

# STORMWATER MANAGEMENT REPORT

*Prepared for:*

**L'OREAL USA**

Block 86.03, Lot 10.32  
100 Commerce Drive

Township of Franklin  
Somerset County, New Jersey

*Prepared by:*

**BOHLER //**

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## 1. Introduction

The subject property is located at 100 Commerce Drive in the Township of Franklin, Somerset County, New Jersey. The property is identified as Block 86.03, Lot 10.32 on the Township of Franklin tax maps and is a total of 29.58 acres in size and will hereafter be referred to as “the site”. The site is bordered to the northeast and northwest by residential properties and Amwell Road beyond; to the east by Franklin Sewage Authority and other commercial uses, with Jiffy Road beyond; to the west by Dahmer Road with residential properties beyond; and to the south by Commerce Drive, Nature Flooring Industries and other commercial uses, with residential properties beyond. A tax map, soil map, and USGS map are included at the beginning of Appendix C for reference.

The site is currently occupied with the existing ±305,200 SF L’Oreal USA Franklin building, along with other existing site features which include an extended detention basin and a bioretention basin, associated parking and driveway areas, loading docks, and landscaping. The site is located within the B-1 Zone, where industrial uses are permitted. The proposed improvements include expanding the existing L’Oreal manufacturing building, which will occur in several phases and will ultimately increase the building floor area to a total of approximately 551,790 SF. Other proposed features include, but are not limited to, additional parking stalls, sidewalks, lighting and landscaping, and utility improvements. A proposed stormwater management system will convey the runoff from the proposed development and impervious areas to new small-scale bioretention basins before being discharged off of the site.

This report summarizes the design objectives, methodology, and calculations for the conveyance, detention, treatment and discharge of stormwater runoff leaving the site and is meant to accompany the Site Plan documents prepared by Bohler Engineering. Pre-development and post-development conditions are examined for stormwater quantity analysis, water quality analysis, groundwater recharge, soil erosion and sediment control, and low impact development based on the *NJDEP Stormwater Management Regulations* of March 2021.

## 2. Pre-Development Site Conditions

The site contains a total area of 29.58 acres, which is also the size of the studied watershed area. The site consists of three unique drainage areas, which drain to three separate points of analysis. These analysis points are identified as Point of Interest #1 (POI #1), Point of Interest #2 (POI #2) and Point of Interest #3 (POI #3). In the pre-development condition, the site is occupied by the existing L’Oreal commercial/industrial facility on the southern portion of the lot, along with its associated parking, driveway, and landscaped areas. The northern area of the site is currently undeveloped and consists primarily of wooded area. Currently, the runoff generated on the developed portion of the site outfalls to a regional stormwater management basin to the southeast of the site after passing through the existing extended detention and bioretention basins. Drainage from the undeveloped wooded area splits between an existing wetland area along the western

property line and the northeast corner of the site. The Existing Drainage Area Map in Appendix C illustrates the limits of each existing drainage area and how they relate to the existing site conditions.

## **2.1 Point of Interest #1**

Point of Interest #1 (POI #1) is located at the southeastern corner of the site within Commerce Drive, and is comprised of several sub-drainage areas as defined in the following sections. POI #1 can be described as the point where all on-site sub-drainage areas ultimately flow to, which in this case is a junction drainage inlet in the street. The Existing Drainage Area Map in Appendix C illustrates the identified point of analysis and how it relates to the existing topography and drainage infrastructure on the site.

### **2.1.1 Existing Drainage Area #1A (EDA-1A)**

EDA-1A contains 17.88 acres of land, of which 10.52 acres are impervious area, which includes the entirety of the roof area from the existing buildings, a majority of the rear driveway and loading dock area, the western and southern parking areas, and a portion of the wooded area to the north which sheet flows into the developed area of the site. The topography of the area slopes generally from north to south from a maximum elevation of approximately 118' to a minimum elevation of approximately 106' with slopes ranging from 1% to 10%. CN values of 98, 74 and 72 were used for impervious, pervious, and wood/grass combination areas, respectively, with a calculated time of concentration of 26.4 minutes. The runoff from EDA-1A sheet flows to a series of surface inlets and drains, and then flows through the existing storm sewer pipes and structures on the site. EDA-1A discharges directly to POI #1.

### **2.1.2 Existing Drainage Area #1B (EDA-1B)**

EDA-1B contains 5.73 acres of land, of which 1.36 acres are impervious pavement surfaces, and includes the on-site area draining to the existing extended detention facility along the eastern side of the property. The topography of the area slopes from north to south from a maximum elevation of approximately 117' to a minimum elevation of approximately 104' at the extended detention basin, with slopes ranging from 0.5% to 10%. CN values of 98, 74 and 70 were used for impervious, pervious, and wooded areas, respectively, with a calculated time of concentration of 15.3 minutes. The runoff from Existing Drainage Area #1B flows from the wooded area on the northeast corner of the site and collects in the pavement area to the east of the primary building, where it is collected by surface inlets and conveyed via storm sewer pipe to the extended detention basin. The runoff is then retained in the extended detention

basin and released at a controlled rate into the adjacent bioretention basin along the eastern property line, which then outfalls to POI #1.

### **2.1.3 Existing Drainage Area #1C (EDA-1C)**

EDA-1C contains 1.15 acres of grass/shrub coverage (CN = 74), which includes the on-site area draining directly to the existing bioretention basin via sheet flow. The bioretention basin was previously designed with an earthen spillway as the primary method of discharge, which is directed out to Commerce Drive and POI #1.

## **2.2 Point of Interest #2**

Point of Interest #2 (POI #2) is located near the northwestern corner of the site along Dahmer Road, which has been identified as a localized depression and wetlands area by NJDEP. The area draining to POI #2 is identified as Existing Drainage Area #2, which is comprised of 3.54 acres of wooded area (CN=70) and 0.06 acres of impervious coverage from the site. The time of concentration for POI #2 was calculated as 19.6 minutes. Runoff within this area drains via sheet flow either directly to the wetlands area, or to existing storm sewer inlets within Dahmer Road, which then discharge to the wetland areas to the west of the site. The Existing Drainage Area Map in Appendix C illustrates the identified point of analysis and how it relates to the existing topography and drainage infrastructure on the site.

## **2.3 Point of Interest #3**

Point of Interest #3 (POI #3) is located at the northeastern corner of the site abutting Block 600, Lot 2.01 and Block 86.03, Lot 1.08. The area draining to POI #3 is identified as Existing Drainage Area #3, which is comprised of 1.23 acres of wooded area (CN=70) and drains via sheet flow to the property boundary and then off of the site. The time of concentration for POI #3 was calculated as 15.2 minutes. The Existing Drainage Area Map in Appendix C illustrates the identified point of analysis and how it relates to the existing topography and drainage infrastructure on the site.

## **3. Post-Development Site Conditions**

The post-development condition for the site includes the construction of a 246,590 SF expansion to the existing building, bringing the total building coverage for the site to be approximately 551,790 SF. The project also proposes to construct additional driveways, loading areas, parking stalls around the perimeter of the site, and landscaping improvements. The proposed site is designed in a manner that generally maintains the existing drainage patterns. The studied watershed area in the post-development condition contains the same 29.58-acre area that was studied in the pre-development condition and consists of several unique drainage areas related

to the three (3) primary points of analysis. The post-development drainage areas and sub-drainage areas are described in more detail in the following sections below.

In addition to the building expansion and associated site improvements, a proposed stormwater conveyance system will collect the runoff from the proposed roofs, pavement and loading areas via inlets, manholes, trench drains and stormwater piping. A portion of the collected runoff will be redirected to the proposed bioretention basins (described further below), and subsequently discharged to the existing extended detention basin, while the remainder of the existing development will drain to Commerce Drive as it does currently. The construction of the proposed improvements will disturb approximately 11 acres of land and will create approximately 7.9 acres of additional impervious coverage ( $\pm 2.2$  acres of additional motor vehicle surface) on the site in the post-development condition. The Proposed Drainage Area Map in Appendix C illustrates the limits of each proposed drainage area and how they relate to the proposed site conditions

### **3.1 Point of Interest #1**

The sub-drainage areas for POI #1 in the post development condition flow to the same point of analysis identified in the existing condition, located near the southeastern property corner within Commerce Drive. As noted above, the Proposed Drainage Area Map in Appendix C illustrates the identified point of analysis and how it relates to the proposed topography on the site.

#### **3.1.1 Proposed Drainage Area #1A (PDA-1A)**

PDA-1A corresponds to EDA-1A in terms of upstream tributary area, where runoff is eventually conveyed through the existing storm sewer system on the southern and western portions of the site and discharged to POI #1 through Commerce Drive.

PDA-1A is further broken down into PDA-1A-a and PDA-1A-b, which are individual areas draining to the proposed porous pavement systems to the west of the proposed building expansion. These areas are comprised of 0.13 acres and 0.39 acres of motor vehicle surface area, respectively. The porous pavement systems provide water quality treatment for runoff, which is then discharged via control orifices downstream to the existing storm sewer network. The porous pavement outflows then join with the remainder of the existing building, parking areas, and open space to the south and west of the site (noted as PDA-1A-c) for conveyance to Commerce Drive and eventually POI #1. PDA-1A-c is comprised of approximately 3.30 acres of open space and 9.51 acres of impervious and roof area.



### **3.1.2 Proposed Drainage Area #1B (PDA-1B)**

PDA-1B also corresponds to EDA-1B in terms of upstream tributary area, where runoff is eventually conveyed to the existing extended detention basin on the eastern side of the site and subsequently discharged to POI #1 via the extended detention basin's outlet control structure and the adjacent bioretention basin.

PDA-1B is further broken down into PDA-1B-a and PDA-1B-b, which are individual areas draining to the proposed bioretention basins near the northeast corner of the building expansion. PDA-1B-a is comprised of 0.53 acres of grass area, 0.27 acres of wooded area, and 0.69 acres of motor vehicle surface, while PDA-1B-b is comprised of 0.15 acres of grass surface and 0.73 acres of motor vehicle surface. The bioretention basins provide water quality treatment for tributary runoff, which is then discharged via control orifices and underdrains downstream to the existing storm sewer network. The basin outflows then join with the remainder of the parking and loading areas to the east of the building, which is noted as PDA-1B-c. A portion of PDA-1B-a also includes a porous asphalt pavement and stone storage area (PDA-1B-d) which will outflow to the bioretention basin in PDA-1B-a. PDA-1B-c is comprised of approximately 2.81 acres of open grass space, and 1.32 acres of impervious motor vehicle surface area (1.18 acres of existing pavement vs. 0.14 acres of increase proposed). Collectively, PDA-1B ultimately drains to the extended detention basin to the east of the loading area via several inlets and headwalls along the curb line. An assumed time of concentration of 10 minutes was utilized for PDA-1A and PDA-1B, as the wooded area to the north of the site is proposed to be removed, which was the primary cause of the higher existing concentration time. The routing of the runoff from these drainage areas is reflected on the Inlet Area Map in Appendix C and is accounted for throughout the other Appendices of this report.

### **3.1.3 Proposed Drainage Area #2 (PDA-2)**

PDA-2 remains mostly unchanged compared to EDA-2, where runoff drains via sheet flow from the northwestern portion of the site to the western property line, and ultimately to the existing isolated wetland area at POI #2. PDA-2 is comprised of 1.77 acres of wooded area, which is reduced from the existing condition and therefore will comply with all NJDEP criteria for off-site runoff volume, peak flow rates, and water quality.

### **3.1.4 Proposed Drainage Area #3 (PDA-3)**

Similar to PDA-2, PDA-3 remains mostly unchanged compared to EDA-3. Runoff will continue to drain from west to east along the northern property line and eventually drain off the site at the northeast corner, where POI #3 is located. PDA-3 is comprised of 0.88 acres of wooded area, which is reduced from the

existing condition and therefore will comply with all NJDEP criteria for off-site runoff volume, peak flow rates, and water quality.

### 3.2 Proposed Structural Stormwater Management Strategies

Several stormwater management strategies have been utilized for the post-development condition in compliance with the regulations set forth by NJDEP for water quantity, water quality, and groundwater recharge, while also providing several “Green Infrastructure” features. These strategies are described in more detail below.

#### 3.2.1 Bioretention Systems

As part of the stormwater management design of the proposed site, a bioretention system is proposed to capture water from impervious areas. The bioretention system meets the minimum requirements outlined in the *New Jersey Stormwater Best Management Practices Manual* by providing 18 inches of soil bed depth, an underdrain system, containment and treatment of the entire Water Quality Design Storm volume, a storage depth of 12 inches maximum in a flat-bottom system, and 1 foot minimum of separation between the bottom of the bioretention basin and the seasonal high ground water table for underdrain systems. Therefore, the bioretention systems will achieve 80% TSS removal per the table below.

**TABLE 3.2.1**

<b>DESIGN PARAMETERS</b>		
<b>TSS Removal Rate</b>	<b>Depth of Soil Bed</b>	<b>Vegetation</b>
80%	18 inches	Terrestrial Forested Community
80%	24 inches	Site-Tolerant Grasses
90%	24 inches	Terrestrial Forested Community
<b>Storage Volume</b>	Entire Water Quality Design Storm Volume	
<b>Minimum Density of Vegetation</b>	85%	
<b>Appropriate Species Selection</b>	See Chapter 7 of the <i>NJ Stormwater Best Management Practices Manual</i>	
<b>Maximum Design Storm Drain Time</b>	72 Hours, Using Slowest Design Permeability Rate	
<b>Permeability Rate Factor of Safety</b>	2	
<b>Minimum Subsoil Design Permeability Rate</b>	0.5 inches/hour	

<b>Soil Testing Requirements</b>	Must be consistent with Appendix E of the <i>NJ Stormwater Best Management Practices Manual</i>
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### 3.2.2 Pervious Paving Systems

Pervious paving materials have been proposed as part of the overall site design and stormwater management system to reduce the impermeable impervious surface on site, while also providing 80% TSS removal for pervious paved surfaces and their tributary areas. The pervious pavement also provide additional storage volume for larger storm events to minimize the sizes of downstream conveyance pipes and basin systems. The pervious paving systems have been designed to have a maximum ratio of additional inflow area to the pavement surface area of 3:1 or less, a maximum surface slope of 5%, a storage bed that fully contains the Water Quality Design Storm runoff volume, and to discharge the design storm within 72 hours of a rain event.

Infiltration through the bottom of the pervious paving systems is not available for the site due to the presence of hydrologic soil group D strata and impermeable subsoils, and therefore multiple series of underdrains have been provided for the site to promote drain-down of the stone storage. The underdrain systems are also designed in conjunction with proposed inlets with grates for maintenance access and to provide overflow relief in the event of a surcharged condition.

**TABLE 3.2.2**

<b>DESIGN PARAMETERS</b>	
<b>Porous Asphalt, Pervious Concrete and Permeable Interlocking Paver Units</b>	6.4 inches/hour Minimum Infiltration Rate

### 3.2.3 Emergency Overflow

The emergency drainage design associated with the proposed bioretention basins have been incorporated into the proposed outlet structures. The horizontal grates at the top of each structure are set slightly above the 100-year storm elevation, meaning they will only be utilized under emergency conditions to pass a design storm that is equivalent to the 100-year storm plus 50%. Approximately one foot of freeboard is provided above the peak water elevation while the emergency grate overflow is operating.

### 3.3 Pre- vs. Post-Development Flow Summary

TABLE 3.3

FLOW SUMMARY TABLE

	EDA-1 (POI-1)	PDA-1 (POI-1)	EDA-2 (POI-2)	PDA-2 (POI-2)	EDA-3 (POI-3)	PDA-3 (POI-3)
2 yr. Flow (cfs)	22.86	29.15	1.91	0.91	0.59	0.42
10 yr. Flow (cfs)	38.73	46.70	4.32	2.09	1.34	0.96
100 yr. Flow (cfs)	70.20	15.79	9.60	4.69	3.00	2.15

## 4. Stormwater Management Design Methodology

In accordance with the NJDEP Stormwater Management Regulations, the proposed development must meet the requirements, if appropriate, for stormwater quantity reductions, water quality, groundwater recharge, soil erosion and sediment control, and low impact development. The following sections describe how each of the above items are addressed on site in the post-development condition.

### 4.1 Stormwater Quantity Controls

The Assessment of stormwater quantity has been based upon the Soil Conservation Service Method (SCS) Unit Hydrograph as described in Technical Release Number 55 (TR55), "Urban Hydrology for Small Watersheds". Theoretical storms are modeled with the 24-Hour SCS Unit Dimensionless Hydrograph using the NOAA Atlas 14 Type C rainfall distribution and recurrence intervals of 2, 10, and 100 years. Hydrograph creation and routings are accomplished using the *HydroCAD* Version 10.00 program by HydroCAD Software Solutions, LLC. The following techniques from the *NJDEP Stormwater Management Regulations* is being applied to each drainage area as noted in section 3.3:

1. NJAC § 7:8-5.6(b)1 states for stormwater runoff leaving the site, post-development runoff hydrographs for the 2-, 10-, and 100-year storms do not exceed, at any point in time, the pre-development runoff hydrographs for the same storm events. The above section of the NJAC will be applied to drainage areas that, under proposed conditions, will remain unchanged or have a net decrease in impervious coverage and/or a net decrease in total area.
2. NJAC § 7:8-5.6(b)3 states the post-development peak runoff rates for the 2-, 10-, and 100-year storm events are 50, 75, and 80 percent, respectively, of the pre-

development peak runoff rates. The above section of the NJAC will be applied to drainage areas that are impacted by the proposed development and flow to a detention or retention system.

3. NJAC § 7:8-5.6(b)4 states in tidal flood hazard areas, stormwater runoff quantity analysis in accordance with the above quantity criteria shall only be applied if the increase in volume of stormwater runoff could increase flood damages below the point of discharge.

Quantity control for PDA-2 and PDA-3 is achieved using Method 1 above (NJAC 7:8-5.6(b)1). The stormwater leaving the site in these two areas, post-construction runoff hydrographs for the two-, 10-, and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events. A comparison of the hydrographs is included in Appendix A.

Quantity control for PDA-1 involves an evaluation of the existing regional stormwater management basin to the south of the site and across Commerce Drive. An evaluation of the regional basin was performed using topographic information available from NOAA (National Oceanic and Atmospheric Administration) in order to determine the drainage area and storage capacity of the existing regional basin. Assuming full build out of the drainage area based on maximum impervious coverage allowances in the zoning district it was determined that the basin volume is sufficient to detain and attenuate the additional impervious surfaces proposed by the development. A HydroCAD model for the regional basin is provided in Appendix A. In addition, the existing on-site detention basin provides attenuation for the design storms therefore lessening the runoff directed to the regional basin. The existing on-site detention basin was designed based on a proposed building expansion in 2013 and subsequently built. However, the proposed addition was not completed to date and therefore is of sufficient capacity to detain a portion of the expansion proposed as part of this application. Our office is in the process of obtaining existing conditions topography for the regional basin to confirm/assess the capacity. Updated analysis will be provided under separate cover when this information is available.

#### **4.1.1 Site Soils**

Site soil information has been obtained from the USDA Natural Resources Conservation Service (NRCS) web soil survey database, last revised in 2012. The major soil types present on site include Penn Silt Loam, which is a somewhat poorly drained soil with 2 to 6 percent slopes. Penn soils are classified as Hydrologic Soil Group Type C soils; therefore, values used in the CN and time of concentration calculations are associated with Type C soils. For areas where the calculated time of concentration is less than 10 minutes, a minimum of 10 minutes was used.

### 4.1.2 Rainfall Data

Rainfall data used in the stormwater calculations of this report are obtained from several different sources based on the latest NJDEP stormwater regulations. The Water Quality storm event is based on the NJDEP BMP Manual Chapter 5 definition of having a total rainfall depth of 1.25 inches and a total duration of two (2) hours. Twenty-four-hour rainfall frequency data in Somerset County for all other storms is obtained from the NOAA Atlas 14, Volume 2, Precipitation-Frequency Atlas of the United States, updated in 2006 and listed in the table below:

**TABLE 4.1**

Event (year)	2	10	25	100
Rainfall (in)	3.34	5.01	6.15	8.21

### 4.1.3 Pipe Sizing

Calculations for sizing the stormwater pipe networks associated with the proposed stormwater management conveyance system can be found in Appendix B of this report. The Rational Method has been used to size the storm piping for the 25-year storm event. The calculations are conservatively based on a time of concentration of 10 minutes to any inlet. An Inlet Area Map is included in Appendix C.

## 4.2 Water Quality Controls

Water quality analysis is based on the requirements of NJAC § 7:8-5.5, which requires 80% TSS removal of post-development runoff from new motor vehicle surface areas before discharging the runoff. Additionally, 50% TSS removal in post-development runoff from replaced impervious areas must be achieved prior to discharging the runoff if no prior TSS removal is provided. The site proposes two (2) bioretention systems and several other pervious pavement areas, each of which provides 80% TSS removal for their tributary areas. Nearly all of the proposed motor vehicle surface for the project is tributary to one of these features. The remaining small percentage of motor vehicle surface that bypasses these systems due to constraints with matching existing grades is tributary to the existing extended detention basin and/or bioretention basin, which each provide TSS removal per the previously approved designs. These treatment techniques achieve 80% TSS removal for all new impervious areas on the site and thus meet the water quality requirements.

### **4.3 Groundwater Recharge**

The NJDEP Stormwater Management Regulations require that a proposed land development site comply with either of the following groundwater recharge requirements:

1. Demonstrate that 100% of the site's average annual pre-developed groundwater recharge volume will be maintained after development; or
2. Demonstrate that 100 percent of the difference between the site's pre-development and post-development 2-year runoff volume is infiltrated.

Additionally, NJAC § 7:8-5.4(a)2 states that the groundwater recharge requirement does not apply to projects within the urban redevelopment area nor projects where recharge would be inconsistent with a remedial action work plan.

There will be an increase in impervious surfaces because of the proposed development. Typically, this would result in a slight decrease in groundwater recharge volume compared to the existing condition. However, as required by NJDEP's Stormwater Management Rules, soil testing was performed which concluded that the soil types in the area of the development are classified as primarily clay, with permeability results of less than 0.2 inches per hour. While the mapped soil types are classified as Hydrologic Soil Group (HSG) C, the observed soil conditions are more indicative of HSG D due to the low permeability rates. When groundwater recharge is calculated using the observed soil type, the existing groundwater recharge volume is maintained in the proposed condition, and therefore complies with NJDEP regulations.

### **4.4 Soil Erosion and Sediment Control**

The Soil Erosion and Sediment Control plans and details are included within the Site Plan documents prepared by Bohler Engineering and must be followed throughout construction. Silt fences, stabilized construction entrances, a temporary stockpile and inlet filters are proposed during construction. This report and the Site Plan documents prepared by Bohler Engineering are being submitted to the Somerset-Union Conservation District for approval.

### **4.5 Low-Impact Development and Non-Structural Stormwater Management Facilities**

In accordance with the NJDEP regulations and the latest *New Jersey Stormwater Best Management Practices Manual*, several non-structural stormwater management strategies have been incorporated into the design of the site and are listed below:

#### **4.5.1 Vegetation and Landscaping**

A comprehensive Landscape Plan has been incorporated into the design of the proposed improvements on the site that provides low maintenance landscaping. The use of lawn areas has been minimized where applicable and fertilizers and pesticides are to be used sparingly.

##### **4.5.1.1 Vegetative Filters and Buffers**

Vegetative filters and buffers are used as part of the proposed design to intercept sheet flow from impervious areas to help increase the time of concentration and provide some water quality treatment prior to entering the proposed stormwater conveyance system. These vegetative filters and buffers differ from the vegetative filter strips described in Section 3.2 above in that they do not meet the requirements to achieve 60%-80% TSS removal but still provide some inherent benefit to the treatment of stormwater runoff. These buffer areas are not part of the calculated water treatment methodology used on site.

#### **4.5.2 Minimize Land Disturbance**

The proposed design of the site incorporates the preservation of existing vegetative areas that will remain undisturbed. The undisturbed areas will be protected during construction and will have easements and/or deed restrictions established as required by other NJDEP regulations and permits to ensure these areas remain undisturbed in the future

#### **4.5.3 Impervious Area Management**

Impervious areas are the primary source of additional runoff in the post-development site condition. The sections below describe the measures that have been taken in the proposed site design to minimize the amount of impervious proposed on site.

##### **4.5.3.1 Streets, Sidewalks, and Parking, Driveway Areas**

As part of the proposed site design, the minimum allowable parking and drive aisle sizes, in accordance with local ordinances, are used in lieu of larger stalls and aisles to reduce the amount of impervious surface in the post-development condition. Additionally, porous pavement areas are proposed where possible to minimize the connected impervious surface on the site.



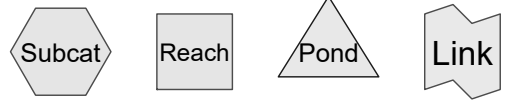
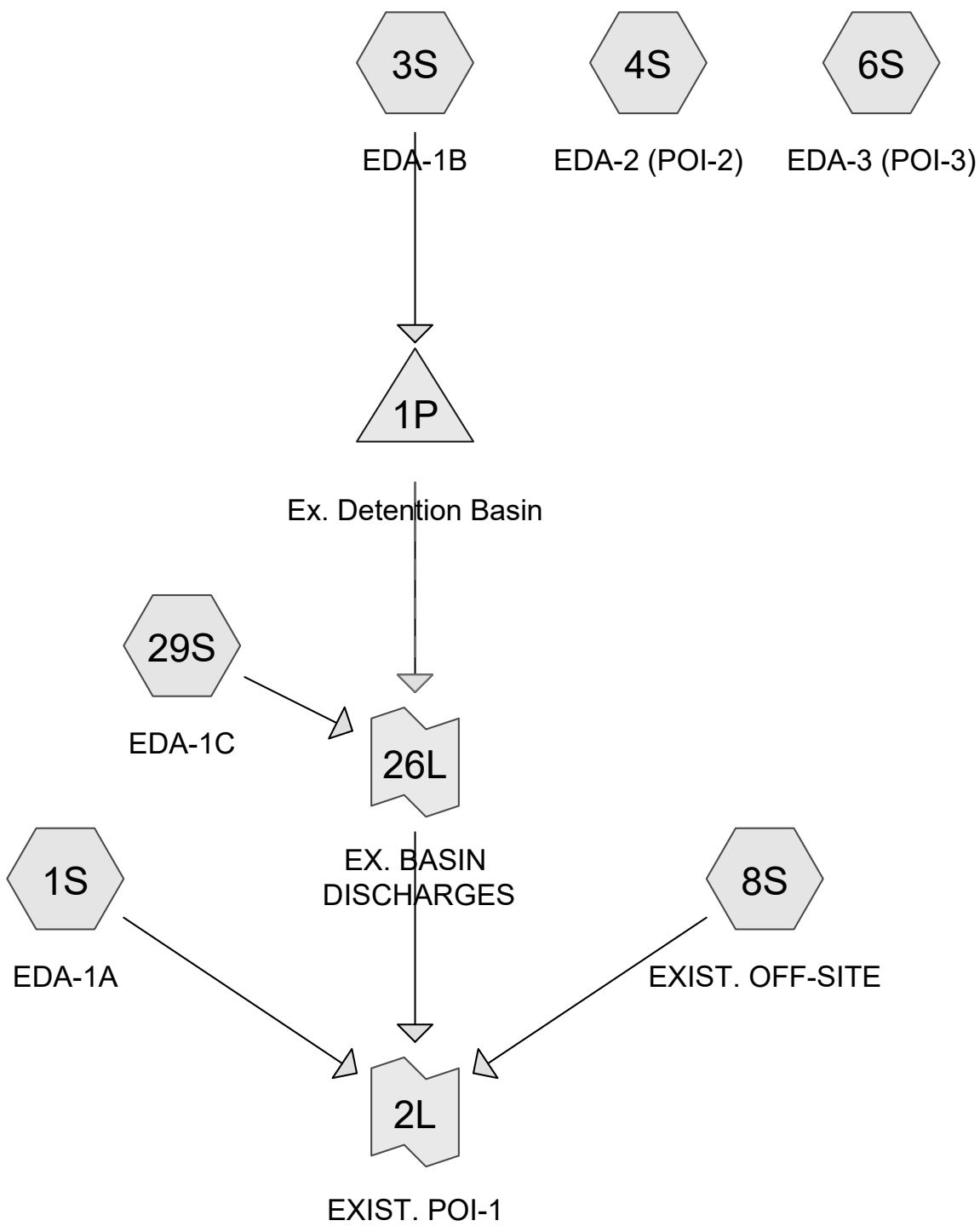
## 5. Conclusions

As demonstrated in the above sections, the stormwater management plan for the proposed development meets the *NJDEP Stormwater Management Regulations* of March 2021, and addresses the requirements for stormwater quantity reductions, water quality, groundwater recharge, soil erosion and sediment control, and low impact development. As a result of the design calculations contained herein, Bohler Engineering anticipates that the stormwater design will not have a negative impact to surrounding areas.

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## **A. PRE- vs. POST-DEVELOPMENT HYDROGRAPHS**

- ◆ **Water Quality Storm Event**
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**Routing Diagram for Pre vs Post\_211020**  
 Prepared by {enter your company name here}, Printed 10/20/2021  
 HydroCAD® 10.00-23 s/n 02612 © 2018 HydroCAD Software Solutions LLC

## Pre vs Post\_211020

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### Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.260	74	>75% Grass cover, Good, HSG C (1S, 3S, 29S)
4.930	98	Paved parking, HSG C (1S, 3S, 4S)
7.010	98	Roofs, HSG C (1S)
6.930	70	Woods, Good, HSG C (3S, 4S, 6S, 8S)
4.600	72	Woods/grass comb., Good, HSG C (1S)
<b>29.730</b>	<b>82</b>	<b>TOTAL AREA</b>

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## Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
29.730	HSG C	1S, 3S, 4S, 6S, 8S, 29S
0.000	HSG D	
0.000	Other	
<b>29.730</b>		<b>TOTAL AREA</b>

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**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	6.260	0.000	0.000	6.260	>75% Grass cover, Good	1S, 3S, 29S
0.000	0.000	4.930	0.000	0.000	4.930	Paved parking	1S, 3S, 4S
0.000	0.000	7.010	0.000	0.000	7.010	Roofs	1S
0.000	0.000	6.930	0.000	0.000	6.930	Woods, Good	3S, 4S, 6S, 8S
0.000	0.000	4.600	0.000	0.000	4.600	Woods/grass comb., Good	1S
<b>0.000</b>	<b>0.000</b>	<b>29.730</b>	<b>0.000</b>	<b>0.000</b>	<b>29.730</b>	<b>TOTAL AREA</b>	

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### 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	1S	0.00	0.00	216.0	0.0134	0.011	12.0	0.0	0.0
2	1S	0.00	0.00	1,457.0	0.0060	0.011	18.0	0.0	0.0
3	1P	105.00	104.50	15.0	0.0333	0.015	18.0	0.0	0.0
4	1P	105.00	104.50	21.0	0.0238	0.010	8.0	0.0	0.0

**Pre vs Post\_211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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Time span=0.00-72.00 hrs, dt=0.50 hrs, 145 points  
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: EDA-1A**

Runoff Area=17.880 ac 58.84% Impervious Runoff Depth=2.27"  
Flow Length=2,264' Tc=26.4 min CN=73/98 Runoff=21.73 cfs 3.382 af

**Subcatchment 3S: EDA-1B**

Runoff Area=5.730 ac 23.73% Impervious Runoff Depth=1.51"  
Flow Length=528' Tc=15.3 min CN=72/98 Runoff=4.24 cfs 0.723 af

**Subcatchment 4S: EDA-2 (POI-2)**

Runoff Area=3.600 ac 1.67% Impervious Runoff Depth=0.95"  
Flow Length=609' Tc=19.6 min CN=70/98 Runoff=1.91 cfs 0.284 af

**Subcatchment 6S: EDA-3 (POI-3)**

Runoff Area=1.230 ac 0.00% Impervious Runoff Depth=0.91"  
Flow Length=291' Tc=15.2 min CN=70/0 Runoff=0.59 cfs 0.093 af

**Subcatchment 8S: EXIST. OFF-SITE**

Runoff Area=0.140 ac 0.00% Impervious Runoff Depth=0.91"  
Flow Length=189' Slope=0.0200 '/' Tc=9.3 min CN=70/0 Runoff=0.06 cfs 0.011 af

**Subcatchment 29S: EDA-1C**

Runoff Area=1.150 ac 0.00% Impervious Runoff Depth=1.13"  
Tc=10.0 min CN=74/0 Runoff=0.69 cfs 0.108 af

**Pond 1P: Ex. Detention Basin**

Peak Elev=105.32' Storage=17,027 cf Inflow=4.24 cfs 0.723 af  
Primary=0.25 cfs 0.203 af Secondary=0.63 cfs 0.491 af Tertiary=0.00 cfs 0.000 af Outflow=0.88 cfs 0.694 af

**Link 2L: EXIST. POI-1**

Inflow=22.86 cfs 4.195 af  
Primary=22.86 cfs 4.195 af

**Link 26L: EX. BASIN DISCHARGES**

Inflow=1.11 cfs 0.802 af  
Primary=1.11 cfs 0.802 af

**Total Runoff Area = 29.730 ac Runoff Volume = 4.601 af Average Runoff Depth = 1.86"**  
**59.84% Pervious = 17.790 ac 40.16% Impervious = 11.940 ac**



**Pre vs Post\_211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Subcatchment 1S: EDA-1A**

Runoff = 21.73 cfs @ 12.48 hrs, Volume= 3.382 af, Depth= 2.27"

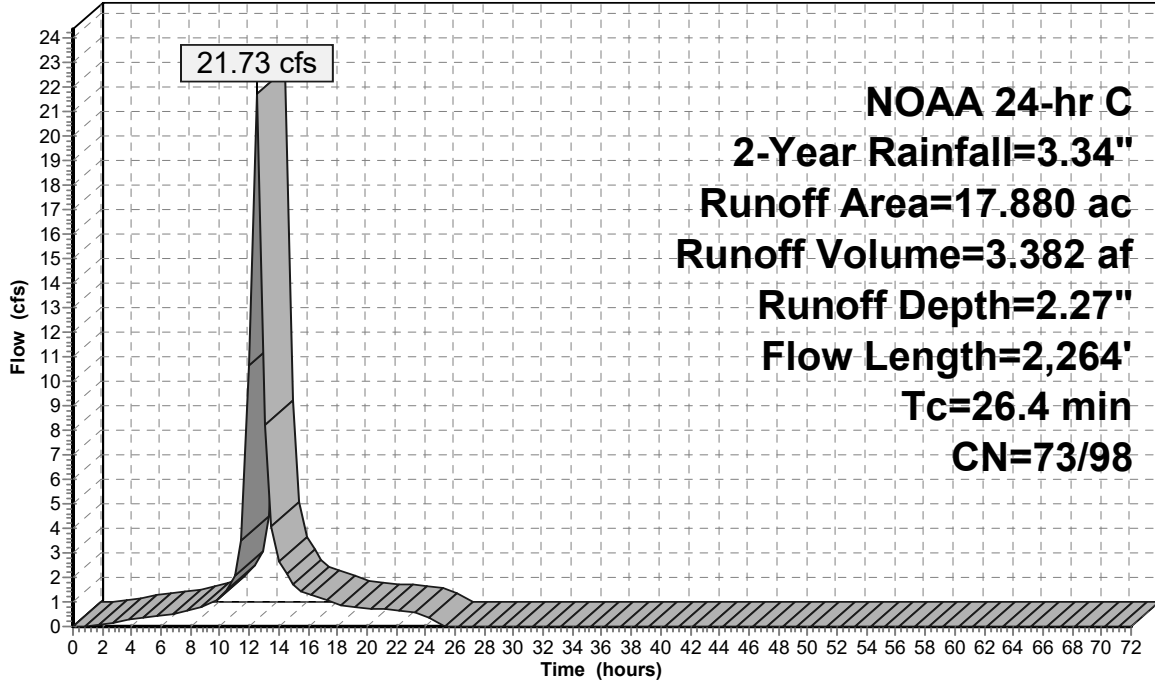
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
7.010	98	Roofs, HSG C
4.600	72	Woods/grass comb., Good, HSG C
2.760	74	>75% Grass cover, Good, HSG C
3.510	98	Paved parking, HSG C
17.880	88	Weighted Average
7.360	73	41.16% Pervious Area
10.520	98	58.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	18	0.0225	0.06		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
15.9	507	0.0113	0.53		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.3	66	0.0280	3.40		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.6	216	0.0134	6.21	4.87	<b>Pipe Channel,</b> 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
4.5	1,457	0.0060	5.44	9.62	<b>Pipe Channel,</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
26.4	2,264	Total			

Subcatchment 1S: EDA-1A

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Subcatchment 3S: EDA-1B**

Runoff = 4.24 cfs @ 12.35 hrs, Volume= 0.723 af, Depth= 1.51"

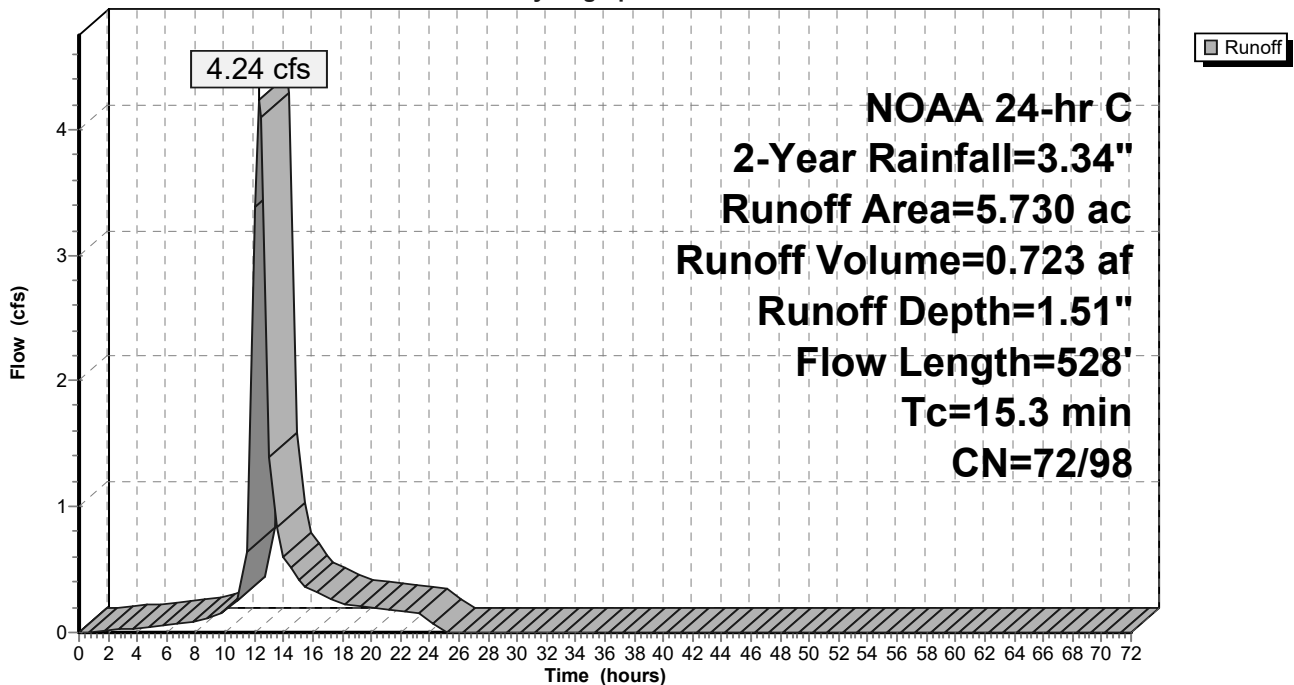
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
2.020	70	Woods, Good, HSG C
2.350	74	>75% Grass cover, Good, HSG C
1.360	98	Paved parking, HSG C
5.730	78	Weighted Average
4.370	72	76.27% Pervious Area
1.360	98	23.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	15	0.0140	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
8.6	365	0.0200	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.4	148	0.0080	1.82		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
15.3	528	Total			

**Subcatchment 3S: EDA-1B**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Subcatchment 4S: EDA-2 (POI-2)**

Runoff = 1.91 cfs @ 12.49 hrs, Volume= 0.284 af, Depth= 0.95"

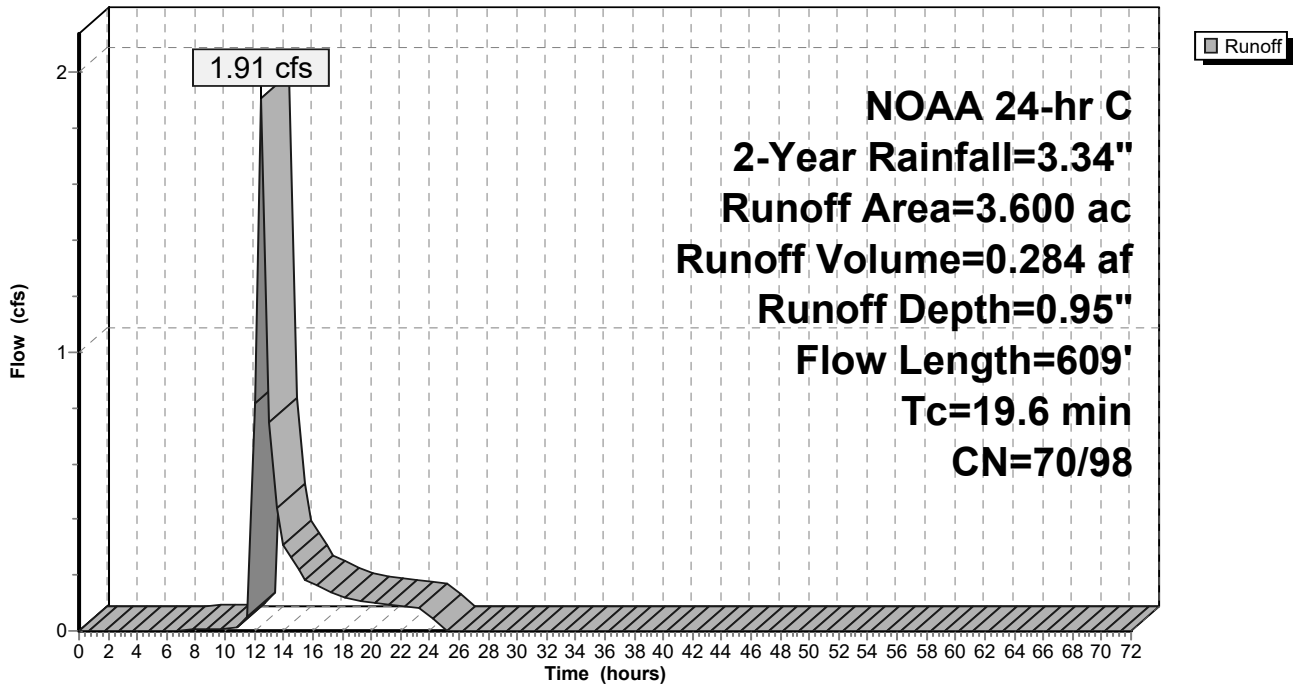
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
3.540	70	Woods, Good, HSG C
0.060	98	Paved parking, HSG C
3.600	70	Weighted Average
3.540	70	98.33% Pervious Area
0.060	98	1.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	17	0.0180	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
14.3	592	0.0190	0.69		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
19.6	609	Total			

**Subcatchment 4S: EDA-2 (POI-2)**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Subcatchment 6S: EDA-3 (POI-3)**

Runoff = 0.59 cfs @ 12.44 hrs, Volume= 0.093 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

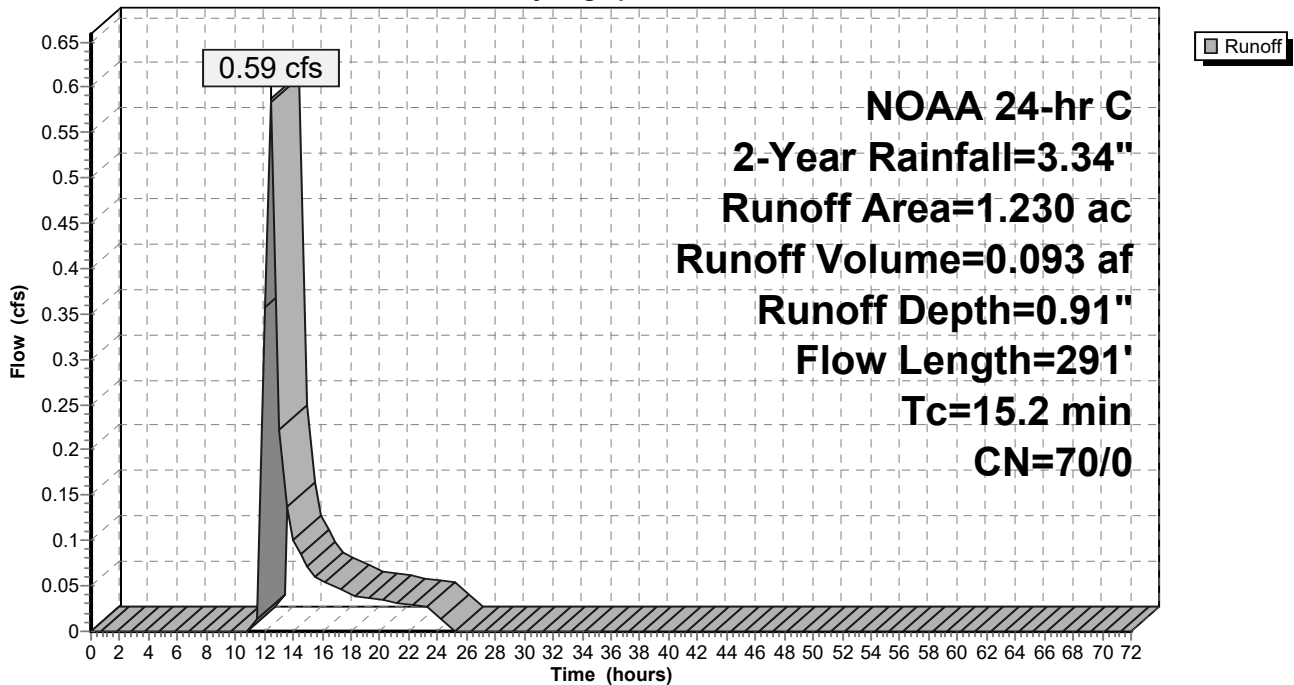
Area (ac)	CN	Description
1.230	70	Woods, Good, HSG C
1.230	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	9	0.0050	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
9.9	282	0.0090	0.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.2	291	Total			

**Subcatchment 6S: EDA-3 (POI-3)**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Subcatchment 8S: EXIST. OFF-SITE**

Runoff = 0.06 cfs @ 12.19 hrs, Volume= 0.011 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

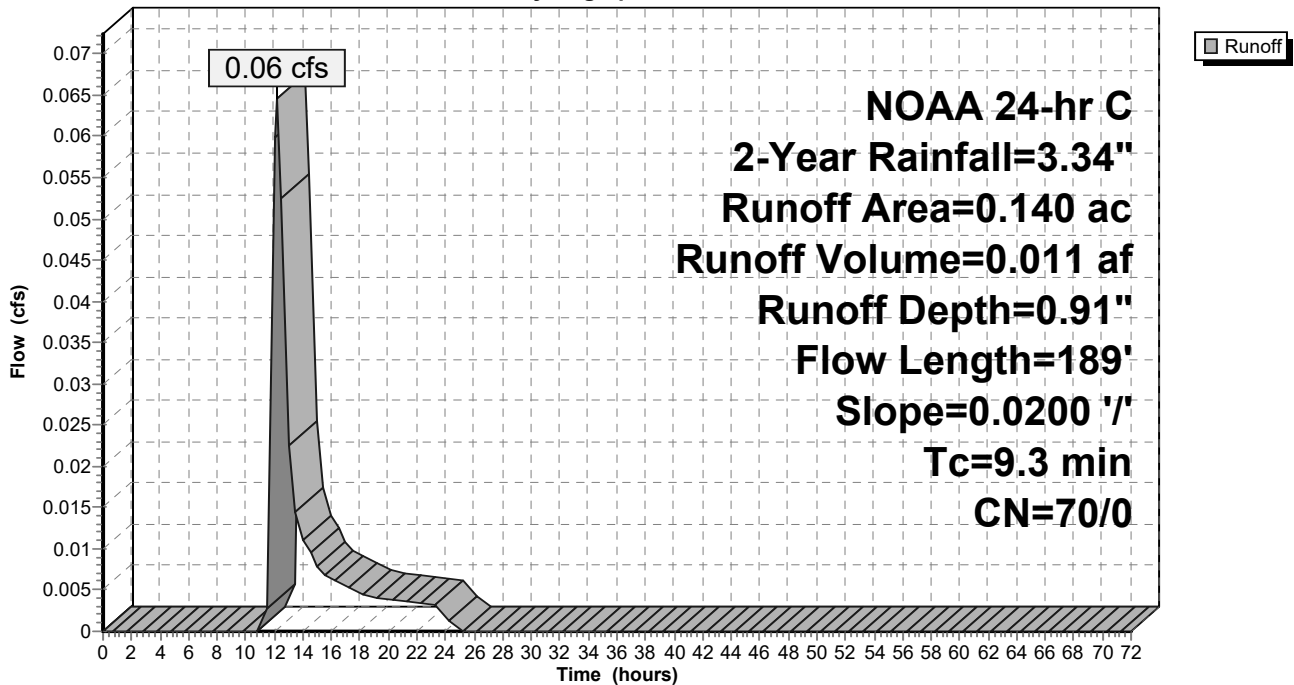
Area (ac)	CN	Description
0.140	70	Woods, Good, HSG C
0.140	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	18	0.0200	0.06		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
4.0	171	0.0200	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.3	189	Total			

**Subcatchment 8S: EXIST. OFF-SITE**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Subcatchment 29S: EDA-1C**

Runoff = 0.69 cfs @ 12.17 hrs, Volume= 0.108 af, Depth= 1.13"

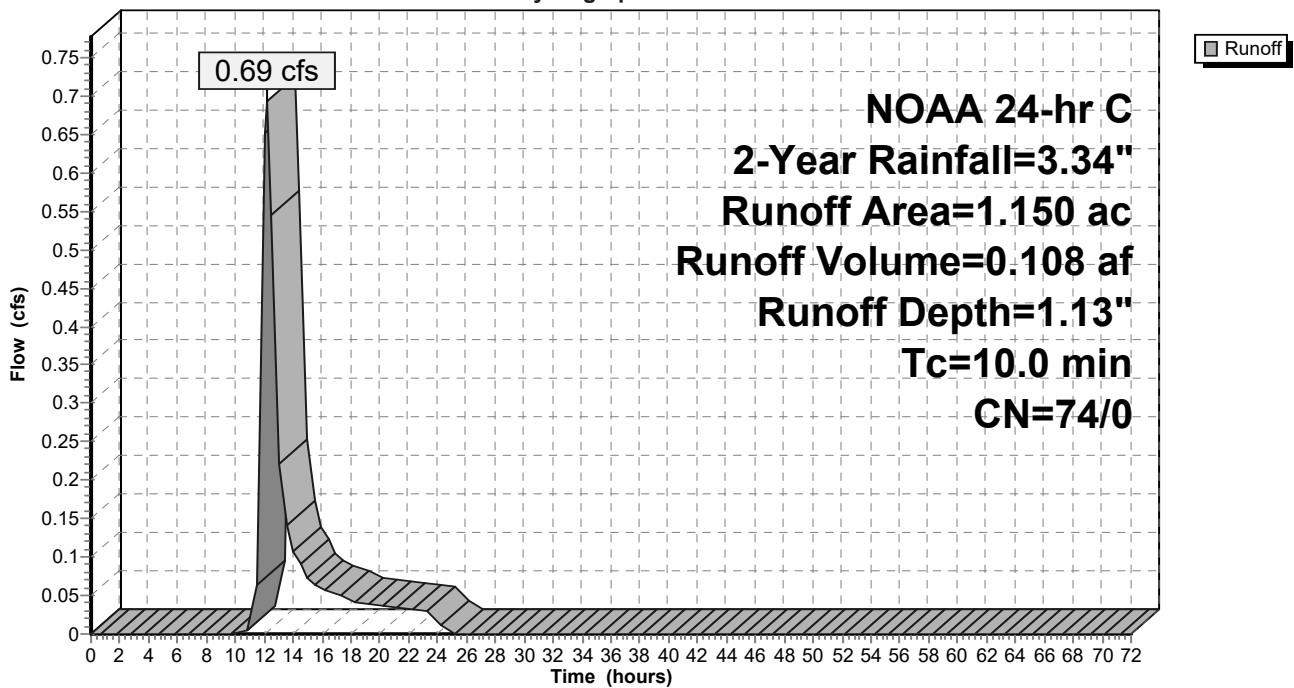
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
1.150	74	>75% Grass cover, Good, HSG C
1.150	74	100.00% Pervious Area

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

**Subcatchment 29S: EDA-1C**

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Pond 1P: Ex. Detention Basin**

Inflow Area = 5.730 ac, 23.73% Impervious, Inflow Depth = 1.51" for 2-Year event  
 Inflow = 4.24 cfs @ 12.35 hrs, Volume= 0.723 af  
 Outflow = 0.88 cfs @ 13.56 hrs, Volume= 0.694 af, Atten= 79%, Lag= 72.7 min  
 Primary = 0.25 cfs @ 13.56 hrs, Volume= 0.203 af  
 Secondary = 0.63 cfs @ 13.56 hrs, Volume= 0.491 af  
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 105.32' @ 13.56 hrs Surf.Area= 54,370 sf Storage= 17,027 cf

Plug-Flow detention time= 474.8 min calculated for 0.694 af (96% of inflow)  
 Center-of-Mass det. time= 452.3 min ( 1,275.4 - 823.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	105.00'	186,871 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
105.00	52,708	0	0
106.00	57,935	55,322	55,322
107.00	67,082	62,509	117,830
108.00	71,000	69,041	186,871

Device	Routing	Invert	Outlet Devices
#1	Primary	105.00'	<b>18.0" Round RCP_Round 18"</b> L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0333 1/1 Cc= 0.900 n= 0.015, Flow Area= 1.77 sf
#2	Device 1	105.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	106.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Secondary	105.00'	<b>8.0" Round Culvert X 2.00</b> L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0238 1/1 Cc= 0.900 n= 0.010, Flow Area= 0.35 sf
#5	Tertiary	107.00'	<b>50.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

**Primary OutFlow** Max=0.25 cfs @ 13.56 hrs HW=105.32' (Free Discharge)

- ↑ 1=RCP\_Round 18" (Passes 0.25 cfs of 0.52 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.25 cfs @ 1.92 fps)
- ↑ 3=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.63 cfs @ 13.56 hrs HW=105.32' (Free Discharge)

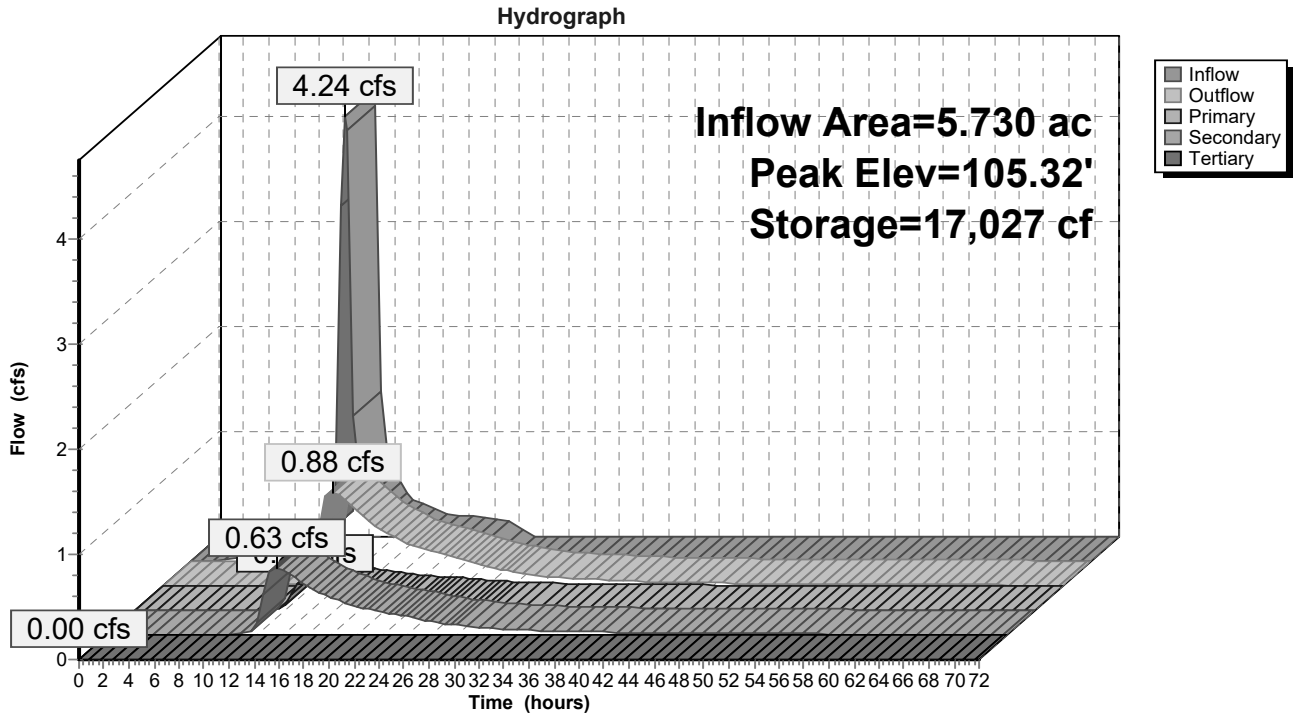
- ↑ 4=Culvert (Inlet Controls 0.63 cfs @ 1.92 fps)

**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=105.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)



### Pond 1P: Ex. Detention Basin



**Pre vs Post 211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Stage-Area-Storage for Pond 1P: Ex. Detention Basin**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
105.00	52,708	0	107.65	69,629	162,261
105.05	52,969	2,642	107.70	69,825	165,747
105.10	53,231	5,297	107.75	70,021	169,243
105.15	53,492	7,965	107.80	70,216	172,749
105.20	53,753	10,646	107.85	70,412	176,265
105.25	54,015	13,340	107.90	70,608	179,791
105.30	54,276	16,048	107.95	70,804	183,326
105.35	54,537	18,768	108.00	<b>71,000</b>	<b>186,871</b>
105.40	54,799	21,501			
105.45	55,060	24,248			
105.50	55,322	27,007			
105.55	55,583	29,780			
105.60	55,844	32,566			
105.65	56,106	35,364			
105.70	56,367	38,176			
105.75	56,628	41,001			
105.80	56,890	43,839			
105.85	57,151	46,690			
105.90	57,412	49,554			
105.95	57,674	52,431			
106.00	57,935	55,322			
106.05	58,392	58,230			
106.10	58,850	61,161			
106.15	59,307	64,115			
106.20	59,764	67,091			
106.25	60,222	70,091			
106.30	60,679	73,114			
106.35	61,136	76,159			
106.40	61,594	79,227			
106.45	62,051	82,318			
106.50	62,509	85,432			
106.55	62,966	88,569			
106.60	63,423	91,729			
106.65	63,881	94,912			
106.70	64,338	98,117			
106.75	64,795	101,345			
106.80	65,253	104,597			
106.85	65,710	107,871			
106.90	66,167	111,168			
106.95	66,625	114,487			
107.00	67,082	117,830			
107.05	67,278	121,189			
107.10	67,474	124,558			
107.15	67,670	127,936			
107.20	67,866	131,325			
107.25	68,062	134,723			
107.30	68,257	138,131			
107.35	68,453	141,549			
107.40	68,649	144,976			
107.45	68,845	148,414			
107.50	69,041	151,861			
107.55	69,237	155,318			
107.60	69,433	158,784			

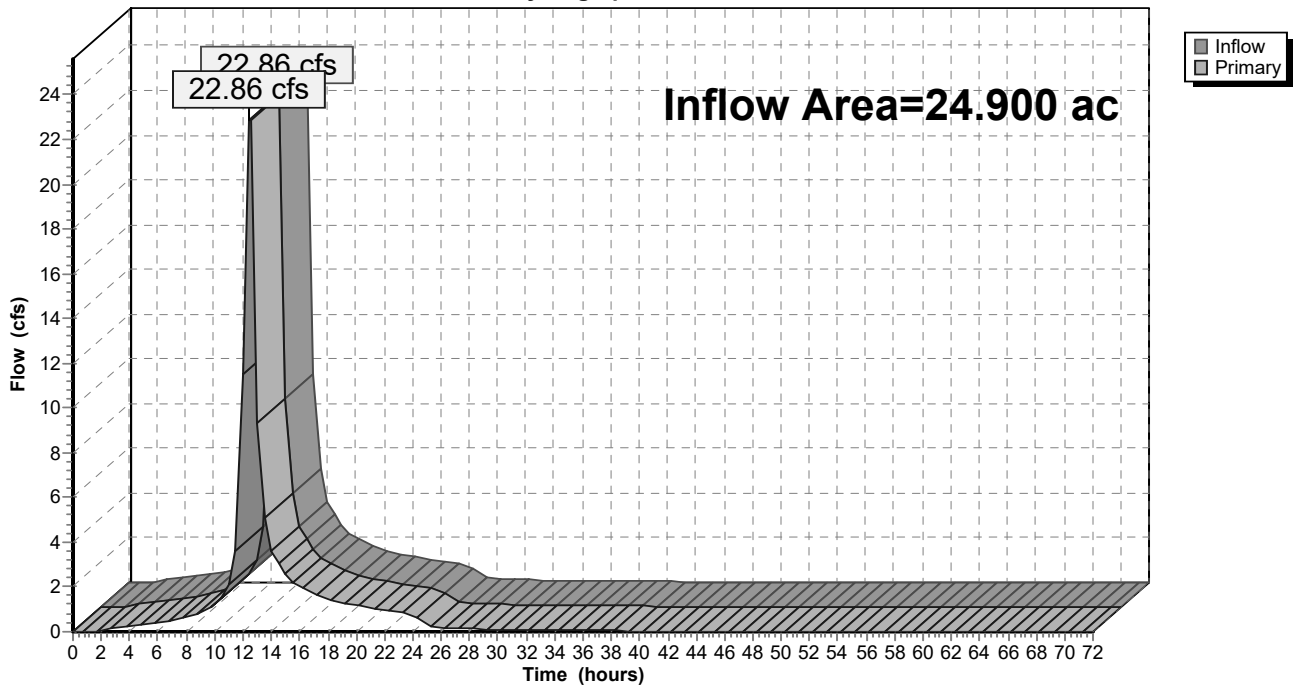
### Summary for Link 2L: EXIST. POI-1

Inflow Area = 24.900 ac, 47.71% Impervious, Inflow Depth > 2.02" for 2-Year event  
Inflow = 22.86 cfs @ 12.48 hrs, Volume= 4.195 af  
Primary = 22.86 cfs @ 12.48 hrs, Volume= 4.195 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 2L: EXIST. POI-1

Hydrograph

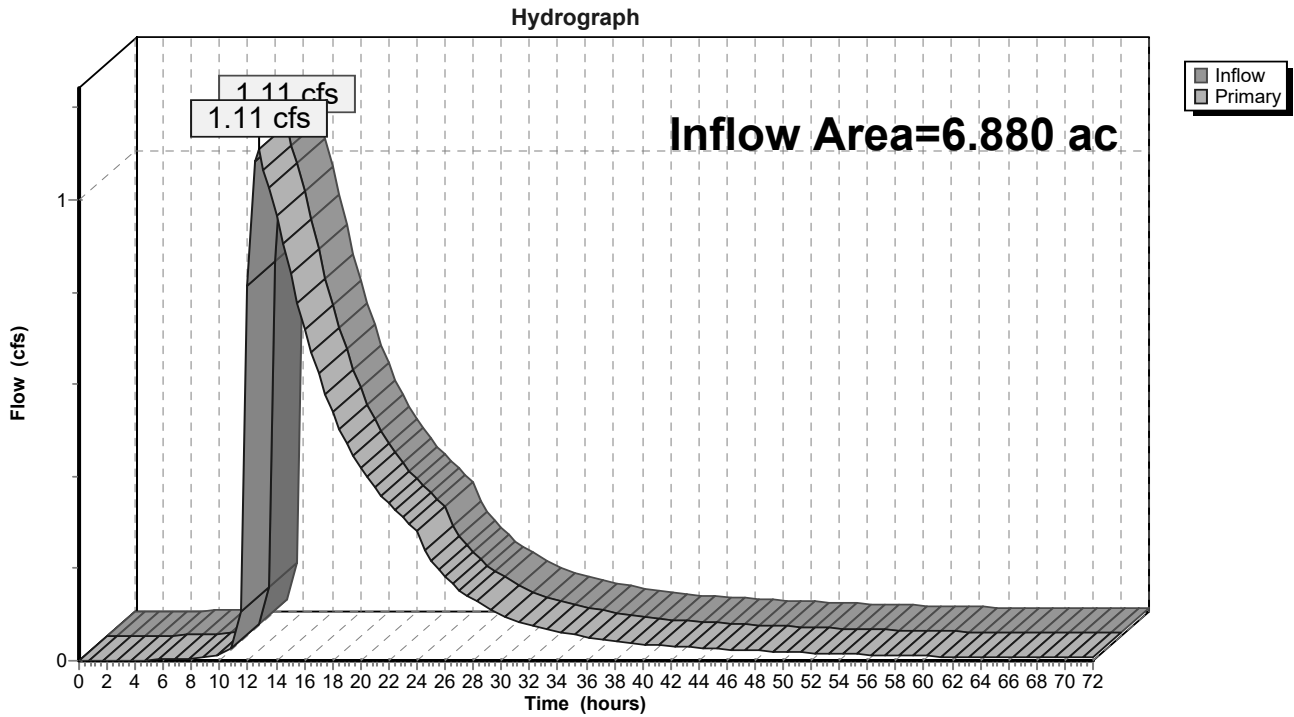


### Summary for Link 26L: EX. BASIN DISCHARGES

Inflow Area = 6.880 ac, 19.77% Impervious, Inflow Depth > 1.40" for 2-Year event  
Inflow = 1.11 cfs @ 12.72 hrs, Volume= 0.802 af  
Primary = 1.11 cfs @ 12.72 hrs, Volume= 0.802 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 26L: EX. BASIN DISCHARGES



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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Time span=0.00-72.00 hrs, dt=0.50 hrs, 145 points  
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: EDA-1A**

Runoff Area=17.880 ac 58.84% Impervious Runoff Depth=3.75"  
Flow Length=2,264' Tc=26.4 min CN=73/98 Runoff=35.98 cfs 5.588 af

**Subcatchment 3S: EDA-1B**

Runoff Area=5.730 ac 23.73% Impervious Runoff Depth=2.81"  
Flow Length=528' Tc=15.3 min CN=72/98 Runoff=8.03 cfs 1.344 af

**Subcatchment 4S: EDA-2 (POI-2)**

Runoff Area=3.600 ac 1.67% Impervious Runoff Depth=2.09"  
Flow Length=609' Tc=19.6 min CN=70/98 Runoff=4.32 cfs 0.627 af

**Subcatchment 6S: EDA-3 (POI-3)**

Runoff Area=1.230 ac 0.00% Impervious Runoff Depth=2.04"  
Flow Length=291' Tc=15.2 min CN=70/0 Runoff=1.34 cfs 0.209 af

**Subcatchment 8S: EXIST. OFF-SITE**

Runoff Area=0.140 ac 0.00% Impervious Runoff Depth=2.04"  
Flow Length=189' Slope=0.0200 '/' Tc=9.3 min CN=70/0 Runoff=0.16 cfs 0.024 af

**Subcatchment 29S: EDA-1C**

Runoff Area=1.150 ac 0.00% Impervious Runoff Depth=2.37"  
Tc=10.0 min CN=74/0 Runoff=1.57 cfs 0.227 af

**Pond 1P: Ex. Detention Basin**

Peak Elev=105.57' Storage=30,682 cf Inflow=8.03 cfs 1.344 af  
Primary=0.53 cfs 0.365 af Secondary=1.62 cfs 0.949 af Tertiary=0.00 cfs 0.000 af Outflow=2.15 cfs 1.314 af

**Link 2L: EXIST. POI-1**

Inflow=38.73 cfs 7.153 af  
Primary=38.73 cfs 7.153 af

**Link 26L: EX. BASIN DISCHARGES**

Inflow=2.69 cfs 1.542 af  
Primary=2.69 cfs 1.542 af

**Total Runoff Area = 29.730 ac Runoff Volume = 8.020 af Average Runoff Depth = 3.24"**  
**59.84% Pervious = 17.790 ac 40.16% Impervious = 11.940 ac**

**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 1S: EDA-1A**

Runoff = 35.98 cfs @ 12.47 hrs, Volume= 5.588 af, Depth= 3.75"

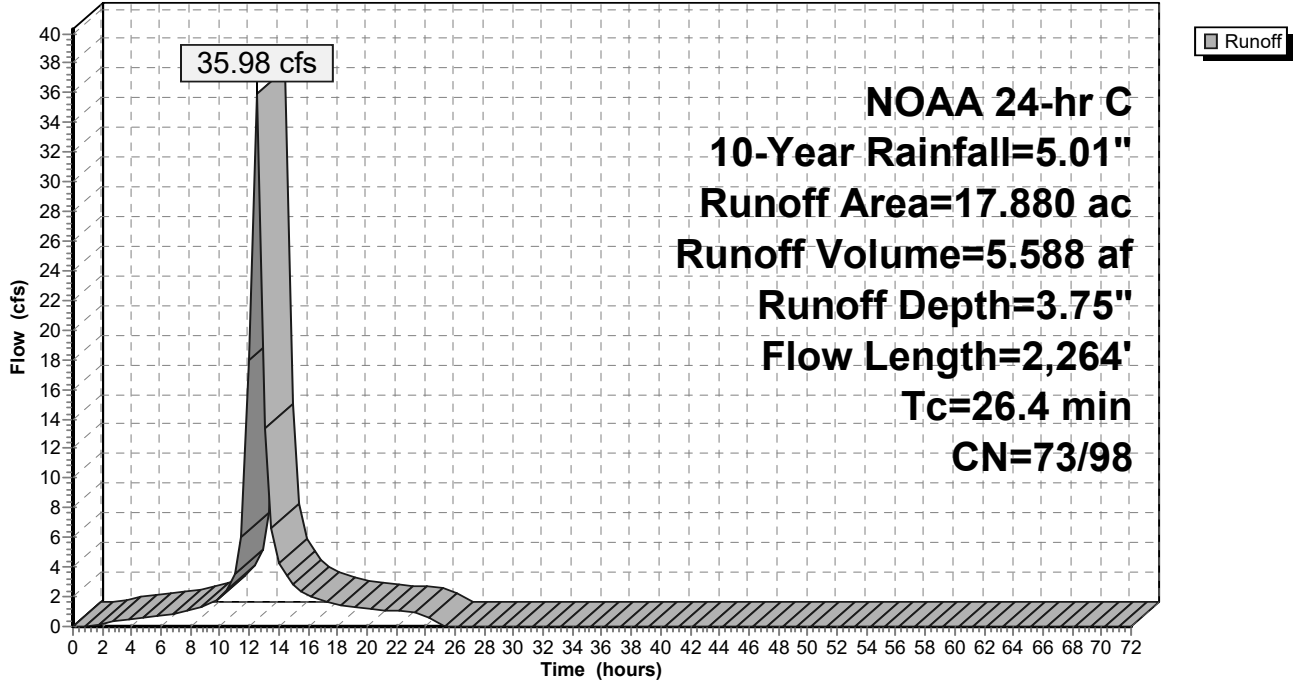
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
7.010	98	Roofs, HSG C
4.600	72	Woods/grass comb., Good, HSG C
2.760	74	>75% Grass cover, Good, HSG C
3.510	98	Paved parking, HSG C
17.880	88	Weighted Average
7.360	73	41.16% Pervious Area
10.520	98	58.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	18	0.0225	0.06		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
15.9	507	0.0113	0.53		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.3	66	0.0280	3.40		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.6	216	0.0134	6.21	4.87	<b>Pipe Channel,</b> 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
4.5	1,457	0.0060	5.44	9.62	<b>Pipe Channel,</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
26.4	2,264	Total			

Subcatchment 1S: EDA-1A

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 3S: EDA-1B**

Runoff = 8.03 cfs @ 12.32 hrs, Volume= 1.344 af, Depth= 2.81"

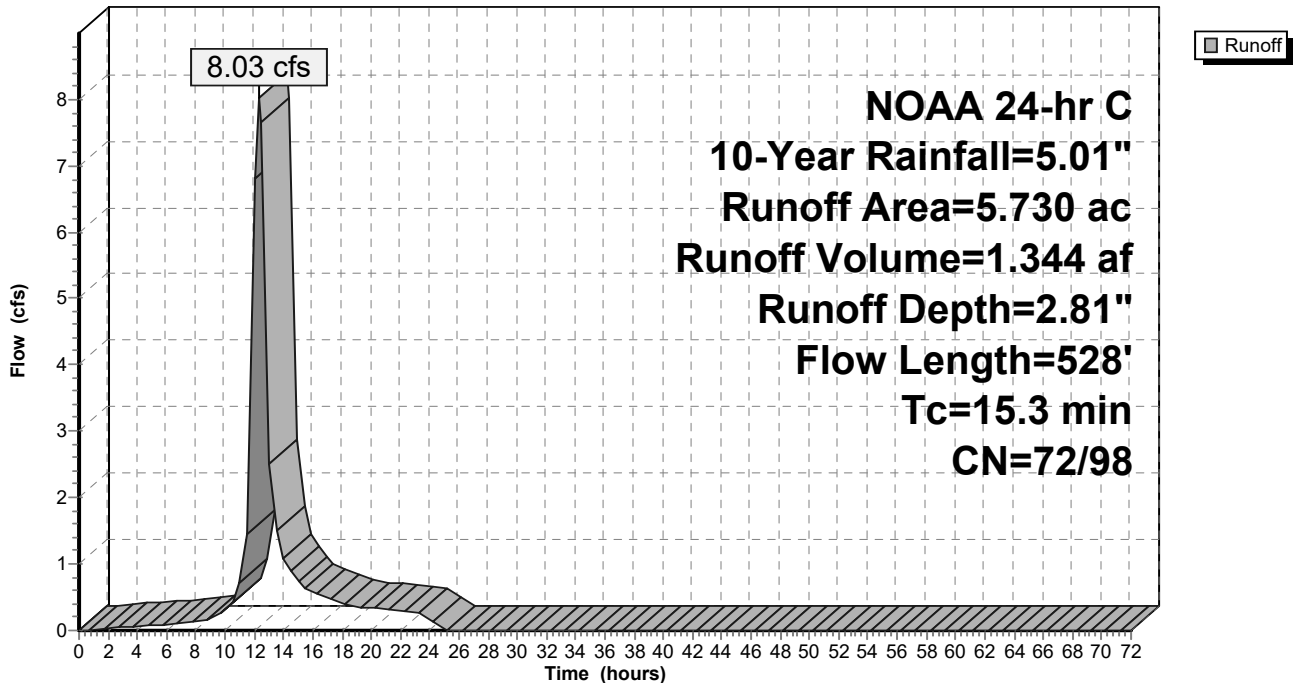
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
2.020	70	Woods, Good, HSG C
2.350	74	>75% Grass cover, Good, HSG C
1.360	98	Paved parking, HSG C
5.730	78	Weighted Average
4.370	72	76.27% Pervious Area
1.360	98	23.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	15	0.0140	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
8.6	365	0.0200	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.4	148	0.0080	1.82		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
15.3	528	Total			

**Subcatchment 3S: EDA-1B**

Hydrograph





**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 4S: EDA-2 (POI-2)**

Runoff = 4.32 cfs @ 12.46 hrs, Volume= 0.627 af, Depth= 2.09"

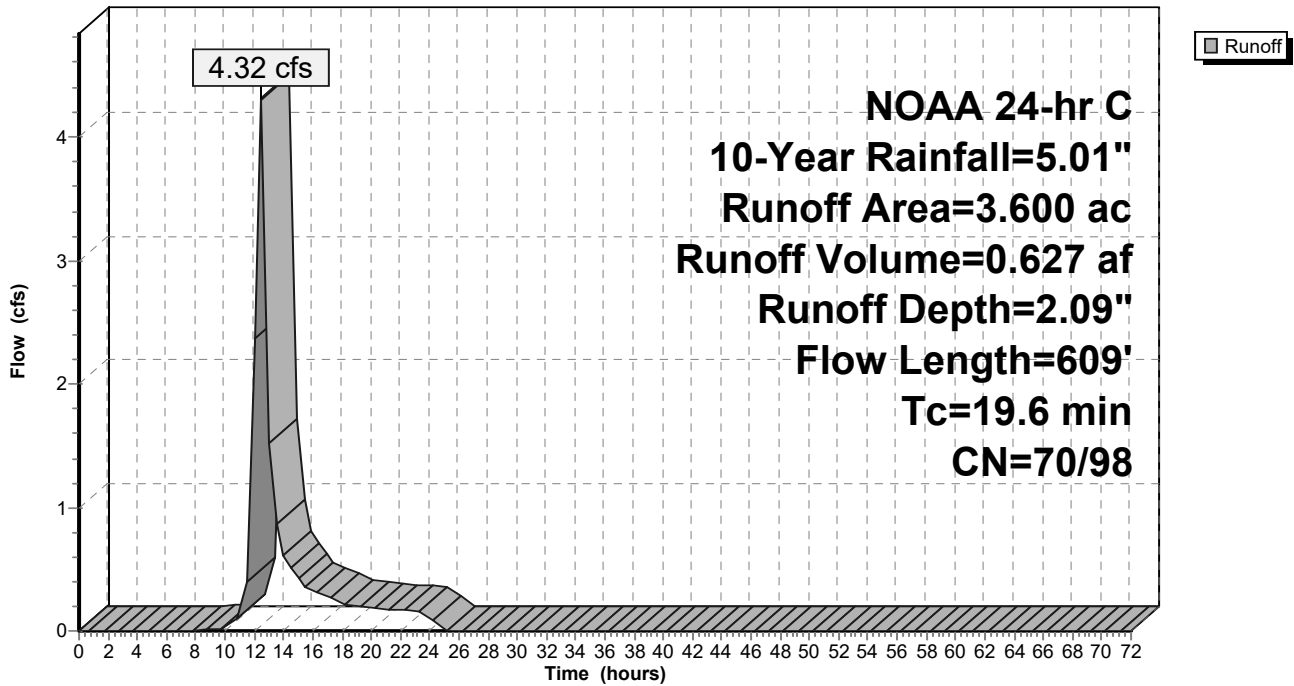
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
3.540	70	Woods, Good, HSG C
0.060	98	Paved parking, HSG C
3.600	70	Weighted Average
3.540	70	98.33% Pervious Area
0.060	98	1.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	17	0.0180	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
14.3	592	0.0190	0.69		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
19.6	609	Total			

**Subcatchment 4S: EDA-2 (POI-2)**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 6S: EDA-3 (POI-3)**

Runoff = 1.34 cfs @ 12.38 hrs, Volume= 0.209 af, Depth= 2.04"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

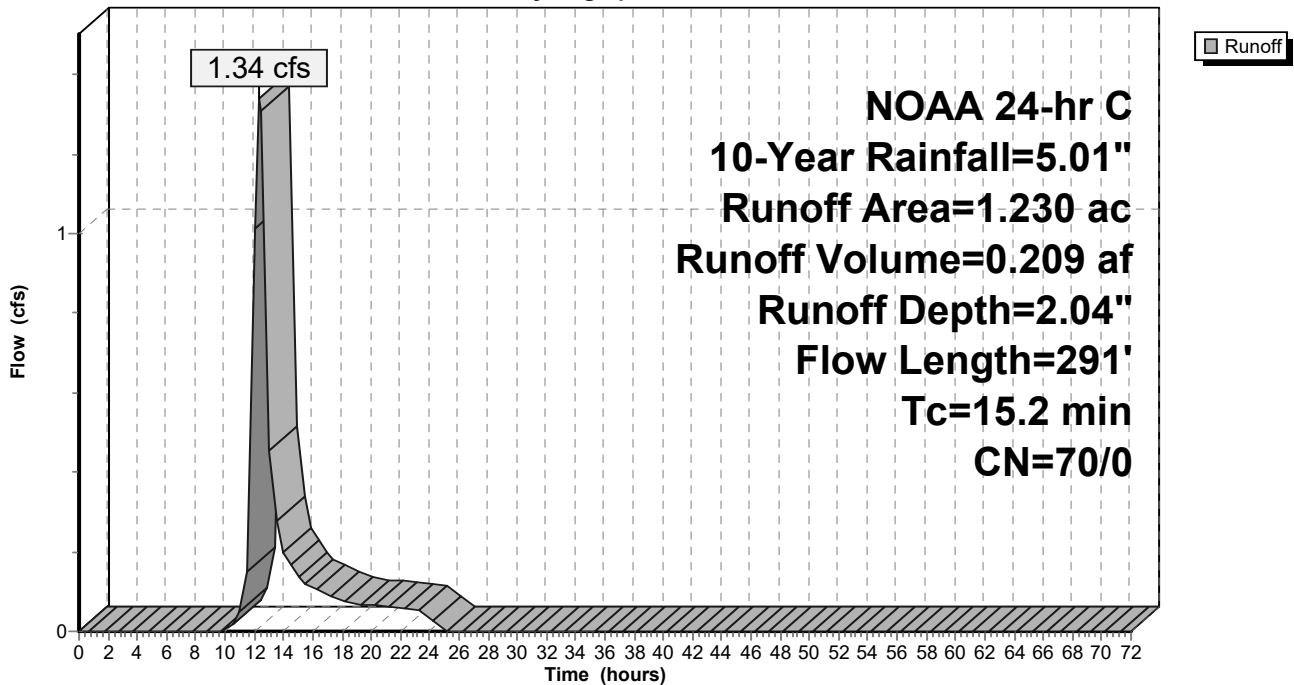
Area (ac)	CN	Description
1.230	70	Woods, Good, HSG C
1.230	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	9	0.0050	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
9.9	282	0.0090	0.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.2	291	Total			

**Subcatchment 6S: EDA-3 (POI-3)**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 8S: EXIST. OFF-SITE**

Runoff = 0.16 cfs @ 12.13 hrs, Volume= 0.024 af, Depth= 2.04"

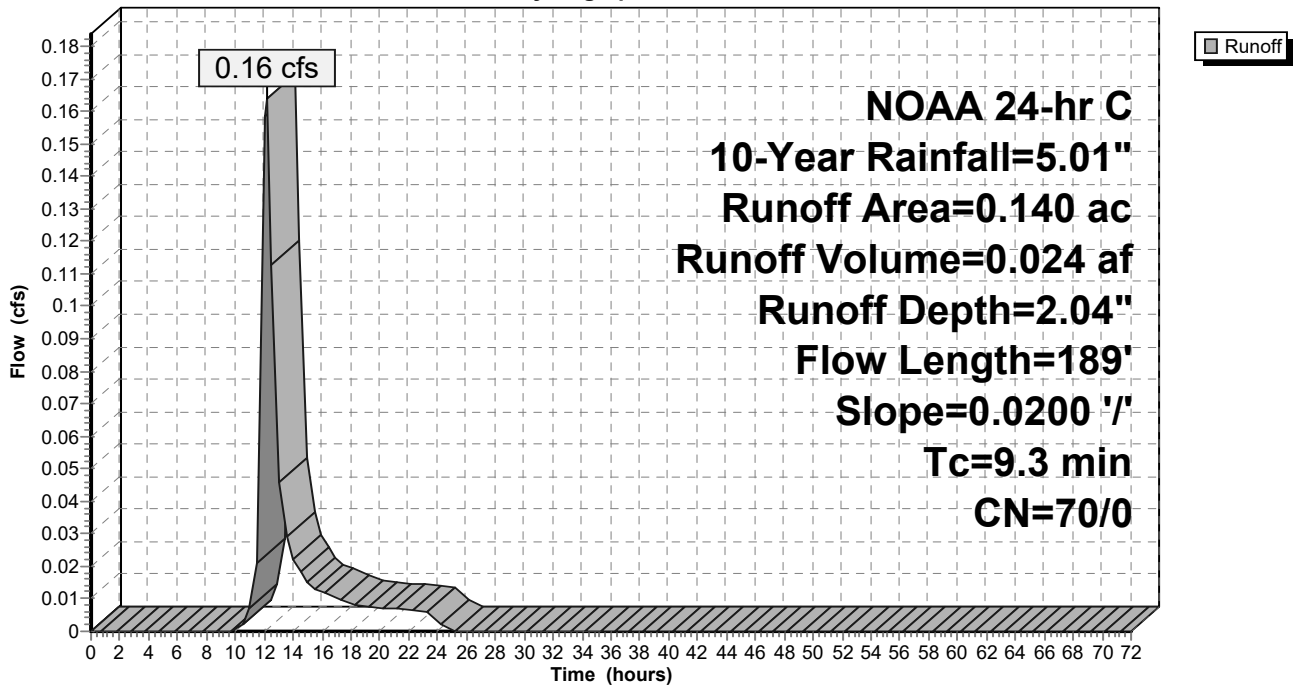
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
0.140	70	Woods, Good, HSG C
0.140	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	18	0.0200	0.06		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
4.0	171	0.0200	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.3	189	Total			

**Subcatchment 8S: EXIST. OFF-SITE**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 29S: EDA-1C**

Runoff = 1.57 cfs @ 12.13 hrs, Volume= 0.227 af, Depth= 2.37"

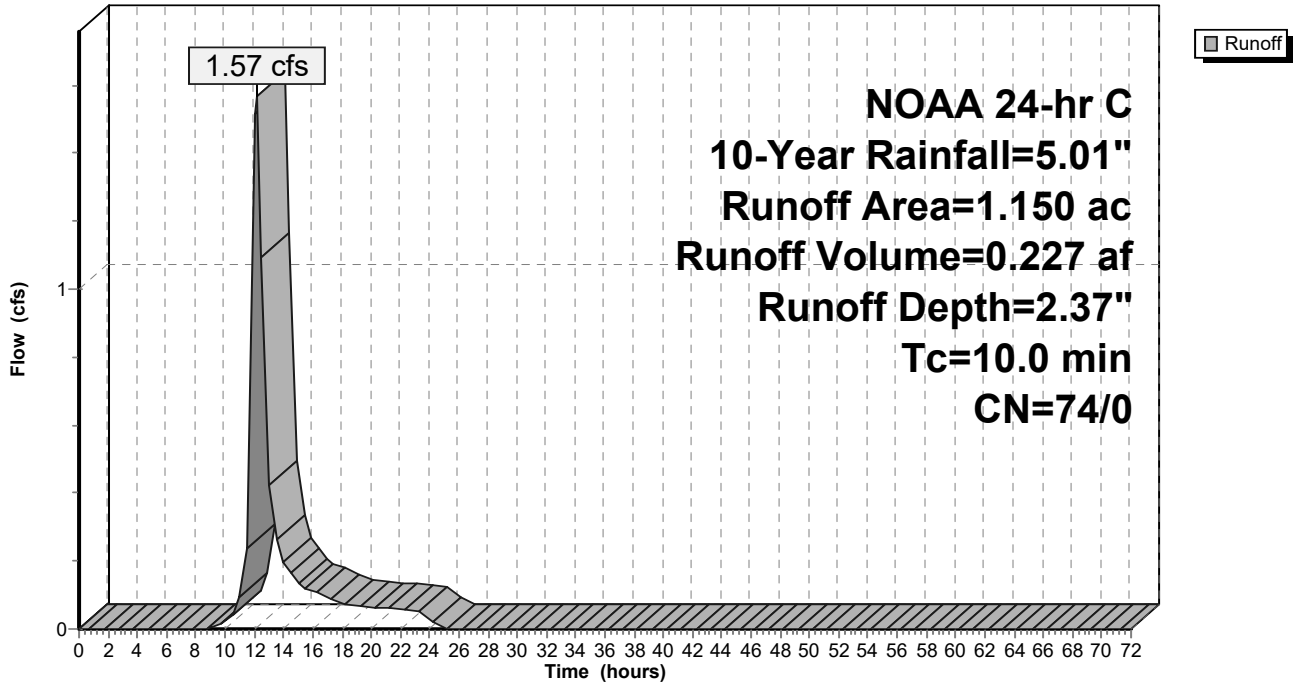
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
1.150	74	>75% Grass cover, Good, HSG C
1.150	74	100.00% Pervious Area

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

**Subcatchment 29S: EDA-1C**

Hydrograph



**Pre vs Post\_211020**

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**Summary for Pond 1P: Ex. Detention Basin**

Inflow Area = 5.730 ac, 23.73% Impervious, Inflow Depth = 2.81" for 10-Year event  
 Inflow = 8.03 cfs @ 12.32 hrs, Volume= 1.344 af  
 Outflow = 2.15 cfs @ 13.24 hrs, Volume= 1.314 af, Atten= 73%, Lag= 55.0 min  
 Primary = 0.53 cfs @ 13.24 hrs, Volume= 0.365 af  
 Secondary = 1.62 cfs @ 13.24 hrs, Volume= 0.949 af  
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 105.57' @ 13.24 hrs Surf.Area= 55,668 sf Storage= 30,682 cf

Plug-Flow detention time= 342.1 min calculated for 1.305 af (97% of inflow)  
 Center-of-Mass det. time= 344.6 min ( 1,160.0 - 815.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	105.00'	186,871 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
105.00	52,708	0	0
106.00	57,935	55,322	55,322
107.00	67,082	62,509	117,830
108.00	71,000	69,041	186,871

Device	Routing	Invert	Outlet Devices
#1	Primary	105.00'	<b>18.0" Round RCP_Round 18"</b> L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0333 1/1' Cc= 0.900 n= 0.015, Flow Area= 1.77 sf
#2	Device 1	105.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	106.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Secondary	105.00'	<b>8.0" Round Culvert X 2.00</b> L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0238 1/1' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf
#5	Tertiary	107.00'	<b>50.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

**Primary OutFlow** Max=0.52 cfs @ 13.24 hrs HW=105.55' (Free Discharge)

- ↑ 1=RCP\_Round 18" (Passes 0.52 cfs of 1.50 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.52 cfs @ 2.65 fps)
- ↑ 3=Orifice/Grate ( Controls 0.00 cfs)

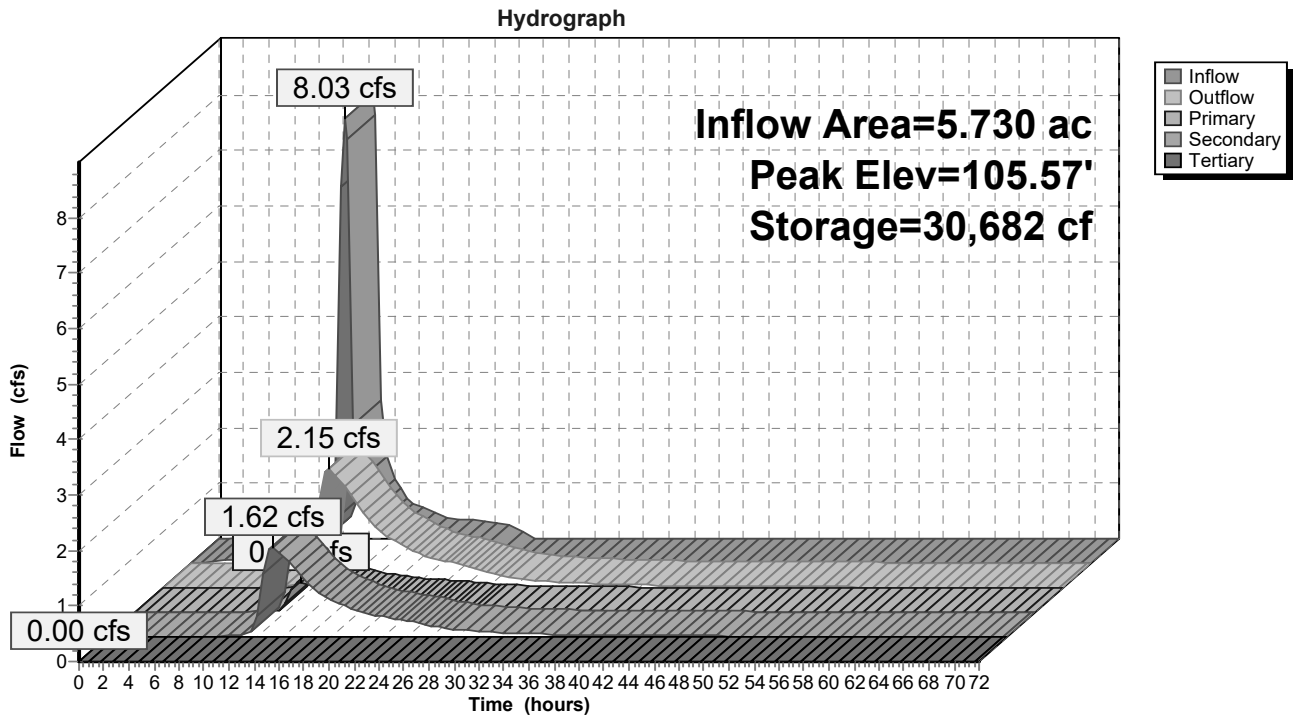
**Secondary OutFlow** Max=1.57 cfs @ 13.24 hrs HW=105.55' (Free Discharge)

- ↑ 4=Culvert (Inlet Controls 1.57 cfs @ 2.53 fps)

**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=105.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

### Pond 1P: Ex. Detention Basin



**Pre vs Post 211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Stage-Area-Storage for Pond 1P: Ex. Detention Basin**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
105.00	52,708	0	107.65	69,629	162,261
105.05	52,969	2,642	107.70	69,825	165,747
105.10	53,231	5,297	107.75	70,021	169,243
105.15	53,492	7,965	107.80	70,216	172,749
105.20	53,753	10,646	107.85	70,412	176,265
105.25	54,015	13,340	107.90	70,608	179,791
105.30	54,276	16,048	107.95	70,804	183,326
105.35	54,537	18,768	108.00	<b>71,000</b>	<b>186,871</b>
105.40	54,799	21,501			
105.45	55,060	24,248			
105.50	55,322	27,007			
105.55	55,583	29,780			
105.60	55,844	32,566			
105.65	56,106	35,364			
105.70	56,367	38,176			
105.75	56,628	41,001			
105.80	56,890	43,839			
105.85	57,151	46,690			
105.90	57,412	49,554			
105.95	57,674	52,431			
106.00	57,935	55,322			
106.05	58,392	58,230			
106.10	58,850	61,161			
106.15	59,307	64,115			
106.20	59,764	67,091			
106.25	60,222	70,091			
106.30	60,679	73,114			
106.35	61,136	76,159			
106.40	61,594	79,227			
106.45	62,051	82,318			
106.50	62,509	85,432			
106.55	62,966	88,569			
106.60	63,423	91,729			
106.65	63,881	94,912			
106.70	64,338	98,117			
106.75	64,795	101,345			
106.80	65,253	104,597			
106.85	65,710	107,871			
106.90	66,167	111,168			
106.95	66,625	114,487			
107.00	67,082	117,830			
107.05	67,278	121,189			
107.10	67,474	124,558			
107.15	67,670	127,936			
107.20	67,866	131,325			
107.25	68,062	134,723			
107.30	68,257	138,131			
107.35	68,453	141,549			
107.40	68,649	144,976			
107.45	68,845	148,414			
107.50	69,041	151,861			
107.55	69,237	155,318			
107.60	69,433	158,784			

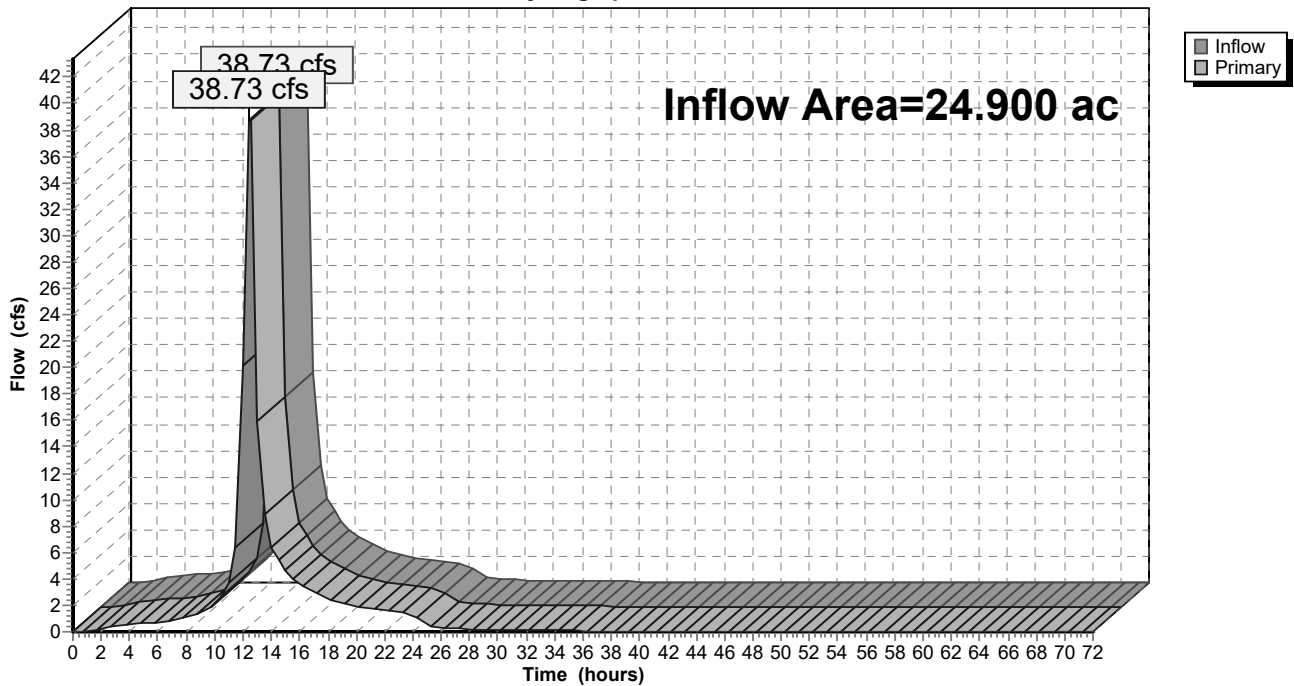
### Summary for Link 2L: EXIST. POI-1

Inflow Area = 24.900 ac, 47.71% Impervious, Inflow Depth > 3.45" for 10-Year event  
Inflow = 38.73 cfs @ 12.47 hrs, Volume= 7.153 af  
Primary = 38.73 cfs @ 12.47 hrs, Volume= 7.153 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 2L: EXIST. POI-1

Hydrograph



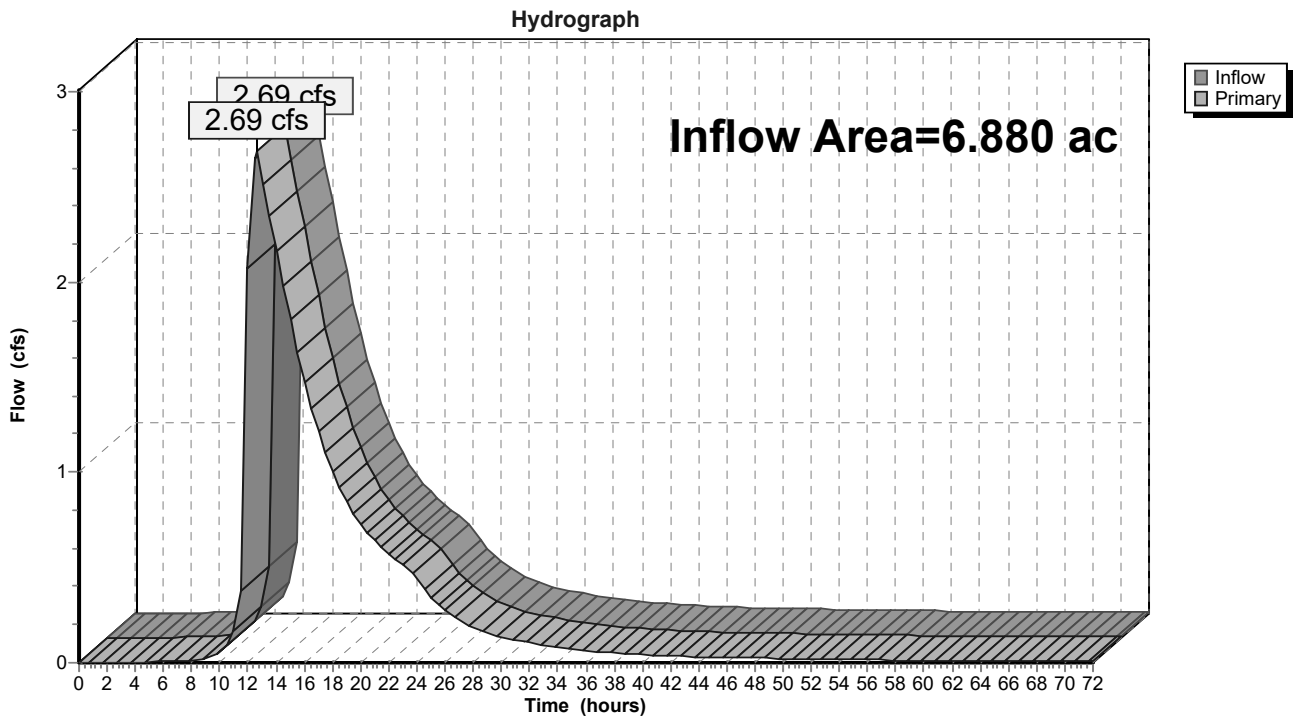


### Summary for Link 26L: EX. BASIN DISCHARGES

Inflow Area = 6.880 ac, 19.77% Impervious, Inflow Depth > 2.69" for 10-Year event  
Inflow = 2.69 cfs @ 12.65 hrs, Volume= 1.542 af  
Primary = 2.69 cfs @ 12.65 hrs, Volume= 1.542 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 26L: EX. BASIN DISCHARGES



**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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Time span=0.00-72.00 hrs, dt=0.50 hrs, 145 points  
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: EDA-1A** Runoff Area=17.880 ac 58.84% Impervious Runoff Depth=4.80"  
Flow Length=2,264' Tc=26.4 min CN=73/98 Runoff=46.02 cfs 7.154 af

**Subcatchment 3S: EDA-1B** Runoff Area=5.730 ac 23.73% Impervious Runoff Depth=3.78"  
Flow Length=528' Tc=15.3 min CN=72/98 Runoff=10.80 cfs 1.805 af

**Subcatchment 4S: EDA-2 (POI-2)** Runoff Area=3.600 ac 1.67% Impervious Runoff Depth=2.97"  
Flow Length=609' Tc=19.6 min CN=70/98 Runoff=6.14 cfs 0.892 af

**Subcatchment 6S: EDA-3 (POI-3)** Runoff Area=1.230 ac 0.00% Impervious Runoff Depth=2.92"  
Flow Length=291' Tc=15.2 min CN=70/0 Runoff=1.91 cfs 0.300 af

**Subcatchment 8S: EXIST. OFF-SITE** Runoff Area=0.140 ac 0.00% Impervious Runoff Depth=2.92"  
Flow Length=189' Slope=0.0200 '/' Tc=9.3 min CN=70/0 Runoff=0.24 cfs 0.034 af

**Subcatchment 29S: EDA-1C** Runoff Area=1.150 ac 0.00% Impervious Runoff Depth=3.31"  
Tc=10.0 min CN=74/0 Runoff=2.23 cfs 0.317 af

**Pond 1P: Ex. Detention Basin** Peak Elev=105.75' Storage=40,999 cf Inflow=10.80 cfs 1.805 af  
Primary=0.67 cfs 0.471 af Secondary=2.17 cfs 1.303 af Tertiary=0.00 cfs 0.000 af Outflow=2.84 cfs 1.774 af

**Link 2L: EXIST. POI-1** Inflow=49.97 cfs 9.279 af  
Primary=49.97 cfs 9.279 af

**Link 26L: EX. BASIN DISCHARGES** Inflow=3.80 cfs 2.092 af  
Primary=3.80 cfs 2.092 af

**Total Runoff Area = 29.730 ac Runoff Volume = 10.502 af Average Runoff Depth = 4.24"**  
**59.84% Pervious = 17.790 ac 40.16% Impervious = 11.940 ac**

**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Subcatchment 1S: EDA-1A**

Runoff = 46.02 cfs @ 12.47 hrs, Volume= 7.154 af, Depth= 4.80"

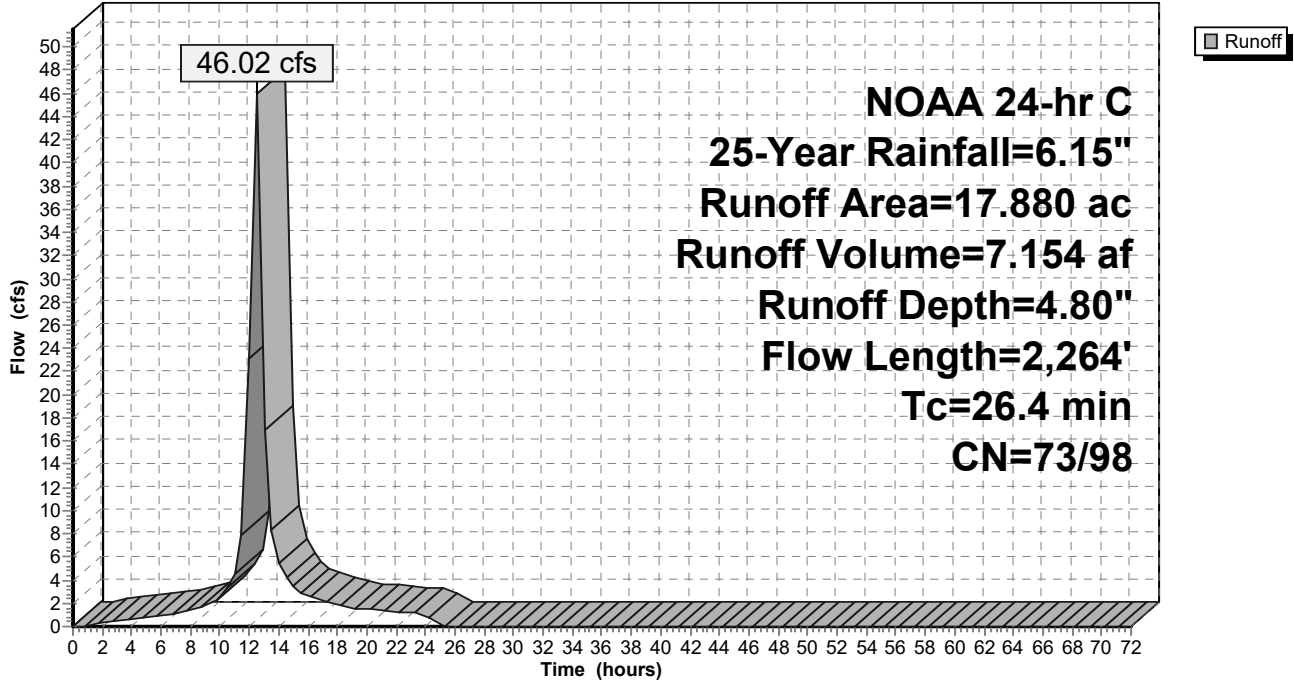
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

Area (ac)	CN	Description
7.010	98	Roofs, HSG C
4.600	72	Woods/grass comb., Good, HSG C
2.760	74	>75% Grass cover, Good, HSG C
3.510	98	Paved parking, HSG C
17.880	88	Weighted Average
7.360	73	41.16% Pervious Area
10.520	98	58.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	18	0.0225	0.06		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
15.9	507	0.0113	0.53		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.3	66	0.0280	3.40		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.6	216	0.0134	6.21	4.87	<b>Pipe Channel,</b> 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
4.5	1,457	0.0060	5.44	9.62	<b>Pipe Channel,</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
26.4	2,264	Total			

Subcatchment 1S: EDA-1A

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Subcatchment 3S: EDA-1B**

Runoff = 10.80 cfs @ 12.30 hrs, Volume= 1.805 af, Depth= 3.78"

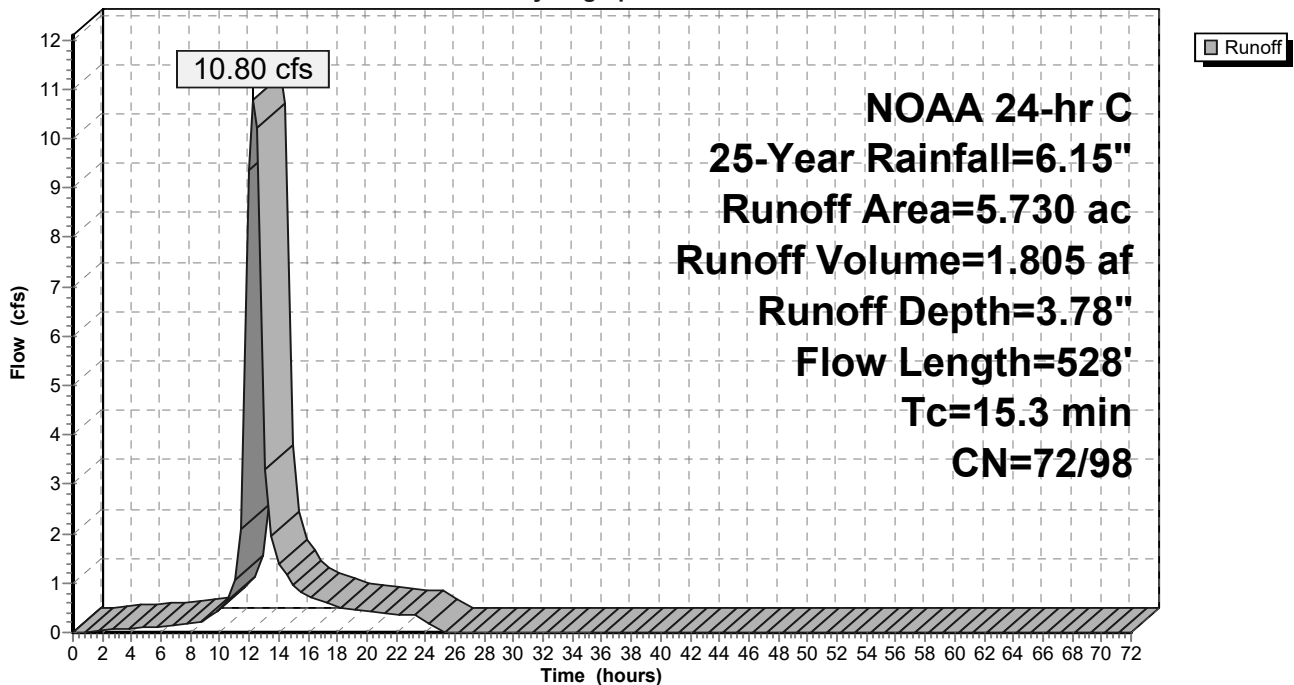
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

Area (ac)	CN	Description
2.020	70	Woods, Good, HSG C
2.350	74	>75% Grass cover, Good, HSG C
1.360	98	Paved parking, HSG C
5.730	78	Weighted Average
4.370	72	76.27% Pervious Area
1.360	98	23.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	15	0.0140	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
8.6	365	0.0200	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.4	148	0.0080	1.82		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
15.3	528	Total			

**Subcatchment 3S: EDA-1B**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Subcatchment 4S: EDA-2 (POI-2)**

Runoff = 6.14 cfs @ 12.44 hrs, Volume= 0.892 af, Depth= 2.97"

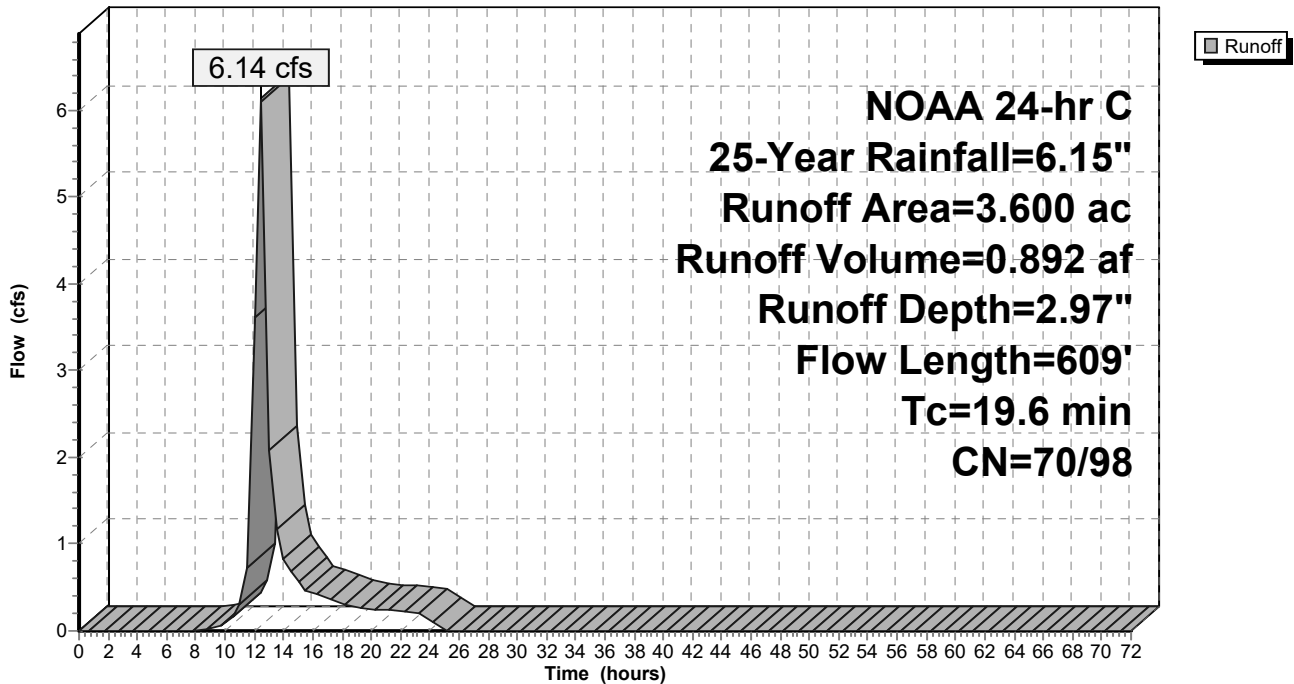
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

Area (ac)	CN	Description
3.540	70	Woods, Good, HSG C
0.060	98	Paved parking, HSG C
3.600	70	Weighted Average
3.540	70	98.33% Pervious Area
0.060	98	1.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	17	0.0180	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
14.3	592	0.0190	0.69		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
19.6	609	Total			

**Subcatchment 4S: EDA-2 (POI-2)**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Subcatchment 6S: EDA-3 (POI-3)**

Runoff = 1.91 cfs @ 12.35 hrs, Volume= 0.300 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

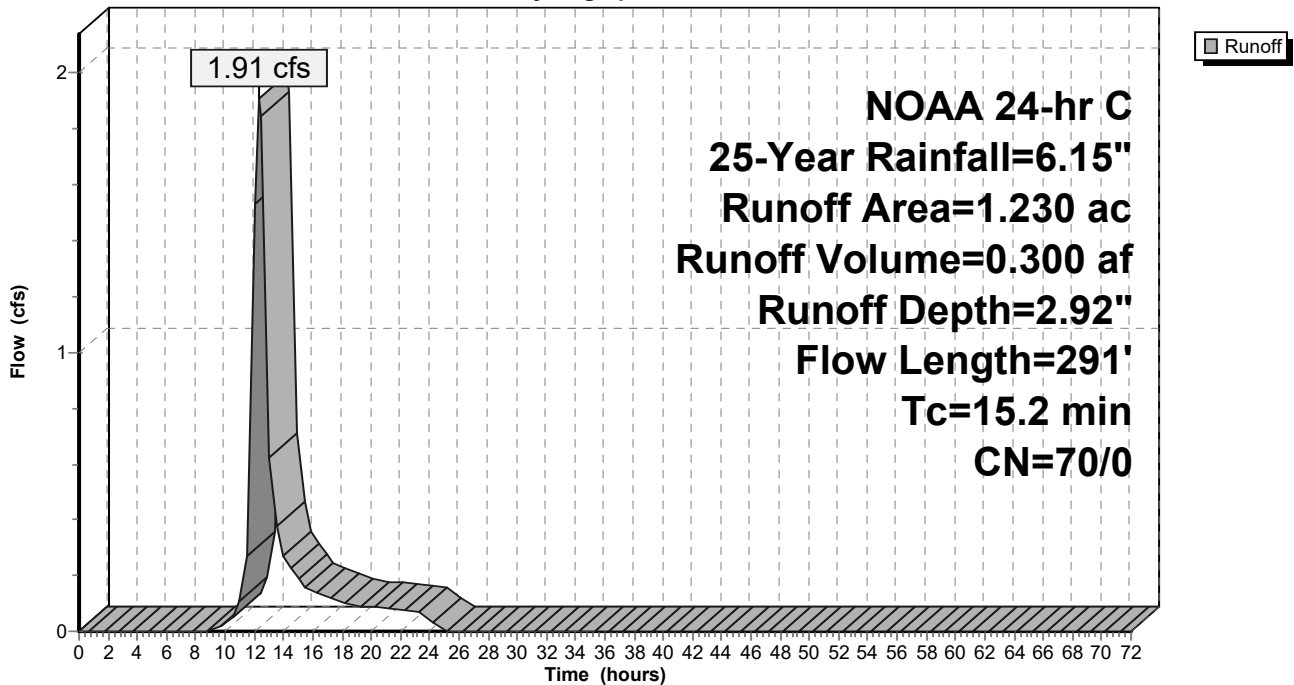
Area (ac)	CN	Description
1.230	70	Woods, Good, HSG C
1.230	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	9	0.0050	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
9.9	282	0.0090	0.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.2	291	Total			

**Subcatchment 6S: EDA-3 (POI-3)**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Subcatchment 8S: EXIST. OFF-SITE**

Runoff = 0.24 cfs @ 12.11 hrs, Volume= 0.034 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

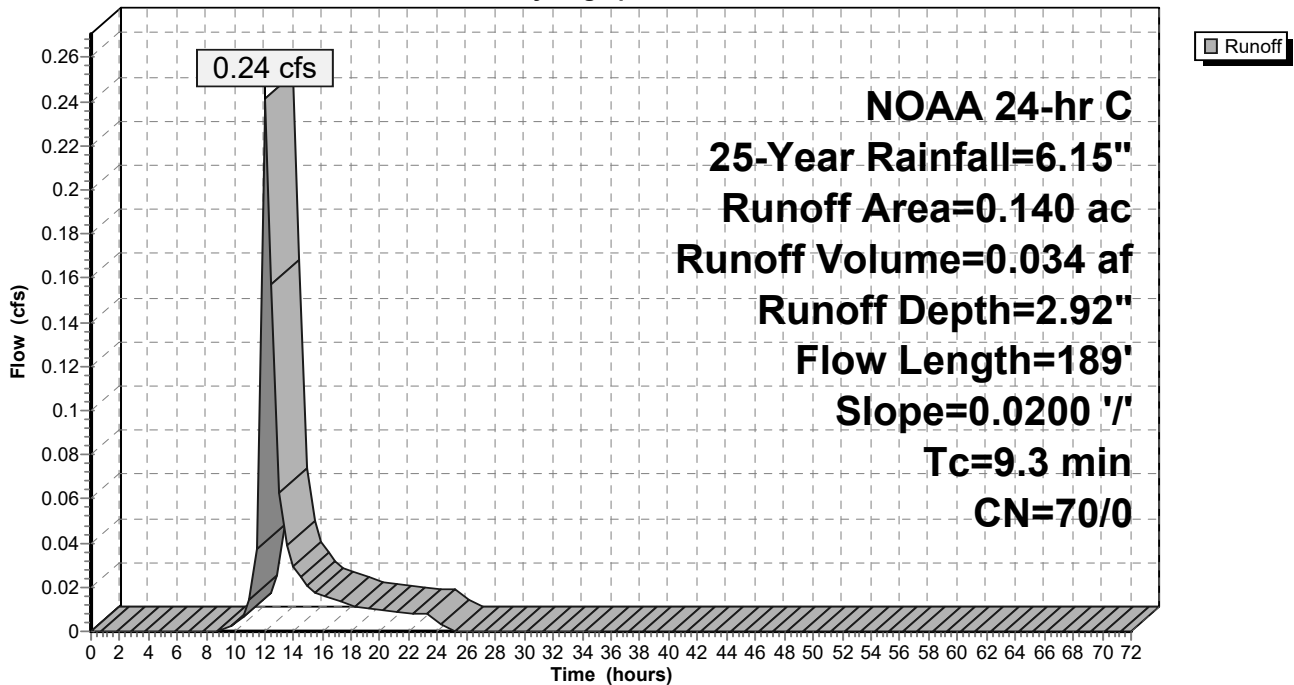
Area (ac)	CN	Description
0.140	70	Woods, Good, HSG C
0.140	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	18	0.0200	0.06		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
4.0	171	0.0200	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.3	189	Total			

**Subcatchment 8S: EXIST. OFF-SITE**

Hydrograph





**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Subcatchment 29S: EDA-1C**

Runoff = 2.23 cfs @ 12.11 hrs, Volume= 0.317 af, Depth= 3.31"

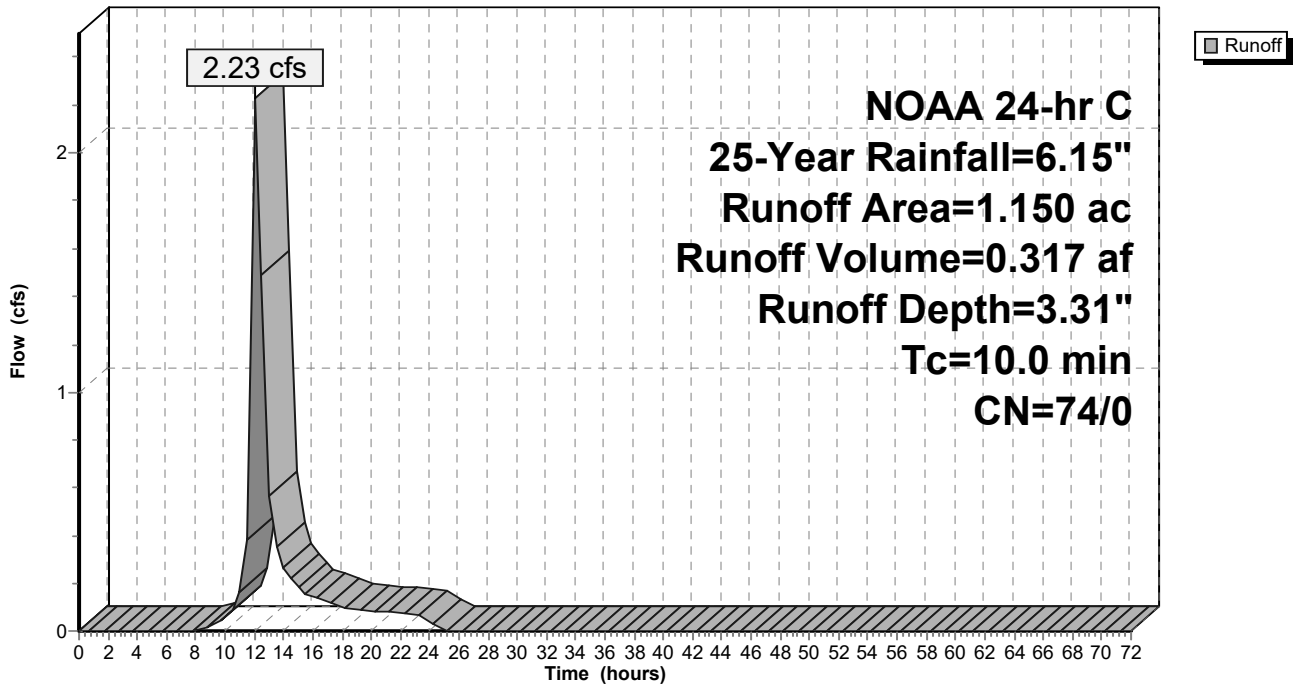
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
NOAA 24-hr C 25-Year Rainfall=6.15"

Area (ac)	CN	Description
1.150	74	>75% Grass cover, Good, HSG C
1.150	74	100.00% Pervious Area

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

**Subcatchment 29S: EDA-1C**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Pond 1P: Ex. Detention Basin**

Inflow Area = 5.730 ac, 23.73% Impervious, Inflow Depth = 3.78" for 25-Year event  
 Inflow = 10.80 cfs @ 12.30 hrs, Volume= 1.805 af  
 Outflow = 2.84 cfs @ 13.23 hrs, Volume= 1.774 af, Atten= 74%, Lag= 55.7 min  
 Primary = 0.67 cfs @ 13.23 hrs, Volume= 0.471 af  
 Secondary = 2.17 cfs @ 13.23 hrs, Volume= 1.303 af  
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 105.75' @ 13.23 hrs Surf.Area= 56,628 sf Storage= 40,999 cf

Plug-Flow detention time= 307.7 min calculated for 1.762 af (98% of inflow)  
 Center-of-Mass det. time= 312.8 min ( 1,123.5 - 810.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	105.00'	186,871 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
105.00	52,708	0	0
106.00	57,935	55,322	55,322
107.00	67,082	62,509	117,830
108.00	71,000	69,041	186,871

Device	Routing	Invert	Outlet Devices
#1	Primary	105.00'	<b>18.0" Round RCP_Round 18"</b> L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0333 1/8" Cc= 0.900 n= 0.015, Flow Area= 1.77 sf
#2	Device 1	105.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	106.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Secondary	105.00'	<b>8.0" Round Culvert X 2.00</b> L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0238 1/8" Cc= 0.900 n= 0.010, Flow Area= 0.35 sf
#5	Tertiary	107.00'	<b>50.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

**Primary OutFlow** Max=0.66 cfs @ 13.23 hrs HW=105.73' (Free Discharge)

- ↑ 1=RCP\_Round 18" (Passes 0.66 cfs of 2.50 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.66 cfs @ 3.34 fps)
- ↑ 3=Orifice/Grate ( Controls 0.00 cfs)

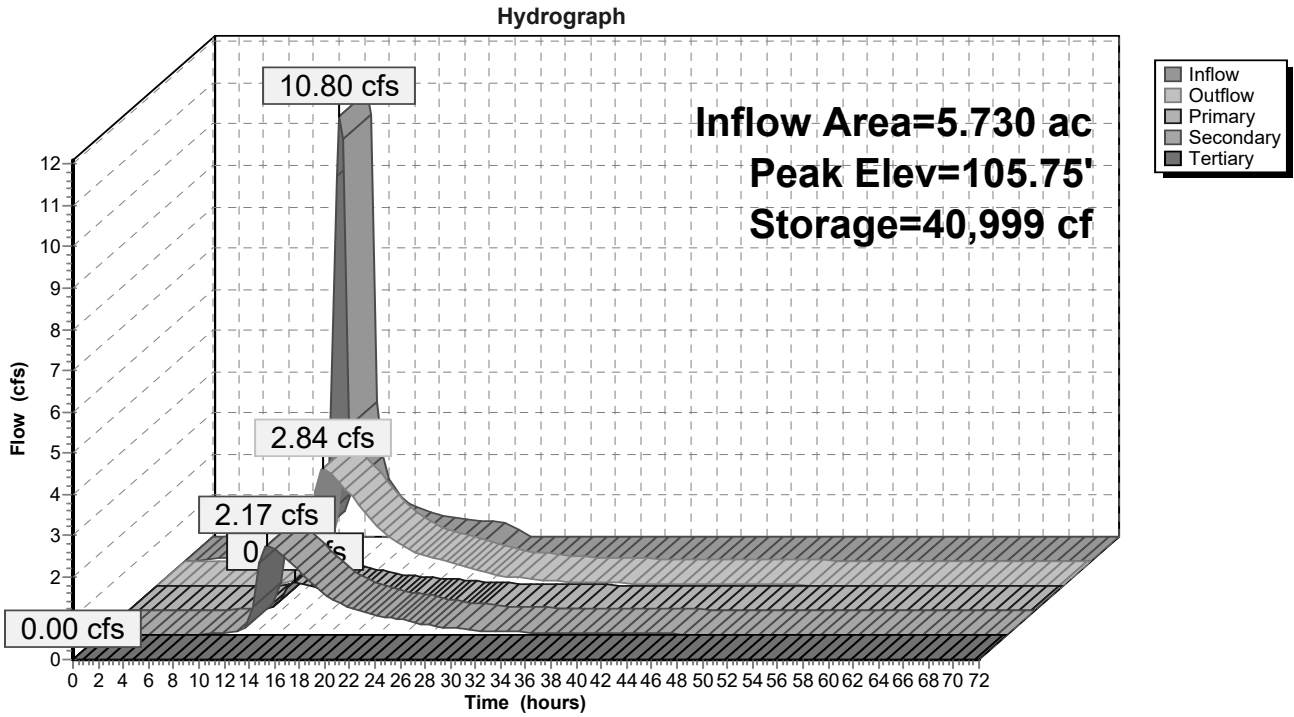
**Secondary OutFlow** Max=2.12 cfs @ 13.23 hrs HW=105.73' (Free Discharge)

- ↑ 4=Culvert (Inlet Controls 2.12 cfs @ 3.04 fps)

**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=105.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

### Pond 1P: Ex. Detention Basin



**Pre vs Post 211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Stage-Area-Storage for Pond 1P: Ex. Detention Basin**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
105.00	52,708	0	107.65	69,629	162,261
105.05	52,969	2,642	107.70	69,825	165,747
105.10	53,231	5,297	107.75	70,021	169,243
105.15	53,492	7,965	107.80	70,216	172,749
105.20	53,753	10,646	107.85	70,412	176,265
105.25	54,015	13,340	107.90	70,608	179,791
105.30	54,276	16,048	107.95	70,804	183,326
105.35	54,537	18,768	108.00	<b>71,000</b>	<b>186,871</b>
105.40	54,799	21,501			
105.45	55,060	24,248			
105.50	55,322	27,007			
105.55	55,583	29,780			
105.60	55,844	32,566			
105.65	56,106	35,364			
105.70	56,367	38,176			
105.75	56,628	41,001			
105.80	56,890	43,839			
105.85	57,151	46,690			
105.90	57,412	49,554			
105.95	57,674	52,431			
106.00	57,935	55,322			
106.05	58,392	58,230			
106.10	58,850	61,161			
106.15	59,307	64,115			
106.20	59,764	67,091			
106.25	60,222	70,091			
106.30	60,679	73,114			
106.35	61,136	76,159			
106.40	61,594	79,227			
106.45	62,051	82,318			
106.50	62,509	85,432			
106.55	62,966	88,569			
106.60	63,423	91,729			
106.65	63,881	94,912			
106.70	64,338	98,117			
106.75	64,795	101,345			
106.80	65,253	104,597			
106.85	65,710	107,871			
106.90	66,167	111,168			
106.95	66,625	114,487			
107.00	67,082	117,830			
107.05	67,278	121,189			
107.10	67,474	124,558			
107.15	67,670	127,936			
107.20	67,866	131,325			
107.25	68,062	134,723			
107.30	68,257	138,131			
107.35	68,453	141,549			
107.40	68,649	144,976			
107.45	68,845	148,414			
107.50	69,041	151,861			
107.55	69,237	155,318			
107.60	69,433	158,784			

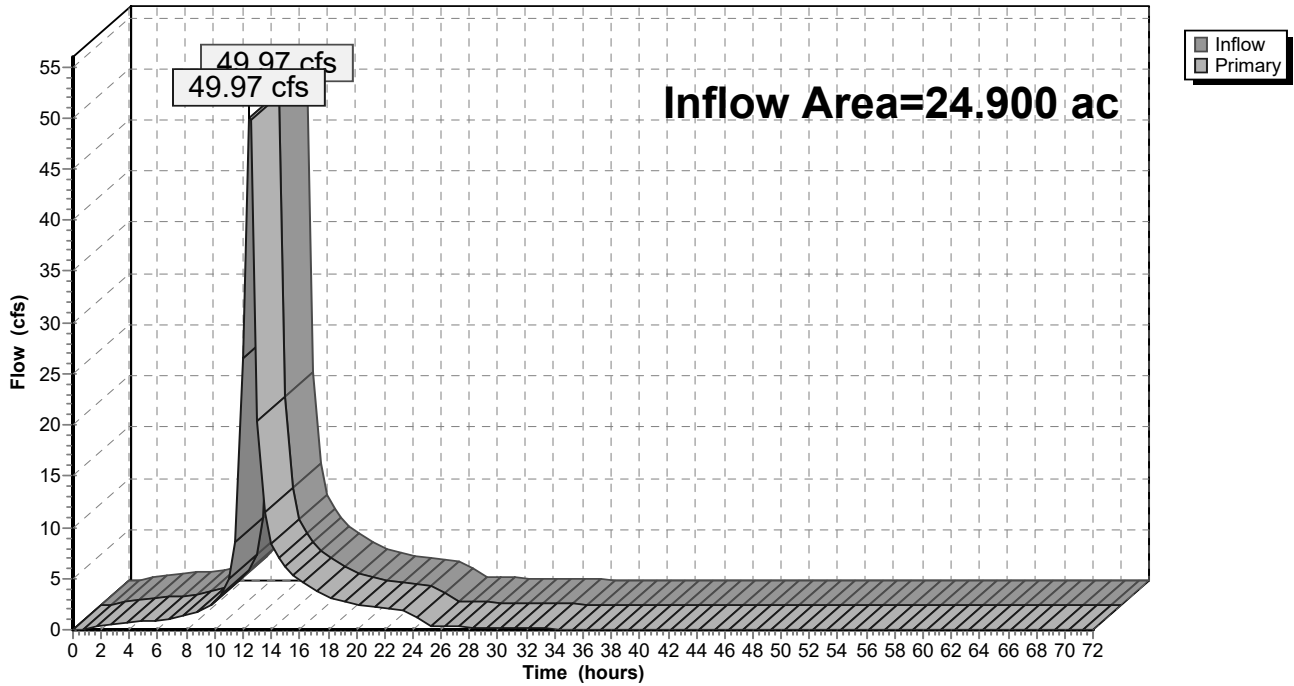
Summary for Link 2L: EXIST. POI-1

Inflow Area = 24.900 ac, 47.71% Impervious, Inflow Depth > 4.47" for 25-Year event  
Inflow = 49.97 cfs @ 12.47 hrs, Volume= 9.279 af  
Primary = 49.97 cfs @ 12.47 hrs, Volume= 9.279 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

Link 2L: EXIST. POI-1

Hydrograph

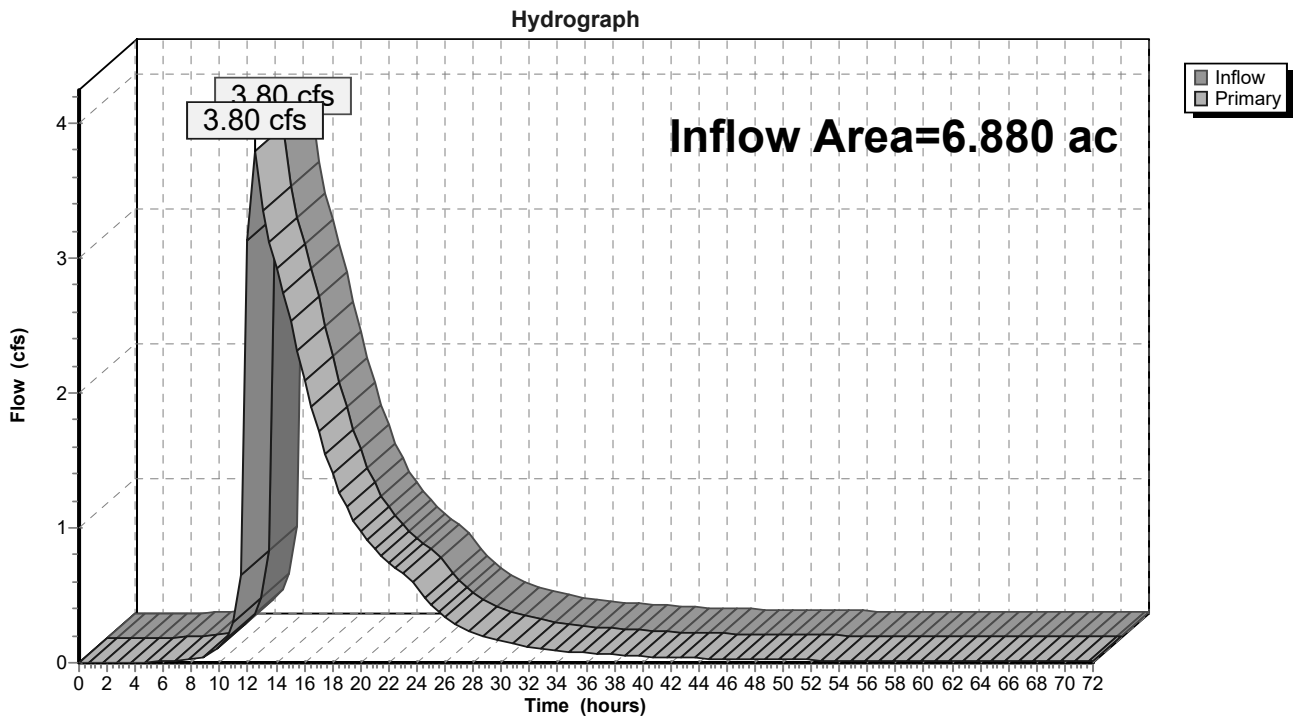


### Summary for Link 26L: EX. BASIN DISCHARGES

Inflow Area = 6.880 ac, 19.77% Impervious, Inflow Depth > 3.65" for 25-Year event  
Inflow = 3.80 cfs @ 12.55 hrs, Volume= 2.092 af  
Primary = 3.80 cfs @ 12.55 hrs, Volume= 2.092 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 26L: EX. BASIN DISCHARGES



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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Time span=0.00-72.00 hrs, dt=0.50 hrs, 145 points  
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: EDA-1A** Runoff Area=17.880 ac 58.84% Impervious Runoff Depth=6.75"  
Flow Length=2,264' Tc=26.4 min CN=73/98 Runoff=64.46 cfs 10.052 af

**Subcatchment 3S: EDA-1B** Runoff Area=5.730 ac 23.73% Impervious Runoff Depth=5.61"  
Flow Length=528' Tc=15.3 min CN=72/98 Runoff=15.99 cfs 2.680 af

**Subcatchment 4S: EDA-2 (POI-2)** Runoff Area=3.600 ac 1.67% Impervious Runoff Depth=4.70"  
Flow Length=609' Tc=19.6 min CN=70/98 Runoff=9.60 cfs 1.410 af

**Subcatchment 6S: EDA-3 (POI-3)** Runoff Area=1.230 ac 0.00% Impervious Runoff Depth=4.65"  
Flow Length=291' Tc=15.2 min CN=70/0 Runoff=3.00 cfs 0.476 af

**Subcatchment 8S: EXIST. OFF-SITE** Runoff Area=0.140 ac 0.00% Impervious Runoff Depth=4.65"  
Flow Length=189' Slope=0.0200 '/' Tc=9.3 min CN=70/0 Runoff=0.39 cfs 0.054 af

**Subcatchment 29S: EDA-1C** Runoff Area=1.150 ac 0.00% Impervious Runoff Depth=5.11"  
Tc=10.0 min CN=74/0 Runoff=3.49 cfs 0.490 af

**Pond 1P: Ex. Detention Basin** Peak Elev=106.11' Storage=61,747 cf Inflow=15.99 cfs 2.680 af  
Primary=0.88 cfs 0.669 af Secondary=2.97 cfs 1.980 af Tertiary=0.00 cfs 0.000 af Outflow=3.84 cfs 2.649 af

**Link 2L: EXIST. POI-1** Inflow=70.20 cfs 13.245 af  
Primary=70.20 cfs 13.245 af

**Link 26L: EX. BASIN DISCHARGES** Inflow=5.52 cfs 3.139 af  
Primary=5.52 cfs 3.139 af

**Total Runoff Area = 29.730 ac Runoff Volume = 15.162 af Average Runoff Depth = 6.12"**  
**59.84% Pervious = 17.790 ac 40.16% Impervious = 11.940 ac**

**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 1S: EDA-1A**

Runoff = 64.46 cfs @ 12.47 hrs, Volume= 10.052 af, Depth= 6.75"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

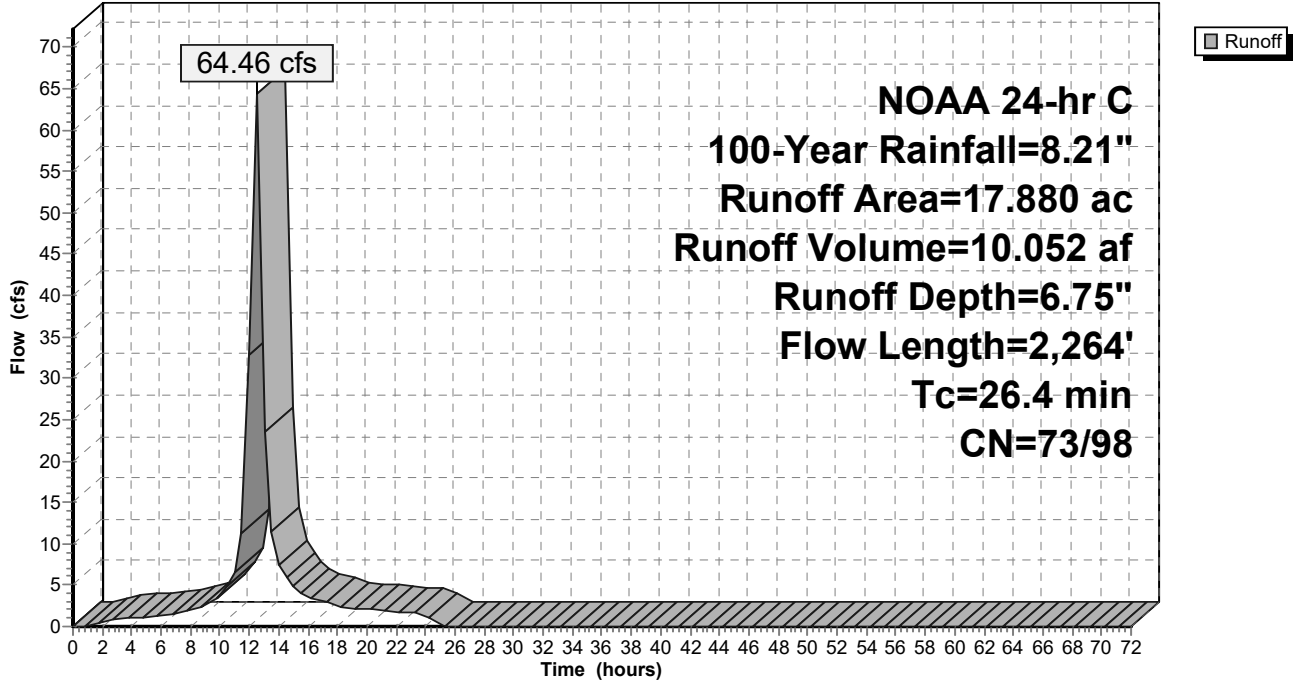
Area (ac)	CN	Description
7.010	98	Roofs, HSG C
4.600	72	Woods/grass comb., Good, HSG C
2.760	74	>75% Grass cover, Good, HSG C
3.510	98	Paved parking, HSG C
17.880	88	Weighted Average
7.360	73	41.16% Pervious Area
10.520	98	58.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	18	0.0225	0.06		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
15.9	507	0.0113	0.53		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.3	66	0.0280	3.40		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.6	216	0.0134	6.21	4.87	<b>Pipe Channel,</b> 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
4.5	1,457	0.0060	5.44	9.62	<b>Pipe Channel,</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
26.4	2,264	Total			



Subcatchment 1S: EDA-1A

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 3S: EDA-1B**

Runoff = 15.99 cfs @ 12.28 hrs, Volume= 2.680 af, Depth= 5.61"

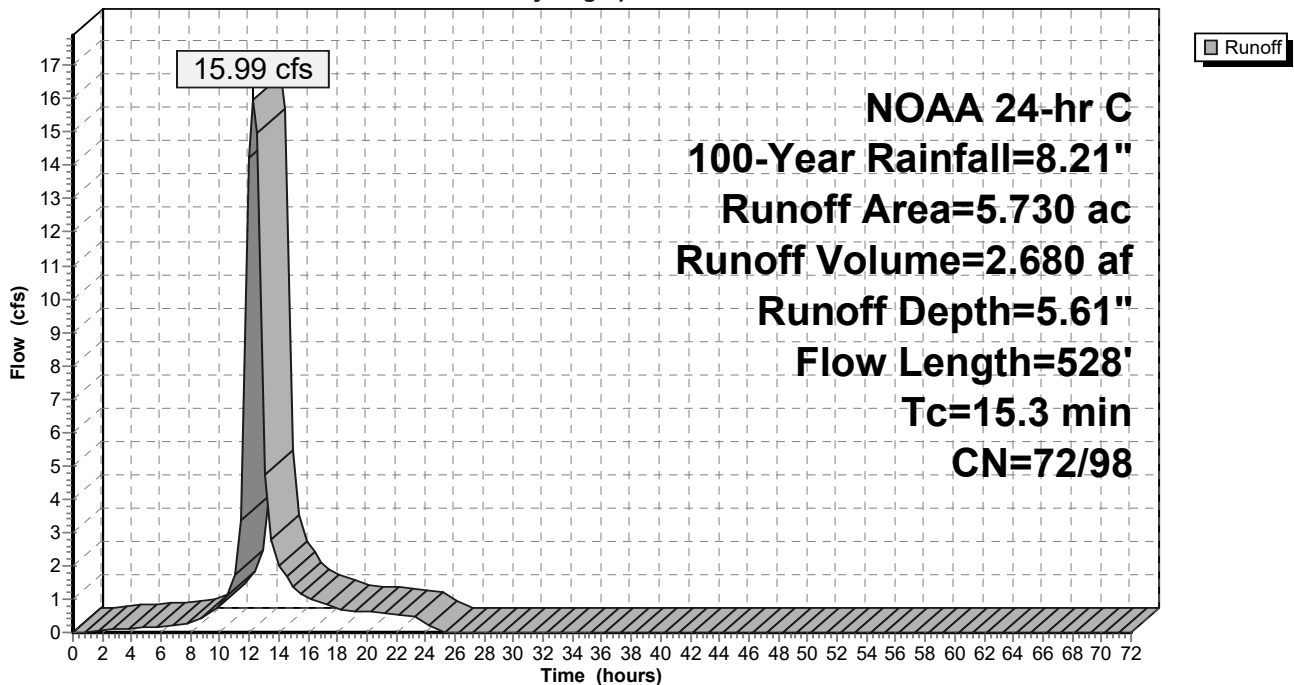
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
2.020	70	Woods, Good, HSG C
2.350	74	>75% Grass cover, Good, HSG C
1.360	98	Paved parking, HSG C
5.730	78	Weighted Average
4.370	72	76.27% Pervious Area
1.360	98	23.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	15	0.0140	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
8.6	365	0.0200	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.4	148	0.0080	1.82		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
15.3	528	Total			

**Subcatchment 3S: EDA-1B**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 4S: EDA-2 (POI-2)**

Runoff = 9.60 cfs @ 12.43 hrs, Volume= 1.410 af, Depth= 4.70"

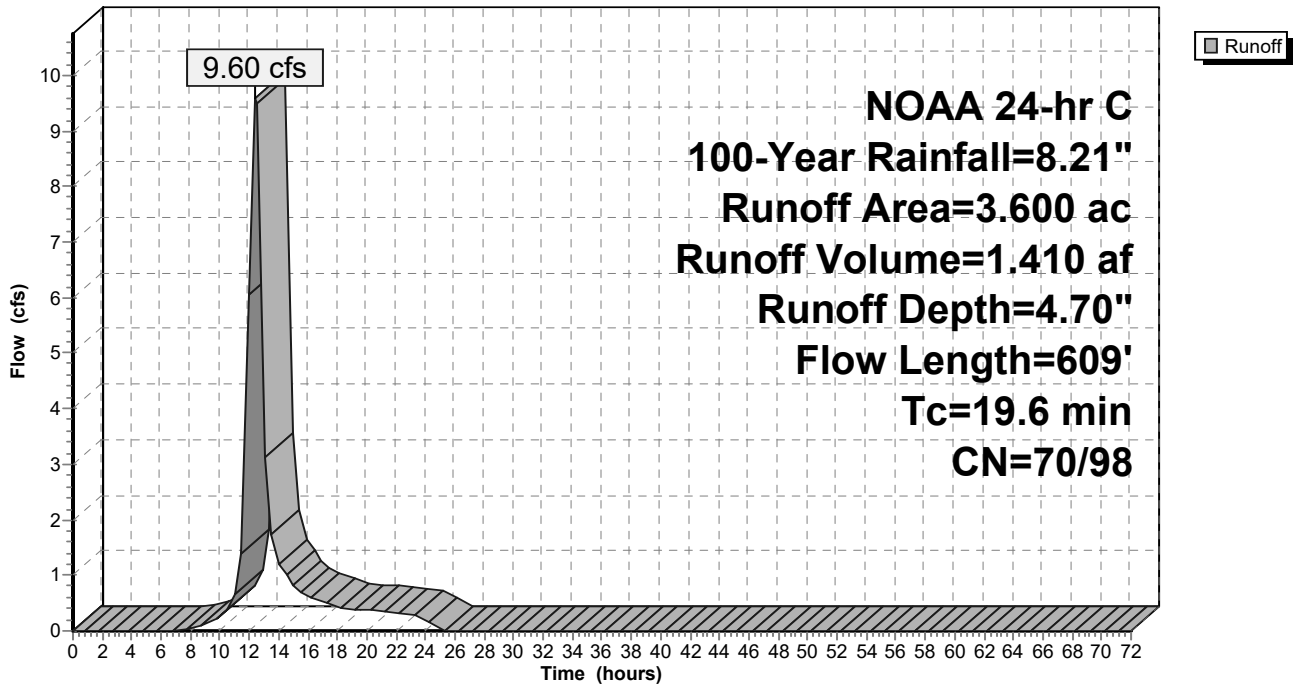
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
3.540	70	Woods, Good, HSG C
0.060	98	Paved parking, HSG C
3.600	70	Weighted Average
3.540	70	98.33% Pervious Area
0.060	98	1.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	17	0.0180	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
14.3	592	0.0190	0.69		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
19.6	609	Total			

**Subcatchment 4S: EDA-2 (POI-2)**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 6S: EDA-3 (POI-3)**

Runoff = 3.00 cfs @ 12.32 hrs, Volume= 0.476 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

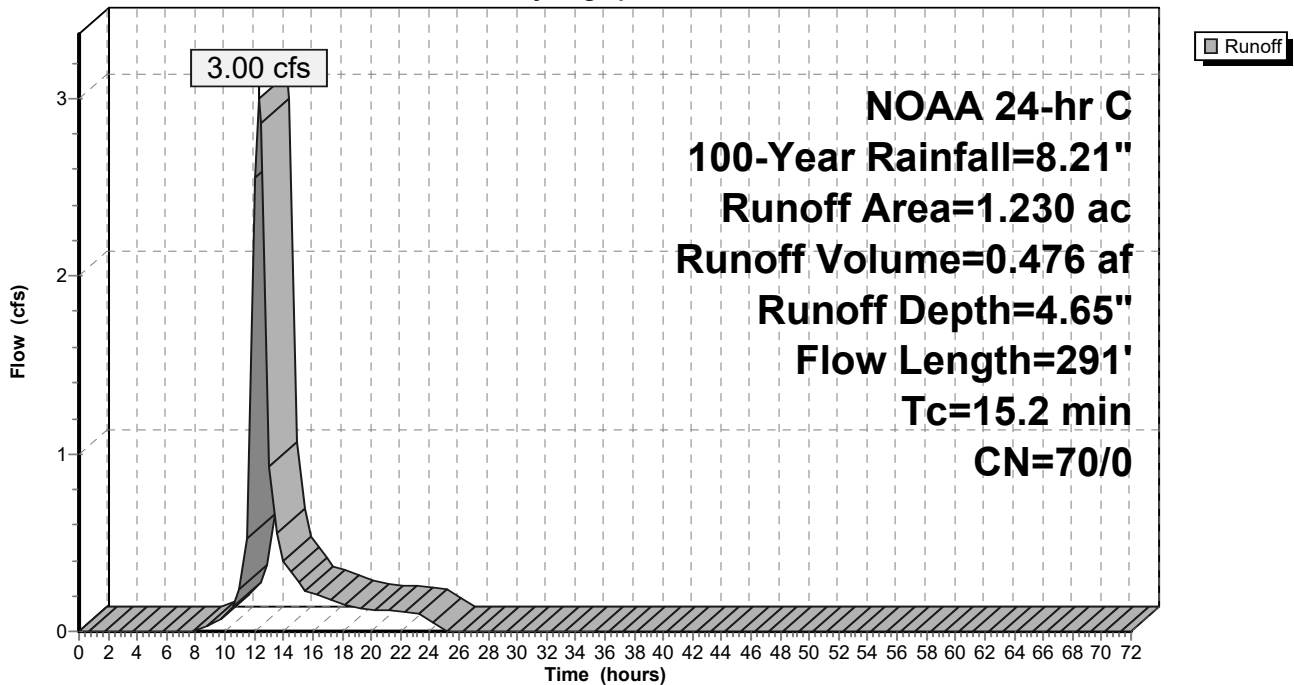
Area (ac)	CN	Description
1.230	70	Woods, Good, HSG C
1.230	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	9	0.0050	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
9.9	282	0.0090	0.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.2	291	Total			

**Subcatchment 6S: EDA-3 (POI-3)**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 8S: EXIST. OFF-SITE**

Runoff = 0.39 cfs @ 12.09 hrs, Volume= 0.054 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

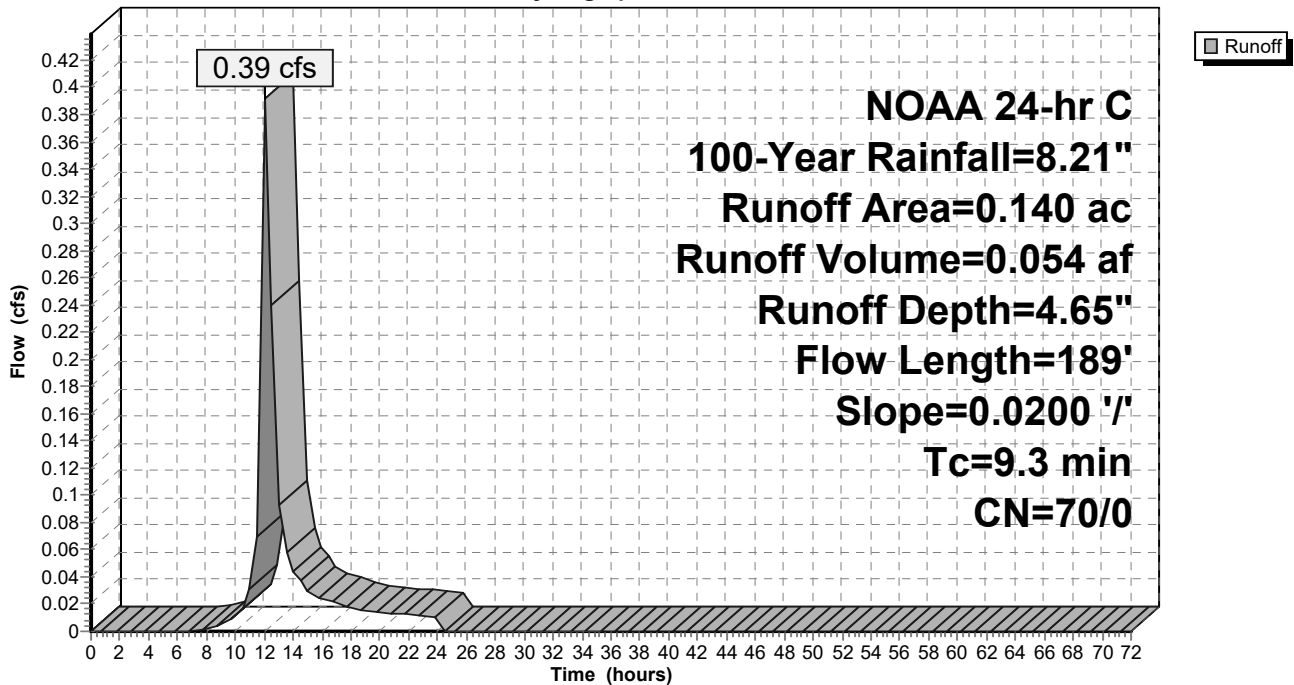
Area (ac)	CN	Description
0.140	70	Woods, Good, HSG C
0.140	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	18	0.0200	0.06		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
4.0	171	0.0200	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.3	189	Total			

**Subcatchment 8S: EXIST. OFF-SITE**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 29S: EDA-1C**

Runoff = 3.49 cfs @ 12.10 hrs, Volume= 0.490 af, Depth= 5.11"

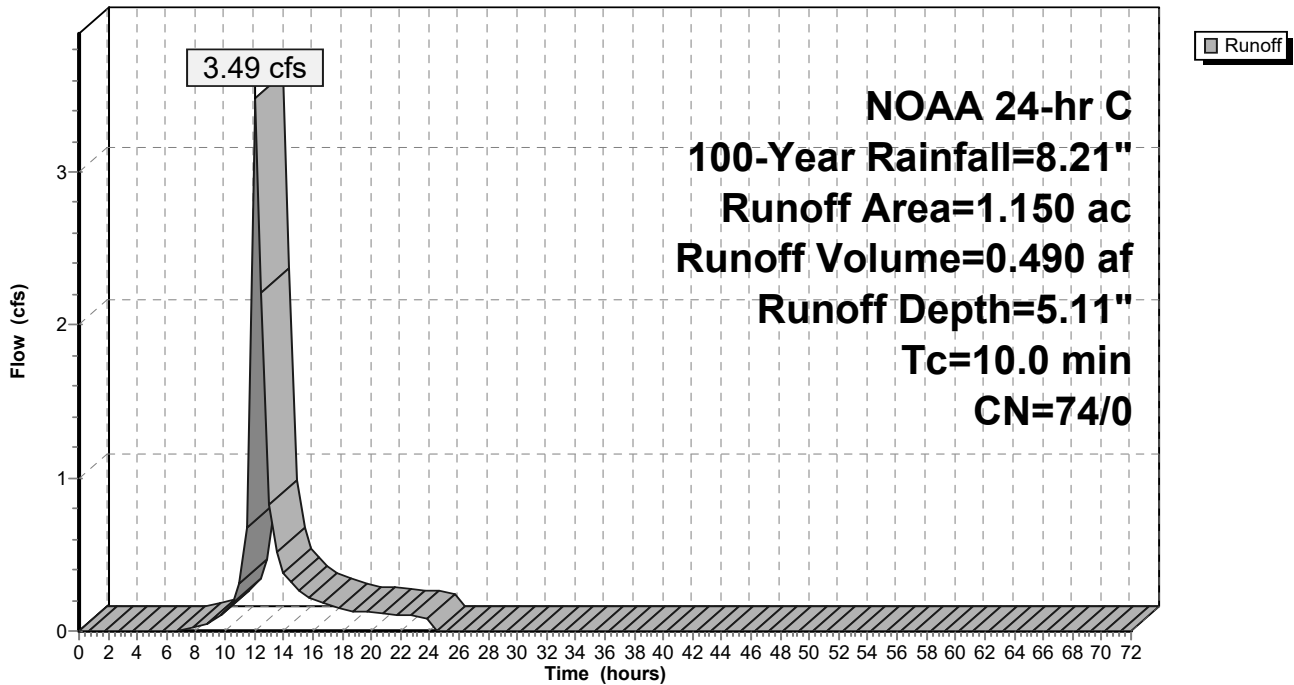
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
1.150	74	>75% Grass cover, Good, HSG C
1.150	74	100.00% Pervious Area

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

**Subcatchment 29S: EDA-1C**

Hydrograph



**Summary for Pond 1P: Ex. Detention Basin**

Inflow Area = 5.730 ac, 23.73% Impervious, Inflow Depth = 5.61" for 100-Year event  
 Inflow = 15.99 cfs @ 12.28 hrs, Volume= 2.680 af  
 Outflow = 3.84 cfs @ 13.25 hrs, Volume= 2.649 af, Atten= 76%, Lag= 57.9 min  
 Primary = 0.88 cfs @ 13.25 hrs, Volume= 0.669 af  
 Secondary = 2.97 cfs @ 13.25 hrs, Volume= 1.980 af  
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 106.11' @ 13.25 hrs Surf.Area= 58,941 sf Storage= 61,747 cf

Plug-Flow detention time= 285.5 min calculated for 2.630 af (98% of inflow)  
 Center-of-Mass det. time= 292.6 min ( 1,096.3 - 803.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	105.00'	186,871 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
105.00	52,708	0	0
106.00	57,935	55,322	55,322
107.00	67,082	62,509	117,830
108.00	71,000	69,041	186,871

Device	Routing	Invert	Outlet Devices
#1	Primary	105.00'	<b>18.0" Round RCP_Round 18"</b> L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0333 1/1' Cc= 0.900 n= 0.015, Flow Area= 1.77 sf
#2	Device 1	105.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	106.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Secondary	105.00'	<b>8.0" Round Culvert X 2.00</b> L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0238 1/1' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf
#5	Tertiary	107.00'	<b>50.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

**Primary OutFlow** Max=0.86 cfs @ 13.25 hrs HW=106.09' (Free Discharge)

- ↑ 1=RCP\_Round 18" (Passes 0.86 cfs of 4.86 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.86 cfs @ 4.40 fps)
- ↑ 3=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=2.92 cfs @ 13.25 hrs HW=106.09' (Free Discharge)

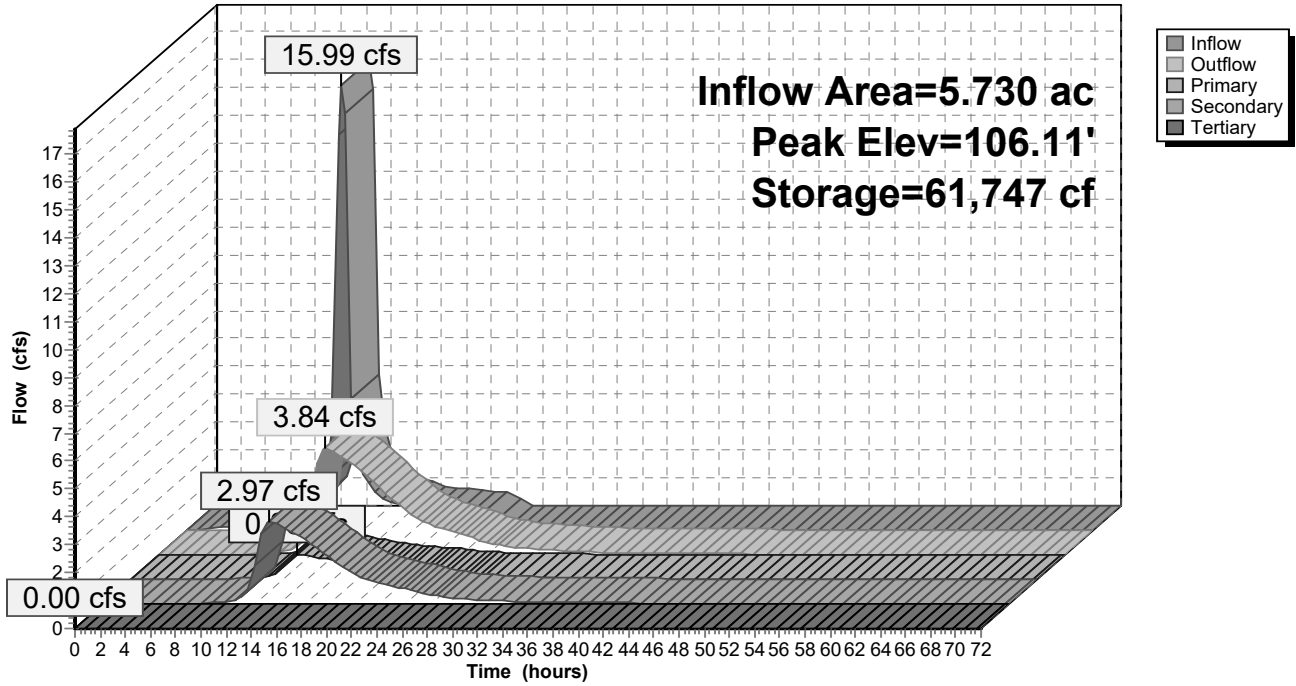
- ↑ 4=Culvert (Inlet Controls 2.92 cfs @ 4.18 fps)

**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=105.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

### Pond 1P: Ex. Detention Basin

Hydrograph





**Pre vs Post 211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Stage-Area-Storage for Pond 1P: Ex. Detention Basin**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
105.00	52,708	0	107.65	69,629	162,261
105.05	52,969	2,642	107.70	69,825	165,747
105.10	53,231	5,297	107.75	70,021	169,243
105.15	53,492	7,965	107.80	70,216	172,749
105.20	53,753	10,646	107.85	70,412	176,265
105.25	54,015	13,340	107.90	70,608	179,791
105.30	54,276	16,048	107.95	70,804	183,326
105.35	54,537	18,768	108.00	<b>71,000</b>	<b>186,871</b>
105.40	54,799	21,501			
105.45	55,060	24,248			
105.50	55,322	27,007			
105.55	55,583	29,780			
105.60	55,844	32,566			
105.65	56,106	35,364			
105.70	56,367	38,176			
105.75	56,628	41,001			
105.80	56,890	43,839			
105.85	57,151	46,690			
105.90	57,412	49,554			
105.95	57,674	52,431			
106.00	57,935	55,322			
106.05	58,392	58,230			
106.10	58,850	61,161			
106.15	59,307	64,115			
106.20	59,764	67,091			
106.25	60,222	70,091			
106.30	60,679	73,114			
106.35	61,136	76,159			
106.40	61,594	79,227			
106.45	62,051	82,318			
106.50	62,509	85,432			
106.55	62,966	88,569			
106.60	63,423	91,729			
106.65	63,881	94,912			
106.70	64,338	98,117			
106.75	64,795	101,345			
106.80	65,253	104,597			
106.85	65,710	107,871			
106.90	66,167	111,168			
106.95	66,625	114,487			
107.00	67,082	117,830			
107.05	67,278	121,189			
107.10	67,474	124,558			
107.15	67,670	127,936			
107.20	67,866	131,325			
107.25	68,062	134,723			
107.30	68,257	138,131			
107.35	68,453	141,549			
107.40	68,649	144,976			
107.45	68,845	148,414			
107.50	69,041	151,861			
107.55	69,237	155,318			
107.60	69,433	158,784			

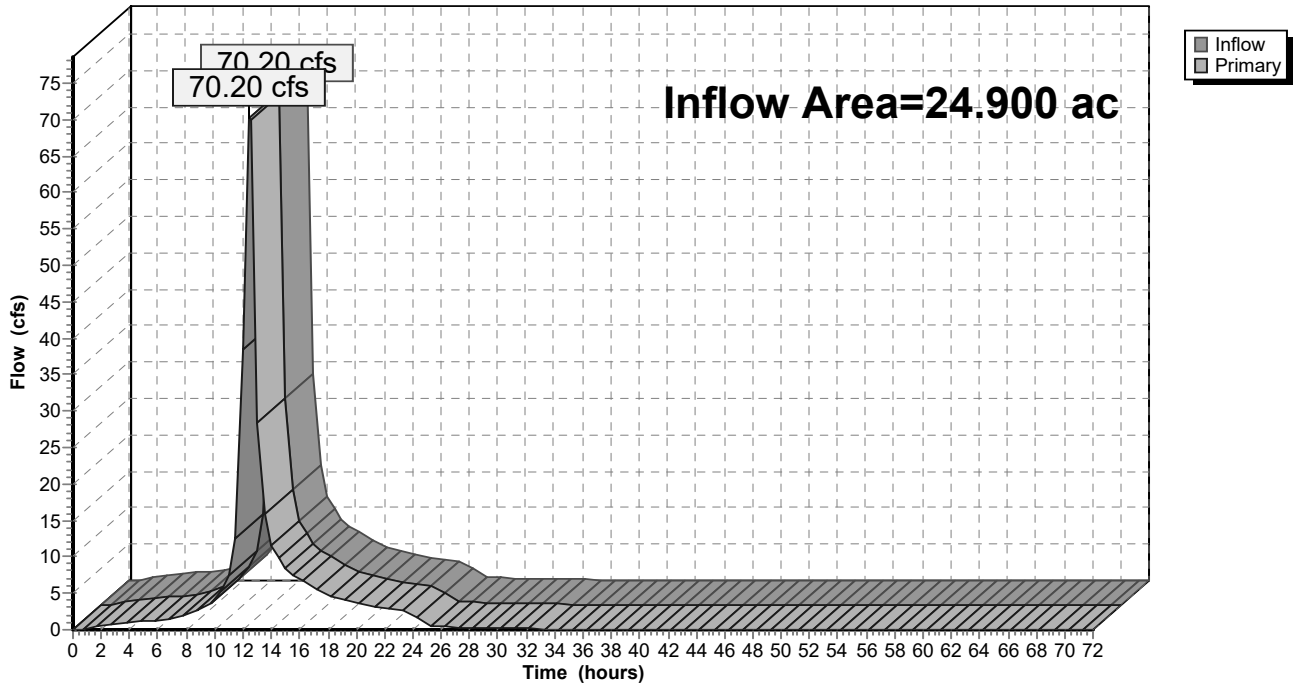
### Summary for Link 2L: EXIST. POI-1

Inflow Area = 24.900 ac, 47.71% Impervious, Inflow Depth > 6.38" for 100-Year event  
Inflow = 70.20 cfs @ 12.46 hrs, Volume= 13.245 af  
Primary = 70.20 cfs @ 12.46 hrs, Volume= 13.245 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 2L: EXIST. POI-1

Hydrograph

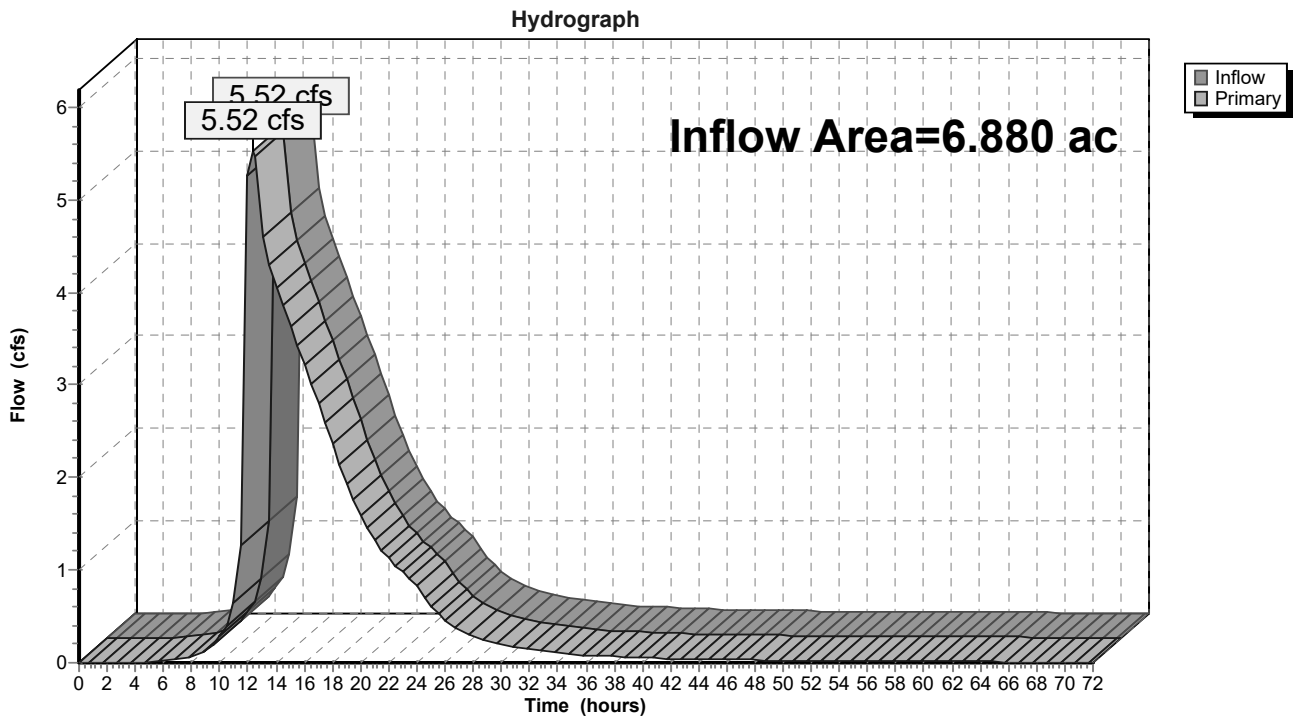


### Summary for Link 26L: EX. BASIN DISCHARGES

Inflow Area = 6.880 ac, 19.77% Impervious, Inflow Depth > 5.47" for 100-Year event  
Inflow = 5.52 cfs @ 12.35 hrs, Volume= 3.139 af  
Primary = 5.52 cfs @ 12.35 hrs, Volume= 3.139 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 26L: EX. BASIN DISCHARGES



**Pre vs Post\_211020**

NJ DEP 2-hr WQ Rainfall=1.25"

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Time span=0.00-72.00 hrs, dt=0.50 hrs, 145 points  
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: EDA-1A**

Runoff Area=17.880 ac 58.84% Impervious Runoff Depth=0.63"  
Flow Length=2,264' Tc=26.4 min CN=73/98 Runoff=13.13 cfs 0.945 af

**Subcatchment 3S: EDA-1B**

Runoff Area=5.730 ac 23.73% Impervious Runoff Depth=0.28"  
Flow Length=528' Tc=15.3 min CN=72/98 Runoff=1.57 cfs 0.136 af

**Subcatchment 4S: EDA-2 (POI-2)**

Runoff Area=3.600 ac 1.67% Impervious Runoff Depth=0.05"  
Flow Length=609' Tc=19.6 min CN=70/98 Runoff=0.18 cfs 0.015 af

**Subcatchment 6S: EDA-3 (POI-3)**

Runoff Area=1.230 ac 0.00% Impervious Runoff Depth=0.03"  
Flow Length=291' Tc=15.2 min CN=70/0 Runoff=0.05 cfs 0.003 af

**Subcatchment 8S: EXIST. OFF-SITE**

Runoff Area=0.140 ac 0.00% Impervious Runoff Depth=0.03"  
Flow Length=189' Slope=0.0200 '/' Tc=9.3 min CN=70/0 Runoff=0.01 cfs 0.000 af

**Subcatchment 29S: EDA-1C**

Runoff Area=1.150 ac 0.00% Impervious Runoff Depth=0.07"  
Tc=10.0 min CN=74/0 Runoff=0.10 cfs 0.007 af

**Pond 1P: Ex. Detention Basin**

Peak Elev=105.10' Storage=5,506 cf Inflow=1.57 cfs 0.136 af  
Primary=0.03 cfs 0.036 af Secondary=0.08 cfs 0.084 af Tertiary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.120 af

**Link 2L: EXIST. POI-1**

Inflow=13.29 cfs 1.072 af  
Primary=13.29 cfs 1.072 af

**Link 26L: EX. BASIN DISCHARGES**

Inflow=0.17 cfs 0.127 af  
Primary=0.17 cfs 0.127 af

**Total Runoff Area = 29.730 ac Runoff Volume = 1.107 af Average Runoff Depth = 0.45"**  
**59.84% Pervious = 17.790 ac 40.16% Impervious = 11.940 ac**

**Pre vs Post\_211020**

NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 1S: EDA-1A**

Runoff = 13.13 cfs @ 1.49 hrs, Volume= 0.945 af, Depth= 0.63"

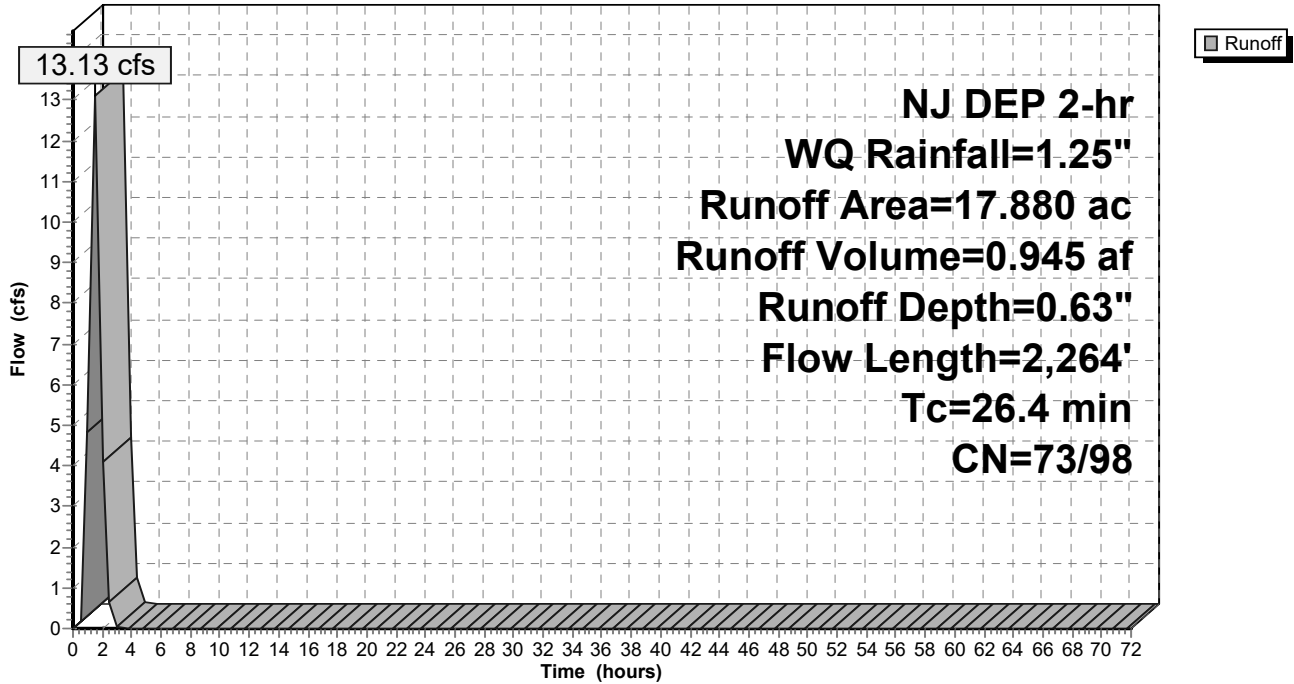
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
7.010	98	Roofs, HSG C
4.600	72	Woods/grass comb., Good, HSG C
2.760	74	>75% Grass cover, Good, HSG C
3.510	98	Paved parking, HSG C
17.880	88	Weighted Average
7.360	73	41.16% Pervious Area
10.520	98	58.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	18	0.0225	0.06		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
15.9	507	0.0113	0.53		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.3	66	0.0280	3.40		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
0.6	216	0.0134	6.21	4.87	<b>Pipe Channel,</b> 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
4.5	1,457	0.0060	5.44	9.62	<b>Pipe Channel,</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
26.4	2,264	Total			

### Subcatchment 1S: EDA-1A

Hydrograph



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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 3S: EDA-1B**

Runoff = 1.57 cfs @ 1.32 hrs, Volume= 0.136 af, Depth= 0.28"

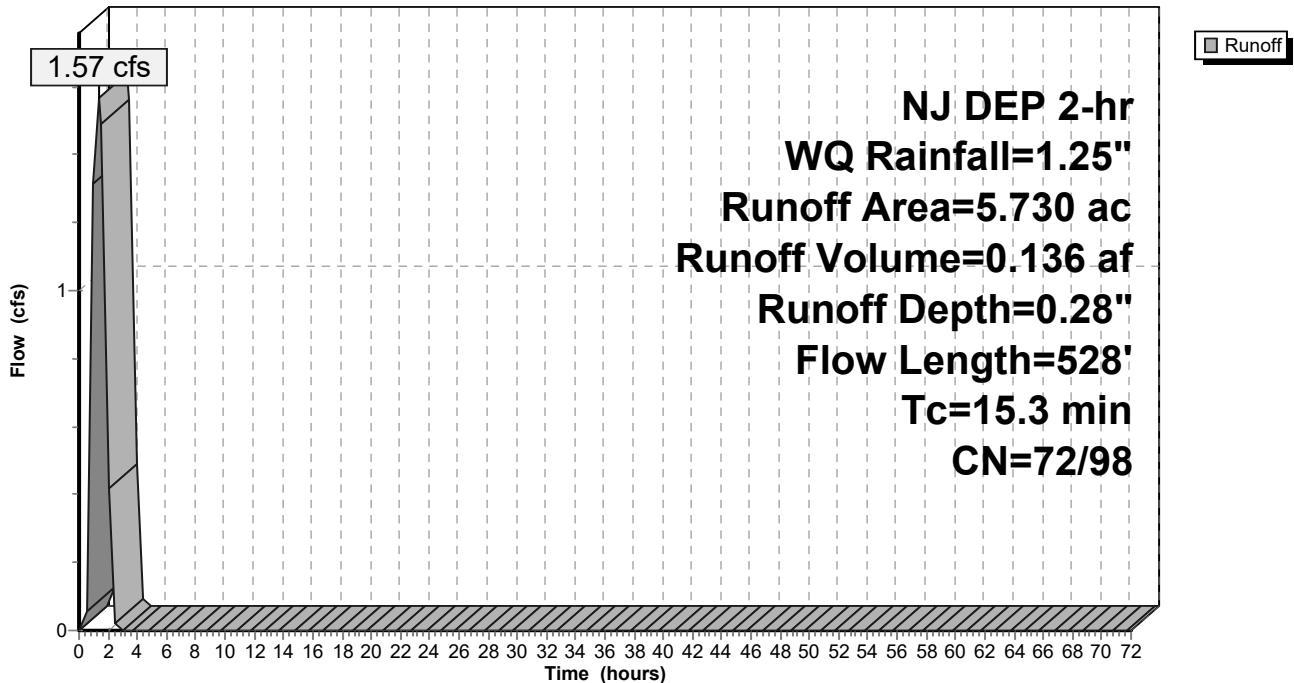
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
2.020	70	Woods, Good, HSG C
2.350	74	>75% Grass cover, Good, HSG C
1.360	98	Paved parking, HSG C
5.730	78	Weighted Average
4.370	72	76.27% Pervious Area
1.360	98	23.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	15	0.0140	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
8.6	365	0.0200	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.4	148	0.0080	1.82		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
15.3	528	Total			

**Subcatchment 3S: EDA-1B**

Hydrograph



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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 4S: EDA-2 (POI-2)**

Runoff = 0.18 cfs @ 1.60 hrs, Volume= 0.015 af, Depth= 0.05"

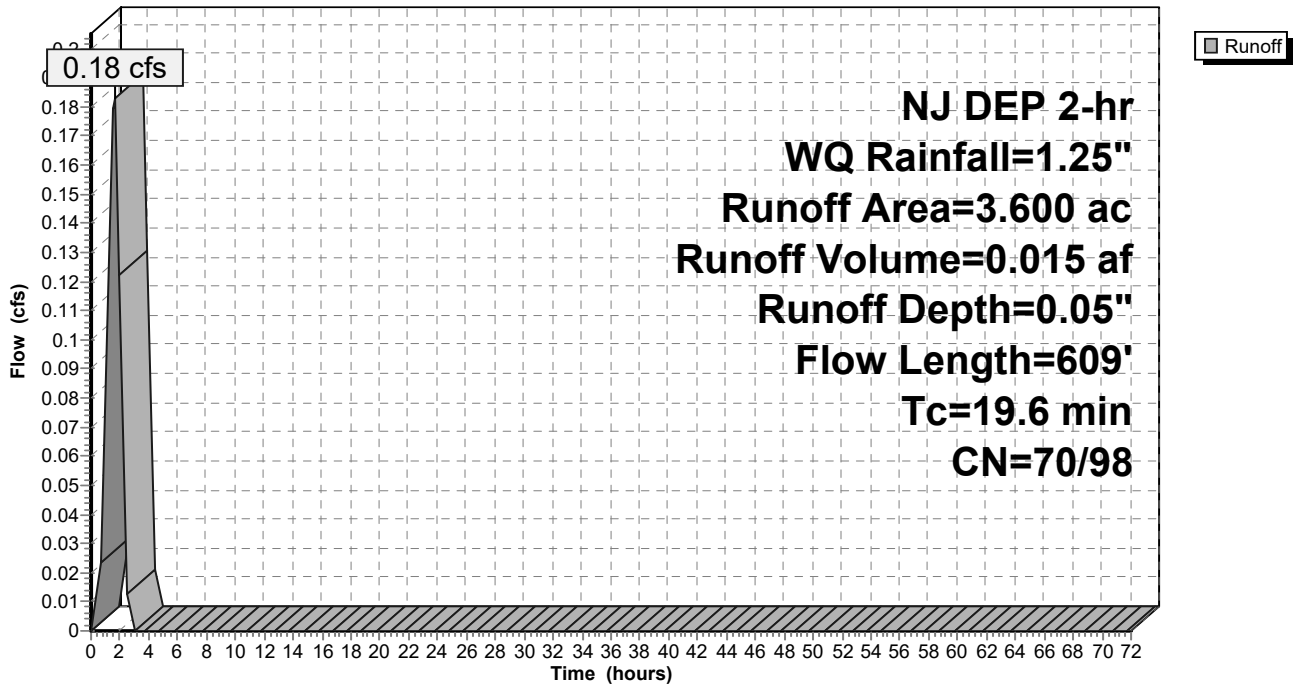
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
3.540	70	Woods, Good, HSG C
0.060	98	Paved parking, HSG C
3.600	70	Weighted Average
3.540	70	98.33% Pervious Area
0.060	98	1.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	17	0.0180	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
14.3	592	0.0190	0.69		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
19.6	609	Total			

**Subcatchment 4S: EDA-2 (POI-2)**

Hydrograph





**Pre vs Post 211020**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 6S: EDA-3 (POI-3)**

Runoff = 0.05 cfs @ 1.64 hrs, Volume= 0.003 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

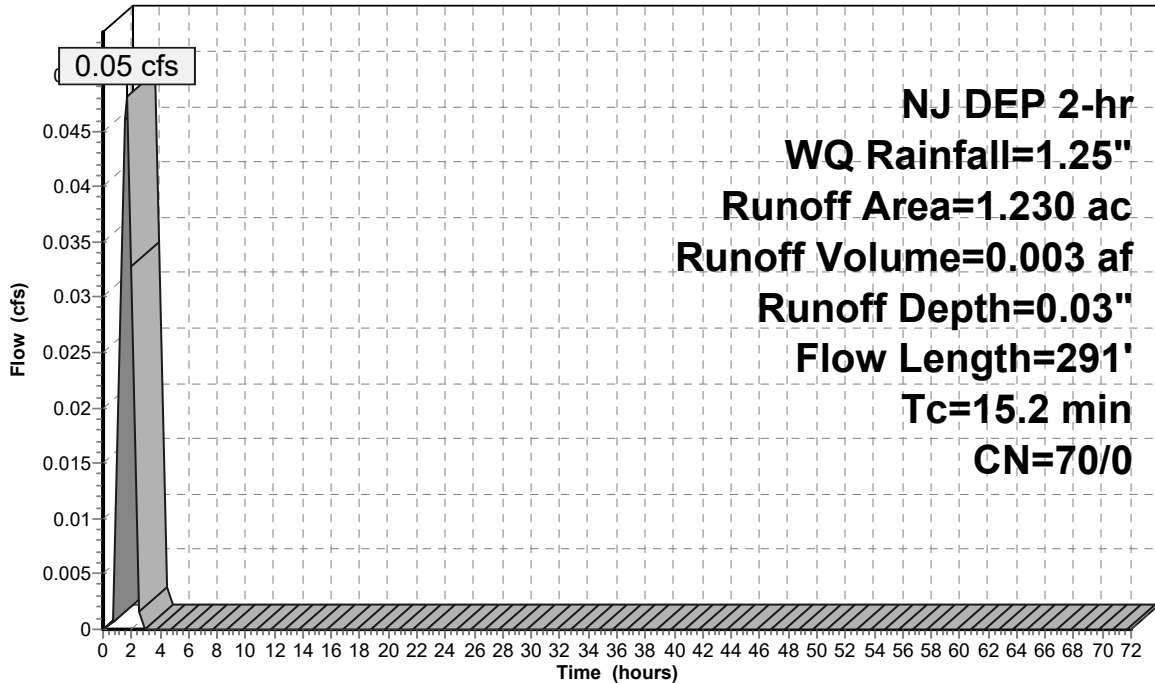
Area (ac)	CN	Description
1.230	70	Woods, Good, HSG C
1.230	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	9	0.0050	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
9.9	282	0.0090	0.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.2	291	Total			

**Subcatchment 6S: EDA-3 (POI-3)**

Hydrograph



Runoff

**Pre vs Post 211020**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 8S: EXIST. OFF-SITE**

Runoff = 0.01 cfs @ 1.57 hrs, Volume= 0.000 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

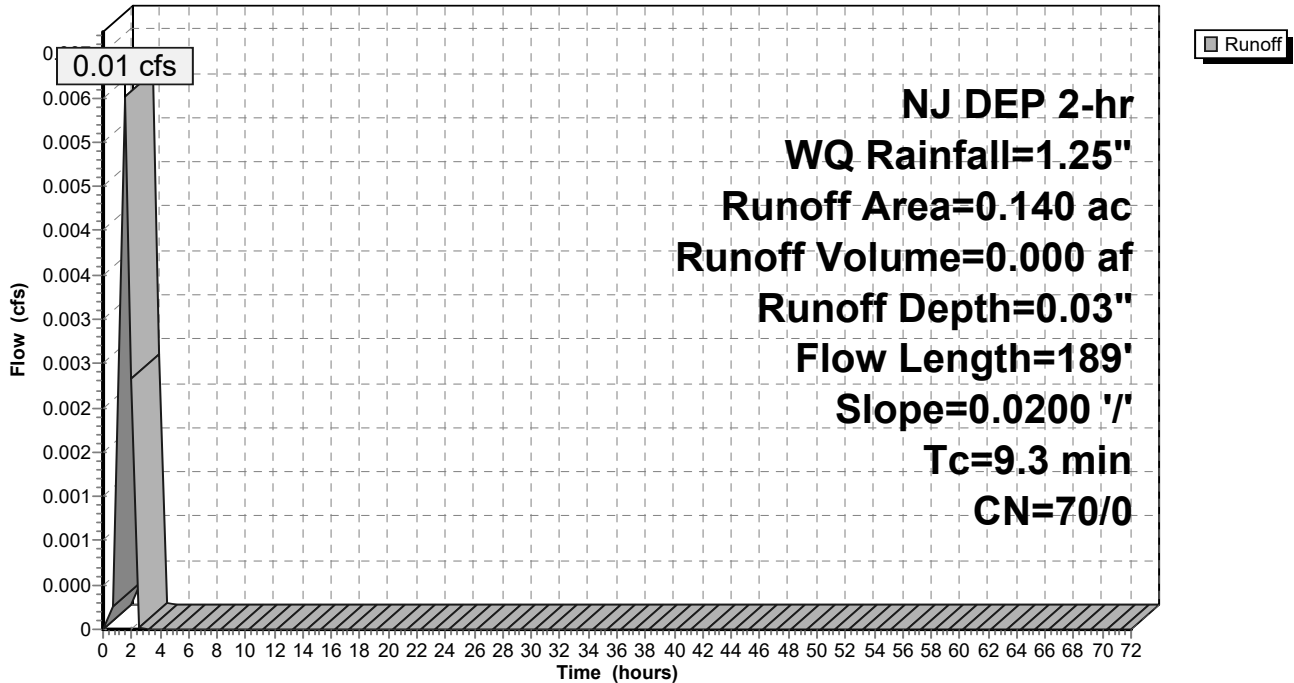
Area (ac)	CN	Description
0.140	70	Woods, Good, HSG C
0.140	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	18	0.0200	0.06		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
4.0	171	0.0200	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.3	189	Total			

**Subcatchment 8S: EXIST. OFF-SITE**

Hydrograph



**Pre vs Post\_211020**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 29S: EDA-1C**

Runoff = 0.10 cfs @ 1.52 hrs, Volume= 0.007 af, Depth= 0.07"

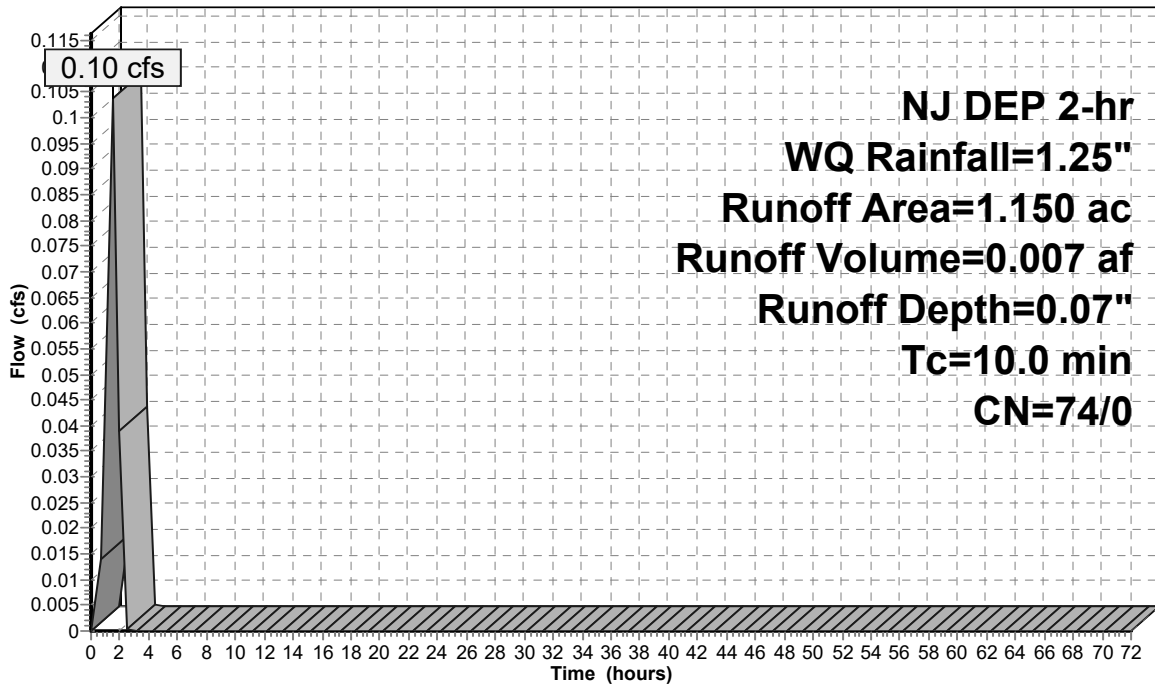
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
1.150	74	>75% Grass cover, Good, HSG C
1.150	74	100.00% Pervious Area

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

**Subcatchment 29S: EDA-1C**

Hydrograph



Runoff

**Pre vs Post 211020**

NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Pond 1P: Ex. Detention Basin**

Inflow Area = 5.730 ac, 23.73% Impervious, Inflow Depth = 0.28" for WQ event  
 Inflow = 1.57 cfs @ 1.32 hrs, Volume= 0.136 af  
 Outflow = 0.11 cfs @ 2.52 hrs, Volume= 0.120 af, Atten= 93%, Lag= 71.7 min  
 Primary = 0.03 cfs @ 2.52 hrs, Volume= 0.036 af  
 Secondary = 0.08 cfs @ 2.52 hrs, Volume= 0.084 af  
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 105.10' @ 2.52 hrs Surf.Area= 53,251 sf Storage= 5,506 cf

Plug-Flow detention time= 1,010.4 min calculated for 0.120 af (88% of inflow)  
 Center-of-Mass det. time= 1,004.9 min ( 1,086.0 - 81.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	105.00'	186,871 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
105.00	52,708	0	0
106.00	57,935	55,322	55,322
107.00	67,082	62,509	117,830
108.00	71,000	69,041	186,871

Device	Routing	Invert	Outlet Devices
#1	Primary	105.00'	<b>18.0" Round RCP_Round 18"</b> L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0333 1/1' Cc= 0.900 n= 0.015, Flow Area= 1.77 sf
#2	Device 1	105.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	106.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Secondary	105.00'	<b>8.0" Round Culvert X 2.00</b> L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0238 1/1' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf
#5	Tertiary	107.00'	<b>50.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

**Primary OutFlow** Max=0.03 cfs @ 2.52 hrs HW=105.10' (Free Discharge)

- ↑ 1=RCP\_Round 18" (Passes 0.03 cfs of 0.06 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.03 cfs @ 1.10 fps)
- ↑ 3=Orifice/Grate ( Controls 0.00 cfs)

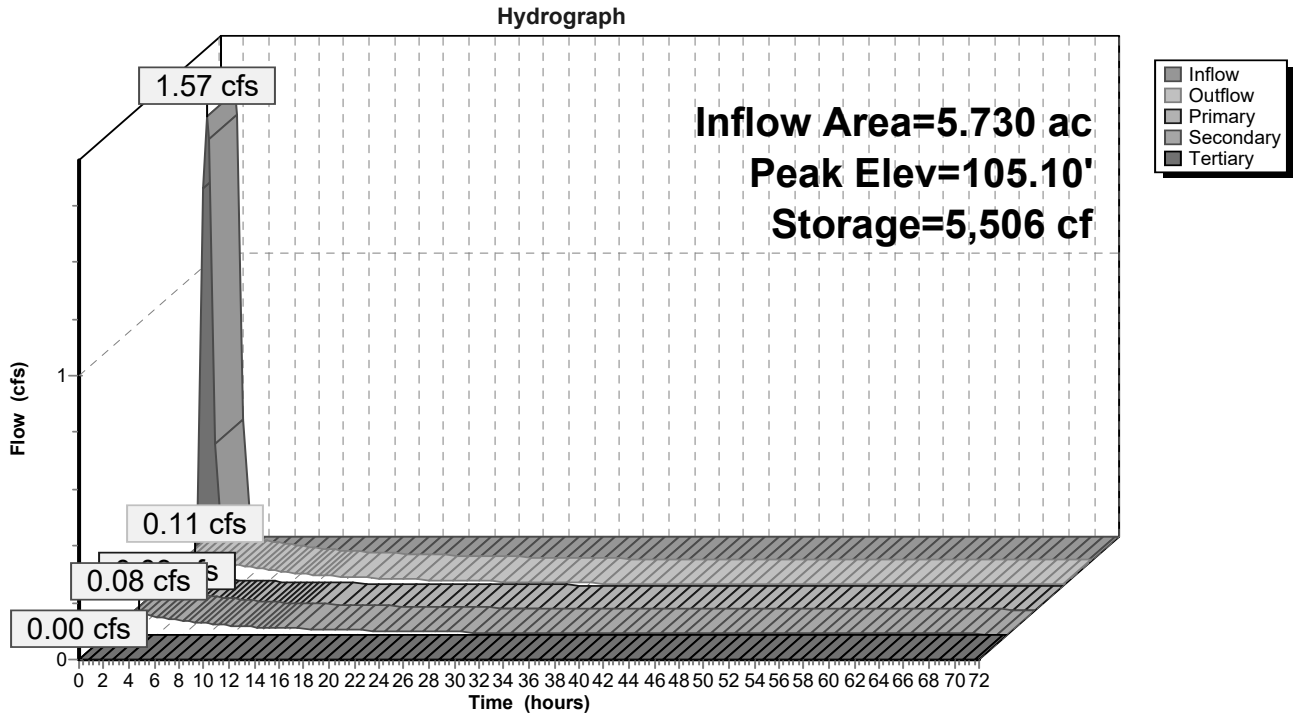
**Secondary OutFlow** Max=0.08 cfs @ 2.52 hrs HW=105.10' (Free Discharge)

- ↑ 4=Culvert (Inlet Controls 0.08 cfs @ 1.10 fps)

**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=105.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

### Pond 1P: Ex. Detention Basin



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**Stage-Area-Storage for Pond 1P: Ex. Detention Basin**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
105.00	52,708	0	107.65	69,629	162,261
105.05	52,969	2,642	107.70	69,825	165,747
105.10	53,231	5,297	107.75	70,021	169,243
105.15	53,492	7,965	107.80	70,216	172,749
105.20	53,753	10,646	107.85	70,412	176,265
105.25	54,015	13,340	107.90	70,608	179,791
105.30	54,276	16,048	107.95	70,804	183,326
105.35	54,537	18,768	108.00	<b>71,000</b>	<b>186,871</b>
105.40	54,799	21,501			
105.45	55,060	24,248			
105.50	55,322	27,007			
105.55	55,583	29,780			
105.60	55,844	32,566			
105.65	56,106	35,364			
105.70	56,367	38,176			
105.75	56,628	41,001			
105.80	56,890	43,839			
105.85	57,151	46,690			
105.90	57,412	49,554			
105.95	57,674	52,431			
106.00	57,935	55,322			
106.05	58,392	58,230			
106.10	58,850	61,161			
106.15	59,307	64,115			
106.20	59,764	67,091			
106.25	60,222	70,091			
106.30	60,679	73,114			
106.35	61,136	76,159			
106.40	61,594	79,227			
106.45	62,051	82,318			
106.50	62,509	85,432			
106.55	62,966	88,569			
106.60	63,423	91,729			
106.65	63,881	94,912			
106.70	64,338	98,117			
106.75	64,795	101,345			
106.80	65,253	104,597			
106.85	65,710	107,871			
106.90	66,167	111,168			
106.95	66,625	114,487			
107.00	67,082	117,830			
107.05	67,278	121,189			
107.10	67,474	124,558			
107.15	67,670	127,936			
107.20	67,866	131,325			
107.25	68,062	134,723			
107.30	68,257	138,131			
107.35	68,453	141,549			
107.40	68,649	144,976			
107.45	68,845	148,414			
107.50	69,041	151,861			
107.55	69,237	155,318			
107.60	69,433	158,784			

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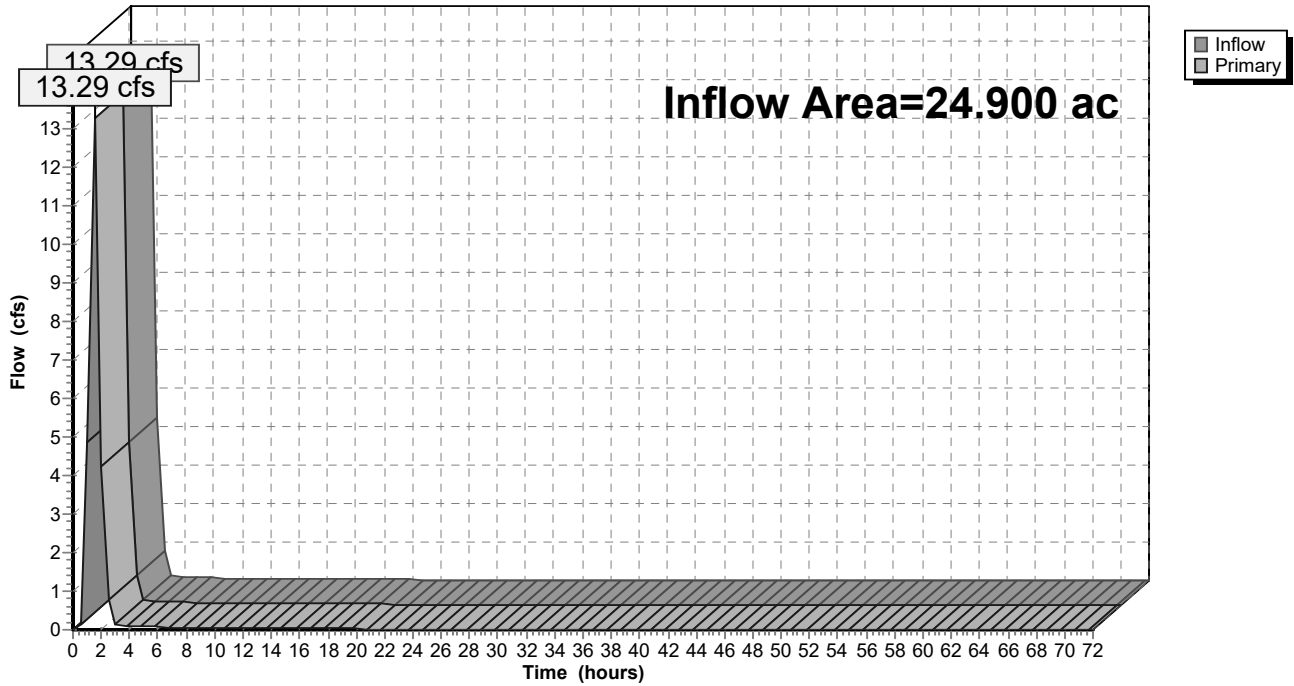
**Summary for Link 2L: EXIST. POI-1**

Inflow Area = 24.900 ac, 47.71% Impervious, Inflow Depth > 0.52" for WQ event  
Inflow = 13.29 cfs @ 1.49 hrs, Volume= 1.072 af  
Primary = 13.29 cfs @ 1.49 hrs, Volume= 1.072 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

**Link 2L: EXIST. POI-1**

Hydrograph

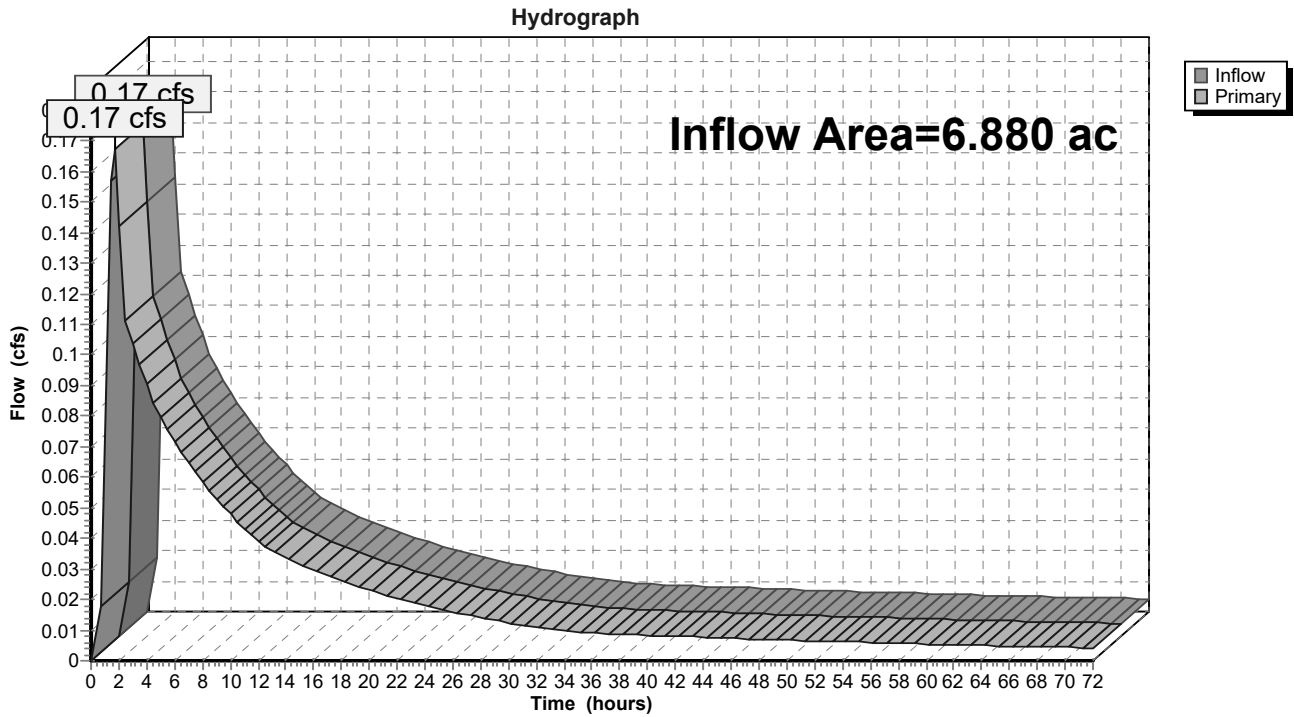


### Summary for Link 26L: EX. BASIN DISCHARGES

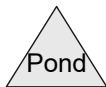
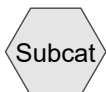
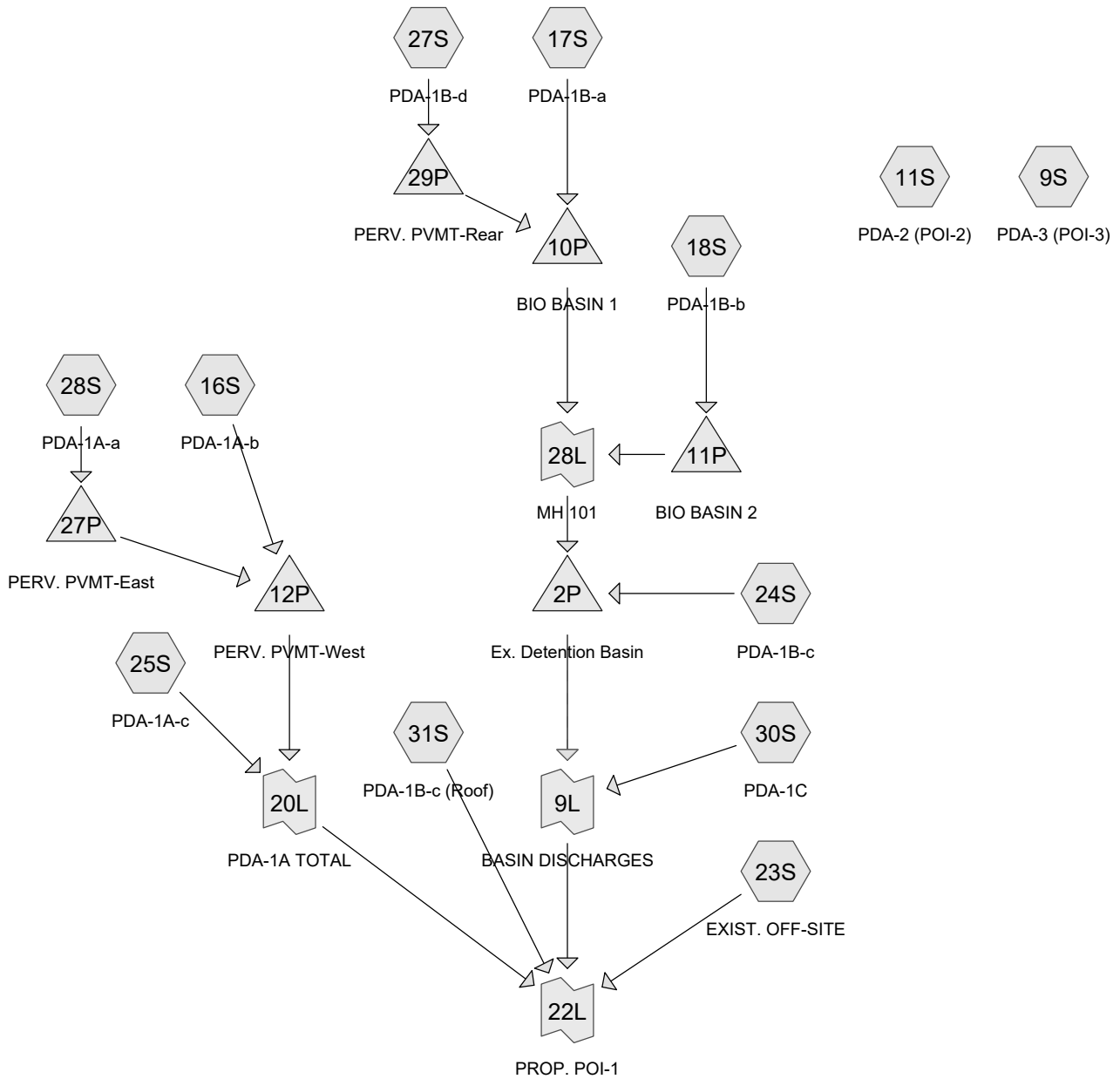
Inflow Area = 6.880 ac, 19.77% Impervious, Inflow Depth > 0.22" for WQ event  
Inflow = 0.17 cfs @ 1.70 hrs, Volume= 0.127 af  
Primary = 0.17 cfs @ 1.70 hrs, Volume= 0.127 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 26L: EX. BASIN DISCHARGES







**Routing Diagram for Pre vs Post\_211020**  
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### Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
8.020	74	>75% Grass cover, Good, HSG C (17S, 18S, 24S, 25S, 27S, 30S)
1.320	98	Impervious (24S)
9.510	98	Impervious & Exist. Roof Areas (25S)
0.140	98	Paved parking, HSG A (27S)
2.000	98	Paved parking, HSG C (16S, 17S, 18S, 28S)
5.680	98	Prop. Roofs (31S)
3.060	70	Woods, Good, HSG C (9S, 11S, 17S, 23S)
<b>29.730</b>	<b>89</b>	<b>TOTAL AREA</b>

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### Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.140	HSG A	27S
0.000	HSG B	
13.080	HSG C	9S, 11S, 16S, 17S, 18S, 23S, 24S, 25S, 27S, 28S, 30S
0.000	HSG D	
16.510	Other	24S, 25S, 31S
<b>29.730</b>		<b>TOTAL AREA</b>

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**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	8.020	0.000	0.000	8.020	>75% Grass cover, Good	17S
							,
							18S
							,
							24S
							,
							25S
							,
							27S
							,
							30S
0.000	0.000	0.000	0.000	1.320	1.320	Impervious	24S
0.000	0.000	0.000	0.000	9.510	9.510	Impervious & Exist. Roof Areas	25S
0.140	0.000	2.000	0.000	0.000	2.140	Paved parking	16S
							,
							17S
							,
							18S
							,
							27S
							,
							28S
0.000	0.000	0.000	0.000	5.680	5.680	Prop. Roofs	31S
0.000	0.000	3.060	0.000	0.000	3.060	Woods, Good	9S,
							11S
							,
							17S
							,
							23S
<b>0.140</b>	<b>0.000</b>	<b>13.080</b>	<b>0.000</b>	<b>16.510</b>	<b>29.730</b>	<b>TOTAL AREA</b>	

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### 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	2P	105.00	104.50	15.0	0.0333	0.015	18.0	0.0	0.0
2	2P	105.00	104.50	21.0	0.0238	0.010	8.0	0.0	0.0
3	10P	106.16	104.50	636.0	0.0026	0.012	18.0	0.0	0.0
4	11P	105.50	105.26	80.0	0.0030	0.011	18.0	0.0	0.0
5	12P	108.25	108.20	19.0	0.0026	0.011	12.0	0.0	0.0
6	27P	108.90	108.85	49.0	0.0010	0.010	6.0	0.0	0.0
7	29P	110.85	110.00	52.0	0.0163	0.010	6.0	0.0	0.0

**Pre vs Post\_211020**

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Time span=0.00-72.00 hrs, dt=0.50 hrs, 145 points  
 Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment9S: PDA-3 (POI-3)</b>	Runoff Area=0.880 ac 0.00% Impervious Runoff Depth=0.91" Flow Length=291' Tc=15.2 min CN=70/0 Runoff=0.42 cfs 0.067 af
<b>Subcatchment11S: PDA-2 (POI-2)</b>	Runoff Area=1.770 ac 0.00% Impervious Runoff Depth=0.91" Flow Length=609' Tc=19.6 min CN=70/0 Runoff=0.91 cfs 0.134 af
<b>Subcatchment16S: PDA-1A-b</b>	Runoff Area=0.390 ac 100.00% Impervious Runoff Depth=3.11" Tc=10.0 min CN=0/98 Runoff=0.67 cfs 0.101 af
<b>Subcatchment17S: PDA-1B-a</b>	Runoff Area=1.490 ac 46.31% Impervious Runoff Depth=2.02" Tc=10.0 min CN=73/98 Runoff=1.63 cfs 0.250 af
<b>Subcatchment18S: PDA-1B-b</b>	Runoff Area=0.880 ac 82.95% Impervious Runoff Depth=2.77" Tc=10.0 min CN=74/98 Runoff=1.34 cfs 0.203 af
<b>Subcatchment23S: EXIST. OFF-SITE</b>	Runoff Area=0.140 ac 0.00% Impervious Runoff Depth=0.91" Flow Length=189' Slope=0.0200 '/' Tc=9.3 min CN=70/0 Runoff=0.06 cfs 0.011 af
<b>Subcatchment24S: PDA-1B-c</b>	Runoff Area=4.130 ac 31.96% Impervious Runoff Depth=1.76" Tc=10.0 min CN=74/98 Runoff=3.94 cfs 0.607 af
<b>Subcatchment25S: PDA-1A-c</b>	Runoff Area=12.810 ac 74.24% Impervious Runoff Depth=2.60" Tc=10.0 min CN=74/98 Runoff=18.28 cfs 2.773 af
<b>Subcatchment27S: PDA-1B-d</b>	Runoff Area=0.220 ac 63.64% Impervious Runoff Depth=2.39" Tc=10.0 min CN=74/98 Runoff=0.29 cfs 0.044 af
<b>Subcatchment28S: PDA-1A-a</b>	Runoff Area=0.190 ac 100.00% Impervious Runoff Depth=3.11" Tc=10.0 min CN=0/98 Runoff=0.33 cfs 0.049 af
<b>Subcatchment30S: PDA-1C</b>	Runoff Area=1.150 ac 0.00% Impervious Runoff Depth=1.13" Tc=10.0 min CN=74/0 Runoff=0.69 cfs 0.108 af
<b>Subcatchment31S: PDA-1B-c (Roof)</b>	Runoff Area=5.680 ac 100.00% Impervious Runoff Depth=3.11" Tc=10.0 min CN=0/98 Runoff=9.75 cfs 1.471 af
<b>Pond 2P: Ex. Detention Basin</b>	Peak Elev=105.37' Storage=19,681 cf Inflow=4.50 cfs 0.966 af Primary=0.32 cfs 0.271 af Secondary=0.81 cfs 0.664 af Tertiary=0.00 cfs 0.000 af Outflow=1.13 cfs 0.935 af
<b>Pond 10P: BIO BASIN 1</b>	Peak Elev=110.39' Storage=4,763 cf Inflow=1.74 cfs 0.294 af Outflow=1.49 cfs 0.220 af
<b>Pond 11P: BIO BASIN 2</b>	Peak Elev=110.36' Storage=5,717 cf Inflow=1.34 cfs 0.203 af Outflow=0.20 cfs 0.140 af
<b>Pond 12P: PERV. PVMT-West</b>	Peak Elev=109.58' Storage=0.069 af Inflow=0.83 cfs 0.150 af Outflow=0.18 cfs 0.150 af

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**Pond 27P: PERV. PVMT-East** Peak Elev=109.14' Storage=0.013 af Inflow=0.33 cfs 0.049 af  
6.0" Round Culvert x 3.00 n=0.010 L=49.0' S=0.0010 '/' Outflow=0.23 cfs 0.049 af

**Pond 29P: PERV. PVMT-Rear** Peak Elev=111.15' Storage=0.013 af Inflow=0.29 cfs 0.044 af  
6.0" Round Culvert n=0.010 L=52.0' S=0.0163 '/' Outflow=0.18 cfs 0.044 af

**Link 9L: BASIN DISCHARGES** Inflow=1.26 cfs 1.043 af  
Primary=1.26 cfs 1.043 af

**Link 20L: PDA-1A TOTAL** Inflow=18.40 cfs 2.923 af  
Primary=18.40 cfs 2.923 af

**Link 22L: PROP. POI-1** Inflow=29.15 cfs 5.448 af  
Primary=29.15 cfs 5.448 af

**Link 28L: MH 101** Inflow=1.68 cfs 0.359 af  
Primary=1.68 cfs 0.359 af

**Total Runoff Area = 29.730 ac Runoff Volume = 5.818 af Average Runoff Depth = 2.35"**  
**37.27% Pervious = 11.080 ac 62.73% Impervious = 18.650 ac**

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**Summary for Subcatchment 9S: PDA-3 (POI-3)**

Runoff = 0.42 cfs @ 12.44 hrs, Volume= 0.067 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

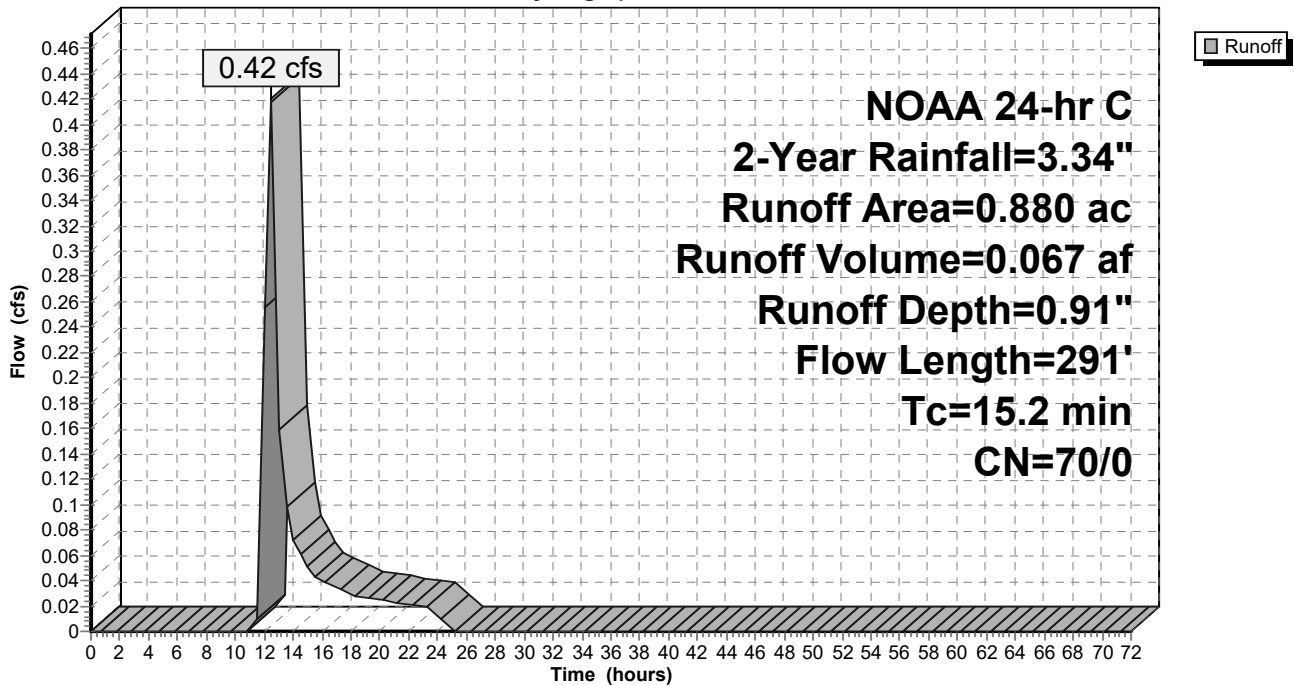
Area (ac)	CN	Description
0.880	70	Woods, Good, HSG C
0.880	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	9	0.0050	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
9.9	282	0.0090	0.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.2	291	Total			

**Subcatchment 9S: PDA-3 (POI-3)**

Hydrograph





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**Summary for Subcatchment 11S: PDA-2 (POI-2)**

Runoff = 0.91 cfs @ 12.50 hrs, Volume= 0.134 af, Depth= 0.91"

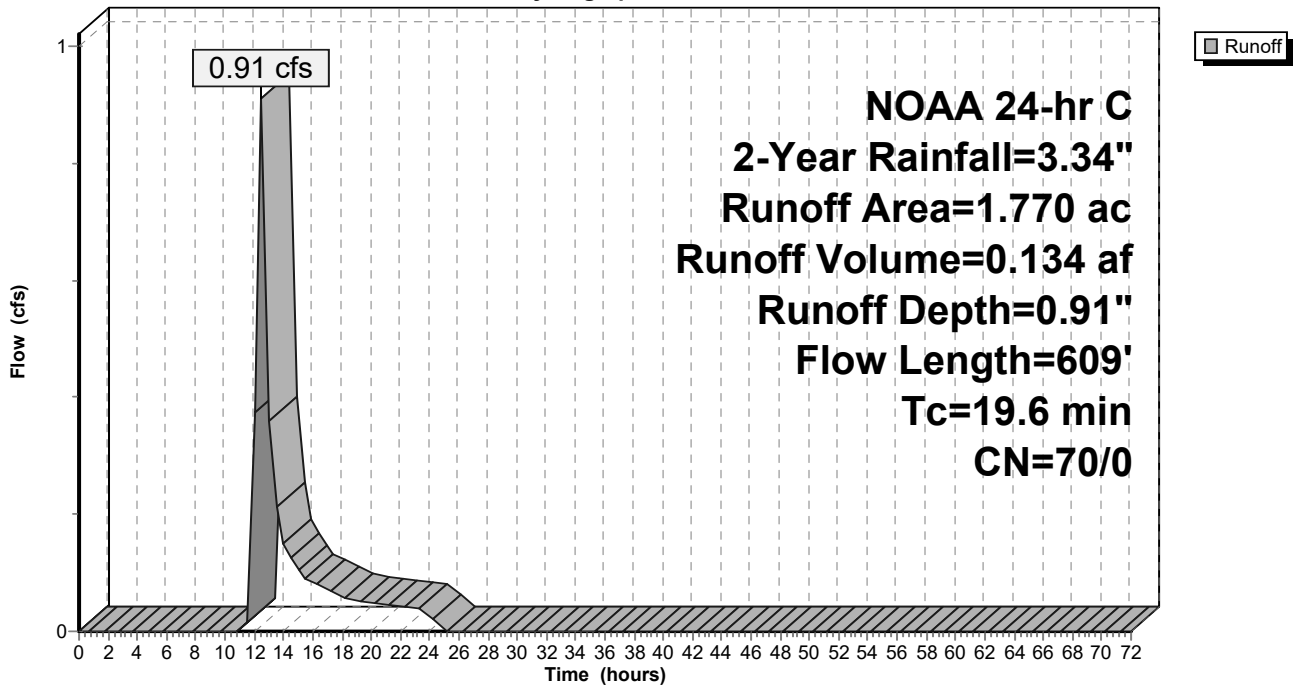
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
1.770	70	Woods, Good, HSG C
1.770	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	17	0.0180	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
14.3	592	0.0190	0.69		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
19.6	609	Total			

**Subcatchment 11S: PDA-2 (POI-2)**

Hydrograph



**Pre vs Post\_211020**

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**Summary for Subcatchment 16S: PDA-1A-b**

Runoff = 0.67 cfs @ 12.07 hrs, Volume= 0.101 af, Depth= 3.11"

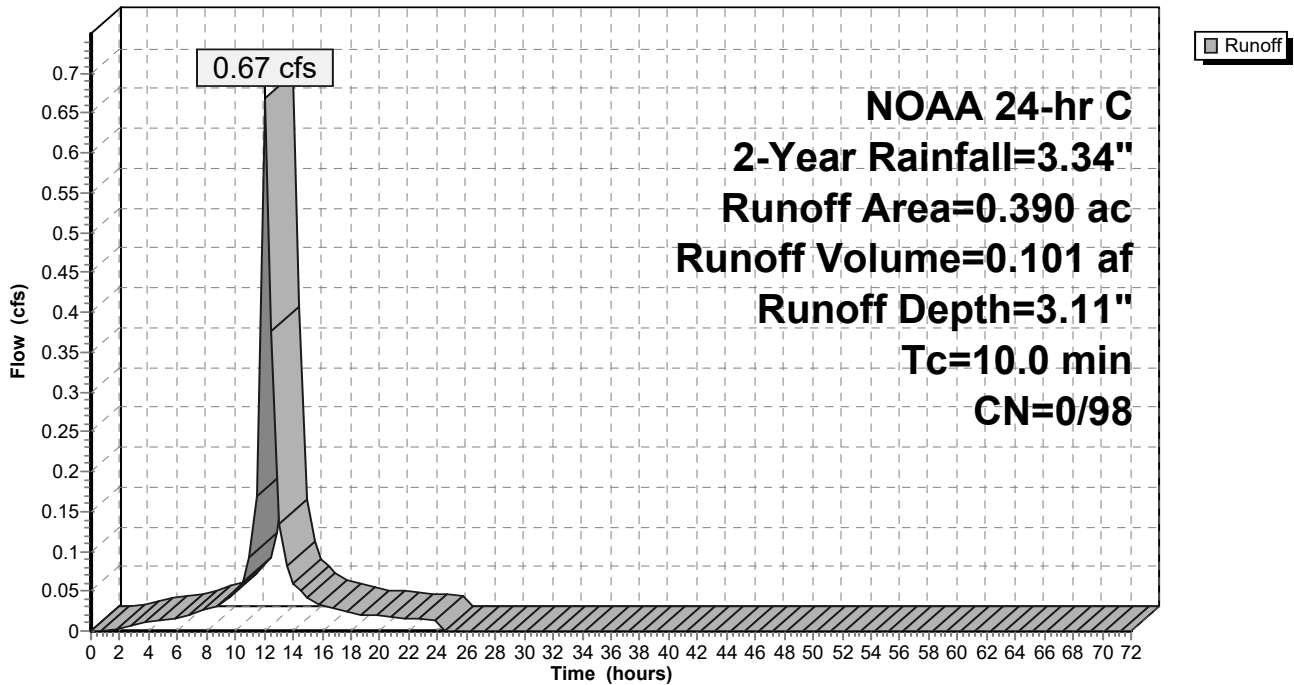
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.390	98	Paved parking, HSG C
0.390	98	100.00% Impervious Area

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

**Subcatchment 16S: PDA-1A-b**

Hydrograph



**Pre vs Post 211020**

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**Summary for Subcatchment 17S: PDA-1B-a**

Runoff = 1.63 cfs @ 12.09 hrs, Volume= 0.250 af, Depth= 2.02"

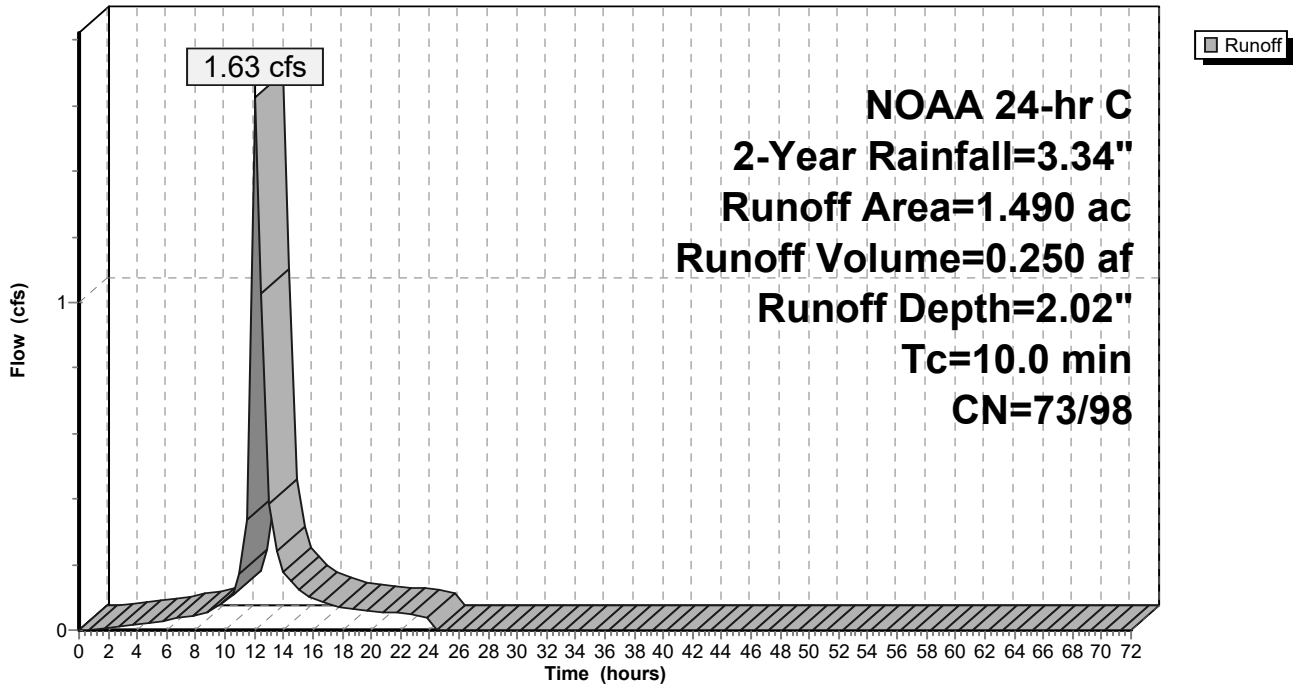
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.270	70	Woods, Good, HSG C
0.690	98	Paved parking, HSG C
0.530	74	>75% Grass cover, Good, HSG C
1.490	84	Weighted Average
0.800	73	53.69% Pervious Area
0.690	98	46.31% Impervious Area

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

**Subcatchment 17S: PDA-1B-a**

Hydrograph



**Pre vs Post\_211020**

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**Summary for Subcatchment 18S: PDA-1B-b**

Runoff = 1.34 cfs @ 12.07 hrs, Volume= 0.203 af, Depth= 2.77"

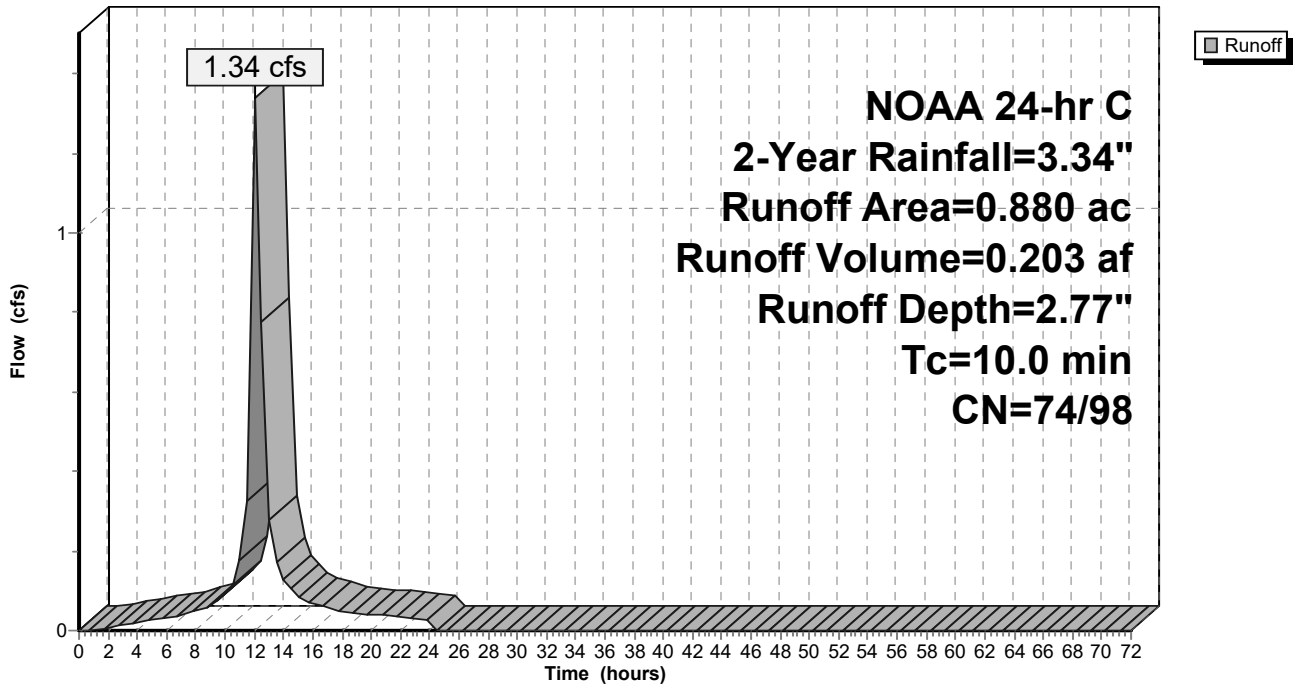
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.730	98	Paved parking, HSG C
0.150	74	>75% Grass cover, Good, HSG C
0.880	94	Weighted Average
0.150	74	17.05% Pervious Area
0.730	98	82.95% Impervious Area

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

**Subcatchment 18S: PDA-1B-b**

Hydrograph



**Pre vs Post\_211020**

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**Summary for Subcatchment 23S: EXIST. OFF-SITE**

Runoff = 0.06 cfs @ 12.19 hrs, Volume= 0.011 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

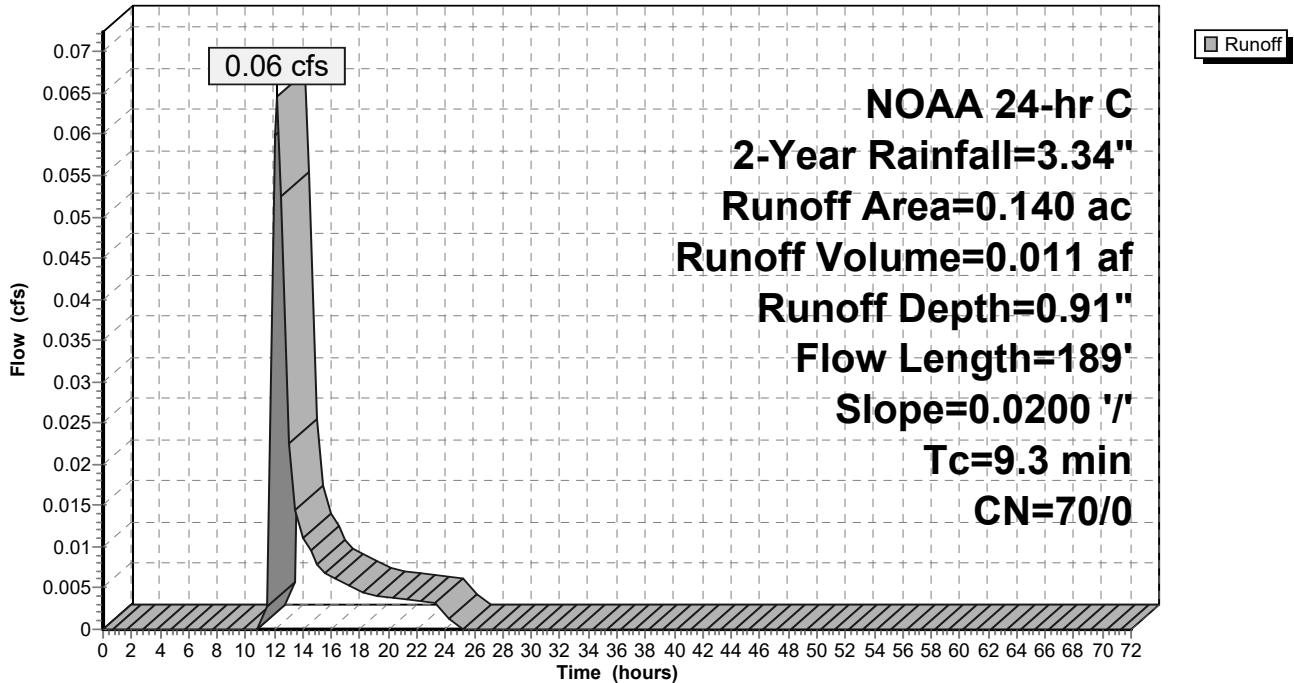
Area (ac)	CN	Description
0.140	70	Woods, Good, HSG C
0.140	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	18	0.0200	0.06		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
4.0	171	0.0200	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.3	189	Total			

**Subcatchment 23S: EXIST. OFF-SITE**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Subcatchment 24S: PDA-1B-c**

Runoff = 3.94 cfs @ 12.11 hrs, Volume= 0.607 af, Depth= 1.76"

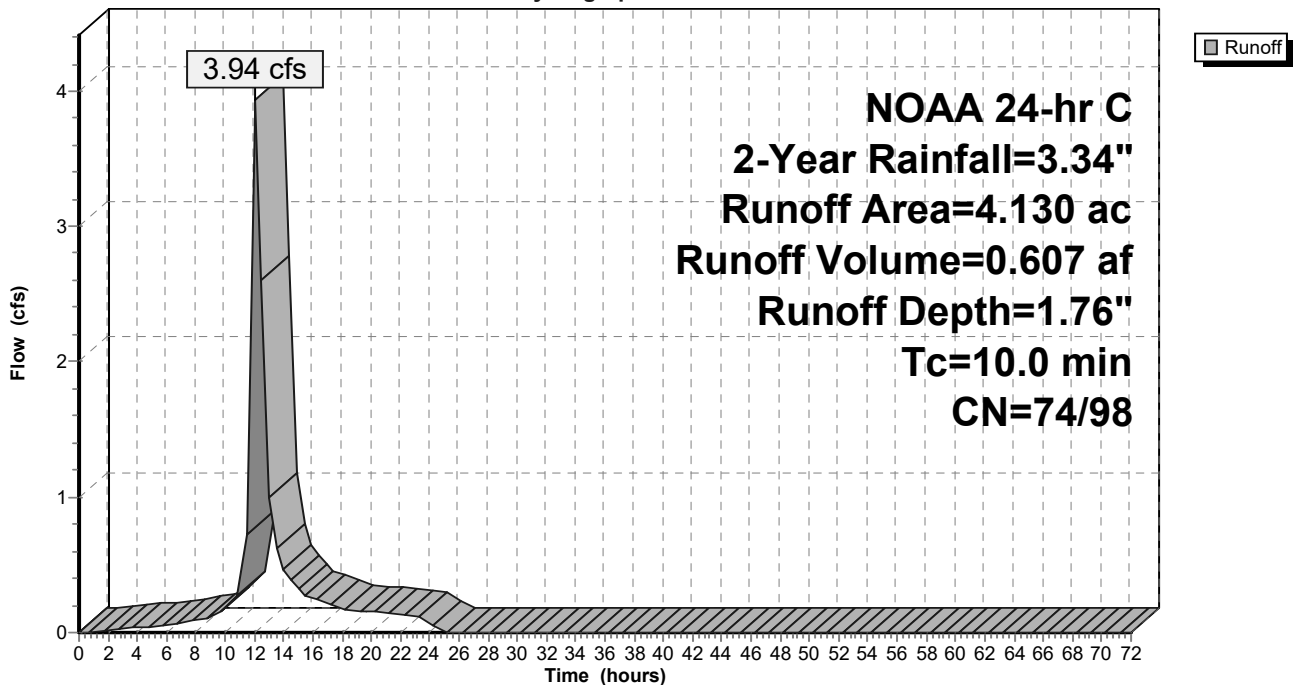
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
2.810	74	>75% Grass cover, Good, HSG C
* 1.320	98	Impervious
4.130	82	Weighted Average
2.810	74	68.04% Pervious Area
1.320	98	31.96% Impervious Area

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

**Subcatchment 24S: PDA-1B-c**

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Subcatchment 25S: PDA-1A-c**

Runoff = 18.28 cfs @ 12.08 hrs, Volume= 2.773 af, Depth= 2.60"

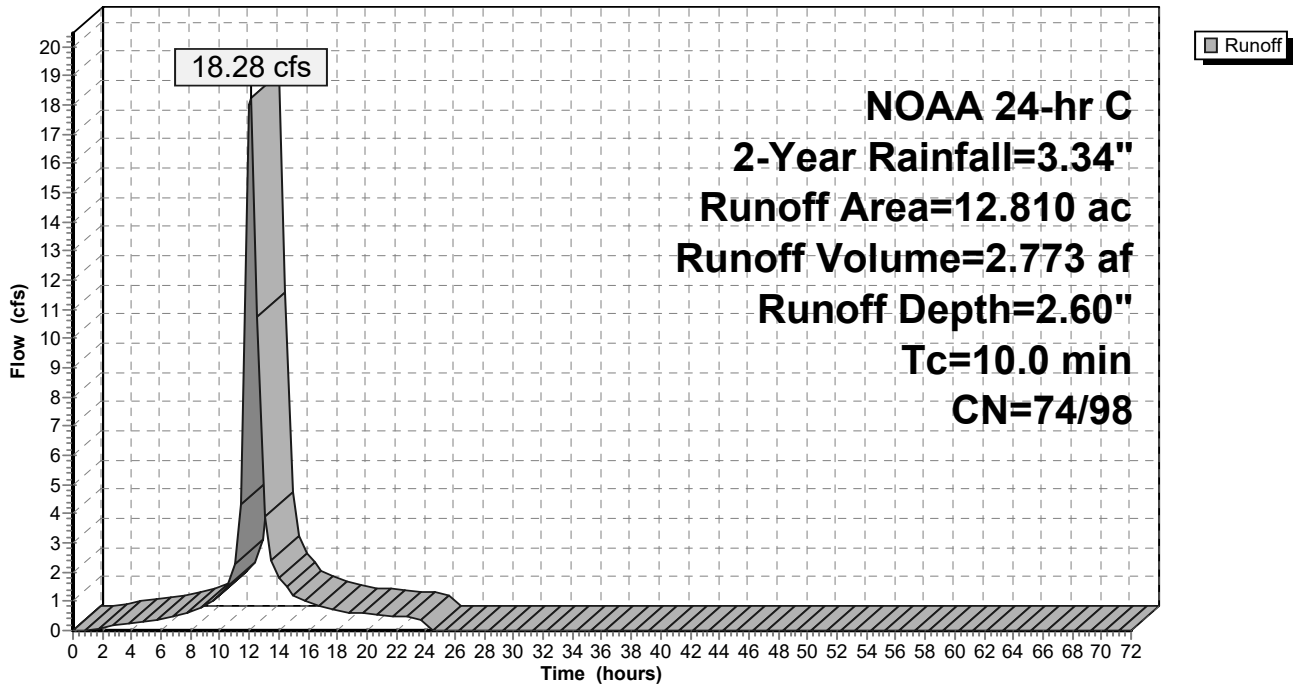
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
3.300	74	>75% Grass cover, Good, HSG C
* 9.510	98	Impervious & Exist. Roof Areas
12.810	92	Weighted Average
3.300	74	25.76% Pervious Area
9.510	98	74.24% Impervious Area

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

**Subcatchment 25S: PDA-1A-c**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Subcatchment 27S: PDA-1B-d**

Runoff = 0.29 cfs @ 12.08 hrs, Volume= 0.044 af, Depth= 2.39"

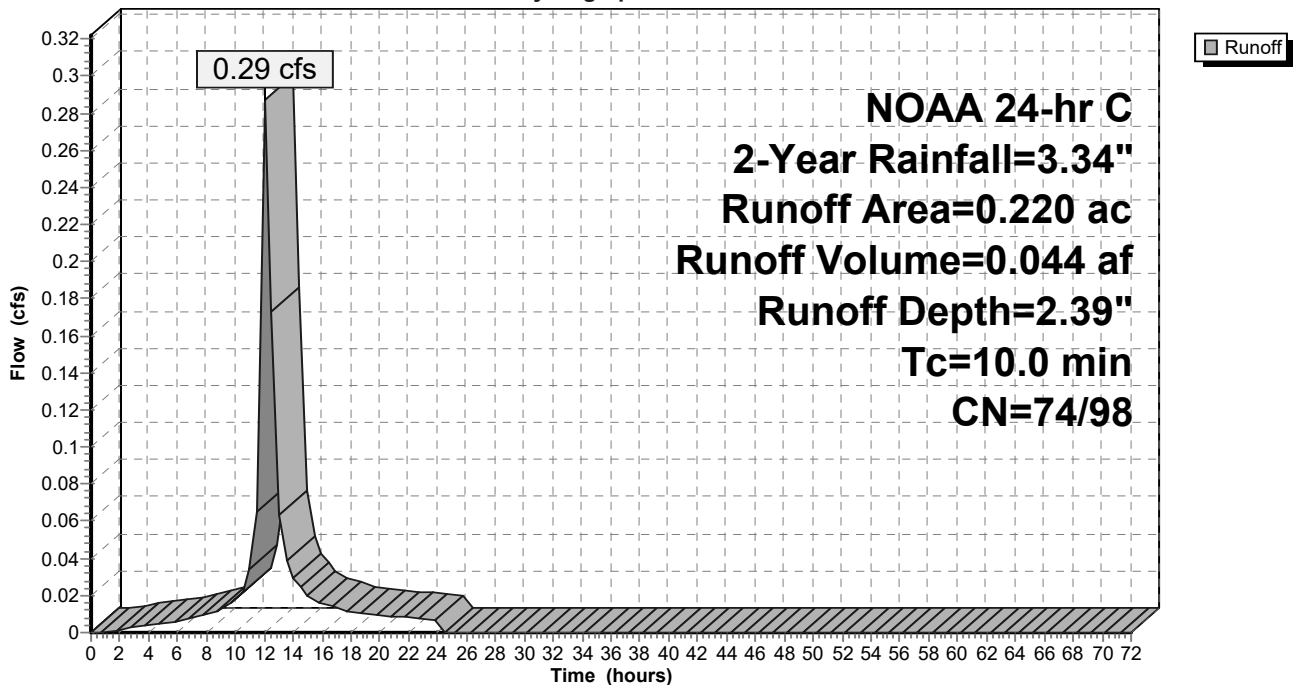
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG A
0.080	74	>75% Grass cover, Good, HSG C
0.220	89	Weighted Average
0.080	74	36.36% Pervious Area
0.140	98	63.64% Impervious Area

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

**Subcatchment 27S: PDA-1B-d**

Hydrograph





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**Summary for Subcatchment 28S: PDA-1A-a**

Runoff = 0.33 cfs @ 12.07 hrs, Volume= 0.049 af, Depth= 3.11"

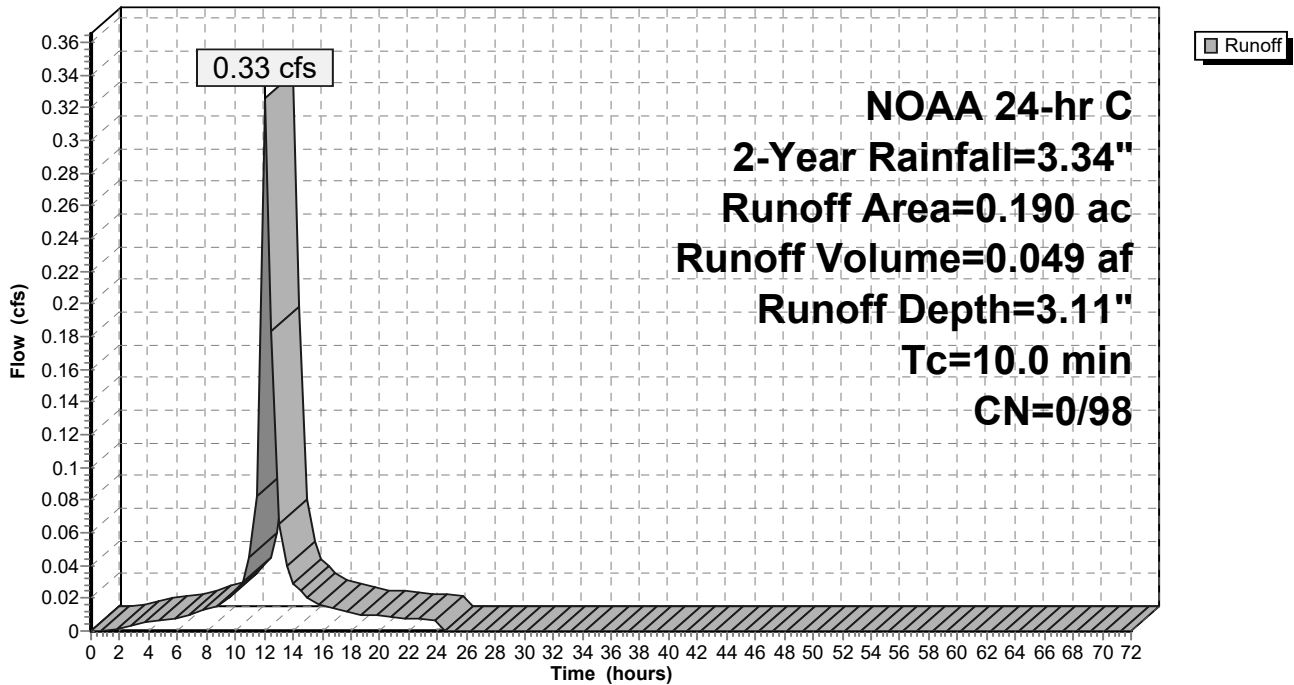
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
0.190	98	Paved parking, HSG C
0.190	98	100.00% Impervious Area

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

**Subcatchment 28S: PDA-1A-a**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Subcatchment 30S: PDA-1C**

Runoff = 0.69 cfs @ 12.17 hrs, Volume= 0.108 af, Depth= 1.13"

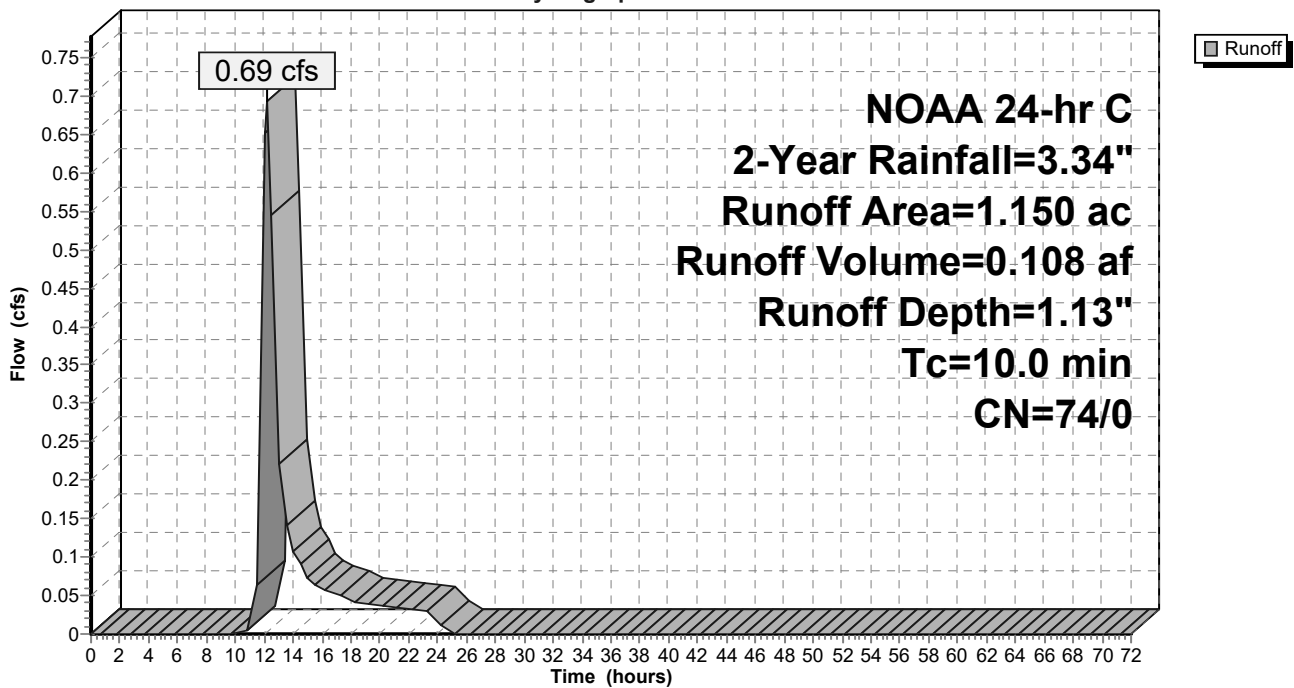
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
1.150	74	>75% Grass cover, Good, HSG C
1.150	74	100.00% Pervious Area

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

**Subcatchment 30S: PDA-1C**

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Subcatchment 31S: PDA-1B-c (Roof)**

Runoff = 9.75 cfs @ 12.07 hrs, Volume= 1.471 af, Depth= 3.11"

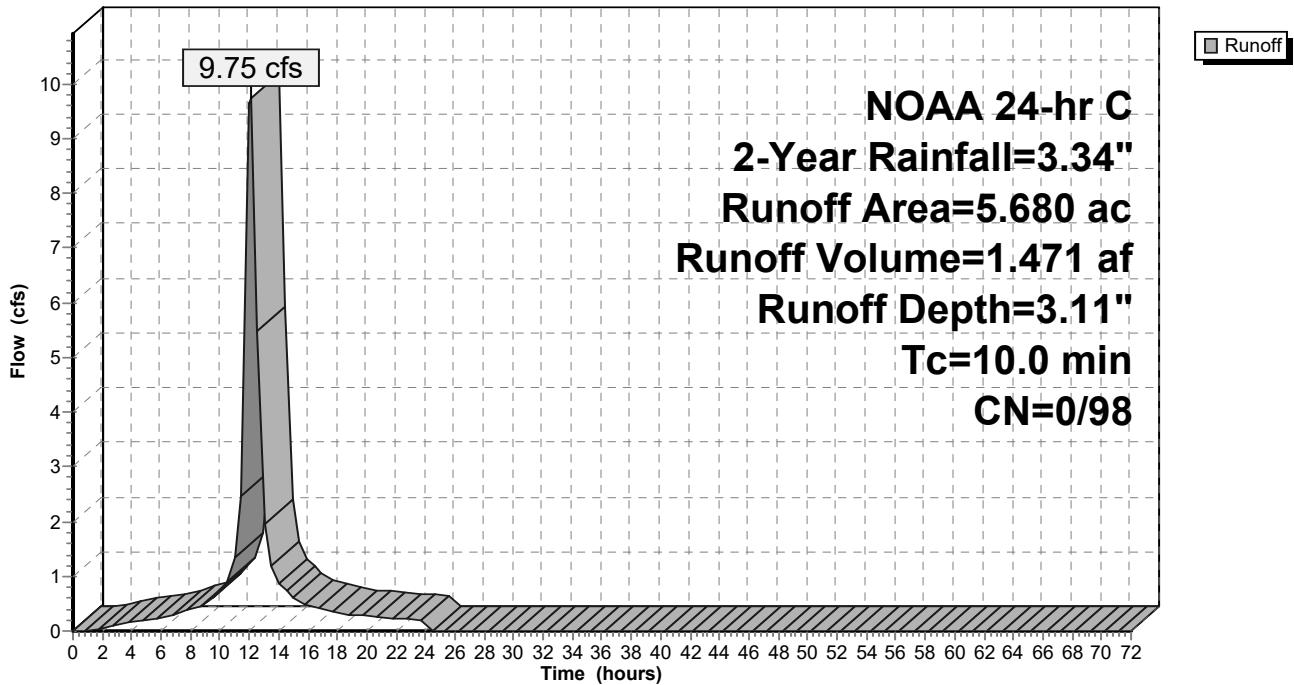
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
* 5.680	98	Prop. Roofs
5.680	98	100.00% Impervious Area

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

**Subcatchment 31S: PDA-1B-c (Roof)**

Hydrograph



**Pre vs Post\_211020**

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**Summary for Pond 2P: Ex. Detention Basin**

Inflow Area = 6.720 ac, 42.86% Impervious, Inflow Depth = 1.72" for 2-Year event  
 Inflow = 4.50 cfs @ 12.27 hrs, Volume= 0.966 af  
 Outflow = 1.13 cfs @ 13.74 hrs, Volume= 0.935 af, Atten= 75%, Lag= 88.1 min  
 Primary = 0.32 cfs @ 13.74 hrs, Volume= 0.271 af  
 Secondary = 0.81 cfs @ 13.74 hrs, Volume= 0.664 af  
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 105.37' @ 13.74 hrs Surf.Area= 54,625 sf Storage= 19,681 cf

Plug-Flow detention time= 423.7 min calculated for 0.935 af (97% of inflow)  
 Center-of-Mass det. time= 399.8 min ( 1,266.2 - 866.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	105.00'	186,871 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
105.00	52,708	0	0
106.00	57,935	55,322	55,322
107.00	67,082	62,509	117,830
108.00	71,000	69,041	186,871

Device	Routing	Invert	Outlet Devices
#1	Primary	105.00'	<b>18.0" Round RCP_Round 18"</b> L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0333 1/1' Cc= 0.900 n= 0.015, Flow Area= 1.77 sf
#2	Device 1	105.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	106.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Secondary	105.00'	<b>8.0" Round Culvert X 2.00</b> L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0238 1/1' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf
#5	Tertiary	107.00'	<b>50.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

**Primary OutFlow** Max=0.32 cfs @ 13.74 hrs HW=105.36' (Free Discharge)

- ↑ 1=RCP\_Round 18" (Passes 0.32 cfs of 0.68 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.32 cfs @ 2.06 fps)
- ↑ 3=Orifice/Grate ( Controls 0.00 cfs)

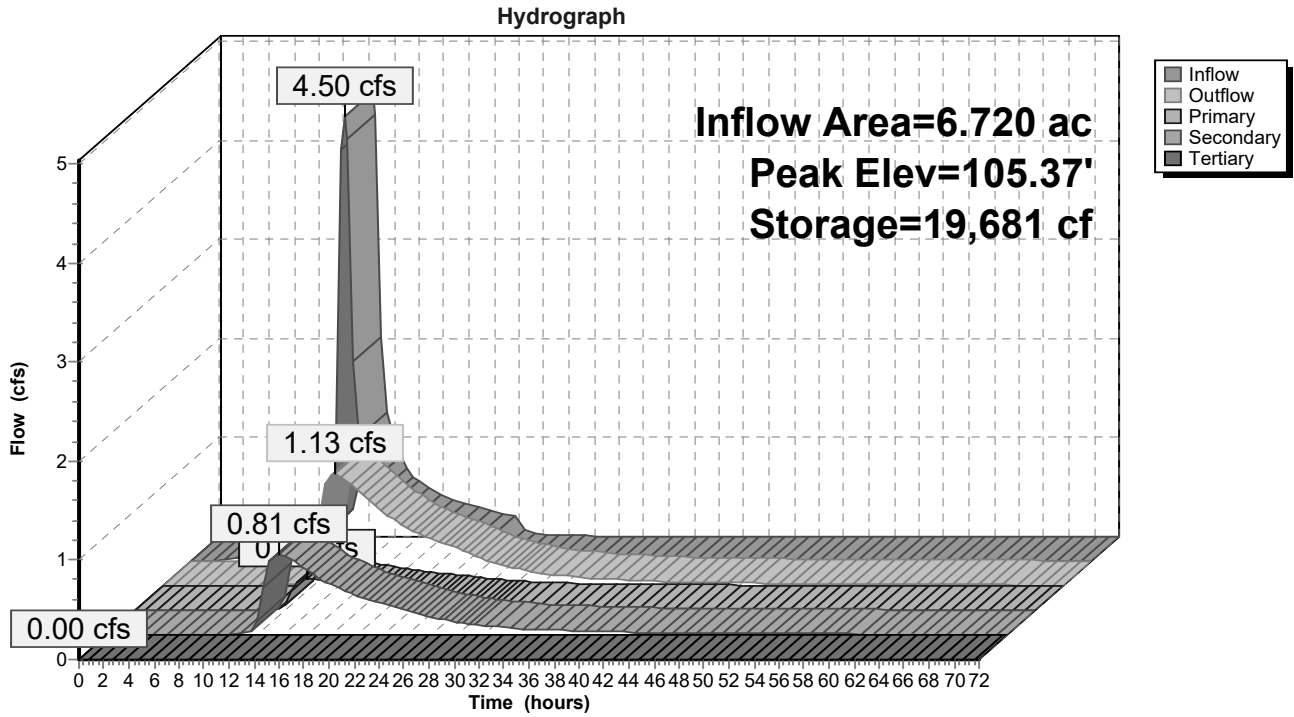
**Secondary OutFlow** Max=0.80 cfs @ 13.74 hrs HW=105.36' (Free Discharge)

- ↑ 4=Culvert (Inlet Controls 0.80 cfs @ 2.06 fps)

**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=105.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

### Pond 2P: Ex. Detention Basin



**Pre vs Post 211020**

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**Stage-Area-Storage for Pond 2P: Ex. Detention Basin**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
105.00	52,708	0	107.65	69,629	162,261
105.05	52,969	2,642	107.70	69,825	165,747
105.10	53,231	5,297	107.75	70,021	169,243
105.15	53,492	7,965	107.80	70,216	172,749
105.20	53,753	10,646	107.85	70,412	176,265
105.25	54,015	13,340	107.90	70,608	179,791
105.30	54,276	16,048	107.95	70,804	183,326
105.35	54,537	18,768	108.00	<b>71,000</b>	<b>186,871</b>
105.40	54,799	21,501			
105.45	55,060	24,248			
105.50	55,322	27,007			
105.55	55,583	29,780			
105.60	55,844	32,566			
105.65	56,106	35,364			
105.70	56,367	38,176			
105.75	56,628	41,001			
105.80	56,890	43,839			
105.85	57,151	46,690			
105.90	57,412	49,554			
105.95	57,674	52,431			
106.00	57,935	55,322			
106.05	58,392	58,230			
106.10	58,850	61,161			
106.15	59,307	64,115			
106.20	59,764	67,091			
106.25	60,222	70,091			
106.30	60,679	73,114			
106.35	61,136	76,159			
106.40	61,594	79,227			
106.45	62,051	82,318			
106.50	62,509	85,432			
106.55	62,966	88,569			
106.60	63,423	91,729			
106.65	63,881	94,912			
106.70	64,338	98,117			
106.75	64,795	101,345			
106.80	65,253	104,597			
106.85	65,710	107,871			
106.90	66,167	111,168			
106.95	66,625	114,487			
107.00	67,082	117,830			
107.05	67,278	121,189			
107.10	67,474	124,558			
107.15	67,670	127,936			
107.20	67,866	131,325			
107.25	68,062	134,723			
107.30	68,257	138,131			
107.35	68,453	141,549			
107.40	68,649	144,976			
107.45	68,845	148,414			
107.50	69,041	151,861			
107.55	69,237	155,318			
107.60	69,433	158,784			

**Pre vs Post 211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Pond 10P: BIO BASIN 1**

Inflow Area = 1.710 ac, 48.54% Impervious, Inflow Depth = 2.06" for 2-Year event  
 Inflow = 1.74 cfs @ 12.12 hrs, Volume= 0.294 af  
 Outflow = 1.49 cfs @ 12.58 hrs, Volume= 0.220 af, Atten= 14%, Lag= 27.6 min  
 Primary = 1.49 cfs @ 12.58 hrs, Volume= 0.220 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 110.39' @ 12.59 hrs Surf.Area= 4,132 sf Storage= 4,763 cf

Plug-Flow detention time= 205.4 min calculated for 0.220 af (75% of inflow)  
 Center-of-Mass det. time= 98.4 min ( 906.2 - 807.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	109.00'	16,075 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.00	2,682	0	0
110.00	3,789	3,236	3,236
111.00	4,677	4,233	7,469
112.00	5,873	5,275	12,744
112.50	7,453	3,332	16,075

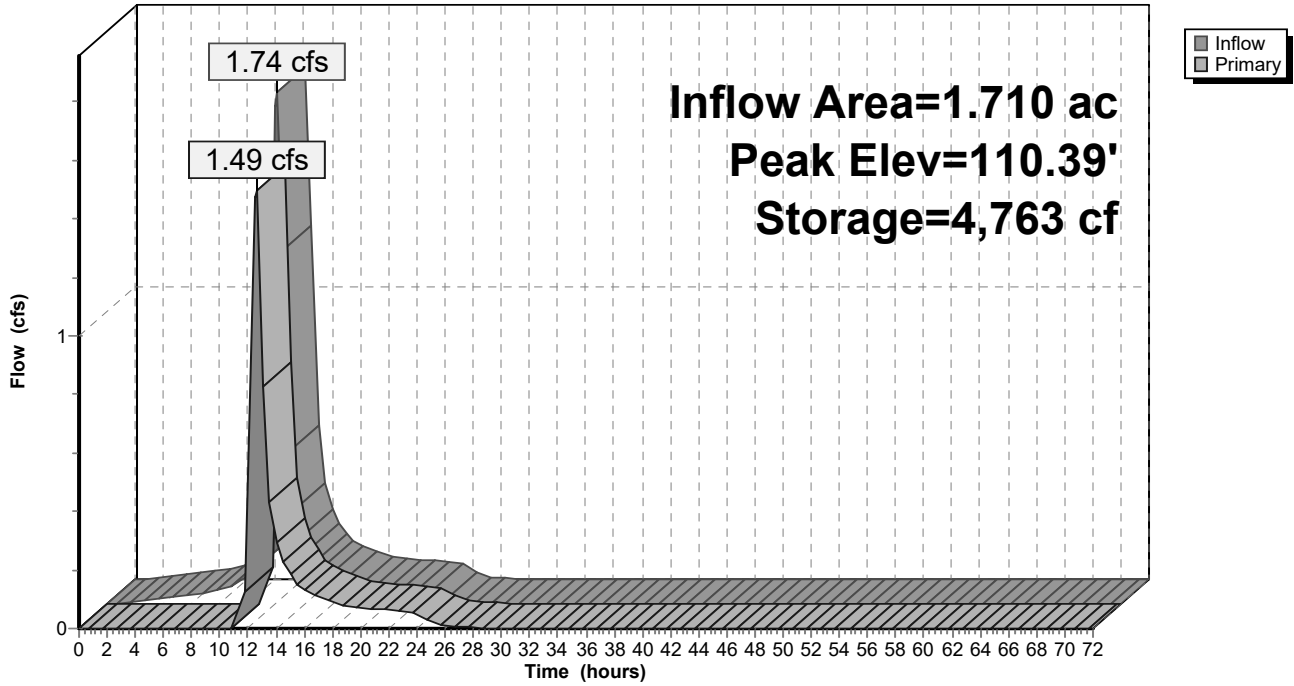
Device	Routing	Invert	Outlet Devices
#1	Primary	106.16'	<b>18.0" Round Culvert</b> L= 636.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 106.16' / 104.50' S= 0.0026 1' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Device 1	110.00'	<b>2.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)
#3	Device 1	111.00'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=1.37 cfs @ 12.58 hrs HW=110.36' (Free Discharge)

- 1=Culvert (Passes 1.37 cfs of 8.77 cfs potential flow)
- 2=Sharp-Crested Rectangular Weir (Weir Controls 1.37 cfs @ 1.96 fps)
- 3=Orifice/Grate ( Controls 0.00 cfs)

### Pond 10P: BIO BASIN 1

Hydrograph





**Pre vs Post 211020**

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**Stage-Area-Storage for Pond 10P: BIO BASIN 1**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
109.00	2,682	0	111.65	5,454	10,761
109.05	2,737	135	111.70	5,514	11,035
109.10	2,793	274	111.75	5,574	11,313
109.15	2,848	415	111.80	5,634	11,593
109.20	2,903	559	111.85	5,694	11,876
109.25	2,959	705	111.90	5,753	12,162
109.30	3,014	854	111.95	5,813	12,451
109.35	3,069	1,007	112.00	5,873	12,744
109.40	3,125	1,161	112.05	6,031	13,041
109.45	3,180	1,319	112.10	6,189	13,347
109.50	3,236	1,479	112.15	6,347	13,660
109.55	3,291	1,643	112.20	6,505	13,981
109.60	3,346	1,808	112.25	6,663	14,311
109.65	3,402	1,977	112.30	6,821	14,648
109.70	3,457	2,149	112.35	6,979	14,993
109.75	3,512	2,323	112.40	7,137	15,346
109.80	3,568	2,500	112.45	7,295	15,706
109.85	3,623	2,680	112.50	<b>7,453</b>	<b>16,075</b>
109.90	3,678	2,862			
109.95	3,734	3,047			
110.00	3,789	3,236			
110.05	3,833	3,426			
110.10	3,878	3,619			
110.15	3,922	3,814			
110.20	3,967	4,011			
110.25	4,011	4,211			
110.30	4,055	4,412			
110.35	4,100	4,616			
110.40	4,144	4,822			
110.45	4,189	5,030			
110.50	4,233	5,241			
110.55	4,277	5,454			
110.60	4,322	5,669			
110.65	4,366	5,886			
110.70	4,411	6,105			
110.75	4,455	6,327			
110.80	4,499	6,551			
110.85	4,544	6,777			
110.90	4,588	7,005			
110.95	4,633	7,236			
111.00	4,677	7,469			
111.05	4,737	7,704			
111.10	4,797	7,942			
111.15	4,856	8,184			
111.20	4,916	8,428			
111.25	4,976	8,675			
111.30	5,036	8,925			
111.35	5,096	9,179			
111.40	5,155	9,435			
111.45	5,215	9,694			
111.50	5,275	9,957			
111.55	5,335	10,222			
111.60	5,395	10,490			

**Pre vs Post\_211020**

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**Summary for Pond 11P: BIO BASIN 2**

Inflow Area = 0.880 ac, 82.95% Impervious, Inflow Depth = 2.77" for 2-Year event  
 Inflow = 1.34 cfs @ 12.07 hrs, Volume= 0.203 af  
 Outflow = 0.20 cfs @ 13.40 hrs, Volume= 0.140 af, Atten= 85%, Lag= 79.9 min  
 Primary = 0.20 cfs @ 13.40 hrs, Volume= 0.140 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 110.36' @ 13.40 hrs Surf.Area= 3,747 sf Storage= 5,717 cf

Plug-Flow detention time= 384.4 min calculated for 0.139 af (68% of inflow)  
 Center-of-Mass det. time= 298.7 min ( 1,065.8 - 767.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.50'	15,574 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
108.50	2,430	0	0
109.00	2,763	1,298	1,298
110.00	3,471	3,117	4,415
111.00	4,237	3,854	8,269
112.00	5,059	4,648	12,917
112.50	5,569	2,657	15,574

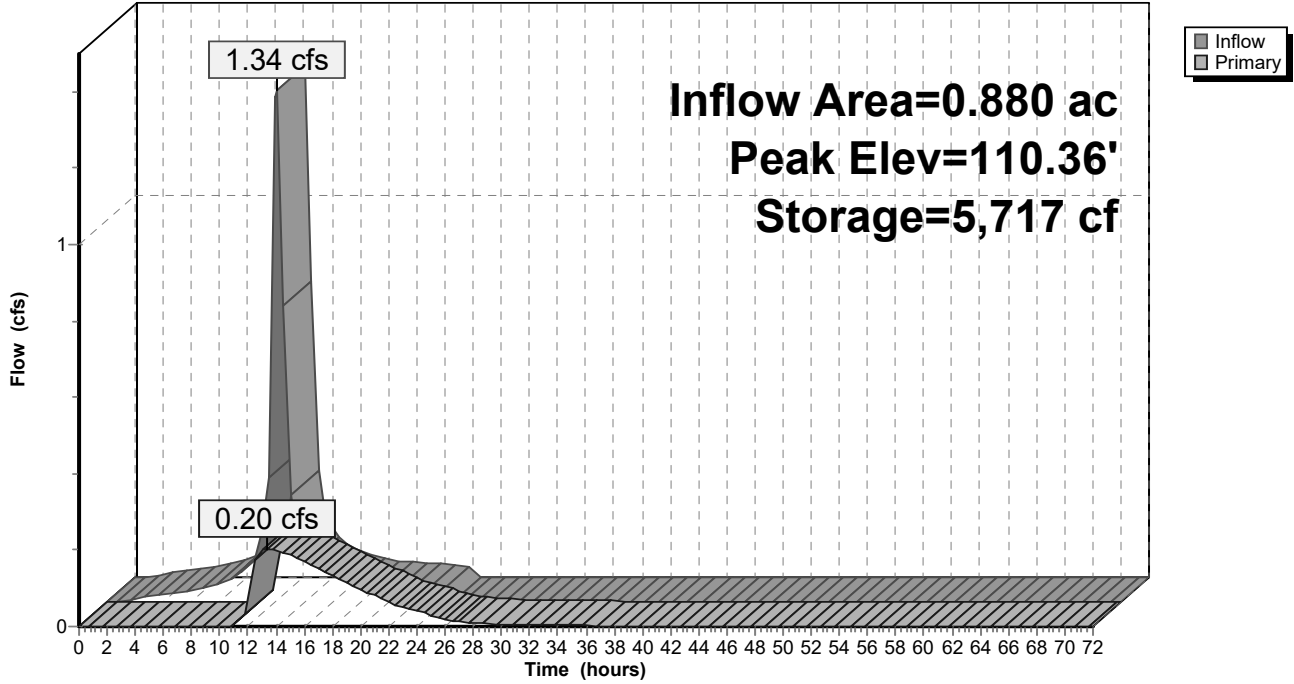
Device	Routing	Invert	Outlet Devices
#1	Primary	105.50'	<b>18.0" Round Culvert</b> L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 105.50' / 105.26' S= 0.0030 1' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	109.50'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	110.50'	<b>4.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s) 0.5' Crest Height
#4	Device 1	111.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=0.20 cfs @ 13.40 hrs HW=110.36' (Free Discharge)

- 1=Culvert (Passes 0.20 cfs of 16.85 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.20 cfs @ 4.12 fps)
- 3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)
- 4=Orifice/Grate ( Controls 0.00 cfs)

### Pond 11P: BIO BASIN 2

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Stage-Area-Storage for Pond 11P: BIO BASIN 2**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
108.50	2,430	0	111.15	4,360	8,914
108.55	2,463	122	111.20	4,401	9,133
108.60	2,497	246	111.25	4,443	9,354
108.65	2,530	372	111.30	4,484	9,577
108.70	2,563	499	111.35	4,525	9,803
108.75	2,597	628	111.40	4,566	10,030
108.80	2,630	759	111.45	4,607	10,259
108.85	2,663	891	111.50	4,648	10,491
108.90	2,696	1,025	111.55	4,689	10,724
108.95	2,730	1,161	111.60	4,730	10,959
109.00	2,763	1,298	111.65	4,771	11,197
109.05	2,798	1,437	111.70	4,812	11,437
109.10	2,834	1,578	111.75	4,854	11,678
109.15	2,869	1,721	111.80	4,895	11,922
109.20	2,905	1,865	111.85	4,936	12,168
109.25	2,940	2,011	111.90	4,977	12,415
109.30	2,975	2,159	111.95	5,018	12,665
109.35	3,011	2,309	112.00	5,059	12,917
109.40	3,046	2,460	112.05	5,110	13,171
109.45	3,082	2,613	112.10	5,161	13,428
109.50	3,117	2,768	112.15	5,212	13,688
109.55	3,152	2,925	112.20	5,263	13,949
109.60	3,188	3,083	112.25	5,314	14,214
109.65	3,223	3,244	112.30	5,365	14,481
109.70	3,259	3,406	112.35	5,416	14,750
109.75	3,294	3,570	112.40	5,467	15,022
109.80	3,329	3,735	112.45	5,518	15,297
109.85	3,365	3,903	112.50	<b>5,569</b>	<b>15,574</b>
109.90	3,400	4,072			
109.95	3,436	4,243			
110.00	3,471	4,415			
110.05	3,509	4,590			
110.10	3,548	4,766			
110.15	3,586	4,945			
110.20	3,624	5,125			
110.25	3,663	5,307			
110.30	3,701	5,491			
110.35	3,739	5,677			
110.40	3,777	5,865			
110.45	3,816	6,055			
110.50	3,854	6,247			
110.55	3,892	6,440			
110.60	3,931	6,636			
110.65	3,969	6,833			
110.70	4,007	7,033			
110.75	4,046	7,234			
110.80	4,084	7,437			
110.85	4,122	7,642			
110.90	4,160	7,849			
110.95	4,199	8,058			
111.00	4,237	8,269			
111.05	4,278	8,482			
111.10	4,319	8,697			

**Pre vs Post\_211020**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Pond 12P: PERV. PVMT-West**

Inflow Area = 0.580 ac, 100.00% Impervious, Inflow Depth = 3.11" for 2-Year event  
 Inflow = 0.83 cfs @ 12.12 hrs, Volume= 0.150 af  
 Outflow = 0.18 cfs @ 13.49 hrs, Volume= 0.150 af, Atten= 78%, Lag= 82.0 min  
 Primary = 0.18 cfs @ 13.49 hrs, Volume= 0.150 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 109.58' @ 13.49 hrs Surf.Area= 0.130 ac Storage= 0.069 af

Plug-Flow detention time= 220.7 min calculated for 0.149 af (99% of inflow)  
 Center-of-Mass det. time= 225.4 min ( 1,021.6 - 796.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.25'	0.159 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.396 af Overall x 40.0% Voids

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
108.25	0.130	0.000	0.000
111.30	0.130	0.396	0.396

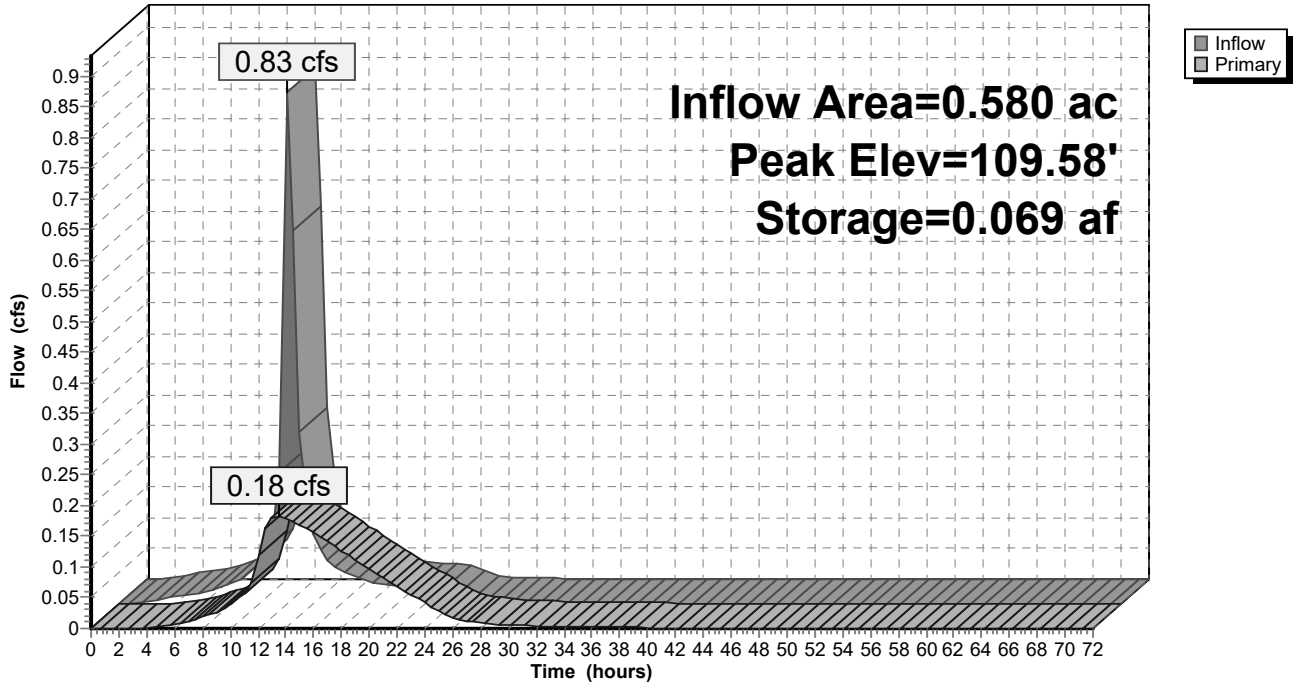
Device	Routing	Invert	Outlet Devices
#1	Primary	108.25'	<b>12.0" Round RCP_Round 12"</b> L= 19.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 108.25' / 108.20' S= 0.0026 ' S= 0.0026 ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	108.25'	<b>2.5" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	109.95'	<b>2.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s) 0.5' Crest Height
#4	Primary	110.95'	<b>48.0" x 48.0" Horiz. Orifice/Grate-Overflow</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=0.18 cfs @ 13.49 hrs HW=109.58' (Free Discharge)

- 1=RCP\_Round 12" (Passes 0.18 cfs of 2.81 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.18 cfs @ 5.34 fps)
- 3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)
- 4=Orifice/Grate-Overflow ( Controls 0.00 cfs)

### Pond 12P: PERV. PVMT-West

Hydrograph



**Pre vs Post 211020**

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**Stage-Area-Storage for Pond 12P: PERV. PVMT-West**

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
108.25	<b>0.130</b>	0.000	110.90	0.130	0.138
108.30	0.130	0.003	110.95	0.130	0.140
108.35	0.130	0.005	111.00	0.130	0.143
108.40	0.130	0.008	111.05	0.130	0.146
108.45	0.130	0.010	111.10	0.130	0.148
108.50	0.130	0.013	111.15	0.130	0.151
108.55	0.130	0.016	111.20	0.130	0.153
108.60	0.130	0.018	111.25	0.130	0.156
108.65	0.130	0.021	111.30	0.130	<b>0.159</b>
108.70	0.130	0.023			
108.75	0.130	0.026			
108.80	0.130	0.029			
108.85	0.130	0.031			
108.90	0.130	0.034			
108.95	0.130	0.036			
109.00	0.130	0.039			
109.05	0.130	0.042			
109.10	0.130	0.044			
109.15	0.130	0.047			
109.20	0.130	0.049			
109.25	0.130	0.052			
109.30	0.130	0.055			
109.35	0.130	0.057			
109.40	0.130	0.060			
109.45	0.130	0.062			
109.50	0.130	0.065			
109.55	0.130	0.068			
109.60	0.130	0.070			
109.65	0.130	0.073			
109.70	0.130	0.075			
109.75	0.130	0.078			
109.80	0.130	0.081			
109.85	0.130	0.083			
109.90	0.130	0.086			
109.95	0.130	0.088			
110.00	0.130	0.091			
110.05	0.130	0.094			
110.10	0.130	0.096			
110.15	0.130	0.099			
110.20	0.130	0.101			
110.25	0.130	0.104			
110.30	0.130	0.107			
110.35	0.130	0.109			
110.40	0.130	0.112			
110.45	0.130	0.114			
110.50	0.130	0.117			
110.55	0.130	0.120			
110.60	0.130	0.122			
110.65	0.130	0.125			
110.70	0.130	0.127			
110.75	0.130	0.130			
110.80	0.130	0.133			
110.85	0.130	0.135			

**Summary for Pond 27P: PERV. PVMT-East**

Inflow Area = 0.190 ac, 100.00% Impervious, Inflow Depth = 3.11" for 2-Year event  
 Inflow = 0.33 cfs @ 12.07 hrs, Volume= 0.049 af  
 Outflow = 0.23 cfs @ 12.50 hrs, Volume= 0.049 af, Atten= 29%, Lag= 25.9 min  
 Primary = 0.23 cfs @ 12.50 hrs, Volume= 0.049 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 109.14' @ 12.50 hrs Surf.Area= 0.130 ac Storage= 0.013 af

Plug-Flow detention time= 102.9 min calculated for 0.049 af (99% of inflow)  
 Center-of-Mass det. time= 111.2 min ( 870.9 - 759.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.90'	0.135 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.338 af Overall x 40.0% Voids

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
108.90	0.130	0.000	0.000
111.50	0.130	0.338	0.338

Device	Routing	Invert	Outlet Devices
#1	Primary	108.90'	<b>6.0" Round Culvert X 3.00</b> L= 49.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 108.90' / 108.85' S= 0.0010 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

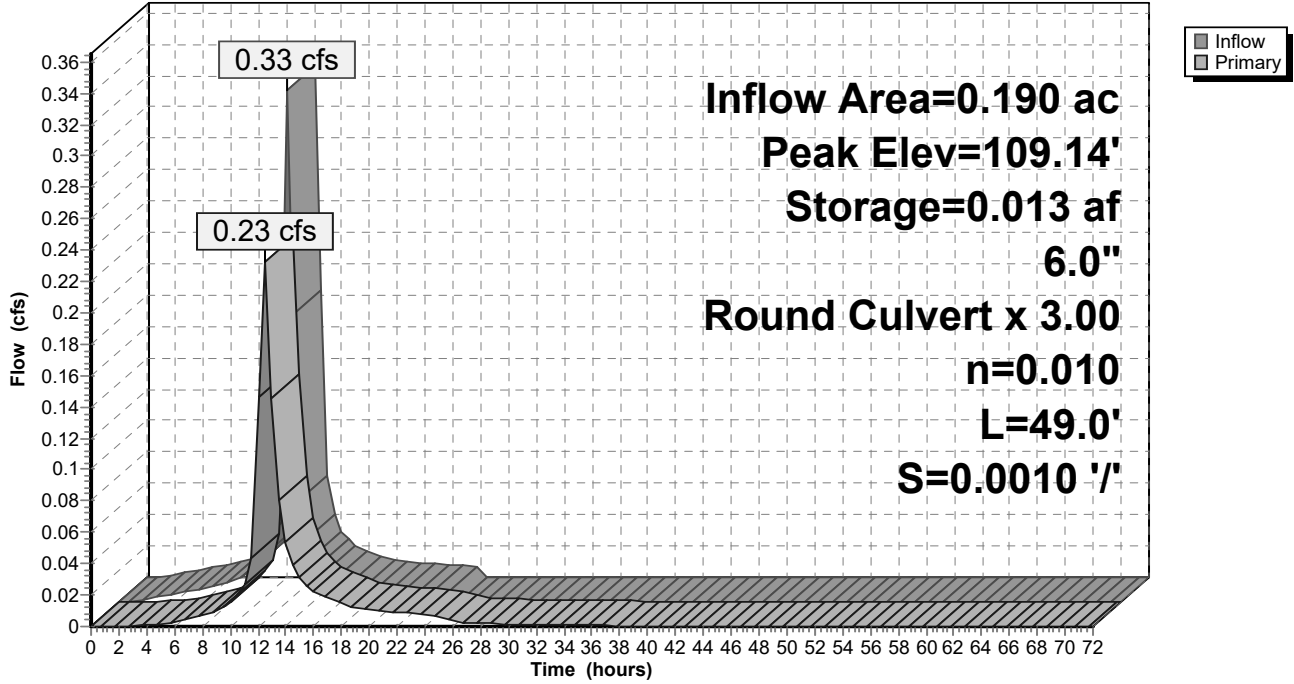
**Primary OutFlow** Max=0.23 cfs @ 12.50 hrs HW=109.14' (Free Discharge)

↑1=Culvert (Barrel Controls 0.23 cfs @ 1.19 fps)



**Pond 27P: PERV. PVMT-East**

Hydrograph



**Pre vs Post\_211020**

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**Stage-Area-Storage for Pond 27P: PERV. PVMT-East**

Elevation (feet)	Surface (acres)	Storage (acre-feet)
108.90	<b>0.130</b>	0.000
108.95	0.130	0.003
109.00	0.130	0.005
109.05	0.130	0.008
109.10	0.130	0.010
109.15	0.130	0.013
109.20	0.130	0.016
109.25	0.130	0.018
109.30	0.130	0.021
109.35	0.130	0.023
109.40	0.130	0.026
109.45	0.130	0.029
109.50	0.130	0.031
109.55	0.130	0.034
109.60	0.130	0.036
109.65	0.130	0.039
109.70	0.130	0.042
109.75	0.130	0.044
109.80	0.130	0.047
109.85	0.130	0.049
109.90	0.130	0.052
109.95	0.130	0.055
110.00	0.130	0.057
110.05	0.130	0.060
110.10	0.130	0.062
110.15	0.130	0.065
110.20	0.130	0.068
110.25	0.130	0.070
110.30	0.130	0.073
110.35	0.130	0.075
110.40	0.130	0.078
110.45	0.130	0.081
110.50	0.130	0.083
110.55	0.130	0.086
110.60	0.130	0.088
110.65	0.130	0.091
110.70	0.130	0.094
110.75	0.130	0.096
110.80	0.130	0.099
110.85	0.130	0.101
110.90	0.130	0.104
110.95	0.130	0.107
111.00	0.130	0.109
111.05	0.130	0.112
111.10	0.130	0.114
111.15	0.130	0.117
111.20	0.130	0.120
111.25	0.130	0.122
111.30	0.130	0.125
111.35	0.130	0.127
111.40	0.130	0.130
111.45	0.130	0.133
111.50	0.130	<b>0.135</b>

**Summary for Pond 29P: PERV. PVMT-Rear**

Inflow Area = 0.220 ac, 63.64% Impervious, Inflow Depth = 2.39" for 2-Year event  
 Inflow = 0.29 cfs @ 12.08 hrs, Volume= 0.044 af  
 Outflow = 0.18 cfs @ 12.58 hrs, Volume= 0.044 af, Atten= 37%, Lag= 29.9 min  
 Primary = 0.18 cfs @ 12.58 hrs, Volume= 0.044 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 111.15' @ 12.59 hrs Surf.Area= 0.107 ac Storage= 0.013 af

Plug-Flow detention time= 114.4 min calculated for 0.043 af (99% of inflow)  
 Center-of-Mass det. time= 124.9 min ( 903.0 - 778.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	110.85'	0.053 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.134 af Overall x 40.0% Voids

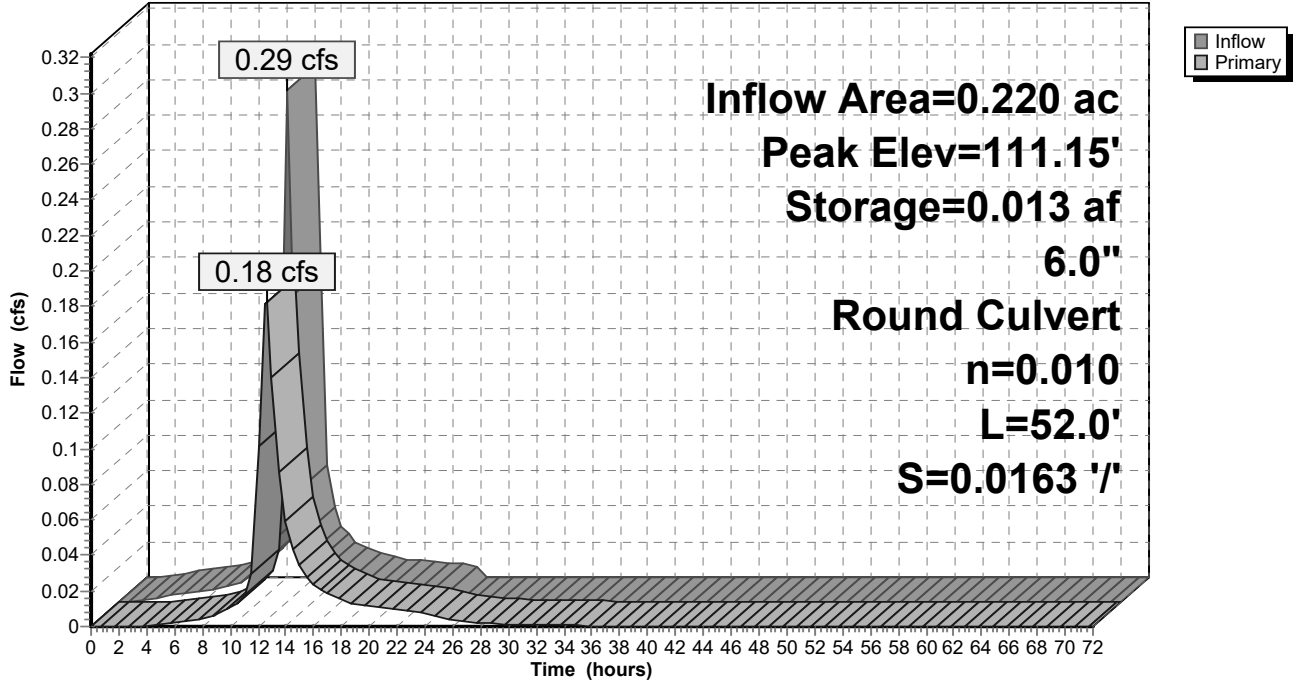
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
110.85	0.107	0.000	0.000
112.10	0.107	0.134	0.134

Device	Routing	Invert	Outlet Devices
#1	Primary	110.85'	<b>6.0" Round Culvert</b> L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 110.85' / 110.00' S= 0.0163 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=0.17 cfs @ 12.58 hrs HW=111.14' (Free Discharge)  
 ↑1=Culvert (Inlet Controls 0.17 cfs @ 1.46 fps)

**Pond 29P: PERV. PVMT-Rear**

Hydrograph



**Pre vs Post\_211020**

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**Stage-Area-Storage for Pond 29P: PERV. PVMT-Rear**

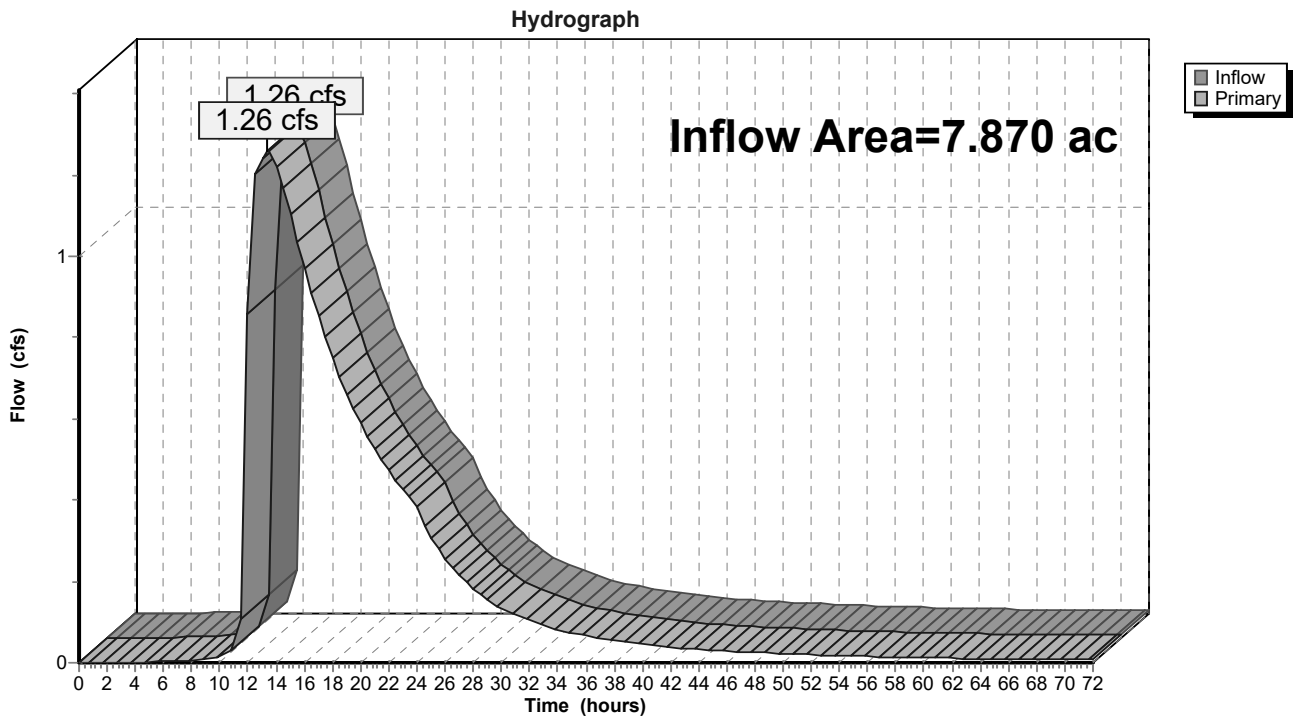
Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
110.85	<b>0.107</b>	0.000	111.91	0.107	0.045
110.87	0.107	0.001	111.93	0.107	0.046
110.89	0.107	0.002	111.95	0.107	0.047
110.91	0.107	0.003	111.97	0.107	0.048
110.93	0.107	0.003	111.99	0.107	0.049
110.95	0.107	0.004	112.01	0.107	0.050
110.97	0.107	0.005	112.03	0.107	0.051
110.99	0.107	0.006	112.05	0.107	0.051
111.01	0.107	0.007	112.07	0.107	0.052
111.03	0.107	0.008	112.09	0.107	<b>0.053</b>
111.05	0.107	0.009			
111.07	0.107	0.009			
111.09	0.107	0.010			
111.11	0.107	0.011			
111.13	0.107	0.012			
111.15	0.107	0.013			
111.17	0.107	0.014			
111.19	0.107	0.015			
111.21	0.107	0.015			
111.23	0.107	0.016			
111.25	0.107	0.017			
111.27	0.107	0.018			
111.29	0.107	0.019			
111.31	0.107	0.020			
111.33	0.107	0.021			
111.35	0.107	0.021			
111.37	0.107	0.022			
111.39	0.107	0.023			
111.41	0.107	0.024			
111.43	0.107	0.025			
111.45	0.107	0.026			
111.47	0.107	0.027			
111.49	0.107	0.027			
111.51	0.107	0.028			
111.53	0.107	0.029			
111.55	0.107	0.030			
111.57	0.107	0.031			
111.59	0.107	0.032			
111.61	0.107	0.033			
111.63	0.107	0.033			
111.65	0.107	0.034			
111.67	0.107	0.035			
111.69	0.107	0.036			
111.71	0.107	0.037			
111.73	0.107	0.038			
111.75	0.107	0.039			
111.77	0.107	0.039			
111.79	0.107	0.040			
111.81	0.107	0.041			
111.83	0.107	0.042			
111.85	0.107	0.043			
111.87	0.107	0.044			
111.89	0.107	0.045			

### Summary for Link 9L: BASIN DISCHARGES

Inflow Area = 7.870 ac, 36.59% Impervious, Inflow Depth > 1.59" for 2-Year event  
Inflow = 1.26 cfs @ 13.39 hrs, Volume= 1.043 af  
Primary = 1.26 cfs @ 13.39 hrs, Volume= 1.043 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 9L: BASIN DISCHARGES



**Pre vs Post\_211020**

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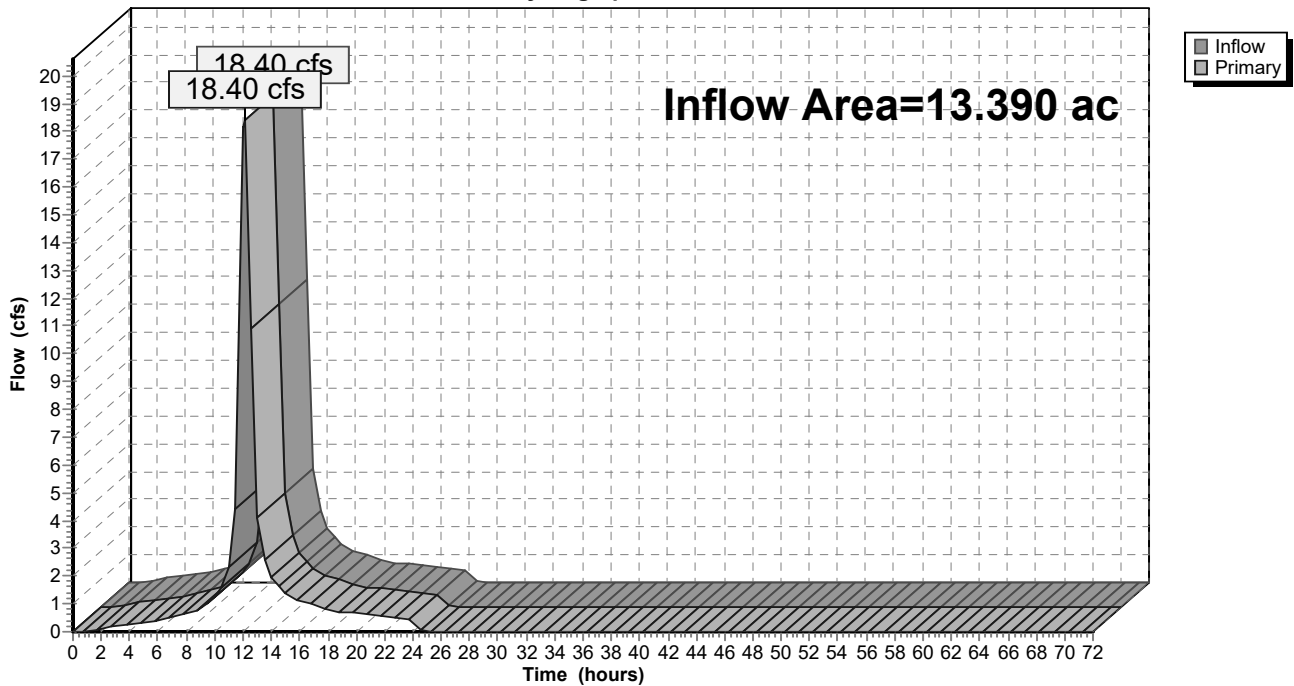
**Summary for Link 20L: PDA-1A TOTAL**

Inflow Area = 13.390 ac, 75.35% Impervious, Inflow Depth = 2.62" for 2-Year event  
Inflow = 18.40 cfs @ 12.08 hrs, Volume= 2.923 af  
Primary = 18.40 cfs @ 12.08 hrs, Volume= 2.923 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

**Link 20L: PDA-1A TOTAL**

Hydrograph



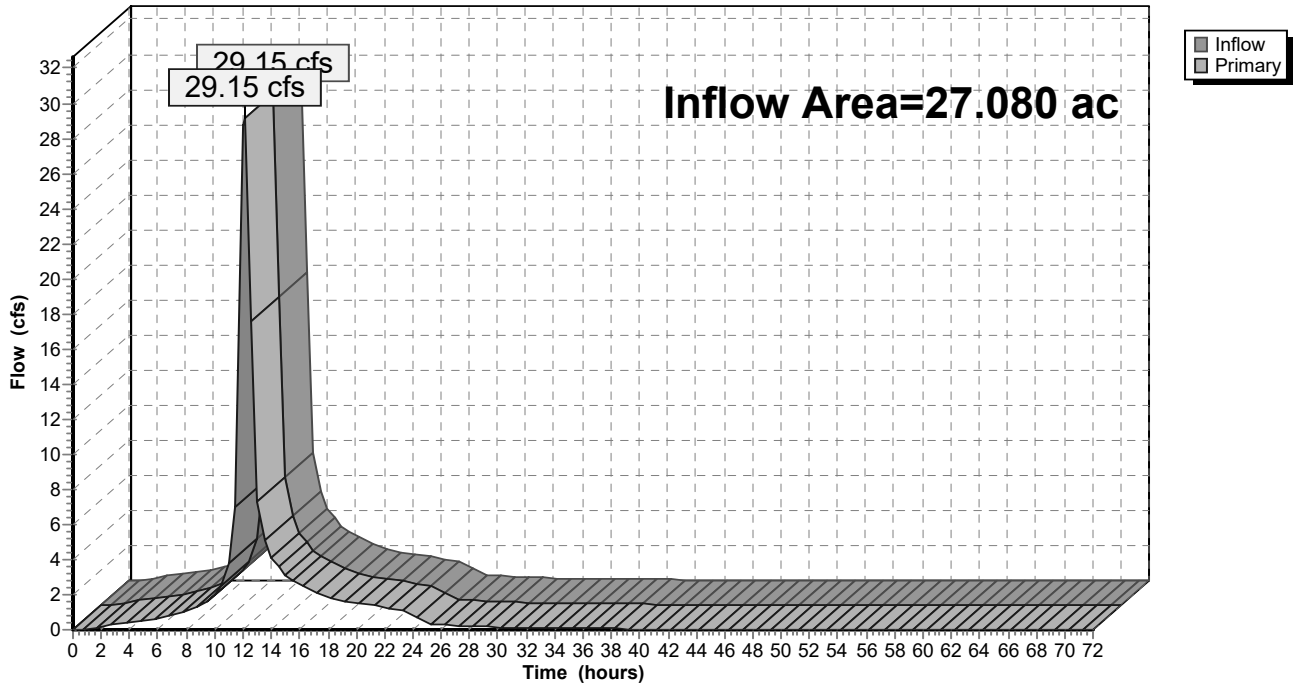
### Summary for Link 22L: PROP. POI-1

Inflow Area = 27.080 ac, 68.87% Impervious, Inflow Depth > 2.41" for 2-Year event  
Inflow = 29.15 cfs @ 12.08 hrs, Volume= 5.448 af  
Primary = 29.15 cfs @ 12.08 hrs, Volume= 5.448 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 22L: PROP. POI-1

Hydrograph





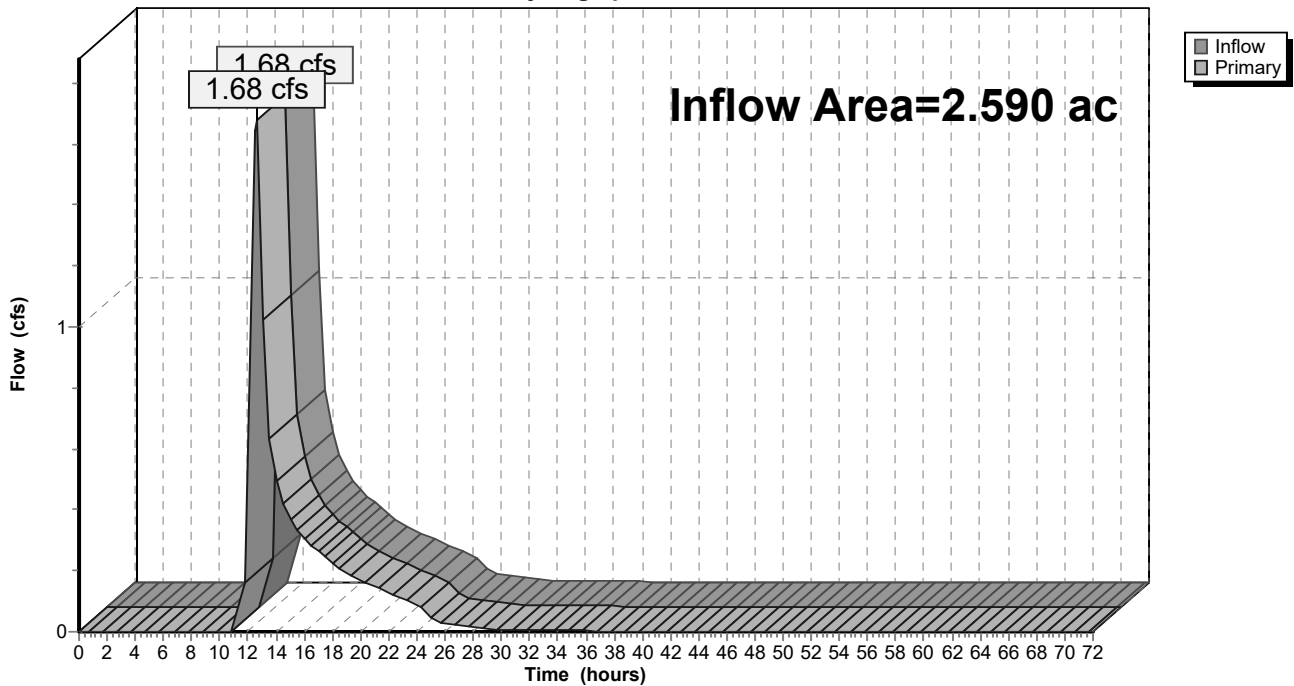
### Summary for Link 28L: MH 101

Inflow Area = 2.590 ac, 60.23% Impervious, Inflow Depth = 1.66" for 2-Year event  
Inflow = 1.68 cfs @ 12.59 hrs, Volume= 0.359 af  
Primary = 1.68 cfs @ 12.59 hrs, Volume= 0.359 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 28L: MH 101

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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Time span=0.00-72.00 hrs, dt=0.50 hrs, 145 points  
 Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment9S: PDA-3 (POI-3)</b>	Runoff Area=0.880 ac 0.00% Impervious Runoff Depth=2.04" Flow Length=291' Tc=15.2 min CN=70/0 Runoff=0.96 cfs 0.150 af
<b>Subcatchment11S: PDA-2 (POI-2)</b>	Runoff Area=1.770 ac 0.00% Impervious Runoff Depth=2.04" Flow Length=609' Tc=19.6 min CN=70/0 Runoff=2.09 cfs 0.301 af
<b>Subcatchment16S: PDA-1A-b</b>	Runoff Area=0.390 ac 100.00% Impervious Runoff Depth=4.77" Tc=10.0 min CN=0/98 Runoff=1.01 cfs 0.155 af
<b>Subcatchment17S: PDA-1B-a</b>	Runoff Area=1.490 ac 46.31% Impervious Runoff Depth=3.44" Tc=10.0 min CN=73/98 Runoff=2.83 cfs 0.427 af
<b>Subcatchment18S: PDA-1B-b</b>	Runoff Area=0.880 ac 82.95% Impervious Runoff Depth=4.36" Tc=10.0 min CN=74/98 Runoff=2.10 cfs 0.320 af
<b>Subcatchment23S: EXIST. OFF-SITE</b>	Runoff Area=0.140 ac 0.00% Impervious Runoff Depth=2.04" Flow Length=189' Slope=0.0200 '/' Tc=9.3 min CN=70/0 Runoff=0.16 cfs 0.024 af
<b>Subcatchment24S: PDA-1B-c</b>	Runoff Area=4.130 ac 31.96% Impervious Runoff Depth=3.14" Tc=10.0 min CN=74/98 Runoff=7.25 cfs 1.081 af
<b>Subcatchment25S: PDA-1A-c</b>	Runoff Area=12.810 ac 74.24% Impervious Runoff Depth=4.15" Tc=10.0 min CN=74/98 Runoff=29.17 cfs 4.435 af
<b>Subcatchment27S: PDA-1B-d</b>	Runoff Area=0.220 ac 63.64% Impervious Runoff Depth=3.90" Tc=10.0 min CN=74/98 Runoff=0.47 cfs 0.072 af
<b>Subcatchment28S: PDA-1A-a</b>	Runoff Area=0.190 ac 100.00% Impervious Runoff Depth=4.77" Tc=10.0 min CN=0/98 Runoff=0.49 cfs 0.076 af
<b>Subcatchment30S: PDA-1C</b>	Runoff Area=1.150 ac 0.00% Impervious Runoff Depth=2.37" Tc=10.0 min CN=74/0 Runoff=1.57 cfs 0.227 af
<b>Subcatchment31S: PDA-1B-c (Roof)</b>	Runoff Area=5.680 ac 100.00% Impervious Runoff Depth=4.77" Tc=10.0 min CN=0/98 Runoff=14.75 cfs 2.259 af
<b>Pond 2P: Ex. Detention Basin</b>	Peak Elev=105.67' Storage=36,365 cf Inflow=9.87 cfs 1.761 af Primary=0.61 cfs 0.465 af Secondary=1.95 cfs 1.265 af Tertiary=0.00 cfs 0.000 af Outflow=2.56 cfs 1.729 af
<b>Pond 10P: BIO BASIN 1</b>	Peak Elev=110.57' Storage=5,528 cf Inflow=3.05 cfs 0.498 af Outflow=2.63 cfs 0.424 af
<b>Pond 11P: BIO BASIN 2</b>	Peak Elev=110.71' Storage=7,075 cf Inflow=2.10 cfs 0.320 af Outflow=1.31 cfs 0.256 af
<b>Pond 12P: PERV. PVMT-West</b>	Peak Elev=110.13' Storage=0.098 af Inflow=1.29 cfs 0.231 af Outflow=0.72 cfs 0.231 af

**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Pond 27P: PERV. PVMT-East** Peak Elev=109.21' Storage=0.016 af Inflow=0.49 cfs 0.076 af  
6.0" Round Culvert x 3.00 n=0.010 L=49.0' S=0.0010 '/' Outflow=0.37 cfs 0.076 af

**Pond 29P: PERV. PVMT-Rear** Peak Elev=111.28' Storage=0.018 af Inflow=0.47 cfs 0.072 af  
6.0" Round Culvert n=0.010 L=52.0' S=0.0163 '/' Outflow=0.31 cfs 0.071 af

**Link 9L: BASIN DISCHARGES** Inflow=3.14 cfs 1.956 af  
Primary=3.14 cfs 1.956 af

**Link 20L: PDA-1A TOTAL** Inflow=29.34 cfs 4.666 af  
Primary=29.34 cfs 4.666 af

**Link 22L: PROP. POI-1** Inflow=46.70 cfs 8.905 af  
Primary=46.70 cfs 8.905 af

**Link 28L: MH 101** Inflow=3.90 cfs 0.681 af  
Primary=3.90 cfs 0.681 af

**Total Runoff Area = 29.730 ac Runoff Volume = 9.527 af Average Runoff Depth = 3.85"**  
**37.27% Pervious = 11.080 ac 62.73% Impervious = 18.650 ac**

**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 9S: PDA-3 (POI-3)**

Runoff = 0.96 cfs @ 12.38 hrs, Volume= 0.150 af, Depth= 2.04"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

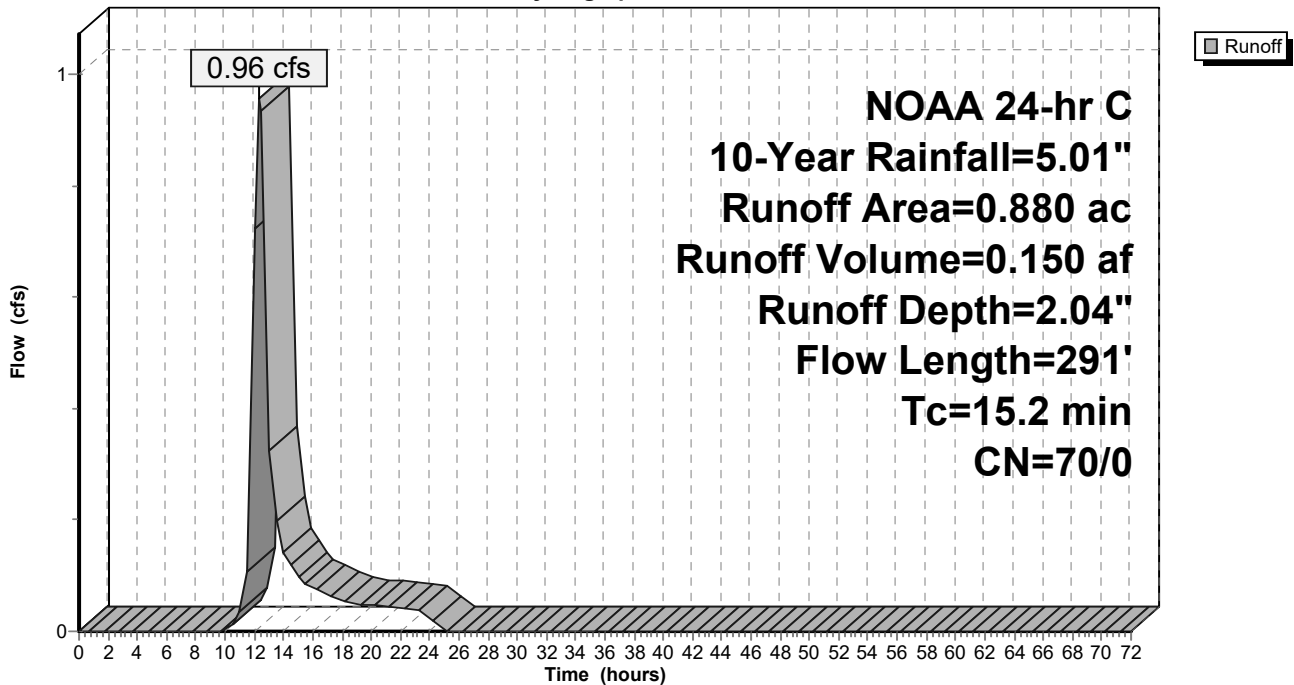
Area (ac)	CN	Description
0.880	70	Woods, Good, HSG C
0.880	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	9	0.0050	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
9.9	282	0.0090	0.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.2	291	Total			

**Subcatchment 9S: PDA-3 (POI-3)**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 11S: PDA-2 (POI-2)**

Runoff = 2.09 cfs @ 12.46 hrs, Volume= 0.301 af, Depth= 2.04"

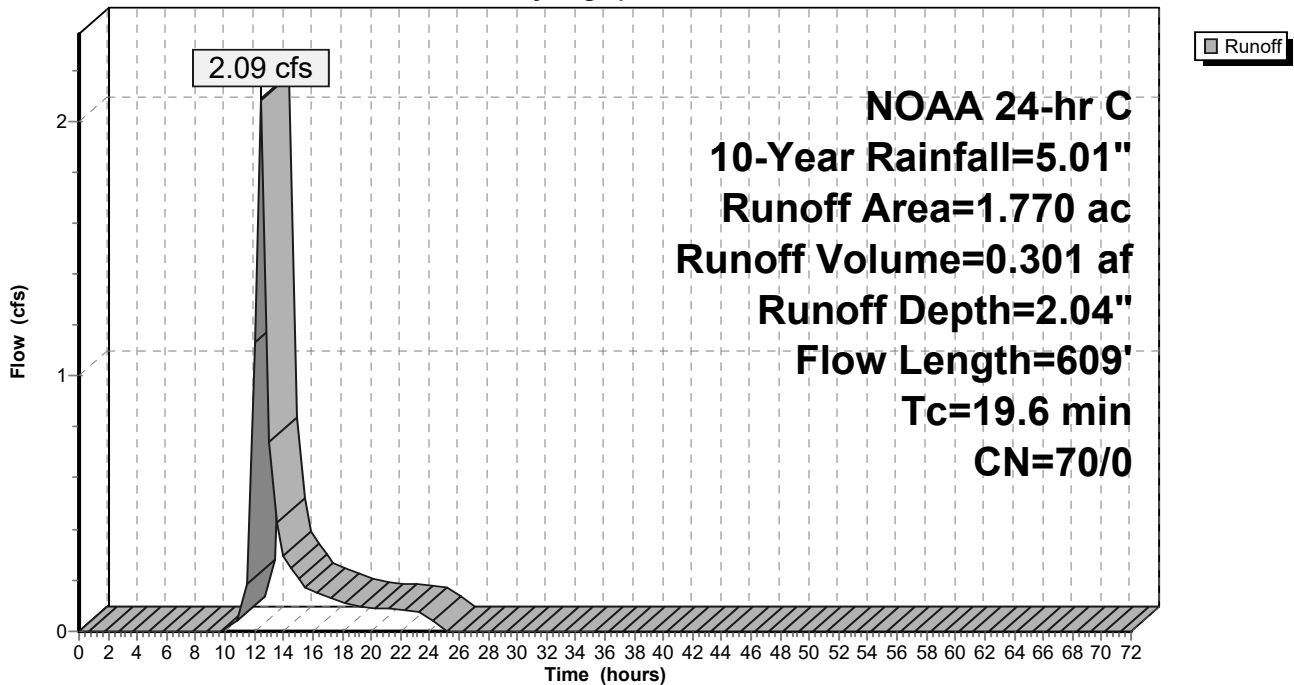
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
1.770	70	Woods, Good, HSG C
1.770	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	17	0.0180	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
14.3	592	0.0190	0.69		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
19.6	609	Total			

**Subcatchment 11S: PDA-2 (POI-2)**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 16S: PDA-1A-b**

Runoff = 1.01 cfs @ 12.07 hrs, Volume= 0.155 af, Depth= 4.77"

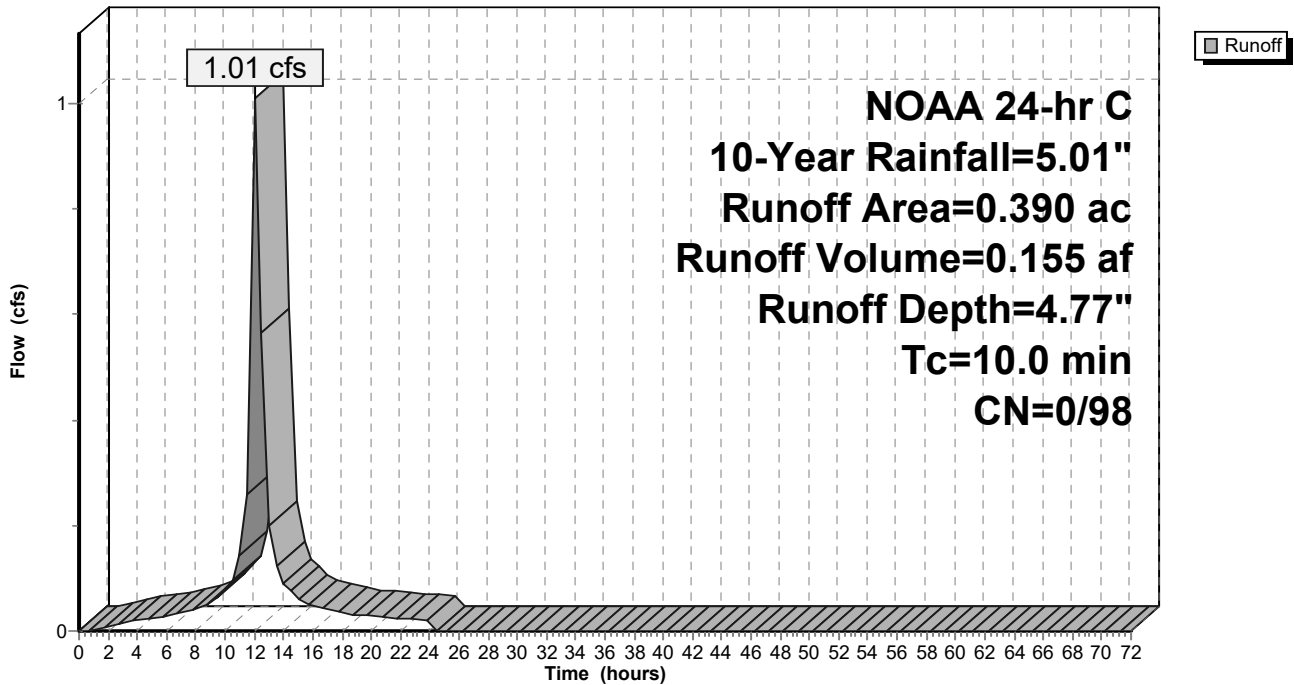
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
0.390	98	Paved parking, HSG C
0.390	98	100.00% Impervious Area

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

**Subcatchment 16S: PDA-1A-b**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 17S: PDA-1B-a**

Runoff = 2.83 cfs @ 12.09 hrs, Volume= 0.427 af, Depth= 3.44"

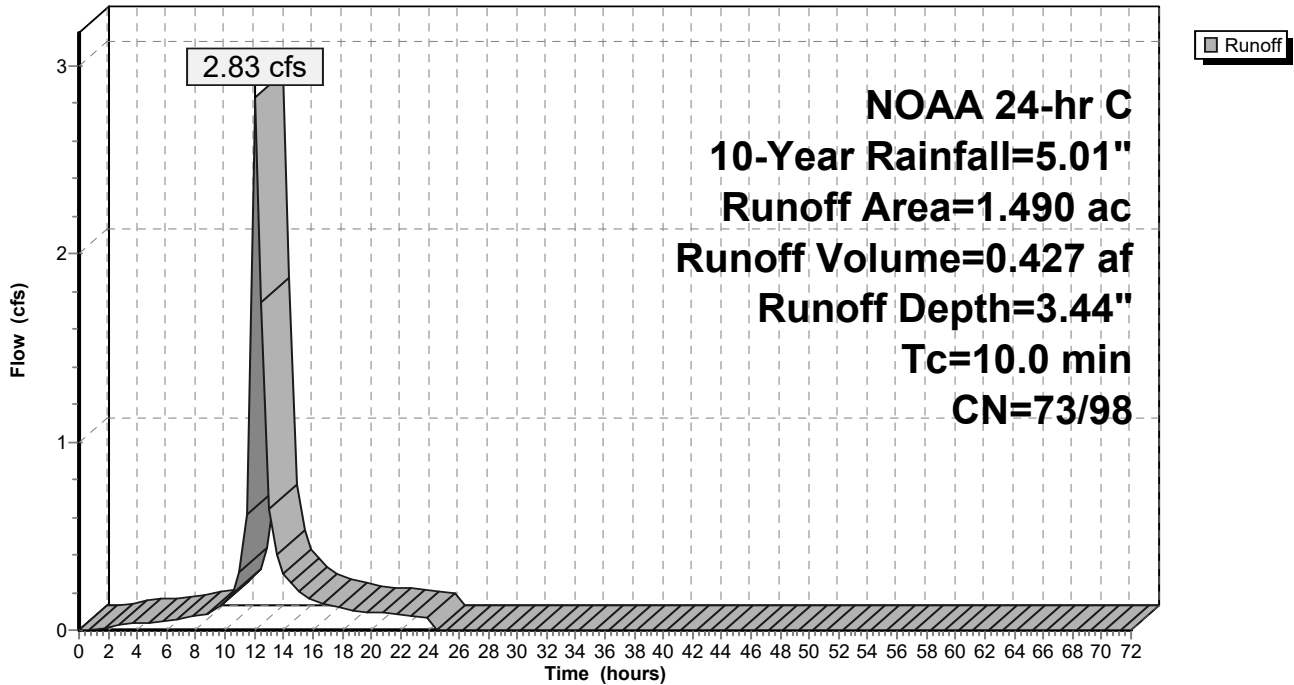
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
0.270	70	Woods, Good, HSG C
0.690	98	Paved parking, HSG C
0.530	74	>75% Grass cover, Good, HSG C
1.490	84	Weighted Average
0.800	73	53.69% Pervious Area
0.690	98	46.31% Impervious Area

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

**Subcatchment 17S: PDA-1B-a**

Hydrograph



**Pre vs Post\_211020**

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**Summary for Subcatchment 18S: PDA-1B-b**

Runoff = 2.10 cfs @ 12.07 hrs, Volume= 0.320 af, Depth= 4.36"

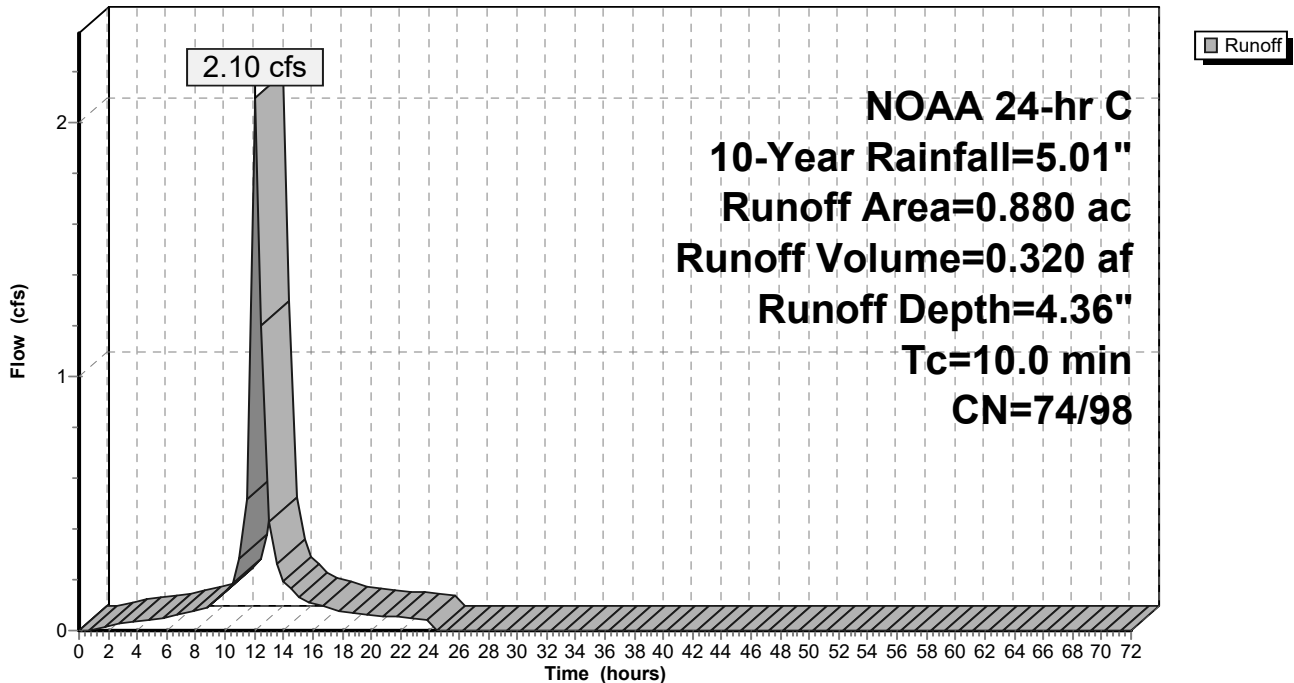
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
0.730	98	Paved parking, HSG C
0.150	74	>75% Grass cover, Good, HSG C
0.880	94	Weighted Average
0.150	74	17.05% Pervious Area
0.730	98	82.95% Impervious Area

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

**Subcatchment 18S: PDA-1B-b**

Hydrograph





**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 23S: EXIST. OFF-SITE**

Runoff = 0.16 cfs @ 12.13 hrs, Volume= 0.024 af, Depth= 2.04"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

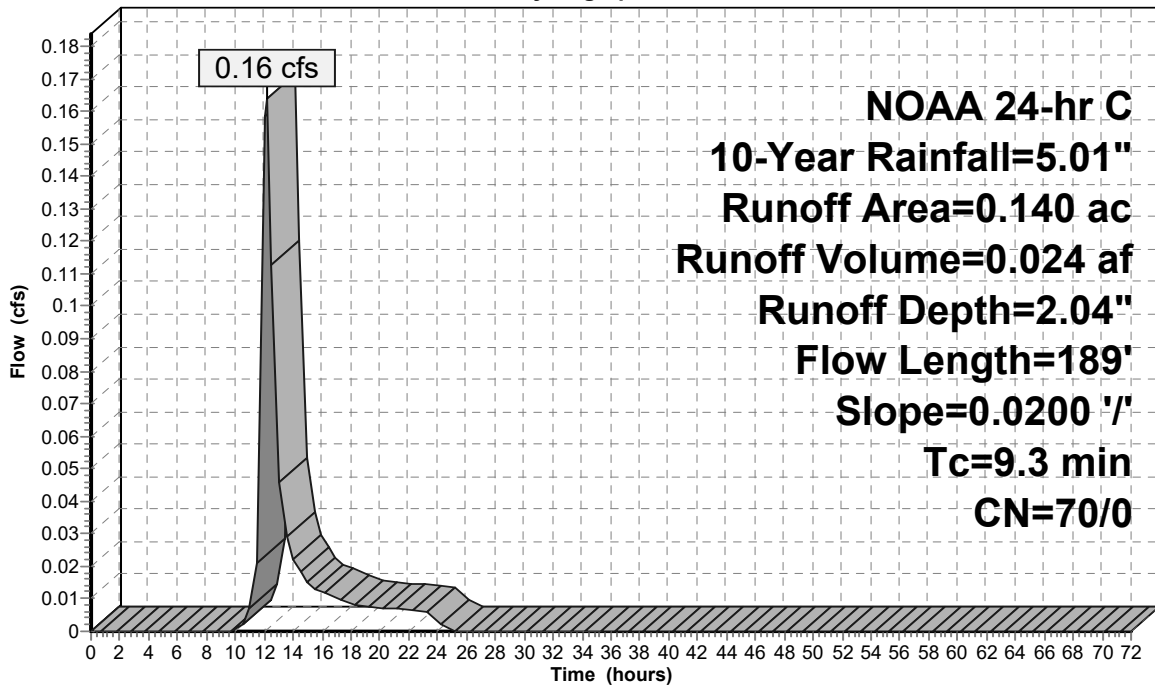
Area (ac)	CN	Description
0.140	70	Woods, Good, HSG C
0.140	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	18	0.0200	0.06		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
4.0	171	0.0200	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.3	189	Total			

**Subcatchment 23S: EXIST. OFF-SITE**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 24S: PDA-1B-c**

Runoff = 7.25 cfs @ 12.10 hrs, Volume= 1.081 af, Depth= 3.14"

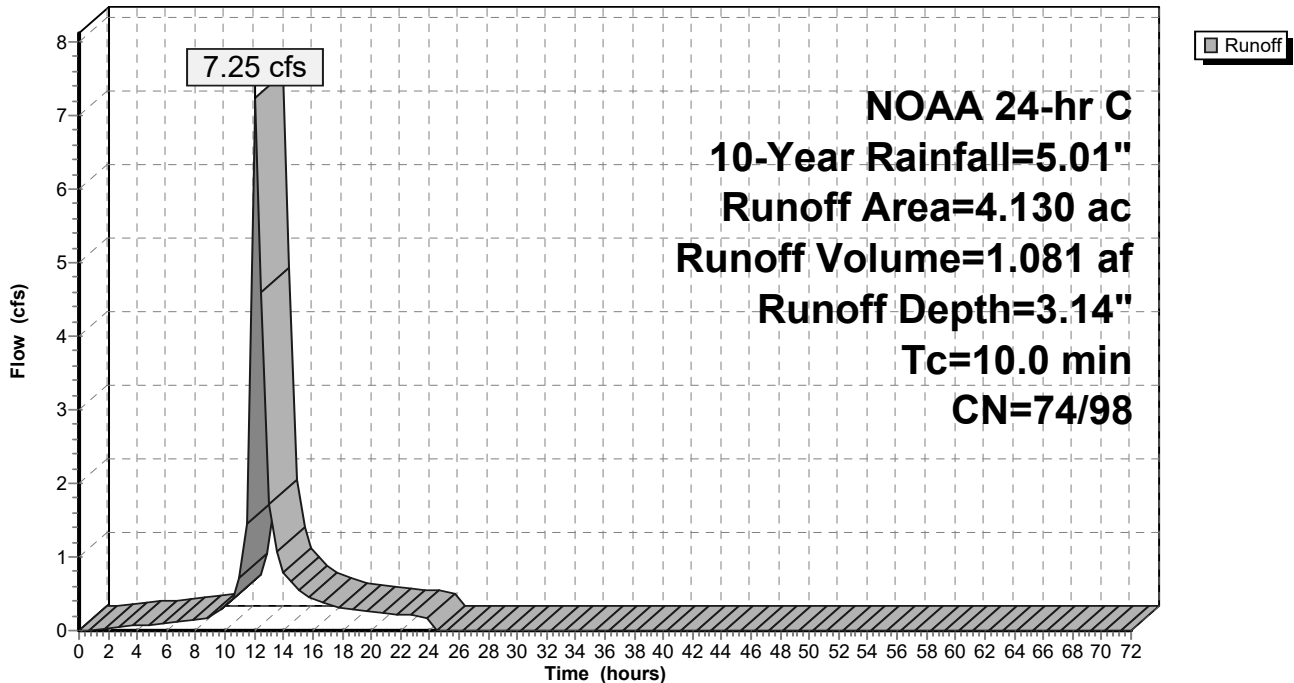
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
2.810	74	>75% Grass cover, Good, HSG C
* 1.320	98	Impervious
4.130	82	Weighted Average
2.810	74	68.04% Pervious Area
1.320	98	31.96% Impervious Area

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

**Subcatchment 24S: PDA-1B-c**

Hydrograph



**Pre vs Post\_211020**

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**Summary for Subcatchment 25S: PDA-1A-c**

Runoff = 29.17 cfs @ 12.07 hrs, Volume= 4.435 af, Depth= 4.15"

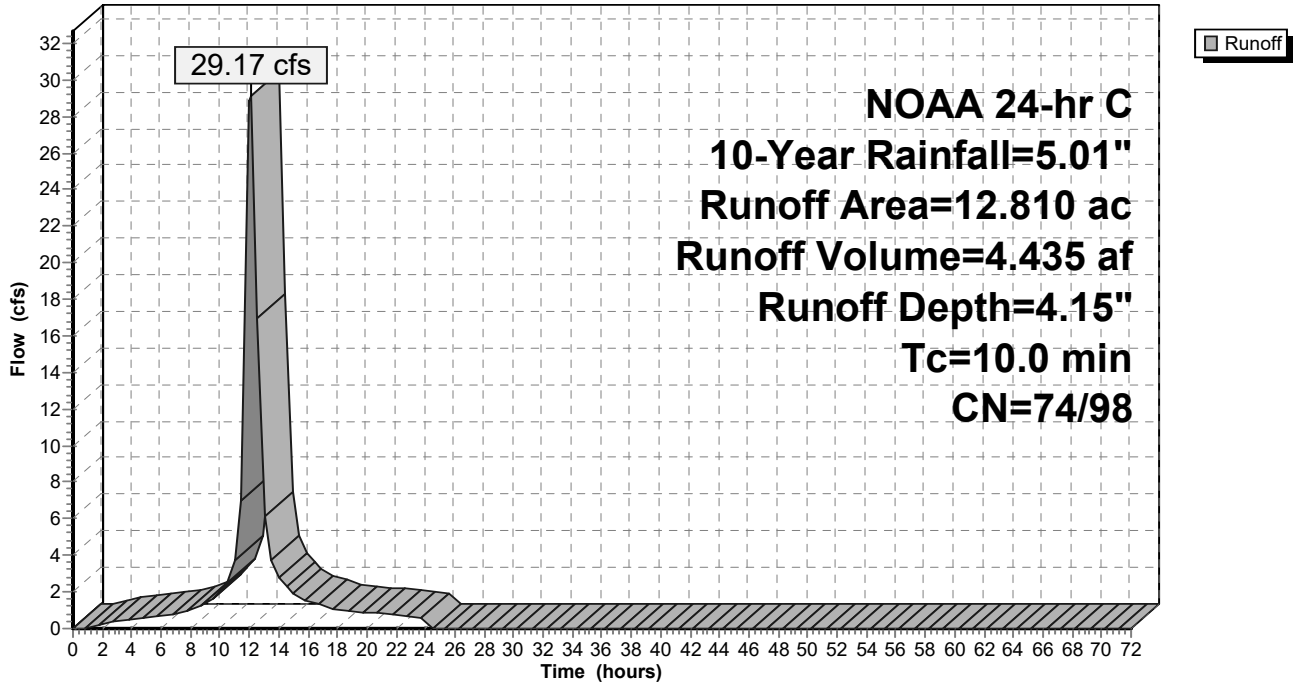
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
3.300	74	>75% Grass cover, Good, HSG C
* 9.510	98	Impervious & Exist. Roof Areas
12.810	92	Weighted Average
3.300	74	25.76% Pervious Area
9.510	98	74.24% Impervious Area

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

**Subcatchment 25S: PDA-1A-c**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 27S: PDA-1B-d**

Runoff = 0.47 cfs @ 12.08 hrs, Volume= 0.072 af, Depth= 3.90"

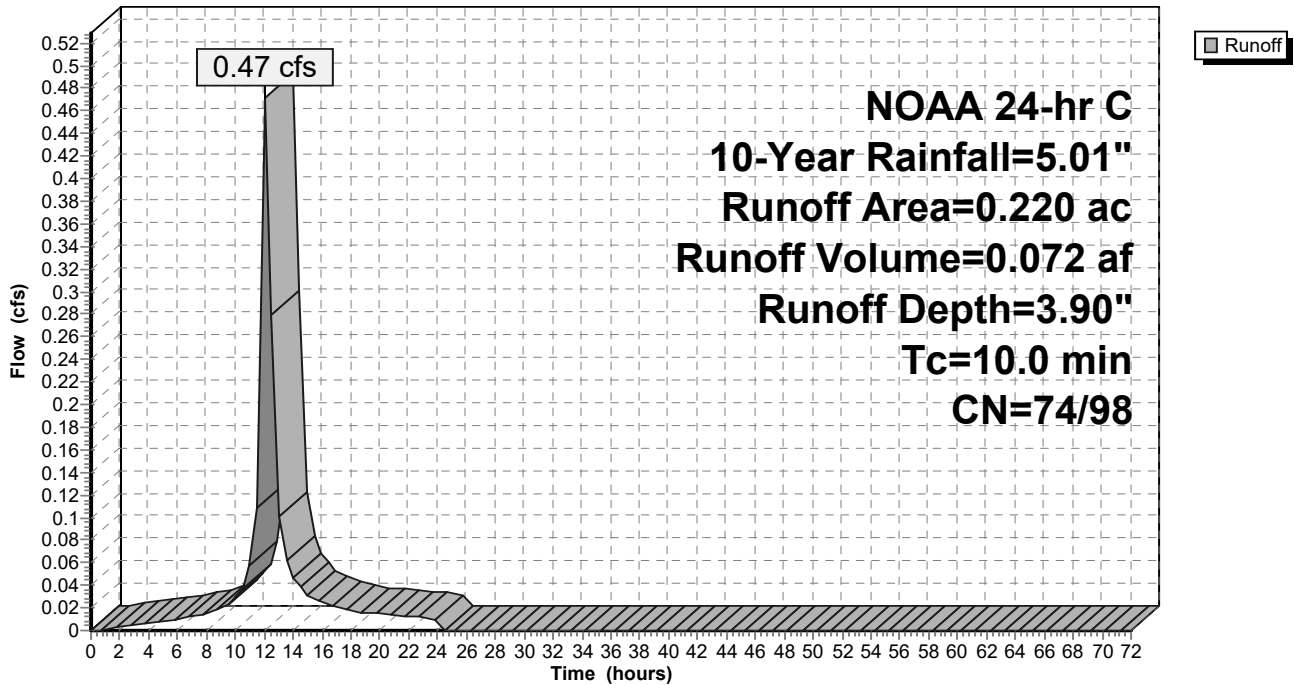
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG A
0.080	74	>75% Grass cover, Good, HSG C
0.220	89	Weighted Average
0.080	74	36.36% Pervious Area
0.140	98	63.64% Impervious Area

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

**Subcatchment 27S: PDA-1B-d**

Hydrograph



**Pre vs Post\_211020**

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**Summary for Subcatchment 28S: PDA-1A-a**

Runoff = 0.49 cfs @ 12.07 hrs, Volume= 0.076 af, Depth= 4.77"

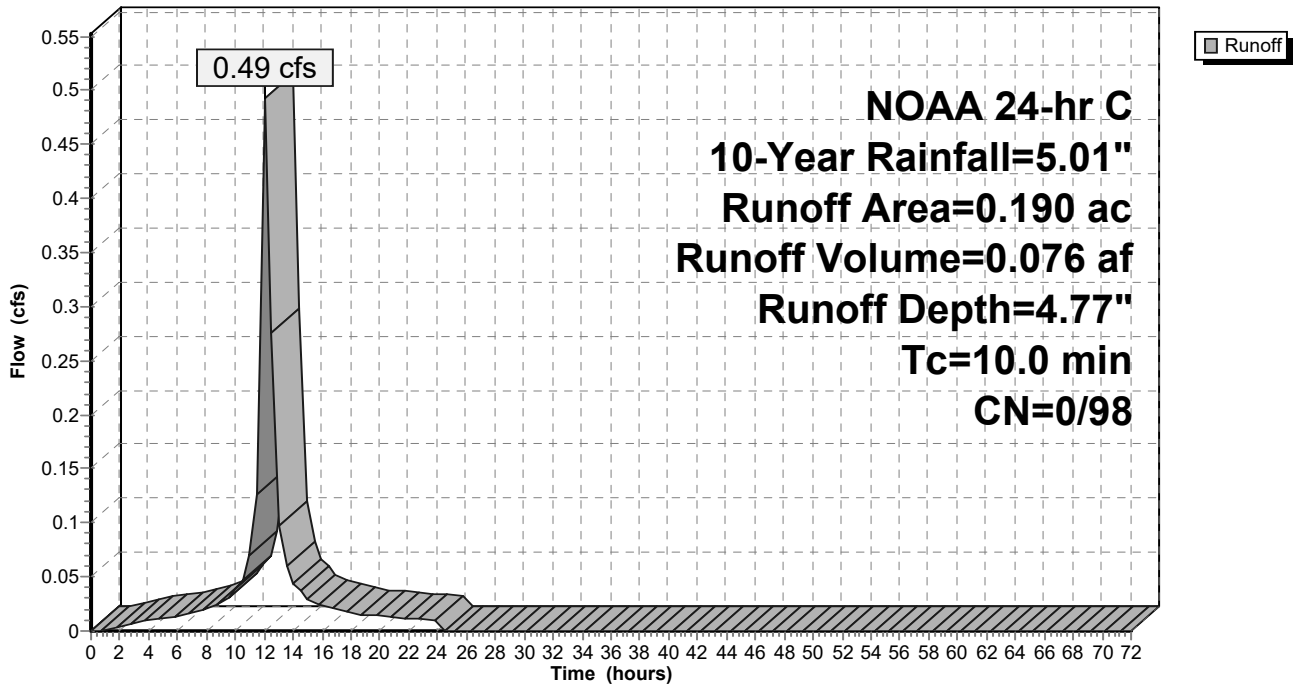
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
0.190	98	Paved parking, HSG C
0.190	98	100.00% Impervious Area

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

**Subcatchment 28S: PDA-1A-a**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 30S: PDA-1C**

Runoff = 1.57 cfs @ 12.13 hrs, Volume= 0.227 af, Depth= 2.37"

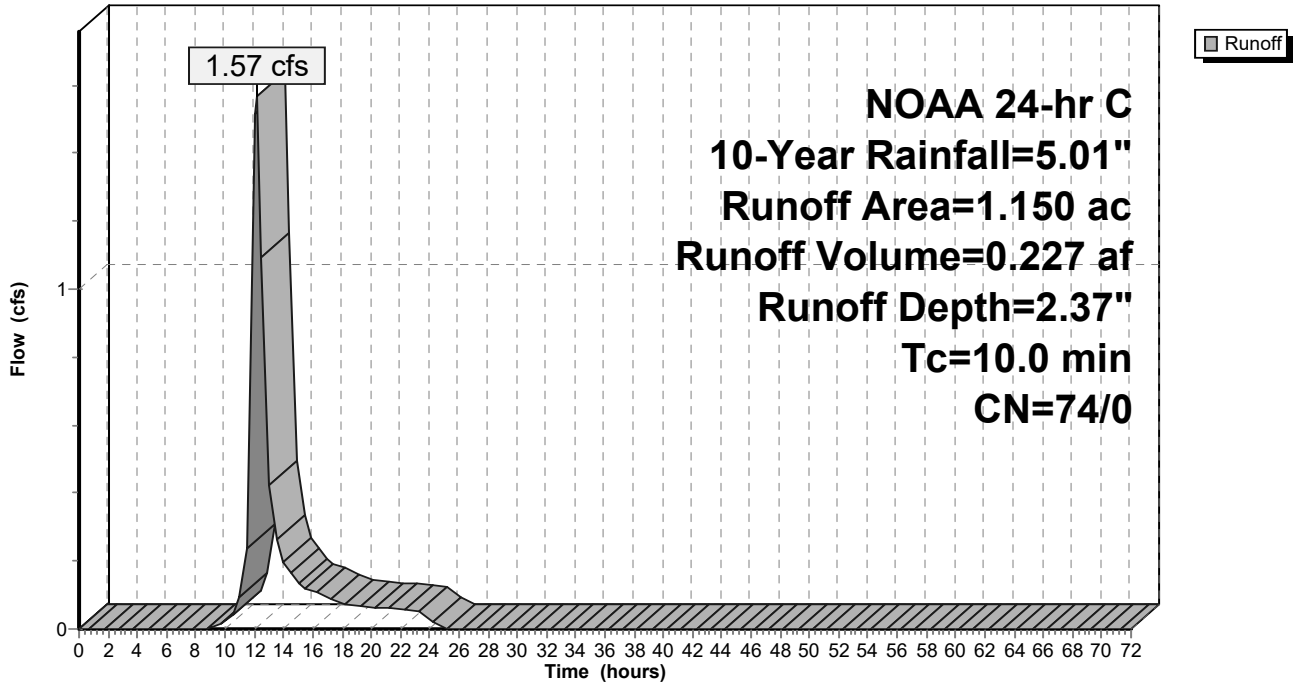
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
1.150	74	>75% Grass cover, Good, HSG C
1.150	74	100.00% Pervious Area

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

**Subcatchment 30S: PDA-1C**

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 31S: PDA-1B-c (Roof)**

Runoff = 14.75 cfs @ 12.07 hrs, Volume= 2.259 af, Depth= 4.77"

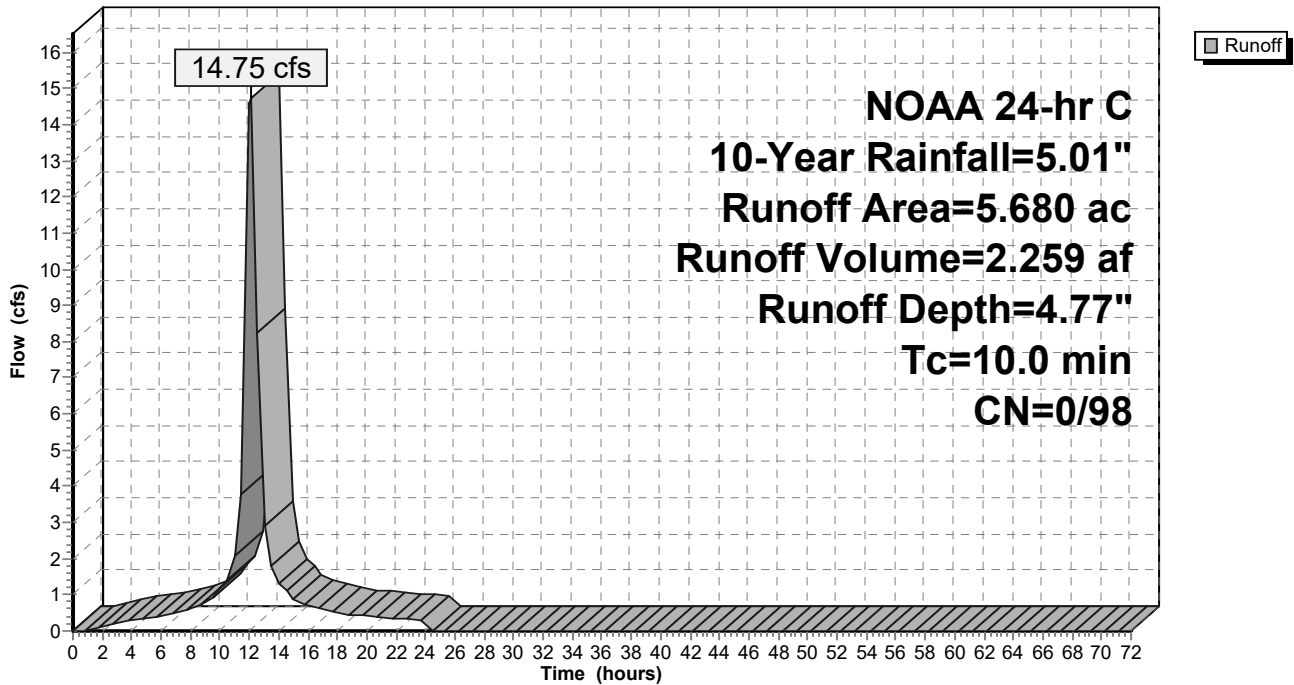
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
* 5.680	98	Prop. Roofs
5.680	98	100.00% Impervious Area

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

**Subcatchment 31S: PDA-1B-c (Roof)**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Pond 2P: Ex. Detention Basin**

Inflow Area = 6.720 ac, 42.86% Impervious, Inflow Depth = 3.14" for 10-Year event  
 Inflow = 9.87 cfs @ 12.21 hrs, Volume= 1.761 af  
 Outflow = 2.56 cfs @ 13.40 hrs, Volume= 1.729 af, Atten= 74%, Lag= 71.7 min  
 Primary = 0.61 cfs @ 13.40 hrs, Volume= 0.465 af  
 Secondary = 1.95 cfs @ 13.40 hrs, Volume= 1.265 af  
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 105.67' @ 13.41 hrs Surf.Area= 56,199 sf Storage= 36,365 cf

Plug-Flow detention time= 328.1 min calculated for 1.729 af (98% of inflow)  
 Center-of-Mass det. time= 313.6 min ( 1,158.6 - 845.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	105.00'	186,871 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
105.00	52,708	0	0
106.00	57,935	55,322	55,322
107.00	67,082	62,509	117,830
108.00	71,000	69,041	186,871

Device	Routing	Invert	Outlet Devices
#1	Primary	105.00'	<b>18.0" Round RCP_Round 18"</b> L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0333 1/1' Cc= 0.900 n= 0.015, Flow Area= 1.77 sf
#2	Device 1	105.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	106.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Secondary	105.00'	<b>8.0" Round Culvert X 2.00</b> L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0238 1/1' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf
#5	Tertiary	107.00'	<b>50.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

**Primary OutFlow** Max=0.61 cfs @ 13.40 hrs HW=105.67' (Free Discharge)

- ↑ 1=RCP\_Round 18" (Passes 0.61 cfs of 2.10 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.61 cfs @ 3.10 fps)
- ↑ 3=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=1.94 cfs @ 13.40 hrs HW=105.67' (Free Discharge)

- ↑ 4=Culvert (Inlet Controls 1.94 cfs @ 2.78 fps)

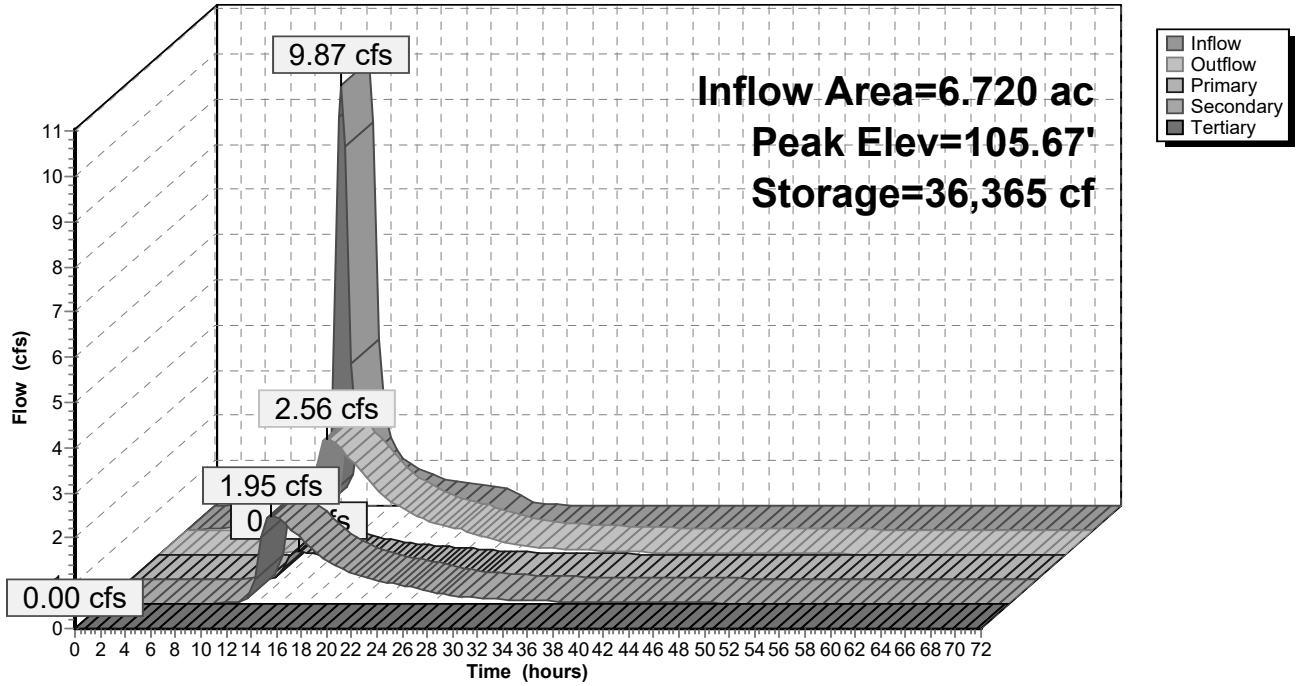
**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=105.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)



### Pond 2P: Ex. Detention Basin

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Stage-Area-Storage for Pond 2P: Ex. Detention Basin**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
105.00	52,708	0	107.65	69,629	162,261
105.05	52,969	2,642	107.70	69,825	165,747
105.10	53,231	5,297	107.75	70,021	169,243
105.15	53,492	7,965	107.80	70,216	172,749
105.20	53,753	10,646	107.85	70,412	176,265
105.25	54,015	13,340	107.90	70,608	179,791
105.30	54,276	16,048	107.95	70,804	183,326
105.35	54,537	18,768	108.00	<b>71,000</b>	<b>186,871</b>
105.40	54,799	21,501			
105.45	55,060	24,248			
105.50	55,322	27,007			
105.55	55,583	29,780			
105.60	55,844	32,566			
105.65	56,106	35,364			
105.70	56,367	38,176			
105.75	56,628	41,001			
105.80	56,890	43,839			
105.85	57,151	46,690			
105.90	57,412	49,554			
105.95	57,674	52,431			
106.00	57,935	55,322			
106.05	58,392	58,230			
106.10	58,850	61,161			
106.15	59,307	64,115			
106.20	59,764	67,091			
106.25	60,222	70,091			
106.30	60,679	73,114			
106.35	61,136	76,159			
106.40	61,594	79,227			
106.45	62,051	82,318			
106.50	62,509	85,432			
106.55	62,966	88,569			
106.60	63,423	91,729			
106.65	63,881	94,912			
106.70	64,338	98,117			
106.75	64,795	101,345			
106.80	65,253	104,597			
106.85	65,710	107,871			
106.90	66,167	111,168			
106.95	66,625	114,487			
107.00	67,082	117,830			
107.05	67,278	121,189			
107.10	67,474	124,558			
107.15	67,670	127,936			
107.20	67,866	131,325			
107.25	68,062	134,723			
107.30	68,257	138,131			
107.35	68,453	141,549			
107.40	68,649	144,976			
107.45	68,845	148,414			
107.50	69,041	151,861			
107.55	69,237	155,318			
107.60	69,433	158,784			

**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Pond 10P: BIO BASIN 1**

Inflow Area = 1.710 ac, 48.54% Impervious, Inflow Depth = 3.50" for 10-Year event  
 Inflow = 3.05 cfs @ 12.11 hrs, Volume= 0.498 af  
 Outflow = 2.63 cfs @ 12.43 hrs, Volume= 0.424 af, Atten= 14%, Lag= 19.6 min  
 Primary = 2.63 cfs @ 12.43 hrs, Volume= 0.424 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 110.57' @ 12.43 hrs Surf.Area= 4,293 sf Storage= 5,528 cf

Plug-Flow detention time= 150.9 min calculated for 0.424 af (85% of inflow)  
 Center-of-Mass det. time= 71.9 min ( 869.7 - 797.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	109.00'	16,075 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.00	2,682	0	0
110.00	3,789	3,236	3,236
111.00	4,677	4,233	7,469
112.00	5,873	5,275	12,744
112.50	7,453	3,332	16,075

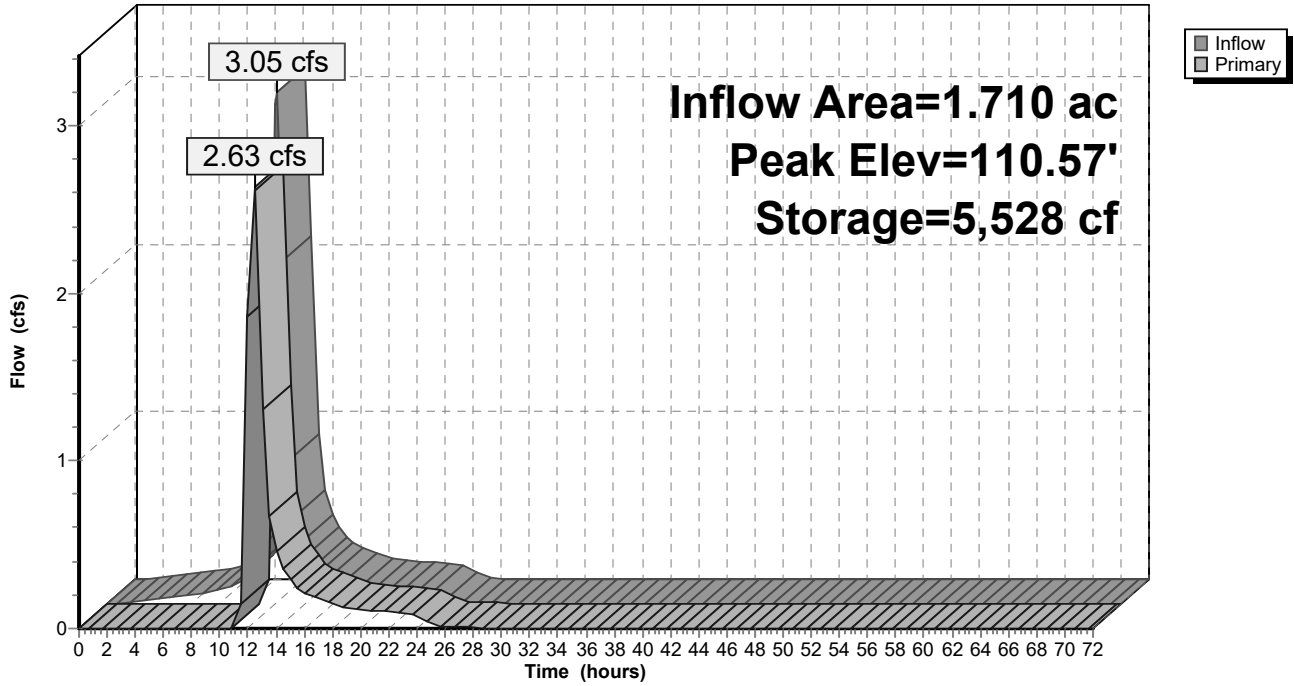
Device	Routing	Invert	Outlet Devices
#1	Primary	106.16'	<b>18.0" Round Culvert</b> L= 636.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 106.16' / 104.50' S= 0.0026 1' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Device 1	110.00'	<b>2.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)
#3	Device 1	111.00'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=2.51 cfs @ 12.43 hrs HW=110.55' (Free Discharge)

- 1=Culvert (Passes 2.51 cfs of 8.95 cfs potential flow)
- 2=Sharp-Crested Rectangular Weir (Weir Controls 2.51 cfs @ 2.42 fps)
- 3=Orifice/Grate ( Controls 0.00 cfs)

### Pond 10P: BIO BASIN 1

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Stage-Area-Storage for Pond 10P: BIO BASIN 1**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
109.00	2,682	0	111.65	5,454	10,761
109.05	2,737	135	111.70	5,514	11,035
109.10	2,793	274	111.75	5,574	11,313
109.15	2,848	415	111.80	5,634	11,593
109.20	2,903	559	111.85	5,694	11,876
109.25	2,959	705	111.90	5,753	12,162
109.30	3,014	854	111.95	5,813	12,451
109.35	3,069	1,007	112.00	5,873	12,744
109.40	3,125	1,161	112.05	6,031	13,041
109.45	3,180	1,319	112.10	6,189	13,347
109.50	3,236	1,479	112.15	6,347	13,660
109.55	3,291	1,643	112.20	6,505	13,981
109.60	3,346	1,808	112.25	6,663	14,311
109.65	3,402	1,977	112.30	6,821	14,648
109.70	3,457	2,149	112.35	6,979	14,993
109.75	3,512	2,323	112.40	7,137	15,346
109.80	3,568	2,500	112.45	7,295	15,706
109.85	3,623	2,680	112.50	<b>7,453</b>	<b>16,075</b>
109.90	3,678	2,862			
109.95	3,734	3,047			
110.00	3,789	3,236			
110.05	3,833	3,426			
110.10	3,878	3,619			
110.15	3,922	3,814			
110.20	3,967	4,011			
110.25	4,011	4,211			
110.30	4,055	4,412			
110.35	4,100	4,616			
110.40	4,144	4,822			
110.45	4,189	5,030			
110.50	4,233	5,241			
110.55	4,277	5,454			
110.60	4,322	5,669			
110.65	4,366	5,886			
110.70	4,411	6,105			
110.75	4,455	6,327			
110.80	4,499	6,551			
110.85	4,544	6,777			
110.90	4,588	7,005			
110.95	4,633	7,236			
111.00	4,677	7,469			
111.05	4,737	7,704			
111.10	4,797	7,942			
111.15	4,856	8,184			
111.20	4,916	8,428			
111.25	4,976	8,675			
111.30	5,036	8,925			
111.35	5,096	9,179			
111.40	5,155	9,435			
111.45	5,215	9,694			
111.50	5,275	9,957			
111.55	5,335	10,222			
111.60	5,395	10,490			

**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Pond 11P: BIO BASIN 2**

Inflow Area = 0.880 ac, 82.95% Impervious, Inflow Depth = 4.36" for 10-Year event  
 Inflow = 2.10 cfs @ 12.07 hrs, Volume= 0.320 af  
 Outflow = 1.31 cfs @ 12.57 hrs, Volume= 0.256 af, Atten= 38%, Lag= 30.1 min  
 Primary = 1.31 cfs @ 12.57 hrs, Volume= 0.256 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 110.71' @ 12.67 hrs Surf.Area= 4,015 sf Storage= 7,075 cf

Plug-Flow detention time= 305.1 min calculated for 0.255 af (80% of inflow)  
 Center-of-Mass det. time= 237.1 min ( 997.5 - 760.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.50'	15,574 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
108.50	2,430	0	0
109.00	2,763	1,298	1,298
110.00	3,471	3,117	4,415
111.00	4,237	3,854	8,269
112.00	5,059	4,648	12,917
112.50	5,569	2,657	15,574

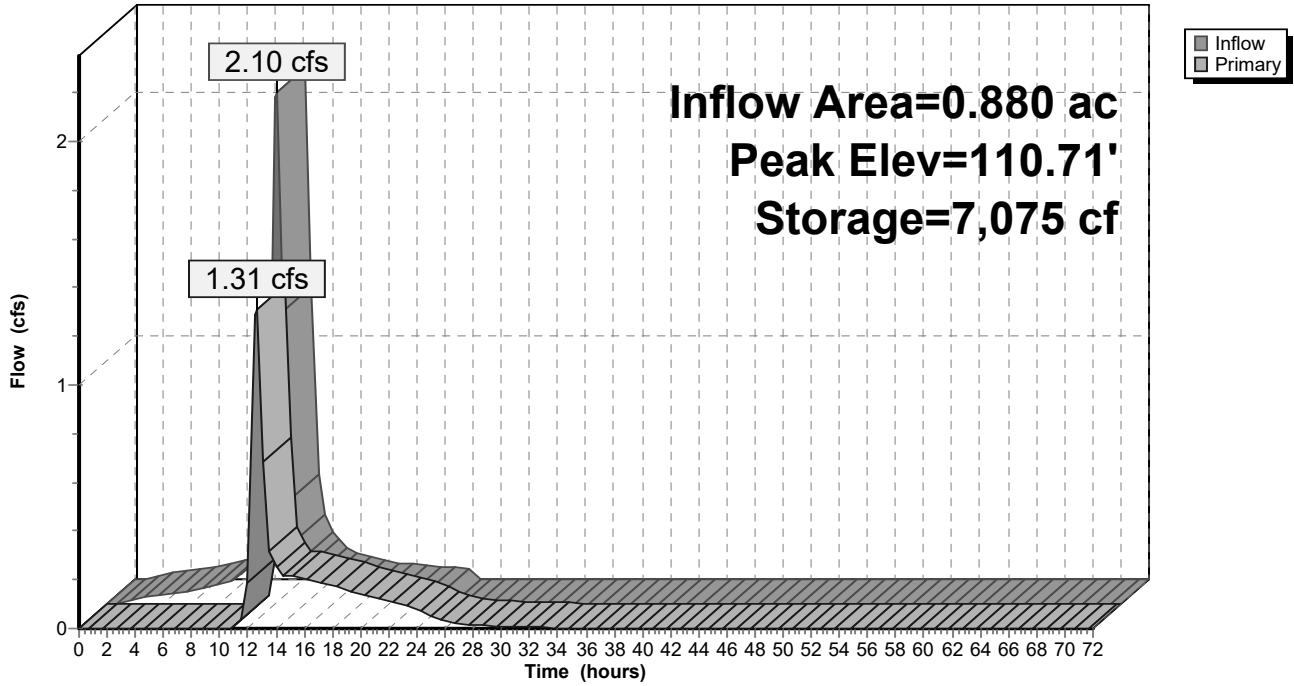
Device	Routing	Invert	Outlet Devices
#1	Primary	105.50'	<b>18.0" Round Culvert</b> L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 105.50' / 105.26' S= 0.0030 1' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	109.50'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	110.50'	<b>4.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s) 0.5' Crest Height
#4	Device 1	111.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=1.18 cfs @ 12.57 hrs HW=110.67' (Free Discharge)

- 1=Culvert (Passes 1.18 cfs of 17.57 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.24 cfs @ 4.92 fps)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 0.94 cfs @ 1.40 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)

### Pond 11P: BIO BASIN 2

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Stage-Area-Storage for Pond 11P: BIO BASIN 2**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
108.50	2,430	0	111.15	4,360	8,914
108.55	2,463	122	111.20	4,401	9,133
108.60	2,497	246	111.25	4,443	9,354
108.65	2,530	372	111.30	4,484	9,577
108.70	2,563	499	111.35	4,525	9,803
108.75	2,597	628	111.40	4,566	10,030
108.80	2,630	759	111.45	4,607	10,259
108.85	2,663	891	111.50	4,648	10,491
108.90	2,696	1,025	111.55	4,689	10,724
108.95	2,730	1,161	111.60	4,730	10,959
109.00	2,763	1,298	111.65	4,771	11,197
109.05	2,798	1,437	111.70	4,812	11,437
109.10	2,834	1,578	111.75	4,854	11,678
109.15	2,869	1,721	111.80	4,895	11,922
109.20	2,905	1,865	111.85	4,936	12,168
109.25	2,940	2,011	111.90	4,977	12,415
109.30	2,975	2,159	111.95	5,018	12,665
109.35	3,011	2,309	112.00	5,059	12,917
109.40	3,046	2,460	112.05	5,110	13,171
109.45	3,082	2,613	112.10	5,161	13,428
109.50	3,117	2,768	112.15	5,212	13,688
109.55	3,152	2,925	112.20	5,263	13,949
109.60	3,188	3,083	112.25	5,314	14,214
109.65	3,223	3,244	112.30	5,365	14,481
109.70	3,259	3,406	112.35	5,416	14,750
109.75	3,294	3,570	112.40	5,467	15,022
109.80	3,329	3,735	112.45	5,518	15,297
109.85	3,365	3,903	112.50	<b>5,569</b>	<b>15,574</b>
109.90	3,400	4,072			
109.95	3,436	4,243			
110.00	3,471	4,415			
110.05	3,509	4,590			
110.10	3,548	4,766			
110.15	3,586	4,945			
110.20	3,624	5,125			
110.25	3,663	5,307			
110.30	3,701	5,491			
110.35	3,739	5,677			
110.40	3,777	5,865			
110.45	3,816	6,055			
110.50	3,854	6,247			
110.55	3,892	6,440			
110.60	3,931	6,636			
110.65	3,969	6,833			
110.70	4,007	7,033			
110.75	4,046	7,234			
110.80	4,084	7,437			
110.85	4,122	7,642			
110.90	4,160	7,849			
110.95	4,199	8,058			
111.00	4,237	8,269			
111.05	4,278	8,482			
111.10	4,319	8,697			



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Pond 12P: PERV. PVMT-West**

Inflow Area = 0.580 ac, 100.00% Impervious, Inflow Depth = 4.77" for 10-Year event  
 Inflow = 1.29 cfs @ 12.12 hrs, Volume= 0.231 af  
 Outflow = 0.72 cfs @ 13.01 hrs, Volume= 0.231 af, Atten= 44%, Lag= 53.0 min  
 Primary = 0.72 cfs @ 13.01 hrs, Volume= 0.231 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 110.13' @ 13.01 hrs Surf.Area= 0.130 ac Storage= 0.098 af

Plug-Flow detention time= 214.6 min calculated for 0.229 af (99% of inflow)  
 Center-of-Mass det. time= 219.1 min ( 1,000.4 - 781.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.25'	0.159 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.396 af Overall x 40.0% Voids

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
108.25	0.130	0.000	0.000
111.30	0.130	0.396	0.396

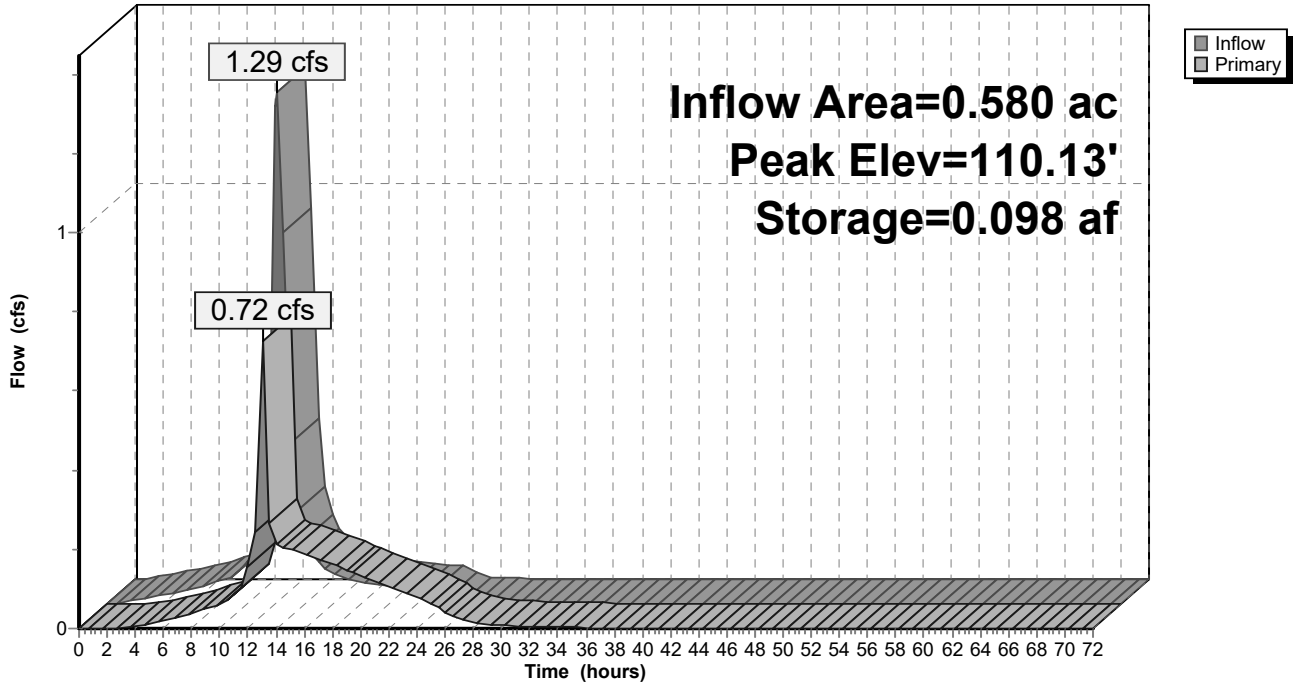
Device	Routing	Invert	Outlet Devices
#1	Primary	108.25'	<b>12.0" Round RCP_Round 12"</b> L= 19.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 108.25' / 108.20' S= 0.0026 ' S= 0.0026 ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	108.25'	<b>2.5" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	109.95'	<b>2.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s) 0.5' Crest Height
#4	Primary	110.95'	<b>48.0" x 48.0" Horiz. Orifice/Grate-Overflow</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=0.72 cfs @ 13.01 hrs HW=110.13' (Free Discharge)

- 1=RCP\_Round 12" (Passes 0.72 cfs of 4.37 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.22 cfs @ 6.41 fps)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 0.50 cfs @ 1.43 fps)
- 4=Orifice/Grate-Overflow ( Controls 0.00 cfs)

Pond 12P: PERV. PVMT-West

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Stage-Area-Storage for Pond 12P: PERV. PVMT-West**

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
108.25	<b>0.130</b>	0.000	110.90	0.130	0.138
108.30	0.130	0.003	110.95	0.130	0.140
108.35	0.130	0.005	111.00	0.130	0.143
108.40	0.130	0.008	111.05	0.130	0.146
108.45	0.130	0.010	111.10	0.130	0.148
108.50	0.130	0.013	111.15	0.130	0.151
108.55	0.130	0.016	111.20	0.130	0.153
108.60	0.130	0.018	111.25	0.130	0.156
108.65	0.130	0.021	111.30	0.130	<b>0.159</b>
108.70	0.130	0.023			
108.75	0.130	0.026			
108.80	0.130	0.029			
108.85	0.130	0.031			
108.90	0.130	0.034			
108.95	0.130	0.036			
109.00	0.130	0.039			
109.05	0.130	0.042			
109.10	0.130	0.044			
109.15	0.130	0.047			
109.20	0.130	0.049			
109.25	0.130	0.052			
109.30	0.130	0.055			
109.35	0.130	0.057			
109.40	0.130	0.060			
109.45	0.130	0.062			
109.50	0.130	0.065			
109.55	0.130	0.068			
109.60	0.130	0.070			
109.65	0.130	0.073			
109.70	0.130	0.075			
109.75	0.130	0.078			
109.80	0.130	0.081			
109.85	0.130	0.083			
109.90	0.130	0.086			
109.95	0.130	0.088			
110.00	0.130	0.091			
110.05	0.130	0.094			
110.10	0.130	0.096			
110.15	0.130	0.099			
110.20	0.130	0.101			
110.25	0.130	0.104			
110.30	0.130	0.107			
110.35	0.130	0.109			
110.40	0.130	0.112			
110.45	0.130	0.114			
110.50	0.130	0.117			
110.55	0.130	0.120			
110.60	0.130	0.122			
110.65	0.130	0.125			
110.70	0.130	0.127			
110.75	0.130	0.130			
110.80	0.130	0.133			
110.85	0.130	0.135			

**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Pond 27P: PERV. PVMT-East**

Inflow Area = 0.190 ac, 100.00% Impervious, Inflow Depth = 4.77" for 10-Year event  
 Inflow = 0.49 cfs @ 12.07 hrs, Volume= 0.076 af  
 Outflow = 0.37 cfs @ 12.46 hrs, Volume= 0.076 af, Atten= 25%, Lag= 23.7 min  
 Primary = 0.37 cfs @ 12.46 hrs, Volume= 0.076 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 109.21' @ 12.46 hrs Surf.Area= 0.130 ac Storage= 0.016 af

Plug-Flow detention time= 94.1 min calculated for 0.076 af (100% of inflow)  
 Center-of-Mass det. time= 89.7 min ( 841.6 - 752.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.90'	0.135 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.338 af Overall x 40.0% Voids

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
108.90	0.130	0.000	0.000
111.50	0.130	0.338	0.338

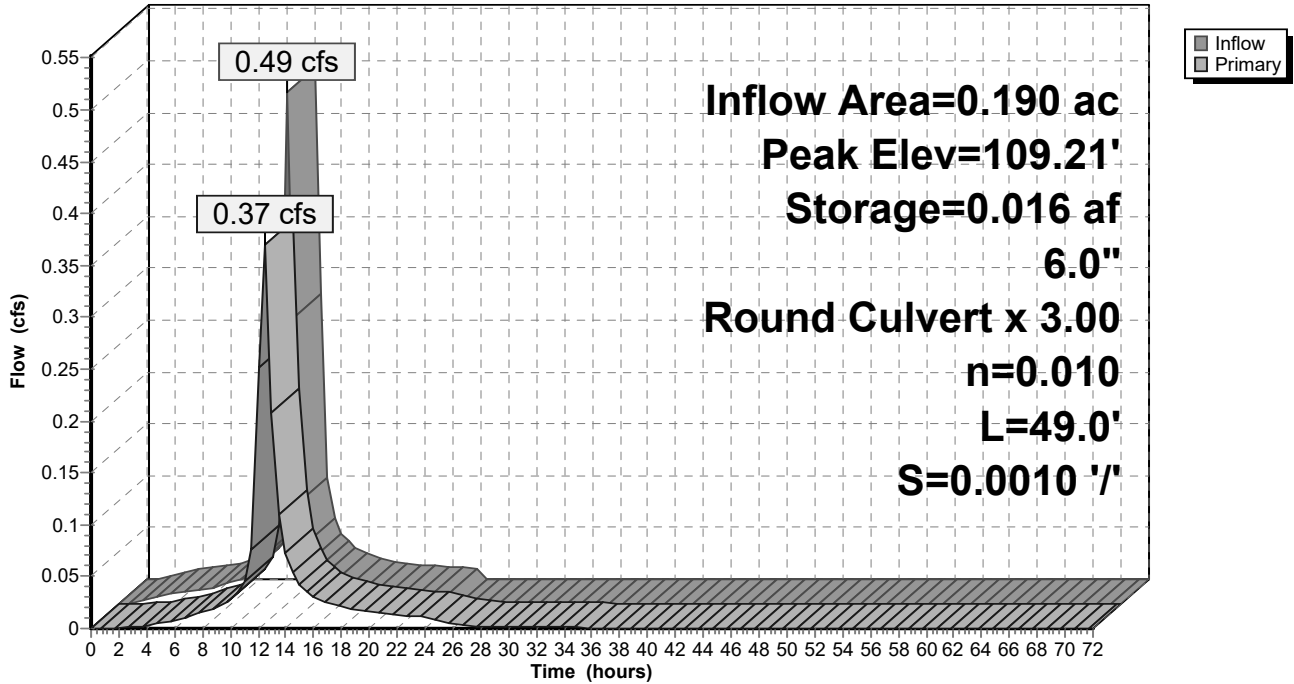
Device	Routing	Invert	Outlet Devices
#1	Primary	108.90'	<b>6.0" Round Culvert X 3.00</b> L= 49.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 108.90' / 108.85' S= 0.0010 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=0.36 cfs @ 12.46 hrs HW=109.21' (Free Discharge)

↑1=Culvert (Barrel Controls 0.36 cfs @ 1.36 fps)

**Pond 27P: PERV. PVMT-East**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Stage-Area-Storage for Pond 27P: PERV. PVMT-East**

Elevation (feet)	Surface (acres)	Storage (acre-feet)
108.90	<b>0.130</b>	0.000
108.95	0.130	0.003
109.00	0.130	0.005
109.05	0.130	0.008
109.10	0.130	0.010
109.15	0.130	0.013
109.20	0.130	0.016
109.25	0.130	0.018
109.30	0.130	0.021
109.35	0.130	0.023
109.40	0.130	0.026
109.45	0.130	0.029
109.50	0.130	0.031
109.55	0.130	0.034
109.60	0.130	0.036
109.65	0.130	0.039
109.70	0.130	0.042
109.75	0.130	0.044
109.80	0.130	0.047
109.85	0.130	0.049
109.90	0.130	0.052
109.95	0.130	0.055
110.00	0.130	0.057
110.05	0.130	0.060
110.10	0.130	0.062
110.15	0.130	0.065
110.20	0.130	0.068
110.25	0.130	0.070
110.30	0.130	0.073
110.35	0.130	0.075
110.40	0.130	0.078
110.45	0.130	0.081
110.50	0.130	0.083
110.55	0.130	0.086
110.60	0.130	0.088
110.65	0.130	0.091
110.70	0.130	0.094
110.75	0.130	0.096
110.80	0.130	0.099
110.85	0.130	0.101
110.90	0.130	0.104
110.95	0.130	0.107
111.00	0.130	0.109
111.05	0.130	0.112
111.10	0.130	0.114
111.15	0.130	0.117
111.20	0.130	0.120
111.25	0.130	0.122
111.30	0.130	0.125
111.35	0.130	0.127
111.40	0.130	0.130
111.45	0.130	0.133
111.50	0.130	<b>0.135</b>

**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Pond 29P: PERV. PVMT-Rear**

Inflow Area = 0.220 ac, 63.64% Impervious, Inflow Depth = 3.90" for 10-Year event  
 Inflow = 0.47 cfs @ 12.08 hrs, Volume= 0.072 af  
 Outflow = 0.31 cfs @ 12.55 hrs, Volume= 0.071 af, Atten= 33%, Lag= 28.0 min  
 Primary = 0.31 cfs @ 12.55 hrs, Volume= 0.071 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 111.28' @ 12.54 hrs Surf.Area= 0.107 ac Storage= 0.018 af

Plug-Flow detention time= 89.6 min calculated for 0.071 af (99% of inflow)  
 Center-of-Mass det. time= 98.5 min ( 870.8 - 772.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	110.85'	0.053 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.134 af Overall x 40.0% Voids

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
110.85	0.107	0.000	0.000
112.10	0.107	0.134	0.134

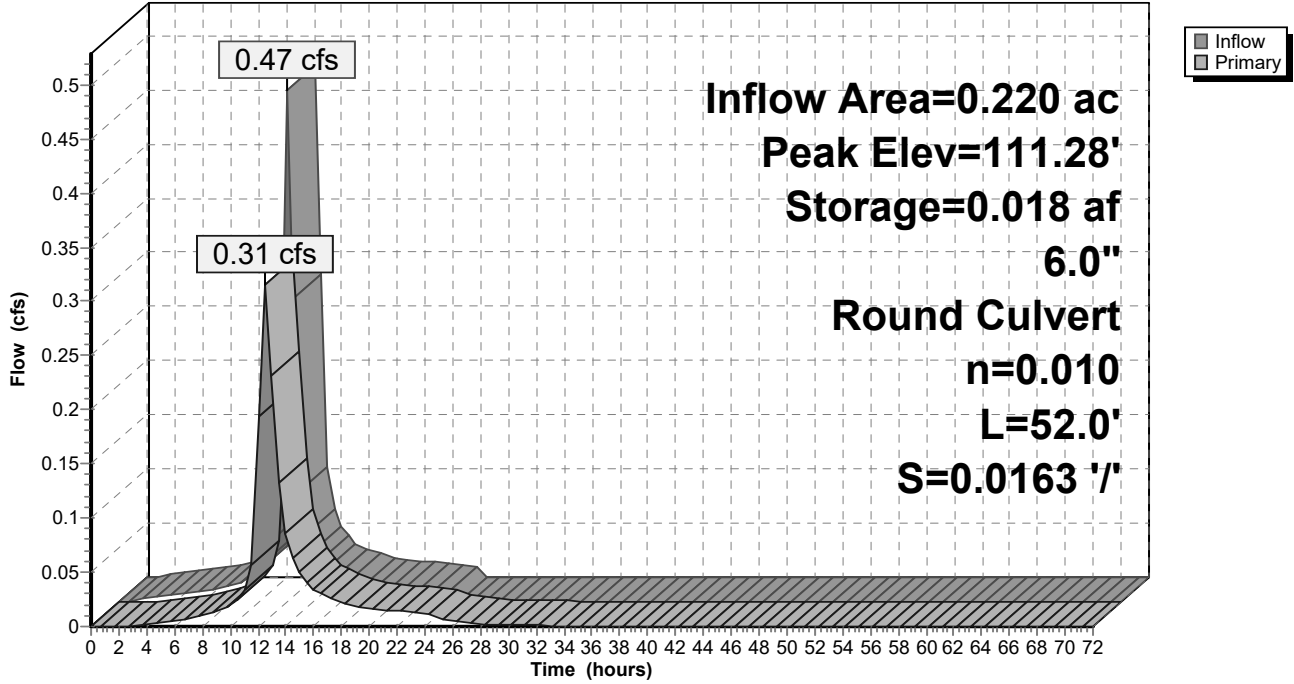
Device	Routing	Invert	Outlet Devices
#1	Primary	110.85'	<b>6.0" Round Culvert</b> L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 110.85' / 110.00' S= 0.0163 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=0.31 cfs @ 12.55 hrs HW=111.27' (Free Discharge)

↑1=Culvert (Inlet Controls 0.31 cfs @ 1.74 fps)

**Pond 29P: PERV. PVMT-Rear**

Hydrograph





**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Stage-Area-Storage for Pond 29P: PERV. PVMT-Rear**

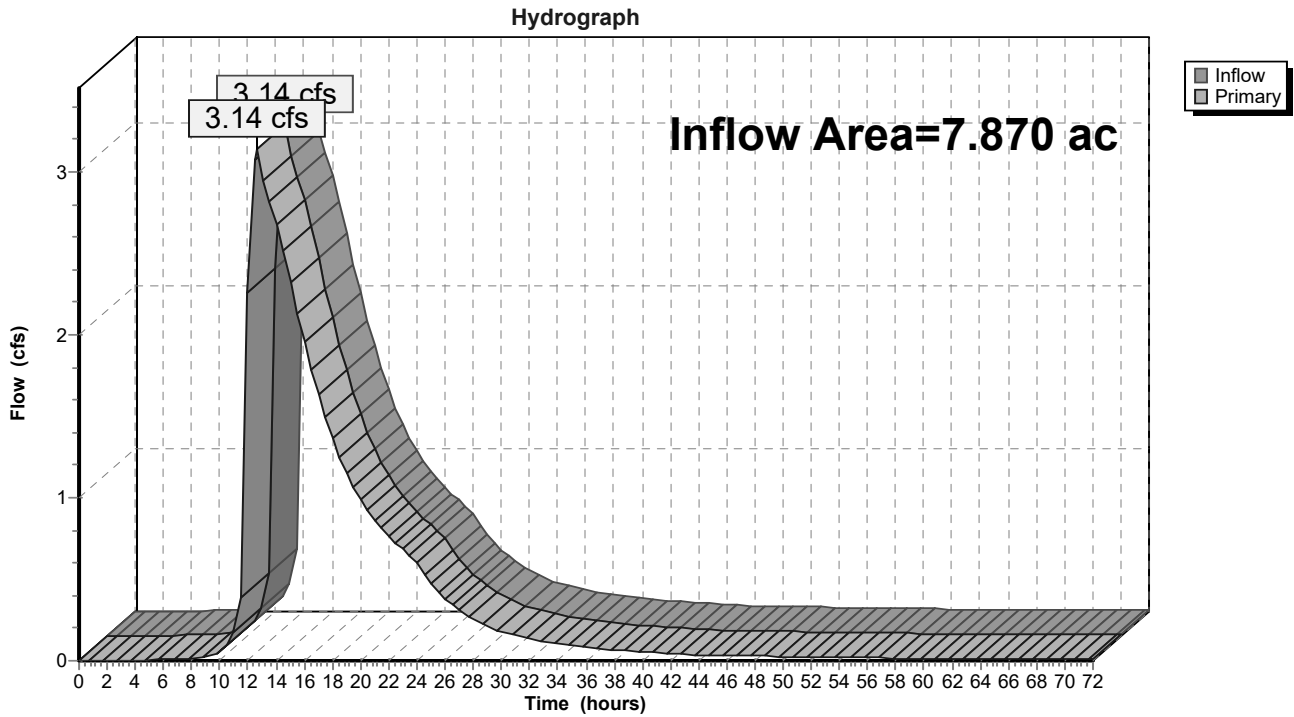
Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
110.85	<b>0.107</b>	0.000	111.91	0.107	0.045
110.87	0.107	0.001	111.93	0.107	0.046
110.89	0.107	0.002	111.95	0.107	0.047
110.91	0.107	0.003	111.97	0.107	0.048
110.93	0.107	0.003	111.99	0.107	0.049
110.95	0.107	0.004	112.01	0.107	0.050
110.97	0.107	0.005	112.03	0.107	0.051
110.99	0.107	0.006	112.05	0.107	0.051
111.01	0.107	0.007	112.07	0.107	0.052
111.03	0.107	0.008	112.09	0.107	<b>0.053</b>
111.05	0.107	0.009			
111.07	0.107	0.009			
111.09	0.107	0.010			
111.11	0.107	0.011			
111.13	0.107	0.012			
111.15	0.107	0.013			
111.17	0.107	0.014			
111.19	0.107	0.015			
111.21	0.107	0.015			
111.23	0.107	0.016			
111.25	0.107	0.017			
111.27	0.107	0.018			
111.29	0.107	0.019			
111.31	0.107	0.020			
111.33	0.107	0.021			
111.35	0.107	0.021			
111.37	0.107	0.022			
111.39	0.107	0.023			
111.41	0.107	0.024			
111.43	0.107	0.025			
111.45	0.107	0.026			
111.47	0.107	0.027			
111.49	0.107	0.027			
111.51	0.107	0.028			
111.53	0.107	0.029			
111.55	0.107	0.030			
111.57	0.107	0.031			
111.59	0.107	0.032			
111.61	0.107	0.033			
111.63	0.107	0.033			
111.65	0.107	0.034			
111.67	0.107	0.035			
111.69	0.107	0.036			
111.71	0.107	0.037			
111.73	0.107	0.038			
111.75	0.107	0.039			
111.77	0.107	0.039			
111.79	0.107	0.040			
111.81	0.107	0.041			
111.83	0.107	0.042			
111.85	0.107	0.043			
111.87	0.107	0.044			
111.89	0.107	0.045			

### Summary for Link 9L: BASIN DISCHARGES

Inflow Area = 7.870 ac, 36.59% Impervious, Inflow Depth > 2.98" for 10-Year event  
Inflow = 3.14 cfs @ 12.68 hrs, Volume= 1.956 af  
Primary = 3.14 cfs @ 12.68 hrs, Volume= 1.956 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 9L: BASIN DISCHARGES



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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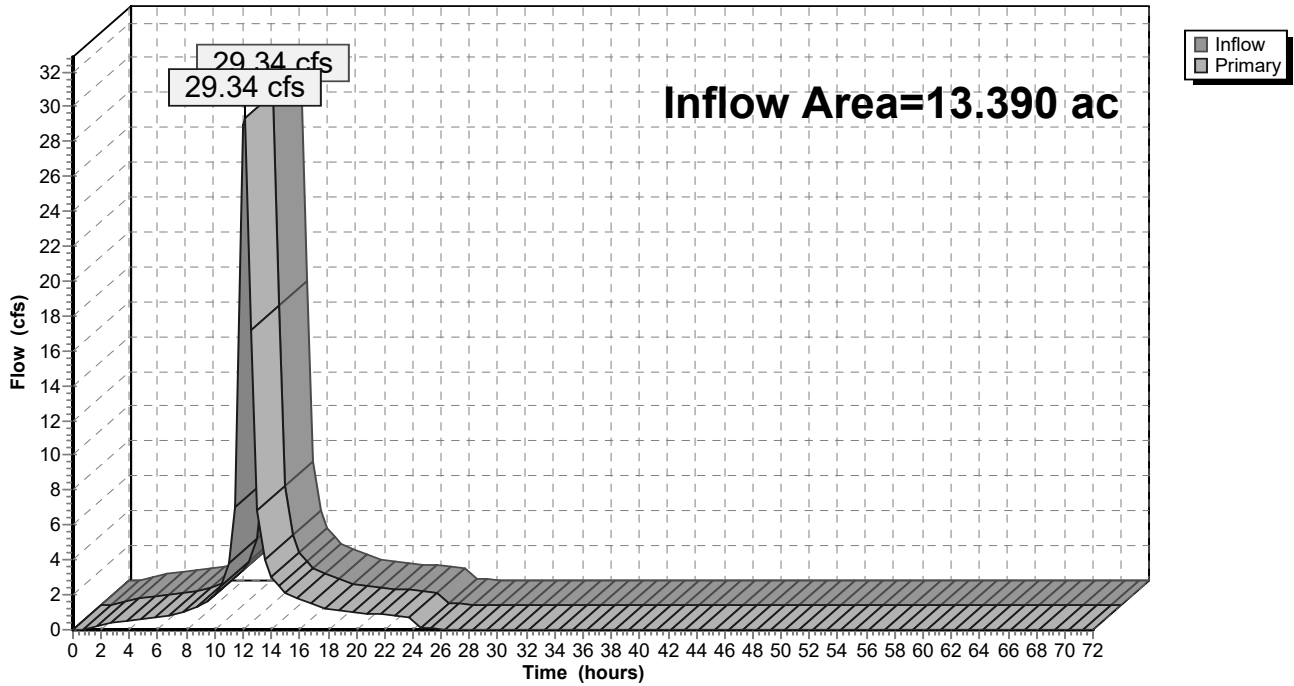
**Summary for Link 20L: PDA-1A TOTAL**

Inflow Area = 13.390 ac, 75.35% Impervious, Inflow Depth = 4.18" for 10-Year event  
Inflow = 29.34 cfs @ 12.08 hrs, Volume= 4.666 af  
Primary = 29.34 cfs @ 12.08 hrs, Volume= 4.666 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

**Link 20L: PDA-1A TOTAL**

Hydrograph



**Pre vs Post 211020**

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NOAA 24-hr C 10-Year Rainfall=5.01"

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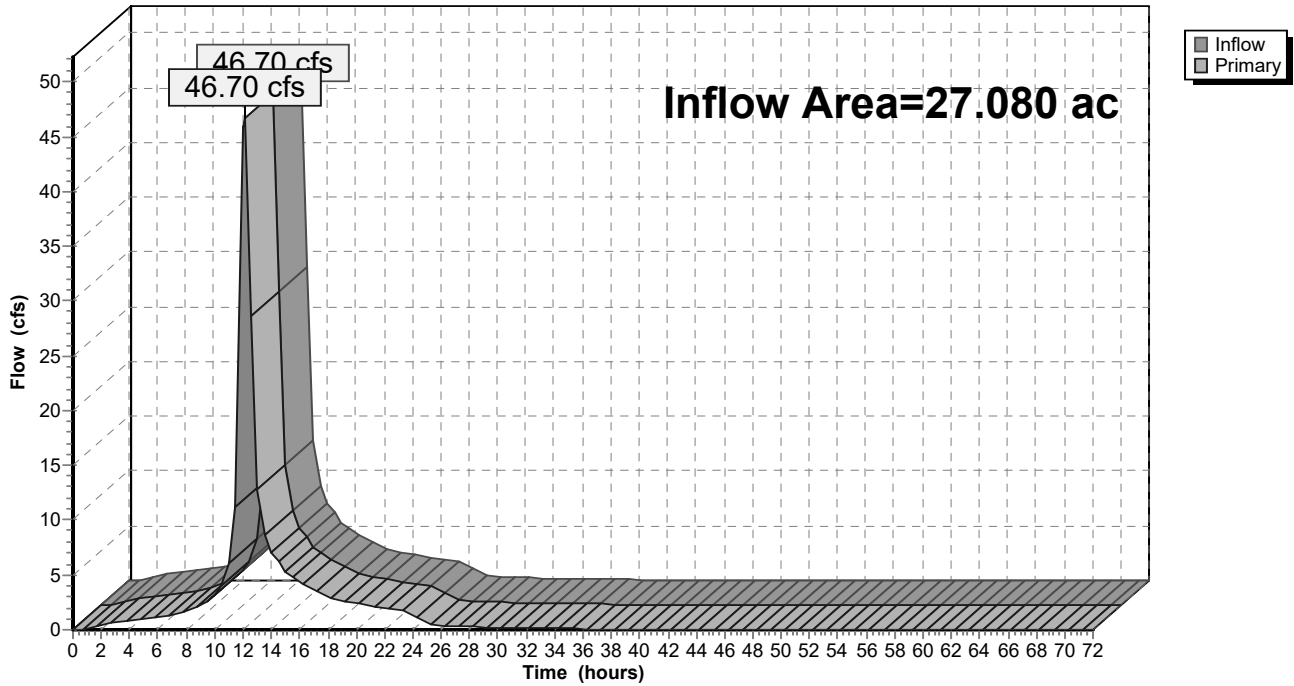
**Summary for Link 22L: PROP. POI-1**

Inflow Area = 27.080 ac, 68.87% Impervious, Inflow Depth > 3.95" for 10-Year event  
Inflow = 46.70 cfs @ 12.08 hrs, Volume= 8.905 af  
Primary = 46.70 cfs @ 12.08 hrs, Volume= 8.905 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

**Link 22L: PROP. POI-1**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 10-Year Rainfall=5.01"

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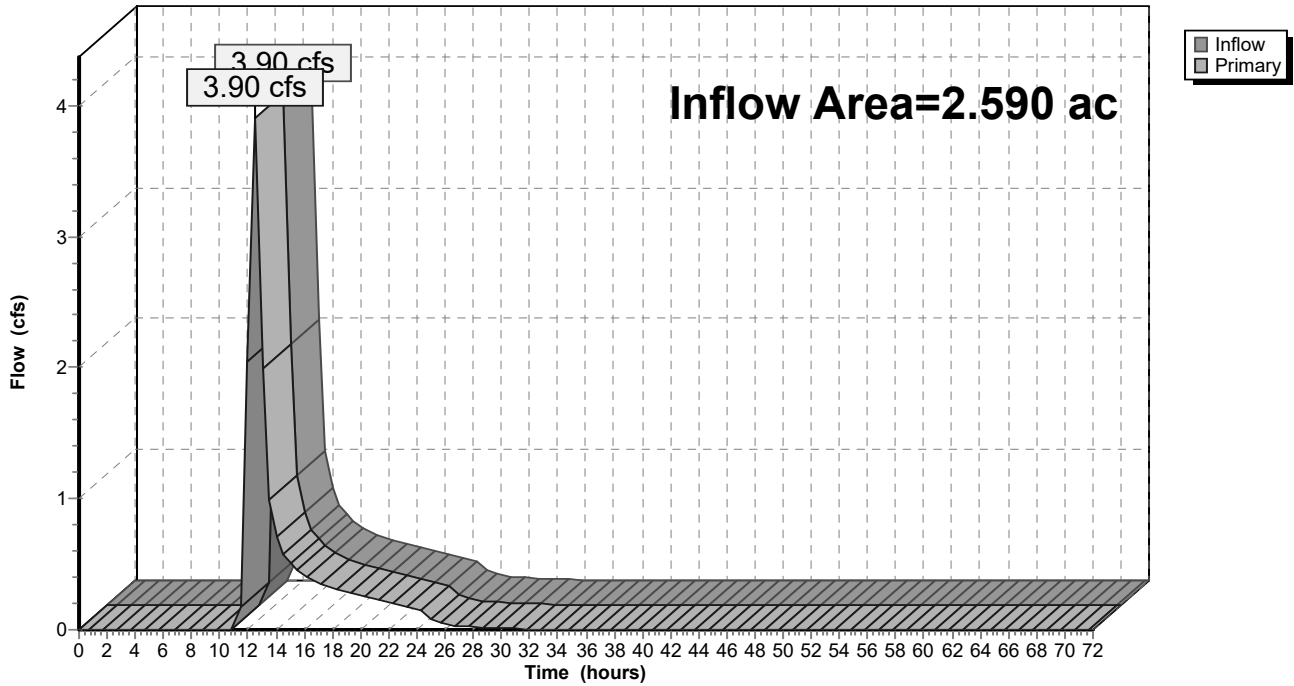
**Summary for Link 28L: MH 101**

Inflow Area = 2.590 ac, 60.23% Impervious, Inflow Depth = 3.15" for 10-Year event  
Inflow = 3.90 cfs @ 12.50 hrs, Volume= 0.681 af  
Primary = 3.90 cfs @ 12.50 hrs, Volume= 0.681 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

**Link 28L: MH 101**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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Time span=0.00-72.00 hrs, dt=0.50 hrs, 145 points  
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment9S: PDA-3 (POI-3)</b>	Runoff Area=0.880 ac 0.00% Impervious Runoff Depth=2.92" Flow Length=291' Tc=15.2 min CN=70/0 Runoff=1.37 cfs 0.214 af
<b>Subcatchment11S: PDA-2 (POI-2)</b>	Runoff Area=1.770 ac 0.00% Impervious Runoff Depth=2.92" Flow Length=609' Tc=19.6 min CN=70/0 Runoff=2.99 cfs 0.431 af
<b>Subcatchment16S: PDA-1A-b</b>	Runoff Area=0.390 ac 100.00% Impervious Runoff Depth=5.91" Tc=10.0 min CN=0/98 Runoff=1.25 cfs 0.192 af
<b>Subcatchment17S: PDA-1B-a</b>	Runoff Area=1.490 ac 46.31% Impervious Runoff Depth=4.46" Tc=10.0 min CN=73/98 Runoff=3.70 cfs 0.554 af
<b>Subcatchment18S: PDA-1B-b</b>	Runoff Area=0.880 ac 82.95% Impervious Runoff Depth=5.47" Tc=10.0 min CN=74/98 Runoff=2.62 cfs 0.401 af
<b>Subcatchment23S: EXIST. OFF-SITE</b>	Runoff Area=0.140 ac 0.00% Impervious Runoff Depth=2.92" Flow Length=189' Slope=0.0200 '/' Tc=9.3 min CN=70/0 Runoff=0.24 cfs 0.034 af
<b>Subcatchment24S: PDA-1B-c</b>	Runoff Area=4.130 ac 31.96% Impervious Runoff Depth=4.14" Tc=10.0 min CN=74/98 Runoff=9.66 cfs 1.426 af
<b>Subcatchment25S: PDA-1A-c</b>	Runoff Area=12.810 ac 74.24% Impervious Runoff Depth=5.24" Tc=10.0 min CN=74/98 Runoff=36.76 cfs 5.596 af
<b>Subcatchment27S: PDA-1B-d</b>	Runoff Area=0.220 ac 63.64% Impervious Runoff Depth=4.97" Tc=10.0 min CN=74/98 Runoff=0.60 cfs 0.091 af
<b>Subcatchment28S: PDA-1A-a</b>	Runoff Area=0.190 ac 100.00% Impervious Runoff Depth=5.91" Tc=10.0 min CN=0/98 Runoff=0.61 cfs 0.094 af
<b>Subcatchment30S: PDA-1C</b>	Runoff Area=1.150 ac 0.00% Impervious Runoff Depth=3.31" Tc=10.0 min CN=74/0 Runoff=2.23 cfs 0.317 af
<b>Subcatchment31S: PDA-1B-c (Roof)</b>	Runoff Area=5.680 ac 100.00% Impervious Runoff Depth=5.91" Tc=10.0 min CN=0/98 Runoff=18.15 cfs 2.798 af
<b>Pond 2P: Ex. Detention Basin</b>	Peak Elev=105.90' Storage=49,686 cf Inflow=13.48 cfs 2.334 af Primary=0.76 cfs 0.594 af Secondary=2.54 cfs 1.708 af Tertiary=0.00 cfs 0.000 af Outflow=3.30 cfs 2.301 af
<b>Pond 10P: BIO BASIN 1</b>	Peak Elev=110.68' Storage=6,031 cf Inflow=3.99 cfs 0.645 af Outflow=3.43 cfs 0.571 af
<b>Pond 11P: BIO BASIN 2</b>	Peak Elev=110.80' Storage=7,454 cf Inflow=2.62 cfs 0.401 af Outflow=2.58 cfs 0.337 af
<b>Pond 12P: PERV. PVMT-West</b>	Peak Elev=110.24' Storage=0.104 af Inflow=1.60 cfs 0.286 af Outflow=1.00 cfs 0.286 af

**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Pond 27P: PERV. PVMT-East** Peak Elev=109.25' Storage=0.018 af Inflow=0.61 cfs 0.094 af  
6.0" Round Culvert x 3.00 n=0.010 L=49.0' S=0.0010 '/' Outflow=0.46 cfs 0.094 af

**Pond 29P: PERV. PVMT-Rear** Peak Elev=111.37' Storage=0.022 af Inflow=0.60 cfs 0.091 af  
6.0" Round Culvert n=0.010 L=52.0' S=0.0163 '/' Outflow=0.39 cfs 0.091 af

**Link 9L: BASIN DISCHARGES** Inflow=4.28 cfs 2.619 af  
Primary=4.28 cfs 2.619 af

**Link 20L: PDA-1A TOTAL** Inflow=37.01 cfs 5.881 af  
Primary=37.01 cfs 5.881 af

**Link 22L: PROP. POI-1** Inflow=59.15 cfs 11.332 af  
Primary=59.15 cfs 11.332 af

**Link 28L: MH 101** Inflow=5.98 cfs 0.908 af  
Primary=5.98 cfs 0.908 af

**Total Runoff Area = 29.730 ac Runoff Volume = 12.149 af Average Runoff Depth = 4.90"**  
**37.27% Pervious = 11.080 ac 62.73% Impervious = 18.650 ac**

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**Summary for Subcatchment 9S: PDA-3 (POI-3)**

Runoff = 1.37 cfs @ 12.35 hrs, Volume= 0.214 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

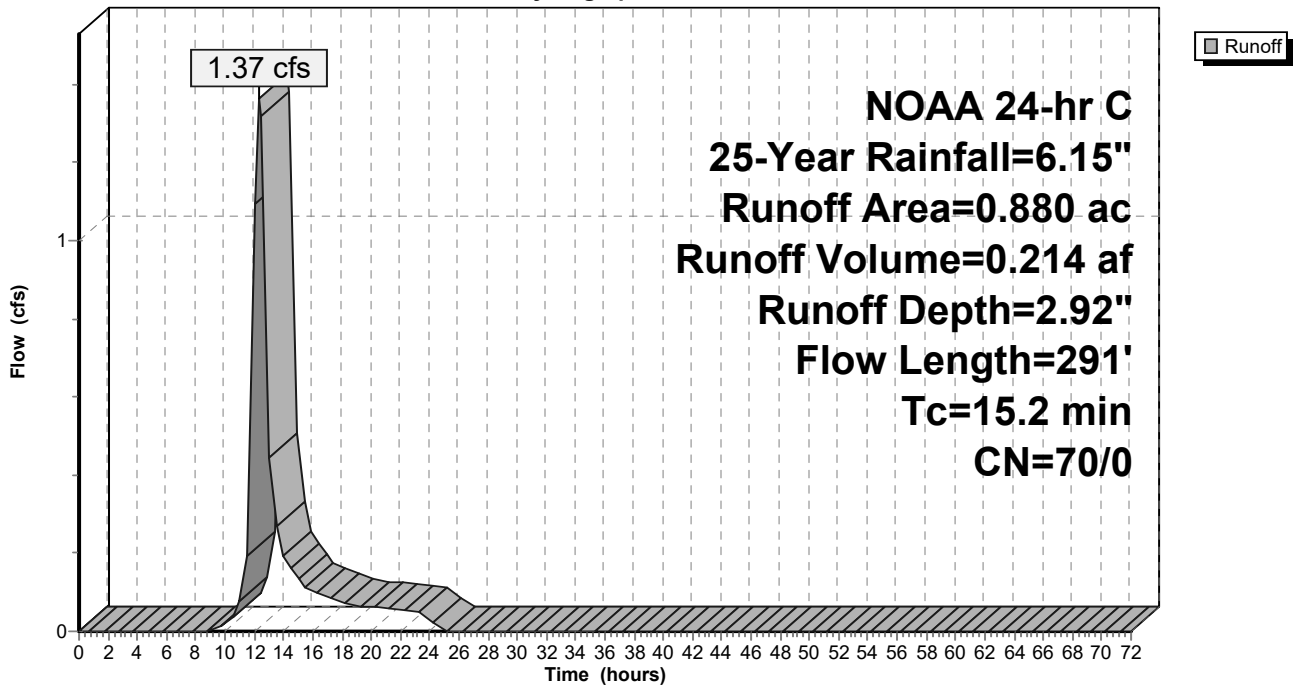
Area (ac)	CN	Description
0.880	70	Woods, Good, HSG C
0.880	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	9	0.0050	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
9.9	282	0.0090	0.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.2	291	Total			

**Subcatchment 9S: PDA-3 (POI-3)**

Hydrograph





**Pre vs Post\_211020**

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**Summary for Subcatchment 11S: PDA-2 (POI-2)**

Runoff = 2.99 cfs @ 12.44 hrs, Volume= 0.431 af, Depth= 2.92"

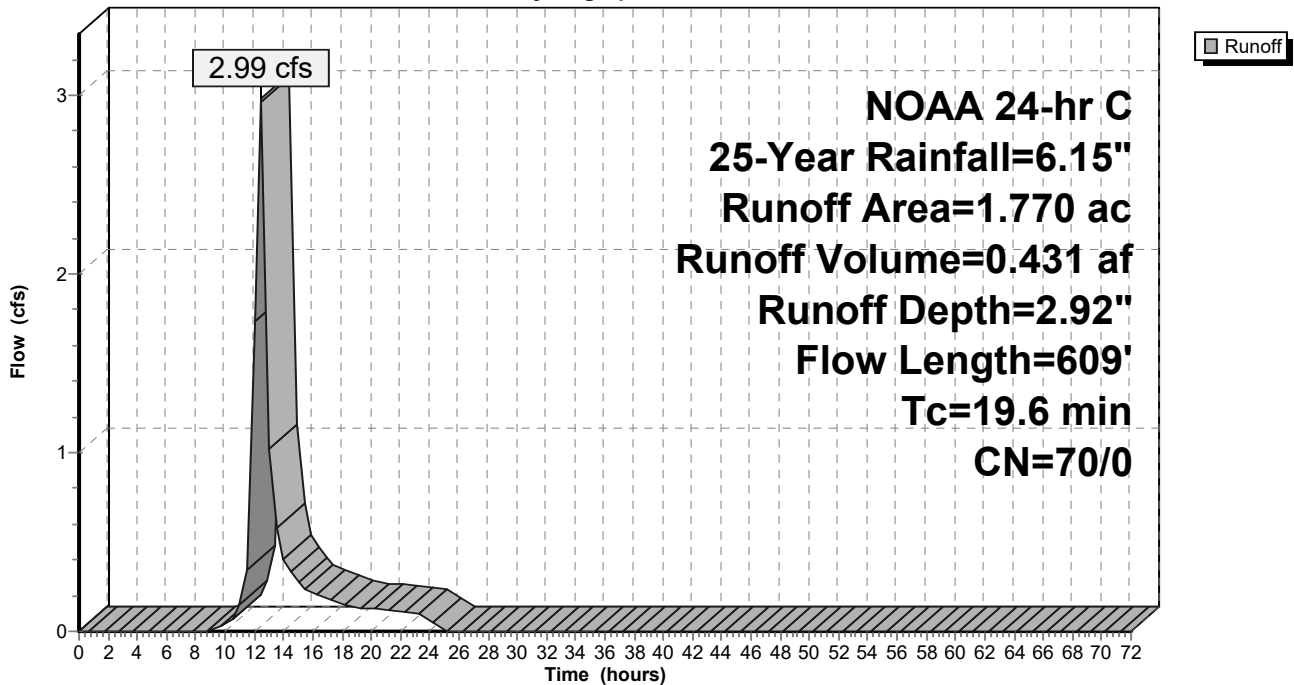
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

Area (ac)	CN	Description
1.770	70	Woods, Good, HSG C
1.770	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	17	0.0180	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
14.3	592	0.0190	0.69		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
19.6	609	Total			

**Subcatchment 11S: PDA-2 (POI-2)**

Hydrograph



**Pre vs Post\_211020**

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**Summary for Subcatchment 16S: PDA-1A-b**

Runoff = 1.25 cfs @ 12.06 hrs, Volume= 0.192 af, Depth= 5.91"

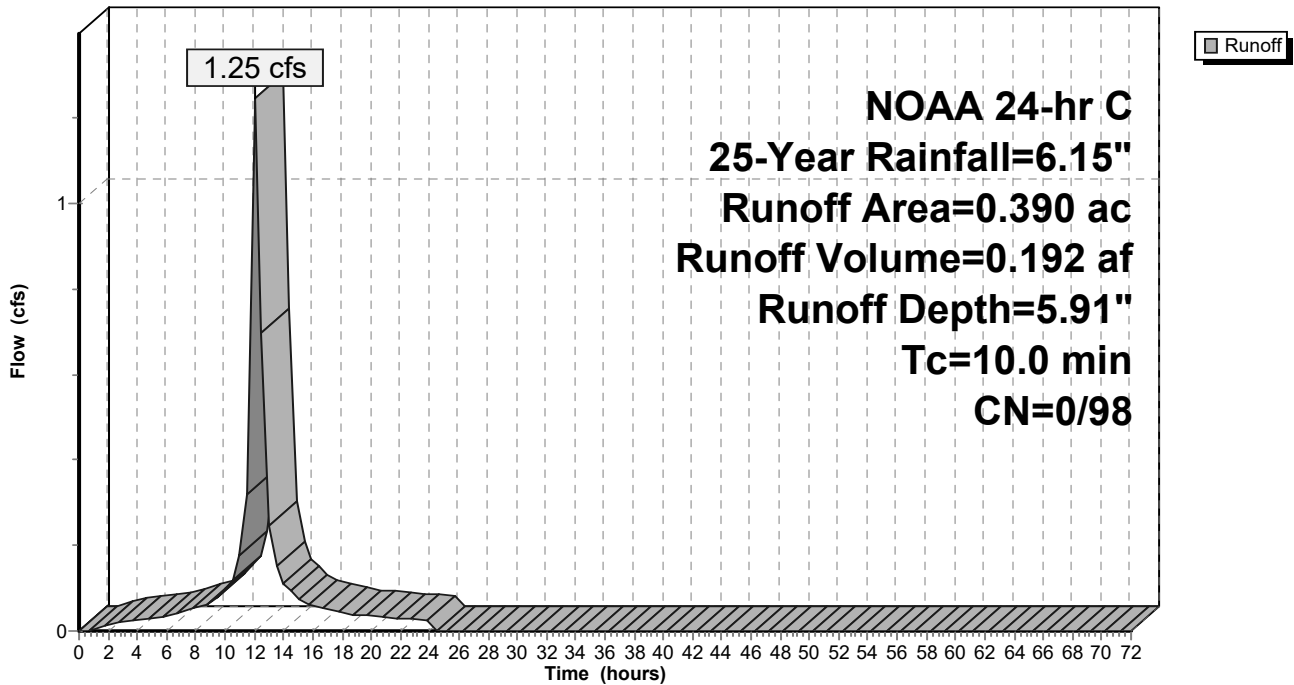
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

Area (ac)	CN	Description
0.390	98	Paved parking, HSG C
0.390	98	100.00% Impervious Area

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

**Subcatchment 16S: PDA-1A-b**

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Subcatchment 17S: PDA-1B-a**

Runoff = 3.70 cfs @ 12.08 hrs, Volume= 0.554 af, Depth= 4.46"

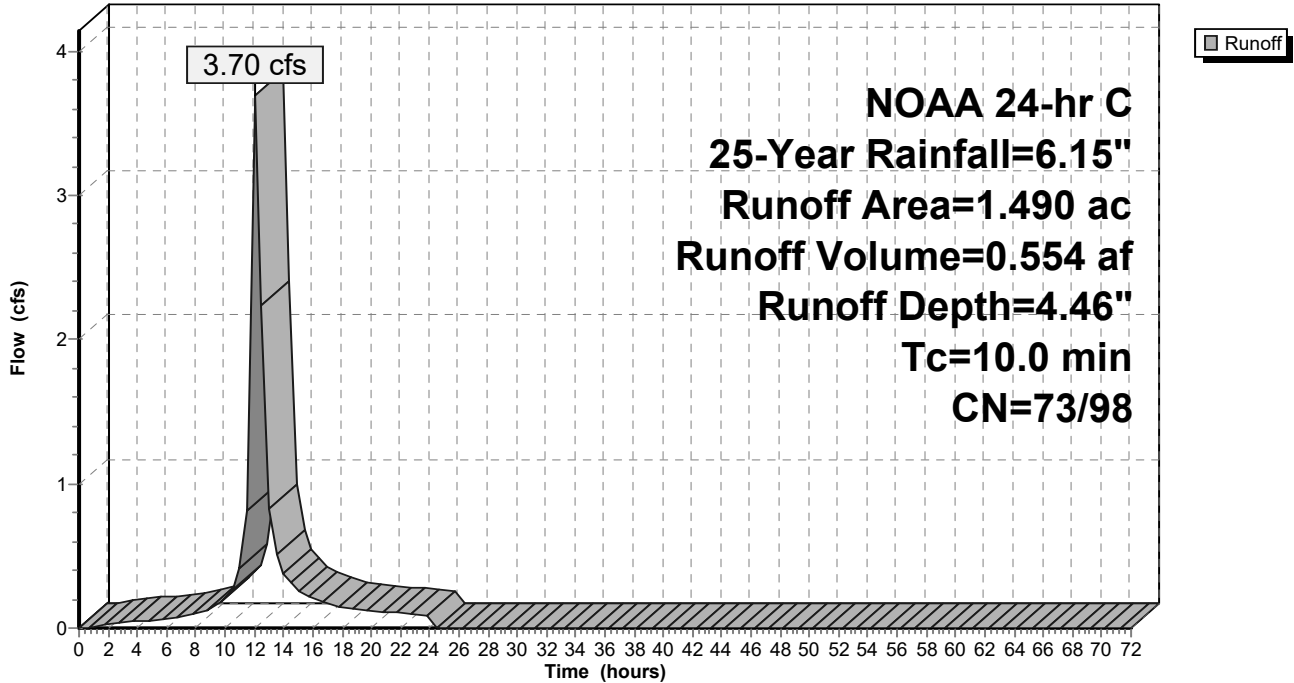
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

Area (ac)	CN	Description
0.270	70	Woods, Good, HSG C
0.690	98	Paved parking, HSG C
0.530	74	>75% Grass cover, Good, HSG C
1.490	84	Weighted Average
0.800	73	53.69% Pervious Area
0.690	98	46.31% Impervious Area

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

**Subcatchment 17S: PDA-1B-a**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Subcatchment 18S: PDA-1B-b**

Runoff = 2.62 cfs @ 12.07 hrs, Volume= 0.401 af, Depth= 5.47"

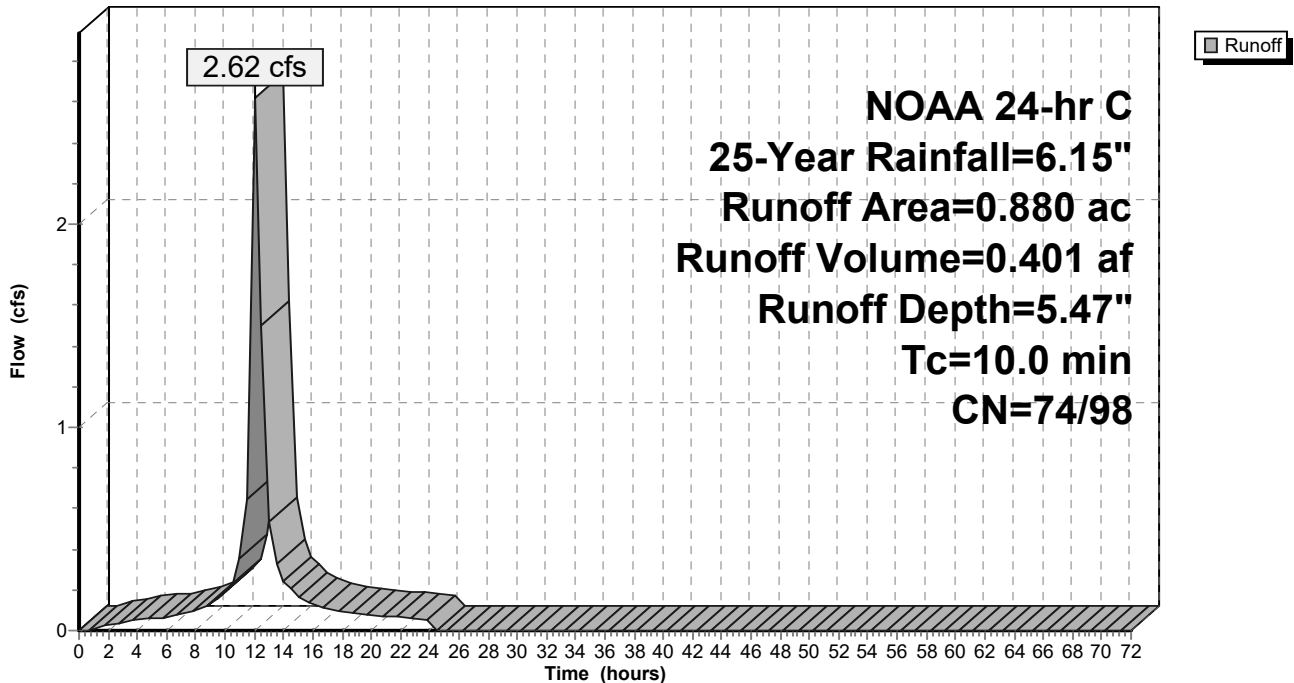
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

Area (ac)	CN	Description
0.730	98	Paved parking, HSG C
0.150	74	>75% Grass cover, Good, HSG C
0.880	94	Weighted Average
0.150	74	17.05% Pervious Area
0.730	98	82.95% Impervious Area

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

**Subcatchment 18S: PDA-1B-b**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Subcatchment 23S: EXIST. OFF-SITE**

Runoff = 0.24 cfs @ 12.11 hrs, Volume= 0.034 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

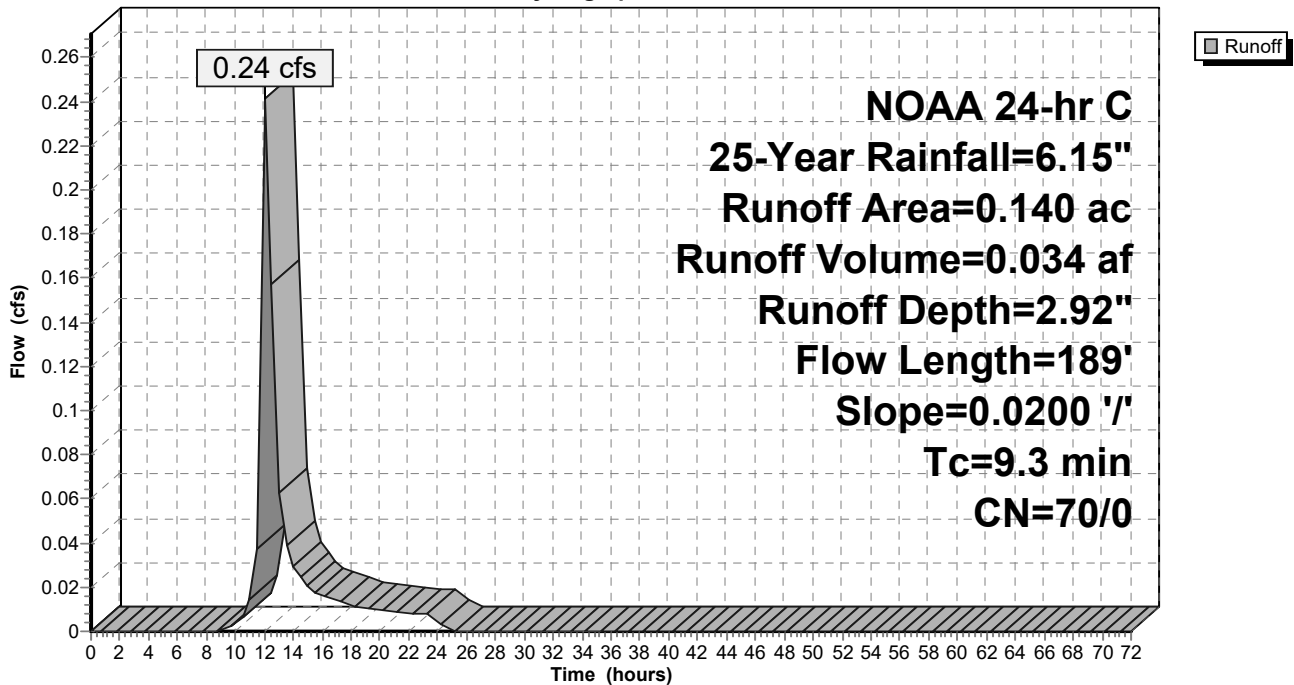
Area (ac)	CN	Description
0.140	70	Woods, Good, HSG C
0.140	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	18	0.0200	0.06		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
4.0	171	0.0200	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.3	189	Total			

**Subcatchment 23S: EXIST. OFF-SITE**

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Subcatchment 24S: PDA-1B-c**

Runoff = 9.66 cfs @ 12.09 hrs, Volume= 1.426 af, Depth= 4.14"

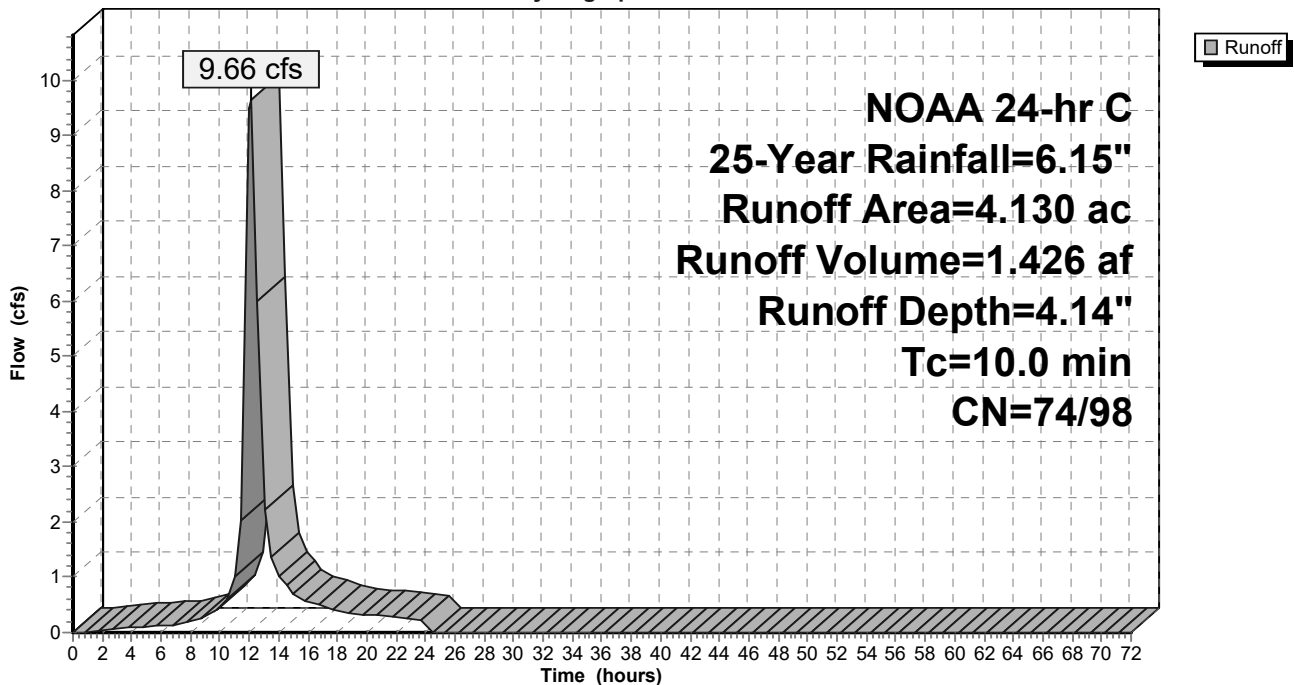
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

Area (ac)	CN	Description
2.810	74	>75% Grass cover, Good, HSG C
* 1.320	98	Impervious
4.130	82	Weighted Average
2.810	74	68.04% Pervious Area
1.320	98	31.96% Impervious Area

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

**Subcatchment 24S: PDA-1B-c**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Subcatchment 25S: PDA-1A-c**

Runoff = 36.76 cfs @ 12.07 hrs, Volume= 5.596 af, Depth= 5.24"

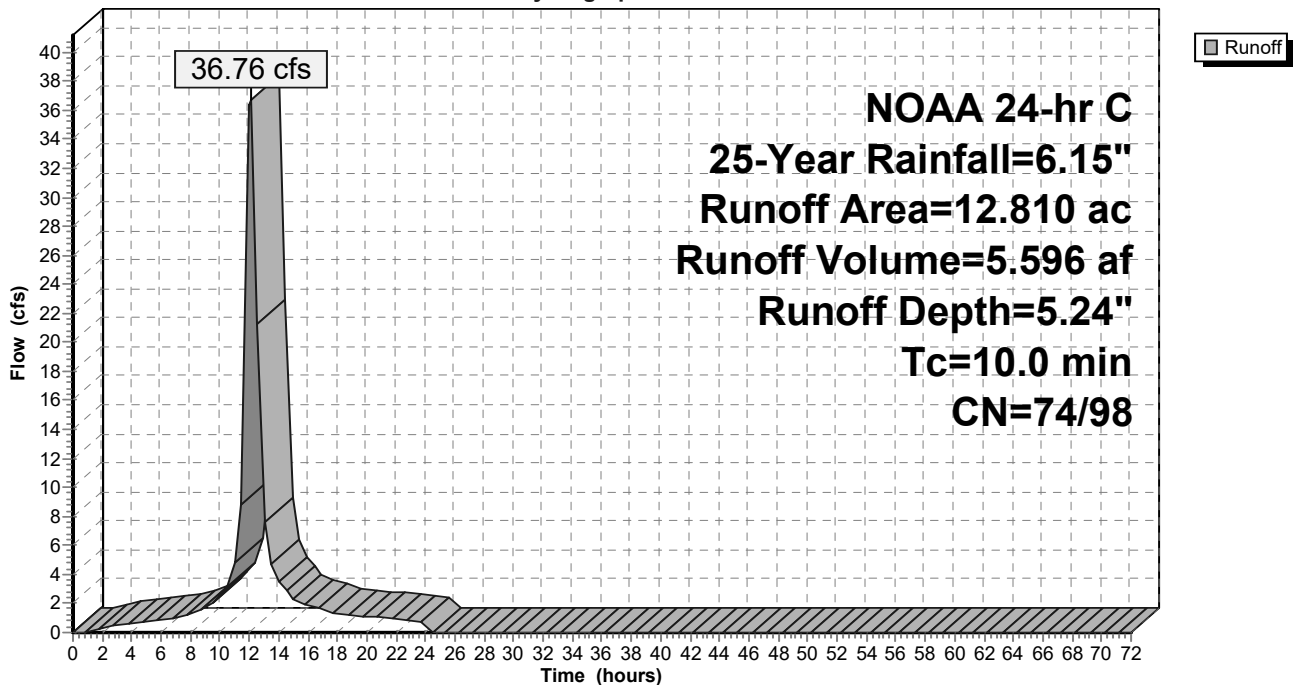
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

Area (ac)	CN	Description
3.300	74	>75% Grass cover, Good, HSG C
* 9.510	98	Impervious & Exist. Roof Areas
12.810	92	Weighted Average
3.300	74	25.76% Pervious Area
9.510	98	74.24% Impervious Area

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

**Subcatchment 25S: PDA-1A-c**

Hydrograph



**Pre vs Post\_211020**

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**Summary for Subcatchment 27S: PDA-1B-d**

Runoff = 0.60 cfs @ 12.08 hrs, Volume= 0.091 af, Depth= 4.97"

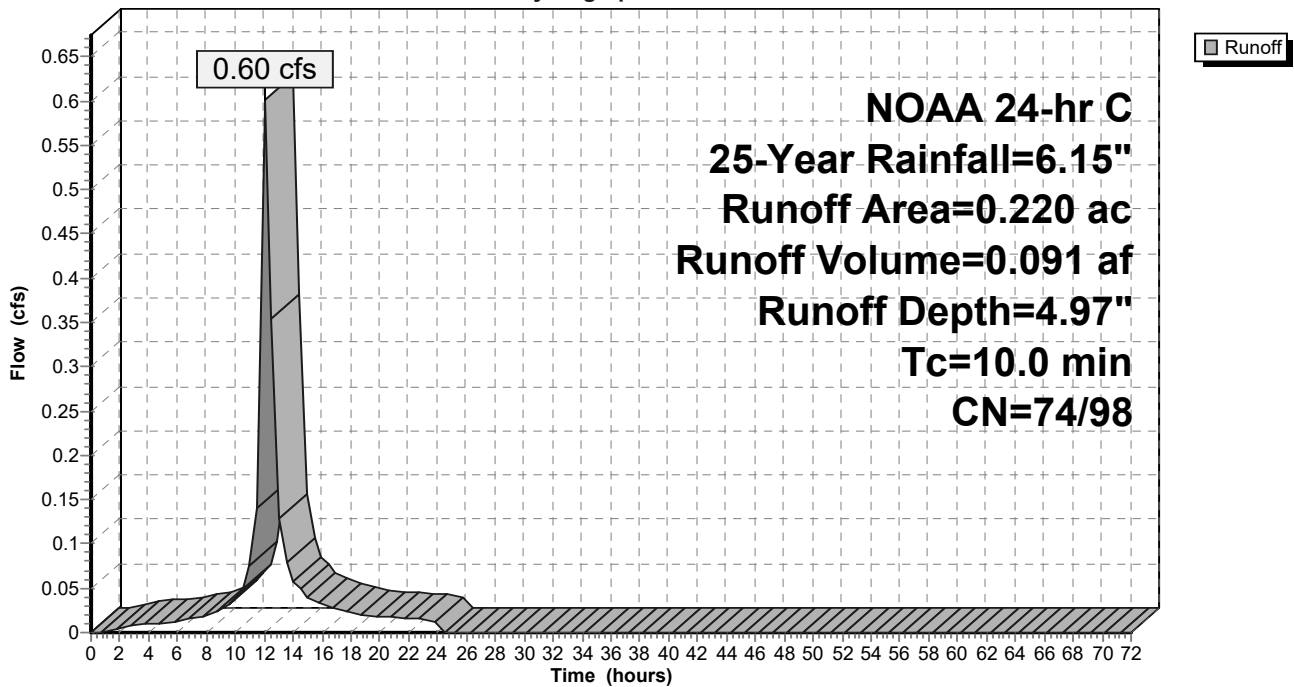
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG A
0.080	74	>75% Grass cover, Good, HSG C
0.220	89	Weighted Average
0.080	74	36.36% Pervious Area
0.140	98	63.64% Impervious Area

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

**Subcatchment 27S: PDA-1B-d**

Hydrograph





**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Subcatchment 28S: PDA-1A-a**

Runoff = 0.61 cfs @ 12.06 hrs, Volume= 0.094 af, Depth= 5.91"

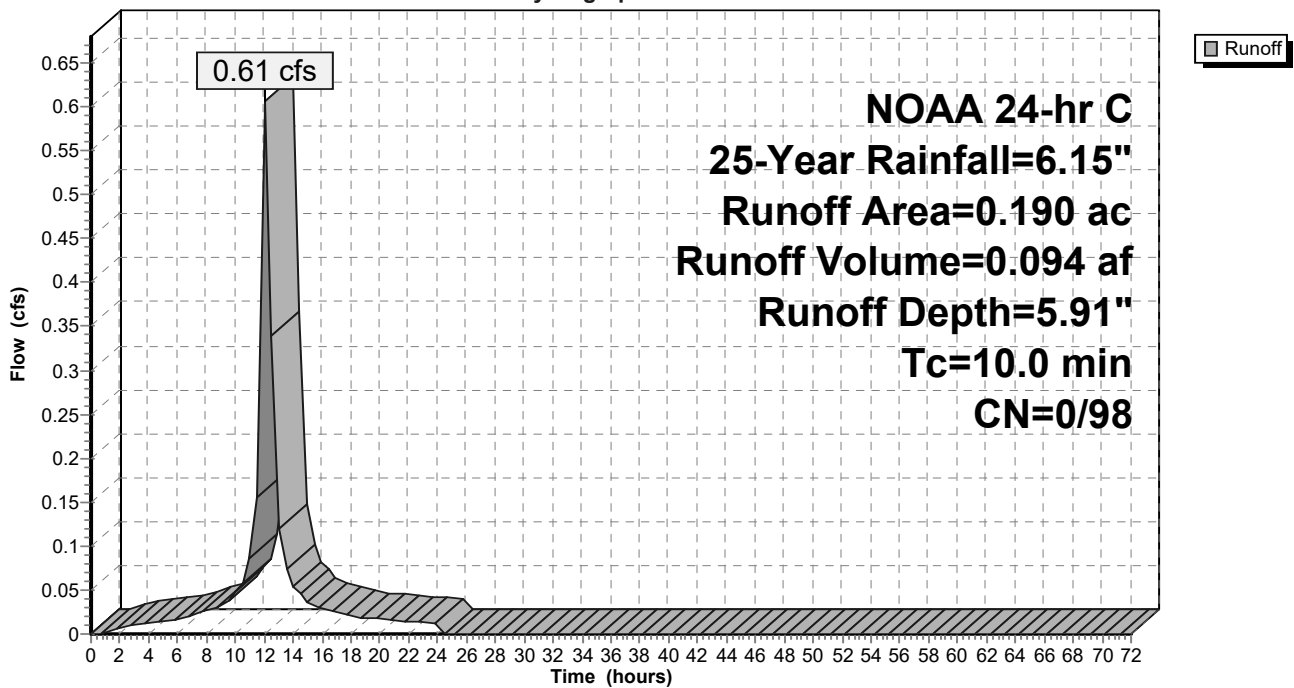
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

Area (ac)	CN	Description
0.190	98	Paved parking, HSG C
0.190	98	100.00% Impervious Area

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

**Subcatchment 28S: PDA-1A-a**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Subcatchment 30S: PDA-1C**

Runoff = 2.23 cfs @ 12.11 hrs, Volume= 0.317 af, Depth= 3.31"

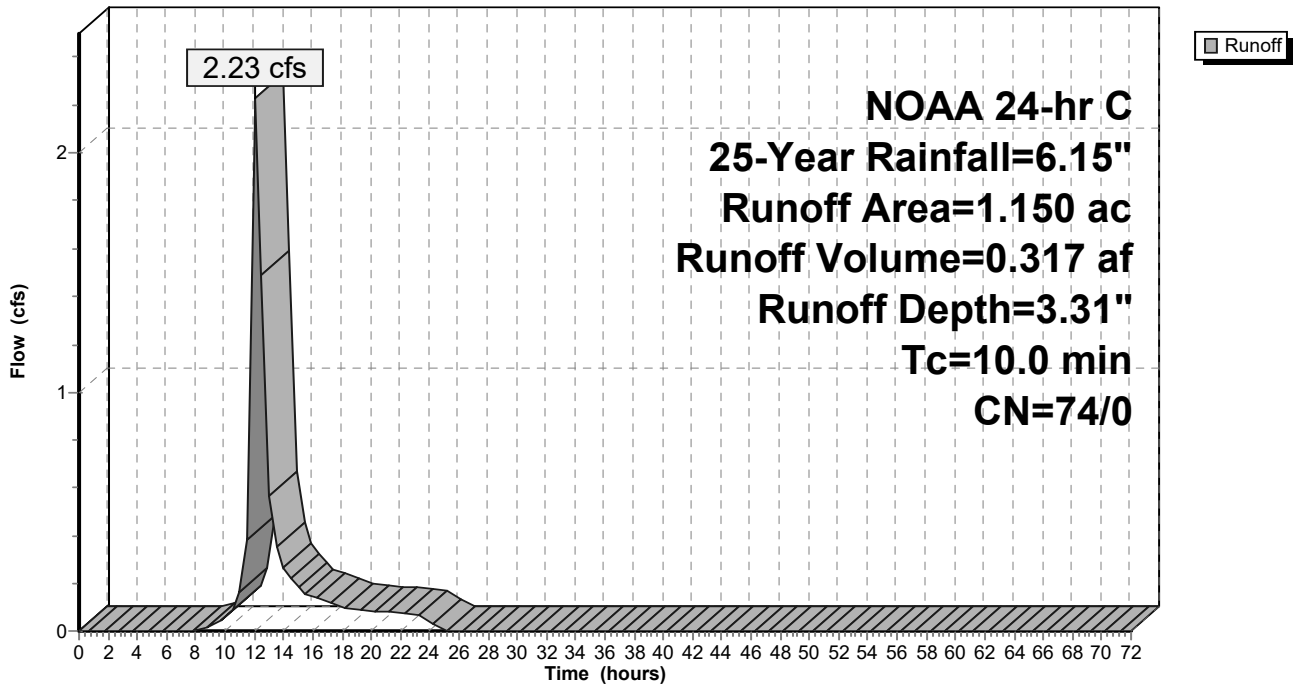
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

Area (ac)	CN	Description
1.150	74	>75% Grass cover, Good, HSG C
1.150	74	100.00% Pervious Area

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

**Subcatchment 30S: PDA-1C**

Hydrograph



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**Summary for Subcatchment 31S: PDA-1B-c (Roof)**

Runoff = 18.15 cfs @ 12.06 hrs, Volume= 2.798 af, Depth= 5.91"

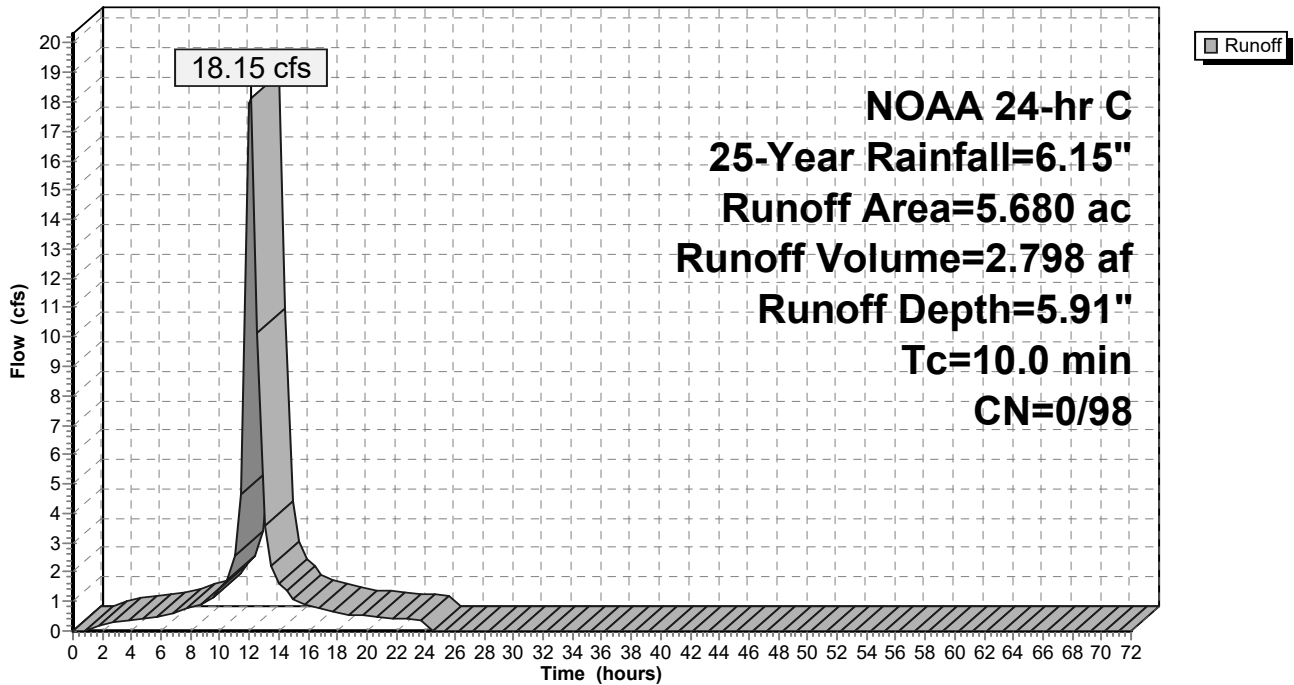
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
NOAA 24-hr C 25-Year Rainfall=6.15"

Area (ac)	CN	Description
* 5.680	98	Prop. Roofs
5.680	98	100.00% Impervious Area

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

**Subcatchment 31S: PDA-1B-c (Roof)**

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Pond 2P: Ex. Detention Basin**

Inflow Area = 6.720 ac, 42.86% Impervious, Inflow Depth = 4.17" for 25-Year event  
 Inflow = 13.48 cfs @ 12.23 hrs, Volume= 2.334 af  
 Outflow = 3.30 cfs @ 13.33 hrs, Volume= 2.301 af, Atten= 76%, Lag= 66.5 min  
 Primary = 0.76 cfs @ 13.33 hrs, Volume= 0.594 af  
 Secondary = 2.54 cfs @ 13.33 hrs, Volume= 1.708 af  
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 105.90' @ 13.34 hrs Surf.Area= 57,424 sf Storage= 49,686 cf

Plug-Flow detention time= 306.2 min calculated for 2.301 af (99% of inflow)  
 Center-of-Mass det. time= 294.5 min ( 1,129.2 - 834.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	105.00'	186,871 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
105.00	52,708	0	0
106.00	57,935	55,322	55,322
107.00	67,082	62,509	117,830
108.00	71,000	69,041	186,871

Device	Routing	Invert	Outlet Devices
#1	Primary	105.00'	<b>18.0" Round RCP_Round 18"</b> L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0333 1/1' Cc= 0.900 n= 0.015, Flow Area= 1.77 sf
#2	Device 1	105.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	106.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Secondary	105.00'	<b>8.0" Round Culvert X 2.00</b> L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0238 1/1' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf
#5	Tertiary	107.00'	<b>50.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

**Primary OutFlow** Max=0.76 cfs @ 13.33 hrs HW=105.90' (Free Discharge)

- ↑ 1=RCP\_Round 18" (Passes 0.76 cfs of 3.56 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.76 cfs @ 3.88 fps)
- ↑ 3=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=2.53 cfs @ 13.33 hrs HW=105.90' (Free Discharge)

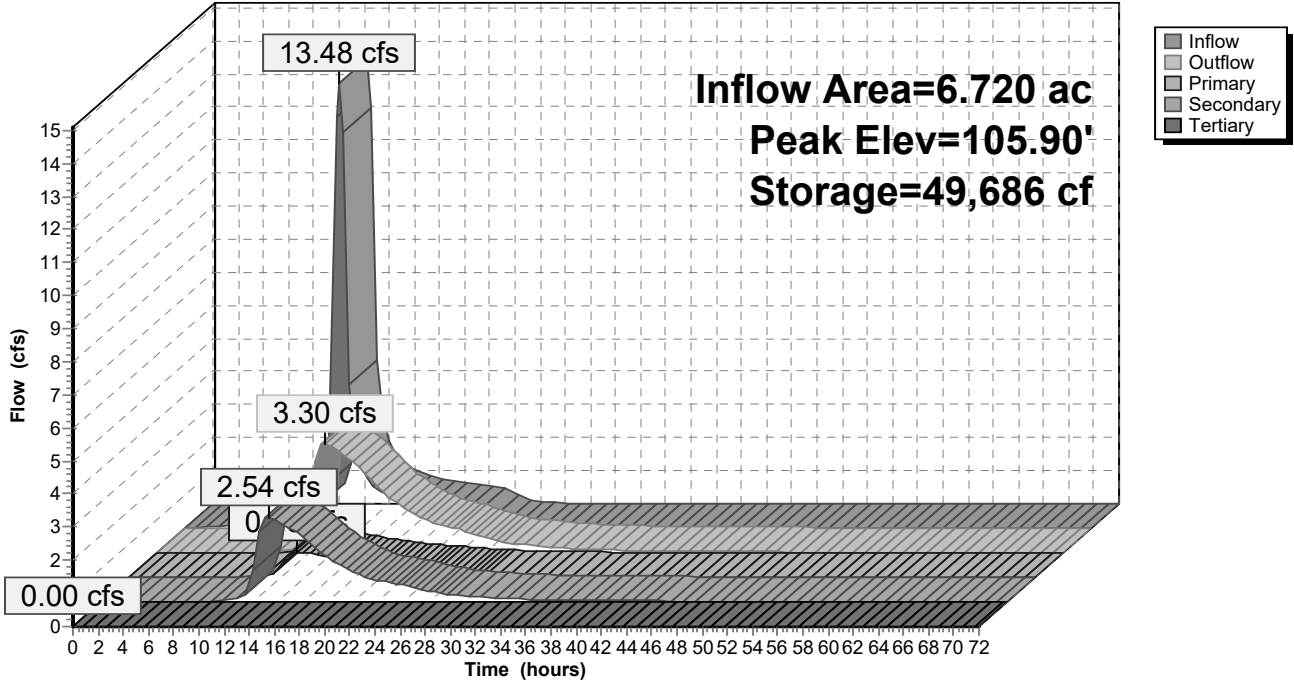
- ↑ 4=Culvert (Inlet Controls 2.53 cfs @ 3.62 fps)

**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=105.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

### Pond 2P: Ex. Detention Basin

Hydrograph



**Pre vs Post 211020**

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**Stage-Area-Storage for Pond 2P: Ex. Detention Basin**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
105.00	52,708	0	107.65	69,629	162,261
105.05	52,969	2,642	107.70	69,825	165,747
105.10	53,231	5,297	107.75	70,021	169,243
105.15	53,492	7,965	107.80	70,216	172,749
105.20	53,753	10,646	107.85	70,412	176,265
105.25	54,015	13,340	107.90	70,608	179,791
105.30	54,276	16,048	107.95	70,804	183,326
105.35	54,537	18,768	108.00	<b>71,000</b>	<b>186,871</b>
105.40	54,799	21,501			
105.45	55,060	24,248			
105.50	55,322	27,007			
105.55	55,583	29,780			
105.60	55,844	32,566			
105.65	56,106	35,364			
105.70	56,367	38,176			
105.75	56,628	41,001			
105.80	56,890	43,839			
105.85	57,151	46,690			
105.90	57,412	49,554			
105.95	57,674	52,431			
106.00	57,935	55,322			
106.05	58,392	58,230			
106.10	58,850	61,161			
106.15	59,307	64,115			
106.20	59,764	67,091			
106.25	60,222	70,091			
106.30	60,679	73,114			
106.35	61,136	76,159			
106.40	61,594	79,227			
106.45	62,051	82,318			
106.50	62,509	85,432			
106.55	62,966	88,569			
106.60	63,423	91,729			
106.65	63,881	94,912			
106.70	64,338	98,117			
106.75	64,795	101,345			
106.80	65,253	104,597			
106.85	65,710	107,871			
106.90	66,167	111,168			
106.95	66,625	114,487			
107.00	67,082	117,830			
107.05	67,278	121,189			
107.10	67,474	124,558			
107.15	67,670	127,936			
107.20	67,866	131,325			
107.25	68,062	134,723			
107.30	68,257	138,131			
107.35	68,453	141,549			
107.40	68,649	144,976			
107.45	68,845	148,414			
107.50	69,041	151,861			
107.55	69,237	155,318			
107.60	69,433	158,784			

**Pre vs Post 211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Pond 10P: BIO BASIN 1**

Inflow Area = 1.710 ac, 48.54% Impervious, Inflow Depth = 4.53" for 25-Year event  
 Inflow = 3.99 cfs @ 12.10 hrs, Volume= 0.645 af  
 Outflow = 3.43 cfs @ 12.41 hrs, Volume= 0.571 af, Atten= 14%, Lag= 18.4 min  
 Primary = 3.43 cfs @ 12.41 hrs, Volume= 0.571 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 110.68' @ 12.40 hrs Surf.Area= 4,396 sf Storage= 6,031 cf

Plug-Flow detention time= 118.4 min calculated for 0.567 af (88% of inflow)  
 Center-of-Mass det. time= 63.5 min ( 856.7 - 793.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	109.00'	16,075 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.00	2,682	0	0
110.00	3,789	3,236	3,236
111.00	4,677	4,233	7,469
112.00	5,873	5,275	12,744
112.50	7,453	3,332	16,075

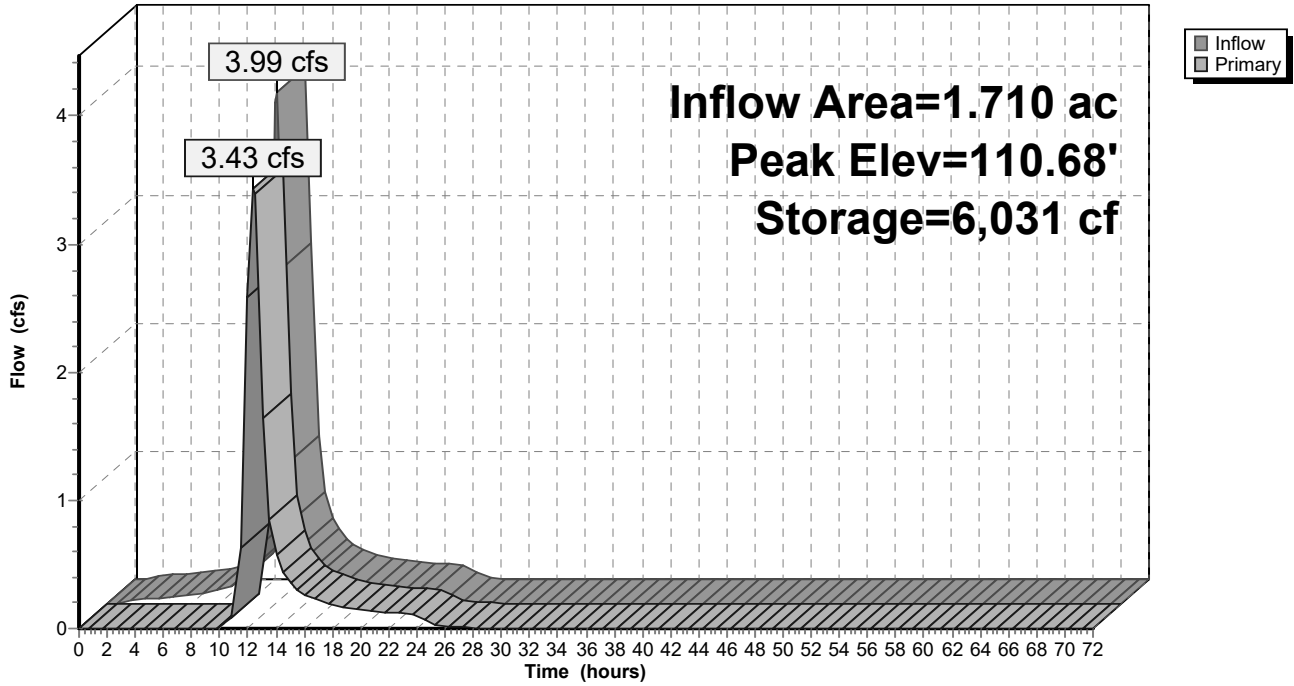
Device	Routing	Invert	Outlet Devices
#1	Primary	106.16'	<b>18.0" Round Culvert</b> L= 636.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 106.16' / 104.50' S= 0.0026 1/8" Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Device 1	110.00'	<b>2.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)
#3	Device 1	111.00'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=3.23 cfs @ 12.41 hrs HW=110.65' (Free Discharge)

- 1=Culvert (Passes 3.23 cfs of 9.06 cfs potential flow)
- 2=Sharp-Crested Rectangular Weir (Weir Controls 3.23 cfs @ 2.64 fps)
- 3=Orifice/Grate ( Controls 0.00 cfs)

### Pond 10P: BIO BASIN 1

Hydrograph





**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Stage-Area-Storage for Pond 10P: BIO BASIN 1**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
109.00	2,682	0	111.65	5,454	10,761
109.05	2,737	135	111.70	5,514	11,035
109.10	2,793	274	111.75	5,574	11,313
109.15	2,848	415	111.80	5,634	11,593
109.20	2,903	559	111.85	5,694	11,876
109.25	2,959	705	111.90	5,753	12,162
109.30	3,014	854	111.95	5,813	12,451
109.35	3,069	1,007	112.00	5,873	12,744
109.40	3,125	1,161	112.05	6,031	13,041
109.45	3,180	1,319	112.10	6,189	13,347
109.50	3,236	1,479	112.15	6,347	13,660
109.55	3,291	1,643	112.20	6,505	13,981
109.60	3,346	1,808	112.25	6,663	14,311
109.65	3,402	1,977	112.30	6,821	14,648
109.70	3,457	2,149	112.35	6,979	14,993
109.75	3,512	2,323	112.40	7,137	15,346
109.80	3,568	2,500	112.45	7,295	15,706
109.85	3,623	2,680	112.50	<b>7,453</b>	<b>16,075</b>
109.90	3,678	2,862			
109.95	3,734	3,047			
110.00	3,789	3,236			
110.05	3,833	3,426			
110.10	3,878	3,619			
110.15	3,922	3,814			
110.20	3,967	4,011			
110.25	4,011	4,211			
110.30	4,055	4,412			
110.35	4,100	4,616			
110.40	4,144	4,822			
110.45	4,189	5,030			
110.50	4,233	5,241			
110.55	4,277	5,454			
110.60	4,322	5,669			
110.65	4,366	5,886			
110.70	4,411	6,105			
110.75	4,455	6,327			
110.80	4,499	6,551			
110.85	4,544	6,777			
110.90	4,588	7,005			
110.95	4,633	7,236			
111.00	4,677	7,469			
111.05	4,737	7,704			
111.10	4,797	7,942			
111.15	4,856	8,184			
111.20	4,916	8,428			
111.25	4,976	8,675			
111.30	5,036	8,925			
111.35	5,096	9,179			
111.40	5,155	9,435			
111.45	5,215	9,694			
111.50	5,275	9,957			
111.55	5,335	10,222			
111.60	5,395	10,490			

**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Pond 11P: BIO BASIN 2**

Inflow Area = 0.880 ac, 82.95% Impervious, Inflow Depth = 5.47" for 25-Year event  
 Inflow = 2.62 cfs @ 12.07 hrs, Volume= 0.401 af  
 Outflow = 2.58 cfs @ 12.51 hrs, Volume= 0.337 af, Atten= 2%, Lag= 26.2 min  
 Primary = 2.58 cfs @ 12.51 hrs, Volume= 0.337 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 110.80' @ 12.51 hrs Surf.Area= 4,087 sf Storage= 7,454 cf

Plug-Flow detention time= 281.0 min calculated for 0.337 af (84% of inflow)  
 Center-of-Mass det. time= 207.3 min ( 964.8 - 757.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.50'	15,574 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
108.50	2,430	0	0
109.00	2,763	1,298	1,298
110.00	3,471	3,117	4,415
111.00	4,237	3,854	8,269
112.00	5,059	4,648	12,917
112.50	5,569	2,657	15,574

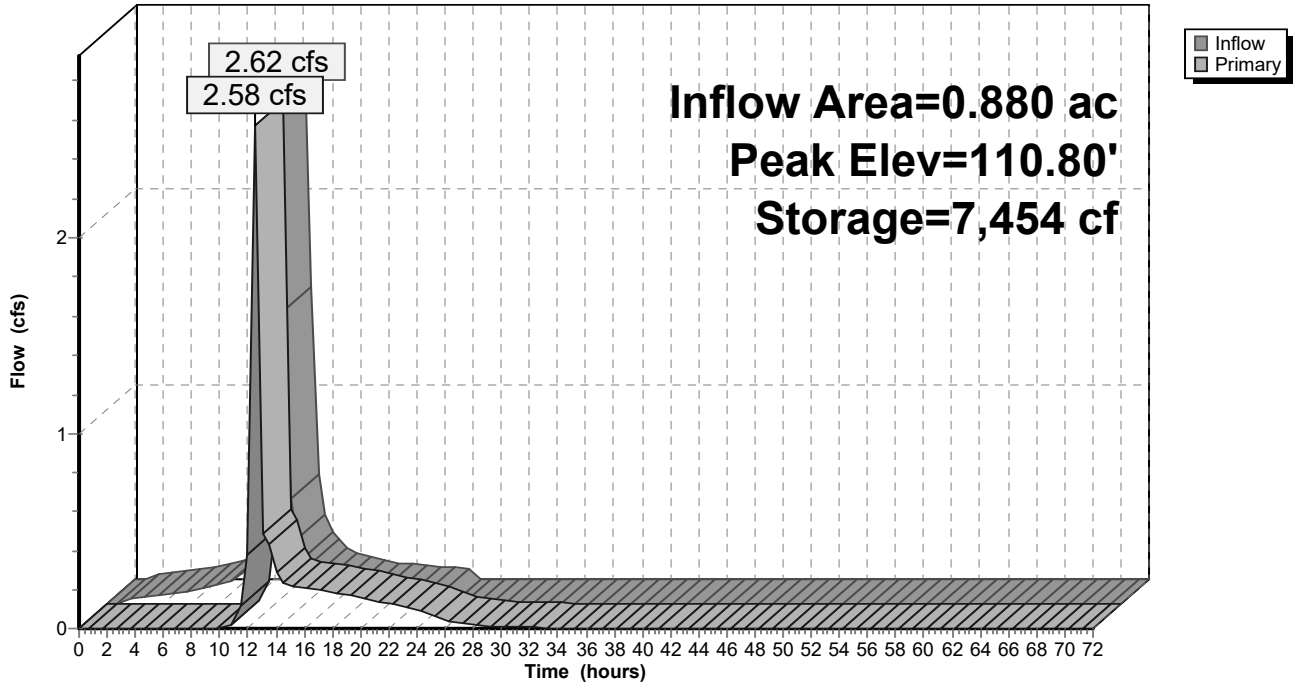
Device	Routing	Invert	Outlet Devices
#1	Primary	105.50'	<b>18.0" Round Culvert</b> L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 105.50' / 105.26' S= 0.0030 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	109.50'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	110.50'	<b>4.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s) 0.5' Crest Height
#4	Device 1	111.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=2.54 cfs @ 12.51 hrs HW=110.80' (Free Discharge)

- 1=Culvert (Passes 2.54 cfs of 17.86 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.26 cfs @ 5.22 fps)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 2.29 cfs @ 1.93 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)

### Pond 11P: BIO BASIN 2

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Stage-Area-Storage for Pond 11P: BIO BASIN 2**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
108.50	2,430	0	111.15	4,360	8,914
108.55	2,463	122	111.20	4,401	9,133
108.60	2,497	246	111.25	4,443	9,354
108.65	2,530	372	111.30	4,484	9,577
108.70	2,563	499	111.35	4,525	9,803
108.75	2,597	628	111.40	4,566	10,030
108.80	2,630	759	111.45	4,607	10,259
108.85	2,663	891	111.50	4,648	10,491
108.90	2,696	1,025	111.55	4,689	10,724
108.95	2,730	1,161	111.60	4,730	10,959
109.00	2,763	1,298	111.65	4,771	11,197
109.05	2,798	1,437	111.70	4,812	11,437
109.10	2,834	1,578	111.75	4,854	11,678
109.15	2,869	1,721	111.80	4,895	11,922
109.20	2,905	1,865	111.85	4,936	12,168
109.25	2,940	2,011	111.90	4,977	12,415
109.30	2,975	2,159	111.95	5,018	12,665
109.35	3,011	2,309	112.00	5,059	12,917
109.40	3,046	2,460	112.05	5,110	13,171
109.45	3,082	2,613	112.10	5,161	13,428
109.50	3,117	2,768	112.15	5,212	13,688
109.55	3,152	2,925	112.20	5,263	13,949
109.60	3,188	3,083	112.25	5,314	14,214
109.65	3,223	3,244	112.30	5,365	14,481
109.70	3,259	3,406	112.35	5,416	14,750
109.75	3,294	3,570	112.40	5,467	15,022
109.80	3,329	3,735	112.45	5,518	15,297
109.85	3,365	3,903	112.50	<b>5,569</b>	<b>15,574</b>
109.90	3,400	4,072			
109.95	3,436	4,243			
110.00	3,471	4,415			
110.05	3,509	4,590			
110.10	3,548	4,766			
110.15	3,586	4,945			
110.20	3,624	5,125			
110.25	3,663	5,307			
110.30	3,701	5,491			
110.35	3,739	5,677			
110.40	3,777	5,865			
110.45	3,816	6,055			
110.50	3,854	6,247			
110.55	3,892	6,440			
110.60	3,931	6,636			
110.65	3,969	6,833			
110.70	4,007	7,033			
110.75	4,046	7,234			
110.80	4,084	7,437			
110.85	4,122	7,642			
110.90	4,160	7,849			
110.95	4,199	8,058			
111.00	4,237	8,269			
111.05	4,278	8,482			
111.10	4,319	8,697			

**Pre vs Post\_211020**

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**Summary for Pond 12P: PERV. PVMT-West**

Inflow Area = 0.580 ac, 100.00% Impervious, Inflow Depth = 5.91" for 25-Year event  
 Inflow = 1.60 cfs @ 12.12 hrs, Volume= 0.286 af  
 Outflow = 1.00 cfs @ 12.67 hrs, Volume= 0.286 af, Atten= 38%, Lag= 32.7 min  
 Primary = 1.00 cfs @ 12.67 hrs, Volume= 0.286 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 110.24' @ 12.73 hrs Surf.Area= 0.130 ac Storage= 0.104 af

Plug-Flow detention time= 191.5 min calculated for 0.284 af (99% of inflow)  
 Center-of-Mass det. time= 196.1 min ( 971.1 - 775.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.25'	0.159 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.396 af Overall x 40.0% Voids

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
108.25	0.130	0.000	0.000
111.30	0.130	0.396	0.396

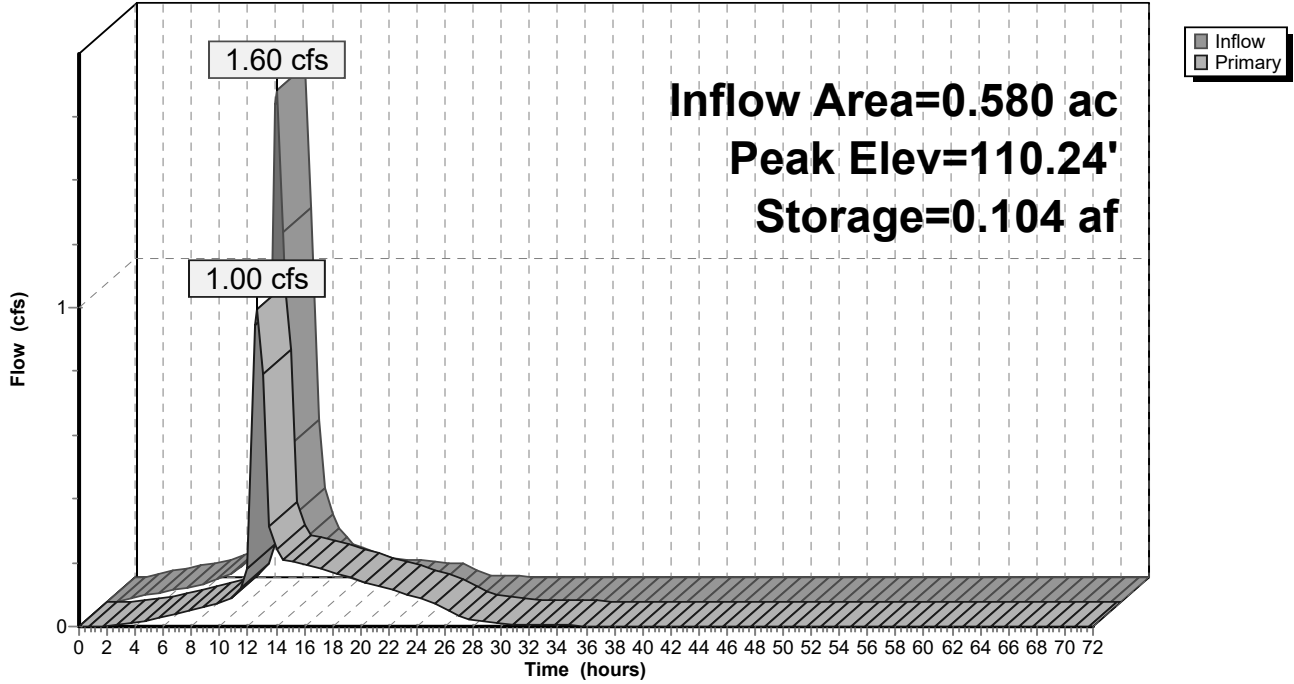
Device	Routing	Invert	Outlet Devices
#1	Primary	108.25'	<b>12.0" Round RCP_Round 12"</b> L= 19.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 108.25' / 108.20' S= 0.0026 ' S= 0.0026 ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	108.25'	<b>2.5" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	109.95'	<b>2.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s) 0.5' Crest Height
#4	Primary	110.95'	<b>48.0" x 48.0" Horiz. Orifice/Grate-Overflow</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=0.89 cfs @ 12.67 hrs HW=110.16' (Free Discharge)

- 1=RCP\_Round 12" (Passes 0.89 cfs of 4.46 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.22 cfs @ 6.48 fps)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 0.67 cfs @ 1.60 fps)
- 4=Orifice/Grate-Overflow ( Controls 0.00 cfs)

**Pond 12P: PERV. PVMT-West**

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Stage-Area-Storage for Pond 12P: PERV. PVMT-West**

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
108.25	<b>0.130</b>	0.000	110.90	0.130	0.138
108.30	0.130	0.003	110.95	0.130	0.140
108.35	0.130	0.005	111.00	0.130	0.143
108.40	0.130	0.008	111.05	0.130	0.146
108.45	0.130	0.010	111.10	0.130	0.148
108.50	0.130	0.013	111.15	0.130	0.151
108.55	0.130	0.016	111.20	0.130	0.153
108.60	0.130	0.018	111.25	0.130	0.156
108.65	0.130	0.021	111.30	0.130	<b>0.159</b>
108.70	0.130	0.023			
108.75	0.130	0.026			
108.80	0.130	0.029			
108.85	0.130	0.031			
108.90	0.130	0.034			
108.95	0.130	0.036			
109.00	0.130	0.039			
109.05	0.130	0.042			
109.10	0.130	0.044			
109.15	0.130	0.047			
109.20	0.130	0.049			
109.25	0.130	0.052			
109.30	0.130	0.055			
109.35	0.130	0.057			
109.40	0.130	0.060			
109.45	0.130	0.062			
109.50	0.130	0.065			
109.55	0.130	0.068			
109.60	0.130	0.070			
109.65	0.130	0.073			
109.70	0.130	0.075			
109.75	0.130	0.078			
109.80	0.130	0.081			
109.85	0.130	0.083			
109.90	0.130	0.086			
109.95	0.130	0.088			
110.00	0.130	0.091			
110.05	0.130	0.094			
110.10	0.130	0.096			
110.15	0.130	0.099			
110.20	0.130	0.101			
110.25	0.130	0.104			
110.30	0.130	0.107			
110.35	0.130	0.109			
110.40	0.130	0.112			
110.45	0.130	0.114			
110.50	0.130	0.117			
110.55	0.130	0.120			
110.60	0.130	0.122			
110.65	0.130	0.125			
110.70	0.130	0.127			
110.75	0.130	0.130			
110.80	0.130	0.133			
110.85	0.130	0.135			

**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Pond 27P: PERV. PVMT-East**

Inflow Area = 0.190 ac, 100.00% Impervious, Inflow Depth = 5.91" for 25-Year event  
 Inflow = 0.61 cfs @ 12.06 hrs, Volume= 0.094 af  
 Outflow = 0.46 cfs @ 12.44 hrs, Volume= 0.094 af, Atten= 24%, Lag= 22.8 min  
 Primary = 0.46 cfs @ 12.44 hrs, Volume= 0.094 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 109.25' @ 12.44 hrs Surf.Area= 0.130 ac Storage= 0.018 af

Plug-Flow detention time= 73.7 min calculated for 0.093 af (99% of inflow)  
 Center-of-Mass det. time= 80.6 min ( 829.2 - 748.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.90'	0.135 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.338 af Overall x 40.0% Voids

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
108.90	0.130	0.000	0.000
111.50	0.130	0.338	0.338

Device	Routing	Invert	Outlet Devices
#1	Primary	108.90'	<b>6.0" Round Culvert X 3.00</b> L= 49.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 108.90' / 108.85' S= 0.0010 ' S= 0.0010 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

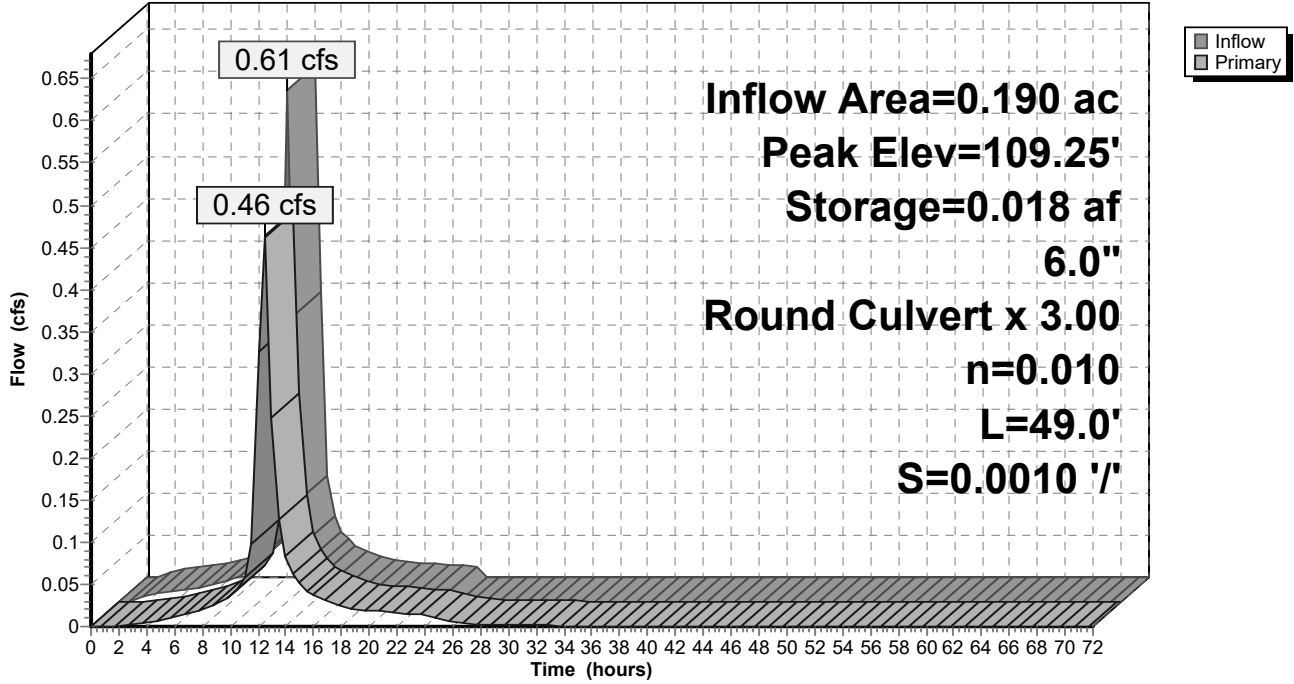
**Primary OutFlow** Max=0.45 cfs @ 12.44 hrs HW=109.24' (Free Discharge)

↑1=Culvert (Barrel Controls 0.45 cfs @ 1.46 fps)



**Pond 27P: PERV. PVMT-East**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Stage-Area-Storage for Pond 27P: PERV. PVMT-East**

Elevation (feet)	Surface (acres)	Storage (acre-feet)
108.90	<b>0.130</b>	0.000
108.95	0.130	0.003
109.00	0.130	0.005
109.05	0.130	0.008
109.10	0.130	0.010
109.15	0.130	0.013
109.20	0.130	0.016
109.25	0.130	0.018
109.30	0.130	0.021
109.35	0.130	0.023
109.40	0.130	0.026
109.45	0.130	0.029
109.50	0.130	0.031
109.55	0.130	0.034
109.60	0.130	0.036
109.65	0.130	0.039
109.70	0.130	0.042
109.75	0.130	0.044
109.80	0.130	0.047
109.85	0.130	0.049
109.90	0.130	0.052
109.95	0.130	0.055
110.00	0.130	0.057
110.05	0.130	0.060
110.10	0.130	0.062
110.15	0.130	0.065
110.20	0.130	0.068
110.25	0.130	0.070
110.30	0.130	0.073
110.35	0.130	0.075
110.40	0.130	0.078
110.45	0.130	0.081
110.50	0.130	0.083
110.55	0.130	0.086
110.60	0.130	0.088
110.65	0.130	0.091
110.70	0.130	0.094
110.75	0.130	0.096
110.80	0.130	0.099
110.85	0.130	0.101
110.90	0.130	0.104
110.95	0.130	0.107
111.00	0.130	0.109
111.05	0.130	0.112
111.10	0.130	0.114
111.15	0.130	0.117
111.20	0.130	0.120
111.25	0.130	0.122
111.30	0.130	0.125
111.35	0.130	0.127
111.40	0.130	0.130
111.45	0.130	0.133
111.50	0.130	<b>0.135</b>

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**Summary for Pond 29P: PERV. PVMT-Rear**

Inflow Area = 0.220 ac, 63.64% Impervious, Inflow Depth = 4.97" for 25-Year event  
 Inflow = 0.60 cfs @ 12.08 hrs, Volume= 0.091 af  
 Outflow = 0.39 cfs @ 12.55 hrs, Volume= 0.091 af, Atten= 35%, Lag= 28.5 min  
 Primary = 0.39 cfs @ 12.55 hrs, Volume= 0.091 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 111.37' @ 12.54 hrs Surf.Area= 0.107 ac Storage= 0.022 af

Plug-Flow detention time= 91.9 min calculated for 0.091 af (100% of inflow)  
 Center-of-Mass det. time= 88.4 min ( 857.8 - 769.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	110.85'	0.053 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.134 af Overall x 40.0% Voids

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
110.85	0.107	0.000	0.000
112.10	0.107	0.134	0.134

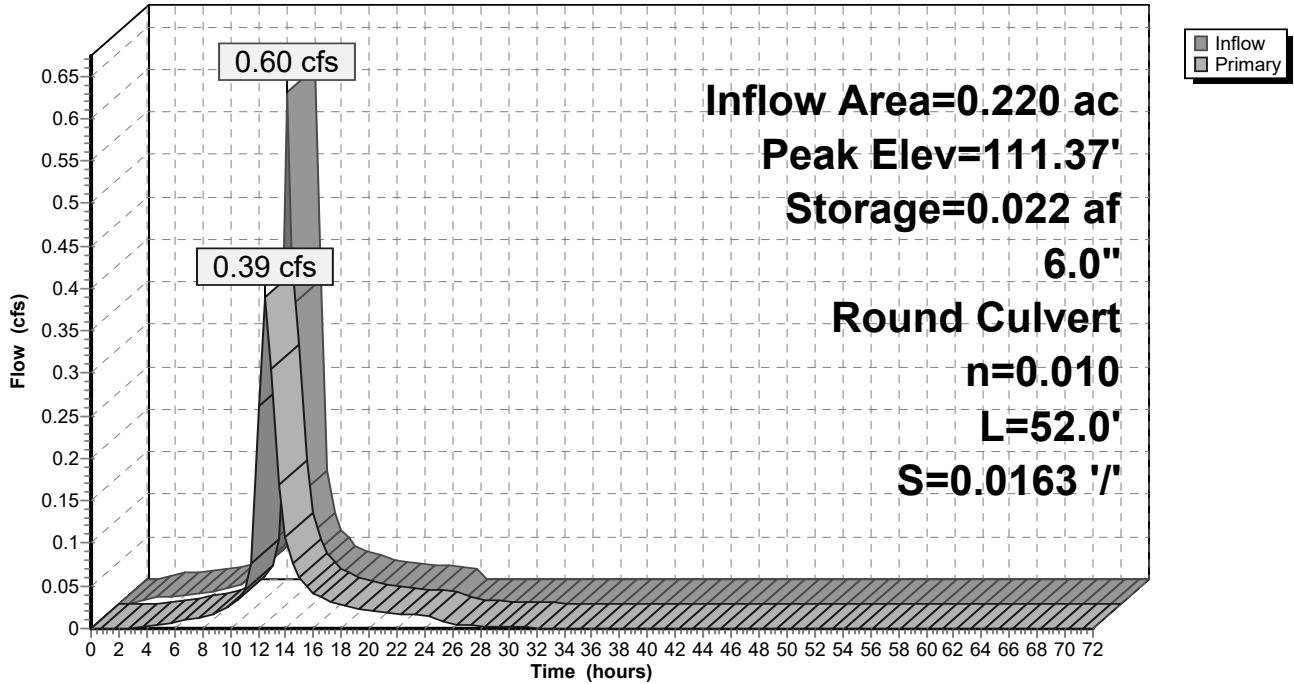
Device	Routing	Invert	Outlet Devices
#1	Primary	110.85'	<b>6.0" Round Culvert</b> L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 110.85' / 110.00' S= 0.0163 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=0.38 cfs @ 12.55 hrs HW=111.36' (Free Discharge)

↑**1=Culvert** (Inlet Controls 0.38 cfs @ 1.94 fps)

**Pond 29P: PERV. PVMT-Rear**

Hydrograph



**Pre vs Post\_211020**

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**Stage-Area-Storage for Pond 29P: PERV. PVMT-Rear**

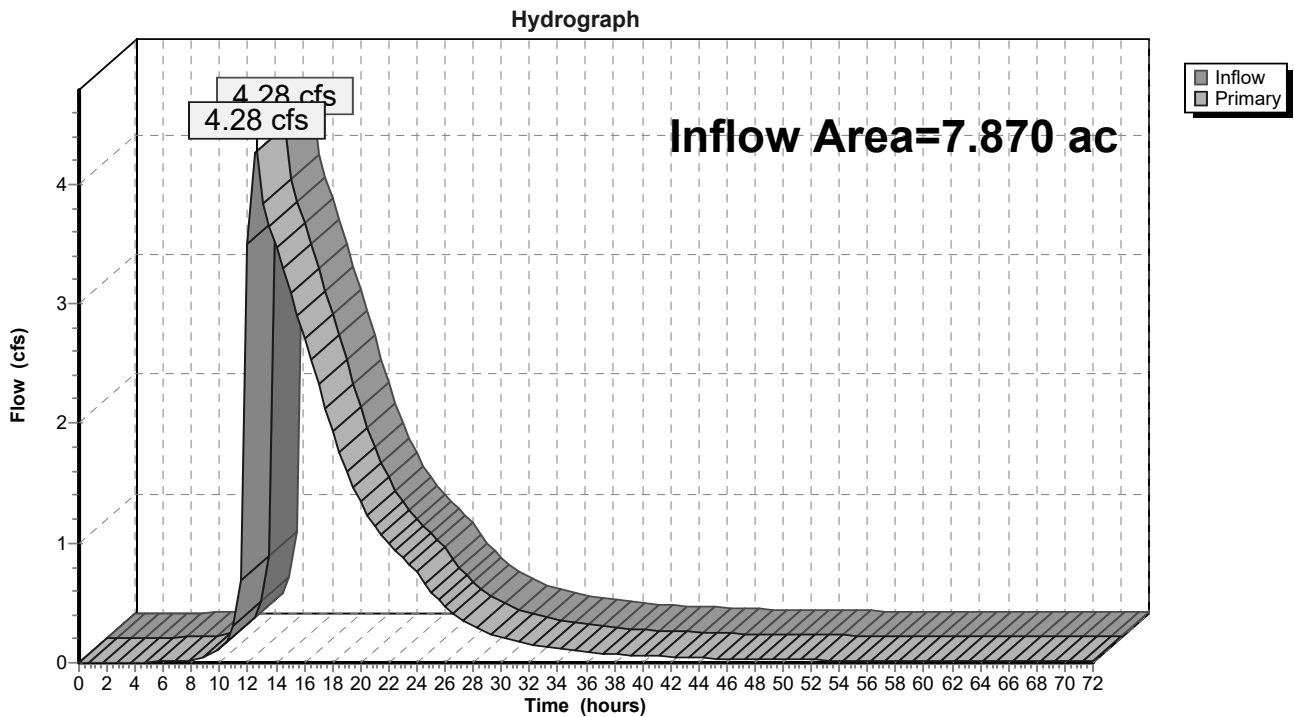
Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
110.85	<b>0.107</b>	0.000	111.91	0.107	0.045
110.87	0.107	0.001	111.93	0.107	0.046
110.89	0.107	0.002	111.95	0.107	0.047
110.91	0.107	0.003	111.97	0.107	0.048
110.93	0.107	0.003	111.99	0.107	0.049
110.95	0.107	0.004	112.01	0.107	0.050
110.97	0.107	0.005	112.03	0.107	0.051
110.99	0.107	0.006	112.05	0.107	0.051
111.01	0.107	0.007	112.07	0.107	0.052
111.03	0.107	0.008	112.09	0.107	<b>0.053</b>
111.05	0.107	0.009			
111.07	0.107	0.009			
111.09	0.107	0.010			
111.11	0.107	0.011			
111.13	0.107	0.012			
111.15	0.107	0.013			
111.17	0.107	0.014			
111.19	0.107	0.015			
111.21	0.107	0.015			
111.23	0.107	0.016			
111.25	0.107	0.017			
111.27	0.107	0.018			
111.29	0.107	0.019			
111.31	0.107	0.020			
111.33	0.107	0.021			
111.35	0.107	0.021			
111.37	0.107	0.022			
111.39	0.107	0.023			
111.41	0.107	0.024			
111.43	0.107	0.025			
111.45	0.107	0.026			
111.47	0.107	0.027			
111.49	0.107	0.027			
111.51	0.107	0.028			
111.53	0.107	0.029			
111.55	0.107	0.030			
111.57	0.107	0.031			
111.59	0.107	0.032			
111.61	0.107	0.033			
111.63	0.107	0.033			
111.65	0.107	0.034			
111.67	0.107	0.035			
111.69	0.107	0.036			
111.71	0.107	0.037			
111.73	0.107	0.038			
111.75	0.107	0.039			
111.77	0.107	0.039			
111.79	0.107	0.040			
111.81	0.107	0.041			
111.83	0.107	0.042			
111.85	0.107	0.043			
111.87	0.107	0.044			
111.89	0.107	0.045			

### Summary for Link 9L: BASIN DISCHARGES

Inflow Area = 7.870 ac, 36.59% Impervious, Inflow Depth > 3.99" for 25-Year event  
Inflow = 4.28 cfs @ 12.57 hrs, Volume= 2.619 af  
Primary = 4.28 cfs @ 12.57 hrs, Volume= 2.619 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 9L: BASIN DISCHARGES



**Pre vs Post\_211020**

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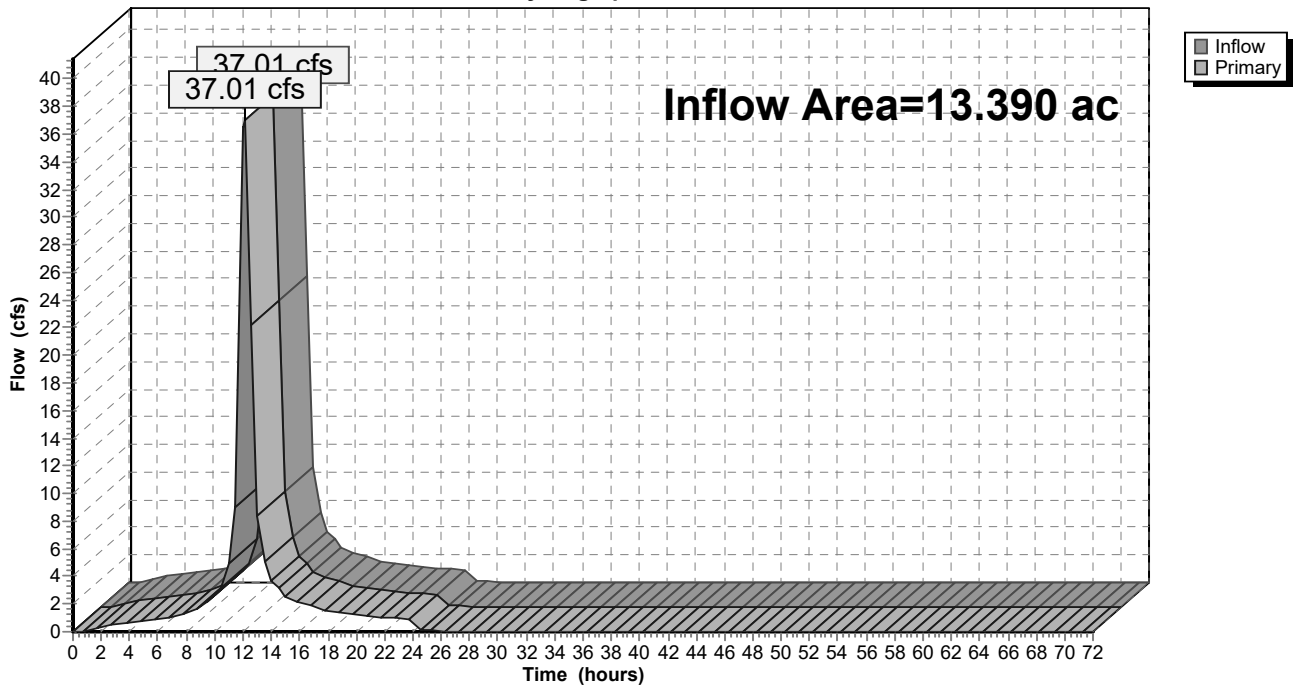
**Summary for Link 20L: PDA-1A TOTAL**

Inflow Area = 13.390 ac, 75.35% Impervious, Inflow Depth = 5.27" for 25-Year event  
Inflow = 37.01 cfs @ 12.08 hrs, Volume= 5.881 af  
Primary = 37.01 cfs @ 12.08 hrs, Volume= 5.881 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

**Link 20L: PDA-1A TOTAL**

Hydrograph



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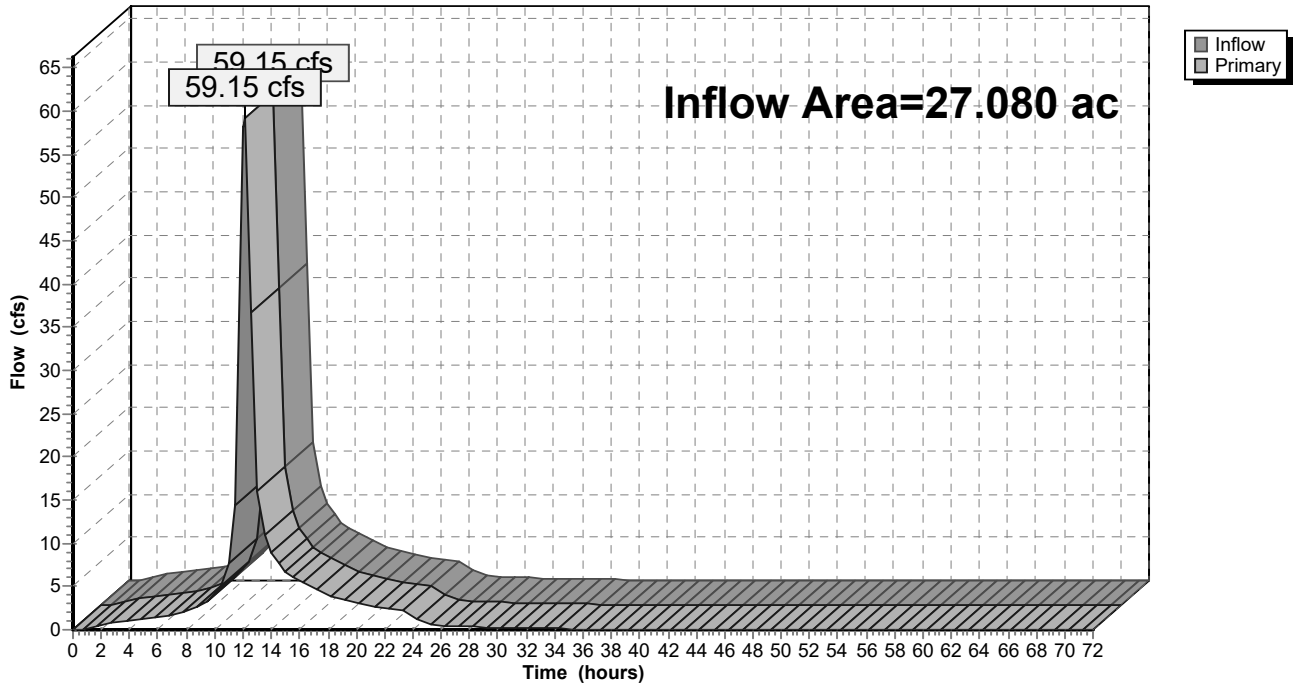
**Summary for Link 22L: PROP. POI-1**

Inflow Area = 27.080 ac, 68.87% Impervious, Inflow Depth > 5.02" for 25-Year event  
Inflow = 59.15 cfs @ 12.09 hrs, Volume= 11.332 af  
Primary = 59.15 cfs @ 12.09 hrs, Volume= 11.332 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

**Link 22L: PROP. POI-1**

Hydrograph





**Pre vs Post\_211020**

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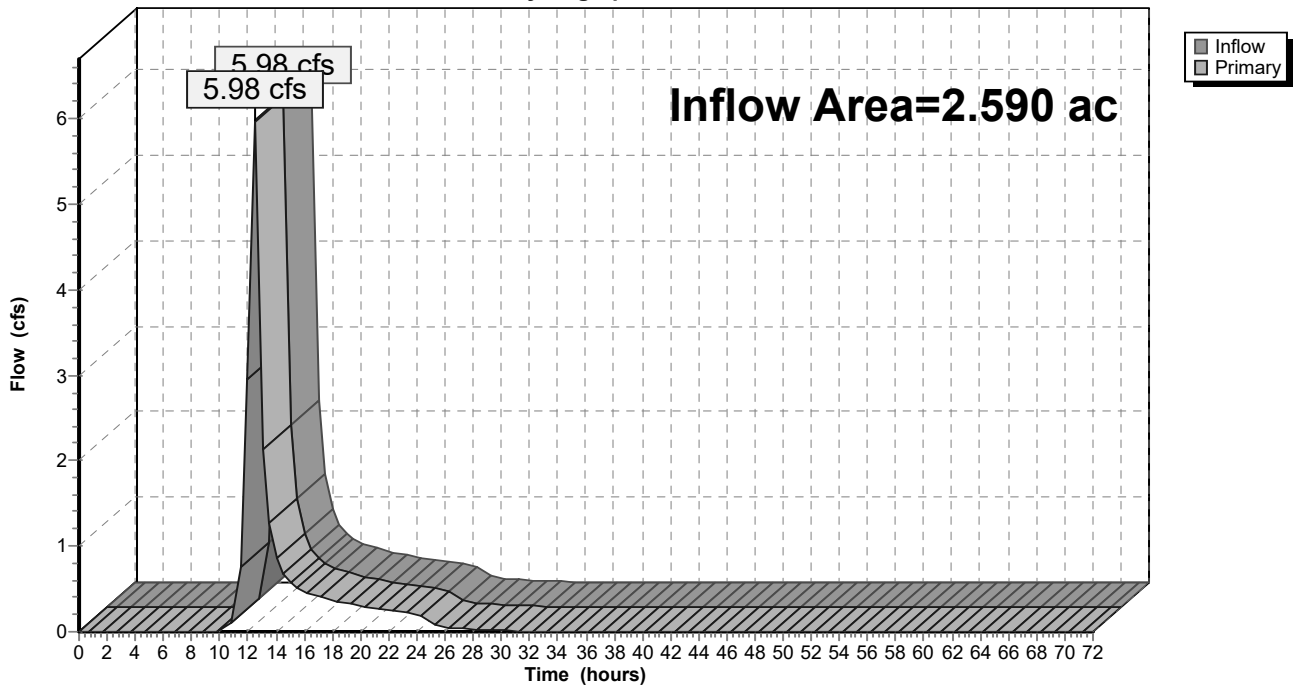
**Summary for Link 28L: MH 101**

Inflow Area = 2.590 ac, 60.23% Impervious, Inflow Depth = 4.21" for 25-Year event  
Inflow = 5.98 cfs @ 12.47 hrs, Volume= 0.908 af  
Primary = 5.98 cfs @ 12.47 hrs, Volume= 0.908 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

**Link 28L: MH 101**

Hydrograph



**Pre vs Post\_211020**

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Time span=0.00-72.00 hrs, dt=0.50 hrs, 145 points  
 Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment9S: PDA-3 (POI-3)</b>	Runoff Area=0.880 ac 0.00% Impervious Runoff Depth=4.65" Flow Length=291' Tc=15.2 min CN=70/0 Runoff=2.15 cfs 0.341 af
<b>Subcatchment11S: PDA-2 (POI-2)</b>	Runoff Area=1.770 ac 0.00% Impervious Runoff Depth=4.65" Flow Length=609' Tc=19.6 min CN=70/0 Runoff=4.69 cfs 0.685 af
<b>Subcatchment16S: PDA-1A-b</b>	Runoff Area=0.390 ac 100.00% Impervious Runoff Depth=7.97" Tc=10.0 min CN=0/98 Runoff=1.67 cfs 0.259 af
<b>Subcatchment17S: PDA-1B-a</b>	Runoff Area=1.490 ac 46.31% Impervious Runoff Depth=6.37" Tc=10.0 min CN=73/98 Runoff=5.31 cfs 0.791 af
<b>Subcatchment18S: PDA-1B-b</b>	Runoff Area=0.880 ac 82.95% Impervious Runoff Depth=7.48" Tc=10.0 min CN=74/98 Runoff=3.57 cfs 0.549 af
<b>Subcatchment23S: EXIST. OFF-SITE</b>	Runoff Area=0.140 ac 0.00% Impervious Runoff Depth=4.65" Flow Length=189' Slope=0.0200 '/' Tc=9.3 min CN=70/0 Runoff=0.39 cfs 0.054 af
<b>Subcatchment24S: PDA-1B-c</b>	Runoff Area=4.130 ac 31.96% Impervious Runoff Depth=6.03" Tc=10.0 min CN=74/98 Runoff=14.15 cfs 2.074 af
<b>Subcatchment25S: PDA-1A-c</b>	Runoff Area=12.810 ac 74.24% Impervious Runoff Depth=7.23" Tc=10.0 min CN=74/98 Runoff=50.63 cfs 7.723 af
<b>Subcatchment27S: PDA-1B-d</b>	Runoff Area=0.220 ac 63.64% Impervious Runoff Depth=6.93" Tc=10.0 min CN=74/98 Runoff=0.84 cfs 0.127 af
<b>Subcatchment28S: PDA-1A-a</b>	Runoff Area=0.190 ac 100.00% Impervious Runoff Depth=7.97" Tc=10.0 min CN=0/98 Runoff=0.81 cfs 0.126 af
<b>Subcatchment30S: PDA-1C</b>	Runoff Area=1.150 ac 0.00% Impervious Runoff Depth=5.11" Tc=10.0 min CN=74/0 Runoff=3.49 cfs 0.490 af
<b>Subcatchment31S: PDA-1B-c (Roof)</b>	Runoff Area=5.680 ac 100.00% Impervious Runoff Depth=7.97" Tc=10.0 min CN=0/98 Runoff=24.28 cfs 3.773 af
<b>Pond 2P: Ex. Detention Basin</b>	Peak Elev=106.34' Storage=75,467 cf Inflow=20.70 cfs 3.403 af Primary=0.99 cfs 0.830 af Secondary=3.37 cfs 2.539 af Tertiary=0.00 cfs 0.000 af Outflow=4.36 cfs 3.370 af
<b>Pond 10P: BIO BASIN 1</b>	Peak Elev=110.88' Storage=6,905 cf Inflow=5.72 cfs 0.918 af Outflow=4.89 cfs 0.844 af
<b>Pond 11P: BIO BASIN 2</b>	Peak Elev=110.86' Storage=7,673 cf Inflow=3.57 cfs 0.549 af Outflow=3.21 cfs 0.485 af
<b>Pond 12P: PERV. PVMT-West</b>	Peak Elev=110.41' Storage=0.112 af Inflow=2.17 cfs 0.385 af Outflow=2.37 cfs 0.385 af

**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Pond 27P: PERV. PVMT-East** Peak Elev=109.32' Storage=0.022 af Inflow=0.81 cfs 0.126 af  
6.0" Round Culvert x 3.00 n=0.010 L=49.0' S=0.0010 '/ Outflow=0.63 cfs 0.126 af

**Pond 29P: PERV. PVMT-Rear** Peak Elev=111.56' Storage=0.030 af Inflow=0.84 cfs 0.127 af  
6.0" Round Culvert n=0.010 L=52.0' S=0.0163 '/ Outflow=0.51 cfs 0.127 af

**Link 9L: BASIN DISCHARGES** Inflow=6.10 cfs 3.860 af  
Primary=6.10 cfs 3.860 af

**Link 20L: PDA-1A TOTAL** Inflow=51.15 cfs 8.108 af  
Primary=51.15 cfs 8.108 af

**Link 22L: PROP. POI-1** Inflow=81.99 cfs 15.794 af  
Primary=81.99 cfs 15.794 af

**Link 28L: MH 101** Inflow=8.10 cfs 1.329 af  
Primary=8.10 cfs 1.329 af

**Total Runoff Area = 29.730 ac Runoff Volume = 16.992 af Average Runoff Depth = 6.86"**  
**37.27% Pervious = 11.080 ac 62.73% Impervious = 18.650 ac**

**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 9S: PDA-3 (POI-3)**

Runoff = 2.15 cfs @ 12.32 hrs, Volume= 0.341 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

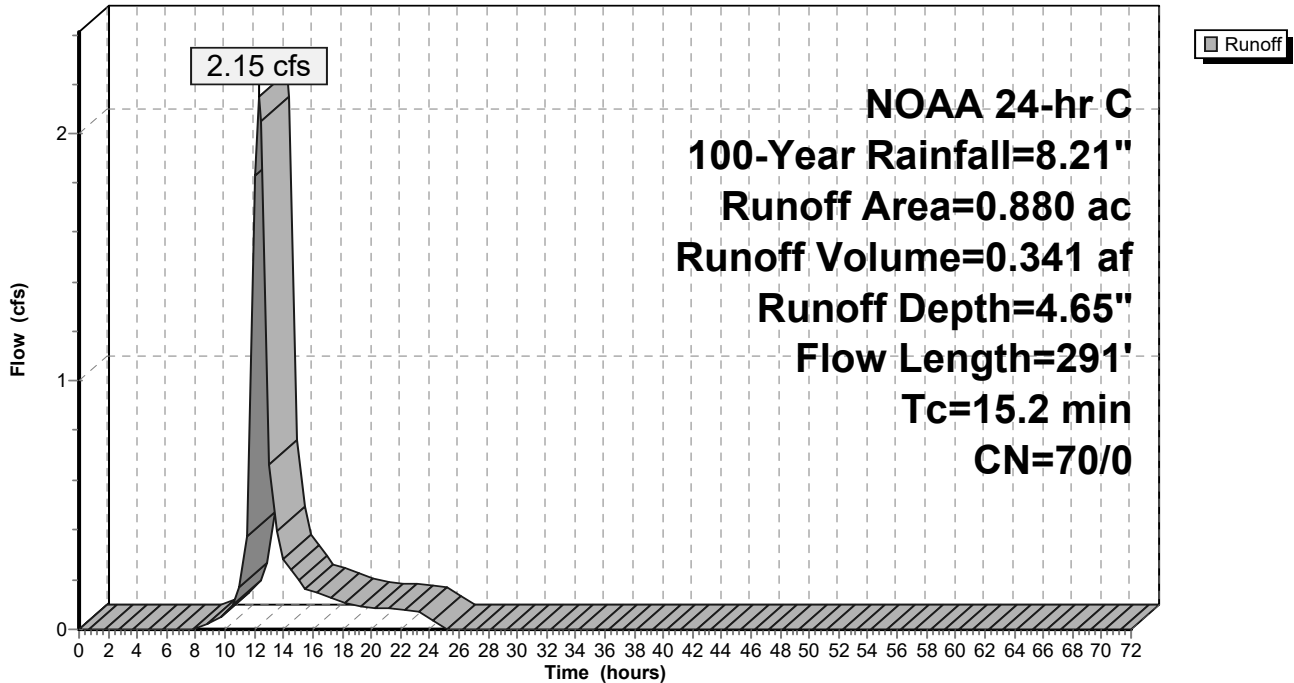
Area (ac)	CN	Description
0.880	70	Woods, Good, HSG C
0.880	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	9	0.0050	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
9.9	282	0.0090	0.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.2	291	Total			

**Subcatchment 9S: PDA-3 (POI-3)**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 11S: PDA-2 (POI-2)**

Runoff = 4.69 cfs @ 12.43 hrs, Volume= 0.685 af, Depth= 4.65"

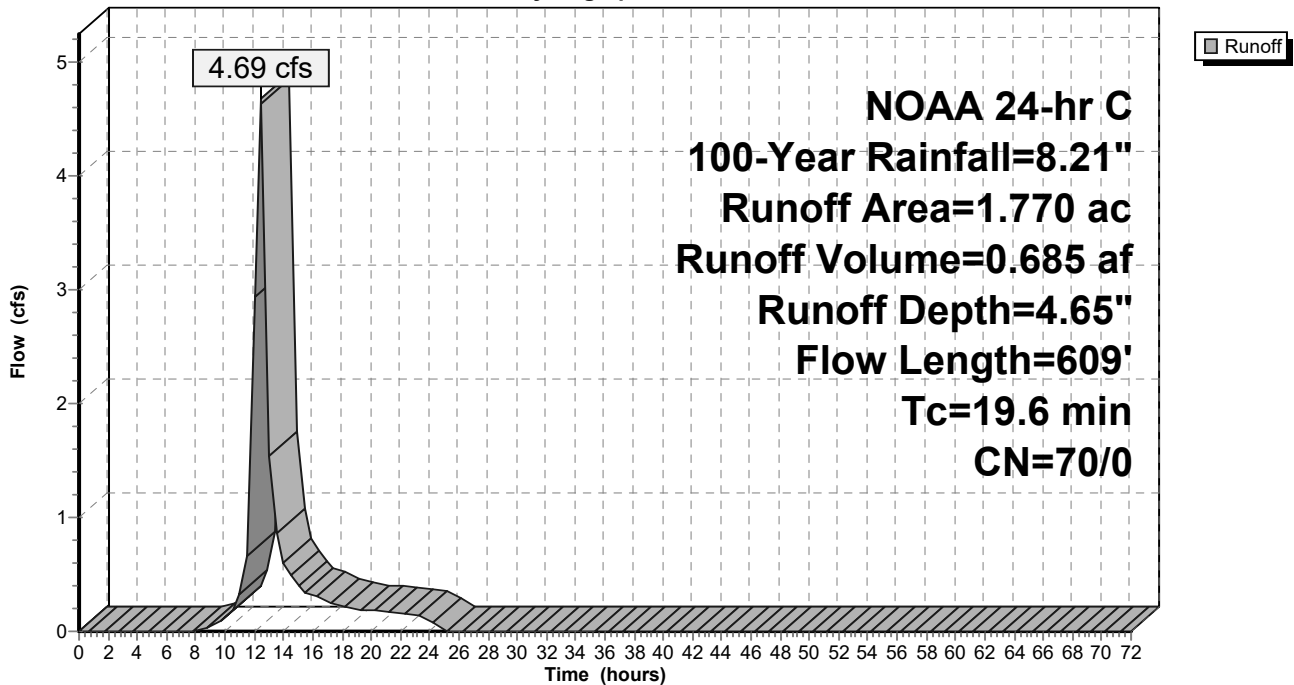
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
1.770	70	Woods, Good, HSG C
1.770	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	17	0.0180	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
14.3	592	0.0190	0.69		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
19.6	609	Total			

**Subcatchment 11S: PDA-2 (POI-2)**

Hydrograph



**Pre vs Post\_211020**

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**Summary for Subcatchment 16S: PDA-1A-b**

Runoff = 1.67 cfs @ 12.06 hrs, Volume= 0.259 af, Depth= 7.97"

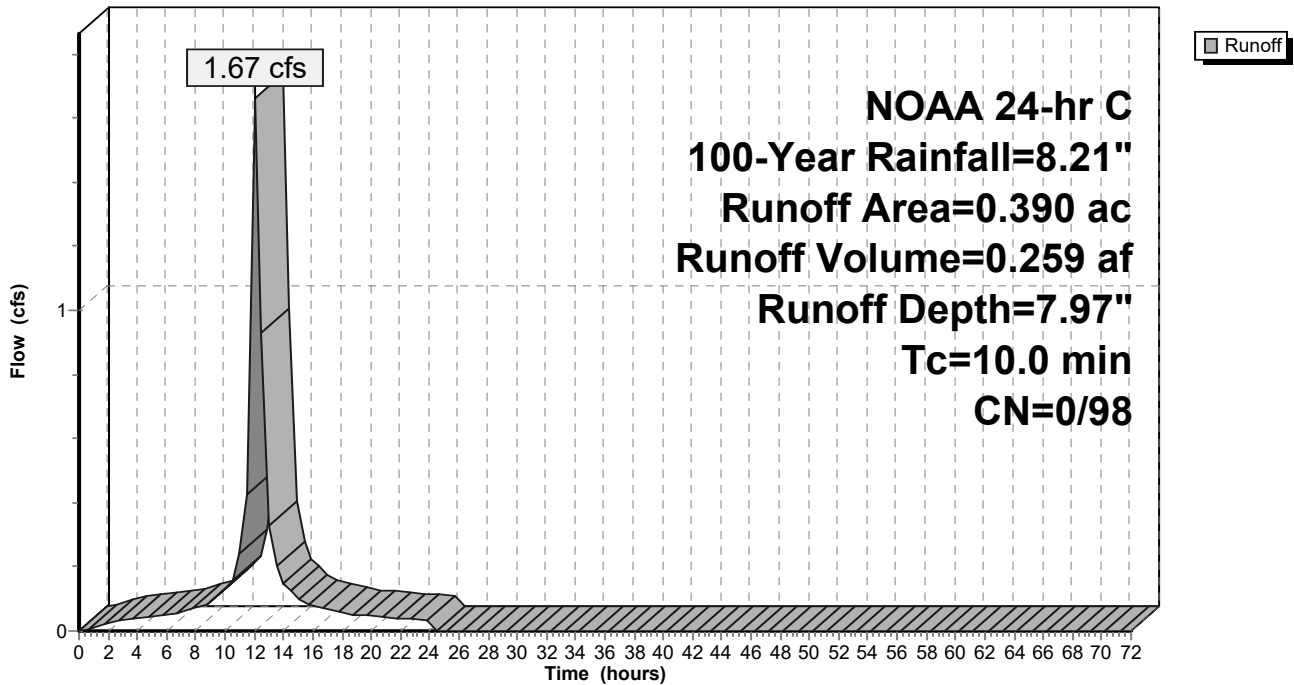
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
0.390	98	Paved parking, HSG C
0.390	98	100.00% Impervious Area

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

**Subcatchment 16S: PDA-1A-b**

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 17S: PDA-1B-a**

Runoff = 5.31 cfs @ 12.08 hrs, Volume= 0.791 af, Depth= 6.37"

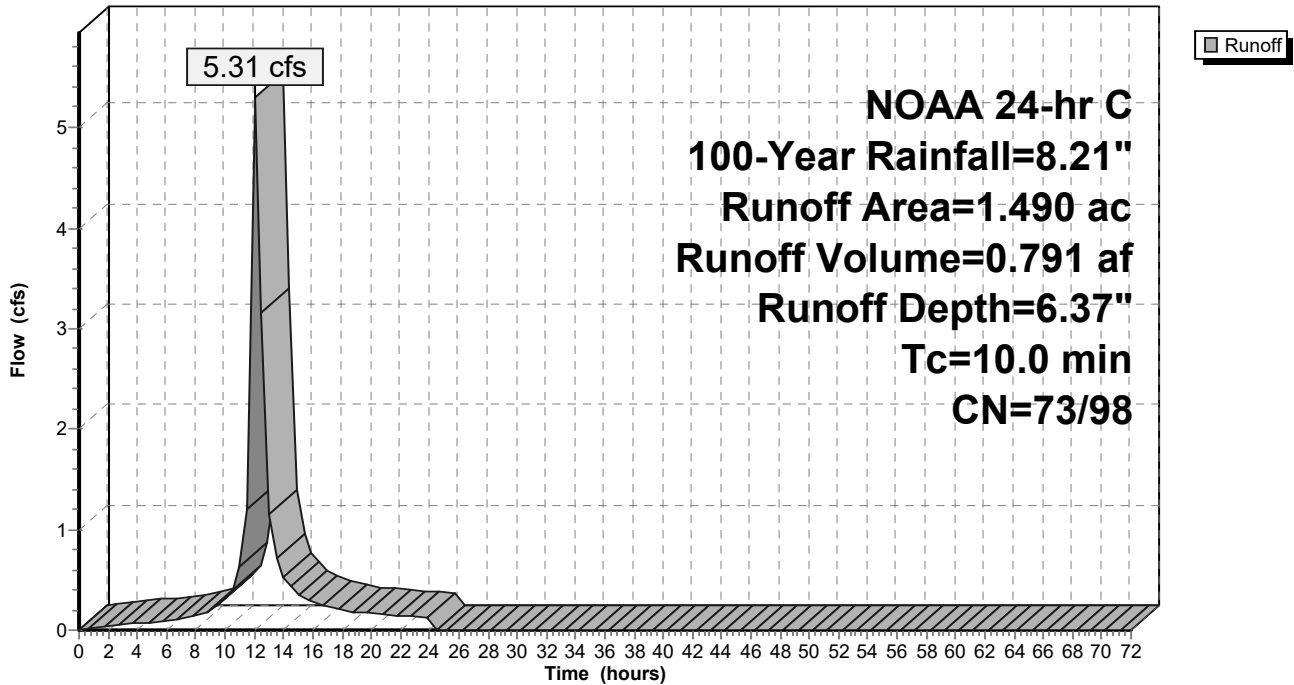
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
0.270	70	Woods, Good, HSG C
0.690	98	Paved parking, HSG C
0.530	74	>75% Grass cover, Good, HSG C
1.490	84	Weighted Average
0.800	73	53.69% Pervious Area
0.690	98	46.31% Impervious Area

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

**Subcatchment 17S: PDA-1B-a**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 18S: PDA-1B-b**

Runoff = 3.57 cfs @ 12.07 hrs, Volume= 0.549 af, Depth= 7.48"

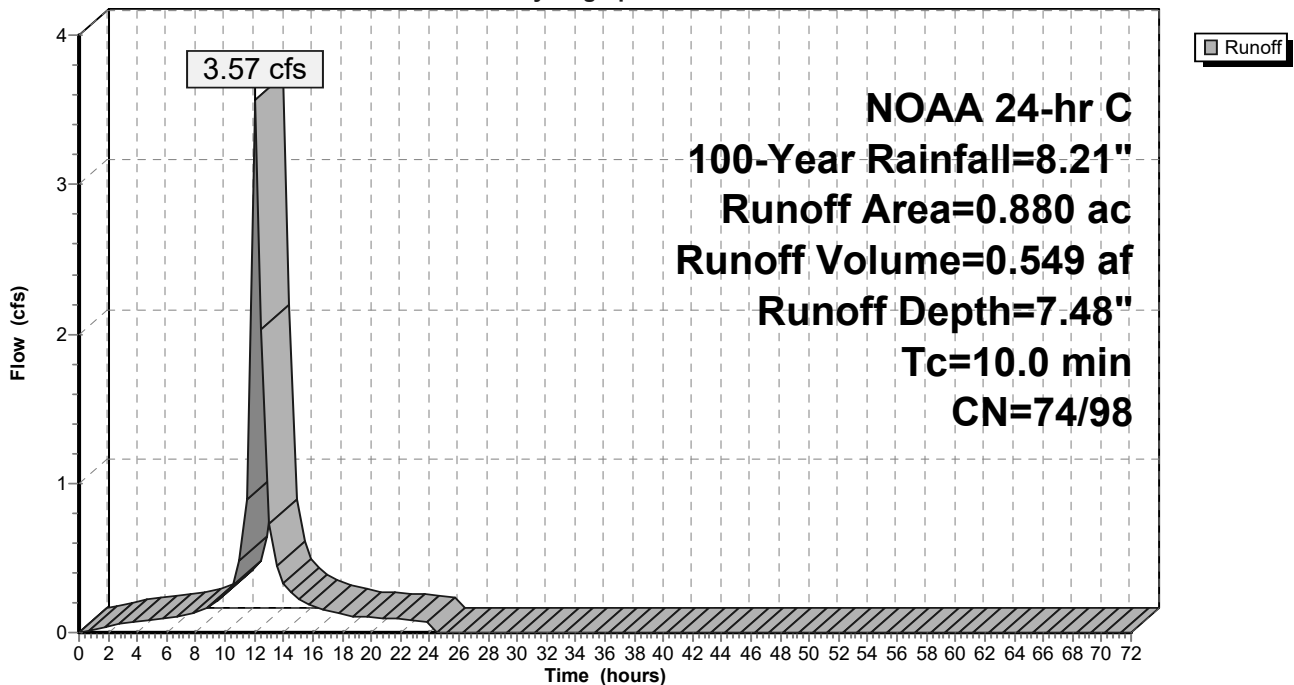
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
0.730	98	Paved parking, HSG C
0.150	74	>75% Grass cover, Good, HSG C
0.880	94	Weighted Average
0.150	74	17.05% Pervious Area
0.730	98	82.95% Impervious Area

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

**Subcatchment 18S: PDA-1B-b**

Hydrograph





**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 23S: EXIST. OFF-SITE**

Runoff = 0.39 cfs @ 12.09 hrs, Volume= 0.054 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

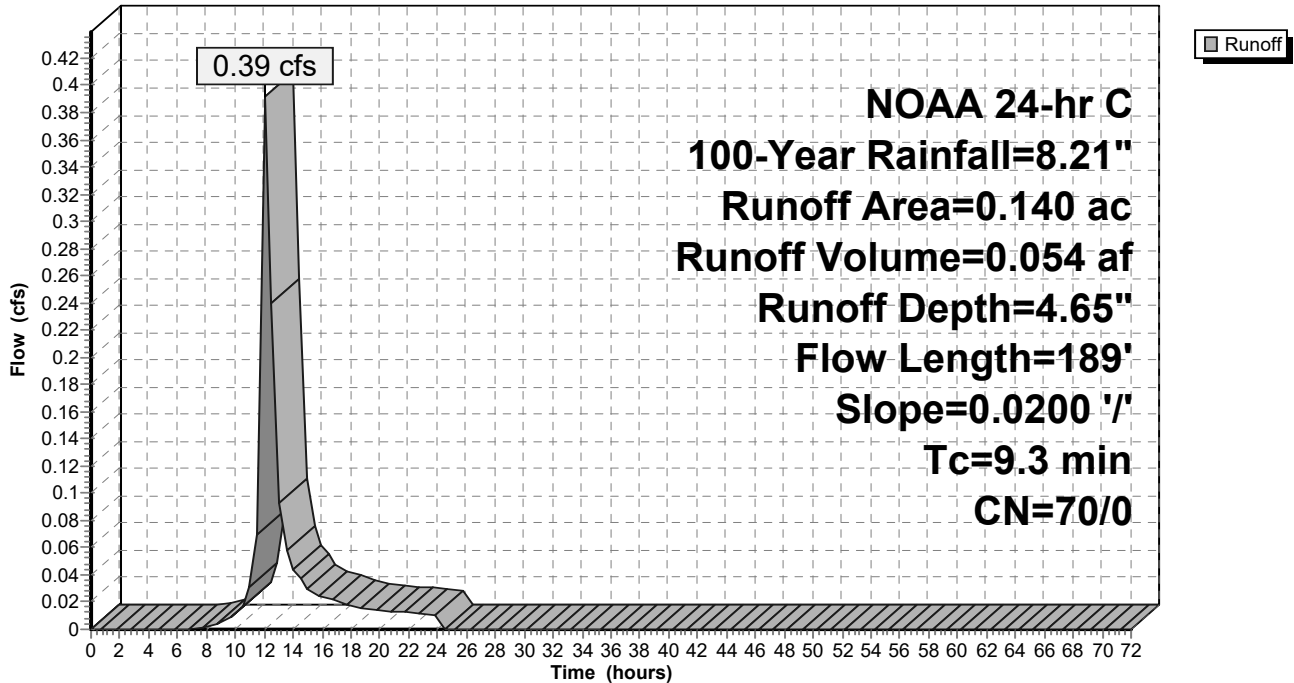
Area (ac)	CN	Description
0.140	70	Woods, Good, HSG C
0.140	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	18	0.0200	0.06		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
4.0	171	0.0200	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.3	189	Total			

**Subcatchment 23S: EXIST. OFF-SITE**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 24S: PDA-1B-c**

Runoff = 14.15 cfs @ 12.08 hrs, Volume= 2.074 af, Depth= 6.03"

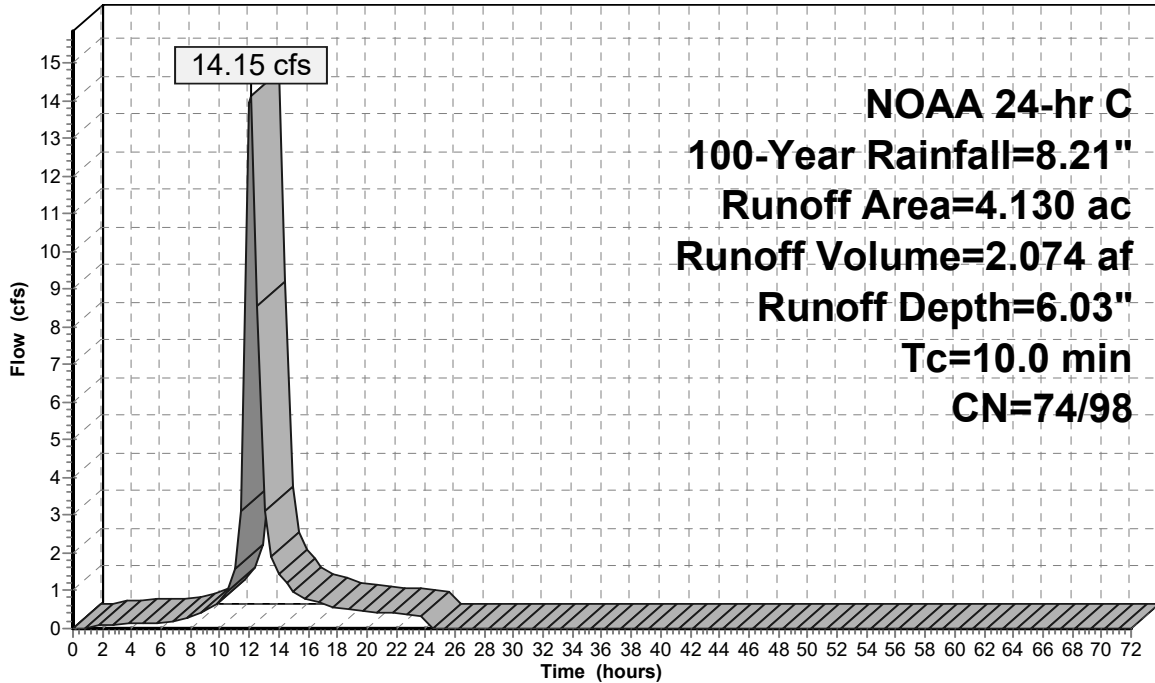
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
2.810	74	>75% Grass cover, Good, HSG C
* 1.320	98	Impervious
4.130	82	Weighted Average
2.810	74	68.04% Pervious Area
1.320	98	31.96% Impervious Area

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

**Subcatchment 24S: PDA-1B-c**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 25S: PDA-1A-c**

Runoff = 50.63 cfs @ 12.07 hrs, Volume= 7.723 af, Depth= 7.23"

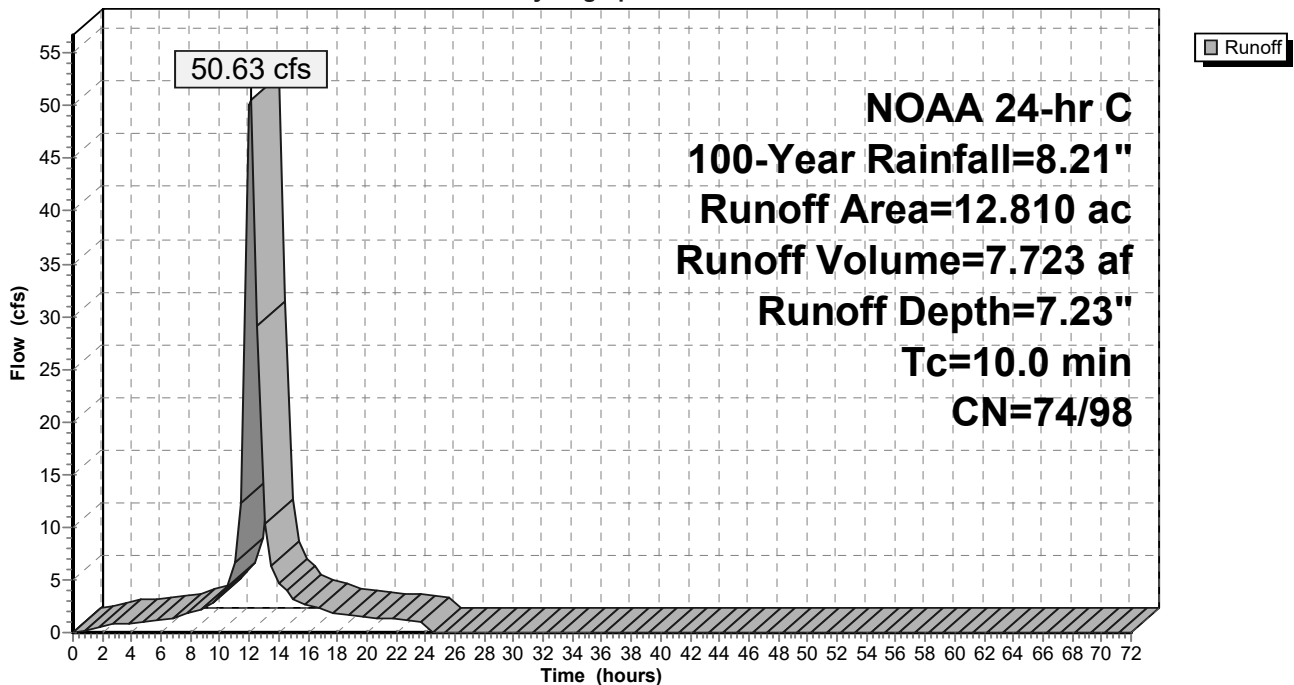
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
3.300	74	>75% Grass cover, Good, HSG C
* 9.510	98	Impervious & Exist. Roof Areas
12.810	92	Weighted Average
3.300	74	25.76% Pervious Area
9.510	98	74.24% Impervious Area

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

**Subcatchment 25S: PDA-1A-c**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 27S: PDA-1B-d**

Runoff = 0.84 cfs @ 12.07 hrs, Volume= 0.127 af, Depth= 6.93"

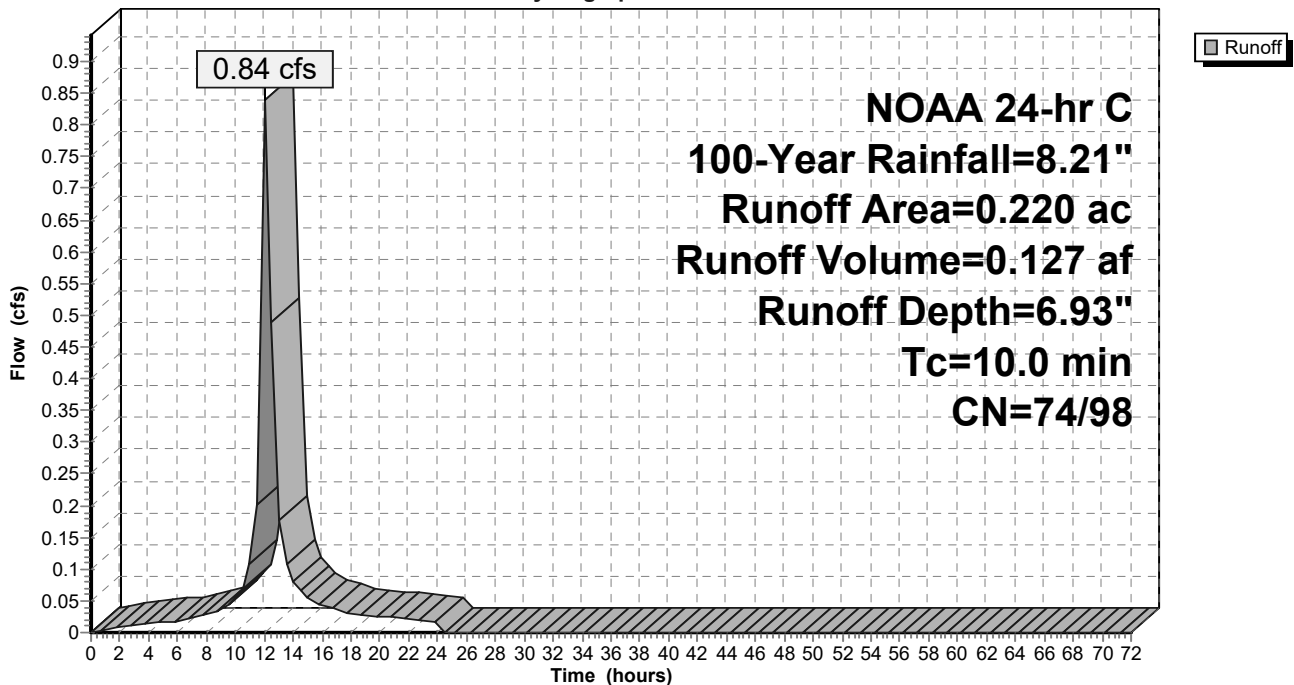
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG A
0.080	74	>75% Grass cover, Good, HSG C
0.220	89	Weighted Average
0.080	74	36.36% Pervious Area
0.140	98	63.64% Impervious Area

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

**Subcatchment 27S: PDA-1B-d**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 28S: PDA-1A-a**

Runoff = 0.81 cfs @ 12.06 hrs, Volume= 0.126 af, Depth= 7.97"

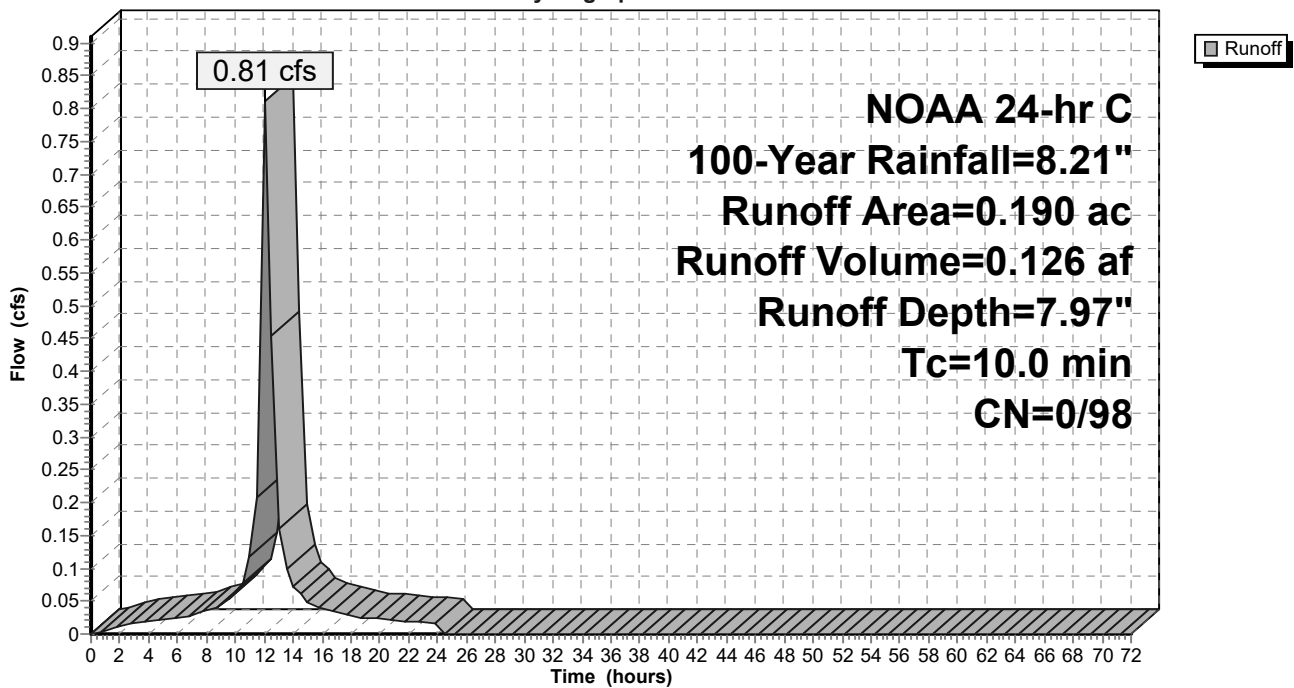
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
0.190	98	Paved parking, HSG C
0.190	98	100.00% Impervious Area

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

**Subcatchment 28S: PDA-1A-a**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 30S: PDA-1C**

Runoff = 3.49 cfs @ 12.10 hrs, Volume= 0.490 af, Depth= 5.11"

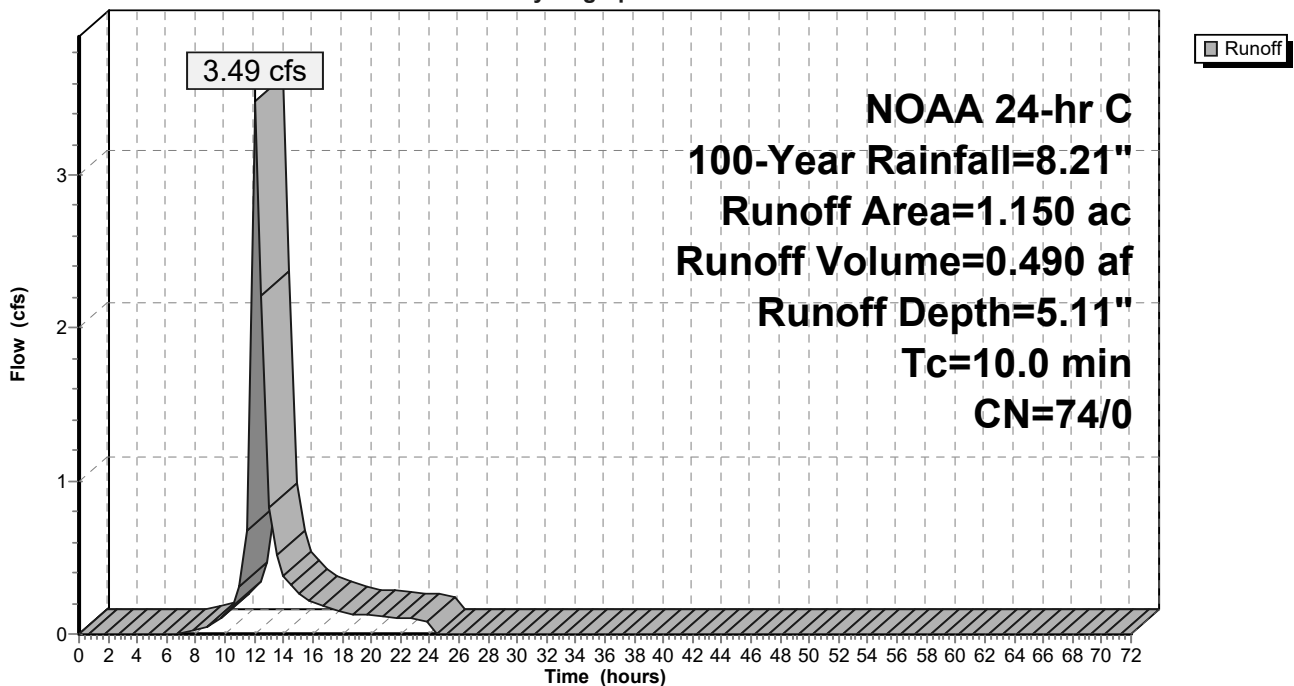
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
1.150	74	>75% Grass cover, Good, HSG C
1.150	74	100.00% Pervious Area

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

**Subcatchment 30S: PDA-1C**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 31S: PDA-1B-c (Roof)**

Runoff = 24.28 cfs @ 12.06 hrs, Volume= 3.773 af, Depth= 7.97"

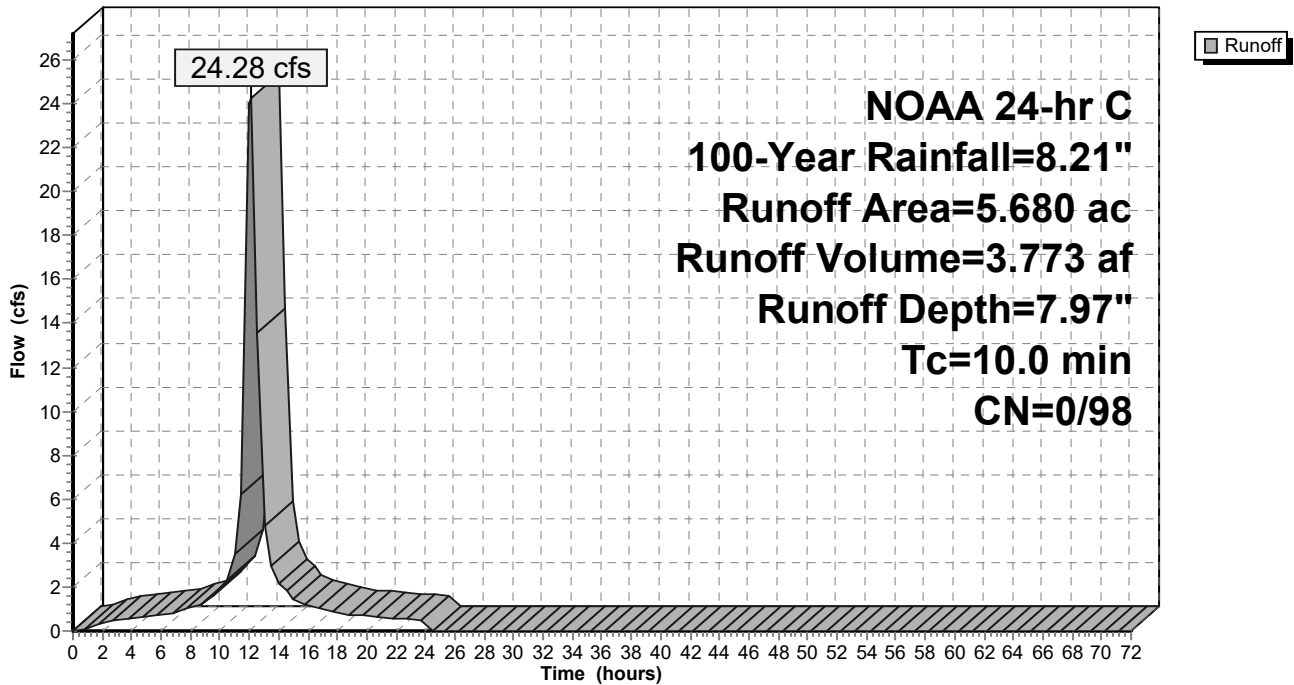
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
* 5.680	98	Prop. Roofs
5.680	98	100.00% Impervious Area

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

**Subcatchment 31S: PDA-1B-c (Roof)**

Hydrograph



**Pre vs Post\_211020**

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**Summary for Pond 2P: Ex. Detention Basin**

Inflow Area = 6.720 ac, 42.86% Impervious, Inflow Depth = 6.08" for 100-Year event  
 Inflow = 20.70 cfs @ 12.16 hrs, Volume= 3.403 af  
 Outflow = 4.36 cfs @ 13.40 hrs, Volume= 3.370 af, Atten= 79%, Lag= 74.0 min  
 Primary = 0.99 cfs @ 13.40 hrs, Volume= 0.830 af  
 Secondary = 3.37 cfs @ 13.40 hrs, Volume= 2.539 af  
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 106.34' @ 13.40 hrs Surf.Area= 61,033 sf Storage= 75,467 cf

Plug-Flow detention time= 284.1 min calculated for 3.347 af (98% of inflow)  
 Center-of-Mass det. time= 289.0 min ( 1,110.7 - 821.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	105.00'	186,871 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
105.00	52,708	0	0
106.00	57,935	55,322	55,322
107.00	67,082	62,509	117,830
108.00	71,000	69,041	186,871

Device	Routing	Invert	Outlet Devices
#1	Primary	105.00'	<b>18.0" Round RCP_Round 18"</b> L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0333 1/1' Cc= 0.900 n= 0.015, Flow Area= 1.77 sf
#2	Device 1	105.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	106.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Secondary	105.00'	<b>8.0" Round Culvert X 2.00</b> L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0238 1/1' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf
#5	Tertiary	107.00'	<b>50.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

**Primary OutFlow** Max=0.98 cfs @ 13.40 hrs HW=106.33' (Free Discharge)

- ↑ 1=RCP\_Round 18" (Passes 0.98 cfs of 6.53 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.98 cfs @ 5.01 fps)
- ↑ 3=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=3.36 cfs @ 13.40 hrs HW=106.33' (Free Discharge)

- ↑ 4=Culvert (Inlet Controls 3.36 cfs @ 4.82 fps)

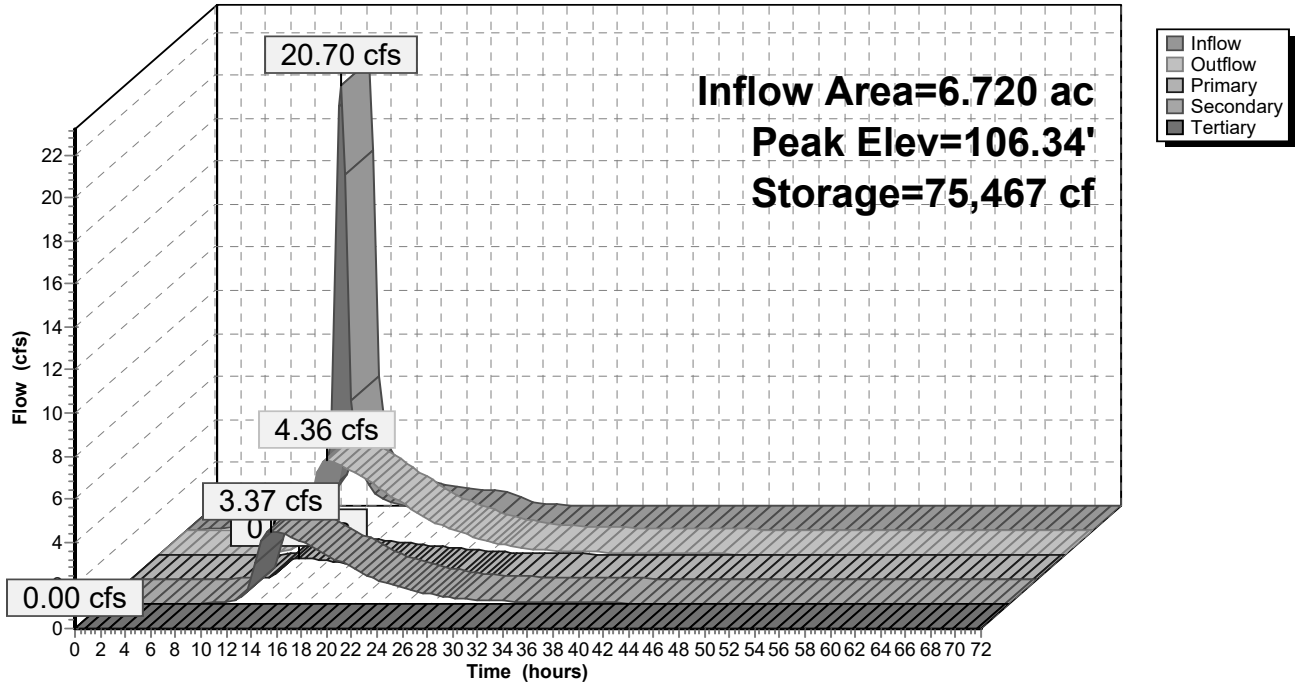
**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=105.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)



### Pond 2P: Ex. Detention Basin

Hydrograph



**Pre vs Post 211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Stage-Area-Storage for Pond 2P: Ex. Detention Basin**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
105.00	52,708	0	107.65	69,629	162,261
105.05	52,969	2,642	107.70	69,825	165,747
105.10	53,231	5,297	107.75	70,021	169,243
105.15	53,492	7,965	107.80	70,216	172,749
105.20	53,753	10,646	107.85	70,412	176,265
105.25	54,015	13,340	107.90	70,608	179,791
105.30	54,276	16,048	107.95	70,804	183,326
105.35	54,537	18,768	108.00	<b>71,000</b>	<b>186,871</b>
105.40	54,799	21,501			
105.45	55,060	24,248			
105.50	55,322	27,007			
105.55	55,583	29,780			
105.60	55,844	32,566			
105.65	56,106	35,364			
105.70	56,367	38,176			
105.75	56,628	41,001			
105.80	56,890	43,839			
105.85	57,151	46,690			
105.90	57,412	49,554			
105.95	57,674	52,431			
106.00	57,935	55,322			
106.05	58,392	58,230			
106.10	58,850	61,161			
106.15	59,307	64,115			
106.20	59,764	67,091			
106.25	60,222	70,091			
106.30	60,679	73,114			
106.35	61,136	76,159			
106.40	61,594	79,227			
106.45	62,051	82,318			
106.50	62,509	85,432			
106.55	62,966	88,569			
106.60	63,423	91,729			
106.65	63,881	94,912			
106.70	64,338	98,117			
106.75	64,795	101,345			
106.80	65,253	104,597			
106.85	65,710	107,871			
106.90	66,167	111,168			
106.95	66,625	114,487			
107.00	67,082	117,830			
107.05	67,278	121,189			
107.10	67,474	124,558			
107.15	67,670	127,936			
107.20	67,866	131,325			
107.25	68,062	134,723			
107.30	68,257	138,131			
107.35	68,453	141,549			
107.40	68,649	144,976			
107.45	68,845	148,414			
107.50	69,041	151,861			
107.55	69,237	155,318			
107.60	69,433	158,784			

**Pre vs Post 211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Pond 10P: BIO BASIN 1**

Inflow Area = 1.710 ac, 48.54% Impervious, Inflow Depth = 6.44" for 100-Year event  
 Inflow = 5.72 cfs @ 12.09 hrs, Volume= 0.918 af  
 Outflow = 4.89 cfs @ 12.39 hrs, Volume= 0.844 af, Atten= 14%, Lag= 17.5 min  
 Primary = 4.89 cfs @ 12.39 hrs, Volume= 0.844 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 110.88' @ 12.38 hrs Surf.Area= 4,569 sf Storage= 6,905 cf

Plug-Flow detention time= 95.3 min calculated for 0.838 af (91% of inflow)  
 Center-of-Mass det. time= 53.9 min ( 840.8 - 786.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	109.00'	16,075 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.00	2,682	0	0
110.00	3,789	3,236	3,236
111.00	4,677	4,233	7,469
112.00	5,873	5,275	12,744
112.50	7,453	3,332	16,075

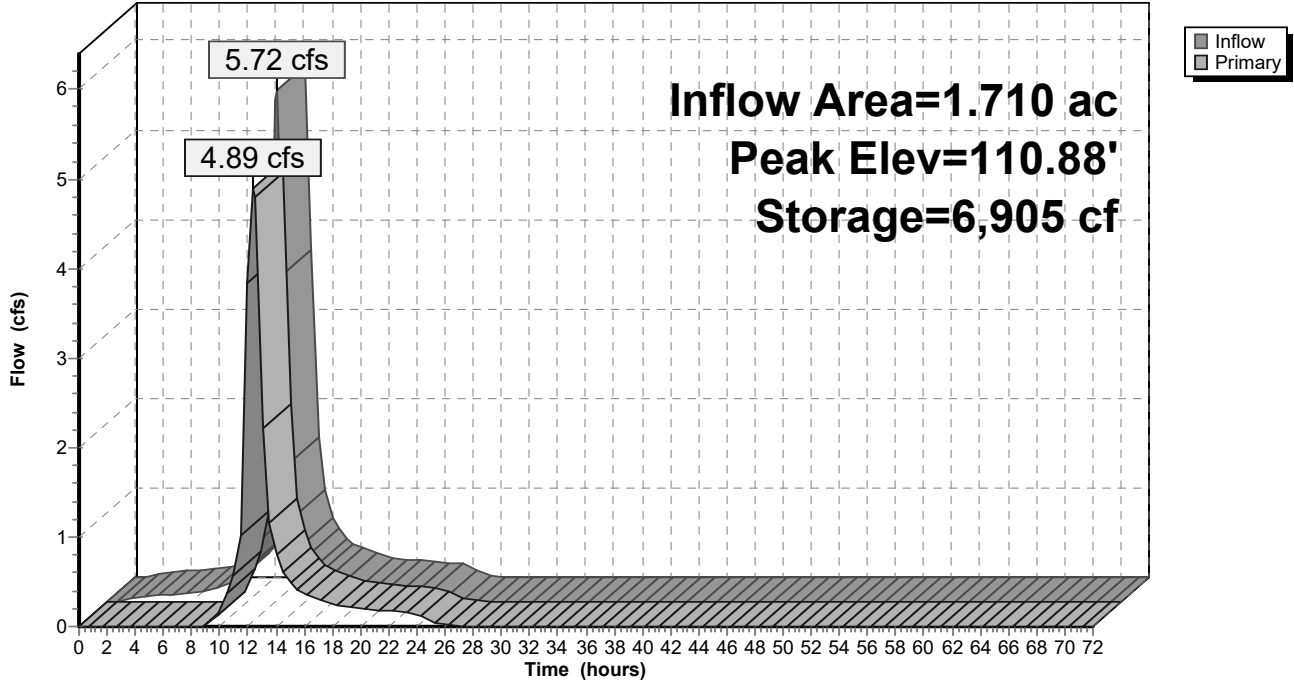
Device	Routing	Invert	Outlet Devices
#1	Primary	106.16'	<b>18.0" Round Culvert</b> L= 636.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 106.16' / 104.50' S= 0.0026 1' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Device 1	110.00'	<b>2.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)
#3	Device 1	111.00'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=4.57 cfs @ 12.39 hrs HW=110.84' (Free Discharge)

- 1=Culvert (Passes 4.57 cfs of 9.23 cfs potential flow)
- 2=Sharp-Crested Rectangular Weir (Weir Controls 4.57 cfs @ 2.99 fps)
- 3=Orifice/Grate ( Controls 0.00 cfs)

### Pond 10P: BIO BASIN 1

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Stage-Area-Storage for Pond 10P: BIO BASIN 1**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
109.00	2,682	0	111.65	5,454	10,761
109.05	2,737	135	111.70	5,514	11,035
109.10	2,793	274	111.75	5,574	11,313
109.15	2,848	415	111.80	5,634	11,593
109.20	2,903	559	111.85	5,694	11,876
109.25	2,959	705	111.90	5,753	12,162
109.30	3,014	854	111.95	5,813	12,451
109.35	3,069	1,007	112.00	5,873	12,744
109.40	3,125	1,161	112.05	6,031	13,041
109.45	3,180	1,319	112.10	6,189	13,347
109.50	3,236	1,479	112.15	6,347	13,660
109.55	3,291	1,643	112.20	6,505	13,981
109.60	3,346	1,808	112.25	6,663	14,311
109.65	3,402	1,977	112.30	6,821	14,648
109.70	3,457	2,149	112.35	6,979	14,993
109.75	3,512	2,323	112.40	7,137	15,346
109.80	3,568	2,500	112.45	7,295	15,706
109.85	3,623	2,680	112.50	<b>7,453</b>	<b>16,075</b>
109.90	3,678	2,862			
109.95	3,734	3,047			
110.00	3,789	3,236			
110.05	3,833	3,426			
110.10	3,878	3,619			
110.15	3,922	3,814			
110.20	3,967	4,011			
110.25	4,011	4,211			
110.30	4,055	4,412			
110.35	4,100	4,616			
110.40	4,144	4,822			
110.45	4,189	5,030			
110.50	4,233	5,241			
110.55	4,277	5,454			
110.60	4,322	5,669			
110.65	4,366	5,886			
110.70	4,411	6,105			
110.75	4,455	6,327			
110.80	4,499	6,551			
110.85	4,544	6,777			
110.90	4,588	7,005			
110.95	4,633	7,236			
111.00	4,677	7,469			
111.05	4,737	7,704			
111.10	4,797	7,942			
111.15	4,856	8,184			
111.20	4,916	8,428			
111.25	4,976	8,675			
111.30	5,036	8,925			
111.35	5,096	9,179			
111.40	5,155	9,435			
111.45	5,215	9,694			
111.50	5,275	9,957			
111.55	5,335	10,222			
111.60	5,395	10,490			

**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Pond 11P: BIO BASIN 2**

Inflow Area = 0.880 ac, 82.95% Impervious, Inflow Depth = 7.48" for 100-Year event  
 Inflow = 3.57 cfs @ 12.07 hrs, Volume= 0.549 af  
 Outflow = 3.21 cfs @ 12.41 hrs, Volume= 0.485 af, Atten= 10%, Lag= 20.8 min  
 Primary = 3.21 cfs @ 12.41 hrs, Volume= 0.485 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 110.86' @ 12.40 hrs Surf.Area= 4,128 sf Storage= 7,673 cf

Plug-Flow detention time= 236.0 min calculated for 0.485 af (88% of inflow)  
 Center-of-Mass det. time= 174.7 min ( 928.3 - 753.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.50'	15,574 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
108.50	2,430	0	0
109.00	2,763	1,298	1,298
110.00	3,471	3,117	4,415
111.00	4,237	3,854	8,269
112.00	5,059	4,648	12,917
112.50	5,569	2,657	15,574

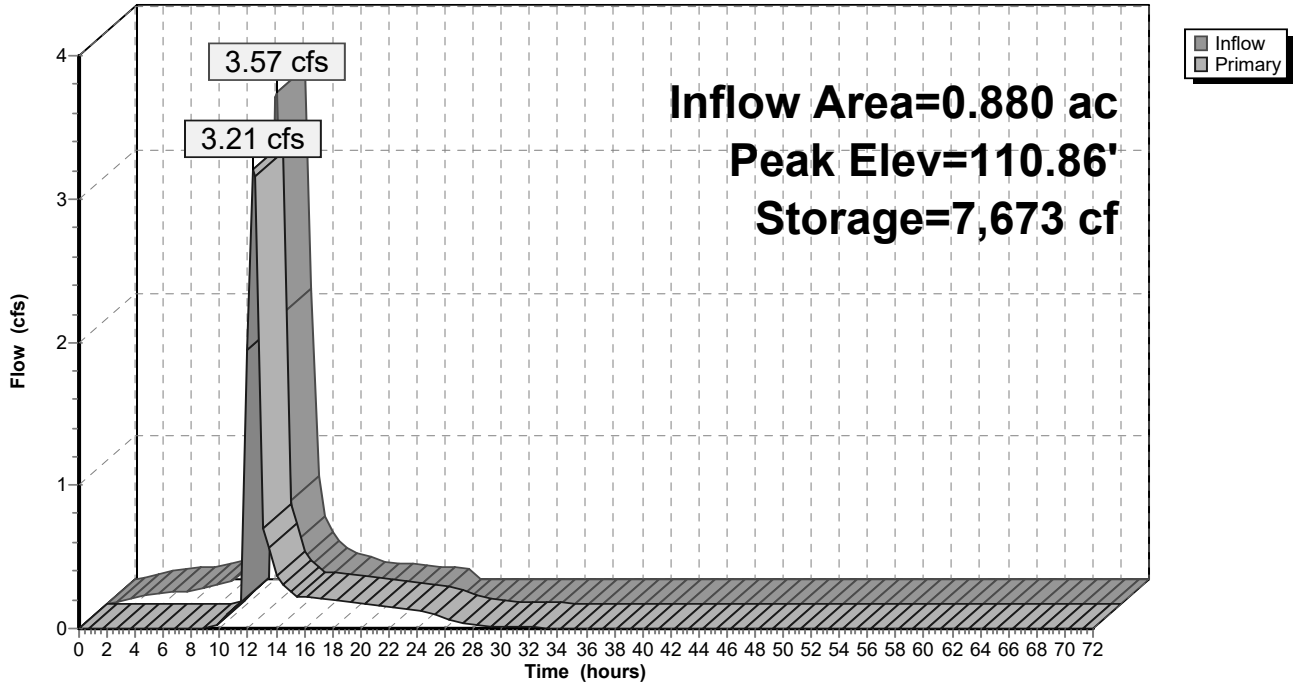
Device	Routing	Invert	Outlet Devices
#1	Primary	105.50'	<b>18.0" Round Culvert</b> L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 105.50' / 105.26' S= 0.0030 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	109.50'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	110.50'	<b>4.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s) 0.5' Crest Height
#4	Device 1	111.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=2.93 cfs @ 12.41 hrs HW=110.83' (Free Discharge)

- 1=Culvert (Passes 2.93 cfs of 17.93 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.26 cfs @ 5.29 fps)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 2.67 cfs @ 2.04 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)

### Pond 11P: BIO BASIN 2

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Stage-Area-Storage for Pond 11P: BIO BASIN 2**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
108.50	2,430	0	111.15	4,360	8,914
108.55	2,463	122	111.20	4,401	9,133
108.60	2,497	246	111.25	4,443	9,354
108.65	2,530	372	111.30	4,484	9,577
108.70	2,563	499	111.35	4,525	9,803
108.75	2,597	628	111.40	4,566	10,030
108.80	2,630	759	111.45	4,607	10,259
108.85	2,663	891	111.50	4,648	10,491
108.90	2,696	1,025	111.55	4,689	10,724
108.95	2,730	1,161	111.60	4,730	10,959
109.00	2,763	1,298	111.65	4,771	11,197
109.05	2,798	1,437	111.70	4,812	11,437
109.10	2,834	1,578	111.75	4,854	11,678
109.15	2,869	1,721	111.80	4,895	11,922
109.20	2,905	1,865	111.85	4,936	12,168
109.25	2,940	2,011	111.90	4,977	12,415
109.30	2,975	2,159	111.95	5,018	12,665
109.35	3,011	2,309	112.00	5,059	12,917
109.40	3,046	2,460	112.05	5,110	13,171
109.45	3,082	2,613	112.10	5,161	13,428
109.50	3,117	2,768	112.15	5,212	13,688
109.55	3,152	2,925	112.20	5,263	13,949
109.60	3,188	3,083	112.25	5,314	14,214
109.65	3,223	3,244	112.30	5,365	14,481
109.70	3,259	3,406	112.35	5,416	14,750
109.75	3,294	3,570	112.40	5,467	15,022
109.80	3,329	3,735	112.45	5,518	15,297
109.85	3,365	3,903	112.50	<b>5,569</b>	<b>15,574</b>
109.90	3,400	4,072			
109.95	3,436	4,243			
110.00	3,471	4,415			
110.05	3,509	4,590			
110.10	3,548	4,766			
110.15	3,586	4,945			
110.20	3,624	5,125			
110.25	3,663	5,307			
110.30	3,701	5,491			
110.35	3,739	5,677			
110.40	3,777	5,865			
110.45	3,816	6,055			
110.50	3,854	6,247			
110.55	3,892	6,440			
110.60	3,931	6,636			
110.65	3,969	6,833			
110.70	4,007	7,033			
110.75	4,046	7,234			
110.80	4,084	7,437			
110.85	4,122	7,642			
110.90	4,160	7,849			
110.95	4,199	8,058			
111.00	4,237	8,269			
111.05	4,278	8,482			
111.10	4,319	8,697			



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Pond 12P: PERV. PVMT-West**

Inflow Area = 0.580 ac, 100.00% Impervious, Inflow Depth = 7.97" for 100-Year event  
 Inflow = 2.17 cfs @ 12.12 hrs, Volume= 0.385 af  
 Outflow = 2.37 cfs @ 12.52 hrs, Volume= 0.385 af, Atten= 0%, Lag= 24.0 min  
 Primary = 2.37 cfs @ 12.52 hrs, Volume= 0.385 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 110.41' @ 12.53 hrs Surf.Area= 0.130 ac Storage= 0.112 af

Plug-Flow detention time= 165.6 min calculated for 0.382 af (99% of inflow)  
 Center-of-Mass det. time= 170.0 min ( 937.4 - 767.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.25'	0.159 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.396 af Overall x 40.0% Voids

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
108.25	0.130	0.000	0.000
111.30	0.130	0.396	0.396

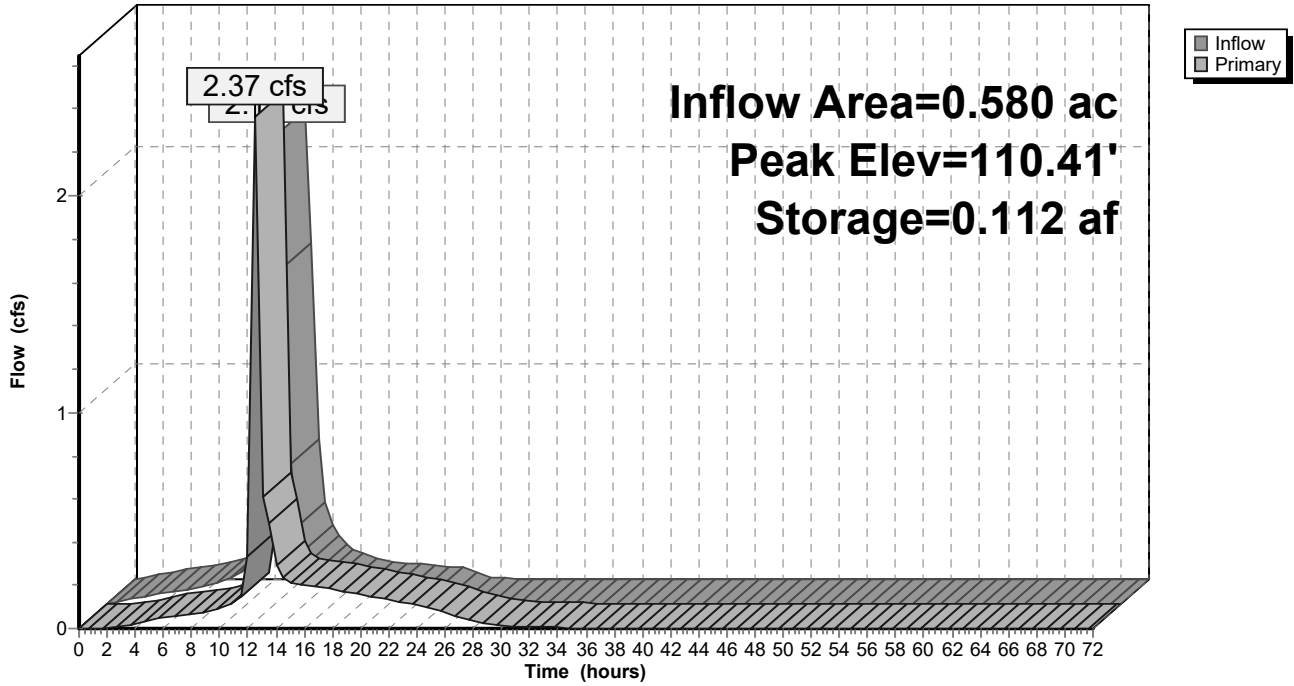
Device	Routing	Invert	Outlet Devices
#1	Primary	108.25'	<b>12.0" Round RCP_Round 12"</b> L= 19.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 108.25' / 108.20' S= 0.0026 ' S= 0.0026 ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	108.25'	<b>2.5" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	109.95'	<b>2.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s) 0.5' Crest Height
#4	Primary	110.95'	<b>48.0" x 48.0" Horiz. Orifice/Grate-Overflow</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=2.28 cfs @ 12.52 hrs HW=110.39' (Free Discharge)

- 1=RCP\_Round 12" (Passes 2.28 cfs of 4.85 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.23 cfs @ 6.88 fps)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 2.05 cfs @ 2.42 fps)
- 4=Orifice/Grate-Overflow ( Controls 0.00 cfs)

### Pond 12P: PERV. PVMT-West

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Stage-Area-Storage for Pond 12P: PERV. PVMT-West**

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
108.25	<b>0.130</b>	0.000	110.90	0.130	0.138
108.30	0.130	0.003	110.95	0.130	0.140
108.35	0.130	0.005	111.00	0.130	0.143
108.40	0.130	0.008	111.05	0.130	0.146
108.45	0.130	0.010	111.10	0.130	0.148
108.50	0.130	0.013	111.15	0.130	0.151
108.55	0.130	0.016	111.20	0.130	0.153
108.60	0.130	0.018	111.25	0.130	0.156
108.65	0.130	0.021	111.30	0.130	<b>0.159</b>
108.70	0.130	0.023			
108.75	0.130	0.026			
108.80	0.130	0.029			
108.85	0.130	0.031			
108.90	0.130	0.034			
108.95	0.130	0.036			
109.00	0.130	0.039			
109.05	0.130	0.042			
109.10	0.130	0.044			
109.15	0.130	0.047			
109.20	0.130	0.049			
109.25	0.130	0.052			
109.30	0.130	0.055			
109.35	0.130	0.057			
109.40	0.130	0.060			
109.45	0.130	0.062			
109.50	0.130	0.065			
109.55	0.130	0.068			
109.60	0.130	0.070			
109.65	0.130	0.073			
109.70	0.130	0.075			
109.75	0.130	0.078			
109.80	0.130	0.081			
109.85	0.130	0.083			
109.90	0.130	0.086			
109.95	0.130	0.088			
110.00	0.130	0.091			
110.05	0.130	0.094			
110.10	0.130	0.096			
110.15	0.130	0.099			
110.20	0.130	0.101			
110.25	0.130	0.104			
110.30	0.130	0.107			
110.35	0.130	0.109			
110.40	0.130	0.112			
110.45	0.130	0.114			
110.50	0.130	0.117			
110.55	0.130	0.120			
110.60	0.130	0.122			
110.65	0.130	0.125			
110.70	0.130	0.127			
110.75	0.130	0.130			
110.80	0.130	0.133			
110.85	0.130	0.135			

**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Pond 27P: PERV. PVMT-East**

Inflow Area = 0.190 ac, 100.00% Impervious, Inflow Depth = 7.97" for 100-Year event  
 Inflow = 0.81 cfs @ 12.06 hrs, Volume= 0.126 af  
 Outflow = 0.63 cfs @ 12.42 hrs, Volume= 0.126 af, Atten= 22%, Lag= 21.6 min  
 Primary = 0.63 cfs @ 12.42 hrs, Volume= 0.126 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 109.32' @ 12.42 hrs Surf.Area= 0.130 ac Storage= 0.022 af

Plug-Flow detention time= 63.4 min calculated for 0.125 af (99% of inflow)  
 Center-of-Mass det. time= 69.5 min ( 814.1 - 744.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.90'	0.135 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.338 af Overall x 40.0% Voids

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
108.90	0.130	0.000	0.000
111.50	0.130	0.338	0.338

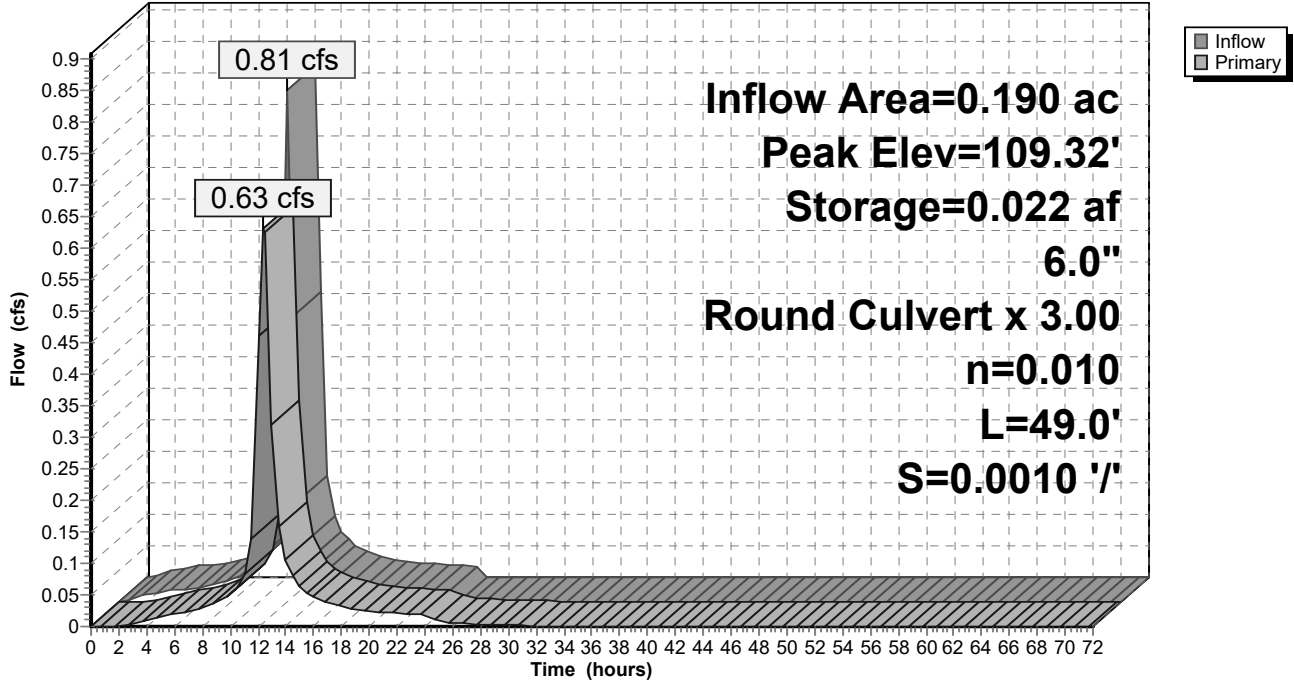
Device	Routing	Invert	Outlet Devices
#1	Primary	108.90'	<b>6.0" Round Culvert X 3.00</b> L= 49.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 108.90' / 108.85' S= 0.0010 ' S= 0.0010 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=0.60 cfs @ 12.42 hrs HW=109.31' (Free Discharge)

↑1=Culvert (Barrel Controls 0.60 cfs @ 1.59 fps)

**Pond 27P: PERV. PVMT-East**

Hydrograph



**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Stage-Area-Storage for Pond 27P: PERV. PVMT-East**

Elevation (feet)	Surface (acres)	Storage (acre-feet)
108.90	<b>0.130</b>	0.000
108.95	0.130	0.003
109.00	0.130	0.005
109.05	0.130	0.008
109.10	0.130	0.010
109.15	0.130	0.013
109.20	0.130	0.016
109.25	0.130	0.018
109.30	0.130	0.021
109.35	0.130	0.023
109.40	0.130	0.026
109.45	0.130	0.029
109.50	0.130	0.031
109.55	0.130	0.034
109.60	0.130	0.036
109.65	0.130	0.039
109.70	0.130	0.042
109.75	0.130	0.044
109.80	0.130	0.047
109.85	0.130	0.049
109.90	0.130	0.052
109.95	0.130	0.055
110.00	0.130	0.057
110.05	0.130	0.060
110.10	0.130	0.062
110.15	0.130	0.065
110.20	0.130	0.068
110.25	0.130	0.070
110.30	0.130	0.073
110.35	0.130	0.075
110.40	0.130	0.078
110.45	0.130	0.081
110.50	0.130	0.083
110.55	0.130	0.086
110.60	0.130	0.088
110.65	0.130	0.091
110.70	0.130	0.094
110.75	0.130	0.096
110.80	0.130	0.099
110.85	0.130	0.101
110.90	0.130	0.104
110.95	0.130	0.107
111.00	0.130	0.109
111.05	0.130	0.112
111.10	0.130	0.114
111.15	0.130	0.117
111.20	0.130	0.120
111.25	0.130	0.122
111.30	0.130	0.125
111.35	0.130	0.127
111.40	0.130	0.130
111.45	0.130	0.133
111.50	0.130	<b>0.135</b>

**Pre vs Post\_211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Pond 29P: PERV. PVMT-Rear**

Inflow Area = 0.220 ac, 63.64% Impervious, Inflow Depth = 6.93" for 100-Year event  
 Inflow = 0.84 cfs @ 12.07 hrs, Volume= 0.127 af  
 Outflow = 0.51 cfs @ 12.57 hrs, Volume= 0.127 af, Atten= 40%, Lag= 29.6 min  
 Primary = 0.51 cfs @ 12.57 hrs, Volume= 0.127 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 111.56' @ 12.56 hrs Surf.Area= 0.107 ac Storage= 0.030 af

Plug-Flow detention time= 70.8 min calculated for 0.126 af (99% of inflow)  
 Center-of-Mass det. time= 77.7 min ( 842.9 - 765.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	110.85'	0.053 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.134 af Overall x 40.0% Voids

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
110.85	0.107	0.000	0.000
112.10	0.107	0.134	0.134

Device	Routing	Invert	Outlet Devices
#1	Primary	110.85'	<b>6.0" Round Culvert</b> L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 110.85' / 110.00' S= 0.0163 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=0.50 cfs @ 12.57 hrs HW=111.54' (Free Discharge)  
 ↑1=Culvert (Inlet Controls 0.50 cfs @ 2.53 fps)

**Pre vs Post\_211020**

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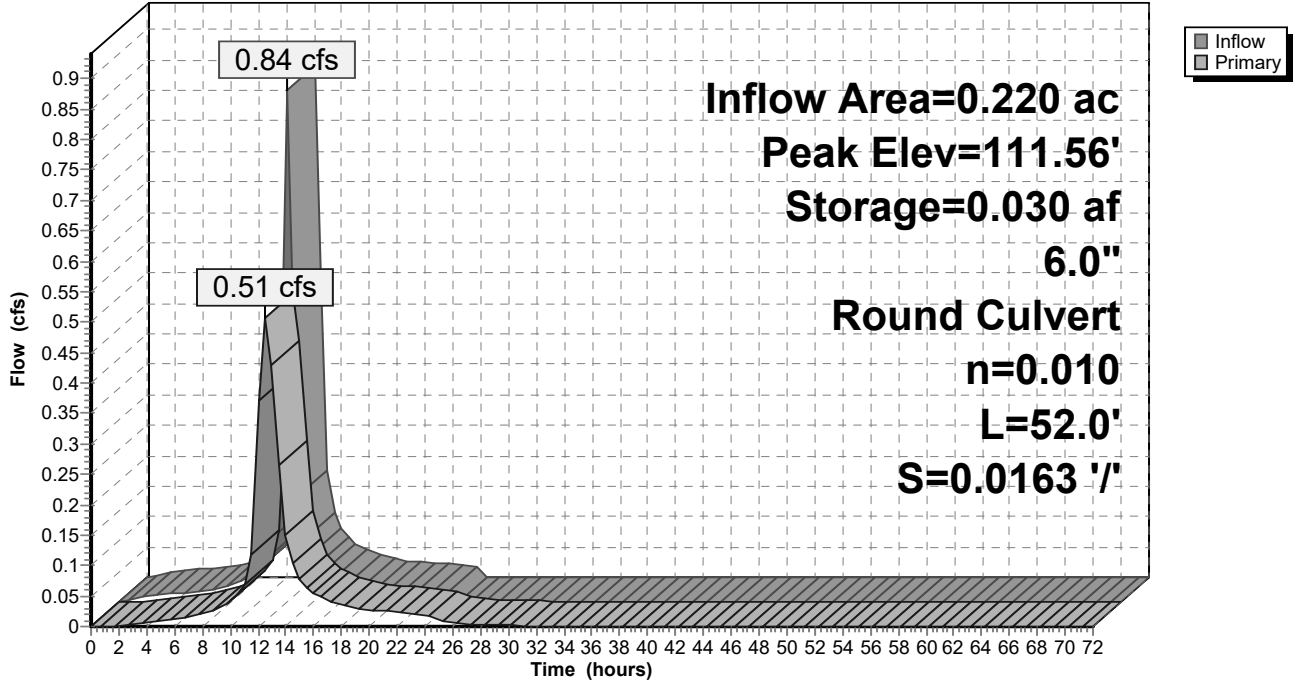
NOAA 24-hr C 100-Year Rainfall=8.21"

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**Pond 29P: PERV. PVMT-Rear**

Hydrograph





**Pre vs Post 211020**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Stage-Area-Storage for Pond 29P: PERV. PVMT-Rear**

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
110.85	<b>0.107</b>	0.000	111.91	0.107	0.045
110.87	0.107	0.001	111.93	0.107	0.046
110.89	0.107	0.002	111.95	0.107	0.047
110.91	0.107	0.003	111.97	0.107	0.048
110.93	0.107	0.003	111.99	0.107	0.049
110.95	0.107	0.004	112.01	0.107	0.050
110.97	0.107	0.005	112.03	0.107	0.051
110.99	0.107	0.006	112.05	0.107	0.051
111.01	0.107	0.007	112.07	0.107	0.052
111.03	0.107	0.008	112.09	0.107	<b>0.053</b>
111.05	0.107	0.009			
111.07	0.107	0.009			
111.09	0.107	0.010			
111.11	0.107	0.011			
111.13	0.107	0.012			
111.15	0.107	0.013			
111.17	0.107	0.014			
111.19	0.107	0.015			
111.21	0.107	0.015			
111.23	0.107	0.016			
111.25	0.107	0.017			
111.27	0.107	0.018			
111.29	0.107	0.019			
111.31	0.107	0.020			
111.33	0.107	0.021			
111.35	0.107	0.021			
111.37	0.107	0.022			
111.39	0.107	0.023			
111.41	0.107	0.024			
111.43	0.107	0.025			
111.45	0.107	0.026			
111.47	0.107	0.027			
111.49	0.107	0.027			
111.51	0.107	0.028			
111.53	0.107	0.029			
111.55	0.107	0.030			
111.57	0.107	0.031			
111.59	0.107	0.032			
111.61	0.107	0.033			
111.63	0.107	0.033			
111.65	0.107	0.034			
111.67	0.107	0.035			
111.69	0.107	0.036			
111.71	0.107	0.037			
111.73	0.107	0.038			
111.75	0.107	0.039			
111.77	0.107	0.039			
111.79	0.107	0.040			
111.81	0.107	0.041			
111.83	0.107	0.042			
111.85	0.107	0.043			
111.87	0.107	0.044			
111.89	0.107	0.045			

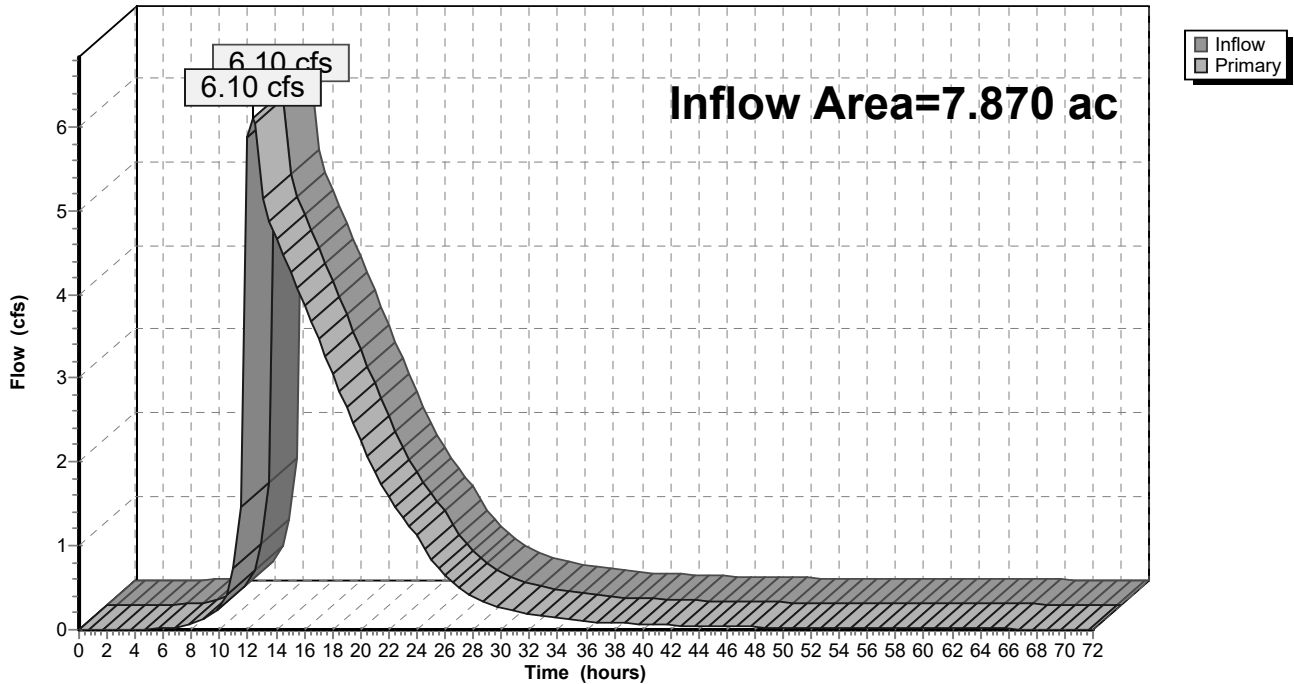
### Summary for Link 9L: BASIN DISCHARGES

Inflow Area = 7.870 ac, 36.59% Impervious, Inflow Depth > 5.89" for 100-Year event  
Inflow = 6.10 cfs @ 12.33 hrs, Volume= 3.860 af  
Primary = 6.10 cfs @ 12.33 hrs, Volume= 3.860 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 9L: BASIN DISCHARGES

Hydrograph



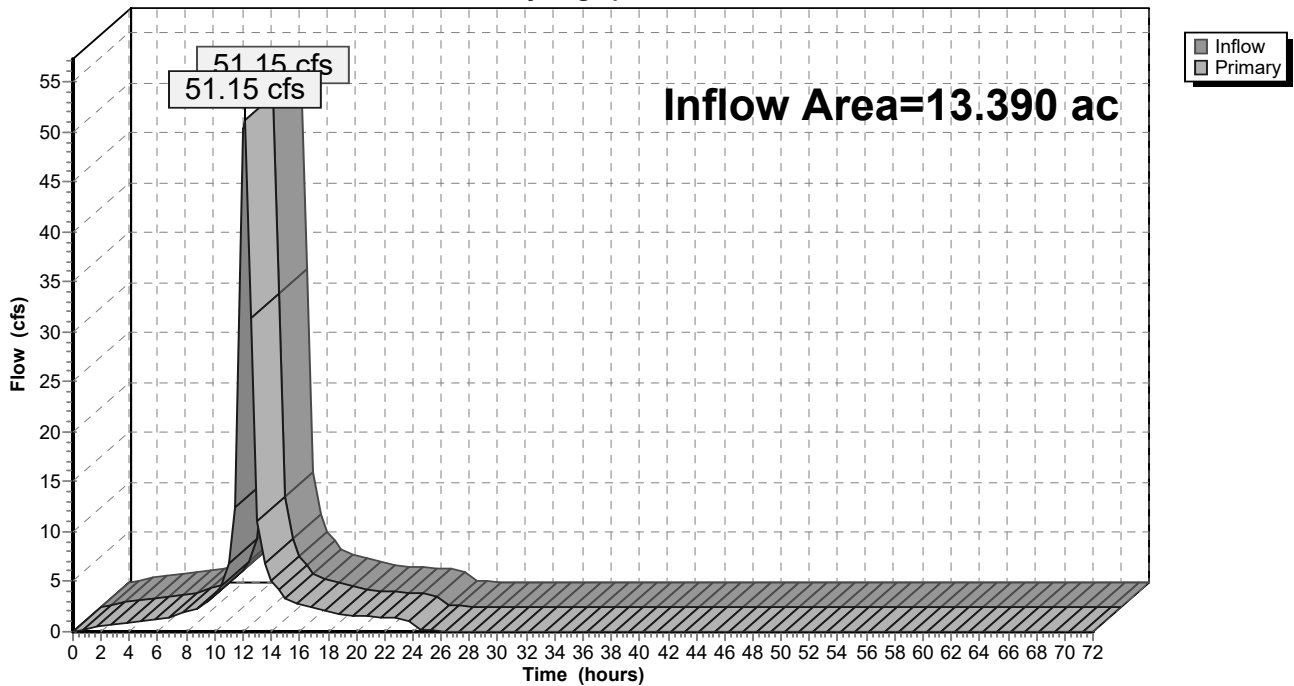
### Summary for Link 20L: PDA-1A TOTAL

Inflow Area = 13.390 ac, 75.35% Impervious, Inflow Depth = 7.27" for 100-Year event  
Inflow = 51.15 cfs @ 12.08 hrs, Volume= 8.108 af  
Primary = 51.15 cfs @ 12.08 hrs, Volume= 8.108 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 20L: PDA-1A TOTAL

Hydrograph



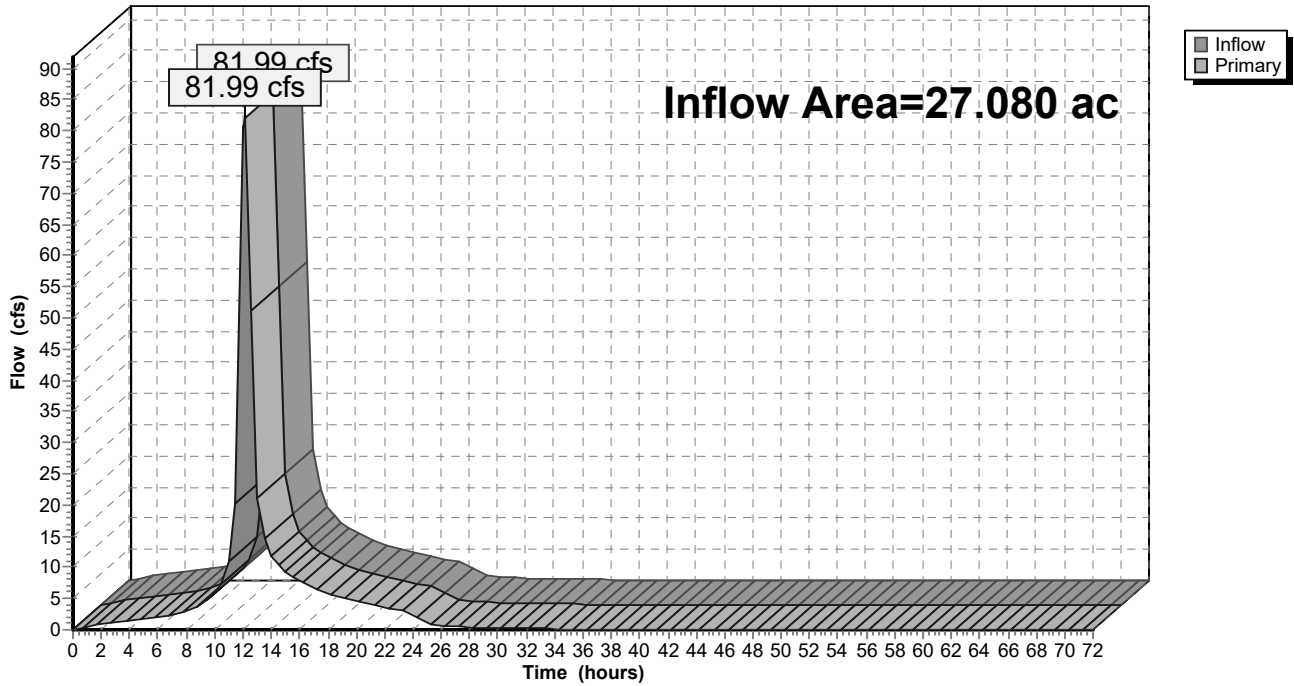
### Summary for Link 22L: PROP. POI-1

Inflow Area = 27.080 ac, 68.87% Impervious, Inflow Depth > 7.00" for 100-Year event  
Inflow = 81.99 cfs @ 12.09 hrs, Volume= 15.794 af  
Primary = 81.99 cfs @ 12.09 hrs, Volume= 15.794 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 22L: PROP. POI-1

Hydrograph



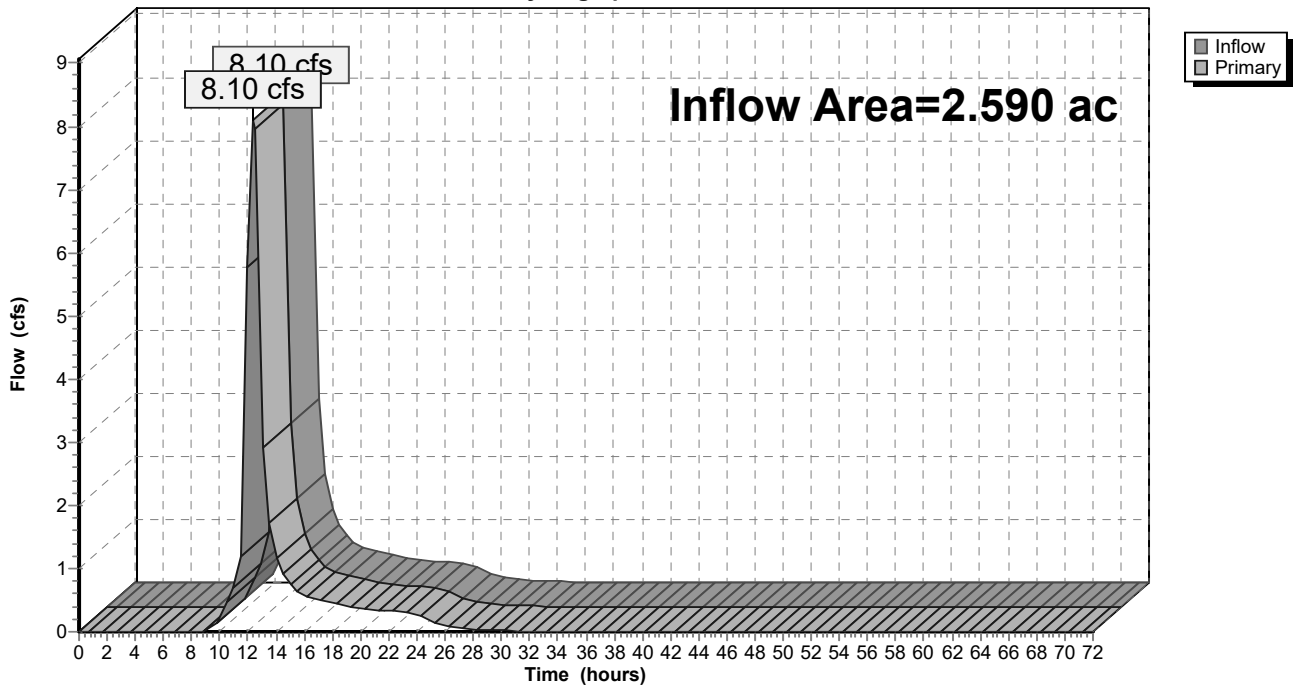
### Summary for Link 28L: MH 101

Inflow Area = 2.590 ac, 60.23% Impervious, Inflow Depth = 6.16" for 100-Year event  
Inflow = 8.10 cfs @ 12.40 hrs, Volume= 1.329 af  
Primary = 8.10 cfs @ 12.40 hrs, Volume= 1.329 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 28L: MH 101

Hydrograph



**Pre vs Post\_211020**

NJ DEP 2-hr WQ Rainfall=1.25"

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Time span=0.00-72.00 hrs, dt=0.50 hrs, 145 points  
 Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment9S: PDA-3 (POI-3)</b>	Runoff Area=0.880 ac 0.00% Impervious Runoff Depth=0.03" Flow Length=291' Tc=15.2 min CN=70/0 Runoff=0.03 cfs 0.002 af
<b>Subcatchment11S: PDA-2 (POI-2)</b>	Runoff Area=1.770 ac 0.00% Impervious Runoff Depth=0.03" Flow Length=609' Tc=19.6 min CN=70/0 Runoff=0.06 cfs 0.005 af
<b>Subcatchment16S: PDA-1A-b</b>	Runoff Area=0.390 ac 100.00% Impervious Runoff Depth=1.03" Tc=10.0 min CN=0/98 Runoff=0.50 cfs 0.034 af
<b>Subcatchment17S: PDA-1B-a</b>	Runoff Area=1.490 ac 46.31% Impervious Runoff Depth=0.51" Tc=10.0 min CN=73/98 Runoff=0.90 cfs 0.064 af
<b>Subcatchment18S: PDA-1B-b</b>	Runoff Area=0.880 ac 82.95% Impervious Runoff Depth=0.87" Tc=10.0 min CN=74/98 Runoff=0.94 cfs 0.064 af
<b>Subcatchment23S: EXIST. OFF-SITE</b>	Runoff Area=0.140 ac 0.00% Impervious Runoff Depth=0.03" Flow Length=189' Slope=0.0200 '/' Tc=9.3 min CN=70/0 Runoff=0.01 cfs 0.000 af
<b>Subcatchment24S: PDA-1B-c</b>	Runoff Area=4.130 ac 31.96% Impervious Runoff Depth=0.38" Tc=10.0 min CN=74/98 Runoff=1.79 cfs 0.131 af
<b>Subcatchment25S: PDA-1A-c</b>	Runoff Area=12.810 ac 74.24% Impervious Runoff Depth=0.79" Tc=10.0 min CN=74/98 Runoff=12.31 cfs 0.840 af
<b>Subcatchment27S: PDA-1B-d</b>	Runoff Area=0.220 ac 63.64% Impervious Runoff Depth=0.69" Tc=10.0 min CN=74/98 Runoff=0.18 cfs 0.013 af
<b>Subcatchment28S: PDA-1A-a</b>	Runoff Area=0.190 ac 100.00% Impervious Runoff Depth=1.03" Tc=10.0 min CN=0/98 Runoff=0.24 cfs 0.016 af
<b>Subcatchment30S: PDA-1C</b>	Runoff Area=1.150 ac 0.00% Impervious Runoff Depth=0.07" Tc=10.0 min CN=74/0 Runoff=0.10 cfs 0.007 af
<b>Subcatchment31S: PDA-1B-c (Roof)</b>	Runoff Area=5.680 ac 100.00% Impervious Runoff Depth=1.03" Tc=10.0 min CN=0/98 Runoff=7.29 cfs 0.490 af
<b>Pond 2P: Ex. Detention Basin</b>	Peak Elev=105.10' Storage=5,302 cf Inflow=1.79 cfs 0.133 af Primary=0.03 cfs 0.035 af Secondary=0.07 cfs 0.082 af Tertiary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.117 af
<b>Pond 10P: BIO BASIN 1</b>	Peak Elev=110.00' Storage=3,247 cf Inflow=0.93 cfs 0.076 af Outflow=0.00 cfs 0.002 af
<b>Pond 11P: BIO BASIN 2</b>	Peak Elev=109.50' Storage=2,781 cf Inflow=0.94 cfs 0.064 af Outflow=0.00 cfs 0.000 af
<b>Pond 12P: PERV. PVMT-West</b>	Peak Elev=108.87' Storage=0.032 af Inflow=0.55 cfs 0.050 af Outflow=0.12 cfs 0.050 af

**Pre vs Post\_211020**

*NJ DEP 2-hr WQ Rainfall=1.25"*

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**Pond 27P: PERV. PVMT-East** Peak Elev=109.08' Storage=0.009 af Inflow=0.24 cfs 0.016 af  
6.0" Round Culvert x 3.00 n=0.010 L=49.0' S=0.0010 '/' Outflow=0.12 cfs 0.016 af

**Pond 29P: PERV. PVMT-Rear** Peak Elev=111.03' Storage=0.008 af Inflow=0.18 cfs 0.013 af  
6.0" Round Culvert n=0.010 L=52.0' S=0.0163 '/' Outflow=0.07 cfs 0.013 af

**Link 9L: BASIN DISCHARGES** Inflow=0.18 cfs 0.124 af  
Primary=0.18 cfs 0.124 af

**Link 20L: PDA-1A TOTAL** Inflow=12.37 cfs 0.890 af  
Primary=12.37 cfs 0.890 af

**Link 22L: PROP. POI-1** Inflow=19.72 cfs 1.504 af  
Primary=19.72 cfs 1.504 af

**Link 28L: MH 101** Inflow=0.00 cfs 0.002 af  
Primary=0.00 cfs 0.002 af

**Total Runoff Area = 29.730 ac Runoff Volume = 1.666 af Average Runoff Depth = 0.67"**  
**37.27% Pervious = 11.080 ac 62.73% Impervious = 18.650 ac**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 9S: PDA-3 (POI-3)**

Runoff = 0.03 cfs @ 1.64 hrs, Volume= 0.002 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

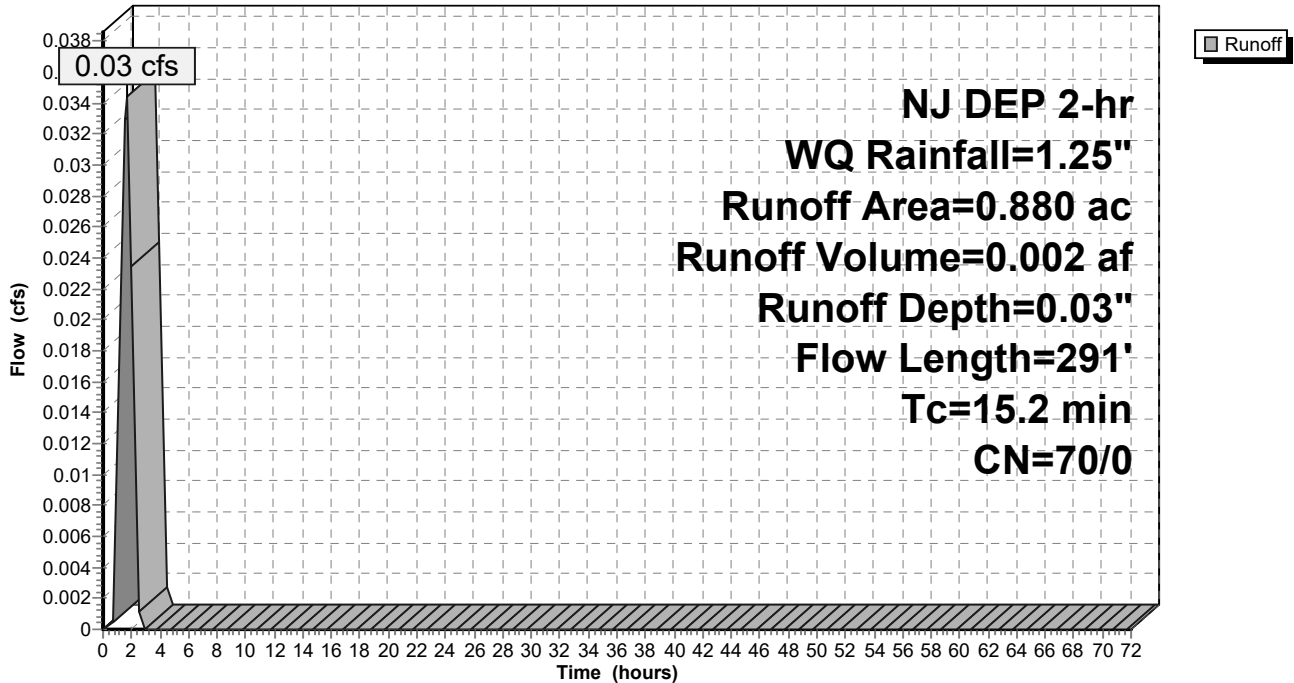
Area (ac)	CN	Description
0.880	70	Woods, Good, HSG C
0.880	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	9	0.0050	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
9.9	282	0.0090	0.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.2	291	Total			

**Subcatchment 9S: PDA-3 (POI-3)**

Hydrograph





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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 11S: PDA-2 (POI-2)**

Runoff = 0.06 cfs @ 1.72 hrs, Volume= 0.005 af, Depth= 0.03"

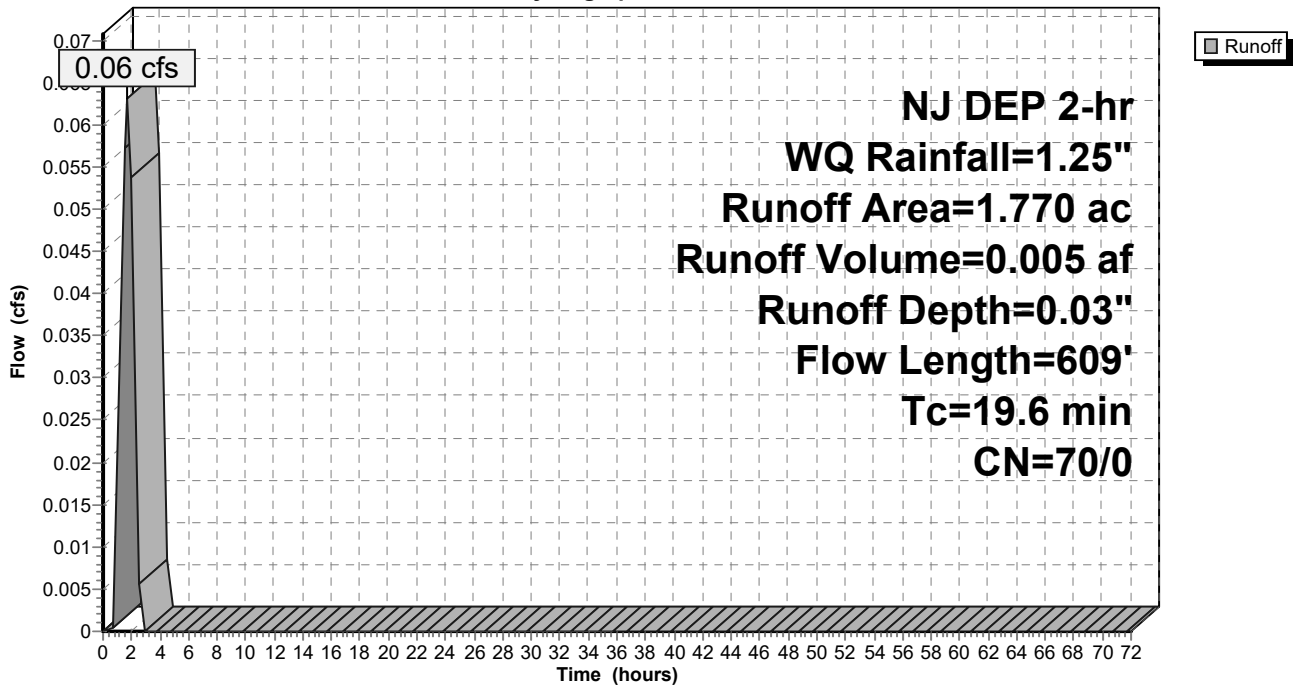
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
1.770	70	Woods, Good, HSG C
1.770	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	17	0.0180	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
14.3	592	0.0190	0.69		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
19.6	609	Total			

**Subcatchment 11S: PDA-2 (POI-2)**

Hydrograph



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**Summary for Subcatchment 16S: PDA-1A-b**

Runoff = 0.50 cfs @ 1.07 hrs, Volume= 0.034 af, Depth= 1.03"

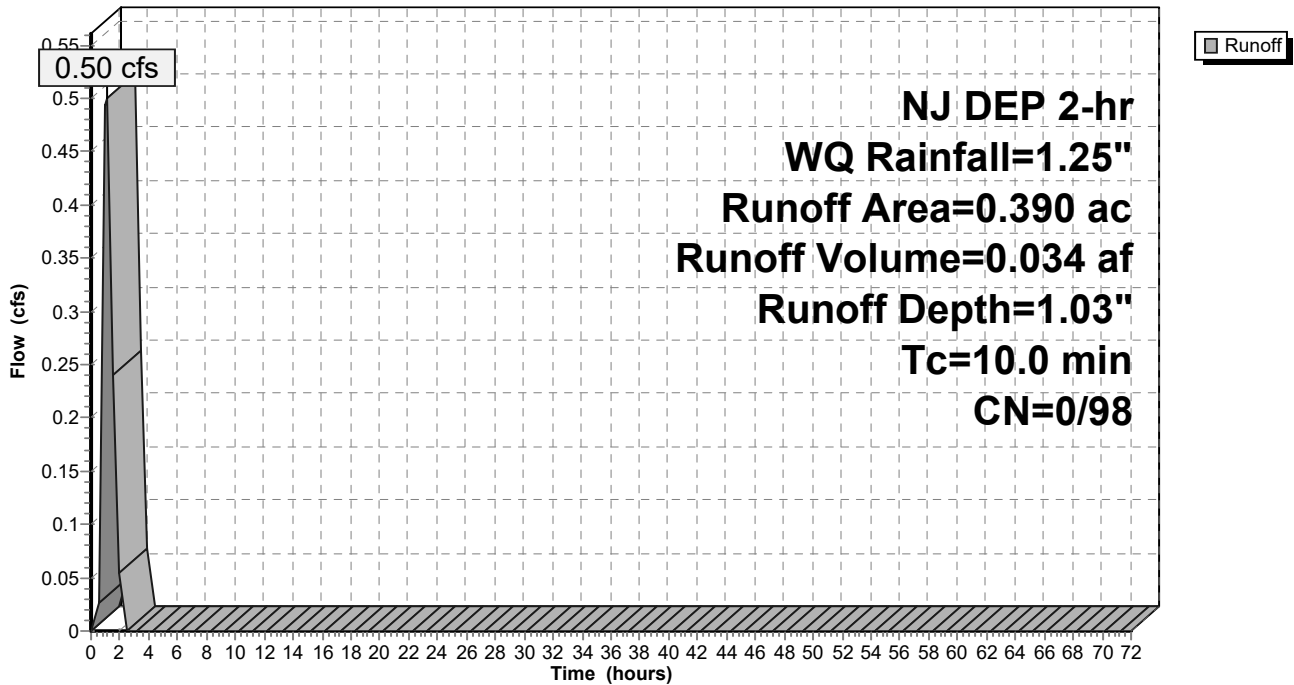
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.390	98	Paved parking, HSG C
0.390	98	100.00% Impervious Area

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

**Subcatchment 16S: PDA-1A-b**

Hydrograph



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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 17S: PDA-1B-a**

Runoff = 0.90 cfs @ 1.09 hrs, Volume= 0.064 af, Depth= 0.51"

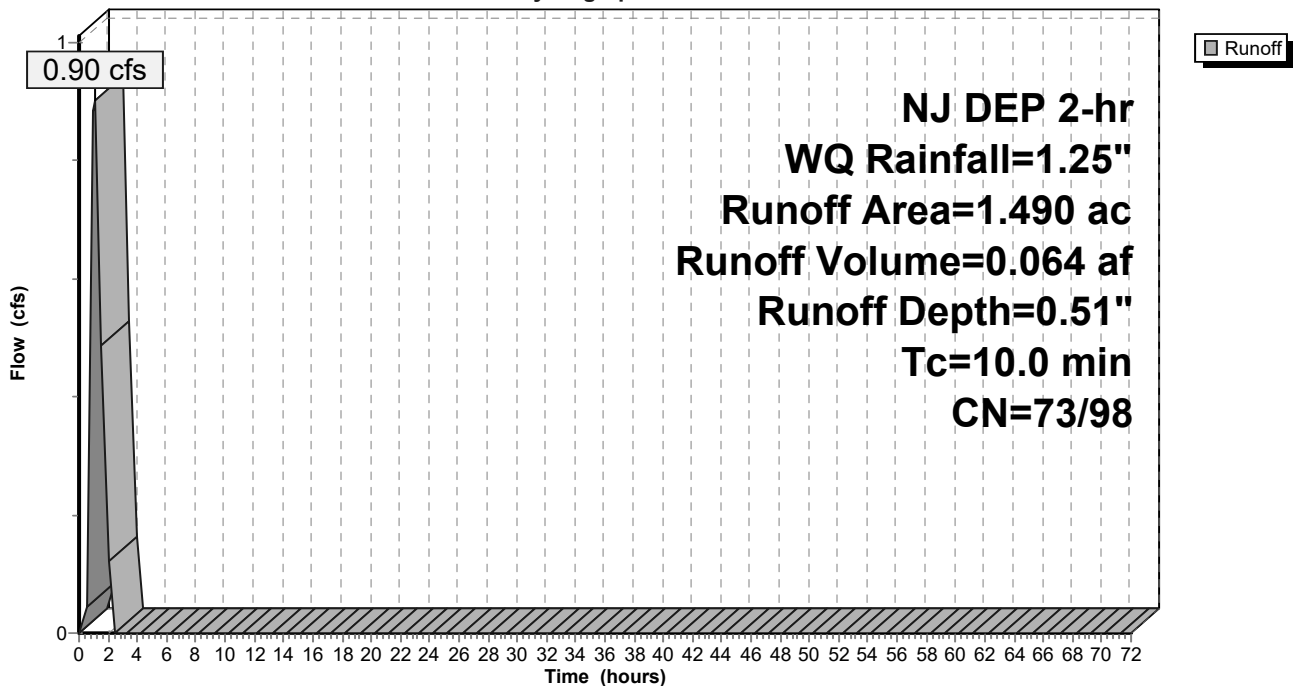
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.270	70	Woods, Good, HSG C
0.690	98	Paved parking, HSG C
0.530	74	>75% Grass cover, Good, HSG C
1.490	84	Weighted Average
0.800	73	53.69% Pervious Area
0.690	98	46.31% Impervious Area

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

**Subcatchment 17S: PDA-1B-a**

Hydrograph



**Pre vs Post\_211020**

NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 18S: PDA-1B-b**

Runoff = 0.94 cfs @ 1.08 hrs, Volume= 0.064 af, Depth= 0.87"

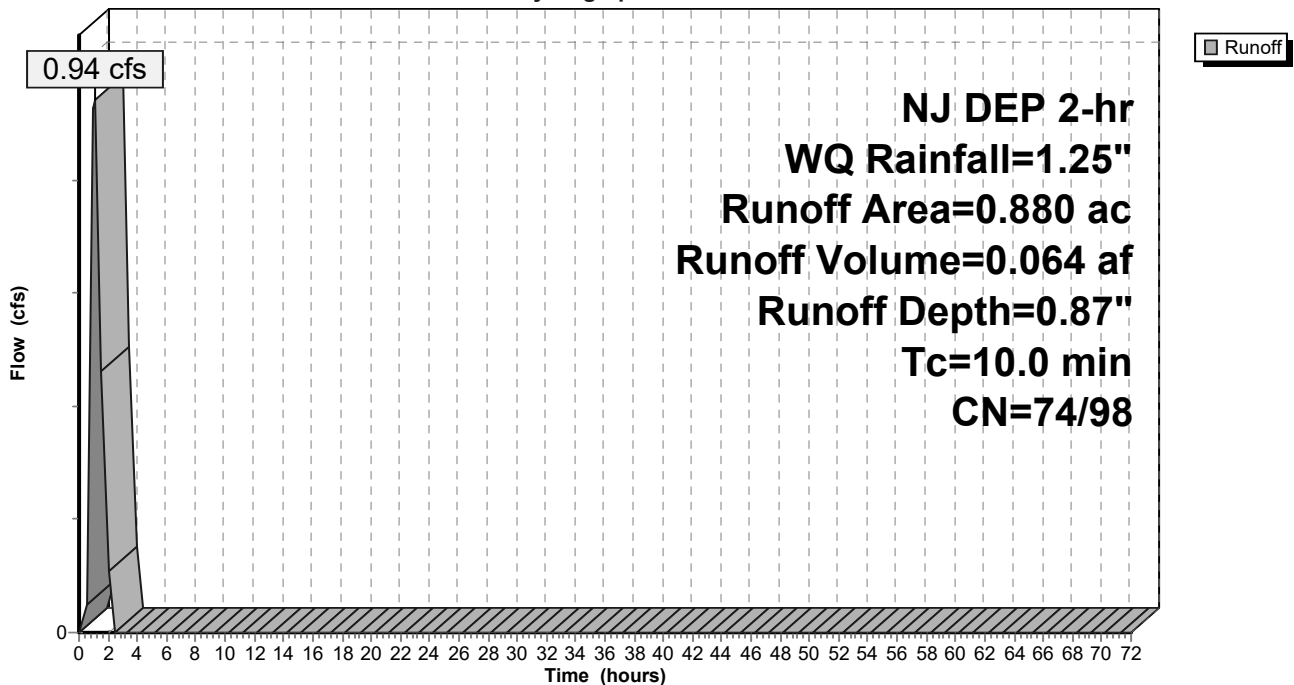
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.730	98	Paved parking, HSG C
0.150	74	>75% Grass cover, Good, HSG C
0.880	94	Weighted Average
0.150	74	17.05% Pervious Area
0.730	98	82.95% Impervious Area

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

**Subcatchment 18S: PDA-1B-b**

Hydrograph



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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 23S: EXIST. OFF-SITE**

Runoff = 0.01 cfs @ 1.57 hrs, Volume= 0.000 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

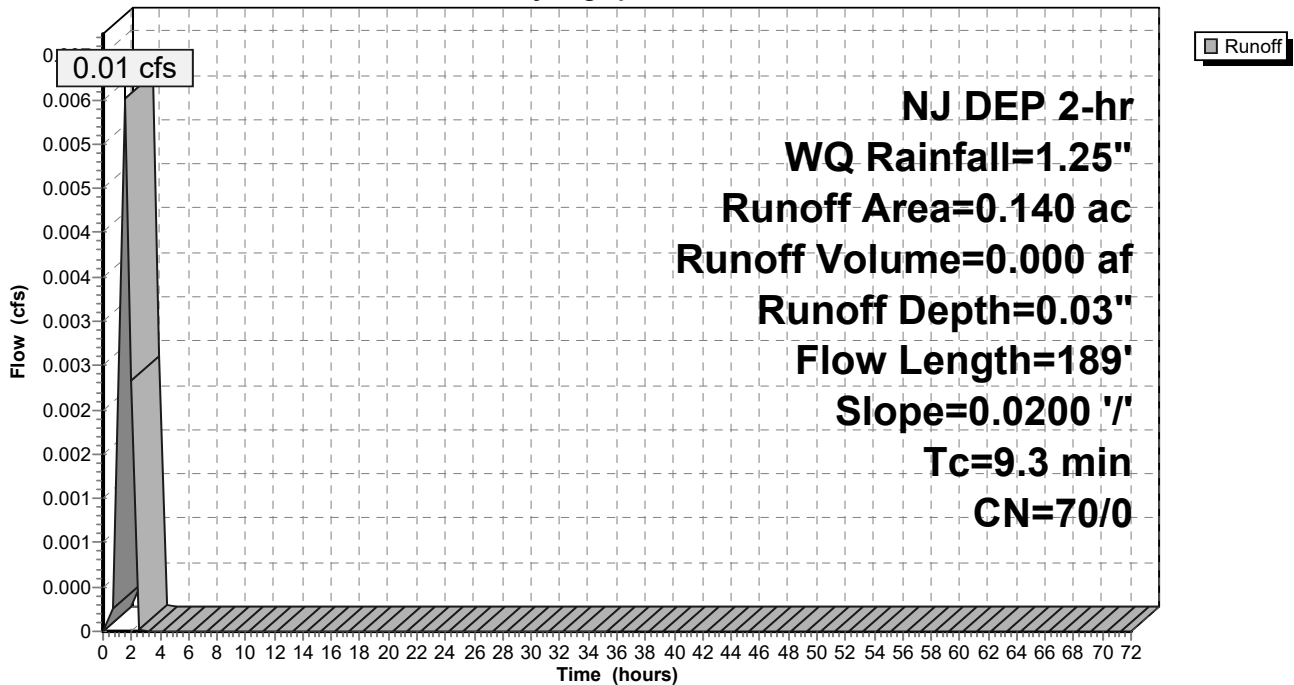
Area (ac)	CN	Description
0.140	70	Woods, Good, HSG C
0.140	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	18	0.0200	0.06		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
4.0	171	0.0200	0.71		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.3	189	Total			

**Subcatchment 23S: EXIST. OFF-SITE**

Hydrograph



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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 24S: PDA-1B-c**

Runoff = 1.79 cfs @ 1.11 hrs, Volume= 0.131 af, Depth= 0.38"

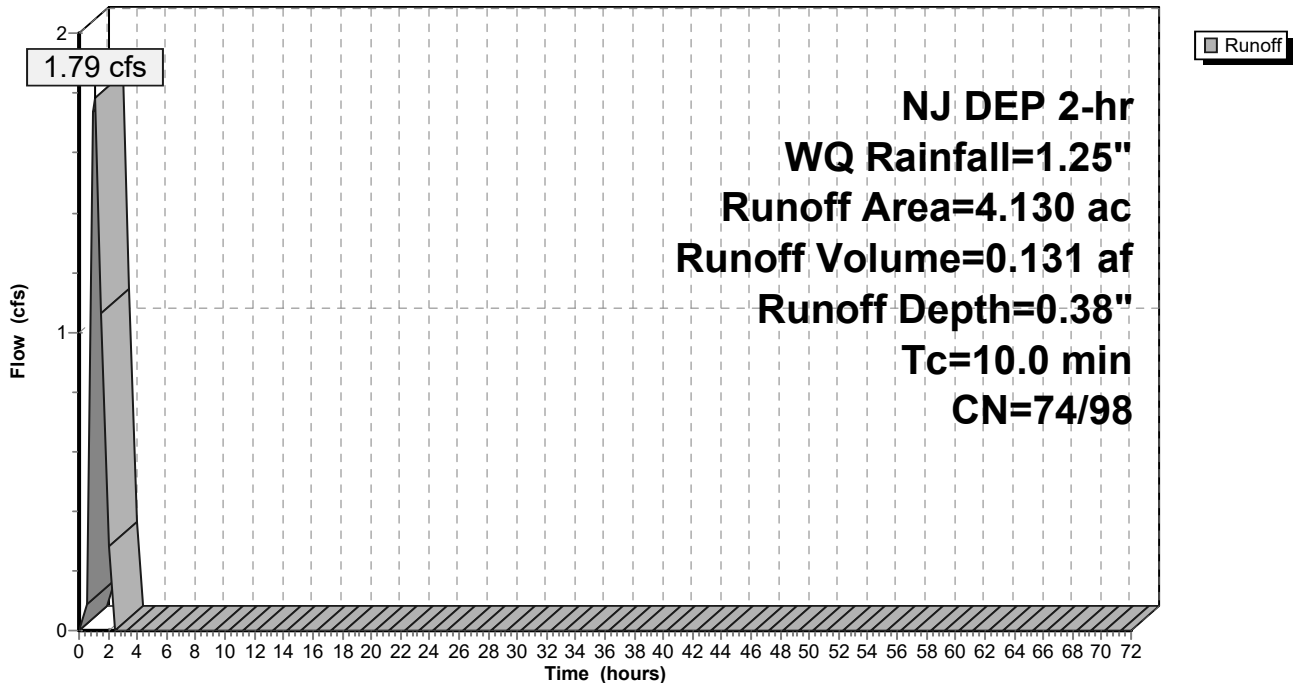
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
2.810	74	>75% Grass cover, Good, HSG C
* 1.320	98	Impervious
4.130	82	Weighted Average
2.810	74	68.04% Pervious Area
1.320	98	31.96% Impervious Area

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

**Subcatchment 24S: PDA-1B-c**

Hydrograph



**Pre vs Post\_211020**

NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 25S: PDA-1A-c**

Runoff = 12.31 cfs @ 1.08 hrs, Volume= 0.840 af, Depth= 0.79"

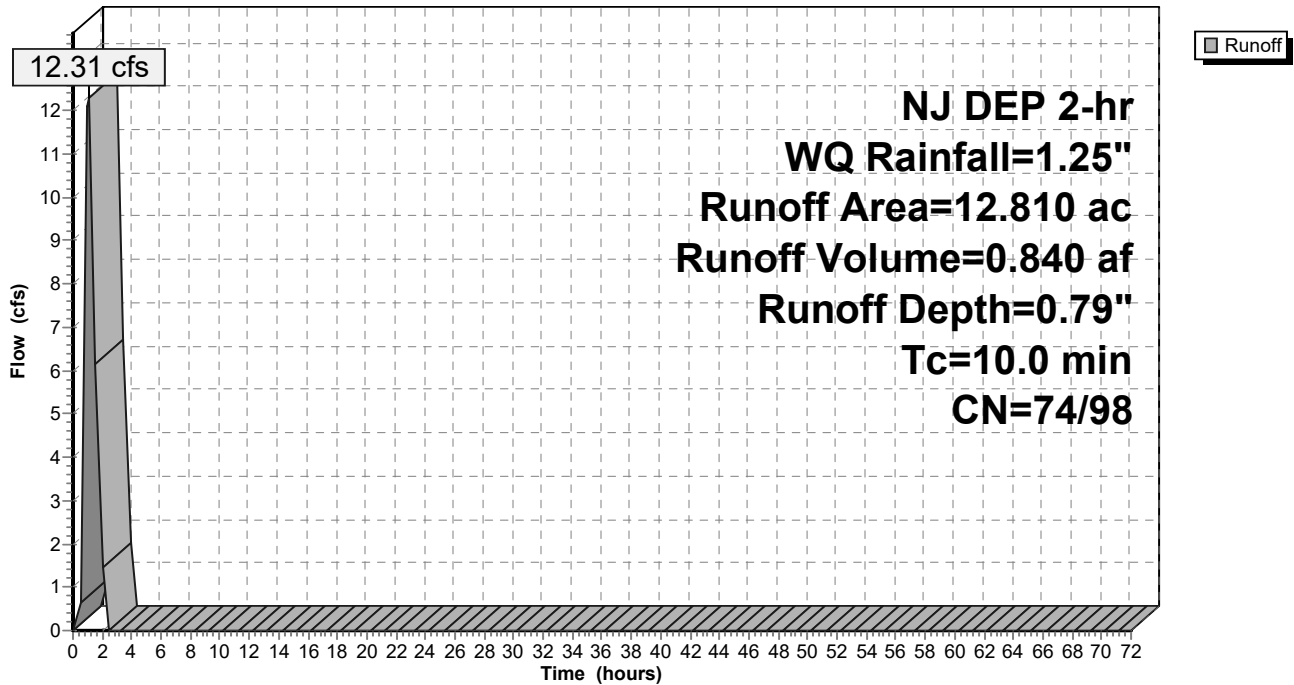
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
3.300	74	>75% Grass cover, Good, HSG C
* 9.510	98	Impervious & Exist. Roof Areas
12.810	92	Weighted Average
3.300	74	25.76% Pervious Area
9.510	98	74.24% Impervious Area

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

**Subcatchment 25S: PDA-1A-c**

Hydrograph



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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 27S: PDA-1B-d**

Runoff = 0.18 cfs @ 1.08 hrs, Volume= 0.013 af, Depth= 0.69"

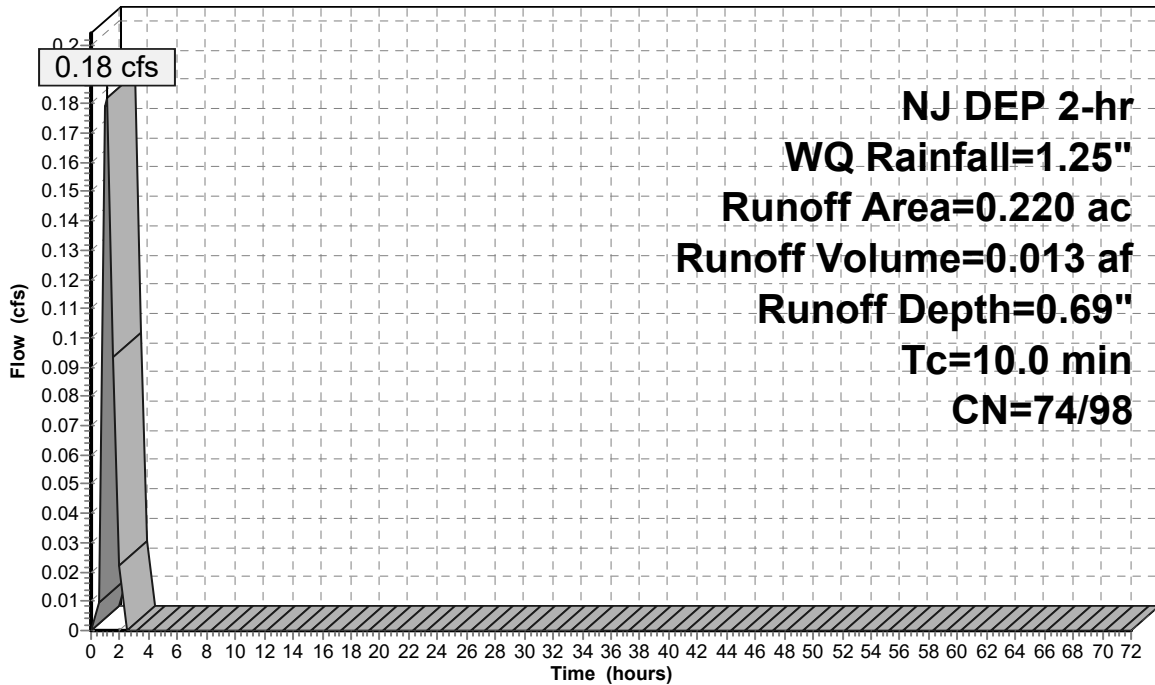
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG A
0.080	74	>75% Grass cover, Good, HSG C
0.220	89	Weighted Average
0.080	74	36.36% Pervious Area
0.140	98	63.64% Impervious Area

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

**Subcatchment 27S: PDA-1B-d**

Hydrograph





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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 28S: PDA-1A-a**

Runoff = 0.24 cfs @ 1.07 hrs, Volume= 0.016 af, Depth= 1.03"

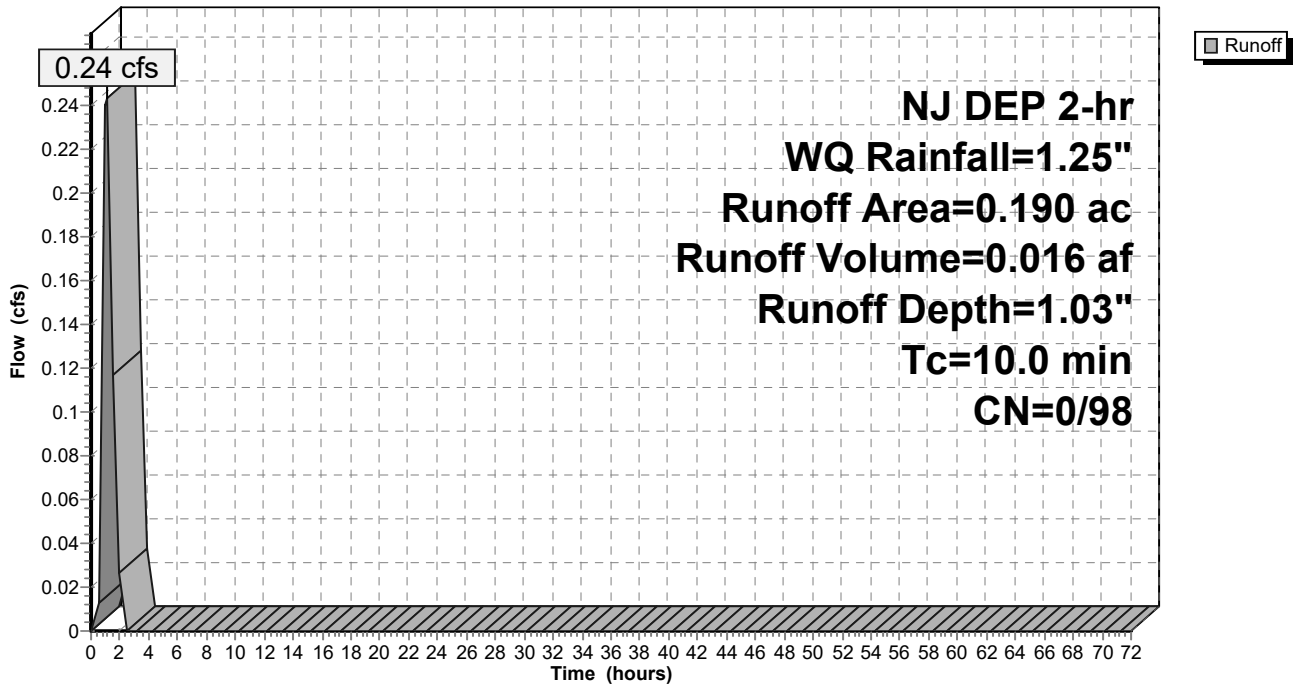
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.190	98	Paved parking, HSG C
0.190	98	100.00% Impervious Area

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

**Subcatchment 28S: PDA-1A-a**

Hydrograph



**Pre vs Post\_211020**

NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 30S: PDA-1C**

Runoff = 0.10 cfs @ 1.52 hrs, Volume= 0.007 af, Depth= 0.07"

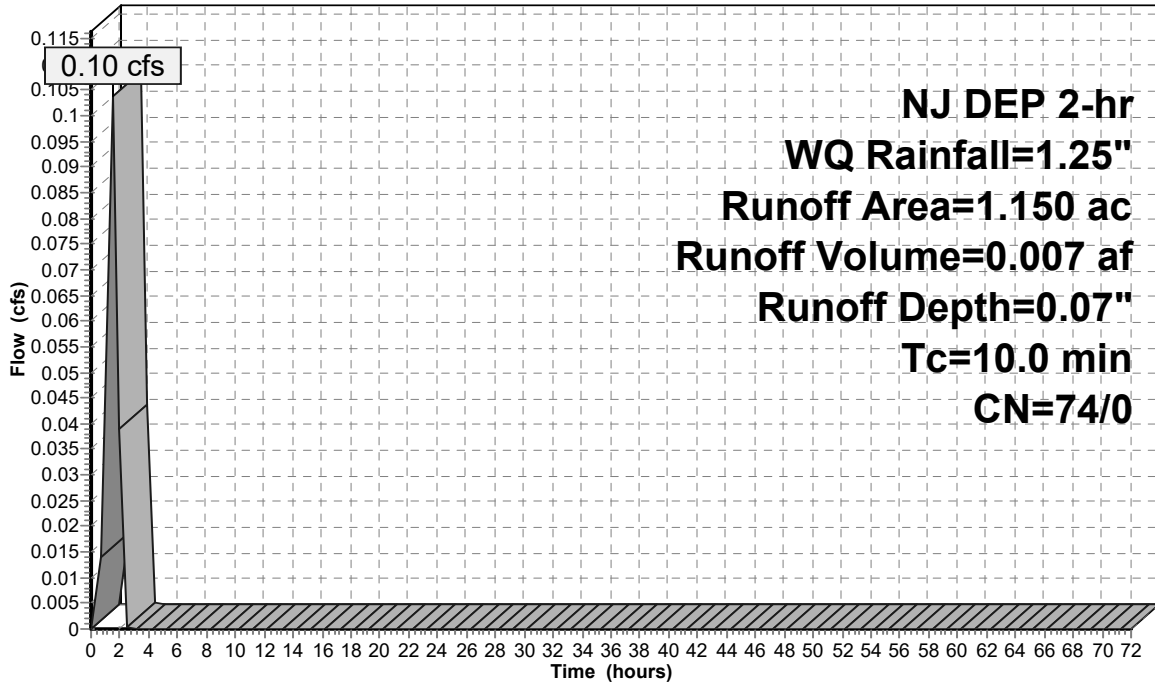
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
1.150	74	>75% Grass cover, Good, HSG C
1.150	74	100.00% Pervious Area

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

**Subcatchment 30S: PDA-1C**

Hydrograph



Runoff

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 31S: PDA-1B-c (Roof)**

Runoff = 7.29 cfs @ 1.07 hrs, Volume= 0.490 af, Depth= 1.03"

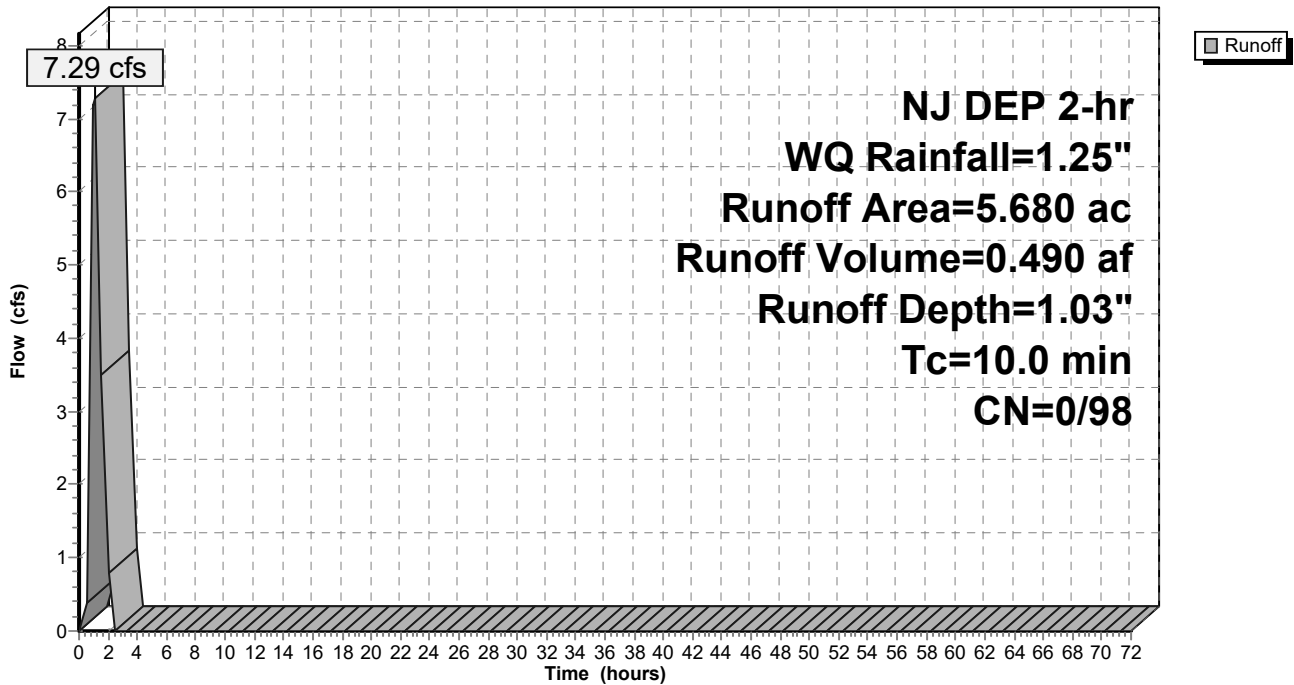
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
* 5.680	98	Prop. Roofs
5.680	98	100.00% Impervious Area

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

**Subcatchment 31S: PDA-1B-c (Roof)**

Hydrograph



**Pre vs Post 211020**

NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Pond 2P: Ex. Detention Basin**

Inflow Area = 6.720 ac, 42.86% Impervious, Inflow Depth = 0.24" for WQ event  
 Inflow = 1.79 cfs @ 1.11 hrs, Volume= 0.133 af  
 Outflow = 0.10 cfs @ 2.40 hrs, Volume= 0.117 af, Atten= 94%, Lag= 77.5 min  
 Primary = 0.03 cfs @ 2.40 hrs, Volume= 0.035 af  
 Secondary = 0.07 cfs @ 2.40 hrs, Volume= 0.082 af  
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 105.10' @ 2.40 hrs Surf.Area= 53,231 sf Storage= 5,302 cf

Plug-Flow detention time= 1,035.1 min calculated for 0.117 af (88% of inflow)  
 Center-of-Mass det. time= 1,015.6 min ( 1,104.6 - 89.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	105.00'	186,871 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
105.00	52,708	0	0
106.00	57,935	55,322	55,322
107.00	67,082	62,509	117,830
108.00	71,000	69,041	186,871

Device	Routing	Invert	Outlet Devices
#1	Primary	105.00'	<b>18.0" Round RCP_Round 18"</b> L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0333 1/1' Cc= 0.900 n= 0.015, Flow Area= 1.77 sf
#2	Device 1	105.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	106.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Secondary	105.00'	<b>8.0" Round Culvert X 2.00</b> L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0238 1/1' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf
#5	Tertiary	107.00'	<b>50.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

**Primary OutFlow** Max=0.03 cfs @ 2.40 hrs HW=105.10' (Free Discharge)

- ↑ 1=RCP\_Round 18" (Passes 0.03 cfs of 0.05 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.03 cfs @ 1.08 fps)
- ↑ 3=Orifice/Grate ( Controls 0.00 cfs)

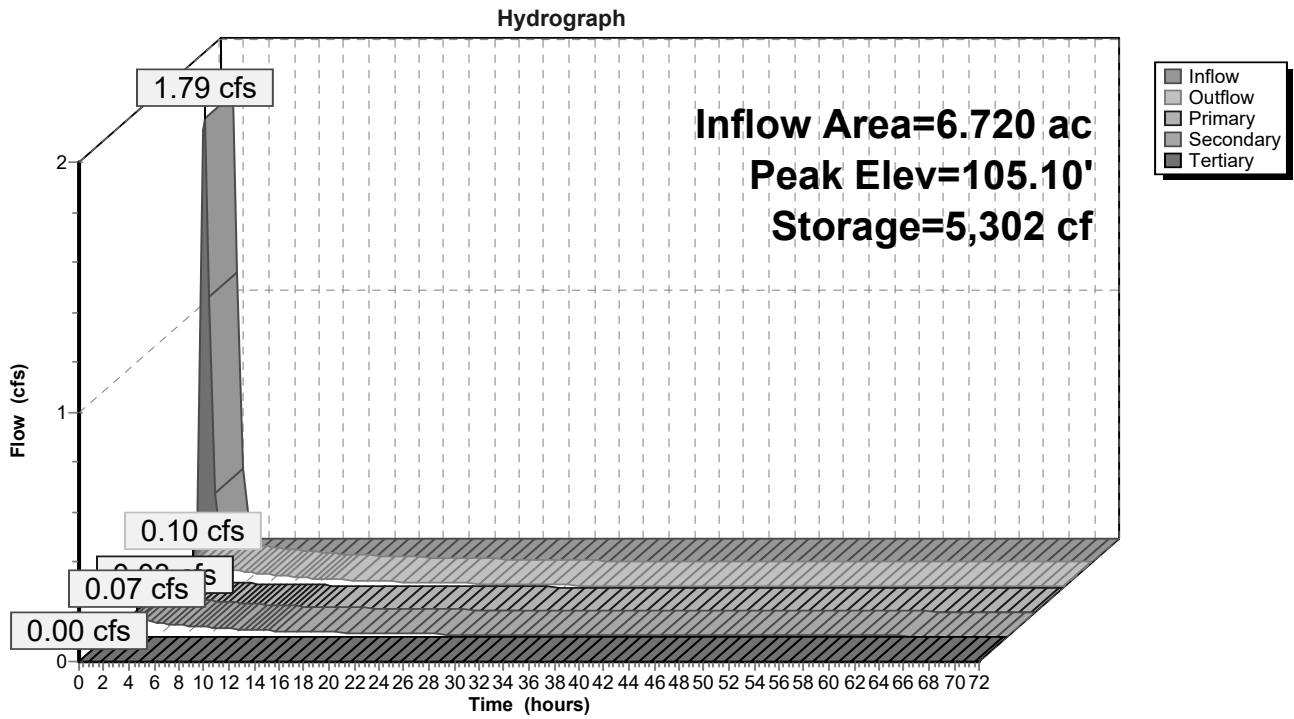
**Secondary OutFlow** Max=0.07 cfs @ 2.40 hrs HW=105.10' (Free Discharge)

- ↑ 4=Culvert (Inlet Controls 0.07 cfs @ 1.08 fps)

**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=105.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

### Pond 2P: Ex. Detention Basin



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**Stage-Area-Storage for Pond 2P: Ex. Detention Basin**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
105.00	52,708	0	107.65	69,629	162,261
105.05	52,969	2,642	107.70	69,825	165,747
105.10	53,231	5,297	107.75	70,021	169,243
105.15	53,492	7,965	107.80	70,216	172,749
105.20	53,753	10,646	107.85	70,412	176,265
105.25	54,015	13,340	107.90	70,608	179,791
105.30	54,276	16,048	107.95	70,804	183,326
105.35	54,537	18,768	108.00	<b>71,000</b>	<b>186,871</b>
105.40	54,799	21,501			
105.45	55,060	24,248			
105.50	55,322	27,007			
105.55	55,583	29,780			
105.60	55,844	32,566			
105.65	56,106	35,364			
105.70	56,367	38,176			
105.75	56,628	41,001			
105.80	56,890	43,839			
105.85	57,151	46,690			
105.90	57,412	49,554			
105.95	57,674	52,431			
106.00	57,935	55,322			
106.05	58,392	58,230			
106.10	58,850	61,161			
106.15	59,307	64,115			
106.20	59,764	67,091			
106.25	60,222	70,091			
106.30	60,679	73,114			
106.35	61,136	76,159			
106.40	61,594	79,227			
106.45	62,051	82,318			
106.50	62,509	85,432			
106.55	62,966	88,569			
106.60	63,423	91,729			
106.65	63,881	94,912			
106.70	64,338	98,117			
106.75	64,795	101,345			
106.80	65,253	104,597			
106.85	65,710	107,871			
106.90	66,167	111,168			
106.95	66,625	114,487			
107.00	67,082	117,830			
107.05	67,278	121,189			
107.10	67,474	124,558			
107.15	67,670	127,936			
107.20	67,866	131,325			
107.25	68,062	134,723			
107.30	68,257	138,131			
107.35	68,453	141,549			
107.40	68,649	144,976			
107.45	68,845	148,414			
107.50	69,041	151,861			
107.55	69,237	155,318			
107.60	69,433	158,784			

**Pre vs Post 211020**

NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Pond 10P: BIO BASIN 1**

Inflow Area = 1.710 ac, 48.54% Impervious, Inflow Depth = 0.53" for WQ event  
 Inflow = 0.93 cfs @ 1.11 hrs, Volume= 0.076 af  
 Outflow = 0.00 cfs @ 7.62 hrs, Volume= 0.002 af, Atten= 100%, Lag= 391.0 min  
 Primary = 0.00 cfs @ 7.62 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 110.00' @ 7.62 hrs Surf.Area= 3,792 sf Storage= 3,247 cf

Plug-Flow detention time= 933.2 min calculated for 0.002 af (2% of inflow)  
 Center-of-Mass det. time= 881.9 min ( 985.3 - 103.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	109.00'	16,075 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.00	2,682	0	0
110.00	3,789	3,236	3,236
111.00	4,677	4,233	7,469
112.00	5,873	5,275	12,744
112.50	7,453	3,332	16,075

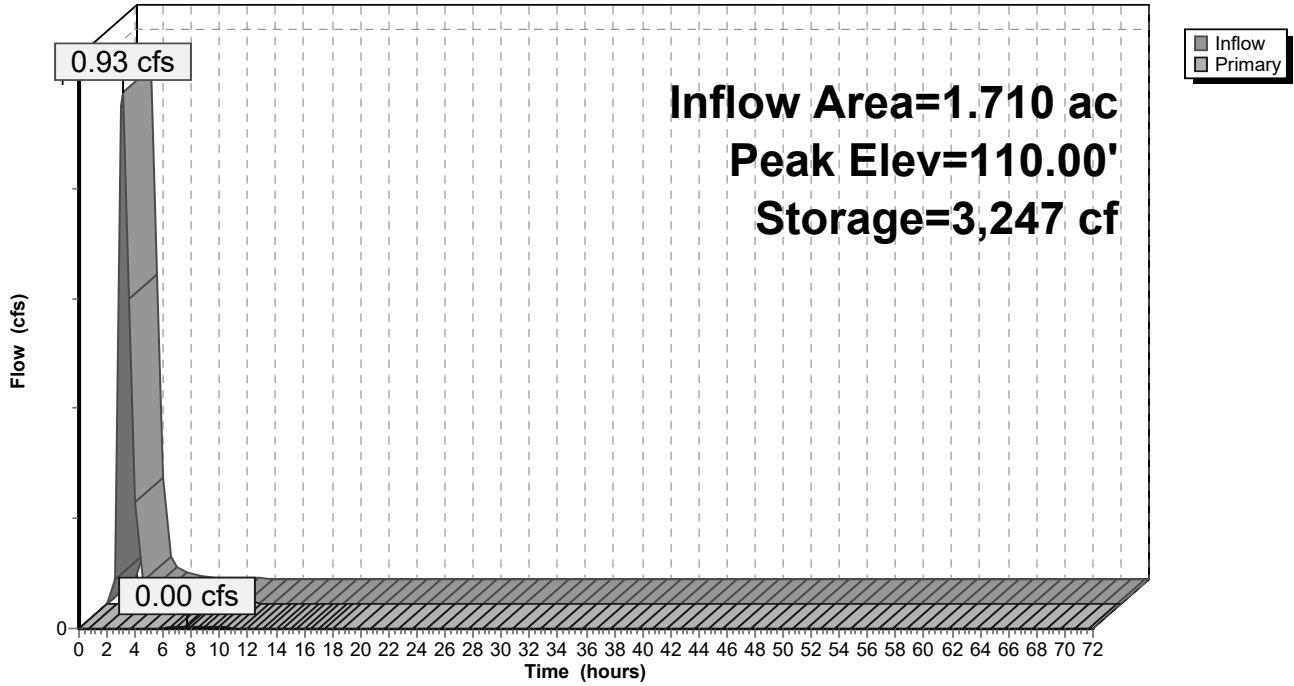
Device	Routing	Invert	Outlet Devices
#1	Primary	106.16'	<b>18.0" Round Culvert</b> L= 636.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 106.16' / 104.50' S= 0.0026 1' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Device 1	110.00'	<b>2.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)
#3	Device 1	111.00'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=0.00 cfs @ 7.62 hrs HW=110.00' (Free Discharge)

- 1=Culvert (Passes 0.00 cfs of 8.40 cfs potential flow)
- 2=Sharp-Crested Rectangular Weir (Weir Controls 0.00 cfs @ 0.18 fps)
- 3=Orifice/Grate ( Controls 0.00 cfs)

### Pond 10P: BIO BASIN 1

Hydrograph





**Pre vs Post\_211020**

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**Stage-Area-Storage for Pond 10P: BIO BASIN 1**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
109.00	2,682	0	111.65	5,454	10,761
109.05	2,737	135	111.70	5,514	11,035
109.10	2,793	274	111.75	5,574	11,313
109.15	2,848	415	111.80	5,634	11,593
109.20	2,903	559	111.85	5,694	11,876
109.25	2,959	705	111.90	5,753	12,162
109.30	3,014	854	111.95	5,813	12,451
109.35	3,069	1,007	112.00	5,873	12,744
109.40	3,125	1,161	112.05	6,031	13,041
109.45	3,180	1,319	112.10	6,189	13,347
109.50	3,236	1,479	112.15	6,347	13,660
109.55	3,291	1,643	112.20	6,505	13,981
109.60	3,346	1,808	112.25	6,663	14,311
109.65	3,402	1,977	112.30	6,821	14,648
109.70	3,457	2,149	112.35	6,979	14,993
109.75	3,512	2,323	112.40	7,137	15,346
109.80	3,568	2,500	112.45	7,295	15,706
109.85	3,623	2,680	112.50	<b>7,453</b>	<b>16,075</b>
109.90	3,678	2,862			
109.95	3,734	3,047			
110.00	3,789	3,236			
110.05	3,833	3,426			
110.10	3,878	3,619			
110.15	3,922	3,814			
110.20	3,967	4,011			
110.25	4,011	4,211			
110.30	4,055	4,412			
110.35	4,100	4,616			
110.40	4,144	4,822			
110.45	4,189	5,030			
110.50	4,233	5,241			
110.55	4,277	5,454			
110.60	4,322	5,669			
110.65	4,366	5,886			
110.70	4,411	6,105			
110.75	4,455	6,327			
110.80	4,499	6,551			
110.85	4,544	6,777			
110.90	4,588	7,005			
110.95	4,633	7,236			
111.00	4,677	7,469			
111.05	4,737	7,704			
111.10	4,797	7,942			
111.15	4,856	8,184			
111.20	4,916	8,428			
111.25	4,976	8,675			
111.30	5,036	8,925			
111.35	5,096	9,179			
111.40	5,155	9,435			
111.45	5,215	9,694			
111.50	5,275	9,957			
111.55	5,335	10,222			
111.60	5,395	10,490			

**Pre vs Post\_211020**

NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Pond 11P: BIO BASIN 2**

Inflow Area = 0.880 ac, 82.95% Impervious, Inflow Depth = 0.87" for WQ event  
 Inflow = 0.94 cfs @ 1.08 hrs, Volume= 0.064 af  
 Outflow = 0.00 cfs @ 2.91 hrs, Volume= 0.000 af, Atten= 100%, Lag= 109.8 min  
 Primary = 0.00 cfs @ 2.91 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 109.50' @ 3.00 hrs Surf.Area= 3,120 sf Storage= 2,781 cf

Plug-Flow detention time= 701.1 min calculated for 0.000 af (0% of inflow)  
 Center-of-Mass det. time= 665.4 min ( 737.6 - 72.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.50'	15,574 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
108.50	2,430	0	0
109.00	2,763	1,298	1,298
110.00	3,471	3,117	4,415
111.00	4,237	3,854	8,269
112.00	5,059	4,648	12,917
112.50	5,569	2,657	15,574

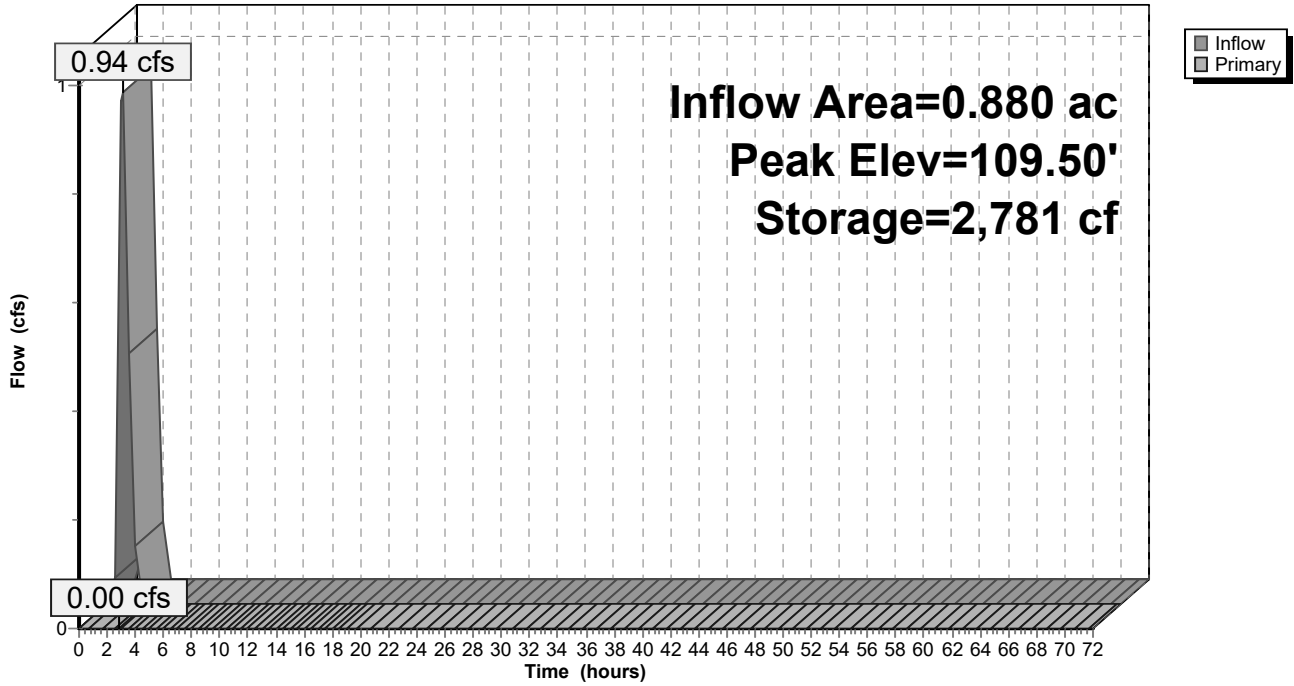
Device	Routing	Invert	Outlet Devices
#1	Primary	105.50'	<b>18.0" Round Culvert</b> L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 105.50' / 105.26' S= 0.0030 1' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	109.50'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	110.50'	<b>4.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s) 0.5' Crest Height
#4	Device 1	111.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=0.00 cfs @ 2.91 hrs HW=109.50' (Free Discharge)

- 1=Culvert (Passes 0.00 cfs of 14.72 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.00 cfs @ 0.21 fps)
- 3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)
- 4=Orifice/Grate ( Controls 0.00 cfs)

### Pond 11P: BIO BASIN 2

Hydrograph



**Pre vs Post\_211020**

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**Stage-Area-Storage for Pond 11P: BIO BASIN 2**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
108.50	2,430	0	111.15	4,360	8,914
108.55	2,463	122	111.20	4,401	9,133
108.60	2,497	246	111.25	4,443	9,354
108.65	2,530	372	111.30	4,484	9,577
108.70	2,563	499	111.35	4,525	9,803
108.75	2,597	628	111.40	4,566	10,030
108.80	2,630	759	111.45	4,607	10,259
108.85	2,663	891	111.50	4,648	10,491
108.90	2,696	1,025	111.55	4,689	10,724
108.95	2,730	1,161	111.60	4,730	10,959
109.00	2,763	1,298	111.65	4,771	11,197
109.05	2,798	1,437	111.70	4,812	11,437
109.10	2,834	1,578	111.75	4,854	11,678
109.15	2,869	1,721	111.80	4,895	11,922
109.20	2,905	1,865	111.85	4,936	12,168
109.25	2,940	2,011	111.90	4,977	12,415
109.30	2,975	2,159	111.95	5,018	12,665
109.35	3,011	2,309	112.00	5,059	12,917
109.40	3,046	2,460	112.05	5,110	13,171
109.45	3,082	2,613	112.10	5,161	13,428
109.50	3,117	2,768	112.15	5,212	13,688
109.55	3,152	2,925	112.20	5,263	13,949
109.60	3,188	3,083	112.25	5,314	14,214
109.65	3,223	3,244	112.30	5,365	14,481
109.70	3,259	3,406	112.35	5,416	14,750
109.75	3,294	3,570	112.40	5,467	15,022
109.80	3,329	3,735	112.45	5,518	15,297
109.85	3,365	3,903	112.50	<b>5,569</b>	<b>15,574</b>
109.90	3,400	4,072			
109.95	3,436	4,243			
110.00	3,471	4,415			
110.05	3,509	4,590			
110.10	3,548	4,766			
110.15	3,586	4,945			
110.20	3,624	5,125			
110.25	3,663	5,307			
110.30	3,701	5,491			
110.35	3,739	5,677			
110.40	3,777	5,865			
110.45	3,816	6,055			
110.50	3,854	6,247			
110.55	3,892	6,440			
110.60	3,931	6,636			
110.65	3,969	6,833			
110.70	4,007	7,033			
110.75	4,046	7,234			
110.80	4,084	7,437			
110.85	4,122	7,642			
110.90	4,160	7,849			
110.95	4,199	8,058			
111.00	4,237	8,269			
111.05	4,278	8,482			
111.10	4,319	8,697			

**Pre vs Post 211020**

NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Pond 12P: PERV. PVMT-West**

Inflow Area = 0.580 ac, 100.00% Impervious, Inflow Depth = 1.03" for WQ event  
 Inflow = 0.55 cfs @ 1.13 hrs, Volume= 0.050 af  
 Outflow = 0.12 cfs @ 2.18 hrs, Volume= 0.050 af, Atten= 78%, Lag= 63.5 min  
 Primary = 0.12 cfs @ 2.18 hrs, Volume= 0.050 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 108.87' @ 2.18 hrs Surf.Area= 0.130 ac Storage= 0.032 af

Plug-Flow detention time= 198.7 min calculated for 0.050 af (99% of inflow)  
 Center-of-Mass det. time= 205.8 min ( 320.6 - 114.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.25'	0.159 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.396 af Overall x 40.0% Voids

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
108.25	0.130	0.000	0.000
111.30	0.130	0.396	0.396

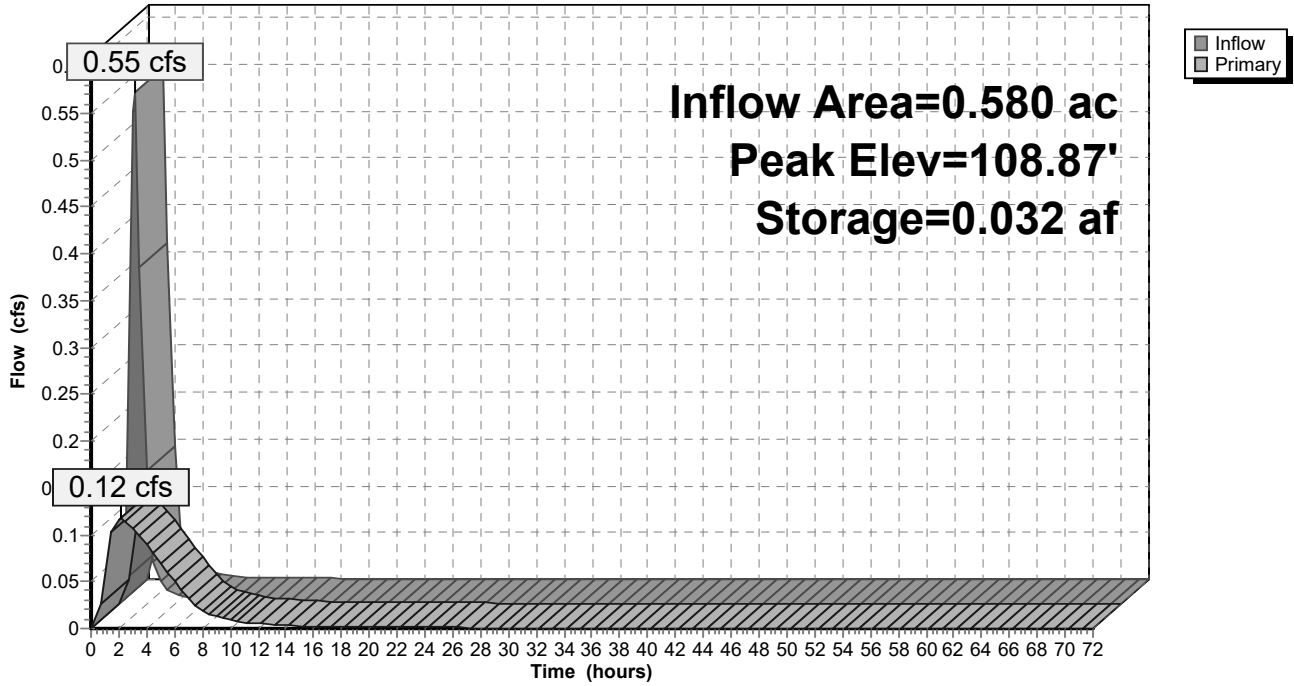
Device	Routing	Invert	Outlet Devices
#1	Primary	108.25'	<b>12.0" Round RCP_Round 12"</b> L= 19.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 108.25' / 108.20' S= 0.0026 ' S= 0.0026 ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	108.25'	<b>2.5" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	109.95'	<b>2.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s) 0.5' Crest Height
#4	Primary	110.95'	<b>48.0" x 48.0" Horiz. Orifice/Grate-Overflow</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=0.12 cfs @ 2.18 hrs HW=108.85' (Free Discharge)

- 1=RCP\_Round 12" (Passes 0.12 cfs of 0.88 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.12 cfs @ 3.40 fps)
- 3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)
- 4=Orifice/Grate-Overflow ( Controls 0.00 cfs)

**Pond 12P: PERV. PVMT-West**

Hydrograph



**Pre vs Post 211020**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Stage-Area-Storage for Pond 12P: PERV. PVMT-West**

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
108.25	<b>0.130</b>	0.000	110.90	0.130	0.138
108.30	0.130	0.003	110.95	0.130	0.140
108.35	0.130	0.005	111.00	0.130	0.143
108.40	0.130	0.008	111.05	0.130	0.146
108.45	0.130	0.010	111.10	0.130	0.148
108.50	0.130	0.013	111.15	0.130	0.151
108.55	0.130	0.016	111.20	0.130	0.153
108.60	0.130	0.018	111.25	0.130	0.156
108.65	0.130	0.021	111.30	0.130	<b>0.159</b>
108.70	0.130	0.023			
108.75	0.130	0.026			
108.80	0.130	0.029			
108.85	0.130	0.031			
108.90	0.130	0.034			
108.95	0.130	0.036			
109.00	0.130	0.039			
109.05	0.130	0.042			
109.10	0.130	0.044			
109.15	0.130	0.047			
109.20	0.130	0.049			
109.25	0.130	0.052			
109.30	0.130	0.055			
109.35	0.130	0.057			
109.40	0.130	0.060			
109.45	0.130	0.062			
109.50	0.130	0.065			
109.55	0.130	0.068			
109.60	0.130	0.070			
109.65	0.130	0.073			
109.70	0.130	0.075			
109.75	0.130	0.078			
109.80	0.130	0.081			
109.85	0.130	0.083			
109.90	0.130	0.086			
109.95	0.130	0.088			
110.00	0.130	0.091			
110.05	0.130	0.094			
110.10	0.130	0.096			
110.15	0.130	0.099			
110.20	0.130	0.101			
110.25	0.130	0.104			
110.30	0.130	0.107			
110.35	0.130	0.109			
110.40	0.130	0.112			
110.45	0.130	0.114			
110.50	0.130	0.117			
110.55	0.130	0.120			
110.60	0.130	0.122			
110.65	0.130	0.125			
110.70	0.130	0.127			
110.75	0.130	0.130			
110.80	0.130	0.133			
110.85	0.130	0.135			

**Pre vs Post\_211020**

NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Pond 27P: PERV. PVMT-East**

Inflow Area = 0.190 ac, 100.00% Impervious, Inflow Depth = 1.03" for WQ event  
 Inflow = 0.24 cfs @ 1.07 hrs, Volume= 0.016 af  
 Outflow = 0.12 cfs @ 1.61 hrs, Volume= 0.016 af, Atten= 50%, Lag= 32.4 min  
 Primary = 0.12 cfs @ 1.61 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 109.08' @ 1.63 hrs Surf.Area= 0.130 ac Storage= 0.009 af

Plug-Flow detention time= 136.9 min calculated for 0.016 af (100% of inflow)  
 Center-of-Mass det. time= 130.7 min ( 202.7 - 72.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.90'	0.135 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.338 af Overall x 40.0% Voids

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
108.90	0.130	0.000	0.000
111.50	0.130	0.338	0.338

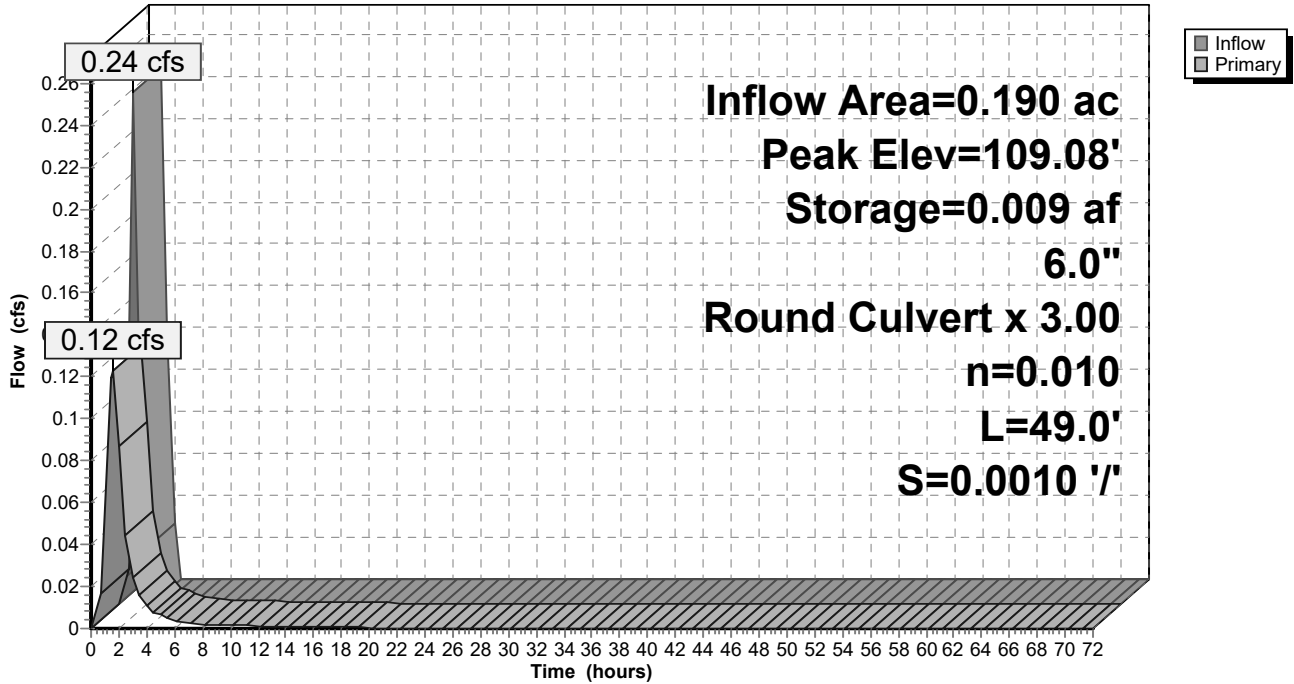
Device	Routing	Invert	Outlet Devices
#1	Primary	108.90'	<b>6.0" Round Culvert X 3.00</b> L= 49.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 108.90' / 108.85' S= 0.0010 ' S= 0.0010 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=0.11 cfs @ 1.61 hrs HW=109.07' (Free Discharge)  
 ↑1=Culvert (Barrel Controls 0.11 cfs @ 0.95 fps)



**Pond 27P: PERV. PVMT-East**

Hydrograph



**Pre vs Post\_211020**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Stage-Area-Storage for Pond 27P: PERV. PVMT-East**

Elevation (feet)	Surface (acres)	Storage (acre-feet)
108.90	<b>0.130</b>	0.000
108.95	0.130	0.003
109.00	0.130	0.005
109.05	0.130	0.008
109.10	0.130	0.010
109.15	0.130	0.013
109.20	0.130	0.016
109.25	0.130	0.018
109.30	0.130	0.021
109.35	0.130	0.023
109.40	0.130	0.026
109.45	0.130	0.029
109.50	0.130	0.031
109.55	0.130	0.034
109.60	0.130	0.036
109.65	0.130	0.039
109.70	0.130	0.042
109.75	0.130	0.044
109.80	0.130	0.047
109.85	0.130	0.049
109.90	0.130	0.052
109.95	0.130	0.055
110.00	0.130	0.057
110.05	0.130	0.060
110.10	0.130	0.062
110.15	0.130	0.065
110.20	0.130	0.068
110.25	0.130	0.070
110.30	0.130	0.073
110.35	0.130	0.075
110.40	0.130	0.078
110.45	0.130	0.081
110.50	0.130	0.083
110.55	0.130	0.086
110.60	0.130	0.088
110.65	0.130	0.091
110.70	0.130	0.094
110.75	0.130	0.096
110.80	0.130	0.099
110.85	0.130	0.101
110.90	0.130	0.104
110.95	0.130	0.107
111.00	0.130	0.109
111.05	0.130	0.112
111.10	0.130	0.114
111.15	0.130	0.117
111.20	0.130	0.120
111.25	0.130	0.122
111.30	0.130	0.125
111.35	0.130	0.127
111.40	0.130	0.130
111.45	0.130	0.133
111.50	0.130	<b>0.135</b>

**Pre vs Post\_211020**

NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Pond 29P: PERV. PVMT-Rear**

Inflow Area = 0.220 ac, 63.64% Impervious, Inflow Depth = 0.69" for WQ event  
 Inflow = 0.18 cfs @ 1.08 hrs, Volume= 0.013 af  
 Outflow = 0.07 cfs @ 1.70 hrs, Volume= 0.013 af, Atten= 59%, Lag= 37.0 min  
 Primary = 0.07 cfs @ 1.70 hrs, Volume= 0.013 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 111.03' @ 1.71 hrs Surf.Area= 0.107 ac Storage= 0.008 af

Plug-Flow detention time= 184.9 min calculated for 0.013 af (100% of inflow)  
 Center-of-Mass det. time= 182.8 min ( 255.5 - 72.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	110.85'	0.053 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.134 af Overall x 40.0% Voids

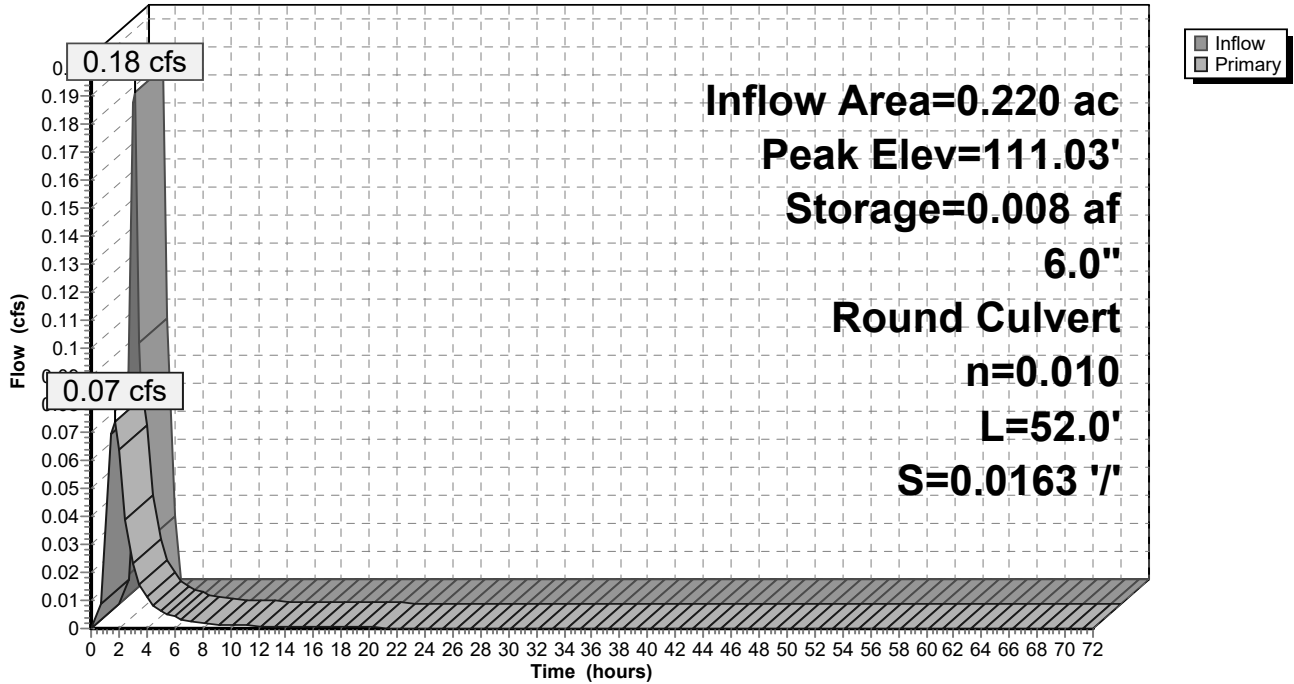
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
110.85	0.107	0.000	0.000
112.10	0.107	0.134	0.134

Device	Routing	Invert	Outlet Devices
#1	Primary	110.85'	<b>6.0" Round Culvert</b> L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 110.85' / 110.00' S= 0.0163 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=0.07 cfs @ 1.70 hrs HW=111.02' (Free Discharge)  
 ↑1=Culvert (Inlet Controls 0.07 cfs @ 1.12 fps)

**Pond 29P: PERV. PVMT-Rear**

Hydrograph



**Pre vs Post\_211020**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Stage-Area-Storage for Pond 29P: PERV. PVMT-Rear**

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
110.85	<b>0.107</b>	0.000	111.91	0.107	0.045
110.87	0.107	0.001	111.93	0.107	0.046
110.89	0.107	0.002	111.95	0.107	0.047
110.91	0.107	0.003	111.97	0.107	0.048
110.93	0.107	0.003	111.99	0.107	0.049
110.95	0.107	0.004	112.01	0.107	0.050
110.97	0.107	0.005	112.03	0.107	0.051
110.99	0.107	0.006	112.05	0.107	0.051
111.01	0.107	0.007	112.07	0.107	0.052
111.03	0.107	0.008	112.09	0.107	<b>0.053</b>
111.05	0.107	0.009			
111.07	0.107	0.009			
111.09	0.107	0.010			
111.11	0.107	0.011			
111.13	0.107	0.012			
111.15	0.107	0.013			
111.17	0.107	0.014			
111.19	0.107	0.015			
111.21	0.107	0.015			
111.23	0.107	0.016			
111.25	0.107	0.017			
111.27	0.107	0.018			
111.29	0.107	0.019			
111.31	0.107	0.020			
111.33	0.107	0.021			
111.35	0.107	0.021			
111.37	0.107	0.022			
111.39	0.107	0.023			
111.41	0.107	0.024			
111.43	0.107	0.025			
111.45	0.107	0.026			
111.47	0.107	0.027			
111.49	0.107	0.027			
111.51	0.107	0.028			
111.53	0.107	0.029			
111.55	0.107	0.030			
111.57	0.107	0.031			
111.59	0.107	0.032			
111.61	0.107	0.033			
111.63	0.107	0.033			
111.65	0.107	0.034			
111.67	0.107	0.035			
111.69	0.107	0.036			
111.71	0.107	0.037			
111.73	0.107	0.038			
111.75	0.107	0.039			
111.77	0.107	0.039			
111.79	0.107	0.040			
111.81	0.107	0.041			
111.83	0.107	0.042			
111.85	0.107	0.043			
111.87	0.107	0.044			
111.89	0.107	0.045			

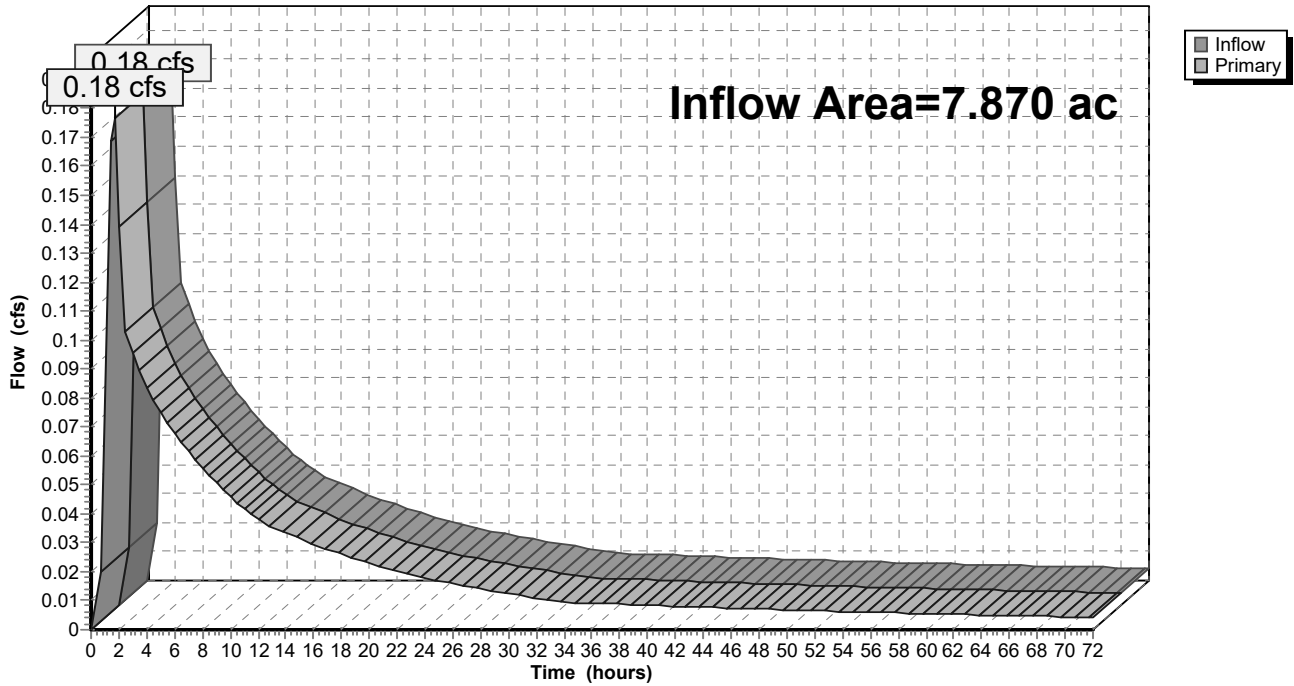
### Summary for Link 9L: BASIN DISCHARGES

Inflow Area = 7.870 ac, 36.59% Impervious, Inflow Depth > 0.19" for WQ event  
Inflow = 0.18 cfs @ 1.66 hrs, Volume= 0.124 af  
Primary = 0.18 cfs @ 1.66 hrs, Volume= 0.124 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 9L: BASIN DISCHARGES

Hydrograph



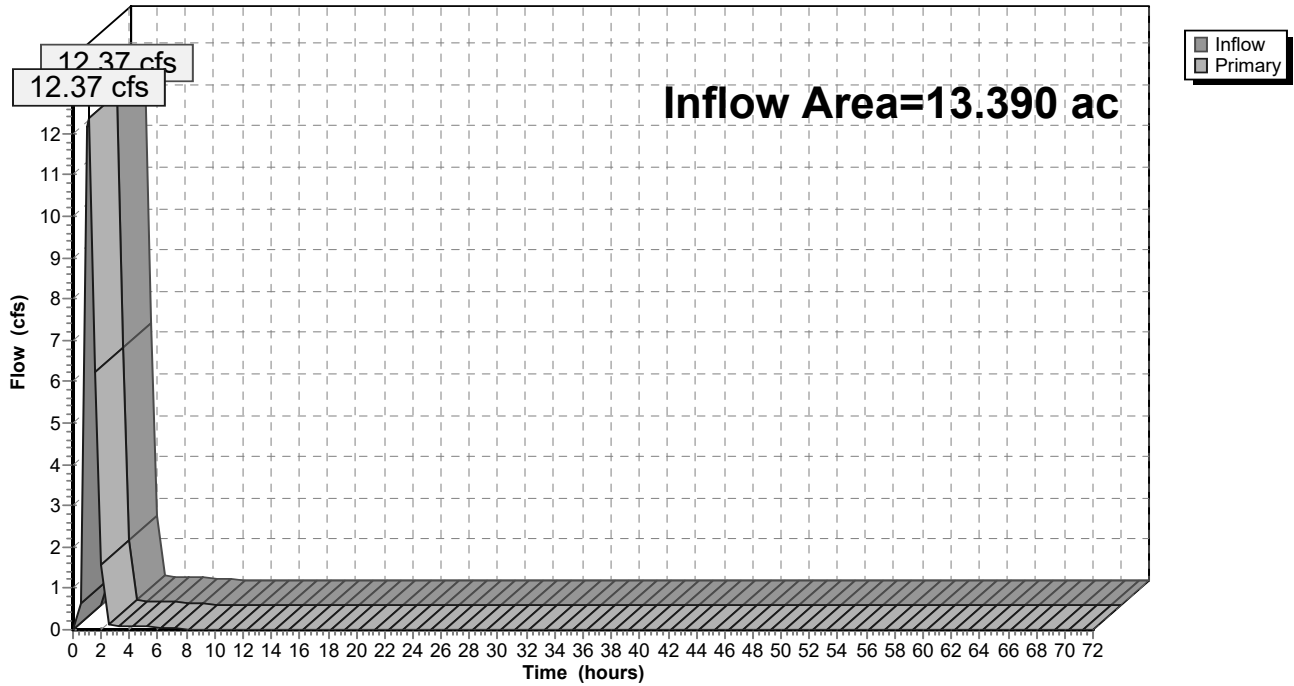
### Summary for Link 20L: PDA-1A TOTAL

Inflow Area = 13.390 ac, 75.35% Impervious, Inflow Depth = 0.80" for WQ event  
Inflow = 12.37 cfs @ 1.08 hrs, Volume= 0.890 af  
Primary = 12.37 cfs @ 1.08 hrs, Volume= 0.890 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 20L: PDA-1A TOTAL

Hydrograph



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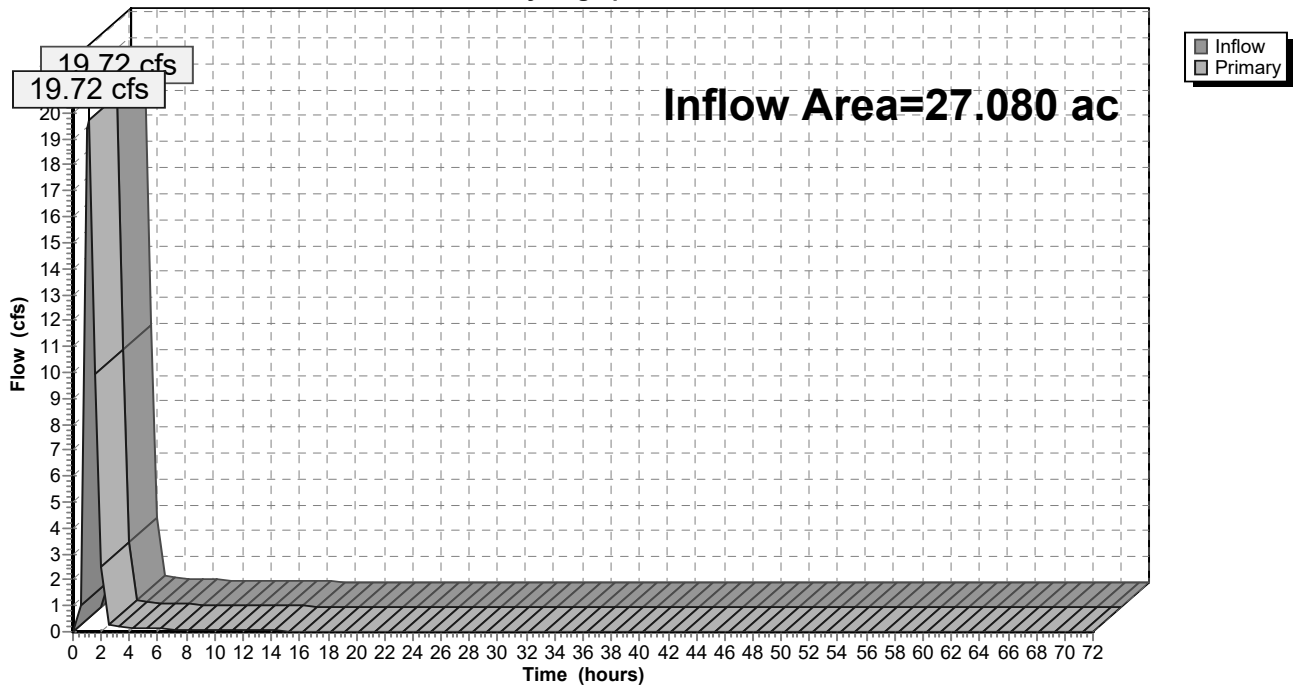
**Summary for Link 22L: PROP. POI-1**

Inflow Area = 27.080 ac, 68.87% Impervious, Inflow Depth > 0.67" for WQ event  
Inflow = 19.72 cfs @ 1.08 hrs, Volume= 1.504 af  
Primary = 19.72 cfs @ 1.08 hrs, Volume= 1.504 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

**Link 22L: PROP. POI-1**

Hydrograph





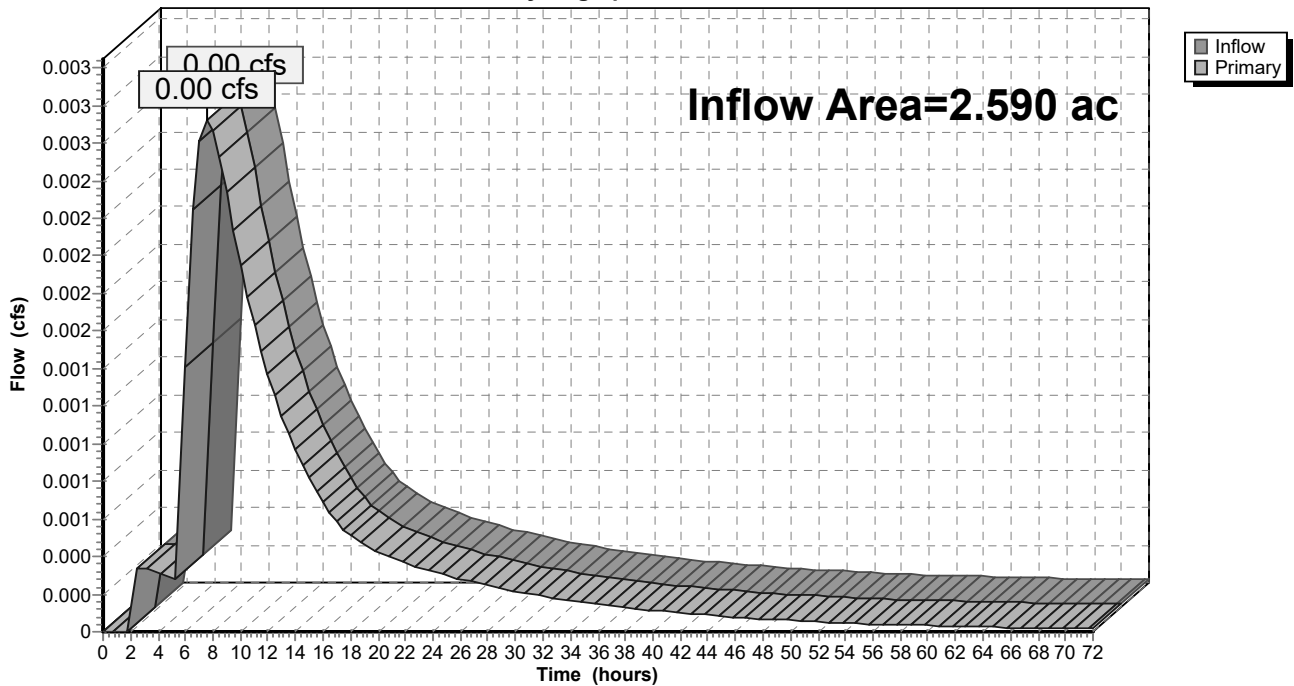
### Summary for Link 28L: MH 101

Inflow Area = 2.590 ac, 60.23% Impervious, Inflow Depth > 0.01" for WQ event  
Inflow = 0.00 cfs @ 7.59 hrs, Volume= 0.002 af  
Primary = 0.00 cfs @ 7.59 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 28L: MH 101

Hydrograph





EDA-2 (POI-2)



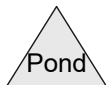
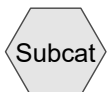
EDA-3 (POI-3)



PDA-2 (POI-2)



PDA-3 (POI-3)



**Routing Diagram for Pre vs Post\_rev**

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**Pre vs Post\_rev**

NOAA 24-hr C 2-Year Rainfall=3.34"

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Time span=0.00-72.00 hrs, dt=0.50 hrs, 145 points  
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment4S: EDA-2 (POI-2)**

Runoff Area=3.600 ac 1.67% Impervious Runoff Depth=0.95"  
Flow Length=609' Tc=19.6 min CN=70/98 Runoff=1.91 cfs 0.284 af

**Subcatchment6S: EDA-3 (POI-3)**

Runoff Area=1.230 ac 0.00% Impervious Runoff Depth=0.91"  
Flow Length=291' Tc=15.2 min CN=70/0 Runoff=0.59 cfs 0.093 af

**Subcatchment9S: PDA-3 (POI-3)**

Runoff Area=0.880 ac 0.00% Impervious Runoff Depth=0.91"  
Flow Length=291' Tc=15.2 min CN=70/0 Runoff=0.42 cfs 0.067 af

**Subcatchment11S: PDA-2 (POI-2)**

Runoff Area=1.770 ac 0.00% Impervious Runoff Depth=0.91"  
Flow Length=609' Tc=19.6 min CN=70/0 Runoff=0.91 cfs 0.134 af

**Total Runoff Area = 7.480 ac Runoff Volume = 0.579 af Average Runoff Depth = 0.93"**  
**99.20% Pervious = 7.420 ac 0.80% Impervious = 0.060 ac**

**Pre vs Post\_rev**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Subcatchment 4S: EDA-2 (POI-2)**

Runoff = 1.91 cfs @ 12.49 hrs, Volume= 0.284 af, Depth= 0.95"

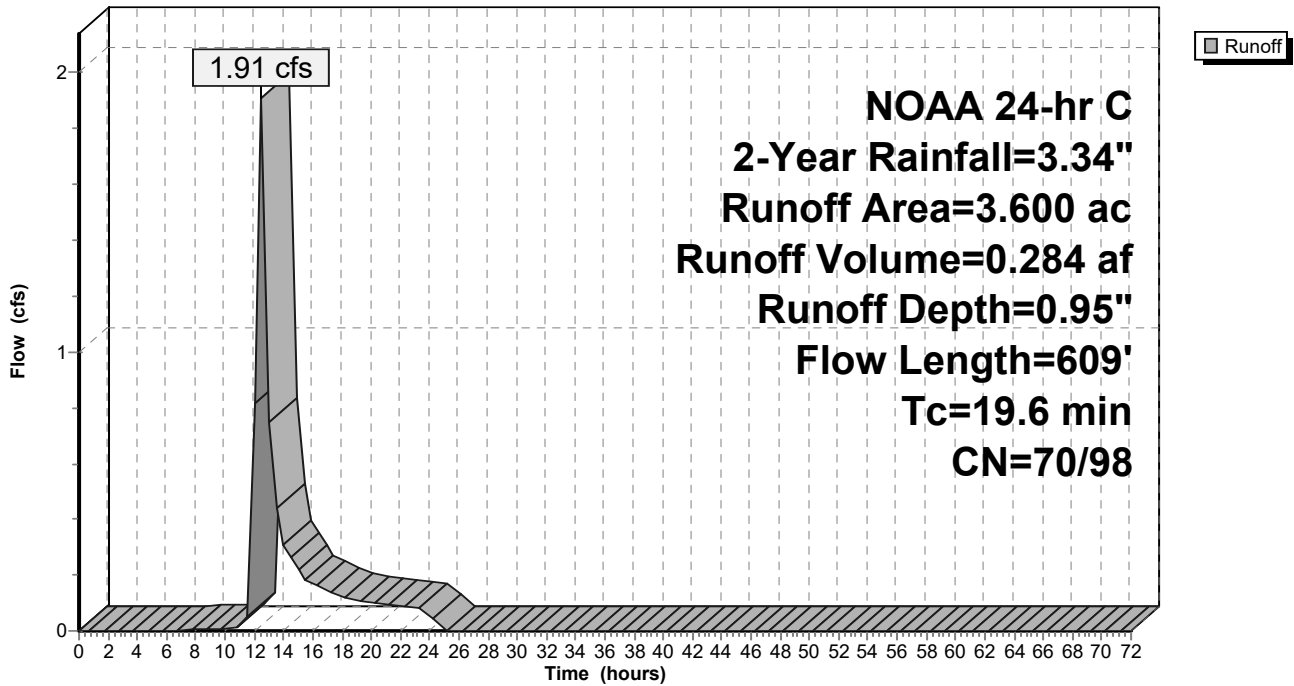
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
3.540	70	Woods, Good, HSG C
0.060	98	Paved parking, HSG C
3.600	70	Weighted Average
3.540	70	98.33% Pervious Area
0.060	98	1.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	17	0.0180	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
14.3	592	0.0190	0.69		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
19.6	609	Total			

**Subcatchment 4S: EDA-2 (POI-2)**

Hydrograph



**Pre vs Post\_rev**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Hydrograph for Subcatchment 4S: EDA-2 (POI-2)**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.50	0.10	0.00	0.01	0.00
5.00	0.21	0.00	0.08	0.00
7.50	0.36	0.00	0.20	0.00
10.00	0.61	0.00	0.42	0.01
12.50	2.35	0.39	2.12	<b>1.91</b>
15.00	2.85	0.63	2.62	0.22
17.50	3.05	0.74	2.81	0.13
20.00	3.18	0.81	2.94	0.10
22.50	<b>3.28</b>	<b>0.88</b>	<b>3.05</b>	0.09
25.00	<b>3.34</b>	<b>0.91</b>	<b>3.11</b>	0.00
27.50	3.34	0.91	3.11	0.00
30.00	3.34	0.91	3.11	0.00
32.50	3.34	0.91	3.11	0.00
35.00	3.34	0.91	3.11	0.00
37.50	3.34	0.91	3.11	0.00
40.00	3.34	0.91	3.11	0.00
42.50	3.34	0.91	3.11	0.00
45.00	3.34	0.91	3.11	0.00
47.50	3.34	0.91	3.11	0.00
50.00	3.34	0.91	3.11	0.00
52.50	3.34	0.91	3.11	0.00
55.00	3.34	0.91	3.11	0.00
57.50	3.34	0.91	3.11	0.00
60.00	3.34	0.91	3.11	0.00
62.50	3.34	0.91	3.11	0.00
65.00	3.34	0.91	3.11	0.00
67.50	3.34	0.91	3.11	0.00
70.00	3.34	0.91	3.11	0.00

**Pre vs Post\_rev**

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NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Subcatchment 6S: EDA-3 (POI-3)**

Runoff = 0.59 cfs @ 12.44 hrs, Volume= 0.093 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

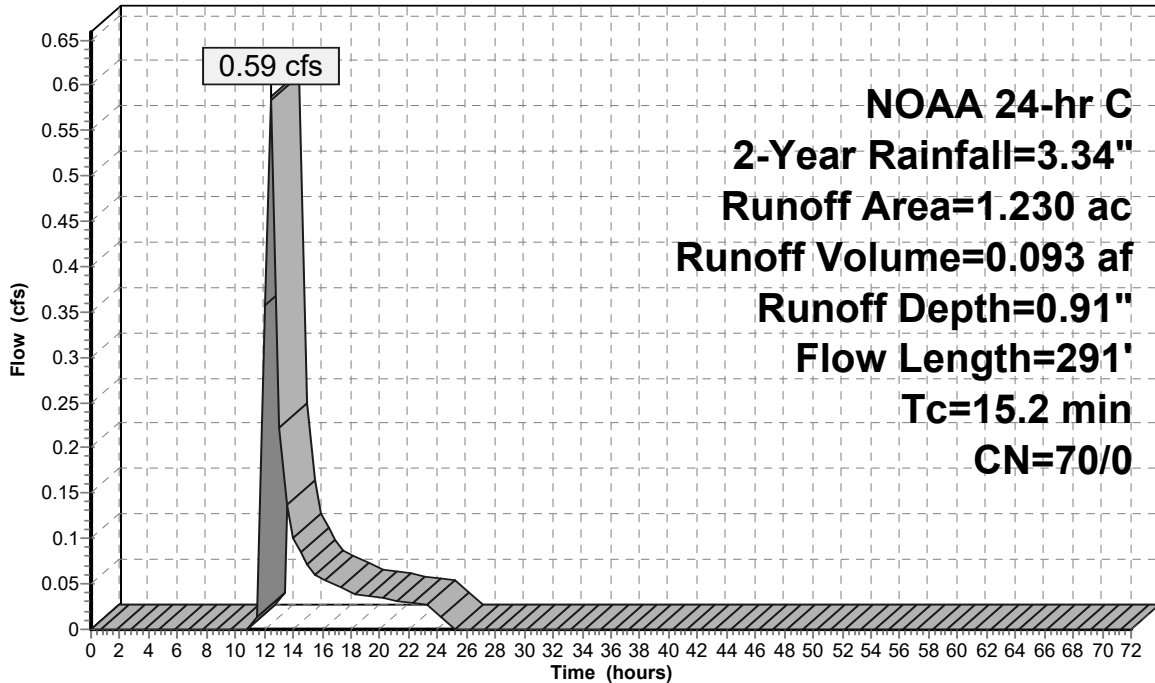
Area (ac)	CN	Description
1.230	70	Woods, Good, HSG C
1.230	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	9	0.0050	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
9.9	282	0.0090	0.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.2	291	Total			

**Subcatchment 6S: EDA-3 (POI-3)**

Hydrograph



Runoff

**NOAA 24-hr C  
 2-Year Rainfall=3.34"  
 Runoff Area=1.230 ac  
 Runoff Volume=0.093 af  
 Runoff Depth=0.91"  
 Flow Length=291'  
 Tc=15.2 min  
 CN=70/0**

**Pre vs Post\_rev**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Hydrograph for Subcatchment 6S: EDA-3 (POI-3)**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	<b>0.00</b>	0.00
2.50	0.10	0.00	0.00	0.00
5.00	0.21	0.00	0.00	0.00
7.50	0.36	0.00	0.00	0.00
10.00	0.61	0.00	0.00	0.00
12.50	2.35	0.39	0.00	<b>0.58</b>
15.00	2.85	0.63	0.00	0.07
17.50	3.05	0.74	0.00	0.04
20.00	3.18	0.81	0.00	0.03
22.50	<b>3.28</b>	<b>0.88</b>	0.00	0.03
25.00	<b>3.34</b>	<b>0.91</b>	0.00	0.00
27.50	3.34	0.91	0.00	0.00
30.00	3.34	0.91	0.00	0.00
32.50	3.34	0.91	0.00	0.00
35.00	3.34	0.91	0.00	0.00
37.50	3.34	0.91	0.00	0.00
40.00	3.34	0.91	0.00	0.00
42.50	3.34	0.91	0.00	0.00
45.00	3.34	0.91	0.00	0.00
47.50	3.34	0.91	0.00	0.00
50.00	3.34	0.91	0.00	0.00
52.50	3.34	0.91	0.00	0.00
55.00	3.34	0.91	0.00	0.00
57.50	3.34	0.91	0.00	0.00
60.00	3.34	0.91	0.00	0.00
62.50	3.34	0.91	0.00	0.00
65.00	3.34	0.91	0.00	0.00
67.50	3.34	0.91	0.00	0.00
70.00	3.34	0.91	0.00	0.00

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NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Subcatchment 9S: PDA-3 (POI-3)**

Runoff = 0.42 cfs @ 12.44 hrs, Volume= 0.067 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

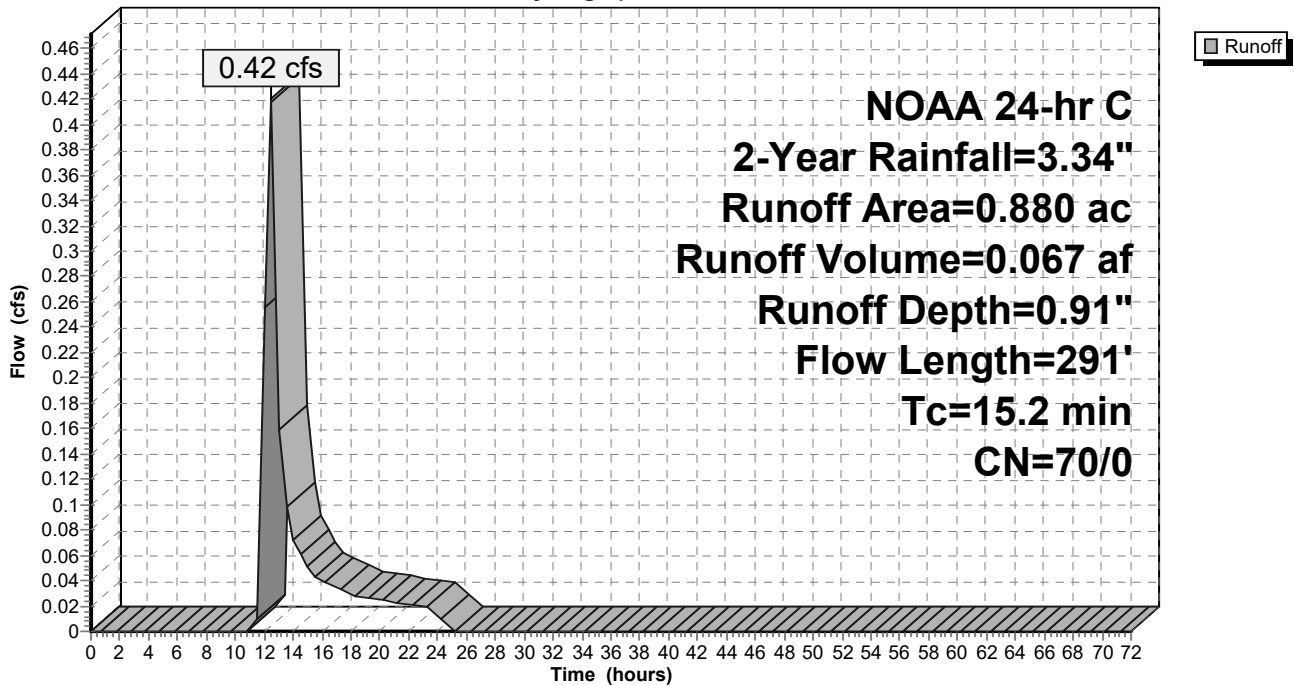
Area (ac)	CN	Description
0.880	70	Woods, Good, HSG C
0.880	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	9	0.0050	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
9.9	282	0.0090	0.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.2	291	Total			

**Subcatchment 9S: PDA-3 (POI-3)**

Hydrograph





**Pre vs Post\_rev**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Hydrograph for Subcatchment 9S: PDA-3 (POI-3)**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	<b>0.00</b>	0.00
2.50	0.10	0.00	0.00	0.00
5.00	0.21	0.00	0.00	0.00
7.50	0.36	0.00	0.00	0.00
10.00	0.61	0.00	0.00	0.00
12.50	2.35	0.39	0.00	<b>0.42</b>
15.00	2.85	0.63	0.00	0.05
17.50	3.05	0.74	0.00	0.03
20.00	3.18	0.81	0.00	0.02
22.50	<b>3.28</b>	<b>0.88</b>	0.00	0.02
25.00	<b>3.34</b>	<b>0.91</b>	0.00	0.00
27.50	3.34	0.91	0.00	0.00
30.00	3.34	0.91	0.00	0.00
32.50	3.34	0.91	0.00	0.00
35.00	3.34	0.91	0.00	0.00
37.50	3.34	0.91	0.00	0.00
40.00	3.34	0.91	0.00	0.00
42.50	3.34	0.91	0.00	0.00
45.00	3.34	0.91	0.00	0.00
47.50	3.34	0.91	0.00	0.00
50.00	3.34	0.91	0.00	0.00
52.50	3.34	0.91	0.00	0.00
55.00	3.34	0.91	0.00	0.00
57.50	3.34	0.91	0.00	0.00
60.00	3.34	0.91	0.00	0.00
62.50	3.34	0.91	0.00	0.00
65.00	3.34	0.91	0.00	0.00
67.50	3.34	0.91	0.00	0.00
70.00	3.34	0.91	0.00	0.00

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NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Subcatchment 11S: PDA-2 (POI-2)**

Runoff = 0.91 cfs @ 12.50 hrs, Volume= 0.134 af, Depth= 0.91"

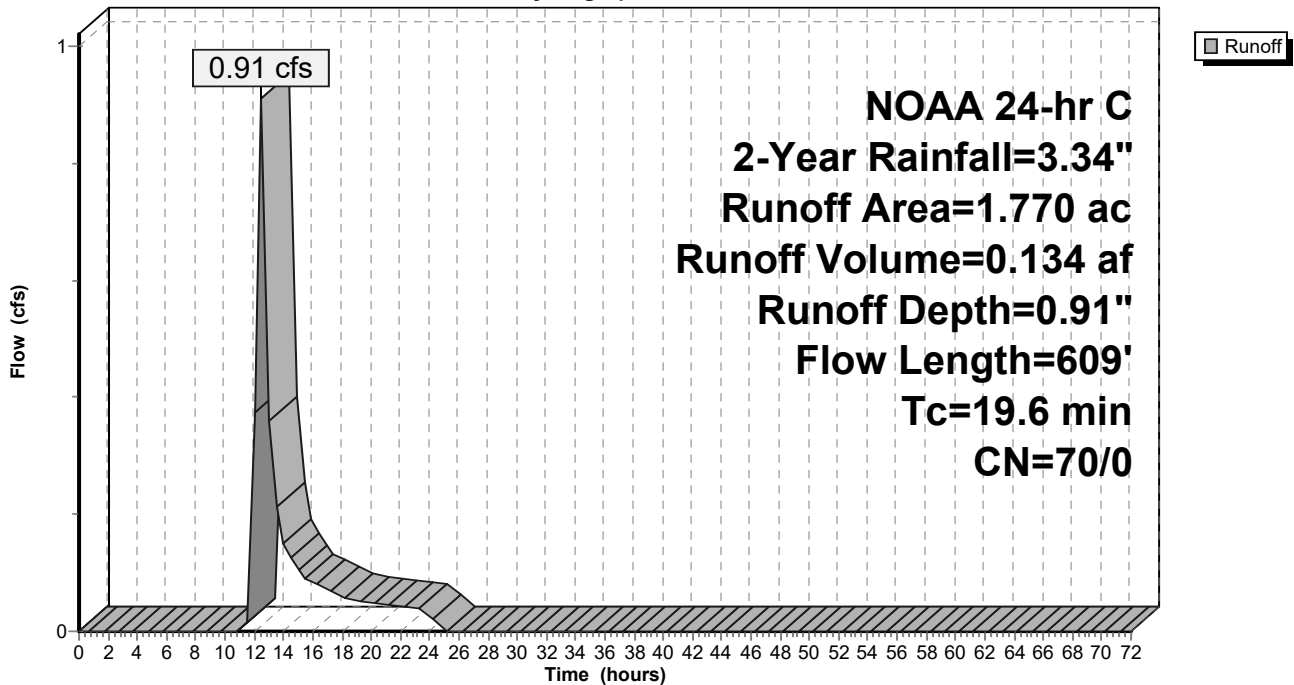
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
1.770	70	Woods, Good, HSG C
1.770	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	17	0.0180	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
14.3	592	0.0190	0.69		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
19.6	609	Total			

**Subcatchment 11S: PDA-2 (POI-2)**

Hydrograph



**Pre vs Post\_rev**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Hydrograph for Subcatchment 11S: PDA-2 (POI-2)**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	<b>0.00</b>	0.00
2.50	0.10	0.00	0.00	0.00
5.00	0.21	0.00	0.00	0.00
7.50	0.36	0.00	0.00	0.00
10.00	0.61	0.00	0.00	0.00
12.50	2.35	0.39	0.00	<b>0.91</b>
15.00	2.85	0.63	0.00	0.11
17.50	3.05	0.74	0.00	0.06
20.00	3.18	0.81	0.00	0.05
22.50	<b>3.28</b>	<b>0.88</b>	0.00	0.04
25.00	<b>3.34</b>	<b>0.91</b>	0.00	0.00
27.50	3.34	0.91	0.00	0.00
30.00	3.34	0.91	0.00	0.00
32.50	3.34	0.91	0.00	0.00
35.00	3.34	0.91	0.00	0.00
37.50	3.34	0.91	0.00	0.00
40.00	3.34	0.91	0.00	0.00
42.50	3.34	0.91	0.00	0.00
45.00	3.34	0.91	0.00	0.00
47.50	3.34	0.91	0.00	0.00
50.00	3.34	0.91	0.00	0.00
52.50	3.34	0.91	0.00	0.00
55.00	3.34	0.91	0.00	0.00
57.50	3.34	0.91	0.00	0.00
60.00	3.34	0.91	0.00	0.00
62.50	3.34	0.91	0.00	0.00
65.00	3.34	0.91	0.00	0.00
67.50	3.34	0.91	0.00	0.00
70.00	3.34	0.91	0.00	0.00

**Pre vs Post\_rev**

NOAA 24-hr C 10-Year Rainfall=5.01"

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Time span=0.00-72.00 hrs, dt=0.50 hrs, 145 points  
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment4S: EDA-2 (POI-2)**

Runoff Area=3.600 ac 1.67% Impervious Runoff Depth=2.09"  
Flow Length=609' Tc=19.6 min CN=70/98 Runoff=4.32 cfs 0.627 af

**Subcatchment6S: EDA-3 (POI-3)**

Runoff Area=1.230 ac 0.00% Impervious Runoff Depth=2.04"  
Flow Length=291' Tc=15.2 min CN=70/0 Runoff=1.34 cfs 0.209 af

**Subcatchment9S: PDA-3 (POI-3)**

Runoff Area=0.880 ac 0.00% Impervious Runoff Depth=2.04"  
Flow Length=291' Tc=15.2 min CN=70/0 Runoff=0.96 cfs 0.150 af

**Subcatchment11S: PDA-2 (POI-2)**

Runoff Area=1.770 ac 0.00% Impervious Runoff Depth=2.04"  
Flow Length=609' Tc=19.6 min CN=70/0 Runoff=2.09 cfs 0.301 af

**Total Runoff Area = 7.480 ac Runoff Volume = 1.288 af Average Runoff Depth = 2.07"**  
**99.20% Pervious = 7.420 ac 0.80% Impervious = 0.060 ac**

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NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 4S: EDA-2 (POI-2)**

Runoff = 4.32 cfs @ 12.46 hrs, Volume= 0.627 af, Depth= 2.09"

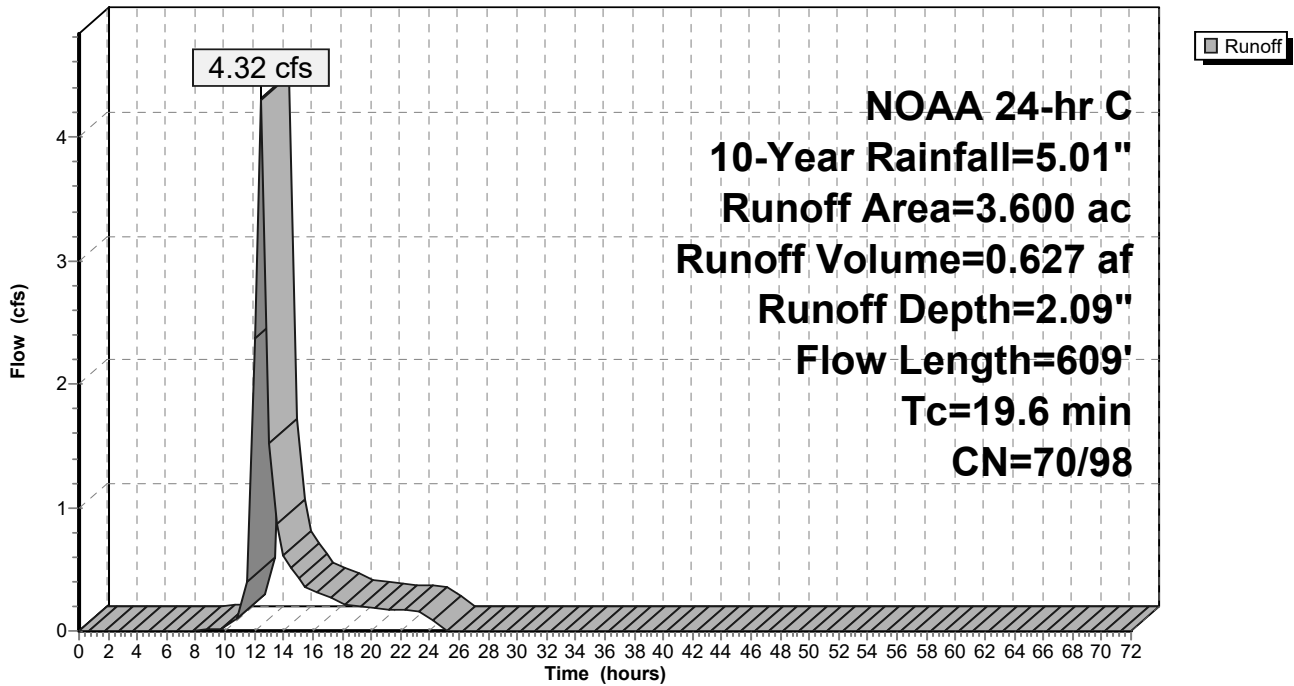
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
3.540	70	Woods, Good, HSG C
0.060	98	Paved parking, HSG C
3.600	70	Weighted Average
3.540	70	98.33% Pervious Area
0.060	98	1.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	17	0.0180	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
14.3	592	0.0190	0.69		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
19.6	609	Total			

**Subcatchment 4S: EDA-2 (POI-2)**

Hydrograph



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NOAA 24-hr C 10-Year Rainfall=5.01"

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**Hydrograph for Subcatchment 4S: EDA-2 (POI-2)**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.50	0.14	0.00	0.03	0.00
5.00	0.32	0.00	0.16	0.00
7.50	0.54	0.00	0.36	0.01
10.00	0.91	0.00	0.71	0.02
12.50	3.53	1.03	3.30	<b>4.30</b>
15.00	4.28	1.52	4.04	0.42
17.50	4.57	1.72	4.33	0.25
20.00	4.76	1.86	4.53	0.19
22.50	<b>4.93</b>	<b>1.98</b>	<b>4.69</b>	0.16
25.00	<b>5.01</b>	<b>2.04</b>	<b>4.77</b>	0.00
27.50	5.01	2.04	4.77	0.00
30.00	5.01	2.04	4.77	0.00
32.50	5.01	2.04	4.77	0.00
35.00	5.01	2.04	4.77	0.00
37.50	5.01	2.04	4.77	0.00
40.00	5.01	2.04	4.77	0.00
42.50	5.01	2.04	4.77	0.00
45.00	5.01	2.04	4.77	0.00
47.50	5.01	2.04	4.77	0.00
50.00	5.01	2.04	4.77	0.00
52.50	5.01	2.04	4.77	0.00
55.00	5.01	2.04	4.77	0.00
57.50	5.01	2.04	4.77	0.00
60.00	5.01	2.04	4.77	0.00
62.50	5.01	2.04	4.77	0.00
65.00	5.01	2.04	4.77	0.00
67.50	5.01	2.04	4.77	0.00
70.00	5.01	2.04	4.77	0.00

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NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 6S: EDA-3 (POI-3)**

Runoff = 1.34 cfs @ 12.38 hrs, Volume= 0.209 af, Depth= 2.04"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

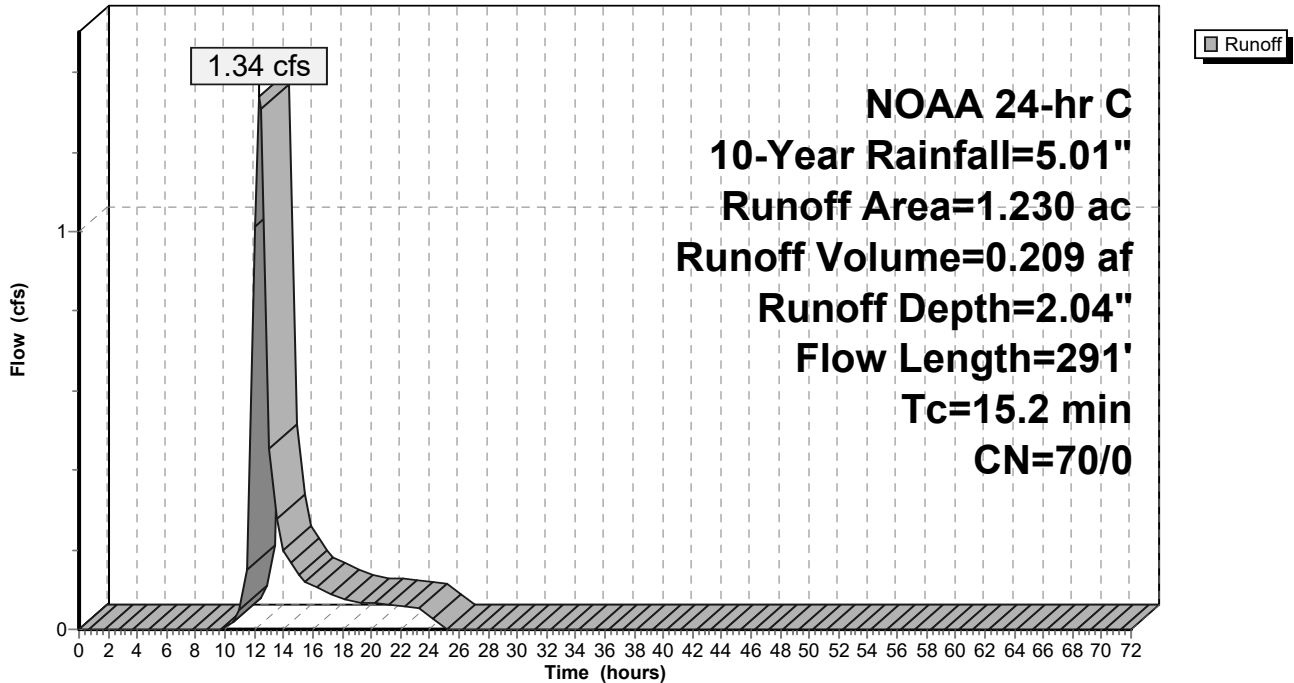
Area (ac)	CN	Description
1.230	70	Woods, Good, HSG C
1.230	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	9	0.0050	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
9.9	282	0.0090	0.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.2	291	Total			

**Subcatchment 6S: EDA-3 (POI-3)**

Hydrograph



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NOAA 24-hr C 10-Year Rainfall=5.01"

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**Hydrograph for Subcatchment 6S: EDA-3 (POI-3)**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	<b>0.00</b>	0.00
2.50	0.14	0.00	0.00	0.00
5.00	0.32	0.00	0.00	0.00
7.50	0.54	0.00	0.00	0.00
10.00	0.91	0.00	0.00	0.00
12.50	3.53	1.03	0.00	<b>1.30</b>
15.00	4.28	1.52	0.00	0.14
17.50	4.57	1.72	0.00	0.08
20.00	4.76	1.86	0.00	0.06
22.50	<b>4.93</b>	<b>1.98</b>	0.00	0.05
25.00	<b>5.01</b>	<b>2.04</b>	0.00	0.00
27.50	5.01	2.04	0.00	0.00
30.00	5.01	2.04	0.00	0.00
32.50	5.01	2.04	0.00	0.00
35.00	5.01	2.04	0.00	0.00
37.50	5.01	2.04	0.00	0.00
40.00	5.01	2.04	0.00	0.00
42.50	5.01	2.04	0.00	0.00
45.00	5.01	2.04	0.00	0.00
47.50	5.01	2.04	0.00	0.00
50.00	5.01	2.04	0.00	0.00
52.50	5.01	2.04	0.00	0.00
55.00	5.01	2.04	0.00	0.00
57.50	5.01	2.04	0.00	0.00
60.00	5.01	2.04	0.00	0.00
62.50	5.01	2.04	0.00	0.00
65.00	5.01	2.04	0.00	0.00
67.50	5.01	2.04	0.00	0.00
70.00	5.01	2.04	0.00	0.00



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NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 9S: PDA-3 (POI-3)**

Runoff = 0.96 cfs @ 12.38 hrs, Volume= 0.150 af, Depth= 2.04"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

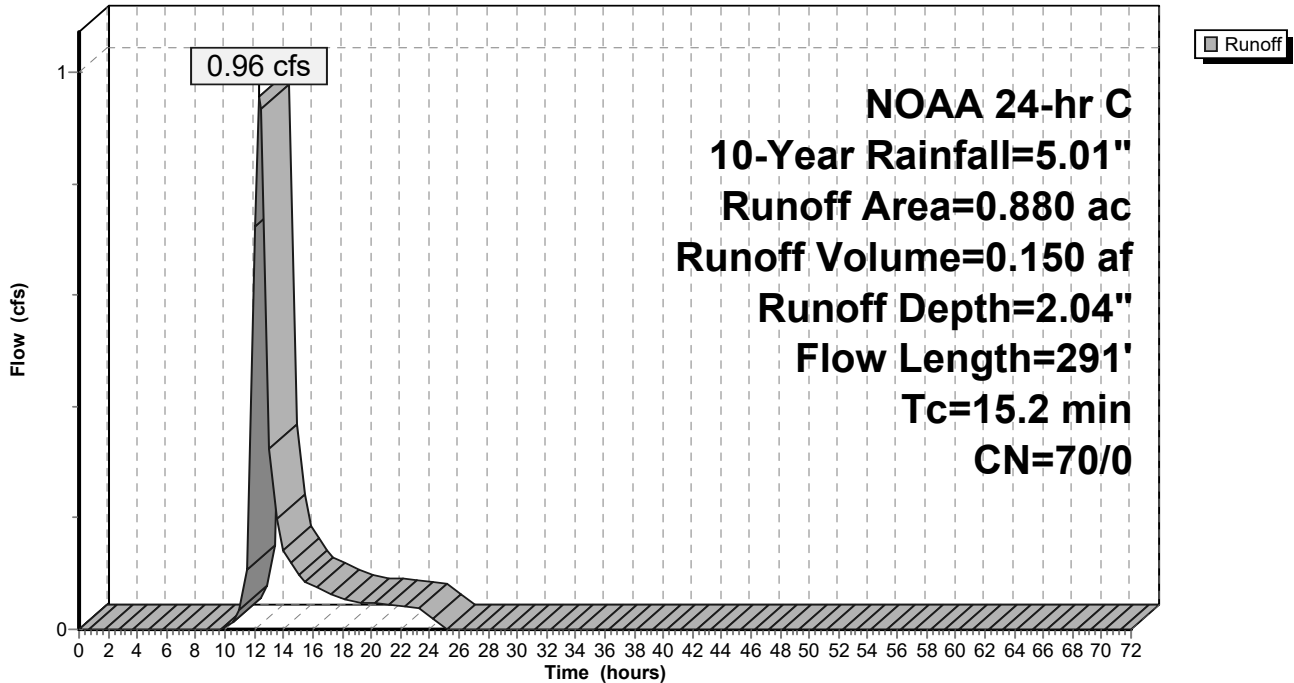
Area (ac)	CN	Description
0.880	70	Woods, Good, HSG C
0.880	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	9	0.0050	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
9.9	282	0.0090	0.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.2	291	Total			

**Subcatchment 9S: PDA-3 (POI-3)**

Hydrograph



**Pre vs Post\_rev**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Hydrograph for Subcatchment 9S: PDA-3 (POI-3)**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	<b>0.00</b>	0.00
2.50	0.14	0.00	0.00	0.00
5.00	0.32	0.00	0.00	0.00
7.50	0.54	0.00	0.00	0.00
10.00	0.91	0.00	0.00	0.00
12.50	3.53	1.03	0.00	<b>0.93</b>
15.00	4.28	1.52	0.00	0.10
17.50	4.57	1.72	0.00	0.06
20.00	4.76	1.86	0.00	0.05
22.50	<b>4.93</b>	<b>1.98</b>	0.00	0.04
25.00	<b>5.01</b>	<b>2.04</b>	0.00	0.00
27.50	5.01	2.04	0.00	0.00
30.00	5.01	2.04	0.00	0.00
32.50	5.01	2.04	0.00	0.00
35.00	5.01	2.04	0.00	0.00
37.50	5.01	2.04	0.00	0.00
40.00	5.01	2.04	0.00	0.00
42.50	5.01	2.04	0.00	0.00
45.00	5.01	2.04	0.00	0.00
47.50	5.01	2.04	0.00	0.00
50.00	5.01	2.04	0.00	0.00
52.50	5.01	2.04	0.00	0.00
55.00	5.01	2.04	0.00	0.00
57.50	5.01	2.04	0.00	0.00
60.00	5.01	2.04	0.00	0.00
62.50	5.01	2.04	0.00	0.00
65.00	5.01	2.04	0.00	0.00
67.50	5.01	2.04	0.00	0.00
70.00	5.01	2.04	0.00	0.00

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NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 11S: PDA-2 (POI-2)**

Runoff = 2.09 cfs @ 12.46 hrs, Volume= 0.301 af, Depth= 2.04"

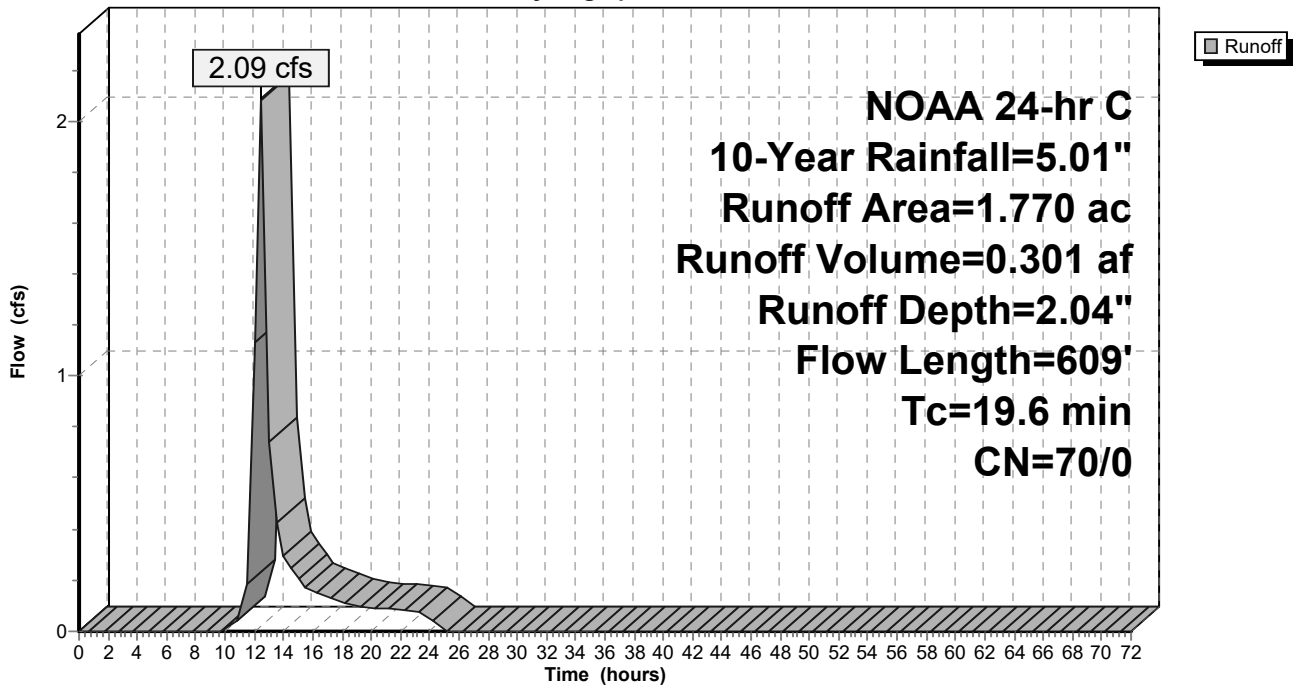
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
1.770	70	Woods, Good, HSG C
1.770	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	17	0.0180	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
14.3	592	0.0190	0.69		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
19.6	609	Total			

**Subcatchment 11S: PDA-2 (POI-2)**

Hydrograph



**Pre vs Post\_rev**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Hydrograph for Subcatchment 11S: PDA-2 (POI-2)**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	<b>0.00</b>	0.00
2.50	0.14	0.00	0.00	0.00
5.00	0.32	0.00	0.00	0.00
7.50	0.54	0.00	0.00	0.00
10.00	0.91	0.00	0.00	0.00
12.50	3.53	1.03	0.00	<b>2.08</b>
15.00	4.28	1.52	0.00	0.20
17.50	4.57	1.72	0.00	0.12
20.00	4.76	1.86	0.00	0.09
22.50	<b>4.93</b>	<b>1.98</b>	0.00	0.08
25.00	<b>5.01</b>	<b>2.04</b>	0.00	0.00
27.50	5.01	2.04	0.00	0.00
30.00	5.01	2.04	0.00	0.00
32.50	5.01	2.04	0.00	0.00
35.00	5.01	2.04	0.00	0.00
37.50	5.01	2.04	0.00	0.00
40.00	5.01	2.04	0.00	0.00
42.50	5.01	2.04	0.00	0.00
45.00	5.01	2.04	0.00	0.00
47.50	5.01	2.04	0.00	0.00
50.00	5.01	2.04	0.00	0.00
52.50	5.01	2.04	0.00	0.00
55.00	5.01	2.04	0.00	0.00
57.50	5.01	2.04	0.00	0.00
60.00	5.01	2.04	0.00	0.00
62.50	5.01	2.04	0.00	0.00
65.00	5.01	2.04	0.00	0.00
67.50	5.01	2.04	0.00	0.00
70.00	5.01	2.04	0.00	0.00

**Pre vs Post\_rev**

NOAA 24-hr C 100-Year Rainfall=8.21"

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Time span=0.00-72.00 hrs, dt=0.50 hrs, 145 points  
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment4S: EDA-2 (POI-2)**

Runoff Area=3.600 ac 1.67% Impervious Runoff Depth=4.70"  
Flow Length=609' Tc=19.6 min CN=70/98 Runoff=9.60 cfs 1.410 af

**Subcatchment6S: EDA-3 (POI-3)**

Runoff Area=1.230 ac 0.00% Impervious Runoff Depth=4.65"  
Flow Length=291' Tc=15.2 min CN=70/0 Runoff=3.00 cfs 0.476 af

**Subcatchment9S: PDA-3 (POI-3)**

Runoff Area=0.880 ac 0.00% Impervious Runoff Depth=4.65"  
Flow Length=291' Tc=15.2 min CN=70/0 Runoff=2.15 cfs 0.341 af

**Subcatchment11S: PDA-2 (POI-2)**

Runoff Area=1.770 ac 0.00% Impervious Runoff Depth=4.65"  
Flow Length=609' Tc=19.6 min CN=70/0 Runoff=4.69 cfs 0.685 af

**Total Runoff Area = 7.480 ac Runoff Volume = 2.912 af Average Runoff Depth = 4.67"**  
**99.20% Pervious = 7.420 ac 0.80% Impervious = 0.060 ac**

**Pre vs Post\_rev**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 4S: EDA-2 (POI-2)**

Runoff = 9.60 cfs @ 12.43 hrs, Volume= 1.410 af, Depth= 4.70"

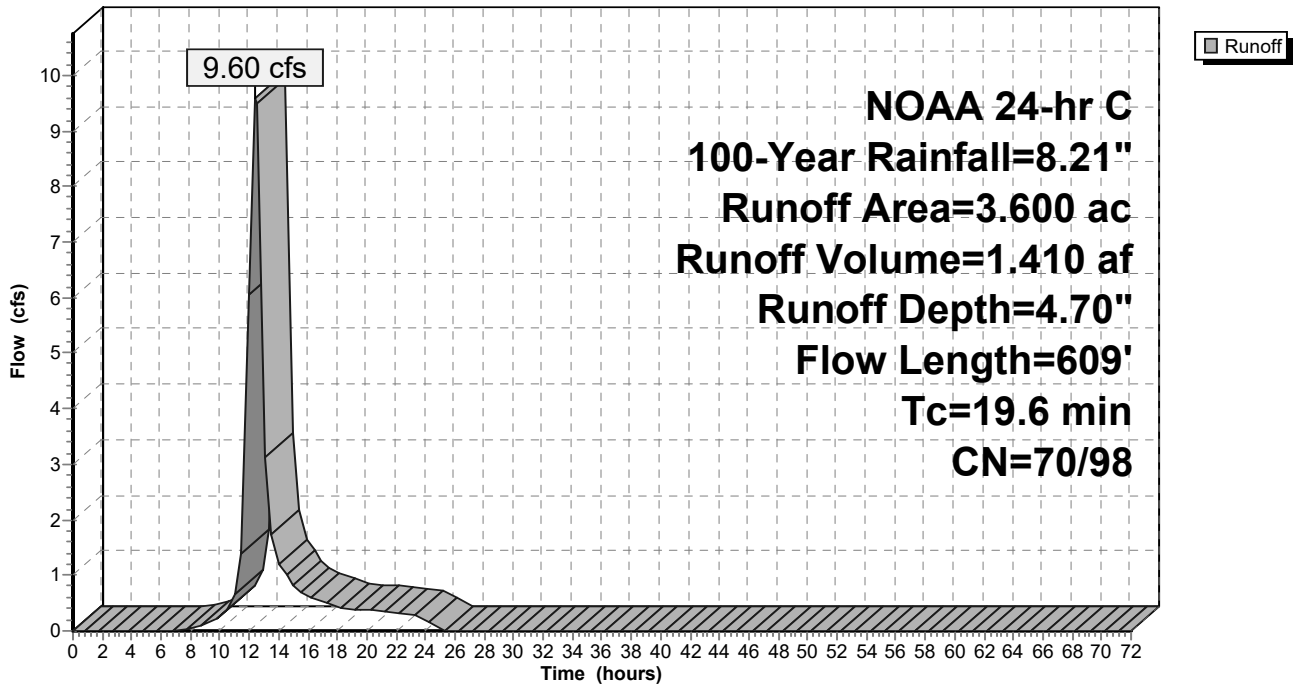
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
3.540	70	Woods, Good, HSG C
0.060	98	Paved parking, HSG C
3.600	70	Weighted Average
3.540	70	98.33% Pervious Area
0.060	98	1.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	17	0.0180	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
14.3	592	0.0190	0.69		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
19.6	609	Total			

**Subcatchment 4S: EDA-2 (POI-2)**

Hydrograph



**Pre vs Post\_rev**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Hydrograph for Subcatchment 4S: EDA-2 (POI-2)**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.50	0.24	0.00	0.10	0.00
5.00	0.52	0.00	0.34	0.01
7.50	0.89	0.00	0.68	0.01
10.00	1.50	0.08	1.28	0.26
12.50	5.78	2.63	5.55	<b>9.49</b>
15.00	7.01	3.63	6.77	0.83
17.50	7.49	4.03	7.25	0.49
20.00	7.81	4.30	7.57	0.37
22.50	<b>8.07</b>	<b>4.53</b>	<b>7.83</b>	0.31
25.00	<b>8.21</b>	<b>4.65</b>	<b>7.97</b>	0.00
27.50	8.21	4.65	7.97	0.00
30.00	8.21	4.65	7.97	0.00
32.50	8.21	4.65	7.97	0.00
35.00	8.21	4.65	7.97	0.00
37.50	8.21	4.65	7.97	0.00
40.00	8.21	4.65	7.97	0.00
42.50	8.21	4.65	7.97	0.00
45.00	8.21	4.65	7.97	0.00
47.50	8.21	4.65	7.97	0.00
50.00	8.21	4.65	7.97	0.00
52.50	8.21	4.65	7.97	0.00
55.00	8.21	4.65	7.97	0.00
57.50	8.21	4.65	7.97	0.00
60.00	8.21	4.65	7.97	0.00
62.50	8.21	4.65	7.97	0.00
65.00	8.21	4.65	7.97	0.00
67.50	8.21	4.65	7.97	0.00
70.00	8.21	4.65	7.97	0.00

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NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 6S: EDA-3 (POI-3)**

Runoff = 3.00 cfs @ 12.32 hrs, Volume= 0.476 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

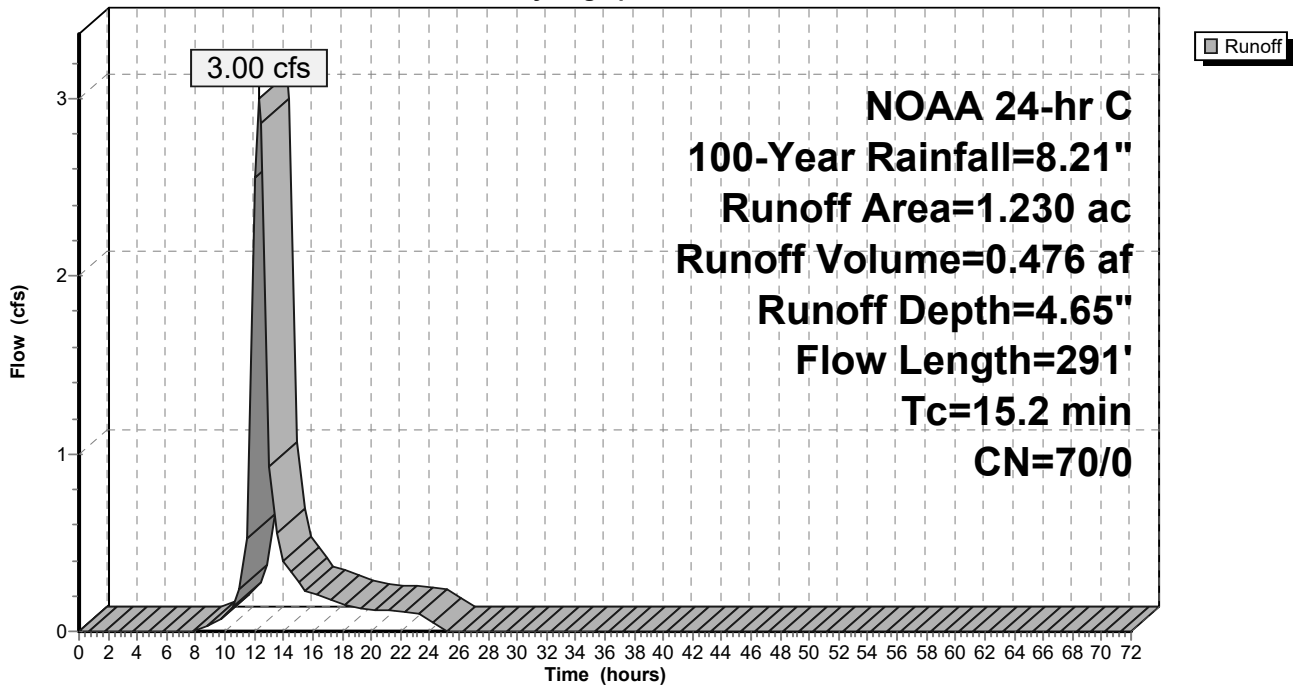
Area (ac)	CN	Description
1.230	70	Woods, Good, HSG C
1.230	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	9	0.0050	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
9.9	282	0.0090	0.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.2	291	Total			

**Subcatchment 6S: EDA-3 (POI-3)**

Hydrograph





**Pre vs Post\_rev**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Hydrograph for Subcatchment 6S: EDA-3 (POI-3)**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	<b>0.00</b>	0.00
2.50	0.24	0.00	0.00	0.00
5.00	0.52	0.00	0.00	0.00
7.50	0.89	0.00	0.00	0.00
10.00	1.50	0.08	0.00	0.09
12.50	5.78	2.63	0.00	<b>2.85</b>
15.00	7.01	3.63	0.00	0.27
17.50	7.49	4.03	0.00	0.17
20.00	7.81	4.30	0.00	0.13
22.50	<b>8.07</b>	<b>4.53</b>	0.00	0.10
25.00	<b>8.21</b>	<b>4.65</b>	0.00	0.00
27.50	8.21	4.65	0.00	0.00
30.00	8.21	4.65	0.00	0.00
32.50	8.21	4.65	0.00	0.00
35.00	8.21	4.65	0.00	0.00
37.50	8.21	4.65	0.00	0.00
40.00	8.21	4.65	0.00	0.00
42.50	8.21	4.65	0.00	0.00
45.00	8.21	4.65	0.00	0.00
47.50	8.21	4.65	0.00	0.00
50.00	8.21	4.65	0.00	0.00
52.50	8.21	4.65	0.00	0.00
55.00	8.21	4.65	0.00	0.00
57.50	8.21	4.65	0.00	0.00
60.00	8.21	4.65	0.00	0.00
62.50	8.21	4.65	0.00	0.00
65.00	8.21	4.65	0.00	0.00
67.50	8.21	4.65	0.00	0.00
70.00	8.21	4.65	0.00	0.00

**Pre vs Post\_rev**

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**Summary for Subcatchment 9S: PDA-3 (POI-3)**

Runoff = 2.15 cfs @ 12.32 hrs, Volume= 0.341 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

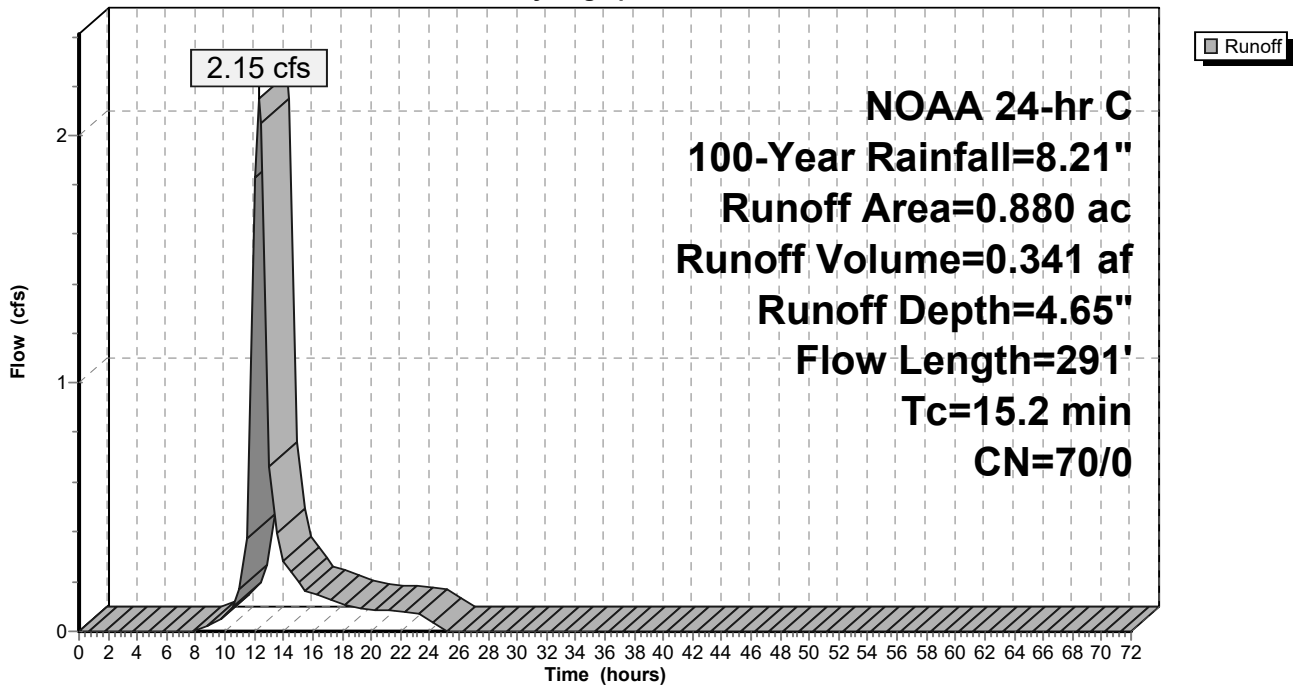
Area (ac)	CN	Description
0.880	70	Woods, Good, HSG C
0.880	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	9	0.0050	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
9.9	282	0.0090	0.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.2	291	Total			

**Subcatchment 9S: PDA-3 (POI-3)**

Hydrograph



**Pre vs Post\_rev**

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**Hydrograph for Subcatchment 9S: PDA-3 (POI-3)**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	<b>0.00</b>	0.00
2.50	0.24	0.00	0.00	0.00
5.00	0.52	0.00	0.00	0.00
7.50	0.89	0.00	0.00	0.00
10.00	1.50	0.08	0.00	0.06
12.50	5.78	2.63	0.00	<b>2.04</b>
15.00	7.01	3.63	0.00	0.20
17.50	7.49	4.03	0.00	0.12
20.00	7.81	4.30	0.00	0.09
22.50	<b>8.07</b>	<b>4.53</b>	0.00	0.07
25.00	<b>8.21</b>	<b>4.65</b>	0.00	0.00
27.50	8.21	4.65	0.00	0.00
30.00	8.21	4.65	0.00	0.00
32.50	8.21	4.65	0.00	0.00
35.00	8.21	4.65	0.00	0.00
37.50	8.21	4.65	0.00	0.00
40.00	8.21	4.65	0.00	0.00
42.50	8.21	4.65	0.00	0.00
45.00	8.21	4.65	0.00	0.00
47.50	8.21	4.65	0.00	0.00
50.00	8.21	4.65	0.00	0.00
52.50	8.21	4.65	0.00	0.00
55.00	8.21	4.65	0.00	0.00
57.50	8.21	4.65	0.00	0.00
60.00	8.21	4.65	0.00	0.00
62.50	8.21	4.65	0.00	0.00
65.00	8.21	4.65	0.00	0.00
67.50	8.21	4.65	0.00	0.00
70.00	8.21	4.65	0.00	0.00

**Pre vs Post\_rev**

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**Summary for Subcatchment 11S: PDA-2 (POI-2)**

Runoff = 4.69 cfs @ 12.43 hrs, Volume= 0.685 af, Depth= 4.65"

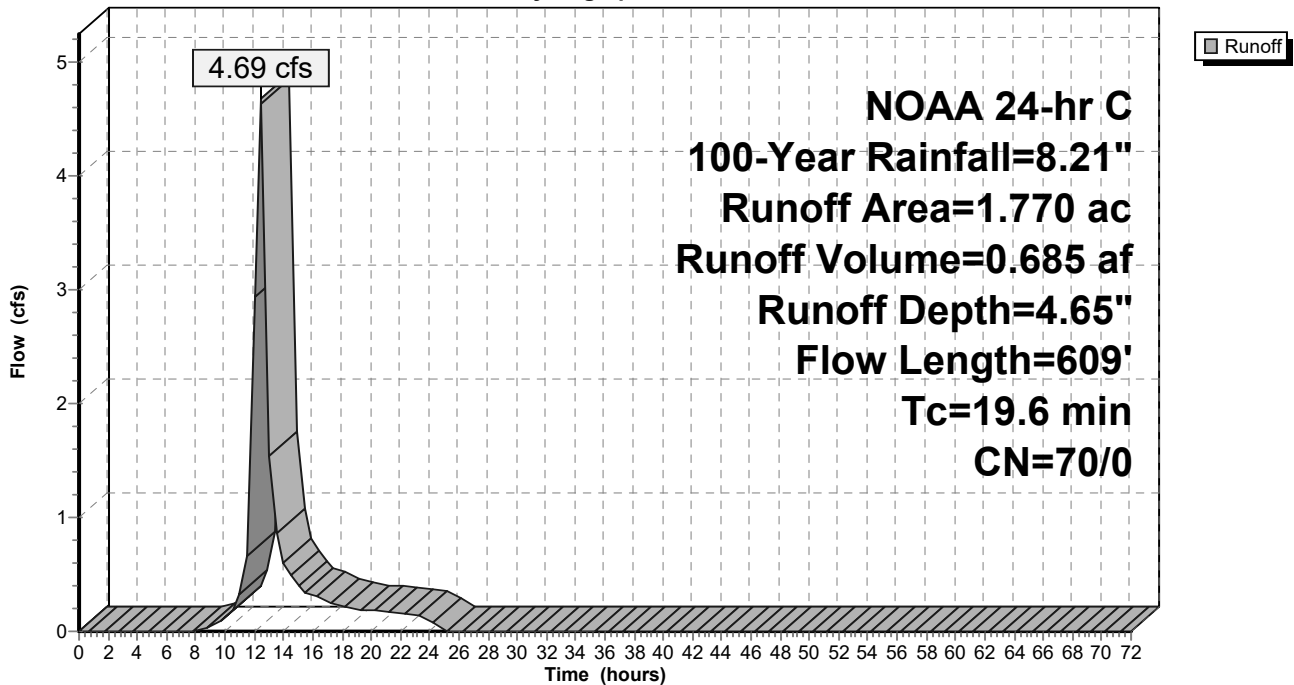
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
1.770	70	Woods, Good, HSG C
1.770	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	17	0.0180	0.05		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.34"
14.3	592	0.0190	0.69		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
19.6	609	Total			

**Subcatchment 11S: PDA-2 (POI-2)**

Hydrograph



**Pre vs Post\_rev**

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**Hydrograph for Subcatchment 11S: PDA-2 (POI-2)**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	<b>0.00</b>	0.00
2.50	0.24	0.00	0.00	0.00
5.00	0.52	0.00	0.00	0.00
7.50	0.89	0.00	0.00	0.00
10.00	1.50	0.08	0.00	0.12
12.50	5.78	2.63	0.00	<b>4.64</b>
15.00	7.01	3.63	0.00	0.40
17.50	7.49	4.03	0.00	0.24
20.00	7.81	4.30	0.00	0.18
22.50	<b>8.07</b>	<b>4.53</b>	0.00	0.15
25.00	<b>8.21</b>	<b>4.65</b>	0.00	0.00
27.50	8.21	4.65	0.00	0.00
30.00	8.21	4.65	0.00	0.00
32.50	8.21	4.65	0.00	0.00
35.00	8.21	4.65	0.00	0.00
37.50	8.21	4.65	0.00	0.00
40.00	8.21	4.65	0.00	0.00
42.50	8.21	4.65	0.00	0.00
45.00	8.21	4.65	0.00	0.00
47.50	8.21	4.65	0.00	0.00
50.00	8.21	4.65	0.00	0.00
52.50	8.21	4.65	0.00	0.00
55.00	8.21	4.65	0.00	0.00
57.50	8.21	4.65	0.00	0.00
60.00	8.21	4.65	0.00	0.00
62.50	8.21	4.65	0.00	0.00
65.00	8.21	4.65	0.00	0.00
67.50	8.21	4.65	0.00	0.00
70.00	8.21	4.65	0.00	0.00

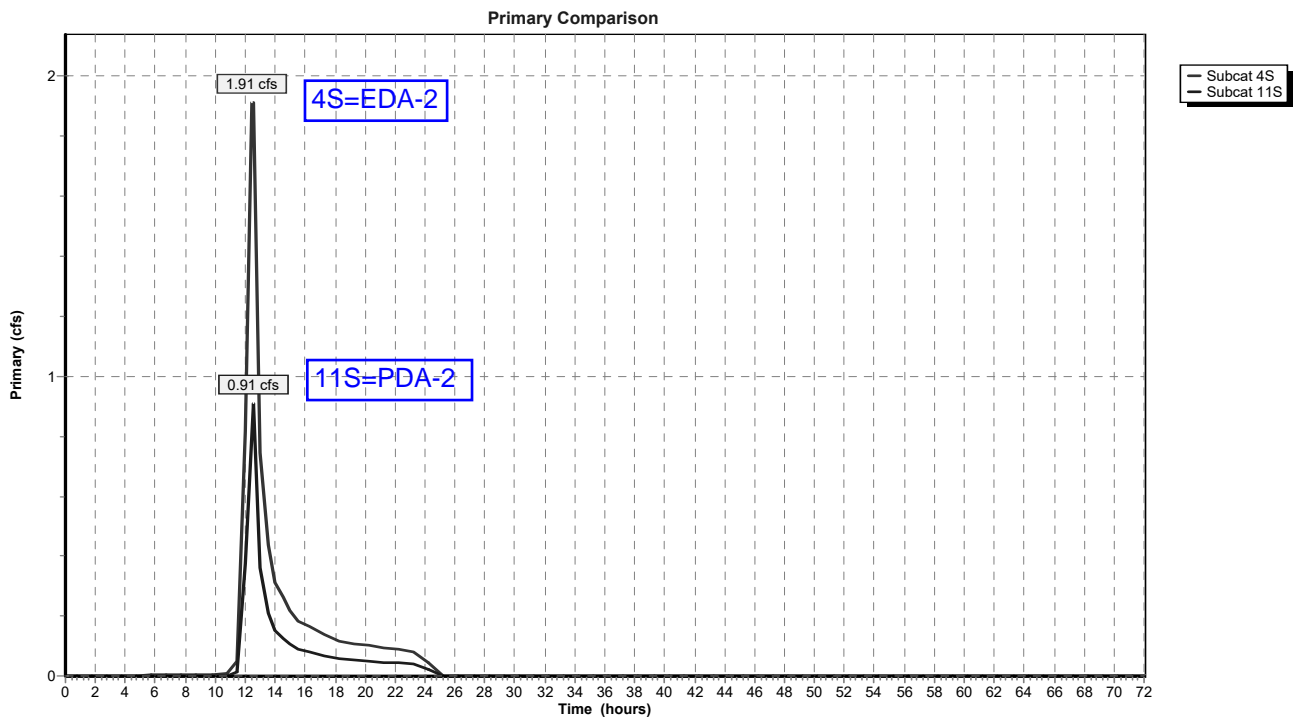
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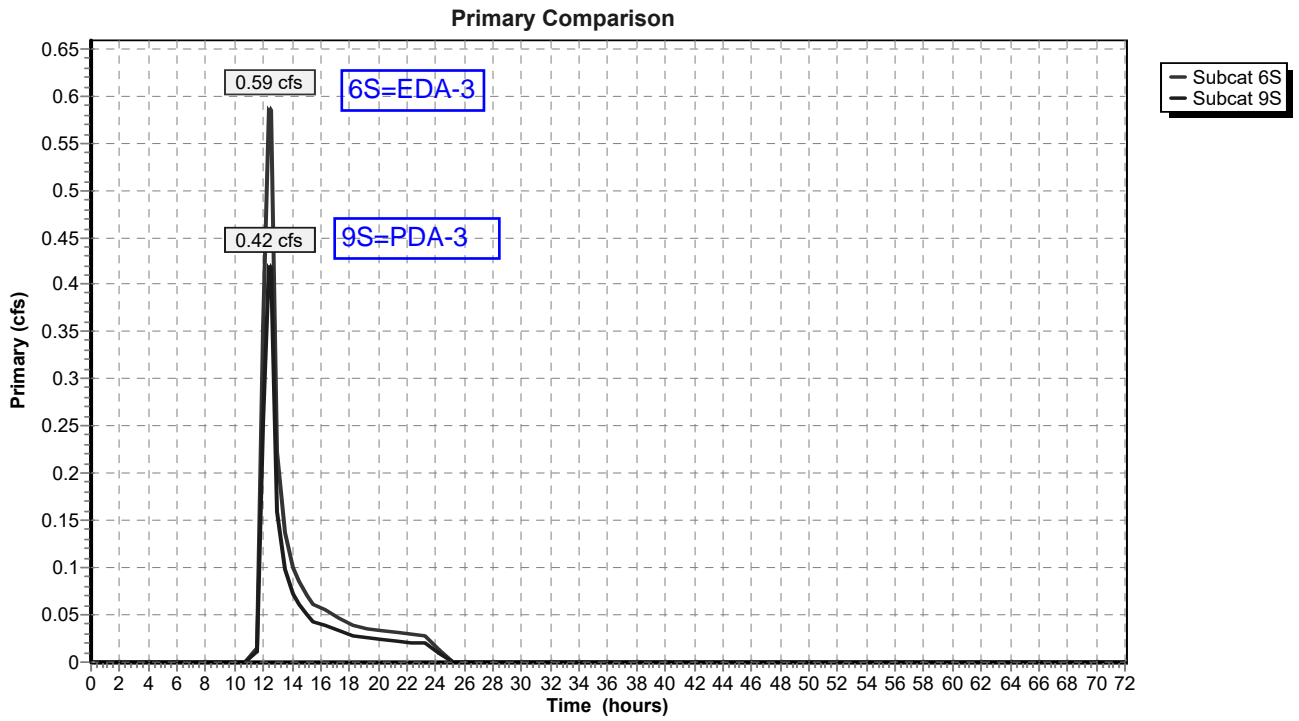
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NOAA 24-hr C 2-Year Rainfall=3.34"

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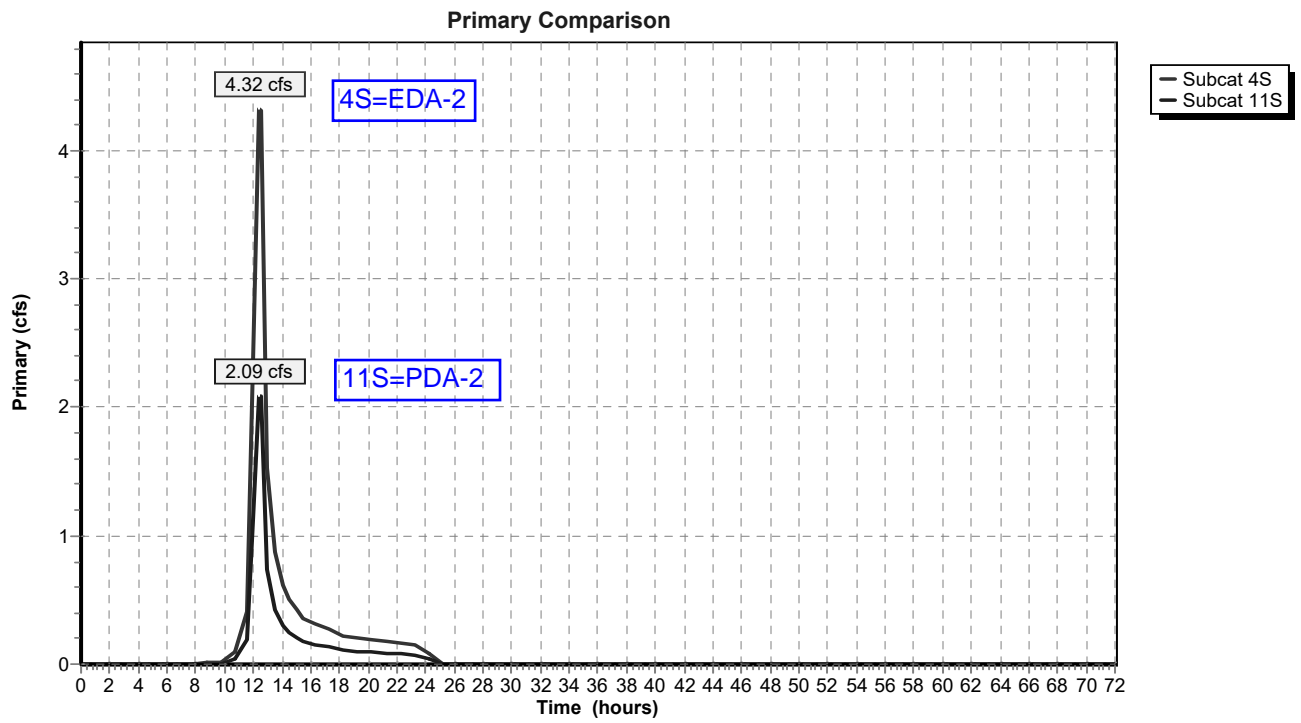
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NOAA 24-hr C 10-Year Rainfall=5.01"

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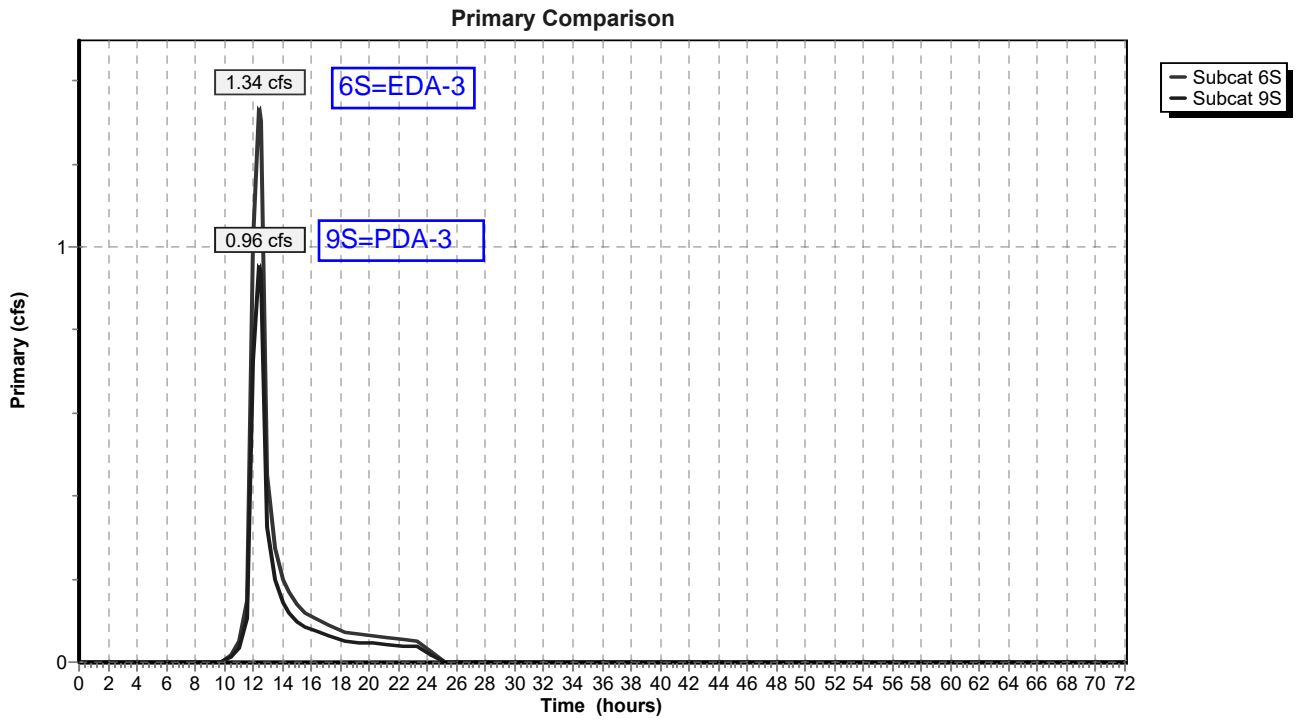
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NOAA 24-hr C 10-Year Rainfall=5.01"

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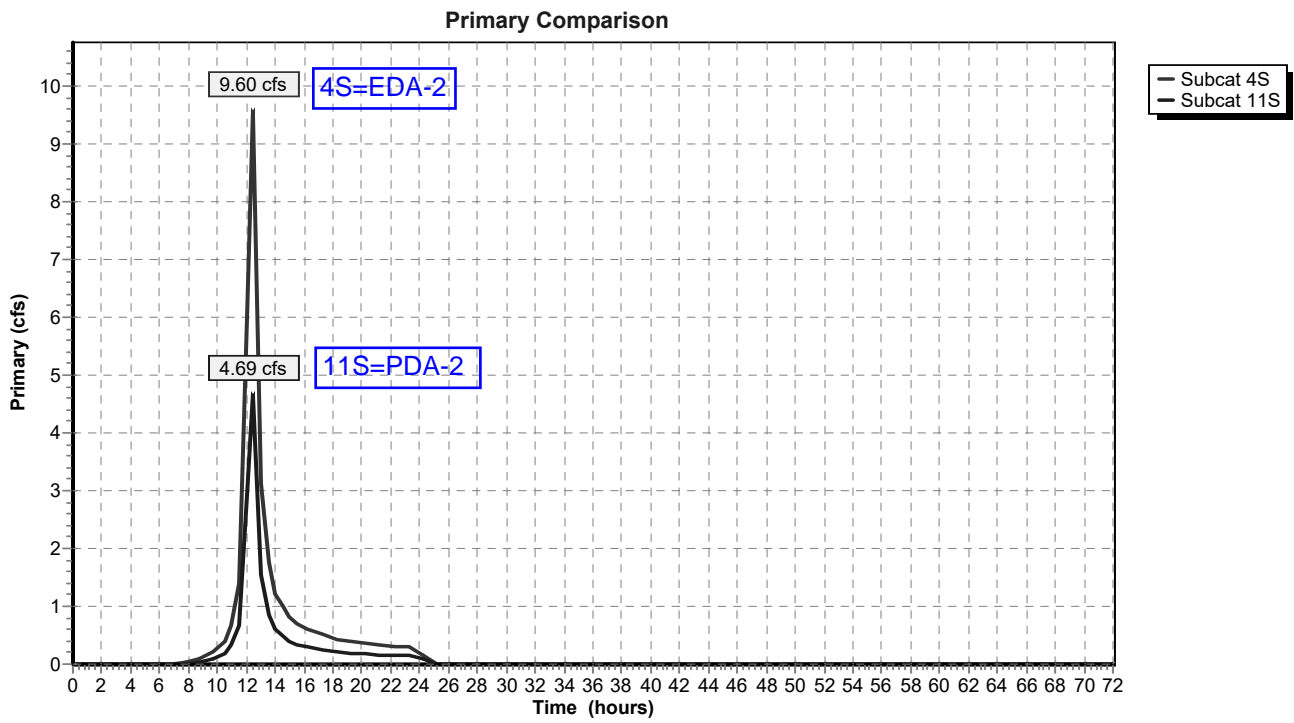
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NOAA 24-hr C 100-Year Rainfall=8.21"

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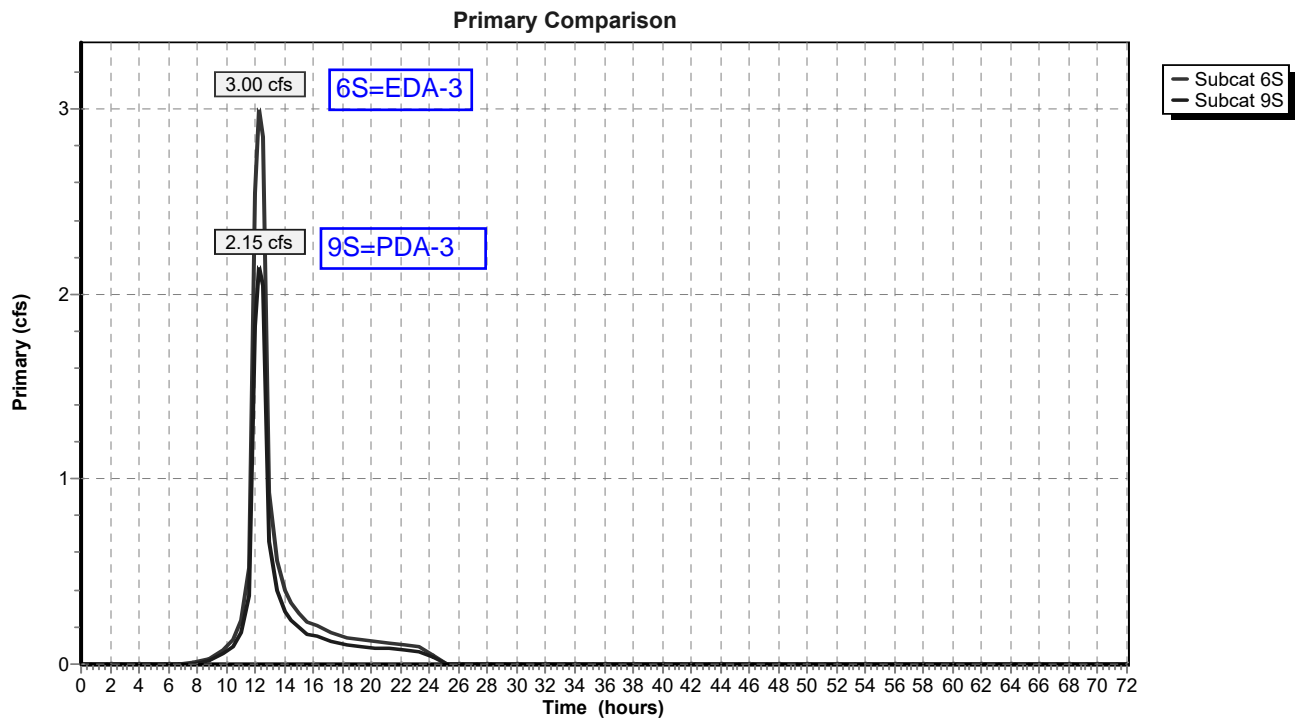
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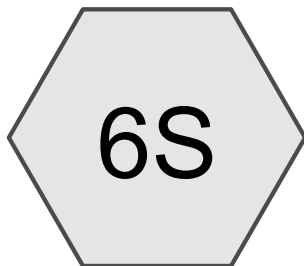
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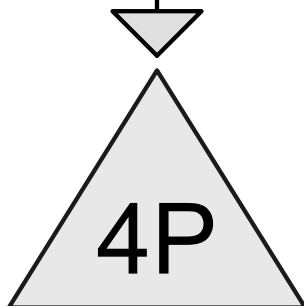
NOAA 24-hr C 100-Year Rainfall=8.21"

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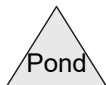
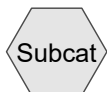




Regional DA to Wet  
Pond



Southern Regional  
Basin



**Routing Diagram for regional basin**

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**regional basin**

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**Area Listing (all nodes)**

Area (acres)	CN	Description (subcatchment-numbers)
56.000	74	>75% Grass cover, Good, HSG C (6S)
84.000	98	Paved parking, HSG A (6S)
<b>140.000</b>	<b>88</b>	<b>TOTAL AREA</b>

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**Soil Listing (all nodes)**

Area (acres)	Soil Group	Subcatchment Numbers
84.000	HSG A	6S
0.000	HSG B	
56.000	HSG C	6S
0.000	HSG D	
0.000	Other	
<b>140.000</b>		<b>TOTAL AREA</b>

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**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	0.000	56.000	0.000	0.000	56.000	>75% Grass cover, Good	6S
84.000	0.000	0.000	0.000	0.000	84.000	Paved parking	6S
<b>84.000</b>	<b>0.000</b>	<b>56.000</b>	<b>0.000</b>	<b>0.000</b>	<b>140.000</b>	<b>TOTAL AREA</b>	

**regional basin**

NOAA 24-hr C 2-Year Rainfall=3.34"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 6S: Regional DA to Wet**      Runoff Area=140.000 ac    60.00% Impervious    Runoff Depth>1.96"  
Tc=30.0 min    CN=88    Runoff=205.00 cfs    22.831 af

**Pond 4P: Southern Regional Basin**      Peak Elev=93.29'    Storage=179,982 cf    Inflow=205.00 cfs    22.831 af  
Outflow=156.69 cfs    22.508 af

**Total Runoff Area = 140.000 ac    Runoff Volume = 22.831 af    Average Runoff Depth = 1.96"**  
**40.00% Pervious = 56.000 ac    60.00% Impervious = 84.000 ac**



**regional basin**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Subcatchment 6S: Regional DA to Wet Pond**

Runoff = 205.00 cfs @ 12.42 hrs, Volume= 22.831 af, Depth> 1.96"

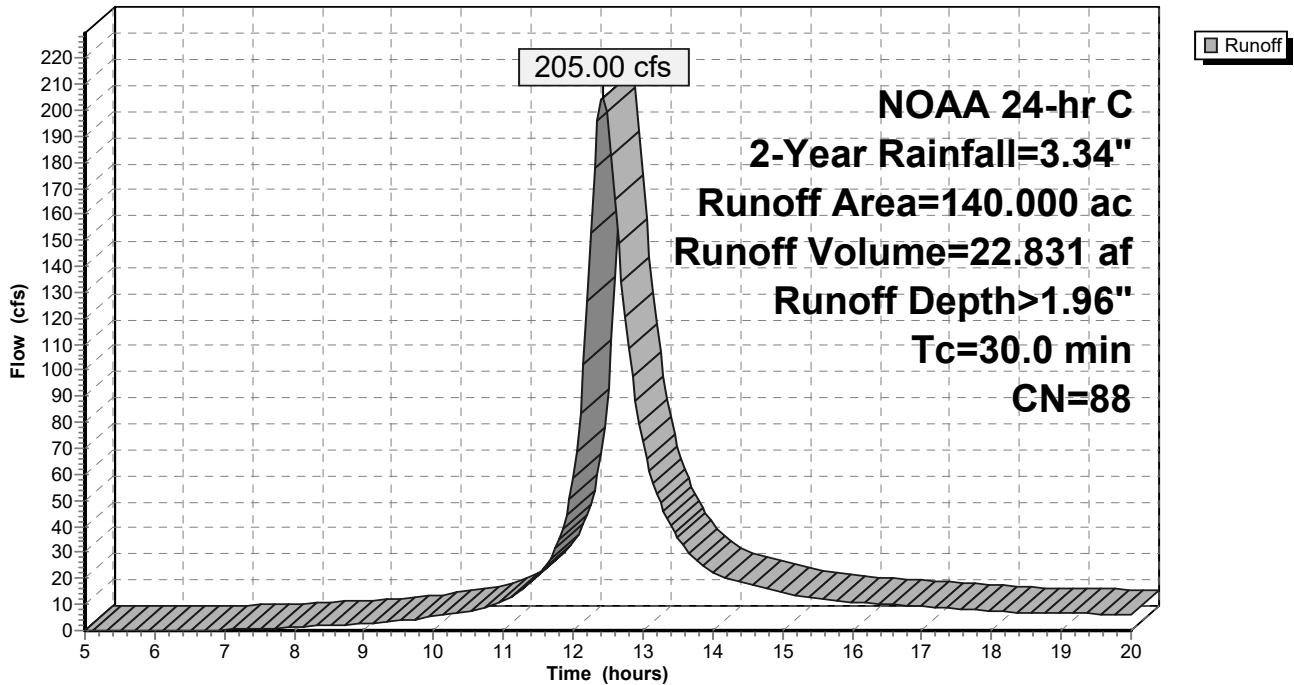
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 2-Year Rainfall=3.34"

Area (ac)	CN	Description
84.000	98	Paved parking, HSG A
56.000	74	>75% Grass cover, Good, HSG C
140.000	88	Weighted Average
56.000		40.00% Pervious Area
84.000		60.00% Impervious Area

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

**Subcatchment 6S: Regional DA to Wet Pond**

Hydrograph



**regional basin**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Summary for Pond 4P: Southern Regional Basin**

Inflow Area = 140.000 ac, 60.00% Impervious, Inflow Depth > 1.96" for 2-Year event  
 Inflow = 205.00 cfs @ 12.42 hrs, Volume= 22.831 af  
 Outflow = 156.69 cfs @ 12.63 hrs, Volume= 22.508 af, Atten= 24%, Lag= 12.4 min  
 Primary = 156.69 cfs @ 12.63 hrs, Volume= 22.508 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 93.29' @ 12.63 hrs Surf.Area= 65,444 sf Storage= 179,982 cf

Plug-Flow detention time= 24.7 min calculated for 22.433 af (98% of inflow)  
 Center-of-Mass det. time= 19.3 min ( 816.3 - 797.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	600,543 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

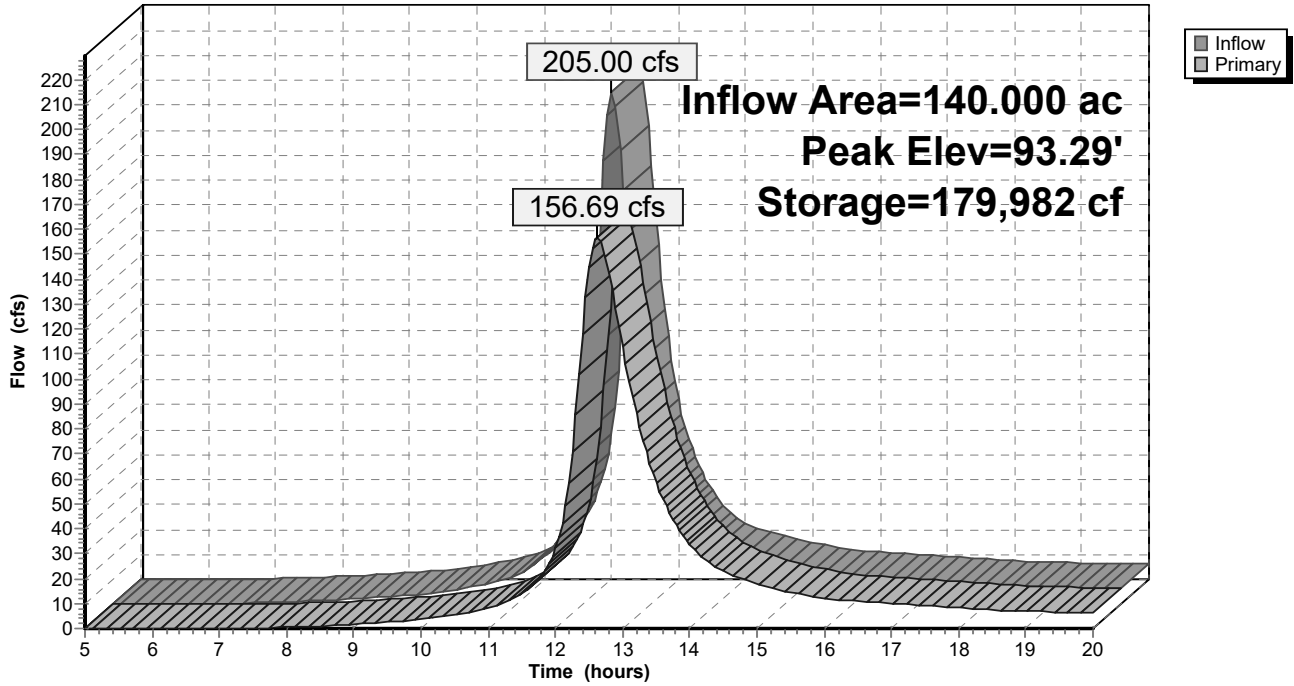
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	33,259	0	0
91.00	52,313	42,786	42,786
92.00	60,192	56,253	99,039
93.00	64,497	62,345	161,383
94.00	67,805	66,151	227,534
95.00	70,324	69,065	296,599
96.00	73,045	71,685	368,283
97.00	75,832	74,439	442,722
98.00	78,823	77,328	520,049
99.00	82,164	80,494	600,543

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	<b>10.0' long x 15.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Primary OutFlow** Max=156.32 cfs @ 12.63 hrs HW=93.28' (Free Discharge)  
 ↑1=Broad-Crested Rectangular Weir (Weir Controls 156.32 cfs @ 4.76 fps)

### Pond 4P: Southern Regional Basin

Hydrograph



**regional basin**

NOAA 24-hr C 2-Year Rainfall=3.34"

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**Stage-Area-Storage for Pond 4P: Southern Regional Basin**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
90.00	33,259	0	95.30	71,140	317,818
90.10	35,164	3,421	95.40	71,412	324,946
90.20	37,070	7,033	95.50	71,685	332,101
90.30	38,975	10,835	95.60	71,957	339,283
90.40	40,881	14,828	95.70	72,229	346,492
90.50	42,786	19,011	95.80	72,501	353,728
90.60	44,691	23,385	95.90	72,773	360,992
90.70	46,597	27,950	96.00	73,045	368,283
90.80	48,502	32,704	96.10	73,324	375,601
90.90	50,408	37,650	96.20	73,602	382,948
91.00	52,313	42,786	96.30	73,881	390,322
91.10	53,101	48,057	96.40	74,160	397,724
91.20	53,889	53,406	96.50	74,439	405,154
91.30	54,677	58,834	96.60	74,717	412,612
91.40	55,465	64,342	96.70	74,996	420,097
91.50	56,253	69,927	96.80	75,275	427,611
91.60	57,040	75,592	96.90	75,553	435,152
91.70	57,828	81,335	97.00	75,832	442,722
91.80	58,616	87,158	97.10	76,131	450,320
91.90	59,404	93,059	97.20	76,430	457,948
92.00	60,192	99,039	97.30	76,729	465,606
92.10	60,622	105,079	97.40	77,028	473,294
92.20	61,053	111,163	97.50	77,328	481,011
92.30	61,483	117,290	97.60	77,627	488,759
92.40	61,914	123,460	97.70	77,926	496,537
92.50	62,345	129,673	97.80	78,225	504,344
92.60	62,775	135,929	97.90	78,524	512,182
92.70	63,206	142,228	98.00	78,823	520,049
92.80	63,636	148,570	98.10	79,157	527,948
92.90	64,067	154,955	98.20	79,491	535,880
93.00	64,497	161,383	98.30	79,825	543,846
93.10	64,828	167,849	98.40	80,159	551,845
93.20	65,159	174,349	98.50	80,494	559,878
93.30	65,489	180,881	98.60	80,828	567,944
93.40	65,820	187,446	98.70	81,162	576,044
93.50	66,151	194,045	98.80	81,496	584,177
93.60	66,482	200,677	98.90	81,830	592,343
93.70	66,813	207,341	99.00	<b>82,164</b>	<b>600,543</b>
93.80	67,143	214,039			
93.90	67,474	220,770			
94.00	67,805	227,534			
94.10	68,057	234,327			
94.20	68,309	241,145			
94.30	68,561	247,989			
94.40	68,813	254,858			
94.50	69,065	261,751			
94.60	69,316	268,670			
94.70	69,568	275,615			
94.80	69,820	282,584			
94.90	70,072	289,579			
95.00	70,324	296,599			
95.10	70,596	303,645			
95.20	70,868	310,718			



**regional basin**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Subcatchment 6S: Regional DA to Wet Pond**

Runoff = 349.38 cfs @ 12.42 hrs, Volume= 39.851 af, Depth> 3.42"

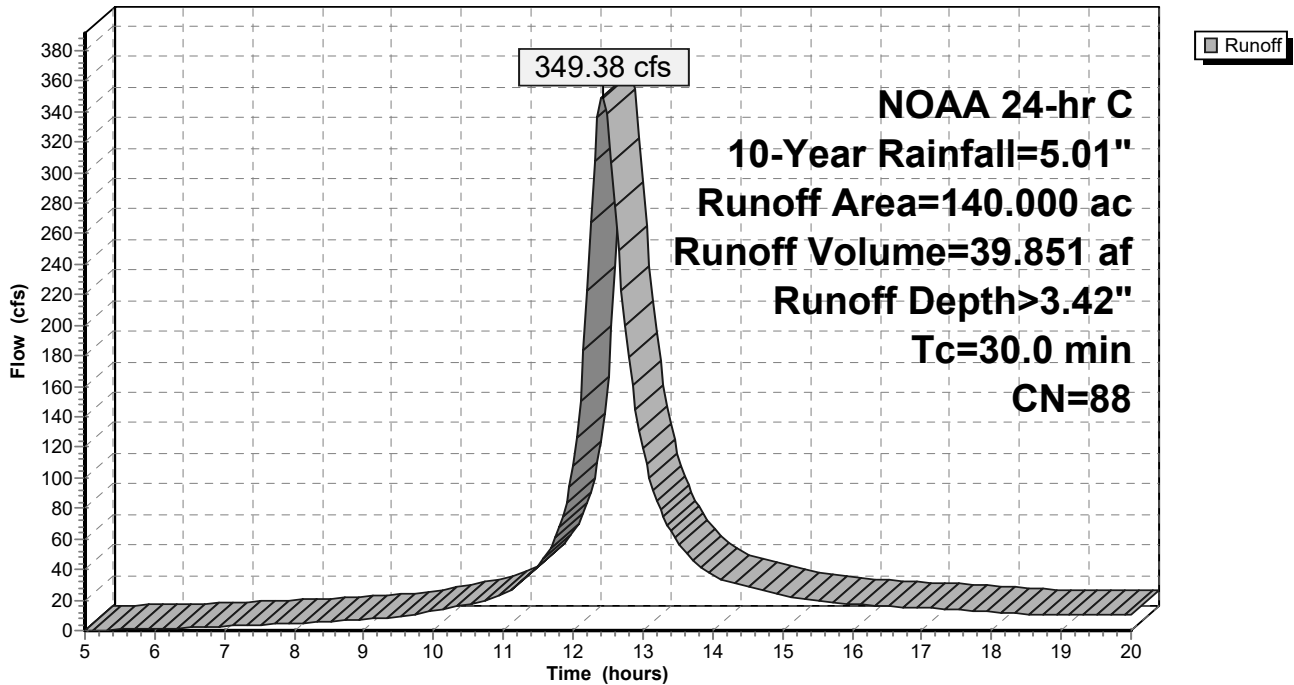
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 10-Year Rainfall=5.01"

Area (ac)	CN	Description
84.000	98	Paved parking, HSG A
56.000	74	>75% Grass cover, Good, HSG C
140.000	88	Weighted Average
56.000		40.00% Pervious Area
84.000		60.00% Impervious Area

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

**Subcatchment 6S: Regional DA to Wet Pond**

Hydrograph



**regional basin**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Summary for Pond 4P: Southern Regional Basin**

Inflow Area = 140.000 ac, 60.00% Impervious, Inflow Depth > 3.42" for 10-Year event  
 Inflow = 349.38 cfs @ 12.42 hrs, Volume= 39.851 af  
 Outflow = 278.11 cfs @ 12.60 hrs, Volume= 39.398 af, Atten= 20%, Lag= 11.2 min  
 Primary = 278.11 cfs @ 12.60 hrs, Volume= 39.398 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 94.82' @ 12.60 hrs Surf.Area= 69,865 sf Storage= 283,812 cf

Plug-Flow detention time= 22.5 min calculated for 39.266 af (99% of inflow)  
 Center-of-Mass det. time= 17.9 min ( 801.9 - 784.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	600,543 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

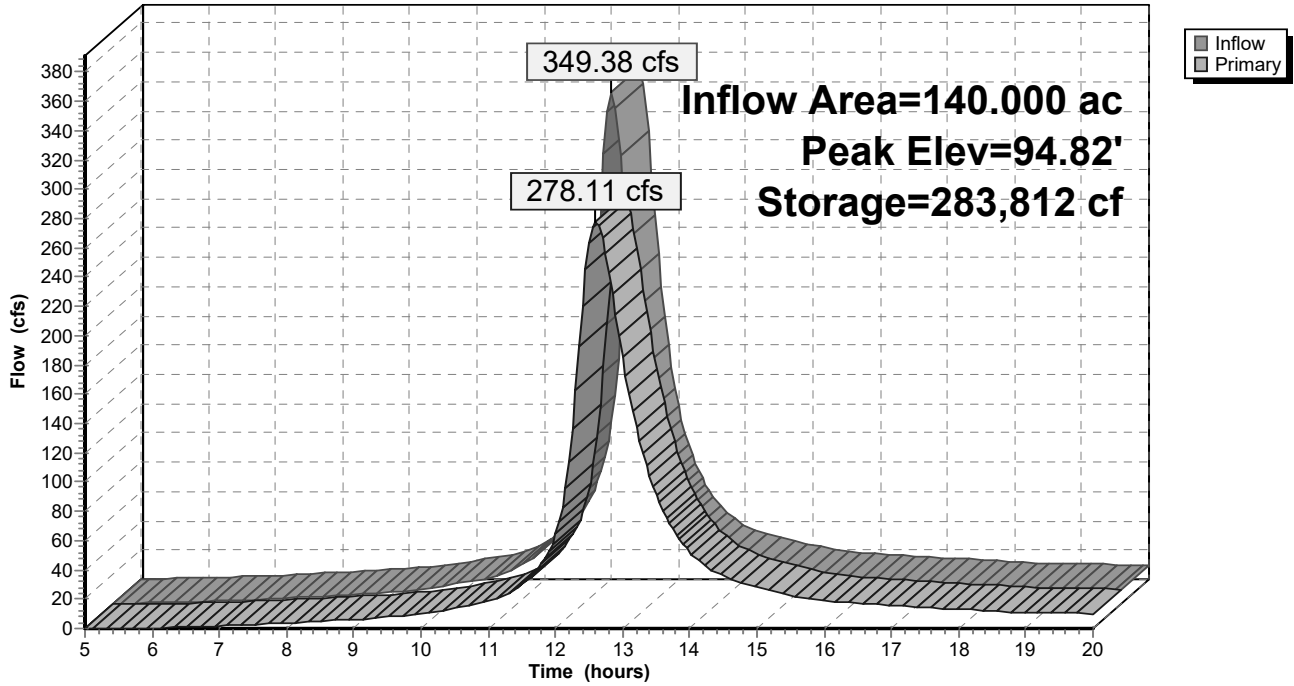
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	33,259	0	0
91.00	52,313	42,786	42,786
92.00	60,192	56,253	99,039
93.00	64,497	62,345	161,383
94.00	67,805	66,151	227,534
95.00	70,324	69,065	296,599
96.00	73,045	71,685	368,283
97.00	75,832	74,439	442,722
98.00	78,823	77,328	520,049
99.00	82,164	80,494	600,543

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	<b>10.0' long x 15.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Primary OutFlow** Max=277.93 cfs @ 12.60 hrs HW=94.82' (Free Discharge)  
 ↑1=Broad-Crested Rectangular Weir (Weir Controls 277.93 cfs @ 5.77 fps)

### Pond 4P: Southern Regional Basin

Hydrograph





**regional basin**

NOAA 24-hr C 10-Year Rainfall=5.01"

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**Stage-Area-Storage for Pond 4P: Southern Regional Basin**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
90.00	33,259	0	95.30	71,140	317,818
90.10	35,164	3,421	95.40	71,412	324,946
90.20	37,070	7,033	95.50	71,685	332,101
90.30	38,975	10,835	95.60	71,957	339,283
90.40	40,881	14,828	95.70	72,229	346,492
90.50	42,786	19,011	95.80	72,501	353,728
90.60	44,691	23,385	95.90	72,773	360,992
90.70	46,597	27,950	96.00	73,045	368,283
90.80	48,502	32,704	96.10	73,324	375,601
90.90	50,408	37,650	96.20	73,602	382,948
91.00	52,313	42,786	96.30	73,881	390,322
91.10	53,101	48,057	96.40	74,160	397,724
91.20	53,889	53,406	96.50	74,439	405,154
91.30	54,677	58,834	96.60	74,717	412,612
91.40	55,465	64,342	96.70	74,996	420,097
91.50	56,253	69,927	96.80	75,275	427,611
91.60	57,040	75,592	96.90	75,553	435,152
91.70	57,828	81,335	97.00	75,832	442,722
91.80	58,616	87,158	97.10	76,131	450,320
91.90	59,404	93,059	97.20	76,430	457,948
92.00	60,192	99,039	97.30	76,729	465,606
92.10	60,622	105,079	97.40	77,028	473,294
92.20	61,053	111,163	97.50	77,328	481,011
92.30	61,483	117,290	97.60	77,627	488,759
92.40	61,914	123,460	97.70	77,926	496,537
92.50	62,345	129,673	97.80	78,225	504,344
92.60	62,775	135,929	97.90	78,524	512,182
92.70	63,206	142,228	98.00	78,823	520,049
92.80	63,636	148,570	98.10	79,157	527,948
92.90	64,067	154,955	98.20	79,491	535,880
93.00	64,497	161,383	98.30	79,825	543,846
93.10	64,828	167,849	98.40	80,159	551,845
93.20	65,159	174,349	98.50	80,494	559,878
93.30	65,489	180,881	98.60	80,828	567,944
93.40	65,820	187,446	98.70	81,162	576,044
93.50	66,151	194,045	98.80	81,496	584,177
93.60	66,482	200,677	98.90	81,830	592,343
93.70	66,813	207,341	99.00	<b>82,164</b>	<b>600,543</b>
93.80	67,143	214,039			
93.90	67,474	220,770			
94.00	67,805	227,534			
94.10	68,057	234,327			
94.20	68,309	241,145			
94.30	68,561	247,989			
94.40	68,813	254,858			
94.50	69,065	261,751			
94.60	69,316	268,670			
94.70	69,568	275,615			
94.80	69,820	282,584			
94.90	70,072	289,579			
95.00	70,324	296,599			
95.10	70,596	303,645			
95.20	70,868	310,718			

**regional basin**

NOAA 24-hr C 25-Year Rainfall=6.15"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 6S: Regional DA to Wet**    Runoff Area=140.000 ac    60.00% Impervious    Runoff Depth>4.44"  
Tc=30.0 min    CN=88    Runoff=447.99 cfs    51.790 af

**Pond 4P: Southern Regional Basin**    Peak Elev=95.75'    Storage=350,065 cf    Inflow=447.99 cfs    51.790 af  
Outflow=362.57 cfs    51.253 af

**Total Runoff Area = 140.000 ac    Runoff Volume = 51.790 af    Average Runoff Depth = 4.44"**  
**40.00% Pervious = 56.000 ac    60.00% Impervious = 84.000 ac**

**regional basin**

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NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Subcatchment 6S: Regional DA to Wet Pond**

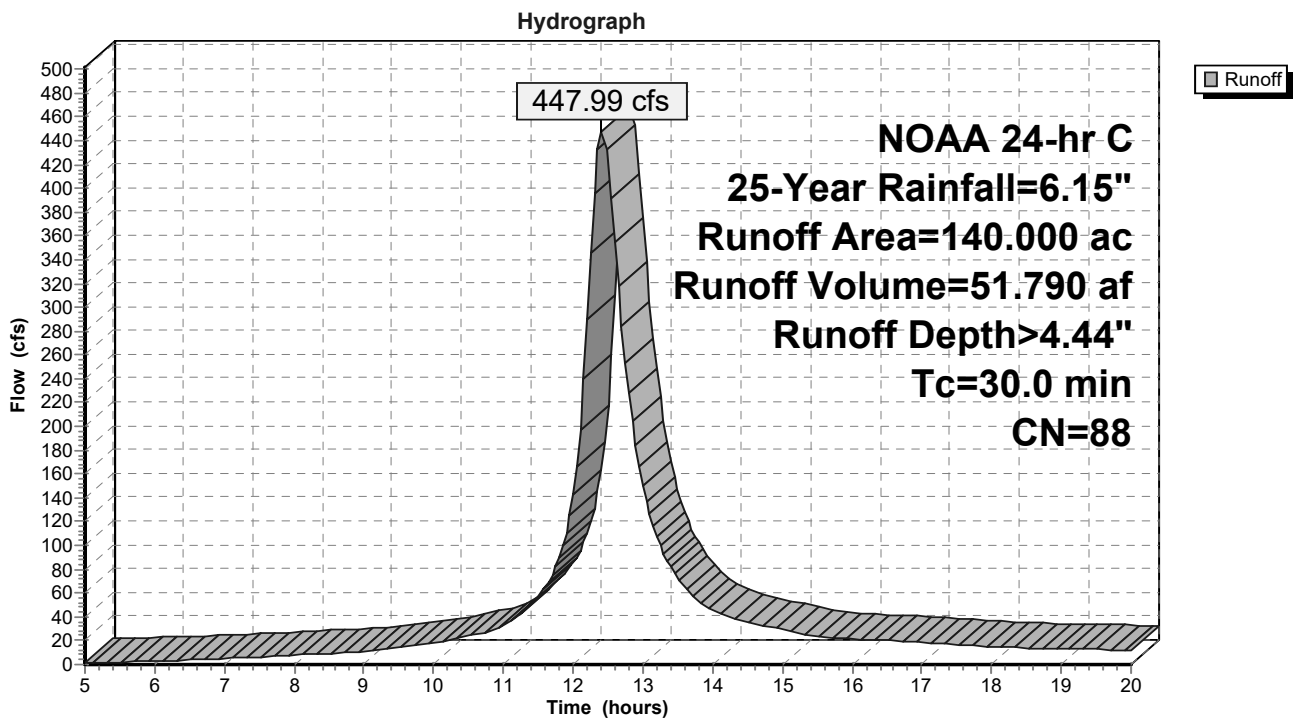
Runoff = 447.99 cfs @ 12.41 hrs, Volume= 51.790 af, Depth> 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 25-Year Rainfall=6.15"

Area (ac)	CN	Description
84.000	98	Paved parking, HSG A
56.000	74	>75% Grass cover, Good, HSG C
140.000	88	Weighted Average
56.000		40.00% Pervious Area
84.000		60.00% Impervious Area

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

**Subcatchment 6S: Regional DA to Wet Pond**



**regional basin**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Summary for Pond 4P: Southern Regional Basin**

Inflow Area = 140.000 ac, 60.00% Impervious, Inflow Depth > 4.44" for 25-Year event  
 Inflow = 447.99 cfs @ 12.41 hrs, Volume= 51.790 af  
 Outflow = 362.57 cfs @ 12.59 hrs, Volume= 51.253 af, Atten= 19%, Lag= 10.7 min  
 Primary = 362.57 cfs @ 12.59 hrs, Volume= 51.253 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 95.75' @ 12.59 hrs Surf.Area= 72,363 sf Storage= 350,065 cf

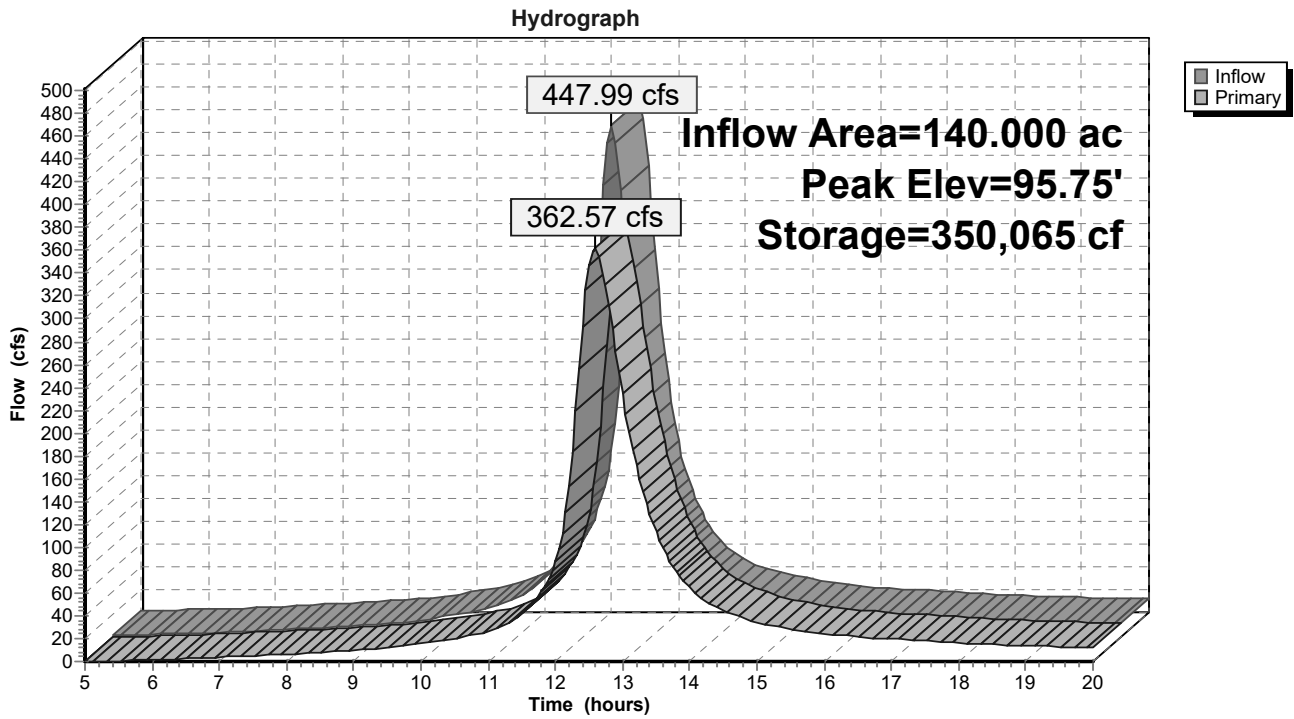
Plug-Flow detention time= 21.5 min calculated for 51.250 af (99% of inflow)  
 Center-of-Mass det. time= 17.3 min ( 795.3 - 778.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	600,543 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	33,259	0	0
91.00	52,313	42,786	42,786
92.00	60,192	56,253	99,039
93.00	64,497	62,345	161,383
94.00	67,805	66,151	227,534
95.00	70,324	69,065	296,599
96.00	73,045	71,685	368,283
97.00	75,832	74,439	442,722
98.00	78,823	77,328	520,049
99.00	82,164	80,494	600,543

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	<b>10.0' long x 15.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Primary OutFlow** Max=361.99 cfs @ 12.59 hrs HW=95.74' (Free Discharge)  
 ↑**1=Broad-Crested Rectangular Weir** (Weir Controls 361.99 cfs @ 6.30 fps)

### Pond 4P: Southern Regional Basin



**regional basin**

NOAA 24-hr C 25-Year Rainfall=6.15"

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**Stage-Area-Storage for Pond 4P: Southern Regional Basin**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
90.00	33,259	0	95.30	71,140	317,818
90.10	35,164	3,421	95.40	71,412	324,946
90.20	37,070	7,033	95.50	71,685	332,101
90.30	38,975	10,835	95.60	71,957	339,283
90.40	40,881	14,828	95.70	72,229	346,492
90.50	42,786	19,011	95.80	72,501	353,728
90.60	44,691	23,385	95.90	72,773	360,992
90.70	46,597	27,950	96.00	73,045	368,283
90.80	48,502	32,704	96.10	73,324	375,601
90.90	50,408	37,650	96.20	73,602	382,948
91.00	52,313	42,786	96.30	73,881	390,322
91.10	53,101	48,057	96.40	74,160	397,724
91.20	53,889	53,406	96.50	74,439	405,154
91.30	54,677	58,834	96.60	74,717	412,612
91.40	55,465	64,342	96.70	74,996	420,097
91.50	56,253	69,927	96.80	75,275	427,611
91.60	57,040	75,592	96.90	75,553	435,152
91.70	57,828	81,335	97.00	75,832	442,722
91.80	58,616	87,158	97.10	76,131	450,320
91.90	59,404	93,059	97.20	76,430	457,948
92.00	60,192	99,039	97.30	76,729	465,606
92.10	60,622	105,079	97.40	77,028	473,294
92.20	61,053	111,163	97.50	77,328	481,011
92.30	61,483	117,290	97.60	77,627	488,759
92.40	61,914	123,460	97.70	77,926	496,537
92.50	62,345	129,673	97.80	78,225	504,344
92.60	62,775	135,929	97.90	78,524	512,182
92.70	63,206	142,228	98.00	78,823	520,049
92.80	63,636	148,570	98.10	79,157	527,948
92.90	64,067	154,955	98.20	79,491	535,880
93.00	64,497	161,383	98.30	79,825	543,846
93.10	64,828	167,849	98.40	80,159	551,845
93.20	65,159	174,349	98.50	80,494	559,878
93.30	65,489	180,881	98.60	80,828	567,944
93.40	65,820	187,446	98.70	81,162	576,044
93.50	66,151	194,045	98.80	81,496	584,177
93.60	66,482	200,677	98.90	81,830	592,343
93.70	66,813	207,341	99.00	<b>82,164</b>	<b>600,543</b>
93.80	67,143	214,039			
93.90	67,474	220,770			
94.00	67,805	227,534			
94.10	68,057	234,327			
94.20	68,309	241,145			
94.30	68,561	247,989			
94.40	68,813	254,858			
94.50	69,065	261,751			
94.60	69,316	268,670			
94.70	69,568	275,615			
94.80	69,820	282,584			
94.90	70,072	289,579			
95.00	70,324	296,599			
95.10	70,596	303,645			
95.20	70,868	310,718			



**regional basin**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 6S: Regional DA to Wet Pond**

Runoff = 625.00 cfs @ 12.41 hrs, Volume= 73.575 af, Depth> 6.31"

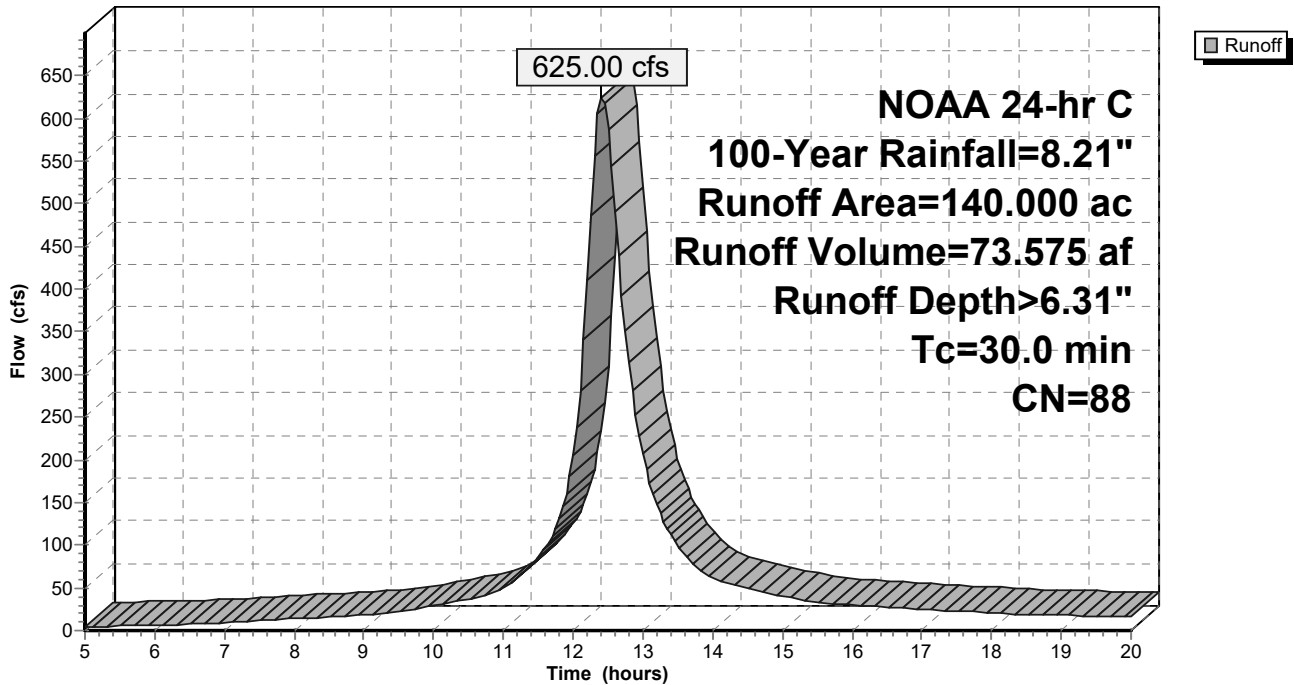
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
84.000	98	Paved parking, HSG A
56.000	74	>75% Grass cover, Good, HSG C
140.000	88	Weighted Average
56.000		40.00% Pervious Area
84.000		60.00% Impervious Area

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

**Subcatchment 6S: Regional DA to Wet Pond**

Hydrograph





**regional basin**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Pond 4P: Southern Regional Basin**

Inflow Area = 140.000 ac, 60.00% Impervious, Inflow Depth > 6.31" for 100-Year event  
 Inflow = 625.00 cfs @ 12.41 hrs, Volume= 73.575 af  
 Outflow = 515.51 cfs @ 12.58 hrs, Volume= 72.888 af, Atten= 18%, Lag= 10.1 min  
 Primary = 515.51 cfs @ 12.58 hrs, Volume= 72.888 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 97.27' @ 12.58 hrs Surf.Area= 76,639 sf Storage= 463,286 cf

Plug-Flow detention time= 20.3 min calculated for 72.880 af (99% of inflow)  
 Center-of-Mass det. time= 16.3 min ( 787.3 - 771.0 )

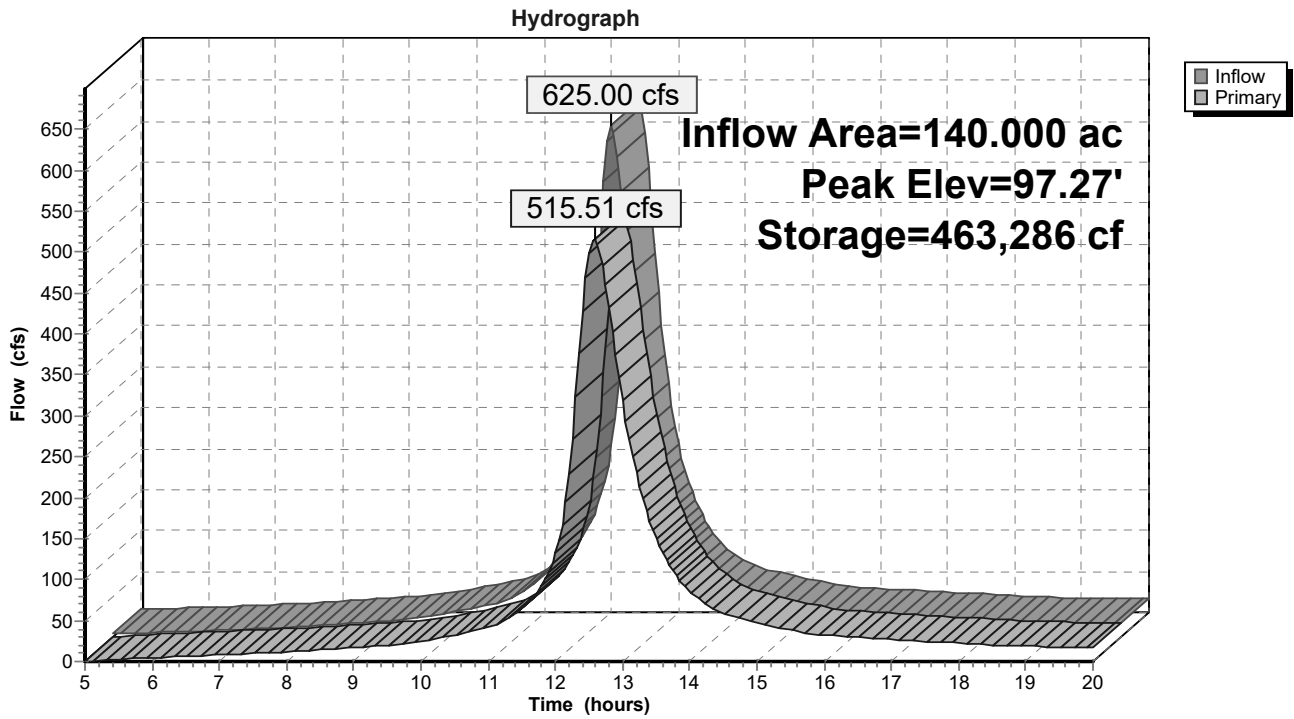
Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	600,543 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	33,259	0	0
91.00	52,313	42,786	42,786
92.00	60,192	56,253	99,039
93.00	64,497	62,345	161,383
94.00	67,805	66,151	227,534
95.00	70,324	69,065	296,599
96.00	73,045	71,685	368,283
97.00	75,832	74,439	442,722
98.00	78,823	77,328	520,049
99.00	82,164	80,494	600,543

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	<b>10.0' long x 15.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Primary OutFlow** Max=514.06 cfs @ 12.58 hrs HW=97.26' (Free Discharge)  
 ↑**1=Broad-Crested Rectangular Weir** (Weir Controls 514.06 cfs @ 7.08 fps)

### Pond 4P: Southern Regional Basin



**regional basin**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Stage-Area-Storage for Pond 4P: Southern Regional Basin**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
90.00	33,259	0	95.30	71,140	317,818
90.10	35,164	3,421	95.40	71,412	324,946
90.20	37,070	7,033	95.50	71,685	332,101
90.30	38,975	10,835	95.60	71,957	339,283
90.40	40,881	14,828	95.70	72,229	346,492
90.50	42,786	19,011	95.80	72,501	353,728
90.60	44,691	23,385	95.90	72,773	360,992
90.70	46,597	27,950	96.00	73,045	368,283
90.80	48,502	32,704	96.10	73,324	375,601
90.90	50,408	37,650	96.20	73,602	382,948
91.00	52,313	42,786	96.30	73,881	390,322
91.10	53,101	48,057	96.40	74,160	397,724
91.20	53,889	53,406	96.50	74,439	405,154
91.30	54,677	58,834	96.60	74,717	412,612
91.40	55,465	64,342	96.70	74,996	420,097
91.50	56,253	69,927	96.80	75,275	427,611
91.60	57,040	75,592	96.90	75,553	435,152
91.70	57,828	81,335	97.00	75,832	442,722
91.80	58,616	87,158	97.10	76,131	450,320
91.90	59,404	93,059	97.20	76,430	457,948
92.00	60,192	99,039	97.30	76,729	465,606
92.10	60,622	105,079	97.40	77,028	473,294
92.20	61,053	111,163	97.50	77,328	481,011
92.30	61,483	117,290	97.60	77,627	488,759
92.40	61,914	123,460	97.70	77,926	496,537
92.50	62,345	129,673	97.80	78,225	504,344
92.60	62,775	135,929	97.90	78,524	512,182
92.70	63,206	142,228	98.00	78,823	520,049
92.80	63,636	148,570	98.10	79,157	527,948
92.90	64,067	154,955	98.20	79,491	535,880
93.00	64,497	161,383	98.30	79,825	543,846
93.10	64,828	167,849	98.40	80,159	551,845
93.20	65,159	174,349	98.50	80,494	559,878
93.30	65,489	180,881	98.60	80,828	567,944
93.40	65,820	187,446	98.70	81,162	576,044
93.50	66,151	194,045	98.80	81,496	584,177
93.60	66,482	200,677	98.90	81,830	592,343
93.70	66,813	207,341	99.00	<b>82,164</b>	<b>600,543</b>
93.80	67,143	214,039			
93.90	67,474	220,770			
94.00	67,805	227,534			
94.10	68,057	234,327			
94.20	68,309	241,145			
94.30	68,561	247,989			
94.40	68,813	254,858			
94.50	69,065	261,751			
94.60	69,316	268,670			
94.70	69,568	275,615			
94.80	69,820	282,584			
94.90	70,072	289,579			
95.00	70,324	296,599			
95.10	70,596	303,645			
95.20	70,868	310,718			

**regional basin**

*NJ DEP 2-hr WQ Rainfall=1.25"*

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 6S: Regional DA to Wet**    Runoff Area=140.000 ac    60.00% Impervious    Runoff Depth=0.00"  
Tc=30.0 min    CN=88    Runoff=0.00 cfs    0.000 af

**Pond 4P: Southern Regional Basin**    Peak Elev=90.00'    Storage=0 cf    Inflow=0.00 cfs    0.000 af  
Outflow=0.00 cfs    0.000 af

**Total Runoff Area = 140.000 ac    Runoff Volume = 0.000 af    Average Runoff Depth = 0.00"**  
**40.00% Pervious = 56.000 ac    60.00% Impervious = 84.000 ac**

**regional basin**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 6S: Regional DA to Wet Pond**

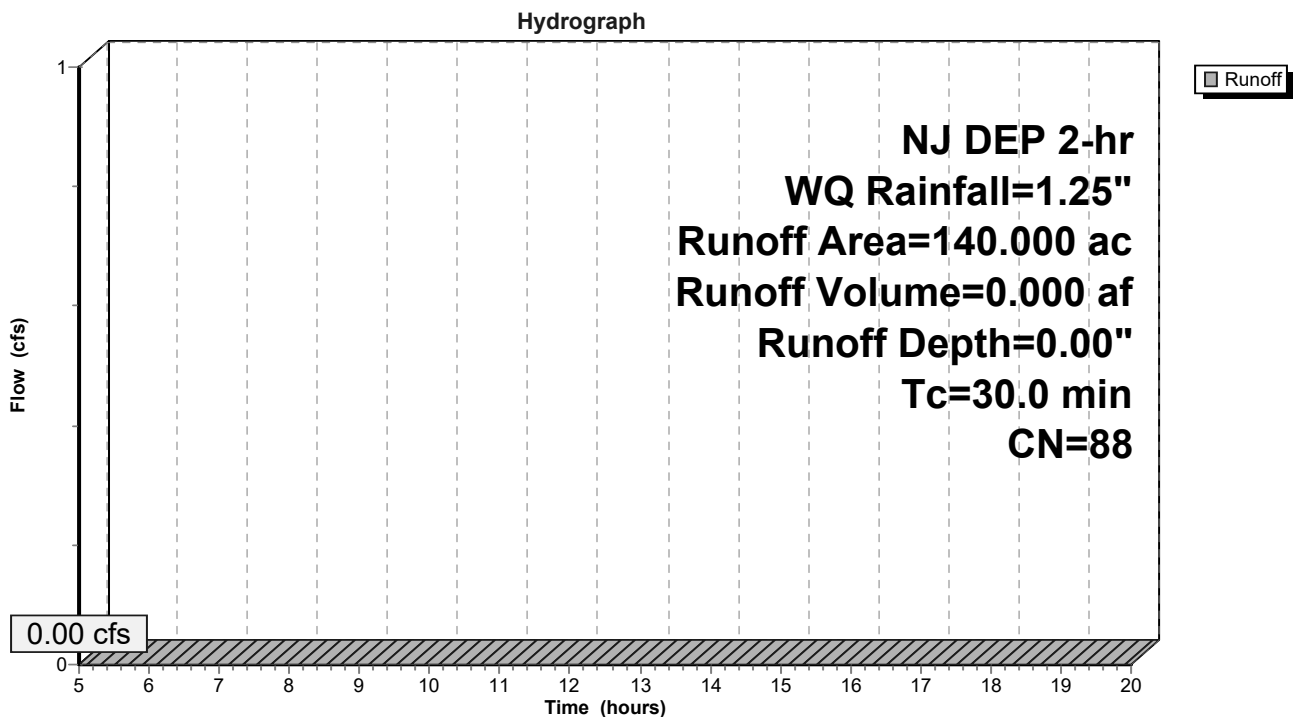
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
84.000	98	Paved parking, HSG A
56.000	74	>75% Grass cover, Good, HSG C
140.000	88	Weighted Average
56.000		40.00% Pervious Area
84.000		60.00% Impervious Area

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

**Subcatchment 6S: Regional DA to Wet Pond**



**regional basin**

NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Pond 4P: Southern Regional Basin**

Inflow Area = 140.000 ac, 60.00% Impervious, Inflow Depth = 0.00" for WQ event  
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af  
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min  
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 90.00' @ 5.00 hrs Surf.Area= 33,259 sf Storage= 0 cf

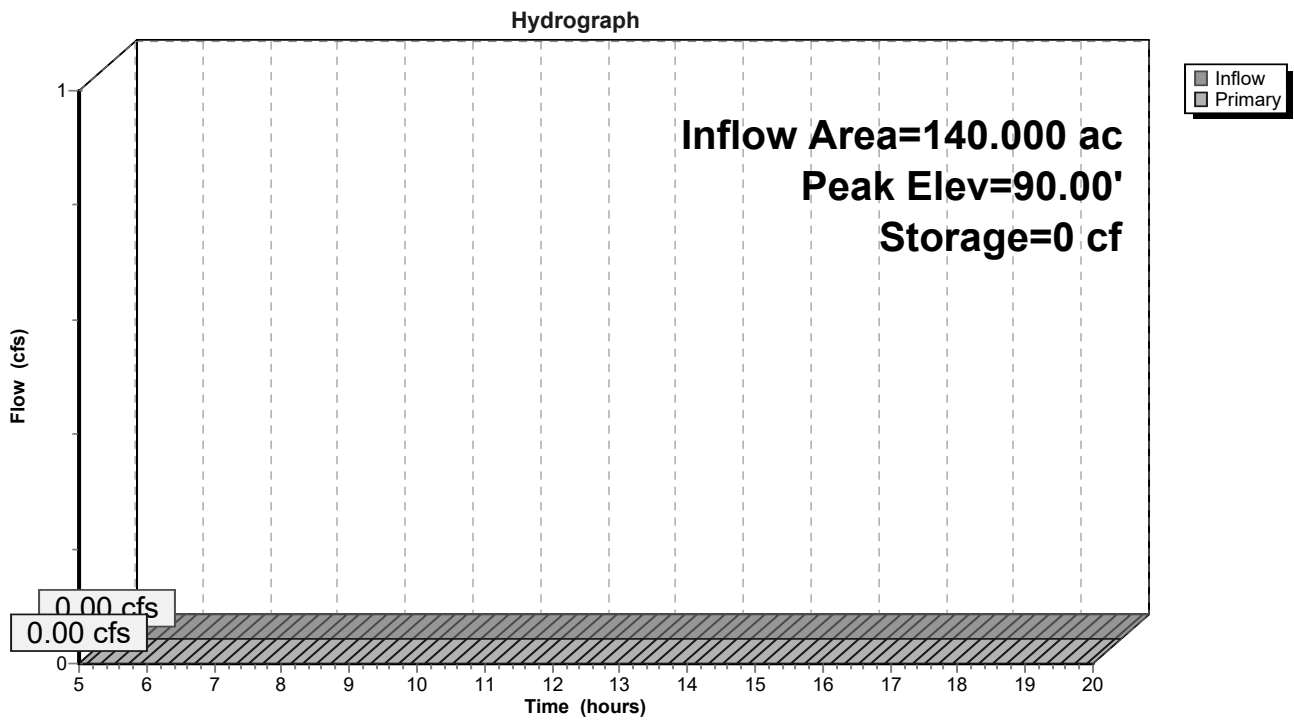
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)  
 Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	600,543 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	33,259	0	0
91.00	52,313	42,786	42,786
92.00	60,192	56,253	99,039
93.00	64,497	62,345	161,383
94.00	67,805	66,151	227,534
95.00	70,324	69,065	296,599
96.00	73,045	71,685	368,283
97.00	75,832	74,439	442,722
98.00	78,823	77,328	520,049
99.00	82,164	80,494	600,543

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	<b>10.0' long x 15.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Primary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=90.00' (Free Discharge)  
 ↑1=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

### Pond 4P: Southern Regional Basin



**regional basin**

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NJ DEP 2-hr WQ Rainfall=1.25"

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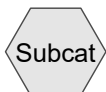
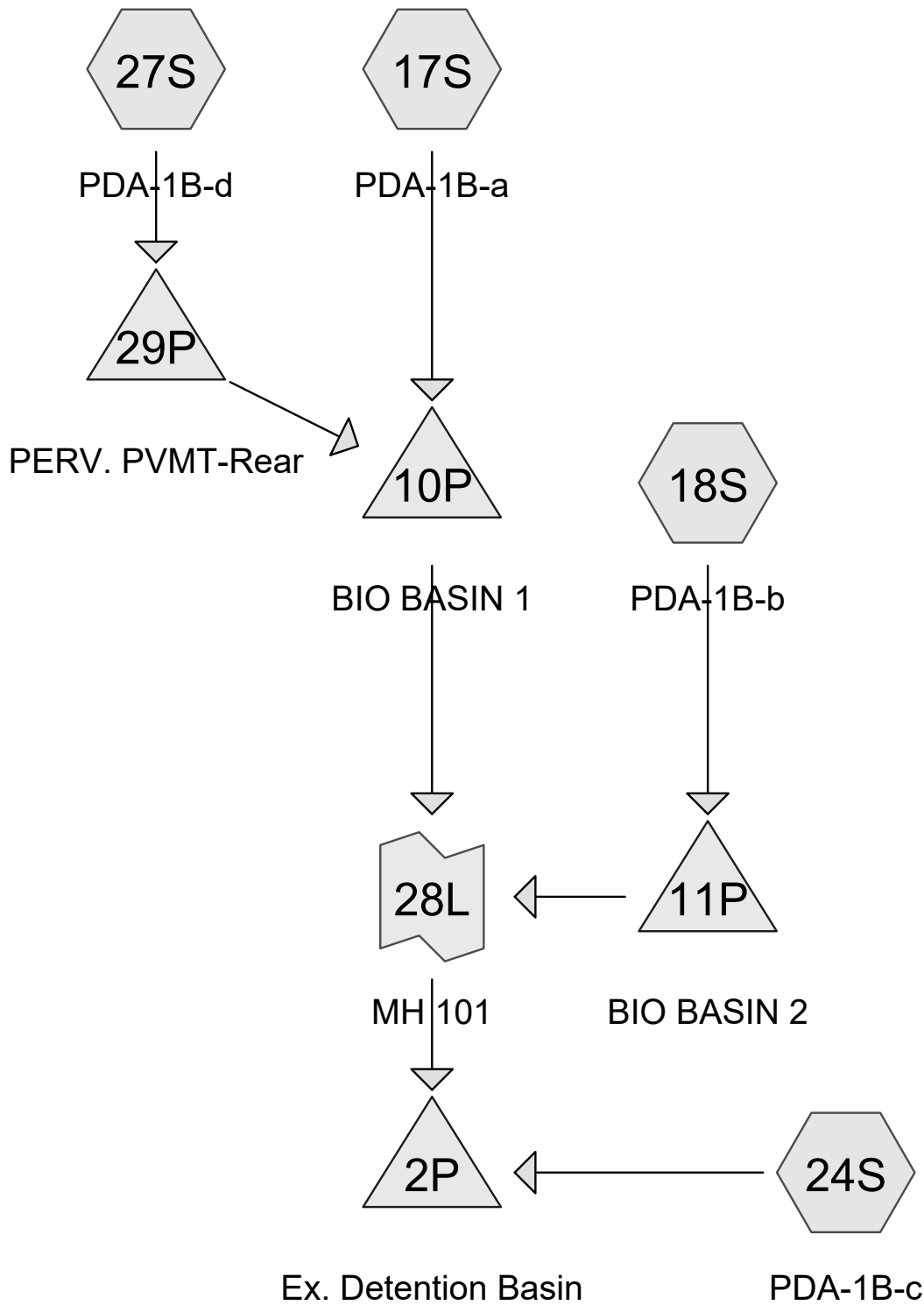
**Stage-Area-Storage for Pond 4P: Southern Regional Basin**

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
90.00	33,259	0	95.30	71,140	317,818
90.10	35,164	3,421	95.40	71,412	324,946
90.20	37,070	7,033	95.50	71,685	332,101
90.30	38,975	10,835	95.60	71,957	339,283
90.40	40,881	14,828	95.70	72,229	346,492
90.50	42,786	19,011	95.80	72,501	353,728
90.60	44,691	23,385	95.90	72,773	360,992
90.70	46,597	27,950	96.00	73,045	368,283
90.80	48,502	32,704	96.10	73,324	375,601
90.90	50,408	37,650	96.20	73,602	382,948
91.00	52,313	42,786	96.30	73,881	390,322
91.10	53,101	48,057	96.40	74,160	397,724
91.20	53,889	53,406	96.50	74,439	405,154
91.30	54,677	58,834	96.60	74,717	412,612
91.40	55,465	64,342	96.70	74,996	420,097
91.50	56,253	69,927	96.80	75,275	427,611
91.60	57,040	75,592	96.90	75,553	435,152
91.70	57,828	81,335	97.00	75,832	442,722
91.80	58,616	87,158	97.10	76,131	450,320
91.90	59,404	93,059	97.20	76,430	457,948
92.00	60,192	99,039	97.30	76,729	465,606
92.10	60,622	105,079	97.40	77,028	473,294
92.20	61,053	111,163	97.50	77,328	481,011
92.30	61,483	117,290	97.60	77,627	488,759
92.40	61,914	123,460	97.70	77,926	496,537
92.50	62,345	129,673	97.80	78,225	504,344
92.60	62,775	135,929	97.90	78,524	512,182
92.70	63,206	142,228	98.00	78,823	520,049
92.80	63,636	148,570	98.10	79,157	527,948
92.90	64,067	154,955	98.20	79,491	535,880
93.00	64,497	161,383	98.30	79,825	543,846
93.10	64,828	167,849	98.40	80,159	551,845
93.20	65,159	174,349	98.50	80,494	559,878
93.30	65,489	180,881	98.60	80,828	567,944
93.40	65,820	187,446	98.70	81,162	576,044
93.50	66,151	194,045	98.80	81,496	584,177
93.60	66,482	200,677	98.90	81,830	592,343
93.70	66,813	207,341	99.00	<b>82,164</b>	<b>600,543</b>
93.80	67,143	214,039			
93.90	67,474	220,770			
94.00	67,805	227,534			
94.10	68,057	234,327			
94.20	68,309	241,145			
94.30	68,561	247,989			
94.40	68,813	254,858			
94.50	69,065	261,751			
94.60	69,316	268,670			
94.70	69,568	275,615			
94.80	69,820	282,584			
94.90	70,072	289,579			
95.00	70,324	296,599			
95.10	70,596	303,645			
95.20	70,868	310,718			



## **B. DESIGN CALCULATIONS**

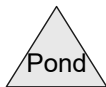
- ◆ **Emergency Overflow Design**
- ◆ **Rip Rap Calculations**
- ◆ **Basin Drain Time**
- ◆ **Pipe Sizing Calculations**
- ◆ **Groundwater Recharge Worksheet**
- ◆ **DRCC NSPS Worksheet**



Subcat



Reach



Pond



Link

**Routing Diagram for Emergency Spillway**

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# Emergency Spillway

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## Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.570	74	>75% Grass cover, Good, HSG C (17S, 18S, 24S, 27S)
1.320	98	Impervious (24S)
0.140	98	Paved parking, HSG A (27S)
1.420	98	Paved parking, HSG C (17S, 18S)
0.270	70	Woods, Good, HSG C (17S)
<b>6.720</b>	<b>84</b>	<b>TOTAL AREA</b>

## Emergency Spillway

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### Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.140	HSG A	27S
0.000	HSG B	
5.260	HSG C	17S, 18S, 24S, 27S
0.000	HSG D	
1.320	Other	24S
<b>6.720</b>		<b>TOTAL AREA</b>

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## 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	0.000	3.570	0.000	0.000	3.570	>75% Grass cover, Good	17S, 18S, 24S, 27S
0.000	0.000	0.000	0.000	1.320	1.320	Impervious	24S
0.140	0.000	1.420	0.000	0.000	1.560	Paved parking	17S, 18S, 27S
0.000	0.000	0.270	0.000	0.000	0.270	Woods, Good	17S
<b>0.140</b>	<b>0.000</b>	<b>5.260</b>	<b>0.000</b>	<b>1.320</b>	<b>6.720</b>	<b>TOTAL AREA</b>	

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## Pipe Listing (all 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	10P	106.16	104.50	636.0	0.0026	0.012	18.0	0.0	0.0
2	11P	105.50	105.26	80.0	0.0030	0.011	18.0	0.0	0.0
3	29P	110.85	110.00	52.0	0.0163	0.010	6.0	0.0	0.0

# Emergency Spillway

NOAA 24-hr C 150% of 100 yr Rainfall=12.30"

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Time span=0.00-72.00 hrs, dt=0.50 hrs, 145 points  
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 17S: PDA-1B-a</b>	Runoff Area=1.490 ac 46.31% Impervious Runoff Depth=10.29" Tc=10.0 min CN=73/98 Runoff=8.57 cfs 1.277 af
<b>Subcatchment 18S: PDA-1B-b</b>	Runoff Area=0.880 ac 82.95% Impervious Runoff Depth=11.52" Tc=10.0 min CN=74/98 Runoff=5.47 cfs 0.845 af
<b>Subcatchment 24S: PDA-1B-c</b>	Runoff Area=4.130 ac 31.96% Impervious Runoff Depth=9.91" Tc=10.0 min CN=74/98 Runoff=23.26 cfs 3.411 af
<b>Subcatchment 27S: PDA-1B-d</b>	Runoff Area=0.220 ac 63.64% Impervious Runoff Depth=10.91" Tc=10.0 min CN=74/98 Runoff=1.32 cfs 0.200 af
<b>Pond 2P: Ex. Detention Basin</b>	Peak Elev=107.26' Storage=135,190 cf Inflow=36.53 cfs 5.321 af Outflow=16.28 cfs 2.616 af
<b>Pond 10P: BIO BASIN 1</b>	Peak Elev=111.30' Storage=8,941 cf Inflow=9.14 cfs 1.477 af Outflow=8.60 cfs 1.306 af
<b>Pond 11P: BIO BASIN 2</b>	Peak Elev=111.75' Storage=11,663 cf Inflow=5.47 cfs 0.845 af Outflow=4.86 cfs 0.604 af
<b>Pond 29P: PERV. PVMT-Rear</b>	Peak Elev=112.01' Storage=0.050 af Inflow=1.32 cfs 0.200 af 6.0" Round Culvert n=0.010 L=52.0' S=0.0163 '/' Outflow=0.71 cfs 0.200 af
<b>Link 28L: MH 101</b>	Inflow=13.43 cfs 1.910 af Primary=13.43 cfs 1.910 af

**Total Runoff Area = 6.720 ac Runoff Volume = 5.733 af Average Runoff Depth = 10.24"**  
**57.14% Pervious = 3.840 ac 42.86% Impervious = 2.880 ac**

# Emergency Spillway

NOAA 24-hr C 150% of 100 yr Rainfall=12.30"

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## Summary for Subcatchment 17S: PDA-1B-a

Runoff = 8.57 cfs @ 12.07 hrs, Volume= 1.277 af, Depth=10.29"

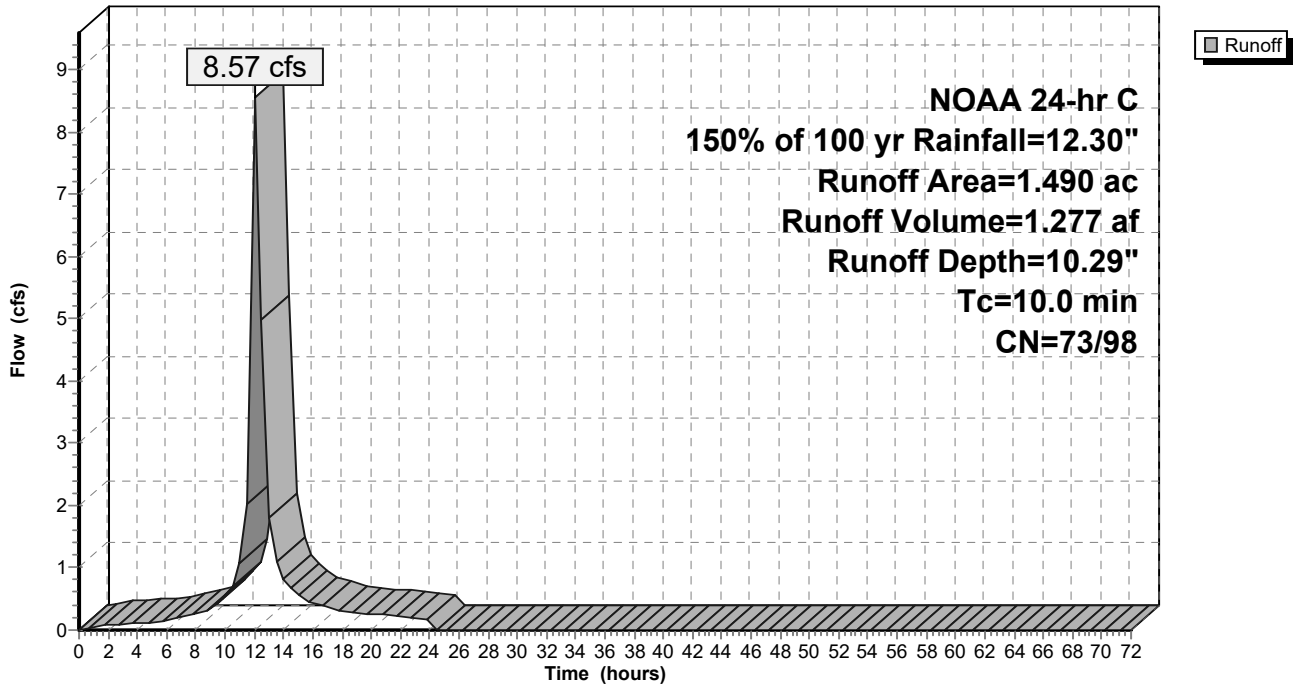
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 150% of 100 yr Rainfall=12.30"

Area (ac)	CN	Description
0.270	70	Woods, Good, HSG C
0.690	98	Paved parking, HSG C
0.530	74	>75% Grass cover, Good, HSG C
1.490	84	Weighted Average
0.800	73	53.69% Pervious Area
0.690	98	46.31% Impervious Area

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

## Subcatchment 17S: PDA-1B-a

Hydrograph





# Emergency Spillway

NOAA 24-hr C 150% of 100 yr Rainfall=12.30"

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## Summary for Subcatchment 18S: PDA-1B-b

Runoff = 5.47 cfs @ 12.07 hrs, Volume= 0.845 af, Depth=11.52"

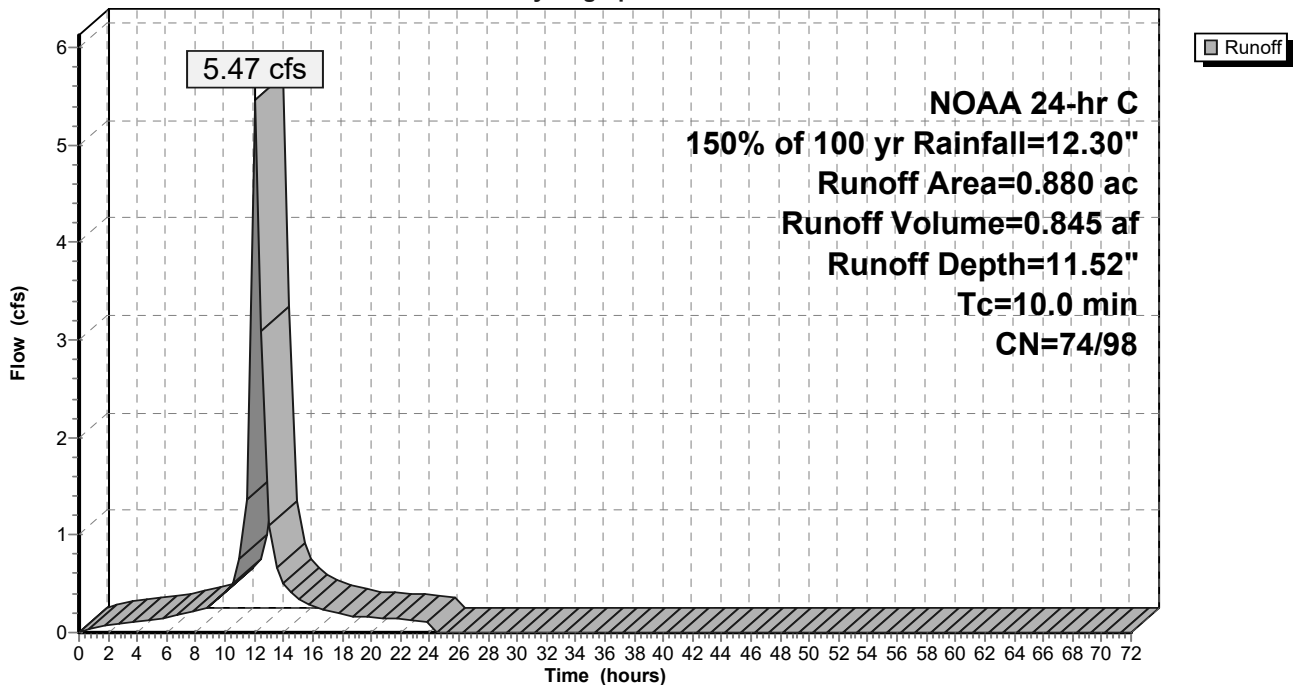
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
NOAA 24-hr C 150% of 100 yr Rainfall=12.30"

Area (ac)	CN	Description
0.730	98	Paved parking, HSG C
0.150	74	>75% Grass cover, Good, HSG C
0.880	94	Weighted Average
0.150	74	17.05% Pervious Area
0.730	98	82.95% Impervious Area

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

## Subcatchment 18S: PDA-1B-b

Hydrograph



# Emergency Spillway

NOAA 24-hr C 150% of 100 yr Rainfall=12.30"

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## Summary for Subcatchment 24S: PDA-1B-c

Runoff = 23.26 cfs @ 12.08 hrs, Volume= 3.411 af, Depth= 9.91"

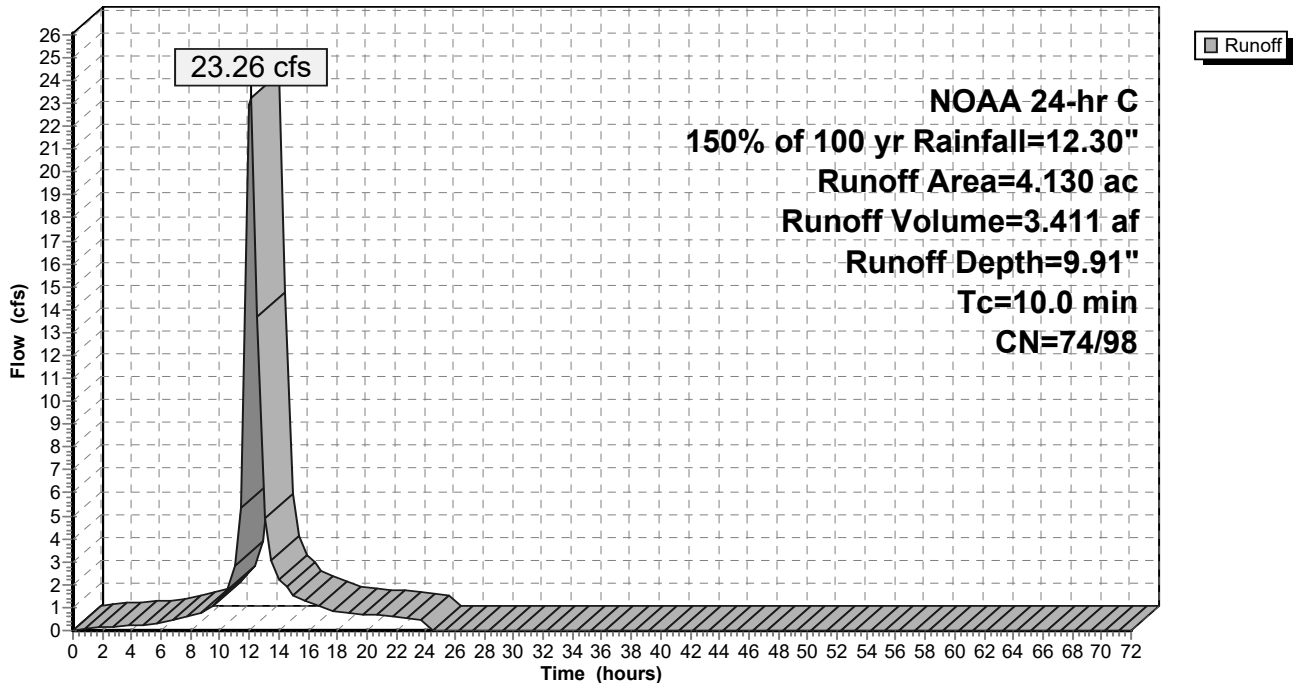
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 150% of 100 yr Rainfall=12.30"

Area (ac)	CN	Description
2.810	74	>75% Grass cover, Good, HSG C
* 1.320	98	Impervious
4.130	82	Weighted Average
2.810	74	68.04% Pervious Area
1.320	98	31.96% Impervious Area

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

## Subcatchment 24S: PDA-1B-c

Hydrograph



# Emergency Spillway

NOAA 24-hr C 150% of 100 yr Rainfall=12.30"

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## Summary for Subcatchment 27S: PDA-1B-d

Runoff = 1.32 cfs @ 12.07 hrs, Volume= 0.200 af, Depth=10.91"

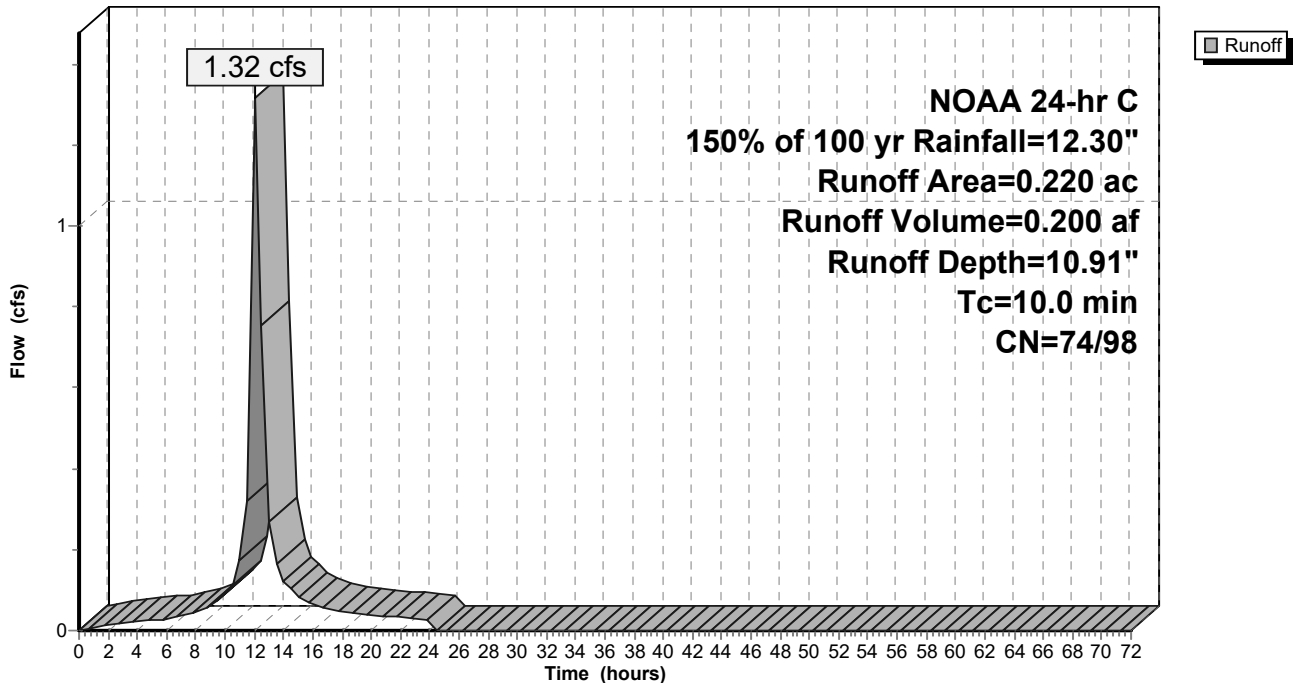
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 150% of 100 yr Rainfall=12.30"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG A
0.080	74	>75% Grass cover, Good, HSG C
0.220	89	Weighted Average
0.080	74	36.36% Pervious Area
0.140	98	63.64% Impervious Area

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

## Subcatchment 27S: PDA-1B-d

Hydrograph



# Emergency Spillway

NOAA 24-hr C 150% of 100 yr Rainfall=12.30"

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## Summary for Pond 2P: Ex. Detention Basin

Inflow Area = 6.720 ac, 42.86% Impervious, Inflow Depth = 9.50" for 150% of 100 yr event  
 Inflow = 36.53 cfs @ 12.11 hrs, Volume= 5.321 af  
 Outflow = 16.28 cfs @ 13.04 hrs, Volume= 2.616 af, Atten= 55%, Lag= 55.8 min  
 Primary = 16.28 cfs @ 13.04 hrs, Volume= 2.616 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 107.26' @ 13.05 hrs Surf.Area= 68,088 sf Storage= 135,190 cf

Plug-Flow detention time= 273.2 min calculated for 2.598 af (49% of inflow)  
 Center-of-Mass det. time= 156.6 min ( 955.3 - 798.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	105.00'	186,871 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
105.00	52,708	0	0
106.00	57,935	55,322	55,322
107.00	67,082	62,509	117,830
108.00	71,000	69,041	186,871

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	<b>50.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

**Primary OutFlow** Max=15.32 cfs @ 13.04 hrs HW=107.25' (Free Discharge)  
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 15.32 cfs @ 1.24 fps)

**Emergency Spillway**

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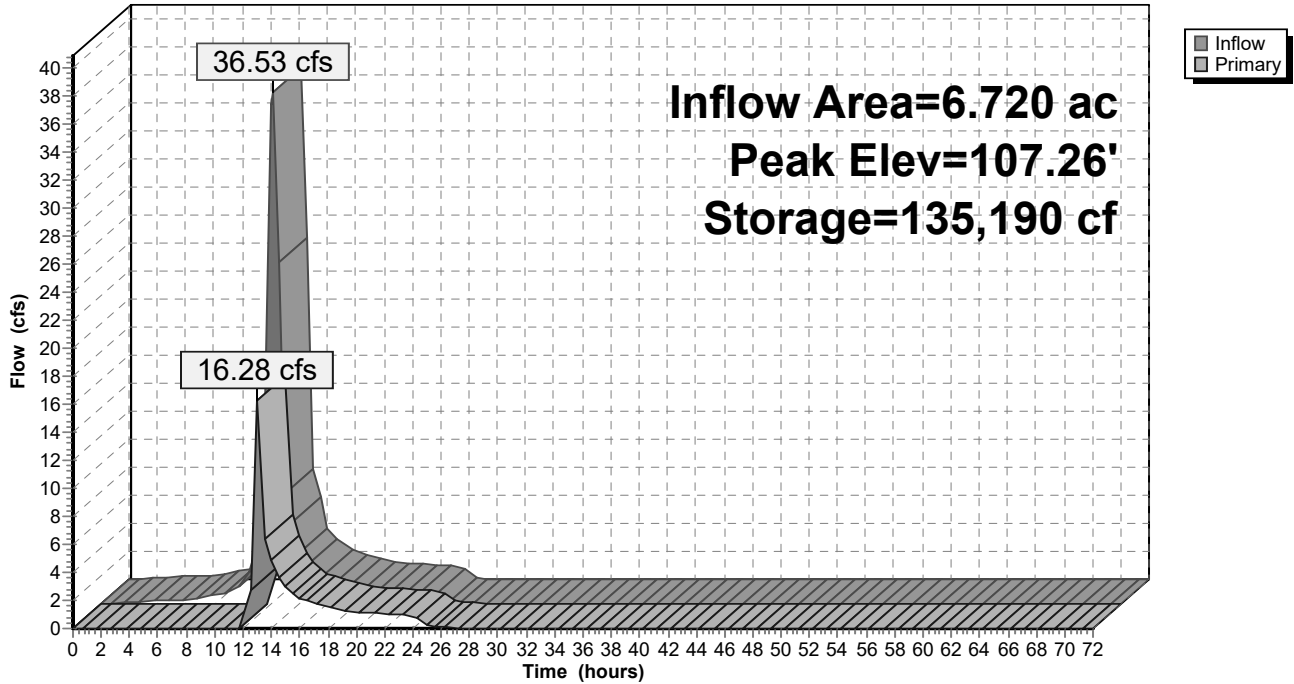
NOAA 24-hr C 150% of 100 yr Rainfall=12.30"

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**Pond 2P: Ex. Detention Basin**

Hydrograph



# Emergency Spillway

NOAA 24-hr C 150% of 100 yr Rainfall=12.30"

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## Summary for Pond 10P: BIO BASIN 1

Inflow Area = 1.710 ac, 48.54% Impervious, Inflow Depth = 10.37" for 150% of 100 yr event  
Inflow = 9.14 cfs @ 12.09 hrs, Volume= 1.477 af  
Outflow = 8.60 cfs @ 12.15 hrs, Volume= 1.306 af, Atten= 6%, Lag= 3.7 min  
Primary = 8.60 cfs @ 12.15 hrs, Volume= 1.306 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
Peak Elev= 111.30' @ 12.16 hrs Surf.Area= 5,039 sf Storage= 8,941 cf

Plug-Flow detention time= 116.2 min calculated for 1.306 af (88% of inflow)  
Center-of-Mass det. time= 49.4 min ( 827.9 - 778.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	109.00'	16,075 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.00	2,682	0	0
110.00	3,789	3,236	3,236
111.00	4,677	4,233	7,469
112.00	5,873	5,275	12,744
112.50	7,453	3,332	16,075

Device	Routing	Invert	Outlet Devices
#1	Primary	106.16'	<b>18.0" Round Culvert</b> L= 636.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 106.16' / 104.50' S= 0.0026 1' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Device 1	111.00'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=7.76 cfs @ 12.15 hrs HW=111.28' (Free Discharge)

↑1=Culvert (Passes 7.76 cfs of 9.65 cfs potential flow)

↑2=Orifice/Grate (Weir Controls 7.76 cfs @ 1.73 fps)

**Emergency Spillway**

NOAA 24-hr C 150% of 100 yr Rainfall=12.30"

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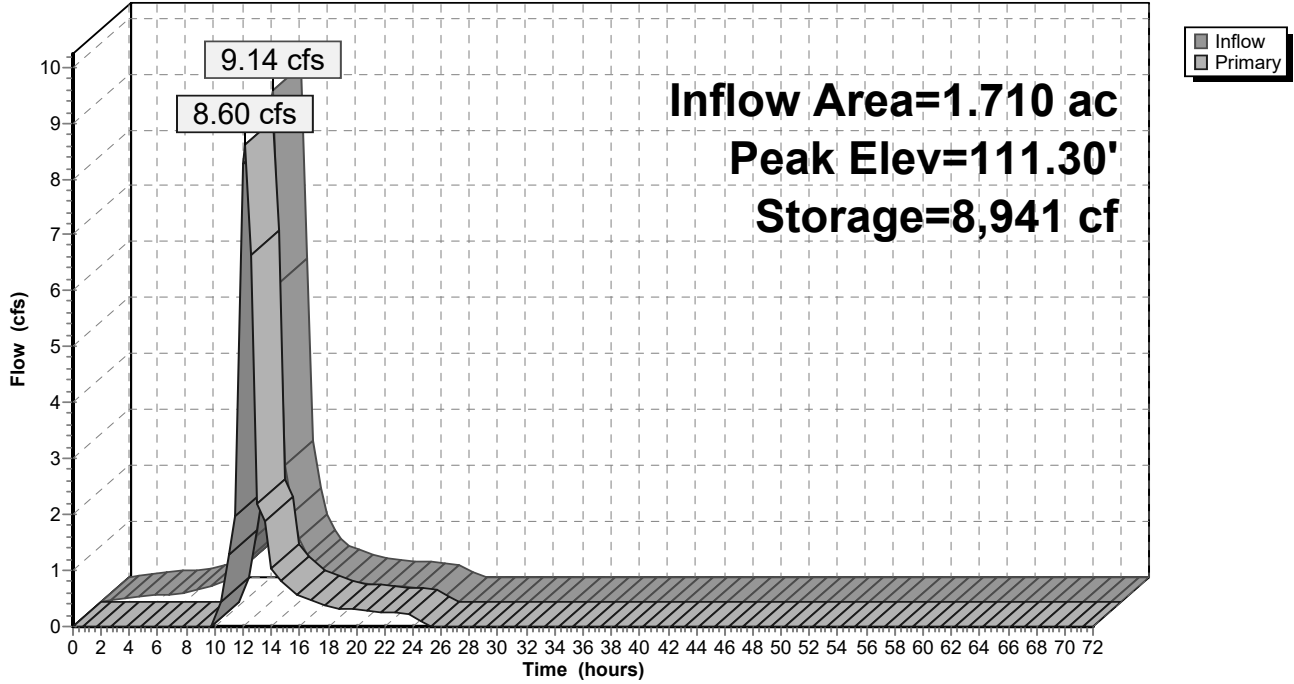
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**Pond 10P: BIO BASIN 1**

Hydrograph



# Emergency Spillway

NOAA 24-hr C 150% of 100 yr Rainfall=12.30"

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## Summary for Pond 11P: BIO BASIN 2

Inflow Area = 0.880 ac, 82.95% Impervious, Inflow Depth = 11.52" for 150% of 100 yr event  
Inflow = 5.47 cfs @ 12.07 hrs, Volume= 0.845 af  
Outflow = 4.86 cfs @ 12.22 hrs, Volume= 0.604 af, Atten= 11%, Lag= 9.3 min  
Primary = 4.86 cfs @ 12.22 hrs, Volume= 0.604 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
Peak Elev= 111.75' @ 12.24 hrs Surf.Area= 4,851 sf Storage= 11,663 cf

Plug-Flow detention time= 188.2 min calculated for 0.604 af (72% of inflow)  
Center-of-Mass det. time= 92.8 min ( 841.6 - 748.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.50'	15,574 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
108.50	2,430	0	0
109.00	2,763	1,298	1,298
110.00	3,471	3,117	4,415
111.00	4,237	3,854	8,269
112.00	5,059	4,648	12,917
112.50	5,569	2,657	15,574

Device	Routing	Invert	Outlet Devices
#1	Primary	105.50'	<b>18.0" Round Culvert</b> L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 105.50' / 105.26' S= 0.0030 ' S= 0.0030 ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	111.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=4.27 cfs @ 12.22 hrs HW=111.69' (Free Discharge)

↑1=Culvert (Passes 4.27 cfs of 19.72 cfs potential flow)

↑2=Orifice/Grate (Weir Controls 4.27 cfs @ 1.42 fps)



**Emergency Spillway**

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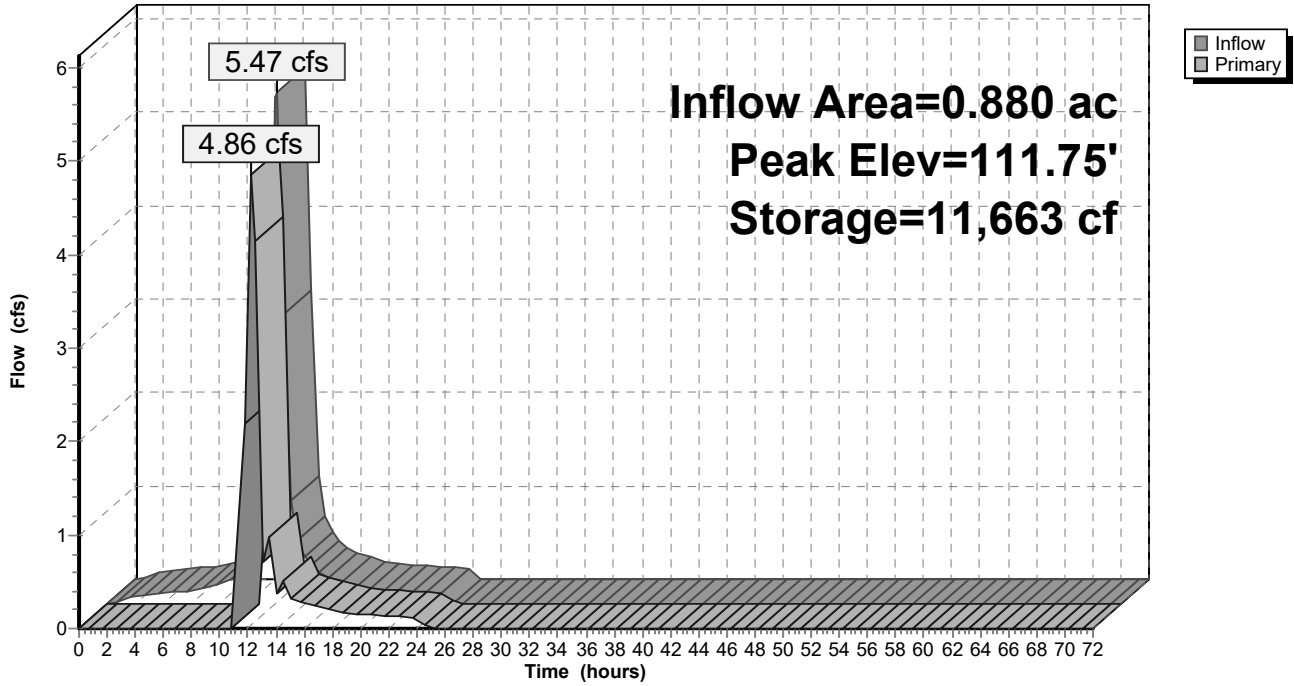
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**Pond 11P: BIO BASIN 2**

Hydrograph



**Emergency Spillway**

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**Summary for Pond 29P: PERV. PVMT-Rear**

Inflow Area = 0.220 ac, 63.64% Impervious, Inflow Depth = 10.91" for 150% of 100 yr event  
 Inflow = 1.32 cfs @ 12.07 hrs, Volume= 0.200 af  
 Outflow = 0.71 cfs @ 12.62 hrs, Volume= 0.200 af, Atten= 46%, Lag= 32.8 min  
 Primary = 0.71 cfs @ 12.62 hrs, Volume= 0.200 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 112.01' @ 12.61 hrs Surf.Area= 0.107 ac Storage= 0.050 af

Plug-Flow detention time= 63.1 min calculated for 0.199 af (99% of inflow)  
 Center-of-Mass det. time= 68.4 min ( 827.9 - 759.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	110.85'	0.053 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.134 af Overall x 40.0% Voids

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
110.85	0.107	0.000	0.000
112.10	0.107	0.134	0.134

Device	Routing	Invert	Outlet Devices
#1	Primary	110.85'	<b>6.0" Round Culvert</b> L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 110.85' / 110.00' S= 0.0163 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=0.69 cfs @ 12.62 hrs HW=111.96' (Free Discharge)  
 ↑1=Culvert (Inlet Controls 0.69 cfs @ 3.53 fps)

**Emergency Spillway**

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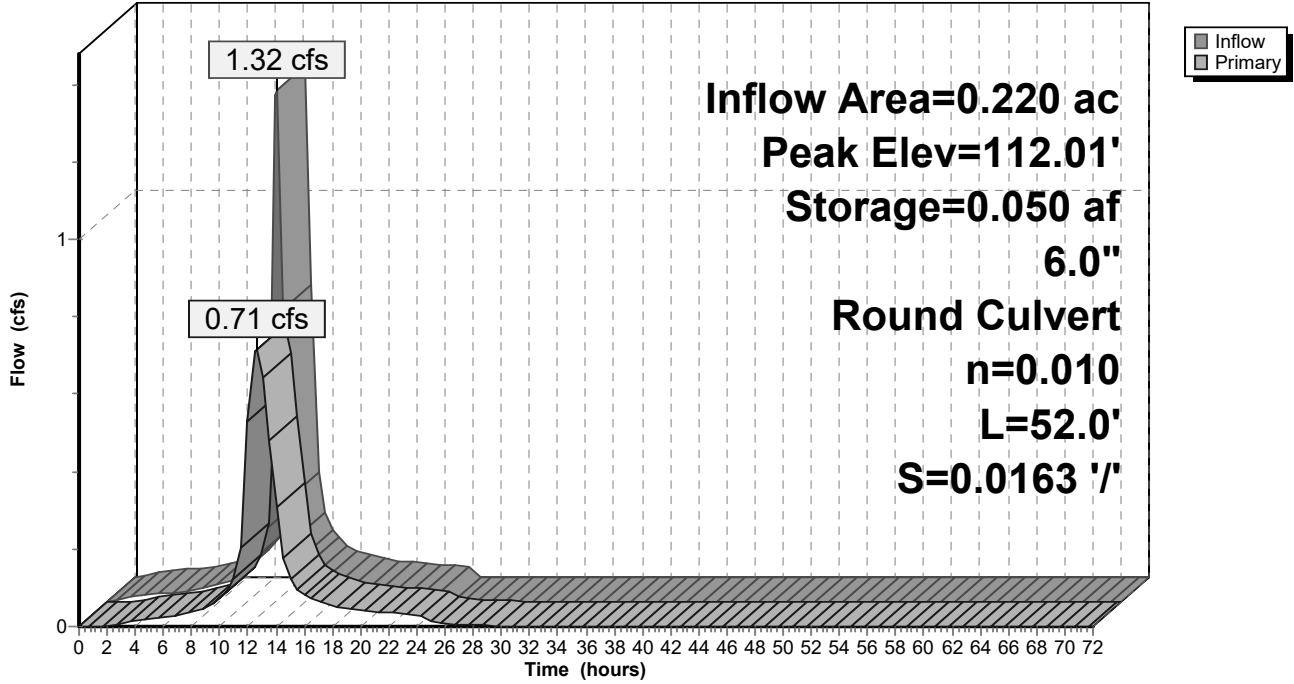
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**Pond 29P: PERV. PVMT-Rear**

Hydrograph



# Emergency Spillway

NOAA 24-hr C 150% of 100 yr Rainfall=12.30"

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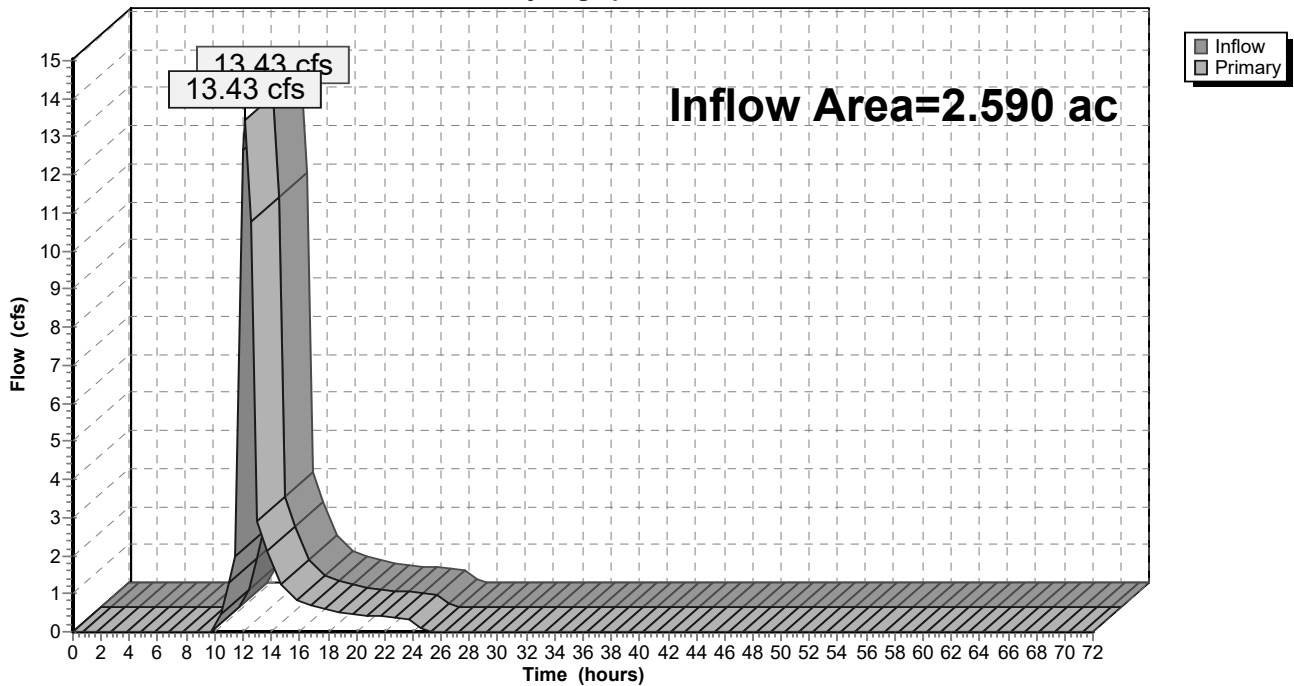
## Summary for Link 28L: MH 101

Inflow Area = 2.590 ac, 60.23% Impervious, Inflow Depth = 8.85" for 150% of 100 yr event  
Inflow = 13.43 cfs @ 12.18 hrs, Volume= 1.910 af  
Primary = 13.43 cfs @ 12.18 hrs, Volume= 1.910 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

### Link 28L: MH 101

Hydrograph



## Conduit Outlet Protection Calculations

### Rip Rap Pad # 1

#### Design Parameters:

Design Storm Flow for 25 Year, Q .....	3.40 cfs
Vertical Dimension of Outlet Pipe, $D_o$ .....	15 in
Horizontal Dimension of Outlet Pipe, $W_o$ .....	15 in
Tailwater Depth, $TW^1$ .....	1.39 ft

#### Apron Dimension Calculations:

Unit Discharge,  $q = Q/W_o = 2.72$  cfs per foot

• **Case I:  $TW < 1/2 D_o$**

Apron Length,  $L_a = \frac{1.8q}{D_o^{1/2}} + 7D_o =$

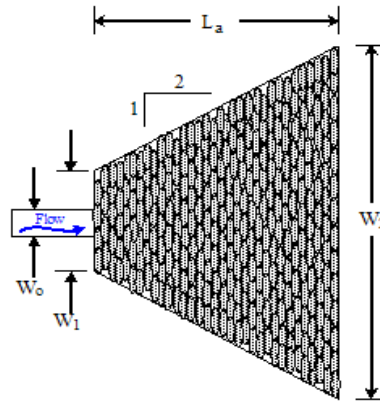
Width,  $W_1 = 3W_o =$

Width,  $W_2 = 3W_o + L_a =$

$L_a :$

$W_1 =$

$W_2 =$



• **Case II:  $TW \geq 1/2 D_o$**

Apron Length,  $L_a = \frac{3q}{D_o^{1/2}} = 7.3$  ft

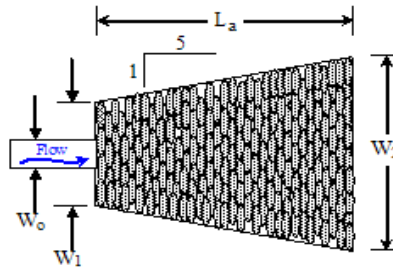
Width,  $W_1 = 3W_o = 3.75$  ft

Width,  $W_2 = 3W_o + 0.4L_a = 6.67$  ft

or  $L_a : 8$  ft

or  $W_1 = 6$  ft

or  $W_2 = 7$  ft



#### Rip Rap Stone Size Calculations:

Median Stone,  $d_{50} = \frac{0.02q^{1.33}}{TW} = 0.65$  in

$d_{50} : 6$  in

#### Notes:

- Where there is a well-defined channel downstream of the apron, the bottom width of the apron shall be at least equal to the bottom width of the channel and the structural lining shall extend at least one foot above the tailwater elevation, but no lower than two-thirds of the vertical conduit dimension above the conduit invert.
- The side slopes shall be 2:1 or flatter.
- The bottom grade shall be 0.0% (level).
- There shall be no overfall at the end of the apron or at the end of the culvert.
- Fifty (50) percent by weight of the rip-rap mixture shall be smaller than the median size stone designated as  $d_{50}$ . The largest stone size in the mixture shall be 1.5 times the  $d_{50}$  size. The rip-rap shall be reasonably well graded.
- The thickness of the rip-rap apron may be two (2) times the median stone diameter provided that the apron is constructed on a bedding of four (4) inches of 3/4 inch clean stone on approved filter fabric material.
- Rip-rap and filter fabric shall meet the standards of the governing Soil Conservation District as well as the requirements of the local municipality.
- No bends or curves at the intersection of the conduit and apron will be permitted.

#### Footnote:

- Tailwater depth shall be the 2 year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use  $TW = 0.2D_o$ .
- For multiple pipes, increase rip-rap sizes by 25% when pipe spacing is greater than or equal to  $1/4 W_o$ .

## Conduit Outlet Protection Calculations

### Rip Rap Pad # 2

#### Design Parameters:

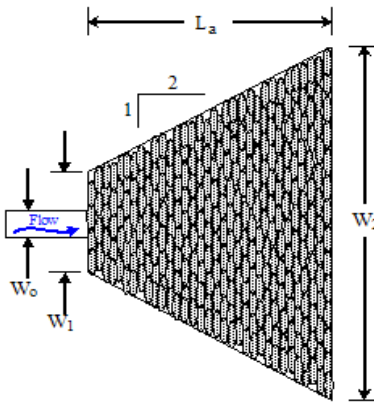
Design Storm Flow for 25 Year, Q .....	4.63 cfs
Vertical Dimension of Outlet Pipe, $D_o$ .....	14 in
Horizontal Dimension of Outlet Pipe, $W_o$ .....	23 in
Tailwater Depth, $TW^1$ .....	1.86 ft

#### Apron Dimension Calculations:

Unit Discharge,  $q = Q/W_o = 2.42$  cfs per foot

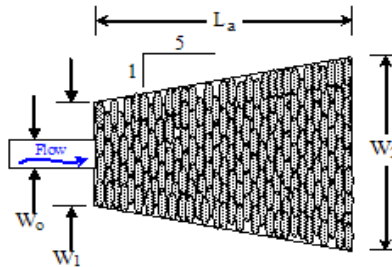
• **Case I:  $TW < 1/2 D_o$**

Apron Length, $L_a = \frac{1.8q}{D_o^{1/2}} + 7D_o =$	$L_a =$
Width, $W_1 = 3W_o =$	$W_1 =$
Width, $W_2 = 3W_o + L_a =$	$W_2 =$



• **Case II:  $TW \geq 1/2 D_o$**

Apron Length, $L_a = \frac{3q}{D_o^{1/2}} = 6.71$ ft	or $L_a = 7$ ft
Width, $W_1 = 3W_o = 5.75$ ft	or $W_1 = 6$ ft
Width, $W_2 = 3W_o + 0.4L_a = 8.43$ ft	or $W_2 = 9$ ft



#### Rip Rap Stone Size Calculations:

Unit Discharge,  $q = Q/D_o = 3.97$  cfs per foot

Median Stone, $d_{50} = \frac{0.02q^{1.33}}{TW} = 0.42$ in	$d_{50} = 6$ in
--	-----------------

#### Notes:

1. Where there is a well-defined channel downstream of the apron, the bottom width of the apron shall be at least equal to the bottom width of the channel and the structural lining shall extend at least one foot above the tailwater elevation, but no lower than two-thirds of the vertical conduit dimension above the conduit invert.
2. The side slopes shall be 2:1 or flatter.
3. The bottom grade shall be 0.0% (level).
4. There shall be no overfall at the end of the apron or at the end of the culvert.
5. Fifty (50) percent by weight of the rip-rap mixture shall be smaller than the median size stone designated as  $d_{50}$ . The largest stone size in the mixture shall be 1.5 times the  $d_{50}$  size. The rip-rap shall be reasonably well graded.
6. The thickness of the rip-rap apron may be two (2) times the median stone diameter provided that the apron is constructed on a bedding of four (4) inches of 3/4 inch clean stone on approved filter fabric material.
7. Rip-rap and filter fabric shall meet the standards of the governing Soil Conservation District as well as the requirements of the local municipality.
8. No bends or curves at the intersection of the conduit and apron will be permitted.

#### Footnote:

1. Tailwater depth shall be the 2 year storm if discharging into a detention basin. For areas where tailwater cannot be computed, use  $TW = 0.2D_o$ .
2. For multiple pipes, increase rip-rap sizes by 25% when pipe spacing is greater than or equal to  $1/4W_o$ .



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## Stormwater Collection System Calculations

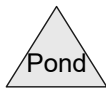
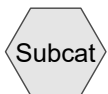
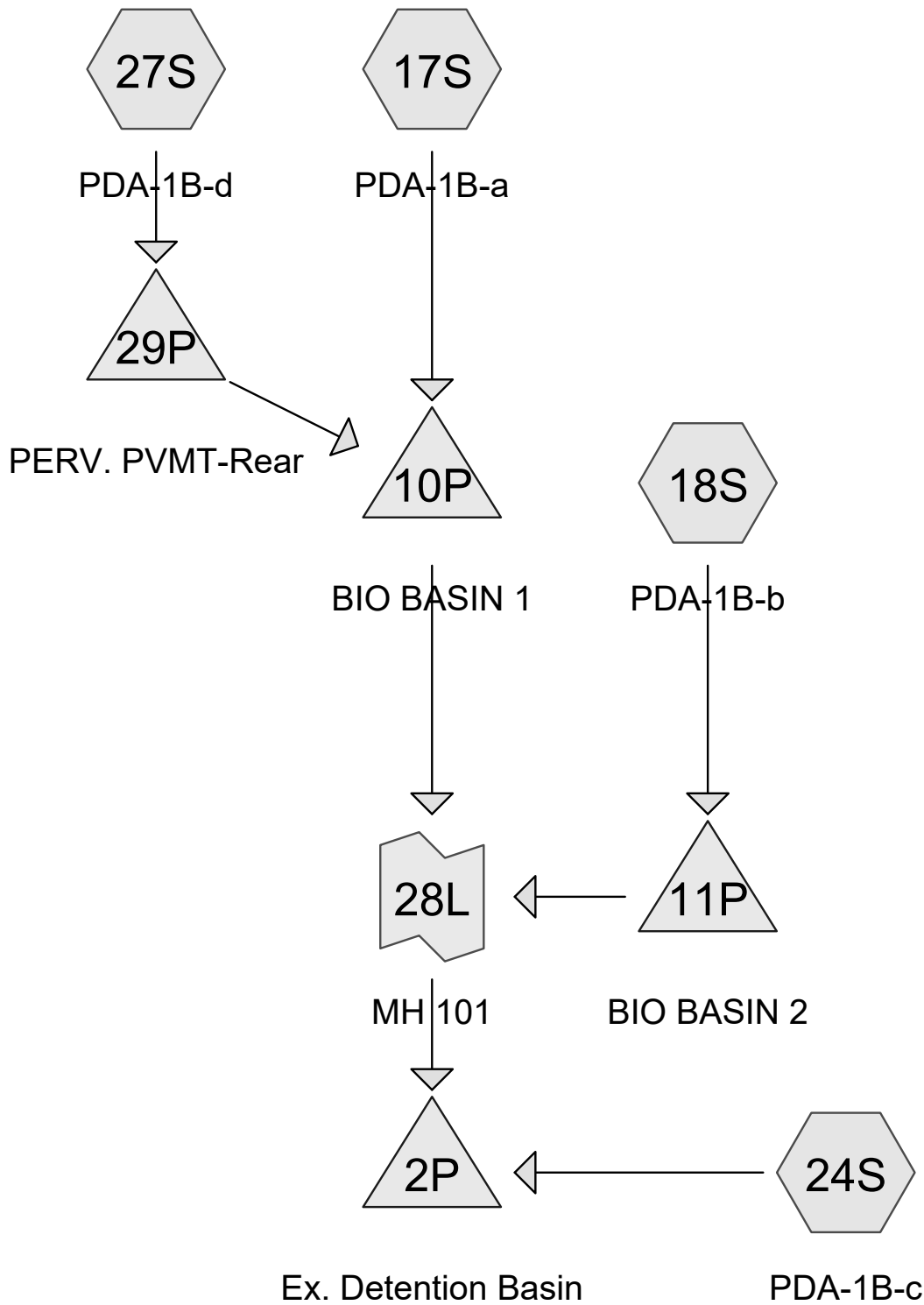
Project: LOREAL - FRANKLIN Computed By: MB  
 Job #: JM210708 Checked By: ML/MSY  
 Location: FRANKLIN, NJ Date: 10/13/2021  
 Design Storm: 25 year

NOTES:  
 1) Design method used is Rational Method

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 (%)	Pipe Capacity (cfs)	Pipe Velocity (fps)	
<b>Closed Drainage System</b>																		
106	105	0.57	0.78	0.45	0.45	10	1.25	10.01	6.60	2.98	2.98	15	216	0.013	0.3	3.54	2.89	
105	BASIN1	0.16	0.60	0.10	0.55	10	0.7	11.27	6.40	0.65	3.53	15	121	0.013	0.3	3.54	2.89	
101	E1	FROM HYDROCAD 100-YEAR STORM EVENT									8.10	8.10	24	187	0.013	0.24	11.09	3.54
304	E2	0.15	0.65	0.10	0.10	10	3.03	10.01	6.60	0.67	0.67	12	454	0.013	0.3	1.96	2.5	
202	BASIN2	0.74	0.94	0.70	0.70	10	0.67	10.01	6.60	4.63	4.63	18	131	0.013	0.3	5.76	3.27	
ROOF	POI 1	FROM HYDROCAD 25-YEAR STORM EVENT									18.15	18.15	24	911	0.013	0.75	19.59	6.24







**Routing Diagram for Pre vs Post\_drain time**  
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## Pre vs Post\_drain time

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### Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.570	74	>75% Grass cover, Good, HSG C (17S, 18S, 24S, 27S)
1.320	98	Impervious (24S)
0.140	98	Paved parking, HSG A (27S)
1.420	98	Paved parking, HSG C (17S, 18S)
0.270	70	Woods, Good, HSG C (17S)
<b>6.720</b>	<b>84</b>	<b>TOTAL AREA</b>

**Pre vs Post\_drain time**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 17S: PDA-1B-a**

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

Runoff = 5.31 cfs @ 12.08 hrs, Volume= 0.791 af, Depth= 6.37"

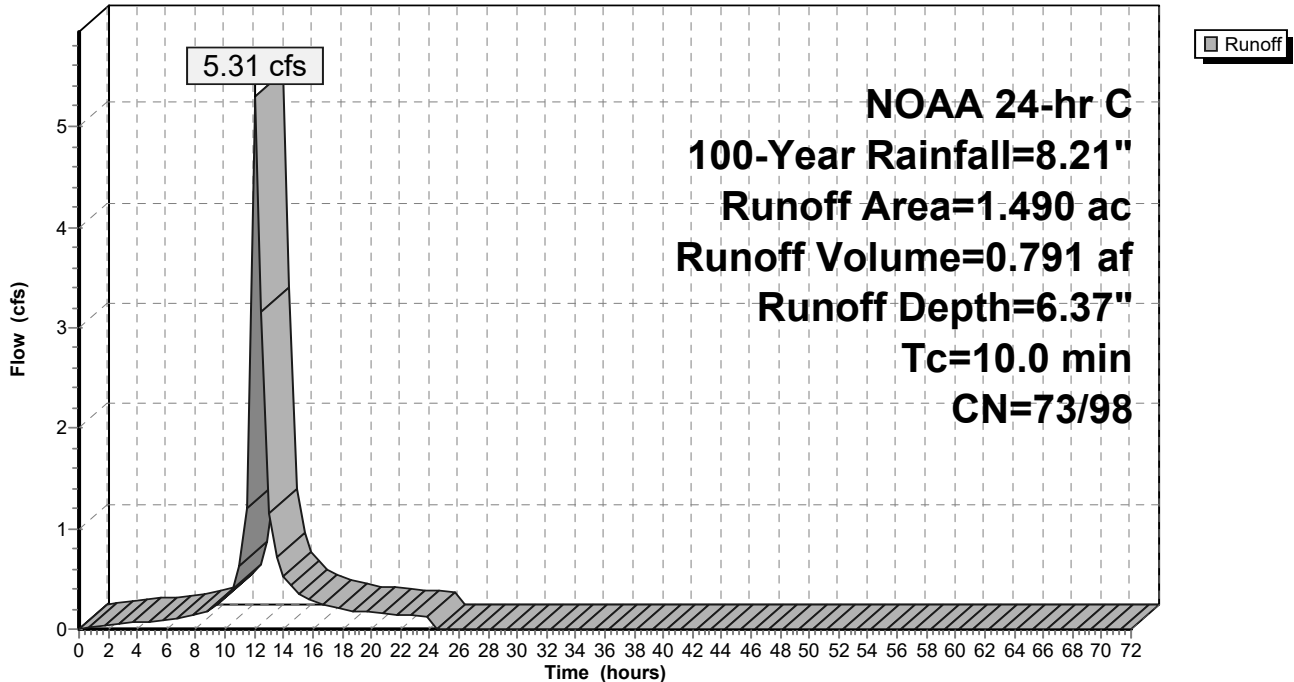
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
0.270	70	Woods, Good, HSG C
0.690	98	Paved parking, HSG C
0.530	74	>75% Grass cover, Good, HSG C
1.490	84	Weighted Average
0.800	73	53.69% Pervious Area
0.690	98	46.31% Impervious Area

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

**Subcatchment 17S: PDA-1B-a**

Hydrograph



**Pre vs Post\_drain time**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Hydrograph for Subcatchment 17S: PDA-1B-a**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.50	0.24	0.00	0.10	0.05
5.00	0.52	0.00	0.34	0.08
7.50	0.89	0.01	0.68	0.13
10.00	1.50	0.13	1.28	<b>0.31</b>
12.50	5.78	2.91	5.55	<b>3.16</b>
15.00	7.01	3.94	6.77	0.36
17.50	7.49	4.36	7.25	0.22
20.00	7.81	4.64	7.57	0.17
22.50	<b>8.07</b>	<b>4.87</b>	<b>7.83</b>	0.14
25.00	<b>8.21</b>	<b>5.00</b>	<b>7.97</b>	0.00
27.50	8.21	5.00	7.97	0.00
30.00	8.21	5.00	7.97	0.00
32.50	8.21	5.00	7.97	0.00
35.00	8.21	5.00	7.97	0.00
37.50	8.21	5.00	7.97	0.00
40.00	8.21	5.00	7.97	0.00
42.50	8.21	5.00	7.97	0.00
45.00	8.21	5.00	7.97	0.00
47.50	8.21	5.00	7.97	0.00
50.00	8.21	5.00	7.97	0.00
52.50	8.21	5.00	7.97	0.00
55.00	8.21	5.00	7.97	0.00
57.50	8.21	5.00	7.97	0.00
60.00	8.21	5.00	7.97	0.00
62.50	8.21	5.00	7.97	0.00
65.00	8.21	5.00	7.97	0.00
67.50	8.21	5.00	7.97	0.00
70.00	8.21	5.00	7.97	0.00

**Pre vs Post\_drain time**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 18S: PDA-1B-b**

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

Runoff = 3.57 cfs @ 12.07 hrs, Volume= 0.549 af, Depth= 7.48"

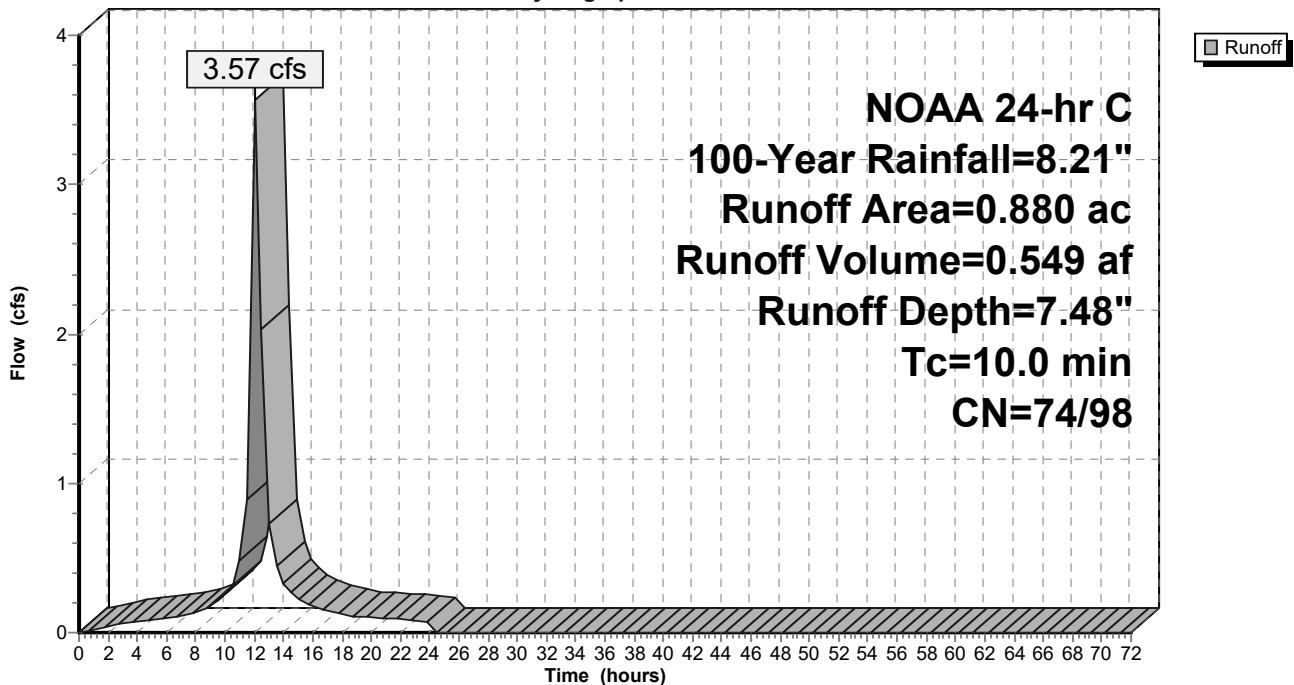
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
0.730	98	Paved parking, HSG C
0.150	74	>75% Grass cover, Good, HSG C
0.880	94	Weighted Average
0.150	74	17.05% Pervious Area
0.730	98	82.95% Impervious Area

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

**Subcatchment 18S: PDA-1B-b**

Hydrograph



**Pre vs Post\_drain time**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Hydrograph for Subcatchment 18S: PDA-1B-b**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.50	0.24	0.00	0.10	0.05
5.00	0.52	0.00	0.34	0.08
7.50	0.89	0.01	0.68	0.13
10.00	1.50	0.15	1.28	<b>0.26</b>
12.50	5.78	3.00	5.55	<b>2.03</b>
15.00	7.01	4.05	6.77	0.22
17.50	7.49	4.47	7.25	0.13
20.00	7.81	4.75	7.57	0.10
22.50	<b>8.07</b>	<b>4.99</b>	<b>7.83</b>	0.08
25.00	<b>8.21</b>	<b>5.11</b>	<b>7.97</b>	0.00
27.50	8.21	5.11	7.97	0.00
30.00	8.21	5.11	7.97	0.00
32.50	8.21	5.11	7.97	0.00
35.00	8.21	5.11	7.97	0.00
37.50	8.21	5.11	7.97	0.00
40.00	8.21	5.11	7.97	0.00
42.50	8.21	5.11	7.97	0.00
45.00	8.21	5.11	7.97	0.00
47.50	8.21	5.11	7.97	0.00
50.00	8.21	5.11	7.97	0.00
52.50	8.21	5.11	7.97	0.00
55.00	8.21	5.11	7.97	0.00
57.50	8.21	5.11	7.97	0.00
60.00	8.21	5.11	7.97	0.00
62.50	8.21	5.11	7.97	0.00
65.00	8.21	5.11	7.97	0.00
67.50	8.21	5.11	7.97	0.00
70.00	8.21	5.11	7.97	0.00

**Pre vs Post\_drain time**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Subcatchment 24S: PDA-1B-c**

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

Runoff = 14.15 cfs @ 12.08 hrs, Volume= 2.074 af, Depth= 6.03"

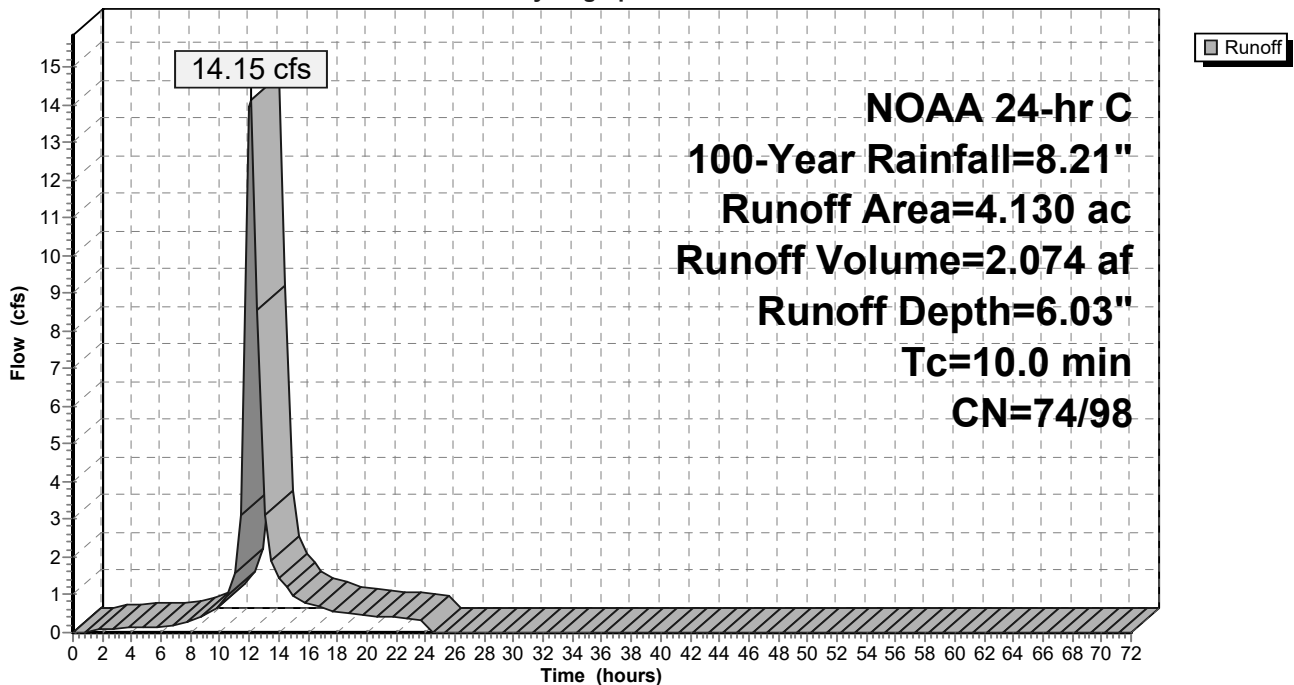
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
2.810	74	>75% Grass cover, Good, HSG C
* 1.320	98	Impervious
4.130	82	Weighted Average
2.810	74	68.04% Pervious Area
1.320	98	31.96% Impervious Area

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

**Subcatchment 24S: PDA-1B-c**

Hydrograph



**Pre vs Post\_drain time**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Hydrograph for Subcatchment 24S: PDA-1B-c**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.50	0.24	0.00	0.10	0.10
5.00	0.52	0.00	0.34	0.15
7.50	0.89	0.01	0.68	0.27
10.00	1.50	0.15	1.28	<b>0.75</b>
12.50	5.78	3.00	5.55	<b>8.55</b>
15.00	7.01	4.05	6.77	0.97
17.50	7.49	4.47	7.25	0.59
20.00	7.81	4.75	7.57	0.45
22.50	<b>8.07</b>	<b>4.99</b>	<b>7.83</b>	0.38
25.00	<b>8.21</b>	<b>5.11</b>	<b>7.97</b>	0.00
27.50	8.21	5.11	7.97	0.00
30.00	8.21	5.11	7.97	0.00
32.50	8.21	5.11	7.97	0.00
35.00	8.21	5.11	7.97	0.00
37.50	8.21	5.11	7.97	0.00
40.00	8.21	5.11	7.97	0.00
42.50	8.21	5.11	7.97	0.00
45.00	8.21	5.11	7.97	0.00
47.50	8.21	5.11	7.97	0.00
50.00	8.21	5.11	7.97	0.00
52.50	8.21	5.11	7.97	0.00
55.00	8.21	5.11	7.97	0.00
57.50	8.21	5.11	7.97	0.00
60.00	8.21	5.11	7.97	0.00
62.50	8.21	5.11	7.97	0.00
65.00	8.21	5.11	7.97	0.00
67.50	8.21	5.11	7.97	0.00
70.00	8.21	5.11	7.97	0.00



**Pre vs Post\_drain time**

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**Summary for Subcatchment 27S: PDA-1B-d**

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

Runoff = 0.84 cfs @ 12.07 hrs, Volume= 0.127 af, Depth= 6.93"

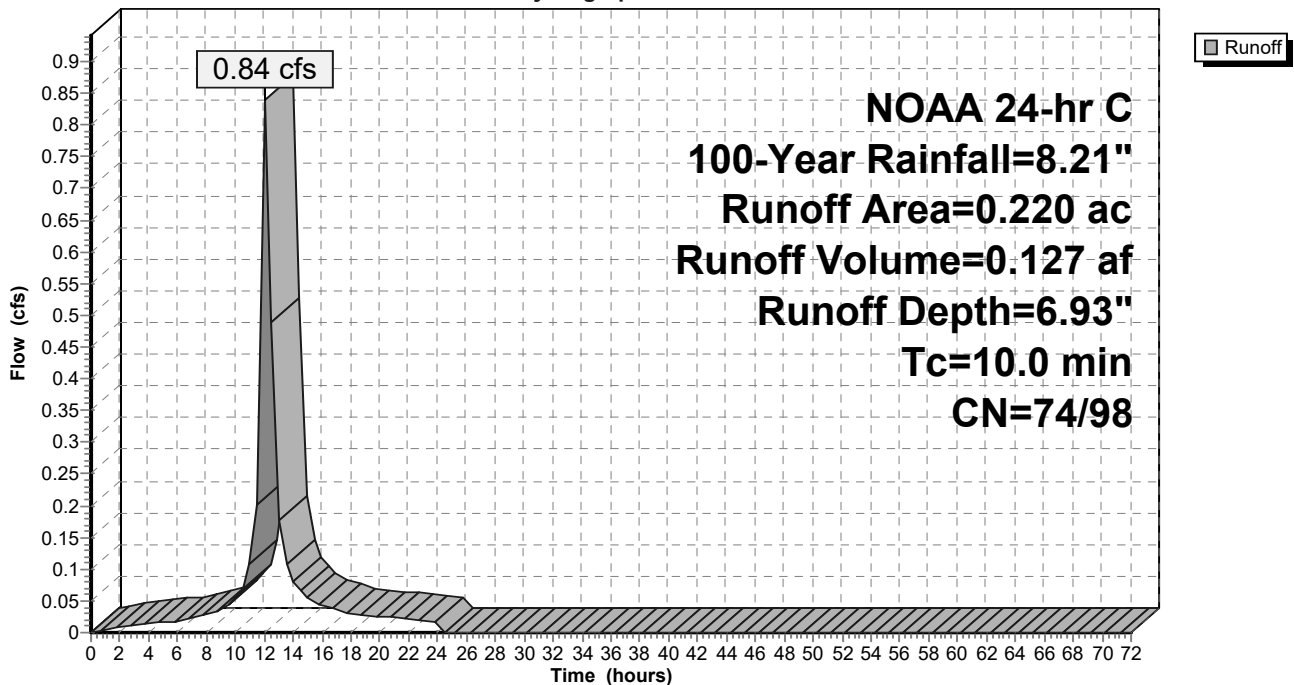
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NOAA 24-hr C 100-Year Rainfall=8.21"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG A
0.080	74	>75% Grass cover, Good, HSG C
0.220	89	Weighted Average
0.080	74	36.36% Pervious Area
0.140	98	63.64% Impervious Area

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

**Subcatchment 27S: PDA-1B-d**

Hydrograph



**Pre vs Post\_drain time**

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**Hydrograph for Subcatchment 27S: PDA-1B-d**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.50	0.24	0.00	0.10	0.01
5.00	0.52	0.00	0.34	0.02
7.50	0.89	0.01	0.68	0.03
10.00	1.50	0.15	1.28	<b>0.06</b>
12.50	5.78	3.00	5.55	<b>0.49</b>
15.00	7.01	4.05	6.77	0.05
17.50	7.49	4.47	7.25	0.03
20.00	7.81	4.75	7.57	0.03
22.50	<b>8.07</b>	<b>4.99</b>	<b>7.83</b>	0.02
25.00	<b>8.21</b>	<b>5.11</b>	<b>7.97</b>	0.00
27.50	8.21	5.11	7.97	0.00
30.00	8.21	5.11	7.97	0.00
32.50	8.21	5.11	7.97	0.00
35.00	8.21	5.11	7.97	0.00
37.50	8.21	5.11	7.97	0.00
40.00	8.21	5.11	7.97	0.00
42.50	8.21	5.11	7.97	0.00
45.00	8.21	5.11	7.97	0.00
47.50	8.21	5.11	7.97	0.00
50.00	8.21	5.11	7.97	0.00
52.50	8.21	5.11	7.97	0.00
55.00	8.21	5.11	7.97	0.00
57.50	8.21	5.11	7.97	0.00
60.00	8.21	5.11	7.97	0.00
62.50	8.21	5.11	7.97	0.00
65.00	8.21	5.11	7.97	0.00
67.50	8.21	5.11	7.97	0.00
70.00	8.21	5.11	7.97	0.00

**Pre vs Post\_drain time**

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**Summary for Pond 2P: Ex. Detention Basin**

Inflow Area = 6.720 ac, 42.86% Impervious, Inflow Depth = 6.32" for 100-Year event  
 Inflow = 18.11 cfs @ 12.19 hrs, Volume= 3.542 af  
 Outflow = 4.26 cfs @ 13.52 hrs, Volume= 3.509 af, Atten= 76%, Lag= 79.8 min  
 Primary = 0.97 cfs @ 13.52 hrs, Volume= 0.864 af  
 Secondary = 3.30 cfs @ 13.52 hrs, Volume= 2.645 af  
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 106.30' @ 13.52 hrs Surf.Area= 60,634 sf Storage= 72,813 cf

Plug-Flow detention time= 295.5 min calculated for 3.509 af (99% of inflow)  
 Center-of-Mass det. time= 288.8 min ( 1,093.0 - 804.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	105.00'	186,871 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
105.00	52,708	0	0
106.00	57,935	55,322	55,322
107.00	67,082	62,509	117,830
108.00	71,000	69,041	186,871

Device	Routing	Invert	Outlet Devices
#1	Primary	105.00'	<b>18.0" Round RCP_Round 18"</b> L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0333 1/1 Cc= 0.900 n= 0.015, Flow Area= 1.77 sf
#2	Device 1	105.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	106.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Secondary	105.00'	<b>8.0" Round Culvert X 2.00</b> L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0238 1/1 Cc= 0.900 n= 0.010, Flow Area= 0.35 sf
#5	Tertiary	107.00'	<b>50.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

**Primary OutFlow** Max=0.97 cfs @ 13.52 hrs HW=106.29' (Free Discharge)

- ↑ 1=RCP\_Round 18" (Passes 0.97 cfs of 6.28 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.97 cfs @ 4.92 fps)
- ↑ 3=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=3.29 cfs @ 13.52 hrs HW=106.29' (Free Discharge)

- ↑ 4=Culvert (Inlet Controls 3.29 cfs @ 4.72 fps)

**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=105.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

**Pre vs Post\_drain time**

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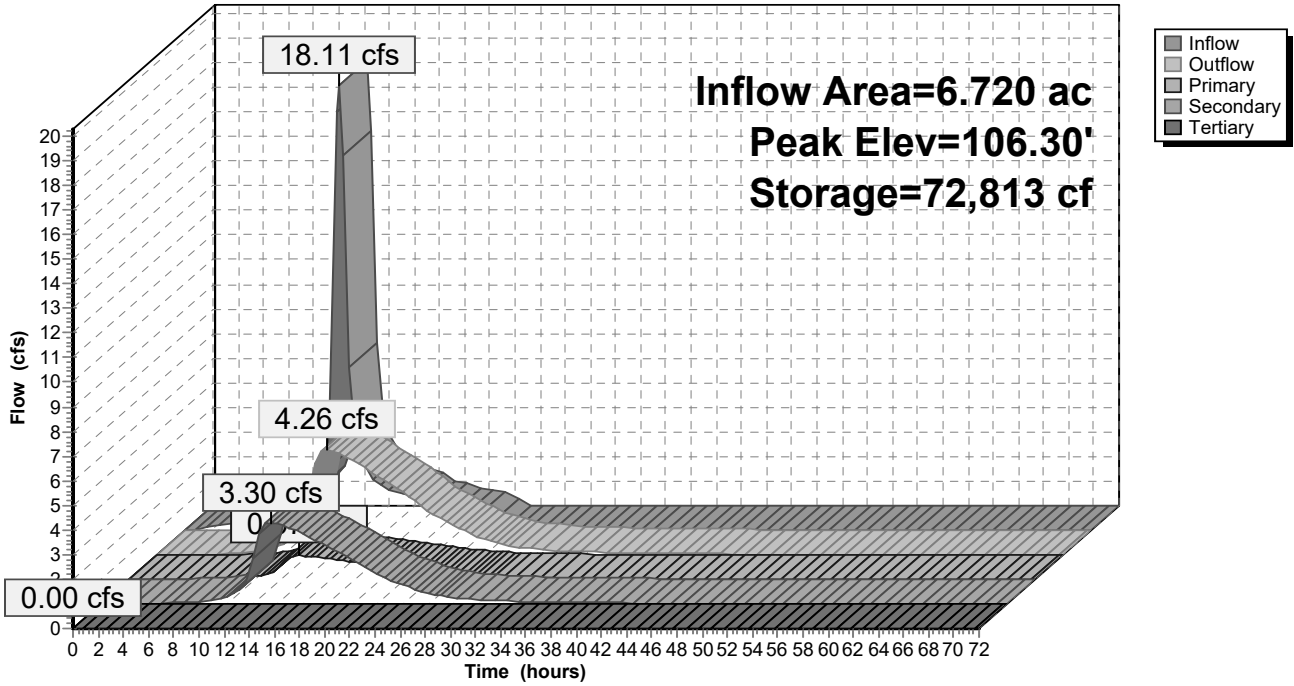
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**Pond 2P: Ex. Detention Basin**

Hydrograph



**Pre vs Post\_drain time**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Hydrograph for Pond 2P: Ex. Detention Basin**

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)	Tertiary (cfs)
0.00	0.00	0	105.00	0.00	0.00	0.00	<b>0.00</b>
2.50	0.20	808	105.02	0.00	0.00	0.00	0.00
5.00	0.32	3,040	105.06	0.03	0.01	0.02	0.00
7.50	0.54	5,912	105.11	0.13	0.04	0.09	0.00
10.00	<b>1.35</b>	11,225	105.21	0.42	0.12	0.30	0.00
12.50	<b>15.20</b>	<b>58,509</b>	<b>106.05</b>	<b>3.70</b>	<b>0.85</b>	<b>2.86</b>	0.00
15.00	2.08	<b>65,480</b>	<b>106.17</b>	<b>3.99</b>	<b>0.91</b>	<b>3.08</b>	0.00
17.50	1.43	48,006	105.87	3.22	0.75	2.47	0.00
20.00	1.00	33,452	105.62	2.37	0.57	1.80	0.00
22.50	0.62	23,107	105.43	1.46	0.40	1.06	0.00
25.00	0.00	16,385	105.31	0.83	0.24	0.59	0.00
27.50	0.00	11,134	105.21	0.41	0.12	0.29	0.00
30.00	0.00	8,310	105.16	0.24	0.07	0.17	0.00
32.50	0.00	6,585	105.12	0.15	0.05	0.11	0.00
35.00	0.00	5,433	105.10	0.11	0.03	0.08	0.00
37.50	0.00	4,615	105.09	0.08	0.02	0.05	0.00
40.00	0.00	3,999	105.08	0.06	0.02	0.04	0.00
42.50	0.00	3,521	105.07	0.05	0.01	0.03	0.00
45.00	0.00	3,150	105.06	0.04	0.01	0.03	0.00
47.50	0.00	2,846	105.05	0.03	0.01	0.02	0.00
50.00	0.00	2,586	105.05	0.03	0.01	0.02	0.00
52.50	0.00	2,364	105.04	0.02	0.01	0.02	0.00
55.00	0.00	2,173	105.04	0.02	0.01	0.01	0.00
57.50	0.00	2,010	105.04	0.02	0.01	0.01	0.00
60.00	0.00	1,871	105.04	0.01	0.00	0.01	0.00
62.50	0.00	1,751	105.03	0.01	0.00	0.01	0.00
65.00	0.00	1,649	105.03	0.01	0.00	0.01	0.00
67.50	0.00	1,562	105.03	0.01	0.00	0.01	0.00
70.00	0.00	1,481	105.03	0.01	0.00	0.01	0.00

**Pre vs Post\_drain time**

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**Summary for Pond 10P: BIO BASIN 1**

[44] Hint: Outlet device #4 is below defined storage

[79] Warning: Submerged Pond 29P Primary device # 1 OUTLET by 0.83'

Inflow Area = 1.710 ac, 48.54% Impervious, Inflow Depth = 6.44" for 100-Year event  
 Inflow = 5.72 cfs @ 12.09 hrs, Volume= 0.918 af  
 Outflow = 5.03 cfs @ 12.48 hrs, Volume= 0.918 af, Atten= 12%, Lag= 23.3 min  
 Primary = 5.03 cfs @ 12.48 hrs, Volume= 0.918 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 110.83' @ 12.48 hrs Surf.Area= 4,526 sf Storage= 6,686 cf

Plug-Flow detention time= 42.2 min calculated for 0.912 af (99% of inflow)  
 Center-of-Mass det. time= 42.0 min ( 828.8 - 786.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	109.00'	16,075 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.00	2,682	0	0
110.00	3,789	3,236	3,236
111.00	4,677	4,233	7,469
112.00	5,873	5,275	12,744
112.50	7,453	3,332	16,075

Device	Routing	Invert	Outlet Devices
#1	Primary	106.16'	<b>18.0" Round Culvert</b> L= 636.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 106.16' / 104.50' S= 0.0026 1' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Device 1	110.00'	<b>2.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)
#3	Device 1	111.00'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#4	Device 1	106.34'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=4.93 cfs @ 12.48 hrs HW=110.82' (Free Discharge)

- 1=Culvert (Passes 4.93 cfs of 9.21 cfs potential flow)
- 2=Sharp-Crested Rectangular Weir (Weir Controls 4.44 cfs @ 2.96 fps)
- 3=Orifice/Grate ( Controls 0.00 cfs)
- 4=Orifice/Grate (Orifice Controls 0.49 cfs @ 10.05 fps)

**Pre vs Post\_drain time**

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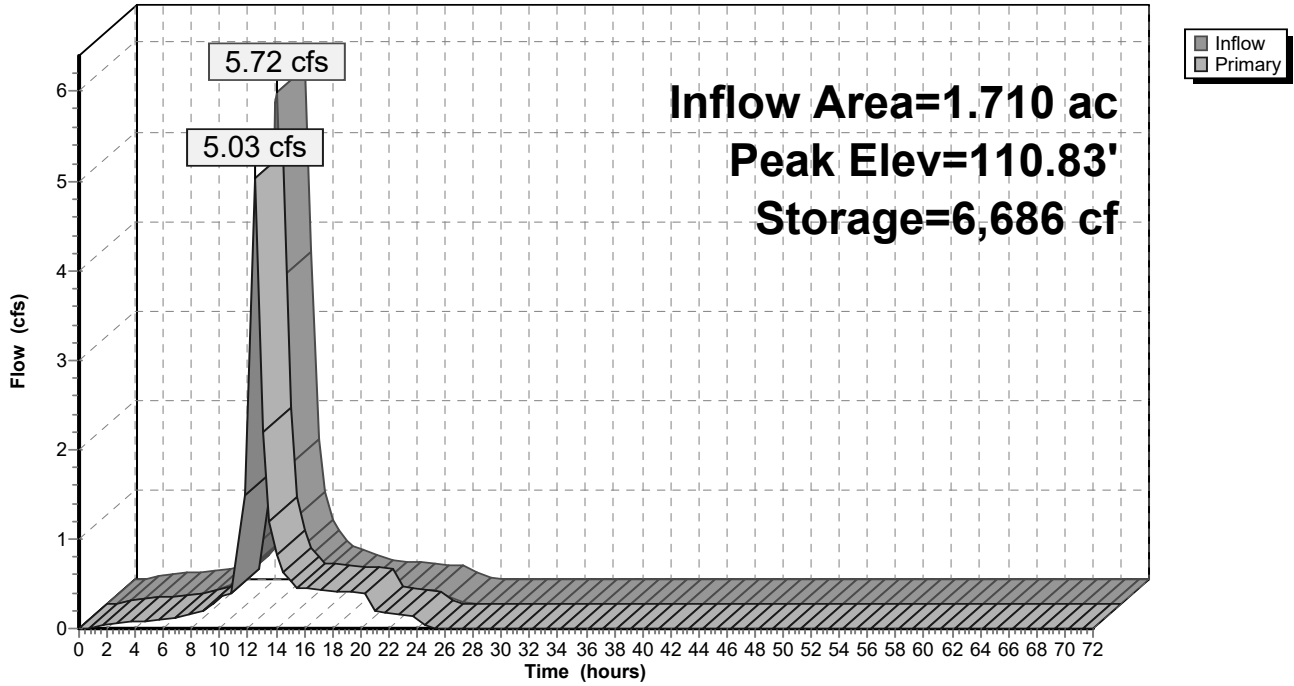
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**Pond 10P: BIO BASIN 1**

Hydrograph



**Pre vs Post\_drain time**

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**Hydrograph for Pond 10P: BIO BASIN 1**

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	109.00	0.00
2.50	0.05	13	109.00	0.05
5.00	0.09	22	109.01	0.09
7.50	0.15	36	109.01	0.14
10.00	<b>0.35</b>	86	109.03	0.34
12.50	<b>3.66</b>	<b>6,684</b>	<b>110.83</b>	<b>5.02</b>
15.00	0.43	3,429	110.05	0.52
17.50	0.26	2,359	109.76	0.43
20.00	0.19	595	109.21	0.39
22.50	0.16	39	109.01	0.16
25.00	0.01	0	109.00	0.00
27.50	0.00	1	109.00	0.00
30.00	0.00	0	109.00	0.00
32.50	0.00	0	109.00	0.00
35.00	0.00	0	109.00	0.00
37.50	0.00	0	109.00	0.00
40.00	0.00	0	109.00	0.00
42.50	0.00	0	109.00	0.00
45.00	0.00	0	109.00	0.00
47.50	0.00	0	109.00	0.00
50.00	0.00	0	109.00	0.00
52.50	0.00	0	109.00	0.00
55.00	0.00	0	109.00	0.00
57.50	0.00	0	109.00	0.00
60.00	0.00	0	109.00	0.00
62.50	0.00	0	109.00	0.00
65.00	0.00	0	109.00	0.00
67.50	0.00	0	109.00	0.00
70.00	0.00	0	109.00	0.00



**Pre vs Post\_drain time**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Pond 11P: BIO BASIN 2**

[44] Hint: Outlet device #5 is below defined storage

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.880 ac, 82.95% Impervious, Inflow Depth = 7.48" for 100-Year event  
 Inflow = 3.57 cfs @ 12.07 hrs, Volume= 0.549 af  
 Outflow = 1.68 cfs @ 12.63 hrs, Volume= 0.549 af, Atten= 53%, Lag= 33.8 min  
 Primary = 1.68 cfs @ 12.63 hrs, Volume= 0.549 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 110.75' @ 12.73 hrs Surf.Area= 4,046 sf Storage= 7,239 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)  
 Center-of-Mass det. time= 67.1 min ( 820.6 - 753.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.50'	15,574 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
108.50	2,430	0	0
109.00	2,763	1,298	1,298
110.00	3,471	3,117	4,415
111.00	4,237	3,854	8,269
112.00	5,059	4,648	12,917
112.50	5,569	2,657	15,574

Device	Routing	Invert	Outlet Devices
#1	Primary	105.50'	<b>18.0" Round Culvert</b> L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 105.50' / 105.26' S= 0.0030 1' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	109.50'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	110.50'	<b>4.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s) 0.5' Crest Height
#4	Device 1	111.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#5	Device 1	105.93'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=1.54 cfs @ 12.63 hrs HW=110.65' (Free Discharge)

- 1=Culvert (Passes 1.54 cfs of 17.53 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.24 cfs @ 4.88 fps)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 0.79 cfs @ 1.32 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)
- 5=Orifice/Grate (Orifice Controls 0.51 cfs @ 10.32 fps)

**Pre vs Post\_drain time**

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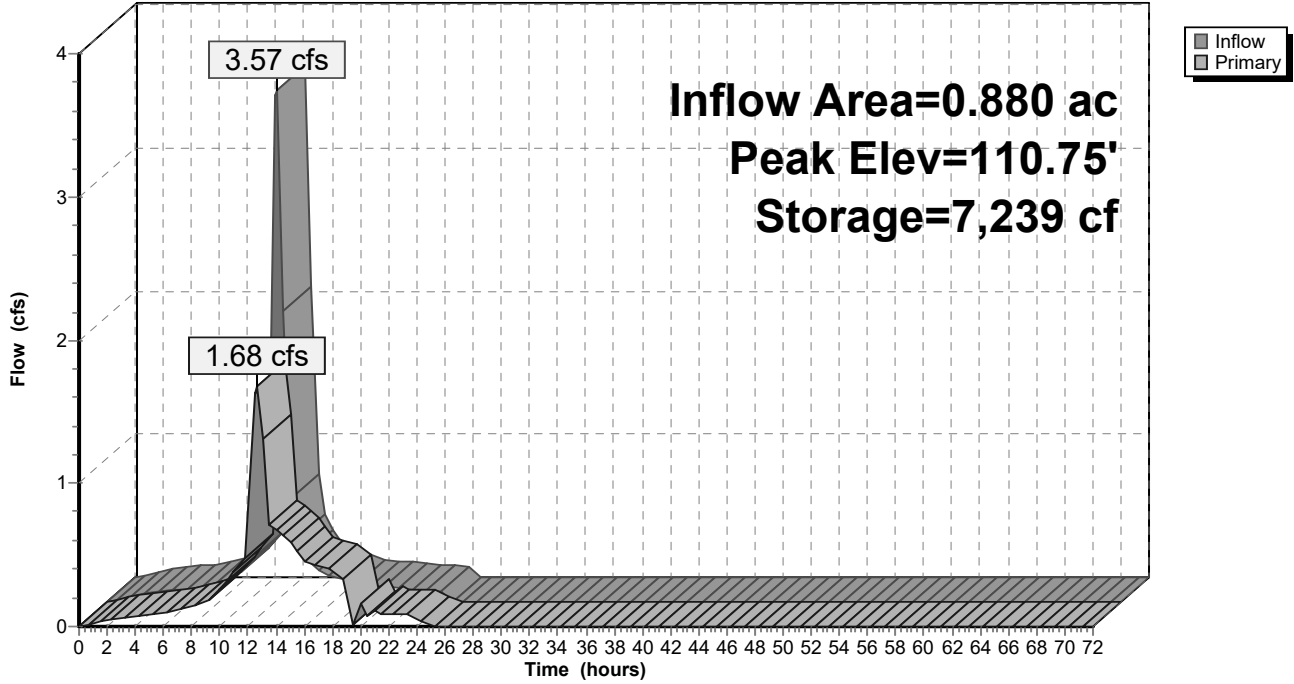
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**Pond 11P: BIO BASIN 2**

Hydrograph



**Pre vs Post\_drain time**

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**Hydrograph for Pond 11P: BIO BASIN 2**

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	108.50	0.00
2.50	0.05	14	108.51	0.05
5.00	0.08	21	108.51	0.08
7.50	0.13	33	108.51	0.13
10.00	<b>0.26</b>	67	108.53	0.26
12.50	<b>2.03</b>	<b>6,883</b>	<b>110.66</b>	<b>1.63</b>
15.00	0.22	4,112	109.91	0.59
17.50	0.13	1,468	109.06	0.41
20.00	0.10	41	108.52	0.16
22.50	0.08	22	108.51	0.08
25.00	0.00	0	108.50	0.00
27.50	0.00	0	108.50	0.00
30.00	0.00	0	108.50	0.00
32.50	0.00	0	108.50	0.00
35.00	0.00	0	108.50	0.00
37.50	0.00	0	108.50	0.00
40.00	0.00	0	108.50	0.00
42.50	0.00	0	108.50	0.00
45.00	0.00	0	108.50	0.00
47.50	0.00	0	108.50	0.00
50.00	0.00	0	108.50	0.00
52.50	0.00	0	108.50	0.00
55.00	0.00	0	108.50	0.00
57.50	0.00	0	108.50	0.00
60.00	0.00	0	108.50	0.00
62.50	0.00	0	108.50	0.00
65.00	0.00	0	108.50	0.00
67.50	0.00	0	108.50	0.00
70.00	0.00	0	108.50	0.00

**Pre vs Post\_drain time**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Summary for Pond 29P: PERV. PVMT-Rear**

Inflow Area = 0.220 ac, 63.64% Impervious, Inflow Depth = 6.93" for 100-Year event  
 Inflow = 0.84 cfs @ 12.07 hrs, Volume= 0.127 af  
 Outflow = 0.51 cfs @ 12.57 hrs, Volume= 0.127 af, Atten= 40%, Lag= 29.6 min  
 Primary = 0.51 cfs @ 12.57 hrs, Volume= 0.127 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 111.56' @ 12.56 hrs Surf.Area= 0.107 ac Storage= 0.030 af

Plug-Flow detention time= 70.8 min calculated for 0.126 af (99% of inflow)  
 Center-of-Mass det. time= 77.7 min ( 842.9 - 765.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	110.85'	0.053 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.134 af Overall x 40.0% Voids

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
110.85	0.107	0.000	0.000
112.10	0.107	0.134	0.134

Device	Routing	Invert	Outlet Devices
#1	Primary	110.85'	<b>6.0" Round Culvert</b> L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 110.85' / 110.00' S= 0.0163 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=0.50 cfs @ 12.57 hrs HW=111.54' (Free Discharge)  
 ↑1=Culvert (Inlet Controls 0.50 cfs @ 2.53 fps)

**Pre vs Post\_drain time**

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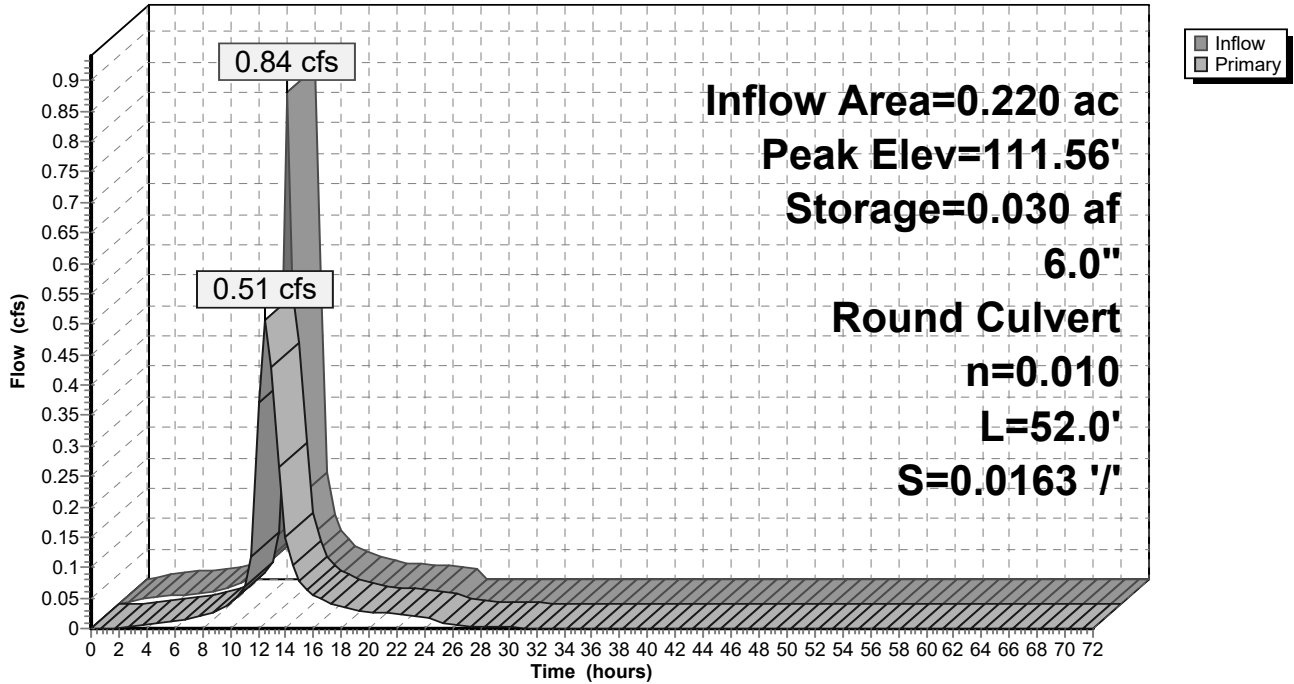
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**Pond 29P: PERV. PVMT-Rear**

Hydrograph



**Pre vs Post\_drain time**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Hydrograph for Pond 29P: PERV. PVMT-Rear**

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	110.85	0.00
2.50	0.01	0.001	110.87	0.00
5.00	0.02	0.003	110.91	0.01
7.50	0.03	0.004	110.94	0.02
10.00	<b>0.06</b>	0.006	110.98	0.04
12.50	<b>0.49</b>	<b>0.030</b>	<b>111.56</b>	<b>0.51</b>
15.00	0.05	0.008	111.04	0.08
17.50	0.03	0.006	110.98	0.04
20.00	0.03	0.005	110.96	0.03
22.50	0.02	0.004	110.95	0.02
25.00	0.00	0.003	110.92	0.01
27.50	0.00	0.002	110.89	0.00
30.00	0.00	0.001	110.88	0.00
32.50	0.00	0.001	110.87	0.00
35.00	0.00	0.001	110.87	0.00
37.50	0.00	0.001	110.86	0.00
40.00	0.00	0.000	110.86	0.00
42.50	0.00	0.000	110.86	0.00
45.00	0.00	0.000	110.86	0.00
47.50	0.00	0.000	110.86	0.00
50.00	0.00	0.000	110.86	0.00
52.50	0.00	0.000	110.86	0.00
55.00	0.00	0.000	110.85	0.00
57.50	0.00	0.000	110.85	0.00
60.00	0.00	0.000	110.85	0.00
62.50	0.00	0.000	110.85	0.00
65.00	0.00	0.000	110.85	0.00
67.50	0.00	0.000	110.85	0.00
70.00	0.00	0.000	110.85	0.00

**Pre vs Post\_drain time**

NOAA 24-hr C 100-Year Rainfall=8.21"

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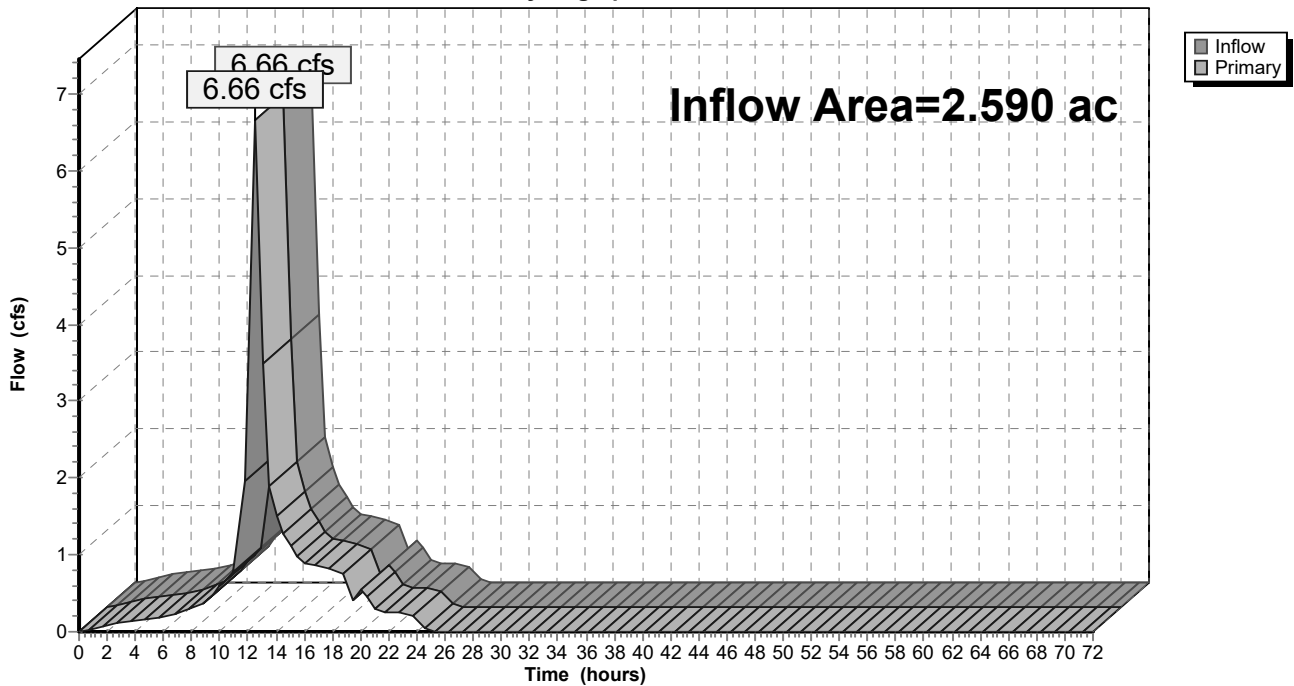
**Summary for Link 28L: MH 101**

Inflow Area = 2.590 ac, 60.23% Impervious, Inflow Depth = 6.80" for 100-Year event  
Inflow = 6.66 cfs @ 12.51 hrs, Volume= 1.467 af  
Primary = 6.66 cfs @ 12.51 hrs, Volume= 1.467 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

**Link 28L: MH 101**

Hydrograph



**Pre vs Post\_drain time**

NOAA 24-hr C 100-Year Rainfall=8.21"

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**Hydrograph for Link 28L: MH 101**

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	<b>0.00</b>	0.00	53.00	0.00	0.00	0.00
1.00	0.03	0.00	0.03	54.00	0.00	0.00	0.00
2.00	0.09	0.00	0.09	55.00	0.00	0.00	0.00
3.00	0.12	0.00	0.12	56.00	0.00	0.00	0.00
4.00	0.15	0.00	0.15	57.00	0.00	0.00	0.00
5.00	0.17	0.00	0.17	58.00	0.00	0.00	0.00
6.00	0.19	0.00	0.19	59.00	0.00	0.00	0.00
7.00	0.24	0.00	0.24	60.00	0.00	0.00	0.00
8.00	0.31	0.00	0.31	61.00	0.00	0.00	0.00
9.00	0.39	0.00	0.39	62.00	0.00	0.00	0.00
10.00	0.60	0.00	0.60	63.00	0.00	0.00	0.00
11.00	0.76	0.00	0.76	64.00	0.00	0.00	0.00
12.00	<b>3.12</b>	0.00	<b>3.12</b>	65.00	0.00	0.00	0.00
13.00	<b>3.49</b>	0.00	<b>3.49</b>	66.00	0.00	0.00	0.00
14.00	1.51	0.00	1.51	67.00	0.00	0.00	0.00
15.00	1.11	0.00	1.11	68.00	0.00	0.00	0.00
16.00	0.89	0.00	0.89	69.00	0.00	0.00	0.00
17.00	0.86	0.00	0.86	70.00	0.00	0.00	0.00
18.00	0.82	0.00	0.82	71.00	0.00	0.00	0.00
19.00	0.70	0.00	0.70	72.00	0.00	0.00	0.00
20.00	0.55	0.00	0.55				
21.00	0.31	0.00	0.31				
22.00	0.27	0.00	0.27				
23.00	0.24	0.00	0.24				
24.00	0.19	0.00	0.19				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				
52.00	0.00	0.00	0.00				



**Pre vs Post\_drain time**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 17S: PDA-1B-a**

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

Runoff = 0.90 cfs @ 1.09 hrs, Volume= 0.064 af, Depth= 0.51"

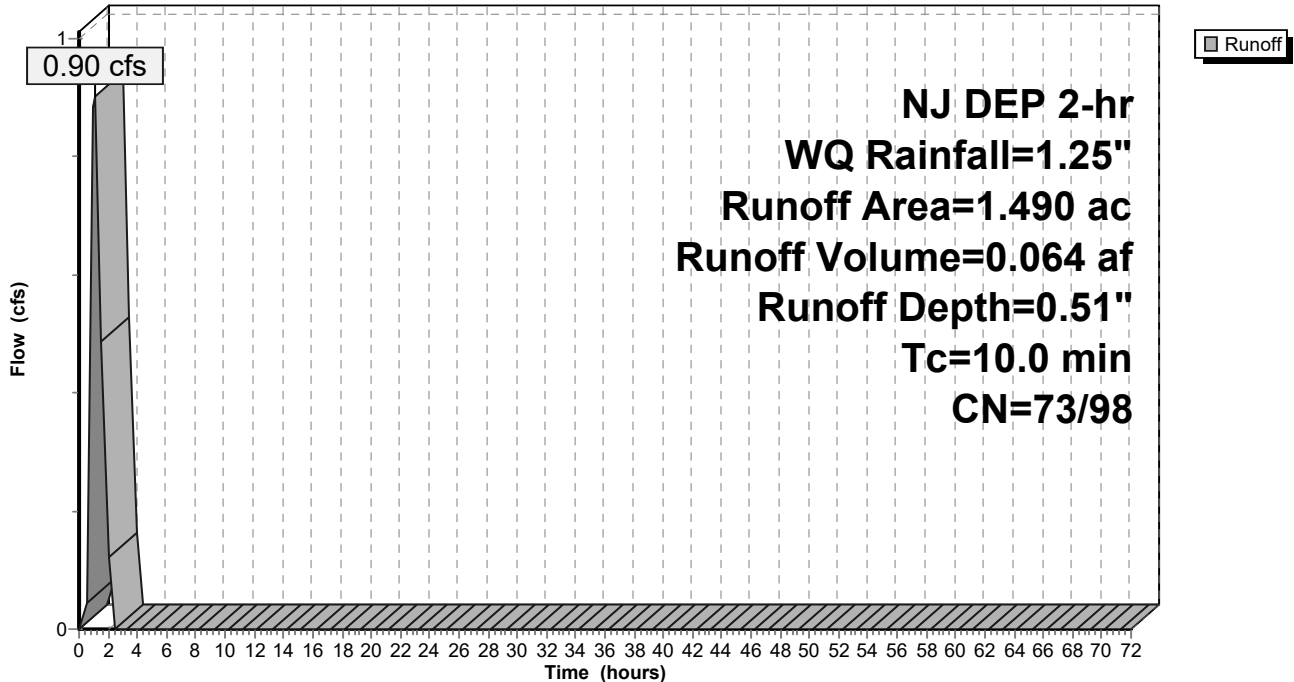
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.270	70	Woods, Good, HSG C
0.690	98	Paved parking, HSG C
0.530	74	>75% Grass cover, Good, HSG C
1.490	84	Weighted Average
0.800	73	53.69% Pervious Area
0.690	98	46.31% Impervious Area

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

**Subcatchment 17S: PDA-1B-a**

Hydrograph



**Pre vs Post\_drain time**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Hydrograph for Subcatchment 17S: PDA-1B-a**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
2.50	<b>1.25</b>	<b>0.06</b>	<b>1.03</b>	<b>0.00</b>
5.00	1.25	0.06	1.03	0.00
7.50	1.25	0.06	1.03	0.00
10.00	1.25	0.06	1.03	0.00
12.50	1.25	0.06	1.03	0.00
15.00	1.25	0.06	1.03	0.00
17.50	1.25	0.06	1.03	0.00
20.00	1.25	0.06	1.03	0.00
22.50	1.25	0.06	1.03	0.00
25.00	1.25	0.06	1.03	0.00
27.50	1.25	0.06	1.03	0.00
30.00	1.25	0.06	1.03	0.00
32.50	1.25	0.06	1.03	0.00
35.00	1.25	0.06	1.03	0.00
37.50	1.25	0.06	1.03	0.00
40.00	1.25	0.06	1.03	0.00
42.50	1.25	0.06	1.03	0.00
45.00	1.25	0.06	1.03	0.00
47.50	1.25	0.06	1.03	0.00
50.00	1.25	0.06	1.03	0.00
52.50	1.25	0.06	1.03	0.00
55.00	1.25	0.06	1.03	0.00
57.50	1.25	0.06	1.03	0.00
60.00	1.25	0.06	1.03	0.00
62.50	1.25	0.06	1.03	0.00
65.00	1.25	0.06	1.03	0.00
67.50	1.25	0.06	1.03	0.00
70.00	1.25	0.06	1.03	0.00

**Pre vs Post\_drain time**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 18S: PDA-1B-b**

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

Runoff = 0.94 cfs @ 1.08 hrs, Volume= 0.064 af, Depth= 0.87"

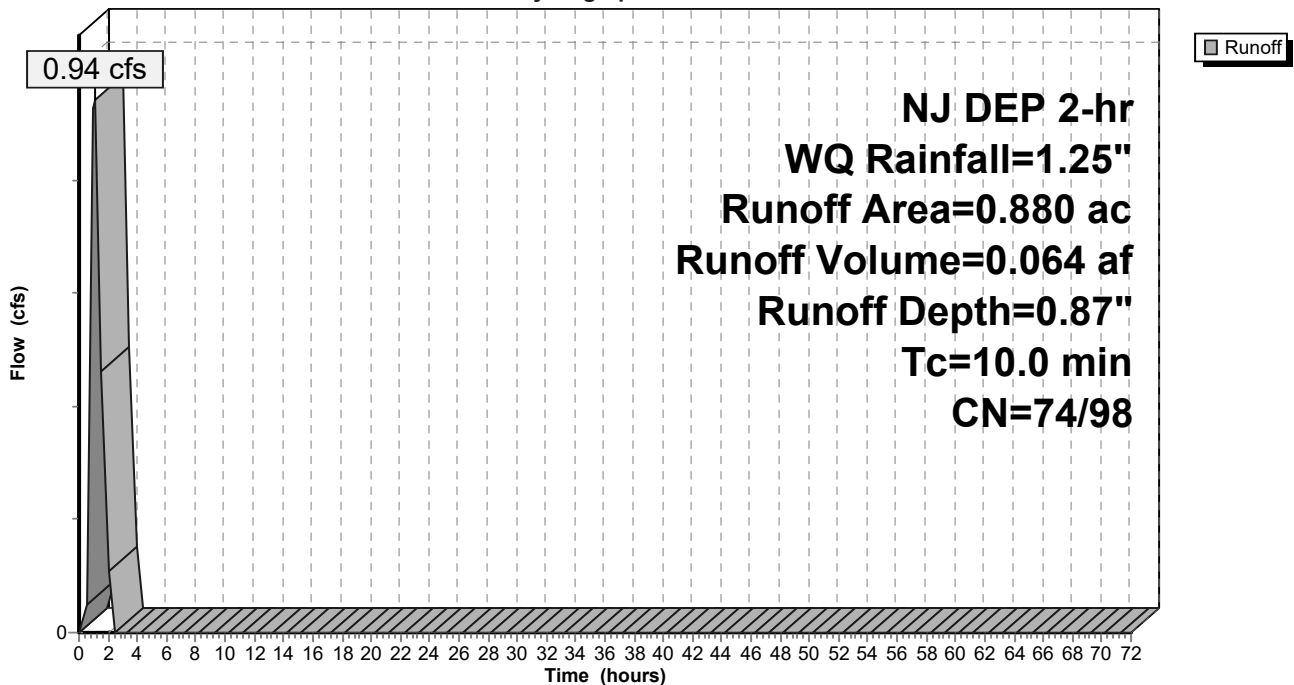
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.730	98	Paved parking, HSG C
0.150	74	>75% Grass cover, Good, HSG C
0.880	94	Weighted Average
0.150	74	17.05% Pervious Area
0.730	98	82.95% Impervious Area

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

**Subcatchment 18S: PDA-1B-b**

Hydrograph



**Pre vs Post\_drain time**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Hydrograph for Subcatchment 18S: PDA-1B-b**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
2.50	<b>1.25</b>	<b>0.07</b>	<b>1.03</b>	<b>0.00</b>
5.00	1.25	0.07	1.03	0.00
7.50	1.25	0.07	1.03	0.00
10.00	1.25	0.07	1.03	0.00
12.50	1.25	0.07	1.03	0.00
15.00	1.25	0.07	1.03	0.00
17.50	1.25	0.07	1.03	0.00
20.00	1.25	0.07	1.03	0.00
22.50	1.25	0.07	1.03	0.00
25.00	1.25	0.07	1.03	0.00
27.50	1.25	0.07	1.03	0.00
30.00	1.25	0.07	1.03	0.00
32.50	1.25	0.07	1.03	0.00
35.00	1.25	0.07	1.03	0.00
37.50	1.25	0.07	1.03	0.00
40.00	1.25	0.07	1.03	0.00
42.50	1.25	0.07	1.03	0.00
45.00	1.25	0.07	1.03	0.00
47.50	1.25	0.07	1.03	0.00
50.00	1.25	0.07	1.03	0.00
52.50	1.25	0.07	1.03	0.00
55.00	1.25	0.07	1.03	0.00
57.50	1.25	0.07	1.03	0.00
60.00	1.25	0.07	1.03	0.00
62.50	1.25	0.07	1.03	0.00
65.00	1.25	0.07	1.03	0.00
67.50	1.25	0.07	1.03	0.00
70.00	1.25	0.07	1.03	0.00

**Pre vs Post\_drain time**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 24S: PDA-1B-c**

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

Runoff = 1.79 cfs @ 1.11 hrs, Volume= 0.131 af, Depth= 0.38"

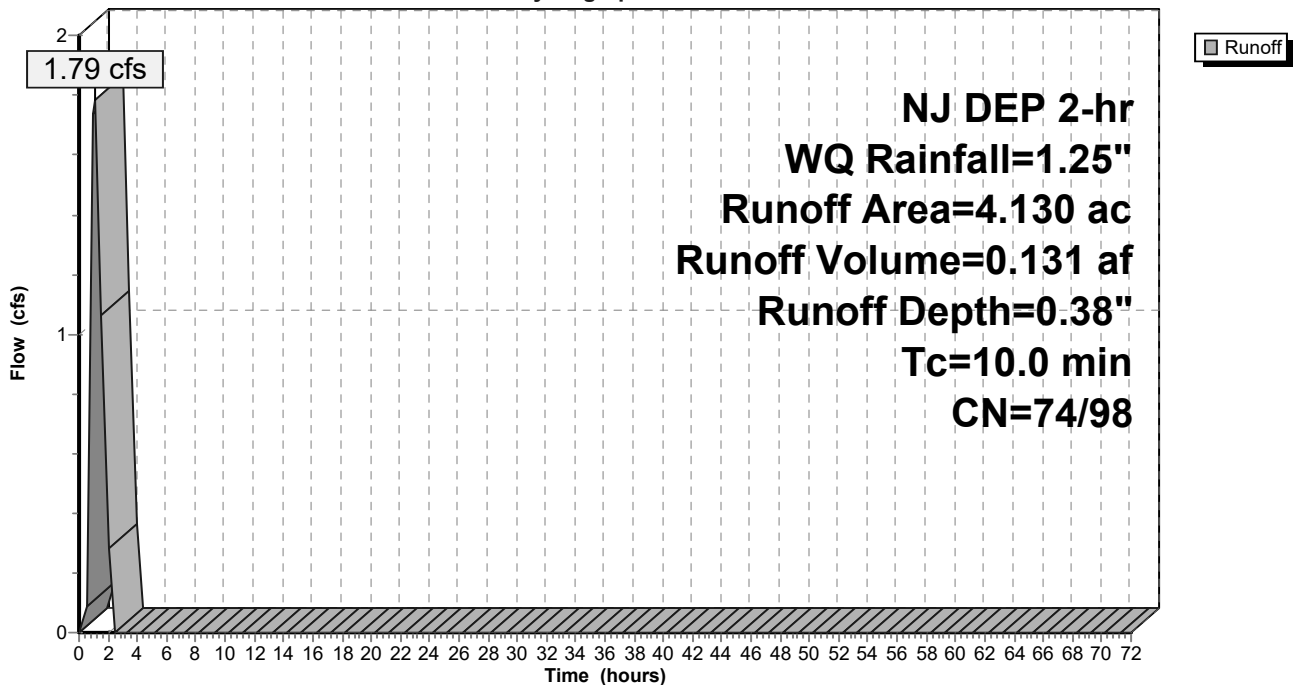
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
2.810	74	>75% Grass cover, Good, HSG C
* 1.320	98	Impervious
4.130	82	Weighted Average
2.810	74	68.04% Pervious Area
1.320	98	31.96% Impervious Area

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

**Subcatchment 24S: PDA-1B-c**

Hydrograph



**NJ DEP 2-hr  
 WQ Rainfall=1.25"  
 Runoff Area=4.130 ac  
 Runoff Volume=0.131 af  
 Runoff Depth=0.38"  
 Tc=10.0 min  
 CN=74/98**

**Pre vs Post\_drain time**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Hydrograph for Subcatchment 24S: PDA-1B-c**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
2.50	<b>1.25</b>	<b>0.07</b>	<b>1.03</b>	<b>0.00</b>
5.00	1.25	0.07	1.03	0.00
7.50	1.25	0.07	1.03	0.00
10.00	1.25	0.07	1.03	0.00
12.50	1.25	0.07	1.03	0.00
15.00	1.25	0.07	1.03	0.00
17.50	1.25	0.07	1.03	0.00
20.00	1.25	0.07	1.03	0.00
22.50	1.25	0.07	1.03	0.00
25.00	1.25	0.07	1.03	0.00
27.50	1.25	0.07	1.03	0.00
30.00	1.25	0.07	1.03	0.00
32.50	1.25	0.07	1.03	0.00
35.00	1.25	0.07	1.03	0.00
37.50	1.25	0.07	1.03	0.00
40.00	1.25	0.07	1.03	0.00
42.50	1.25	0.07	1.03	0.00
45.00	1.25	0.07	1.03	0.00
47.50	1.25	0.07	1.03	0.00
50.00	1.25	0.07	1.03	0.00
52.50	1.25	0.07	1.03	0.00
55.00	1.25	0.07	1.03	0.00
57.50	1.25	0.07	1.03	0.00
60.00	1.25	0.07	1.03	0.00
62.50	1.25	0.07	1.03	0.00
65.00	1.25	0.07	1.03	0.00
67.50	1.25	0.07	1.03	0.00
70.00	1.25	0.07	1.03	0.00

**Pre vs Post\_drain time**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Subcatchment 27S: PDA-1B-d**

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

Runoff = 0.18 cfs @ 1.08 hrs, Volume= 0.013 af, Depth= 0.69"

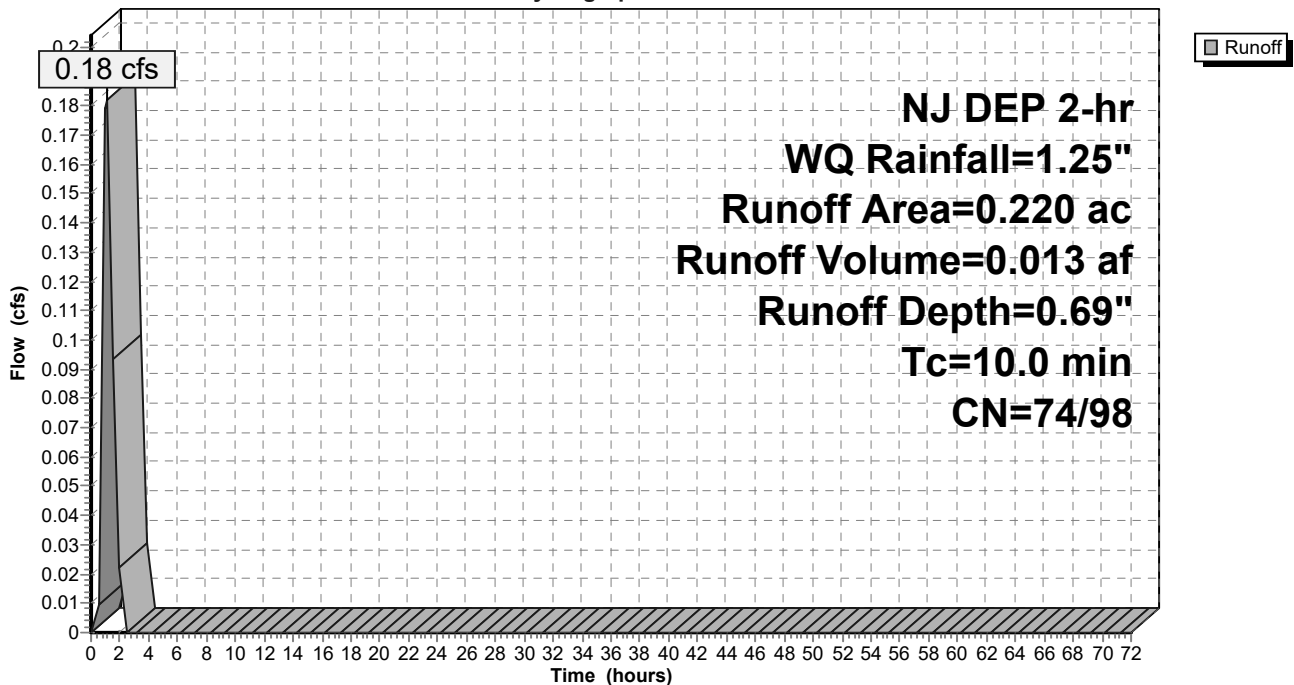
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 NJ DEP 2-hr WQ Rainfall=1.25"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG A
0.080	74	>75% Grass cover, Good, HSG C
0.220	89	Weighted Average
0.080	74	36.36% Pervious Area
0.140	98	63.64% Impervious Area

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

**Subcatchment 27S: PDA-1B-d**

Hydrograph



**Pre vs Post\_drain time**

*NJ DEP 2-hr WQ Rainfall=1.25"*

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**Hydrograph for Subcatchment 27S: PDA-1B-d**

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
2.50	<b>1.25</b>	<b>0.07</b>	<b>1.03</b>	<b>0.00</b>
5.00	1.25	0.07	1.03	0.00
7.50	1.25	0.07	1.03	0.00
10.00	1.25	0.07	1.03	0.00
12.50	1.25	0.07	1.03	0.00
15.00	1.25	0.07	1.03	0.00
17.50	1.25	0.07	1.03	0.00
20.00	1.25	0.07	1.03	0.00
22.50	1.25	0.07	1.03	0.00
25.00	1.25	0.07	1.03	0.00
27.50	1.25	0.07	1.03	0.00
30.00	1.25	0.07	1.03	0.00
32.50	1.25	0.07	1.03	0.00
35.00	1.25	0.07	1.03	0.00
37.50	1.25	0.07	1.03	0.00
40.00	1.25	0.07	1.03	0.00
42.50	1.25	0.07	1.03	0.00
45.00	1.25	0.07	1.03	0.00
47.50	1.25	0.07	1.03	0.00
50.00	1.25	0.07	1.03	0.00
52.50	1.25	0.07	1.03	0.00
55.00	1.25	0.07	1.03	0.00
57.50	1.25	0.07	1.03	0.00
60.00	1.25	0.07	1.03	0.00
62.50	1.25	0.07	1.03	0.00
65.00	1.25	0.07	1.03	0.00
67.50	1.25	0.07	1.03	0.00
70.00	1.25	0.07	1.03	0.00



**Pre vs Post\_drain time**

NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Pond 2P: Ex. Detention Basin**

Inflow Area = 6.720 ac, 42.86% Impervious, Inflow Depth = 0.49" for WQ event  
 Inflow = 2.63 cfs @ 1.14 hrs, Volume= 0.275 af  
 Outflow = 0.34 cfs @ 2.95 hrs, Volume= 0.256 af, Atten= 87%, Lag= 108.2 min  
 Primary = 0.10 cfs @ 2.95 hrs, Volume= 0.076 af  
 Secondary = 0.24 cfs @ 2.95 hrs, Volume= 0.180 af  
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 105.19' @ 2.95 hrs Surf.Area= 53,692 sf Storage= 10,015 cf

Plug-Flow detention time= 703.8 min calculated for 0.254 af (92% of inflow)  
 Center-of-Mass det. time= 715.5 min ( 813.7 - 98.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	105.00'	186,871 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
105.00	52,708	0	0
106.00	57,935	55,322	55,322
107.00	67,082	62,509	117,830
108.00	71,000	69,041	186,871

Device	Routing	Invert	Outlet Devices
#1	Primary	105.00'	<b>18.0" Round RCP_Round 18"</b> L= 15.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0333 1/8" Cc= 0.900 n= 0.015, Flow Area= 1.77 sf
#2	Device 1	105.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	106.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Secondary	105.00'	<b>8.0" Round Culvert X 2.00</b> L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 105.00' / 104.50' S= 0.0238 1/8" Cc= 0.900 n= 0.010, Flow Area= 0.35 sf
#5	Tertiary	107.00'	<b>50.0' long x 10.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

**Primary OutFlow** Max=0.10 cfs @ 2.95 hrs HW=105.19' (Free Discharge)

- ↑ 1=RCP\_Round 18" (Passes 0.10 cfs of 0.19 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.10 cfs @ 1.47 fps)
- ↑ 3=Orifice/Grate ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.24 cfs @ 2.95 hrs HW=105.19' (Free Discharge)

- ↑ 4=Culvert (Inlet Controls 0.24 cfs @ 1.47 fps)

**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=105.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

**Pre vs Post\_drain time**

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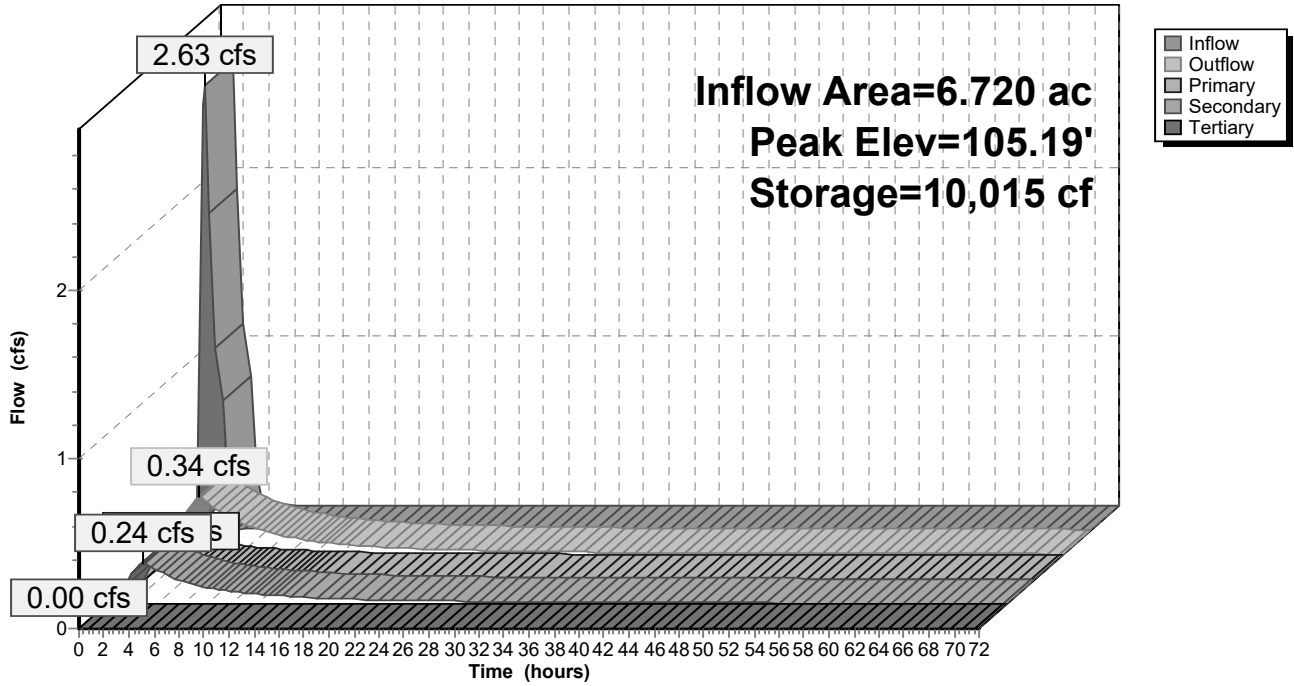
NJ DEP 2-hr WQ Rainfall=1.25"

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**Pond 2P: Ex. Detention Basin**

Hydrograph



**Pre vs Post\_drain time**

*NJ DEP 2-hr WQ Rainfall=1.25"*

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**Hydrograph for Pond 2P: Ex. Detention Basin**

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)	Tertiary (cfs)
0.00	<b>0.00</b>	0	105.00	0.00	0.00	0.00	<b>0.00</b>
2.50	<b>0.77</b>	<b>9,744</b>	<b>105.18</b>	<b>0.32</b>	<b>0.10</b>	<b>0.23</b>	0.00
5.00	0.01	<b>8,182</b>	<b>105.15</b>	<b>0.23</b>	<b>0.07</b>	<b>0.16</b>	0.00
7.50	0.00	6,523	105.12	0.15	0.05	0.11	0.00
10.00	0.00	5,397	105.10	0.11	0.03	0.07	0.00
12.50	0.00	4,593	105.09	0.08	0.02	0.05	0.00
15.00	0.00	3,985	105.08	0.06	0.02	0.04	0.00
17.50	0.00	3,511	105.07	0.05	0.01	0.03	0.00
20.00	0.00	3,142	105.06	0.04	0.01	0.03	0.00
22.50	0.00	2,840	105.05	0.03	0.01	0.02	0.00
25.00	0.00	2,582	105.05	0.03	0.01	0.02	0.00
27.50	0.00	2,360	105.04	0.02	0.01	0.02	0.00
30.00	0.00	2,171	105.04	0.02	0.01	0.01	0.00
32.50	0.00	2,008	105.04	0.02	0.01	0.01	0.00
35.00	0.00	1,869	105.04	0.01	0.00	0.01	0.00
37.50	0.00	1,751	105.03	0.01	0.00	0.01	0.00
40.00	0.00	1,649	105.03	0.01	0.00	0.01	0.00
42.50	0.00	1,561	105.03	0.01	0.00	0.01	0.00
45.00	0.00	1,481	105.03	0.01	0.00	0.01	0.00
47.50	0.00	1,404	105.03	0.01	0.00	0.01	0.00
50.00	0.00	1,331	105.03	0.01	0.00	0.01	0.00
52.50	0.00	1,262	105.02	0.01	0.00	0.01	0.00
55.00	0.00	1,197	105.02	0.01	0.00	0.00	0.00
57.50	0.00	1,135	105.02	0.01	0.00	0.00	0.00
60.00	0.00	1,076	105.02	0.01	0.00	0.00	0.00
62.50	0.00	1,020	105.02	0.01	0.00	0.00	0.00
65.00	0.00	967	105.02	0.01	0.00	0.00	0.00
67.50	0.00	917	105.02	0.01	0.00	0.00	0.00
70.00	0.00	869	105.02	0.01	0.00	0.00	0.00

**Pre vs Post\_drain time**

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**Summary for Pond 10P: BIO BASIN 1**

[44] Hint: Outlet device #4 is below defined storage

Inflow Area = 1.710 ac, 48.54% Impervious, Inflow Depth = 0.53" for WQ event  
 Inflow = 0.93 cfs @ 1.11 hrs, Volume= 0.076 af  
 Outflow = 0.40 cfs @ 1.50 hrs, Volume= 0.078 af, Atten= 57%, Lag= 23.7 min  
 Primary = 0.40 cfs @ 1.50 hrs, Volume= 0.078 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 109.39' @ 1.71 hrs Surf.Area= 3,117 sf Storage= 1,139 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)  
 Center-of-Mass det. time= 30.3 min ( 133.7 - 103.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	109.00'	16,075 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.00	2,682	0	0
110.00	3,789	3,236	3,236
111.00	4,677	4,233	7,469
112.00	5,873	5,275	12,744
112.50	7,453	3,332	16,075

Device	Routing	Invert	Outlet Devices
#1	Primary	106.16'	<b>18.0" Round Culvert</b> L= 636.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 106.16' / 104.50' S= 0.0026 1' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Device 1	110.00'	<b>2.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s)
#3	Device 1	111.00'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#4	Device 1	106.34'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.40 cfs @ 1.50 hrs HW=109.37' (Free Discharge)

- 1=Culvert (Passes 0.40 cfs of 7.71 cfs potential flow)
- 2=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)
- 3=Orifice/Grate ( Controls 0.00 cfs)
- 4=Orifice/Grate (Orifice Controls 0.40 cfs @ 8.21 fps)

**Pre vs Post\_drain time**

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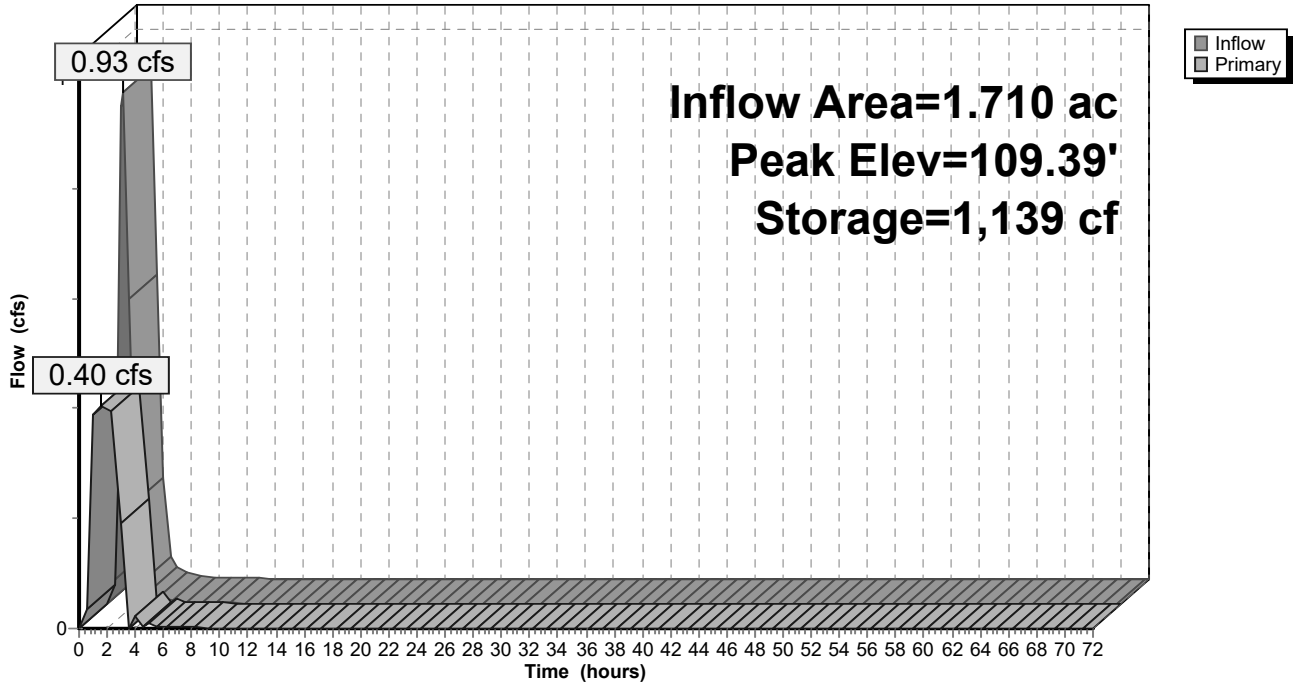
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**Pond 10P: BIO BASIN 1**

Hydrograph



**Pre vs Post\_drain time**

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**Hydrograph for Pond 10P: BIO BASIN 1**

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	<b>0.00</b>	<b>0</b>	<b>109.00</b>	<b>0.00</b>
2.50	<b>0.04</b>	<b>512</b>	<b>109.18</b>	<b>0.39</b>
5.00	0.01	2	109.00	0.01
7.50	0.00	1	109.00	0.00
10.00	0.00	0	109.00	0.00
12.50	0.00	0	109.00	0.00
15.00	0.00	0	109.00	0.00
17.50	0.00	0	109.00	0.00
20.00	0.00	0	109.00	0.00
22.50	0.00	0	109.00	0.00
25.00	0.00	0	109.00	0.00
27.50	0.00	0	109.00	0.00
30.00	0.00	0	109.00	0.00
32.50	0.00	0	109.00	0.00
35.00	0.00	0	109.00	0.00
37.50	0.00	0	109.00	0.00
40.00	0.00	0	109.00	0.00
42.50	0.00	0	109.00	0.00
45.00	0.00	0	109.00	0.00
47.50	0.00	0	109.00	0.00
50.00	0.00	0	109.00	0.00
52.50	0.00	0	109.00	0.00
55.00	0.00	0	109.00	0.00
57.50	0.00	0	109.00	0.00
60.00	0.00	0	109.00	0.00
62.50	0.00	0	109.00	0.00
65.00	0.00	0	109.00	0.00
67.50	0.00	0	109.00	0.00
70.00	0.00	0	109.00	0.00

**Pre vs Post\_drain time**

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**Summary for Pond 11P: BIO BASIN 2**

[44] Hint: Outlet device #5 is below defined storage

Inflow Area = 0.880 ac, 82.95% Impervious, Inflow Depth = 0.87" for WQ event  
 Inflow = 0.94 cfs @ 1.08 hrs, Volume= 0.064 af  
 Outflow = 0.40 cfs @ 1.62 hrs, Volume= 0.066 af, Atten= 58%, Lag= 32.4 min  
 Primary = 0.40 cfs @ 1.62 hrs, Volume= 0.066 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 108.92' @ 1.62 hrs Surf.Area= 2,708 sf Storage= 1,071 cf

Plug-Flow detention time= 28.9 min calculated for 0.064 af (100% of inflow)  
 Center-of-Mass det. time= 30.7 min ( 103.0 - 72.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	108.50'	15,574 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
108.50	2,430	0	0
109.00	2,763	1,298	1,298
110.00	3,471	3,117	4,415
111.00	4,237	3,854	8,269
112.00	5,059	4,648	12,917
112.50	5,569	2,657	15,574

Device	Routing	Invert	Outlet Devices
#1	Primary	105.50'	<b>18.0" Round Culvert</b> L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 105.50' / 105.26' S= 0.0030 1/1' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	109.50'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	110.50'	<b>4.0' long Sharp-Crested Rectangular Weir</b> 2 End Contraction(s) 0.5' Crest Height
#4	Device 1	111.50'	<b>48.0" x 48.0" Horiz. Orifice/Grate</b> C= 0.600 in 48.0" x 48.0" Grate (100% open area) Limited to weir flow at low heads
#5	Device 1	105.93'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.40 cfs @ 1.62 hrs HW=108.89' (Free Discharge)

- 1=Culvert (Passes 0.40 cfs of 12.97 cfs potential flow)
- 2=Orifice/Grate ( Controls 0.00 cfs)
- 3=Sharp-Crested Rectangular Weir ( Controls 0.00 cfs)
- 4=Orifice/Grate ( Controls 0.00 cfs)
- 5=Orifice/Grate (Orifice Controls 0.40 cfs @ 8.11 fps)

**Pre vs Post\_drain time**

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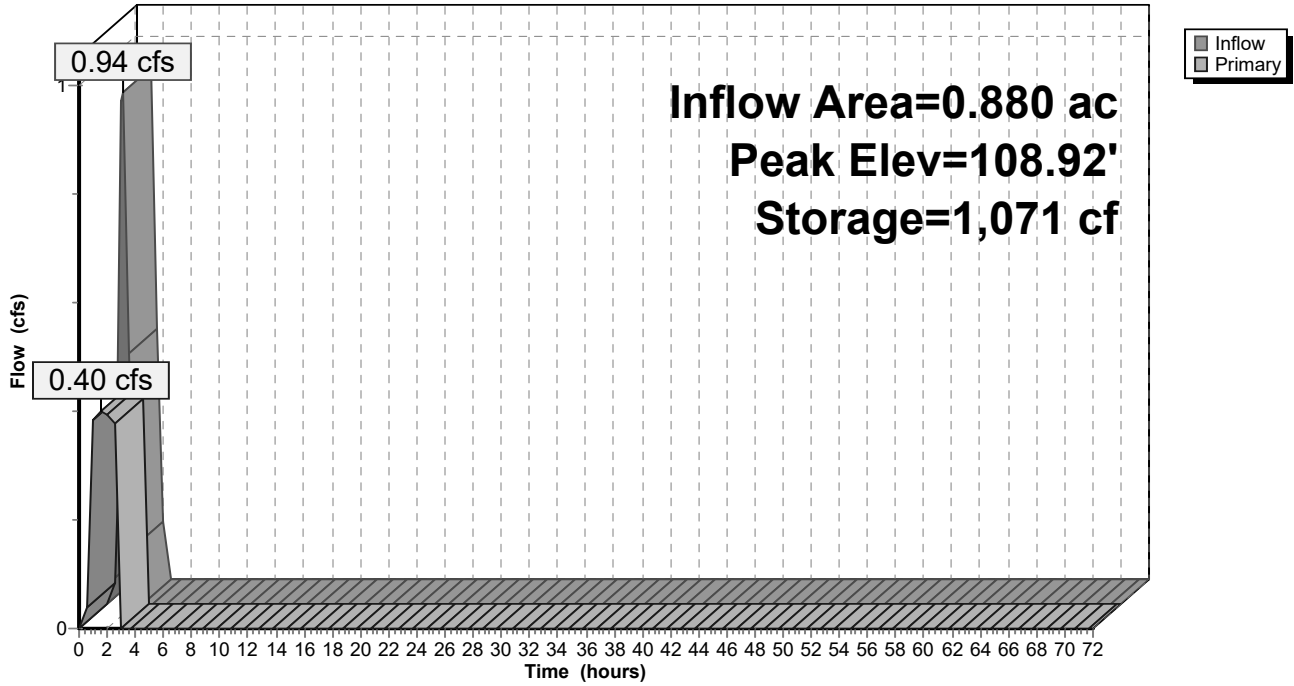
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**Pond 11P: BIO BASIN 2**

Hydrograph





**Pre vs Post\_drain time**

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**Hydrograph for Pond 11P: BIO BASIN 2**

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	<b>0.00</b>	<b>0</b>	<b>108.50</b>	<b>0.00</b>
2.50	<b>0.00</b>	<b>253</b>	<b>108.60</b>	<b>0.38</b>
5.00	0.00	0	108.50	0.00
7.50	0.00	0	108.50	0.00
10.00	0.00	0	108.50	0.00
12.50	0.00	0	108.50	0.00
15.00	0.00	0	108.50	0.00
17.50	0.00	0	108.50	0.00
20.00	0.00	0	108.50	0.00
22.50	0.00	0	108.50	0.00
25.00	0.00	0	108.50	0.00
27.50	0.00	0	108.50	0.00
30.00	0.00	0	108.50	0.00
32.50	0.00	0	108.50	0.00
35.00	0.00	0	108.50	0.00
37.50	0.00	0	108.50	0.00
40.00	0.00	0	108.50	0.00
42.50	0.00	0	108.50	0.00
45.00	0.00	0	108.50	0.00
47.50	0.00	0	108.50	0.00
50.00	0.00	0	108.50	0.00
52.50	0.00	0	108.50	0.00
55.00	0.00	0	108.50	0.00
57.50	0.00	0	108.50	0.00
60.00	0.00	0	108.50	0.00
62.50	0.00	0	108.50	0.00
65.00	0.00	0	108.50	0.00
67.50	0.00	0	108.50	0.00
70.00	0.00	0	108.50	0.00

**Pre vs Post\_drain time**

NJ DEP 2-hr WQ Rainfall=1.25"

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**Summary for Pond 29P: PERV. PVMT-Rear**

Inflow Area = 0.220 ac, 63.64% Impervious, Inflow Depth = 0.69" for WQ event  
 Inflow = 0.18 cfs @ 1.08 hrs, Volume= 0.013 af  
 Outflow = 0.07 cfs @ 1.70 hrs, Volume= 0.013 af, Atten= 59%, Lag= 37.0 min  
 Primary = 0.07 cfs @ 1.70 hrs, Volume= 0.013 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs  
 Peak Elev= 111.03' @ 1.71 hrs Surf.Area= 0.107 ac Storage= 0.008 af

Plug-Flow detention time= 184.9 min calculated for 0.013 af (100% of inflow)  
 Center-of-Mass det. time= 182.8 min ( 255.5 - 72.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	110.85'	0.053 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 0.134 af Overall x 40.0% Voids

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
110.85	0.107	0.000	0.000
112.10	0.107	0.134	0.134

Device	Routing	Invert	Outlet Devices
#1	Primary	110.85'	<b>6.0" Round Culvert</b> L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 110.85' / 110.00' S= 0.0163 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=0.07 cfs @ 1.70 hrs HW=111.02' (Free Discharge)  
 ↑1=Culvert (Inlet Controls 0.07 cfs @ 1.12 fps)

**Pre vs Post\_drain time**

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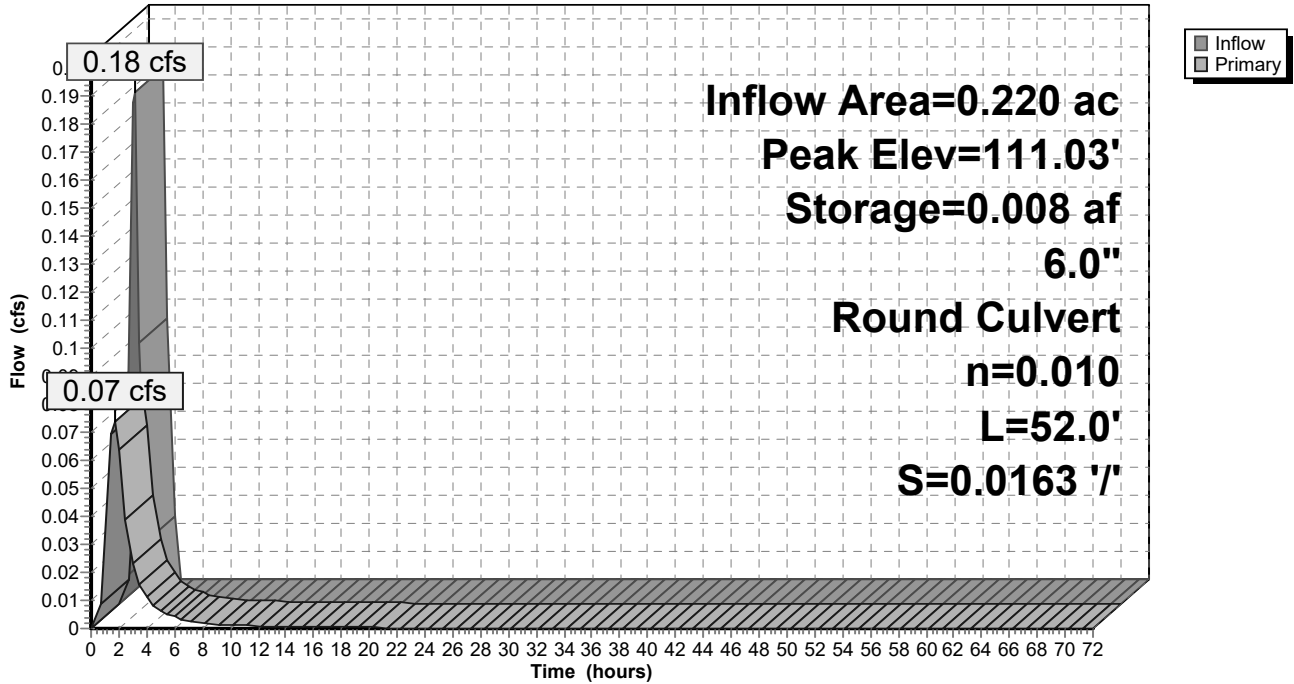
NJ DEP 2-hr WQ Rainfall=1.25"

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**Pond 29P: PERV. PVMT-Rear**

Hydrograph



**Pre vs Post\_drain time**

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NJ DEP 2-hr WQ Rainfall=1.25"

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**Hydrograph for Pond 29P: PERV. PVMT-Rear**

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	<b>0.00</b>	<b>0.000</b>	<b>110.85</b>	<b>0.00</b>
2.50	<b>0.00</b>	<b>0.006</b>	<b>110.98</b>	<b>0.04</b>
5.00	0.00	0.002	110.90	0.01
7.50	0.00	0.001	110.88	0.00
10.00	0.00	0.001	110.87	0.00
12.50	0.00	0.001	110.87	0.00
15.00	0.00	0.001	110.86	0.00
17.50	0.00	0.001	110.86	0.00
20.00	0.00	0.000	110.86	0.00
22.50	0.00	0.000	110.86	0.00
25.00	0.00	0.000	110.86	0.00
27.50	0.00	0.000	110.86	0.00
30.00	0.00	0.000	110.86	0.00
32.50	0.00	0.000	110.85	0.00
35.00	0.00	0.000	110.85	0.00
37.50	0.00	0.000	110.85	0.00
40.00	0.00	0.000	110.85	0.00
42.50	0.00	0.000	110.85	0.00
45.00	0.00	0.000	110.85	0.00
47.50	0.00	0.000	110.85	0.00
50.00	0.00	0.000	110.85	0.00
52.50	0.00	0.000	110.85	0.00
55.00	0.00	0.000	110.85	0.00
57.50	0.00	0.000	110.85	0.00
60.00	0.00	0.000	110.85	0.00
62.50	0.00	0.000	110.85	0.00
65.00	0.00	0.000	110.85	0.00
67.50	0.00	0.000	110.85	0.00
70.00	0.00	0.000	110.85	0.00

**Pre vs Post\_drain time**

Prepared by {enter your company name here}

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NJ DEP 2-hr WQ Rainfall=1.25"

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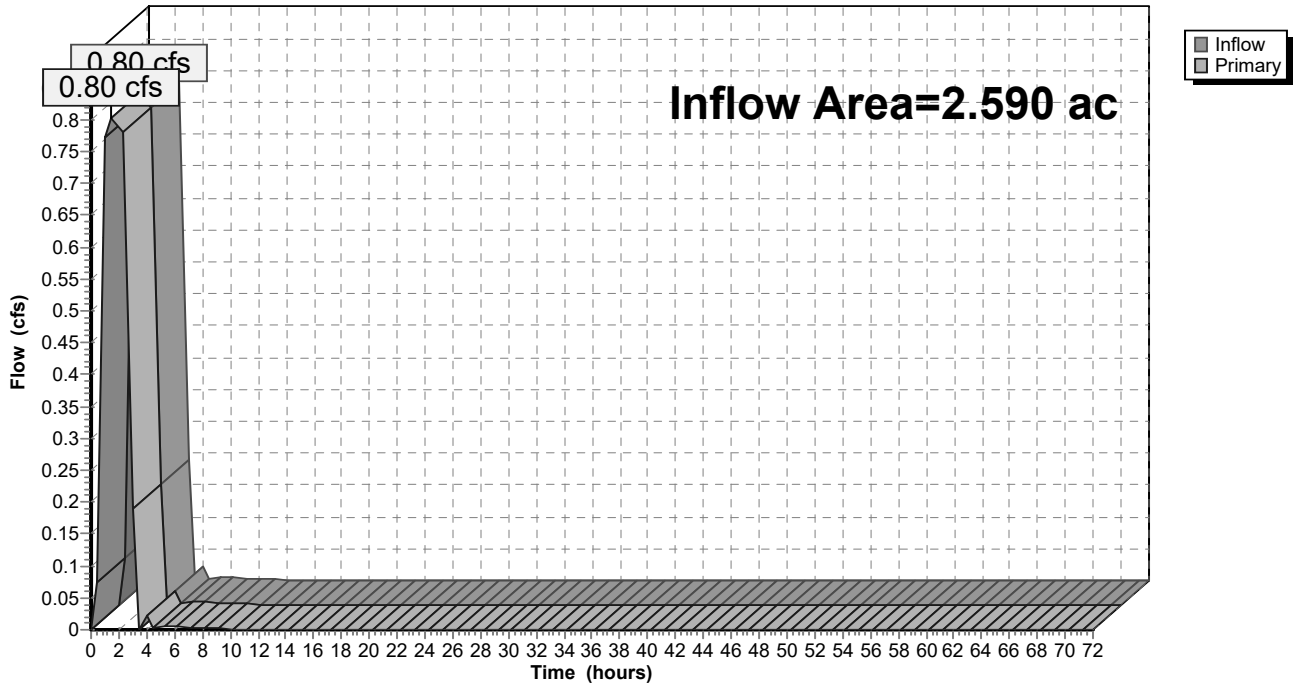
**Summary for Link 28L: MH 101**

Inflow Area = 2.590 ac, 60.23% Impervious, Inflow Depth = 0.67" for WQ event  
Inflow = 0.80 cfs @ 1.50 hrs, Volume= 0.144 af  
Primary = 0.80 cfs @ 1.50 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.50 hrs

**Link 28L: MH 101**

Hydrograph



**Pre vs Post\_drain time**

Prepared by {enter your company name here}

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NJ DEP 2-hr WQ Rainfall=1.25"

Printed 10/20/2021

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**Hydrograph for Link 28L: MH 101**

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	<b>0.00</b>	0.00	53.00	0.00	0.00	0.00
1.00	<b>0.77</b>	0.00	<b>0.77</b>	54.00	0.00	0.00	0.00
2.00	<b>0.80</b>	0.00	<b>0.80</b>	55.00	0.00	0.00	0.00
3.00	0.19	0.00	0.19	56.00	0.00	0.00	0.00
4.00	0.02	0.00	0.02	57.00	0.00	0.00	0.00
5.00	0.01	0.00	0.01	58.00	0.00	0.00	0.00
6.00	0.01	0.00	0.01	59.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	62.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	63.00	0.00	0.00	0.00
11.00	0.00	0.00	0.00	64.00	0.00	0.00	0.00
12.00	0.00	0.00	0.00	65.00	0.00	0.00	0.00
13.00	0.00	0.00	0.00	66.00	0.00	0.00	0.00
14.00	0.00	0.00	0.00	67.00	0.00	0.00	0.00
15.00	0.00	0.00	0.00	68.00	0.00	0.00	0.00
16.00	0.00	0.00	0.00	69.00	0.00	0.00	0.00
17.00	0.00	0.00	0.00	70.00	0.00	0.00	0.00
18.00	0.00	0.00	0.00	71.00	0.00	0.00	0.00
19.00	0.00	0.00	0.00	72.00	0.00	0.00	0.00
20.00	0.00	0.00	0.00				
21.00	0.00	0.00	0.00				
22.00	0.00	0.00	0.00				
23.00	0.00	0.00	0.00				
24.00	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				
52.00	0.00	0.00	0.00				

## Annual Groundwater Recharge Analysis (based on GSR-32)

New Jersey  
Groundwater  
Recharge  
Spreadsheet  
Version 2.0  
November, 2003

<b>Project Name:</b> L'Oreal Franklin	
<b>Description:</b> Building Expansion	
<b>Analysis Date:</b> 10/06/21	

### Post-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	0.15	Open space	Alluvial Land	0.0	-
2	0.9	Woods	Alluvial Land	0.0	-
3	0.16	Impervious areas	Alluvial Land	0.0	-
4	3.91	Open space	Alluvial Land	0.0	-
5	0.83	Woods	Alluvial Land	0.0	-
6	6.96	Impervious areas	Alluvial Land	0.0	-
7	0.05	Gravel, dirt	Alluvial Land	0.0	-
8	1.33	Woods	Alluvial Land	0.0	-
9	3.46	Open space	Alluvial Land	0.0	-
10	11.83	Impervious areas	Alluvial Land	0.0	-
11	0				
12	0				
13	0				
14	0				
15	0				
<b>Total =</b>	<b>29.6</b>			<b>0.0</b>	<b>Total Annual Recharge (cu.ft)</b>

### Pre-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	1.18	Woods	Alluvial Land	0.0	-
2	0.03	Open space	Alluvial Land	0.0	-
3	4.1	Open space	Alluvial Land	0.0	-
4	6.73	Impervious areas	Alluvial Land	0.0	-
5	0.87	Woods	Alluvial Land	0.0	-
6	2.33	Open space	Alluvial Land	0.0	-
7	9.15	Woods	Alluvial Land	0.0	-
8	5.19	Impervious areas	Alluvial Land	0.0	-
9	0				
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
<b>Total =</b>	<b>29.6</b>			<b>0.0</b>	<b>Total Annual Recharge (cu.ft)</b>

**Annual Recharge Requirements Calculation ↓**

<b>% of Pre-Developed Annual Recharge to Preserve =</b>	<b>100%</b>
<b>Post-Development Annual Recharge Deficit=</b>	<b>0</b>
<b>Recharge Efficiency Parameters Calculations (area averages)</b>	
RWC= 0.00 (in)	DRWC= 0.00 (in)
ERWC = 0.00 (in)	EDRWC = 0.00 (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.

<b>Total Annual Recharge (in)</b>	<b>0.0</b>
<b>Total Annual Recharge (cu.ft)</b>	<b>825,462</b>

**NJDEP Nonstructural Strategies Points System (NSPS)**

**Version: January 31, 2006**

**Note: Input Values in Yellow Cells Only**

**Project:**

**Date:**

**User:**

**Notes:**


**Step 1 - Provide Basic Major Development Site Information**

**A. Specify Total Area in Acres of Development Site Described in Steps 2 and 3 =**  **Acres**

**B. Specify by Percent the Various Planning Areas Located within the Development Site:**

State Plan Planning Area:	PA-1	PA-2	PA-3	PA-4	PA-4B	PA-5	Total % Area
Percent of Each Planning Area within Site:	<input type="text" value="100.0%"/>	<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value="100.0%"/>

**Note:** See User's Guide for Equivalent Zones within Designated Centers and the NJ Meadowlands, Pinelands, and Highlands Districts



**Step 2 - Describe Existing or Pre-Developed Site Conditions**

**A. Specify Existing Land Use/Land Cover Descriptions and Areas:**

Site Segment	Land Use/Land Cover Description	Specify Land Use/Land Cover in Acres for Each HSG				Use/Cover Subtotals	Points
		HSG A	HSG B	HSG C	HSG D		
1	Wetlands and Undisturbed Stream Buffers					0.0	0
2	Lawn and Open Space			6.5		6.5	51
3	Brush and Shrub					0.0	0
4	Meadow, Pasture, Grassland, or Range					0.0	0
5	Row Crop					0.0	0
6	Small Grain and Legumes					0.0	0
7	Woods - Indigenous			11.2		11.2	122
8	Woods - Planted					0.0	0
9	Woods and Grass Combination					0.0	0
10	Ponds, Lakes, and Other Open Water					0.0	0
11	Gravel and Dirt			0.1		0.1	0
12	Porous and Permeable Paving					0.0	0
13	Directly Connected Impervious			11.8		11.8	0
14	Unconnected Impervious with Small D/S Pervious					0.0	0
15	Unconnected Impervious with Large D/S Pervious					0.0	0
<b>HSG Subtotals (Acres):</b>		0.0	0.0	29.6	0.0		<b>Total Area: 29.6</b>
<b>HSG Subtotals (%):</b>		0.0%	0.0%	100.0%	0.0%		<b>Total % Area: 100.0%</b>

Points Subtotal: **173**

**Total Existing Site Points: 173**

**Step 3 - Describe Proposed or Post-Developed Site Conditions**

**A. Specify Proposed Land Use/Land Cover Descriptions and Areas:**

Site Segment	Land Use/Land Cover Description	Specify Land Use/Land Cover in Acres for Each HSG				Use/Cover Subtotals	Points
		HSG A	HSG B	HSG C	HSG D		
1	Wetlands and Undisturbed Stream Buffers					0.0	0
2	Lawn and Open Space			7.9		7.9	62
3	Brush and Shrub					0.0	0
4	Meadow, Pasture, Grassland, or Range					0.0	0
5	Row Crop					0.0	0
6	Small Grain and Legumes					0.0	0
7	Woods - Indigenous			0.7		0.7	8
8	Woods - Planted			2.1		2.1	21
9	Woods and Grass Combination					0.0	0
10	Ponds, Lakes, and Other Open Water					0.0	0
11	Gravel and Dirt			0.1		0.1	0
12	Porous and Permeable Paving			0.3		0.3	2
13	Directly Connected Impervious			18.5		18.5	0
14	Unconnected Impervious with Small D/S Pervious					0.0	0
15	Unconnected Impervious with Large D/S Pervious					0.0	0
<b>HSG Subtotals (Acres):</b>		0.0	0.0	29.6	0.0		<b>Total Area:</b>
<b>HSG Subtotals (%):</b>		0.0%	0.0%	100.0%	0.0%		<b>Total % Area:</b>

**Points Subtotal: 93**

**B. Compare Proposed Impervious Coverage with Maximum Allowable Impervious Coverage:**

Total Directly Connected Impervious Coverage =  
 Total Unconnected Impervious Coverage with Small D/S Pervious =  
 Total Unconnected Impervious Coverage with Large D/S Pervious =  
 Total Site Impervious Coverage =  
 Effective Site Impervious Coverage =

63%	% of Site
0%	% of Site
0%	% of Site
63%	% of Site
63%	% of Site

Specify Source of Maximum Allowable Impervious Coverage: (None or Table)

Table
-------

Allowable Site Impervious Cover from Maximum Impervious Cover Table:  
 Note: See Maximum Impervious Cover Table Worksheet for Details

72%
-----

Points Subtotal: **6**

**C. Compare Proposed Site Disturbance with Maximum Allowable Site Disturbance:**

Total Proposed Site Disturbance =  
 Maximum Allowable Site Disturbance by Municipal Ordinance =

34%	% of Site
100%	% of Site

Points Subtotal: **30**

**D. Describe Proposed Runoff Conveyance System:**

Total Length of Runoff Conveyance System =  
 Length of Vegetated Runoff Conveyance System =  
 % of Total Runoff Conveyance System That is Vegetated =

2812	Feet
190	Feet
7%	

Points Subtotal: **6**

**E. Residential Lot Clustering:**

Percent of Total Site Area that will be Clustered =  
 Minimum Standard Lot Size as Per Zoning (Note: 1/2 Acre or Greater) =  
 Maximum Proposed Cluster Lot Size (Note: 1/4 Acre or Less) =  
 Percent of Clustered Portion of Site to be Preserved as Vegetated Open Space =

	% of Site
	Acres
	Acres
	% of Clustered Site Portion

Points Subtotal: **0**

**F. Will the Following be Utilized to Minimize Soil Compaction?**

Proposed Lawn Areas will be Graded with Lightweight Construction Equipment:  
Percent of Proposed Lawn Areas to be Graded with Such Equipment:

Yes
100%

(Yes or No)  
% of Lawn Areas

Points Subtotal: **23**

**G. Are Any of the Following Stormwater Management Standards Met Using Only Nonstructural Strategies and Measures?**

Groundwater Recharge Standards (NJAC 7:8-5.4-a-2):  
Stormwater Runoff Quality Standards (NJAC 7:8-5.5):  
Stormwater Runoff Quantity Standards (NJAC 7:8-5.4-a-3):

No
Yes
No

(Yes or No)  
(Yes or No)  
(Yes or No)

Points Subtotal: **55**

**Note: If the Answers to All Three Questions at G Above are "Yes", Adequate Nonstructural Measures have been Utilized.**

**Total Proposed Site Points: 214**

**Ratio of Proposed to Existing Site Points: 123%**

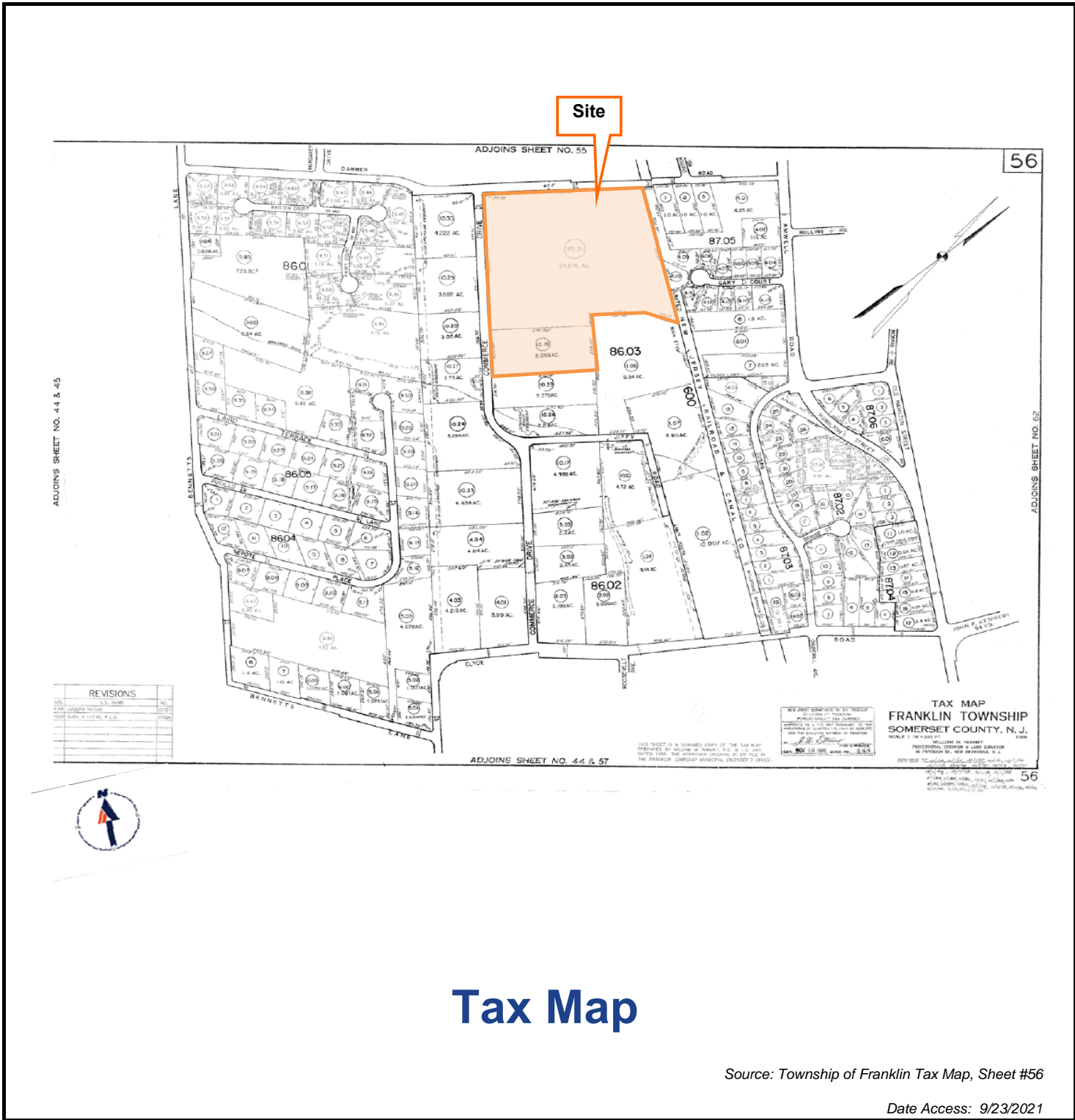
**Required Site Points Ratio: 95%**

**Nonstructural Point System Results:**

**Proposed Nonstructural Measures are Adequate**

## **C. MAPS**

- ◆ **Tax Map**
- ◆ **Soil Map**
- ◆ **USGS Map**
- ◆ **Drainage Area Maps**
  - **Existing Drainage Area Map**
  - **Proposed Drainage Area Map**
  - **Inlet Area Map**
  - **Regional Basin Drainage Area Map**



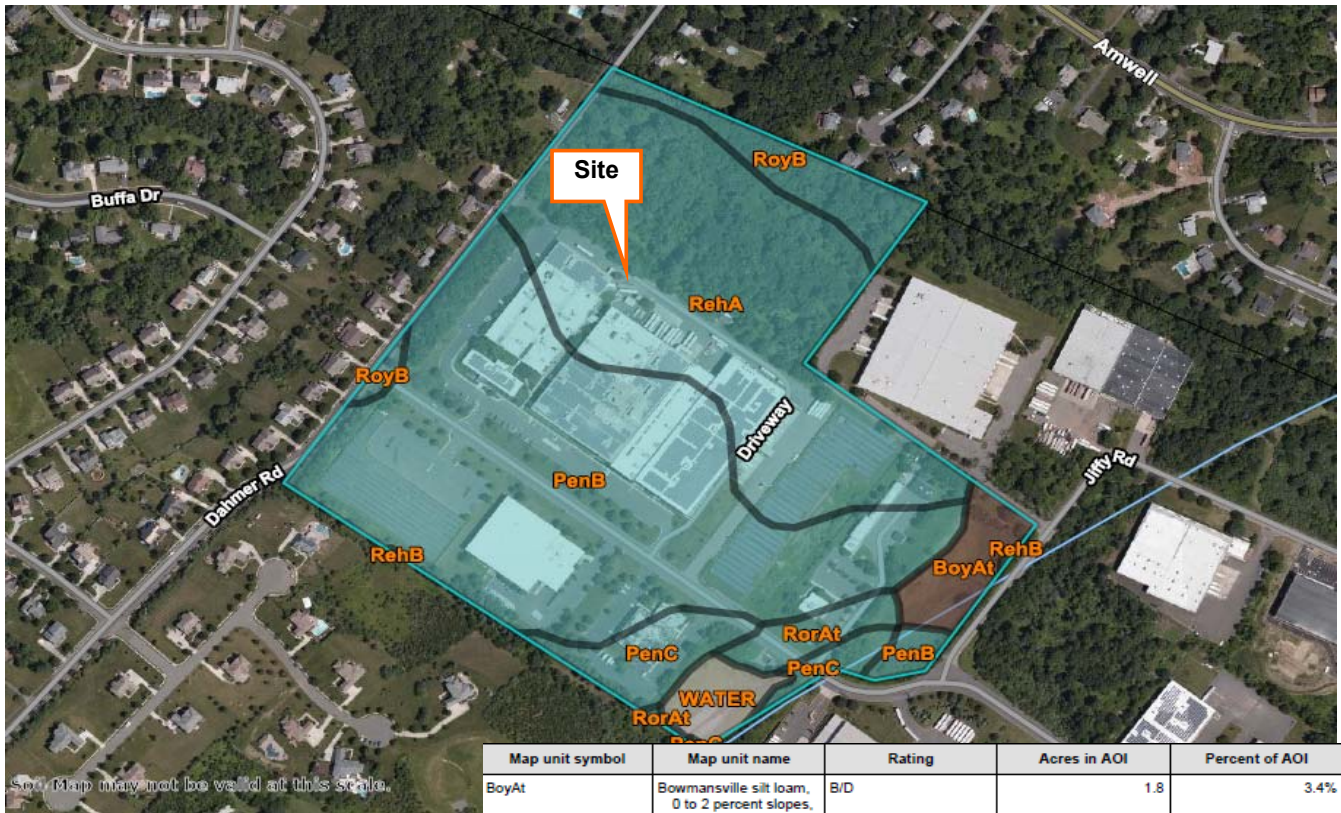
# Tax Map

Source: Township of Franklin Tax Map, Sheet #56

Date Access: 9/23/2021

<h1>L'Oreal USA Products, Inc</h1>	
100 Commerce Drive Block 86.03; Lot 10.32	Township of Franklin, Somerset County, NJ
BENJ #JM210708	
Prepared by: alc	Date: 9/23/2021
Checked by: MSY	Scale: nts
<h1>BOHLER //</h1>	





Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BoyAt	Bowmansville silt loam, 0 to 2 percent slopes, frequently flooded	B/D	1.8	3.4%
PenB	Penn silt loam, 2 to 6 percent slopes	C	24.9	46.7%
PenC	Penn silt loam, 6 to 12 percent slopes	C	2.7	5.1%
RehA	Reaville silt loam, 0 to 2 percent slopes	C	18.4	34.6%
RehB	Reaville silt loam, 2 to 6 percent slopes	C	0.0	0.1%
RorAt	Rowland silt loam, 0 to 2 percent slopes, frequently flooded	C	1.3	2.5%
RoyB	Royce silt loam, 2 to 6 percent slopes	C	2.8	5.2%
WATER	Water		1.3	2.4%
<b>Totals for Area of Interest</b>			<b>53.2</b>	<b>100.0%</b>



## Soils Map

Source: NRCS Web Soil Survey, 2012

Date Access: 9/23/2021

# L'Oreal USA Products, Inc

100 Commerce Drive  
Block 86.03; Lot 10.32

Township of Franklin, Somerset County, NJ

BENJ #JM210708

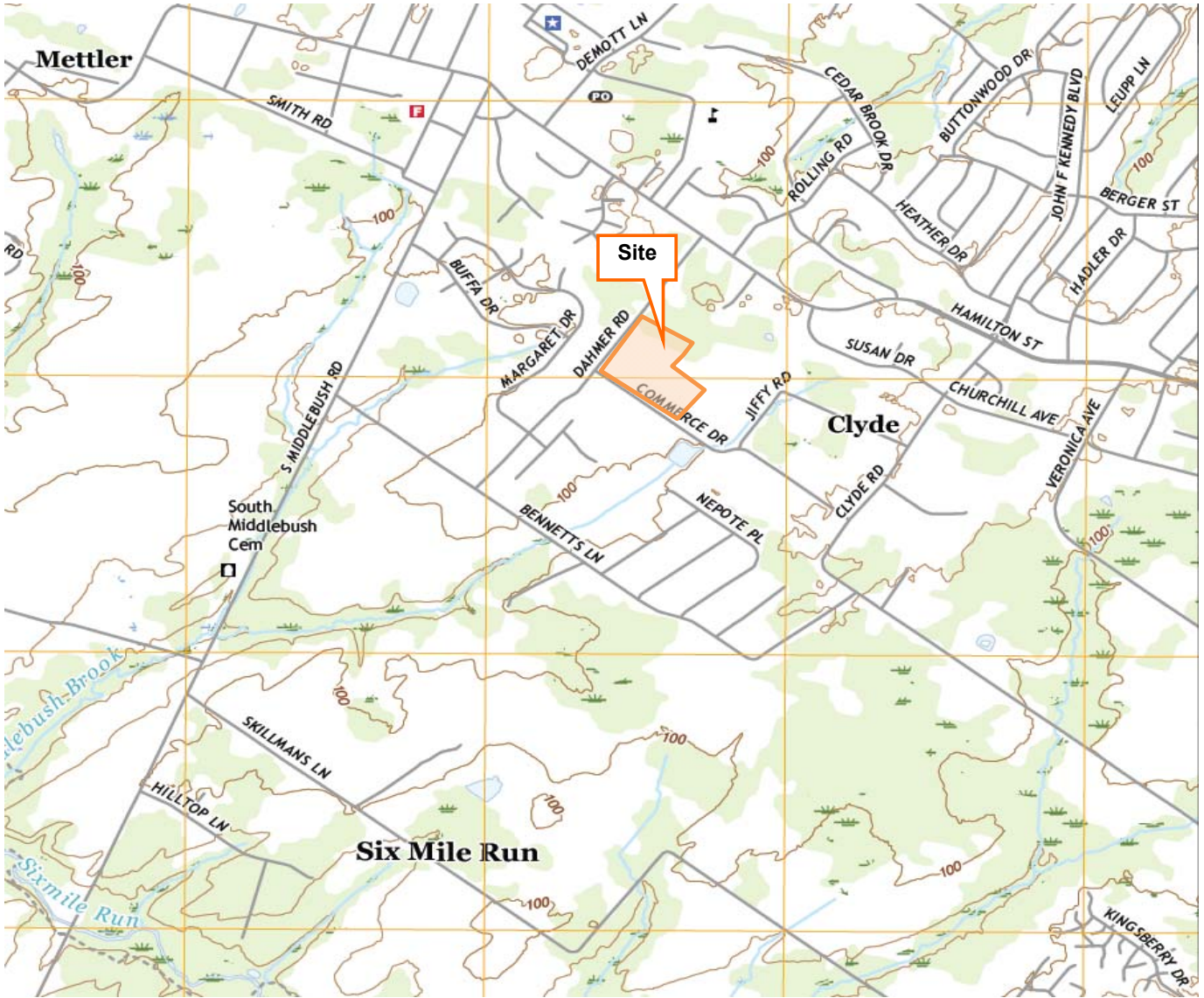
Prepared by: alc

Date: 9/23/2021

Checked by: MSY

Scale: nts

# BOHLER //



**USGS Map**  
**40°48'82" N, -74°52'12" W**  
**Monmouth Junction Quadrangle**

Source: USGS, 2019

Date Access: 9/23/2021

**L'Oreal USA Products, Inc**

100 Commerce Drive  
 Block 86.03; Lot 10.32

Township of Franklin, Somerset County, NJ

BENJ #JM210708

Prepared by: alc

Date: 9/23/2021

Checked by: MSY

Scale: nts

**BOHLER** //





NAVD 83

### GARY COURT

(50' WIDE R.O.W.)  
(ASPHALT ROAD: 4Y)  
(TWO WAY TRAFFIC)

BLOCK 87.05  
LOT 4.09  
N.P. LANDS OF  
THE CHRYSLER FINANCIAL LLC  
PROCEEDS OF THE CHRYSLER TRUST  
D.B. 6748, PG. 2390

BLOCK 87.05  
LOT 4.10  
N.P. LANDS OF  
THE CHRYSLER FINANCIAL LLC  
PROCEEDS OF THE CHRYSLER TRUST  
D.B. 6748, PG. 2390

BLOCK 600  
LOT 2.01  
N.P. LANDS OF  
UNITED NEW JERSEY INSURANCE CO.  
D.B. 6748, PG. 2390

EXISTING DRAINAGE AREA #3  
TOTAL: 1.23 AC.  
WOODED: 1.23 AC. (HSG: C)  
TC: 15 MIN.

BLOCK 86.03  
LOT 1.08  
N.P. LANDS OF  
THE CHRYSLER FINANCIAL LLC  
PROCEEDS OF THE CHRYSLER TRUST  
D.B. 6748, PG. 2390

OFF-SITE DRAINAGE AREA  
TOTAL: 0.14 AC.  
WOODED: 0.14 AC. (HSG: C)  
TC: 23.1 MIN.

EXISTING DRAINAGE AREA #2  
TOTAL: 3.60 AC.  
WOODED: 3.54 AC. (HSG: C)  
IMPERVIOUS: 0.06 AC.  
TC: 20 MIN.

POI #2

### DAHMER ROAD

(VARIABLE WIDTH R.O.W.)  
(TWO WAY TRAFFIC)

EXISTING DRAINAGE AREA #1A  
TOTAL: 7.89 AC.  
ROOF: 7.01 AC.  
WOODED: 4.60 AC. (HSG: C)  
GRASS: 2.76 AC. (HSG: C)  
IMPERVIOUS: 3.51 AC.  
TC: 26 MIN.

BLOCK 86.03  
LOT 10.32  
N.P. LANDS OF  
YONEX USA PRODUCTS, INC.  
D.B. 5146, PG. 3380

EXISTING DRAINAGE AREA #1B  
TOTAL AREA: 5.73 AC.  
WOODED: 2.02 AC.  
GRASS: 2.35 AC.  
IMPERVIOUS: 1.36 AC.  
TC: 15 MIN.

BLOCK 86.03  
LOT 10.25  
N.P. LANDS OF  
THE CHRYSLER FINANCIAL LLC  
PROCEEDS OF THE CHRYSLER TRUST  
D.B. 1086, PG. 380

BLOCK 86.03  
LOT 10.26  
N.P. LANDS OF  
DAVID R. WELLS  
PROCEEDS OF THE CHRYSLER FINANCIAL LLC  
D.B. 1547, PG. 1547

EDA-TC  
TOTAL: 1.15 AC.  
GRASS: 1.15 AC. (HSG: C)  
TC: 10 MIN.

### JIFFY ROAD

(50' WIDE R.O.W.)  
(TWO WAY TRAFFIC)

### JIFFY ROAD

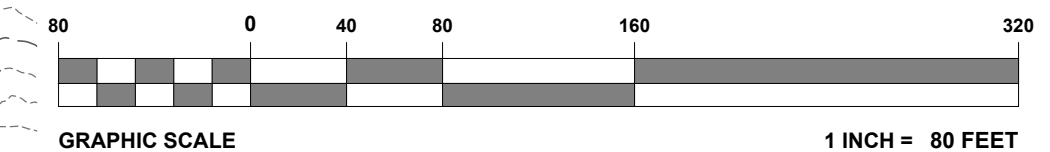
(80' WIDE R.O.W.)  
(ASPHALT ROADWAY)  
(TWO WAY TRAFFIC)

### COMMERCE DRIVE

(80' WIDE R.O.W.)  
(ASPHALT ROADWAY)  
(TWO WAY TRAFFIC)

BLOCK 86.01

G:\2020\10718\10718\DRAWINGS\PLAN SET\DRAINAGE MAPS\MJM10718-EDAM-0A-KAYOUT-1-EDA



SITE CIVIL AND CONSULTING ENGINEERING  
LAND SURVEYING  
PROGRAM MANAGEMENT  
LAND MANAGEMENT  
SUSTAINABLE DESIGN  
PERMITTING SERVICES  
TRANSPORTATION SERVICES

#### REVISIONS

REV	DATE	COMMENT	DRAWN BY	CHECKED BY

Table with 5 columns: REV, DATE, COMMENT, DRAWN BY, CHECKED BY. It contains 19 empty rows for revisions.



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PROJECT No.: JM210708  
DRAWN BY: MB  
CHECKED BY: AT  
DATE: 10/01/2021  
CAD I.D.: JM210708-EDAM-0A

#### DRAINAGE MAPS

FOR

### L'ORÉAL

PROPOSED  
FACILITY EXPANSION  
100 COMMERCE DRIVE  
BLOCK 86.01, LOTS 10.32  
TOWNSHIP OF FRANKLIN  
SOMERSET COUNTY, NEW JERSEY  
B-1 ZONE | TAX MAP SHEET #56



BOHLER ENGINEERING N.J. LLC  
10000 MIDLANTIC DRIVE, SUITE 410W  
MOUNT LAUREL, NJ 08054  
PHONE: (856) 930-4000  
FAX: (856) 930-4001  
www.BohlerEngineering.com  
ALSO SEE: CONTRACTOR'S RECORD DRAWINGS & RECORDS



PROFESSIONAL ENGINEER  
NEW JERSEY LICENSE No. 46184  
PENNSYLVANIA LICENSE No. 73909

SHEET TITLE:

### EXISTING DRAINAGE AREA MAP

SHEET NUMBER:

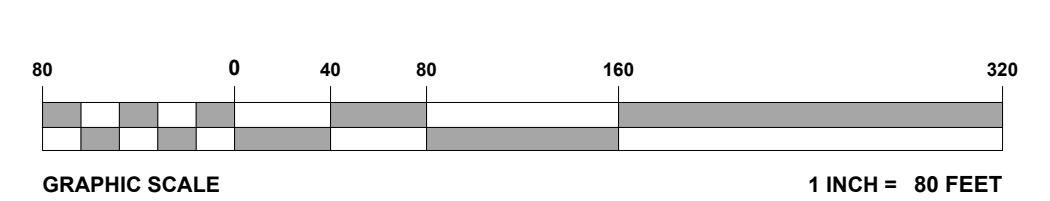
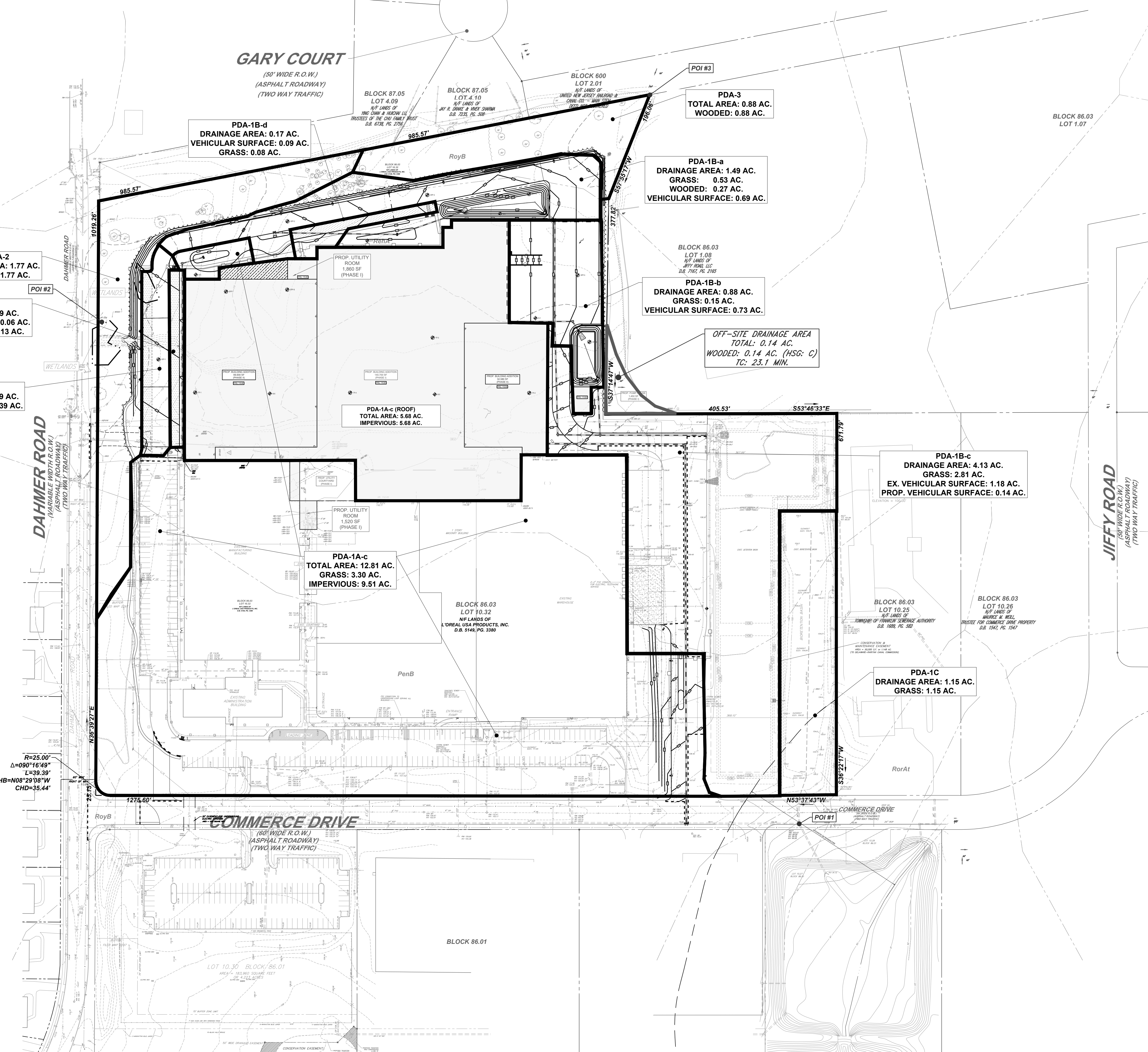
1

ORG. DATE - 10/01/2021





NAD 83



**REVISIONS**

REV	DATE	COMMENT	DRAWN BY



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PROJECT No.: JM210708  
 DRAWN BY: MB  
 CHECKED BY: AT  
 DATE: 10/01/2021  
 CAD L.D.: JM210708-PDAM-0A

**DRAINAGE MAPS**

FOR

**L'ORÉAL**

PROPOSED  
 FACILITY EXPANSION  
 100 COMMERCE DRIVE  
 BLOCK 86.01, LOTS 10.32  
 TOWNSHIP OF FRANKLIN  
 SOMERSET COUNTY, NEW JERSEY  
 B-1 ZONE | TAX MAP SHEET #56



**A. TAMOUS**

PROFESSIONAL ENGINEER  
 NEW JERSEY LICENSE No. 46184  
 PENNSYLVANIA LICENSE No. 73959

SHEET TITLE:  
**PROPOSED DRAINAGE AREA MAP**

SHEET NUMBER:  
**2**  
 ORG. DATE : 10/01/2021

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