STORMWATER MANAGEMENT ANALYSIS

For

Renard Management, Inc.

Proposed Self-Storage Facility

Block 29002, Lots 49 & 50
1026 Georgetown Franklin Turnpike (C.R. 518)
Township of Montgomery
Somerset County, NJ

Prepared by:

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I. SITE DESCRIPTION

The project area is comprised of Lots 49 and 50, Block 29002 in the Township of Montgomery, Somerset County, New Jersey. The property is located at 1026 Georgetown Franklin Turnpike (C.R. 518). The subject parcel previously consisted of a dilapidated building, which has since been demolished with associated driveways, parking areas and open space areas. The site presently contains approximately 1.95 AC of impervious coverage and 1.31 AC of motor vehicle surfaces. Stormwater runoff from the existing development ultimately drains to the existing stormwater conveyance system within Georgetown Franklin Turnpike (C.R. 518) and the existing conveyance system to the North.

The proposed development includes the construction of one (1) one-story drive-up self-storage building (9,907 SF) and one (1) three-story self-storage building (123,259 SF) with driveways, parking areas, utilities, lighting, and accommodating site improvements as shown on the Use Variance & Preliminary & Final Major Site Plan drawings, prepared by Dynamic Engineering Consultants, PC. The proposed development will result in a total amount of impervious coverage of approximately 1.76 Acres and 0.49 AC of motor vehicle surface (0.82 AC reduction in motor vehicle surfaces). The total disturbance area is approximately 2.87 Acres. The project will utilize existing drainage patterns on-site to address applicable aspects of NJAC 7:8.

The existing conditions of the tract have been verified by the ALTA/NSPS Land Title Survey, as prepared by Dynamic Survey, LLC dated 08/11/2022.

II. DESIGN OVERVIEW

This report has been prepared to define and analyze the stormwater drainage conditions that would occur as a result of the redevelopment of the above referenced site in the Township of Montgomery, Somerset County, New Jersey.

The proposed development includes the construction of one (1) one-story drive-up self-storage building (9,907 SF), one (1) three-story self-storage building (123,259 SF) and the associated site improvements as shown on the accompanying Site Plans.

The proposed redevelopment within the limit of disturbance proposes a net decrease in impervious coverage and therefore, reduces and does not exceed at any time the stormwater runoff volume and peak rate of runoff from the development for the 2, 10 and 100-year storm events. Runoff peak flows and peak volumes will be reduced to the existing stormwater conveyance systems. The water quantity rates and volumes are demonstrated to meet the requirements of NJAC 7:8.

A hydrological evaluation is provided for the 2, 10, and 100-year storm events utilizing the Urban Hydrology for Small Watershed TR55 method. It is the intention of the design of this site to comply with the Stormwater Management Best Management Practices.

II. EXISTING SITE CONDITIONS

The existing conditions of the tract have been verified by the ALTA/NSPS Land Title Survey, as prepared by Dynamic Survey, LLC dated 08/11/2022. This information has been utilized to establish the Existing Conditions Drainage Area Map which is included within the Appendix of this Report.

The tract has been evaluated with the following existing drainage sub-watershed areas:

Study Area North: This area consists of a majority of the previously existing building, impervious areas, open space and wooded areas that will be disturbed as part of the proposed site improvements. Stormwater runoff generated by this area is tributary to the existing stormwater conveyance system to the north.

Study Area South: This area consists of a portion of the existing building, along with impervious, open space, and wooded areas that will be disturbed as part of the proposed site improvements. Stormwater runoff generated by this area is tributary to the existing stormwater conveyance system located within Georgetown Franklin Turnpike (C.R. 518).

Based on Somerset County soils survey information, the soil types native to the site include:

SOMERSET COUNTY SOIL SURVEY INFORMATION		
SOIL TYPE (SYMBOL)	**SOIL TYPE (NAME)**	**HYDROLOGIC SOIL GROUP**
BhnB	Birdsboro silt loam, 2 to 6 percent slopes	B

III. PROPOSED SITE CONDITIONS

The proposed development includes the construction of one (1) one-story self-storage building (9,907 SF) and one (1) three-story self-storage building (123,259 SF). Additional site improvements include constructing driveways, parking areas, landscaping, lighting and other associated site improvements. The proposed development will maintain and utilize existing drainage patterns.

The tract has been evaluated with the following drainage sub-watershed areas as depicted on the Proposed Drainage Area Map included within the Appendix of this report.

Study Area North: This area consists of the roof area of the one-story building and half of the roof area of the three-story building and the northern portion of the impervious areas on site, as well as the open space area and

wooded areas within the northern portion of the property. The stormwater runoff from this study area drains via overland flow to existing and proposed inlets which route the runoff to the existing stormwater conveyance system to the north.

Study Area South: This area consists of half of the roof area for the three-story building, and the southern portion of impervious areas on-site, as well as the open space, and wooded areas within the southern portion of the property. The stormwater runoff from this study area is tributary to the existing stormwater conveyance system located within Georgetown Franklin Turnpike (C.R. 518).

IV. DESIGN METHODOLOGY

The intention of the design of the proposed stormwater management facilities for this project is to provide measures as required to address applicable aspects of the Township of Montgomery Land Use Ordinance and NJAC 7:8. In order to prepare the stormwater calculations for the subject project, initial investigation of the property and topography was performed. On-site review of the tract was initially performed by Dynamic Engineering Consultants, PC to verify existing site conditions and land cover characteristics. Dynamic Survey, LLC was contracted to prepare an ALTA/NSPS Land Title Survey depicting the boundary, location and topography for the existing site and surrounding watershed areas.

Based on our review of the existing site conditions and the ALTA/NSPS Land Title Survey, the Drainage Area Maps for the existing and proposed site conditions as defined within this report were established. A grading plan was developed for the proposed site improvements with considerations to the existing drainage patterns.

The overall stormwater management report for the subject tract has been evaluated by Dynamic Engineering Consultants to ensure that the overall development satisfies the applicable stormwater criteria set forth in the Township of Montgomery Land Use Ordinance and NJAC 7:8.

V. RUNOFF RATE REDUCTION PERFORMANCE

The following is a comparison of the existing and proposed runoff rates:

Pre-Development and Post-Development Peak Runoff Results
Summary for Study Area North Total

	EXISTING RUNOFF RATE (CFS)	PROPOSED RUNOFF RATE (CFS)	TOTAL REDUCTION (CFS)
2 Year	4.39	3.93	0.46
10 Year	6.86	6.32	0.54
100 Year	11.90	11.35	0.55

Pre-Development and Post-Development Peak Runoff Results
Summary for Study Area South Total

	EXISTING RUNOFF RATE (CFS)	PROPOSED RUNOFF RATE (CFS)	TOTAL REDUCTION (CFS)
2 Year	3.55	3.16	0.39
10 Year	5.61	5.11	0.50
100 Year	9.77	9.10	0.67

The proposed redevelopment will reduce the overall impervious coverage and motor vehicle impervious coverage; therefore, reduces the stormwater runoff volume and peak rate of runoff from the development for the 2, 10, and 100-year storm events. As shown in the Hydrograph Summary Reports within the appendix of this report, the post development runoff hydrographs for all drainage areas do not exceed at any point in time, the pre-development runoff hydrographs for the 2, 10, and 100-year storms. Therefore, the overall development satisfies the applicable stormwater criteria set forth in the Township of Montgomery Land Use Ordinance and NJAC 7:8.

VI. WATER QUALITY

The subject development does not result in a ¼ acre or more of new regulated motor vehicle surfaces; therefore, the State's Stormwater Runoff Water Quality Standards, set forth by NJAC 7:8, would not be applicable to this project.

In addition, the redevelopment of the site is proposing to reconstruct approximately 0.56 acres of existing motor vehicle surface. It should be noted that the proposed motor vehicle surface on the site is being reduced from 1.31 acres to 0.56 acres. In the existing condition, the 1.31 acres did not receive any water quality treatment. As a result, the project would be credited with 0.75 acres of water quality that would not require water quality treatment in accordance with DRCC regulations (N.J.A.C. 7:45-8.7).

VII. GROUNDWATER RECHARGE

As previously stated within this report, under proposed conditions, overall impervious coverage will be reduced; therefore, the proposed project meets groundwater recharge requirements. The New Jersey Groundwater Recharge Spreadsheet (NJGRS) – Version 2 has been utilized to verify satisfaction of the groundwater recharge requirement. The NJ Groundwater Recharge Spreadsheet is included in the appendix of this report.

VIII. CONCLUSION

The proposed overall 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.

The proposed redevelopment reduces the overall impervious coverage and motor vehicle impervious coverage; therefore, reduces the stormwater runoff volume and peak rate of runoff from the development for the 2, 10 and 100-year storm events. With this stated, it is evident that the proposed development will not have a negative impact on the existing drainage patterns, water quality, or groundwater recharge on site or within the vicinity of the subject parcel.

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 Somerset County, New Jersey

May 24, 2023

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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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

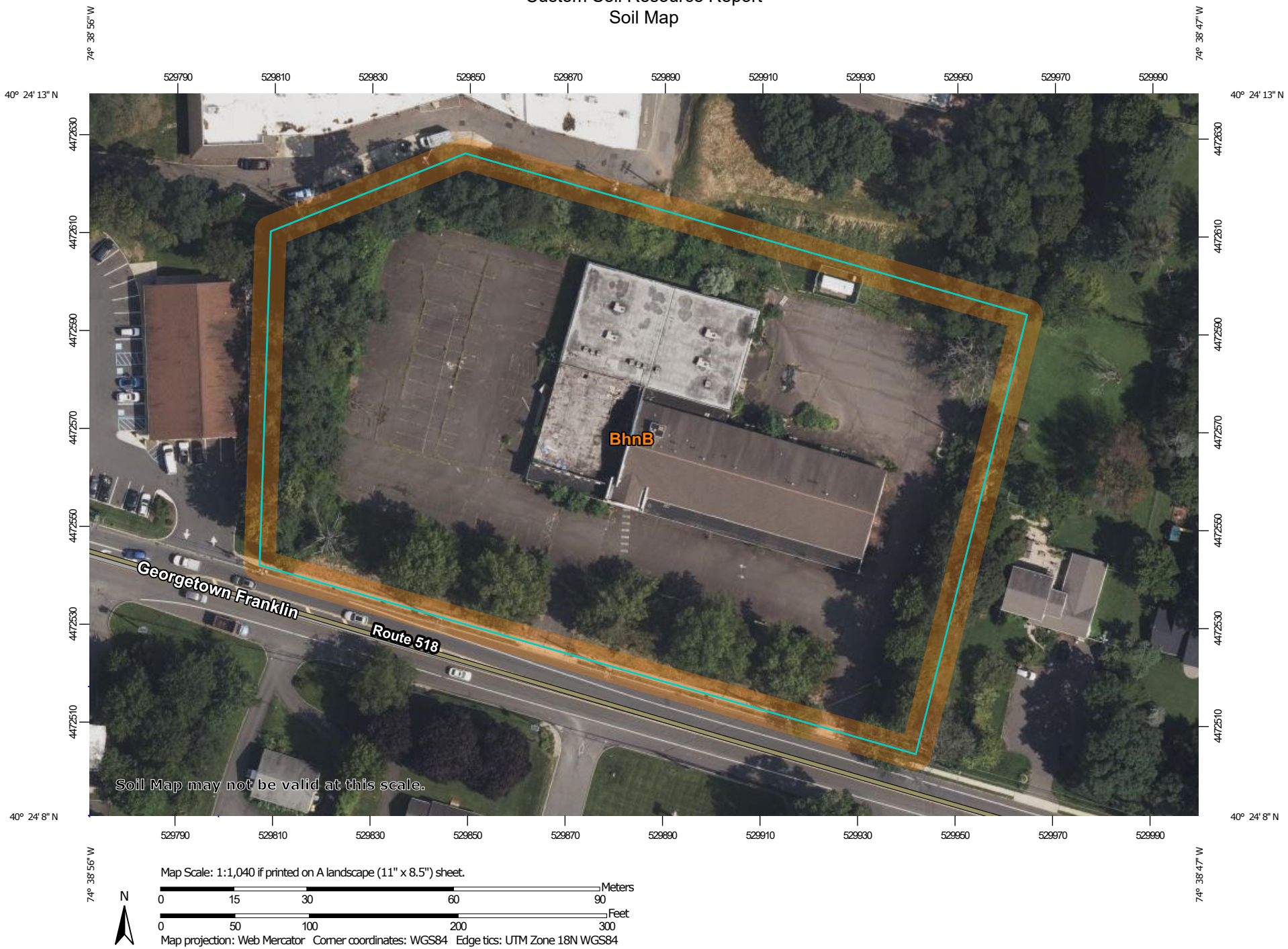
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

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: 1:1,040 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

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

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 1:24,000.

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: Somerset County, New Jersey
Survey Area Data: Version 20, Aug 30, 2022

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

Date(s) aerial images were photographed: Mar 13, 2021—Sep 14, 2021

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
BhnB	Birdsboro silt loam, 2 to 6 percent slopes	3.3	100.0%
Totals for Area of Interest		**3.3**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

Somerset County, New Jersey

BhnB—Birdsboro silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 1j514
Elevation: 200 to 1,000 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: All areas are prime farmland

Map Unit Composition

Birdsboro and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Birdsboro

Setting

Landform: Stream terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Old alluvium derived from sandstone and siltstone and/or shale

Typical profile

Ap - 0 to 8 inches: silt loam
BA - 8 to 13 inches: silt loam
Bt - 13 to 29 inches: silt loam
BC - 29 to 40 inches: silt loam
C - 40 to 60 inches: stratified sand to silty clay loam
2C - 60 to 80 inches: stratified sand to fine sand

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F148XY025PA - Moist, Triassic, Upland, Mixed Oak - Hardwood - Conifer Forest
Hydric soil rating: No

Minor Components

Duffield

Percent of map unit: 5 percent
Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Bucks

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

Raritan, rarely flooded

Percent of map unit: 5 percent
Landform: Stream terraces
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

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

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

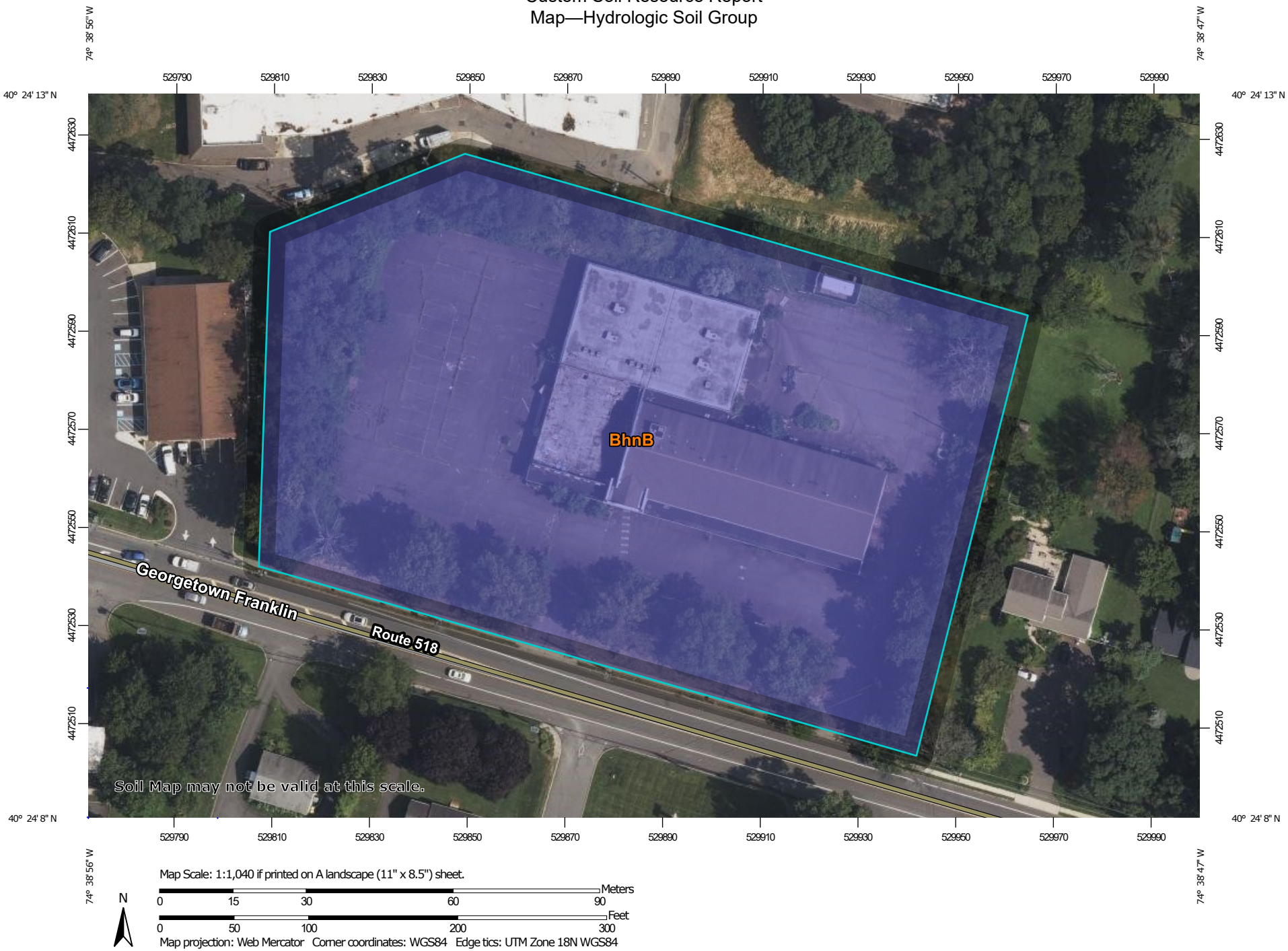
Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

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

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

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

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



Map Scale: 1:1,040 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Somerset County, New Jersey
Survey Area Data: Version 20, Aug 30, 2022

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

Date(s) aerial images were photographed: Mar 13, 2021—Sep 14, 2021

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.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BhnB	Birdsboro silt loam, 2 to 6 percent slopes	B	3.3	100.0%
Totals for Area of Interest			**3.3**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

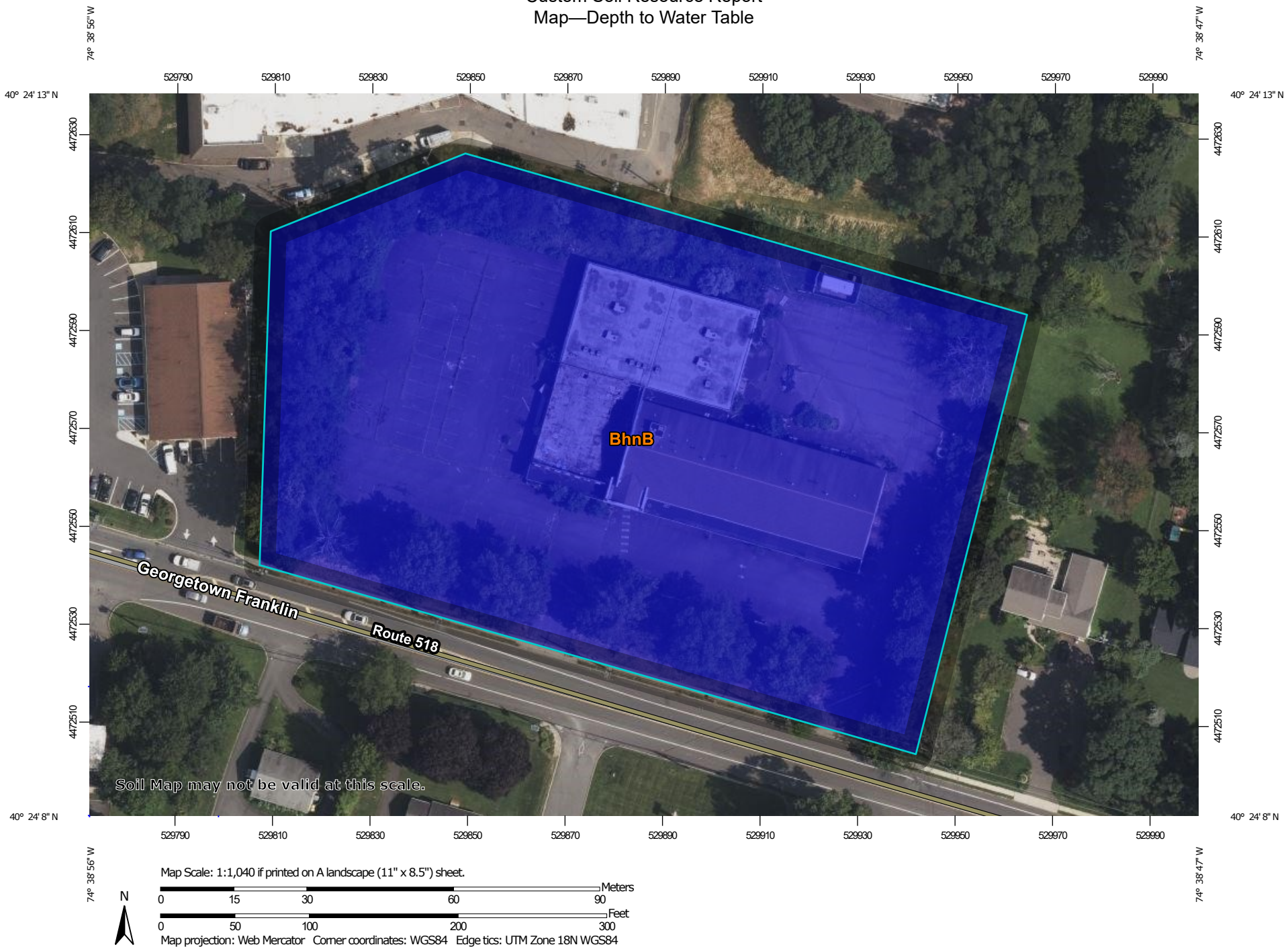
Water Features

Water Features include ponding frequency, flooding frequency, and depth to water table.

Depth to Water Table

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.



Map Scale: 1:1,040 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Lines

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Points

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Somerset County, New Jersey
Survey Area Data: Version 20, Aug 30, 2022

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

Date(s) aerial images were photographed: Mar 13, 2021—Sep 14, 2021

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.

Table—Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
BhnB	Birdsboro silt loam, 2 to 6 percent slopes	>200	3.3	100.0%
Totals for Area of Interest			**3.3**	**100.0%**

Rating Options—Depth to Water Table

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

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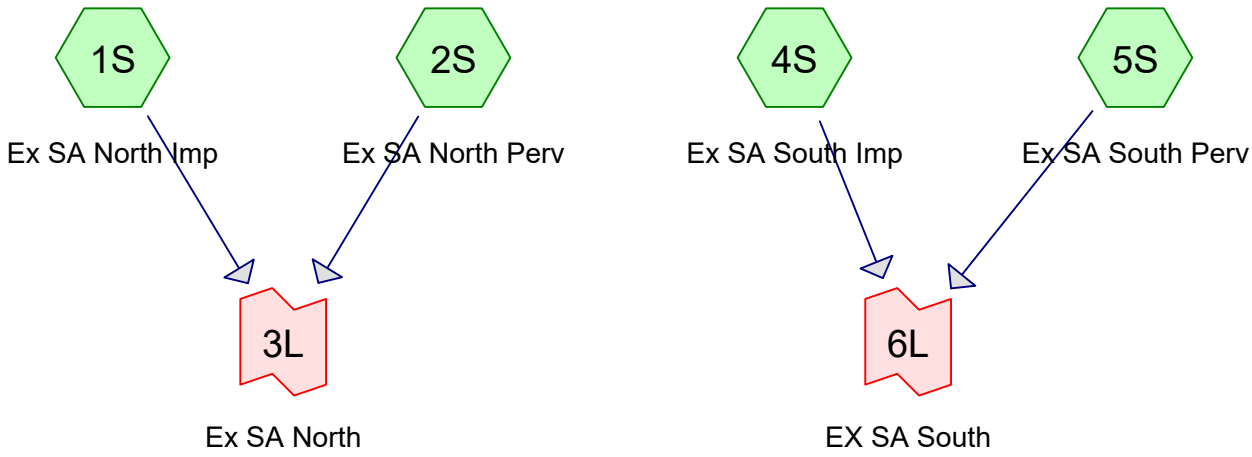
HydroCAD SUMMARY REPORTS – EXISTING CONDITIONS 2 YR 10 YR & 100 YR



Subcat Reach Pond Link

Routing Diagram for Ex 2 yr, 10 yr, 100 yr
Prepared by Dynamic Engineering, Printed 6/14/2023

Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 6617 NJ Somerset-C

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	NOAA 24-hr	C	Default	24.00	1	3.34	2
2	10-Year	NOAA 24-hr	C	Default	24.00	1	5.01	2
3	100-Year	NOAA 24-hr	C	Default	24.00	1	8.21	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.588	61	>75% Grass cover, Good, HSG B (2S, 5S)
1.533	98	Paved parking, HSG B (1S, 4S)
0.462	98	Roofs, HSG B (1S, 4S)
0.406	55	Woods, Good, HSG B (2S, 5S)
2.990	**85**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2.990	HSG B	1S, 2S, 4S, 5S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
2.990		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.588	0.000	0.000	0.000	0.588	>75% Grass cover, Good	2S, 5S
0.000	1.533	0.000	0.000	0.000	1.533	Paved parking	1S, 4S
0.000	0.462	0.000	0.000	0.000	0.462	Roofs	1S, 4S
0.000	0.406	0.000	0.000	0.000	0.406	Woods, Good	2S, 5S
0.000	**2.990**	**0.000**	**0.000**	**0.000**	**2.990**	**TOTAL AREA**	

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex SA North Imp Runoff Area=48,361 sf 100.00% Impervious Runoff Depth=3.11"
Flow Length=200' Tc=2.1 min CN=98 Runoff=4.38 cfs 0.287 af

Subcatchment2S: Ex SA North Perv Runoff Area=24,838 sf 0.00% Impervious Runoff Depth=0.36"
Flow Length=135' Slope=0.0300 '/' Tc=12.1 min CN=57 Runoff=0.11 cfs 0.017 af

Subcatchment4S: Ex SA South Imp Runoff Area=38,562 sf 100.00% Impervious Runoff Depth=3.11"
Flow Length=140' Slope=0.0090 '/' Tc=1.9 min CN=98 Runoff=3.50 cfs 0.229 af

Subcatchment5S: Ex SA South Perv Runoff Area=18,480 sf 0.00% Impervious Runoff Depth=0.46"
Flow Length=70' Slope=0.0250 '/' Tc=9.6 min CN=60 Runoff=0.15 cfs 0.016 af

Link 3L: Ex SA North Inflow=4.39 cfs 0.304 af
Primary=4.39 cfs 0.304 af

Link 6L: EX SA South Inflow=3.55 cfs 0.246 af
Primary=3.55 cfs 0.246 af

Total Runoff Area = 2.990 ac Runoff Volume = 0.550 af Average Runoff Depth = 2.21"
33.26% Pervious = 0.994 ac 66.74% Impervious = 1.995 ac

Summary for Subcatchment 1S: Ex SA North Imp

[49] Hint: Tc<2dt may require smaller dt

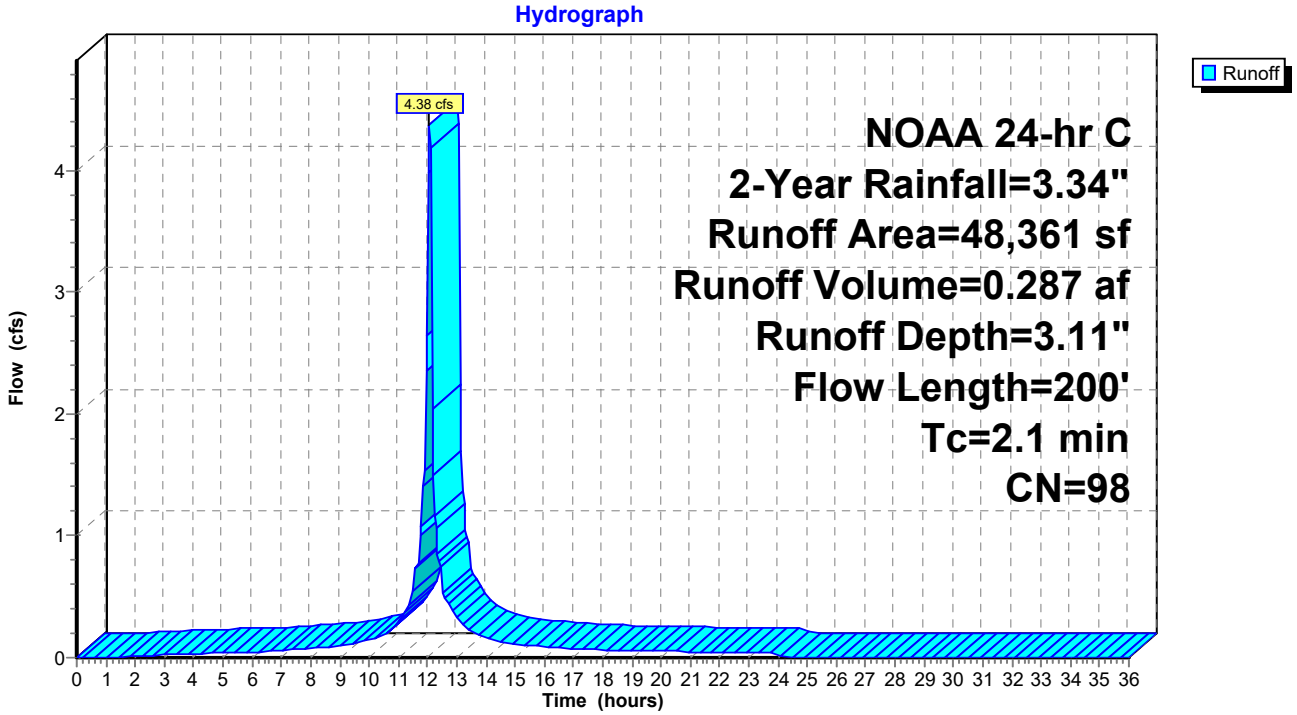
Runoff = 4.38 cfs @ 12.08 hrs, Volume= 0.287 af, Depth= 3.11"
Routed to Link 3L : Ex SA North

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year Rainfall=3.34"

Area (sf)	CN	Description
33,877	98	Paved parking, HSG B
14,484	98	Roofs, HSG B
48,361	98	Weighted Average
48,361		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0110	1.11		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.34"
0.6	100	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Flow** Paved Kv= 20.3 fps
2.1	200	Total			

Subcatchment 1S: Ex SA North Imp



Hydrograph for Subcatchment 1S: Ex SA North Imp

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.01
2.00	0.08	0.01	0.01
2.50	0.10	0.01	0.02
3.00	0.12	0.02	0.02
3.50	0.14	0.03	0.03
4.00	0.16	0.05	0.03
4.50	0.19	0.06	0.04
5.00	0.21	0.08	0.04
5.50	0.24	0.10	0.04
6.00	0.26	0.12	0.05
6.50	0.29	0.14	0.05
7.00	0.33	0.17	0.06
7.50	0.36	0.20	0.07
8.00	0.40	0.23	0.08
8.50	0.44	0.27	0.09
9.00	0.49	0.31	0.09
9.50	0.54	0.36	0.12
10.00	0.61	0.42	0.15
10.50	0.69	0.49	0.18
11.00	0.80	0.60	0.28
11.50	0.99	0.78	0.48
12.00	1.59	1.37	**2.65**
12.50	2.35	2.12	**0.74**
13.00	2.54	2.31	0.33
13.50	2.65	2.42	0.21
14.00	2.73	2.50	0.17
14.50	2.80	2.57	0.14
15.00	2.85	2.62	0.11
15.50	2.90	2.67	0.10
16.00	2.94	2.71	0.09
16.50	2.98	2.75	0.08
17.00	3.01	2.78	0.08
17.50	3.05	2.81	0.07
18.00	3.08	2.84	0.06
18.50	3.10	2.87	0.06
19.00	3.13	2.90	0.06
19.50	3.15	2.92	0.05
20.00	3.18	2.94	0.05
20.50	3.20	2.97	0.05
21.00	3.22	2.99	0.05
21.50	3.24	3.01	0.05
22.00	3.26	3.03	0.05
22.50	3.28	3.05	0.04
23.00	3.30	3.07	0.04
23.50	3.32	3.09	0.04
24.00	**3.34**	**3.11**	0.05
24.50	3.34	3.11	0.00
25.00	3.34	3.11	0.00
25.50	3.34	3.11	0.00
26.00	3.34	3.11	0.00
26.50	3.34	3.11	0.00
27.00	3.34	3.11	0.00
27.50	3.34	3.11	0.00
28.00	3.34	3.11	0.00
28.50	3.34	3.11	0.00
29.00	3.34	3.11	0.00
29.50	3.34	3.11	0.00
30.00	3.34	3.11	0.00
30.50	3.34	3.11	0.00
31.00	3.34	3.11	0.00
31.50	3.34	3.11	0.00
32.00	3.34	3.11	0.00
32.50	3.34	3.11	0.00
33.00	3.34	3.11	0.00
33.50	3.34	3.11	0.00
34.00	3.34	3.11	0.00
34.50	3.34	3.11	0.00
35.00	3.34	3.11	0.00
35.50	3.34	3.11	0.00
36.00	3.34	3.11	0.00

Summary for Subcatchment 2S: Ex SA North Perv

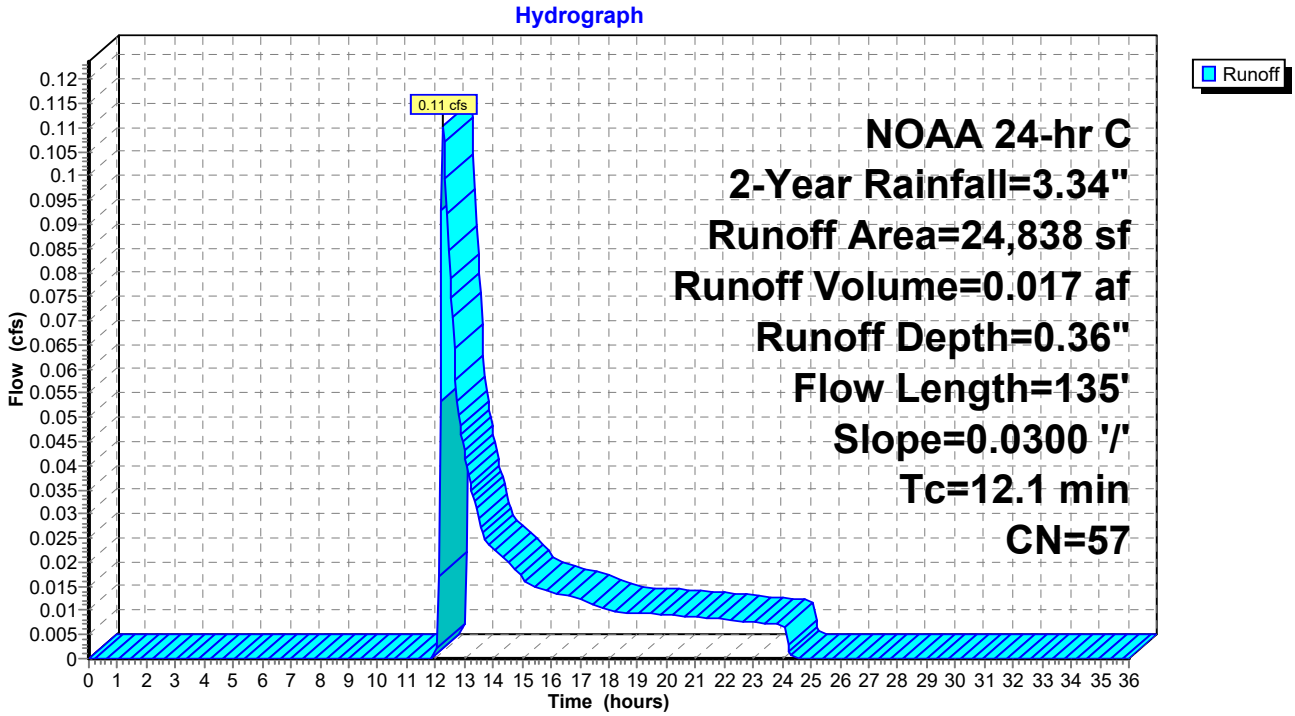
Runoff = 0.11 cfs @ 12.27 hrs, Volume= 0.017 af, Depth= 0.36"
Routed to Link 3L : Ex SA North

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year Rainfall=3.34"

Area (sf)	CN	Description
15,636	55	Woods, Good, HSG B
9,202	61	>75% Grass cover, Good, HSG B
24,838	57	Weighted Average
24,838		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.0300	0.14		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 3.34"
0.2	35	0.0300	2.79		**Shallow Concentrated Flow, Shallow Concentrated Flow** Unpaved Kv= 16.1 fps
12.1	135	Total			

Subcatchment 2S: Ex SA North Perv



Hydrograph for Subcatchment 2S: Ex SA North Perv

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.10	0.00	0.00
3.00	0.12	0.00	0.00
3.50	0.14	0.00	0.00
4.00	0.16	0.00	0.00
4.50	0.19	0.00	0.00
5.00	0.21	0.00	0.00
5.50	0.24	0.00	0.00
6.00	0.26	0.00	0.00
6.50	0.29	0.00	0.00
7.00	0.33	0.00	0.00
7.50	0.36	0.00	0.00
8.00	0.40	0.00	0.00
8.50	0.44	0.00	0.00
9.00	0.49	0.00	0.00
9.50	0.54	0.00	0.00
10.00	0.61	0.00	0.00
10.50	0.69	0.00	0.00
11.00	0.80	0.00	0.00
11.50	0.99	0.00	0.00
12.00	1.59	0.00	**0.00**
12.50	2.35	0.08	**0.08**
13.00	2.54	0.12	0.04
13.50	2.65	0.15	0.03
14.00	2.73	0.17	0.02
14.50	2.80	0.19	0.02
15.00	2.85	0.20	0.02
15.50	2.90	0.22	0.01
16.00	2.94	0.23	0.01
16.50	2.98	0.24	0.01
17.00	3.01	0.25	0.01
17.50	3.05	0.26	0.01
18.00	3.08	0.27	0.01
18.50	3.10	0.28	0.01
19.00	3.13	0.29	0.01
19.50	3.15	0.29	0.01
20.00	3.18	0.30	0.01
20.50	3.20	0.31	0.01
21.00	3.22	0.32	0.01
21.50	3.24	0.32	0.01
22.00	3.26	0.33	0.01
22.50	3.28	0.34	0.01
23.00	3.30	0.34	0.01
23.50	3.32	0.35	0.01
24.00	**3.34**	**0.36**	0.01
24.50	3.34	0.36	0.00
25.00	3.34	0.36	0.00
25.50	3.34	0.36	0.00
26.00	3.34	0.36	0.00
26.50	3.34	0.36	0.00
27.00	3.34	0.36	0.00
27.50	3.34	0.36	0.00
28.00	3.34	0.36	0.00
28.50	3.34	0.36	0.00
29.00	3.34	0.36	0.00
29.50	3.34	0.36	0.00
30.00	3.34	0.36	0.00
30.50	3.34	0.36	0.00
31.00	3.34	0.36	0.00
31.50	3.34	0.36	0.00
32.00	3.34	0.36	0.00
32.50	3.34	0.36	0.00
33.00	3.34	0.36	0.00
33.50	3.34	0.36	0.00
34.00	3.34	0.36	0.00
34.50	3.34	0.36	0.00
35.00	3.34	0.36	0.00
35.50	3.34	0.36	0.00
36.00	3.34	0.36	0.00

Summary for Subcatchment 4S: Ex SA South Imp

[49] Hint: Tc<2dt may require smaller dt

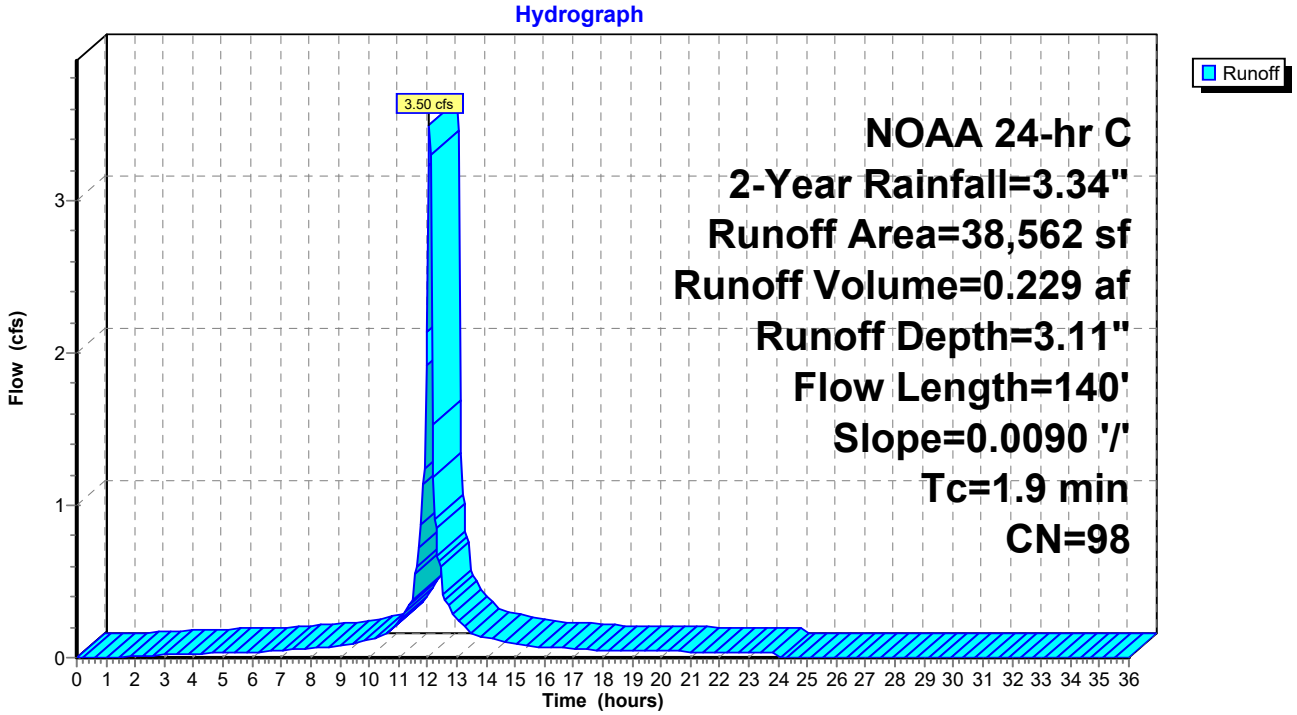
Runoff = 3.50 cfs @ 12.08 hrs, Volume= 0.229 af, Depth= 3.11"
Routed to Link 6L : EX SA South

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year Rainfall=3.34"

Area (sf)	CN	Description
32,900	98	Paved parking, HSG B
5,662	98	Roofs, HSG B
38,562	98	Weighted Average
38,562		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0090	1.02		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.34"
0.3	40	0.0090	1.93		**Shallow Concentrated Flow, Shallow Concentrated Flow** Paved Kv= 20.3 fps
1.9	140	Total			

Subcatchment 4S: Ex SA South Imp



Hydrograph for Subcatchment 4S: Ex SA South Imp

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.01	0.01
2.50	0.10	0.01	0.01
3.00	0.12	0.02	0.02
3.50	0.14	0.03	0.02
4.00	0.16	0.05	0.03
4.50	0.19	0.06	0.03
5.00	0.21	0.08	0.03
5.50	0.24	0.10	0.03
6.00	0.26	0.12	0.04
6.50	0.29	0.14	0.04
7.00	0.33	0.17	0.05
7.50	0.36	0.20	0.06
8.00	0.40	0.23	0.06
8.50	0.44	0.27	0.07
9.00	0.49	0.31	0.08
9.50	0.54	0.36	0.10
10.00	0.61	0.42	0.12
10.50	0.69	0.49	0.14
11.00	0.80	0.60	0.23
11.50	0.99	0.78	0.39
12.00	1.59	1.37	**2.14**
12.50	2.35	2.12	**0.59**
13.00	2.54	2.31	0.26
13.50	2.65	2.42	0.17
14.00	2.73	2.50	0.13
14.50	2.80	2.57	0.11
15.00	2.85	2.62	0.09
15.50	2.90	2.67	0.08
16.00	2.94	2.71	0.07
16.50	2.98	2.75	0.07
17.00	3.01	2.78	0.06
17.50	3.05	2.81	0.05
18.00	3.08	2.84	0.05
18.50	3.10	2.87	0.05
19.00	3.13	2.90	0.05
19.50	3.15	2.92	0.04
20.00	3.18	2.94	0.04
20.50	3.20	2.97	0.04
21.00	3.22	2.99	0.04
21.50	3.24	3.01	0.04
22.00	3.26	3.03	0.04
22.50	3.28	3.05	0.03
23.00	3.30	3.07	0.03
23.50	3.32	3.09	0.03
24.00	**3.34**	**3.11**	0.04
24.50	3.34	3.11	0.00
25.00	3.34	3.11	0.00
25.50	3.34	3.11	0.00
26.00	3.34	3.11	0.00
26.50	3.34	3.11	0.00
27.00	3.34	3.11	0.00
27.50	3.34	3.11	0.00
28.00	3.34	3.11	0.00
28.50	3.34	3.11	0.00
29.00	3.34	3.11	0.00
29.50	3.34	3.11	0.00
30.00	3.34	3.11	0.00
30.50	3.34	3.11	0.00
31.00	3.34	3.11	0.00
31.50	3.34	3.11	0.00
32.00	3.34	3.11	0.00
32.50	3.34	3.11	0.00
33.00	3.34	3.11	0.00
33.50	3.34	3.11	0.00
34.00	3.34	3.11	0.00
34.50	3.34	3.11	0.00
35.00	3.34	3.11	0.00
35.50	3.34	3.11	0.00
36.00	3.34	3.11	0.00

Summary for Subcatchment 5S: Ex SA South Perv

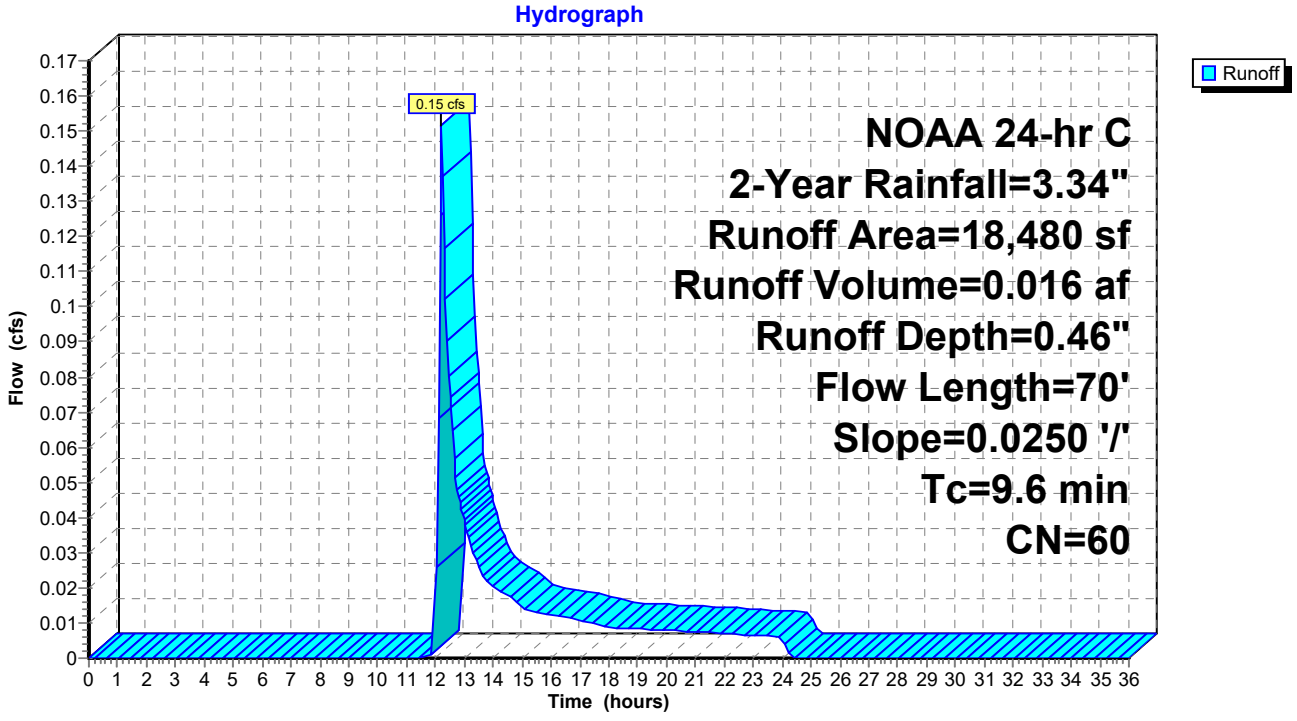
Runoff = 0.15 cfs @ 12.21 hrs, Volume= 0.016 af, Depth= 0.46"
Routed to Link 6L : EX SA South

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year Rainfall=3.34"

Area (sf)	CN	Description
2,059	55	Woods, Good, HSG B
16,421	61	>75% Grass cover, Good, HSG B
18,480	60	Weighted Average
18,480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	70	0.0250	0.12		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 3.34"

Subcatchment 5S: Ex SA South Perv



Hydrograph for Subcatchment 5S: Ex SA South Perv

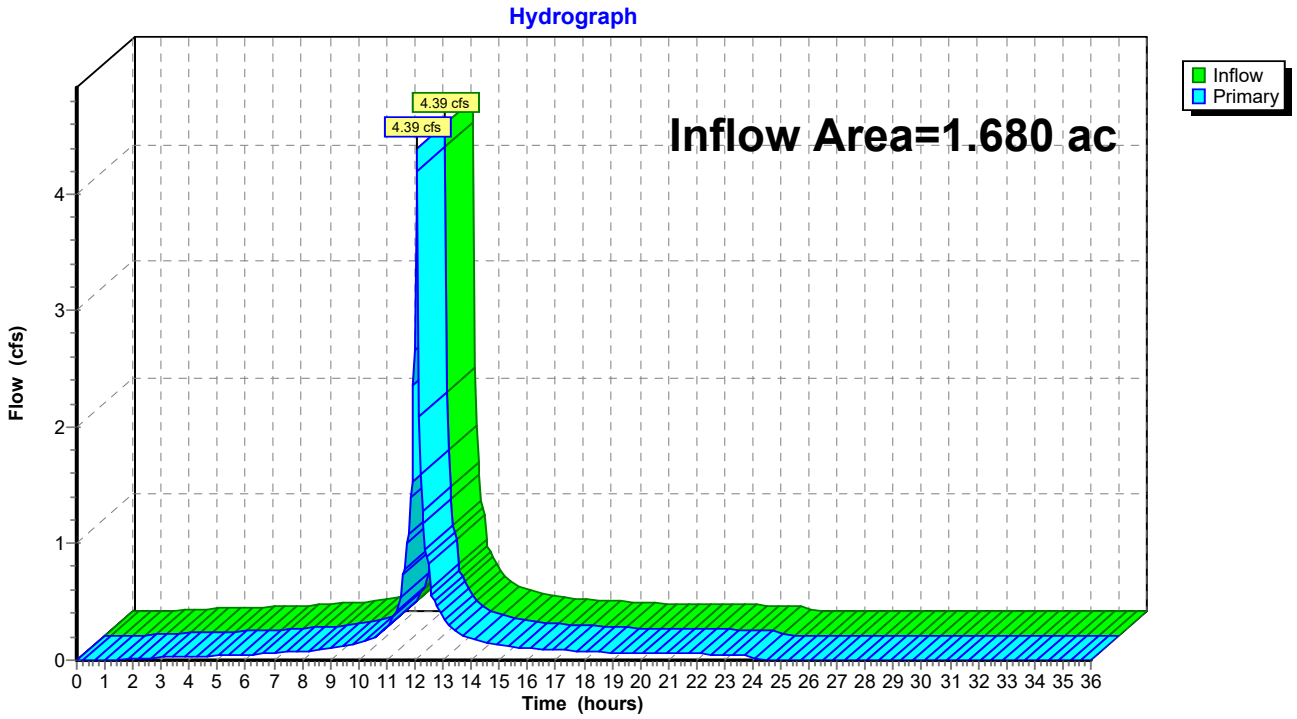
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.10	0.00	0.00
3.00	0.12	0.00	0.00
3.50	0.14	0.00	0.00
4.00	0.16	0.00	0.00
4.50	0.19	0.00	0.00
5.00	0.21	0.00	0.00
5.50	0.24	0.00	0.00
6.00	0.26	0.00	0.00
6.50	0.29	0.00	0.00
7.00	0.33	0.00	0.00
7.50	0.36	0.00	0.00
8.00	0.40	0.00	0.00
8.50	0.44	0.00	0.00
9.00	0.49	0.00	0.00
9.50	0.54	0.00	0.00
10.00	0.61	0.00	0.00
10.50	0.69	0.00	0.00
11.00	0.80	0.00	0.00
11.50	0.99	0.00	0.00
12.00	1.59	0.01	**0.01**
12.50	2.35	0.14	**0.07**
13.00	2.54	0.18	0.04
13.50	2.65	0.22	0.03
14.00	2.73	0.24	0.02
14.50	2.80	0.26	0.02
15.00	2.85	0.28	0.01
15.50	2.90	0.30	0.01
16.00	2.94	0.31	0.01
16.50	2.98	0.33	0.01
17.00	3.01	0.34	0.01
17.50	3.05	0.35	0.01
18.00	3.08	0.36	0.01
18.50	3.10	0.37	0.01
19.00	3.13	0.38	0.01
19.50	3.15	0.39	0.01
20.00	3.18	0.40	0.01
20.50	3.20	0.41	0.01
21.00	3.22	0.42	0.01
21.50	3.24	0.43	0.01
22.00	3.26	0.43	0.01
22.50	3.28	0.44	0.01
23.00	3.30	0.45	0.01
23.50	3.32	0.46	0.01
24.00	**3.34**	**0.46**	0.01
24.50	3.34	0.46	0.00
25.00	3.34	0.46	0.00
25.50	3.34	0.46	0.00
26.00	3.34	0.46	0.00
26.50	3.34	0.46	0.00
27.00	3.34	0.46	0.00
27.50	3.34	0.46	0.00
28.00	3.34	0.46	0.00
28.50	3.34	0.46	0.00
29.00	3.34	0.46	0.00
29.50	3.34	0.46	0.00
30.00	3.34	0.46	0.00
30.50	3.34	0.46	0.00
31.00	3.34	0.46	0.00
31.50	3.34	0.46	0.00
32.00	3.34	0.46	0.00
32.50	3.34	0.46	0.00
33.00	3.34	0.46	0.00
33.50	3.34	0.46	0.00
34.00	3.34	0.46	0.00
34.50	3.34	0.46	0.00
35.00	3.34	0.46	0.00
35.50	3.34	0.46	0.00
36.00	3.34	0.46	0.00

Summary for Link 3L: Ex SA North

Inflow Area = 1.680 ac, 66.07% Impervious, Inflow Depth = 2.17" for 2-Year event
Inflow = 4.39 cfs @ 12.08 hrs, Volume= 0.304 af
Primary = 4.39 cfs @ 12.08 hrs, Volume= 0.304 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 3L: Ex SA North



Hydrograph for Link 3L: Ex SA North

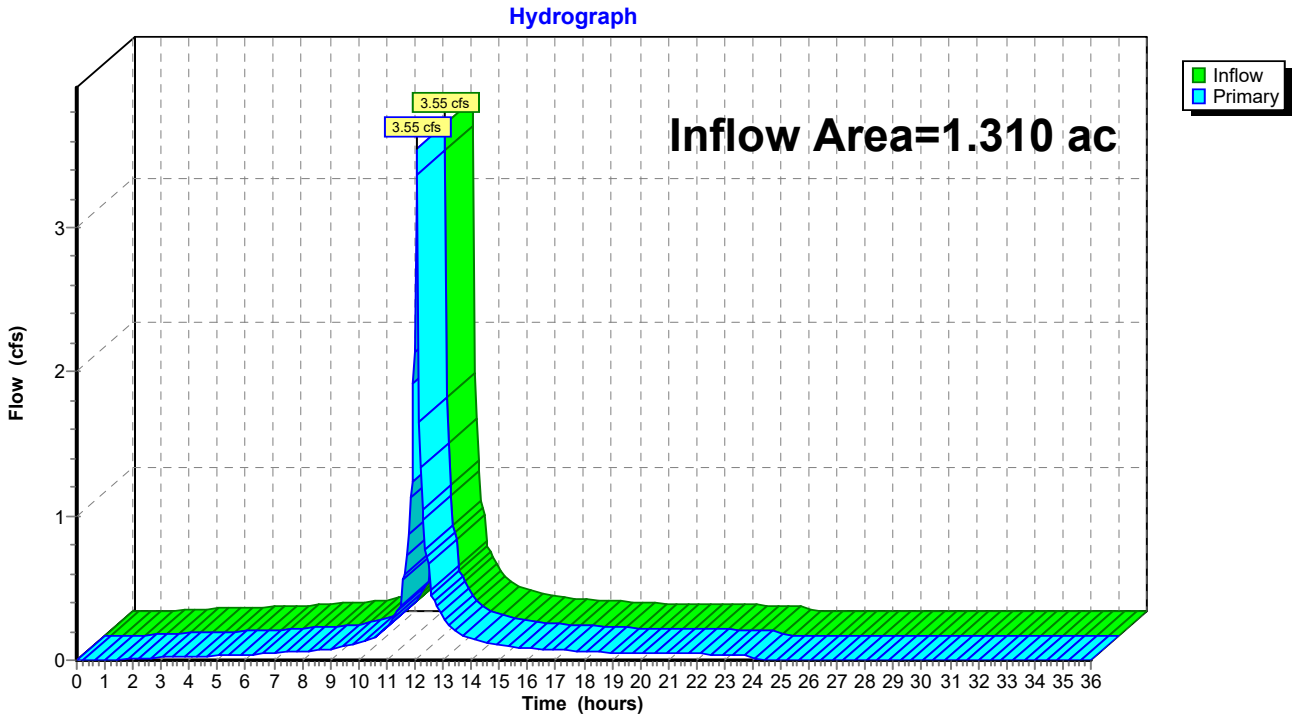
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00
1.50	0.01	0.00	0.01	27.50	0.00	0.00	0.00
2.00	0.01	0.00	0.01	28.00	0.00	0.00	0.00
2.50	0.02	0.00	0.02	28.50	0.00	0.00	0.00
3.00	0.02	0.00	0.02	29.00	0.00	0.00	0.00
3.50	0.03	0.00	0.03	29.50	0.00	0.00	0.00
4.00	0.03	0.00	0.03	30.00	0.00	0.00	0.00
4.50	0.04	0.00	0.04	30.50	0.00	0.00	0.00
5.00	0.04	0.00	0.04	31.00	0.00	0.00	0.00
5.50	0.04	0.00	0.04	31.50	0.00	0.00	0.00
6.00	0.05	0.00	0.05	32.00	0.00	0.00	0.00
6.50	0.05	0.00	0.05	32.50	0.00	0.00	0.00
7.00	0.06	0.00	0.06	33.00	0.00	0.00	0.00
7.50	0.07	0.00	0.07	33.50	0.00	0.00	0.00
8.00	0.08	0.00	0.08	34.00	0.00	0.00	0.00
8.50	0.09	0.00	0.09	34.50	0.00	0.00	0.00
9.00	0.09	0.00	0.09	35.00	0.00	0.00	0.00
9.50	0.12	0.00	0.12	35.50	0.00	0.00	0.00
10.00	0.15	0.00	0.15	36.00	0.00	0.00	0.00
10.50	0.18	0.00	0.18				
11.00	0.28	0.00	0.28				
11.50	0.48	0.00	0.48				
12.00	**2.65**	0.00	**2.65**				
12.50	**0.82**	0.00	**0.82**				
13.00	0.38	0.00	0.38				
13.50	0.24	0.00	0.24				
14.00	0.19	0.00	0.19				
14.50	0.16	0.00	0.16				
15.00	0.13	0.00	0.13				
15.50	0.11	0.00	0.11				
16.00	0.10	0.00	0.10				
16.50	0.10	0.00	0.10				
17.00	0.09	0.00	0.09				
17.50	0.08	0.00	0.08				
18.00	0.07	0.00	0.07				
18.50	0.07	0.00	0.07				
19.00	0.07	0.00	0.07				
19.50	0.06	0.00	0.06				
20.00	0.06	0.00	0.06				
20.50	0.06	0.00	0.06				
21.00	0.06	0.00	0.06				
21.50	0.06	0.00	0.06				
22.00	0.05	0.00	0.05				
22.50	0.05	0.00	0.05				
23.00	0.05	0.00	0.05				
23.50	0.05	0.00	0.05				
24.00	0.05	0.00	0.05				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Summary for Link 6L: EX SA South

Inflow Area = 1.310 ac, 67.60% Impervious, Inflow Depth = 2.25" for 2-Year event
Inflow = 3.55 cfs @ 12.08 hrs, Volume= 0.246 af
Primary = 3.55 cfs @ 12.08 hrs, Volume= 0.246 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 6L: EX SA South



Hydrograph for Link 6L: EX SA South

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00
1.50	0.00	0.00	0.00	27.50	0.00	0.00	0.00
2.00	0.01	0.00	0.01	28.00	0.00	0.00	0.00
2.50	0.01	0.00	0.01	28.50	0.00	0.00	0.00
3.00	0.02	0.00	0.02	29.00	0.00	0.00	0.00
3.50	0.02	0.00	0.02	29.50	0.00	0.00	0.00
4.00	0.03	0.00	0.03	30.00	0.00	0.00	0.00
4.50	0.03	0.00	0.03	30.50	0.00	0.00	0.00
5.00	0.03	0.00	0.03	31.00	0.00	0.00	0.00
5.50	0.03	0.00	0.03	31.50	0.00	0.00	0.00
6.00	0.04	0.00	0.04	32.00	0.00	0.00	0.00
6.50	0.04	0.00	0.04	32.50	0.00	0.00	0.00
7.00	0.05	0.00	0.05	33.00	0.00	0.00	0.00
7.50	0.06	0.00	0.06	33.50	0.00	0.00	0.00
8.00	0.06	0.00	0.06	34.00	0.00	0.00	0.00
8.50	0.07	0.00	0.07	34.50	0.00	0.00	0.00
9.00	0.08	0.00	0.08	35.00	0.00	0.00	0.00
9.50	0.10	0.00	0.10	35.50	0.00	0.00	0.00
10.00	0.12	0.00	0.12	36.00	0.00	0.00	0.00
10.50	0.14	0.00	0.14				
11.00	0.23	0.00	0.23				
11.50	0.39	0.00	0.39				
12.00	**2.14**	0.00	**2.14**				
12.50	**0.66**	0.00	**0.66**				
13.00	0.30	0.00	0.30				
13.50	0.19	0.00	0.19				
14.00	0.15	0.00	0.15				
14.50	0.13	0.00	0.13				
15.00	0.10	0.00	0.10				
15.50	0.09	0.00	0.09				
16.00	0.08	0.00	0.08				
16.50	0.08	0.00	0.08				
17.00	0.07	0.00	0.07				
17.50	0.06	0.00	0.06				
18.00	0.06	0.00	0.06				
18.50	0.06	0.00	0.06				
19.00	0.05	0.00	0.05				
19.50	0.05	0.00	0.05				
20.00	0.05	0.00	0.05				
20.50	0.05	0.00	0.05				
21.00	0.05	0.00	0.05				
21.50	0.04	0.00	0.04				
22.00	0.04	0.00	0.04				
22.50	0.04	0.00	0.04				
23.00	0.04	0.00	0.04				
23.50	0.04	0.00	0.04				
24.00	0.04	0.00	0.04				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex SA North Imp Runoff Area=48,361 sf 100.00% Impervious Runoff Depth=4.77"
Flow Length=200' Tc=2.1 min CN=98 Runoff=6.61 cfs 0.442 af

Subcatchment2S: Ex SA North Perv Runoff Area=24,838 sf 0.00% Impervious Runoff Depth=1.11"
Flow Length=135' Slope=0.0300 '/' Tc=12.1 min CN=57 Runoff=0.58 cfs 0.053 af

Subcatchment4S: Ex SA South Imp Runoff Area=38,562 sf 100.00% Impervious Runoff Depth=4.77"
Flow Length=140' Slope=0.0090 '/' Tc=1.9 min CN=98 Runoff=5.28 cfs 0.352 af

Subcatchment5S: Ex SA South Perv Runoff Area=18,480 sf 0.00% Impervious Runoff Depth=1.31"
Flow Length=70' Slope=0.0250 '/' Tc=9.6 min CN=60 Runoff=0.57 cfs 0.046 af

Link 3L: Ex SA North Inflow=6.86 cfs 0.494 af
Primary=6.86 cfs 0.494 af

Link 6L: EX SA South Inflow=5.61 cfs 0.398 af
Primary=5.61 cfs 0.398 af

Total Runoff Area = 2.990 ac Runoff Volume = 0.893 af Average Runoff Depth = 3.58"
33.26% Pervious = 0.994 ac 66.74% Impervious = 1.995 ac

Summary for Subcatchment 1S: Ex SA North Imp

[49] Hint: Tc<2dt may require smaller dt

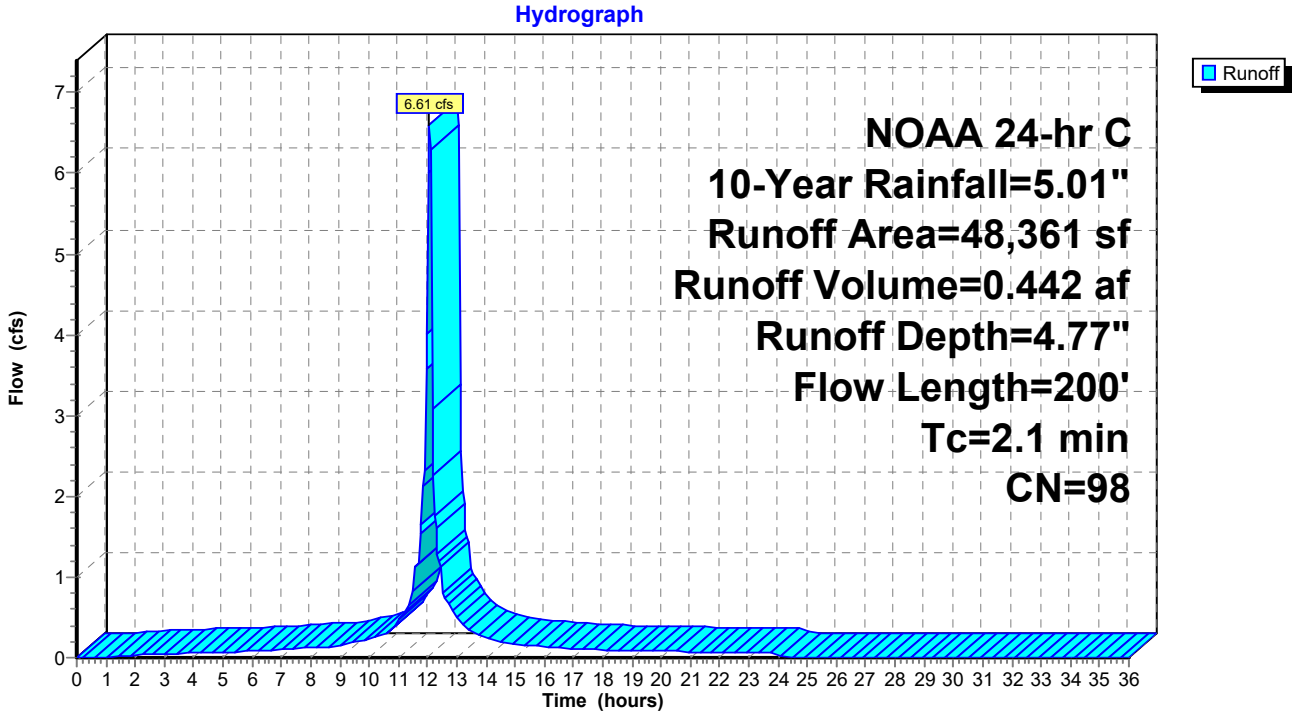
Runoff = 6.61 cfs @ 12.08 hrs, Volume= 0.442 af, Depth= 4.77"
Routed to Link 3L : Ex SA North

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year Rainfall=5.01"

Area (sf)	CN	Description
33,877	98	Paved parking, HSG B
14,484	98	Roofs, HSG B
48,361	98	Weighted Average
48,361		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0110	1.11		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.34"
0.6	100	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Flow** Paved Kv= 20.3 fps
2.1	200	Total			

Subcatchment 1S: Ex SA North Imp



Hydrograph for Subcatchment 1S: Ex SA North Imp

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.01
1.50	0.08	0.01	0.02
2.00	0.11	0.02	0.03
2.50	0.14	0.03	0.04
3.00	0.18	0.05	0.05
3.50	0.21	0.08	0.05
4.00	0.25	0.10	0.06
4.50	0.28	0.13	0.06
5.00	0.32	0.16	0.07
5.50	0.36	0.19	0.07
6.00	0.40	0.23	0.08
6.50	0.44	0.26	0.09
7.00	0.49	0.31	0.10
7.50	0.54	0.36	0.11
8.00	0.60	0.41	0.13
8.50	0.66	0.47	0.14
9.00	0.73	0.53	0.15
9.50	0.81	0.61	0.19
10.00	0.91	0.71	0.23
10.50	1.03	0.82	0.28
11.00	1.20	0.99	0.44
11.50	1.48	1.26	0.74
12.00	2.39	2.16	**4.01**
12.50	3.53	3.30	**1.11**
13.00	3.81	3.57	0.50
13.50	3.98	3.74	0.31
14.00	4.10	3.86	0.25
14.50	4.20	3.96	0.21
15.00	4.28	4.04	0.16
15.50	4.35	4.11	0.15
16.00	4.41	4.17	0.14
16.50	4.47	4.23	0.13
17.00	4.52	4.29	0.11
17.50	4.57	4.33	0.10
18.00	4.61	4.38	0.09
18.50	4.65	4.42	0.09
19.00	4.69	4.46	0.09
19.50	4.73	4.49	0.08
20.00	4.76	4.53	0.08
20.50	4.80	4.56	0.08
21.00	4.83	4.60	0.07
21.50	4.87	4.63	0.07
22.00	4.90	4.66	0.07
22.50	4.93	4.69	0.07
23.00	4.96	4.72	0.06
23.50	4.98	4.75	0.06
24.00	**5.01**	**4.77**	0.07
24.50	5.01	4.77	0.00
25.00	5.01	4.77	0.00
25.50	5.01	4.77	0.00
26.00	5.01	4.77	0.00
26.50	5.01	4.77	0.00
27.00	5.01	4.77	0.00
27.50	5.01	4.77	0.00
28.00	5.01	4.77	0.00
28.50	5.01	4.77	0.00
29.00	5.01	4.77	0.00
29.50	5.01	4.77	0.00
30.00	5.01	4.77	0.00
30.50	5.01	4.77	0.00
31.00	5.01	4.77	0.00
31.50	5.01	4.77	0.00
32.00	5.01	4.77	0.00
32.50	5.01	4.77	0.00
33.00	5.01	4.77	0.00
33.50	5.01	4.77	0.00
34.00	5.01	4.77	0.00
34.50	5.01	4.77	0.00
35.00	5.01	4.77	0.00
35.50	5.01	4.77	0.00
36.00	5.01	4.77	0.00

Summary for Subcatchment 2S: Ex SA North Perv

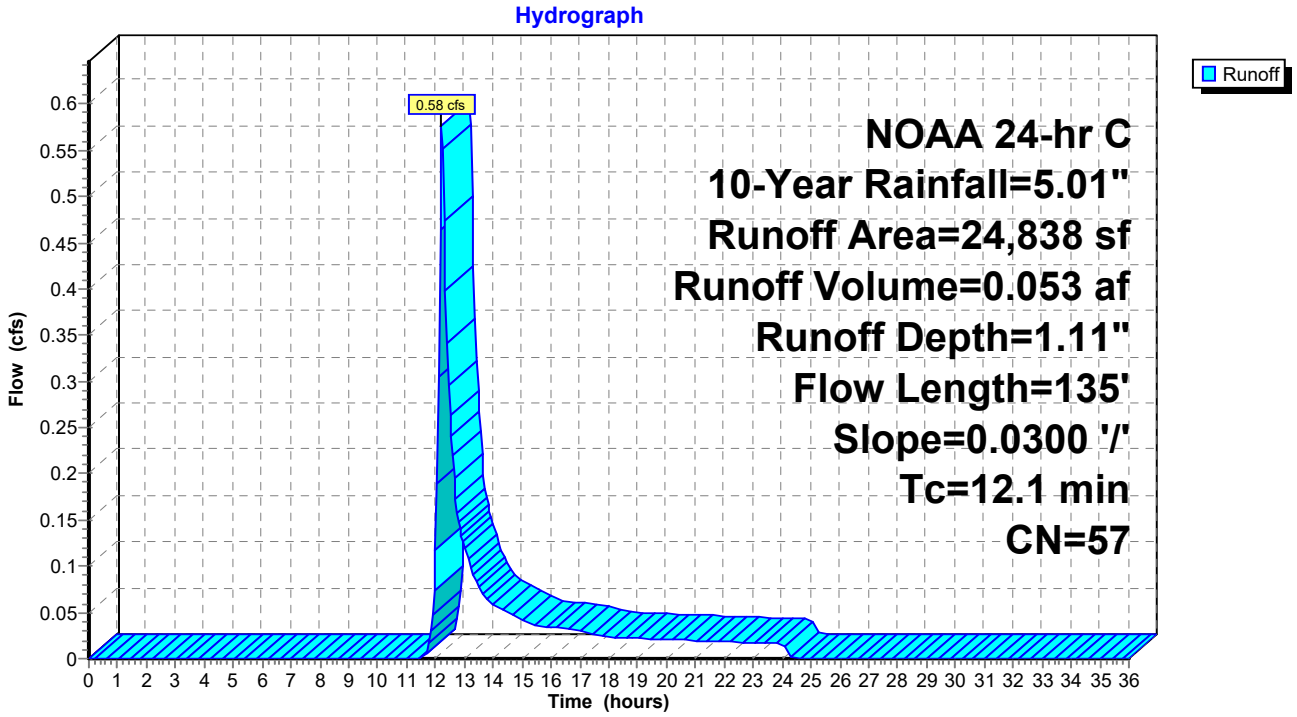
Runoff = 0.58 cfs @ 12.22 hrs, Volume= 0.053 af, Depth= 1.11"
Routed to Link 3L : Ex SA North

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year Rainfall=5.01"

Area (sf)	CN	Description
15,636	55	Woods, Good, HSG B
9,202	61	>75% Grass cover, Good, HSG B
24,838	57	Weighted Average
24,838		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.0300	0.14		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 3.34"
0.2	35	0.0300	2.79		**Shallow Concentrated Flow, Shallow Concentrated Flow** Unpaved Kv= 16.1 fps
12.1	135	Total			

Subcatchment 2S: Ex SA North Perv



Hydrograph for Subcatchment 2S: Ex SA North Perv

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.18	0.00	0.00
3.50	0.21	0.00	0.00
4.00	0.25	0.00	0.00
4.50	0.28	0.00	0.00
5.00	0.32	0.00	0.00
5.50	0.36	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.00	0.00
9.00	0.73	0.00	0.00
9.50	0.81	0.00	0.00
10.00	0.91	0.00	0.00
10.50	1.03	0.00	0.00
11.00	1.20	0.00	0.00
11.50	1.48	0.00	0.00
12.00	2.39	0.09	**0.12**
12.50	3.53	0.43	**0.26**
13.00	3.81	0.54	0.12
13.50	3.98	0.61	0.08
14.00	4.10	0.66	0.06
14.50	4.20	0.71	0.05
15.00	4.28	0.74	0.04
15.50	4.35	0.78	0.04
16.00	4.41	0.81	0.03
16.50	4.47	0.83	0.03
17.00	4.52	0.86	0.03
17.50	4.57	0.88	0.03
18.00	4.61	0.90	0.02
18.50	4.65	0.92	0.02
19.00	4.69	0.94	0.02
19.50	4.73	0.96	0.02
20.00	4.76	0.98	0.02
20.50	4.80	1.00	0.02
21.00	4.83	1.02	0.02
21.50	4.87	1.03	0.02
22.00	4.90	1.05	0.02
22.50	4.93	1.07	0.02
23.00	4.96	1.08	0.02
23.50	4.98	1.10	0.02
24.00	**5.01**	**1.11**	0.02
24.50	5.01	1.11	0.00
25.00	5.01	1.11	0.00
25.50	5.01	1.11	0.00
26.00	5.01	1.11	0.00
26.50	5.01	1.11	0.00
27.00	5.01	1.11	0.00
27.50	5.01	1.11	0.00
28.00	5.01	1.11	0.00
28.50	5.01	1.11	0.00
29.00	5.01	1.11	0.00
29.50	5.01	1.11	0.00
30.00	5.01	1.11	0.00
30.50	5.01	1.11	0.00
31.00	5.01	1.11	0.00
31.50	5.01	1.11	0.00
32.00	5.01	1.11	0.00
32.50	5.01	1.11	0.00
33.00	5.01	1.11	0.00
33.50	5.01	1.11	0.00
34.00	5.01	1.11	0.00
34.50	5.01	1.11	0.00
35.00	5.01	1.11	0.00
35.50	5.01	1.11	0.00
36.00	5.01	1.11	0.00

Summary for Subcatchment 4S: Ex SA South Imp

[49] Hint: Tc<2dt may require smaller dt

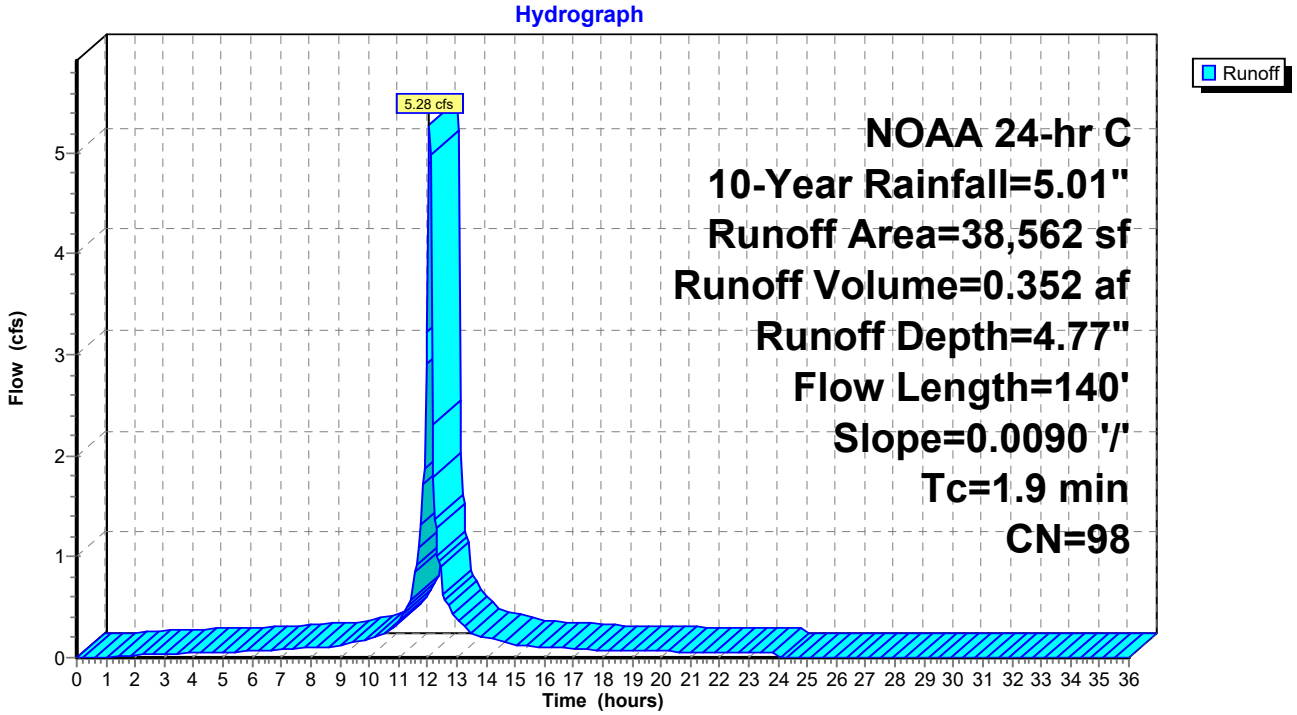
Runoff = 5.28 cfs @ 12.08 hrs, Volume= 0.352 af, Depth= 4.77"
Routed to Link 6L : EX SA South

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year Rainfall=5.01"

Area (sf)	CN	Description
32,900	98	Paved parking, HSG B
5,662	98	Roofs, HSG B
38,562	98	Weighted Average
38,562		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0090	1.02		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.34"
0.3	40	0.0090	1.93		**Shallow Concentrated Flow, Shallow Concentrated Flow** Paved Kv= 20.3 fps
1.9	140	Total			

Subcatchment 4S: Ex SA South Imp



Hydrograph for Subcatchment 4S: Ex SA South Imp

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.01
1.50	0.08	0.01	0.02
2.00	0.11	0.02	0.02
2.50	0.14	0.03	0.03
3.00	0.18	0.05	0.04
3.50	0.21	0.08	0.04
4.00	0.25	0.10	0.05
4.50	0.28	0.13	0.05
5.00	0.32	0.16	0.06
5.50	0.36	0.19	0.06
6.00	0.40	0.23	0.06
6.50	0.44	0.26	0.07
7.00	0.49	0.31	0.08
7.50	0.54	0.36	0.09
8.00	0.60	0.41	0.10
8.50	0.66	0.47	0.11
9.00	0.73	0.53	0.12
9.50	0.81	0.61	0.15
10.00	0.91	0.71	0.19
10.50	1.03	0.82	0.22
11.00	1.20	0.99	0.35
11.50	1.48	1.26	0.59
12.00	2.39	2.16	**3.23**
12.50	3.53	3.30	**0.88**
13.00	3.81	3.57	0.40
13.50	3.98	3.74	0.25
14.00	4.10	3.86	0.20
14.50	4.20	3.96	0.17
15.00	4.28	4.04	0.13
15.50	4.35	4.11	0.12
16.00	4.41	4.17	0.11
16.50	4.47	4.23	0.10
17.00	4.52	4.29	0.09
17.50	4.57	4.33	0.08
18.00	4.61	4.38	0.07
18.50	4.65	4.42	0.07
19.00	4.69	4.46	0.07
19.50	4.73	4.49	0.07
20.00	4.76	4.53	0.06
20.50	4.80	4.56	0.06
21.00	4.83	4.60	0.06
21.50	4.87	4.63	0.06
22.00	4.90	4.66	0.05
22.50	4.93	4.69	0.05
23.00	4.96	4.72	0.05
23.50	4.98	4.75	0.05
24.00	**5.01**	**4.77**	0.05
24.50	5.01	4.77	0.00
25.00	5.01	4.77	0.00
25.50	5.01	4.77	0.00
26.00	5.01	4.77	0.00
26.50	5.01	4.77	0.00
27.00	5.01	4.77	0.00
27.50	5.01	4.77	0.00
28.00	5.01	4.77	0.00
28.50	5.01	4.77	0.00
29.00	5.01	4.77	0.00
29.50	5.01	4.77	0.00
30.00	5.01	4.77	0.00
30.50	5.01	4.77	0.00
31.00	5.01	4.77	0.00
31.50	5.01	4.77	0.00
32.00	5.01	4.77	0.00
32.50	5.01	4.77	0.00
33.00	5.01	4.77	0.00
33.50	5.01	4.77	0.00
34.00	5.01	4.77	0.00
34.50	5.01	4.77	0.00
35.00	5.01	4.77	0.00
35.50	5.01	4.77	0.00
36.00	5.01	4.77	0.00

Summary for Subcatchment 5S: Ex SA South Perv

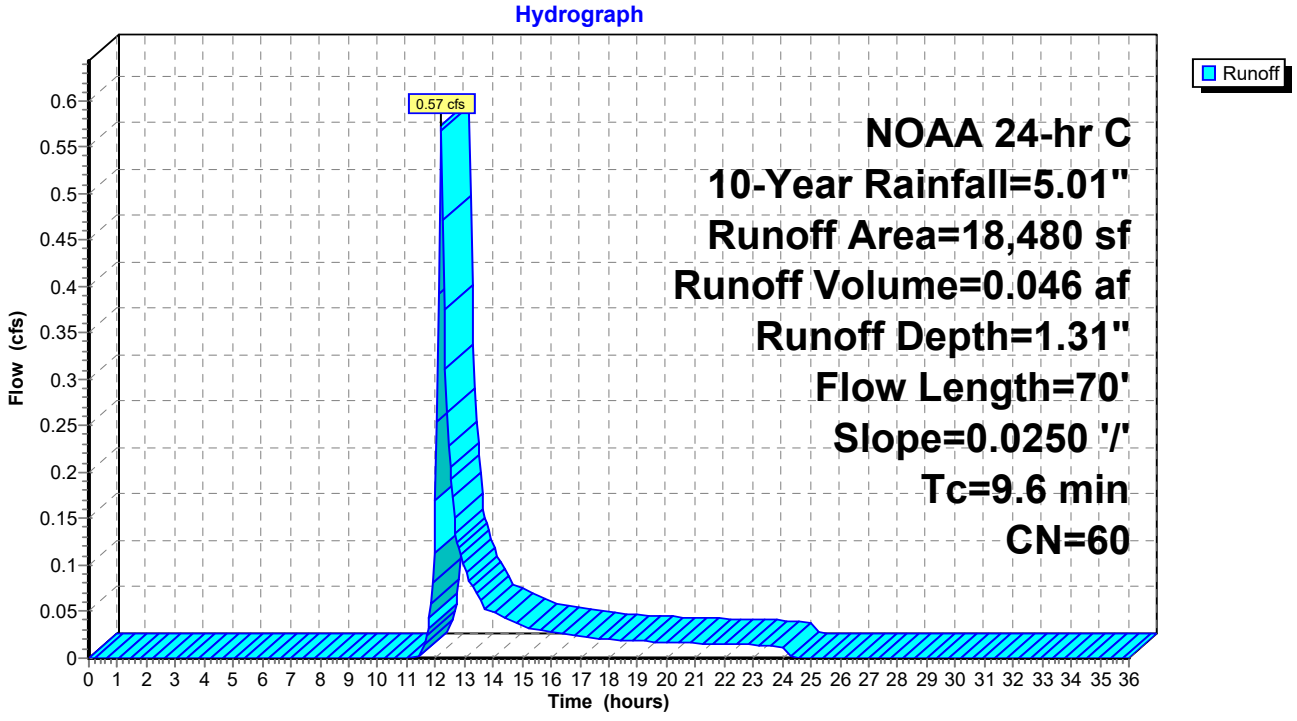
Runoff = 0.57 cfs @ 12.18 hrs, Volume= 0.046 af, Depth= 1.31"
Routed to Link 6L : EX SA South

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year Rainfall=5.01"

Area (sf)	CN	Description
2,059	55	Woods, Good, HSG B
16,421	61	>75% Grass cover, Good, HSG B
18,480	60	Weighted Average
18,480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	70	0.0250	0.12		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 3.34"

Subcatchment 5S: Ex SA South Perv



Hydrograph for Subcatchment 5S: Ex SA South Perv

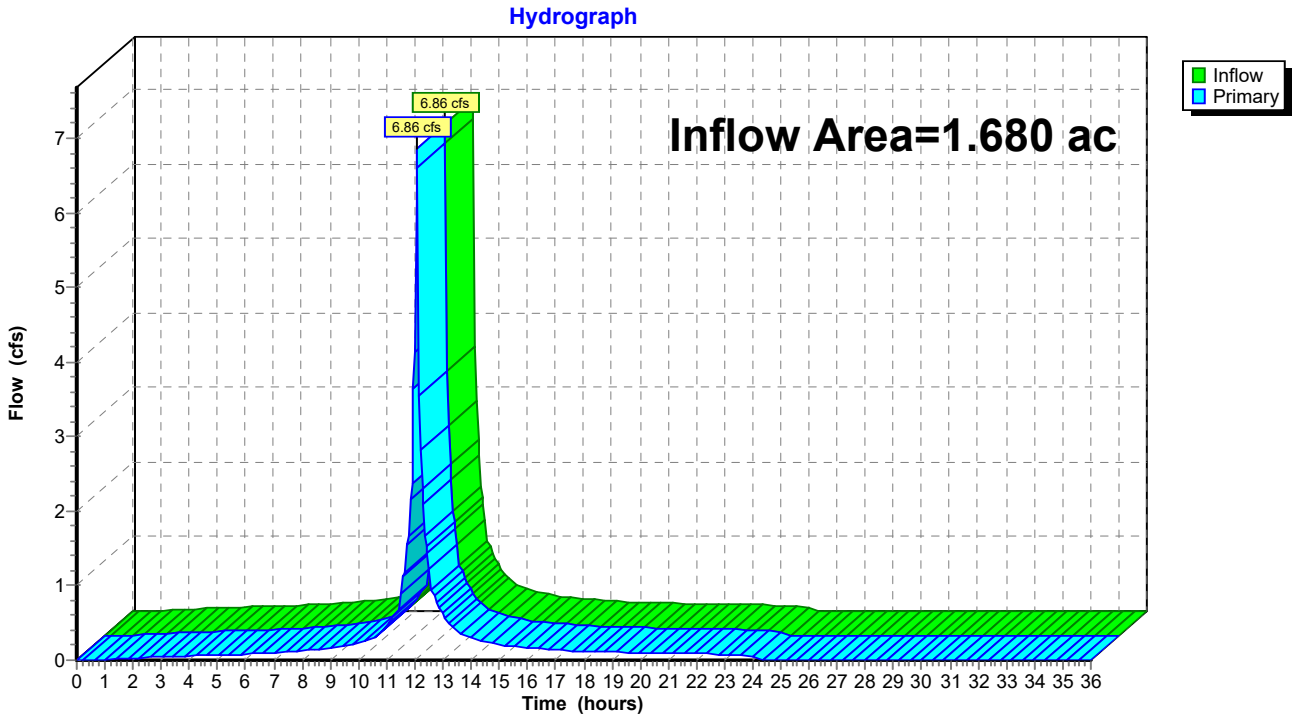
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.18	0.00	0.00
3.50	0.21	0.00	0.00
4.00	0.25	0.00	0.00
4.50	0.28	0.00	0.00
5.00	0.32	0.00	0.00
5.50	0.36	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.00	0.00
9.00	0.73	0.00	0.00
9.50	0.81	0.00	0.00
10.00	0.91	0.00	0.00
10.50	1.03	0.00	0.00
11.00	1.20	0.00	0.00
11.50	1.48	0.00	0.00
12.00	2.39	0.14	**0.17**
12.50	3.53	0.54	**0.21**
13.00	3.81	0.67	0.10
13.50	3.98	0.75	0.06
14.00	4.10	0.81	0.05
14.50	4.20	0.86	0.04
15.00	4.28	0.90	0.03
15.50	4.35	0.94	0.03
16.00	4.41	0.97	0.03
16.50	4.47	1.00	0.03
17.00	4.52	1.03	0.02
17.50	4.57	1.06	0.02
18.00	4.61	1.08	0.02
18.50	4.65	1.10	0.02
19.00	4.69	1.12	0.02
19.50	4.73	1.15	0.02
20.00	4.76	1.17	0.02
20.50	4.80	1.19	0.02
21.00	4.83	1.20	0.02
21.50	4.87	1.22	0.02
22.00	4.90	1.24	0.02
22.50	4.93	1.26	0.01
23.00	4.96	1.28	0.01
23.50	4.98	1.29	0.01
24.00	**5.01**	**1.31**	0.01
24.50	5.01	1.31	0.00
25.00	5.01	1.31	0.00
25.50	5.01	1.31	0.00
26.00	5.01	1.31	0.00
26.50	5.01	1.31	0.00
27.00	5.01	1.31	0.00
27.50	5.01	1.31	0.00
28.00	5.01	1.31	0.00
28.50	5.01	1.31	0.00
29.00	5.01	1.31	0.00
29.50	5.01	1.31	0.00
30.00	5.01	1.31	0.00
30.50	5.01	1.31	0.00
31.00	5.01	1.31	0.00
31.50	5.01	1.31	0.00
32.00	5.01	1.31	0.00
32.50	5.01	1.31	0.00
33.00	5.01	1.31	0.00
33.50	5.01	1.31	0.00
34.00	5.01	1.31	0.00
34.50	5.01	1.31	0.00
35.00	5.01	1.31	0.00
35.50	5.01	1.31	0.00
36.00	5.01	1.31	0.00

Summary for Link 3L: Ex SA North

Inflow Area = 1.680 ac, 66.07% Impervious, Inflow Depth = 3.53" for 10-Year event
Inflow = 6.86 cfs @ 12.08 hrs, Volume= 0.494 af
Primary = 6.86 cfs @ 12.08 hrs, Volume= 0.494 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 3L: Ex SA North



Hydrograph for Link 3L: Ex SA North

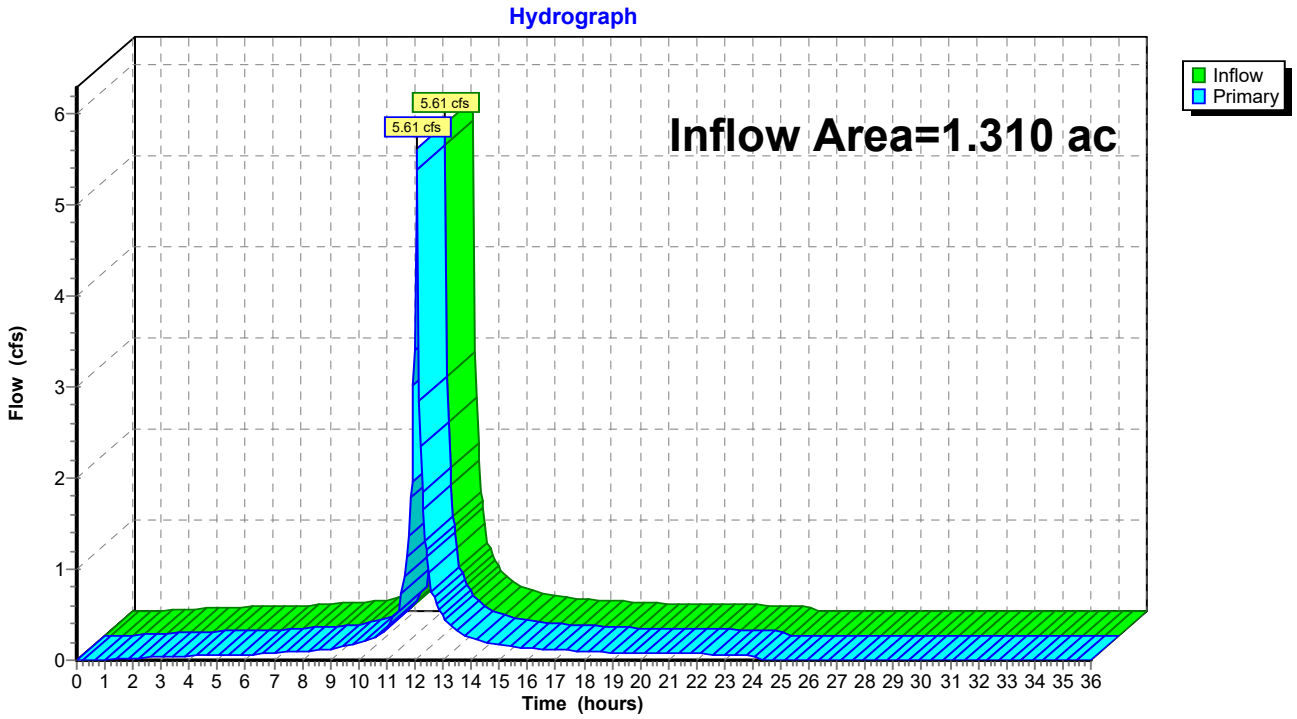
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.01	0.00	0.01	27.00	0.00	0.00	0.00
1.50	0.02	0.00	0.02	27.50	0.00	0.00	0.00
2.00	0.03	0.00	0.03	28.00	0.00	0.00	0.00
2.50	0.04	0.00	0.04	28.50	0.00	0.00	0.00
3.00	0.05	0.00	0.05	29.00	0.00	0.00	0.00
3.50	0.05	0.00	0.05	29.50	0.00	0.00	0.00
4.00	0.06	0.00	0.06	30.00	0.00	0.00	0.00
4.50	0.06	0.00	0.06	30.50	0.00	0.00	0.00
5.00	0.07	0.00	0.07	31.00	0.00	0.00	0.00
5.50	0.07	0.00	0.07	31.50	0.00	0.00	0.00
6.00	0.08	0.00	0.08	32.00	0.00	0.00	0.00
6.50	0.09	0.00	0.09	32.50	0.00	0.00	0.00
7.00	0.10	0.00	0.10	33.00	0.00	0.00	0.00
7.50	0.11	0.00	0.11	33.50	0.00	0.00	0.00
8.00	0.13	0.00	0.13	34.00	0.00	0.00	0.00
8.50	0.14	0.00	0.14	34.50	0.00	0.00	0.00
9.00	0.15	0.00	0.15	35.00	0.00	0.00	0.00
9.50	0.19	0.00	0.19	35.50	0.00	0.00	0.00
10.00	0.23	0.00	0.23	36.00	0.00	0.00	0.00
10.50	0.28	0.00	0.28				
11.00	0.44	0.00	0.44				
11.50	0.74	0.00	0.74				
12.00	**4.13**	0.00	**4.13**				
12.50	**1.37**	0.00	**1.37**				
13.00	0.62	0.00	0.62				
13.50	0.39	0.00	0.39				
14.00	0.31	0.00	0.31				
14.50	0.26	0.00	0.26				
15.00	0.21	0.00	0.21				
15.50	0.18	0.00	0.18				
16.00	0.17	0.00	0.17				
16.50	0.16	0.00	0.16				
17.00	0.14	0.00	0.14				
17.50	0.13	0.00	0.13				
18.00	0.12	0.00	0.12				
18.50	0.11	0.00	0.11				
19.00	0.11	0.00	0.11				
19.50	0.10	0.00	0.10				
20.00	0.10	0.00	0.10				
20.50	0.10	0.00	0.10				
21.00	0.09	0.00	0.09				
21.50	0.09	0.00	0.09				
22.00	0.09	0.00	0.09				
22.50	0.08	0.00	0.08				
23.00	0.08	0.00	0.08				
23.50	0.08	0.00	0.08				
24.00	0.08	0.00	0.08				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Summary for Link 6L: EX SA South

Inflow Area = 1.310 ac, 67.60% Impervious, Inflow Depth = 3.65" for 10-Year event
Inflow = 5.61 cfs @ 12.08 hrs, Volume= 0.398 af
Primary = 5.61 cfs @ 12.08 hrs, Volume= 0.398 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 6L: EX SA South



Hydrograph for Link 6L: EX SA South

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.01	0.00	0.01	27.00	0.00	0.00	0.00
1.50	0.02	0.00	0.02	27.50	0.00	0.00	0.00
2.00	0.02	0.00	0.02	28.00	0.00	0.00	0.00
2.50	0.03	0.00	0.03	28.50	0.00	0.00	0.00
3.00	0.04	0.00	0.04	29.00	0.00	0.00	0.00
3.50	0.04	0.00	0.04	29.50	0.00	0.00	0.00
4.00	0.05	0.00	0.05	30.00	0.00	0.00	0.00
4.50	0.05	0.00	0.05	30.50	0.00	0.00	0.00
5.00	0.06	0.00	0.06	31.00	0.00	0.00	0.00
5.50	0.06	0.00	0.06	31.50	0.00	0.00	0.00
6.00	0.06	0.00	0.06	32.00	0.00	0.00	0.00
6.50	0.07	0.00	0.07	32.50	0.00	0.00	0.00
7.00	0.08	0.00	0.08	33.00	0.00	0.00	0.00
7.50	0.09	0.00	0.09	33.50	0.00	0.00	0.00
8.00	0.10	0.00	0.10	34.00	0.00	0.00	0.00
8.50	0.11	0.00	0.11	34.50	0.00	0.00	0.00
9.00	0.12	0.00	0.12	35.00	0.00	0.00	0.00
9.50	0.15	0.00	0.15	35.50	0.00	0.00	0.00
10.00	0.19	0.00	0.19	36.00	0.00	0.00	0.00
10.50	0.22	0.00	0.22				
11.00	0.35	0.00	0.35				
11.50	0.60	0.00	0.60				
12.00	**3.40**	0.00	**3.40**				
12.50	**1.09**	0.00	**1.09**				
13.00	0.50	0.00	0.50				
13.50	0.31	0.00	0.31				
14.00	0.25	0.00	0.25				
14.50	0.21	0.00	0.21				
15.00	0.17	0.00	0.17				
15.50	0.15	0.00	0.15				
16.00	0.14	0.00	0.14				
16.50	0.13	0.00	0.13				
17.00	0.12	0.00	0.12				
17.50	0.10	0.00	0.10				
18.00	0.09	0.00	0.09				
18.50	0.09	0.00	0.09				
19.00	0.09	0.00	0.09				
19.50	0.08	0.00	0.08				
20.00	0.08	0.00	0.08				
20.50	0.08	0.00	0.08				
21.00	0.08	0.00	0.08				
21.50	0.07	0.00	0.07				
22.00	0.07	0.00	0.07				
22.50	0.07	0.00	0.07				
23.00	0.06	0.00	0.06				
23.50	0.06	0.00	0.06				
24.00	0.07	0.00	0.07				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Ex SA North Imp Runoff Area=48,361 sf 100.00% Impervious Runoff Depth=7.97"
Flow Length=200' Tc=2.1 min CN=98 Runoff=10.86 cfs 0.737 af

Subcatchment2S: Ex SA North Perv Runoff Area=24,838 sf 0.00% Impervious Runoff Depth=3.15"
Flow Length=135' Slope=0.0300 '/' Tc=12.1 min CN=57 Runoff=1.85 cfs 0.150 af

Subcatchment4S: Ex SA South Imp Runoff Area=38,562 sf 100.00% Impervious Runoff Depth=7.97"
Flow Length=140' Slope=0.0090 '/' Tc=1.9 min CN=98 Runoff=8.68 cfs 0.588 af

Subcatchment5S: Ex SA South Perv Runoff Area=18,480 sf 0.00% Impervious Runoff Depth=3.49"
Flow Length=70' Slope=0.0250 '/' Tc=9.6 min CN=60 Runoff=1.66 cfs 0.123 af

Link 3L: Ex SA North Inflow=11.90 cfs 0.887 af
Primary=11.90 cfs 0.887 af

Link 6L: EX SA South Inflow=9.77 cfs 0.711 af
Primary=9.77 cfs 0.711 af

Total Runoff Area = 2.990 ac Runoff Volume = 1.599 af Average Runoff Depth = 6.42"
33.26% Pervious = 0.994 ac 66.74% Impervious = 1.995 ac

Summary for Subcatchment 1S: Ex SA North Imp

[49] Hint: Tc<2dt may require smaller dt

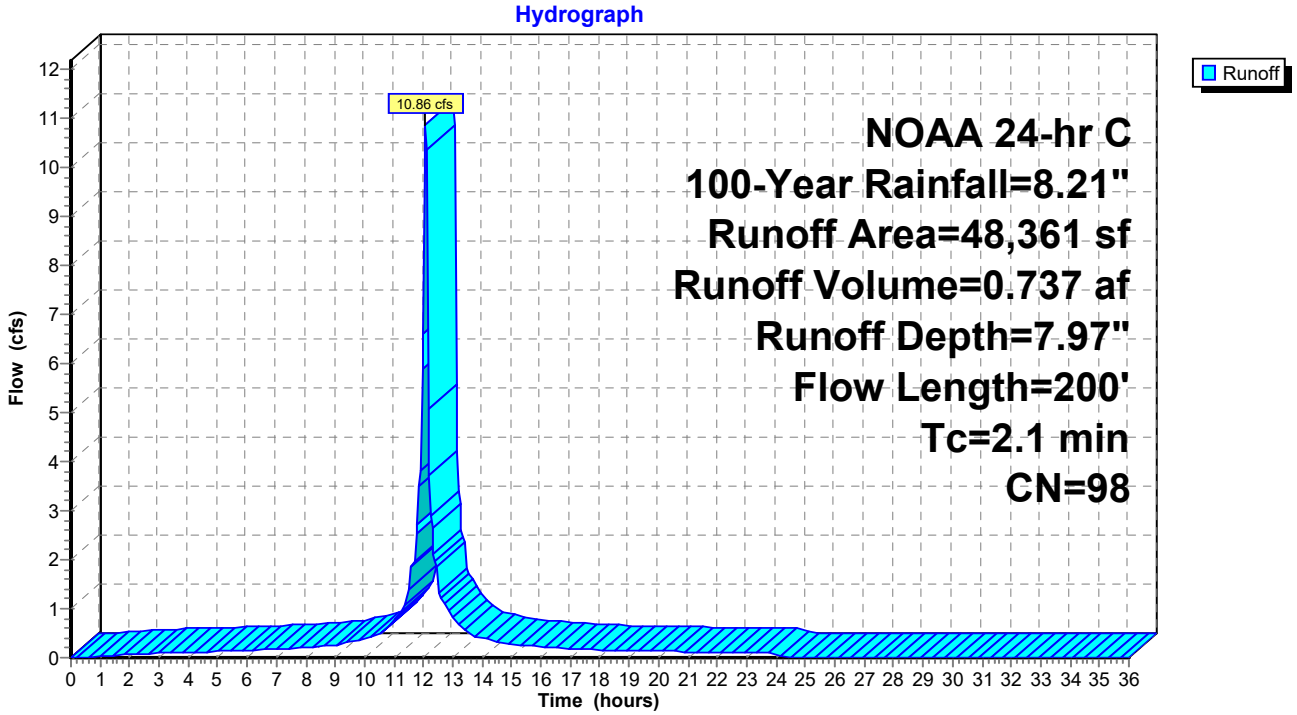
Runoff = 10.86 cfs @ 12.08 hrs, Volume= 0.737 af, Depth= 7.97"
Routed to Link 3L : Ex SA North

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year Rainfall=8.21"

Area (sf)	CN	Description
33,877	98	Paved parking, HSG B
14,484	98	Roofs, HSG B
48,361	98	Weighted Average
48,361		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0110	1.11		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.34"
0.6	100	0.0200	2.87		**Shallow Concentrated Flow, Shallow Concentrated Flow** Paved Kv= 20.3 fps
2.1	200	Total			

Subcatchment 1S: Ex SA North Imp



Hydrograph for Subcatchment 1S: Ex SA North Imp

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.09	0.01	0.03
1.50	0.14	0.03	0.06
2.00	0.19	0.06	0.07
2.50	0.24	0.10	0.09
3.00	0.29	0.14	0.10
3.50	0.34	0.18	0.11
4.00	0.40	0.23	0.11
4.50	0.46	0.28	0.12
5.00	0.52	0.34	0.13
5.50	0.59	0.40	0.13
6.00	0.65	0.46	0.14
6.50	0.72	0.52	0.16
7.00	0.80	0.60	0.18
7.50	0.89	0.68	0.20
8.00	0.98	0.78	0.21
8.50	1.09	0.88	0.23
9.00	1.20	0.98	0.25
9.50	1.33	1.12	0.32
10.00	1.50	1.28	0.39
10.50	1.69	1.47	0.46
11.00	1.97	1.74	0.73
11.50	2.43	2.20	1.22
12.00	3.91	3.68	**6.60**
12.50	5.78	5.55	**1.83**
13.00	6.24	6.00	0.82
13.50	6.52	6.28	0.51
14.00	6.71	6.47	0.41
14.50	6.88	6.64	0.34
15.00	7.01	6.77	0.27
15.50	7.12	6.88	0.24
16.00	7.23	6.99	0.22
16.50	7.32	7.08	0.21
17.00	7.41	7.17	0.19
17.50	7.49	7.25	0.17
18.00	7.56	7.32	0.15
18.50	7.62	7.39	0.14
19.00	7.69	7.45	0.14
19.50	7.75	7.51	0.13
20.00	7.81	7.57	0.13
20.50	7.87	7.63	0.13
21.00	7.92	7.68	0.12
21.50	7.97	7.73	0.12
22.00	8.02	7.78	0.11
22.50	8.07	7.83	0.11
23.00	8.12	7.88	0.10
23.50	8.17	7.93	0.10
24.00	**8.21**	**7.97**	0.11
24.50	8.21	7.97	0.00
25.00	8.21	7.97	0.00
25.50	8.21	7.97	0.00
26.00	8.21	7.97	0.00
26.50	8.21	7.97	0.00
27.00	8.21	7.97	0.00
27.50	8.21	7.97	0.00
28.00	8.21	7.97	0.00
28.50	8.21	7.97	0.00
29.00	8.21	7.97	0.00
29.50	8.21	7.97	0.00
30.00	8.21	7.97	0.00
30.50	8.21	7.97	0.00
31.00	8.21	7.97	0.00
31.50	8.21	7.97	0.00
32.00	8.21	7.97	0.00
32.50	8.21	7.97	0.00
33.00	8.21	7.97	0.00
33.50	8.21	7.97	0.00
34.00	8.21	7.97	0.00
34.50	8.21	7.97	0.00
35.00	8.21	7.97	0.00
35.50	8.21	7.97	0.00
36.00	8.21	7.97	0.00

Summary for Subcatchment 2S: Ex SA North Perv

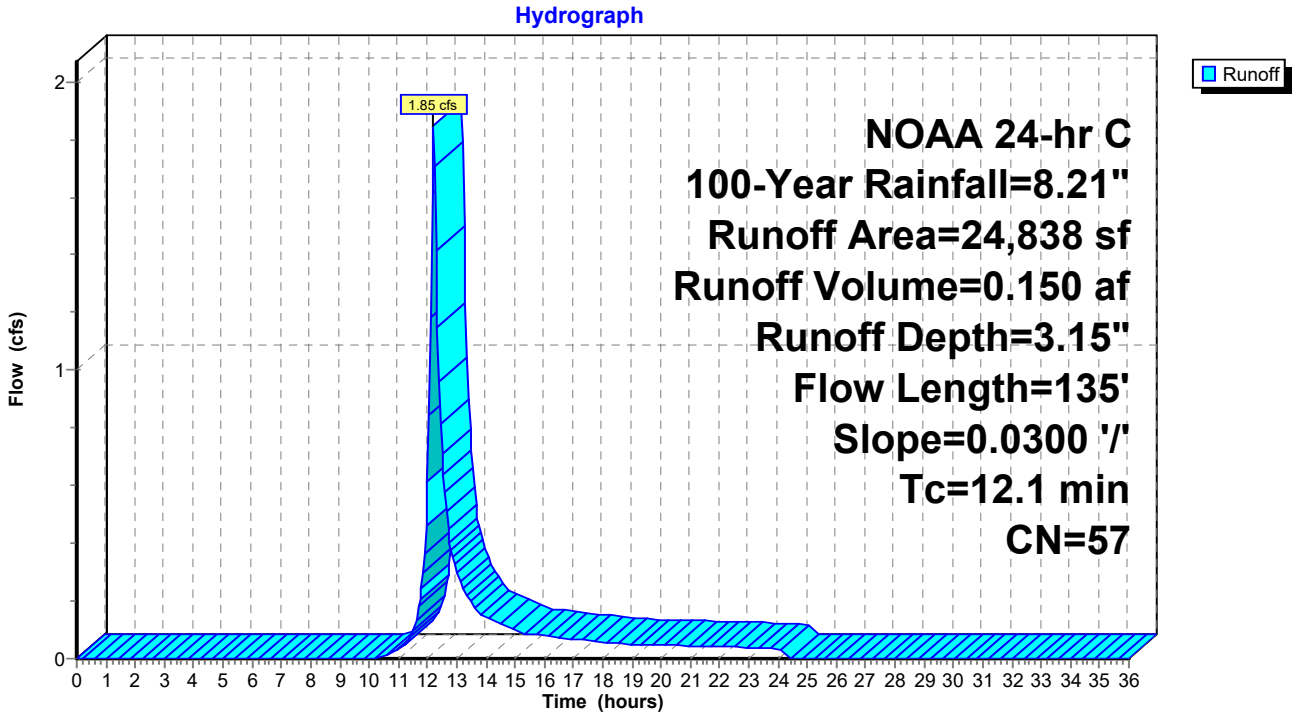
Runoff = 1.85 cfs @ 12.21 hrs, Volume= 0.150 af, Depth= 3.15"
Routed to Link 3L : Ex SA North

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year Rainfall=8.21"

Area (sf)	CN	Description
15,636	55	Woods, Good, HSG B
9,202	61	>75% Grass cover, Good, HSG B
24,838	57	Weighted Average
24,838		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.0300	0.14		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 3.34"
0.2	35	0.0300	2.79		**Shallow Concentrated Flow, Shallow Concentrated Flow** Unpaved Kv= 16.1 fps
12.1	135	Total			

Subcatchment 2S: Ex SA North Perv



Hydrograph for Subcatchment 2S: Ex SA North Perv

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.09	0.00	0.00
1.50	0.14	0.00	0.00
2.00	0.19	0.00	0.00
2.50	0.24	0.00	0.00
3.00	0.29	0.00	0.00
3.50	0.34	0.00	0.00
4.00	0.40	0.00	0.00
4.50	0.46	0.00	0.00
5.00	0.52	0.00	0.00
5.50	0.59	0.00	0.00
6.00	0.65	0.00	0.00
6.50	0.72	0.00	0.00
7.00	0.80	0.00	0.00
7.50	0.89	0.00	0.00
8.00	0.98	0.00	0.00
8.50	1.09	0.00	0.00
9.00	1.20	0.00	0.00
9.50	1.33	0.00	0.00
10.00	1.50	0.00	0.00
10.50	1.69	0.00	0.01
11.00	1.97	0.03	0.03
11.50	2.43	0.10	0.09
12.00	3.91	0.58	**0.61**
12.50	5.78	1.55	**0.71**
13.00	6.24	1.82	0.30
13.50	6.52	2.00	0.19
14.00	6.71	2.12	0.14
14.50	6.88	2.23	0.12
15.00	7.01	2.32	0.10
15.50	7.12	2.40	0.09
16.00	7.23	2.47	0.08
16.50	7.32	2.53	0.07
17.00	7.41	2.59	0.07
17.50	7.49	2.64	0.06
18.00	7.56	2.69	0.06
18.50	7.62	2.74	0.05
19.00	7.69	2.78	0.05
19.50	7.75	2.83	0.05
20.00	7.81	2.87	0.05
20.50	7.87	2.91	0.05
21.00	7.92	2.95	0.04
21.50	7.97	2.98	0.04
22.00	8.02	3.02	0.04
22.50	8.07	3.05	0.04
23.00	8.12	3.09	0.04
23.50	8.17	3.12	0.04
24.00	**8.21**	**3.15**	0.04
24.50	8.21	3.15	0.00
25.00	8.21	3.15	0.00
25.50	8.21	3.15	0.00
26.00	8.21	3.15	0.00
26.50	8.21	3.15	0.00
27.00	8.21	3.15	0.00
27.50	8.21	3.15	0.00
28.00	8.21	3.15	0.00
28.50	8.21	3.15	0.00
29.00	8.21	3.15	0.00
29.50	8.21	3.15	0.00
30.00	8.21	3.15	0.00
30.50	8.21	3.15	0.00
31.00	8.21	3.15	0.00
31.50	8.21	3.15	0.00
32.00	8.21	3.15	0.00
32.50	8.21	3.15	0.00
33.00	8.21	3.15	0.00
33.50	8.21	3.15	0.00
34.00	8.21	3.15	0.00
34.50	8.21	3.15	0.00
35.00	8.21	3.15	0.00
35.50	8.21	3.15	0.00
36.00	8.21	3.15	0.00

Summary for Subcatchment 4S: Ex SA South Imp

[49] Hint: Tc<2dt may require smaller dt

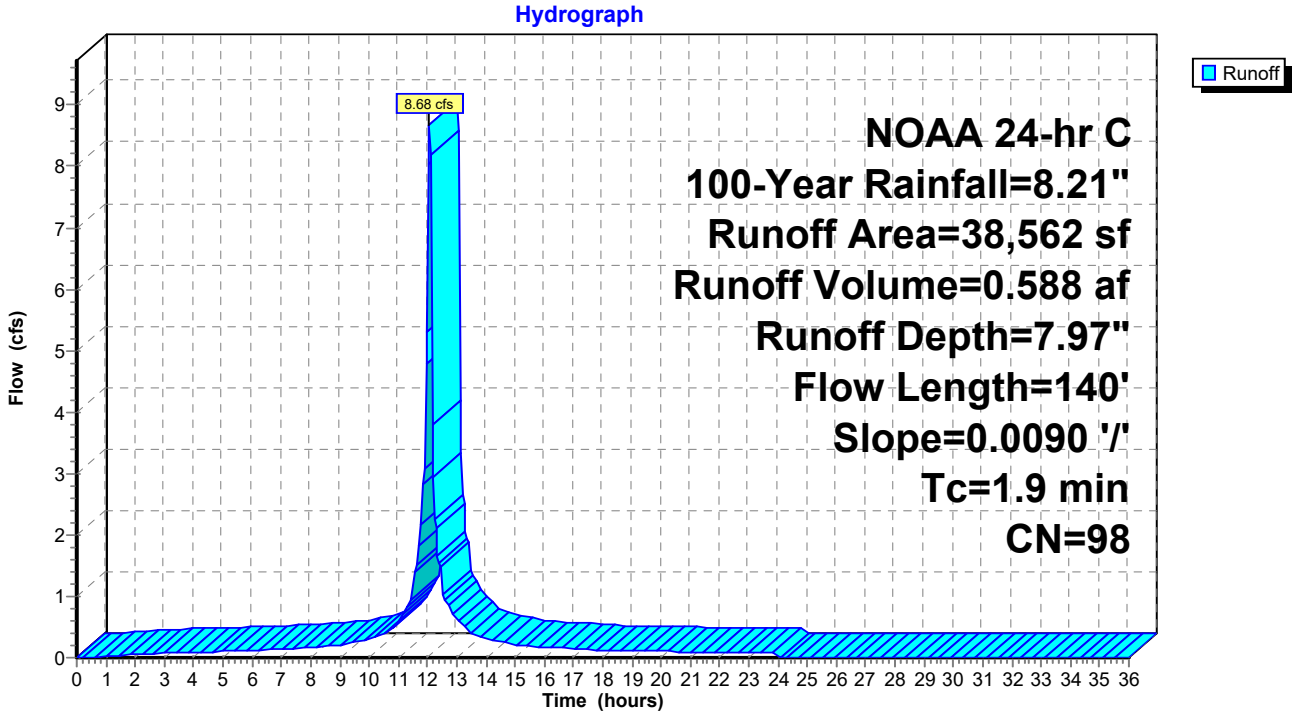
Runoff = 8.68 cfs @ 12.08 hrs, Volume= 0.588 af, Depth= 7.97"
Routed to Link 6L : EX SA South

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year Rainfall=8.21"

Area (sf)	CN	Description
32,900	98	Paved parking, HSG B
5,662	98	Roofs, HSG B
38,562	98	Weighted Average
38,562		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0090	1.02		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.34"
0.3	40	0.0090	1.93		**Shallow Concentrated Flow, Shallow Concentrated Flow** Paved Kv= 20.3 fps
1.9	140	Total			

Subcatchment 4S: Ex SA South Imp



Hydrograph for Subcatchment 4S: Ex SA South Imp

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.09	0.01	0.03
1.50	0.14	0.03	0.05
2.00	0.19	0.06	0.06
2.50	0.24	0.10	0.07
3.00	0.29	0.14	0.08
3.50	0.34	0.18	0.08
4.00	0.40	0.23	0.09
4.50	0.46	0.28	0.10
5.00	0.52	0.34	0.10
5.50	0.59	0.40	0.11
6.00	0.65	0.46	0.11
6.50	0.72	0.52	0.13
7.00	0.80	0.60	0.14
7.50	0.89	0.68	0.16
8.00	0.98	0.78	0.17
8.50	1.09	0.88	0.19
9.00	1.20	0.98	0.20
9.50	1.33	1.12	0.26
10.00	1.50	1.28	0.31
10.50	1.69	1.47	0.37
11.00	1.97	1.74	0.58
11.50	2.43	2.20	0.98
12.00	3.91	3.68	**5.31**
12.50	5.78	5.55	**1.45**
13.00	6.24	6.00	0.65
13.50	6.52	6.28	0.41
14.00	6.71	6.47	0.33
14.50	6.88	6.64	0.27
15.00	7.01	6.77	0.22
15.50	7.12	6.88	0.19
16.00	7.23	6.99	0.18
16.50	7.32	7.08	0.16
17.00	7.41	7.17	0.15
17.50	7.49	7.25	0.14
18.00	7.56	7.32	0.12
18.50	7.62	7.39	0.11
19.00	7.69	7.45	0.11
19.50	7.75	7.51	0.11
20.00	7.81	7.57	0.10
20.50	7.87	7.63	0.10
21.00	7.92	7.68	0.10
21.50	7.97	7.73	0.09
22.00	8.02	7.78	0.09
22.50	8.07	7.83	0.09
23.00	8.12	7.88	0.08
23.50	8.17	7.93	0.08
24.00	**8.21**	**7.97**	0.09
24.50	8.21	7.97	0.00
25.00	8.21	7.97	0.00
25.50	8.21	7.97	0.00
26.00	8.21	7.97	0.00
26.50	8.21	7.97	0.00
27.00	8.21	7.97	0.00
27.50	8.21	7.97	0.00
28.00	8.21	7.97	0.00
28.50	8.21	7.97	0.00
29.00	8.21	7.97	0.00
29.50	8.21	7.97	0.00
30.00	8.21	7.97	0.00
30.50	8.21	7.97	0.00
31.00	8.21	7.97	0.00
31.50	8.21	7.97	0.00
32.00	8.21	7.97	0.00
32.50	8.21	7.97	0.00
33.00	8.21	7.97	0.00
33.50	8.21	7.97	0.00
34.00	8.21	7.97	0.00
34.50	8.21	7.97	0.00
35.00	8.21	7.97	0.00
35.50	8.21	7.97	0.00
36.00	8.21	7.97	0.00

Summary for Subcatchment 5S: Ex SA South Perv

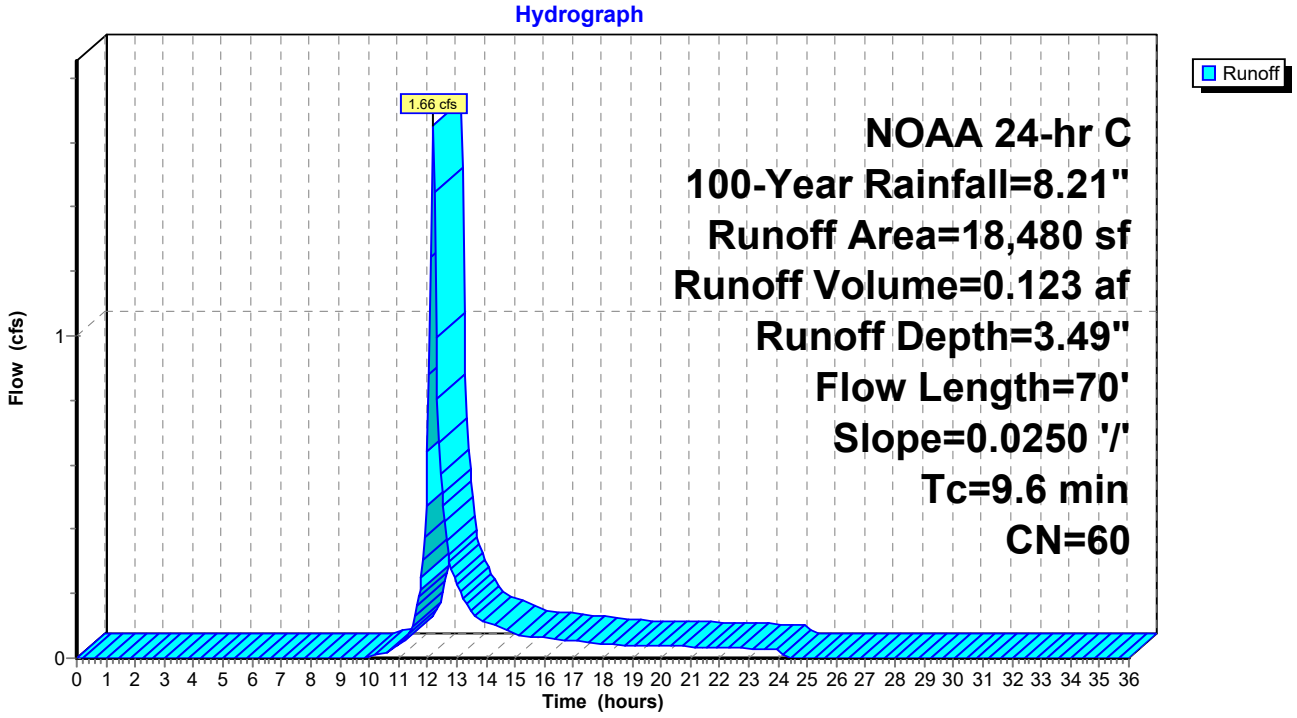
Runoff = 1.66 cfs @ 12.17 hrs, Volume= 0.123 af, Depth= 3.49"
Routed to Link 6L : EX SA South

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year Rainfall=8.21"

Area (sf)	CN	Description
2,059	55	Woods, Good, HSG B
16,421	61	>75% Grass cover, Good, HSG B
18,480	60	Weighted Average
18,480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	70	0.0250	0.12		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 3.34"

Subcatchment 5S: Ex SA South Perv



Hydrograph for Subcatchment 5S: Ex SA South Perv

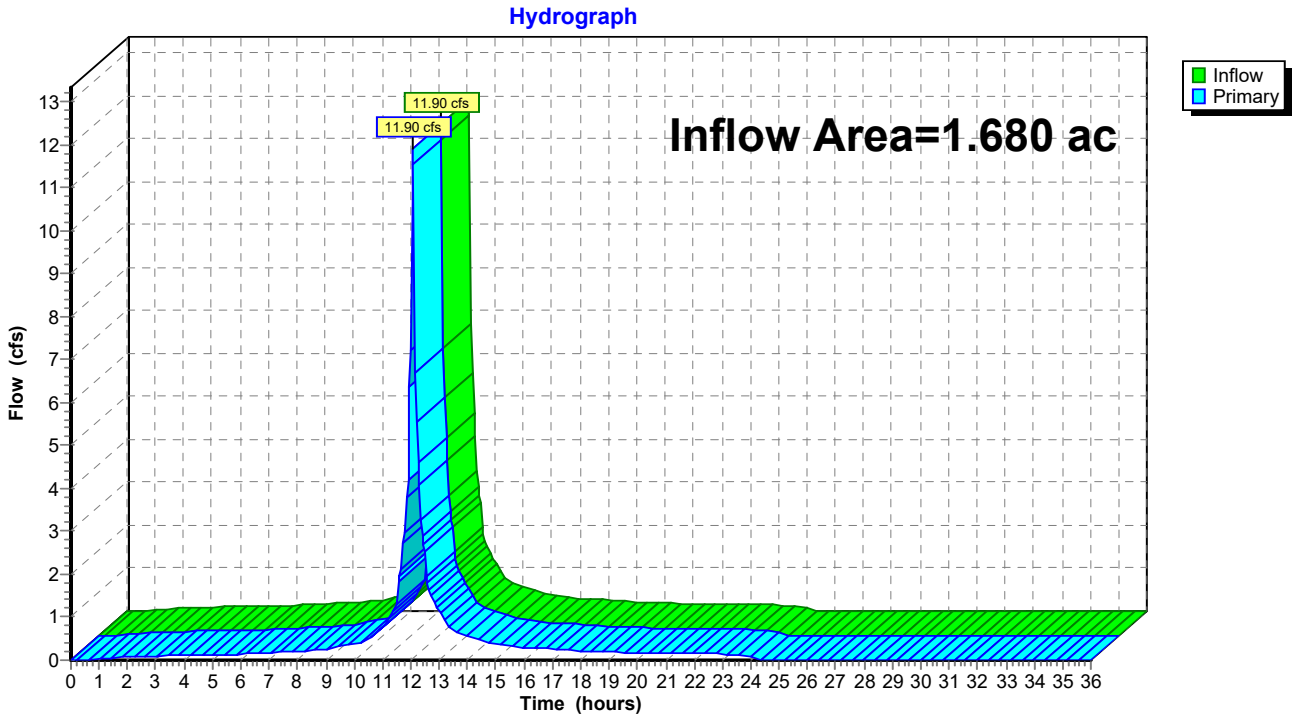
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.09	0.00	0.00
1.50	0.14	0.00	0.00
2.00	0.19	0.00	0.00
2.50	0.24	0.00	0.00
3.00	0.29	0.00	0.00
3.50	0.34	0.00	0.00
4.00	0.40	0.00	0.00
4.50	0.46	0.00	0.00
5.00	0.52	0.00	0.00
5.50	0.59	0.00	0.00
6.00	0.65	0.00	0.00
6.50	0.72	0.00	0.00
7.00	0.80	0.00	0.00
7.50	0.89	0.00	0.00
8.00	0.98	0.00	0.00
8.50	1.09	0.00	0.00
9.00	1.20	0.00	0.00
9.50	1.33	0.00	0.00
10.00	1.50	0.00	0.00
10.50	1.69	0.02	0.01
11.00	1.97	0.06	0.04
11.50	2.43	0.15	0.10
12.00	3.91	0.72	**0.64**
12.50	5.78	1.78	**0.51**
13.00	6.24	2.08	0.23
13.50	6.52	2.27	0.15
14.00	6.71	2.40	0.11
14.50	6.88	2.52	0.09
15.00	7.01	2.61	0.08
15.50	7.12	2.69	0.07
16.00	7.23	2.77	0.06
16.50	7.32	2.83	0.06
17.00	7.41	2.90	0.05
17.50	7.49	2.95	0.05
18.00	7.56	3.01	0.04
18.50	7.62	3.05	0.04
19.00	7.69	3.10	0.04
19.50	7.75	3.15	0.04
20.00	7.81	3.19	0.04
20.50	7.87	3.23	0.04
21.00	7.92	3.27	0.03
21.50	7.97	3.31	0.03
22.00	8.02	3.35	0.03
22.50	8.07	3.39	0.03
23.00	8.12	3.42	0.03
23.50	8.17	3.46	0.03
24.00	**8.21**	**3.49**	0.03
24.50	8.21	3.49	0.00
25.00	8.21	3.49	0.00
25.50	8.21	3.49	0.00
26.00	8.21	3.49	0.00
26.50	8.21	3.49	0.00
27.00	8.21	3.49	0.00
27.50	8.21	3.49	0.00
28.00	8.21	3.49	0.00
28.50	8.21	3.49	0.00
29.00	8.21	3.49	0.00
29.50	8.21	3.49	0.00
30.00	8.21	3.49	0.00
30.50	8.21	3.49	0.00
31.00	8.21	3.49	0.00
31.50	8.21	3.49	0.00
32.00	8.21	3.49	0.00
32.50	8.21	3.49	0.00
33.00	8.21	3.49	0.00
33.50	8.21	3.49	0.00
34.00	8.21	3.49	0.00
34.50	8.21	3.49	0.00
35.00	8.21	3.49	0.00
35.50	8.21	3.49	0.00
36.00	8.21	3.49	0.00

Summary for Link 3L: Ex SA North

Inflow Area = 1.680 ac, 66.07% Impervious, Inflow Depth = 6.34" for 100-Year event
Inflow = 11.90 cfs @ 12.08 hrs, Volume= 0.887 af
Primary = 11.90 cfs @ 12.08 hrs, Volume= 0.887 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 3L: Ex SA North



Hydrograph for Link 3L: Ex SA North

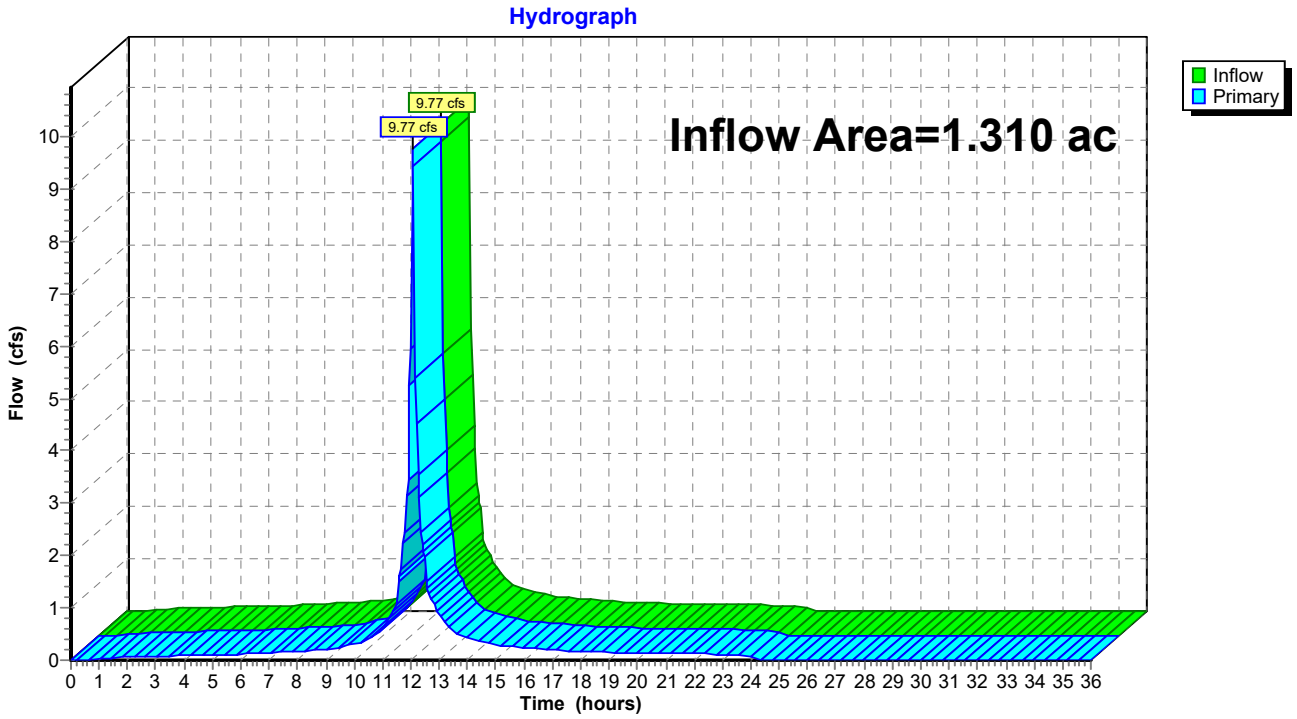
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.03	0.00	0.03	27.00	0.00	0.00	0.00
1.50	0.06	0.00	0.06	27.50	0.00	0.00	0.00
2.00	0.07	0.00	0.07	28.00	0.00	0.00	0.00
2.50	0.09	0.00	0.09	28.50	0.00	0.00	0.00
3.00	0.10	0.00	0.10	29.00	0.00	0.00	0.00
3.50	0.11	0.00	0.11	29.50	0.00	0.00	0.00
4.00	0.11	0.00	0.11	30.00	0.00	0.00	0.00
4.50	0.12	0.00	0.12	30.50	0.00	0.00	0.00
5.00	0.13	0.00	0.13	31.00	0.00	0.00	0.00
5.50	0.13	0.00	0.13	31.50	0.00	0.00	0.00
6.00	0.14	0.00	0.14	32.00	0.00	0.00	0.00
6.50	0.16	0.00	0.16	32.50	0.00	0.00	0.00
7.00	0.18	0.00	0.18	33.00	0.00	0.00	0.00
7.50	0.20	0.00	0.20	33.50	0.00	0.00	0.00
8.00	0.21	0.00	0.21	34.00	0.00	0.00	0.00
8.50	0.23	0.00	0.23	34.50	0.00	0.00	0.00
9.00	0.25	0.00	0.25	35.00	0.00	0.00	0.00
9.50	0.32	0.00	0.32	35.50	0.00	0.00	0.00
10.00	0.39	0.00	0.39	36.00	0.00	0.00	0.00
10.50	0.47	0.00	0.47				
11.00	0.76	0.00	0.76				
11.50	1.32	0.00	1.32				
12.00	**7.21**	0.00	**7.21**				
12.50	**2.54**	0.00	**2.54**				
13.00	1.13	0.00	1.13				
13.50	0.71	0.00	0.71				
14.00	0.55	0.00	0.55				
14.50	0.46	0.00	0.46				
15.00	0.37	0.00	0.37				
15.50	0.33	0.00	0.33				
16.00	0.30	0.00	0.30				
16.50	0.28	0.00	0.28				
17.00	0.26	0.00	0.26				
17.50	0.23	0.00	0.23				
18.00	0.21	0.00	0.21				
18.50	0.20	0.00	0.20				
19.00	0.19	0.00	0.19				
19.50	0.18	0.00	0.18				
20.00	0.18	0.00	0.18				
20.50	0.17	0.00	0.17				
21.00	0.17	0.00	0.17				
21.50	0.16	0.00	0.16				
22.00	0.15	0.00	0.15				
22.50	0.15	0.00	0.15				
23.00	0.14	0.00	0.14				
23.50	0.14	0.00	0.14				
24.00	0.15	0.00	0.15				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Summary for Link 6L: EX SA South

Inflow Area = 1.310 ac, 67.60% Impervious, Inflow Depth = 6.52" for 100-Year event
Inflow = 9.77 cfs @ 12.08 hrs, Volume= 0.711 af
Primary = 9.77 cfs @ 12.08 hrs, Volume= 0.711 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 6L: EX SA South



Hydrograph for Link 6L: EX SA South

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.03	0.00	0.03	27.00	0.00	0.00	0.00
1.50	0.05	0.00	0.05	27.50	0.00	0.00	0.00
2.00	0.06	0.00	0.06	28.00	0.00	0.00	0.00
2.50	0.07	0.00	0.07	28.50	0.00	0.00	0.00
3.00	0.08	0.00	0.08	29.00	0.00	0.00	0.00
3.50	0.08	0.00	0.08	29.50	0.00	0.00	0.00
4.00	0.09	0.00	0.09	30.00	0.00	0.00	0.00
4.50	0.10	0.00	0.10	30.50	0.00	0.00	0.00
5.00	0.10	0.00	0.10	31.00	0.00	0.00	0.00
5.50	0.11	0.00	0.11	31.50	0.00	0.00	0.00
6.00	0.11	0.00	0.11	32.00	0.00	0.00	0.00
6.50	0.13	0.00	0.13	32.50	0.00	0.00	0.00
7.00	0.14	0.00	0.14	33.00	0.00	0.00	0.00
7.50	0.16	0.00	0.16	33.50	0.00	0.00	0.00
8.00	0.17	0.00	0.17	34.00	0.00	0.00	0.00
8.50	0.19	0.00	0.19	34.50	0.00	0.00	0.00
9.00	0.20	0.00	0.20	35.00	0.00	0.00	0.00
9.50	0.26	0.00	0.26	35.50	0.00	0.00	0.00
10.00	0.32	0.00	0.32	36.00	0.00	0.00	0.00
10.50	0.38	0.00	0.38				
11.00	0.62	0.00	0.62				
11.50	1.08	0.00	1.08				
12.00	**5.95**	0.00	**5.95**				
12.50	**1.96**	0.00	**1.96**				
13.00	0.89	0.00	0.89				
13.50	0.56	0.00	0.56				
14.00	0.44	0.00	0.44				
14.50	0.37	0.00	0.37				
15.00	0.29	0.00	0.29				
15.50	0.26	0.00	0.26				
16.00	0.24	0.00	0.24				
16.50	0.22	0.00	0.22				
17.00	0.20	0.00	0.20				
17.50	0.18	0.00	0.18				
18.00	0.16	0.00	0.16				
18.50	0.16	0.00	0.16				
19.00	0.15	0.00	0.15				
19.50	0.15	0.00	0.15				
20.00	0.14	0.00	0.14				
20.50	0.14	0.00	0.14				
21.00	0.13	0.00	0.13				
21.50	0.13	0.00	0.13				
22.00	0.12	0.00	0.12				
22.50	0.12	0.00	0.12				
23.00	0.11	0.00	0.11				
23.50	0.11	0.00	0.11				
24.00	0.12	0.00	0.12				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

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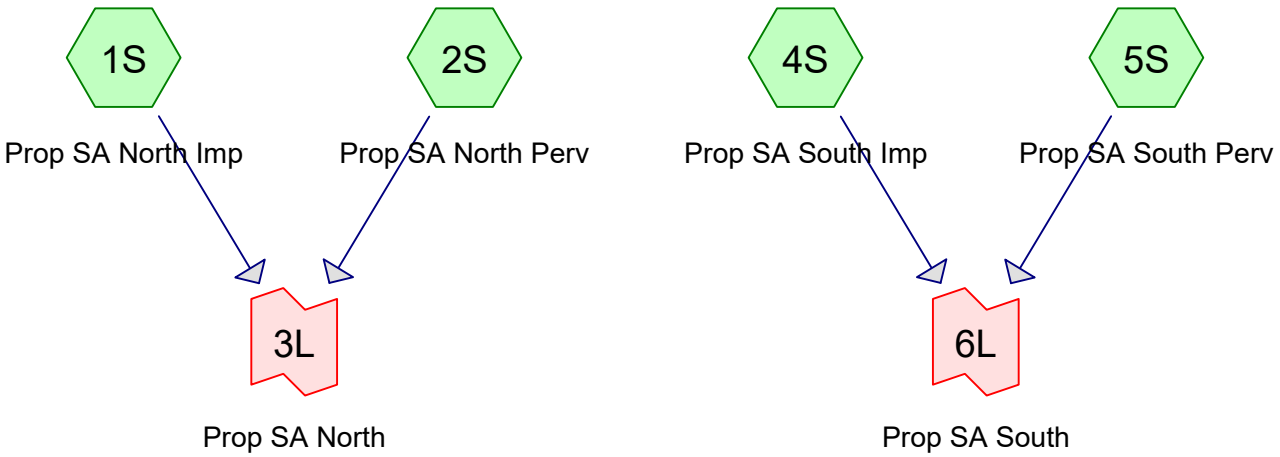
HydroCAD SUMMARY REPORTS – PROPOSED CONDITIONS 2 YR 10 YR & 100 YR



Subcat Reach Pond Link

Routing Diagram for Prop 2 yr, 10 yr, 100 yr
Prepared by Dynamic Engineering, Printed 6/14/2023

Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 6617 NJ Somerset-C

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	NOAA 24-hr	C	Default	24.00	1	3.34	2
2	10-Year	NOAA 24-hr	C	Default	24.00	1	5.01	2
3	100-Year	NOAA 24-hr	C	Default	24.00	1	8.21	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.041	61	>75% Grass cover, Good, HSG B (2S, 5S)
0.560	98	Paved parking, HSG B (1S, 4S)
1.211	98	Roofs, HSG B (1S, 4S)
0.179	55	Woods, Good, HSG B (2S, 5S)
2.990	**83**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2.990	HSG B	1S, 2S, 4S, 5S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
2.990		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	1.041	0.000	0.000	0.000	1.041	>75% Grass cover, Good	2S, 5S
0.000	0.560	0.000	0.000	0.000	0.560	Paved parking	1S, 4S
0.000	1.211	0.000	0.000	0.000	1.211	Roofs	1S, 4S
0.000	0.179	0.000	0.000	0.000	0.179	Woods, Good	2S, 5S
0.000	**2.990**	**0.000**	**0.000**	**0.000**	**2.990**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	1S	0.00	0.00	90.0	0.0200	0.010	0.0	15.0	0.0	
2	4S	0.00	0.00	135.0	0.0050	0.010	0.0	12.0	0.0	

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Prop SA North Imp Runoff Area=43,300 sf 100.00% Impervious Runoff Depth=3.11"
Flow Length=160' Tc=1.4 min CN=98 Runoff=3.87 cfs 0.257 af

Subcatchment2S: Prop SA North Perv Runoff Area=29,815 sf 0.00% Impervious Runoff Depth=0.46"
Flow Length=159' Slope=0.0170 '/' Tc=9.9 min CN=60 Runoff=0.24 cfs 0.026 af

Subcatchment4S: Prop SA South Imp Runoff Area=33,852 sf 100.00% Impervious Runoff Depth=3.11"
Flow Length=225' Tc=1.9 min CN=98 Runoff=3.07 cfs 0.201 af

Subcatchment5S: Prop SA South Perv Runoff Area=23,298 sf 0.00% Impervious Runoff Depth=0.50"
Flow Length=70' Slope=0.0180 '/' Tc=9.3 min CN=61 Runoff=0.22 cfs 0.022 af

Link 3L: Prop SA North Inflow=3.93 cfs 0.284 af
Primary=3.93 cfs 0.284 af

Link 6L: Prop SA South Inflow=3.16 cfs 0.224 af
Primary=3.16 cfs 0.224 af

Total Runoff Area = 2.990 ac Runoff Volume = 0.507 af Average Runoff Depth = 2.04"
40.77% Pervious = 1.219 ac 59.23% Impervious = 1.771 ac

Summary for Subcatchment 1S: Prop SA North Imp

Sheet Flow = 100 * SqRoot(s)/N = 100 * SqRoot(0.01)/0.011 = 909' (Use 70')

[49] Hint: Tc<2dt may require smaller dt

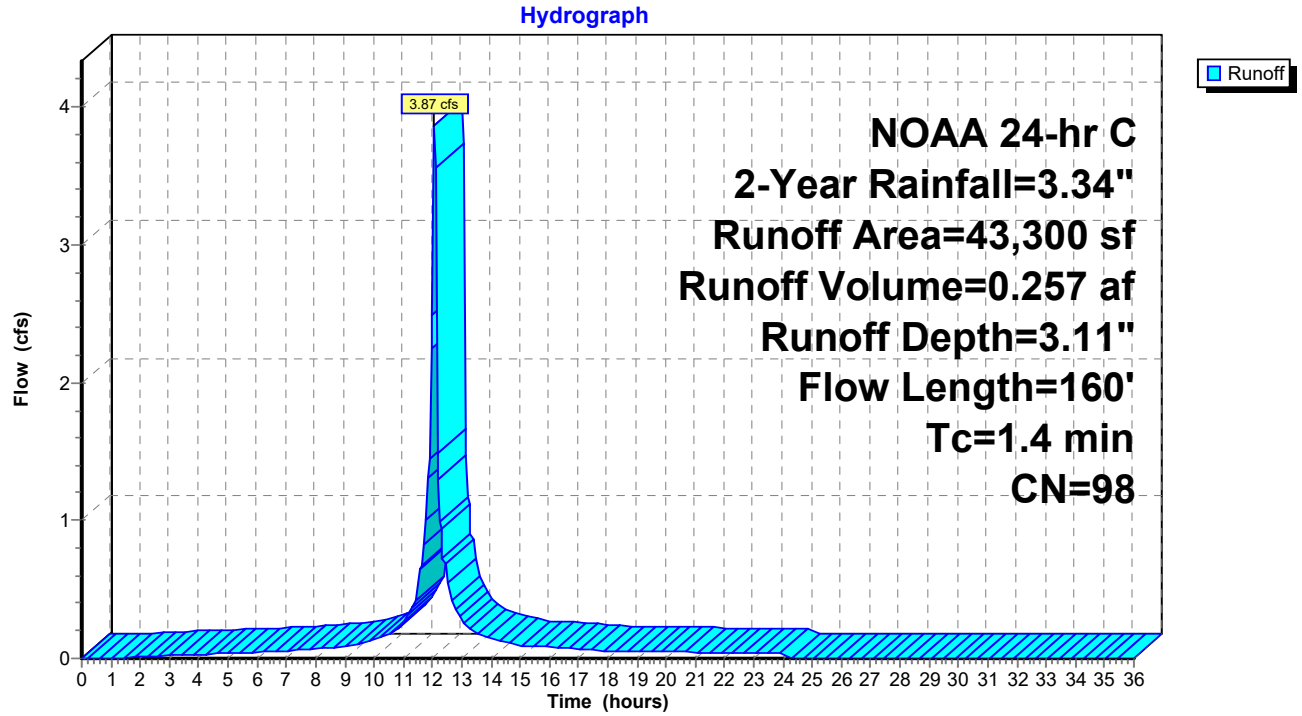
Runoff = 3.87 cfs @ 12.07 hrs, Volume= 0.257 af, Depth= 3.11"
Routed to Link 3L : Prop SA North

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year Rainfall=3.34"

Area (sf)	CN	Description
12,060	98	Paved parking, HSG B
31,240	98	Roofs, HSG B
43,300	98	Weighted Average
43,300		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	70	0.0100	0.99		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.34"
0.2	90	0.0200	9.68	11.88	**Pipe Channel, Channel Flow** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
1.4	160	Total			

Subcatchment 1S: Prop SA North Imp



Hydrograph for Subcatchment 1S: Prop SA North Imp

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.01	0.01
2.50	0.10	0.01	0.02
3.00	0.12	0.02	0.02
3.50	0.14	0.03	0.02
4.00	0.16	0.05	0.03
4.50	0.19	0.06	0.03
5.00	0.21	0.08	0.04
5.50	0.24	0.10	0.04
6.00	0.26	0.12	0.04
6.50	0.29	0.14	0.05
7.00	0.33	0.17	0.06
7.50	0.36	0.20	0.06
8.00	0.40	0.23	0.07
8.50	0.44	0.27	0.08
9.00	0.49	0.31	0.09
9.50	0.54	0.36	0.11
10.00	0.61	0.42	0.13
10.50	0.69	0.49	0.16
11.00	0.80	0.60	0.26
11.50	0.99	0.78	0.45
12.00	1.59	1.37	**2.49**
12.50	2.35	2.12	**0.64**
13.00	2.54	2.31	0.30
13.50	2.65	2.42	0.19
14.00	2.73	2.50	0.15
14.50	2.80	2.57	0.12
15.00	2.85	2.62	0.10
15.50	2.90	2.67	0.09
16.00	2.94	2.71	0.08
16.50	2.98	2.75	0.07
17.00	3.01	2.78	0.07
17.50	3.05	2.81	0.06
18.00	3.08	2.84	0.05
18.50	3.10	2.87	0.05
19.00	3.13	2.90	0.05
19.50	3.15	2.92	0.05
20.00	3.18	2.94	0.05
20.50	3.20	2.97	0.05
21.00	3.22	2.99	0.04
21.50	3.24	3.01	0.04
22.00	3.26	3.03	0.04
22.50	3.28	3.05	0.04
23.00	3.30	3.07	0.04
23.50	3.32	3.09	0.04
24.00	**3.34**	**3.11**	0.04
24.50	3.34	3.11	0.00
25.00	3.34	3.11	0.00
25.50	3.34	3.11	0.00
26.00	3.34	3.11	0.00
26.50	3.34	3.11	0.00
27.00	3.34	3.11	0.00
27.50	3.34	3.11	0.00
28.00	3.34	3.11	0.00
28.50	3.34	3.11	0.00
29.00	3.34	3.11	0.00
29.50	3.34	3.11	0.00
30.00	3.34	3.11	0.00
30.50	3.34	3.11	0.00
31.00	3.34	3.11	0.00
31.50	3.34	3.11	0.00
32.00	3.34	3.11	0.00
32.50	3.34	3.11	0.00
33.00	3.34	3.11	0.00
33.50	3.34	3.11	0.00
34.00	3.34	3.11	0.00
34.50	3.34	3.11	0.00
35.00	3.34	3.11	0.00
35.50	3.34	3.11	0.00
36.00	3.34	3.11	0.00

Summary for Subcatchment 2S: Prop SA North Perv

Sheet Flow = 100 * SqRoot(s)/N = 100 * SqRoot(0.017)/0.24 = 54' (Use 54')

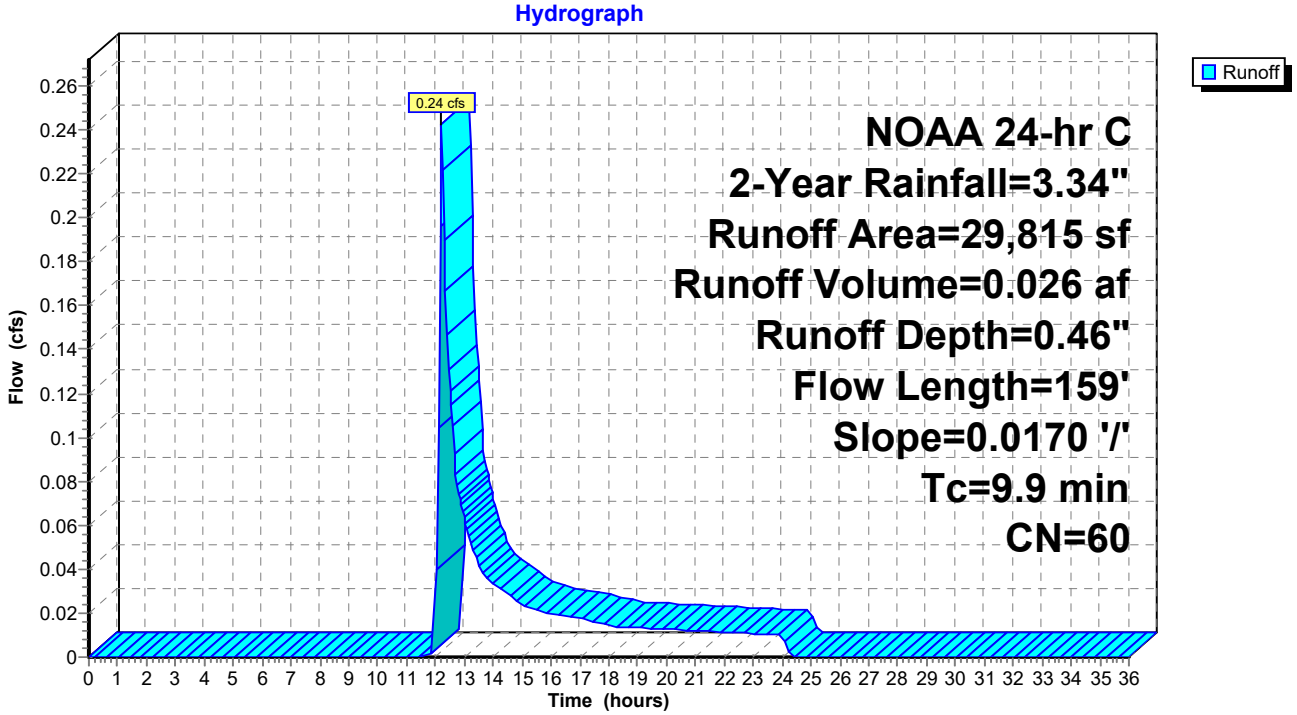
Runoff = 0.24 cfs @ 12.21 hrs, Volume= 0.026 af, Depth= 0.46"
Routed to Link 3L : Prop SA North

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year Rainfall=3.34"

Area (sf)	CN	Description
6,265	55	Woods, Good, HSG B
23,550	61	>75% Grass cover, Good, HSG B
29,815	60	Weighted Average
29,815		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	54	0.0170	0.10		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 3.34"
0.8	105	0.0170	2.10		**Shallow Concentrated Flow, Shallow Concentrated Flow** Unpaved Kv= 16.1 fps
9.9	159	Total			

Subcatchment 2S: Prop SA North Perv



Hydrograph for Subcatchment 2S: Prop SA North Perv

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.10	0.00	0.00
3.00	0.12	0.00	0.00
3.50	0.14	0.00	0.00
4.00	0.16	0.00	0.00
4.50	0.19	0.00	0.00
5.00	0.21	0.00	0.00
5.50	0.24	0.00	0.00
6.00	0.26	0.00	0.00
6.50	0.29	0.00	0.00
7.00	0.33	0.00	0.00
7.50	0.36	0.00	0.00
8.00	0.40	0.00	0.00
8.50	0.44	0.00	0.00
9.00	0.49	0.00	0.00
9.50	0.54	0.00	0.00
10.00	0.61	0.00	0.00
10.50	0.69	0.00	0.00
11.00	0.80	0.00	0.00
11.50	0.99	0.00	0.00
12.00	1.59	0.01	**0.01**
12.50	2.35	0.14	**0.12**
13.00	2.54	0.18	0.06
13.50	2.65	0.22	0.04
14.00	2.73	0.24	0.03
14.50	2.80	0.26	0.03
15.00	2.85	0.28	0.02
15.50	2.90	0.30	0.02
16.00	2.94	0.31	0.02
16.50	2.98	0.33	0.02
17.00	3.01	0.34	0.02
17.50	3.05	0.35	0.02
18.00	3.08	0.36	0.01
18.50	3.10	0.37	0.01
19.00	3.13	0.38	0.01
19.50	3.15	0.39	0.01
20.00	3.18	0.40	0.01
20.50	3.20	0.41	0.01
21.00	3.22	0.42	0.01
21.50	3.24	0.43	0.01
22.00	3.26	0.43	0.01
22.50	3.28	0.44	0.01
23.00	3.30	0.45	0.01
23.50	3.32	0.46	0.01
24.00	**3.34**	**0.46**	0.01
24.50	3.34	0.46	0.00
25.00	3.34	0.46	0.00
25.50	3.34	0.46	0.00
26.00	3.34	0.46	0.00
26.50	3.34	0.46	0.00
27.00	3.34	0.46	0.00
27.50	3.34	0.46	0.00
28.00	3.34	0.46	0.00
28.50	3.34	0.46	0.00
29.00	3.34	0.46	0.00
29.50	3.34	0.46	0.00
30.00	3.34	0.46	0.00
30.50	3.34	0.46	0.00
31.00	3.34	0.46	0.00
31.50	3.34	0.46	0.00
32.00	3.34	0.46	0.00
32.50	3.34	0.46	0.00
33.00	3.34	0.46	0.00
33.50	3.34	0.46	0.00
34.00	3.34	0.46	0.00
34.50	3.34	0.46	0.00
35.00	3.34	0.46	0.00
35.50	3.34	0.46	0.00
36.00	3.34	0.46	0.00

Summary for Subcatchment 4S: Prop SA South Imp

Sheet Flow = 100 * SqRoot(s)/N = 100 * SqRoot(0.0125)/0.011 = 1016' (Use 100')

[49] Hint: Tc<2dt may require smaller dt

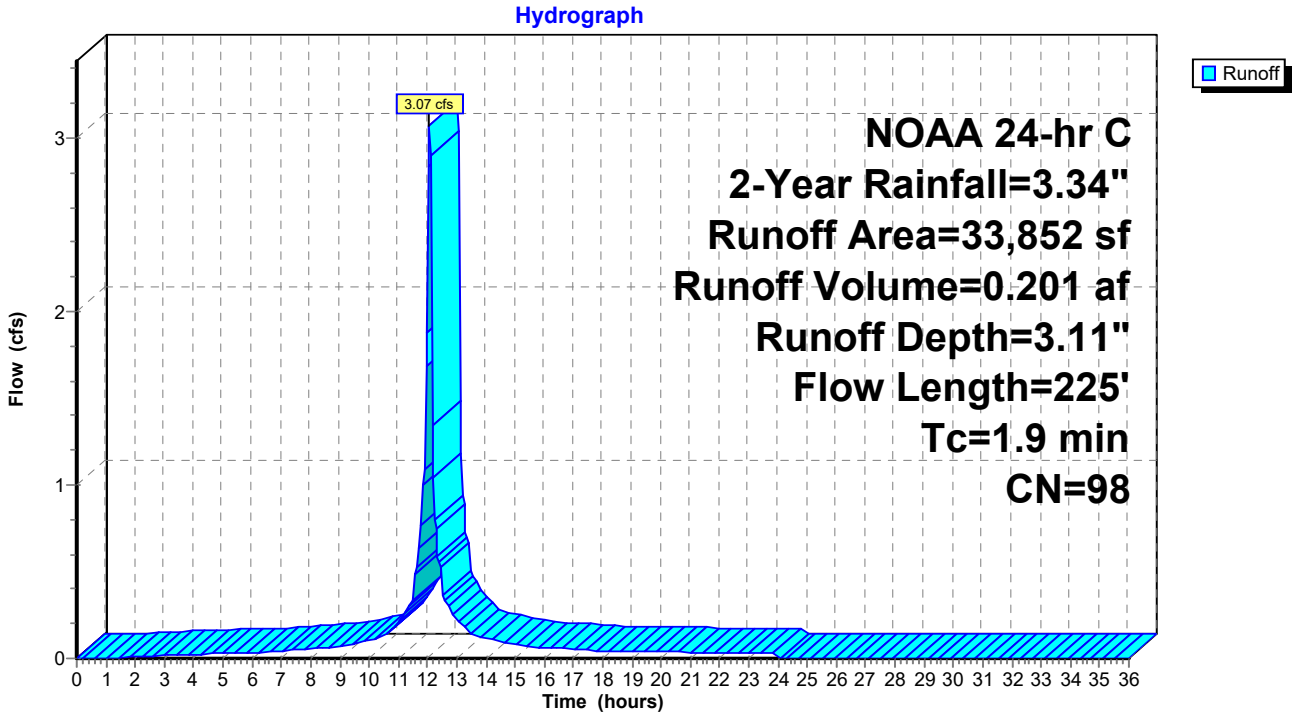
Runoff = 3.07 cfs @ 12.08 hrs, Volume= 0.201 af, Depth= 3.11"
Routed to Link 6L : Prop SA South

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year Rainfall=3.34"

Area (sf)	CN	Description
21,513	98	Roofs, HSG B
12,339	98	Paved parking, HSG B
33,852	98	Weighted Average
33,852		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	90	0.0100	1.04		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.34"
0.5	135	0.0050	4.17	3.28	**Pipe Channel, Pipe Cahnnel Flow B** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
1.9	225	Total			

Subcatchment 4S: Prop SA South Imp



Hydrograph for Subcatchment 4S: Prop SA South Imp

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.01	0.01
2.50	0.10	0.01	0.01
3.00	0.12	0.02	0.02
3.50	0.14	0.03	0.02
4.00	0.16	0.05	0.02
4.50	0.19	0.06	0.03
5.00	0.21	0.08	0.03
5.50	0.24	0.10	0.03
6.00	0.26	0.12	0.03
6.50	0.29	0.14	0.04
7.00	0.33	0.17	0.04
7.50	0.36	0.20	0.05
8.00	0.40	0.23	0.05
8.50	0.44	0.27	0.06
9.00	0.49	0.31	0.07
9.50	0.54	0.36	0.09
10.00	0.61	0.42	0.10
10.50	0.69	0.49	0.13
11.00	0.80	0.60	0.20
11.50	0.99	0.78	0.34
12.00	1.59	1.37	**1.88**
12.50	2.35	2.12	**0.51**
13.00	2.54	2.31	0.23
13.50	2.65	2.42	0.15
14.00	2.73	2.50	0.12
14.50	2.80	2.57	0.10
15.00	2.85	2.62	0.08
15.50	2.90	2.67	0.07
16.00	2.94	2.71	0.06
16.50	2.98	2.75	0.06
17.00	3.01	2.78	0.05
17.50	3.05	2.81	0.05
18.00	3.08	2.84	0.04
18.50	3.10	2.87	0.04
19.00	3.13	2.90	0.04
19.50	3.15	2.92	0.04
20.00	3.18	2.94	0.04
20.50	3.20	2.97	0.04
21.00	3.22	2.99	0.03
21.50	3.24	3.01	0.03
22.00	3.26	3.03	0.03
22.50	3.28	3.05	0.03
23.00	3.30	3.07	0.03
23.50	3.32	3.09	0.03
24.00	**3.34**	**3.11**	0.03
24.50	3.34	3.11	0.00
25.00	3.34	3.11	0.00
25.50	3.34	3.11	0.00
26.00	3.34	3.11	0.00
26.50	3.34	3.11	0.00
27.00	3.34	3.11	0.00
27.50	3.34	3.11	0.00
28.00	3.34	3.11	0.00
28.50	3.34	3.11	0.00
29.00	3.34	3.11	0.00
29.50	3.34	3.11	0.00
30.00	3.34	3.11	0.00
30.50	3.34	3.11	0.00
31.00	3.34	3.11	0.00
31.50	3.34	3.11	0.00
32.00	3.34	3.11	0.00
32.50	3.34	3.11	0.00
33.00	3.34	3.11	0.00
33.50	3.34	3.11	0.00
34.00	3.34	3.11	0.00
34.50	3.34	3.11	0.00
35.00	3.34	3.11	0.00
35.50	3.34	3.11	0.00
36.00	3.34	3.11	0.00

Summary for Subcatchment 5S: Prop SA South Perv

Sheet Flow = 100 * SqRoot(s)/n = 100 * SqRoot(0.018)/0.24 = 56' (Use 56')

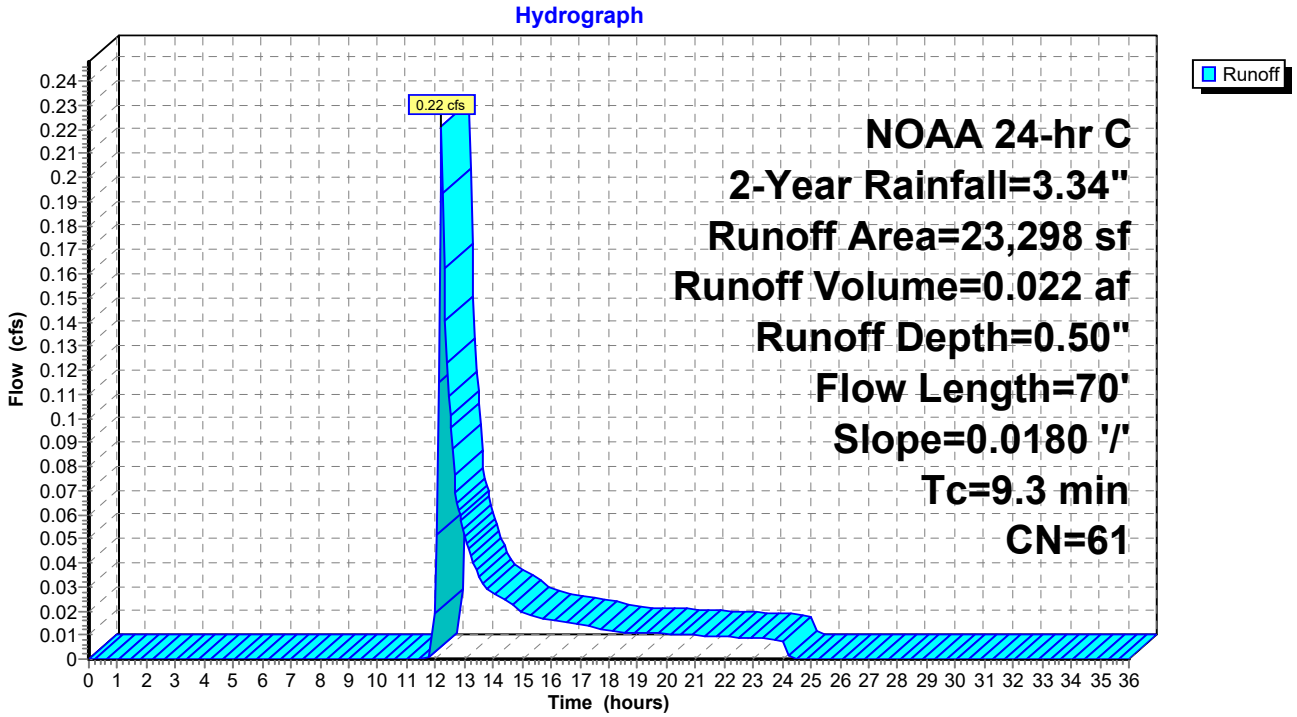
Runoff = 0.22 cfs @ 12.20 hrs, Volume= 0.022 af, Depth= 0.50"
Routed to Link 6L : Prop SA South

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 2-Year Rainfall=3.34"

Area (sf)	CN	Description
1,516	55	Woods, Good, HSG B
21,782	61	>75% Grass cover, Good, HSG B
23,298	61	Weighted Average
23,298		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	56	0.0180	0.10		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 3.34"
0.1	14	0.0180	2.16		**Shallow Concentrated Flow, Shallow Concentrated Flow** Unpaved Kv= 16.1 fps
9.3	70	Total			

Subcatchment 5S: Prop SA South Perv



Hydrograph for Subcatchment 5S: Prop SA South Perv

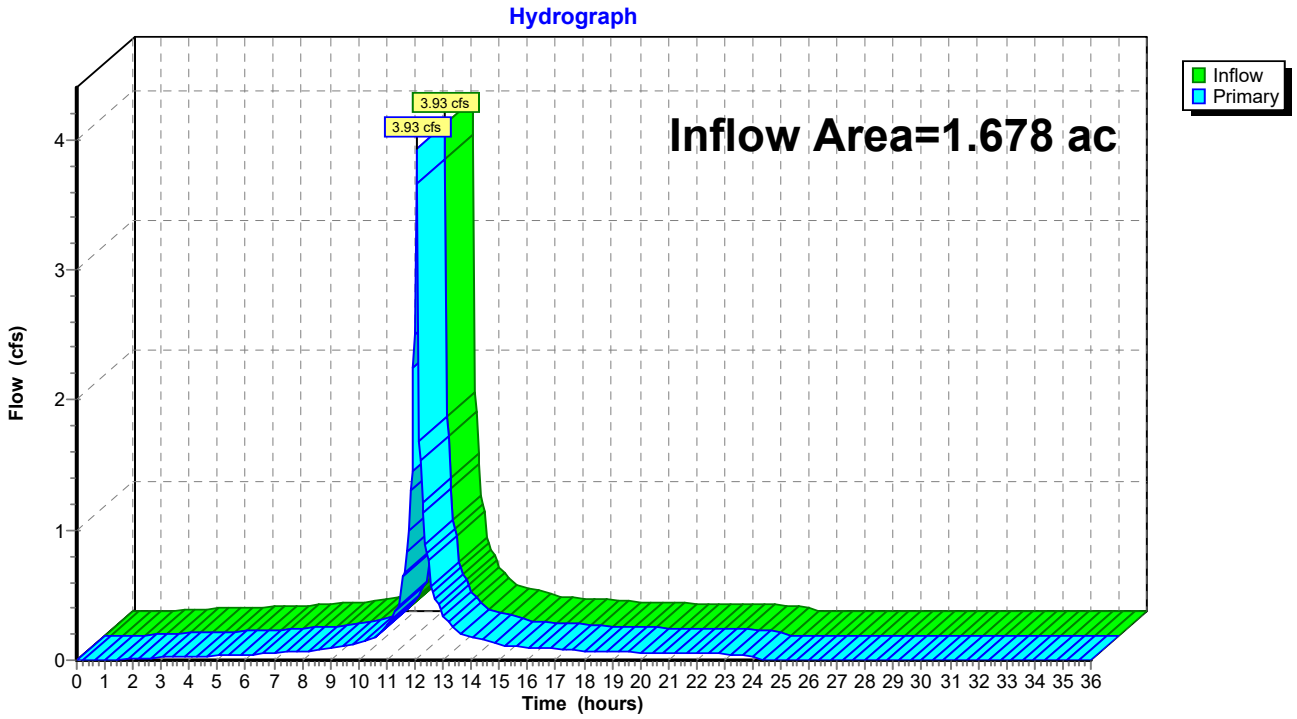
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.06	0.00	0.00
2.00	0.08	0.00	0.00
2.50	0.10	0.00	0.00
3.00	0.12	0.00	0.00
3.50	0.14	0.00	0.00
4.00	0.16	0.00	0.00
4.50	0.19	0.00	0.00
5.00	0.21	0.00	0.00
5.50	0.24	0.00	0.00
6.00	0.26	0.00	0.00
6.50	0.29	0.00	0.00
7.00	0.33	0.00	0.00
7.50	0.36	0.00	0.00
8.00	0.40	0.00	0.00
8.50	0.44	0.00	0.00
9.00	0.49	0.00	0.00
9.50	0.54	0.00	0.00
10.00	0.61	0.00	0.00
10.50	0.69	0.00	0.00
11.00	0.80	0.00	0.00
11.50	0.99	0.00	0.00
12.00	1.59	0.01	**0.02**
12.50	2.35	0.15	**0.10**
13.00	2.54	0.21	0.05
13.50	2.65	0.24	0.04
14.00	2.73	0.27	0.03
14.50	2.80	0.29	0.02
15.00	2.85	0.31	0.02
15.50	2.90	0.33	0.02
16.00	2.94	0.34	0.02
16.50	2.98	0.36	0.02
17.00	3.01	0.37	0.01
17.50	3.05	0.38	0.01
18.00	3.08	0.39	0.01
18.50	3.10	0.40	0.01
19.00	3.13	0.41	0.01
19.50	3.15	0.42	0.01
20.00	3.18	0.43	0.01
20.50	3.20	0.44	0.01
21.00	3.22	0.45	0.01
21.50	3.24	0.46	0.01
22.00	3.26	0.47	0.01
22.50	3.28	0.48	0.01
23.00	3.30	0.49	0.01
23.50	3.32	0.49	0.01
24.00	**3.34**	**0.50**	0.01
24.50	3.34	0.50	0.00
25.00	3.34	0.50	0.00
25.50	3.34	0.50	0.00
26.00	3.34	0.50	0.00
26.50	3.34	0.50	0.00
27.00	3.34	0.50	0.00
27.50	3.34	0.50	0.00
28.00	3.34	0.50	0.00
28.50	3.34	0.50	0.00
29.00	3.34	0.50	0.00
29.50	3.34	0.50	0.00
30.00	3.34	0.50	0.00
30.50	3.34	0.50	0.00
31.00	3.34	0.50	0.00
31.50	3.34	0.50	0.00
32.00	3.34	0.50	0.00
32.50	3.34	0.50	0.00
33.00	3.34	0.50	0.00
33.50	3.34	0.50	0.00
34.00	3.34	0.50	0.00
34.50	3.34	0.50	0.00
35.00	3.34	0.50	0.00
35.50	3.34	0.50	0.00
36.00	3.34	0.50	0.00

Summary for Link 3L: Prop SA North

Inflow Area = 1.678 ac, 59.22% Impervious, Inflow Depth = 2.03" for 2-Year event
Inflow = 3.93 cfs @ 12.07 hrs, Volume= 0.284 af
Primary = 3.93 cfs @ 12.07 hrs, Volume= 0.284 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 3L: Prop SA North



Hydrograph for Link 3L: Prop SA North

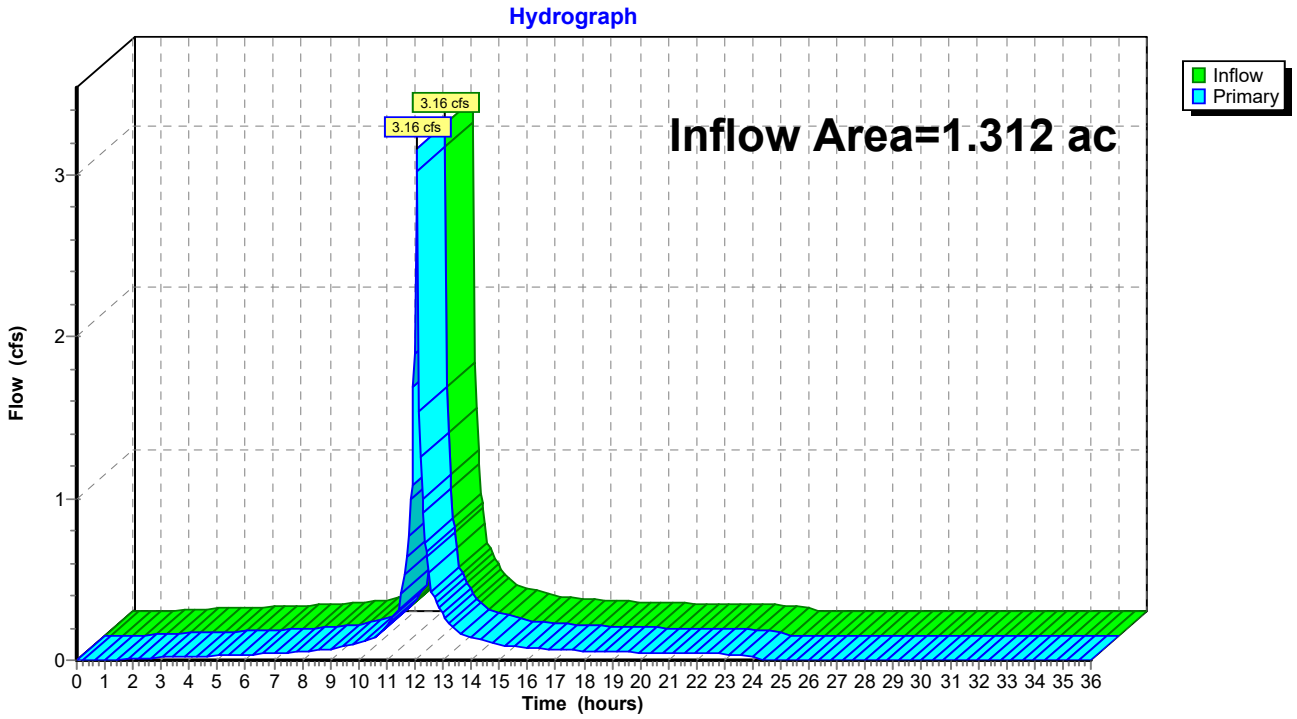
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00
1.50	0.00	0.00	0.00	27.50	0.00	0.00	0.00
2.00	0.01	0.00	0.01	28.00	0.00	0.00	0.00
2.50	0.02	0.00	0.02	28.50	0.00	0.00	0.00
3.00	0.02	0.00	0.02	29.00	0.00	0.00	0.00
3.50	0.02	0.00	0.02	29.50	0.00	0.00	0.00
4.00	0.03	0.00	0.03	30.00	0.00	0.00	0.00
4.50	0.03	0.00	0.03	30.50	0.00	0.00	0.00
5.00	0.04	0.00	0.04	31.00	0.00	0.00	0.00
5.50	0.04	0.00	0.04	31.50	0.00	0.00	0.00
6.00	0.04	0.00	0.04	32.00	0.00	0.00	0.00
6.50	0.05	0.00	0.05	32.50	0.00	0.00	0.00
7.00	0.06	0.00	0.06	33.00	0.00	0.00	0.00
7.50	0.06	0.00	0.06	33.50	0.00	0.00	0.00
8.00	0.07	0.00	0.07	34.00	0.00	0.00	0.00
8.50	0.08	0.00	0.08	34.50	0.00	0.00	0.00
9.00	0.09	0.00	0.09	35.00	0.00	0.00	0.00
9.50	0.11	0.00	0.11	35.50	0.00	0.00	0.00
10.00	0.13	0.00	0.13	36.00	0.00	0.00	0.00
10.50	0.16	0.00	0.16				
11.00	0.26	0.00	0.26				
11.50	0.45	0.00	0.45				
12.00	**2.51**	0.00	**2.51**				
12.50	**0.76**	0.00	**0.76**				
13.00	0.36	0.00	0.36				
13.50	0.23	0.00	0.23				
14.00	0.18	0.00	0.18				
14.50	0.15	0.00	0.15				
15.00	0.12	0.00	0.12				
15.50	0.11	0.00	0.11				
16.00	0.10	0.00	0.10				
16.50	0.09	0.00	0.09				
17.00	0.09	0.00	0.09				
17.50	0.08	0.00	0.08				
18.00	0.07	0.00	0.07				
18.50	0.07	0.00	0.07				
19.00	0.06	0.00	0.06				
19.50	0.06	0.00	0.06				
20.00	0.06	0.00	0.06				
20.50	0.06	0.00	0.06				
21.00	0.06	0.00	0.06				
21.50	0.05	0.00	0.05				
22.00	0.05	0.00	0.05				
22.50	0.05	0.00	0.05				
23.00	0.05	0.00	0.05				
23.50	0.05	0.00	0.05				
24.00	0.05	0.00	0.05				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Summary for Link 6L: Prop SA South

Inflow Area = 1.312 ac, 59.23% Impervious, Inflow Depth = 2.05" for 2-Year event
Inflow = 3.16 cfs @ 12.08 hrs, Volume= 0.224 af
Primary = 3.16 cfs @ 12.08 hrs, Volume= 0.224 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 6L: Prop SA South



Hydrograph for Link 6L: Prop SA South

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00	27.00	0.00	0.00	0.00
1.50	0.00	0.00	0.00	27.50	0.00	0.00	0.00
2.00	0.01	0.00	0.01	28.00	0.00	0.00	0.00
2.50	0.01	0.00	0.01	28.50	0.00	0.00	0.00
3.00	0.02	0.00	0.02	29.00	0.00	0.00	0.00
3.50	0.02	0.00	0.02	29.50	0.00	0.00	0.00
4.00	0.02	0.00	0.02	30.00	0.00	0.00	0.00
4.50	0.03	0.00	0.03	30.50	0.00	0.00	0.00
5.00	0.03	0.00	0.03	31.00	0.00	0.00	0.00
5.50	0.03	0.00	0.03	31.50	0.00	0.00	0.00
6.00	0.03	0.00	0.03	32.00	0.00	0.00	0.00
6.50	0.04	0.00	0.04	32.50	0.00	0.00	0.00
7.00	0.04	0.00	0.04	33.00	0.00	0.00	0.00
7.50	0.05	0.00	0.05	33.50	0.00	0.00	0.00
8.00	0.05	0.00	0.05	34.00	0.00	0.00	0.00
8.50	0.06	0.00	0.06	34.50	0.00	0.00	0.00
9.00	0.07	0.00	0.07	35.00	0.00	0.00	0.00
9.50	0.09	0.00	0.09	35.50	0.00	0.00	0.00
10.00	0.10	0.00	0.10	36.00	0.00	0.00	0.00
10.50	0.13	0.00	0.13				
11.00	0.20	0.00	0.20				
11.50	0.34	0.00	0.34				
12.00	**1.89**	0.00	**1.89**				
12.50	**0.62**	0.00	**0.62**				
13.00	0.29	0.00	0.29				
13.50	0.18	0.00	0.18				
14.00	0.14	0.00	0.14				
14.50	0.12	0.00	0.12				
15.00	0.10	0.00	0.10				
15.50	0.09	0.00	0.09				
16.00	0.08	0.00	0.08				
16.50	0.07	0.00	0.07				
17.00	0.07	0.00	0.07				
17.50	0.06	0.00	0.06				
18.00	0.05	0.00	0.05				
18.50	0.05	0.00	0.05				
19.00	0.05	0.00	0.05				
19.50	0.05	0.00	0.05				
20.00	0.05	0.00	0.05				
20.50	0.05	0.00	0.05				
21.00	0.04	0.00	0.04				
21.50	0.04	0.00	0.04				
22.00	0.04	0.00	0.04				
22.50	0.04	0.00	0.04				
23.00	0.04	0.00	0.04				
23.50	0.04	0.00	0.04				
24.00	0.04	0.00	0.04				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Prop SA North Imp Runoff Area=43,300 sf 100.00% Impervious Runoff Depth=4.77"
Flow Length=160' Tc=1.4 min CN=98 Runoff=5.84 cfs 0.395 af

Subcatchment2S: Prop SA North Perv Runoff Area=29,815 sf 0.00% Impervious Runoff Depth=1.31"
Flow Length=159' Slope=0.0170 '/' Tc=9.9 min CN=60 Runoff=0.92 cfs 0.075 af

Subcatchment4S: Prop SA South Imp Runoff Area=33,852 sf 100.00% Impervious Runoff Depth=4.77"
Flow Length=225' Tc=1.9 min CN=98 Runoff=4.64 cfs 0.309 af

Subcatchment5S: Prop SA South Perv Runoff Area=23,298 sf 0.00% Impervious Runoff Depth=1.38"
Flow Length=70' Slope=0.0180 '/' Tc=9.3 min CN=61 Runoff=0.78 cfs 0.061 af

Link 3L: Prop SA North Inflow=6.32 cfs 0.470 af
Primary=6.32 cfs 0.470 af

Link 6L: Prop SA South Inflow=5.11 cfs 0.370 af
Primary=5.11 cfs 0.370 af

Total Runoff Area = 2.990 ac Runoff Volume = 0.840 af Average Runoff Depth = 3.37"
40.77% Pervious = 1.219 ac 59.23% Impervious = 1.771 ac

Summary for Subcatchment 1S: Prop SA North Imp

Sheet Flow = 100 * SqRoot(s)/N = 100 * SqRoot(0.01)/0.011 = 909' (Use 70')

[49] Hint: Tc<2dt may require smaller dt

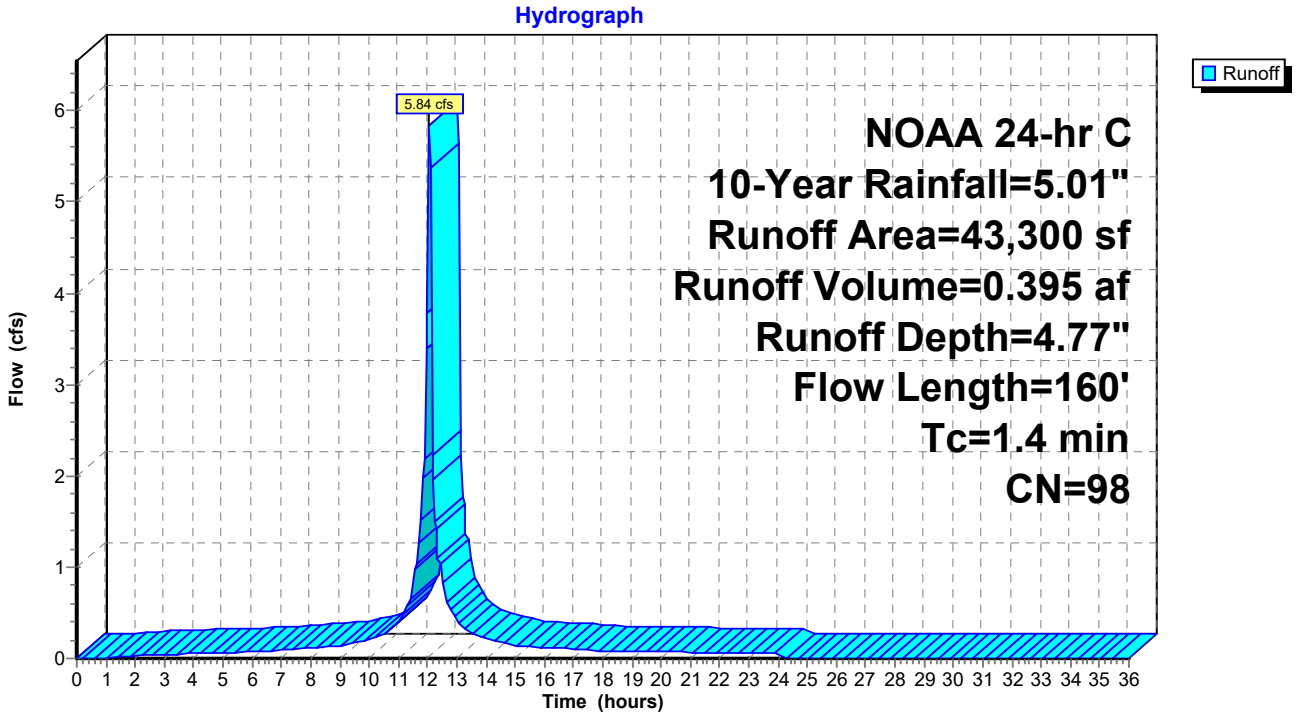
Runoff = 5.84 cfs @ 12.07 hrs, Volume= 0.395 af, Depth= 4.77"
Routed to Link 3L : Prop SA North

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year Rainfall=5.01"

Area (sf)	CN	Description
12,060	98	Paved parking, HSG B
31,240	98	Roofs, HSG B
43,300	98	Weighted Average
43,300		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	70	0.0100	0.99		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.34"
0.2	90	0.0200	9.68	11.88	**Pipe Channel, Channel Flow** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
1.4	160	Total			

Subcatchment 1S: Prop SA North Imp



Hydrograph for Subcatchment 1S: Prop SA North Imp

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.01
1.50	0.08	0.01	0.02
2.00	0.11	0.02	0.03
2.50	0.14	0.03	0.04
3.00	0.18	0.05	0.04
3.50	0.21	0.08	0.05
4.00	0.25	0.10	0.05
4.50	0.28	0.13	0.06
5.00	0.32	0.16	0.06
5.50	0.36	0.19	0.07
6.00	0.40	0.23	0.07
6.50	0.44	0.26	0.08
7.00	0.49	0.31	0.09
7.50	0.54	0.36	0.10
8.00	0.60	0.41	0.11
8.50	0.66	0.47	0.12
9.00	0.73	0.53	0.13
9.50	0.81	0.61	0.17
10.00	0.91	0.71	0.21
10.50	1.03	0.82	0.25
11.00	1.20	0.99	0.40
11.50	1.48	1.26	0.69
12.00	2.39	2.16	**3.77**
12.50	3.53	3.30	**0.97**
13.00	3.81	3.57	0.44
13.50	3.98	3.74	0.28
14.00	4.10	3.86	0.22
14.50	4.20	3.96	0.18
15.00	4.28	4.04	0.15
15.50	4.35	4.11	0.13
16.00	4.41	4.17	0.12
16.50	4.47	4.23	0.11
17.00	4.52	4.29	0.10
17.50	4.57	4.33	0.09
18.00	4.61	4.38	0.08
18.50	4.65	4.42	0.08
19.00	4.69	4.46	0.08
19.50	4.73	4.49	0.07
20.00	4.76	4.53	0.07
20.50	4.80	4.56	0.07
21.00	4.83	4.60	0.07
21.50	4.87	4.63	0.06
22.00	4.90	4.66	0.06
22.50	4.93	4.69	0.06
23.00	4.96	4.72	0.06
23.50	4.98	4.75	0.05
24.00	**5.01**	**4.77**	0.06
24.50	5.01	4.77	0.00
25.00	5.01	4.77	0.00
25.50	5.01	4.77	0.00
26.00	5.01	4.77	0.00
26.50	5.01	4.77	0.00
27.00	5.01	4.77	0.00
27.50	5.01	4.77	0.00
28.00	5.01	4.77	0.00
28.50	5.01	4.77	0.00
29.00	5.01	4.77	0.00
29.50	5.01	4.77	0.00
30.00	5.01	4.77	0.00
30.50	5.01	4.77	0.00
31.00	5.01	4.77	0.00
31.50	5.01	4.77	0.00
32.00	5.01	4.77	0.00
32.50	5.01	4.77	0.00
33.00	5.01	4.77	0.00
33.50	5.01	4.77	0.00
34.00	5.01	4.77	0.00
34.50	5.01	4.77	0.00
35.00	5.01	4.77	0.00
35.50	5.01	4.77	0.00
36.00	5.01	4.77	0.00

Summary for Subcatchment 2S: Prop SA North Perv

Sheet Flow = 100 * SqRoot(s)/N = 100 * SqRoot(0.017)/0.24 = 54' (Use 54')

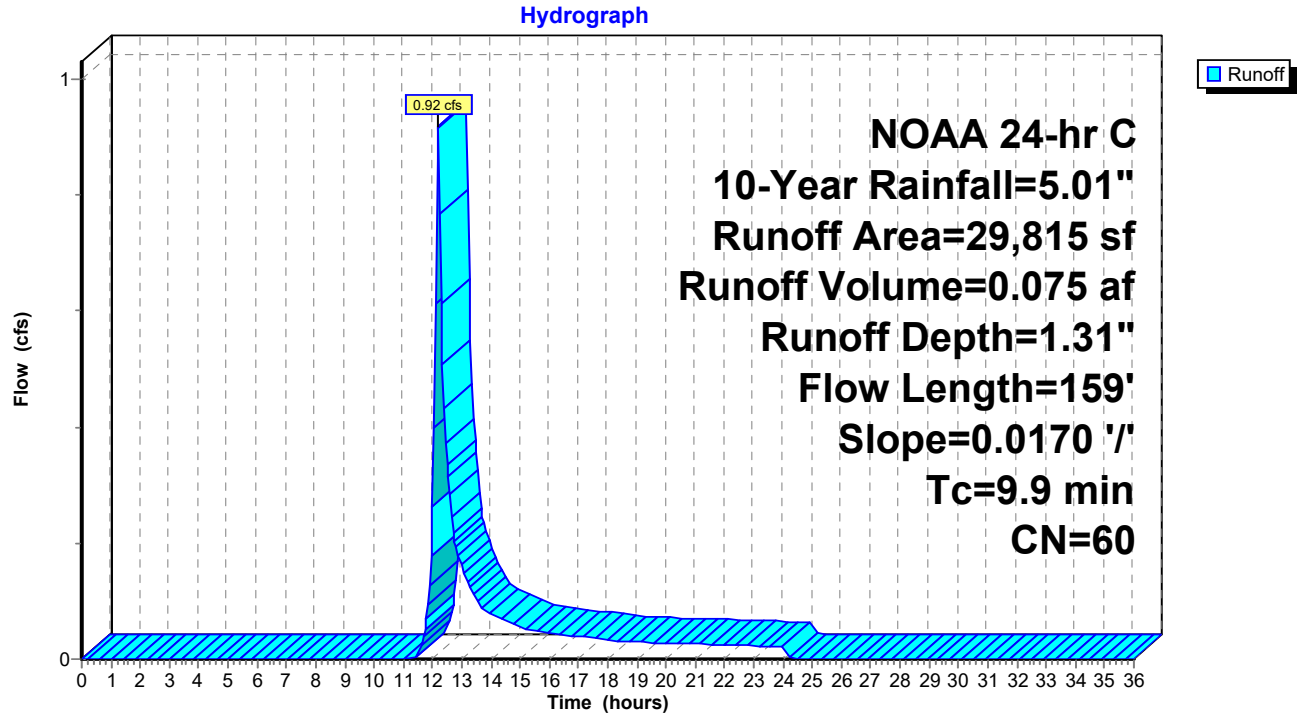
Runoff = 0.92 cfs @ 12.19 hrs, Volume= 0.075 af, Depth= 1.31"
Routed to Link 3L : Prop SA North

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year Rainfall=5.01"

Area (sf)	CN	Description
6,265	55	Woods, Good, HSG B
23,550	61	>75% Grass cover, Good, HSG B
29,815	60	Weighted Average
29,815		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	54	0.0170	0.10		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 3.34"
0.8	105	0.0170	2.10		**Shallow Concentrated Flow, Shallow Concentrated Flow** Unpaved Kv= 16.1 fps
9.9	159	Total			

Subcatchment 2S: Prop SA North Perv



Hydrograph for Subcatchment 2S: Prop SA North Perv

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.18	0.00	0.00
3.50	0.21	0.00	0.00
4.00	0.25	0.00	0.00
4.50	0.28	0.00	0.00
5.00	0.32	0.00	0.00
5.50	0.36	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.00	0.00
9.00	0.73	0.00	0.00
9.50	0.81	0.00	0.00
10.00	0.91	0.00	0.00
10.50	1.03	0.00	0.00
11.00	1.20	0.00	0.00
11.50	1.48	0.00	0.01
12.00	2.39	0.14	**0.26**
12.50	3.53	0.54	**0.34**
13.00	3.81	0.67	0.16
13.50	3.98	0.75	0.10
14.00	4.10	0.81	0.08
14.50	4.20	0.86	0.07
15.00	4.28	0.90	0.06
15.50	4.35	0.94	0.05
16.00	4.41	0.97	0.05
16.50	4.47	1.00	0.04
17.00	4.52	1.03	0.04
17.50	4.57	1.06	0.04
18.00	4.61	1.08	0.03
18.50	4.65	1.10	0.03
19.00	4.69	1.12	0.03
19.50	4.73	1.15	0.03
20.00	4.76	1.17	0.03
20.50	4.80	1.19	0.03
21.00	4.83	1.20	0.03
21.50	4.87	1.22	0.03
22.00	4.90	1.24	0.02
22.50	4.93	1.26	0.02
23.00	4.96	1.28	0.02
23.50	4.98	1.29	0.02
24.00	**5.01**	**1.31**	0.02
24.50	5.01	1.31	0.00
25.00	5.01	1.31	0.00
25.50	5.01	1.31	0.00
26.00	5.01	1.31	0.00
26.50	5.01	1.31	0.00
27.00	5.01	1.31	0.00
27.50	5.01	1.31	0.00
28.00	5.01	1.31	0.00
28.50	5.01	1.31	0.00
29.00	5.01	1.31	0.00
29.50	5.01	1.31	0.00
30.00	5.01	1.31	0.00
30.50	5.01	1.31	0.00
31.00	5.01	1.31	0.00
31.50	5.01	1.31	0.00
32.00	5.01	1.31	0.00
32.50	5.01	1.31	0.00
33.00	5.01	1.31	0.00
33.50	5.01	1.31	0.00
34.00	5.01	1.31	0.00
34.50	5.01	1.31	0.00
35.00	5.01	1.31	0.00
35.50	5.01	1.31	0.00
36.00	5.01	1.31	0.00

Summary for Subcatchment 4S: Prop SA South Imp

Sheet Flow = 100 * SqRoot(s)/N = 100 * SqRoot(0.0125)/0.011 = 1016' (Use 100')

[49] Hint: Tc<2dt may require smaller dt
[47] Hint: Peak is 142% of capacity of segment #2

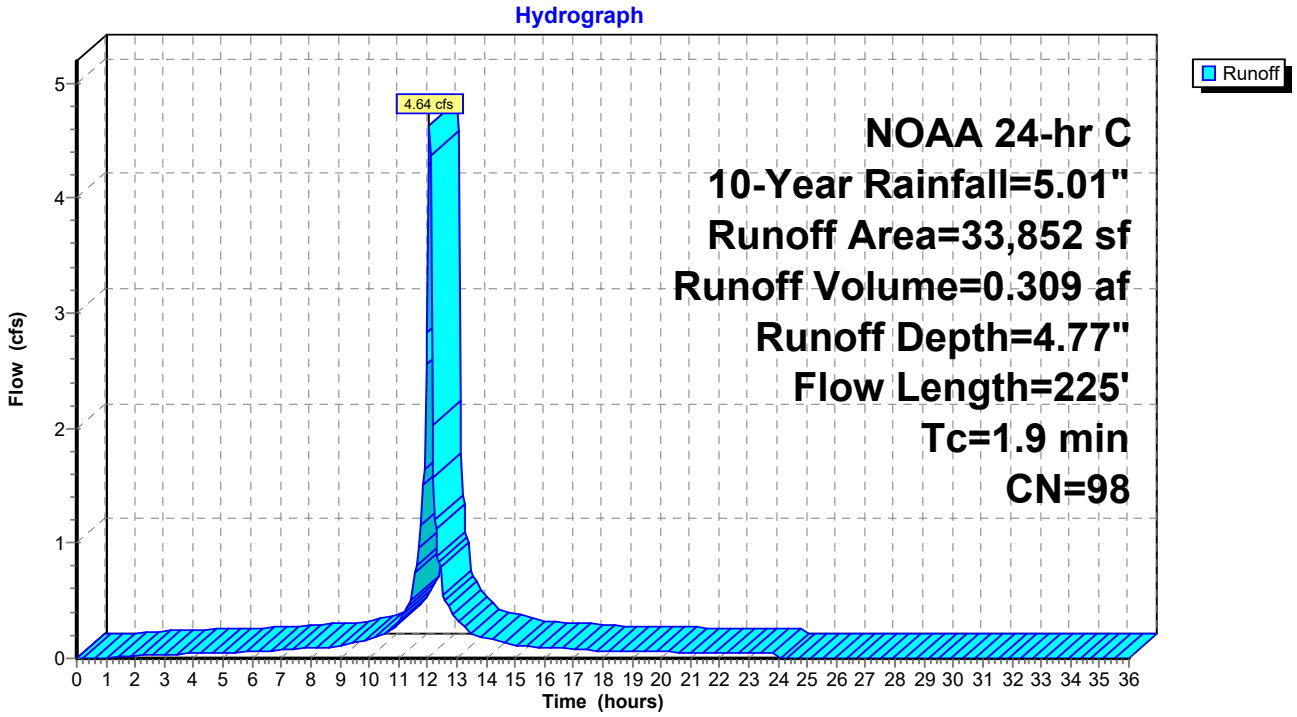
Runoff = 4.64 cfs @ 12.08 hrs, Volume= 0.309 af, Depth= 4.77"
Routed to Link 6L : Prop SA South

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year Rainfall=5.01"

Area (sf)	CN	Description
21,513	98	Roofs, HSG B
12,339	98	Paved parking, HSG B
33,852	98	Weighted Average
33,852		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	90	0.0100	1.04		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.34"
0.5	135	0.0050	4.17	3.28	**Pipe Channel, Pipe Cahnnel Flow B** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
1.9	225	Total			

Subcatchment 4S: Prop SA South Imp



Hydrograph for Subcatchment 4S: Prop SA South Imp

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.01	0.01
2.00	0.11	0.02	0.02
2.50	0.14	0.03	0.03
3.00	0.18	0.05	0.03
3.50	0.21	0.08	0.04
4.00	0.25	0.10	0.04
4.50	0.28	0.13	0.05
5.00	0.32	0.16	0.05
5.50	0.36	0.19	0.05
6.00	0.40	0.23	0.05
6.50	0.44	0.26	0.06
7.00	0.49	0.31	0.07
7.50	0.54	0.36	0.08
8.00	0.60	0.41	0.09
8.50	0.66	0.47	0.10
9.00	0.73	0.53	0.10
9.50	0.81	0.61	0.13
10.00	0.91	0.71	0.16
10.50	1.03	0.82	0.19
11.00	1.20	0.99	0.31
11.50	1.48	1.26	0.52
12.00	2.39	2.16	**2.83**
12.50	3.53	3.30	**0.77**
13.00	3.81	3.57	0.35
13.50	3.98	3.74	0.22
14.00	4.10	3.86	0.17
14.50	4.20	3.96	0.14
15.00	4.28	4.04	0.12
15.50	4.35	4.11	0.10
16.00	4.41	4.17	0.10
16.50	4.47	4.23	0.09
17.00	4.52	4.29	0.08
17.50	4.57	4.33	0.07
18.00	4.61	4.38	0.06
18.50	4.65	4.42	0.06
19.00	4.69	4.46	0.06
19.50	4.73	4.49	0.06
20.00	4.76	4.53	0.06
20.50	4.80	4.56	0.05
21.00	4.83	4.60	0.05
21.50	4.87	4.63	0.05
22.00	4.90	4.66	0.05
22.50	4.93	4.69	0.05
23.00	4.96	4.72	0.04
23.50	4.98	4.75	0.04
24.00	**5.01**	**4.77**	0.05
24.50	5.01	4.77	0.00
25.00	5.01	4.77	0.00
25.50	5.01	4.77	0.00
26.00	5.01	4.77	0.00
26.50	5.01	4.77	0.00
27.00	5.01	4.77	0.00
27.50	5.01	4.77	0.00
28.00	5.01	4.77	0.00
28.50	5.01	4.77	0.00
29.00	5.01	4.77	0.00
29.50	5.01	4.77	0.00
30.00	5.01	4.77	0.00
30.50	5.01	4.77	0.00
31.00	5.01	4.77	0.00
31.50	5.01	4.77	0.00
32.00	5.01	4.77	0.00
32.50	5.01	4.77	0.00
33.00	5.01	4.77	0.00
33.50	5.01	4.77	0.00
34.00	5.01	4.77	0.00
34.50	5.01	4.77	0.00
35.00	5.01	4.77	0.00
35.50	5.01	4.77	0.00
36.00	5.01	4.77	0.00

Summary for Subcatchment 5S: Prop SA South Perv

Sheet Flow = 100 * SqRoot(s)/n = 100 * SqRoot(0.018)/0.24 = 56' (Use 56')

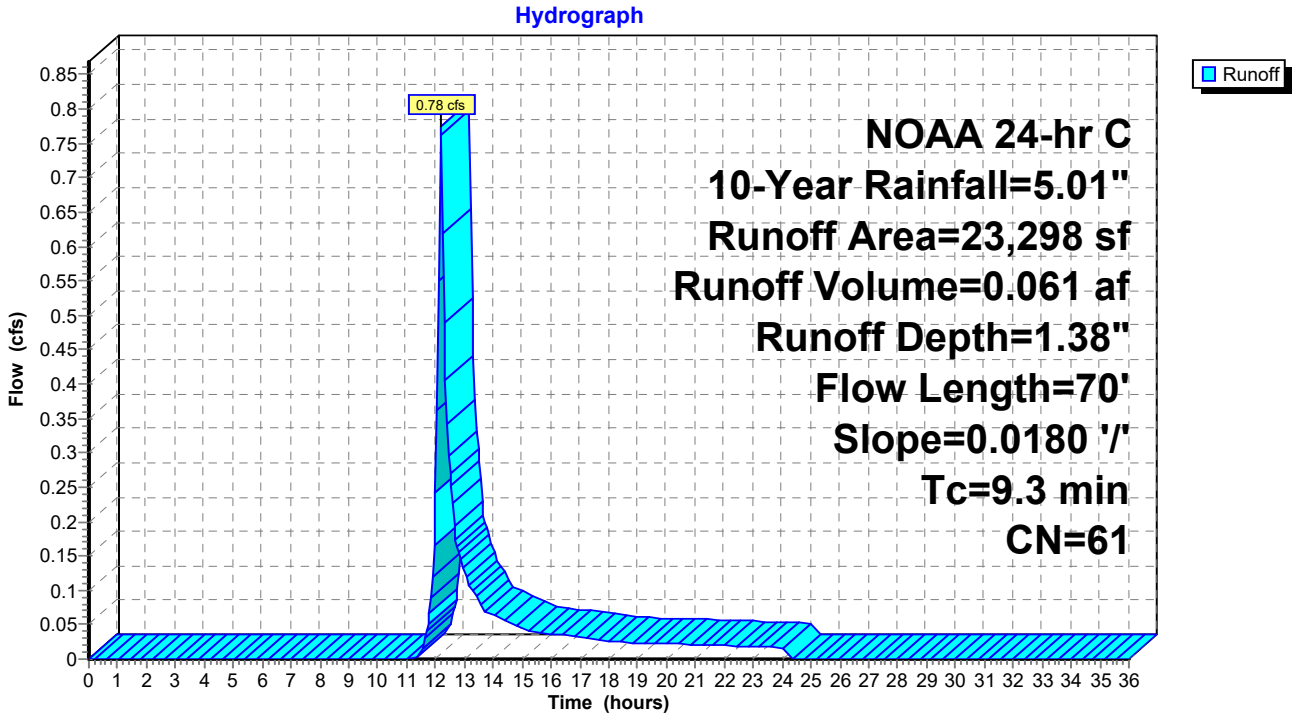
Runoff = 0.78 cfs @ 12.18 hrs, Volume= 0.061 af, Depth= 1.38"
Routed to Link 6L : Prop SA South

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 10-Year Rainfall=5.01"

Area (sf)	CN	Description
1,516	55	Woods, Good, HSG B
21,782	61	>75% Grass cover, Good, HSG B
23,298	61	Weighted Average
23,298		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	56	0.0180	0.10		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 3.34"
0.1	14	0.0180	2.16		**Shallow Concentrated Flow, Shallow Concentrated Flow** Unpaved Kv= 16.1 fps
9.3	70	Total			

Subcatchment 5S: Prop SA South Perv



Hydrograph for Subcatchment 5S: Prop SA South Perv

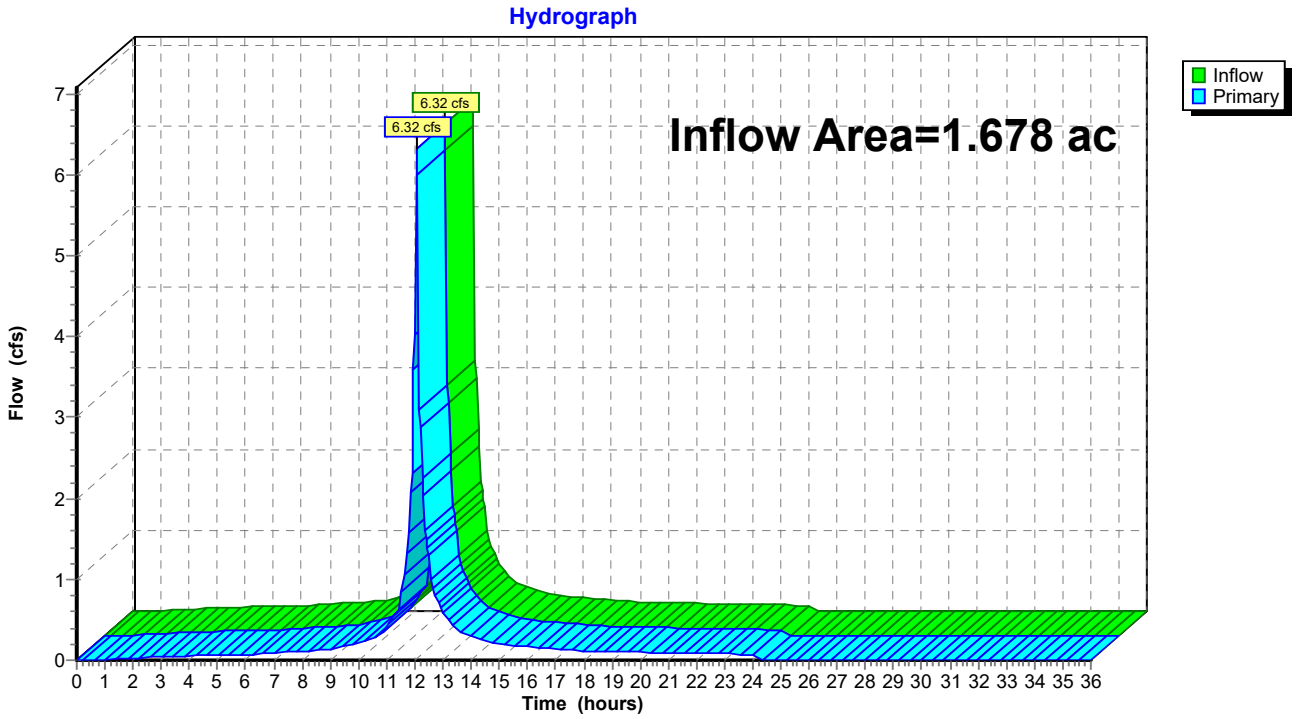
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.18	0.00	0.00
3.50	0.21	0.00	0.00
4.00	0.25	0.00	0.00
4.50	0.28	0.00	0.00
5.00	0.32	0.00	0.00
5.50	0.36	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.00	0.00
9.00	0.73	0.00	0.00
9.50	0.81	0.00	0.00
10.00	0.91	0.00	0.00
10.50	1.03	0.00	0.00
11.00	1.20	0.00	0.00
11.50	1.48	0.01	0.01
12.00	2.39	0.16	**0.24**
12.50	3.53	0.59	**0.27**
13.00	3.81	0.72	0.13
13.50	3.98	0.80	0.08
14.00	4.10	0.86	0.06
14.50	4.20	0.91	0.05
15.00	4.28	0.96	0.04
15.50	4.35	0.99	0.04
16.00	4.41	1.03	0.04
16.50	4.47	1.06	0.03
17.00	4.52	1.09	0.03
17.50	4.57	1.12	0.03
18.00	4.61	1.14	0.03
18.50	4.65	1.17	0.02
19.00	4.69	1.19	0.02
19.50	4.73	1.21	0.02
20.00	4.76	1.23	0.02
20.50	4.80	1.25	0.02
21.00	4.83	1.27	0.02
21.50	4.87	1.29	0.02
22.00	4.90	1.31	0.02
22.50	4.93	1.33	0.02
23.00	4.96	1.34	0.02
23.50	4.98	1.36	0.02
24.00	**5.01**	**1.38**	0.02
24.50	5.01	1.38	0.00
25.00	5.01	1.38	0.00
25.50	5.01	1.38	0.00
26.00	5.01	1.38	0.00
26.50	5.01	1.38	0.00
27.00	5.01	1.38	0.00
27.50	5.01	1.38	0.00
28.00	5.01	1.38	0.00
28.50	5.01	1.38	0.00
29.00	5.01	1.38	0.00
29.50	5.01	1.38	0.00
30.00	5.01	1.38	0.00
30.50	5.01	1.38	0.00
31.00	5.01	1.38	0.00
31.50	5.01	1.38	0.00
32.00	5.01	1.38	0.00
32.50	5.01	1.38	0.00
33.00	5.01	1.38	0.00
33.50	5.01	1.38	0.00
34.00	5.01	1.38	0.00
34.50	5.01	1.38	0.00
35.00	5.01	1.38	0.00
35.50	5.01	1.38	0.00
36.00	5.01	1.38	0.00

Summary for Link 3L: Prop SA North

Inflow Area = 1.678 ac, 59.22% Impervious, Inflow Depth = 3.36" for 10-Year event
Inflow = 6.32 cfs @ 12.07 hrs, Volume= 0.470 af
Primary = 6.32 cfs @ 12.07 hrs, Volume= 0.470 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 3L: Prop SA North



Hydrograph for Link 3L: Prop SA North

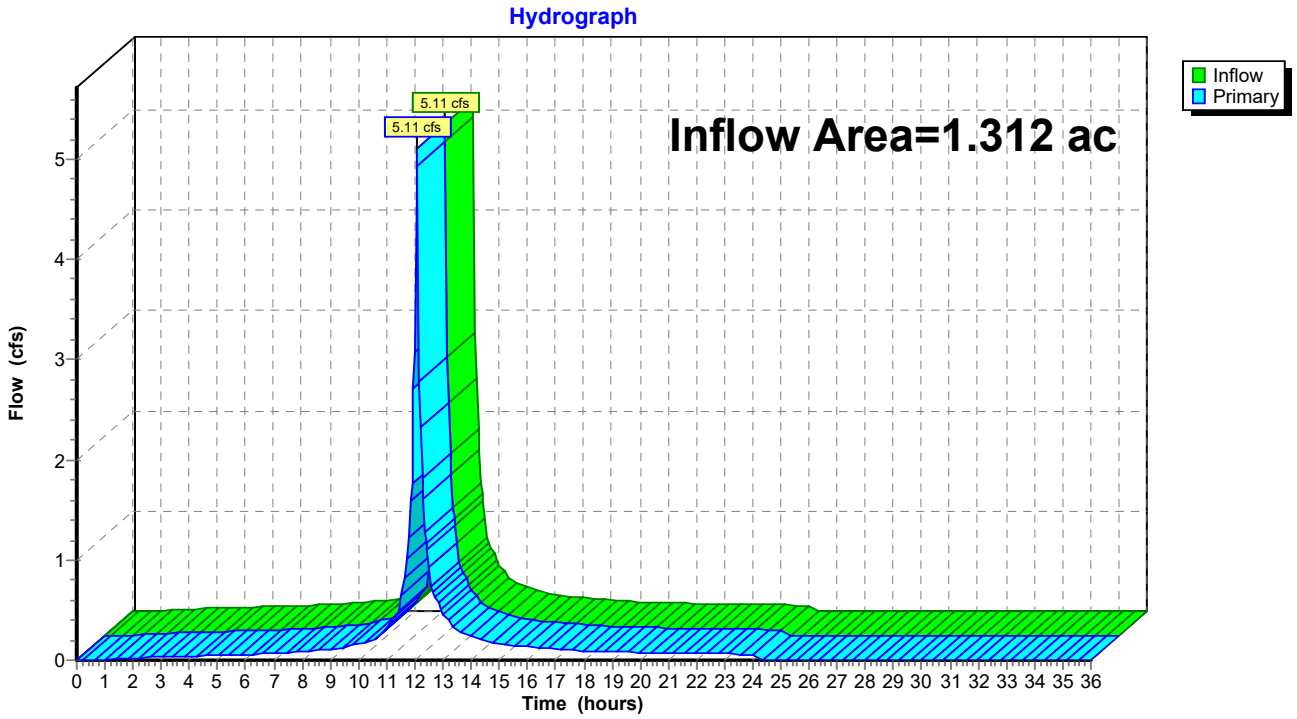
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.01	0.00	0.01	27.00	0.00	0.00	0.00
1.50	0.02	0.00	0.02	27.50	0.00	0.00	0.00
2.00	0.03	0.00	0.03	28.00	0.00	0.00	0.00
2.50	0.04	0.00	0.04	28.50	0.00	0.00	0.00
3.00	0.04	0.00	0.04	29.00	0.00	0.00	0.00
3.50	0.05	0.00	0.05	29.50	0.00	0.00	0.00
4.00	0.05	0.00	0.05	30.00	0.00	0.00	0.00
4.50	0.06	0.00	0.06	30.50	0.00	0.00	0.00
5.00	0.06	0.00	0.06	31.00	0.00	0.00	0.00
5.50	0.07	0.00	0.07	31.50	0.00	0.00	0.00
6.00	0.07	0.00	0.07	32.00	0.00	0.00	0.00
6.50	0.08	0.00	0.08	32.50	0.00	0.00	0.00
7.00	0.09	0.00	0.09	33.00	0.00	0.00	0.00
7.50	0.10	0.00	0.10	33.50	0.00	0.00	0.00
8.00	0.11	0.00	0.11	34.00	0.00	0.00	0.00
8.50	0.12	0.00	0.12	34.50	0.00	0.00	0.00
9.00	0.13	0.00	0.13	35.00	0.00	0.00	0.00
9.50	0.17	0.00	0.17	35.50	0.00	0.00	0.00
10.00	0.21	0.00	0.21	36.00	0.00	0.00	0.00
10.50	0.25	0.00	0.25				
11.00	0.40	0.00	0.40				
11.50	0.70	0.00	0.70				
12.00	**4.03**	0.00	**4.03**				
12.50	**1.30**	0.00	**1.30**				
13.00	0.60	0.00	0.60				
13.50	0.38	0.00	0.38				
14.00	0.30	0.00	0.30				
14.50	0.25	0.00	0.25				
15.00	0.20	0.00	0.20				
15.50	0.18	0.00	0.18				
16.00	0.17	0.00	0.17				
16.50	0.15	0.00	0.15				
17.00	0.14	0.00	0.14				
17.50	0.13	0.00	0.13				
18.00	0.11	0.00	0.11				
18.50	0.11	0.00	0.11				
19.00	0.11	0.00	0.11				
19.50	0.10	0.00	0.10				
20.00	0.10	0.00	0.10				
20.50	0.10	0.00	0.10				
21.00	0.09	0.00	0.09				
21.50	0.09	0.00	0.09				
22.00	0.09	0.00	0.09				
22.50	0.08	0.00	0.08				
23.00	0.08	0.00	0.08				
23.50	0.08	0.00	0.08				
24.00	0.08	0.00	0.08				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Summary for Link 6L: Prop SA South

Inflow Area = 1.312 ac, 59.23% Impervious, Inflow Depth = 3.39" for 10-Year event
Inflow = 5.11 cfs @ 12.08 hrs, Volume= 0.370 af
Primary = 5.11 cfs @ 12.08 hrs, Volume= 0.370 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 6L: Prop SA South



Hydrograph for Link 6L: Prop SA South

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
0.50	0.00	0.00	0.00
1.00	0.00	0.00	0.00
1.50	0.01	0.00	0.01
2.00	0.02	0.00	0.02
2.50	0.03	0.00	0.03
3.00	0.03	0.00	0.03
3.50	0.04	0.00	0.04
4.00	0.04	0.00	0.04
4.50	0.05	0.00	0.05
5.00	0.05	0.00	0.05
5.50	0.05	0.00	0.05
6.00	0.05	0.00	0.05
6.50	0.06	0.00	0.06
7.00	0.07	0.00	0.07
7.50	0.08	0.00	0.08
8.00	0.09	0.00	0.09
8.50	0.10	0.00	0.10
9.00	0.10	0.00	0.10
9.50	0.13	0.00	0.13
10.00	0.16	0.00	0.16
10.50	0.19	0.00	0.19
11.00	0.31	0.00	0.31
11.50	0.53	0.00	0.53
12.00	**3.08**	0.00	**3.08**
12.50	**1.04**	0.00	**1.04**
13.00	0.48	0.00	0.48
13.50	0.30	0.00	0.30
14.00	0.24	0.00	0.24
14.50	0.20	0.00	0.20
15.00	0.16	0.00	0.16
15.50	0.14	0.00	0.14
16.00	0.13	0.00	0.13
16.50	0.12	0.00	0.12
17.00	0.11	0.00	0.11
17.50	0.10	0.00	0.10
18.00	0.09	0.00	0.09
18.50	0.09	0.00	0.09
19.00	0.08	0.00	0.08
19.50	0.08	0.00	0.08
20.00	0.08	0.00	0.08
20.50	0.08	0.00	0.08
21.00	0.07	0.00	0.07
21.50	0.07	0.00	0.07
22.00	0.07	0.00	0.07
22.50	0.06	0.00	0.06
23.00	0.06	0.00	0.06
23.50	0.06	0.00	0.06
24.00	0.06	0.00	0.06
24.50	0.00	0.00	0.00
25.00	0.00	0.00	0.00
25.50	0.00	0.00	0.00
26.00	0.00	0.00	0.00
26.50	0.00	0.00	0.00
27.00	0.00	0.00	0.00
27.50	0.00	0.00	0.00
28.00	0.00	0.00	0.00
28.50	0.00	0.00	0.00
29.00	0.00	0.00	0.00
29.50	0.00	0.00	0.00
30.00	0.00	0.00	0.00
30.50	0.00	0.00	0.00
31.00	0.00	0.00	0.00
31.50	0.00	0.00	0.00
32.00	0.00	0.00	0.00
32.50	0.00	0.00	0.00
33.00	0.00	0.00	0.00
33.50	0.00	0.00	0.00
34.00	0.00	0.00	0.00
34.50	0.00	0.00	0.00
35.00	0.00	0.00	0.00
35.50	0.00	0.00	0.00
36.00	0.00	0.00	0.00

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Prop SA North Imp Runoff Area=43,300 sf 100.00% Impervious Runoff Depth=7.97"
Flow Length=160' Tc=1.4 min CN=98 Runoff=9.60 cfs 0.660 af

Subcatchment2S: Prop SA North Perv Runoff Area=29,815 sf 0.00% Impervious Runoff Depth=3.49"
Flow Length=159' Slope=0.0170 '/' Tc=9.9 min CN=60 Runoff=2.64 cfs 0.199 af

Subcatchment4S: Prop SA South Imp Runoff Area=33,852 sf 100.00% Impervious Runoff Depth=7.97"
Flow Length=225' Tc=1.9 min CN=98 Runoff=7.62 cfs 0.516 af

Subcatchment5S: Prop SA South Perv Runoff Area=23,298 sf 0.00% Impervious Runoff Depth=3.61"
Flow Length=70' Slope=0.0180 '/' Tc=9.3 min CN=61 Runoff=2.18 cfs 0.161 af

Link 3L: Prop SA North Inflow=11.35 cfs 0.859 af
Primary=11.35 cfs 0.859 af

Link 6L: Prop SA South Inflow=9.10 cfs 0.677 af
Primary=9.10 cfs 0.677 af

Total Runoff Area = 2.990 ac Runoff Volume = 1.536 af Average Runoff Depth = 6.16"
40.77% Pervious = 1.219 ac 59.23% Impervious = 1.771 ac

Summary for Subcatchment 1S: Prop SA North Imp

Sheet Flow = 100 * SqRoot(s)/N = 100 * SqRoot(0.01)/0.011 = 909' (Use 70')

[49] Hint: Tc<2dt may require smaller dt

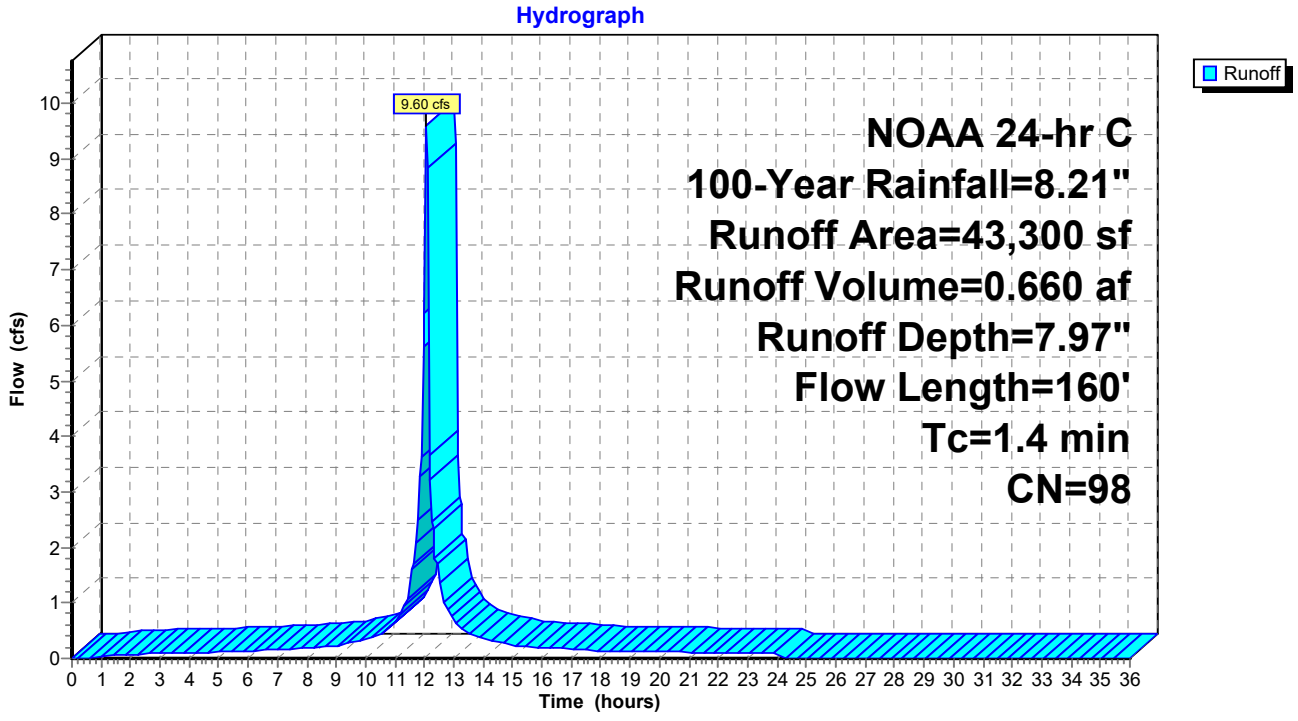
Runoff = 9.60 cfs @ 12.07 hrs, Volume= 0.660 af, Depth= 7.97"
Routed to Link 3L : Prop SA North

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year Rainfall=8.21"

Area (sf)	CN	Description
12,060	98	Paved parking, HSG B
31,240	98	Roofs, HSG B
43,300	98	Weighted Average
43,300		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	70	0.0100	0.99		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.34"
0.2	90	0.0200	9.68	11.88	**Pipe Channel, Channel Flow** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
1.4	160	Total			

Subcatchment 1S: Prop SA North Imp



Hydrograph for Subcatchment 1S: Prop SA North Imp

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.09	0.01	0.03
1.50	0.14	0.03	0.05
2.00	0.19	0.06	0.07
2.50	0.24	0.10	0.08
3.00	0.29	0.14	0.09
3.50	0.34	0.18	0.09
4.00	0.40	0.23	0.10
4.50	0.46	0.28	0.11
5.00	0.52	0.34	0.11
5.50	0.59	0.40	0.12
6.00	0.65	0.46	0.12
6.50	0.72	0.52	0.14
7.00	0.80	0.60	0.16
7.50	0.89	0.68	0.18
8.00	0.98	0.78	0.19
8.50	1.09	0.88	0.21
9.00	1.20	0.98	0.23
9.50	1.33	1.12	0.29
10.00	1.50	1.28	0.35
10.50	1.69	1.47	0.42
11.00	1.97	1.74	0.66
11.50	2.43	2.20	1.14
12.00	3.91	3.68	**6.20**
12.50	5.78	5.55	**1.59**
13.00	6.24	6.00	0.73
13.50	6.52	6.28	0.46
14.00	6.71	6.47	0.36
14.50	6.88	6.64	0.30
15.00	7.01	6.77	0.24
15.50	7.12	6.88	0.22
16.00	7.23	6.99	0.20
16.50	7.32	7.08	0.18
17.00	7.41	7.17	0.17
17.50	7.49	7.25	0.15
18.00	7.56	7.32	0.14
18.50	7.62	7.39	0.13
19.00	7.69	7.45	0.12
19.50	7.75	7.51	0.12
20.00	7.81	7.57	0.12
20.50	7.87	7.63	0.11
21.00	7.92	7.68	0.11
21.50	7.97	7.73	0.10
22.00	8.02	7.78	0.10
22.50	8.07	7.83	0.10
23.00	8.12	7.88	0.09
23.50	8.17	7.93	0.09
24.00	**8.21**	**7.97**	0.09
24.50	8.21	7.97	0.00
25.00	8.21	7.97	0.00
25.50	8.21	7.97	0.00
26.00	8.21	7.97	0.00
26.50	8.21	7.97	0.00
27.00	8.21	7.97	0.00
27.50	8.21	7.97	0.00
28.00	8.21	7.97	0.00
28.50	8.21	7.97	0.00
29.00	8.21	7.97	0.00
29.50	8.21	7.97	0.00
30.00	8.21	7.97	0.00
30.50	8.21	7.97	0.00
31.00	8.21	7.97	0.00
31.50	8.21	7.97	0.00
32.00	8.21	7.97	0.00
32.50	8.21	7.97	0.00
33.00	8.21	7.97	0.00
33.50	8.21	7.97	0.00
34.00	8.21	7.97	0.00
34.50	8.21	7.97	0.00
35.00	8.21	7.97	0.00
35.50	8.21	7.97	0.00
36.00	8.21	7.97	0.00

Summary for Subcatchment 2S: Prop SA North Perv

Sheet Flow = 100 * SqRoot(s)/N = 100 * SqRoot(0.017)/0.24 = 54' (Use 54')

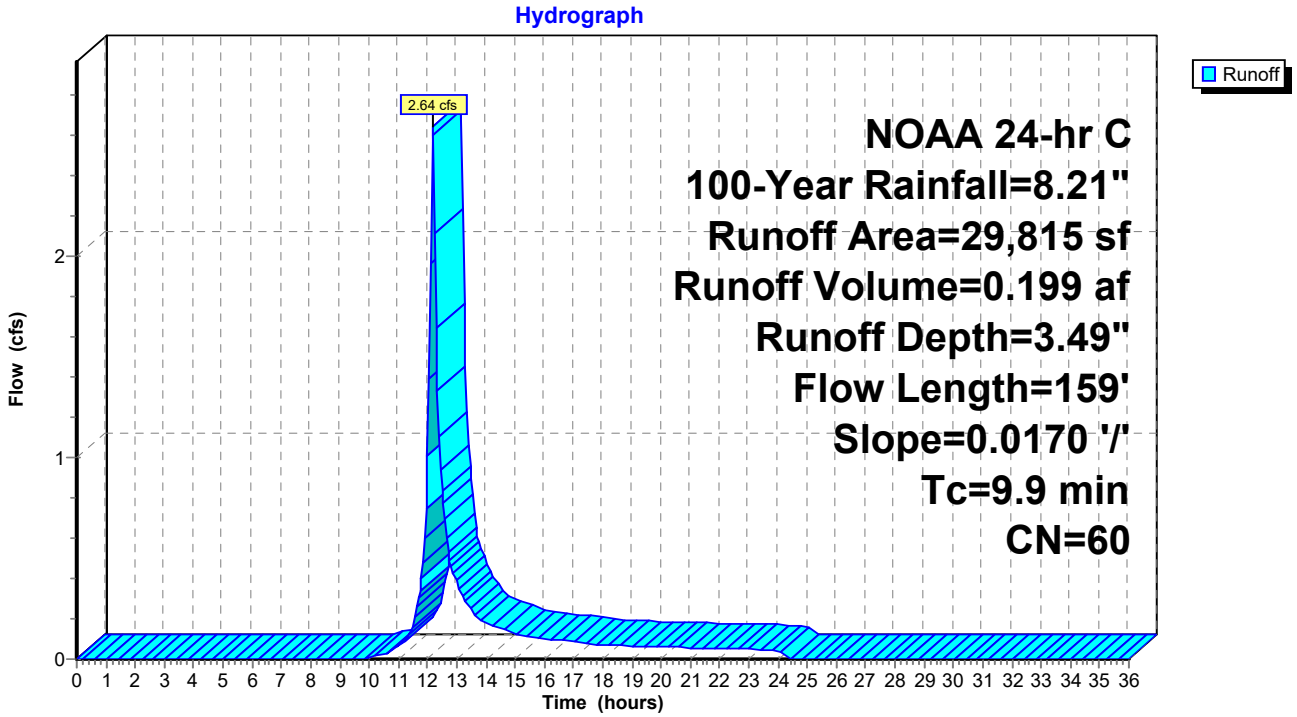
Runoff = 2.64 cfs @ 12.18 hrs, Volume= 0.199 af, Depth= 3.49"
Routed to Link 3L : Prop SA North

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year Rainfall=8.21"

Area (sf)	CN	Description
6,265	55	Woods, Good, HSG B
23,550	61	>75% Grass cover, Good, HSG B
29,815	60	Weighted Average
29,815		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	54	0.0170	0.10		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 3.34"
0.8	105	0.0170	2.10		**Shallow Concentrated Flow, Shallow Concentrated Flow** Unpaved Kv= 16.1 fps
9.9	159	Total			

Subcatchment 2S: Prop SA North Perv



Hydrograph for Subcatchment 2S: Prop SA North Perv

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.09	0.00	0.00
1.50	0.14	0.00	0.00
2.00	0.19	0.00	0.00
2.50	0.24	0.00	0.00
3.00	0.29	0.00	0.00
3.50	0.34	0.00	0.00
4.00	0.40	0.00	0.00
4.50	0.46	0.00	0.00
5.00	0.52	0.00	0.00
5.50	0.59	0.00	0.00
6.00	0.65	0.00	0.00
6.50	0.72	0.00	0.00
7.00	0.80	0.00	0.00
7.50	0.89	0.00	0.00
8.00	0.98	0.00	0.00
8.50	1.09	0.00	0.00
9.00	1.20	0.00	0.00
9.50	1.33	0.00	0.00
10.00	1.50	0.00	0.01
10.50	1.69	0.02	0.02
11.00	1.97	0.06	0.06
11.50	2.43	0.15	0.16
12.00	3.91	0.72	**1.01**
12.50	5.78	1.78	**0.84**
13.00	6.24	2.08	0.38
13.50	6.52	2.27	0.24
14.00	6.71	2.40	0.18
14.50	6.88	2.52	0.15
15.00	7.01	2.61	0.12
15.50	7.12	2.69	0.11
16.00	7.23	2.77	0.10
16.50	7.32	2.83	0.09
17.00	7.41	2.90	0.09
17.50	7.49	2.95	0.08
18.00	7.56	3.01	0.07
18.50	7.62	3.05	0.07
19.00	7.69	3.10	0.06
19.50	7.75	3.15	0.06
20.00	7.81	3.19	0.06
20.50	7.87	3.23	0.06
21.00	7.92	3.27	0.06
21.50	7.97	3.31	0.05
22.00	8.02	3.35	0.05
22.50	8.07	3.39	0.05
23.00	8.12	3.42	0.05
23.50	8.17	3.46	0.05
24.00	**8.21**	**3.49**	0.05
24.50	8.21	3.49	0.00
25.00	8.21	3.49	0.00
25.50	8.21	3.49	0.00
26.00	8.21	3.49	0.00
26.50	8.21	3.49	0.00
27.00	8.21	3.49	0.00
27.50	8.21	3.49	0.00
28.00	8.21	3.49	0.00
28.50	8.21	3.49	0.00
29.00	8.21	3.49	0.00
29.50	8.21	3.49	0.00
30.00	8.21	3.49	0.00
30.50	8.21	3.49	0.00
31.00	8.21	3.49	0.00
31.50	8.21	3.49	0.00
32.00	8.21	3.49	0.00
32.50	8.21	3.49	0.00
33.00	8.21	3.49	0.00
33.50	8.21	3.49	0.00
34.00	8.21	3.49	0.00
34.50	8.21	3.49	0.00
35.00	8.21	3.49	0.00
35.50	8.21	3.49	0.00
36.00	8.21	3.49	0.00

Summary for Subcatchment 4S: Prop SA South Imp

Sheet Flow = 100 * SqRoot(s)/N = 100 * SqRoot(0.0125)/0.011 = 1016' (Use 100')

[49] Hint: Tc<2dt may require smaller dt
[47] Hint: Peak is 233% of capacity of segment #2

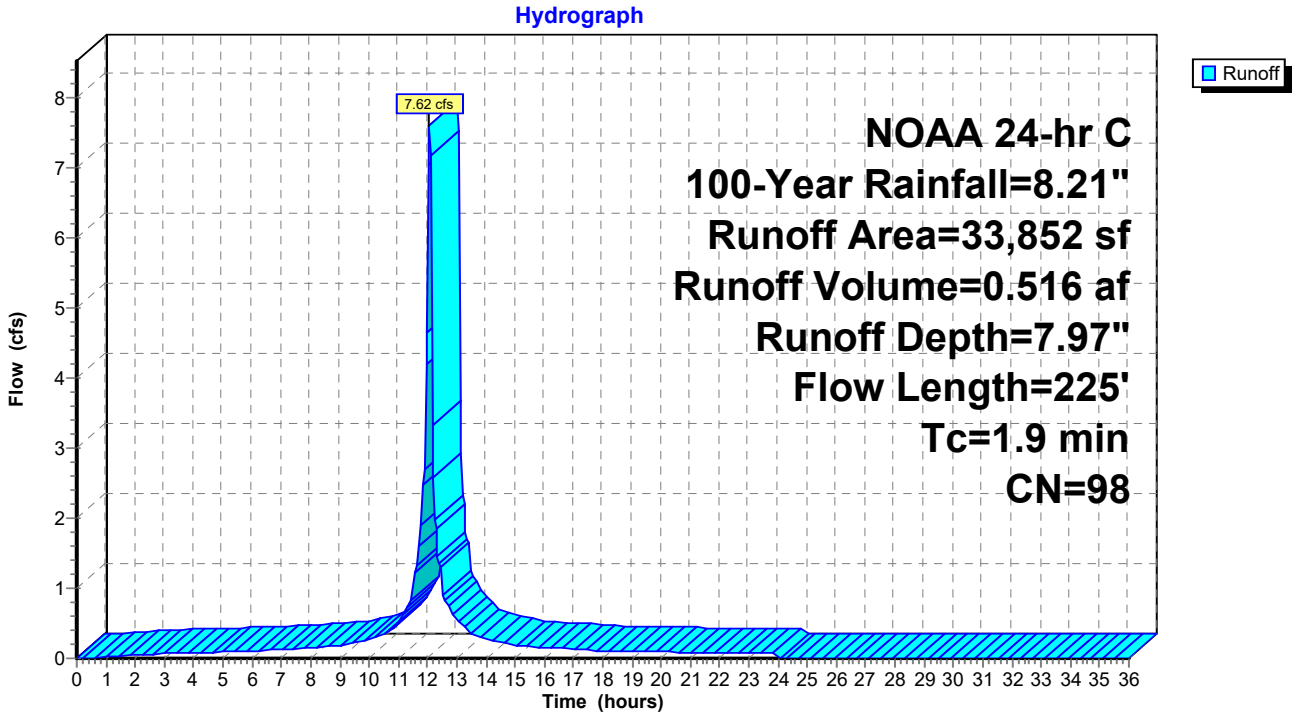
Runoff = 7.62 cfs @ 12.08 hrs, Volume= 0.516 af, Depth= 7.97"
Routed to Link 6L : Prop SA South

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year Rainfall=8.21"

Area (sf)	CN	Description
21,513	98	Roofs, HSG B
12,339	98	Paved parking, HSG B
33,852	98	Weighted Average
33,852		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	90	0.0100	1.04		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.34"
0.5	135	0.0050	4.17	3.28	**Pipe Channel, Pipe Cahnnel Flow B** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
1.9	225	Total			

Subcatchment 4S: Prop SA South Imp



Hydrograph for Subcatchment 4S: Prop SA South Imp

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.09	0.01	0.02
1.50	0.14	0.03	0.04
2.00	0.19	0.06	0.05
2.50	0.24	0.10	0.06
3.00	0.29	0.14	0.07
3.50	0.34	0.18	0.07
4.00	0.40	0.23	0.08
4.50	0.46	0.28	0.08
5.00	0.52	0.34	0.09
5.50	0.59	0.40	0.09
6.00	0.65	0.46	0.10
6.50	0.72	0.52	0.11
7.00	0.80	0.60	0.12
7.50	0.89	0.68	0.14
8.00	0.98	0.78	0.15
8.50	1.09	0.88	0.16
9.00	1.20	0.98	0.18
9.50	1.33	1.12	0.22
10.00	1.50	1.28	0.27
10.50	1.69	1.47	0.32
11.00	1.97	1.74	0.51
11.50	2.43	2.20	0.86
12.00	3.91	3.68	**4.66**
12.50	5.78	5.55	**1.27**
13.00	6.24	6.00	0.57
13.50	6.52	6.28	0.36
14.00	6.71	6.47	0.29
14.50	6.88	6.64	0.24
15.00	7.01	6.77	0.19
15.50	7.12	6.88	0.17
16.00	7.23	6.99	0.16
16.50	7.32	7.08	0.14
17.00	7.41	7.17	0.13
17.50	7.49	7.25	0.12
18.00	7.56	7.32	0.11
18.50	7.62	7.39	0.10
19.00	7.69	7.45	0.10
19.50	7.75	7.51	0.09
20.00	7.81	7.57	0.09
20.50	7.87	7.63	0.09
21.00	7.92	7.68	0.08
21.50	7.97	7.73	0.08
22.00	8.02	7.78	0.08
22.50	8.07	7.83	0.08
23.00	8.12	7.88	0.07
23.50	8.17	7.93	0.07
24.00	**8.21**	**7.97**	0.08
24.50	8.21	7.97	0.00
25.00	8.21	7.97	0.00
25.50	8.21	7.97	0.00
26.00	8.21	7.97	0.00
26.50	8.21	7.97	0.00
27.00	8.21	7.97	0.00
27.50	8.21	7.97	0.00
28.00	8.21	7.97	0.00
28.50	8.21	7.97	0.00
29.00	8.21	7.97	0.00
29.50	8.21	7.97	0.00
30.00	8.21	7.97	0.00
30.50	8.21	7.97	0.00
31.00	8.21	7.97	0.00
31.50	8.21	7.97	0.00
32.00	8.21	7.97	0.00
32.50	8.21	7.97	0.00
33.00	8.21	7.97	0.00
33.50	8.21	7.97	0.00
34.00	8.21	7.97	0.00
34.50	8.21	7.97	0.00
35.00	8.21	7.97	0.00
35.50	8.21	7.97	0.00
36.00	8.21	7.97	0.00

Summary for Subcatchment 5S: Prop SA South Perv

Sheet Flow = 100 * SqRoot(s)/n = 100 * SqRoot(0.018)/0.24 = 56' (Use 56')

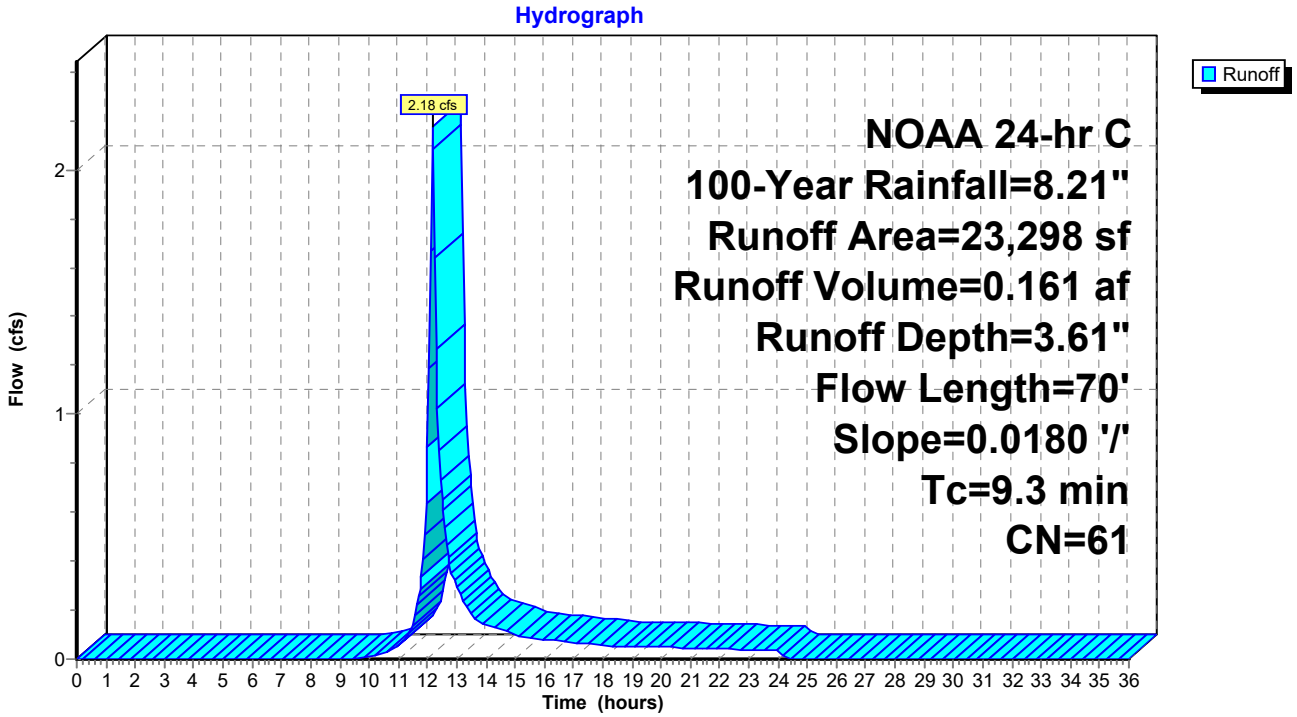
Runoff = 2.18 cfs @ 12.17 hrs, Volume= 0.161 af, Depth= 3.61"
Routed to Link 6L : Prop SA South

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NOAA 24-hr C 100-Year Rainfall=8.21"

Area (sf)	CN	Description
1,516	55	Woods, Good, HSG B
21,782	61	>75% Grass cover, Good, HSG B
23,298	61	Weighted Average
23,298		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	56	0.0180	0.10		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 3.34"
0.1	14	0.0180	2.16		**Shallow Concentrated Flow, Shallow Concentrated Flow** Unpaved Kv= 16.1 fps
9.3	70	Total			

Subcatchment 5S: Prop SA South Perv



Hydrograph for Subcatchment 5S: Prop SA South Perv

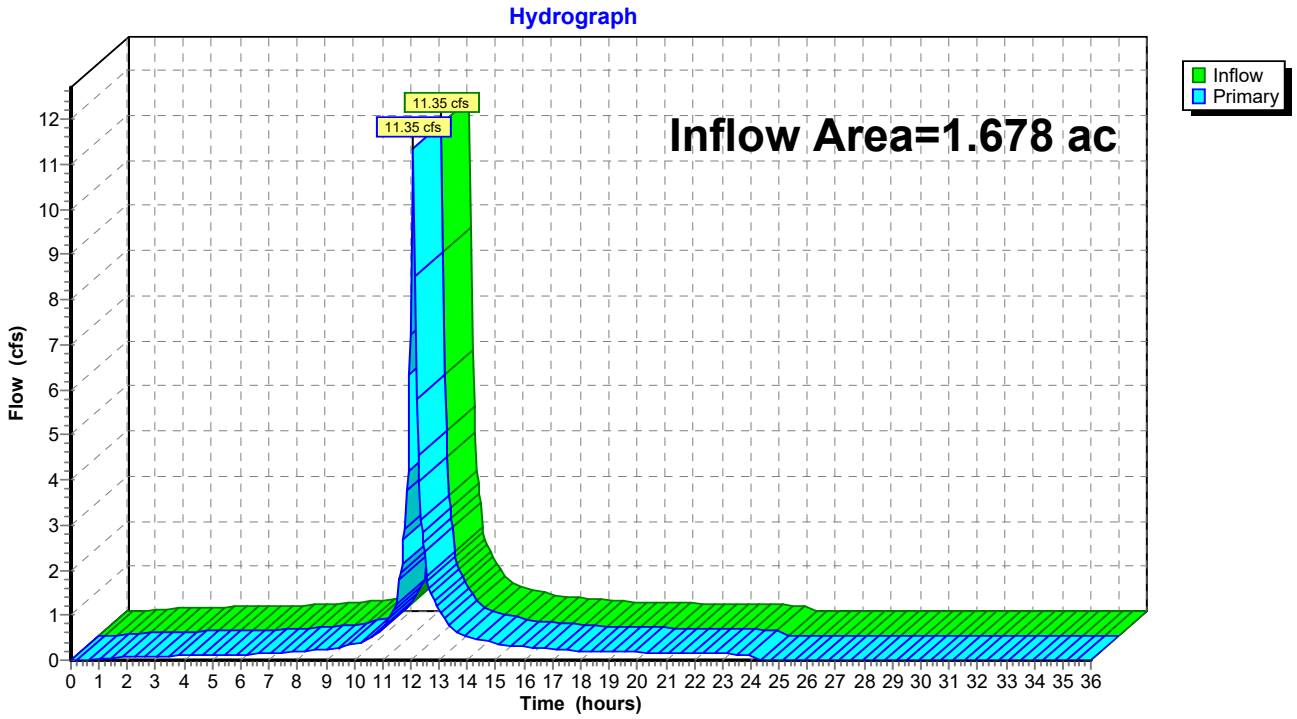
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.04	0.00	0.00
1.00	0.09	0.00	0.00
1.50	0.14	0.00	0.00
2.00	0.19	0.00	0.00
2.50	0.24	0.00	0.00
3.00	0.29	0.00	0.00
3.50	0.34	0.00	0.00
4.00	0.40	0.00	0.00
4.50	0.46	0.00	0.00
5.00	0.52	0.00	0.00
5.50	0.59	0.00	0.00
6.00	0.65	0.00	0.00
6.50	0.72	0.00	0.00
7.00	0.80	0.00	0.00
7.50	0.89	0.00	0.00
8.00	0.98	0.00	0.00
8.50	1.09	0.00	0.00
9.00	1.20	0.00	0.00
9.50	1.33	0.00	0.00
10.00	1.50	0.01	0.01
10.50	1.69	0.03	0.02
11.00	1.97	0.07	0.05
11.50	2.43	0.17	0.14
12.00	3.91	0.77	**0.87**
12.50	5.78	1.86	**0.65**
13.00	6.24	2.17	0.30
13.50	6.52	2.36	0.19
14.00	6.71	2.50	0.14
14.50	6.88	2.61	0.12
15.00	7.01	2.71	0.10
15.50	7.12	2.79	0.09
16.00	7.23	2.87	0.08
16.50	7.32	2.94	0.07
17.00	7.41	3.00	0.07
17.50	7.49	3.06	0.06
18.00	7.56	3.11	0.06
18.50	7.62	3.16	0.05
19.00	7.69	3.21	0.05
19.50	7.75	3.25	0.05
20.00	7.81	3.30	0.05
20.50	7.87	3.34	0.05
21.00	7.92	3.38	0.04
21.50	7.97	3.42	0.04
22.00	8.02	3.46	0.04
22.50	8.07	3.50	0.04
23.00	8.12	3.54	0.04
23.50	8.17	3.57	0.04
24.00	**8.21**	**3.61**	0.04
24.50	8.21	3.61	0.00
25.00	8.21	3.61	0.00
25.50	8.21	3.61	0.00
26.00	8.21	3.61	0.00
26.50	8.21	3.61	0.00
27.00	8.21	3.61	0.00
27.50	8.21	3.61	0.00
28.00	8.21	3.61	0.00
28.50	8.21	3.61	0.00
29.00	8.21	3.61	0.00
29.50	8.21	3.61	0.00
30.00	8.21	3.61	0.00
30.50	8.21	3.61	0.00
31.00	8.21	3.61	0.00
31.50	8.21	3.61	0.00
32.00	8.21	3.61	0.00
32.50	8.21	3.61	0.00
33.00	8.21	3.61	0.00
33.50	8.21	3.61	0.00
34.00	8.21	3.61	0.00
34.50	8.21	3.61	0.00
35.00	8.21	3.61	0.00
35.50	8.21	3.61	0.00
36.00	8.21	3.61	0.00

Summary for Link 3L: Prop SA North

Inflow Area = 1.678 ac, 59.22% Impervious, Inflow Depth = 6.14" for 100-Year event
Inflow = 11.35 cfs @ 12.08 hrs, Volume= 0.859 af
Primary = 11.35 cfs @ 12.08 hrs, Volume= 0.859 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 3L: Prop SA North



Hydrograph for Link 3L: Prop SA North

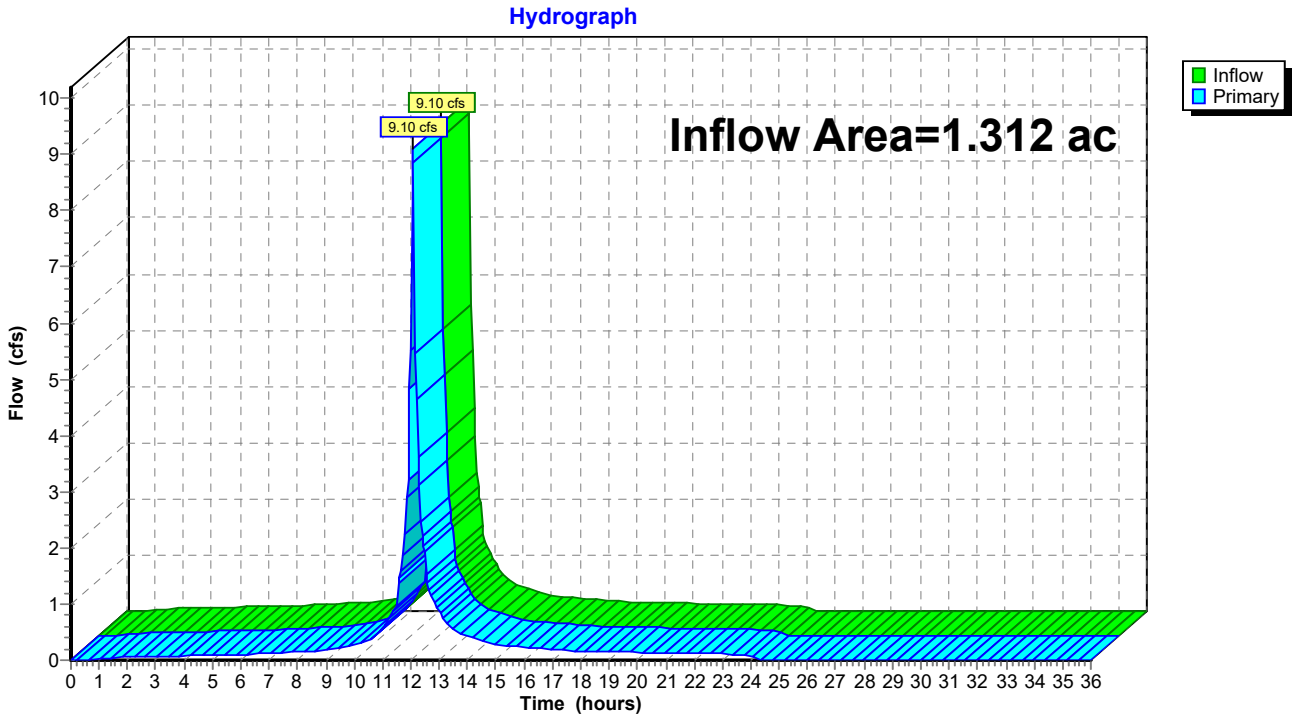
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	26.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00	26.50	0.00	0.00	0.00
1.00	0.03	0.00	0.03	27.00	0.00	0.00	0.00
1.50	0.05	0.00	0.05	27.50	0.00	0.00	0.00
2.00	0.07	0.00	0.07	28.00	0.00	0.00	0.00
2.50	0.08	0.00	0.08	28.50	0.00	0.00	0.00
3.00	0.09	0.00	0.09	29.00	0.00	0.00	0.00
3.50	0.09	0.00	0.09	29.50	0.00	0.00	0.00
4.00	0.10	0.00	0.10	30.00	0.00	0.00	0.00
4.50	0.11	0.00	0.11	30.50	0.00	0.00	0.00
5.00	0.11	0.00	0.11	31.00	0.00	0.00	0.00
5.50	0.12	0.00	0.12	31.50	0.00	0.00	0.00
6.00	0.12	0.00	0.12	32.00	0.00	0.00	0.00
6.50	0.14	0.00	0.14	32.50	0.00	0.00	0.00
7.00	0.16	0.00	0.16	33.00	0.00	0.00	0.00
7.50	0.18	0.00	0.18	33.50	0.00	0.00	0.00
8.00	0.19	0.00	0.19	34.00	0.00	0.00	0.00
8.50	0.21	0.00	0.21	34.50	0.00	0.00	0.00
9.00	0.23	0.00	0.23	35.00	0.00	0.00	0.00
9.50	0.29	0.00	0.29	35.50	0.00	0.00	0.00
10.00	0.36	0.00	0.36	36.00	0.00	0.00	0.00
10.50	0.44	0.00	0.44				
11.00	0.72	0.00	0.72				
11.50	1.30	0.00	1.30				
12.00	**7.21**	0.00	**7.21**				
12.50	**2.43**	0.00	**2.43**				
13.00	1.11	0.00	1.11				
13.50	0.70	0.00	0.70				
14.00	0.54	0.00	0.54				
14.50	0.46	0.00	0.46				
15.00	0.37	0.00	0.37				
15.50	0.33	0.00	0.33				
16.00	0.30	0.00	0.30				
16.50	0.28	0.00	0.28				
17.00	0.25	0.00	0.25				
17.50	0.23	0.00	0.23				
18.00	0.21	0.00	0.21				
18.50	0.19	0.00	0.19				
19.00	0.19	0.00	0.19				
19.50	0.18	0.00	0.18				
20.00	0.18	0.00	0.18				
20.50	0.17	0.00	0.17				
21.00	0.16	0.00	0.16				
21.50	0.16	0.00	0.16				
22.00	0.15	0.00	0.15				
22.50	0.15	0.00	0.15				
23.00	0.14	0.00	0.14				
23.50	0.13	0.00	0.13				
24.00	0.14	0.00	0.14				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				

Summary for Link 6L: Prop SA South

Inflow Area = 1.312 ac, 59.23% Impervious, Inflow Depth = 6.19" for 100-Year event
Inflow = 9.10 cfs @ 12.08 hrs, Volume= 0.677 af
Primary = 9.10 cfs @ 12.08 hrs, Volume= 0.677 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link 6L: Prop SA South



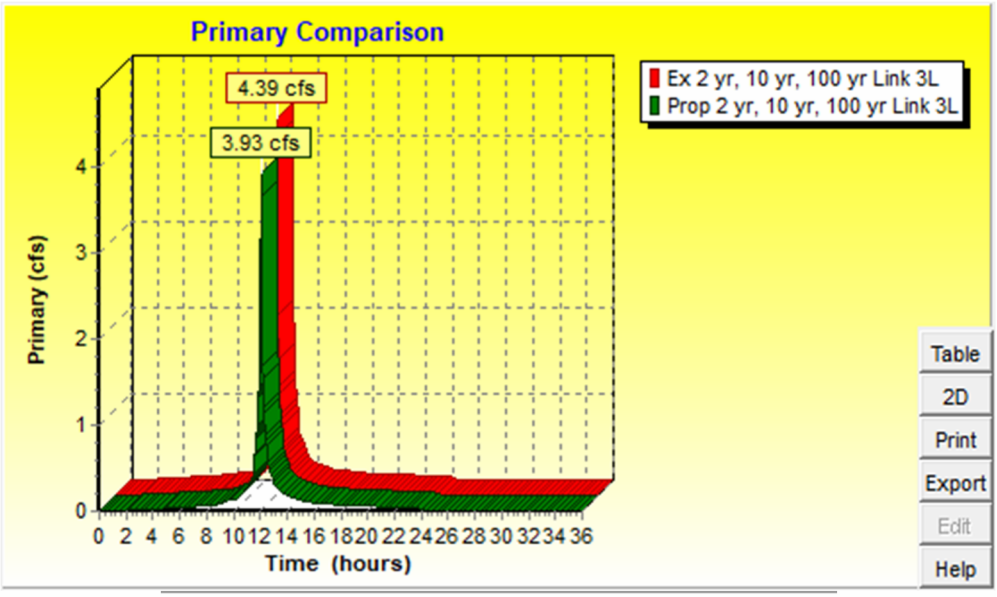
Hydrograph for Link 6L: Prop SA South

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00
0.50	0.00	0.00	0.00
1.00	0.02	0.00	0.02
1.50	0.04	0.00	0.04
2.00	0.05	0.00	0.05
2.50	0.06	0.00	0.06
3.00	0.07	0.00	0.07
3.50	0.07	0.00	0.07
4.00	0.08	0.00	0.08
4.50	0.08	0.00	0.08
5.00	0.09	0.00	0.09
5.50	0.09	0.00	0.09
6.00	0.10	0.00	0.10
6.50	0.11	0.00	0.11
7.00	0.12	0.00	0.12
7.50	0.14	0.00	0.14
8.00	0.15	0.00	0.15
8.50	0.16	0.00	0.16
9.00	0.18	0.00	0.18
9.50	0.23	0.00	0.23
10.00	0.28	0.00	0.28
10.50	0.35	0.00	0.35
11.00	0.56	0.00	0.56
11.50	1.00	0.00	1.00
12.00	**5.53**	0.00	**5.53**
12.50	**1.92**	0.00	**1.92**
13.00	0.87	0.00	0.87
13.50	0.55	0.00	0.55
14.00	0.43	0.00	0.43
14.50	0.36	0.00	0.36
15.00	0.29	0.00	0.29
15.50	0.26	0.00	0.26
16.00	0.24	0.00	0.24
16.50	0.22	0.00	0.22
17.00	0.20	0.00	0.20
17.50	0.18	0.00	0.18
18.00	0.16	0.00	0.16
18.50	0.15	0.00	0.15
19.00	0.15	0.00	0.15
19.50	0.14	0.00	0.14
20.00	0.14	0.00	0.14
20.50	0.13	0.00	0.13
21.00	0.13	0.00	0.13
21.50	0.12	0.00	0.12
22.00	0.12	0.00	0.12
22.50	0.12	0.00	0.12
23.00	0.11	0.00	0.11
23.50	0.11	0.00	0.11
24.00	0.11	0.00	0.11
24.50	0.00	0.00	0.00
25.00	0.00	0.00	0.00
25.50	0.00	0.00	0.00
26.00	0.00	0.00	0.00
26.50	0.00	0.00	0.00
27.00	0.00	0.00	0.00
27.50	0.00	0.00	0.00
28.00	0.00	0.00	0.00
28.50	0.00	0.00	0.00
29.00	0.00	0.00	0.00
29.50	0.00	0.00	0.00
30.00	0.00	0.00	0.00
30.50	0.00	0.00	0.00
31.00	0.00	0.00	0.00
31.50	0.00	0.00	0.00
32.00	0.00	0.00	0.00
32.50	0.00	0.00	0.00
33.00	0.00	0.00	0.00
33.50	0.00	0.00	0.00
34.00	0.00	0.00	0.00
34.50	0.00	0.00	0.00
35.00	0.00	0.00	0.00
35.50	0.00	0.00	0.00
36.00	0.00	0.00	0.00

TABLE OF CONTENTS

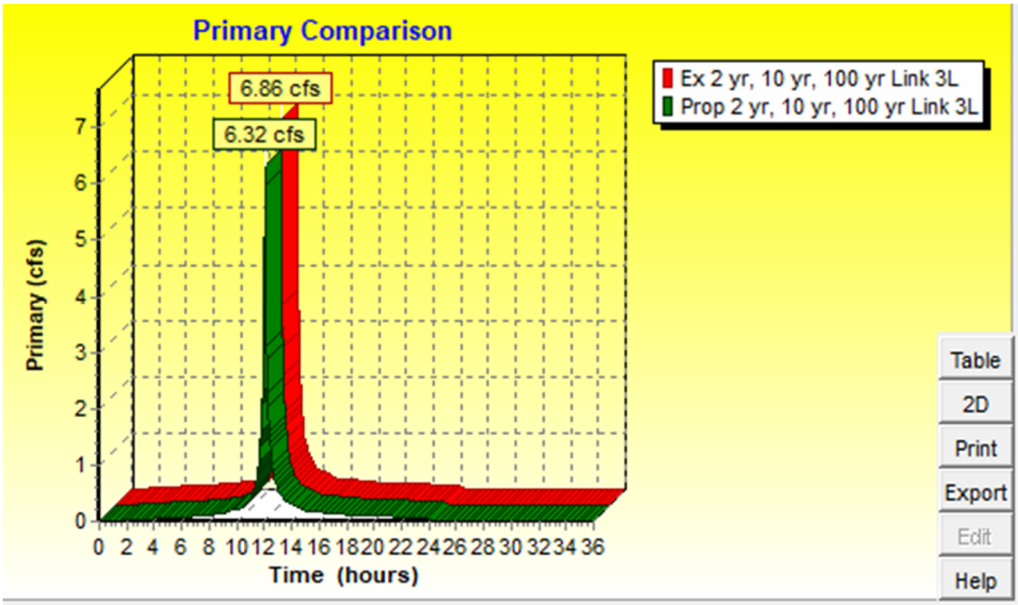
HydroCAD SUMMARY REPORTS – PRE VS POST CONDITIONS 2 YR, 10 YR & 100 YR

Study Area North (2-year Storm)



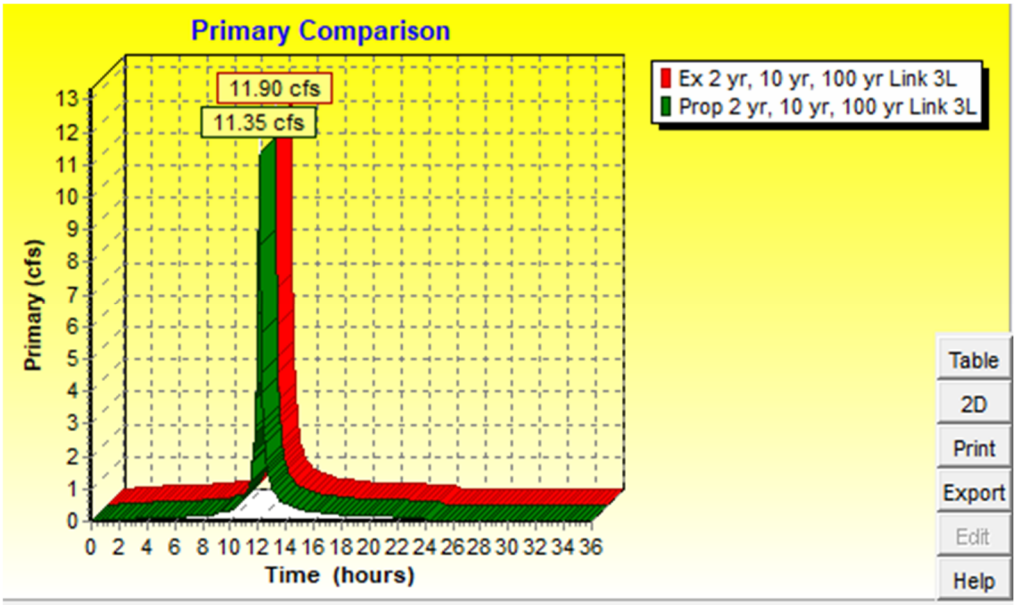
Time (hours)	Ex 2 yr, 10 yr, 100 yr Link 3L (cfs)	Prop 2 yr, 10 yr, 100 yr Link 3L (cfs)
0.00	0.00	0.00
1.00	0.00	0.00
2.00	0.01	0.01
3.00	0.02	0.02
4.00	0.03	0.03
5.00	0.04	0.04
6.00	0.05	0.04
7.00	0.06	0.06
8.00	0.08	0.07
9.00	0.09	0.09
10.00	0.15	0.13
11.00	0.28	0.26
12.00	**2.65**	**2.51**
13.00	**0.38**	**0.36**
14.00	0.19	0.18
15.00	0.13	0.12
16.00	0.10	0.10
17.00	0.09	0.09
18.00	0.07	0.07
19.00	0.07	0.06
20.00	0.06	0.06
21.00	0.06	0.06
22.00	0.05	0.05
23.00	0.05	0.05
24.00	0.05	0.05
25.00	0.00	0.00
26.00	0.00	0.00
27.00	0.00	0.00
28.00	0.00	0.00
29.00	0.00	0.00
30.00	0.00	0.00
31.00	0.00	0.00
32.00	0.00	0.00
33.00	0.00	0.00
34.00	0.00	0.00
35.00	0.00	0.00
36.00	0.00	0.00

Study Area North (10-year Storm)



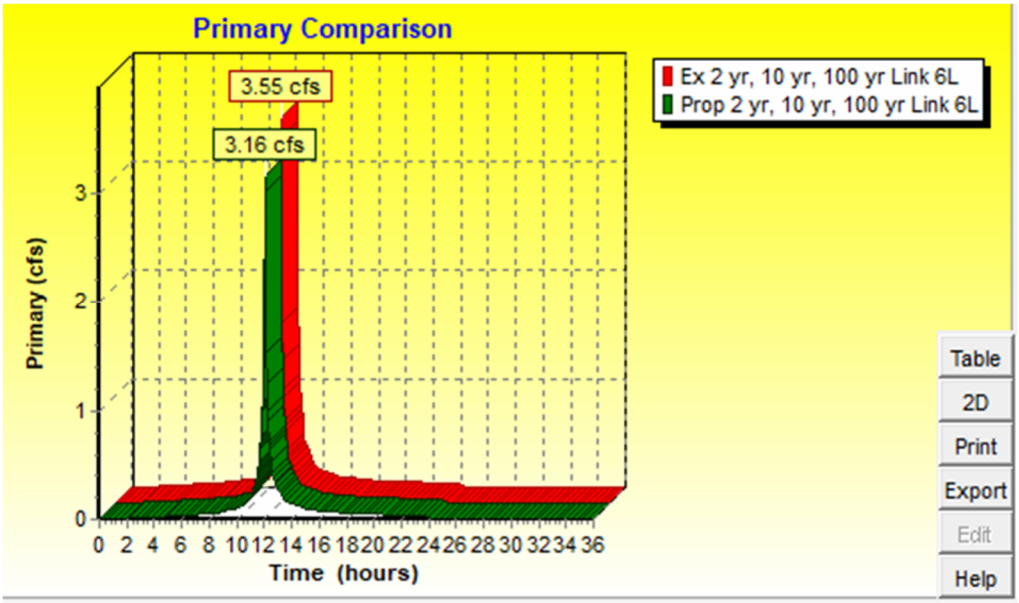
Time (hours)	Ex 2 yr, 10 yr, 100 yr Link 3L (cfs)	Prop 2 yr, 10 yr, 100 yr Link 3L (cfs)
0.00	0.00	0.00
1.00	0.01	0.01
2.00	0.03	0.03
3.00	0.05	0.04
4.00	0.06	0.05
5.00	0.07	0.06
6.00	0.08	0.07
7.00	0.10	0.09
8.00	0.13	0.11
9.00	0.15	0.13
10.00	0.23	0.21
11.00	0.44	0.40
12.00	**4.13**	**4.03**
13.00	**0.62**	**0.60**
14.00	0.31	0.30
15.00	0.21	0.20
16.00	0.17	0.17
17.00	0.14	0.14
18.00	0.12	0.11
19.00	0.11	0.11
20.00	0.10	0.10
21.00	0.09	0.09
22.00	0.09	0.09
23.00	0.08	0.08
24.00	0.08	0.08
25.00	0.00	0.00
26.00	0.00	0.00
27.00	0.00	0.00
28.00	0.00	0.00
29.00	0.00	0.00
30.00	0.00	0.00
31.00	0.00	0.00
32.00	0.00	0.00
33.00	0.00	0.00
34.00	0.00	0.00
35.00	0.00	0.00
36.00	0.00	0.00

Study Area North (100-year Storm)



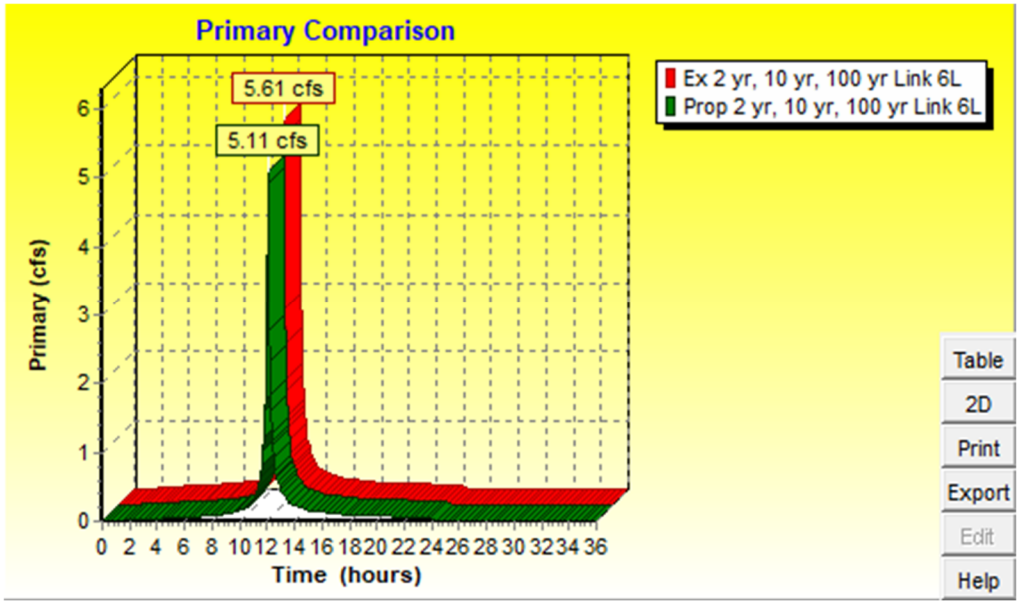
Time (hours)	Ex 2 yr, 10 yr, 100 yr Link 3L (cfs)	Prop 2 yr, 10 yr, 100 yr Link 3L (cfs)
0.00	0.00	0.00
1.00	0.03	0.03
2.00	0.07	0.07
3.00	0.10	0.09
4.00	0.11	0.10
5.00	0.13	0.11
6.00	0.14	0.12
7.00	0.18	0.16
8.00	0.21	0.19
9.00	0.25	0.23
10.00	0.39	0.36
11.00	0.76	0.72
12.00	**7.21**	**7.21**
13.00	**1.13**	**1.11**
14.00	0.55	0.54
15.00	0.37	0.37
16.00	0.30	0.30
17.00	0.26	0.25
18.00	0.21	0.21
19.00	0.19	0.19
20.00	0.18	0.18
21.00	0.17	0.16
22.00	0.15	0.15
23.00	0.14	0.14
24.00	0.15	0.14
25.00	0.00	0.00
26.00	0.00	0.00
27.00	0.00	0.00
28.00	0.00	0.00
29.00	0.00	0.00
30.00	0.00	0.00
31.00	0.00	0.00
32.00	0.00	0.00
33.00	0.00	0.00
34.00	0.00	0.00
35.00	0.00	0.00
36.00	0.00	0.00

Study Area South (2-year Storm)



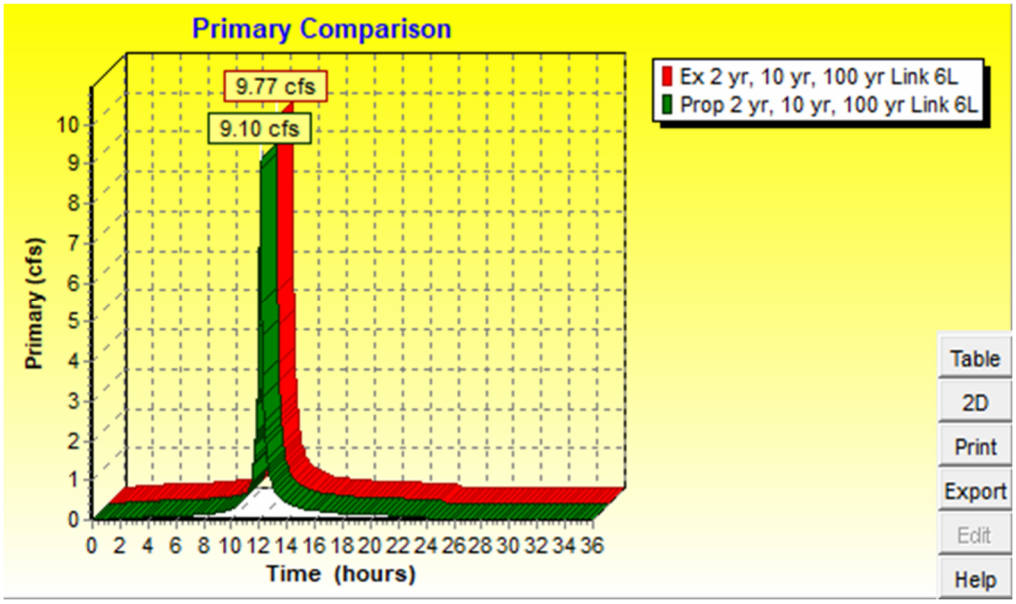
Time (hours)	Ex 2 yr, 10 yr, 100 yr Link 6L (cfs)	Prop 2 yr, 10 yr, 100 yr Link 6L (cfs)
0.00	0.00	0.00
1.00	0.00	0.00
2.00	0.01	0.01
3.00	0.02	0.02
4.00	0.03	0.02
5.00	0.03	0.03
6.00	0.04	0.03
7.00	0.05	0.04
8.00	0.06	0.05
9.00	0.08	0.07
10.00	0.12	0.10
11.00	0.23	0.20
12.00	**2.14**	**1.89**
13.00	**0.30**	**0.29**
14.00	0.15	0.14
15.00	0.10	0.10
16.00	0.08	0.08
17.00	0.07	0.07
18.00	0.06	0.05
19.00	0.05	0.05
20.00	0.05	0.05
21.00	0.05	0.04
22.00	0.04	0.04
23.00	0.04	0.04
24.00	0.04	0.04
25.00	0.00	0.00
26.00	0.00	0.00
27.00	0.00	0.00
28.00	0.00	0.00
29.00	0.00	0.00
30.00	0.00	0.00
31.00	0.00	0.00
32.00	0.00	0.00
33.00	0.00	0.00
34.00	0.00	0.00
35.00	0.00	0.00
36.00	0.00	0.00

Study Area South (10-year Storm)



Time (hours)	Ex 2 yr, 10 yr, 100 yr Link 6L (cfs)	Prop 2 yr, 10 yr, 100 yr Link 6L (cfs)
0.00	0.00	0.00
1.00	0.01	0.00
2.00	0.02	0.02
3.00	0.04	0.03
4.00	0.05	0.04
5.00	0.06	0.05
6.00	0.06	0.05
7.00	0.08	0.07
8.00	0.10	0.09
9.00	0.12	0.10
10.00	0.19	0.16
11.00	0.35	0.31
12.00	**3.40**	**3.08**
13.00	**0.50**	**0.48**
14.00	0.25	0.24
15.00	0.17	0.16
16.00	0.14	0.13
17.00	0.12	0.11
18.00	0.09	0.09
19.00	0.09	0.08
20.00	0.08	0.08
21.00	0.08	0.07
22.00	0.07	0.07
23.00	0.06	0.06
24.00	0.07	0.06
25.00	0.00	0.00
26.00	0.00	0.00
27.00	0.00	0.00
28.00	0.00	0.00
29.00	0.00	0.00
30.00	0.00	0.00
31.00	0.00	0.00
32.00	0.00	0.00
33.00	0.00	0.00
34.00	0.00	0.00
35.00	0.00	0.00
36.00	0.00	0.00

Study Area South (100-year Storm)



Time (hours)	Ex 2 yr, 10 yr, 100 yr Link 6L (cfs)	Prop 2 yr, 10 yr, 100 yr Link 6L (cfs)
0.00	0.00	0.00
1.00	0.03	0.02
2.00	0.06	0.05
3.00	0.08	0.07
4.00	0.09	0.08
5.00	0.10	0.09
6.00	0.11	0.10
7.00	0.14	0.12
8.00	0.17	0.15
9.00	0.20	0.18
10.00	0.32	0.28
11.00	0.62	0.56
12.00	**5.95**	**5.53**
13.00	**0.89**	**0.87**
14.00	0.44	0.43
15.00	0.29	0.29
16.00	0.24	0.24
17.00	0.20	0.20
18.00	0.16	0.16
19.00	0.15	0.15
20.00	0.14	0.14
21.00	0.13	0.13
22.00	0.12	0.12
23.00	0.11	0.11
24.00	0.12	0.11
25.00	0.00	0.00
26.00	0.00	0.00
27.00	0.00	0.00
28.00	0.00	0.00
29.00	0.00	0.00
30.00	0.00	0.00
31.00	0.00	0.00
32.00	0.00	0.00
33.00	0.00	0.00
34.00	0.00	0.00
35.00	0.00	0.00
36.00	0.00	0.00

NEW JERSEY GROUNDWATER RECHARGE SPREADSHEET (NJGRS) – VERSION 2

New Jersey Groundwater Recharge Spreadsheet Version 2.0 November 2003

Annual Groundwater Recharge Analysis (based on GSR-32)

Select Township ↓	Average Annual P (in)	Climatic Factor
SOMERSET CO., MONTGOMERY TWP	46.0	1.50

Project Name:	**Renard Management, Inc**
Description:	**Proposed Self-Storage Facility**
Analysis Date:	**06/14/23**

Pre-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	2	Impervious areas	Birdsboro	0.0	-
2	0.41	Woods	Birdsboro	14.7	21,863
3	0.58	Open space	Birdsboro	14.5	30,497
4					
5					
6					
7	0				
8	0				
9	0				
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	3.0			Total Annual Recharge (in)	Total Annual Recharge (cu-ft)
				4.8	52,360

Post-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	1.77	Impervious areas	Birdsboro	0.0	-
2	0.18	Woods	Birdsboro	14.7	9,598
3	1.04	Open space	Birdsboro	14.5	54,684
4					
5	0				
6	0				
7	0				
8	0				
9	0				
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	3.0			Total Annual Recharge (in)	Total Annual Recharge (cu.ft)
				5.9	64,282

Annual Recharge Requirements Calculation ↓

% of Pre-Developed Annual Recharge to Preserve =	100%	Total Impervious Area (sq.ft) 77,101
Post-Development Annual Recharge Deficit=	*-11,922*	(cubic feet)

Recharge Efficiency Parameters Calculations (area averages)

RWC=	5.50	(in)	DRWC= 5.50	(in)
ERWC =	1.37	(in)	EDRWC= 1.37	(in)

Procedure to fill the Pre-Development and Post-Development Conditions Tables

For each land segment, first enter the area, then select TR-55 Land Cover, then select Soil. Start from the top of the table and proceed downward. Don't leave blank rows (with A=0) in between your segment entries. Rows with A=0 will not be displayed or used in calculations. For impervious areas outside of standard lots select "Impervious Areas" as the Land Cover. Soil type for impervious areas are only required if an infiltration facility will be built within these areas.

STORMWATER COLLECTION SYSTEM CALCULATIONS (PIPE SIZING)

DYNAMIC ENGINEERING

Inlet Area Summary and Average Coefficient (C) Calculations

Project: Renard Managements, Inc
Job #: 2334-22-00894
Location: Township of Montgomery, NJ

Computed By: BC
Checked By: DT
Date: 6/14/2023

Drainage Area	Impervious Area (sf)	Coefficient (C) Used	Open Space (SF)	Coefficient (C) Used	Average Coefficient (C) Used	Total Area (SF)	Total Area (acres)
IA 1	0	0.95	1735	0.35	0.35	1735	0.04
IA 2	0	0.95	2363	0.35	0.35	2363	0.05
IA 4	0	0.95	3725	0.35	0.35	3725	0.09
ROOF 1C	5390	0.95	0	0.35	0.95	5390	0.12
IA 5	220	0.95	4600	0.35	0.38	4820	0.11
ROOF 1D	5390	0.95	0	0.35	0.95	5390	0.12
ROOF 1E	10780	0.95	0	0.35	0.95	10780	0.25
IA 9	8300	0.95	0	0.35	0.95	8300	0.19
IA 8	6215	0.95	430	0.35	0.91	6645	0.15
ROOF 2	9907	0.95	0	0.35	0.95	9907	0.23
IA 15	0	0.95	724	0.35	0.35	724	0.02
ROOF 1A	10755	0.95	0	0.35	0.95	10755	0.25
IA 31	3194	0.95	1072	0.35	0.80	4266	0.10
ROOF 1B	10520	0.95	0	0.35	0.95	10520	0.24
IA 30	2698	0.95	566	0.35	0.85	3264	0.07
IA 29	0	0.95	5557	0.35	0.35	5557	0.13
IA 27	0	0.95	1397	0.35	0.35	1397	0.03

DYNAMIC ENGINEERING

Stormwater Collection System Calculations

Project: Renard Management, Inc
Job #: 2334-22-00894
Location: Township of Montgomery, NJ
Design Storm: 25 year

Computed By: BC
Checked By: DT
Date: 6/14/2023

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)
IA 2	IA 4	0.05	0.35	0.02	0.03	10.00	0.32	10.24	6.80	0.14	0.20	12	80.0	0.010	0.0050	3.27	4.17
ROOF 1C	IA 4	0.12	0.95	0.11	0.11	10.00	0.07	10.00	6.80	0.75	0.75	12	18.0	0.010	0.0050	3.27	4.17
IA 4	IA 5	0.09	0.35	0.03	0.17	10.00	0.24	10.56	6.68	0.20	1.14	12	60.0	0.010	0.0050	3.27	4.17
ROOF 1D	IA 5	0.12	0.95	0.11	0.11	10.00	0.07	10.00	6.80	0.75	0.75	12	18.0	0.010	0.0050	3.27	4.17
IA 5	POA 1	0.11	0.38	0.04	0.32	10.00	0.22	10.80	6.68	0.27	2.14	12	54.0	0.010	0.0050	3.27	4.17
ROOF 1E	MH1	0.25	0.95	0.24	0.24	10.00	0.40	10.00	6.80	1.63	1.63	12	140.0	0.010	0.0100	4.63	5.90
IA 9	MH1	0.19	0.95	0.18	0.18	10.00	0.21	10.00	6.80	1.22	1.22	12	75.0	0.010	0.0100	4.63	5.90
MH1	POA 2	0.00	0.95	0.00	0.42	10.00	0.37	10.40	6.80	0.00	2.86	12	130.0	0.010	0.0100	4.63	5.90
ROOF 2	IA 8	0.23	0.95	0.22	0.22	10.00	0.34	10.00	6.80	1.50	1.50	15	200.0	0.010	0.0200	11.87	9.68
IA 8	IA 15	0.15	0.91	0.14	0.36	10.00	0.15	10.34	6.80	0.95	2.45	15	90.0	0.010	0.0200	11.87	9.68
IA 27	IA 29	0.03	0.35	0.01	0.01	10.00	0.12	10.00	6.80	0.07	0.07	15	70.0	0.010	0.0200	11.87	9.68
IA 29	IA 30	0.13	0.35	0.05	0.06	10.00	0.12	10.12	6.80	0.34	0.41	15	70.0	0.010	0.0200	11.87	9.68
IA 30	IA 31	0.07	0.85	0.06	0.36	10.00	0.15	10.24	6.80	0.41	2.45	15	85.0	0.010	0.0200	11.87	9.68
ROOF 1B	IA 30	0.25	0.95	0.24	0.24	10.00	0.05	10.00	6.80	1.63	1.63	15	30.0	0.010	0.0200	11.87	9.68
ROOF 1A	IA 31	0.24	0.95	0.23	0.23	10.00	0.03	10.00	6.80	1.56	1.56	15	15.0	0.010	0.0200	11.87	9.68
IA 31	IA 15	0.10	0.80	0.08	0.67	10.00	0.09	10.39	6.80	0.54	4.56	15	50.0	0.010	0.0200	11.87	9.68
IA 15	POA 3	0.02	0.35	0.01	1.04	10.00	0.06	10.49	6.80	0.07	7.07	15	40.0	0.010	0.0300	14.54	11.85

ATTACHMENT D – MAJOR DEVELOPMENT STORMWATER SUMMARY

Attachment D – Major Development Stormwater Summary

General Information

1. Project Name: Proposed Self-Storage Facility — Lot & Block Info:
2. Municipality: Township of Montgomery — County: Somerset County — Block 29002
3. Site Location (State Plane Coordinates – NAD83) — E: 450,968 — N: 571,814 — Lots 49 & 50
4. Date of Final Approval for Construction by Municipality (MM/DD/YYYY): TBD
   Date of Certificate of Occupancy (MM/DD/YYYY): TBD
5. Project Type (place an "x" after all that apply)
   Residential ☐ Commercial ☑ Industrial ☐ Other (please specify) _____
6. Soil Conservation District Project #: TBD
7. Did the project require a NJDEP Land Use Permit? Yes ○ No ◉ Land Use Permit #: _____
8. Did the project require any mitigation measures? Yes ○ No ◉
   If yes, which standard was mitigated? _____

Site Design Specifications

1. Site Area (acres): 2.99 Area of Disturbance (acres): 2.76 Area of Proposed Impervious (acres): 1.76
2. List all Hydrologic Soil Groups: B
3. Identify the Quantities of Each Type of Best Management Practices (BMPs) Incorporated into the Site Design:

   Bioretention Systems _____ Constructed Wetlands _____ Dry Wells _____ Extended Detention Basins _____
   Infiltration Basins _____ Combination Infiltration/Detention Basins _____ Manufactured Treatment Devices _____
   Pervious Paving Systems _____ Sand Filters _____ Vegetative Filter Strips _____ Wet Ponds _____
   Grass Swales _____ Subsurface Gravel Wetlands _____ Other: _____

Storm Event Information

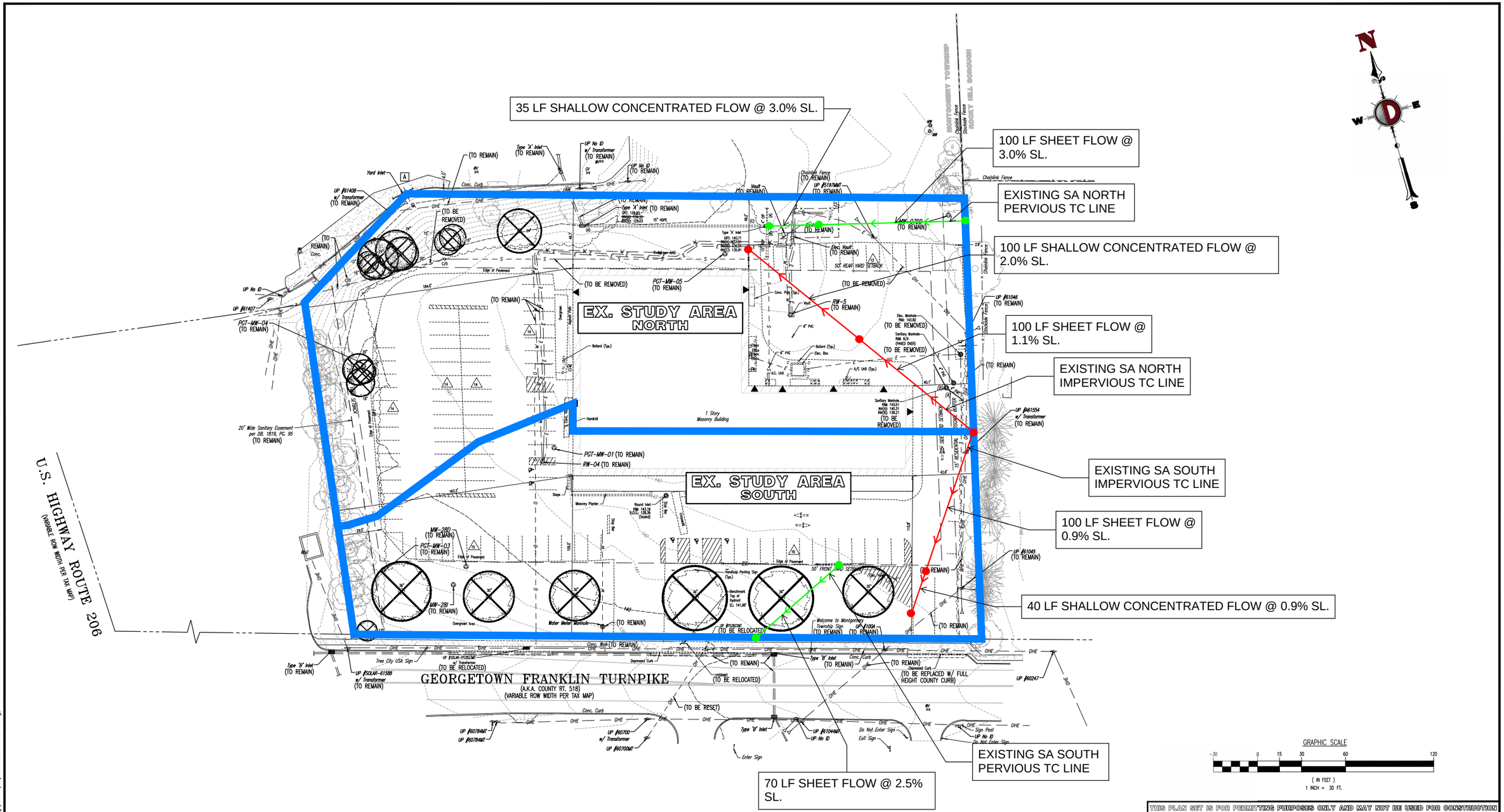
1. Storm Event – Rainfall (inches) / Duration (hours)
   2 year: 3.34 / 24 hr 10 year: 5.01 / 24 hr 100 year: 8.21 / 24 hr
   Water Quality Design Storm: 1.25 / 2 hr
2. Runoff Computation Method (mark one):
   NRCS Dimensionless Unit Hydrograph ☑ NRCS Delmarva Unit Hydrograph ☐ Rational Method ☐
   Modified Rational Method ☐ Other (describe):

BMP Specifications (answer all that apply) - If more than one BMP, see reverse side

1. BMP Name: _____ Type of BMP: _____
   Location (mark one): Surface ○ Subsurface ○ Is forebay part of the design? Yes ○ No ○
2. Owner (mark one): Public ○ Private ○
   If private, Owner's Name: _____ Owner's Telephone No.: _____
3. BMP Completion Date (MM/DD/YYYY): _____
4. Does the BMP have an underdrain? Yes ○ No ○
5. What is the Water Quality Design Storm Drain Down Time (hours)? _____
   What is the Design Soil Permeability (inches/hour): _____
6. What is the Seasonal High Water Table Depth from the BMP bottom (feet)? _____ Month Obtained: _____
7. Groundwater Recharge Methodology (mark one): 2-Year Difference ○ NJGRS ○ Other ○ N/A ○
8. Was Groundwater Mounding analyzed? Yes ○ No ○ If yes, Methodology: _____
9. Was a Maintenance Plan submitted? Yes ○ No ○ Is the BMP deed restricted? Yes ○ No ○

Name of Person Completing This Form: Joshua M. Sewald Signature: _____
Title: PE, PP Date: 06/14/2023

DRAINAGE AREA MAPS



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TITLE: EXISTING DRAINAGE AREA MAP

PROJECT: **RENARD MANAGEMENT, INC.**
PROPOSED SELF-STORAGE FACILITY
BLOCK 29002, LOTS 49 & 50
1026 ROUTE 518
TOWNSHIP OF MONTGOMERY, SOMERSET COUNTY, NEW JERSEY

JOB No:	2334-22-00894
DATE:	06/08/2023
DRAWN BY:	KNG
SCALE: (H) 1"=30' (V) -	
DESIGNED BY:	BC
CHECKED BY:	DT
CHECKED BY:	-
SHEET No:	1 OF 3
Rev.	0

JOSHUA M. SEWALD
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE No. 52908

KYLE C. KAVINSKI
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE No. 52985

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90 LF PIPE CHANNEL FLOW @ 2.0% SL.

105 LF SHALLOW CONCENTRATED FLOW @ 1.7% SL.

54 LF SHEET FLOW @ 1.7% SL.

PROPOSED SA NORTH PERVIOUS TC LINE

70 LF SHEET FLOW @ 1.0% SL.

PROPOSED SA NORTH IMPERVIOUS TC LINE

PROPOSED SA SOUTH IMPERVIOUS TC LINE

90 LF SHEET FLOW @ 1.0% SL.

135 LF PIPE CHANNEL FLOW @ 0.5% SL.

PROPOSED SA SOUTH PERVIOUS TC LINE

56 LF SHEET FLOW @ 1.8% SL.

14 LF SHALLOW CONCENTRATED FLOW @ 1.8% SL.

PROP. STUDY AREA NORTH

PROP. STUDY AREA SOUTH

U.S. HIGHWAY ROUTE 206
(VARIABLE ROW WIDTH PER TAX MAP)

GEORGETOWN FRANKLIN TURNPIKE
(A.K.A. COUNTY RT. 518)
(VARIABLE ROW WIDTH PER TAX MAP)

BOUNDARY TOWNSHIP
ROCKY HILL BOROUGH

GRAPHIC SCALE
-30 0 15 30 60 120
(IN FEET)
1 INCH = 30 FT.

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Newtown, Pennsylvania T: 267.685.0276 | Philadelphia, Pennsylvania T: 215.233.4888 | Bethlehem, Pennsylvania T: 610.798.4400

TITLE:
PROPOSED DRAINAGE AREA MAP

PROJECT: **RENARD MANAGEMENT, INC.**
PROPOSED SELF-STORAGE FACILITY
BLOCK 29002, LOTS 49 & 50
1026 ROUTE 518
TOWNSHIP OF MONTGOMERY, SOMERSET COUNTY, NEW JERSEY

JOB No:	2334-22-00894
DATE:	06/08/2023
DRAWN BY:	KNG
SCALE: (H) 1"=30' (V) -	
DESIGNED BY:	BC
CHECKED BY:	DT
CHECKED BY:	-
SHEET No:	2 OF 3
Rev. #	0

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KYLE C. KAVINSKI
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE No. 52985

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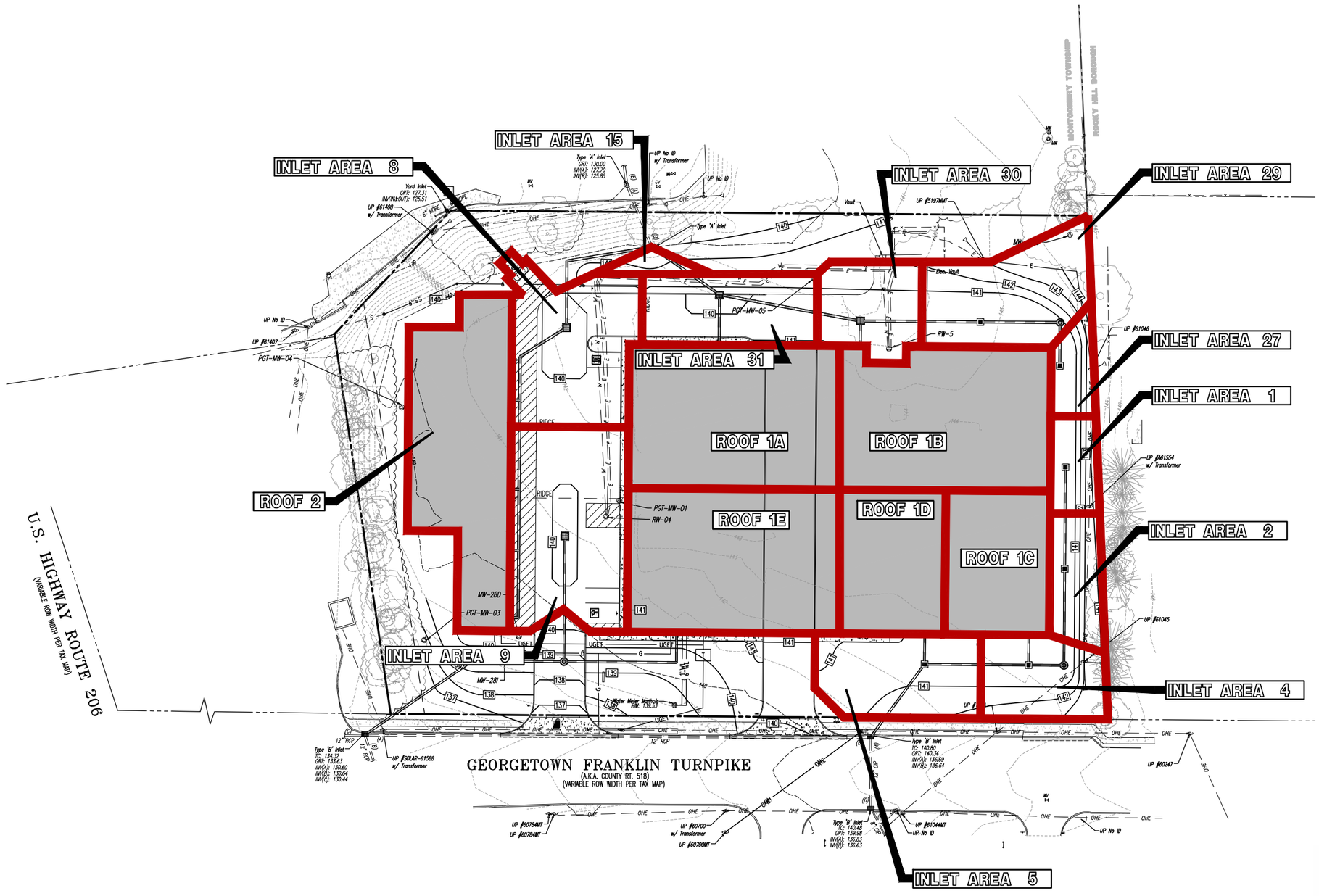

GRAPHIC SCALE

-30 0 15 30 60 120

(IN FEET)

1 INCH = 30 FT.

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TITLE:

INLET AREA MAP

PROJECT: **RENARD MANAGEMENT, INC.**
PROPOSED SELF-STORAGE FACILITY
BLOCK 29002, LOTS 49 & 50
1026 ROUTE 518
TOWNSHIP OF MONTGOMERY, SOMERSET COUNTY, NEW JERSEY

JOB No:	2334-22-00894
DRAWN BY:	UV
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Rev. #	0

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