

STORM WATER REPORT FOR:

SHIHAB LAW OFFICE BUILDING

EMERALD PARKWAY
DUBLIN, OHIO 43016

Nov. 21st, 2022

Prepared by:
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INTRODUCTION

The proposed Shihab Law Office Building project is located at the northwest corner of the Emerald Parkway and Woerner Temple Road intersection in Dublin, OH. The proposed 1.820 ± acre site will be cut out of an existing 2.856 ± acre parcel (PN: 273-004511). Improvements will consist of a building, parking lot, dry pond, underground storage chambers, trash enclosure, and sidewalk. There is vacant commercial land to the east, a nursing home to the south, a developed commercial site to the north, and a church to the west of the proposed site.

The design intent of the storm water management plan is to detain runoff and provide storage volume in both the dry pond and underground chambers. The underground chambers will also be used to treat the site runoff's water quality volume.

SITE CONDITIONS

The existing site consists of a grass field. On the west side of the property there is an existing bike path and tunnel.

According to the Web Soil Survey, the soil in the project area consists of Crosby Silt Loam (CrA), Kokomo Silty Clay Loam (Ko), and Lewisburg-Crosby Complex (LeB). These soils are classified as C/D and D, so for the purposes of this report Type D soil is used for analysis. A copy of the NRCS Soils Map is included in this report.

The developer proposes to improve the site with 1 building, parking spaces, trash enclosure, sidewalk, landscaping, and storm water management facilities.

Since the site disturbs more than one (1) acre, a Storm Water Pollution Prevention Plan (SWPPP) and water quality measures have been incorporated into the design.

HYDROLOGY

The existing site primarily drains into two sub-catchments. From the high point in the middle of the site, about half of the site drains from west to east. This runoff travels to an existing catch basin near the northeast corner of the site, which eventually carries the runoff to a 78" trunk sewer at the south-east corner of the site. The other half of the site flows from the west to east, away from the middle of the site. This runoff is directed to a catch basin in the northwest corner of the site, which also eventually ends up at the same 78" trunk sewer. All the runoff from the existing site is eventually tributary to the Scioto River.

Critical storm calculations are not necessary to determine the runoff rates for this site. The City of Dublin has provided data to determine runoff rates which meet their local jurisdictional requirements.

According to Table C-13 "Cramer Creek Watershed Release Rate Requirements" our site (located in Sub-Basin 900) is granted runoff rates for each storm event on a cfs per acre basis as found in the table below. To determine allowable release rates, the area which drains to the detention system (1.410 acres), has been used. Note that due to grading constraints, there are

0.247 acres located within the total disturbed area (1.657 acres) that do not drain to the detention system and are excluded from the stormwater analysis. Of the 0.247 acres, 0.091 acres is impervious, and 0.0521 acres is located within R/W).

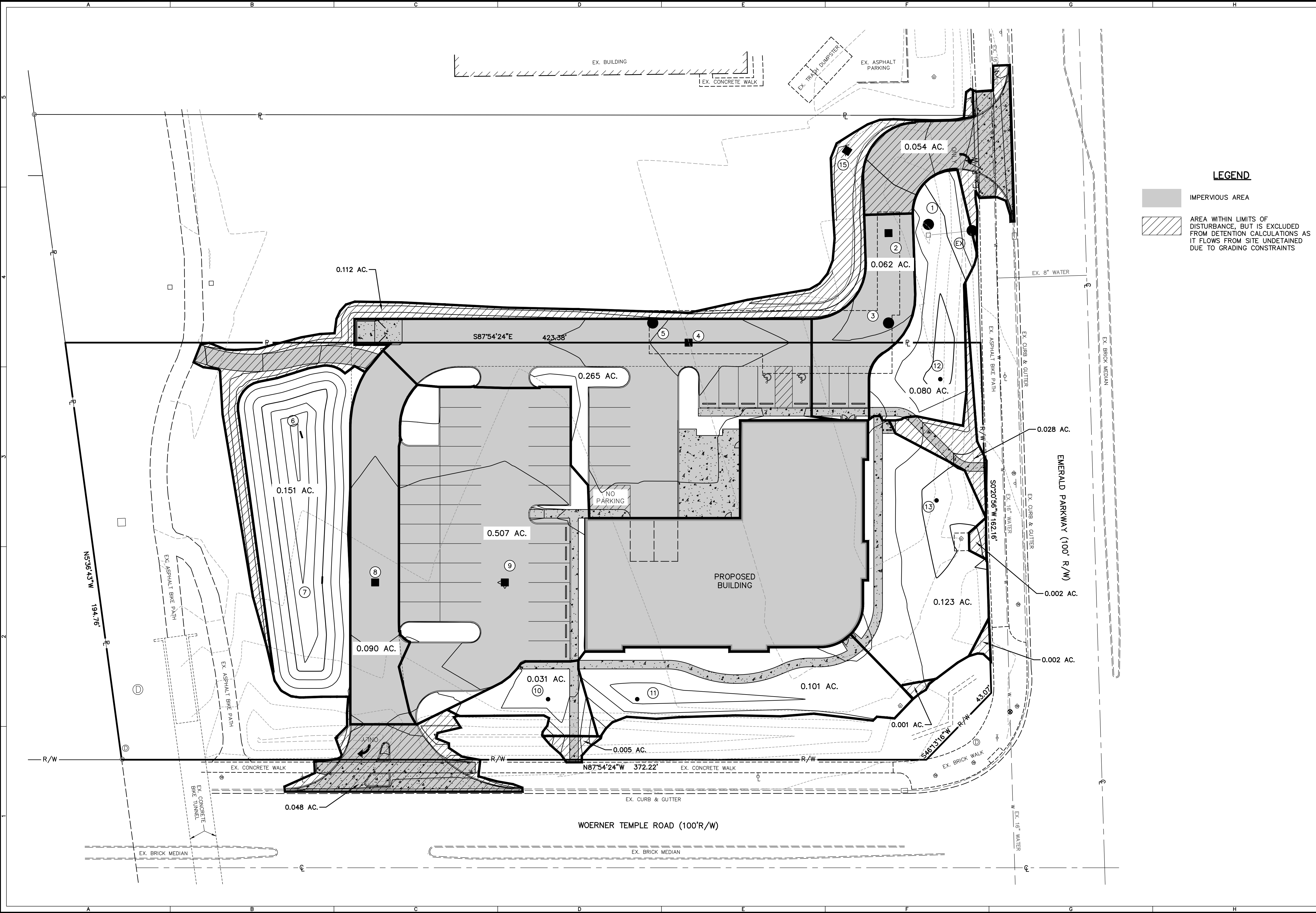
Storm Event	Sub-Basin 900 Allow. Release Rate (cfs/ac.)	Shihab Law Allow. Release Rate (cfs)	Proposed Release Rate (cfs)
1-Year	0.10 cfs	0.14 cfs	0.14 cfs
2- Year	0.20 cfs	0.28 cfs	0.21 cfs
5-Year	0.20 cfs	0.28 cfs	0.28 cfs
10-Year	0.30 cfs	0.43 cfs	0.35 cfs
25-Year	0.30 cfs	0.43 cfs	0.43 cfs
50-Year	0.50 cfs	0.71 cfs	0.60 cfs
100-Year	0.70 cfs	0.99 cfs	0.99 cfs

WATER QUALITY

Since the site disturbs more than 1 acre, water quality will be provided, and will be handled within the underground ADS detention chambers.

The required water quality volume (WQV) is 2,919 ft³. See attached calculations.

DRAINAGE DIVIDES MAP



LEGEND

IMPERVIOUS AREA

AREA WITHIN LIMITS OF DISTURBANCE, BUT IS EXCLUDED FROM DETENTION CALCULATIONS AS IT FLOWS FROM SITE UNDETAINED DUE TO GRADING CONSTRAINTS

GRAPHIC SCALE

(IN FEET)

1 inch = 20 ft.

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REVISION:

SUBMISSION:

- ☐ PRELIMINARY ENGINEERING SET
- ☐ AGENCY REVIEW SET
- ☐ CONSTRUCTION DOCUMENT SET
- ☐ AS-BUILT DOCUMENT SET

STAMP:

NOT FOR CONSTRUCTION

SHIHAB LAW OFFICE
BUILDING

EMERALD PARKWAY
DUBLIN, OHIO

DESIGN	DRAFT	CHECK
LMS	LMS	EPC

IBI NO.: 141124

DATE: NOVEMBER 18 2022

SCALE:

SHEET TITLE:

DRAINAGE MAP

SHEET NO.: 1/1

WATER QUALITY CALCULATIONS

Water Quality BMP Calculations - Post Construction

Project Name: Shihab Law Office Building
Project Number: 141124

Water Quality Volume Calculations

	Area
Total Drainage Area to BMP = A	1.410 Acres
Impervious Area (Existing)	0.000 Acres
Impervious Area (Existing Removed)	<u>0.000</u> Acres
Undisturbed Impervious Area (Existing)	0.000 Acres
Impervious Area (Proposed)	0.908 Acres
P =	0.90

Proposed Post-Construction Conditions

Total Impervious Surface Area = 0.908 Acres

Proposed Impervious Fraction, I = 0.908 / 1.410 = 0.644

Rv = volumetric runoff coefficient for proposed impervious = 0.05 + 0.9*(0.644) = 0.630

WQV = Rv x P x A / 12 = 0.630 x 0.90 x 1.410 / 12 = 0.067 Ac-Ft = 2,919 CF

SOILS REPORT



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

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

Custom Soil Resource Report for Franklin County, Ohio



November 3, 2022

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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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

Custom Soil Resource Report

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



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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: Franklin County, Ohio
Survey Area Data: Version 21, Sep 8, 2022

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

Date(s) aerial images were photographed: Aug 4, 2014—Aug 27, 2014

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
CrA	Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	0.4	12.9%
Ko	Kokomo silty clay loam, 0 to 2 percent slopes	1.9	68.1%
LeB	Lewisburg-Crosby complex, 2 to 6 percent slopes	0.5	19.1%
Totals for Area of Interest		2.8	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.

Franklin County, Ohio

CrA—Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2thy7
Elevation: 520 to 1,550 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Crosby and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Crosby

Setting

Landform: Recessional moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Silty material or loess over loamy till

Typical profile

Ap - 0 to 8 inches: silt loam
BE - 8 to 11 inches: silt loam
Bt1 - 11 to 14 inches: silt loam
2Bt2 - 14 to 28 inches: silty clay loam
2BCt - 28 to 36 inches: loam
2Cd - 36 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high
(0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Kokomo, drained

Percent of map unit: 5 percent
Landform: Swales, water-lain moraines, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Celina, eroded

Percent of map unit: 4 percent
Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, head slope, nose slope, crest, rise
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Miamian, eroded

Percent of map unit: 1 percent
Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, nose slope, head slope, side slope, rise
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Ko—Kokomo silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2rwj8
Elevation: 820 to 1,140 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kokomo and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting

Landform: Depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy glaciofluvial deposits derived from sedimentary rock over loamy till derived from limestone and dolomite

Typical profile

Ap - 0 to 11 inches: silty clay loam
Btg - 11 to 41 inches: clay loam
Bt - 41 to 64 inches: clay loam
2C - 64 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Minor Components

Crosby

Percent of map unit: 5 percent
Landform: Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

Celina

Percent of map unit: 5 percent
Landform: Till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Rise
Down-slope shape: Convex

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Across-slope shape: Convex
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

LeB—Lewisburg-Crosby complex, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5mqh
Elevation: 600 to 1,200 feet
Mean annual precipitation: 33 to 45 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 140 to 195 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Lewisburg and similar soils: 45 percent
Crosby and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lewisburg

Setting

Landform: Till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 16 inches: silty clay loam
H3 - 16 to 70 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 47 percent
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e

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Hydrologic Soil Group: D
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Description of Crosby

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 31 inches: silty clay loam
H3 - 31 to 70 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F111XA008IN - Wet Till Ridge
Forage suitability group: Unnamed (G111AYC-1OH)
Other vegetative classification: Unnamed (G111AYC-1OH)
Hydric soil rating: No

Minor Components

Kokomo

Percent of map unit: 15 percent
Landform: Depressions
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Eroded areas with a clay loam surface layer

Percent of map unit:

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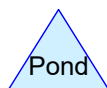
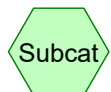
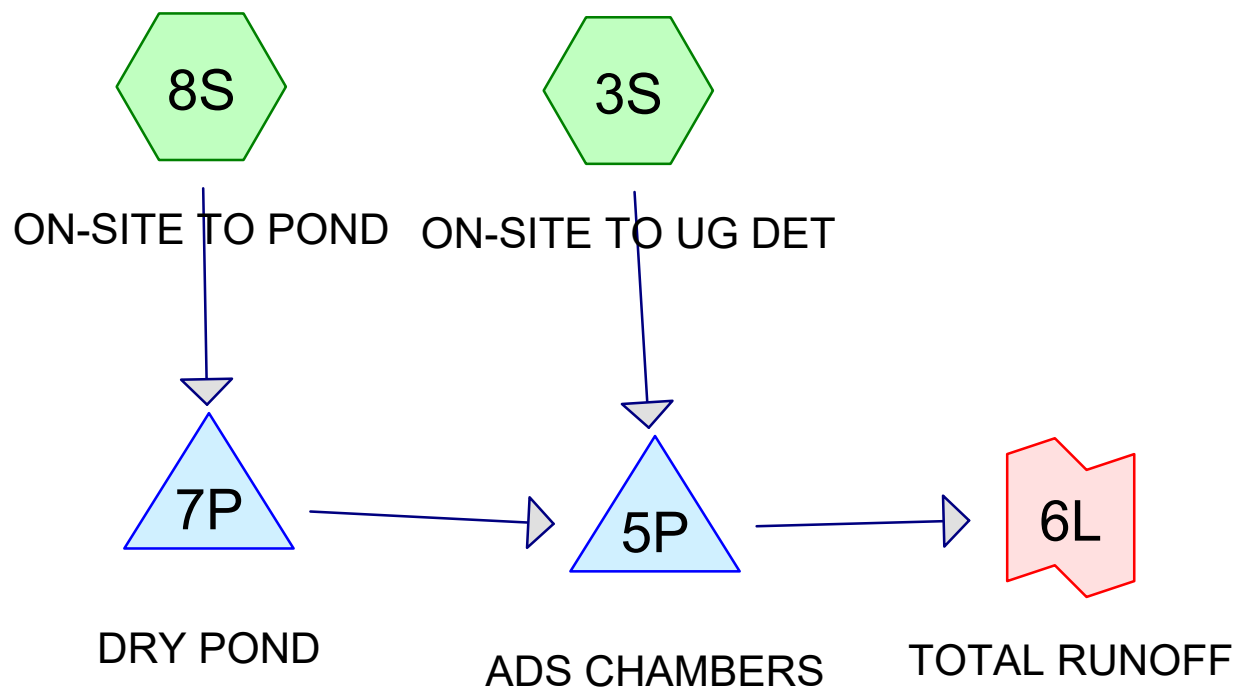
Custom Soil Resource Report

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HYDROCAD REPORT



Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.502	80	>75% Grass cover, Good, HSG D (3S, 8S)
0.908	98	Paved parking, HSG D (3S, 8S)
1.410	92	TOTAL AREA

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
1.410	HSG D	3S, 8S
0.000	Other	
1.410		TOTAL AREA

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.502	0.000	0.502	>75% Grass cover, Good	3S, 8S
0.000	0.000	0.000	0.908	0.000	0.908	Paved parking	3S, 8S
0.000	0.000	0.000	1.410	0.000	1.410	TOTAL AREA	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	5P	897.25	889.96	75.0	0.0972	0.012	24.0	0.0	0.0
2	7P	902.00	897.25	96.0	0.0495	0.012	12.0	0.0	0.0

Time span=5.00-72.00 hrs, dt=0.01 hrs, 6701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment3S: ON-SITE TO UG DET Runoff Area=0.530 ac 57.74% Impervious Runoff Depth=1.27"
Tc=5.0 min CN=90 Runoff=1.22 cfs 0.056 af

Subcatchment8S: ON-SITE TO POND Runoff Area=0.880 ac 68.41% Impervious Runoff Depth=1.42"
Tc=5.0 min CN=92 Runoff=2.24 cfs 0.104 af

Pond 5P: ADS CHAMBERS Peak Elev=899.02' Storage=4,548 cf Inflow=3.14 cfs 0.160 af
Outflow=0.14 cfs 0.159 af

Pond 7P: DRY POND Peak Elev=902.93' Storage=274 cf Inflow=2.24 cfs 0.104 af
12.0" Round Culvert n=0.012 L=96.0' S=0.0495 ' /' Outflow=1.98 cfs 0.104 af

Link 6L: TOTAL RUNOFF Inflow=0.14 cfs 0.159 af
Primary=0.14 cfs 0.159 af

Total Runoff Area = 1.410 ac Runoff Volume = 0.160 af Average Runoff Depth = 1.36"
35.60% Pervious = 0.502 ac 64.40% Impervious = 0.908 ac

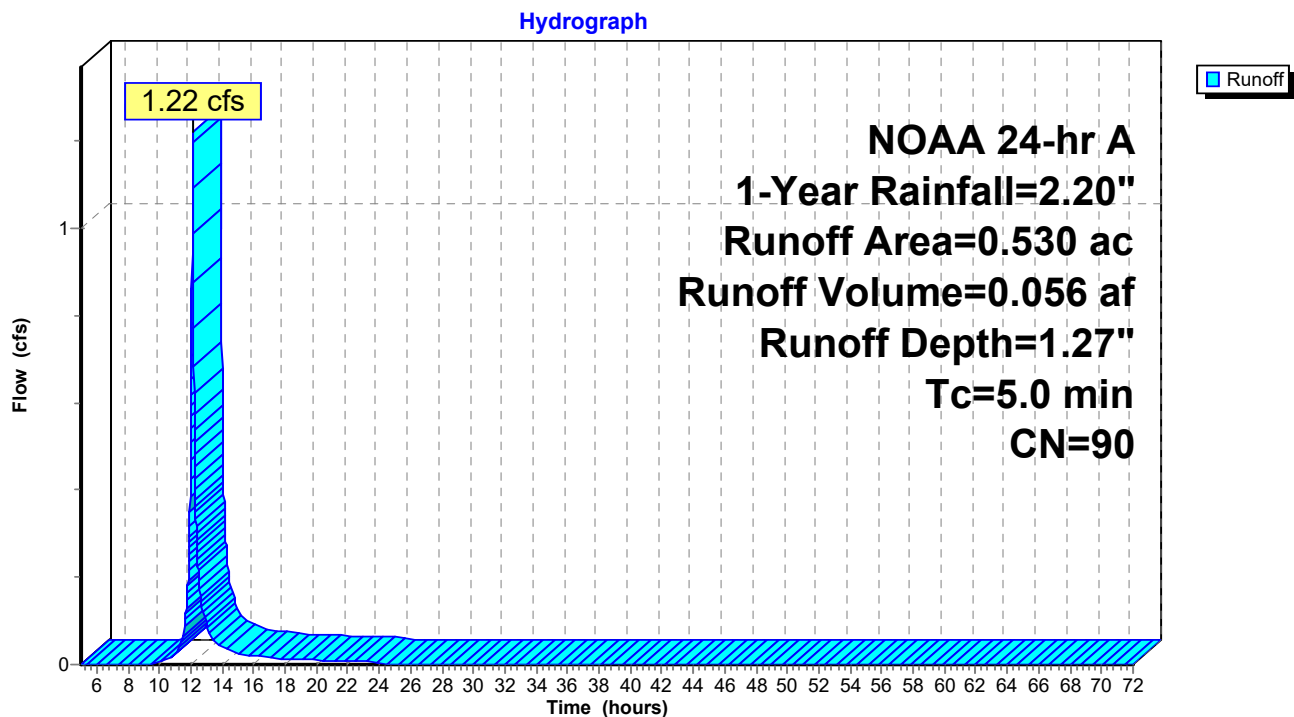
Summary for Subcatchment 3S: ON-SITE TO UG DET

Runoff = 1.22 cfs @ 12.12 hrs, Volume= 0.056 af, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr A 1-Year Rainfall=2.20"

Area (ac)	CN	Description
0.306	98	Paved parking, HSG D
0.224	80	>75% Grass cover, Good, HSG D
0.530	90	Weighted Average
0.224		42.26% Pervious Area
0.306		57.74% Impervious Area

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

Subcatchment 3S: ON-SITE TO UG DET

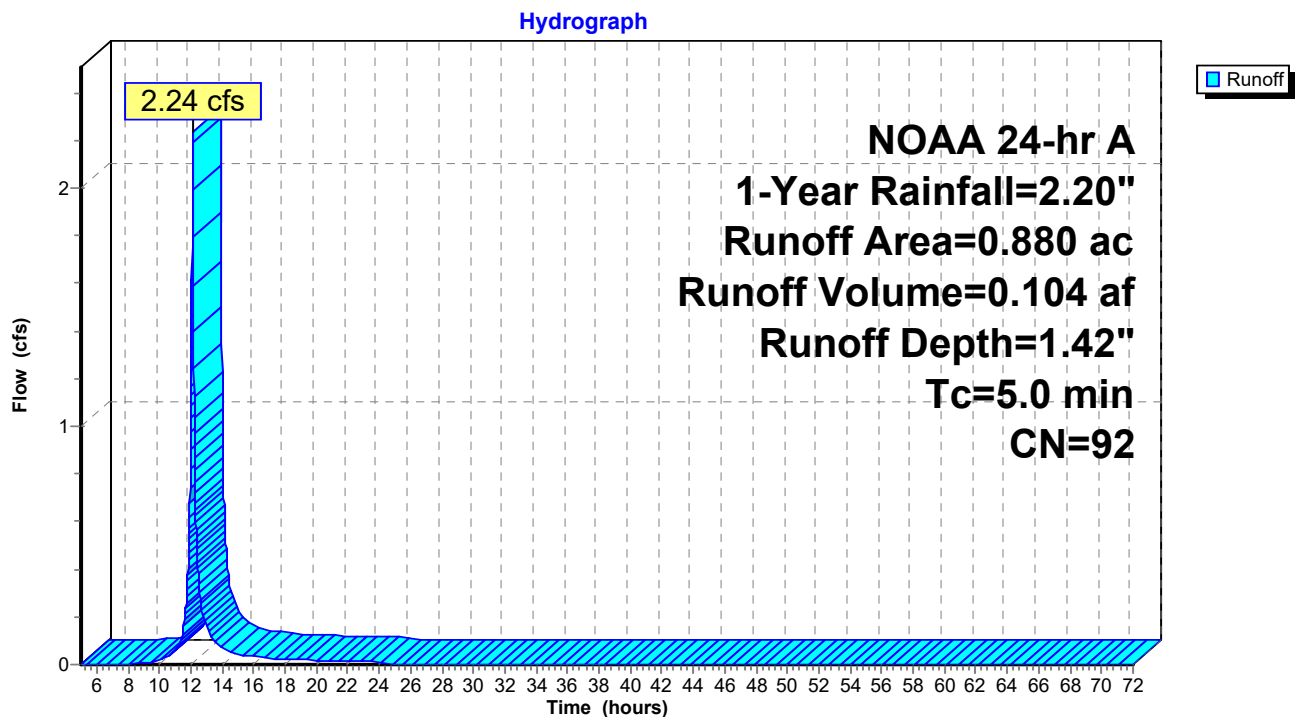
Summary for Subcatchment 8S: ON-SITE TO POND

Runoff = 2.24 cfs @ 12.12 hrs, Volume= 0.104 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr A 1-Year Rainfall=2.20"

Area (ac)	CN	Description
0.602	98	Paved parking, HSG D
0.278	80	>75% Grass cover, Good, HSG D
0.880	92	Weighted Average
0.278		31.59% Pervious Area
0.602		68.41% Impervious Area

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

Subcatchment 8S: ON-SITE TO POND

Summary for Pond 5P: ADS CHAMBERS

Inflow Area = 1.410 ac, 64.40% Impervious, Inflow Depth = 1.36" for 1-Year event
 Inflow = 3.14 cfs @ 12.14 hrs, Volume= 0.160 af
 Outflow = 0.14 cfs @ 13.57 hrs, Volume= 0.159 af, Atten= 96%, Lag= 86.1 min
 Primary = 0.14 cfs @ 13.57 hrs, Volume= 0.159 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 899.02' @ 13.57 hrs Surf.Area= 3,270 sf Storage= 4,548 cf

Plug-Flow detention time= 437.3 min calculated for 0.159 af (100% of inflow)
 Center-of-Mass det. time= 434.9 min (1,233.9 - 798.9)

Volume	Invert	Avail.Storage	Storage Description
#1	897.25'	5,733 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 22,073 cf Overall - 7,740 cf Embedded = 14,333 cf x 40.0% Voids
#2	897.25'	7,740 cf	ADS_StormTech MC-4500 +Cap x 70 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 4 Rows of 18 Chambers Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		13,473 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.25	3,270	0	0
904.00	3,270	22,073	22,073

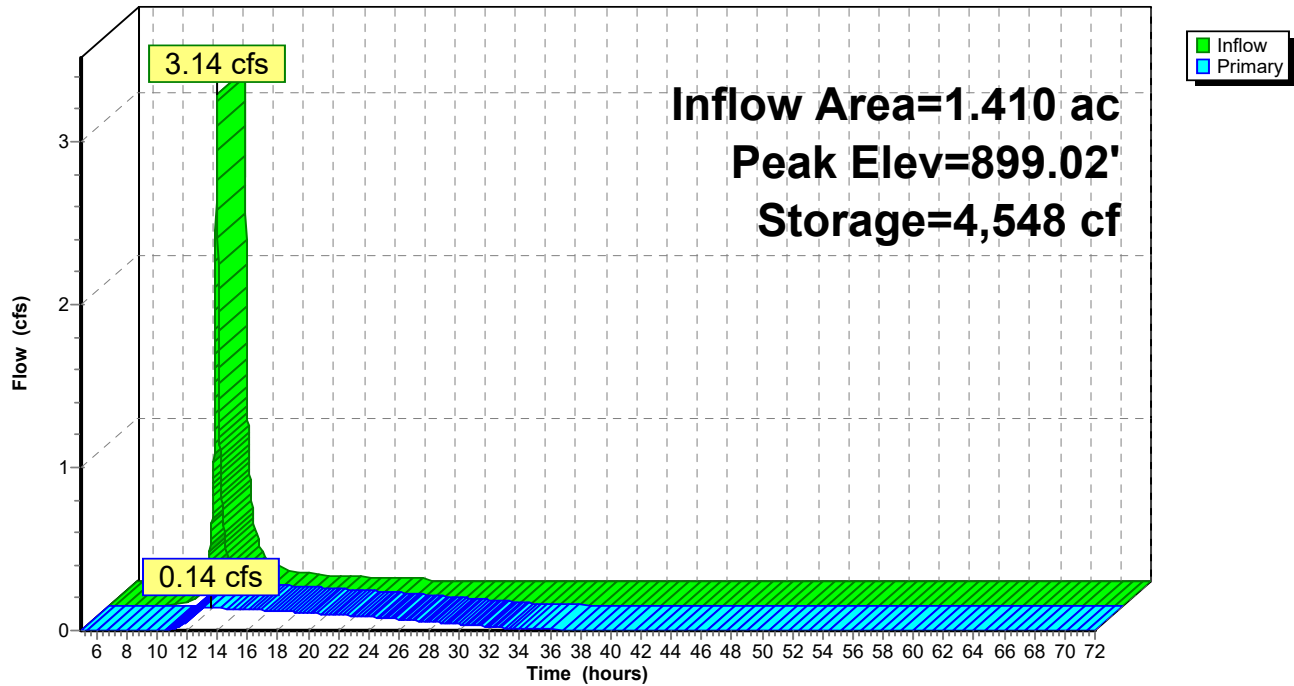
Device	Routing	Invert	Outlet Devices
#1	Primary	897.25'	24.0" Round Culvert L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 897.25' / 889.96' S= 0.0972 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf
#2	Device 1	897.25'	2.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	899.00'	1.8" Vert. Orifice/Grate C= 0.600
#4	Device 1	900.40'	1.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	903.25'	6.5" W x 3.0" H Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.14 cfs @ 13.57 hrs HW=899.02' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 0.14 cfs of 10.53 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.14 cfs @ 6.26 fps)
- 3=Orifice/Grate (Orifice Controls 0.00 cfs @ 0.51 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)
- 5=Orifice/Grate (Controls 0.00 cfs)

Pond 5P: ADS CHAMBERS

Hydrograph



Summary for Pond 7P: DRY POND

Inflow Area = 0.880 ac, 68.41% Impervious, Inflow Depth = 1.42" for 1-Year event
 Inflow = 2.24 cfs @ 12.12 hrs, Volume= 0.104 af
 Outflow = 1.98 cfs @ 12.15 hrs, Volume= 0.104 af, Atten= 12%, Lag= 1.6 min
 Primary = 1.98 cfs @ 12.15 hrs, Volume= 0.104 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 902.93' @ 12.15 hrs Surf.Area= 528 sf Storage= 274 cf

Plug-Flow detention time= 2.9 min calculated for 0.104 af (100% of inflow)
 Center-of-Mass det. time= 2.9 min (797.3 - 794.5)

Volume	Invert	Avail.Storage	Storage Description
#1	902.00'	11,394 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

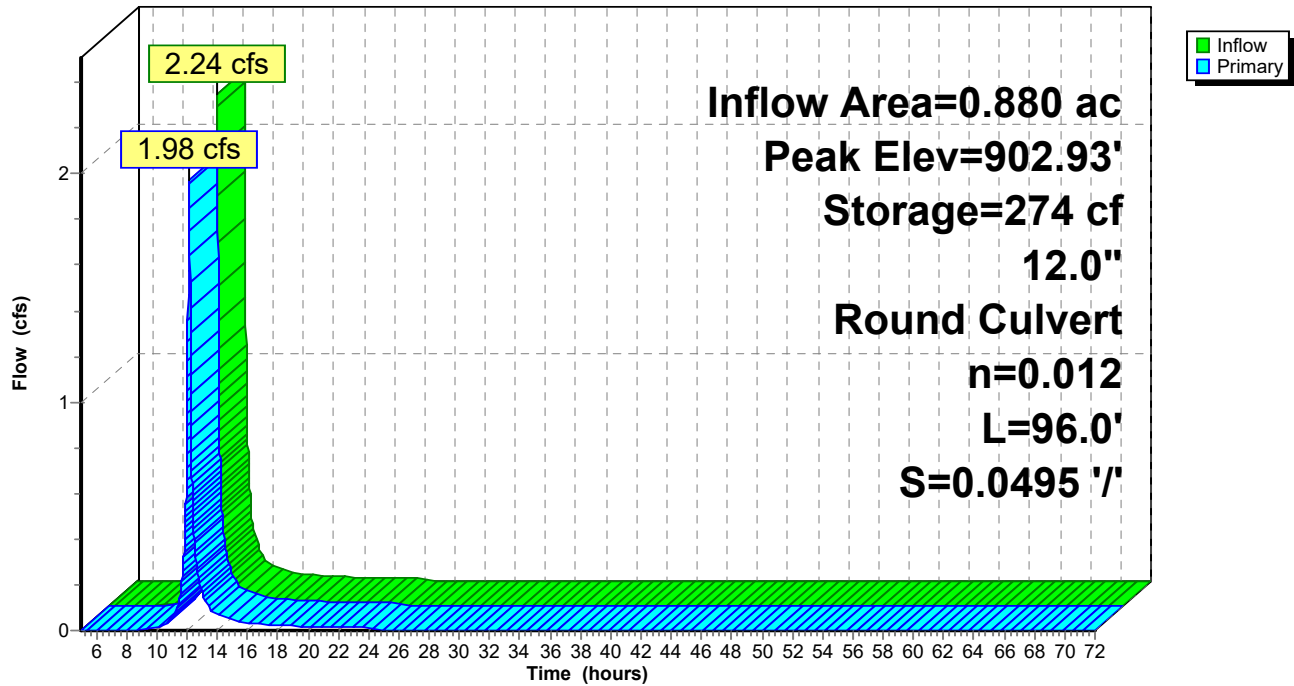
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
902.00	60	0	0
903.00	563	312	312
904.00	1,555	1,059	1,371
905.00	2,686	2,121	3,491
906.00	3,926	3,306	6,797
907.00	5,268	4,597	11,394

Device	Routing	Invert	Outlet Devices
#1	Primary	902.00'	12.0" Round Culvert L= 96.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 902.00' / 897.25' S= 0.0495 ' S Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.97 cfs @ 12.15 hrs HW=902.93' TW=898.22' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 1.97 cfs @ 2.59 fps)

Pond 7P: DRY POND

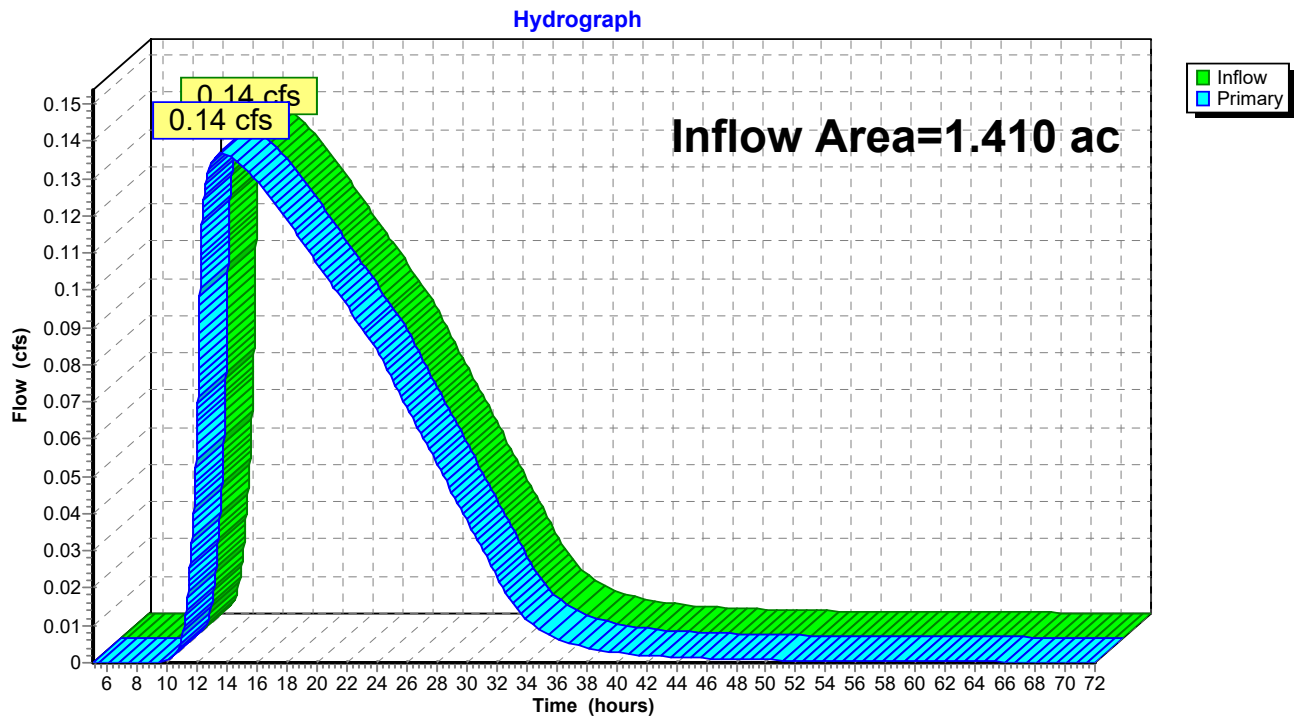
Hydrograph



Summary for Link 6L: TOTAL RUNOFF

Inflow Area = 1.410 ac, 64.40% Impervious, Inflow Depth > 1.36" for 1-Year event
Inflow = 0.14 cfs @ 13.57 hrs, Volume= 0.159 af
Primary = 0.14 cfs @ 13.57 hrs, Volume= 0.159 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs

Link 6L: TOTAL RUNOFF

Time span=5.00-72.00 hrs, dt=0.01 hrs, 6701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment3S: ON-SITE TO UG DET Runoff Area=0.530 ac 57.74% Impervious Runoff Depth=1.65"
Tc=5.0 min CN=90 Runoff=1.58 cfs 0.073 af

Subcatchment8S: ON-SITE TO POND Runoff Area=0.880 ac 68.41% Impervious Runoff Depth=1.81"
Tc=5.0 min CN=92 Runoff=2.83 cfs 0.133 af

Pond 5P: ADS CHAMBERS Peak Elev=899.53' Storage=5,783 cf Inflow=3.84 cfs 0.206 af
Outflow=0.21 cfs 0.205 af

Pond 7P: DRY POND Peak Elev=903.12' Storage=385 cf Inflow=2.83 cfs 0.133 af
12.0" Round Culvert n=0.012 L=96.0' S=0.0495 ' /' Outflow=2.35 cfs 0.133 af

Link 6L: TOTAL RUNOFF Inflow=0.21 cfs 0.205 af
Primary=0.21 cfs 0.205 af

Total Runoff Area = 1.410 ac Runoff Volume = 0.206 af Average Runoff Depth = 1.75"
35.60% Pervious = 0.502 ac 64.40% Impervious = 0.908 ac

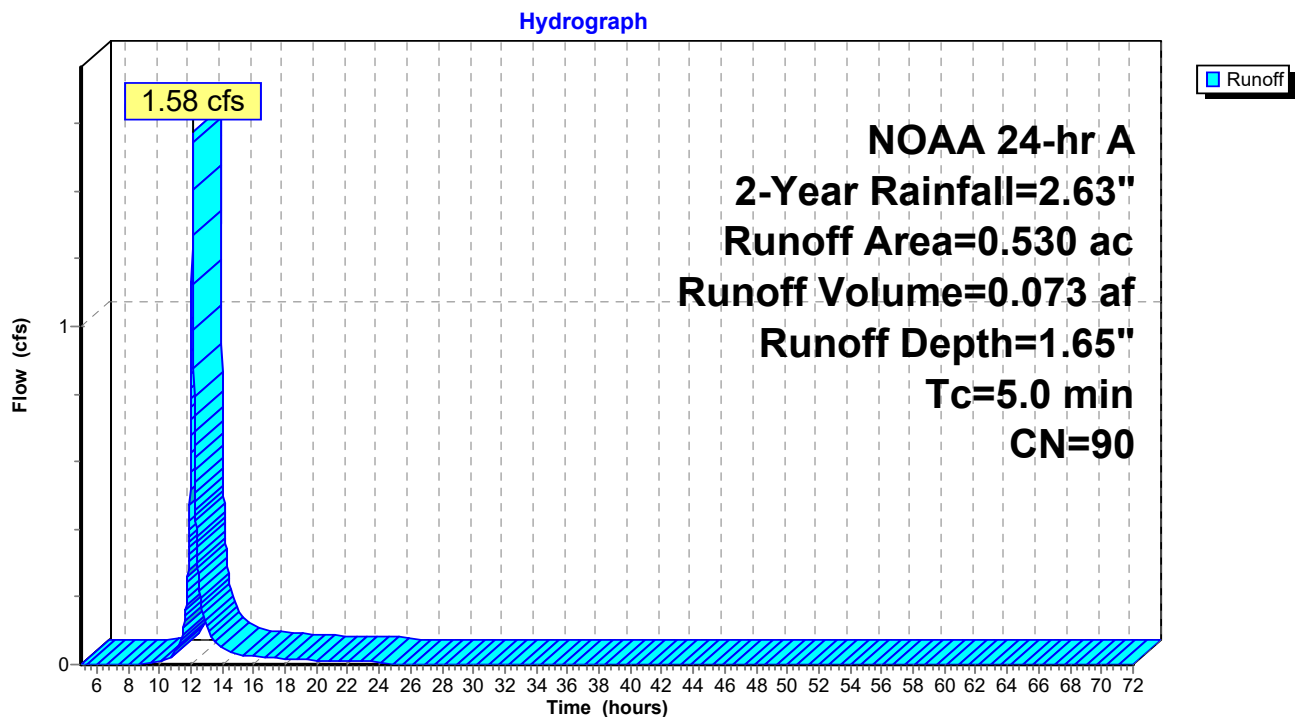
Summary for Subcatchment 3S: ON-SITE TO UG DET

Runoff = 1.58 cfs @ 12.12 hrs, Volume= 0.073 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr A 2-Year Rainfall=2.63"

Area (ac)	CN	Description
0.306	98	Paved parking, HSG D
0.224	80	>75% Grass cover, Good, HSG D
0.530	90	Weighted Average
0.224		42.26% Pervious Area
0.306		57.74% Impervious Area

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

Subcatchment 3S: ON-SITE TO UG DET

Summary for Subcatchment 8S: ON-SITE TO POND

Runoff = 2.83 cfs @ 12.12 hrs, Volume= 0.133 af, Depth= 1.81"

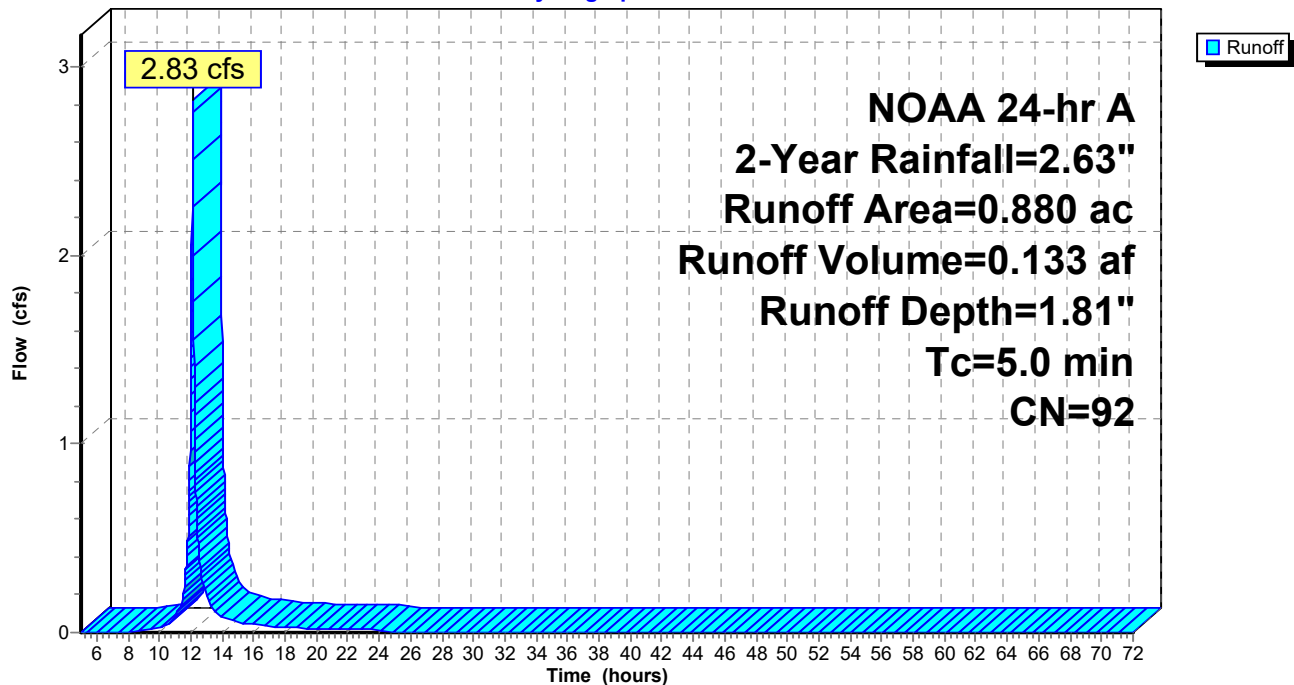
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr A 2-Year Rainfall=2.63"

Area (ac)	CN	Description
0.602	98	Paved parking, HSG D
0.278	80	>75% Grass cover, Good, HSG D
0.880	92	Weighted Average
0.278		31.59% Pervious Area
0.602		68.41% Impervious Area

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

Subcatchment 8S: ON-SITE TO POND

Hydrograph



Summary for Pond 5P: ADS CHAMBERS

Inflow Area = 1.410 ac, 64.40% Impervious, Inflow Depth = 1.75" for 2-Year event
 Inflow = 3.84 cfs @ 12.13 hrs, Volume= 0.206 af
 Outflow = 0.21 cfs @ 13.37 hrs, Volume= 0.205 af, Atten= 94%, Lag= 73.9 min
 Primary = 0.21 cfs @ 13.37 hrs, Volume= 0.205 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 899.53' @ 13.37 hrs Surf.Area= 3,270 sf Storage= 5,783 cf

Plug-Flow detention time= 435.5 min calculated for 0.205 af (100% of inflow)
 Center-of-Mass det. time= 433.6 min (1,227.3 - 793.7)

Volume	Invert	Avail.Storage	Storage Description
#1	897.25'	5,733 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 22,073 cf Overall - 7,740 cf Embedded = 14,333 cf x 40.0% Voids
#2	897.25'	7,740 cf	ADS_StormTech MC-4500 +Cap x 70 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 4 Rows of 18 Chambers Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		13,473 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.25	3,270	0	0
904.00	3,270	22,073	22,073

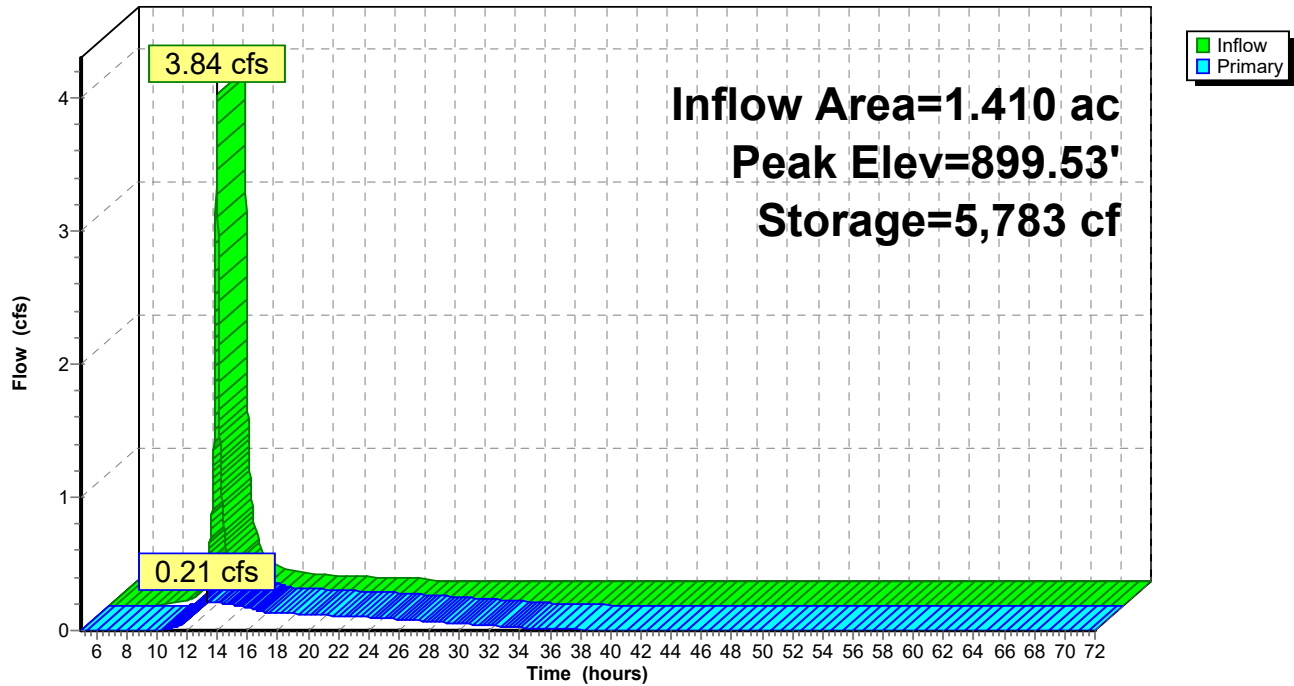
Device	Routing	Invert	Outlet Devices
#1	Primary	897.25'	24.0" Round Culvert L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 897.25' / 889.96' S= 0.0972 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf
#2	Device 1	897.25'	2.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	899.00'	1.8" Vert. Orifice/Grate C= 0.600
#4	Device 1	900.40'	1.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	903.25'	6.5" W x 3.0" H Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.21 cfs @ 13.37 hrs HW=899.53' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 0.21 cfs of 13.50 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.16 cfs @ 7.13 fps)
- 3=Orifice/Grate (Orifice Controls 0.06 cfs @ 3.24 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)
- 5=Orifice/Grate (Controls 0.00 cfs)

Pond 5P: ADS CHAMBERS

Hydrograph



Summary for Pond 7P: DRY POND

Inflow Area = 0.880 ac, 68.41% Impervious, Inflow Depth = 1.81" for 2-Year event
 Inflow = 2.83 cfs @ 12.12 hrs, Volume= 0.133 af
 Outflow = 2.35 cfs @ 12.16 hrs, Volume= 0.133 af, Atten= 17%, Lag= 2.0 min
 Primary = 2.35 cfs @ 12.16 hrs, Volume= 0.133 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 903.12' @ 12.16 hrs Surf.Area= 681 sf Storage= 385 cf

Plug-Flow detention time= 2.8 min calculated for 0.133 af (100% of inflow)
 Center-of-Mass det. time= 2.8 min (792.2 - 789.4)

Volume	Invert	Avail.Storage	Storage Description
#1	902.00'	11,394 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

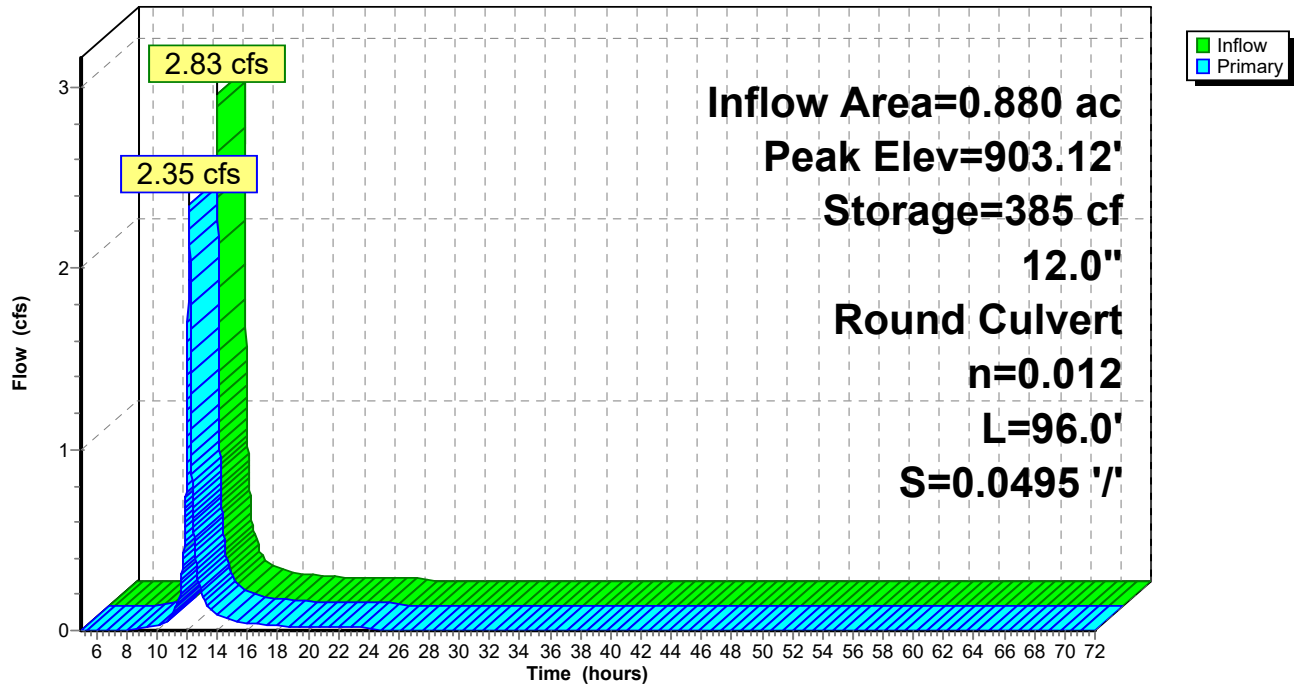
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
902.00	60	0	0
903.00	563	312	312
904.00	1,555	1,059	1,371
905.00	2,686	2,121	3,491
906.00	3,926	3,306	6,797
907.00	5,268	4,597	11,394

Device	Routing	Invert	Outlet Devices
#1	Primary	902.00'	12.0" Round Culvert L= 96.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 902.00' / 897.25' S= 0.0495 ' S Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.35 cfs @ 12.16 hrs HW=903.12' TW=898.57' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 2.35 cfs @ 2.99 fps)

Pond 7P: DRY POND

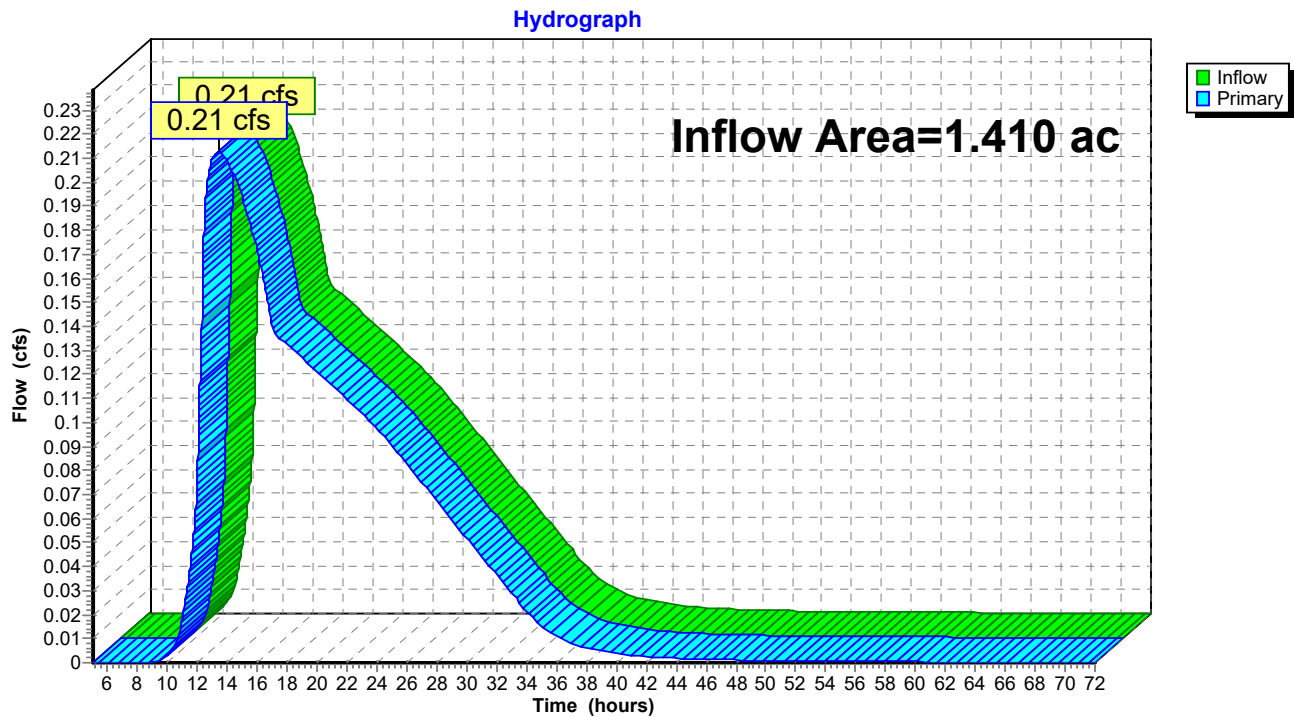
Hydrograph



Summary for Link 6L: TOTAL RUNOFF

Inflow Area = 1.410 ac, 64.40% Impervious, Inflow Depth > 1.75" for 2-Year event
Inflow = 0.21 cfs @ 13.37 hrs, Volume= 0.205 af
Primary = 0.21 cfs @ 13.37 hrs, Volume= 0.205 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs

Link 6L: TOTAL RUNOFF

Time span=5.00-72.00 hrs, dt=0.01 hrs, 6701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment3S: ON-SITE TO UG DET Runoff Area=0.530 ac 57.74% Impervious Runoff Depth=2.21"
Tc=5.0 min CN=90 Runoff=2.08 cfs 0.097 af

Subcatchment8S: ON-SITE TO POND Runoff Area=0.880 ac 68.41% Impervious Runoff Depth=2.39"
Tc=5.0 min CN=92 Runoff=3.66 cfs 0.175 af

Pond 5P: ADS CHAMBERS Peak Elev=900.36' Storage=7,704 cf Inflow=4.74 cfs 0.273 af
Outflow=0.28 cfs 0.272 af

Pond 7P: DRY POND Peak Elev=903.37' Storage=592 cf Inflow=3.66 cfs 0.175 af
12.0" Round Culvert n=0.012 L=96.0' S=0.0495 ' /' Outflow=2.79 cfs 0.175 af

Link 6L: TOTAL RUNOFF Inflow=0.28 cfs 0.272 af
Primary=0.28 cfs 0.272 af

Total Runoff Area = 1.410 ac Runoff Volume = 0.273 af Average Runoff Depth = 2.32"
35.60% Pervious = 0.502 ac 64.40% Impervious = 0.908 ac

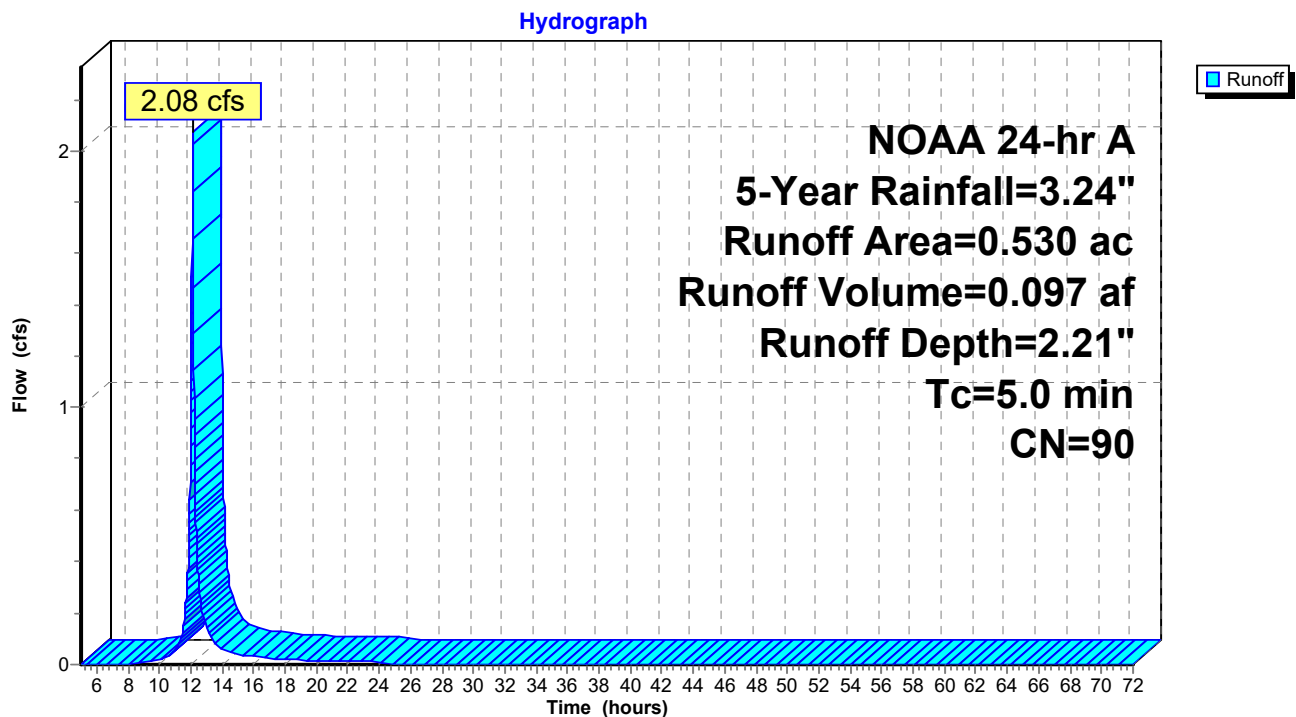
Summary for Subcatchment 3S: ON-SITE TO UG DET

Runoff = 2.08 cfs @ 12.12 hrs, Volume= 0.097 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
NOAA 24-hr A 5-Year Rainfall=3.24"

Area (ac)	CN	Description
0.306	98	Paved parking, HSG D
0.224	80	>75% Grass cover, Good, HSG D
0.530	90	Weighted Average
0.224		42.26% Pervious Area
0.306		57.74% Impervious Area

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

Subcatchment 3S: ON-SITE TO UG DET

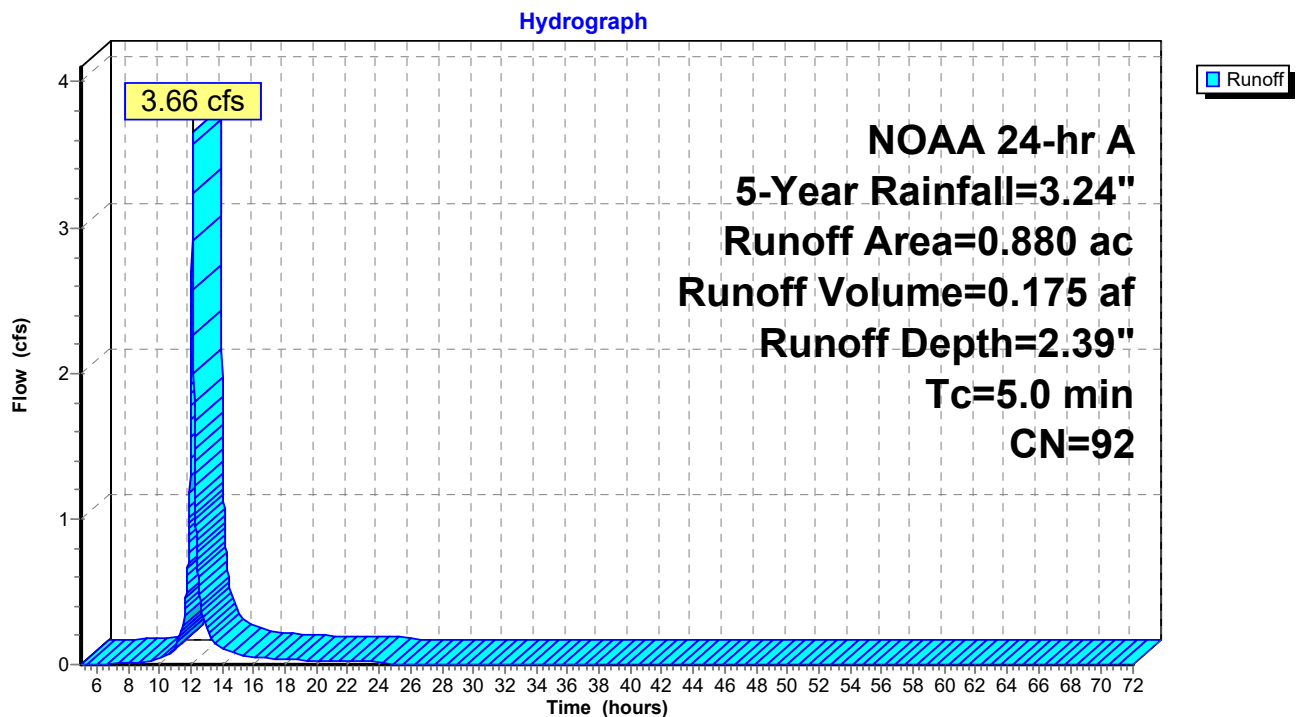
Summary for Subcatchment 8S: ON-SITE TO POND

Runoff = 3.66 cfs @ 12.12 hrs, Volume= 0.175 af, Depth= 2.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr A 5-Year Rainfall=3.24"

Area (ac)	CN	Description
0.602	98	Paved parking, HSG D
0.278	80	>75% Grass cover, Good, HSG D
0.880	92	Weighted Average
0.278		31.59% Pervious Area
0.602		68.41% Impervious Area

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

Subcatchment 8S: ON-SITE TO POND

Summary for Pond 5P: ADS CHAMBERS

Inflow Area = 1.410 ac, 64.40% Impervious, Inflow Depth = 2.32" for 5-Year event
 Inflow = 4.74 cfs @ 12.13 hrs, Volume= 0.273 af
 Outflow = 0.28 cfs @ 13.34 hrs, Volume= 0.272 af, Atten= 94%, Lag= 72.3 min
 Primary = 0.28 cfs @ 13.34 hrs, Volume= 0.272 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 900.36' @ 13.34 hrs Surf.Area= 3,270 sf Storage= 7,704 cf

Plug-Flow detention time= 437.3 min calculated for 0.272 af (100% of inflow)
 Center-of-Mass det. time= 436.1 min (1,224.1 - 788.0)

Volume	Invert	Avail.Storage	Storage Description
#1	897.25'	5,733 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 22,073 cf Overall - 7,740 cf Embedded = 14,333 cf x 40.0% Voids
#2	897.25'	7,740 cf	ADS_StormTech MC-4500 +Cap x 70 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 4 Rows of 18 Chambers Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
13,473 cf			Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.25	3,270	0	0
904.00	3,270	22,073	22,073

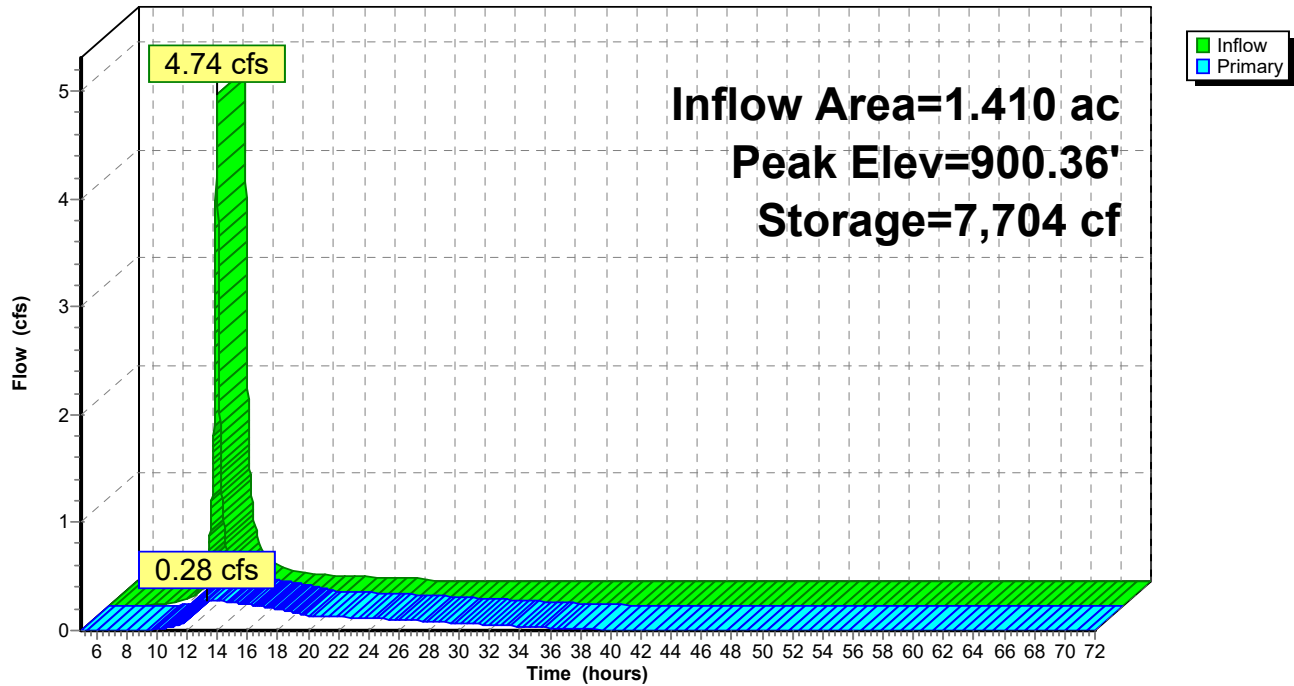
Device	Routing	Invert	Outlet Devices
#1	Primary	897.25'	24.0" Round Culvert L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 897.25' / 889.96' S= 0.0972 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf
#2	Device 1	897.25'	2.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	899.00'	1.8" Vert. Orifice/Grate C= 0.600
#4	Device 1	900.40'	1.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	903.25'	6.5" W x 3.0" H Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.28 cfs @ 13.34 hrs HW=900.36' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 0.28 cfs of 17.33 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.18 cfs @ 8.37 fps)
- 3=Orifice/Grate (Orifice Controls 0.10 cfs @ 5.45 fps)
- 4=Orifice/Grate (Controls 0.00 cfs)
- 5=Orifice/Grate (Controls 0.00 cfs)

Pond 5P: ADS CHAMBERS

Hydrograph



Summary for Pond 7P: DRY POND

Inflow Area = 0.880 ac, 68.41% Impervious, Inflow Depth = 2.39" for 5-Year event
 Inflow = 3.66 cfs @ 12.12 hrs, Volume= 0.175 af
 Outflow = 2.79 cfs @ 12.16 hrs, Volume= 0.175 af, Atten= 24%, Lag= 2.5 min
 Primary = 2.79 cfs @ 12.16 hrs, Volume= 0.175 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 903.37' @ 12.16 hrs Surf.Area= 934 sf Storage= 592 cf

Plug-Flow detention time= 3.1 min calculated for 0.175 af (100% of inflow)
 Center-of-Mass det. time= 2.9 min (786.7 - 783.8)

Volume	Invert	Avail.Storage	Storage Description
#1	902.00'	11,394 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

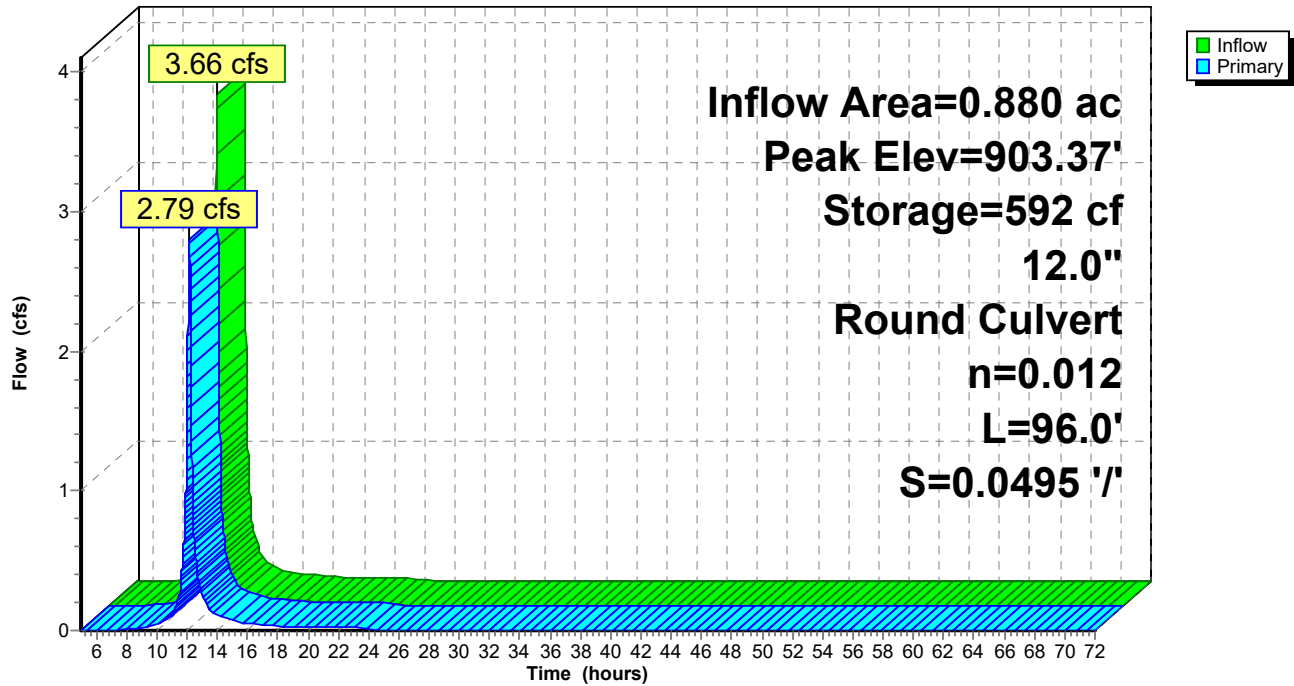
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
902.00	60	0	0
903.00	563	312	312
904.00	1,555	1,059	1,371
905.00	2,686	2,121	3,491
906.00	3,926	3,306	6,797
907.00	5,268	4,597	11,394

Device	Routing	Invert	Outlet Devices
#1	Primary	902.00'	12.0" Round Culvert L= 96.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 902.00' / 897.25' S= 0.0495 ' S Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.79 cfs @ 12.16 hrs HW=903.37' TW=899.10' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 2.79 cfs @ 3.55 fps)

Pond 7P: DRY POND

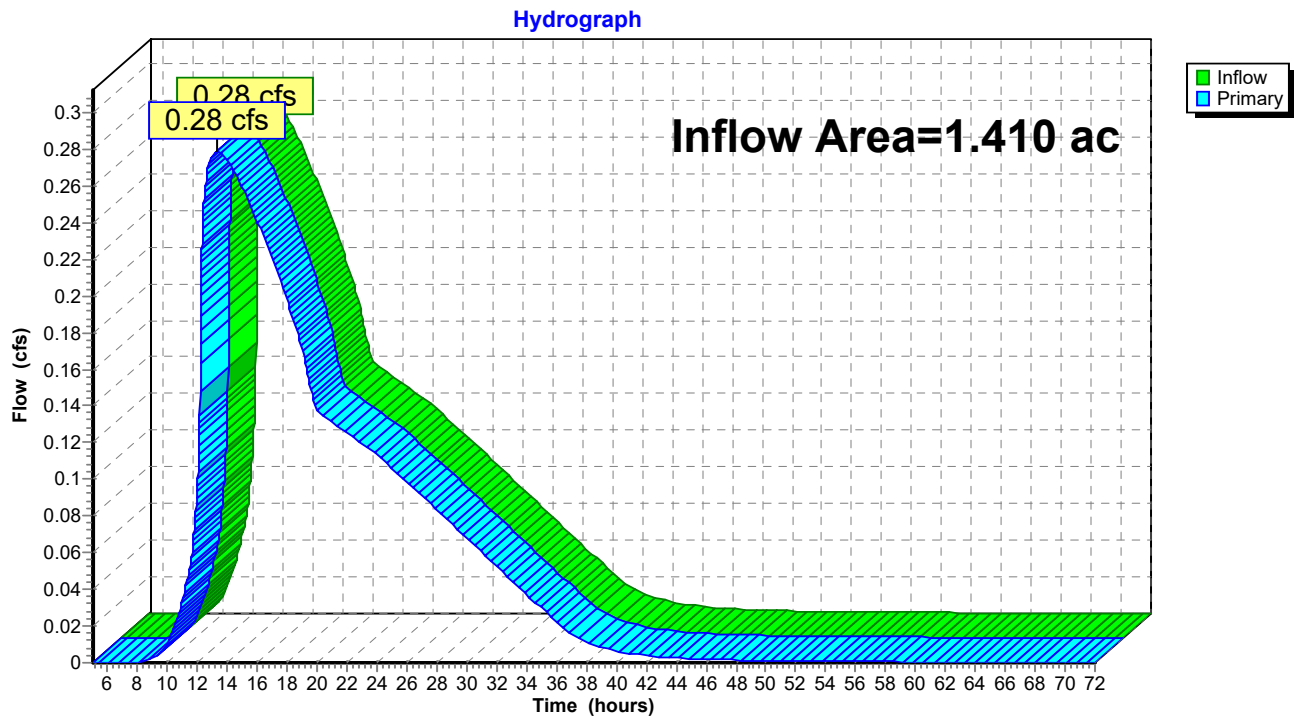
Hydrograph



Summary for Link 6L: TOTAL RUNOFF

Inflow Area = 1.410 ac, 64.40% Impervious, Inflow Depth > 2.31" for 5-Year event
Inflow = 0.28 cfs @ 13.34 hrs, Volume= 0.272 af
Primary = 0.28 cfs @ 13.34 hrs, Volume= 0.272 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs

Link 6L: TOTAL RUNOFF

Time span=5.00-72.00 hrs, dt=0.01 hrs, 6701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment3S: ON-SITE TO UG DET Runoff Area=0.530 ac 57.74% Impervious Runoff Depth=2.66"
Tc=5.0 min CN=90 Runoff=2.48 cfs 0.118 af

Subcatchment8S: ON-SITE TO POND Runoff Area=0.880 ac 68.41% Impervious Runoff Depth=2.86"
Tc=5.0 min CN=92 Runoff=4.33 cfs 0.210 af

Pond 5P: ADS CHAMBERS Peak Elev=901.09' Storage=9,257 cf Inflow=5.41 cfs 0.327 af
Outflow=0.35 cfs 0.327 af

Pond 7P: DRY POND Peak Elev=903.57' Storage=794 cf Inflow=4.33 cfs 0.210 af
12.0" Round Culvert n=0.012 L=96.0' S=0.0495 ' /' Outflow=3.09 cfs 0.210 af

Link 6L: TOTAL RUNOFF Inflow=0.35 cfs 0.327 af
Primary=0.35 cfs 0.327 af

Total Runoff Area = 1.410 ac Runoff Volume = 0.327 af Average Runoff Depth = 2.78"
35.60% Pervious = 0.502 ac 64.40% Impervious = 0.908 ac

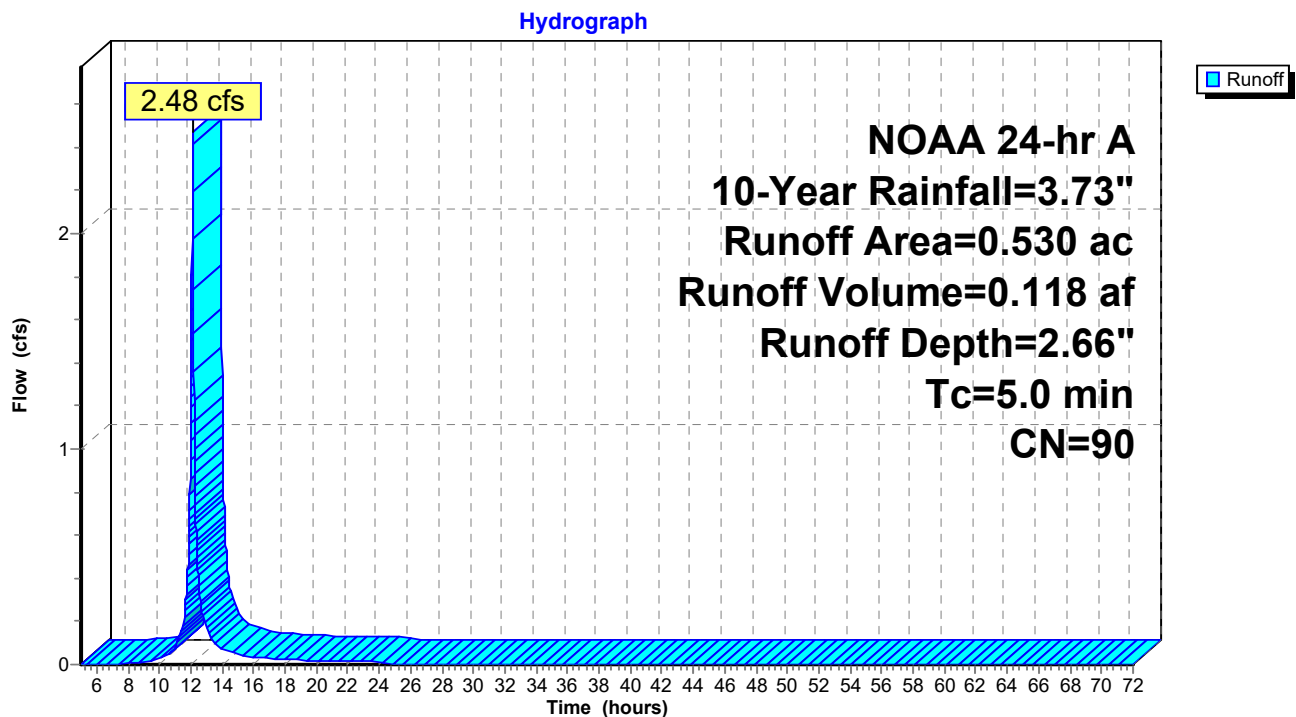
Summary for Subcatchment 3S: ON-SITE TO UG DET

Runoff = 2.48 cfs @ 12.12 hrs, Volume= 0.118 af, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr A 10-Year Rainfall=3.73"

Area (ac)	CN	Description
0.306	98	Paved parking, HSG D
0.224	80	>75% Grass cover, Good, HSG D
0.530	90	Weighted Average
0.224		42.26% Pervious Area
0.306		57.74% Impervious Area

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

Subcatchment 3S: ON-SITE TO UG DET

Summary for Subcatchment 8S: ON-SITE TO POND

Runoff = 4.33 cfs @ 12.12 hrs, Volume= 0.210 af, Depth= 2.86"

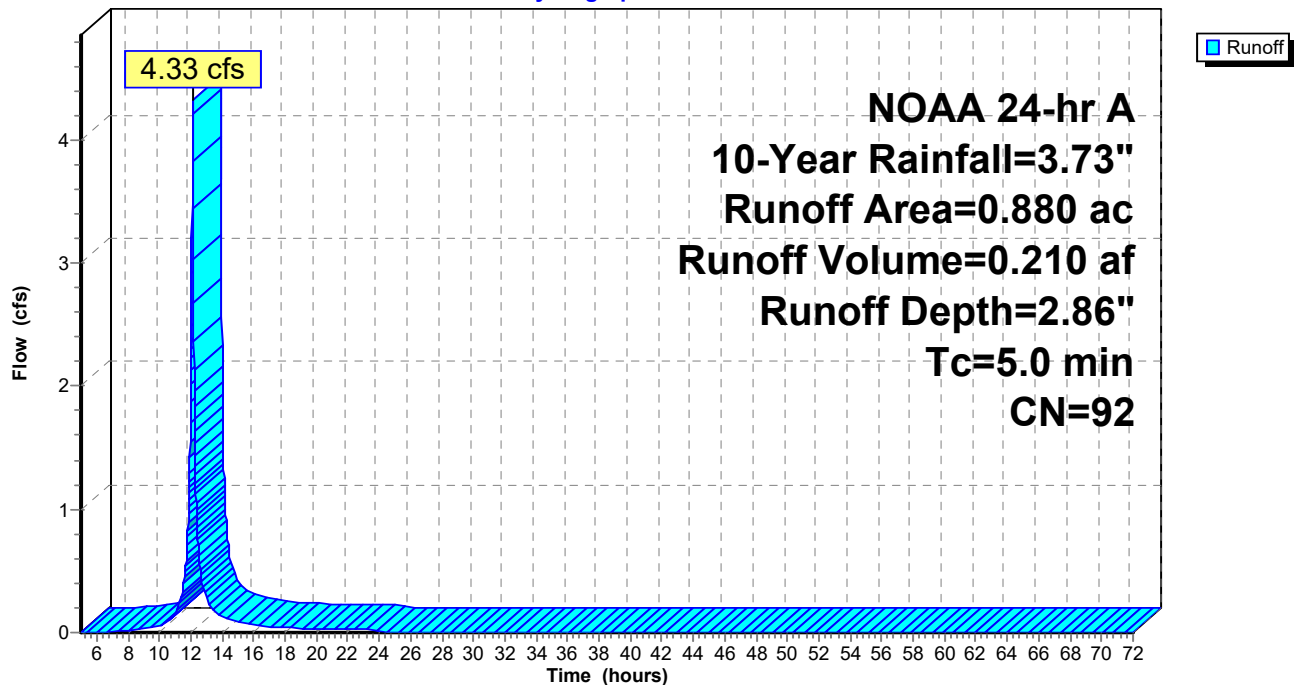
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr A 10-Year Rainfall=3.73"

Area (ac)	CN	Description
0.602	98	Paved parking, HSG D
0.278	80	>75% Grass cover, Good, HSG D
0.880	92	Weighted Average
0.278		31.59% Pervious Area
0.602		68.41% Impervious Area

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

Subcatchment 8S: ON-SITE TO POND

Hydrograph



Summary for Pond 5P: ADS CHAMBERS

Inflow Area = 1.410 ac, 64.40% Impervious, Inflow Depth = 2.78" for 10-Year event
 Inflow = 5.41 cfs @ 12.13 hrs, Volume= 0.327 af
 Outflow = 0.35 cfs @ 13.27 hrs, Volume= 0.327 af, Atten= 94%, Lag= 68.5 min
 Primary = 0.35 cfs @ 13.27 hrs, Volume= 0.327 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 901.09' @ 13.27 hrs Surf.Area= 3,270 sf Storage= 9,257 cf

Plug-Flow detention time= 436.6 min calculated for 0.327 af (100% of inflow)
 Center-of-Mass det. time= 435.3 min (1,219.7 - 784.4)

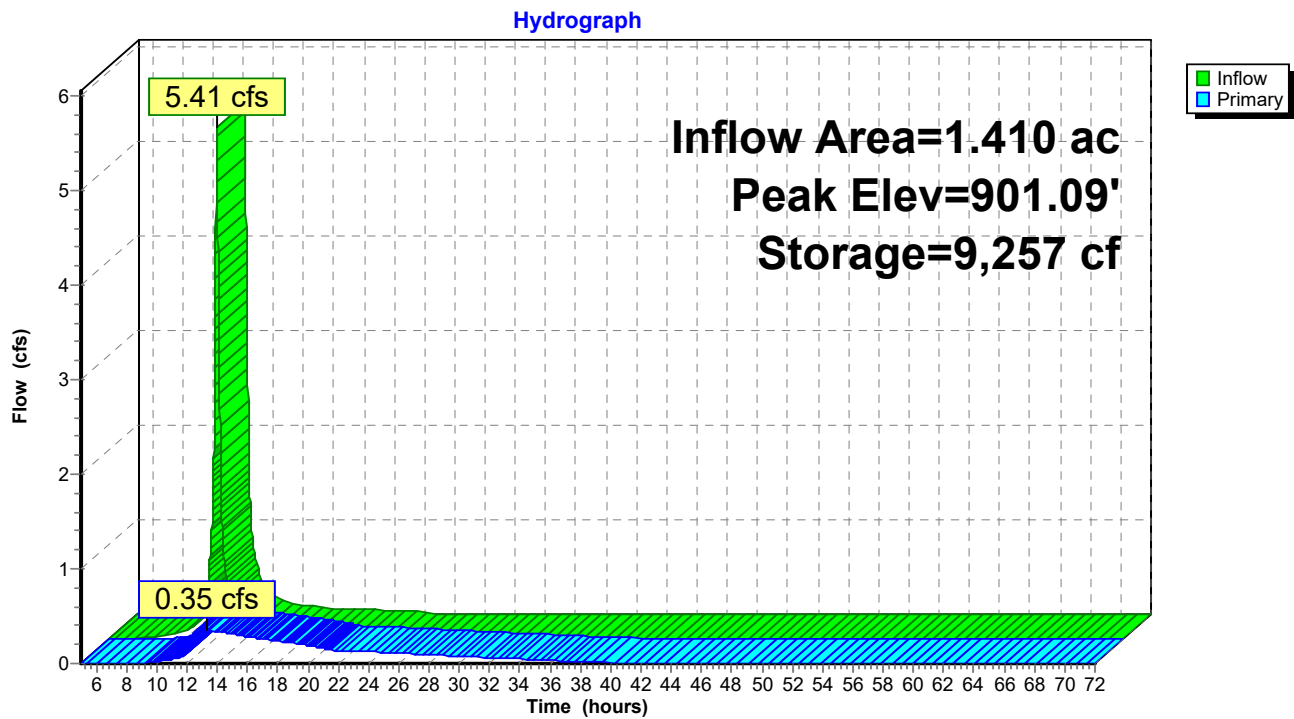
Volume	Invert	Avail.Storage	Storage Description
#1	897.25'	5,733 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 22,073 cf Overall - 7,740 cf Embedded = 14,333 cf x 40.0% Voids
#2	897.25'	7,740 cf	ADS_StormTech MC-4500 +Cap x 70 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 4 Rows of 18 Chambers Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		13,473 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.25	3,270	0	0
904.00	3,270	22,073	22,073

Device	Routing	Invert	Outlet Devices
#1	Primary	897.25'	24.0" Round Culvert L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 897.25' / 889.96' S= 0.0972 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf
#2	Device 1	897.25'	2.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	899.00'	1.8" Vert. Orifice/Grate C= 0.600
#4	Device 1	900.40'	1.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	903.25'	6.5" W x 3.0" H Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.35 cfs @ 13.27 hrs HW=901.09' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 0.35 cfs of 20.12 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.20 cfs @ 9.33 fps)
- 3=Orifice/Grate (Orifice Controls 0.12 cfs @ 6.83 fps)
- 4=Orifice/Grate (Orifice Controls 0.02 cfs @ 3.87 fps)
- 5=Orifice/Grate (Controls 0.00 cfs)

Pond 5P: ADS CHAMBERS

Summary for Pond 7P: DRY POND

Inflow Area = 0.880 ac, 68.41% Impervious, Inflow Depth = 2.86" for 10-Year event
 Inflow = 4.33 cfs @ 12.12 hrs, Volume= 0.210 af
 Outflow = 3.09 cfs @ 12.17 hrs, Volume= 0.210 af, Atten= 29%, Lag= 2.8 min
 Primary = 3.09 cfs @ 12.17 hrs, Volume= 0.210 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 903.57' @ 12.17 hrs Surf.Area= 1,129 sf Storage= 794 cf

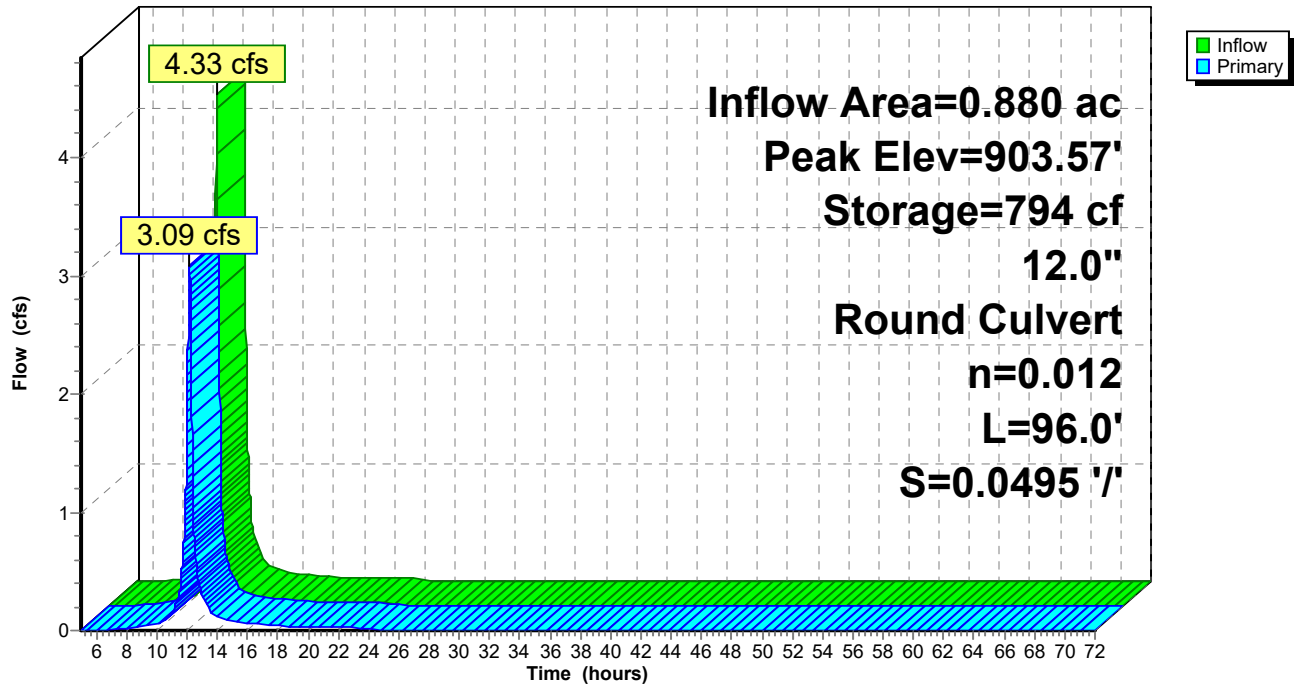
Plug-Flow detention time= 3.0 min calculated for 0.210 af (100% of inflow)
 Center-of-Mass det. time= 3.0 min (783.1 - 780.2)

Volume	Invert	Avail.Storage	Storage Description
#1	902.00'	11,394 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
902.00	60	0	0
903.00	563	312	312
904.00	1,555	1,059	1,371
905.00	2,686	2,121	3,491
906.00	3,926	3,306	6,797
907.00	5,268	4,597	11,394

Device	Routing	Invert	Outlet Devices
#1	Primary	902.00'	12.0" Round Culvert L= 96.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 902.00' / 897.25' S= 0.0495 ' S Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

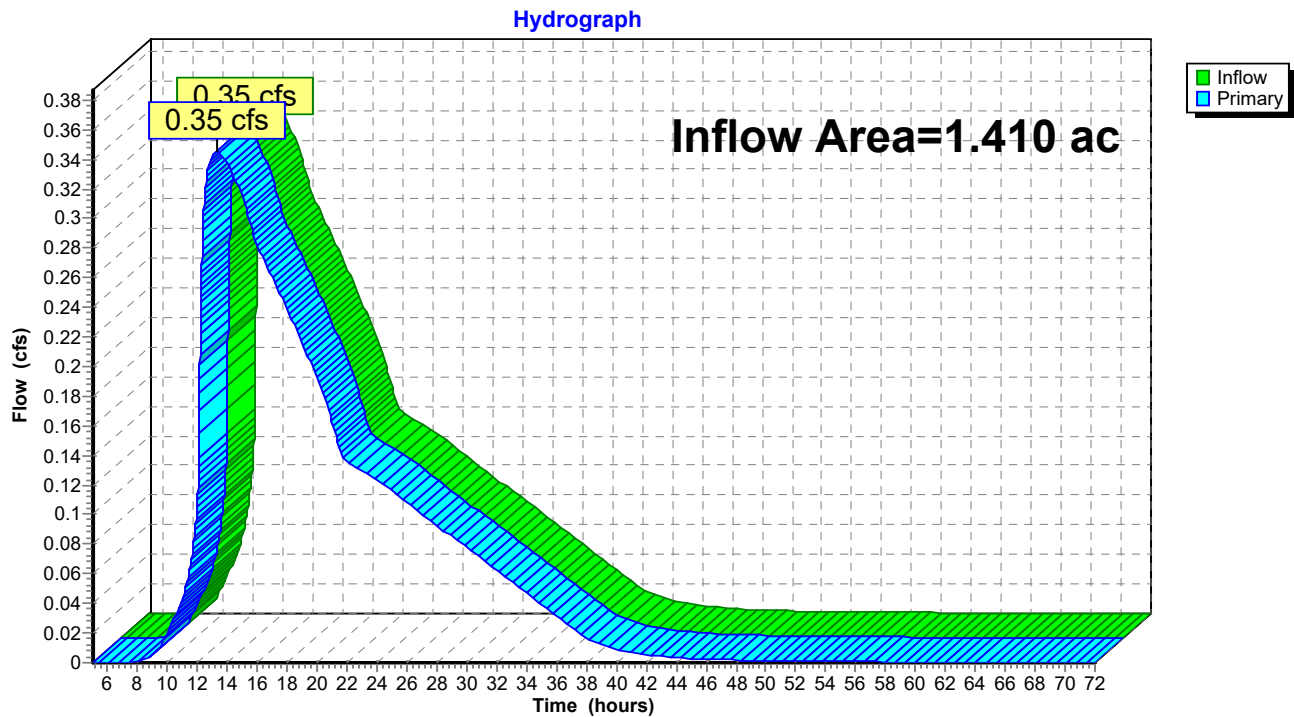
Primary OutFlow Max=3.09 cfs @ 12.17 hrs HW=903.57' TW=899.55' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 3.09 cfs @ 3.93 fps)

Pond 7P: DRY POND**Hydrograph**

Summary for Link 6L: TOTAL RUNOFF

Inflow Area = 1.410 ac, 64.40% Impervious, Inflow Depth > 2.78" for 10-Year event
Inflow = 0.35 cfs @ 13.27 hrs, Volume= 0.327 af
Primary = 0.35 cfs @ 13.27 hrs, Volume= 0.327 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs

Link 6L: TOTAL RUNOFF

Time span=5.00-72.00 hrs, dt=0.01 hrs, 6701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment3S: ON-SITE TO UG DET	Runoff Area=0.530 ac 57.74% Impervious Runoff Depth=3.34" Tc=5.0 min CN=90 Runoff=3.06 cfs 0.147 af
Subcatchment8S: ON-SITE TO POND	Runoff Area=0.880 ac 68.41% Impervious Runoff Depth>3.54" Tc=5.0 min CN=92 Runoff=5.29 cfs 0.260 af
Pond 5P: ADS CHAMBERS	Peak Elev=902.49' Storage=11,494 cf Inflow=6.33 cfs 0.407 af Outflow=0.43 cfs 0.407 af
Pond 7P: DRY POND	Peak Elev=903.84' Storage=1,137 cf Inflow=5.29 cfs 0.260 af 12.0" Round Culvert n=0.012 L=96.0' S=0.0495 ' Outflow=3.46 cfs 0.260 af
Link 6L: TOTAL RUNOFF	Inflow=0.43 cfs 0.407 af Primary=0.43 cfs 0.407 af
Total Runoff Area = 1.410 ac Runoff Volume = 0.407 af Average Runoff Depth = 3.47" 35.60% Pervious = 0.502 ac 64.40% Impervious = 0.908 ac	

Summary for Subcatchment 3S: ON-SITE TO UG DET

Runoff = 3.06 cfs @ 12.12 hrs, Volume= 0.147 af, Depth= 3.34"

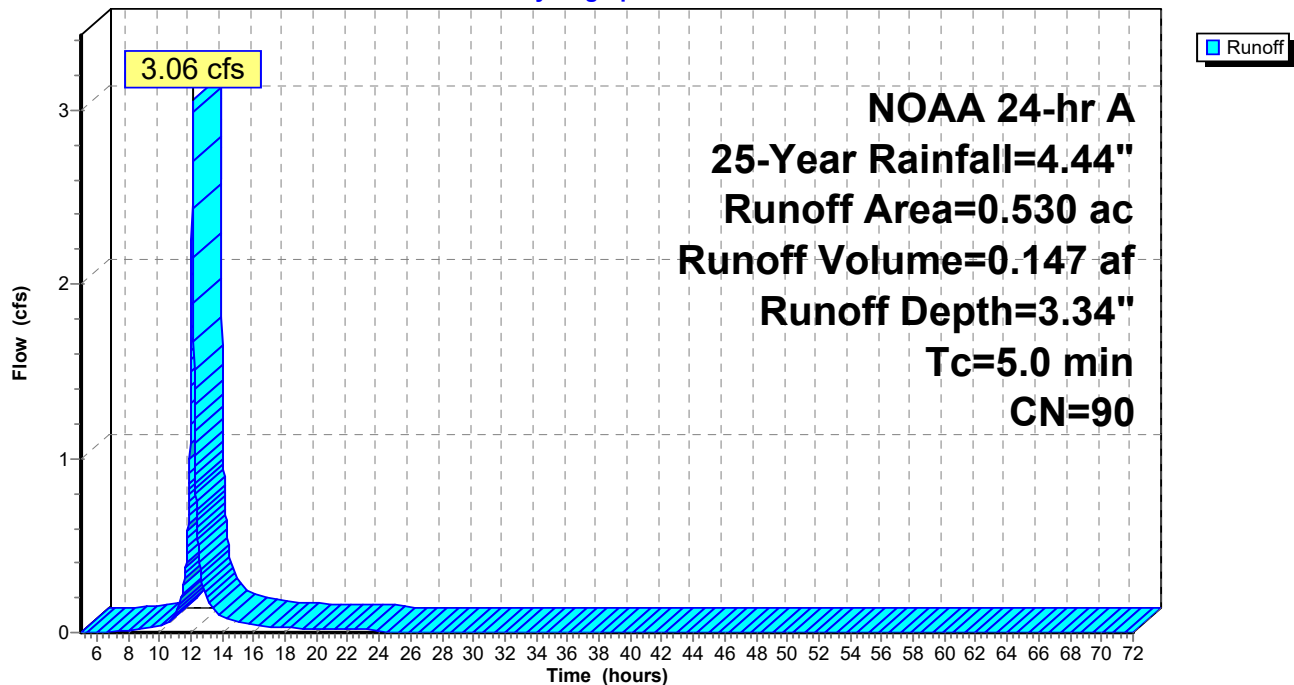
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr A 25-Year Rainfall=4.44"

Area (ac)	CN	Description
0.306	98	Paved parking, HSG D
0.224	80	>75% Grass cover, Good, HSG D
0.530	90	Weighted Average
0.224		42.26% Pervious Area
0.306		57.74% Impervious Area

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

Subcatchment 3S: ON-SITE TO UG DET

Hydrograph



Summary for Subcatchment 8S: ON-SITE TO POND

Runoff = 5.29 cfs @ 12.12 hrs, Volume= 0.260 af, Depth> 3.54"

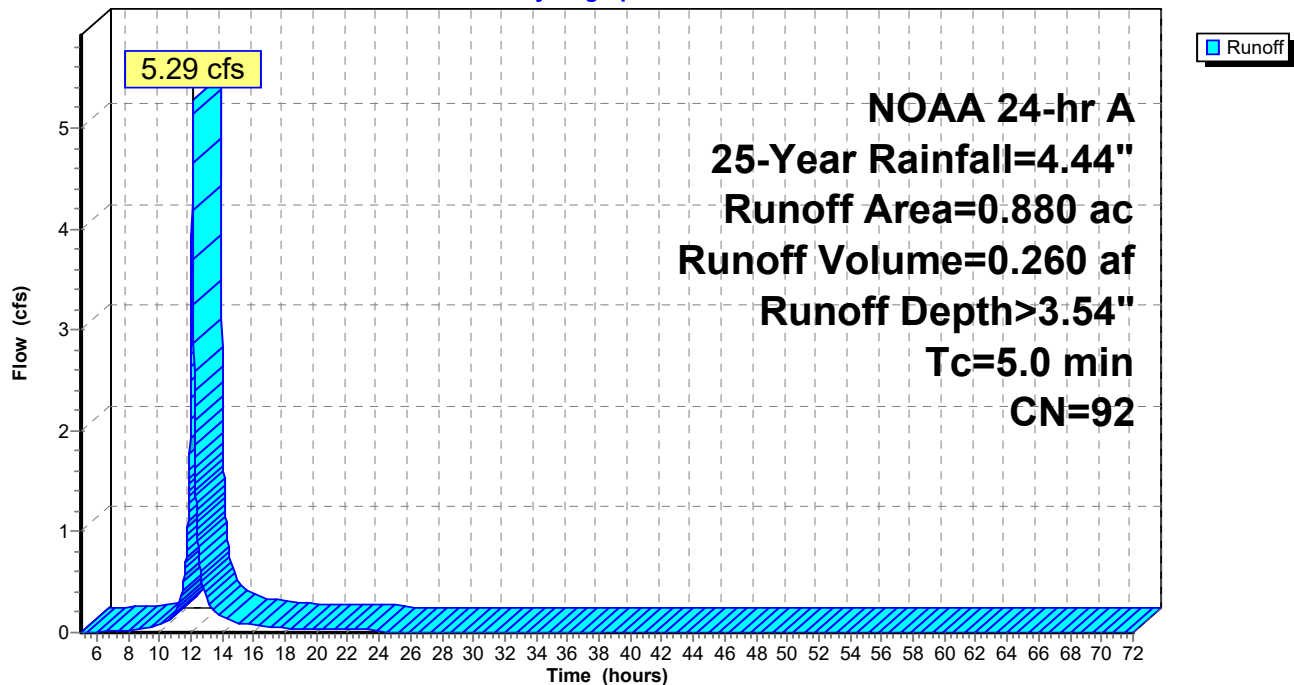
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr A 25-Year Rainfall=4.44"

Area (ac)	CN	Description
0.602	98	Paved parking, HSG D
0.278	80	>75% Grass cover, Good, HSG D
0.880	92	Weighted Average
0.278		31.59% Pervious Area
0.602		68.41% Impervious Area

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

Subcatchment 8S: ON-SITE TO POND

Hydrograph



Summary for Pond 5P: ADS CHAMBERS

Inflow Area = 1.410 ac, 64.40% Impervious, Inflow Depth = 3.47" for 25-Year event
 Inflow = 6.33 cfs @ 12.13 hrs, Volume= 0.407 af
 Outflow = 0.43 cfs @ 13.23 hrs, Volume= 0.407 af, Atten= 93%, Lag= 65.9 min
 Primary = 0.43 cfs @ 13.23 hrs, Volume= 0.407 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 902.49' @ 13.23 hrs Surf.Area= 3,270 sf Storage= 11,494 cf

Plug-Flow detention time= 435.2 min calculated for 0.407 af (100% of inflow)
 Center-of-Mass det. time= 434.4 min (1,214.8 - 780.4)

Volume	Invert	Avail.Storage	Storage Description
#1	897.25'	5,733 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 22,073 cf Overall - 7,740 cf Embedded = 14,333 cf x 40.0% Voids
#2	897.25'	7,740 cf	ADS_StormTech MC-4500 +Cap x 70 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 4 Rows of 18 Chambers Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		13,473 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.25	3,270	0	0
904.00	3,270	22,073	22,073

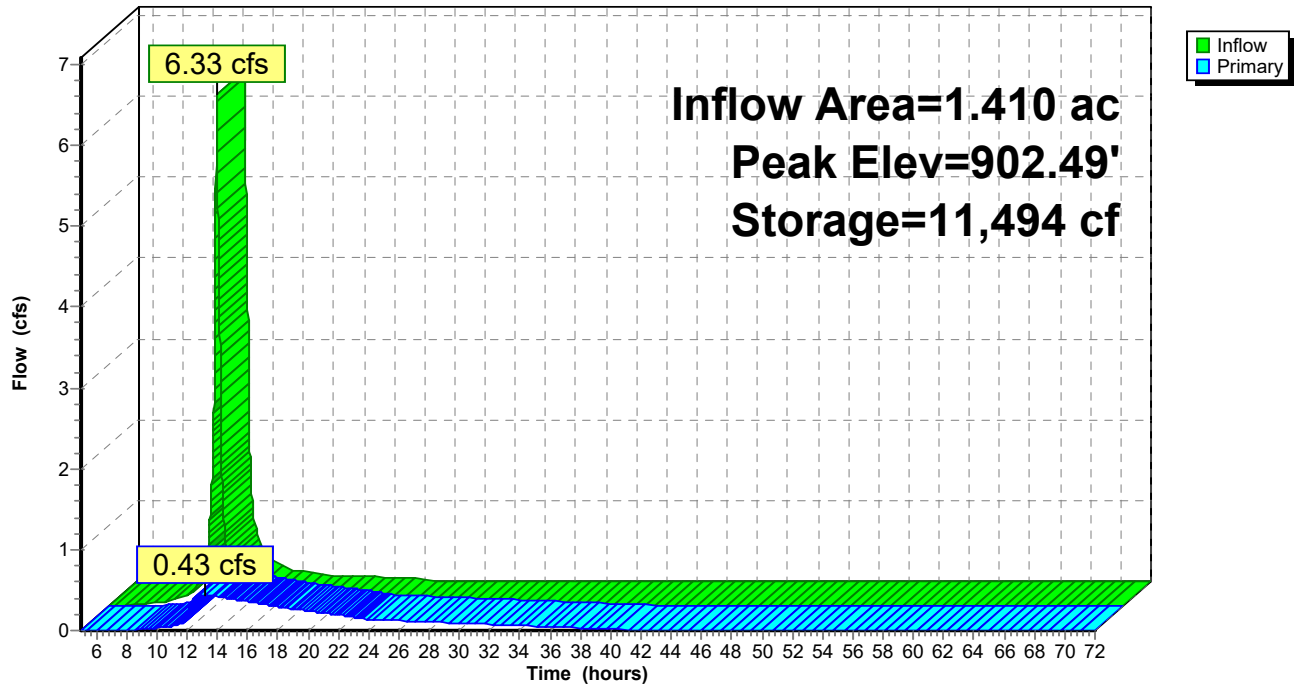
Device	Routing	Invert	Outlet Devices
#1	Primary	897.25'	24.0" Round Culvert L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 897.25' / 889.96' S= 0.0972 ' /' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf
#2	Device 1	897.25'	2.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	899.00'	1.8" Vert. Orifice/Grate C= 0.600
#4	Device 1	900.40'	1.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	903.25'	6.5" W x 3.0" H Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.43 cfs @ 13.23 hrs HW=902.49' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 0.43 cfs of 24.58 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.24 cfs @ 10.93 fps)
- 3=Orifice/Grate (Orifice Controls 0.16 cfs @ 8.89 fps)
- 4=Orifice/Grate (Orifice Controls 0.04 cfs @ 6.89 fps)
- 5=Orifice/Grate (Controls 0.00 cfs)

Pond 5P: ADS CHAMBERS

Hydrograph



Summary for Pond 7P: DRY POND

Inflow Area = 0.880 ac, 68.41% Impervious, Inflow Depth > 3.54" for 25-Year event
 Inflow = 5.29 cfs @ 12.12 hrs, Volume= 0.260 af
 Outflow = 3.46 cfs @ 12.18 hrs, Volume= 0.260 af, Atten= 35%, Lag= 3.2 min
 Primary = 3.46 cfs @ 12.18 hrs, Volume= 0.260 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 903.84' @ 12.18 hrs Surf.Area= 1,398 sf Storage= 1,137 cf

Plug-Flow detention time= 3.9 min calculated for 0.260 af (100% of inflow)
 Center-of-Mass det. time= 3.7 min (779.5 - 775.8)

Volume	Invert	Avail.Storage	Storage Description
#1	902.00'	11,394 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

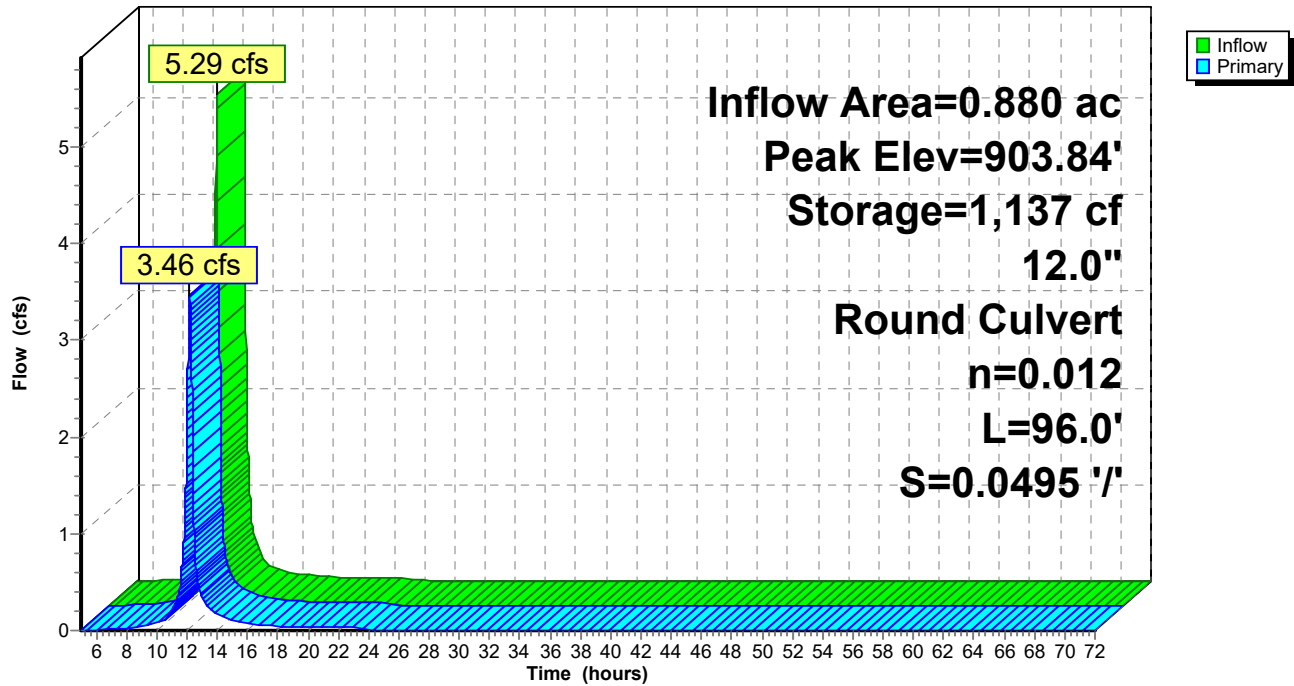
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
902.00	60	0	0
903.00	563	312	312
904.00	1,555	1,059	1,371
905.00	2,686	2,121	3,491
906.00	3,926	3,306	6,797
907.00	5,268	4,597	11,394

Device	Routing	Invert	Outlet Devices
#1	Primary	902.00'	12.0" Round Culvert L= 96.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 902.00' / 897.25' S= 0.0495 ' S Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.46 cfs @ 12.18 hrs HW=903.84' TW=900.22' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 3.46 cfs @ 4.40 fps)

Pond 7P: DRY POND

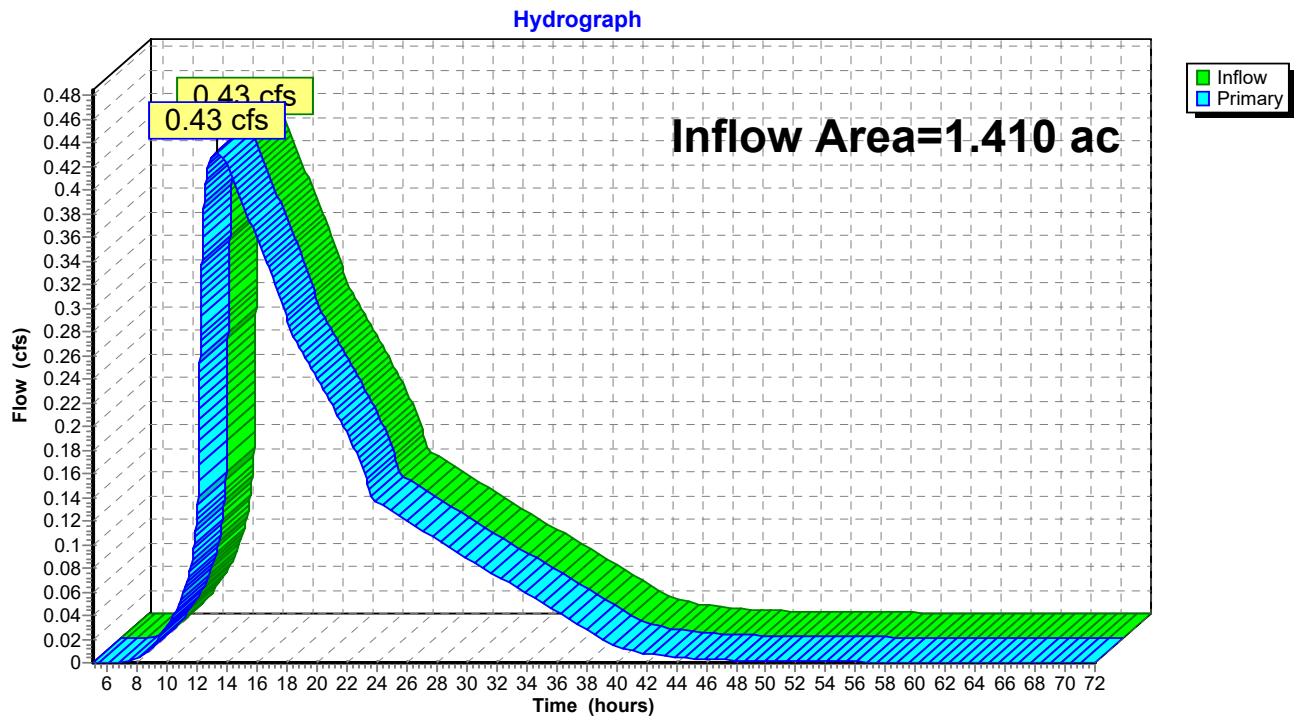
Hydrograph



Summary for Link 6L: TOTAL RUNOFF

Inflow Area = 1.410 ac, 64.40% Impervious, Inflow Depth > 3.46" for 25-Year event
Inflow = 0.43 cfs @ 13.23 hrs, Volume= 0.407 af
Primary = 0.43 cfs @ 13.23 hrs, Volume= 0.407 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs

Link 6L: TOTAL RUNOFF

Time span=5.00-72.00 hrs, dt=0.01 hrs, 6701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment3S: ON-SITE TO UG DET Runoff Area=0.530 ac 57.74% Impervious Runoff Depth=3.89"
Tc=5.0 min CN=90 Runoff=3.53 cfs 0.172 af

Subcatchment8S: ON-SITE TO POND Runoff Area=0.880 ac 68.41% Impervious Runoff Depth>4.10"
Tc=5.0 min CN=92 Runoff=6.06 cfs 0.300 af

Pond 5P: ADS CHAMBERS Peak Elev=903.42' Storage=12,715 cf Inflow=7.02 cfs 0.472 af
Outflow=0.60 cfs 0.471 af

Pond 7P: DRY POND Peak Elev=904.05' Storage=1,447 cf Inflow=6.06 cfs 0.300 af
12.0" Round Culvert n=0.012 L=96.0' S=0.0495 ' /' Outflow=3.72 cfs 0.300 af

Link 6L: TOTAL RUNOFF Inflow=0.60 cfs 0.471 af
Primary=0.60 cfs 0.471 af

Total Runoff Area = 1.410 ac Runoff Volume = 0.472 af Average Runoff Depth = 4.02"
35.60% Pervious = 0.502 ac 64.40% Impervious = 0.908 ac

Summary for Subcatchment 3S: ON-SITE TO UG DET

Runoff = 3.53 cfs @ 12.12 hrs, Volume= 0.172 af, Depth= 3.89"

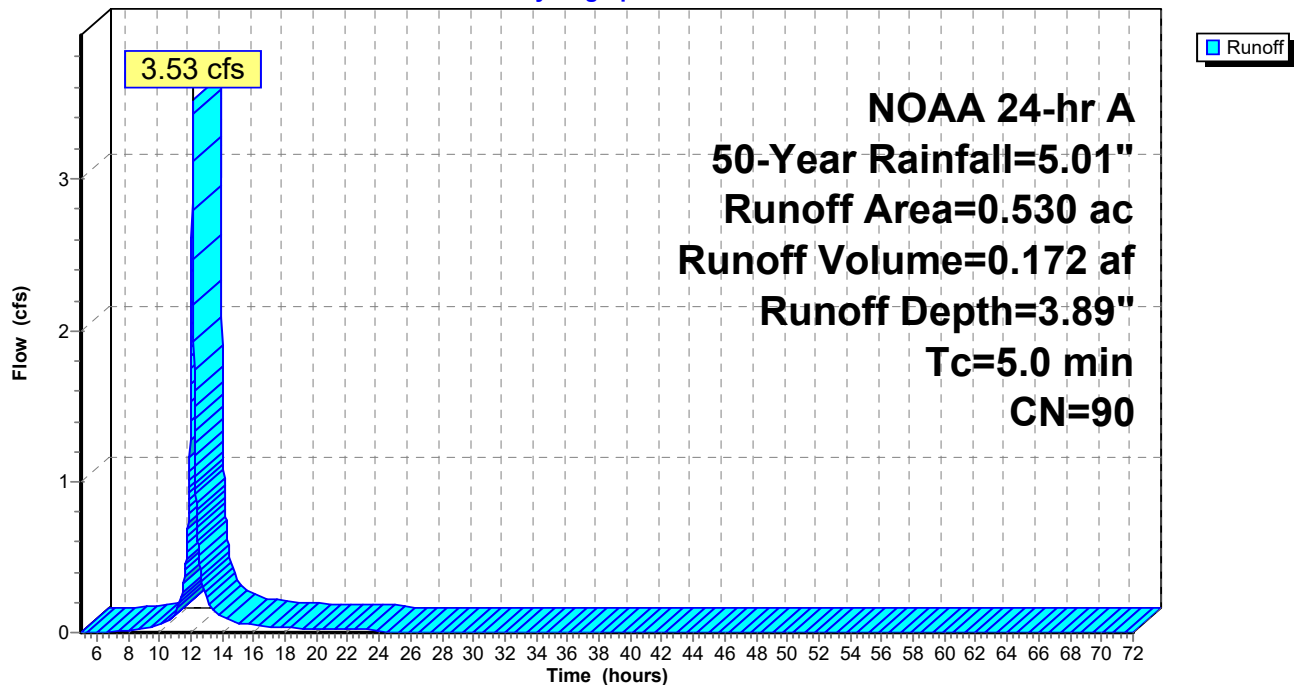
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr A 50-Year Rainfall=5.01"

Area (ac)	CN	Description
0.306	98	Paved parking, HSG D
0.224	80	>75% Grass cover, Good, HSG D
0.530	90	Weighted Average
0.224		42.26% Pervious Area
0.306		57.74% Impervious Area

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

Subcatchment 3S: ON-SITE TO UG DET

Hydrograph



Summary for Subcatchment 8S: ON-SITE TO POND

Runoff = 6.06 cfs @ 12.12 hrs, Volume= 0.300 af, Depth> 4.10"

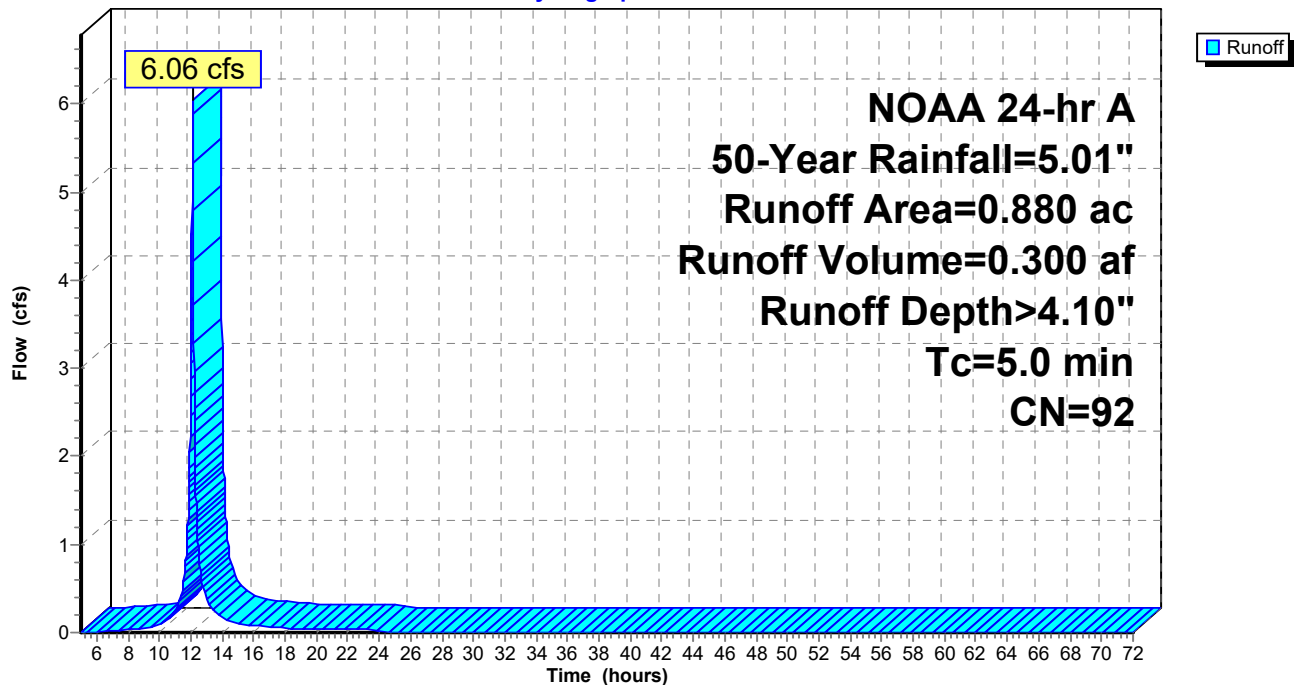
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr A 50-Year Rainfall=5.01"

Area (ac)	CN	Description
0.602	98	Paved parking, HSG D
0.278	80	>75% Grass cover, Good, HSG D
0.880	92	Weighted Average
0.278		31.59% Pervious Area
0.602		68.41% Impervious Area

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

Subcatchment 8S: ON-SITE TO POND

Hydrograph



Summary for Pond 5P: ADS CHAMBERS

Inflow Area = 1.410 ac, 64.40% Impervious, Inflow Depth = 4.02" for 50-Year event
 Inflow = 7.02 cfs @ 12.13 hrs, Volume= 0.472 af
 Outflow = 0.60 cfs @ 13.05 hrs, Volume= 0.471 af, Atten= 91%, Lag= 55.2 min
 Primary = 0.60 cfs @ 13.05 hrs, Volume= 0.471 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 903.42' @ 13.05 hrs Surf.Area= 3,270 sf Storage= 12,715 cf

Plug-Flow detention time= 427.5 min calculated for 0.471 af (100% of inflow)
 Center-of-Mass det. time= 426.9 min (1,207.7 - 780.8)

Volume	Invert	Avail.Storage	Storage Description
#1	897.25'	5,733 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 22,073 cf Overall - 7,740 cf Embedded = 14,333 cf x 40.0% Voids
#2	897.25'	7,740 cf	ADS_StormTech MC-4500 +Cap x 70 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 4 Rows of 18 Chambers Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		13,473 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.25	3,270	0	0
904.00	3,270	22,073	22,073

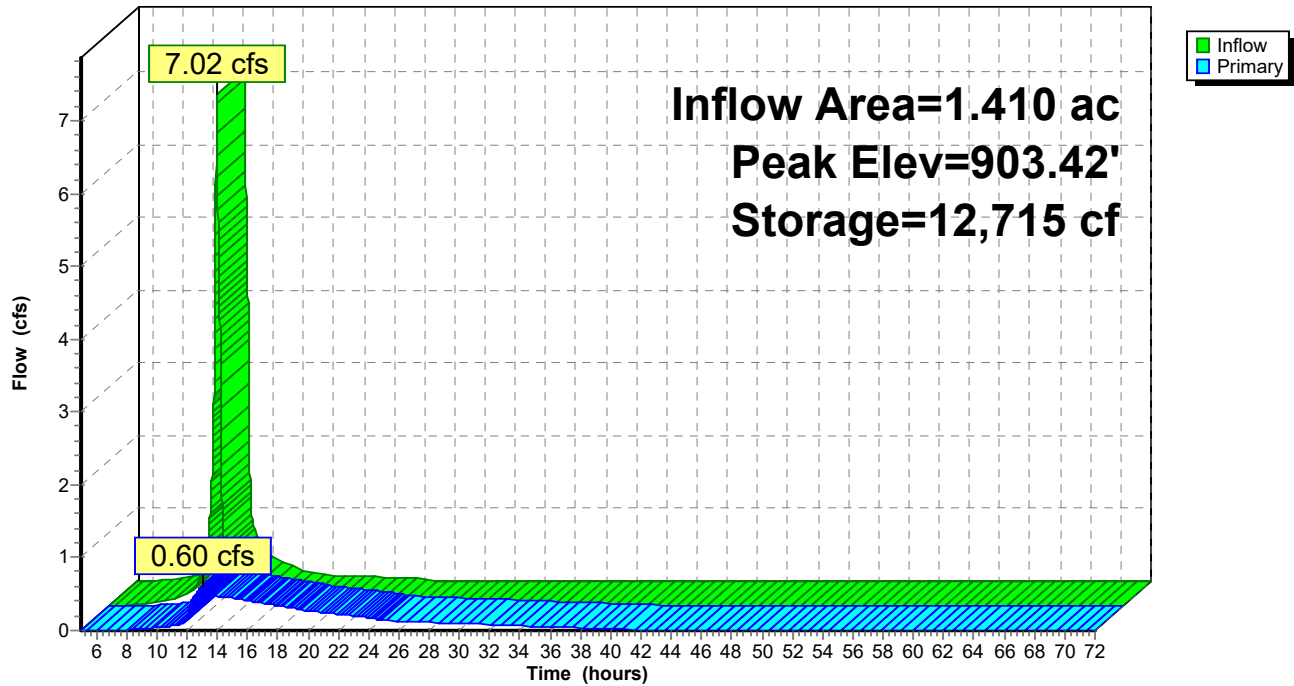
Device	Routing	Invert	Outlet Devices
#1	Primary	897.25'	24.0" Round Culvert L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 897.25' / 889.96' S= 0.0972 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf
#2	Device 1	897.25'	2.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	899.00'	1.8" Vert. Orifice/Grate C= 0.600
#4	Device 1	900.40'	1.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	903.25'	6.5" W x 3.0" H Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.60 cfs @ 13.05 hrs HW=903.42' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 0.60 cfs of 27.16 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.26 cfs @ 11.88 fps)
- 3=Orifice/Grate (Orifice Controls 0.18 cfs @ 10.04 fps)
- 4=Orifice/Grate (Orifice Controls 0.05 cfs @ 8.31 fps)
- 5=Orifice/Grate (Orifice Controls 0.12 cfs @ 1.33 fps)

Pond 5P: ADS CHAMBERS

Hydrograph



Summary for Pond 7P: DRY POND

Inflow Area = 0.880 ac, 68.41% Impervious, Inflow Depth > 4.10" for 50-Year event
 Inflow = 6.06 cfs @ 12.12 hrs, Volume= 0.300 af
 Outflow = 3.72 cfs @ 12.18 hrs, Volume= 0.300 af, Atten= 39%, Lag= 3.5 min
 Primary = 3.72 cfs @ 12.18 hrs, Volume= 0.300 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 904.05' @ 12.18 hrs Surf.Area= 1,610 sf Storage= 1,447 cf

Plug-Flow detention time= 9.0 min calculated for 0.300 af (100% of inflow)
 Center-of-Mass det. time= 8.7 min (781.8 - 773.1)

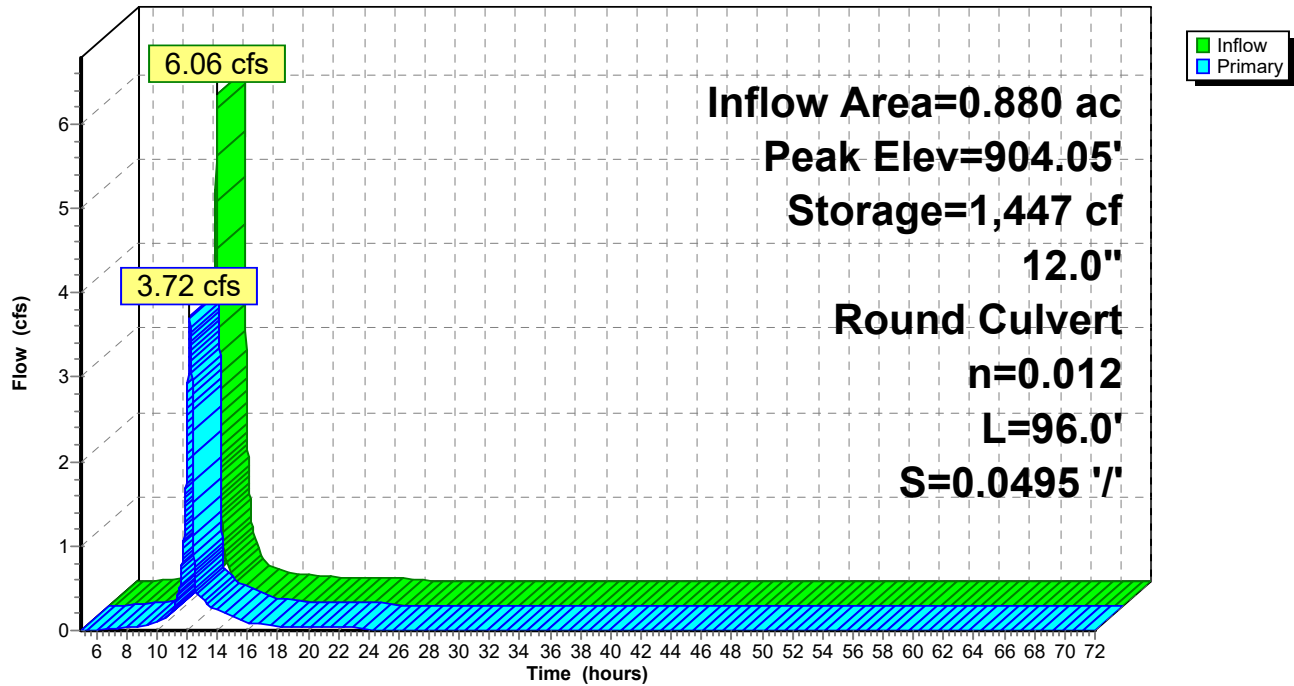
Volume	Invert	Avail.Storage	Storage Description
#1	902.00'	11,394 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
902.00	60	0	0
903.00	563	312	312
904.00	1,555	1,059	1,371
905.00	2,686	2,121	3,491
906.00	3,926	3,306	6,797
907.00	5,268	4,597	11,394

Device	Routing	Invert	Outlet Devices
#1	Primary	902.00'	12.0" Round Culvert L= 96.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 902.00' / 897.25' S= 0.0495 ' S Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.71 cfs @ 12.18 hrs HW=904.05' TW=900.80' (Dynamic Tailwater)

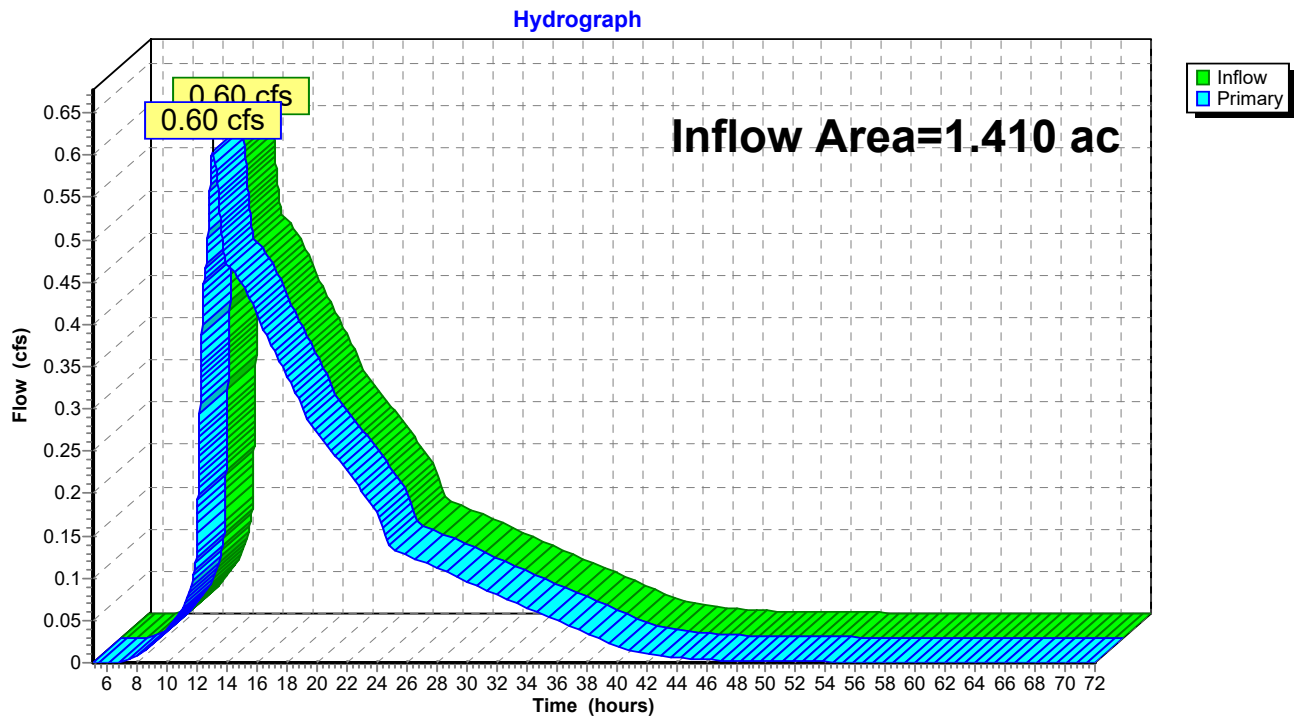
↑**1=Culvert** (Inlet Controls 3.71 cfs @ 4.73 fps)

Pond 7P: DRY POND**Hydrograph**

Summary for Link 6L: TOTAL RUNOFF

Inflow Area = 1.410 ac, 64.40% Impervious, Inflow Depth > 4.01" for 50-Year event
Inflow = 0.60 cfs @ 13.05 hrs, Volume= 0.471 af
Primary = 0.60 cfs @ 13.05 hrs, Volume= 0.471 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs

Link 6L: TOTAL RUNOFF

Time span=5.00-72.00 hrs, dt=0.01 hrs, 6701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment3S: ON-SITE TO UG DET Runoff Area=0.530 ac 57.74% Impervious Runoff Depth>4.49"
Tc=5.0 min CN=90 Runoff=4.04 cfs 0.198 af

Subcatchment8S: ON-SITE TO POND Runoff Area=0.880 ac 68.41% Impervious Runoff Depth>4.70"
Tc=5.0 min CN=92 Runoff=6.89 cfs 0.345 af

Pond 5P: ADS CHAMBERS Peak Elev=903.92' Storage=13,373 cf Inflow=7.75 cfs 0.543 af
Outflow=0.99 cfs 0.542 af

Pond 7P: DRY POND Peak Elev=904.26' Storage=1,815 cf Inflow=6.89 cfs 0.345 af
12.0" Round Culvert n=0.012 L=96.0' S=0.0495 '/' Outflow=3.96 cfs 0.345 af

Link 6L: TOTAL RUNOFF Inflow=0.99 cfs 0.542 af
Primary=0.99 cfs 0.542 af

Total Runoff Area = 1.410 ac Runoff Volume = 0.543 af Average Runoff Depth = 4.62"
35.60% Pervious = 0.502 ac 64.40% Impervious = 0.908 ac

Summary for Subcatchment 3S: ON-SITE TO UG DET

Runoff = 4.04 cfs @ 12.12 hrs, Volume= 0.198 af, Depth> 4.49"

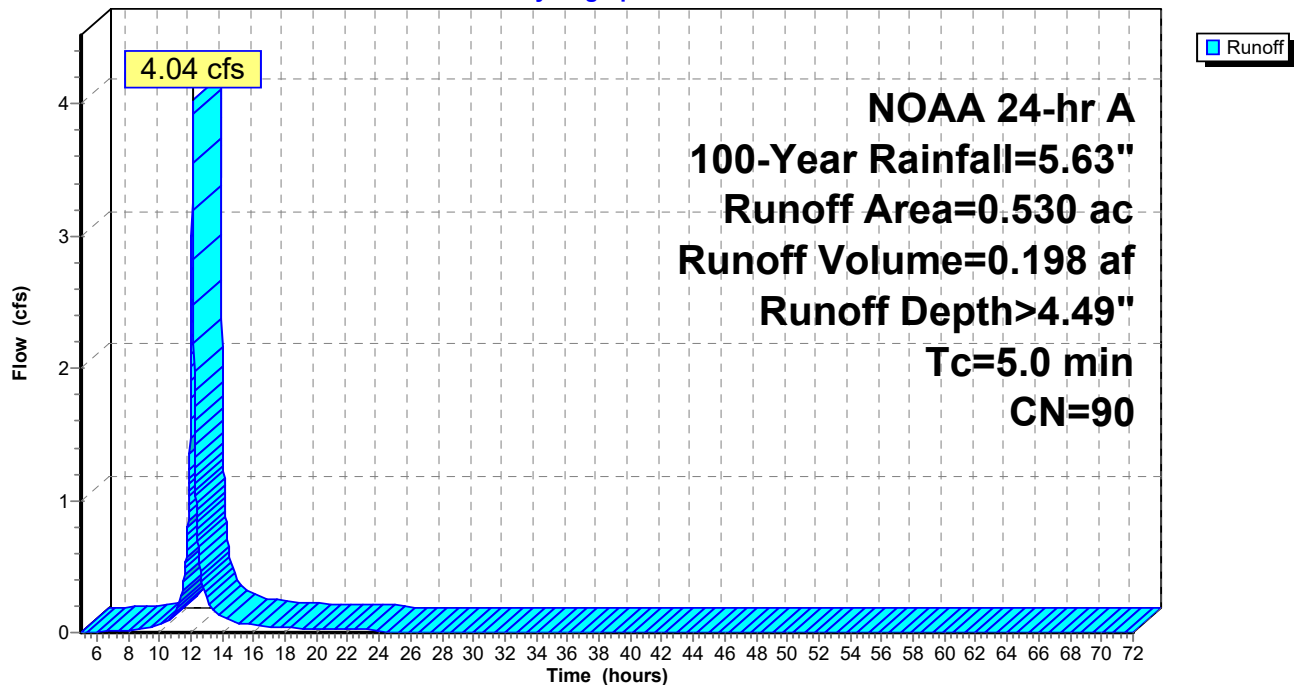
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr A 100-Year Rainfall=5.63"

Area (ac)	CN	Description
0.306	98	Paved parking, HSG D
0.224	80	>75% Grass cover, Good, HSG D
0.530	90	Weighted Average
0.224		42.26% Pervious Area
0.306		57.74% Impervious Area

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

Subcatchment 3S: ON-SITE TO UG DET

Hydrograph



Summary for Subcatchment 8S: ON-SITE TO POND

Runoff = 6.89 cfs @ 12.12 hrs, Volume= 0.345 af, Depth> 4.70"

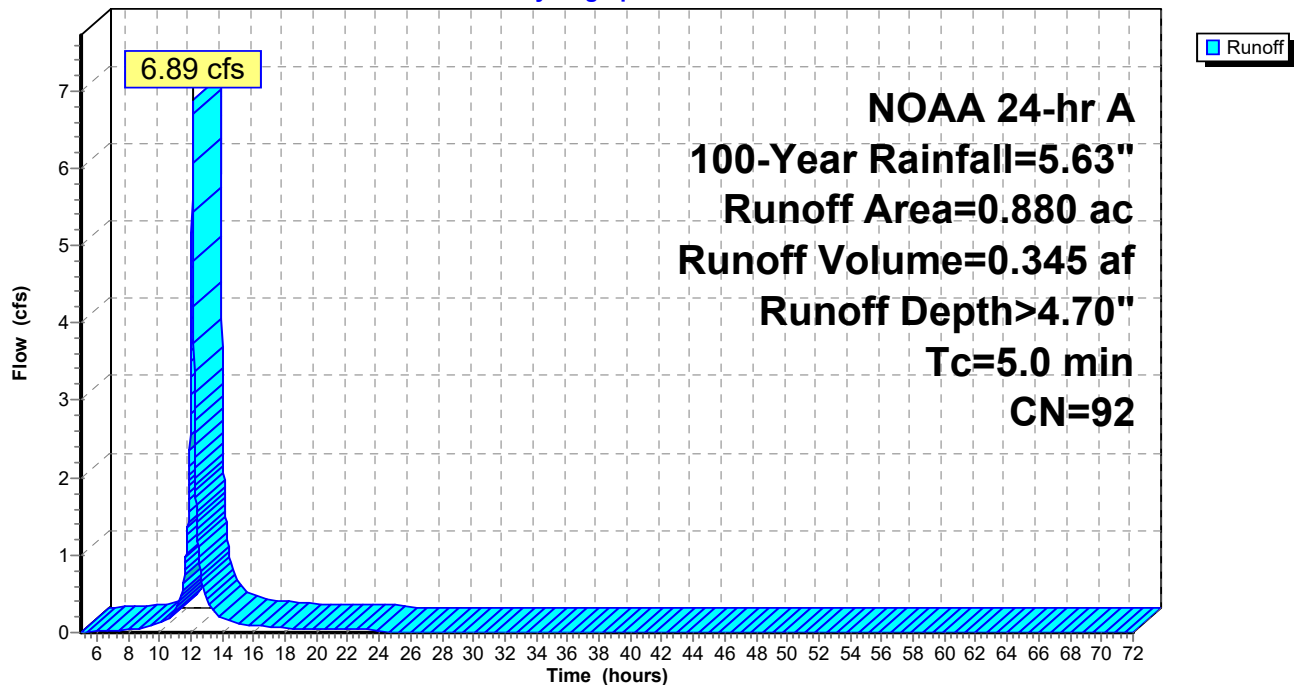
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 NOAA 24-hr A 100-Year Rainfall=5.63"

Area (ac)	CN	Description
0.602	98	Paved parking, HSG D
0.278	80	>75% Grass cover, Good, HSG D
0.880	92	Weighted Average
0.278		31.59% Pervious Area
0.602		68.41% Impervious Area

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

Subcatchment 8S: ON-SITE TO POND

Hydrograph



Summary for Pond 5P: ADS CHAMBERS

Inflow Area = 1.410 ac, 64.40% Impervious, Inflow Depth > 4.62" for 100-Year event
 Inflow = 7.75 cfs @ 12.13 hrs, Volume= 0.543 af
 Outflow = 0.99 cfs @ 12.75 hrs, Volume= 0.542 af, Atten= 87%, Lag= 37.2 min
 Primary = 0.99 cfs @ 12.75 hrs, Volume= 0.542 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 903.92' @ 12.75 hrs Surf.Area= 3,270 sf Storage= 13,373 cf

Plug-Flow detention time= 393.4 min calculated for 0.542 af (100% of inflow)
 Center-of-Mass det. time= 392.5 min (1,173.0 - 780.5)

Volume	Invert	Avail.Storage	Storage Description
#1	897.25'	5,733 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 22,073 cf Overall - 7,740 cf Embedded = 14,333 cf x 40.0% Voids
#2	897.25'	7,740 cf	ADS_StormTech MC-4500 +Cap x 70 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 4 Rows of 18 Chambers Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		13,473 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.25	3,270	0	0
904.00	3,270	22,073	22,073

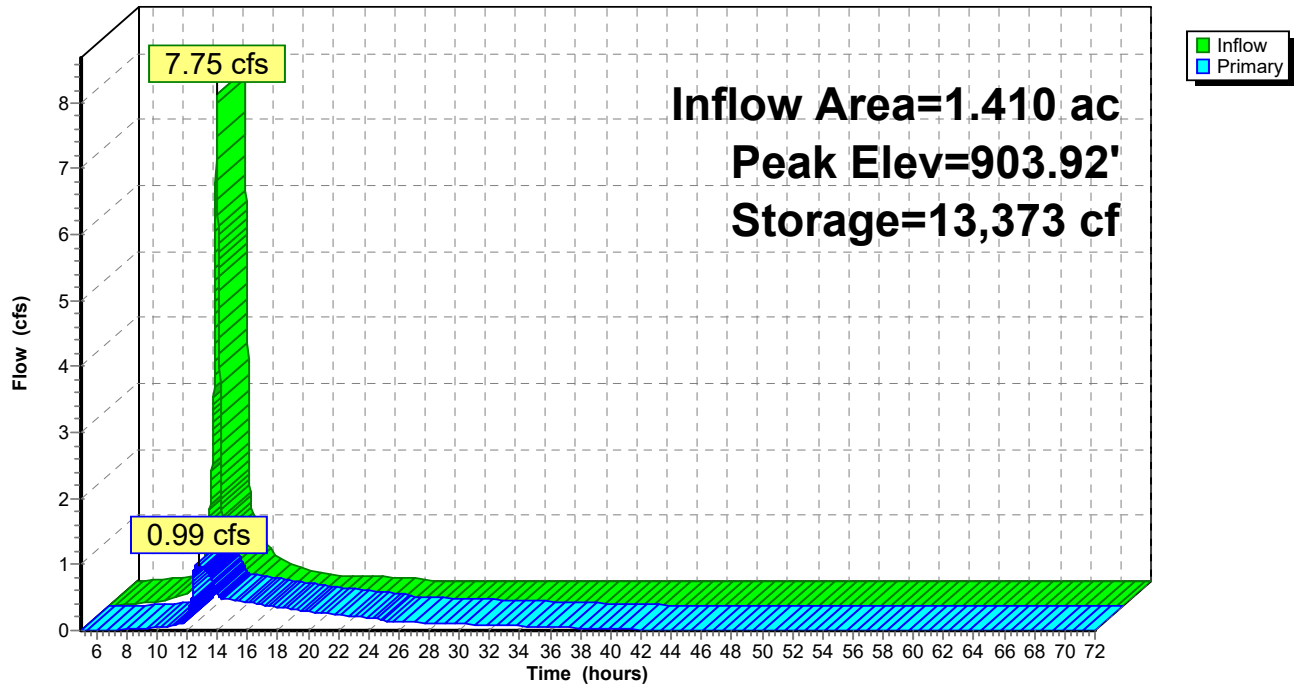
Device	Routing	Invert	Outlet Devices
#1	Primary	897.25'	24.0" Round Culvert L= 75.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 897.25' / 889.96' S= 0.0972 ' /' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf
#2	Device 1	897.25'	2.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	899.00'	1.8" Vert. Orifice/Grate C= 0.600
#4	Device 1	900.40'	1.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	903.25'	6.5" W x 3.0" H Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.99 cfs @ 12.75 hrs HW=903.92' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 0.99 cfs of 28.45 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.27 cfs @ 12.36 fps)
 3=Orifice/Grate (Orifice Controls 0.19 cfs @ 10.60 fps)
 4=Orifice/Grate (Orifice Controls 0.05 cfs @ 8.99 fps)
 5=Orifice/Grate (Orifice Controls 0.48 cfs @ 3.56 fps)

Pond 5P: ADS CHAMBERS

Hydrograph



Summary for Pond 7P: DRY POND

Inflow Area = 0.880 ac, 68.41% Impervious, Inflow Depth > 4.70" for 100-Year event
 Inflow = 6.89 cfs @ 12.12 hrs, Volume= 0.345 af
 Outflow = 3.96 cfs @ 12.19 hrs, Volume= 0.345 af, Atten= 43%, Lag= 3.8 min
 Primary = 3.96 cfs @ 12.19 hrs, Volume= 0.345 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 904.26' @ 12.19 hrs Surf.Area= 1,850 sf Storage= 1,815 cf

Plug-Flow detention time= 12.5 min calculated for 0.345 af (100% of inflow)
 Center-of-Mass det. time= 12.5 min (783.1 - 770.6)

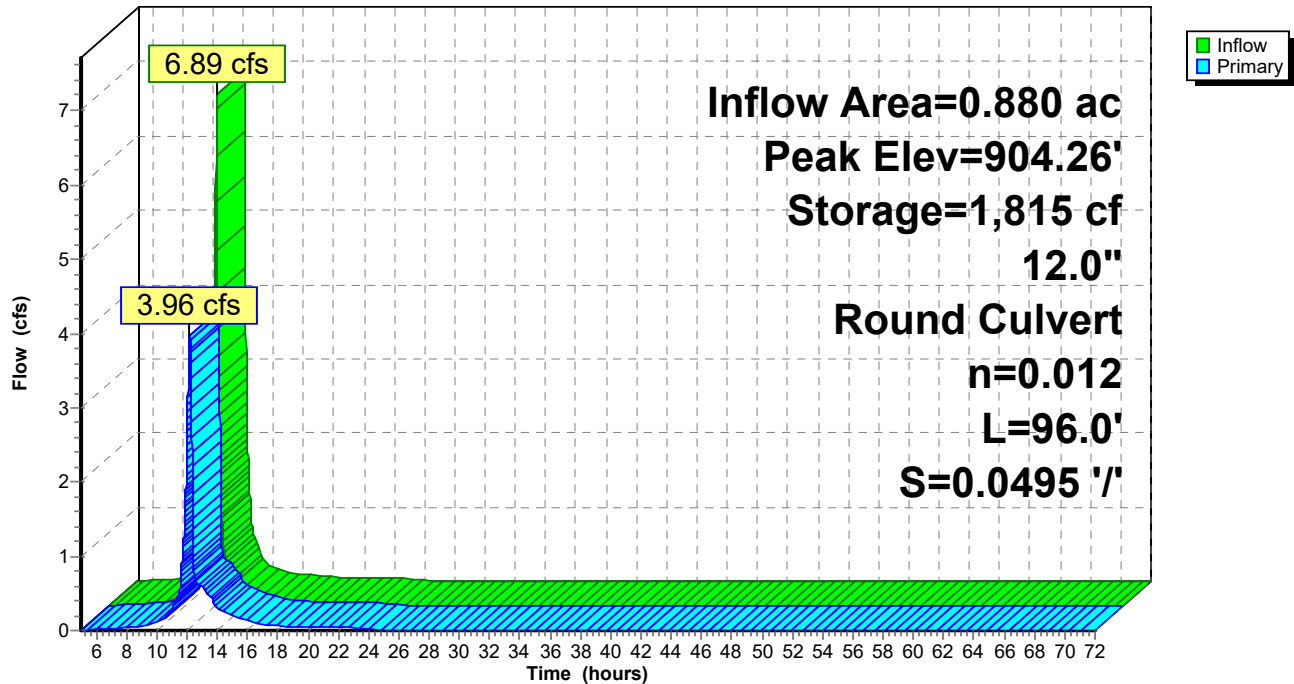
Volume	Invert	Avail.Storage	Storage Description
#1	902.00'	11,394 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
902.00	60	0	0
903.00	563	312	312
904.00	1,555	1,059	1,371
905.00	2,686	2,121	3,491
906.00	3,926	3,306	6,797
907.00	5,268	4,597	11,394

Device	Routing	Invert	Outlet Devices
#1	Primary	902.00'	12.0" Round Culvert L= 96.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 902.00' / 897.25' S= 0.0495 ' S= 0.0495 ' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.96 cfs @ 12.19 hrs HW=904.26' TW=901.50' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 3.96 cfs @ 5.04 fps)

Pond 7P: DRY POND**Hydrograph**

Summary for Link 6L: TOTAL RUNOFF

Inflow Area = 1.410 ac, 64.40% Impervious, Inflow Depth > 4.61" for 100-Year event
Inflow = 0.99 cfs @ 12.75 hrs, Volume= 0.542 af
Primary = 0.99 cfs @ 12.75 hrs, Volume= 0.542 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-72.00 hrs, dt= 0.01 hrs

Link 6L: TOTAL RUNOFF