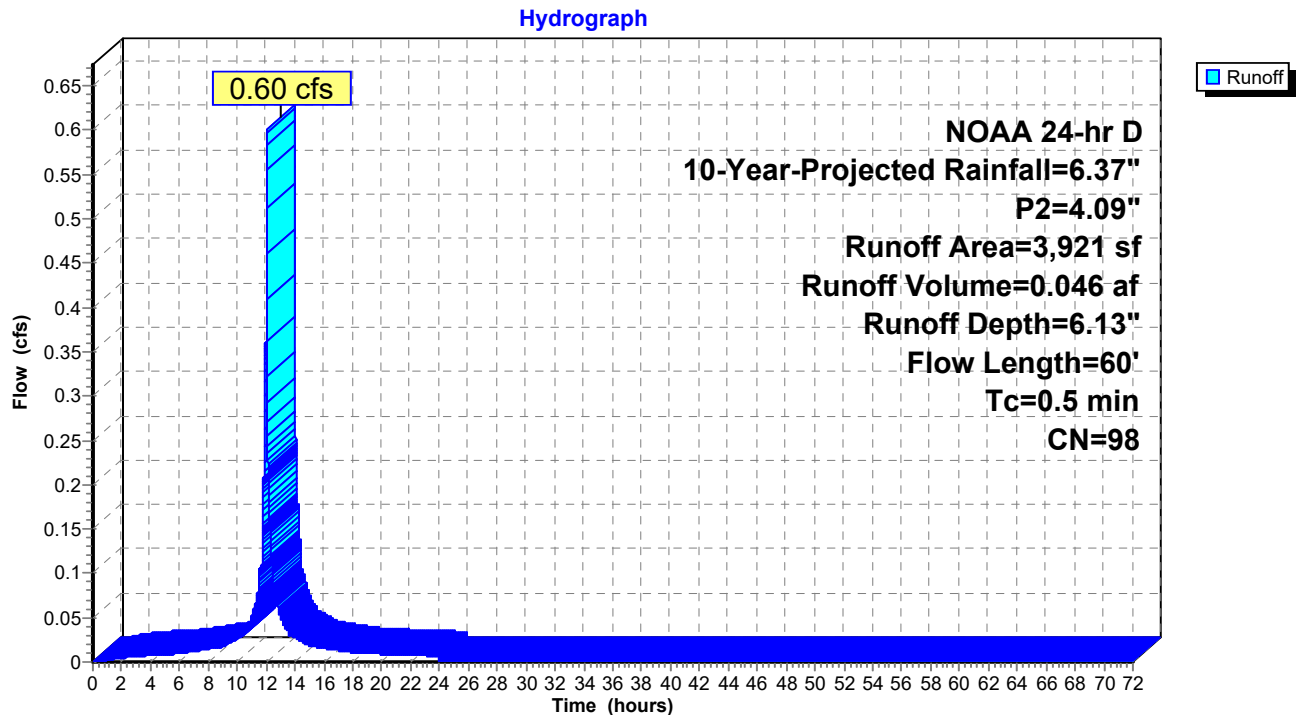
Runoff = 0.60 cfs @ 12.10 hrs, Volume= 0.046 af, Depth= 6.13"
 Routed to Pond 2P : BIO BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 10-Year-Projected Rainfall=6.37", P2=4.09"

Area (sf)	CN	Description
3,921	98	Paved parking, HSG B
3,921		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	42	0.0326	1.59		Sheet Flow, A-B
					Smooth surfaces n= 0.011 P2= 4.09"
0.1	18	0.1180	5.53		Shallow Concentrated Flow, B-C (RIP-RAP)
					Unpaved Kv= 16.1 fps
0.5	60	Total			

Subcatchment 6S: PDA #1 - Impervious to Bio



Summary for Subcatchment 7S: PDA #1 - Pervious to Bio

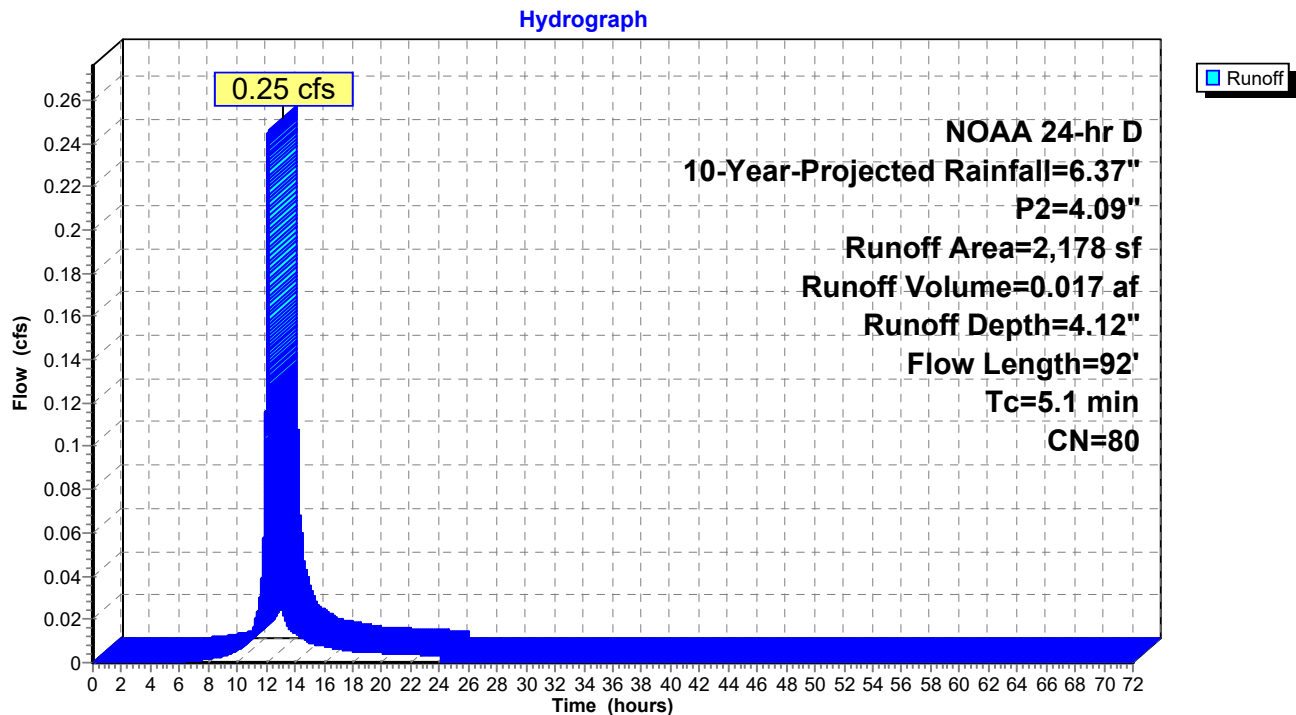
Runoff = 0.25 cfs @ 12.12 hrs, Volume= 0.017 af, Depth= 4.12"
 Routed to Pond 2P : BIO BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 10-Year-Projected Rainfall=6.37", P2=4.09"

Area (sf)	CN	Description
2,178	80	>75% Grass cover, Good, HSG D
2,178		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	45	0.0450	0.16		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 4.09"
0.2	29	0.0148	2.47		Shallow Concentrated Flow, B-C
					Paved Kv= 20.3 fps
0.1	18	0.1180	5.53		Shallow Concentrated Flow, C-D (RIP-RAP)
					Unpaved Kv= 16.1 fps
5.1	92	Total			

Subcatchment 7S: PDA #1 - Pervious to Bio



Summary for Pond 1P: UG BASIN

Inflow Area = 0.142 ac, 100.00% Impervious, Inflow Depth = 6.13" for 10-Year-Projected event
Inflow = 0.95 cfs @ 12.10 hrs, Volume= 0.073 af
Outflow = 0.34 cfs @ 12.14 hrs, Volume= 0.073 af, Atten= 64%, Lag= 2.2 min
Primary = 0.34 cfs @ 12.14 hrs, Volume= 0.073 af
Routed to Link 2L : POI #1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
Peak Elev= 619.95' @ 12.14 hrs Surf.Area= 0.006 ac Storage= 0.011 af

Plug-Flow detention time= 10.1 min calculated for 0.073 af (100% of inflow)
Center-of-Mass det. time= 10.1 min (750.7 - 740.6)

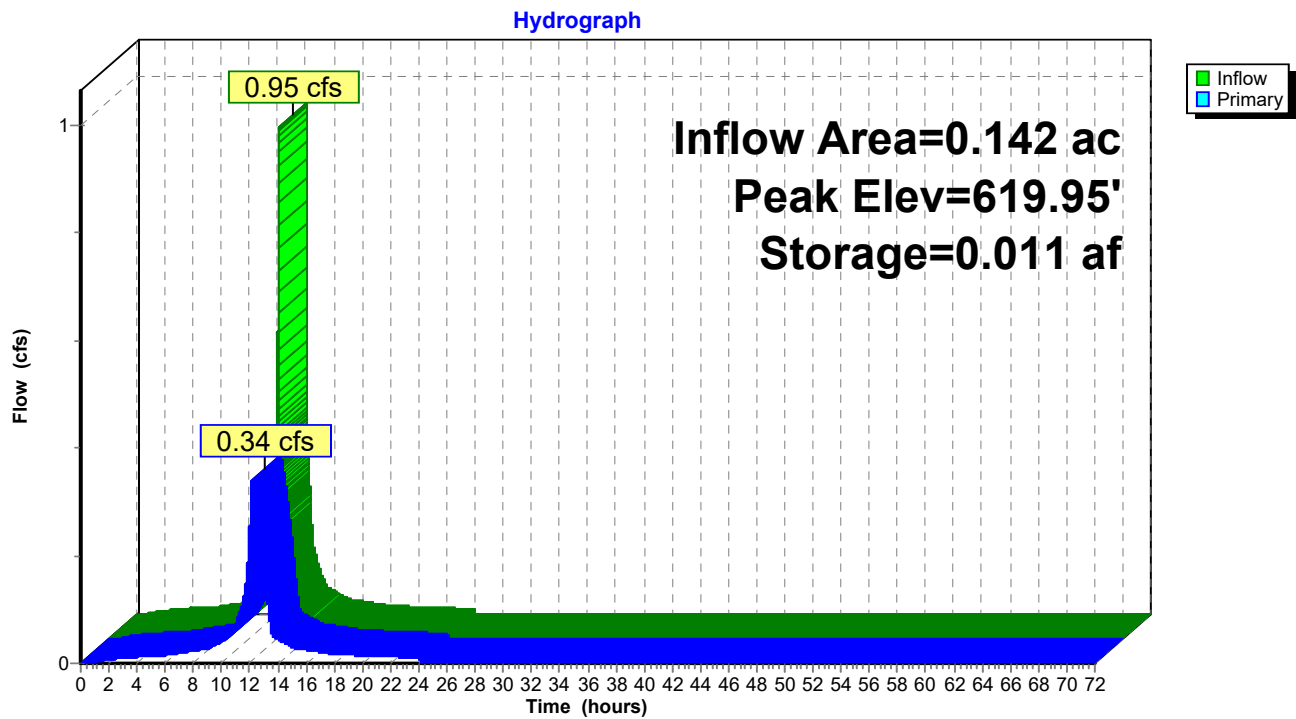
Volume	Invert	Avail.Storage	Storage Description
#1	617.75'	0.020 af	48.0" Round Pipe Storage L= 70.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	617.75'	15.0" Round RCP_Round 15" L= 15.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 617.75' / 617.55' S= 0.0133 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Device 1	617.75'	3.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	620.25'	6.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	621.45'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.34 cfs @ 12.14 hrs HW=619.95' (Free Discharge)

1=RCP_Round 15" (Passes 0.34 cfs of 8.92 cfs potential flow)
2=Orifice (Orifice Controls 0.34 cfs @ 6.93 fps)
3=Orifice (Controls 0.00 cfs)
4=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

Pond 1P: UG BASIN



Summary for Pond 2P: BIO BASIN

Inflow Area = 0.140 ac, 64.29% Impervious, Inflow Depth = 5.41" for 10-Year-Projected event
 Inflow = 0.84 cfs @ 12.10 hrs, Volume= 0.063 af
 Outflow = 0.58 cfs @ 12.11 hrs, Volume= 0.055 af, Atten= 30%, Lag= 0.5 min
 Primary = 0.58 cfs @ 12.11 hrs, Volume= 0.055 af
 Routed to Link 2L : POI #1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 Peak Elev= 623.36' @ 12.11 hrs Surf.Area= 716 sf Storage= 685 cf

Plug-Flow detention time= 134.8 min calculated for 0.055 af (86% of inflow)
 Center-of-Mass det. time= 68.3 min (829.8 - 761.5)

Volume	Invert	Avail.Storage	Storage Description
#1	622.00'	1,219 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
622.00	323	0	0
623.00	577	450	450
624.00	960	769	1,219

Device	Routing	Invert	Outlet Devices
#1	Primary	619.11'	15.0" Round Culvert L= 35.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 619.11' / 618.93' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	622.86'	0.6' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Device 1	623.70'	48.0" x 48.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.58 cfs @ 12.11 hrs HW=623.36' (Free Discharge)

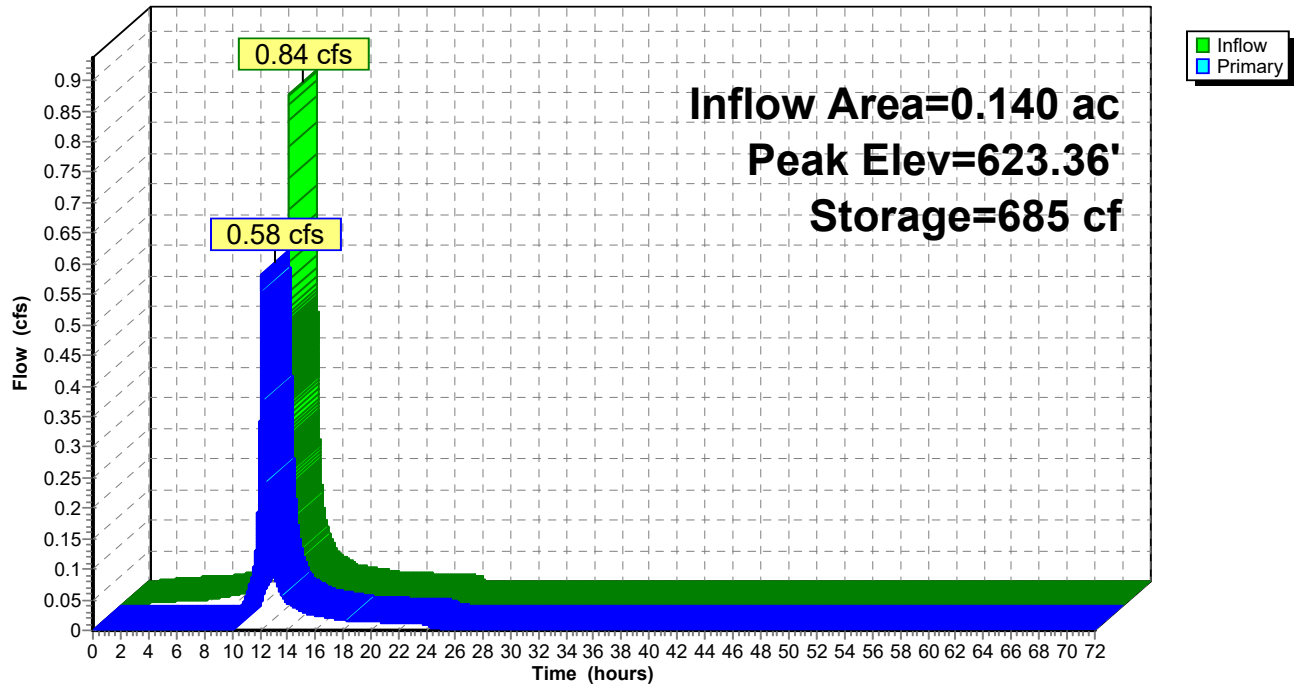
↑ **1=Culvert** (Passes 0.58 cfs of 12.69 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir**(Weir Controls 0.58 cfs @ 2.32 fps)

↑ **3=Grate** (Controls 0.00 cfs)

Pond 2P: BIO BASIN

Hydrograph

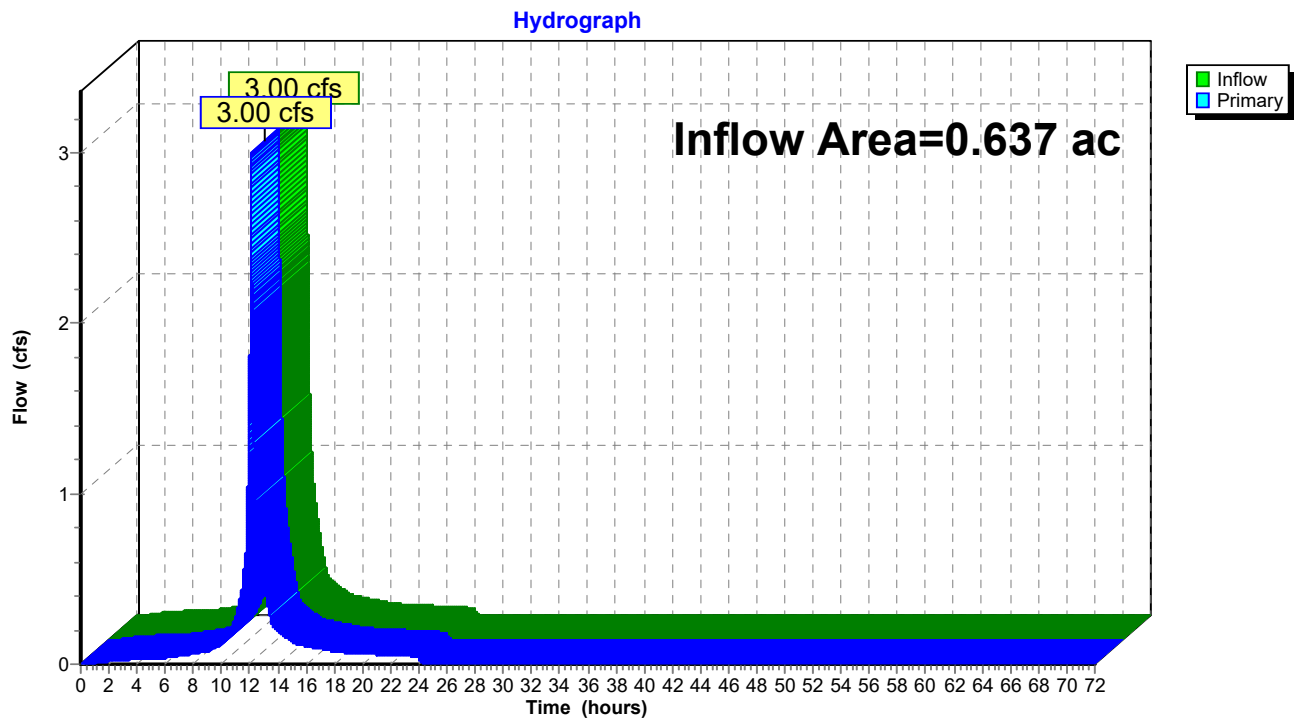


Summary for Link 2L: POI #1

Inflow Area = 0.637 ac, 68.48% Impervious, Inflow Depth = 5.34" for 10-Year-Projected event
Inflow = 3.00 cfs @ 12.11 hrs, Volume= 0.283 af
Primary = 3.00 cfs @ 12.11 hrs, Volume= 0.283 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs

Link 2L: POI #1



Summary for Subcatchment 3S: Proposed Roof

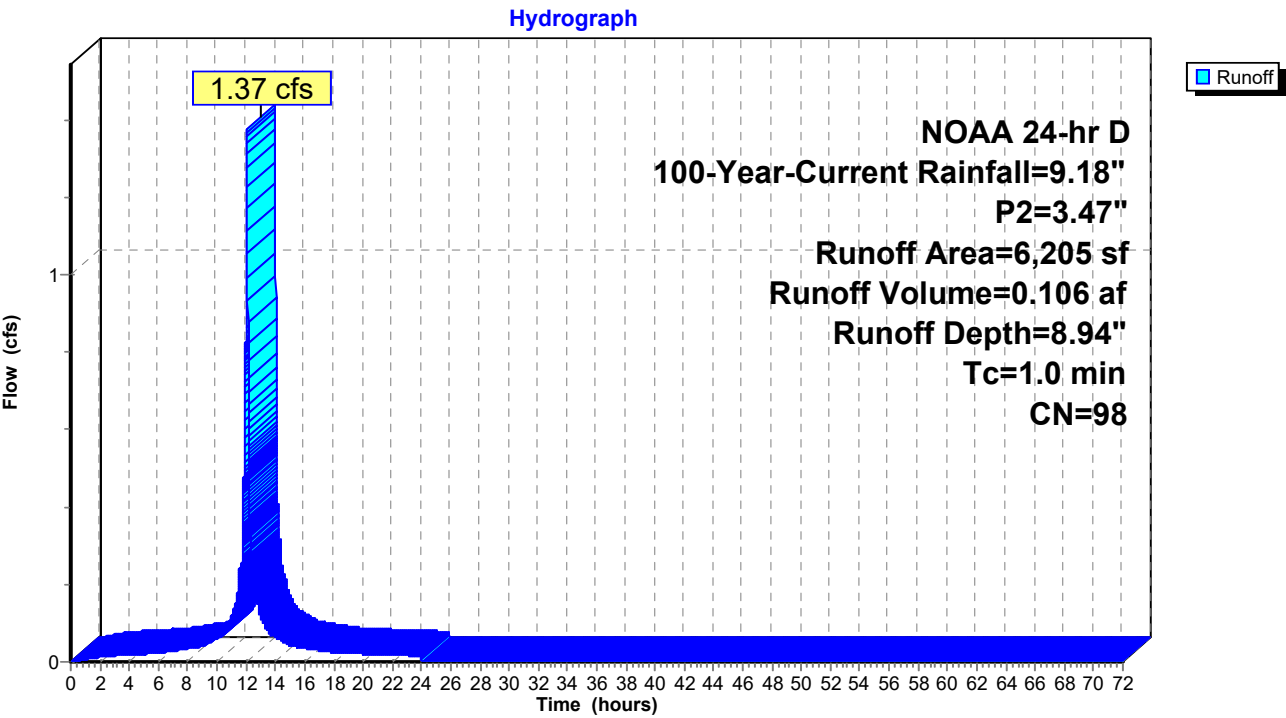
Runoff = 1.37 cfs @ 12.10 hrs, Volume= 0.106 af, Depth= 8.94"
Routed to Pond 1P : UG BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
NOAA 24-hr D 100-Year-Current Rainfall=9.18", P2=3.47"

Area (sf)	CN	Description
6,205	98	Roofs, HSG B
6,205		100.00% Impervious Area

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

Subcatchment 3S: Proposed Roof



Summary for Subcatchment 4S: PDA #1 - Undetained Impervious

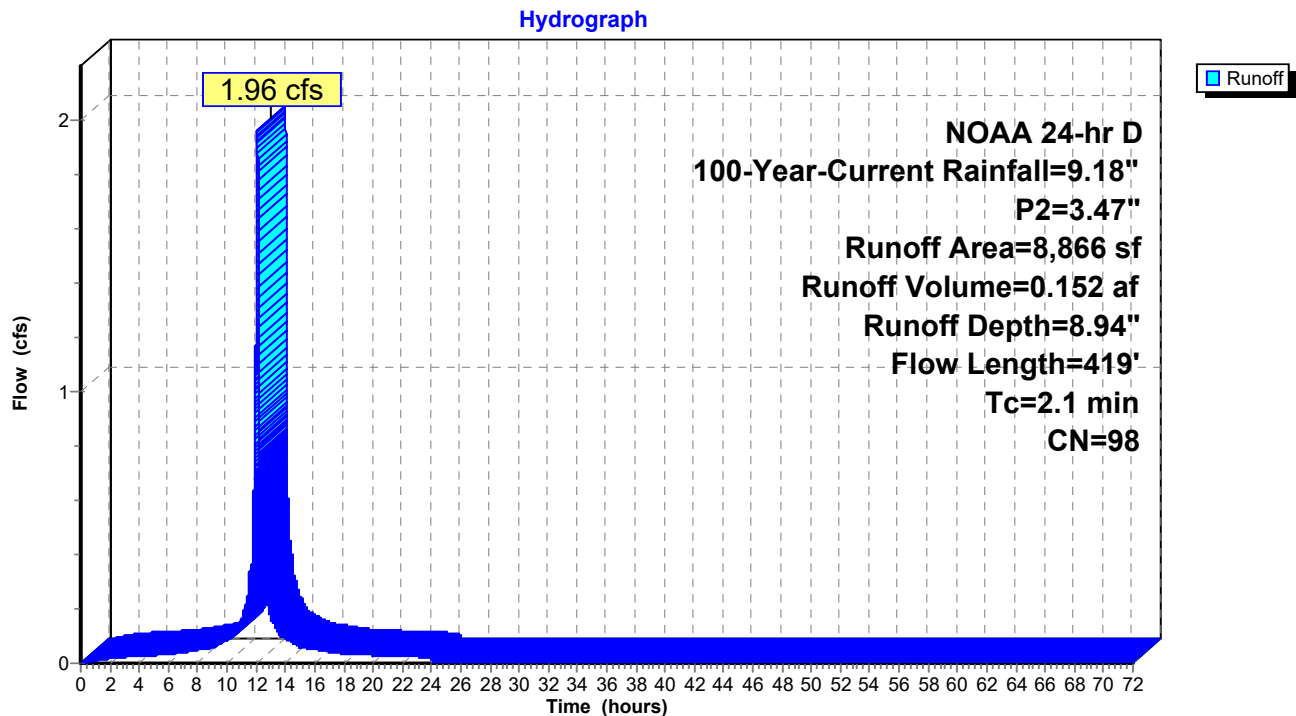
Runoff = 1.96 cfs @ 12.10 hrs, Volume= 0.152 af, Depth= 8.94"
 Routed to Link 2L : POI #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 100-Year-Current Rainfall=9.18", P2=3.47"

Area (sf)	CN	Description
8,866	98	Paved parking, HSG D
8,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	93	0.0188	1.38		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.47"
1.0	326	0.0115	5.64	6.93	Pipe Channel, B-C 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
2.1	419	Total			

Subcatchment 4S: PDA #1 - Undetained Impervious



Summary for Subcatchment 5S: PDA #1 - Undetained Pervious

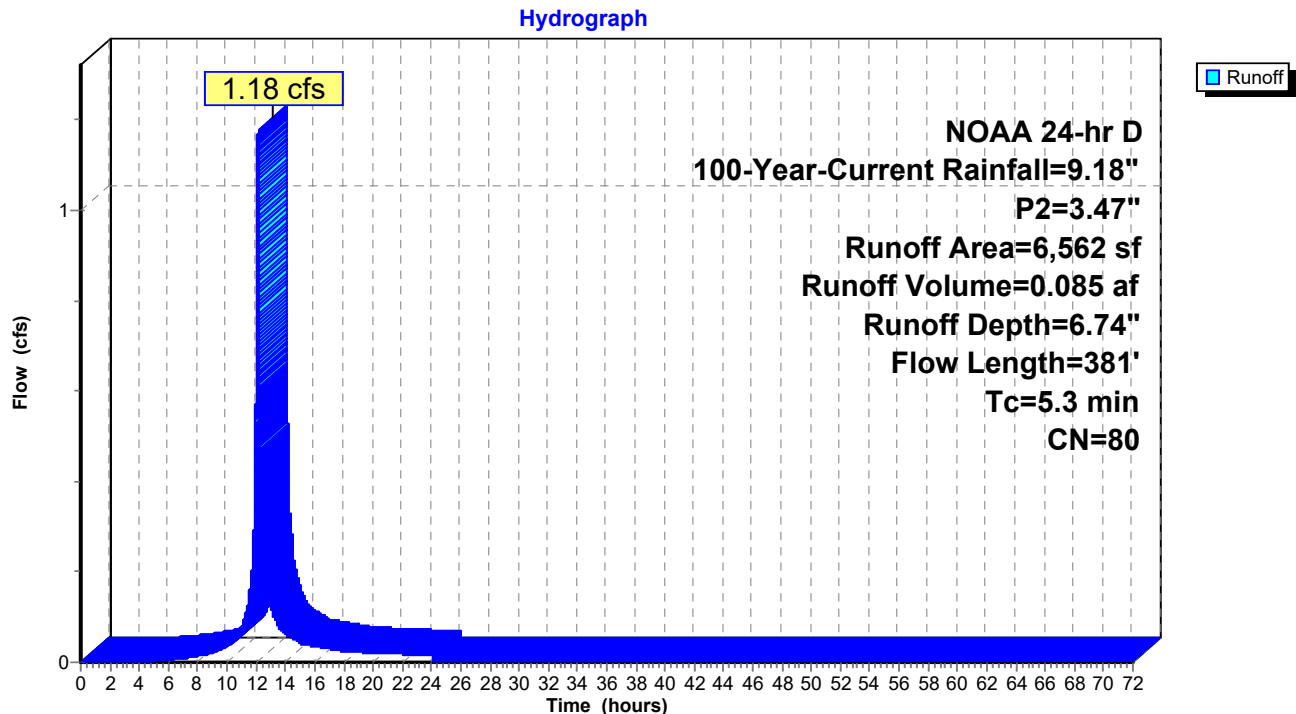
Runoff = 1.18 cfs @ 12.12 hrs, Volume= 0.085 af, Depth= 6.74"
 Routed to Link 2L : POI #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 100-Year-Current Rainfall=9.18", P2=3.47"

Area (sf)	CN	Description
6,562	80	>75% Grass cover, Good, HSG D
6,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	20	0.0200	0.09		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.47"
0.5	35	0.0200	1.16		Sheet Flow, B-C Smooth surfaces n= 0.011 P2= 3.47"
1.0	326	0.0115	5.64	6.93	Pipe Channel, C-D 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
5.3	381	Total			

Subcatchment 5S: PDA #1 - Undetained Pervious



Summary for Subcatchment 6S: PDA #1 - Impervious to Bio

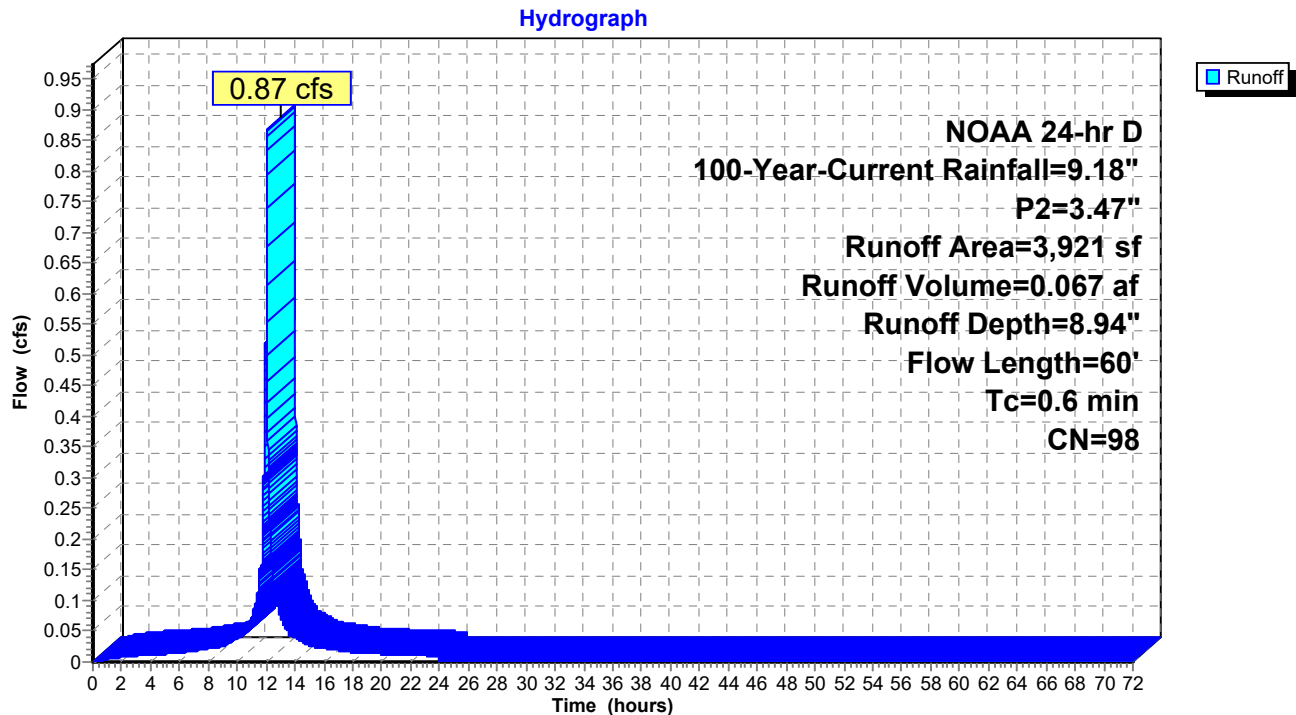
Runoff = 0.87 cfs @ 12.10 hrs, Volume= 0.067 af, Depth= 8.94"
 Routed to Pond 2P : BIO BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 100-Year-Current Rainfall=9.18", P2=3.47"

Area (sf)	CN	Description
3,921	98	Paved parking, HSG B
3,921		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	42	0.0326	1.46		Sheet Flow, A-B
					Smooth surfaces n= 0.011 P2= 3.47"
0.1	18	0.1180	5.53		Shallow Concentrated Flow, B-C (RIP-RAP)
					Unpaved Kv= 16.1 fps
0.6	60	Total			

Subcatchment 6S: PDA #1 - Impervious to Bio



Summary for Subcatchment 7S: PDA #1 - Pervious to Bio

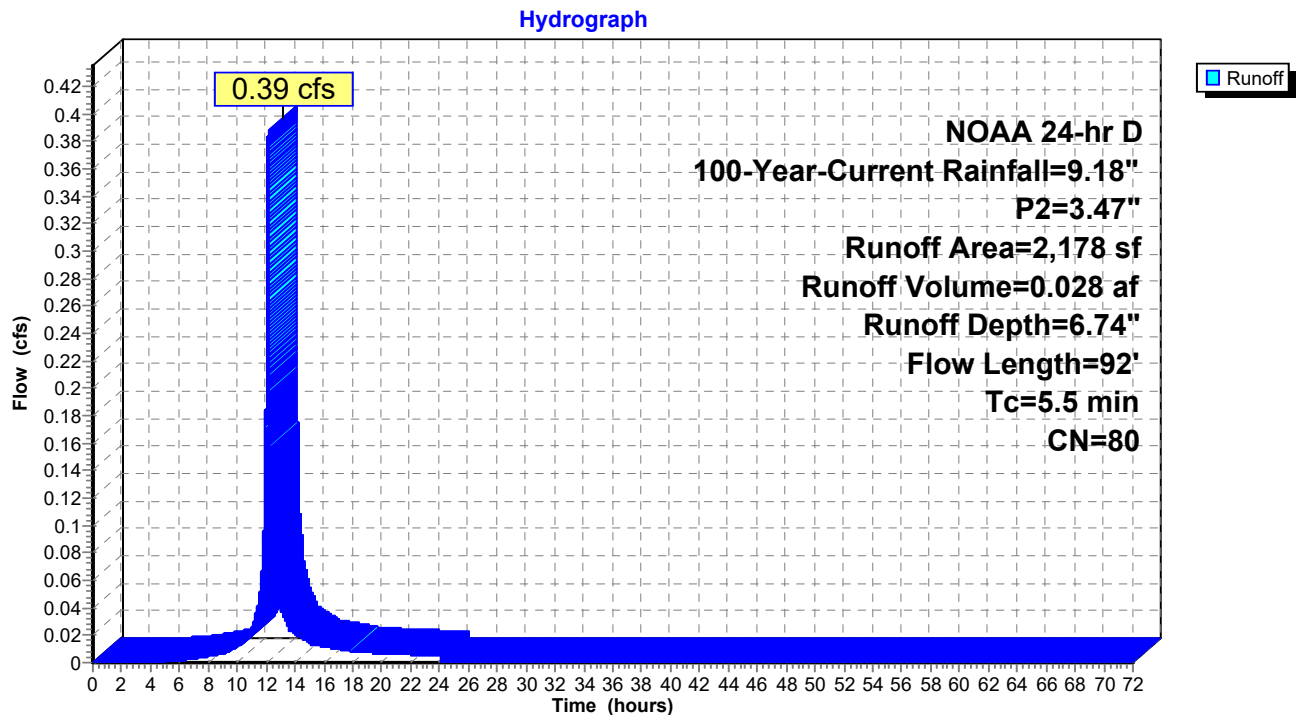
Runoff = 0.39 cfs @ 12.13 hrs, Volume= 0.028 af, Depth= 6.74"
 Routed to Pond 2P : BIO BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 100-Year-Current Rainfall=9.18", P2=3.47"

Area (sf)	CN	Description
2,178	80	>75% Grass cover, Good, HSG D
2,178		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	45	0.0450	0.14		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.47"
0.2	29	0.0148	2.47		Shallow Concentrated Flow, B-C
					Paved Kv= 20.3 fps
0.1	18	0.1180	5.53		Shallow Concentrated Flow, C-D (RIP-RAP)
					Unpaved Kv= 16.1 fps
5.5	92	Total			

Subcatchment 7S: PDA #1 - Pervious to Bio



Summary for Pond 1P: UG BASIN

Inflow Area = 0.142 ac, 100.00% Impervious, Inflow Depth = 8.94" for 100-Year-Current event
 Inflow = 1.37 cfs @ 12.10 hrs, Volume= 0.106 af
 Outflow = 0.95 cfs @ 12.11 hrs, Volume= 0.106 af, Atten= 31%, Lag= 0.8 min
 Primary = 0.95 cfs @ 12.11 hrs, Volume= 0.106 af
 Routed to Link 2L : POI #1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 Peak Elev= 620.83' @ 12.11 hrs Surf.Area= 0.005 ac Storage= 0.017 af

Plug-Flow detention time= 11.1 min calculated for 0.106 af (100% of inflow)
 Center-of-Mass det. time= 11.1 min (746.7 - 735.7)

Volume	Invert	Avail.Storage	Storage Description
#1	617.75'	0.020 af	48.0" Round Pipe Storage L= 70.0'

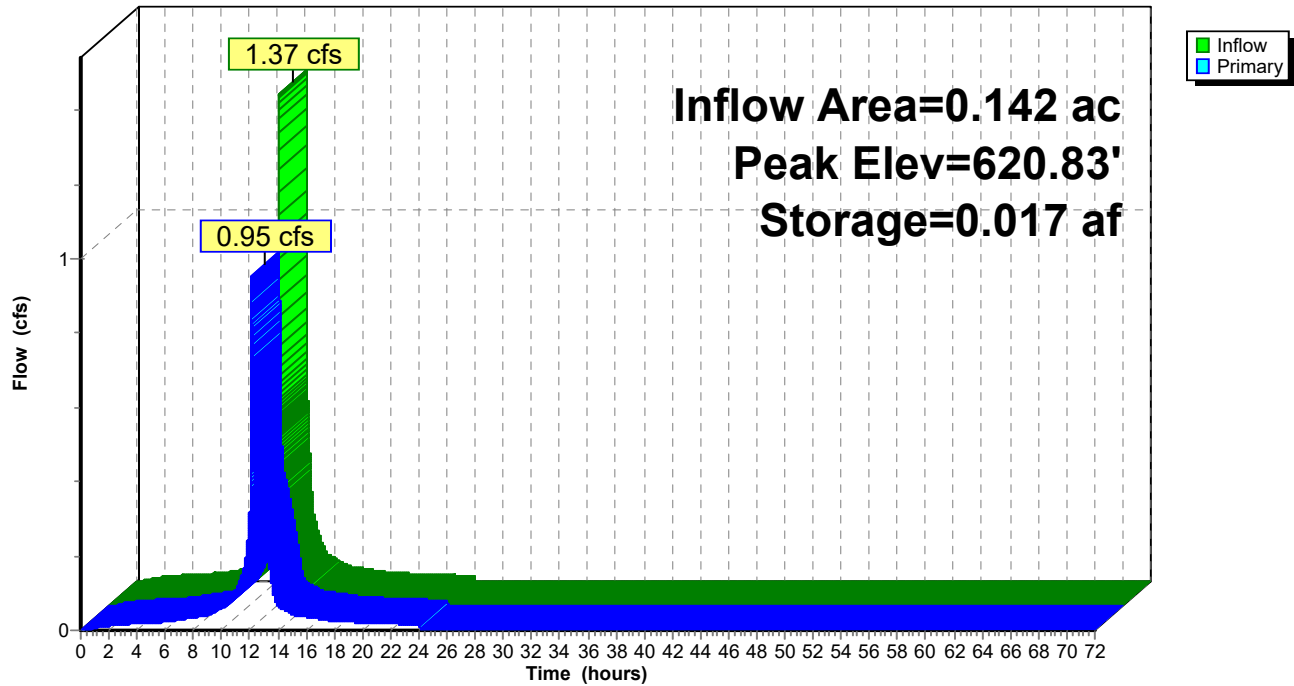
Device	Routing	Invert	Outlet Devices
#1	Primary	617.75'	15.0" Round RCP_Round 15" L= 15.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 617.75' / 617.55' S= 0.0133 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Device 1	617.75'	3.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	620.25'	6.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	621.45'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.95 cfs @ 12.11 hrs HW=620.83' (Free Discharge)

- 1=RCP_Round 15" (Passes 0.95 cfs of 11.87 cfs potential flow)
- 2=Orifice (Orifice Controls 0.41 cfs @ 8.28 fps)
- 3=Orifice (Orifice Controls 0.54 cfs @ 2.77 fps)
- 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1P: UG BASIN

Hydrograph



Summary for Pond 2P: BIO BASIN

Inflow Area = 0.140 ac, 64.29% Impervious, Inflow Depth = 8.15" for 100-Year-Current event
 Inflow = 1.24 cfs @ 12.10 hrs, Volume= 0.095 af
 Outflow = 0.85 cfs @ 12.11 hrs, Volume= 0.087 af, Atten= 31%, Lag= 0.6 min
 Primary = 0.85 cfs @ 12.11 hrs, Volume= 0.087 af
 Routed to Link 2L : POI #1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 Peak Elev= 623.54' @ 12.11 hrs Surf.Area= 784 sf Storage= 818 cf

Plug-Flow detention time= 105.1 min calculated for 0.087 af (91% of inflow)
 Center-of-Mass det. time= 55.7 min (811.2 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1	622.00'	1,219 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
622.00	323	0	0
623.00	577	450	450
624.00	960	769	1,219

Device	Routing	Invert	Outlet Devices
#1	Primary	619.11'	15.0" Round Culvert L= 35.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 619.11' / 618.93' S= 0.0051 ' S= 0.0051 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	622.86'	0.6' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Device 1	623.70'	48.0" x 48.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.85 cfs @ 12.11 hrs HW=623.54' (Free Discharge)

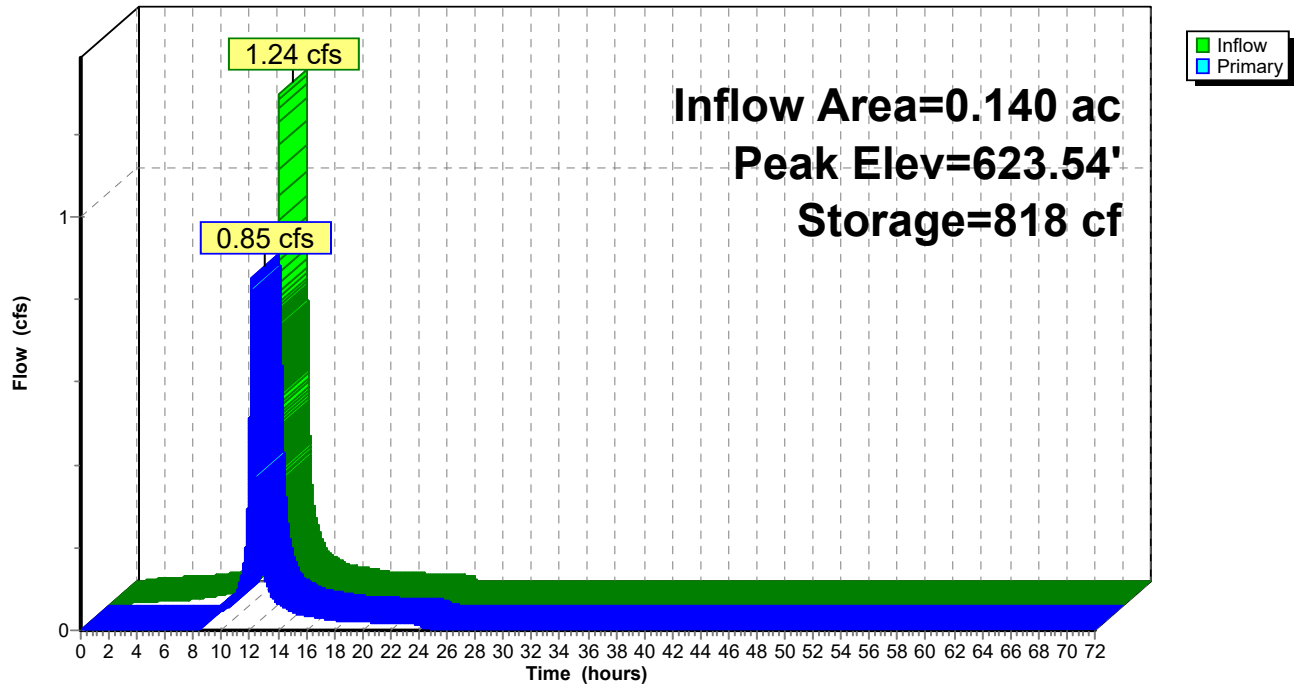
1=Culvert (Passes 0.85 cfs of 13.04 cfs potential flow)

2=Sharp-Crested Rectangular Weir (Weir Controls 0.85 cfs @ 2.70 fps)

3=Grate (Controls 0.00 cfs)

Pond 2P: BIO BASIN

Hydrograph

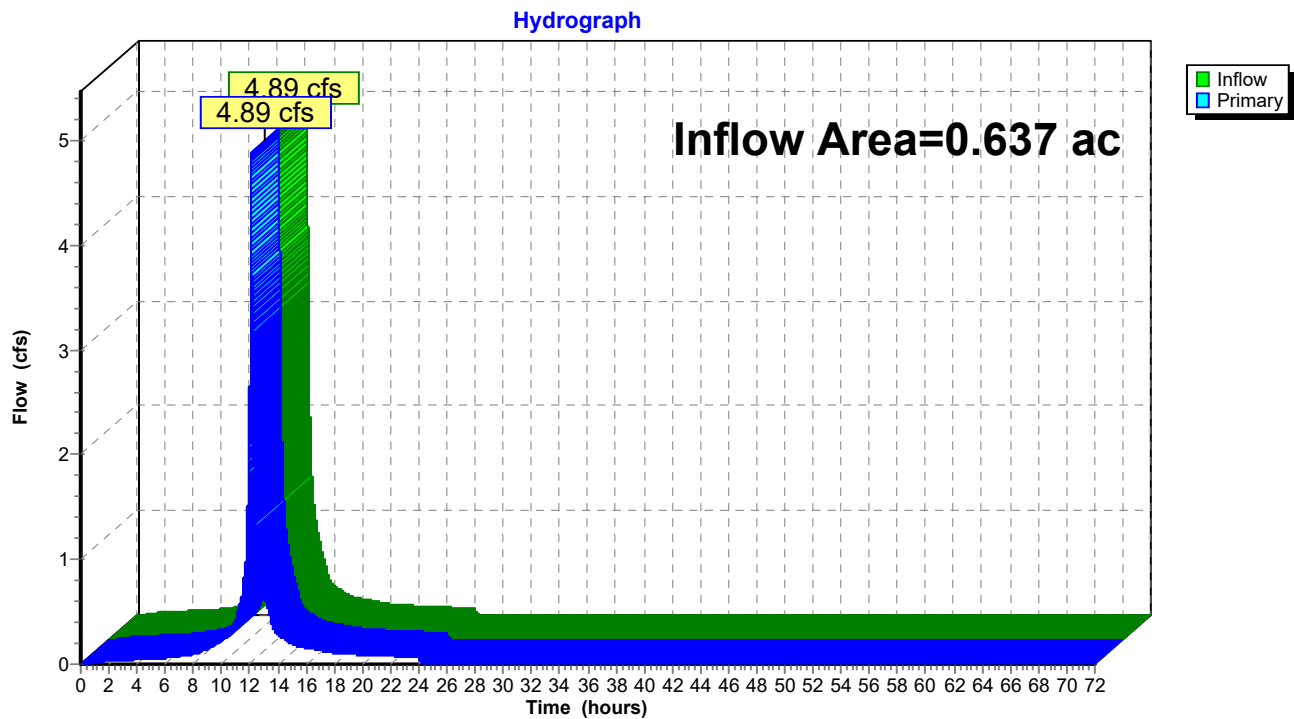


Summary for Link 2L: POI #1

Inflow Area = 0.637 ac, 68.48% Impervious, Inflow Depth = 8.09" for 100-Year-Current event
Inflow = 4.89 cfs @ 12.11 hrs, Volume= 0.429 af
Primary = 4.89 cfs @ 12.11 hrs, Volume= 0.429 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs

Link 2L: POI #1



Summary for Subcatchment 3S: Proposed Roof

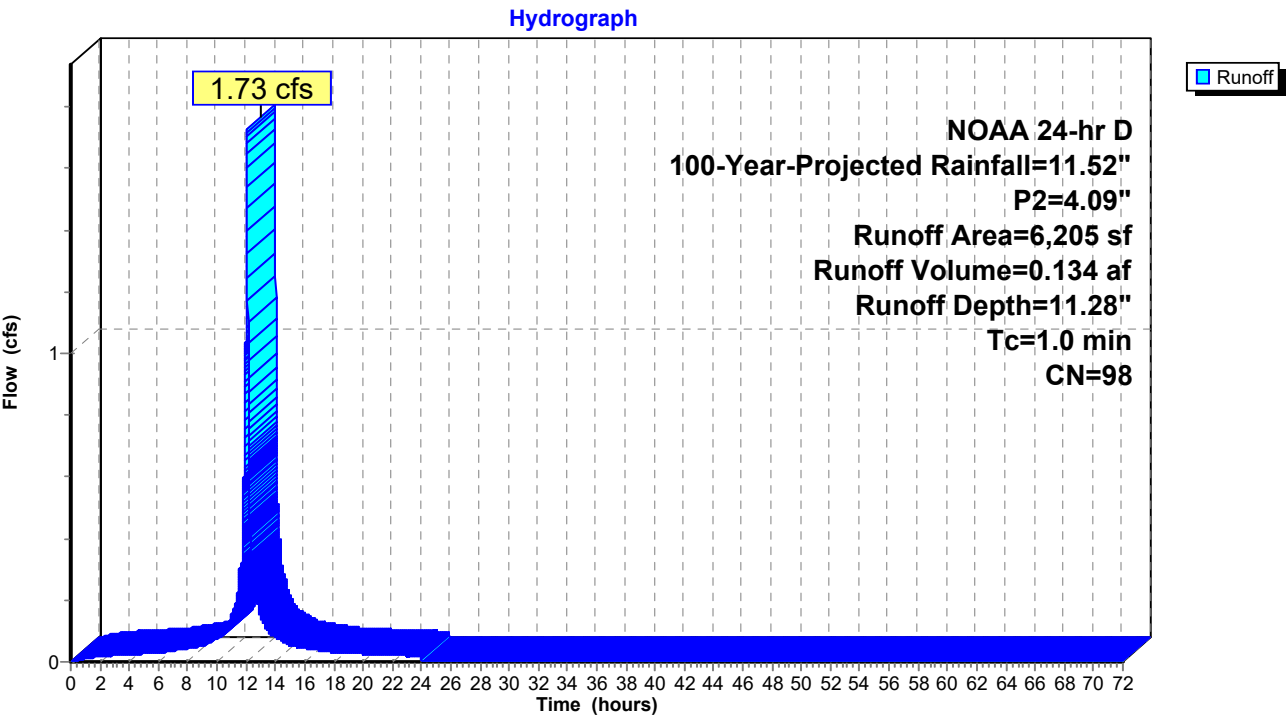
Runoff = 1.73 cfs @ 12.10 hrs, Volume= 0.134 af, Depth=11.28"
Routed to Pond 1P : UG BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
NOAA 24-hr D 100-Year-Projected Rainfall=11.52", P2=4.09"

Area (sf)	CN	Description
6,205	98	Roofs, HSG B
6,205		100.00% Impervious Area

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

Subcatchment 3S: Proposed Roof



Summary for Subcatchment 4S: PDA #1 - Undetained Impervious

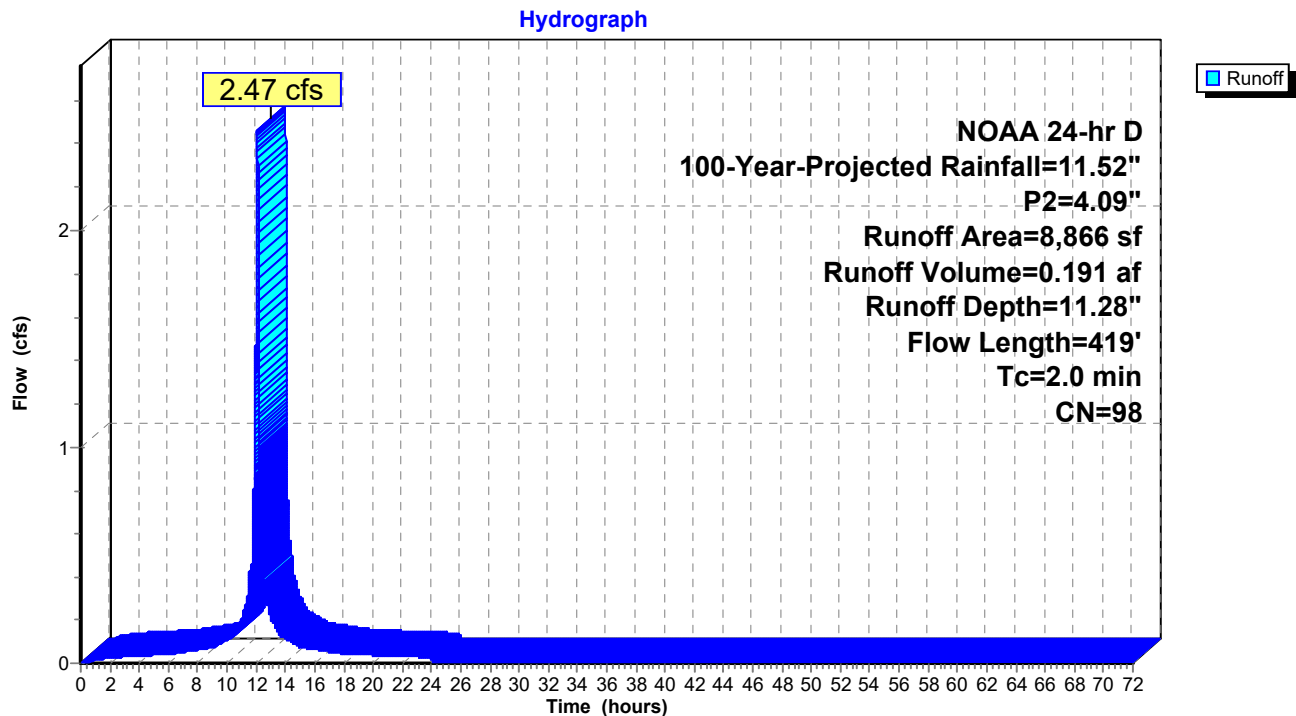
Runoff = 2.47 cfs @ 12.10 hrs, Volume= 0.191 af, Depth=11.28"
 Routed to Link 2L : POI #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 100-Year-Projected Rainfall=11.52", P2=4.09"

Area (sf)	CN	Description
8,866	98	Paved parking, HSG D
8,866		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	93	0.0188	1.50		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 4.09"
1.0	326	0.0115	5.64	6.93	Pipe Channel, B-C 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
2.0	419	Total			

Subcatchment 4S: PDA #1 - Undetained Impervious



Summary for Subcatchment 5S: PDA #1 - Undetained Pervious

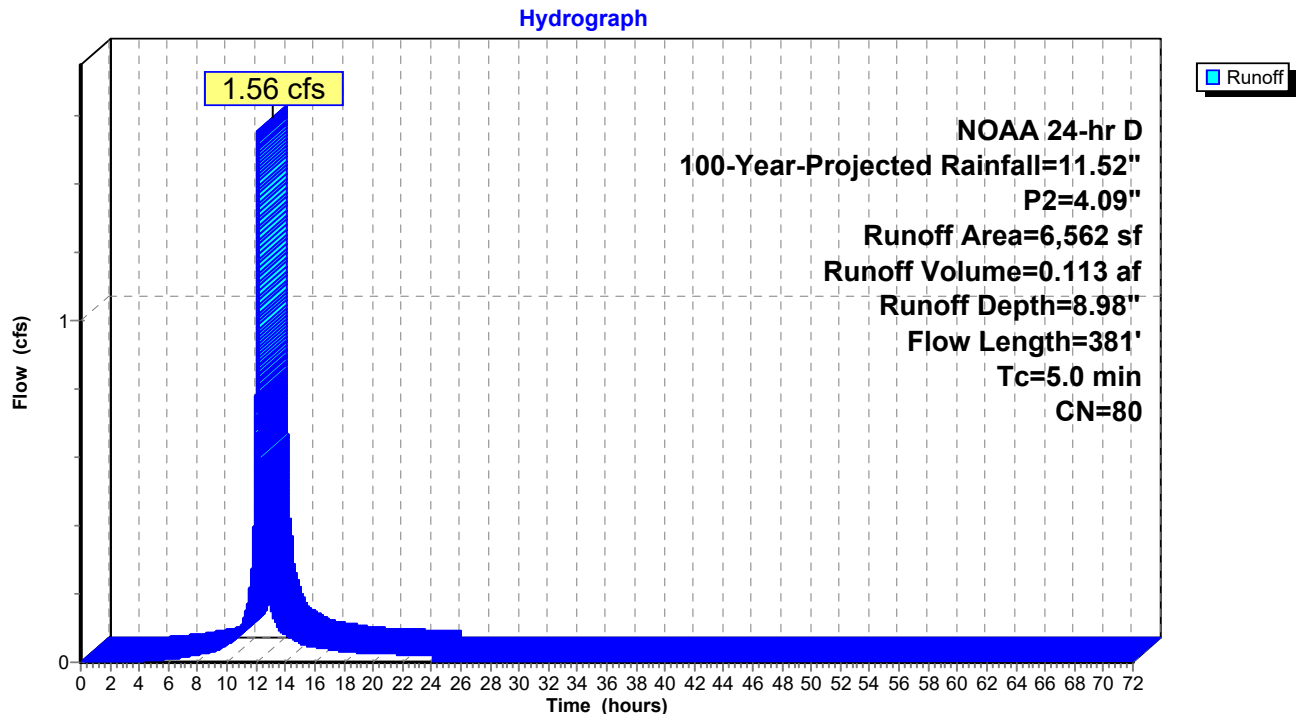
Runoff = 1.56 cfs @ 12.12 hrs, Volume= 0.113 af, Depth= 8.98"
 Routed to Link 2L : POI #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 100-Year-Projected Rainfall=11.52", P2=4.09"

Area (sf)	CN	Description
6,562	80	>75% Grass cover, Good, HSG D
6,562		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	20	0.0200	0.10		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 4.09"
0.5	35	0.0200	1.26		Sheet Flow, B-C Smooth surfaces n= 0.011 P2= 4.09"
1.0	326	0.0115	5.64	6.93	Pipe Channel, C-D 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
5.0	381	Total			

Subcatchment 5S: PDA #1 - Undetained Pervious



Summary for Subcatchment 6S: PDA #1 - Impervious to Bio

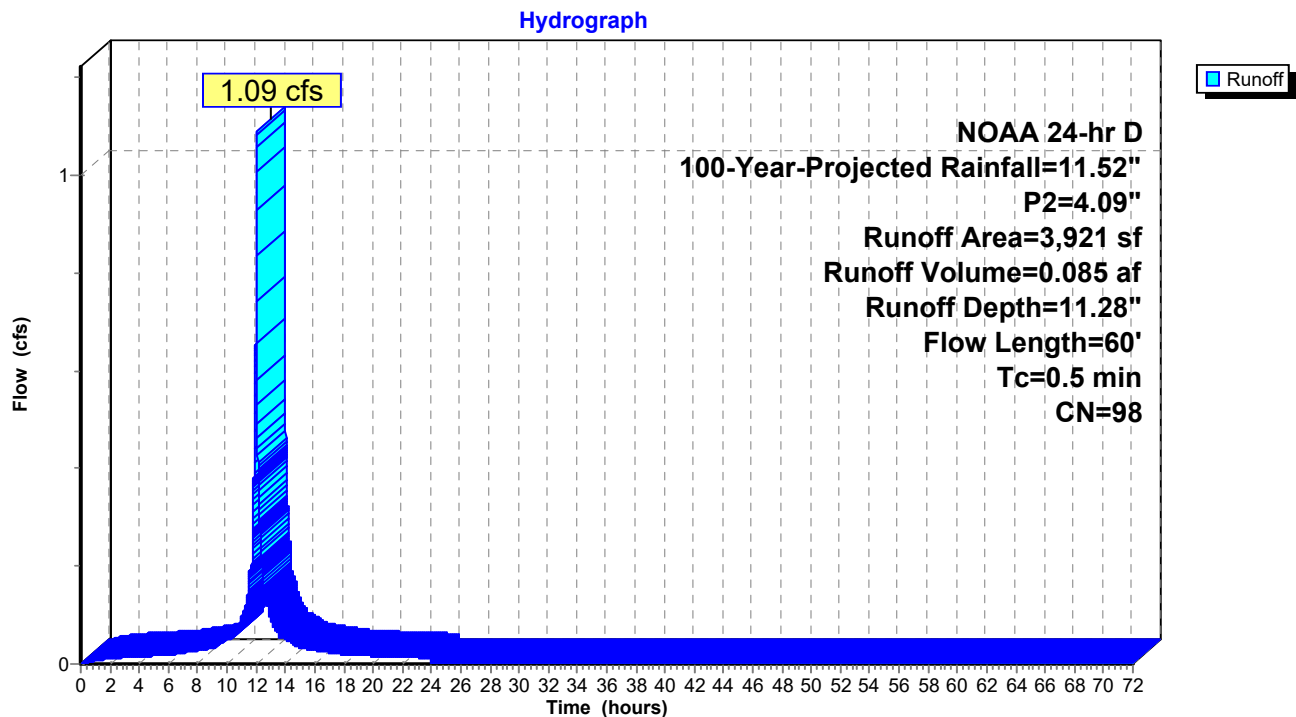
Runoff = 1.09 cfs @ 12.10 hrs, Volume= 0.085 af, Depth=11.28"
Routed to Pond 2P : BIO BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
NOAA 24-hr D 100-Year-Projected Rainfall=11.52", P2=4.09"

Area (sf)	CN	Description
3,921	98	Paved parking, HSG B
3,921		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	42	0.0326	1.59		Sheet Flow, A-B
					Smooth surfaces n= 0.011 P2= 4.09"
0.1	18	0.1180	5.53		Shallow Concentrated Flow, B-C (RIP-RAP)
					Unpaved Kv= 16.1 fps
0.5	60	Total			

Subcatchment 6S: PDA #1 - Impervious to Bio



Summary for Subcatchment 7S: PDA #1 - Pervious to Bio

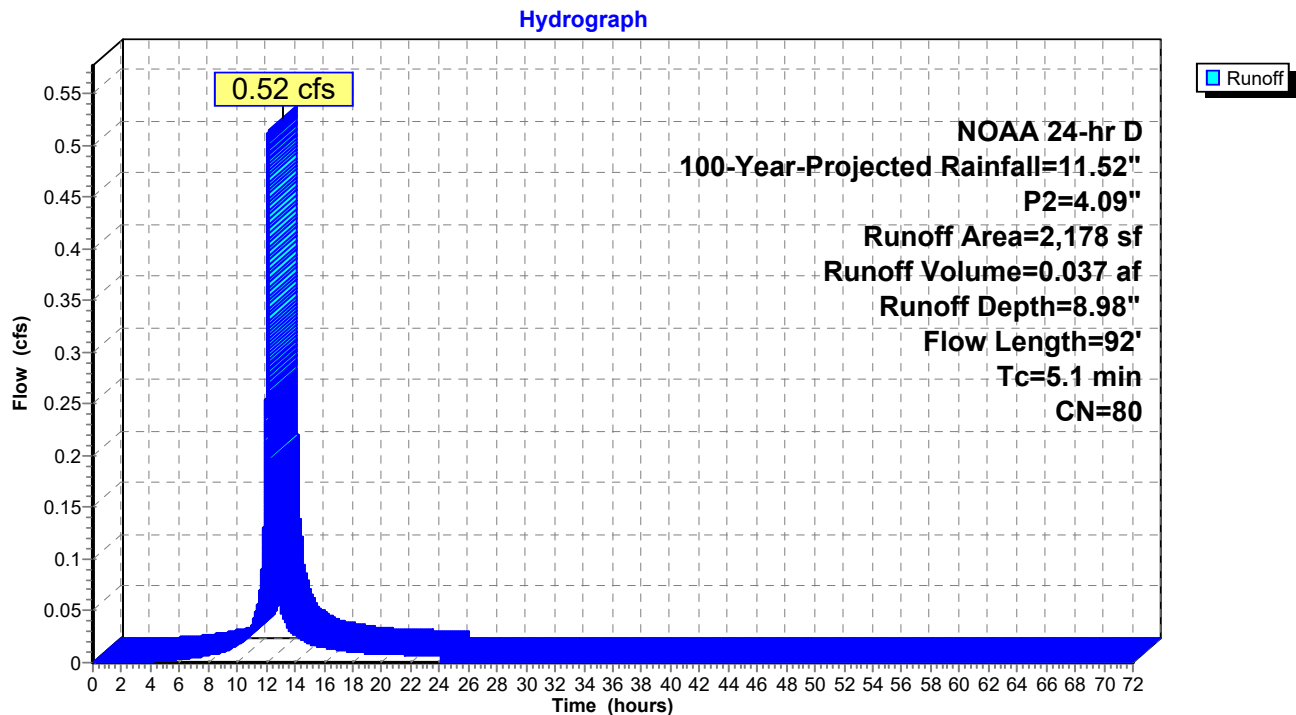
Runoff = 0.52 cfs @ 12.12 hrs, Volume= 0.037 af, Depth= 8.98"
 Routed to Pond 2P : BIO BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 NOAA 24-hr D 100-Year-Projected Rainfall=11.52", P2=4.09"

Area (sf)	CN	Description
2,178	80	>75% Grass cover, Good, HSG D
2,178		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	45	0.0450	0.16		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 4.09"
0.2	29	0.0148	2.47		Shallow Concentrated Flow, B-C
					Paved Kv= 20.3 fps
0.1	18	0.1180	5.53		Shallow Concentrated Flow, C-D (RIP-RAP)
					Unpaved Kv= 16.1 fps
5.1	92	Total			

Subcatchment 7S: PDA #1 - Pervious to Bio



Summary for Pond 1P: UG BASIN

Inflow Area = 0.142 ac, 100.00% Impervious, Inflow Depth = 11.28" for 100-Year-Projected event
Inflow = 1.73 cfs @ 12.10 hrs, Volume= 0.134 af
Outflow = 1.36 cfs @ 12.11 hrs, Volume= 0.134 af, Atten= 21%, Lag= 0.6 min
Primary = 1.36 cfs @ 12.11 hrs, Volume= 0.134 af
Routed to Link 2L : POI #1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
Peak Elev= 621.44' @ 12.11 hrs Surf.Area= 0.003 ac Storage= 0.019 af

Plug-Flow detention time= 10.9 min calculated for 0.134 af (100% of inflow)
Center-of-Mass det. time= 10.9 min (744.1 - 733.1)

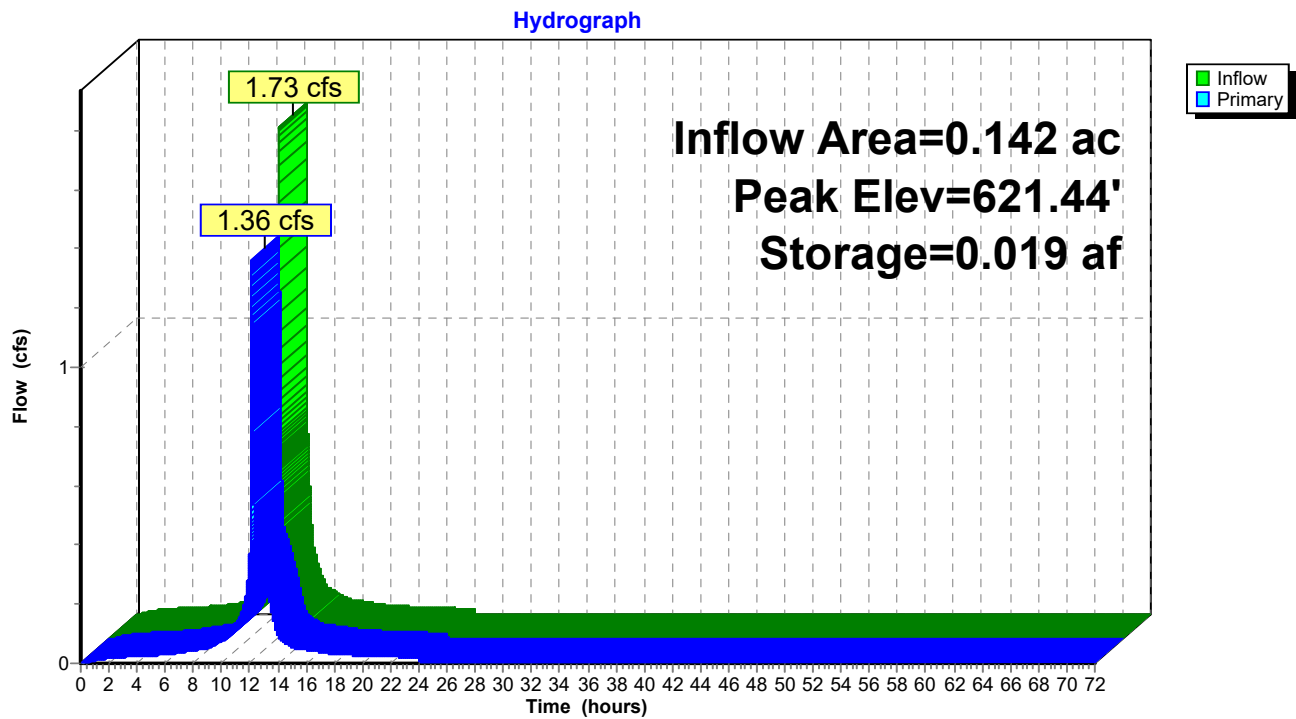
Volume	Invert	Avail.Storage	Storage Description
#1	617.75'	0.020 af	48.0" Round Pipe Storage L= 70.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	617.75'	15.0" Round RCP_Round 15" L= 15.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 617.75' / 617.55' S= 0.0133 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Device 1	617.75'	3.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#3	Device 1	620.25'	6.0" Vert. Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	621.45'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=1.36 cfs @ 12.11 hrs HW=621.44' (Free Discharge)

1=RCP_Round 15" (Passes 1.36 cfs of 13.52 cfs potential flow)
2=Orifice (Orifice Controls 0.45 cfs @ 9.09 fps)
3=Orifice (Orifice Controls 0.91 cfs @ 4.66 fps)
4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1P: UG BASIN



Summary for Pond 2P: BIO BASIN

Inflow Area = 0.140 ac, 64.29% Impervious, Inflow Depth = 10.46" for 100-Year-Projected event
 Inflow = 1.59 cfs @ 12.10 hrs, Volume= 0.122 af
 Outflow = 1.07 cfs @ 12.11 hrs, Volume= 0.113 af, Atten= 33%, Lag= 0.5 min
 Primary = 1.07 cfs @ 12.11 hrs, Volume= 0.113 af
 Routed to Link 2L : POI #1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 Peak Elev= 623.69' @ 12.11 hrs Surf.Area= 840 sf Storage= 938 cf

Plug-Flow detention time= 89.2 min calculated for 0.113 af (93% of inflow)
 Center-of-Mass det. time= 48.7 min (800.3 - 751.6)

Volume	Invert	Avail.Storage	Storage Description
#1	622.00'	1,219 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
622.00	323	0	0
623.00	577	450	450
624.00	960	769	1,219

Device	Routing	Invert	Outlet Devices
#1	Primary	619.11'	15.0" Round Culvert L= 35.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 619.11' / 618.93' S= 0.0051 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	622.86'	0.6' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Device 1	623.70'	48.0" x 48.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.07 cfs @ 12.11 hrs HW=623.69' (Free Discharge)

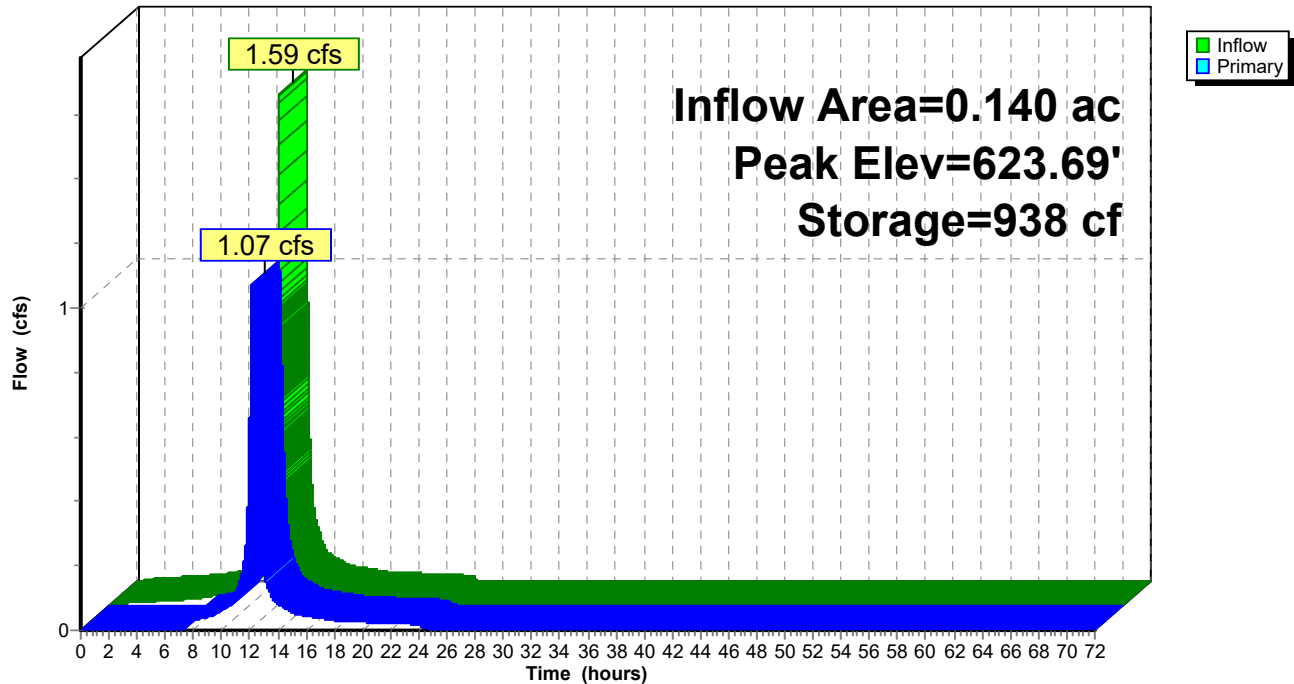
↑ **1=Culvert** (Passes 1.07 cfs of 13.32 cfs potential flow)

↑ **2=Sharp-Crested Rectangular Weir**(Weir Controls 1.07 cfs @ 2.98 fps)

↑ **3=Grate** (Controls 0.00 cfs)

Pond 2P: BIO BASIN

Hydrograph



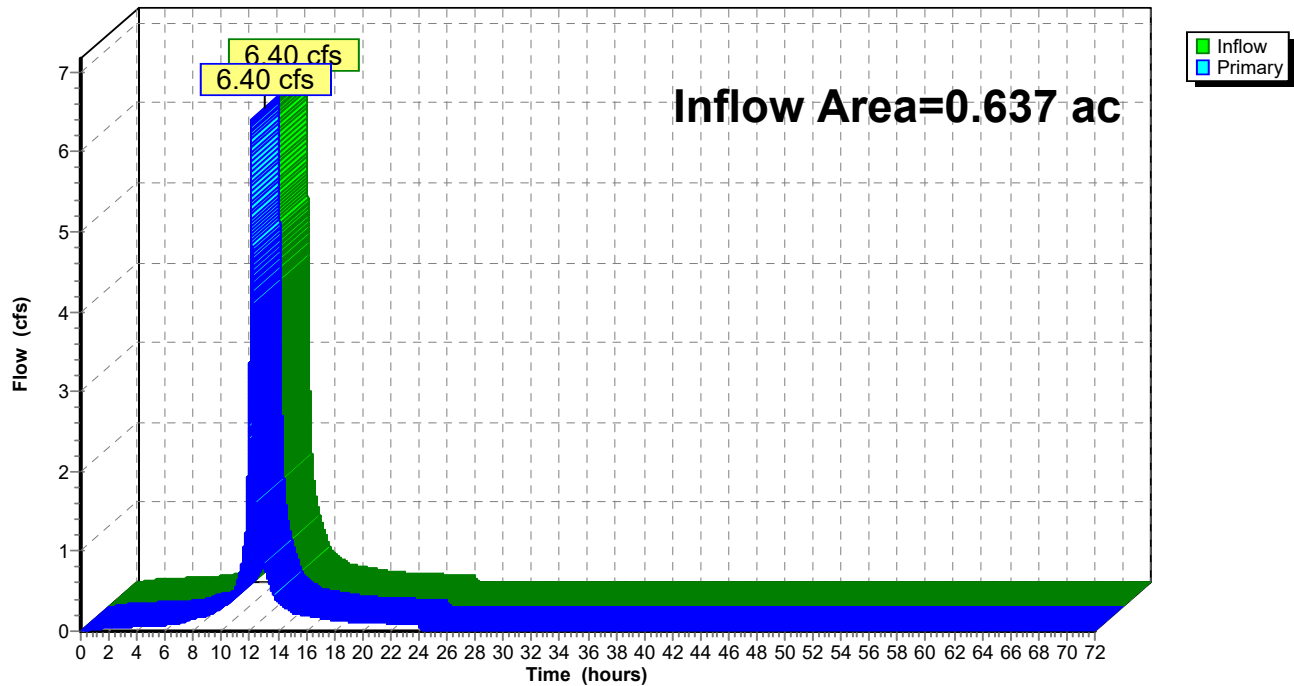
Summary for Link 2L: POI #1

Inflow Area = 0.637 ac, 68.48% Impervious, Inflow Depth = 10.39" for 100-Year-Projected event
Inflow = 6.40 cfs @ 12.11 hrs, Volume= 0.551 af
Primary = 6.40 cfs @ 12.11 hrs, Volume= 0.551 af, Atten= 0%, Lag= 0.0 min

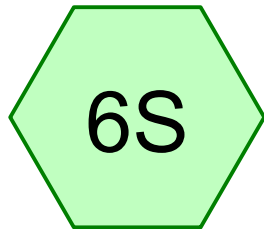
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs

Link 2L: POI #1

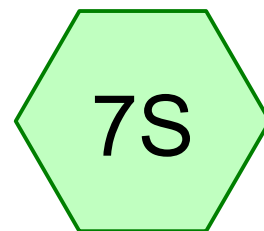
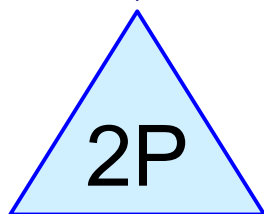
Hydrograph



WATER QUALITY CALCULATIONS

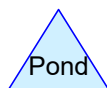
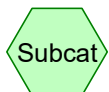


PDA #1 - Impervious to
Bio



BIO BASIN

PDA #1 - Pervious to
Bio



2026-02 Proposed Conditions - AJH

NJ DEP 2-hr WQ Rainfall=1.25", P2=4.09"

Prepared by Dynamic Engineering

Printed 2/16/2026

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Page 2

Summary for Subcatchment 6S: PDA #1 - Impervious to Bio

Runoff = 0.28 cfs @ 1.08 hrs, Volume= 0.008 af, Depth= 1.03"
Routed to Pond 2P : BIO BASIN

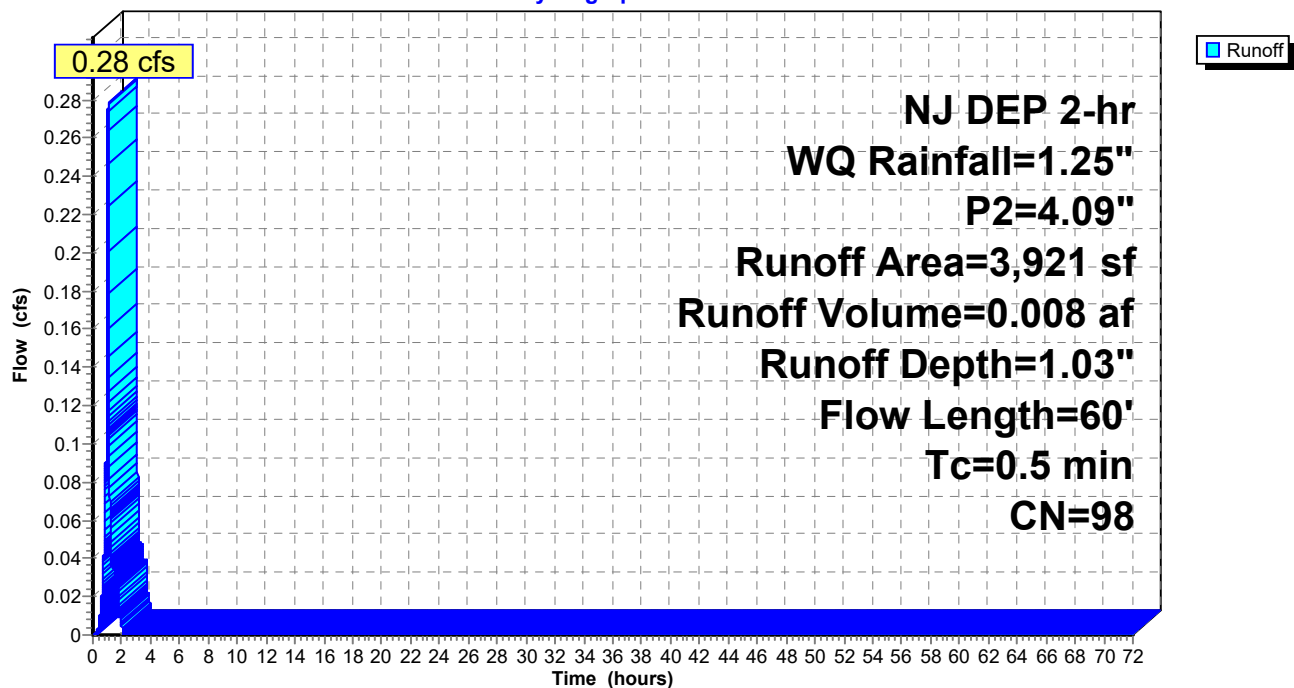
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=4.09"

Area (sf)	CN	Description
3,921	98	Paved parking, HSG B
3,921		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	42	0.0326	1.59		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 4.09"
0.1	18	0.1180	5.53		Shallow Concentrated Flow, B-C (RIP-RAP) Unpaved Kv= 16.1 fps
0.5	60	Total			

Subcatchment 6S: PDA #1 - Impervious to Bio

Hydrograph



2026-02 Proposed Conditions - AJH

NJ DEP 2-hr WQ Rainfall=1.25", P2=4.09"

Prepared by Dynamic Engineering

Printed 2/16/2026

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Page 3

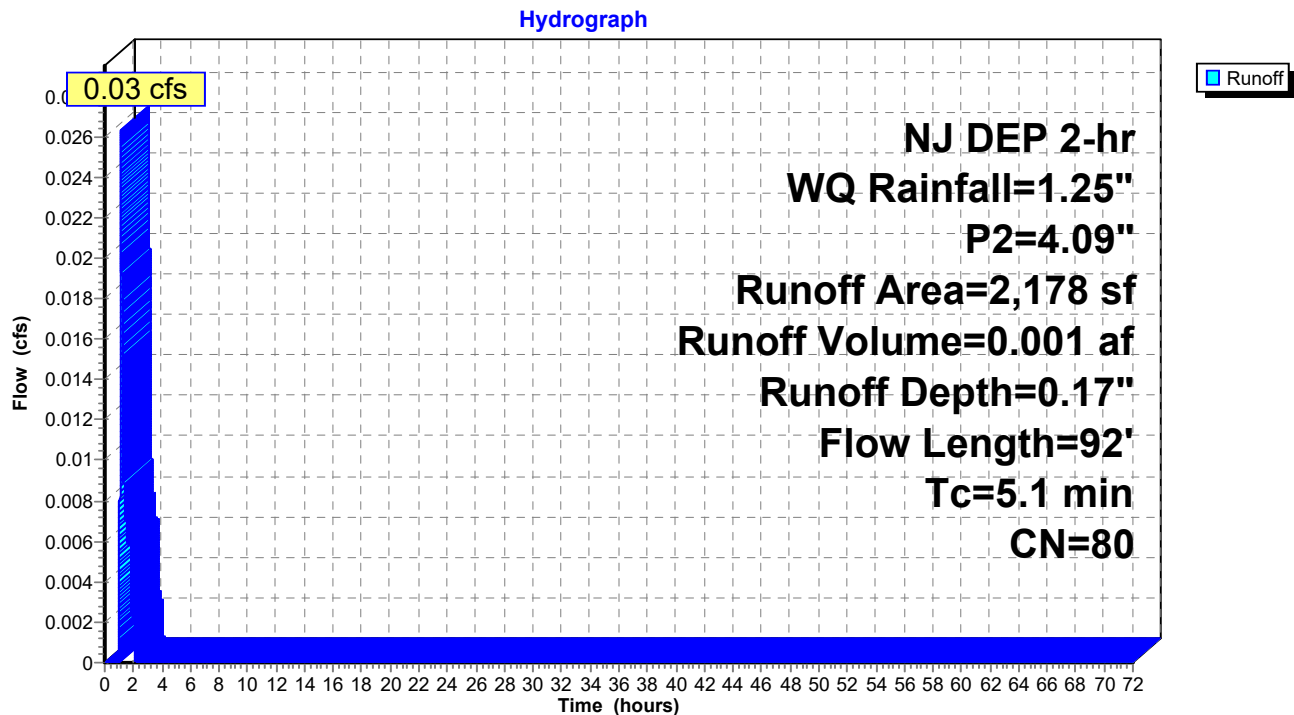
Summary for Subcatchment 7S: PDA #1 - Pervious to Bio

Runoff = 0.03 cfs @ 1.13 hrs, Volume= 0.001 af, Depth= 0.17"
Routed to Pond 2P : BIO BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
NJ DEP 2-hr WQ Rainfall=1.25", P2=4.09"

Area (sf)	CN	Description
2,178	80	>75% Grass cover, Good, HSG D
2,178		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	45	0.0450	0.16		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 4.09"
0.2	29	0.0148	2.47		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.1	18	0.1180	5.53		Shallow Concentrated Flow, C-D (RIP-RAP) Unpaved Kv= 16.1 fps
5.1	92	Total			

Subcatchment 7S: PDA #1 - Pervious to Bio

2026-02 Proposed Conditions - AJH

NJ DEP 2-hr WQ Rainfall=1.25", P2=4.09"

Prepared by Dynamic Engineering

Printed 2/16/2026

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Summary for Pond 2P: BIO BASIN

Inflow Area = 0.140 ac, 64.29% Impervious, Inflow Depth = 0.73" for WQ event
 Inflow = 0.30 cfs @ 1.08 hrs, Volume= 0.008 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.001 hrs
 Peak Elev= 622.86' @ 2.29 hrs Surf.Area= 540 sf Storage= 369 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	622.00'	1,219 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
622.00	323	0	0
623.00	577	450	450
624.00	960	769	1,219

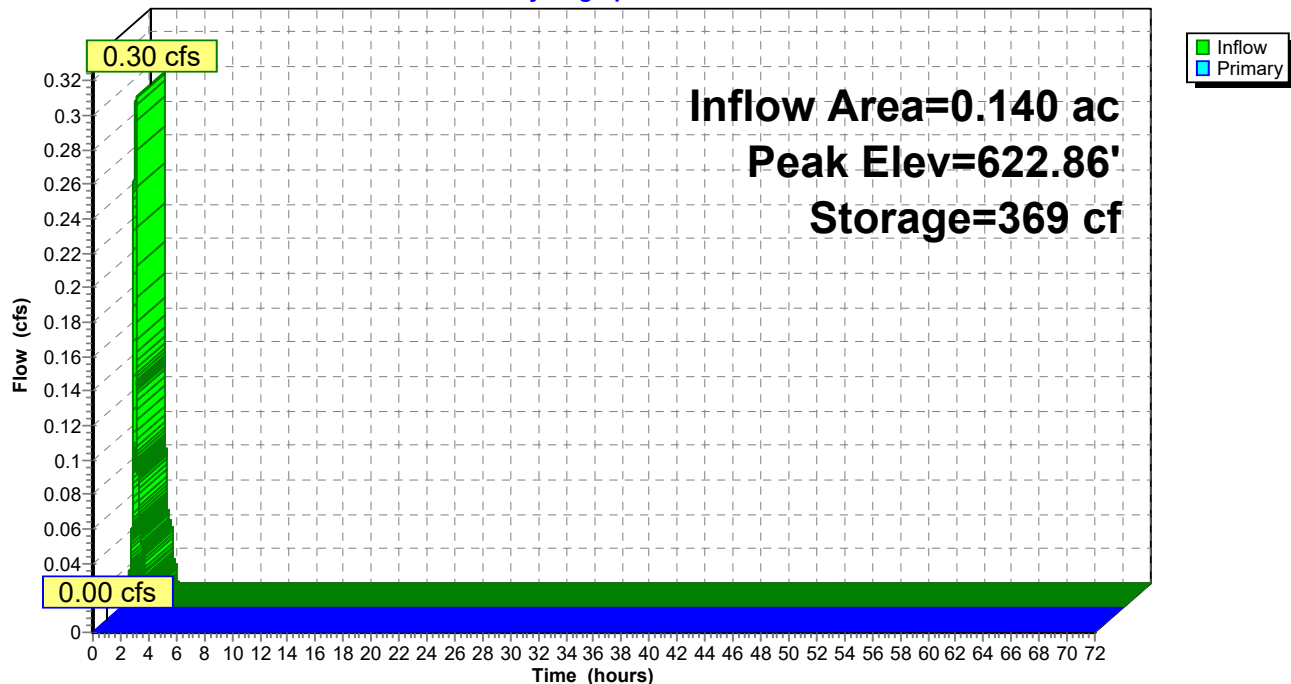
Device	Routing	Invert	Outlet Devices
#1	Primary	619.11'	15.0" Round Culvert L= 35.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 619.11' / 618.93' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	622.86'	0.6' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Device 1	623.70'	48.0" x 48.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=622.00' (Free Discharge)

↑ **1=Culvert** (Passes 0.00 cfs of 9.60 cfs potential flow)
 ↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
 ↑ **3=Grate** (Controls 0.00 cfs)

Pond 2P: BIO BASIN

Hydrograph



STORMWATER COLLECTION SYSTEM CALCULATIONS (PIPE SIZING)



DYNAMIC ENGINEERING

Stormwater Collection System Calculations

Project: Mavis Tire Supply, LLC

Job #: 1956-24-04187

Location: West Orange Township

Design Storm: 25 yr

Computed By: AJH

Checked By: RR

Date: 2/16/2026

NOTES:

- 1) Design method used is Rational Method, unless otherwise noted.
- 2) Refer to Weighted Runoff Coefficient table for calculation of incremental areas and C values

PIPE SECTION		SUBCATCHMENT AREA	INCREMENTAL		CUMULATIVE	TIME OF CONCENTRATION			I	PEAK RUNOFF		PIPING INPUT			PIPING DATA		
FROM	TO	Area (Acres)	"C"	A x C Ac	A x C (acres)	Tc to Inlet (min)	Tc in Pipe (min.)	Final Tc (min)	(In/Hr)	Q to Inlet (CFS)	Q cum. for Pipe (CFS)	Dia. (In)	Length (Ft)	Man. "n"	Slope (ft/ft)	Pipe Capacity (cfs)	Pipe Velocity (fps)
EXIST. ROUND INLET	PROP. MH #3	0.10	0.95	0.10	0.10	6.00	0.06	6.00	7.70	0.77	0.77	12	26.0	0.013	0.0255	5.69	7.25
PROP. INLET #7	PROP. INLET #6	0.08	0.88	0.07	0.07	6.00	0.32	6.00	7.70	0.54	0.54	15	64.0	0.012	0.0035	4.14	3.38
PROP. INLET #6	PROP. MH #3	0.07	0.89	0.07	0.14	6.00	0.32	6.32	7.70	0.54	1.08	15	64.0	0.012	0.0035	4.14	3.38
PROP. MH #3	PROP. OCS #2	0.00	0.00	0.00	0.24	6.00	0.33	6.64	7.59	0.00	1.82	15	67.0	0.012	0.0035	4.14	3.38
PROP. OCS #2	EXIST. A-INLET	0.14	0.74	0.10	0.34	6.00	0.07	6.97	7.59	0.76	2.58	15	15.0	0.012	0.0035	4.14	3.38
EXIST. A-INLET	EXIST. MANHOLE	0.01	0.35	0.00	0.34	6.00	0.24	7.04	7.48	0.00	2.54	15	97.0	0.012	0.0143	8.37	6.82
PROP. UG BASIN OCS	EXIST. MANHOLE	0.14	0.95	0.13	0.13	6.00	0.07	6.00	7.70	1.00	1.00	15	15.0	0.012	0.0035	4.14	3.38

**RESULTS OF TEST PIT EXCAVATION AND
INFILTRATION TESTING – PREPARED BY ECS**



January 29, 2025

Ms. Rachael Dickinson
Pre-Construction Project Manager
Mavis Tire Supply, LLC
200 Summit Lake Drive, Suite 350
Valhalla, NY 10595

ECS Project Number: 44:2100-A

Reference: Addendum No. 1 - Results of Test Pit Excavation and Infiltration Testing
Mavis Store #2296
460 Prospect Avenue,
West Orange, New Jersey

Dear Ms. Dickinson:

ECS Mid-Atlantic, LLC (ECS) is pleased to present the interpreted subsurface profiles and results from the test pits excavations and infiltration testing completed at the referenced project site location. The work described herein was performed to supplement the previous subsurface exploration executed under ECS project No. 44:2100. The purpose of the explorations was:

- To perform infiltration testing, the results of which will be considered in the design of the potential stormwater management (SWM) facilities.
- To further evaluate the existing fill materials and to better understand the make-up and depth of these materials to further determine suitability for support of the foundations and/or if undercuts will be necessary.

Our services were provided in general accordance with the scope provided to Mavis in email correspondence dated December 12, 2024 (ECS Proposal No. 44:2237-GP), which was authorized via email on December 16, 2024.

PROJECT UNDERSTANDING

The project site is located at 460 Prospect Avenue, West Orange, Essex County, New Jersey. In discussions with Mavis, further evaluation of the fill material within the footprint of the proposed retail auto service building was required. In addition, as understood from information provided by Mavis, a stormwater management (SWM) facility is proposed as part of the overall site development. Limited details regarding the SWM facility were available at the time of testing and the infiltration testing locations were selected in the general location of the SWM facility as approved by Mavis.

The soil profiling and infiltration test program performed was based on the information obtained from our previous subsurface exploration and discussions with Mavis.

SUBSURFACE EXPLORATION AND TESTING

Our exploration procedures are explained in greater detail in the Attachment 2 in the insert titled Subsurface Exploration Procedure. A rubber tracked excavator was used by Sano Drilling, and the Exploration Location Diagram in Attachment 1 depicts the approximate as-completed locations of the test pit excavations. Soil profiling and field infiltration testing was performed in general accordance with Chapter 12 of the BMP Manual. The Single Ring Infiltration Test (Subsection A5 of the Chapter 12 Appendix) was used.

Upon completion of the infiltration testing, the test pits were backfilled with the excavation spoils. The spoils were placed in consecutive, generally horizontal lifts of relatively uniform thickness and tamped with the excavator bucket. Excess spoils were mounded above the backfilled test pit footprint and smoothed and firmed with the excavator bucket.

SUBSURFACE CHARACTERIZATION

Soils encountered were visually classified during logging on the basis of texture in general accordance with the United States Department of Agriculture (USDA) Textural Classification System per the requirements of the BMP Manual. After classification, the samples were grouped in the major zones noted on the exploration logs contained in the Attachment 2. Divisions between soil strata/soil horizons on the exploration logs are approximate; in-situ, the transitions may be gradual. Additionally, index property tests were performed on select soil samples collected to confirm USDA classifications made in the field. Each laboratory test was completed in general accordance with the applicable ASTM Standard Test Method as indicated on the laboratory testing sheets included in Attachment 3.

The subsurface conditions encountered were generally consistent with the published geologic mapping available from the New Jersey Geological and Water Survey via NJ-GeoWeb and the United States Department of Agriculture Natural Resources Conservation Service (USDA-NRCS) via Web Soil Survey for the general site vicinity.

TEST PIT DESIGNATION	EXISTING GROUND SURFACE ELEVATION	BOTTOM OF FILL ELEVATION	APPROXIMATE FILL DEPTH (feet)
TP-01	±619.0	±617.0	±2.0
TP-02	±619.0	±615.75	±3.25
TP-03	±619.0	±616.0	±3.0
TP-04	±618.0	±617.0	±1.0
TP-05	±616.0	±613.0	±3.0

GROUNDWATER

During the test pit exploration, groundwater was not observed within the test pits. No water was observed entering the other test pits; however, each of the test pits were not left open for 24-hour to monitor the seasonal high-water determination (SHWT). No mottling was observed in any of the test pits as well.

The possibility of groundwater level fluctuations should be considered in stormwater design development. Variations in perched groundwater levels and long-term water table may occur as a result of changes in precipitation, evaporation, surface water runoff, construction activities, and other factors.

INFILTRATION TEST RESULTS

As previously indicated, field infiltration testing was performed within two of the test pits in general accordance with the Appendix to Chapter 12 of the BMP Manual, Subsection A5, Single Ring Infiltration Test. Findings from our field infiltration testing are reported on the Single Ring Infiltrometer Test Logs contained in the attachments. Listed in the following table present the hydraulic conductivity rate of the soil layers tested as determined by the procedure outlined in Subsection A5.

TEST PIT DESIGNATION	INFILTRATION TEST ID	APPROXIMATE TEST ELEVATION	USDA TEXTURAL CLASSIFICATION AT TEST ELEVATION	TESTED SOIL HYDRAULIC CONDUCTIVITY RATE
				(inch/hour)
TP-01	TP-01A	±615.0	SANDY LOAM	0.04
TP-02	TP-02A	±615.0	SANDY LOAM	0.39

EXISTING FILL AND SHALLOW FOUNDATIONS

Based on the visual observation of the fill materials encountered while test pitting the existing fill materials on the site do not appear to be suitable for support of the building foundations. The existing fills are variable in composition, containing deleterious debris such as brick, plastic, glass, and metals. Therefore, the recommendation included in the report should be followed and these materials should be removed in their entirety below foundation elements and heavily proofrolled during site grading operations in areas supporting pavements and slabs on grade.

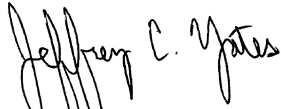
CLOSING

This letter has been prepared as an addendum to our Geotechnical Engineering Report dated December 10, 2024 (under ECS Project No. 44:2100); as such, it should only be utilized in conjunction with that exploration and report. Should any of the assumptions outlined above regarding the proposed conditions be inaccurate, alternative recommendations may apply including those provided in our geotechnical report.

It has been our pleasure to be of service during this phase of the project. Please note, ECS is not responsible for the conclusions, opinions, or recommendations of others based on the data contained in this letter and its associated attachments. Should you have any questions concerning the information contained herein, or if we can be of further assistance to you, please contact us.

Respectfully,

ECS MID-ATLANTIC, LLC



Jeffrey C. Yates, P.E.

Geotechnical Department Manager

jcyates@ecslimited.com



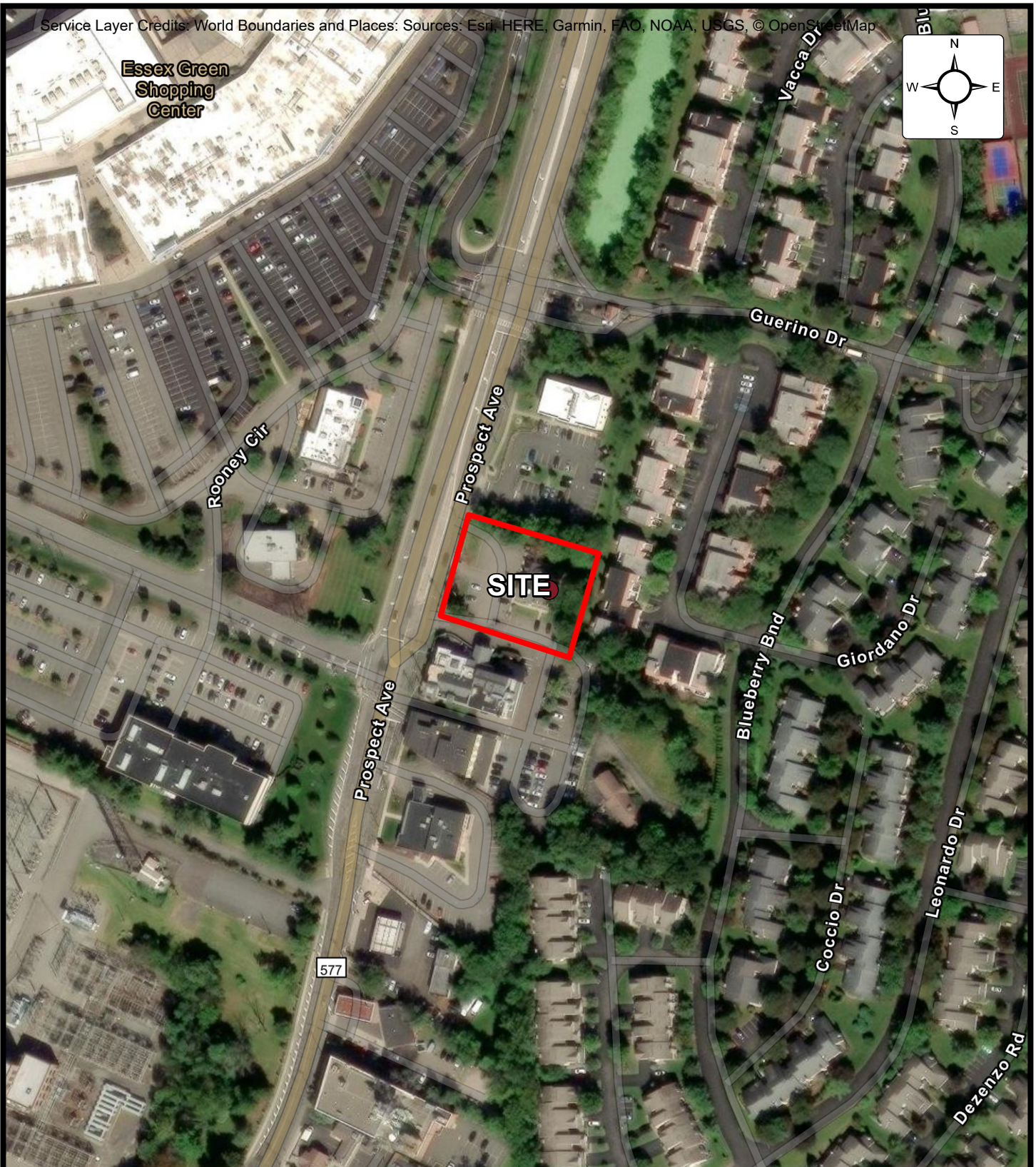
Stephen F. Patt, P.E.

Geotechnical Principal Engineer

spatt@ecslimited.com

Attachments: Attachment 1 – Drawings and Reports
Attachment 2 - Test Pit and Infiltration Logs
Attachment 3 - Laboratory Testing

Attachment 1
Drawing and Reports



SITE LOCATION DIAGRAM Mavis #2296 - West Orange, NJ

460 Prospect Avenue
West Orange, New Jersey

Mavis Tire Supply, LLC

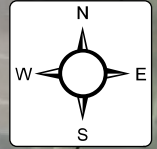
ENGINEER
JCY

SCALE
1" = 200'

PROJECT NO.
44:2100

SHEET
1

DATE
12/10/2024



Legend

-  Approximate Previous Boring Locations - B
Drilled November 22, 2024
-  Approximate Test Pit Locations - TP
Excavated January 14, 2025



EXPLORATION LOCATION DIAGRAM Mavis #2296 - Additional Infiltration

460 Prospect Avenue
West Orange, New Jersey

Mavis Tire Supply, LLC

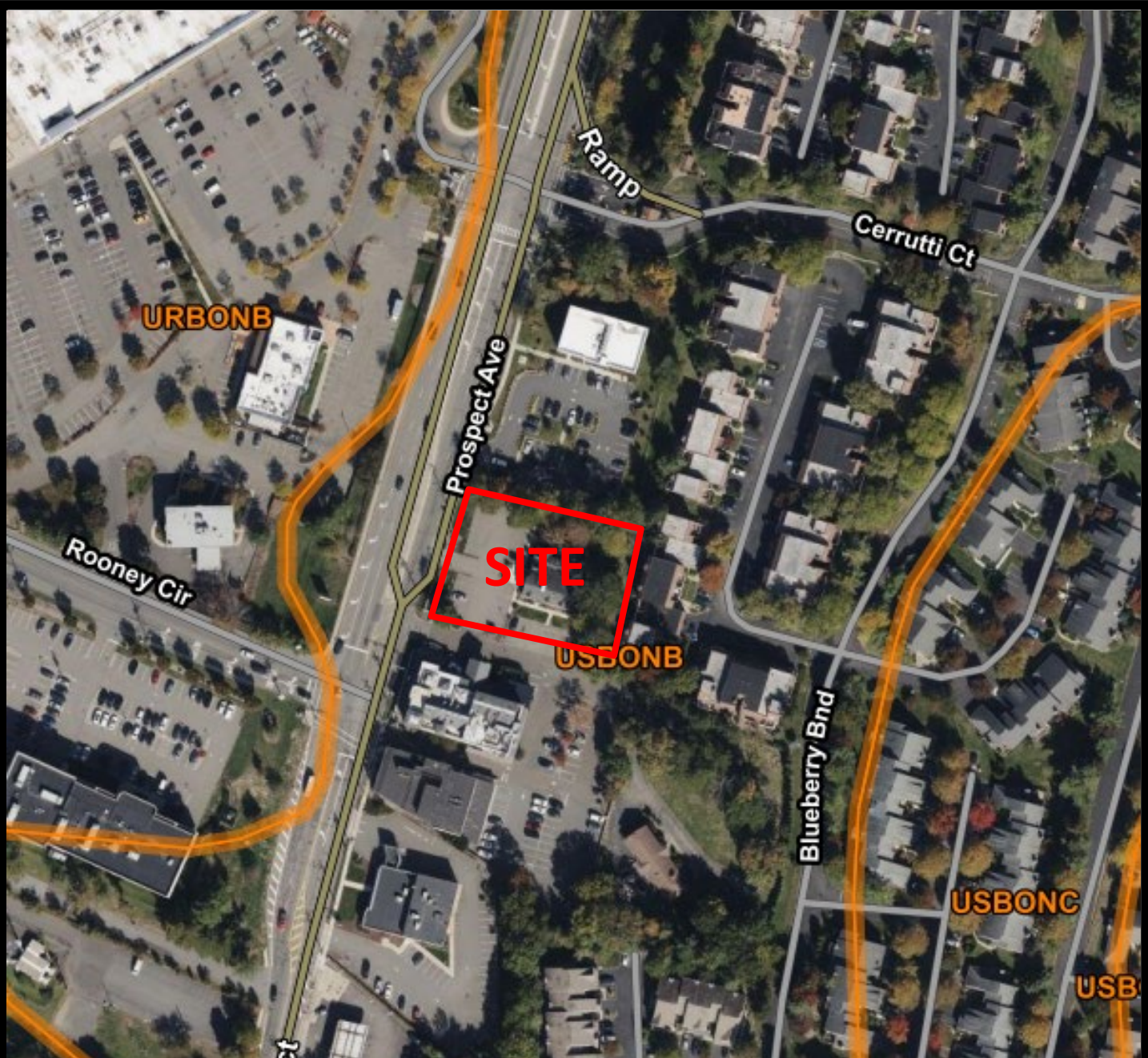
ENGINEER
JCY

SCALE
1" = 40'

PROJECT NO.
44:2100-A

SHEET

DATE
1/20/2025



Map Unit Symbol	Map Unit Name
USBONB	Urban land, Boonton substratum - Boonton complex, 0 to 8 percent slopes
URBONB	Urban land, Boonton substratum - Boonton complex, 0 to 8 percent slopes
USBONC	Urban land, Boonton substratum - Boonton complex, 8 to 15 percent slopes

Source: Web Soil Survey



Mavis Store #2296

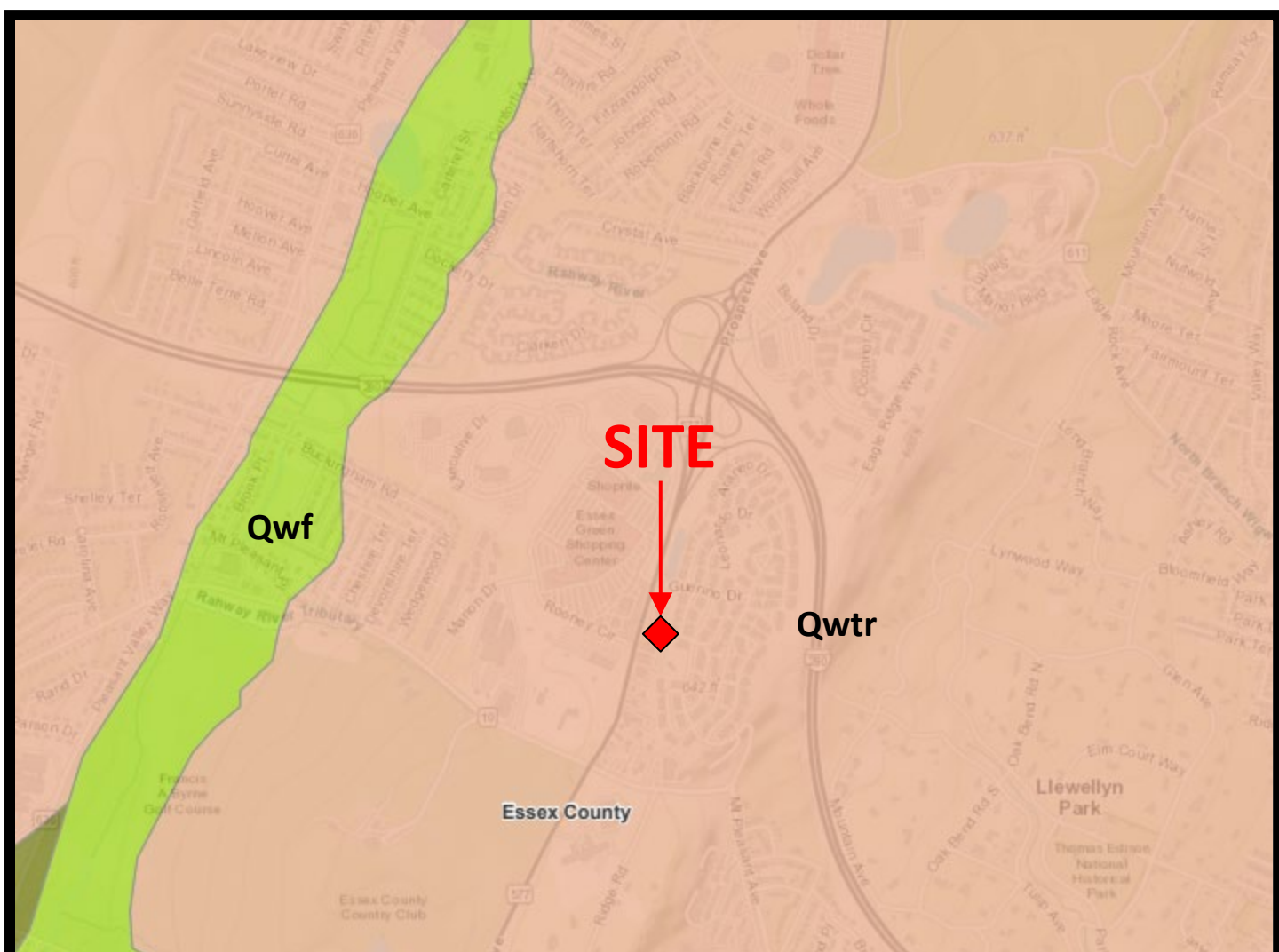
460 Prospect Avenue
West Orange, NJ

Mavis Tire Supply



SOIL SURVEY MAP

ECS Project 44:2100
December 10, 2024



Geologic Formation Name (Abbreviation)	Lithology	Notes
Rahway Till (Qwtr)	Clayey silt to sandy silt with some to many pebbles and cobbles and few boulders; reddish brown, reddish yellow, yellowish brown, brown. As much as 100 feet thick, generally less than 40 feet thick.	Deposited directly from glacial ice during the late Wisconsinan glaciation.
Late Wisconsinan Glaciofluvial Deposits (Qwf)	Sand and pebble-to-cobble gravel, minor silt; yellowish brown to reddish brown. As much as 50 feet thick.	Form plain and terraces (undifferentiated) deposited by glacial streams during the late Wisconsinan glaciation. Where plains and terraces are differentiated they are mapped separately as units Qwfv and Qwft, respectively

Source: NJ-Geoweb (Surficial Geology)



Mavis Store #2296

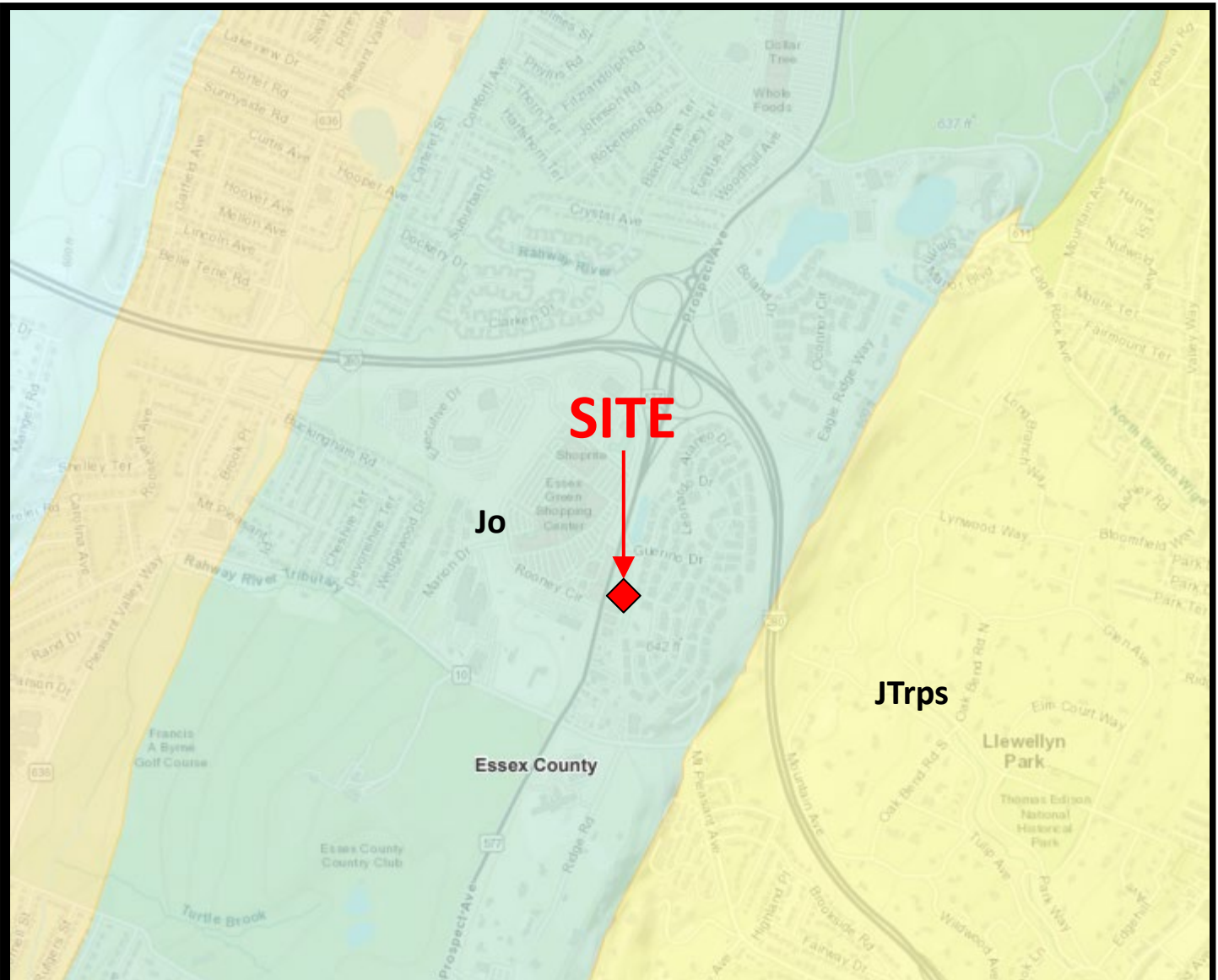
460 Prospect Avenue
West Orange, NJ

Mavis Tire Supply



SURFICIAL GEOLOGY MAP

ECS Project 44:2100
December 10 2024



Stratigraphic Unit Name (Abbreviation)	Stratigraphic Unit Number	Lithology
Orange Mountain Basalt (Jo)	3,700	Basalt, fine-to-medium-grained
Passaic Formation Sandstone and Siltstone Facies (JTprs)	4,500	Sandstone and siltstone

Source: NJ-Geoweb (Regional Geology)



Mavis Store #2296

460 Prospect Avenue
West Orange, NJ

Mavis Tire Supply



REGIONAL GEOLOGY MAP

ECS Project 44:2100
December 10, 2024

Attachment 2

Test Pit and Infiltration Logs

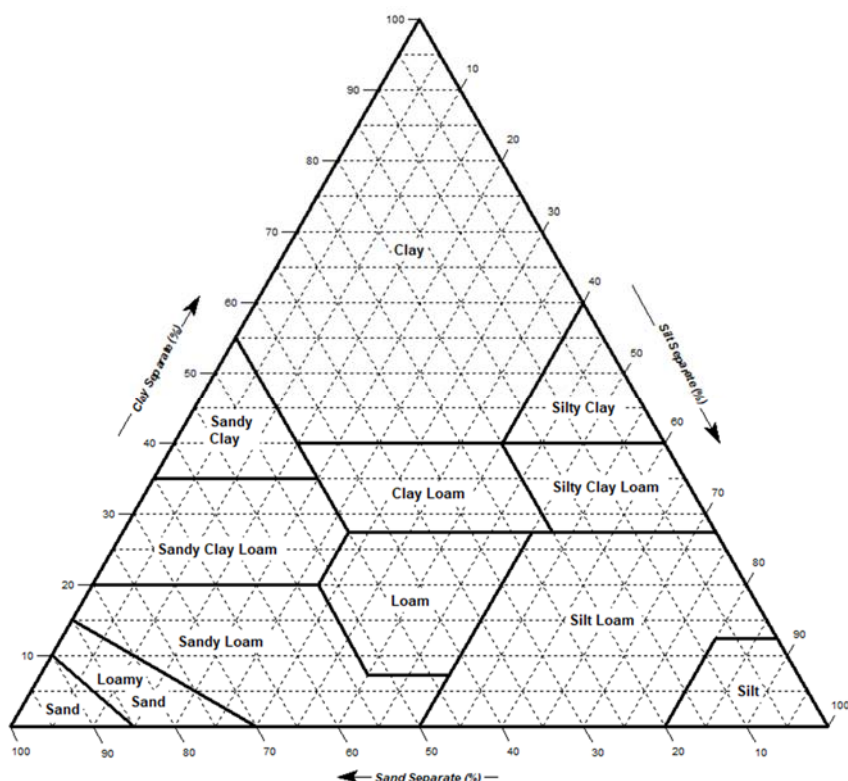
Test Pit Photolog



U.S. Department of Agriculture (USDA) Soil Classification System

Texture Triangle

Fine Earth Texture Classes (—)



Texture Class

Texture Class or Subclass	Code	
	Conv.	NASIS
Coarse Sand	cos	COS
Sand	s	S
Fine Sand	fs	FS
Very Fine Sand	vfs	VFS
Loamy Coarse Sand	lcos	LCOS
Loamy Sand	ls	LS
Loamy Fine Sand	lfs	LFS
Loamy Very Fine Sand	lvfs	LVFS
Coarse Sandy Loam	cosl	COSL
Sandy Loam	sl	SL
Fine Sandy Loam	fsl	FSL
Very Fine Sandy Loam	vfsl	VFSL
Loam	l	L
Silt Loam	sil	SIL
Silt	si	SI
Sandy Clay Loam	scl	SCL
Clay Loam	cl	CL
Silty Clay Loam	sicl	SICL
Sandy Clay	sc	SC
Silty Clay	sic	SIC
Clay	c	C

Texture Modifiers – Conventions for using “Rock Fragment Texture Modifiers” and for using textural adjectives that convey the “% volume” ranges for **Rock Fragments – Size and Quantity**.

Fragment Content % By Volume	Rock Fragment Modifier Usage
< 15	No texture adjective is used (noun only; e.g., <i>loam</i>).
15 to < 35	Use adjective for appropriate size; e.g., <i>gravelly</i> .
35 to < 60	Use “very” with the appropriate size adjective; e.g., <i>very gravelly</i> .
60 to < 90	Use “extremely” with the appropriate size adjective; e.g., <i>extremely gravelly</i> .
≥ 90	No adjective modifier. If ≤ 10% fine earth, use the appropriate noun for the dominant size class; e.g., <i>gravel</i> . Use terms in lieu of texture.

Texture Modifiers – (Adjectives)

Rock Fragments: Size and Quantity	Code		Criteria: Percent (by volume) of total rock fragments and dominated by (<i>name size</i>):
	Conv.	PDP/ NASIS	
<i>Rock Fragments (> 2mm; ≥ Strongly Cemented)</i>			
Gravelly	GR	GR	≥ 15% but < 35% gravel
Fine Gravelly	FGR	GRF	≥ 15% but < 35% fine gravel
Medium Gravelly	MGR	GRM	≥ 15% but < 35% med. gravel
Coarse Gravelly	CGR	GRC	≥ 15% but <35% coarse gravel
Very Gravelly	VGR	GRV	≥ 35% but < 60% gravel
Extremely Gravelly	XGR	GRX	≥ 60% but < 90% gravel
Cobbly	CB	CB	≥ 15% but < 35% cobbles
Very Cobbly	VCB	CBV	≥ 35% but < 60% cobbles
Extremely Cobbly	XCB	CBX	≥ 60% but < 90% cobbles
Stony	ST	ST	≥ 15% but < 35% stones
Very Stony	VST	STV	≥ 35% but < 60% stones
Extremely Stony	XST	STX	≥ 60% but < 90% stones
Bouldery	BY	BY	≥ 15% but < 35% boulders
Very Bouldery	VBY	BYV	≥ 35% but < 60% boulders
Extremely Bouldery	XBY	BYX	≥ 60% but < 90% boulders
Channery	CN	CN	≥ 15% but < 35% channers
Very Channery	VCN	CNV	≥ 35% but < 60% channers
Extremely Channery	XCN	CNX	≥ 60% but < 90% channers
Flaggy	FL	FL	≥ 15% but < 35% flagstones
Very Flaggy	VFL	FLV	≥ 35% but < 60% flagstones
Extremely Flaggy	XFL	FLX	≥ 60% but < 90% flagstones



SUBSURFACE EXPLORATION PROCEDURE: TEST PIT EXCAVATION

A test pit is an excavation of subsurface materials to characterize the composition and rippability/excavation efforts. Test pit exploration allows observation of the boundary relationships within a soil and rock profile and is useful to identify existing fill composition, disturbed material or the depth of soft sediments. Both track mounted excavators and backhoes are used in a variety of ground conditions allowing for difficult terrain to be accessed. The excavation process also provides access for in-situ and field testing and acquisition of samples for laboratory testing.

TEST PIT Procedure:

- Involves excavation subsurface material to observe composition and physical characteristics
- Recording the approximate depth of subsurface strata
- Excavation is continued as prescribed or to limits of equipment and subsurface conditions
- The exploration is typically carried out with an excavator or backhoe, with the depth dependent on machine size and ground



Soil Profile Report

Project Name/#:	Mavis #2296 - Additional Infiltration Testing	Municipality:	West Orange		
Project Location:	460 Prospect Avenue	Block/Lot:	Block: 105 Lot: 64.01		
Driller:	Sano Drilling	Inspector:	Maddie Trudnak / ECS		
Date of Observation:		1/14/2025		Lowest point in BMP (ft) =	
Prepared by:		JCY		Maximum Impounded Water Depth (ft) =	
				Required Soil Profile Depth (ft) =	
				Elevations are approximate and based on Google Earth©.	
Exploration ID:	TP-01				
		Elevation (ft)			
Existing Ground Level:		619.0			
Proposed SWM Basin Bottom Level:		-			
Seasonal High Water Table:		-			
Termination:		611.0			
USDA Soil Texture	Mark Most Hydraulically Restrictive	Top Elevation/Bottom Elevation (ft.)	Observed Water Table Elevation (ft.)	Soil Morphological Observations	Note
Loamy Silt		619.0/618.5		10 YR 4/2 dark grayish brown, moist, blocky, friable	Topsoil, contains roots
Silt Loam		618.5/617.0		7.5 YR 4/4 brown, moist, blocky, very friable	Fill, contains metal nails, plastic sprinkler system, roots
SANDY LOAM	x	617.0/611.0	Not encountered	5 YR 3/3 dark reddish brown, moist, blocky, very friable, 10% gravel	Infiltration Test at 615.0

Soil Profile Report

Project Name/#:	Mavis #2296 - Additional Infiltration Testing	Municipality:	West Orange		
Project Location:	460 Prospect Avenue	Block/Lot:	Block: 105 Lot: 64.01		
Driller:	Sano Drilling	Inspector:	Maddie Trudnak / ECS		
Date of Observation:		1/14/2025		Lowest point in BMP (ft) =	
Prepared by:		JCY		Maximum Impounded Water Depth (ft) =	
				Required Soil Profile Depth (ft) =	
				Elevations are approximate and based on Google Earth©.	
Exploration ID:	TP-02				
		Elevation (ft)			
Existing Ground Level:		619.0			
Proposed SWM Basin Bottom Level:		-			
Seasonal High Water Table:		-			
Termination:		611.0			
USDA Soil Texture	Mark Most Hydraulically Restrictive	Top Elevation/Bottom Elevation (ft.)	Observed Water Table Elevation (ft.)	Soil Morphological Observations	Note
Silt Loam		619.0/618.75		10 YR 4/2 dark grayish brown, moist, blocky, hard	Topsoil, Fill
Loamy Silt	x	618.75/615.75		7.5 YR 4/4 brown, moist, blocky, very friable	Fill, contains brick
SANDY LOAM		615.75/611.0	Not encountered	5 YR 3/3 dark reddish brown, moist, single grain, loose, 10% gravel	Infiltration Test at 615.0

Soil Profile Report

Project Name/#:	Mavis #2296 - Additional Infiltration Testing	Municipality:	West Orange		
Project Location:	460 Prospect Avenue	Block/Lot:	Block: 105 Lot: 64.01		
Driller:	Sano Drilling	Inspector:	Maddie Trudnak / ECS		
Date of Observation:		1/14/2025		Lowest point in BMP (ft) =	
Prepared by:		JCY		Maximum Impounded Water Depth (ft) =	
				Required Soil Profile Depth (ft) =	
				Elevations are approximate and based on Google Earth©.	
Exploration ID:	TP-03				
		Elevation (ft)			
Existing Ground Level:		619.0			
Proposed SWM Basin Bottom Level:		-			
Seasonal High Water Table:		-			
Termination:		610.5			
USDA Soil Texture	Mark Most Hydraulically Restrictive	Top Elevation/Bottom Elevation (ft.)	Observed Water Table Elevation (ft.)	Soil Morphological Observations	Note
Loamy Silt		619.0/618.5		10 YR 4/2 dark grayish brown, moist, blocky, loose	Topsoil, contains roots
Silt Loam	x	618.5/616.0		10 YR 3/2 very dark grayish brown, moist, blocky, friable, 10% gravel	Fill, plastic sprinkler system
Sandy Silt		616.0/610.5	Not encountered	5 YR 3/3 dark reddish brown, moist, single grain & blocky, loose, 50% gravel	Bucket refusal @ 8.5' bgs

Soil Profile Report

Project Name/#:	Mavis #2296 - Additional Infiltration Testing	Municipality:	West Orange		
Project Location:	460 Prospect Avenue	Block/Lot:	Block: 105 Lot: 64.01		
Driller:	Sano Drilling	Inspector:	Maddie Trudnak / ECS		
Date of Observation:		1/14/2025		Lowest point in BMP (ft) =	
Prepared by:		JCY		Maximum Impounded Water Depth (ft) =	
				Required Soil Profile Depth (ft) =	
				Elevations are approximate and based on Google Earth©.	
Exploration ID:	TP-04				
		Elevation (ft)			
Existing Ground Level:		618.0			
Proposed SWM Basin Bottom Level:		-			
Seasonal High Water Table:		-			
Termination:		606.0			
USDA Soil Texture	Mark Most Hydraulically Restrictive	Top Elevation/Bottom Elevation (ft.)	Observed Water Table Elevation (ft.)	Soil Morphological Observations	Note
Silt Loam		618.0/617.7		10 YR 3/2 very dark grayish brown, moist, blocky, loose	Topsoil
Sandy Loam		617.7/617.4		7.5 YR 5/4 brown, moist, blocky, loose, 5% gravel	Fill
Silty Loam		617.4/617.0		2.5Y 5/1 gray, moist, blocky, loose, 90% gravel	Fill, contains glass bottles
Clay Loam	x	617.0/615.0		7.5 YR 3/1 very dark gray, moist, blocky, friable, 20% gravel	
Sandy Silt		615.0/606.0	Not encountered	5 YR 3/3 dark reddish brown, moist, single grain, loose, 40% gravel	

Soil Profile Report

Project Name/#:	Mavis #2296 - Additional Infiltration Testing	Municipality:	West Orange		
Project Location:	460 Prospect Avenue	Block/Lot:	Block: 105 Lot: 64.01		
Driller:	Sano Drilling	Inspector:	Maddie Trudnak / ECS		
Date of Observation:		1/14/2025		Lowest point in BMP (ft) =	
Prepared by:		JCY		Maximum Impounded Water Depth (ft) =	
				Required Soil Profile Depth (ft) =	
				Elevations are approximate and based on Google Earth©.	
Exploration ID:	TP-05				
		Elevation (ft)			
Existing Ground Level:		616.0			
Proposed SWM Basin Bottom Level:		-			
Seasonal High Water Table:		-			
Termination:		607.0			
USDA Soil Texture	Mark Most Hydraulically Restrictive	Top Elevation/Bottom Elevation (ft.)	Observed Water Table Elevation (ft.)	Soil Morphological Observations	Note
Asphalt		616.0/615.2			
Sandy Loam		615.2/615.0		10YR 6/2 light brownish gray, moist, 90% gravel	Subgrade
Sandy Loam		615.0/613.0		10YR 5/1 gray, moist, blocky & single grain, loose, 30% gravel	Fill, contains brick, plastic, cobbles
Silty Clay Loam	x	613.0/607.0	Not encountered	5YR 3/3 dark reddish brown, moist, blocky, friable, 30% gravel and cobbles	Bucket refusal @ 9.0' bgs

Single Ring Infiltrometer Test Log

ECS Project No.: 44:2100-A

Project Location: 460 Prospect Avenue

Project Name: Mavis #2296 Infiltration Testing - West Orange

Township: West Orange

Block/Lot:

Testing per New Jersey Stormwater Best Management Practices Manual, Chapter 12, Subsection A5 (April 2022)

				TEST ID:	TP-01A			Soil Layer Classification:	Sandy Loam	Infiltration Test Elev.:		615.0
				Date:	1/14/2025							
Water Level Drop	MM	SS	.ss	Trial #	Water Level Drop (in)	Field Recorded Time (MM:SS.ss)	Calculated Time Per 1-inch Water Level Drop (MM.mm)	Field Observed Intake Rate (inches/min)	Field Observed Intake Rate (inches/hr)	Converted Hydraulic Conductivity (inches/hr)	Averaged Hydraulic Conductivity Rate (inches/hr)	
0.13	60	00	00	1	0.1	60:00.00	60.00	0.0021	0.13	0.04	0.04	
0.13	60	00	00	2	0.1	60:00.00	60.00	0.0021	0.13	0.04		
0.13	60	00	00	3	0.1	60:00.00	60.00	0.0021	0.13	0.04		
0.13	60	00	00	4	0.1	60:00.00	60.00	0.0021	0.13	0.04		

				TEST ID:	TP-02A			Soil Layer Classification:	Sandy Loam	Infiltration Test Elev.:		615.0
				Date:	1/14/2025							
Water Level Drop	MM	SS	.ss	Trial #	Water Level Drop (in)	Field Recorded Time (MM:SS.ss)	Calculated Time Per 1-inch Water Level Drop (MM.mm)	Field Observed Intake Rate (inches/min)	Field Observed Intake Rate (inches/hr)	Converted Hydraulic Conductivity (inches/hr)	Averaged Hydraulic Conductivity Rate (inches/hr)	
1.00	28	00	00	1	1.0	28:00.00	28.00	0.0357	2.14	0.73	0.39	
1.00	53	46	00	2	1.0	53:46.00	53.77	0.0186	1.12	0.38		
0.83	60	00	00	3	0.8	60:00.00	60.00	0.0138	0.83	0.28		
0.50	60	00	00	4	0.5	60:00.00	60.00	0.0083	0.50	0.17		





Photograph 1 (Top left):

TP-01: Sprinkler system, wires, roots between 0.5 and 1.5 feet below ground surface.

Photograph 2 (Top right):

TP-01: Metal nails encountered between 0.5 and 1.5 feet below ground surface.

Photograph 3 (Bottom left):

TP-02: Sprinkler system and brick encountered between 0.25 and 3.25 feet below ground surface .

**Mavis #2296 – Additional
Infiltration Testing**

460 Prospect Avenue
West Orange, NJ

Mavis Tire Supply, LLC



SELECT PROJECT PHOTOGRAPHS

ECS Project 44:2100-A
January 23, 2025



Photograph 4 (Top left):

TP-03: Sprinkler system and wires encountered between 0.5 and 3.0 feet below ground surface.

Photograph 5 (Top right):

TP-04: Subgrade and fill materials encountered between 0.0 and 1.2 feet below ground surface.

Photograph 6 (Bottom left):

TP-04: Glass bottle recovered from approximately 3.0 feet below ground surface.

**Mavis #2296 – Additional
Infiltration Testing**

460 Prospect Avenue
West Orange, NJ

Mavis Tire Supply, LLC



SELECT PROJECT PHOTOGRAPHS

ECS Project 44:2100-A
January 23, 2025



Photograph 7 (Top left):

TP-05: 10 inches of asphalt underlain by gravel. Wires, large gravel, cobble, and brick encountered between 1.0 and 3.0 feet below ground surface.

Photograph 8 (Top right):

TP-05: Reddish brown Silt and Sand Loam encountered between 3.0 and 9.0 feet-below ground surface.

Photograph 9 (Bottom left):

TP-05: Fill encountered.

**Mavis #2296 – Additional
Infiltration Testing**

460 Prospect Avenue
West Orange, NJ

Mavis Tire Supply, LLC



SELECT PROJECT PHOTOGRAPHS

ECS Project 44:2100-A
January 23, 2025

Attachment 3
Laboratory Testing

Laboratory Testing Summary

Sample Location	Sample Number	Depth (ft)	^MC (%)	Soil Type	Atterberg Limits			**Percent Passing No. 200 Sieve	Moisture - Density		CBR (%)		#Organic Content (%)
					LL	PL	PI		<Maximum Density (pcf)	<Optimum Moisture (%)	0.1 in.	0.2 in.	
TP-01	S-1	4	16.5					37.6					
TP-02	S-1	4	11.7					38.1					

Notes: See test reports for test method, ^ASTM D2216-19, *ASTM D2488, **ASTM D1140-17, #ASTM D2974-20e1 < See test report for D4718 corrected values

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content

Project: Mavis #2296 - Additional Infiltration Testing
Client: Mavis Tire Supply, LLC

Project No.: 44:2100-A
Date Reported: 1/29/2025



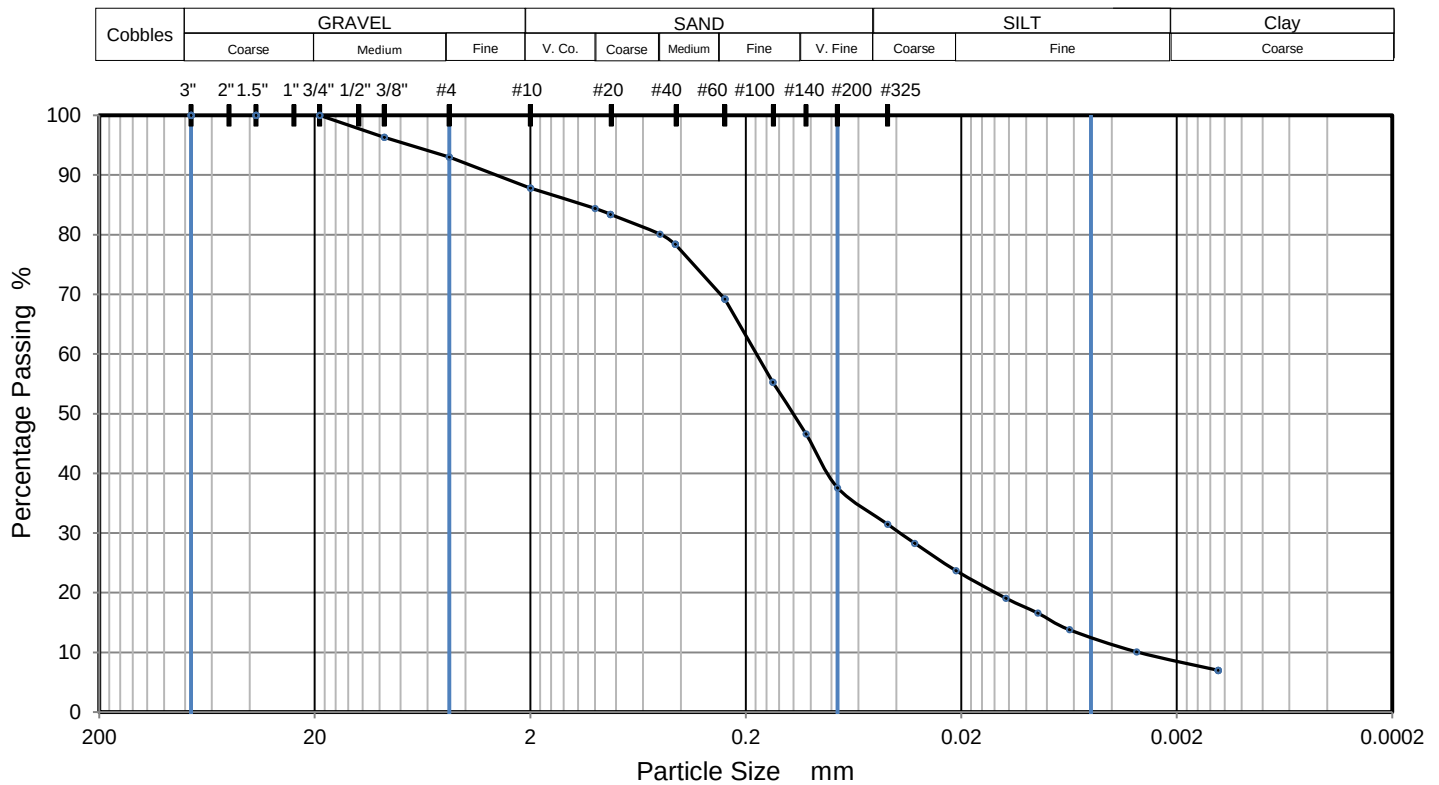
Office / Lab
ECS Mid-Atlantic LLC - Philadelphia

Address
2 Executive Drive
Suite 11
Moorestown, NJ 08057

Office Number / Fax
(609)832-3910
(484)840-5586

Tested by	Checked by	Approved by	Date Received
J Gross	M Trudnak	J Yates	1/23/2025

PARTICLE SIZE DISTRIBUTION



TEST RESULTS (ASTM D6913M-17-METHOD B & ASTM D422-63(2007))

Sieving			Hydrometer Sedimentation		
Particle Size mm	Wgt. Retained, g	% Passing	Particle Size mm	Calc. Wt. Retained, g	% Passing
75	0.00	100.0	0.0329	17.69	28.3
37.5	0.00	100.0	0.0212	25.44	23.7
19	0.00	100.0	0.0124	25.44	19.1
9.5	20.32	96.3	0.0088	13.82	16.6
4.75	38.96	93.0	0.0063	15.48	13.8
2	67.45	87.8	0.0031	20.46	10.1
1	2.04	84.4	0.0013	17.14	7.0
0.85	2.65	83.4			
0.5	4.63	80.1			
0.425	5.61	78.4			
0.25	11.13	69.2	Specific Gravity (Historical) 2.65		
0.15	19.47	55.3			
0.105	24.67	46.6			
0.075	30.08	37.6			
0.044	33.73	31.5			

Dry Mass of sample, g

553.0

Uncorrected USDA Soil Percentages:

% GRAVEL	12.20
% SAND	54.84
% Very Coarse Sand	3.40
% Coarse Sand	4.30
% Medium Sand	10.90
% Fine Sand	23.91
% Very Fine Sand	12.33
% SILT	24.39
% Coarse Silt	9.76
% Fine Silt	14.60
% CLAY	8.57
% Coarse Clay	
% Fine Clay	

Project: Mavis #2296 - Additional Infiltration Testing

Client: Mavis Tire Supply, LLC

Sample Description: Reddish Brown Sandy Loam

Sample Source: TP-01

Project No.: 44:2100-A

Depth (ft): 4

Sample No.: S-1

Date Reported: 1/29/2025



Office / Lab

Address

Office Number / Fax

ECS Mid-Atlantic LLC - Philadelphia

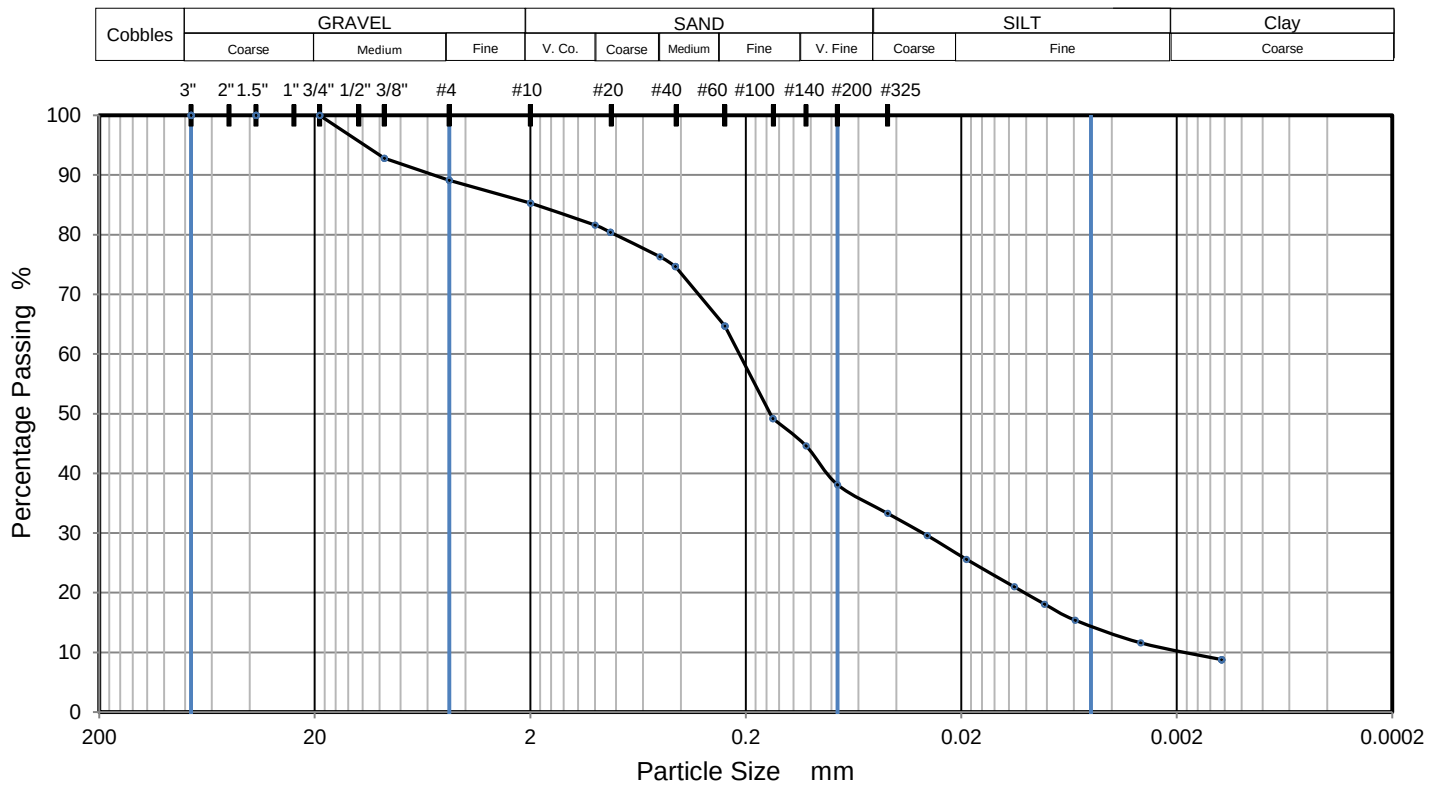
2 Executive Drive
Suite 11
Moorestown, NJ 08057

(609)832-3910

(484)840-5586

Tested by	Checked by	Approved by	Date Received	Remarks
J Gross	M Trudnak	J Yates	1/23/2025	

PARTICLE SIZE DISTRIBUTION



TEST RESULTS (ASTM D6913M-17-METHOD B & ASTM D422-63(2007))

Sieving			Hydrometer Sedimentation		
Particle Size mm	Wgt. Retained, g	% Passing	Particle Size mm	Calc. Wt. Retained, g	% Passing
75	0.00	100.0	0.0288	20.48	29.6
37.5	0.00	100.0	0.0189	22.14	25.6
19	0.00	100.0	0.0114	25.46	21.0
9.5	39.68	92.8	0.0082	16.05	18.1
4.75	60.25	89.1	0.0059	14.94	15.4
2	81.09	85.3	0.0029	21.03	11.6
1	4.45	81.6	0.0012	15.50	8.8
0.85	5.87	80.4			
0.5	10.72	76.3			
0.425	12.70	74.7			
0.25	24.56	64.7	Specific Gravity (Historical) 2.65		
0.15	42.98	49.2			
0.105	48.50	44.6			
0.075	56.19	38.1			
0.044	61.93	33.3			

Dry Mass of sample, g

553.4

Uncorrected USDA Soil Percentages:

% GRAVEL	14.70
% SAND	50.85
% Very Coarse Sand	3.70
% Coarse Sand	5.30
% Medium Sand	11.60
% Fine Sand	21.04
% Very Fine Sand	9.21
% SILT	24.10
% Coarse Silt	8.35
% Fine Silt	15.70
% CLAY	10.35
% Coarse Clay	
% Fine Clay	

Project: Mavis #2296 - Additional Infiltration Testing

Client: Mavis Tire Supply, LLC

Sample Description: Reddish Brown Sandy Loam

Sample Source: TP-02

Project No.: 44:2100-A

Depth (ft): 4

Sample No.: S-1

Date Reported: 1/29/2025



Office / Lab

Address

Office Number / Fax

ECS Mid-Atlantic LLC - Philadelphia

2 Executive Drive
Suite 11
Moorestown, NJ 08057

(609)832-3910

(484)840-5586

Tested by	Checked by	Approved by	Date Received	Remarks
J Gross	M Trudnak	J Yates	1/23/2025	

USDA Classification

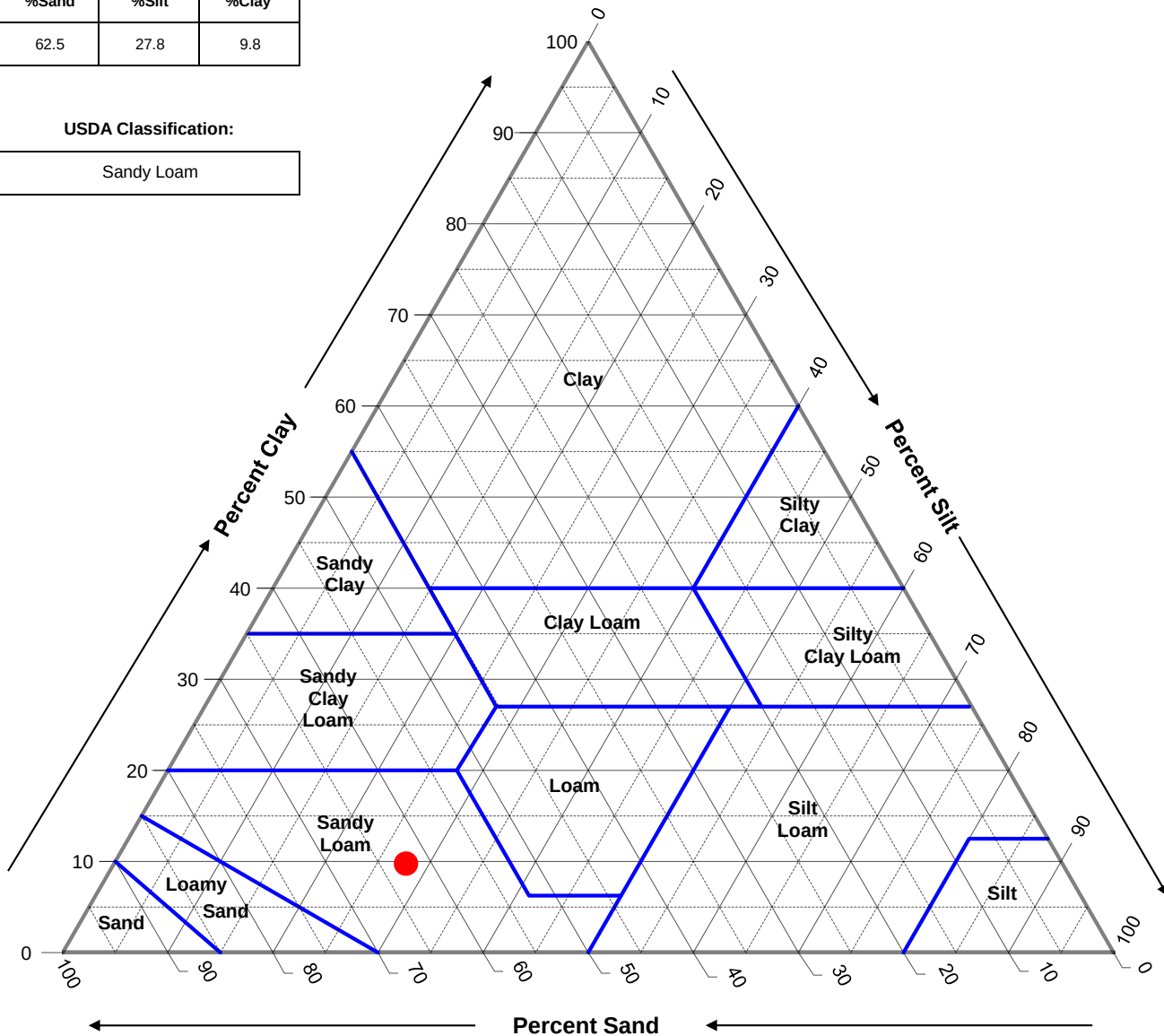
TEST RESULTS (ASTM D6913M-17-METHOD B & ASTM D422-63(2007))

USDA Soil Percentages
(Corrected for Gravel):

%Sand	%Silt	%Clay
62.5	27.8	9.8

USDA Classification:

Sandy Loam



Project: Mavis #2296 - Additional Infiltration Testing

Client: Mavis Tire Supply, LLC

Sample Description: Reddish Brown Sandy Loam

Sample Source: TP-01

Project No.: 44:2100-A

Depth (ft): 4

Sample No.: S-1

Date Reported: 1/29/2025



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Tested by	Checked by	Approved by	Date Received	Remarks
J Gross	M Trudnak	J Yates	1/23/2025	

USDA Classification

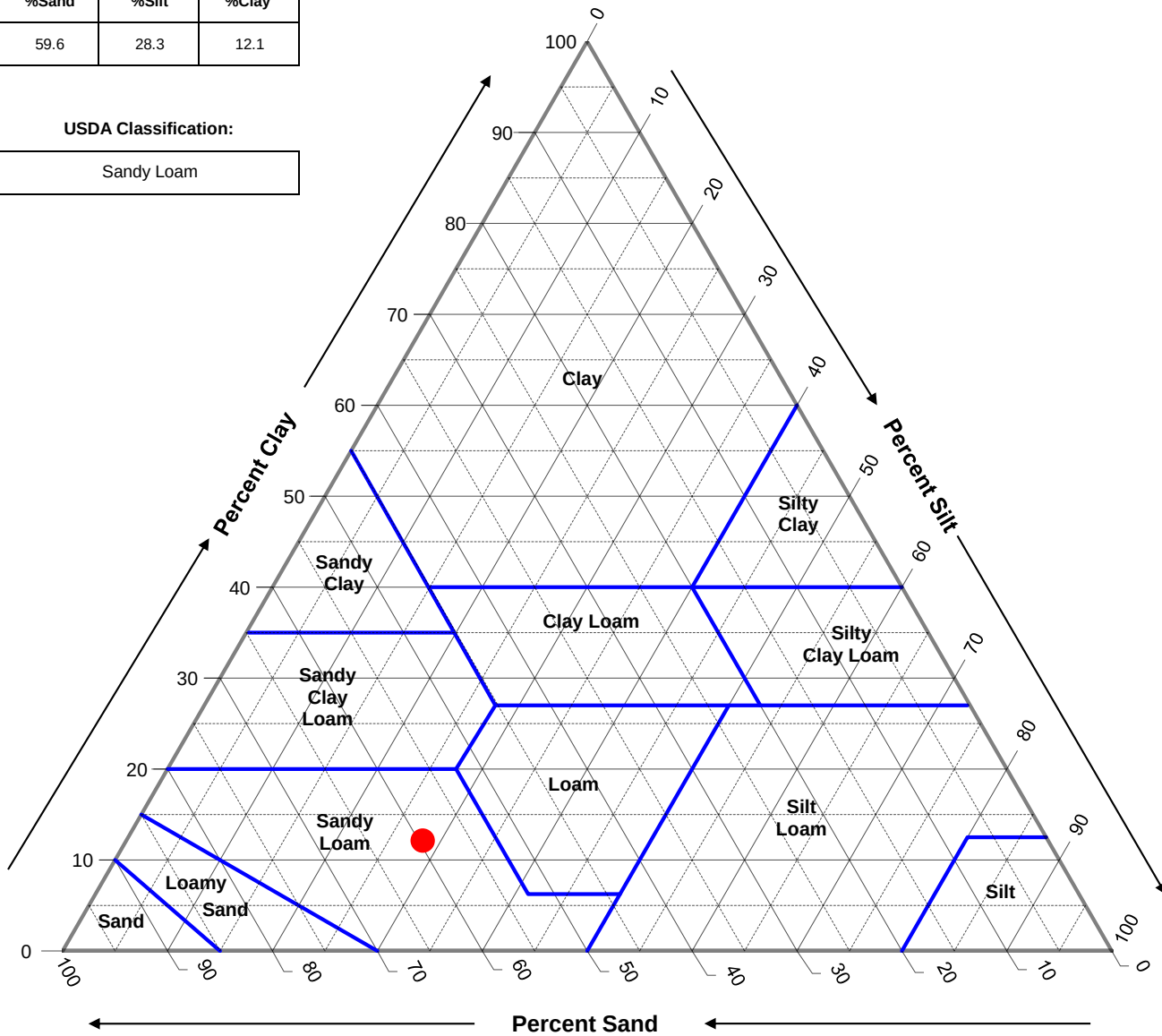
TEST RESULTS (ASTM D6913M-17-METHOD B & ASTM D422-63(2007))

USDA Soil Percentages
(Corrected for Gravel):

%Sand	%Silt	%Clay
59.6	28.3	12.1

USDA Classification:

Sandy Loam



Project: Mavis #2296 - Additional Infiltration Testing

Client: Mavis Tire Supply, LLC

Sample Description: Reddish Brown Sandy Loam

Sample Source: TP-02

Project No.: 44:2100-A

Depth (ft): 4

Sample No.: S-1

Date Reported: 1/29/2025



Office / Lab

ECS Mid-Atlantic LLC - Philadelphia

Address

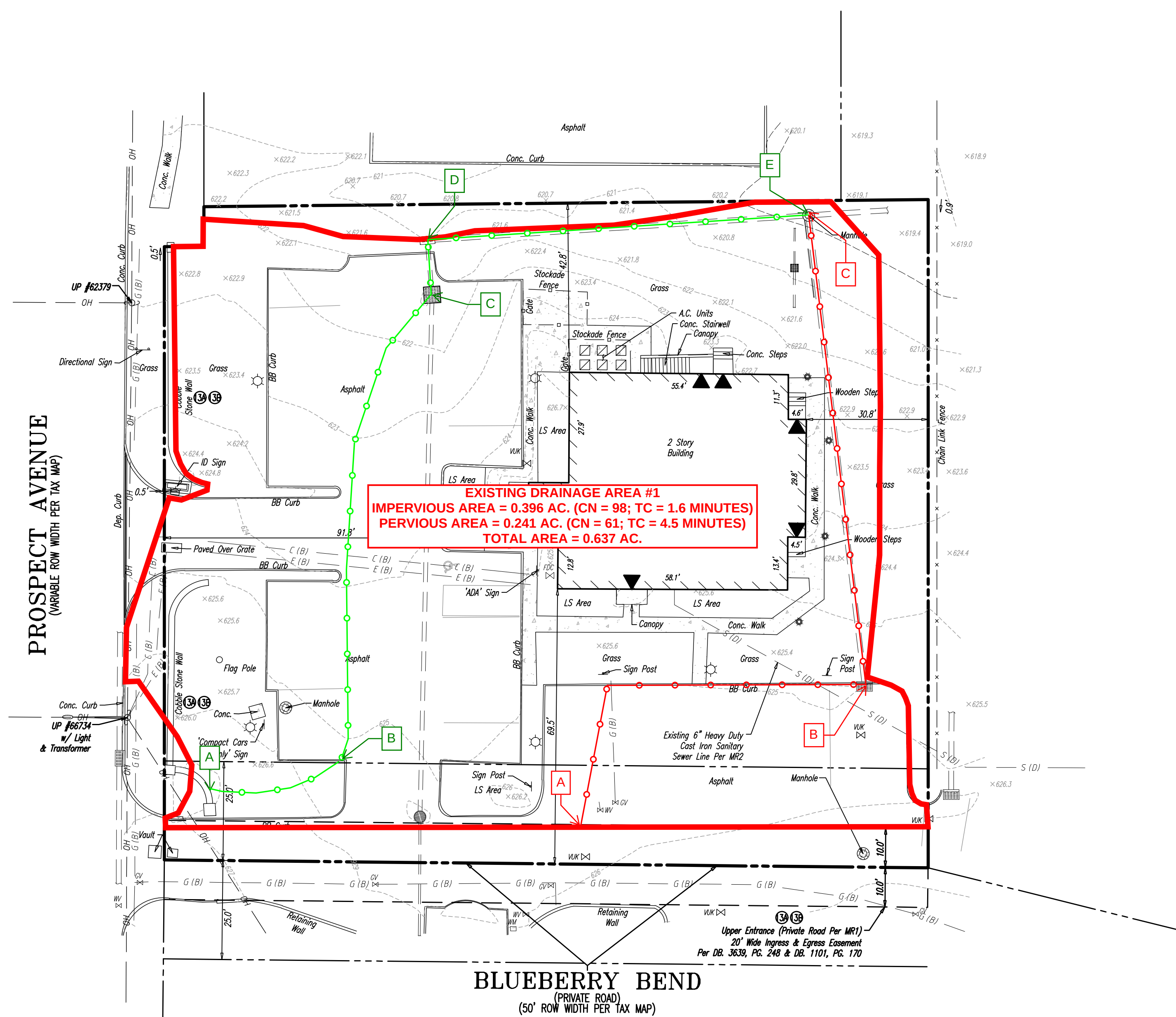
2 Executive Drive
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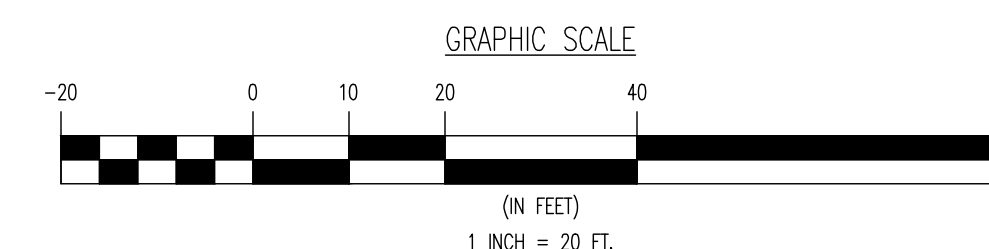
Tested by	Checked by	Approved by	Date Received	Remarks
J Gross	M Trudnak	J Yates	1/23/2025	

DRAINAGE AREA MAPS

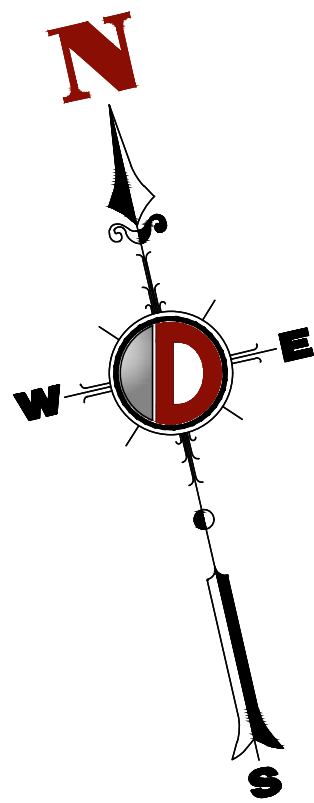


PERVIOUS SURFACE TC PATH

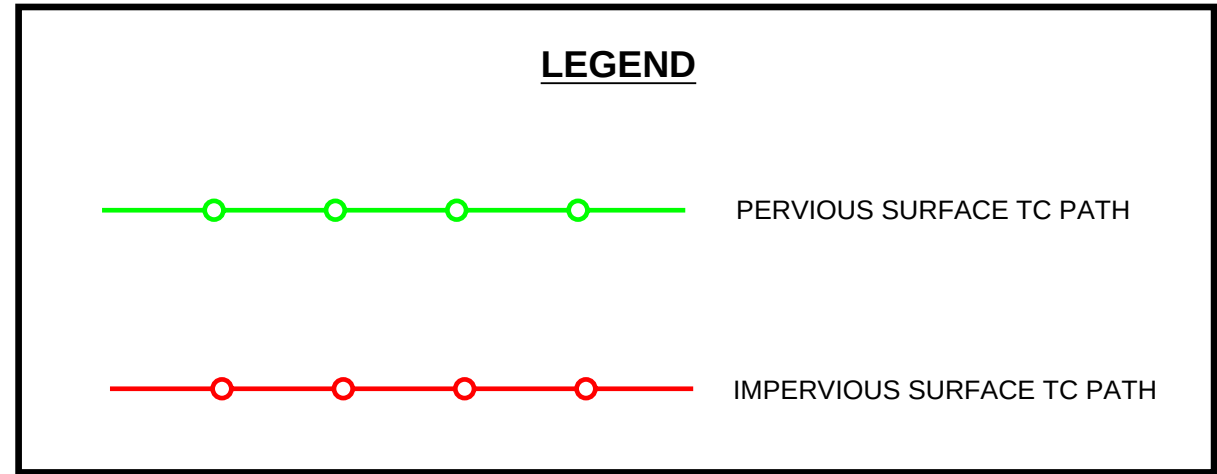
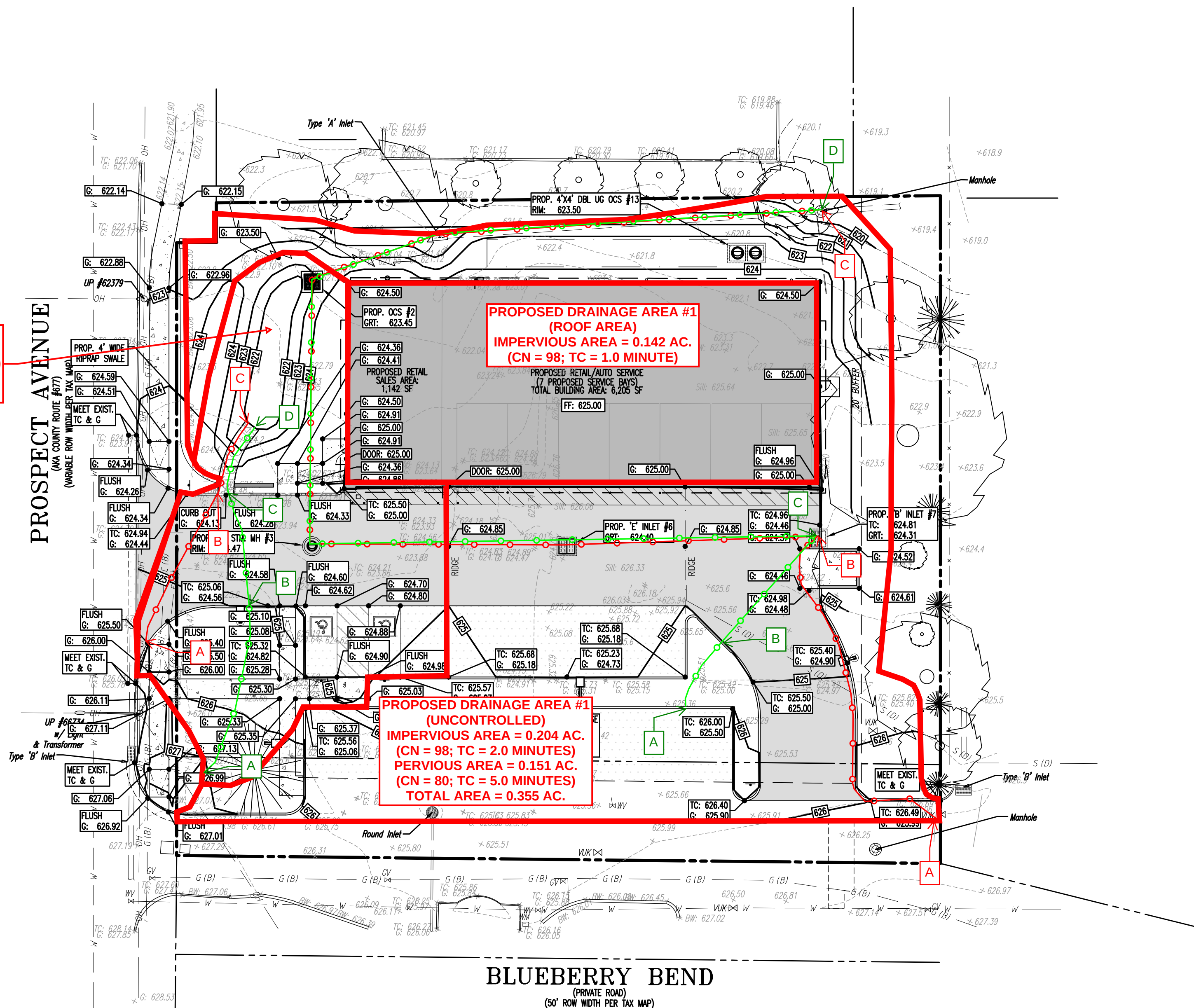
IMPERVIOUS SURFACE TC PATH



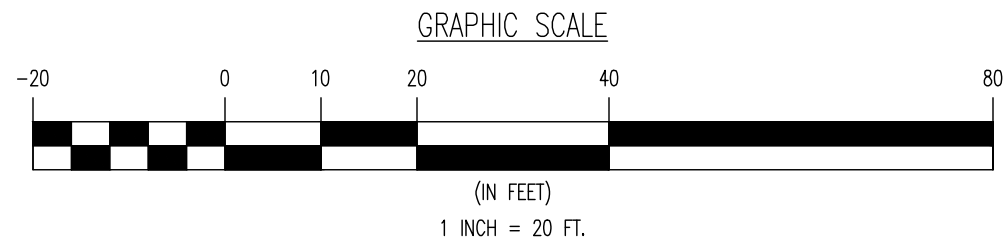
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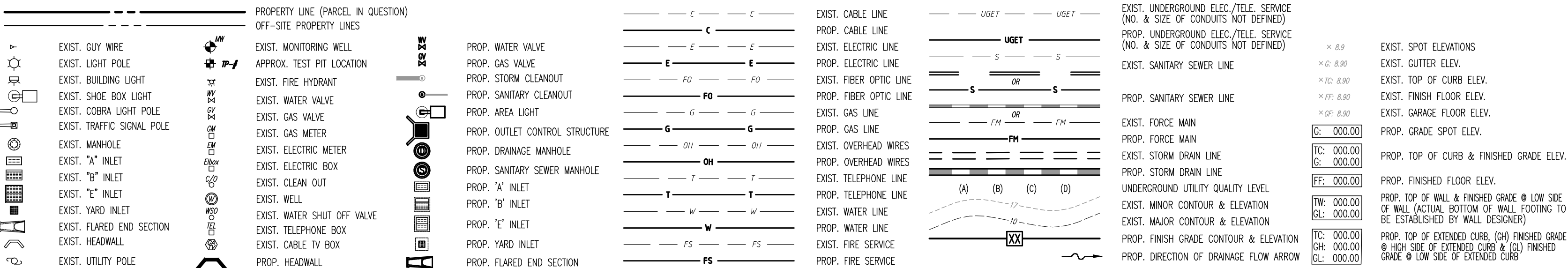
PROPOSED DRAINAGE AREA #1
(BIORETENTION BASIN)
IMPERVIOUS AREA = 0.090 AC. (CN = 98; TC = 0.5 MINUTES)
PERVIOUS AREA = 0.050 AC. (CN = 80; TC = 5.1 MINUTES)
TOTAL AREA = 0.140 AC.



SEE SHEET 3 OF 19 FOR GRADING PLAN NOTES



GRADING/UTILITY GRAPHIC LEGEND



THIS PLAN SET IS FOR PERMITTING PURPOSES ONLY AND MAY NOT BE USED FOR CONSTRUCTION

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TITLE: **PROPOSED DRAINAGE AREA MAP**

PROJECT: **MAVIS TIRE SUPPLY, LLC
PROPOSED AUTOMOTIVE SERVICE AND RETAIL CENTER**
BLOCK 105, LOT 64.01
460 PROSPECT AVENUE
TOWNSHIP OF WEST ORANGE, ESSEX COUNTY, NEW JERSEY

JOB No: 1956-24-04187
DATE: 07/16/2025
DRAWN BY: RPK
DESIGNED BY: KED
CHECKED BY: RRR
SHEET No: 2 OF 2

RODMAN R. RITCHIE
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ROBERT P. FREUD
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