November 4, 2019
Revised through January 17, 2020

STORMWATER REPORT

For

PENTUCKET REGIONAL SCHOOL DISTRICT BUILDING PROJECT
24 Main Street
West Newbury and Groveland, MA

Prepared for:

DORE AND WHITTIER ARCHITECTS
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Nitsch Project #12360

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1.0 INTRODUCTION

Nitsch Engineering has prepared this Stormwater Report to support the Notice of Intent application to West Newbury and Groveland for the new Pentucket Regional School District Project located in West Newbury and Groveland, MA. The Project site is located at 24 Main Street, West Newbury, MA (subsequently referred to as the "Site"). The proposed project is to build a new school building, parking facilities and athletic facilities on the site of the existing Pentucket High School.

The site improvements include the following:

1. Demolition of the existing high school and middle school buildings and existing site utilities;
2. Construction of new parking facilitates and pedestrian walkways;
3. Construction of a new middle/high school building;
4. Construction of new athletic facilities;
5. Installation of new utilities to support the proposed facilities; and
6. Construction of a new stormwater management system.

The proposed stormwater management system has been designed to comply with the requirements of the Massachusetts Department of Environmental Protection (DEP) Stormwater Management Standards.

2.0 EXISTING CONDITIONS

The Site is located at 24 Main Street, West Newbury, MA. It straddles the border of West Newbury and Groveland. The existing site contains Pentucket Regional High School and Pentucket Regional Middle School and their associated parking and athletic facilities. There are also several small outbuildings positioned to the west of the high school building. The high school is in the northern portion of the site and the middle school is in the southern portion of the site. The site contains approximately 50% impervious area.

The site is bounded by Farm Lane to the North, Main Street to the east, the Merrimack River to the west, and residential properties to the south.

2.1 Existing Drainage Infrastructure

<u>Onsite Drainage</u>

The majority of stormwater generated on the existing Pentucket High School and Middle School site is collected using catch basins and roof drains and is piped via a closed drainage system to outfall headwalls positioned along the edges of the wetlands and discharged to the wetland system. In some portions of the site, rainwater flows overland to discharge directly into the wetland.

There is also a large detention pond in the northeastern portion of the site that collects some piped stormwater and some overland flow from the site. The detention pond discharges to the wetlands. There is also some water from offsite that is directed to the detention pond.

Nitsch Engineering reached out to the Town of West Newbury to try to find any design or as-built information about the existing detention pond. Because no information could be obtained, several assumptions were made about the behavior of the detention pond, based on a combination of survey measurements, field observations, and Google Earth images. Nitsch assumed the detention pond to be six (6) feet deep with 3.5:1 side slopes. Based on these assumptions, the retention volume was assumed to be approximately 70,000 cubic feet. Nitsch also made an assumption about the outlet of the pond. The survey documents a catch basin structure at the edge of the pond which is assumed to act as an outlet for the pond in larger storm events. Nitsch Engineering has assumed that this structure has a grate at the rim elevation of the structure that would allow stormwater to overflow when it reaches this rim elevation. Nitsch has also assumed that in the 10-, 25-, and 100-year storm events, stormwater will overflow over the road and flow into the adjacent wetland. Refer to the existing conditions HydroCAD analysis in Appendix B for more information on the assumed design of the basin.

The existing stormwater management system provides very little water quality treatment. Stormwater is mostly collected and discharged directly into the wetland with some runoff flowing through the detention pond before discharging to the wetland. The wetland system ultimately discharges to the Merrimack River.

<u>Offsite Drainage Areas</u>
Record plans and supplemental LiDAR contours, as well as on site observations show that some untreated stormwater from the neighborhood north of Farm Lane flows through the site via a piped system that discharges to the detention pond (OFF-01, OFF-02, OFF-03 in Figure DR-1). There is also a portion of offsite area (OFF-04 in Figure DR-1) that flows through the site via a closed drainage system that runs through the northern portion of the site and discharges to the wetlands. These record locations were taken from the “Town of West Newbury Drainage Infrastructure” plan which is included in Appendix H. These drains were not located by the survey. The offsite areas are included in the HydroCAD stormwater calculations because they affect the way the detention pond and onsite drainage patterns function (Refer to the HydroCAD analysis in Appendix B).

2.2 NRSC Soil Designations

The Soil Classification Summary (Table 1) outlines the Natural Resources Conservation Services (NRCS) designation of the soil series at the Site. The majority of soils are classified as Udorthents, smoothed with a hydrologic soil group (HSG) rating of A, indicating that the soils have a high infiltrative capacity (refer to the NRCS Soil Maps and Descriptions in Appendix G). Other soil groups that appear significantly on the site are Scarboro mucky fine sandy loam (HSG A/D), Elmwood fine sandy loam (HSG B) and urban land (no HSG).

Table 1. NRCS Soil Classification Summary

Soil Unit	Soil Series	Hydrologic Soil Group
6A	Scarboro mucky fine sandy loam, 0-3% slopes	A/D
240A/B	Elmwood fine sandy loam, 0-8% slopes	B
602	Urban land	--
651	Udorthents, smoothed	A

2.3 On-Site Soil Investigations

On-site soil investigations were performed to supplement and confirm the information obtained from the NRCS Web Soil Survey. Eleven (11) borings were performed by HML Associates in December 2018. The results indicated varying soils throughout the site consisting of mainly silty sand, silty clay, and poorly graded sand. Groundwater was encountered in almost all borings at relatively shallow depths ranging from 3 to 7 feet below grade. These borings were all performed within and near the location of the proposed building.

PES Associates performed nine (9) test pits in June 2019. These test pits were located throughout the site, with eight (8) in the northern portion of the site and one (1) in the southern portion. The test pits indicated that the soil quality was different than the NRCS survey indicated. Clay was encountered throughout the site, especially the western part of the site beneath the location of the new school. There were only two test pits where clay was not encountered, on the eastern side of the northern portion of the site. Test pit depths ranged between 66 and 120 inches.

HML Associates performed twelve (12) additional borings in July 2019. Eight (8) were performed in the north portion of the site in the area of the existing high school. Four (4) were performed in the south portion of the site in the area of the existing middle school. The borings taken around the high school indicated varying groundwater levels with ground water not encountered in several of the boreholes and between 4 and 14 feet below grade in those where groundwater was encountered. Varying soils were encountered with silty sand and silty clay gravelly sand and glacial till being the most prevalent. The borings taken around the middle school indicated varying groundwater levels with levels ranging between 5 and 15 feet below grade in those where groundwater was encountered. Varying soils were encountered with mainly silty sand, sand and glacial till present.

The varying soil textures were taken into account during the proposed drainage design as described in this Report. These test pit logs are provided in Appendix G under a separate cover.

2.4 Wetland Resource Areas

The Project site is bordered to the west by the Merrimack River. An intermittent stream flows through the middle portion of the from east to west and becomes a perennial stream just before meeting the Merrimack River. The intermittent stream has associated bordering vegetated wetlands (BVW). There is also BVW located to the east of the project site between the site and Main Street, to the west of the project site between the Merrimack River and the site, and to the south of the project site.

The proposed work is located outside of the 200-foot Riverfront Area to the Merrimack River and the tributary perennial stream. There is an AE floodplain associated with the perennial stream and Merrimack River, however; all work is proposed outside of the Zone AE.

The project site contains the following jurisdictional wetland resource areas: Bordering Vegetated Wetlands. LEC Environmental Consultants, Inc. conducted a site visit to delineate these resource areas. Detailed information on these resources is provided in the Wetland Resource Area Analysis Report, prepared by Richard A. Kirby and Julia Hoogeboom, provided in Section 3 of the NOI.

2.5 Total Maximum Daily Load (TMDL)

The Site discharges to the wetland system onsite which discharges to the Merrimack River. The Merrimack River is impaired with enterococcus bacteria and PCBs but does not have a TMDL.

3.0 PROPOSED CONDITIONS

3.1 Project Description

The proposed Project includes the construction of a new 211,700 gross square foot, three-story, Middle and High School building. The proposed site improvements include the following:

1. Demolition of the existing high school and middle school buildings and existing site utilities;
2. Construction of new parking facilitates and pedestrian walkways;
3. Construction of a new middle/high school building;
4. Construction of new athletic facilities;
5. Installation of new utilities to support the proposed facilities; and
6. Construction of a new stormwater management system.

The site is currently developed and contains two existing buildings: a high school building and a middle school building. The Project is anticipated to maintain approximately the same amount of impervious area between existing and proposed conditions with an increase of 0.1 acres of impervious area. The proposed pervious area does include the proposed football and softball fields even though they will be turf fields. This is because the fields were modeled as a natural grass surface with storage below. Refer to Table 2 for a comparison of the existing and proposed land use for the Site. Offsite areas were delineated separately and are included in Table 3.

Table 2. Proposed land use for 24 Main Street (in acres)

Land Use	Existing Site (acres)	Proposed Site (acres)	Change
Buildings	5.4	2.7	-2.7
Impervious	7.0	9.8	2.8
Pervious Areas	14.5	14.4	-0.1
Total	26.9	26.9	---

Table 3. Land use for Off-site areas (in acres)

Land Use	Off-Site Areas (acres)
Impervious Area	0.8
Pervious Area	0.7
1/3 Acre Lots*	5.5
Total	7.0

*1/3 Acre Lots were assumed for offsite areas where survey data was not available. 1/3 acre lots are assumed to have 30% impervious area in HydroCAD.

3.2 Stormwater Management System

The Site will include the installation of a stormwater management system that is being designed to meet the MassDEP Stormwater Management Standards.

The proposed stormwater management system for the Project will include deep-sump and hooded catch basins, bioretention basins with sediment forebays, a subsurface infiltration system, a subsurface detention system, and proprietary water quality structures. Overflow from the proposed BMPs will be discharged to the adjacent wetlands.

Deep Sump and Hooded Catch Basins

Deep-sump and hooded catch basins are proposed to provide pretreatment in the impervious areas of the parking lot and driveways that are not being directed overland to a sediment forebay. Stormwater captured in the catch basins will be directed to another treatment or infiltration BMP prior to discharge.

Subsurface Infiltration System

There will be one subsurface infiltration system incorporated into the onsite stormwater management system. The subsurface infiltration system will collect and infiltrate runoff from areas directly east of the proposed building as well as a portion of the parking lots to the east of the proposed building and a portion of the driveway along the north side of the site. The system consists of 16-inch plastic chambers surrounded by crushed stone. The infiltration system has been located where test pits have revealed soils without clay. The system will help in treating stormwater runoff and lowering peak discharge rates for the 2-, 10-, 25-, and 100-year storms. It ultimately discharges to DP-1, the central wetland.

Subsurface Detention System

Nitsch assumed that Offsite Areas OFF-01, OFF-02, and OFF-03 flow directly into the existing detention pond. Because this detention pond will be filled in as part of the proposed construction, a subsurface detention system has been proposed to replace the storage lost by removing the detention pond. The offsite areas that currently discharge to the detention pond will be redirected to a new underground detention system which will ultimately discharge to the wetland.

The subsurface detention system will collect and detain runoff only from the offsite areas in order to keep the onsite drainage separate from the offsite drainage. The detention system was designed to replace the 70,000 cubic feet lost by removing the detention pond. The system consists of 3.5’ tall concrete chambers. It ultimately discharges to DP-1.

Bioretention Basins with Sediment Forebays

Three (3) bioretention basins are proposed to treat and detain stormwater runoff. Bioretention Basins 1 and 2 are located in the center of the parking areas east of the proposed school building. Bioretention Basin 1 is on the eastern side and Bioretention Basin 2 is on the western side. Bioretention Basin 3 is located to the north of the other two bioretention basins, along the southern edge of the proposed entrance road to the site. The bioretention basins include a minimum 24-inch media filter to provide TSS and nutrient pollutant removal. Due to high groundwater, these basins will be lined and will have an underdrain. They will be used for treatment and rate attenuation but will not provide infiltration.

Pretreatment for the bioretention basins will be provided by sediment forebays and in some cases, deep-sump and hooded catch basins and a sediment forebay. The sediment forebays were designed in accordance with the MassDEP Stormwater Management Handbook to provide a water quality volume (WQV) equivalent to 0.1 inches per impervious acre:

Bioretention Basin 1

Tributary Impervious Area = 0.939 acres
WQV = (0.939 acres * 43,560 sf/acre) * (0.1 in. / 12 in./ft) = 340 cubic feet

Bioretention Basin 2

Tributary Impervious Area = 0.406 acres
WQV = (0.406 acres * 43,560 sf/acre) * (0.1 in. / 12 in./ft) = 147 cubic feet

Bioretention Basin 3

Tributary Impervious Area = 1.070 acres
WQV = (1.070 acres * 43,560 sf/acre) * (0.1 in. / 12 in./ft) = 388 cubic feet

Water Quality Structures

Nine (9) proprietary water quality structures are proposed for water quality treatment in areas of the Site where space is limited and no infiltration or detention is proposed or additional pretreatment is required prior to infiltration. These BMPs have been designed to remove greater than 80% TSS in conjunction with their associated deep-sump and hooded catch basins. Sizing calculations are provided in Appendix A.

Refer to the TSS Removal spreadsheets in Appendix A for TSS removal summaries for each treatment train.

3.3 Stormwater Management During Construction

The Site Contractor will be responsible for stormwater management of the active construction site and is required to adhere to the conditions of the 2017 Construction General Permit under the Environmental Protection Agency through the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP). A draft SWPPP has been prepared in accordance with the MassDEP Stormwater Management Standards and the 2017 Construction General Permit (Appendix F).

4.0 STORMWATER MANAGEMENT ANALYSIS

4.1 Methodology

Nitsch Engineering completed a hydrologic analysis of the existing project site utilizing Soil Conservation Service (SCS) Runoff Curve Number (CN) methodology. The SCS method calculates the rate at which the runoff reaches the design point considering several factors: the slope and flow lengths of the subcatchment area, the soil type of the subcatchment area, and the type of surface cover in the subcatchment area. HydroCAD Version 10.00 computer modeling software was used in conjunction with the SCS method to determine the peak runoff rates and runoff volumes for the 2-, 10-, 25-, and 100-year, 24-hour storm events. The proposed project site is being analyzed with the same methodology.

The Site was divided into multiple drainage areas, or subcatchments, which drain to the design points along the property boundary and within the site. For each subcatchment area, SCS Runoff Curve Numbers (CNs) were selected by using the cover type and hydrologic soil group of each area. The peak runoff rates and runoff volumes for the 2-, 10-, 25- and 100-year 24-hour storm events were then determined by inputting the drainage areas, CNs, and time of concentration (T_c) paths into the HydroCAD model.

The National Oceanic and Atmospheric Administration Atlas 14 precipitation frequency estimates were used to calculate the 2-, 10-, 25-, and 100- year 24-hour storm events in HydroCAD. Refer to the HydroCAD calculations in Appendix B and C for rainfall information.

4.2 HydroCAD Version 10.00

The HydroCAD computer program uses SCS and TR-20 methods to model drainage systems. TR-20 (Technical Release 20) was developed by the Soil Conservation Service to estimate runoff and peak discharges in small watersheds. TR-20 is generally accepted by engineers and reviewing authorities as the standard method for estimating runoff and peak discharges.

HydroCAD Version 10.00 uses up to four types of components to analyze the hydrology of a given site: subcatchments, reaches, basins, and links. Subcatchments are areas of land that produce surface runoff. The area, weighted CN, and T_c characterize each individual subcatchment area. Reaches are generally uniform streams, channels, or pipes that convey water from one point to another. A basin is any impoundment that fills with water from one or more sources and empties via an outlet structure. Links are used to introduce hydrographs into a project from another source or to provide a junction for more than one hydrograph within a project. The time span for the model was set for 0-48 hours in order to prevent truncation of the hydrograph.

4.3 Existing Hydrologic Conditions

As summarized in Section 2.1, Nitsch Engineering delineated the project site into thirteen (13) on-site subcatchment (watershed) areas and three (3) offsite areas which discharge to three (3) design points utilizing an existing conditions survey, LiDAR contour data, and on-site observations (See Figure DR-1). The design points (DP) are defined as the central wetland (DP-1) that divides the northern portion of the site from the southern portion, the eastern wetland (DP-2) that runs along Main Street east of the existing middle school building, and the southern wetland (DP-3) southwest of the existing middle school building. The HydroCAD model for existing conditions is provided in Appendix B and results from the HydroCAD calculations are summarized below in Table 4.

4.4 Proposed Hydrologic Conditions

The proposed project has been designed to mitigate the change in stormwater runoff at each of the design points as required by the DEP Stormwater Management Standards, the Town of Groveland Wetland Protection Bylaw, and the Town of West Newbury Wetland By-Law. The existing watershed areas were modified to reflect the proposed topography, storm drainage structures and BMPs, and roof areas. (See Figure DR-2). The HydroCAD model for proposed conditions is provided in Appendix C and results from the calculations are summarized in Table 4.

4.5 Peak Flow Rates

The proposed stormwater management system is expected to reduce the proposed peak runoff rates to at or below the existing rates for Design Points DP-1, DP-2, and DP-3. Table 4 below summarize the existing and proposed hydrologic analyses for the site at each design point.

Table 4 – Peak Rates of Runoff in Cubic Feet per Second (cfs)

	Storm Event	2-year	10-year	25-year	100-year
DP-1	Existing	19.11	41.51	57.86	87.12
	Proposed	19.09	36.43	53.10	84.28
DP-2	Existing	3.27	6.77	9.49	16.51
	Proposed	3.16	5.93	8.77	15.61
DP-3	Existing	3.28	7.52	10.39	14.9
	Proposed	2.73	5.60	7.79	11.56

5.0 MassDEP Stormwater Management Standards

Because the Project results in a small increase in impervious areas, the Project is considered a mix of ***new development and redevelopment*** under the DEP Stormwater Management System. The Site will be designed to meet the MassDEP Stormwater Management Standards as summarized below:

Standard 1: No New Untreated Discharges

The Project will not discharge any untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth. Stormwater from the Site will be collected and treated in accordance with the MassDEP Stormwater Management Standards and stormwater outfalls will be stabilized to prevent erosion.

Standard 2: Peak Rate Attenuation

The proposed stormwater management system will be designed so that the post-development peak discharge rates do not exceed pre-development peak discharge rates. To prevent storm damage and downstream flooding, the proposed stormwater management practices will mitigate peak runoff rates for the 2-, 10-, 25- and 100-year, 24-hour storm events. Refer to Table 4 for a pre- and post-development peak runoff rate comparison.

Standard 3: Groundwater Recharge

The majority of the site is comprised of A and D soils and a large portion of the site has shallow bedrock. The Massachusetts Stormwater Standards say that sites with these conditions are required to meet this standard only to the maximum extent practicable. The soils onsite are not capable of absorbing the required recharge volume in all locations and therefore, infiltration is only located where the soils will allow for infiltration. Although Nitsch does not believe all the soils onsite should be considered an “A” soil, the required recharge volume for an A soil was used for our calculation.

Impervious Area in HSG A	= 12.5 acres (Including paved and roof areas)
Rv (Recharge Volume)	= 12.5 acres x 43,560 sf x 0.6 in. / (12 inches/ft)
	= 27,225 cubic feet
Total Required Recharge Volume	= **27,225 cubic feet**

A minimum 2 feet but less than 4 feet of separation has been maintained between the bottom of the infiltration system and seasonal high groundwater. Groundwater mounding calculations have been provided in Appendix A.

The proposed Recharge volume for each BMP was calculated using the simple dynamic method as follows:

SA=Rv/(D+KT) so Rv=SA(D+KT) where
Rv=Recharge Volume
d=Depth of infiltration facility (with stone)
n=% porosity of stone
D=dn=Depth of infiltration facility (no stone)
SA= Surface area of the infiltration system
K=Saturated hydraulic conductivity
T=Allowable drawdown during the peak of the storm (2 hours)

<u>Subsurface Infiltration System #1</u>
SA(dn+KT)=Rv
195.44 x 134.83 (0.6 x 0.4 + 0.52 x 2) = **33,729 cf**

Standard 4: Water Quality Treatment

The proposed stormwater management system will be designed to remove greater than 80% of the average annual post-construction load of Total Suspended Solids (TSS). Structural stormwater BMPs including deep-sump and hooded catch basins, bioretention basins with sediment forebays, underground infiltration system, and water quality units are sized to capture the required water quality volume and remove a minimum of 80% of total suspended solids.

Table 7. Proposed Treatment Train Summary

Watershed	Treatment Train
PR-1A, PR-1B, PR-1F, PR-1P, PR-1R, PR-2D, PR-2E, PR-3B	Deep sump hooded catch basin – water quality structure - discharge
PR-1M, PR-1U, PR-1V	Deep sump hooded catch basin – bioretention basin - discharge
PR-1G, PR-1H, PR-1O, PR-1S	Deep sump hooded catch basin – water quality structure – subsurface infiltration - discharge
PR-1I, PR-1J, PR-1L, PR-1N	Bioretention Basin with sediment forebay - discharge

TSS removal calculation spreadsheets and water quality structure sizing calculations are provided in Appendix A.

Source control and pollution prevention measures, such as vacuum cleaning, street sweeping, proper snow management, and stabilization of eroded surfaces, are included in the Long-Term Pollution Prevention Plan and Operation and Maintenance Plan (Appendix E).

Standard 5: Land Uses with Higher Potential Pollutant Loads

The project is not considered a LUHPPL and therefore, this standard is not applicable.

Standard 6: Critical Areas

The Project is not located within any critical areas. Therefore, this standard is not applicable.

Standard 7: Redevelopments

The project is considered a mix of new development and redevelopment under the MassDEP Stormwater Management Standards. Therefore, the project will meet Standard 2, Standard 3, and the pretreatment and structural stormwater BMP requirements of Standards 4, 5, and 6 to the maximum extent practicable. The projects should comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

Standard 8: Construction Period Pollution Prevention and Sedimentation Control

A plan to control construction-related impacts, including erosion, sedimentation, and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) will be developed and implemented during the Notice of Intent permitting process.

Because the Project will disturb more than one (1) acre of land, a Notice of Intent will be submitted to the Environmental Protection Agency (EPA) for coverage under the National Pollution Discharge Elimination System (NPDES) Construction General Permit. As part of this application the Applicant is required to prepare a Stormwater Pollution Prevention Plan (SWPPP) and implement the measures in the SWPPP. The SWPPP, which is to be kept on site, includes erosion and sediment controls (stabilization practices and structural practices), temporary and permanent stormwater management measures, Contractor inspection schedules and reporting of all SWPPP features, materials management, waste disposal, off-site vehicle tracking, spill prevention and response, sanitation, and non-stormwater discharges. A draft SWPPP is provided in Appendix F.

Standard 9: Operation and Maintenance Plan

A post-construction operation and maintenance plan has been prepared and will be implemented to ensure that stormwater management systems function as designed. Source control and stormwater BMP operation requirements for the site are summarized in the Long-Term Pollution Prevention Plan and Operation and Maintenance Plan provided in Appendix E.

Standard 10: Prohibition of Illicit Discharges

There will be no illicit discharges to the stormwater management system associated with the Project. An Illicit Discharge Compliance Statement is provided in Appendix A.

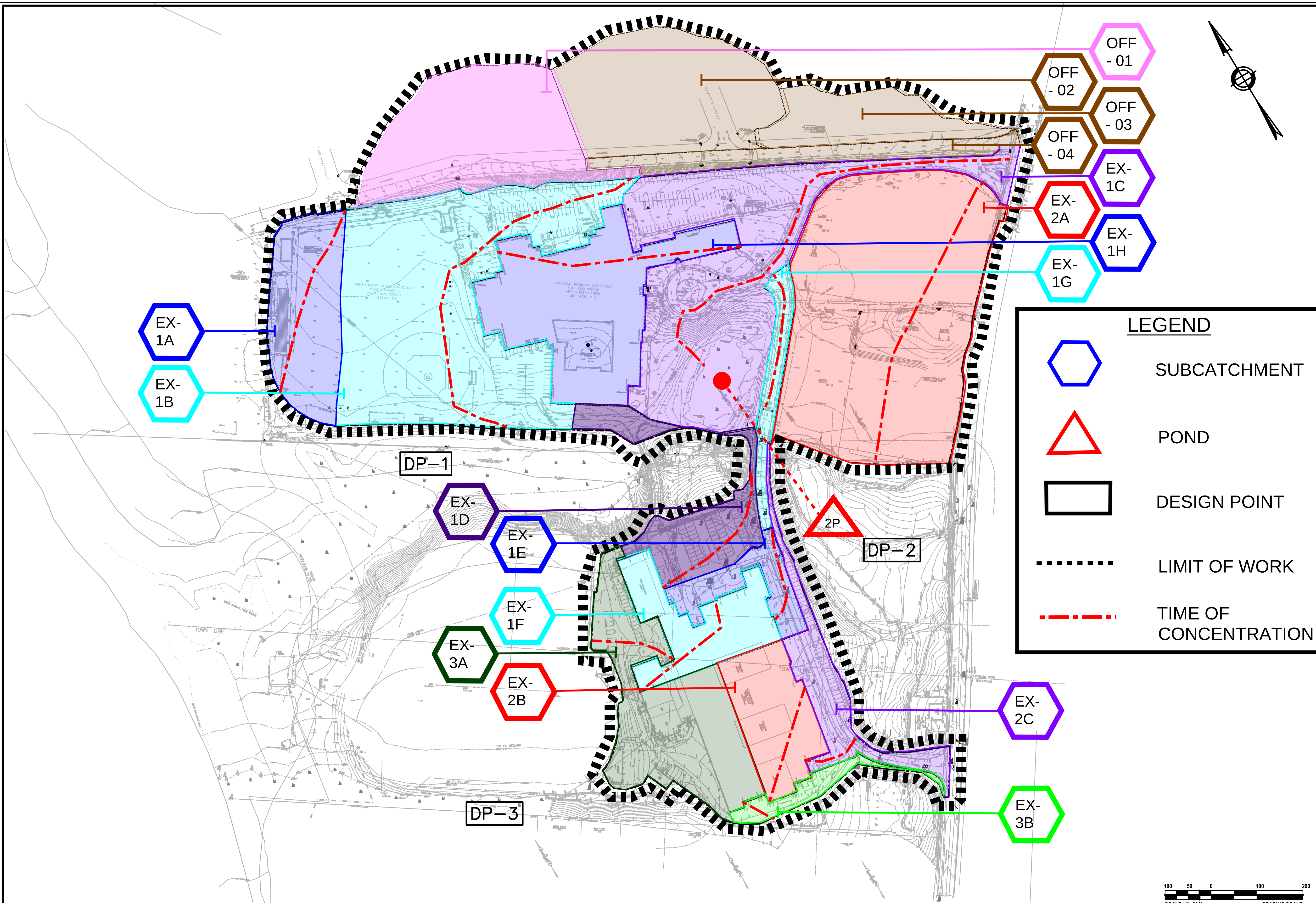
6.0 CLOSED DRAINAGE SYSTEM DESIGN

The proposed closed drainage system consists of deep sump and hooded catch basins, drainage manholes, and proprietary water quality treatment units connected with corrugated polyethylene pipe. The closed drainage system was designed to convey the 25-year storm event using the Rational method. Refer to Appendix D for more information.

7.0 CONCLUSION

In conclusion, the Project's stormwater management system will reduce or maintain peak runoff rates and through the use of infiltration and detention BMPs and improve the water quality of stormwater being discharged from the Site. The Project is being designed to meet and exceed the MassDEP Stormwater Management.

FIGURES



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- Land Surveying
- Transportation Engineering
- Structural Engineering
- Green Infrastructure
- Planning
- GIS

EXISTING DRAINAGE AREAS

PENTUCKET REGIONAL SCHOOL DISTRICT BUILDING PROJECT
24 MAIN STREET, WEST NEWBURY, MA

PREPARED FOR:

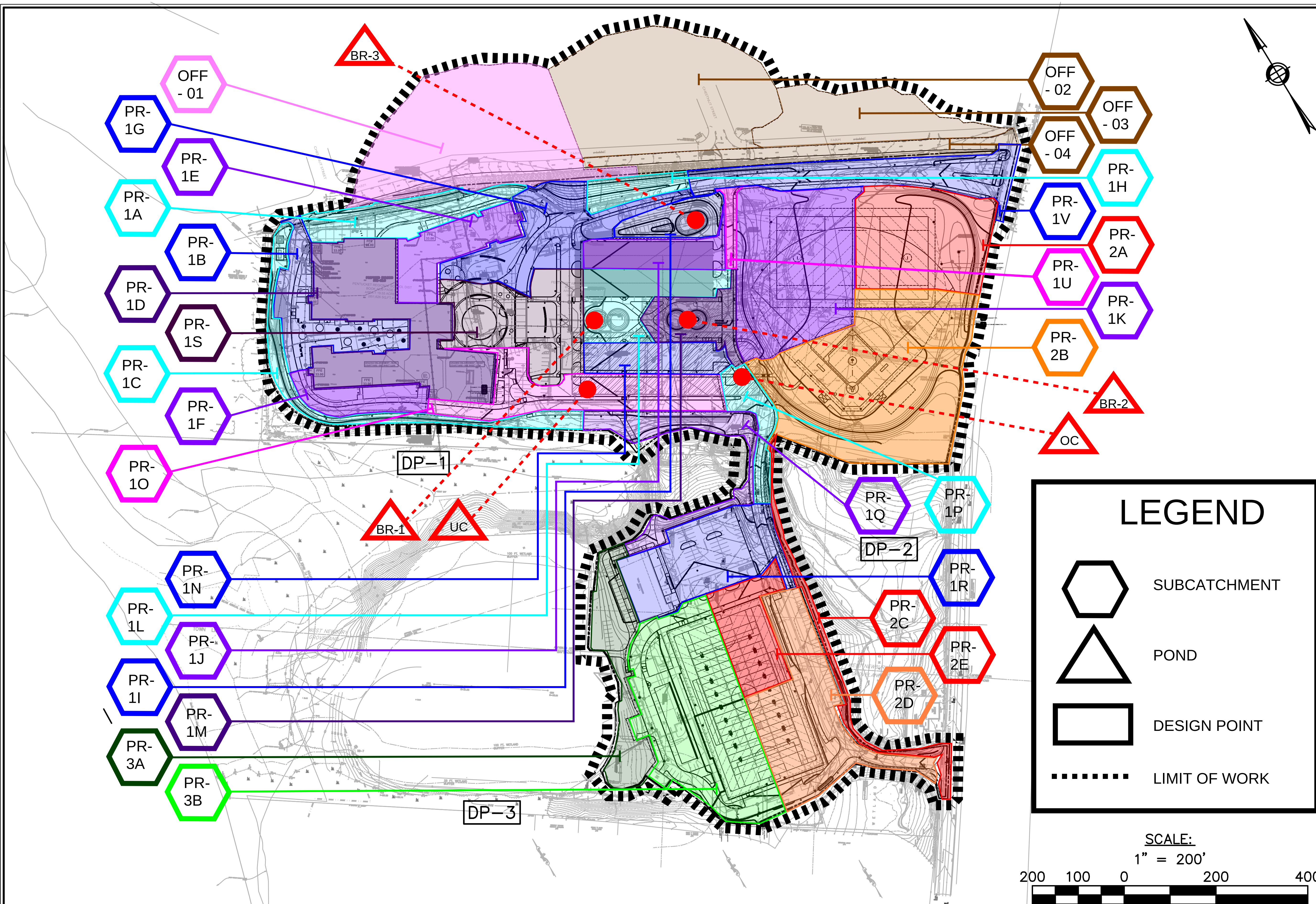
DORE AND WHITTIER ARCHITECTS
260 MERRIMAC STREET, NEWBURYPORT, MA 01950

PROJECT #	12360
FILE:	12360DA.DWG
SCALE:	1"=200'
DATE:	OCTOBER 30, 2019
PROJECT MGR:	AG
SURVEYOR:	
DRAFTED BY:	BA
CHECKED BY:	AM

SHEET:

DR-1

OF REV.



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PROPOSED DRAINAGE AREAS

PENTUCKET REGIONAL SCHOOL DISTRICT BUILDING PROJECT
24 MAIN STREET, WEST NEWBURY, MA

PREPARED FOR:
DORE AND WHITTIER ARCHITECTS
260 MERRIMAC STREET, NEWBURYPORT, MA 01950

PROJECT # 12360
FILE: 12360DA.DWG
SCALE: 1"=200'
DATE: OCTOBER 30, 2019
PROJECT MGR: AG
SURVEYOR:
DRAFTED BY: BA
CHECKED BY: AM

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APPENDIX A

Stormwater Management Standards Documentation

MassDEP Checklist for Stormwater Report
Standard 3: 72-Hour Drawdown Calculations
Standard 3: Mounding Analysis
Standard 4: TSS Removal Calculations
Standard 4: Proprietary Water Quality Structure Calculations
Standard 10: Illicit Discharge Compliance Statement

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

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[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☐ Redevelopment

☒ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☒ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☐ Reduced Impervious Area (Redevelopment Only)

☐ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☐ Use of “country drainage” versus curb and gutter conveyance and pipe

☒ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☐ Grass Channel

☐ Green Roof

☐ Other (describe): ______________________________

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☒ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist (continued)

Standard 3: Recharge (continued)

☒ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:
- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☐ The ½" or 1" Water Quality Volume or
- ☒ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- ☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

- ☐ The project is ***not*** covered by a NPDES Construction General Permit.
- ☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- ☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- ☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
  - ☒ Name of the stormwater management system owners;
  - ☒ Party responsible for operation and maintenance;
  - ☒ Schedule for implementation of routine and non-routine maintenance tasks;
  - ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
  - ☐ Description and delineation of public safety features;
  - ☐ Estimated operation and maintenance budget; and
  - ☒ Operation and Maintenance Log Form.
- ☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
  - ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
  - ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- ☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- ☒ An Illicit Discharge Compliance Statement is attached;
- ☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

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Form S3-G: Standard 3 – Recharge
72-Hour Drawdown Calculation

Project Name: Pentucket Regional School	Nitsch Project #: 12360
Location: West Newbury/ Groveland	Checked by: **MC**
Prepared by: BV	Sheet No. 1 of **1**
Date: **11/1/2019**	

INSTRUCTIONS:
1. In 'Method' Column, Click on Blue Cell to Activate Drop Down Menu
2. Enter the "Required recharge Volume" (in cubic feet) in Blue Cell for the appropriate chosen Method
3. Enter the "Bottom Area" (in square feet) in the blue cell as the maximum infiltration surface area. Do not use sidewalls.
4. **For "Dynamic: In-Situ Method" ONLY** (if other go to 4b) Enter hydraulic Conductivity Rate in Blue Cell
5. In 'Texture Class' Column, Click on Blue Cell to Activate Drop Down Menu

Step No.				
1	Method:	**Static**		
2	Required Recharge Volume (in cubic feet):	*7430*	as determined by the	Static Method
3	Bottom Area (in Sq.Ft.)	*26351*		
		Hydraulic Conductivity Rate:	In-Situ Saturated Hydraulic Conductivity Rate	
4a	ONLY - If using Dynamic: In-Situ Method --> Enter Hydraulic Conductivity Rate	*0.52*	0.26	
	Texture Class	NRCS Hydrologic Soil Group (HSG)	Infiltration Rate (Inches/Hour)	
4b	Loam	B	0.52	**Hours**
			$\text{Time}_{drawdown}$ =	6.51
			72-Hour Drawdown Requirement Check:	***OK***

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin.
Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.
Cells highlighted in yellow are values that can be changed by the user. Cells highlighted in red are output values based on user-specified inputs. The user MUST click the blue "Re-Calculate Now" button each time ANY of the user-specified inputs are changed otherwise necessary iterations to converge on the correct solution will not be done and values shown will be incorrect. Use consistent units for all input values (for example, feet and days)

use consistent units (e.g. feet & days **or** inches & hours)

Input Values				
0.0800	*R*	**Recharge (infiltration) rate (feet/day)**		
0.230	Sy	**Specific yield, Sy (dimensionless, between 0 and 1)**		
20.00	K	**Horizontal hydraulic conductivity, Kh (feet/day)***		
97.500	x	**1/2 length of basin (x direction, in feet)**		
67.500	y	**1/2 width of basin (y direction, in feet)**		
3.000	t	**duration of infiltration period (days)**		
30.000	hi(0)	**initial thickness of saturated zone (feet)**		

Conversion Table

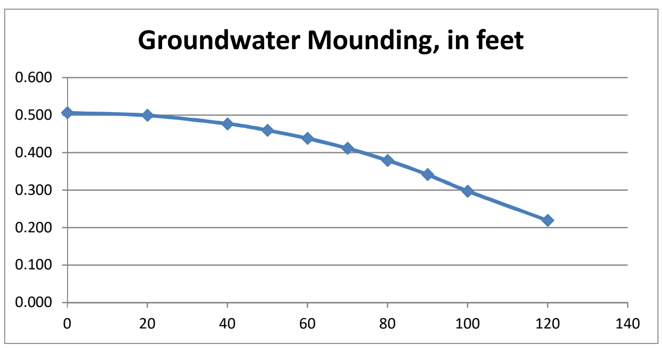
inch/hour	**feet/day**
0.67	1.33
2.00	4.00
hours	**days**
36	1.50

In the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

30.507	h(max)	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
0.507	Δh(max)	**maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	**Distance from center of basin in x direction, in feet**
0.507	**0**
0.499	**20**
0.477	**40**
0.460	**50**
0.438	**60**
0.411	**70**
0.379	**80**
0.341	**90**
0.298	**100**
0.219	**120**

Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

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PENTUCKET REGIONAL SCHOOL DISTRICT PROJECT
WATER QUALITY TREATMENT SUMMARY (11/4/19)

Nitsch Engineering has prepared this Water Quality Treatment Summary for the proposed Pentucket Regional School District Project. In compliance with MassDEP Stormwater Management Standard #4, the proposed stormwater management system is designed to remove at least 80% of the average annual post-construction load of TSS prior to discharge.

A summary of treatment trains proposed to provide water quantity control and water quality improvement at the proposed project site is provided below.

Treatment Train A
Catchment Areas: PR1A, PR-1B, PR-1F, PR-1P, PR-1R, PR-2D, PR-2E, PR-3B
Deep Sump & Hooded Catch Basin → Water Quality Structure→ Discharge

Treatment Train B
Catchment Areas: PR-1M, PR-1U, PR-1V
Deep Sump & Hooded Catch Basin → Bioretention Basin → Discharge

Treatment Train C
Catchment Areas: PR-1G, PR-1H, PR-1O, PR-1S
Deep Sump & Hooded Catch Basin → Water Quality Structure → Subsurface Infiltration → Discharge

Treatment Train D
Catchment Areas: PR-1I, PR-1J, PR-1L, PR-1N
Bioretention Basin with Sediment Forebay → Discharge

<u>Treatment Train A :</u>
Deep Sump & Hooded Catch Basin → Water Quality Structure→ Discharge

Treatment Spreadsheet

B BMP	**C** TSS Removal Rate	**D** Starting TSS Load	**E** Amount Removed (C*D)	**F** Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**0.25**	**1.0**	**0.25**	**0.75**
Water Quality Structure	**0.8**	**0.75**	**0.6**	**0.15**

Total TSS Removal = 85%

Meets 80% TSS removal requirement

<u>Treatment Train B :</u>
Deep Sump & Hooded Catch Basin → Bioretention Basin → Discharge

Treatment Spreadsheet

B BMP	C TSS Removal Rate	D Starting TSS Load	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump & Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Bioretention Area	**0.90**	**0.75**	**0.675**	**0.08**

Total TSS Removal = 92%

Meets 80% TSS removal requirement

<u>Treatment Train C :</u>
Deep Sump & Hooded Catch Basin → Water Quality Structure → Subsurface Infiltration → Discharge

Treatment Spreadsheet

B BMP	**C** TSS Removal Rate	**D** Starting TSS Load	**E** Amount Removed (C*D)	**F** Remaining Load (D-E)
Deep Sump & Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Water Quality Structure	**0.8**	**0.75**	**0.6**	**0.15**
Subsurface Infiltration	**0.8**	**0.15**	**0.12**	**0.03**

Total TSS Removal = 97%

Meets 80% TSS removal requirement

Treatment Train D :
Bioretention Basin with Sediment Forebay → Discharge

Treatment Spreadsheet

B BMP	C TSS Removal Rate	D Starting TSS Load	E Amount Removed (C*D)	F Remaining Load (D-E)
Bioretention Area	**0.90**	**1.00**	**0.90**	**0.10**

Total TSS Removal = 90%

Meets 80% TSS removal requirement

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Sediment Storage Calculation Sheet

Nitsch Job #	12360	Date:	1/22/2020
Project Name:	Pentucket Regional School District Building Project		
Calculated by:	AMM	Checked by:	
Water Quality ID:	WQS-400		

This spreadsheet should be used to calculate the required amount of sediment storage for proposed water quality units.

Assumptions:	150	mg/L	TSS Loading
*change these as needed	42	inches	Annual Rainfall - Boston Area
	2650	kg/m^3	SG
	80%		TSS Removal
	3	years	Storage Capacity

Input:	Drainage Area:	0.42	acres
	% Impervious:	67.43%	of area

Volume of Runoff:	43114.228	cf/year =	1220.857	m^3/year		
Loading:	0.150	kg/m^3				
Sediment:	183.129	kg/year =	0.069	m^3/year =	2.440	cf/year
Sediment Removal:	1.952	cf/year				
Sediment Storage Required:	**6 cf**					

Notes
1) TSS Loading is a conservative estimate based on a study completed by Maestre and Pitt in 2005
2) Rainfall data is based on NOAA Atlas 14 Volume 10 for town/city of West Newbury, MA.
3) Specific Gravity is based on the NJDEP testing requirements for dynamic separators.
4) TSS removal goal is for storage calculations only.
5) Providing 3 years of storage capacity as a factor of safety assuming yearly cleaning of WQS.

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Sediment Storage Calculation Sheet

Nitsch Job #	12360	Date:	1/22/2020
Project Name:	Pentucket Regional School District Building Project		
Calculated by:	AMM	Checked by:	
Water Quality ID:	WQS-401		

This spreadsheet should be used to calculate the required amount of sediment storage for proposed water quality units.

Assumptions:	150	mg/L	TSS Loading
*change these as needed	42	inches	Annual Rainfall - Boston Area
	2650	kg/m^3	SG
	80%		TSS Removal
	3	years	Storage Capacity

Input:	Drainage Area:	1.50	acres
	% Impervious:	66.67%	of area

Volume of Runoff:	152460.000	cf/year =	4317.179	m^3/year		
Loading:	0.150	kg/m^3				
Sediment:	647.577	kg/year =	0.244	m^3/year =	8.630	cf/year
Sediment Removal:	6.904	cf/year				
Sediment Storage Required:	**21 cf**					

Notes
1) TSS Loading is a conservative estimate based on a study completed by Maestre and Pitt in 2005
2) Rainfall data is based on NOAA Atlas 14 Volume 10 for town/city of West Newbury, MA.
3) Specific Gravity is based on the NJDEP testing requirements for dynamic separators.
4) TSS removal goal is for storage calculations only.
5) Providing 3 years of storage capacity as a factor of safety assuming yearly cleaning of WQS.

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Sediment Storage Calculation Sheet

Nitsch Job #	12360	Date:	1/22/2020
Project Name:	Pentucket Regional School District Building Project		
Calculated by:	AMM	Checked by:	
Water Quality ID:	WQS-402		

This spreadsheet should be used to calculate the required amount of sediment storage for proposed water quality units.

Assumptions:	150	mg/L	TSS Loading
*change these as needed	42	inches	Annual Rainfall - Boston Area
	2650	kg/m^3	SG
	80%		TSS Removal
	3	years	Storage Capacity

Input:	Drainage Area:	0.30	acres
	% Impervious:	88.78%	of area

Volume of Runoff:	40606.673	cf/year =	1149.851	m^3/year		
Loading:	0.150	kg/m^3				
Sediment:	172.478	kg/year =	0.065	m^3/year =	2.298	cf/year
Sediment Removal:	1.839	cf/year				
Sediment Storage Required:	**6 cf**					

Notes
1) TSS Loading is a conservative estimate based on a study completed by Maestre and Pitt in 2005
2) Rainfall data is based on NOAA Atlas 14 Volume 10 for town/city of West Newbury, MA.
3) Specific Gravity is based on the NJDEP testing requirements for dynamic separators.
4) TSS removal goal is for storage calculations only.
5) Providing 3 years of storage capacity as a factor of safety assuming yearly cleaning of WQS.

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Sediment Storage Calculation Sheet

Nitsch Job #	12360	Date:	1/22/2020
Project Name:	Pentucket Regional School District Building Project		
Calculated by:	AMM	Checked by:	
Water Quality ID:	WQS-403		

This spreadsheet should be used to calculate the required amount of sediment storage for proposed water quality units.

Assumptions:	150	mg/L	TSS Loading
*change these as needed	42	inches	Annual Rainfall - Boston Area
	2650	kg/m^3	SG
	80%		TSS Removal
	3	years	Storage Capacity

Input:	Drainage Area:	1.00	acres			
	% Impervious:	34.80%	of area			
Volume of Runoff:	52896.912	cf/year =	1497.871	m^3/year		
Loading:	0.150	kg/m^3				
Sediment:	224.681	kg/year =	0.085	m^3/year =	2.994	cf/year
Sediment Removal:	2.395	cf/year				
Sediment Storage Required:	**7 cf**					

Notes
1) TSS Loading is a conservative estimate based on a study completed by Maestre and Pitt in 2005
2) Rainfall data is based on NOAA Atlas 14 Volume 10 for town/city of West Newbury, MA.
3) Specific Gravity is based on the NJDEP testing requirements for dynamic separators.
4) TSS removal goal is for storage calculations only.
5) Providing 3 years of storage capacity as a factor of safety assuming yearly cleaning of WQS.

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Sediment Storage Calculation Sheet

Nitsch Job #	12360	Date:	1/22/2020
Project Name:	Pentucket Regional School District Building Project		
Calculated by:	AMM	Checked by:	
Water Quality ID:	WQS-404		

This spreadsheet should be used to calculate the required amount of sediment storage for proposed water quality units.

Assumptions:	150	mg/L	TSS Loading
*change these as needed	42	inches	Annual Rainfall - Boston Area
	2650	kg/m^3	SG
	80%		TSS Removal
	3	years	Storage Capacity

Input:	Drainage Area:	1.19	acres
	% Impervious:	59.97%	of area

Volume of Runoff:	109161.360	cf/year =	3091.1	m^3/year		
Loading:	0.150	kg/m^3				
Sediment:	463.665	kg/year =	0.175	m^3/year =	6.179	cf/year
Sediment Removal:	4.943	cf/year				

Sediment Storage Required:	**15 cf**

Notes
1) TSS Loading is a conservative estimate based on a study completed by Maestre and Pitt in 2005
2) Rainfall data is based on NOAA Atlas 14 Volume 10 for town/city of West Newbury, MA.
3) Specific Gravity is based on the NJDEP testing requirements for dynamic separators.
4) TSS removal goal is for storage calculations only.
5) Providing 3 years of storage capacity as a factor of safety assuming yearly cleaning of WQS.

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Sediment Storage Calculation Sheet

Nitsch Job #: 12360 Date: 1/22/2020
Project Name: Pentucket Regional School District Building Project
Calculated by: AMM Checked by:
Water Quality ID: WQS-405

This spreadsheet should be used to calculate the required amount of sediment storage for proposed water quality units.

Assumptions:	150	mg/L	TSS Loading
*change these as needed	42	inches	Annual Rainfall - Boston Area
	2650	kg/m^3	SG
	80%		TSS Removal
	3	years	Storage Capacity

Input:	Drainage Area:		0.50	acres		
	% Impervious:		81.09%	of area		
Volume of Runoff:	61441.380	cf/year =	1739.823	m^3/year		
Loading:	0.150	kg/m^3				
Sediment:	260.973	kg/year =	0.098	m^3/year =	3.478	cf/year
Sediment Removal:	2.782	cf/year				
Sediment Storage Required:	**8 cf**					

Notes
1) TSS Loading is a conservative estimate based on a study completed by Maestre and Pitt in 2005
2) Rainfall data is based on NOAA Atlas 14 Volume 10 for town/city of West Newbury, MA.
3) Specific Gravity is based on the NJDEP testing requirements for dynamic separators.
4) TSS removal goal is for storage calculations only.
5) Providing 3 years of storage capacity as a factor of safety assuming yearly cleaning of WQS.

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Sediment Storage Calculation Sheet

Nitsch Job #	12360	Date:	1/22/2020
Project Name:	Pentucket Regional School District Building Project		
Calculated by:	AMM	Checked by:	
Water Quality ID:	WQS-406		

This spreadsheet should be used to calculate the required amount of sediment storage for proposed water quality units.

Assumptions:	150	mg/L	TSS Loading
*change these as needed	42	inches	Annual Rainfall - Boston Area
	2650	kg/m^3	SG
	80%		TSS Removal
	3	years	Storage Capacity

Input:	Drainage Area:	2.40	acres			
	% Impervious:	54.17%	of area			
Volume of Runoff:	198198.000	cf/year =	5612.333	m^3/year		
Loading:	0.150	kg/m^3				
Sediment:	841.850	kg/year =	0.318	m^3/year =	11.219	cf/year
Sediment Removal:	8.975	cf/year				
Sediment Storage Required:	**27 cf**					

Notes
1) TSS Loading is a conservative estimate based on a study completed by Maestre and Pitt in 2005
2) Rainfall data is based on NOAA Atlas 14 Volume 10 for town/city of West Newbury, MA.
3) Specific Gravity is based on the NJDEP testing requirements for dynamic separators.
4) TSS removal goal is for storage calculations only.
5) Providing 3 years of storage capacity as a factor of safety assuming yearly cleaning of WQS.

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Sediment Storage Calculation Sheet

Nitsch Job #	12360	Date:	1/22/2020
Project Name:	Pentucket Regional School District Building Project		
Calculated by:	AMM	Checked by:	
Water Quality ID:	WQS-407		

This spreadsheet should be used to calculate the required amount of sediment storage for proposed water quality units.

Assumptions:	150	mg/L	TSS Loading
*change these as needed	42	inches	Annual Rainfall - Boston Area
	2650	kg/m^3	SG
	80%		TSS Removal
	3	years	Storage Capacity

Input:	Drainage Area:	1.01	acres
	% Impervious:	82.85%	of area

Volume of Runoff:	127456.560	cf/year =	3609.162	m^3/year		
Loading:	0.150	kg/m^3				
Sediment:	541.374	kg/year =	0.204	m^3/year =	7.215	cf/year
Sediment Removal:	5.772	cf/year				

Sediment Storage Required:	**17 cf**

Notes
1) TSS Loading is a conservative estimate based on a study completed by Maestre and Pitt in 2005
2) Rainfall data is based on NOAA Atlas 14 Volume 10 for town/city of West Newbury, MA.
3) Specific Gravity is based on the NJDEP testing requirements for dynamic separators.
4) TSS removal goal is for storage calculations only.
5) Providing 3 years of storage capacity as a factor of safety assuming yearly cleaning of WQS.

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Sediment Storage Calculation Sheet

Nitsch Job #	12360	Date:	1/22/2020
Project Name:	Pentucket Regional School District Building Project		
Calculated by:	AMM	Checked by:	
Water Quality ID:	WQS-408		

This spreadsheet should be used to calculate the required amount of sediment storage for proposed water quality units.

Assumptions:	150	mg/L	TSS Loading
*change these as needed	42	inches	Annual Rainfall - Boston Area
	2650	kg/m^3	SG
	80%		TSS Removal
	3	years	Storage Capacity

Input:	Drainage Area:	1.20	acres
	% Impervious:	83.33%	of area

Volume of Runoff:	152460.000 cf/year =	4317.179	m^3/year		
Loading:	0.150 kg/m^3				
Sediment:	647.577 kg/year =	0.244	m^3/year =	8.630	cf/year
Sediment Removal:	6.904 cf/year				

Sediment Storage Required: **21 cf**

Notes
1) TSS Loading is a conservative estimate based on a study completed by Maestre and Pitt in 2005
2) Rainfall data is based on NOAA Atlas 14 Volume 10 for town/city of West Newbury, MA.
3) Specific Gravity is based on the NJDEP testing requirements for dynamic separators.
4) TSS removal goal is for storage calculations only.
5) Providing 3 years of storage capacity as a factor of safety assuming yearly cleaning of WQS.

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STANDARD 10: Illicit Discharge Compliance Statement

Project Name: Pentucket Regional School District Project	Nitsch Project #: 12360
Location: West Newbury and Groveland, MA	Checked by: Michelle Callahan
Prepared by: Anna Murphy	Sheet No. 1 of 1
Date: October 30, 2019	

Standard 10 states: All illicit discharges to the stormwater management system are prohibited.

This is to verify:

1. Based on the information available there are no known or suspected illicit discharges to the stormwater management system at Pentucket Regional School District Project site as defined in the MassDEP Stormwater Handbook.

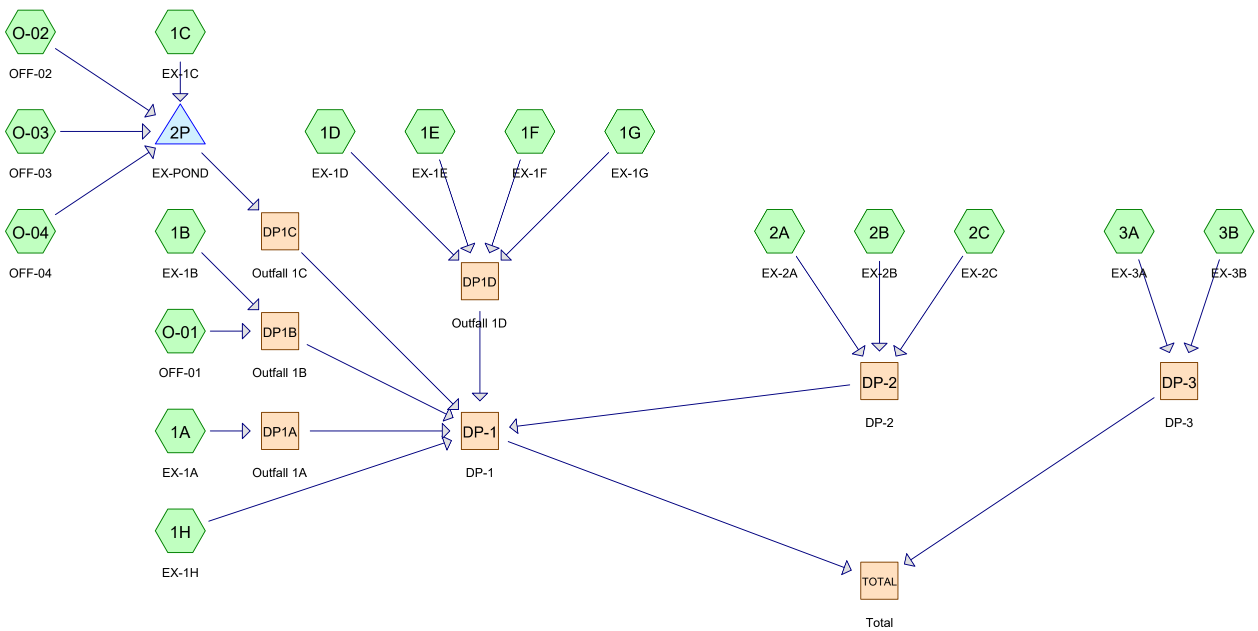
2. The design of the stormwater system includes no proposed illicit discharges.

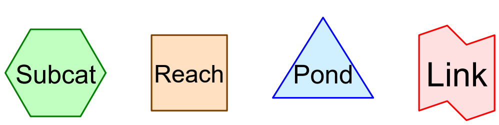
Michelle Callahan, PE

Date

APPENDIX B

Pre-Development Conditions – HydroCAD Calculations





Routing Diagram for 12360_Existing
Prepared by {enter your company name here}, Printed 1/16/2020
HydroCAD® 10.00-20 s/n 00546 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
239,589	57	1/3 acre lots, 30% imp, HSG A (O-01, O-02, O-03)
78,954	49	50-75% Grass cover, Fair, HSG A (1C)
582,556	39	>75% Grass cover, Good, HSG A (1A, 1B, 1D, 1E, 1F, 1H, 2A, 2B, 2C, 3A, 3B, O-01, O-04)
304,373	98	Paved parking, HSG A (1A, 1B, 1C, 1D, 1E, 1G, 2A, 2C, 3A, 3B)
234,138	98	Roofs, HSG A (1A, 1B, 1F, 1H, 2A, 2B, 3A)
33,620	98	Unconnected pavement, HSG A (O-01, O-04)
1,473,230	**65**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
1,473,230	HSG A	1A, 1B, 1C, 1D, 1E, 1F, 1G, 1H, 2A, 2B, 2C, 3A, 3B, O-01, O-02, O-03, O-04
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
1,473,230		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
239,589	0	0	0	0	239,589	1/3 acre lots, 30% imp	
78,954	0	0	0	0	78,954	50-75% Grass cover, Fair	
582,556	0	0	0	0	582,556	>75% Grass cover, Good	
304,373	0	0	0	0	304,373	Paved parking	
234,138	0	0	0	0	234,138	Roofs	
33,620	0	0	0	0	33,620	Unconnected pavement	
1,473,230	**0**	**0**	**0**	**0**	**1,473,230**	**TOTAL AREA**	

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	DP-2	16.00	15.12	96.0	0.0092	0.011	36.0	0.0	0.0
2	2P	18.72	17.59	24.3	0.0465	0.012	24.0	0.0	0.0

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A: EX-1A	Runoff Area=65,046 sf 15.40% Impervious Runoff Depth=0.11" Flow Length=405' Tc=6.9 min CN=48 Runoff=0.02 cfs 572 cf
Subcatchment1B: EX-1B	Runoff Area=220,211 sf 33.47% Impervious Runoff Depth=0.41" Flow Length=521' Tc=10.0 min CN=59 Runoff=1.23 cfs 7,487 cf
Subcatchment1C: EX-1C	Runoff Area=185,095 sf 57.34% Impervious Runoff Depth=1.28" Tc=6.0 min CN=77 Runoff=6.13 cfs 19,690 cf
Subcatchment1D: EX-1D	Runoff Area=48,816 sf 58.62% Impervious Runoff Depth=1.10" Tc=6.0 min CN=74 Runoff=1.37 cfs 4,464 cf
Subcatchment1E: EX-1E	Runoff Area=24,840 sf 82.66% Impervious Runoff Depth=2.08" Tc=6.0 min CN=88 Runoff=1.33 cfs 4,302 cf
Subcatchment1F: EX-1F	Runoff Area=48,259 sf 97.34% Impervious Runoff Depth=2.84" Tc=6.0 min CN=96 Runoff=3.24 cfs 11,413 cf
Subcatchment1G: EX-1G	Runoff Area=19,306 sf 100.00% Impervious Runoff Depth=3.06" Tc=6.0 min CN=98 Runoff=1.34 cfs 4,918 cf
Subcatchment1H: EX-1H	Runoff Area=116,037 sf 90.23% Impervious Runoff Depth=2.44" Tc=6.0 min CN=92 Runoff=7.07 cfs 23,558 cf
Subcatchment2A: EX-2A	Runoff Area=245,993 sf 0.60% Impervious Runoff Depth=0.00" Flow Length=663' Tc=10.1 min CN=39 Runoff=0.00 cfs 34 cf
Subcatchment2B: EX-2B	Runoff Area=47,149 sf 75.39% Impervious Runoff Depth=1.68" Tc=6.0 min CN=83 Runoff=2.08 cfs 6,614 cf
Subcatchment2C: EX-2C	Runoff Area=39,008 sf 61.89% Impervious Runoff Depth=1.22" Tc=6.0 min CN=76 Runoff=1.23 cfs 3,950 cf
Subcatchment3A: EX-3A	Runoff Area=97,064 sf 62.88% Impervious Runoff Depth=1.22" Tc=6.0 min CN=76 Runoff=3.05 cfs 9,828 cf
Subcatchment3B: EX-3B	Runoff Area=13,333 sf 47.42% Impervious Runoff Depth=0.73" Tc=6.0 min CN=67 Runoff=0.23 cfs 816 cf
SubcatchmentO-01: OFF-01	Runoff Area=112,122 sf 33.01% Impervious Runoff Depth=0.41" Tc=6.0 min CN=59 Runoff=0.76 cfs 3,812 cf
SubcatchmentO-02: OFF-02	Runoff Area=109,762 sf 30.00% Impervious Runoff Depth=0.34" Tc=6.0 min CN=57 Runoff=0.50 cfs 3,112 cf
SubcatchmentO-03: OFF-03	Runoff Area=45,823 sf 30.00% Impervious Runoff Depth=0.34" Tc=6.0 min CN=57 Runoff=0.21 cfs 1,299 cf

Subcatchment O-04: OFF-04 Runoff Area=35,366 sf 61.66% Impervious Runoff Depth=1.16"
Tc=6.0 min CN=75 Runoff=1.05 cfs 3,405 cf

Reach DP-1: DP-1 Inflow=19.11 cfs 71,124 cf
Outflow=19.11 cfs 71,124 cf

Reach DP-2: DP-2 Avg. Flow Depth=0.43' Max Vel=5.34 fps Inflow=3.30 cfs 10,598 cf
36.0" Round Pipe n=0.011 L=96.0' S=0.0092 '/' Capacity=75.47 cfs Outflow=3.27 cfs 10,598 cf

Reach DP-3: DP-3 Inflow=3.28 cfs 10,645 cf
Outflow=3.28 cfs 10,645 cf

Reach DP1A: Outfall 1A Inflow=0.02 cfs 572 cf
Outflow=0.02 cfs 572 cf

Reach DP1B: Outfall 1B Inflow=1.83 cfs 11,300 cf
Outflow=1.83 cfs 11,300 cf

Reach DP1C: Outfall 1C Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Reach DP1D: Outfall 1D Inflow=7.27 cfs 25,097 cf
Outflow=7.27 cfs 25,097 cf

Reach TOTAL: Total Inflow=22.39 cfs 81,769 cf
Outflow=22.39 cfs 81,769 cf

Pond 2P: EX-POND Peak Elev=20.68' Storage=27,505 cf Inflow=7.83 cfs 27,506 cf
Outflow=0.00 cfs 0 cf

Total Runoff Area = 1,473,230 sf Runoff Volume = 109,275 cf Average Runoff Depth = 0.89"
56.29% Pervious = 829,222 sf 43.71% Impervious = 644,008 sf

Summary for Subcatchment 1A: EX-1A

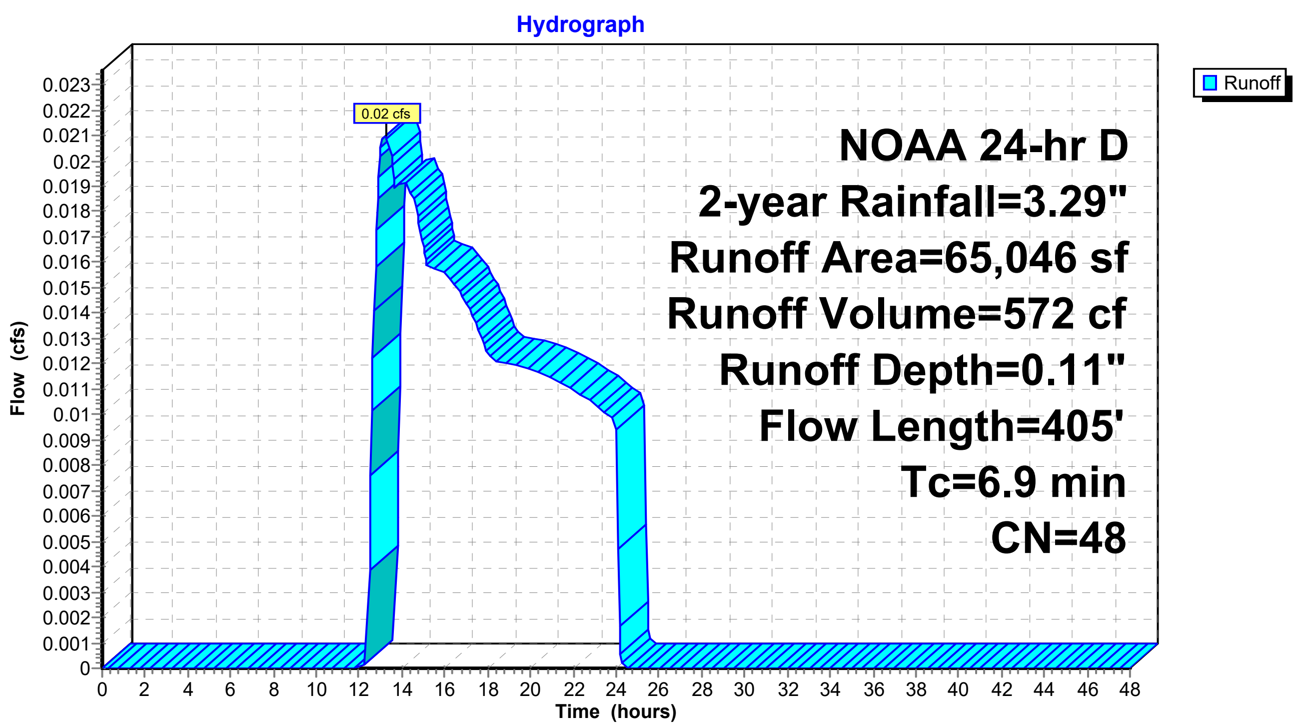
Runoff = 0.02 cfs @ 13.26 hrs, Volume= 572 cf, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
5,063	98	Roofs, HSG A
4,956	98	Paved parking, HSG A
55,027	39	>75% Grass cover, Good, HSG A
65,046	48	Weighted Average
55,027		84.60% Pervious Area
10,019		15.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0700	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.29"
3.5	355	0.0127	1.69		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.9	405	Total			

Subcatchment 1A: EX-1A



Summary for Subcatchment 1B: EX-1B

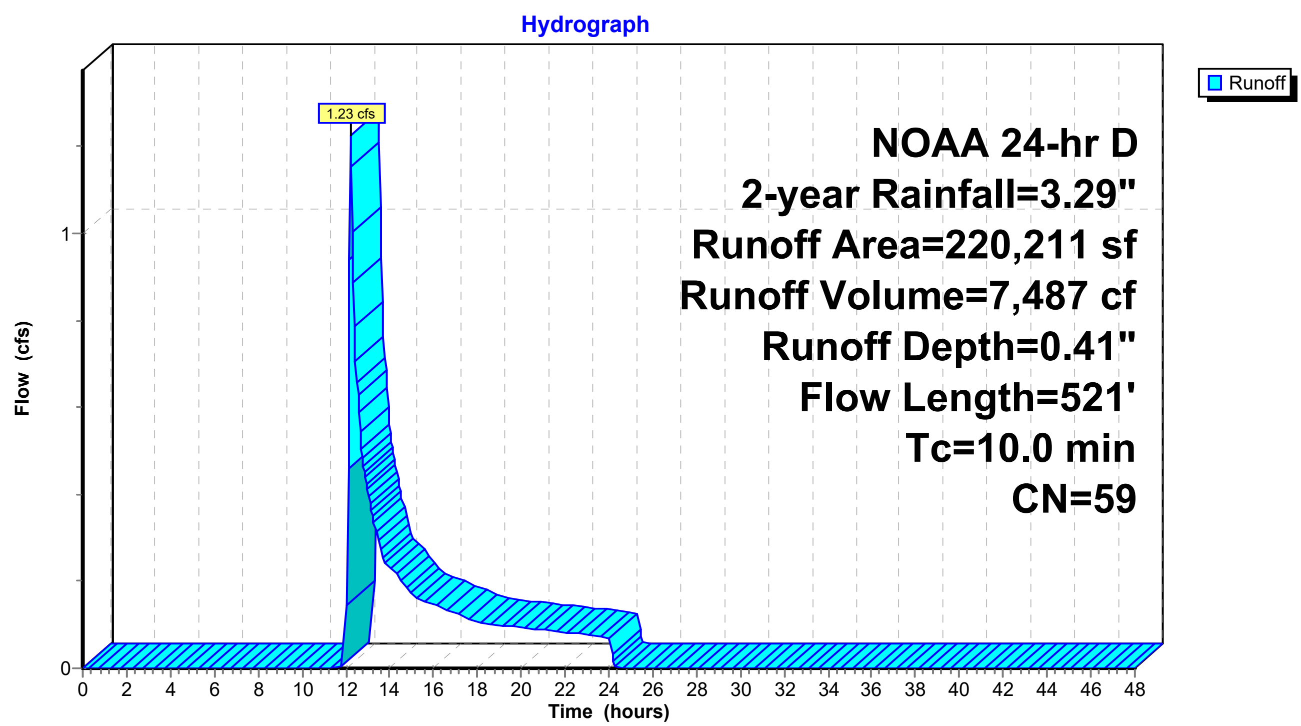
Runoff = 1.23 cfs @ 12.22 hrs, Volume= 7,487 cf, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
3,434	98	Roofs, HSG A
70,263	98	Paved parking, HSG A
146,514	39	>75% Grass cover, Good, HSG A
220,211	59	Weighted Average
146,514		66.53% Pervious Area
73,697		33.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.29"
5.3	471	0.0096	1.47		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.0	521	Total			

Subcatchment 1B: EX-1B



Summary for Subcatchment 1C: EX-1C

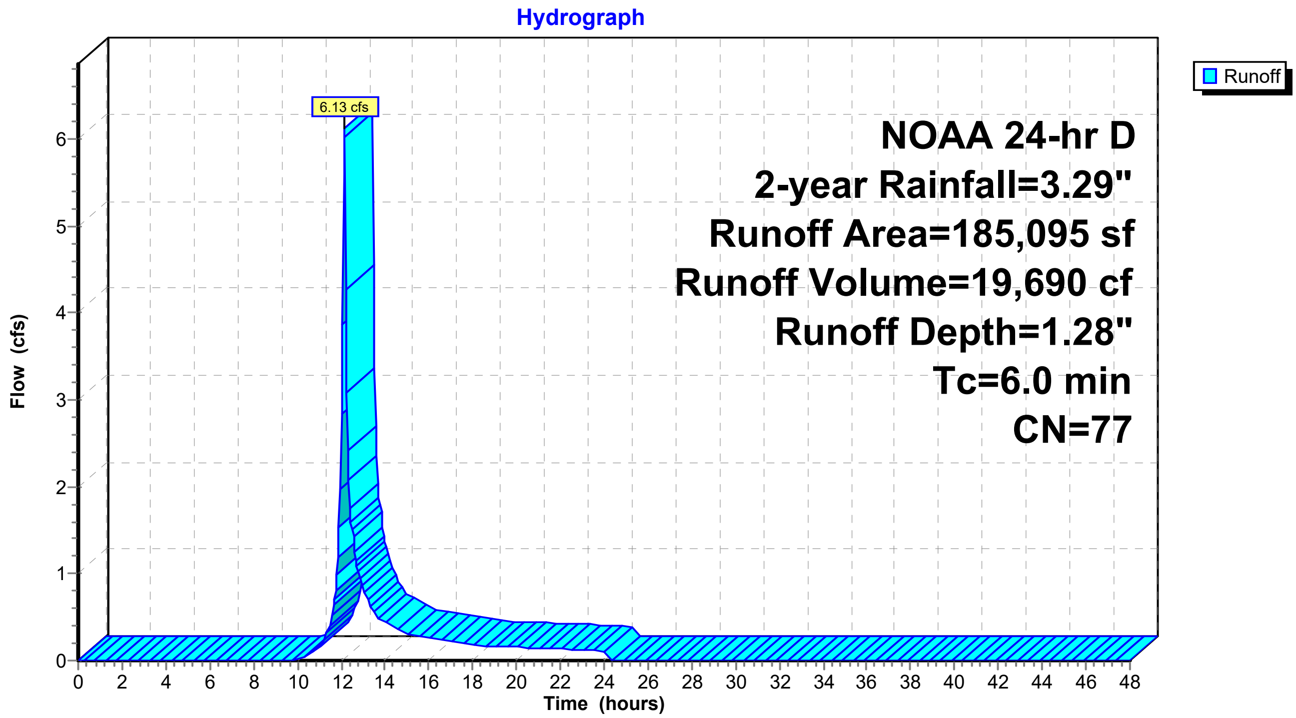
Runoff = 6.13 cfs @ 12.13 hrs, Volume= 19,690 cf, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
106,141	98	Paved parking, HSG A
78,954	49	50-75% Grass cover, Fair, HSG A
185,095	77	Weighted Average
78,954		42.66% Pervious Area
106,141		57.34% Impervious Area

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

Subcatchment 1C: EX-1C



Summary for Subcatchment 1D: EX-1D

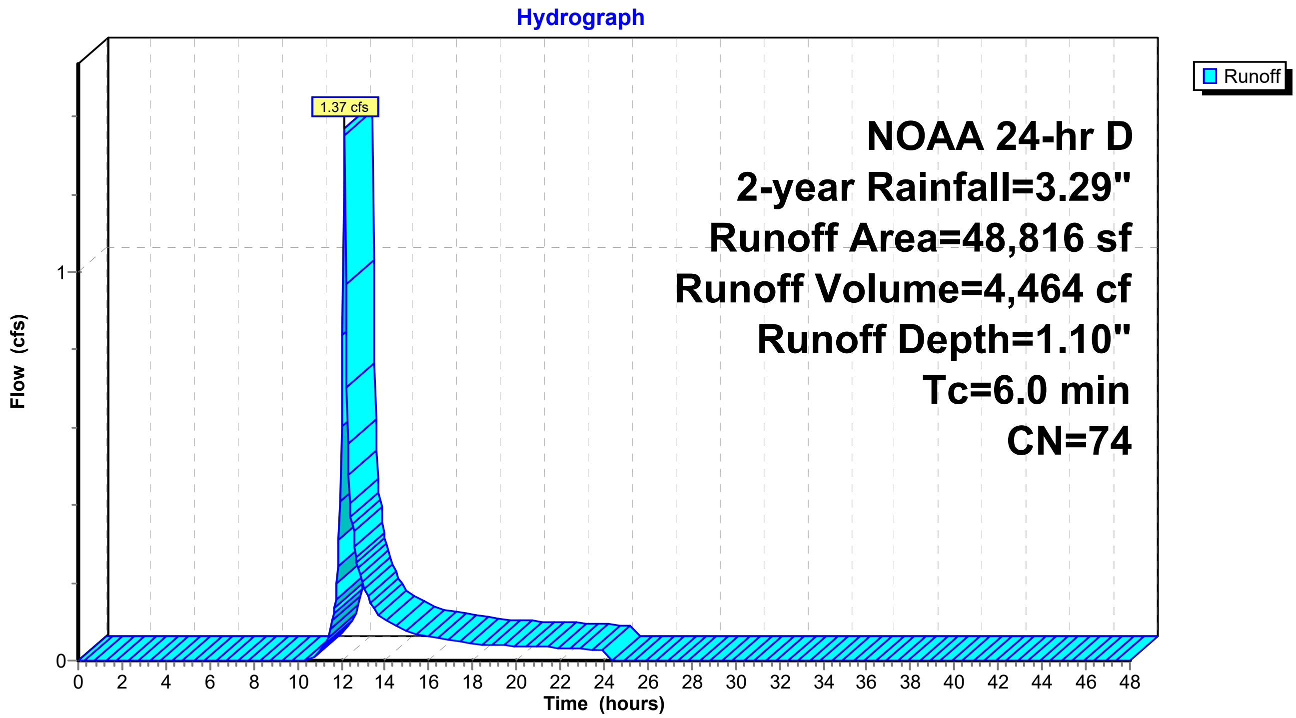
Runoff = 1.37 cfs @ 12.14 hrs, Volume= 4,464 cf, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
28,618	98	Paved parking, HSG A
20,198	39	>75% Grass cover, Good, HSG A
48,816	74	Weighted Average
20,198		41.38% Pervious Area
28,618		58.62% Impervious Area

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

Subcatchment 1D: EX-1D



Summary for Subcatchment 1E: EX-1E

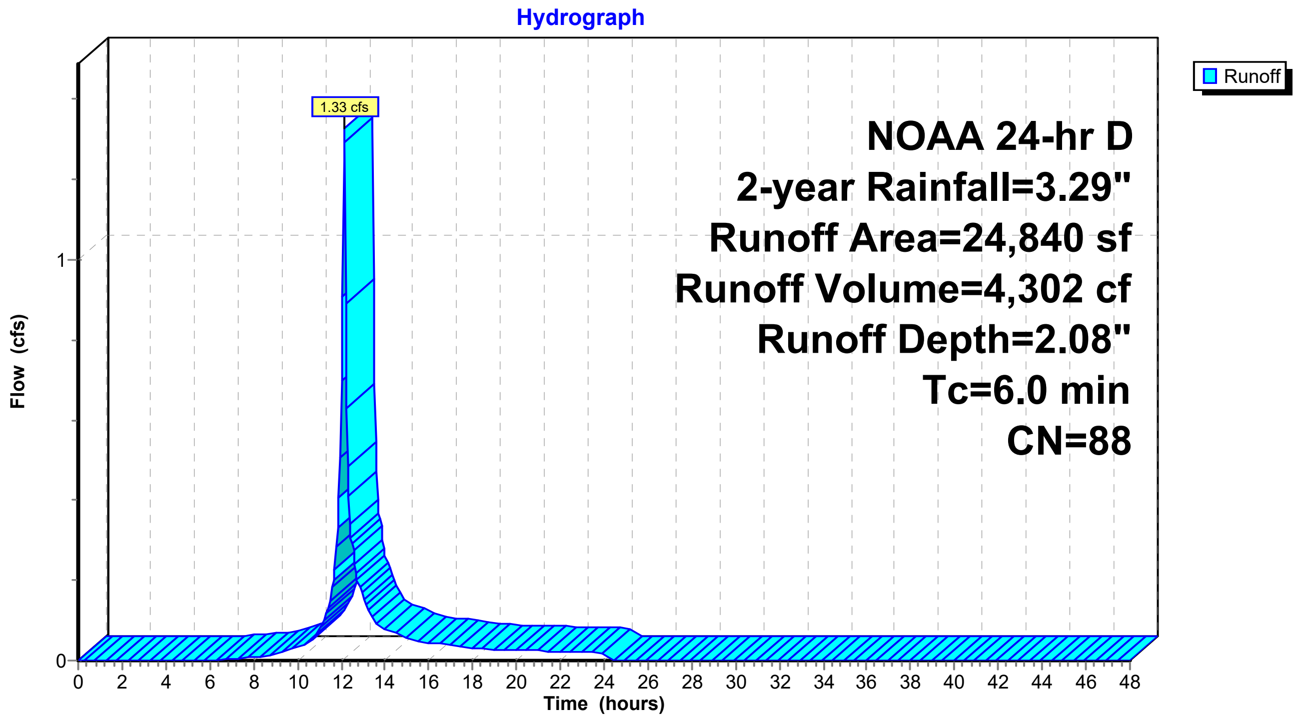
Runoff = 1.33 cfs @ 12.13 hrs, Volume= 4,302 cf, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
20,533	98	Paved parking, HSG A
4,307	39	>75% Grass cover, Good, HSG A
24,840	88	Weighted Average
4,307		17.34% Pervious Area
20,533		82.66% Impervious Area

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

Subcatchment 1E: EX-1E



Summary for Subcatchment 1F: EX-1F

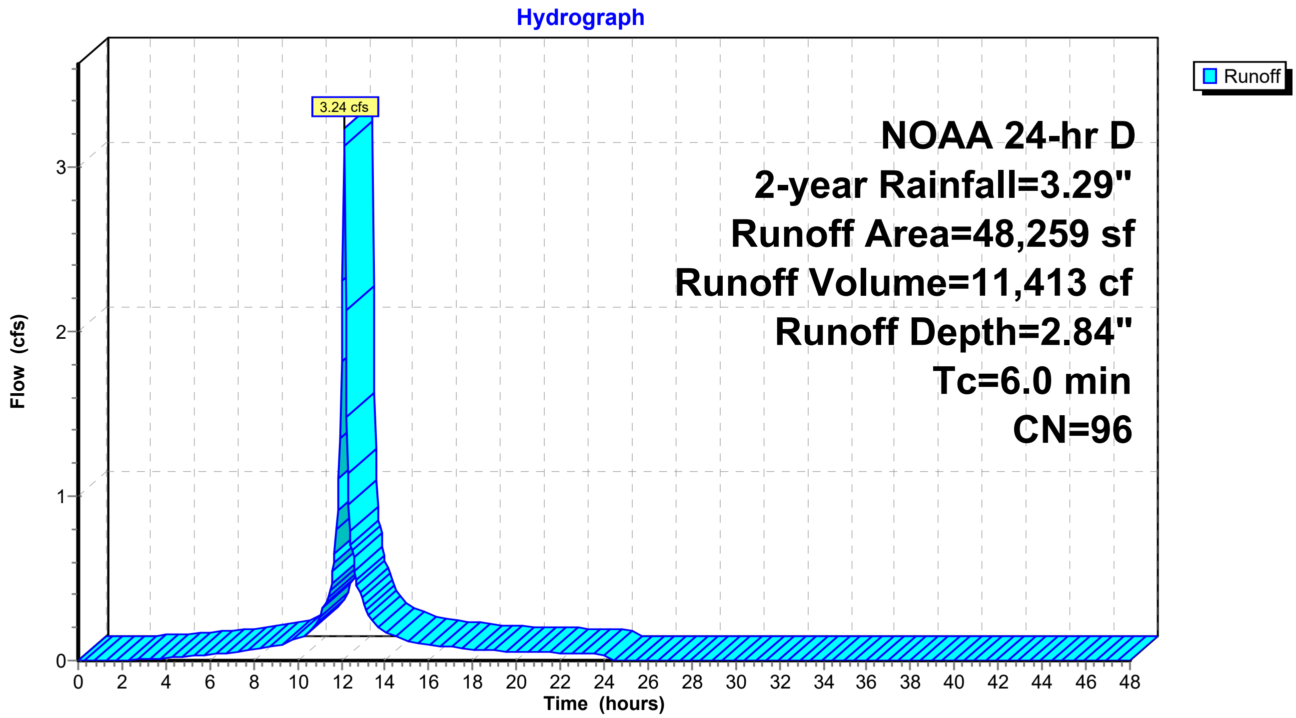
Runoff = 3.24 cfs @ 12.13 hrs, Volume= 11,413 cf, Depth= 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
46,973	98	Roofs, HSG A
1,286	39	>75% Grass cover, Good, HSG A
48,259	96	Weighted Average
1,286		2.66% Pervious Area
46,973		97.34% Impervious Area

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

Subcatchment 1F: EX-1F



Summary for Subcatchment 1G: EX-1G

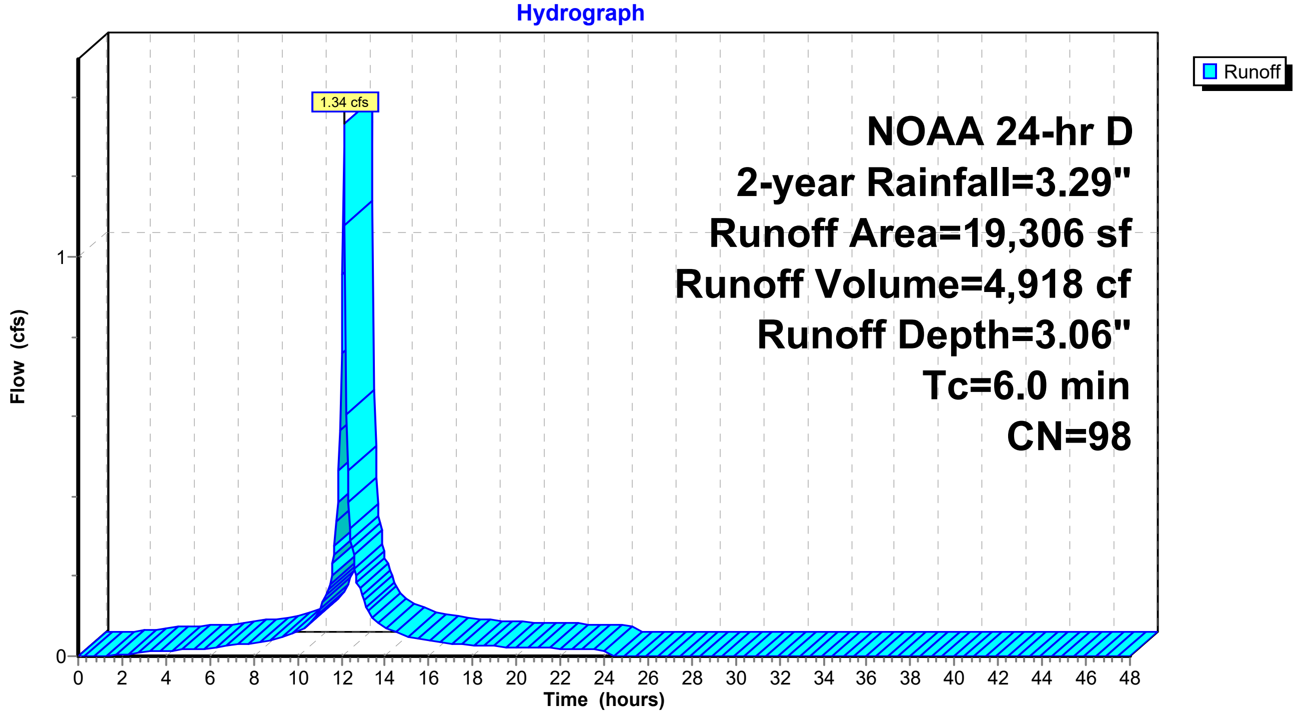
Runoff = 1.34 cfs @ 12.13 hrs, Volume= 4,918 cf, Depth= 3.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
19,306	98	Paved parking, HSG A
19,306		100.00% Impervious Area

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

Subcatchment 1G: EX-1G



Summary for Subcatchment 1H: EX-1H

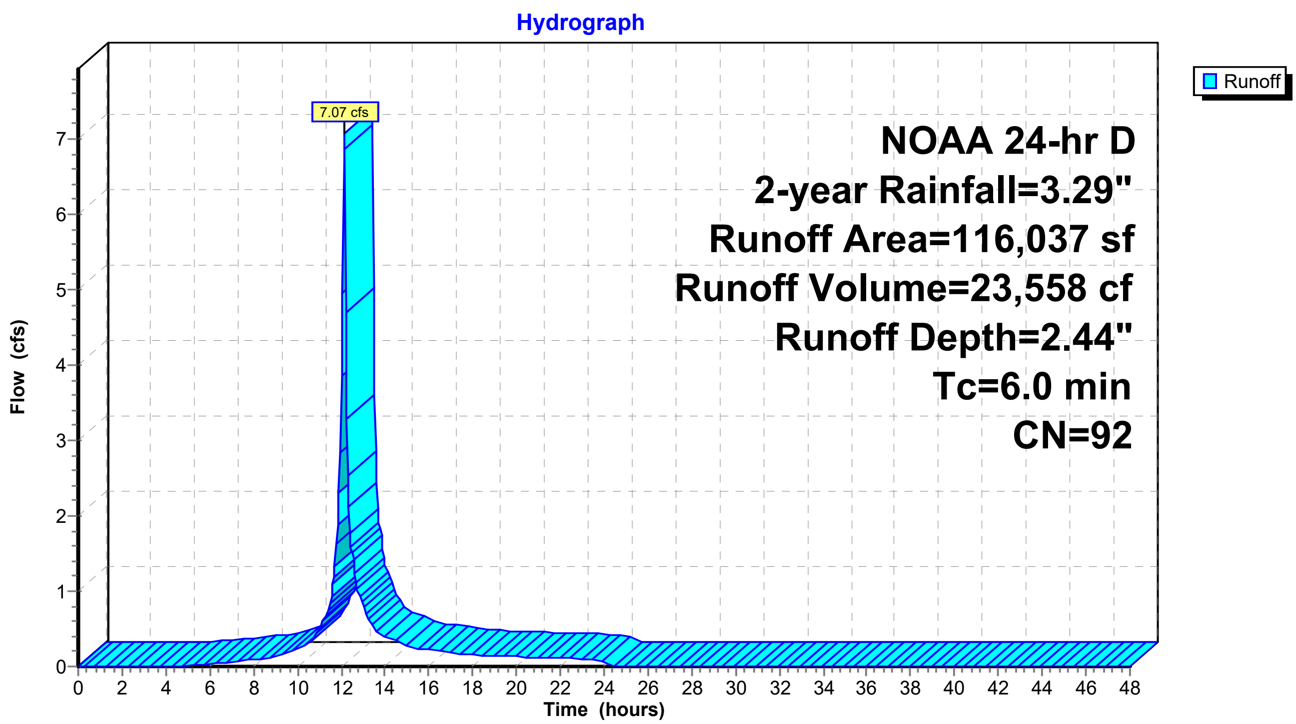
Runoff = 7.07 cfs @ 12.13 hrs, Volume= 23,558 cf, Depth= 2.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
104,697	98	Roofs, HSG A
11,340	39	>75% Grass cover, Good, HSG A
116,037	92	Weighted Average
11,340		9.77% Pervious Area
104,697		90.23% Impervious Area

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

Subcatchment 1H: EX-1H



Summary for Subcatchment 2A: EX-2A

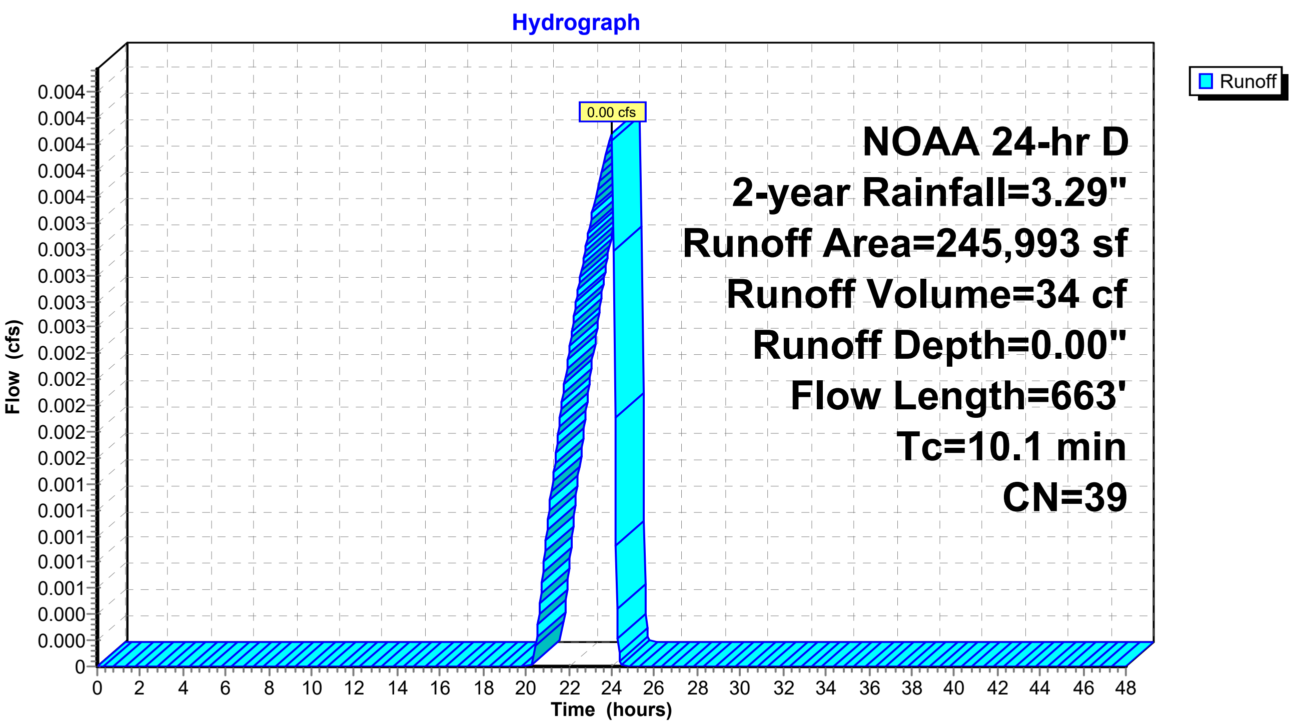
Runoff = 0.00 cfs @ 23.99 hrs, Volume= 34 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
763	98	Roofs, HSG A
720	98	Paved parking, HSG A
244,510	39	>75% Grass cover, Good, HSG A
245,993	39	Weighted Average
244,510		99.40% Pervious Area
1,483		0.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0356	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.29"
2.5	247	0.0121	1.65		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.6	145	0.0623	3.74		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.6	221	0.0091	1.43		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.1	663	Total			

Subcatchment 2A: EX-2A



Summary for Subcatchment 2B: EX-2B

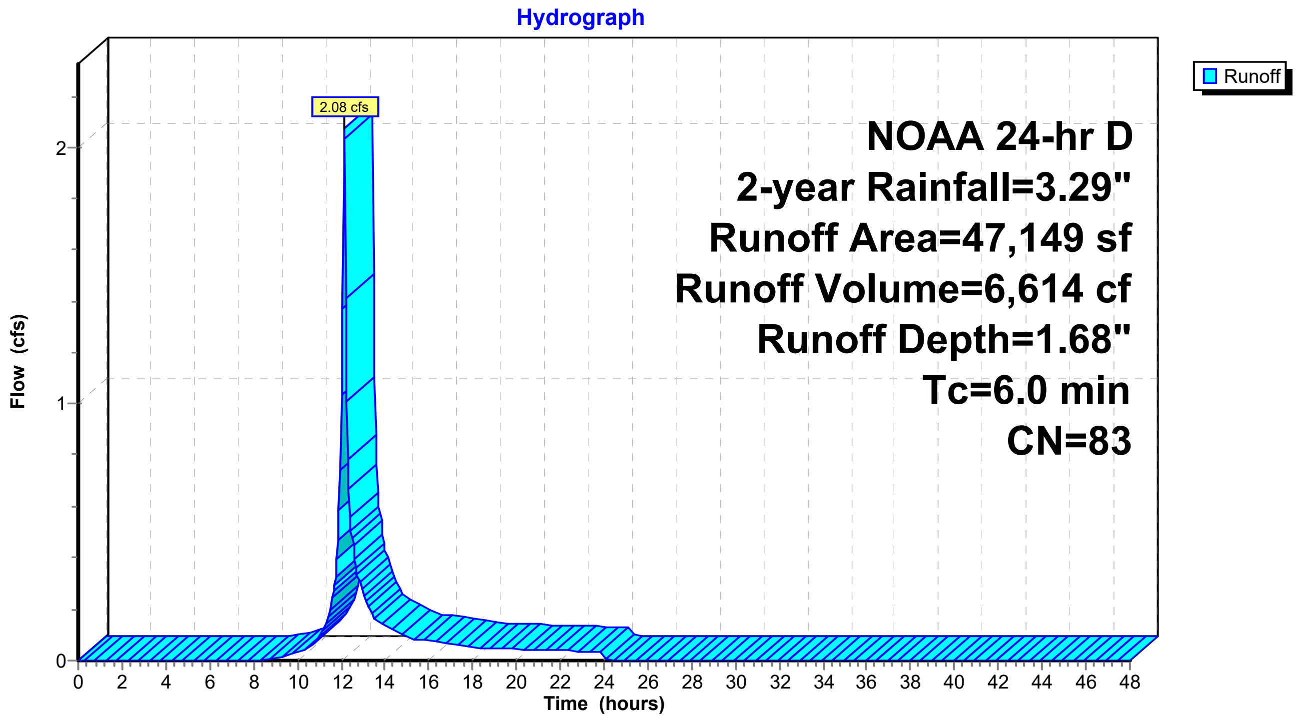
Runoff = 2.08 cfs @ 12.13 hrs, Volume= 6,614 cf, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
35,544	98	Roofs, HSG A
11,605	39	>75% Grass cover, Good, HSG A
47,149	83	Weighted Average
11,605		24.61% Pervious Area
35,544		75.39% Impervious Area

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

Subcatchment 2B: EX-2B



Summary for Subcatchment 2C: EX-2C

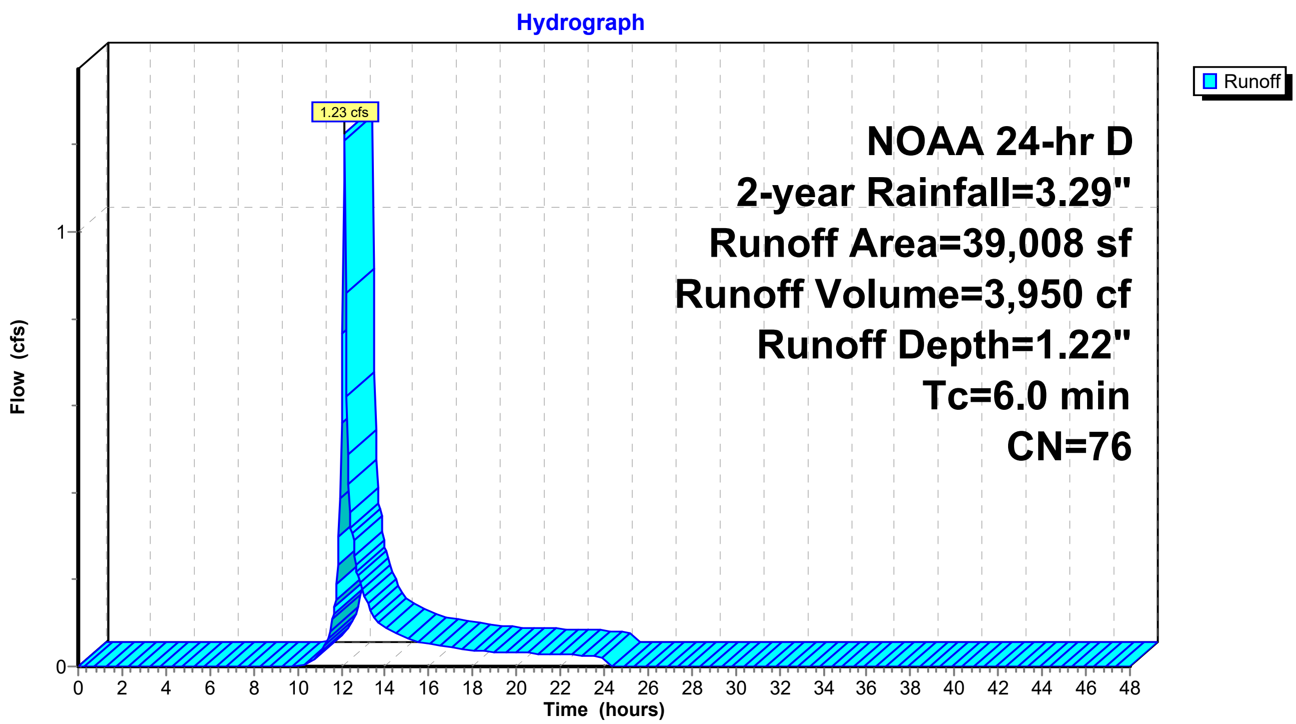
Runoff = 1.23 cfs @ 12.14 hrs, Volume= 3,950 cf, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
24,142	98	Paved parking, HSG A
14,866	39	>75% Grass cover, Good, HSG A
39,008	76	Weighted Average
14,866		38.11% Pervious Area
24,142		61.89% Impervious Area

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

Subcatchment 2C: EX-2C



Summary for Subcatchment 3A: EX-3A

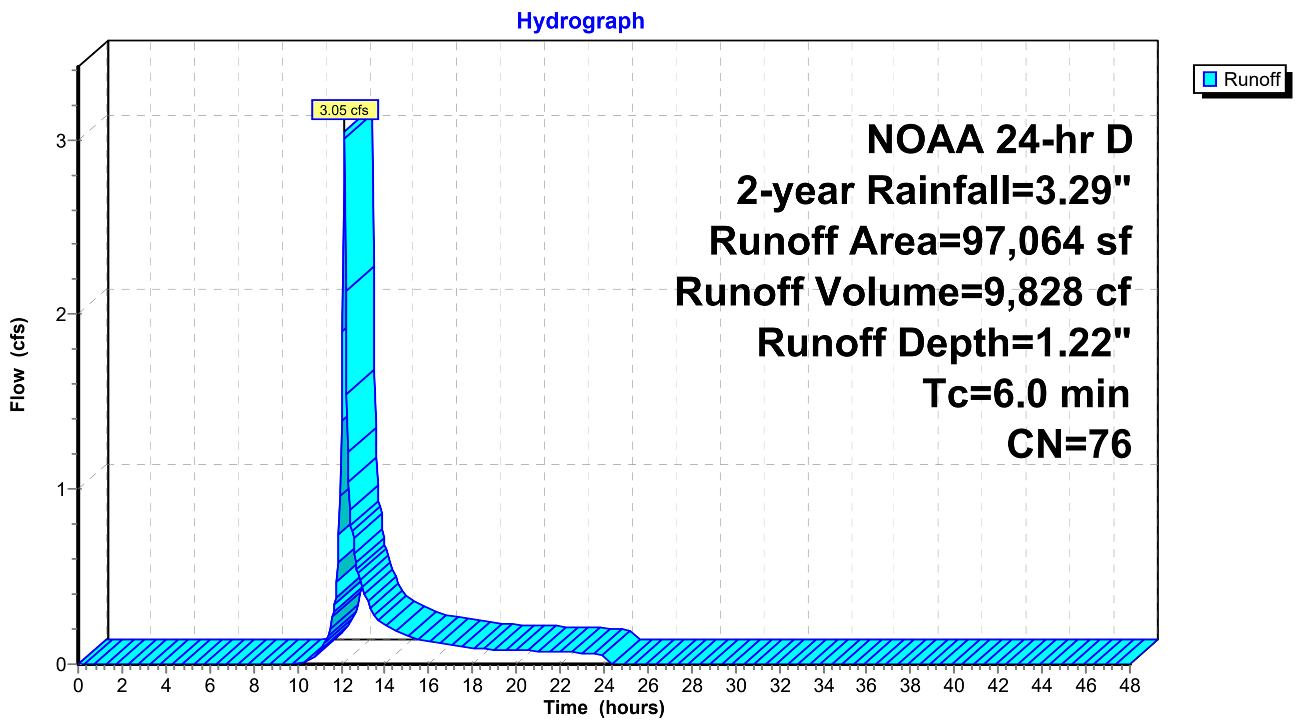
Runoff = 3.05 cfs @ 12.14 hrs, Volume= 9,828 cf, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
37,664	98	Roofs, HSG A
23,371	98	Paved parking, HSG A
36,029	39	>75% Grass cover, Good, HSG A
97,064	76	Weighted Average
36,029		37.12% Pervious Area
61,035		62.88% Impervious Area

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

Subcatchment 3A: EX-3A



Summary for Subcatchment 3B: EX-3B

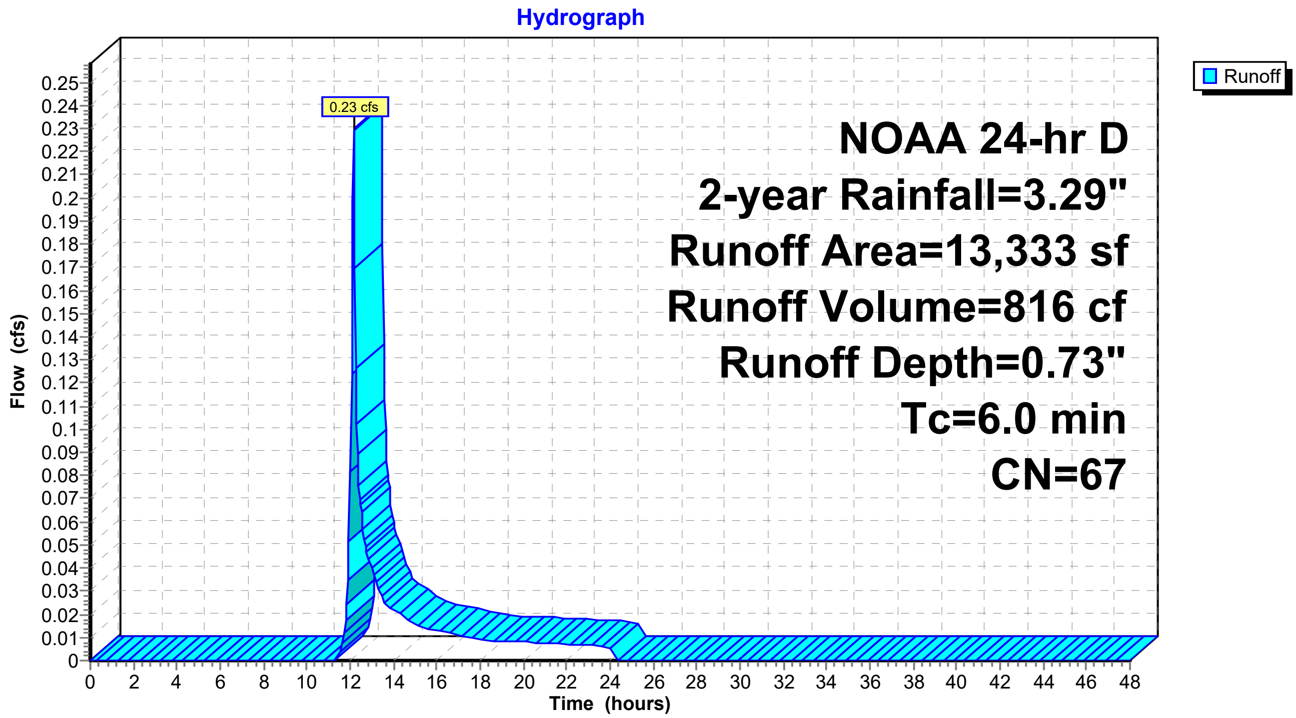
Runoff = 0.23 cfs @ 12.14 hrs, Volume= 816 cf, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
6,323	98	Paved parking, HSG A
7,010	39	>75% Grass cover, Good, HSG A
13,333	67	Weighted Average
7,010		52.58% Pervious Area
6,323		47.42% Impervious Area

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

Subcatchment 3B: EX-3B



Summary for Subcatchment O-01: OFF-01

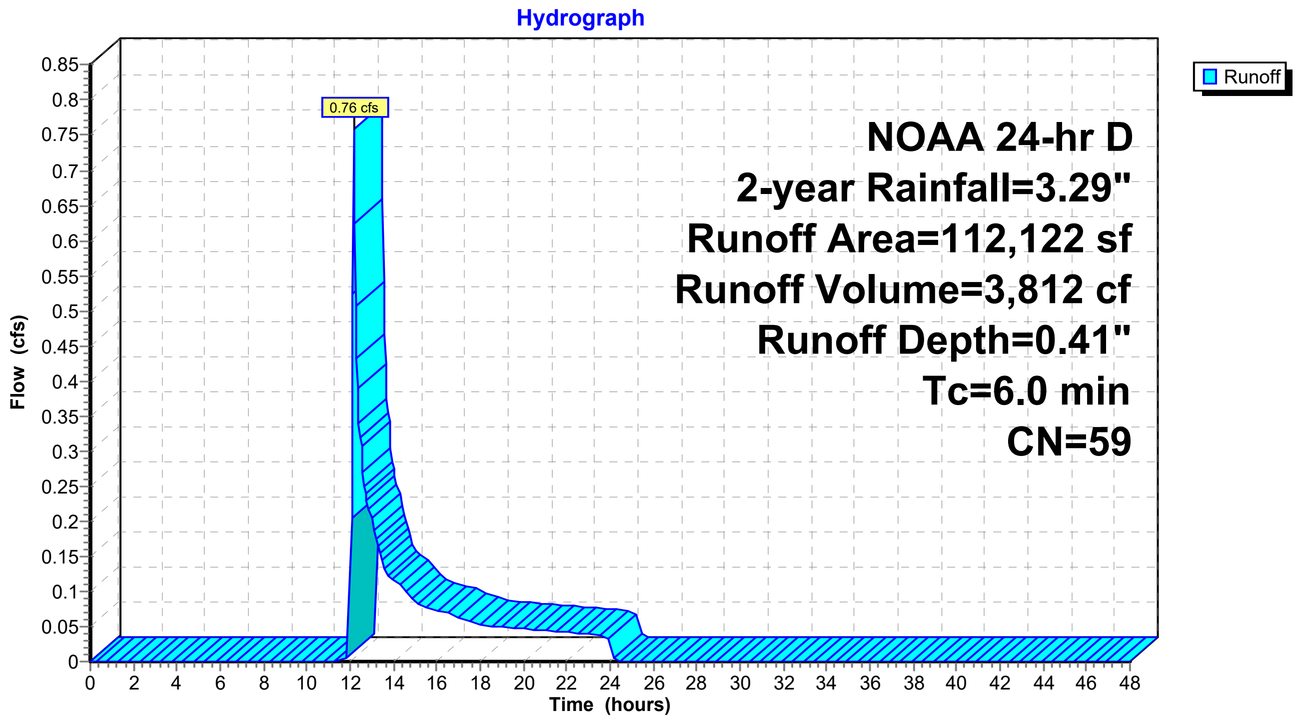
Runoff = 0.76 cfs @ 12.16 hrs, Volume= 3,812 cf, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
16,305	39	>75% Grass cover, Good, HSG A
11,813	98	Unconnected pavement, HSG A
84,004	57	1/3 acre lots, 30% imp, HSG A
112,122	59	Weighted Average
75,108		66.99% Pervious Area
37,014		33.01% Impervious Area
11,813		31.91% Unconnected

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

Subcatchment O-01: OFF-01



Summary for Subcatchment O-02: OFF-02

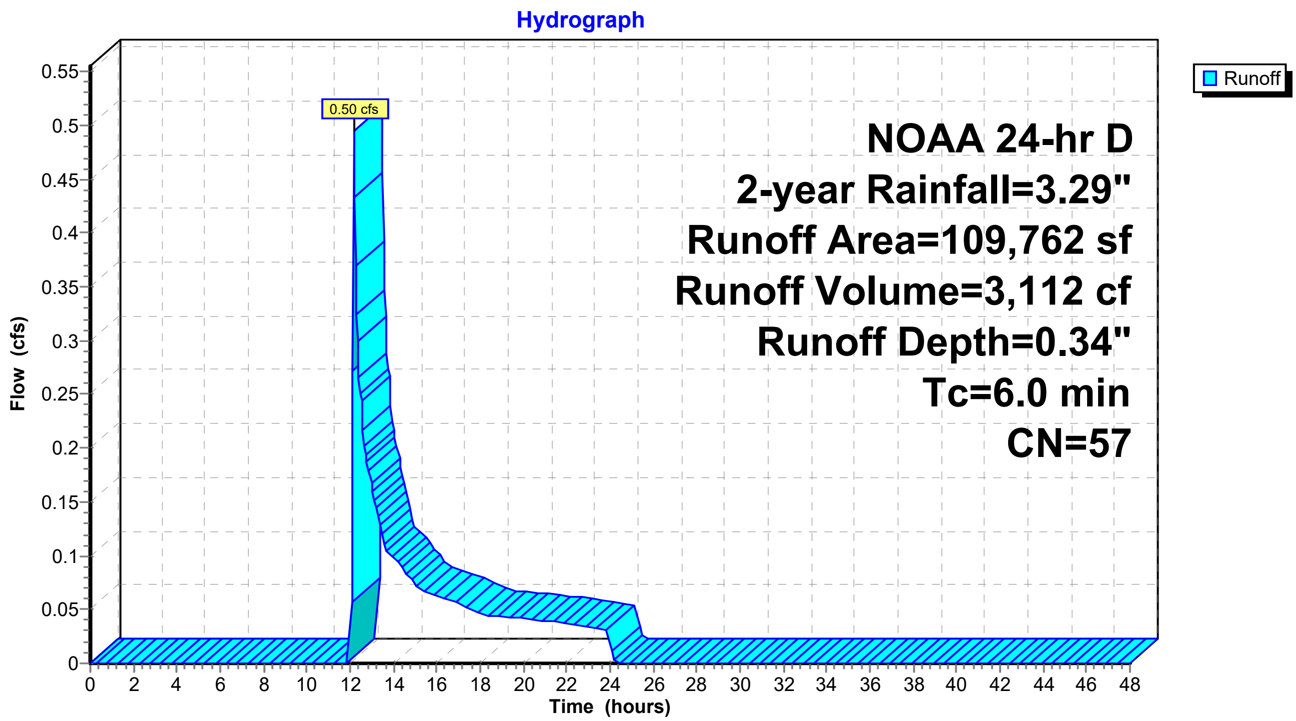
Runoff = 0.50 cfs @ 12.17 hrs, Volume= 3,112 cf, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
109,762	57	1/3 acre lots, 30% imp, HSG A
76,833		70.00% Pervious Area
32,929		30.00% Impervious Area

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

Subcatchment O-02: OFF-02



Summary for Subcatchment O-03: OFF-03

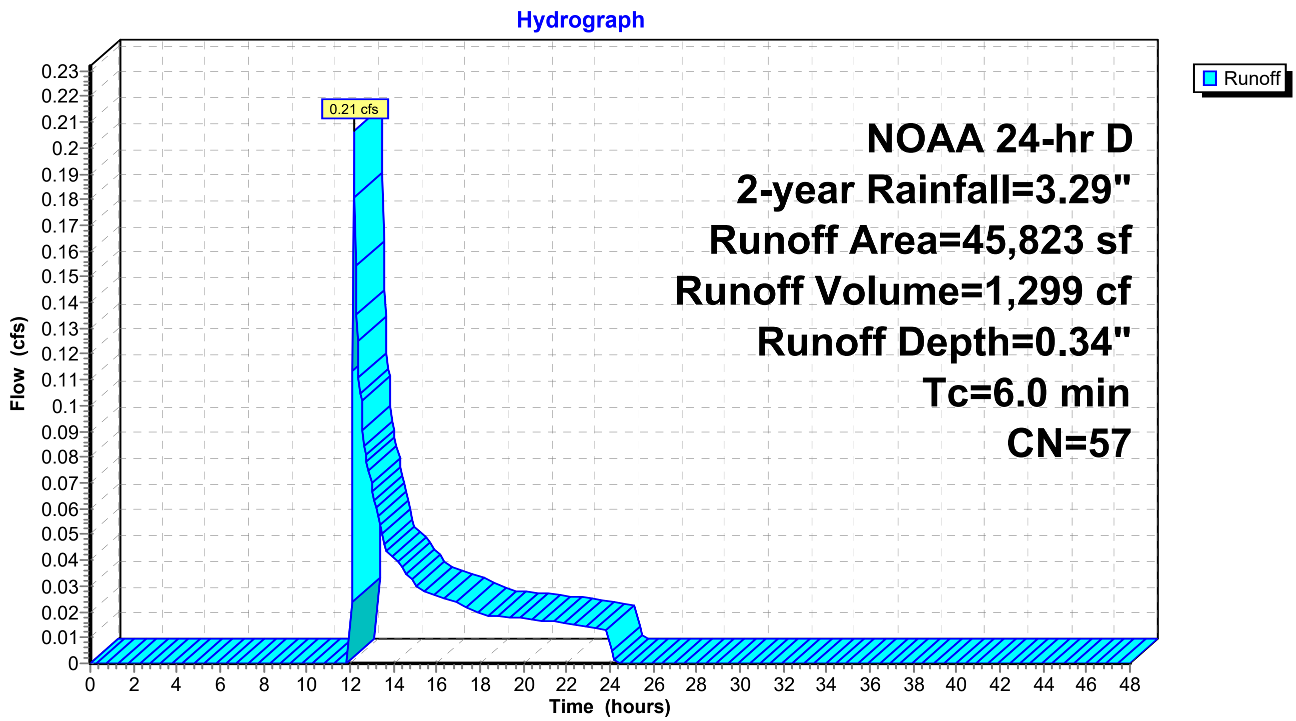
Runoff = 0.21 cfs @ 12.17 hrs, Volume= 1,299 cf, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
45,823	57	1/3 acre lots, 30% imp, HSG A
32,076		70.00% Pervious Area
13,747		30.00% Impervious Area

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

Subcatchment O-03: OFF-03



Summary for Subcatchment O-04: OFF-04

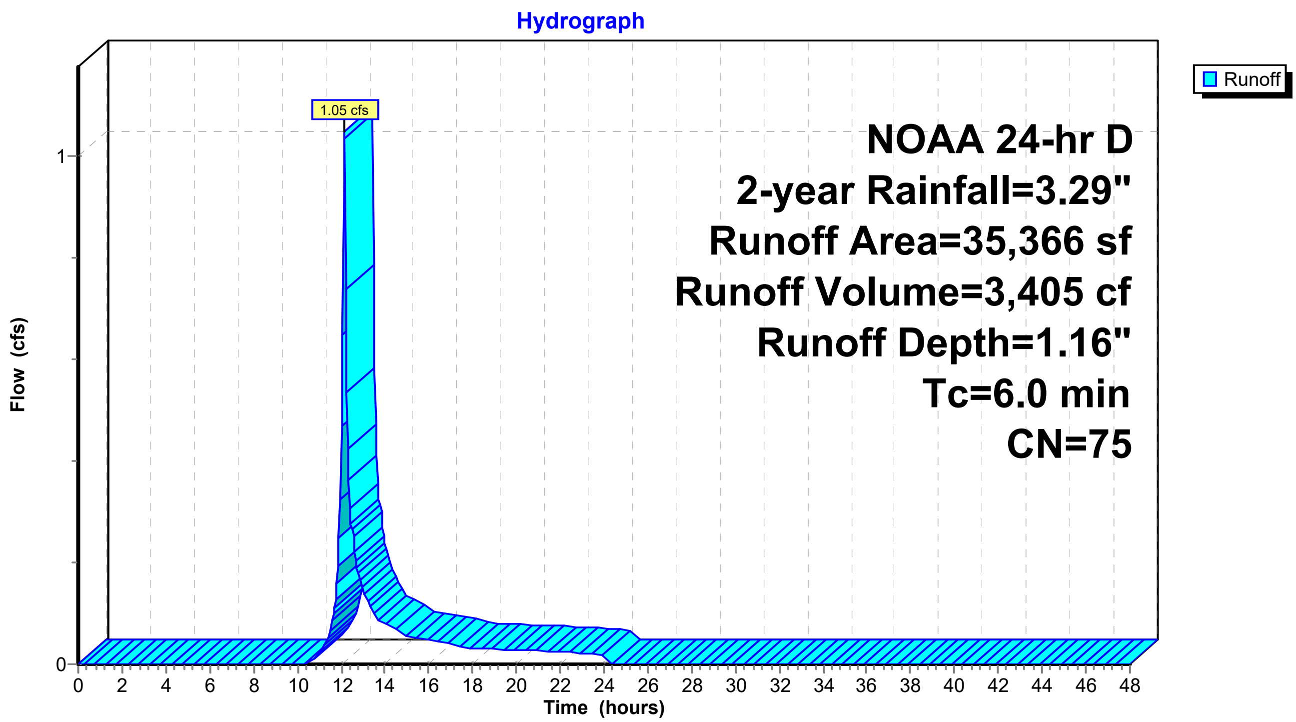
Runoff = 1.05 cfs @ 12.14 hrs, Volume= 3,405 cf, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
21,807	98	Unconnected pavement, HSG A
13,559	39	>75% Grass cover, Good, HSG A
35,366	75	Weighted Average
13,559		38.34% Pervious Area
21,807		61.66% Impervious Area
21,807		100.00% Unconnected

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

Subcatchment O-04: OFF-04

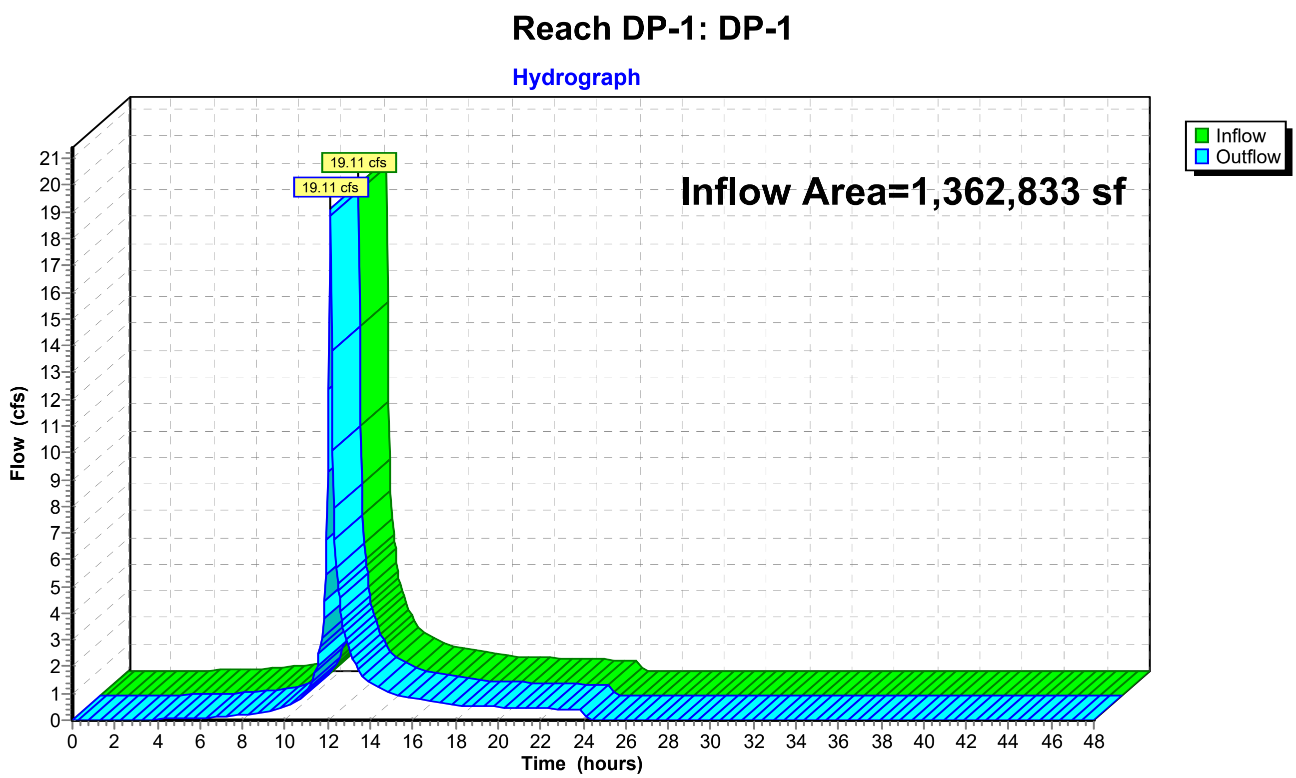


Summary for Reach DP-1: DP-1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,362,833 sf, 42.31% Impervious, Inflow Depth = 0.63" for 2-year event
Inflow = 19.11 cfs @ 12.14 hrs, Volume= 71,124 cf
Outflow = 19.11 cfs @ 12.14 hrs, Volume= 71,124 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



Summary for Reach DP-2: DP-2

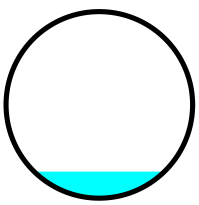
[52] Hint: Inlet/Outlet conditions not evaluated

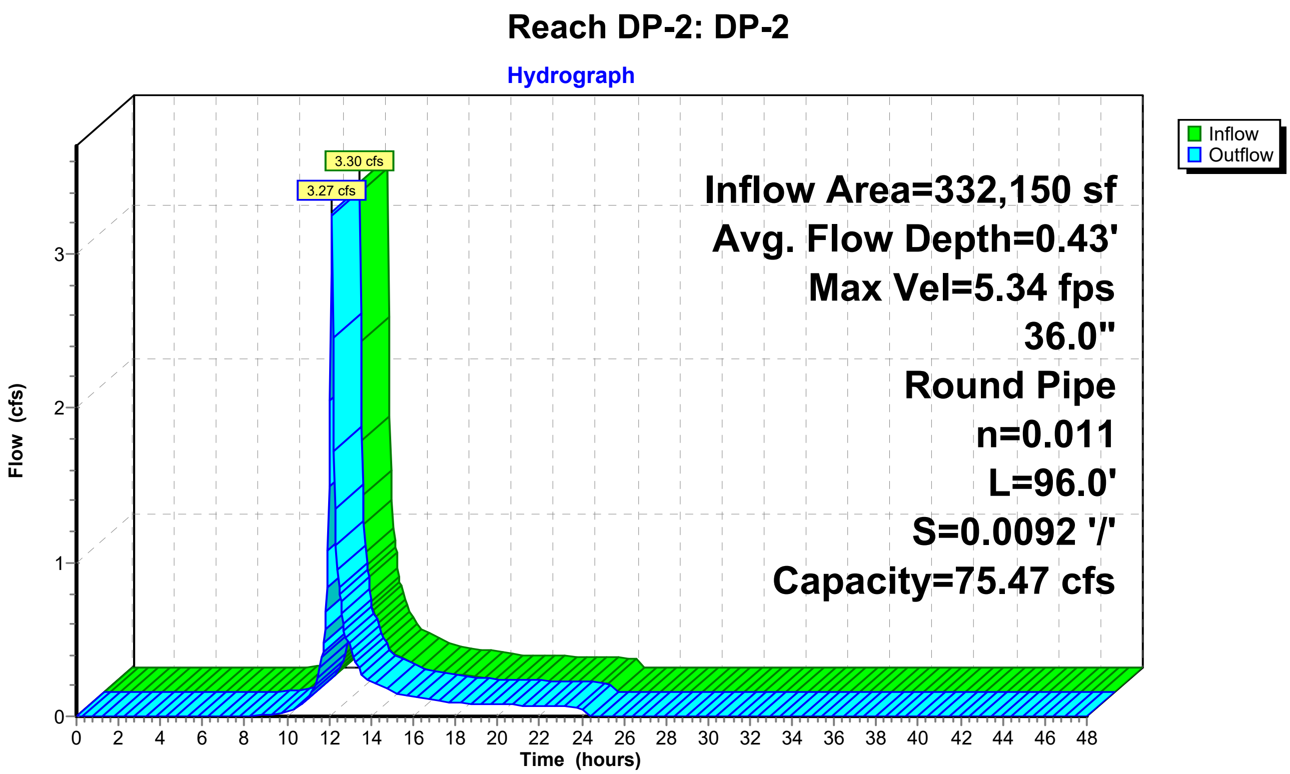
Inflow Area = 332,150 sf, 18.42% Impervious, Inflow Depth = 0.38" for 2-year event
Inflow = 3.30 cfs @ 12.13 hrs, Volume= 10,598 cf
Outflow = 3.27 cfs @ 12.14 hrs, Volume= 10,598 cf, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.34 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.92 fps, Avg. Travel Time= 0.8 min

Peak Storage= 59 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 75.47 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 96.0' Slope= 0.0092 '/'
Inlet Invert= 16.00', Outlet Invert= 15.12'



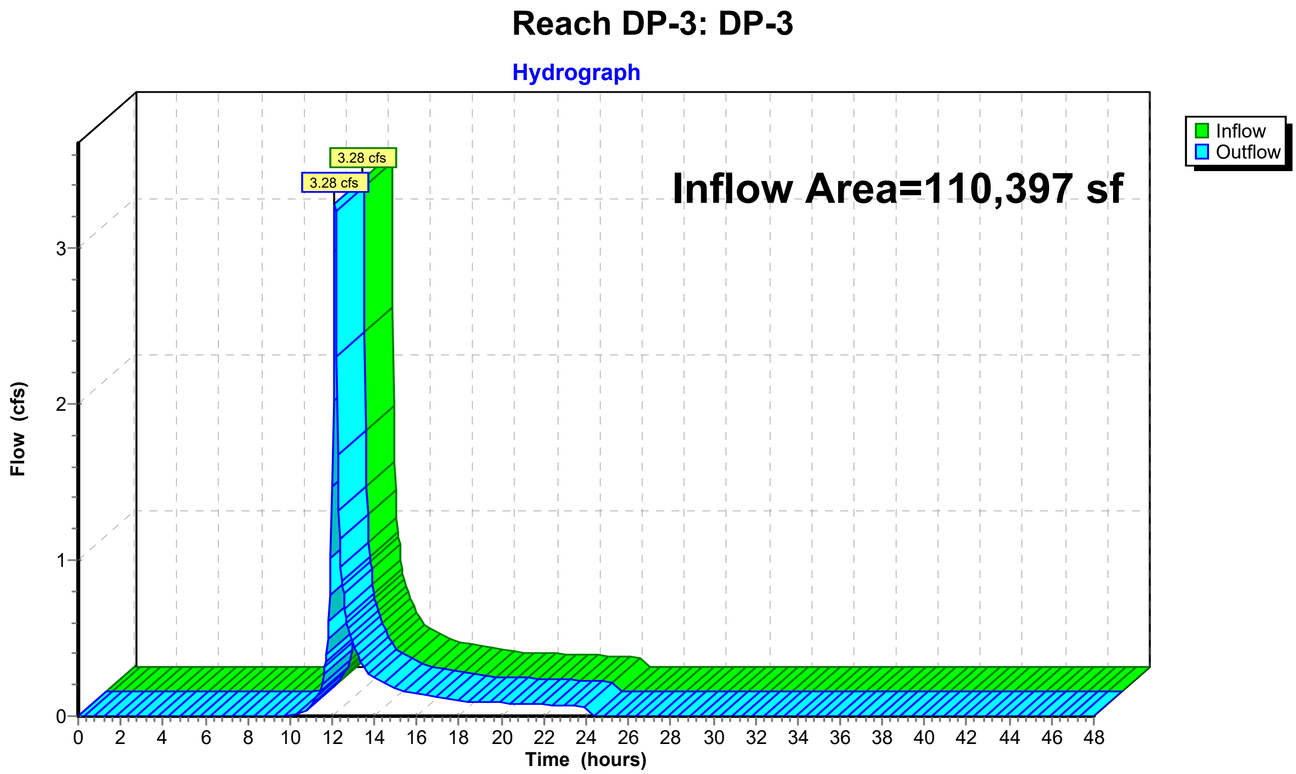


Summary for Reach DP-3: DP-3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 110,397 sf, 61.01% Impervious, Inflow Depth = 1.16" for 2-year event
Inflow = 3.28 cfs @ 12.14 hrs, Volume= 10,645 cf
Outflow = 3.28 cfs @ 12.14 hrs, Volume= 10,645 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



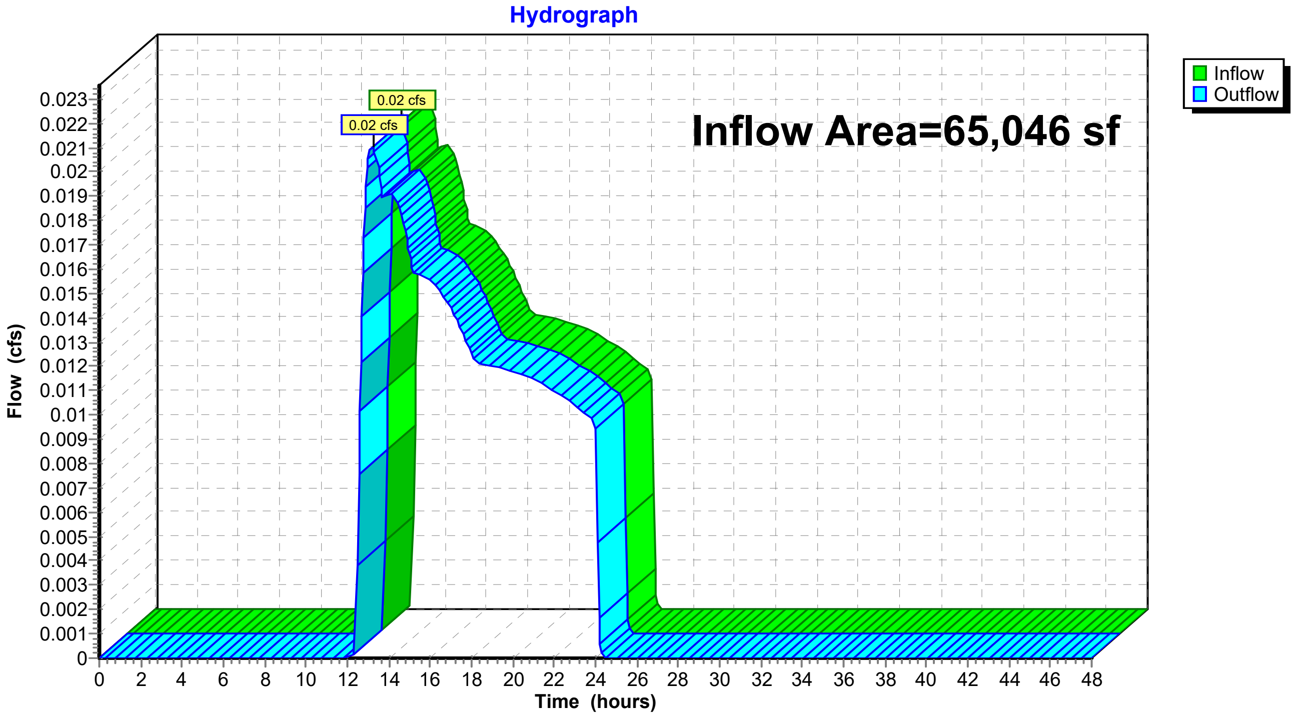
Summary for Reach DP1A: Outfall 1A

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 65,046 sf, 15.40% Impervious, Inflow Depth = 0.11" for 2-year event
Inflow = 0.02 cfs @ 13.26 hrs, Volume= 572 cf
Outflow = 0.02 cfs @ 13.26 hrs, Volume= 572 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP1A: Outfall 1A



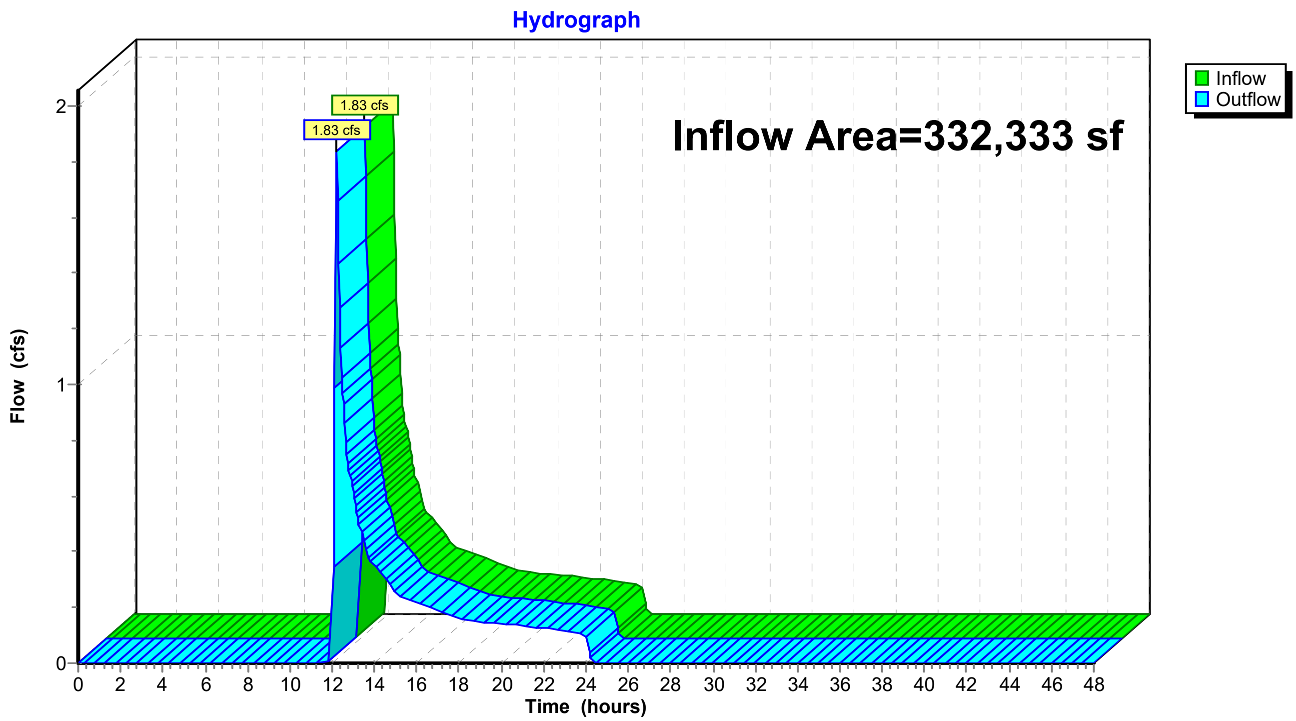
Summary for Reach DP1B: Outfall 1B

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	332,333 sf,	33.31% Impervious,	Inflow Depth = 0.41"	for 2-year event
Inflow =	1.83 cfs @	12.20 hrs, Volume=	11,300 cf	
Outflow =	1.83 cfs @	12.20 hrs, Volume=	11,300 cf, Atten= 0%, Lag= 0.0 min	

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP1B: Outfall 1B



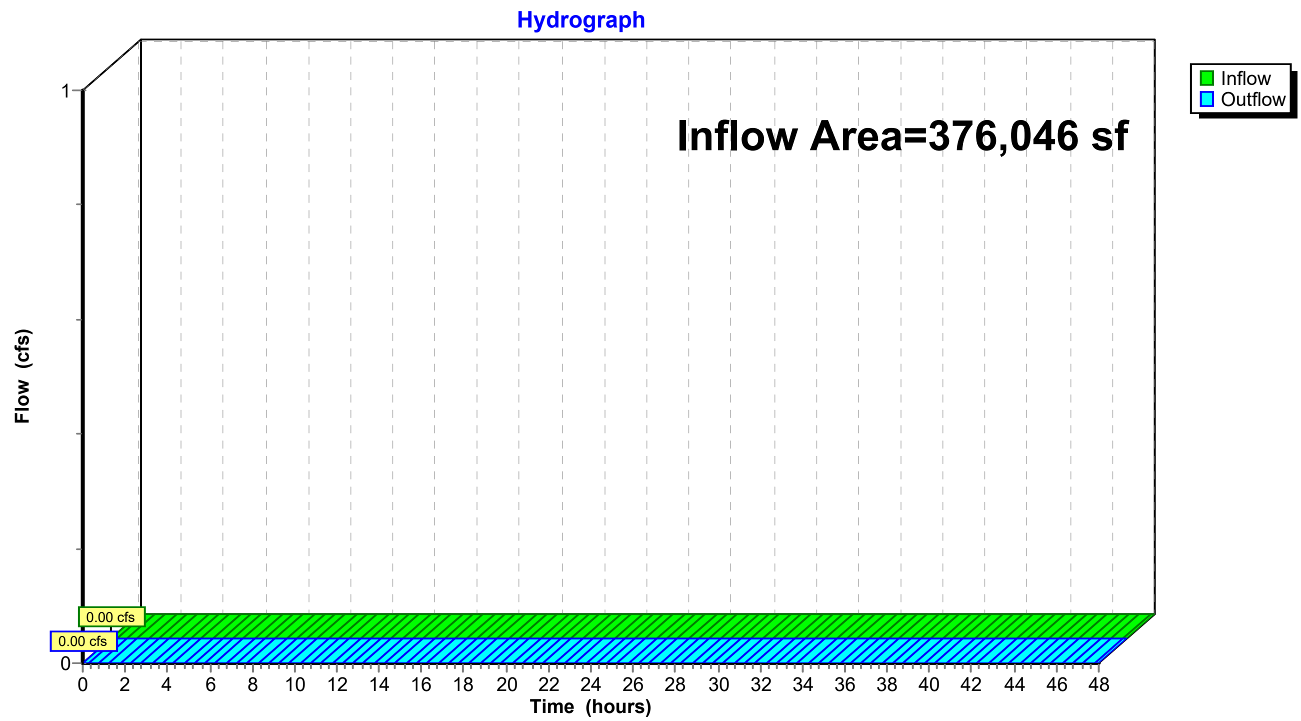
Summary for Reach DP1C: Outfall 1C

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 376,046 sf, 46.44% Impervious, Inflow Depth = 0.00" for 2-year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP1C: Outfall 1C



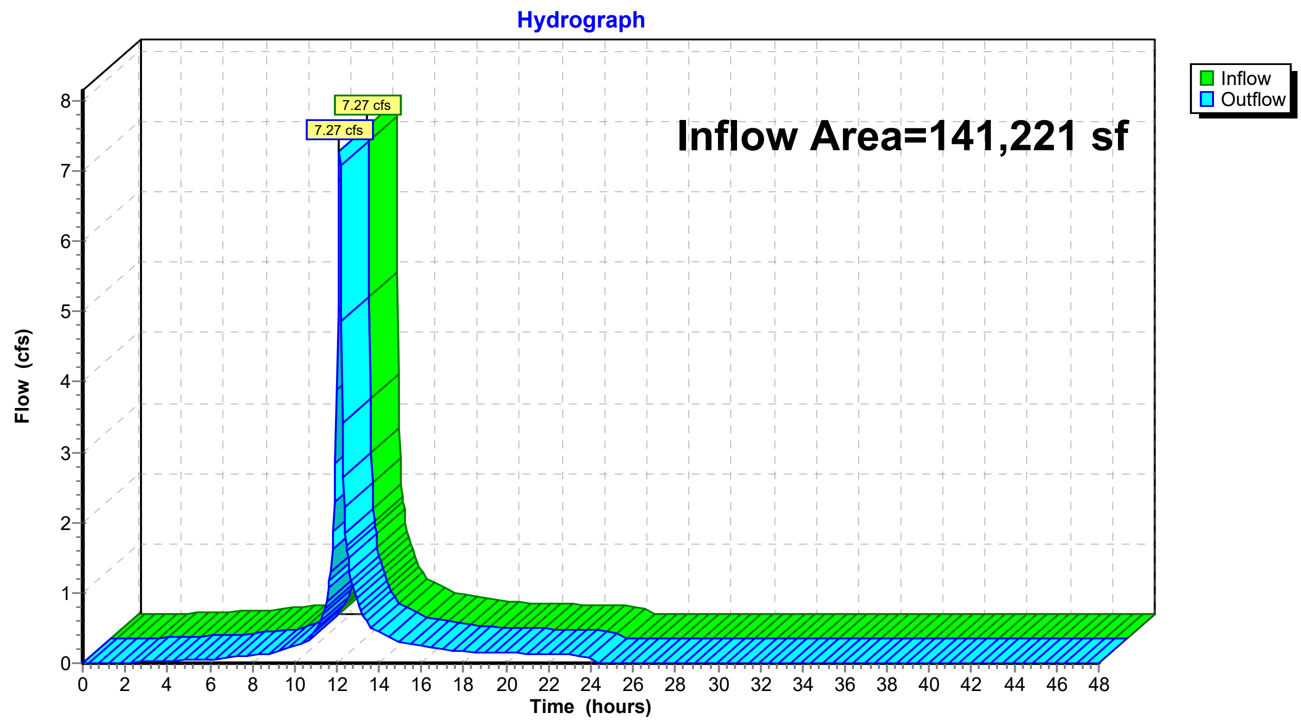
Summary for Reach DP1D: Outfall 1D

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 141,221 sf, 81.74% Impervious, Inflow Depth = 2.13" for 2-year event
Inflow = 7.27 cfs @ 12.13 hrs, Volume= 25,097 cf
Outflow = 7.27 cfs @ 12.13 hrs, Volume= 25,097 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP1D: Outfall 1D



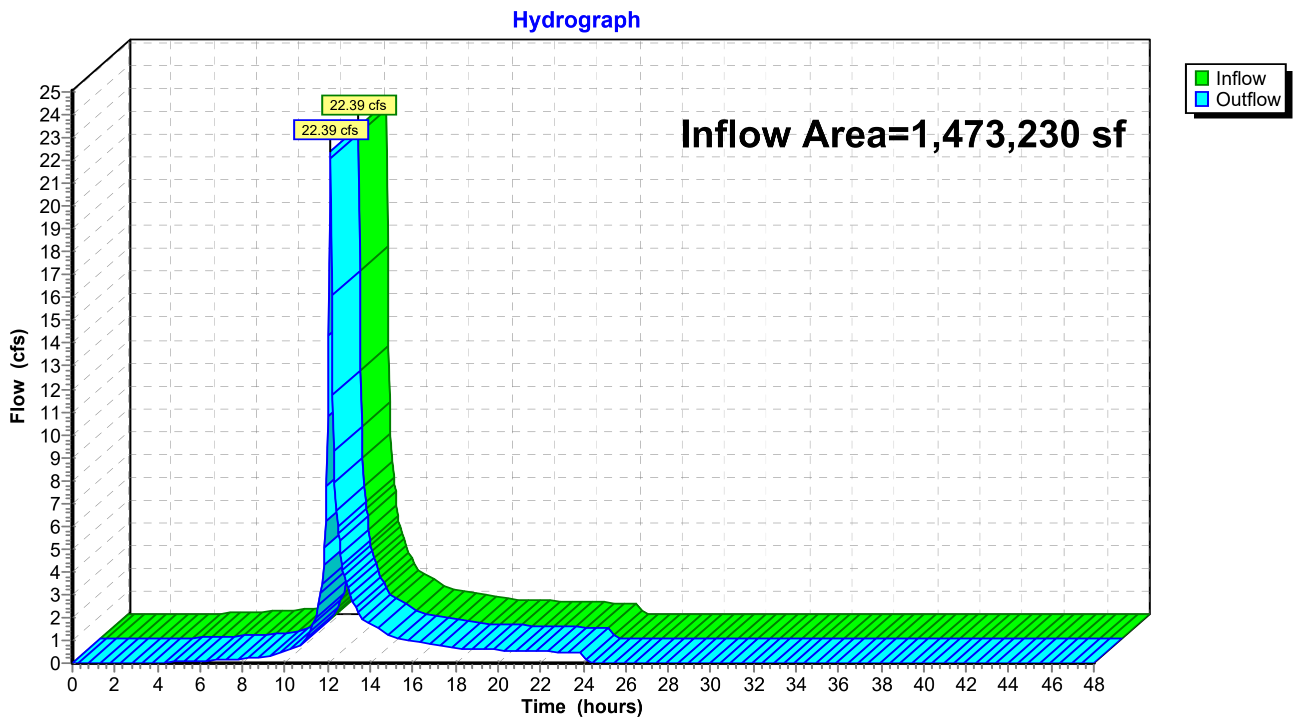
Summary for Reach TOTAL: Total

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,473,230 sf, 43.71% Impervious, Inflow Depth = 0.67" for 2-year event
Inflow = 22.39 cfs @ 12.14 hrs, Volume= 81,769 cf
Outflow = 22.39 cfs @ 12.14 hrs, Volume= 81,769 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach TOTAL: Total



Summary for Pond 2P: EX-POND

Inflow Area = 376,046 sf, 46.44% Impervious, Inflow Depth = 0.88" for 2-year event
Inflow = 7.83 cfs @ 12.14 hrs, Volume= 27,506 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 20.68' @ 24.40 hrs Surf.Area= 12,203 sf Storage= 27,505 cf

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

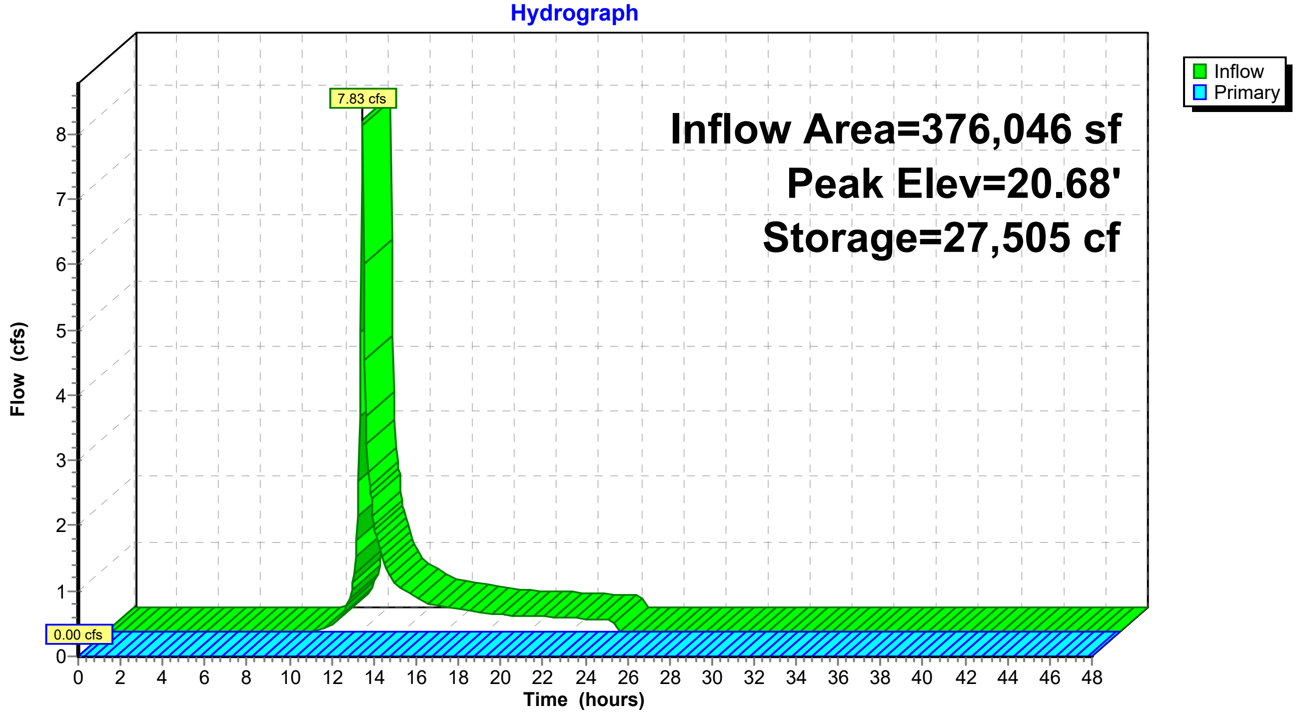
Volume	Invert	Avail.Storage	Storage Description
#1	18.00'	95,308 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.00	8,452	0	0
19.00	9,777	9,115	9,115
20.00	11,187	10,482	19,597
21.00	12,690	11,939	31,535
22.00	14,289	13,490	45,025
23.00	16,001	15,145	60,170
24.00	18,138	17,070	77,239
25.00	18,000	18,069	95,308

Device	Routing	Invert	Outlet Devices
#1	Primary	18.72'	**24.0" Round Culvert** L= 24.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 18.72' / 17.59' S= 0.0465 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	23.70'	**24.0" x 24.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#3	Primary	23.90'	**100.0' long x 30.0' breadth Broad-Crested Rectangular Weir** 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 @ 0.00 hrs HW=18.00' (Free Discharge)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: EX-POND



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A: EX-1A Runoff Area=65,046 sf 15.40% Impervious Runoff Depth=0.66"
Flow Length=405' Tc=6.9 min CN=48 Runoff=0.70 cfs 3,597 cf

Subcatchment1B: EX-1B Runoff Area=220,211 sf 33.47% Impervious Runoff Depth=1.35"
Flow Length=521' Tc=10.0 min CN=59 Runoff=6.19 cfs 24,761 cf

Subcatchment1C: EX-1C Runoff Area=185,095 sf 57.34% Impervious Runoff Depth=2.79"
Tc=6.0 min CN=77 Runoff=13.49 cfs 43,053 cf

Subcatchment1D: EX-1D Runoff Area=48,816 sf 58.62% Impervious Runoff Depth=2.52"
Tc=6.0 min CN=74 Runoff=3.23 cfs 10,271 cf

Subcatchment1E: EX-1E Runoff Area=24,840 sf 82.66% Impervious Runoff Depth=3.86"
Tc=6.0 min CN=88 Runoff=2.40 cfs 7,989 cf

Subcatchment1F: EX-1F Runoff Area=48,259 sf 97.34% Impervious Runoff Depth=4.73"
Tc=6.0 min CN=96 Runoff=5.25 cfs 19,028 cf

Subcatchment1G: EX-1G Runoff Area=19,306 sf 100.00% Impervious Runoff Depth=4.96"
Tc=6.0 min CN=98 Runoff=2.13 cfs 7,984 cf

Subcatchment1H: EX-1H Runoff Area=116,037 sf 90.23% Impervious Runoff Depth=4.28"
Tc=6.0 min CN=92 Runoff=12.02 cfs 41,433 cf

Subcatchment2A: EX-2A Runoff Area=245,993 sf 0.60% Impervious Runoff Depth=0.24"
Flow Length=663' Tc=10.1 min CN=39 Runoff=0.24 cfs 4,968 cf

Subcatchment2B: EX-2B Runoff Area=47,149 sf 75.39% Impervious Runoff Depth=3.36"
Tc=6.0 min CN=83 Runoff=4.07 cfs 13,184 cf

Subcatchment2C: EX-2C Runoff Area=39,008 sf 61.89% Impervious Runoff Depth=2.70"
Tc=6.0 min CN=76 Runoff=2.75 cfs 8,781 cf

Subcatchment3A: EX-3A Runoff Area=97,064 sf 62.88% Impervious Runoff Depth=2.70"
Tc=6.0 min CN=76 Runoff=6.85 cfs 21,849 cf

Subcatchment3B: EX-3B Runoff Area=13,333 sf 47.42% Impervious Runoff Depth=1.94"
Tc=6.0 min CN=67 Runoff=0.67 cfs 2,160 cf

SubcatchmentO-01: OFF-01 Runoff Area=112,122 sf 33.01% Impervious Runoff Depth=1.35"
Tc=6.0 min CN=59 Runoff=3.70 cfs 12,607 cf

SubcatchmentO-02: OFF-02 Runoff Area=109,762 sf 30.00% Impervious Runoff Depth=1.21"
Tc=6.0 min CN=57 Runoff=3.17 cfs 11,093 cf

SubcatchmentO-03: OFF-03 Runoff Area=45,823 sf 30.00% Impervious Runoff Depth=1.21"
Tc=6.0 min CN=57 Runoff=1.32 cfs 4,631 cf

Subcatchment O-04: OFF-04 Runoff Area=35,366 sf 61.66% Impervious Runoff Depth=2.61"
Tc=6.0 min CN=75 Runoff=2.42 cfs 7,699 cf

Reach DP-1: DP-1 Inflow=41.51 cfs 154,601 cf
Outflow=41.51 cfs 154,601 cf

Reach DP-2: DP-2 Avg. Flow Depth=0.61' Max Vel=6.61 fps Inflow=6.82 cfs 26,933 cf
36.0" Round Pipe n=0.011 L=96.0' S=0.0092 '/' Capacity=75.47 cfs Outflow=6.77 cfs 26,933 cf

Reach DP-3: DP-3 Inflow=7.52 cfs 24,009 cf
Outflow=7.52 cfs 24,009 cf

Reach DP1A: Outfall 1A Inflow=0.70 cfs 3,597 cf
Outflow=0.70 cfs 3,597 cf

Reach DP1B: Outfall 1B Inflow=9.57 cfs 37,368 cf
Outflow=9.57 cfs 37,368 cf

Reach DP1C: Outfall 1C Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Reach DP1D: Outfall 1D Inflow=12.99 cfs 45,272 cf
Outflow=12.99 cfs 45,272 cf

Reach TOTAL: Total Inflow=49.02 cfs 178,610 cf
Outflow=49.02 cfs 178,610 cf

Pond 2P: EX-POND Peak Elev=23.38' Storage=66,475 cf Inflow=20.38 cfs 66,476 cf
Outflow=0.00 cfs 0 cf

Total Runoff Area = 1,473,230 sf Runoff Volume = 245,086 cf Average Runoff Depth = 2.00"
56.29% Pervious = 829,222 sf 43.71% Impervious = 644,008 sf

Summary for Subcatchment 1A: EX-1A

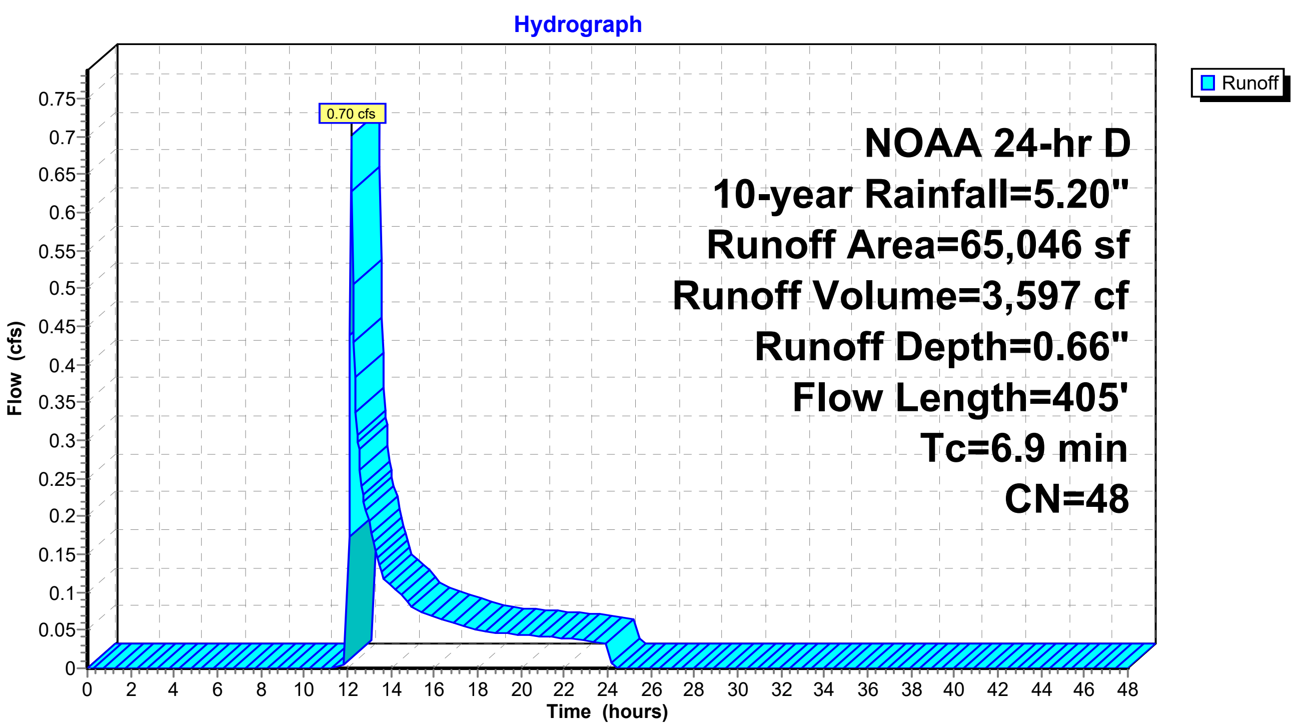
Runoff = 0.70 cfs @ 12.17 hrs, Volume= 3,597 cf, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
5,063	98	Roofs, HSG A
4,956	98	Paved parking, HSG A
55,027	39	>75% Grass cover, Good, HSG A
65,046	48	Weighted Average
55,027		84.60% Pervious Area
10,019		15.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0700	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.29"
3.5	355	0.0127	1.69		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.9	405	Total			

Subcatchment 1A: EX-1A



Summary for Subcatchment 1B: EX-1B

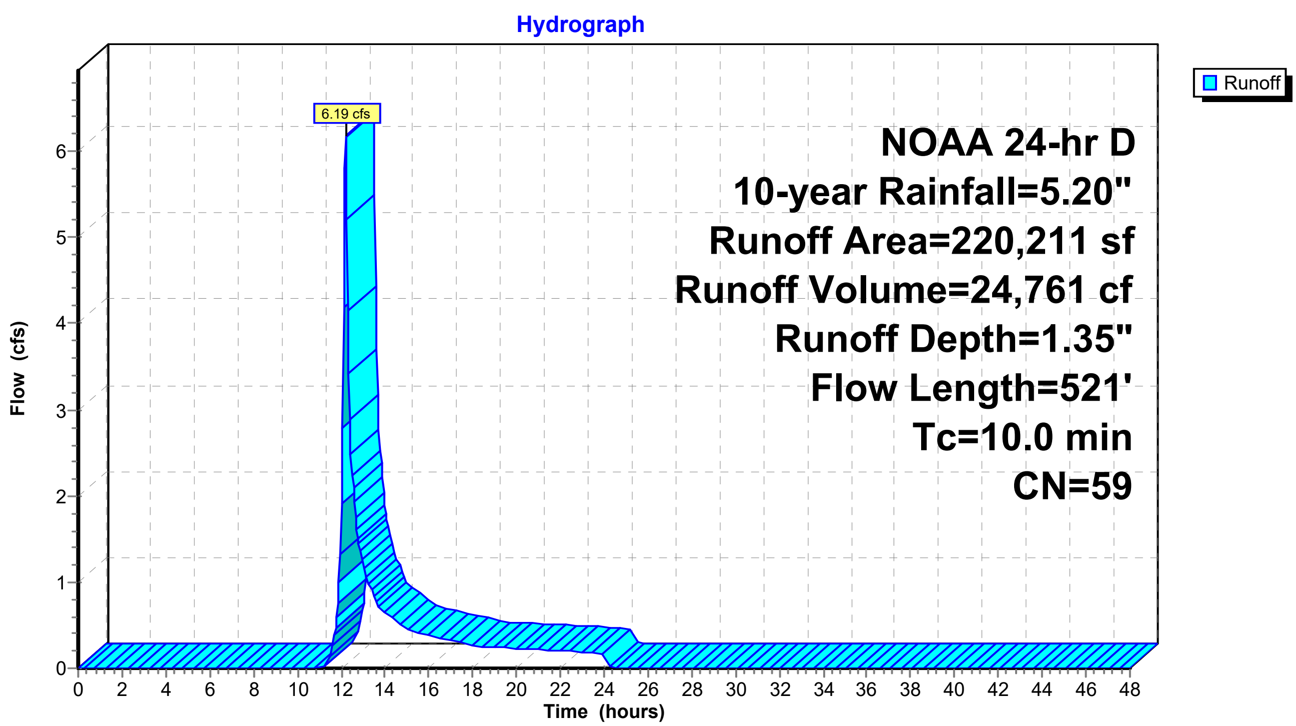
Runoff = 6.19 cfs @ 12.19 hrs, Volume= 24,761 cf, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
3,434	98	Roofs, HSG A
70,263	98	Paved parking, HSG A
146,514	39	>75% Grass cover, Good, HSG A
220,211	59	Weighted Average
146,514		66.53% Pervious Area
73,697		33.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.29"
5.3	471	0.0096	1.47		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.0	521	Total			

Subcatchment 1B: EX-1B



Summary for Subcatchment 1C: EX-1C

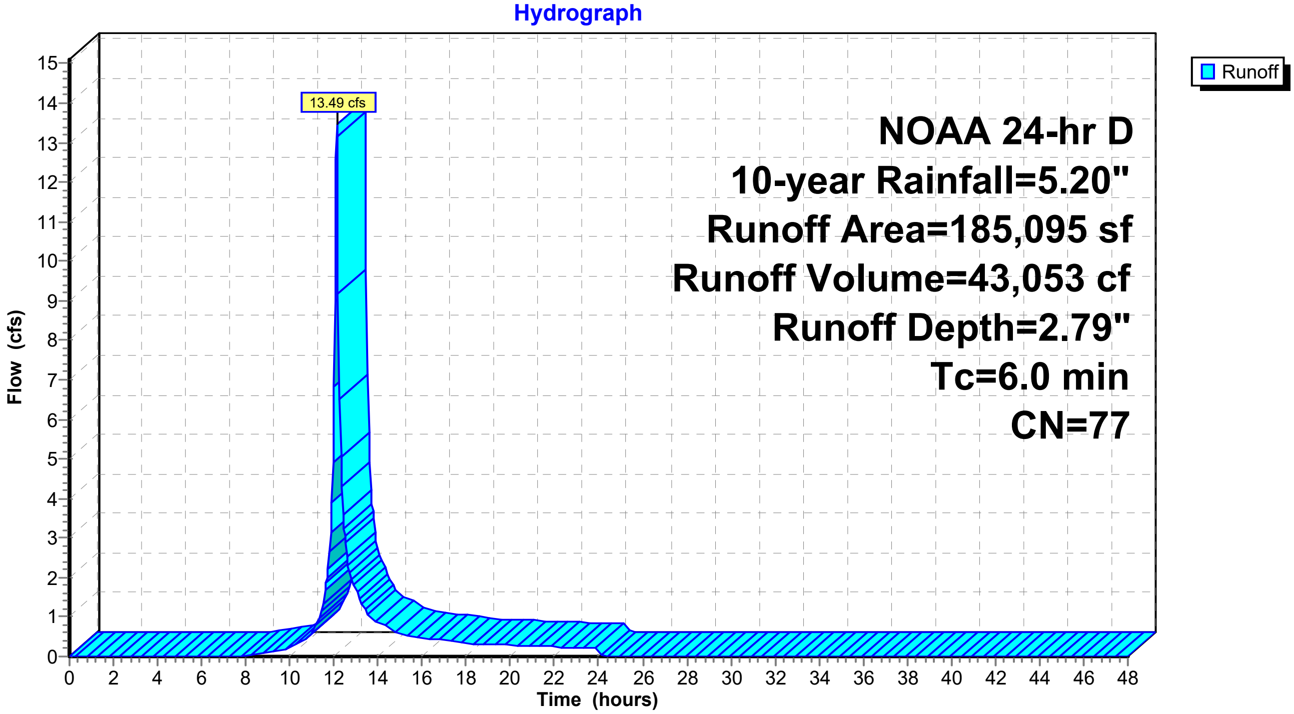
Runoff = 13.49 cfs @ 12.13 hrs, Volume= 43,053 cf, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
106,141	98	Paved parking, HSG A
78,954	49	50-75% Grass cover, Fair, HSG A
185,095	77	Weighted Average
78,954		42.66% Pervious Area
106,141		57.34% Impervious Area

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

Subcatchment 1C: EX-1C



Summary for Subcatchment 1D: EX-1D

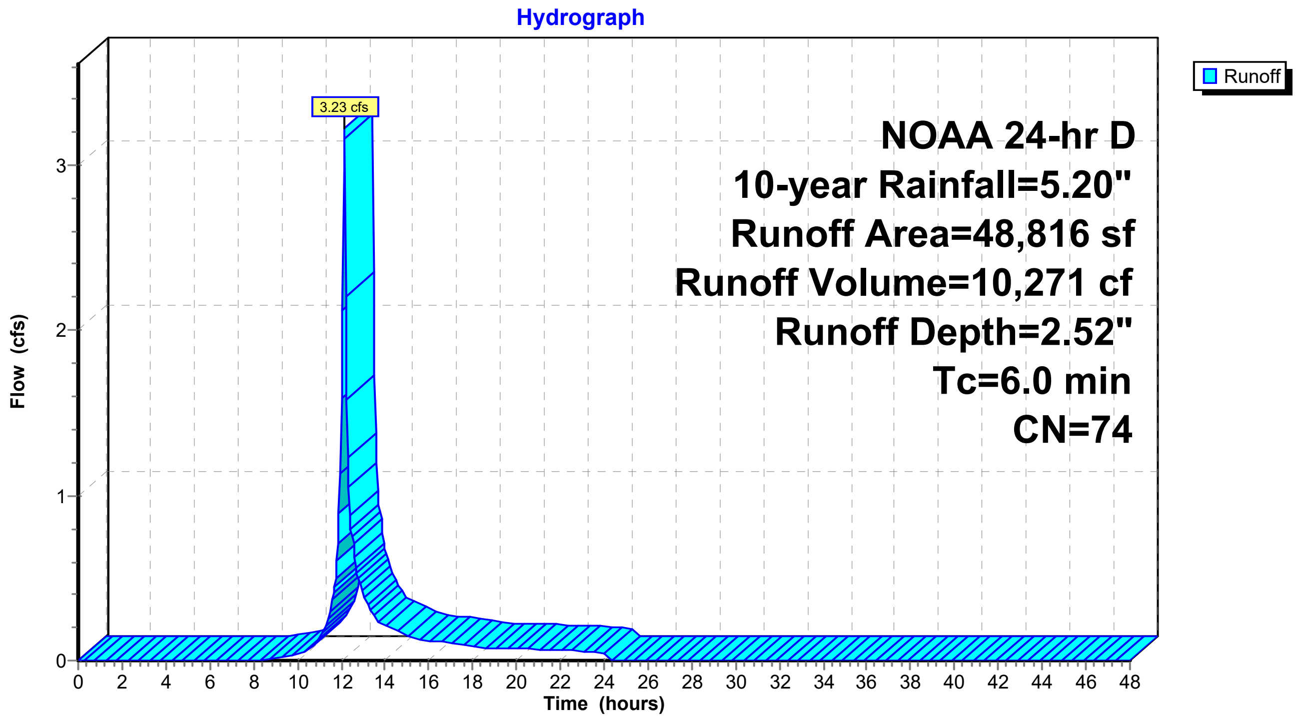
Runoff = 3.23 cfs @ 12.13 hrs, Volume= 10,271 cf, Depth= 2.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
28,618	98	Paved parking, HSG A
20,198	39	>75% Grass cover, Good, HSG A
48,816	74	Weighted Average
20,198		41.38% Pervious Area
28,618		58.62% Impervious Area

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

Subcatchment 1D: EX-1D



Summary for Subcatchment 1E: EX-1E

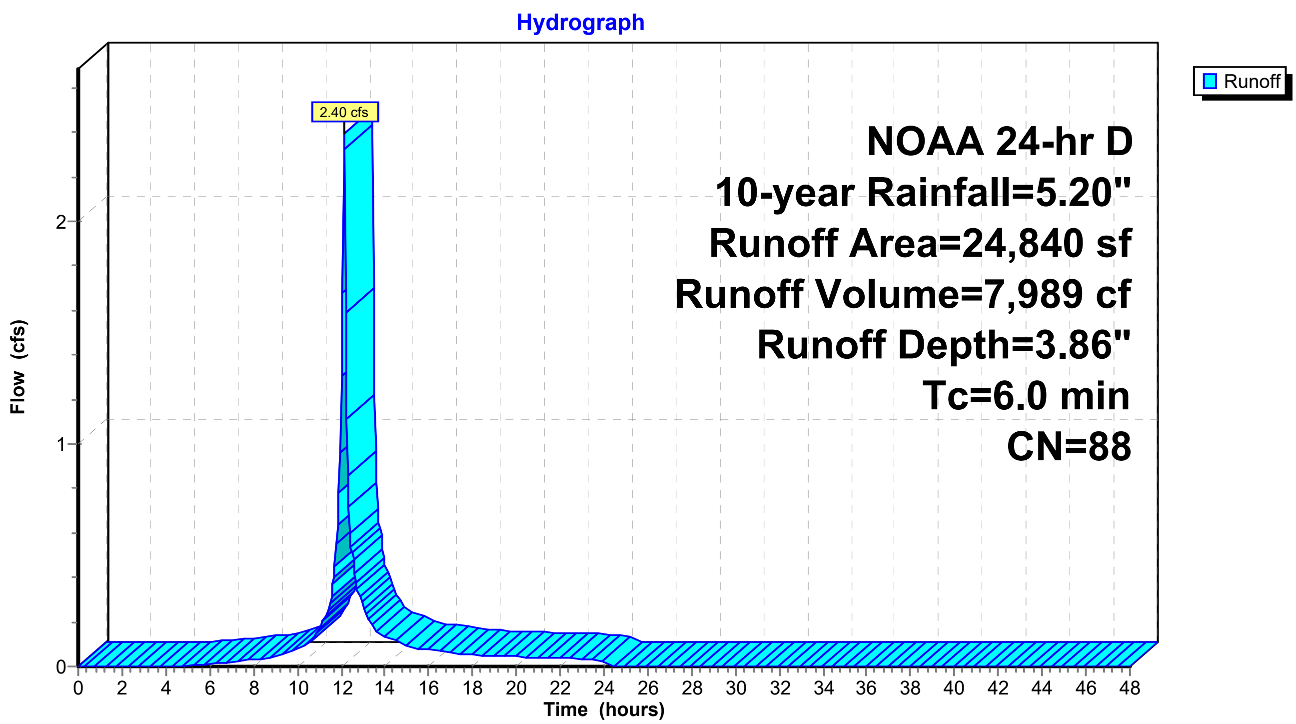
Runoff = 2.40 cfs @ 12.13 hrs, Volume= 7,989 cf, Depth= 3.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
20,533	98	Paved parking, HSG A
4,307	39	>75% Grass cover, Good, HSG A
24,840	88	Weighted Average
4,307		17.34% Pervious Area
20,533		82.66% Impervious Area

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

Subcatchment 1E: EX-1E



Summary for Subcatchment 1F: EX-1F

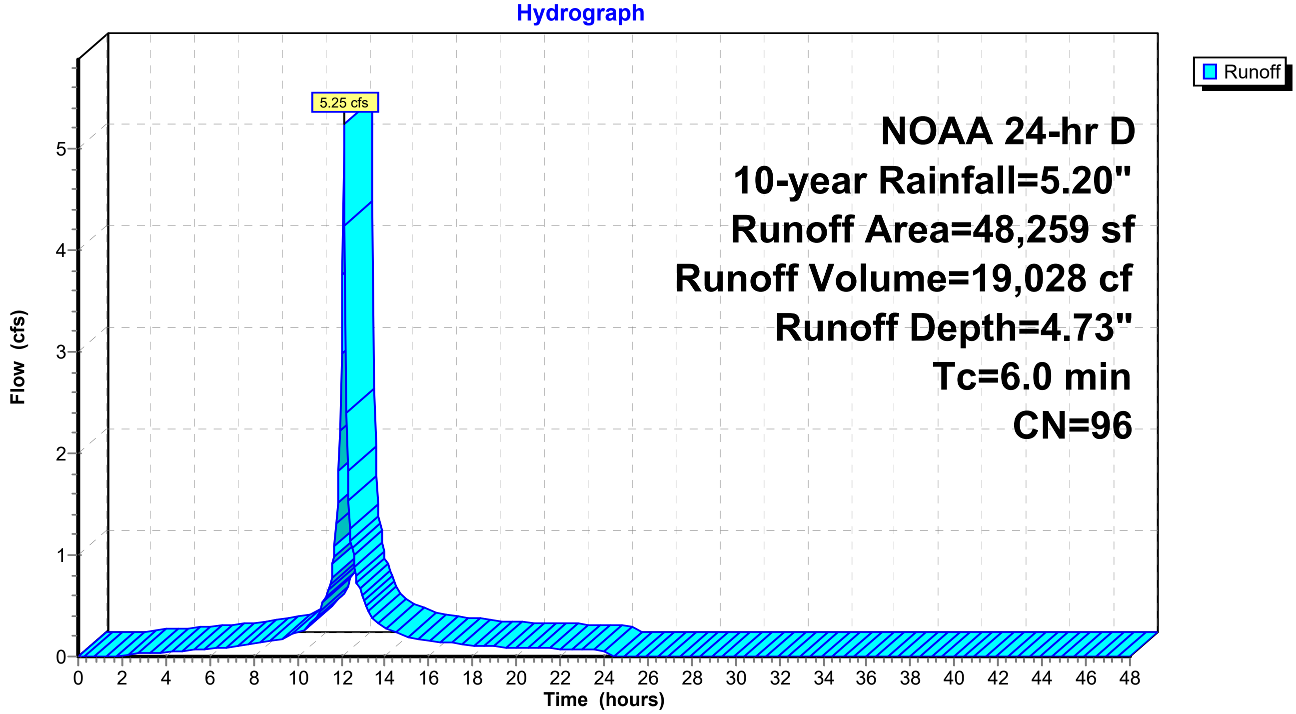
Runoff = 5.25 cfs @ 12.13 hrs, Volume= 19,028 cf, Depth= 4.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
46,973	98	Roofs, HSG A
1,286	39	>75% Grass cover, Good, HSG A
48,259	96	Weighted Average
1,286		2.66% Pervious Area
46,973		97.34% Impervious Area

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

Subcatchment 1F: EX-1F



Summary for Subcatchment 1G: EX-1G

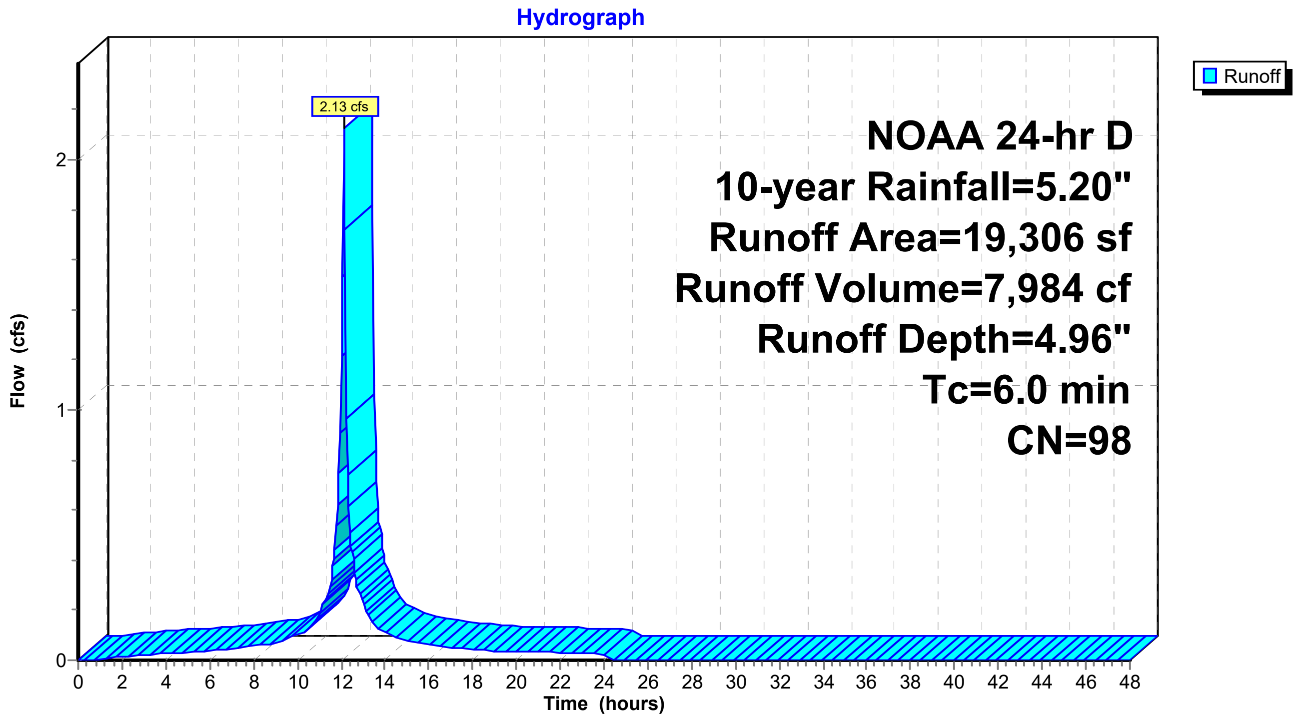
Runoff = 2.13 cfs @ 12.13 hrs, Volume= 7,984 cf, Depth= 4.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
19,306	98	Paved parking, HSG A
19,306		100.00% Impervious Area

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

Subcatchment 1G: EX-1G



Summary for Subcatchment 1H: EX-1H

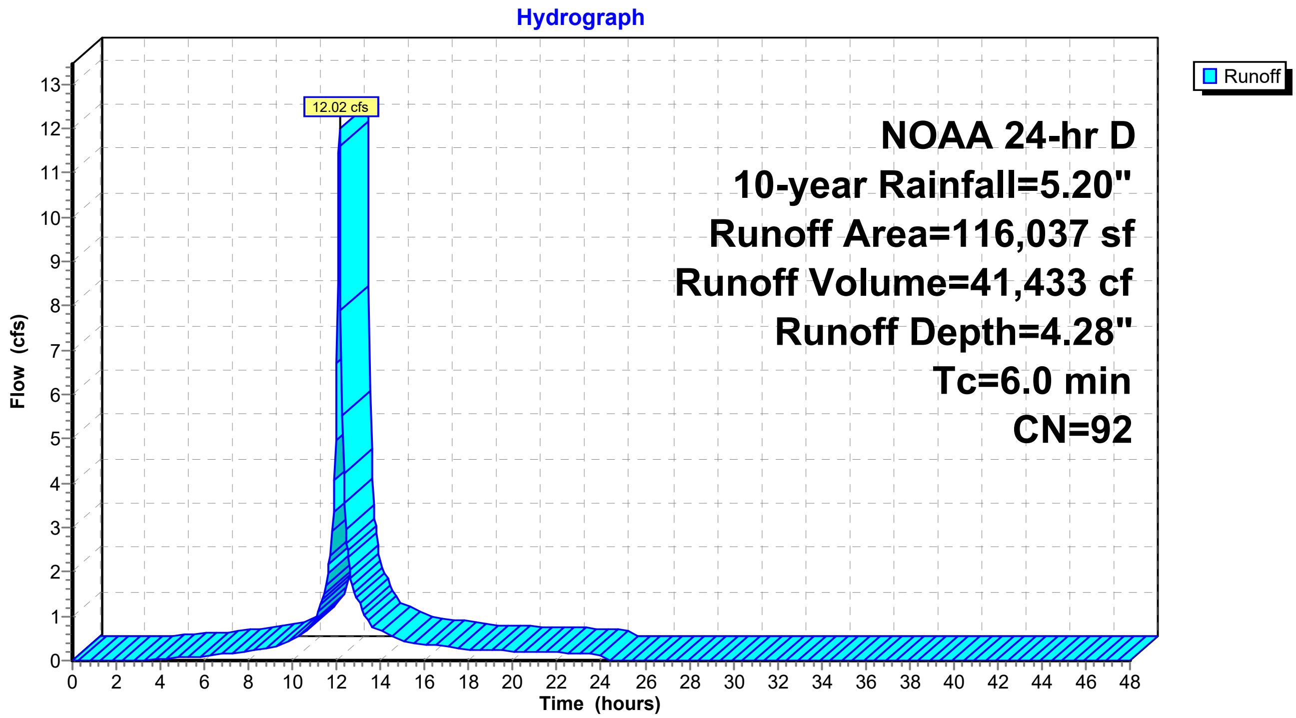
Runoff = 12.02 cfs @ 12.13 hrs, Volume= 41,433 cf, Depth= 4.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
104,697	98	Roofs, HSG A
11,340	39	>75% Grass cover, Good, HSG A
116,037	92	Weighted Average
11,340		9.77% Pervious Area
104,697		90.23% Impervious Area

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

Subcatchment 1H: EX-1H



Summary for Subcatchment 2A: EX-2A

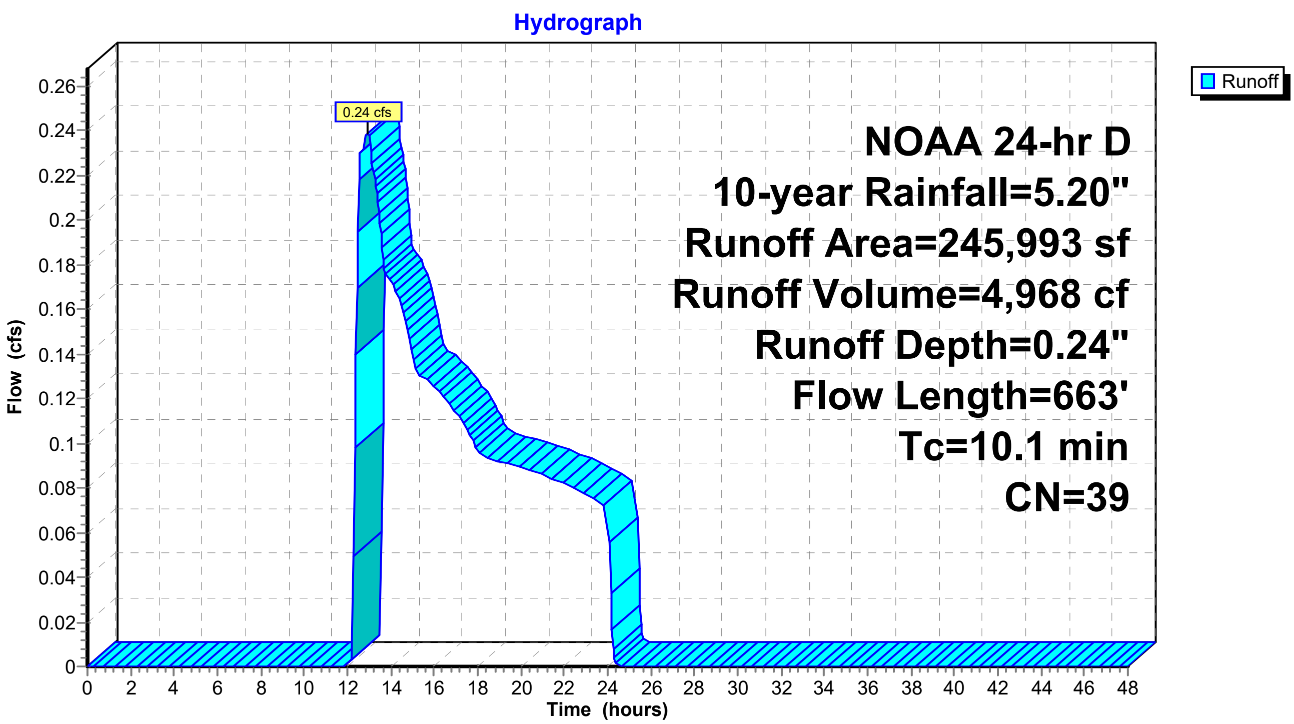
Runoff = 0.24 cfs @ 12.93 hrs, Volume= 4,968 cf, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
763	98	Roofs, HSG A
720	98	Paved parking, HSG A
244,510	39	>75% Grass cover, Good, HSG A
245,993	39	Weighted Average
244,510		99.40% Pervious Area
1,483		0.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0356	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.29"
2.5	247	0.0121	1.65		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.6	145	0.0623	3.74		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.6	221	0.0091	1.43		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.1	663	Total			

Subcatchment 2A: EX-2A



Summary for Subcatchment 2B: EX-2B

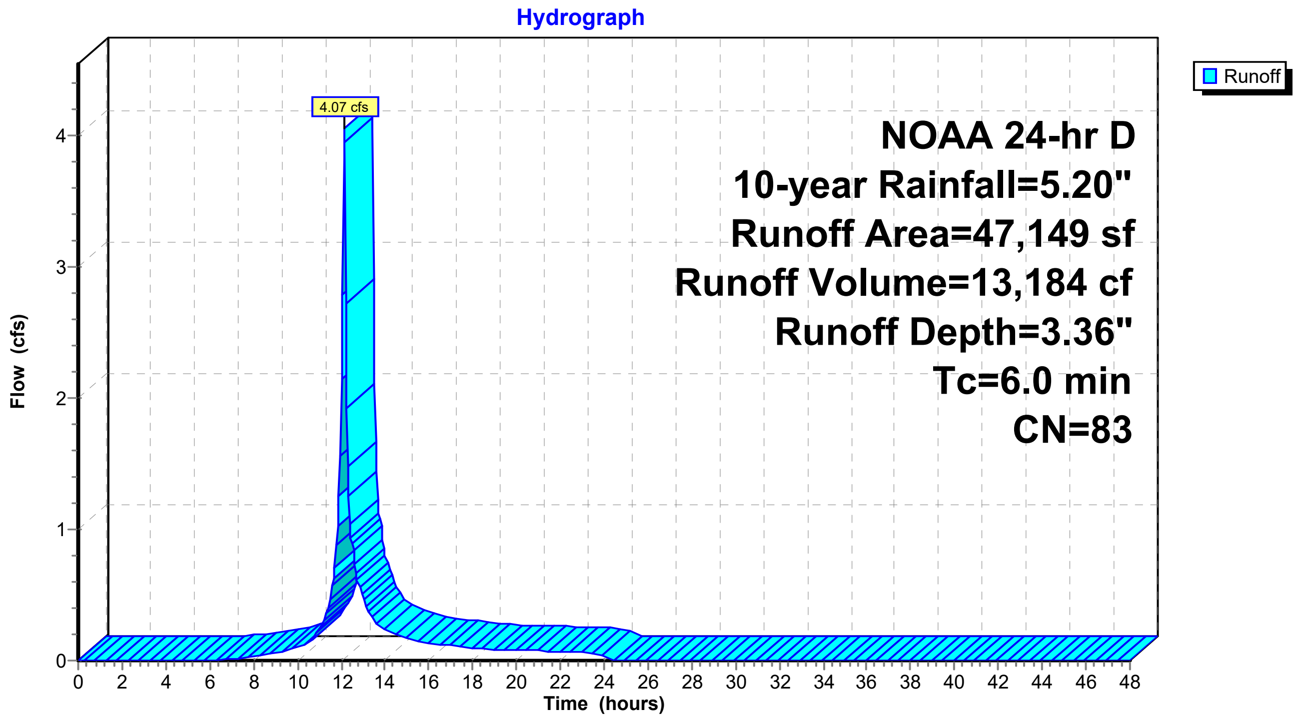
Runoff = 4.07 cfs @ 12.13 hrs, Volume= 13,184 cf, Depth= 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
35,544	98	Roofs, HSG A
11,605	39	>75% Grass cover, Good, HSG A
47,149	83	Weighted Average
11,605		24.61% Pervious Area
35,544		75.39% Impervious Area

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

Subcatchment 2B: EX-2B



Summary for Subcatchment 2C: EX-2C

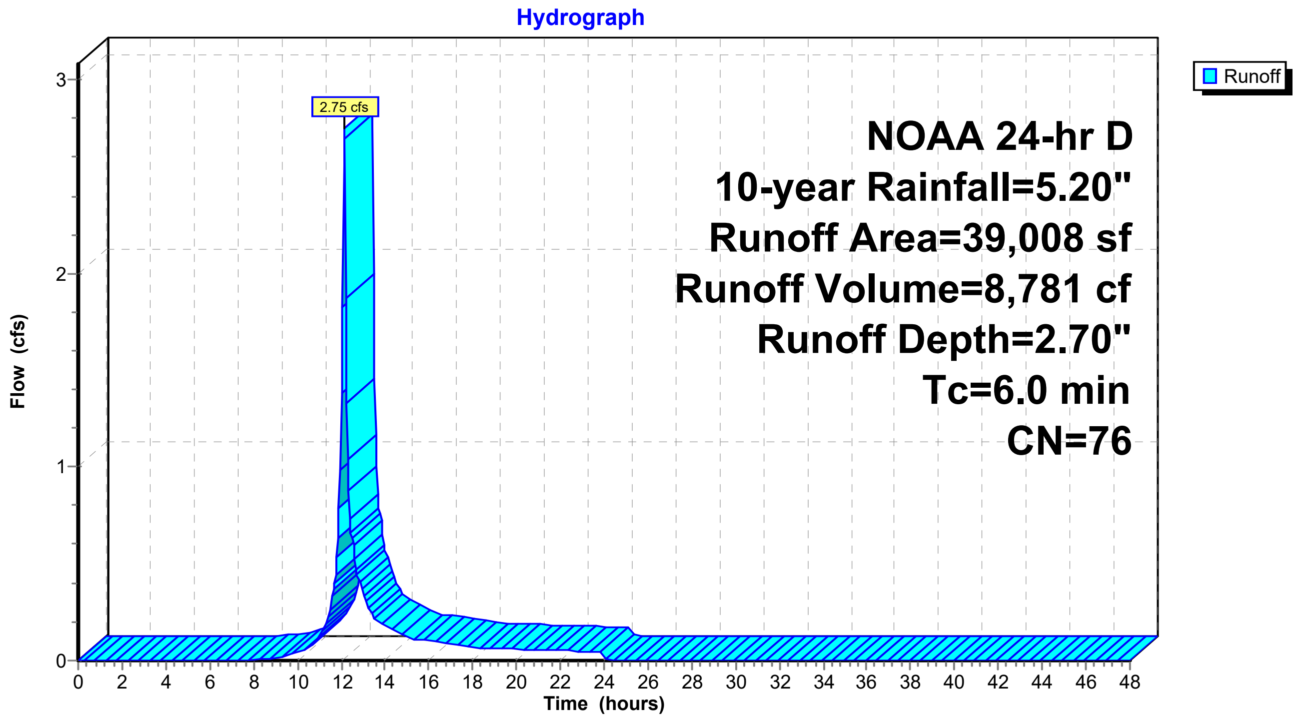
Runoff = 2.75 cfs @ 12.13 hrs, Volume= 8,781 cf, Depth= 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
24,142	98	Paved parking, HSG A
14,866	39	>75% Grass cover, Good, HSG A
39,008	76	Weighted Average
14,866		38.11% Pervious Area
24,142		61.89% Impervious Area

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

Subcatchment 2C: EX-2C



Summary for Subcatchment 3A: EX-3A

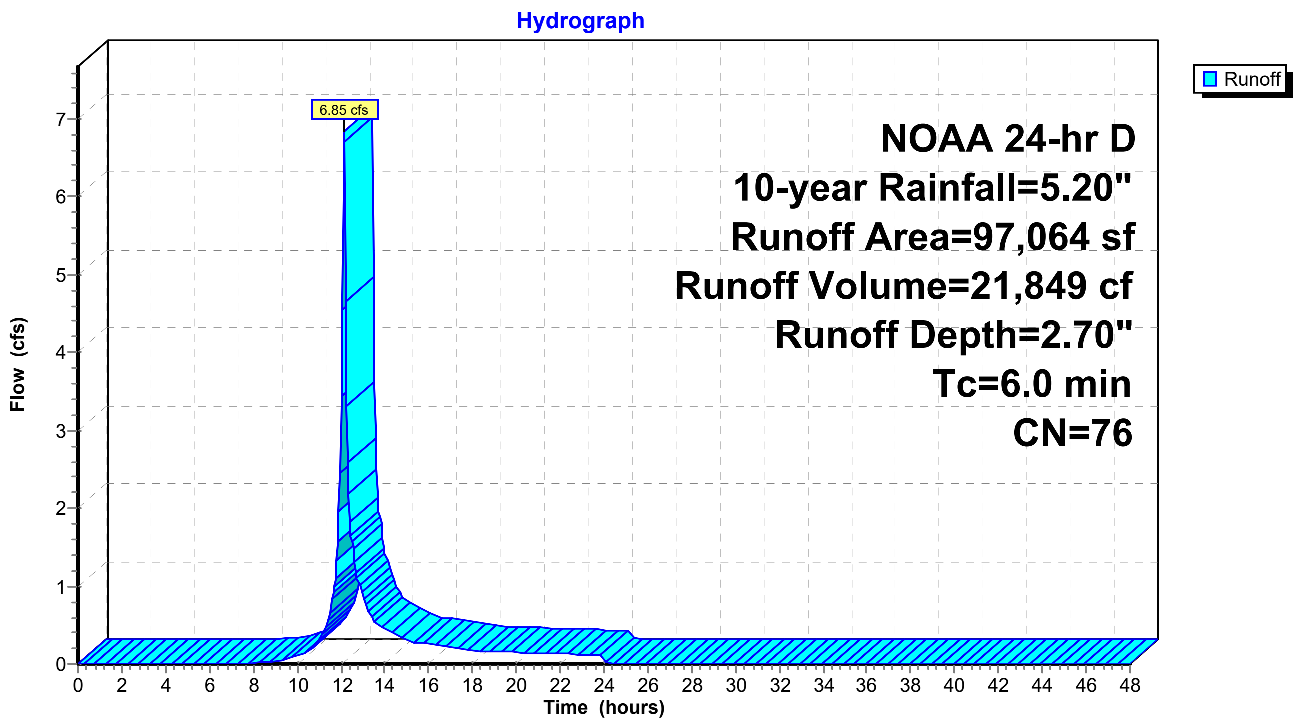
Runoff = 6.85 cfs @ 12.13 hrs, Volume= 21,849 cf, Depth= 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
37,664	98	Roofs, HSG A
23,371	98	Paved parking, HSG A
36,029	39	>75% Grass cover, Good, HSG A
97,064	76	Weighted Average
36,029		37.12% Pervious Area
61,035		62.88% Impervious Area

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

Subcatchment 3A: EX-3A



Summary for Subcatchment 3B: EX-3B

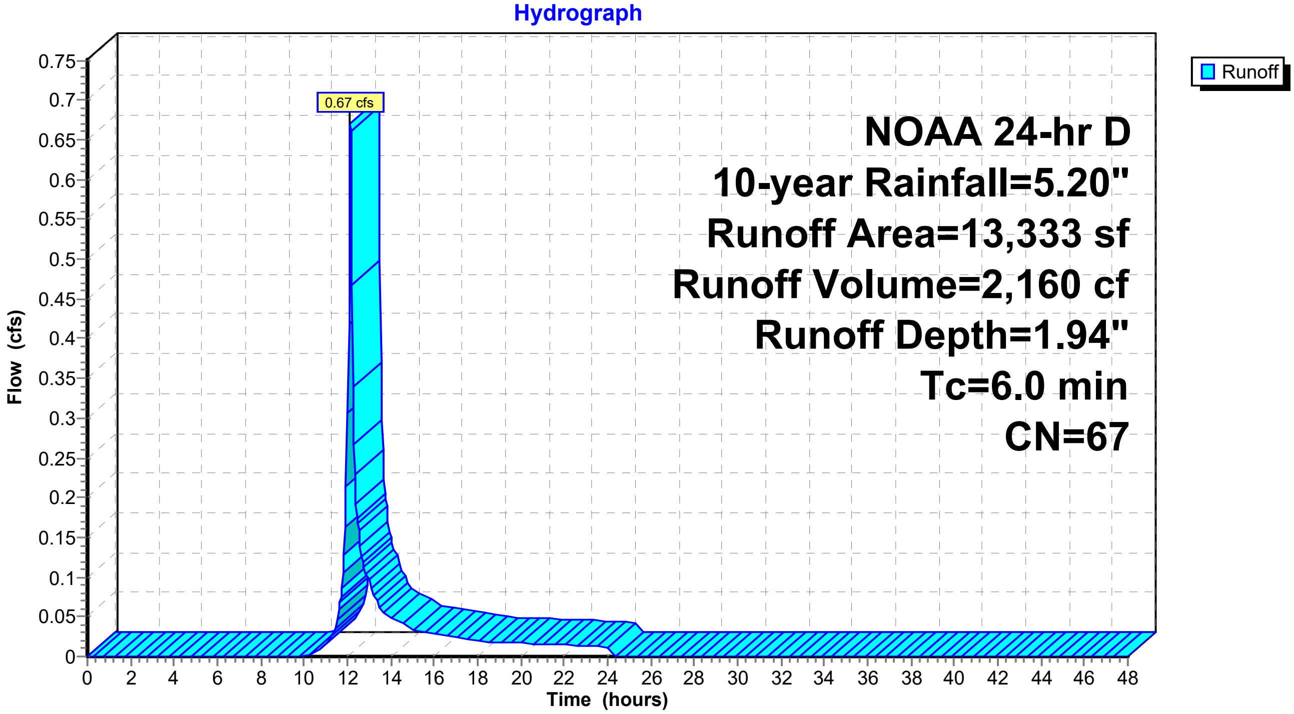
Runoff = 0.67 cfs @ 12.14 hrs, Volume= 2,160 cf, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
6,323	98	Paved parking, HSG A
7,010	39	>75% Grass cover, Good, HSG A
13,333	67	Weighted Average
7,010		52.58% Pervious Area
6,323		47.42% Impervious Area

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

Subcatchment 3B: EX-3B



Summary for Subcatchment O-01: OFF-01

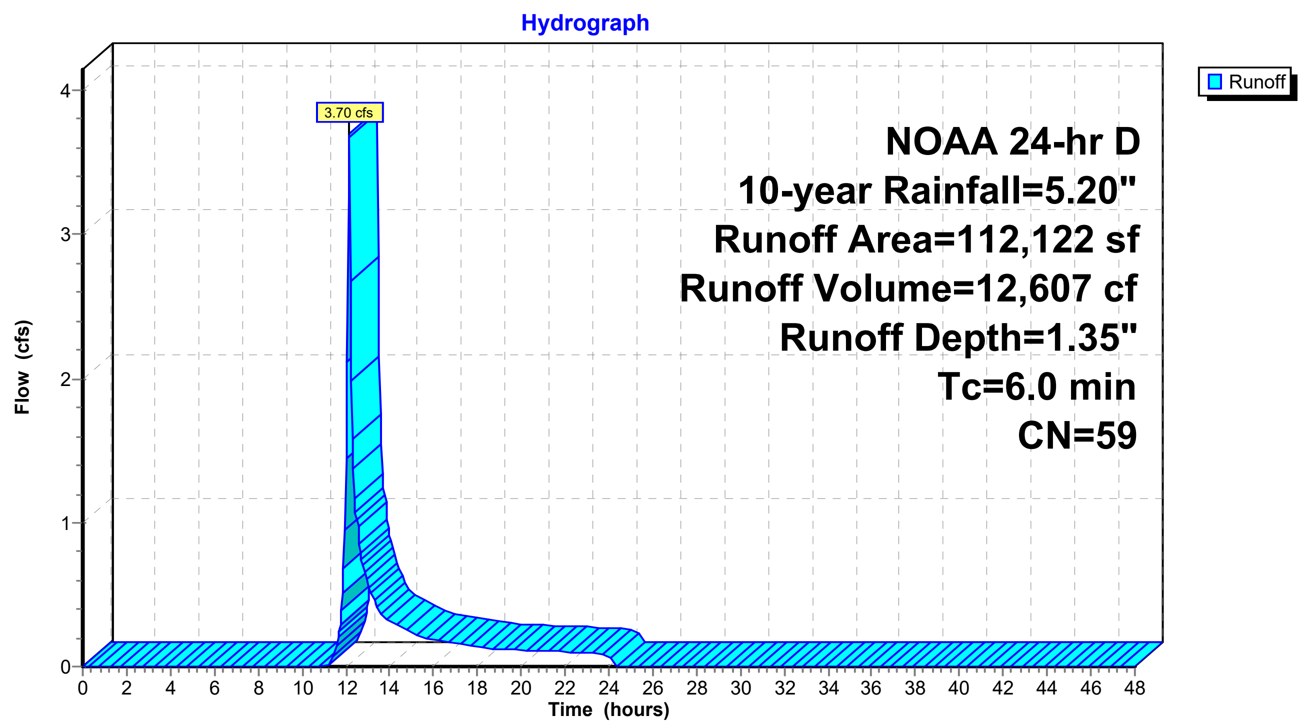
Runoff = 3.70 cfs @ 12.14 hrs, Volume= 12,607 cf, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
16,305	39	>75% Grass cover, Good, HSG A
11,813	98	Unconnected pavement, HSG A
84,004	57	1/3 acre lots, 30% imp, HSG A
112,122	59	Weighted Average
75,108		66.99% Pervious Area
37,014		33.01% Impervious Area
11,813		31.91% Unconnected

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

Subcatchment O-01: OFF-01



Summary for Subcatchment O-02: OFF-02

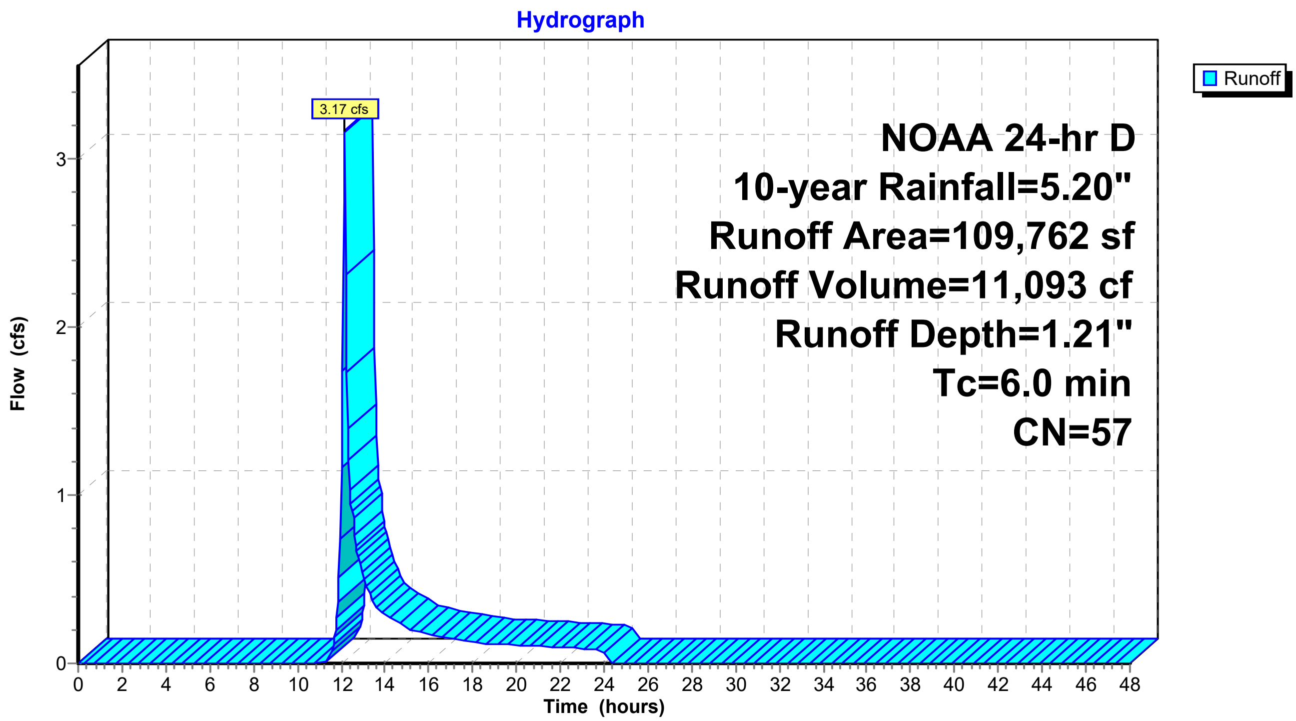
Runoff = 3.17 cfs @ 12.14 hrs, Volume= 11,093 cf, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
109,762	57	1/3 acre lots, 30% imp, HSG A
76,833		70.00% Pervious Area
32,929		30.00% Impervious Area

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

Subcatchment O-02: OFF-02



Summary for Subcatchment O-03: OFF-03

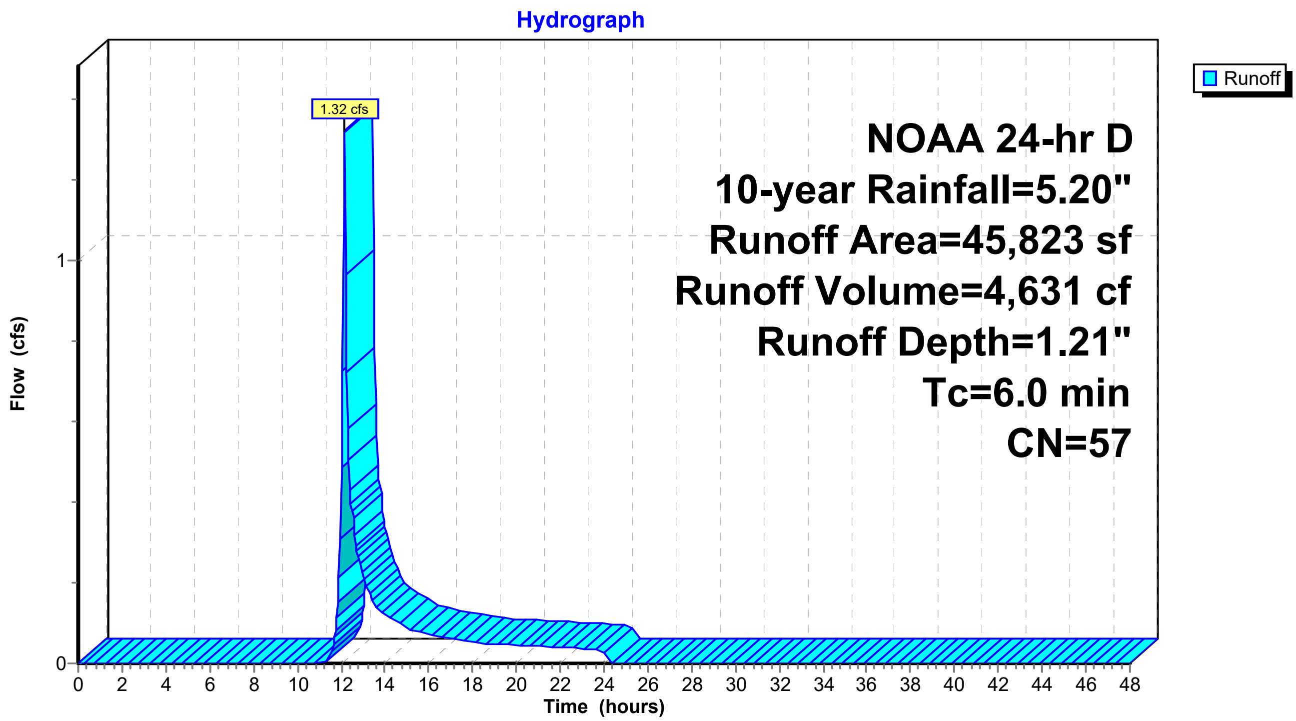
Runoff = 1.32 cfs @ 12.14 hrs, Volume= 4,631 cf, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
45,823	57	1/3 acre lots, 30% imp, HSG A
32,076		70.00% Pervious Area
13,747		30.00% Impervious Area

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

Subcatchment O-03: OFF-03



Summary for Subcatchment O-04: OFF-04

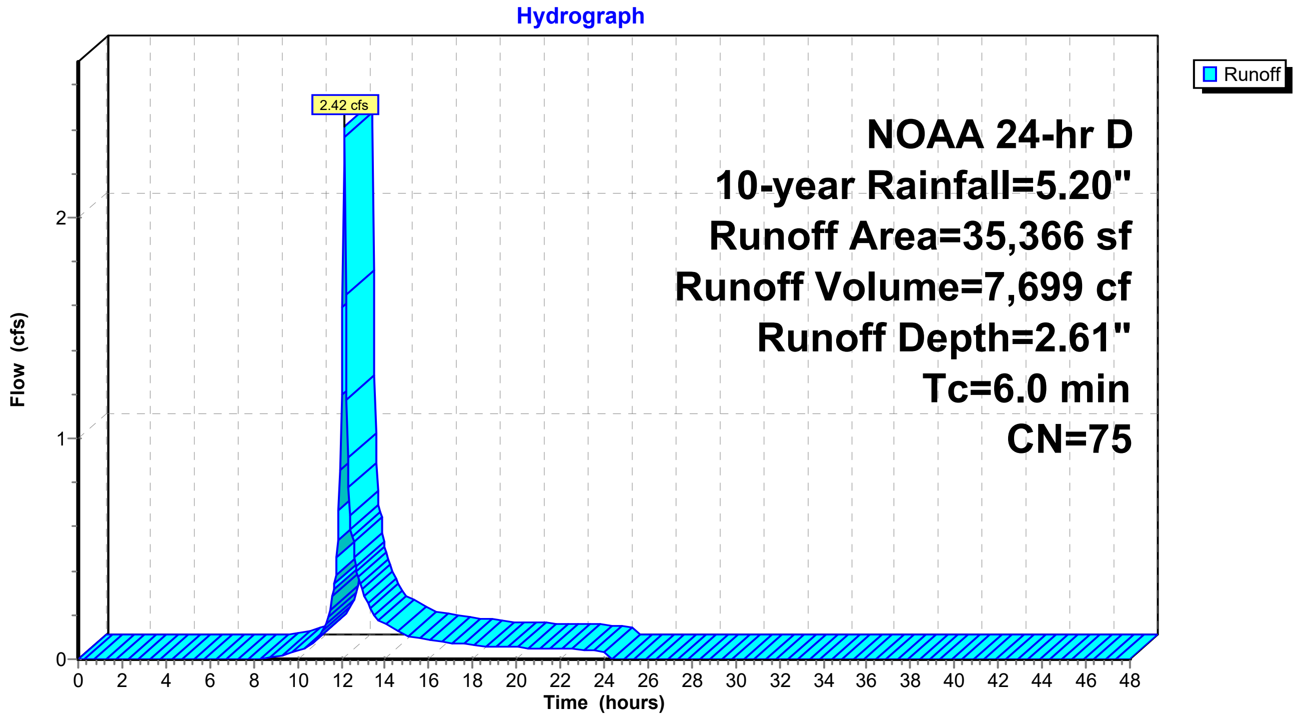
Runoff = 2.42 cfs @ 12.13 hrs, Volume= 7,699 cf, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
21,807	98	Unconnected pavement, HSG A
13,559	39	>75% Grass cover, Good, HSG A
35,366	75	Weighted Average
13,559		38.34% Pervious Area
21,807		61.66% Impervious Area
21,807		100.00% Unconnected

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

Subcatchment O-04: OFF-04



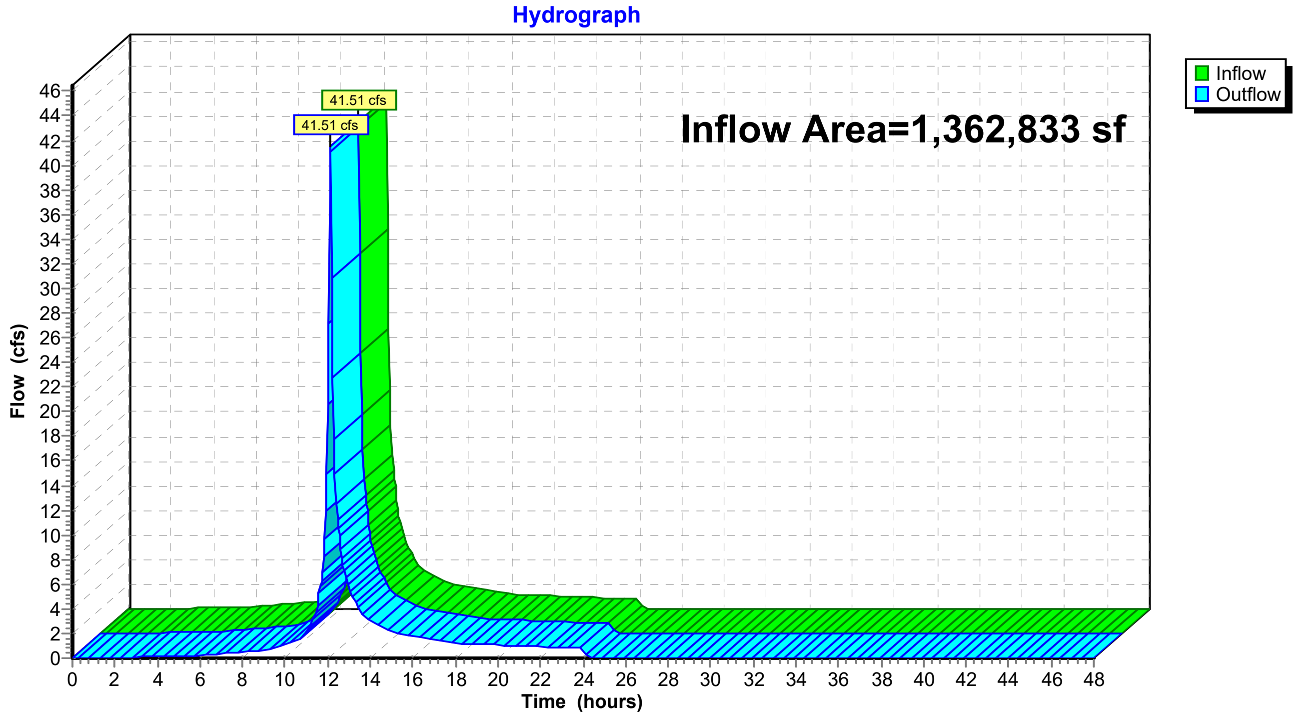
Summary for Reach DP-1: DP-1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,362,833 sf, 42.31% Impervious, Inflow Depth = 1.36" for 10-year event
Inflow = 41.51 cfs @ 12.14 hrs, Volume= 154,601 cf
Outflow = 41.51 cfs @ 12.14 hrs, Volume= 154,601 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-1: DP-1



Summary for Reach DP-2: DP-2

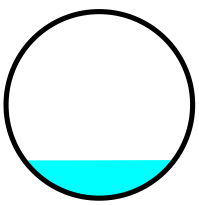
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 332,150 sf, 18.42% Impervious, Inflow Depth = 0.97" for 10-year event
Inflow = 6.82 cfs @ 12.13 hrs, Volume= 26,933 cf
Outflow = 6.77 cfs @ 12.14 hrs, Volume= 26,933 cf, Atten= 1%, Lag= 0.4 min

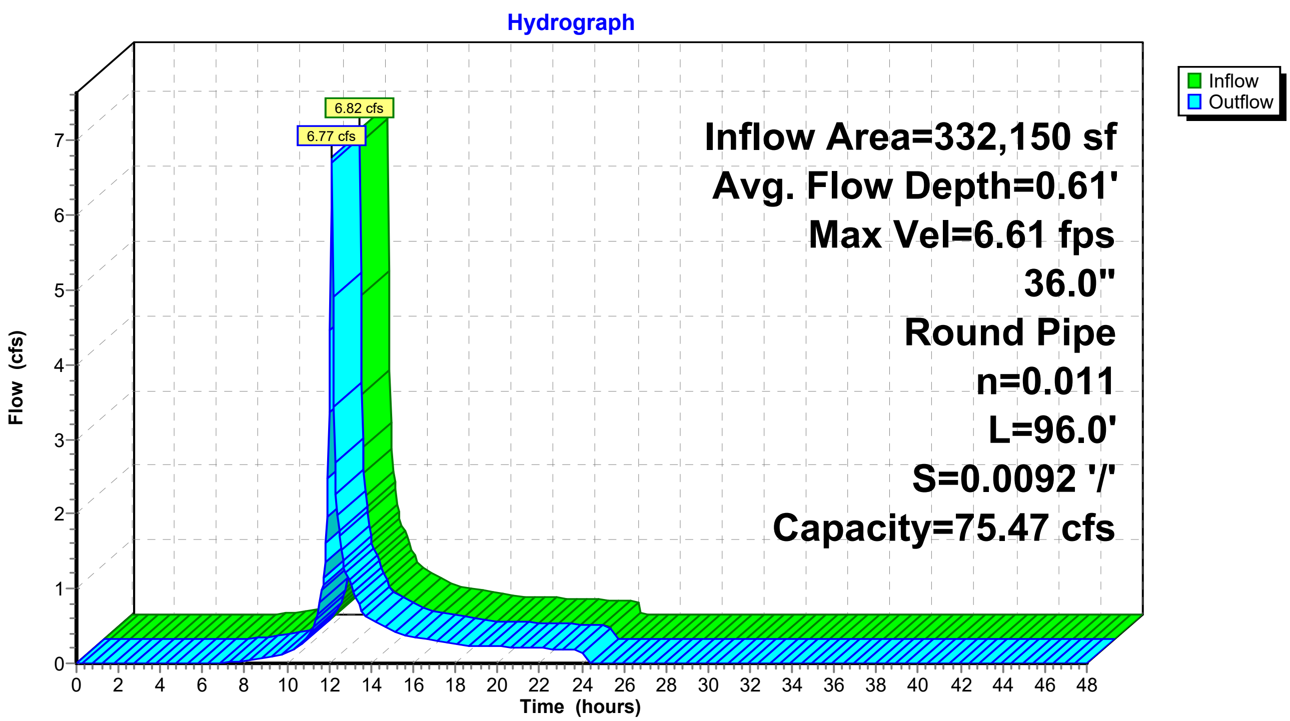
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.61 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.44 fps, Avg. Travel Time= 0.7 min

Peak Storage= 99 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 75.47 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 96.0' Slope= 0.0092 '/'
Inlet Invert= 16.00', Outlet Invert= 15.12'



Reach DP-2: DP-2



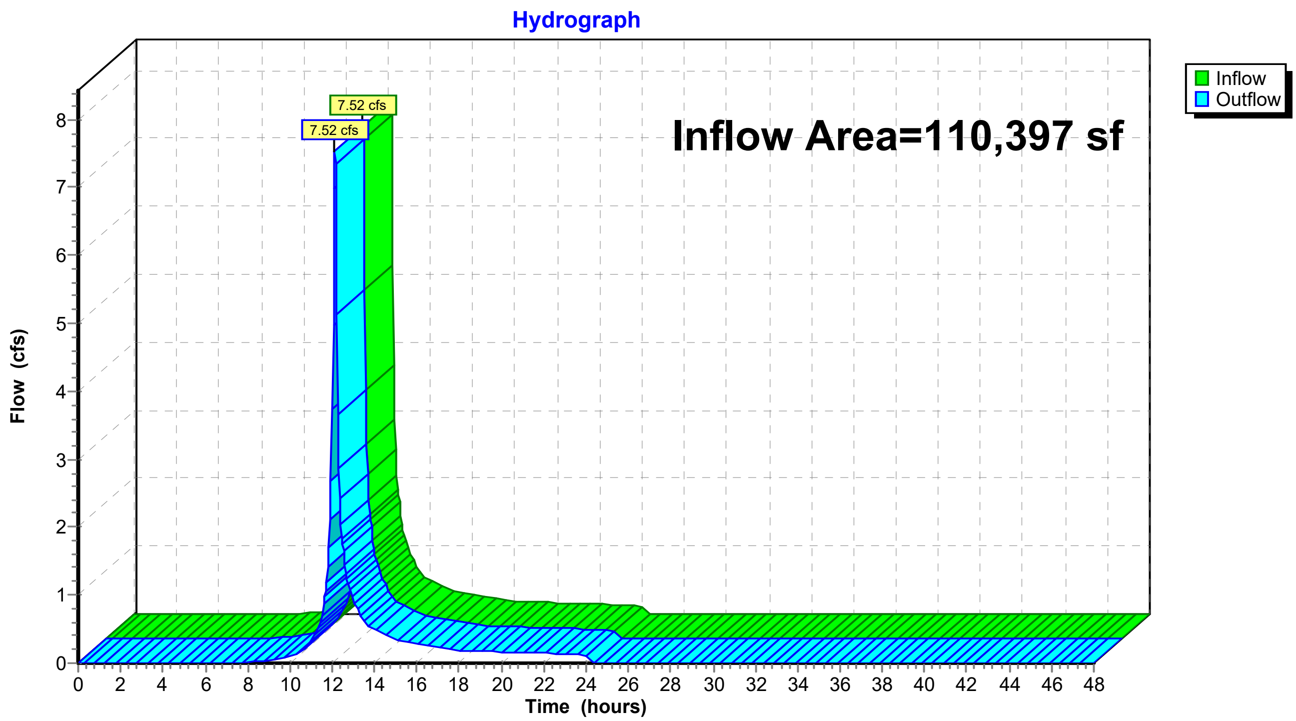
Summary for Reach DP-3: DP-3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	110,397 sf, 61.01% Impervious,	Inflow Depth = 2.61"	for 10-year event
Inflow =	7.52 cfs @ 12.13 hrs, Volume=	24,009 cf	
Outflow =	7.52 cfs @ 12.13 hrs, Volume=	24,009 cf, Atten= 0%, Lag= 0.0 min	

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-3: DP-3



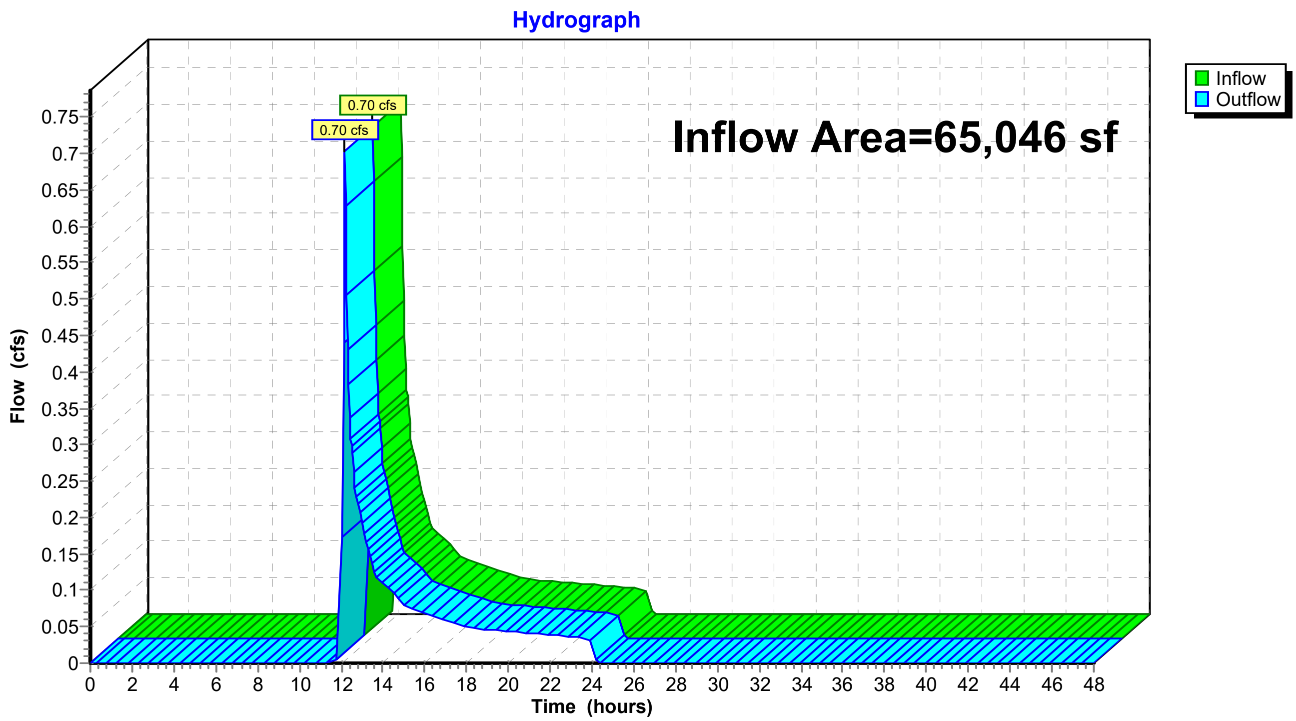
Summary for Reach DP1A: Outfall 1A

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	65,046 sf,	15.40% Impervious, Inflow Depth = 0.66"	for 10-year event
Inflow =	0.70 cfs @	12.17 hrs, Volume=	3,597 cf
Outflow =	0.70 cfs @	12.17 hrs, Volume=	3,597 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP1A: Outfall 1A

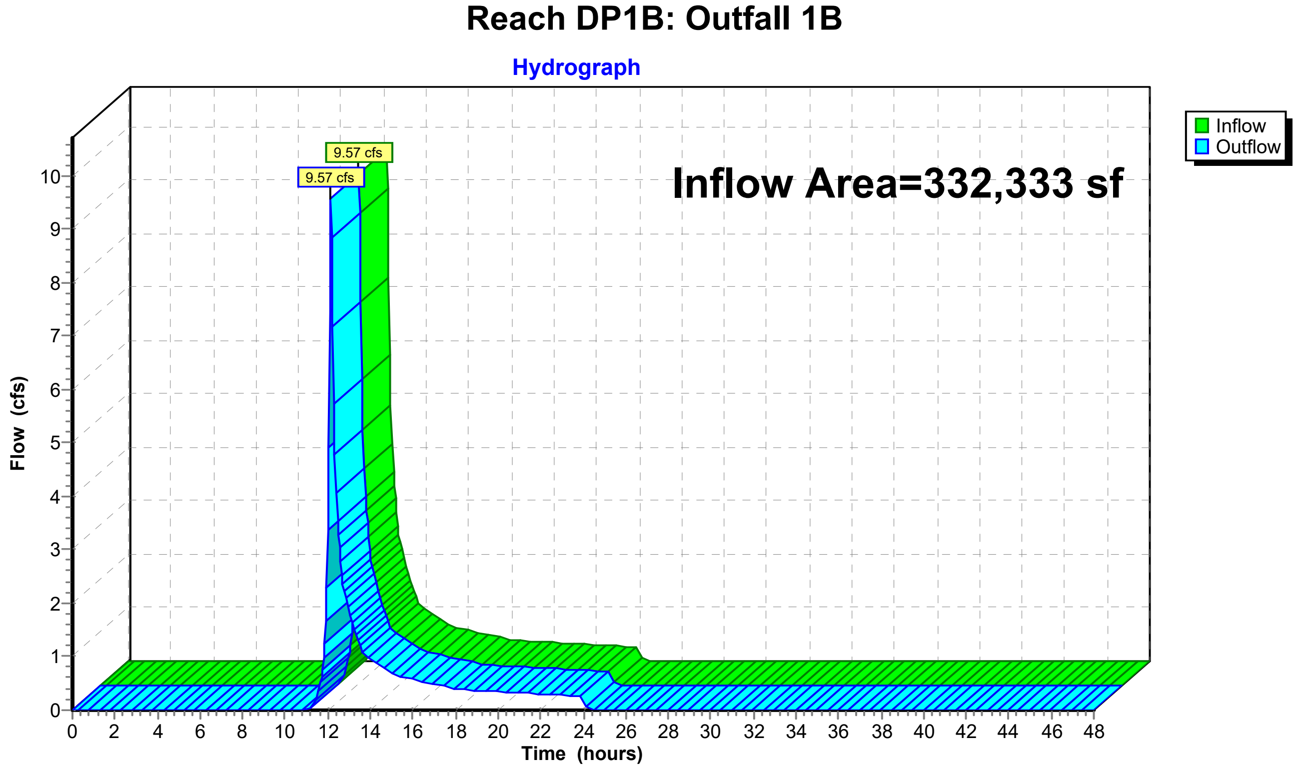


Summary for Reach DP1B: Outfall 1B

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	332,333 sf,	33.31% Impervious,	Inflow Depth = 1.35"	for 10-year event
Inflow =	9.57 cfs @	12.16 hrs, Volume=	37,368 cf	
Outflow =	9.57 cfs @	12.16 hrs, Volume=	37,368 cf,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



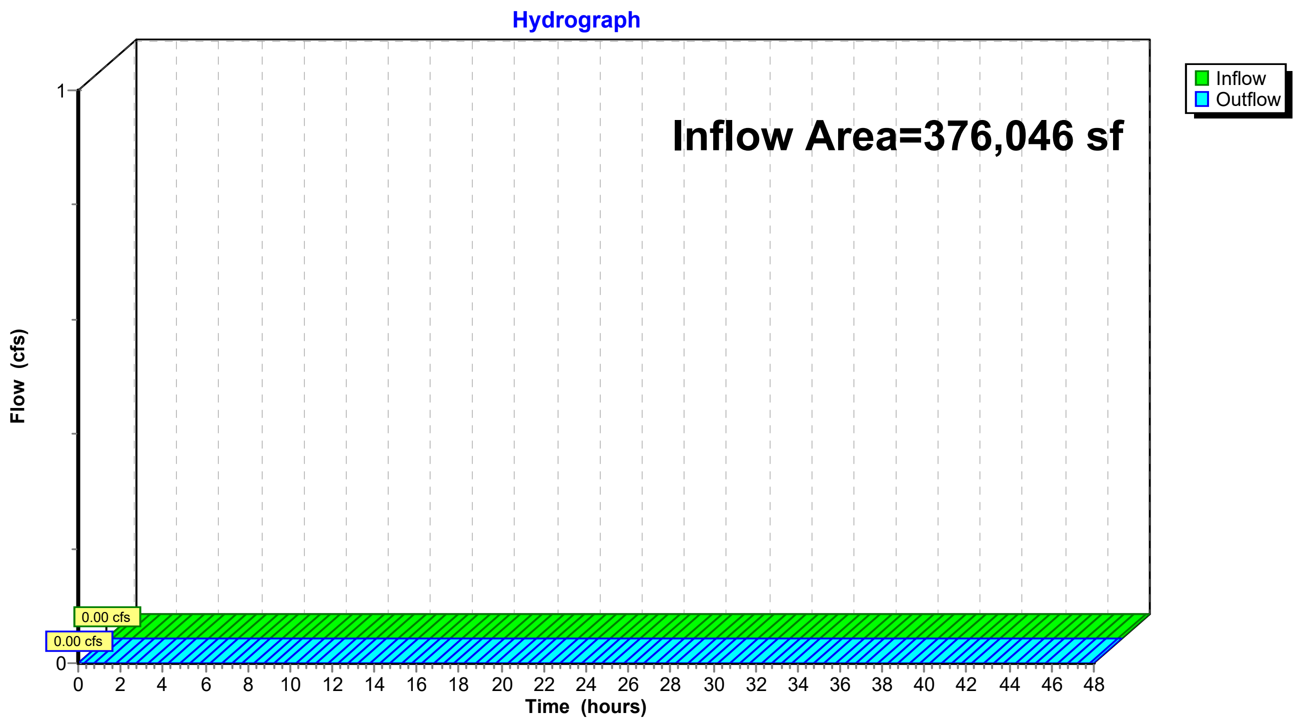
Summary for Reach DP1C: Outfall 1C

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	376,046 sf,	46.44% Impervious,	Inflow Depth = 0.00"	for 10-year event
Inflow =	0.00 cfs @	0.00 hrs, Volume=	0 cf	
Outflow =	0.00 cfs @	0.00 hrs, Volume=	0 cf, Atten= 0%, Lag= 0.0 min	

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP1C: Outfall 1C

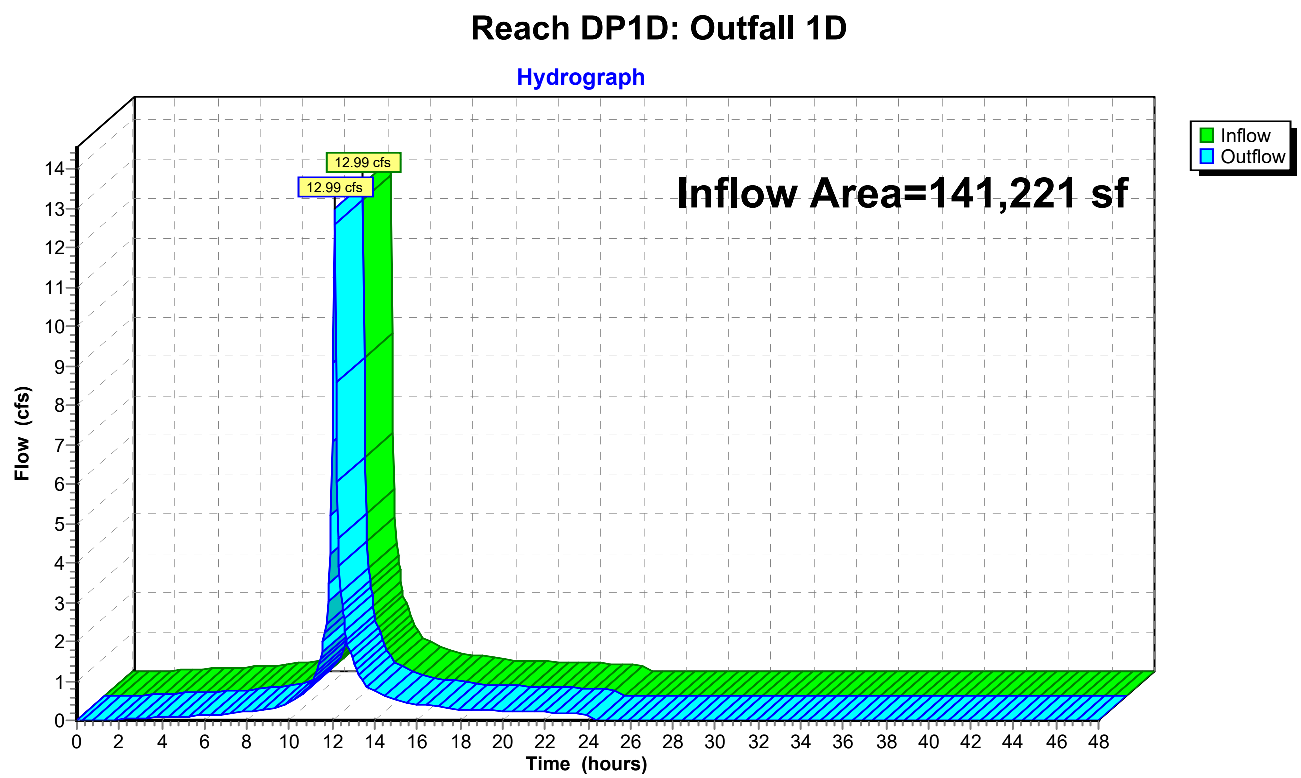


Summary for Reach DP1D: Outfall 1D

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	141,221 sf,	81.74% Impervious,	Inflow Depth = 3.85"	for 10-year event
Inflow =	12.99 cfs @	12.13 hrs, Volume=	45,272 cf	
Outflow =	12.99 cfs @	12.13 hrs, Volume=	45,272 cf,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



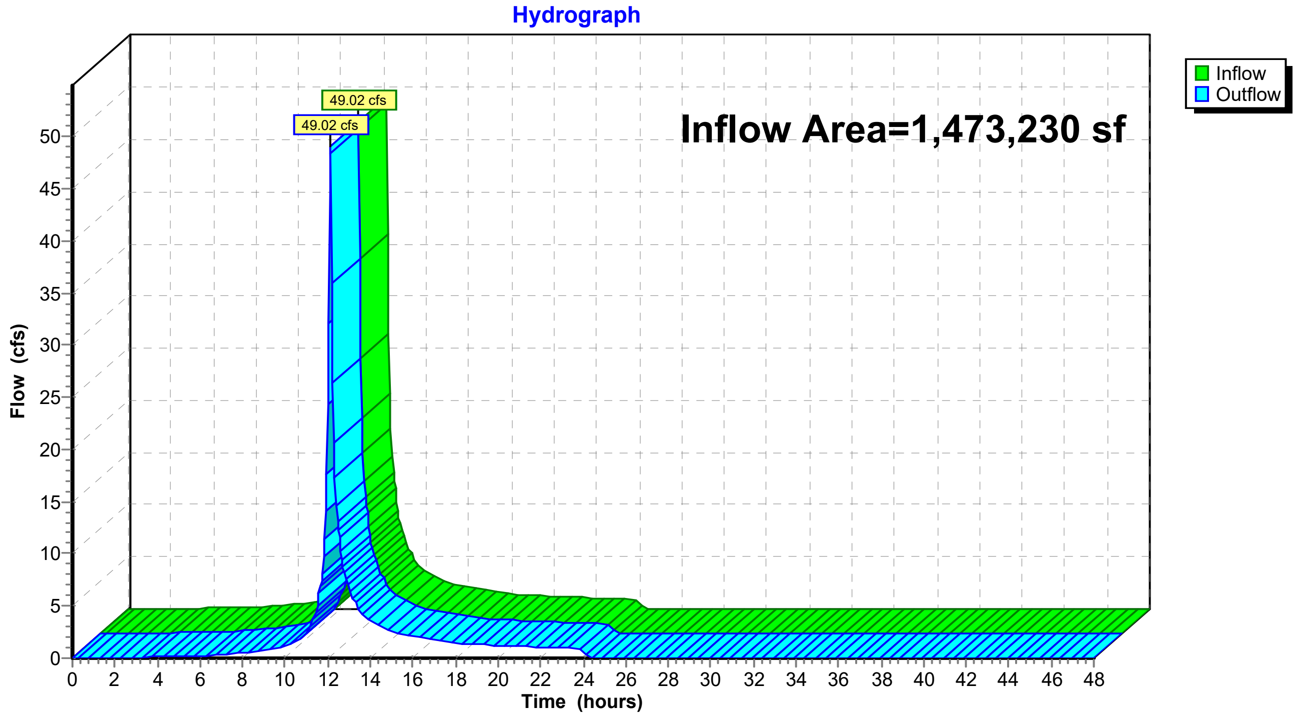
Summary for Reach TOTAL: Total

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,473,230 sf, 43.71% Impervious, Inflow Depth = 1.45" for 10-year event
Inflow = 49.02 cfs @ 12.14 hrs, Volume= 178,610 cf
Outflow = 49.02 cfs @ 12.14 hrs, Volume= 178,610 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach TOTAL: Total



Summary for Pond 2P: EX-POND

Inflow Area = 376,046 sf, 46.44% Impervious, Inflow Depth = 2.12" for 10-year event
Inflow = 20.38 cfs @ 12.13 hrs, Volume= 66,476 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 23.38' @ 24.40 hrs Surf.Area= 16,822 sf Storage= 66,475 cf

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

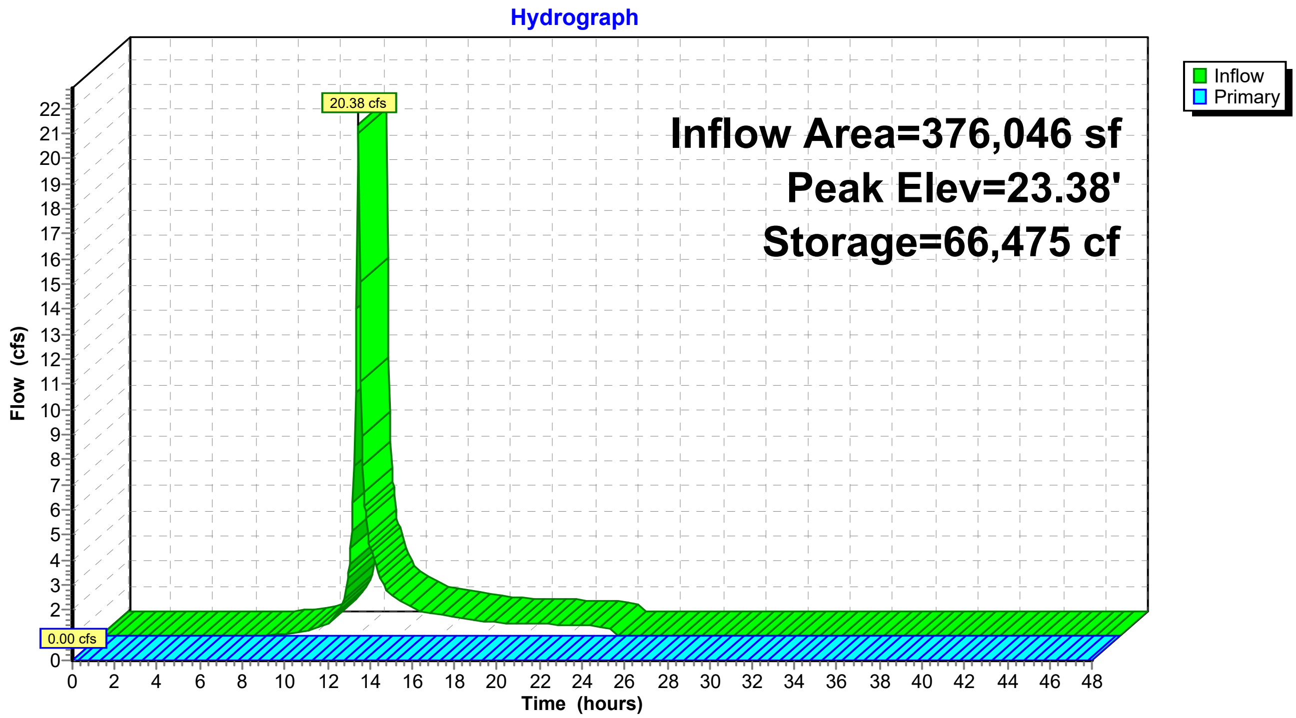
Volume	Invert	Avail.Storage	Storage Description
#1	18.00'	95,308 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.00	8,452	0	0
19.00	9,777	9,115	9,115
20.00	11,187	10,482	19,597
21.00	12,690	11,939	31,535
22.00	14,289	13,490	45,025
23.00	16,001	15,145	60,170
24.00	18,138	17,070	77,239
25.00	18,000	18,069	95,308

Device	Routing	Invert	Outlet Devices
#1	Primary	18.72'	**24.0" Round Culvert** L= 24.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 18.72' / 17.59' S= 0.0465 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	23.70'	**24.0" x 24.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#3	Primary	23.90'	**100.0' long x 30.0' breadth Broad-Crested Rectangular Weir** 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 @ 0.00 hrs HW=18.00' (Free Discharge)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: EX-POND



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A: EX-1A Runoff Area=65,046 sf 15.40% Impervious Runoff Depth=1.19"
Flow Length=405' Tc=6.9 min CN=48 Runoff=1.64 cfs 6,447 cf

Subcatchment1B: EX-1B Runoff Area=220,211 sf 33.47% Impervious Runoff Depth=2.10"
Flow Length=521' Tc=10.0 min CN=59 Runoff=10.11 cfs 38,517 cf

Subcatchment1C: EX-1C Runoff Area=185,095 sf 57.34% Impervious Runoff Depth=3.83"
Tc=6.0 min CN=77 Runoff=18.38 cfs 59,087 cf

Subcatchment1D: EX-1D Runoff Area=48,816 sf 58.62% Impervious Runoff Depth=3.52"
Tc=6.0 min CN=74 Runoff=4.49 cfs 14,336 cf

Subcatchment1E: EX-1E Runoff Area=24,840 sf 82.66% Impervious Runoff Depth=5.01"
Tc=6.0 min CN=88 Runoff=3.07 cfs 10,375 cf

Subcatchment1F: EX-1F Runoff Area=48,259 sf 97.34% Impervious Runoff Depth=5.93"
Tc=6.0 min CN=96 Runoff=6.50 cfs 23,831 cf

Subcatchment1G: EX-1G Runoff Area=19,306 sf 100.00% Impervious Runoff Depth=6.16"
Tc=6.0 min CN=98 Runoff=2.62 cfs 9,913 cf

Subcatchment1H: EX-1H Runoff Area=116,037 sf 90.23% Impervious Runoff Depth=5.46"
Tc=6.0 min CN=92 Runoff=15.09 cfs 52,827 cf

Subcatchment2A: EX-2A Runoff Area=245,993 sf 0.60% Impervious Runoff Depth=0.57"
Flow Length=663' Tc=10.1 min CN=39 Runoff=1.17 cfs 11,603 cf

Subcatchment2B: EX-2B Runoff Area=47,149 sf 75.39% Impervious Runoff Depth=4.46"
Tc=6.0 min CN=83 Runoff=5.34 cfs 17,540 cf

Subcatchment2C: EX-2C Runoff Area=39,008 sf 61.89% Impervious Runoff Depth=3.73"
Tc=6.0 min CN=76 Runoff=3.78 cfs 12,118 cf

Subcatchment3A: EX-3A Runoff Area=97,064 sf 62.88% Impervious Runoff Depth=3.73"
Tc=6.0 min CN=76 Runoff=9.40 cfs 30,152 cf

Subcatchment3B: EX-3B Runoff Area=13,333 sf 47.42% Impervious Runoff Depth=2.84"
Tc=6.0 min CN=67 Runoff=0.99 cfs 3,151 cf

SubcatchmentO-01: OFF-01 Runoff Area=112,122 sf 33.01% Impervious Runoff Depth=2.10"
Tc=6.0 min CN=59 Runoff=6.01 cfs 19,611 cf

SubcatchmentO-02: OFF-02 Runoff Area=109,762 sf 30.00% Impervious Runoff Depth=1.92"
Tc=6.0 min CN=57 Runoff=5.32 cfs 17,598 cf

SubcatchmentO-03: OFF-03 Runoff Area=45,823 sf 30.00% Impervious Runoff Depth=1.92"
Tc=6.0 min CN=57 Runoff=2.22 cfs 7,347 cf

Subcatchment O-04: OFF-04 Runoff Area=35,366 sf 61.66% Impervious Runoff Depth=3.63"
Tc=6.0 min CN=75 Runoff=3.34 cfs 10,685 cf

Reach DP-1: DP-1 Inflow=57.86 cfs 239,939 cf
Outflow=57.86 cfs 239,939 cf

Reach DP-2: DP-2 Avg. Flow Depth=0.72' Max Vel=7.31 fps Inflow=9.54 cfs 41,260 cf
36.0" Round Pipe n=0.011 L=96.0' S=0.0092 '/' Capacity=75.47 cfs Outflow=9.49 cfs 41,260 cf

Reach DP-3: DP-3 Inflow=10.39 cfs 33,303 cf
Outflow=10.39 cfs 33,303 cf

Reach DP1A: Outfall 1A Inflow=1.64 cfs 6,447 cf
Outflow=1.64 cfs 6,447 cf

Reach DP1B: Outfall 1B Inflow=15.65 cfs 58,129 cf
Outflow=15.65 cfs 58,129 cf

Reach DP1C: Outfall 1C Inflow=0.97 cfs 22,822 cf
Outflow=0.97 cfs 22,822 cf

Reach DP1D: Outfall 1D Inflow=16.67 cfs 58,454 cf
Outflow=16.67 cfs 58,454 cf

Reach TOTAL: Total Inflow=68.22 cfs 273,242 cf
Outflow=68.22 cfs 273,242 cf

Pond 2P: EX-POND Peak Elev=23.83' Storage=74,233 cf Inflow=29.24 cfs 94,716 cf
Outflow=0.97 cfs 22,822 cf

Total Runoff Area = 1,473,230 sf Runoff Volume = 345,135 cf Average Runoff Depth = 2.81"
56.29% Pervious = 829,222 sf 43.71% Impervious = 644,008 sf

Summary for Subcatchment 1A: EX-1A

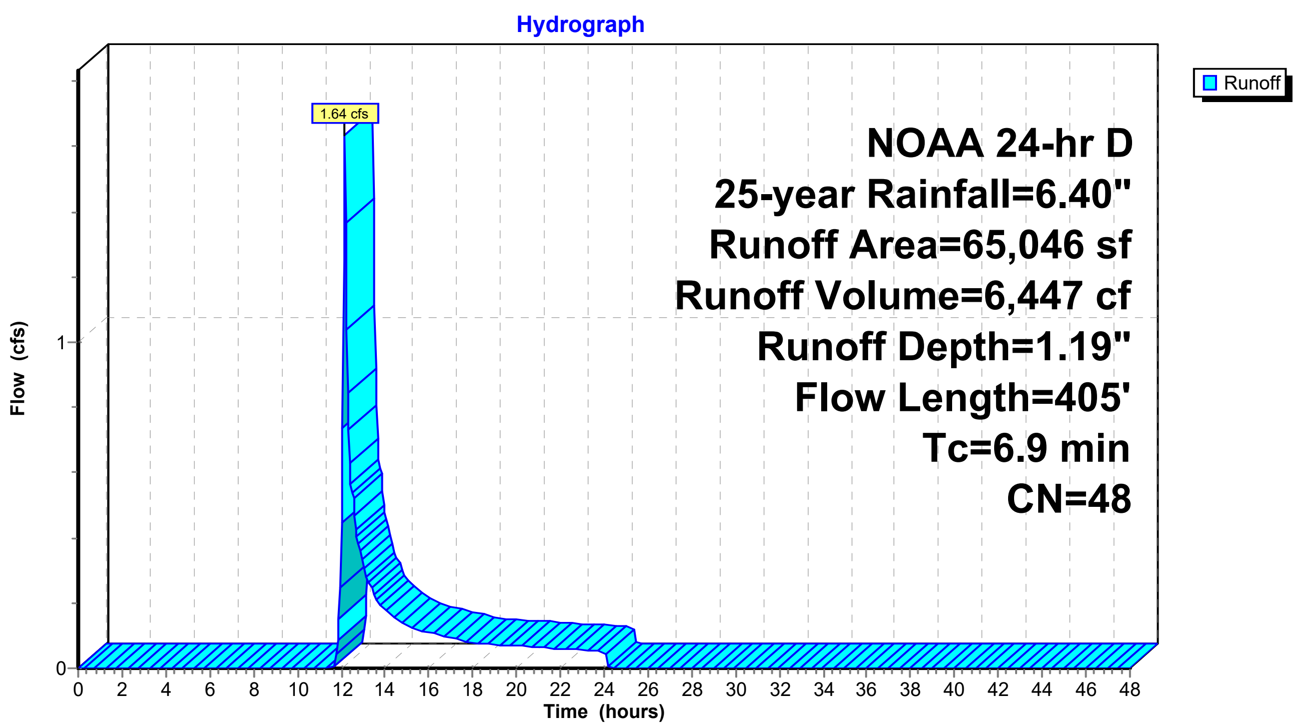
Runoff = 1.64 cfs @ 12.15 hrs, Volume= 6,447 cf, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
5,063	98	Roofs, HSG A
4,956	98	Paved parking, HSG A
55,027	39	>75% Grass cover, Good, HSG A
65,046	48	Weighted Average
55,027		84.60% Pervious Area
10,019		15.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0700	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.29"
3.5	355	0.0127	1.69		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.9	405	Total			

Subcatchment 1A: EX-1A



Summary for Subcatchment 1B: EX-1B

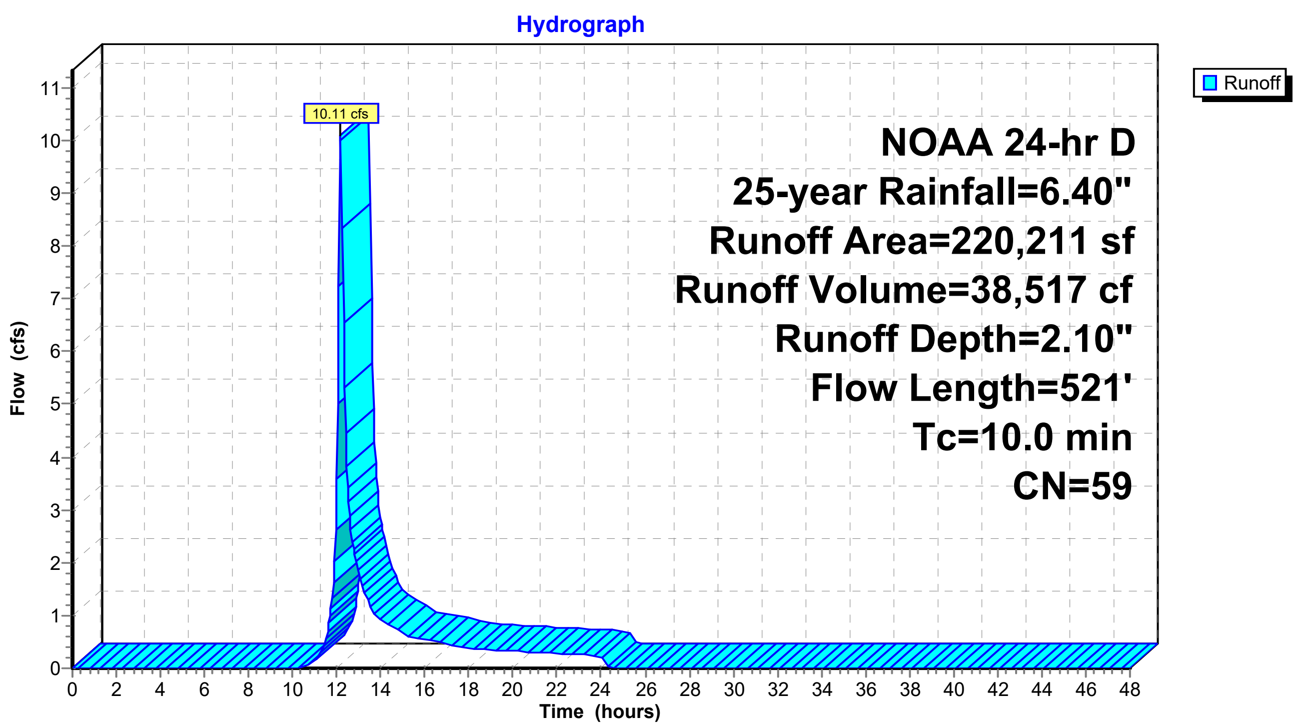
Runoff = 10.11 cfs @ 12.18 hrs, Volume= 38,517 cf, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
3,434	98	Roofs, HSG A
70,263	98	Paved parking, HSG A
146,514	39	>75% Grass cover, Good, HSG A
220,211	59	Weighted Average
146,514		66.53% Pervious Area
73,697		33.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.29"
5.3	471	0.0096	1.47		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.0	521	Total			

Subcatchment 1B: EX-1B



Summary for Subcatchment 1C: EX-1C

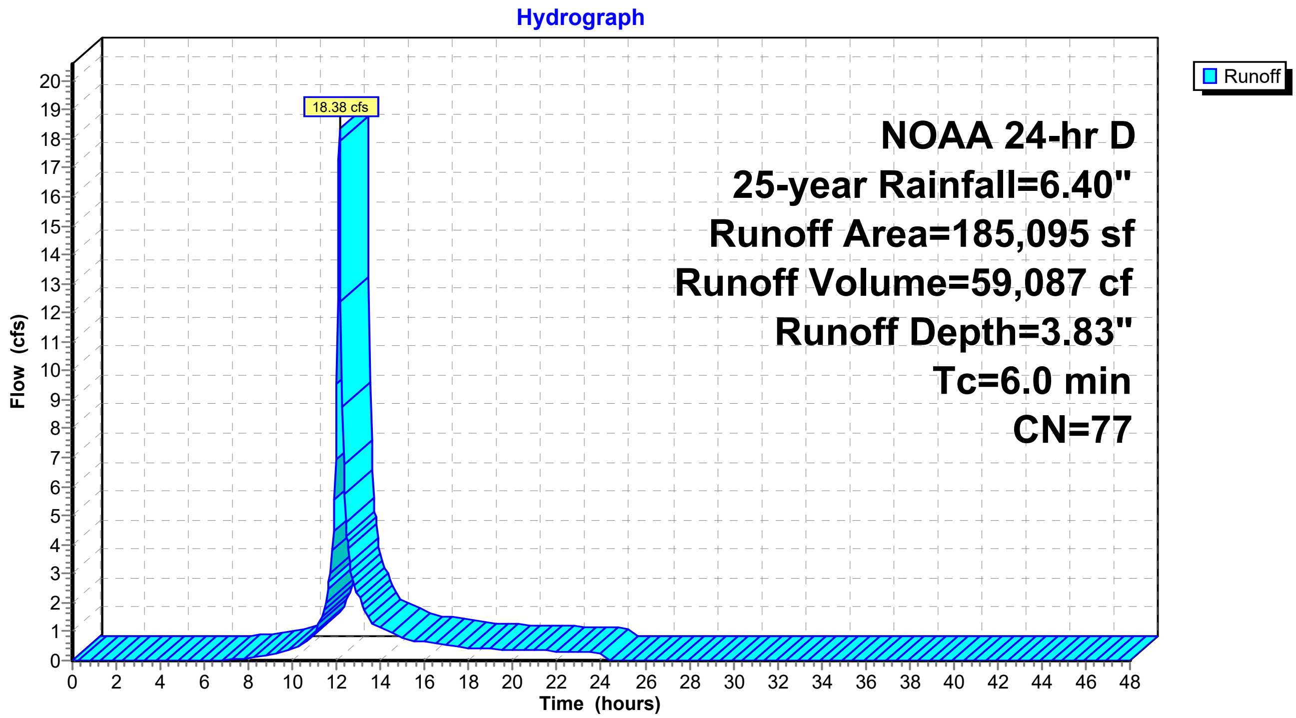
Runoff = 18.38 cfs @ 12.13 hrs, Volume= 59,087 cf, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
106,141	98	Paved parking, HSG A
78,954	49	50-75% Grass cover, Fair, HSG A
185,095	77	Weighted Average
78,954		42.66% Pervious Area
106,141		57.34% Impervious Area

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

Subcatchment 1C: EX-1C



Summary for Subcatchment 1D: EX-1D

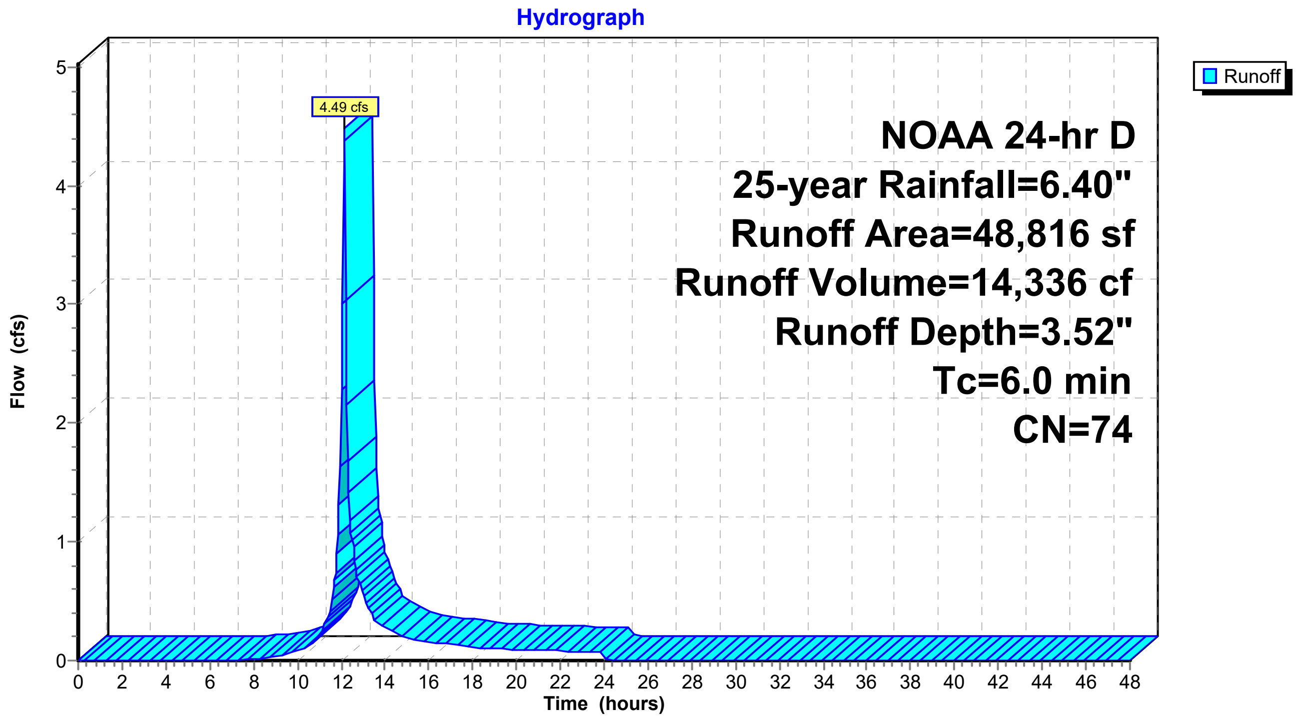
Runoff = 4.49 cfs @ 12.13 hrs, Volume= 14,336 cf, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
28,618	98	Paved parking, HSG A
20,198	39	>75% Grass cover, Good, HSG A
48,816	74	Weighted Average
20,198		41.38% Pervious Area
28,618		58.62% Impervious Area

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

Subcatchment 1D: EX-1D



Summary for Subcatchment 1E: EX-1E

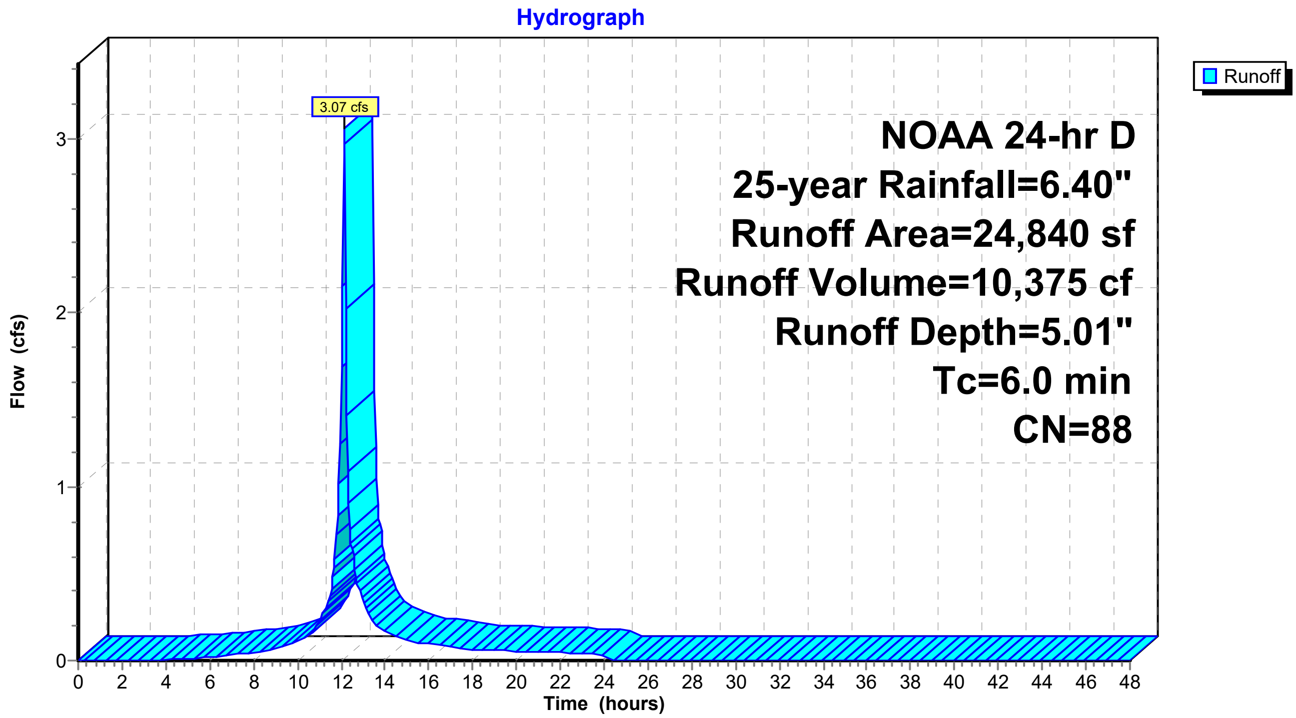
Runoff = 3.07 cfs @ 12.13 hrs, Volume= 10,375 cf, Depth= 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
20,533	98	Paved parking, HSG A
4,307	39	>75% Grass cover, Good, HSG A
24,840	88	Weighted Average
4,307		17.34% Pervious Area
20,533		82.66% Impervious Area

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

Subcatchment 1E: EX-1E



Summary for Subcatchment 1F: EX-1F

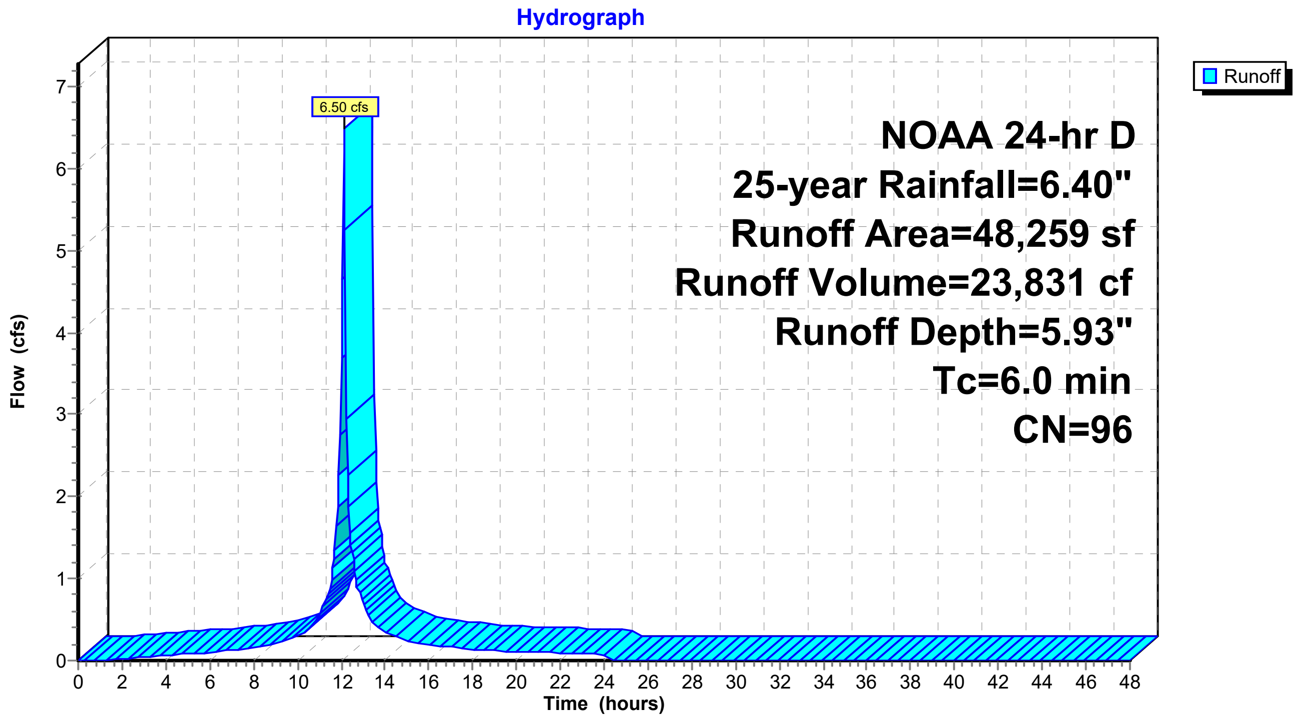
Runoff = 6.50 cfs @ 12.13 hrs, Volume= 23,831 cf, Depth= 5.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
46,973	98	Roofs, HSG A
1,286	39	>75% Grass cover, Good, HSG A
48,259	96	Weighted Average
1,286		2.66% Pervious Area
46,973		97.34% Impervious Area

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

Subcatchment 1F: EX-1F



Summary for Subcatchment 1G: EX-1G

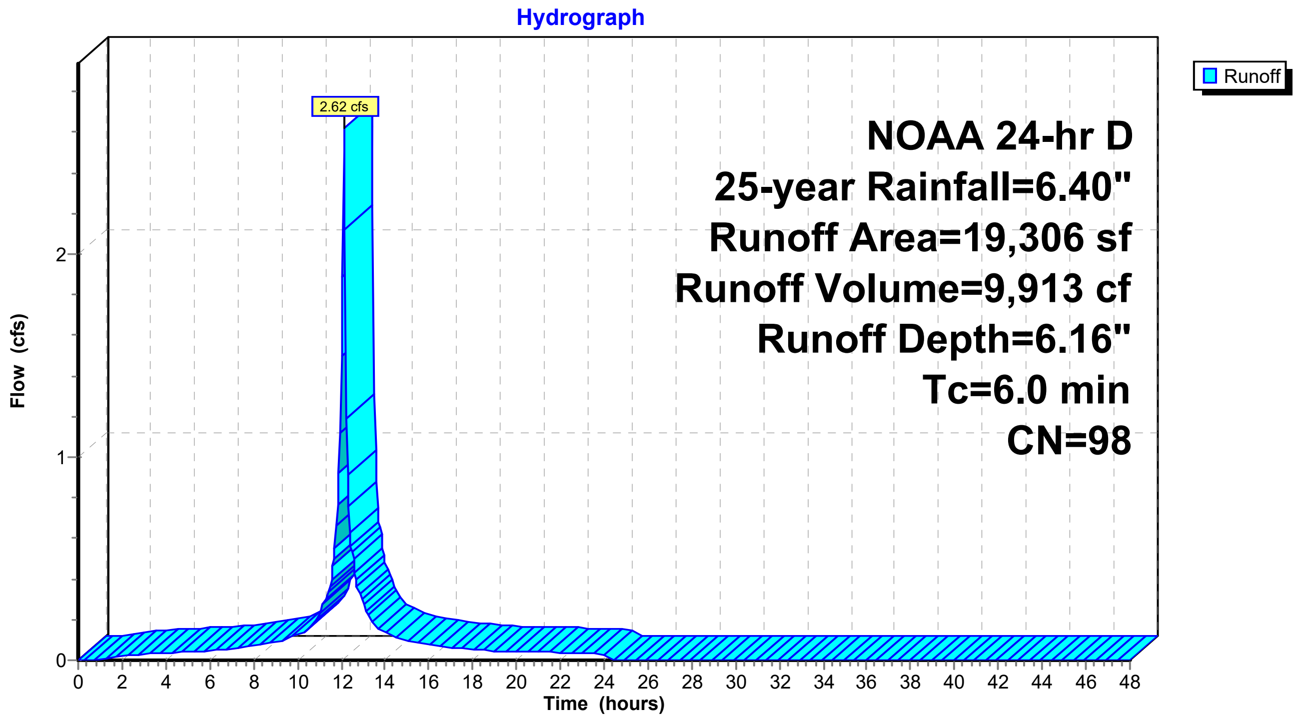
Runoff = 2.62 cfs @ 12.13 hrs, Volume= 9,913 cf, Depth= 6.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
19,306	98	Paved parking, HSG A
19,306		100.00% Impervious Area

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

Subcatchment 1G: EX-1G



Summary for Subcatchment 1H: EX-1H

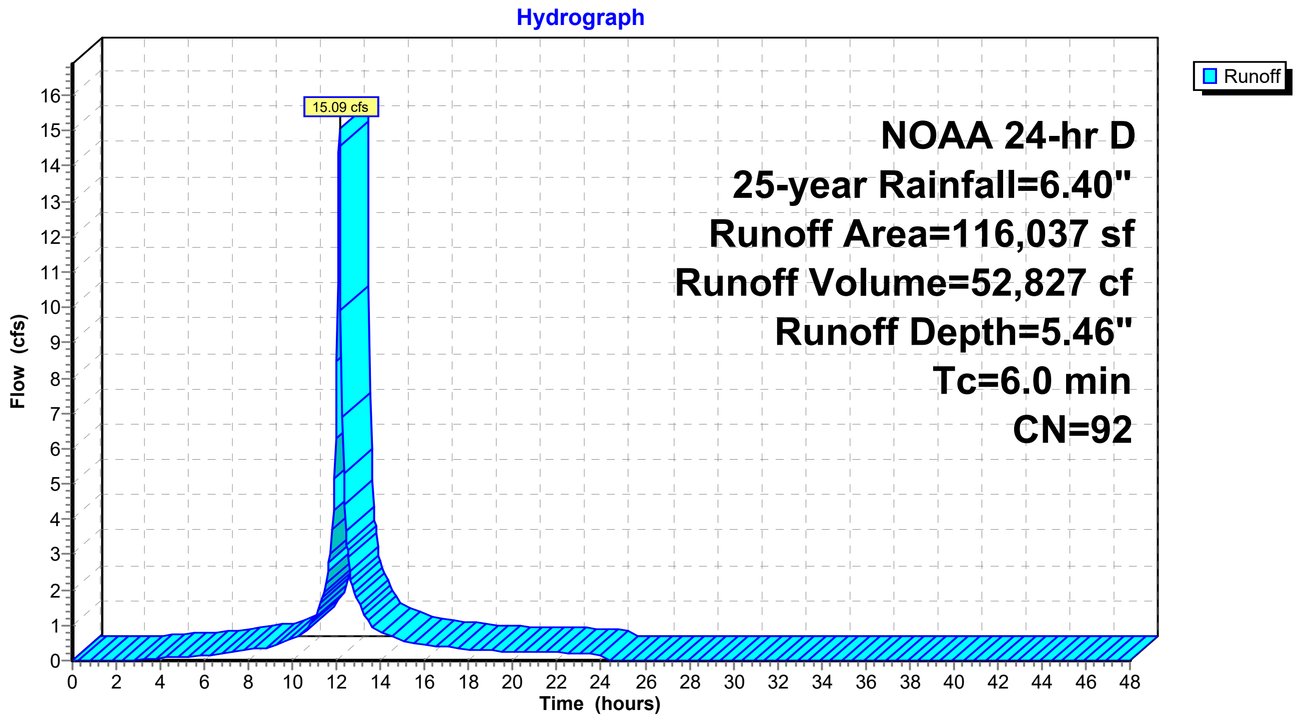
Runoff = 15.09 cfs @ 12.13 hrs, Volume= 52,827 cf, Depth= 5.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
104,697	98	Roofs, HSG A
11,340	39	>75% Grass cover, Good, HSG A
116,037	92	Weighted Average
11,340		9.77% Pervious Area
104,697		90.23% Impervious Area

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

Subcatchment 1H: EX-1H



Summary for Subcatchment 2A: EX-2A

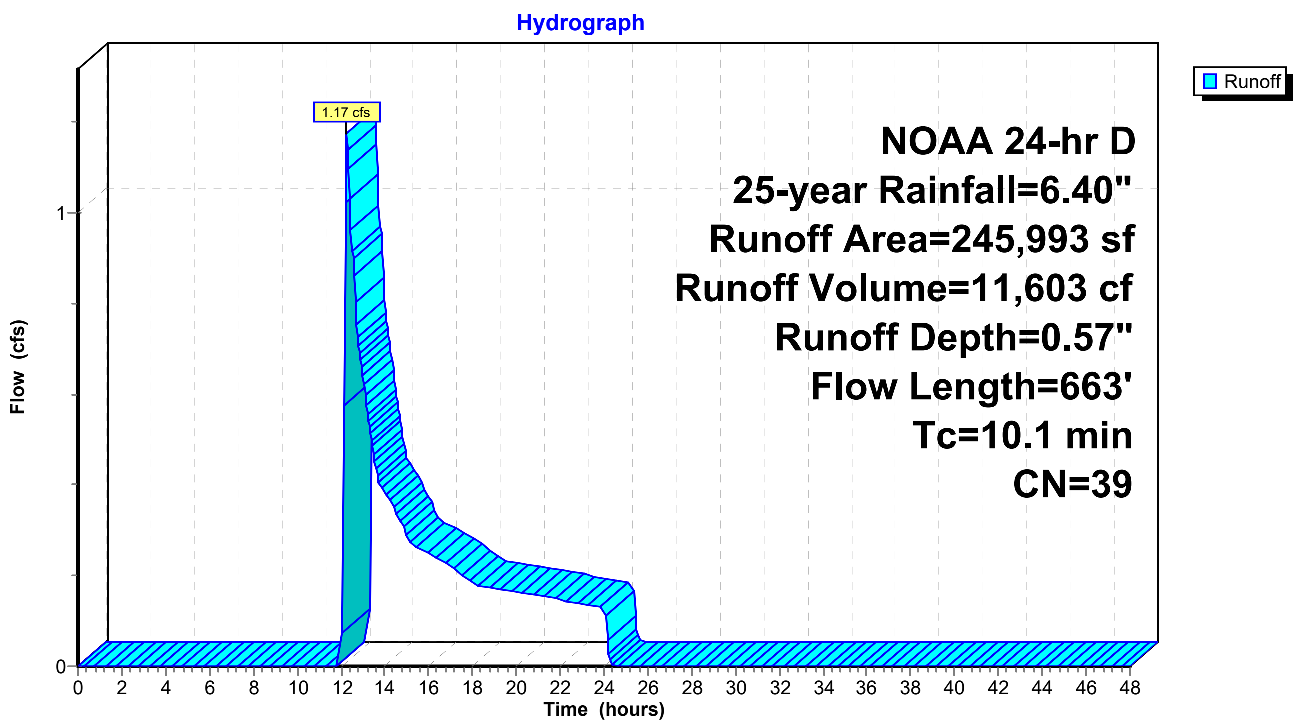
Runoff = 1.17 cfs @ 12.27 hrs, Volume= 11,603 cf, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
763	98	Roofs, HSG A
720	98	Paved parking, HSG A
244,510	39	>75% Grass cover, Good, HSG A
245,993	39	Weighted Average
244,510		99.40% Pervious Area
1,483		0.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0356	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.29"
2.5	247	0.0121	1.65		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.6	145	0.0623	3.74		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.6	221	0.0091	1.43		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.1	663	Total			

Subcatchment 2A: EX-2A



Summary for Subcatchment 2B: EX-2B

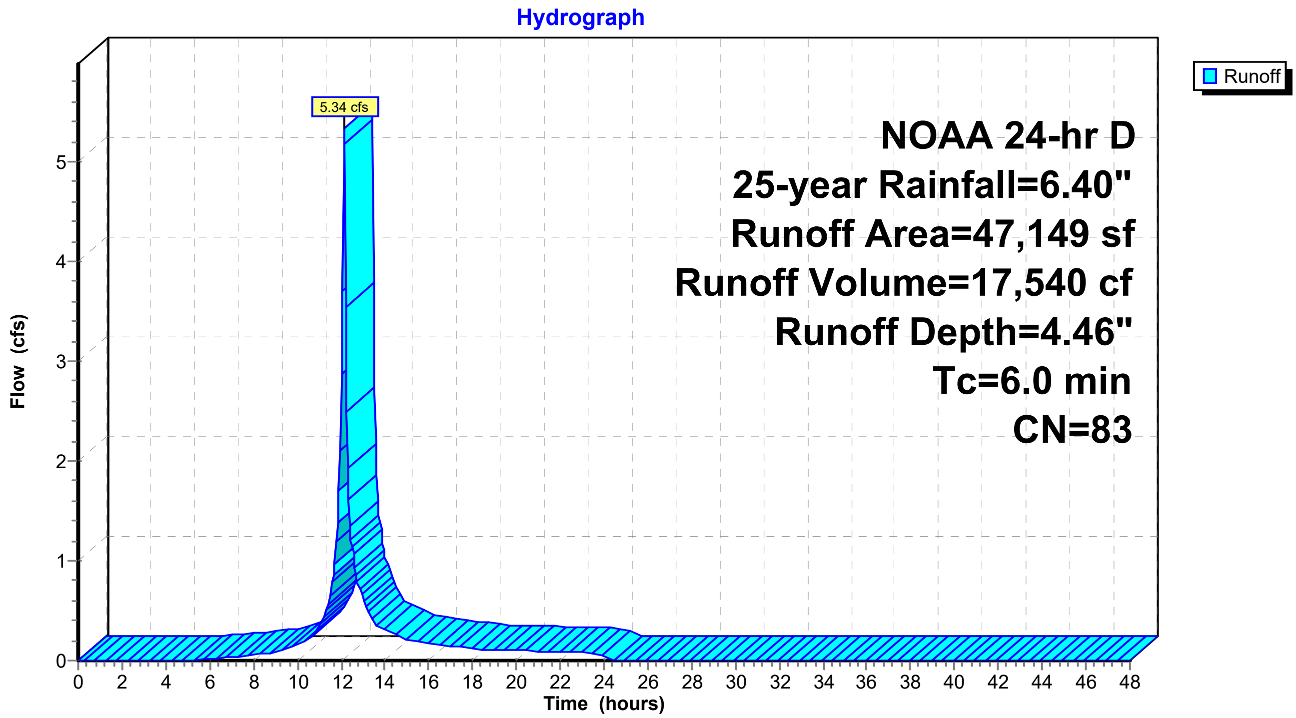
Runoff = 5.34 cfs @ 12.13 hrs, Volume= 17,540 cf, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
35,544	98	Roofs, HSG A
11,605	39	>75% Grass cover, Good, HSG A
47,149	83	Weighted Average
11,605		24.61% Pervious Area
35,544		75.39% Impervious Area

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

Subcatchment 2B: EX-2B



Summary for Subcatchment 2C: EX-2C

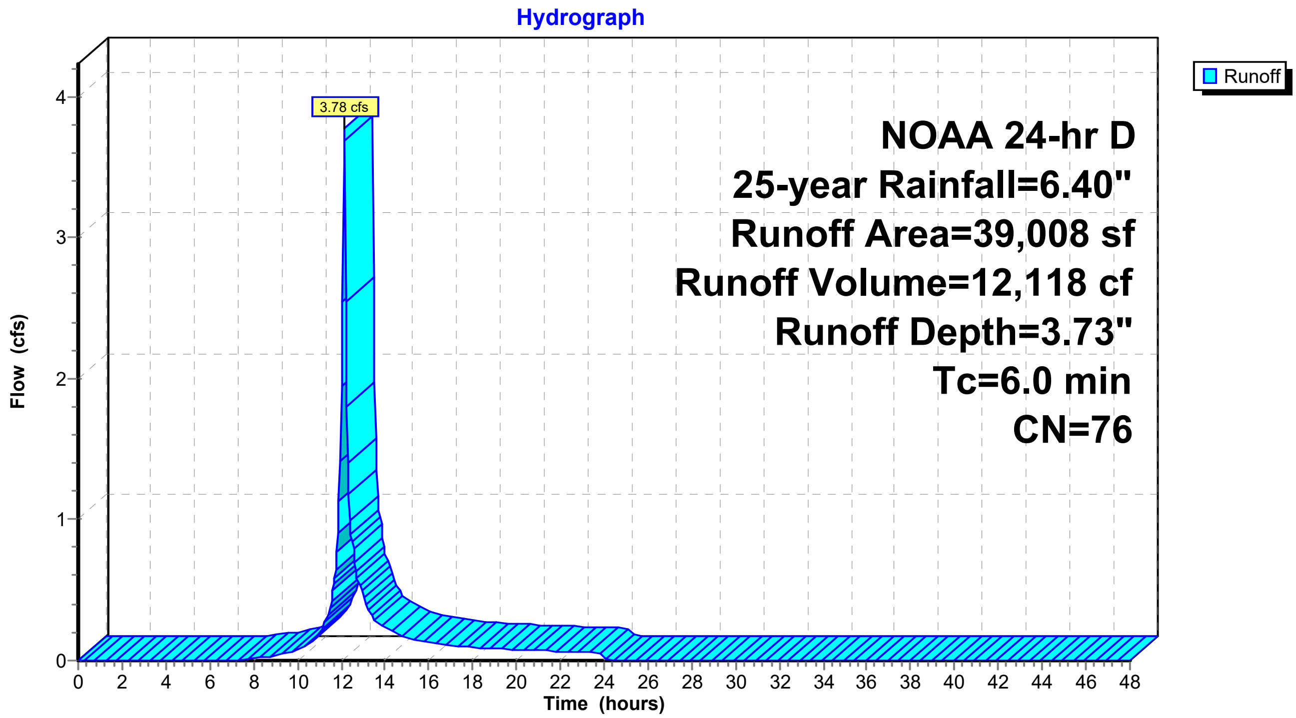
Runoff = 3.78 cfs @ 12.13 hrs, Volume= 12,118 cf, Depth= 3.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
24,142	98	Paved parking, HSG A
14,866	39	>75% Grass cover, Good, HSG A
39,008	76	Weighted Average
14,866		38.11% Pervious Area
24,142		61.89% Impervious Area

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

Subcatchment 2C: EX-2C



Summary for Subcatchment 3A: EX-3A

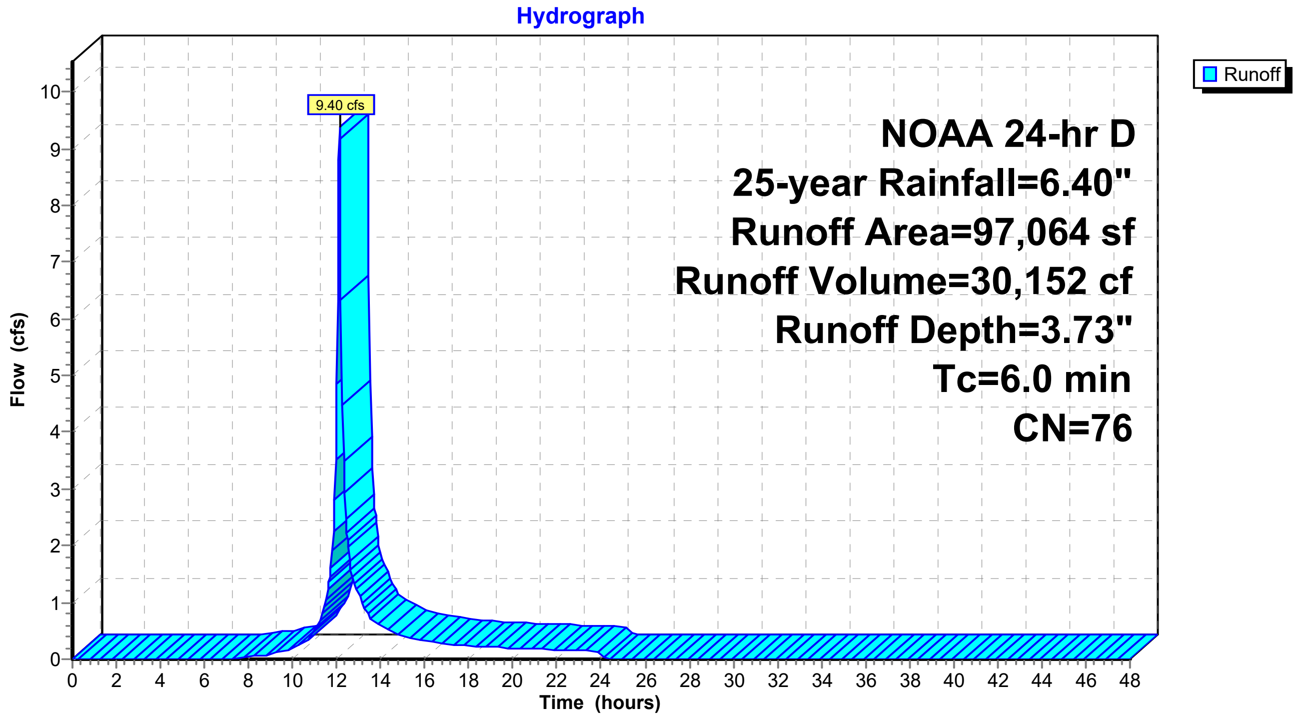
Runoff = 9.40 cfs @ 12.13 hrs, Volume= 30,152 cf, Depth= 3.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
37,664	98	Roofs, HSG A
23,371	98	Paved parking, HSG A
36,029	39	>75% Grass cover, Good, HSG A
97,064	76	Weighted Average
36,029		37.12% Pervious Area
61,035		62.88% Impervious Area

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

Subcatchment 3A: EX-3A



Summary for Subcatchment 3B: EX-3B

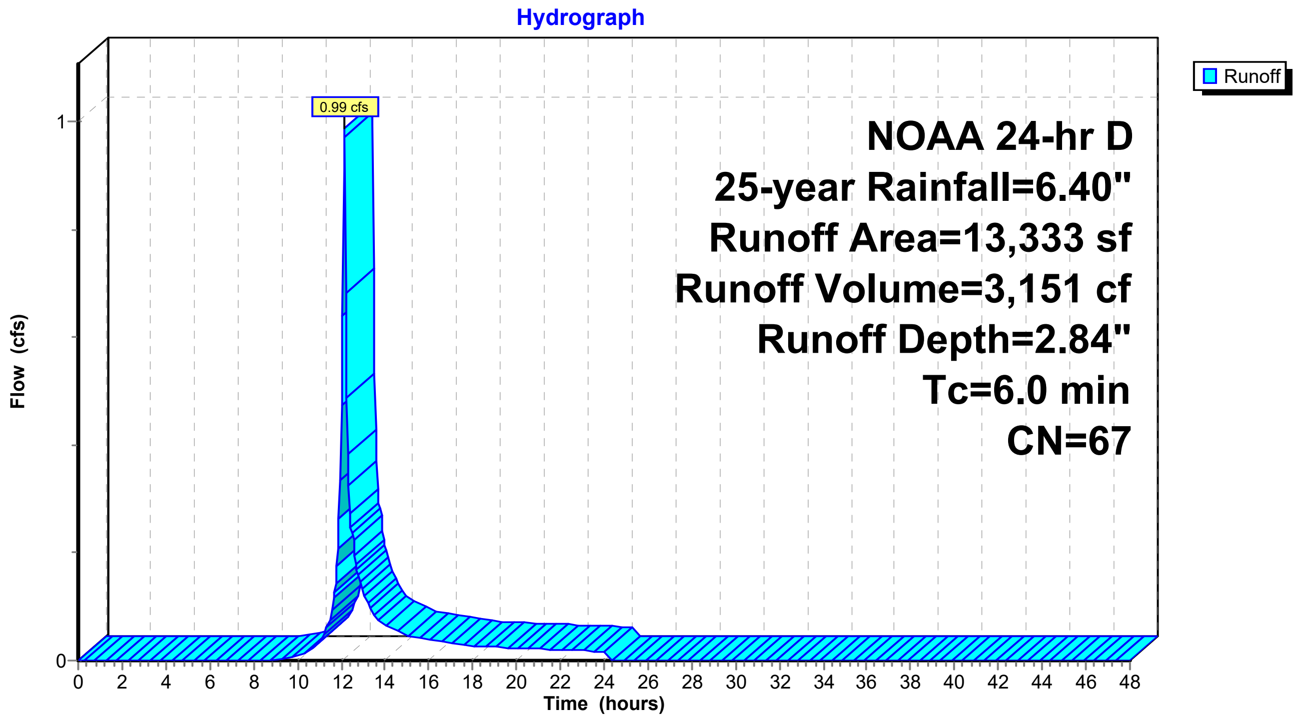
Runoff = 0.99 cfs @ 12.13 hrs, Volume= 3,151 cf, Depth= 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
6,323	98	Paved parking, HSG A
7,010	39	>75% Grass cover, Good, HSG A
13,333	67	Weighted Average
7,010		52.58% Pervious Area
6,323		47.42% Impervious Area

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

Subcatchment 3B: EX-3B



Summary for Subcatchment O-01: OFF-01

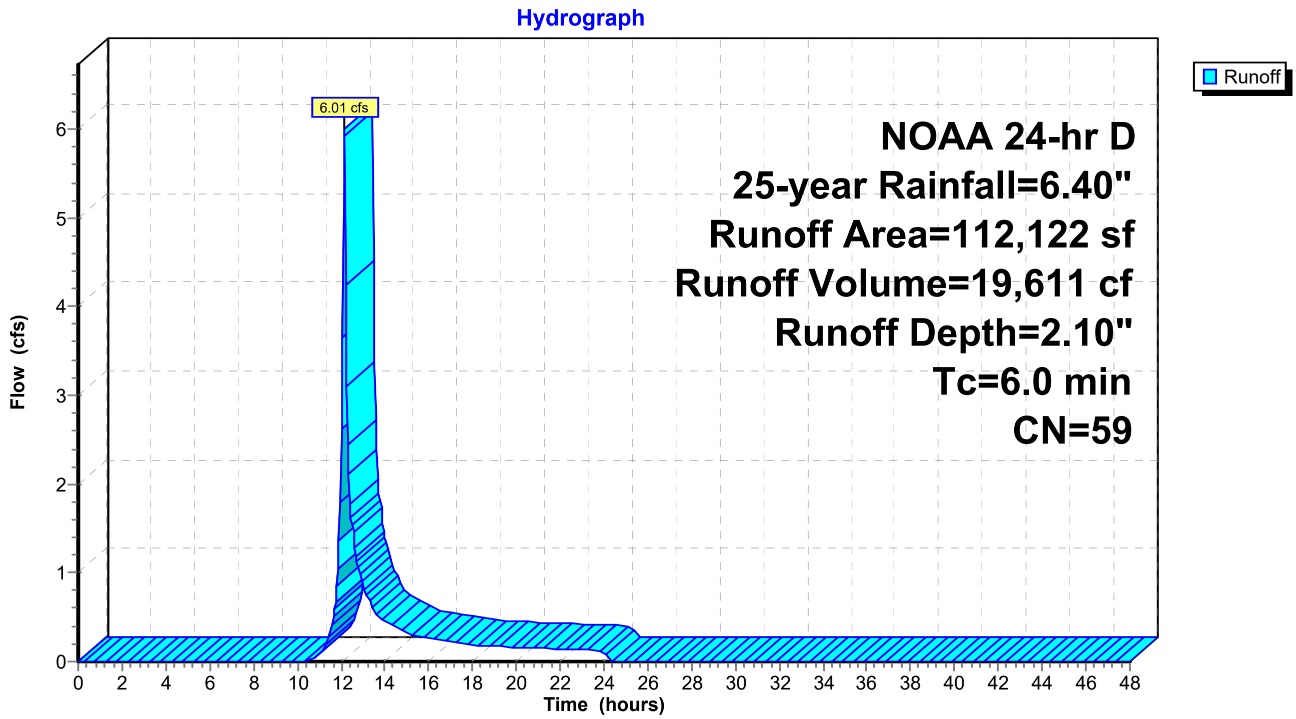
Runoff = 6.01 cfs @ 12.14 hrs, Volume= 19,611 cf, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
16,305	39	>75% Grass cover, Good, HSG A
11,813	98	Unconnected pavement, HSG A
84,004	57	1/3 acre lots, 30% imp, HSG A
112,122	59	Weighted Average
75,108		66.99% Pervious Area
37,014		33.01% Impervious Area
11,813		31.91% Unconnected

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

Subcatchment O-01: OFF-01



Summary for Subcatchment O-02: OFF-02

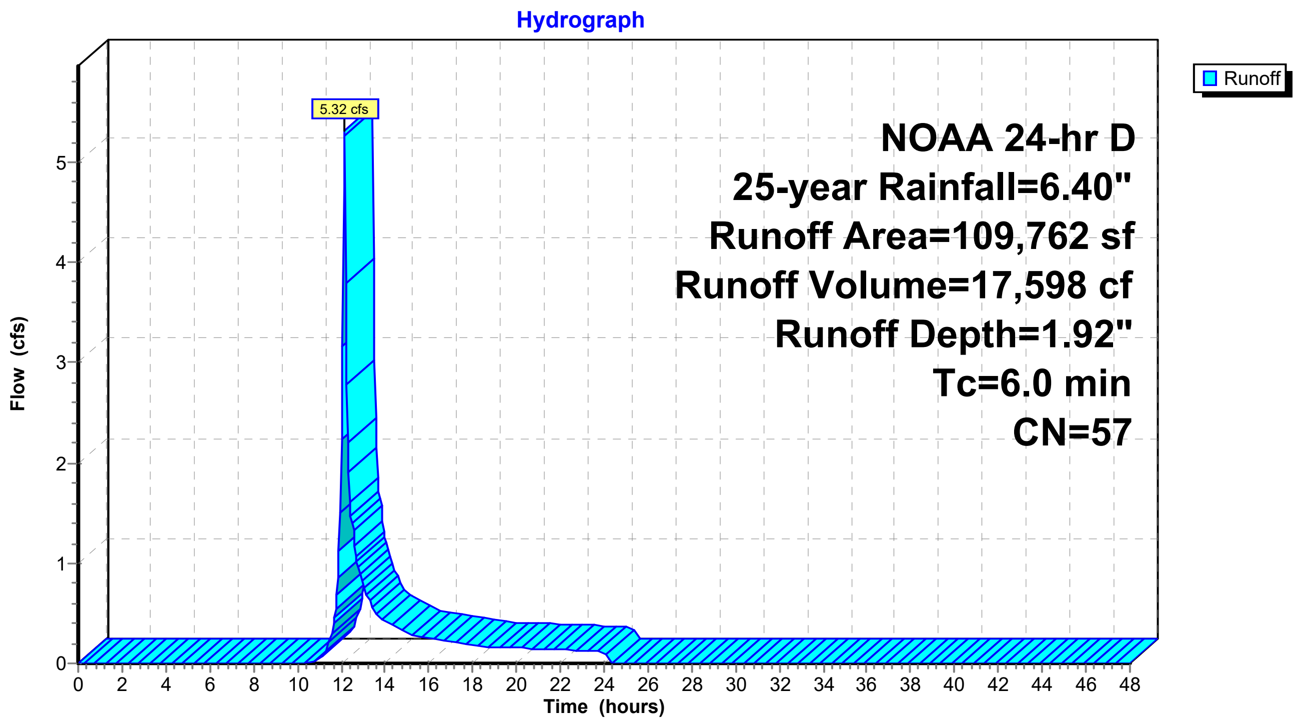
Runoff = 5.32 cfs @ 12.14 hrs, Volume= 17,598 cf, Depth= 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
109,762	57	1/3 acre lots, 30% imp, HSG A
76,833		70.00% Pervious Area
32,929		30.00% Impervious Area

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

Subcatchment O-02: OFF-02



Summary for Subcatchment O-03: OFF-03

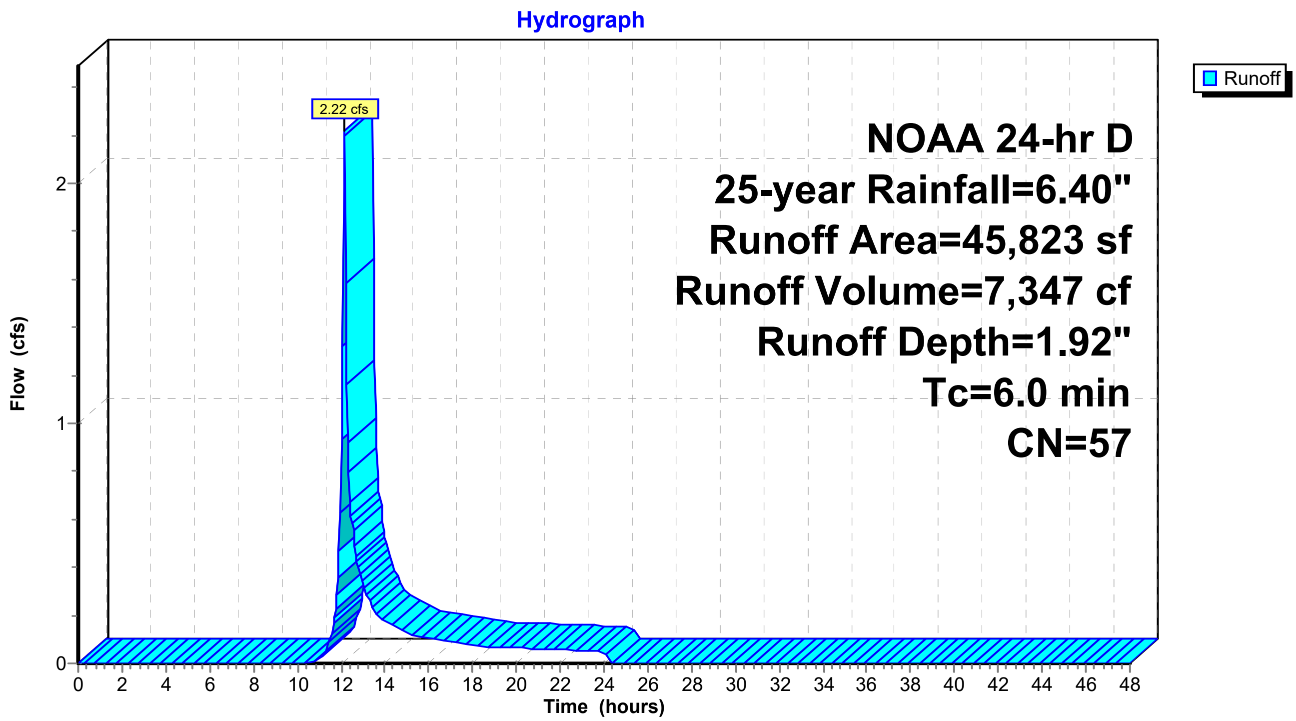
Runoff = 2.22 cfs @ 12.14 hrs, Volume= 7,347 cf, Depth= 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
45,823	57	1/3 acre lots, 30% imp, HSG A
32,076		70.00% Pervious Area
13,747		30.00% Impervious Area

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

Subcatchment O-03: OFF-03



Summary for Subcatchment O-04: OFF-04

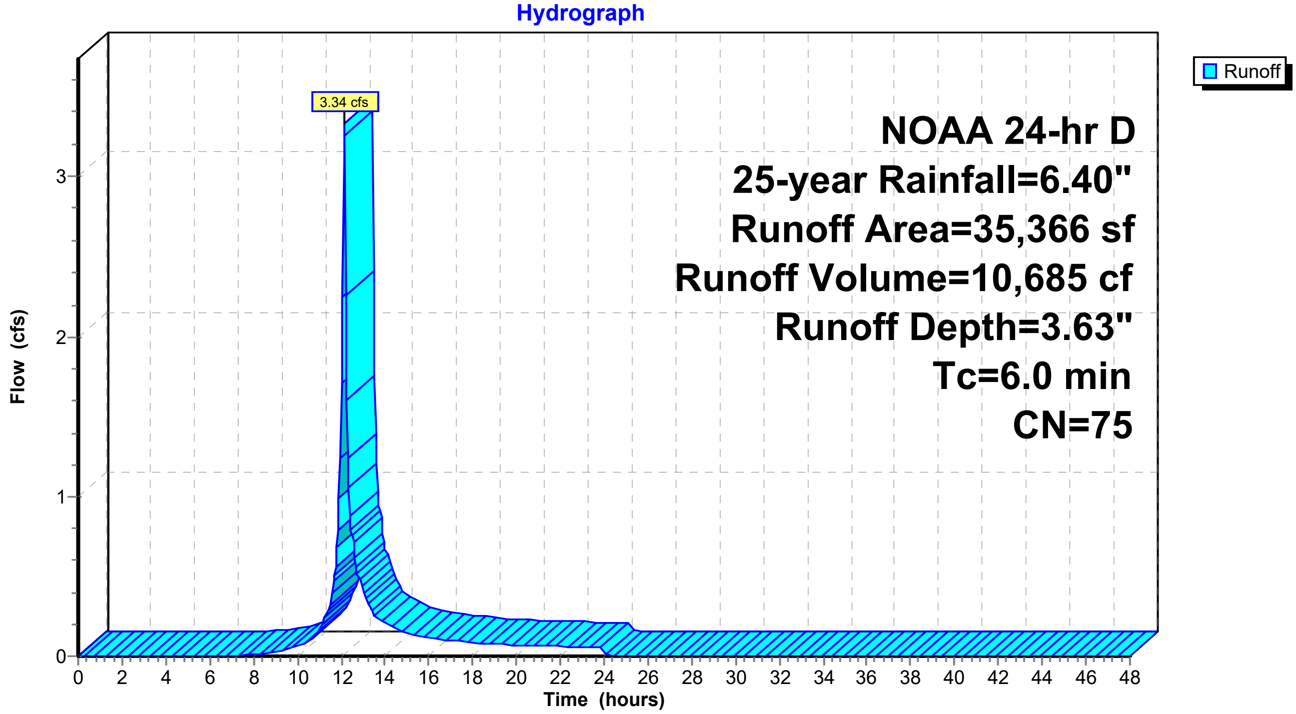
Runoff = 3.34 cfs @ 12.13 hrs, Volume= 10,685 cf, Depth= 3.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
21,807	98	Unconnected pavement, HSG A
13,559	39	>75% Grass cover, Good, HSG A
35,366	75	Weighted Average
13,559		38.34% Pervious Area
21,807		61.66% Impervious Area
21,807		100.00% Unconnected

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

Subcatchment O-04: OFF-04

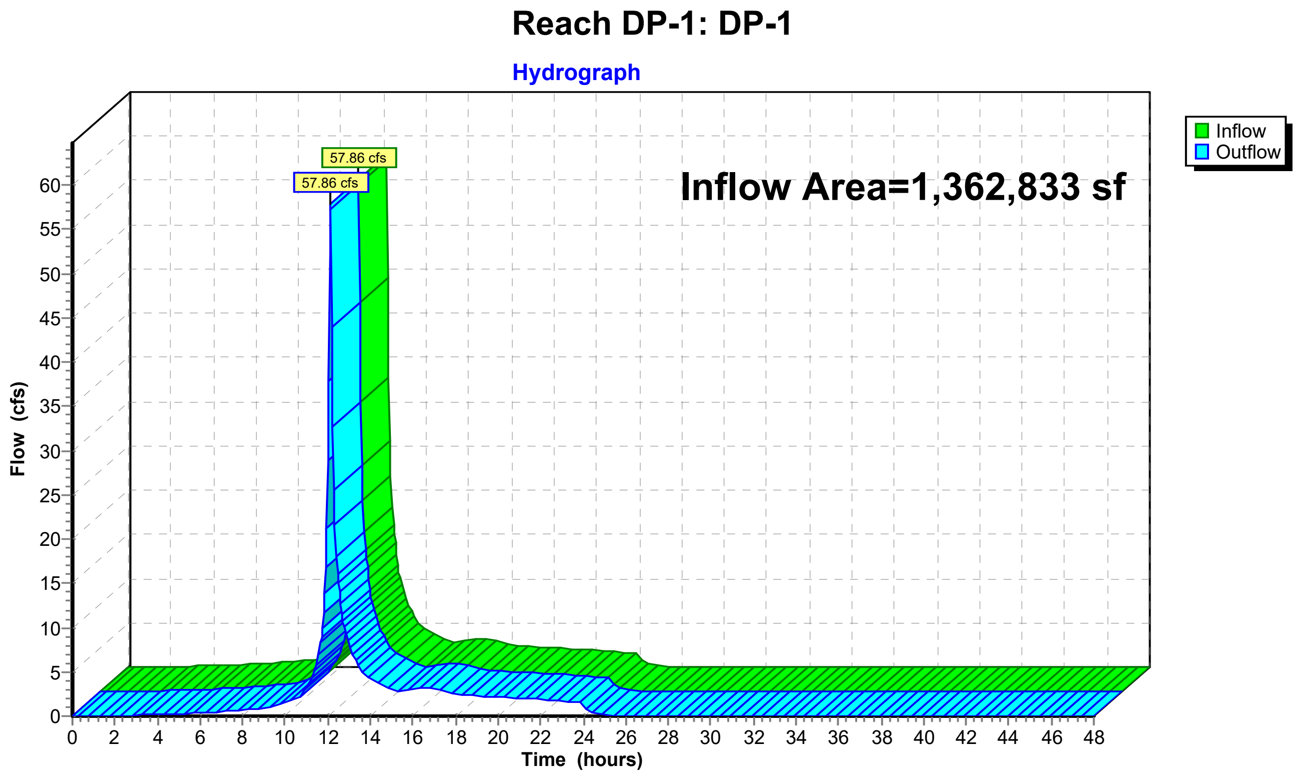


Summary for Reach DP-1: DP-1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,362,833 sf, 42.31% Impervious, Inflow Depth = 2.11" for 25-year event
Inflow = 57.86 cfs @ 12.14 hrs, Volume= 239,939 cf
Outflow = 57.86 cfs @ 12.14 hrs, Volume= 239,939 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



Summary for Reach DP-2: DP-2

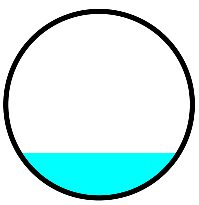
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 332,150 sf, 18.42% Impervious, Inflow Depth = 1.49" for 25-year event
Inflow = 9.54 cfs @ 12.14 hrs, Volume= 41,260 cf
Outflow = 9.49 cfs @ 12.14 hrs, Volume= 41,260 cf, Atten= 1%, Lag= 0.4 min

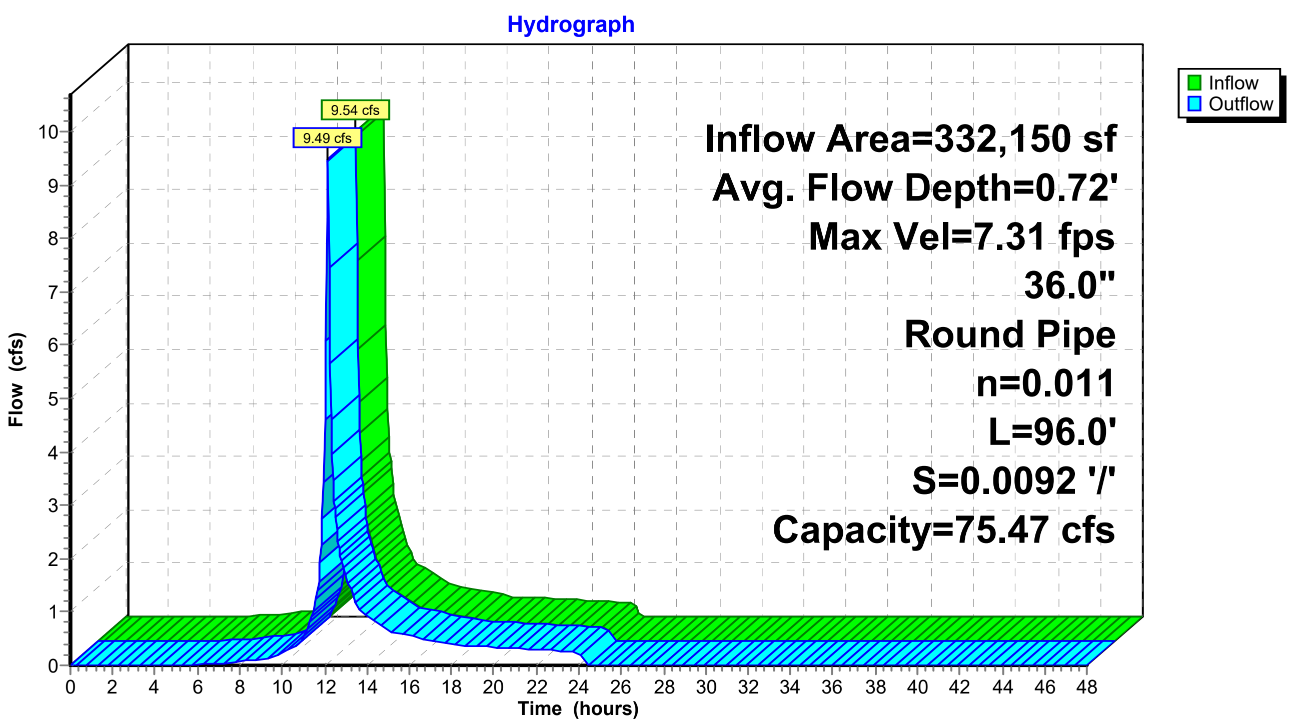
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.31 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.70 fps, Avg. Travel Time= 0.6 min

Peak Storage= 126 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.72'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 75.47 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 96.0' Slope= 0.0092 '/'
Inlet Invert= 16.00', Outlet Invert= 15.12'



Reach DP-2: DP-2



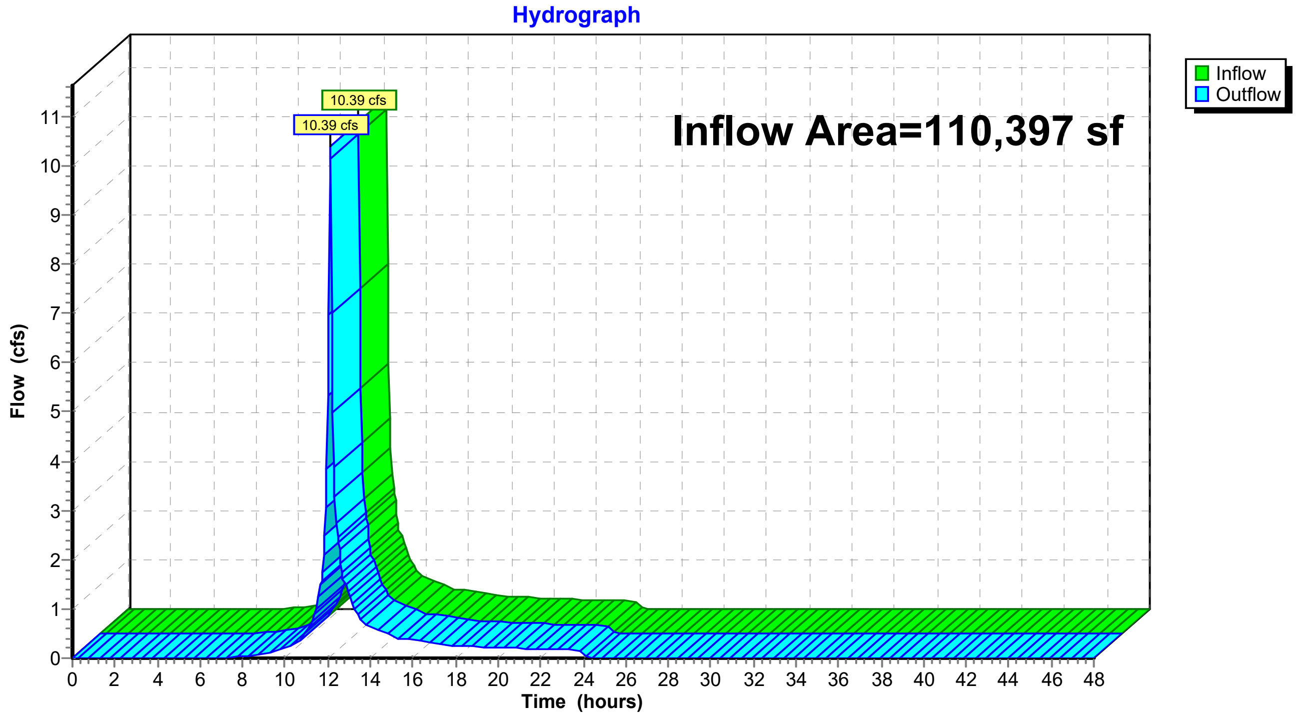
Summary for Reach DP-3: DP-3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	110,397 sf, 61.01% Impervious,	Inflow Depth = 3.62"	for 25-year event
Inflow =	10.39 cfs @ 12.13 hrs, Volume=	33,303 cf	
Outflow =	10.39 cfs @ 12.13 hrs, Volume=	33,303 cf, Atten= 0%, Lag= 0.0 min	

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-3: DP-3

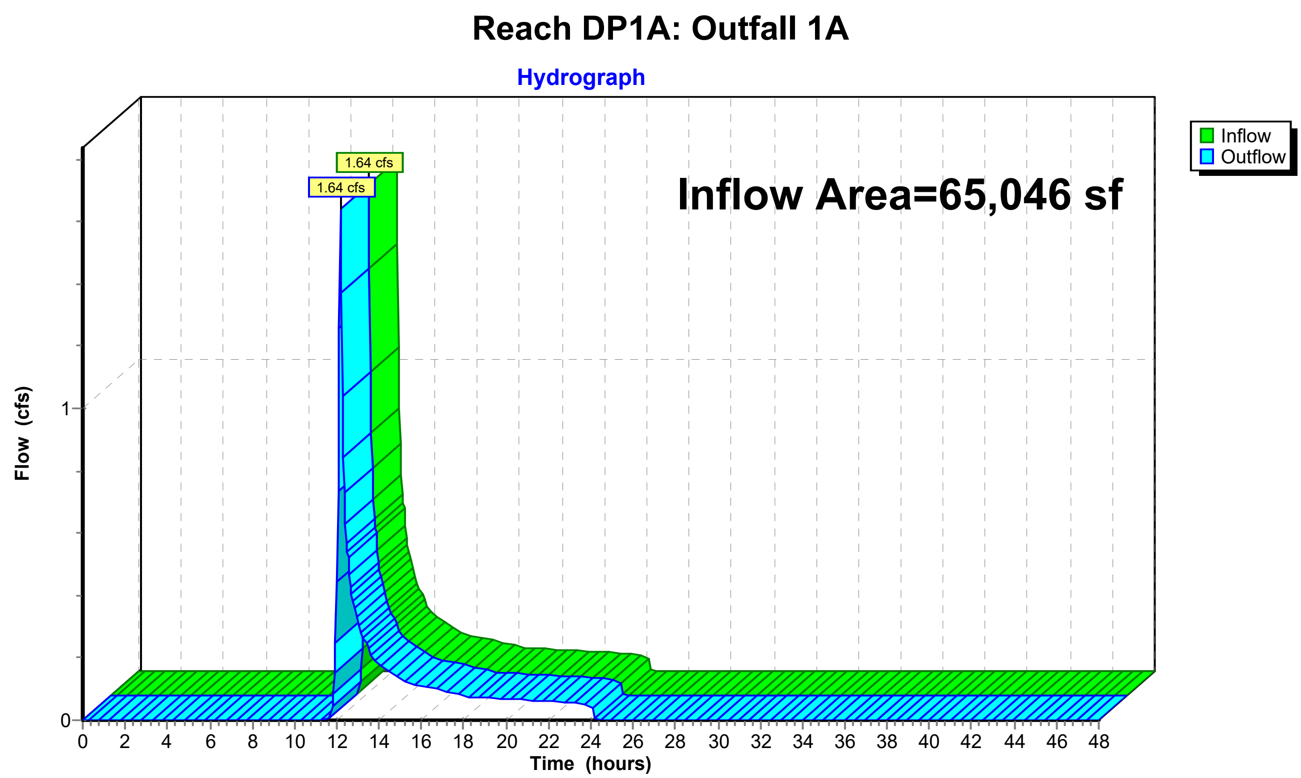


Summary for Reach DP1A: Outfall 1A

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	65,046 sf, 15.40% Impervious,	Inflow Depth = 1.19"	for 25-year event
Inflow =	1.64 cfs @ 12.15 hrs,	Volume=	6,447 cf
Outflow =	1.64 cfs @ 12.15 hrs,	Volume=	6,447 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



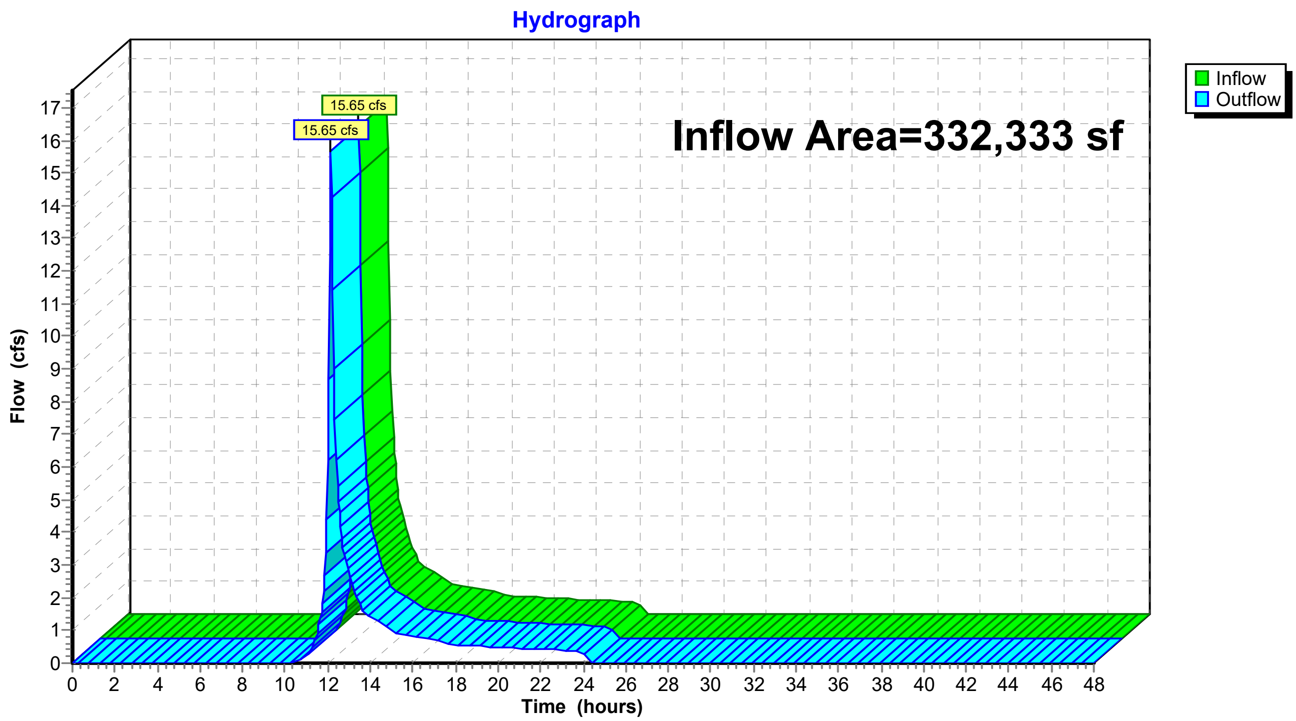
Summary for Reach DP1B: Outfall 1B

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	332,333 sf, 33.31% Impervious,	Inflow Depth = 2.10"	for 25-year event
Inflow =	15.65 cfs @ 12.16 hrs, Volume=	58,129 cf	
Outflow =	15.65 cfs @ 12.16 hrs, Volume=	58,129 cf, Atten= 0%, Lag= 0.0 min	

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP1B: Outfall 1B



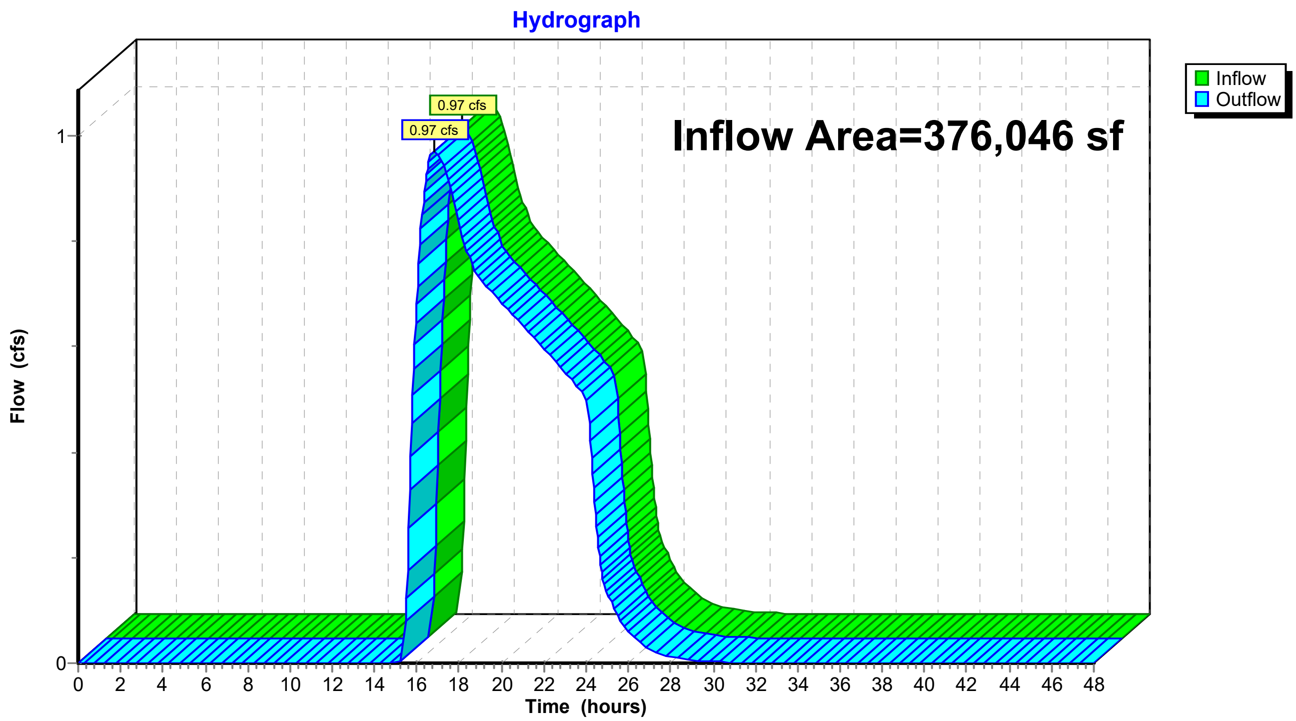
Summary for Reach DP1C: Outfall 1C

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 376,046 sf, 46.44% Impervious, Inflow Depth = 0.73" for 25-year event
Inflow = 0.97 cfs @ 16.85 hrs, Volume= 22,822 cf
Outflow = 0.97 cfs @ 16.85 hrs, Volume= 22,822 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP1C: Outfall 1C

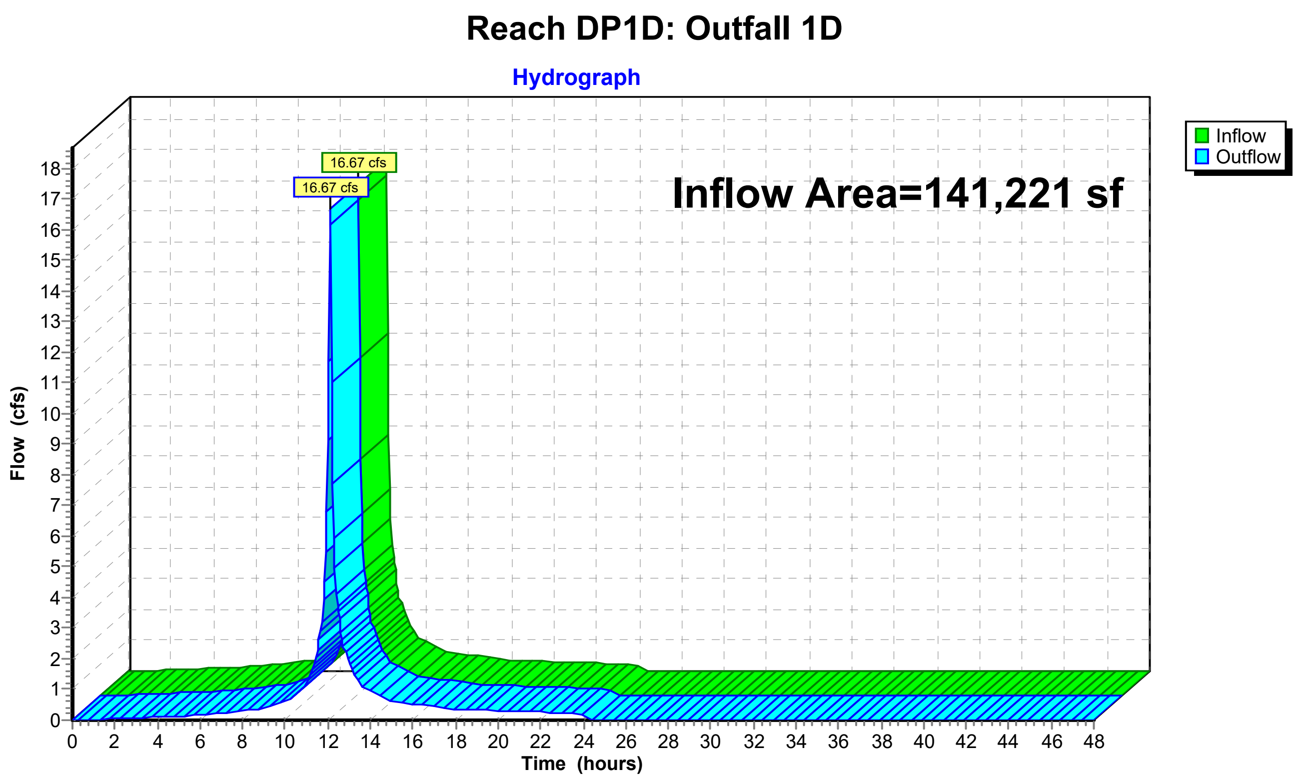


Summary for Reach DP1D: Outfall 1D

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	141,221 sf,	81.74% Impervious,	Inflow Depth = 4.97"	for 25-year event
Inflow =	16.67 cfs @	12.13 hrs, Volume=	58,454 cf	
Outflow =	16.67 cfs @	12.13 hrs, Volume=	58,454 cf,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

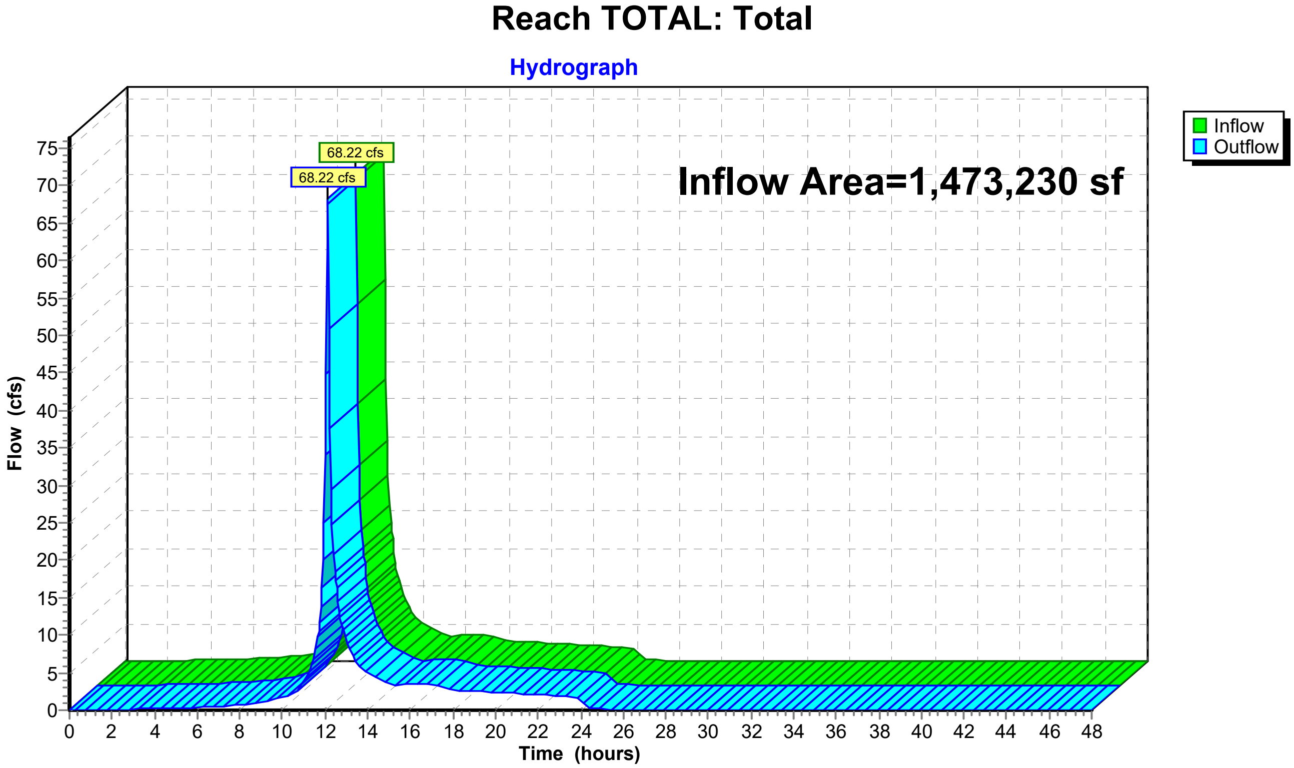


Summary for Reach TOTAL: Total

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,473,230 sf, 43.71% Impervious, Inflow Depth = 2.23" for 25-year event
Inflow = 68.22 cfs @ 12.14 hrs, Volume= 273,242 cf
Outflow = 68.22 cfs @ 12.14 hrs, Volume= 273,242 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



Summary for Pond 2P: EX-POND

Inflow Area = 376,046 sf, 46.44% Impervious, Inflow Depth = 3.02" for 25-year event
Inflow = 29.24 cfs @ 12.13 hrs, Volume= 94,716 cf
Outflow = 0.97 cfs @ 16.85 hrs, Volume= 22,822 cf, Atten= 97%, Lag= 283.1 min
Primary = 0.97 cfs @ 16.85 hrs, Volume= 22,822 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 23.83' @ 16.85 hrs Surf.Area= 17,780 sf Storage= 74,233 cf

Plug-Flow detention time= 506.3 min calculated for 22,822 cf (24% of inflow)
Center-of-Mass det. time= 348.0 min (1,190.0 - 842.0)

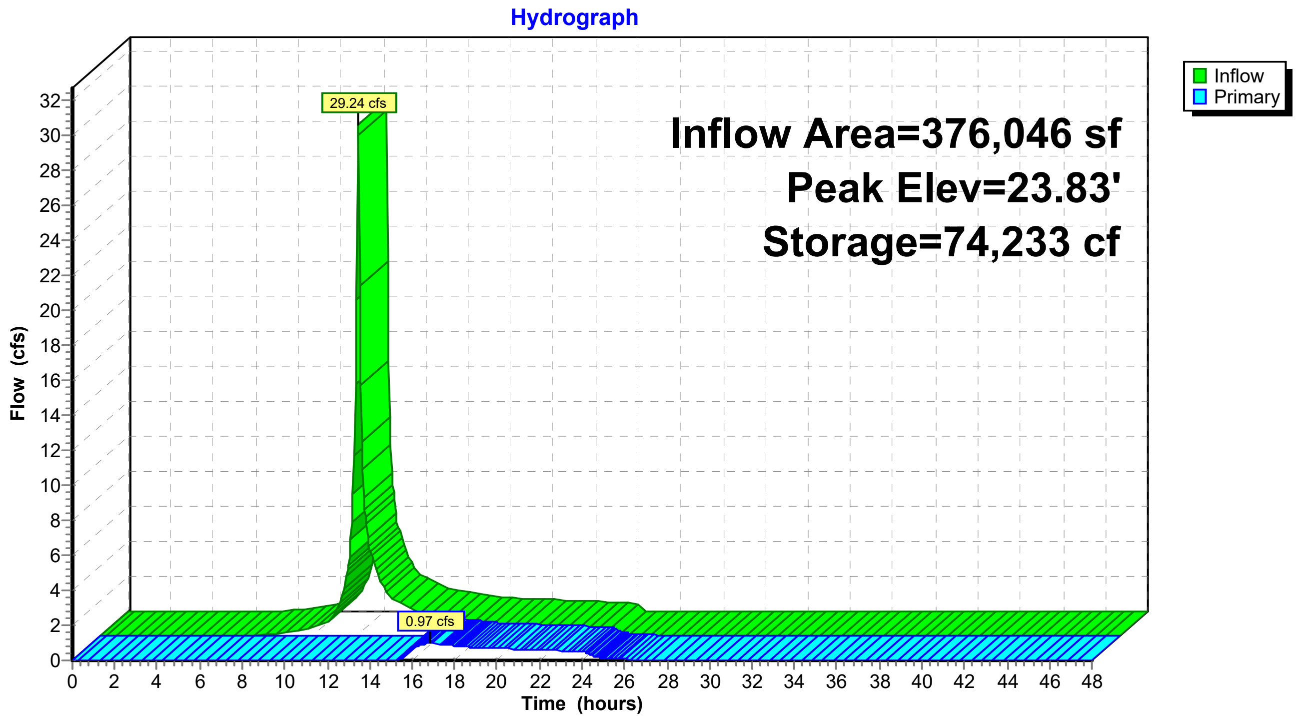
Volume	Invert	Avail.Storage	Storage Description
#1	18.00'	95,308 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.00	8,452	0	0
19.00	9,777	9,115	9,115
20.00	11,187	10,482	19,597
21.00	12,690	11,939	31,535
22.00	14,289	13,490	45,025
23.00	16,001	15,145	60,170
24.00	18,138	17,070	77,239
25.00	18,000	18,069	95,308

Device	Routing	Invert	Outlet Devices
#1	Primary	18.72'	**24.0" Round Culvert** L= 24.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 18.72' / 17.59' S= 0.0465 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	23.70'	**24.0" x 24.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#3	Primary	23.90'	**100.0' long x 30.0' breadth Broad-Crested Rectangular Weir** 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=0.95 cfs @ 16.85 hrs HW=23.83' (Free Discharge)
└─**1=Culvert** (Passes 0.95 cfs of 30.68 cfs potential flow)
  └─**2=Orifice/Grate** (Weir Controls 0.95 cfs @ 0.89 fps)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: EX-POND



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A: EX-1A Runoff Area=65,046 sf 15.40% Impervious Runoff Depth=2.18"
Flow Length=405' Tc=6.9 min CN=48 Runoff=3.40 cfs 11,826 cf

Subcatchment1B: EX-1B Runoff Area=220,211 sf 33.47% Impervious Runoff Depth=3.40"
Flow Length=521' Tc=10.0 min CN=59 Runoff=16.83 cfs 62,403 cf

Subcatchment1C: EX-1C Runoff Area=185,095 sf 57.34% Impervious Runoff Depth=5.49"
Tc=6.0 min CN=77 Runoff=26.01 cfs 84,757 cf

Subcatchment1D: EX-1D Runoff Area=48,816 sf 58.62% Impervious Runoff Depth=5.14"
Tc=6.0 min CN=74 Runoff=6.48 cfs 20,913 cf

Subcatchment1E: EX-1E Runoff Area=24,840 sf 82.66% Impervious Runoff Depth=6.80"
Tc=6.0 min CN=88 Runoff=4.08 cfs 14,082 cf

Subcatchment1F: EX-1F Runoff Area=48,259 sf 97.34% Impervious Runoff Depth=7.76"
Tc=6.0 min CN=96 Runoff=8.41 cfs 31,208 cf

Subcatchment1G: EX-1G Runoff Area=19,306 sf 100.00% Impervious Runoff Depth=8.00"
Tc=6.0 min CN=98 Runoff=3.38 cfs 12,871 cf

Subcatchment1H: EX-1H Runoff Area=116,037 sf 90.23% Impervious Runoff Depth=7.28"
Tc=6.0 min CN=92 Runoff=19.75 cfs 70,407 cf

Subcatchment2A: EX-2A Runoff Area=245,993 sf 0.60% Impervious Runoff Depth=1.26"
Flow Length=663' Tc=10.1 min CN=39 Runoff=5.06 cfs 25,811 cf

Subcatchment2B: EX-2B Runoff Area=47,149 sf 75.39% Impervious Runoff Depth=6.21"
Tc=6.0 min CN=83 Runoff=7.29 cfs 24,387 cf

Subcatchment2C: EX-2C Runoff Area=39,008 sf 61.89% Impervious Runoff Depth=5.38"
Tc=6.0 min CN=76 Runoff=5.38 cfs 17,478 cf

Subcatchment3A: EX-3A Runoff Area=97,064 sf 62.88% Impervious Runoff Depth=5.38"
Tc=6.0 min CN=76 Runoff=13.39 cfs 43,491 cf

Subcatchment3B: EX-3B Runoff Area=13,333 sf 47.42% Impervious Runoff Depth=4.32"
Tc=6.0 min CN=67 Runoff=1.51 cfs 4,801 cf

SubcatchmentO-01: OFF-01 Runoff Area=112,122 sf 33.01% Impervious Runoff Depth=3.40"
Tc=6.0 min CN=59 Runoff=9.94 cfs 31,773 cf

SubcatchmentO-02: OFF-02 Runoff Area=109,762 sf 30.00% Impervious Runoff Depth=3.17"
Tc=6.0 min CN=57 Runoff=9.04 cfs 29,032 cf

SubcatchmentO-03: OFF-03 Runoff Area=45,823 sf 30.00% Impervious Runoff Depth=3.17"
Tc=6.0 min CN=57 Runoff=3.77 cfs 12,120 cf

Subcatchment O-04: OFF-04 Runoff Area=35,366 sf 61.66% Impervious Runoff Depth=5.26"
Tc=6.0 min CN=75 Runoff=4.79 cfs 15,498 cf

Reach DP-1: DP-1 Inflow=87.12 cfs 392,674 cf
Outflow=87.12 cfs 392,674 cf

Reach DP-2: DP-2 Avg. Flow Depth=0.96' Max Vel=8.57 fps Inflow=16.60 cfs 67,677 cf
36.0" Round Pipe n=0.011 L=96.0' S=0.0092 '/' Capacity=75.47 cfs Outflow=16.51 cfs 67,677 cf

Reach DP-3: DP-3 Inflow=14.90 cfs 48,292 cf
Outflow=14.90 cfs 48,292 cf

Reach DP1A: Outfall 1A Inflow=3.40 cfs 11,826 cf
Outflow=3.40 cfs 11,826 cf

Reach DP1B: Outfall 1B Inflow=26.07 cfs 94,175 cf
Outflow=26.07 cfs 94,175 cf

Reach DP1C: Outfall 1C Inflow=6.97 cfs 69,515 cf
Outflow=6.97 cfs 69,515 cf

Reach DP1D: Outfall 1D Inflow=22.34 cfs 79,074 cf
Outflow=22.34 cfs 79,074 cf

Reach TOTAL: Total Inflow=101.92 cfs 440,966 cf
Outflow=101.92 cfs 440,966 cf

Pond 2P: EX-POND Peak Elev=23.96' Storage=76,533 cf Inflow=43.59 cfs 141,408 cf
Outflow=6.97 cfs 69,515 cf

Total Runoff Area = 1,473,230 sf Runoff Volume = 512,860 cf Average Runoff Depth = 4.18"
56.29% Pervious = 829,222 sf 43.71% Impervious = 644,008 sf

Summary for Subcatchment 1A: EX-1A

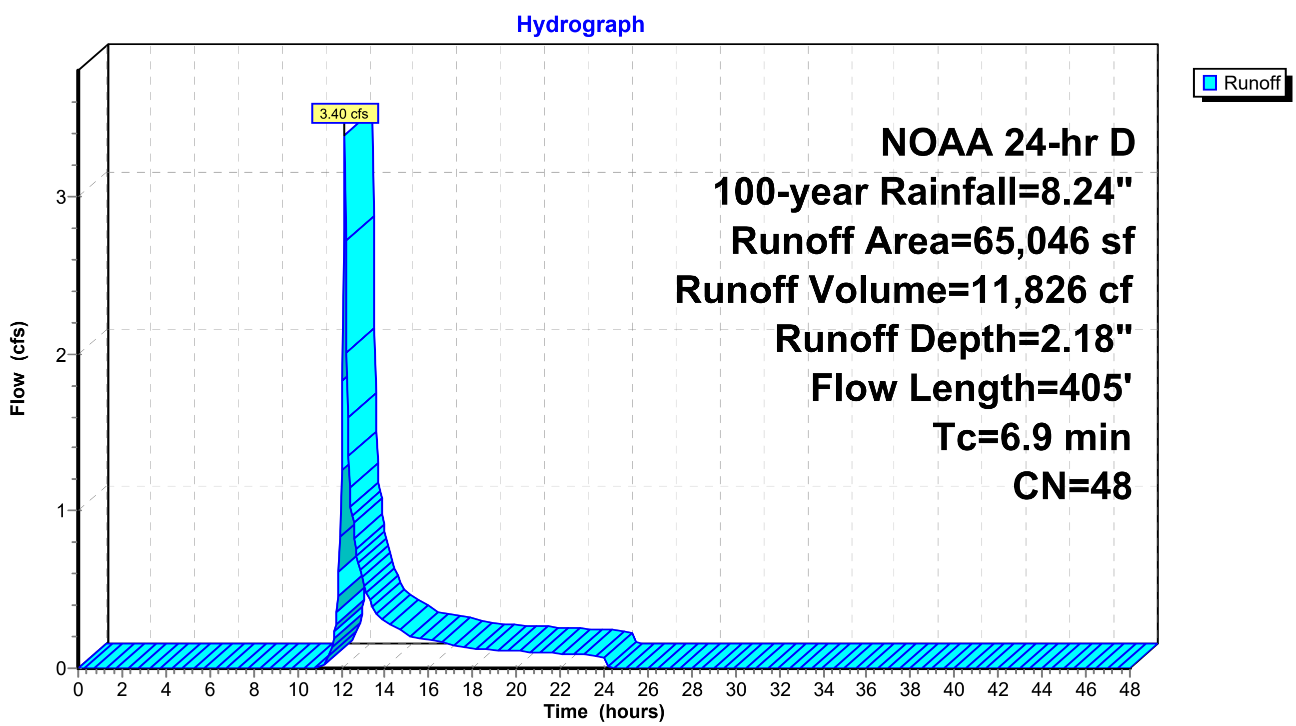
Runoff = 3.40 cfs @ 12.15 hrs, Volume= 11,826 cf, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
5,063	98	Roofs, HSG A
4,956	98	Paved parking, HSG A
55,027	39	>75% Grass cover, Good, HSG A
65,046	48	Weighted Average
55,027		84.60% Pervious Area
10,019		15.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0700	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.29"
3.5	355	0.0127	1.69		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.9	405	Total			

Subcatchment 1A: EX-1A



Summary for Subcatchment 1B: EX-1B

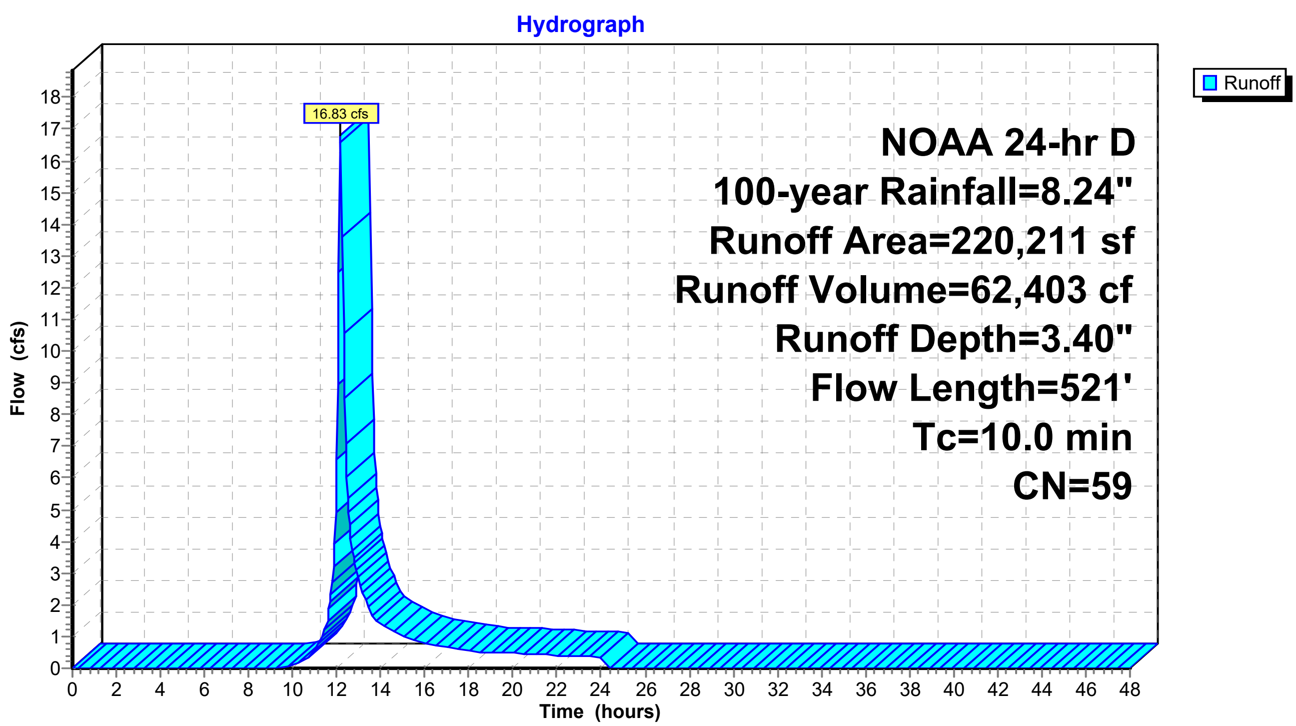
Runoff = 16.83 cfs @ 12.18 hrs, Volume= 62,403 cf, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
3,434	98	Roofs, HSG A
70,263	98	Paved parking, HSG A
146,514	39	>75% Grass cover, Good, HSG A
220,211	59	Weighted Average
146,514		66.53% Pervious Area
73,697		33.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0300	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.29"
5.3	471	0.0096	1.47		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.0	521	Total			

Subcatchment 1B: EX-1B



Summary for Subcatchment 1C: EX-1C

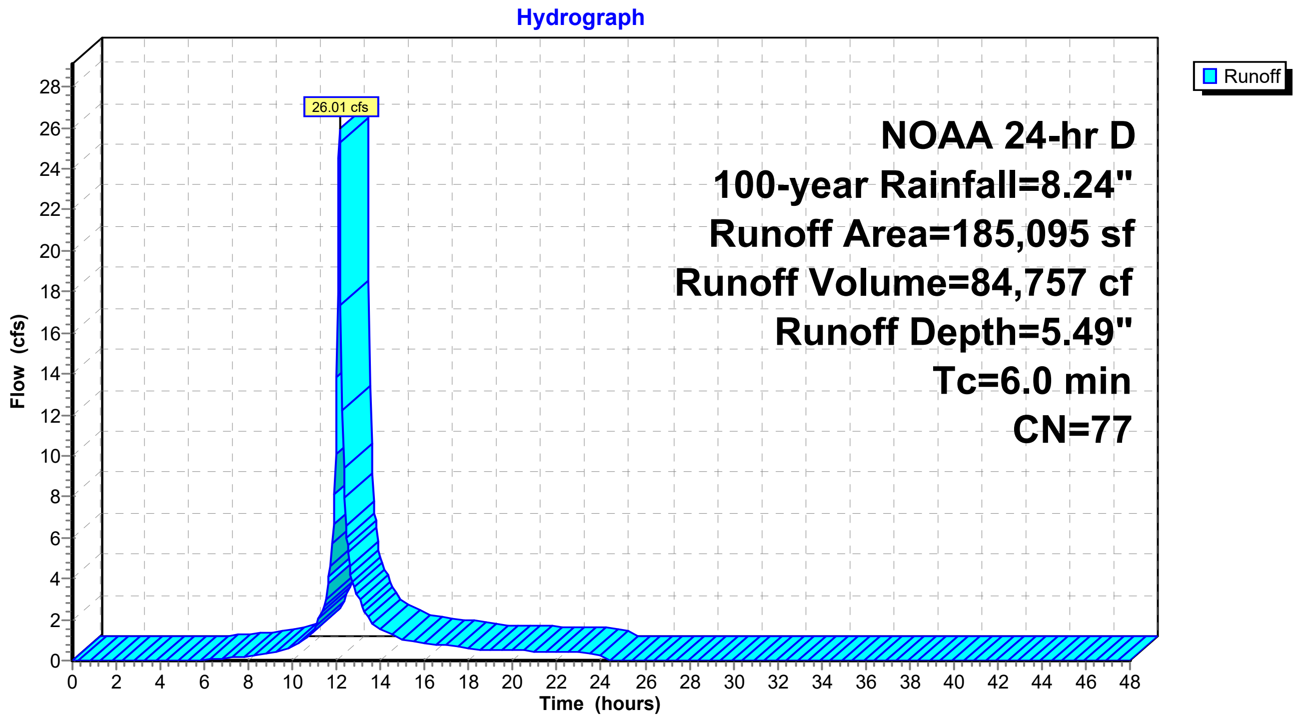
Runoff = 26.01 cfs @ 12.13 hrs, Volume= 84,757 cf, Depth= 5.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
106,141	98	Paved parking, HSG A
78,954	49	50-75% Grass cover, Fair, HSG A
185,095	77	Weighted Average
78,954		42.66% Pervious Area
106,141		57.34% Impervious Area

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

Subcatchment 1C: EX-1C



Summary for Subcatchment 1D: EX-1D

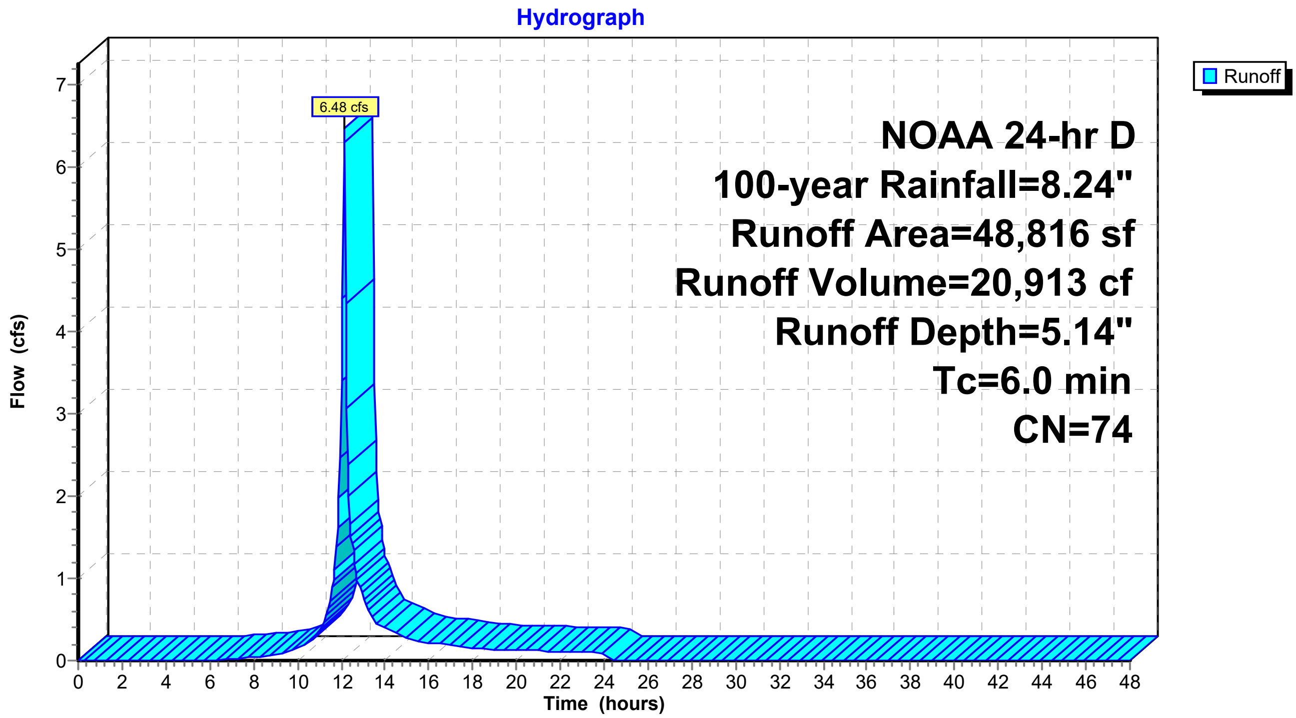
Runoff = 6.48 cfs @ 12.13 hrs, Volume= 20,913 cf, Depth= 5.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
28,618	98	Paved parking, HSG A
20,198	39	>75% Grass cover, Good, HSG A
48,816	74	Weighted Average
20,198		41.38% Pervious Area
28,618		58.62% Impervious Area

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

Subcatchment 1D: EX-1D



Summary for Subcatchment 1E: EX-1E

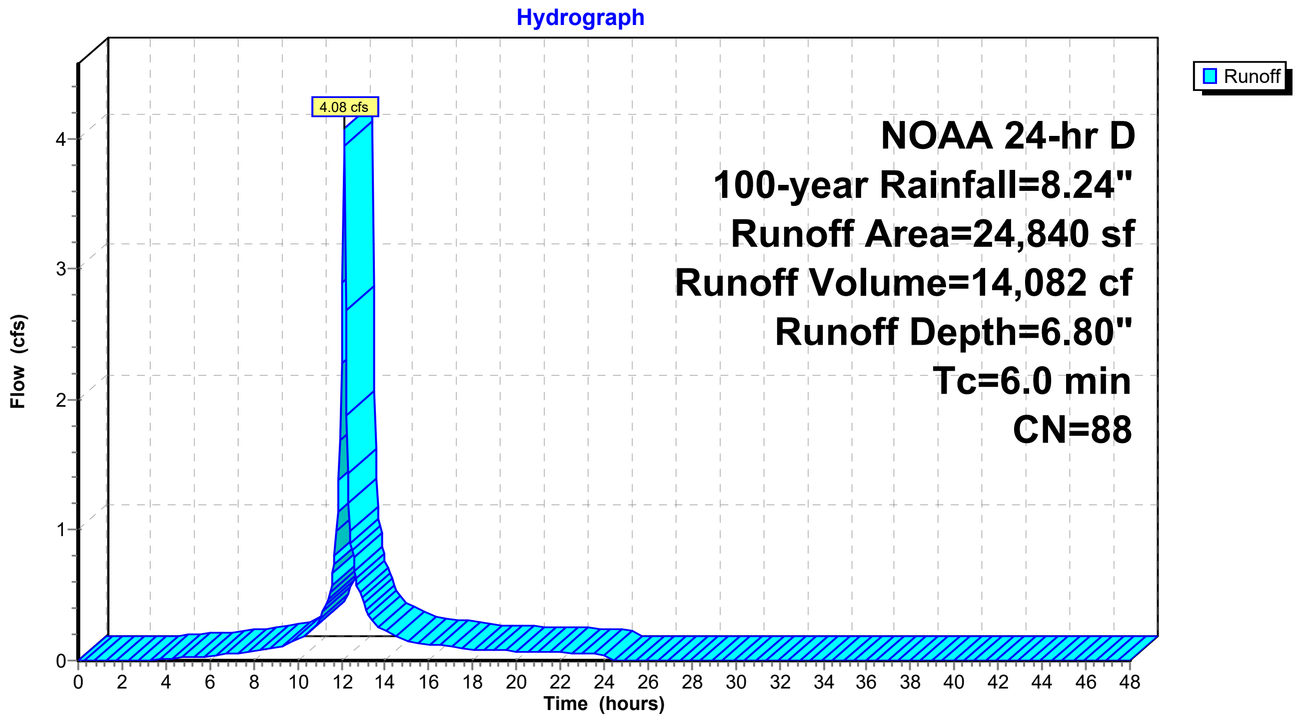
Runoff = 4.08 cfs @ 12.13 hrs, Volume= 14,082 cf, Depth= 6.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
20,533	98	Paved parking, HSG A
4,307	39	>75% Grass cover, Good, HSG A
24,840	88	Weighted Average
4,307		17.34% Pervious Area
20,533		82.66% Impervious Area

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

Subcatchment 1E: EX-1E



Summary for Subcatchment 1F: EX-1F

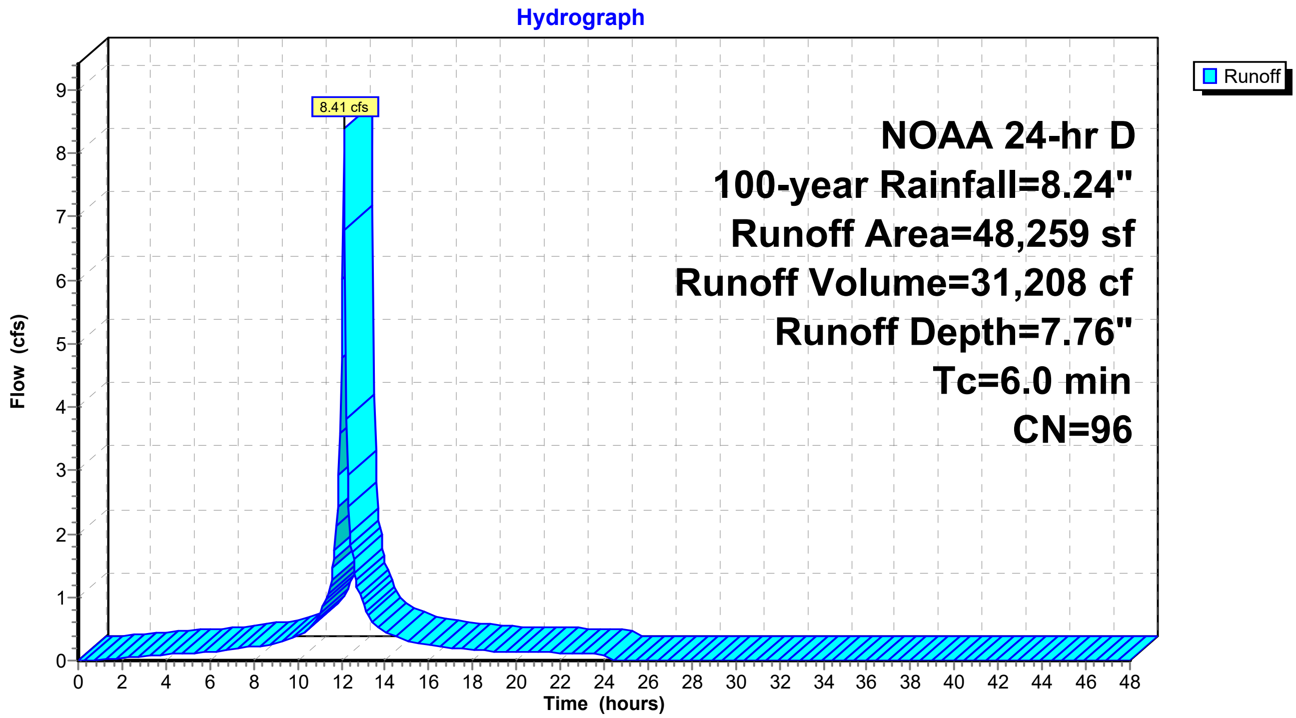
Runoff = 8.41 cfs @ 12.13 hrs, Volume= 31,208 cf, Depth= 7.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
46,973	98	Roofs, HSG A
1,286	39	>75% Grass cover, Good, HSG A
48,259	96	Weighted Average
1,286		2.66% Pervious Area
46,973		97.34% Impervious Area

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

Subcatchment 1F: EX-1F



Summary for Subcatchment 1G: EX-1G

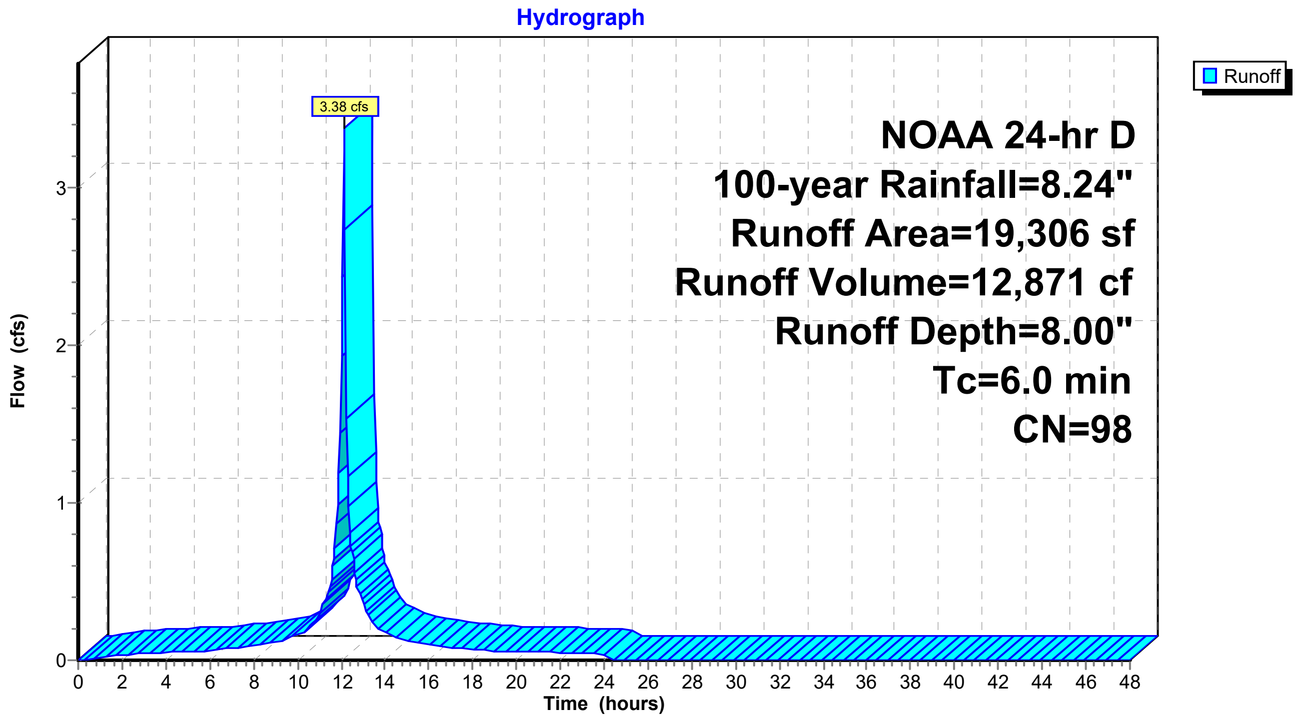
Runoff = 3.38 cfs @ 12.13 hrs, Volume= 12,871 cf, Depth= 8.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
19,306	98	Paved parking, HSG A
19,306		100.00% Impervious Area

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

Subcatchment 1G: EX-1G



Summary for Subcatchment 1H: EX-1H

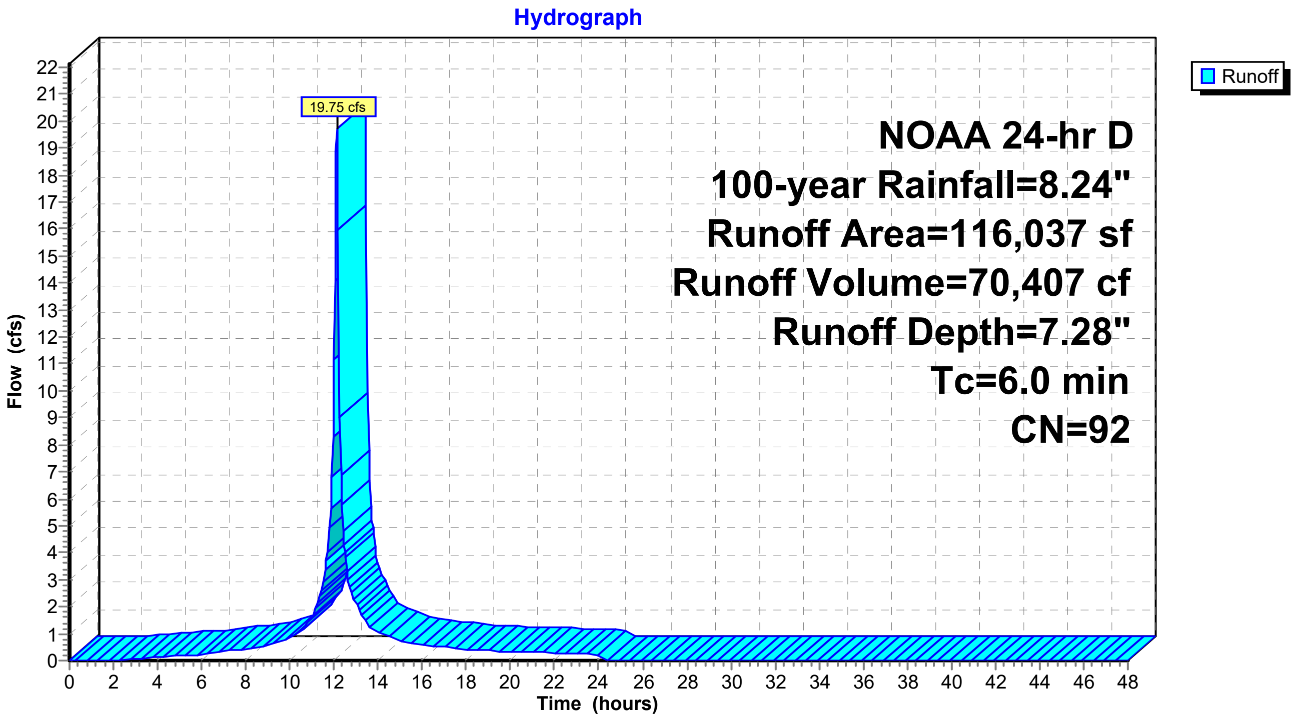
Runoff = 19.75 cfs @ 12.13 hrs, Volume= 70,407 cf, Depth= 7.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
104,697	98	Roofs, HSG A
11,340	39	>75% Grass cover, Good, HSG A
116,037	92	Weighted Average
11,340		9.77% Pervious Area
104,697		90.23% Impervious Area

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

Subcatchment 1H: EX-1H



Summary for Subcatchment 2A: EX-2A

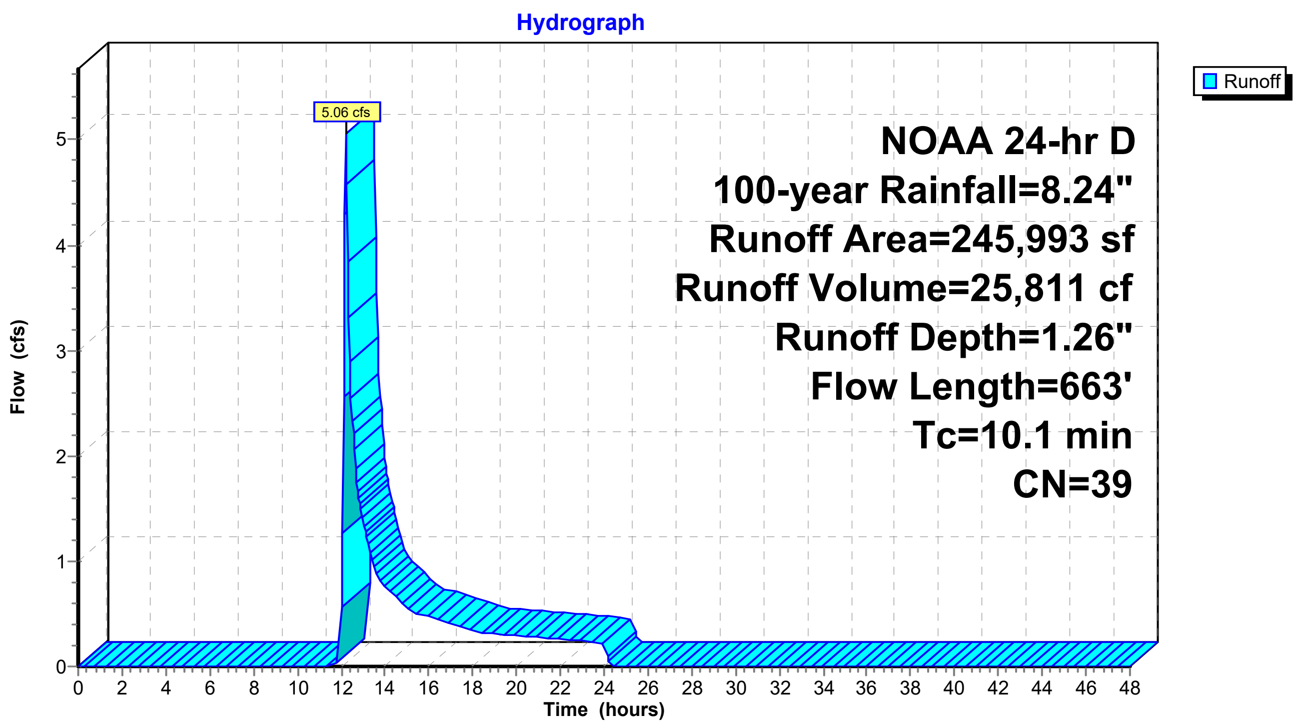
Runoff = 5.06 cfs @ 12.21 hrs, Volume= 25,811 cf, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
763	98	Roofs, HSG A
720	98	Paved parking, HSG A
244,510	39	>75% Grass cover, Good, HSG A
245,993	39	Weighted Average
244,510		99.40% Pervious Area
1,483		0.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0356	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.29"
2.5	247	0.0121	1.65		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.6	145	0.0623	3.74		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.6	221	0.0091	1.43		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.1	663	Total			

Subcatchment 2A: EX-2A



Summary for Subcatchment 2B: EX-2B

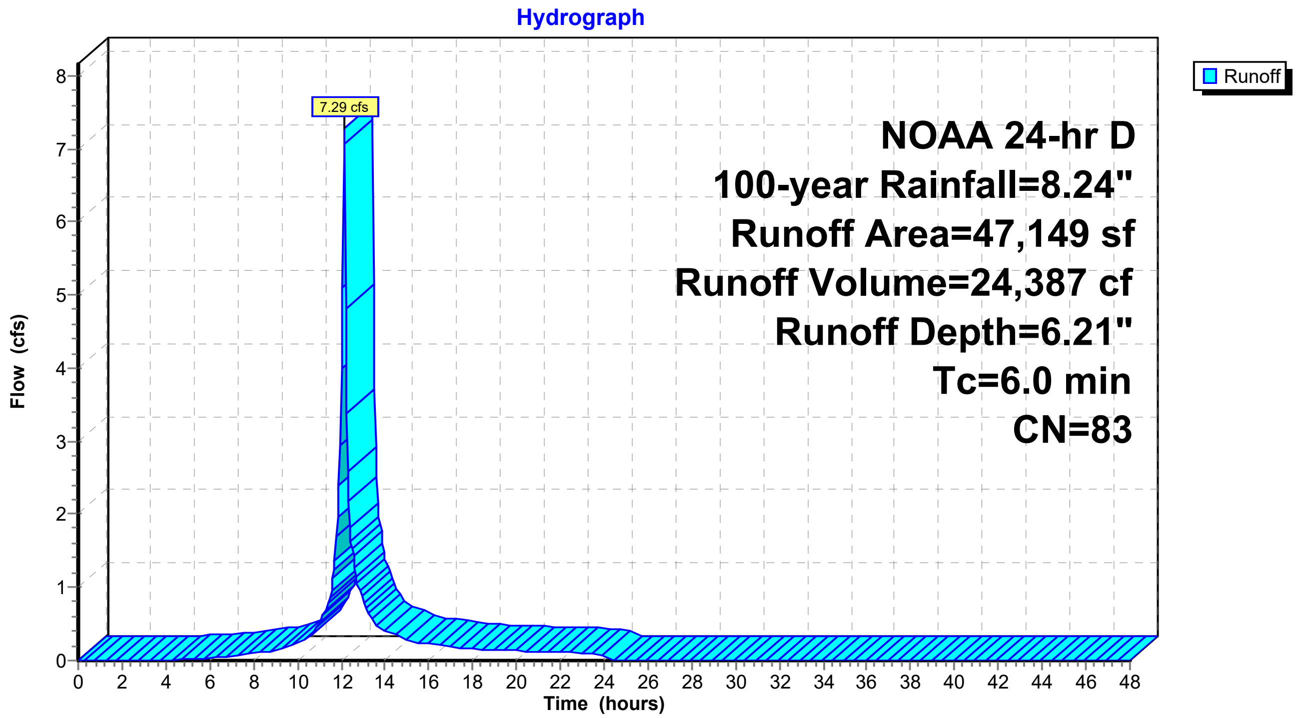
Runoff = 7.29 cfs @ 12.13 hrs, Volume= 24,387 cf, Depth= 6.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
35,544	98	Roofs, HSG A
11,605	39	>75% Grass cover, Good, HSG A
47,149	83	Weighted Average
11,605		24.61% Pervious Area
35,544		75.39% Impervious Area

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

Subcatchment 2B: EX-2B



Summary for Subcatchment 2C: EX-2C

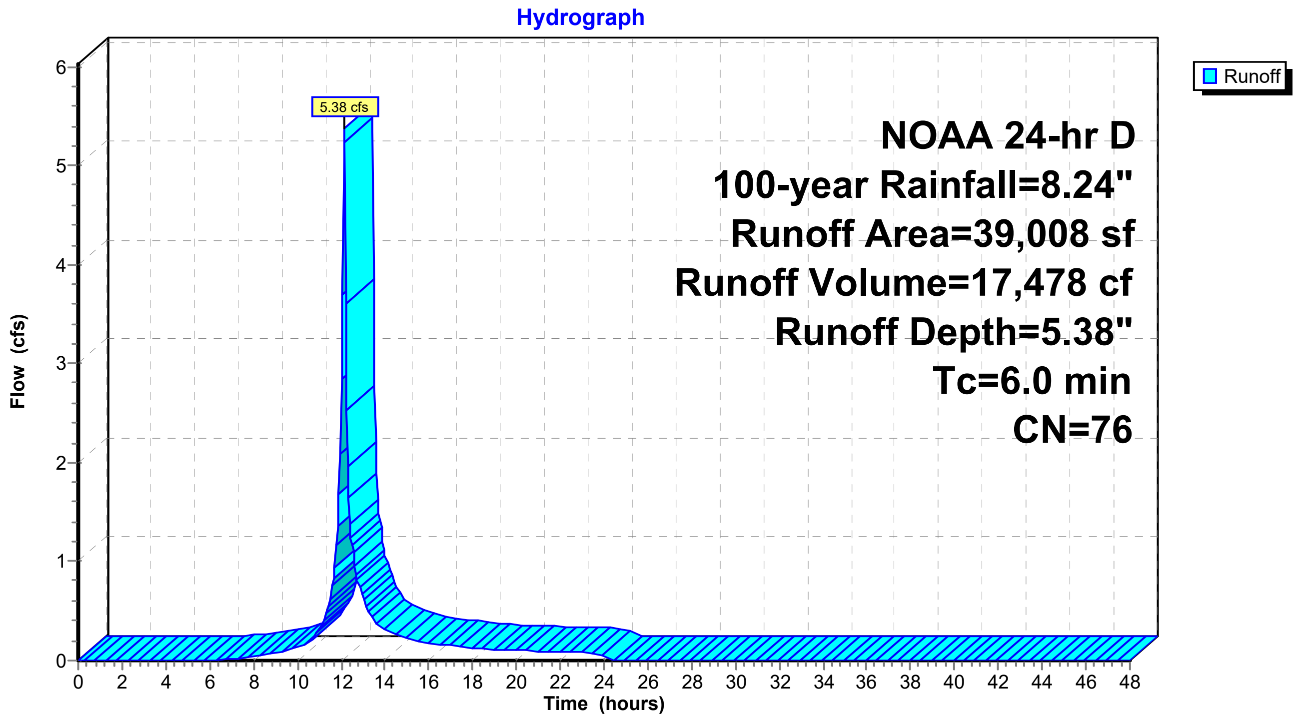
Runoff = 5.38 cfs @ 12.13 hrs, Volume= 17,478 cf, Depth= 5.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
24,142	98	Paved parking, HSG A
14,866	39	>75% Grass cover, Good, HSG A
39,008	76	Weighted Average
14,866		38.11% Pervious Area
24,142		61.89% Impervious Area

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

Subcatchment 2C: EX-2C



Summary for Subcatchment 3A: EX-3A

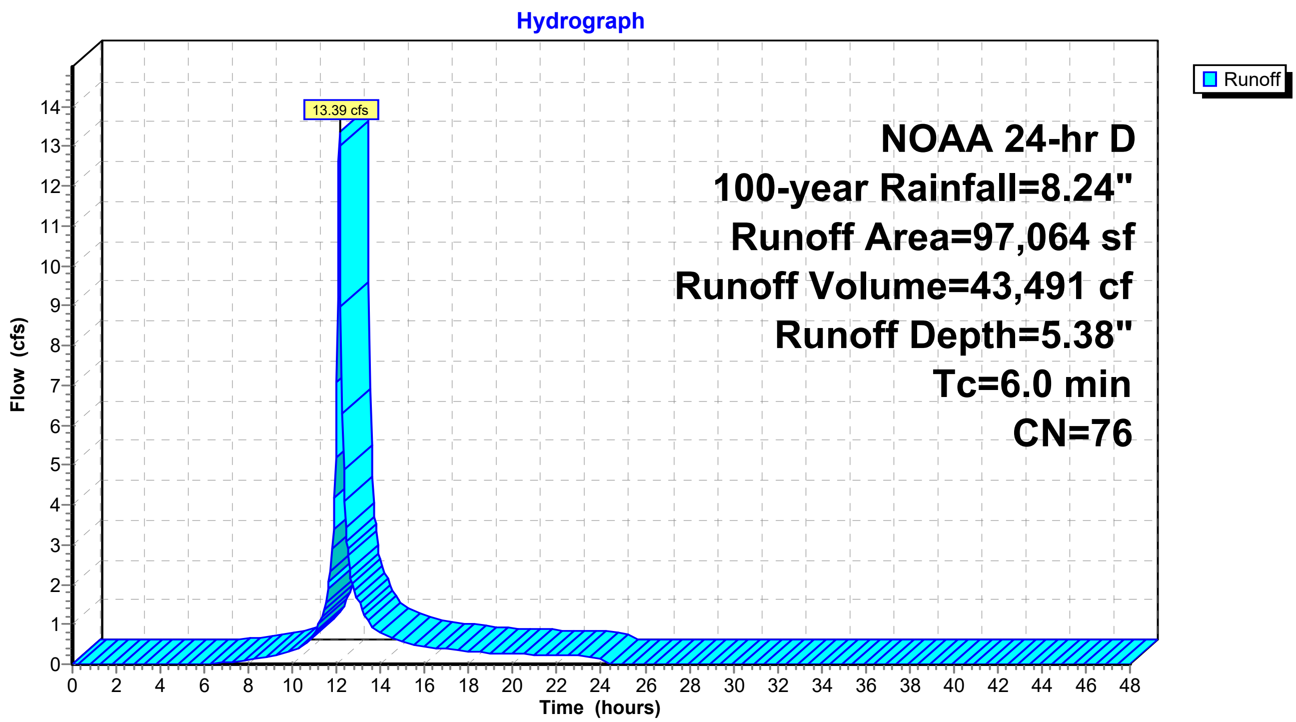
Runoff = 13.39 cfs @ 12.13 hrs, Volume= 43,491 cf, Depth= 5.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
37,664	98	Roofs, HSG A
23,371	98	Paved parking, HSG A
36,029	39	>75% Grass cover, Good, HSG A
97,064	76	Weighted Average
36,029		37.12% Pervious Area
61,035		62.88% Impervious Area

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

Subcatchment 3A: EX-3A



Summary for Subcatchment 3B: EX-3B

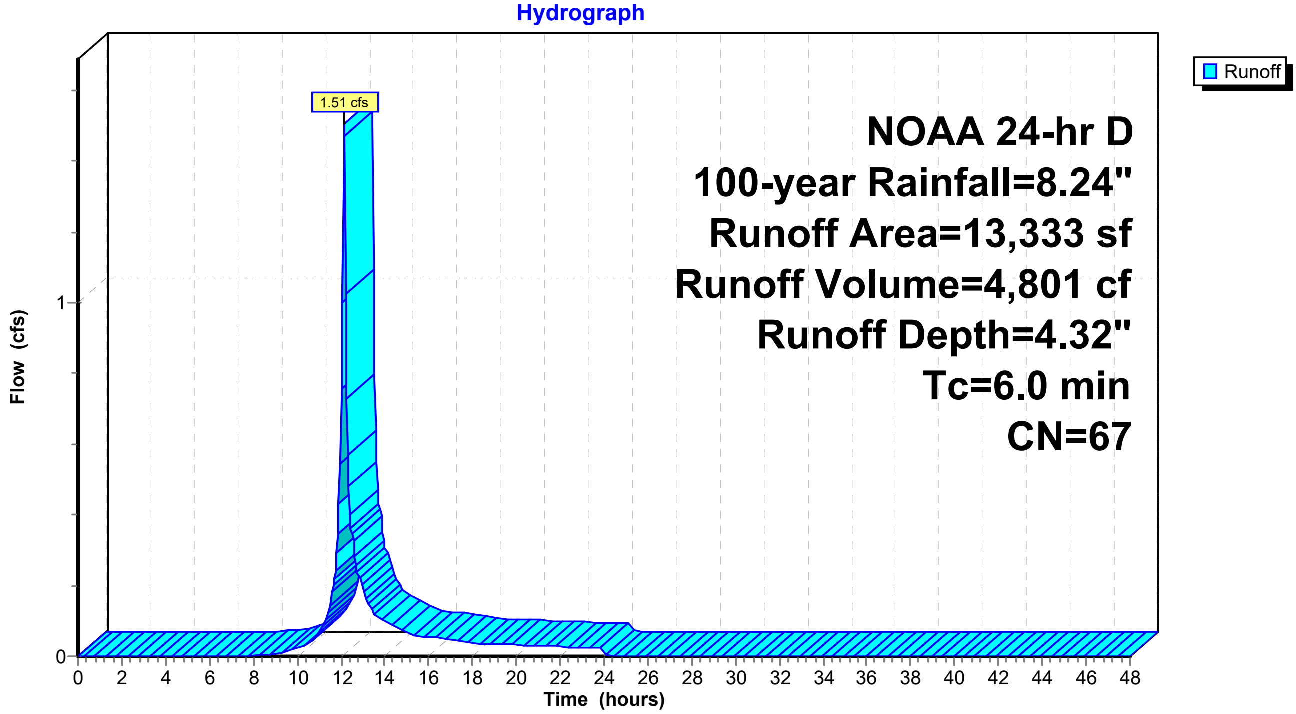
Runoff = 1.51 cfs @ 12.13 hrs, Volume= 4,801 cf, Depth= 4.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
6,323	98	Paved parking, HSG A
7,010	39	>75% Grass cover, Good, HSG A
13,333	67	Weighted Average
7,010		52.58% Pervious Area
6,323		47.42% Impervious Area

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

Subcatchment 3B: EX-3B



Summary for Subcatchment O-01: OFF-01

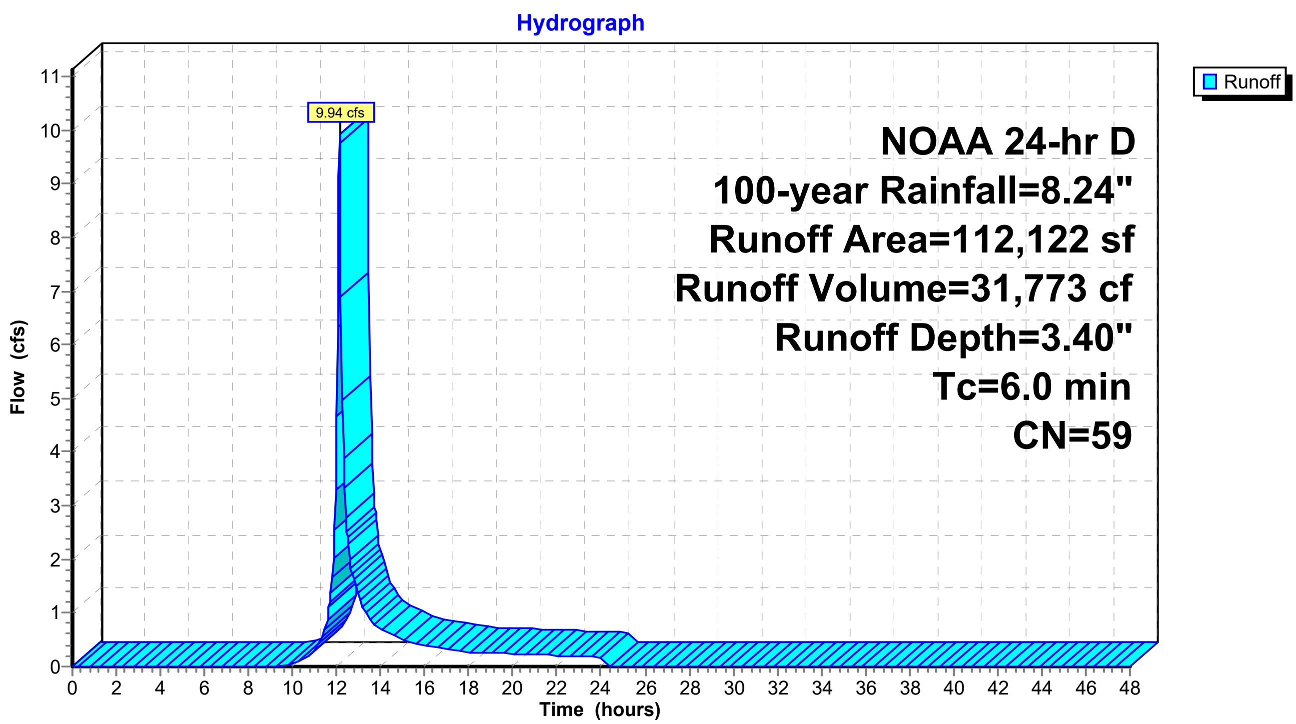
Runoff = 9.94 cfs @ 12.13 hrs, Volume= 31,773 cf, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
16,305	39	>75% Grass cover, Good, HSG A
11,813	98	Unconnected pavement, HSG A
84,004	57	1/3 acre lots, 30% imp, HSG A
112,122	59	Weighted Average
75,108		66.99% Pervious Area
37,014		33.01% Impervious Area
11,813		31.91% Unconnected

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

Subcatchment O-01: OFF-01



Summary for Subcatchment O-02: OFF-02

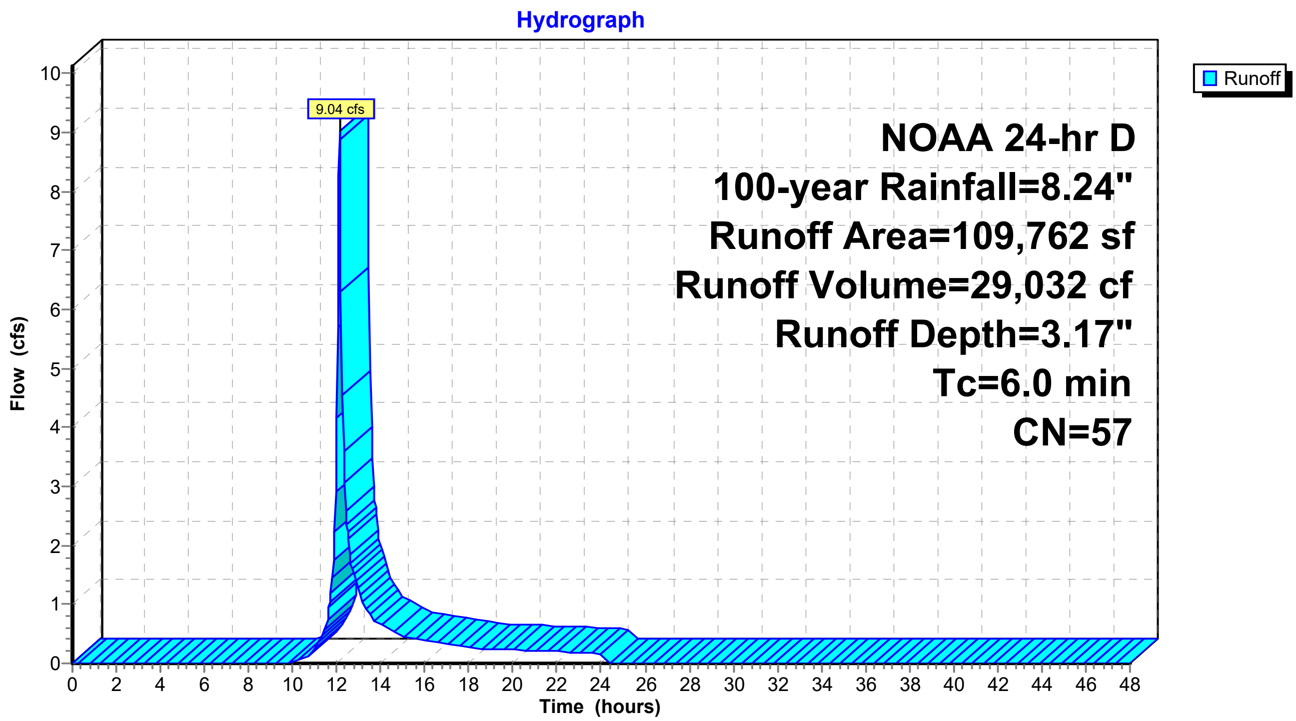
Runoff = 9.04 cfs @ 12.13 hrs, Volume= 29,032 cf, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
109,762	57	1/3 acre lots, 30% imp, HSG A
76,833		70.00% Pervious Area
32,929		30.00% Impervious Area

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

Subcatchment O-02: OFF-02



Summary for Subcatchment O-03: OFF-03

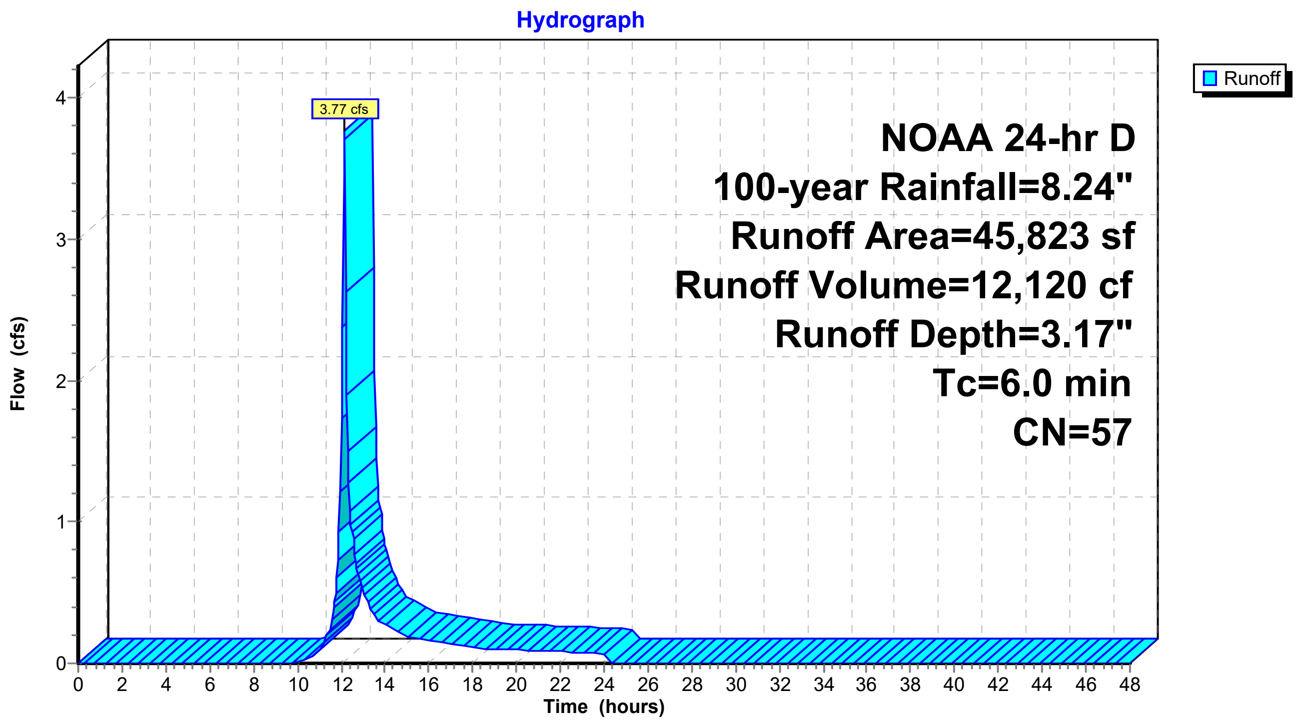
Runoff = 3.77 cfs @ 12.13 hrs, Volume= 12,120 cf, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
45,823	57	1/3 acre lots, 30% imp, HSG A
32,076		70.00% Pervious Area
13,747		30.00% Impervious Area

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

Subcatchment O-03: OFF-03



Summary for Subcatchment O-04: OFF-04

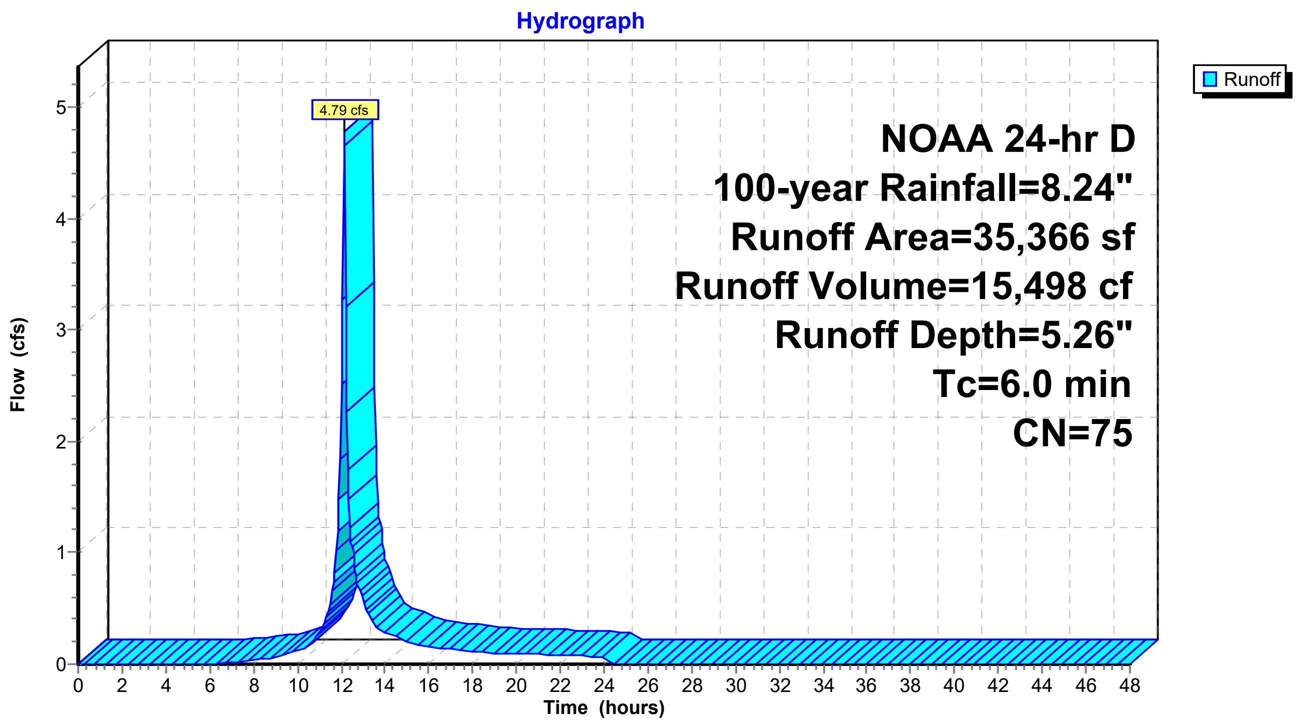
Runoff = 4.79 cfs @ 12.13 hrs, Volume= 15,498 cf, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
21,807	98	Unconnected pavement, HSG A
13,559	39	>75% Grass cover, Good, HSG A
35,366	75	Weighted Average
13,559		38.34% Pervious Area
21,807		61.66% Impervious Area
21,807		100.00% Unconnected

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

Subcatchment O-04: OFF-04

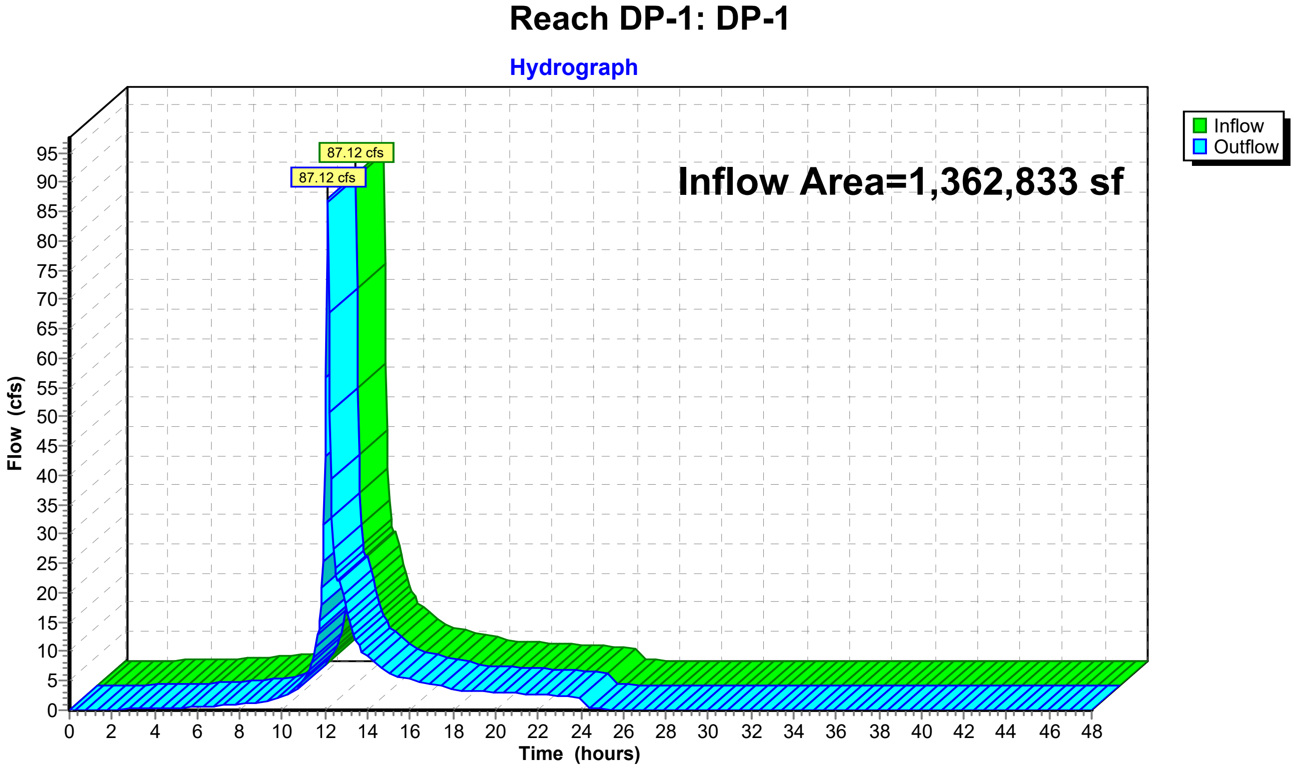


Summary for Reach DP-1: DP-1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,362,833 sf, 42.31% Impervious, Inflow Depth = 3.46" for 100-year event
Inflow = 87.12 cfs @ 12.14 hrs, Volume= 392,674 cf
Outflow = 87.12 cfs @ 12.14 hrs, Volume= 392,674 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



Summary for Reach DP-2: DP-2

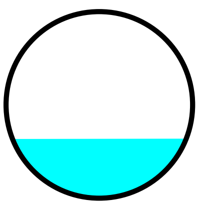
[52] Hint: Inlet/Outlet conditions not evaluated

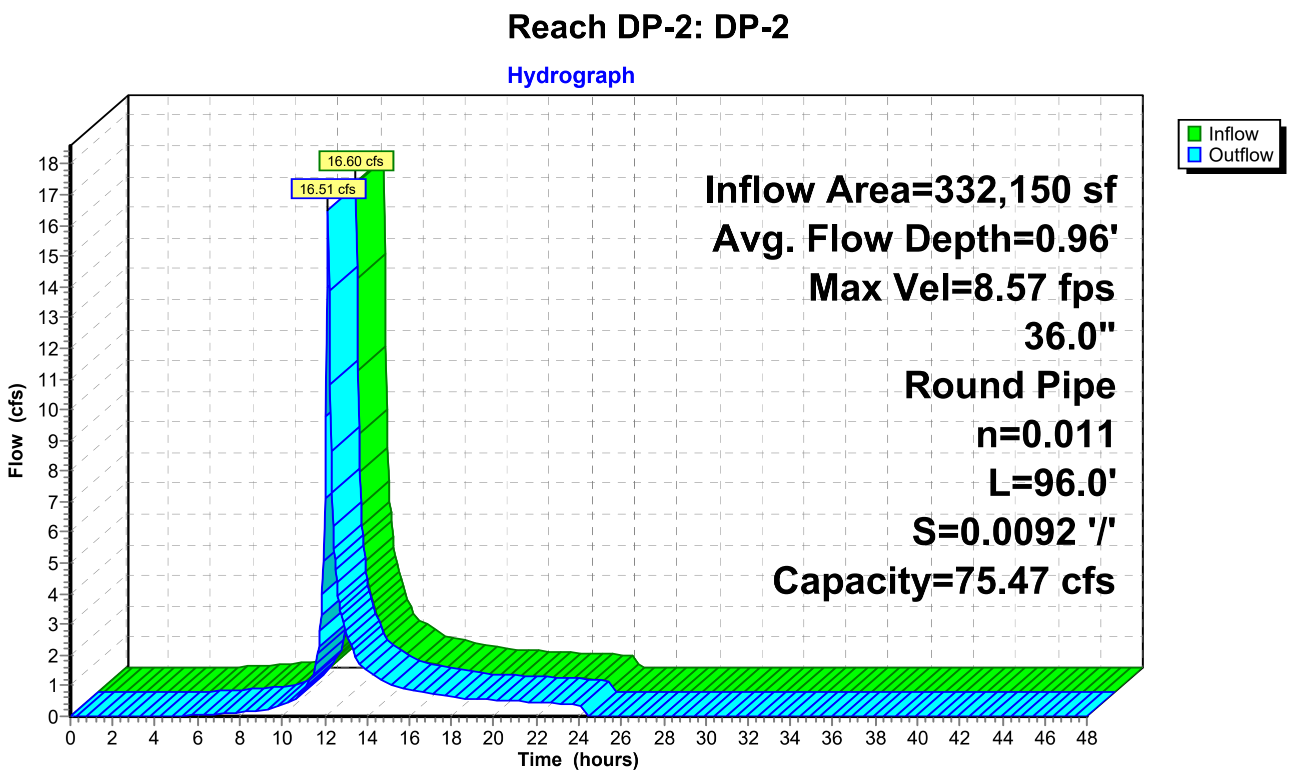
Inflow Area = 332,150 sf, 18.42% Impervious, Inflow Depth = 2.45" for 100-year event
Inflow = 16.60 cfs @ 12.14 hrs, Volume= 67,677 cf
Outflow = 16.51 cfs @ 12.15 hrs, Volume= 67,677 cf, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.57 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.04 fps, Avg. Travel Time= 0.5 min

Peak Storage= 187 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.96'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 75.47 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 96.0' Slope= 0.0092 '/'
Inlet Invert= 16.00', Outlet Invert= 15.12'





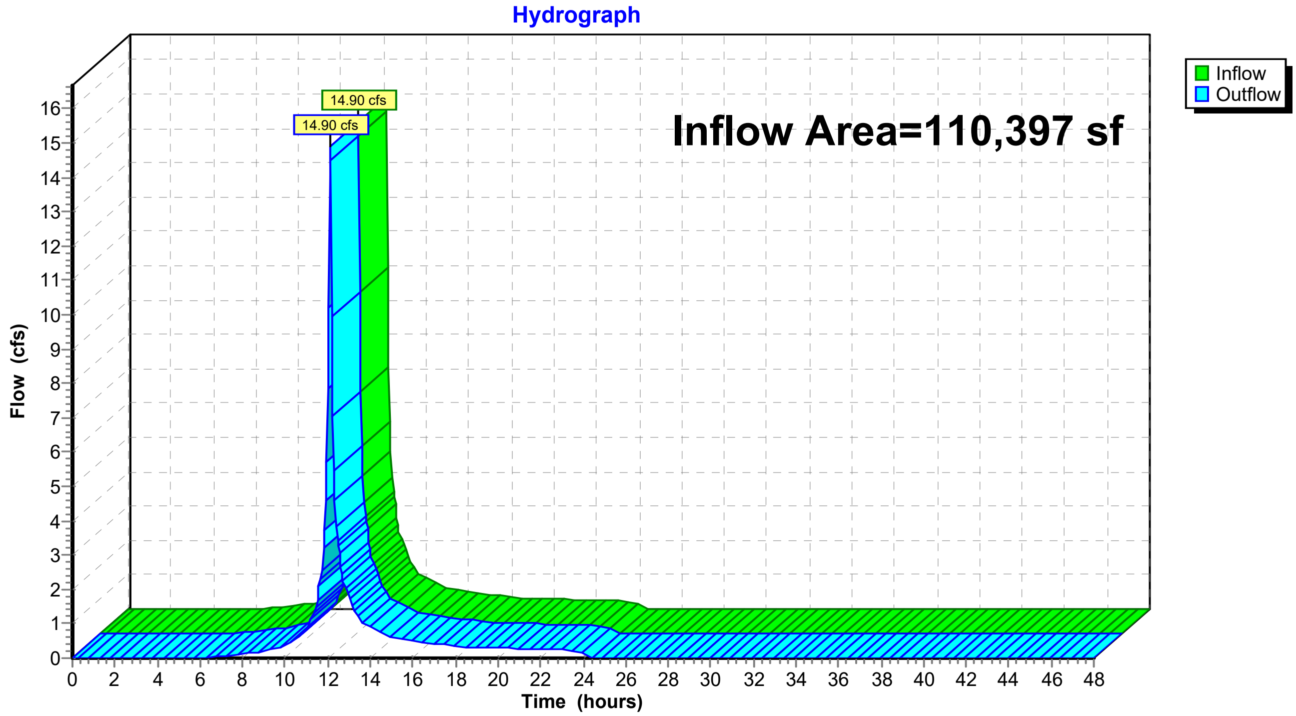
Summary for Reach DP-3: DP-3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 110,397 sf, 61.01% Impervious, Inflow Depth = 5.25" for 100-year event
Inflow = 14.90 cfs @ 12.13 hrs, Volume= 48,292 cf
Outflow = 14.90 cfs @ 12.13 hrs, Volume= 48,292 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-3: DP-3

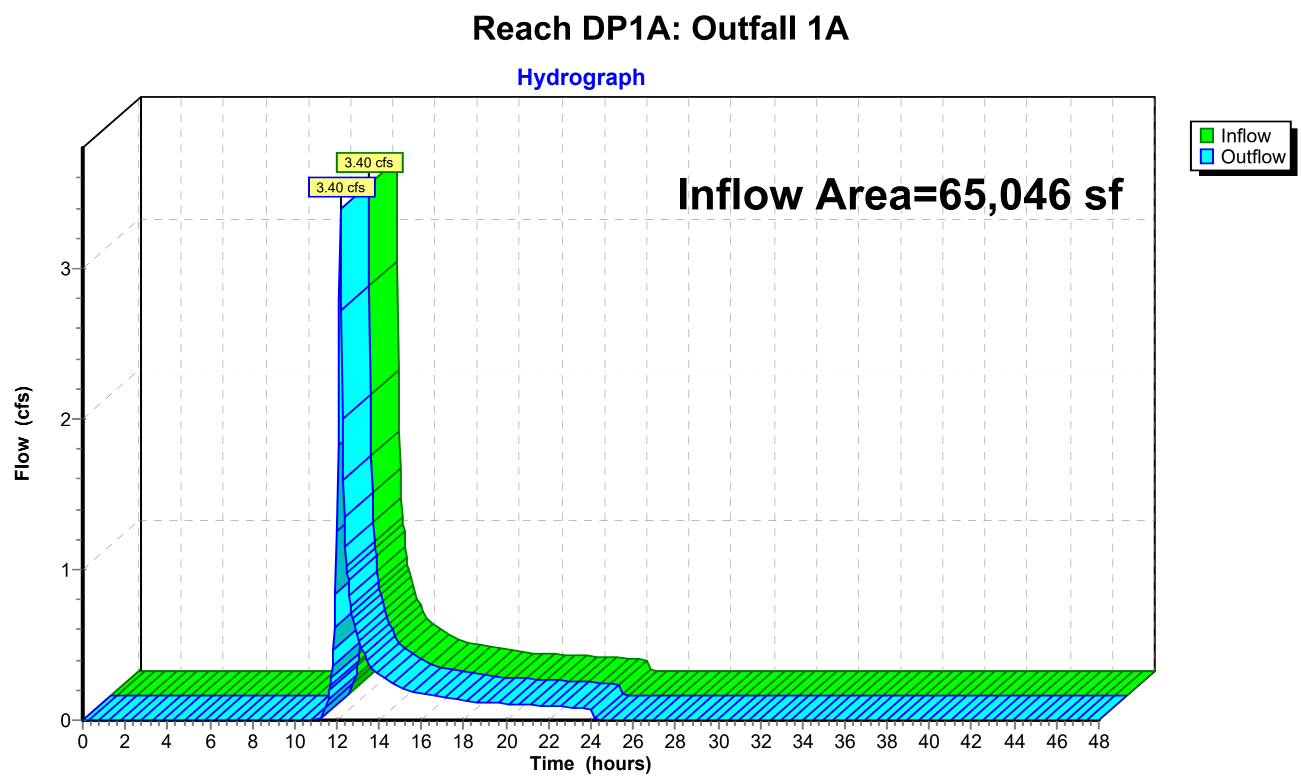


Summary for Reach DP1A: Outfall 1A

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	65,046 sf,	15.40% Impervious,	Inflow Depth = 2.18"	for 100-year event
Inflow =	3.40 cfs @	12.15 hrs, Volume=	11,826 cf	
Outflow =	3.40 cfs @	12.15 hrs, Volume=	11,826 cf, Atten= 0%, Lag= 0.0 min	

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



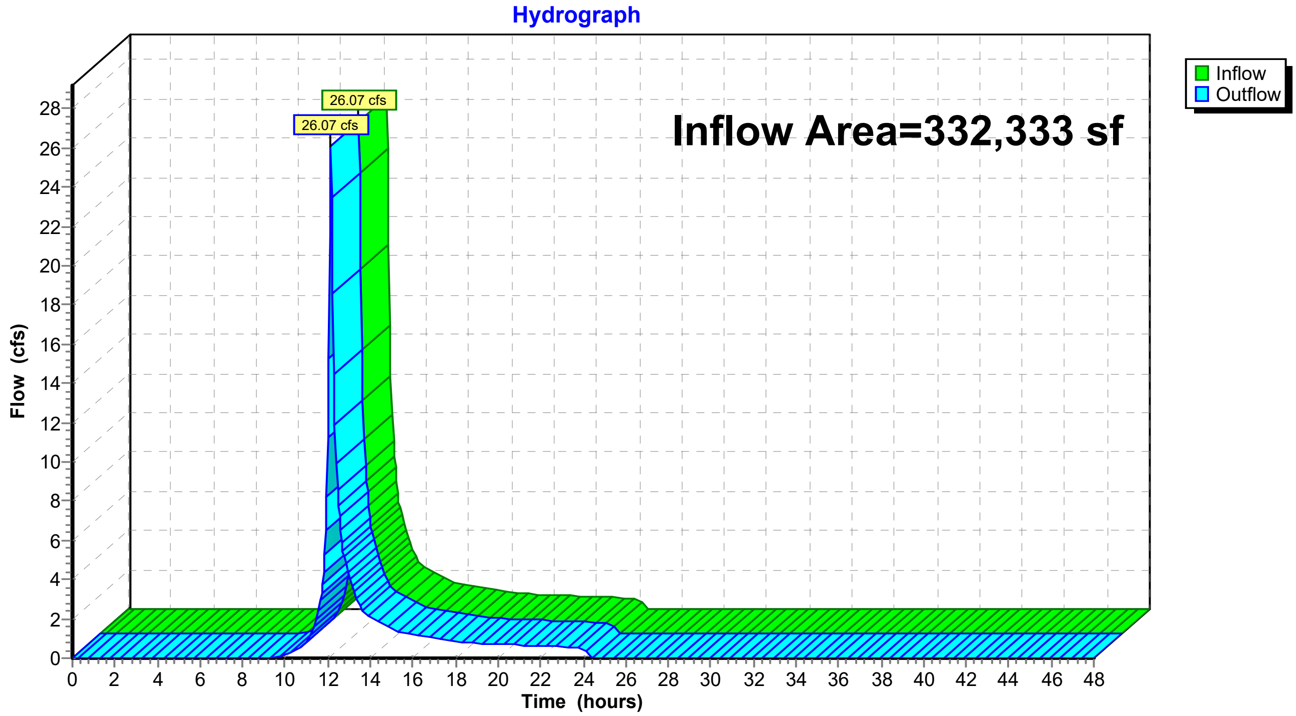
Summary for Reach DP1B: Outfall 1B

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 332,333 sf, 33.31% Impervious, Inflow Depth = 3.40" for 100-year event
Inflow = 26.07 cfs @ 12.16 hrs, Volume= 94,175 cf
Outflow = 26.07 cfs @ 12.16 hrs, Volume= 94,175 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP1B: Outfall 1B



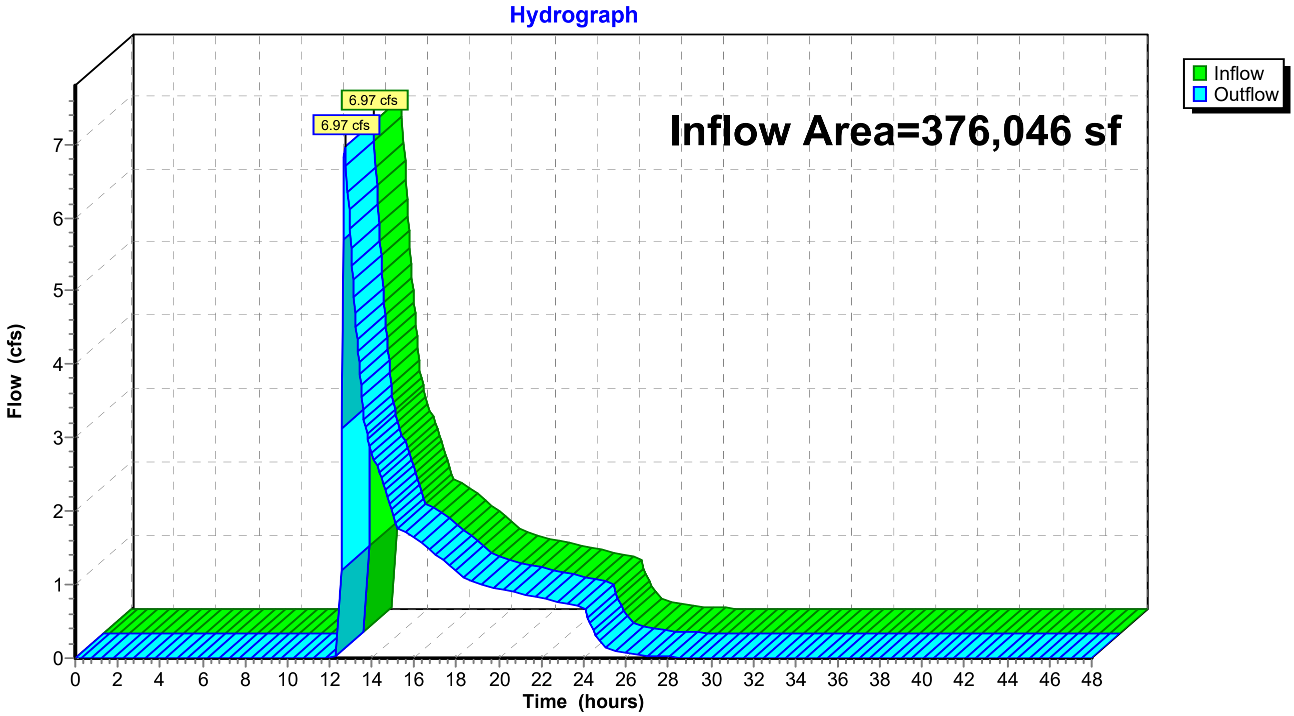
Summary for Reach DP1C: Outfall 1C

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	376,046 sf, 46.44% Impervious,	Inflow Depth = 2.22"	for 100-year event
Inflow =	6.97 cfs @ 12.72 hrs, Volume=	69,515 cf	
Outflow =	6.97 cfs @ 12.72 hrs, Volume=	69,515 cf, Atten= 0%, Lag= 0.0 min	

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP1C: Outfall 1C



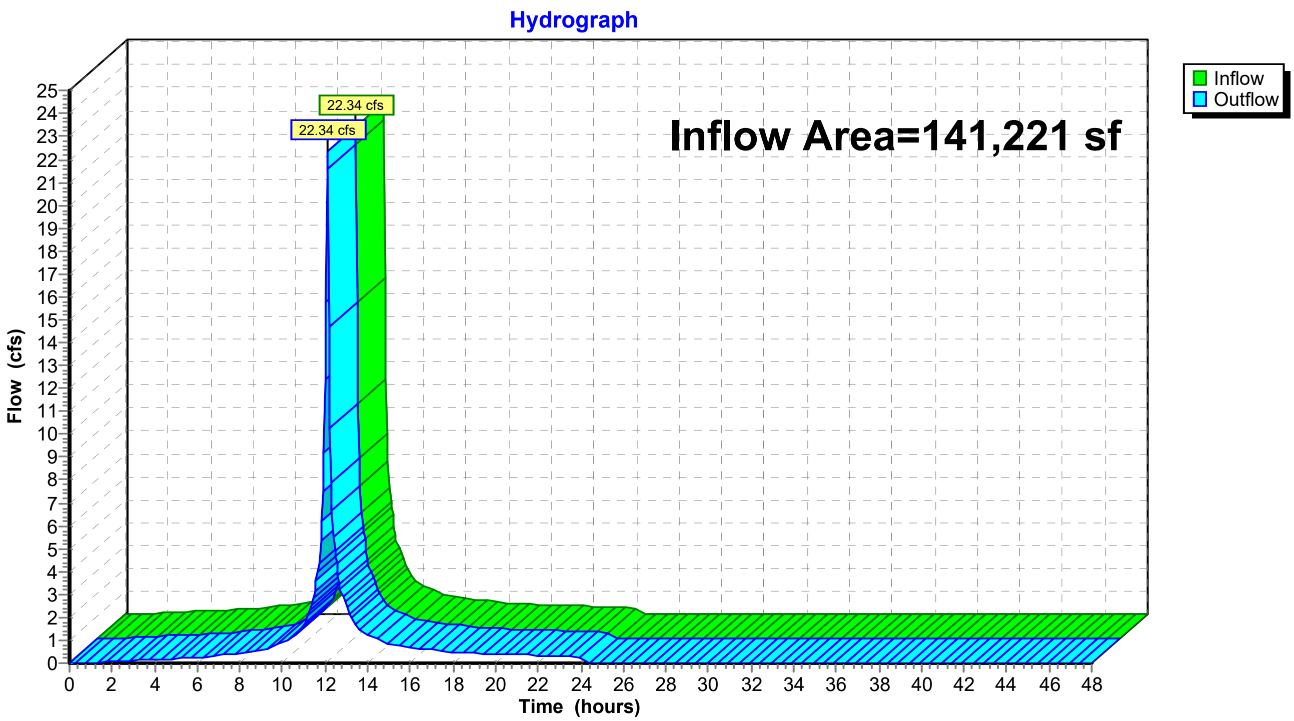
Summary for Reach DP1D: Outfall 1D

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 141,221 sf, 81.74% Impervious, Inflow Depth = 6.72" for 100-year event
Inflow = 22.34 cfs @ 12.13 hrs, Volume= 79,074 cf
Outflow = 22.34 cfs @ 12.13 hrs, Volume= 79,074 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP1D: Outfall 1D

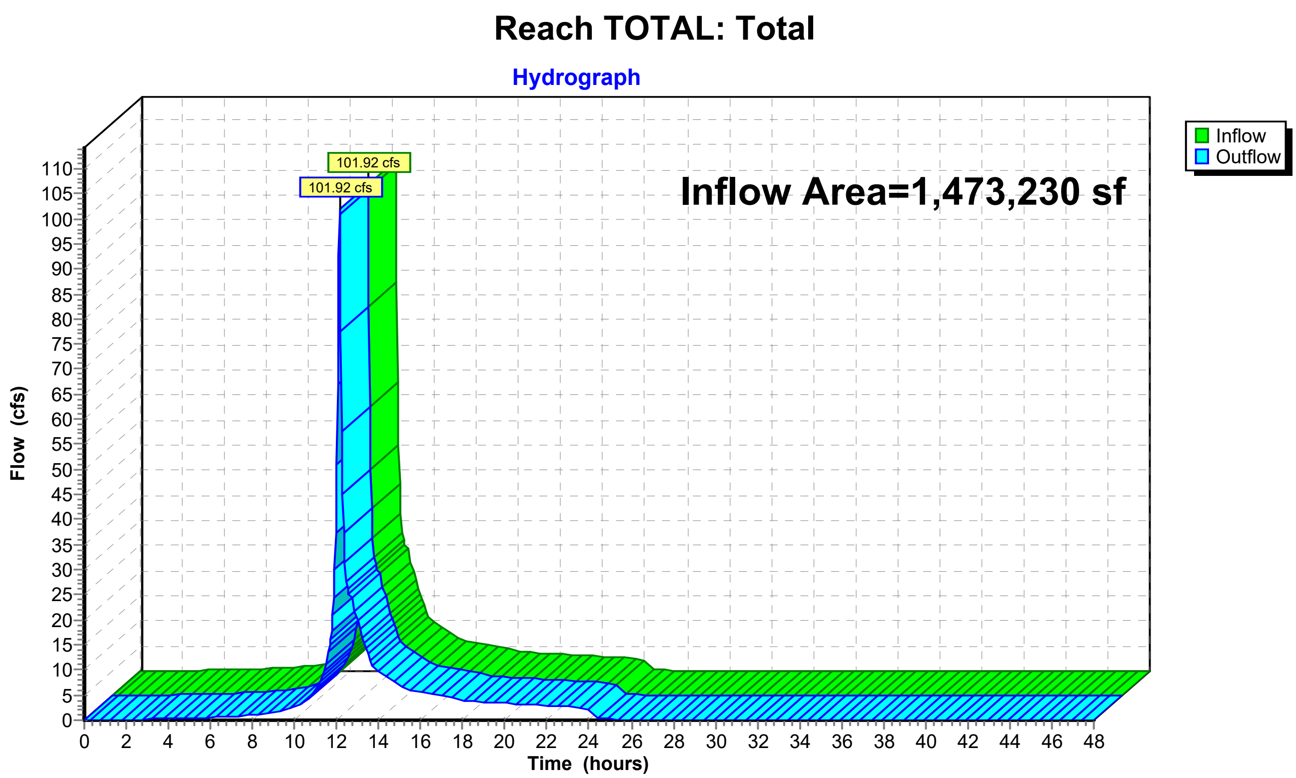


Summary for Reach TOTAL: Total

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	1,473,230 sf, 43.71% Impervious,	Inflow Depth = 3.59"	for 100-year event
Inflow =	101.92 cfs @ 12.14 hrs, Volume=	440,966 cf	
Outflow =	101.92 cfs @ 12.14 hrs, Volume=	440,966 cf, Atten= 0%, Lag= 0.0 min	

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



Summary for Pond 2P: EX-POND

Inflow Area = 376,046 sf, 46.44% Impervious, Inflow Depth = 4.51" for 100-year event
Inflow = 43.59 cfs @ 12.13 hrs, Volume= 141,408 cf
Outflow = 6.97 cfs @ 12.72 hrs, Volume= 69,515 cf, Atten= 84%, Lag= 35.6 min
Primary = 6.97 cfs @ 12.72 hrs, Volume= 69,515 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 23.96' @ 12.70 hrs Surf.Area= 18,055 sf Storage= 76,533 cf

Plug-Flow detention time= 291.1 min calculated for 69,442 cf (49% of inflow)
Center-of-Mass det. time= 162.5 min (992.9 - 830.4)

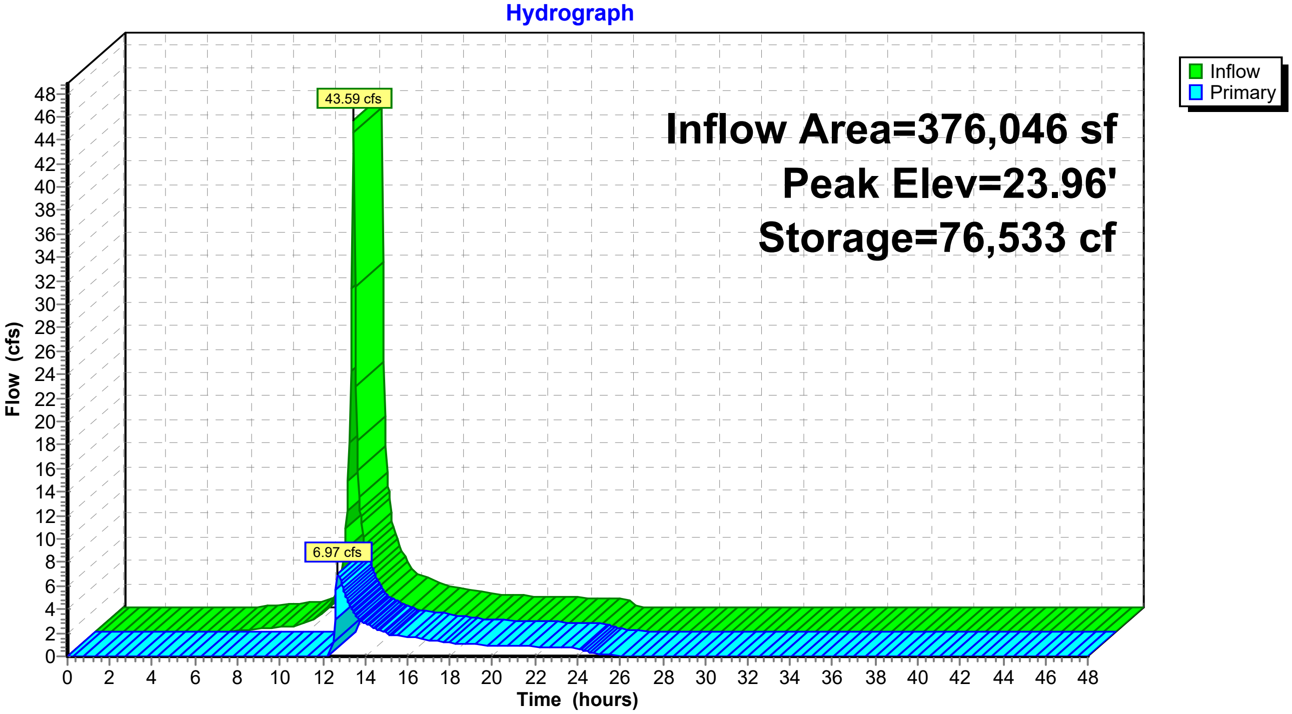
Volume	Invert	Avail.Storage	Storage Description
#1	18.00'	95,308 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
18.00	8,452	0	0
19.00	9,777	9,115	9,115
20.00	11,187	10,482	19,597
21.00	12,690	11,939	31,535
22.00	14,289	13,490	45,025
23.00	16,001	15,145	60,170
24.00	18,138	17,070	77,239
25.00	18,000	18,069	95,308

Device	Routing	Invert	Outlet Devices
#1	Primary	18.72'	**24.0" Round Culvert** L= 24.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 18.72' / 17.59' S= 0.0465 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	23.70'	**24.0" x 24.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#3	Primary	23.90'	**100.0' long x 30.0' breadth Broad-Crested Rectangular Weir** 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

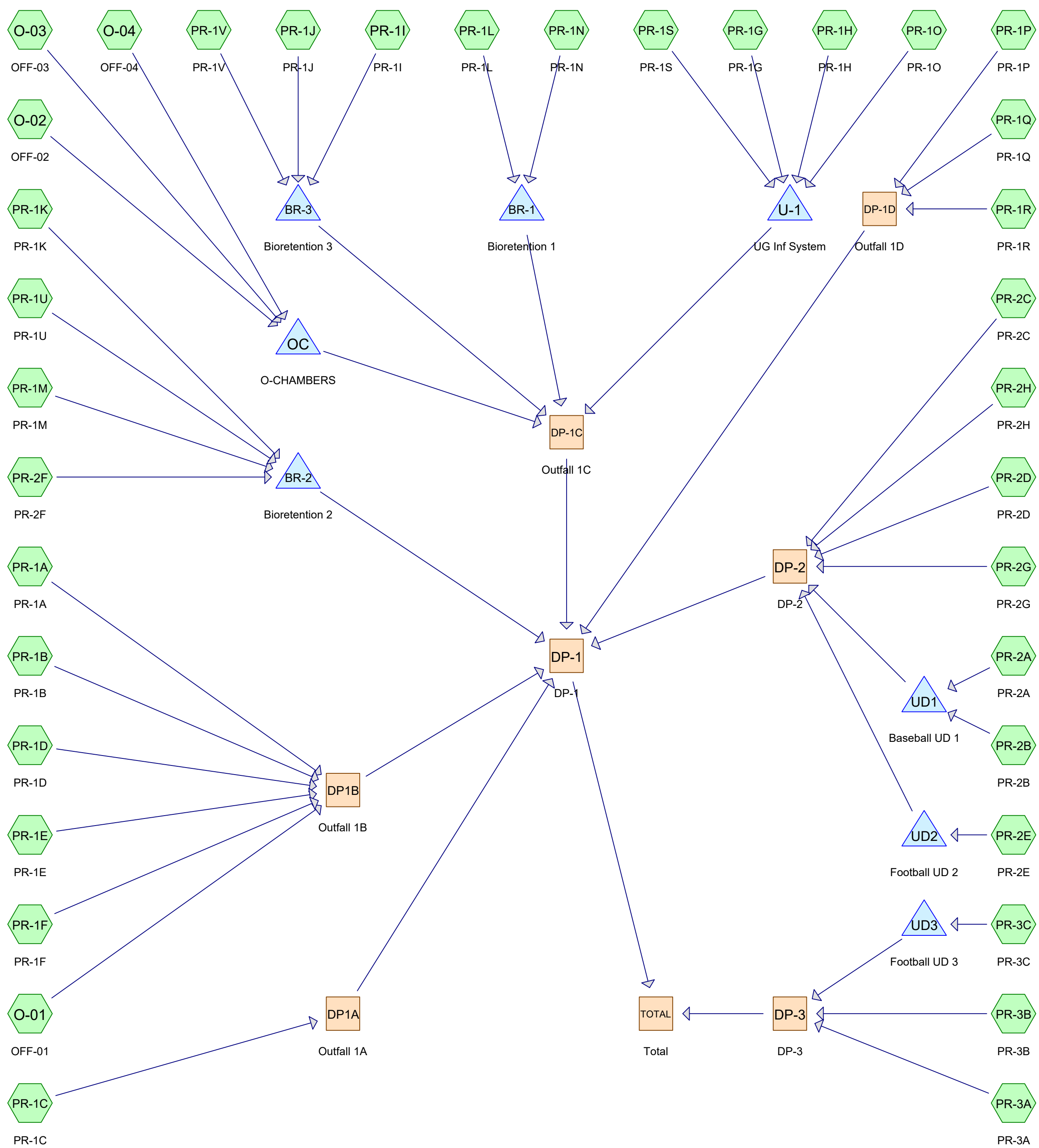
Primary OutFlow Max=6.65 cfs @ 12.72 hrs HW=23.96' (Free Discharge)
↑—**1=Culvert** (Passes 2.62 cfs of 31.15 cfs potential flow)
  ↑—**2=Orifice/Grate** (Weir Controls 2.62 cfs @ 1.25 fps)
└—**3=Broad-Crested Rectangular Weir** (Weir Controls 4.04 cfs @ 0.66 fps)

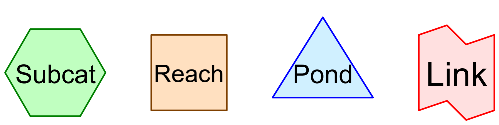
Pond 2P: EX-POND



APPENDIX C

Post-Development Conditions – HydroCAD Calculations





Routing Diagram for 12360_Proposed
Prepared by {enter your company name here}, Printed 1/16/2020
HydroCAD® 10.00-20 s/n 00546 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
239,589	57	1/3 acre lots, 30% imp, HSG A (O-01, O-02, O-03)
658,853	39	>75% Grass cover, Good, HSG A (O-01, O-04, PR-1A, PR-1B, PR-1C, PR-1F, PR-1G, PR-1H, PR-1I, PR-1J, PR-1K, PR-1L, PR-1M, PR-1N, PR-1O, PR-1P, PR-1Q, PR-1R, PR-1S, PR-1V, PR-2A, PR-2B, PR-2C, PR-2D, PR-2E, PR-2F, PR-2G, PR-2H, PR-3A, PR-3B, PR-3C)
446,382	98	Paved parking, HSG A (O-04, PR-1A, PR-1B, PR-1C, PR-1F, PR-1G, PR-1H, PR-1I, PR-1J, PR-1K, PR-1L, PR-1M, PR-1N, PR-1O, PR-1P, PR-1Q, PR-1R, PR-1S, PR-1U, PR-1V, PR-2C, PR-2D, PR-2G, PR-2H, PR-3A, PR-3B)
105,287	98	Roofs, HSG A (PR-1D, PR-1E)
11,813	98	Unconnected pavement, HSG A (O-01)
11,306	98	Unconnected roofs, HSG A (PR-1R)
1,473,230	**65**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
1,473,230	HSG A	O-01, O-02, O-03, O-04, PR-1A, PR-1B, PR-1C, PR-1D, PR-1E, PR-1F, PR-1G, PR-1H, PR-1I, PR-1J, PR-1K, PR-1L, PR-1M, PR-1N, PR-1O, PR-1P, PR-1Q, PR-1R, PR-1S, PR-1U, PR-1V, PR-2A, PR-2B, PR-2C, PR-2D, PR-2E, PR-2F, PR-2G, PR-2H, PR-3A, PR-3B, PR-3C
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
1,473,230		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
239,589	0	0	0	0	239,589	1/3 acre lots, 30% imp	
658,853	0	0	0	0	658,853	>75% Grass cover, Good	
446,382	0	0	0	0	446,382	Paved parking	
105,287	0	0	0	0	105,287	Roofs	
11,813	0	0	0	0	11,813	Unconnected pavement	
11,306	0	0	0	0	11,306	Unconnected roofs	
1,473,230	**0**	**0**	**0**	**0**	**1,473,230**	**TOTAL AREA**	

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	DP-2	16.00	15.12	96.0	0.0092	0.011	36.0	0.0	0.0
2	UD1	27.65	27.24	41.5	0.0099	0.013	12.0	0.0	0.0
3	UD1	32.12	31.95	15.5	0.0110	0.013	12.0	0.0	0.0
4	UD1	31.30	30.91	38.6	0.0101	0.013	6.0	0.0	0.0
5	UD2	36.00	35.00	22.3	0.0448	0.013	6.0	0.0	0.0
6	UD2	36.00	35.00	46.4	0.0216	0.013	6.0	0.0	0.0
7	UD2	36.00	35.00	30.2	0.0331	0.013	6.0	0.0	0.0
8	UD3	35.00	34.00	80.2	0.0125	0.013	12.0	0.0	0.0

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentO-01: OFF-01 Runoff Area=112,122 sf 33.01% Impervious Runoff Depth=0.41"
Tc=6.0 min CN=59 Runoff=0.76 cfs 3,812 cf

SubcatchmentO-02: OFF-02 Runoff Area=109,762 sf 30.00% Impervious Runoff Depth=0.34"
Tc=6.0 min CN=57 Runoff=0.50 cfs 3,112 cf

SubcatchmentO-03: OFF-03 Runoff Area=45,823 sf 30.00% Impervious Runoff Depth=0.34"
Tc=6.0 min CN=57 Runoff=0.21 cfs 1,299 cf

SubcatchmentO-04: OFF-04 Runoff Area=35,366 sf 61.66% Impervious Runoff Depth=1.16"
Tc=6.0 min CN=75 Runoff=1.05 cfs 3,405 cf

SubcatchmentPR-1A: PR-1A Runoff Area=30,658 sf 60.37% Impervious Runoff Depth=1.16"
Tc=6.0 min CN=75 Runoff=0.91 cfs 2,952 cf

SubcatchmentPR-1B: PR-1B Runoff Area=34,631 sf 76.81% Impervious Runoff Depth=1.76"
Tc=6.0 min CN=84 Runoff=1.59 cfs 5,073 cf

SubcatchmentPR-1C: PR-1C Runoff Area=24,918 sf 3.36% Impervious Runoff Depth=0.01"
Tc=6.0 min CN=41 Runoff=0.00 cfs 24 cf

SubcatchmentPR-1D: PR-1D Runoff Area=78,681 sf 100.00% Impervious Runoff Depth=3.06"
Tc=6.0 min CN=98 Runoff=5.45 cfs 20,045 cf

SubcatchmentPR-1E: PR-1E Runoff Area=26,606 sf 100.00% Impervious Runoff Depth=3.06"
Tc=6.0 min CN=98 Runoff=1.84 cfs 6,778 cf

SubcatchmentPR-1F: PR-1F Runoff Area=18,266 sf 67.43% Impervious Runoff Depth=1.40"
Tc=6.0 min CN=79 Runoff=0.67 cfs 2,138 cf

SubcatchmentPR-1G: PR-1G Runoff Area=50,158 sf 46.00% Impervious Runoff Depth=0.69"
Tc=6.0 min CN=66 Runoff=0.80 cfs 2,880 cf

SubcatchmentPR-1H: PR-1H Runoff Area=11,588 sf 24.62% Impervious Runoff Depth=0.25"
Tc=6.0 min CN=54 Runoff=0.02 cfs 240 cf

SubcatchmentPR-1I: PR-1I Runoff Area=16,195 sf 0.59% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 2 cf

SubcatchmentPR-1J: PR-1J Runoff Area=21,163 sf 85.81% Impervious Runoff Depth=2.25"
Tc=6.0 min CN=90 Runoff=1.21 cfs 3,972 cf

SubcatchmentPR-1K: PR-1K Runoff Area=40,076 sf 13.82% Impervious Runoff Depth=0.09"
Tc=6.0 min CN=47 Runoff=0.01 cfs 290 cf

SubcatchmentPR-1L: PR-1L Runoff Area=32,440 sf 69.13% Impervious Runoff Depth=1.47"
Tc=6.0 min CN=80 Runoff=1.25 cfs 3,978 cf

SubcatchmentPR-1M: PR-1M Runoff Area=22,109 sf 44.24% Impervious Runoff Depth=0.64"
Tc=6.0 min CN=65 Runoff=0.32 cfs 1,188 cf

SubcatchmentPR-1N: PR-1N Runoff Area=21,140 sf 87.46% Impervious Runoff Depth=2.34"
Tc=6.0 min CN=91 Runoff=1.25 cfs 4,127 cf

SubcatchmentPR-1O: PR-1O Runoff Area=50,633 sf 85.81% Impervious Runoff Depth=2.25"
Tc=6.0 min CN=90 Runoff=2.90 cfs 9,503 cf

SubcatchmentPR-1P: PR-1P Runoff Area=13,652 sf 88.78% Impervious Runoff Depth=2.34"
Tc=6.0 min CN=91 Runoff=0.81 cfs 2,665 cf

SubcatchmentPR-1Q: PR-1Q Runoff Area=29,096 sf 14.64% Impervious Runoff Depth=0.11"
Tc=6.0 min CN=48 Runoff=0.01 cfs 256 cf

SubcatchmentPR-1R: PR-1R Runoff Area=55,082 sf 84.15% Impervious Runoff Depth=2.16"
Tc=6.0 min CN=89 Runoff=3.05 cfs 9,933 cf

SubcatchmentPR-1S: PR-1S Runoff Area=52,894 sf 67.24% Impervious Runoff Depth=1.40"
Tc=6.0 min CN=79 Runoff=1.94 cfs 6,192 cf

SubcatchmentPR-1U: PR-1U Runoff Area=4,791 sf 100.00% Impervious Runoff Depth=3.06"
Tc=6.0 min CN=98 Runoff=0.33 cfs 1,221 cf

SubcatchmentPR-1V: PR-1V Runoff Area=42,997 sf 65.96% Impervious Runoff Depth=1.34"
Tc=6.0 min CN=78 Runoff=1.50 cfs 4,800 cf

SubcatchmentPR-2A: PR-2A Runoff Area=33,957 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 5 cf

SubcatchmentPR-2B: PR-2B Runoff Area=71,412 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 10 cf

SubcatchmentPR-2C: PR-2C Runoff Area=9,359 sf 17.98% Impervious Runoff Depth=0.15"
Tc=6.0 min CN=50 Runoff=0.01 cfs 115 cf

SubcatchmentPR-2D: PR-2D Runoff Area=53,639 sf 82.78% Impervious Runoff Depth=2.08"
Tc=0.0 min CN=88 Runoff=3.28 cfs 9,289 cf

SubcatchmentPR-2E: PR-2E Runoff Area=65,696 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 9 cf

SubcatchmentPR-2F: PR-2F Runoff Area=33,980 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 5 cf

SubcatchmentPR-2G: PR-2G Runoff Area=80,069 sf 7.34% Impervious Runoff Depth=0.03"
Tc=0.0 min CN=43 Runoff=0.01 cfs 196 cf

SubcatchmentPR-2H: PR-2H Runoff Area=30,529 sf 1.48% Impervious Runoff Depth=0.01"
Tc=6.0 min CN=40 Runoff=0.00 cfs 14 cf

Subcatchment PR-3A: PR-3A Runoff Area=31,912 sf 15.32% Impervious Runoff Depth=0.11"
Tc=6.0 min CN=48 Runoff=0.01 cfs 281 cf

Subcatchment PR-3B: PR-3B Runoff Area=59,565 sf 75.56% Impervious Runoff Depth=1.76"
Tc=6.0 min CN=84 Runoff=2.73 cfs 8,726 cf

Subcatchment PR-3C: PR-3C Runoff Area=22,265 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 3 cf

Reach DP-1: DP-1 Inflow=19.09 cfs 89,999 cf
Outflow=19.09 cfs 89,999 cf

Reach DP-1C: Outfall 1C Inflow=2.22 cfs 23,981 cf
Outflow=2.22 cfs 23,981 cf

Reach DP-1D: Outfall 1D Inflow=3.86 cfs 12,854 cf
Outflow=3.86 cfs 12,854 cf

Reach DP-2: DP-2 Avg. Flow Depth=0.42' Max Vel=5.32 fps Inflow=3.28 cfs 9,637 cf
36.0" Round Pipe n=0.011 L=96.0' S=0.0092 '/' Capacity=75.47 cfs Outflow=3.16 cfs 9,637 cf

Reach DP-3: DP-3 Inflow=2.73 cfs 9,010 cf
Outflow=2.73 cfs 9,010 cf

Reach DP1A: Outfall 1A Inflow=0.00 cfs 24 cf
Outflow=0.00 cfs 24 cf

Reach DP1B: Outfall 1B Inflow=11.16 cfs 40,799 cf
Outflow=11.16 cfs 40,799 cf

Reach TOTAL: Total Inflow=21.77 cfs 99,008 cf
Outflow=21.77 cfs 99,008 cf

Pond BR-1: Bioretention 1 Peak Elev=26.11' Storage=970 cf Inflow=2.50 cfs 8,105 cf
Outflow=1.33 cfs 8,105 cf

Pond BR-2: Bioretention 2 Peak Elev=26.31' Storage=233 cf Inflow=0.65 cfs 2,703 cf
Outflow=0.40 cfs 2,703 cf

Pond BR-3: Bioretention 3 Peak Elev=26.52' Storage=1,326 cf Inflow=2.71 cfs 8,774 cf
Outflow=0.87 cfs 8,774 cf

Pond OC: O-CHAMBERS Peak Elev=25.19' Storage=3,739 cf Inflow=1.72 cfs 7,816 cf
Outflow=0.14 cfs 7,012 cf

Pond U-1: UG Inf System Peak Elev=22.65' Storage=8,464 cf Inflow=5.64 cfs 18,814 cf
Discarded=0.32 cfs 18,724 cf Primary=0.01 cfs 90 cf Outflow=0.33 cfs 18,814 cf

Pond UD1: Baseball UD 1 Peak Elev=39.17' Storage=0 cf Inflow=0.00 cfs 15 cf
Outflow=0.00 cfs 15 cf

Pond UD2: Football UD 2 Peak Elev=40.17' Storage=0 cf Inflow=0.00 cfs 9 cf
Outflow=0.00 cfs 9 cf

Pond UD3: Football UD 3 Peak Elev=39.27' Storage=0 cf Inflow=0.00 cfs 3 cf
12.0" Round Culvert n=0.013 L=80.2' S=0.0125 '/' Outflow=0.00 cfs 3 cf

Total Runoff Area = 1,473,230 sf Runoff Volume = 118,537 cf Average Runoff Depth = 0.97"
56.11% Pervious = 826,565 sf 43.89% Impervious = 646,665 sf

Summary for Subcatchment O-01: OFF-01

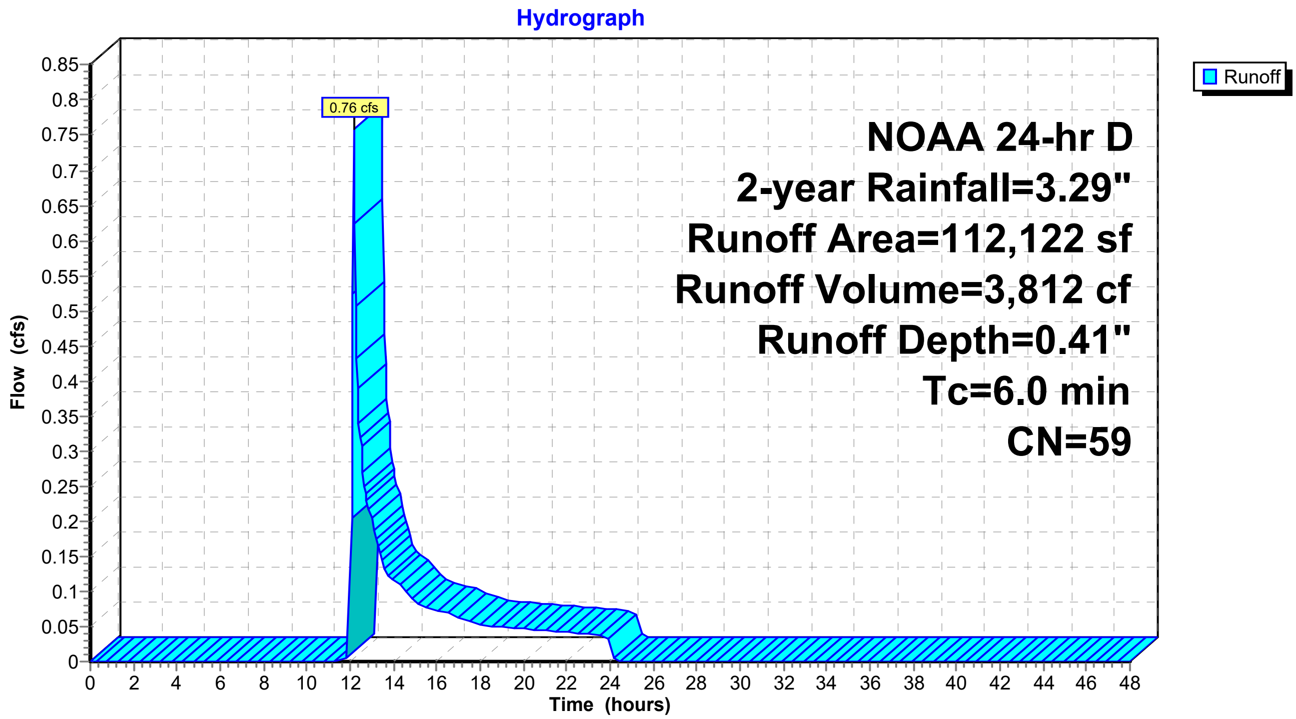
Runoff = 0.76 cfs @ 12.16 hrs, Volume= 3,812 cf, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
11,813	98	Unconnected pavement, HSG A
16,305	39	>75% Grass cover, Good, HSG A
84,004	57	1/3 acre lots, 30% imp, HSG A
112,122	59	Weighted Average
75,108		66.99% Pervious Area
37,014		33.01% Impervious Area
11,813		31.91% Unconnected

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

Subcatchment O-01: OFF-01



Summary for Subcatchment O-02: OFF-02

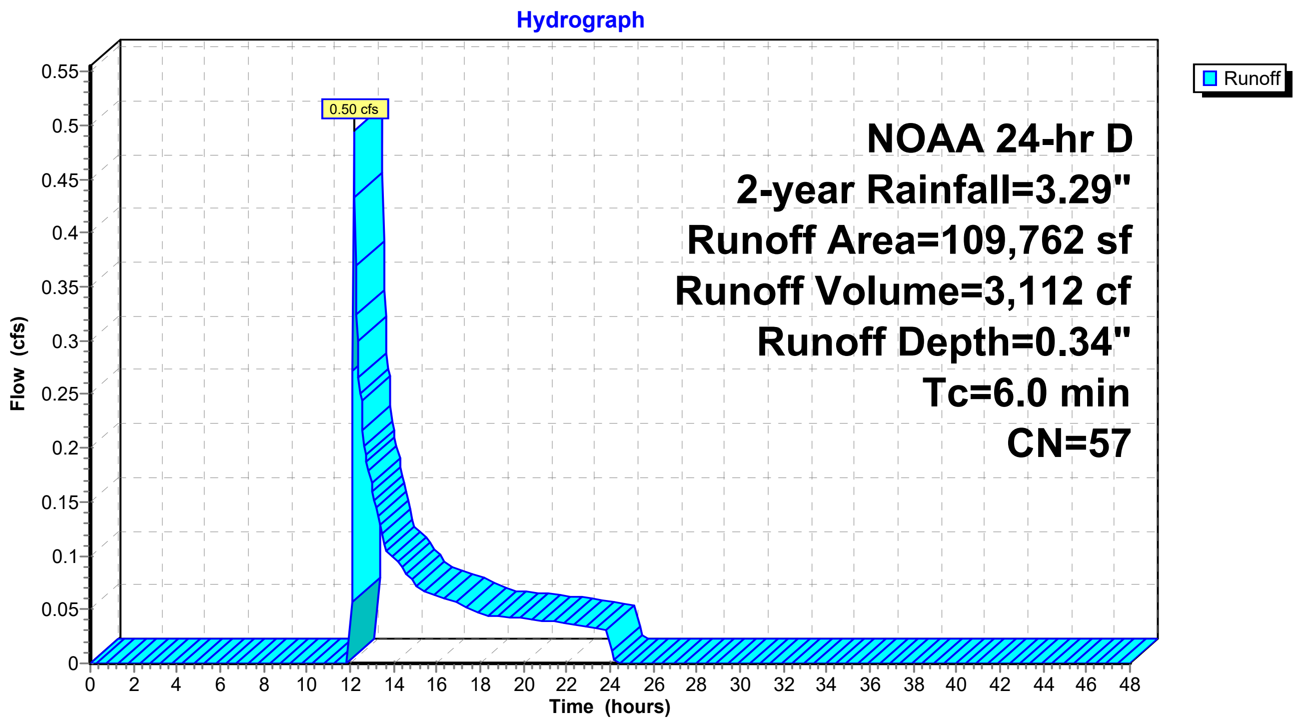
Runoff = 0.50 cfs @ 12.17 hrs, Volume= 3,112 cf, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
109,762	57	1/3 acre lots, 30% imp, HSG A
76,833		70.00% Pervious Area
32,929		30.00% Impervious Area

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

Subcatchment O-02: OFF-02



Summary for Subcatchment O-03: OFF-03

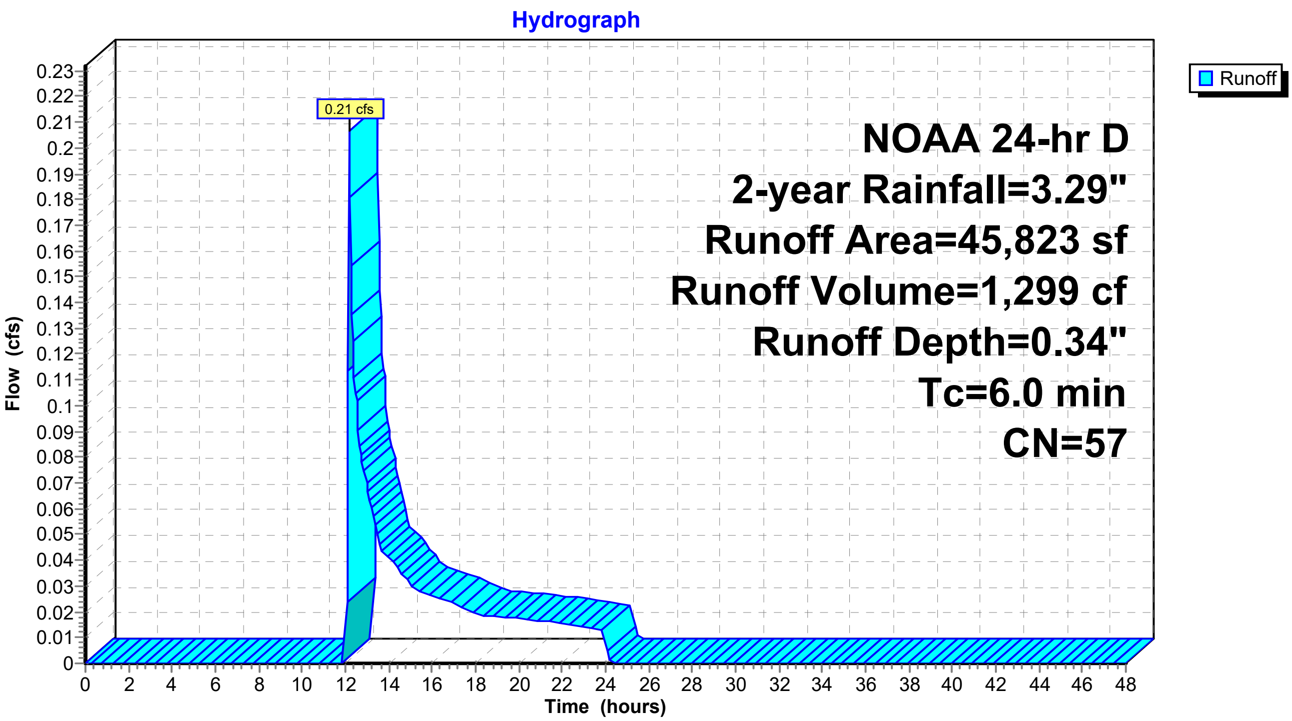
Runoff = 0.21 cfs @ 12.17 hrs, Volume= 1,299 cf, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
45,823	57	1/3 acre lots, 30% imp, HSG A
32,076		70.00% Pervious Area
13,747		30.00% Impervious Area

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

Subcatchment O-03: OFF-03



Summary for Subcatchment O-04: OFF-04

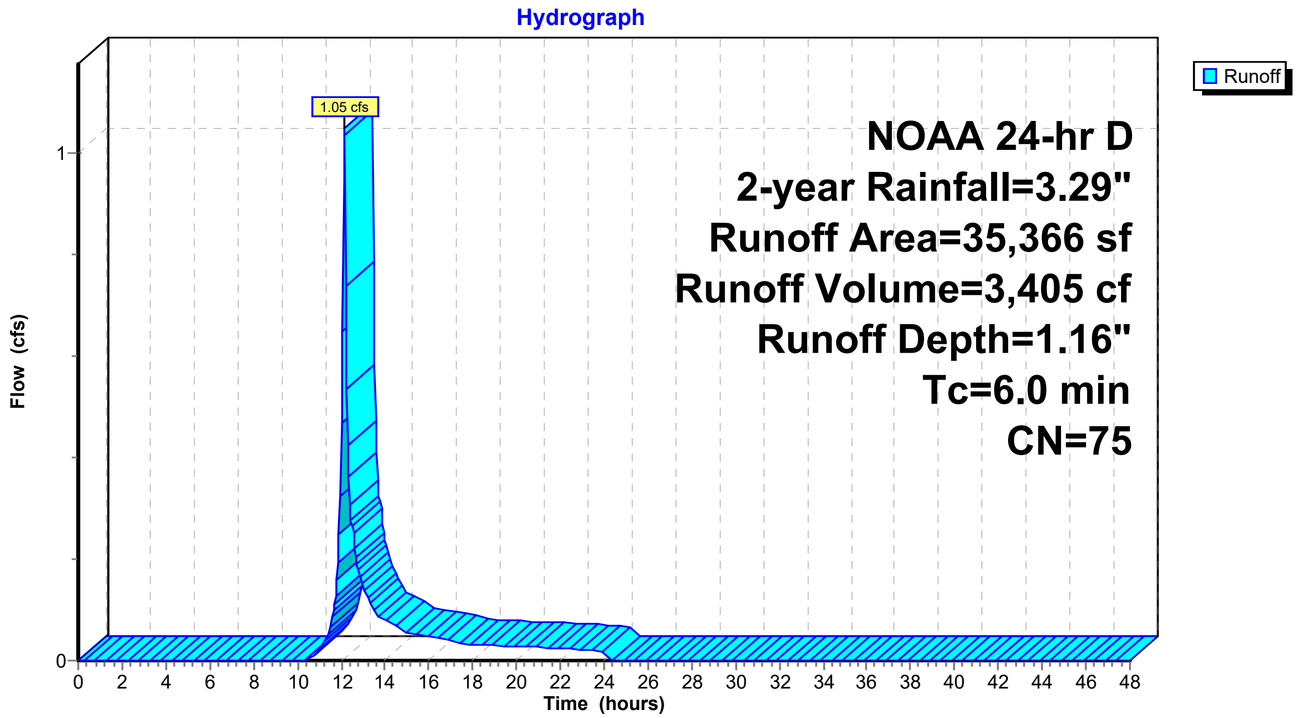
Runoff = 1.05 cfs @ 12.14 hrs, Volume= 3,405 cf, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
21,807	98	Paved parking, HSG A
13,559	39	>75% Grass cover, Good, HSG A
35,366	75	Weighted Average
13,559		38.34% Pervious Area
21,807		61.66% Impervious Area

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

Subcatchment O-04: OFF-04



Summary for Subcatchment PR-1A: PR-1A

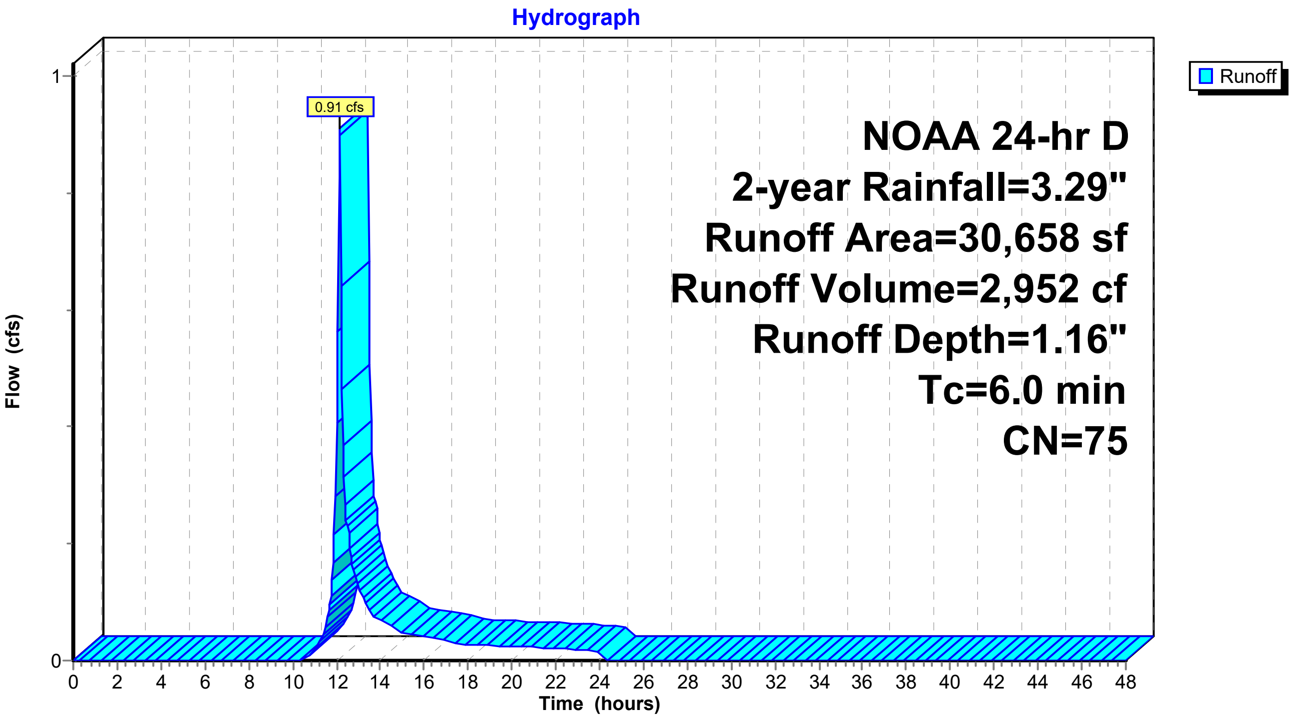
Runoff = 0.91 cfs @ 12.14 hrs, Volume= 2,952 cf, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
18,507	98	Paved parking, HSG A
12,151	39	>75% Grass cover, Good, HSG A
30,658	75	Weighted Average
12,151		39.63% Pervious Area
18,507		60.37% Impervious Area

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

Subcatchment PR-1A: PR-1A



Summary for Subcatchment PR-1B: PR-1B

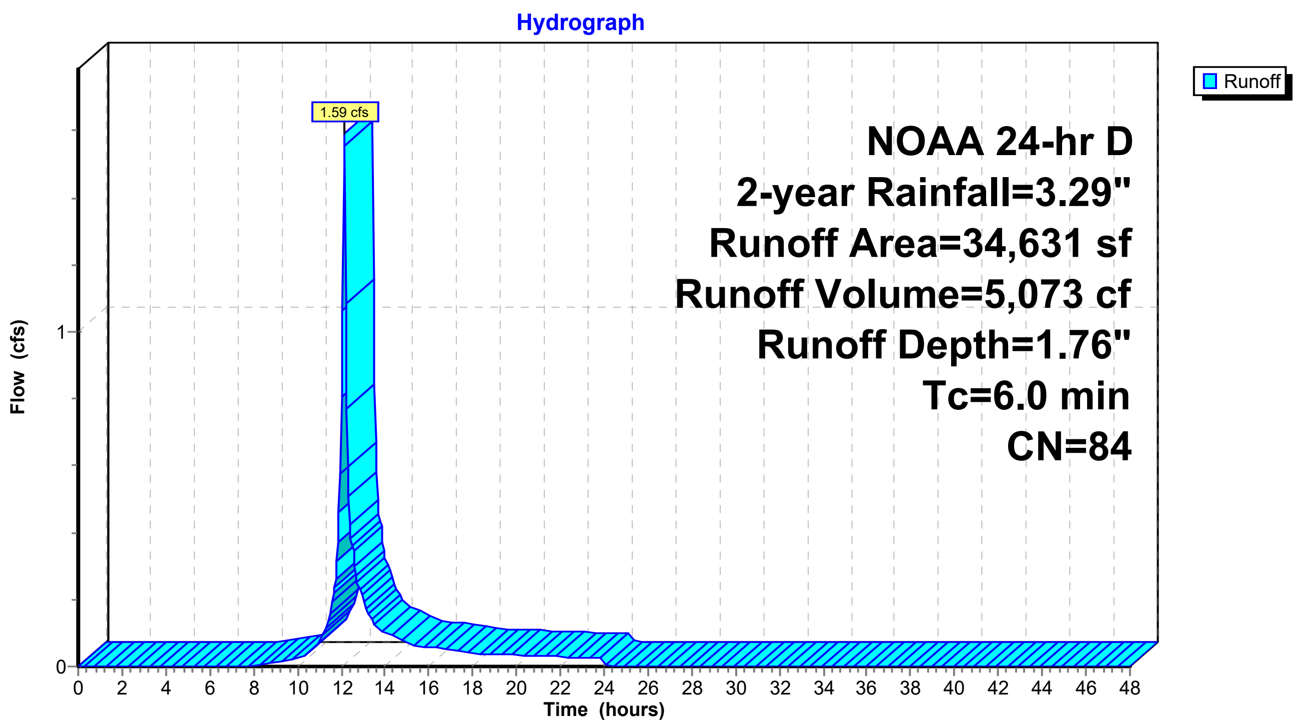
Runoff = 1.59 cfs @ 12.13 hrs, Volume= 5,073 cf, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
26,601	98	Paved parking, HSG A
8,030	39	>75% Grass cover, Good, HSG A
34,631	84	Weighted Average
8,030		23.19% Pervious Area
26,601		76.81% Impervious Area

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

Subcatchment PR-1B: PR-1B



Summary for Subcatchment PR-1C: PR-1C

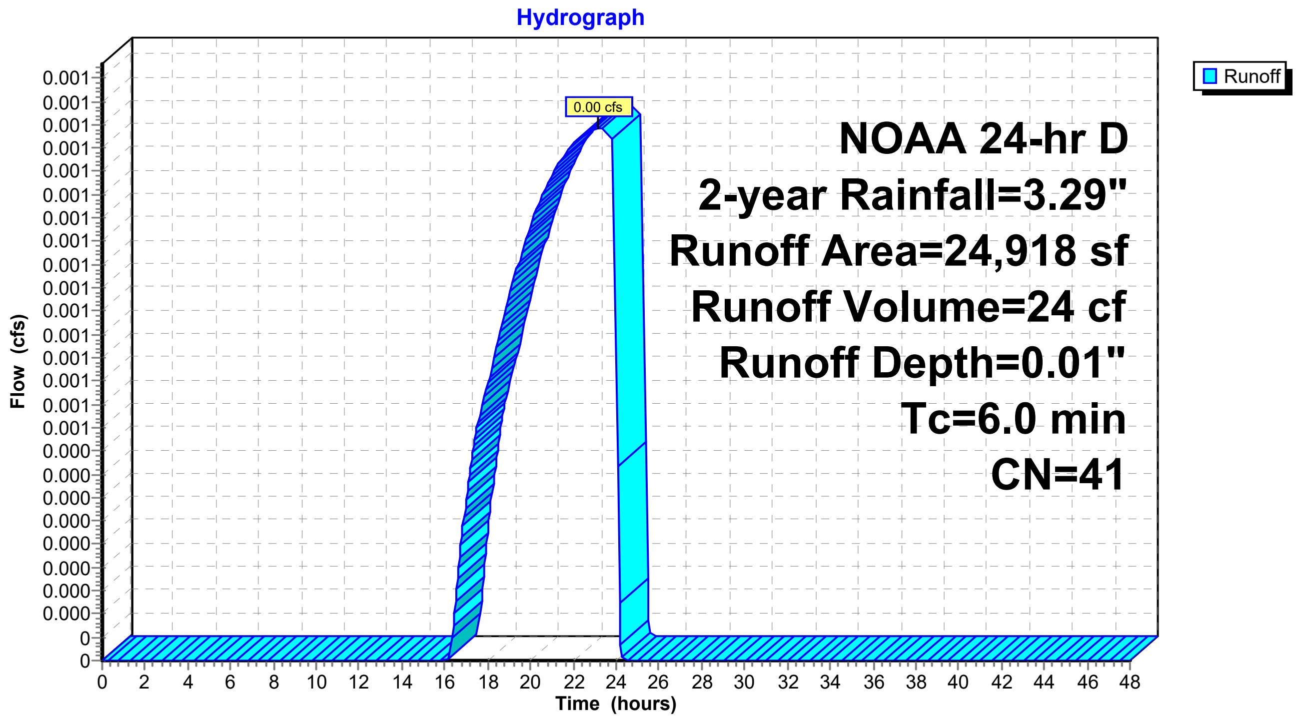
Runoff = 0.00 cfs @ 23.15 hrs, Volume= 24 cf, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
836	98	Paved parking, HSG A
24,082	39	>75% Grass cover, Good, HSG A
24,918	41	Weighted Average
24,082		96.64% Pervious Area
836		3.36% Impervious Area

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

Subcatchment PR-1C: PR-1C



Summary for Subcatchment PR-1D: PR-1D

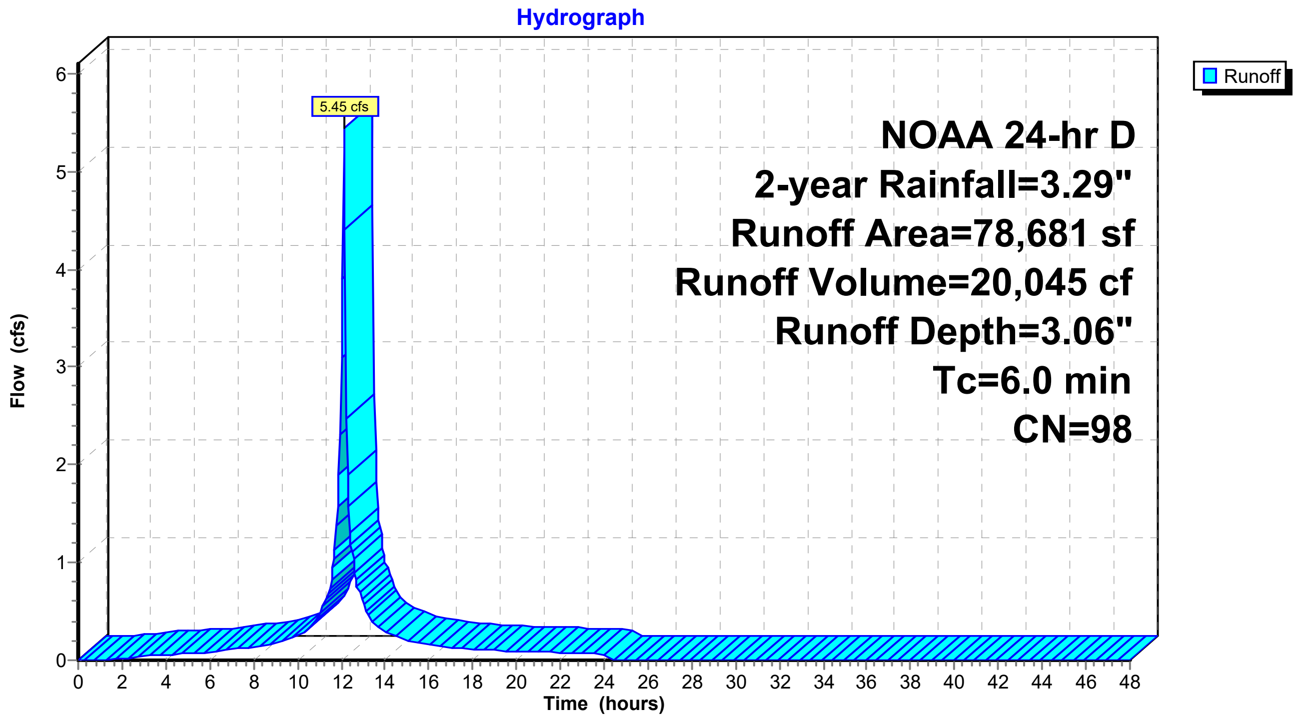
Runoff = 5.45 cfs @ 12.13 hrs, Volume= 20,045 cf, Depth= 3.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
78,681	98	Roofs, HSG A
78,681		100.00% Impervious Area

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

Subcatchment PR-1D: PR-1D



Summary for Subcatchment PR-1E: PR-1E

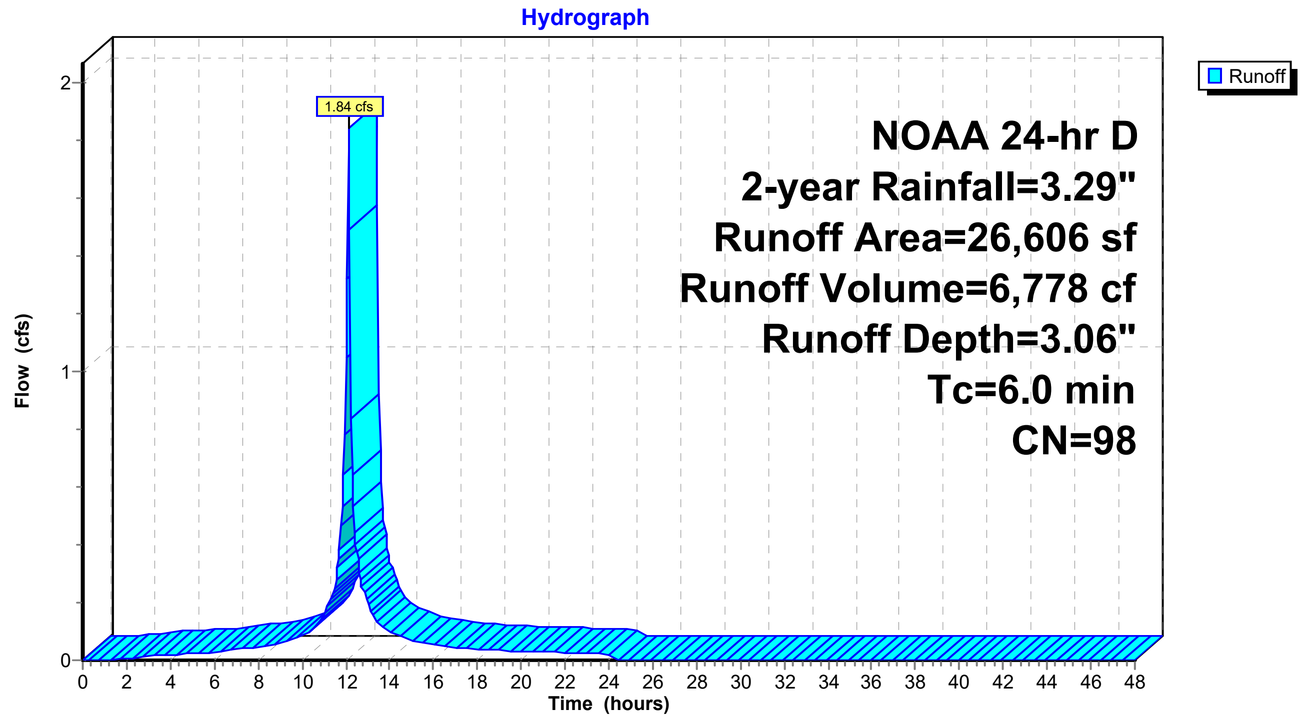
Runoff = 1.84 cfs @ 12.13 hrs, Volume= 6,778 cf, Depth= 3.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
26,606	98	Roofs, HSG A
26,606		100.00% Impervious Area

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

Subcatchment PR-1E: PR-1E



Summary for Subcatchment PR-1F: PR-1F

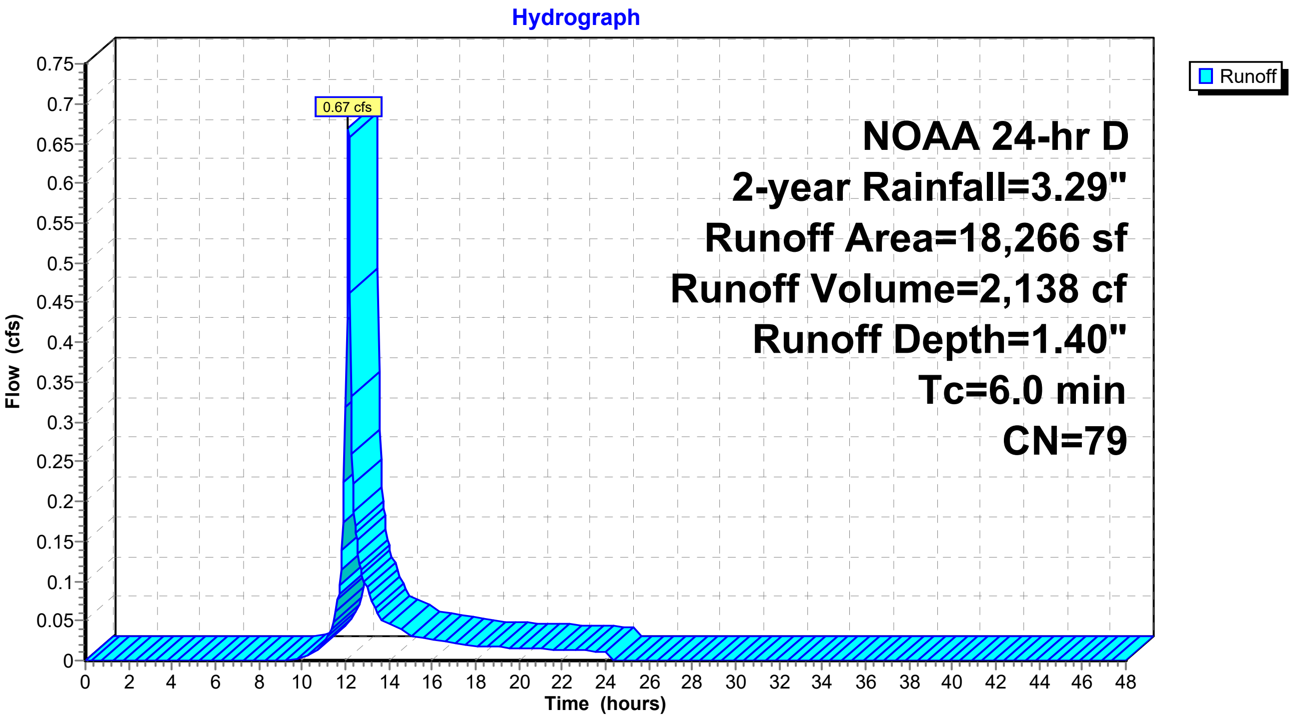
Runoff = 0.67 cfs @ 12.13 hrs, Volume= 2,138 cf, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
12,317	98	Paved parking, HSG A
5,949	39	>75% Grass cover, Good, HSG A
18,266	79	Weighted Average
5,949		32.57% Pervious Area
12,317		67.43% Impervious Area

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

Subcatchment PR-1F: PR-1F



Summary for Subcatchment PR-1G: PR-1G

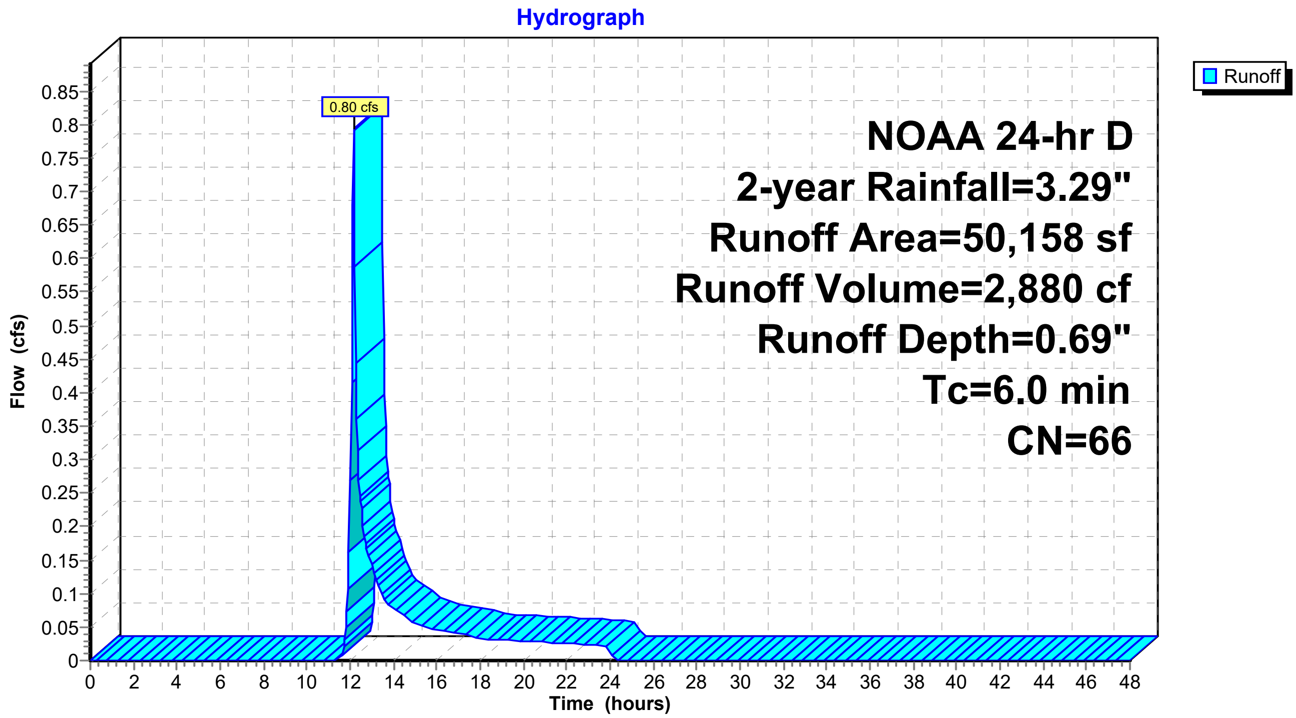
Runoff = 0.80 cfs @ 12.14 hrs, Volume= 2,880 cf, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
23,071	98	Paved parking, HSG A
27,087	39	>75% Grass cover, Good, HSG A
50,158	66	Weighted Average
27,087		54.00% Pervious Area
23,071		46.00% Impervious Area

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

Subcatchment PR-1G: PR-1G



Summary for Subcatchment PR-1H: PR-1H

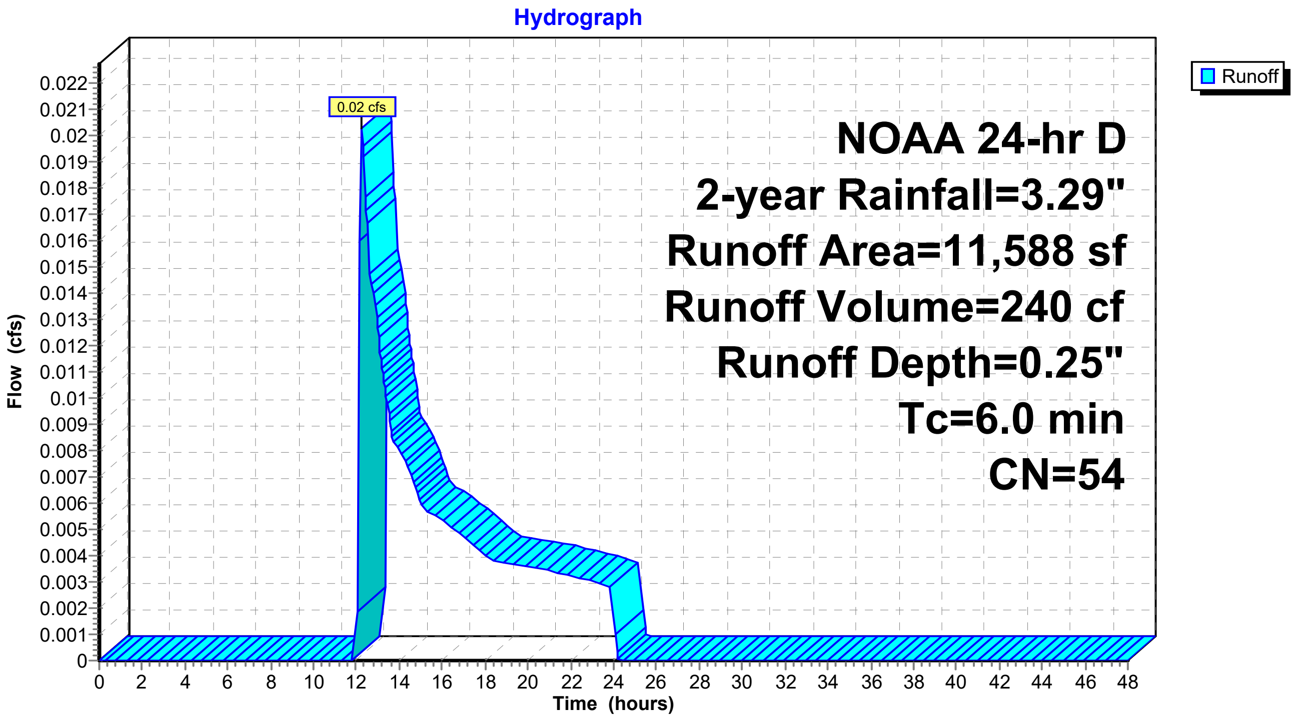
Runoff = 0.02 cfs @ 12.24 hrs, Volume= 240 cf, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
2,853	98	Paved parking, HSG A
8,735	39	>75% Grass cover, Good, HSG A
11,588	54	Weighted Average
8,735		75.38% Pervious Area
2,853		24.62% Impervious Area

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

Subcatchment PR-1H: PR-1H



Summary for Subcatchment PR-1I: PR-1I

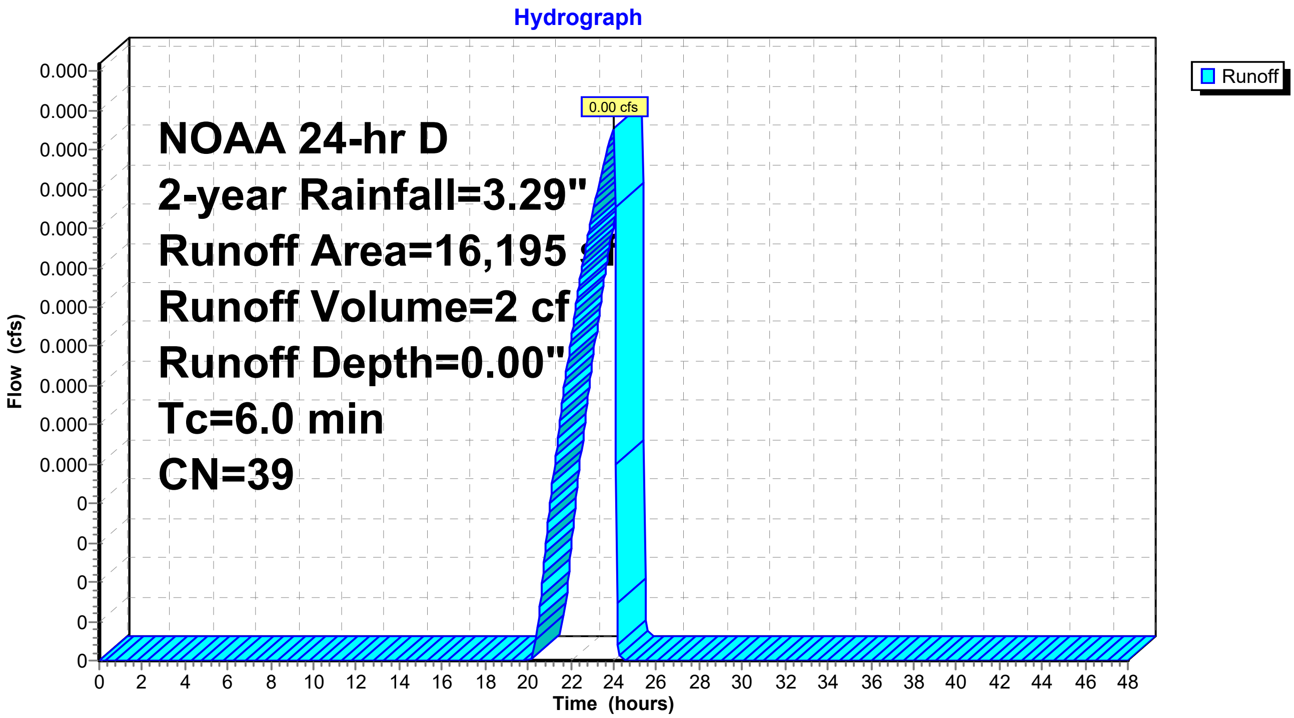
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 2 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
95	98	Paved parking, HSG A
16,100	39	>75% Grass cover, Good, HSG A
16,195	39	Weighted Average
16,100		99.41% Pervious Area
95		0.59% Impervious Area

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

Subcatchment PR-1I: PR-1I



Summary for Subcatchment PR-1J: PR-1J

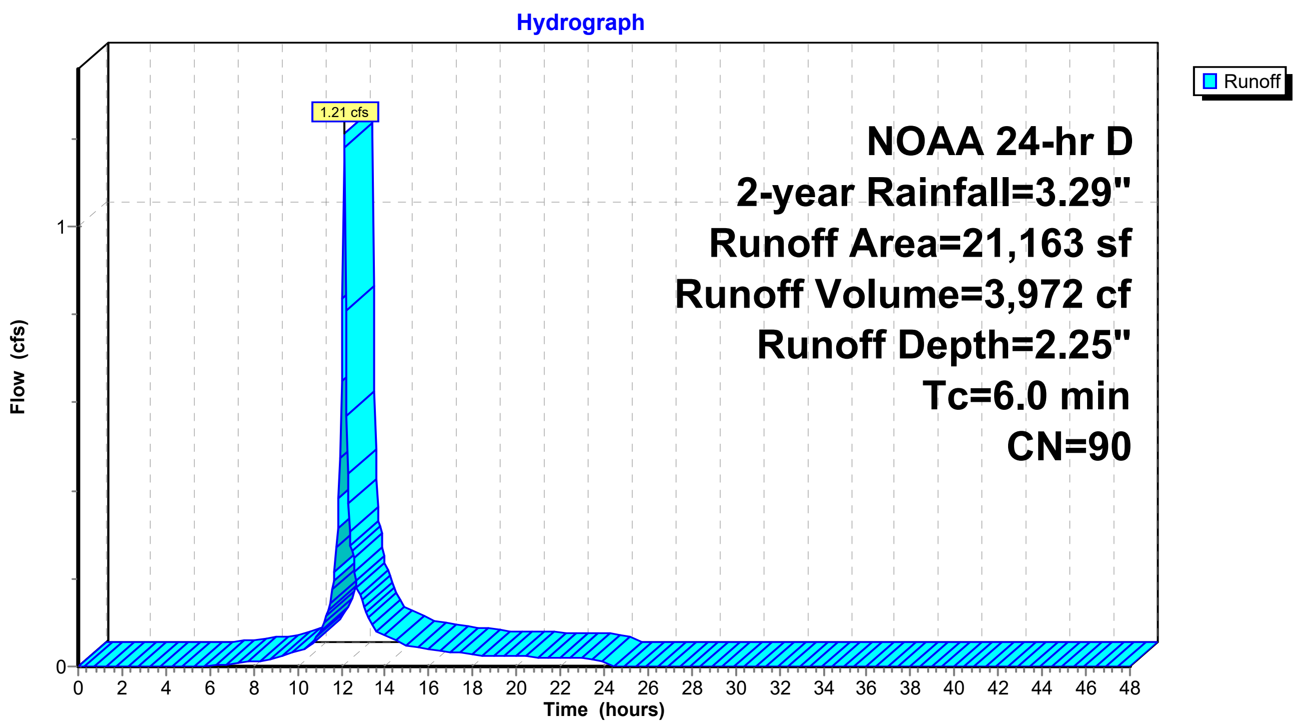
Runoff = 1.21 cfs @ 12.13 hrs, Volume= 3,972 cf, Depth= 2.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
18,160	98	Paved parking, HSG A
3,003	39	>75% Grass cover, Good, HSG A
21,163	90	Weighted Average
3,003		14.19% Pervious Area
18,160		85.81% Impervious Area

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

Subcatchment PR-1J: PR-1J



Summary for Subcatchment PR-1K: PR-1K

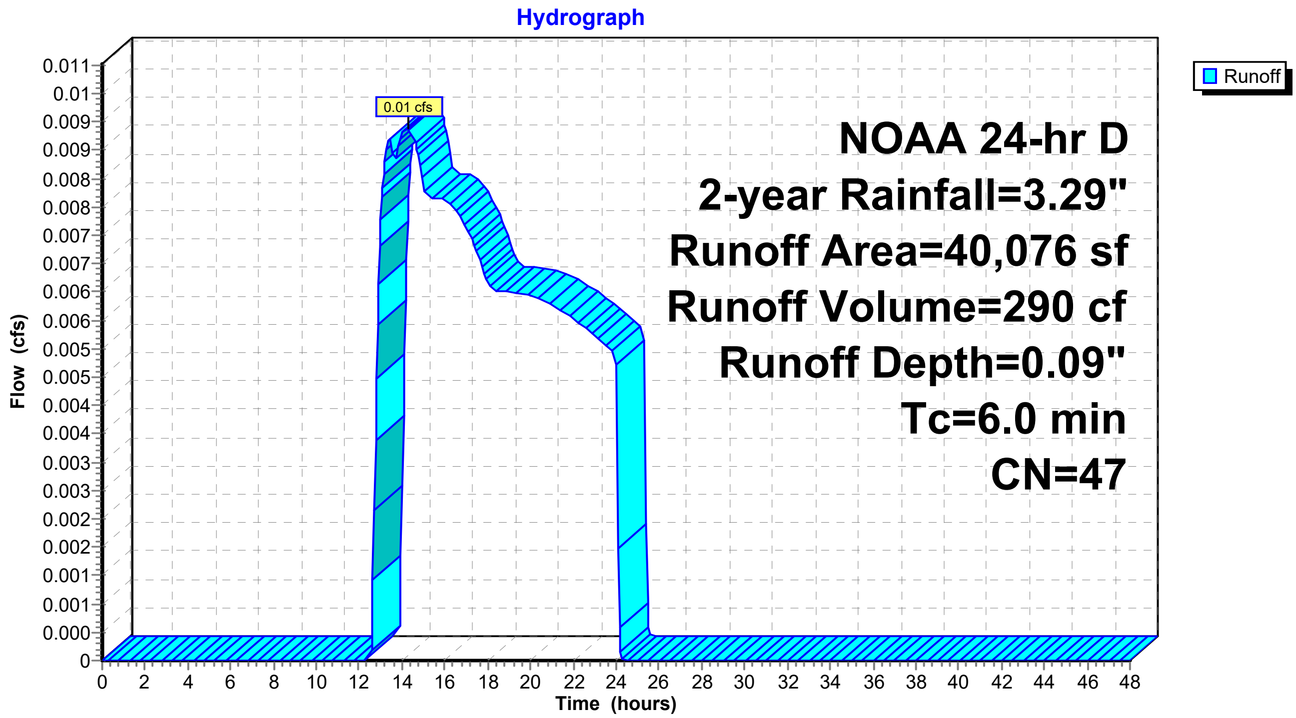
Runoff = 0.01 cfs @ 14.25 hrs, Volume= 290 cf, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
5,537	98	Paved parking, HSG A
34,539	39	>75% Grass cover, Good, HSG A
40,076	47	Weighted Average
34,539		86.18% Pervious Area
5,537		13.82% Impervious Area

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

Subcatchment PR-1K: PR-1K



Summary for Subcatchment PR-1L: PR-1L

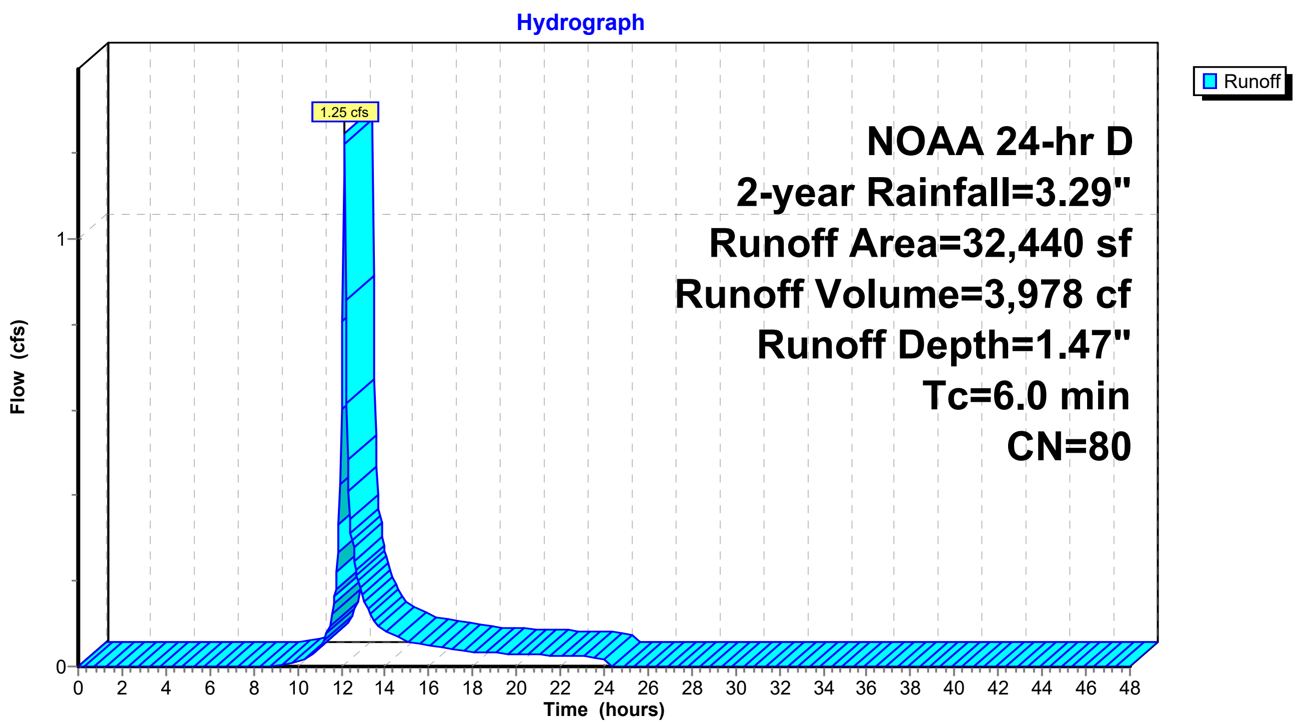
Runoff = 1.25 cfs @ 12.13 hrs, Volume= 3,978 cf, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
22,426	98	Paved parking, HSG A
10,014	39	>75% Grass cover, Good, HSG A
32,440	80	Weighted Average
10,014		30.87% Pervious Area
22,426		69.13% Impervious Area

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

Subcatchment PR-1L: PR-1L



Summary for Subcatchment PR-1M: PR-1M

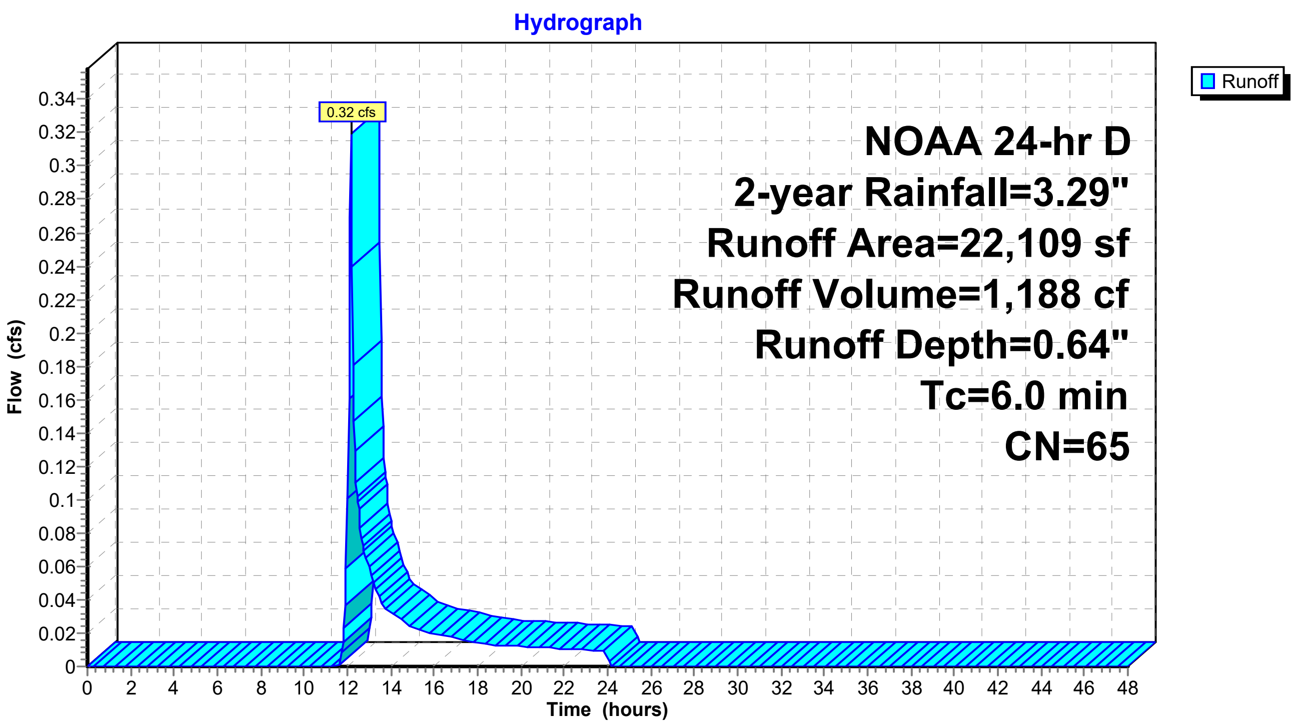
Runoff = 0.32 cfs @ 12.14 hrs, Volume= 1,188 cf, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
9,781	98	Paved parking, HSG A
12,328	39	>75% Grass cover, Good, HSG A
22,109	65	Weighted Average
12,328		55.76% Pervious Area
9,781		44.24% Impervious Area

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

Subcatchment PR-1M: PR-1M



Summary for Subcatchment PR-1N: PR-1N

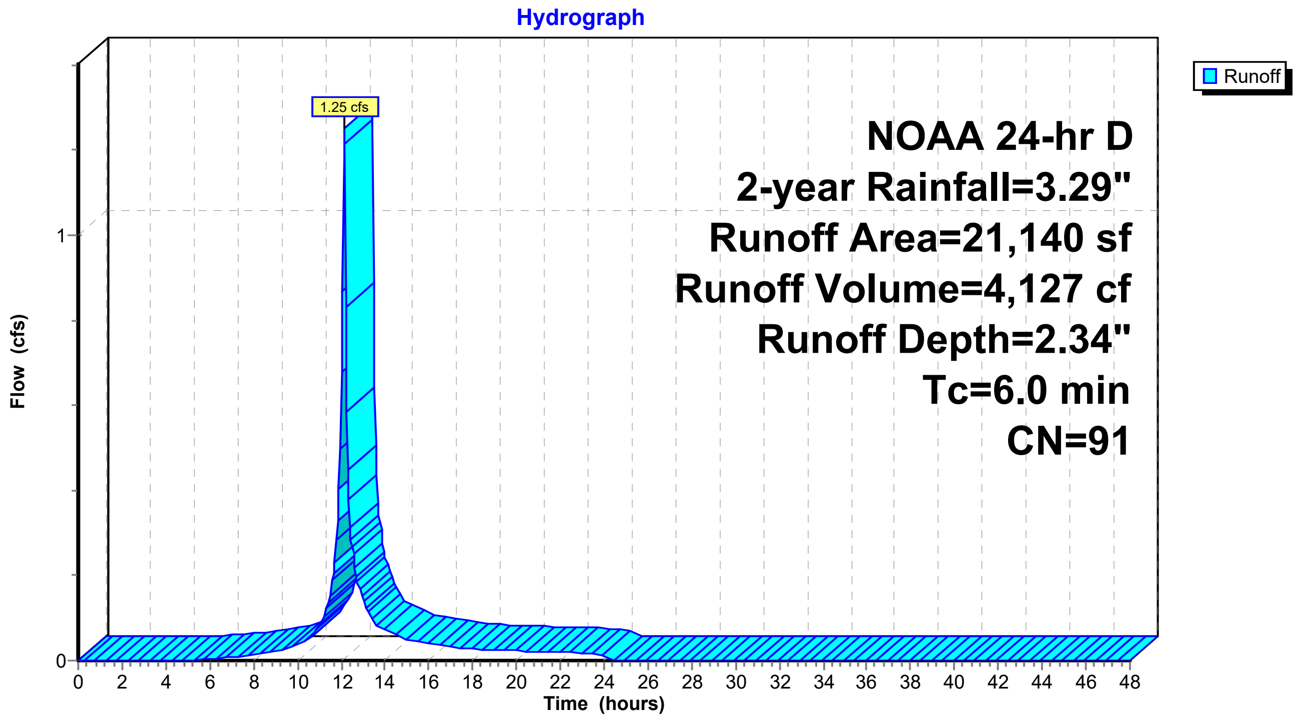
Runoff = 1.25 cfs @ 12.13 hrs, Volume= 4,127 cf, Depth= 2.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
18,490	98	Paved parking, HSG A
2,650	39	>75% Grass cover, Good, HSG A
21,140	91	Weighted Average
2,650		12.54% Pervious Area
18,490		87.46% Impervious Area

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

Subcatchment PR-1N: PR-1N



Summary for Subcatchment PR-1O: PR-1O

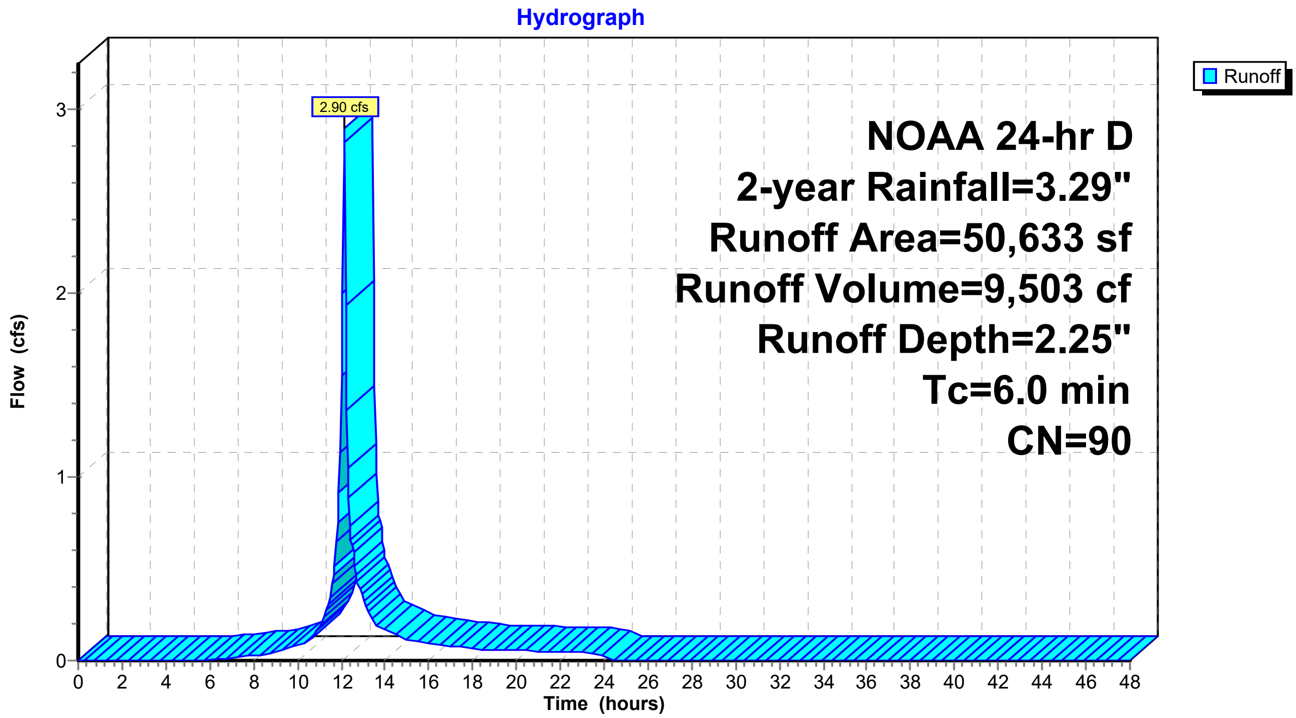
Runoff = 2.90 cfs @ 12.13 hrs, Volume= 9,503 cf, Depth= 2.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
43,450	98	Paved parking, HSG A
7,183	39	>75% Grass cover, Good, HSG A
50,633	90	Weighted Average
7,183		14.19% Pervious Area
43,450		85.81% Impervious Area

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

Subcatchment PR-1O: PR-1O



Summary for Subcatchment PR-1P: PR-1P

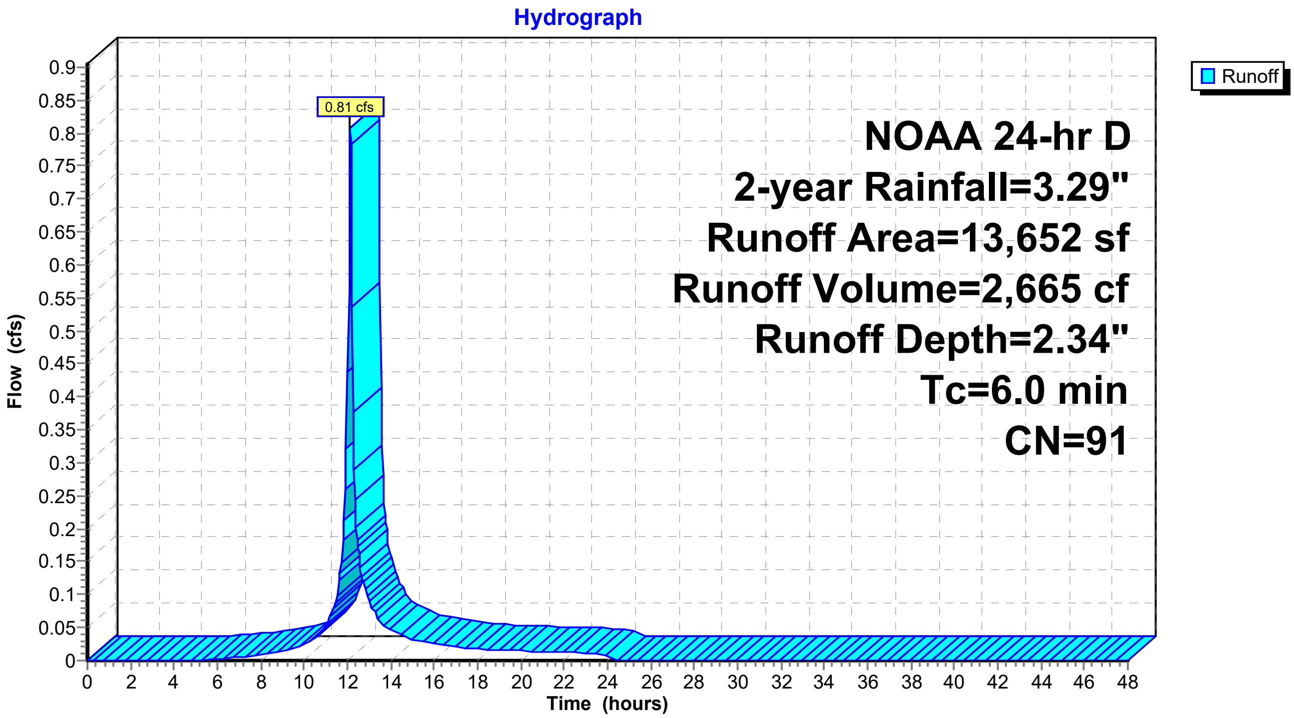
Runoff = 0.81 cfs @ 12.13 hrs, Volume= 2,665 cf, Depth= 2.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
12,120	98	Paved parking, HSG A
1,532	39	>75% Grass cover, Good, HSG A
13,652	91	Weighted Average
1,532		11.22% Pervious Area
12,120		88.78% Impervious Area

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

Subcatchment PR-1P: PR-1P



Summary for Subcatchment PR-1Q: PR-1Q

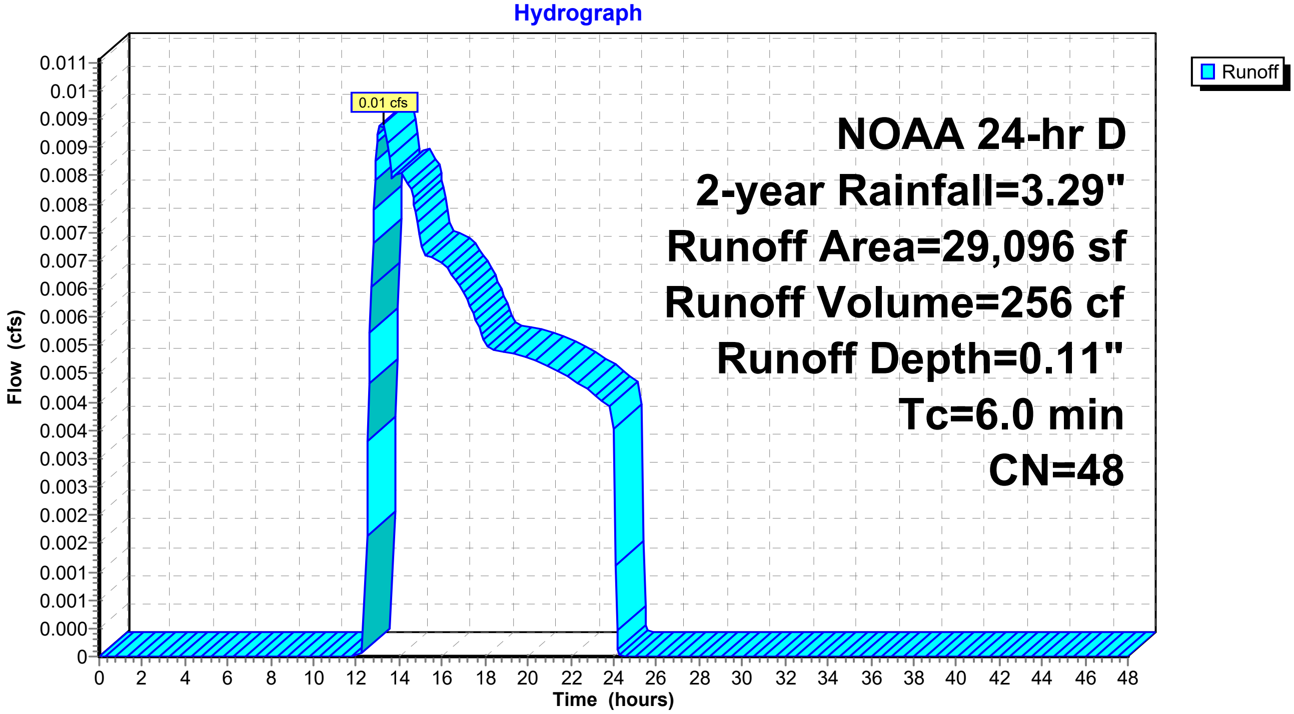
Runoff = 0.01 cfs @ 13.25 hrs, Volume= 256 cf, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
4,261	98	Paved parking, HSG A
24,835	39	>75% Grass cover, Good, HSG A
29,096	48	Weighted Average
24,835		85.36% Pervious Area
4,261		14.64% Impervious Area

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

Subcatchment PR-1Q: PR-1Q



Summary for Subcatchment PR-1R: PR-1R

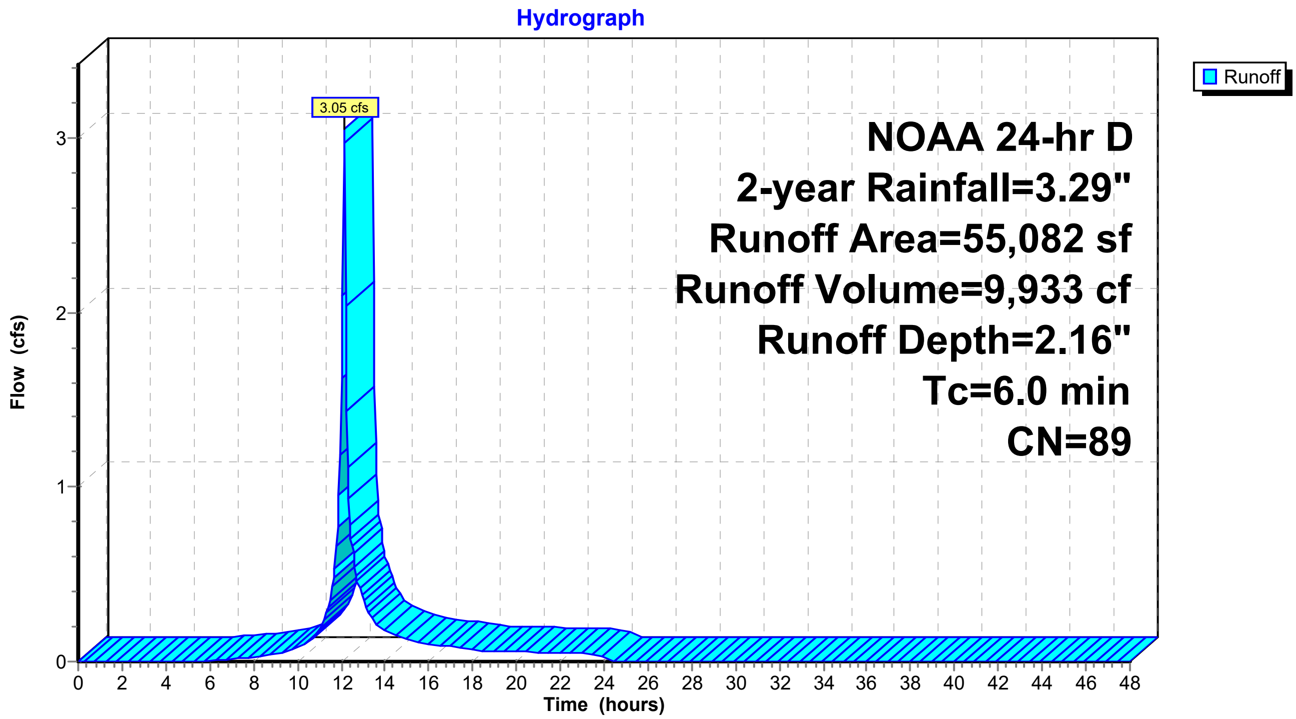
Runoff = 3.05 cfs @ 12.13 hrs, Volume= 9,933 cf, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
35,043	98	Paved parking, HSG A
8,733	39	>75% Grass cover, Good, HSG A
11,306	98	Unconnected roofs, HSG A
55,082	89	Weighted Average
8,733		15.85% Pervious Area
46,349		84.15% Impervious Area
11,306		24.39% Unconnected

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

Subcatchment PR-1R: PR-1R



Summary for Subcatchment PR-1S: PR-1S

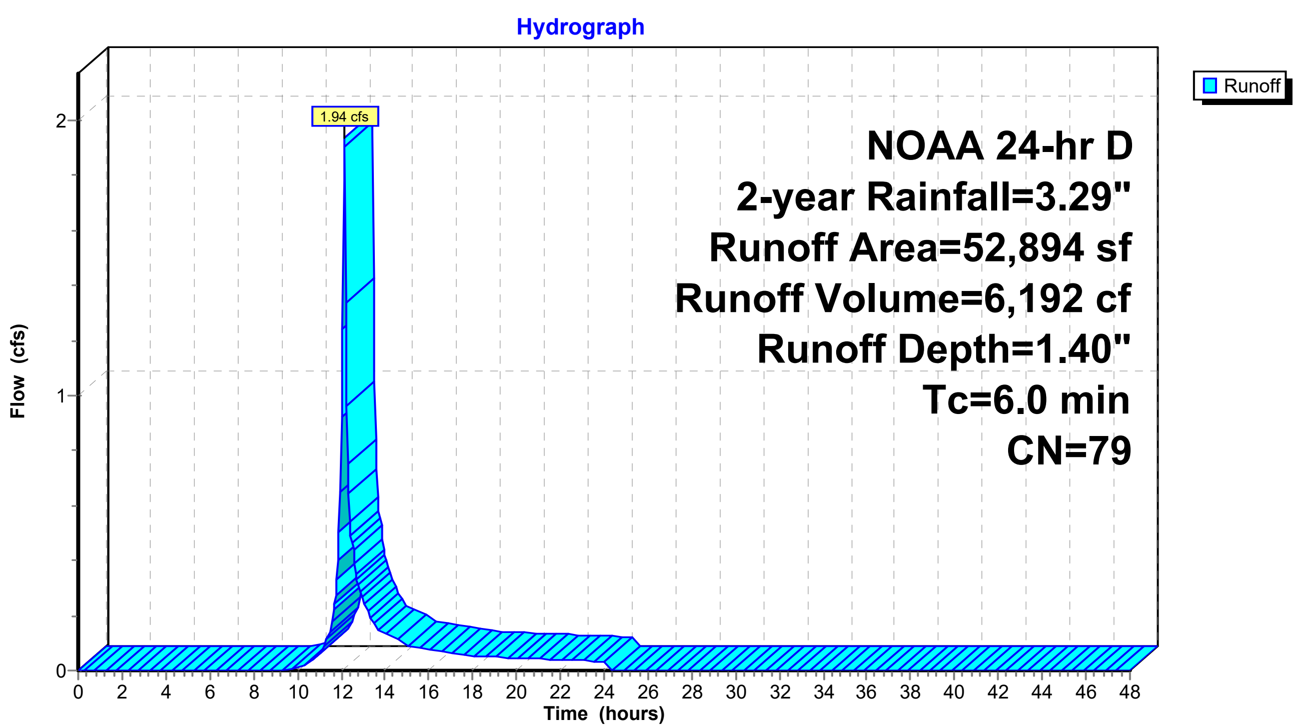
Runoff = 1.94 cfs @ 12.13 hrs, Volume= 6,192 cf, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
35,565	98	Paved parking, HSG A
17,329	39	>75% Grass cover, Good, HSG A
52,894	79	Weighted Average
17,329		32.76% Pervious Area
35,565		67.24% Impervious Area

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

Subcatchment PR-1S: PR-1S



Summary for Subcatchment PR-1U: PR-1U

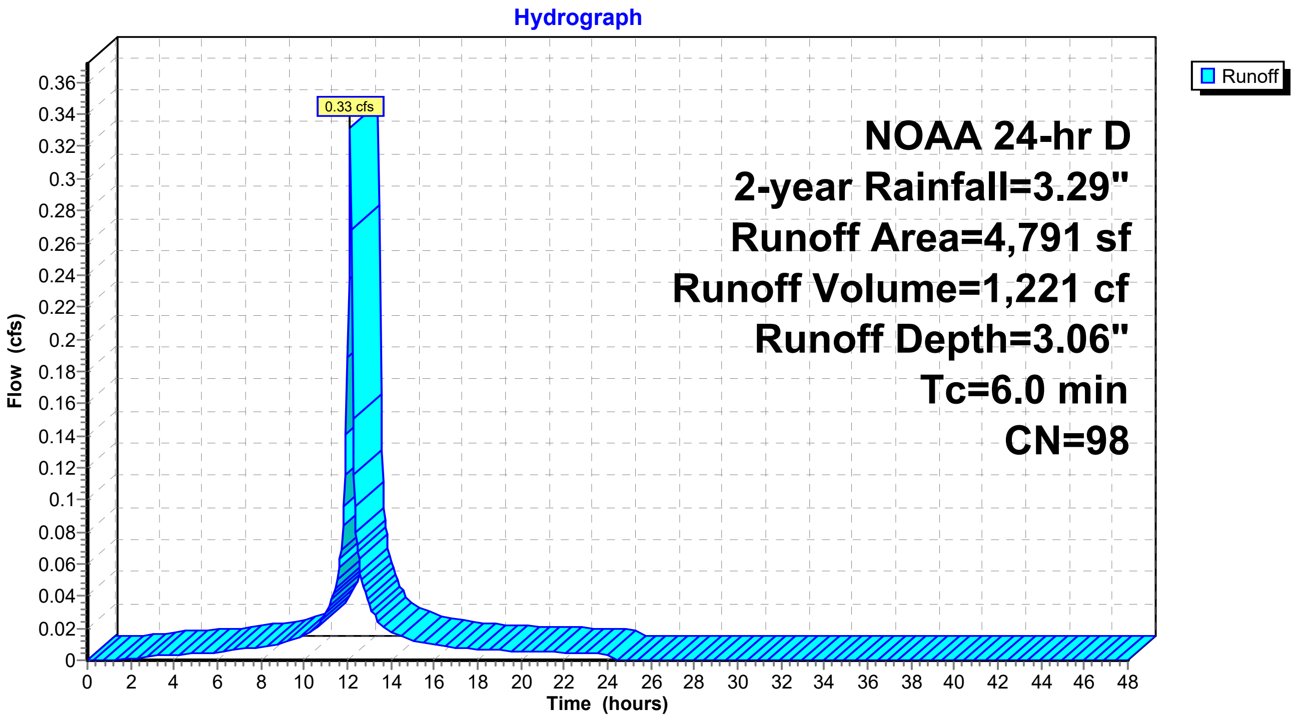
Runoff = 0.33 cfs @ 12.13 hrs, Volume= 1,221 cf, Depth= 3.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
4,791	98	Paved parking, HSG A
4,791		100.00% Impervious Area

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

Subcatchment PR-1U: PR-1U



Summary for Subcatchment PR-1V: PR-1V

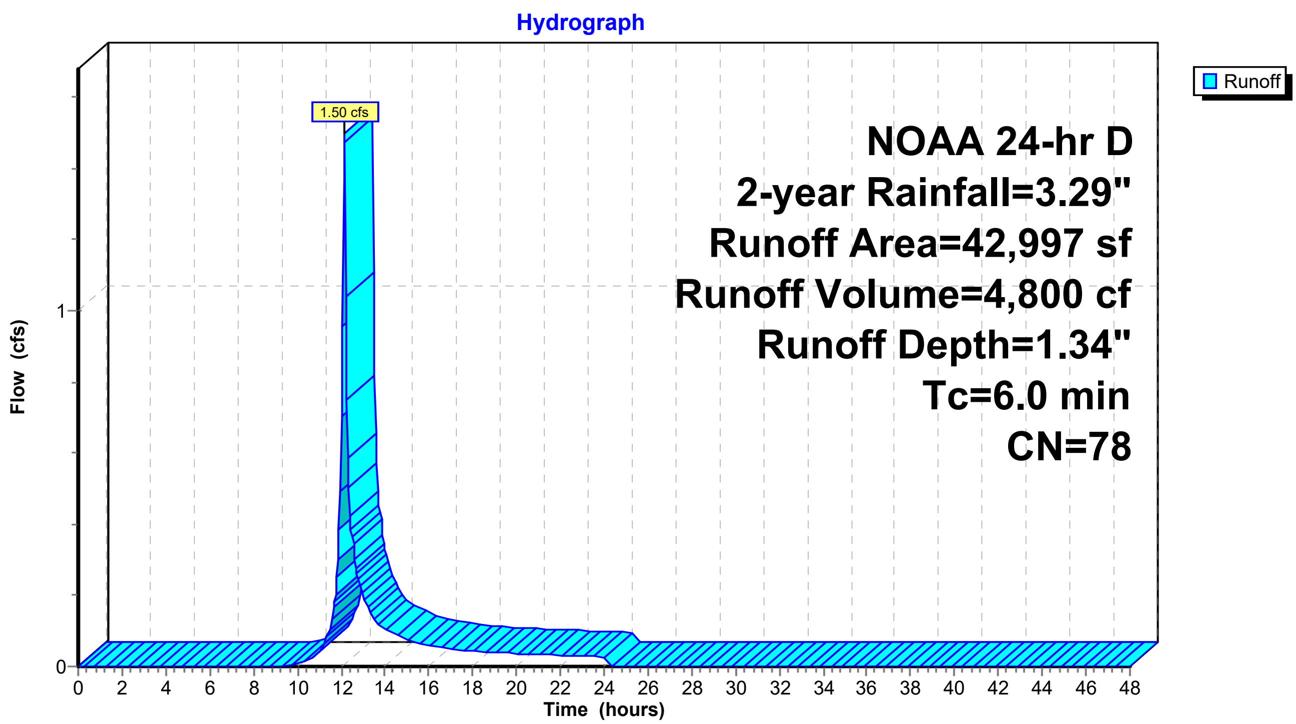
Runoff = 1.50 cfs @ 12.13 hrs, Volume= 4,800 cf, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
28,362	98	Paved parking, HSG A
14,635	39	>75% Grass cover, Good, HSG A
42,997	78	Weighted Average
14,635		34.04% Pervious Area
28,362		65.96% Impervious Area

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

Subcatchment PR-1V: PR-1V



Summary for Subcatchment PR-2A: PR-2A

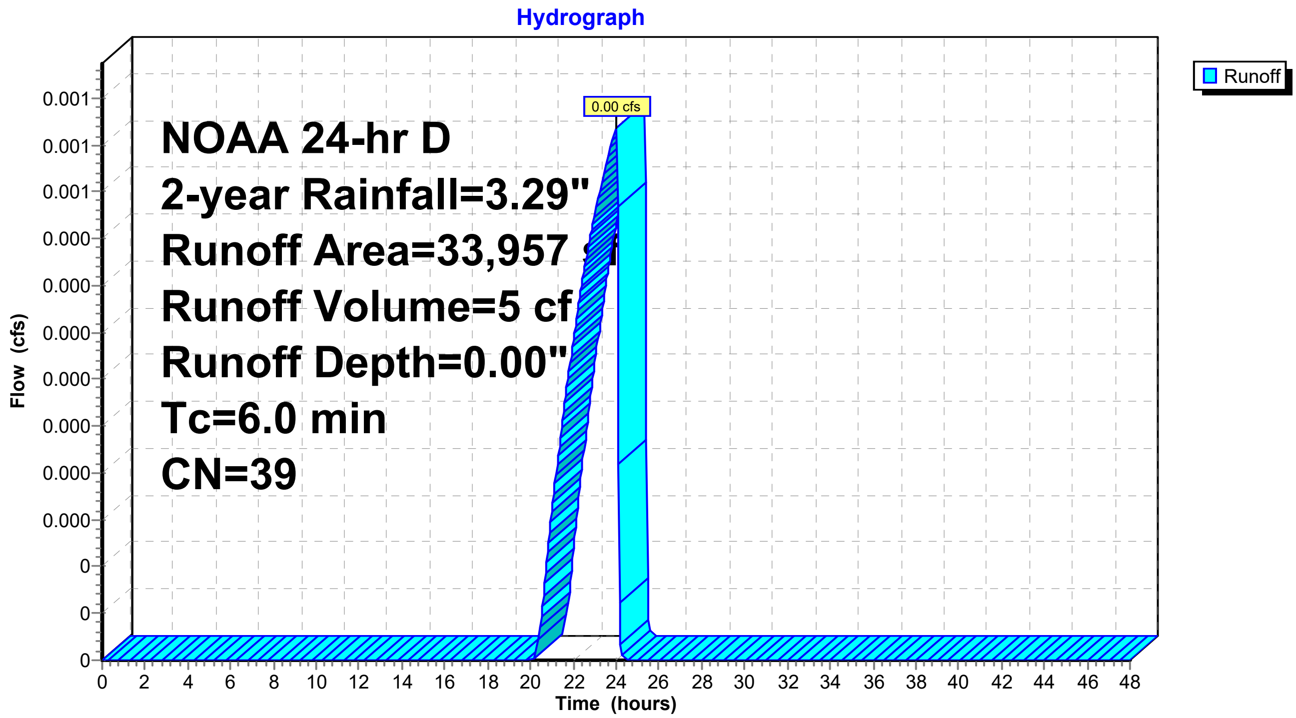
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 5 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
33,957	39	>75% Grass cover, Good, HSG A
33,957		100.00% Pervious Area

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

Subcatchment PR-2A: PR-2A



Summary for Subcatchment PR-2B: PR-2B

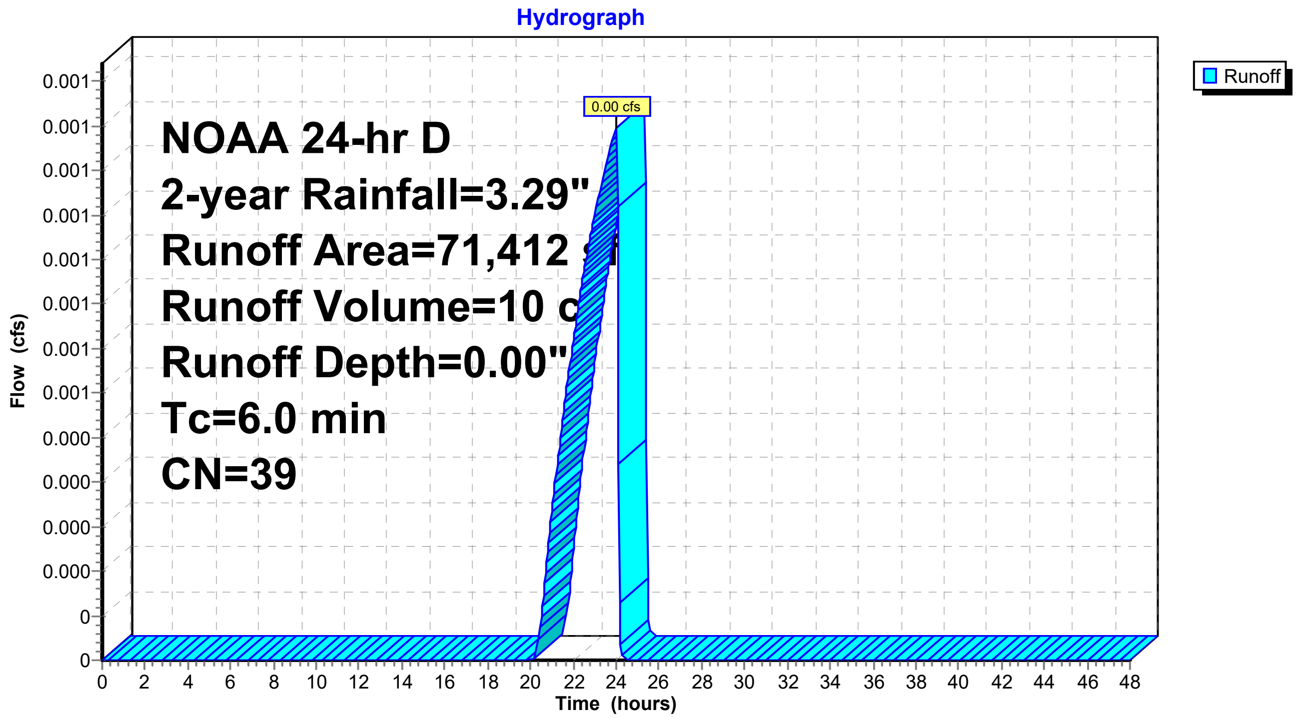
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 10 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
71,412	39	>75% Grass cover, Good, HSG A
71,412		100.00% Pervious Area

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

Subcatchment PR-2B: PR-2B



Summary for Subcatchment PR-2C: PR-2C

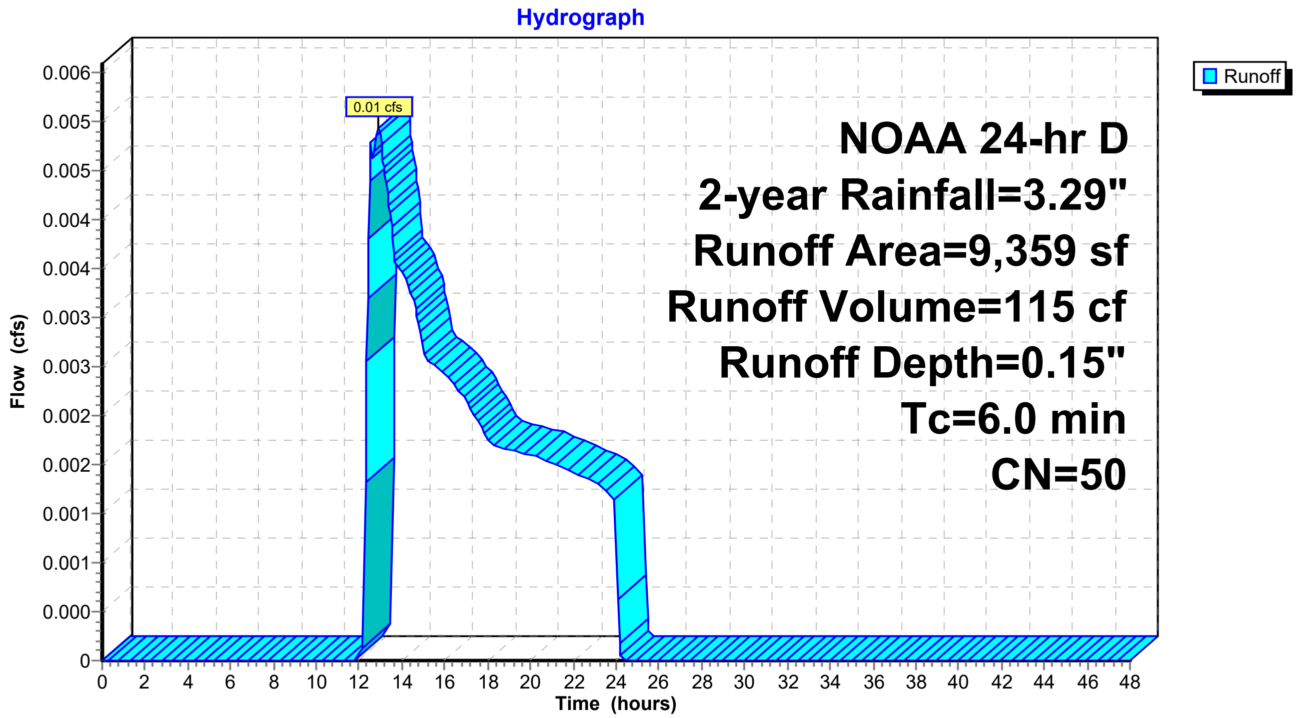
Runoff = 0.01 cfs @ 12.86 hrs, Volume= 115 cf, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
1,683	98	Paved parking, HSG A
7,676	39	>75% Grass cover, Good, HSG A
9,359	50	Weighted Average
7,676		82.02% Pervious Area
1,683		17.98% Impervious Area

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

Subcatchment PR-2C: PR-2C



Summary for Subcatchment PR-2D: PR-2D

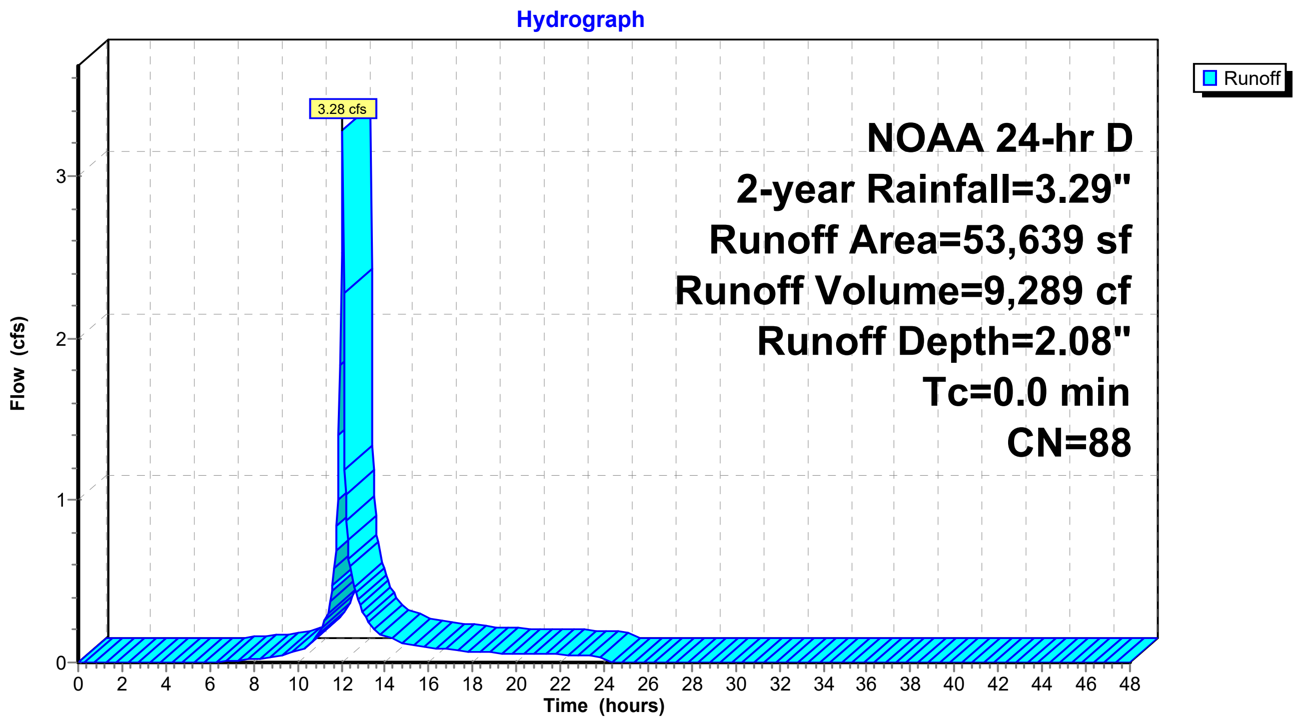
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 3.28 cfs @ 12.05 hrs, Volume= 9,289 cf, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
44,403	98	Paved parking, HSG A
9,236	39	>75% Grass cover, Good, HSG A
53,639	88	Weighted Average
9,236		17.22% Pervious Area
44,403		82.78% Impervious Area

Subcatchment PR-2D: PR-2D



Summary for Subcatchment PR-2E: PR-2E

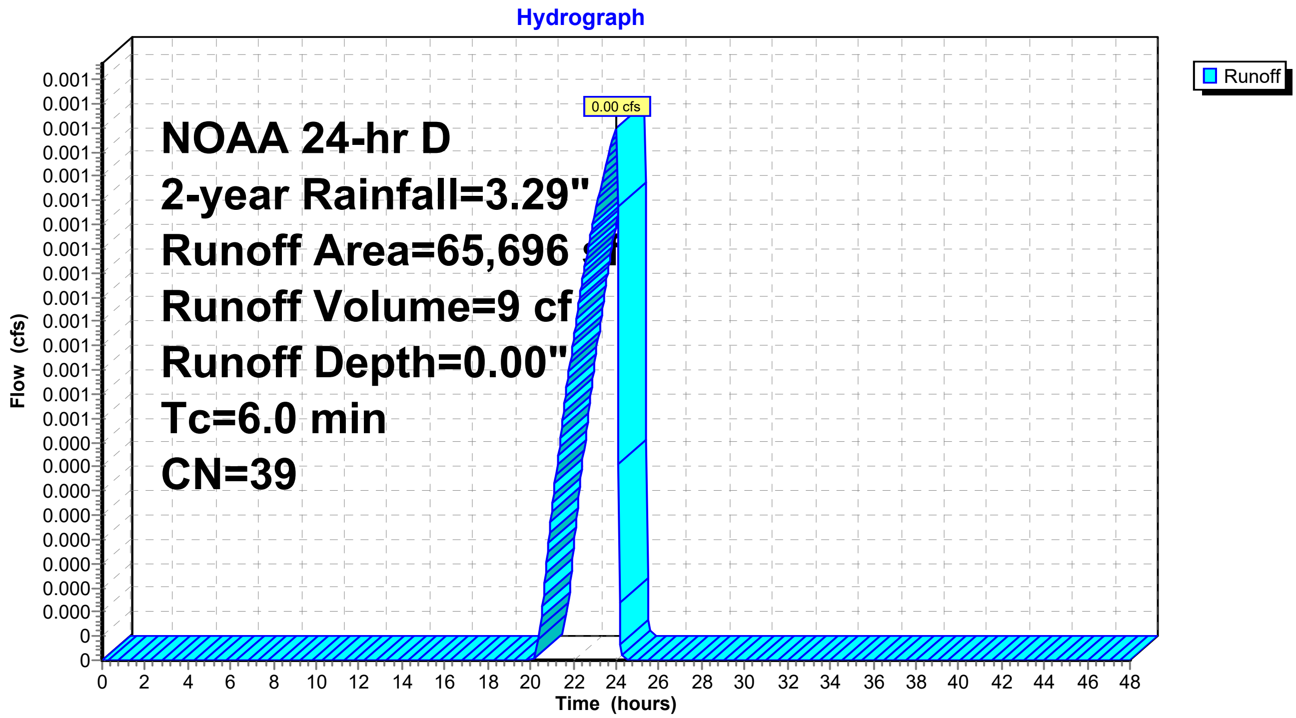
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 9 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
65,696	39	>75% Grass cover, Good, HSG A
65,696		100.00% Pervious Area

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

Subcatchment PR-2E: PR-2E



Summary for Subcatchment PR-2F: PR-2F

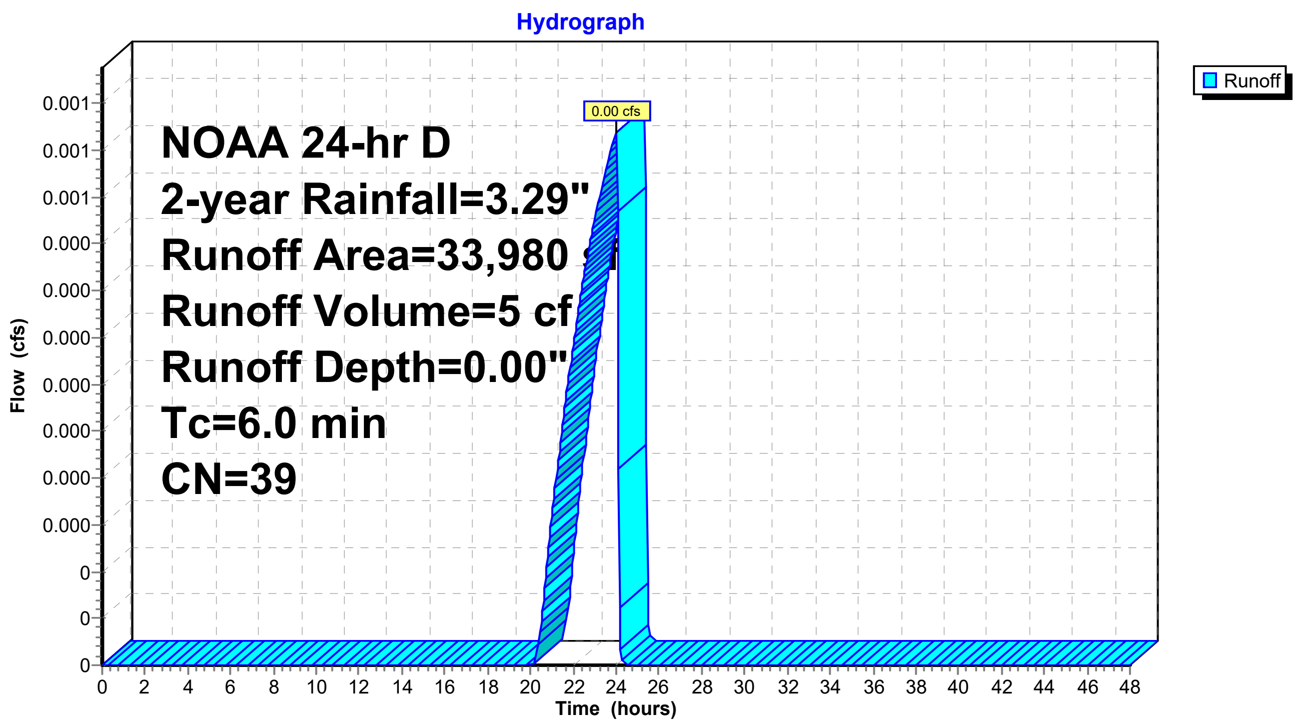
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 5 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
33,980	39	>75% Grass cover, Good, HSG A
33,980		100.00% Pervious Area

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

Subcatchment PR-2F: PR-2F



Summary for Subcatchment PR-2G: PR-2G

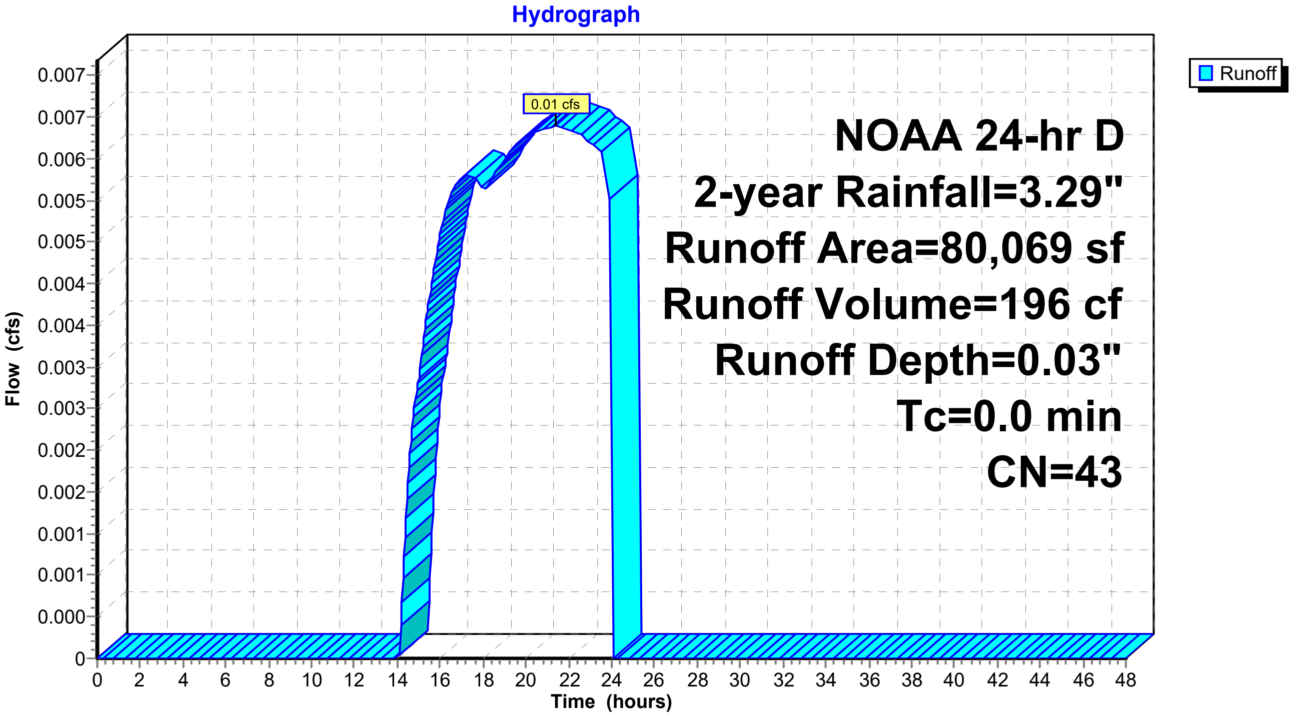
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.01 cfs @ 21.35 hrs, Volume= 196 cf, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
5,874	98	Paved parking, HSG A
74,195	39	>75% Grass cover, Good, HSG A
80,069	43	Weighted Average
74,195		92.66% Pervious Area
5,874		7.34% Impervious Area

Subcatchment PR-2G: PR-2G



Summary for Subcatchment PR-2H: PR-2H

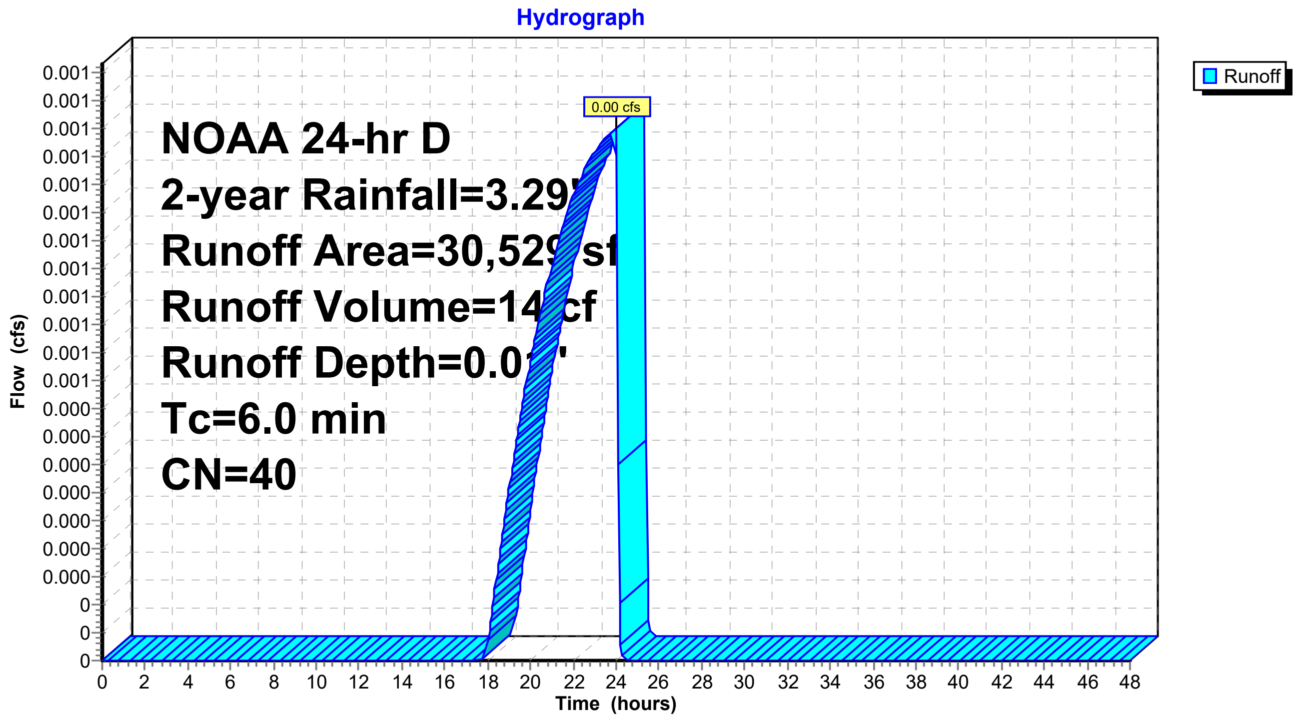
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 14 cf, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
453	98	Paved parking, HSG A
30,076	39	>75% Grass cover, Good, HSG A
30,529	40	Weighted Average
30,076		98.52% Pervious Area
453		1.48% Impervious Area

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

Subcatchment PR-2H: PR-2H



Summary for Subcatchment PR-3A: PR-3A

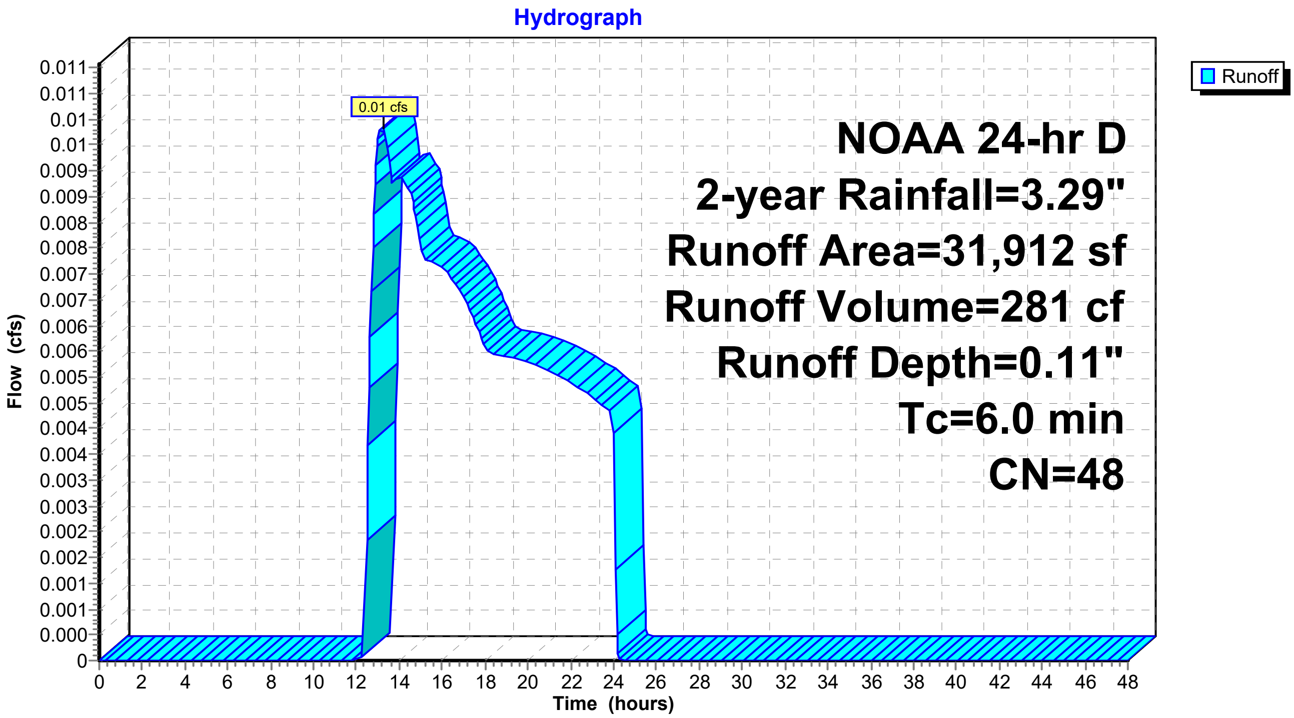
Runoff = 0.01 cfs @ 13.25 hrs, Volume= 281 cf, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
4,890	98	Paved parking, HSG A
27,022	39	>75% Grass cover, Good, HSG A
31,912	48	Weighted Average
27,022		84.68% Pervious Area
4,890		15.32% Impervious Area

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

Subcatchment PR-3A: PR-3A



Summary for Subcatchment PR-3B: PR-3B

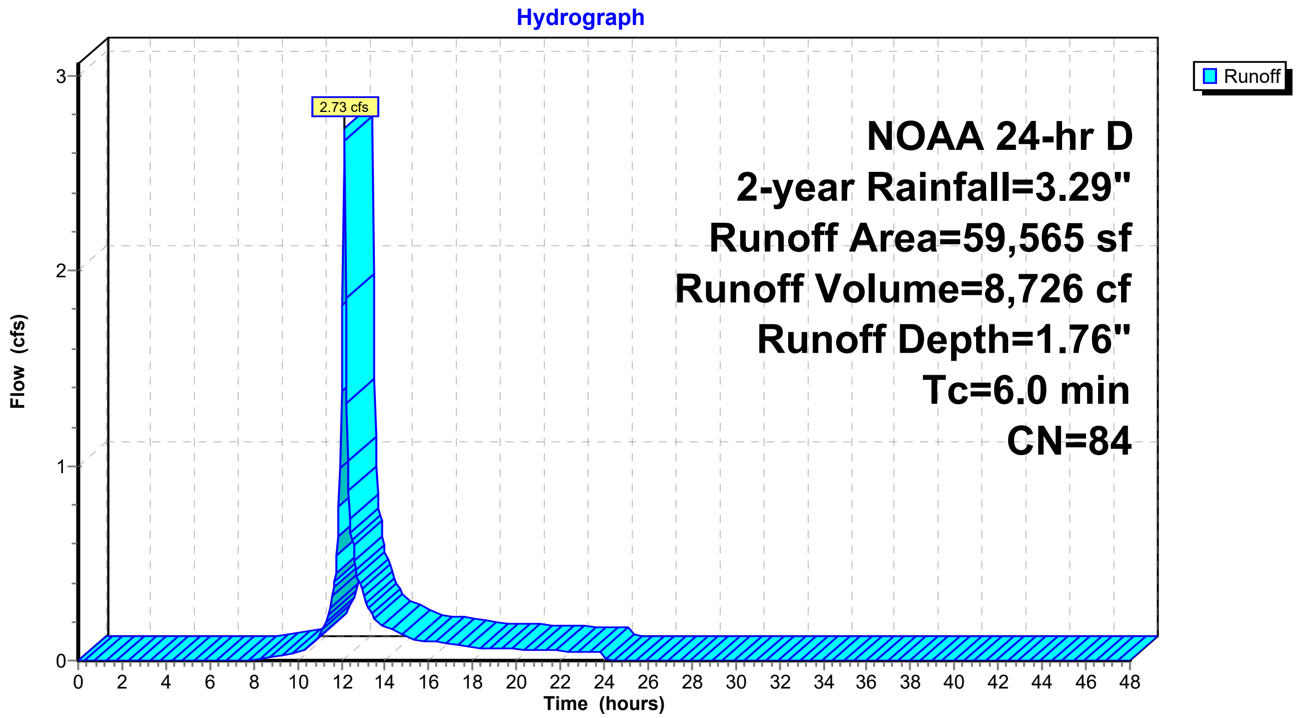
Runoff = 2.73 cfs @ 12.13 hrs, Volume= 8,726 cf, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
45,006	98	Paved parking, HSG A
14,559	39	>75% Grass cover, Good, HSG A
59,565	84	Weighted Average
14,559		24.44% Pervious Area
45,006		75.56% Impervious Area

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

Subcatchment PR-3B: PR-3B



Summary for Subcatchment PR-3C: PR-3C

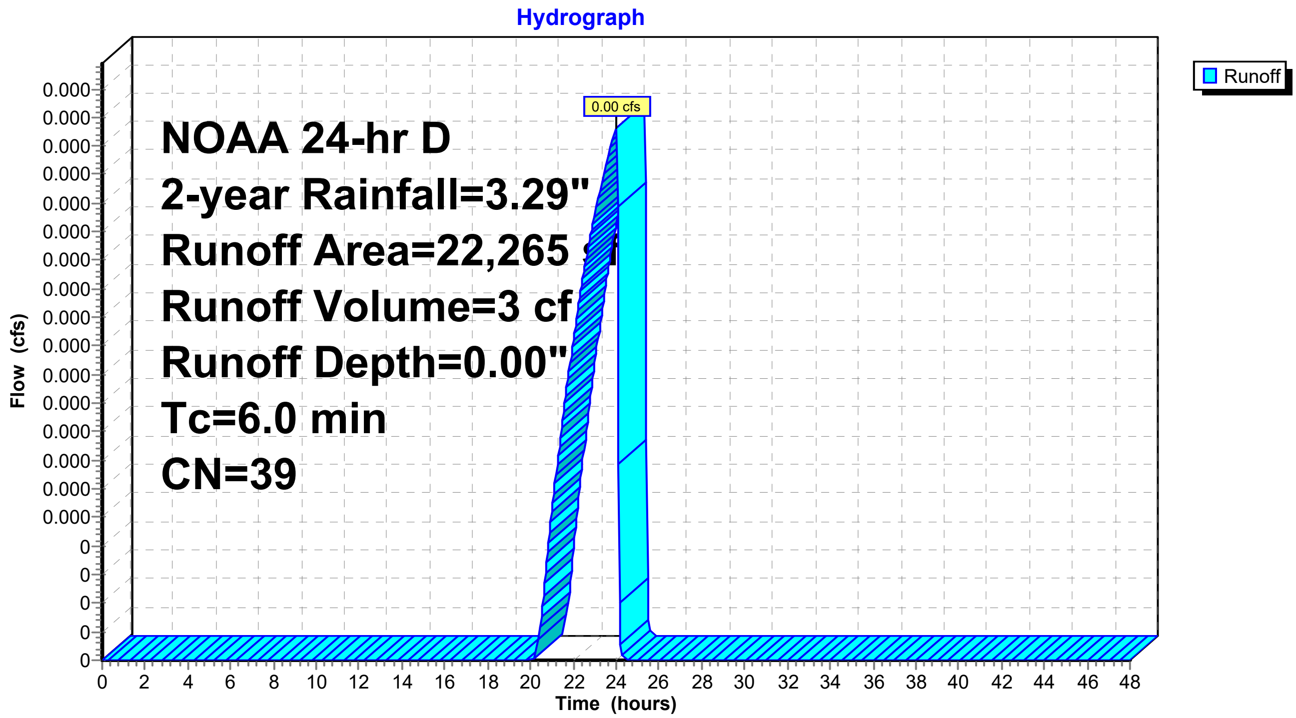
Runoff = 0.00 cfs @ 24.00 hrs, Volume= 3 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2-year Rainfall=3.29"

Area (sf)	CN	Description
22,265	39	>75% Grass cover, Good, HSG A
22,265		100.00% Pervious Area

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

Subcatchment PR-3C: PR-3C



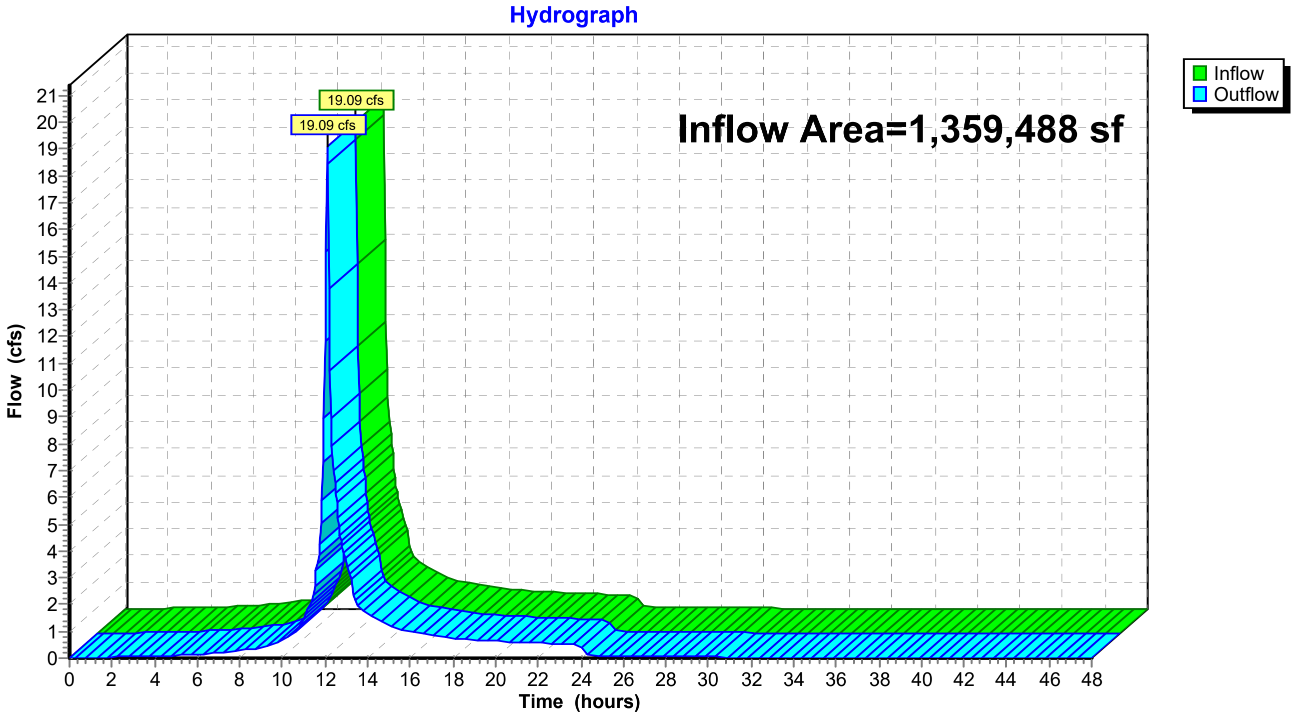
Summary for Reach DP-1: DP-1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,359,488 sf, 43.90% Impervious, Inflow Depth > 0.79" for 2-year event
Inflow = 19.09 cfs @ 12.12 hrs, Volume= 89,999 cf
Outflow = 19.09 cfs @ 12.12 hrs, Volume= 89,999 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-1: DP-1

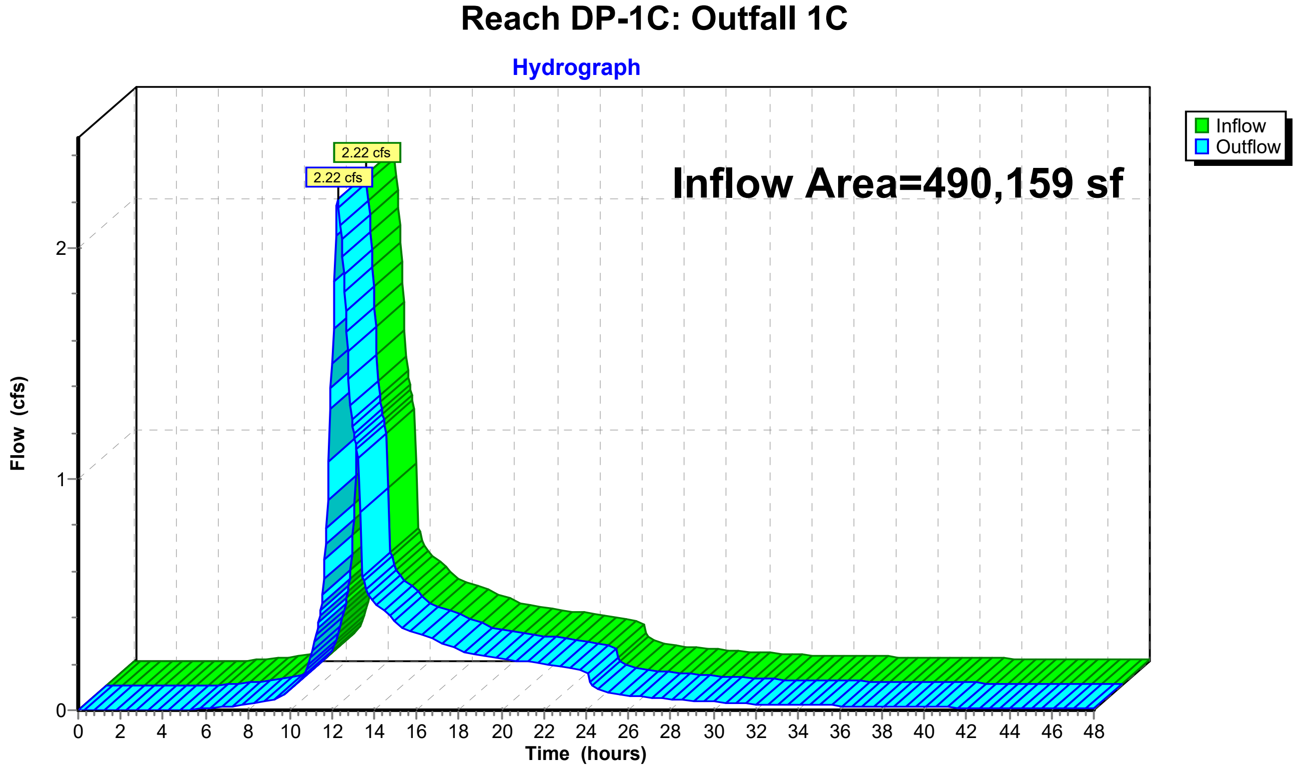


Summary for Reach DP-1C: Outfall 1C

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 490,159 sf, 53.24% Impervious, Inflow Depth > 0.59" for 2-year event
Inflow = 2.22 cfs @ 12.26 hrs, Volume= 23,981 cf
Outflow = 2.22 cfs @ 12.26 hrs, Volume= 23,981 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



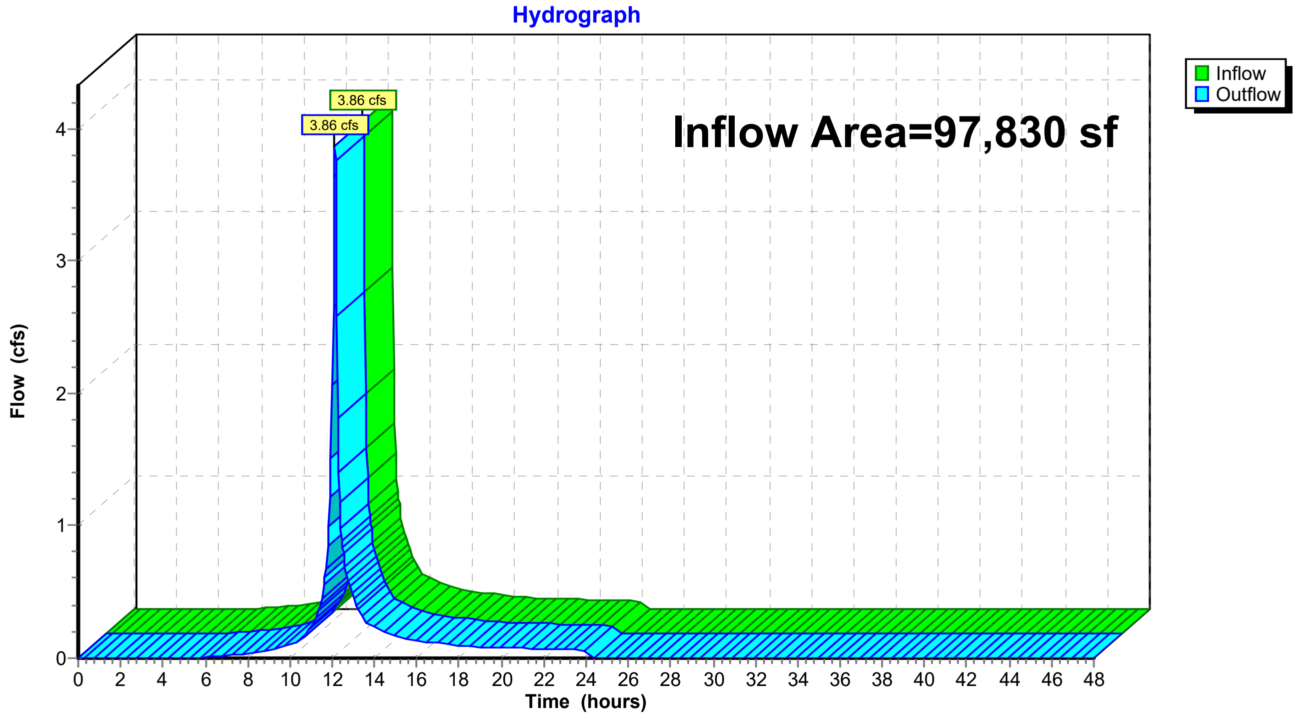
Summary for Reach DP-1D: Outfall 1D

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 97,830 sf, 64.12% Impervious, Inflow Depth = 1.58" for 2-year event
Inflow = 3.86 cfs @ 12.13 hrs, Volume= 12,854 cf
Outflow = 3.86 cfs @ 12.13 hrs, Volume= 12,854 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-1D: Outfall 1D



Summary for Reach DP-2: DP-2

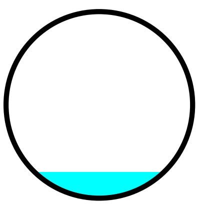
[52] Hint: Inlet/Outlet conditions not evaluated

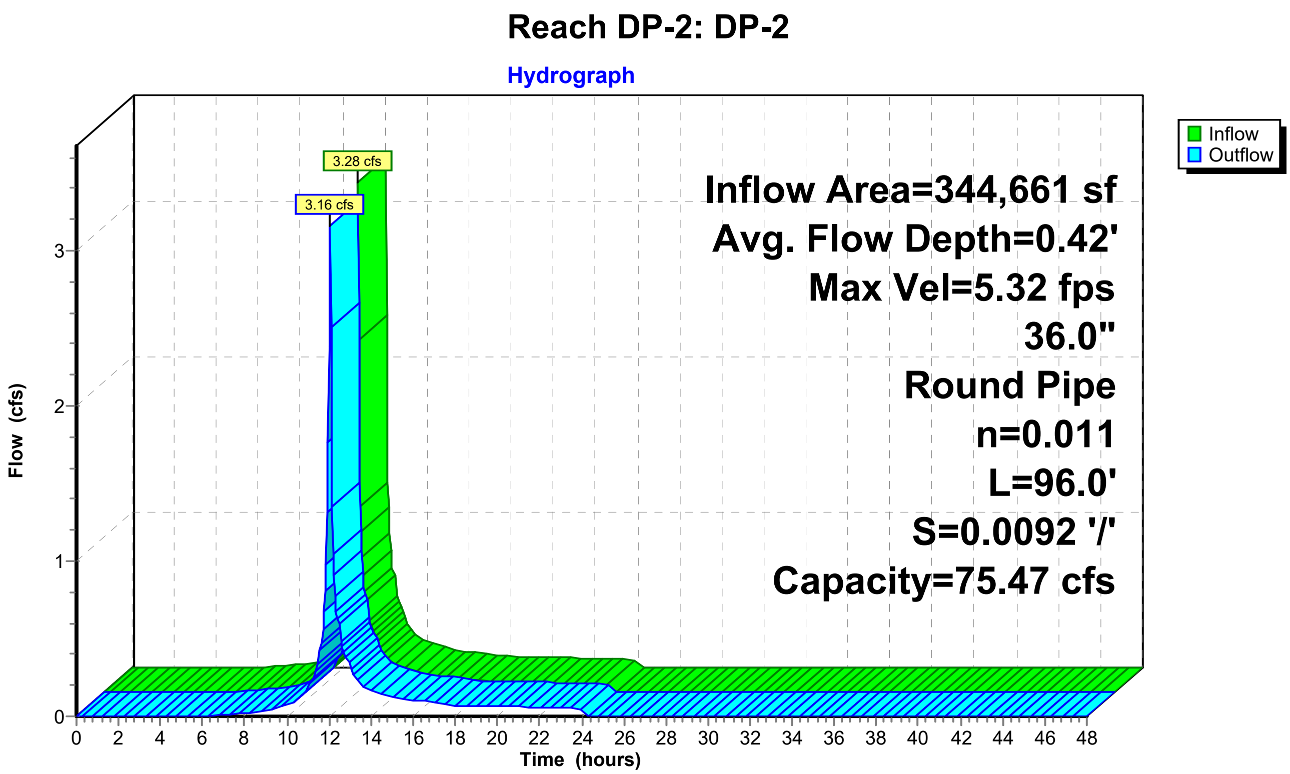
Inflow Area = 344,661 sf, 15.21% Impervious, Inflow Depth = 0.34" for 2-year event
Inflow = 3.28 cfs @ 12.05 hrs, Volume= 9,637 cf
Outflow = 3.16 cfs @ 12.05 hrs, Volume= 9,637 cf, Atten= 4%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.32 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.81 fps, Avg. Travel Time= 0.9 min

Peak Storage= 58 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 75.47 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 96.0' Slope= 0.0092 '/'
Inlet Invert= 16.00', Outlet Invert= 15.12'





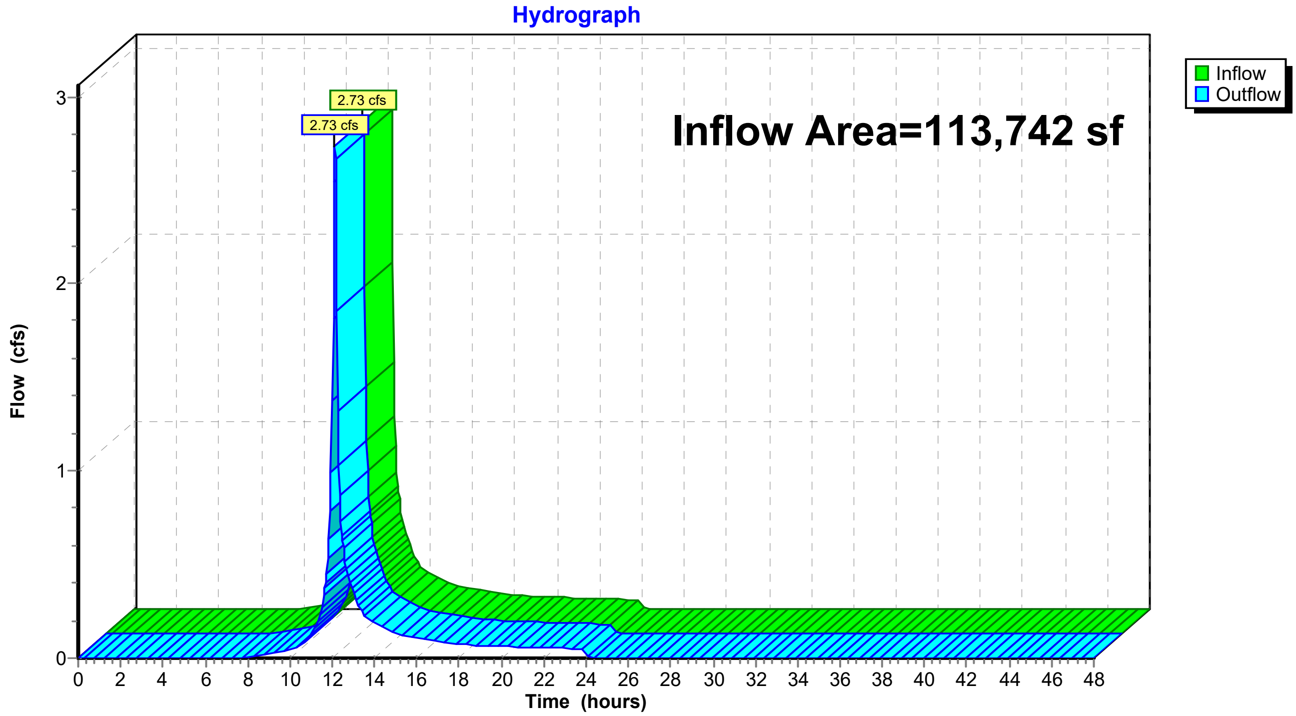
Summary for Reach DP-3: DP-3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 113,742 sf, 43.87% Impervious, Inflow Depth = 0.95" for 2-year event
Inflow = 2.73 cfs @ 12.13 hrs, Volume= 9,010 cf
Outflow = 2.73 cfs @ 12.13 hrs, Volume= 9,010 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-3: DP-3

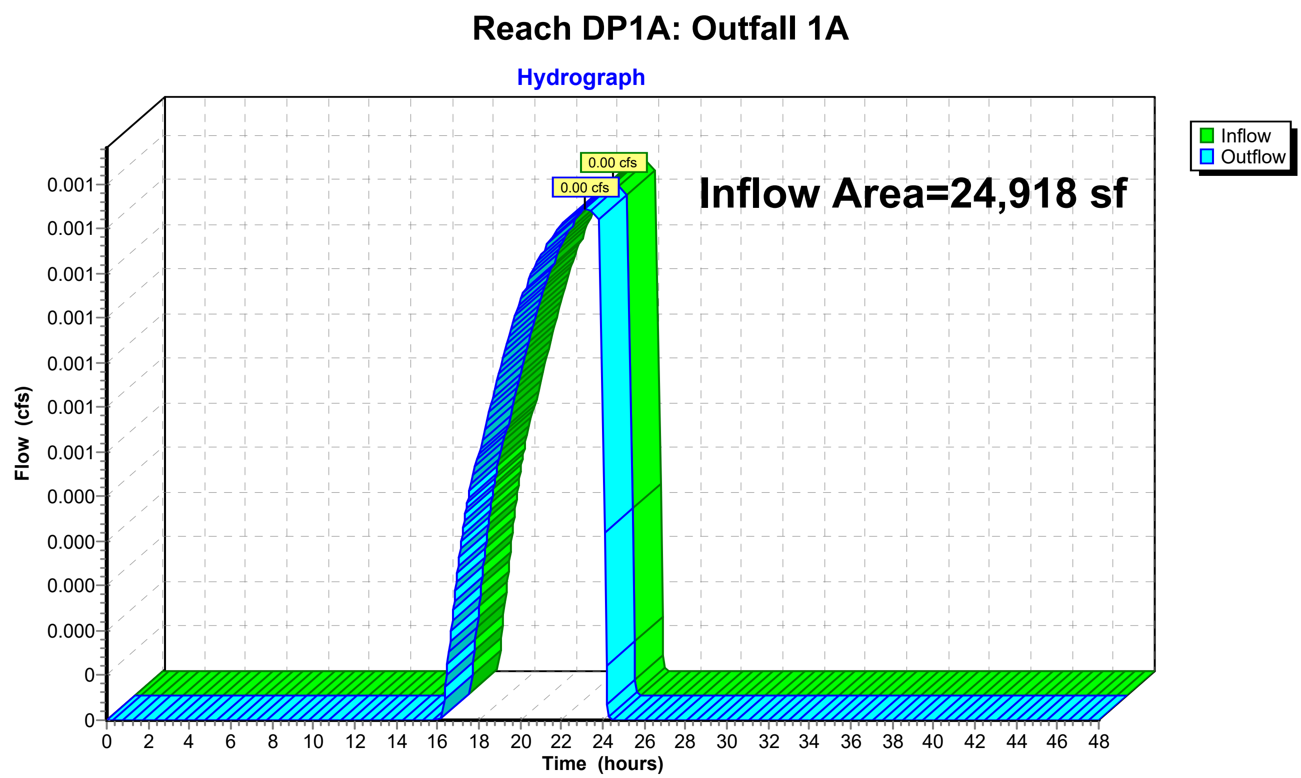


Summary for Reach DP1A: Outfall 1A

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	24,918 sf,	3.36% Impervious,	Inflow Depth = 0.01"	for 2-year event
Inflow =	0.00 cfs @	23.15 hrs, Volume=	24 cf	
Outflow =	0.00 cfs @	23.15 hrs, Volume=	24 cf, Atten= 0%, Lag= 0.0 min	

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

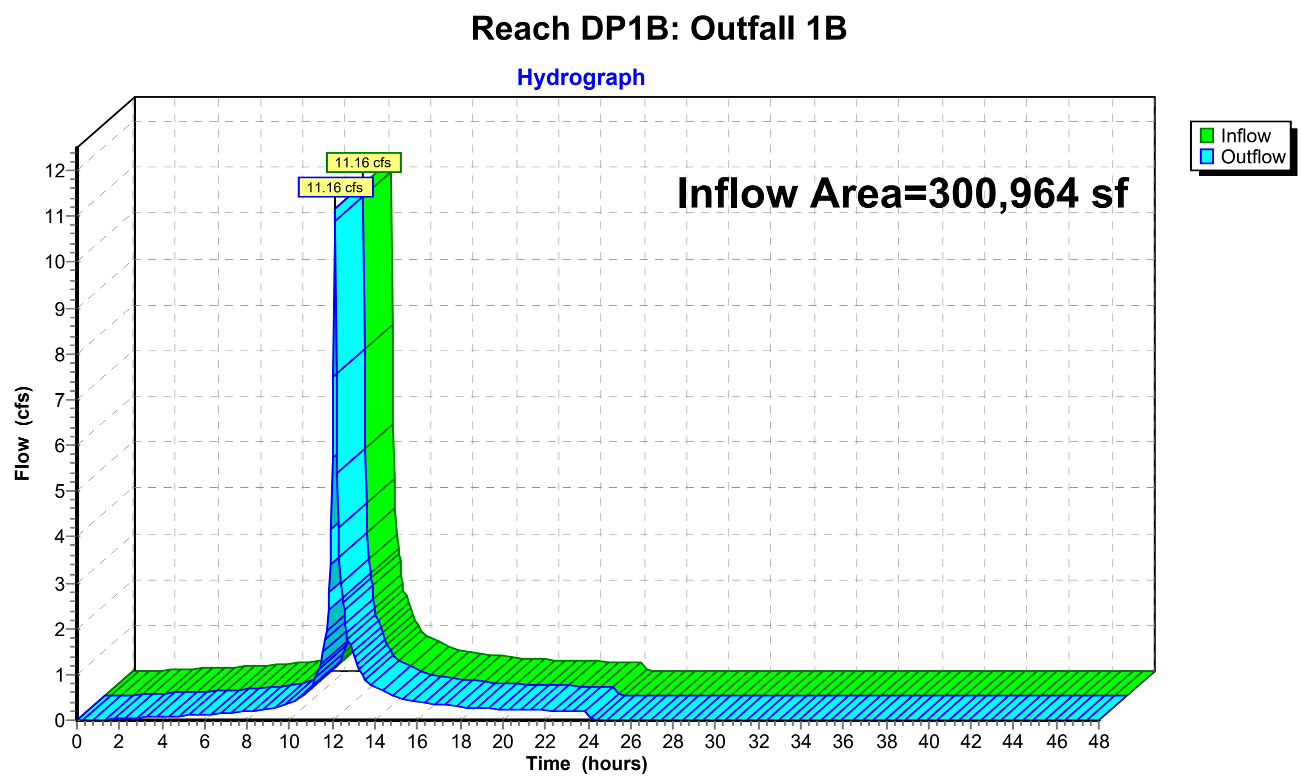


Summary for Reach DP1B: Outfall 1B

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 300,964 sf, 66.36% Impervious, Inflow Depth = 1.63" for 2-year event
Inflow = 11.16 cfs @ 12.13 hrs, Volume= 40,799 cf
Outflow = 11.16 cfs @ 12.13 hrs, Volume= 40,799 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



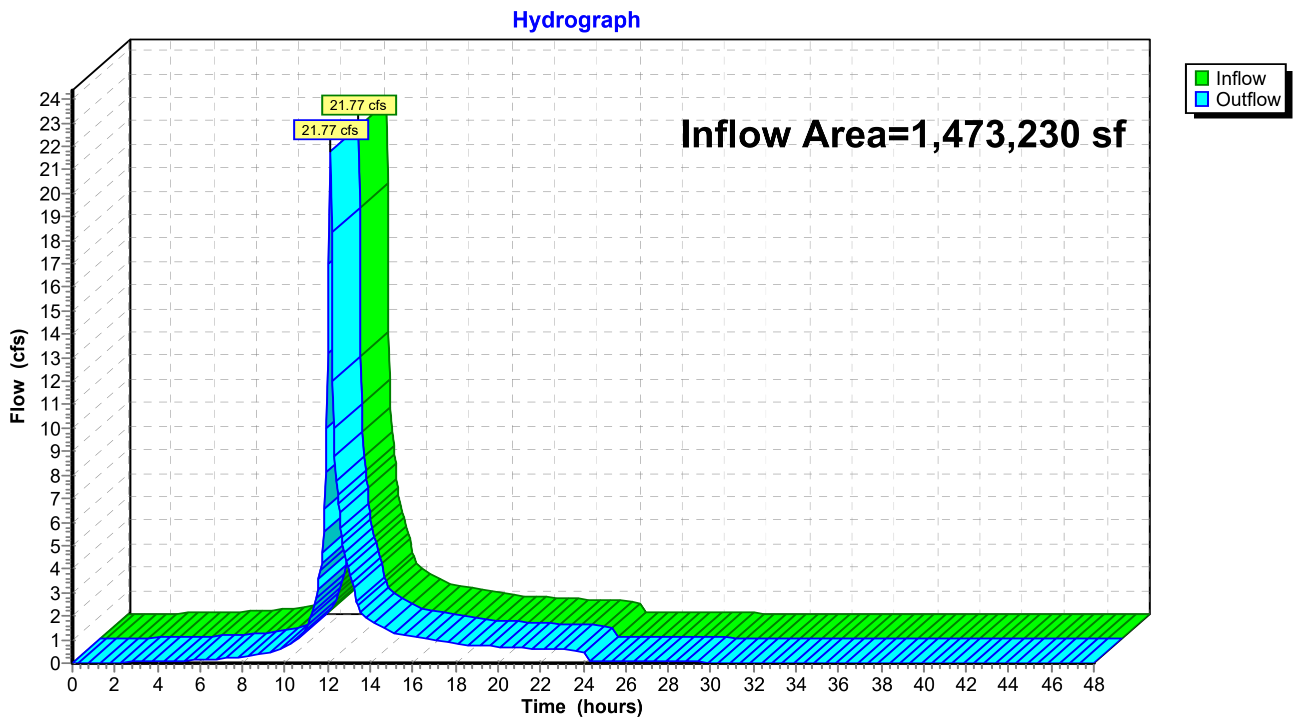
Summary for Reach TOTAL: Total

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,473,230 sf, 43.89% Impervious, Inflow Depth > 0.81" for 2-year event
Inflow = 21.77 cfs @ 12.12 hrs, Volume= 99,008 cf
Outflow = 21.77 cfs @ 12.12 hrs, Volume= 99,008 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach TOTAL: Total



Summary for Pond BR-1: Bioretention 1

Inflow Area = 53,580 sf, 76.36% Impervious, Inflow Depth = 1.82" for 2-year event
Inflow = 2.50 cfs @ 12.13 hrs, Volume= 8,105 cf
Outflow = 1.33 cfs @ 12.24 hrs, Volume= 8,105 cf, Atten= 47%, Lag= 6.6 min
Primary = 1.33 cfs @ 12.24 hrs, Volume= 8,105 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 26.11' @ 12.24 hrs Surf.Area= 1,055 sf Storage= 970 cf

Plug-Flow detention time= 8.7 min calculated for 8,097 cf (100% of inflow)
Center-of-Mass det. time= 8.7 min (838.6 - 829.9)

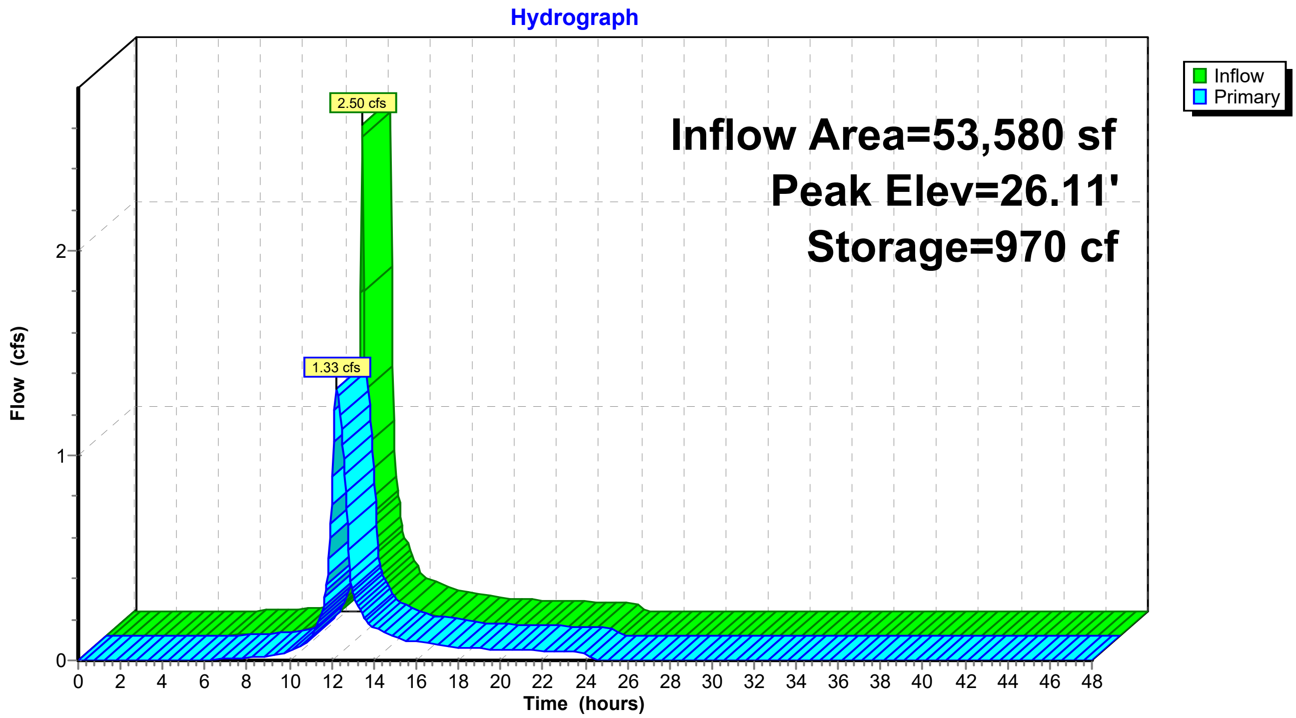
Volume	Invert	Avail.Storage	Storage Description
#1	25.00'	3,647 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
25.00	707	94.2	0	0	707
26.00	1,018	113.1	858	858	1,036
27.00	1,385	131.9	1,197	2,055	1,422
28.00	1,810	150.8	1,593	3,647	1,870

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**8.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#2	Primary	27.00'	**12.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#3	Primary	26.20'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.32 cfs @ 12.24 hrs HW=26.10' (Free Discharge)
1=Orifice/Grate (Orifice Controls 1.32 cfs @ 3.79 fps)
2=Orifice/Grate (Controls 0.00 cfs)
3=Orifice/Grate (Controls 0.00 cfs)

Pond BR-1: Bioretention 1



Summary for Pond BR-2: Bioretention 2

Inflow Area = 100,956 sf, 19.92% Impervious, Inflow Depth = 0.32" for 2-year event
Inflow = 0.65 cfs @ 12.14 hrs, Volume= 2,703 cf
Outflow = 0.40 cfs @ 12.23 hrs, Volume= 2,703 cf, Atten= 39%, Lag= 5.3 min
Primary = 0.40 cfs @ 12.23 hrs, Volume= 2,703 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 26.31' @ 12.23 hrs Surf.Area= 798 sf Storage= 233 cf

Plug-Flow detention time= 12.6 min calculated for 2,701 cf (100% of inflow)
Center-of-Mass det. time= 12.7 min (871.8 - 859.1)

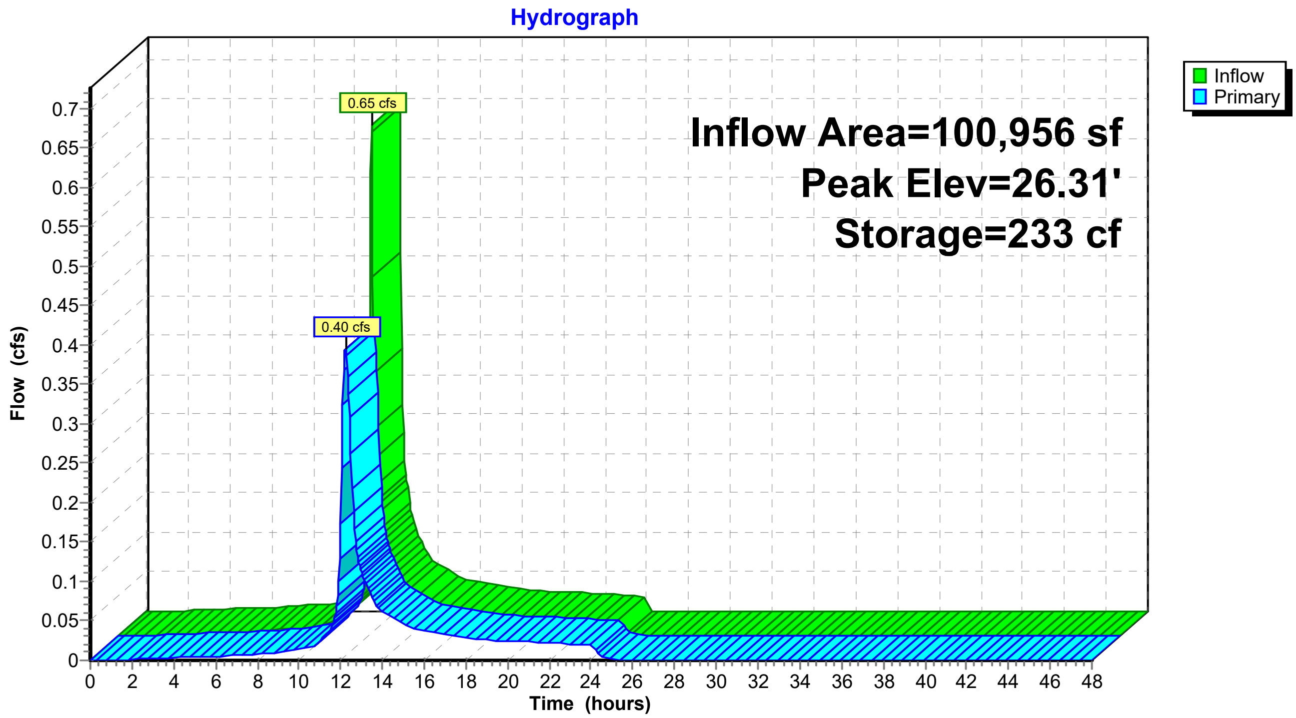
Volume	Invert	Avail.Storage	Storage Description
#1	26.00'	3,647 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
26.00	707	94.2	0	0	707
27.00	1,018	113.1	858	858	1,036
28.00	1,385	131.9	1,197	2,055	1,422
29.00	1,810	150.8	1,593	3,647	1,870

Device	Routing	Invert	Outlet Devices
#1	Primary	27.00'	**15.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#2	Primary	26.00'	**6.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.39 cfs @ 12.23 hrs HW=26.31' (Free Discharge)
├─**1=Orifice/Grate** (Controls 0.00 cfs)
└─**2=Orifice/Grate** (Orifice Controls 0.39 cfs @ 2.00 fps)

Pond BR-2: Bioretention 2



Summary for Pond BR-3: Bioretention 3

Inflow Area = 80,355 sf, 58.01% Impervious, Inflow Depth = 1.31" for 2-year event
Inflow = 2.71 cfs @ 12.13 hrs, Volume= 8,774 cf
Outflow = 0.87 cfs @ 12.35 hrs, Volume= 8,774 cf, Atten= 68%, Lag= 13.1 min
Primary = 0.87 cfs @ 12.35 hrs, Volume= 8,774 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 26.52' @ 12.35 hrs Surf.Area= 2,756 sf Storage= 1,326 cf

Plug-Flow detention time= 7.9 min calculated for 8,765 cf (100% of inflow)
Center-of-Mass det. time= 7.9 min (846.4 - 838.5)

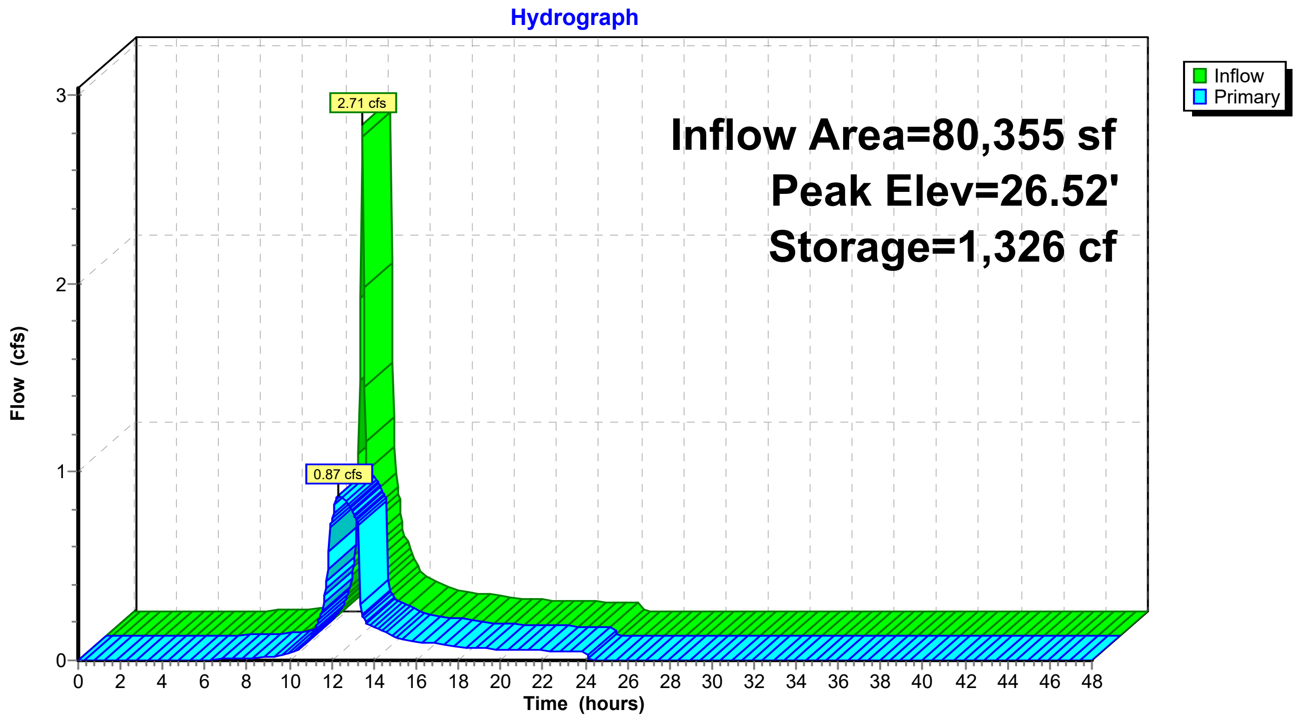
Volume	Invert	Avail.Storage	Storage Description
#1	26.00'	6,285 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
26.00	2,376	243.9	0	0	2,376
27.00	3,137	262.8	2,748	2,748	3,179
28.00	3,953	281.7	3,537	6,285	4,042

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**6.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#2	Primary	27.10'	**15.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.87 cfs @ 12.35 hrs HW=26.52' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.87 cfs @ 4.45 fps)
2=Orifice/Grate (Controls 0.00 cfs)

Pond BR-3: Bioretention 3



Summary for Pond OC: O-CHAMBERS

Inflow Area =	190,951 sf, 35.86% Impervious,	Inflow Depth = 0.49"	for 2-year event
Inflow =	1.72 cfs @ 12.15 hrs, Volume=	7,816 cf	
Outflow =	0.14 cfs @ 16.06 hrs, Volume=	7,012 cf,	Atten= 92%, Lag= 234.3 min
Primary =	0.14 cfs @ 16.06 hrs, Volume=	7,012 cf	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 25.19' @ 16.06 hrs Surf.Area= 23,411 sf Storage= 3,739 cf

Plug-Flow detention time= 469.0 min calculated for 7,004 cf (90% of inflow)
Center-of-Mass det. time= 420.5 min (1,338.1 - 917.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	25.00'	0 cf	**137.92'W x 169.75'L x 4.17'H Field A** 97,547 cf Overall - 97,547 cf Embedded = 0 cf x 0.0% Voids
#2A	25.00'	70,200 cf	**StormTrap ST1 SingleTrap 3-6** x 240 Inside #1 Inside= 82.7"W x 42.0"H => 20.80 sf x 14.06'L = 292.5 cf Outside= 82.7"W x 50.0"H => 28.73 sf x 14.06'L = 404.1 cf 20 Rows of 12 Chambers 137.92' x 168.75' Core + 0.00' x 0.50' Border = 137.92' x 169.75' System
		70,200 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**10.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.13 cfs @ 16.06 hrs HW=25.19' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.13 cfs @ 1.47 fps)

Pond OC: O-CHAMBERS - Chamber Wizard Field A

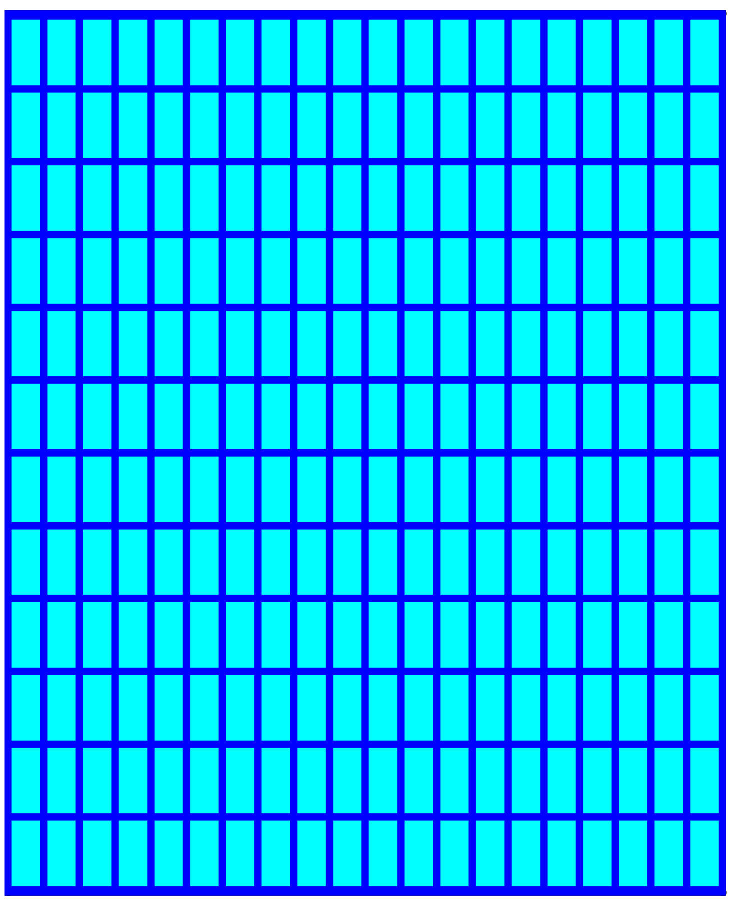
Chamber Model = StormTrap ST1 SingleTrap 3-6 (StormTrap ST1 SingleTrap®Type VI)
Inside= 82.7"W x 42.0"H => 20.80 sf x 14.06'L = 292.5 cf
Outside= 82.7"W x 50.0"H => 28.73 sf x 14.06'L = 404.1 cf

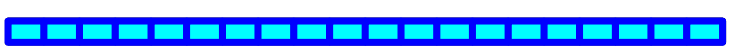
12 Chambers/Row x 14.06' Long = 168.75' Row Length +6.0" Border x 2 = 169.75' Base Length
20 Rows x 82.7" Wide = 137.92' Base Width
50.0" Chamber Height = 4.17' Field Height

240 Chambers x 292.5 cf = 70,199.7 cf Chamber Storage
240 Chambers x 404.1 cf + 574.7 cf Border = 97,547.3 cf Displacement

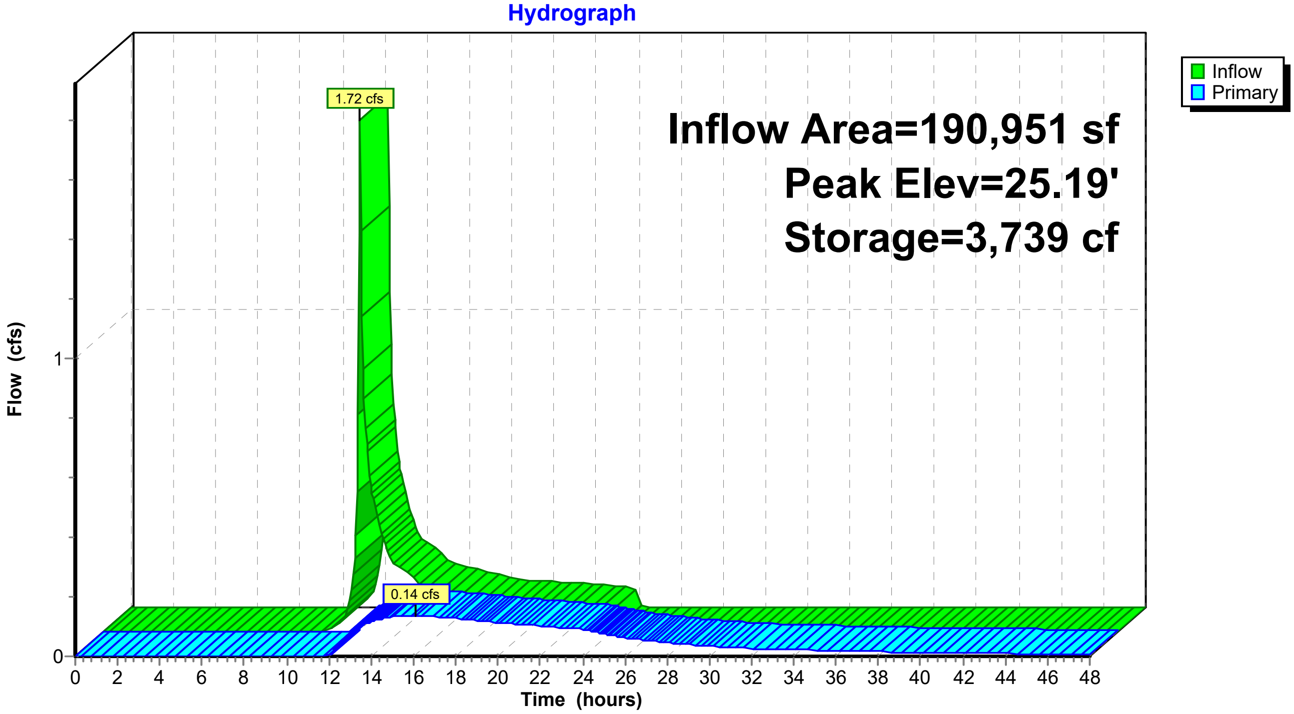
Chamber Storage = 70,199.7 cf = 1.612 af
Overall Storage Efficiency = 72.0%
Overall System Size = 169.75' x 137.92' x 4.17'

240 Chambers (plus border)
3,612.9 cy Field





Pond OC: O-CHAMBERS



Summary for Pond U-1: UG Inf System

Inflow Area =	165,273 sf, 63.49% Impervious,	Inflow Depth = 1.37"	for 2-year event	
Inflow =	5.64 cfs @	12.13 hrs, Volume=	18,814 cf	
Outflow =	0.33 cfs @	14.55 hrs, Volume=	18,814 cf,	Atten= 94%, Lag= 144.9 min
Discarded =	0.32 cfs @	11.40 hrs, Volume=	18,724 cf	
Primary =	0.01 cfs @	14.55 hrs, Volume=	90 cf	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 22.65' @ 14.55 hrs Surf.Area= 26,352 sf Storage= 8,464 cf

Plug-Flow detention time= 262.9 min calculated for 18,795 cf (100% of inflow)
Center-of-Mass det. time= 262.9 min (1,106.1 - 843.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	22.00'	18,227 cf	**134.83'W x 195.44'L x 2.33'H Field A** 61,488 cf Overall - 15,921 cf Embedded = 45,566 cf x 40.0% Voids
#2A	22.50'	15,921 cf	**ADS_StormTech SC-310 +Cap** x 1080 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 40 Rows of 27 Chambers
		34,148 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	22.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	22.60'	**10.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	23.35'	**8.0" Vert. Orifice/Grate** C= 0.600
#4	Primary	23.45'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.32 cfs @ 11.40 hrs HW=22.02' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=0.01 cfs @ 14.55 hrs HW=22.65' (Free Discharge)
├─**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 0.75 fps)
├─**3=Orifice/Grate** (Controls 0.00 cfs)
└─**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond U-1: UG Inf System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-310 +Cap (ADS StormTech®SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

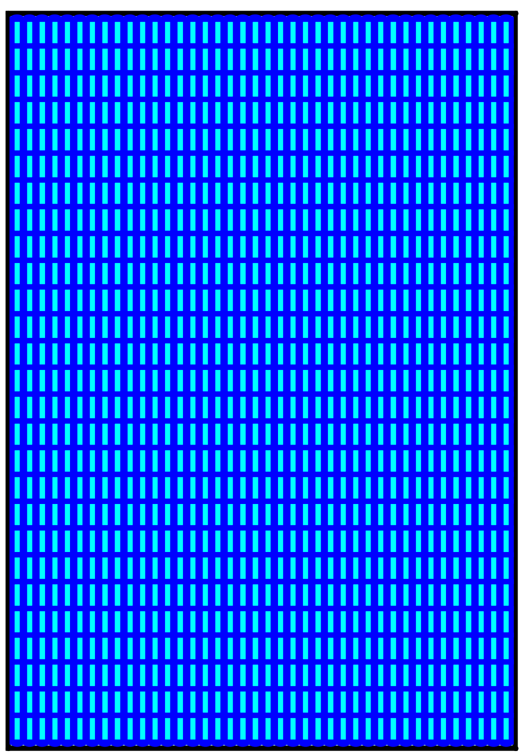
27 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 193.44' Row Length +12.0" End Stone x 2 = 195.44' Base Length
40 Rows x 34.0" Wide + 6.0" Spacing x 39 + 12.0" Side Stone x 2 = 134.83' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

1,080 Chambers x 14.7 cf = 15,921.3 cf Chamber Storage

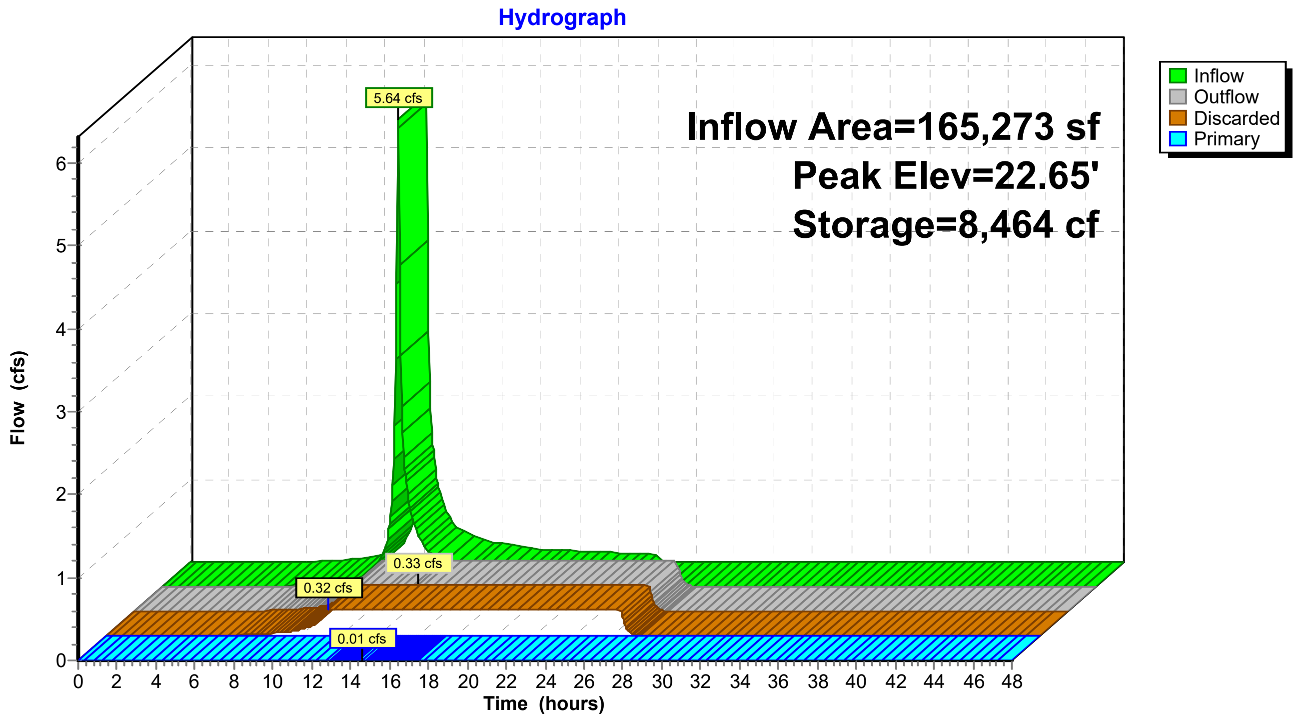
61,487.6 cf Field - 15,921.3 cf Chambers = 45,566.3 cf Stone x 40.0% Voids = 18,226.5 cf Stone Storage

Chamber Storage + Stone Storage = 34,147.8 cf = 0.784 af
Overall Storage Efficiency = 55.5%
Overall System Size = 195.44' x 134.83' x 2.33'

1,080 Chambers
2,277.3 cy Field
1,687.6 cy Stone



Pond U-1: UG Inf System



Summary for Pond UD1: Baseball UD 1

Inflow Area = 105,369 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-year event
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 15 cf
Outflow = 0.00 cfs @ 24.00 hrs, Volume= 15 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 24.00 hrs, Volume= 15 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 39.17' @ 24.00 hrs Surf.Area= 149,290 sf Storage= 0 cf

Plug-Flow detention time= 0.2 min calculated for 15 cf (100% of inflow)
Center-of-Mass det. time= 0.2 min (1,363.6 - 1,363.4)

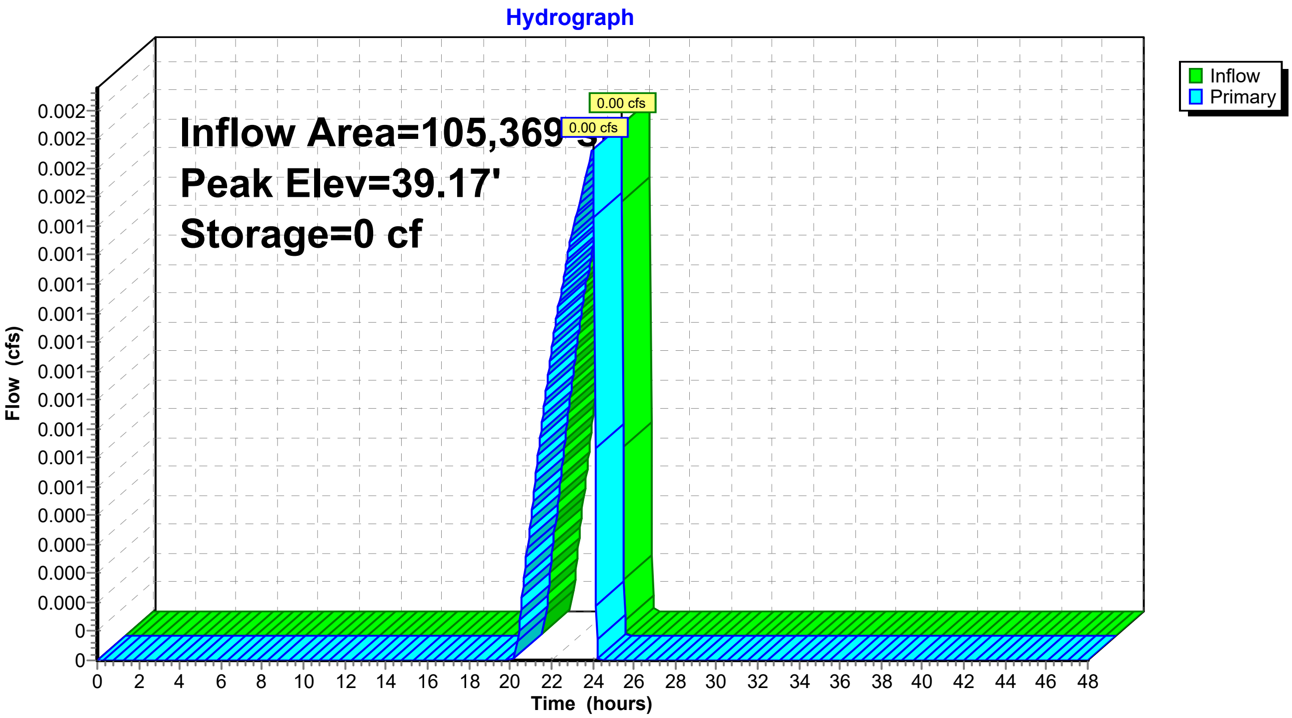
Volume	Invert	Avail.Storage	Storage Description
#1	39.17'	29,858 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 74,645 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
39.17	149,290	1,398.0	0	0	149,290
39.67	149,290	1,398.0	74,645	74,645	149,989

Device	Routing	Invert	Outlet Devices
#1	Primary	27.65'	**12.0" Round CMP_Round 12"** L= 41.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 27.65' / 27.24' S= 0.0099 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	32.12'	**12.0" Round CMP_Round 12"** L= 15.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 32.12' / 31.95' S= 0.0110 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Primary	31.30'	**6.0" Round Culvert** L= 38.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 31.30' / 30.91' S= 0.0101 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=24.18 cfs @ 24.00 hrs HW=39.17' (Free Discharge)
├─**1=CMP_Round 12"** (Barrel Controls 12.45 cfs @ 15.85 fps)
├─**2=CMP_Round 12"** (Inlet Controls 9.68 cfs @ 12.32 fps)
└─**3=Culvert** (Barrel Controls 2.06 cfs @ 10.48 fps)

Pond UD1: Baseball UD 1



Summary for Pond UD2: Football UD 2

Inflow Area = 65,696 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-year event
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 9 cf
Outflow = 0.00 cfs @ 24.00 hrs, Volume= 9 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 24.00 hrs, Volume= 9 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 40.17' @ 24.00 hrs Surf.Area= 65,694 sf Storage= 0 cf

Plug-Flow detention time= 0.4 min calculated for 9 cf (100% of inflow)
Center-of-Mass det. time= 0.4 min (1,363.8 - 1,363.4)

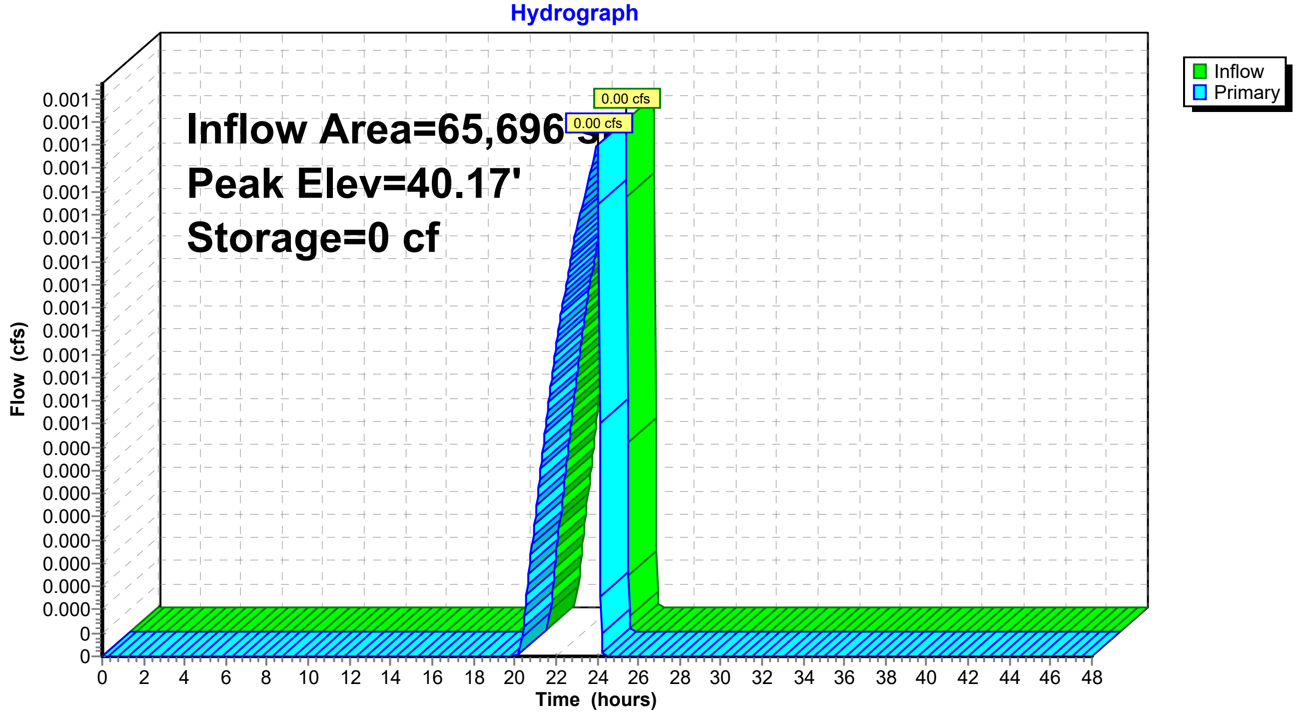
Volume	Invert	Avail.Storage	Storage Description
#1	40.17'	13,139 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 32,847 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
40.17	65,694	1,239.8	0	0	65,694
40.67	65,694	1,239.8	32,847	32,847	66,314

Device	Routing	Invert	Outlet Devices
#1	Primary	36.00'	**6.0" Round Culvert** L= 22.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.00' / 35.00' S= 0.0448 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Primary	36.00'	**6.0" Round Culvert** L= 46.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.00' / 35.00' S= 0.0216 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Primary	36.00'	**6.0" Round Culvert** L= 30.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.00' / 35.00' S= 0.0331 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=5.10 cfs @ 24.00 hrs HW=40.17' (Free Discharge)
├—**1=Culvert** (Inlet Controls 1.87 cfs @ 9.53 fps)
├—**2=Culvert** (Barrel Controls 1.50 cfs @ 7.63 fps)
└—**3=Culvert** (Barrel Controls 1.73 cfs @ 8.79 fps)

Pond UD2: Football UD 2



Summary for Pond UD3: Football UD 3

Inflow Area = 22,265 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-year event
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 3 cf
Outflow = 0.00 cfs @ 24.00 hrs, Volume= 3 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 24.00 hrs, Volume= 3 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 39.27' @ 24.00 hrs Surf.Area= 22,338 sf Storage= 0 cf

Plug-Flow detention time= 0.1 min calculated for 3 cf (100% of inflow)
Center-of-Mass det. time= 0.1 min (1,363.5 - 1,363.4)

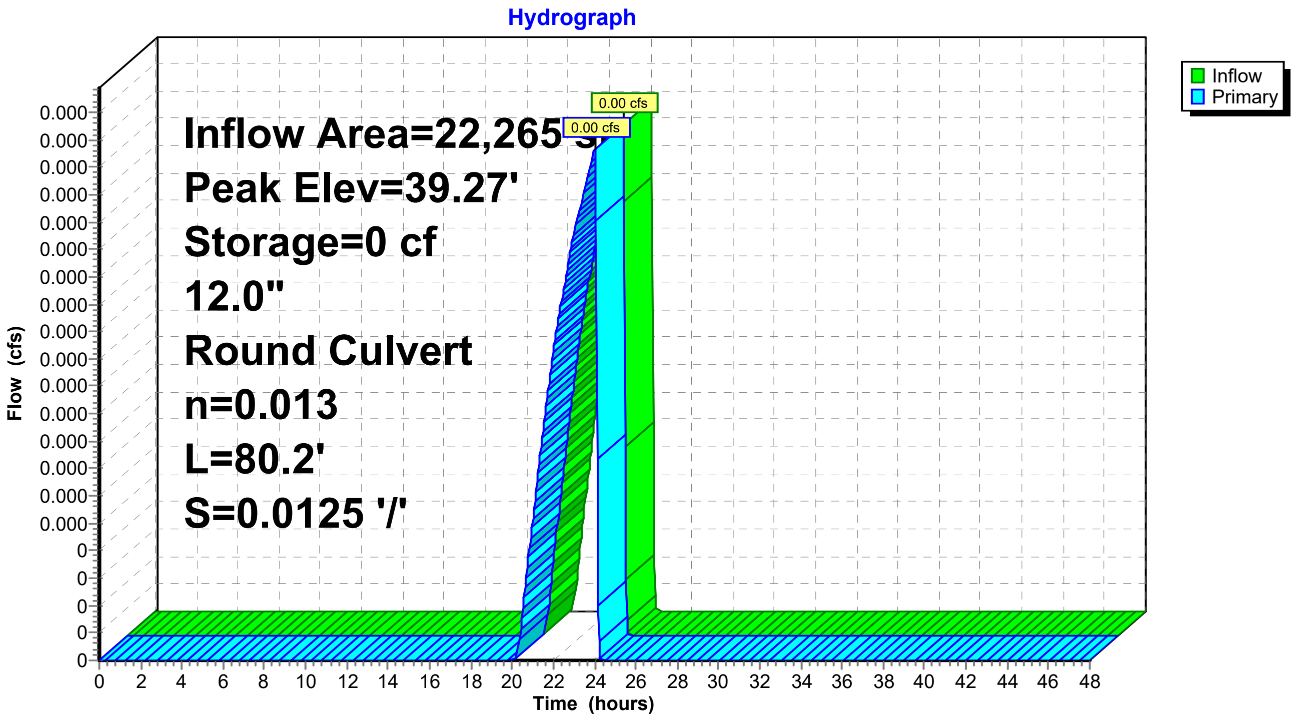
Volume	Invert	Avail.Storage	Storage Description
#1	39.27'	4,378 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 10,946 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
39.27	22,338	624.7	0	0	22,338
39.76	22,338	624.7	10,946	10,946	22,644

Device	Routing	Invert	Outlet Devices
#1	Primary	35.00'	**12.0" Round Culvert** L= 80.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.00' / 34.00' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=6.50 cfs @ 24.00 hrs HW=39.27' (Free Discharge)
└─**1=Culvert** (Barrel Controls 6.50 cfs @ 8.27 fps)

Pond UD3: Football UD 3



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentO-01: OFF-01 Runoff Area=112,122 sf 33.01% Impervious Runoff Depth=1.35"
Tc=6.0 min CN=59 Runoff=3.70 cfs 12,607 cf

SubcatchmentO-02: OFF-02 Runoff Area=109,762 sf 30.00% Impervious Runoff Depth=1.21"
Tc=6.0 min CN=57 Runoff=3.17 cfs 11,093 cf

SubcatchmentO-03: OFF-03 Runoff Area=45,823 sf 30.00% Impervious Runoff Depth=1.21"
Tc=6.0 min CN=57 Runoff=1.32 cfs 4,631 cf

SubcatchmentO-04: OFF-04 Runoff Area=35,366 sf 61.66% Impervious Runoff Depth=2.61"
Tc=6.0 min CN=75 Runoff=2.42 cfs 7,699 cf

SubcatchmentPR-1A: PR-1A Runoff Area=30,658 sf 60.37% Impervious Runoff Depth=2.61"
Tc=6.0 min CN=75 Runoff=2.10 cfs 6,674 cf

SubcatchmentPR-1B: PR-1B Runoff Area=34,631 sf 76.81% Impervious Runoff Depth=3.45"
Tc=6.0 min CN=84 Runoff=3.06 cfs 9,968 cf

SubcatchmentPR-1C: PR-1C Runoff Area=24,918 sf 3.36% Impervious Runoff Depth=0.32"
Tc=6.0 min CN=41 Runoff=0.04 cfs 670 cf

SubcatchmentPR-1D: PR-1D Runoff Area=78,681 sf 100.00% Impervious Runoff Depth=4.96"
Tc=6.0 min CN=98 Runoff=8.67 cfs 32,540 cf

SubcatchmentPR-1E: PR-1E Runoff Area=26,606 sf 100.00% Impervious Runoff Depth=4.96"
Tc=6.0 min CN=98 Runoff=2.93 cfs 11,004 cf

SubcatchmentPR-1F: PR-1F Runoff Area=18,266 sf 67.43% Impervious Runoff Depth=2.97"
Tc=6.0 min CN=79 Runoff=1.41 cfs 4,528 cf

SubcatchmentPR-1G: PR-1G Runoff Area=50,158 sf 46.00% Impervious Runoff Depth=1.87"
Tc=6.0 min CN=66 Runoff=2.41 cfs 7,796 cf

SubcatchmentPR-1H: PR-1H Runoff Area=11,588 sf 24.62% Impervious Runoff Depth=1.02"
Tc=6.0 min CN=54 Runoff=0.26 cfs 982 cf

SubcatchmentPR-1I: PR-1I Runoff Area=16,195 sf 0.59% Impervious Runoff Depth=0.24"
Tc=6.0 min CN=39 Runoff=0.02 cfs 327 cf

SubcatchmentPR-1J: PR-1J Runoff Area=21,163 sf 85.81% Impervious Runoff Depth=4.07"
Tc=6.0 min CN=90 Runoff=2.12 cfs 7,177 cf

SubcatchmentPR-1K: PR-1K Runoff Area=40,076 sf 13.82% Impervious Runoff Depth=0.61"
Tc=6.0 min CN=47 Runoff=0.38 cfs 2,036 cf

SubcatchmentPR-1L: PR-1L Runoff Area=32,440 sf 69.13% Impervious Runoff Depth=3.07"
Tc=6.0 min CN=80 Runoff=2.58 cfs 8,294 cf

SubcatchmentPR-1M: PR-1M	Runoff Area=22,109 sf 44.24% Impervious Runoff Depth=1.79" Tc=6.0 min CN=65 Runoff=1.01 cfs 3,294 cf
SubcatchmentPR-1N: PR-1N	Runoff Area=21,140 sf 87.46% Impervious Runoff Depth=4.18" Tc=6.0 min CN=91 Runoff=2.16 cfs 7,358 cf
SubcatchmentPR-1O: PR-1O	Runoff Area=50,633 sf 85.81% Impervious Runoff Depth=4.07" Tc=6.0 min CN=90 Runoff=5.07 cfs 17,171 cf
SubcatchmentPR-1P: PR-1P	Runoff Area=13,652 sf 88.78% Impervious Runoff Depth=4.18" Tc=6.0 min CN=91 Runoff=1.39 cfs 4,751 cf
SubcatchmentPR-1Q: PR-1Q	Runoff Area=29,096 sf 14.64% Impervious Runoff Depth=0.66" Tc=6.0 min CN=48 Runoff=0.33 cfs 1,609 cf
SubcatchmentPR-1R: PR-1R	Runoff Area=55,082 sf 84.15% Impervious Runoff Depth=3.96" Tc=6.0 min CN=89 Runoff=5.42 cfs 18,194 cf
SubcatchmentPR-1S: PR-1S	Runoff Area=52,894 sf 67.24% Impervious Runoff Depth=2.97" Tc=6.0 min CN=79 Runoff=4.09 cfs 13,111 cf
SubcatchmentPR-1U: PR-1U	Runoff Area=4,791 sf 100.00% Impervious Runoff Depth=4.96" Tc=6.0 min CN=98 Runoff=0.53 cfs 1,981 cf
SubcatchmentPR-1V: PR-1V	Runoff Area=42,997 sf 65.96% Impervious Runoff Depth=2.88" Tc=6.0 min CN=78 Runoff=3.23 cfs 10,327 cf
SubcatchmentPR-2A: PR-2A	Runoff Area=33,957 sf 0.00% Impervious Runoff Depth=0.24" Tc=6.0 min CN=39 Runoff=0.03 cfs 686 cf
SubcatchmentPR-2B: PR-2B	Runoff Area=71,412 sf 0.00% Impervious Runoff Depth=0.24" Tc=6.0 min CN=39 Runoff=0.07 cfs 1,442 cf
SubcatchmentPR-2C: PR-2C	Runoff Area=9,359 sf 17.98% Impervious Runoff Depth=0.78" Tc=6.0 min CN=50 Runoff=0.14 cfs 605 cf
SubcatchmentPR-2D: PR-2D	Runoff Area=53,639 sf 82.78% Impervious Runoff Depth=3.86" Tc=0.0 min CN=88 Runoff=5.91 cfs 17,250 cf
SubcatchmentPR-2E: PR-2E	Runoff Area=65,696 sf 0.00% Impervious Runoff Depth=0.24" Tc=6.0 min CN=39 Runoff=0.06 cfs 1,327 cf
SubcatchmentPR-2F: PR-2F	Runoff Area=33,980 sf 0.00% Impervious Runoff Depth=0.24" Tc=6.0 min CN=39 Runoff=0.03 cfs 686 cf
SubcatchmentPR-2G: PR-2G	Runoff Area=80,069 sf 7.34% Impervious Runoff Depth=0.41" Tc=0.0 min CN=43 Runoff=0.34 cfs 2,743 cf
SubcatchmentPR-2H: PR-2H	Runoff Area=30,529 sf 1.48% Impervious Runoff Depth=0.28" Tc=6.0 min CN=40 Runoff=0.04 cfs 716 cf

SubcatchmentPR-3A: PR-3A Runoff Area=31,912 sf 15.32% Impervious Runoff Depth=0.66"
Tc=6.0 min CN=48 Runoff=0.36 cfs 1,765 cf

SubcatchmentPR-3B: PR-3B Runoff Area=59,565 sf 75.56% Impervious Runoff Depth=3.45"
Tc=6.0 min CN=84 Runoff=5.26 cfs 17,144 cf

SubcatchmentPR-3C: PR-3C Runoff Area=22,265 sf 0.00% Impervious Runoff Depth=0.24"
Tc=6.0 min CN=39 Runoff=0.02 cfs 450 cf

Reach DP-1: DP-1 Inflow=36.43 cfs 204,173 cf
Outflow=36.43 cfs 204,173 cf

Reach DP-1C: Outfall 1C Inflow=5.30 cfs 68,861 cf
Outflow=5.30 cfs 68,861 cf

Reach DP-1D: Outfall 1D Inflow=7.12 cfs 24,554 cf
Outflow=7.12 cfs 24,554 cf

Reach DP-2: DP-2 Avg. Flow Depth=0.57' Max Vel=6.40 fps Inflow=6.12 cfs 24,769 cf
36.0" Round Pipe n=0.011 L=96.0' S=0.0092 '/' Capacity=75.47 cfs Outflow=5.93 cfs 24,769 cf

Reach DP-3: DP-3 Inflow=5.60 cfs 19,358 cf
Outflow=5.60 cfs 19,358 cf

Reach DP1A: Outfall 1A Inflow=0.04 cfs 670 cf
Outflow=0.04 cfs 670 cf

Reach DP1B: Outfall 1B Inflow=21.84 cfs 77,321 cf
Outflow=21.84 cfs 77,321 cf

Reach TOTAL: Total Inflow=42.18 cfs 223,531 cf
Outflow=42.18 cfs 223,531 cf

Pond BR-1: Bioretention 1 Peak Elev=27.00' Storage=2,059 cf Inflow=4.74 cfs 15,651 cf
Outflow=2.94 cfs 15,651 cf

Pond BR-2: Bioretention 2 Peak Elev=27.07' Storage=932 cf Inflow=1.90 cfs 7,998 cf
Outflow=0.92 cfs 7,998 cf

Pond BR-3: Bioretention 3 Peak Elev=27.29' Storage=3,674 cf Inflow=5.35 cfs 17,831 cf
Outflow=1.84 cfs 17,831 cf

Pond OC: O-CHAMBERS Peak Elev=25.48' Storage=9,693 cf Inflow=6.90 cfs 23,423 cf
Outflow=0.78 cfs 22,529 cf

Pond U-1: UG Inf System Peak Elev=23.09' Storage=17,523 cf Inflow=11.83 cfs 39,061 cf
Discarded=0.32 cfs 26,211 cf Primary=0.80 cfs 12,850 cf Outflow=1.12 cfs 39,061 cf

Pond UD1: Baseball UD 1 Peak Elev=39.17' Storage=1 cf Inflow=0.10 cfs 2,128 cf
Outflow=0.10 cfs 2,128 cf

Pond UD2: Football UD 2 Peak Elev=40.17' Storage=2 cf Inflow=0.06 cfs 1,327 cf
Outflow=0.06 cfs 1,327 cf

Pond UD3: Football UD 3 Peak Elev=39.27' Storage=0 cf Inflow=0.02 cfs 450 cf
12.0" Round Culvert n=0.013 L=80.2' S=0.0125 '/' Outflow=0.02 cfs 450 cf

Total Runoff Area = 1,473,230 sf Runoff Volume = 250,636 cf Average Runoff Depth = 2.04"
56.11% Pervious = 826,565 sf 43.89% Impervious = 646,665 sf

Summary for Subcatchment O-01: OFF-01

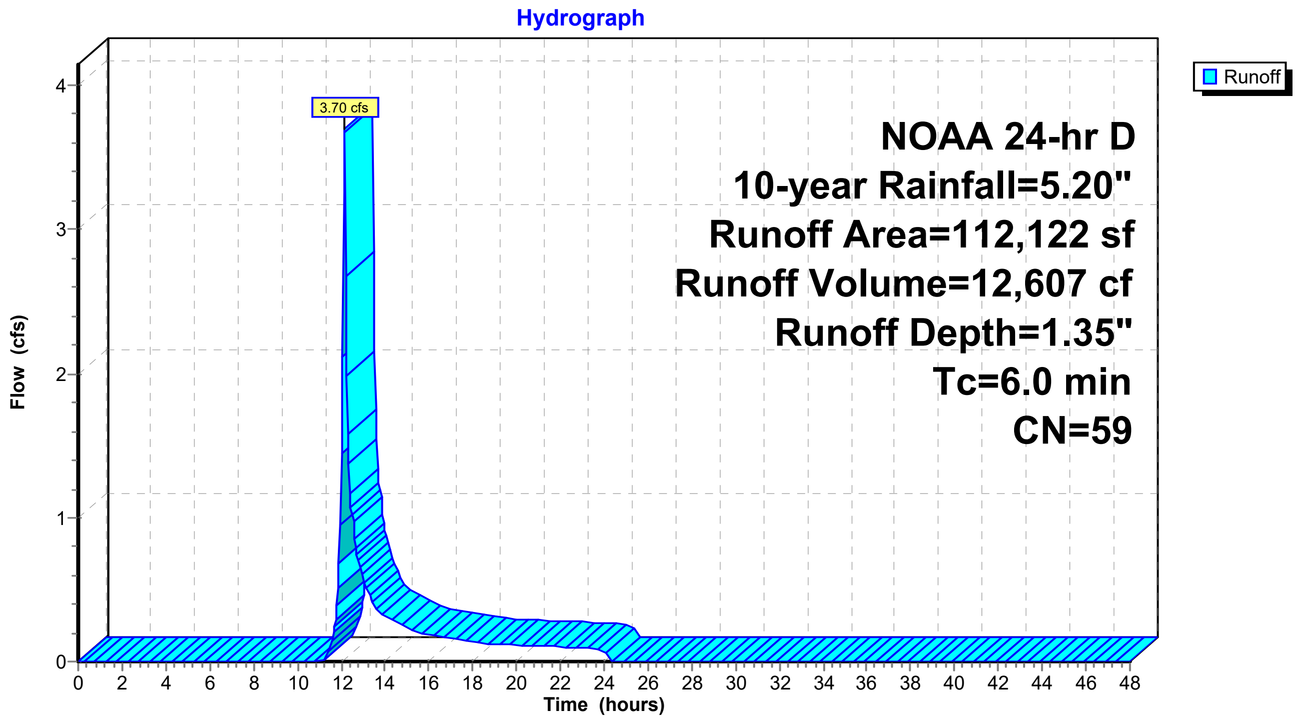
Runoff = 3.70 cfs @ 12.14 hrs, Volume= 12,607 cf, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
11,813	98	Unconnected pavement, HSG A
16,305	39	>75% Grass cover, Good, HSG A
84,004	57	1/3 acre lots, 30% imp, HSG A
112,122	59	Weighted Average
75,108		66.99% Pervious Area
37,014		33.01% Impervious Area
11,813		31.91% Unconnected

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

Subcatchment O-01: OFF-01



Summary for Subcatchment O-02: OFF-02

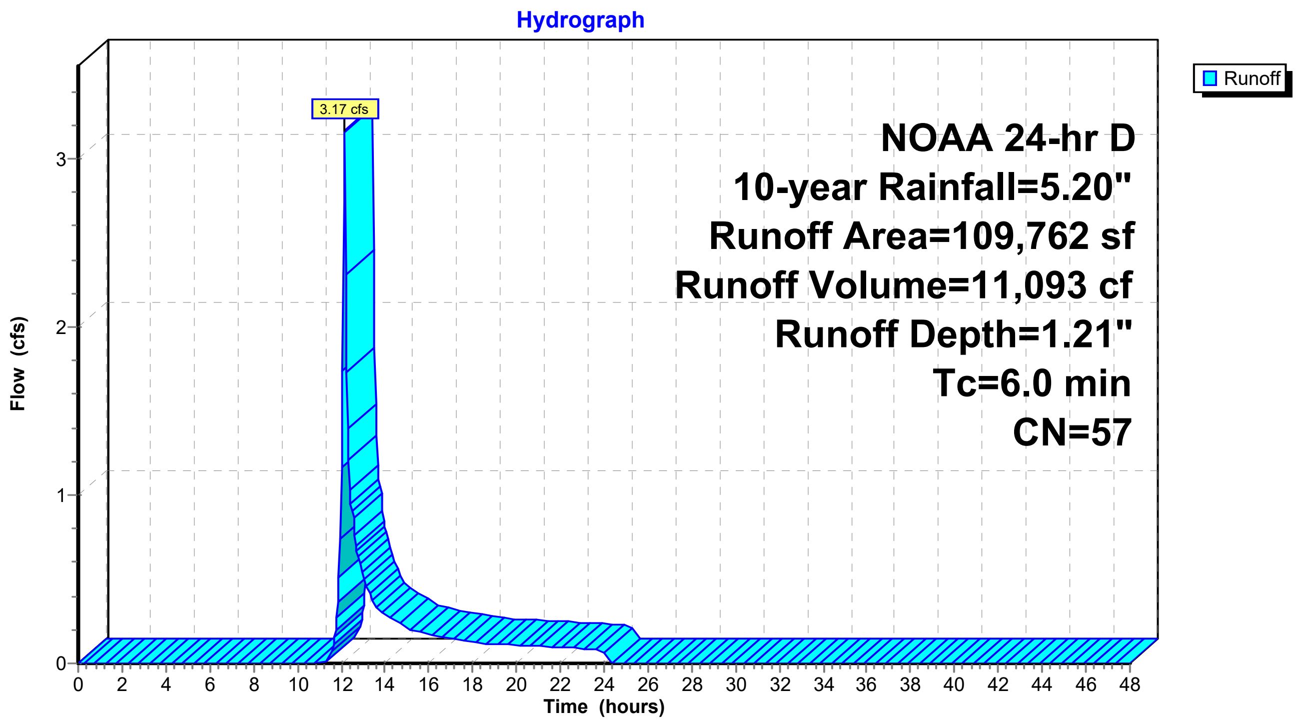
Runoff = 3.17 cfs @ 12.14 hrs, Volume= 11,093 cf, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
109,762	57	1/3 acre lots, 30% imp, HSG A
76,833		70.00% Pervious Area
32,929		30.00% Impervious Area

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

Subcatchment O-02: OFF-02



Summary for Subcatchment O-03: OFF-03

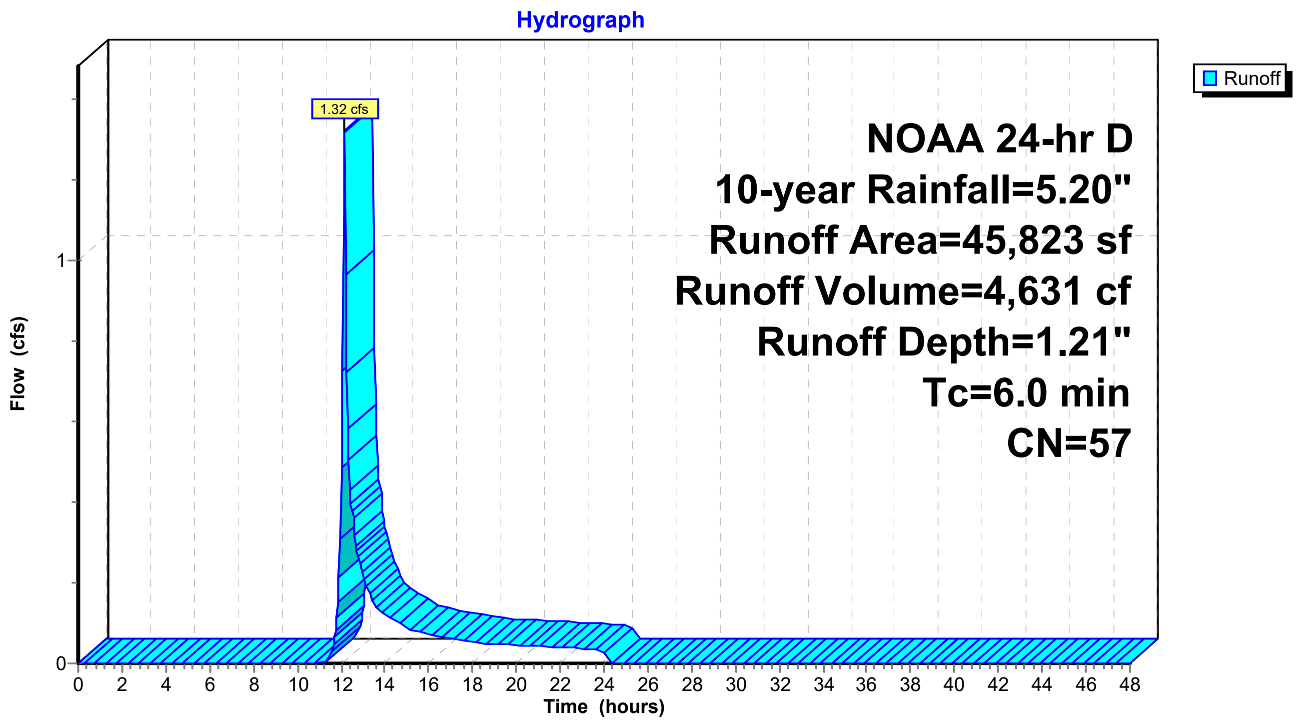
Runoff = 1.32 cfs @ 12.14 hrs, Volume= 4,631 cf, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
45,823	57	1/3 acre lots, 30% imp, HSG A
32,076		70.00% Pervious Area
13,747		30.00% Impervious Area

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

Subcatchment O-03: OFF-03



Summary for Subcatchment O-04: OFF-04

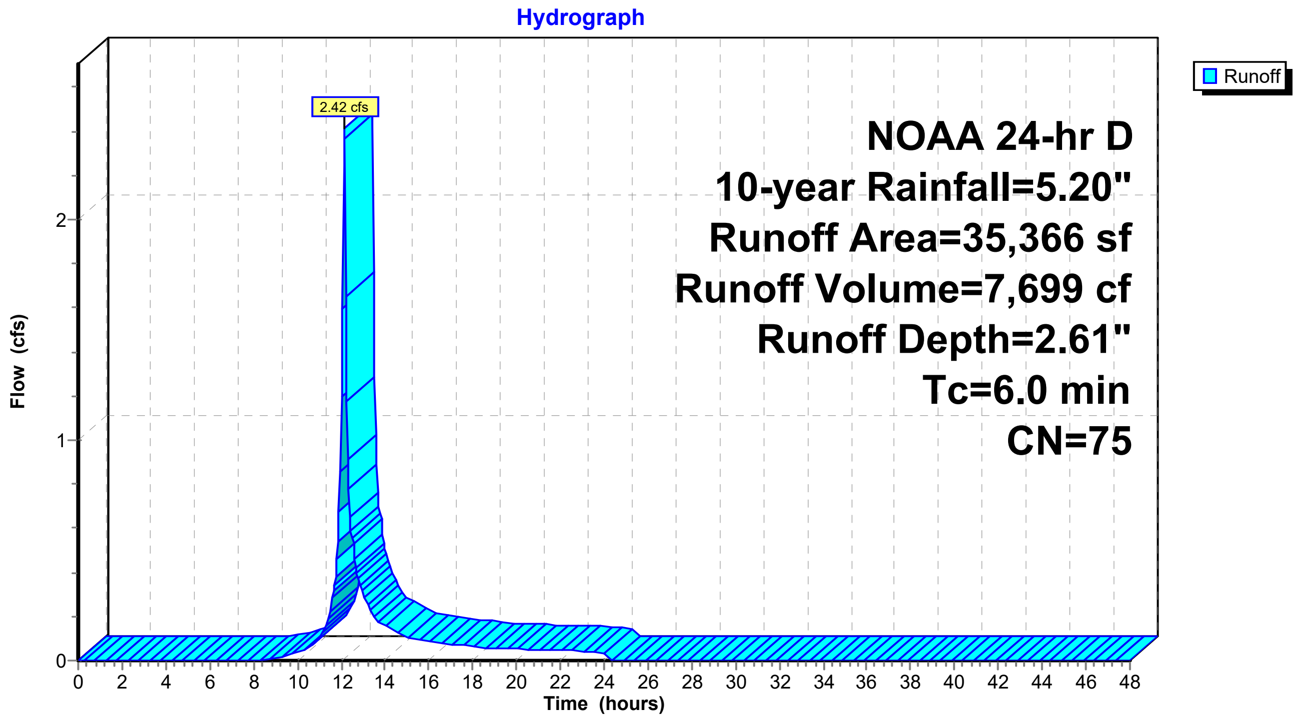
Runoff = 2.42 cfs @ 12.13 hrs, Volume= 7,699 cf, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
21,807	98	Paved parking, HSG A
13,559	39	>75% Grass cover, Good, HSG A
35,366	75	Weighted Average
13,559		38.34% Pervious Area
21,807		61.66% Impervious Area

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

Subcatchment O-04: OFF-04



Summary for Subcatchment PR-1A: PR-1A

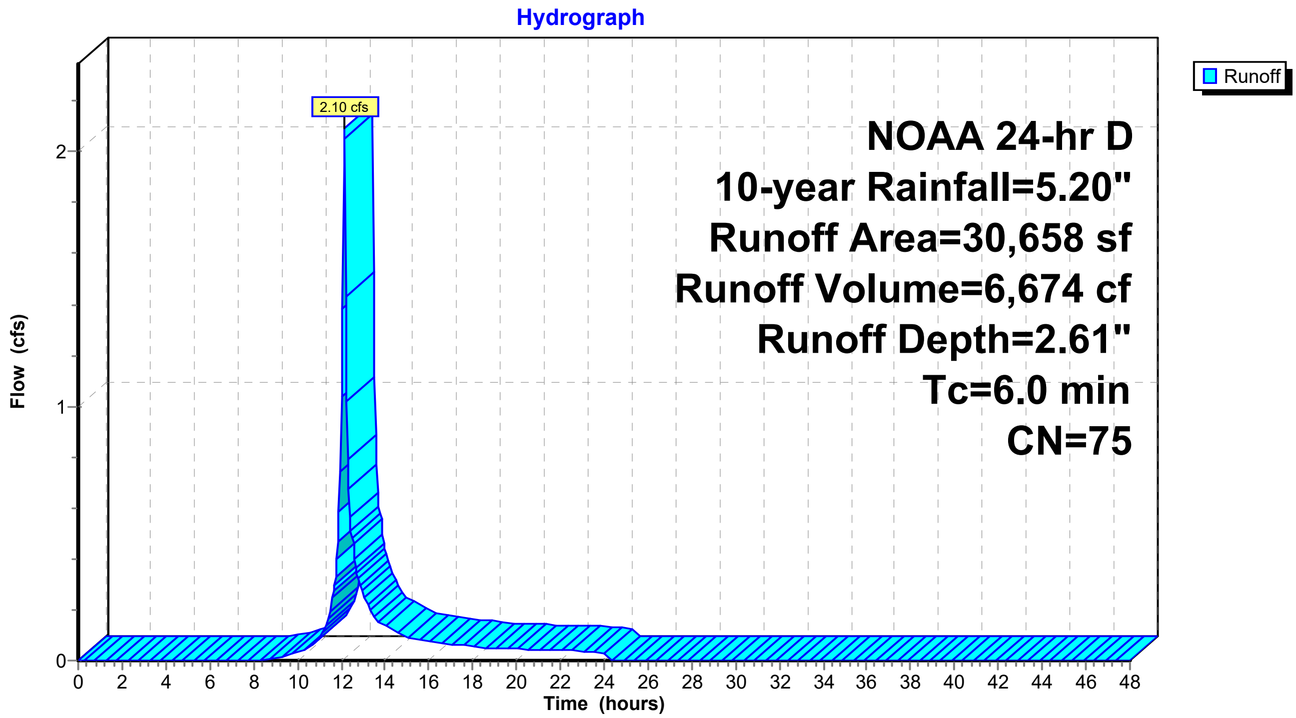
Runoff = 2.10 cfs @ 12.13 hrs, Volume= 6,674 cf, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
18,507	98	Paved parking, HSG A
12,151	39	>75% Grass cover, Good, HSG A
30,658	75	Weighted Average
12,151		39.63% Pervious Area
18,507		60.37% Impervious Area

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

Subcatchment PR-1A: PR-1A



Summary for Subcatchment PR-1B: PR-1B

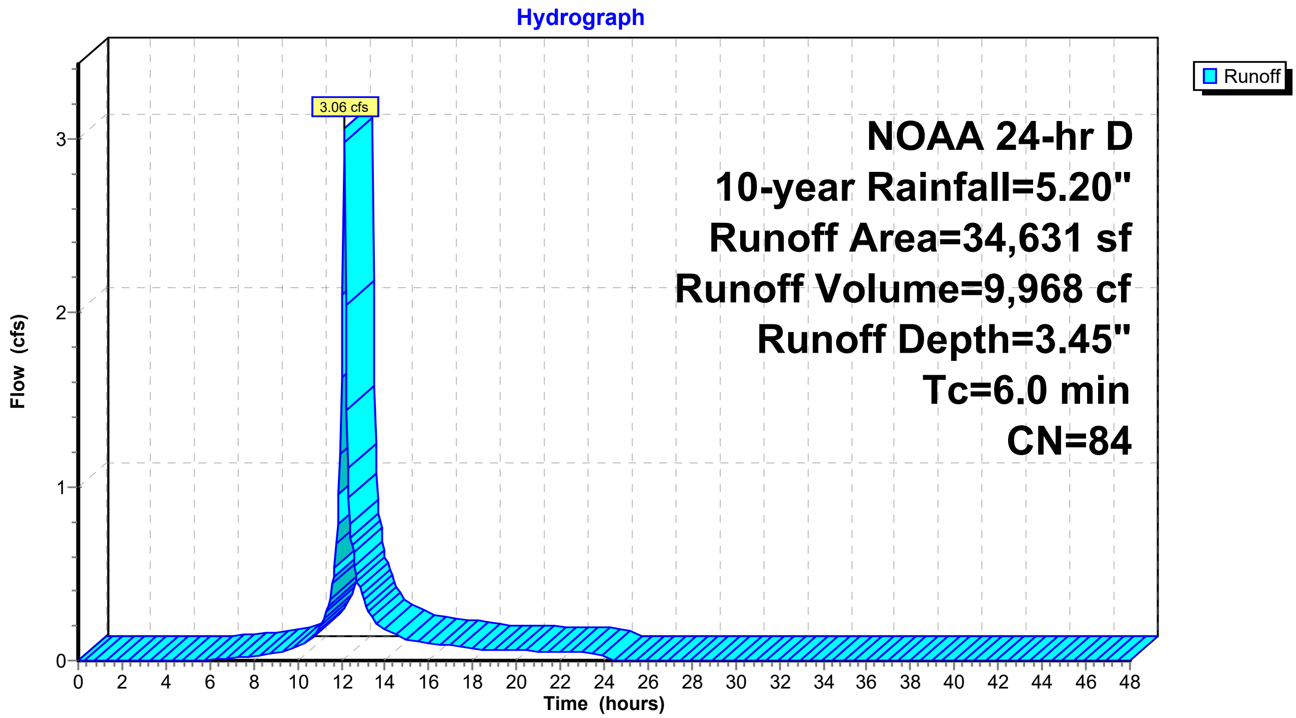
Runoff = 3.06 cfs @ 12.13 hrs, Volume= 9,968 cf, Depth= 3.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
26,601	98	Paved parking, HSG A
8,030	39	>75% Grass cover, Good, HSG A
34,631	84	Weighted Average
8,030		23.19% Pervious Area
26,601		76.81% Impervious Area

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

Subcatchment PR-1B: PR-1B



Summary for Subcatchment PR-1C: PR-1C

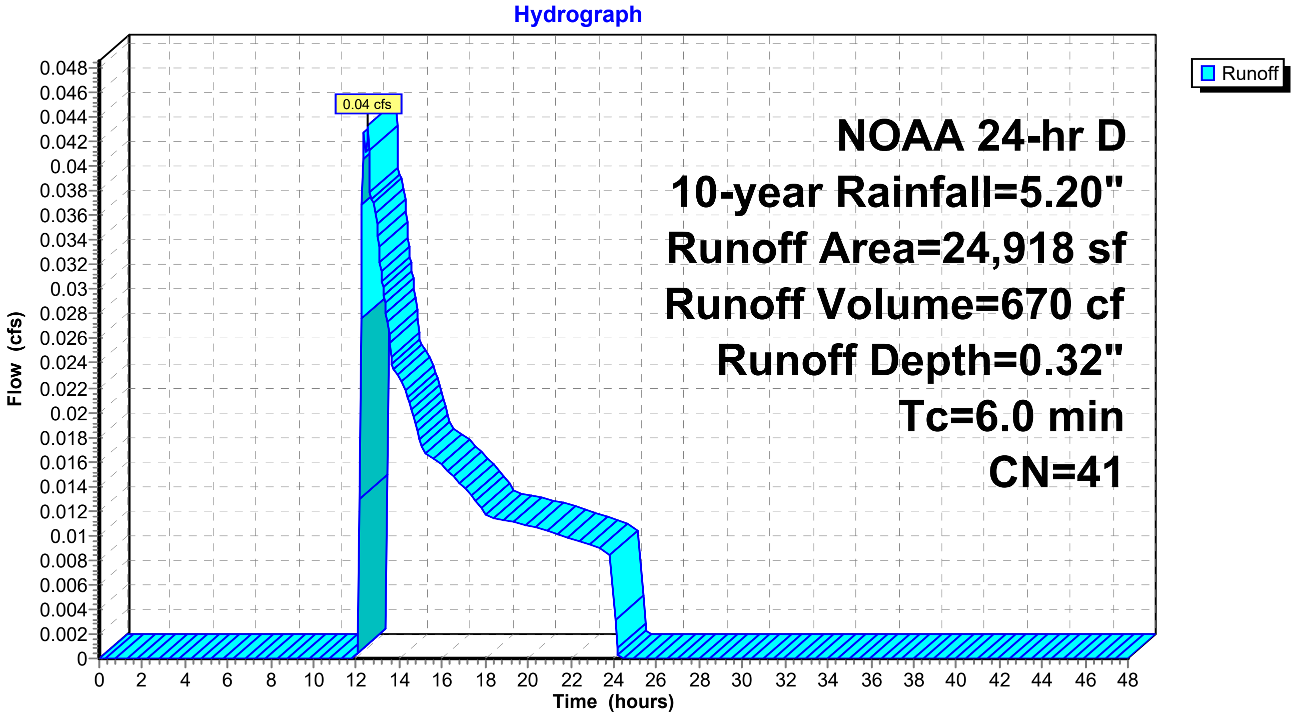
Runoff = 0.04 cfs @ 12.53 hrs, Volume= 670 cf, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
836	98	Paved parking, HSG A
24,082	39	>75% Grass cover, Good, HSG A
24,918	41	Weighted Average
24,082		96.64% Pervious Area
836		3.36% Impervious Area

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

Subcatchment PR-1C: PR-1C



Summary for Subcatchment PR-1D: PR-1D

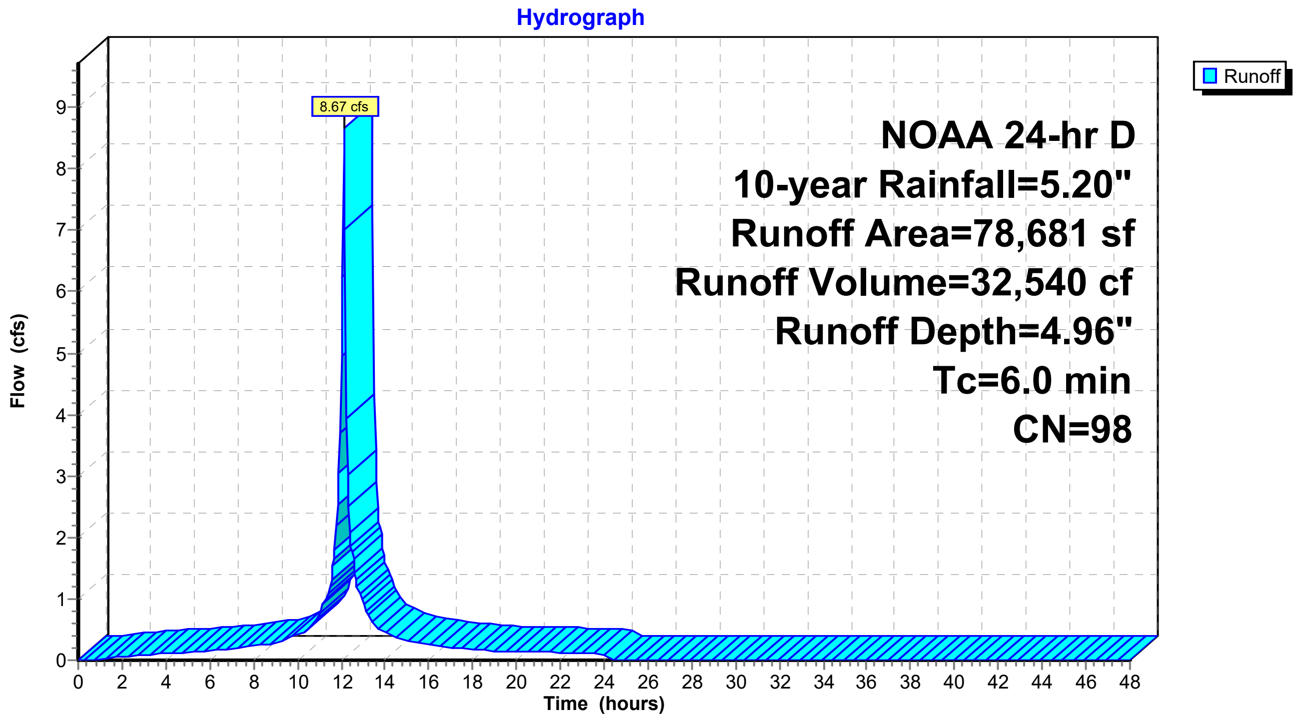
Runoff = 8.67 cfs @ 12.13 hrs, Volume= 32,540 cf, Depth= 4.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
78,681	98	Roofs, HSG A
78,681		100.00% Impervious Area

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

Subcatchment PR-1D: PR-1D



Summary for Subcatchment PR-1E: PR-1E

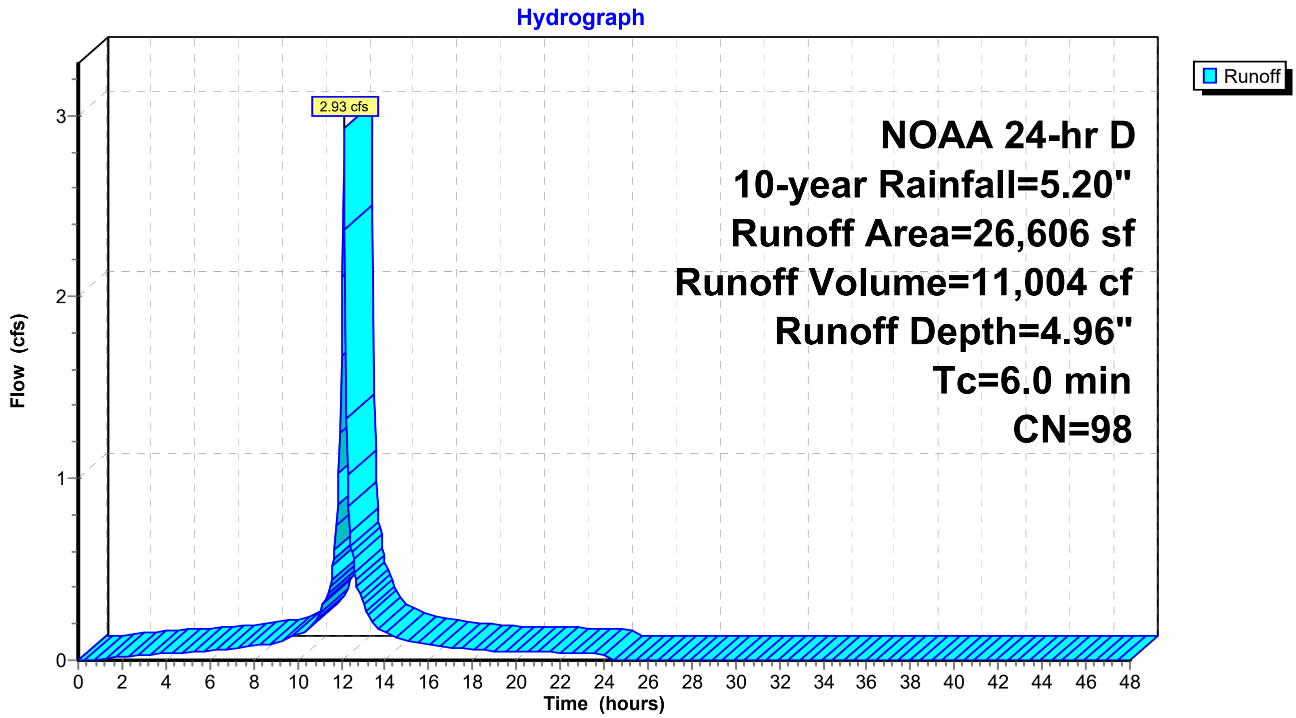
Runoff = 2.93 cfs @ 12.13 hrs, Volume= 11,004 cf, Depth= 4.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
26,606	98	Roofs, HSG A
26,606		100.00% Impervious Area

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

Subcatchment PR-1E: PR-1E



Summary for Subcatchment PR-1F: PR-1F

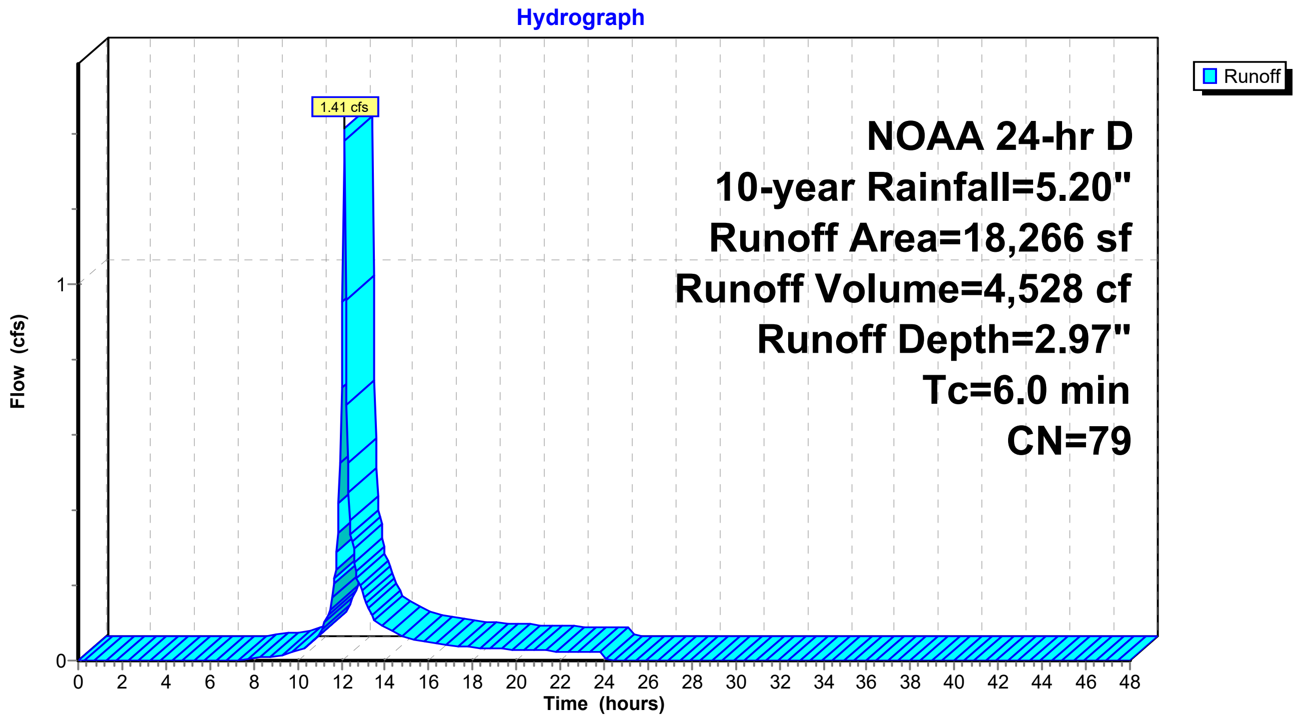
Runoff = 1.41 cfs @ 12.13 hrs, Volume= 4,528 cf, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
12,317	98	Paved parking, HSG A
5,949	39	>75% Grass cover, Good, HSG A
18,266	79	Weighted Average
5,949		32.57% Pervious Area
12,317		67.43% Impervious Area

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

Subcatchment PR-1F: PR-1F



Summary for Subcatchment PR-1G: PR-1G

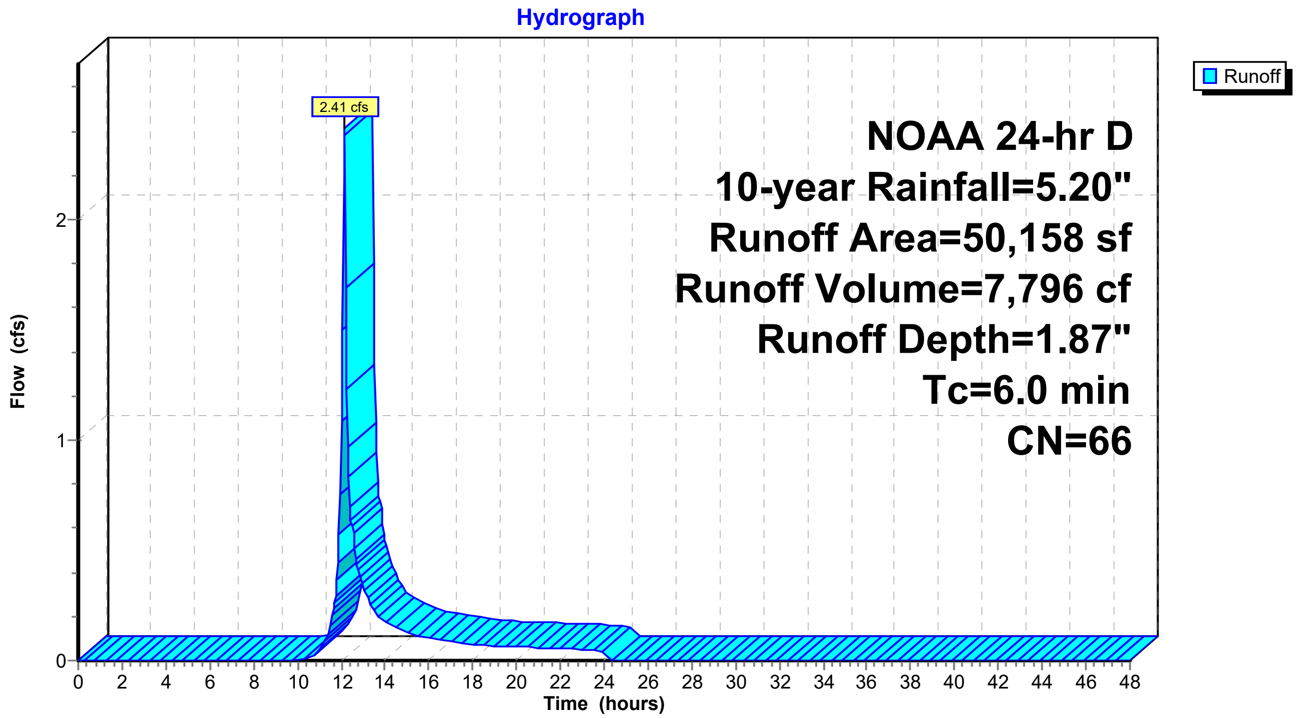
Runoff = 2.41 cfs @ 12.14 hrs, Volume= 7,796 cf, Depth= 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
23,071	98	Paved parking, HSG A
27,087	39	>75% Grass cover, Good, HSG A
50,158	66	Weighted Average
27,087		54.00% Pervious Area
23,071		46.00% Impervious Area

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

Subcatchment PR-1G: PR-1G



Summary for Subcatchment PR-1H: PR-1H

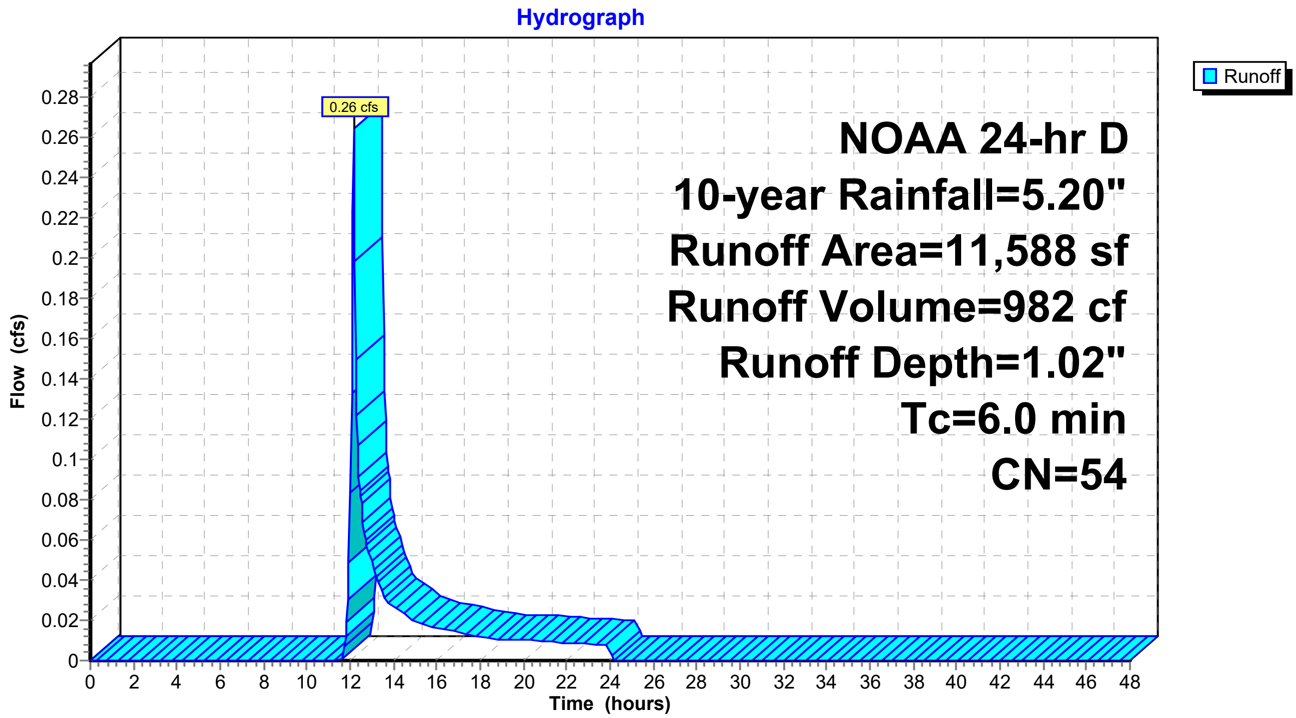
Runoff = 0.26 cfs @ 12.14 hrs, Volume= 982 cf, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
2,853	98	Paved parking, HSG A
8,735	39	>75% Grass cover, Good, HSG A
11,588	54	Weighted Average
8,735		75.38% Pervious Area
2,853		24.62% Impervious Area

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

Subcatchment PR-1H: PR-1H



Summary for Subcatchment PR-1I: PR-1I

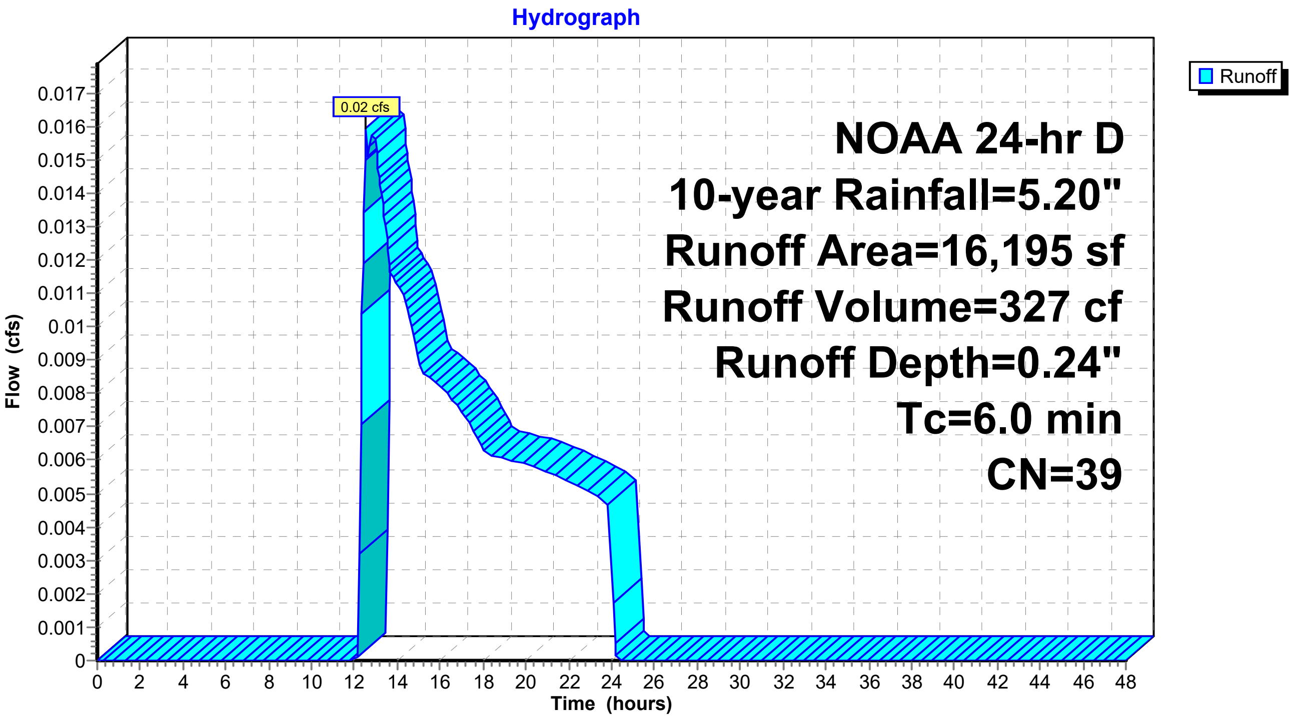
Runoff = 0.02 cfs @ 12.55 hrs, Volume= 327 cf, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
95	98	Paved parking, HSG A
16,100	39	>75% Grass cover, Good, HSG A
16,195	39	Weighted Average
16,100		99.41% Pervious Area
95		0.59% Impervious Area

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

Subcatchment PR-1I: PR-1I



Summary for Subcatchment PR-1J: PR-1J

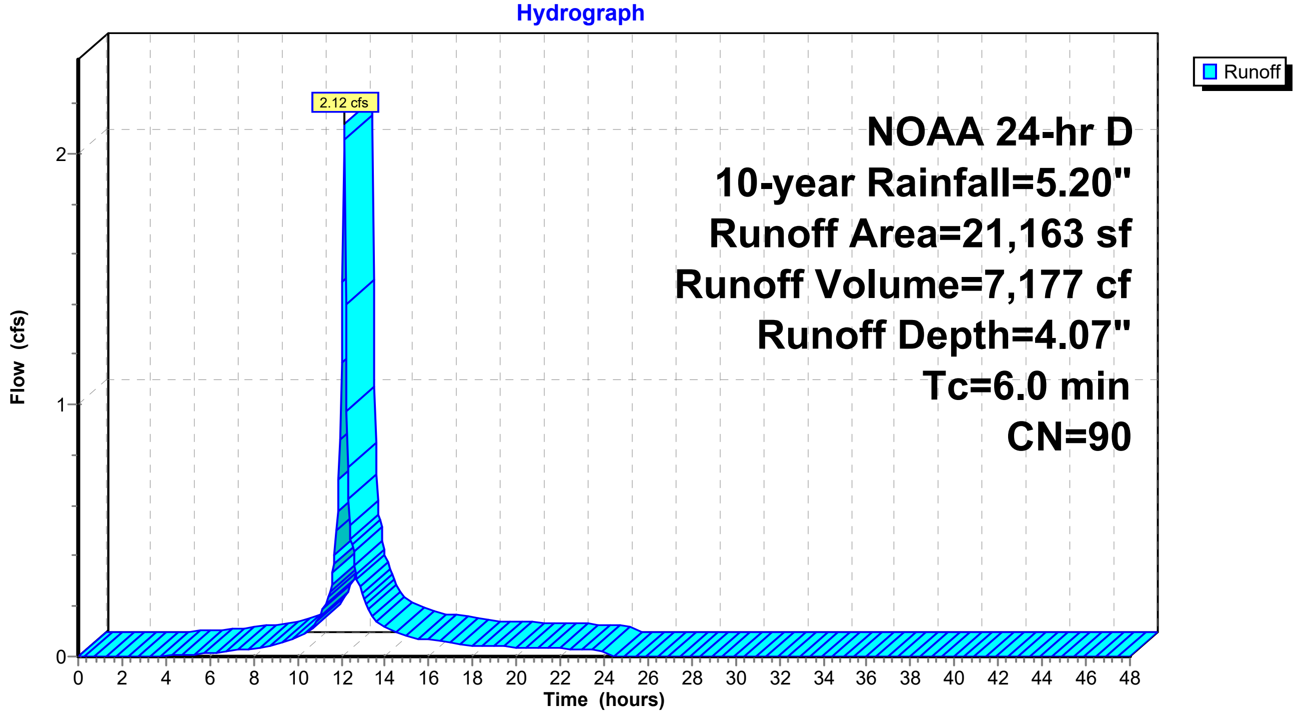
Runoff = 2.12 cfs @ 12.13 hrs, Volume= 7,177 cf, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
18,160	98	Paved parking, HSG A
3,003	39	>75% Grass cover, Good, HSG A
21,163	90	Weighted Average
3,003		14.19% Pervious Area
18,160		85.81% Impervious Area

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

Subcatchment PR-1J: PR-1J



Summary for Subcatchment PR-1K: PR-1K

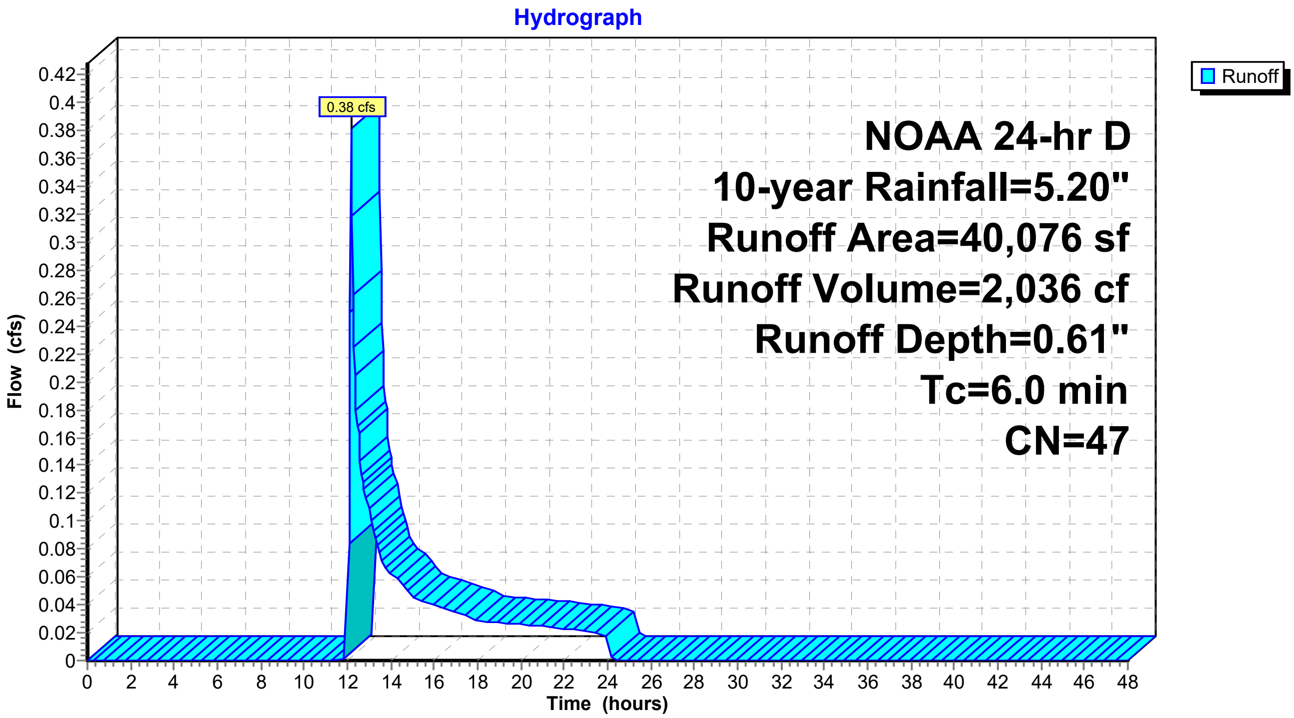
Runoff = 0.38 cfs @ 12.16 hrs, Volume= 2,036 cf, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
5,537	98	Paved parking, HSG A
34,539	39	>75% Grass cover, Good, HSG A
40,076	47	Weighted Average
34,539		86.18% Pervious Area
5,537		13.82% Impervious Area

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

Subcatchment PR-1K: PR-1K



Summary for Subcatchment PR-1L: PR-1L

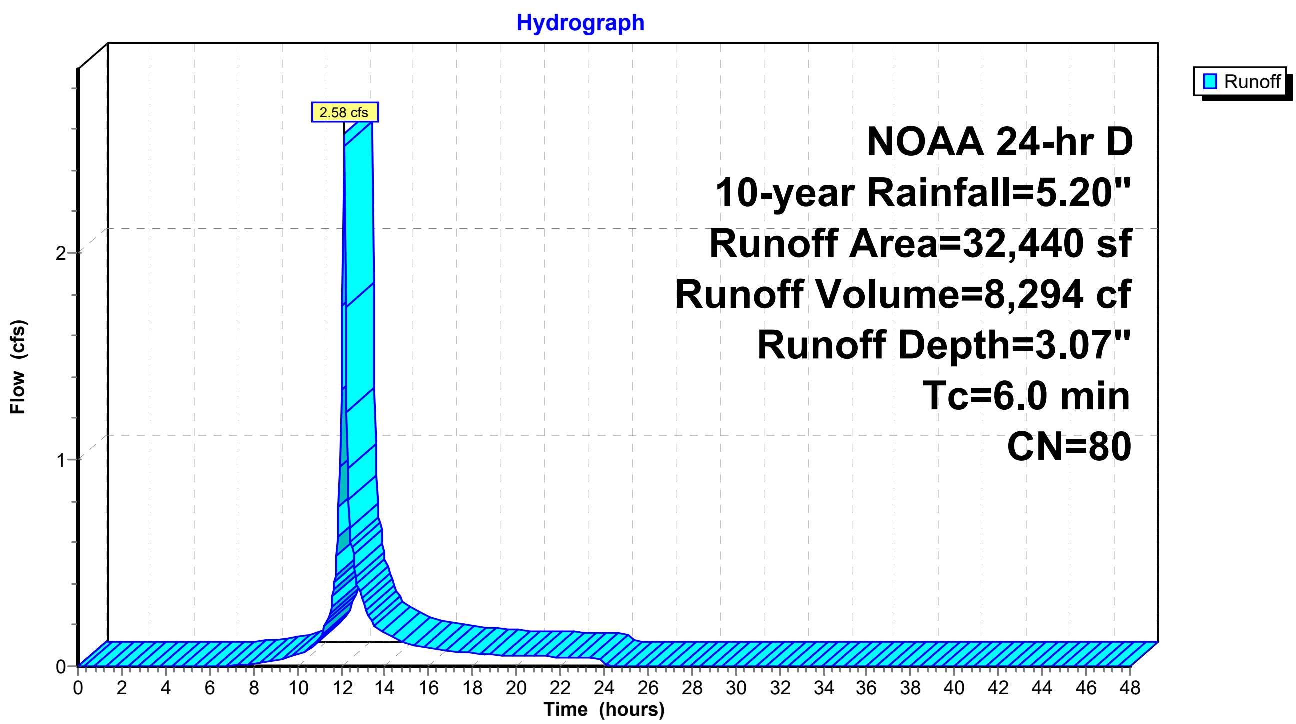
Runoff = 2.58 cfs @ 12.13 hrs, Volume= 8,294 cf, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
22,426	98	Paved parking, HSG A
10,014	39	>75% Grass cover, Good, HSG A
32,440	80	Weighted Average
10,014		30.87% Pervious Area
22,426		69.13% Impervious Area

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

Subcatchment PR-1L: PR-1L



Summary for Subcatchment PR-1M: PR-1M

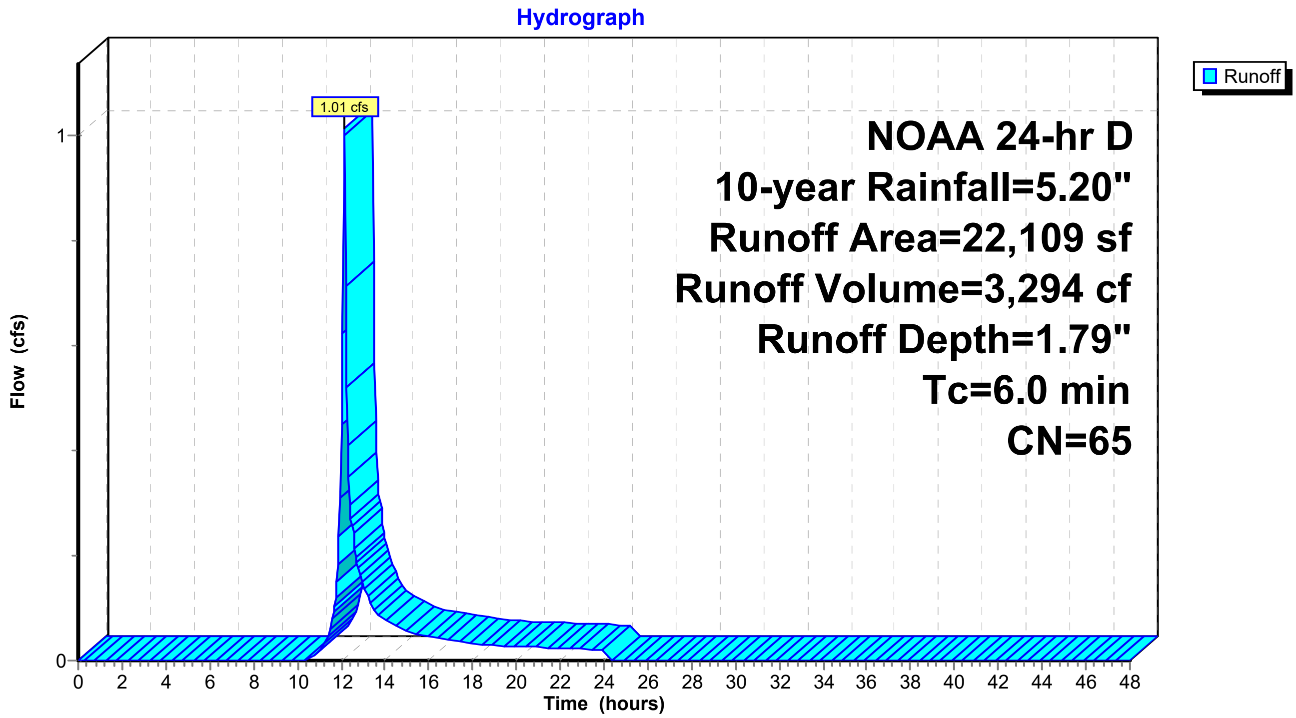
Runoff = 1.01 cfs @ 12.14 hrs, Volume= 3,294 cf, Depth= 1.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
9,781	98	Paved parking, HSG A
12,328	39	>75% Grass cover, Good, HSG A
22,109	65	Weighted Average
12,328		55.76% Pervious Area
9,781		44.24% Impervious Area

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

Subcatchment PR-1M: PR-1M



Summary for Subcatchment PR-1N: PR-1N

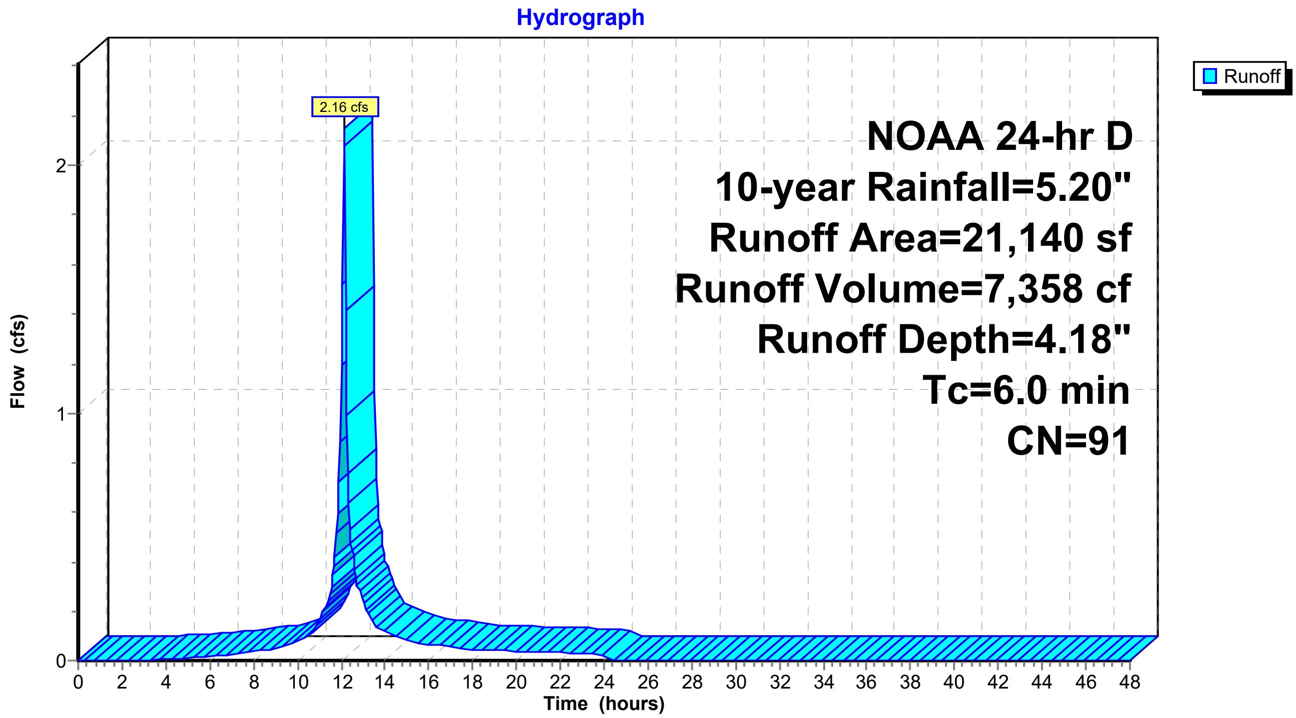
Runoff = 2.16 cfs @ 12.13 hrs, Volume= 7,358 cf, Depth= 4.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
18,490	98	Paved parking, HSG A
2,650	39	>75% Grass cover, Good, HSG A
21,140	91	Weighted Average
2,650		12.54% Pervious Area
18,490		87.46% Impervious Area

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

Subcatchment PR-1N: PR-1N



Summary for Subcatchment PR-1O: PR-1O

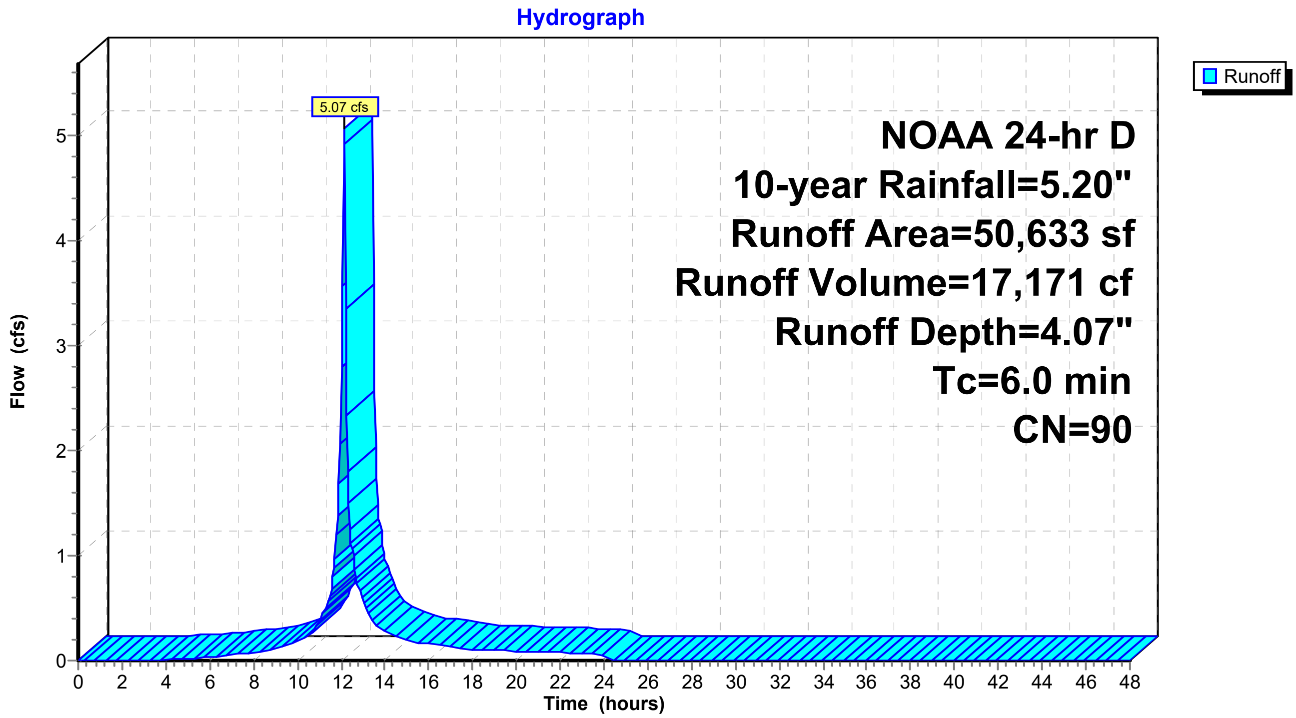
Runoff = 5.07 cfs @ 12.13 hrs, Volume= 17,171 cf, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
43,450	98	Paved parking, HSG A
7,183	39	>75% Grass cover, Good, HSG A
50,633	90	Weighted Average
7,183		14.19% Pervious Area
43,450		85.81% Impervious Area

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

Subcatchment PR-1O: PR-1O



Summary for Subcatchment PR-1P: PR-1P

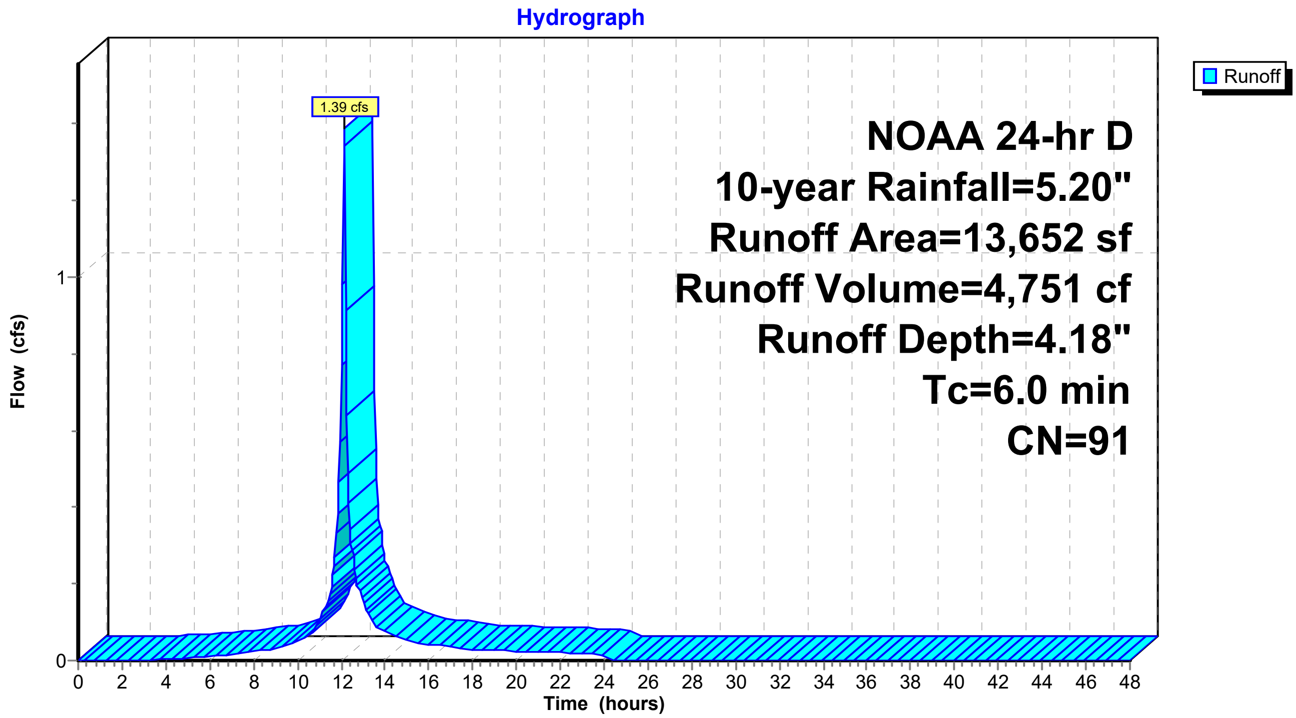
Runoff = 1.39 cfs @ 12.13 hrs, Volume= 4,751 cf, Depth= 4.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
12,120	98	Paved parking, HSG A
1,532	39	>75% Grass cover, Good, HSG A
13,652	91	Weighted Average
1,532		11.22% Pervious Area
12,120		88.78% Impervious Area

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

Subcatchment PR-1P: PR-1P



Summary for Subcatchment PR-1Q: PR-1Q

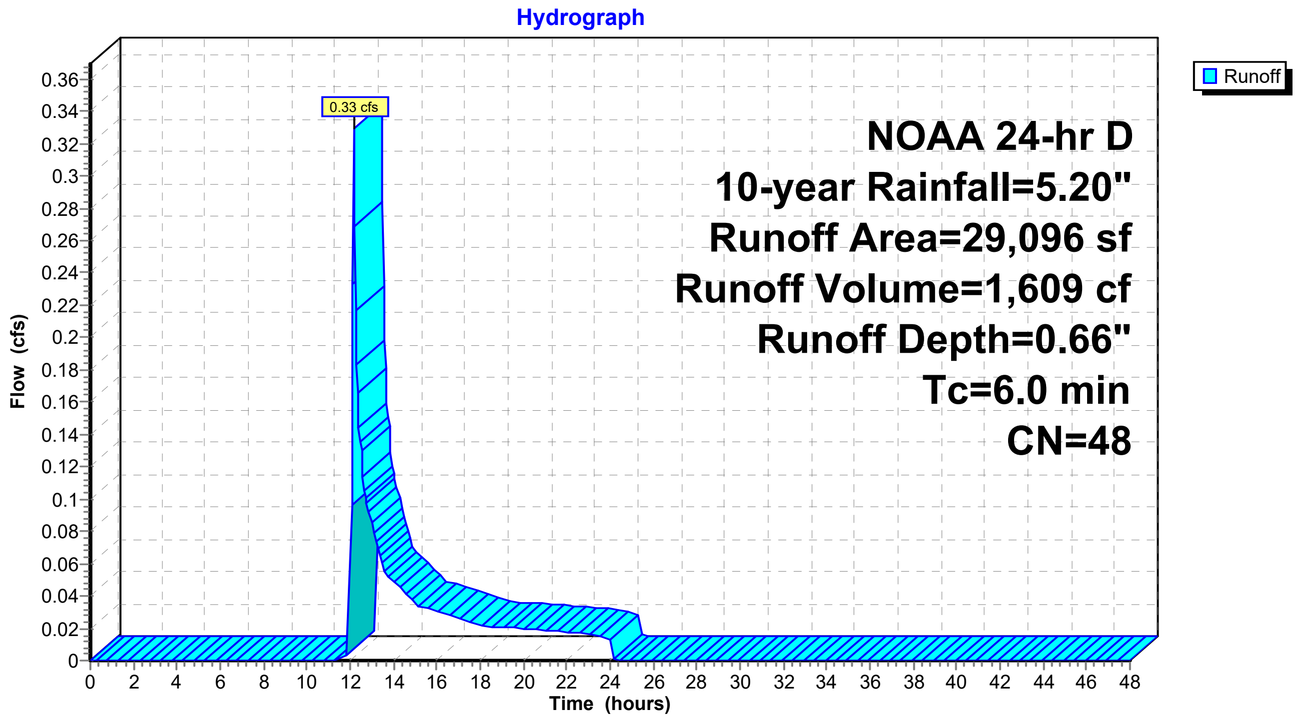
Runoff = 0.33 cfs @ 12.16 hrs, Volume= 1,609 cf, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
4,261	98	Paved parking, HSG A
24,835	39	>75% Grass cover, Good, HSG A
29,096	48	Weighted Average
24,835		85.36% Pervious Area
4,261		14.64% Impervious Area

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

Subcatchment PR-1Q: PR-1Q



Summary for Subcatchment PR-1R: PR-1R

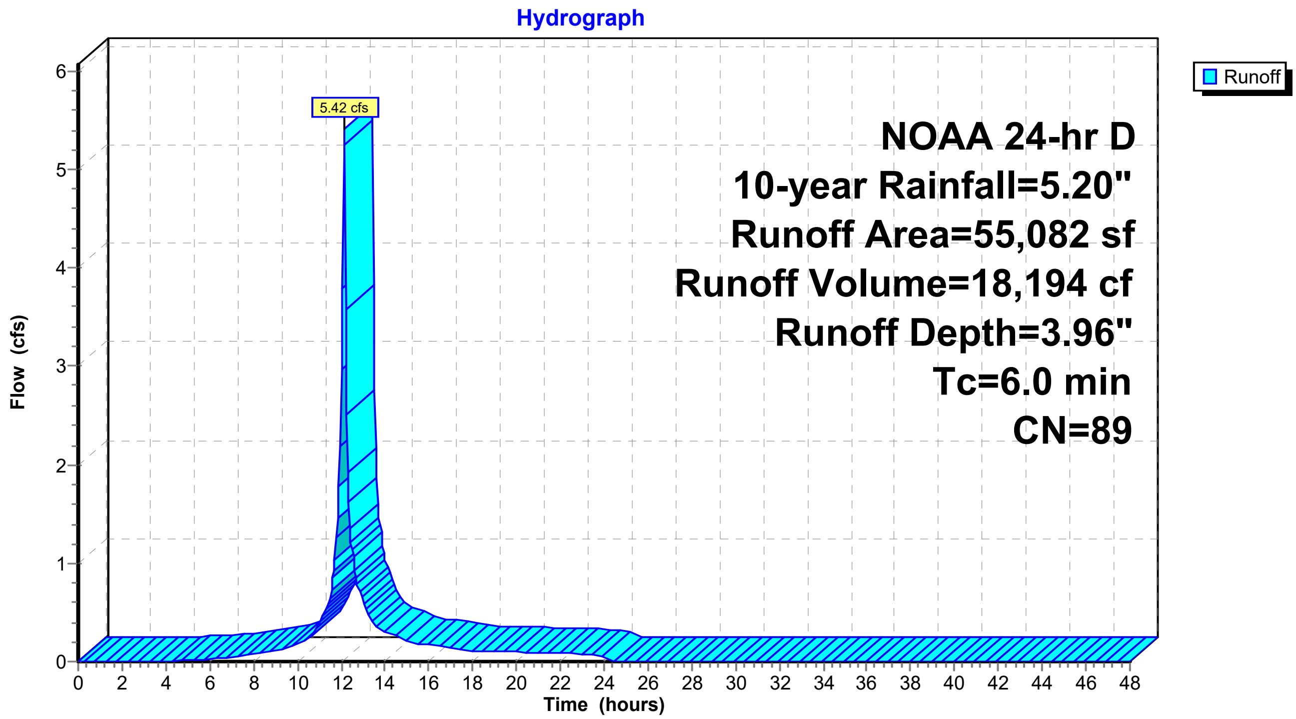
Runoff = 5.42 cfs @ 12.13 hrs, Volume= 18,194 cf, Depth= 3.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
35,043	98	Paved parking, HSG A
8,733	39	>75% Grass cover, Good, HSG A
11,306	98	Unconnected roofs, HSG A
55,082	89	Weighted Average
8,733		15.85% Pervious Area
46,349		84.15% Impervious Area
11,306		24.39% Unconnected

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

Subcatchment PR-1R: PR-1R



Summary for Subcatchment PR-1S: PR-1S

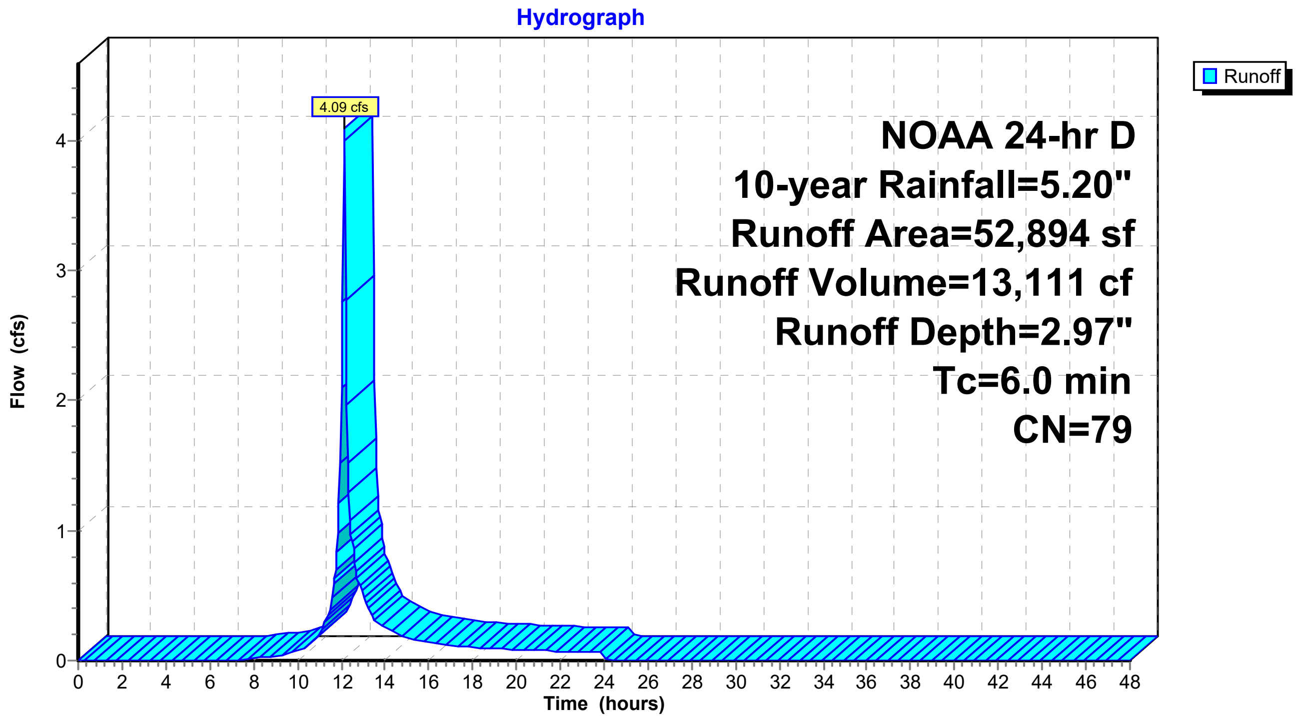
Runoff = 4.09 cfs @ 12.13 hrs, Volume= 13,111 cf, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
35,565	98	Paved parking, HSG A
17,329	39	>75% Grass cover, Good, HSG A
52,894	79	Weighted Average
17,329		32.76% Pervious Area
35,565		67.24% Impervious Area

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

Subcatchment PR-1S: PR-1S



Summary for Subcatchment PR-1U: PR-1U

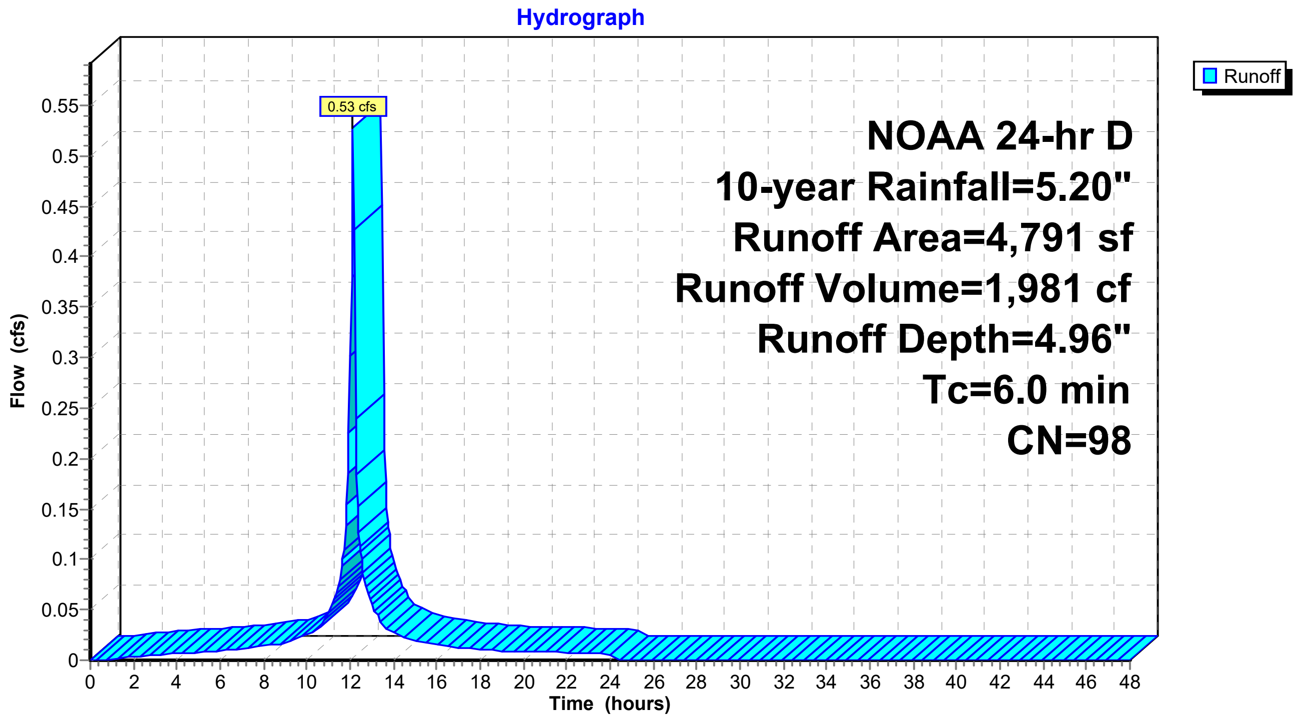
Runoff = 0.53 cfs @ 12.13 hrs, Volume= 1,981 cf, Depth= 4.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
4,791	98	Paved parking, HSG A
4,791		100.00% Impervious Area

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

Subcatchment PR-1U: PR-1U



Summary for Subcatchment PR-1V: PR-1V

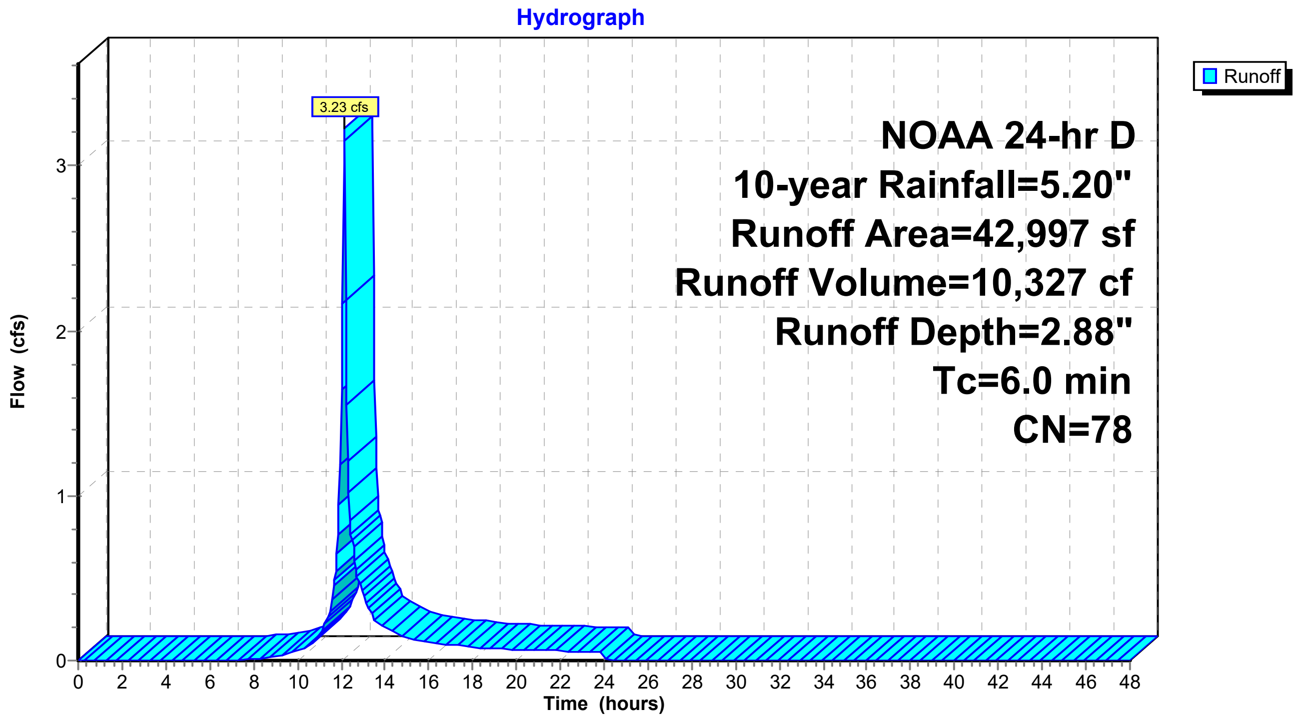
Runoff = 3.23 cfs @ 12.13 hrs, Volume= 10,327 cf, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
28,362	98	Paved parking, HSG A
14,635	39	>75% Grass cover, Good, HSG A
42,997	78	Weighted Average
14,635		34.04% Pervious Area
28,362		65.96% Impervious Area

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

Subcatchment PR-1V: PR-1V



Summary for Subcatchment PR-2A: PR-2A

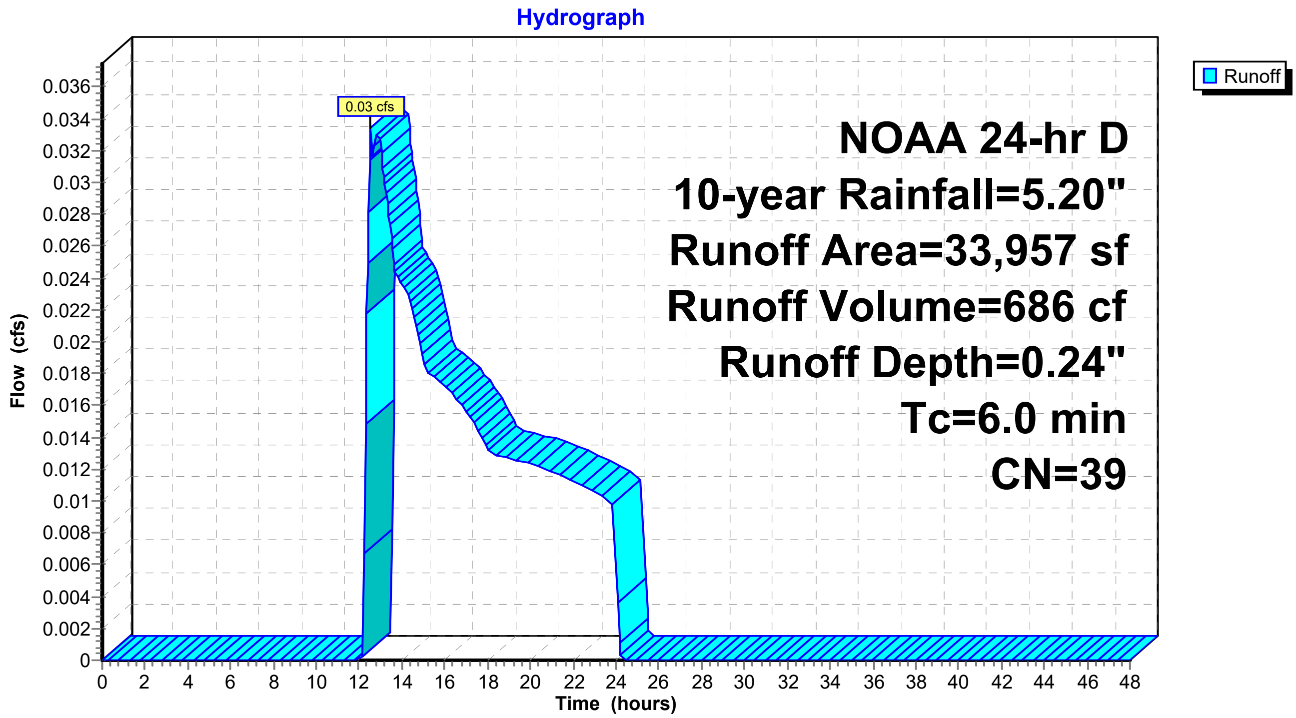
Runoff = 0.03 cfs @ 12.55 hrs, Volume= 686 cf, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
33,957	39	>75% Grass cover, Good, HSG A
33,957		100.00% Pervious Area

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

Subcatchment PR-2A: PR-2A



Summary for Subcatchment PR-2B: PR-2B

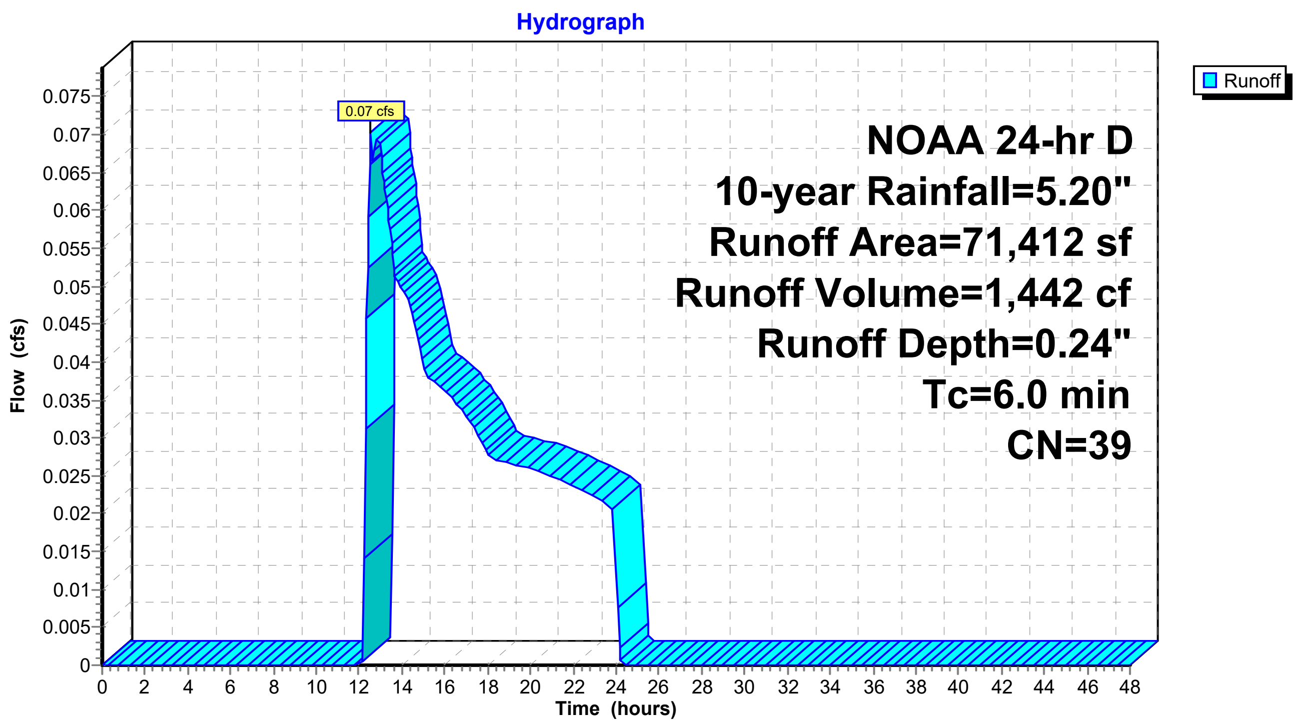
Runoff = 0.07 cfs @ 12.55 hrs, Volume= 1,442 cf, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
71,412	39	>75% Grass cover, Good, HSG A
71,412		100.00% Pervious Area

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

Subcatchment PR-2B: PR-2B



Summary for Subcatchment PR-2C: PR-2C

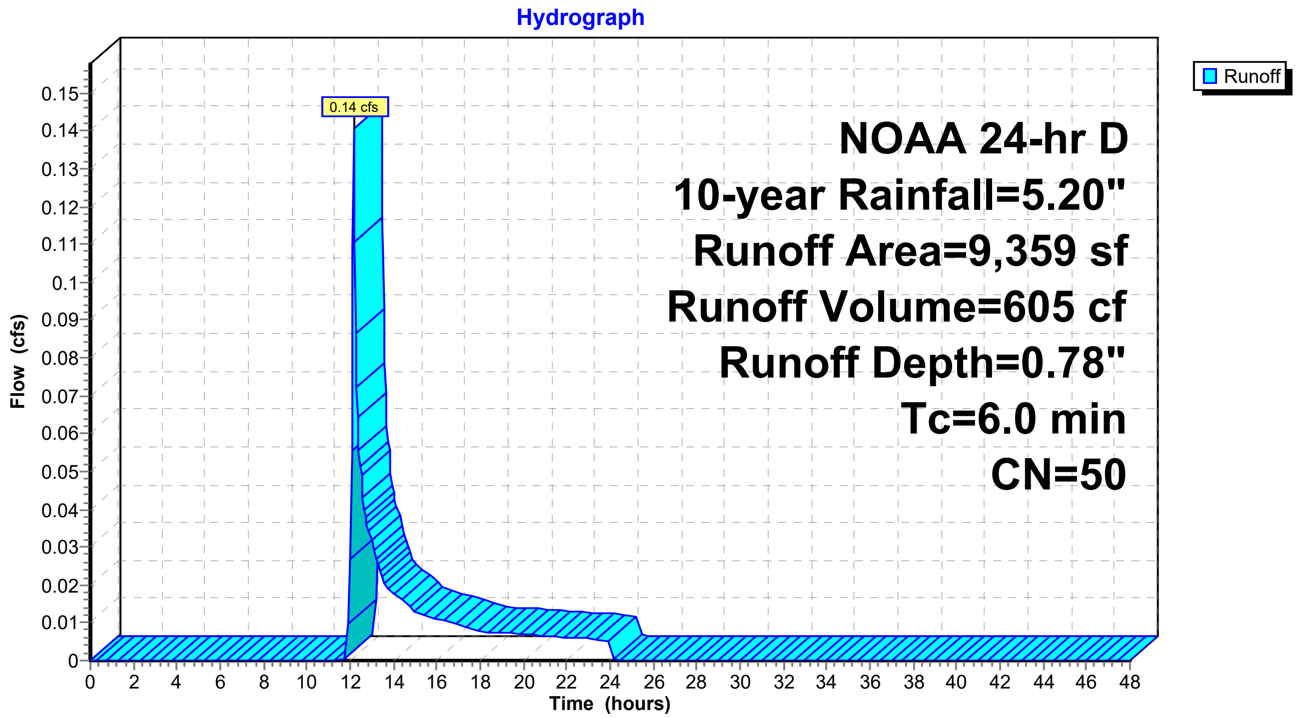
Runoff = 0.14 cfs @ 12.15 hrs, Volume= 605 cf, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
1,683	98	Paved parking, HSG A
7,676	39	>75% Grass cover, Good, HSG A
9,359	50	Weighted Average
7,676		82.02% Pervious Area
1,683		17.98% Impervious Area

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

Subcatchment PR-2C: PR-2C



Summary for Subcatchment PR-2D: PR-2D

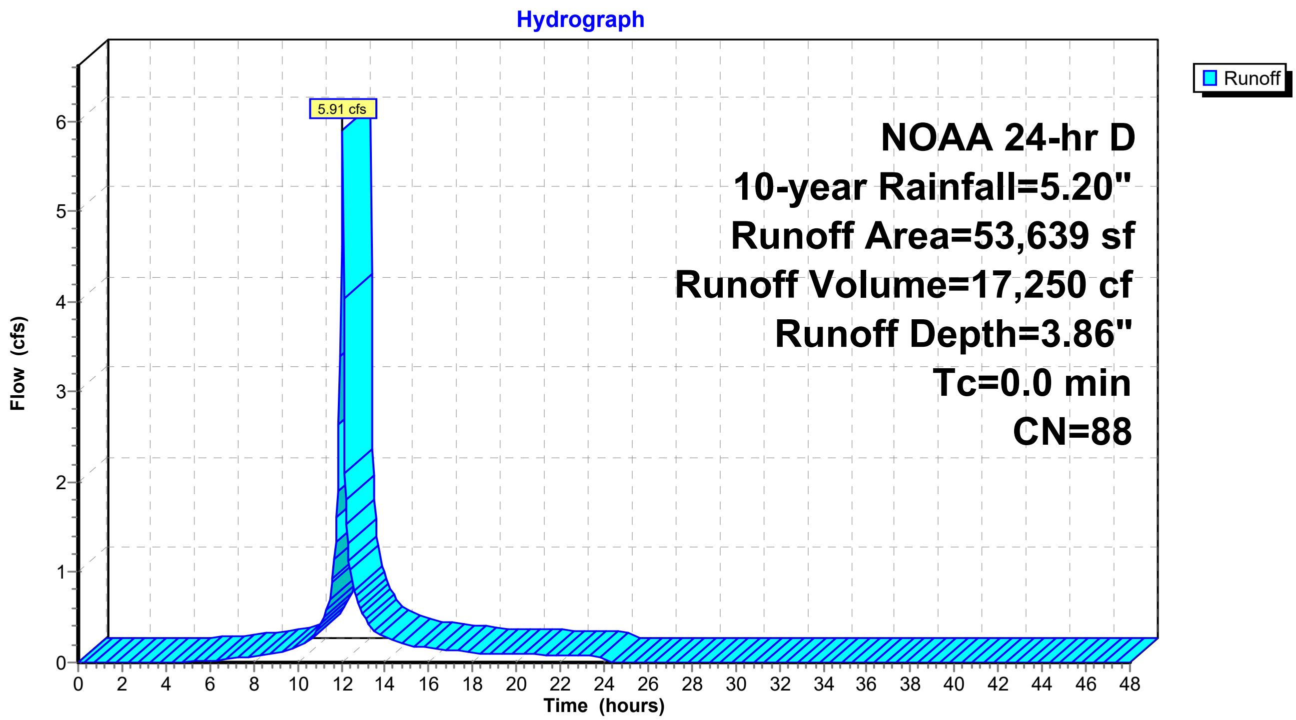
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 5.91 cfs @ 12.05 hrs, Volume= 17,250 cf, Depth= 3.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
44,403	98	Paved parking, HSG A
9,236	39	>75% Grass cover, Good, HSG A
53,639	88	Weighted Average
9,236		17.22% Pervious Area
44,403		82.78% Impervious Area

Subcatchment PR-2D: PR-2D



Summary for Subcatchment PR-2E: PR-2E

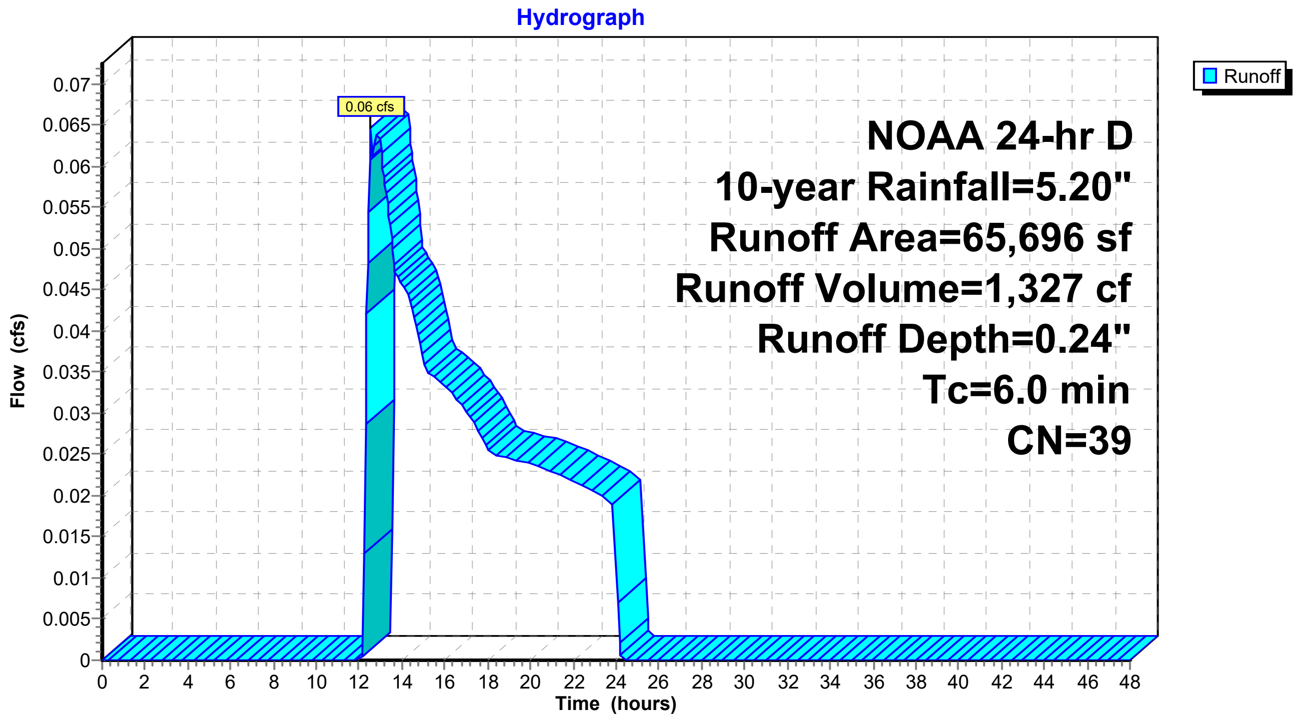
Runoff = 0.06 cfs @ 12.55 hrs, Volume= 1,327 cf, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
65,696	39	>75% Grass cover, Good, HSG A
65,696		100.00% Pervious Area

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

Subcatchment PR-2E: PR-2E



Summary for Subcatchment PR-2F: PR-2F

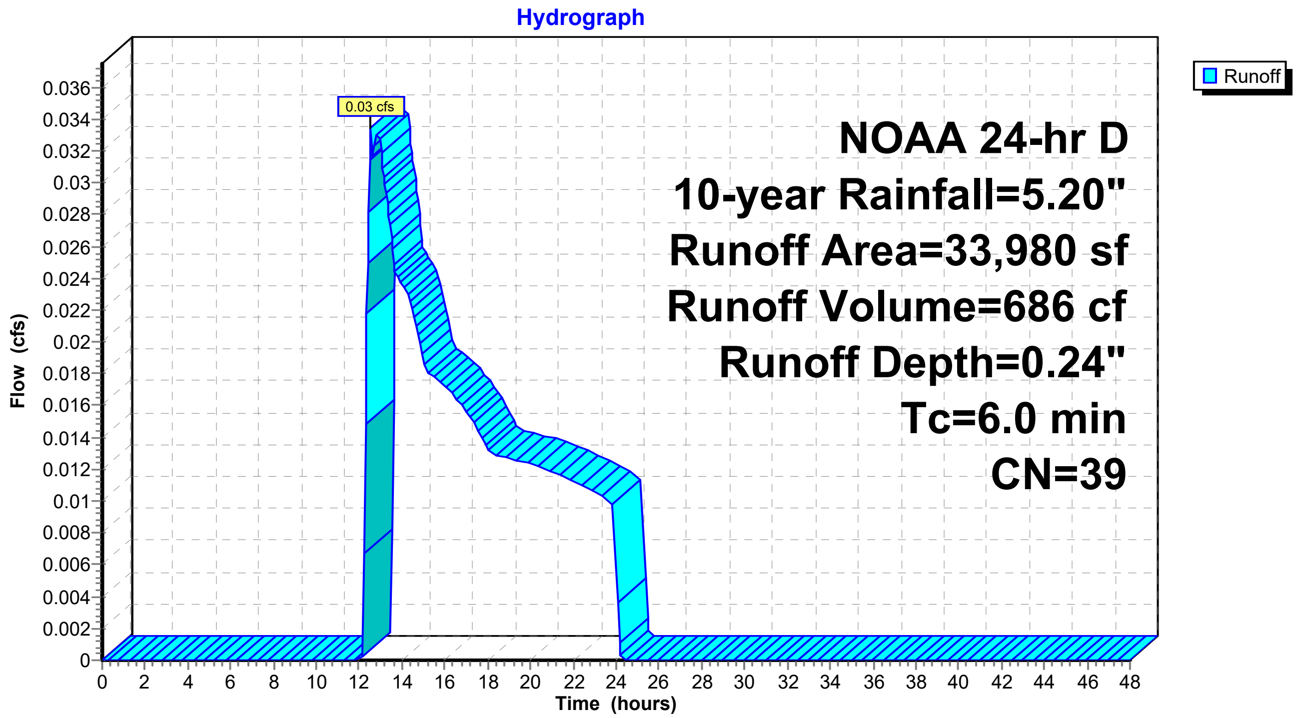
Runoff = 0.03 cfs @ 12.55 hrs, Volume= 686 cf, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
33,980	39	>75% Grass cover, Good, HSG A
33,980		100.00% Pervious Area

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

Subcatchment PR-2F: PR-2F



Summary for Subcatchment PR-2G: PR-2G

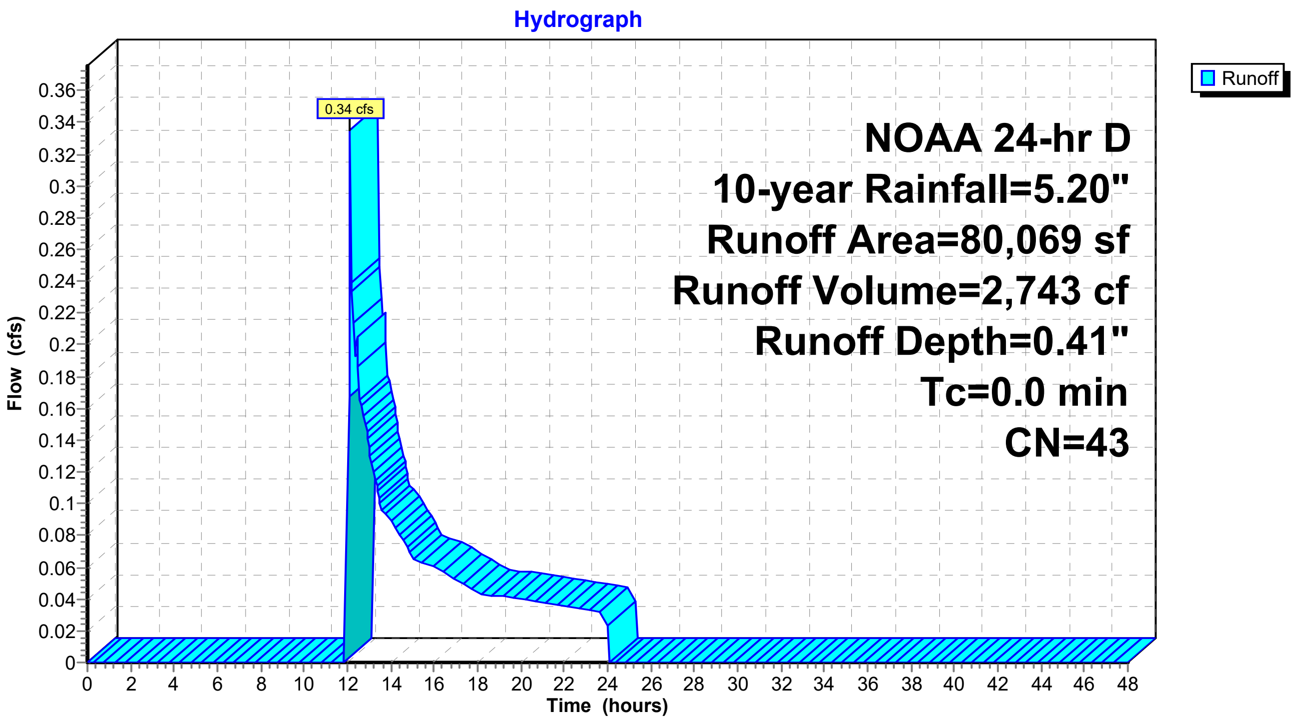
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.34 cfs @ 12.11 hrs, Volume= 2,743 cf, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
5,874	98	Paved parking, HSG A
74,195	39	>75% Grass cover, Good, HSG A
80,069	43	Weighted Average
74,195		92.66% Pervious Area
5,874		7.34% Impervious Area

Subcatchment PR-2G: PR-2G



Summary for Subcatchment PR-2H: PR-2H

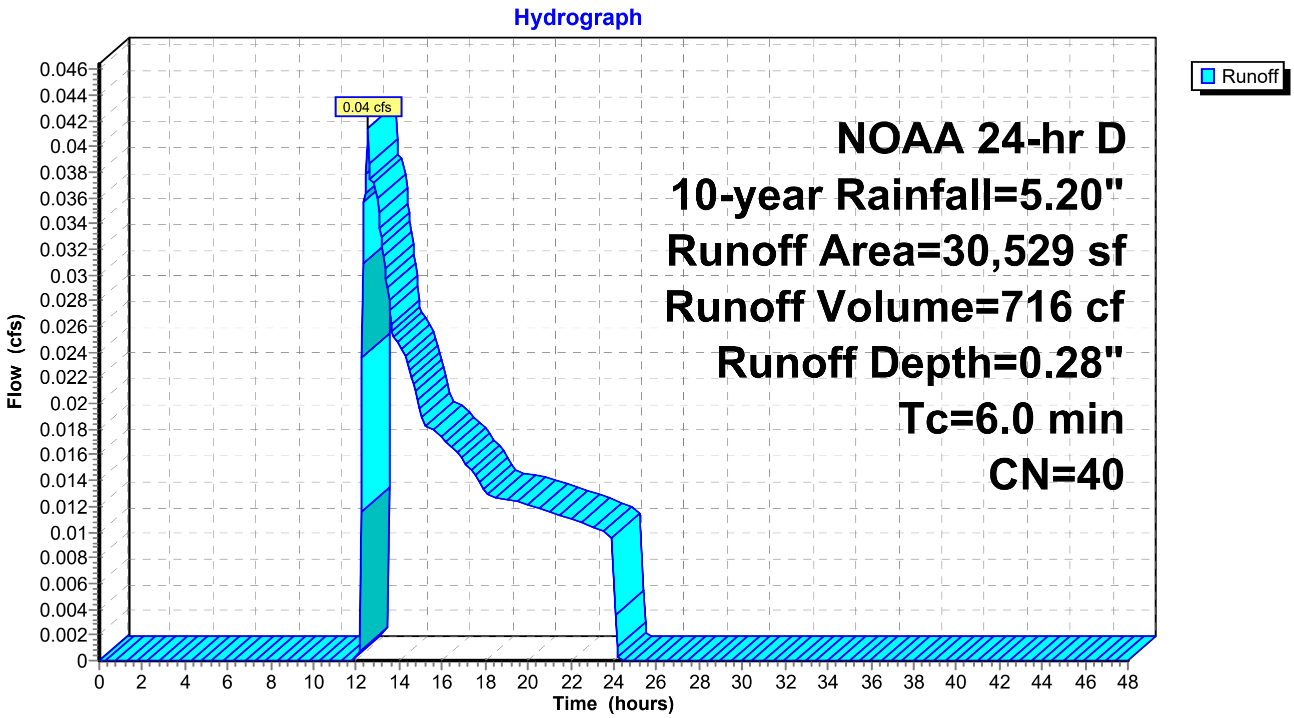
Runoff = 0.04 cfs @ 12.54 hrs, Volume= 716 cf, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
453	98	Paved parking, HSG A
30,076	39	>75% Grass cover, Good, HSG A
30,529	40	Weighted Average
30,076		98.52% Pervious Area
453		1.48% Impervious Area

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

Subcatchment PR-2H: PR-2H



Summary for Subcatchment PR-3A: PR-3A

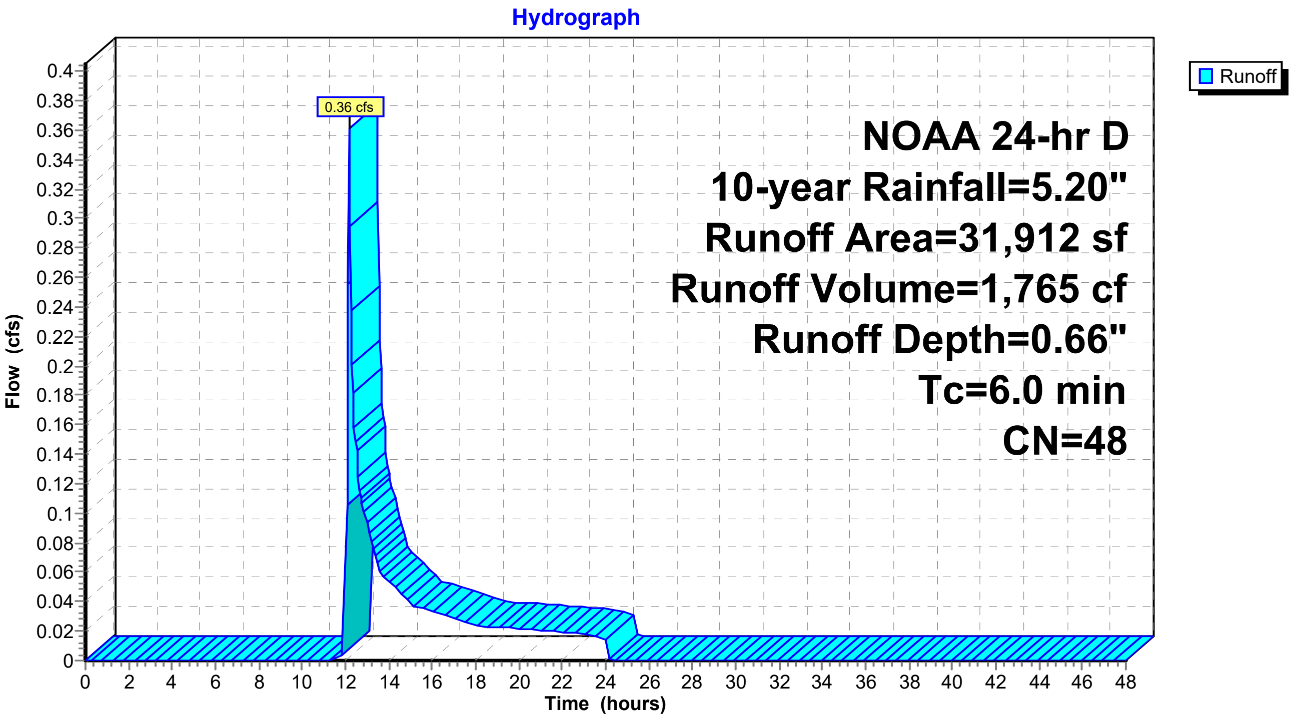
Runoff = 0.36 cfs @ 12.16 hrs, Volume= 1,765 cf, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
4,890	98	Paved parking, HSG A
27,022	39	>75% Grass cover, Good, HSG A
31,912	48	Weighted Average
27,022		84.68% Pervious Area
4,890		15.32% Impervious Area

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

Subcatchment PR-3A: PR-3A



Summary for Subcatchment PR-3B: PR-3B

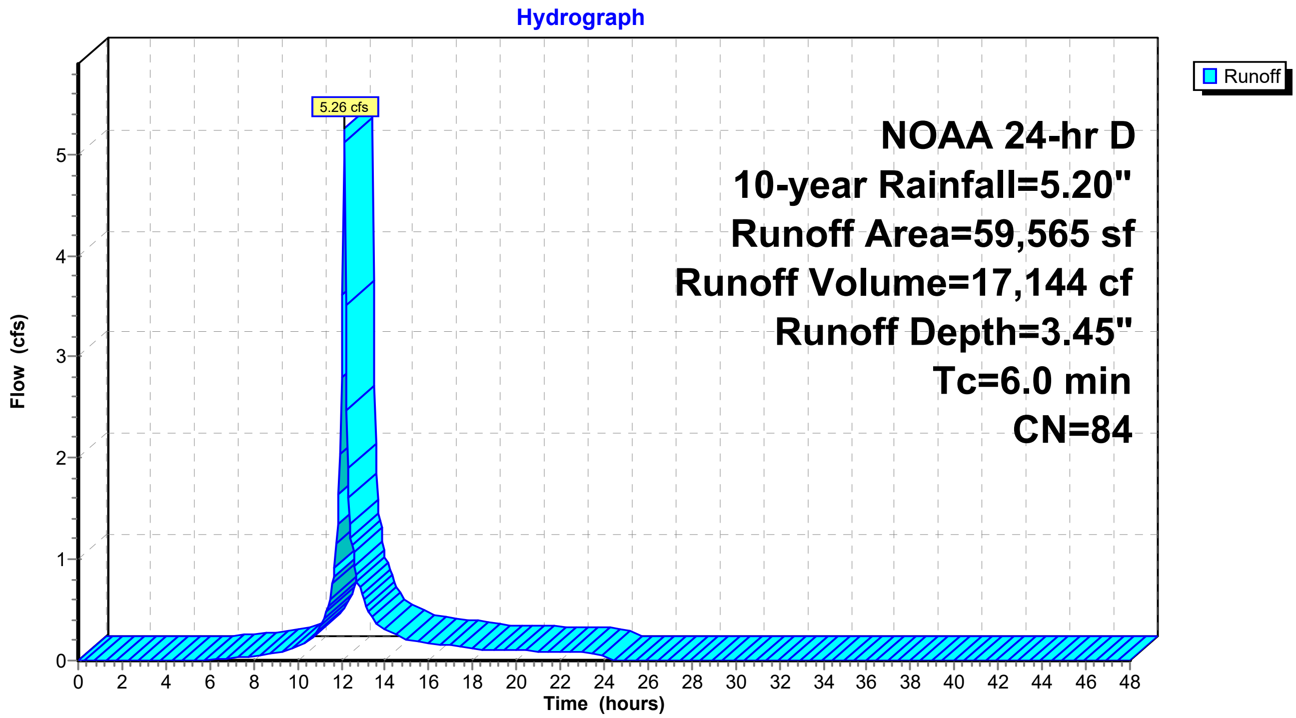
Runoff = 5.26 cfs @ 12.13 hrs, Volume= 17,144 cf, Depth= 3.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
45,006	98	Paved parking, HSG A
14,559	39	>75% Grass cover, Good, HSG A
59,565	84	Weighted Average
14,559		24.44% Pervious Area
45,006		75.56% Impervious Area

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

Subcatchment PR-3B: PR-3B



Summary for Subcatchment PR-3C: PR-3C

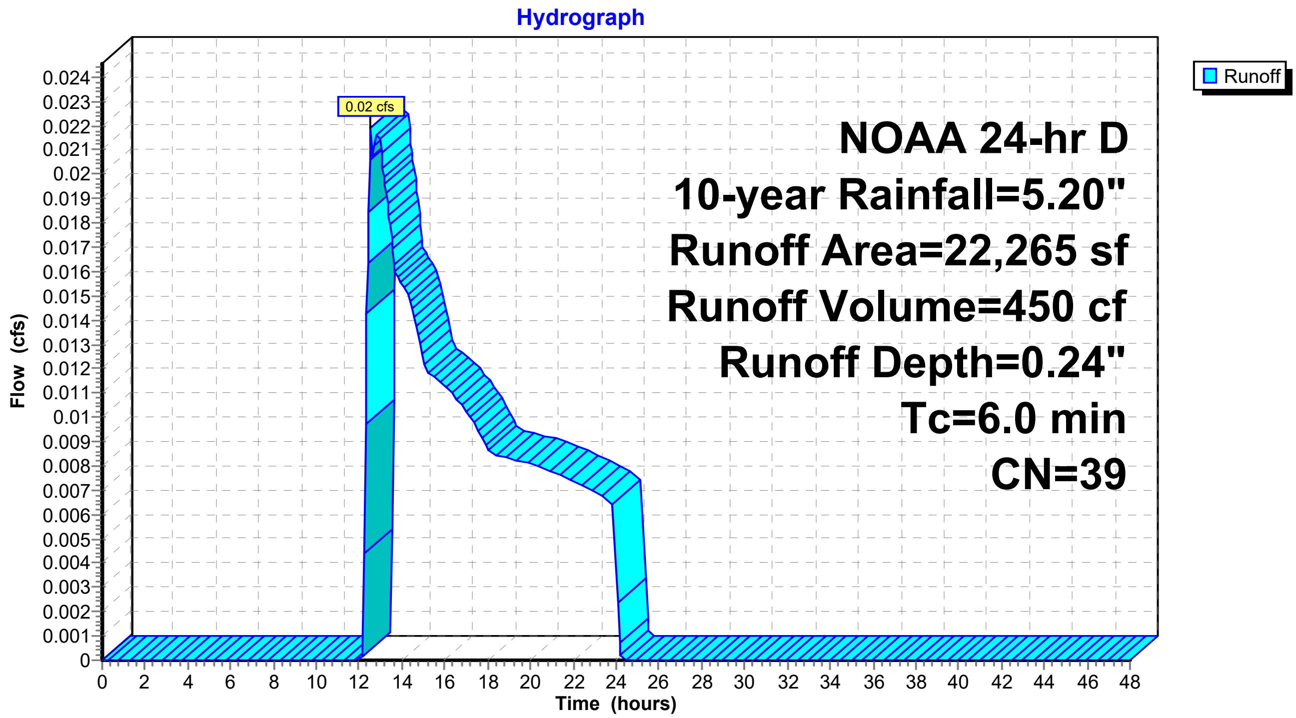
Runoff = 0.02 cfs @ 12.55 hrs, Volume= 450 cf, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10-year Rainfall=5.20"

Area (sf)	CN	Description
22,265	39	>75% Grass cover, Good, HSG A
22,265		100.00% Pervious Area

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

Subcatchment PR-3C: PR-3C



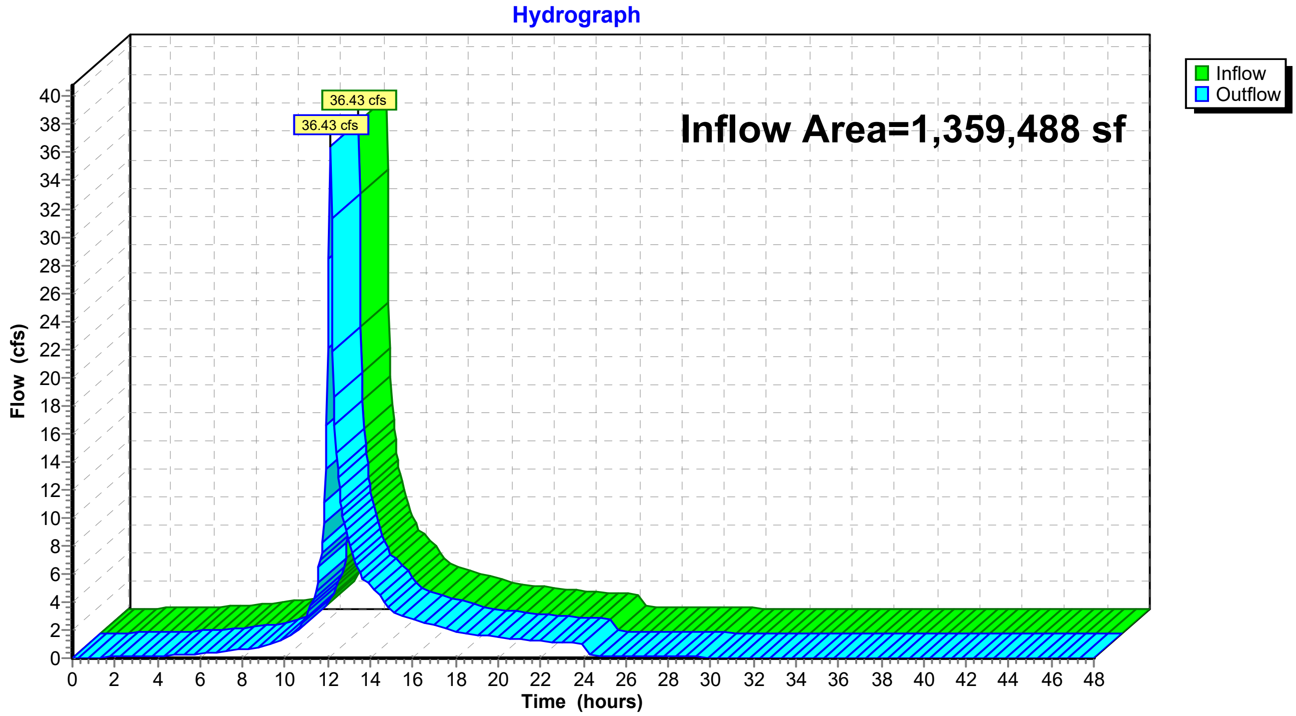
Summary for Reach DP-1: DP-1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,359,488 sf, 43.90% Impervious, Inflow Depth > 1.80" for 10-year event
Inflow = 36.43 cfs @ 12.12 hrs, Volume= 204,173 cf
Outflow = 36.43 cfs @ 12.12 hrs, Volume= 204,173 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-1: DP-1

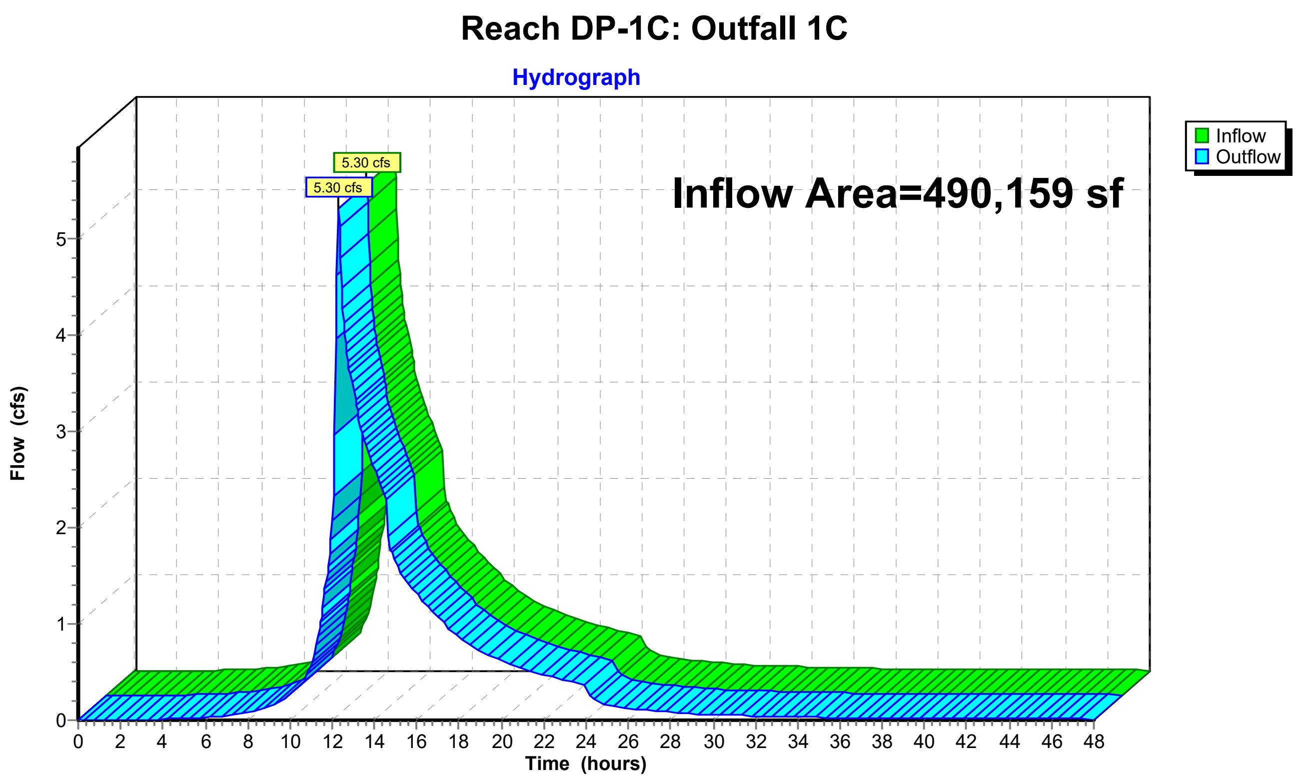


Summary for Reach DP-1C: Outfall 1C

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	490,159 sf,	53.24% Impervious,	Inflow Depth > 1.69"	for 10-year event
Inflow =	5.30 cfs @	12.29 hrs, Volume=	68,861 cf	
Outflow =	5.30 cfs @	12.29 hrs, Volume=	68,861 cf,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

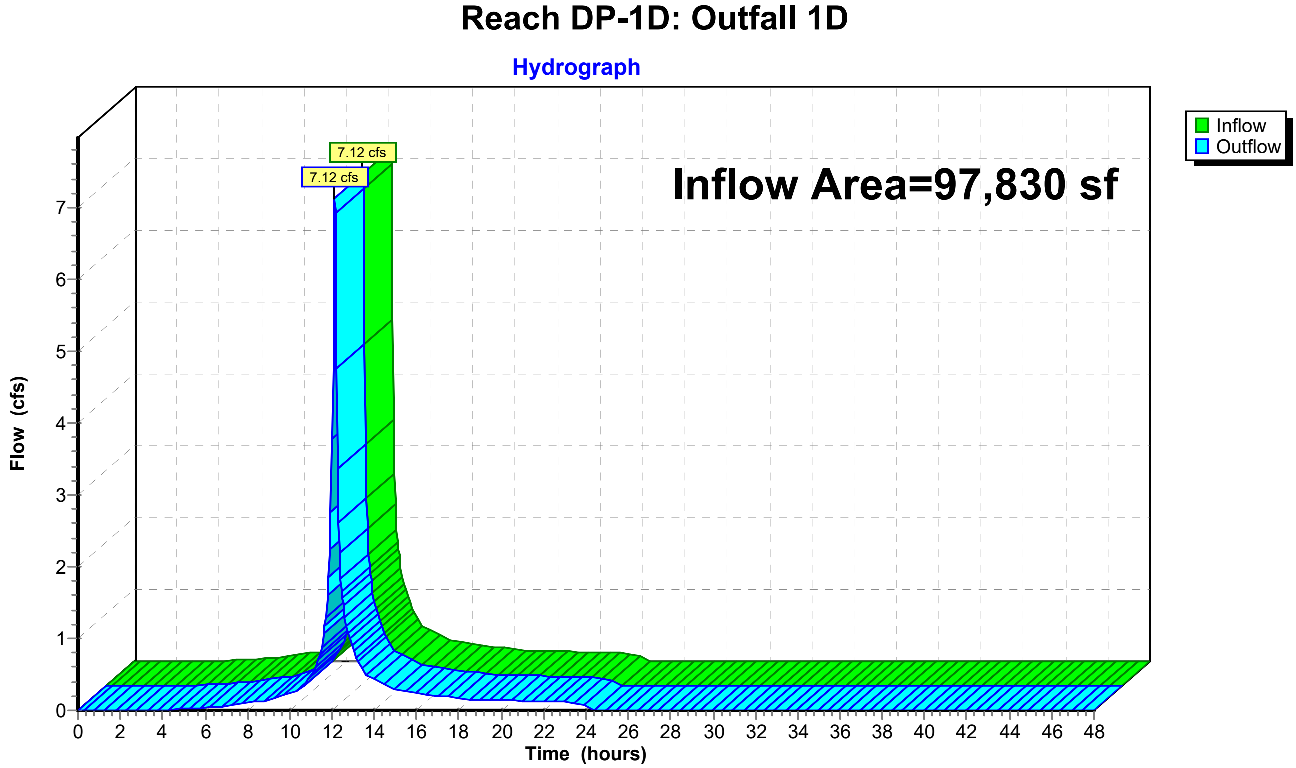


Summary for Reach DP-1D: Outfall 1D

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	97,830 sf,	64.12% Impervious,	Inflow Depth = 3.01"	for 10-year event
Inflow =	7.12 cfs @	12.13 hrs, Volume=	24,554 cf	
Outflow =	7.12 cfs @	12.13 hrs, Volume=	24,554 cf,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



Summary for Reach DP-2: DP-2

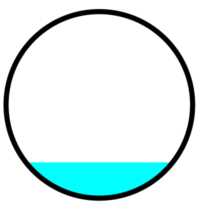
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 344,661 sf, 15.21% Impervious, Inflow Depth = 0.86" for 10-year event
Inflow = 6.12 cfs @ 12.05 hrs, Volume= 24,769 cf
Outflow = 5.93 cfs @ 12.05 hrs, Volume= 24,769 cf, Atten= 3%, Lag= 0.3 min

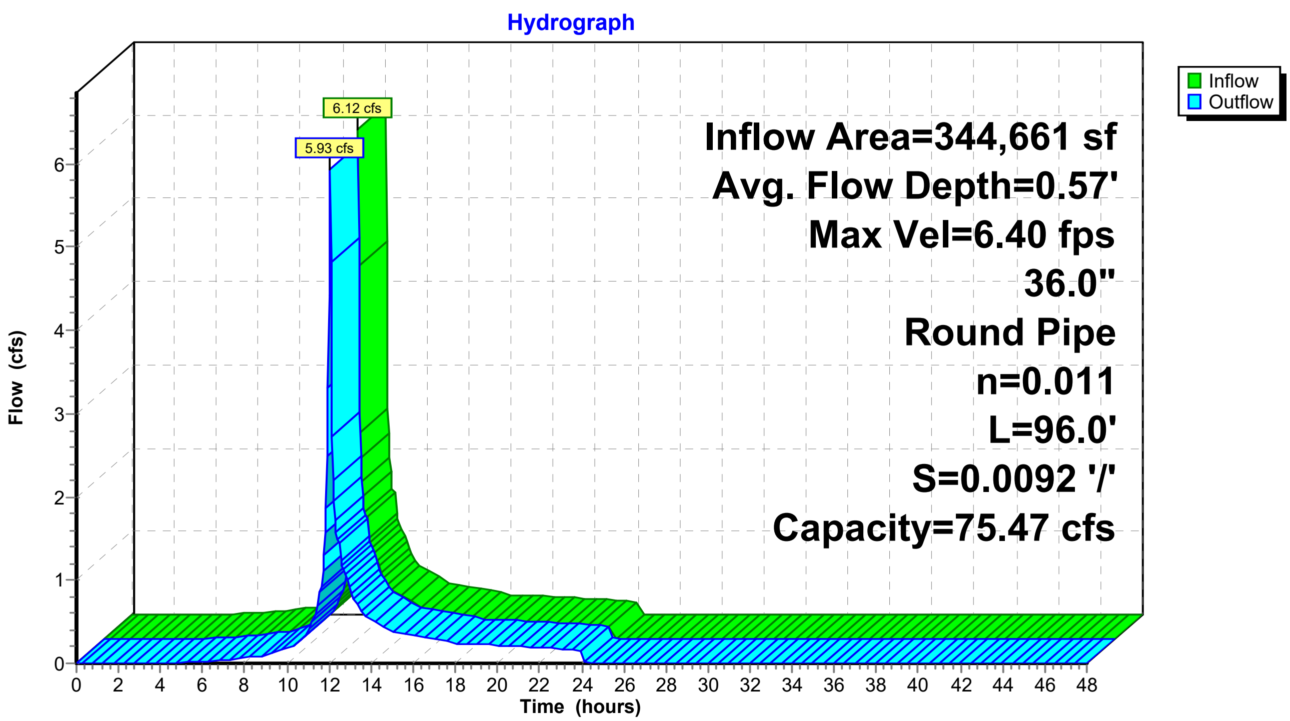
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.40 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.35 fps, Avg. Travel Time= 0.7 min

Peak Storage= 91 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 75.47 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 96.0' Slope= 0.0092 '/'
Inlet Invert= 16.00', Outlet Invert= 15.12'



Reach DP-2: DP-2



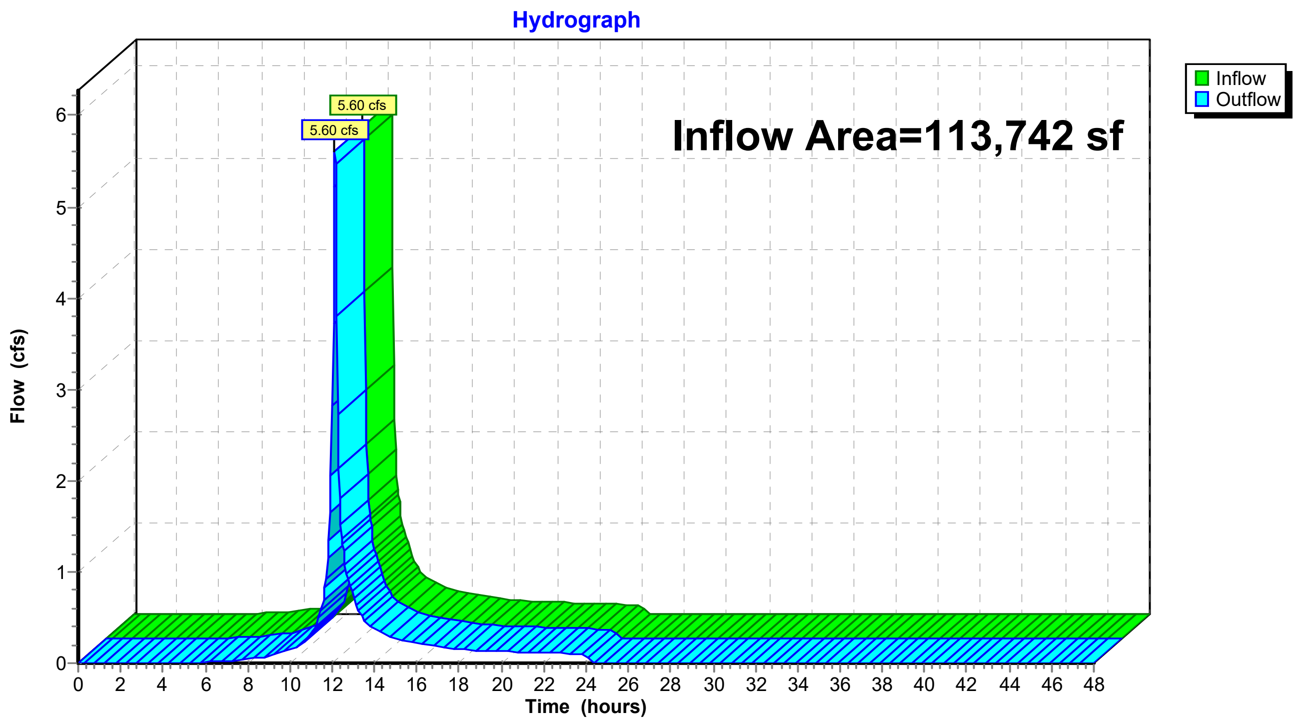
Summary for Reach DP-3: DP-3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 113,742 sf, 43.87% Impervious, Inflow Depth = 2.04" for 10-year event
Inflow = 5.60 cfs @ 12.13 hrs, Volume= 19,358 cf
Outflow = 5.60 cfs @ 12.13 hrs, Volume= 19,358 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-3: DP-3

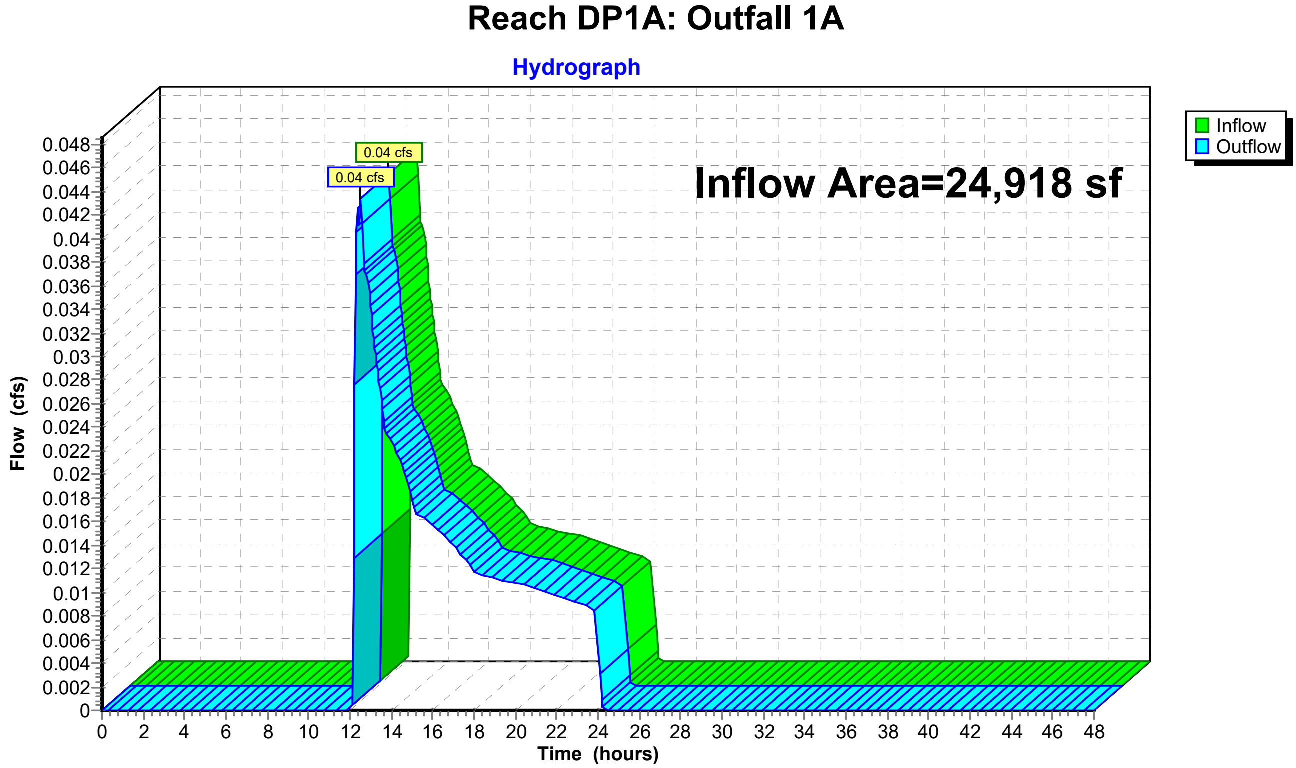


Summary for Reach DP1A: Outfall 1A

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	24,918 sf,	3.36% Impervious,	Inflow Depth = 0.32"	for 10-year event
Inflow =	0.04 cfs @	12.53 hrs, Volume=	670 cf	
Outflow =	0.04 cfs @	12.53 hrs, Volume=	670 cf, Atten= 0%, Lag= 0.0 min	

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

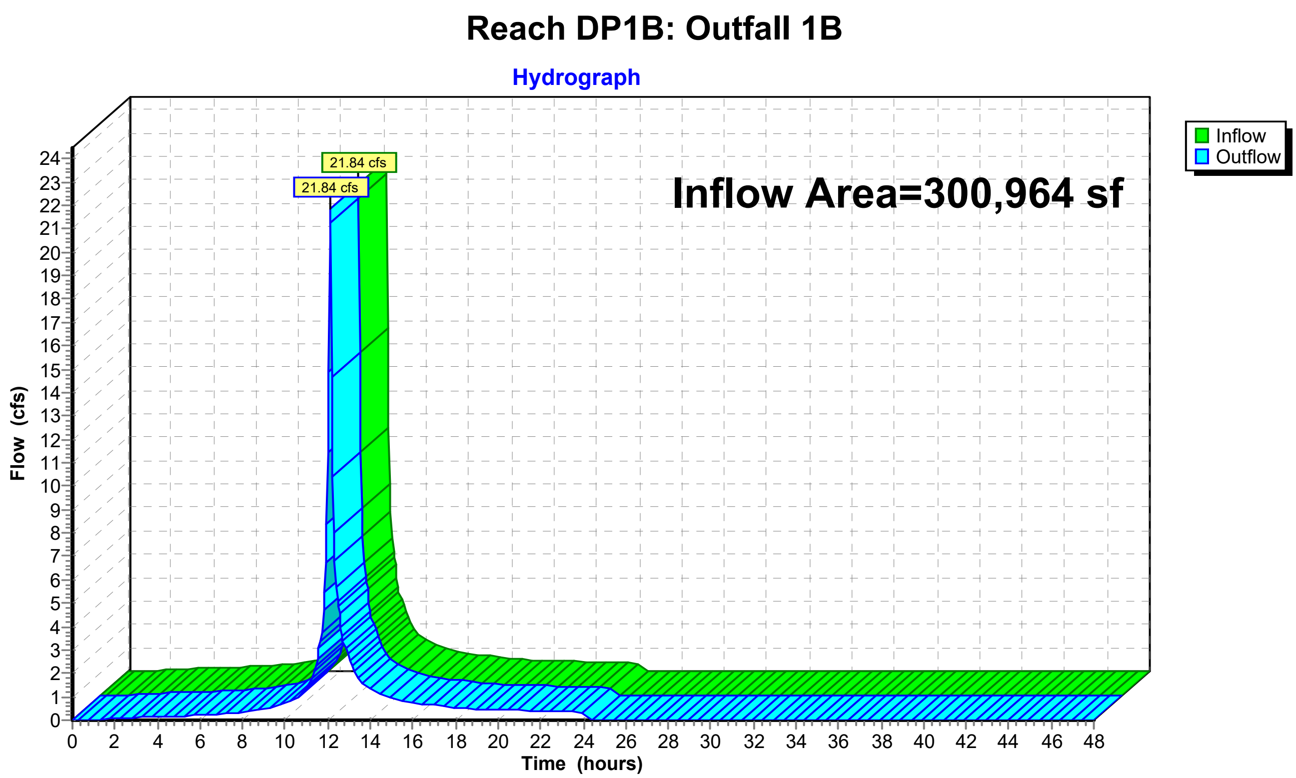


Summary for Reach DP1B: Outfall 1B

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 300,964 sf, 66.36% Impervious, Inflow Depth = 3.08" for 10-year event
Inflow = 21.84 cfs @ 12.13 hrs, Volume= 77,321 cf
Outflow = 21.84 cfs @ 12.13 hrs, Volume= 77,321 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

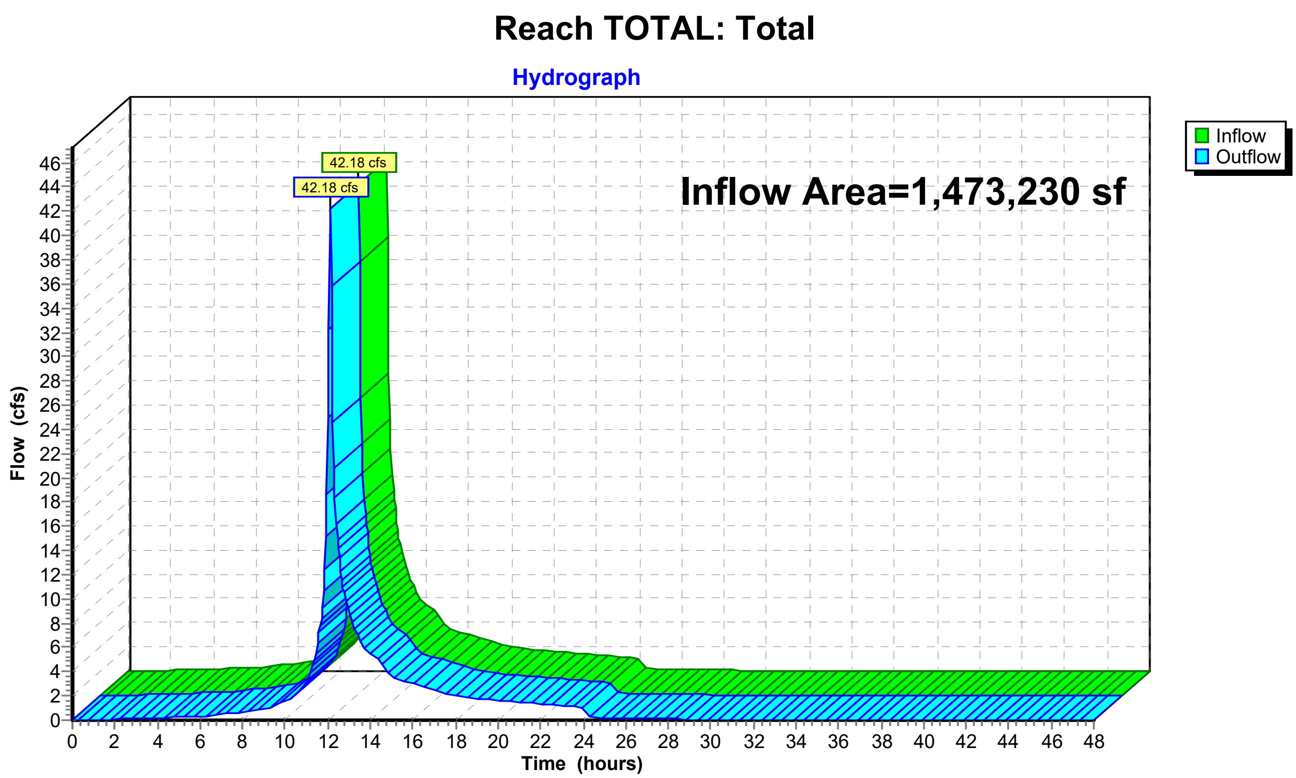


Summary for Reach TOTAL: Total

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,473,230 sf, 43.89% Impervious, Inflow Depth > 1.82" for 10-year event
Inflow = 42.18 cfs @ 12.13 hrs, Volume= 223,531 cf
Outflow = 42.18 cfs @ 12.13 hrs, Volume= 223,531 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



Summary for Pond BR-1: Bioretention 1

Inflow Area = 53,580 sf, 76.36% Impervious, Inflow Depth = 3.51" for 10-year event
Inflow = 4.74 cfs @ 12.13 hrs, Volume= 15,651 cf
Outflow = 2.94 cfs @ 12.22 hrs, Volume= 15,651 cf, Atten= 38%, Lag= 5.3 min
Primary = 2.94 cfs @ 12.22 hrs, Volume= 15,651 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 27.00' @ 12.22 hrs Surf.Area= 1,386 sf Storage= 2,059 cf

Plug-Flow detention time= 9.1 min calculated for 15,635 cf (100% of inflow)
Center-of-Mass det. time= 9.1 min (820.0 - 810.9)

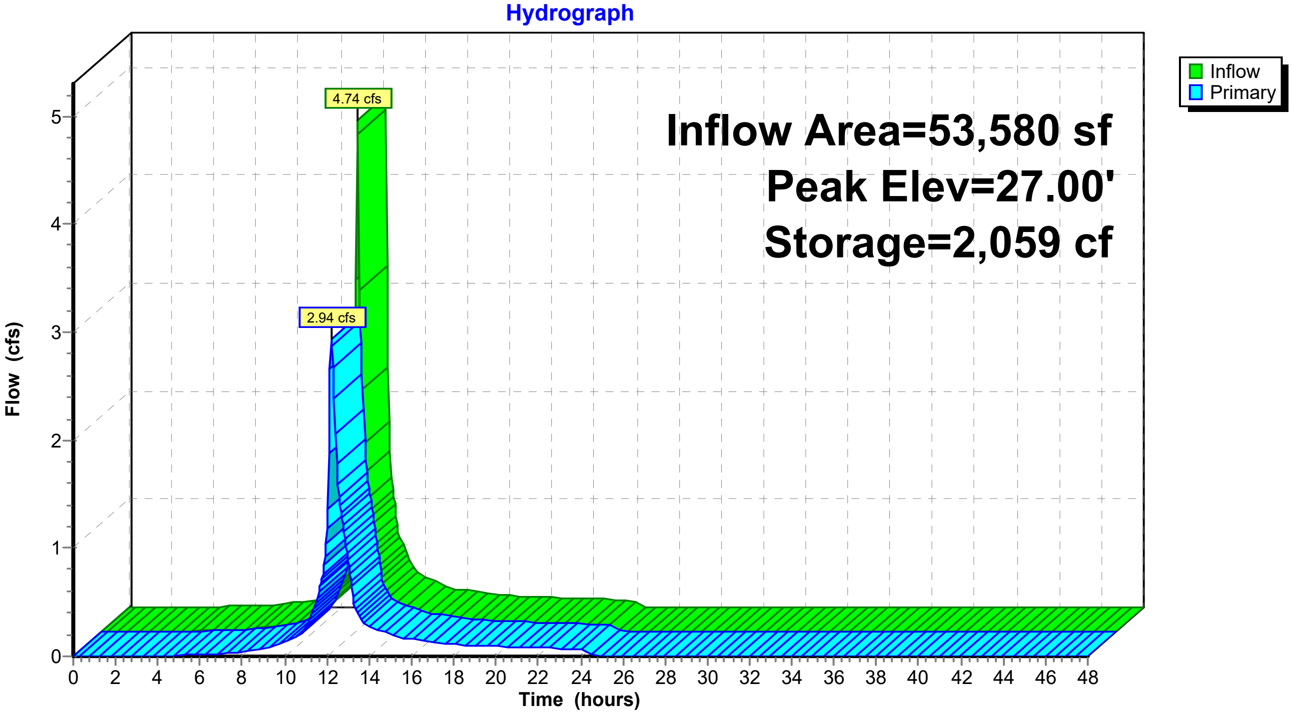
Volume	Invert	Avail.Storage	Storage Description
#1	25.00'	3,647 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
25.00	707	94.2	0	0	707
26.00	1,018	113.1	858	858	1,036
27.00	1,385	131.9	1,197	2,055	1,422
28.00	1,810	150.8	1,593	3,647	1,870

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**8.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#2	Primary	27.00'	**12.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#3	Primary	26.20'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.90 cfs @ 12.22 hrs HW=26.98' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 1.78 cfs @ 5.09 fps)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Orifice Controls 1.13 cfs @ 3.23 fps)

Pond BR-1: Bioretention 1



Summary for Pond BR-2: Bioretention 2

Inflow Area = 100,956 sf, 19.92% Impervious, Inflow Depth = 0.95" for 10-year event
Inflow = 1.90 cfs @ 12.14 hrs, Volume= 7,998 cf
Outflow = 0.92 cfs @ 12.28 hrs, Volume= 7,998 cf, Atten= 52%, Lag= 8.6 min
Primary = 0.92 cfs @ 12.28 hrs, Volume= 7,998 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 27.07' @ 12.28 hrs Surf.Area= 1,042 sf Storage= 932 cf

Plug-Flow detention time= 12.8 min calculated for 7,990 cf (100% of inflow)
Center-of-Mass det. time= 12.9 min (885.3 - 872.5)

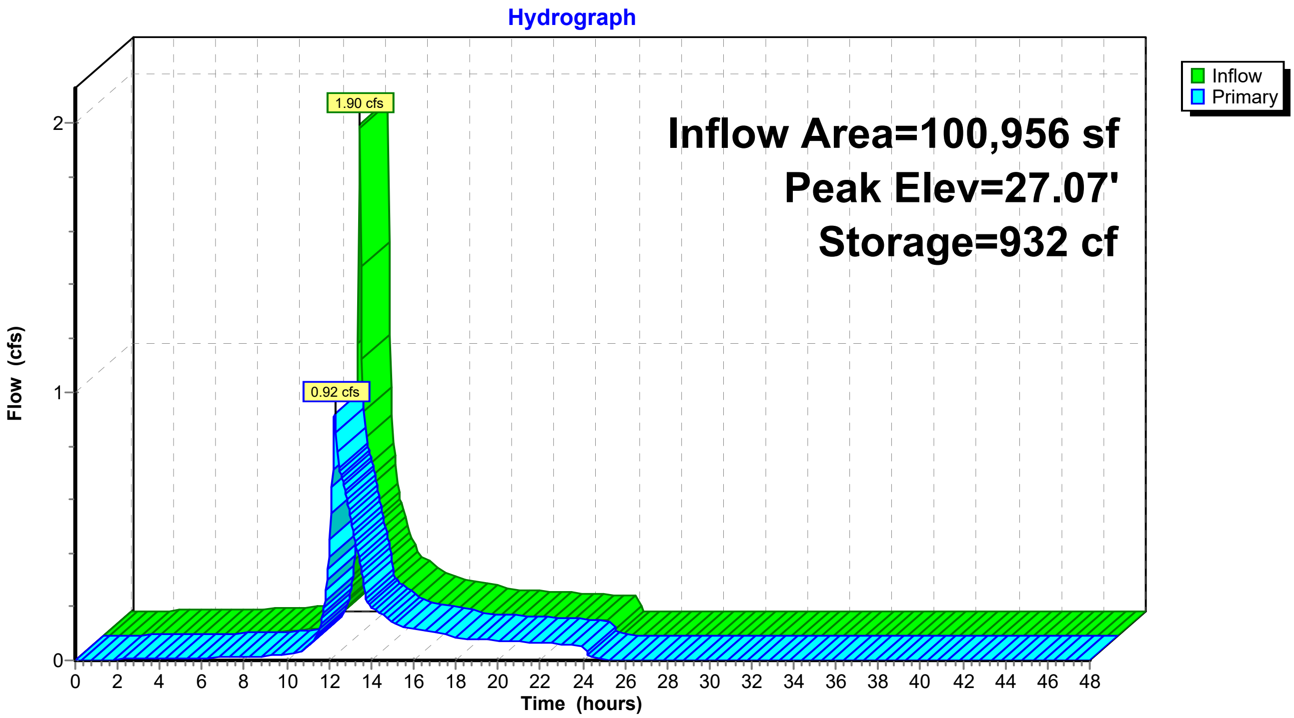
Volume	Invert	Avail.Storage	Storage Description
#1	26.00'	3,647 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
26.00	707	94.2	0	0	707
27.00	1,018	113.1	858	858	1,036
28.00	1,385	131.9	1,197	2,055	1,422
29.00	1,810	150.8	1,593	3,647	1,870

Device	Routing	Invert	Outlet Devices
#1	Primary	27.00'	**15.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#2	Primary	26.00'	**6.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.91 cfs @ 12.28 hrs HW=27.07' (Free Discharge)
├─**1=Orifice/Grate** (Weir Controls 0.18 cfs @ 0.65 fps)
└─**2=Orifice/Grate** (Orifice Controls 0.73 cfs @ 3.73 fps)

Pond BR-2: Bioretention 2



Summary for Pond BR-3: Bioretention 3

Inflow Area = 80,355 sf, 58.01% Impervious, Inflow Depth = 2.66" for 10-year event
Inflow = 5.35 cfs @ 12.13 hrs, Volume= 17,831 cf
Outflow = 1.84 cfs @ 12.32 hrs, Volume= 17,831 cf, Atten= 66%, Lag= 11.7 min
Primary = 1.84 cfs @ 12.32 hrs, Volume= 17,831 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 27.29' @ 12.32 hrs Surf.Area= 3,360 sf Storage= 3,674 cf

Plug-Flow detention time= 19.3 min calculated for 17,813 cf (100% of inflow)
Center-of-Mass det. time= 19.2 min (841.3 - 822.1)

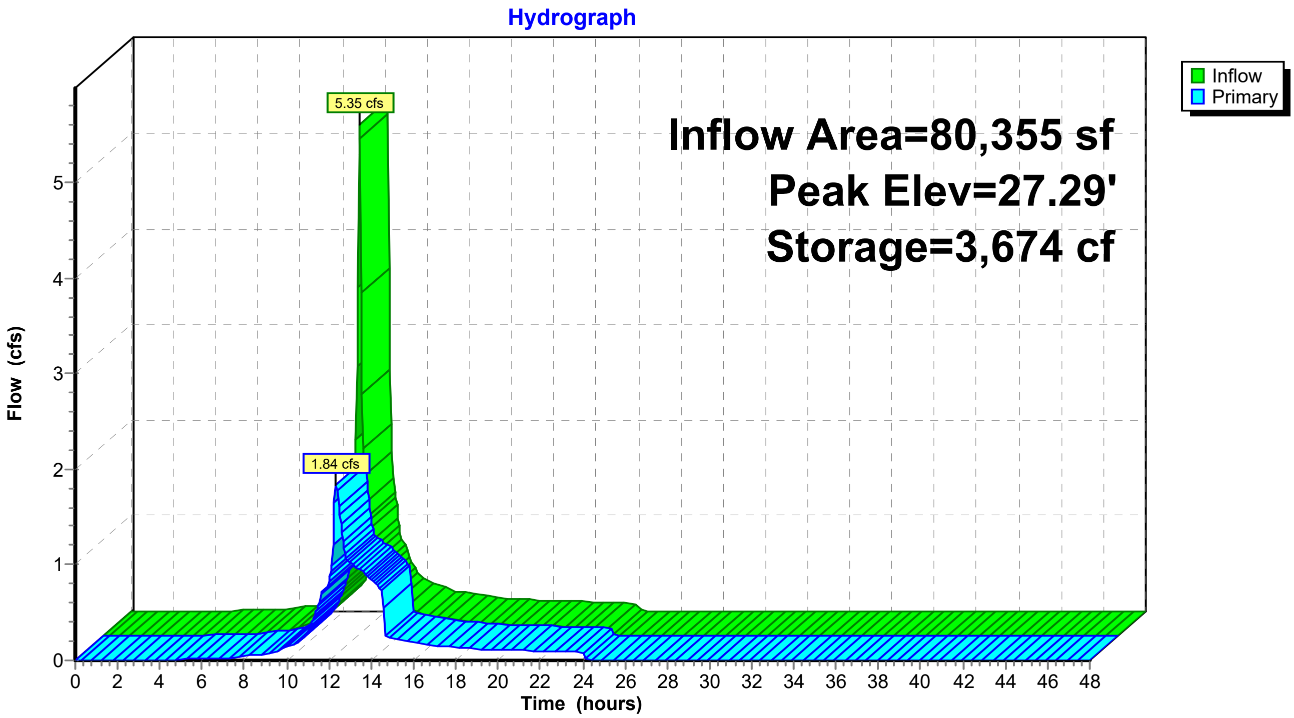
Volume	Invert	Avail.Storage	Storage Description
#1	26.00'	6,285 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
26.00	2,376	243.9	0	0	2,376
27.00	3,137	262.8	2,748	2,748	3,179
28.00	3,953	281.7	3,537	6,285	4,042

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**6.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#2	Primary	27.10'	**15.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.82 cfs @ 12.32 hrs HW=27.28' (Free Discharge)
├─**1=Orifice/Grate** (Orifice Controls 1.07 cfs @ 5.45 fps)
└─**2=Orifice/Grate** (Weir Controls 0.75 cfs @ 1.05 fps)

Pond BR-3: Bioretention 3



Summary for Pond OC: O-CHAMBERS

Inflow Area = 190,951 sf, 35.86% Impervious, Inflow Depth = 1.47" for 10-year event
Inflow = 6.90 cfs @ 12.14 hrs, Volume= 23,423 cf
Outflow = 0.78 cfs @ 13.40 hrs, Volume= 22,529 cf, Atten= 89%, Lag= 75.4 min
Primary = 0.78 cfs @ 13.40 hrs, Volume= 22,529 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 25.48' @ 13.40 hrs Surf.Area= 23,411 sf Storage= 9,693 cf

Plug-Flow detention time= 281.1 min calculated for 22,505 cf (96% of inflow)
Center-of-Mass det. time= 261.9 min (1,141.2 - 879.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	25.00'	0 cf	**137.92'W x 169.75'L x 4.17'H Field A** 97,547 cf Overall - 97,547 cf Embedded = 0 cf x 0.0% Voids
#2A	25.00'	70,200 cf	**StormTrap ST1 SingleTrap 3-6** x 240 Inside #1 Inside= 82.7"W x 42.0"H => 20.80 sf x 14.06'L = 292.5 cf Outside= 82.7"W x 50.0"H => 28.73 sf x 14.06'L = 404.1 cf 20 Rows of 12 Chambers 137.92' x 168.75' Core + 0.00' x 0.50' Border = 137.92' x 169.75' System
		70,200 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**10.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.78 cfs @ 13.40 hrs HW=25.48' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.78 cfs @ 2.37 fps)

Pond OC: O-CHAMBERS - Chamber Wizard Field A

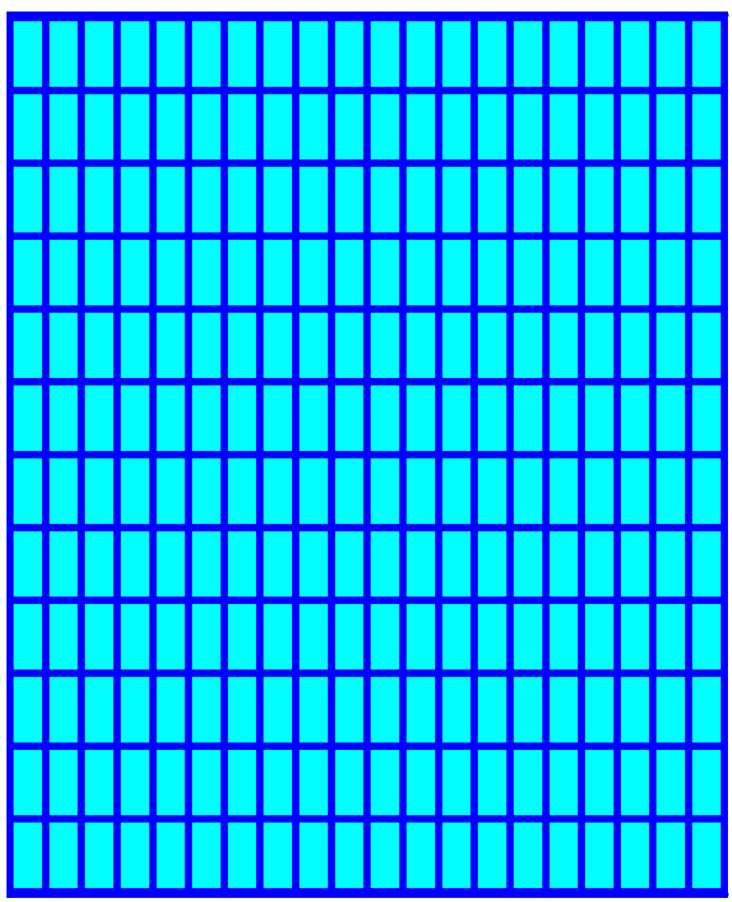
Chamber Model = StormTrap ST1 SingleTrap 3-6 (StormTrap ST1 SingleTrap®Type VI)
Inside= 82.7"W x 42.0"H => 20.80 sf x 14.06'L = 292.5 cf
Outside= 82.7"W x 50.0"H => 28.73 sf x 14.06'L = 404.1 cf

12 Chambers/Row x 14.06' Long = 168.75' Row Length +6.0" Border x 2 = 169.75' Base Length
20 Rows x 82.7" Wide = 137.92' Base Width
50.0" Chamber Height = 4.17' Field Height

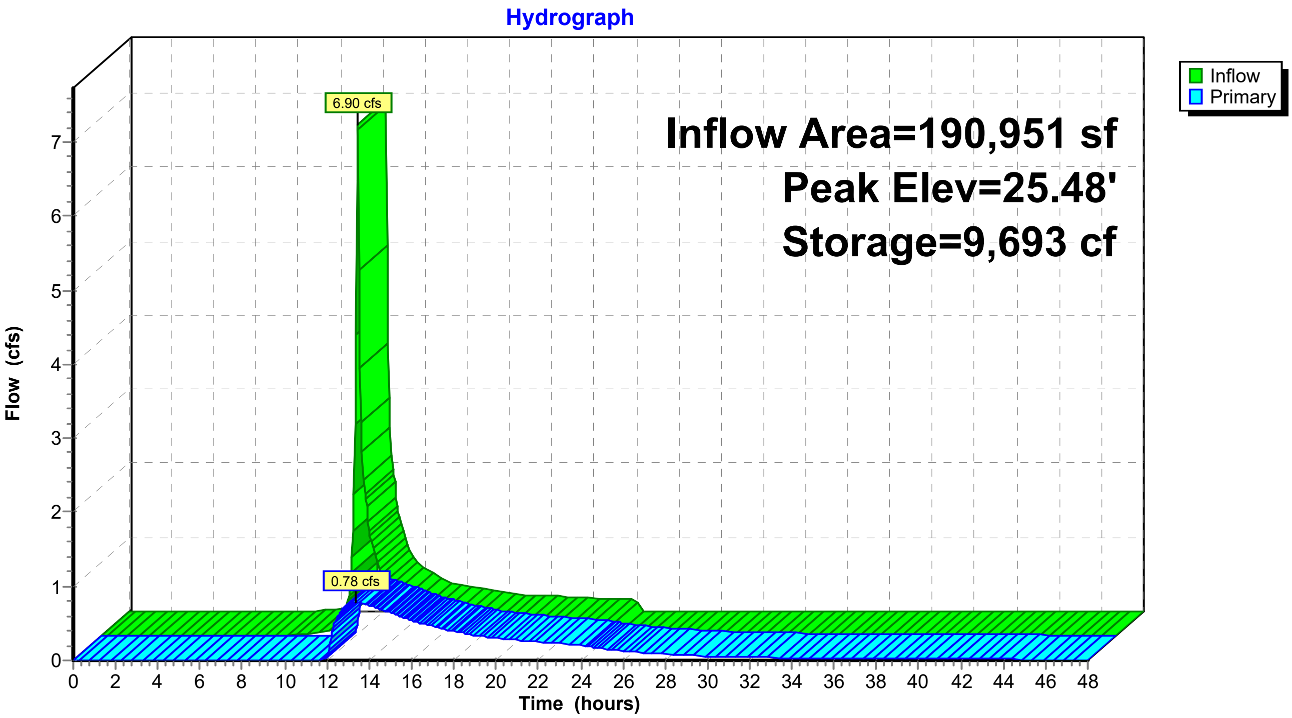
240 Chambers x 292.5 cf = 70,199.7 cf Chamber Storage
240 Chambers x 404.1 cf + 574.7 cf Border = 97,547.3 cf Displacement

Chamber Storage = 70,199.7 cf = 1.612 af
Overall Storage Efficiency = 72.0%
Overall System Size = 169.75' x 137.92' x 4.17'

240 Chambers (plus border)
3,612.9 cy Field



Pond OC: O-CHAMBERS



Summary for Pond U-1: UG Inf System

Inflow Area = 165,273 sf, 63.49% Impervious, Inflow Depth = 2.84" for 10-year event
Inflow = 11.83 cfs @ 12.13 hrs, Volume= 39,061 cf
Outflow = 1.12 cfs @ 13.30 hrs, Volume= 39,061 cf, Atten= 91%, Lag= 70.1 min
Discarded = 0.32 cfs @ 10.50 hrs, Volume= 26,211 cf
Primary = 0.80 cfs @ 13.30 hrs, Volume= 12,850 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 23.09' @ 13.30 hrs Surf.Area= 26,352 sf Storage= 17,523 cf

Plug-Flow detention time= 291.3 min calculated for 39,020 cf (100% of inflow)
Center-of-Mass det. time= 291.5 min (1,116.3 - 824.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	22.00'	18,227 cf	**134.83'W x 195.44'L x 2.33'H Field A**
			61,488 cf Overall - 15,921 cf Embedded = 45,566 cf x 40.0% Voids
#2A	22.50'	15,921 cf	**ADS_StormTech SC-310 +Cap** x 1080 Inside #1
			Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
			Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
			40 Rows of 27 Chambers
		34,148 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	22.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	22.60'	**10.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	23.35'	**8.0" Vert. Orifice/Grate** C= 0.600
#4	Primary	23.45'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.32 cfs @ 10.50 hrs HW=22.02' (Free Discharge)
└—**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=0.80 cfs @ 13.30 hrs HW=23.09' (Free Discharge)
├—**2=Orifice/Grate** (Orifice Controls 0.80 cfs @ 2.39 fps)
├—**3=Orifice/Grate** (Controls 0.00 cfs)
└—**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond U-1: UG Inf System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-310 +Cap (ADS StormTech®SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

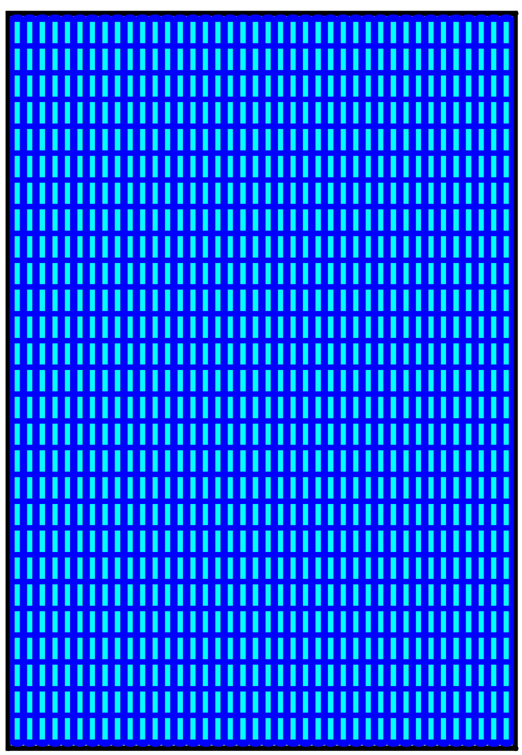
27 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 193.44' Row Length +12.0" End Stone x 2 = 195.44' Base Length
40 Rows x 34.0" Wide + 6.0" Spacing x 39 + 12.0" Side Stone x 2 = 134.83' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

1,080 Chambers x 14.7 cf = 15,921.3 cf Chamber Storage

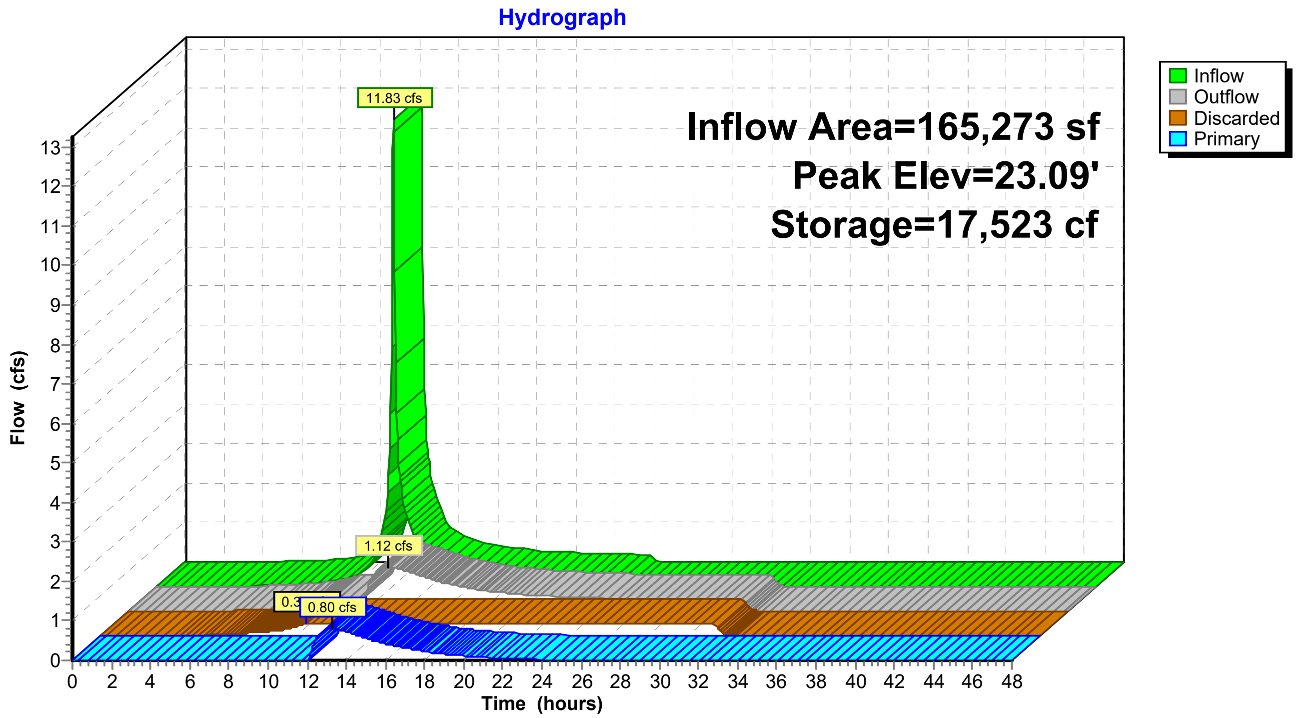
61,487.6 cf Field - 15,921.3 cf Chambers = 45,566.3 cf Stone x 40.0% Voids = 18,226.5 cf Stone Storage

Chamber Storage + Stone Storage = 34,147.8 cf = 0.784 af
Overall Storage Efficiency = 55.5%
Overall System Size = 195.44' x 134.83' x 2.33'

1,080 Chambers
2,277.3 cy Field
1,687.6 cy Stone



Pond U-1: UG Inf System



Summary for Pond UD1: Baseball UD 1

Inflow Area = 105,369 sf, 0.00% Impervious, Inflow Depth = 0.24" for 10-year event
Inflow = 0.10 cfs @ 12.55 hrs, Volume= 2,128 cf
Outflow = 0.10 cfs @ 12.56 hrs, Volume= 2,128 cf, Atten= 0%, Lag= 0.2 min
Primary = 0.10 cfs @ 12.56 hrs, Volume= 2,128 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 39.17' @ 12.56 hrs Surf.Area= 149,290 sf Storage= 1 cf

Plug-Flow detention time= 0.2 min calculated for 2,126 cf (100% of inflow)
Center-of-Mass det. time= 0.2 min (1,021.7 - 1,021.5)

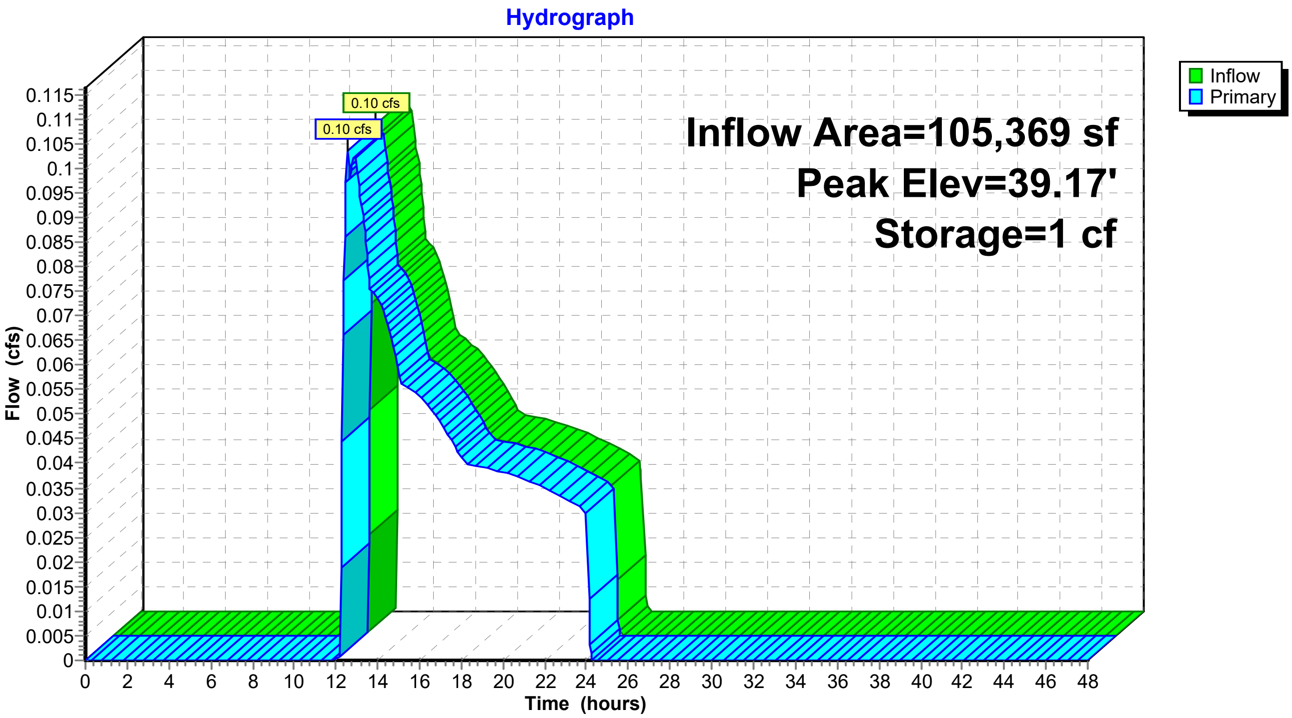
Volume	Invert	Avail.Storage	Storage Description
#1	39.17'	29,858 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 74,645 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
39.17	149,290	1,398.0	0	0	149,290
39.67	149,290	1,398.0	74,645	74,645	149,989

Device	Routing	Invert	Outlet Devices
#1	Primary	27.65'	**12.0" Round CMP_Round 12"** L= 41.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 27.65' / 27.24' S= 0.0099 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	32.12'	**12.0" Round CMP_Round 12"** L= 15.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 32.12' / 31.95' S= 0.0110 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Primary	31.30'	**6.0" Round Culvert** L= 38.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 31.30' / 30.91' S= 0.0101 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=24.18 cfs @ 12.56 hrs HW=39.17' (Free Discharge)
├—**1=CMP_Round 12"** (Barrel Controls 12.45 cfs @ 15.85 fps)
├—**2=CMP_Round 12"** (Inlet Controls 9.68 cfs @ 12.32 fps)
└—**3=Culvert** (Barrel Controls 2.06 cfs @ 10.48 fps)

Pond UD1: Baseball UD 1



Summary for Pond UD2: Football UD 2

Inflow Area = 65,696 sf, 0.00% Impervious, Inflow Depth = 0.24" for 10-year event
Inflow = 0.06 cfs @ 12.55 hrs, Volume= 1,327 cf
Outflow = 0.06 cfs @ 12.56 hrs, Volume= 1,327 cf, Atten= 0%, Lag= 0.5 min
Primary = 0.06 cfs @ 12.56 hrs, Volume= 1,327 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 40.17' @ 12.56 hrs Surf.Area= 65,694 sf Storage= 2 cf

Plug-Flow detention time= 0.4 min calculated for 1,325 cf (100% of inflow)
Center-of-Mass det. time= 0.4 min (1,021.9 - 1,021.5)

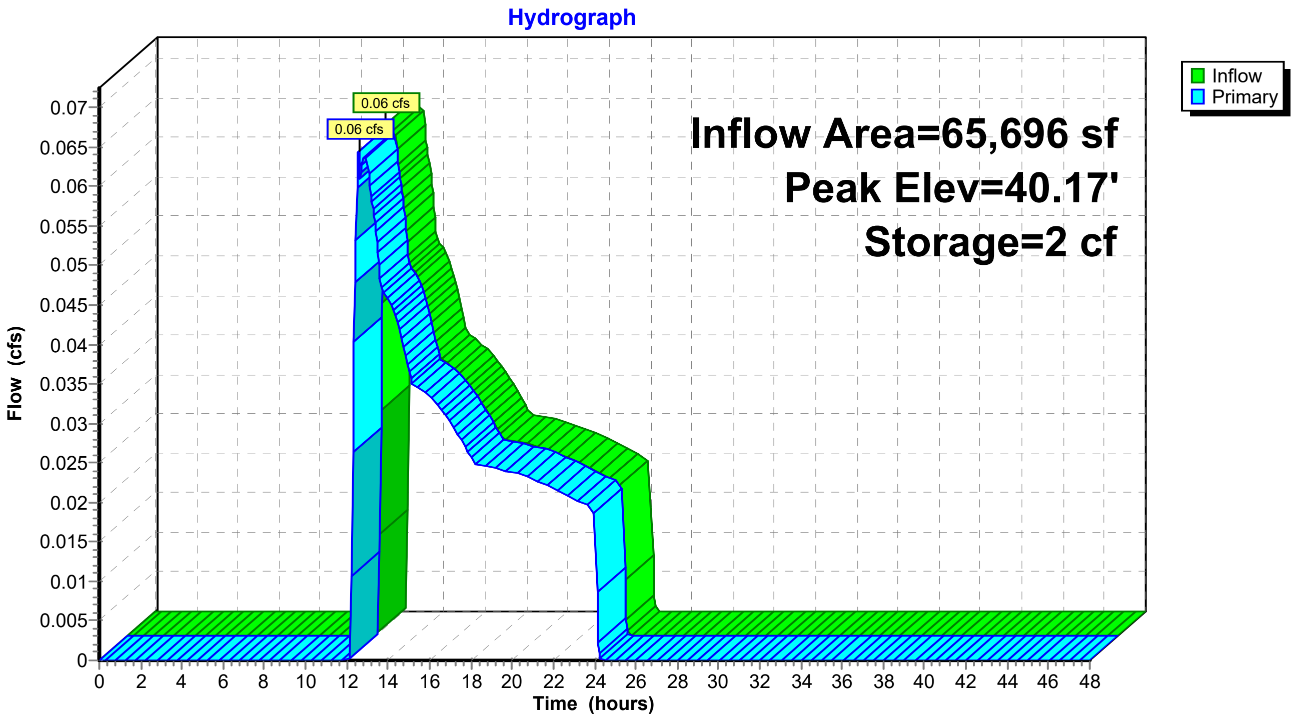
Volume	Invert	Avail.Storage	Storage Description
#1	40.17'	13,139 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 32,847 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
40.17	65,694	1,239.8	0	0	65,694
40.67	65,694	1,239.8	32,847	32,847	66,314

Device	Routing	Invert	Outlet Devices
#1	Primary	36.00'	**6.0" Round Culvert** L= 22.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.00' / 35.00' S= 0.0448 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Primary	36.00'	**6.0" Round Culvert** L= 46.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.00' / 35.00' S= 0.0216 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Primary	36.00'	**6.0" Round Culvert** L= 30.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.00' / 35.00' S= 0.0331 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=5.10 cfs @ 12.56 hrs HW=40.17' (Free Discharge)
├─**1=Culvert** (Inlet Controls 1.87 cfs @ 9.53 fps)
├─**2=Culvert** (Barrel Controls 1.50 cfs @ 7.63 fps)
└─**3=Culvert** (Barrel Controls 1.73 cfs @ 8.79 fps)

Pond UD2: Football UD 2



Summary for Pond UD3: Football UD 3

Inflow Area = 22,265 sf, 0.00% Impervious, Inflow Depth = 0.24" for 10-year event
Inflow = 0.02 cfs @ 12.55 hrs, Volume= 450 cf
Outflow = 0.02 cfs @ 12.56 hrs, Volume= 450 cf, Atten= 0%, Lag= 0.1 min
Primary = 0.02 cfs @ 12.56 hrs, Volume= 450 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 39.27' @ 12.56 hrs Surf.Area= 22,338 sf Storage= 0 cf

Plug-Flow detention time= 0.1 min calculated for 449 cf (100% of inflow)
Center-of-Mass det. time= 0.1 min (1,021.6 - 1,021.5)

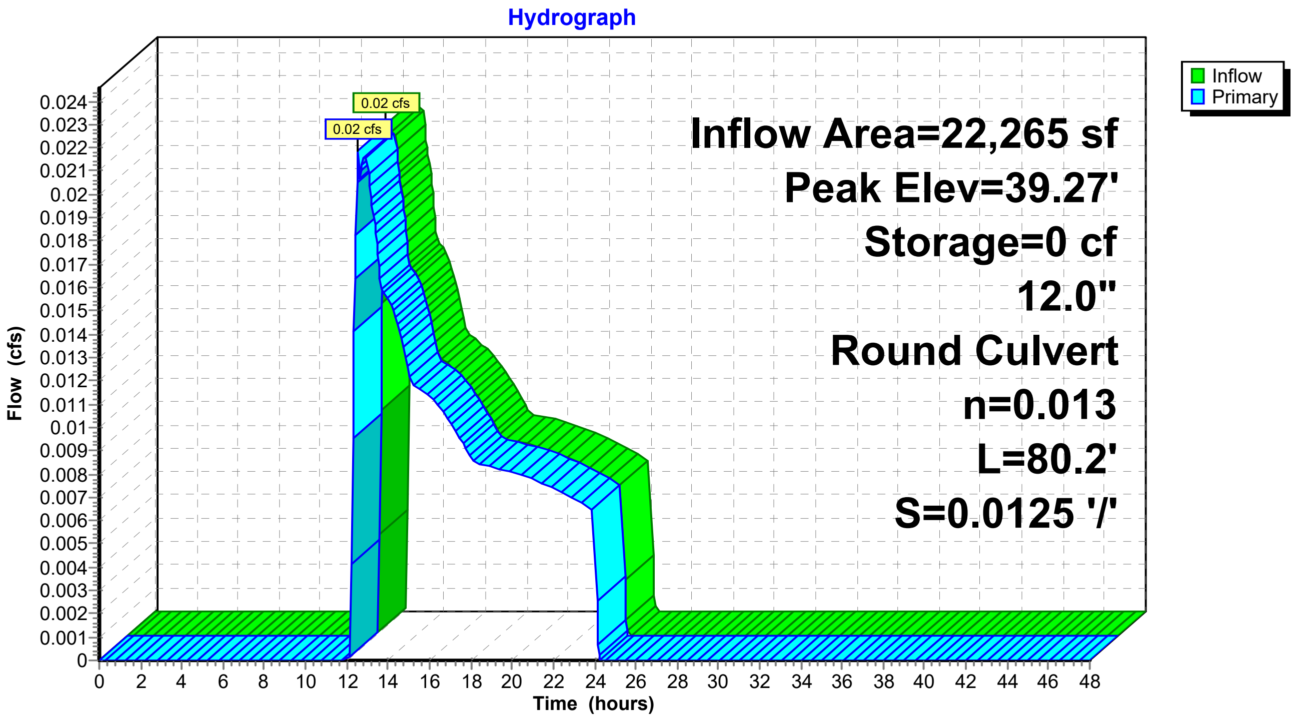
Volume	Invert	Avail.Storage	Storage Description
#1	39.27'	4,378 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 10,946 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
39.27	22,338	624.7	0	0	22,338
39.76	22,338	624.7	10,946	10,946	22,644

Device	Routing	Invert	Outlet Devices
#1	Primary	35.00'	**12.0" Round Culvert** L= 80.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.00' / 34.00' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=6.50 cfs @ 12.56 hrs HW=39.27' (Free Discharge)
└─**1=Culvert** (Barrel Controls 6.50 cfs @ 8.27 fps)

Pond UD3: Football UD 3



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentO-01: OFF-01 Runoff Area=112,122 sf 33.01% Impervious Runoff Depth=2.10"
Tc=6.0 min CN=59 Runoff=6.01 cfs 19,611 cf

SubcatchmentO-02: OFF-02 Runoff Area=109,762 sf 30.00% Impervious Runoff Depth=1.92"
Tc=6.0 min CN=57 Runoff=5.32 cfs 17,598 cf

SubcatchmentO-03: OFF-03 Runoff Area=45,823 sf 30.00% Impervious Runoff Depth=1.92"
Tc=6.0 min CN=57 Runoff=2.22 cfs 7,347 cf

SubcatchmentO-04: OFF-04 Runoff Area=35,366 sf 61.66% Impervious Runoff Depth=3.63"
Tc=6.0 min CN=75 Runoff=3.34 cfs 10,685 cf

SubcatchmentPR-1A: PR-1A Runoff Area=30,658 sf 60.37% Impervious Runoff Depth=3.63"
Tc=6.0 min CN=75 Runoff=2.89 cfs 9,263 cf

SubcatchmentPR-1B: PR-1B Runoff Area=34,631 sf 76.81% Impervious Runoff Depth=4.57"
Tc=6.0 min CN=84 Runoff=4.00 cfs 13,195 cf

SubcatchmentPR-1C: PR-1C Runoff Area=24,918 sf 3.36% Impervious Runoff Depth=0.69"
Tc=6.0 min CN=41 Runoff=0.24 cfs 1,438 cf

SubcatchmentPR-1D: PR-1D Runoff Area=78,681 sf 100.00% Impervious Runoff Depth=6.16"
Tc=6.0 min CN=98 Runoff=10.69 cfs 40,399 cf

SubcatchmentPR-1E: PR-1E Runoff Area=26,606 sf 100.00% Impervious Runoff Depth=6.16"
Tc=6.0 min CN=98 Runoff=3.62 cfs 13,661 cf

SubcatchmentPR-1F: PR-1F Runoff Area=18,266 sf 67.43% Impervious Runoff Depth=4.04"
Tc=6.0 min CN=79 Runoff=1.90 cfs 6,148 cf

SubcatchmentPR-1G: PR-1G Runoff Area=50,158 sf 46.00% Impervious Runoff Depth=2.74"
Tc=6.0 min CN=66 Runoff=3.59 cfs 11,455 cf

SubcatchmentPR-1H: PR-1H Runoff Area=11,588 sf 24.62% Impervious Runoff Depth=1.67"
Tc=6.0 min CN=54 Runoff=0.47 cfs 1,612 cf

SubcatchmentPR-1I: PR-1I Runoff Area=16,195 sf 0.59% Impervious Runoff Depth=0.57"
Tc=6.0 min CN=39 Runoff=0.09 cfs 764 cf

SubcatchmentPR-1J: PR-1J Runoff Area=21,163 sf 85.81% Impervious Runoff Depth=5.24"
Tc=6.0 min CN=90 Runoff=2.69 cfs 9,234 cf

SubcatchmentPR-1K: PR-1K Runoff Area=40,076 sf 13.82% Impervious Runoff Depth=1.11"
Tc=6.0 min CN=47 Runoff=0.95 cfs 3,720 cf

SubcatchmentPR-1L: PR-1L Runoff Area=32,440 sf 69.13% Impervious Runoff Depth=4.14"
Tc=6.0 min CN=80 Runoff=3.45 cfs 11,203 cf

SubcatchmentPR-1M: PR-1M Runoff Area=22,109 sf 44.24% Impervious Runoff Depth=2.65"
Tc=6.0 min CN=65 Runoff=1.52 cfs 4,875 cf

SubcatchmentPR-1N: PR-1N Runoff Area=21,140 sf 87.46% Impervious Runoff Depth=5.35"
Tc=6.0 min CN=91 Runoff=2.72 cfs 9,424 cf

SubcatchmentPR-1O: PR-1O Runoff Area=50,633 sf 85.81% Impervious Runoff Depth=5.24"
Tc=6.0 min CN=90 Runoff=6.43 cfs 22,093 cf

SubcatchmentPR-1P: PR-1P Runoff Area=13,652 sf 88.78% Impervious Runoff Depth=5.35"
Tc=6.0 min CN=91 Runoff=1.75 cfs 6,086 cf

SubcatchmentPR-1Q: PR-1Q Runoff Area=29,096 sf 14.64% Impervious Runoff Depth=1.19"
Tc=6.0 min CN=48 Runoff=0.76 cfs 2,884 cf

SubcatchmentPR-1R: PR-1R Runoff Area=55,082 sf 84.15% Impervious Runoff Depth=5.12"
Tc=6.0 min CN=89 Runoff=6.90 cfs 23,518 cf

SubcatchmentPR-1S: PR-1S Runoff Area=52,894 sf 67.24% Impervious Runoff Depth=4.04"
Tc=6.0 min CN=79 Runoff=5.51 cfs 17,803 cf

SubcatchmentPR-1U: PR-1U Runoff Area=4,791 sf 100.00% Impervious Runoff Depth=6.16"
Tc=6.0 min CN=98 Runoff=0.65 cfs 2,460 cf

SubcatchmentPR-1V: PR-1V Runoff Area=42,997 sf 65.96% Impervious Runoff Depth=3.93"
Tc=6.0 min CN=78 Runoff=4.37 cfs 14,097 cf

SubcatchmentPR-2A: PR-2A Runoff Area=33,957 sf 0.00% Impervious Runoff Depth=0.57"
Tc=6.0 min CN=39 Runoff=0.18 cfs 1,602 cf

SubcatchmentPR-2B: PR-2B Runoff Area=71,412 sf 0.00% Impervious Runoff Depth=0.57"
Tc=6.0 min CN=39 Runoff=0.38 cfs 3,368 cf

SubcatchmentPR-2C: PR-2C Runoff Area=9,359 sf 17.98% Impervious Runoff Depth=1.34"
Tc=6.0 min CN=50 Runoff=0.29 cfs 1,049 cf

SubcatchmentPR-2D: PR-2D Runoff Area=53,639 sf 82.78% Impervious Runoff Depth=5.01"
Tc=0.0 min CN=88 Runoff=7.55 cfs 22,403 cf

SubcatchmentPR-2E: PR-2E Runoff Area=65,696 sf 0.00% Impervious Runoff Depth=0.57"
Tc=6.0 min CN=39 Runoff=0.35 cfs 3,099 cf

SubcatchmentPR-2F: PR-2F Runoff Area=33,980 sf 0.00% Impervious Runoff Depth=0.57"
Tc=6.0 min CN=39 Runoff=0.18 cfs 1,603 cf

SubcatchmentPR-2G: PR-2G Runoff Area=80,069 sf 7.34% Impervious Runoff Depth=0.83"
Tc=0.0 min CN=43 Runoff=1.33 cfs 5,515 cf

SubcatchmentPR-2H: PR-2H Runoff Area=30,529 sf 1.48% Impervious Runoff Depth=0.63"
Tc=6.0 min CN=40 Runoff=0.23 cfs 1,598 cf

Subcatchment PR-3A: PR-3A Runoff Area=31,912 sf 15.32% Impervious Runoff Depth=1.19"
Tc=6.0 min CN=48 Runoff=0.83 cfs 3,163 cf

Subcatchment PR-3B: PR-3B Runoff Area=59,565 sf 75.56% Impervious Runoff Depth=4.57"
Tc=6.0 min CN=84 Runoff=6.87 cfs 22,695 cf

Subcatchment PR-3C: PR-3C Runoff Area=22,265 sf 0.00% Impervious Runoff Depth=0.57"
Tc=6.0 min CN=39 Runoff=0.12 cfs 1,050 cf

Reach DP-1: DP-1 Inflow=53.10 cfs 291,517 cf
Outflow=53.10 cfs 291,517 cf

Reach DP-1C: Outfall 1C Inflow=10.30 cfs 104,023 cf
Outflow=10.30 cfs 104,023 cf

Reach DP-1D: Outfall 1D Inflow=9.39 cfs 32,488 cf
Outflow=9.39 cfs 32,488 cf

Reach DP-2: DP-2 Avg. Flow Depth=0.70' Max Vel=7.17 fps Inflow=9.01 cfs 38,633 cf
36.0" Round Pipe n=0.011 L=96.0' S=0.0092 '/' Capacity=75.47 cfs Outflow=8.77 cfs 38,633 cf

Reach DP-3: DP-3 Inflow=7.79 cfs 26,908 cf
Outflow=7.79 cfs 26,908 cf

Reach DP1A: Outfall 1A Inflow=0.24 cfs 1,438 cf
Outflow=0.24 cfs 1,438 cf

Reach DP1B: Outfall 1B Inflow=29.08 cfs 102,277 cf
Outflow=29.08 cfs 102,277 cf

Reach TOTAL: Total Inflow=60.86 cfs 318,425 cf
Outflow=60.86 cfs 318,425 cf

Pond BR-1: Bioretention 1 Peak Elev=27.31' Storage=2,509 cf Inflow=6.17 cfs 20,626 cf
Outflow=4.76 cfs 20,626 cf

Pond BR-2: Bioretention 2 Peak Elev=27.34' Storage=1,223 cf Inflow=3.28 cfs 12,658 cf
Outflow=2.72 cfs 12,658 cf

Pond BR-3: Bioretention 3 Peak Elev=27.53' Storage=4,533 cf Inflow=7.13 cfs 24,095 cf
Outflow=3.88 cfs 24,095 cf

Pond OC: O-CHAMBERS Peak Elev=25.72' Storage=14,433 cf Inflow=10.87 cfs 35,629 cf
Outflow=1.45 cfs 34,705 cf

Pond U-1: UG Inf System Peak Elev=23.39' Storage=22,979 cf Inflow=15.99 cfs 52,962 cf
Discarded=0.32 cfs 28,366 cf Primary=1.63 cfs 24,596 cf Outflow=1.95 cfs 52,962 cf

Pond UD1: Baseball UD 1 Peak Elev=39.17' Storage=7 cf Inflow=0.56 cfs 4,970 cf
Outflow=0.58 cfs 4,970 cf

Pond UD2: Football UD 2 Peak Elev=40.17' Storage=9 cf Inflow=0.35 cfs 3,099 cf
Outflow=0.37 cfs 3,099 cf

Pond UD3: Football UD 3 Peak Elev=39.27' Storage=1 cf Inflow=0.12 cfs 1,050 cf
12.0" Round Culvert n=0.013 L=80.2' S=0.0125 '/' Outflow=0.12 cfs 1,050 cf

Total Runoff Area = 1,473,230 sf Runoff Volume = 347,715 cf Average Runoff Depth = 2.83"
56.11% Pervious = 826,565 sf 43.89% Impervious = 646,665 sf

Summary for Subcatchment O-01: OFF-01

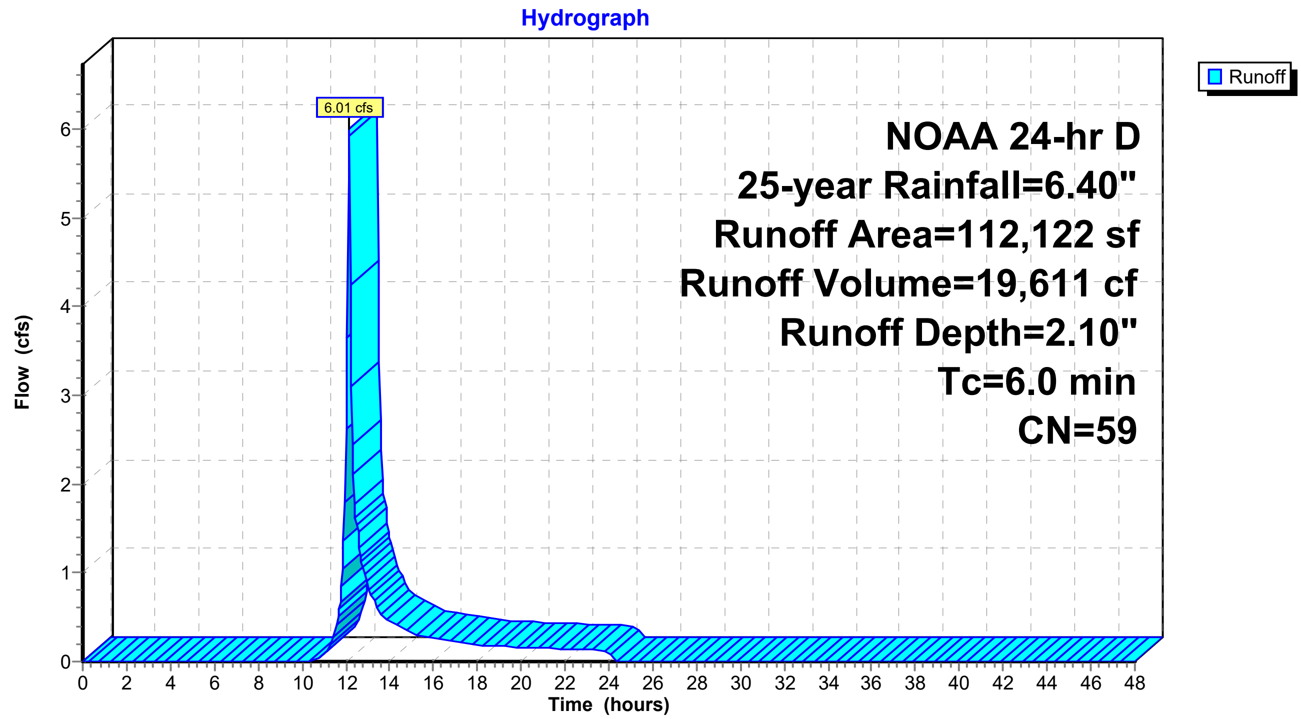
Runoff = 6.01 cfs @ 12.14 hrs, Volume= 19,611 cf, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
11,813	98	Unconnected pavement, HSG A
16,305	39	>75% Grass cover, Good, HSG A
84,004	57	1/3 acre lots, 30% imp, HSG A
112,122	59	Weighted Average
75,108		66.99% Pervious Area
37,014		33.01% Impervious Area
11,813		31.91% Unconnected

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

Subcatchment O-01: OFF-01



Summary for Subcatchment O-02: OFF-02

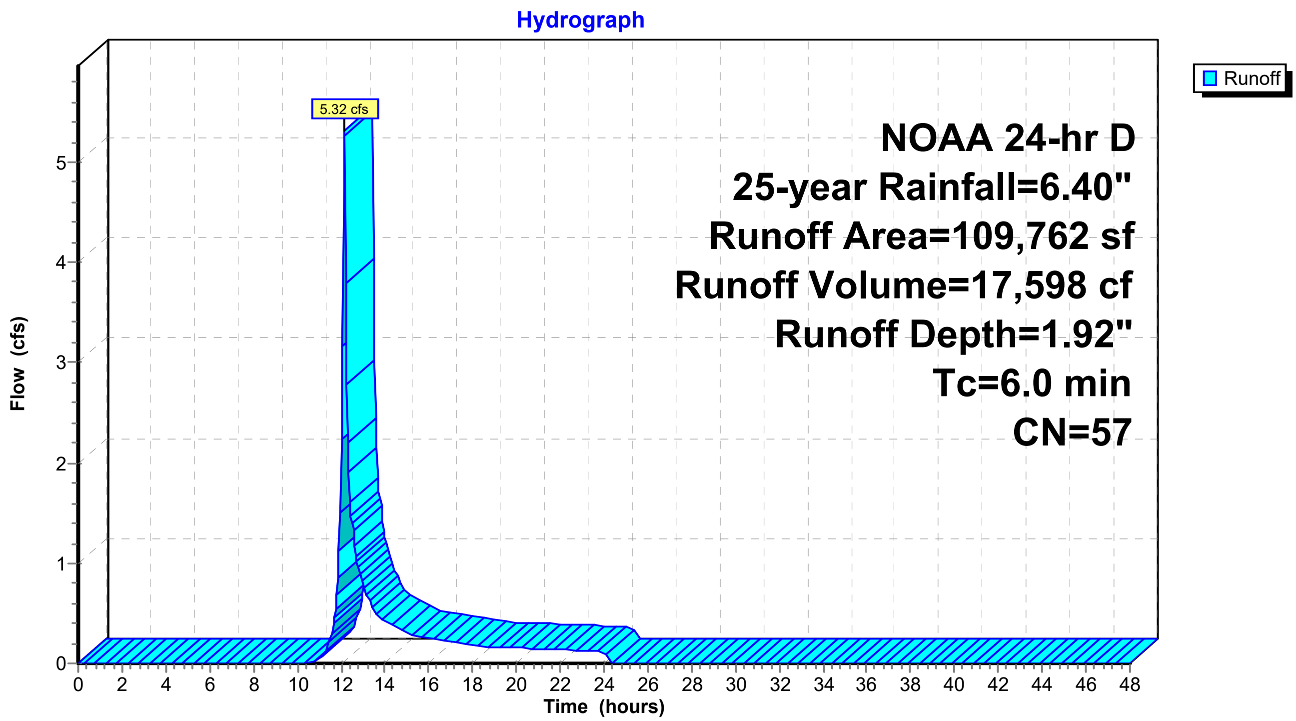
Runoff = 5.32 cfs @ 12.14 hrs, Volume= 17,598 cf, Depth= 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
109,762	57	1/3 acre lots, 30% imp, HSG A
76,833		70.00% Pervious Area
32,929		30.00% Impervious Area

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

Subcatchment O-02: OFF-02



Summary for Subcatchment O-03: OFF-03

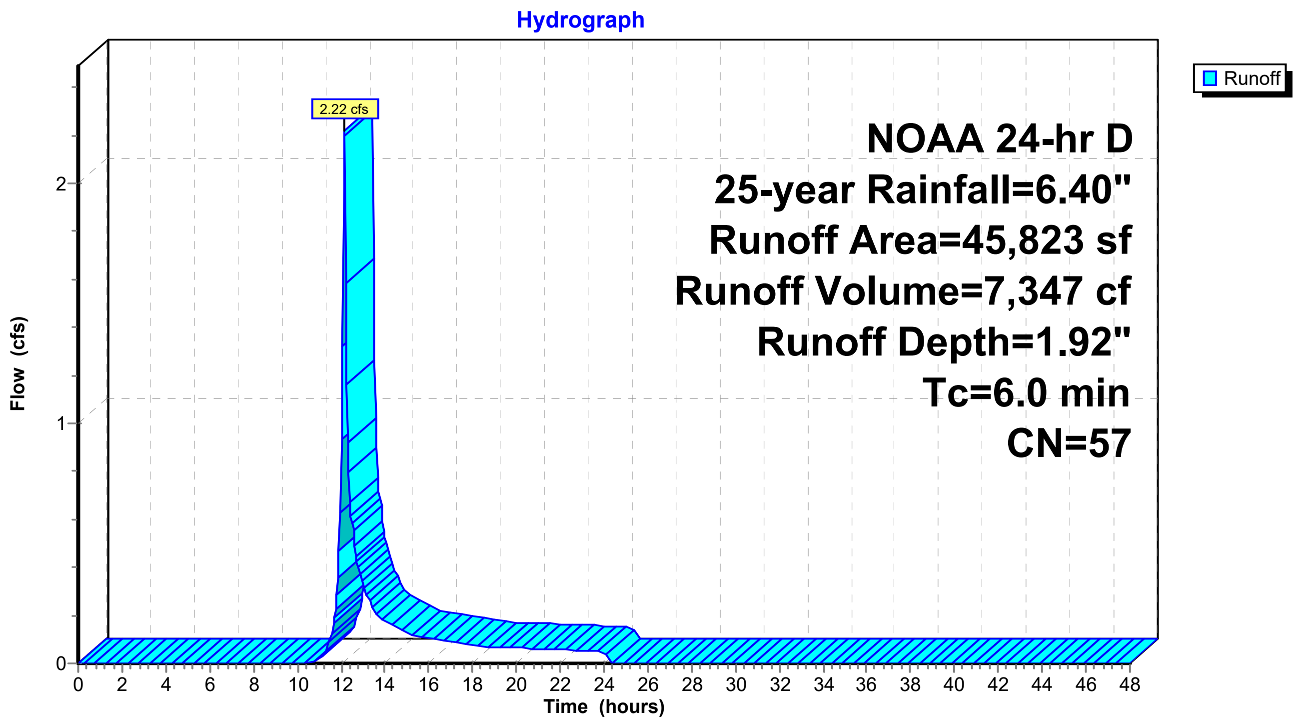
Runoff = 2.22 cfs @ 12.14 hrs, Volume= 7,347 cf, Depth= 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
45,823	57	1/3 acre lots, 30% imp, HSG A
32,076		70.00% Pervious Area
13,747		30.00% Impervious Area

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

Subcatchment O-03: OFF-03



Summary for Subcatchment O-04: OFF-04

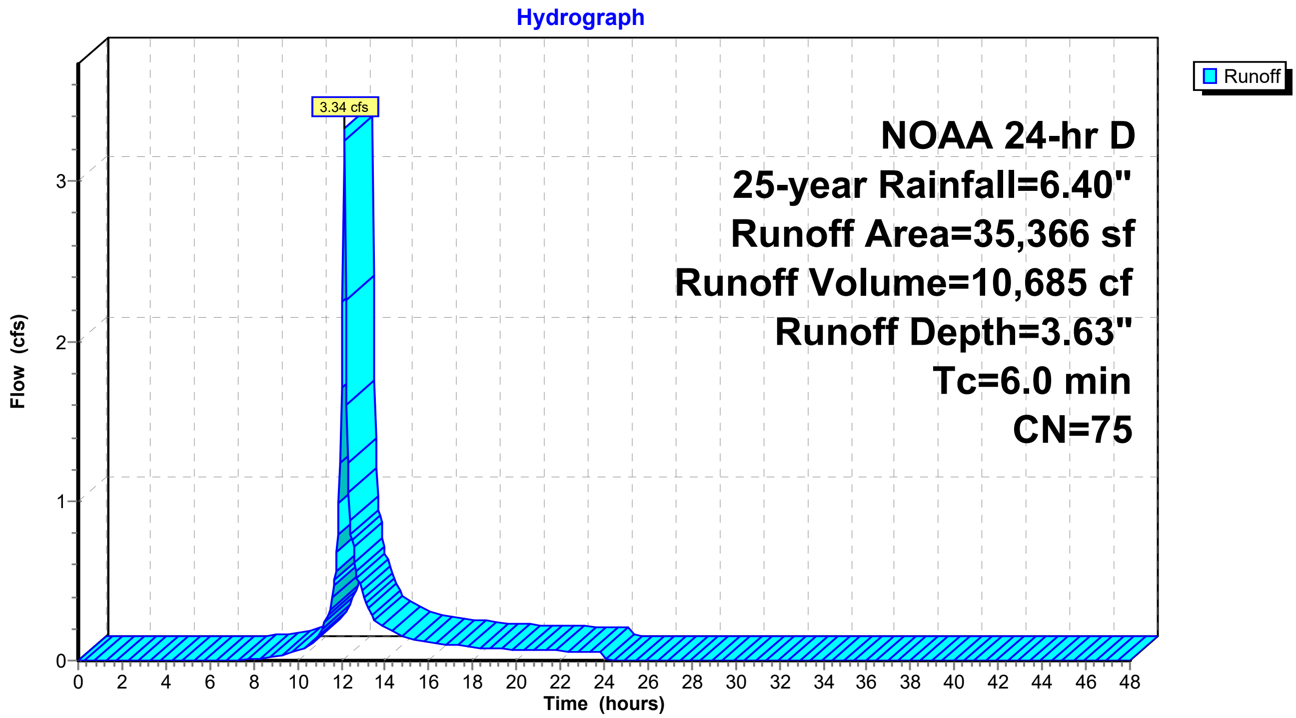
Runoff = 3.34 cfs @ 12.13 hrs, Volume= 10,685 cf, Depth= 3.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
21,807	98	Paved parking, HSG A
13,559	39	>75% Grass cover, Good, HSG A
35,366	75	Weighted Average
13,559		38.34% Pervious Area
21,807		61.66% Impervious Area

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

Subcatchment O-04: OFF-04



Summary for Subcatchment PR-1A: PR-1A

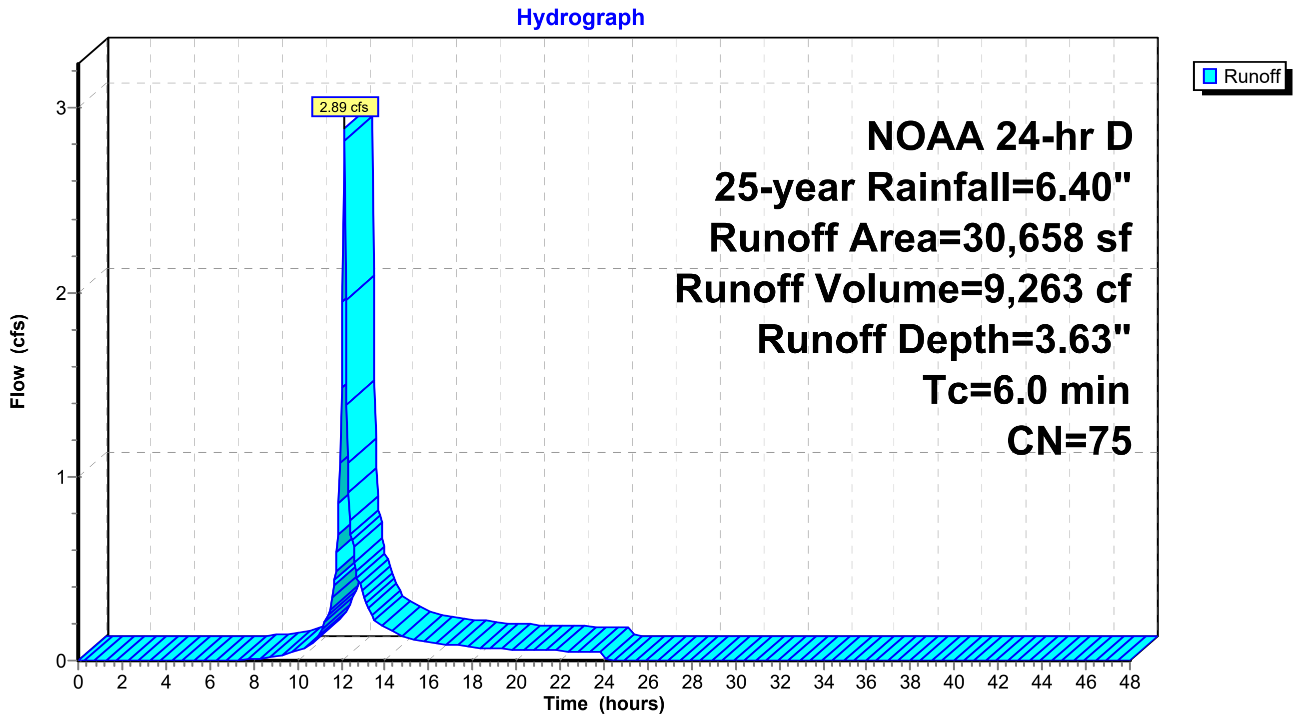
Runoff = 2.89 cfs @ 12.13 hrs, Volume= 9,263 cf, Depth= 3.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
18,507	98	Paved parking, HSG A
12,151	39	>75% Grass cover, Good, HSG A
30,658	75	Weighted Average
12,151		39.63% Pervious Area
18,507		60.37% Impervious Area

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

Subcatchment PR-1A: PR-1A



Summary for Subcatchment PR-1B: PR-1B

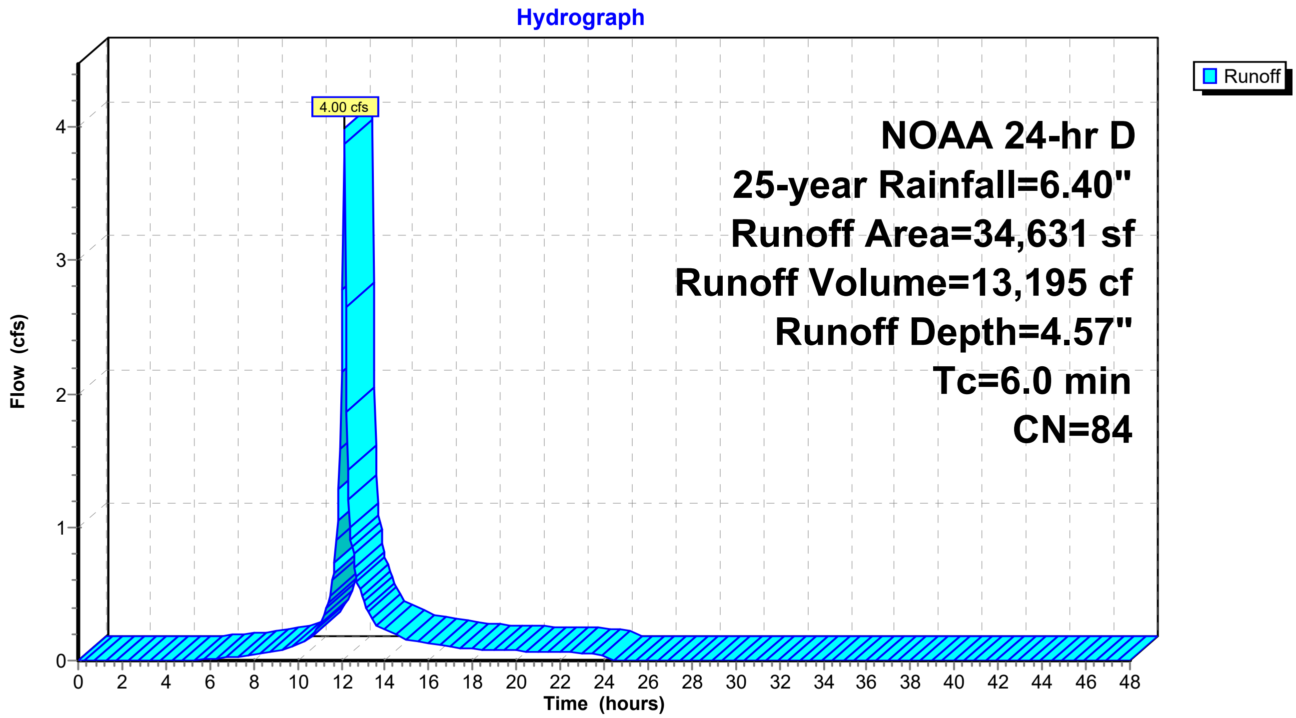
Runoff = 4.00 cfs @ 12.13 hrs, Volume= 13,195 cf, Depth= 4.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
26,601	98	Paved parking, HSG A
8,030	39	>75% Grass cover, Good, HSG A
34,631	84	Weighted Average
8,030		23.19% Pervious Area
26,601		76.81% Impervious Area

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

Subcatchment PR-1B: PR-1B



Summary for Subcatchment PR-1C: PR-1C

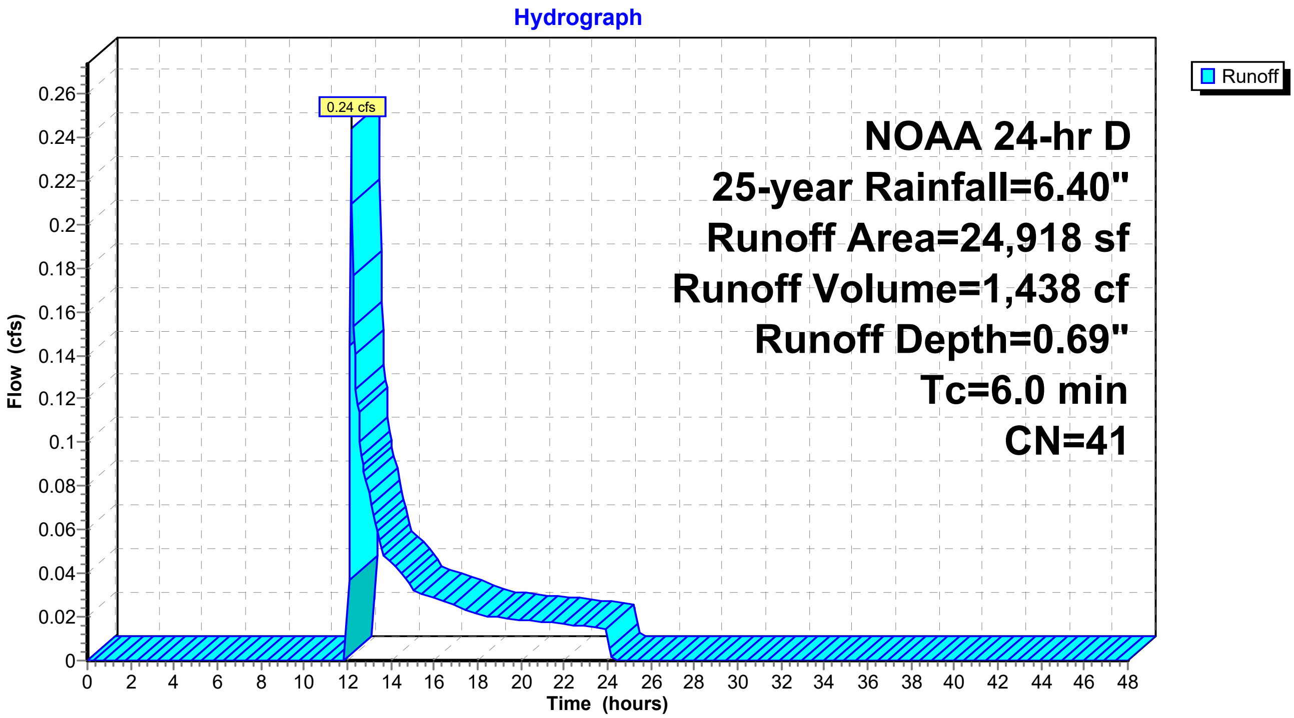
Runoff = 0.24 cfs @ 12.16 hrs, Volume= 1,438 cf, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
836	98	Paved parking, HSG A
24,082	39	>75% Grass cover, Good, HSG A
24,918	41	Weighted Average
24,082		96.64% Pervious Area
836		3.36% Impervious Area

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

Subcatchment PR-1C: PR-1C



Summary for Subcatchment PR-1D: PR-1D

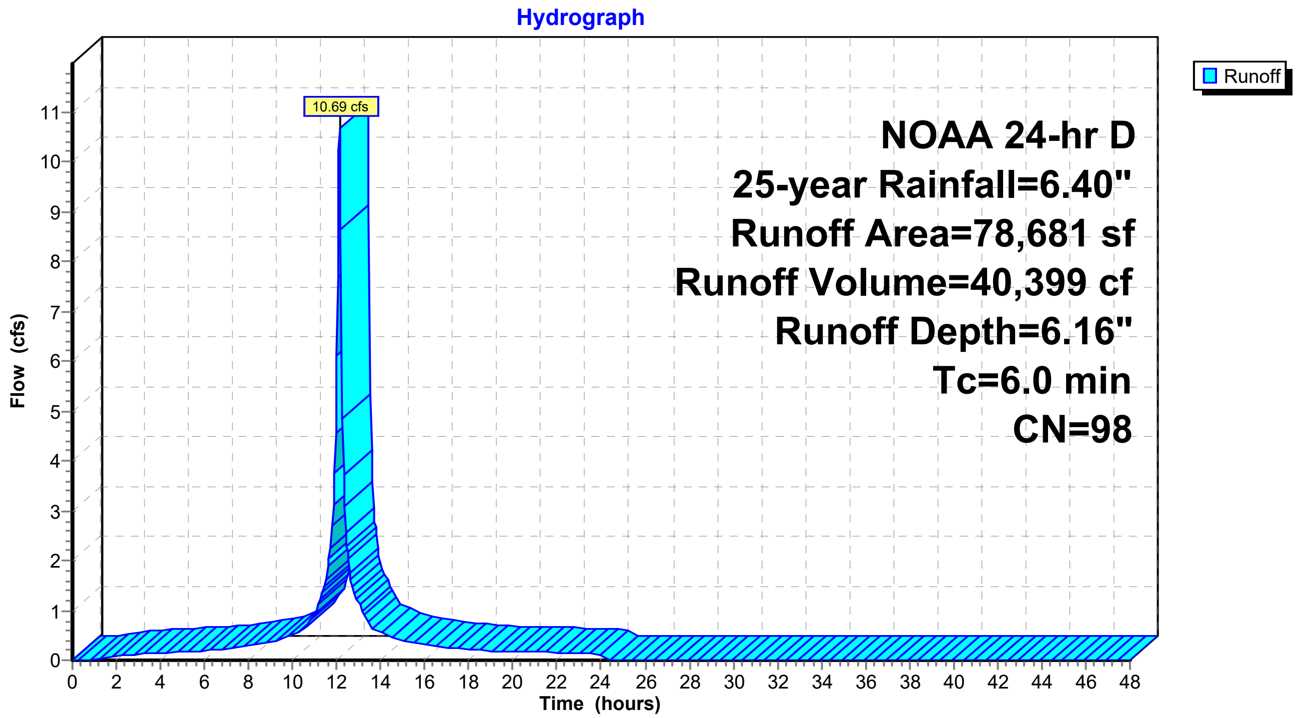
Runoff = 10.69 cfs @ 12.13 hrs, Volume= 40,399 cf, Depth= 6.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
78,681	98	Roofs, HSG A
78,681		100.00% Impervious Area

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

Subcatchment PR-1D: PR-1D



Summary for Subcatchment PR-1E: PR-1E

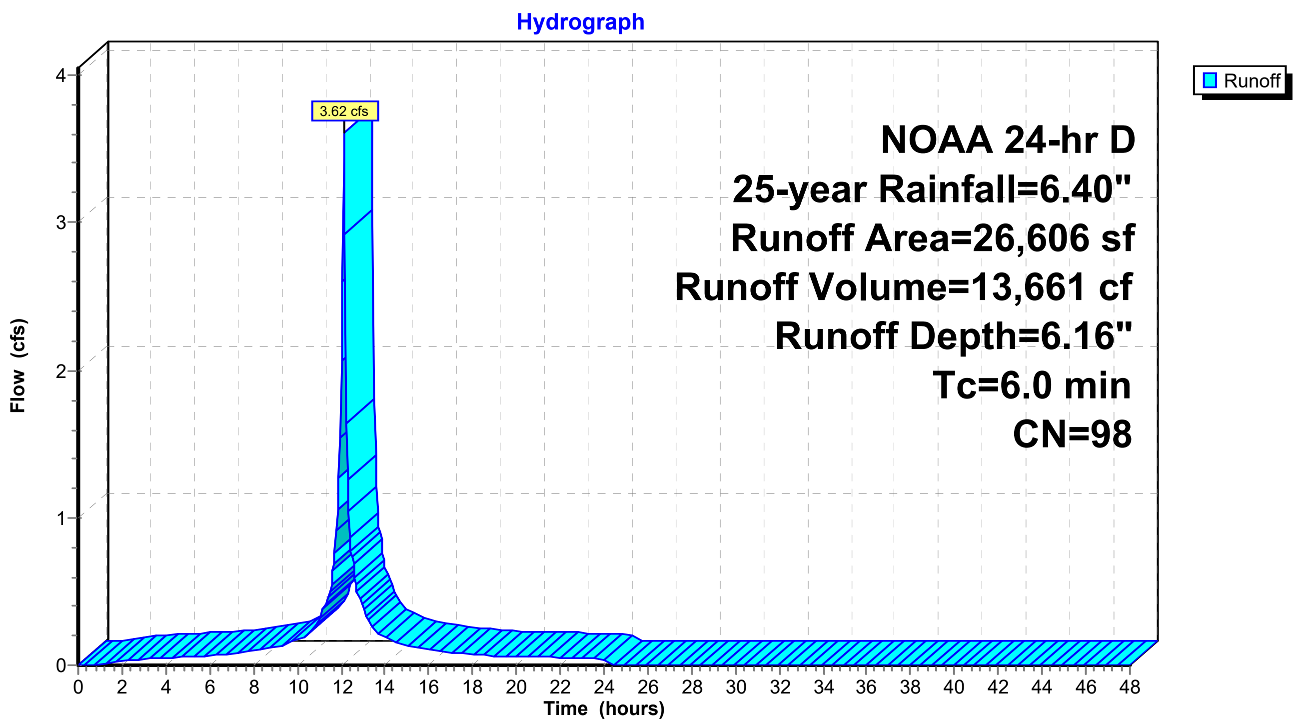
Runoff = 3.62 cfs @ 12.13 hrs, Volume= 13,661 cf, Depth= 6.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
26,606	98	Roofs, HSG A
26,606		100.00% Impervious Area

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

Subcatchment PR-1E: PR-1E



Summary for Subcatchment PR-1F: PR-1F

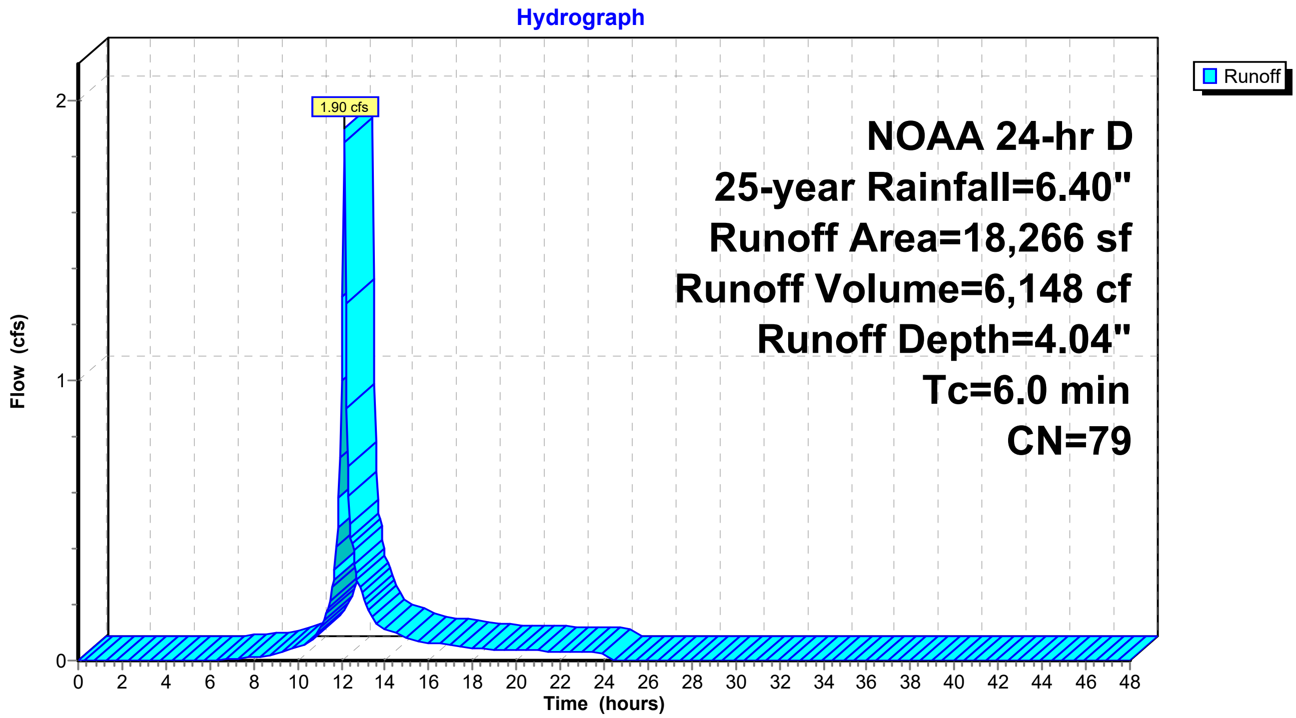
Runoff = 1.90 cfs @ 12.13 hrs, Volume= 6,148 cf, Depth= 4.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
12,317	98	Paved parking, HSG A
5,949	39	>75% Grass cover, Good, HSG A
18,266	79	Weighted Average
5,949		32.57% Pervious Area
12,317		67.43% Impervious Area

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

Subcatchment PR-1F: PR-1F



Summary for Subcatchment PR-1G: PR-1G

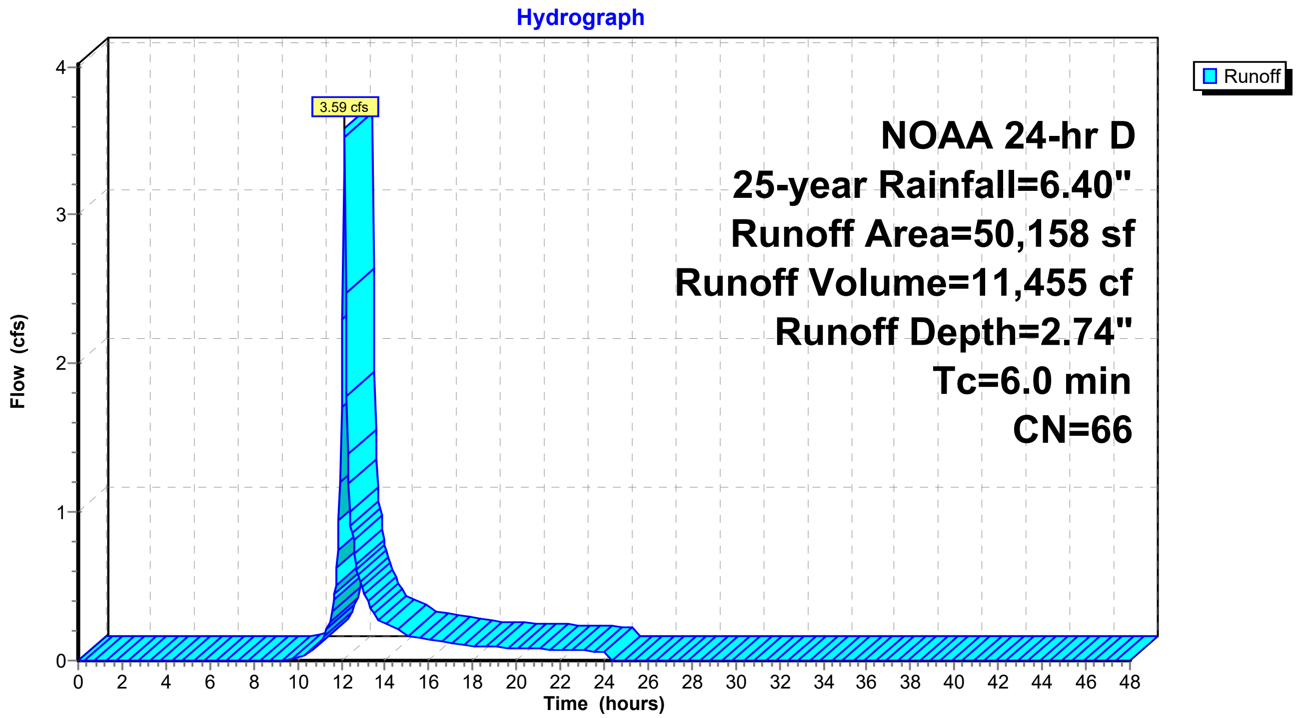
Runoff = 3.59 cfs @ 12.13 hrs, Volume= 11,455 cf, Depth= 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
23,071	98	Paved parking, HSG A
27,087	39	>75% Grass cover, Good, HSG A
50,158	66	Weighted Average
27,087		54.00% Pervious Area
23,071		46.00% Impervious Area

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

Subcatchment PR-1G: PR-1G



Summary for Subcatchment PR-1H: PR-1H

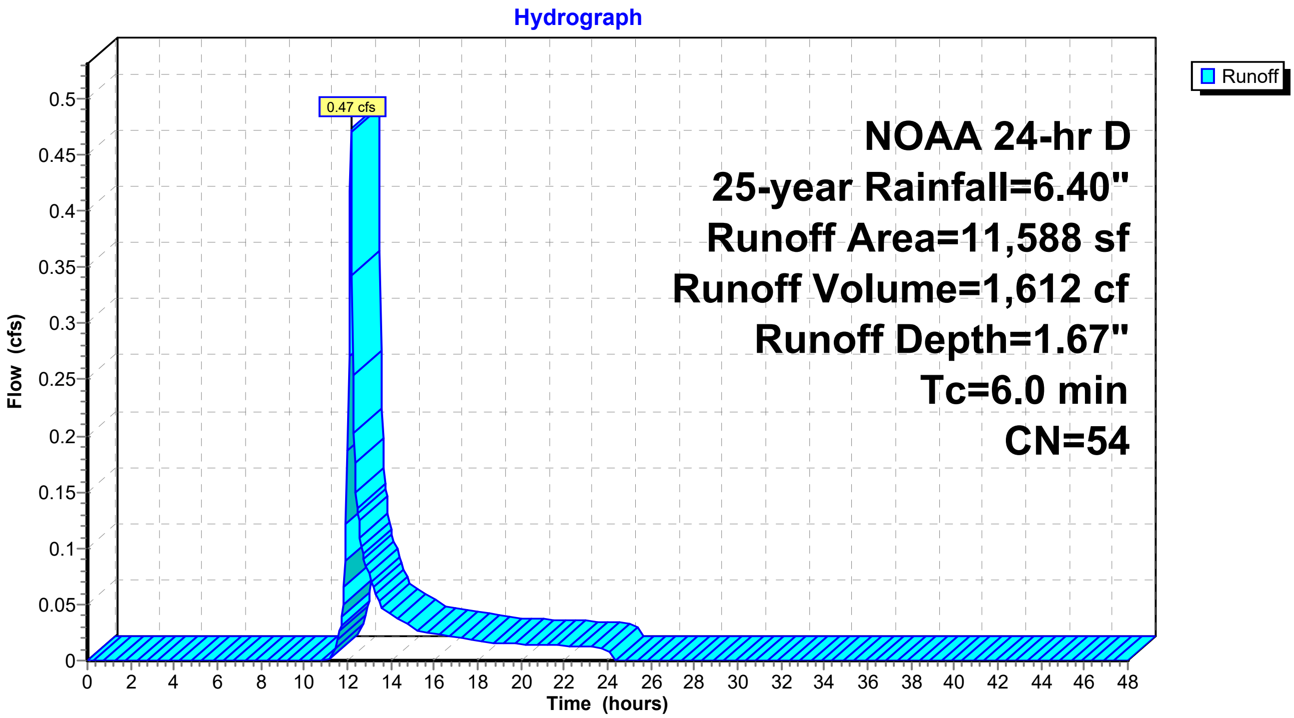
Runoff = 0.47 cfs @ 12.14 hrs, Volume= 1,612 cf, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
2,853	98	Paved parking, HSG A
8,735	39	>75% Grass cover, Good, HSG A
11,588	54	Weighted Average
8,735		75.38% Pervious Area
2,853		24.62% Impervious Area

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

Subcatchment PR-1H: PR-1H



Summary for Subcatchment PR-1I: PR-1I

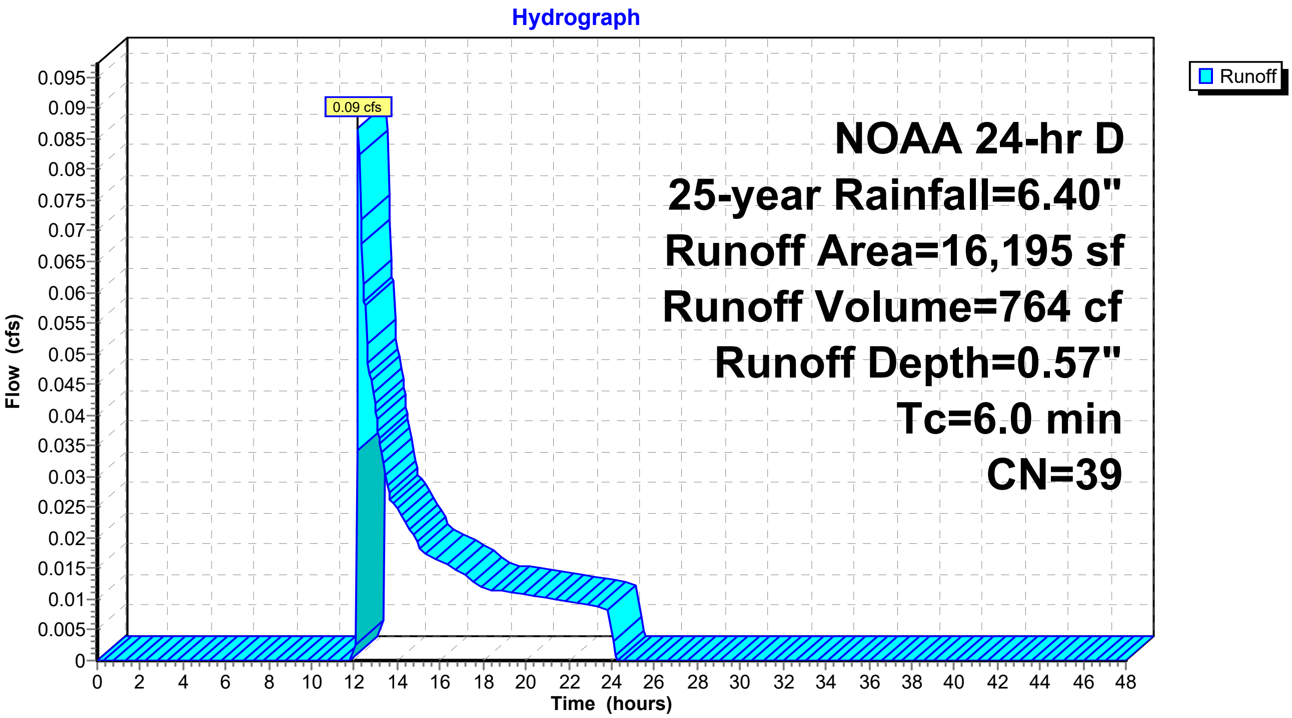
Runoff = 0.09 cfs @ 12.18 hrs, Volume= 764 cf, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
95	98	Paved parking, HSG A
16,100	39	>75% Grass cover, Good, HSG A
16,195	39	Weighted Average
16,100		99.41% Pervious Area
95		0.59% Impervious Area

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

Subcatchment PR-1I: PR-1I



Summary for Subcatchment PR-1J: PR-1J

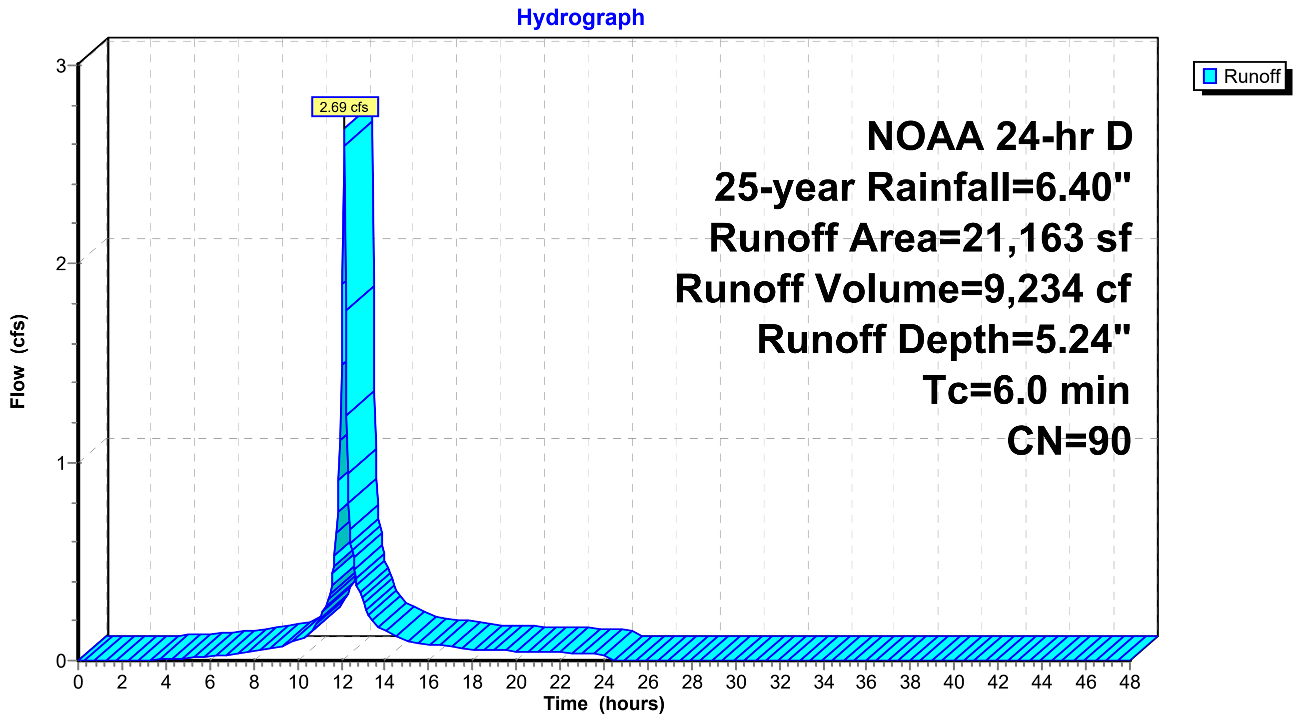
Runoff = 2.69 cfs @ 12.13 hrs, Volume= 9,234 cf, Depth= 5.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
18,160	98	Paved parking, HSG A
3,003	39	>75% Grass cover, Good, HSG A
21,163	90	Weighted Average
3,003		14.19% Pervious Area
18,160		85.81% Impervious Area

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

Subcatchment PR-1J: PR-1J



Summary for Subcatchment PR-1K: PR-1K

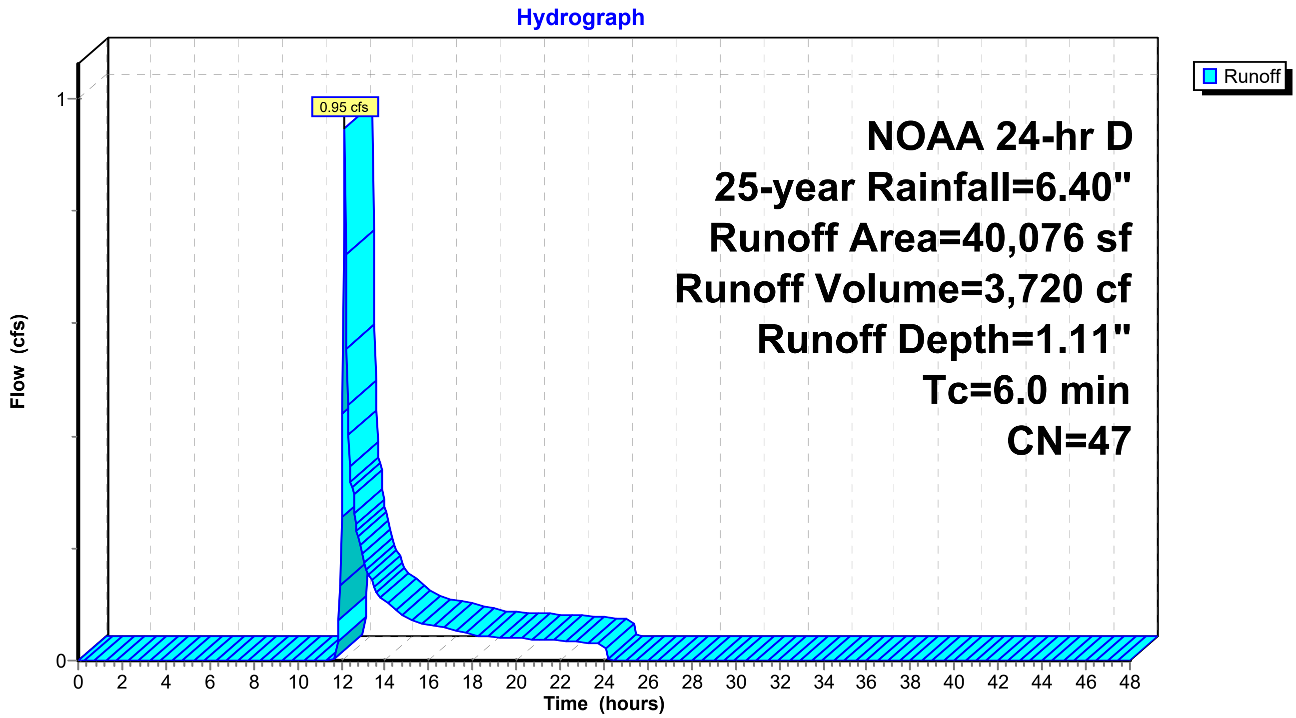
Runoff = 0.95 cfs @ 12.15 hrs, Volume= 3,720 cf, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
5,537	98	Paved parking, HSG A
34,539	39	>75% Grass cover, Good, HSG A
40,076	47	Weighted Average
34,539		86.18% Pervious Area
5,537		13.82% Impervious Area

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

Subcatchment PR-1K: PR-1K



Summary for Subcatchment PR-1L: PR-1L

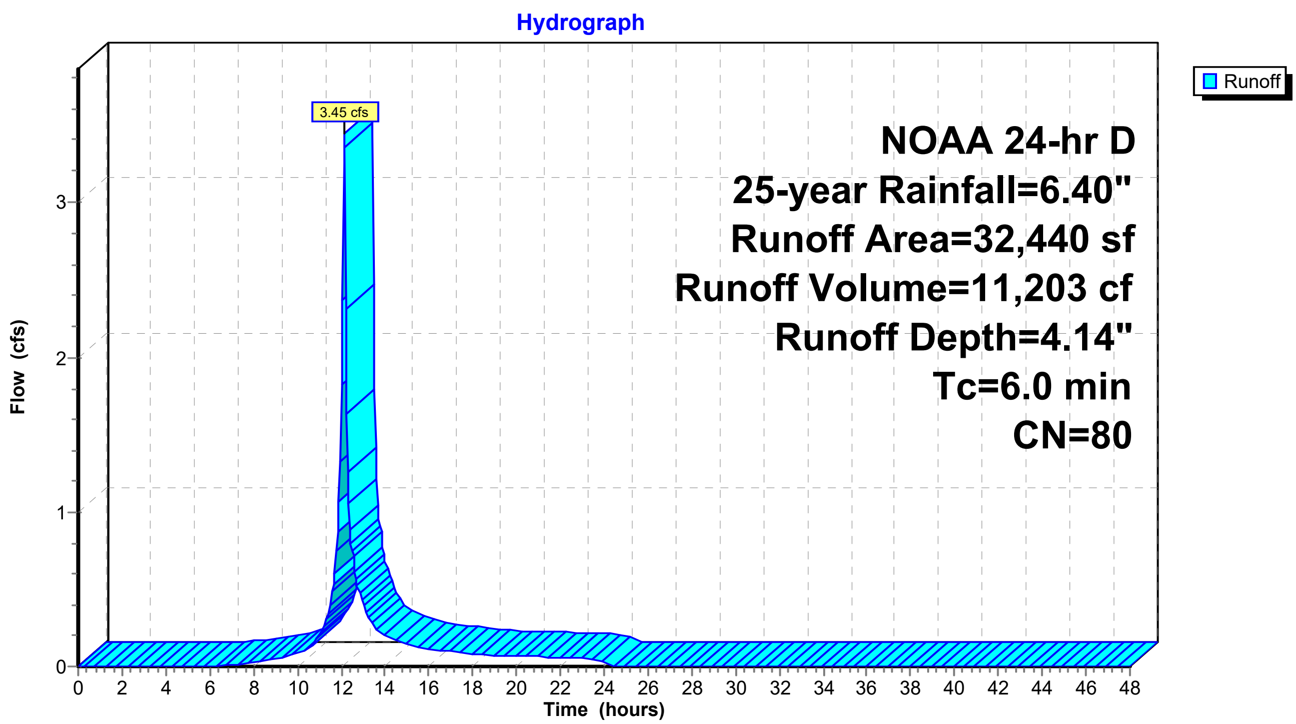
Runoff = 3.45 cfs @ 12.13 hrs, Volume= 11,203 cf, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
22,426	98	Paved parking, HSG A
10,014	39	>75% Grass cover, Good, HSG A
32,440	80	Weighted Average
10,014		30.87% Pervious Area
22,426		69.13% Impervious Area

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

Subcatchment PR-1L: PR-1L



Summary for Subcatchment PR-1M: PR-1M

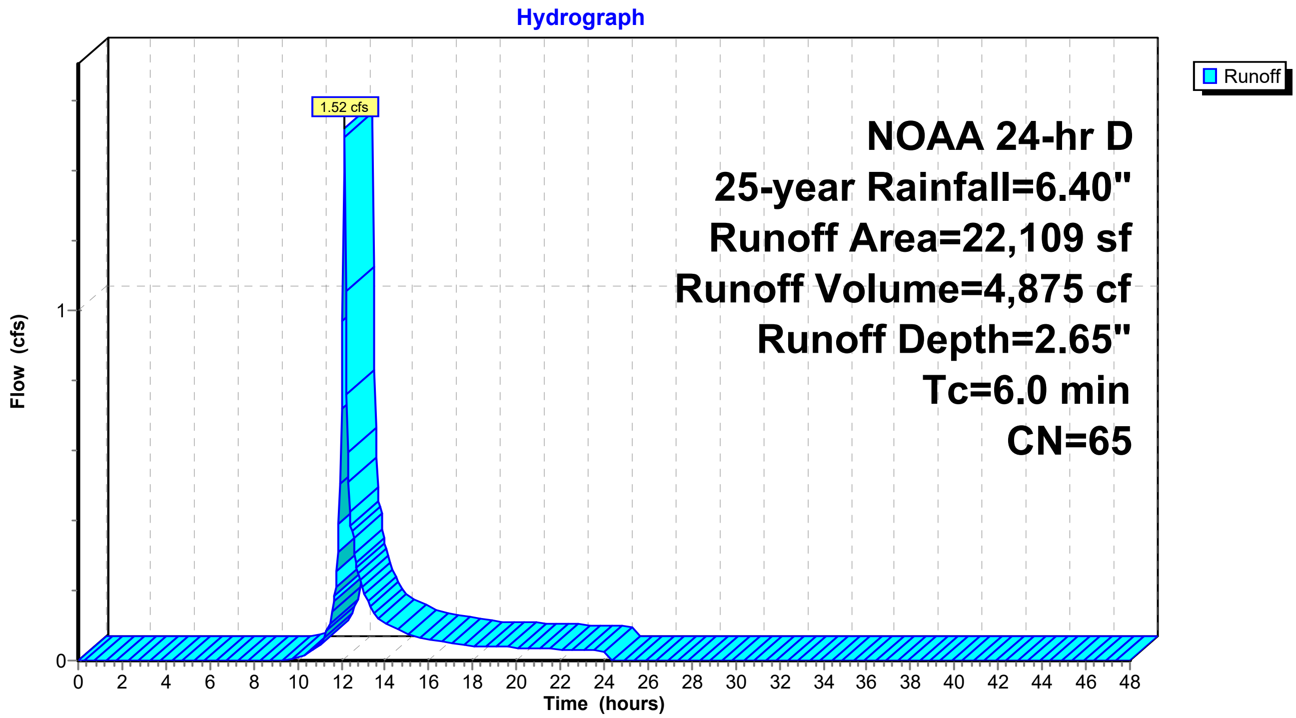
Runoff = 1.52 cfs @ 12.13 hrs, Volume= 4,875 cf, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
9,781	98	Paved parking, HSG A
12,328	39	>75% Grass cover, Good, HSG A
22,109	65	Weighted Average
12,328		55.76% Pervious Area
9,781		44.24% Impervious Area

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

Subcatchment PR-1M: PR-1M



Summary for Subcatchment PR-1N: PR-1N

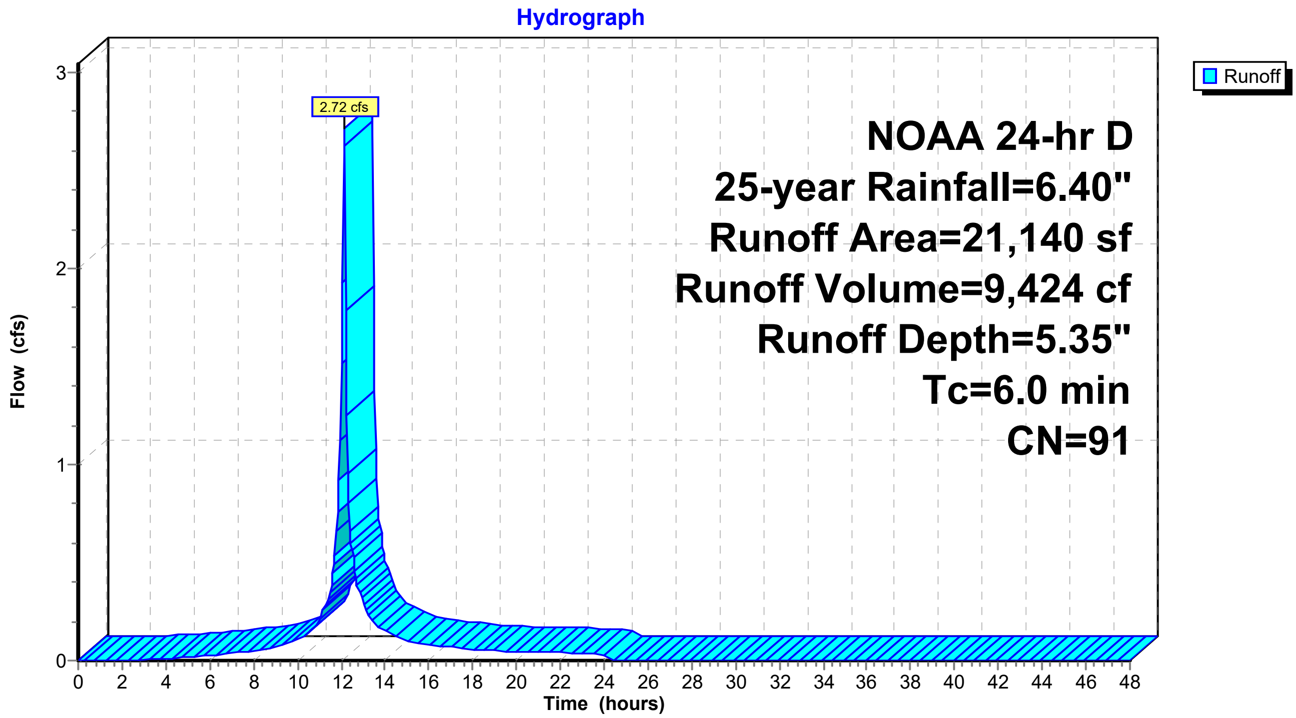
Runoff = 2.72 cfs @ 12.13 hrs, Volume= 9,424 cf, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
18,490	98	Paved parking, HSG A
2,650	39	>75% Grass cover, Good, HSG A
21,140	91	Weighted Average
2,650		12.54% Pervious Area
18,490		87.46% Impervious Area

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

Subcatchment PR-1N: PR-1N



Summary for Subcatchment PR-1O: PR-1O

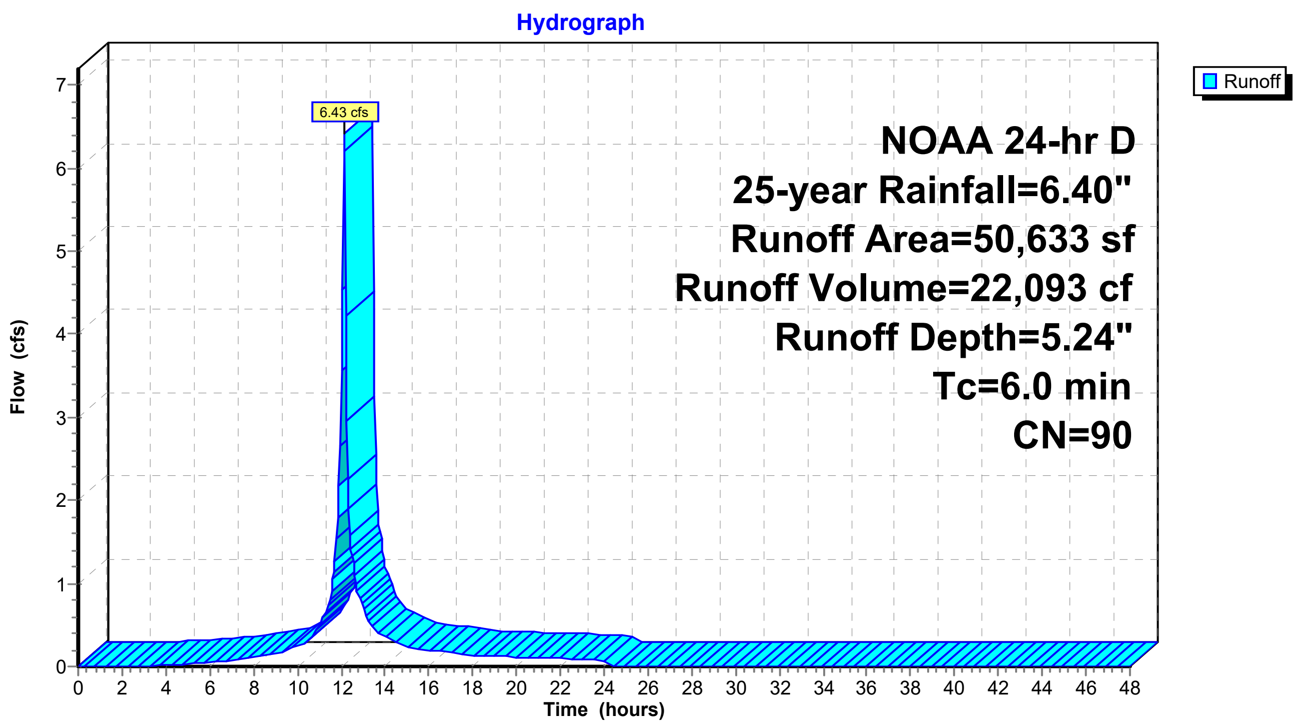
Runoff = 6.43 cfs @ 12.13 hrs, Volume= 22,093 cf, Depth= 5.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
43,450	98	Paved parking, HSG A
7,183	39	>75% Grass cover, Good, HSG A
50,633	90	Weighted Average
7,183		14.19% Pervious Area
43,450		85.81% Impervious Area

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

Subcatchment PR-1O: PR-1O



Summary for Subcatchment PR-1P: PR-1P

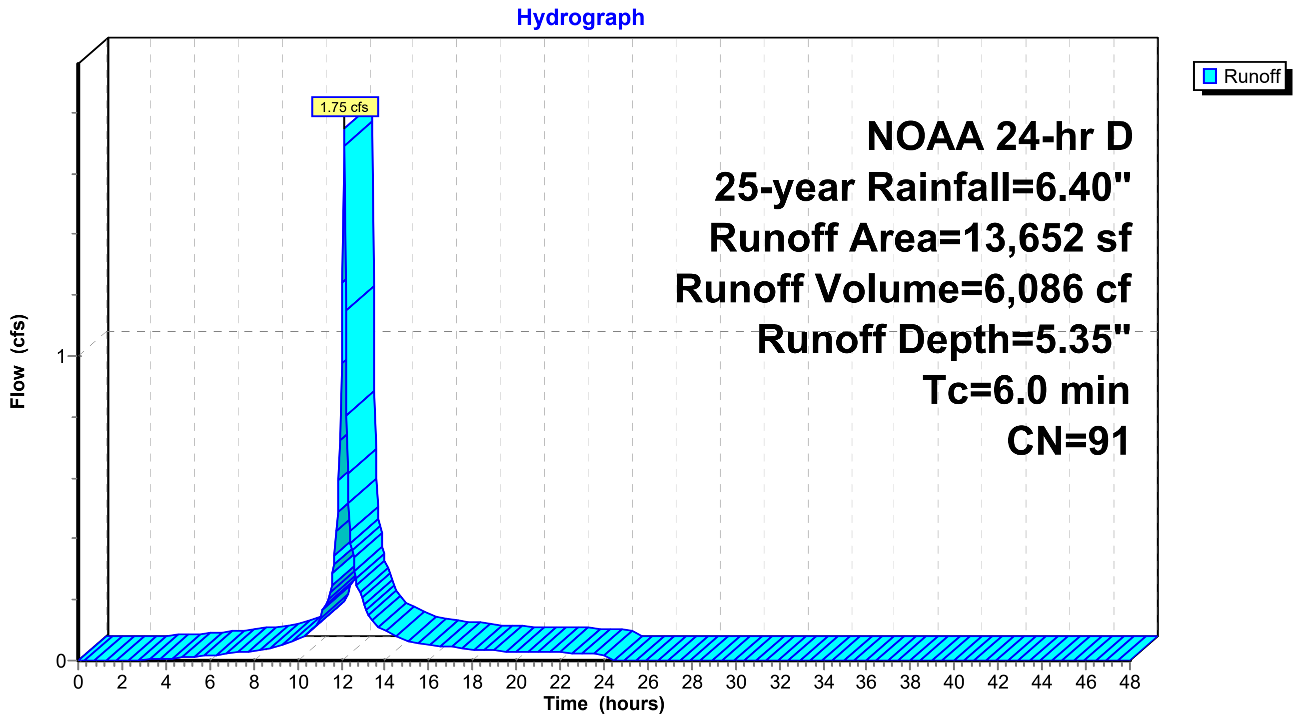
Runoff = 1.75 cfs @ 12.13 hrs, Volume= 6,086 cf, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
12,120	98	Paved parking, HSG A
1,532	39	>75% Grass cover, Good, HSG A
13,652	91	Weighted Average
1,532		11.22% Pervious Area
12,120		88.78% Impervious Area

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

Subcatchment PR-1P: PR-1P



Summary for Subcatchment PR-1Q: PR-1Q

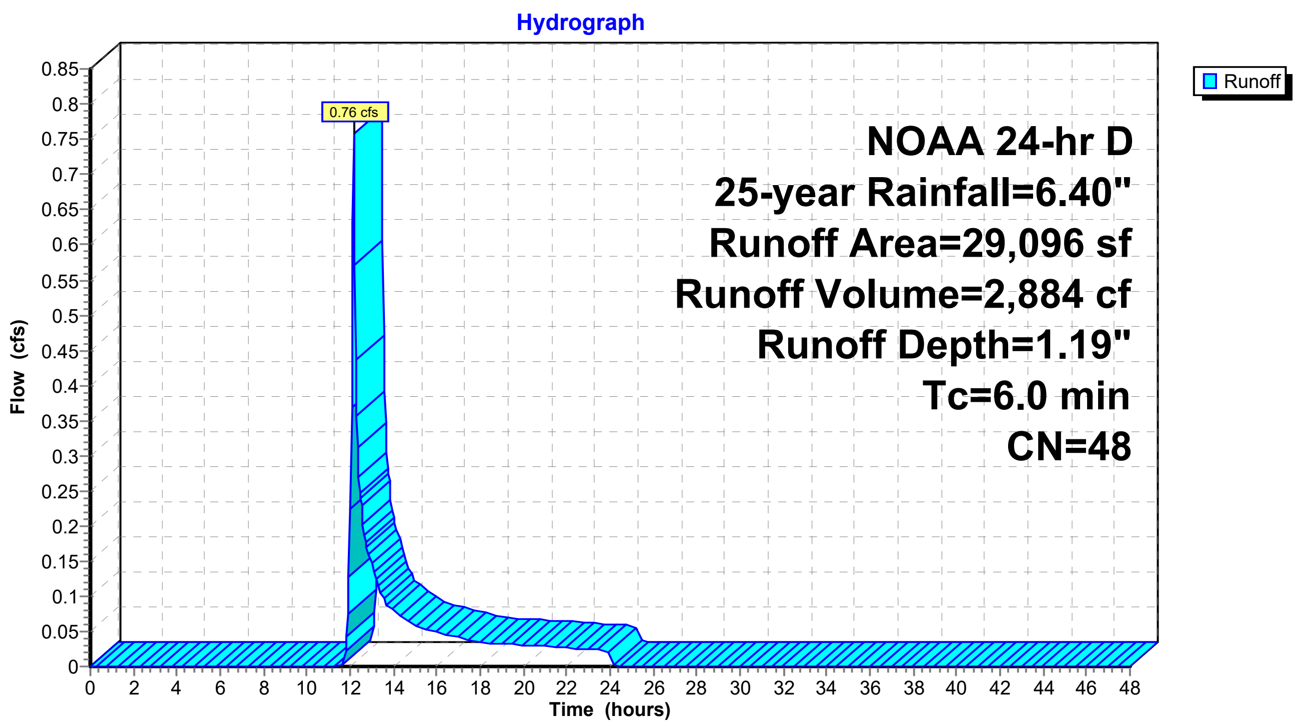
Runoff = 0.76 cfs @ 12.15 hrs, Volume= 2,884 cf, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
4,261	98	Paved parking, HSG A
24,835	39	>75% Grass cover, Good, HSG A
29,096	48	Weighted Average
24,835		85.36% Pervious Area
4,261		14.64% Impervious Area

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

Subcatchment PR-1Q: PR-1Q



Summary for Subcatchment PR-1R: PR-1R

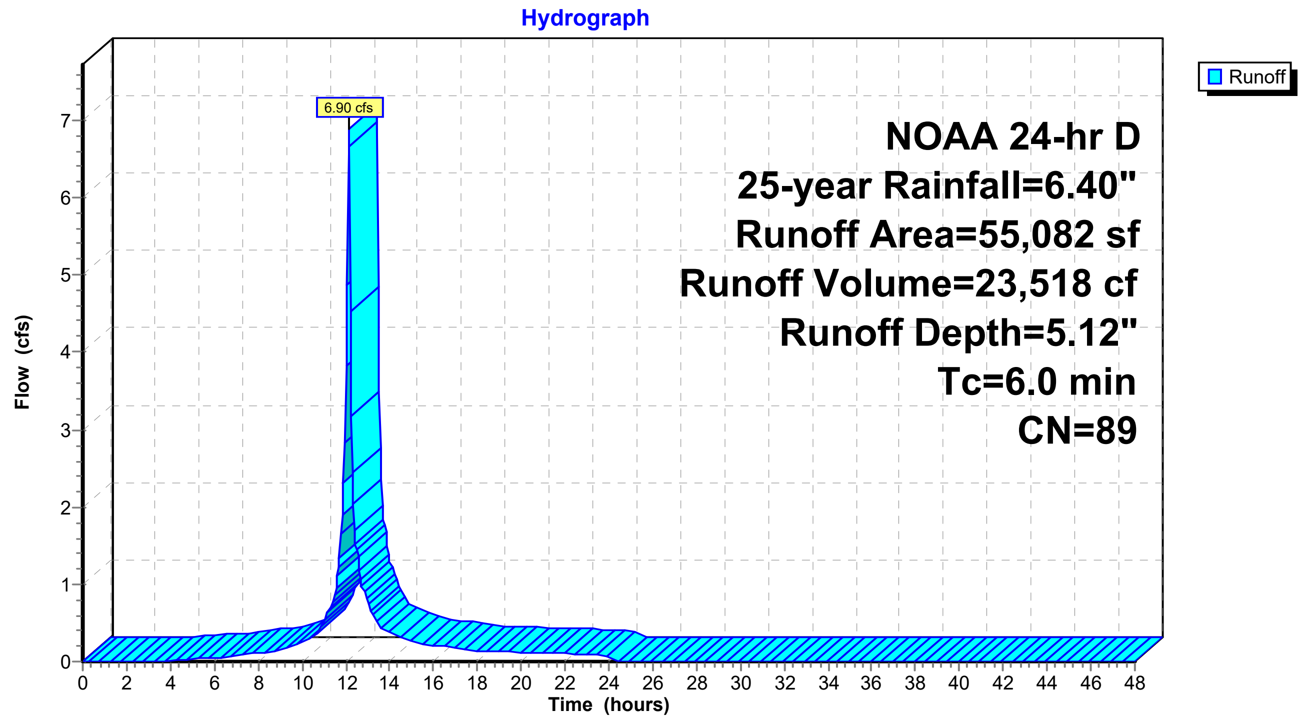
Runoff = 6.90 cfs @ 12.13 hrs, Volume= 23,518 cf, Depth= 5.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
35,043	98	Paved parking, HSG A
8,733	39	>75% Grass cover, Good, HSG A
11,306	98	Unconnected roofs, HSG A
55,082	89	Weighted Average
8,733		15.85% Pervious Area
46,349		84.15% Impervious Area
11,306		24.39% Unconnected

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

Subcatchment PR-1R: PR-1R



Summary for Subcatchment PR-1S: PR-1S

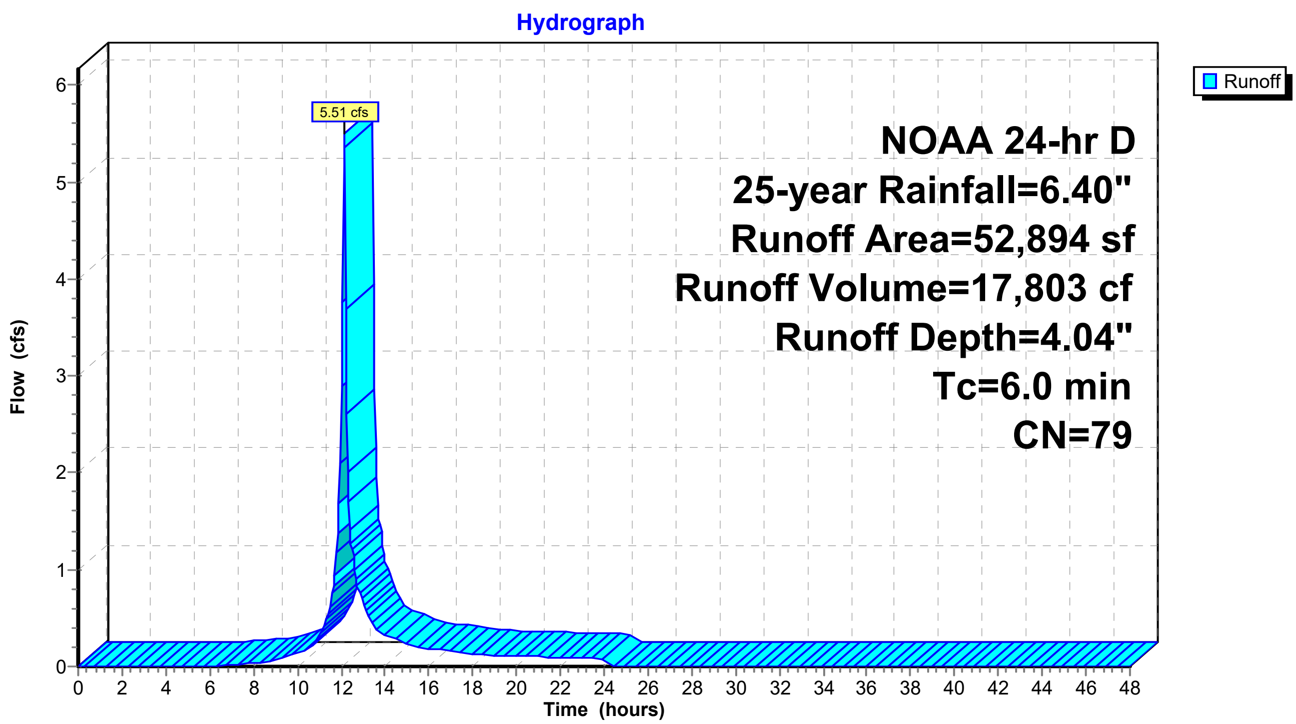
Runoff = 5.51 cfs @ 12.13 hrs, Volume= 17,803 cf, Depth= 4.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
35,565	98	Paved parking, HSG A
17,329	39	>75% Grass cover, Good, HSG A
52,894	79	Weighted Average
17,329		32.76% Pervious Area
35,565		67.24% Impervious Area

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

Subcatchment PR-1S: PR-1S



Summary for Subcatchment PR-1U: PR-1U

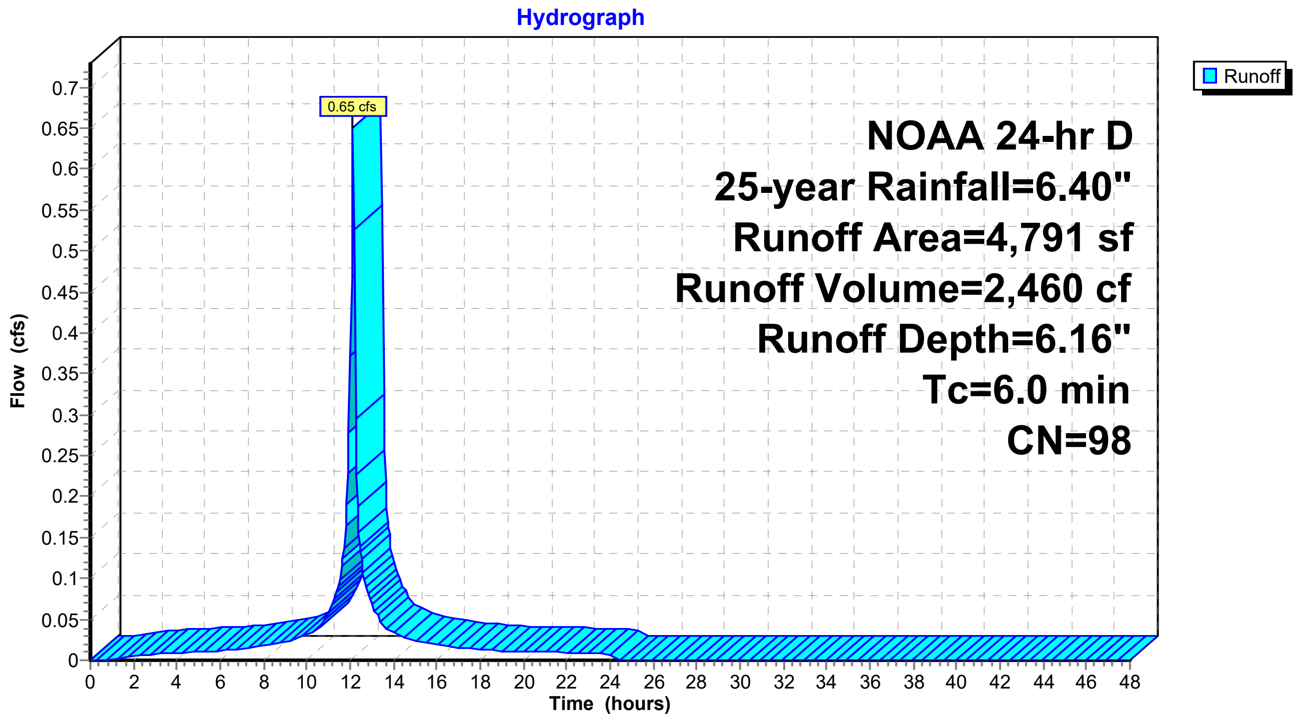
Runoff = 0.65 cfs @ 12.13 hrs, Volume= 2,460 cf, Depth= 6.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
4,791	98	Paved parking, HSG A
4,791		100.00% Impervious Area

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

Subcatchment PR-1U: PR-1U



Summary for Subcatchment PR-1V: PR-1V

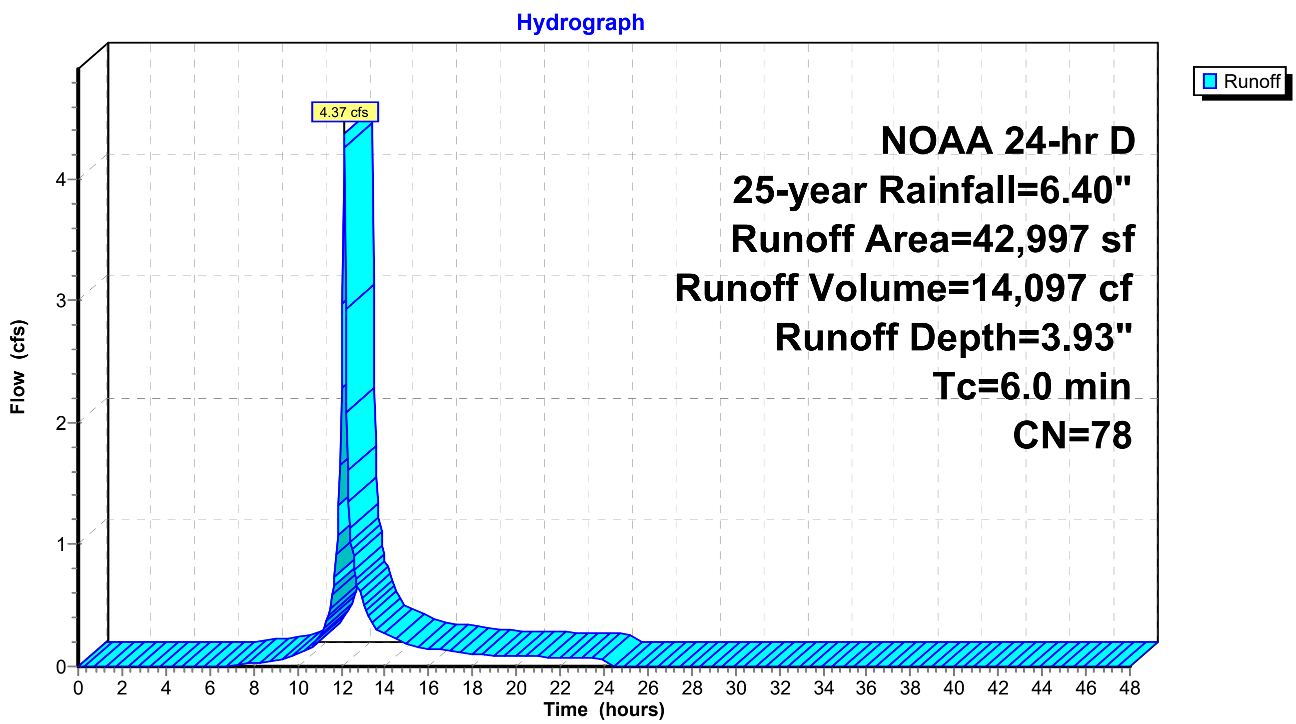
Runoff = 4.37 cfs @ 12.13 hrs, Volume= 14,097 cf, Depth= 3.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
28,362	98	Paved parking, HSG A
14,635	39	>75% Grass cover, Good, HSG A
42,997	78	Weighted Average
14,635		34.04% Pervious Area
28,362		65.96% Impervious Area

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

Subcatchment PR-1V: PR-1V



Summary for Subcatchment PR-2A: PR-2A

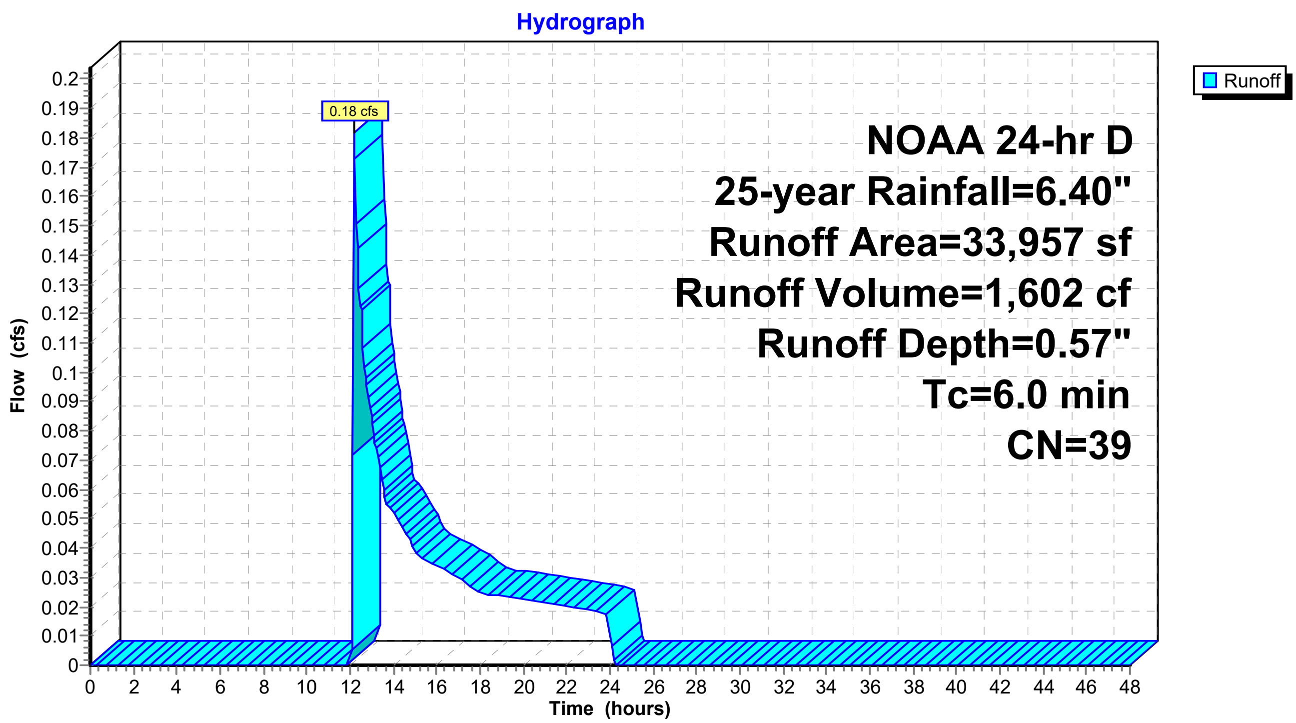
Runoff = 0.18 cfs @ 12.18 hrs, Volume= 1,602 cf, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
33,957	39	>75% Grass cover, Good, HSG A
33,957		100.00% Pervious Area

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

Subcatchment PR-2A: PR-2A



Summary for Subcatchment PR-2B: PR-2B

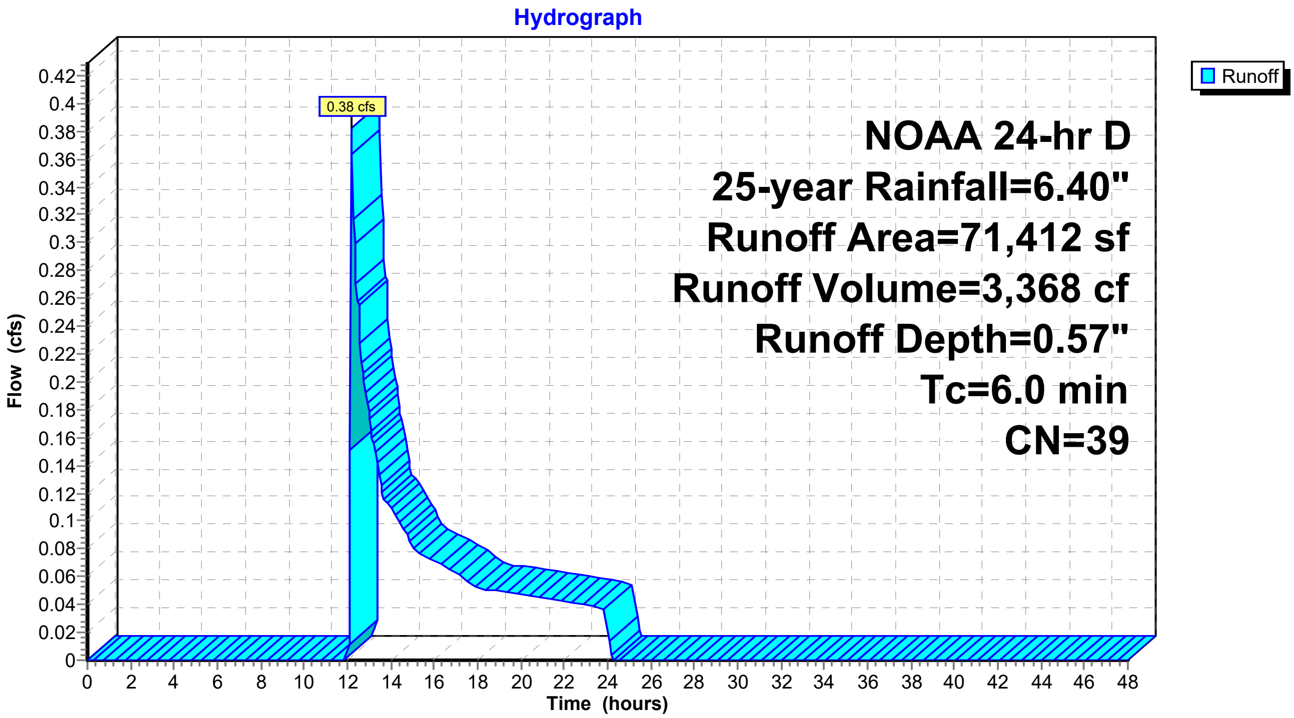
Runoff = 0.38 cfs @ 12.18 hrs, Volume= 3,368 cf, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
71,412	39	>75% Grass cover, Good, HSG A
71,412		100.00% Pervious Area

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

Subcatchment PR-2B: PR-2B



Summary for Subcatchment PR-2C: PR-2C

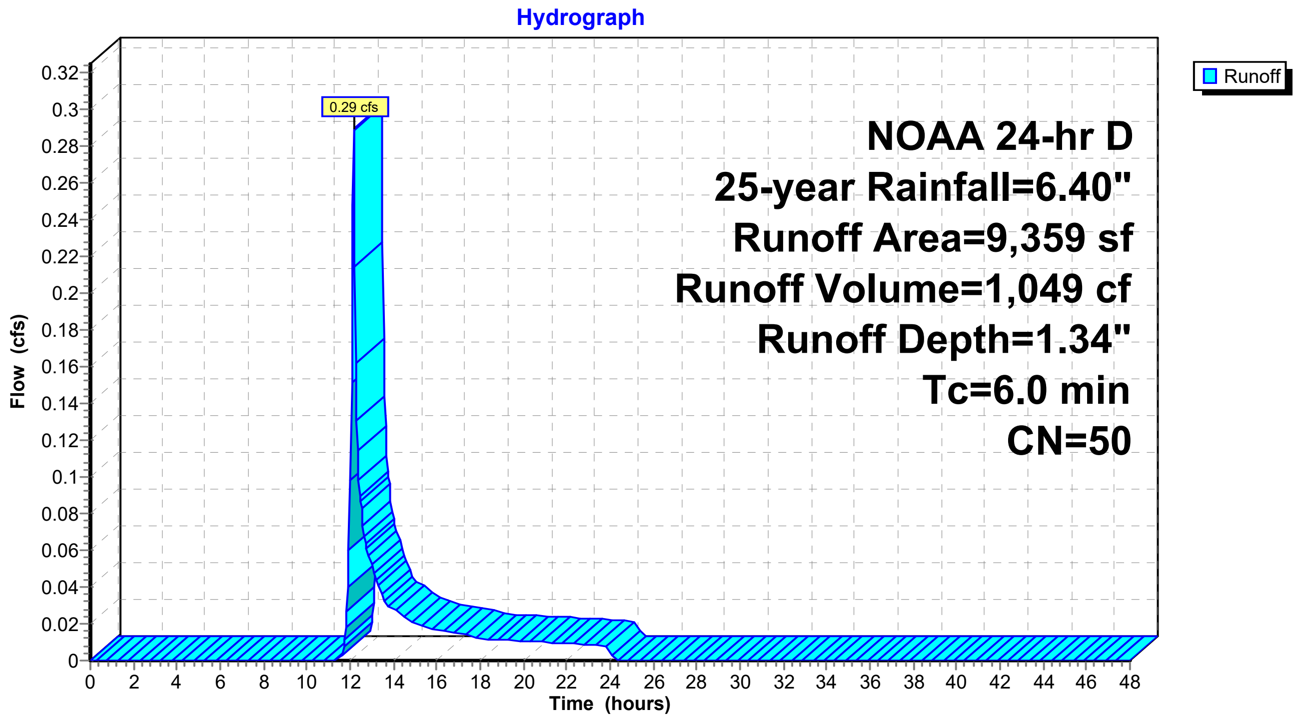
Runoff = 0.29 cfs @ 12.14 hrs, Volume= 1,049 cf, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
1,683	98	Paved parking, HSG A
7,676	39	>75% Grass cover, Good, HSG A
9,359	50	Weighted Average
7,676		82.02% Pervious Area
1,683		17.98% Impervious Area

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

Subcatchment PR-2C: PR-2C



Summary for Subcatchment PR-2D: PR-2D

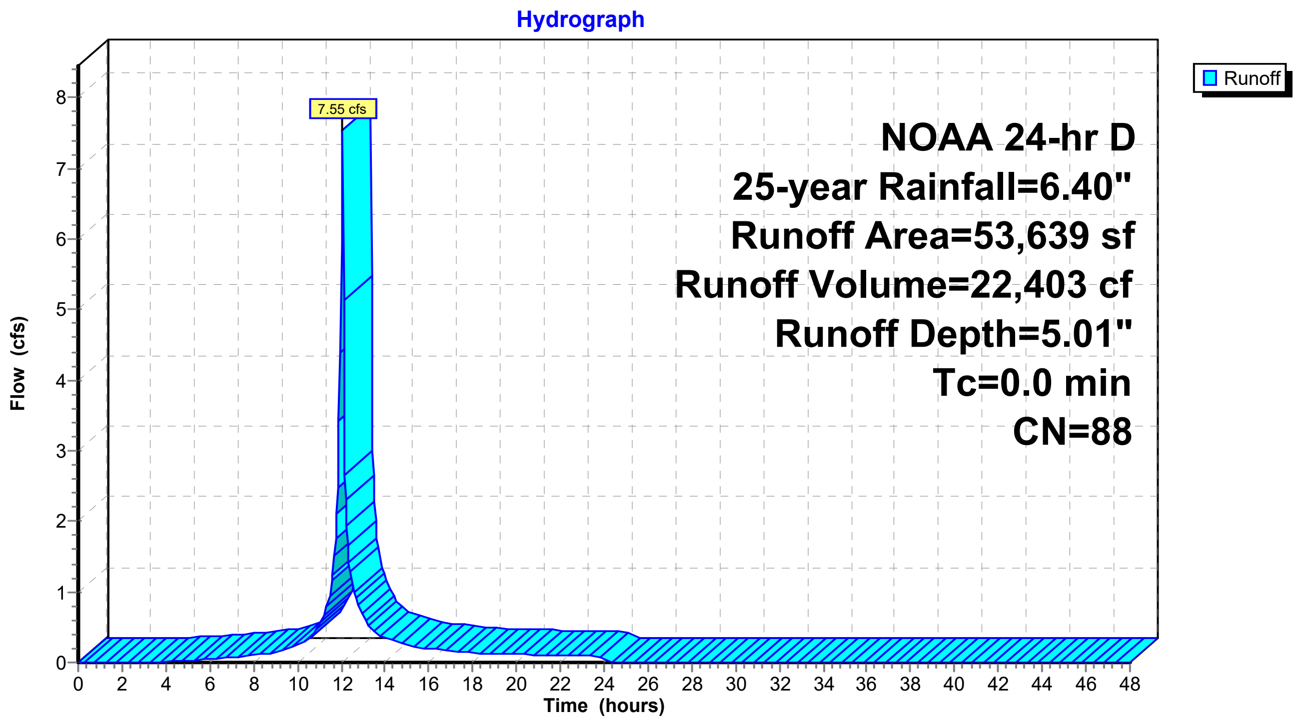
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 7.55 cfs @ 12.05 hrs, Volume= 22,403 cf, Depth= 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
44,403	98	Paved parking, HSG A
9,236	39	>75% Grass cover, Good, HSG A
53,639	88	Weighted Average
9,236		17.22% Pervious Area
44,403		82.78% Impervious Area

Subcatchment PR-2D: PR-2D



Summary for Subcatchment PR-2E: PR-2E

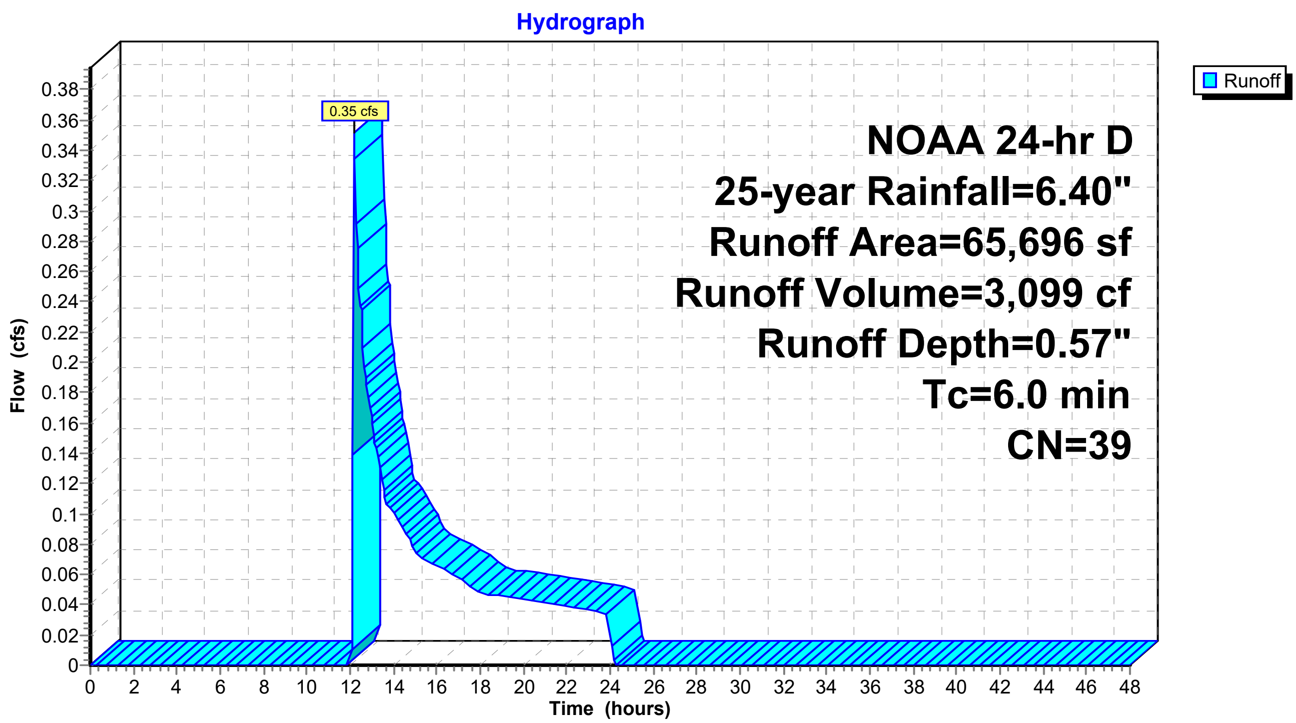
Runoff = 0.35 cfs @ 12.18 hrs, Volume= 3,099 cf, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
65,696	39	>75% Grass cover, Good, HSG A
65,696		100.00% Pervious Area

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

Subcatchment PR-2E: PR-2E



Summary for Subcatchment PR-2F: PR-2F

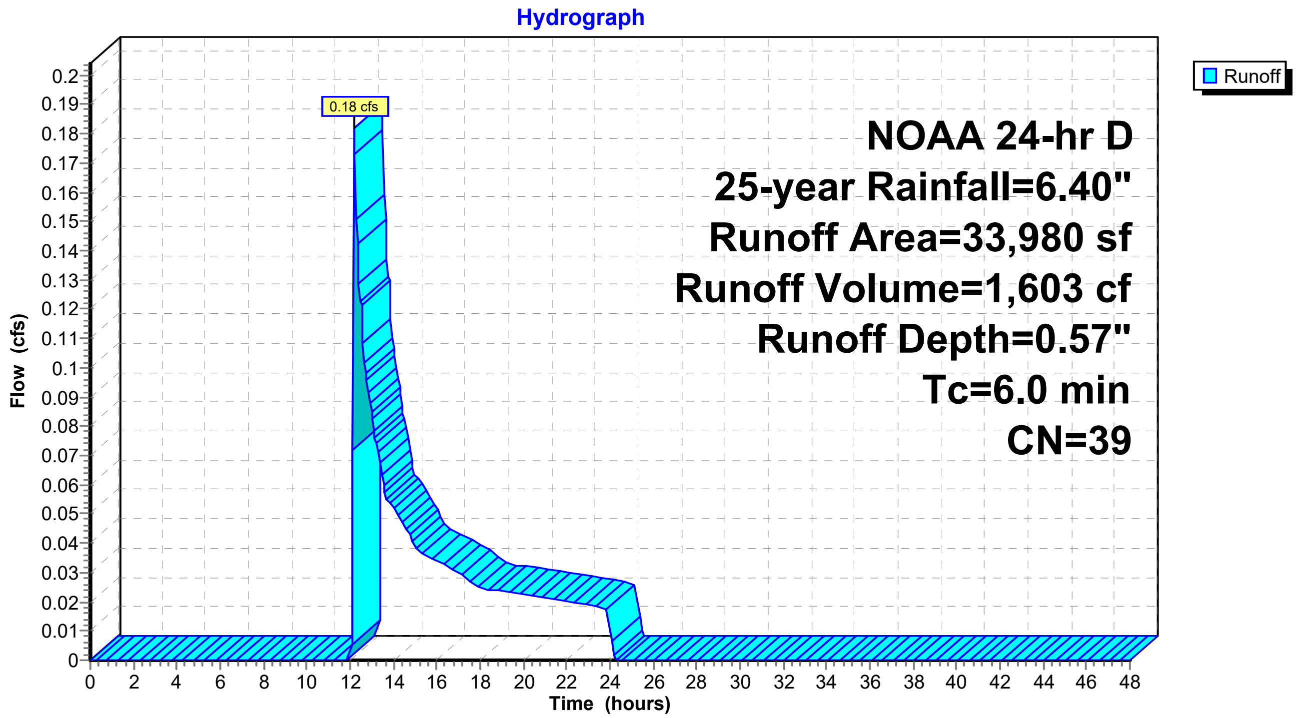
Runoff = 0.18 cfs @ 12.18 hrs, Volume= 1,603 cf, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
33,980	39	>75% Grass cover, Good, HSG A
33,980		100.00% Pervious Area

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

Subcatchment PR-2F: PR-2F



Summary for Subcatchment PR-2G: PR-2G

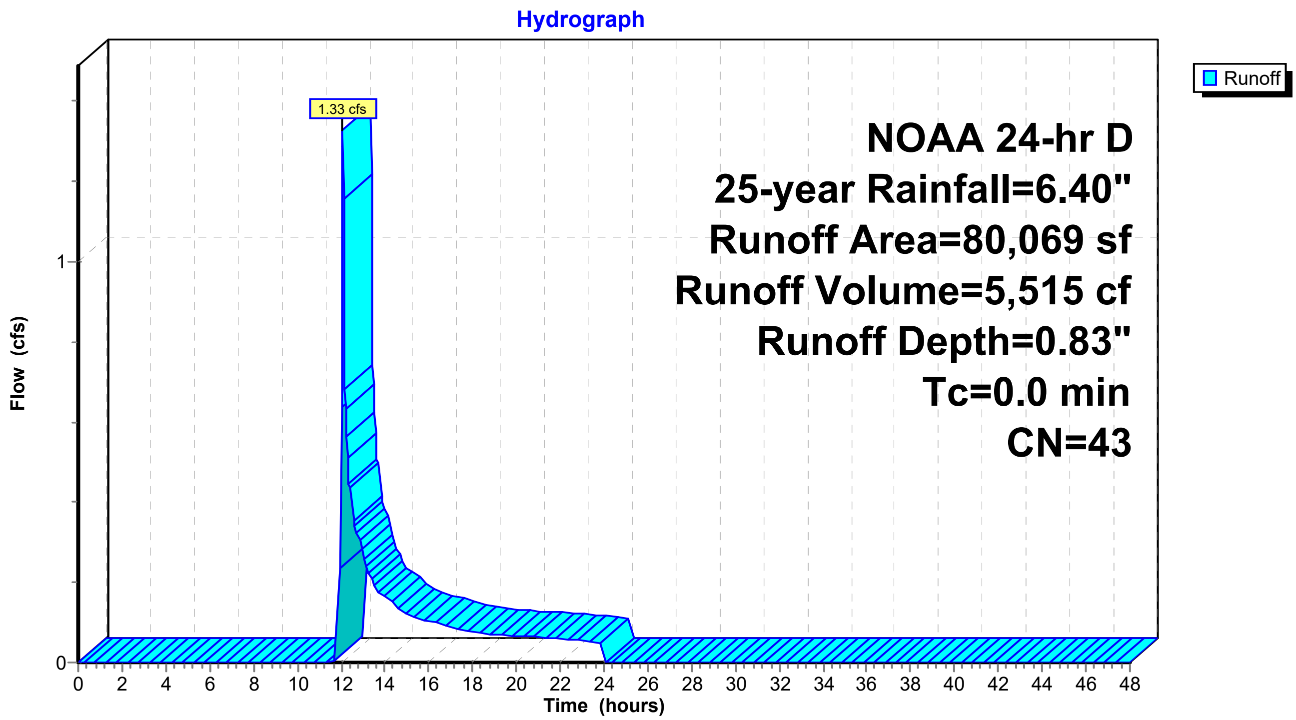
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 1.33 cfs @ 12.07 hrs, Volume= 5,515 cf, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
5,874	98	Paved parking, HSG A
74,195	39	>75% Grass cover, Good, HSG A
80,069	43	Weighted Average
74,195		92.66% Pervious Area
5,874		7.34% Impervious Area

Subcatchment PR-2G: PR-2G



Summary for Subcatchment PR-2H: PR-2H

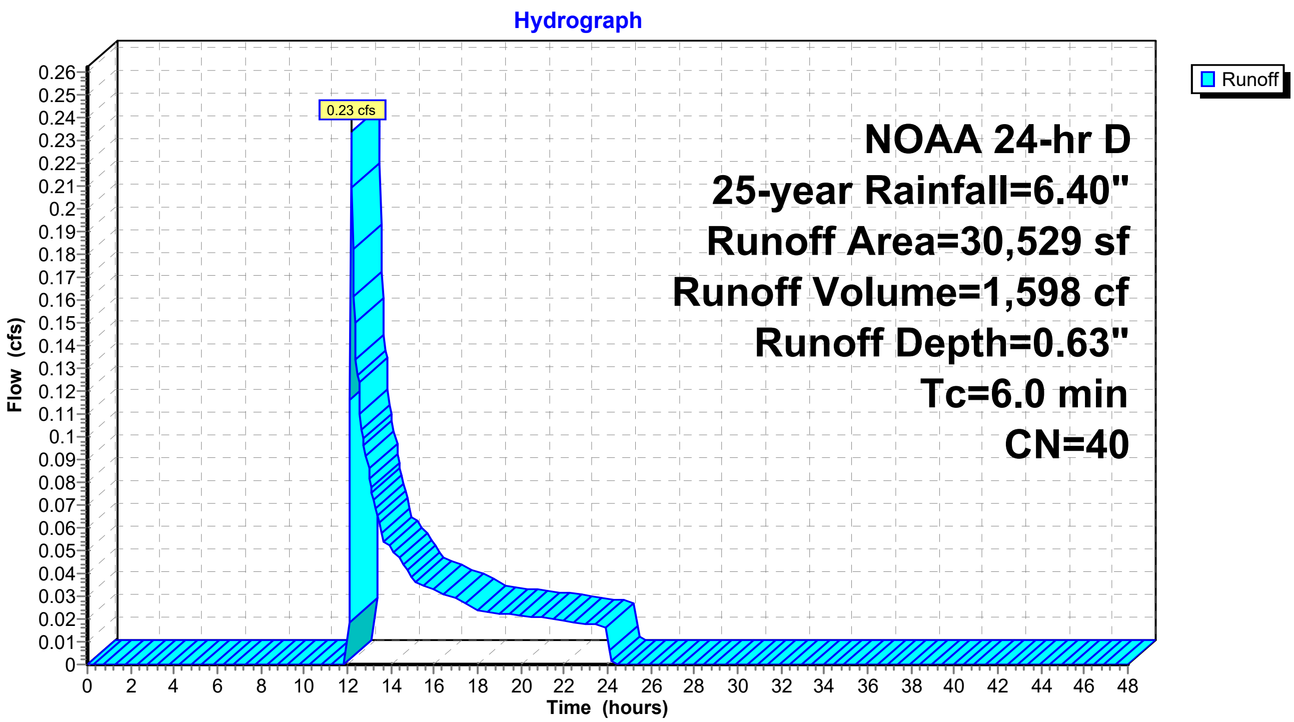
Runoff = 0.23 cfs @ 12.17 hrs, Volume= 1,598 cf, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
453	98	Paved parking, HSG A
30,076	39	>75% Grass cover, Good, HSG A
30,529	40	Weighted Average
30,076		98.52% Pervious Area
453		1.48% Impervious Area

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

Subcatchment PR-2H: PR-2H



Summary for Subcatchment PR-3A: PR-3A

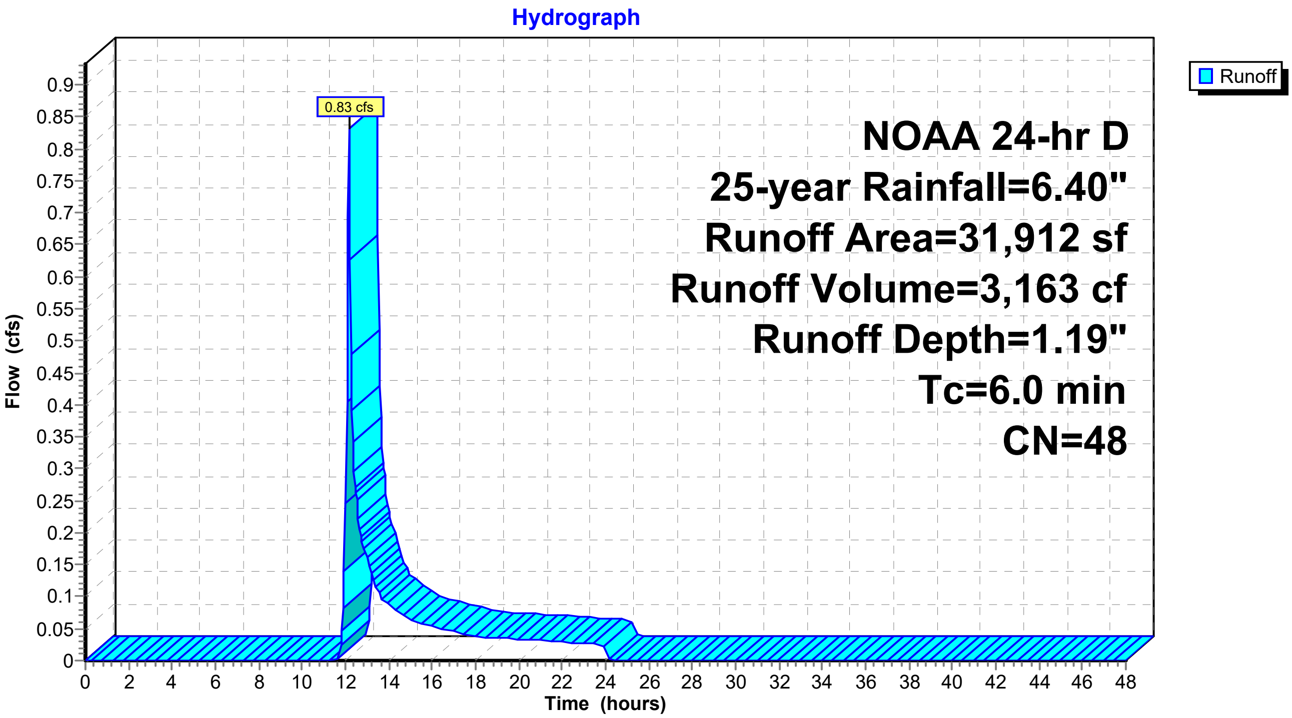
Runoff = 0.83 cfs @ 12.15 hrs, Volume= 3,163 cf, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
4,890	98	Paved parking, HSG A
27,022	39	>75% Grass cover, Good, HSG A
31,912	48	Weighted Average
27,022		84.68% Pervious Area
4,890		15.32% Impervious Area

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

Subcatchment PR-3A: PR-3A



Summary for Subcatchment PR-3B: PR-3B

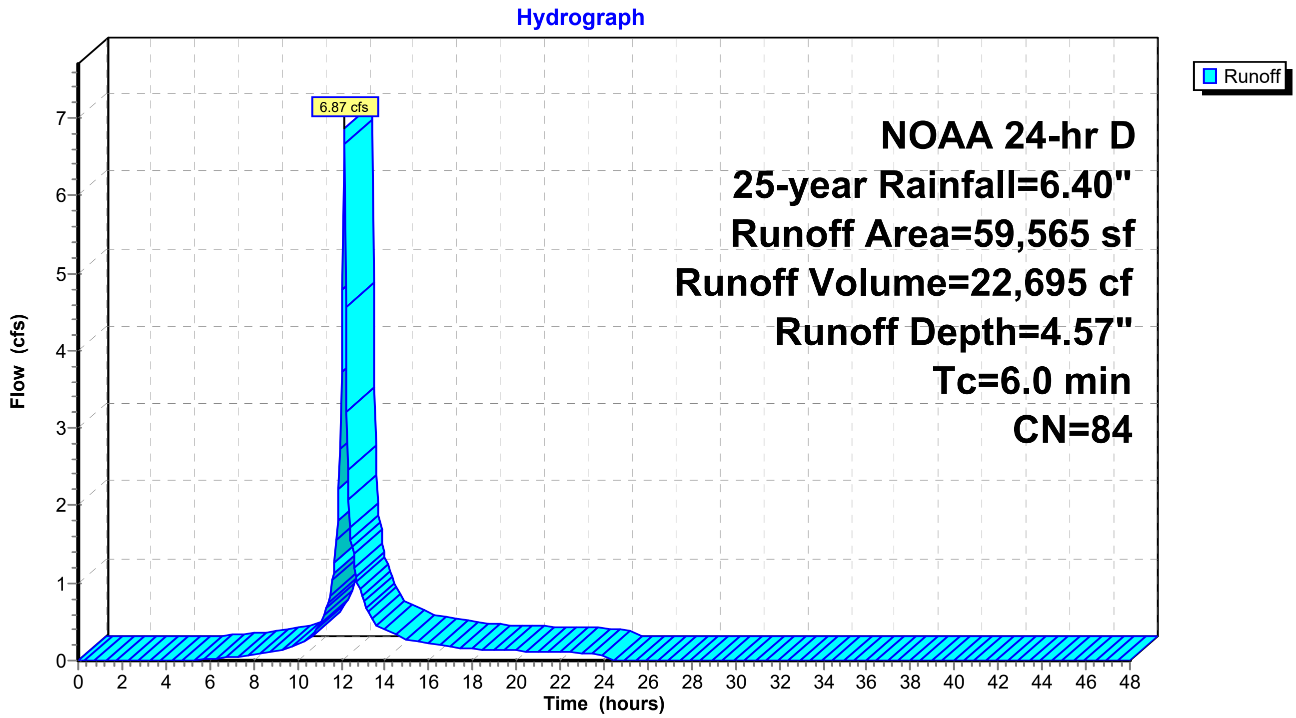
Runoff = 6.87 cfs @ 12.13 hrs, Volume= 22,695 cf, Depth= 4.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
45,006	98	Paved parking, HSG A
14,559	39	>75% Grass cover, Good, HSG A
59,565	84	Weighted Average
14,559		24.44% Pervious Area
45,006		75.56% Impervious Area

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

Subcatchment PR-3B: PR-3B



Summary for Subcatchment PR-3C: PR-3C

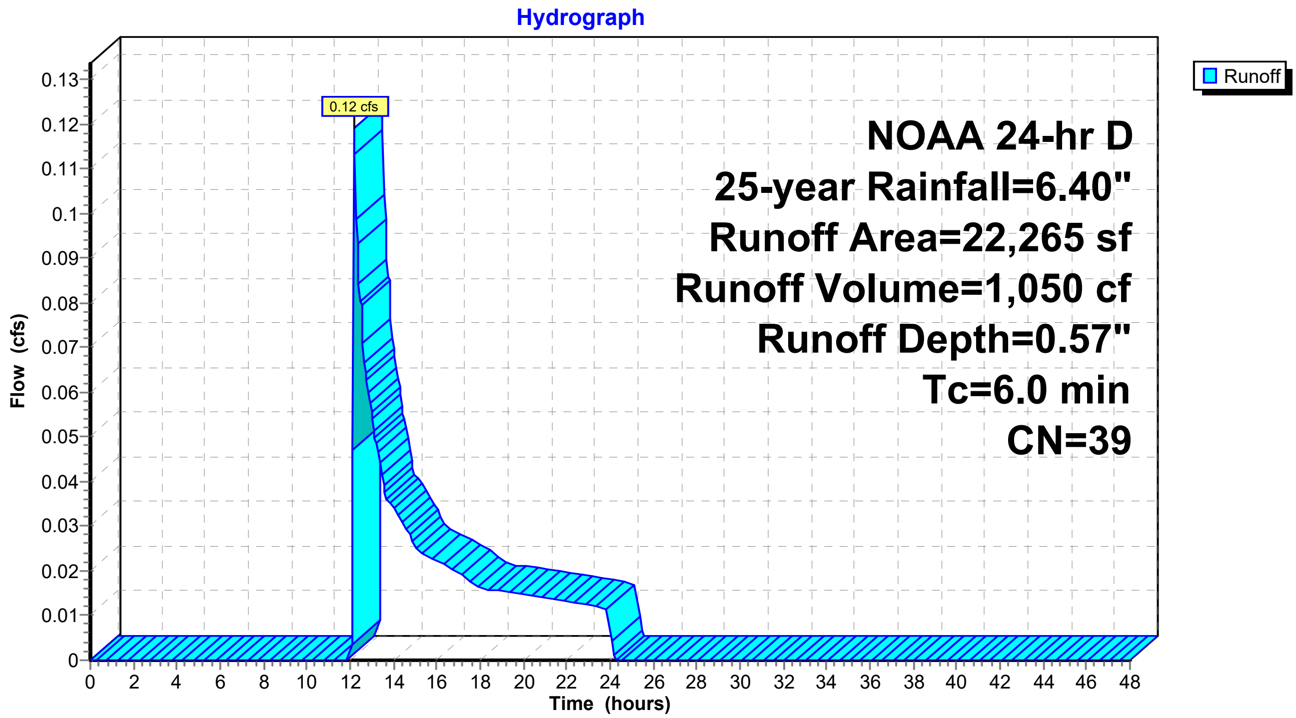
Runoff = 0.12 cfs @ 12.18 hrs, Volume= 1,050 cf, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25-year Rainfall=6.40"

Area (sf)	CN	Description
22,265	39	>75% Grass cover, Good, HSG A
22,265		100.00% Pervious Area

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

Subcatchment PR-3C: PR-3C



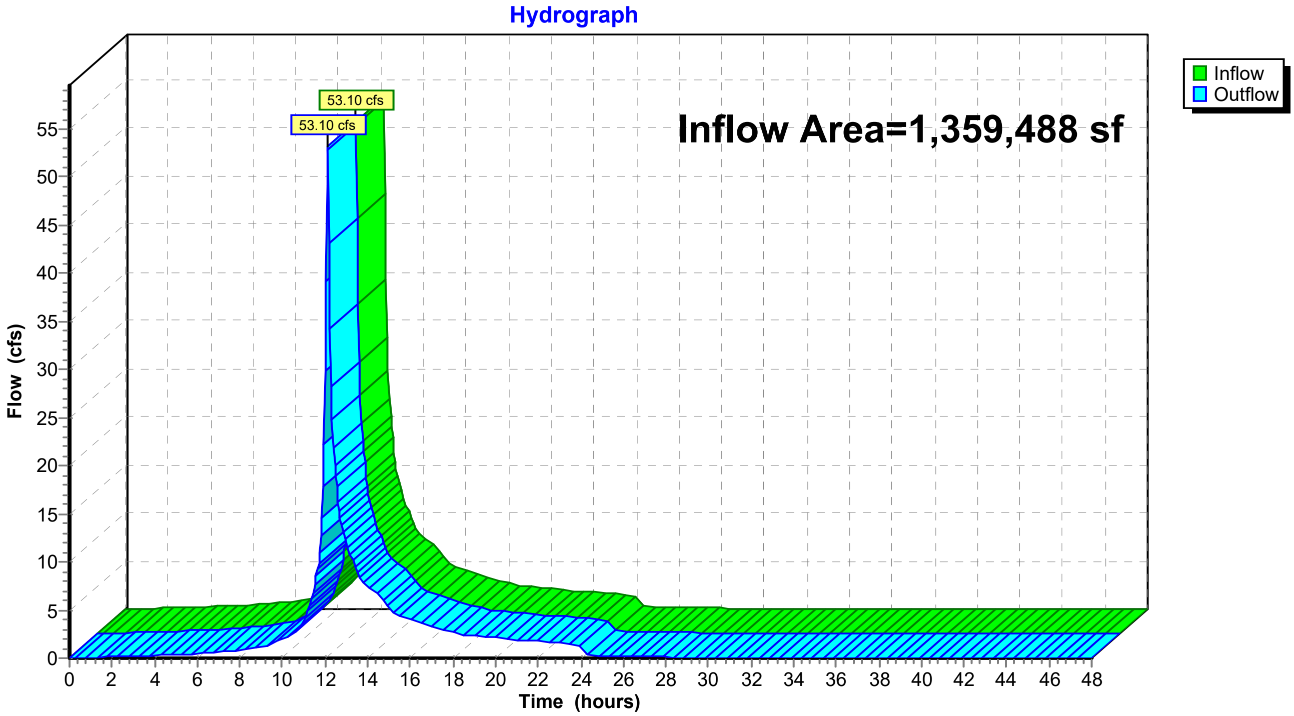
Summary for Reach DP-1: DP-1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,359,488 sf, 43.90% Impervious, Inflow Depth > 2.57" for 25-year event
Inflow = 53.10 cfs @ 12.14 hrs, Volume= 291,517 cf
Outflow = 53.10 cfs @ 12.14 hrs, Volume= 291,517 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-1: DP-1



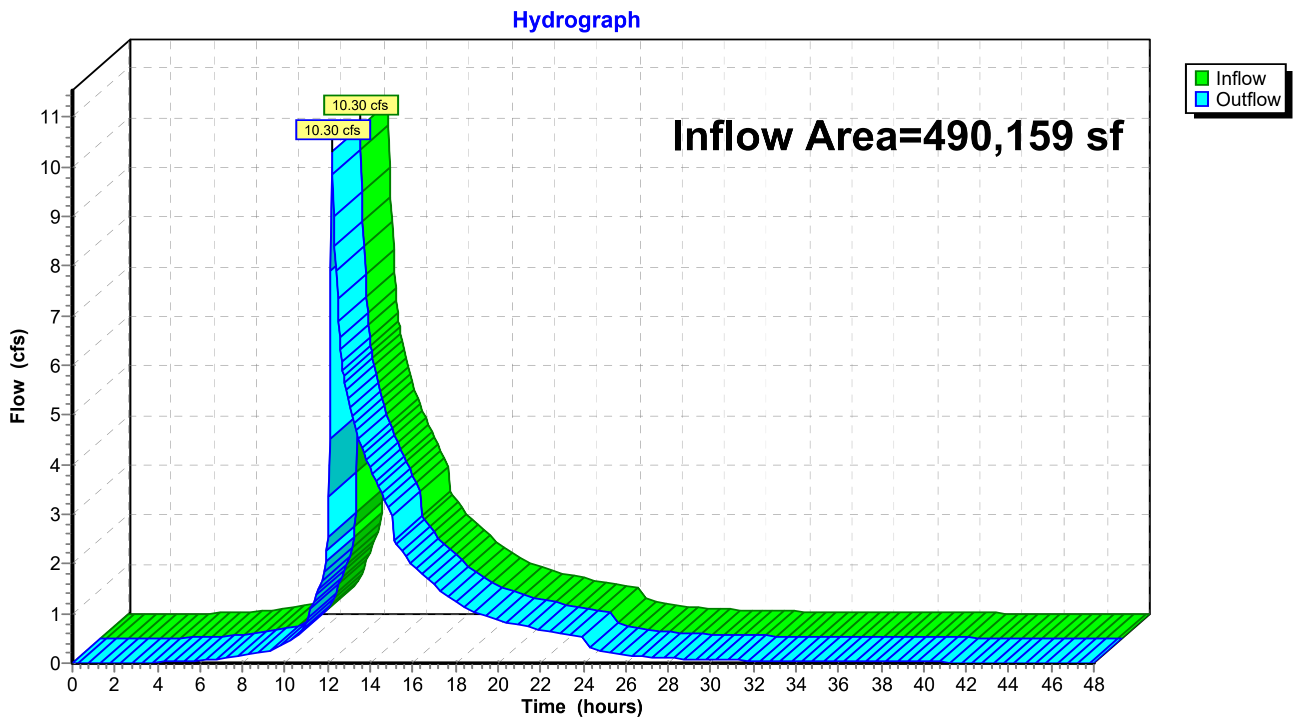
Summary for Reach DP-1C: Outfall 1C

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 490,159 sf, 53.24% Impervious, Inflow Depth > 2.55" for 25-year event
Inflow = 10.30 cfs @ 12.22 hrs, Volume= 104,023 cf
Outflow = 10.30 cfs @ 12.22 hrs, Volume= 104,023 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-1C: Outfall 1C

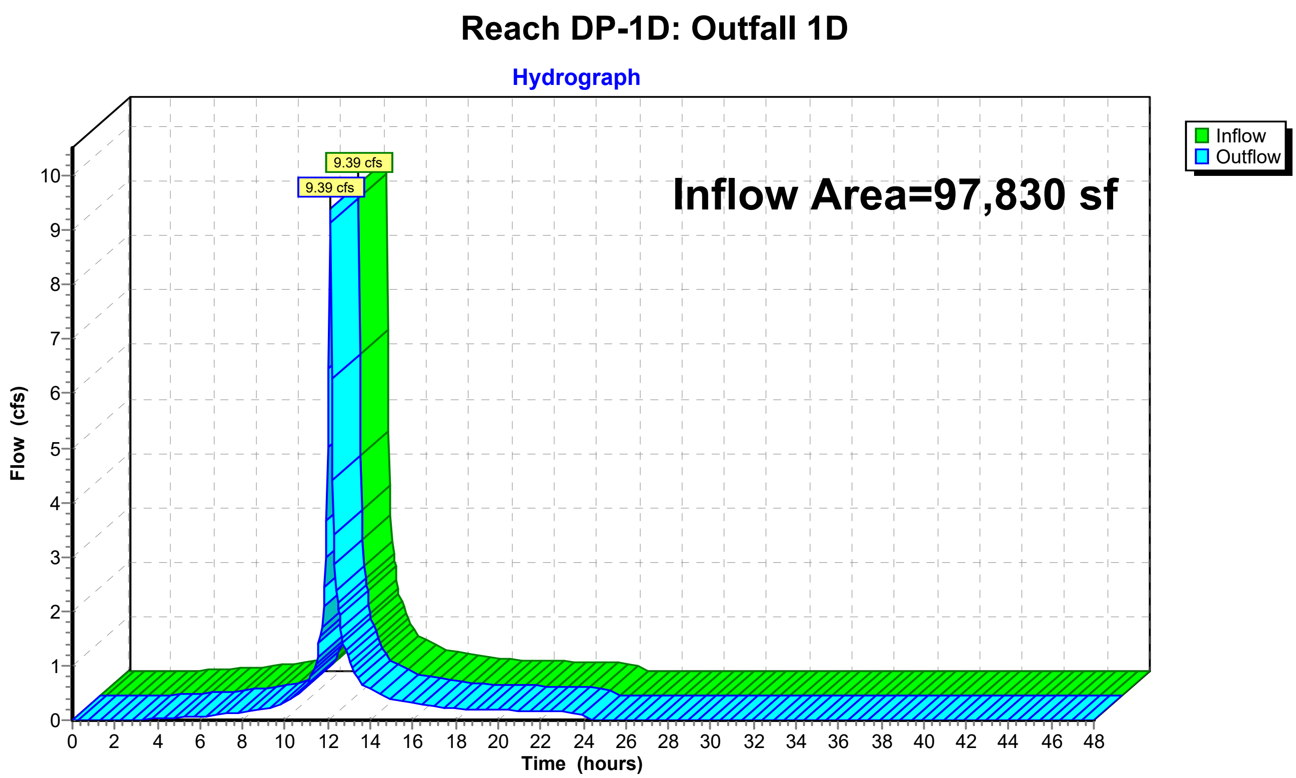


Summary for Reach DP-1D: Outfall 1D

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 97,830 sf, 64.12% Impervious, Inflow Depth = 3.99" for 25-year event
Inflow = 9.39 cfs @ 12.13 hrs, Volume= 32,488 cf
Outflow = 9.39 cfs @ 12.13 hrs, Volume= 32,488 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



Summary for Reach DP-2: DP-2

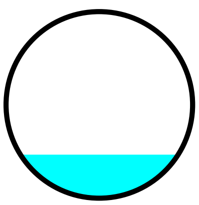
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 344,661 sf, 15.21% Impervious, Inflow Depth = 1.35" for 25-year event
Inflow = 9.01 cfs @ 12.05 hrs, Volume= 38,633 cf
Outflow = 8.77 cfs @ 12.06 hrs, Volume= 38,633 cf, Atten= 3%, Lag= 0.3 min

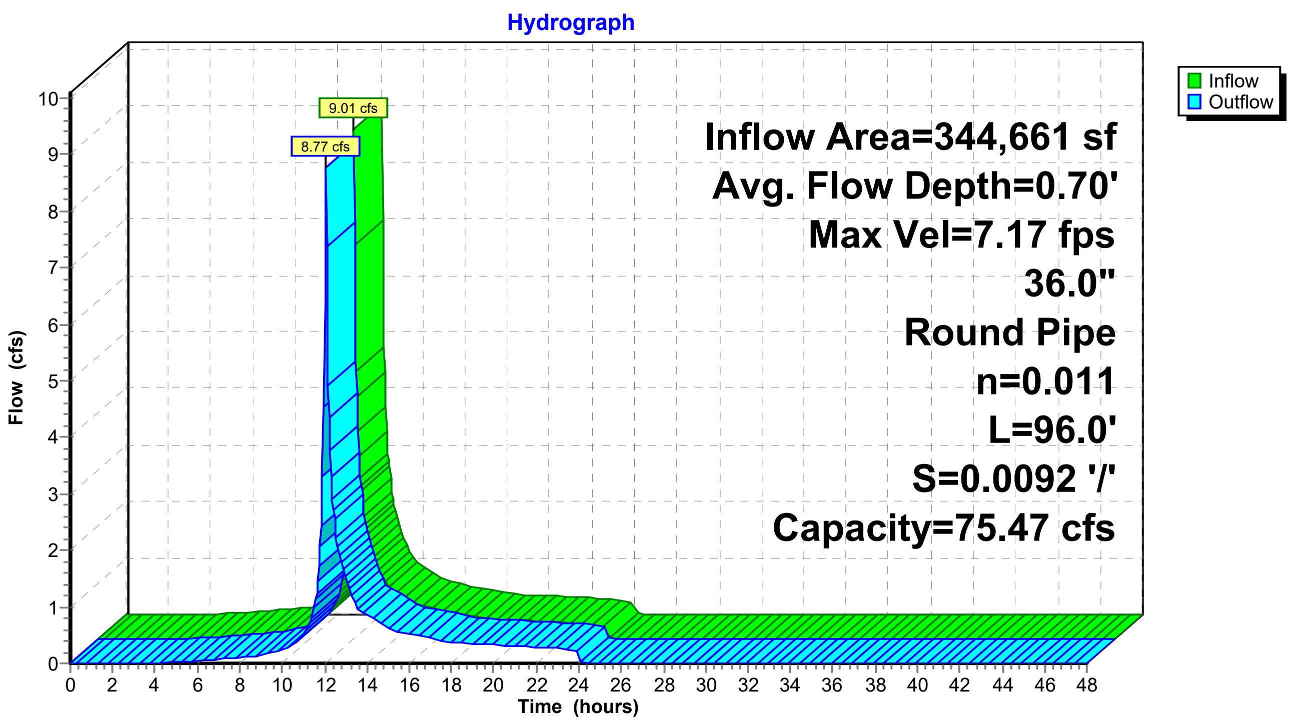
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.17 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.62 fps, Avg. Travel Time= 0.6 min

Peak Storage= 120 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 75.47 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 96.0' Slope= 0.0092 '/'
Inlet Invert= 16.00', Outlet Invert= 15.12'



Reach DP-2: DP-2



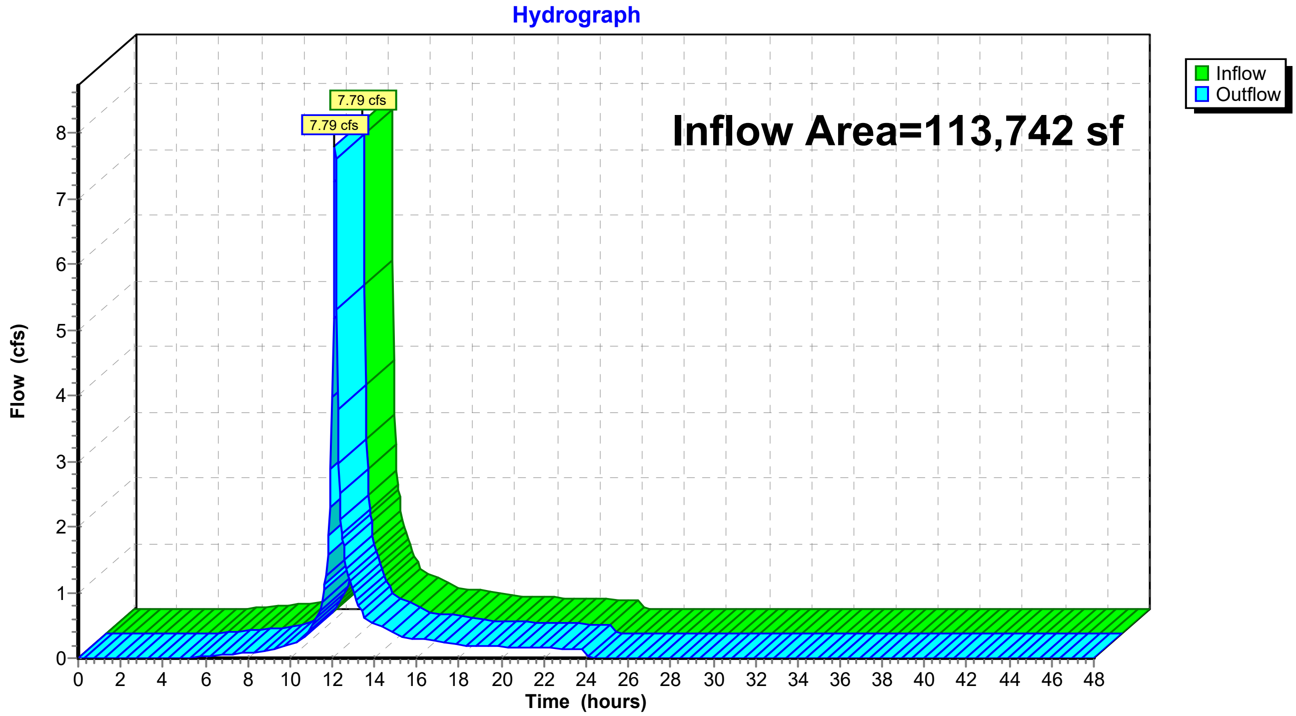
Summary for Reach DP-3: DP-3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 113,742 sf, 43.87% Impervious, Inflow Depth = 2.84" for 25-year event
Inflow = 7.79 cfs @ 12.13 hrs, Volume= 26,908 cf
Outflow = 7.79 cfs @ 12.13 hrs, Volume= 26,908 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-3: DP-3



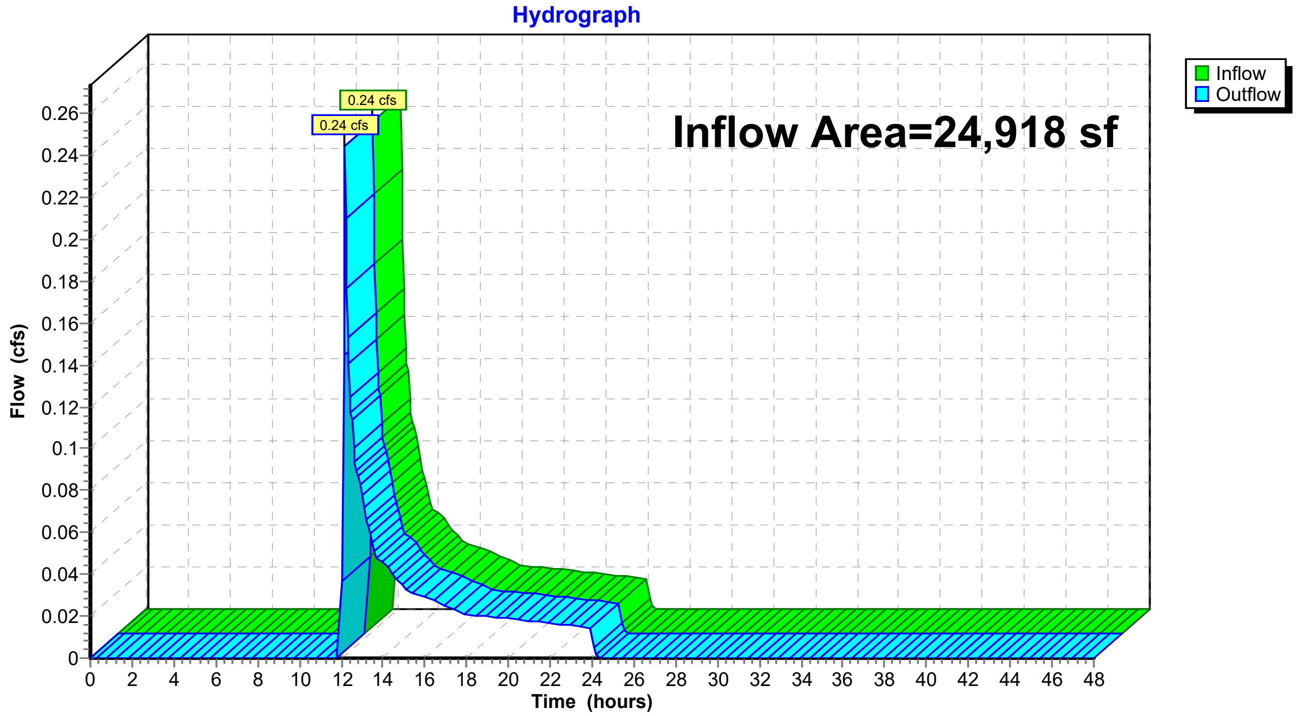
Summary for Reach DP1A: Outfall 1A

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	24,918 sf,	3.36% Impervious,	Inflow Depth = 0.69"	for 25-year event
Inflow =	0.24 cfs @	12.16 hrs, Volume=	1,438 cf	
Outflow =	0.24 cfs @	12.16 hrs, Volume=	1,438 cf,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP1A: Outfall 1A

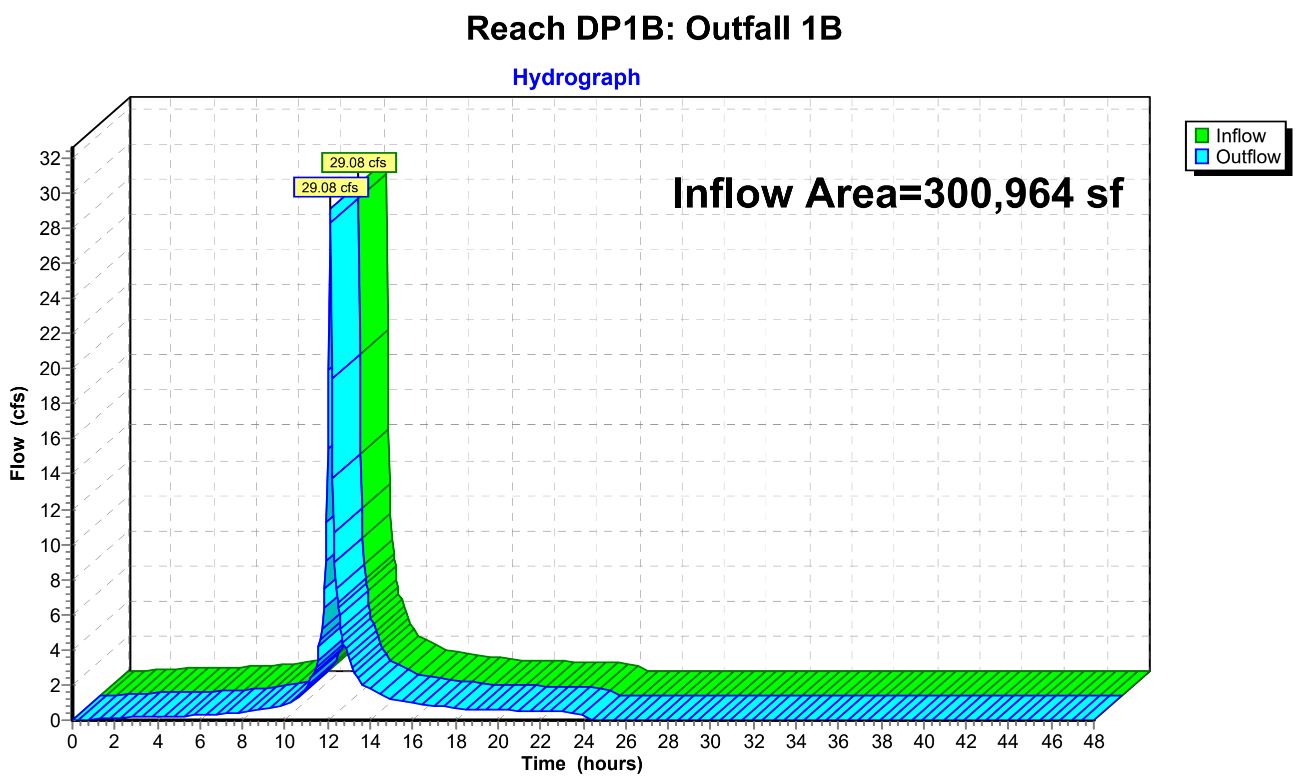


Summary for Reach DP1B: Outfall 1B

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	300,964 sf,	66.36% Impervious,	Inflow Depth = 4.08"	for 25-year event
Inflow =	29.08 cfs @	12.13 hrs, Volume=	102,277 cf	
Outflow =	29.08 cfs @	12.13 hrs, Volume=	102,277 cf,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



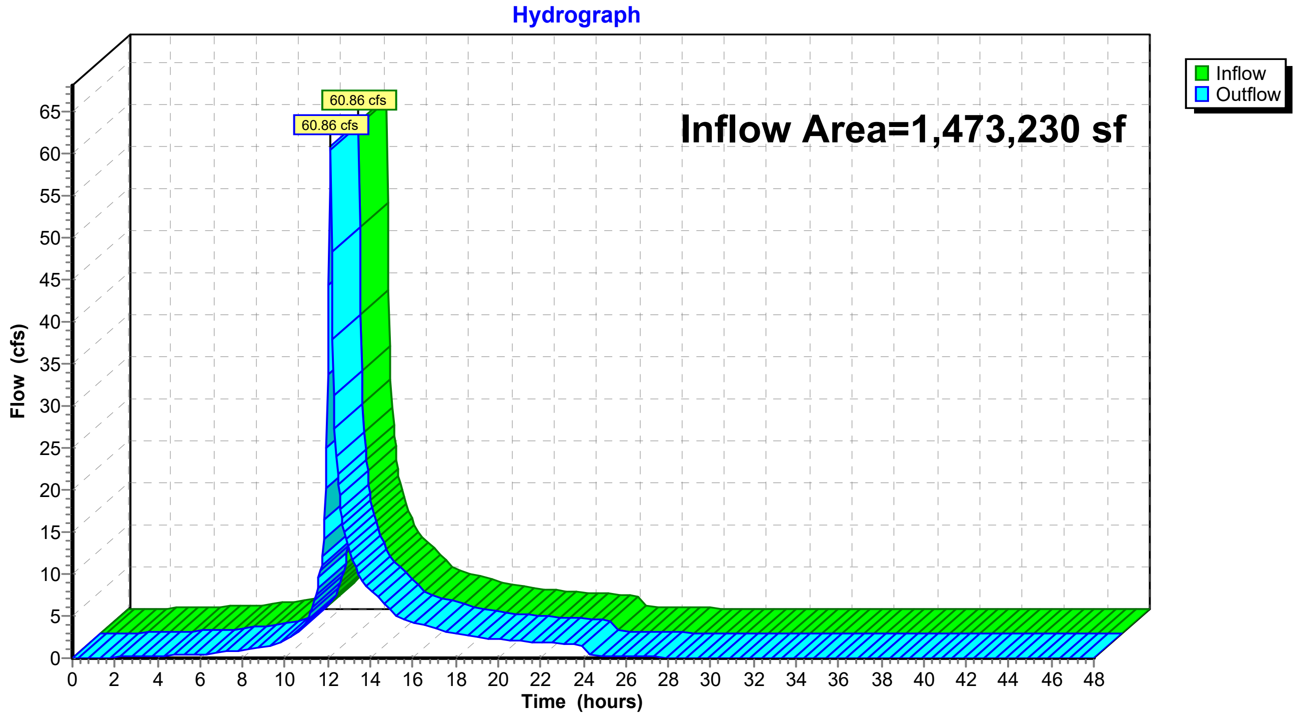
Summary for Reach TOTAL: Total

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	1,473,230 sf,	43.89% Impervious,	Inflow Depth > 2.59"	for 25-year event
Inflow =	60.86 cfs @	12.14 hrs, Volume=	318,425 cf	
Outflow =	60.86 cfs @	12.14 hrs, Volume=	318,425 cf,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach TOTAL: Total



Summary for Pond BR-1: Bioretention 1

Inflow Area = 53,580 sf, 76.36% Impervious, Inflow Depth = 4.62" for 25-year event
Inflow = 6.17 cfs @ 12.13 hrs, Volume= 20,626 cf
Outflow = 4.76 cfs @ 12.19 hrs, Volume= 20,626 cf, Atten= 23%, Lag= 3.9 min
Primary = 4.76 cfs @ 12.19 hrs, Volume= 20,626 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 27.31' @ 12.19 hrs Surf.Area= 1,512 sf Storage= 2,509 cf

Plug-Flow detention time= 8.8 min calculated for 20,605 cf (100% of inflow)
Center-of-Mass det. time= 8.8 min (811.8 - 802.9)

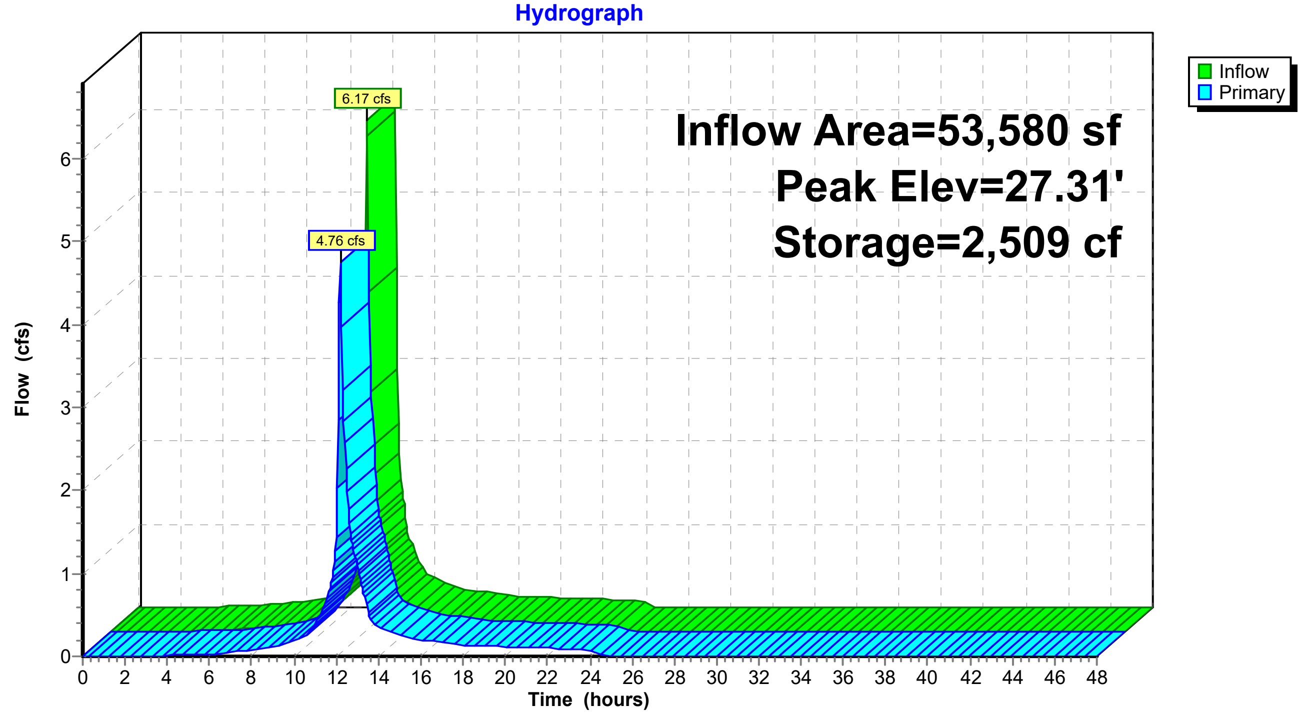
Volume	Invert	Avail.Storage	Storage Description
#1	25.00'	3,647 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
25.00	707	94.2	0	0	707
26.00	1,018	113.1	858	858	1,036
27.00	1,385	131.9	1,197	2,055	1,422
28.00	1,810	150.8	1,593	3,647	1,870

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**8.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#2	Primary	27.00'	**12.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#3	Primary	26.20'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=4.69 cfs @ 12.19 hrs HW=27.31' (Free Discharge)
├─**1=Orifice/Grate** (Orifice Controls 1.91 cfs @ 5.48 fps)
├─**2=Orifice/Grate** (Weir Controls 1.30 cfs @ 1.35 fps)
└─**3=Orifice/Grate** (Orifice Controls 1.48 cfs @ 4.23 fps)

Pond BR-1: Bioretention 1



Summary for Pond BR-2: Bioretention 2

Inflow Area = 100,956 sf, 19.92% Impervious, Inflow Depth = 1.50" for 25-year event
Inflow = 3.28 cfs @ 12.14 hrs, Volume= 12,658 cf
Outflow = 2.72 cfs @ 12.20 hrs, Volume= 12,658 cf, Atten= 17%, Lag= 3.4 min
Primary = 2.72 cfs @ 12.20 hrs, Volume= 12,658 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 27.34' @ 12.20 hrs Surf.Area= 1,136 sf Storage= 1,223 cf

Plug-Flow detention time= 11.9 min calculated for 12,645 cf (100% of inflow)
Center-of-Mass det. time= 11.9 min (879.1 - 867.2)

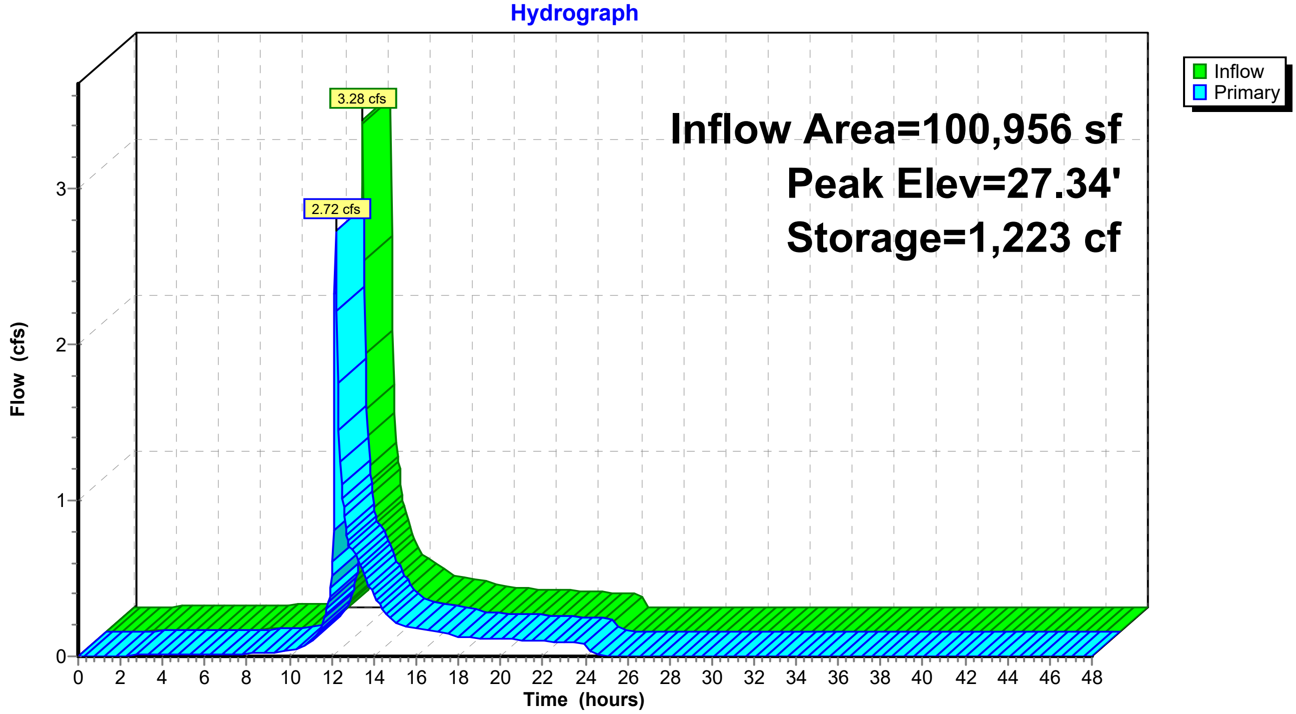
Volume	Invert	Avail.Storage	Storage Description
#1	26.00'	3,647 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
26.00	707	94.2	0	0	707
27.00	1,018	113.1	858	858	1,036
28.00	1,385	131.9	1,197	2,055	1,422
29.00	1,810	150.8	1,593	3,647	1,870

Device	Routing	Invert	Outlet Devices
#1	Primary	27.00'	**15.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#2	Primary	26.00'	**6.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.69 cfs @ 12.20 hrs HW=27.34' (Free Discharge)
├─**1=Orifice/Grate** (Weir Controls 1.87 cfs @ 1.42 fps)
└─**2=Orifice/Grate** (Orifice Controls 0.82 cfs @ 4.17 fps)

Pond BR-2: Bioretention 2



Summary for Pond BR-3: Bioretention 3

Inflow Area = 80,355 sf, 58.01% Impervious, Inflow Depth = 3.60" for 25-year event
Inflow = 7.13 cfs @ 12.13 hrs, Volume= 24,095 cf
Outflow = 3.88 cfs @ 12.24 hrs, Volume= 24,095 cf, Atten= 46%, Lag= 6.6 min
Primary = 3.88 cfs @ 12.24 hrs, Volume= 24,095 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 27.53' @ 12.24 hrs Surf.Area= 3,561 sf Storage= 4,533 cf

Plug-Flow detention time= 18.6 min calculated for 24,070 cf (100% of inflow)
Center-of-Mass det. time= 18.6 min (833.6 - 815.0)

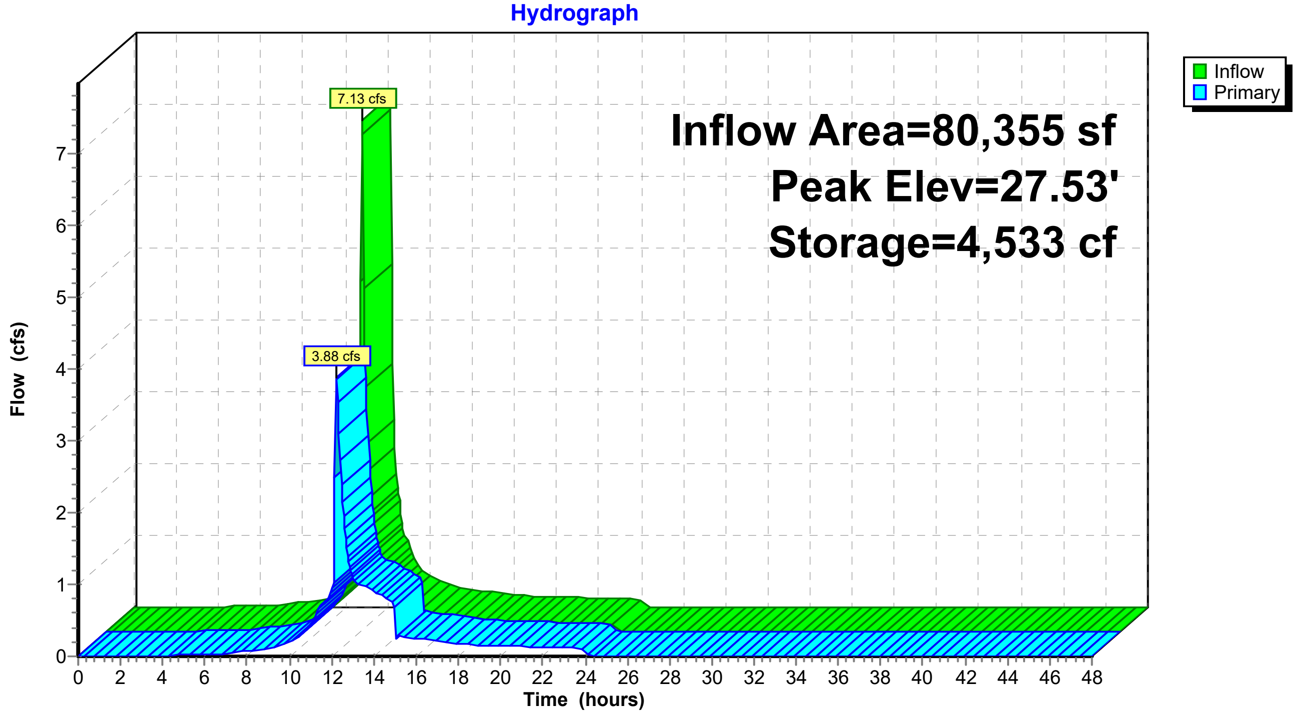
Volume	Invert	Avail.Storage	Storage Description
#1	26.00'	6,285 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
26.00	2,376	243.9	0	0	2,376
27.00	3,137	262.8	2,748	2,748	3,179
28.00	3,953	281.7	3,537	6,285	4,042

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**6.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#2	Primary	27.10'	**15.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.84 cfs @ 12.24 hrs HW=27.53' (Free Discharge)
├─**1=Orifice/Grate** (Orifice Controls 1.13 cfs @ 5.74 fps)
└─**2=Orifice/Grate** (Weir Controls 2.71 cfs @ 1.61 fps)

Pond BR-3: Bioretention 3



Summary for Pond OC: O-CHAMBERS

Inflow Area =	190,951 sf,	35.86% Impervious,	Inflow Depth = 2.24"	for 25-year event	
Inflow =	10.87 cfs @	12.14 hrs,	Volume=	35,629 cf	
Outflow =	1.45 cfs @	13.07 hrs,	Volume=	34,705 cf,	Atten= 87%, Lag= 56.1 min
Primary =	1.45 cfs @	13.07 hrs,	Volume=	34,705 cf	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 25.72' @ 13.07 hrs Surf.Area= 23,411 sf Storage= 14,433 cf

Plug-Flow detention time= 232.6 min calculated for 34,669 cf (97% of inflow)
Center-of-Mass det. time= 219.5 min (1,085.5 - 866.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	25.00'	0 cf	**137.92'W x 169.75'L x 4.17'H Field A** 97,547 cf Overall - 97,547 cf Embedded = 0 cf x 0.0% Voids
#2A	25.00'	70,200 cf	**StormTrap ST1 SingleTrap 3-6** x 240 Inside #1 Inside= 82.7"W x 42.0"H => 20.80 sf x 14.06'L = 292.5 cf Outside= 82.7"W x 50.0"H => 28.73 sf x 14.06'L = 404.1 cf 20 Rows of 12 Chambers 137.92' x 168.75' Core + 0.00' x 0.50' Border = 137.92' x 169.75' System
		70,200 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**10.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.45 cfs @ 13.07 hrs HW=25.72' (Free Discharge)
└—**1=Orifice/Grate** (Orifice Controls 1.45 cfs @ 2.89 fps)

Pond OC: O-CHAMBERS - Chamber Wizard Field A

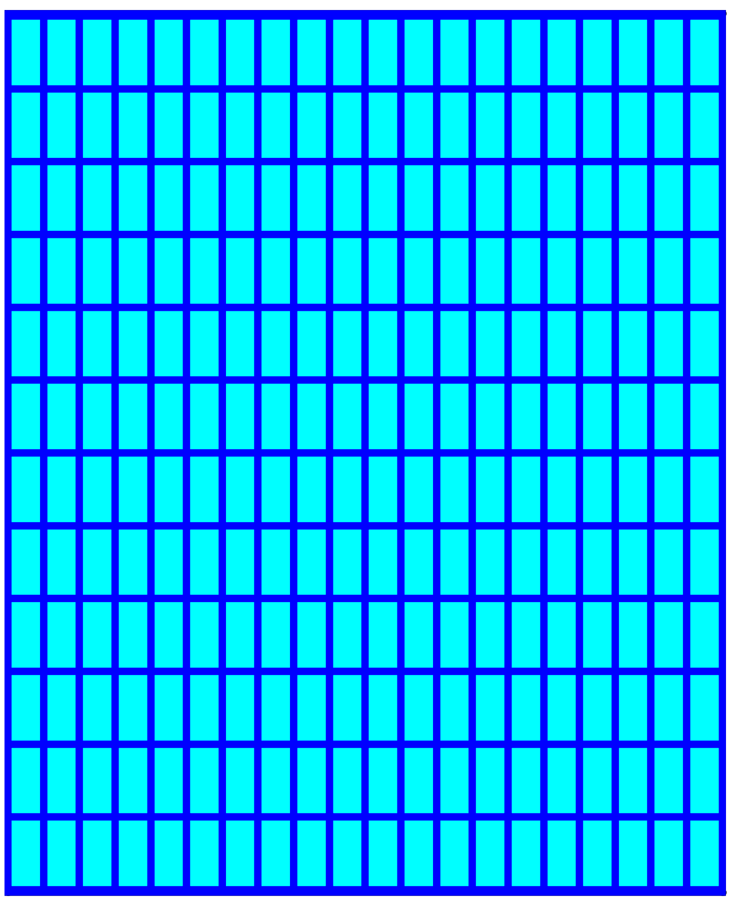
Chamber Model = StormTrap ST1 SingleTrap 3-6 (StormTrap ST1 SingleTrap®Type VI)
Inside= 82.7"W x 42.0"H => 20.80 sf x 14.06'L = 292.5 cf
Outside= 82.7"W x 50.0"H => 28.73 sf x 14.06'L = 404.1 cf

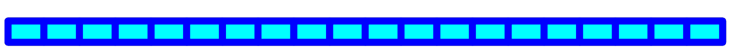
12 Chambers/Row x 14.06' Long = 168.75' Row Length +6.0" Border x 2 = 169.75' Base Length
20 Rows x 82.7" Wide = 137.92' Base Width
50.0" Chamber Height = 4.17' Field Height

240 Chambers x 292.5 cf = 70,199.7 cf Chamber Storage
240 Chambers x 404.1 cf + 574.7 cf Border = 97,547.3 cf Displacement

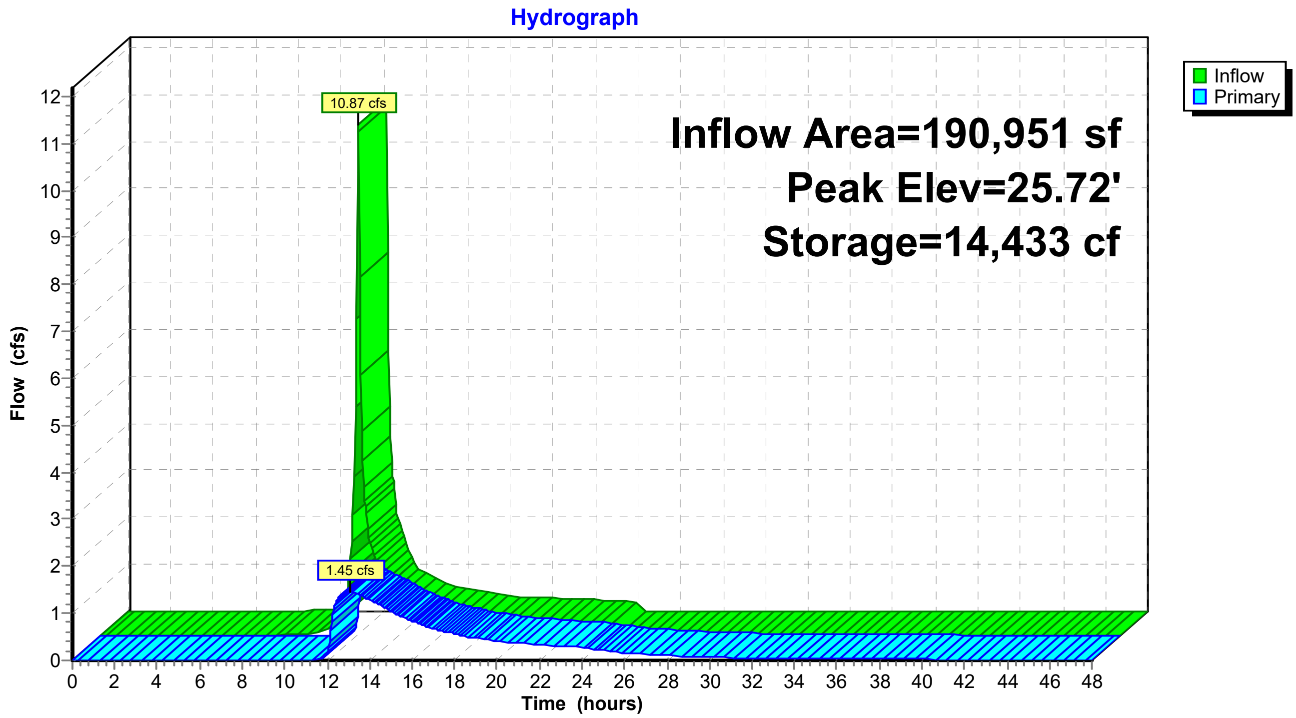
Chamber Storage = 70,199.7 cf = 1.612 af
Overall Storage Efficiency = 72.0%
Overall System Size = 169.75' x 137.92' x 4.17'

240 Chambers (plus border)
3,612.9 cy Field





Pond OC: O-CHAMBERS



Summary for Pond U-1: UG Inf System

Inflow Area = 165,273 sf, 63.49% Impervious, Inflow Depth = 3.85" for 25-year event
Inflow = 15.99 cfs @ 12.13 hrs, Volume= 52,962 cf
Outflow = 1.95 cfs @ 12.98 hrs, Volume= 52,962 cf, Atten= 88%, Lag= 51.1 min
Discarded = 0.32 cfs @ 9.80 hrs, Volume= 28,366 cf
Primary = 1.63 cfs @ 12.98 hrs, Volume= 24,596 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 23.39' @ 12.98 hrs Surf.Area= 26,352 sf Storage= 22,979 cf

Plug-Flow detention time= 259.4 min calculated for 52,907 cf (100% of inflow)
Center-of-Mass det. time= 259.7 min (1,076.7 - 816.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	22.00'	18,227 cf	**134.83'W x 195.44'L x 2.33'H Field A** 61,488 cf Overall - 15,921 cf Embedded = 45,566 cf x 40.0% Voids
#2A	22.50'	15,921 cf	**ADS_StormTech SC-310 +Cap** x 1080 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 40 Rows of 27 Chambers
		34,148 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	22.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	22.60'	**10.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	23.35'	**8.0" Vert. Orifice/Grate** C= 0.600
#4	Primary	23.45'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.32 cfs @ 9.80 hrs HW=22.02' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=1.63 cfs @ 12.98 hrs HW=23.39' (Free Discharge)
├─**2=Orifice/Grate** (Orifice Controls 1.63 cfs @ 3.03 fps)
├─**3=Orifice/Grate** (Orifice Controls 0.01 cfs @ 0.71 fps)
└─**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond U-1: UG Inf System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-310 +Cap (ADS StormTech®SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

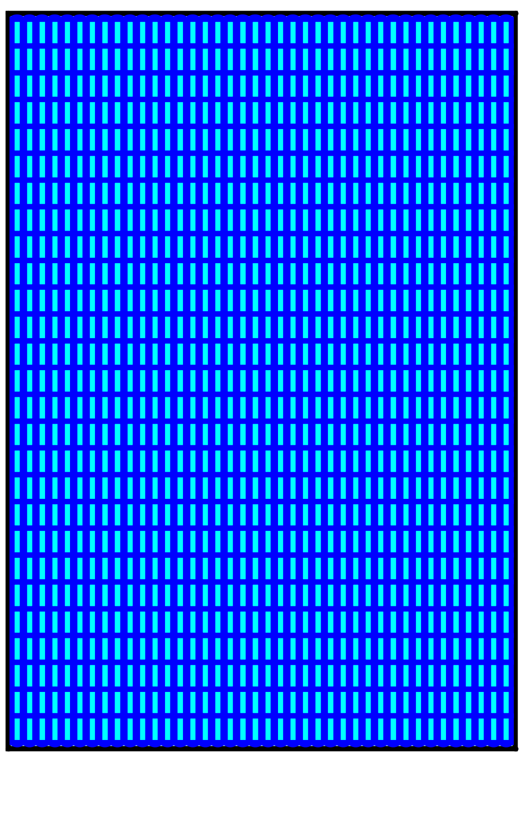
27 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 193.44' Row Length +12.0" End Stone x 2 = 195.44' Base Length
40 Rows x 34.0" Wide + 6.0" Spacing x 39 + 12.0" Side Stone x 2 = 134.83' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

1,080 Chambers x 14.7 cf = 15,921.3 cf Chamber Storage

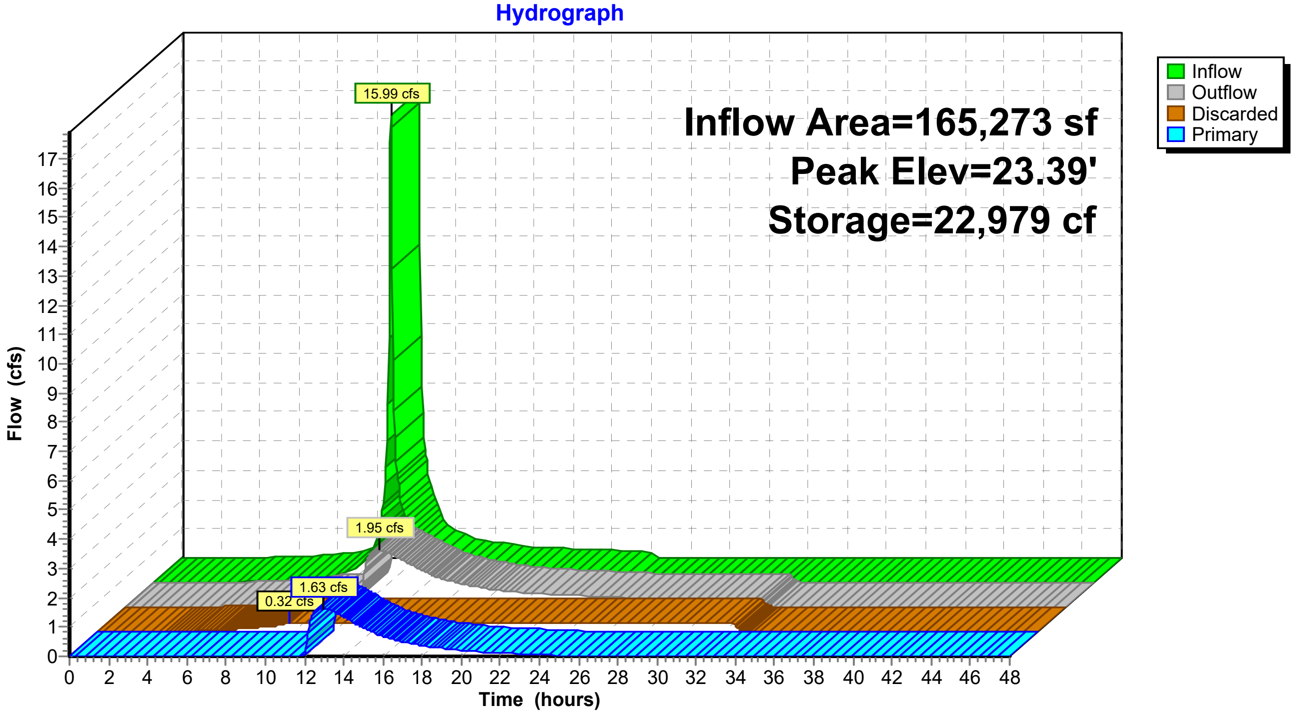
61,487.6 cf Field - 15,921.3 cf Chambers = 45,566.3 cf Stone x 40.0% Voids = 18,226.5 cf Stone Storage

Chamber Storage + Stone Storage = 34,147.8 cf = 0.784 af
Overall Storage Efficiency = 55.5%
Overall System Size = 195.44' x 134.83' x 2.33'

1,080 Chambers
2,277.3 cy Field
1,687.6 cy Stone



Pond U-1: UG Inf System



Summary for Pond UD1: Baseball UD 1

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 105,369 sf, 0.00% Impervious, Inflow Depth = 0.57" for 25-year event
Inflow = 0.56 cfs @ 12.18 hrs, Volume= 4,970 cf
Outflow = 0.58 cfs @ 12.19 hrs, Volume= 4,970 cf, Atten= 0%, Lag= 0.8 min
Primary = 0.58 cfs @ 12.19 hrs, Volume= 4,970 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 39.17' @ 12.19 hrs Surf.Area= 149,290 sf Storage= 7 cf

Plug-Flow detention time= 0.2 min calculated for 4,965 cf (100% of inflow)
Center-of-Mass det. time= 0.2 min (966.9 - 966.7)

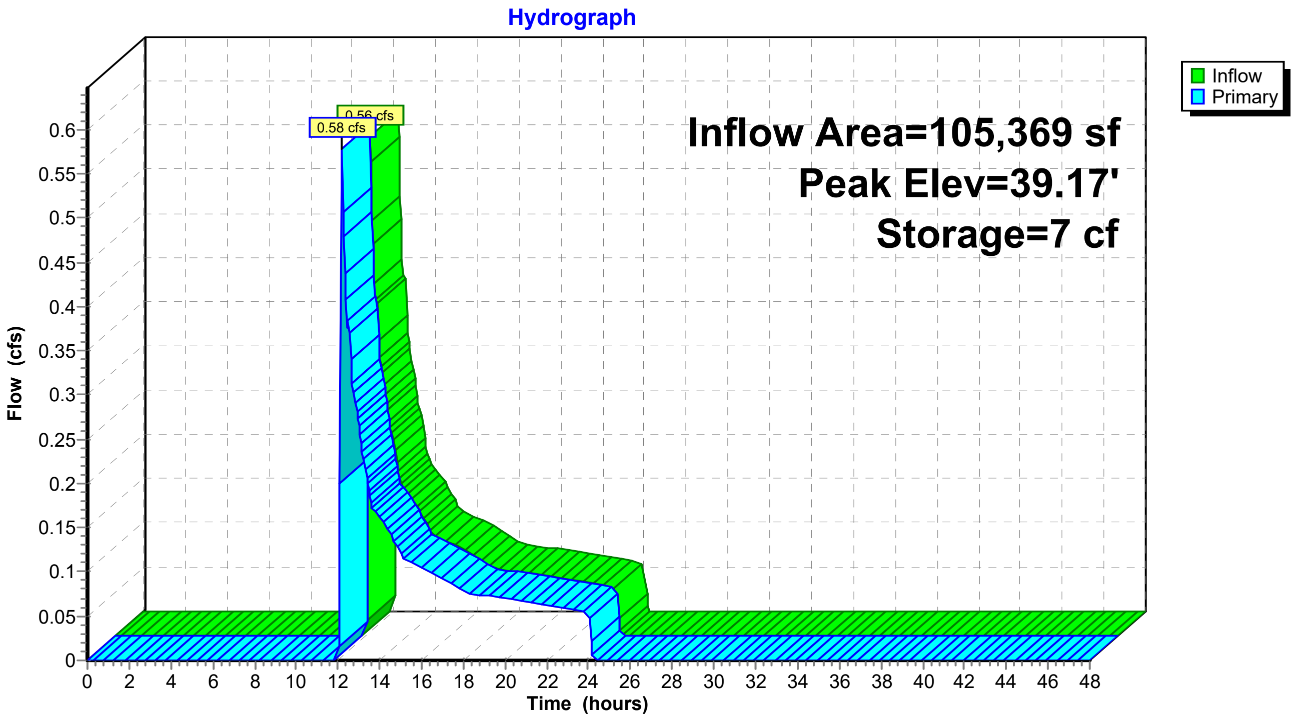
Volume	Invert	Avail.Storage	Storage Description
#1	39.17'	29,858 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 74,645 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
39.17	149,290	1,398.0	0	0	149,290
39.67	149,290	1,398.0	74,645	74,645	149,989

Device	Routing	Invert	Outlet Devices
#1	Primary	27.65'	**12.0" Round CMP_Round 12"** L= 41.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 27.65' / 27.24' S= 0.0099 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	32.12'	**12.0" Round CMP_Round 12"** L= 15.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 32.12' / 31.95' S= 0.0110 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Primary	31.30'	**6.0" Round Culvert** L= 38.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 31.30' / 30.91' S= 0.0101 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=24.18 cfs @ 12.19 hrs HW=39.17' (Free Discharge)
├**1=CMP_Round 12"** (Barrel Controls 12.45 cfs @ 15.85 fps)
├**2=CMP_Round 12"** (Inlet Controls 9.68 cfs @ 12.32 fps)
└**3=Culvert** (Barrel Controls 2.06 cfs @ 10.48 fps)

Pond UD1: Baseball UD 1



Summary for Pond UD2: Football UD 2

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 65,696 sf, 0.00% Impervious, Inflow Depth = 0.57" for 25-year event
Inflow = 0.35 cfs @ 12.18 hrs, Volume= 3,099 cf
Outflow = 0.37 cfs @ 12.20 hrs, Volume= 3,099 cf, Atten= 0%, Lag= 1.2 min
Primary = 0.37 cfs @ 12.20 hrs, Volume= 3,099 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 40.17' @ 12.20 hrs Surf.Area= 65,694 sf Storage= 9 cf

Plug-Flow detention time= 0.4 min calculated for 3,095 cf (100% of inflow)
Center-of-Mass det. time= 0.4 min (967.1 - 966.7)

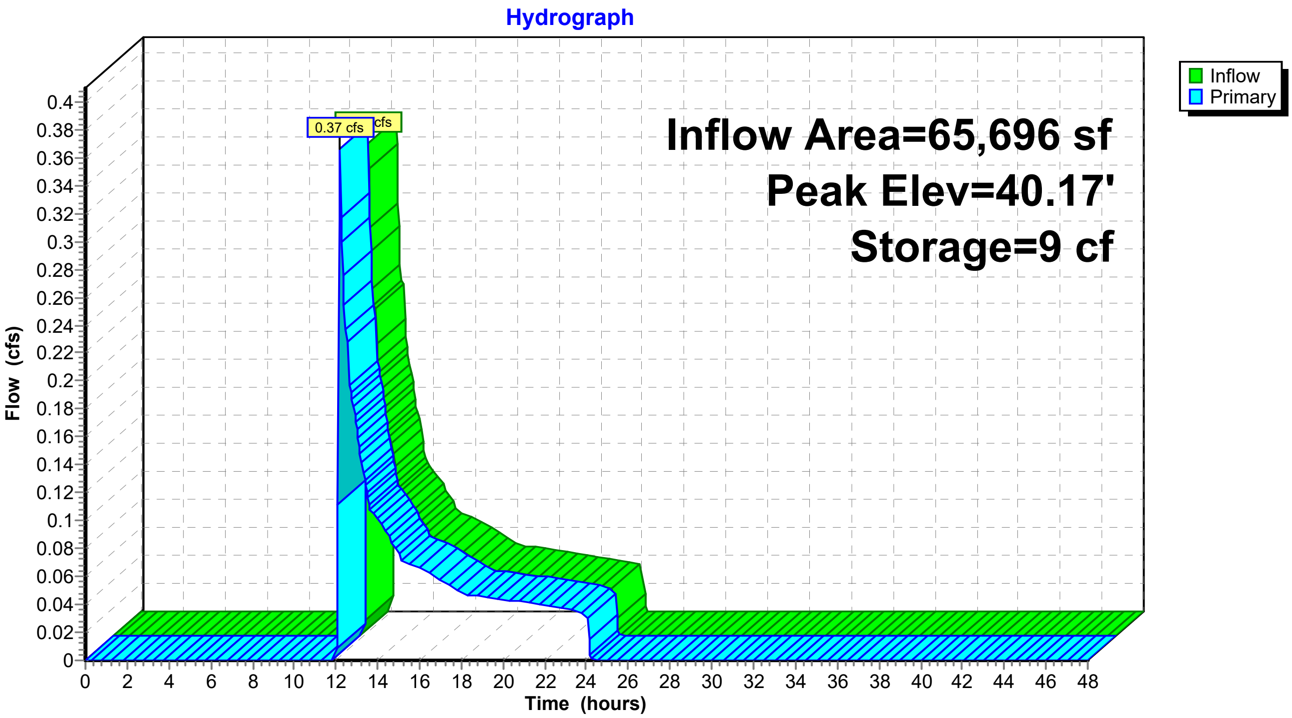
Volume	Invert	Avail.Storage	Storage Description
#1	40.17'	13,139 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 32,847 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
40.17	65,694	1,239.8	0	0	65,694
40.67	65,694	1,239.8	32,847	32,847	66,314

Device	Routing	Invert	Outlet Devices
#1	Primary	36.00'	**6.0" Round Culvert** L= 22.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.00' / 35.00' S= 0.0448 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Primary	36.00'	**6.0" Round Culvert** L= 46.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.00' / 35.00' S= 0.0216 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Primary	36.00'	**6.0" Round Culvert** L= 30.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.00' / 35.00' S= 0.0331 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=5.10 cfs @ 12.20 hrs HW=40.17' (Free Discharge)
├—**1=Culvert** (Inlet Controls 1.87 cfs @ 9.53 fps)
├—**2=Culvert** (Barrel Controls 1.50 cfs @ 7.63 fps)
└—**3=Culvert** (Barrel Controls 1.73 cfs @ 8.79 fps)

Pond UD2: Football UD 2



Summary for Pond UD3: Football UD 3

Inflow Area =	22,265 sf,	0.00% Impervious, Inflow Depth = 0.57"	for 25-year event
Inflow =	0.12 cfs @	12.18 hrs, Volume=	1,050 cf
Outflow =	0.12 cfs @	12.19 hrs, Volume=	1,050 cf, Atten= 0%, Lag= 0.6 min
Primary =	0.12 cfs @	12.19 hrs, Volume=	1,050 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 39.27' @ 12.19 hrs Surf.Area= 22,338 sf Storage= 1 cf

Plug-Flow detention time= 0.1 min calculated for 1,049 cf (100% of inflow)
Center-of-Mass det. time= 0.1 min (966.8 - 966.7)

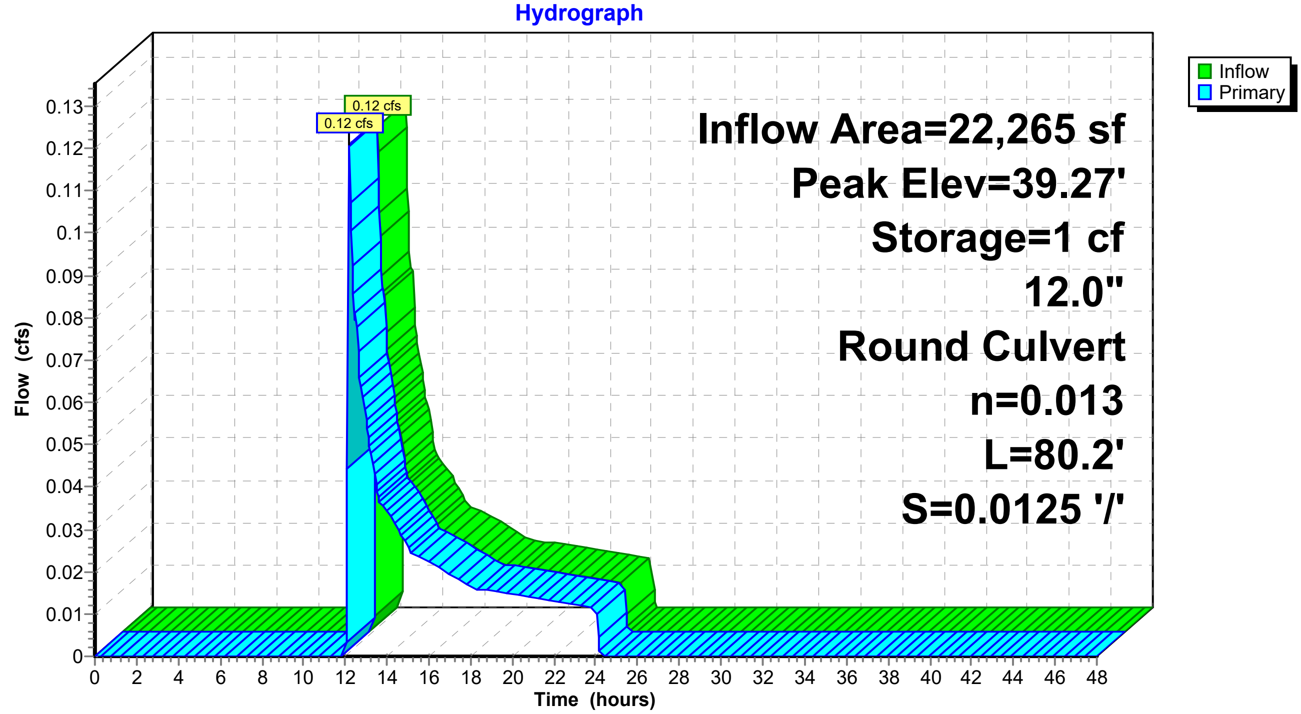
Volume	Invert	Avail.Storage	Storage Description
#1	39.27'	4,378 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 10,946 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
39.27	22,338	624.7	0	0	22,338
39.76	22,338	624.7	10,946	10,946	22,644

Device	Routing	Invert	Outlet Devices
#1	Primary	35.00'	**12.0" Round Culvert** L= 80.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.00' / 34.00' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=6.50 cfs @ 12.19 hrs HW=39.27' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 6.50 cfs @ 8.27 fps)

Pond UD3: Football UD 3



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentO-01: OFF-01 Runoff Area=112,122 sf 33.01% Impervious Runoff Depth=3.40"
Tc=6.0 min CN=59 Runoff=9.94 cfs 31,773 cf

SubcatchmentO-02: OFF-02 Runoff Area=109,762 sf 30.00% Impervious Runoff Depth=3.17"
Tc=6.0 min CN=57 Runoff=9.04 cfs 29,032 cf

SubcatchmentO-03: OFF-03 Runoff Area=45,823 sf 30.00% Impervious Runoff Depth=3.17"
Tc=6.0 min CN=57 Runoff=3.77 cfs 12,120 cf

SubcatchmentO-04: OFF-04 Runoff Area=35,366 sf 61.66% Impervious Runoff Depth=5.26"
Tc=6.0 min CN=75 Runoff=4.79 cfs 15,498 cf

SubcatchmentPR-1A: PR-1A Runoff Area=30,658 sf 60.37% Impervious Runoff Depth=5.26"
Tc=6.0 min CN=75 Runoff=4.15 cfs 13,435 cf

SubcatchmentPR-1B: PR-1B Runoff Area=34,631 sf 76.81% Impervious Runoff Depth=6.33"
Tc=6.0 min CN=84 Runoff=5.43 cfs 18,256 cf

SubcatchmentPR-1C: PR-1C Runoff Area=24,918 sf 3.36% Impervious Runoff Depth=1.46"
Tc=6.0 min CN=41 Runoff=0.78 cfs 3,022 cf

SubcatchmentPR-1D: PR-1D Runoff Area=78,681 sf 100.00% Impervious Runoff Depth=8.00"
Tc=6.0 min CN=98 Runoff=13.79 cfs 52,454 cf

SubcatchmentPR-1E: PR-1E Runoff Area=26,606 sf 100.00% Impervious Runoff Depth=8.00"
Tc=6.0 min CN=98 Runoff=4.66 cfs 17,737 cf

SubcatchmentPR-1F: PR-1F Runoff Area=18,266 sf 67.43% Impervious Runoff Depth=5.73"
Tc=6.0 min CN=79 Runoff=2.66 cfs 8,725 cf

SubcatchmentPR-1G: PR-1G Runoff Area=50,158 sf 46.00% Impervious Runoff Depth=4.21"
Tc=6.0 min CN=66 Runoff=5.52 cfs 17,576 cf

SubcatchmentPR-1H: PR-1H Runoff Area=11,588 sf 24.62% Impervious Runoff Depth=2.84"
Tc=6.0 min CN=54 Runoff=0.84 cfs 2,740 cf

SubcatchmentPR-1I: PR-1I Runoff Area=16,195 sf 0.59% Impervious Runoff Depth=1.26"
Tc=6.0 min CN=39 Runoff=0.40 cfs 1,699 cf

SubcatchmentPR-1J: PR-1J Runoff Area=21,163 sf 85.81% Impervious Runoff Depth=7.04"
Tc=6.0 min CN=90 Runoff=3.54 cfs 12,419 cf

SubcatchmentPR-1K: PR-1K Runoff Area=40,076 sf 13.82% Impervious Runoff Depth=2.07"
Tc=6.0 min CN=47 Runoff=2.02 cfs 6,930 cf

SubcatchmentPR-1L: PR-1L Runoff Area=32,440 sf 69.13% Impervious Runoff Depth=5.85"
Tc=6.0 min CN=80 Runoff=4.80 cfs 15,815 cf

SubcatchmentPR-1M: PR-1M	Runoff Area=22,109 sf 44.24% Impervious Runoff Depth=4.09" Tc=6.0 min CN=65 Runoff=2.37 cfs 7,534 cf
SubcatchmentPR-1N: PR-1N	Runoff Area=21,140 sf 87.46% Impervious Runoff Depth=7.16" Tc=6.0 min CN=91 Runoff=3.57 cfs 12,616 cf
SubcatchmentPR-1O: PR-1O	Runoff Area=50,633 sf 85.81% Impervious Runoff Depth=7.04" Tc=6.0 min CN=90 Runoff=8.48 cfs 29,713 cf
SubcatchmentPR-1P: PR-1P	Runoff Area=13,652 sf 88.78% Impervious Runoff Depth=7.16" Tc=6.0 min CN=91 Runoff=2.31 cfs 8,147 cf
SubcatchmentPR-1Q: PR-1Q	Runoff Area=29,096 sf 14.64% Impervious Runoff Depth=2.18" Tc=6.0 min CN=48 Runoff=1.56 cfs 5,290 cf
SubcatchmentPR-1R: PR-1R	Runoff Area=55,082 sf 84.15% Impervious Runoff Depth=6.92" Tc=6.0 min CN=89 Runoff=9.14 cfs 31,775 cf
SubcatchmentPR-1S: PR-1S	Runoff Area=52,894 sf 67.24% Impervious Runoff Depth=5.73" Tc=6.0 min CN=79 Runoff=7.69 cfs 25,265 cf
SubcatchmentPR-1U: PR-1U	Runoff Area=4,791 sf 100.00% Impervious Runoff Depth=8.00" Tc=6.0 min CN=98 Runoff=0.84 cfs 3,194 cf
SubcatchmentPR-1V: PR-1V	Runoff Area=42,997 sf 65.96% Impervious Runoff Depth=5.61" Tc=6.0 min CN=78 Runoff=6.15 cfs 20,113 cf
SubcatchmentPR-2A: PR-2A	Runoff Area=33,957 sf 0.00% Impervious Runoff Depth=1.26" Tc=6.0 min CN=39 Runoff=0.84 cfs 3,563 cf
SubcatchmentPR-2B: PR-2B	Runoff Area=71,412 sf 0.00% Impervious Runoff Depth=1.26" Tc=6.0 min CN=39 Runoff=1.77 cfs 7,493 cf
SubcatchmentPR-2C: PR-2C	Runoff Area=9,359 sf 17.98% Impervious Runoff Depth=2.40" Tc=6.0 min CN=50 Runoff=0.56 cfs 1,870 cf
SubcatchmentPR-2D: PR-2D	Runoff Area=53,639 sf 82.78% Impervious Runoff Depth=6.80" Tc=0.0 min CN=88 Runoff=10.04 cfs 30,408 cf
SubcatchmentPR-2E: PR-2E	Runoff Area=65,696 sf 0.00% Impervious Runoff Depth=1.26" Tc=6.0 min CN=39 Runoff=1.63 cfs 6,893 cf
SubcatchmentPR-2F: PR-2F	Runoff Area=33,980 sf 0.00% Impervious Runoff Depth=1.26" Tc=6.0 min CN=39 Runoff=0.84 cfs 3,565 cf
SubcatchmentPR-2G: PR-2G	Runoff Area=80,069 sf 7.34% Impervious Runoff Depth=1.66" Tc=0.0 min CN=43 Runoff=3.47 cfs 11,060 cf
SubcatchmentPR-2H: PR-2H	Runoff Area=30,529 sf 1.48% Impervious Runoff Depth=1.36" Tc=6.0 min CN=40 Runoff=0.85 cfs 3,451 cf

Subcatchment PR-3A: PR-3A Runoff Area=31,912 sf 15.32% Impervious Runoff Depth=2.18"
Tc=6.0 min CN=48 Runoff=1.71 cfs 5,802 cf

Subcatchment PR-3B: PR-3B Runoff Area=59,565 sf 75.56% Impervious Runoff Depth=6.33"
Tc=6.0 min CN=84 Runoff=9.34 cfs 31,400 cf

Subcatchment PR-3C: PR-3C Runoff Area=22,265 sf 0.00% Impervious Runoff Depth=1.26"
Tc=6.0 min CN=39 Runoff=0.55 cfs 2,336 cf

Reach DP-1: DP-1 Inflow=84.28 cfs 439,418 cf
Outflow=84.28 cfs 439,418 cf

Reach DP-1C: Outfall 1C Inflow=18.71 cfs 162,841 cf
Outflow=18.71 cfs 162,841 cf

Reach DP-1D: Outfall 1D Inflow=12.99 cfs 45,212 cf
Outflow=12.99 cfs 45,212 cf

Reach DP-2: DP-2 Avg. Flow Depth=0.93' Max Vel=8.42 fps Inflow=15.93 cfs 64,739 cf
36.0" Round Pipe n=0.011 L=96.0' S=0.0092 '/' Capacity=75.47 cfs Outflow=15.61 cfs 64,739 cf

Reach DP-3: DP-3 Inflow=11.56 cfs 39,538 cf
Outflow=11.56 cfs 39,538 cf

Reach DP1A: Outfall 1A Inflow=0.78 cfs 3,022 cf
Outflow=0.78 cfs 3,022 cf

Reach DP1B: Outfall 1B Inflow=40.59 cfs 142,380 cf
Outflow=40.59 cfs 142,380 cf

Reach TOTAL: Total Inflow=95.84 cfs 478,956 cf
Outflow=95.84 cfs 478,956 cf

Pond BR-1: Bioretention 1 Peak Elev=27.73' Storage=3,169 cf Inflow=8.37 cfs 28,432 cf
Outflow=6.34 cfs 28,432 cf

Pond BR-2: Bioretention 2 Peak Elev=27.77' Storage=1,743 cf Inflow=6.05 cfs 21,223 cf
Outflow=4.83 cfs 21,223 cf

Pond BR-3: Bioretention 3 Peak Elev=27.99' Storage=6,258 cf Inflow=10.08 cfs 34,231 cf
Outflow=5.42 cfs 34,231 cf

Pond OC: O-CHAMBERS Peak Elev=26.19' Storage=23,820 cf Inflow=17.59 cfs 56,651 cf
Outflow=2.31 cfs 55,694 cf

Pond U-1: UG Inf System Peak Elev=23.81' Storage=28,670 cf Inflow=22.53 cfs 75,294 cf
Discarded=0.32 cfs 30,810 cf Primary=6.48 cfs 44,484 cf Outflow=6.80 cfs 75,294 cf

Pond UD1: Baseball UD 1 Peak Elev=39.17' Storage=32 cf Inflow=2.62 cfs 11,056 cf
Outflow=2.62 cfs 11,056 cf

Pond UD2: Football UD 2 Peak Elev=40.17' Storage=42 cf Inflow=1.63 cfs 6,893 cf
Outflow=1.62 cfs 6,893 cf

Pond UD3: Football UD 3 Peak Elev=39.27' Storage=4 cf Inflow=0.55 cfs 2,336 cf
12.0" Round Culvert n=0.013 L=80.2' S=0.0125 '/' Outflow=0.55 cfs 2,336 cf

Total Runoff Area = 1,473,230 sf Runoff Volume = 510,723 cf Average Runoff Depth = 4.16"
56.11% Pervious = 826,565 sf 43.89% Impervious = 646,665 sf

Summary for Subcatchment O-01: OFF-01

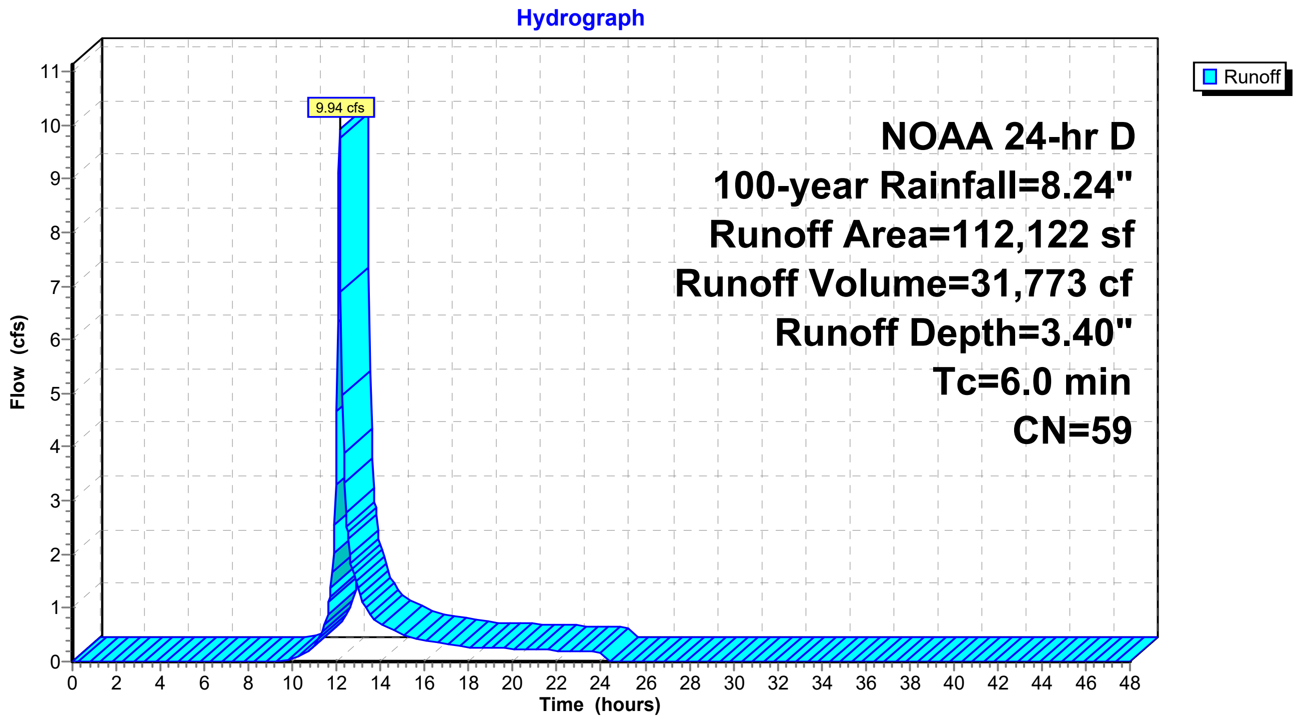
Runoff = 9.94 cfs @ 12.13 hrs, Volume= 31,773 cf, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
11,813	98	Unconnected pavement, HSG A
16,305	39	>75% Grass cover, Good, HSG A
84,004	57	1/3 acre lots, 30% imp, HSG A
112,122	59	Weighted Average
75,108		66.99% Pervious Area
37,014		33.01% Impervious Area
11,813		31.91% Unconnected

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

Subcatchment O-01: OFF-01



Summary for Subcatchment O-02: OFF-02

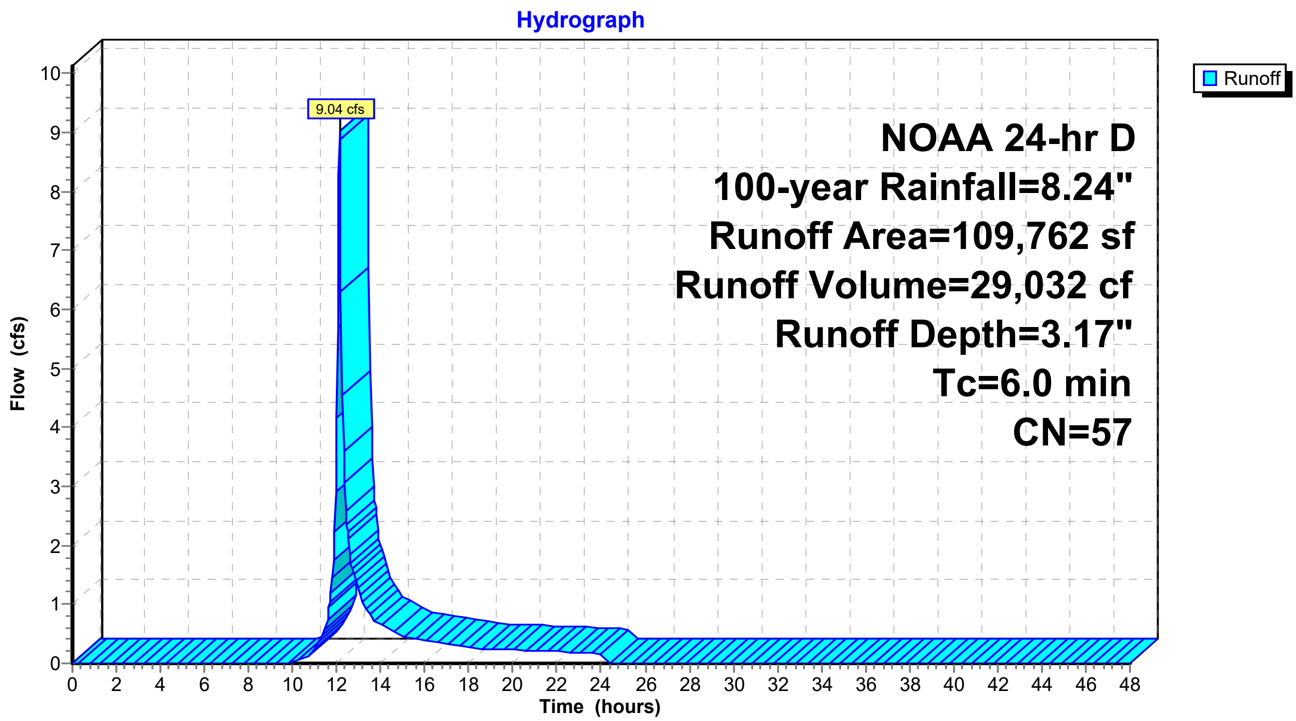
Runoff = 9.04 cfs @ 12.13 hrs, Volume= 29,032 cf, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
109,762	57	1/3 acre lots, 30% imp, HSG A
76,833		70.00% Pervious Area
32,929		30.00% Impervious Area

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

Subcatchment O-02: OFF-02



Summary for Subcatchment O-03: OFF-03

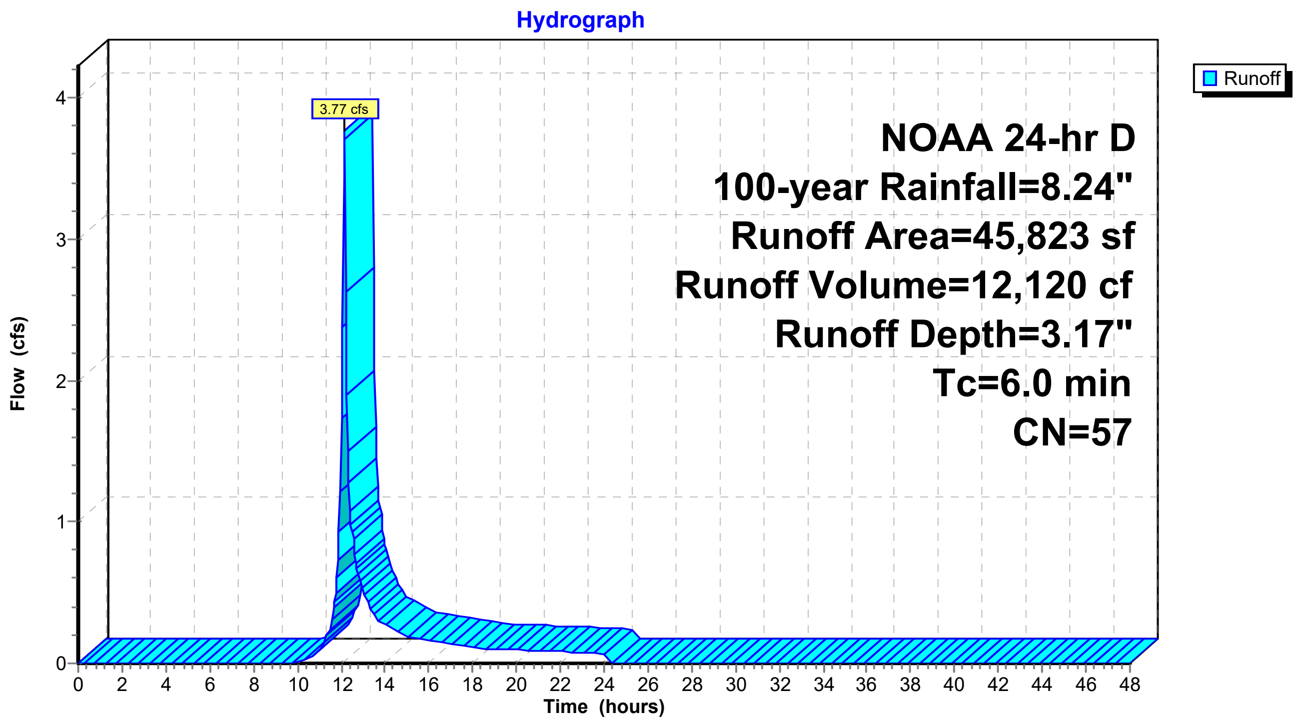
Runoff = 3.77 cfs @ 12.13 hrs, Volume= 12,120 cf, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
45,823	57	1/3 acre lots, 30% imp, HSG A
32,076		70.00% Pervious Area
13,747		30.00% Impervious Area

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

Subcatchment O-03: OFF-03



Summary for Subcatchment O-04: OFF-04

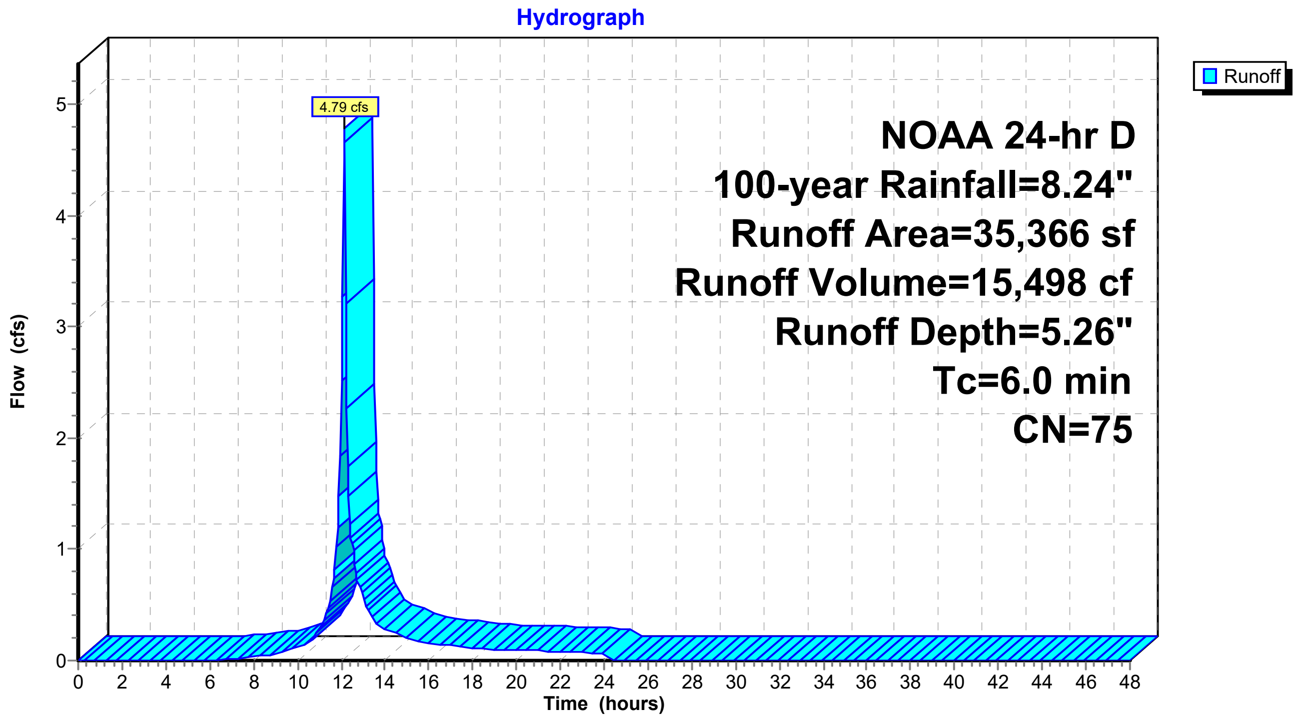
Runoff = 4.79 cfs @ 12.13 hrs, Volume= 15,498 cf, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
21,807	98	Paved parking, HSG A
13,559	39	>75% Grass cover, Good, HSG A
35,366	75	Weighted Average
13,559		38.34% Pervious Area
21,807		61.66% Impervious Area

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

Subcatchment O-04: OFF-04



Summary for Subcatchment PR-1A: PR-1A

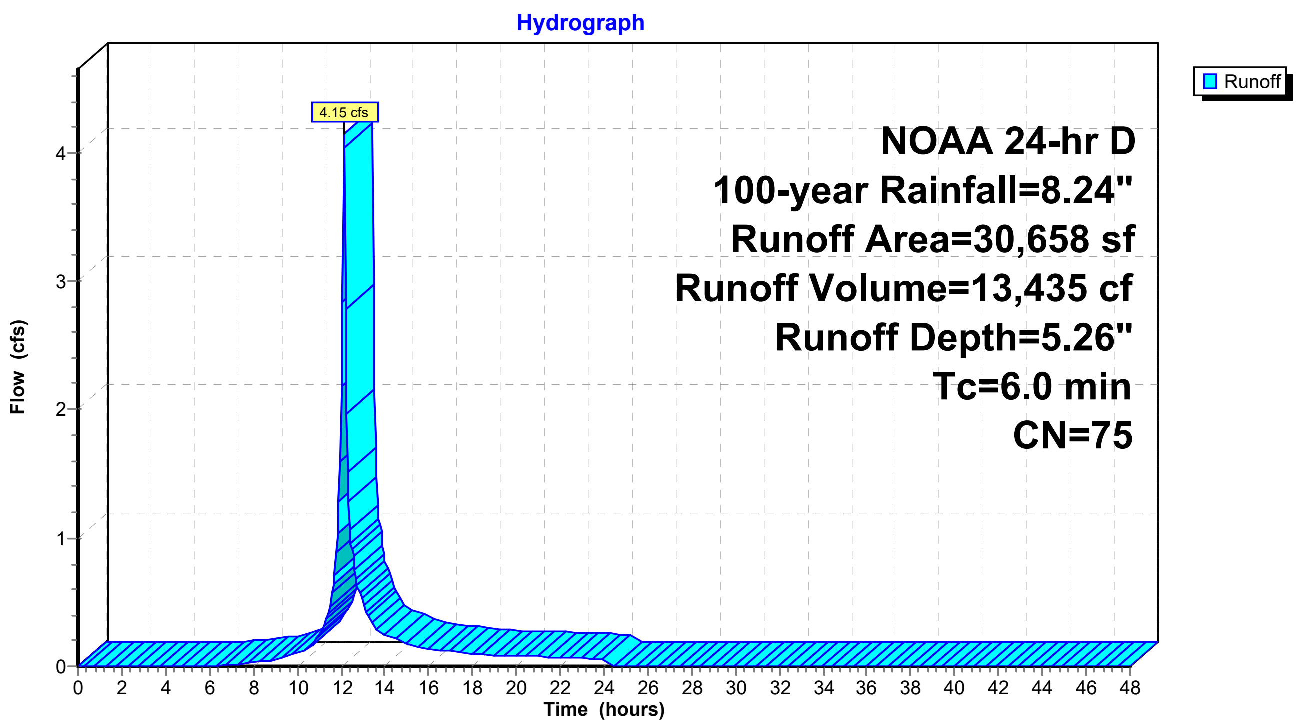
Runoff = 4.15 cfs @ 12.13 hrs, Volume= 13,435 cf, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
18,507	98	Paved parking, HSG A
12,151	39	>75% Grass cover, Good, HSG A
30,658	75	Weighted Average
12,151		39.63% Pervious Area
18,507		60.37% Impervious Area

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

Subcatchment PR-1A: PR-1A



Summary for Subcatchment PR-1B: PR-1B

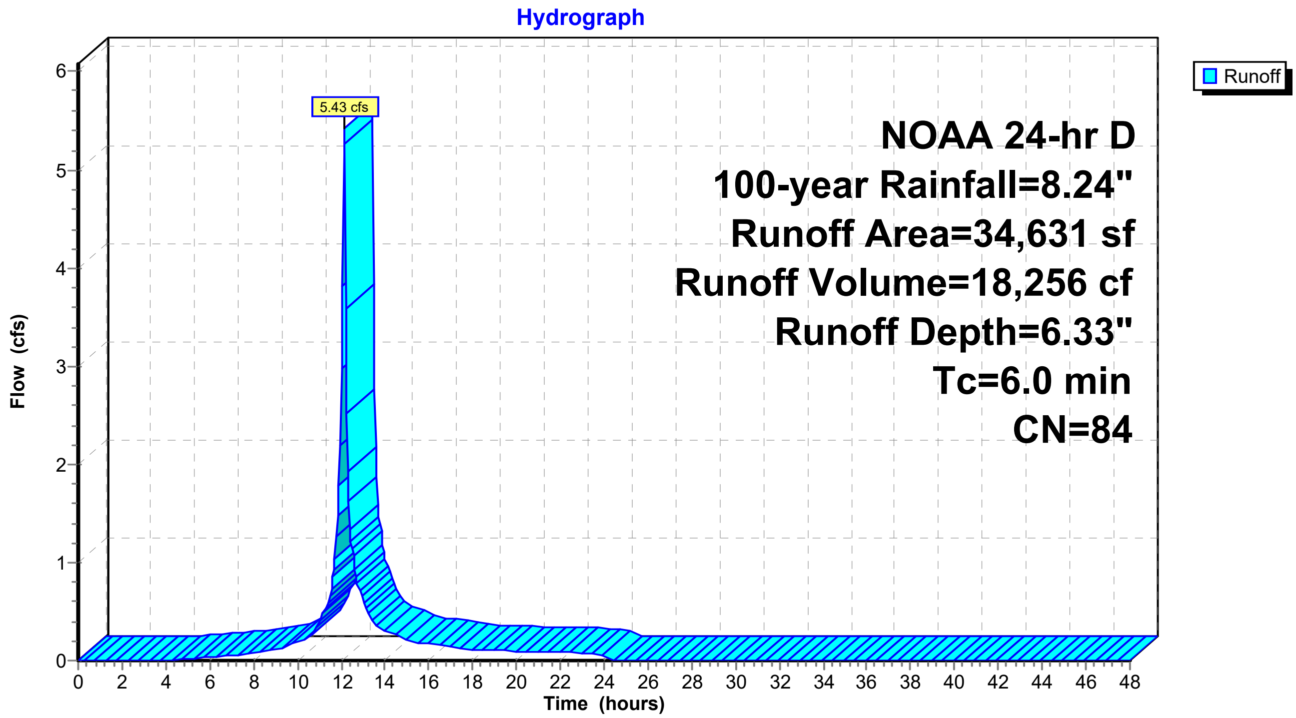
Runoff = 5.43 cfs @ 12.13 hrs, Volume= 18,256 cf, Depth= 6.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
26,601	98	Paved parking, HSG A
8,030	39	>75% Grass cover, Good, HSG A
34,631	84	Weighted Average
8,030		23.19% Pervious Area
26,601		76.81% Impervious Area

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

Subcatchment PR-1B: PR-1B



Summary for Subcatchment PR-1C: PR-1C

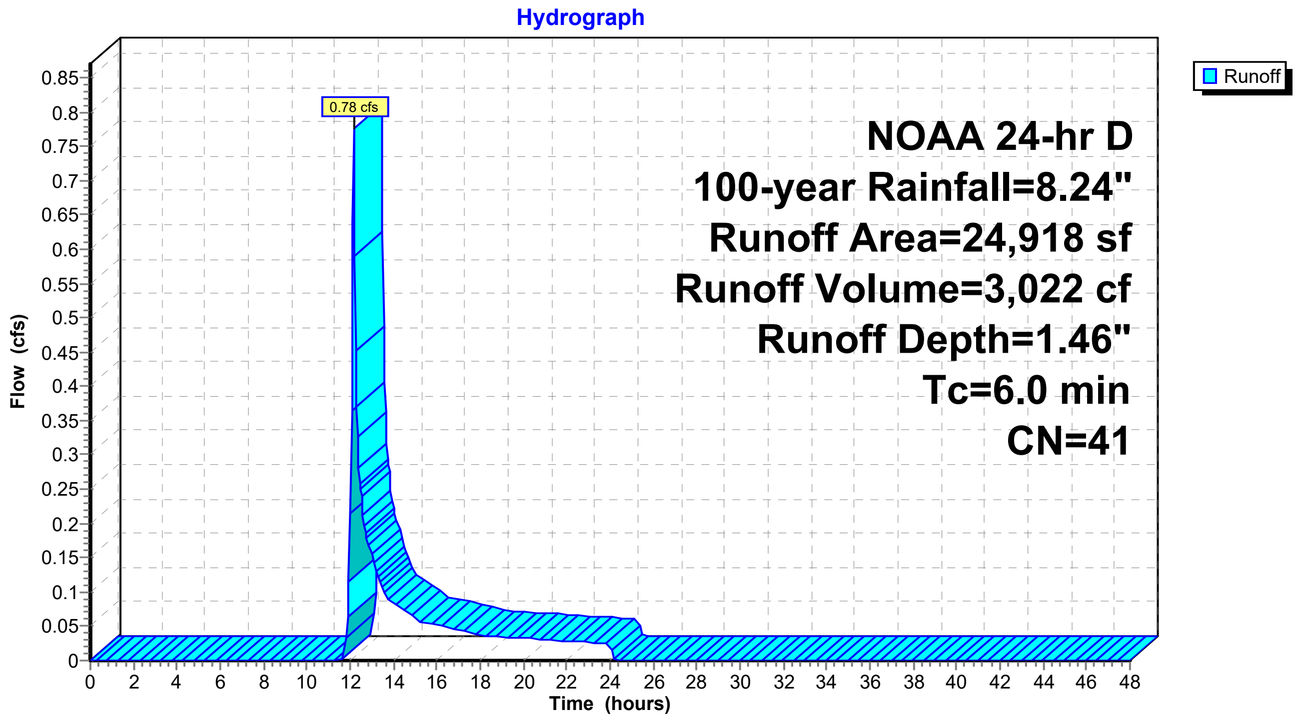
Runoff = 0.78 cfs @ 12.15 hrs, Volume= 3,022 cf, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
836	98	Paved parking, HSG A
24,082	39	>75% Grass cover, Good, HSG A
24,918	41	Weighted Average
24,082		96.64% Pervious Area
836		3.36% Impervious Area

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

Subcatchment PR-1C: PR-1C



Summary for Subcatchment PR-1D: PR-1D

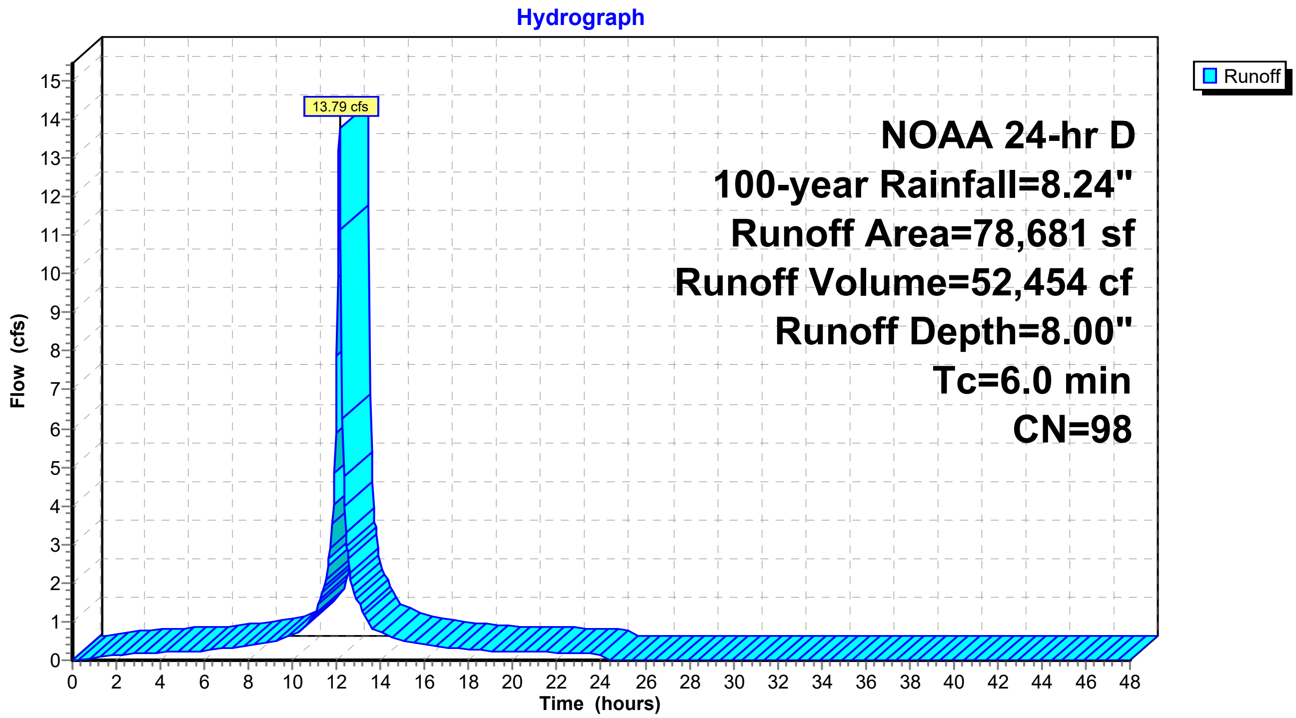
Runoff = 13.79 cfs @ 12.13 hrs, Volume= 52,454 cf, Depth= 8.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
78,681	98	Roofs, HSG A
78,681		100.00% Impervious Area

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

Subcatchment PR-1D: PR-1D



Summary for Subcatchment PR-1E: PR-1E

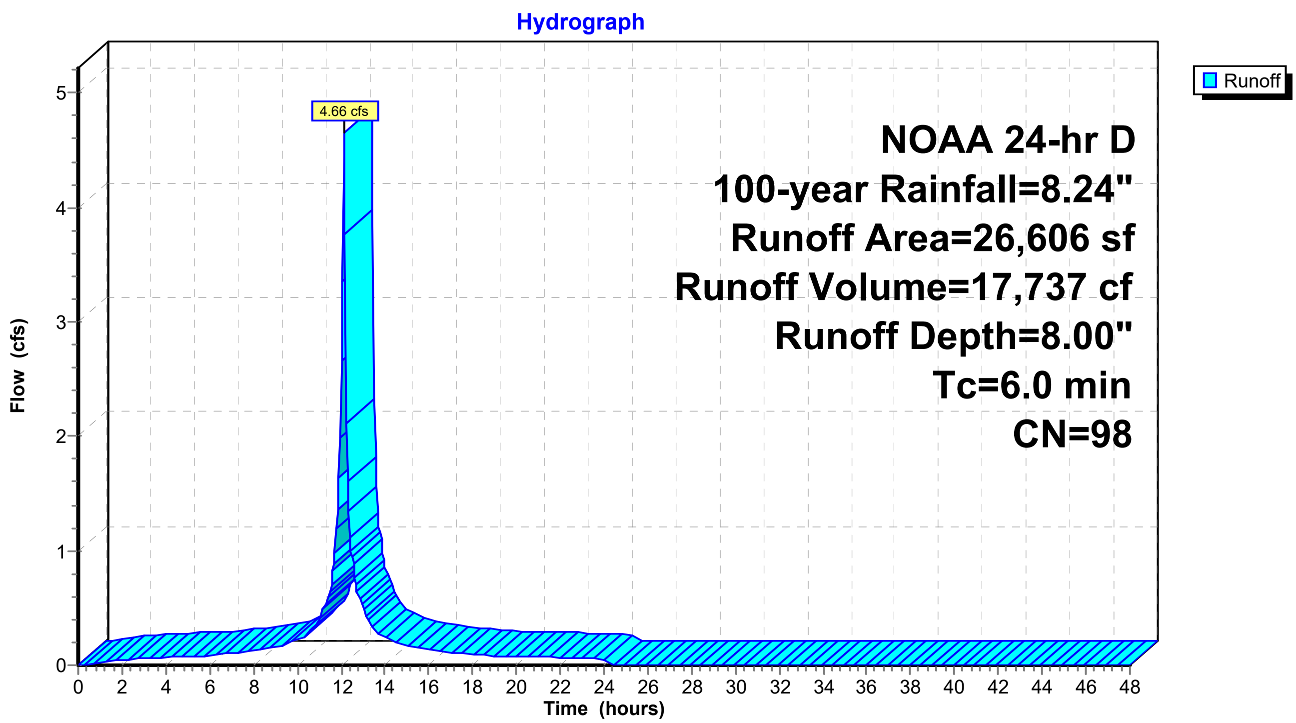
Runoff = 4.66 cfs @ 12.13 hrs, Volume= 17,737 cf, Depth= 8.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
26,606	98	Roofs, HSG A
26,606		100.00% Impervious Area

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

Subcatchment PR-1E: PR-1E



Summary for Subcatchment PR-1F: PR-1F

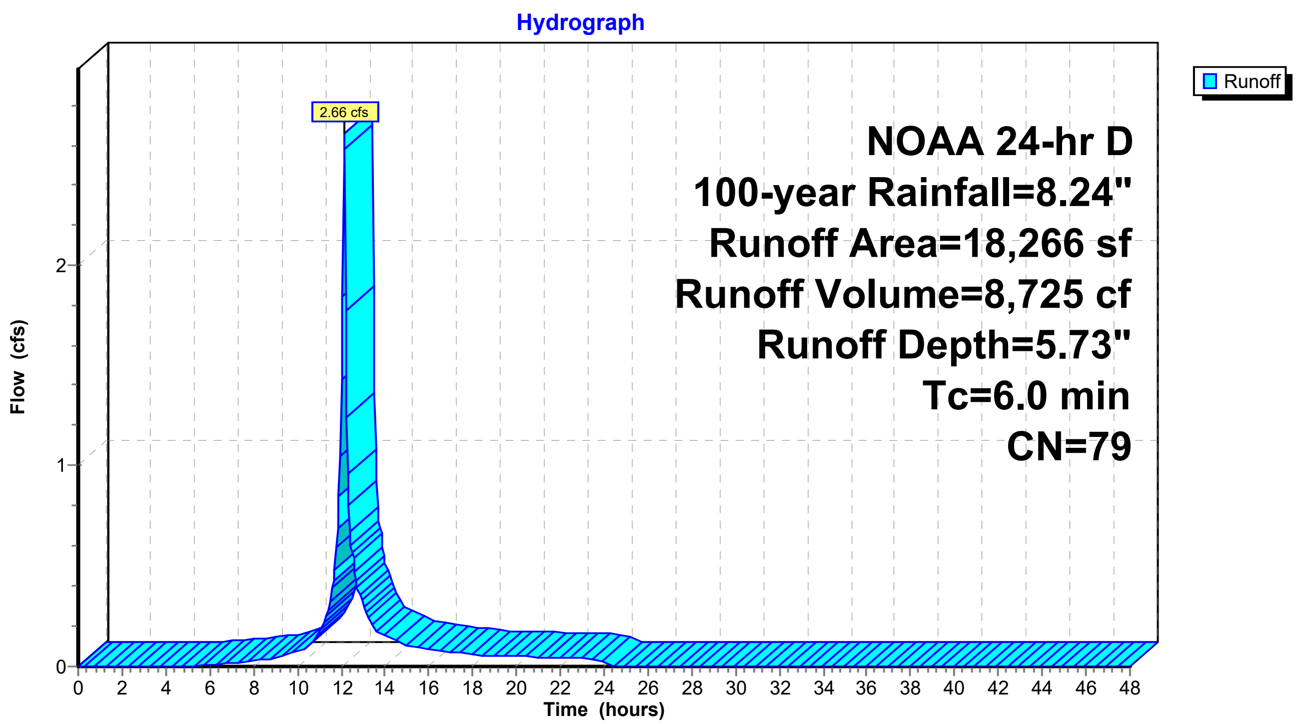
Runoff = 2.66 cfs @ 12.13 hrs, Volume= 8,725 cf, Depth= 5.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
12,317	98	Paved parking, HSG A
5,949	39	>75% Grass cover, Good, HSG A
18,266	79	Weighted Average
5,949		32.57% Pervious Area
12,317		67.43% Impervious Area

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

Subcatchment PR-1F: PR-1F



Summary for Subcatchment PR-1G: PR-1G

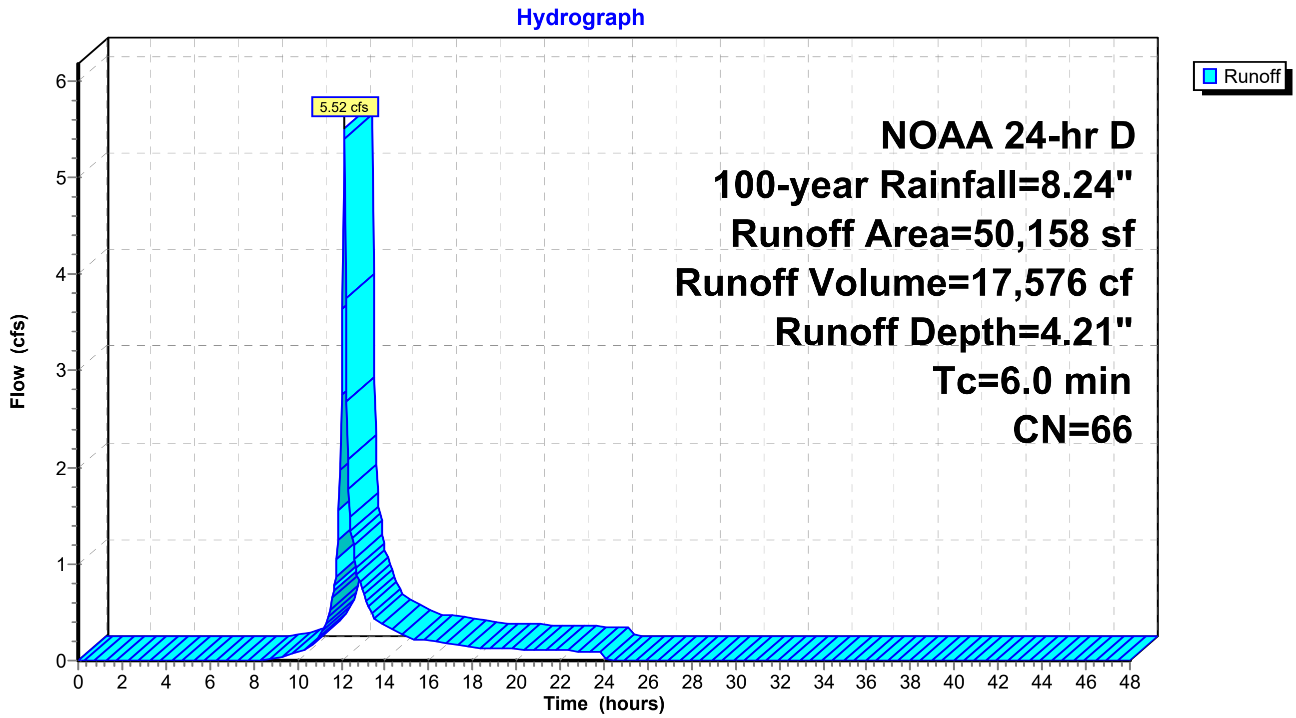
Runoff = 5.52 cfs @ 12.13 hrs, Volume= 17,576 cf, Depth= 4.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
23,071	98	Paved parking, HSG A
27,087	39	>75% Grass cover, Good, HSG A
50,158	66	Weighted Average
27,087		54.00% Pervious Area
23,071		46.00% Impervious Area

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

Subcatchment PR-1G: PR-1G



Summary for Subcatchment PR-1H: PR-1H

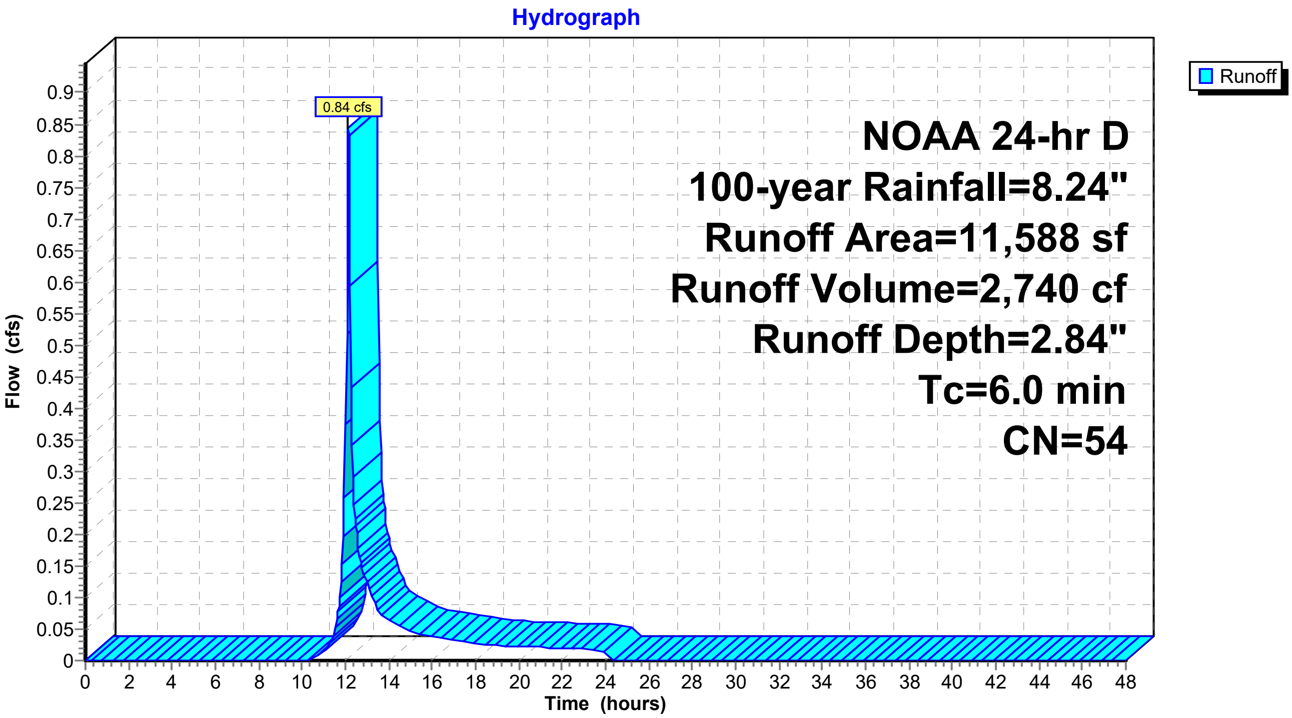
Runoff = 0.84 cfs @ 12.14 hrs, Volume= 2,740 cf, Depth= 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
2,853	98	Paved parking, HSG A
8,735	39	>75% Grass cover, Good, HSG A
11,588	54	Weighted Average
8,735		75.38% Pervious Area
2,853		24.62% Impervious Area

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

Subcatchment PR-1H: PR-1H



Summary for Subcatchment PR-1I: PR-1I

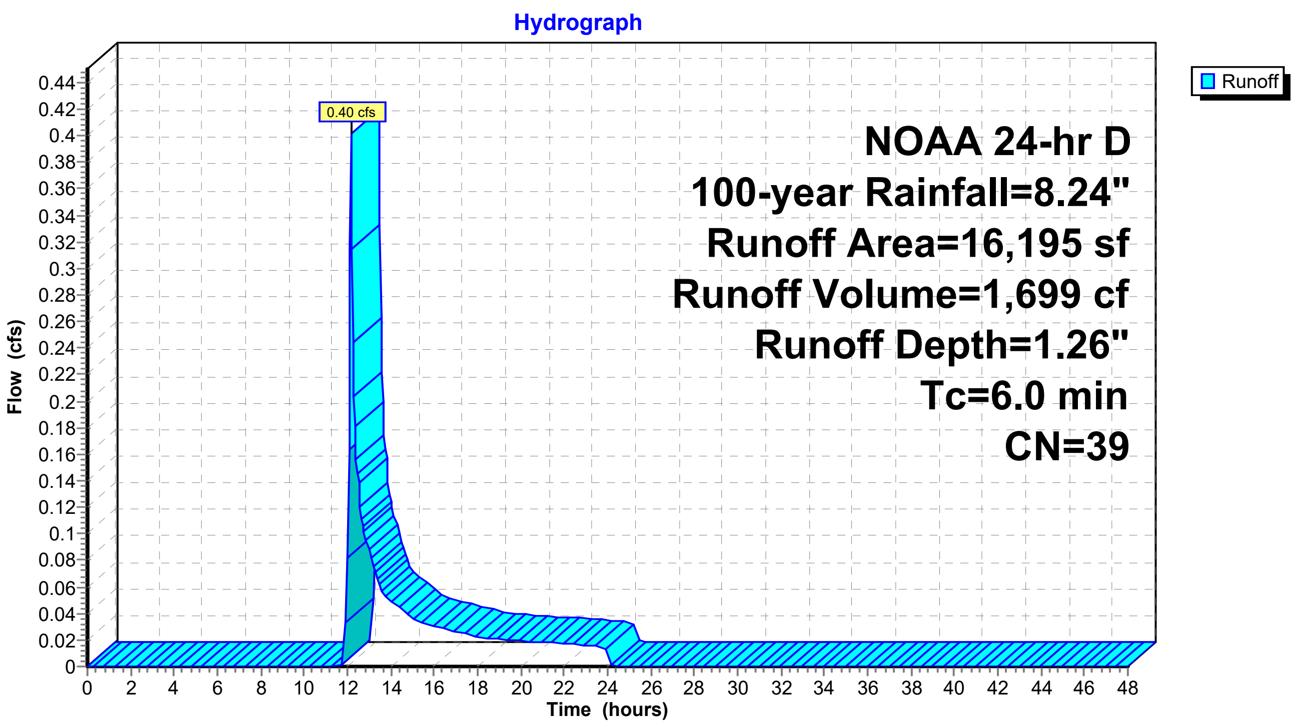
Runoff = 0.40 cfs @ 12.15 hrs, Volume= 1,699 cf, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
95	98	Paved parking, HSG A
16,100	39	>75% Grass cover, Good, HSG A
16,195	39	Weighted Average
16,100		99.41% Pervious Area
95		0.59% Impervious Area

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

Subcatchment PR-1I: PR-1I



Summary for Subcatchment PR-1J: PR-1J

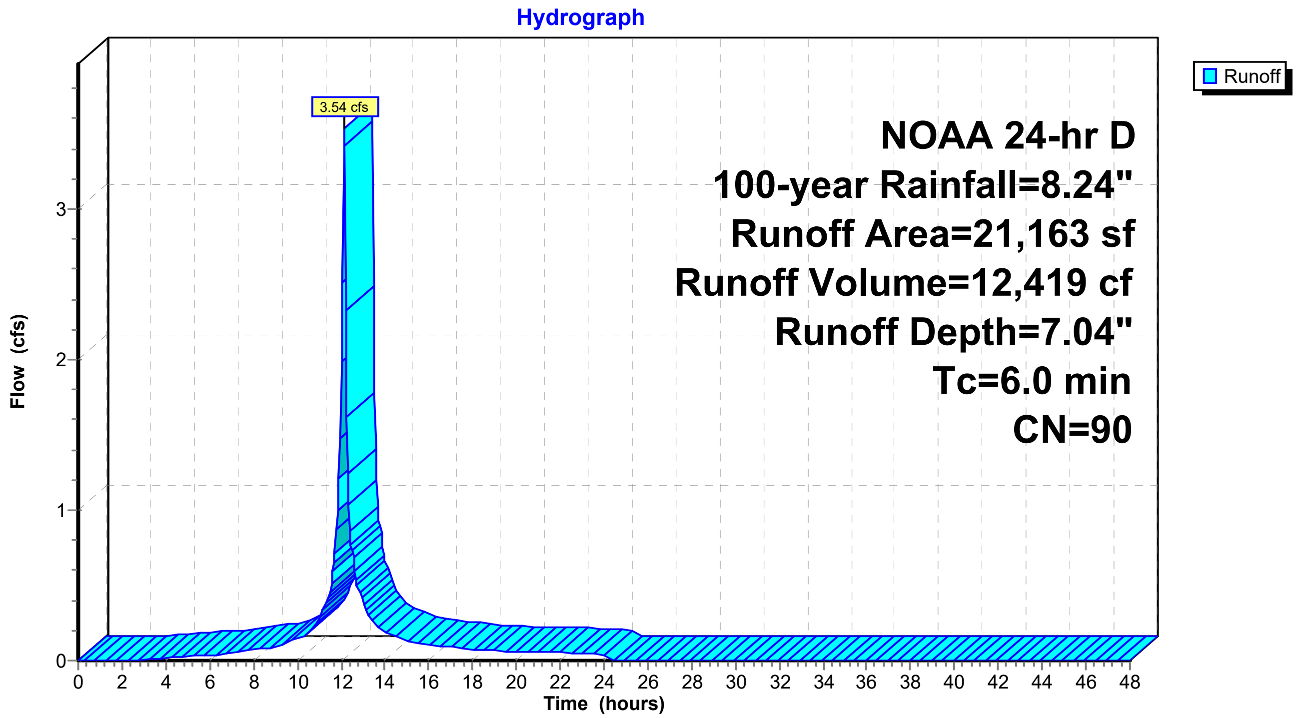
Runoff = 3.54 cfs @ 12.13 hrs, Volume= 12,419 cf, Depth= 7.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
18,160	98	Paved parking, HSG A
3,003	39	>75% Grass cover, Good, HSG A
21,163	90	Weighted Average
3,003		14.19% Pervious Area
18,160		85.81% Impervious Area

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

Subcatchment PR-1J: PR-1J



Summary for Subcatchment PR-1K: PR-1K

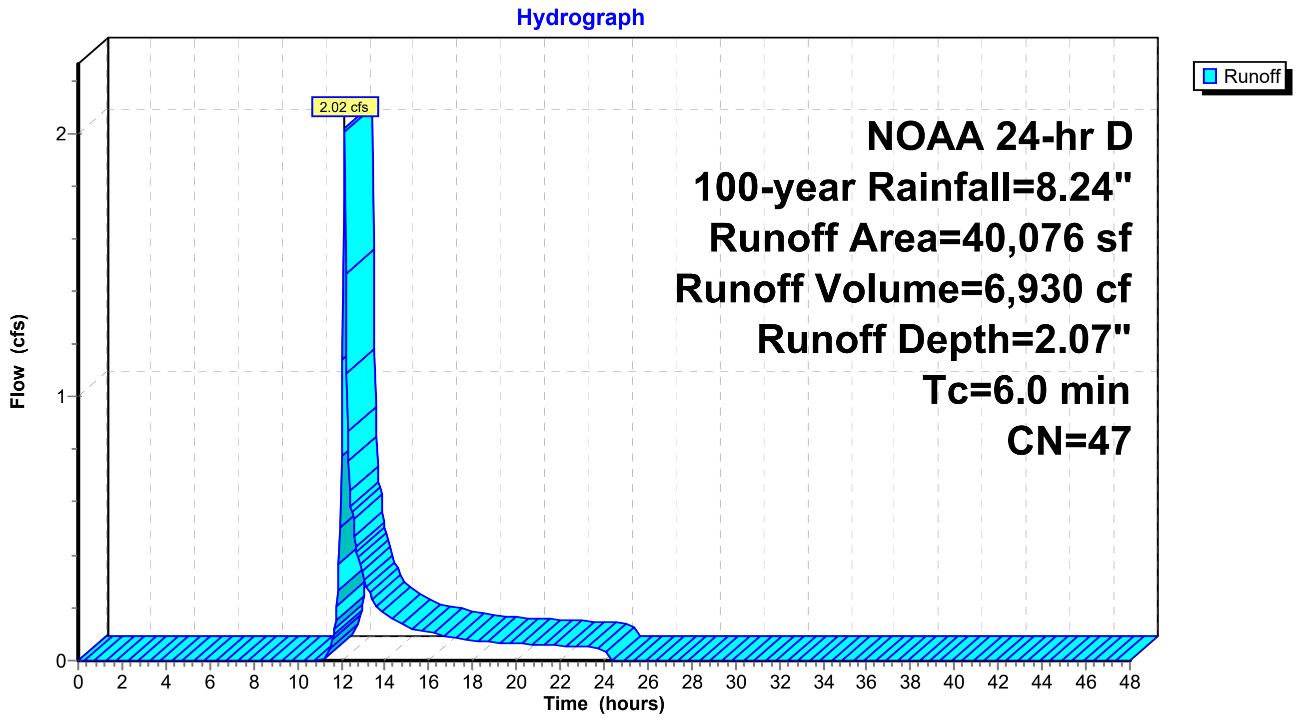
Runoff = 2.02 cfs @ 12.14 hrs, Volume= 6,930 cf, Depth= 2.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
5,537	98	Paved parking, HSG A
34,539	39	>75% Grass cover, Good, HSG A
40,076	47	Weighted Average
34,539		86.18% Pervious Area
5,537		13.82% Impervious Area

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

Subcatchment PR-1K: PR-1K



Summary for Subcatchment PR-1L: PR-1L

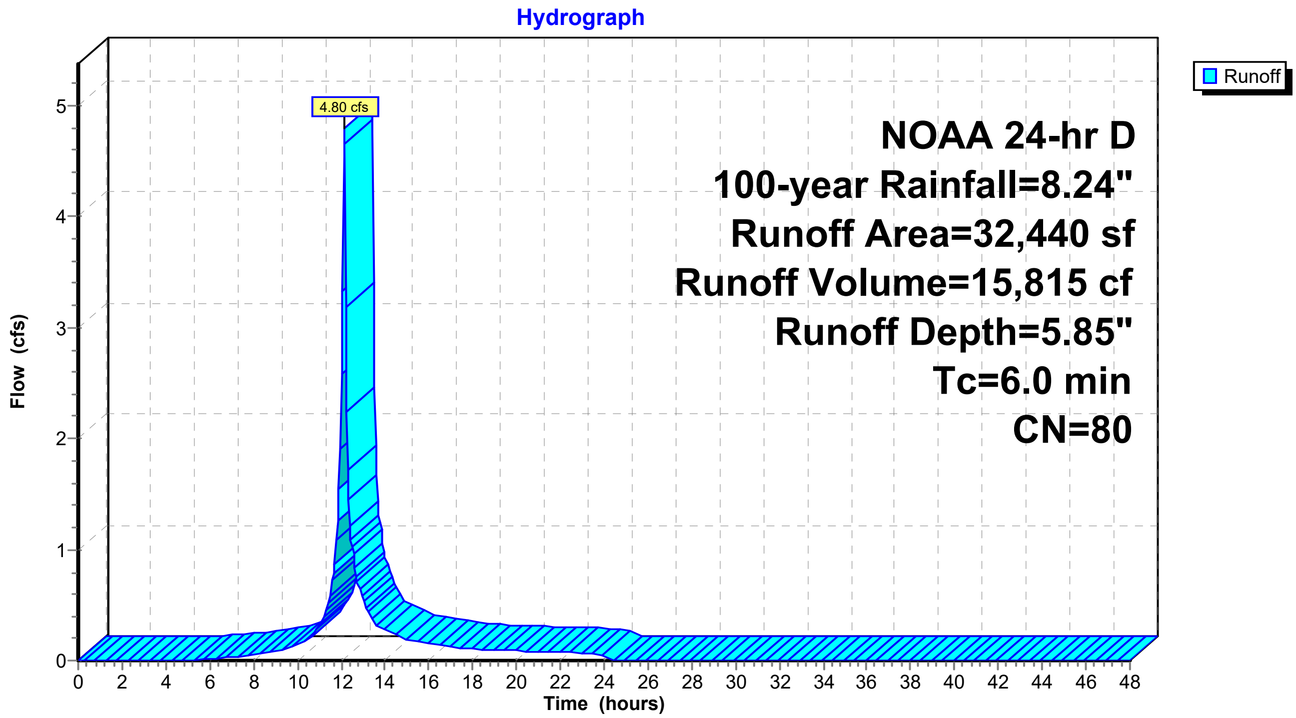
Runoff = 4.80 cfs @ 12.13 hrs, Volume= 15,815 cf, Depth= 5.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
22,426	98	Paved parking, HSG A
10,014	39	>75% Grass cover, Good, HSG A
32,440	80	Weighted Average
10,014		30.87% Pervious Area
22,426		69.13% Impervious Area

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

Subcatchment PR-1L: PR-1L



Summary for Subcatchment PR-1M: PR-1M

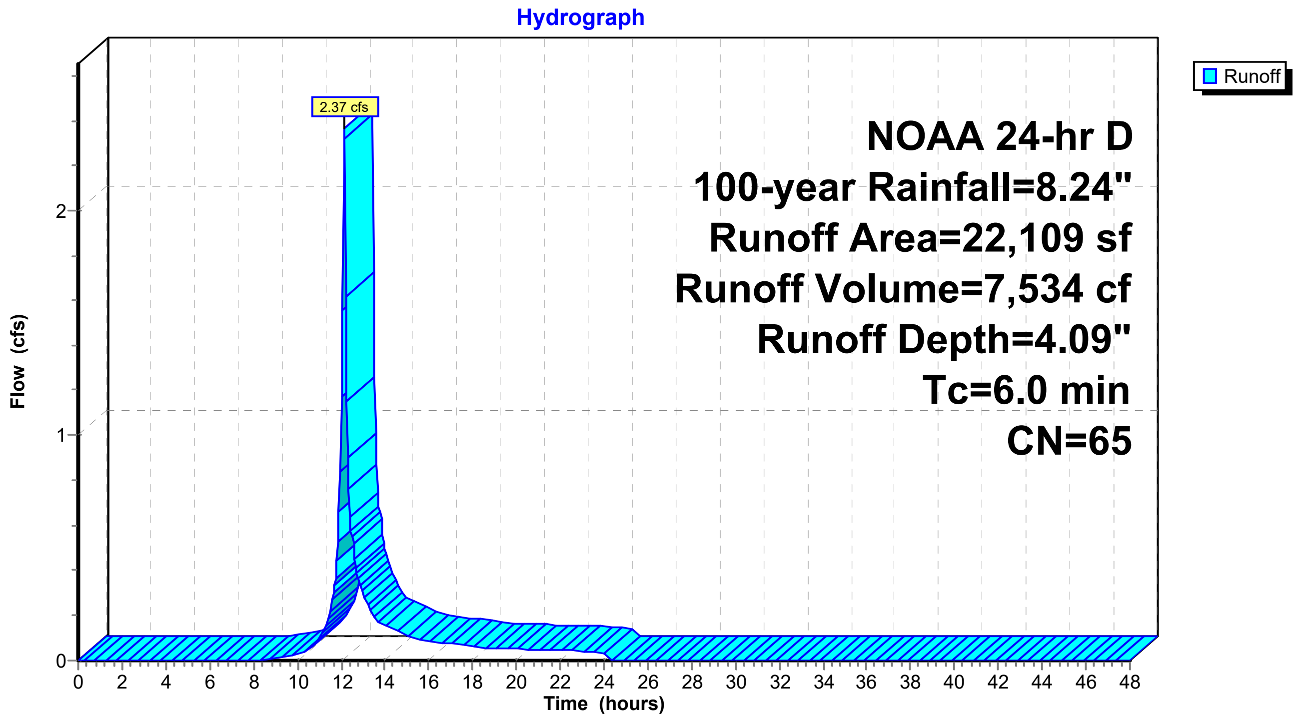
Runoff = 2.37 cfs @ 12.13 hrs, Volume= 7,534 cf, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
9,781	98	Paved parking, HSG A
12,328	39	>75% Grass cover, Good, HSG A
22,109	65	Weighted Average
12,328		55.76% Pervious Area
9,781		44.24% Impervious Area

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

Subcatchment PR-1M: PR-1M



Summary for Subcatchment PR-1N: PR-1N

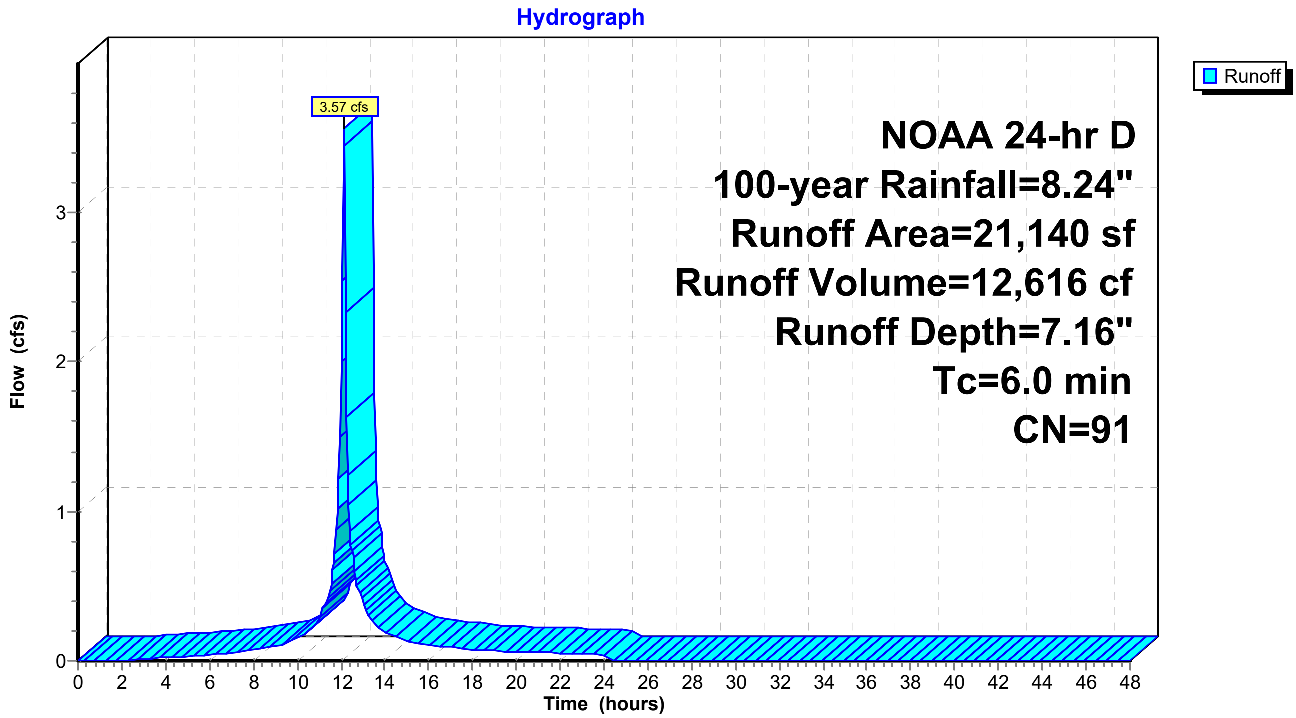
Runoff = 3.57 cfs @ 12.13 hrs, Volume= 12,616 cf, Depth= 7.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
18,490	98	Paved parking, HSG A
2,650	39	>75% Grass cover, Good, HSG A
21,140	91	Weighted Average
2,650		12.54% Pervious Area
18,490		87.46% Impervious Area

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

Subcatchment PR-1N: PR-1N



Summary for Subcatchment PR-1O: PR-1O

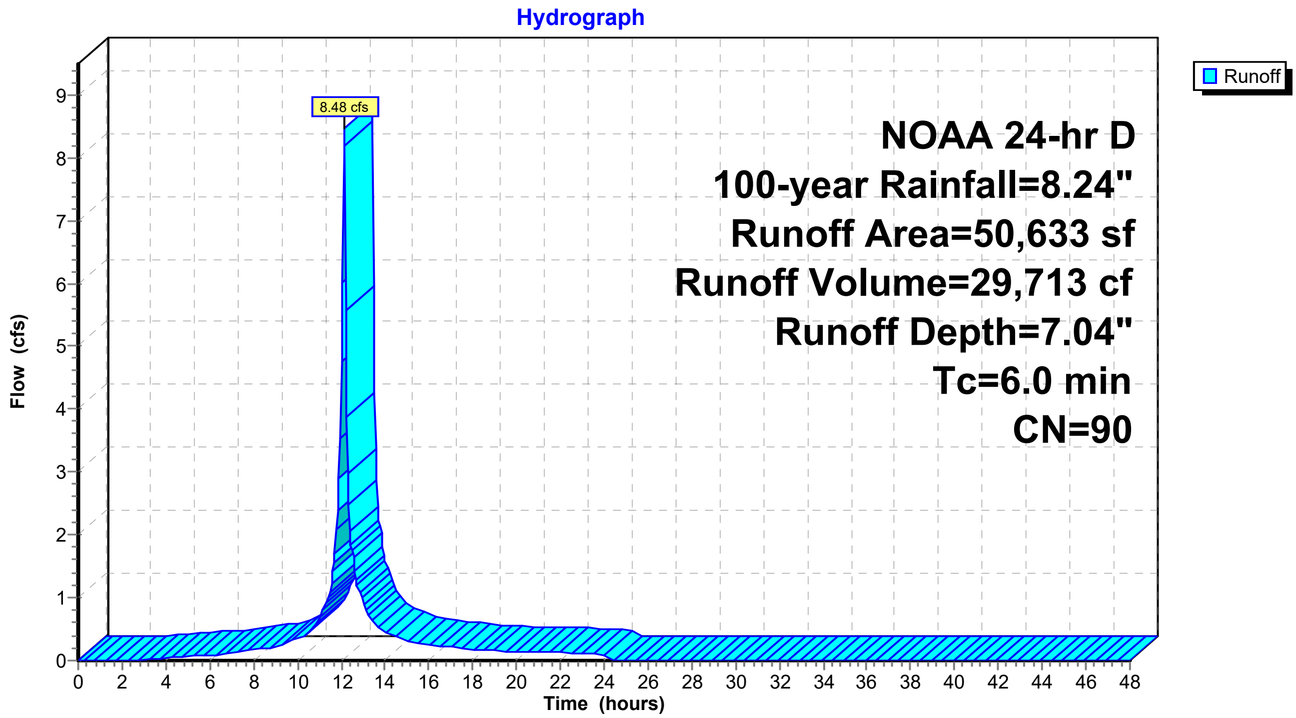
Runoff = 8.48 cfs @ 12.13 hrs, Volume= 29,713 cf, Depth= 7.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
43,450	98	Paved parking, HSG A
7,183	39	>75% Grass cover, Good, HSG A
50,633	90	Weighted Average
7,183		14.19% Pervious Area
43,450		85.81% Impervious Area

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

Subcatchment PR-1O: PR-1O



Summary for Subcatchment PR-1P: PR-1P

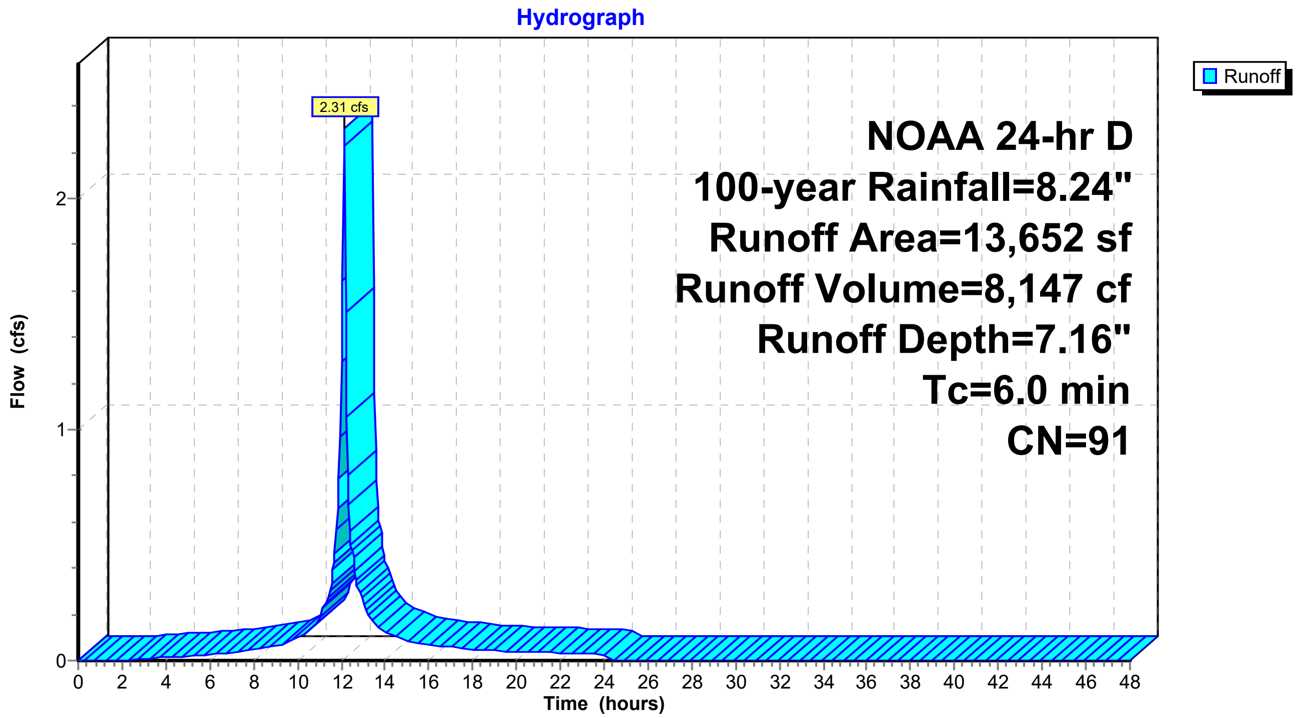
Runoff = 2.31 cfs @ 12.13 hrs, Volume= 8,147 cf, Depth= 7.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
12,120	98	Paved parking, HSG A
1,532	39	>75% Grass cover, Good, HSG A
13,652	91	Weighted Average
1,532		11.22% Pervious Area
12,120		88.78% Impervious Area

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

Subcatchment PR-1P: PR-1P



Summary for Subcatchment PR-1Q: PR-1Q

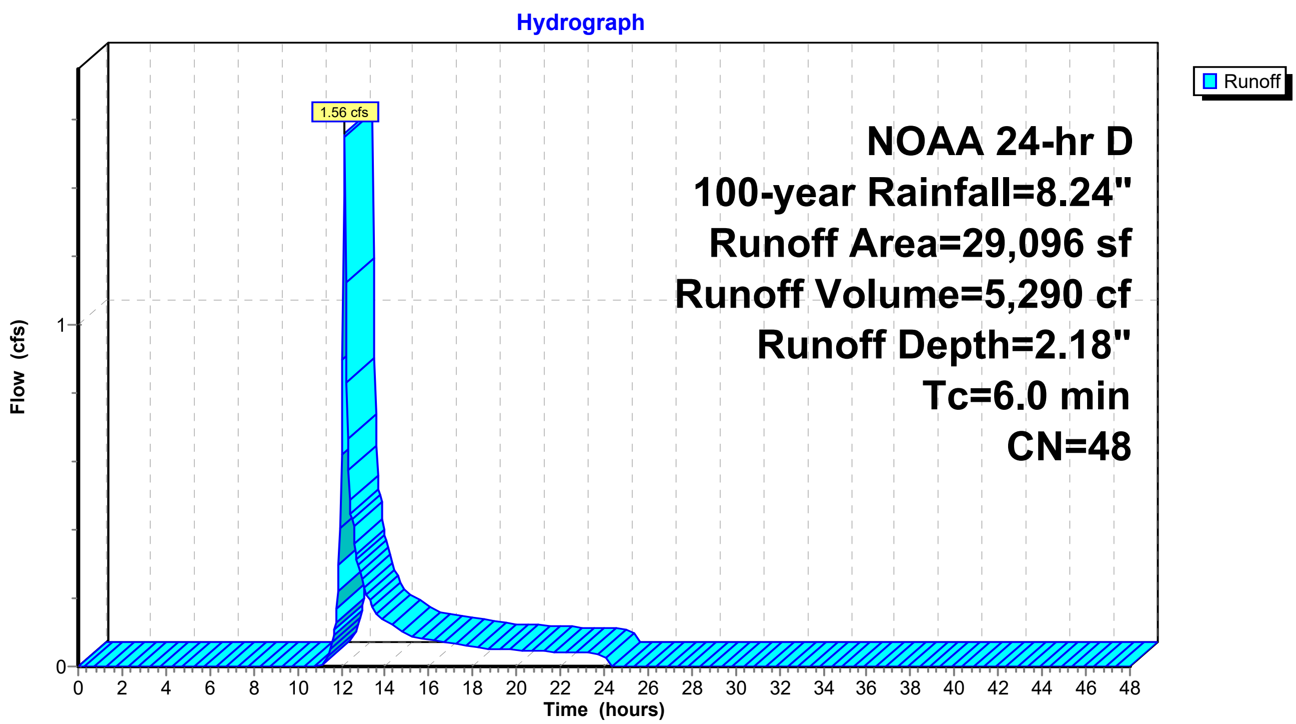
Runoff = 1.56 cfs @ 12.14 hrs, Volume= 5,290 cf, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
4,261	98	Paved parking, HSG A
24,835	39	>75% Grass cover, Good, HSG A
29,096	48	Weighted Average
24,835		85.36% Pervious Area
4,261		14.64% Impervious Area

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

Subcatchment PR-1Q: PR-1Q



Summary for Subcatchment PR-1R: PR-1R

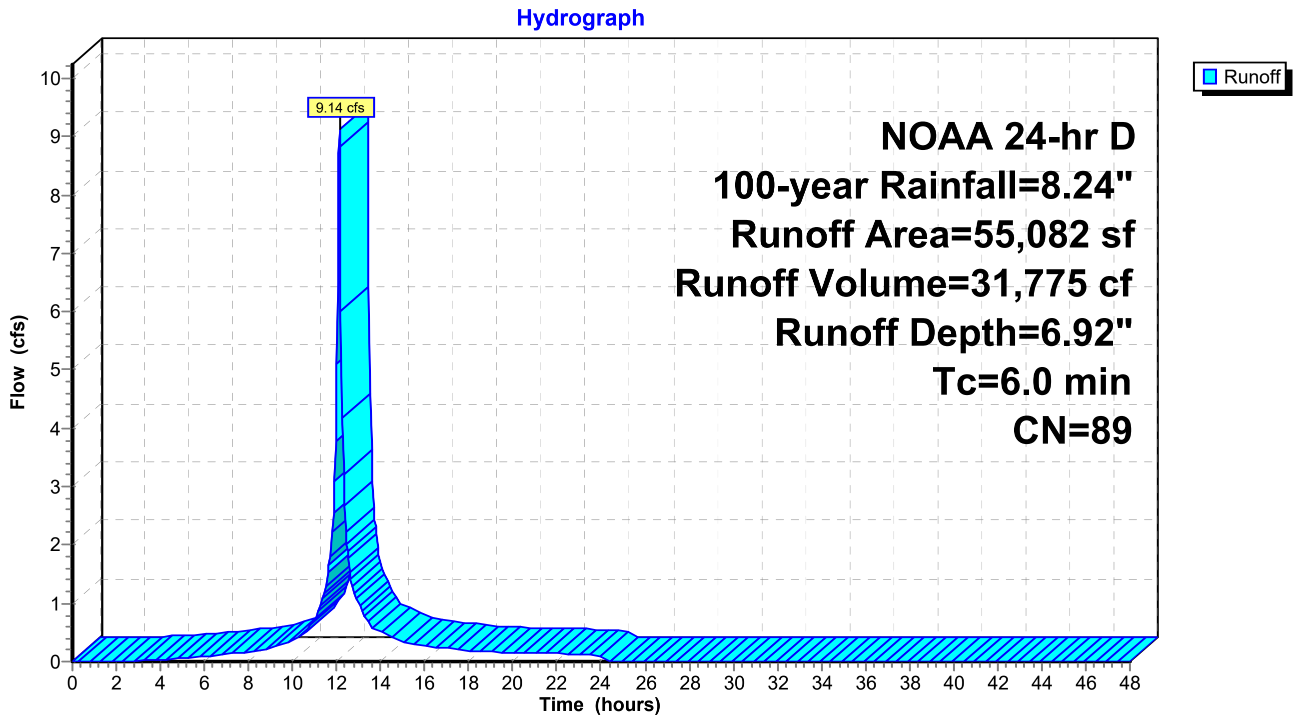
Runoff = 9.14 cfs @ 12.13 hrs, Volume= 31,775 cf, Depth= 6.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
35,043	98	Paved parking, HSG A
8,733	39	>75% Grass cover, Good, HSG A
11,306	98	Unconnected roofs, HSG A
55,082	89	Weighted Average
8,733		15.85% Pervious Area
46,349		84.15% Impervious Area
11,306		24.39% Unconnected

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

Subcatchment PR-1R: PR-1R



Summary for Subcatchment PR-1S: PR-1S

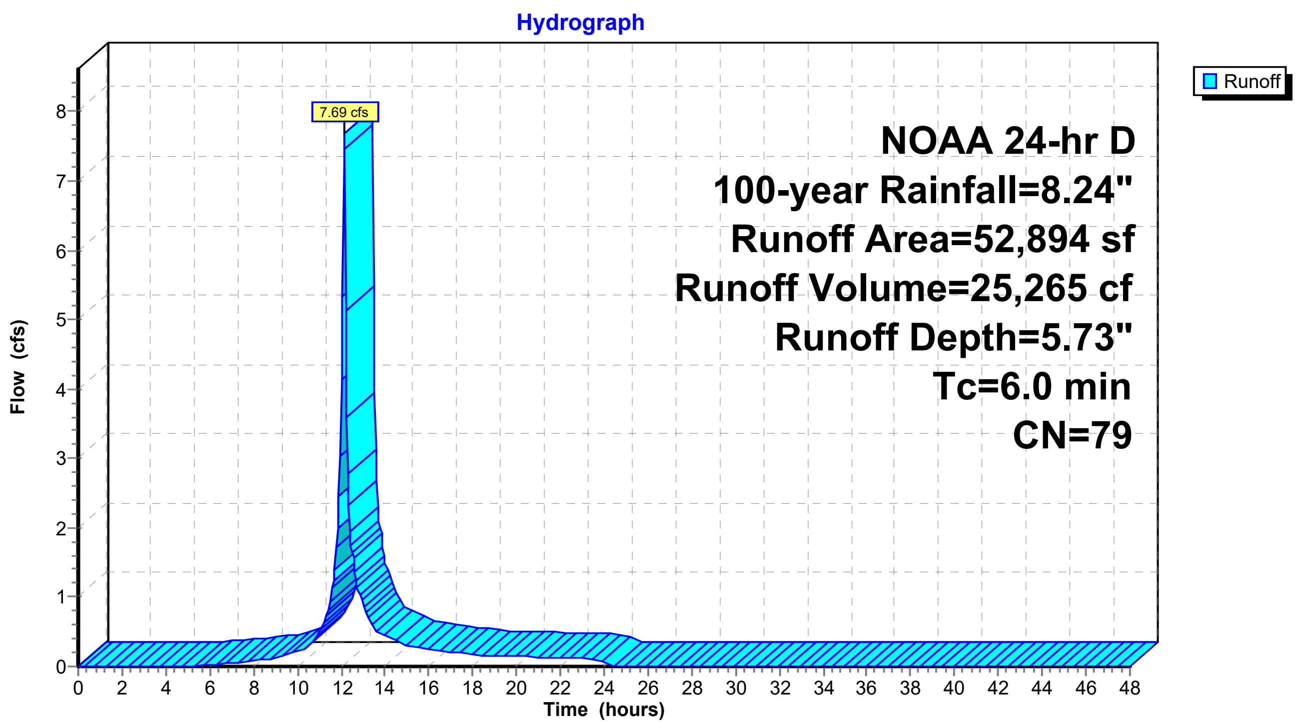
Runoff = 7.69 cfs @ 12.13 hrs, Volume= 25,265 cf, Depth= 5.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
35,565	98	Paved parking, HSG A
17,329	39	>75% Grass cover, Good, HSG A
52,894	79	Weighted Average
17,329		32.76% Pervious Area
35,565		67.24% Impervious Area

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

Subcatchment PR-1S: PR-1S



Summary for Subcatchment PR-1U: PR-1U

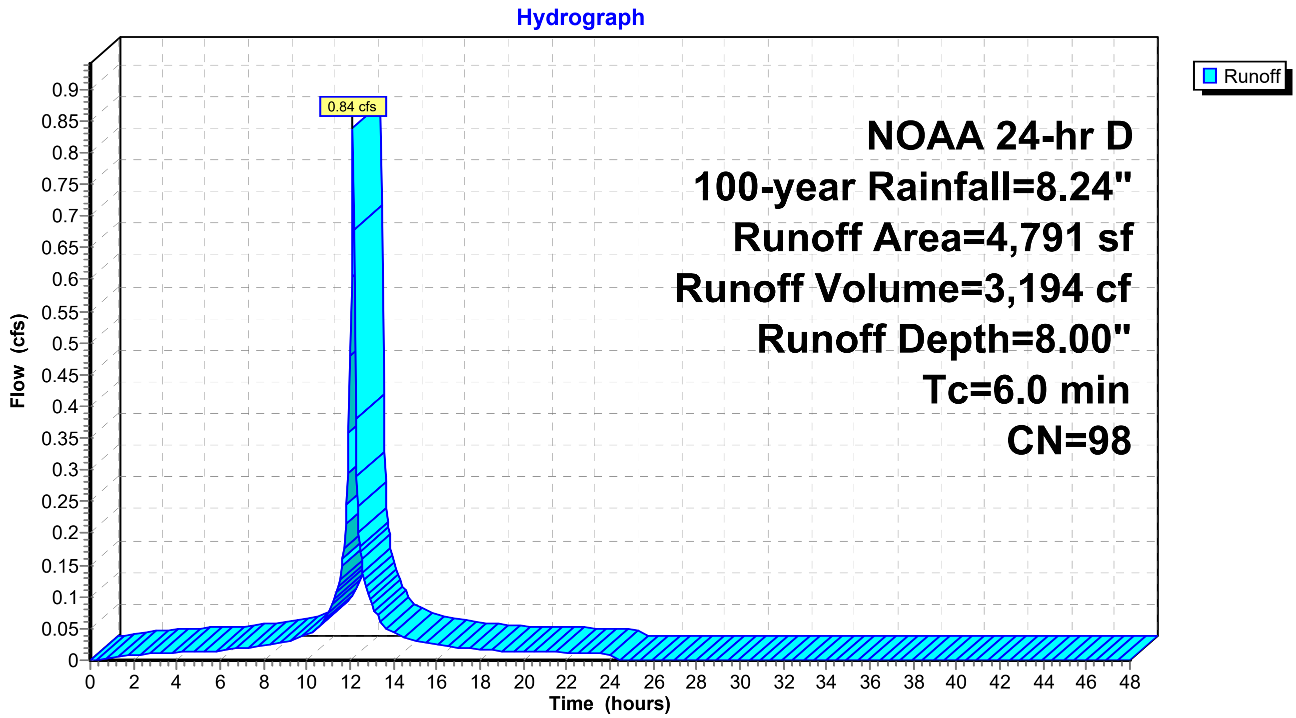
Runoff = 0.84 cfs @ 12.13 hrs, Volume= 3,194 cf, Depth= 8.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
4,791	98	Paved parking, HSG A
4,791		100.00% Impervious Area

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

Subcatchment PR-1U: PR-1U



Summary for Subcatchment PR-1V: PR-1V

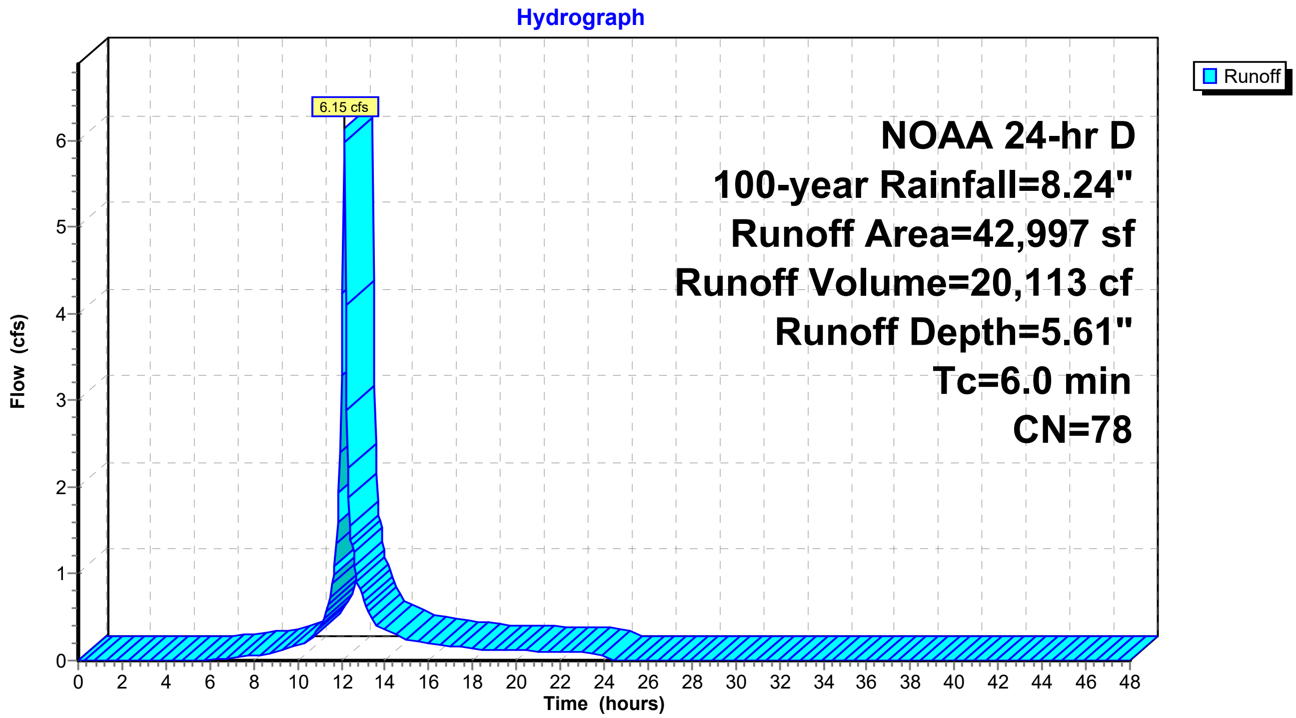
Runoff = 6.15 cfs @ 12.13 hrs, Volume= 20,113 cf, Depth= 5.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
28,362	98	Paved parking, HSG A
14,635	39	>75% Grass cover, Good, HSG A
42,997	78	Weighted Average
14,635		34.04% Pervious Area
28,362		65.96% Impervious Area

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

Subcatchment PR-1V: PR-1V



Summary for Subcatchment PR-2A: PR-2A

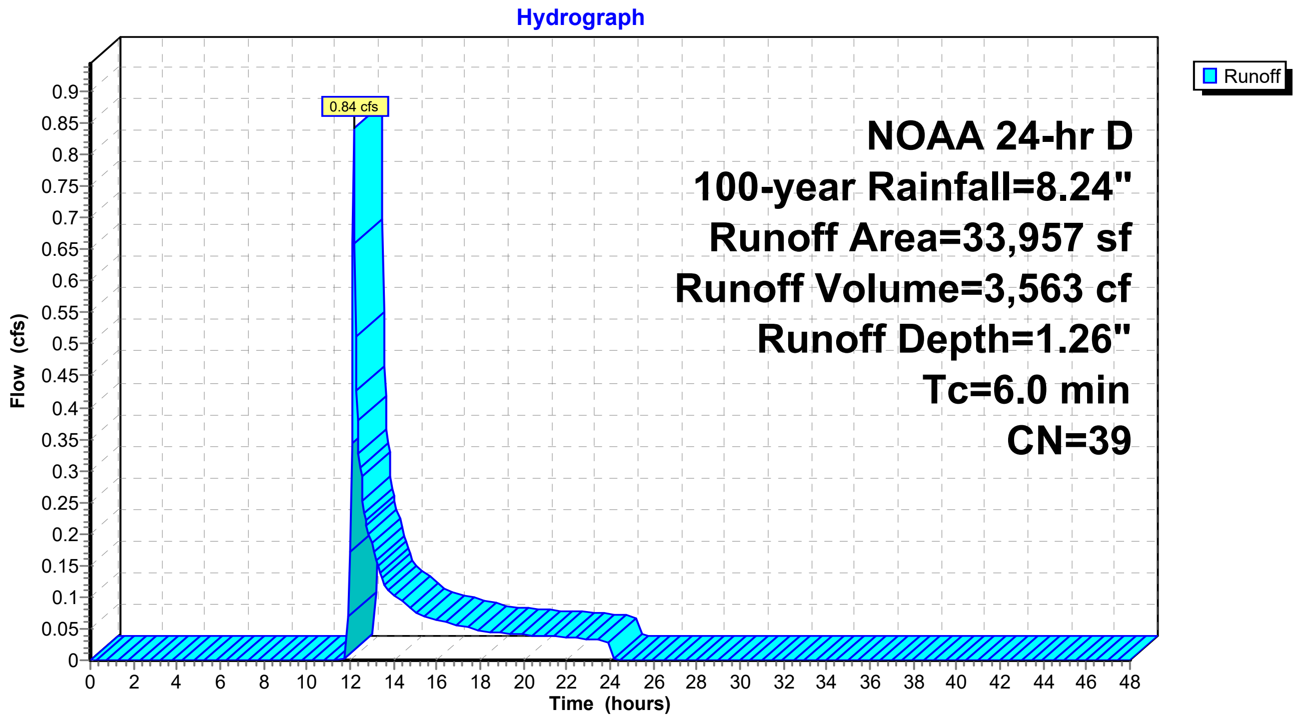
Runoff = 0.84 cfs @ 12.15 hrs, Volume= 3,563 cf, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
33,957	39	>75% Grass cover, Good, HSG A
33,957		100.00% Pervious Area

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

Subcatchment PR-2A: PR-2A



Summary for Subcatchment PR-2B: PR-2B

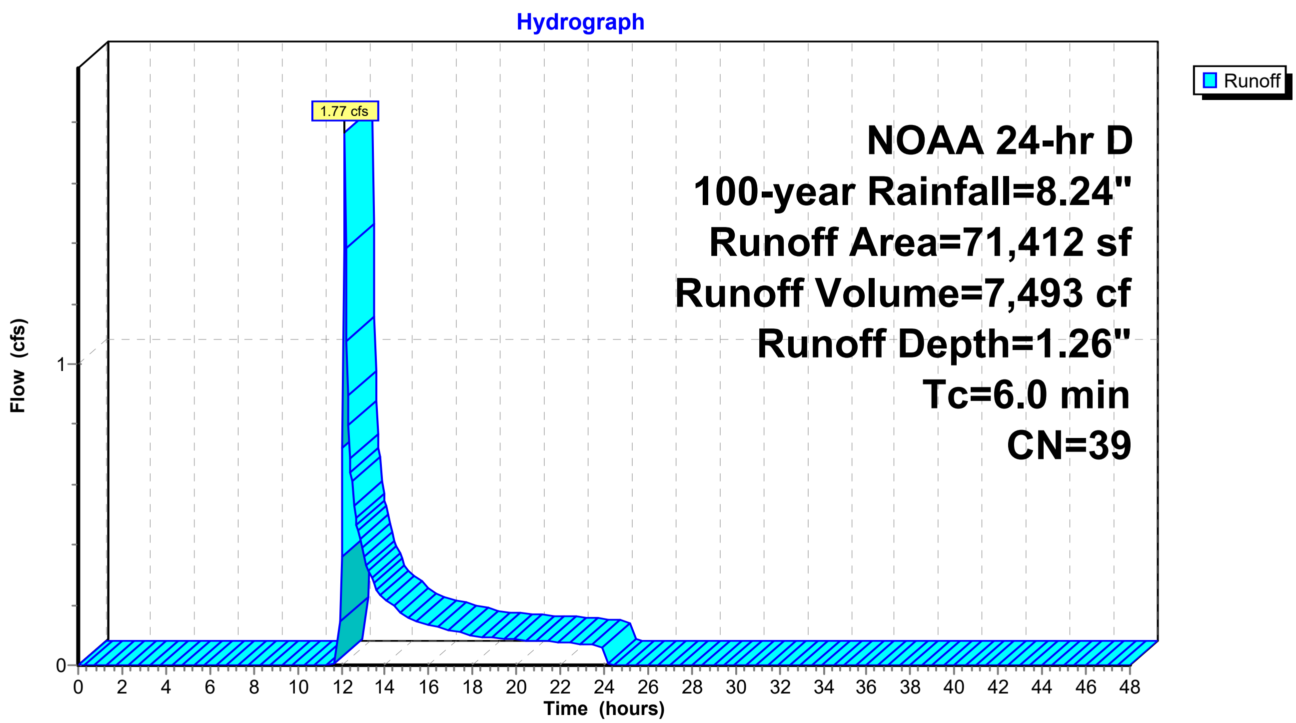
Runoff = 1.77 cfs @ 12.15 hrs, Volume= 7,493 cf, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
71,412	39	>75% Grass cover, Good, HSG A
71,412		100.00% Pervious Area

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

Subcatchment PR-2B: PR-2B



Summary for Subcatchment PR-2C: PR-2C

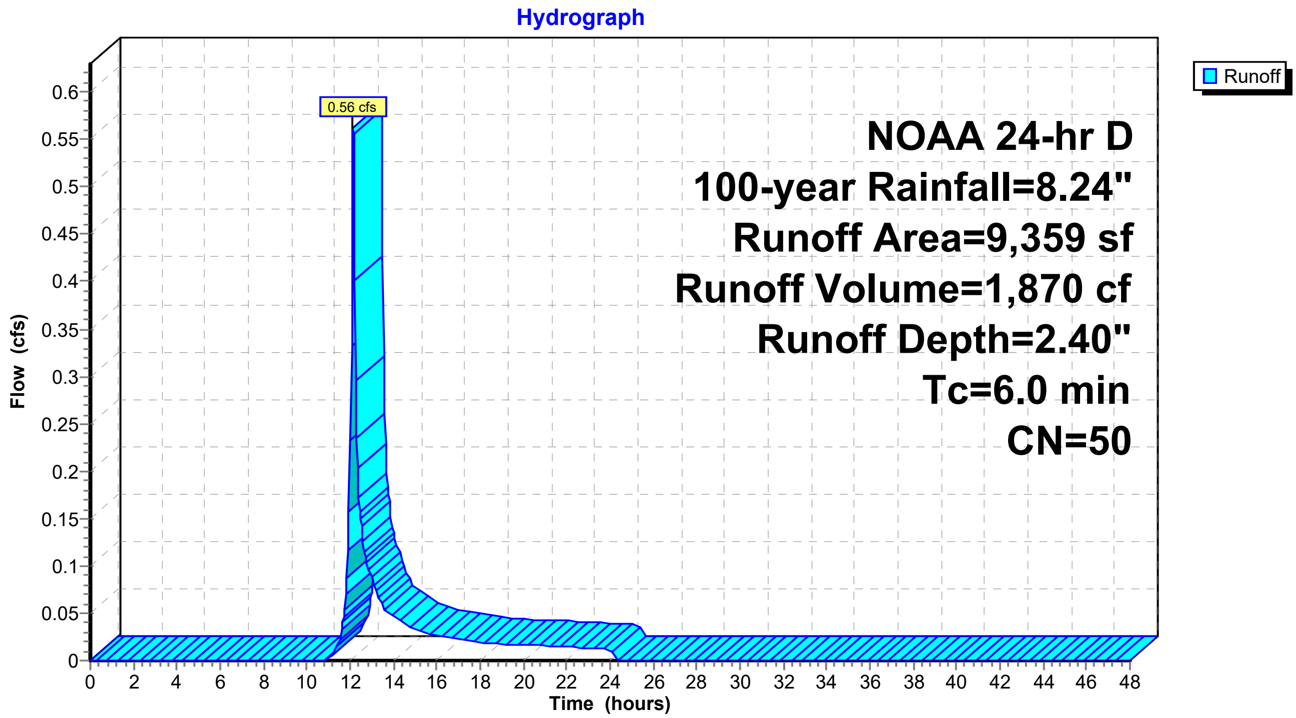
Runoff = 0.56 cfs @ 12.14 hrs, Volume= 1,870 cf, Depth= 2.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
1,683	98	Paved parking, HSG A
7,676	39	>75% Grass cover, Good, HSG A
9,359	50	Weighted Average
7,676		82.02% Pervious Area
1,683		17.98% Impervious Area

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

Subcatchment PR-2C: PR-2C



Summary for Subcatchment PR-2D: PR-2D

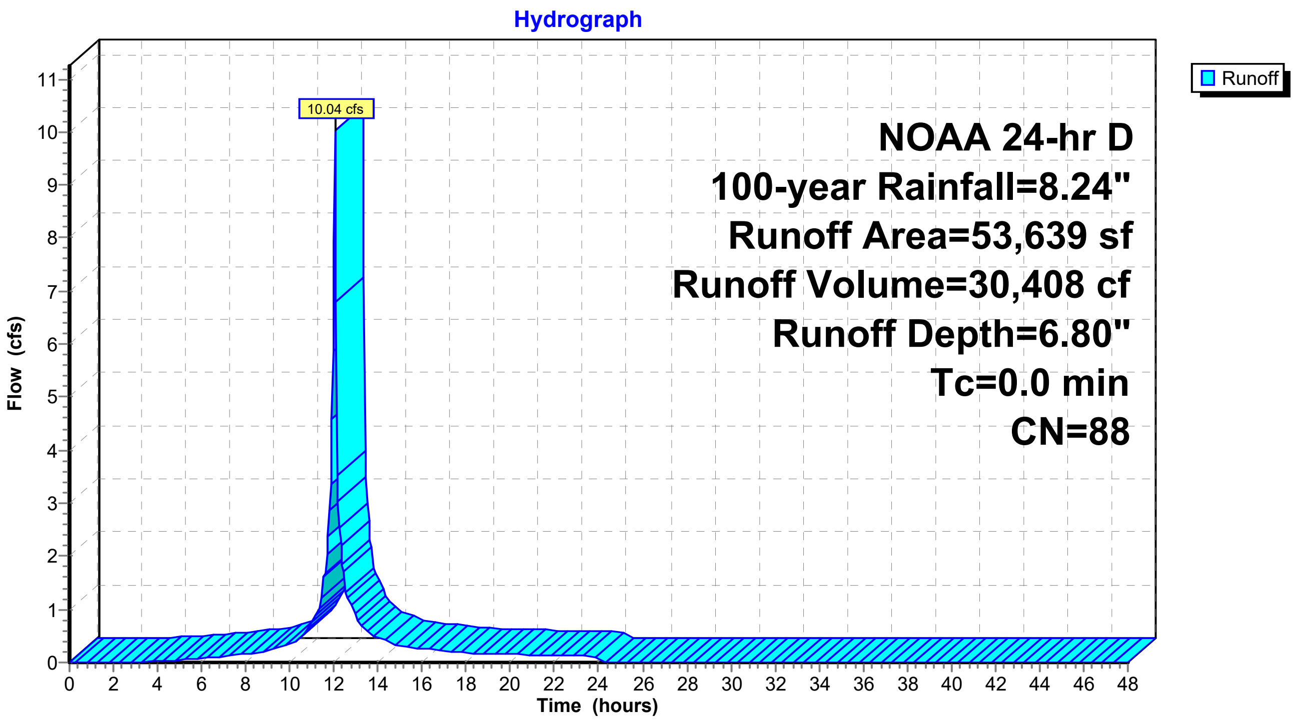
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 10.04 cfs @ 12.04 hrs, Volume= 30,408 cf, Depth= 6.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
44,403	98	Paved parking, HSG A
9,236	39	>75% Grass cover, Good, HSG A
53,639	88	Weighted Average
9,236		17.22% Pervious Area
44,403		82.78% Impervious Area

Subcatchment PR-2D: PR-2D



Summary for Subcatchment PR-2E: PR-2E

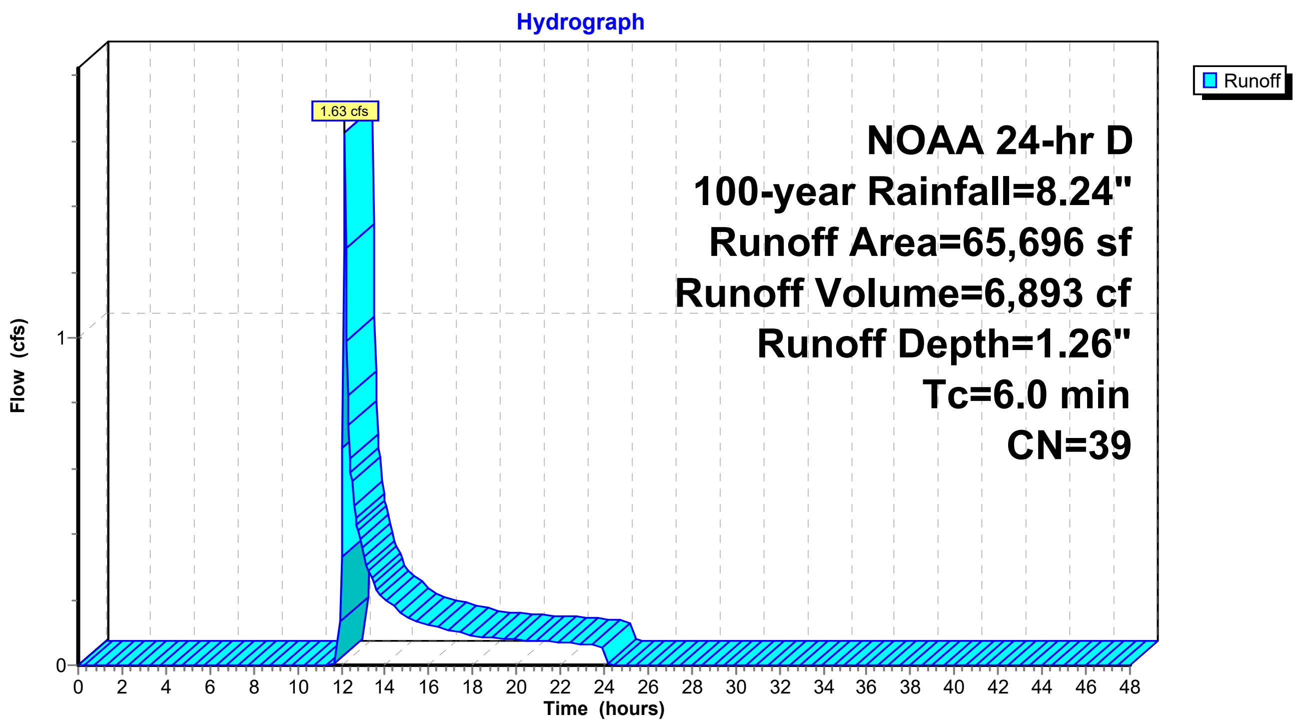
Runoff = 1.63 cfs @ 12.15 hrs, Volume= 6,893 cf, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
65,696	39	>75% Grass cover, Good, HSG A
65,696		100.00% Pervious Area

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

Subcatchment PR-2E: PR-2E



Summary for Subcatchment PR-2F: PR-2F

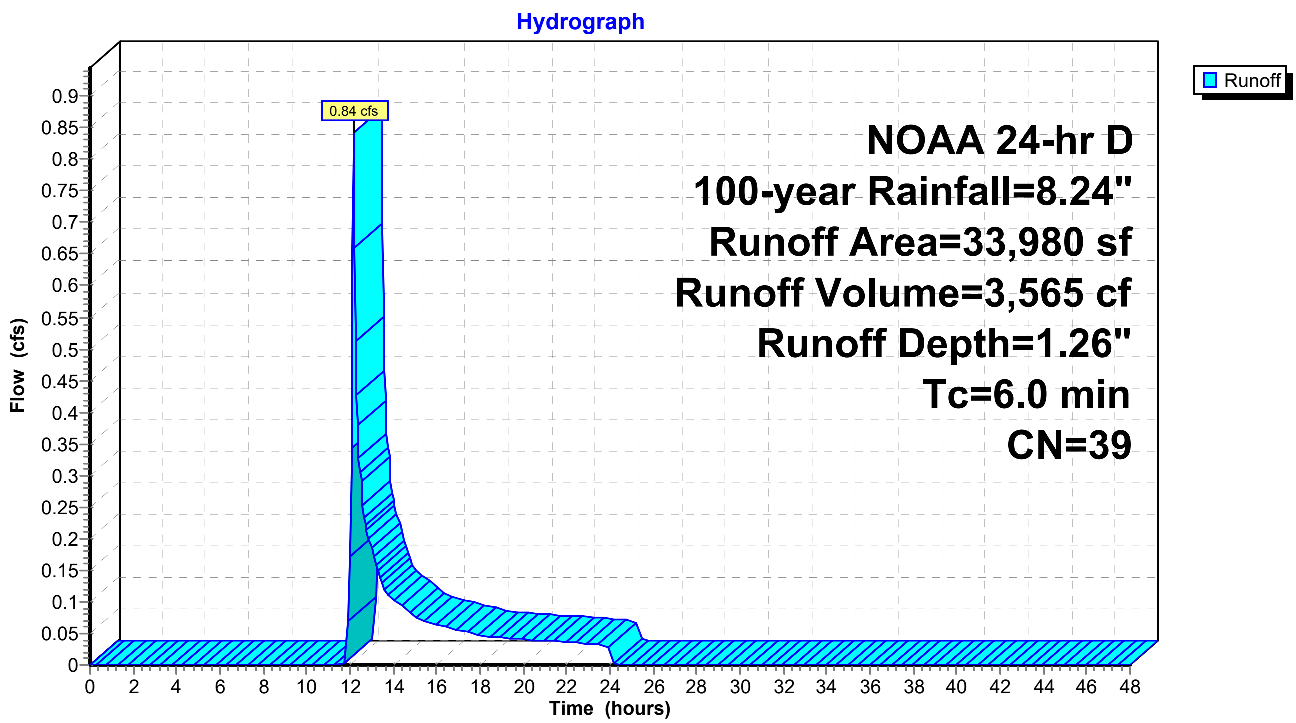
Runoff = 0.84 cfs @ 12.15 hrs, Volume= 3,565 cf, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
33,980	39	>75% Grass cover, Good, HSG A
33,980		100.00% Pervious Area

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

Subcatchment PR-2F: PR-2F



Summary for Subcatchment PR-2G: PR-2G

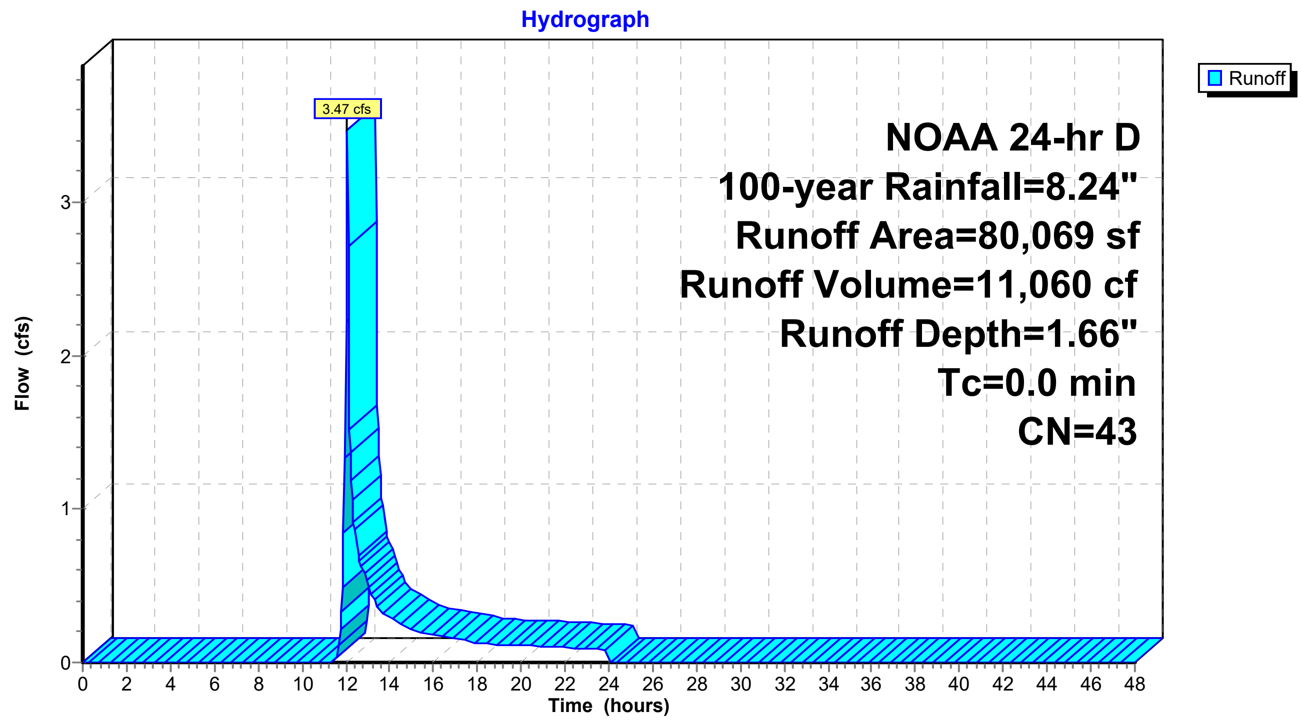
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 3.47 cfs @ 12.06 hrs, Volume= 11,060 cf, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
5,874	98	Paved parking, HSG A
74,195	39	>75% Grass cover, Good, HSG A
80,069	43	Weighted Average
74,195		92.66% Pervious Area
5,874		7.34% Impervious Area

Subcatchment PR-2G: PR-2G



Summary for Subcatchment PR-2H: PR-2H

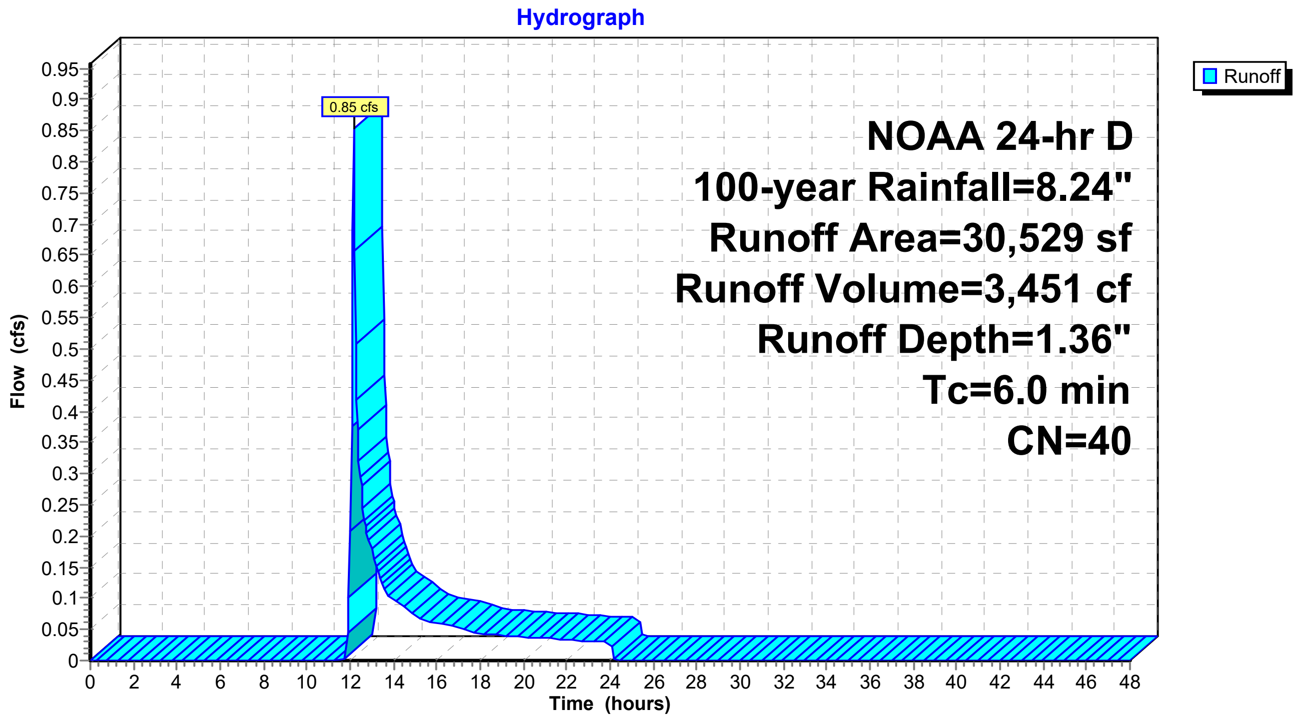
Runoff = 0.85 cfs @ 12.15 hrs, Volume= 3,451 cf, Depth= 1.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
453	98	Paved parking, HSG A
30,076	39	>75% Grass cover, Good, HSG A
30,529	40	Weighted Average
30,076		98.52% Pervious Area
453		1.48% Impervious Area

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

Subcatchment PR-2H: PR-2H



Summary for Subcatchment PR-3A: PR-3A

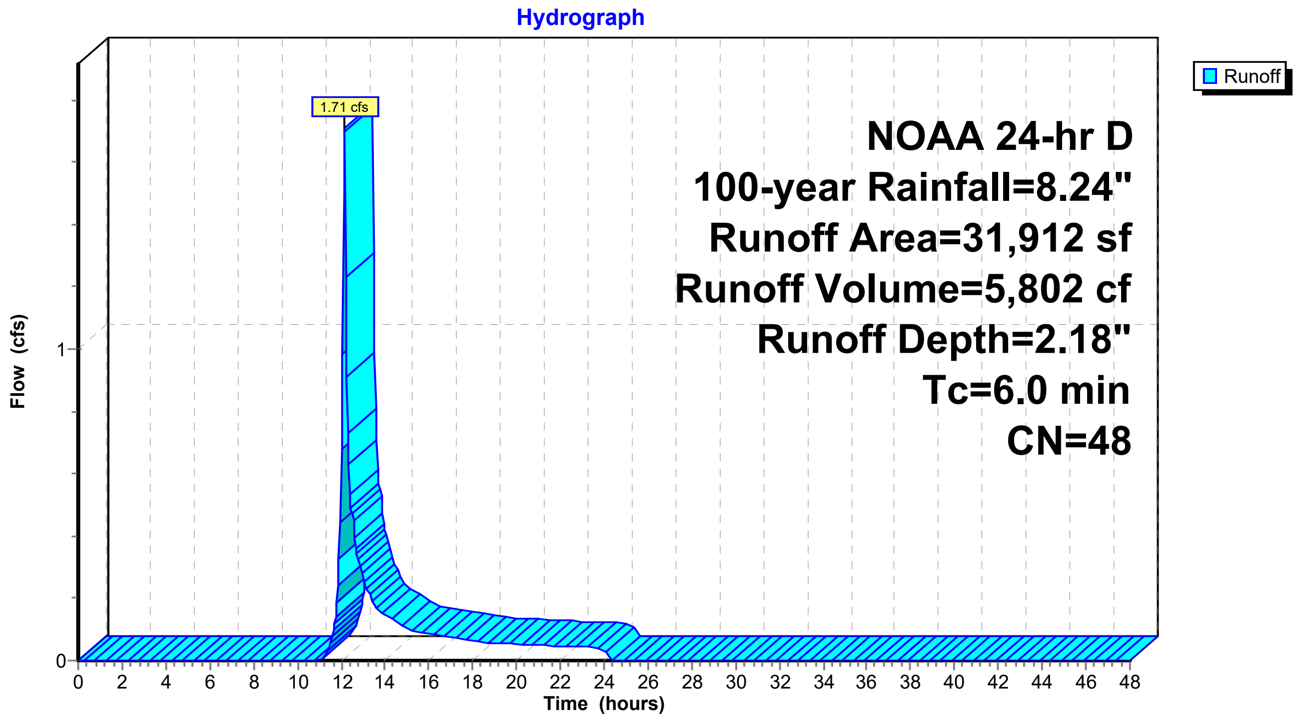
Runoff = 1.71 cfs @ 12.14 hrs, Volume= 5,802 cf, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
4,890	98	Paved parking, HSG A
27,022	39	>75% Grass cover, Good, HSG A
31,912	48	Weighted Average
27,022		84.68% Pervious Area
4,890		15.32% Impervious Area

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

Subcatchment PR-3A: PR-3A



Summary for Subcatchment PR-3B: PR-3B

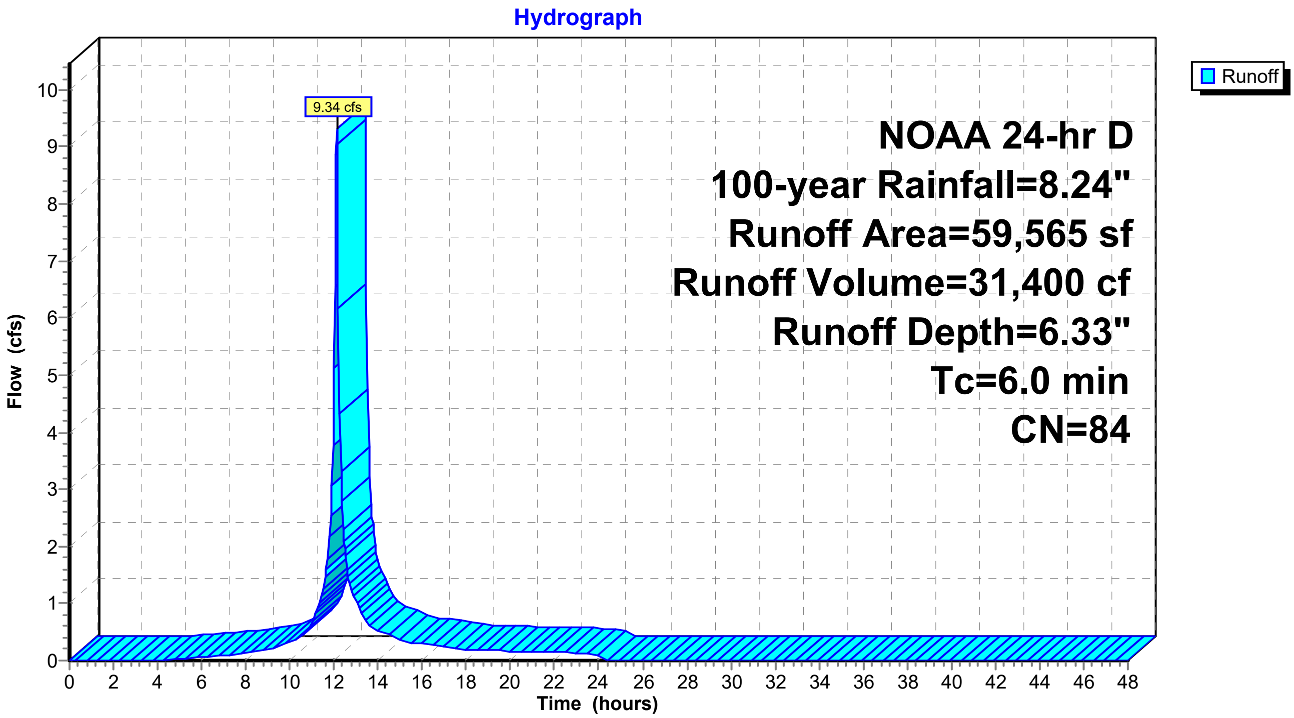
Runoff = 9.34 cfs @ 12.13 hrs, Volume= 31,400 cf, Depth= 6.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
45,006	98	Paved parking, HSG A
14,559	39	>75% Grass cover, Good, HSG A
59,565	84	Weighted Average
14,559		24.44% Pervious Area
45,006		75.56% Impervious Area

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

Subcatchment PR-3B: PR-3B



Summary for Subcatchment PR-3C: PR-3C

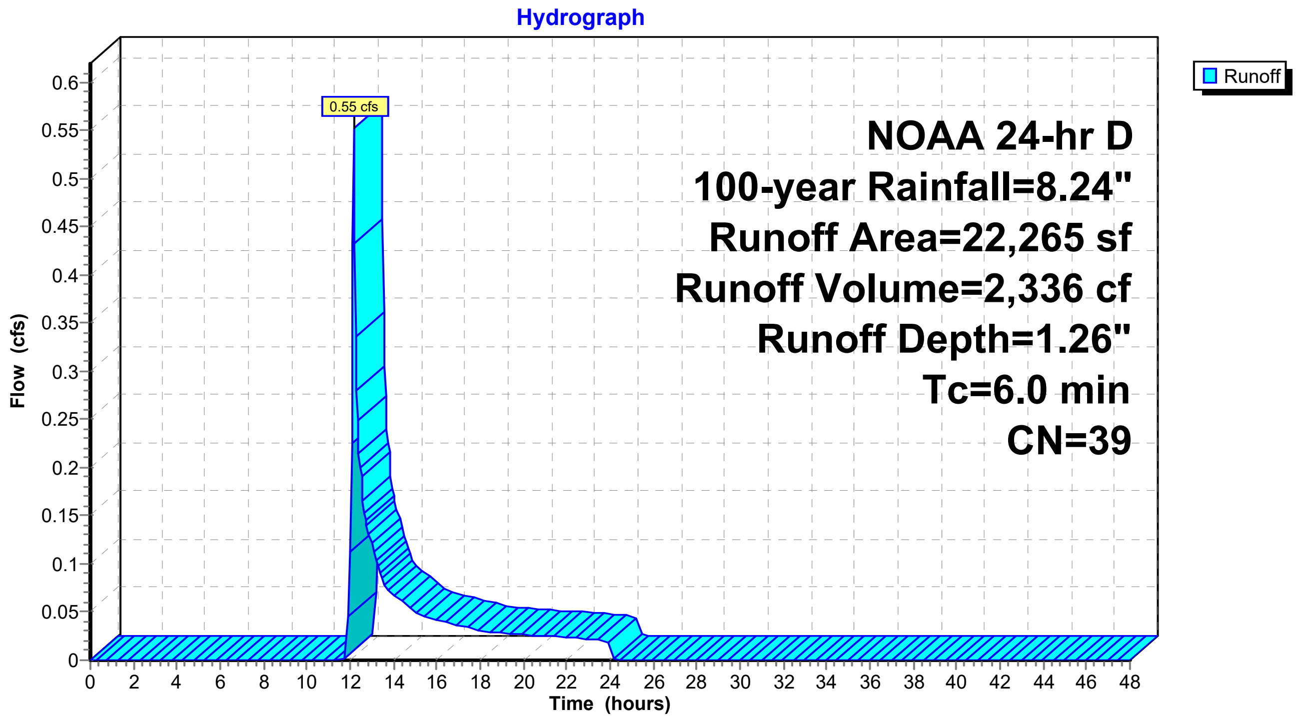
Runoff = 0.55 cfs @ 12.15 hrs, Volume= 2,336 cf, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100-year Rainfall=8.24"

Area (sf)	CN	Description
22,265	39	>75% Grass cover, Good, HSG A
22,265		100.00% Pervious Area

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

Subcatchment PR-3C: PR-3C

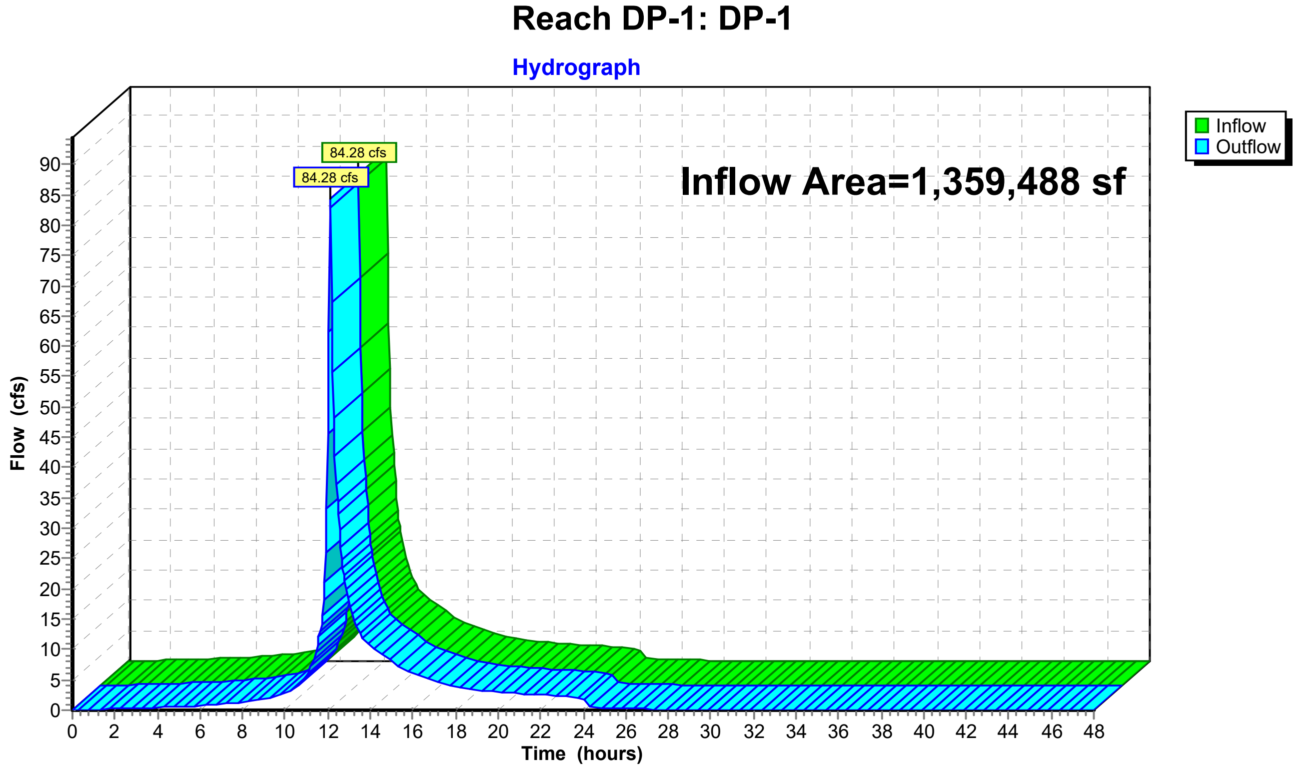


Summary for Reach DP-1: DP-1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	1,359,488 sf, 43.90% Impervious,	Inflow Depth > 3.88"	for 100-year event
Inflow =	84.28 cfs @ 12.13 hrs, Volume=	439,418 cf	
Outflow =	84.28 cfs @ 12.13 hrs, Volume=	439,418 cf, Atten= 0%, Lag= 0.0 min	

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

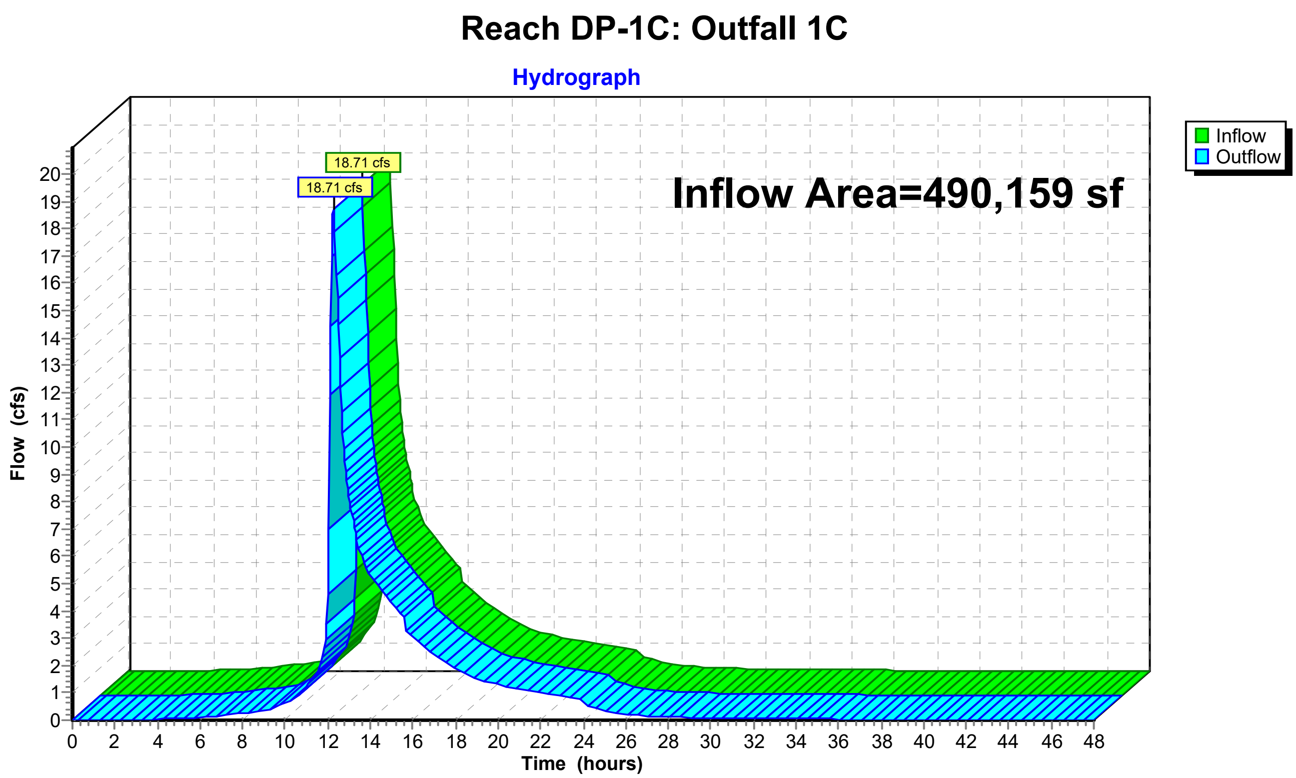


Summary for Reach DP-1C: Outfall 1C

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 490,159 sf, 53.24% Impervious, Inflow Depth > 3.99" for 100-year event
Inflow = 18.71 cfs @ 12.27 hrs, Volume= 162,841 cf
Outflow = 18.71 cfs @ 12.27 hrs, Volume= 162,841 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



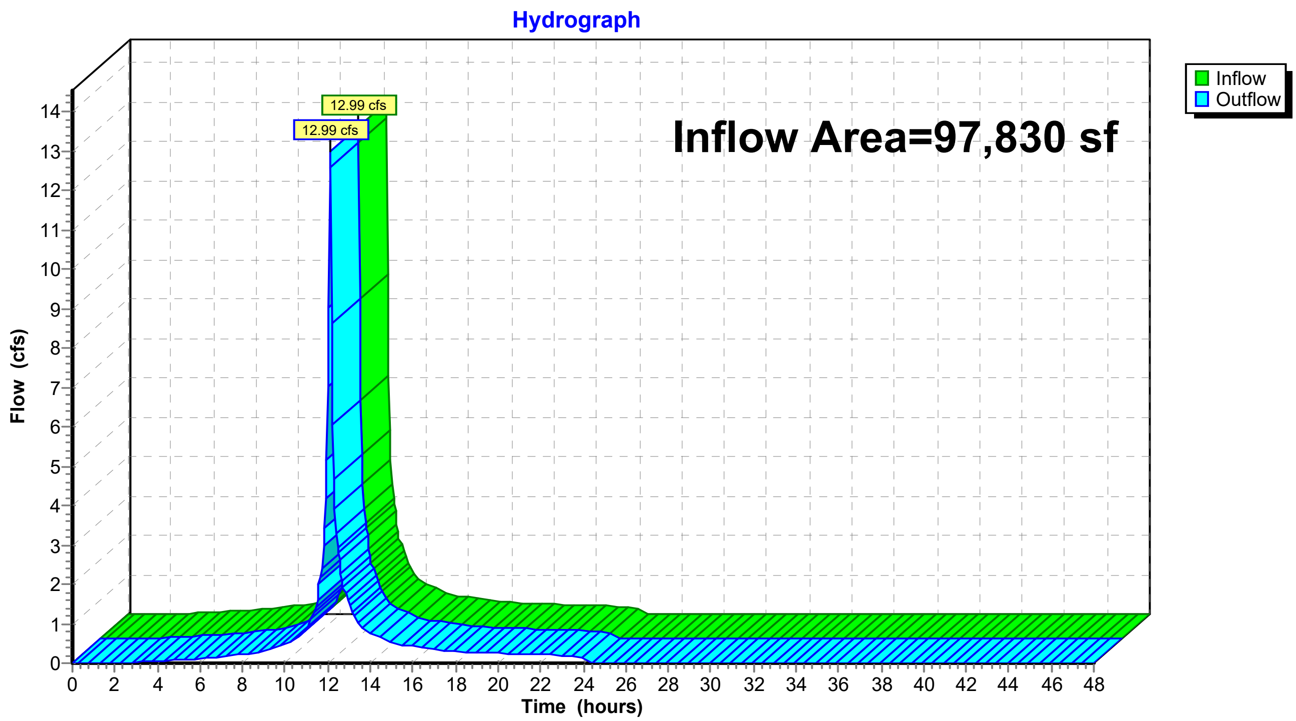
Summary for Reach DP-1D: Outfall 1D

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	97,830 sf, 64.12% Impervious,	Inflow Depth = 5.55"	for 100-year event
Inflow =	12.99 cfs @ 12.13 hrs, Volume=	45,212 cf	
Outflow =	12.99 cfs @ 12.13 hrs, Volume=	45,212 cf, Atten= 0%, Lag= 0.0 min	

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-1D: Outfall 1D



Summary for Reach DP-2: DP-2

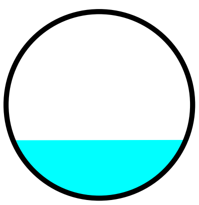
[52] Hint: Inlet/Outlet conditions not evaluated

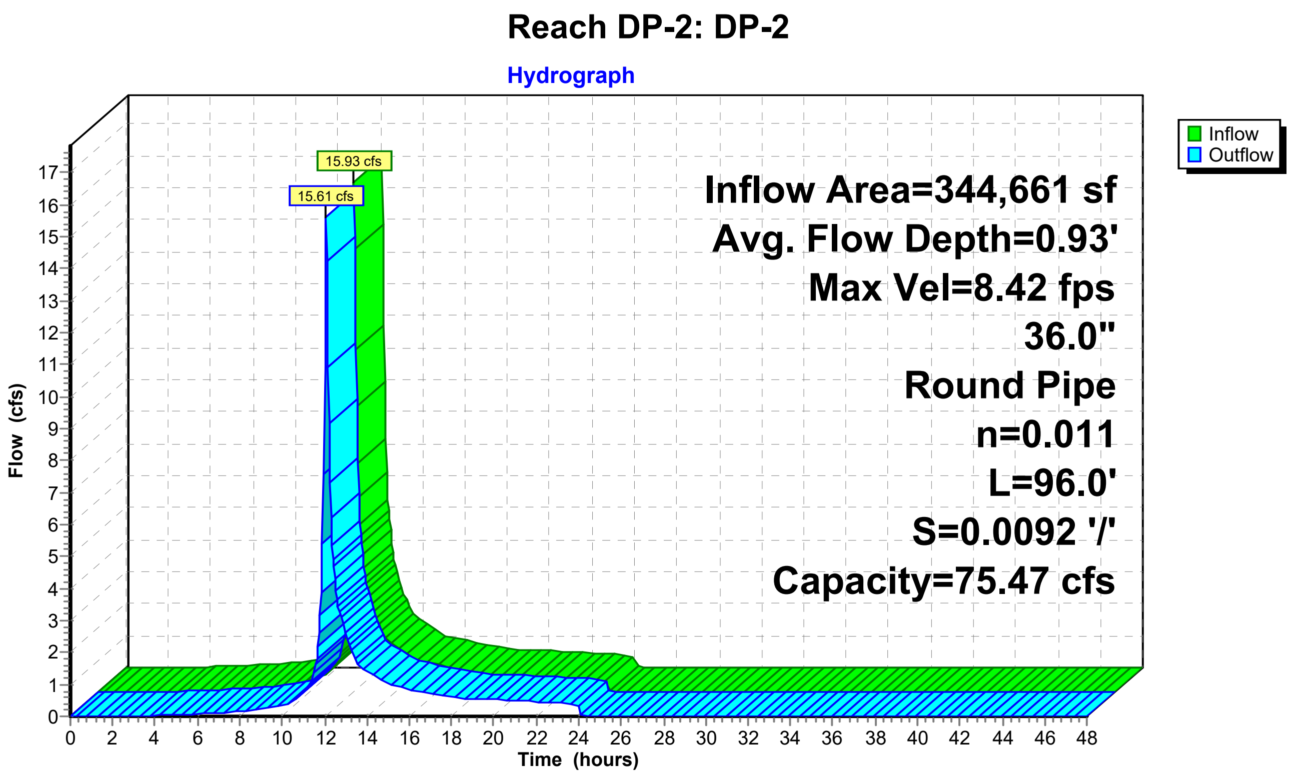
Inflow Area = 344,661 sf, 15.21% Impervious, Inflow Depth = 2.25" for 100-year event
Inflow = 15.93 cfs @ 12.06 hrs, Volume= 64,739 cf
Outflow = 15.61 cfs @ 12.06 hrs, Volume= 64,739 cf, Atten= 2%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.42 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.97 fps, Avg. Travel Time= 0.5 min

Peak Storage= 180 cf @ 12.06 hrs
Average Depth at Peak Storage= 0.93'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 75.47 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 96.0' Slope= 0.0092 '/'
Inlet Invert= 16.00', Outlet Invert= 15.12'





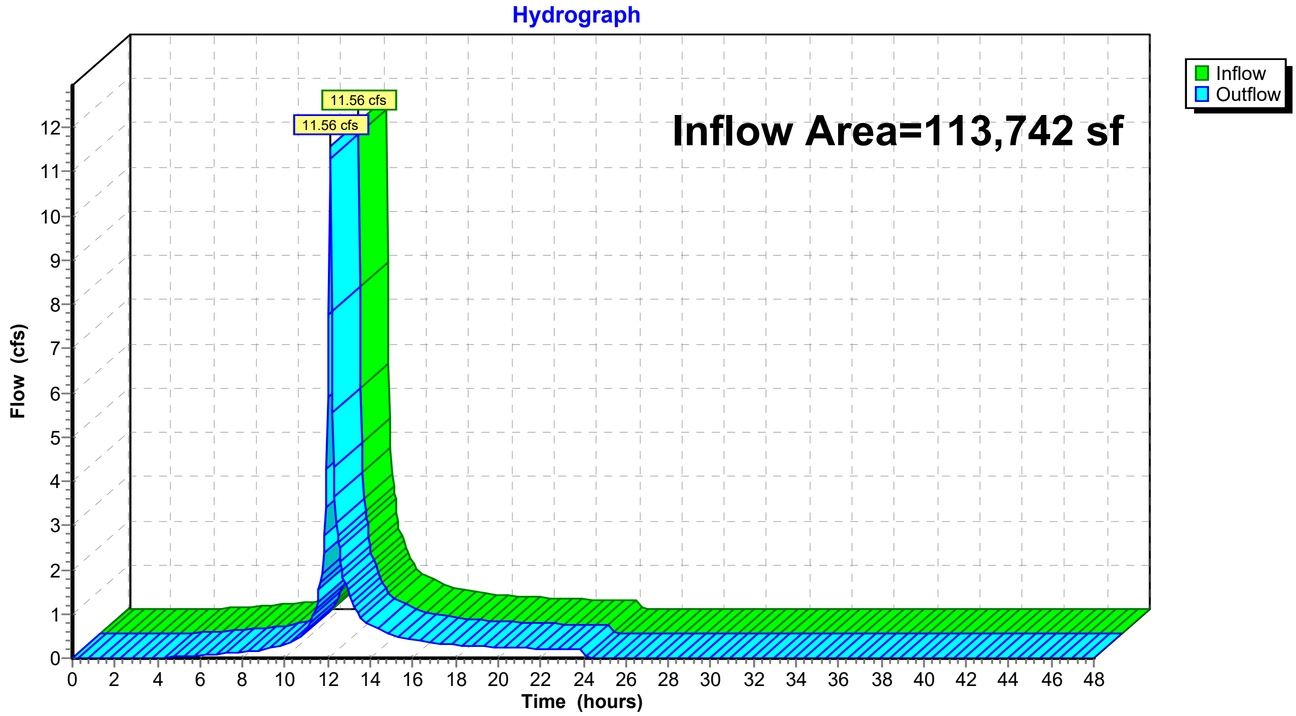
Summary for Reach DP-3: DP-3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	113,742 sf, 43.87% Impervious,	Inflow Depth = 4.17"	for 100-year event
Inflow =	11.56 cfs @ 12.13 hrs, Volume=	39,538 cf	
Outflow =	11.56 cfs @ 12.13 hrs, Volume=	39,538 cf, Atten= 0%, Lag= 0.0 min	

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach DP-3: DP-3

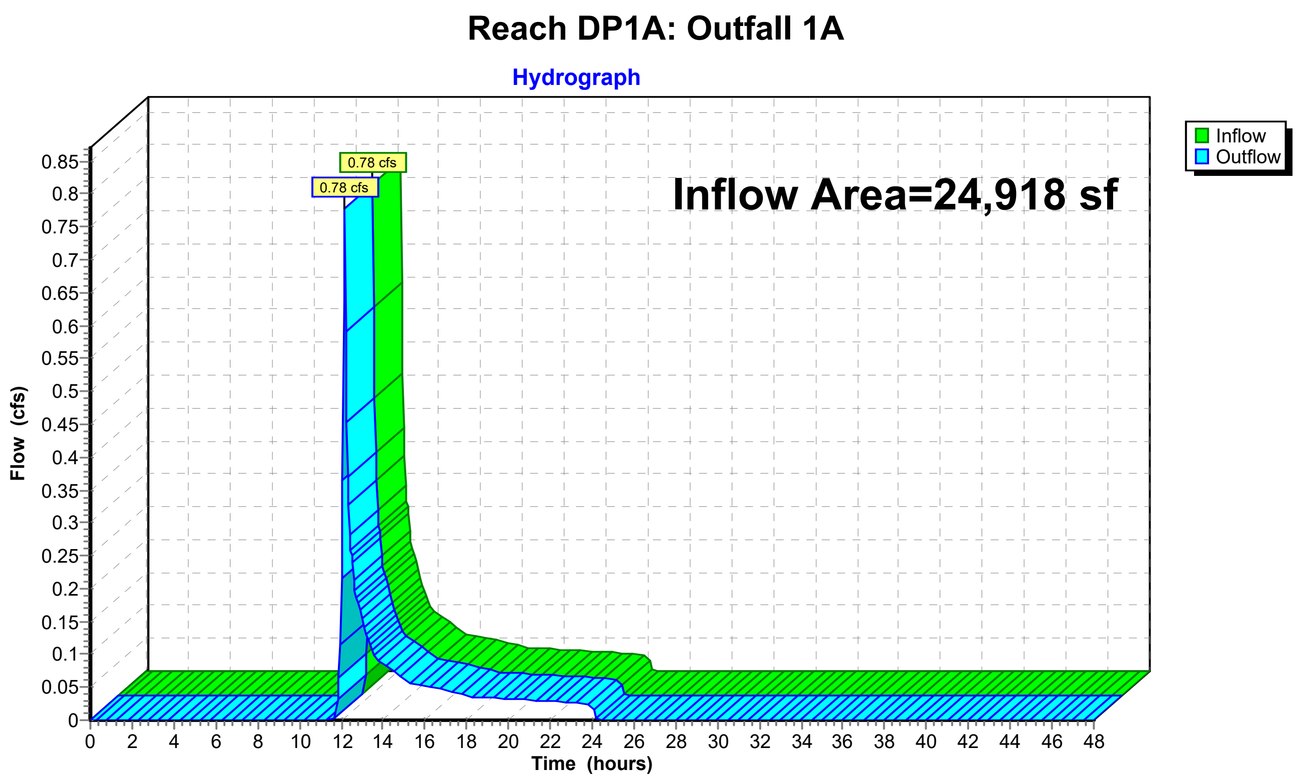


Summary for Reach DP1A: Outfall 1A

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area =	24,918 sf,	3.36% Impervious,	Inflow Depth = 1.46"	for 100-year event
Inflow =	0.78 cfs @	12.15 hrs, Volume=	3,022 cf	
Outflow =	0.78 cfs @	12.15 hrs, Volume=	3,022 cf, Atten= 0%, Lag= 0.0 min	

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

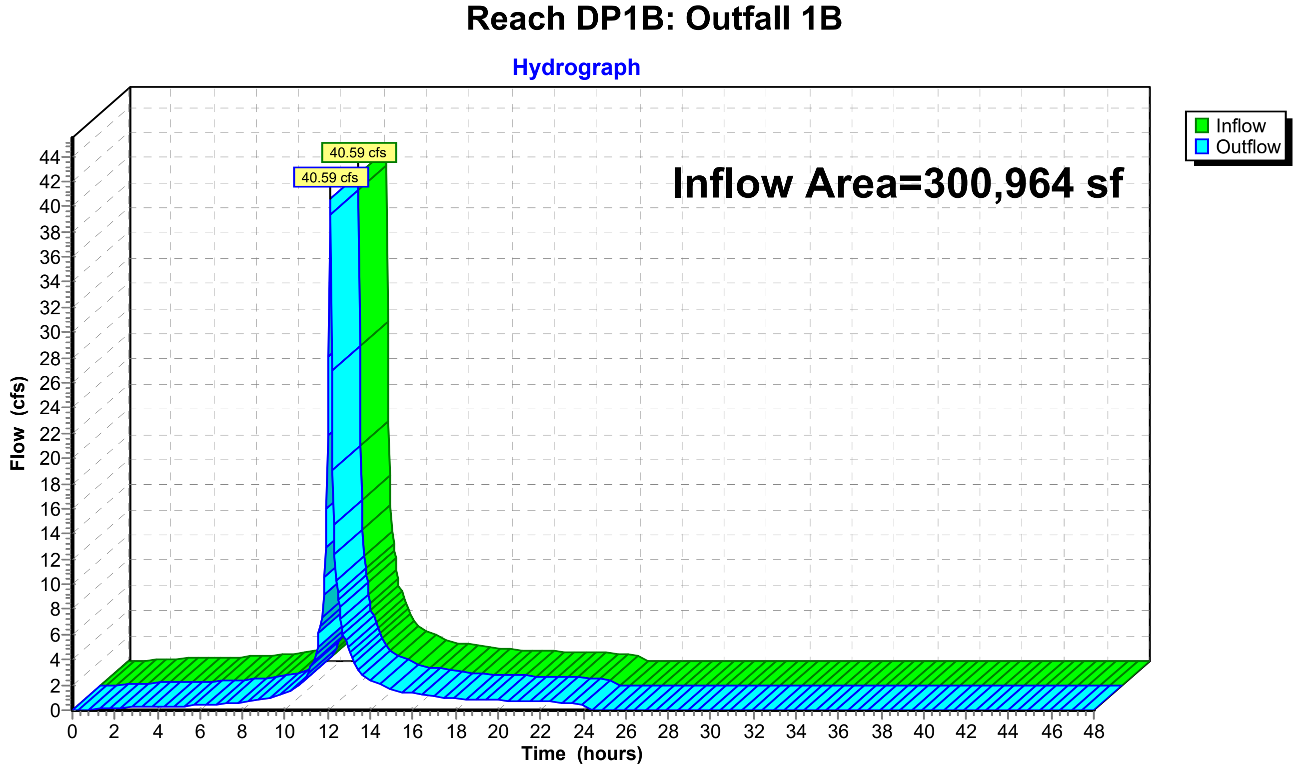


Summary for Reach DP1B: Outfall 1B

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 300,964 sf, 66.36% Impervious, Inflow Depth = 5.68" for 100-year event
Inflow = 40.59 cfs @ 12.13 hrs, Volume= 142,380 cf
Outflow = 40.59 cfs @ 12.13 hrs, Volume= 142,380 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

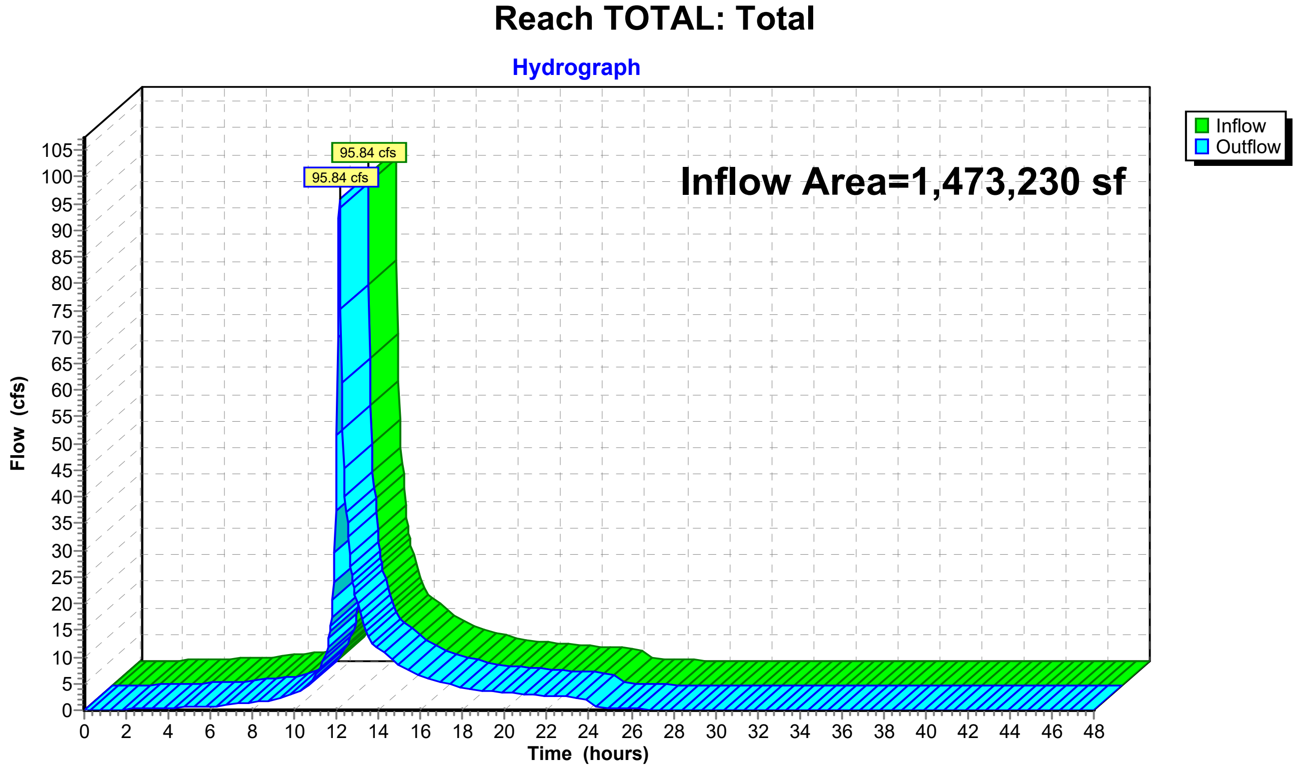


Summary for Reach TOTAL: Total

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,473,230 sf, 43.89% Impervious, Inflow Depth > 3.90" for 100-year event
Inflow = 95.84 cfs @ 12.13 hrs, Volume= 478,956 cf
Outflow = 95.84 cfs @ 12.13 hrs, Volume= 478,956 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



Summary for Pond BR-1: Bioretention 1

Inflow Area = 53,580 sf, 76.36% Impervious, Inflow Depth = 6.37" for 100-year event
Inflow = 8.37 cfs @ 12.13 hrs, Volume= 28,432 cf
Outflow = 6.34 cfs @ 12.19 hrs, Volume= 28,432 cf, Atten= 24%, Lag= 3.7 min
Primary = 6.34 cfs @ 12.19 hrs, Volume= 28,432 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 27.73' @ 12.19 hrs Surf.Area= 1,688 sf Storage= 3,169 cf

Plug-Flow detention time= 8.6 min calculated for 28,402 cf (100% of inflow)
Center-of-Mass det. time= 8.6 min (802.4 - 793.8)

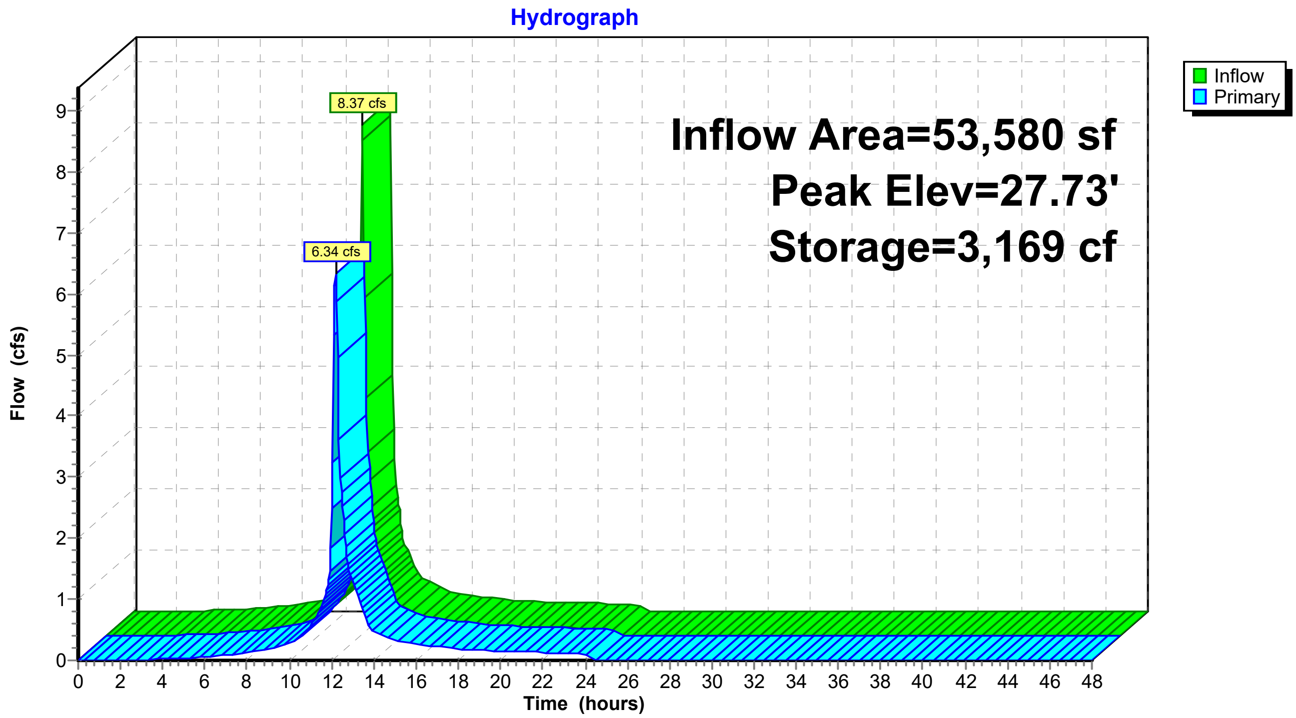
Volume	Invert	Avail.Storage	Storage Description
#1	25.00'	3,647 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
25.00	707	94.2	0	0	707
26.00	1,018	113.1	858	858	1,036
27.00	1,385	131.9	1,197	2,055	1,422
28.00	1,810	150.8	1,593	3,647	1,870

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**8.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#2	Primary	27.00'	**12.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#3	Primary	26.20'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=6.28 cfs @ 12.19 hrs HW=27.71' (Free Discharge)
├─**1=Orifice/Grate** (Orifice Controls 2.07 cfs @ 5.94 fps)
├─**2=Orifice/Grate** (Orifice Controls 2.39 cfs @ 3.04 fps)
└─**3=Orifice/Grate** (Orifice Controls 1.82 cfs @ 5.22 fps)

Pond BR-1: Bioretention 1



Summary for Pond BR-2: Bioretention 2

Inflow Area = 100,956 sf, 19.92% Impervious, Inflow Depth = 2.52" for 100-year event
Inflow = 6.05 cfs @ 12.14 hrs, Volume= 21,223 cf
Outflow = 4.83 cfs @ 12.19 hrs, Volume= 21,223 cf, Atten= 20%, Lag= 3.2 min
Primary = 4.83 cfs @ 12.19 hrs, Volume= 21,223 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 27.77' @ 12.19 hrs Surf.Area= 1,295 sf Storage= 1,743 cf

Plug-Flow detention time= 10.7 min calculated for 21,201 cf (100% of inflow)
Center-of-Mass det. time= 10.7 min (868.8 - 858.0)

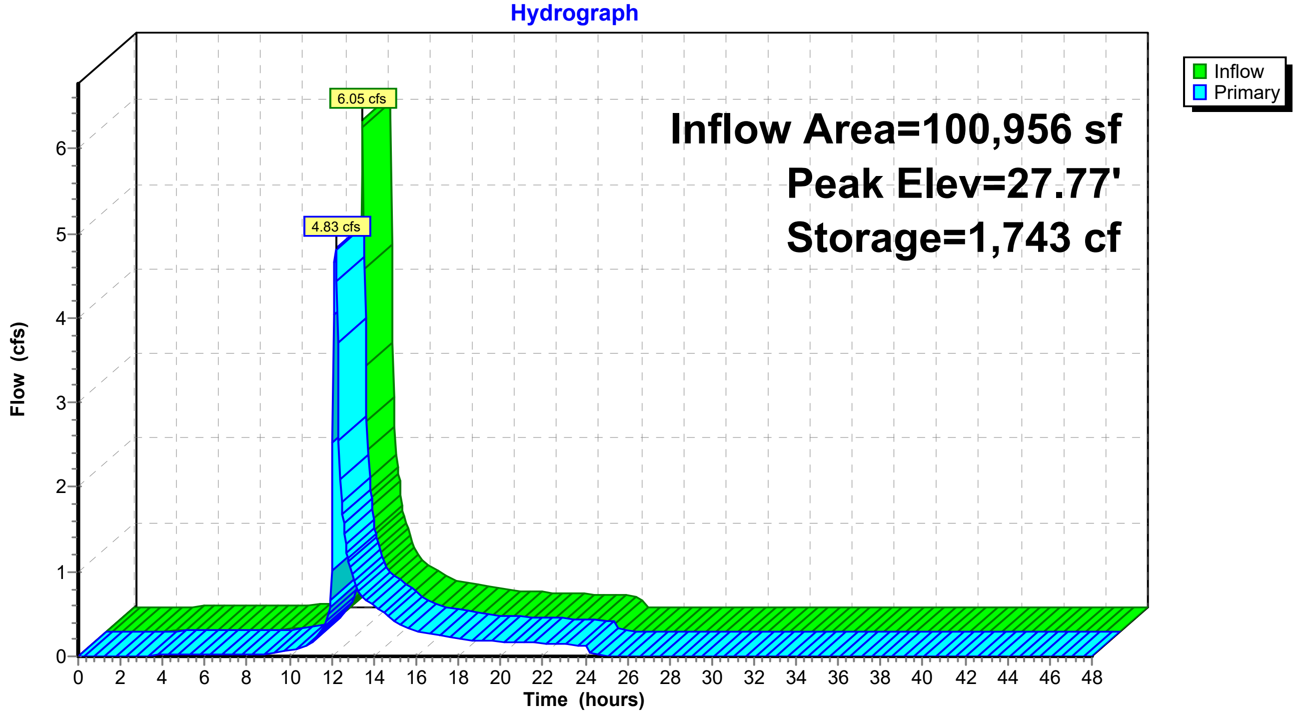
Volume	Invert	Avail.Storage	Storage Description
#1	26.00'	3,647 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
26.00	707	94.2	0	0	707
27.00	1,018	113.1	858	858	1,036
28.00	1,385	131.9	1,197	2,055	1,422
29.00	1,810	150.8	1,593	3,647	1,870

Device	Routing	Invert	Outlet Devices
#1	Primary	27.00'	**15.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#2	Primary	26.00'	**6.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.78 cfs @ 12.19 hrs HW=27.75' (Free Discharge)
├─**1=Orifice/Grate** (Orifice Controls 3.84 cfs @ 3.13 fps)
└─**2=Orifice/Grate** (Orifice Controls 0.94 cfs @ 4.78 fps)

Pond BR-2: Bioretention 2



Summary for Pond BR-3: Bioretention 3

Inflow Area = 80,355 sf, 58.01% Impervious, Inflow Depth = 5.11" for 100-year event
Inflow = 10.08 cfs @ 12.13 hrs, Volume= 34,231 cf
Outflow = 5.42 cfs @ 12.24 hrs, Volume= 34,231 cf, Atten= 46%, Lag= 6.4 min
Primary = 5.42 cfs @ 12.24 hrs, Volume= 34,231 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 27.99' @ 12.24 hrs Surf.Area= 3,947 sf Storage= 6,258 cf

Plug-Flow detention time= 18.3 min calculated for 34,196 cf (100% of inflow)
Center-of-Mass det. time= 18.3 min (824.9 - 806.6)

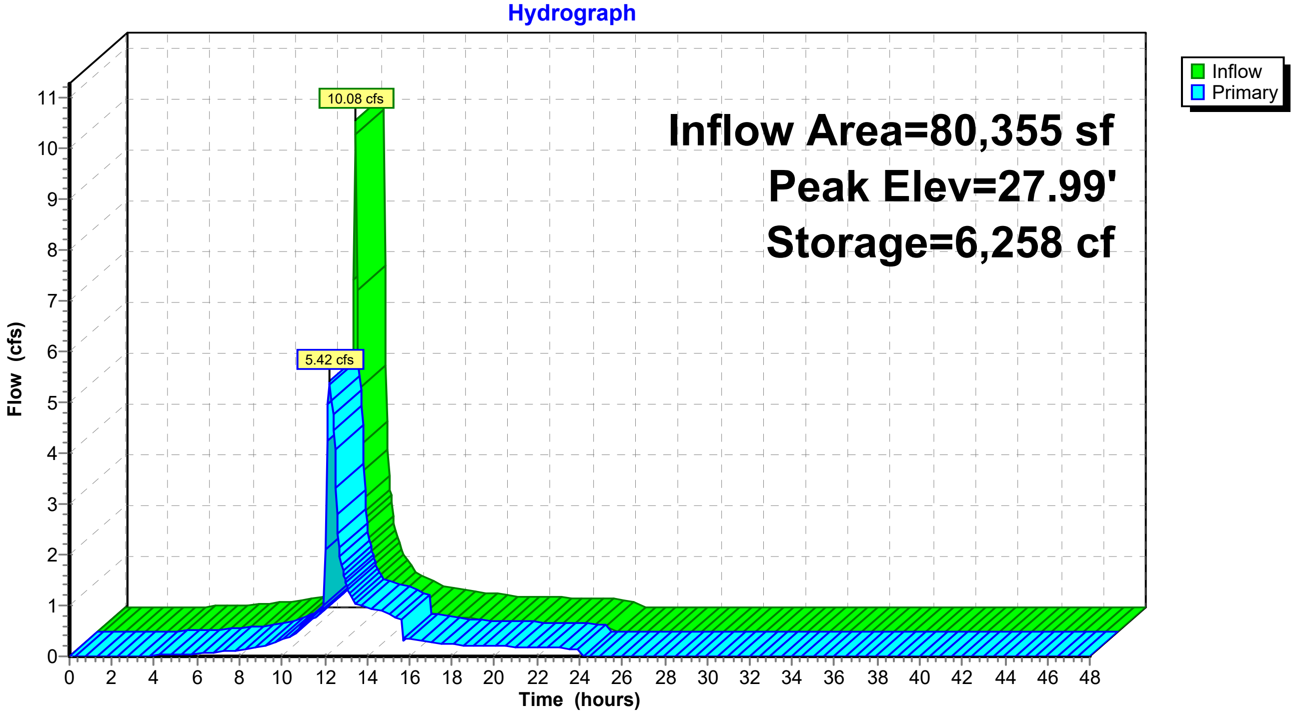
Volume	Invert	Avail.Storage	Storage Description
#1	26.00'	6,285 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
26.00	2,376	243.9	0	0	2,376
27.00	3,137	262.8	2,748	2,748	3,179
28.00	3,953	281.7	3,537	6,285	4,042

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**6.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads
#2	Primary	27.10'	**15.0" Horiz. Orifice/Grate X 0.75** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.40 cfs @ 12.24 hrs HW=27.99' (Free Discharge)
├─**1=Orifice/Grate** (Orifice Controls 1.23 cfs @ 6.24 fps)
└─**2=Orifice/Grate** (Orifice Controls 4.17 cfs @ 3.40 fps)

Pond BR-3: Bioretention 3



Summary for Pond OC: O-CHAMBERS

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Inflow Area =        190,951 sf, 35.86% Impervious,  Inflow Depth =  3.56"   for 100-year event
Inflow      =     17.59 cfs @  12.13 hrs,  Volume=          56,651 cf
Outflow     =      2.31 cfs @  13.01 hrs,  Volume=          55,694 cf,  Atten= 87%,  Lag= 52.8 min
Primary     =      2.31 cfs @  13.01 hrs,  Volume=          55,694 cf
```

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 26.19' @ 13.01 hrs Surf.Area= 23,411 sf Storage= 23,820 cf

Plug-Flow detention time= 203.0 min calculated for 55,636 cf (98% of inflow)
Center-of-Mass det. time= 194.6 min (1,046.4 - 851.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	25.00'	0 cf	**137.92'W x 169.75'L x 4.17'H Field A** 97,547 cf Overall - 97,547 cf Embedded = 0 cf x 0.0% Voids
#2A	25.00'	70,200 cf	**StormTrap ST1 SingleTrap 3-6** x 240 Inside #1 Inside= 82.7"W x 42.0"H => 20.80 sf x 14.06'L = 292.5 cf Outside= 82.7"W x 50.0"H => 28.73 sf x 14.06'L = 404.1 cf 20 Rows of 12 Chambers 137.92' x 168.75' Core + 0.00' x 0.50' Border = 137.92' x 169.75' System
		70,200 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	25.00'	**10.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.31 cfs @ 13.01 hrs HW=26.19' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 2.31 cfs @ 4.23 fps)

Pond OC: O-CHAMBERS - Chamber Wizard Field A

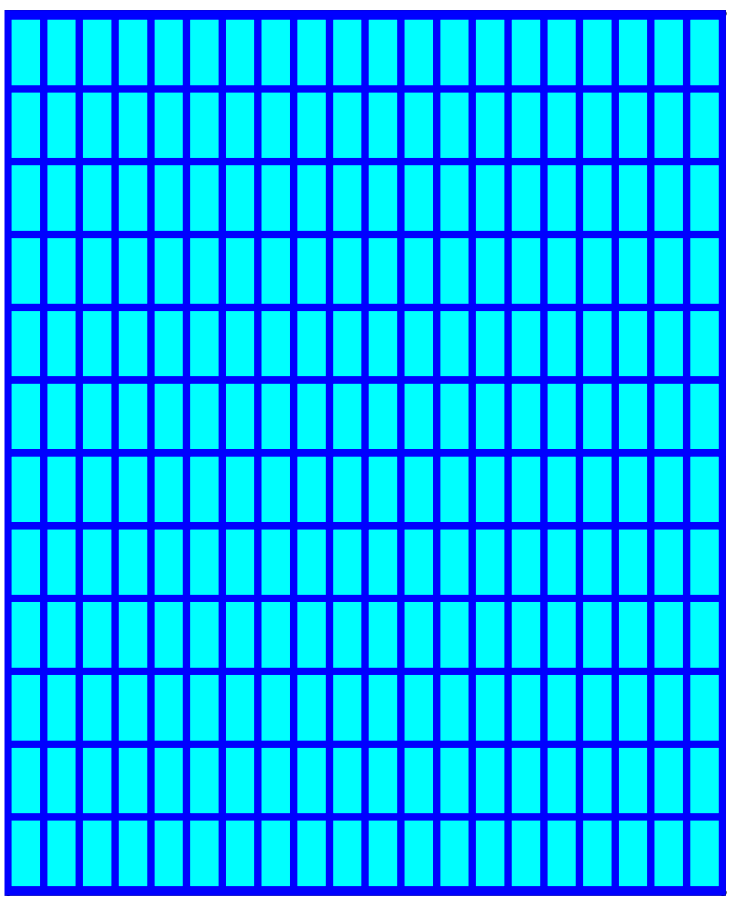
Chamber Model = StormTrap ST1 SingleTrap 3-6 (StormTrap ST1 SingleTrap®Type VI)
Inside= 82.7"W x 42.0"H => 20.80 sf x 14.06'L = 292.5 cf
Outside= 82.7"W x 50.0"H => 28.73 sf x 14.06'L = 404.1 cf

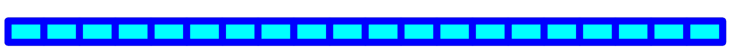
12 Chambers/Row x 14.06' Long = 168.75' Row Length +6.0" Border x 2 = 169.75' Base Length
20 Rows x 82.7" Wide = 137.92' Base Width
50.0" Chamber Height = 4.17' Field Height

240 Chambers x 292.5 cf = 70,199.7 cf Chamber Storage
240 Chambers x 404.1 cf + 574.7 cf Border = 97,547.3 cf Displacement

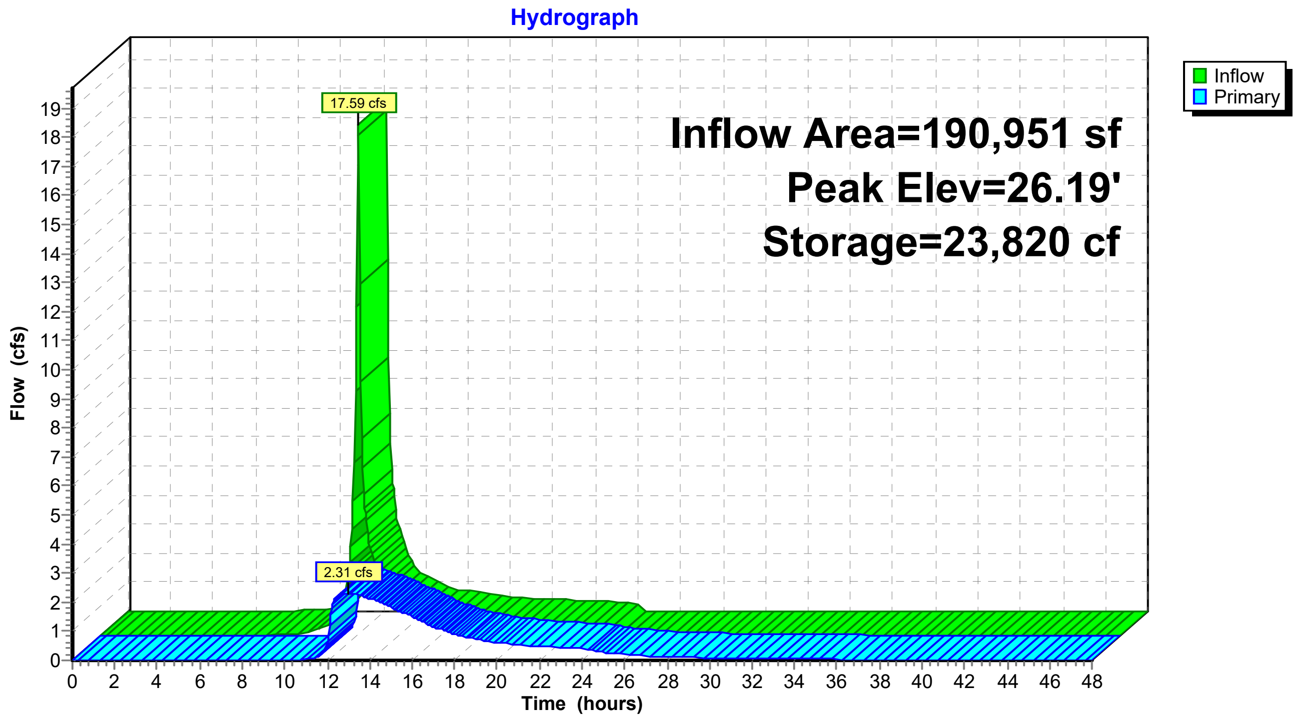
Chamber Storage = 70,199.7 cf = 1.612 af
Overall Storage Efficiency = 72.0%
Overall System Size = 169.75' x 137.92' x 4.17'

240 Chambers (plus border)
3,612.9 cy Field





Pond OC: O-CHAMBERS



Summary for Pond U-1: UG Inf System

Inflow Area = 165,273 sf, 63.49% Impervious, Inflow Depth = 5.47" for 100-year event
Inflow = 22.53 cfs @ 12.13 hrs, Volume= 75,294 cf
Outflow = 6.80 cfs @ 12.36 hrs, Volume= 75,294 cf, Atten= 70%, Lag= 13.8 min
Discarded = 0.32 cfs @ 8.80 hrs, Volume= 30,810 cf
Primary = 6.48 cfs @ 12.36 hrs, Volume= 44,484 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 23.81' @ 12.36 hrs Surf.Area= 26,352 sf Storage= 28,670 cf

Plug-Flow detention time= 214.2 min calculated for 75,294 cf (100% of inflow)
Center-of-Mass det. time= 214.1 min (1,021.8 - 807.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	22.00'	18,227 cf	**134.83'W x 195.44'L x 2.33'H Field A** 61,488 cf Overall - 15,921 cf Embedded = 45,566 cf x 40.0% Voids
#2A	22.50'	15,921 cf	**ADS_StormTech SC-310 +Cap** x 1080 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 40 Rows of 27 Chambers
		34,148 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	22.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	22.60'	**10.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	23.35'	**8.0" Vert. Orifice/Grate** C= 0.600
#4	Primary	23.45'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.32 cfs @ 8.80 hrs HW=22.02' (Free Discharge)
└—**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=6.46 cfs @ 12.36 hrs HW=23.81' (Free Discharge)
├—**2=Orifice/Grate** (Orifice Controls 2.34 cfs @ 4.30 fps)
├—**3=Orifice/Grate** (Orifice Controls 0.60 cfs @ 2.32 fps)
└—**4=Sharp-Crested Rectangular Weir** (Weir Controls 3.52 cfs @ 1.97 fps)

Pond U-1: UG Inf System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-310 +Cap (ADS StormTech®SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

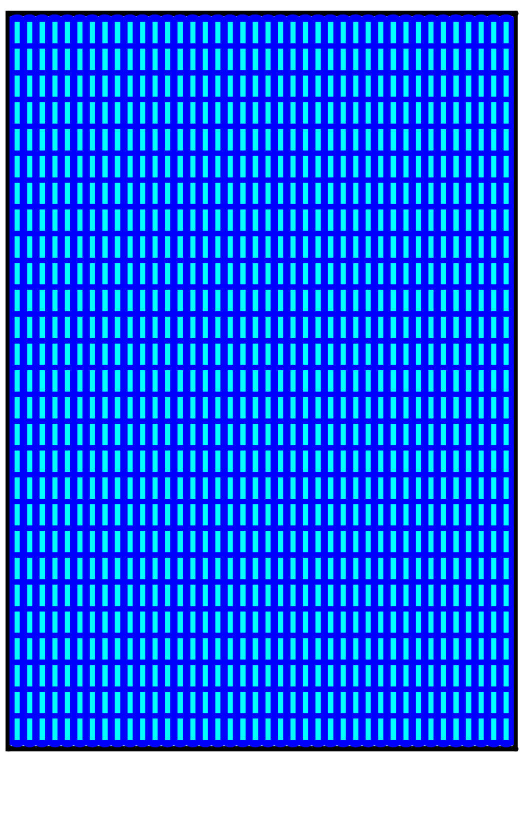
27 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 193.44' Row Length +12.0" End Stone x 2 = 195.44' Base Length
40 Rows x 34.0" Wide + 6.0" Spacing x 39 + 12.0" Side Stone x 2 = 134.83' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

1,080 Chambers x 14.7 cf = 15,921.3 cf Chamber Storage

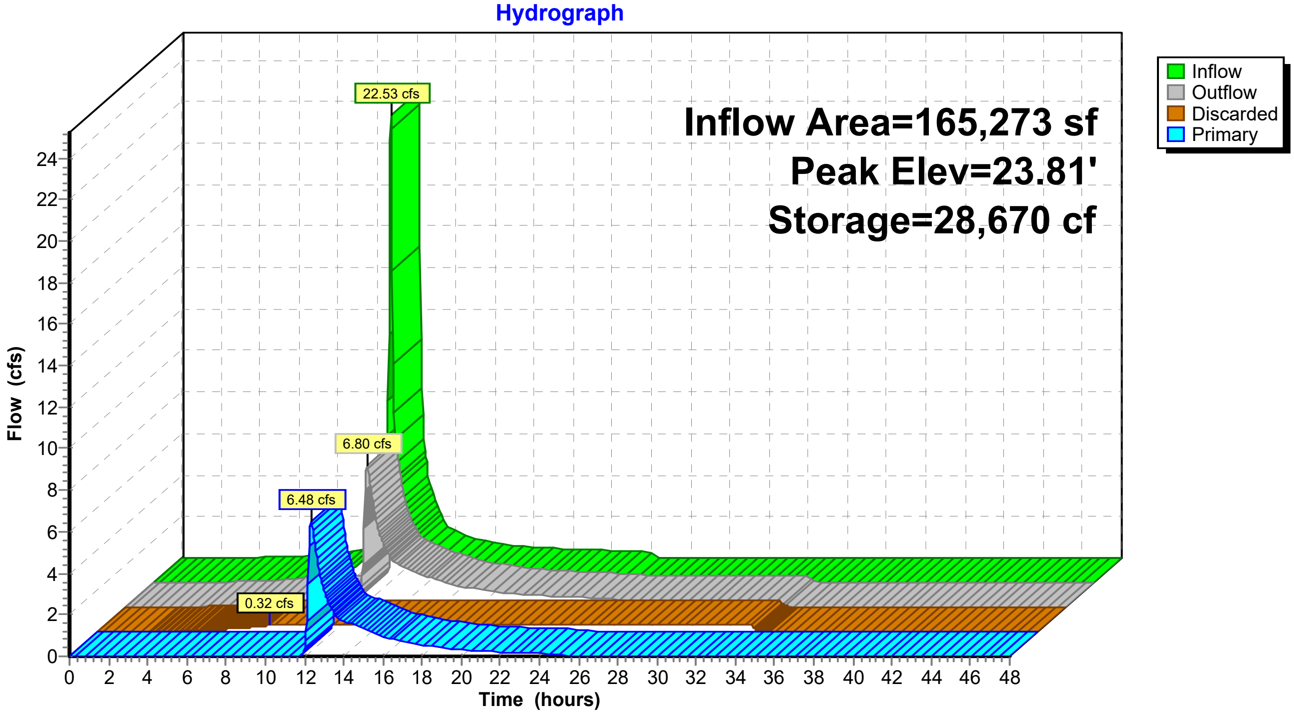
61,487.6 cf Field - 15,921.3 cf Chambers = 45,566.3 cf Stone x 40.0% Voids = 18,226.5 cf Stone Storage

Chamber Storage + Stone Storage = 34,147.8 cf = 0.784 af
Overall Storage Efficiency = 55.5%
Overall System Size = 195.44' x 134.83' x 2.33'

1,080 Chambers
2,277.3 cy Field
1,687.6 cy Stone



Pond U-1: UG Inf System



Summary for Pond UD1: Baseball UD 1

Inflow Area = 105,369 sf, 0.00% Impervious, Inflow Depth = 1.26" for 100-year event
Inflow = 2.62 cfs @ 12.15 hrs, Volume= 11,056 cf
Outflow = 2.62 cfs @ 12.15 hrs, Volume= 11,056 cf, Atten= 0%, Lag= 0.2 min
Primary = 2.62 cfs @ 12.15 hrs, Volume= 11,056 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 39.17' @ 12.15 hrs Surf.Area= 149,290 sf Storage= 32 cf

Plug-Flow detention time= 0.2 min calculated for 11,045 cf (100% of inflow)
Center-of-Mass det. time= 0.2 min (925.9 - 925.7)

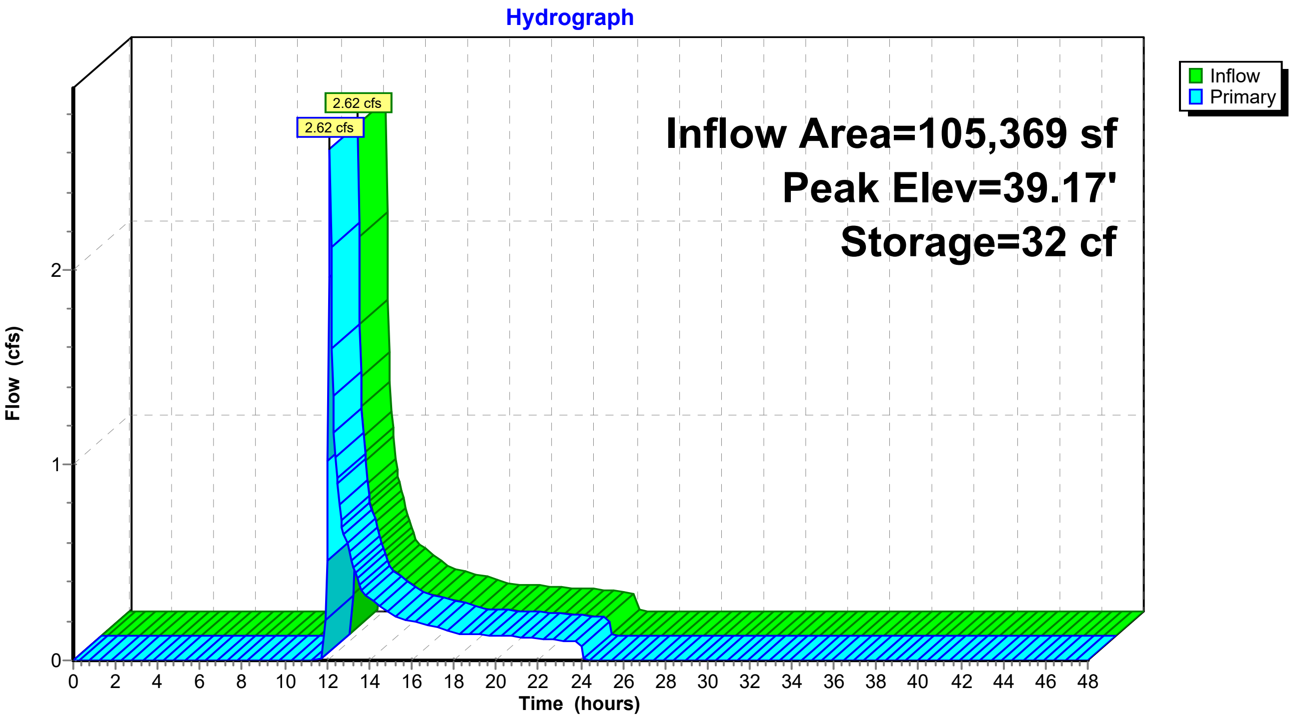
Volume	Invert	Avail.Storage	Storage Description
#1	39.17'	29,858 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 74,645 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
39.17	149,290	1,398.0	0	0	149,290
39.67	149,290	1,398.0	74,645	74,645	149,989

Device	Routing	Invert	Outlet Devices
#1	Primary	27.65'	**12.0" Round CMP_Round 12"** L= 41.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 27.65' / 27.24' S= 0.0099 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	32.12'	**12.0" Round CMP_Round 12"** L= 15.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 32.12' / 31.95' S= 0.0110 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Primary	31.30'	**6.0" Round Culvert** L= 38.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 31.30' / 30.91' S= 0.0101 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=24.18 cfs @ 12.15 hrs HW=39.17' (Free Discharge)
├─**1=CMP_Round 12"** (Barrel Controls 12.45 cfs @ 15.85 fps)
├─**2=CMP_Round 12"** (Inlet Controls 9.68 cfs @ 12.32 fps)
└─**3=Culvert** (Barrel Controls 2.06 cfs @ 10.48 fps)

Pond UD1: Baseball UD 1



Summary for Pond UD2: Football UD 2

Inflow Area = 65,696 sf, 0.00% Impervious, Inflow Depth = 1.26" for 100-year event
Inflow = 1.63 cfs @ 12.15 hrs, Volume= 6,893 cf
Outflow = 1.62 cfs @ 12.16 hrs, Volume= 6,893 cf, Atten= 1%, Lag= 0.4 min
Primary = 1.62 cfs @ 12.16 hrs, Volume= 6,893 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 40.17' @ 12.16 hrs Surf.Area= 65,694 sf Storage= 42 cf

Plug-Flow detention time= 0.4 min calculated for 6,886 cf (100% of inflow)
Center-of-Mass det. time= 0.4 min (926.1 - 925.7)

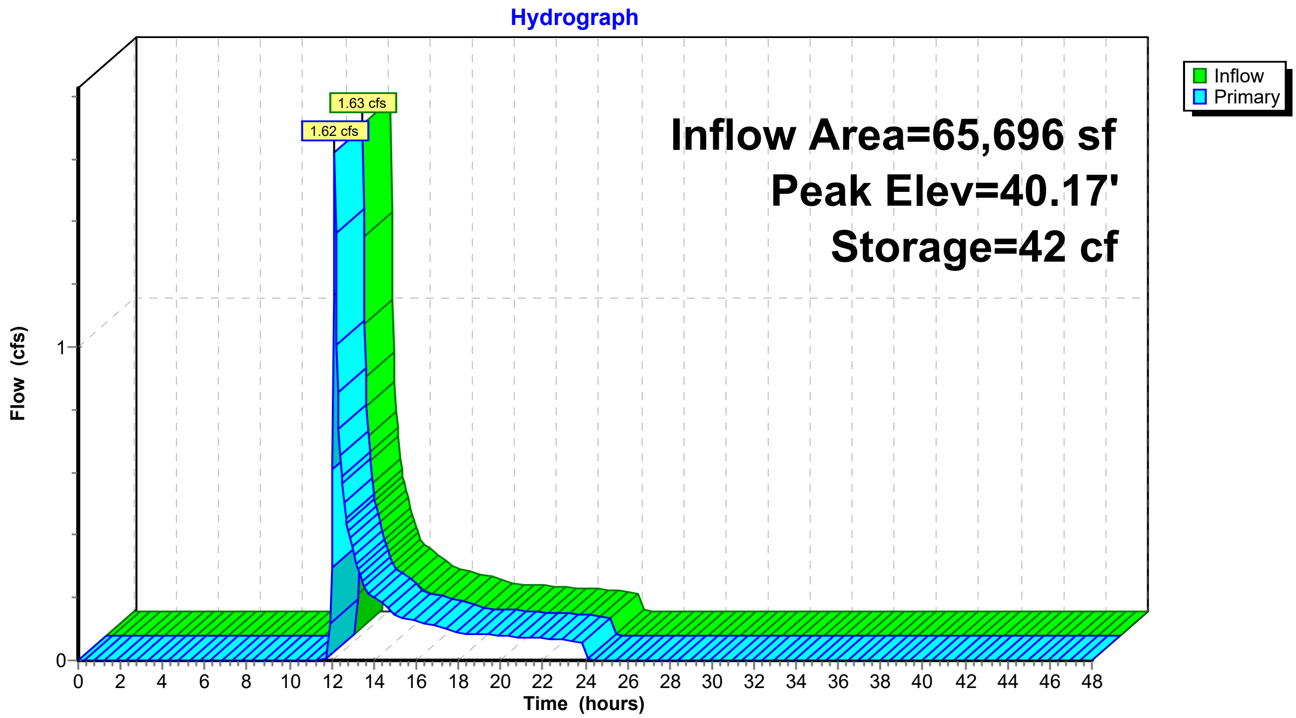
Volume	Invert	Avail.Storage	Storage Description
#1	40.17'	13,139 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 32,847 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
40.17	65,694	1,239.8	0	0	65,694
40.67	65,694	1,239.8	32,847	32,847	66,314

Device	Routing	Invert	Outlet Devices
#1	Primary	36.00'	**6.0" Round Culvert** L= 22.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.00' / 35.00' S= 0.0448 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Primary	36.00'	**6.0" Round Culvert** L= 46.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.00' / 35.00' S= 0.0216 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Primary	36.00'	**6.0" Round Culvert** L= 30.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.00' / 35.00' S= 0.0331 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=5.10 cfs @ 12.16 hrs HW=40.17' (Free Discharge)
—**1=Culvert** (Inlet Controls 1.87 cfs @ 9.54 fps)
—**2=Culvert** (Barrel Controls 1.50 cfs @ 7.63 fps)
—**3=Culvert** (Barrel Controls 1.73 cfs @ 8.80 fps)

Pond UD2: Football UD 2



Summary for Pond UD3: Football UD 3

Inflow Area =	22,265 sf,	0.00% Impervious, Inflow Depth = 1.26"	for 100-year event
Inflow =	0.55 cfs @	12.15 hrs, Volume=	2,336 cf
Outflow =	0.55 cfs @	12.15 hrs, Volume=	2,336 cf, Atten= 0%, Lag= 0.1 min
Primary =	0.55 cfs @	12.15 hrs, Volume=	2,336 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 39.27' @ 12.15 hrs Surf.Area= 22,338 sf Storage= 4 cf

Plug-Flow detention time= 0.1 min calculated for 2,334 cf (100% of inflow)
Center-of-Mass det. time= 0.1 min (925.8 - 925.7)

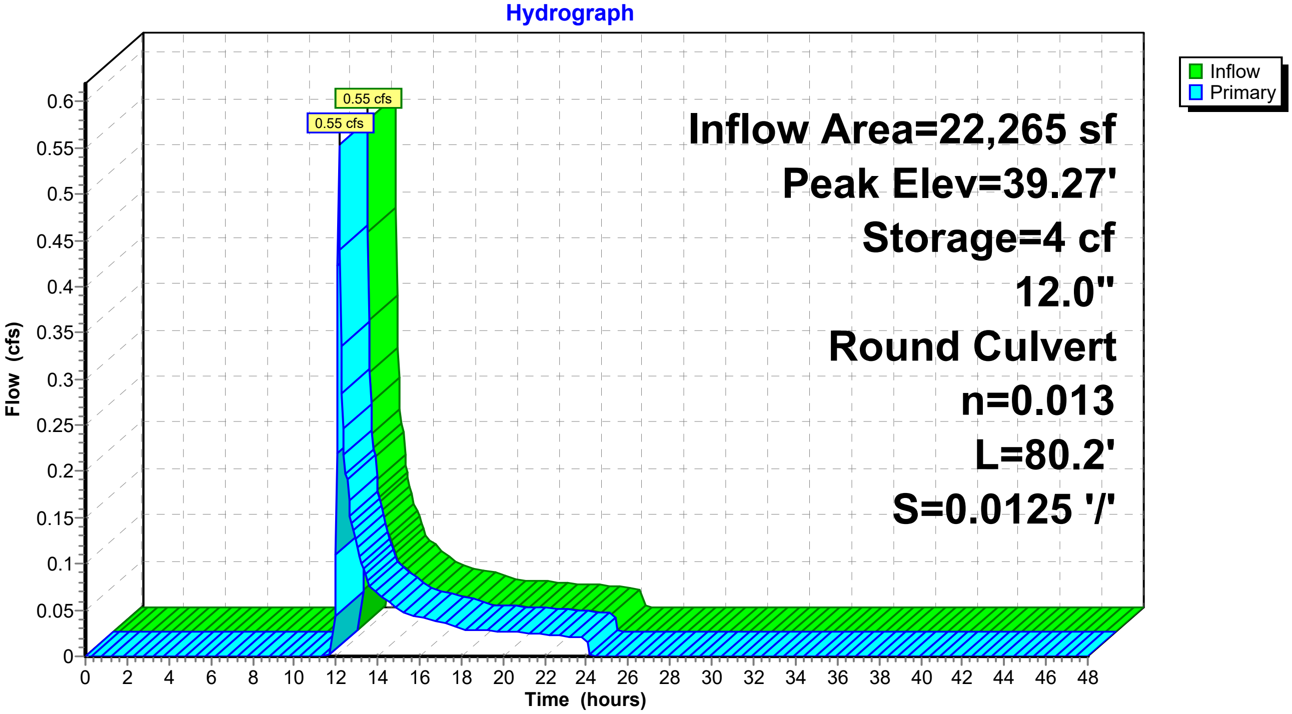
Volume	Invert	Avail.Storage	Storage Description
#1	39.27'	4,378 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 10,946 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
39.27	22,338	624.7	0	0	22,338
39.76	22,338	624.7	10,946	10,946	22,644

Device	Routing	Invert	Outlet Devices
#1	Primary	35.00'	**12.0" Round Culvert** L= 80.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.00' / 34.00' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=6.50 cfs @ 12.15 hrs HW=39.27' (Free Discharge)
└**1=Culvert** (Barrel Controls 6.50 cfs @ 8.27 fps)

Pond UD3: Football UD 3



Project Description

File Name	2019-10-22_Closed Drainage Analysis - 2019-10-22.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	Oct 22, 2019	00:00:00
End Analysis On	Oct 22, 2019	01:00:00
Start Reporting On	Oct 22, 2019	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	72
Nodes	172
Junctions	159
Outfalls	13
Flow Diversions	0
Inlets	0
Storage Nodes	0
Links	159
Channels	0
Pipes	159
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	25 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	SUB-101	0.18	0.6500	0.64	0.42	0.08	0.76	0 00:06:00
2	SUB-102	0.24	0.7000	0.64	0.45	0.11	1.05	0 00:06:00
3	SUB-103	0.07	0.6900	0.64	0.44	0.03	0.30	0 00:06:00
4	SUB-104	0.40	0.7900	0.64	0.51	0.20	2.00	0 00:06:00
5	SUB-105	0.18	0.6900	0.64	0.44	0.08	0.79	0 00:06:00
6	SUB-106	0.53	0.5900	0.64	0.38	0.20	1.98	0 00:06:00
7	SUB-110	0.14	0.8000	0.64	0.51	0.07	0.73	0 00:06:00
8	SUB-111	0.16	0.7800	0.64	0.50	0.08	0.82	0 00:06:00
9	SUB-112	0.27	0.5100	0.64	0.33	0.09	0.89	0 00:06:00
10	SUB-113	0.19	0.7100	0.64	0.45	0.09	0.87	0 00:06:00
11	SUB-114	0.09	0.5200	0.64	0.33	0.03	0.30	0 00:06:00
12	SUB-115	0.07	0.7100	0.64	0.45	0.03	0.31	0 00:06:00
13	SUB-116	0.09	0.4900	0.64	0.31	0.03	0.27	0 00:06:00
14	SUB-117	0.04	0.8200	0.64	0.52	0.02	0.23	0 00:06:00
15	SUB-120	0.23	0.8400	0.64	0.54	0.12	1.24	0 00:06:00
16	SUB-121	0.46	0.8400	0.64	0.54	0.25	2.49	0 00:06:00
17	SUB-122	0.47	0.7300	0.64	0.47	0.22	2.17	0 00:06:00
18	SUB-123	0.65	0.5000	0.64	0.32	0.21	2.07	0 00:06:00
19	SUB-124	0.70	0.4600	0.64	0.29	0.20	2.05	0 00:06:00
20	SUB-125	0.22	0.5900	0.64	0.38	0.08	0.85	0 00:06:00
21	SUB-127	0.15	0.6500	0.64	0.42	0.06	0.63	0 00:06:00
22	SUB-128	0.27	0.4000	0.64	0.26	0.07	0.68	0 00:06:00
23	SUB-131	0.05	0.8900	0.64	0.57	0.03	0.30	0 00:06:00
24	SUB-132	0.05	0.8900	0.64	0.57	0.03	0.30	0 00:06:00
25	SUB-133	0.16	0.5500	0.64	0.35	0.06	0.58	0 00:06:00
26	SUB-134	0.06	0.8900	0.64	0.57	0.03	0.32	0 00:06:00
27	SUB-141	1.46	0.2400	0.64	0.15	0.22	2.24	0 00:06:00
28	SUB-142	0.69	0.2400	0.64	0.15	0.11	1.06	0 00:06:00
29	SUB-152	0.14	0.8500	0.64	0.54	0.08	0.76	0 00:06:00
30	SUB-161	0.08	0.8900	0.64	0.57	0.04	0.44	0 00:06:00
31	SUB-162	0.48	0.8900	0.64	0.57	0.27	2.73	0 00:06:00
32	SUB-163	0.45	0.8900	0.64	0.57	0.26	2.56	0 00:06:00
33	SUB-171	0.15	0.4000	0.64	0.26	0.04	0.38	0 00:06:00
34	SUB-172	0.11	0.7600	0.64	0.49	0.05	0.52	0 00:06:00
35	SUB-173	0.11	0.7300	0.64	0.47	0.05	0.53	0 00:06:00
36	SUB-174	0.08	0.8900	0.64	0.57	0.04	0.44	0 00:06:00
37	SUB-181	0.36	0.8300	0.64	0.53	0.19	1.93	0 00:06:00
38	SUB-182	0.16	0.8500	0.64	0.54	0.09	0.89	0 00:06:00
39	SUB-183	0.21	0.7400	0.64	0.47	0.10	1.00	0 00:06:00
40	SUB-184	0.11	0.8800	0.64	0.56	0.06	0.62	0 00:06:00
41	SUB-185	0.13	0.7200	0.64	0.46	0.06	0.60	0 00:06:00
42	SUB-186	0.12	0.7400	0.64	0.47	0.06	0.59	0 00:06:00
43	SUB-187	0.08	0.6900	0.64	0.44	0.04	0.37	0 00:06:00
44	SUB-191	0.32	0.7300	0.64	0.47	0.15	1.49	0 00:06:00
45	SUB-192	0.20	0.7900	0.64	0.51	0.10	0.99	0 00:06:00
46	SUB-193	0.17	0.8300	0.64	0.53	0.09	0.88	0 00:06:00
47	SUB-194	0.33	0.7400	0.64	0.47	0.16	1.57	0 00:06:00
48	SUB-2	0.16	0.9500	0.64	0.61	0.09	0.94	0 00:06:00
49	SUB-3	0.17	0.9500	0.64	0.61	0.10	1.02	0 00:06:00
50	SUB-4	0.15	0.9500	0.64	0.61	0.09	0.91	0 00:06:00
51	Sub-58	0.22	0.8100	0.64	0.52	0.11	1.12	0 00:06:00
52	Sub-62	0.50	0.9500	0.64	0.61	0.31	3.05	0 00:06:00
53	Sub-63	0.49	0.9500	0.64	0.61	0.30	2.99	0 00:06:00
54	Sub-67	0.14	0.9500	0.64	0.61	0.08	0.84	0 00:06:00
55	Sub-68	0.37	0.9500	0.64	0.61	0.23	2.26	0 00:06:00
56	Sub-69	0.39	0.9500	0.64	0.61	0.24	2.36	0 00:06:00
57	Sub-70	0.65	0.9500	0.64	0.61	0.40	3.95	0 00:06:00
58	Sub-71	0.21	0.9500	0.64	0.61	0.12	1.24	0 00:06:00
59	Sub-73	0.03	0.9500	0.64	0.61	0.02	0.20	0 00:06:00
60	Sub-74	0.05	0.7600	0.64	0.49	0.02	0.23	0 00:06:00
61	Sub-75	0.24	0.8500	0.64	0.54	0.13	1.33	0 00:06:00
62	Sub-76	1.15	0.1500	0.64	0.10	0.11	1.10	0 00:06:00
63	SUB-8	0.19	0.9500	0.64	0.61	0.11	1.14	0 00:06:00
64	SUB-FB-2	0.51	0.9500	0.64	0.61	0.31	3.11	0 00:06:00
65	SUB-FB-3	0.51	0.9500	0.64	0.61	0.31	3.11	0 00:06:00
66	SUB-SD	0.73	0.6200	0.64	0.40	0.29	2.90	0 00:06:00
67	SUB-TD-102	0.10	0.6900	0.64	0.44	0.04	0.45	0 00:06:00
68	SUB-TD-103	0.18	0.6900	0.64	0.44	0.08	0.80	0 00:06:00
69	SUB-TD-113	0.22	0.8900	0.64	0.57	0.12	1.23	0 00:06:00
70	SUB-TD-114	0.07	0.8900	0.64	0.57	0.04	0.40	0 00:06:00
71	SUB-TD-121	0.11	0.8900	0.64	0.57	0.06	0.61	0 00:06:00
72	SUB-UDB1	1.80	0.2500	0.64	0.16	0.29	2.87	0 00:06:00

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	AB-200	Junction	28.40	35.03	28.40	35.03	0.00	1.50	28.84	0.00	6.19	0 00:00	0.00	0.00
2	AB-201	Junction	27.90	30.95	27.90	30.95	0.00	0.39	28.13	0.00	2.82	0 00:00	0.00	0.00
3	AB-202	Junction	28.00	32.37	28.00	32.37	0.00	1.43	28.79	0.00	3.58	0 00:00	0.00	0.00
4	AB-203	Junction	29.65	32.60	29.65	32.60	0.00	0.65	29.94	0.00	2.66	0 00:00	0.00	0.00
5	AB-204	Junction	30.15	32.60	30.15	32.60	0.00	0.22	30.39	0.00	2.21	0 00:00	0.00	0.00
6	AB-221	Junction	28.29	31.10	0.00	0.00	0.00	0.27	28.84	0.00	2.26	0 00:00	0.00	0.00
7	AB-231	Junction	37.92	41.40	0.00	0.00	0.00	1.10	38.14	0.00	3.26	0 00:00	0.00	0.00
8	AB-235	Junction	35.71	41.60	0.00	0.00	0.00	0.00	35.71	0.00	5.89	0 00:00	0.00	0.00
9	AD-100	Junction	22.90	28.00	22.90	27.50	0.00	3.88	23.83	0.00	4.17	0 00:00	0.00	0.00
10	AD-103	Junction	21.90	28.50	21.90	28.50	0.00	2.72	22.90	0.00	5.60	0 00:00	0.00	0.00
11	AD-105	Junction	21.50	26.77	21.50	26.77	0.00	4.76	23.61	0.00	3.16	0 00:00	0.00	0.00
12	AD-107	Junction	35.00	38.50	35.00	0.00	0.00	0.00	35.00	0.00	3.50	0 00:00	0.00	0.00
13	AD-108	Junction	36.50	40.00	36.50	0.00	0.00	0.00	36.50	0.00	3.50	0 00:00	0.00	0.00
14	CB-101	Junction	27.00	30.80	27.00	30.80	0.00	0.76	27.26	0.00	3.54	0 00:00	0.00	0.00
15	CB-102	Junction	27.00	30.30	27.00	30.30	0.00	1.05	27.32	0.00	2.98	0 00:00	0.00	0.00
16	CB-103	Junction	28.00	31.75	28.00	31.75	0.00	0.30	28.19	0.00	3.56	0 00:00	0.00	0.00
17	CB-104	Junction	27.00	30.55	27.00	30.55	0.00	2.00	27.61	0.00	2.94	0 00:00	0.00	0.00
18	CB-105	Junction	28.50	32.00	28.50	32.00	0.00	0.79	28.87	0.00	3.13	0 00:00	0.00	0.00
19	CB-106	Junction	28.00	30.50	28.00	30.50	0.00	1.98	28.70	0.00	1.80	0 00:00	0.00	0.00
20	CB-110	Junction	41.00	44.50	41.00	44.50	0.00	0.73	41.30	0.00	3.20	0 00:00	0.00	0.00
21	CB-111	Junction	41.00	44.50	41.00	44.50	0.00	0.82	41.33	0.00	3.17	0 00:00	0.00	0.00
22	CB-112	Junction	36.20	39.55	36.20	39.55	0.00	0.89	36.62	0.00	2.93	0 00:00	0.00	0.00
23	CB-113	Junction	36.20	39.55	36.20	39.55	0.00	0.87	36.62	0.00	2.93	0 00:00	0.00	0.00
24	CB-114	Junction	34.20	37.50	34.20	37.50	0.00	0.30	34.59	0.00	2.91	0 00:00	0.00	0.00
25	CB-115	Junction	34.20	37.50	34.20	37.50	0.00	0.31	34.59	0.00	2.91	0 00:00	0.00	0.00
26	CB-116	Junction	32.20	35.50	32.20	35.50	0.00	0.27	32.68	0.00	2.82	0 00:00	0.00	0.00
27	CB-117	Junction	32.20	35.50	32.20	35.50	0.00	0.23	32.68	0.00	2.82	0 00:00	0.00	0.00
28	CB-120	Junction	27.20	30.24	27.20	30.24	0.00	1.23	27.66	0.00	2.58	0 00:00	0.00	0.00
29	CB-121	Junction	25.00	28.00	25.00	28.00	0.00	2.49	25.96	0.00	2.04	0 00:00	0.00	0.00
30	CB-122	Junction	25.00	28.30	25.00	28.30	0.00	2.17	25.87	0.00	2.43	0 00:00	0.00	0.00
31	CB-123	Junction	24.50	27.80	24.50	27.80	0.00	2.07	25.35	0.00	2.45	0 00:00	0.00	0.00
32	CB-124	Junction	25.65	28.25	25.65	28.25	0.00	2.05	26.42	0.00	1.83	0 00:00	0.00	0.00
33	CB-125	Junction	25.60	28.80	25.60	28.80	0.00	0.84	26.28	0.00	2.52	0 00:00	0.00	0.00
34	CB-127	Junction	27.00	29.90	27.00	29.90	0.00	0.63	27.21	0.00	2.69	0 00:00	0.00	0.00
35	CB-128	Junction	27.00	29.87	27.00	29.87	0.00	0.68	27.21	0.00	2.66	0 00:00	0.00	0.00
36	CB-131	Junction	30.30	33.00	30.30	33.00	0.00	0.30	30.50	0.00	2.50	0 00:00	0.00	0.00
37	CB-132	Junction	30.10	32.60	30.10	32.60	0.00	0.30	30.43	0.00	2.17	0 00:00	0.00	0.00
38	CB-133	Junction	29.00	31.50	29.00	31.50	0.00	0.58	29.45	0.00	2.05	0 00:00	0.00	0.00
39	CB-134	Junction	29.00	31.50	29.00	31.50	0.00	0.32	29.43	0.00	2.07	0 00:00	0.00	0.00
40	CB-141	Junction	34.40	37.00	34.40	37.00	0.00	2.24	38.59	0.00	0.38	0 00:00	0.00	0.00
41	CB-142	Junction	33.00	35.80	33.00	35.80	0.00	1.06	35.05	0.00	0.75	0 00:00	0.00	0.00
42	CB-151	Junction	24.00	27.70	24.00	27.70	0.00	1.12	24.40	0.00	3.30	0 00:00	0.00	0.00
43	CB-152	Junction	24.00	27.70	24.00	27.70	0.00	0.76	24.29	0.00	3.41	0 00:00	0.00	0.00
44	CB-161	Junction	36.00	39.25	36.00	39.25	0.00	0.44	36.19	0.00	3.06	0 00:00	0.00	0.00
45	CB-162	Junction	36.00	39.25	36.00	39.25	0.00	2.73	36.72	0.00	2.53	0 00:00	0.00	0.00
46	CB-163	Junction	33.00	37.90	33.00	37.90	0.00	2.56	33.64	0.00	4.26	0 00:00	0.00	0.00
47	CB-171	Junction	29.80	33.00	29.80	33.00	0.00	0.38	30.08	0.00	2.92	0 00:00	0.00	0.00
48	CB-172	Junction	29.80	33.25	29.80	33.25	0.00	0.51	30.10	0.00	3.15	0 00:00	0.00	0.00
49	CB-173	Junction	36.00	38.00	36.00	38.00	0.00	0.53	36.35	0.00	1.65	0 00:00	0.00	0.00
50	CB-174	Junction	36.00	39.30	36.00	39.30	0.00	0.44	36.34	0.00	2.96	0 00:00	0.00	0.00
51	CB-181	Junction	34.90	37.90	34.90	37.90	0.00	1.92	35.45	0.00	2.45	0 00:00	0.00	0.00
52	CB-182	Junction	34.50	38.00	34.50	38.00	0.00	0.88	34.84	0.00	3.16	0 00:00	0.00	0.00
53	CB-183	Junction	33.00	36.50	33.00	36.50	0.00	1.00	33.25	0.00	3.25	0 00:00	0.00	0.00
54	CB-184	Junction	33.00	36.80	33.00	36.80	0.00	0.62	33.17	0.00	3.63	0 00:00	0.00	0.00
55	CB-185	Junction	34.75	38.75	34.75	38.75	0.00	0.60	34.92	0.00	3.83	0 00:00	0.00	0.00
56	CB-186	Junction	35.00	39.00	35.00	39.00	0.00	0.59	35.18	0.00	3.82	0 00:00	0.00	0.00
57	CB-187	Junction	35.00	38.90	35.00	38.90	0.00	0.38	35.73	0.00	3.17	0 00:00	0.00	0.00
58	CB-191	Junction	34.00	37.53	34.00	37.53	0.00	1.49	34.98	0.00	2.55	0 00:00	0.00	0.00
59	CB-192	Junction	34.00	37.50	34.00	37.50	0.00	0.99	34.33	0.00	3.17	0 00:00	0.00	0.00
60	CB-193	Junction	34.00	37.75	34.00	37.75	0.00	0.88	34.30	0.00	3.45	0 00:00	0.00	0.00
61	CB-194	Junction	34.00	37.50	34.00	37.50	0.00	1.56	34.49	0.00	3.01	0 00:00	0.00	0.00
62	DMH-110	Junction	28.79	41.25	28.79	0.00	0.00	0.00	28.79	0.00	12.46	0 00:00	0.00	0.00
63	DMH-200	Junction	21.30	27.07	21.30	27.07	0.00	16.67	23.16	0.00	3.91	0 00:00	0.00	0.00
64	DMH-201	Junction	21.55	29.50	21.55	29.50	0.00	16.67	23.77	0.00	5.73	0 00:00	0.00	0.00
65	DMH-202	Junction	22.75	31.00	22.75	31.00	0.00	11.96	24.39	0.00	6.61	0 00:00	0.00	0.00
66	DMH-203	Junction	23.25	31.50	23.25	31.50	0.00	12.18	24.91	0.00	6.59	0 00:00	0.00	0.00
67	DMH-204	Junction	23.80	30.94	23.80	30.94	0.00	10.87	25.36	0.00	5.57	0 00:00	0.00	0.00
68	DMH-205	Junction	24.15	31.70	24.15	31.70	0.00	10.94	25.79	0.00	5.91	0 00:00	0.00	0.00
69	DMH-206	Junction	24.80	31.75	24.80	31.75	0.00	5.19	26.25	0.00	5.50	0 00:00	0.00	0.00
70	DMH-207	Junction	25.35	31.93	25.35	31.93	0.00	3.92	26.55	0.00	5.39	0 00:00	0.00	0.00
71	DMH-208	Junction	26.20	33.00	26.20	33.00	0.00	2.43	27.24	0.00	5.76	0 00:00	0.00	0.00
72	DMH-209	Junction	26.90	32.25	26.90	32.25	0.00	2.65	27.76	0.00	4.49	0 00:00	0.00	0.00
73	DMH-210	Junction	25.01	32.50	25.01	32.50	0.00	6.05	26.33	0.00	6.17	0 00:00	0.00	0.00
74	DMH-211	Junction	25.35	32.25	25.35	32.25	0.00	5.03	26.81	0.00	5.44	0 00:00	0.00	0.00
75	DMH-212	Junction	25.94	32.90	25.94	32.90	0.00	4.38	27.26	0.00	5.64	0 00:00	0.00	0.00
76	DMH-213	Junction	26.88	33.00	26.88	33.00	0.00	2.16	27.66	0.00	5.34	0 00:00	0.00	0.00
77	DMH-214	Junction	26.71	32.67	26.71	32.67	0.00	2.34	28.99	0.00	3.67	0 00:00	0.00	0.00
78	DMH-215	Junction	28.52	32.05	28.52	32.05	0.00	0.90	29.12	0.00	2.93	0 00:00	0.00	0.00
79	DMH-216	Junction	27.85	32.50	27.85	32.50	0.00	1.77	28.65	0.00	3.85	0 00:00	0.00	0.00
80	DMH-217	Junction	27.30	31.13	27.30	31.13	0.00	1.69	28.04	0.00	3.09	0 00:00	0.00	0.00
81	DMH-218	Junction	26.70	31.00	26.70	31.00	0.00	1.58	27.42	0.00	3.58	0 00:00	0.00	0.00

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft^2)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
82	DMH-219	Junction	26.15	32.20	26.15	32.20	0.00	2.20	26.77	0.00	5.43	0 00:00	0.00	0.00
83	DMH-220	Junction	25.50	32.50	25.50	32.50	0.00	2.20	26.11	0.00	6.39	0 00:00	0.00	0.00
84	DMH-221	Junction	24.90	32.50	24.90	32.50	0.00	2.88	25.57	0.00	6.93	0 00:00	0.00	0.00
85	DMH-222	Junction	24.00	32.20	24.00	32.20	0.00	6.29	25.06	0.00	7.14	0 00:00	0.00	0.00
86	DMH-223	Junction	23.20	31.06	23.20	31.06	0.00	6.26	24.41	0.00	6.65	0 00:00	0.00	0.00
87	DMH-224	Junction	22.80	29.50	22.80	29.50	0.00	6.14	24.15	0.00	5.35	0 00:00	0.00	0.00
88	DMH-225	Junction	31.90	35.45	31.90	35.45	0.00	3.94	32.68	0.00	2.77	0 00:00	0.00	0.00
89	DMH-226	Junction	33.90	37.50	33.90	37.50	0.00	3.54	34.59	0.00	2.91	0 00:00	0.00	0.00
90	DMH-227	Junction	35.90	39.50	35.90	39.50	0.00	3.18	36.56	0.00	2.94	0 00:00	0.00	0.00
91	DMH-228	Junction	40.40	44.20	40.40	44.20	0.00	1.53	40.78	0.00	3.42	0 00:00	0.00	0.00
92	DMH-229	Junction	28.21	35.05	28.21	35.05	0.00	2.26	28.95	0.00	6.10	0 00:00	0.00	0.00
93	DMH-232	Junction	26.90	30.94	26.90	30.94	0.00	1.23	27.27	0.00	3.67	0 00:00	0.00	0.00
94	DMH-233	Junction	24.40	27.88	24.40	27.88	0.00	4.36	25.69	0.00	2.19	0 00:00	0.00	0.00
95	DMH-235	Junction	23.45	28.77	23.45	28.77	0.00	11.87	25.00	0.00	3.77	0 00:00	0.00	0.00
96	DMH-236	Junction	27.40	30.27	27.40	30.27	0.00	3.05	28.04	0.00	2.23	0 00:00	0.00	0.00
97	DMH-237	Junction	25.00	29.90	25.00	29.90	0.00	6.89	25.95	0.00	3.95	0 00:00	0.00	0.00
98	DMH-238	Junction	25.30	28.50	25.30	28.50	0.00	2.80	26.25	0.00	2.25	0 00:00	0.00	0.00
99	DMH-239	Junction	26.00	29.50	26.00	29.50	0.00	4.20	26.86	0.00	2.64	0 00:00	0.00	0.00
100	DMH-250	Junction	17.80	25.50	17.80	25.50	0.00	21.60	20.20	0.00	5.30	0 00:00	0.00	0.00
101	DMH-251	Junction	18.80	31.42	18.80	31.42	0.00	11.36	20.54	0.00	10.88	0 00:00	0.00	0.00
102	DMH-252	Junction	20.80	31.30	20.80	31.30	0.00	11.36	22.78	0.00	8.52	0 00:00	0.00	0.00
103	DMH-253	Junction	28.70	31.80	28.70	31.80	0.00	2.37	29.42	0.00	2.38	0 00:00	0.00	0.00
104	DMH-254	Junction	29.90	33.00	29.90	33.00	0.00	1.67	30.41	0.00	2.59	0 00:00	0.00	0.00
105	DMH-255	Junction	26.80	32.00	26.80	32.00	0.00	5.33	27.63	0.00	4.37	0 00:00	0.00	0.00
106	DMH-256	Junction	27.80	39.00	27.80	39.00	0.00	5.32	32.63	0.00	6.37	0 00:00	0.00	0.00
107	DMH-257	Junction	31.20	38.00	31.20	38.00	0.00	3.08	35.03	0.00	2.97	0 00:00	0.00	0.00
108	DMH-258	Junction	32.50	39.00	32.50	39.00	0.00	2.16	36.57	0.00	2.43	0 00:00	0.00	0.00
109	DMH-259	Junction	33.90	37.80	33.90	37.80	0.00	2.19	37.67	0.00	0.50	0 00:00	0.00	0.00
110	DMH-262	Junction	36.99	36.50	0.00	0.00	0.00	0.00	36.99	0.00	1.50	0 00:00	0.00	0.00
111	DMH-272	Junction	29.40	33.00	29.40	33.00	0.00	4.52	30.08	0.00	2.92	0 00:00	0.00	0.00
112	DMH-273	Junction	31.90	34.75	31.90	34.75	0.00	3.73	32.44	0.00	2.31	0 00:00	0.00	0.00
113	DMH-274	Junction	34.90	38.70	34.90	38.70	0.00	3.75	35.55	0.00	3.15	0 00:00	0.00	0.00
114	DMH-275	Junction	35.40	39.35	35.40	39.35	0.00	3.81	36.34	0.00	3.01	0 00:00	0.00	0.00
115	DMH-281	Junction	26.30	37.25	26.30	37.25	0.00	10.68	29.07	0.00	8.18	0 00:00	0.00	0.00
116	DMH-282	Junction	30.50	37.80	30.50	37.80	0.00	9.57	31.94	0.00	5.86	0 00:00	0.00	0.00
117	DMH-283	Junction	31.90	38.50	31.90	38.50	0.00	2.75	32.53	0.00	5.97	0 00:00	0.00	0.00
118	DMH-284	Junction	34.15	38.70	34.15	38.70	0.00	1.90	34.62	0.00	4.08	0 00:00	0.00	0.00
119	DMH-285	Junction	31.70	39.50	31.70	39.50	0.00	7.37	33.03	0.00	6.47	0 00:00	0.00	0.00
120	DMH-286	Junction	34.10	38.48	34.31	38.48	0.00	3.97	34.87	0.00	3.60	0 00:00	0.00	0.00
121	DMH-287	Junction	34.90	39.75	34.90	39.75	0.00	3.43	35.72	0.00	4.03	0 00:00	0.00	0.00
122	DMH-291	Junction	33.00	37.90	33.00	37.90	0.00	4.49	35.09	0.00	2.81	0 00:00	0.00	0.00
123	DMH-292	Junction	32.00	37.60	32.00	37.60	0.00	5.66	33.69	0.00	3.91	0 00:00	0.00	0.00
124	DMH-293	Junction	31.40	37.80	31.40	37.80	0.00	2.39	32.08	0.00	5.72	0 00:00	0.00	0.00
125	DMH-294	Junction	33.65	37.60	33.65	37.60	0.00	1.56	34.08	0.00	3.52	0 00:00	0.00	0.00
126	DMH-296	Junction	35.40	39.30	35.40	39.30	0.00	3.13	35.95	0.00	3.35	0 00:00	0.00	0.00
127	DMH-297	Junction	28.60	39.00	28.60	39.00	0.00	5.55	29.66	0.00	9.34	0 00:00	0.00	0.00
128	FB-UD-1	Junction	35.00	40.00	35.00	40.00	0.00	3.11	37.49	0.00	2.51	0 00:00	0.00	0.00
129	FB-UD-2	Junction	29.20	40.00	29.20	40.00	0.00	3.11	37.50	0.00	2.50	0 00:00	0.00	0.00
130	FB-UD-3	Junction	35.00	40.00	35.00	40.00	0.00	2.99	37.59	0.00	2.41	0 00:00	0.00	0.00
131	FB-UD-4	Junction	27.11	40.00	27.11	40.00	0.00	3.05	37.49	0.00	2.51	0 00:00	0.00	0.00
132	OCS-400	Junction	22.00	26.19	22.00	26.19	0.00	7.16	22.82	0.00	3.37	0 00:00	0.00	0.00
133	OCS-401	Junction	25.00	27.27	25.00	27.27	0.00	3.08	25.46	0.00	1.82	0 00:00	0.00	0.00
134	RD-1	Junction	28.50	33.00	28.50	33.00	0.00	0.84	28.78	0.00	4.22	0 00:00	0.00	0.00
135	RD-2	Junction	28.25	33.00	28.25	33.00	0.00	0.94	28.59	0.00	4.41	0 00:00	0.00	0.00
136	RD-3	Junction	28.33	40.00	28.33	-2.96	0.00	1.02	28.99	0.00	11.01	0 00:00	0.00	0.00
137	RD-4	Junction	28.67	40.00	28.67	-2.98	0.00	0.90	29.74	0.00	10.26	0 00:00	0.00	0.00
138	RD-5	Junction	28.33	40.00	28.33	-2.96	0.00	2.26	29.74	0.00	10.26	0 00:00	0.00	0.00
139	RD-6	Junction	28.67	33.00	28.67	33.00	0.00	2.36	29.72	0.00	3.28	0 00:00	0.00	0.00
140	RD-7	Junction	28.00	40.00	28.00	-2.96	0.00	1.24	28.27	0.00	11.73	0 00:00	0.00	0.00
141	RD-8	Junction	28.00	40.00	28.00	-2.96	0.00	1.14	28.53	0.00	11.47	0 00:00	0.00	0.00
142	RD-9	Junction	28.67	40.00	28.67	-2.95	0.00	3.95	29.04	0.00	10.96	0 00:00	0.00	0.00
143	TD-101	Junction	30.50	32.66	30.50	32.66	0.00	0.23	30.73	0.00	1.94	0 00:00	0.00	0.00
144	TD-102	Junction	30.50	32.46	30.50	32.46	0.00	0.45	30.75	0.00	1.71	0 00:00	0.00	0.00
145	TD-103	Junction	30.50	32.71	30.50	32.71	0.00	0.80	30.94	0.00	1.78	0 00:00	0.00	0.00
146	TD-112	Junction	28.43	31.10	30.50	0.67	0.00	0.20	29.97	0.00	1.13	0 00:00	0.00	0.00
147	TD-113	Junction	28.50	30.16	28.50	30.16	0.00	1.23	28.80	0.00	1.36	0 00:00	0.00	0.00
148	TD-114	Junction	28.14	31.10	29.50	-2.94	0.00	0.40	29.07	0.00	2.03	0 00:00	0.00	0.00
149	TD-121	Junction	37.00	40.00	37.00	40.00	0.00	0.61	37.24	0.00	2.76	0 00:00	0.00	0.00
150	UD	Junction	27.65	40.00	27.65	40.00	0.00	2.87	35.66	0.00	4.34	0 00:00	0.00	0.00
151	WQS-400	Junction	24.25	31.40	24.25	31.40	0.00	1.78	24.94	0.00	6.46	0 00:00	0.00	0.00
152	WQS-401	Junction	24.60	31.80	24.60	31.80	0.00	5.10	26.07	0.00	5.73	0 00:00	0.00	0.00
153	WQS-402	Junction	23.25	29.00	23.25	29.00	0.00	1.86	23.68	0.00	5.32	0 00:00	0.00	0.00
154	WQS-403	Junction	26.50	31.60	26.50	31.60	0.00	4.51	27.68	0.00	3.92	0 00:00	0.00	0.00
155	WQS-404	Junction	32.25	38.10	32.25	38.10	0.00	5.59	33.37	0.00	4.73	0 00:00	0.00	0.00
156	WQS-405	Junction	30.90	38.00	30.90	38.00	0.00	2.39	31.60	0.00	6.40	0 00:00	0.00	0.00
157	WQS-406	Junction	22.50	28.25	22.50	28.25	0.00	11.41	24.11	0.00	4.14	0 00:00	0.00	0.00
158	WQS-407	Junction	24.65	34.00	24.65	34.00	0.00	10.66	27.14	0.00	6.86	0 00:00	0.00	0.00
159	WQS-408	Junction	23.75	30.43	23.75	30.43	0.00	5.56	24.64	0.00	5.79	0 00:00	0.00	0.00
160	DMH-261	Outfall	22.00					1.86	22.35					
161	DMH-271	Outfall	20.00					4.50	20.00					
162	Out-01	Outfall	30.55					5.46	31.37					

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
163	Out-1Pipe - (117) (1)	Outfall	17.40					21.60	18.86					
164	Out-1Pipe - (129)	Outfall	22.05					5.55	22.05					
165	Out-1Pipe - (301)	Outfall	21.10					16.67	22.37					
166	Out-1Pipe - (342)	Outfall	26.00					5.33	26.58					
167	Out-1Pipe - (346) (1)	Outfall	24.54					10.66	25.41					
168	Out-1Pipe - (383)	Outfall	30.50					3.94	31.14					
169	Out-1Pipe - (393)	Outfall	28.25					2.37	28.85					
170	Out-1Pipe - (402) (1)	Outfall	22.10					11.41	22.10					
171	Out-1Pipe - (404)	Outfall	30.70					2.39	31.19					
172	Out-1Pipe - (409) (1)	Outfall	28.16					5.55	28.94					

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
1	Link-01	Pipe	DMH-292	Out-01	46.45	32.00	30.55	3.1200	12.000	0.0150	5.46	5.46	1.00	7.27	0.97	1.00	0.00	SURCHARGED
2	Link-02	Pipe	AD-107	DMH-217	97.27	35.00	27.40	7.8100	18.000	0.0150	0.00	25.45	0.00	0.00	0.32	0.21	0.00	Calculated
3	Link-03	Pipe	DMH-110	DMH-237	87.70	28.79	26.20	2.9500	18.000	0.0150	0.00	15.64	0.00	0.00	0.00	0.00	0.00	Calculated
4	Link-04	Pipe	AB-201	DMH-236	69.58	27.79	27.11	0.9700	18.000	0.0150	0.38	7.72	0.05	2.02	0.43	0.29	0.00	Calculated
5	Link-05	Pipe	AB-221	AB-200	20.19	28.30	28.10	0.9500	12.000	0.0150	0.27	2.23	0.12	1.83	0.49	0.49	0.00	Calculated
6	Link-06	Pipe	AB-231	DMH-254	125.99	37.92	30.00	6.2800	18.000	0.0150	1.09	22.82	0.05	4.82	0.32	0.21	0.00	Calculated
7	Link-07	Pipe	DMH-262	AB-235	117.77	36.89	35.71	1.0000	18.000	0.0150	0.00	9.49	0.00	0.00	0.00	0.00	0.00	Calculated
8	Link-08	Pipe	AB-235	DMH-256	105.20	35.61	32.24	3.2000	18.000	0.0150	0.00	16.53	0.00	0.00	0.19	0.13	0.00	Calculated
9	Link-09	Pipe	CB-123	DMH-235	40.59	24.50	24.30	0.4900	12.000	0.0150	2.02	2.18	0.93	3.30	0.75	0.75	0.00	Calculated
10	Link-10	Pipe	DMH-235	WQS-406	15.55	22.80	22.60	1.2900	18.000	0.0150	11.41	21.29	0.54	6.46	1.50	1.00	0.00	SURCHARGED
11	Pipe - (102)	Pipe	CB-106	DMH-209	238.61	28.00	27.00	0.4200	12.000	0.0120	1.91	2.73	0.70	3.25	0.71	0.71	0.00	Calculated
12	Pipe - (105)	Pipe	CB-141	DMH-259	81.21	37.98	37.16	1.0000	12.000	0.0120	2.19	3.86	0.57	4.67	0.58	0.58	0.00	Calculated
13	Pipe - (105) (1)	Pipe	DMH-258	DMH-257	160.29	36.00	34.37	1.0200	12.000	0.0120	2.16	3.90	0.56	4.45	0.61	0.61	0.00	Calculated
14	Pipe - (105) (2)	Pipe	DMH-259	DMH-258	96.44	37.06	36.10	1.0000	12.000	0.0120	2.16	3.86	0.56	4.70	0.57	0.57	0.00	Calculated
15	Pipe - (106)	Pipe	CB-124	DMH-238	23.21	25.65	25.40	1.0800	12.000	0.0120	2.01	4.01	0.50	3.21	0.81	0.81	0.00	Calculated
16	Pipe - (107)	Pipe	CB-142	DMH-257	17.19	31.00	30.00	5.8200	12.000	0.0120	1.06	12.49	0.08	4.93	1.00	1.00	56.00	SURCHARGED
17	Pipe - (117)	Pipe	AD-103	DMH-252	16.56	21.90	21.75	0.9100	15.000	0.0120	2.83	6.66	0.42	4.34	1.02	0.81	0.00	Calculated
18	Pipe - (117) (1)	Pipe	DMH-250	Out-1Pipe - (117) (1)	51.53	17.92	17.40	1.0000	24.000	0.0120	21.60	24.50	0.88	7.48	1.73	0.86	0.00	Calculated
19	Pipe - (128)	Pipe	DMH-232	WQS-408	116.89	26.90	25.20	1.4500	12.000	0.0120	1.19	4.65	0.26	4.75	0.36	0.36	0.00	Calculated
20	Pipe - (129)	Pipe	WQS-408	Out-1Pipe - (129)	17.28	23.75	22.50	7.2300	12.000	0.0120	5.55	10.38	0.53	9.40	0.71	0.71	0.00	Calculated
21	Pipe - (130)	Pipe	OCS-400	DMH-250	114.20	18.57	18.00	0.5000	15.000	0.0120	7.85	13.10	0.60	8.56	1.03	0.82	0.00	Calculated
22	Pipe - (136)	Pipe	DMH-239	DMH-237	36.42	26.00	25.10	2.4700	12.000	0.0120	4.13	6.07	0.68	5.80	0.85	0.85	0.00	Calculated
23	Pipe - (148)	Pipe	CB-133	DMH-253	18.52	29.00	28.90	0.5400	12.000	0.0120	0.55	2.84	0.20	2.08	0.48	0.48	0.00	Calculated
24	Pipe - (157)	Pipe	CB-120	DMH-232	12.38	27.20	27.00	1.6200	12.000	0.0120	1.23	4.91	0.25	4.19	0.40	0.40	0.00	Calculated
25	Pipe - (161)	Pipe	DMH-214	DMH-212	78.05	28.51	26.04	3.1700	10.000	0.0120	2.32	4.23	0.55	5.66	0.66	0.79	0.00	Calculated
26	Pipe - (162)	Pipe	CB-121	DMH-233	41.75	25.00	24.50	1.2000	12.000	0.0120	2.33	4.22	0.55	3.35	0.98	0.98	0.00	Calculated
27	Pipe - (167)	Pipe	DMH-211	DMH-210	47.06	25.35	25.11	0.5200	15.000	0.0120	4.99	5.04	0.99	4.09	1.24	0.99	0.00	Calculated
28	Pipe - (211)	Pipe	DMH-257	DMH-256	205.97	34.30	32.40	0.9200	12.000	0.0120	2.91	3.71	0.79	4.99	0.70	0.70	0.00	Calculated
29	Pipe - (212)	Pipe	DMH-256	DMH-255	87.52	32.14	26.80	6.1000	15.000	0.0120	5.33	17.29	0.31	8.74	0.66	0.53	0.00	Calculated
30	Pipe - (213)	Pipe	WQS-402	DMH-261	38.48	23.25	22.00	3.2500	12.000	0.0120	1.86	6.96	0.27	6.60	0.39	0.39	0.00	Calculated
31	Pipe - (230) (1) (1) (1)	Pipe	WQS-403	DMH-271	25.83	26.50	26.00	1.9400	12.000	0.0120	4.50	5.37	0.84	6.32	0.85	0.85	0.00	Calculated
32	Pipe - (231)	Pipe	CB-163	WQS-404	8.57	33.00	32.50	5.8400	12.000	0.0120	2.55	9.32	0.27	5.46	0.75	0.75	0.00	Calculated
33	Pipe - (232)	Pipe	CB-193	DMH-293	10.12	34.00	33.50	4.9400	12.000	0.0120	0.87	8.58	0.10	5.53	0.25	0.26	0.00	Calculated
34	Pipe - (233)	Pipe	CB-191	DMH-291	19.95	34.00	33.50	2.5100	12.000	0.0120	1.43	6.11	0.23	3.90	0.99	0.99	0.00	Calculated
35	Pipe - (236)	Pipe	CB-102	WQS-400	71.85	27.00	25.50	2.0900	12.000	0.0120	1.03	5.58	0.18	5.11	0.30	0.30	0.00	Calculated
36	Pipe - (236) (1)	Pipe	WQS-400	DMH-203	8.87	24.25	24.00	2.8200	12.000	0.0120	1.76	6.48	0.27	4.94	0.80	0.80	0.00	Calculated
37	Pipe - (237)	Pipe	TD-101	AB-204	12.85	30.50	30.25	1.9500	6.000	0.0150	0.22	0.68	0.33	2.82	0.21	0.43	0.00	Calculated
38	Pipe - (238)	Pipe	AB-204	AB-203	78.70	29.94	29.16	1.0000	6.000	0.0120	0.22	0.48	0.45	2.08	0.26	0.53	0.00	Calculated
39	Pipe - (238) (1)	Pipe	AB-203	AB-202	56.55	29.06	28.49	1.0000	8.000	0.0120	0.65	1.87	0.35	4.33	0.30	0.44	0.00	Calculated
40	Pipe - (239)	Pipe	AB-202	DMH-206	81.29	28.39	27.00	1.7100	12.000	0.0120	1.41	5.05	0.28	5.16	0.38	0.38	0.00	Calculated
41	Pipe - (240)	Pipe	TD-102	AB-203	4.15	30.50	30.00	12.0600	6.000	0.0150	0.44	1.69	0.26	5.55	0.21	0.42	0.00	Calculated
42	Pipe - (241)	Pipe	TD-103	AB-202	10.00	30.50	30.00	5.0000	6.000	0.0150	0.79	1.09	0.73	4.97	0.38	0.75	0.00	Calculated
43	Pipe - (243) (2)	Pipe	AB-200	DMH-236	89.37	28.00	27.11	1.0000	12.000	0.0120	1.48	4.08	0.36	4.50	0.54	0.54	0.00	Calculated
44	Pipe - (245)	Pipe	TD-113	DMH-236	15.88	28.00	27.11	5.6100	12.000	0.0150	1.23	8.13	0.15	3.51	0.46	0.46	0.00	Calculated
45	Pipe - (269)	Pipe	CB-187	DMH-287	17.82	34.20	34.00	1.1400	12.000	0.0120	0.39	2.89	0.14	2.14	0.77	0.77	0.00	Calculated
46	Pipe - (269) (1) (1)	Pipe	DMH-285	DMH-282	66.48	31.70	30.60	1.6500	15.000	0.0120	7.10	9.00	0.79	6.17	1.25	1.00	1.00	SURCHARGED
47	Pipe - (271)	Pipe	CB-186	DMH-286	18.72	35.00	34.00	5.3400	12.000	0.0120	0.58	8.46	0.07	3.58	0.47	0.47	0.00	Calculated
48	Pipe - (272)	Pipe	CB-185	DMH-285	41.54	34.75	32.00	6.6200	12.000	0.0120	0.60	9.93	0.06	5.48	0.58	0.58	0.00	Calculated
49	Pipe - (273)	Pipe	CB-181	DMH-284	53.04	34.90	34.25	1.2300	12.000	0.0120	1.90	4.27	0.44	4.74	0.51	0.51	0.00	Calculated
50	Pipe - (274)	Pipe	CB-134	DMH-253	14.11	29.00	28.90	0.7100	12.000	0.0120	0.30	3.25	0.09	1.80	0.47	0.47	0.00	Calculated
51	Pipe - (275)	Pipe	CB-128	DMH-239	26.70	26.50	26.20	1.1200	12.000	0.0120	0.68	6.68	0.10	3.34	0.44	0.44	0.00	Calculated
52	Pipe - (282)	Pipe	UD	DMH-256	41.51	35.00	34.00	2.4100	12.000	0.0150	2.84	4.79	0.59	5.70	0.61	0.61	0.00	Calculated
53	Pipe - (288)	Pipe	AD-100	DMH-252	201.51	22.90	21.89	0.5000	15.000	0.0120	3.89	4.95	0.79	4.11	0.91	0.73	0.00	Calculated
54	Pipe - (289)	Pipe	DMH-252	DMH-251	169.05	21.40	20.55	0.5000	24.000	0.0120	11.36	17.38	0.65	5.35	1.28	0.64	0.00	Calculated
55	Pipe - (291)	Pipe	AD-105	DMH-252	82.70	21.90	21.49	0.5000	15.000	0.0150	4.84	3.96	1.22	4.16	1.25	1.00	58.00	SURCHARGED
56	Pipe - (298)	Pipe	DMH-204	DMH-203	98.71	23.80	23.35	0.4600	24.000	0.0120	10.76	17.33	0.62	4.21	1.56	0.78	0.00	Calculated
57	Pipe - (298) (1)	Pipe	DMH-203	DMH-202	93.96	23.25	22.85	0.4300	24.000	0.0120	11.96	17.33	0.69	4.96	1.60	0.80	0.00	Calculated
58	Pipe - (299)	Pipe	DMH-205	DMH-204	56.39	24.15	23.90	0.4400	24.000	0.0120	10.87	17.33	0.63	4.25	1.55	0.78	0.00	Calculated

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
59	Pipe - (300)	Pipe	CB-192	DMH-292	16.04	34.00	33.50	3.1200	12.000	0.0120	0.98	6.81	0.14	5.11	0.29	0.29	0.00	Calculated
60	Pipe - (301)	Pipe	DMH-200	Out-1Pipe - (301)	23.00	21.30	21.10	0.8700	24.000	0.0120	16.67	22.85	0.73	6.33	1.56	0.78	0.00	Calculated
61	Pipe - (302)	Pipe	CB-105	DMH-209	4.79	28.50	28.40	2.0900	12.000	0.0120	0.78	5.58	0.14	3.77	0.31	0.31	0.00	Calculated
62	Pipe - (303)	Pipe	DMH-209	DMH-208	122.31	26.90	26.30	0.4900	12.000	0.0120	2.43	2.73	0.89	3.72	0.87	0.87	0.00	Calculated
63	Pipe - (304)	Pipe	DMH-208	DMH-207	190.93	26.20	25.34	0.4500	12.000	0.0120	2.32	2.73	0.85	3.11	1.00	1.00	1.00	SURCHARGED
64	Pipe - (308)	Pipe	CB-152	WQS-402	18.05	24.00	23.50	2.7700	12.000	0.0120	0.75	6.42	0.12	4.69	0.26	0.26	0.00	Calculated
65	Pipe - (309)	Pipe	CB-151	WQS-402	37.54	24.00	23.50	1.3300	12.000	0.0120	1.11	4.45	0.25	4.21	0.37	0.37	0.00	Calculated
66	Pipe - (310)	Pipe	DMH-220	DMH-221	67.88	25.50	25.00	0.7400	15.000	0.0120	2.20	6.01	0.37	3.95	0.59	0.47	0.00	Calculated
67	Pipe - (311)	Pipe	DMH-219	DMH-220	88.71	26.15	25.60	0.6200	15.000	0.0120	2.20	5.51	0.40	3.92	0.58	0.47	0.00	Calculated
68	Pipe - (312)	Pipe	DMH-218	DMH-219	83.45	26.70	26.25	0.5400	10.000	0.0120	1.56	1.74	0.90	3.47	0.64	0.77	0.00	Calculated
69	Pipe - (313)	Pipe	DMH-217	DMH-218	95.08	27.30	26.80	0.5300	10.000	0.0120	1.58	1.72	0.92	3.41	0.68	0.81	0.00	Calculated
70	Pipe - (314)	Pipe	DMH-216	DMH-217	85.71	27.85	27.40	0.5300	10.000	0.0120	1.69	1.72	0.98	3.48	0.70	0.84	0.00	Calculated
71	Pipe - (315)	Pipe	DMH-215	DMH-216	130.20	28.52	27.87	0.5000	8.000	0.0120	0.78	0.93	0.84	2.37	0.63	0.95	0.00	Calculated
72	Pipe - (316)	Pipe	RD-1	DMH-221	36.69	28.50	27.25	3.4100	12.000	0.0150	0.83	5.70	0.15	4.85	0.27	0.27	0.00	Calculated
73	Pipe - (317)	Pipe	DMH-210	DMH-205	27.92	25.01	24.56	1.6000	15.000	0.0120	5.96	8.86	0.67	5.53	1.24	0.99	0.00	Calculated
74	Pipe - (319)	Pipe	RD-2	DMH-219	18.32	28.25	27.25	5.4600	8.000	0.0150	0.93	2.45	0.38	5.77	0.31	0.47	0.00	Calculated
75	Pipe - (321)	Pipe	DMH-229	DMH-213	27.38	28.21	26.98	4.5200	8.000	0.0120	2.16	2.78	0.78	6.47	0.65	0.98	0.00	Calculated
76	Pipe - (322)	Pipe	DMH-213	DMH-212	174.58	26.88	26.04	0.4800	12.000	0.0120	2.08	2.73	0.76	2.99	0.89	0.89	0.00	Calculated
77	Pipe - (323)	Pipe	RD-7	DMH-211	11.06	28.00	25.93	18.7100	8.000	0.0150	1.23	4.53	0.27	8.47	0.47	0.70	0.00	Calculated
78	Pipe - (324)	Pipe	DMH-212	DMH-211	90.69	25.94	25.47	0.5100	15.000	0.0120	3.94	5.01	0.79	3.36	1.25	1.00	1.00	SURCHARGED
79	Pipe - (329)	Pipe	DMH-202	DMH-201	235.15	22.75	21.65	0.4700	24.000	0.0120	11.43	17.33	0.66	3.94	1.82	0.91	0.00	Calculated
80	Pipe - (329) (1)	Pipe	DMH-201	DMH-200	21.25	21.55	21.40	0.7100	24.000	0.0120	16.67	20.59	0.81	5.44	1.88	0.94	0.00	Calculated
81	Pipe - (330)	Pipe	CB-101	WQS-400	70.15	27.00	25.50	2.1400	12.000	0.0120	0.75	5.64	0.13	4.74	0.26	0.26	0.00	Calculated
82	Pipe - (335)	Pipe	TD-112	AB-200	35.03	28.43	28.10	0.9400	12.000	0.0150	1.29	2.18	0.59	4.45	0.47	0.51	0.00	Calculated
83	Pipe - (341)	Pipe	DMH-251	DMH-250	82.16	18.41	18.00	0.5000	24.000	0.0120	11.36	24.18	0.47	3.83	1.87	0.93	0.00	Calculated
84	Pipe - (342)	Pipe	DMH-255	Out-1Pipe - (342)	27.07	26.70	26.00	2.5900	15.000	0.0120	5.33	12.03	0.44	7.42	0.71	0.57	0.00	Calculated
85	Pipe - (343)	Pipe	DMH-294	DMH-293	69.66	33.65	32.50	1.6500	12.000	0.0120	1.54	4.96	0.31	5.15	0.41	0.41	0.00	Calculated
86	Pipe - (345)	Pipe	DMH-287	DMH-286	49.44	34.90	34.20	1.4200	12.000	0.0120	3.40	4.59	0.74	5.50	0.74	0.74	0.00	Calculated
87	Pipe - (346)	Pipe	DMH-281	WQS-407	32.91	26.30	25.10	3.6500	15.000	0.0120	10.66	13.36	0.80	8.68	1.25	1.00	4.00	SURCHARGED
88	Pipe - (346) (1)	Pipe	WQS-407	Out-1Pipe - (346) (1)	13.77	25.00	24.54	3.3400	15.000	0.0120	10.66	12.79	0.83	9.60	1.06	0.85	0.00	Calculated
89	Pipe - (347)	Pipe	CB-184	DMH-281	17.51	33.00	31.00	11.4200	12.000	0.0120	0.62	13.04	0.05	7.62	0.16	0.16	0.00	Calculated
90	Pipe - (348)	Pipe	CB-183	DMH-281	31.97	33.00	31.00	6.2600	12.000	0.0120	1.00	9.65	0.10	7.20	0.23	0.23	0.00	Calculated
91	Pipe - (349)	Pipe	DMH-282	DMH-281	51.75	30.50	29.00	2.9000	15.000	0.0120	9.30	11.91	0.78	8.72	1.04	0.83	0.00	Calculated
92	Pipe - (350)	Pipe	CB-194	DMH-294	5.89	34.00	33.75	4.2500	12.000	0.0120	1.56	7.96	0.20	5.21	0.40	0.41	0.00	Calculated
93	Pipe - (351)	Pipe	DMH-236	DMH-235	80.13	27.01	26.00	1.2600	12.000	0.0120	2.97	5.10	0.58	6.13	0.59	0.59	0.00	Calculated
94	Pipe - (365)	Pipe	TD-114	AB-201	25.15	28.14	27.89	1.0000	6.000	0.0150	0.39	0.48	0.82	3.85	0.30	0.60	0.00	Calculated
95	Pipe - (367)	Pipe	FB-UD-4	DMH-285	20.45	37.00	35.00	9.7800	12.000	0.0150	3.04	9.66	0.31	9.15	0.44	0.44	0.00	Calculated
96	Pipe - (368)	Pipe	FB-UD-2	DMH-287	30.19	37.00	35.00	6.6200	12.000	0.0150	3.10	7.95	0.39	7.00	0.60	0.61	0.00	Calculated
97	Pipe - (369)	Pipe	FB-UD-3	DMH-275	43.58	37.00	35.50	3.4400	12.000	0.0150	2.97	5.73	0.52	5.04	0.71	0.71	0.00	Calculated
98	Pipe - (370)	Pipe	FB-UD-1	DMH-291	78.91	37.00	33.50	4.4400	12.000	0.0150	3.10	6.50	0.48	5.80	0.74	0.74	0.00	Calculated
99	Pipe - (372)	Pipe	DMH-284	DMH-283	145.94	34.15	32.00	1.4700	12.000	0.0120	1.91	4.68	0.41	5.23	0.49	0.49	0.00	Calculated
100	Pipe - (372) (1)	Pipe	DMH-283	DMH-282	90.39	31.90	30.50	1.5500	12.000	0.0120	2.55	4.80	0.53	4.45	0.82	0.82	0.00	Calculated
101	Pipe - (373)	Pipe	CB-122	DMH-233	39.43	25.00	24.50	1.2700	12.000	0.0120	2.03	4.35	0.47	3.16	0.94	0.94	0.00	Calculated
102	Pipe - (374)	Pipe	DMH-233	WQS-408	27.64	24.40	24.00	1.4500	12.000	0.0120	4.36	4.64	0.94	5.93	0.88	0.89	0.00	Calculated
103	Pipe - (375)	Pipe	TD-121	DMH-292	63.60	37.00	32.46	7.1400	6.000	0.0150	0.61	1.30	0.47	5.31	0.37	0.74	0.00	Calculated
104	Pipe - (376)	Pipe	CB-173	DMH-275	36.44	35.68	35.50	0.5000	12.000	0.0120	0.53	4.52	0.12	2.19	0.59	0.59	0.00	Calculated
105	Pipe - (378) (1)	Pipe	DMH-291	DMH-292	70.80	33.40	32.10	1.8400	12.000	0.0120	4.17	5.23	0.80	5.45	1.00	1.00	2.00	SURCHARGED
106	Pipe - (379)	Pipe	CB-110	DMH-228	32.75	41.00	40.50	1.5300	12.000	0.0120	0.72	4.77	0.15	3.89	0.29	0.29	0.00	Calculated
107	Pipe - (380)	Pipe	DMH-228	DMH-227	269.18	40.40	36.00	1.6300	12.000	0.0120	1.48	4.93	0.30	4.19	0.46	0.46	0.00	Calculated
108	Pipe - (381)	Pipe	DMH-227	DMH-226	131.90	35.90	34.00	1.4400	12.000	0.0120	3.01	4.63	0.65	5.88	0.62	0.62	0.00	Calculated
109	Pipe - (382)	Pipe	DMH-226	DMH-225	104.51	33.90	32.00	1.8200	12.000	0.0120	3.54	5.20	0.68	6.19	0.68	0.68	0.00	Calculated
110	Pipe - (383)	Pipe	DMH-225	Out-1Pipe - (383)	72.94	31.90	30.50	1.9200	12.000	0.0120	3.94	5.35	0.74	6.61	0.71	0.71	0.00	Calculated
111	Pipe - (384)	Pipe	CB-111	DMH-228	35.47	41.00	40.50	1.4100	12.000	0.0120	0.81	4.58	0.18	3.97	0.31	0.31	0.00	Calculated
112	Pipe - (385)	Pipe	CB-112	DMH-227	10.59	36.20	36.00	1.8900	12.000	0.0120	0.88	5.30	0.17	3.21	0.48	0.48	0.00	Calculated
113	Pipe - (386)	Pipe	CB-113	DMH-227	11.73	36.20	36.00	1.7100	12.000	0.0120	0.86	5.04	0.17	3.11	0.48	0.48	0.00	Calculated
114	Pipe - (387)	Pipe	CB-114	DMH-226	15.36	34.20	34.00	1.3000	12.000	0.0120	0.28	4.40	0.06	2.04	0.49	0.49	0.00	Calculated
115	Pipe - (388)	Pipe	CB-115	DMH-226	14.65	34.20	34.00	1.3700	12.000	0.0120	0.29	4.51	0.06	2.09	0.49	0.49	0.00	Calculated
116	Pipe - (389)	Pipe	CB-116	DMH-225	12.93	32.20	32.00	1.5500	12.000	0.0120	0.25	4.80	0.05	2.09	0.58	0.58	0.00	Calculated

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
117	Pipe - (390)	Pipe	CB-117	DMH-225	14.26	32.20	32.00	1.4000	12.000	0.0120	0.20	4.57	0.04	1.92	0.58	0.58	0.00	Calculated
118	Pipe - (391)	Pipe	CB-131	DMH-254	38.87	30.30	30.00	0.7700	12.000	0.0120	0.30	3.39	0.09	1.71	0.30	0.30	0.00	Calculated
119	Pipe - (392)	Pipe	DMH-254	DMH-253	109.52	29.90	29.00	0.8200	12.000	0.0120	1.57	3.50	0.45	4.09	0.49	0.49	0.00	Calculated
120	Pipe - (393)	Pipe	DMH-253	Out-1Pipe - (393)	53.76	28.70	28.25	0.8400	12.000	0.0120	2.37	3.53	0.67	4.33	0.66	0.66	0.00	Calculated
121	Pipe - (394)	Pipe	CB-132	DMH-254	18.09	30.10	30.00	0.5500	12.000	0.0120	0.29	2.87	0.10	1.57	0.37	0.37	0.00	Calculated
122	Pipe - (395)	Pipe	OCS-401	DMH-250	48.06	25.00	21.50	7.2800	12.000	0.0120	3.17	10.42	0.30	10.32	0.42	0.42	0.00	Calculated
123	Pipe - (396)	Pipe	CB-127	DMH-239	29.03	27.00	26.20	2.7600	12.000	0.0120	0.62	6.41	0.10	3.18	0.43	0.43	0.00	Calculated
124	Pipe - (397)	Pipe	CB-125	DMH-238	23.04	25.60	25.40	0.8700	12.000	0.0120	0.80	3.60	0.22	1.87	0.77	0.77	0.00	Calculated
125	Pipe - (399)	Pipe	DMH-238	DMH-237	13.37	25.30	25.10	1.5000	12.000	0.0120	2.76	4.72	0.59	3.73	0.90	0.90	0.00	Calculated
126	Pipe - (400)	Pipe	DMH-237	DMH-235	184.96	25.00	22.90	1.1400	18.000	0.0120	6.95	10.42	0.67	4.57	1.22	0.81	0.00	Calculated
127	Pipe - (402) (1)	Pipe	WQS-406	Out-1Pipe - (402) (1)	10.55	22.50	22.25	2.3700	18.000	0.0120	11.41	17.52	0.65	7.58	1.19	0.79	0.00	Calculated
128	Pipe - (403)	Pipe	DMH-293	WQS-405	27.57	31.40	31.00	1.4500	12.000	0.0120	2.39	4.65	0.51	4.54	0.64	0.64	0.00	Calculated
129	Pipe - (404)	Pipe	WQS-405	Out-1Pipe - (404)	11.87	30.90	30.70	1.6800	12.000	0.0120	2.39	5.01	0.48	4.94	0.59	0.59	0.00	Calculated
130	Pipe - (405)	Pipe	CB-174	DMH-275	17.69	36.00	35.50	2.8300	12.000	0.0120	0.44	6.49	0.07	2.80	0.59	0.59	0.00	Calculated
131	Pipe - (407)	Pipe	DMH-275	DMH-274	25.00	35.40	35.00	1.6000	12.000	0.0120	3.75	4.88	0.77	5.59	0.80	0.80	0.00	Calculated
132	Pipe - (408)	Pipe	CB-161	DMH-296	22.49	36.00	35.50	2.2200	12.000	0.0120	0.44	5.76	0.08	2.57	0.32	0.32	0.00	Calculated
133	Pipe - (408) (1)	Pipe	DMH-296	WQS-404	139.60	35.40	32.50	2.0800	12.000	0.0120	3.13	5.56	0.56	5.22	0.71	0.71	0.00	Calculated
134	Pipe - (409)	Pipe	WQS-404	DMH-297	6.51	32.25	32.15	1.5400	15.000	0.0120	5.55	8.67	0.64	5.69	0.93	0.74	0.00	Calculated
135	Pipe - (409) (1)	Pipe	DMH-297	Out-1Pipe - (409) (1)	36.10	28.60	28.16	1.2200	15.000	0.0120	5.55	7.73	0.72	5.74	0.92	0.74	0.00	Calculated
136	Pipe - (410)	Pipe	CB-182	DMH-283	34.68	34.50	34.00	1.4400	12.000	0.0120	0.87	4.63	0.19	4.08	0.32	0.32	0.00	Calculated
137	Pipe - (411)	Pipe	CB-171	DMH-272	12.47	29.80	29.60	1.6000	12.000	0.0120	0.37	4.89	0.08	2.58	0.38	0.38	0.00	Calculated
138	Pipe - (412)	Pipe	DMH-272	WQS-403	34.73	29.40	27.50	5.4700	12.000	0.0120	4.51	9.03	0.50	9.39	0.59	0.59	0.00	Calculated
139	Pipe - (413)	Pipe	CB-172	DMH-272	14.40	29.80	29.60	1.3900	12.000	0.0120	0.50	4.55	0.11	2.71	0.38	0.38	0.00	Calculated
140	Pipe - (414)	Pipe	DMH-221	DMH-222	114.19	24.90	24.10	0.7000	15.000	0.0120	2.86	5.86	0.49	3.97	0.81	0.65	0.00	Calculated
141	Pipe - (415)	Pipe	DMH-222	DMH-223	93.31	24.00	23.30	0.7500	18.000	0.0120	6.26	9.86	0.63	4.90	1.06	0.70	0.00	Calculated
142	Pipe - (416)	Pipe	DMH-223	DMH-224	34.04	23.20	22.90	0.8800	18.000	0.0120	6.14	10.68	0.58	5.27	1.23	0.82	0.00	Calculated
143	Pipe - (417)	Pipe	DMH-224	DMH-201	133.27	22.80	21.65	0.8600	18.000	0.0120	5.51	10.57	0.52	4.38	1.43	0.95	0.00	Calculated
144	Pipe - (418)	Pipe	CB-162	DMH-296	38.16	36.00	35.50	1.3100	12.000	0.0120	2.70	4.42	0.61	5.10	0.64	0.64	0.00	Calculated
145	Pipe - (419)	Pipe	DMH-274	DMH-273	122.00	34.90	32.00	2.3800	12.000	0.0120	3.73	5.95	0.63	7.44	0.61	0.61	0.00	Calculated
146	Pipe - (421)	Pipe	DMH-273	DMH-272	43.54	31.90	29.50	5.5100	12.000	0.0120	3.73	9.06	0.41	8.31	0.56	0.56	0.00	Calculated
147	Pipe - (426)	Pipe	DMH-286	DMH-285	157.55	34.10	31.80	1.4600	12.000	0.0120	3.85	4.66	0.83	5.23	0.89	0.89	0.00	Calculated
148	Pipe - (428)	Pipe	RD-5	DMH-229	3.79	28.50	28.30	5.2700	8.000	0.0150	2.26	2.40	0.94	6.64	0.66	0.98	0.00	Calculated
149	Pipe - (429)	Pipe	RD-4	DMH-215	10.18	29.00	28.60	3.9300	6.000	0.0150	0.90	0.96	0.94	4.73	0.50	1.00	1.00	SURCHARGED
150	Pipe - (430)	Pipe	RD-3	DMH-216	15.22	28.33	28.18	1.0000	8.000	0.0150	1.00	1.05	0.95	3.15	0.57	0.85	0.00	Calculated
151	Pipe - (431)	Pipe	RD-9	DMH-222	5.85	28.67	24.10	78.1100	10.000	0.0150	3.94	16.78	0.24	13.33	0.60	0.72	0.00	Calculated
152	Pipe - (432)	Pipe	RD-8	DMH-210	8.59	28.00	27.75	2.9100	8.000	0.0150	1.13	1.79	0.63	4.43	0.46	0.69	0.00	Calculated
153	Pipe - (433)	Pipe	RD-6	DMH-214	11.47	29.00	28.61	3.4000	10.000	0.0150	2.34	3.50	0.67	5.49	0.61	0.73	0.00	Calculated
154	Pipe - (444)	Pipe	AD-108	DMH-217	53.75	29.00	27.40	2.9800	8.000	0.0120	0.00	5.39	0.00	0.00	0.32	0.48	0.00	Calculated
155	Pipe - (93)	Pipe	CB-104	DMH-207	55.26	27.00	26.50	0.9000	12.000	0.0120	1.96	3.67	0.53	4.29	0.57	0.57	0.00	Calculated
156	Pipe - (94)	Pipe	CB-103	DMH-206	7.19	28.00	27.80	2.7800	12.000	0.0120	0.30	6.44	0.05	3.45	0.17	0.17	0.00	Calculated
157	Pipe - (95)	Pipe	DMH-207	DMH-206	67.36	25.24	24.90	0.5000	15.000	0.0120	3.63	5.72	0.63	3.15	1.22	0.98	0.00	Calculated
158	Pipe - (95) (2) (1)	Pipe	DMH-206	WQS-401	20.28	24.80	24.70	0.4900	18.000	0.0120	5.10	8.05	0.63	3.43	1.41	0.94	0.00	Calculated
159	Pipe - (95) (2) (1) (1)	Pipe	WQS-401	DMH-205	80.07	24.60	24.25	0.4400	18.000	0.0120	5.08	8.05	0.63	2.88	1.49	0.99	0.00	Calculated

Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft²)	Minimum Pipe Cover (in)
1	AB-200	28.40	35.03	6.63	28.40	0.00	35.03	0.00	0.00	0.00
2	AB-201	27.90	30.95	3.05	27.90	0.00	30.95	0.00	0.00	0.00
3	AB-202	28.00	32.37	4.37	28.00	0.00	32.37	0.00	0.00	0.00
4	AB-203	29.65	32.60	2.95	29.65	0.00	32.60	0.00	0.00	0.00
5	AB-204	30.15	32.60	2.45	30.15	0.00	32.60	0.00	0.00	0.00
6	AB-221	28.29	31.10	2.81	0.00	-28.29	0.00	-31.10	0.00	0.00
7	AB-231	37.92	41.40	3.48	0.00	-37.92	0.00	-41.40	0.00	0.00
8	AB-235	35.71	41.60	5.89	0.00	-35.71	0.00	-41.60	0.00	0.00
9	AD-100	22.90	28.00	5.10	22.90	0.00	27.50	-0.50	0.00	0.00
10	AD-103	21.90	28.50	6.60	21.90	0.00	28.50	0.00	0.00	0.00
11	AD-105	21.50	26.77	5.27	21.50	0.00	26.77	0.00	0.00	0.00
12	AD-107	35.00	38.50	3.50	35.00	0.00	0.00	-38.50	0.00	0.00
13	AD-108	36.50	40.00	3.50	36.50	0.00	0.00	-40.00	0.00	0.00
14	CB-101	27.00	30.80	3.80	27.00	0.00	30.80	0.00	0.00	0.00
15	CB-102	27.00	30.30	3.30	27.00	0.00	30.30	0.00	0.00	0.00
16	CB-103	28.00	31.75	3.75	28.00	0.00	31.75	0.00	0.00	0.00
17	CB-104	27.00	30.55	3.55	27.00	0.00	30.55	0.00	0.00	0.00
18	CB-105	28.50	32.00	3.50	28.50	0.00	32.00	0.00	0.00	0.00
19	CB-106	28.00	30.50	2.50	28.00	0.00	30.50	0.00	0.00	0.00
20	CB-110	41.00	44.50	3.50	41.00	0.00	44.50	0.00	0.00	0.00
21	CB-111	41.00	44.50	3.50	41.00	0.00	44.50	0.00	0.00	0.00
22	CB-112	36.20	39.55	3.35	36.20	0.00	39.55	0.00	0.00	0.00
23	CB-113	36.20	39.55	3.35	36.20	0.00	39.55	0.00	0.00	0.00
24	CB-114	34.20	37.50	3.30	34.20	0.00	37.50	0.00	0.00	0.00
25	CB-115	34.20	37.50	3.30	34.20	0.00	37.50	0.00	0.00	0.00
26	CB-116	32.20	35.50	3.30	32.20	0.00	35.50	0.00	0.00	0.00
27	CB-117	32.20	35.50	3.30	32.20	0.00	35.50	0.00	0.00	0.00
28	CB-120	27.20	30.24	3.04	27.20	0.00	30.24	0.00	0.00	0.00
29	CB-121	25.00	28.00	3.00	25.00	0.00	28.00	0.00	0.00	0.00
30	CB-122	25.00	28.30	3.30	25.00	0.00	28.30	0.00	0.00	0.00
31	CB-123	24.50	27.80	3.30	24.50	0.00	27.80	0.00	0.00	0.00
32	CB-124	25.65	28.25	2.60	25.65	0.00	28.25	0.00	0.00	0.00
33	CB-125	25.60	28.80	3.20	25.60	0.00	28.80	0.00	0.00	0.00
34	CB-127	27.00	29.90	2.90	27.00	0.00	29.90	0.00	0.00	0.00
35	CB-128	27.00	29.87	2.87	27.00	0.00	29.87	0.00	0.00	0.00
36	CB-131	30.30	33.00	2.70	30.30	0.00	33.00	0.00	0.00	0.00
37	CB-132	30.10	32.60	2.50	30.10	0.00	32.60	0.00	0.00	0.00
38	CB-133	29.00	31.50	2.50	29.00	0.00	31.50	0.00	0.00	0.00
39	CB-134	29.00	31.50	2.50	29.00	0.00	31.50	0.00	0.00	0.00
40	CB-141	34.40	37.00	2.60	34.40	0.00	37.00	0.00	0.00	0.00
41	CB-142	33.00	35.80	2.80	33.00	0.00	35.80	0.00	0.00	0.00
42	CB-151	24.00	27.70	3.70	24.00	0.00	27.70	0.00	0.00	0.00
43	CB-152	24.00	27.70	3.70	24.00	0.00	27.70	0.00	0.00	0.00
44	CB-161	36.00	39.25	3.25	36.00	0.00	39.25	0.00	0.00	0.00
45	CB-162	36.00	39.25	3.25	36.00	0.00	39.25	0.00	0.00	0.00
46	CB-163	33.00	37.90	4.90	33.00	0.00	37.90	0.00	0.00	0.00
47	CB-171	29.80	33.00	3.20	29.80	0.00	33.00	0.00	0.00	0.00
48	CB-172	29.80	33.25	3.45	29.80	0.00	33.25	0.00	0.00	0.00
49	CB-173	36.00	38.00	2.00	36.00	0.00	38.00	0.00	0.00	0.00
50	CB-174	36.00	39.30	3.30	36.00	0.00	39.30	0.00	0.00	0.00
51	CB-181	34.90	37.90	3.00	34.90	0.00	37.90	0.00	0.00	0.00
52	CB-182	34.50	38.00	3.50	34.50	0.00	38.00	0.00	0.00	0.00
53	CB-183	33.00	36.50	3.50	33.00	0.00	36.50	0.00	0.00	0.00
54	CB-184	33.00	36.80	3.80	33.00	0.00	36.80	0.00	0.00	0.00
55	CB-185	34.75	38.75	4.00	34.75	0.00	38.75	0.00	0.00	0.00
56	CB-186	35.00	39.00	4.00	35.00	0.00	39.00	0.00	0.00	0.00
57	CB-187	35.00	38.90	3.90	35.00	0.00	38.90	0.00	0.00	0.00
58	CB-191	34.00	37.53	3.53	34.00	0.00	37.53	0.00	0.00	0.00
59	CB-192	34.00	37.50	3.50	34.00	0.00	37.50	0.00	0.00	0.00
60	CB-193	34.00	37.75	3.75	34.00	0.00	37.75	0.00	0.00	0.00
61	CB-194	34.00	37.50	3.50	34.00	0.00	37.50	0.00	0.00	0.00
62	DMH-110	28.79	41.25	12.46	28.79	0.00	0.00	-41.25	0.00	0.00
63	DMH-200	21.30	27.07	5.77	21.30	0.00	27.07	0.00	0.00	0.00
64	DMH-201	21.55	29.50	7.95	21.55	0.00	29.50	0.00	0.00	0.00
65	DMH-202	22.75	31.00	8.25	22.75	0.00	31.00	0.00	0.00	0.00
66	DMH-203	23.25	31.50	8.25	23.25	0.00	31.50	0.00	0.00	0.00
67	DMH-204	23.80	30.94	7.14	23.80	0.00	30.94	0.00	0.00	0.00
68	DMH-205	24.15	31.70	7.55	24.15	0.00	31.70	0.00	0.00	0.00
69	DMH-206	24.80	31.75	6.95	24.80	0.00	31.75	0.00	0.00	0.00
70	DMH-207	25.35	31.93	6.58	25.35	0.00	31.93	0.00	0.00	0.00
71	DMH-208	26.20	33.00	6.80	26.20	0.00	33.00	0.00	0.00	0.00
72	DMH-209	26.90	32.25	5.35	26.90	0.00	32.25	0.00	0.00	0.00
73	DMH-210	25.01	32.50	7.50	25.01	0.00	32.50	0.00	0.00	0.00
74	DMH-211	25.35	32.25	6.90	25.35	0.00	32.25	0.00	0.00	0.00
75	DMH-212	25.94	32.90	6.96	25.94	0.00	32.90	0.00	0.00	0.00
76	DMH-213	26.88	33.00	6.13	26.88	0.00	33.00	0.00	0.00	0.00
77	DMH-214	26.71	32.67	5.96	26.71	0.00	32.67	0.00	0.00	0.00
78	DMH-215	28.52	32.05	3.53	28.52	0.00	32.05	0.00	0.00	0.00
79	DMH-216	27.85	32.50	4.65	27.85	0.00	32.50	0.00	0.00	0.00
80	DMH-217	27.30	31.13	3.83	27.30	0.00	31.13	0.00	0.00	0.00
81	DMH-218	26.70	31.00	4.30	26.70	0.00	31.00	0.00	0.00	0.00
82	DMH-219	26.15	32.20	6.05	26.15	0.00	32.20	0.00	0.00	0.00

Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft²)	Minimum Pipe Cover (in)
83	DMH-220	25.50	32.50	7.00	25.50	0.00	32.50	0.00	0.00	0.00
84	DMH-221	24.90	32.50	7.60	24.90	0.00	32.50	0.00	0.00	0.00
85	DMH-222	24.00	32.20	8.20	24.00	0.00	32.20	0.00	0.00	0.00
86	DMH-223	23.20	31.06	7.86	23.20	0.00	31.06	0.00	0.00	0.00
87	DMH-224	22.80	29.50	6.70	22.80	0.00	29.50	0.00	0.00	0.00
88	DMH-225	31.90	35.45	3.55	31.90	0.00	35.45	0.00	0.00	0.00
89	DMH-226	33.90	37.50	3.60	33.90	0.00	37.50	0.00	0.00	0.00
90	DMH-227	35.90	39.50	3.60	35.90	0.00	39.50	0.00	0.00	0.00
91	DMH-228	40.40	44.20	3.80	40.40	0.00	44.20	0.00	0.00	0.00
92	DMH-229	28.21	35.05	6.83	28.21	0.00	35.05	0.00	0.00	0.00
93	DMH-232	26.90	30.94	4.04	26.90	0.00	30.94	0.00	0.00	0.00
94	DMH-233	24.40	27.88	3.48	24.40	0.00	27.88	0.00	0.00	0.00
95	DMH-235	23.45	28.77	5.32	23.45	0.00	28.77	0.00	0.00	0.00
96	DMH-236	27.40	30.27	2.87	27.40	0.00	30.27	0.00	0.00	0.00
97	DMH-237	25.00	29.90	4.90	25.00	0.00	29.90	0.00	0.00	0.00
98	DMH-238	25.30	28.50	3.20	25.30	0.00	28.50	0.00	0.00	0.00
99	DMH-239	26.00	29.50	3.50	26.00	0.00	29.50	0.00	0.00	0.00
100	DMH-250	17.80	25.50	7.70	17.80	0.00	25.50	0.00	0.00	0.00
101	DMH-251	18.80	31.42	12.62	18.80	0.00	31.42	0.00	0.00	0.00
102	DMH-252	20.80	31.30	10.50	20.80	0.00	31.30	0.00	0.00	0.00
103	DMH-253	28.70	31.80	3.10	28.70	0.00	31.80	0.00	0.00	0.00
104	DMH-254	29.90	33.00	3.10	29.90	0.00	33.00	0.00	0.00	0.00
105	DMH-255	26.80	32.00	5.20	26.80	0.00	32.00	0.00	0.00	0.00
106	DMH-256	27.80	39.00	11.20	27.80	0.00	39.00	0.00	0.00	0.00
107	DMH-257	31.20	38.00	6.80	31.20	0.00	38.00	0.00	0.00	0.00
108	DMH-258	32.50	39.00	6.50	32.50	0.00	39.00	0.00	0.00	0.00
109	DMH-259	33.90	37.80	3.90	33.90	0.00	37.80	0.00	0.00	0.00
110	DMH-262	36.99	36.50	-0.49	0.00	-36.99	0.00	-36.50	0.00	0.00
111	DMH-272	29.40	33.00	3.60	29.40	0.00	33.00	0.00	0.00	0.00
112	DMH-273	31.90	34.75	2.85	31.90	0.00	34.75	0.00	0.00	0.00
113	DMH-274	34.90	38.70	3.80	34.90	0.00	38.70	0.00	0.00	0.00
114	DMH-275	35.40	39.35	3.95	35.40	0.00	39.35	0.00	0.00	0.00
115	DMH-281	26.30	37.25	10.95	26.30	0.00	37.25	0.00	0.00	0.00
116	DMH-282	30.50	37.80	7.30	30.50	0.00	37.80	0.00	0.00	0.00
117	DMH-283	31.90	38.50	6.60	31.90	0.00	38.50	0.00	0.00	0.00
118	DMH-284	34.15	38.70	4.55	34.15	0.00	38.70	0.00	0.00	0.00
119	DMH-285	31.70	39.50	7.80	31.70	0.00	39.50	0.00	0.00	0.00
120	DMH-286	34.10	38.48	4.38	34.31	0.21	38.48	0.00	0.00	0.00
121	DMH-287	34.90	39.75	4.85	34.90	0.00	39.75	0.00	0.00	0.00
122	DMH-291	33.00	37.90	4.90	33.00	0.00	37.90	0.00	0.00	0.00
123	DMH-292	32.00	37.60	5.60	32.00	0.00	37.60	0.00	0.00	0.00
124	DMH-293	31.40	37.80	6.40	31.40	0.00	37.80	0.00	0.00	0.00
125	DMH-294	33.65	37.60	3.95	33.65	0.00	37.60	0.00	0.00	0.00
126	DMH-296	35.40	39.30	3.90	35.40	0.00	39.30	0.00	0.00	0.00
127	DMH-297	28.60	39.00	10.40	28.60	0.00	39.00	0.00	0.00	0.00
128	FB-UD-1	35.00	40.00	5.00	35.00	0.00	40.00	0.00	0.00	0.00
129	FB-UD-2	29.20	40.00	10.80	29.20	0.00	40.00	0.00	0.00	0.00
130	FB-UD-3	35.00	40.00	5.00	35.00	0.00	40.00	0.00	0.00	0.00
131	FB-UD-4	27.11	40.00	12.89	27.11	0.00	40.00	0.00	0.00	0.00
132	OCS-400	22.00	26.19	4.19	22.00	0.00	26.19	0.00	0.00	0.00
133	OCS-401	25.00	27.27	2.27	25.00	0.00	27.27	0.00	0.00	0.00
134	RD-1	28.50	33.00	4.50	28.50	0.00	33.00	0.00	0.00	0.00
135	RD-2	28.25	33.00	4.75	28.25	0.00	33.00	0.00	0.00	0.00
136	RD-3	28.33	40.00	11.67	28.33	0.00	-2.96	-42.96	0.00	0.00
137	RD-4	28.67	40.00	11.33	28.67	0.00	-2.98	-42.98	0.00	0.00
138	RD-5	28.33	40.00	11.67	28.33	0.00	-2.96	-42.96	0.00	0.00
139	RD-6	28.67	33.00	4.33	28.67	0.00	33.00	0.00	0.00	0.00
140	RD-7	28.00	40.00	12.00	28.00	0.00	-2.96	-42.96	0.00	0.00
141	RD-8	28.00	40.00	12.00	28.00	0.00	-2.96	-42.96	0.00	0.00
142	RD-9	28.67	40.00	11.33	28.67	0.00	-2.95	-42.95	0.00	0.00
143	TD-101	30.50	32.66	2.16	30.50	0.00	32.66	0.00	0.00	0.00
144	TD-102	30.50	32.46	1.96	30.50	0.00	32.46	0.00	0.00	0.00
145	TD-103	30.50	32.71	2.21	30.50	0.00	32.71	0.00	0.00	0.00
146	TD-112	28.43	31.10	2.67	30.50	2.07	0.67	-30.44	0.00	0.00
147	TD-113	28.50	30.16	1.66	28.50	0.00	30.16	0.00	0.00	0.00
148	TD-114	28.14	31.10	2.96	29.50	1.36	-2.94	-34.04	0.00	0.00
149	TD-121	37.00	40.00	3.00	37.00	0.00	40.00	0.00	0.00	0.00
150	UD	27.65	40.00	12.35	27.65	0.00	40.00	0.00	0.00	0.00
151	WQS-400	24.25	31.40	7.15	24.25	0.00	31.40	0.00	0.00	0.00
152	WQS-401	24.60	31.80	7.20	24.60	0.00	31.80	0.00	0.00	0.00
153	WQS-402	23.25	29.00	5.75	23.25	0.00	29.00	0.00	0.00	0.00
154	WQS-403	26.50	31.60	5.10	26.50	0.00	31.60	0.00	0.00	0.00
155	WQS-404	32.25	38.10	5.85	32.25	0.00	38.10	0.00	0.00	0.00
156	WQS-405	30.90	38.00	7.10	30.90	0.00	38.00	0.00	0.00	0.00
157	WQS-406	22.50	28.25	5.75	22.50	0.00	28.25	0.00	0.00	0.00
158	WQS-407	24.65	34.00	9.35	24.65	0.00	34.00	0.00	0.00	0.00
159	WQS-408	23.75	30.43	6.68	23.75	0.00	30.43	0.00	0.00	0.00

Junction Results

SN	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Max HGL Depth Attained	Max Surcharge Depth Attained	Min Freeboard Attained	Average HGL Elevation Attained	Average HGL Depth Attained	Time of Max HGL Occurrence	Time of Peak Flooding Occurrence	Total Flooded Volume	Total Time Flooded
		(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(days hh:mm)	(days hh:mm)	(ac-in)	(min)
1	AB-200	1.50	1.32	28.84	0.44	0.00	6.19	28.51	0.11	0 00:06	0 00:00	0.00	0.00
2	AB-201	0.39	0.00	28.13	0.23	0.00	2.82	27.96	0.06	0 00:06	0 00:00	0.00	0.00
3	AB-202	1.43	0.00	28.79	0.79	0.00	3.58	28.48	0.48	0 00:06	0 00:00	0.00	0.00
4	AB-203	0.65	0.00	29.94	0.29	0.00	2.66	29.72	0.07	0 00:06	0 00:00	0.00	0.00
5	AB-204	0.22	0.00	30.39	0.24	0.00	2.21	30.21	0.06	0 00:06	0 00:00	0.00	0.00
6	AB-221	0.27	0.00	28.84	0.55	0.00	2.26	28.51	0.22	0 00:06	0 00:00	0.00	0.00
7	AB-231	1.10	1.10	38.14	0.22	0.00	3.26	37.97	0.05	0 00:06	0 00:00	0.00	0.00
8	AB-235	0.00	0.00	35.71	0.00	0.00	5.89	35.71	0.00	0 00:00	0 00:00	0.00	0.00
9	AD-100	3.88	3.88	23.83	0.93	0.00	4.17	23.82	0.92	0 00:02	0 00:00	0.00	0.00
10	AD-103	2.72	2.72	22.90	1.00	0.00	5.60	22.89	0.99	0 00:16	0 00:00	0.00	0.00
11	AD-105	4.76	4.76	23.61	2.11	0.00	3.16	23.59	2.09	0 00:16	0 00:00	0.00	0.00
12	AD-107	0.00	0.00	35.00	0.00	0.00	3.50	35.00	0.00	0 00:00	0 00:00	0.00	0.00
13	AD-108	0.00	0.00	36.50	0.00	0.00	3.50	36.50	0.00	0 00:00	0 00:00	0.00	0.00
14	CB-101	0.76	0.76	27.26	0.26	0.00	3.54	27.06	0.06	0 00:06	0 00:00	0.00	0.00
15	CB-102	1.05	1.05	27.32	0.32	0.00	2.98	27.07	0.07	0 00:06	0 00:00	0.00	0.00
16	CB-103	0.30	0.30	28.19	0.19	0.00	3.56	28.04	0.04	0 00:06	0 00:00	0.00	0.00
17	CB-104	2.00	2.00	27.61	0.61	0.00	2.94	27.13	0.13	0 00:06	0 00:00	0.00	0.00
18	CB-105	0.79	0.79	28.87	0.37	0.00	3.13	28.58	0.08	0 00:06	0 00:00	0.00	0.00
19	CB-106	1.98	1.98	28.70	0.70	0.00	1.80	28.15	0.15	0 00:06	0 00:00	0.00	0.00
20	CB-110	0.73	0.73	41.30	0.30	0.00	3.20	41.07	0.07	0 00:06	0 00:00	0.00	0.00
21	CB-111	0.82	0.82	41.33	0.33	0.00	3.17	41.07	0.07	0 00:06	0 00:00	0.00	0.00
22	CB-112	0.89	0.89	36.62	0.42	0.00	2.93	36.29	0.09	0 00:06	0 00:00	0.00	0.00
23	CB-113	0.87	0.87	36.62	0.42	0.00	2.93	36.29	0.09	0 00:06	0 00:00	0.00	0.00
24	CB-114	0.30	0.30	34.59	0.39	0.00	2.91	34.27	0.07	0 00:07	0 00:00	0.00	0.00
25	CB-115	0.31	0.31	34.59	0.39	0.00	2.91	34.27	0.07	0 00:07	0 00:00	0.00	0.00
26	CB-116	0.27	0.27	32.68	0.48	0.00	2.82	32.28	0.08	0 00:07	0 00:00	0.00	0.00
27	CB-117	0.23	0.23	32.68	0.48	0.00	2.82	32.28	0.08	0 00:07	0 00:00	0.00	0.00
28	CB-120	1.23	1.23	27.66	0.46	0.00	2.58	27.30	0.10	0 00:06	0 00:00	0.00	0.00
29	CB-121	2.49	2.49	25.96	0.96	0.00	2.04	25.16	0.16	0 00:06	0 00:00	0.00	0.00
30	CB-122	2.17	2.17	25.87	0.87	0.00	2.43	25.14	0.14	0 00:06	0 00:00	0.00	0.00
31	CB-123	2.07	2.07	25.35	0.85	0.00	2.45	24.68	0.18	0 00:06	0 00:00	0.00	0.00
32	CB-124	2.05	2.05	26.42	0.77	0.00	1.83	25.80	0.15	0 00:06	0 00:00	0.00	0.00
33	CB-125	0.84	0.84	26.28	0.68	0.00	2.52	25.71	0.11	0 00:06	0 00:00	0.00	0.00
34	CB-127	0.63	0.63	27.21	0.21	0.00	2.69	27.05	0.05	0 00:06	0 00:00	0.00	0.00
35	CB-128	0.68	0.68	27.21	0.21	0.00	2.66	27.05	0.05	0 00:06	0 00:00	0.00	0.00
36	CB-131	0.30	0.30	30.50	0.20	0.00	2.50	30.35	0.05	0 00:06	0 00:00	0.00	0.00
37	CB-132	0.30	0.30	30.43	0.33	0.00	2.17	30.17	0.07	0 00:06	0 00:00	0.00	0.00
38	CB-133	0.58	0.58	29.45	0.45	0.00	2.05	29.09	0.09	0 00:06	0 00:00	0.00	0.00
39	CB-134	0.32	0.32	29.43	0.43	0.00	2.07	29.08	0.08	0 00:06	0 00:00	0.00	0.00
40	CB-141	2.24	2.24	38.59	4.19	0.00	0.38	37.99	3.59	0 00:06	0 00:00	0.00	0.00
41	CB-142	1.06	1.06	35.05	2.05	0.00	0.75	34.34	1.34	0 00:07	0 00:00	0.00	0.00
42	CB-151	1.12	1.12	24.40	0.40	0.00	3.30	24.09	0.09	0 00:06	0 00:00	0.00	0.00
43	CB-152	0.76	0.76	24.29	0.29	0.00	3.41	24.06	0.06	0 00:06	0 00:00	0.00	0.00
44	CB-161	0.44	0.44	36.19	0.19	0.00	3.06	36.04	0.04	0 00:06	0 00:00	0.00	0.00
45	CB-162	2.73	2.73	36.72	0.72	0.00	2.53	36.15	0.15	0 00:06	0 00:00	0.00	0.00
46	CB-163	2.56	2.56	33.64	0.64	0.00	4.26	33.13	0.13	0 00:06	0 00:00	0.00	0.00
47	CB-171	0.38	0.38	30.08	0.28	0.00	2.92	29.85	0.05	0 00:06	0 00:00	0.00	0.00
48	CB-172	0.51	0.51	30.10	0.30	0.00	3.15	29.86	0.06	0 00:06	0 00:00	0.00	0.00
49	CB-173	0.53	0.53	36.35	0.35	0.00	1.65	36.06	0.06	0 00:06	0 00:00	0.00	0.00
50	CB-174	0.44	0.44	36.34	0.34	0.00	2.96	36.05	0.05	0 00:06	0 00:00	0.00	0.00
51	CB-181	1.92	1.92	35.45	0.55	0.00	2.45	35.02	0.12	0 00:06	0 00:00	0.00	0.00
52	CB-182	0.88	0.88	34.84	0.34	0.00	3.16	34.58	0.08	0 00:06	0 00:00	0.00	0.00
53	CB-183	1.00	1.00	33.25	0.25	0.00	3.25	33.06	0.06	0 00:06	0 00:00	0.00	0.00
54	CB-184	0.62	0.62	33.17	0.17	0.00	3.63	33.04	0.04	0 00:06	0 00:00	0.00	0.00
55	CB-185	0.60	0.60	34.92	0.17	0.00	3.83	34.79	0.04	0 00:06	0 00:00	0.00	0.00
56	CB-186	0.59	0.59	35.18	0.18	0.00	3.82	35.04	0.04	0 00:06	0 00:00	0.00	0.00
57	CB-187	0.38	0.37	35.73	0.73	0.00	3.17	35.13	0.13	0 00:06	0 00:00	0.00	0.00
58	CB-191	1.49	1.49	34.98	0.98	0.00	2.55	34.11	0.11	0 00:06	0 00:00	0.00	0.00
59	CB-192	0.99	0.99	34.33	0.33	0.00	3.17	34.07	0.07	0 00:06	0 00:00	0.00	0.00
60	CB-193	0.88	0.88	34.30	0.30	0.00	3.45	34.06	0.06	0 00:06	0 00:00	0.00	0.00
61	CB-194	1.56	1.56	34.49	0.49	0.00	3.01	34.10	0.10	0 00:06	0 00:00	0.00	0.00
62	DMH-110	0.00	0.00	28.79	0.00	0.00	12.46	28.79	0.00	0 00:00	0 00:00	0.00	0.00
63	DMH-200	16.67	0.00	23.16	1.86	0.00	3.91	21.75	0.45	0 00:09	0 00:00	0.00	0.00
64	DMH-201	16.67	0.00	23.77	2.22	0.00	5.73	22.08	0.53	0 00:08	0 00:00	0.00	0.00
65	DMH-202	11.96	0.00	24.39	1.64	0.00	6.61	23.12	0.37	0 00:09	0 00:00	0.00	0.00
66	DMH-203	12.18	0.00	24.91	1.66	0.00	6.59	23.65	0.40	0 00:08	0 00:00	0.00	0.00
67	DMH-204	10.87	0.00	25.36	1.56	0.00	5.57	24.17	0.37	0 00:08	0 00:00	0.00	0.00
68	DMH-205	10.94	0.00	25.79	1.64	0.00	5.91	24.54	0.39	0 00:07	0 00:00	0.00	0.00
69	DMH-206	5.19	0.00	26.25	1.45	0.00	5.50	25.13	0.33	0 00:07	0 00:00	0.00	0.00
70	DMH-207	3.92	0.00	26.55	1.20	0.00	5.39	25.61	0.26	0 00:07	0 00:00	0.00	0.00
71	DMH-208	2.43	0.00	27.24	1.04	0.00	5.76	26.40	0.20	0 00:08	0 00:00	0.00	0.00
72	DMH-209	2.65	0.00	27.76	0.86	0.00	4.49	27.09	0.19	0 00:07	0 00:00	0.00	0.00
73	DMH-210	6.05	0.00	26.33	1.32	0.00	6.17	25.28	0.27	0 00:07	0 00:00	0.00	0.00
74	DMH-211	5.03	0.00	26.81	1.46	0.00	5.44	25.65	0.30	0 00:07	0 00:00	0.00	0.00
75	DMH-212	4.38	0.00	27.26	1.32	0.00	5.64	26.19	0.25	0 00:07	0 00:00	0.00	0.00
76	DMH-213	2.16	0.00	27.66	0.78	0.00	5.34	27.04	0.16	0 00:07	0 00:00	0.00	0.00
77	DMH-214	2.34	0.00	28.99	2.28	0.00	3.67	28.55	1.84	0 00:06	0 00:00	0.00	0.00
78	DMH-215	0.90	0.00	29.12	0.60	0.00	2.93	28.64	0.12	0 00:07	0 00:00	0.00	0.00
79	DMH-216	1.77	0.00	28.65	0.80	0.00	3.85	28.02	0.17	0 00:06	0 00:00	0.00	0.00
80	DMH-217	1.69	0.00	28.04	0.74	0.00	3.09	27.47	0.17	0 00:08	0 00:00	0.00	0.00
81	DMH-218	1.58	0.00	27.42	0.72	0.00	3.58	26.87	0.17	0 00:08	0 00:00	0.00	0.00

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
82	DMH-219	2.20	0.00	26.77	0.62	0.00	5.43	26.32	0.17	0 00:07	0 00:00	0.00	0.00
83	DMH-220	2.20	0.00	26.11	0.61	0.00	6.39	25.66	0.16	0 00:07	0 00:00	0.00	0.00
84	DMH-221	2.88	0.00	25.57	0.67	0.00	6.93	25.08	0.18	0 00:07	0 00:00	0.00	0.00
85	DMH-222	6.29	0.00	25.06	1.06	0.00	7.14	24.27	0.27	0 00:06	0 00:00	0.00	0.00
86	DMH-223	6.26	0.00	24.41	1.21	0.00	6.65	23.49	0.29	0 00:08	0 00:00	0.00	0.00
87	DMH-224	6.14	0.00	24.15	1.35	0.00	5.35	23.09	0.29	0 00:08	0 00:00	0.00	0.00
88	DMH-225	3.94	0.00	32.68	0.78	0.00	2.77	32.08	0.18	0 00:07	0 00:00	0.00	0.00
89	DMH-226	3.54	0.00	34.59	0.69	0.00	2.91	34.06	0.16	0 00:07	0 00:00	0.00	0.00
90	DMH-227	3.18	0.00	36.56	0.66	0.00	2.94	36.05	0.15	0 00:06	0 00:00	0.00	0.00
91	DMH-228	1.53	0.00	40.78	0.38	0.00	3.42	40.49	0.09	0 00:06	0 00:00	0.00	0.00
92	DMH-229	2.26	0.00	28.95	0.74	0.00	6.10	28.34	0.13	0 00:06	0 00:00	0.00	0.00
93	DMH-232	1.23	0.00	27.27	0.37	0.00	3.67	26.99	0.09	0 00:06	0 00:00	0.00	0.00
94	DMH-233	4.36	0.00	25.69	1.29	0.00	2.19	24.63	0.23	0 00:06	0 00:00	0.00	0.00
95	DMH-235	11.87	0.00	25.00	1.55	0.00	3.77	23.74	0.29	0 00:07	0 00:00	0.00	0.00
96	DMH-236	3.05	0.00	28.04	0.64	0.00	2.23	27.55	0.15	0 00:06	0 00:00	0.00	0.00
97	DMH-237	6.89	0.00	25.95	0.95	0.00	3.95	25.21	0.21	0 00:06	0 00:00	0.00	0.00
98	DMH-238	2.80	0.00	26.25	0.95	0.00	2.25	25.49	0.19	0 00:06	0 00:00	0.00	0.00
99	DMH-239	4.20	2.90	26.86	0.86	0.00	2.64	26.17	0.17	0 00:06	0 00:00	0.00	0.00
100	DMH-250	21.60	0.00	20.20	2.40	0.00	5.30	20.15	2.35	0 00:18	0 00:00	0.00	0.00
101	DMH-251	11.36	0.00	20.54	1.74	0.00	10.88	20.49	1.69	0 00:18	0 00:00	0.00	0.00
102	DMH-252	11.36	0.00	22.78	1.98	0.00	8.52	22.76	1.96	0 00:17	0 00:00	0.00	0.00
103	DMH-253	2.37	0.00	29.42	0.72	0.00	2.38	28.86	0.16	0 00:06	0 00:00	0.00	0.00
104	DMH-254	1.67	0.00	30.41	0.51	0.00	2.59	30.02	0.12	0 00:06	0 00:00	0.00	0.00
105	DMH-255	5.33	0.00	27.63	0.83	0.00	4.37	26.96	0.16	0 00:07	0 00:00	0.00	0.00
106	DMH-256	5.32	0.00	32.63	4.83	0.00	6.37	31.90	4.10	0 00:06	0 00:00	0.00	0.00
107	DMH-257	3.08	0.00	35.03	3.83	0.00	2.97	34.25	3.05	0 00:07	0 00:00	0.00	0.00
108	DMH-258	2.16	0.00	36.57	4.07	0.00	2.43	35.74	3.24	0 00:06	0 00:00	0.00	0.00
109	DMH-259	2.19	0.00	37.67	3.77	0.00	0.50	36.95	3.05	0 00:06	0 00:00	0.00	0.00
110	DMH-262	0.00	0.00	36.99	0.00	0.00	1.50	36.99	0.00	0 00:00	0 00:00	0.00	0.00
111	DMH-272	4.52	0.00	30.08	0.68	0.00	2.92	29.54	0.14	0 00:06	0 00:00	0.00	0.00
112	DMH-273	3.73	0.00	32.44	0.54	0.00	2.31	32.02	0.12	0 00:06	0 00:00	0.00	0.00
113	DMH-274	3.75	0.00	35.55	0.65	0.00	3.15	35.04	0.14	0 00:06	0 00:00	0.00	0.00
114	DMH-275	3.81	0.00	36.34	0.94	0.00	3.01	35.59	0.19	0 00:06	0 00:00	0.00	0.00
115	DMH-281	10.68	0.00	29.07	2.77	0.00	8.18	26.70	0.40	0 00:07	0 00:00	0.00	0.00
116	DMH-282	9.57	0.00	31.94	1.44	0.00	5.86	30.76	0.26	0 00:07	0 00:00	0.00	0.00
117	DMH-283	2.75	0.00	32.53	0.63	0.00	5.97	32.03	0.13	0 00:07	0 00:00	0.00	0.00
118	DMH-284	1.90	0.00	34.62	0.47	0.00	4.08	34.26	0.11	0 00:06	0 00:00	0.00	0.00
119	DMH-285	7.37	0.00	33.03	1.33	0.00	6.47	31.93	0.23	0 00:07	0 00:00	0.00	0.00
120	DMH-286	3.97	0.00	34.87	0.77	0.00	3.60	34.26	0.16	0 00:06	0 00:00	0.00	0.00
121	DMH-287	3.43	0.00	35.72	0.82	0.00	4.03	35.05	0.15	0 00:06	0 00:00	0.00	0.00
122	DMH-291	4.49	0.00	35.09	2.09	0.00	2.81	33.60	0.60	0 00:06	0 00:00	0.00	0.00
123	DMH-292	5.66	0.00	33.69	1.69	0.00	3.91	32.26	0.26	0 00:07	0 00:00	0.00	0.00
124	DMH-293	2.39	0.00	32.08	0.68	0.00	5.72	31.54	0.14	0 00:06	0 00:00	0.00	0.00
125	DMH-294	1.56	0.00	34.08	0.43	0.00	3.52	33.75	0.10	0 00:06	0 00:00	0.00	0.00
126	DMH-296	3.13	0.00	35.95	0.55	0.00	3.35	35.52	0.12	0 00:06	0 00:00	0.00	0.00
127	DMH-297	5.55	0.00	29.66	1.06	0.00	9.34	28.82	0.22	0 00:06	0 00:00	0.00	0.00
128	FB-UD-1	3.11	3.11	37.49	2.49	0.00	2.51	37.07	2.07	0 00:06	0 00:00	0.00	0.00
129	FB-UD-2	3.11	3.11	37.50	8.30	0.00	2.50	36.78	7.58	0 00:06	0 00:00	0.00	0.00
130	FB-UD-3	2.99	2.99	37.59	2.59	0.00	2.41	37.08	2.08	0 00:06	0 00:00	0.00	0.00
131	FB-UD-4	3.05	3.05	37.49	10.38	0.00	2.51	36.63	9.52	0 00:06	0 00:00	0.00	0.00
132	OCS-400	7.16	7.16	22.82	0.82	0.00	3.37	22.80	0.80	0 00:00	0 00:00	0.00	0.00
133	OCS-401	3.08	3.08	25.46	0.46	0.00	1.82	25.44	0.44	0 00:00	0 00:00	0.00	0.00
134	RD-1	0.84	0.84	28.78	0.28	0.00	4.22	28.56	0.06	0 00:06	0 00:00	0.00	0.00
135	RD-2	0.94	0.94	28.59	0.34	0.00	4.41	28.32	0.07	0 00:06	0 00:00	0.00	0.00
136	RD-3	1.02	1.02	28.99	0.66	0.00	11.01	28.47	0.14	0 00:06	0 00:00	0.00	0.00
137	RD-4	0.90	0.90	29.74	1.07	0.00	10.26	29.11	0.44	0 00:06	0 00:00	0.00	0.00
138	RD-5	2.26	2.26	29.74	1.41	0.00	10.26	28.69	0.36	0 00:06	0 00:00	0.00	0.00
139	RD-6	2.36	2.36	29.72	1.05	0.00	3.28	29.14	0.47	0 00:06	0 00:00	0.00	0.00
140	RD-7	1.24	1.24	28.27	0.27	0.00	11.73	28.06	0.06	0 00:06	0 00:00	0.00	0.00
141	RD-8	1.14	1.14	28.53	0.53	0.00	11.47	28.11	0.11	0 00:06	0 00:00	0.00	0.00
142	RD-9	3.95	3.95	29.04	0.37	0.00	10.96	28.74	0.07	0 00:06	0 00:00	0.00	0.00
143	TD-101	0.23	0.23	30.73	0.23	0.00	1.94	30.55	0.05	0 00:06	0 00:00	0.00	0.00
144	TD-102	0.45	0.45	30.75	0.25	0.00	1.71	30.55	0.05	0 00:06	0 00:00	0.00	0.00
145	TD-103	0.80	0.80	30.94	0.44	0.00	1.78	30.59	0.09	0 00:06	0 00:00	0.00	0.00
146	TD-112	0.20	0.20	29.97	1.54	0.00	1.13	28.54	0.11	0 00:00	0 00:00	0.00	0.00
147	TD-113	1.23	1.23	28.80	0.30	0.00	1.36	28.56	0.06	0 00:06	0 00:00	0.00	0.00
148	TD-114	0.40	0.40	29.07	0.93	0.00	2.03	28.23	0.09	0 00:00	0 00:00	0.00	0.00
149	TD-121	0.61	0.61	37.24	0.24	0.00	2.76	37.06	0.06	0 00:06	0 00:00	0.00	0.00
150	UD	2.87	2.87	35.66	8.01	0.00	4.34	34.82	7.17	0 00:06	0 00:00	0.00	0.00
151	WQS-400	1.78	0.00	24.94	0.69	0.00	6.46	24.40	0.15	0 00:08	0 00:00	0.00	0.00
152	WQS-401	5.10	0.00	26.07	1.47	0.00	5.73	24.93	0.33	0 00:07	0 00:00	0.00	0.00
153	WQS-402	1.86	0.00	23.68	0.43	0.00	5.32	23.34	0.09	0 00:06	0 00:00	0.00	0.00
154	WQS-403	4.51	0.00	27.68	1.18	0.00	3.92	26.72	0.22	0 00:07	0 00:00	0.00	0.00
155	WQS-404	5.59	0.00	33.37	1.12	0.00	4.73	32.49	0.24	0 00:06	0 00:00	0.00	0.00
156	WQS-405	2.39	0.00	31.60	0.70	0.00	6.40	31.05	0.15	0 00:06	0 00:00	0.00	0.00
157	WQS-406	11.41	0.00	24.11	1.61	0.00	4.14	22.83	0.33	0 00:07	0 00:00	0.00	0.00
158	WQS-407	10.66	0.00	27.14	2.49	0.00	6.86	25.37	0.72	0 00:07	0 00:00	0.00	0.00
159	WQS-408	5.56	0.00	24.64	0.89	0.00	5.79	23.93	0.18	0 00:06	0 00:00	0.00	0.00

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate
1	Link-01	46.45	32.00	0.00	30.55	0.00	1.45	3.1200	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No
2	Link-02	97.27	35.00	0.00	27.40	0.10	7.60	7.8100	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No
3	Link-03	87.70	28.79	0.00	26.20	1.20	2.59	2.9500	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No
4	Link-04	69.58	27.79	-0.12	27.11	-0.29	0.68	0.9700	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No
5	Link-05	20.19	28.30	0.01	28.10	-0.30	0.19	0.9500	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No
6	Link-06	125.99	37.92	0.00	30.00	0.10	7.92	6.2800	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No
7	Link-07	117.77	36.89	-0.10	35.71	0.00	1.18	1.0000	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No
8	Link-08	105.20	35.61	-0.10	32.24	4.44	3.37	3.2000	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No
9	Link-09	40.59	24.50	0.00	24.30	0.85	0.20	0.4900	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No
10	Link-10	15.55	22.80	-0.65	22.60	0.10	0.20	1.2900	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No
11	Pipe - (102)	238.61	28.00	0.00	27.00	0.10	1.00	0.4200	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
12	Pipe - (105)	81.21	37.98	3.58	37.16	3.26	0.81	1.0000	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
13	Pipe - (105) (1)	160.29	36.00	3.50	34.37	3.17	1.63	1.0200	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
14	Pipe - (105) (2)	96.44	37.06	3.16	36.10	3.60	0.96	1.0000	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
15	Pipe - (106)	23.21	25.65	0.00	25.40	0.10	0.25	1.0800	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
16	Pipe - (107)	17.19	31.00	-2.00	30.00	-1.20	1.00	5.8200	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
17	Pipe - (117)	16.56	21.90	0.00	21.75	0.95	0.15	0.9100	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
18	Pipe - (117) (1)	51.53	17.92	0.11	17.40	0.00	0.52	1.0000	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No
19	Pipe - (128)	116.89	26.90	0.00	25.20	1.45	1.70	1.4500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
20	Pipe - (129)	17.28	23.75	0.00	22.50	0.45	1.25	7.2300	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
21	Pipe - (130)	114.20	18.57	-3.43	18.00	0.20	0.57	0.5000	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
22	Pipe - (136)	36.42	26.00	0.00	25.10	0.10	0.90	2.4700	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
23	Pipe - (148)	18.52	29.00	0.00	28.90	0.20	0.10	0.5400	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
24	Pipe - (157)	12.38	27.20	0.00	27.00	0.10	0.20	1.6200	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
25	Pipe - (161)	78.05	28.51	1.80	26.04	0.10	2.47	3.1700	CIRCULAR	9.960	9.960	0.0120	0.5000	0.5000	0.0000	0.00	No
26	Pipe - (162)	41.75	25.00	0.00	24.50	0.10	0.50	1.2000	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
27	Pipe - (167)	47.06	25.35	0.00	25.11	0.10	0.24	0.5200	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
28	Pipe - (211)	205.97	34.30	3.10	32.40	4.60	1.90	0.9200	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
29	Pipe - (212)	87.52	32.14	4.34	26.80	0.00	5.34	6.1000	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
30	Pipe - (213)	38.48	23.25	0.00	22.00	0.00	1.25	3.2500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
31	Pipe - (230) (1) (1) (1)	25.83	26.50	0.00	26.00	6.00	0.50	1.9400	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
32	Pipe - (231)	8.57	33.00	0.00	32.50	0.25	0.50	5.8400	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
33	Pipe - (232)	10.12	34.00	0.00	33.50	2.10	0.50	4.9400	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
34	Pipe - (233)	19.95	34.00	0.00	33.50	0.50	0.50	2.5100	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
35	Pipe - (236)	71.85	27.00	0.00	25.50	1.25	1.50	2.0900	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
36	Pipe - (236) (1)	8.87	24.25	0.00	24.00	0.75	0.25	2.8200	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
37	Pipe - (237)	12.85	30.50	0.00	30.25	0.10	0.25	1.9500	CIRCULAR	6.000	6.000	0.0150	0.5000	0.5000	0.0000	0.00	No
38	Pipe - (238)	78.70	29.94	-0.21	29.16	-0.49	0.79	1.0000	CIRCULAR	6.000	6.000	0.0120	0.5000	0.5000	0.0000	0.00	No
39	Pipe - (238) (1)	56.55	29.06	-0.59	28.49	0.49	0.56	1.0000	CIRCULAR	8.040	8.040	0.0120	0.5000	0.5000	0.0000	0.00	No
40	Pipe - (239)	81.29	28.39	0.39	27.00	2.20	1.39	1.7100	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
41	Pipe - (240)	4.15	30.50	0.00	30.00	0.35	0.50	12.0600	CIRCULAR	6.000	6.000	0.0150	0.5000	0.5000	0.0000	0.00	No
42	Pipe - (241)	10.00	30.50	0.00	30.00	2.00	0.50	5.0000	CIRCULAR	6.000	6.000	0.0150	0.5000	0.5000	0.0000	0.00	No
43	Pipe - (243) (2)	89.37	28.00	-0.40	27.11	-0.29	0.89	1.0000	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
44	Pipe - (245)	15.88	28.00	-0.50	27.11	-0.29	0.89	5.6100	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No
45	Pipe - (269)	17.82	34.20	-0.80	34.00	-0.90	0.20	1.1400	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
46	Pipe - (269) (1) (1)	66.48	31.70	0.00	30.60	0.10	1.10	1.6500	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
47	Pipe - (271)	18.72	35.00	0.00	34.00	-0.10	1.00	5.3400	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
48	Pipe - (272)	41.54	34.75	0.00	32.00	0.30	2.75	6.6200	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
49	Pipe - (273)	53.04	34.90	0.00	34.25	0.10	0.65	1.2300	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
50	Pipe - (274)	14.11	29.00	0.00	28.90	0.20	0.10	0.7100	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
51	Pipe - (275)	26.70	26.50	-0.50	26.20	0.20	0.30	1.1200	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
52	Pipe - (282)	41.51	35.00	7.35	34.00	6.20	1.00	2.4100	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No
53	Pipe - (288)	201.51	22.90	0.00	21.89	1.09	1.01	0.5000	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
54	Pipe - (289)	169.05	21.40	0.60	20.55	1.75	0.85	0.5000	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No
55	Pipe - (291)	82.70	21.90	0.40	21.49	0.69	0.41	0.5000	CIRCULAR	15.000	15.000	0.0150	0.5000	0.5000	0.0000	0.00	No
56	Pipe - (298)	98.71	23.80	0.00	23.35	0.10	0.45	0.4600	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No
57	Pipe - (298) (1)	93.96	23.25	0.00	22.85	0.10	0.40	0.4300	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No
58	Pipe - (299)	56.39	24.15	0.00	23.90	0.10	0.25	0.4400	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No
59	Pipe - (300)	16.04	34.00	0.00	33.50	1.50	0.50	3.1200	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
60	Pipe - (301)	23.00	21.30	0.00	21.10	0.00	0.20	0.8700	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No
61	Pipe - (302)	4.79	28.50	0.00	28.40	1.50	0.10	2.0900	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
62	Pipe - (303)	122.31	26.90	0.00	26.30	0.10	0.60	0.4900	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
63	Pipe - (304)	190.93	26.20	0.00	25.34	-0.01	0.86	0.4500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
64	Pipe - (308)	18.05	24.00	0.00	23.50	0.25	0.50	2.7700	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
65	Pipe - (309)	37.54	24.00	0.00	23.50	0.25	0.50	1.3300	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
66	Pipe - (310)	67.88	25.50	0.00	25.00	0.10	0.50	0.7400	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
67	Pipe - (311)	88.71	26.15	0.00	25.60	0.10	0.55	0.6200	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
68	Pipe - (312)	83.45	26.70	0.00	26.25	0.10	0.45	0.5400	CIRCULAR	9.960	9.960	0.0120	0.5000	0.5000	0.0000	0.00	No
69	Pipe - (313)	95.08	27.30	0.00	26.80	0.10	0.50	0.5300	CIRCULAR	9.960	9.960	0.0120	0.5000	0.5000	0.0000	0.00	No
70	Pipe - (314)	85.71	27.85	0.00	27.40	0.10	0.45	0.5300	CIRCULAR	9.960	9.960	0.0120	0.5000	0.5000	0.0000	0.00	No
71	Pipe - (315)	130.20	28.52	0.00	27.87	0.02	0.65	0.5000	CIRCULAR	8.040	8.040	0.0120	0.5000	0.5000	0.0000	0.00	No
72	Pipe - (316)	36.69	28.50	0.00	27.25	2.35	1.25	3.4100	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No
73	Pipe - (317)	27.92	25.01	0.00	24.56	0.41	0.45	1.6000	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
74	Pipe - (319)	18.32	28.25	0.00	27.25	1.10	1.00	5.4600	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No
75	Pipe - (321)	27.38	28.21	0.00	26.98	0.10	1.24	4.5200	CIRCULAR	8.040	8.040	0.0120	0.5000	0.5000	0.0000	0.00	No
76	Pipe - (322)	174.58	26.88	0.00	26.04	0.10	0.84	0.4800	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
77	Pipe - (323)	11.06	28.00	0.00	25.93	0.58	2.07	18.7100	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No
78	Pipe - (324)	90.69	25.94	0.00	25.47	0.12	0.47	0.5100	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
79	Pipe - (329)	235.15	22.75	0.00	21.65	0.10	1.10	0.4700	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No
80	Pipe - (329) (1)	21.25	21.55	0.00	21.40	0.10	0.15	0.7100	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No
81	Pipe - (330)	70.15	27.00	0.00	25.50	1.25	1.50	2.1400	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
82	Pipe - (335)	35.03	28.43	0.00	28.10	-0.30	0.33	0.9400	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate
83	Pipe - (341)	82.16	18.41	-0.39	18.00	0.20	0.41	0.5000	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000	0.00	No
84	Pipe - (342)	27.07	26.70	-0.10	26.00	0.00	0.70	2.5900	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
85	Pipe - (343)	69.66	33.65	0.00	32.50	1.10	1.15	1.6500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
86	Pipe - (345)	49.44	34.90	0.00	34.20	0.10	0.70	1.4200	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
87	Pipe - (346)	32.91	26.30	0.00	25.10	0.45	1.20	3.6500	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
88	Pipe - (346) (1)	13.77	25.00	0.35	24.54	0.00	0.46	3.3400	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
89	Pipe - (347)	17.51	33.00	0.00	31.00	4.70	2.00	11.4200	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
90	Pipe - (348)	31.97	33.00	0.00	31.00	4.70	2.00	6.2600	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
91	Pipe - (349)	51.75	30.50	0.00	29.00	2.70	1.50	2.9000	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
92	Pipe - (350)	5.89	34.00	0.00	33.75	0.10	0.25	4.2500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
93	Pipe - (351)	80.13	27.01	-0.39	26.00	2.55	1.01	1.2600	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
94	Pipe - (365)	25.15	28.14	0.00	27.89	-0.02	0.25	1.0000	CIRCULAR	6.000	6.000	0.0150	0.5000	0.5000	0.0000	0.00	No
95	Pipe - (367)	20.45	37.00	9.89	35.00	3.30	2.00	9.7800	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No
96	Pipe - (368)	30.19	37.00	7.80	35.00	0.10	2.00	6.6200	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No
97	Pipe - (369)	43.58	37.00	2.00	35.50	0.10	1.50	3.4400	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No
98	Pipe - (370)	78.91	37.00	2.00	33.50	0.50	3.50	4.4400	CIRCULAR	12.000	12.000	0.0150	0.5000	0.5000	0.0000	0.00	No
99	Pipe - (372)	145.94	34.15	0.00	32.00	0.10	2.15	1.4700	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
100	Pipe - (372) (1)	90.39	31.90	0.00	30.50	0.00	1.40	1.5500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
101	Pipe - (373)	39.43	25.00	0.00	24.50	0.10	0.50	1.2700	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
102	Pipe - (374)	27.64	24.40	0.00	24.00	0.25	0.40	1.4500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
103	Pipe - (375)	63.60	37.00	0.00	32.46	0.46	4.54	7.1400	CIRCULAR	6.000	6.000	0.0150	0.5000	0.5000	0.0000	0.00	No
104	Pipe - (376)	36.44	35.68	-0.32	35.50	0.10	0.18	0.5000	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
105	Pipe - (378) (1)	70.80	33.40	0.40	32.10	0.10	1.30	1.8400	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
106	Pipe - (379)	32.75	41.00	0.00	40.50	0.10	0.50	1.5300	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
107	Pipe - (380)	269.18	40.40	0.00	36.00	0.10	4.40	1.6300	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
108	Pipe - (381)	131.90	35.90	0.00	34.00	0.10	1.90	1.4400	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
109	Pipe - (382)	104.51	33.90	0.00	32.00	0.10	1.90	1.8200	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
110	Pipe - (383)	72.94	31.90	0.00	30.50	0.00	1.40	1.9200	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
111	Pipe - (384)	35.47	41.00	0.00	40.50	0.10	0.50	1.4100	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
112	Pipe - (385)	10.59	36.20	0.00	36.00	0.10	0.20	1.8900	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
113	Pipe - (386)	11.73	36.20	0.00	36.00	0.10	0.20	1.7100	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
114	Pipe - (387)	15.36	34.20	0.00	34.00	0.10	0.20	1.3000	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
115	Pipe - (388)	14.65	34.20	0.00	34.00	0.10	0.20	1.3700	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
116	Pipe - (389)	12.93	32.20	0.00	32.00	0.10	0.20	1.5500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
117	Pipe - (390)	14.26	32.20	0.00	32.00	0.10	0.20	1.4000	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
118	Pipe - (391)	38.87	30.30	0.00	30.00	0.10	0.30	0.7700	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
119	Pipe - (392)	109.52	29.90	0.00	29.00	0.30	0.90	0.8200	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
120	Pipe - (393)	53.76	28.70	0.00	28.25	0.00	0.45	0.8400	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
121	Pipe - (394)	18.09	30.10	0.00	30.00	0.10	0.10	0.5500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
122	Pipe - (395)	48.06	25.00	0.00	21.50	3.70	3.50	7.2800	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
123	Pipe - (396)	29.03	27.00	0.00	26.20	0.20	0.80	2.7600	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
124	Pipe - (397)	23.04	25.60	0.00	25.40	0.10	0.20	0.8700	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
125	Pipe - (399)	13.37	25.30	0.00	25.10	0.10	0.20	1.5000	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
126	Pipe - (400)	184.96	25.00	0.00	22.90	-0.55	2.10	1.1400	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No
127	Pipe - (402) (1)	10.55	22.50	0.00	22.25	0.15	0.25	2.3700	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No
128	Pipe - (403)	27.57	31.40	0.00	31.00	0.10	0.40	1.4500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
129	Pipe - (404)	11.87	30.90	0.00	30.70	0.00	0.20	1.6800	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
130	Pipe - (405)	17.69	36.00	0.00	35.50	0.10	0.50	2.8300	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
131	Pipe - (407)	25.00	35.40	0.00	35.00	0.10	0.40	1.6000	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
132	Pipe - (408)	22.49	36.00	0.00	35.50	0.10	0.50	2.2200	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
133	Pipe - (408) (1)	139.60	35.40	0.00	32.50	0.25	2.90	2.0800	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
134	Pipe - (409)	6.51	32.25	0.00	32.15	3.55	0.10	1.5400	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
135	Pipe - (409) (1)	36.10	28.60	0.00	28.16	0.00	0.44	1.2200	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
136	Pipe - (410)	34.68	34.50	0.00	34.00	2.10	0.50	1.4400	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
137	Pipe - (411)	12.47	29.80	0.00	29.60	0.20	0.20	1.6000	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
138	Pipe - (412)	34.73	29.40	0.00	27.50	1.00	1.90	5.4700	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
139	Pipe - (413)	14.40	29.80	0.00	29.60	0.20	0.20	1.3900	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
140	Pipe - (414)	114.19	24.90	0.00	24.10	0.10	0.80	0.7000	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
141	Pipe - (415)	93.31	24.00	0.00	23.30	0.10	0.70	0.7500	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No
142	Pipe - (416)	34.04	23.20	0.00	22.90	0.10	0.30	0.8800	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No
143	Pipe - (417)	133.27	22.80	0.00	21.65	0.10	1.15	0.8600	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No
144	Pipe - (418)	38.16	36.00	0.00	35.50	0.10	0.50	1.3100	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
145	Pipe - (419)	122.00	34.90	0.00	32.00	0.10	2.90	2.3800	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
146	Pipe - (421)	43.54	31.90	0.00	29.50	0.10	2.40	5.5100	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
147	Pipe - (426)	157.55	34.10	0.00	31.80	0.10	2.30	1.4600	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
148	Pipe - (428)	3.79	28.50	0.17	28.30	0.09	0.20	5.2700	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No
149	Pipe - (429)	10.18	29.00	0.33	28.60	0.08	0.40	3.9300	CIRCULAR	6.000	6.000	0.0150	0.5000	0.5000	0.0000	0.00	No
150	Pipe - (430)	15.22	28.33	0.00	28.18	0.33	0.15	1.0000	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No
151	Pipe - (431)	5.85	28.67	0.00	24.10	0.10	4.57	78.1100	CIRCULAR	9.960	9.960	0.0150	0.5000	0.5000	0.0000	0.00	No
152	Pipe - (432)	8.59	28.00	0.00	27.75	2.74	0.25	2.9100	CIRCULAR	8.040	8.040	0.0150	0.5000	0.5000	0.0000	0.00	No
153	Pipe - (433)	11.47	29.00	0.33	28.61	1.90	0.39	3.4000	CIRCULAR	9.960	9.960	0.0150	0.5000	0.5000	0.0000	0.00	No
154	Pipe - (444)	53.75	29.00	-7.50	27.40	0.10	1.60	2.9800	CIRCULAR	8.040	8.040	0.0120	0.5000	0.5000	0.0000	0.00	No
155	Pipe - (93)	55.26	27.00	0.00	26.50	1.15	0.50	0.9000	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
156	Pipe - (94)	7.19	28.00	0.00	27.80	3.00	0.20	2.7800	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.0000	0.00	No
157	Pipe - (95)	67.36	25.24	-0.11	24.90	0.10	0.34	0.5000	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.0000	0.00	No
158	Pipe - (95) (2) (1)	20.28	24.80	0.00	24.70	0.10	0.10	0.4900	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No
159	Pipe - (95) (2) (1) (1)	80.07	24.60	0.00	24.25	0.10	0.35	0.4400	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.0000	0.00	No

Pipe Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
1	Link-01	5.46	0 00:07	5.46	1.00	7.27	0.11	0.97	1.00	0.00		SURCHARGED
2	Link-02	0.00	0 00:00	25.45	0.00	0.00		0.32	0.21	0.00		Calculated
3	Link-03	0.00	0 00:00	15.64	0.00	0.00		0.00	0.00	0.00		Calculated
4	Link-04	0.38	0 00:06	7.72	0.05	2.02	0.57	0.43	0.29	0.00		Calculated
5	Link-05	0.27	0 00:00	2.23	0.12	1.83	0.18	0.49	0.49	0.00		Calculated
6	Link-06	1.09	0 00:06	22.82	0.05	4.82	0.44	0.32	0.21	0.00		Calculated
7	Link-07	0.00	0 00:00	9.49	0.00	0.00		0.00	0.00	0.00		Calculated
8	Link-08	0.00	0 00:00	16.53	0.00	0.00		0.19	0.13	0.00		Calculated
9	Link-09	2.02	0 00:06	2.18	0.93	3.30	0.21	0.75	0.75	0.00		Calculated
10	Link-10	11.41	0 00:07	21.29	0.54	6.46	0.04	1.50	1.00	0.00		SURCHARGED
11	Pipe - (102)	1.91	0 00:06	2.73	0.70	3.25	1.22	0.71	0.71	0.00		Calculated
12	Pipe - (105)	2.19	0 00:06	3.86	0.57	4.67	0.29	0.58	0.58	0.00		Calculated
13	Pipe - (105) (1)	2.16	0 00:07	3.90	0.56	4.45	0.60	0.61	0.61	0.00		Calculated
14	Pipe - (105) (2)	2.16	0 00:06	3.86	0.56	4.70	0.34	0.57	0.57	0.00		Calculated
15	Pipe - (106)	2.01	0 00:06	4.01	0.50	3.21	0.12	0.81	0.81	0.00		Calculated
16	Pipe - (107)	1.06	0 00:06	12.49	0.08	4.93	0.06	1.00	1.00	56.00		SURCHARGED
17	Pipe - (117)	2.83	0 00:00	6.66	0.42	4.34	0.06	1.02	0.81	0.00		Calculated
18	Pipe - (117) (1)	21.60	0 00:18	24.50	0.88	7.48	0.11	1.73	0.86	0.00		Calculated
19	Pipe - (128)	1.19	0 00:06	4.65	0.26	4.75	0.41	0.36	0.36	0.00		Calculated
20	Pipe - (129)	5.55	0 00:06	10.38	0.53	9.40	0.03	0.71	0.71	0.00		Calculated
21	Pipe - (130)	7.85	0 00:00	13.10	0.60	8.56	0.22	1.03	0.82	0.00		Calculated
22	Pipe - (136)	4.13	0 00:06	6.07	0.68	5.80	0.10	0.85	0.85	0.00		Calculated
23	Pipe - (148)	0.55	0 00:06	2.84	0.20	2.08	0.15	0.48	0.48	0.00		Calculated
24	Pipe - (157)	1.23	0 00:06	4.91	0.25	4.19	0.05	0.40	0.40	0.00		Calculated
25	Pipe - (161)	2.32	0 00:06	4.23	0.55	5.66	0.23	0.66	0.79	0.00		Calculated
26	Pipe - (162)	2.33	0 00:06	4.22	0.55	3.35	0.21	0.98	0.98	0.00		Calculated
27	Pipe - (167)	4.99	0 00:07	5.04	0.99	4.09	0.19	1.24	0.99	0.00		Calculated
28	Pipe - (211)	2.91	0 00:07	3.71	0.79	4.99	0.69	0.70	0.70	0.00		Calculated
29	Pipe - (212)	5.33	0 00:07	17.29	0.31	8.74	0.17	0.66	0.53	0.00		Calculated
30	Pipe - (213)	1.86	0 00:06	6.96	0.27	6.60	0.10	0.39	0.39	0.00		Calculated
31	Pipe - (230) (1) (1) (1)	4.50	0 00:07	5.37	0.84	6.32	0.07	0.85	0.85	0.00		Calculated
32	Pipe - (231)	2.55	0 00:06	9.32	0.27	5.46	0.03	0.75	0.75	0.00		Calculated
33	Pipe - (232)	0.87	0 00:06	8.58	0.10	5.53	0.03	0.25	0.26	0.00		Calculated
34	Pipe - (233)	1.43	0 00:06	6.11	0.23	3.90	0.09	0.99	0.99	0.00		Calculated
35	Pipe - (236)	1.03	0 00:06	5.58	0.18	5.11	0.23	0.30	0.30	0.00		Calculated
36	Pipe - (236) (1)	1.76	0 00:06	6.48	0.27	4.94	0.03	0.80	0.80	0.00		Calculated
37	Pipe - (237)	0.22	0 00:06	0.68	0.33	2.82	0.08	0.21	0.43	0.00		Calculated
38	Pipe - (238)	0.22	0 00:06	0.48	0.45	2.08	0.63	0.26	0.53	0.00		Calculated
39	Pipe - (238) (1)	0.65	0 00:06	1.87	0.35	4.33	0.22	0.30	0.44	0.00		Calculated
40	Pipe - (239)	1.41	0 00:06	5.05	0.28	5.16	0.26	0.38	0.38	0.00		Calculated
41	Pipe - (240)	0.44	0 00:06	1.69	0.26	5.55	0.01	0.21	0.42	0.00		Calculated
42	Pipe - (241)	0.79	0 00:06	1.09	0.73	4.97	0.03	0.38	0.75	0.00		Calculated
43	Pipe - (243) (2)	1.48	0 00:06	4.08	0.36	4.50	0.33	0.54	0.54	0.00		Calculated
44	Pipe - (245)	1.23	0 00:06	8.13	0.15	3.51	0.08	0.46	0.46	0.00		Calculated
45	Pipe - (269)	0.39	0 00:06	2.89	0.14	2.14	0.14	0.77	0.77	0.00		Calculated
46	Pipe - (269) (1) (1)	7.10	0 00:06	9.00	0.79	6.17	0.18	1.25	1.00	1.00		SURCHARGED
47	Pipe - (271)	0.58	0 00:06	8.46	0.07	3.58	0.09	0.47	0.47	0.00		Calculated
48	Pipe - (272)	0.60	0 00:06	9.93	0.06	5.48	0.13	0.58	0.58	0.00		Calculated
49	Pipe - (273)	1.90	0 00:06	4.27	0.44	4.74	0.19	0.51	0.51	0.00		Calculated
50	Pipe - (274)	0.30	0 00:06	3.25	0.09	1.80	0.13	0.47	0.47	0.00		Calculated
51	Pipe - (275)	0.68	0 00:06	6.68	0.10	3.34	0.13	0.44	0.44	0.00		Calculated
52	Pipe - (282)	2.84	0 00:06	4.79	0.59	5.70	0.12	0.61	0.61	0.00		Calculated
53	Pipe - (288)	3.89	0 00:02	4.95	0.79	4.11	0.82	0.91	0.73	0.00		Calculated
54	Pipe - (289)	11.36	0 00:17	17.38	0.65	5.35	0.53	1.28	0.64	0.00		Calculated
55	Pipe - (291)	4.84	0 00:01	3.96	1.22	4.16	0.33	1.25	1.00	58.00		SURCHARGED
56	Pipe - (298)	10.76	0 00:07	17.33	0.62	4.21	0.39	1.56	0.78	0.00		Calculated
57	Pipe - (298) (1)	11.96	0 00:07	17.33	0.69	4.96	0.32	1.60	0.80	0.00		Calculated
58	Pipe - (299)	10.87	0 00:07	17.33	0.63	4.25	0.22	1.55	0.78	0.00		Calculated
59	Pipe - (300)	0.98	0 00:06	6.81	0.14	5.11	0.05	0.29	0.29	0.00		Calculated
60	Pipe - (301)	16.67	0 00:09	22.85	0.73	6.33	0.06	1.56	0.78	0.00		Calculated
61	Pipe - (302)	0.78	0 00:06	5.58	0.14	3.77	0.02	0.31	0.31	0.00		Calculated
62	Pipe - (303)	2.43	0 00:07	2.73	0.89	3.72	0.55	0.87	0.87	0.00		Calculated
63	Pipe - (304)	2.32	0 00:09	2.73	0.85	3.11	1.02	1.00	1.00	1.00		SURCHARGED
64	Pipe - (308)	0.75	0 00:06	6.42	0.12	4.69	0.06	0.26	0.26	0.00		Calculated
65	Pipe - (309)	1.11	0 00:06	4.45	0.25	4.21	0.15	0.37	0.37	0.00		Calculated
66	Pipe - (310)	2.20	0 00:07	6.01	0.37	3.95	0.29	0.59	0.47	0.00		Calculated
67	Pipe - (311)	2.20	0 00:07	5.51	0.40	3.92	0.38	0.58	0.47	0.00		Calculated
68	Pipe - (312)	1.56	0 00:08	1.74	0.90	3.47	0.40	0.64	0.77	0.00		Calculated
69	Pipe - (313)	1.58	0 00:08	1.72	0.92	3.41	0.46	0.68	0.81	0.00		Calculated
70	Pipe - (314)	1.69	0 00:07	1.72	0.98	3.48	0.41	0.70	0.84	0.00		Calculated
71	Pipe - (315)	0.78	0 00:06	0.93	0.84	2.37	0.92	0.63	0.95	0.00		Calculated
72	Pipe - (316)	0.83	0 00:06	5.70	0.15	4.85	0.13	0.27	0.27	0.00		Calculated
73	Pipe - (317)	5.96	0 00:06	8.86	0.67	5.53	0.08	1.24	0.99	0.00		Calculated
74	Pipe - (319)	0.93	0 00:06	2.45	0.38	5.77	0.05	0.31	0.47	0.00		Calculated
75	Pipe - (321)	2.16	0 00:06	2.78	0.78	6.47	0.07	0.65	0.98	0.00		Calculated
76	Pipe - (322)	2.08	0 00:06	2.73	0.76	2.99	0.97	0.89	0.89	0.00		Calculated
77	Pipe - (323)	1.23	0 00:06	4.53	0.27	8.47	0.02	0.47	0.70	0.00		Calculated
78	Pipe - (324)	3.94	0 00:07	5.01	0.79	3.36	0.45	1.25	1.00	1.00		SURCHARGED
79	Pipe - (329)	11.43	0 00:09	17.33	0.66	3.94	0.99	1.82	0.91	0.00		Calculated
80	Pipe - (329) (1)	16.67	0 00:08	20.59	0.81	5.44	0.07	1.88	0.94	0.00		Calculated
81	Pipe - (330)	0.75	0 00:06	5.64	0.13	4.74	0.25	0.26	0.26	0.00		Calculated

Pipe Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
82	Pipe - (335)	1.29	0 00:00	2.18	0.59	4.45	0.13	0.47	0.51	0.00		Calculated
83	Pipe - (341)	11.36	0 00:18	24.18	0.47	3.83	0.36	1.87	0.93	0.00		Calculated
84	Pipe - (342)	5.33	0 00:07	12.03	0.44	7.42	0.06	0.71	0.57	0.00		Calculated
85	Pipe - (343)	1.54	0 00:06	4.96	0.31	5.15	0.23	0.41	0.41	0.00		Calculated
86	Pipe - (345)	3.40	0 00:06	4.59	0.74	5.50	0.15	0.74	0.74	0.00		Calculated
87	Pipe - (346)	10.66	0 00:07	13.36	0.80	8.68	0.06	1.25	1.00	4.00		SURCHARGED
88	Pipe - (346) (1)	10.66	0 00:07	12.79	0.83	9.60	0.02	1.06	0.85	0.00		Calculated
89	Pipe - (347)	0.62	0 00:06	13.04	0.05	7.62	0.04	0.16	0.16	0.00		Calculated
90	Pipe - (348)	1.00	0 00:06	9.65	0.10	7.20	0.07	0.23	0.23	0.00		Calculated
91	Pipe - (349)	9.30	0 00:07	11.91	0.78	8.72	0.10	1.04	0.83	0.00		Calculated
92	Pipe - (350)	1.56	0 00:06	7.96	0.20	5.21	0.02	0.40	0.41	0.00		Calculated
93	Pipe - (351)	2.97	0 00:06	5.10	0.58	6.13	0.22	0.59	0.59	0.00		Calculated
94	Pipe - (365)	0.39	0 00:06	0.48	0.82	3.85	0.11	0.30	0.60	0.00		Calculated
95	Pipe - (367)	3.04	0 00:06	9.66	0.31	9.15	0.04	0.44	0.44	0.00		Calculated
96	Pipe - (368)	3.10	0 00:06	7.95	0.39	7.00	0.07	0.60	0.61	0.00		Calculated
97	Pipe - (369)	2.97	0 00:06	5.73	0.52	5.04	0.14	0.71	0.71	0.00		Calculated
98	Pipe - (370)	3.10	0 00:06	6.50	0.48	5.80	0.23	0.74	0.74	0.00		Calculated
99	Pipe - (372)	1.91	0 00:06	4.68	0.41	5.23	0.47	0.49	0.49	0.00		Calculated
100	Pipe - (372) (1)	2.55	0 00:07	4.80	0.53	4.45	0.34	0.82	0.82	0.00		Calculated
101	Pipe - (373)	2.03	0 00:06	4.35	0.47	3.16	0.21	0.94	0.94	0.00		Calculated
102	Pipe - (374)	4.36	0 00:06	4.64	0.94	5.93	0.08	0.88	0.89	0.00		Calculated
103	Pipe - (375)	0.61	0 00:06	1.30	0.47	5.31	0.20	0.37	0.74	0.00		Calculated
104	Pipe - (376)	0.53	0 00:06	4.52	0.12	2.19	0.28	0.59	0.59	0.00		Calculated
105	Pipe - (378) (1)	4.17	0 00:06	5.23	0.80	5.45	0.22	1.00	1.00	2.00		SURCHARGED
106	Pipe - (379)	0.72	0 00:06	4.77	0.15	3.89	0.14	0.29	0.29	0.00		Calculated
107	Pipe - (380)	1.48	0 00:06	4.93	0.30	4.19	1.07	0.46	0.46	0.00		Calculated
108	Pipe - (381)	3.01	0 00:07	4.63	0.65	5.88	0.37	0.62	0.62	0.00		Calculated
109	Pipe - (382)	3.54	0 00:07	5.20	0.68	6.19	0.28	0.68	0.68	0.00		Calculated
110	Pipe - (383)	3.94	0 00:07	5.35	0.74	6.61	0.18	0.71	0.71	0.00		Calculated
111	Pipe - (384)	0.81	0 00:06	4.58	0.18	3.97	0.15	0.31	0.31	0.00		Calculated
112	Pipe - (385)	0.88	0 00:06	5.30	0.17	3.21	0.05	0.48	0.48	0.00		Calculated
113	Pipe - (386)	0.86	0 00:06	5.04	0.17	3.11	0.06	0.48	0.48	0.00		Calculated
114	Pipe - (387)	0.28	0 00:06	4.40	0.06	2.04	0.13	0.49	0.49	0.00		Calculated
115	Pipe - (388)	0.29	0 00:06	4.51	0.06	2.09	0.12	0.49	0.49	0.00		Calculated
116	Pipe - (389)	0.25	0 00:06	4.80	0.05	2.09	0.10	0.58	0.58	0.00		Calculated
117	Pipe - (390)	0.20	0 00:06	4.57	0.04	1.92	0.12	0.58	0.58	0.00		Calculated
118	Pipe - (391)	0.30	0 00:06	3.39	0.09	1.71	0.38	0.30	0.30	0.00		Calculated
119	Pipe - (392)	1.57	0 00:06	3.50	0.45	4.09	0.45	0.49	0.49	0.00		Calculated
120	Pipe - (393)	2.37	0 00:06	3.53	0.67	4.33	0.21	0.66	0.66	0.00		Calculated
121	Pipe - (394)	0.29	0 00:06	2.87	0.10	1.57	0.19	0.37	0.37	0.00		Calculated
122	Pipe - (395)	3.17	0 00:00	10.42	0.30	10.32	0.08	0.42	0.42	0.00		Calculated
123	Pipe - (396)	0.62	0 00:06	6.41	0.10	3.18	0.15	0.43	0.43	0.00		Calculated
124	Pipe - (397)	0.80	0 00:06	3.60	0.22	1.87	0.21	0.77	0.77	0.00		Calculated
125	Pipe - (399)	2.76	0 00:06	4.72	0.59	3.73	0.06	0.90	0.90	0.00		Calculated
126	Pipe - (400)	6.95	0 00:06	10.42	0.67	4.57	0.67	1.22	0.81	0.00		Calculated
127	Pipe - (402) (1)	11.41	0 00:07	17.52	0.65	7.58	0.02	1.19	0.79	0.00		Calculated
128	Pipe - (403)	2.39	0 00:06	4.65	0.51	4.54	0.10	0.64	0.64	0.00		Calculated
129	Pipe - (404)	2.39	0 00:06	5.01	0.48	4.94	0.04	0.59	0.59	0.00		Calculated
130	Pipe - (405)	0.44	0 00:06	6.49	0.07	2.80	0.11	0.59	0.59	0.00		Calculated
131	Pipe - (407)	3.75	0 00:06	4.88	0.77	5.59	0.07	0.80	0.80	0.00		Calculated
132	Pipe - (408)	0.44	0 00:06	5.76	0.08	2.57	0.15	0.32	0.32	0.00		Calculated
133	Pipe - (408) (1)	3.13	0 00:06	5.56	0.56	5.22	0.45	0.71	0.71	0.00		Calculated
134	Pipe - (409)	5.55	0 00:06	8.67	0.64	5.69	0.02	0.93	0.74	0.00		Calculated
135	Pipe - (409) (1)	5.55	0 00:06	7.73	0.72	5.74	0.10	0.92	0.74	0.00		Calculated
136	Pipe - (410)	0.87	0 00:06	4.63	0.19	4.08	0.14	0.32	0.32	0.00		Calculated
137	Pipe - (411)	0.37	0 00:06	4.89	0.08	2.58	0.08	0.38	0.38	0.00		Calculated
138	Pipe - (412)	4.51	0 00:07	9.03	0.50	9.39	0.06	0.59	0.59	0.00		Calculated
139	Pipe - (413)	0.50	0 00:06	4.55	0.11	2.71	0.09	0.38	0.38	0.00		Calculated
140	Pipe - (414)	2.86	0 00:07	5.86	0.49	3.97	0.48	0.81	0.65	0.00		Calculated
141	Pipe - (415)	6.26	0 00:06	9.86	0.63	4.90	0.32	1.06	0.70	0.00		Calculated
142	Pipe - (416)	6.14	0 00:06	10.68	0.58	5.27	0.11	1.23	0.82	0.00		Calculated
143	Pipe - (417)	5.51	0 00:06	10.57	0.52	4.38	0.51	1.43	0.95	0.00		Calculated
144	Pipe - (418)	2.70	0 00:06	4.42	0.61	5.10	0.12	0.64	0.64	0.00		Calculated
145	Pipe - (419)	3.73	0 00:06	5.95	0.63	7.44	0.27	0.61	0.61	0.00		Calculated
146	Pipe - (421)	3.73	0 00:06	9.06	0.41	8.31	0.09	0.56	0.56	0.00		Calculated
147	Pipe - (426)	3.85	0 00:06	4.66	0.83	5.23	0.50	0.89	0.89	0.00		Calculated
148	Pipe - (428)	2.26	0 00:06	2.40	0.94	6.64	0.01	0.66	0.98	0.00		Calculated
149	Pipe - (429)	0.90	0 00:06	0.96	0.94	4.73	0.04	0.50	1.00	1.00		SURCHARGED
150	Pipe - (430)	1.00	0 00:06	1.05	0.95	3.15	0.08	0.57	0.85	0.00		Calculated
151	Pipe - (431)	3.94	0 00:06	16.78	0.24	13.33	0.01	0.60	0.72	0.00		Calculated
152	Pipe - (432)	1.13	0 00:06	1.79	0.63	4.43	0.03	0.46	0.69	0.00		Calculated
153	Pipe - (433)	2.34	0 00:06	3.50	0.67	5.49	0.03	0.61	0.73	0.00		Calculated
154	Pipe - (444)	0.00	0 00:00	5.39	0.00	0.00		0.32	0.48	0.00		Calculated
155	Pipe - (93)	1.96	0 00:06	3.67	0.53	4.29	0.21	0.57	0.57	0.00		Calculated
156	Pipe - (94)	0.30	0 00:06	6.44	0.05	3.45	0.03	0.17	0.17	0.00		Calculated
157	Pipe - (95)	3.63	0 00:08	5.72	0.63	3.15	0.36	1.22	0.98	0.00		Calculated
158	Pipe - (95) (2) (1)	5.10	0 00:07	8.05	0.63	3.43	0.10	1.41	0.94	0.00		Calculated
159	Pipe - (95) (2) (1) (1)	5.08	0 00:07	8.05	0.63	2.88	0.46	1.49	0.99	0.00		Calculated

APPENDIX E

Long-Term Pollution Prevention and Stormwater Operation and Maintenance Plan

Nitsch Engineering

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LONG-TERM POLLUTION PREVENTION PLAN AND STORMWATER OPERATION AND MAINTENANCE PLAN

Pentucket Regional School Building School, Groveland/West Newbury, MA

TABLE OF CONTENTS

FIGURES

1.0 INTRODUCTION

The purpose of this document is to specify the pollution prevention measures and stormwater management system operation and maintenance for the Pentucket School District Building Project site. The Responsible Party indicated below shall implement the management practices outlined in this document and proactively conduct operations at the project site in an environmentally responsible manner. Compliance with this Manual does not in any way dismiss the responsible party, owner, property manager, or occupants from compliance with other applicable federal, state or local laws.

Responsible Party: Pentucket Regional School District
Justin Bartholomew, Superintendent
22 Main Street, West Newbury
978-363-2280

This Document has been prepared in compliance with Standards 4 and 9 of the 2008 Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards, which state:

Standard 4:
The Long Term Pollution Prevention Plan shall include the proper procedures for the following:

- Good housekeeping
- Storing materials and waste products inside or under cover
- Vehicle washing
- Routine inspections of stormwater best management practices
- Spill prevention and response
- Maintenance of lawns, gardens, and other landscaped areas
- Proper management of deicing chemicals and snow

Standard 9:
The Long-Term Operation and Maintenance Plan shall at a minimum include:

- Stormwater management system(s) owner(s)
- The party or parties responsible for operation and maintenance, including how future property owners shall be notified of the presence of the stormwater management system and the requirement for operation and maintenance
- The routine and non-routine maintenance tasks to be undertaken after construction is complete and a schedule for implementing those tasks

2.0 LONG-TERM POLLUTION PREVENTION PLAN

The Responsible Party shall implement the following good housekeeping procedures at the project site to reduce the possibility of accidental releases and to reduce safety hazards.

2.1 Storage of Hazardous Materials

To prevent leaks and spills, keep hazardous materials and waste products under cover or inside. Use drip pans or spill containment systems to prevent chemicals from entering the drainage system. Inspect storage areas for materials and waste products at least once per year to determine amount and type of the material on site, and if the material requires disposal.

Securely store liquid petroleum products and other liquid chemicals in federally- and state-approved containers. Restrict access to maintenance personnel and administrators.

2.2 Storage of Waste Products

Collect and store all waste materials in securely lidded dumpster(s) or other secure containers as applicable to the material. Keep dumpster lids closed and the areas around them clean. Do not fill the dumpsters with liquid waste or hose them out. Sweep areas around the dumpster regularly and put the debris in the garbage, instead of sweeping or hosing it into the parking lot. Legally dispose of collected waste on a regular basis.

Segregate liquid wastes, from solid waste and recycle through hazardous waste disposal companies, whenever possible. Contact a hazardous waste hauler for proper disposal to a hazardous waste collection center.

2.3 Spill Prevention and Response

Implement spill response procedures for releases of significant materials such as fuels, oils, or chemical materials onto the ground or other area that could reasonably be expected to discharge to surface or groundwater.

- For minor spills, keep fifty (50) gallon spill control kits and Speedy Dry at all shop and work areas.
- Immediately contact applicable Federal, State, and local agencies for reportable quantities as required by law.
- Immediately perform applicable containment and cleanup procedures following a spill release.
- Promptly remove and dispose of all material collected during the response in accordance with Federal, State and local requirements. A licensed emergency response contractor may be required to assist in cleanup of releases depending on the amount of the release, and the ability of the Contractor to perform the required response.
- Reportable quantities of chemicals, fuels, or oils are established under the Clean Water Act and enforced through Massachusetts Department of Environmental Protection (DEP).

2.4 Minimize Soil Erosion

Soil erosion facilitates mechanical transport of nutrients, pathogens, and organic matter to surface water bodies. Repair all areas where erosion is occurring throughout the project site. Stabilize bare soil with riprap, seed, mulch, or vegetation.

2.5 Vehicle Washing

No vehicle washing will occur onsite.

2.6 Maintenance of Lawns, Gardens, and other Landscaped Areas

Pesticides and fertilizers shall not be used in the landscaped areas associated with the project site and shall not be stored on-site. Dumping of lawn wastes, brush or leaves or other materials or debris is not permitted in any Resource Area. Grass clippings pruned branches and any other landscaped waste should be disposed of or composted in an appropriate location. No irrigation shall be used in the landscaped areas for this project. Refer to Figure 1- Grass and Landscaping Storage Plan for locations to store clippings.

2.7 Management of Deicing Chemicals and Snow

The qualified contractor selected for snow plowing and deicing shall be made fully aware of the requirements of this section.

During typical snow plowing operations, snow shall be pushed to the designated snow removal areas noted on the Snow Storage Plan (Figure 2). Snow shall not be stockpiled in wetland resource areas or the 100-foot Buffer Zone, catch basins, or bioretention basins, . In severe conditions where snow cannot be stockpiled on site, the snow shall be removed from the site and properly disposed of in accordance with DEP Guideline BRP601-01.

Before winter begins, the property owner and the contractor shall review snow plowing, deicing, and stockpiling procedures. Areas designated for stockpiling should be cleaned of any debris. Street and parking lot sweeping should be followed in accordance with the Operation and Maintenance Plan.

2.8 Coordination with other Permits and Requirements

Certain conditions of other approvals affecting the long term management of the property shall be considered part of this Long Term Pollution Prevention Plan. The Owner shall become familiar with those documents and comply with the guidelines set forth in those documents.

3.0 STORMWATER MANAGEMENT SYSTEM OPERATION AND MAINTENANCE PLAN

3.1 Introduction

This Operation and Maintenance Plan (O&M Plan) for Pentucket Regional School District Building Project site is required under Standard 9 of the 2008 MassDEP Stormwater Handbook to provide best management practices for implementing maintenance activities for the stormwater management system in a manner that minimizes impacts to wetland resource areas.

The Owner shall implement this O&M Plan and proactively conduct operations at the site in an environmentally responsible manner. Compliance with this O&M Plan does not in any way dismiss the Owner from compliance with other applicable Federal, State or local laws.

Routine maintenance during construction and post-development phases of the project, as defined in the Operation and Maintenance Plan, shall be permitted without amendment to the Order of Conditions. A continuing condition in the Certificate of Compliance shall ensure that maintenance can be performed without triggering further filings under the Wetlands Protection Act.

All stormwater best management practices (BMPs) shall be operated and maintained in accordance with the design plans and the Operation and Maintenance Plan approved by the issuing authority. The Owner shall:

a. Maintain an operation and maintenance log for the last three years, including inspections, repairs, replacement and disposal (for disposal the log shall indicate the type of material and the disposal location). This is a rolling log in which the responsible party records all operation and maintenance activities for the past three years.

b. Make this log available to MassDEP and the Conservation Commissions upon request; and

c. Allow members and agents of the MassDEP and the Conservation Commissions to enter and inspect the premises to evaluate and ensure that the Owner complies with the Operation and Maintenance requirements for each BMP.

3.2 Stormwater Operation and Maintenance Requirements

Inspect and maintain the stormwater management system as directed below. Refer to the Site Utility Plans for the location of each component of the system. Repairs to any component of the system shall be made as soon as possible to prevent any potential pollutants (including silt) from entering the resource areas.

<u>Deep Sump and Hooded Catch Basins</u>

Inspect catch basins four times per year, including after the foliage season. Other inspection and maintenance requirements include:

- Remove organic material, sediment and hydrocarbons four times per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the basin.
- Always clean out catch basins after street sweeping. If any evidence of hydrocarbons is found during inspection, the material immediately remove using absorbent pads or other suitable measures and dispose of legally. Remove other accumulated debris as necessary.
- Transport and disposal of accumulated sediment off-site shall be in accordance with applicable local, state and federal guidelines and regulations.

Area Drains

Inspect area drains at least once per month and remove debris from the grate. Clean out accumulated sediments at least once per year and more frequently as necessary.

Water Quality Units (Proprietary Separators)

Maintain water quality units according the recommendations set forth by the manufacturer. General inspection and maintenance procedures for proprietary devices are provided below:

- Inspect units following completion of construction, prior to being put into service.
- Inspect units at least twice per year following installation and no less than once per year thereafter.
- Inspect units immediately after any oil, fuel or chemical spill.
- All inspections shall include checking the oil level and sediment depth in the unit. Removal of sediments/oils shall occur per manufacturer recommendations.
- A licensed waste management company shall remove captured petroleum waste products from any oil, chemical or fuel spills and dispose.
- OSHA confined space entry protocols shall be followed if entry into the unit is required.

Subsurface Detention/Infiltration Structures

- Inspect subsurface detention/infiltration structures twice per year. Inspect the inlets and observation ports to determine if there is accumulated sediment within the system. Remove all debris and accumulated sediment that may clog the system.

Bioretention Areas

Perform annual maintenance of all components of the bioretention area, including plants, soil, and mulch. Table 1, below, outlines recommended maintenance activities.

Table 1. Bioretention area maintenance recommendations

Location	Description	Frequency	Time of Year
Surface	Inspect and remove trash	Monthly	Year round
Soil	Inspect and repair erosion	Monthly	Year round
Organic Layer	Remulch void areas	Annually	Spring
	Remove previous mulch layer before applying new layer (optional)	Annually	Spring
Plants	Water vegetation at end of day for 14 consecutive days after planting	Immediately after planting	As needed
	Remove and replace all dead and diseased vegetation that cannot be treated	Annually	Spring
	Treat all diseased trees and shrubs	As needed	Variable

During and after storm events, record the length of time standing water remains in the bioretention areas. If the time is greater than 72 hours, thoroughly inspect the basins for signs of clogging and develop a corrective action plan. The corrective action plan, prepared by a qualified professional, will outline procedures to restore infiltrative function. The owner of the site shall take immediate action to implement these corrective measures.

Stormwater Outfalls

Inspect flared end sections and associated riprap spillways at least once per year and after major storm events (rainfall totals greater than 2.5 inches in 24 hours) to ensure that the stability of the outlet area is maintained. Keep the outfall area clear of debris such as trash, branches, and sediment. Make repairs immediately if riprap displacement or downstream channel scour is observed.

3.3 Street Sweeping

Perform street sweeping at least twice per year, whenever there is significant debris present on roads and parking lots. Street sweeping shall occur in the spring and fall. Sweepings must be handled and disposed of properly according to the West Newbury/Groveland Conservation Commissions.

3.4 Repair of the Stormwater Management System

The stormwater management system shall be maintained. The repair of any component of the system shall be made as soon as possible to prevent any potential pollutants including silt from entering the resource areas or the existing closed drainage system.

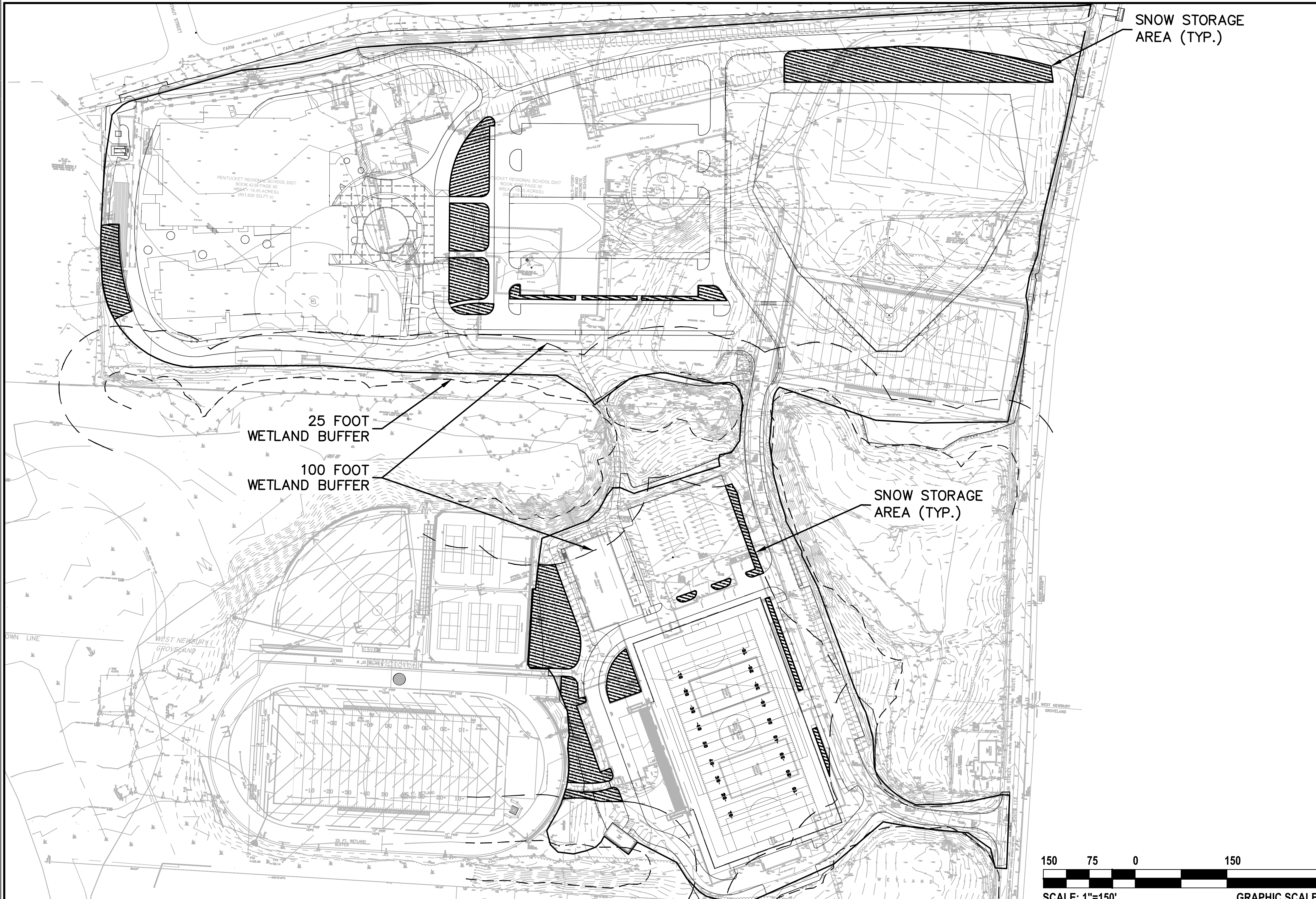
3.5 Reporting

The Owner shall maintain a record of drainage system inspections and maintenance (per this Plan) and submit a yearly report to the West Newbury/Groveland Conservation Commissions.

STORMWATER MANAGEMENT SYSTEM INSPECTION FORM

24 Main Street **West Newbury/Groveland, MA**		**Inspected by:____________** **Date:____________**
Component	**Status/Inspection**	**Action Taken**
Deep Sump Catch Basins, Area Drains, and Drain Manholes		
Bioretention Basins		
Subsurface Infiltration/Detention Systems		
Water Quality Units		
General site conditions – evidence of erosion, etc.		

SUBMIT COPIES OF STORMWATER MANAGEMENT SYSTEM INSPECTION FORM TO THE WEST NEWBURY AND GROVELAND CONSERVATION COMMISSIONS WITH THE YEARLY REPORT.



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- Civil Engineering
- Land Surveying
- Transportation Engineering
- Structural Engineering
- Green Infrastructure
- Planning
- GIS

PENTUCKET REGIONAL SCHOOL DISTRICT BUILDING PROJECT

GRASS AND LANDSCAPE STORAGE MAP
24 MAIN STREET, WEST NEWBURY, MA

PREPARED FOR:

DORE AND WHITTIER ARCHITECTS
260 MERRIMAC STREET, NEWBURYPORT, MA 01950

PROJECT #	12360
FILE:	12360DA.DWG
SCALE:	1"=150'
DATE:	01/17/2020
PROJECT MGR:	AG
SURVEYOR:	
DRAFTED BY:	AM
CHECKED BY:	AM

SHEET:

FIGURE-1

OF

REV.

APPENDIX F

DRAFT Stormwater Pollution Prevention Plan (SWPPP)

DRAFT Stormwater Pollution Prevention Plan (SWPPP)

For Construction Activities At:

Pentucket Regional School District Building Project
24 Main Street
West Newbury, MA, 01985
Site Telephone Number: xxx-xxx-xxxx

SWPPP Prepared For:

Dore and Whittier Architects
260 Merrimac Street
Newburyport, MA, 01950
T: 978-499-2999
Email Address/Fax Number

SWPPP Prepared By:

Nitsch Engineering
Michelle Callahan, PE
Basel Alhadidi
2 Center Plaza
Boston, MA 02108
T: 617-338-0063
F: 617-338-6472

SWPPP Preparation Date:

10/30/2019

Estimated Project Dates:

Project Start Date: XX/XX/XXXX
Project Completion Date: XX/XX/XXXX

Nitsch Engineering

Contents

SECTION 1: CONTACT INFORMATION/RESPONSIBLE PARTIES

1.1 Operator(s) / Subcontractor(s)

Operator(s):

Construction Manager Responsibilities:

Construction Manager shall maintain the Stormwater Pollution Prevention Plan (SWPPP) documentation and will conduct and document self-inspections required under the 2017 Construction General Permit (CGP) once every 14 days and within 24 hours of a storm event 0.25" or greater. Construction Manager will provide copies of inspections reports to the Owner's Representative within 24 hours following each inspection. Incidents of non-compliance will be immediately brought to the attention of the Owner's Representative. Construction Manager shall be responsible for maintaining compliance with the SWPPP, including all requirements in the CGP and will maintain erosion and sediment control Best Management Practices (BMPs) in all areas of the site under its day-to-day control.

Construction Manager shall file a Notice of Intent (NOI) to be covered by the CGP and obtain coverage by the Environmental Protection Agency (EPA) before beginning construction at the project. Permit coverage will be maintained throughout the project. Construction Manager shall not file a Notice of Termination (NOT) until all disturbed areas of the site under its day-to-day control have been fully stabilized with permanent erosion controls that satisfy the final stabilization requirements in the CGP or have met another criteria of the NOT. Construction Manager will maintain a clean site and construction trash and debris will be picked up and disposed of properly by the end of each day.

Each Operator is responsible for advising employees and subcontractors working on this project of the requirements in the CGP and SWPPP. Particular emphasis should be placed on ensuring that employees and subcontractors do not damage BMPs and maintain compliance with the CGP.

Construction Manager Company Name
Construction Manager Contact Person, Position
Street Address
Town, State, Zip Code
T: xxx-xxx-xxxx
Email address:

Owner's Representative Responsibilities:
Owner's Representative shall provide general oversight of the project including review of the SWPPP and any amendments, inspection reports, and corrective actions. Owner's Representative shall file a NOI to be covered by the CGP and obtain coverage by the EPA before beginning construction at the project. Permit coverage will be maintained throughout the project. Owner's Representative shall not file a notice of Termination until all disturbed areas of the site have been fully stabilized with permanent erosion controls that satisfy the final stabilization requirements in the CGP. Owner's Representative will coordinate with the Construction Manager to maintain a clean site so that trash and debris will be picked up and disposed of properly by the end of the day.

Each Operator is responsible for advising employees and subcontractors working on this project of the requirements in the CGP and SWPPP. Particular emphasis should be placed on ensuring that employees and subcontractors do not damage BMPs and maintain compliance with the CGP.

Owner's Representative Company Name
Owner's Representative Contact person, Position
Street Address
Town, State, Zip Code
T: xxx-xxx-xxxx
Email Address:

Site Contractor:

Company Name
Contact person, Position
Street Address
Town, State, Zip Code
T: xxx-xxx-xxxx
Email Address:

Emergency 24-Hour Contact:

Company
Emergency Contact person, Position
T: xxx-xxx-xxxx

1.2 Stormwater Team

Construction Manager: Company

Stormwater Role/Responsibility: Responsible for overseeing the development of the SWPPP, modifications and updates to the SWPPP, and for compliance with the requirements in the CGP (e.g., installing and maintaining stormwater controls, conducting site inspections, picking up trash, taking corrective actions where required, etc.).

Contact:
Construction Manager Contact Person, Position
T: xxx-xxx-xxxx
Email address

I, Construction Manager Contact Person, have read the CGP and Understand the Applicable Requirements
☐ Yes
Date: ___________

Site Contractor: Company

Stormwater Role/Responsibility: Responsible for compliance with the requirements in this permit (e.g., installing and maintaining stormwater controls, conducting site inspections, taking corrective actions where required, etc.).

Contact:
Contact Person, Position
T: xxx-xxx-xxxx
Email Address

Refer to the Subcontractor Certifications/Agreements in Attachment G.

SECTION 2: SITE EVALUATION, ASSESSMENT, AND PLANNING

2.1 Project/Site Information

Project Name and Address

Project/Site Name: Pentucket Regional School District Building Project
Project Street/Location: 24 Main Street
City/Town: West Newbury
State: Massachusetts
ZIP Code: 01985
County or Similar Subdivision: Essex

Project Latitude/Longitude

Latitude:
1. 42.782493º (degrees, decimals)

Longitude:
1. -71.013302º (degrees, decimals)

Method for determining latitude/longitude:
☐ USGS topographic map (specify scale: ____________) ☒ GPS
☐ Other (please specify):

Horizontal Reference Datum:
☐ NAD 27 ☒ NAD 83 ☐ WGS 84

If you used a U.S.G.S topographic map, what was the scale? ____________________________

Additional Project Information

Is the project/site located on Indian country lands, or located on a property of religious or cultural significance to an Indian tribe? ☐ Yes ☒ No

Are you applying for permit coverage as a "federal operator" as defined in Appendix A of the CGP?
☐ Yes ☒ No

Will there be demolition of any structure built or renovated before January 1, 1980?
☒ Yes ☐ No

If yes, do any of the structures being demolished have at least 10,000 square feet of floor space?
☒ Yes ☐ No

Was pre-development land use used for agriculture (see Appendix A of the CGP for definition of "agricultural land")?
☐ Yes ☒ No

Type of Construction Site (check all that apply): ☐ Single-Family Residential
☐ Multi-Family Residential ☐ Commercial ☐ Industrial ☒ Institutional ☐ Highway or Road
☐ Utility ☐ Other _____________

2.2 Discharge Information

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)?
☐ Yes ☒ No

Are there any surface waters that are located within 50 feet of your construction disturbances?
☒ Yes ☐ No

Table 1 – Names of Receiving Waters

Name(s) of the first surface water that receives stormwater directly from your site and/or from the MS4 (note: multiple rows provided where your site has more than one point of discharge that flows to different surface waters)
001. Merrimack River
002.
003.

Table 2 – Impaired Waters / TMDLs (Answer the following for each surface water listed in Table 1 above)

	Is this surface water listed as "impaired" on the CWA303(d) list?	If you answered yes, then answer the following:			
		What pollutant(s) are causing the impairment?	Has a TMDL been completed?	Title of the TMDL document	Pollutant(s) for which there is a TMDL
001.	☒ YES ☐ NO	- **Enterococcus Bacteria** - **Polychlorinated Biphenyls (PCBs)**	☐ YES ☒ NO	**N/A**	**N/A**
002.	☐ YES ☐ NO				
003.	☐ YES ☐ NO				

Table 3 – Tier 2, 2.5, or 3 Waters (Answer the following for each surface water listed in Table 1 above)

	Is this surface water designated as a Tier 2, Tier 2.5, or Tier 3 water?	If you answered yes, specify which Tier (2, 2.5, or 3) the surface water is designated as?
001.	☐ YES ☒ NO	
002.	☐ YES ☐ NO	
003.	☐ YES ☐ NO	

2.3 Nature of the Construction Activity

General Description of Project

This project is the construction of a new Middle/High School building for the Pentucket Regional School District in West Newbury, Massachusetts. The site is currently developed and contains two existing buildings, a high school and middle school. The new school building will be a combined middle and high school which are currently separated. The new building will be constructed adjacent to the site of the existing high school building in the northern portion of the site.

Construction activities include the following:

- Demolition of two existing school buildings;
- Demolition of existing site utilities
- Construction of a new 190,000 square-foot, three-story building;
- Construction of parking facilities and pedestrian walkways;
- Construction of new athletic facilities, including a new football field an baseball field
- Installation of new utilities to support the proposed building; and
- Construction of a new stormwater management system.

Size of Construction Project

Size of Property: 27 acres
Total Area of Construction Disturbances: 27 acres
Maximum Area to be Disturbed at Any One Time: 27 acres

Construction Support Activities

Include a description of the construction support activities or reference Site Maps in Attachment A that include this information.

Contact Information for Construction Support Activity:
Name: XXX
Telephone: XXX-XXX-XXXX
Email: XXXX
Address and/or Latitude and Longitude:

Business Hours
Day-Day Xa.m-Xp.m.

2.4 Sequence and Estimated Dates of Construction Activities

Phase I: Name of Phase

- Description of Phase

- Schedule: Month, Day Year – Month, Day Year
- Area Disturbed During Phase: xx acres
- Description of stormwater controls that will be installed/maintained during phase

2.5 Allowable Non-Stormwater Discharges

List of Allowable Non-Stormwater Discharges Present at the Site

Type of Allowable Non-Stormwater Discharge	**Likely to be Present at Your Site?**
Discharges from emergency fire-fighting activities	☐ YES ☒ NO
Fire hydrant flushings	☒ YES ☐ NO
Landscape irrigation	☒ YES ☐ NO
Waters used to wash vehicles and equipment, provided that there is no discharge of soaps, solvents, or detergents used for such purposes	☒ YES ☐ NO
Water used to control dust	☒ YES ☐ NO
Potable water including uncontaminated water line flushings	☒ YES ☐ NO
External building washdown, provided soaps, solvents, and detergents are not used, and external surfaces do not contain hazardous substances (as defined in Appendix A of the CGP) (e.g., paint or caulk containing polychlorinated biphenyls (PCBs))	☒ YES ☐ NO
Pavement wash waters, provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used.	☒ YES ☐ NO
Uncontaminated air conditioning or compressor condensate	☒ YES ☐ NO
Uncontaminated, non-turbid discharges of ground water or spring water	☒ YES ☐ NO
Foundation or footing drains where flows are not contaminated with process materials such as solvents or contaminated groundwater	☒ YES ☐ NO
Construction dewatering water discharged in accordance with Part 2.4 of the CGP	☒ YES ☐ NO

Note: You are prohibited from directing pavement wash waters directly into any water of the U.S., storm drain inlet, or stormwater conveyance, unless the conveyance is connected to a sediment basin, sediment trap, or similarly effective control.

2.6 Site Maps

Refer to Attachment A

SECTION 3: DOCUMENTATION OF COMPLIANCE WITH OTHER FEDERAL REQUIREMENTS

3.1 Endangered Species Protection

Eligibility Criterion

Under which criterion listed in Appendix D of the CGP are you eligible for coverage under this permit?

☒ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E**

For reference purposes, the eligibility criteria listed in Appendix D of the CGP are as follows:

Criterion A. No federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in your site's "action area" as defined in Appendix A of the CGP.

Criterion B. The construction site's discharges and discharge-related activities were already addressed in another operator's valid certification of eligibility for your action area under eligibility Criterion A, C, D, E, or F and there is no reason to believe that federally-listed species or federally-designated critical habitat not considered in the prior certification may be present or located in the "action area". To certify your eligibility under this Criterion, there must be no lapse of NPDES permit coverage in the other operator's certification. By certifying eligibility under this Criterion, you agree to comply with any effluent limitations or conditions upon which the other operator's certification was based. You must include in your NOI the tracking number from the other operator's notification of authorization under this permit. If your certification is based on another operator's certification under Criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in Criterion C in your NOI form.

Criterion C. Federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in or near your site's "action area," and your site's discharges and discharge-related activities are not likely to adversely affect listed threatened or endangered species or critical habitat. This determination may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to adversely affect listed species and critical habitat. To make this certification, you must include the following in your NOI: 1) any federally listed species and/or designated habitat located in your "action area"; and 2) the distance between your site and the listed species or designated critical habitat (in miles). You must also include a copy of your site map with your NOI.

Criterion D. Coordination between you and the Services has been concluded. The coordination must have addressed the effects of your site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and must have resulted in a written concurrence from the relevant Service(s) that your site's discharges and discharge-related activities are not likely to adversely affect listed species or critical habitat. You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Criterion E. Consultation between a Federal Agency and the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has been concluded. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat. The result of this consultation must be either:

i. a biological opinion that concludes that the action in question (taking into account the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the continued existence of listed species, nor the destruction or adverse modification of critical habitat; or

ii. written concurrence from the applicable Service(s) with a finding that the site's discharges and discharge-related activities are not likely to adversely affect federally-listed species or federally-designated habitat.

You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Criterion F. Your construction activities are authorized through the issuance of a permit under section 10 of the ESA, and this authorization addresses the effects of the site's discharges and discharge-related activities on federally-listed species and federally-designated critical habitat. You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

For criterion A, indicate the basis for your determination that no federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in your site's action area (as defined in Appendix A of the CGP). Check the applicable source of information you relied upon:

☐ Specific communication with staff of the U.S. Fish & Wildlife Service or National Marine Fisheries Service.
☐ Publicly available species list.
☒ Other source: NHESP data layer (August 2017 or as amended) from MassGIS, U.S. Fish and Wildlife online system Information for Planning and Conservation (IPaC) – Refer to Attachment K.

3.2 Historic Preservation

Appendix E (of the CGP), Step 1
Do you plan on installing any of the following stormwater controls at your site? Check all that apply below, and proceed to Appendix E, Step 2.

☐ Dike
☐ Berm
☒ Catch Basin
☐ Pond
☐ Stormwater Conveyance Channel (e.g., ditch, trench, perimeter drain, swale, etc.)
☐ Culvert
☒ Other type of ground-disturbing stormwater control: Water Quality Structures, Outlet Control Structure, Subsurface Infiltration System, Drain Manhole, Trench Drain.

If you will not be installing any ground-disturbing stormwater controls, no further documentation is required for Section 3.2 of the Template.

3.3 *Safe Drinking Water Act Underground Injection Control Requirements*

Do you plan to install any of the following controls? Check all that apply below.

- ☐ Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system);

- ☒ Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow; and

- ☐ Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

SECTION 4: EROSION AND SEDIMENT CONTROLS REQUIREMENTS

Section 4 of this document describes the stormwater controls that will be implemented throughout construction. The operator must install and maintain all stormwater controls in compliance with Parts 2.2 and 2.3 of the CGP. The operator must install stormwater controls by the time construction activity in any givern portion of the site begins.

The stormwater controls shall be designed and installed in accordance with good engineering practices and applicable design specifications. Specifications titled "- Utility Demolition and Erosion Control Plan," dated 10/22/2019 and prepared by Nitsch Engineering and details titled "Erosion and Control Details," dated 10/22/2019 and prepared by Nitsch Engineering have been provided to the contractor under separate cover.

4.1 Natural Buffers or Equivalent Sediment Controls

Buffer Compliance Alternatives

Are there any surface waters within 50 feet of your project's earth disturbances? ☒ YES ☐ NO

(Note: If no, no further documentation is required for Part 4.1 in the SWPPP Template. Continue to Part 4.2.)

Check the compliance alternative that you have chosen:

☒ I will provide and maintain a 50-foot undisturbed natural buffer.

(Note [1]: You must show the 50-foot boundary line of the natural buffer on your site map.)

(Note [2]: You must show on your site map how all discharges from your construction disturbances through the natural buffer area will first be treated by the site's erosion and sediment controls. Also, show on the site map any velocity dissipation devices used to prevent erosion within the natural buffer area.)

4.2 Perimeter Controls

General

The site will be enclosed by a temporary construction fence as shown on the Erosion and Sedimentation Control Plan in Attachment A. Construction gates will be located at the entrance to the site as shown on the Erosion and Sedimentation Control Plan and all entrances will have stabilized construction entrances. All gates and entrances to the site will be secured during non-working hours. The areas of the site that will receive pollutant discharges will be surrounded by a Specific Perimeter Control listed below as shown on the Erosion and Sedimentation Control Plan in Attachment A. Sediment tracked offsite must be removed by the end of the same workday.

Specific Perimeter Controls

Perimeter Control # 1

- BMP Description: Silt Fence.
- Installation Schedule: Prior to the Start of Construction.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as described in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

Perimeter Control # 2

- BMP Description: Silt Fence with Wattles.
- Installation Schedule: Prior to the Start of Construction.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as described in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

Perimeter Control # 3

- BMP Description: Super Silt Fence.
- Installation Schedule: Prior to the Start of Construction.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as described in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

Perimeter Control # 4

- BMP Description: Wattles.
- Installation Schedule: Prior to the Start of Construction.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as described in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

Perimeter Control # 5

- BMP Description: Silt Fence with Straw Bales.
- Installation Schedule: Prior to the Start of Construction and/or immediately after stockpile is established.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

4.3 Sediment Track-Out

General
Gates will be located as shown on the Utility Demolition and Erosion Control Plan in Attachment A to allow for construction vehicle access. Construction access points will have a stabilized construction entrance station or wheel wash station to minimize the track-out of sediment onto off-site streets, other paved areas, and sidewalks from vehicles exiting the construction site. Where sediment has been tracked out from your site onto paved roads, sidewalks, or other paved areas outside of your site, remove the deposited sediment by the end of the same business day in which the track-out occurs or by the end of the next business day if track-out occurs on a non-business day. Remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. You are prohibited from hosing or sweeping tracked out sediment into any stormwater conveyance, storm drain inlet, or water of the U.S.

Specific Track-Out Controls

Track-Out Control # 1

- BMP Description: Street Sweeping.
- Installation Schedule: Start of construction.
- Inspection Schedule: The areas adjacent to the site should be inspected daily to determine if street sweeping is required.
- Responsible Staff Construction Manager and Site Contractor(s).

Track-Out Control # 2

- BMP Description: Stabilized Construction Entrance.
- Installation Schedule: Start of construction.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as described in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Track-Out Control # 3

- BMP Description: Wheel Wash Station.
- Installation Schedule: Start of construction.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective. condition as described in part 2.1.4 of the CGP(s). The operator must provide an effective means of minimizing the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other types of wash waters. The operator must ensure there is no discharge of soaps, solvents, or detergents in equipment and vehicle wash water. For storage of soaps, detergents, or solvents, the operator shall provide either a cover to minimze the exposure of these detergents to precipitation and to stormwater, or a similarily effective means designed to minimze discharge of pollutants from these areas.
- Responsible Staff: Construction Manager and Site Contractor.

4.4 Stockpiled Sediment or Soil

General
All soil stockpiles will be located outside of any natural buffers and away from existing and proposed catch basins and area drains and outside of proposed infiltration system footprints. A sediment barrier shall be installed along all downgradient perimeter areas. Examples of sediment barriers include silt fence, super silt fence, or wattles.

You are prohibited from hosing down or sweeping soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or water of the U.S.

For stockpiles that will be unused for 14 or more days, a cover such as a tarp or blown straw shall be provided or temporary stabilization should be provided (consistent with Part 2.2.14 of the CGP).

Specific Stockpile Controls

Stockpile Control # 1
- BMP Description: Silt Fence.
- Installation Schedule: Immediately after stockpile is established.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP. Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

Stockpile Control # 2
- BMP Description: Wattles.
- Installation Schedule: Immediately after stockpile is established.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
  Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

Stockpile Control # 3
- BMP Description: Tarp.
- Installation Schedule: When stockpile will remain inactive for 14 or more calendar days.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
  Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

Stockpile Control # 4
- BMP Description: Straw Bales.
- Installation Schedule: Immediately after stockpile is established.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or

Greater.

- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
  Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

Stockpile Control # 5

- BMP Description: Blown Straw.
- Installation Schedule: When stockpile will remain inactive for 14 or more calendar days.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
  Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

Stockpile Control # 6

- BMP Description: Hydroseeding.
- Installation Schedule: When stockpile will remain inactive for 14 or more calendar days.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
  Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

4.5 Minimize Dust

General

Disturbed land will be temporarily stabilized as required by the CGP. Dust will be minimized using measures including sprinkling/irrigation, vegetative cover, mulch, and/or stone. Stockpiles will be handled in accordance with section 4.4 of the SWPPP.

Earth-disturbing activities are considered temporarily ceased when work will not resume for a period of 14 or more calendar days. Stabilization shall be initiated when earth-disturbing activities are temporarily or permanently ceased. Stabilization activities shall be complete within 7 calendar days after the initiation of soil stabilization measures.

Specific Dust Controls

Dust Control # 1

- BMP Description: Sprinkling/Irrigation.
- Installation Schedule: As needed throughout earthwork activities as determined by the site contractor and construction manager.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.

- Responsible Staff: Construction Manager and Site Contractor(s).

Dust Control # 2

- BMP Description: Straw or Mulch.
- Installation Schedule: As needed throughout earthwork activities as determined by the site contractor and construction manager. When disturbed land will remain inactive for 14 or more calendar days.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

4.6 Minimize the Disturbance of Steep Slopes

General

Steep slopes are defined as slopes of 15% or greater in grade. No steep slopes are proposed as part of this project. The EPA notes that the requirement to minimize disturbances to steep slopes does not apply to the creation of stockpiles.

4.7 Preserve Native Topsoil

Onsite native topsoil shall be preserved, unless infeasible. Preserving native topsoil is not required where the intended function of a specific area of the site dictates that the topsoil be disturbed or removed.

Stockpiling topsoil at off-site locations or transferring topsoil to other locations is an example of a way to preserve native topsoil.

The contractor shall perform construction sequencing such that earth materials are exposed for a minimum of time before they are covered, seeded, or otherwise stabilized.

4.8 Minimize Soil Compaction

General

In areas where infiltration practices will be installed or areas of the site where final vegetative stabilization will occur, soil compaction shall be minimized. This includes restricting vehicle access and equipment use.

Areas used for post-construction infiltration shall be constructed after all ground surfaces are fully stabilized when feasible. If proposed infiltration areas are constructed prior to the site being fully stabilized, additional erosion controls shall be installed. All stockpiled and material storage areas shall be located outside of the areas proposed for post-construction infiltration.

Areas of post-construction landscaping shall be constructed after all ground surface are fully stabilized. If proposed landscaped areas are constructed prior to the site being fully stabilized, additional erosion controls shall be installed. All soil stockpiles and material storage areas shall be located outside of the areas proposed for post-construction landscaping where feasible. Where this is not feasible, use techniques that rehabilitate and condition the soils as necessary to support vegetative growth prior to planting.

4.9 Storm Drain Inlets

General
All existing and proposed storm drain inlets affected by construction activities should be protected using an Inlet Sediment Filter as shown on the Utility Demolition and Erosion Control Plan provided in Attachment A.

Clean or remove and replace the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, remove the deposited sediment by the end of the same business day in which it is found or by the end of the following business day if removal by the same business day is not feasible.

Specific Storm Drain Inlet Controls

Storm Drain Inlet Control # 1
- BMP Description: Inlet Sediment Filter.
- Installation Schedule: Prior to the Start of Construction.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or greater.
- Maintenance: Ensure that all stormwater controls remain in effective. condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Storm Drain Inlet Control # 2
- BMP Description: Inlet Protection with Gravel.
- Installation Schedule: Prior to the Start of Construction .
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Storm Drain Inlet Control # 3
- BMP Description: Inlet Protection with Block and Gravel.
- Installation Schedule: Prior to the Start of Construction.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

4.10 Minimize Erosion of Stormwater Conveyances

The contractor shall minimize erosion of stormwater conveyance channels and their embankments, outlets, adjacent streambanks, slopes, and downstream waters. The contractor shall install erosion controls and velocity dissipation devices within and along the length of any stormwater conveyance channel and at any outlet to slow down runoff to minimize erosion.

Stormwater Conveyance Control # 1
- BMP Description: Check Dam.
- Installation Schedule: Start of construction of stormwater conveyance channel.

- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Stormwater Conveyance Control # 2

- BMP Description: Sediment Trap.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Stormwater Conveyance Control # 3

- BMP Description: Rip Rap.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

Stormwater Conveyance Control # 4

- BMP Description: Grouted Rip Rap at outlets.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25” or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

4.11 Sediment Basins

There are no proposed sediment basins associated with this project.

4.12 Chemical Treatment

There are no proposed chemical treatments associated with this project.

4.13 Dewatering Practices

Dewatering will occur in a way that minimizes the discharge of pollutants in ground water or accumulated stormwater that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation. Dewatering water shall be treated in compliance with Section 2.4 of the CGP and water with visible floating solids or foam may not be discharged.

Any applicable permits shall be obtained from local permitting authorities.

<u>*Dewatering Control # 1*</u>

- BMP Description: Sediment basin or Sediment Trap.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

<u>*Dewatering Control # 2*</u>

- BMP Description: Sediment socks.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

<u>*Dewatering Control # 3*</u>

- BMP Description: Dewatering Tanks.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or greater and as required by the manufacturer.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

<u>*Dewatering Control # 4*</u>

- BMP Description: Filtration Systems.
- Installation Schedule: Start of construction of stormwater conveyance channel.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or greater and as required by the manufacturer.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

4.14 Other Stormwater Controls

Any changes in construction activity that that include means of stormwater control not included in this document will be identified, the SWPPP will be amended, and the appropriate erosion and sedimentation controls will be implemented.

4.15 Site Stabilization

Initiate the installation of stabilization measures immediately in any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days. Complete the installation of stabilization measures as soon as practicable, but no later than 7 calendar days after stabilization has been initiated.

Site Stabilization Practice #1
☐ *Vegetative* ☒ *Non-Vegetative*
☒ *Temporary* ☐ *Permanent*

- BMP Description: Soil Stabilization Mat.
- Installation Schedule: As/if required.
- Maintenance and Inspection: Once every 14 days and within 24 hours of a storm event 0.25” or greater.
- Responsible Staff: Construction Manager and Site Contractor(s).

Site Stabilization Practice #2
☒ *Vegetative* ☐ *Non-Vegetative*
☒ *Temporary* ☐ *Permanent*

- BMP Description: Temporary Seeding.
- Installation Schedule: As/if required.
- Maintenance and Inspection: Once every 14 days and within 24 hours of a storm event 0.25” or greater.
- Responsible Staff: Construction Manager and Site Contractor(s).

SECTION 5: POLLUTION PREVENTION STANDARDS

5.1 Potential Sources of Pollution

Potential sources of sediment to stormwater runoff:

- Stockpiles and construction staging
- Clearing and grubbing operations
- Grading and site excavation
- Topsoil stripping
- Landscape operations
- Soil tracking offsite from construction vehicles
- Runoff from unstabilized areas
- Construction debris

Potential pollutants and sources, other than sediment, to stormwater runoff:

- Combined Staging Area – fueling activities, equipment maintenance, sanitary facilities, and hazardous waste storage
- Materials Storage Area – building materials, solvents, adhesives, paving materials, paints, aggregates, trash, etc.
- Construction Activity-paving, curb installation, concrete pouring, and building construction

Staging areas are shown on the Utility Demolition and Erosion Control Plan provided in Attachment A.

Construction Site Pollutants

Pollutant-Generating Activity	Pollutants or Pollutant Constituents (that could be discharged if exposed to stormwater)	Location on Site (or reference SWPPP site map where this is shown)
Pesticides (insecticides, fungicides, herbicides, rodenticides)	Chlorinated hydrocarbons, organophosphates, carbonates, arsenic	Herbicides used for noxious weed control
Fertilizers	Nitrogen, phosphorous	Newly seeded areas
Plaster	Calcium sulphate, calcium carbonate, sulfuric acid	Building construction
Cleaning Solvents	Perchloroethylene, methylene chloride, trichloroethylene, petroleum distillates	No equipment cleaning allowed in project limits
Asphalt	Oil, petroleum distillates	Streets and parking lots
Concrete	Limestone, sand pH, chromium	Curb and gutter, sidewalk, building construction
Glue, Adhesives	Polymers, epoxies	Building construction
Paints	Metal oxides, Stoddard solvent, talc, calcium carbonate, arsenic	Building construction
Curing compounds	Naphtha	Curb and gutter, building construction
Wood preservatives	Stoddard solvent, petroleum distillates, arsenic, copper, chromium	Timber pads, bracing, building construction
Hydraulic Oils/fluids	Mineral oil	Leaks/broken hoses from equipment
Gasoline	Benzene, ethyl benzene, toluene, xylene, MTBE	Secondary containment/staging area
Diesel Fuel	Petroleum distillate, oil & grease, naphthalene, xylenes	Secondary containment/staging area
Kerosene	Coal oil, petroleum distillates	Secondary containment/staging area
Antifreeze/coolant	Ethylene glycol, propylene glycol, heavy metals (copper, lead, zinc)	Leaks or broken hoses from equipment
Sanitary toilets	Bacteria, parasites, and viruses	Staging area

5.2 Spill Prevention and Response

BMP Description: Spill kit, vehicle washing, silt sack catch basin protection, silt fence
Installation Schedule: Start of construction activity
Maintenance and Inspection: Minimum weekly & as necessary
Responsible Staff: Construction Manager and Site Contractor

- Major vehicle maintenance onsite is prohibited
- Re-fueling of vehicles within 25 feet of a drainage structure is prohibited
- Spill kit shall be kept onsite consisting of:
    - Gloves
    - Absorbent mats
    - Drip pan

Spill Prevention and Control Plan

- Refer to contractor's Spill Plan.
- Manufacturers' recommended spill control methods will be posted onsite and site personnel will be made aware of the requirements.
- Cleanup supplies will be kept onsite in a materials storage area. This equipment will include: goggles, brooms, dustpans, mops, rags, gloves, oil absorbent, sawdust, plastic and metal trash cans, and other materials and supplies specifically designated for cleanup.
- All spills will be immediately cleaned up after discovery.
- The spill area will be well ventilated.
- Cleanup personnel will wear suitable protective clothing.
- Spills of toxic and/or hazardous material will be reported to state, local, and Federal authorities, as required by law. Spills shall also be reported immediately to the owner.
- A spill incident report will be filed detailing the amount and extent of the spill, material(s) involved, and effectiveness of the cleanup. This report will be on file at the Construction Manager/Site Contractor office, as well as kept onsite in the field office. A copy shall also be filed with the Hazard Communication Coordinator (HCC).

The Construction Manager/Site Contractor will designate someone onsite that will serve as the Spill Cleanup Coordinator. At least two other personnel will be designated as alternate spill coordinators. All spill control personnel will be trained in spill prevention, control, and cleanup. The names of the responsible personnel will be posted at the jobsite office of the Construction Manager/ Site Contractor.

5.3 Fueling and Maintenance of Equipment or Vehicles

General

Minor vehicle and equipment emergency maintenance can be performed onsite away from drainage structures. Major vehicle and equipment maintenance must be performed offsite. Equipment/vehicle storage areas and any onsite fuel tanks will be inspected weekly and after storm events. Equipment and vehicles will be inspected for leaks, equipment damage, and other service problems on each day of use. Any leaks will be repaired immediately or the equipment/vehicle will be removed from the site.

Minor vehicle and equipment emergency maintenance shall occur when a vehicle cannot be safely removed from the site. The vehicle should be repaired so it can be taken off-site so that the rest of the maintenance can occur.

Major vehicle maintenance onsite is prohibited. Re-fueling or maintenance of vehicles within 25 feet of a drainage structure shall be prohibited. Drip pans, drip cloths, or absorbent pads should be used when replacing spent fluids. The fluids should be collect and stored prior to being disposed of offsite.

<u>Specific Pollution Prevention Practice #1</u>

- BMP Description: Spill Kit.
- Installation Schedule: Onsite throughout construction.
- Responsible Staff: Construction Manager and Site Contractor.

Specific Pollution Prevention Practice #1

- BMP Description: Drip Pans, Drip Cloths, Absorbent Pads.
- Installation Schedule: Onsite throughout construction.
- Responsible Staff: Construction Manager and Site Contractor.

5.4 Washing of Equipment and Vehicles

General

Vehicle and equipment washout areas shall be constructed by the contractor so that no untreated water enters the storm drain system. Soaps, detergents, or solvents must be stored in a way to prevent these detergents from coming into contact with rainwater, or a similarly effective means designed to prevent the discharge of pollutants from these areas.

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1

- BMP Description: Designated vehicle/equipment washing areas
- Installation Schedule: Start of construction.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25” or greater.
- Responsible Staff: Construction Manager and Site Contractor

Pollution Prevention Practice # 2

- BMP Description: Spill kit, vehicle washing, straw bale catch basin protection, silt fence
- Installation Schedule: Start of construction activity
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25” or greater.
- Responsible Staff: Construction Manager and Site Contractor

5.5 Storage, Handling, and Disposal of Construction Products, Materials, and Wastes

5.5.1 Building Products

General

The contractor will recycle all construction materials possible. For materials that cannot be recycled, solid waste will be disposed of in accordance with DEP Regulations for Solid Waste Facilities, 310 CMR 10.00.

Any building materials required to be stored onsite will be stored at a combined staging and materials storage area as shown on the CMP. Larger items will be elevated by appropriate methods to minimize contact with runoff. The storage area will be inspected weekly and after storm events. It will be kept clean, organized, and equipped with appropriate cleaning supplies.

Building product usage shall follow the following good housekeeping BMPs:

- The Responsible Staff: Construction Manager or Site Contractor representative will inspect daily for inspection of the work area to ensure proper management of waste materials.
- Store only enough material onsite required for that job as to satisfy current construction needs.
- Store required materials in tightly lidded containers under cover.
- Store materials in original containers with clearly legible labels.
- Separate and store materials apart from each other.
- Do not mix materials unless specifically in accordance with manufacturers' recommendations.
- Use all products from a container before disposing of the container.
- Follow manufacturers' instructions for handling, storage, and disposing of all materials.
- All materials shall be stored in an area to prevent the discharge of pollutants from building products.

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1

- BMP Description: Perimeter Protection control around Stockpiles.
- Installation Schedule: Start of construction/ Immediately after stockpile is established.
- Inspection Schedule: Once every 14 days and within 24 hours of a storm event 0.25" or greater.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
  Remove any sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- Responsible Staff: Construction Manager and Site Contractor(s).

5.5.2 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscape Materials

- In storage areas, provide either (1) cover to minimize the exposure of these chemicals to precipitation and to stormwater or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas.
- Comply with all application and disposal requirements included on the registered pesticide, herbicide, insecticide, and fertilizer label.

5.5.3 Diesel Fuel, Oil, Hydraulic Fluids, Other Petroleum Products, and Other Chemicals

General

- Only skilled personnel in a designated area will perform fueling of vehicles onsite.
- Vehicles used onsite will be monitored for fuel and oil leaks.
- Vehicles used onsite will be maintained in good working order.
- Asphalt substances will be applied in accordance with manufacturers' recommendations.
- The use of petroleum products as a release agent for asphalt transport trucks is prohibited.
- Vehicle fueling will only be done in vehicle fueling areas located by the contractor. See section 5.3 of the SWPPP.
- The contractor shall be responsible for locating the fuel storage and re-fueling area onsite to minimize disturbance to construction activates and site area.
- Construction equipment not in active use for 5 minutes or more will be turned off.

5.5.4 Hazardous or Toxic Waste

(Note: Examples include paints, solvents, petroleum-based products, wood preservatives, additives, curing compounds, acids.)

General

- Keep products in their original containers.
- Original container labels should be clearly visible.
- Material safety data sheets will be kept onsite and be available.
- Follow all state, local, and Federal regulations regarding the handling, use, storage, and disposal of hazardous material.

Paints:

- All paint containers will be tightly sealed when not in use.
- Remove excess paint in original labeled containers from the jobsite.
- Paint will not be disposed of onsite. Remove excess paint material from the site and legally dispose of.
- Paint shall not be disposed of in the storm drain system.

5.5.5 Construction and Domestic Waste

General
The contractor will manage domestic waste onsite. The contractor will provide waste containers of sufficient size and number to contain construction and domestic wastes. The waste container lids will be kept closed when not in use and lids will be closed at the end of the business day for those containers that are actively used throughout the day. For waste containers that do not have lids, provide either a cover or a similarly effective means designed to minimize discharge of pollutants. Clean up immediately if containers overflow.

Pollution Prevention Practice # 1

- BMP Description: Dumpster.
- Installation Schedule: Start of construction.
- Maintenance and Inspection: Weekly and covered daily.
- Responsible Staff: Construction Manager and Site Contractor(s).

Pollution Prevention Practice # 2

- BMP Description: Litter/debris pick-up.
- Installation Schedule: Start of construction.
- Maintenance and Inspection: Daily.
- Responsible Staff: Construction Manager and Site Contractor(s).

5.5.6 Sanitary Waste

All sanitary waste portable toilets shall be positioned so that they are secure and will not be tipped or knocked over, and located away from any stormwater inlets or conveyances.

Pollution Prevention Practice # 1

- BMP Description: Porta John.
- Installation Schedule: Start of construction.
- Maintenance and Inspection: As manufacturer requires.
- Responsible Staff: Construction Manager and Site Contractor(s).

5.6 Washing of Applicators and Containers used for Paint, Concrete, or Other Materials

General
Washing of applicators and containers used for paint, concrete, or other materials shall follow the following good housekeeping BMPs:

- An effective means of eliminating the discharge of water from the washout and cleanout of stucco, paint, concrete, form release oils, curing compounds, and other construction materials.
- All washwater must be directed into a leak-proof container or leak-proof pit. The container or pit must be designed so that no overflows can occur due to inadequate sizing or precipitation.
- Washout and cleanout wastes should be handled as follows:
  - Do not dump liquid wastes into storm sewers.
  - Dispose of liquid wastes in accordance with applicable requirements.
  - Remove and dispose of hardened concrete waste consistent with the handling of other construction wastes.
- Locate any washout or cleanout activities as far away as possible from surface waters and stormwater inlets or conveyances, and to the extent practicable, designate areas to be used for these activities and conduct such activities only in these areas.

Pollution Prevention Practice # 1

- BMP Description: Designated applicator and container washing areas.
- Installation Schedule: Start of construction.
- Maintenance and Inspection: Daily.
- Responsible Staff: Construction Manager and Site Contractor(s).

5.7 Fertilizers

General
If fertilizer is required onsite, installation will follow the following guidelines:

- Fertilizers will be used at the application rates called for in the specifications for the project.
- Once applied, fertilizer will be worked into the soil to minimize wash off from irrigation and stormwater.
- Fertilizer will be stored under cover.
- The contents of partially used fertilizer bags will be transferred to re-sealable, watertight containers clearly labeled with their contents.
- Avoid applying before heavy rains.
- Never apply to frozen ground.
- Never apply to stormwater conveyance channels with flowing water.

5.8 Other Pollution Prevention Practices

Any changes in construction activity that produce other allowable non-stormwater discharges will be identified, the SWPPP will be amended and the appropriate erosion and sedimentation controls will be implemented.

Control # X
- BMP Description: Description of control to be installed.
- Installation Schedule: Approximate date of installation.
- Inspection Schedule: Pick Inspection schedule from above.
- Maintenance: Ensure that all stormwater controls remain in effective condition as decribed in part 2.1.4 of the CGP.
- Responsible Staff: Construction Manager and Site Contractor(s).

SECTION 6: INSPECTION AND CORRECTIVE ACTION

6.1 Inspection Personnel and Procedures

Personnel Responsible for Inspections

Construction Manager
Contact Person

Site Contractor
Contact person

(Note: All personnel conducting inspections must be considered a "qualified person." CGP Part 4.1.1 clarifies that a "qualified person" is a person knowledgeable in the principles and practices of erosion and sediment controls and pollution prevention, who possesses the skills to assess conditions at the construction site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.)

Inspection Schedule

Specific Inspection Frequency

The contractor shall inspect and maintain erosion control measures, and remove sediment therefrom, once every 14 days and within 24 hours of a storm event 0.25" or greater.

Rain Gauge Location:

NOAA Rain Gauge Location: Groveland 0.8 S, MA US – Latitude and Longitude: 42.7391°, -71.0306°

See Attachment M for location map.

Reductions in Inspection Frequency (if applicable):

Inspection frequency may be reduced to twice per month (no more than 14 days apart) for the first month in areas of the site where the stabilization steps outlines in Parts 2.2.14 of the CGP have been completed. After the first month, inspection frequency may be reduced to once per month. If construction activity resumes in this portion of the site at a later date, the inspection frequency immediately increases to that required in Parts 4.2 and 4.3 as applicable. You must document the beginning and ending dates of this period in the SWPPP.

Inspection frequency may be reduced to once per month and within 24 hours of the occurrence of a storm event of 0.25 inches or greater if the project is located in an arid, semi-arid, or drought-stricken area and construction is occurring during the seasonally dry period or a period in which drought is predicted to occur. If this inspection frequency is followed, you must document the beginning and ending dates of this period in the SWPPP.

Inspections can be temporarily suspended under the following conditions:

- Earth-disturbing activity is suspended due to frozen condition;
- Runoff is unlikely due to continuous frozen conditions that are likely to continue at the site for at least three months based on historic seasonal averaged. **If unexpected weather conditions make discharges likely, the operators must immediately resume the regular inspection schedule**;
- Land disturbances have been suspended; and
- All disturbed areas of the site have been stabilized in accordance with Part 2.2.14a of the CGP.

Inspection frequency may be reduced to once per month under the following conditions:

- The operator is still conducting earth disturbing activities under frozen conditions;
- Runoff is unlikely due to continuous frozen conditions that are likely to continue at the site for at least three months based on historic seasonal averages. **If unexpected weather conditions make discharges likely, the operator must immediately resume the regular inspection schedule**; and
- Except for areas in which the operator is conducting earth-disturbing activities, disturbed areas of the site have been stabilized in accordance with Part 2.2.14a of the CGP.

Inspection Report Forms
Copies of inspection reports are in Attachment D.

6.2 Corrective Action

Personnel Responsible for Corrective Actions
Contact Person, Construction Manager Company
Contact Person, Site Contractor

Corrective Action Forms
A copy of the Corrective Action Form is in Attachment E.

6.3 Delegation of Authority

Duly Authorized Representative(s) or Position(s):
Construction Manager Company
Contact Person
Contact Person Title
Street Address
Town/City, State Zip Code
xxx-xxx-xxxx
Email address

SECTION 7: TRAINING LOG

Refer to Attachment **I** for a Training Log to be completed for each SWPPP training session**.**

Table 7-1: Documentation for Completion of Training

Name	**Date Training Completed**

SECTION 8: CERTIFICATION AND NOTIFICATION

Operator – Owner's Representative

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: ______________________________ Title: ______________________________

Signature: ______________________________________ Date: __________________

Operator – Construction Manager

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: ______________________________ Title: ______________________________

Signature: ______________________________________ Date: __________________

SWPPP *Attachment A – Site Maps*

Attachment B – 2017 Construction General Permit

Attachment C – NOI and EPA Authorization Email

Attachment D – Inspection Form

Attachment E – Corrective Action Form

Attachment F – SWPPP Amendment Log

Attachment G – Subcontractor Certifications/Agreements

Attachment H – Grading and Stabilization Activities Log

Attachment I – SWPPP Training Log

Attachment J – Delegation of Authority Form

Attachment K – Endangered Species Documentation

Attachment L – Historic Preservation Documentation

Attachment M – Rainfall Gauge

Attachment N – Order of Conditions

Attachment A – Site Maps

Figure A-1: Locus Map
24 Main Street
West Newbury, MA

Data Source: MassGIS
Nitsch Project #12360

Nitsch Engineering

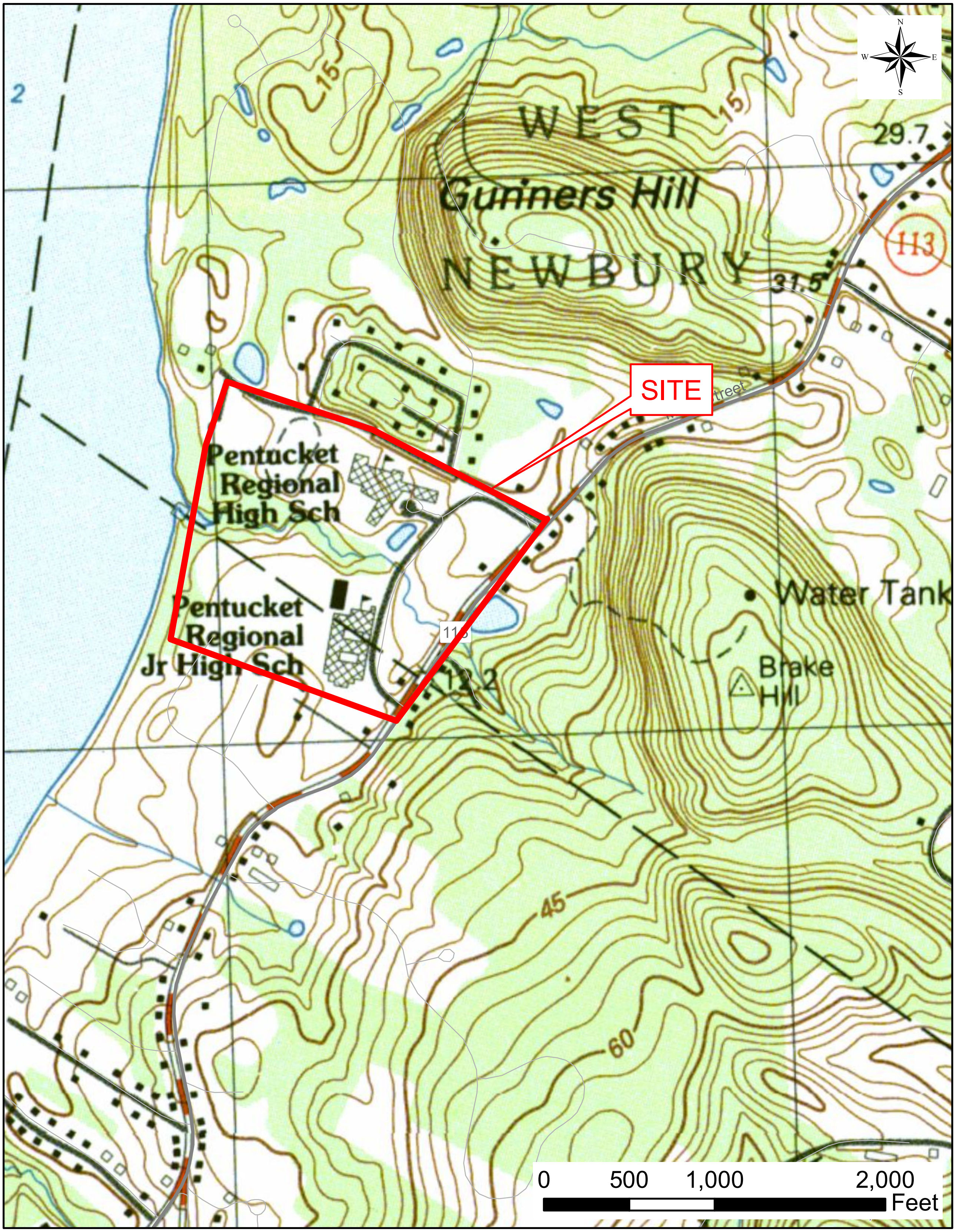

Figure A-2 : USGS Locus Map

24 Main Street
West Newbury, MA

Nitsch Engineering

Data Source: MassGIS
Nitsch Project #12360

Attachment B – 2017 Construction General Permit

National Pollutant Discharge Elimination System
General Permit for Discharges from
Construction Activities

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §1251 et. seq., (hereafter CWA), as amended by the Water Quality Act of 1987, P.L. 100-4, "operators" of construction activities (defined in Appendix A) that meet the requirements of Part 1.1 of this National Pollutant Discharge Elimination System (NPDES) general permit, are authorized to discharge pollutants in accordance with the effluent limitations and conditions set forth herein. Permit coverage is required from the "commencement of construction activities" (see Appendix A) until one of the conditions for terminating CGP coverage has been met (see Part 8.2).

This permit becomes effective on **February 16, 2017**.

This permit and the authorization to discharge expire at 11:59pm, **February 16, 2022.**

Signed and issued this 11th day of January 2017

Deborah Szaro,
Acting Regional Administrator, EPA Region 1

Signed and issued this 11th day of January 2017

Javier Laureano, Ph.D.,
Director, Clean Water Division, EPA Region 2

Signed and issued this 11th day of January 2017

Jose C. Font,
Acting Director, Caribbean Environmental Protection Division, EPA Region 2.

Signed and issued this 11th day of January 2017

Dominique Lueckenhoff,
Acting Director, Water Protection Division, EPA Region 3

Signed and issued this 11th day of January 2017

César A. Zapata,
Deputy Director, Water Protection Division, EPA Region 4

Signed and issued this 11th day of January 2017

Christopher Korleski,
Director, Water Division, EPA Region 5

Signed and issued this 11th day of January 2017

William K. Honker, P.E.,
Director, Water Division, EPA Region 6

Signed and issued this 11th day of January 2017

Karen Flournoy,
Director, Water, Wetlands, and Pesticides Division, EPA Region 7

Signed and issued this 11th day of January 2017

Darcy O'Connor,
Assistant Regional Administrator, Office of Water Protection, EPA Region 8

Signed and issued this 11th day of January 2017

Kristin Gullatt
Deputy Director, Water Division, EPA Region 9

Signed and issued this 11th day of January 2017

Daniel D. Opalski,
Director, Office of Water and Watersheds, EPA Region 10

CONTENTS

1 HOW TO OBTAIN COVERAGE UNDER THE CONSTRUCTION GENERAL PERMIT (CGP)

To be covered under this permit, you must meet the eligibility conditions and follow the requirements for obtaining permit coverage in this Part.

1.1 ELIGIBILITY CONDITIONS

1.1.1 You are an "operator" of a construction site for which discharges will be covered under this permit. For the purposes of this permit and in the context of stormwater discharges associated with construction activity, an "operator" is any party associated with a construction project that meets either of the following two criteria:

a. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications *(e.g., in most cases this is the owner of the site);* or

b. The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions *(e.g., they are authorized to direct workers at a site to carry out activities required by the permit; in most cases this is the general contractor (as defined in Appendix A) of the project)*.

Where there are multiple operators associated with the same project, all operators must obtain permit coverage.[1] Subcontractors generally are not considered operators for the purposes of this permit.

1.1.2 Your site's construction activities:

a. Will disturb one or more acres of land, or will disturb less than one acre of land but are part of a common plan of development or sale that will ultimately disturb one or more acres of land; or

b. Have been designated by EPA as needing permit coverage under 40 CFR 122.26(a)(1)(v) or 40 CFR 122.26(b)(15)(ii);

1.1.3 Your site is located in an area where EPA is the permitting authority (see Appendix B);

1.1.4 Discharges from your site are not:

a. Already covered by a different NPDES permit for the same discharge; or

b. In the process of having coverage under a different NPDES permit for the same discharge denied, terminated, or revoked.[2, 3]

1.1.5 You are able to demonstrate that you meet one of the criteria listed in Appendix D with respect to the protection of species that are federally listed as endangered or threatened under the Endangered Species Act (ESA) and federally designated critical habitat;

[1] If the operator of a "construction support activity" (see Part 1.2.1c) is different than the operator of the main site, that operator must also obtain permit coverage. See Part 7.1 for clarification on the sharing of liability between and among operators on the same site and for conditions that apply to developing a SWPPP for multiple operators associated with the same site.

[2] Parts 1.1.4a and 1.1.4b do not include sites currently covered under the 2012 CGP that are in the process of obtaining coverage under this permit, nor sites covered under this permit that are transferring coverage to a different operator.

[3] Notwithstanding a site being made ineligible for coverage under this permit because it falls under the description of Parts 1.1.4a or 1.1.4b, above, EPA may waive the applicable eligibility requirement after specific review if it determines that coverage under this permit is appropriate.

1.1.6 You have completed the screening process in Appendix E relating to the protection of historic properties; and

1.1.7 You have complied with all requirements in Part 9 imposed by the applicable state, Indian tribe, or territory in which your construction activities and/or discharge will occur.

1.1.8 For "new sources" (as defined in Appendix A) only:

a. EPA has not, prior to authorization under this permit, determined that discharges from your site will cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard. Where such a determination is made prior to authorization, EPA may notify you that an individual permit application is necessary. However, EPA may authorize your coverage under this permit after you have included appropriate controls and implementation procedures designed to bring your discharge into compliance with this permit, specifically the requirement to meet water quality standards. In the absence of information demonstrating otherwise, EPA expects that compliance with the requirements of this permit, including the requirements applicable to such discharges in Part 3, will result in discharges that will not cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard.

b. Discharges from your site to a Tier 2, Tier 2.5, or Tier 3 water[4] will not lower the water quality of the applicable water. In the absence of information demonstrating otherwise, EPA expects that compliance with the requirements of this permit, including the requirements applicable to such discharges in Part 3.2, will result in discharges that will not lower the water quality of such waters.

1.1.9 If you plan to add "cationic treatment chemicals" (as defined in Appendix A) to stormwater and/or authorized non-stormwater prior to discharge, you may not submit your Notice of Intent (NOI) unless and until you notify your applicable EPA Regional Office (see Appendix L) in advance and the EPA Regional Office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to discharges that cause an exceedance of water quality standards.

1.2 TYPES OF DISCHARGES AUTHORIZED[5]

1.2.1 The following stormwater discharges are authorized under this permit provided that appropriate stormwater controls are designed, installed, and maintained (see Parts 2 and 3):

a. Stormwater discharges, including stormwater runoff, snowmelt runoff, and surface runoff and drainage, associated with construction activity under 40 CFR 122.26(b)(14) or 122.26(b)(15)(i);

[4] Note: Your site will be considered to discharge to a Tier 2, Tier 2.5, or Tier 3 water if the first water to which you discharge is identified by a state, tribe, or EPA as a Tier 2, Tier 2.5, or Tier 3 water. For discharges that enter a storm sewer system prior to discharge, the first water of the U.S. to which you discharge is the waterbody that receives the stormwater discharge from the storm sewer system. See list of Tier 2, Tier 2.5, and Tier 3 waters in Appendix F.

[5] See "Discharge" as defined in Appendix A. Note: Any discharges not expressly authorized in this permit cannot become authorized or shielded from liability under CWA section 402(k) by disclosure to EPA, state, or local authorities after issuance of this permit via any means, including the Notice of Intent (NOI) to be covered by the permit, the SWPPP, or during an inspection.

b. Stormwater discharges designated by EPA as needing a permit under 40 CFR 122.26(a)(1)(v) or 122.26(b)(15)(ii);

c. Stormwater discharges from construction support activities *(e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas)* provided that:

   i. The support activity is directly related to the construction site required to have permit coverage for stormwater discharges;

   ii. The support activity is not a commercial operation, nor does it serve multiple unrelated construction sites;

   iii. The support activity does not continue to operate beyond the completion of the construction activity at the site it supports; and

   iv. Stormwater controls are implemented in accordance with Part 2 and Part 3 for discharges from the support activity areas.

d. Stormwater discharges from earth-disturbing activities associated with the construction of staging areas and the construction of access roads conducted prior to active mining.

1.2.2 The following non-stormwater discharges associated with your construction activity are authorized under this permit provided that, with the exception of water used to control dust and to irrigate vegetation in stabilized areas, these discharges are not routed to areas of exposed soil on your site and you comply with any applicable requirements for these discharges in Parts 2 and 3:

a. Discharges from emergency fire-fighting activities;

b. Fire hydrant flushings;

c. Landscape irrigation;

d. Water used to wash vehicles and equipment, provided that there is no discharge of soaps, solvents, or detergents used for such purposes;

e. Water used to control dust;

f. Potable water including uncontaminated water line flushings;

g. External building washdown, provided soaps, solvents, and detergents are not used, and external surfaces do not contain hazardous substances (as defined in Appendix A) *(e.g., paint or caulk containing polychlorinated biphenyls (PCBs)*);

h. Pavement wash waters, provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used. You are prohibited from directing pavement wash waters directly into any water of the U.S., storm drain inlet, or stormwater conveyance, unless the conveyance is connected to a sediment basin, sediment trap, or similarly effective control;

i. Uncontaminated air conditioning or compressor condensate;

j. Uncontaminated, non-turbid discharges of ground water or spring water;

k. Foundation or footing drains where flows are not contaminated with process materials such as solvents or contaminated ground water; and

l. Construction dewatering water discharged in accordance with Part 2.4.

1.2.3 Also authorized under this permit are discharges of stormwater listed above in Part 1.2.1, or authorized non-stormwater discharges listed above in Part 1.2.2, commingled with a discharge authorized by a different NPDES permit and/or a discharge that does not require NPDES permit authorization.

1.3 PROHIBITED DISCHARGES[6]

1.3.1 Wastewater from washout of concrete, unless managed by an appropriate control as described in Part 2.3.4;

1.3.2 Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials;

1.3.3 Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;

1.3.4 Soaps, solvents, or detergents used in vehicle and equipment washing or external building washdown; and

1.3.5 Toxic or hazardous substances from a spill or other release.

To prevent the above-listed prohibited non-stormwater discharges, operators must comply with the applicable pollution prevention requirements in Part 2.3.

1.4 SUBMITTING YOUR NOTICE OF INTENT (NOI)

All "operators" (as defined in Appendix A) associated with your construction site, who meet the Part 1.1 eligibility requirements, and who seek coverage under this permit, must submit to EPA a complete and accurate NOI in accordance with the deadlines in **Table 1** prior to commencing construction activities.

Exception: If you are conducting construction activities in response to a public emergency *(e.g., mud slides, earthquake, extreme flooding conditions, widespread disruption in essential public services)*, and the related work requires immediate authorization to avoid imminent endangerment to human health, public safety, or the environment, or to reestablish essential public services, you may discharge on the condition that a complete and accurate NOI is submitted within 30 calendar days after commencing construction activities (see Table 1) establishing that you are eligible for coverage under this permit. You must also provide documentation in your Stormwater Pollution Prevention Plan (SWPPP) to substantiate the occurrence of the public emergency.

1.4.1 Prerequisite for Submitting Your NOI

You must develop a SWPPP consistent with Part 7 before submitting your NOI for coverage under this permit.

1.4.2 How to Submit Your NOI

You must use EPA's NPDES eReporting Tool (NeT) to electronically prepare and submit your NOI for coverage under the 2017 CGP, unless you received a waiver from your EPA Regional Office.

To access NeT, go to https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting.

[6] EPA includes these prohibited non-stormwater discharges here as a reminder to the operator that the only non-stormwater discharges authorized by this permit are at Part 1.2.2. Any unauthorized non-stormwater discharges must be covered under an individual permit or alternative general permit.

Waivers from electronic reporting may be granted based on one of the following conditions:

a. If your operational headquarters is physically located in a geographic area (*i.e., ZIP code or census tract*) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission; or

b. If you have limitations regarding available computer access or computer capability.

If the EPA Regional Office grants you approval to use a paper NOI, and you elect to use it, you must complete the form in Appendix J.

1.4.3 Deadlines for Submitting Your NOI and Your Official Date of Permit Coverage

Table 1 provides the deadlines for submitting your NOI and the official start date of your permit coverage, which differ depending on when you commence construction activities.

Table 1 NOI Submittal Deadlines and Official Start Date for Permit Coverage.

Type of Operator	**NOI Submittal Deadline**[7]	**Permit Authorization Date**[8]
Operator of a new site (*i.e., a site where construction activities commence on or after February 16, 2017*)	At least 14 calendar days before commencing construction activities.	14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied.
Operator of an existing site (*i.e., a site with 2012 CGP coverage where construction activities commenced prior to February 16, 2017*)	No later than **May 17, 2017**.	
New operator of a permitted site (*i.e., an operator that through transfer of ownership and/or operation replaces the operator of an already permitted construction site that is either a "new site" or an "existing site"*)	At least 14 calendar days before the date the transfer to the new operator will take place.	
Operator of an "emergency-related project" (*i.e., a project initiated in response to a public emergency (e.g., mud slides, earthquake, extreme flooding conditions, disruption in essential public services), for which the related work requires immediate authorization to avoid imminent endangerment to human health or the environment, or to reestablish essential public services*)	No later than 30 calendar days after commencing construction activities.	You are considered provisionally covered under the terms and conditions of this permit immediately, and fully covered 14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied.

[7] If you miss the deadline to submit your NOI, any and all discharges from your construction activities will continue to be unauthorized under the CWA until they are covered by this or a different NPDES permit. EPA may take enforcement action for any unpermitted discharges that occur between the commencement of construction activities and discharge authorization.

[8] Discharges are not authorized if your NOI is incomplete or inaccurate or if you are not eligible for permit coverage.

1.4.4 Modifying your NOI

If after submitting your NOI you need to correct or update any fields, you may do so by submitting a "Change NOI" form using NeT. Waivers from electronic reporting may be granted as specified in Part 1.4.1. If the EPA Regional Office has granted you approval to submit a paper NOI modification, you may indicate any NOI changes on the same NOI form in Appendix J.

When there is a change to the site's operator, the new operator must submit a new NOI, and the previous operator must submit a Notice of Termination (NOT) form as specified in Part 8.3.

1.4.5 Your Official End Date of Permit Coverage

Once covered under this permit, your coverage will last until the date that:

a. You terminate permit coverage consistent with Part 8; or

b. You receive permit coverage under a different NPDES permit or a reissued or replacement version of this permit after expiring on February 16, 2022; or

c. You fail to submit an NOI for coverage under a revised or replacement version of this permit before the deadline for existing construction sites where construction activities continue after this permit has expired.

1.5 REQUIREMENT TO POST A NOTICE OF YOUR PERMIT COVERAGE

You must post a sign or other notice of your permit coverage at a safe, publicly accessible location in close proximity to the construction site. The notice must be located so that it is visible from the public road that is nearest to the active part of the construction site, and it must use a font large enough to be readily viewed from a public right-of-way.[9] At a minimum, the notice must include:

a. The NPDES ID (*i.e., permit tracking number assigned to your NOI*);

b. A contact name and phone number for obtaining additional construction site information;

c. The Uniform Resource Locator (URL) for the SWPPP (if available), or the following statement: "If you would like to obtain a copy of the Stormwater Pollution Prevention Plan (SWPPP) for this site, contact the EPA Regional Office at [*include the appropriate CGP Regional Office contact information found at https://www.epa.gov/npdes/contact-us-stormwater#regional*];" and

d. The following statement "If you observe indicators of stormwater pollutants in the discharge or in the receiving waterbody, contact the EPA through the following website: https://www.epa.gov/enforcement/report-environmental-violations."

2 TECHNOLOGY-BASED EFFLUENT LIMITATIONS

You must comply with the following technology-based effluent limitations in this Part for all authorized discharges.[10]

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[9] If the active part of the construction site is not visible from a public road, then place the notice of permit coverage in a position that is visible from the nearest public road and as close as possible to the construction site.

[10] For each of the effluent limits in Part 2, as applicable to your site, you must include in your SWPPP (1) a

2.1 GENERAL STORMWATER CONTROL DESIGN, INSTALLATION, AND MAINTENANCE REQUIREMENTS

You must design, install, and maintain stormwater controls required in Parts 2.2 and 2.3 to minimize the discharge of pollutants in stormwater from construction activities. To meet this requirement, you must:

2.1.1 Account for the following factors in designing your stormwater controls:

a. The expected amount, frequency, intensity, and duration of precipitation;

b. The nature of stormwater runoff and run-on at the site, including factors such as expected flow from impervious surfaces, slopes, and site drainage features. You must design stormwater controls to control stormwater volume, velocity, and peak flow rates to minimize discharges of pollutants in stormwater and to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points; and

c. The soil type and range of soil particle sizes expected to be present on the site.

2.1.2 Design and install all stormwater controls in accordance with good engineering practices, including applicable design specifications.[11]

2.1.3 Complete installation of stormwater controls by the time each phase of construction activities has begun.

a. By the time construction activity in any given portion of the site begins, install and make operational any downgradient sediment controls (*e.g., buffers, perimeter controls, exit point controls, storm drain inlet protection*) that control discharges from the initial site clearing, grading, excavating, and other earth-disturbing activities.[12]

b. Following the installation of these initial controls, install and make operational all stormwater controls needed to control discharges prior to subsequent earth-disturbing activities.

2.1.4 Ensure that all stormwater controls are maintained and remain in effective operating condition during permit coverage and are protected from activities that would reduce their effectiveness.

a. Comply with any specific maintenance requirements for the stormwater controls listed in this permit, as well as any recommended by the manufacturer.[13]

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description of the specific control(s) to be implemented to meet the effluent limit; (2) any applicable design specifications; (3) routine maintenance specifications; and (4) the projected schedule for its (their) installation/implementation. See Part 7.2.6.

[11] Design specifications may be found in manufacturer specifications and/or in applicable erosion and sediment control manuals or ordinances. Any departures from such specifications must reflect good engineering practices and must be explained in your SWPPP. You must also comply with any additional design and installation requirements specified for the effluent limits in Parts 2.2 and 2.3.

[12] Note that the requirement to install stormwater controls prior to each phase of construction activities for the site does not apply to the earth disturbance associated with the actual installation of these controls. Operators should take all reasonable actions to minimize the discharges of pollutants during the installation of stormwater controls.

[13] Any departures from such maintenance recommendations made by the manufacturer must reflect good engineering practices and must be explained in your SWPPP.

b. If at any time you find that a stormwater control needs routine maintenance, you must immediately initiate the needed maintenance work, and complete such work by the close of the next business day.

c. If at any time you find that a stormwater control needs repair or replacement, you must comply with the corrective action requirements in Part 5.

2.2 EROSION AND SEDIMENT CONTROL REQUIREMENTS

You must implement erosion and sediment controls in accordance with the following requirements to minimize the discharge of pollutants in stormwater from construction activities.

2.2.1 Provide and maintain natural buffers and/or equivalent erosion and sediment controls when a water of the U.S. is located within 50 feet of the site's earth disturbances.

a. **Compliance Alternatives.** For any discharges to waters of the U.S. located within 50 feet of your site's earth disturbances, you must comply with one of the following alternatives:

   i. Provide and maintain a 50-foot undisturbed natural buffer; or

   ii. Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve, in combination, the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or

   iii. If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

   See Appendix G, Part G.2 for additional conditions applicable to each compliance alternative.

b. **Exceptions.** See Appendix G, Part G.2 for exceptions to the compliance alternatives.

2.2.2 Direct stormwater to vegetated areas and maximize stormwater infiltration and filtering to reduce pollutant discharges, unless infeasible.

2.2.3 Install sediment controls along any perimeter areas of the site that will receive pollutant discharges.[14]

a. Remove sediment before it has accumulated to one-half of the above-ground height of any perimeter control.

b. **Exception**. For areas at "linear construction sites" (as defined in Appendix A) where perimeter controls are infeasible *(e.g., due to a limited or restricted right-of-way),* implement other practices as necessary to minimize pollutant discharges to perimeter areas of the site.

2.2.4 Minimize sediment track-out.

a. Restrict vehicle use to properly designated exit points;

b. Use appropriate stabilization techniques[15] at all points that exit onto paved roads.

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[14] Examples of perimeter controls include filter berms, silt fences, vegetative strips, and temporary diversion dikes.

[15] Examples of appropriate stabilization techniques include the use of aggregate stone with an underlying geotextile or non-woven filter fabric, and turf mats.

i. **Exception**: Stabilization is not required for exit points at linear utility construction sites that are used only episodically and for very short durations over the life of the project, provided other exit point controls[16] are implemented to minimize sediment track-out;

c. Implement additional track-out controls[17] as necessary to ensure that sediment removal occurs prior to vehicle exit; and

d. Where sediment has been tracked-out from your site onto paved roads, sidewalks, or other paved areas outside of your site, remove the deposited sediment by the end of the same business day in which the track-out occurs or by the end of the next business day if track-out occurs on a non-business day. Remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. You are prohibited from hosing or sweeping tracked-out sediment into any stormwater conveyance, storm drain inlet, or water of the U.S.[18]

2.2.5 Manage stockpiles or land clearing debris piles composed, in whole or in part, of sediment and/or soil:

a. Locate the piles outside of any natural buffers established under Part 2.2.1 and away from any stormwater conveyances, drain inlets, and areas where stormwater flow is concentrated;

b. Install a sediment barrier along all downgradient perimeter areas;[19]

c. For piles that will be unused for 14 or more days, provide cover[20] or appropriate temporary stabilization (consistent with Part 2.2.14);

d. You are prohibited from hosing down or sweeping soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or water of the U.S.

2.2.6 Minimize dust. On areas of exposed soil, minimize the generation of dust through the appropriate application of water or other dust suppression techniques.

2.2.7 Minimize steep slope disturbances. Minimize the disturbance of “steep slopes” (as defined in Appendix A).

[16] Examples of other exit point controls include preventing the use of exit points during wet periods; minimizing exit point use by keeping vehicles on site to the extent possible; limiting exit point size to the width needed for vehicle and equipment usage; using scarifying and compaction techniques on the soil; and avoiding establishing exit points in environmentally sensitive areas (*e.g., karst areas; steep slopes)*.

[17] Examples of additional track-out controls include the use of wheel washing, rumble strips, and rattle plates.

[18] Fine grains that remain visible *(i.e., staining)* on the surfaces of off-site streets, other paved areas, and sidewalks after you have implemented sediment removal practices are not a violation of Part 2.2.4.

[19] Examples of sediment barriers include berms, dikes, fiber rolls, silt fences, sandbags, gravel bags, or straw bale.

[20] Examples of cover include tarps, blown straw and hydroseeding.

2.2.8 Preserve native topsoil, unless infeasible.[21]

2.2.9 Minimize soil compaction.[22] In areas of your site where final vegetative stabilization will occur or where infiltration practices will be installed:

a. Restrict vehicle and equipment use in these locations to avoid soil compaction; and

b. Before seeding or planting areas of exposed soil that have been compacted, use techniques that rehabilitate and condition the soils as necessary to support vegetative growth.

2.2.10 Protect storm drain inlets.

a. Install inlet protection measures that remove sediment from discharges prior to entry into any storm drain inlet that carries stormwater flow from your site to a water of the U.S., provided you have authority to access the storm drain inlet;[23] and

b. Clean, or remove and replace, the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, remove the deposited sediment by the end of the same business day in which it is found or by the end of the following business day if removal by the same business day is not feasible.

2.2.11 Minimize erosion of stormwater conveyance channels and their embankments, outlets, adjacent streambanks, slopes, and downstream waters. Use erosion controls and velocity dissipation devices[24] within and along the length of any stormwater conveyance channel and at any outlet to slow down runoff to minimize erosion.

2.2.12 If you install a sediment basin or similar impoundment:

a. Situate the basin or impoundment outside of any water of the U.S. and any natural buffers established under Part 2.2.1;

b. Design the basin or impoundment to avoid collecting water from wetlands;

c. Design the basin or impoundment to provide storage for either:

i. The calculated volume of runoff from a 2-year, 24-hour storm (see Appendix H); or

ii. 3,600 cubic feet per acre drained.

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[21] Stockpiling topsoil at off-site locations, or transferring topsoil to other locations, is an example of a practice that is consistent with the requirements in Part 2.2.8. Preserving native topsoil is not required where the intended function of a specific area of the site dictates that the topsoil be disturbed or removed. For example, some sites may be designed to be highly impervious after construction, and therefore little or no vegetation is intended to remain, or may not have space to stockpile native topsoil on site for later use, in which case, it may not be feasible to preserve topsoil.

[22] Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted.

[23] Inlet protection measures can be removed in the event of flood conditions or to prevent erosion.

[24] Examples of velocity dissipation devices include check dams, sediment traps, riprap, and grouted riprap at outlets.

d. Utilize outlet structures that withdraw water from the surface of the sediment basin or similar impoundment, unless infeasible;[25]

e. Use erosion controls and velocity dissipation devices to prevent erosion at inlets and outlets; and

f. Remove accumulated sediment to maintain at least one-half of the design capacity and conduct all other appropriate maintenance to ensure the basin or impoundment remains in effective operating condition.

2.2.13 If using treatment chemicals (*e.g., polymers, flocculants, coagulants*):

a. **Use conventional erosion and sediment controls before and after the application of treatment chemicals.** Chemicals may only be applied where treated stormwater is directed to a sediment control *(e.g., sediment basin, perimeter control)* before discharge.

b. **Select appropriate treatment chemicals**. Chemicals must be appropriately suited to the types of soils likely to be exposed during construction and present in the discharges being treated *(i.e., the expected turbidity, pH, and flow rate of stormwater flowing into the chemical treatment system or area)*.

c. **Minimize discharge risk from stored chemicals.** Store all treatment chemicals in leak-proof containers that are kept under storm-resistant cover and surrounded by secondary containment structures *(e.g., spill berms, decks, spill containment pallets)*, or provide equivalent measures designed and maintained to minimize the potential discharge of treatment chemicals in stormwater or by any other means *(e.g., storing chemicals in a covered area, having a spill kit available on site and ensuring personnel are available to respond expeditiously in the event of a leak or spill)*.

d. **Comply with state/local requirements.** Comply with applicable state and local requirements regarding the use of treatment chemicals.

e. **Use chemicals in accordance with good engineering practices and specifications of the chemical provider/supplier.** Use treatment chemicals and chemical treatment systems in accordance with good engineering practices, and with dosing specifications and sediment removal design specifications provided by the provider/supplier of the applicable chemicals, or document in your SWPPP specific departures from these specifications and how they reflect good engineering practice.

f. **Ensure proper training.** Ensure that all persons who handle and use treatment chemicals at the construction site are provided with appropriate, product-specific training. Among other things, the training must cover proper dosing requirements.

g. **Perform additional measures specified by the EPA Regional Office for the authorized use of cationic chemicals.** If you have been authorized to use cationic chemicals at your site pursuant to Part 1.1.9, you must perform all additional measures as conditioned by your authorization to ensure that the use of such chemicals will not cause an exceedance of water quality standards.

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[25] The circumstances in which it is infeasible to design outlet structures in this manner are rare. Exceptions may include areas with extended cold weather, where using surface outlets may not be feasible during certain time periods (although they must be used during other periods). If you determine that it is infeasible to meet this requirement, you must provide documentation in your SWPPP to support your determination, including the specific conditions or time periods when this exception will apply.

2.2.14 Stabilize exposed portions of the site. Implement and maintain stabilization measures (*e.g., seeding protected by erosion controls until vegetation is established, sodding, mulching, erosion control blankets, hydromulch, gravel*) that minimize erosion from exposed portions of the site in accordance with Parts 2.2.14a and 2.2.14b.

a. **Stabilization Deadlines:**[26]

Total Amount of Land Disturbance Occurring At Any One Time[27]	**Deadline**
i. **Five acres or less (≤5.0)** **Note: this includes sites disturbing more than five acres (>5.0) total over the course of a project, but that limit disturbance at any one time *(i.e., phase the disturbance)* to five acres or less (≤5.0)**	• Initiate the installation of stabilization measures immediately[28] in any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days;[29] and • Complete the installation of stabilization measures as soon as practicable, but no later than 14 calendar days after stabilization has been initiated.[30]

[26] EPA may determine, based on an inspection carried out under Part 4.8 and corrective actions required under Part 5.3, that the level of sediment discharge on the site makes it necessary to require a faster schedule for completing stabilization. For instance, if sediment discharges from an area of exposed soil that is required to be stabilized are compromising the performance of existing stormwater controls, EPA may require stabilization to correct this problem.

[27] Limiting disturbances to five (5) acres or less at any one time means that at no time during the project do the cumulative earth disturbances exceed five (5) acres. The following examples would qualify as limiting disturbances at any one time to five (5) acres or less:
1. The total area of disturbance for a project is five (5) acres or less.
2. The total area of disturbance for a project will exceed five (5) acres, but the operator ensures that no more than five (5) acres will be disturbed at any one time through implementation of stabilization measures. In this way, site stabilization can be used to "free up" land that can be disturbed without exceeding the five (5)-acre cap to qualify for the 14-day stabilization deadline. For instance, if an operator completes stabilization of two (2) acres of land on a five (5)-acre disturbance, then two (2) additional acres could be disturbed while still qualifying for the longer 14-day stabilization deadline.

[28] The following are examples of activities that would constitute the immediate initiation of stabilization:
1. Prepping the soil for vegetative or non-vegetative stabilization as long as seeding, planting, and/or installation of non-vegetative stabilization products takes place as soon as practicable, but no later than one (1) calendar day of completing soil preparation;
2. Applying mulch or other non-vegetative product to the exposed area;
3. Seeding or planting the exposed area;
4. Starting any of the activities in # 1 – 3 on a portion of the entire area that will be stabilized; and
5. Finalizing arrangements to have stabilization product fully installed in compliance with the deadlines for completing stabilization.

[29] The requirement to initiate stabilization immediately is triggered as soon as you know that construction work on a portion of the site is temporarily ceased and will not resume for 14 or more days, or as soon as you know that construction work is permanently ceased. In the context of this provision, "immediately" means as soon as practicable, but no later than the end of the next business day, following the day when the construction activities have temporarily or permanently ceased.

[30] If vegetative stabilization measures are being implemented, stabilization is considered "installed" when all activities necessary to seed or plant the area are completed. If non-vegetative stabilization measures are being implemented, stabilization is considered "installed" when all such measures are implemented or applied.

ii. **More than five acres (>5.0)**	• Initiate the installation of stabilization measures immediately[31] in any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days;[32] and • Complete the installation of stabilization measures as soon as practicable, but no later than seven (7) calendar days after stabilization has been initiated.[33]

iii. **Exceptions:**

(a) Arid, semi-arid, and drought-stricken areas (as defined in Appendix A)**.** If it is the seasonally dry period or a period in which drought is occurring, and vegetative stabilization measures are being used:

(i) Immediately initiate and, within 14 calendar days of a temporary or permanent cessation of work in any portion of your site, complete the installation of temporary non-vegetative stabilization measures to the extent necessary to prevent erosion;

(ii) As soon as practicable, given conditions or circumstances on the site, complete all activities necessary to seed or plant the area to be stabilized; and

(iii) If construction is occurring during the seasonally dry period, indicate in your SWPPP the beginning and ending dates of the seasonally dry period and your site conditions. Also include the schedule you will follow for initiating and completing vegetative stabilization.

(b) Operators that are affected by unforeseen circumstances[34] that delay the initiation and/or completion of vegetative stabilization:

(i) Immediately initiate and, within 14 calendar days, complete the installation of temporary non-vegetative stabilization measures to prevent erosion;

(ii) Complete all soil conditioning, seeding, watering or irrigation installation, mulching, and other required activities related to the planting and initial establishment of vegetation as soon as conditions or circumstances allow it on your site; and

(iii) Document in the SWPPP the circumstances that prevent you from meeting the deadlines in Part 2.2.14a and the schedule you will follow for initiating and completing stabilization.

(c) Discharges to a sediment- or nutrient-impaired water or to a water that is identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes. Complete stabilization as soon as

[31] See footnote 27

[32] See footnote 28

[33] See footnote 29

[34] Examples include problems with the supply of seed stock or with the availability of specialized equipment and unsuitability of soil conditions due to excessive precipitation and/or flooding.

practicable, but no later than seven (7) calendar days after stabilization has been initiated.

b. **Final Stabilization Criteria** (for any areas not covered by permanent structures)**:**

i. Establish uniform, perennial vegetation *(i.e., evenly distributed, without large bare areas)* that provides 70 percent or more of the cover that is provided by vegetation native to local undisturbed areas; and/or

ii. Implement permanent non-vegetative stabilization measures[35] to provide effective cover.

iii. **Exceptions:**

(a) **Arid, semi-arid, and drought-stricken areas** (as defined in Appendix A). Final stabilization is met if the area has been seeded or planted to establish vegetation that provides 70 percent or more of the cover that is provided by vegetation native to local undisturbed areas within three (3) years and, to the extent necessary to prevent erosion on the seeded or planted area, non-vegetative erosion controls have been applied that provide cover for at least three years without active maintenance.

(b) **Disturbed areas on agricultural land that are restored to their preconstruction agricultural use.** The Part 2.2.14b final stabilization criteria does not apply.

(c) **Areas that need to remain disturbed.** In limited circumstances, stabilization may not be required if the intended function of a specific area of the site necessitates that it remain disturbed, and only the minimum area needed remains disturbed *(e.g., dirt access roads, utility pole pads, areas being used for storage of vehicles, equipment, materials).*

2.3 POLLUTION PREVENTION REQUIREMENTS[36]

You must implement pollution prevention controls in accordance with the following requirements to minimize the discharge of pollutants in stormwater and to prevent the discharge of pollutants from spilled or leaked materials from construction activities.

2.3.1 For equipment and vehicle fueling and maintenance:

a. Provide an effective means of eliminating the discharge of spilled or leaked chemicals, including fuels and oils, from these activities;[37]

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[35] Examples of permanent non-vegetative stabilization measures include riprap, gravel, gabions, and geotextiles.

[36] Under this permit, you are not required to minimize exposure for any products or materials where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

[37] Examples of effective means include:

- Locating activities away from waters of the U.S. and stormwater inlets or conveyances so that stormwater coming into contact with these activities cannot reach waters of the U.S.;
- Providing secondary containment (*e.g., spill berms, decks, spill containment pallets*) and cover where appropriate; and
- Having a spill kit available on site and ensuring personnel are available to respond expeditiously in the event of a leak or spill.

b. If applicable, comply with the Spill Prevention Control and Countermeasures (SPCC) requirements in 40 CFR part 112 and Section 311 of the CWA;

c. Ensure adequate supplies are available at all times to handle spills, leaks, and disposal of used liquids;

d. Use drip pans and absorbents under or around leaky vehicles;

e. Dispose of or recycle oil and oily wastes in accordance with other federal, state, tribal, or local requirements; and

f. Clean up spills or contaminated surfaces immediately, using dry clean up measures (do not clean contaminated surfaces by hosing the area down), and eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.

2.3.2 For equipment and vehicle washing:

a. Provide an effective means of minimizing the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other types of wash waters;[38]

b. Ensure there is no discharge of soaps, solvents, or detergents in equipment and vehicle wash water; and

c. For storage of soaps, detergents, or solvents, provide either (1) cover *(e.g., plastic sheeting, temporary roofs)* to minimize the exposure of these detergents to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas.

2.3.3 For storage, handling, and disposal of building products, materials, and wastes:

a. *For building materials and building products*[39], provide either (1) cover (*e.g., plastic sheeting, temporary roofs*) to minimize the exposure of these products to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas.

b. *For pesticides, herbicides, insecticides, fertilizers, and landscape materials*:

i. In storage areas, provide either (1) cover (*e.g., plastic sheeting, temporary roofs*) to minimize the exposure of these chemicals to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas; and

ii. Comply with all application and disposal requirements included on the registered pesticide, herbicide, insecticide, and fertilizer label (see also Part 2.3.5).

c. *For diesel fuel, oil, hydraulic fluids, other petroleum products, and other chemicals*:

i. Store chemicals in water-tight containers, and provide either (1) cover *(e.g., plastic sheeting, temporary roofs)* to minimize the exposure of these containers to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas *(e.g., having a spill kit available on site and ensuring personnel are available to respond expeditiously in*

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[38] Examples of effective means include locating activities away from waters of the U.S. and stormwater inlets or conveyances and directing wash waters to a sediment basin or sediment trap, using filtration devices, such as filter bags or sand filters, or using other similarly effective controls.

[39] Examples of building materials and building products typically present at construction sites include asphalt sealants, copper flashing, roofing materials, adhesives, concrete admixtures, and gravel and mulch stockpiles.

the event of a leak or spill), or provide secondary containment *(e.g., spill berms, decks, spill containment pallets)*; and

ii. Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly. You are prohibited from hosing the area down to clean surfaces or spills. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge.

d. *For hazardous or toxic wastes*:[40]

i. Separate hazardous or toxic waste from construction and domestic waste;

ii. Store waste in sealed containers, which are constructed of suitable materials to prevent leakage and corrosion, and which are labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and all other applicable federal, state, tribal, or local requirements;

iii. Store all outside containers within appropriately-sized secondary containment (*e.g., spill berms, decks, spill containment pallets*) to prevent spills from being discharged, or provide a similarly effective means designed to prevent the discharge of pollutants from these areas *(e.g., storing chemicals in a covered area, having a spill kit available on site);*

iv. Dispose of hazardous or toxic waste in accordance with the manufacturer's recommended method of disposal and in compliance with federal, state, tribal, and local requirements;

v. Clean up spills immediately, using dry clean-up methods, and dispose of used materials properly. You are prohibited from hosing the area down to clean surfaces or spills. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge; and

vi. Follow all other federal, state, tribal, and local requirements regarding hazardous or toxic waste.

e. *For construction and domestic wastes*:[41]

i. Provide waste containers *(e.g., dumpster, trash receptacle)* of sufficient size and number to contain construction and domestic wastes;

ii. Keep waste container lids closed when not in use and close lids at the end of the business day for those containers that are actively used throughout the day. For waste containers that do not have lids, provide either (1) cover *(e.g., a tarp, plastic sheeting, temporary roof)* to minimize exposure of wastes to precipitation, or (2) a similarly effective means designed to minimize the discharge of pollutants *(e.g., secondary containment)*;

iii. On business days, clean up and dispose of waste in designated waste containers; and

iv. Clean up immediately if containers overflow.

[40] Examples of hazardous or toxic waste that may be present at construction sites include paints, caulks, sealants, fluorescent light ballasts, solvents, petroleum-based products, wood preservatives, additives, curing compounds, and acids.

[41] Examples of construction and domestic waste include packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, styrofoam, concrete, demolition debris; and other trash or building materials.

f. *For sanitary waste*, position portable toilets so that they are secure and will not be tipped or knocked over, and located away from waters of the U.S. and stormwater inlets or conveyances.

2.3.4 For washing applicators and containers used for stucco, paint, concrete, form release oils, curing compounds, or other materials:

a. Direct wash water into a leak-proof container or leak-proof and lined pit designed so that no overflows can occur due to inadequate sizing or precipitation;

b. Handle washout or cleanout wastes as follows:

   i. Do not dump liquid wastes in storm sewers or waters of the U.S.;

   ii. Dispose of liquid wastes in accordance with applicable requirements in Part 2.3.3; and

   iii. Remove and dispose of hardened concrete waste consistent with your handling of other construction wastes in Part 2.3.3; and

c. Locate any washout or cleanout activities as far away as possible from waters of the U.S. and stormwater inlets or conveyances, and, to the extent feasible, designate areas to be used for these activities and conduct such activities only in these areas.

2.3.5 For the application of fertilizers:

a. Apply at a rate and in amounts consistent with manufacturer's specifications, or document in the SWPPP departures from the manufacturer specifications where appropriate in accordance with Part 7.2.6.b.ix;

b. Apply at the appropriate time of year for your location, and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth;

c. Avoid applying before heavy rains that could cause excess nutrients to be discharged;

d. Never apply to frozen ground;

e. Never apply to stormwater conveyance channels; and

f. Follow all other federal, state, tribal, and local requirements regarding fertilizer application.

2.3.6 Emergency Spill Notification Requirements

Discharges of toxic or hazardous substances from a spill or other release are prohibited, consistent with Part 1.3.5. Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR 110, 40 CFR 117, or 40 CFR 302 occurs during a 24-hour period, you must notify the National Response Center (NRC) at (800) 424-8802 or, in the Washington, DC metropolitan area, call (202) 267-2675 in accordance with the requirements of 40 CFR 110, 40 CFR 117, and 40 CFR 302 as soon as you have knowledge of the release. You must also, within seven (7) calendar days of knowledge of the release, provide a description of the release, the circumstances leading to the release, and the date of the release. State, tribal, or local requirements may necessitate additional reporting of spills or discharges to local emergency response, public health, or drinking water supply agencies.

2.4 CONSTRUCTION DEWATERING REQUIREMENTS

Comply with the following requirements to minimize the discharge of pollutants in ground water or accumulated stormwater that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation, in accordance with Part 1.2.2.[42]

2.4.1 Treat dewatering discharges with controls to minimize discharges of pollutants;[43]

2.4.2 Do not discharge visible floating solids or foam;

2.4.3 Use an oil-water separator or suitable filtration device (such as a cartridge filter) that is designed to remove oil, grease, or other products if dewatering water is found to contain these materials;

2.4.4 To the extent feasible, use vegetated, upland areas of the site to infiltrate dewatering water before discharge. You are prohibited from using waters of the U.S. as part of the treatment area;

2.4.5 At all points where dewatering water is discharged, comply with the velocity dissipation requirements of Part 2.2.11;

2.4.6 With backwash water, either haul it away for disposal or return it to the beginning of the treatment process; and

2.4.7 Replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.

3 WATER QUALITY-BASED EFFLUENT LIMITATIONS

3.1 GENERAL EFFLUENT LIMITATION TO MEET APPLICABLE WATER QUALITY STANDARDS

Discharges must be controlled as necessary to meet applicable water quality standards. Discharges must also comply with any additional state or tribal requirements that are in Part 9.

In the absence of information demonstrating otherwise, EPA expects that compliance with the conditions in this permit will result in stormwater discharges being controlled as necessary to meet applicable water quality standards. If at any time you become aware, or EPA determines, that discharges are not being controlled as necessary to meet applicable water quality standards, you must take corrective action as required in Parts 5.1 and 5.2, and document the corrective actions as required in Part 5.4.

EPA may insist that you install additional controls (to meet the narrative water quality-based effluent limit above) on a site-specific basis, or require you to obtain coverage under an individual permit, if information in your NOI or from other sources indicates that your discharges are not controlled as necessary to meet applicable water quality standards. This includes situations where additional controls are necessary to comply with a wasteload allocation in an EPA-established or approved TMDL.

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[42] Uncontaminated, clear (non-turbid) dewatering water can be discharged without being routed to a control.

[43] Appropriate controls include sediment basins or sediment traps, sediment socks, dewatering tanks, tube settlers, weir tanks, filtration systems (*e.g., bag or sand filters*), and passive treatment systems that are designed to remove sediment. Appropriate controls to use downstream of dewatering controls to minimize erosion include vegetated buffers, check dams, riprap, and grouted riprap at outlets.

If during your coverage under a previous permit, you were required to install and maintain stormwater controls specifically to meet the assumptions and requirements of an EPA-approved or established TMDL (for any parameter) or to otherwise control your discharge to meet water quality standards, you must continue to implement such controls as part of your coverage under this permit.

3.2 DISCHARGE LIMITATIONS FOR SITES DISCHARGING TO SENSITIVE WATERS[44]

For any portion of the site that discharges to a sediment or nutrient-impaired water or to a water that is identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes, you must comply with the inspection frequency specified in 4.3 and you must comply with the stabilization deadline specified in Part 2.2.14.a.iii.(c).[45]

If you discharge to a water that is impaired for a parameter other than a sediment-related parameter or nutrients, EPA will inform you if any additional controls are necessary for your discharge to be controlled as necessary to meet water quality standards, including for it to be consistent with the assumptions of any available wasteload allocation in any applicable TMDL, or if coverage under an individual permit is necessary.

In addition, on a case-by-case basis, EPA may notify operators of new sites or operators of existing sites with increased discharges that additional analyses, stormwater controls, or other measures are necessary to comply with the applicable antidegradation requirements, or notify you that an individual permit application is necessary.

If you discharge to a water that is impaired for polychlorinated biphenyls (PCBs) and are engaging in demolition of any structure with at least 10,000 square feet of floor space built or renovated before January 1, 1980, you must:

[44] Sensitive waters include waters that are impaired and Tier 2, Tier 2.5, and Tier 3 waters.

"Impaired waters" are those waters identified by the state, tribe, or EPA as not meeting an applicable water quality standard and (1) requires development of a TMDL (pursuant to section 303(d) of the CWA; or (2) is addressed by an EPA-approved or established TMDL; or (3) is not in either of the above categories but the waterbody is covered by a pollution control program that meets the requirements of 40 CFR 130.7(b)(1). Your construction site will be considered to discharge to an impaired water if the first water of the U.S. to which you discharge is an impaired water for the pollutants contained in the discharge from your site. For discharges that enter a storm sewer system prior to discharge, the first water of the U.S. to which you discharge is the waterbody that receives the stormwater discharge from the storm sewer system. For assistance in determining whether your site discharges to impaired waters, EPA has developed a tool that is available both within the electronic NOI form in NeT, and at https://water.epa.gov/polwaste/npdes/stormwater/discharge.cfm.

Tiers 2, 2.5 and 3 refer to waters either identified by the state as high quality waters or Outstanding National Resource Waters under 40 CFR 131.12(a)(2) and (3). For the purposes of this permit, you are considered to discharge to a Tier 2, Tier 2.5, or Tier 3 water if the first water of the U.S. to which you discharge is identified by a state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3. For discharges that enter a storm sewer system prior to discharge, the water of the U.S. to which you discharge is the first water of the U.S. that receives the stormwater discharge from the storm sewer system. See list of Tier 2, Tier 2.5, and Tier 3 waters in Appendix F.

EPA may determine on a case-by-case basis that a site discharges to a sensitive water.

[45] If you qualify for any of the reduced inspection frequencies in Part 4.4, you may conduct inspections in accordance with Part 4.4 for any portion of your site that discharges to a sensitive water.

a. Implement controls[46] to minimize the exposure of PCB-containing building materials, including paint, caulk, and pre-1980 fluorescent lighting fixtures, to precipitation and to stormwater; and

b. Ensure that disposal of such materials is performed in compliance with applicable state, federal, and local laws.

4 SITE INSPECTION REQUIREMENTS

4.1 PERSON(S) RESPONSIBLE FOR INSPECTING SITE

The person(s) inspecting your site may be a person on your staff or a third party you hire to conduct such inspections. You are responsible for ensuring that the person who conducts inspections is a "qualified person."[47]

4.2 FREQUENCY OF INSPECTIONS.[48]

At a minimum, you must conduct a site inspection in accordance with one of the two schedules listed below, unless you are subject to the Part 4.3 site inspection frequency for discharges to sensitive waters or qualify for a Part 4.4 reduction in the inspection frequency:

4.2.1 At least once every seven (7) calendar days; *or*

4.2.2 Once every 14 calendar days *and* within 24 hours of the occurrence of a storm event of 0.25 inches or greater, or the occurrence of runoff from snowmelt sufficient to cause a discharge.[49] To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any day of rainfall during normal business hours that measures 0.25 inches or greater, you must record the total rainfall measured for that day in accordance with Part 4.7.1d.

4.3 INCREASE IN INSPECTION FREQUENCY FOR SITES DISCHARGING TO SENSITIVE WATERS.

For any portion of the site that discharges to a sediment or nutrient-impaired water or to a water that is identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes (see Part 3.2), instead of the inspection frequency specified in

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[46] Examples of controls to minimize exposure of PCBs to precipitation and stormwater include separating work areas from non-work areas and selecting appropriate personal protective equipment and tools, constructing a containment area so that all dust or debris generated by the work remains within the protected area, using tools that minimize dust and heat (<212°F). For additional information, refer to Part 2.3.3 of the CGP Fact Sheet.

[47] A "qualified person" is a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality, and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

[48] Inspections are only required during the site's normal working hours.

[49] "Within 24 hours of the occurrence of a storm event" means that you must conduct an inspection within 24 hours once a storm event has produced 0.25 inches within a 24-hour period, even if the storm event is still continuing. Thus, if you have elected to inspect bi-weekly in accordance with Part 4.2.2 and there is a storm event at your site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, you must conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm.

Part 4.2, you must conduct inspections in accordance with the following inspection frequencies:

Once every seven (7) calendar days *and* within 24 hours of the occurrence of a storm event of 0.25 inches or greater, or the occurrence of runoff from snowmelt sufficient to cause a discharge. To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any day of rainfall during normal business hours that measures 0.25 inches or greater, you must record the total rainfall measured for that day in accordance with Part 4.7.1d.

4.4 REDUCTIONS IN INSPECTION FREQUENCY

4.4.1 Stabilized areas.

a. You may reduce the frequency of inspections to twice per month for the first month, no more than 14 calendar days apart, then once per month in any area of your site where the stabilization steps in 2.2.14a have been completed. If construction activity resumes in this portion of the site at a later date, the inspection frequency immediately increases to that required in Parts 4.2 and 4.3, as applicable. You must document the beginning and ending dates of this period in your SWPPP.

b. **Exception.** For "linear construction sites" (as defined in Appendix A) where disturbed portions have undergone final stabilization at the same time active construction continues on others, you may reduce the frequency of inspections to twice per month for the first month, no more than 14 calendar days apart, in any area of your site where the stabilization steps in 2.2.14a have been completed. After the first month, inspect once more within 24 hours of the occurrence of a storm event of 0.25 inches or greater. If there are no issues or evidence of stabilization problems, you may suspend further inspections. If "wash-out" of stabilization materials and/or sediment is observed, following re-stabilization, inspections must resume at the inspection frequency required in Part 4.4.1a Inspections must continue until final stabilization is visually confirmed following a storm event of 0.25 inches or greater.

4.4.2 Arid, semi-arid, or drought-stricken areas (as defined in Appendix A). If it is the seasonally dry period or a period in which drought is occurring, you may reduce the frequency of inspections to once per month and within 24 hours of the occurrence of a storm event of 0.25 inches or greater. You must document that you are using this reduced schedule and the beginning and ending dates of the seasonally dry period in your SWPPP. To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any day of rainfall during normal business hours that measures 0.25 inches or greater, you must record the total rainfall measured for that day in accordance with Part 4.7.1d.

4.4.3 Frozen conditions:

a. If you are suspending construction activities due to frozen conditions, you may temporarily suspend inspections on your site until thawing conditions (as defined in Appendix A) begin to occur if:

   i. Runoff is unlikely due to continuous frozen conditions that are likely to continue at your site for at least three (3) months based on historic seasonal averages. If unexpected weather conditions (such as above freezing temperatures or rain events) make discharges likely, you must immediately resume your regular inspection frequency as described in Parts 4.2 and 4.3, as applicable;

ii. Land disturbances have been suspended; and

iii. All disturbed areas of the site have been stabilized in accordance with Part 2.2.14a.

b. If you are still conducting construction activities during frozen conditions, you may reduce your inspection frequency to once per month if:

i. Runoff is unlikely due to continuous frozen conditions that are likely to continue at your site for at least three (3) months based on historic seasonal averages. If unexpected weather conditions (such as above freezing temperatures or rain events) make discharges likely, you must immediately resume your regular inspection frequency as described in Parts 4.2 and 4.3, as applicable; and

ii. Except for areas in which you are actively conducting construction activities, disturbed areas of the site have been stabilized in accordance with Part 2.2.14a.

You must document the beginning and ending dates of this period in your SWPPP.

4.5 AREAS THAT MUST BE INSPECTED

During your site inspection, you must at a minimum inspect the following areas of your site:

4.5.1 All areas that have been cleared, graded, or excavated and that have not yet completed stabilization consistent with Part 2.2.14a;

4.5.2 All stormwater controls (including pollution prevention controls) installed at the site to comply with this permit;[50]

4.5.3 Material, waste, borrow, and equipment storage and maintenance areas that are covered by this permit;

4.5.4 All areas where stormwater typically flows within the site, including drainageways designed to divert, convey, and/or treat stormwater;

4.5.5 All points of discharge from the site; and

4.5.6 All locations where stabilization measures have been implemented.

You are not required to inspect areas that, at the time of the inspection, are considered unsafe to your inspection personnel.

4.6 REQUIREMENTS FOR INSPECTIONS

During your site inspection, you must at a minimum:

4.6.1 Check whether all stormwater controls *(i.e., erosion and sediment controls and pollution prevention controls)* are properly installed, appear to be operational, and are working as intended to minimize pollutant discharges;

4.6.2 Check for the presence of conditions that could lead to spills, leaks, or other accumulations of pollutants on the site;

[50] This includes the requirement to inspect for sediment that has been tracked out from the site onto paved roads, sidewalks, or other paved areas consistent with Part 2.2.4.

4.6.3 Identify any locations where new or modified stormwater controls are necessary to meet the requirements of Parts 2 and/or 3;

4.6.4 Check for signs of visible erosion and sedimentation *(i.e., sediment deposits)* that have occurred and are attributable to your discharge at points of discharge and, if applicable, the banks of any waters of the U.S. flowing within or immediately adjacent to the site;

4.6.5 Identify any incidents of noncompliance observed;

4.6.6 If a discharge is occurring during your inspection:

a. Identify all discharge points at the site; and

b. Observe and document the visual quality of the discharge, and take note of the characteristics of the stormwater discharge, including color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants.

4.6.7 Based on the results of your inspection, complete any necessary maintenance under Part 2.1.4 and corrective action under Part 5.

4.7 INSPECTION REPORT

4.7.1 You must complete an inspection report within 24 hours of completing any site inspection. Each inspection report must include the following:

a. The inspection date;

b. Names and titles of personnel making the inspection;

c. A summary of your inspection findings, covering at a minimum the observations you made in accordance with Part 4.6, including any necessary maintenance or corrective actions;

d. If you are inspecting your site at the frequency specified in Part 4.2.2, Part 4.3, or Part 4.4.1b, and you conducted an inspection because of rainfall measuring 0.25 inches or greater, you must include the applicable rain gauge or weather station readings that triggered the inspection; and

e. If you determined that it is unsafe to inspect a portion of your site, you must describe the reason you found it to be unsafe and specify the locations to which this condition applies.

4.7.2 Each inspection report must be signed in accordance with Appendix I, Part I.11 of this permit.

4.7.3 You must keep a copy of all inspection reports at the site or at an easily accessible location, so that it can be made available at the time of an on-site inspection or upon request by EPA.

4.7.4 You must retain all inspection reports completed for this Part for at least three (3) years from the date that your permit coverage expires or is terminated.

4.8 INSPECTIONS BY EPA

You must allow EPA, or an authorized representative of EPA, to conduct the following activities at reasonable times. To the extent that you are utilizing shared controls that are not on site to comply with this permit, you must make arrangements for EPA to have access at all reasonable times to those areas where the shared controls are located.

4.8.1 Enter onto all areas of the site, including any construction support activity areas covered by this permit, any off-site areas where shared controls are utilized to comply with this permit, discharge locations, adjoining waterbodies, and locations where records are kept under the conditions of this permit;

4.8.2 Access and copy any records that must be kept under the conditions of this permit;

4.8.3 Inspect your construction site, including any construction support activity areas covered by this permit (see Part 1.2.1c), any stormwater controls installed and maintained at the site, and any off-site shared controls utilized to comply with this permit; and

4.8.4 Sample or monitor for the purpose of ensuring compliance.

5 CORRECTIVE ACTIONS

5.1 CONDITIONS TRIGGERING CORRECTIVE ACTION.

You must take corrective action to address any of the following conditions identified at your site:

5.1.1 A stormwater control needs repair or replacement (beyond routine maintenance required under Part 2.1.4); or

5.1.2 A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly; or

5.1.3 Your discharges are causing an exceedance of applicable water quality standards; or

5.1.4 A prohibited discharge has occurred (see Part 1.3).

5.2 CORRECTIVE ACTION DEADLINES

For any corrective action triggering conditions in Part 5.1, you must**:**

5.2.1 Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events;

5.2.2 When the problem does not require a new or replacement control or significant repair, the corrective action must be completed by the close of the next business day;

5.2.3 When the problem requires a new or replacement control or significant repair, install the new or modified control and make it operational, or complete the repair, by no later than seven (7) calendar days from the time of discovery. If it is infeasible to complete the installation or repair within seven (7) calendar days, you must document in your records why it is infeasible to complete the installation or repair within the 7-day timeframe and document your schedule for installing the stormwater control(s) and making it operational as soon as feasible after the 7-day timeframe. Where these actions result in changes to any of the stormwater controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within seven (7) calendar days of completing this work.

5.3 CORRECTIVE ACTION REQUIRED BY EPA

You must comply with any corrective actions required by EPA as a result of permit violations found during an inspection carried out under Part 4.8.

5.4 CORRECTIVE ACTION REPORT

For each corrective action taken in accordance with this Part, you must complete a report in accordance with the following:

5.4.1 Within 24 hours of identifying the corrective action condition, document the specific condition and the date and time it was identified.

5.4.2 Within 24 hours of completing the corrective action (in accordance with the deadlines in Part 5.2), document the actions taken to address the condition, including whether any SWPPP modifications are required.

5.4.3 Each corrective action report must be signed in accordance with Appendix I, Part I.11 of this permit.

5.4.4 You must keep a copy of all corrective action reports at the site or at an easily accessible location, so that it can be made available at the time of an on-site inspection or upon request by EPA.

5.4.5 You must retain all corrective action reports completed for this Part for at least three (3) years from the date that your permit coverage expires or is terminated.

6 STAFF TRAINING REQUIREMENTS

Each operator, or group of multiple operators, must assemble a "stormwater team" to carry out compliance activities associated with the requirements in this permit.

6.1 Prior to the commencement of construction activities, you must ensure that the following personnel[51] on the stormwater team understand the requirements of this permit and their specific responsibilities with respect to those requirements:

a. Personnel who are responsible for the design, installation, maintenance, and/or repair of stormwater controls (including pollution prevention controls);
b. Personnel responsible for the application and storage of treatment chemicals (if applicable);
c. Personnel who are responsible for conducting inspections as required in Part 4.1; and
d. Personnel who are responsible for taking corrective actions as required in Part 5.

6.2 You are responsible for ensuring that all activities on the site comply with the requirements of this permit. You are not required to provide or document formal training for subcontractors or other outside service providers, but you must ensure that such personnel understand any requirements of this permit that may be affected by the work they are subcontracted to perform.

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[51] If the person requiring training is a new employee who starts after you commence construction activities, you must ensure that this person has the proper understanding as required above prior to assuming particular responsibilities related to compliance with this permit.

For emergency-related projects, the requirement to train personnel prior to commencement of construction activities does not apply, however, such personnel must have the required training prior to NOI submission.

6.3 At a minimum, members of the stormwater team must be trained to understand the following if related to the scope of their job duties *(e.g., only personnel responsible for conducting inspections need to understand how to conduct inspections*):

a. The permit deadlines associated with installation, maintenance, and removal of stormwater controls and with stabilization;

b. The location of all stormwater controls on the site required by this permit and how they are to be maintained;

c. The proper procedures to follow with respect to the permit's pollution prevention requirements; and

d. When and how to conduct inspections, record applicable findings, and take corrective actions.

6.4 Each member of the stormwater team must have easy access to an electronic or paper copy of applicable portions of this permit, the most updated copy of your SWPPP, and other relevant documents or information that must be kept with the SWPPP.

7 STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

7.1 GENERAL REQUIREMENTS

All operators associated with a construction site under this permit must develop a SWPPP consistent with the requirements in Part 7 prior to their submittal of the NOI.[52, 53] The SWPPP must be kept up-to-date throughout coverage under this permit.

If a SWPPP was prepared under a previous version of this permit, the operator must review and update the SWPPP to ensure that this permit's requirements are addressed prior to submitting an NOI for coverage under this permit.

7.2 SWPPP CONTENTS

At a minimum, the SWPPP must include the information specified in this Part and as

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[52] The SWPPP does not establish the effluent limits that apply to your site's discharges; these limits are established in this permit in Parts 2 and 3.

[53] You have the option of developing a group SWPPP where you are one of several operators at your site. For instance, if both the owner and the general contractor of the construction site are operators and thus are both required to obtain a permit, the owner may be the party undertaking SWPPP development, and the general contractor (or any other operator at the site) can choose to use this same SWPPP, as long as the SWPPP addresses the general contractor's (or other operator's) scope of construction work and functions to be performed under the SWPPP. Regardless of whether there is a group SWPPP or several individual SWPPPs, all operators would be jointly and severally liable for compliance with the permit.

Where there are multiple operators associated with the same site through a common plan of development or sale, operators may assign to themselves various permit-related functions under the SWPPP provided that each SWPPP, or a group SWPPP, documents which operator will perform each function under the SWPPP. However, dividing the functions to be performed under each SWPPP, or a single group SWPPP, does not relieve an individual operator from liability for complying with the permit should another operator fail to implement any measures that are necessary for that individual operator to comply with the permit, e.g., the installation and maintenance of any shared controls. In addition, all operators must ensure, either directly or through coordination with other operators, that their activities do not cause a violation and/or render any other operators' controls and/or any shared controls ineffective. All operators who rely on a shared control to comply with the permit are jointly and severally liable for violations of the permit resulting from the failure to properly install, operate and/or maintain the shared control.

specified in other parts of this permit.

7.2.1 **All Site Operators.** Include a list of all other operators who will be engaged in construction activities at the site, and the areas of the site over which each operator has control.

7.2.2 **Stormwater Team.** Identify the personnel (by name or position) that are part of the stormwater team, as well as their individual responsibilities, including which members are responsible for conducting inspections.

7.2.3 **Nature of Construction Activities**.[54] Include the following:

a. A description of the nature of your construction activities, including the age or dates of past renovations for structures that are undergoing demolition;

b. The size of the property (in acres or length in miles if a linear construction site);

c. The total area expected to be disturbed by the construction activities (to the nearest quarter acre or nearest quarter mile if a linear construction site);

d. A description of any on-site and off-site construction support activity areas covered by this permit (see Part 1.2.1c);

e. The maximum area expected to be disturbed at any one time, including on-site and off-site construction support activity areas;

f. A description and projected schedule for the following:

i. Commencement of construction activities in each portion of the site, including clearing and grubbing, mass grading, demolition activities, site preparation (*i.e., excavating, cutting and filling*), final grading, and creation of soil and vegetation stockpiles requiring stabilization;

ii. Temporary or permanent cessation of construction activities in each portion of the site;

iii. Temporary or final stabilization of exposed areas for each portion of the site; and

iv. Removal of temporary stormwater controls and construction equipment or vehicles, and the cessation of construction-related pollutant-generating activities.

g. A list and description of all pollutant-generating activities[55] on the site. For each pollutant-generating activity, include an inventory of pollutants or pollutant constituents (*e.g., sediment, fertilizers, pesticides, paints, caulks, sealants, fluorescent light ballasts, contaminated substrates, solvents, fuels*) associated with that activity, which could be discharged in stormwater from your construction site. You must take into account where potential spills and leaks could occur that contribute pollutants to stormwater discharges, and any known hazardous or toxic substances, such as PCBs and asbestos, that will be disturbed or removed during construction;

h. Business days and hours for the project;

i. If you are conducting construction activities in response to a public emergency (see Part 1.4), a description of the cause of the public emergency *(e.g., mud slides,*

[54] If plans change due to unforeseen circumstances or for other reasons, the requirement to describe the sequence and estimated dates of construction activities is not meant to "lock in" the operator to meeting these dates. When departures from initial projections are necessary, this should be documented in the SWPPP itself, or in associated records, as appropriate.

[55] Examples of pollutant-generating activities include paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering operations.

earthquake, extreme flooding conditions, widespread disruption in essential public services), information substantiating its occurrence *(e.g., state disaster declaration or similar state or local declaration)*, and a description of the construction necessary to reestablish affected public services.

7.2.4 **Site Map.** Include a legible map, or series of maps, showing the following features of the site:

a. Boundaries of the property;

b. Locations where construction activities will occur, including:

    i. Locations where earth-disturbing activities will occur (note any phasing), including any demolition activities;

    ii. Approximate slopes before and after major grading activities (note any steep slopes (as defined in Appendix A));

    iii. Locations where sediment, soil, or other construction materials will be stockpiled;

    iv. Any water of the U.S. crossings;

    v. Designated points where vehicles will exit onto paved roads;

    vi. Locations of structures and other impervious surfaces upon completion of construction; and

    vii. Locations of on-site and off-site construction support activity areas covered by this permit (see Part 1.2.1c).

c. Locations of all waters of the U.S. within and one mile downstream of the site's discharge point. Also identify if any are listed as impaired, or are identified as a Tier 2, Tier 2.5, or Tier 3 water;

d. Areas of federally listed critical habitat within the site and/or at discharge locations;

e. Type and extent of pre-construction cover on the site (*e.g., vegetative cover, forest, pasture, pavement, structures*);

f. Drainage patterns of stormwater and authorized non-stormwater before and after major grading activities;

g. Stormwater and authorized non-stormwater discharge locations, including:

    i. Locations where stormwater and/or authorized non-stormwater will be discharged to storm drain inlets;[56] and

    ii. Locations where stormwater or authorized non-stormwater will be discharged directly to waters of the U.S.

h. Locations of all potential pollutant-generating activities identified in Part 7.2.3g;

i. Locations of stormwater controls, including natural buffer areas and any shared controls utilized to comply with this permit; and

j. Locations where polymers, flocculants, or other treatment chemicals will be used and stored.

[56] The requirement to show storm drain inlets in the immediate vicinity of the site on your site map only applies to those inlets that are easily identifiable from your site or from a publicly accessible area immediately adjacent to your site.

7.2.5 Non-Stormwater Discharges. Identify all authorized non-stormwater discharges in Part 1.2.2 that will or may occur.

7.2.6 Description of Stormwater Controls.

a. For each of the Part 2.2 erosion and sediment control effluent limits, Part 2.3 pollution prevention effluent limits, and Part 2.4 construction dewatering effluent limits, as applicable to your site, you must include the following:
   i. A description of the specific control(s) to be implemented to meet the effluent limit;
   ii. Any applicable stormwater control design specifications (including references to any manufacturer specifications and/or erosion and sediment control manuals/ordinances relied upon);[57]
   iii. Routine stormwater control maintenance specifications; and
   iv. The projected schedule for stormwater control installation/implementation.

b. You must also include any of the following additional information as applicable.
   i. **Natural buffers and/or equivalent sediment controls** (see Part 2.2.1 and Appendix G). You must include the following:
      (a) The compliance alternative to be implemented;
      (b) If complying with alternative 2, the width of natural buffer retained;
      (c) If complying with alternative 2 or 3, the erosion and sediment control(s) you will use to achieve an equivalent sediment reduction, and any information you relied upon to demonstrate the equivalency;
      (d) If complying with alternative 3, a description of why it is infeasible for you to provide and maintain an undisturbed natural buffer of any size;
      (e) For "linear construction sites" where it is infeasible to implement compliance alternative 1, 2, or 3, a rationale for this determination, and a description of any buffer width retained and/or supplemental erosion and sediment controls installed; and
      (f) A description of any disturbances that are exempt under Part 2.2.1 that occur within 50 feet of a water of the U.S.

   ii. **Perimeter controls for a "linear construction site"** (see Part 2.2.3). For areas where perimeter controls are not feasible, include documentation to support this determination and a description of the other practices that will be implemented to minimize discharges of pollutants in stormwater associated with construction activities.

   Note: Routine maintenance specifications for perimeter controls documented in the SWPPP must include the Part 2.2.3a requirement that sediment be removed before it has accumulated to one-half of the above-ground height of any perimeter control.

   iii. **Sediment track-out controls** (see Parts 2.2.4b and 2.2.4c)**.** Document the specific stabilization techniques and/or controls that will be implemented to remove sediment prior to vehicle exit.

   iv. **Sediment basins** (see Part 2.2.12). In circumstances where it is infeasible to utilize outlet structures that withdraw water from the surface, include documentation to

[57] Design specifications may be found in manufacturer specifications and/or in applicable erosion and sediment control manuals or ordinances. Any departures from such specifications must reflect good engineering practice and must be explained in the SWPPP.

support this determination, including the specific conditions or time periods when this exception will apply.

v. **Treatment chemicals** (see Part 2.2.13), you must include the following:

(a) A listing of the soil types that are expected to be exposed during construction in areas of the project that will drain to chemical treatment systems. Also include a listing of soil types expected to be found in fill material to be used in these same areas, to the extent you have this information prior to construction;

(b) A listing of all treatment chemicals to be used at the site and why the selection of these chemicals is suited to the soil characteristics of your site;

(c) If the applicable EPA Regional Office authorized you to use cationic treatment chemicals for sediment control, include the specific controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to an exceedance of water quality standards;

(d) The dosage of all treatment chemicals to be used at the site or the methodology to be used to determine dosage;

(e) Information from any applicable Safety Data Sheet (SDS);

(f) Schematic drawings of any chemically enhanced stormwater controls or chemical treatment systems to be used for application of the treatment chemicals;

(g) A description of how chemicals will be stored consistent with Part 2.2.13c;

(h) References to applicable state or local requirements affecting the use of treatment chemicals, and copies of applicable manufacturer's specifications regarding the use of your specific treatment chemicals and/or chemical treatment systems; and

(i) A description of the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to use of the treatment chemicals at your site.

vi. **Stabilization measures** (see Part 2.2.14). You must include the following:

(a) The specific vegetative and/or non-vegetative practices that will be used;

(b) The stabilization deadline that will be met in accordance with Part 2.2.14.a.i-ii;

(c) If complying with the deadlines for sites in arid, semi-arid, or drought-stricken areas, the beginning and ending dates of the seasonally dry period and the schedule you will follow for initiating and completing vegetative stabilization; and

(d) If complying with deadlines for sites affected by unforeseen circumstances that delay the initiation and/or completion of vegetative stabilization, document the circumstances and the schedule for initiating and completing stabilization.

vii. **Spill prevention and response procedures** (see Part 1.3.5 and Part 2.3). You must include the following:

(a) Procedures for expeditiously stopping, containing, and cleaning up spills, leaks, and other releases. Identify the name or position of the employee(s) responsible for detection and response of spills or leaks; and

(b) Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity consistent with Part 2.3.6 and established under either 40 CFR 110, 40 CFR 117, or 40 CFR 302, occurs during a 24-hour period. Contact information must be in locations that are readily accessible and available to all employees.

You may also reference the existence of Spill Prevention Control and Countermeasure (SPCC) plans developed for the construction activity under Part 311 of the CWA, or spill control programs otherwise required by an NPDES permit for the construction activity, provided that you keep a copy of that other plan on site.[58]

viii. **Waste management procedures** (see Part 2.3.3). Describe the procedures you will follow for handling, storing and disposing of all wastes generated at your site consistent with all applicable federal, state, tribal, and local requirements, including clearing and demolition debris, sediment removed from the site, construction and domestic waste, hazardous or toxic waste, and sanitary waste.

ix. **Application of fertilizers** (see Part 2.3.5). Document any departures from the manufacturer specifications where appropriate.

7.2.7 Procedures for Inspection, Maintenance, and Corrective Action. Describe the procedures you will follow for maintaining your stormwater controls, conducting site inspections, and, where necessary, taking corrective actions, in accordance with Part 2.1.4, Part 4, and Part 5 of this permit. Also include:

a. The inspection schedule you will follow, which is based on whether your site is subject to Part 4.2 or Part 4.3, or whether your site qualifies for any of the reduced inspection frequencies in Part 4.4;

b. If you will be conducting inspections in accordance with the inspection schedule in Part 4.2.2, Part 4.3, or Part 4.4.1b, the location of the rain gauge or the address of the weather station you will be using to obtain rainfall data;

c. If you will be reducing your inspection frequency in accordance with Part 4.4.1b, the beginning and ending dates of the seasonally defined arid period for your area or the valid period of drought;

d. If you will be reducing your inspection frequency in accordance with Part 4.4.3, the beginning and ending dates of frozen conditions on your site; and

e. Any maintenance or inspection checklists or other forms that will be used.

7.2.8 Staff Training. Include documentation that the required personnel were, or will be, trained in accordance with Part 6.

7.2.9 Compliance with Other Requirements.

a. **Threatened and Endangered Species Protection.** Include documentation required in Appendix D supporting your eligibility with regard to the protection of threatened and endangered species and designated critical habitat.

[58] Even if you already have an SPCC or other spill prevention plan in existence, your plans will only be considered adequate if they meet all of the requirements of this Part, either as part of your existing plan or supplemented as part of the SWPPP.

b. **Historic Properties.** Include documentation required in Appendix E supporting your eligibility with regard to the protection of historic properties.

c. **Safe Drinking Water Act Underground Injection Control (UIC) Requirements for Certain Subsurface Stormwater Controls.** If you are using any of the following stormwater controls at your site, document any contact you have had with the applicable state agency[59] or EPA Regional Office responsible for implementing the requirements for underground injection wells in the Safe Drinking Water Act and EPA's implementing regulations at 40 CFR 144 -147. Such controls would generally be considered Class V UIC wells:

   i. Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system);

   ii. Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow; and

   iii. Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system).

7.2.10 SWPPP Certification. You must sign and date your SWPPP in accordance with Appendix I, Part I.11.

7.2.11 Post-Authorization Additions to the SWPPP. Once you are authorized for coverage under this permit, you must include the following documents as part of your SWPPP:

a. A copy of your NOI submitted to EPA along with any correspondence exchanged between you and EPA related to coverage under this permit;

b. A copy of the acknowledgment letter you receive from NeT assigning your NPDES ID (*i.e., permit tracking number*);

c. A copy of this permit (an electronic copy easily available to the stormwater team is also acceptable).

7.3 ON-SITE AVAILABILITY OF YOUR SWPPP

You must keep a current copy of your SWPPP at the site or at an easily accessible location so that it can be made available at the time of an on-site inspection or upon request by EPA; a state, tribal, or local agency approving stormwater management plans; the operator of a storm sewer system receiving discharges from the site; or representatives of the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS).

EPA may provide access to portions of your SWPPP to a member of the public upon request. Confidential Business Information (CBI) will be withheld from the public, but may not be withheld from EPA, USFWS, or NMFS.[60]

[59] For state UIC program contacts, refer to the following EPA website: https://www.epa.gov/uic.

[60] Information covered by a claim of confidentiality will be disclosed by EPA only to the extent of, and by means of, the procedures set forth in 40 CFR Part 2, Subpart B. In general, submitted information protected by a business confidentiality claim may be disclosed to other employees, officers, or authorized representatives of the United States concerned with implementing the CWA. The authorized representatives, including employees of other executive branch agencies, may review CBI during the course of reviewing draft regulations.

If an on-site location is unavailable to keep the SWPPP when no personnel are present, notice of the plan's location must be posted near the main entrance of your construction site.

7.4 SWPPP MODIFICATIONS

7.4.1 You must modify your SWPPP, including the site map(s), within seven (7) days of any of the following conditions:

a. Whenever new operators become active in construction activities on your site, or you make changes to your construction plans, stormwater controls, or other activities at your site that are no longer accurately reflected in your SWPPP. This includes changes made in response to corrective actions triggered under Part 5. You do not need to modify your SWPPP if the estimated dates in Part 7.2.3f change during the course of construction;

b. To reflect areas on your site map where operational control has been transferred (and the date of transfer) since initiating permit coverage;

c. If inspections or investigations by EPA or its authorized representatives determine that SWPPP modifications are necessary for compliance with this permit;

d. Where EPA determines it is necessary to install and/or implement additional controls at your site in order to meet the requirements of this permit, the following must be included in your SWPPP:

   i. A copy of any correspondence describing such measures and requirements; and

   ii. A description of the controls that will be used to meet such requirements.

e. To reflect any revisions to applicable federal, state, tribal, or local requirements that affect the stormwater controls implemented at the site; and

f. If applicable, if a change in chemical treatment systems or chemically enhanced stormwater control is made, including use of a different treatment chemical, different dosage rate, or different area of application.

7.4.2 You must maintain records showing the dates of all SWPPP modifications. The records must include the name of the person authorizing each change (see Part 7.2.10 above) and a brief summary of all changes.

7.4.3 All modifications made to the SWPPP consistent with Part 7.4 must be authorized by a person identified in Appendix I, Part I.11.b.

7.4.4 Upon determining that a modification to your SWPPP is required, if there are multiple operators covered under this permit, you must immediately notify any operators who may be impacted by the change to the SWPPP.

8 HOW TO TERMINATE COVERAGE

Until you terminate coverage under this permit, you must comply with all conditions and effluent limitations in the permit. To terminate permit coverage, you must submit to EPA a complete and accurate Notice of Termination (NOT), which certifies that you have met the requirements for terminating in Part 8.

8.1 MINIMUM INFORMATION REQUIRED IN NOT

8.1.1 NPDES ID (*i.e., permit tracking number)* provided by EPA when you received coverage under this permit;

8.1.2 Basis for submission of the NOT (see Part 8.2);

8.1.3 Operator contact information;

8.1.4 Name of site and address (or a description of location if no street address is available); and

8.1.5 NOT certification.

8.2 CONDITIONS FOR TERMINATING CGP COVERAGE

You must terminate CGP coverage only if one or more of the following conditions has occurred:

8.2.1 You have completed all construction activities at your site and, if applicable, construction support activities covered by this permit (see Part 1.2.1c), and you have met the following requirements:

a. For any areas that (1) were disturbed during construction, (2) are not covered over by permanent structures, and (3) over which you had control during the construction activities, you have met the requirements for final vegetative or non-vegetative stabilization in Part 2.2.14b;

b. You have removed and properly disposed of all construction materials, waste and waste handling devices, and have removed all equipment and vehicles that were used during construction, unless intended for long-term use following your termination of permit coverage;

c. You have removed all stormwater controls that were installed and maintained during construction, except those that are intended for long-term use following your termination of permit coverage or those that are biodegradable; and

d. You have removed all potential pollutants and pollutant-generating activities associated with construction, unless needed for long-term use following your termination of permit coverage; or

8.2.2 You have transferred control of all areas of the site for which you are responsible under this permit to another operator, and that operator has submitted an NOI and obtained coverage under this permit; or

8.2.3 Coverage under an individual or alternative general NPDES permit has been obtained.

8.3 HOW TO SUBMIT YOUR NOT

You must use EPA's NPDES eReporting Tool (NeT) to electronically prepare and submit your NOT for the 2017 CGP.

To access NeT, go to https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting.

Waivers from electronic reporting may be granted as specified in Part 1.4.1. If the EPA Regional Office grants you approval to use a paper NOT, and you elect to use it, you must complete the form in Appendix K.

8.4 DEADLINE FOR SUBMITTING THE NOT

You must submit your NOT within 30 calendar days after any one of the conditions in Part 8.2 occurs.

8.5 EFFECTIVE DATE OF TERMINATION OF COVERAGE

Your authorization to discharge under this permit terminates at midnight of the calendar day that a complete NOT is submitted to EPA.

9 PERMIT CONDITIONS APPLICABLE TO SPECIFIC STATES, INDIAN COUNTRY LANDS, OR TERRITORIES

The provisions in this Part provide modifications or additions to the applicable conditions of this permit to reflect specific additional conditions required as part of the state or tribal CWA Section 401 certification process, or the Coastal Zone Management Act (CZMA) certification process, or as otherwise established by the permitting authority. The specific additional revisions and requirements only apply to activities in those specific states, Indian country, and areas in certain states subject to construction projects by Federal Operators. States, Indian country, and areas subject to construction by Federal Operators not included in this Part do not have any modifications or additions to the applicable conditions of this permit.

9.1 EPA Region 1

9.1.1 NHR100000 State of New Hampshire

a. If you disturb 100,000 square feet or more of contiguous area, you must also apply for an Alteration of Terrain (AoT) permit from DES pursuant to RSA 485- A:17 and Env-Wq 1500. This requirement also applies to a lower disturbance threshold of 50,000 square feet or more when construction occurs within the protected shoreline under the Shoreland Water Quality Protection Act (see RSA 483-B and Env-Wq 1400). A permit application must also be filed if your project disturbs an area of greater than 2,500 square feet, is within 50 feet of any surface water, and has a flow path of 50 feet or longer disturbing a grade of 25 percent or greater. Project sites with disturbances smaller than those discussed above, that have the potential to adversely affect state surface waters, are subject to the conditions of an AoT General Permit by Rule.

b. You must determine that any excavation dewatering discharges are not contaminated before they will be authorized as an allowable non-stormwater discharge under this permit (see Part 1.2.2). The water is considered uncontaminated if there is no groundwater contamination within 1,000 feet of the groundwater dewatering location. Information on groundwater contamination can be generated over the Internet via the NHDES web site http://des.nh.gov/ by using the One Stop Data Mapper at http://des.nh.gov/onestop/gis.htm. If it is determined that the groundwater to be dewatered is near a remediation or other waste site you must apply for the Remediation General Permit (see https://www3.epa.gov/region1/npdes/rgp.html.)

c. You must treat any uncontaminated excavation dewatering discharges as necessary to remove suspended solids and turbidity. The discharges must be sampled at least once per week during weeks when discharges occur. Samples must be analyzed for total suspended solids (TSS) or turbidity and must meet monthly average and daily maximum limits of 50 milligrams per liter (mg/L) and 100 mg/L, respectively for TSS or 33 mg/l and 67 mg/l, respectively for turbidity. TSS (a.k.a. Residue, Nonfilterable) or turbidity sampling and analysis must be performed in accordance with Tables IB and II in 40 CFR 136.3 (http://www.ecfr.gov/cgi-bin/text-idx?SID=0243e3c4283cbd7d8257eb6afc7ce9a2&mc=true&node=se40.25.136_13&r

gn=div8). Records of any sampling and analysis must be maintained and kept with the SWPPP for at least three years after final site stabilization.

d. Construction site owners and operators must consider opportunities for post-construction groundwater recharge using infiltration best management practices (BMPs) during site design and preparation of the SWPPP. If your construction site is in a town that is required to obtain coverage under the NPDES General Permit for discharges from Municipal Separate Storm Sewer Systems (MS4) you may be required to use such practices. The SWPPP must include a description of any on-site infiltration that will be installed as a post-construction stormwater management measure or reasons for not employing such measures such as 1) The facility is located in a wellhead protection area as defined in RSA 485- C:2; or 2) The facility is located in an area where groundwater has been reclassified to GAA, GAI or GA2 pursuant to RSA 485-C and Env-DW 901; or 3) Any areas that would be exempt from the groundwater recharge requirements contained in Env-Wq 1507.04(e), including all land uses or activities considered to be a "High-load Area" (see Env-Wq 1502.26). For design considerations for infiltration measures see Volume II of the NH Stormwater Manual.

e. Appendix F contains a list of Tier 2, or high quality waters. Although there is no official list of tier 2 waters, it can be assumed that all NH surface waters are tier 2 for turbidity unless 1) the surface water that you are proposing to discharge into is listed as impaired for turbidity in the states listing of impaired waters (see Surface Water Quality - Watershed Report Cards at http://des.nh.gov/organization/divisions/water/wmb/swqa/report_cards.htm) or 2) sampling upstream of the proposed discharge location shows turbidity values greater than 10 NTU. A single grab sample collected during dry weather (no precipitation within 48 hours) is acceptable.

f. To ensure compliance with RSA 485-C, RSA 485-A, RSA 485-A:13, I(a), Env-Wq 1700 and Env-Wq 302, the following information may be requested by NHDES. This information must be kept on site unless you receive a written request from NHDES that it be sent to the address shown in Part 9.1.4 (g).

    i. A site map required in Part 7.2.4, showing the type and location of all post-construction infiltration BMPs utilized at the facility or the reason(s) why none were installed;

    ii. A list of all non-stormwater discharges that occur at the facility, including their source locations and the control measures being used (see Part 1.2.2).

    iii. Records of sampling and analysis of TSS required for construction dewatering discharges (see Part 9.1.4 (c)).

g. All required or requested documents must be sent to:

    NH Department of Environmental Services, Wastewater Engineering Bureau,
    Permits & Compliance Section
    P.O. Box 95
    Concord, NH 03302-0095

9.2 EPA Region 3

9.2.1 DCR100000 District of Columbia

a. The permittee must comply with the District of Columbia Water Pollution Control Act of 1984, as amended, (D.C. Official Code §8-103.01 *et seq.*) and its implementing regulations in Title 21, Chapters 11 and 19 of the District of Columbia Municipal Regulations. Nothing in this permit will be construed to preclude the institution of any legal action or relieve the permitee from any responsibilities, liabilities, or penalties established pursuant to District of Columbia laws and regulations.

b. The permittee must comply with the District of Columbia Stormwater Management, and Soil Erosion and Sediment Control in Chapter 5 of Title 21 of the District of Columbia Municipal Regulations.

c. The permittee must comply with the District of Columbia Flood Management control in Chapter 31 of Title 20 of the District of Columbia Municipal Regulations.

d. The Department may request a copy of the Stormwater Pollution Prevention Plan (SWPPP) and the permittee is required to submit the SWPPP to the Department with 14 days of such request. The Department may conduct an inspection of any facility covered by this permit to ensure compliance with District's law requirements including water quality.

9.2.2 DER10F000 Areas in the State of Delaware subject to construction by a Federal Operator

a. Federal agencies engaging in construction activities must submit, to DNREC, a sediment and stormwater management (S&S) plan and obtain approval from DNREC in accordance with 7 Del. C. §4010, 7 DE Admin. Code 5101, and 7 DE Admin. Code 7201.

b. Federal agencies engaging in construction activities must provide for construction review by a certified construction reviewer in accordance with 7 Del. C. §§4010 & 4013 and 7 DE Admin. Code 5101, subsection 6.1.6.

c. Federal agencies engaging in construction activities must certify that all responsible personnel involved in the construction project will have attended the blue card training prior to initiation of any land disturbing activity – *see* 7 Del. C. §§ 4002 & 4014 and 7 DE Admin. Code 5101.

9.3 EPA Region 5

9.3.1 MNR10I000 Indian country within the State of Minnesota

9.3.1.1 Fond du Lac Band of Lake Superior Chippewa. The following conditions apply only to discharges on the Fond du Lac Band of Lake Superior Chippewa Reservation:

a. A copy of the Stormwater Pollution Prevention Plan (SWPPP) must be submitted to the Office of Water Protection at least fifteen (15) days in advance of sending the Notice of Intent (NOI) to EPA. The SWPPP can be submitted electronically to richardgitar@FDLREZ.com or by hardcopy sent to:

Fond du Lac Reservation
Office of Water Protection
1720 Big Lake Road
Cloquet, MN 55720

CGP applicants are encouraged to work with the FDL Office of Water Protection in the identification of all proposed receiving.

b. Copies of the Notice of Intent (NOI) and the Notice of Termination (NOT) must be sent to the Fond du Lac Office of Water Protection at the same time they are submitted to EPA.

c. The turbidity limit shall NOT exceed 10% of natural background within the receiving water(s) as determined by Office of Water Protection staff.

d. Turbidity sampling must take place within 24 hours of a ½-inch or greater rainfall event. The results of the sampling must be reported to the Office of Water Protection within 7 days of the sample collection. All sample reporting must include the date and time, location (GPS: UTM/Zone 15), and NTU. CGP applicants are encouraged to work with the Office of Water Protection in determining the most appropriate location(s) for sampling.

e. Receiving waters with open water must be sampled for turbidity prior to any authorized discharge as determined by Office of Water Protection staff. This requirement only applies to receiving waters in which no ambient turbidity data exists.

f. This Certification does not pertain to any new discharge to Outstanding Reservation Resource Waters (ORRW) as described in §105 b.3. of the Fond du Lac Water Quality Standards (Ordinance #12/98, as amended). Although additional waters may be designated in the future, currently Perch Lake, Rice Portage Lake, Miller Lake, Deadfish Lake, and Jaskari Lake are designated as ORRWs. New dischargers wishing to discharge to an ORRW must obtain an individual permit from EPA for stormwater discharges from large and small construction activities.

g. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in the Water Quality Standards of the Fond du Lac Reservation, Ordinance 12/98, as amended. This includes, but is not limited to, the prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of water of the Fond du Lac Reservation for any of the uses designated in the Water Quality Standards of the Fond du Lac Reservation. These uses include wildlife, aquatic life, warm water fisheries, cold water fisheries, subsistence fishing (netting), primary contact recreation, secondary contact recreation, cultural, wild rice areas, aesthetic waters, agriculture, navigation, and commercial.

h. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the Fond du Lac Reservation. All spills must be reported to the appropriate emergency management agency (National Response Center AND the State Duty Officer), and measures shall be taken immediately to prevent the pollution of waters of the Fond du Lac Reservation, including groundwater. The Fond du Lac Office of Water Protection must also be notified immediately of any spill regardless of size.

i. This certification does not authorize impacts to cultural, historical, or archeological features or sites, or properties that may be eligible for such listing.

9.3.1.2 Grand Portage Band of Lake Superior Chippewa. The following conditions apply only to discharges on the Grand Portage Band of Lake Superior Chippewa Reservation:

a. The CGP authorization is for construction activities that may occur within the exterior boundaries of the Grand Portage Reservation in accordance to the Grand Portage Land Use Ordinance. The CGP regulates stormwater discharges associated with construction sites of one acre or more in size. Only those activities specifically authorized by the CGP are authorized by this certification (the

"Certification"). This Certification does not authorize impacts to cultural, historical, or archeological features or sites, or properties that may be eligible for listing as such.

b. All construction stormwater discharges authorized by the CGP must comply with the Water Quality Standards and Water Resources Ordinance, as well as Applicable Federal Standards (as defined in the Water Resources Ordinance). As such, appropriate steps must be taken to ensure that petroleum products or other chemical pollutants are prevented from entering the Waters of the Reservation (as defined in the Water Resources Ordinance). All spills must be reported to the appropriate emergency-management agency, and measures must be taken to prevent the pollution of the Waters of the Reservation, including groundwater.

c. The 2017 CGP requires inspections and monitoring reports of the construction site stormwater discharges by a qualified person. Monitoring and inspection reports must comply with the minimum requirements contained in the 2017 CGP. The monitoring plan must be prepared and incorporated into the Stormwater Pollution Prevention Plan (the "SWPPP"). A copy of the SWPPP must be submitted to the Board at least 30 days in advance of sending the requisite Notice of Intent to EPA. The SWPPP should be sent to:

    Grand Portage Environmental Resources Board
    P.O. Box 428
    Grand Portage, MN 55605

   Copies of the Notice of Intent and Notice of Termination required under the CGP must be submitted to the Board at the address above at the same time they are submitted to the EPA.

d. If requested by the Grand Portage Environmental Department, the permittee must provide additional information necessary for a case-by-case eligibility determination to assure compliance with the Water Quality Standards and any Applicable Federal Standards.

e. Discharges that the Board has determined to be or that may reasonably be expected to be contributing to a violation of Water Quality Standards or Applicable Federal Standards are not authorized by this Certification.

f. The Board retains full authority provided by the Water Resources Ordinance to ensure compliance with and to enforce the provisions of the Water Resource Ordinance and Water Quality Standards, Applicable Federal Standards, and these Certification conditions.

g. Appeals related to Board actions taken in accordance with any of the preceding conditions may be heard by the Grand Portage Tribal Court.

9.3.2 WIR10I000 Indian country within the State of Wisconsin, except the Sokaogon Chippewa (Mole Lake) Community

9.3.2.1 Bad River Band of Lake Superior Tribe of Chippewa Indians: The following conditions apply only to discharges on the Bad River Band of the Lake Superior Tribe of Chippewa Indians Reservation:

a. Only those activities specifically authorized by the CGP are authorized by this Certification. This Certification does not authorize impacts to cultural properties, or historical sites, or properties that may be eligible for listing as such.[61, 62]

b. Operators are not eligible to obtain authorization under the CGP for all new discharges to an Outstanding Tribal Resource Water (or Tier 3 water).[63] Outstanding Tribal Resource Waters, or Tier 3 waters, include the following: Kakagon Slough and the lower wetland reaches of its tributaries that support wild rice, Kakagon River, Bad River Slough, Honest John Lake, Bog Lake, a portion of Bad River, from where it enters the Reservation through the confluence with the White River, and Potato River.[64]

c. Projects utilizing cationic treatment chemicals[65] within the Bad River Reservation boundaries are not eligible for coverage under the CGP.[66]

d. All projects which are eligible for coverage under the CGP and are located within the exterior boundaries of the Bad River Reservation shall be implemented in such a manner that is consistent with the Tribe's Water Quality Standards (WQS).[67]

e. An operator proposing to discharge to an Outstanding Resource Water (or Tier 2.5 water) under the CGP must comply with the antidegradation provisions of the Tribe's WQS. Outstanding Resource Waters, or Tier 2.5 waters, include the following: a portion of Bad River, from downstream the confluence with the White River to Lake Superior, White River, Marengo River, Graveyard Creek, Bear Trap Creek, Wood Creek, Brunsweiler River, Tyler Forks, Bell Creek, and Vaughn Creek.[68] The antidegradation demonstration materials described in provision E.4.iii. must be submitted to the following address:

Bad River Tribe's Natural Resources Department
Attn: Water Resources Specialist
P.O. Box 39
Odanah, WI 54861

[61] Bad River Band of Lake Superior Tribe of Chippewa Indians Water Quality Standards adopted by Resolution No. 7-6-11-441 (hereafter, Tribe's WQS).

[62] 36 C.F.R. § 800.16(l)(2).

[63] Tribe's WQS: See provisions E.3.ii. and E.4.iv.

[64] Tribe's WQS: See provision E.2.iii.

[65] See definition of cationic treatment chemicals in Appendix A of the CGP.

[66] Tribe's WQS: See provisions E.6.ii.a. and E.6.ii.c.

[67] See footnote 61.

[68] Tribe's WQS: See provision E.2.ii.

f. An operator proposing to discharge to an Exceptional Resource Water (or Tier 2 water) under the CGP must comply with the antidegradation provisions of the Tribe's WQS. Exceptional Resource Waters, or Tier 2 waters, include the following: any surface water within the exterior boundaries of the Reservation that is not specifically classified as an Outstanding Resource Water (Tier 2.5 water) or an Outstanding Tribal Resource Water (Tier 3 water).[69] The antidegradation demonstration materials described in provision E.4.ii. must be submitted to the following address:

Bad River Tribe's Natural Resources Department
Attn: Water Resources Specialist
P.O. Box 39
Odanah, WI 54861

g. A discharge to a surface water within the Bad River Reservation boundaries shall not cause or contribute to an exceedance of the turbidity criterion included in the Tribe's WQS, which states: Turbidity shall not exceed 5 NTU over natural background turbidity when the background turbidity is 50 NTU or less, or turbidity shall not increase more than 10% when the background turbidity is more than 50 NTU.[70]

h. All projects which are eligible for coverage under the CGP within the exterior boundaries of the Bad River Reservation must comply with the Bad River Reservation Wetland and Watercourse Protection Ordinance, or Chapter 323 of the Bad River Tribal Ordinances, including the erosion and sedimentation control, natural buffer, and stabilization requirements. Questions regarding Chapter 323 and requests for permit applications can be directed to the Wetlands Specialist in the Tribe's Natural Resources Department at (715) 682-7123 or wetlands@badriver-nsn.gov.

i. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must notify the Tribe prior to the commencing earth-disturbing activities.[71, 72] The operator must submit a copy of the Notice of Intent (NOI) to the following addresses at the same time it is submitted to the U.S. EPA:

Bad River Tribe's Natural Resources Department
Attn: Water Resources Specialist
P.O. Box 39
Odanah, WI 54861

Bad River Tribe's Natural Resources Department
Attn: Tribal Historic Preservation Officer (THPO)
P.O. Box 39
Odanah, WI 54861

[69] Tribe's WQS: See provision E.2.i.

[70] Tribe's WQS: See provision E.7.iii.

[71] See footnote 61.

[72] See footnote 62.

The operator must also submit a copy of the Notice of Termination (NOT) to the above addresses at the same time it is submitted to the U.S. EPA.

j. The THPO must be provided 30 days to comment on the project.[73]

k. The operator must obtain THPO concurrence in writing. This written concurrence will outline measures to be taken to prevent or mitigate effects to historic properties. For more information regarding the specifics of the cultural resources process, see 36 CFR Part 800. A best practice for an operator is to consult with the THPO during the planning stages of an undertaking.[74]

l. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must submit a copy of the Stormwater Pollution Prevention Plan (SWPPP) to the following address at the same time as submitting the NOI: [75]

Bad River Tribe's Natural Resources Department
Attn: Water Resources Specialist
P.O. Box 39
Odanah, WI 54861

m. Any corrective action reports that are required under the CGP must be submitted to the following address within one (1) working day of the report completion: [76]

Bad River Tribe's Natural Resources Department
P.O. Box 39
Odanah, WI 54861

n. An operator shall be responsible for meeting any additional permit requirements imposed by the U.S. EPA necessary to comply with the Tribe's antidegradation policies if the discharge point is located upstream of waters designated by the Tribe.[77]

9.3.2.2 Lac du Flambeau Band of Lake Superior Tribe of Chippewa Indians: The following conditions apply only to discharges on the Lac du Flambeau Band of the Lake Superior Tribe of Chippewa Indians Reservation:

a. A copy of the Stormwater Pollution Prevention Plan must be submitted to the following office, for the Traival environmental review process, at least thirty (30) days in advance of sending the Notice of Intent (NOI) to EPA:

Lac du Flambeau
Tribal Land Management
P.O. Box 279

[73] 36 C.F.R. § 800.3(c)(4).

[74] 36 C.F.R. § 800.3(b).

[75] See footnote 61.

[76] See footnote 61.

[77] See footnote 61.

Lac du Flambeau, WI 54538

CGP applicants are encouraged to work with the LdF Water Resources Program in the identification of all proposed receiving waters.

b. Copies of the NOI and the Notice of Termination (NOT) must be sent to the LdF Water Resources Program at the same time they are submitted to EPA.

c. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in the Water Quality Standards of the Lac du Flambeau Reservation. This includes, but is not limited to, the prevention of any discharge that cause a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of water of the Lac du Flambeau Reservation for any of the uses designated in the Water Quality Standards of the Lac du Flambeau Reservation.

d. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the Lac du Flambeau Reservation. All spills must be reported to the appropriate emergency management agency, and measures shall be taken immediately to prevent the pollution of waters of the Lac du Flambeau reservation, including groundwater.

e. This certification does not authorize impacts to cultural, historical, or archeological features or sties, or properties that may be eligible for such listing.

f. Due to the significant ecological and cultural importance of the Lac du Flambeau Reservation, any operator requesting a permit for a point source discharge of pollutants (i.e., discharge) associated with the Stormwater Discharge will need a stormwater pollution prevention plan in place that does not violate Lac du Flambeau Water Quality Standards to protect Reservation Waters.

9.4 EPA Region 6

9.4.1 NMR100000 State of New Mexico, except Indian country

a. 20.6.4.13 NMAC General Criteria states: ...Surface waters of the state shall be free of any water contaminant in such quantity and of such duration as may with reasonable probability injure human health, animal or plant life or property, or unreasonably interfere with public welfare or use with property:

b. Bottom Deposits and Suspended or Settleable Solids:

    i. Surface waters of the state shall be free of water contaminants including fine sediment particles (less than two millimeters in diameter), precipitates or organic or inorganic solids from other than natural causes that have settled to form layers on or fill the interstices of the natural or dominant substrate in quantities that damage or impair the normal growth, function or reproduction of aquatic life or significantly alter the physical or chemical properties of the bottom.

    ii. Suspended or settleable solids from other than natural causes shall not be present in surface waters of the state in quantities that damage or impair the normal growth, function or reproduction of aquatic life or adversely affect other designated uses.

c. Floating Solids, Oil and Grease: Surface waters of the state shall be free of oils, scum, grease and other floating materials resulting from other than natural causes that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

d. Color: Color-producing materials resulting from other than natural causes shall not create an aesthetically undesirable condition nor shall color impair the use of the water by desirable aquatic life presently common in surface waters of the state.

e. Toxic Pollutants: Except as provided in 20.6.4.16 N MAC, surface waters of the state shall be free of toxic pollutants from other than natural causes in amounts, concentrations or combinations that affect the propagation of fish or that are toxic to humans, livestock or other animals, fish or other aquatic organisms, wildlife using aquatic environments for habitation or aquatic organisms for food, or that will or can reasonably be expected to bioaccumulate in tissues of fish, shellfish and other aquatic organisms to levels that will impair the health of aquatic organisms or wildlife or result in unacceptable tastes, odors or health risks to human consumers of aquatic organisms.

f. Turbidity: Turbidity attributable to other than natural causes shall not reduce light transmission to the point that the normal growth, function or reproduction of aquatic life is impaired or that will cause substantial visible contrast with the natural appearance of the water. Activities or discharges shall not cause turbidity to increase more than 10 NTU over background turbidity when the background turbidity, measured at a point immediately upstream of the activity, is 50 NTU or less, nor to increase more than 20 percent when the background turbidity is more than 50 NTU. However, limited-duration turbidity increases caused by dredging, construction or other similar activities may be allowed provided all practicable turbidity control techniques have been applied and all appropriate permits, certifications and approvals have been obtained.

g. Total Dissolved Solids (TDS): TDS attributable to other than natural causes shall not damage or impair the normal growth, function or reproduction of animal, plant or aquatic life. TDS shall be measured by either the "calculation method" (sum of constituents) or the filterable residue method. Approved test procedures for these determinations are set forth in 20.6.4.14 NMAC.

h. Dissolved Gases: Surface waters of the state shall be free of nitrogen and other dissolved gases at levels above 110 percent saturation when this supersaturation is attributable to municipal, industrial or other discharges.

i. 20.6.4.52 NMAC: *PECOS RIVER BASIN: In order to protect existing and designated uses, it is a goal of the state of New Mexico to prevent increases in TDS in the Pecos River above the following benchmark values, which are expressed as flow-weighted, annual average concentrations, at three USGS gauging stations: at Santa Rosa 500 mg/L; near Artesia 2, 700 mg/L; and near Malaga 3,600 mg/l. The benchmark values serve to guide state action. They are adopted pursuant to the New Mexico Water Quality Act, not the Clean Water Act.*

j. 20.6.4.54 NMAC: *COLORADO RIVER BASIN: For the tributaries of the Colorado river system, the state of New Mexico will cooperate with the Colorado river basin states and the federal government to support and implement the salinity policy and program outlined in the most current "review, water quality standards for salinity, Colorado river system" or equivalent report by the Colorado river salinity control forum.*

k. Segment-specific criteria across the state specify numeric limits for TDS, sulfate and chloride depending on the receiving waterbody, and numeric constituent specific values in 20.6.4.900 NMAC also apply depending on the designated use of the waterbody.

l. If construction dewatering activities are anticipated at a site, permittees must complete the following steps:

   i. Investigative information must be documented in the facility SWPPP.

   ii. Refer to the GWQB Mapper at https://gis.web.env.nm.gov/GWQB/ AND the PSTB Mapper (Go Mapper) at https://gis.web.env.nm.gov/GoNM/ and check if the following sources are located within the noted distance from your anticipated construct site groundwater dewatering activity:

Project Location Relative to a Source of Potential Groundwater Contamination	***Constituents likely to be required for testing***
Within 0.5 mile of an open Leaking Underground Storage Tank (LUST) site	*BTEX (Benzene, Toluene, Ethylbenzene, and Xylene) plus additional parameters depending on site conditions.**
Within 0.5 mile of an open Voluntary Remediation site	*All parameters listed in Appendix A (or an alternate list approved by the NMED SWQB)***
Within 0.5 mile of an open RCRA Corrective Action Site	
Within 0.5 mile of an open Abatement Site	
Within 0.5 mile of an open Brownfield Site	
Within 1.0 mile or more of a Superfund site or National Priorities List (NPL) site with associated groundwater contamination.	

**For further assistance determining whether dewatering may encounter impacted groundwater, the permittee may contact the NMED Ground Water Quality Bureau at: 505-827-2965.*

***EPA approved-sufficiently sensitive methods must be used - approved methods are listed in 40 CFR Part 136.3.*

   ii. Indicate on the NO/ that dewatering activities are anticipated. Provide information on flow and potential to encounter impacted groundwater.

   iii. Permittee must test the quality of the groundwater according to the chart above. Hardness and pH must also be measured.

   iv. Permittee must send test result data to EPA Region 6 and the NMED Surface Water Quality Bureau. If the test data exceed standards, it cannot be discharged from the construction site into surface waters under this permit. Discharge to surface waters must be conducted under a separate NPDES individual permit to ensure proper treatment and disposal.

   v. If disposal will be to the ground surface or in an unlined pond, the permittee must submit an NO/ to the NMED Ground Water Quality Bureau.

m. State regulations at 20.6.4.8 NMAC state: *No degradation shall be allowed in waters designated by the commission as outstanding national resource waters (ONRWs), except as provided in Subparagraphs (a) through (e) of this paragraph and in Paragraph (4) of this Subsection A.*

n. Operators are not eligible to obtain authorization under this permit for all new and existing storm water discharges to outstanding national resource waters (ONRWs) (also referred to as "Tier 3" waters.)

o. NMED does not believe compliance with the permit necessarily assures that no degradation will occur. Although state WQS provide for temporary and short-term degradation of water quality in an ONRW under very limited circumstances if approved by the Water Quality Control Commission as specified at 20.6.4.8.A NMAC, the approval process required for these activities does not lend itself for use for projects covered under this general permit. This condition is necessary to ensure that no degradation is allowed in ONRWs by requiring proposed storm water discharges to be reviewed under the individual permit process. Tier 3 waters are defined in Appendix F of the proposed permit.

p. EPA regulations at 40 CFR Part 122.44(k) require, in part: *Best management practices (BMPs) to control or abate the discharge of pollutants when:*

> *(3) Numeric effluent limitations are infeasible, or*
>
> *(4) The practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.*

q. State regulations at 20.6.4.8.A(2) state in part: ...*Further, the state shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources...*

r. State regulations at 20.6.4.8.B NMAC also state:

> (3) assess the probable effect of the effluent on the receiving water relative to its attainable or designated uses and numeric and narrative criteria.

s. Operators who intend to obtain authorization under this permit for new and existing storm water discharges from construction sites must satisfy the following condition: The SWPPP must include site-specific interim and permanent stabilization, managerial, and structural solids, erosion and sediment control best management practices (BMPs) and/or other controls that are designed to prevent to the maximum extent practicable an increase in the sediment yield and flow velocity from pre-construction, pre-development conditions to assure that applicable standards in 20.6.4.NMAC, including the antidegradation policy, or TMDL waste load allocations (WLAs) are met. This requirement applies to discharges both during construction and after construction operations have been completed. The SWPPP must identify and document the rationale for selecting these BMPs and/or other controls. The SWPPP must also describe design specifications, construction specifications, maintenance schedules (including a long term maintenance plan), criteria for inspections, and expected performance and longevity of these BMPs. For sites greater than 5 acres in size, BMP selection must be made based on the use of appropriate soil loss prediction models (i.e. SEDCAD, RUSLE, SEDIMOT, MULTISED, etc.) OR equivalent generally accepted (by professional erosion control specialists) soil loss prediction tools.

t. For all sites, the operator(s) must demonstrate, and include documentation in the SWPPP, that implementation of the site-specific practices will assure that the applicable standards or TMDL WLAs are met, and will result in sediment yields and flow velocities that, to the maximum extent practicable, will not be greater than the sediment yield levels and flow velocities from preconstruction, pre-development conditions.

u. All SWPPPs must be prepared in accordance with good engineering practices by qualified (e.g. CPESC certified, engineers with appropriate training) erosion control specialists familiar with the use of soil loss prediction models and design of erosion and sediment control systems based on these models (or equivalent soil loss prediction tools). Qualifications of the preparer (e.g., professional certifications, description of appropriate training) must be documented in the SWPPP. The operator(s) must design, implement, and maintain BMPs in the manner specified in the SWPPP.

v. State regulations at 20.6.2.1203 NMAC state: *With respect to any discharge from any facility of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property, the following notifications and corrective actions are required:*

  i. As soon as possible after learning of such a discharge, but in no event more than twenty-four (24) hours thereafter, any person in charge of the facility shall orally notify the Chief of the Ground Water Quality Bureau of the department, or his counterpart in any constituent agency delegated responsibility for enforcement of these rules as ta any facility subject to such delegation.

Permittees can call 505-827-9329 for emergencies at any time and 505-476-6000 for non-emergencies during business hours from 5am-5pm, Monday through Friday.

w. EPA regulations at 40 CFR Part 122.44(k) require, in part: *Best management practices (BMPs) ta control or abate the discharge of pollutants when:*

(3) Numeric effluent /imitations are infeasible, or

(4) The practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.

x. State regulations at 20.6.4.8.A(2) state in part:...*Further, the state shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources...*

9.4.2 NMR10I000 Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10000I and Ute Mountain Reservation Lands that are covered under Colorado permit COR10000I.

9.4.2.1 Pueblo of Isleta. The following conditions apply only to discharges on the Pueblo of Isleta Reservation:

a. CGP at 1.3 Prohibited discharges: Stormwater discharges associated with construction activity that EPA or the Pueblo of Isleta, prior to authorization under this perm it, determines will cause, have the reasonable potential to cause, or may reasonably be expected to contribute to a violation or excursion of any applicable water quality standard, including the antidegradation policy, or the impairment of a designated use of receiving waters are not authorized by this permit.

b. CGP at 1.4.1 How to Submit Your NOI: The operator shall provide a copy of the Notice of Intent ("NOI") to the Pueblo of Isleta at the same time it is submitted to the

U.S. Environmental Protection Agency, for projects occurring within the exterior boundaries of the Pueblo of Isleta. The operator shall also notify the Pueblo of Isleta when it has submitted the Notice of Termination ("NOT"). The NOI and NOT shall be sent to the Pueblo of Isleta at the following address:

Water Quality Control Officer
Pueblo of Isleta
Environment Division
PO Box 1270
Isleta, NM 87022
(505) 869-7565
E-mail: POI36871@isletapueblo.com

Overnight/Express Mail Delivery
Pueblo of Isleta
Environment Division
6 Sagebrush St.
Albuquerque, NM 87105

c. CGP at 1.5 Requirement to post a notice of your permit coverage: Amend to read: "You must post a sign or other notice of your permit coverage at a safe, publicly accessible location in close proximity to the construction site. The notice must be located so that it is visible from the public road or tribal road that is nearest to the active part of the construction site…"

d. CGP at 7.2.6 Description of stormwater controls: The SWPPP will be considered to be incomplete if the operator has not coordinated requirements under this Part with the Pueblo of Isleta Public Services Department.

e. CGP I.12.6.1 at pg.I-6 of 8. The Pueblo of Isleta requests notification within 10 hours (rather than 24 hrs.) if health or the environment become endangered.

f. CGP at I.12.2 Anticipated noncompliance: Amend to read: "You must give advance notice to EPA and the Pueblo of Isleta at the address indicated in 1.4.1(a) of any planned changes in the permitted facility or activity which may results in noncompliance with permit requirements."

g. CGP at I.12.6.1: Any noncompliance for projects within the exterior boundaries of the Pueblo of Isleta which may endanger health or the environment shall be reported directly to the EPA Regional Office [(see contacts at https://www2.epa.gov/national-pollutant-discharge-elimination-system-npdes/contact-us-stormwater#regional)I and to the Pueblo of Isleta Water Quality Control Officer. Any information must be provided orally with n 12 hours of the time you become aware of the circumstances. Other requirements of this Part for a written submission apply. Electronic communication (E-mail) shall be provided as soon as practical. Verbal notice shall be provided to:

Water Quality Control Officer
Pueblo of Isleta
E-mail: POI36871@isletapueblo.com
(505) 869-7565
(505) 263-5425 cellular
(505) 869-3030 Police Dispatch

h. CGP at 2.2 Erosion and sediment control requirements: Erosion and sediment controls shall be designed to retain sediment on-site.

i. CGP at 2.2 Under Sediment control requirements, Standard Permit Condition Duty to Mitigate Volumes of sediment at or over (five) 5 cubic yards must be removed and placed for disposal within a tribally approved sediment Disposal Site, located on Pueblo of Isleta lands. CGP 2.2 at pg. 8.

j. Under Minimize erosion, a permittee must secure permission from the Pueblo or affected Pueblo of Isleta land assignment owner if a dissipation device needs to be placed up- or down- elevation of a given construction site. CGP 2.2.11 at pg. 11.

k. CGP at 2.3.6 Emergency spill notification requirements: You must notify the Pueblo of Isleta Water Quality Control Officer and National Response Center (NRC) [at (800) 424-8802 or, in the Washington, DC metropolitan area, call (202) 267-2675 in accordance with the requirements of 40 CFR 110, 40 CFR 117, and 40 CFR 302] as soon as you have knowledge of the release. Verbal and electronic notice shall be provided as specified in I.12.6.1

l. CGP at C.3 Equivalent analysis waiver: Parties wishing to apply for an Equivalent Analysis Waiver (see Appendix D, Section C) must provide a copy of the waiver analysis to the Pueblo of Isleta Water Quality Control Officer at the address indicated in 1.4.1 (a).

9.4.2.2 Pueblo of Sandia. The following conditions apply only to discharges on the Pueblo of Sandia Reservation:

a. Only those activities specifically authorized by the CGP are authorized by the Pueblo of Sandia's Water Quality certification. The Pueblo of Sandia's Water Quality Certification does not authorize impact to cultural properties, historical sites or properties that may be eligible as such.

b. Copies of all Notices of Intent (NOI) submitted to the EPA must also be sent concurrently to the Pueblo of Sandia at the following address. Discharges are not authorized by this permit unless an accurate and complete NOI has been submitted to the Pueblo of Sandia, either by mail or electronically.

Regular U.S. Delivery Mail:
Pueblo of Sandia Environment Department
Attention: Scott Bulgrin, Water Quality Manager
481 Sandia Loop
Bernalillo, New Mexico 87004

Electronically:
sbulgrin@sandiapueblo.nsn.us

c. Any correspondences between the applicant and EPA related to analytical data, written reports, corrective action, enforcement, monitoring, or an adverse incident written reports should likewise be routed to the Pueblo of Sandia at the above address.

d. The Stormwater Pollution Prevention Plan (SWPPP) must be available to the Pueblo of Sandia Environment Department either electronically or hard copy upon request for review. The SWPPP must be made available at least fourteen (14) days before construction begins. The fourteen (14) day period will give Pueblo staff time to become familiar with the project site, prepare for construction site inspections, and determine compliance with the Pueblo of Sandia Water Quality Standards. Failure to provide a SWPPP to the Pueblo of Sandia may result in the delay or denial of the construction project.

e. If requested by the Pueblo of Sandia Environment Department, the permittee must provide additional information necessary for a case-by-case eligibility determination to assure compliance with the Pueblo of Sandia Water Quality Standards and/or applicable Federal Standards not authorized by this certification.

f. An "Authorization to Proceed Letter" with site specific mitigation requirements may be sent out to the permittee when a review of the NOI and SWPPP, on a case- by-case basis is completed by the Pueblo of Sandia Environment Department. This approval will allow the application to proceed if all mitigation requirements are met.

g. The Pueblo of Sandia will not allow Small construction Waivers (Appendix C) or the Rainfall Erosivity Waiver (Appendix C.1) to be granted for any small construction activities.

h. Before submitting a Notice of Termination (NOT) to the EPA, permittees must clearly demonstrate to the Pueblo of Sandia Environment Department through a site visit or documentation that requirements for site stabilization have been met and any temporary erosion control structures have been removed. A short letter stating the NOT is acceptable and all requirements have been met will be sent to the permittee to add to the permittee's NOT submission to EPA.

i. Copies of all NOT submitted to the EPA must also be sent concurrently to the Pueblo of Sandia through the mail or electronically.

<u>Regular U.S. Delivery Mail:</u>
Pueblo of Sandia Environment Department
Attention: Scott Bulgrin, Water Quality Manager
481 Sandia Loop
Bernalillo, New Mexico 87004

<u>Electronically:</u>
sbulgrin@sandiapueblo.nsn.us

j. The Pueblo of Sandia may require the permittee to perform water quality monitoring for pH, turbidity, and total suspended solids (TSS) during the permit term if the discharge is to a surface water leading to the Rio Grande for the protection of public health and the environment.

9.4.2.3 Pueblo of Santa Ana. The following conditions apply only to discharges on the Pueblo of Santa Ana Reservation:

a. The operator shall provide a copy of the Notice of Intent (NOI) to the Pueblo of Santa Ana (the Pueblo), at the same time it is submitted to the U.S. Environmental Protection Agency (EPA), for projects with discharges onto the lands of the Pueblo as defined in the Pueblo of Santa Ana Water Quality Standards.

b. The operator shall provide a copy of the Stormwater Pollution Prevention Plan (SWPPP), at the same time that an NOI is submitted to the EPA, to the Pueblo for projects with discharges onto the lands of the Pueblo as defined in the Pueblo of Santa Ana Water Quality Standards.

c. The operator shall provide a copy of the SWPPP, copies of inspections reports, and copies of corrective action reports to the Pueblo at the address below for review, upon request.

d. The NOI, SWPPP and Notice of Termination (NOT) shall be sent to the Pueblo at the following address:

Pueblo of Santa Ana Department of Natural Resources,
Attention: Water Quality Program Specialist
2 Dove Road
Santa Ana Pueblo, NM, 87004

e. Discharges are not authorized by this permit unless an accurate and complete NOI and SWPPP have been submitted to the Pueblo. Failure to provide an accurate and complete NOI and SWPPP may result in a denial of the discharge permit or groundbreaking or construction delay.

f. The operator will not proceed with site work until authorized by the Pueblo. The Pueblo requires review of the complete and final SWPPP by the Pueblo before authorization to proceed. The Pueblo will provide an "authorization to proceed" notice after review and approval of the SWPPP.

g. Before submitting a NOT, permittees must certify to the Pueblo's Department of Natural Resources in writing that requirements for site stabilization have been met, and any temporary erosion control structures have been removed. Documentation of the Pueblo's review that such requirements have been reviewed and met will be provided for the permittee to add to the permittee's NOT submission to EPA. Copies of all NOT submitted to the EPA must also be sent to the Pueblo at the address provided above.

9.4.2.4 **Pueblo of Santa Clara.** The following conditions apply only to discharges on the Pueblo of Santa Clara Reservation:

a. The operator must provide a copy of the Notice of Intent (NOI) and Notice of Termination (NOT) to the Santa Clara Pueblo Governor's Office at the same time it is provided to the US Environmental Protection Agency.

b. A copy of the Storm water Pollution Prevention Plan shall be made available to the Pueblo of Santa Clara staff upon request.

9.4.2.5 **Pueblo of Tesuque.** The following conditions apply only to discharges on the Pueblo of Tesuque Reservation:

a. The operator shall provide a copy of the Notice of Intent (NOI) to the Pueblo of Tesuque Governor’s Office and Environment Department at same time it is submitted to the Environmental Protection Agency, for projects occurring within the exterior boundaries of our tribal lands. The operator shall also notify the Pueblo of Tesuque Governor's Office and Environment Department when it submitted the Notice of Termination. The NOI and NOT shall be sent to the Pueblo of Tesuque Governor's Office and Environment Department at the following address:

Pueblo of Tesuque
Office of the Governor

Route 42 Box 360-T
Santa Fe, NM 87506 or
email: governor@pueblooftesuque.org

b. The operator shall also provide a copy of the Stormwater Pollution Prevention Plan, copies of inspections reports, and copies of corrective action reports to staff in the Pueblo of Tesuque Environment Department.

9.4.2.6 **Taos Pueblo**. The following conditions apply only to discharges on the Taos Pueblo Reservation:

a. The operator shall provide a copy of the Notice of Intent (NOI) to the Taos Pueblo Governor's Office, War Chief's Office and Environmental Office, at the same time it is submitted to the U.S. Environmental Protection Agency, for projects occurring within the exterior boundaries of Taos Pueblo. The operator shall also notify Taos Pueblo when it has submitted the Notice of Termination (NOT). The NOI and NOT shall be sent to the Taos Pueblo at the following addresses:

i. Taos Pueblo Governor's Office
P.O. Box 1846
Taos NM 87571

ii. Taos Pueblo War Chief's Office
P.O. Box 2596
Taos NM 87571

iii. Environmental Office
Attn: Program Manger
P.O. Box 1846
Taos NM 87571

b. Taos Pueblo requests that in the event Indian artifacts or human remains are inadvertently discovered on projects occurring near or on Taos Pueblo lands that consultation with the tribal Governor's Office occur at the earliest possible time.

c. The operator shall provide a copy of the Stormwater Pollution Prevention Plan, copies of inspections reports, and copies of corrective action reports to staff in the Taos Pueblo Environmental Office for review and copy, upon request.

9.4.2.7 **Ohkay Owingeh.** The following conditions apply only to discharges on the Ohkay Owingeh Reservation:

a. Prior to commencement of any construction activity on Ohkay Owingeh Lands requiring permit coverage under EPA's Construction General Permit, the operator(s) shall submit to Ohkay Owingeh Office of Environmental Affairs, a copy of the electronic "Notice of Intent," submitted to the Environmental Protection Agency, immediately following EPA's electronic notification that the NOI has been received. A copy of the Stormwater Pollution Prevention Plan(s) must be made available to the Ohkay Owingeh Office of Environmental Affairs upon the tribe's request either electronically or hard copy. Operator(s) shall also submit to Ohkay Owingeh Office of Environmental Affairs a copy of the electronic Notice of Termination (NOT) submitted to the Environmental Protection Agency. Documents shall be submitted to Ohkay Owingeh at the following address:

Ohkay Owingeh Office of Environment Affairs
Attention: Environmental Programs Manager

P.O. Box 717
Ohkay Owingeh, New Mexico 87566
Office # 505.852.4212
Fax # 505.852.1432
Electronic mail: naomi.archuleta@ohkay.org

b. Ohkay Owingeh will not allow the Rainfall Erosivity Waivers (see Appendix C) to be granted for any small construction activities.

c. All vegetation used to prevent soil loss, seeding or planting of the disturbed area(s) to meet the vegetative stabilization requirements must utilize native seeds/vegetation commonly known to the area. All temporary erosion control structures, such as silt fences must be removed as soon as stabilization requirements are met.

9.4.3 OKR10I000 Indian country within the State of Oklahoma

9.4.3.1 Pawnee Nation. The following conditions apply only to discharges within Pawnee Indian country:

a. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be provided to the Pawnee Nation at the same time it is submitted to the Environmental Protection Agency to the following address:

Pawnee Nation Department of Environmental Conservation and Safety
P.O. Box 470
Pawnee, OK 74058
Or email to mmatlock@pawneenation.org

b. The Storm Water Pollution Prevention Plan must be available to Departmental inspectors upon request.

c. The Department must be notified at 918.762.3655 immediately upon discovery of any noncompliance with any provision of the permit conditions.

9.4.4 OKR10F000 Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, including activities associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).

a. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Lee Creek or any water or watershed designated "ORW" in Oklahoma's Water Quality Standards, this permit may only be used to authorize discharges from temporary construction activities. Certification is denied for any on-going activities such as sand and gravel mining or any other mineral mining.

b. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Lee Creek or any water or watershed designated "ORW" in Oklahoma's Water Quality Standards, certification is denied for any discharges originating from support activities, including concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, or borrow areas.

c. In order to company with Oklahoma's Water Quality Standards, these conditions and restrictions also apply to any construction projects located wholly or partially on Indian Country lands within the State of Oklahoma.

9.5 EPA Region 8

9.5.1 MTR10I000 Indian country within the State of Montana

9.5.1.1 The Confederated Salish and Kootenai Tribes of the Flathead Nation. The following conditions apply only to discharges on the Confederated Salish and Kootenai Tribes of the Flathead Nation Reservation:

a. Permittees must submit the Stormwater Pollution Prevention Plan (SWPPP) to the Confederated Salish and Kootenai Tribes at least 30 days before construction starts.

b. Before submitting the Notice of Termination (NOT), permittees must clearly demonstrate to an appointed Tribal staff person during an onsite inspection that requirements for site stabilization have been met.

c. The permittee must send a copy of the Notice of Intent (NOI) and the NOT to CSKT.

d. Permittees may submit their SWPPPs, NOIs and NOTs electronically to: clintf@cskt.org.

e. Written SWPPPs, NOIs and NOTs may be mailed to:

Clint Folden, Water Quality Regulatory Specialist
Confederated Salish and Kootenai Tribes
Natural Resources Department
P.O. Box 278
Pablo, MT 59855

9.6 EPA Region 9

9.6.1 CAR10I000 Indian country within the State of California

9.6.1.1 Twenty-Nine Palms Band of Mission Indians. The following conditions apply only to discharges on the Twenty-Nine Palms Band of Mission Indians Reservation:

a. At the time the applicant submits its Notice of Intent (NOI) to the EPA, the applicant must concurrently submit written notification of the NOI and a copy of the Stormwater Pollution Prevention Plan (SWPPP) to the Twenty-Nine Palms Band of Mission Indians at the address below:

Tribal Environmental Coordinator
Twenty-Nine Palms Band of Mission Indians
46-200 Harrison Place
Coachella, CA 92236

b. The applicant must also concurrently submit to the Tribal Environmental Coordinator written notification of any other forms or information submitted to the EPA, including waivers, reporting, and Notice of Termination (NOT).

c. Permitted entities under the CGP must keep the Tribal EPA informed of authorized discharges under the CGP by submitting written information about the type, quantity, frequency and location, intended purpose, and potential human health and/or environmental effects of their activities. These requirements are pursuant to Section 4 of the Twenty-Nine Palms Band of Mission Indians Water Pollution Control Ordinance (022405A). This information may be submitted to Tribal EPA in the form of Stormwater Pollution Prevention Plans (SWPPPs), monitoring reports, or other reports as required under the CGP. Spills, leaks, or unpermitted discharges must be reported in writing to Tribal EPA within 24 hours of the incident.

9.6.2 **GUR100000 Island of Guam**. The following conditions apply only to discharges on the Island of Guam:

a. Any earth-moving operations which require a permit must be obtained from the Department of Public Works (DPW) with clearance approval from various Government of Guam Agencies including Guam EPA prior to the start of any earth-moving activity.

b. In the event that the construction sites are within the Guam Sole Source Aquifer, the construction site owner and operator must consider opportunities to facilitate groundwater recharge for construction and post-construction implementing infiltration Best Management Practices. Stormwater disposal systems shall be designed and operated within the boundaries of the project. Stormwater systems shall not be permitted within any Wellhead Protection Zone unless the discharge meets the Guam Water Quality Standards within the zone. Waters discharged within the identified category G-2 recharge zone shall receive treatment to the degree required to protect the drinking water quality prior to it entering the category G-1 resource zone.

c. All conditions and requirements set forth in the 22 Guam Administrative Rules and Regulations (GARR), Division II, Water Control, Chapter 10, Guam Soil Erosion and Sediment Control Regulations (GSESCR) that are more protective than the CGP regarding construction activities must be complied with.

d. All standards and requirements set forth in the 22 GARR, Division II, Water Control, Chapter 5, *Guam Water Quality Standards (GWQS) 2001 Revisions*, must be complied with to include reporting GWQS exceedance to Guam EPA.

e. All operators/owners of any property development or earth moving activities shall comply with the erosion control pre-construction and post-construction BMP design performance standards and criteria set forth in the 2006 CNMI and Guam Stormwater Management Manual.

f. All conditions and requirements regarding dewatering activities set forth in 22 Guam Administrative Rules and Regulations Chapter 7, Water Resources Development and Operating Regulations must be complied with to include securing permits with Guam EPA prior to the start of any dewatering activities.

g. If a project to be developed is covered under the Federal Stormwater Regulations (40 CFR Parts 122 & 123), a Notice of Intent (NOI) to discharge stormwater to the surface and marine waters of Guam must be submitted to the U.S. EPA and a copy furnished to Guam EPA, pursuant to Section 10, 104(B)(5)(d) 22GAR, Division II, Chapter 10.

h. Guam EPA shall apply the Buffer Requirements listed in Appendix G of the CGP NPDES Permit for construction activities as it pertains to Waters of the U.S. in Guam. Guam EPA shall also apply the same buffer requirements for sinkholes in Guam.

i. When Guam EPA, through its permit review process, identifies that the proposed construction activity is close proximity to marine waters, contractors and owners will be informed that any activity that may impair water quality are required to stop during peak coral spawning periods as per the Guam Coral Spawning Construction Moratoriums.

j. The Proposed Construction General Permit must set appropriate measures and conditions to protect Guam's Threatened and Endangered Species and Outstanding Resource Waters of exceptional recreational or ecological significance as determined by the Guam EPA Administrator as per *Guam Water Quality Standards 2001 Revisions,* §5102, Categories of Waters, D. Outstanding Resource Waters.

k. When Guam EPA through its permit review process identifies that proposed construction activity is in close proximity to any Section 303d impaired waters, which includes marine waters and surface waters, shall ensure that construction activity does not increase the impaired water's ambient parameters.

l. When Rainfall Erosivity and TMDL Waivers reflected in the CGP, Appendix C, are submitted to the U.S. EPA, Guam EPA will review waivers on a project by project basis.

m. Prior to submission of the Notice of Termination (NOT) to the U.S. EPA, permittees must clearly demonstration to Guam EPA that the project site has met all soil stabilization requirements and removal of any temporary erosion control as outlined in the GSESCR.

9.7 EPA Region 10

9.7.1 IDR100000 State of Idaho, except Indian country

a. *Idaho's Antidegradation Policy*. The WQS contain an antidegradation policy providing three levels of protection to water bodies in Idaho (IDAPA 58.01.02.051).

1. Tier I Protection. The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and ensures that existing uses of a water body and the level of water quality necessary to protect those existing uses will be maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). Additionally, a Tier 1 review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.05).
2. Tier II Protection. The second level of protection applies to those water bodies considered high quality and ensures that no lowering of water quality will be allowed unless deemed necessary to accommodate important economic or social development (IDAPA 58.01.02.051.02; 58.01.02.052.08).
3. Tier III Protection. The third level of protection applies to water bodies that have been designated outstanding resource waters and requires that activities not cause a lowering of water quality (IDAPA 58.01.02.051.03; 58.01.02.052.09).

DEQ is employing a water body by water body approach to implementing Idaho's antidegradation policy. This approach means that any water body fully supporting its beneficial uses will be considered high quality (IDAPA 58.01.02.052.05.a). Any water body not fully supporting its beneficial uses will be provided Tier I protection for that use, unless specific circumstances warranting Tier II protection are met (IDAPA 58.01.02.052.05.c). The most recent federally approved Integrated Report and supporting data are used to determine support status and the tier of protection (IDAPA 58.01.02.052.05).

b. *Pollutants of Concern.* The primary pollutants of concern associated with stormwater discharges from construction activities are sediment, typically measured as total suspended solids and turbidity. Other potential pollutants include the following: phosphorus, nitrogen, pesticides, organics, metals, PCBs, petroleum products, construction chemicals, and solid wastes.

c. *Receiving Water Body Level of Protection.* The CGP provides coverage to construction activities throughout the entire State of Idaho. Because of the statewide applicability, all of the jurisdictional waters within Idaho could potentially receive discharges either directly or indirectly from activities covered under the CGP. DEQ applies a water body by water body approach to determine the level of antidegradation a water body will receive.

All waters in Idaho that receive discharges from activities authorized under the CGP will receive, at minimum Tier I antidegradation protection because Idaho's antidegradation policy applies to all waters of the state. Water bodies that fully support their aquatic life or recreational uses are considered to be *high quality waters* and will receive Tier II antidegradation protection.

Although Idaho does not currently have any Tier III designated outstanding resource waters (ORWs) designated, it is possible for a water body to be designated as an ORW during the life of the CGP. Because of this potential, the antidegradation review also assesses whether the permit complies with the outstanding resource water requirements of Idaho's antidegradation policy.

To determine the support status of the receiving water body, persons filing a Notice of Intent (NOI) for coverage under this general permit must use the most recent EPA-approved Integrated Report, available on Idaho DEQ's website: http://www.deq.idaho.gov/water-quality/surface-water/monitoring-assessment/integrated-report/.

High quality waters are identified in Categories 1 and 2 of the Integrated Report. If a water body is in either Category 1 or 2, it is a Tier II water body.

Unassessed waters are identified as Category 3 of DEQ's Integrated Report. These waters require a case-by-case determination to be made by DEQ based on available information at the time of the application for permit coverage. If a water body is unassessed, the applicant is directed to contact DEQ for assistance in filing the NOI.

Impaired waters are identified in Categories 4 and 5 of the Integrated Report. Category 4(a) contains impaired waters for which a TMDL has been approved by EPA. Category 4(b) contains impaired waters for which controls other than a TMDL have been approved by EPA. Category 5 contains waters which have been identified as "impaired," for which a TMDL is needed. These waters are Tier I waters, for the use which is impaired. With the exception, if the aquatic life uses are impaired for any of these three pollutants—dissolved oxygen, pH, or temperature—and the biological or aquatic habitat parameters show a health, balanced biological community, then the water body shall receive Tier II protection, in addition to Tier I protection, for aquatic life uses (IDAPA 58.01.02.052.05.c.i.).

DEQ's webpage also has a link to the state's map-based Integrated Report which presents information from the Integrated Report in a searchable, map-based format: http://www.deq.idaho.gov/assistance-resources/maps-data/.

Water bodies can be in multiple categories for different causes. If assistance is needed in using these tools, or if additional information/clarification regarding the support status of the receiving water body is desired, the operator is directed to make contact with the appropriate DEQ regional office of the State office in the table below:

Regional and State Office	**Address**	**Phone Number**	**Email**
Boise	1445 N. Orchard Rd., Boise 83706	208-373-0550	Kati.carberry@deq.idaho.gov
Coeur d'Alene	2110 Ironwood Parkway, Coeur D'Alene 83814	208-769-1422	June.bergquist@deq.idaho.gov
Idaho Falls	900 N. Skyline, Suite B., Idaho Falls 83402	208-528-2650	Troy.saffle@deq.idaho.gov
Lewiston	1118 "F" St., Lewiston 83501	208-799-4370	Mark.sellet@deq.idaho.gov
Pocatello	444 Hospital way, #300 Pocatello 83201	208-236-6160	Lynn.vanevery@deq.idaho.gov
Twin Falls	650 Addison Ave., W., Suite 110, Twin Falls 83301	208-736-2190	Balthasar.buhidar@deq.idaho.gov
State Office	1410 N. Hilton Rd., Boise 83706	208-373-0502	Nicole.deinarowicz@deq.idaho.gov

d. *Turbidity Monitoring.* The permittee must conduct turbidity monitoring during construction activities and thereafter on days where there is a direct discharge of pollutants from an unstabilized portion of the site which is causing a visible plume to a water of the U.S.

A properly and regularly calibrated turbidimeter is required for measurements analyzed in the field (preferred method), but grab samples may be collected and taken to a laboratory for analysis. If the permittee can demonstrate that there will be no direct discharge from the construction site, then turbidity monitoring is not required. When monitoring is required, a sample must be taken at an undisturbed area immediately upstream of the project area to establish background turbidity levels for the monitoring event. Background turbidity, location, date and time must be recorded prior to monitoring downstream of the project area. A sample must also be taken immediately downstream from any point of discharge and *within* any visible plume. The turbidity, location, date and time must be recorded. The downstream sample must be taken immediately following the upstream sample in order to obtain meaningful and representative results.

Results from the compliance point sampling or observation[78] must be compared to the background levels to determine whether project activities are causing an exceedance of state WQS. If the downstream turbidity is 50 NTUs or more than the upstream turbidity, then the project is causing an exceedance of WQS. *Any exceedance of the turbidity standard must be reporting to the appropriate DEQ regional office within 24 hours. The following six (6) steps should be followed to ensure compliance with the turbidity standard:*

1. If a visible plume is observed, quantify the plume by collecting turbidity measurements from within the plume and compare the results to Idaho's instantaneous numeric turbidity criterion (50 NTU over the background).
2. If turbidity is less than 50 NTU instantaneously over the background turbidity; continue monitoring as long as the plume is visible. If turbidity exceeds background turbidity by more than 50 NTU instantaneously then stop all earth disturbing construction activities and proceed to step 3.
3. Take immediate action to address the cause of the exceedance. That may include inspection the condition of project BMPs. If the BMPs are functioning to their fullest capability, then the permittee must modify project activities and/or BMPs to correct the exceedance.
4. Notify the appropriate DEQ regional office within 24 hours.
5. Possibly increase monitoring frequency until state water quality standards are met.
6. Continue earth disturbing construction activities once turbidity readings return to within 50 NTU instantaneously <u>and</u> 25 NTU for more than ten consecutive days over the background turbidity.

Copies of daily logs for turbidity monitoring must be available to DEQ upon request. The report must describe all exceedances and subsequent actions taken, including the effectiveness of the action.

e. *<u>Reporting of Discharges Containing Hazardous Materials or Petroleum Products.</u>* All spills of hazardous material, deleterious material or petroleum products which may impact waters (ground and surface) of the state shall be immediately reported. Call 911 if immediate assistance is required to control, contain or clean up the spill. If no assistance is needed in cleaning up the spill, contact the appropriate DEQ regional office in the table below during normal working hours or Idaho State Communications Center after normal working hours. If the spilled volume is above federal reportable quantities, contact the National Repose Center.

<u>For immediate assistance</u>: Call 911

<u>National Response Center</u>: (800) 424-8802

[78] A visual observation is only acceptable to determine whether BMPs are functioning properly. If a plume is observed, the project may be causing an exceedance of WQS and the permittee must collect turbidity data and inspect the condition of the projects BMPs. If the BMPs appear to be functioning to their fullest capability and the turbidity is 50 NTUs or more than the upstream turbidity, then the permittee must modify the activity or implement additional BMPs (this may also include modifying existing BMPs).

Idaho State Communications Center: (208) 632-8000

Regional office	Toll Free Phone Number	Phone Number
Boise	888-800-3480	208-373-0321
Coeur d'Alene	877-370-0017	208-769-1422
Idaho Falls	800-232-4635	208-528-2650
Lewiston	977-547-3304	208-799-4370
Pocatello	888-655-6160	208-236-6160
Twin Falls	800-270-1663	208-736-2190

9.7.2 IDR10I000 Indian country within the State of Idaho, except Duck Valley Reservation lands (see Region 9)

9.7.2.1 Shoshone-Bannock Tribes. The following conditions apply only to discharges on the Shoshone-Bannock Reservation:

f. Each operator shall submit a signed hard copy of the Notice of Intent (NOI) to the Shoshone-Bannock Tribes Water Resources Department at the same time it is submitted electronically to the Environmental Protection Agency (EPA) and shall provide the Shoshone-Bannock Tribes Water Resources Department the acknowledgement of receipt of the NOI from the EPA within 7 calendar days of receipt from the EPA.

9.7.3 WAR10F000 Areas in the State of Washington, except those located on Indian country, subject to construction activity by a Federal Operator. The following conditions apply only to discharges on federal facilities in the State of Washington:

a. Discharges shall not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), groundwater quality standards (Chapter 173-200 WAC), sediment management standards (Chapter 173-204 WAC), and human health-based criteria in the National Toxics Rule (40 CFR Part 131.36). Discharges that are not in compliance with these standards are not authorized.

b. Prior to the discharge of stormwater and non-storm water to waters of the State, the Permittee must apply all known, available, and reasonable methods of prevention, control, and treatment (AKART). This includes the preparation and implementation of an adequate SWPPP, with all appropriate BMPs installed and maintained in accordance with the SWPPP and the terms and conditions of this permit.

c. Permittees who discharge to segments of waterbodies listed as impaired by the State of Washington under Section 303(d) of the Clean Water Act for turbidity, fine sediment, phosphorus, or pH must comply with the following numeric effluent limits:

Parameter Identified in 303(d) Listing	Parameter Sampled	Unit	Analytical Method	Numeric Effluent Limit
• Turbidity • Fine Sediment • Phosphorus	Turbidity	NTU	SM2130 or EPA 180.1	25 NTUs at the point where the stormwater is discharged from the site.
High pH	pH	Su	pH meter	In the range of

				6.5 – 8.5

d. All references and requirements associated with Section 303(d) of the Clean Water Act mean the most current EPA approved listing of impaired waters that exists on February 16, 2017, or the date when the operator's complete permit application is received by EPA, whichever is later.

e. Discharges to waterbodies subject to an applicable Total Maximum Daily Load (TMDL) for turbidity, fine sediment, high pH, or phosphorus, shall be consistent with the assumptions and requirements of the TMDL.

   i. Where an applicable TMDL sets specific waste load allocations or requirements for discharges covered by this permit, discharges shall be consistent with any specific waste load allocations or requirements establish by the applicable TMDL.

   ii. Where an applicable TMDL has established a general waste load allocation for construction stormwater discharges, but no specific requirements have been identified, compliance with this permit will be assumed to be consistent with the approved TMDL.

   iii. Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharges, but has not excluded these discharges, compliance with this permit will be assumed to be consistent with the approved TMDL.

   iv. Where an applicable TMDL specifically precludes or prohibits discharges from construction activity, the operator is not eligible for coverage under this permit.

   v. Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus, which has been completed and approved by EPA prior to February 16, 2017, or prior to the date the operator's complete NOI is received by EPA, whichever is later.

9.7.4 WAR10I000 Indian country within the State of Washington

9.7.4.1 Confederated Tribes of the Colville Reservation. The following conditions apply only to discharges on the Colville Indian Reservation (CIR) and on other Tribal trust lands or allotments of the Confederated Tribes of the Colville Reservation:

a. A copy of the Stormwater Pollution Prevention Plan must be submitted to the following office at least thirty (30) days in advance of sending the Notice of Intent (NOI) to EPA:

   Environmental Trust Department
   Confederated Tribes of the Colville Reservation
   PO Box 150
   Nesepelem, WA 99155

b. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be sent to the ETD at the same time they are submitted to EPA.

c. Discharges to Omak Creek, the Okanogan River, and Columbia River downstream of Chief Joseph Dam may affect threatened or endangered species, and shall only be permitted in adherence with Appendix D of the CGP.

d. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in Chapter 4-8 Water Quality Standards of the Colville Law and Order Code, as amended.

e. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the CIR. All spills must be reported to the appropriate emergency management agency and the ETD, and measures shall be taken immediately to prevent the pollution of waters of the CIR, including groundwater.

f. Stormwater site inspections shall be conducted at least once every 7 calendar days, within 24-hours of the occurrence of a rain event of 0.25 inches or greater in a 24-hour period, and daily during periods of saturated ground surface or snowmelt with accompanying surface runoff.

g. Results of discharge sampling must be reported to the ETD within 7 days of sample collection. All sample reporting must include the date and time, location, and individual performing the sampling.

h. Any corrective action reports that are required under the CGP must be submitted to the ETD at the above address within one (1) working day of the report completion.

i. This certification does not authorize impacts to cultural, historical, or archeological features or sites, or proprieties that may be eligible for such listing.

9.7.4.2 Lummi Nation. The following conditions apply only to discharges on the Lummi Reservation:

a. The Lummi Nation reserves the right to modify this 401 certification if the final version of the NPDES General Permit for Storm Water Discharges Associated with Construction Activity (CGP) on tribal lands in the State of Washington (Permit No. WAR10I000) is substantively different than the draft version of the proposed permit that was made available for public comments during April 2016. The Lummi Nation will determine if the final version of the NPDES CGP is substantively different than the draft version following review of the final version once the EPA makes it available.

b. This certification does not exempt and is provisional upon compliance with other applicable statutes and codes administered by federal and Lummi tribal agencies. Pursuant to Lummi Code of Laws (LCL) 17.05.020(a), the operator must also obtain a land use permit from the Lummi Planning Department as provided in Title 15 of the Lummi Code of Laws and regulations adopted thereunder.

c. Pursuant to LCL 17.05.020(a), each operator shall develop and submit a Storm Water Pollution Prevention Plan to the Lummi Water Resources Division for review and approval by the Water Resources Manager prior to beginning any discharge activities.

d. Pursuant to LCL Title 17, each operator shall be responsible for achieving compliance with the Water Quality Standards for Surface Waters of the Lummi Indian Reservation (Lummi Administrative Regulations [LAR] 17 LAR 07.010 through 17 LAR 07.210 together with supplements and amendments thereto).

e. Each operator shall submit a signed hard copy of the Notice of Intent (NOI) to the Lummi Water Resources Division at the same time it is submitted electronically to the Environmental Protection Agency (EPA) and shall provide the Lummi Water Resources Division the acknowledgement of receipt of the NOI from the EPA and the associated NPDES tracking number provided by the EPA within 7 calendar days of receipt from the EPA.

f. Each operator shall submit a signed hard copy of the Notice of Termination (NOT) to the Lummi Water Resources Division at the same time it is submitted electronically to the EPA and shall provide the Lummi Water Resources Division the EPA acknowledgement of receipt of the NOT.

g. Storm Water Pollution Prevention Plans, Notice of Intent, Notice of Termination and associated correspondence with the EPA shall be submitted to:

Lummi Natural Resources Department
ATTN: Water Resources Manager
2665 Kwina Road
Bellingham, WA 98226-9298

9.7.4.3 Makah Tribe. The following conditions apply only to discharges on the Makah Reservation:

a. The operator shall be responsible for achieving compliance with the Makah Tribe's Water Quality Standards.

b. The operator shall submit a Storm Water Pollution Prevention Plan to the Makah Tribe Water Quality Program and Makah Fisheries Habitat Division for review and approval at least thirty (30) days prior to beginning any discharge activities.

c. The operator shall submit a copy of the Notice of Intent to the Makah Tribe Water Quality Program and Makah Fisheries Habitat Division at the same time it is submitted to EPA.

d. Storm Water Pollution Prevention Plans and Notices of Intent shall be submitted to:

Aaron Parker
Makah Fisheries Management Water Quality Specialist
(360) 645-3162
Cell 206-356-0319
Aaron.parker@makah.com
PO Box 115
Neah Bay WA 98357

9.7.4.4 Puyallup Tribe of Indians. The following conditions apply only to discharges on the Puyallup Tribe of Indians Reservation:

a. Each permittee shall be responsible for achieving compliance with the Puyallup Tribe's Water Quality Standards, including antidegradation provisions. The Puyallup Natural Resources Department will conduct an antidegradation review for permitted activities that have the potential to lower water quality. The antidegradation review will be consistent with the Tribe's Antidegradation Implementation Procedures. The Tribe may also impose additional controls on a site-specific basis, or request EPA to require the operator obtain coverage under an individual permit, if information in the NOI or from other sources indicates that the operator's discharges are not controlled as necessary to meet applicable water quality standards.

b. The permittee shall be responsible for meeting any additional permit requirements imposed by EPA necessary to comply with the Puyallup Tribe's antidegradation policies if the discharge point is located within 1 linear mile upstream of waters designated by the Tribe.

c. Each permittee shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to Char Naylor (char.naylor@puyalluptribe.com) and Russ Ladley (russ.ladley@puyalluptribe.com) by email or at the address listed below at the same time it is submitted to EPA.

Puyallup Tribe of Indians
3009 E. Portland Avenue
Tacoma, WA 98404
ATTN: Russ Ladley and Char Naylor

d. All supporting documentation and certifications in the NOI related to coverage under the general permit for Endangered Species Act purposes shall be submitted to the Tribe's Resource Protection Manager (russ.ladley@puyalluptribe.com) and Char Naylor (char.naylor@puyalluptribe.com) for review.

e. If EPA requires coverage under an individual or alternative permit, the permittee shall submit a copy of the permit to Russ Ladley and Char Naylor at the address listed above.

f. The permittee shall submit all stormwater pollution prevention plans to Char Naylor for review and approval prior to beginning any activities resulting in a discharge to tribal waters.

g. The permittee shall conduct benchmark monitoring for turbidity (or transparency) and, in the event of significant concrete work or engineered soils, pH monitoring as well. Monitoring, benchmarks, and reporting requirements contained in Condition S.4. (pp.13-20) of the Washington State Construction Stormwater General Permit, effective January 1, 2016, shall apply, as applicable.

h. The permittee shall notify Char Naylor (253-680-5520) and Russ Ladley (253-680-5560) prior to conducting inspections at construction sites generating storm water discharged to tribal waters.

i. Treat dewatering discharges with controls necessary to minimize discharges of pollutants in order to minimize the discharge of pollutants to groundwater or surface waters from stormwater that is removed from excavations, trenches, foundations, vaults, or other storage areas. Examples of appropriate controls include sediment basins or sediment traps, sediment socks, dewatering tanks, tube settlers, weir tanks, and filtration systems (e.g., bag or sand filters) that are designed to remove sediment.

   To the extent feasible, utilize vegetated, upland areas of the site to infiltrate dewatering water before discharge. At all points where dewatering water is discharged, comply with the velocity dissipation requirements of Part 2.2.11 of EPA's 2016 General Construction Stormwater Permit. Examples of velocity dissipation devices include check dams, sediment traps, riprap, and grouted riprap at outlets.

j. The permittee shall provide and maintain natural buffers to the maximum extent possible (and/or equivalent erosion and sediment controls) when tribal waters are located within 100 feet of the site's earth disturbances. If infeasible to provide and maintain an undisturbed 100 foot natural buffer, erosion and sediment controls to achieve the sediment load reduction equivalent to a 100-foot undisturbed natural buffer shall be required.

9.7.4.5 Spokane Tribe of Indians. The following conditions apply only to discharges on the Spokane Tribe Reservation:

a. Pursuant to Tribal Law and Order Code (TLOC) Chapter 30 each operator shall be responsible for achieving compliance with the Surface Water Quality Standards of the Spokane Tribe. The operator shall notify the Spokane Tribe, Water Control Board (WCB) of any spills of hazardous material and;

b. Each operator shall submit a signed hard copy of the Notice of Intent (NOI) to the WCB at the same time it is submitted to EPA.

c. The permittee shall allow the Tribal Water Control Board or its designee to inspect and sample at the construction site as needed.

d. Each operator shall submit a signed copy of the Notice of Termination (NOT) to the WCB at the same time it is submitted to EPA.

The correspondence address for the Spokane Tribe Water Control Board is:

Water Control Board
c/o. Brian Crossley
P0 Box 480
Wellpinit WA 99040
(509)626-4409
crossley@spokanetribe.com

9.7.4.6 Swinomish Indian Tribal Community. The following conditions apply only to discharges on the Swinomish Reservation:

a. Owners and operators seeking coverage under this permit who intend to discharge to Regulated Surface Waters must submit a copy of the Notice of Intent (NOI) to the DEP at the same time the NOI is submitted to EPA.

b. Owners and operators seeking coverage under this permit must also submit a Stormwater Pollution Prevention Plan to the DEP for review and approval by DEP prior to beginning any discharge activities.

c. Owners and operators must also submit to the DEP Changes in NOI and/or Notices of Termination at the same time they are submitted to EPA.

9.7.4.7 Tulalip Tribes. The following conditions apply only to discharges on the Tulalip Reservation:

a. This certification does not exempt and is provisional upon compliance with other applicable statues and codes administered by federal and Tulalip tribal agencies. Pursuant to Tulalip Tribes code of law, the operator must also obtain a land use permit from the Tulalip Tribes Planning Department as provided in Title 7 of the Tulalip Tribal Code (http://www.codepublishing.com/WA/Tulalip/?Tulalip02/Tulalip0205.html).

b. Each CGP operator shall be responsible for achieving compliance with Tulalip Tribes Water Quality Standards.

c. Each CGP operator shall submit their Stormwater Pollution Prevention Plan (SWPPP) to the:

Tulalip Natural & Cultural Resources Department
Tulalip Tribes
6406 Marine Drive
Tulalip, WA 98271

Attachment C – NOI and EPA Authorization e-mail

Attachment D – Inspection Form

2017 Construction General Permit
Inspection Report Template – Field Version

Purpose

This Inspection Report Template (or "template") is to assist you in preparing inspection reports for EPA's 2017 Construction General Permit (CGP). If you are covered under the 2017 CGP, you can use this template to create an inspection report form that is customized to the specific circumstances of your site and that complies with the minimum reporting requirements of Part 4.7 of the permit. Note that the use of this form is optional; you may use your own inspection report form provided it includes the minimum information required in Part 4.7 of the CGP.

If you are covered under a state CGP, this template may be helpful in developing a form that can be used for that permit; however, it will need to be modified to meet the specific requirements of that permit. If your permitting authority requires you to use a specific inspection report form, you should not use this form.

Notes:

While EPA has made every effort to ensure the accuracy of all instructions contained in the Inspection Report Template, it is the permit, not the template, that determines the actual obligations of regulated construction stormwater discharges. In the event of a conflict between the Inspection Report Template and any corresponding provision of the 2017 CGP, you must abide by the requirements in the permit. EPA welcomes comments on the Inspection Report Template at any time and will consider those comments in any future revision of this document. You may contact EPA for CGP-related inquiries at cgp@epa.gov.

Overview of Inspection Requirements (see CGP Part 4)

Construction operators covered under the 2017 CGP are subject to the following inspection requirements:

Person(s) Responsible for Inspecting the Site (see Part 4.1)
The person(s) inspecting your site must be a "qualified person" who may be either on your staff or a third party you hire to conduct such inspections.

- A "qualified person" is a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality, and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

Inspection Frequency (see Part 4.2)
You are required to conduct inspections either:

- Once every 7 calendar days; or
- Once every 14 calendar days and within 24 hours of a storm event of 0.25 inches or greater or the occurrence of runoff from snowmelt sufficient to cause a discharge.

Your inspection frequency is increased if the site discharges to a sensitive water. See Part 4.3. Your inspection frequency may be decreased to account for stabilized areas, or for arid, semi-arid, or drought-stricken conditions, or for frozen conditions. See Part 4.4.

Areas That Need to Be Inspected (see Part 4.5)
During each inspection, you must inspect the following areas of your site:

- Cleared, graded, or excavated areas of the site;
- Stormwater controls (e.g., perimeter controls, sediment basins, inlets, exit points etc.) and pollution prevention practices (e.g., pollution prevention practices for vehicle fueling/maintenance and washing, construction product storage, handling, and disposal, etc.) at the site;
- Material, waste, or borrow areas covered by the permit, and equipment storage and maintenance areas;
- Areas where stormwater flows within the site;
- Stormwater discharge points; and
- Areas where stabilization has been implemented.

What to Check For During Your Inspection (see Part 4.6)
During your site inspection, you are required to check:

- Whether stormwater controls or pollution prevention practices are properly installed, require maintenance or corrective action, or whether new or modified controls are required;
- For the presence of conditions that could lead to spills, leaks, or other pollutant accumulations and discharges;
- For locations where new or modified stormwater controls are necessary to meet requirements of the permit;

- Whether there are visible signs of erosion and sediment accumulation at points of discharge and to the channels and streambanks that are in the immediate vicinity of the discharge;
- If a stormwater discharge is occurring at the time of the inspection, whether there are obvious, visual signs of pollutant discharges; and
- If any permit violations have occurred on the site.

Inspection Reports (see Part 4.7)
Within 24 hours of completing each inspection, you are required to complete an inspection report that includes:
- Date of inspection;
- Names and titles of person(s) conducting the inspection;
- Summary of inspection findings;
- Rain gauge or weather station readings if your inspection is triggered by the 0.25-inch storm threshold; and
- If you determine that a portion of your site is unsafe to access for the inspection, documentation of what conditions prevented the inspection and where these conditions occurred on the site

Instructions for Using This Template
This Field Version of the Inspection Report Template is intended to be used in the field and filled out by hand. If you will be filling out the Inspection Report Template electronically (i.e., you will be typing in your findings), please use the Electronic Version of the Inspection Report Template available at https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources. The Electronic Version includes text fields with instructions for what to enter.

Keep in mind that this document is a template and not an "off-the-shelf" inspection report that is ready to use without some modification. You must first customize this form to include the specifics of your project in order for it to be useable for your inspection reports. Once you have entered all of your site-specific information into these fields, you may print out this form for use in the field to complete inspection reports.

The following tips for using this template will help you ensure that the minimum permit requirements are met:

- **Review the inspection requirements.** Before you start developing your inspection report form, read the CGP's Part 4 inspection requirements. This will ensure that you have a working understanding of the permit's underlying inspection requirements.
- **Complete all required text fields.** Fill out all text fields. Only by filling out all fields will the template be compliant with the requirements of the permit. (Note: Where you do not need the number of rows provided in the template form for your inspection, you may leave those rows blank. Or, if you need more space to document your findings, you may add an additional sheet.)
- **Use your site map to document inspection findings.** In several places in the template, you are directed to specify the location of certain features of your site, including where stormwater controls are installed and where you will be stabilizing exposed soil. You are also asked to fill in location information for unsafe conditions and the locations of any discharges occurring during your inspections. Where you are asked for location information, EPA encourages you to reference the point on your SWPPP site map that corresponds to the requested location on the inspection form. Using the site map as a tool in this way will help you conduct efficient inspections, will assist you in evaluating problems found, and will ensure proper documentation.
- **Sign and certify each inspection report.** The operator or a duly authorized representative (see Appendix I, Part I.11.2) must sign and certify each inspection report for it to be considered complete. Where a contractor or subcontractor carries out your inspections, it is recommended that you also have the inspector sign and certify the form, in addition to the signature and certification required of the permitted operator. The template includes a signature block for both parties.
- **Include the inspection form with your SWPPP.** Once your form is complete, make sure to include a copy of the inspection form in your SWPPP in accordance with Part 7.2.7.e of the CGP.
- **Retain copies of all inspection reports with your records.** You must also retain in your records copies of all inspection reports in accordance with the requirements in Part 4.7.3 of the 2017 CGP. These reports must be retained for at least 3 years from the date your permit coverage expires or is terminated.

Section-by-Section Instructions
You will find specific instructions corresponding to each section of the report form on the reverse side of each page. These instructions provide you with more details in terms of what EPA expects to be documented in these reports.

General Information (see reverse for instructions)					
Name of Project		**NPDES ID No.**		**Inspection Date**	
Weather conditions during inspection		**Inspection start time**		**Inspection end time**	
Inspector Name, Title & Contact Information					
Present Phase of Construction					
Inspection Location (if multiple inspections are required, specify location where this inspection is being conducted)					

Inspection Frequency *(Note: you may be subject to different inspection frequencies in different areas of the site. Check all that apply)*

Standard Frequency:
- ☐ Every 7 days
- ☐ Every 14 days and within 24 hours of a 0.25" rain or the occurrence of runoff from snowmelt sufficient to cause a discharge

Increased Frequency:
- ☐ Every 7 days and within 24 hours of a 0.25" rain (for areas of sites discharging to sediment or nutrient-impaired waters or to waters designated as Tier 2, Tier 2.5, or Tier 3)

Reduced Frequency:
- ☐ Twice during first month, no more than 14 calendar days apart; then once per month after first month; (for stabilized areas)
- ☐ Twice during first month, no more than 14 calendar days apart; then once more within 24 hours of a 0.25" rain (for stabilized areas on "linear construction sites")
- ☐ Once per month and within 24 hours of a 0.25" rain (for arid, semi-arid, or drought-stricken areas during seasonally dry periods or during drought)
- ☐ Once per month (for frozen conditions where earth-disturbing activities are being conducted)

Was this inspection triggered by a 0.25" storm event? ☐ Yes ☐ No

If yes, how did you determined whether a 0.25" storm event has occurred?

☐ Rain gauge on site ☐ Weather station representative of site. Specify weather station source:

Total rainfall amount that triggered the inspection (in inches)**:**

Was this inspection triggered by the occurrence of runoff from snowmelt sufficient to cause a discharge? ☐ Yes ☐ No

Unsafe Conditions for Inspection

Did you determine that any portion of your site was unsafe for inspection per CGP Part 4.5? ☐ Yes ☐ No

If "yes", complete the following:

- Describe the conditions that prevented you from conducting the inspection in this location:

- Location(s) where conditions were found:

Instructions for Filling Out "General Information" Section

Name of Project
Enter the name for the project.

NPDES ID No.
Enter the NPDES ID number that was assigned to your NOI for permit coverage.

Inspection Date
Enter the date you conducted the inspection.

Weather Conditions During Inspection
Enter the weather conditions occurring during the inspection, e.g., sunny, overcast, light rain, heavy rain, snowing, icy, windy.

Inspection start and end times
Enter the time you started and ended the inspection.

Inspector Name, Title & Contact Information
Provide the name of the person(s) (either a member of your company's staff or a contractor or subcontractor) that conducted this inspection. Provide the inspector's name, title, and contact information as directed in the form.

Present Phase of Construction
If this project is being completed in more than one phase, indicate which phase it is currently in.

Inspection Location
If your project has multiple locations where you conduct separate inspections, specify the location where this inspection is being conducted. If only one inspection is conducted for your entire project, enter "Entire Site." If necessary, complete additional inspection report forms for each separate inspection location.

Inspection Frequency
Check the box that describes the inspection frequency that applies to you. Note that you may be subject to different inspection frequencies in different areas of your site. If your project does not discharge to a "sensitive water" (i.e., a water impaired for sediment or nutrients, or listed as Tier 2, 2.5, or 3 by your state or tribe) and you are not affected by any of the circumstances described in CGP Part 4.4, then you can choose your frequency based on CGP Part 4.2 – either every 7 calendar days, or every 14 calendar days <u>and</u> within 24 hours of a 0.25-inch storm event. For any portion of your site that discharges to a sensitive water, your inspection frequency for that area is fixed under CGP Part 4.3 at every 7calendar days <u>and</u> within 24 hours of a 0.25-inch storm event. If portions of your site are stabilized, are located in arid, semi-arid, or drought-stricken areas, or are subject to frozen conditions, consult CGP Part 4.4 for the applicable inspection frequency. Check all the inspection frequencies that apply to your project.

Was This Inspection Triggered by a 0.25 Inch Storm Event or the occurrence of runoff from snowmelt sufficient to cause a discharge?
If you were required to conduct this inspection because of a 0.25-inch (or greater) rain event, indicate whether you relied on an on-site rain gauge or a nearby weather station (and where the weather station is located). Also, specify the total amount of rainfall for this specific storm event. If you were required to conduct this inspection because of the occurrence of runoff from snowmelt, then check the appropriate box.

Unsafe Conditions for Inspection
Inspections are not required where a portion of the site or the entire site is subject to unsafe conditions. See CGP Part 4.5. These conditions should not regularly occur, and should not be consistently present on a site. Generally, unsafe conditions are those that render the site (or a portion of it) inaccessible or that would pose a significant probability of injury to applicable personnel. Examples could include severe storm or flood conditions, high winds, and downed electrical wires.

If your site, or a portion of it, is affected by unsafe conditions during the time of your inspection, provide a description of the conditions that prevented you from conducting the inspection and what parts of the site were affected. If the entire site was considered unsafe, specify the location as "Entire site"

Condition and Effectiveness of Erosion and Sediment (E&S) Controls (CGP Part 2.2) (see reverse for instructions)				
Type/Location of E&S Control **[Add an additional sheet if necessary]**	**Maintenance Needed?***	**Corrective Action Required?***	**Date on Which Maintenance or Corrective Action First Identified?**	**Notes**
1.	☐Yes ☐No	☐Yes ☐No		
2.	☐Yes ☐No	☐Yes ☐No		
3.	☐Yes ☐No	☐Yes ☐No		
4.	☐Yes ☐No	☐Yes ☐No		
5.	☐Yes ☐No	☐Yes ☐No		
6.	☐Yes ☐No	☐Yes ☐No		
7.	☐Yes ☐No	☐Yes ☐No		
8.	☐Yes ☐No	☐Yes ☐No		
9.	☐Yes ☐No	☐Yes ☐No		
10.	☐Yes ☐No	☐Yes ☐No		

*** Note:** The permit differentiates between conditions requiring routine maintenance, and those requiring corrective action. The permit requires maintenance in order to keep controls in effective operating condition. Corrective actions are triggered only for specific conditions, which include: 1) A stormwater control needs repair or replacement (beyond routine maintenance) if it is not operating as intended; 2) A stormwater control necessary to comply with the permit was never installed or was installed incorrectly; 3) You become aware that the stormwater controls you have installed and are maintaining are not effective enough for the discharge to meet applicable water quality standards or applicable requirements in Part 3.1; 4) One of the prohibited discharges in Part 1.3 is occurring or has occurred; or 5) EPA requires corrective actions as a result of a permit violation found during an inspection carried out under Part 4.8. If a condition on your site requires a corrective action, you must also fill out a corrective action form found at https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources. See Part 5 of the permit for more information.

Instructions for Filling Out the "Erosion and Sediment Control" Table

Type and Location of E&S Controls
Provide a list of all erosion and sediment (E&S) controls that your SWPPP indicates will be installed and implemented at your site. This list must include at a minimum all E&S controls required by CGP Part 2.2. Include also any natural buffers established under CGP Part 2.2.1. Buffer requirements apply if your project's earth-disturbing activities will occur within 50 feet of a water of the U.S. You may group your E&S controls on your form if you have several of the same type of controls (e.g., you may group "Inlet Protection Measures", "Perimeter Controls", and "Stockpile Controls" together on one line), but if there are any problems with a specific control, you must separately identify the location of the control, whether maintenance or corrective action is necessary, and in the notes section you must describe the specifics about the problem you observed.

Maintenance Needed?
Answer "yes" if the E&S control requires maintenance due to normal wear and tear in order for the control to continue operating effectively. At a minimum, maintenance is required in the following specific instances: (1) for perimeter controls, whenever sediment has accumulated to half or more the above-ground height of the control (CGP Part 2.2.3.a); (2) where sediment has been tracked-out onto the surface of off-site streets or other paved areas (CGP Part 2.2.4); (3) for inlet protection measures, when sediment accumulates, the filter becomes clogged, and/or performance is compromised (CGP Part 2.2.10); and (4) for sediment basins, as necessary to maintain at least half of the design capacity of the basin (CGP Part 2.2.12.f). Note: In many cases, "yes" answers are expected and indicate a project with an active operation and maintenance program. You should also answer "yes" if work to fix the problem is still ongoing from the previous inspection.

Corrective Action Needed?
Answer "yes" if during your inspection you found any of the following conditions to be present (CGP, Part 5.1): (1) a required E&S control needs repair or replacement (beyond routine maintenance required under Part 2.1.4); (2) a require E&S control was never installed or was installed incorrectly; (3) you become aware that the inadequacy of the E&S control has led to an exceedance of an applicable water quality standard; (4) one of the prohibited discharges in Part 1.3 is occurring or has occurred; or (5) EPA requires corrective action for an E&S control as a result of a permit violation found during an inspection carried out under Part 4.8. If you answer "yes", you must take corrective action and complete a corrective action report, found at https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources.. Note: You should answer "yes" if work to fix the problem from a previous inspection is still ongoing.

Date on Which Maintenance or Corrective Action First Identified?
Provide the date on which the condition that triggered the need for maintenance or corrective action was first identified. If the condition was just discovered during this inspection, enter the inspection date. If the condition is a carryover from a previous inspection, enter the original date of the condition's discovery.

Notes
For each E&S control and the area immediately surrounding it, note whether the control is properly installed and whether it appears to be working to minimize sediment discharge. Describe any problem conditions you observed such as the following, and why you think they occurred as well as actions (e.g., maintenance or corrective action) you will take or have taken to fix the problem:

1. Failure to install or to properly install a required E&S control
2. Damage or destruction to an E&S control caused by vehicles, equipment, or personnel, a storm event, or other event
3. Mud or sediment deposits found downslope from E&S controls
4. Sediment tracked out onto paved areas by vehicles leaving construction site
5. Noticeable erosion at discharge outlets or at adjacent streambanks or channels
6. Erosion of the site's sloped areas (e.g., formation of rills or gullies)
7. E&S control is no longer working due to lack of maintenance

For buffer areas, make note of whether they are marked off as required, whether there are signs of construction disturbance within the buffer, which is prohibited under the CGP, and whether there are visible signs of erosion resulting from discharges through the area.

If maintenance or corrective action is required, briefly note the reason. If maintenance or corrective action have been completed, make a note of the date it was completed and what was done. *If corrective action is required, note that you will need to complete a separate corrective action report describing the condition and your work to fix the problem*.

Condition and Effectiveness of Pollution Prevention (P2) Practices (CGP Part 2.3) (see reverse for instructions)				
Type/Location of P2 Practices [Add an additional sheet if necessary]	**Maintenance Needed?***	**Corrective Action Required?***	**Date on Which Maintenance or Corrective Action First Identified?**	**Notes**
1.	☐Yes ☐No	☐Yes ☐No		
2.	☐Yes ☐No	☐Yes ☐No		
3.	☐Yes ☐No	☐Yes ☐No		
4.	☐Yes ☐No	☐Yes ☐No		
5.	☐Yes ☐No	☐Yes ☐No		
6.	☐Yes ☐No	☐Yes ☐No		
7.	☐Yes ☐No	☐Yes ☐No		
8.	☐Yes ☐No	☐Yes ☐No		
9.	☐Yes ☐No	☐Yes ☐No		
10.	☐Yes ☐No	☐Yes ☐No		

*** Note:** The permit differentiates between conditions requiring routine maintenance, and those requiring corrective action. The permit requires maintenance in order to keep controls in effective operating condition. Corrective actions are triggered only for specific conditions, which include: 1) A stormwater control needs repair or replacement (beyond routine maintenance) if it is not operating as intended; 2) A stormwater control necessary to comply with the permit was never installed or was installed incorrectly; 3) You become aware that the stormwater controls you have installed and are maintaining are not effective enough for the discharge to meet applicable water quality standards or applicable requirements in Part 3.1; 4) One of the prohibited discharges in Part 1.3 is occurring or has occurred; or 5) EPA requires corrective actions as a result of a permit violation found during an inspection carried out under Part 4.8. If a condition on your site requires a corrective action, you must also fill out a corrective action form found at https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources. See Part 5 of the permit for more information.

Instructions for Filling Out the "Pollution Prevention (P2) Practice" Table

Type and Location of P2 Controls
Provide a list of all pollution prevention (P2) practices that are implemented at your site. This list must include all P2 practices required by Part 2.3, and those that are described in your SWPPP.

Maintenance Needed?
Answer "yes" if the P2 practice requires maintenance due to normal wear and tear in order for the control to continue operating effectively. Note: In many cases, "yes" answers are expected and indicate a project with an active operation and maintenance program.

Corrective Action Needed?
Answer "yes" if during your inspection you found any of the following conditions to be present (CGP, Part 5.1): (1) a required P2 practice needs repair or replacement (beyond routine maintenance required under Part 2.1.4); (2) a require P2 practice was never installed or was installed incorrectly; (3) you become aware that the inadequacy of the P2 practice has led to an exceedance of an applicable water quality standard; (4) one of the "prohibited discharges" listed in CGP Part 1.3 is occurring or has occurred, or (5) EPA requires corrective action for a P2 practice as a result of a permit violation found during an inspection carried out under Part 4.8. If you answer "yes", you must take corrective action and complete a corrective action report (see https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources). Note: You should answer "yes" if work to fix the problem from a previous inspection is still ongoing.

Date on Which Maintenance or Corrective Action First Identified?
Provide the date on which the condition that triggered the need for maintenance or corrective action was first identified. If the condition was just discovered during this inspection, enter the inspection date. If the condition is a carryover from a previous inspection, enter the original date of the condition's discovery.

Notes
For each P2 control and the area immediately surrounding it, note whether the control is properly installed, whether it appears to be working to minimize or eliminate pollutant discharges, and whether maintenance or corrective action is required. Describe problem conditions you observed such as the following, and why you think they occurred, as well as actions you will take or have taken to fix the problem:

1. Failure to install or to properly install a required P2 control
2. Damage or destruction to a P2 control caused by vehicles, equipment, or personnel, or a storm event
3. Evidence of a spill, leak, or other type of pollutant discharge, or failure to have properly cleaned up a previous spill, leak, or other type of pollutant discharge
4. Spill response supplies are absent, insufficient, or not where they are supposed to be located
5. Improper storage, handling, or disposal of chemicals, building materials or products, fuels, or wastes
6. P2 practice is no longer working due to lack of maintenance

If maintenance or corrective action is required, briefly note the reason. If maintenance or corrective action have been completed, make a note of the date it was completed and what was done. *If corrective action is required, note that you will need to complete a separate corrective action report describing the condition and your work to fix the problem*.

Stabilization of Exposed Soil (CGP Part 2.2.14) (see reverse for instructions)			
Stabilization Area **[Add an additional sheet if necessary]**	**Stabilization Method**	**Have You Initiated Stabilization?**	**Notes**
1.		☐ YES ☐ NO If yes, provide date:	
2.		☐ YES ☐ NO If yes, provide date:	
3.		☐ YES ☐ NO If yes, provide date:	
4.		☐ YES ☐ NO If yes, provide date:	
5.		☐ YES ☐ NO If yes, provide date:	

Description of Discharges (CGP Part 4.6.6) (see reverse for instructions)	
Was a stormwater discharge or other discharge occurring from any part of your site at the time of the inspection? ☐ Yes ☐ No **If "yes", provide the following information for each point of discharge:**	
Discharge Location **[Add an additional sheet if necessary]**	**Observations**
1.	Describe the discharge: At points of discharge and the channels and banks of waters of the U.S. in the immediate vicinity, are there any visible signs of erosion and/or sediment accumulation that can be attributed to your discharge? ☐ Yes ☐ No If yes, describe what you see, specify the location(s) where these conditions were found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue:
2.	Describe the discharge: At points of discharge and the channels and banks of waters of the U.S. in the immediate vicinity, are there any visible signs of erosion and/or sediment accumulation that can be attributed to your discharge? ☐ Yes ☐ No If yes, describe what you see, specify the location(s) where these conditions were found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue:

Instructions for Filling Out the "Stabilization of Exposed Soil" Table

Stabilization Area
List all areas where soil stabilization is required to begin because construction work in that area has permanently stopped or temporarily stopped (i.e., work will stop for 14 or more days), and all areas where stabilization has been implemented.

Stabilization Method
For each area, specify the method of stabilization (e.g., hydroseed, sod, planted vegetation, erosion control blanket, mulch, rock).

Have You Initiated Stabilization
For each area, indicate whether stabilization has been initiated.

Notes
For each area where stabilization has been initiated, describe the progress that has been made, and what additional actions are necessary to complete stabilization. Note the effectiveness of stabilization in preventing erosion. If stabilization has been initiated but not completed, make a note of the date it is to be completed. If stabilization has been completed, make a note of the date it was completed. If stabilization has not yet been initiated, make a note of the date it is to be initiated, and the date it is to be completed.

Instructions for Filling Out the "Description of Discharges" Table

You are only required to complete this section if a discharge is occurring at the time of the inspection.

Was a Stormwater Discharge Occurring From Any Part of Your Site At The Time of the Inspection?
During your inspection, examine all points of discharge from your site, and determine whether a discharge is occurring. If there is a discharge, answer "yes" and complete the questions below regarding the specific discharge. If there is not a discharge, answer "no" and skip to the next page.

Discharge Location (repeat as necessary if there are multiple points of discharge)
Location of discharge. Specify the location on your site where the discharge is occurring. The location may be an outlet from a stormwater control or constructed stormwater channel, a discharge into a storm sewer inlet, or a specific point on the site. Be as specific as possible; it is recommended that you refer to a precise point on your site map.

Describe the discharge. Include a specific description of any noteworthy characteristics of the discharge such as color; odor; floating, settled, or suspended solids; foam; oil sheen; and other obvious pollution indicators.

Are there visible signs of erosion or sediment accumulation? At each point of discharge and the channel and streambank in the immediate vicinity, visually assess whether there are any obvious signs of erosion and/or sediment accumulation that can be attributed to your discharge. If you answer "yes", include a description in the space provided of the erosion and sediment deposition that you have found, specify where on the site or in the water of the U.S. it is found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue.

Contractor or Subcontractor Signature and Certification (see reverse for instructions)
"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." **Signature of Contractor or Subcontractor:** ______________________ **Date:** **Printed Name and Affiliation:** ______________________

Operator Signature and Certification (see reverse for instructions)
"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." **Signature of Operator or "Duly Authorized Representative":** ______________________ **Date:** **Printed Name and Affiliation:** ______________________

Instructions for Signature/Certification

Each inspection report must be signed and certified to be considered complete.

Contractor or Subcontractor Signature and Certification

Where you rely on a contractor or subcontractor to carry out the inspection and complete the inspection report, you should require the inspector to sign and certify each report. Note that this does not relieve you, the permitted operator, of the requirement to sign and certify the inspection report as well.

Operator Signature and Certification

At a minimum, the inspection report must be signed by either (1) the person who signed the NOI, or (2) a duly authorized representative of that person. The following requirements apply to scenarios (1) and (2):

If the signatory will be the person who signed the NOI for permit coverage, as a reminder, that person must be one of the following types of individuals:

- *For a corporation*: A responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- *For a partnership or sole proprietorship*: A general partner or the proprietor, respectively.
- *For a municipality, state, federal, or other public agency*: Either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

If the signatory will be a duly authorized representative, the following requirements must be met:

- The authorization is made in writing by the person who signed the NOI (see above);
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

Attachment E – Corrective Action Form

2017 Construction General Permit
Corrective Action Report Form – Field Version

Purpose
This Corrective Action Report Form is to assist you in preparing corrective action reports for EPA's 2017 Construction General Permit (CGP). If you are covered under EPA's 2017 CGP, you can use this form to create a corrective action report that complies with the minimum reporting requirements of Part 5.4 of the permit.

You are only required to fill out this form if one of the conditions triggering corrective action in Part 5.1 or 5.3 occurs on your site. Routine maintenance is generally not considered to trigger corrective action. Corrective actions are triggered only for specific conditions that are identified below in the "Overview of Corrective Action Requirements."

If you are covered under a state CGP, this form may be helpful in developing a report that can be used for that permit; however, it will need to be modified to meet the specific requirements of the permit. If your permitting authority requires you to use a specific corrective action report form, you should not use this form.

Notes
While EPA has made every effort to ensure the accuracy of all instructions contained in the Corrective Action Report Form, it is the permit, not the form, that determines the actual obligations of regulated construction stormwater discharges. In the event of a conflict between the Corrective Action Report Form and any corresponding provision of the 2017 CGP, you must abide by the requirements in the permit. EPA welcomes comments on the Corrective Action Report Form at any time and will consider those comments in any future revision of this document. You may contact EPA for CGP-related inquiries at cgp@epa.gov.

Overview of Corrective Action Requirements
Construction operators covered under the 2017 CGP are required to conduct corrective actions and report on progress made in correcting the problem condition(s) in accordance with the following requirements:

Conditions Triggering Corrective Action (Parts 5.1 and 5.3)
Corrective action is required whenever any of the following conditions occur at your site:

- A stormwater control needs repair or replacement (beyond routine maintenance required under Part 2.1.4); or
- A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly; or
- Discharges are causing an exceedance of applicable water quality standards; or
- A Part 1.3 prohibited discharge has occurred; or
- EPA requires corrective action as a result of permit violations found during an inspection carried out under Part 4.8.

Deadlines for Completing Corrective Actions (Part 5.2)
For any condition triggering corrective action:

- You must immediately take all reasonable steps to address the condition (e.g. cleaning up contaminated surfaces so the material(s) is not discharged in subsequent storm events);
- If the problem does not require a new or replacement control or significant repair, you must complete the corrective action by the close of the next business day
- If the problem does require a new or replacement control or significant repair, you must complete corrective action (e.g., installing and making operational any new or modified control, completing repairs) by no later than 7 calendar days from the time of discovery of the condition. If infeasible to complete the installation or repair within 7 calendar days, you must document why it is infeasible and document your schedule for completing the corrective action as soon as practicable. If any of these actions result in changes to the stormwater controls documented in your SWPPP, you must modify your SWPPP within 7 calendar days.

Deadlines for Documenting Corrective Actions in a Report (Part 5.4)
You are required to complete a corrective action report for each corrective action you take in accordance with the following deadlines.

- Within 24 hours of *identifying* the corrective action condition, you must document the following:
  - The condition identified at your site; and
  - The date and time you identified the condition

- Within 24 hours of completing the corrective action, you must document the following:
  - The actions you took to address the condition, and
  - Whether any SWPPP modifications are required.

Instructions for Using This Report Form
This Field Version of the Corrective Action Report Form is intended to be used in the field and filled out by hand. If you will be filling out the Corrective Action Report Form electronically (i.e., you will be typing in your findings), please use the Electronic Version of the Corrective Action Report Form available at https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources. The Electronic Version includes text fields with instructions for what to enter.

The following tips for using this form will help you ensure that the minimum permit requirements are met:

- **Review the corrective action requirements.** Before you fill out this corrective action report form, read the CGP's Part 5 corrective action requirements. This will ensure that you have a working understanding of the permit's underlying corrective action requirements.

- **Complete a separate report for each condition that triggers corrective action.** For each triggering condition on your site, you will need to fill out a separate corrective action report form.

- **Complete all required text fields.** Fill out all text fields. Only by filling out all fields will the form be compliant with the requirements of the permit. (Note: Where you do not need the number of rows provided in the corrective action report form, you may leave those rows blank. Or, if you need more space to document your findings, you may add an additional sheet.)

- **Sign and certify each corrective action report.** The operator or a duly authorized representative (see Appendix I, Part I.11.2) must sign and certify each corrective action report form for it to be considered complete. Where a contractor or subcontractor carries out your corrective actions, it is recommended that you also have that individual sign and certify the form, in addition to the signature and certification required of the permitted operator. The form includes a signature block for both parties.

- **Include the corrective action report form with your SWPPP.** Once your form is complete, make sure to include a copy of the corrective action report form in your SWPPP in accordance with Part 7.2.7.e of the CGP.

- **Retain copies of all corrective action reports with your records.** You must retain copies of your corrective action reports in your records in accordance with the requirements in Part 5.4.4 of the 2017 CGP. These reports must be retained for at least 3 years from the date your permit coverage expires or is terminated.

Section-by-Section Instructions
You will find specific instructions corresponding to each section of the report form on the reverse side of each page. These instructions were written in order to provide you with more details in terms of what EPA expects to be documented in these reports

Section A – Initial Report (CGP Part 5.4.1) (Complete this section within 24 hours of identifying the condition that triggered corrective action)					
Name of Project		**NPDES ID No.**		**Today's Date**	
Date Problem First Discovered		**Time Problem First Discovered**			
Name and Contact Information of Individual Completing this Form					

What site conditions triggered the requirement to conduct corrective action *(check the box that applies)*:

- ☐ A stormwater control needs repair or replacement (beyond routine maintenance required under Part 2.1.4)
- ☐ A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly
- ☐ A discharge is causing an exceedance of applicable water quality standards
- ☐ A Part 1.3 prohibited discharge has occurred
- ☐ EPA requires corrective action as a result of permit violations found during an EPA inspection carried out under Part 4.8

Provide a description of the problem:

Deadline for completing corrective action *(check the box that applies)*:

- ☐ Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events
- ☐ Complete by close of the next business day when problem does not require a new or replacement control or significant repair
- ☐ No later than 7 calendar days from the time of discovery for problems that require a new or replacement control or significant repair
- ☐ Infeasible to complete the installation or repair within 7 calendar days. Explain why it is infeasible and document schedule for installing control:

Enter date of corrective action completion: ______________________

Section B – Corrective Action Completion (CGP Part 5.4.2)

(Complete this section no later than 24 hours after completing the corrective action)

Section B.1 – Why the Problem Occurred

Cause(s) of Problem *(Add an additional sheet if necessary)*	**How You Determined the Cause and the Date You Determined the Cause**
1.	**1.**
2.	**2.**

Section B.2 – Stormwater Control Modifications Implemented to Correct the Problem

List of Stormwater Control Modification(s) Needed to Correct Problem *(Add an additional sheet if necessary)*	**Date of Completion**	**SWPPP Update Necessary?**	**Notes**
1.		☐Yes ☐No If yes, provide date SWPPP modified:	
2.		☐Yes ☐No If yes, provide date SWPPP modified:	

Instructions for Filling Out the Initial Report (Section A)

You must complete Section A of the report form within 24 hours of discovering the condition that triggered corrective action

Name of Project
Enter the name for the project.

NPDES ID No.
Enter the NPDES ID number that was assigned to your NOI for permit coverage.

Today's Date
Enter the date you completed this form.

Date/Time Problem First Discovered
Specify the date on which the triggering condition was first discovered. Also specify the time of the discovery.

Name/Contact Information
Provide the individual's name, title, and contact information as directed in the form.

Site Condition That Triggered Corrective Action
Under the CGP, corrective action is required when one of 4 triggering conditions occurs at your site or when EPA requires a corrective action as a result of a permit violation found during an EPA inspection. See CGP Parts 5.1 and 5.3. Check the box that corresponds to the condition that triggered this corrective action.

Description of the Site Condition
Provide a summary description of the condition you found that triggered corrective action under CGP Part 5.1 and the specific location where it was found. Be as specific as possible about the location; it is recommended that you refer to a precise point on your site map. If you have already provided this explanation in an inspection report, you can refer to that report.

Deadline for Completing Corrective Action
This deadline is fixed in CGP Part 5.2. For all projects, the deadlines are: (1) immediately take all reasonable steps; (2) by the close of the next business day when the problem does not require significant repair or replacement; (3) no more than 7 calendar days after the date you discovered the problem when the problem does require significant repair or replacement, or (4) if it is infeasible to complete work within the first 7 days, as soon as practicable following the 7th day. If your estimated date of completion falls after the 7-day deadline consistent with (3), above, explain (a) why you believe it is infeasible to complete work within 7 days, and (b) why the date you have established for making the new or modified stormwater control operational is the soonest practicable timeframe.

Instructions for Filling Out the Corrective Action Completion Table (Section B)

You must complete Section B of the report form no later than 24 hours after completing the correction action.

Section B.1 – Why the Problem Occurred
After you have had the opportunity to examine the problem more closely, provide details as to what you believe to be the cause of the problem, and specify the follow-up actions you took (along with the dates of such actions) to diagnose the problem. This is consistent with CGP Part 5.4.2.

Section B.2 – Stormwater Control Modifications Implemented
Provide a list of modifications you made to your stormwater controls to correct the problem and the date you completed such work. Keep in mind that your work must be completed within the timeline specified in Section A for the completion of corrective action work.

Also, if a SWPPP modification is necessary consistent with Part 7.4.1.a in order to reflect changes implemented at your site, indicate the date you modified your SWPPP. Keep in mind that SWPPP changes must be made within 7 days of discovering the problem that triggered this corrective action.

Space is provided for you to include additional notes or observations regarding the change that you implemented at your site to correct the problem.

Section C –Signature and Certification (CGP Part 5.4.3)

Section C.1 – Contractor or Subcontractor Signature and Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature of Contractor or Subcontractor: ______________________________

Date:

Printed Name and Affiliation: ______________________________

Section C.2 – Operator Signature and Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature of Operator or "Duly Authorized Representative": ______________________________

Date:

Printed Name and Affiliation: ______________________________

Instructions for Signature and Certification (Section C)

Each corrective action report must be signed and certified to be considered complete.

Section C.1 – Contractor or Subcontractor Signature and Certification
Where you rely on a contractor or subcontractor to complete this report and the associated corrective action, you should require the individual(s) to sign and certify each report. Note that this does not relieve you, the permitted operator, of the requirement to sign and certify the report as well.

Section C.2 – Operator Signature and Certification
At a minimum, the corrective action report form must be signed by either (1) the person who signed the NOI, or (2) a duly authorized representative of that person. The following requirements apply to scenarios (1) and (2):

If the signatory will be the person who signed the NOI for permit coverage, as a reminder, that person must be one of the following types of individuals:

- *For a corporation*: A responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- *For a partnership or sole proprietorship*: A general partner or the proprietor, respectively.
- *For a municipality, state, federal, or other public agency*: Either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

If the signatory will be a duly authorized representative, the following requirements must be met:

- The authorization is made in writing by the person who signed the NOI (see above);
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

Attachment F – SWPPP Amendment Log

No.	Description of the Amendment	Date of Amendment	Amendment Prepared by [Name(s) and Title]

Attachment G –Subcontractor Certifications/Agreements

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

Project Number: ____

Project Title: ____

Operator(s): ____

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform onsite. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: ____

Address: ____

Telephone Number: _______________________________

Type of construction service to be provided: ______________________________________

____

____

Signature: _______________________________

Title: _______________________________

Date: _______________________________

Attachment H – Grading and Stabilization Activities Log

Date Grading Activity Initiated	**Description of Grading Activity**	**Description of Stabilization Measure and Location**	**Date Grading Activity Ceased** (Indicate Temporary or Permanent)	**Date When Stabilization Measures Initiated**

Attachment I – SWPPP Training Log

Stormwater Pollution Prevention Training Log

Project Name:

Project Location:

Instructor's Name(s):

Instructor's Title(s):

Course Location: ____ Date: _____________________

Course Length (hours): ___________________________________

Stormwater Training Topic: (*check as appropriate)*

- ❑ **Sediment and Erosion Controls**
- ❑ **Stabilization Controls**
- ❑ **Pollution Prevention Measures**
- ❑ **Emergency Procedures**
- ❑ **Inspections/Corrective Actions**

Specific Training Objective:____

____

Attendee Roster: (*attach additional pages as necessary)*

No.	Name of Attendee	Company
1		
2		
3		
4		
5		
6		
7		
8		

Attachment J – Delegation of Authority Form

Delegation of Authority

I, ________________________ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction General Permit, at the _____________________________________ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

____ (name of person or position)
____ (company)
____ (address)
____ (city, state, zip)
____ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in Appendix I of EPA's Construction General Permit (CGP), and that the designee above meets the definition of a "duly authorized representative" as set forth in Appendix I.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: ____

Company: ____

Title: ____

Signature: ____

Date: ____

Attachment K – Endangered Species Documentation

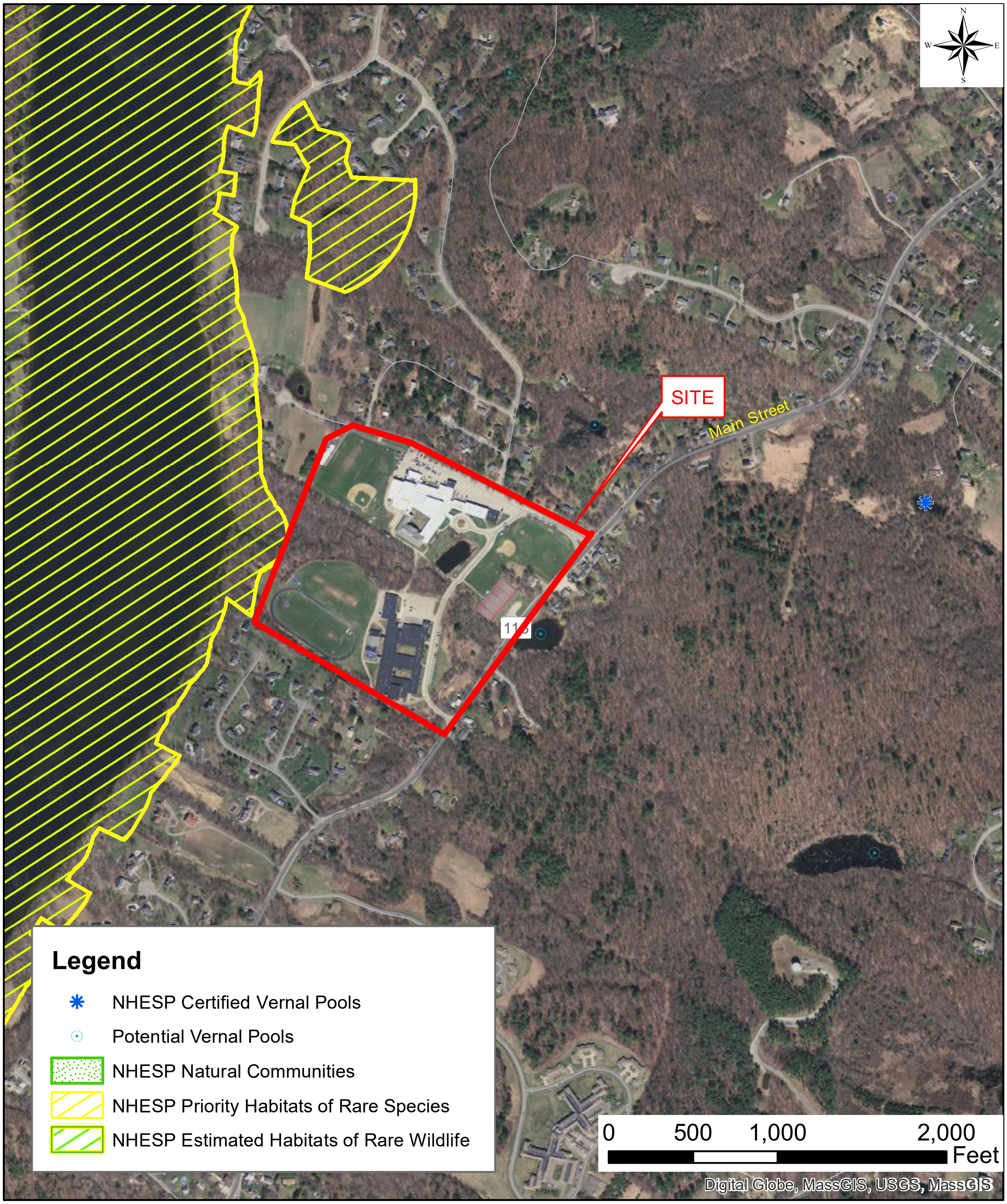


Figure K-1: NHESP Map
24 Main Street
West Newbury, MA

Data Source: MassGIS
Nitsch Project #12360

Nitsch Engineering

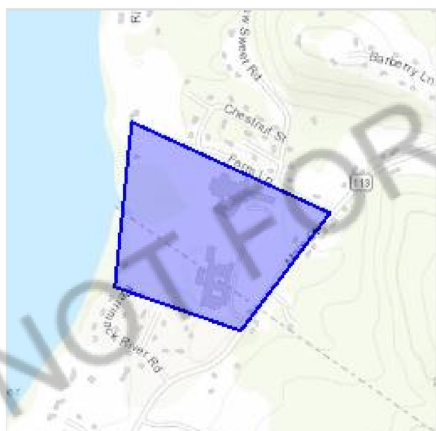
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Essex County, Massachusetts



Local office

New England Ecological Services Field Office

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

http://www.fws.gov/newengland

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species

[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act

[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Black-billed Cuckoo Coccyzus erythropthalmus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Canada Warbler Cardellina canadensis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Evening Grosbeak Coccothraustes vespertinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere

Lesser Yellowlegs *Tringa flavipes* — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Prairie Warbler *Dendroica discolor* — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler *Protonotaria citrea* — Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Rusty Blackbird *Euphagus carolinus* — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush *Hylocichla mustelina* — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

[PEM1/SS1E]

FRESHWATER FORESTED/SHRUB WETLAND

[PFO1A]

FRESHWATER POND

[PUBHx]

RIVERINE

[R5UBH]

[R4SBC]

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

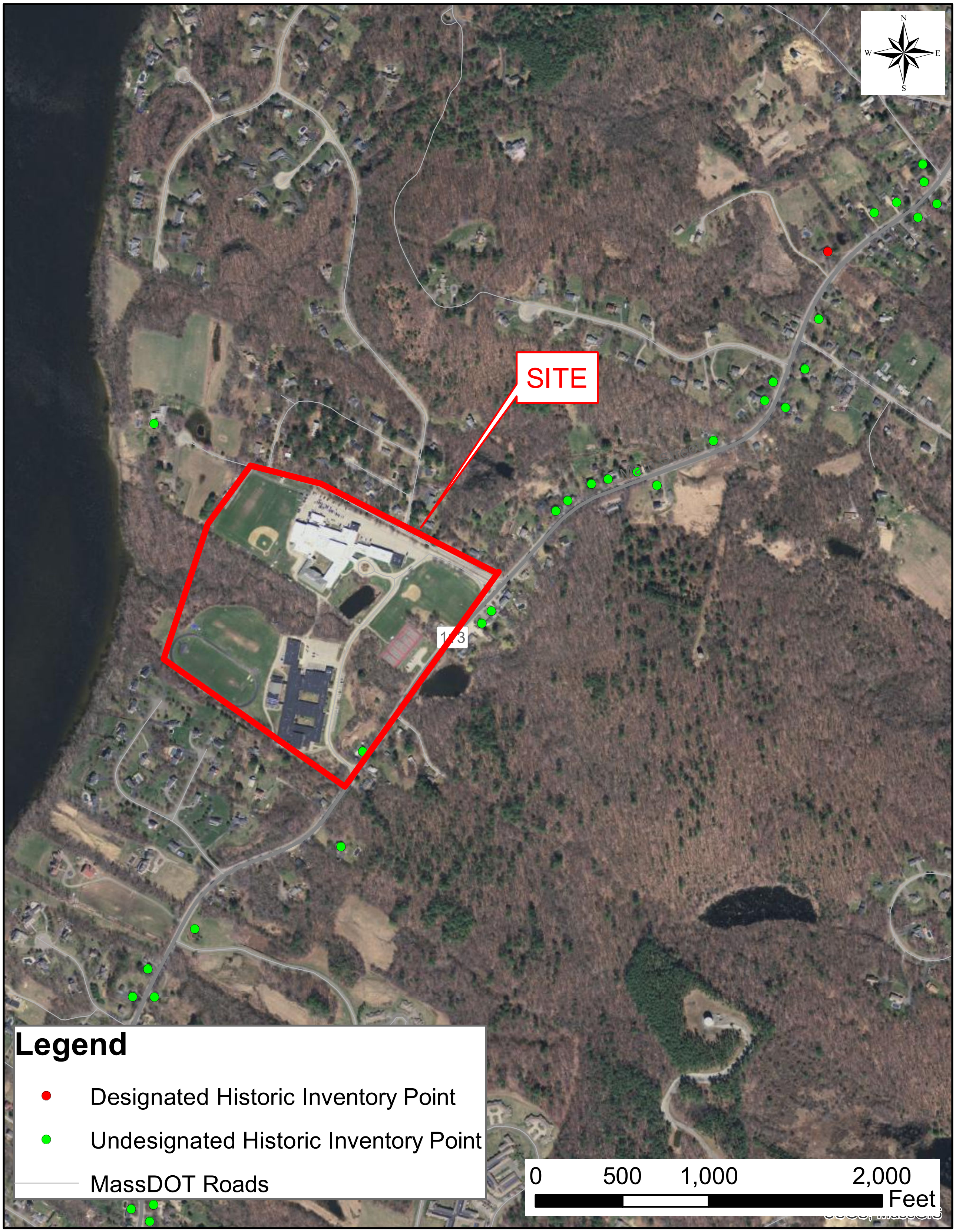
Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Attachment L – Historic Preservation Documentation



Attachment L: Historic Inventory Map

24 Main Street
West Newbury, MA

Data Source: MassGIS
Nitsch Project #12360

Nitsch Engineering

Attachment M – Rainfall Gauge Recording

Use the table below to record the rainfall gauge readings at the beginning and end of each work day. An example table follows.

Month/Year			Month/Year			Month/Year		
Day	Start time	End time	Day	Start time	End time	Day	Start time	End time
1			1			1		
2			2			2		
3			3			3		
4			4			4		
5			5			5		
6			6			6		
7			7			7		
8			8			8		
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27			27			27		
28			28			28		
29			29			29		
30			30			30		
31			31			31		

Figure M: Location of NOAA Rain Gauge

24 Main Street
West Newbury, MA

Data Source: MassGIS
Nitsch Project #12360

Nitsch Engineering

APPENDIX G – UNDER SEPARATE COVER

Soil Investigations

APPENDIX H

Town of West Newbury Drainage Infrastructure Plan

Town of West Newbury
Drainage Infrastructure

Legend

Census Urbanized Area	Outfall
Town Boundary	**Pipe**
Water	Drain Pipe
Road	Swale/Ditch
Interstate	Drainage Area
Roads	Property Parcels

0 1,000 2,000 Feet

Merrimack Valley Planning Commission
plan • develop • promote

Path: J:\Projects\WestNewbury\2018\OutfallsPipes_WestNewbury_DrainageInfrastructure_26x36.mxd

Revised: 8/16/2018 MM