Streamlined Stormwater Management Report

According to the Massachusetts Department of Environmental Protection Stormwater Management Regulations, the project is considered a redevelopment project. As such, the project has been designed to meet all applicable standards of the MassDEP Stormwater Management Handbook to the maximum extent practicable. In accordance with the DEP Stormwater Management Handbook, Standards 1,8, 9, and 10 must be met fully, while the remaining standards must be met to the maximum extent practicable.

Standard 1: New Stormwater Conveyances

Per Massachusetts Stormwater Management Standard #1, no new outfalls may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth. The two existing outfall locations are being maintained, there are no new outfalls. On the south side of the bridge crossing, on both sides of the road, a 1-foot-deep grass swale with grassed check dams are proposed to reduce runoff rates, promote infiltration, and provide treatment to runoff prior to discharging to the Catacoonamug Brook. On the north side of the bridge crossing, a grassed drainage ditch is proposed on the east side of the roadway. Drop inlets with deep sumps will collect excess runoff at the bottom of the swales and ditch. New deep sump catch basin will replace the existing catch basins within the roadway near the bridge crossing. Runoff direct to the drop inlets and catch basins will flow to new drain manholes and from there the runoff is directed to flared end sections, one in the southeast quadrant and one in the northwest quadrant, that discharge towards the brook into stone for pipe ends.

The deep sump catch basins will provide 25% TSS removal and the grassed swales with grassed check dams will provide up to 50% TSS removal.

Standard 2: Stormwater Runoff Rates

This project proposes to reduce the impervious area of the road and replace with grass swales. This will result in lower post-development runoff rates versus pre-development rates. As a redevelopment project, this standard is not applicable, however, the proposed design meets this standard to the maximum extent practicable.

	Existing Conditions (cfs)	Proposed Improvements (cfs)	Change in Peak Runoff (cfs)
2-year Peak Runoff	1.22	0.91	-0.31
10-year Peak Runoff	2.01	1.74	-0.27
100-year Peak Runoff	3.87	3.83	-0.04

Standard 3: Groundwater Recharge

As a redevelopment project, this standard is not applicable. The proposed grassed swales with grassed check dams will promote infiltration and provide increased groundwater recharge over existing conditions. As a redevelopment project, this standard has been met to the maximum extent practicable.

Standard 4: Water Quality

As a redevelopment project, this standard is not applicable. However, the two grassed swales and drainage ditch will be implemented to improve the water quality of the runoff at the site. As a redevelopment project, this standard has been met to the maximum extent practicable.

Standard 5: Land Uses with Higher Pollutant Loads (LUHPPL)

The Project is not a land use with higher potential pollutant loads.

Standard 6: Stormwater Discharges to a Critical Area

As a redevelopment project, this standard is not applicable. The project is located within a Critical Area, the Catacoonamug Brook is identified as a Cold-Water Fishery. The deep sump catch basins and grassed swales and drainage ditch will provide increased runoff treatment over existing conditions. As a redevelopment project, this standard has been met to the maximum extent practicable.

Standard 7: Redevelopment Projects

This project is a redevelopment project. In accordance with the DEP Stormwater Management Handbook, standards 1, 8, 9 and 10 have been fully met. In addition, the project has met all other standards (Standards 2, 3, 4, 5, 6, and 7) to the maximum extent practicable.

Standard 8: Sedimentation and Erosion Control Plan

Erosion control measures, including silt sacks in catch basins and sediment control barriers placed at the bottom of proposed slopes and limits of work will be installed during construction.

Standard 9: Long Term Operations and Maintenance Plan

Temporarily impacted areas associated with project construction activities will be restored following the completion of project work and will result in an overall improvement over existing condition. Proposed project activities will not be considered complete until the areas disturbed as part of project activities are considered adequately stabilized, as determined by the Devens Enterprise Commissions.

Standard 10: Illicit Discharges to the Stormwater Management System are Prohibited

There are no known illicit discharges to the proposed Stormwater Management System.

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.

[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.

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

Checklist for Stormwater Report

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

4/20/22
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

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

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.

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

Checklist for Stormwater Report

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

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]

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

☐ 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.

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

Checklist for Stormwater Report

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.

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

Checklist for Stormwater Report

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.

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

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.

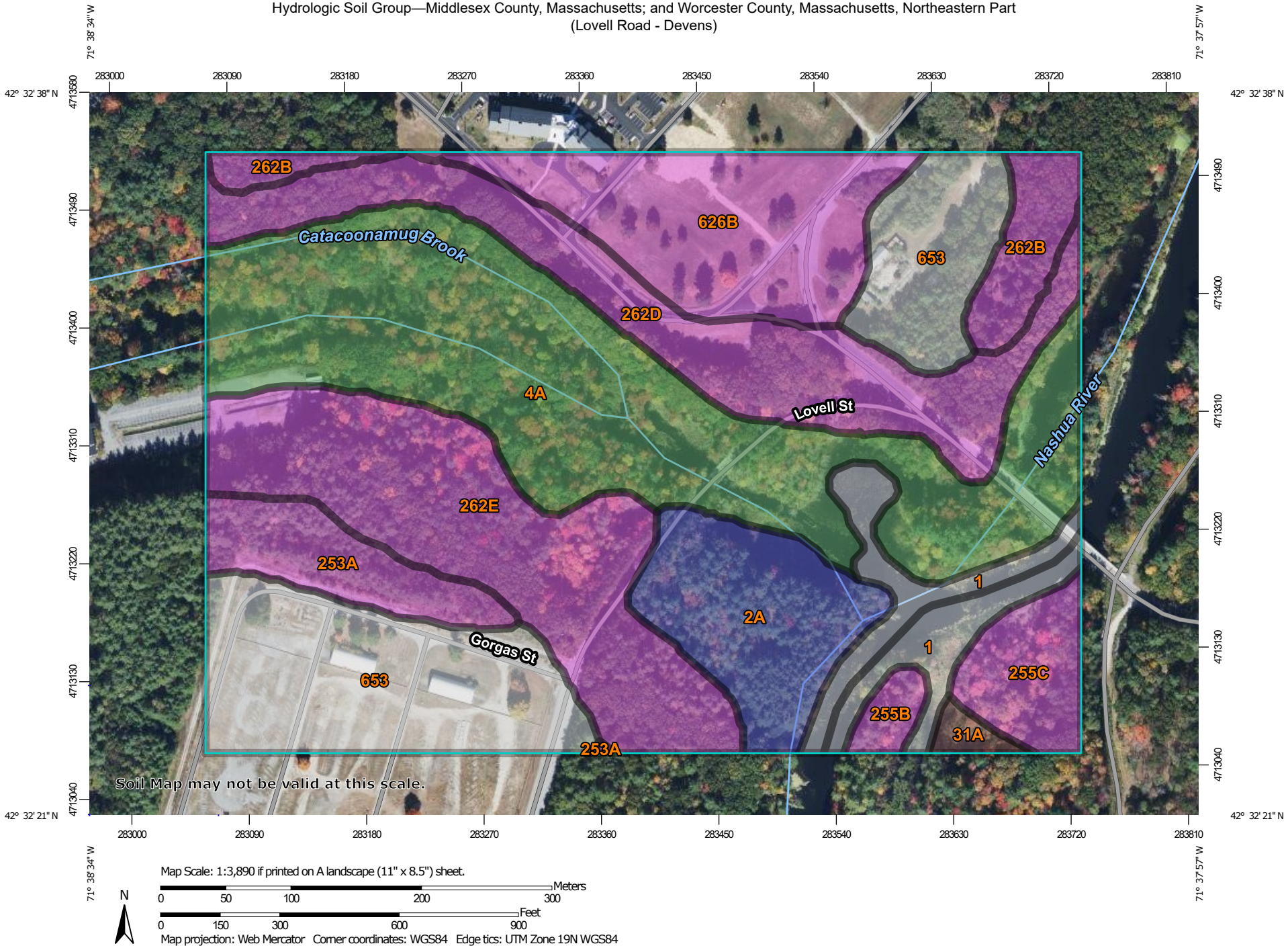
Standard 10: Prohibition of Illicit Discharges

☐ 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.

Hydrologic Soil Group—Middlesex County, Massachusetts; and Worcester County, Massachusetts, Northeastern Part
(Lovell Road - Devens)



Map Scale: 1:3,890 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 21, Sep 2, 2021

Soil Survey Area: Worcester County, Massachusetts, Northeastern Part
Survey Area Data: Version 16, Sep 3, 2021

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Aug 13, 2020—Oct 18, 2020

MAP LEGEND

MAP INFORMATION

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		2.0	2.6%
2A	Pootatuck fine sandy loam, 0 to 3 percent slopes, occasionally flooded	B	5.3	6.9%
4A	Rippowam fine sandy loam, 0 to 3 percent slopes, frequently flooded	A/D	19.8	25.9%
253A	Hinckley loamy sand, 0 to 3 percent slopes	A	2.9	3.9%
262B	Quonset sandy loam, 3 to 8 percent slopes	A	2.5	3.3%
262D	Quonset sandy loam, 15 to 25 percent slopes	A	9.0	11.8%
262E	Quonset sandy loam, 25 to 35 percent slopes	A	11.0	14.4%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	A	7.3	9.5%
653	Udorthents, sandy		11.4	14.9%
Subtotals for Soil Survey Area			**71.2**	**93.2%**
Totals for Area of Interest			**76.4**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		1.7	2.3%
31A	Walpole sandy loam, 0 to 3 percent slopes	B/D	0.4	0.6%
255B	Windsor loamy sand, 3 to 8 percent slopes	A	0.7	0.9%
255C	Windsor loamy sand, 8 to 15 percent slopes	A	2.4	3.1%
Subtotals for Soil Survey Area			**5.2**	**6.8%**
Totals for Area of Interest			**76.4**	**100.0%**

Description

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

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

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

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

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

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

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

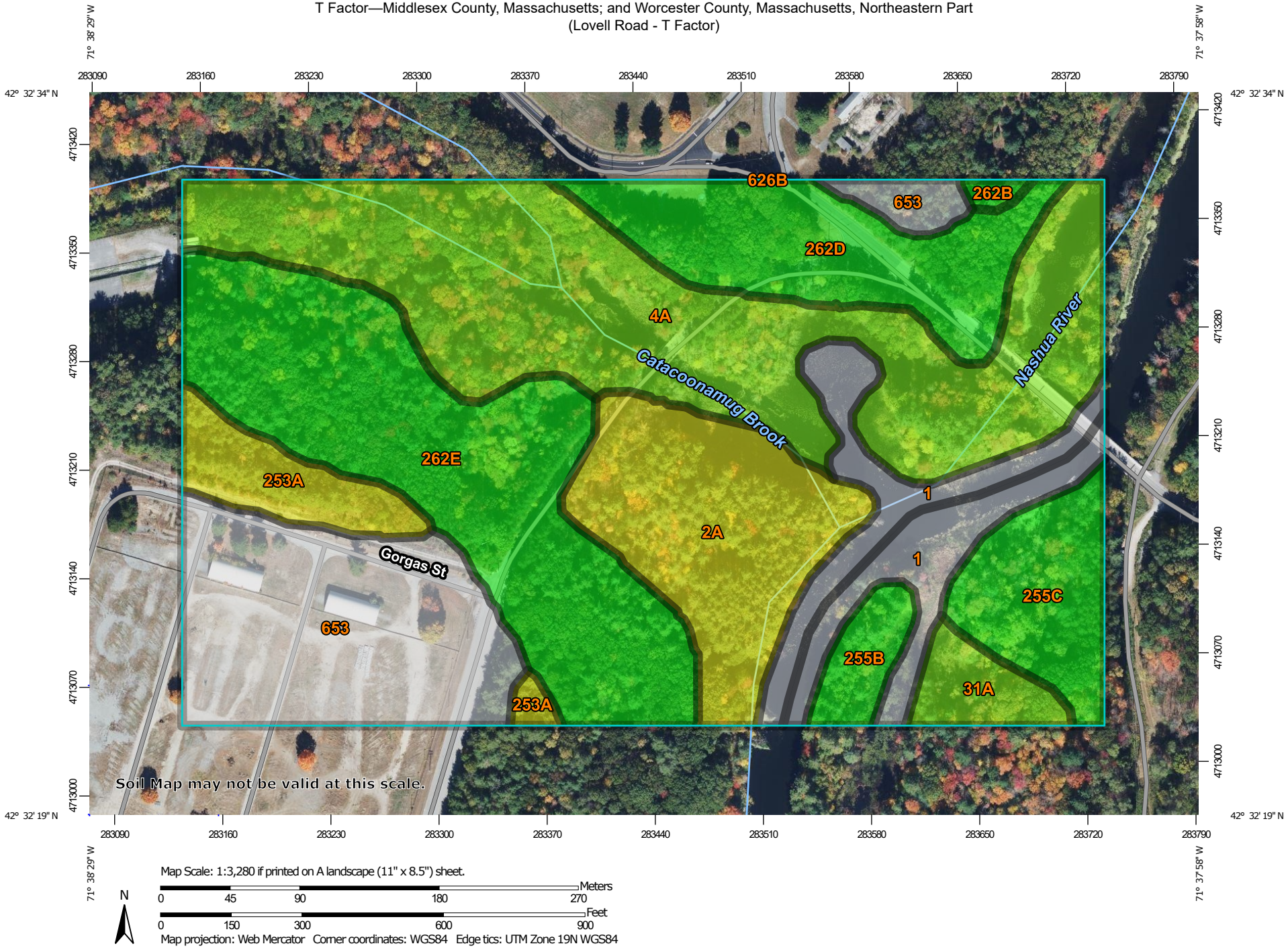
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

T Factor—Middlesex County, Massachusetts; and Worcester County, Massachusetts, Northeastern Part
(Lovell Road - T Factor)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- 1
- 2
- 3
- 4
- 5
- Not rated or not available

Soil Rating Lines
- 1
- 2
- 3
- 4
- 5
- Not rated or not available

Soil Rating Points
- 1
- 2
- 3
- 4
- 5
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

Date(s) aerial images were photographed: Aug 13, 2020—Oct 18, 2020

MAP LEGEND

MAP INFORMATION

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T Factor

Map unit symbol	Map unit name	Rating (tons per acre per year)	Acres in AOI	Percent of AOI
1	Water		2.1	4.1%
2A	Pootatuck fine sandy loam, 0 to 3 percent slopes, occasionally flooded	3	5.6	10.7%
4A	Rippowam fine sandy loam, 0 to 3 percent slopes, frequently flooded	4	13.7	26.2%
253A	Hinckley loamy sand, 0 to 3 percent slopes	3	1.9	3.7%
262B	Quonset sandy loam, 3 to 8 percent slopes	5	0.2	0.3%
262D	Quonset sandy loam, 15 to 25 percent slopes	5	4.8	9.2%
262E	Quonset sandy loam, 25 to 35 percent slopes	5	10.0	19.2%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	4	0.0	0.0%
653	Udorthents, sandy		7.2	13.7%
Subtotals for Soil Survey Area			**45.4**	**87.1%**
Totals for Area of Interest			**52.2**	**100.0%**

Map unit symbol	Map unit name	Rating (tons per acre per year)	Acres in AOI	Percent of AOI
1	Water		2.0	3.8%
31A	Walpole sandy loam, 0 to 3 percent slopes	4	1.1	2.1%
255B	Windsor loamy sand, 3 to 8 percent slopes	5	1.0	1.9%
255C	Windsor loamy sand, 8 to 15 percent slopes	5	2.7	5.2%
Subtotals for Soil Survey Area			**6.7**	**12.9%**
Totals for Area of Interest			**52.2**	**100.0%**

Description

The T factor is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Rating Options

Units of Measure: tons per acre per year

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Calculation Sheet

BSC GROUP

Project No. 23365.06
Subject Devens - Lovell Road
Location Devens (Shirley), MA

Calc By DX
Date 4/19/2022
Checked by KLE
Date 4/20/2022

Existing Drainage Areas

AREA No.	TOTAL AREA (SF)	TOTAL AREA (AC)	IMPERVIOUS AREA (SF)	IMPERVIOUS AREA (AC)	PERVIOUS AREA (SF)	PERVIOUS AREA (AC)	GRAVEL AREA (SF)	GRAVEL AREA (AC)
1 (NW)	8,500	0.20	6,245	0.14	2,244	0.05	0	0.00
2 (SW)	8,700	0.20	6,800	0.16	1,900	0.04	0	0.00
3 (NE&SE)	1,920	0.04	1,920	0.04	0	0.00	0	0.00
4 (BRIDGE)	2,660	0.06	2,660	0.06	0	0.00	0	0.00
TOTAL AREA	**21,780**	**0.50**	**17,625**	**0.40**	**4,144**	**0.10**	**0**	**0.00**

Calculation Sheet

BSC GROUP

Project No. 23365.06
Subject Devens - Lovell Road
Location Devens (Shirley), MA

Calc By DX
Date 4/19/2022
Checked by KLE
Date 4/20/2022

Proposed Drainage Areas

AREA No.	TOTAL AREA (SF)	TOTAL AREA (AC)	IMPERVIOUS AREA (SF)	IMPERVIOUS AREA (AC)	PERVIOUS AREA (SF)	PERVIOUS AREA (AC)	GRAVEL AREA (SF)	GRAVEL AREA (AC)
1 (NW-W)	8,070	0.19	4,215	0.10	3,855	0.09	0	0.00
2 (NW-E)	1,480	0.03	1,480	0.03	0	0.00	0	0.00
3 (SW-W)	7,555	0.17	4,415	0.10	3,140	0.07	0	0.00
4 (SW-E)	1,435	0.03	1,435	0.03	0	0.00	0	0.00
5 (BRIDGE)	2,185	0.05	2,185	0.05	0	0.00	0	0.00
6 (NE-W)	330	0.01	330	0.01	0	0.00	0	0.00
7 (NE)	2,290	0.05	2,290	0.05	0	0.00	0	0.00
8 (EAST)	6,380	0.15	4,755	0.11	1,625	0.04	0	0.00
TOTAL AREA	**29,725**	**0.68**	**21,105**	**0.48**	**8,620**	**0.20**	**0**	**0**

TSS Removal Calculation Worksheet

Location: Devens (Shirley), MA

Project: Devens - Lovell Road

BSC GROUP

Prepared By: DX

Date: 04/19/2022

Area S1

Total Impervious Area, Acres= 0.101

A	B	C	D	E
BMP	TSS Removal Rate	Starting TSS Load*	Amount Removed (BxC)	Remaining Load (C-D)
Drainage Channel	0.25	1.00	0.25	0.75
Deep Sump and Hooded Catchbasins	0.25	0.75	0.19	0.56

TSS Removal = 0.44

Area S2

Total Impervious Area, Acres= 0.033

A	B	C	D	E
BMP	TSS Removal Rate	Starting TSS Load*	Amount Removed (BxC)	Remaining Load (C-D)
Deep Sump and Hooded Catchbasins	0.25	1.00	0.25	0.75

TSS Removal = 0.25

Area Bridge

Total Impervious Area, Acres= 0.050

A	B	C	D	E
BMP	TSS Removal Rate	Starting TSS Load*	Amount Removed (BxC)	Remaining Load (C-D)
		1.00		1.00

TSS Removal = --

Area S3

Total Impervious Area, Acres= 0.053

A	B	C	D	E
BMP	TSS Removal Rate	Starting TSS Load*	Amount Removed (BxC)	Remaining Load (C-D)
Drainage Channel	0.25	1.00	0.25	0.75

TSS Removal = 0.25

Area S4

Total Impervious Area, Acres= 0.109

A	B	C	D	E
BMP	TSS Removal Rate	Starting TSS Load*	Amount Removed (BxC)	Remaining Load (C-D)
Drainage Channel	0.25	1.00	0.25	0.75
Deep Sump and Hooded Catchbasins	0.25	0.75	0.19	0.56

TSS Removal = 0.44

WEIGHTED AVERAGE

Total =Sum(Watershed Impervious Area * TSS Removal Rate)

Sum(Impervious Area)

Total Site TSS Removal = 0.33

Calculation Sheet

BSC GROUP

Project No.	23365.06	**Calc By**	DX
Subject	Devens - Lovell Road	**Date**	4/19/2022
Location	Devens (Shirley)	**Checked by**	KLE
		Date	4/20/2022

Swale Water Storage Volume

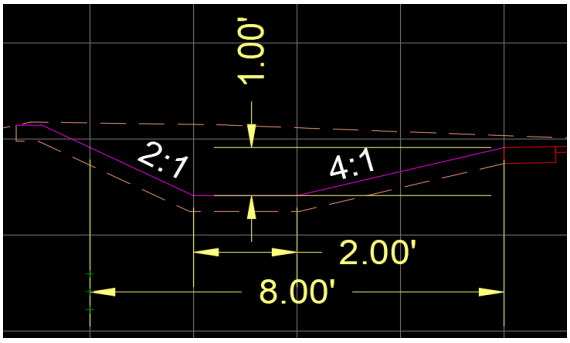
Take average swale slope from profile		5.5%	
Swale Size	Length	230	FT
	Bottom Width	2	FT
	Top Width	8	FT
	Depth	1	FT
Swale Water Storage		1150	CF

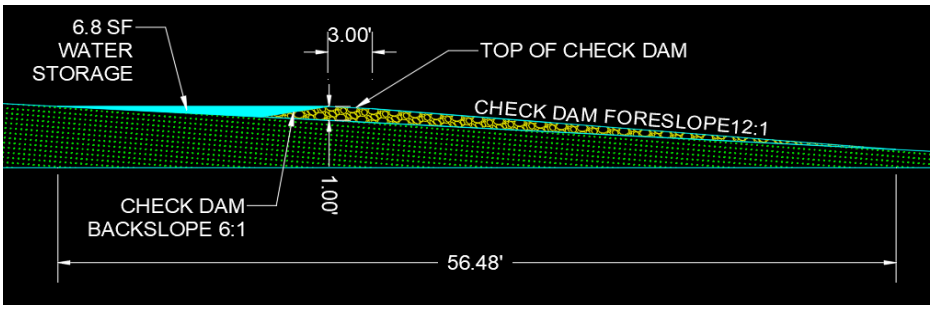
Check Dam Water Storage Volume

Water Storage Profile Section Area in CAD	6.8	SF
Check Dam Height	1	FT
# of Check Dam	3	EA
Check Dam Water Storage	81.6	CF

Required Water Quality Volume

Proposed Impervious Area	4215.00	SF
Water Quality Pretreatment Depth	0.10	IN
Water Quality Volume	35.13	CF





Calculation Sheet

BSC GROUP

Project No.	23365.06	**Calc By**	DX
Subject	Devens - Lovell Road	**Date**	4/19/2022
Location	Devens (Shirley)	**Checked by**	KLE
		Date	4/20/2022

Swale Water Storage Volume

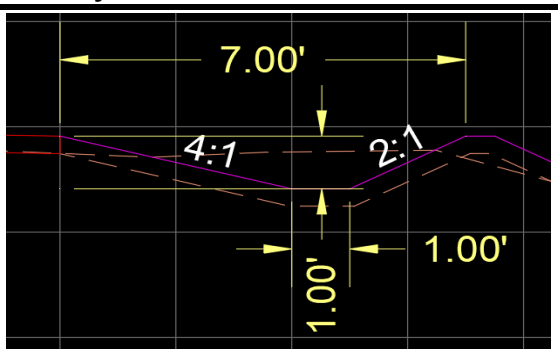
Take average swale slope from profile		5.5%	
Swale Size	Length	226	FT
	Bottom Width	1	FT
	Top Width	7	FT
	Depth	1	FT
Swale Water Storage		904	CF

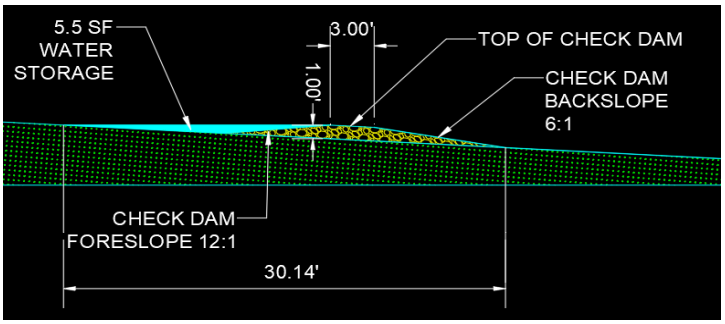
Check Dam Water Storage Volume

Water Storage Profile Section Area in CAD	5.5	SF
Check Dam Height	1	FT
# of Check Dam	7	EA
Check Dam Water Storage	115.5	CF

Required Water Quality Volume

Proposed Impervious Area	4415.00	SF
Water Quality Pretreatment Depth	0.10	IN
Water Quality Volume	36.79	CF





Calculation Sheet

BSC GROUP

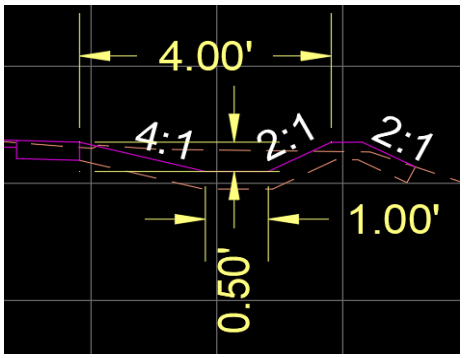
Project No.	23365.06	**Calc By**	DX
Subject	Devens - Lovell Road	**Date**	4/19/2022
Location	Devens (Shirley)	**Checked by**	KLE
		Date	4/20/2022

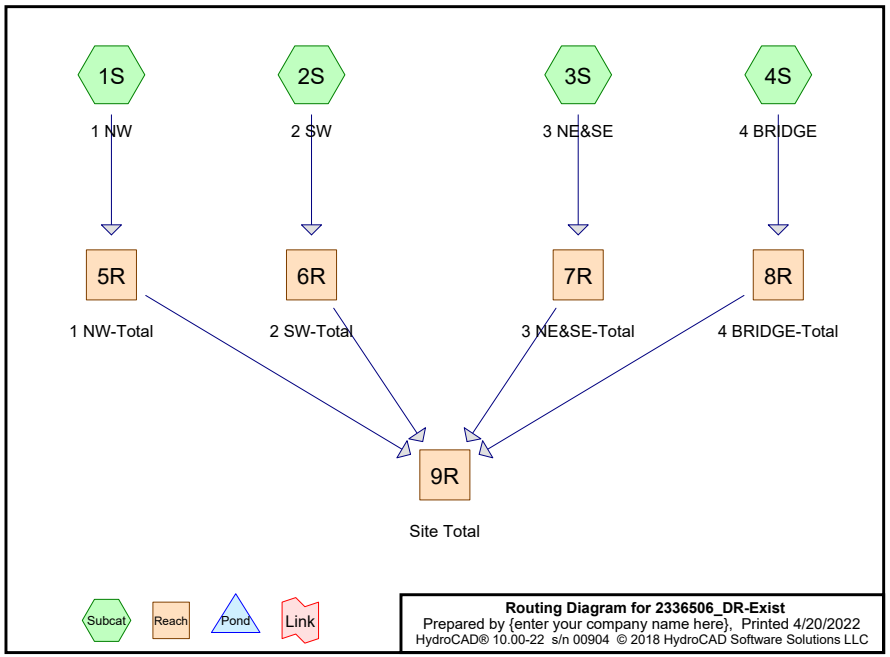
Ditch Water Storage Volume

Take average swale slope from profile		5.5%	
Swale Size	Length	183	FT
	Bottom Width	1	FT
	Top Width	4	FT
	Depth	0.5	FT
Swale Water Storage		228.75	CF

Required Water Quality Volume

Proposed Impervious Area	4755.00	SF
Water Quality Pretreatment Depth	0.10	IN
Water Quality Volume	39.63	CF





Routing Diagram for 2336506_DR-Exist
Prepared by {enter your company name here}, Printed 4/20/2022
HydroCAD® 10.00-22 s/n 00904 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.405	98	Paved roads w/curbs & sewers, HSG A (1S, 2S, 3S, 4S)
0.095	58	Woods/grass comb., Good, HSG B (1S, 2S)
0.500	**90**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.405	HSG A	1S, 2S, 3S, 4S
0.095	HSG B	1S, 2S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.500		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.405	0.000	0.000	0.000	0.000	0.405	Paved roads w/curbs & sewers	1S, 2S, 3S, 4S
0.000	0.095	0.000	0.000	0.000	0.095	Woods/grass comb., Good	1S, 2S
0.405	**0.095**	**0.000**	**0.000**	**0.000**	**0.500**	**TOTAL AREA**	

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 NW Runoff Area=8,489 sf 73.57% Impervious Runoff Depth=1.74"
Tc=6.0 min CN=87 Runoff=0.43 cfs 0.028 af

Subcatchment 2S: 2 SW Runoff Area=8,700 sf 78.16% Impervious Runoff Depth=1.90"
Tc=6.0 min CN=89 Runoff=0.47 cfs 0.032 af

Subcatchment 3S: 3 NE&SE Runoff Area=1,920 sf 100.00% Impervious Runoff Depth=2.77"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment 4S: 4 BRIDGE Runoff Area=2,660 sf 100.00% Impervious Runoff Depth=2.77"
Tc=6.0 min CN=98 Runoff=0.19 cfs 0.014 af

Reach 5R: 1 NW-Total Inflow=0.43 cfs 0.028 af
Outflow=0.43 cfs 0.028 af

Reach 6R: 2 SW-Total Inflow=0.47 cfs 0.032 af
Outflow=0.47 cfs 0.032 af

Reach 7R: 3 NE&SE-Total Inflow=0.13 cfs 0.010 af
Outflow=0.13 cfs 0.010 af

Reach 8R: 4 BRIDGE-Total Inflow=0.19 cfs 0.014 af
Outflow=0.19 cfs 0.014 af

Reach 9R: Site Total Inflow=1.22 cfs 0.084 af
Outflow=1.22 cfs 0.084 af

Total Runoff Area = 0.500 ac Runoff Volume = 0.084 af Average Runoff Depth = 2.02"
19.04% Pervious = 0.095 ac 80.96% Impervious = 0.405 ac

Summary for Subcatchment 1S: 1 NW

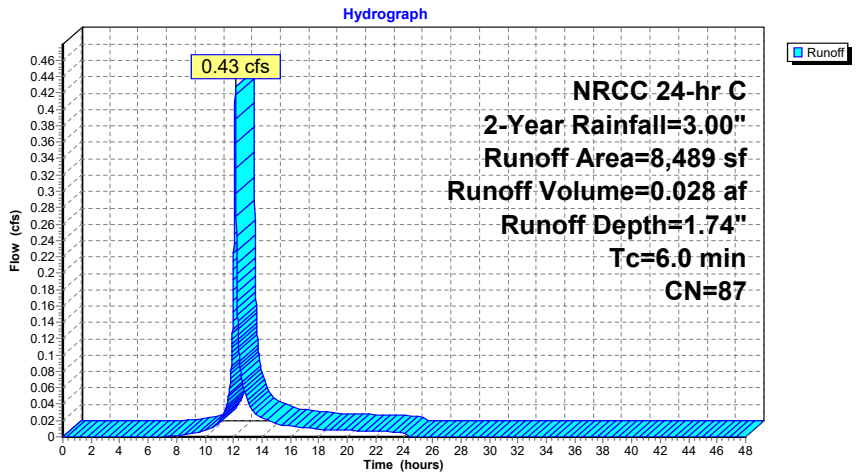
Runoff = 0.43 cfs @ 12.13 hrs, Volume= 0.028 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
6,245	98	Paved roads w/curbs & sewers, HSG A
2,244	58	Woods/grass comb., Good, HSG B
8,489	87	Weighted Average
2,244		26.43% Pervious Area
6,245		73.57% Impervious Area

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

Subcatchment 1S: 1 NW



Summary for Subcatchment 2S: 2 SW

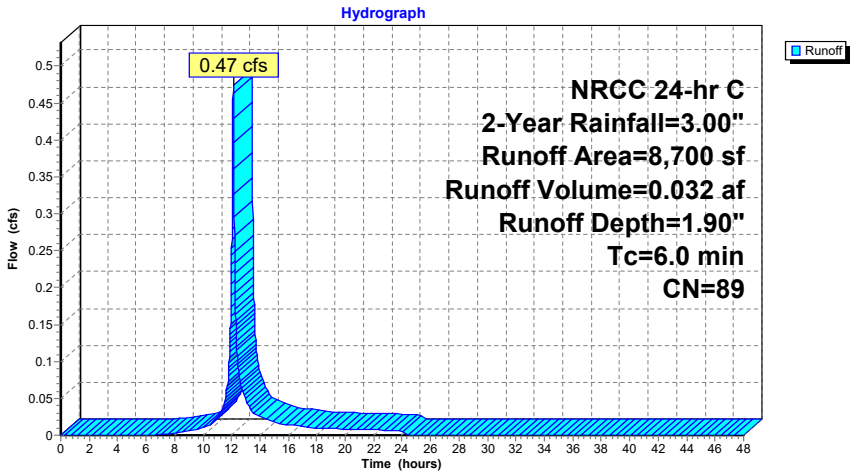
Runoff = 0.47 cfs @ 12.13 hrs, Volume= 0.032 af, Depth= 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
6,800	98	Paved roads w/curbs & sewers, HSG A
1,900	58	Woods/grass comb., Good, HSG B
8,700	89	Weighted Average
1,900		21.84% Pervious Area
6,800		78.16% Impervious Area

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

Subcatchment 2S: 2 SW



Summary for Subcatchment 3S: 3 NE&SE

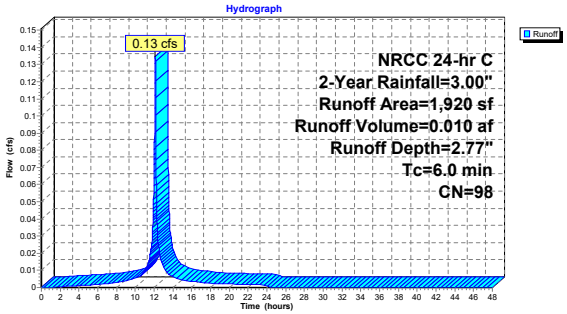
Runoff = 0.13 cfs @ 12.13 hrs, Volume= 0.010 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,920	98	Paved roads w/curbs & sewers, HSG A
1,920		100.00% Impervious Area

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

Subcatchment 3S: 3 NE&SE



Summary for Subcatchment 4S: 4 BRIDGE

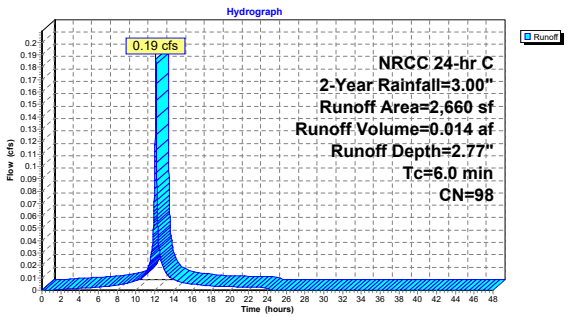
Runoff = 0.19 cfs @ 12.13 hrs, Volume= 0.014 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
2,660	98	Paved roads w/curbs & sewers, HSG A
2,660		100.00% Impervious Area

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

Subcatchment 4S: 4 BRIDGE

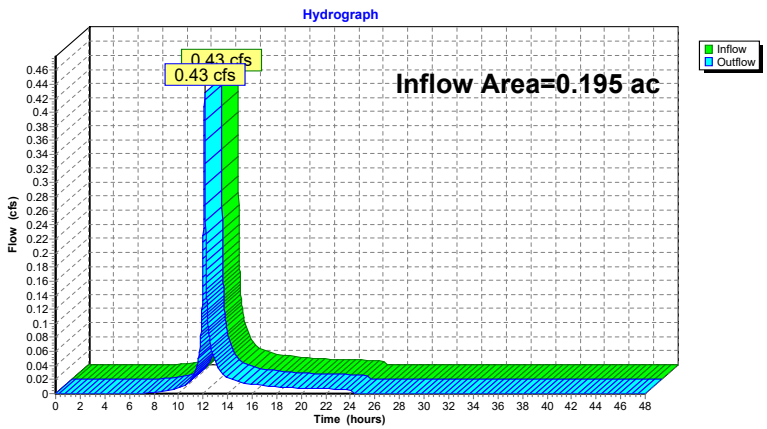


Summary for Reach 5R: 1 NW-Total

Inflow Area = 0.195 ac, 73.57% Impervious, Inflow Depth = 1.74" for 2-Year event
Inflow = 0.43 cfs @ 12.13 hrs, Volume= 0.028 af
Outflow = 0.43 cfs @ 12.13 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 5R: 1 NW-Total



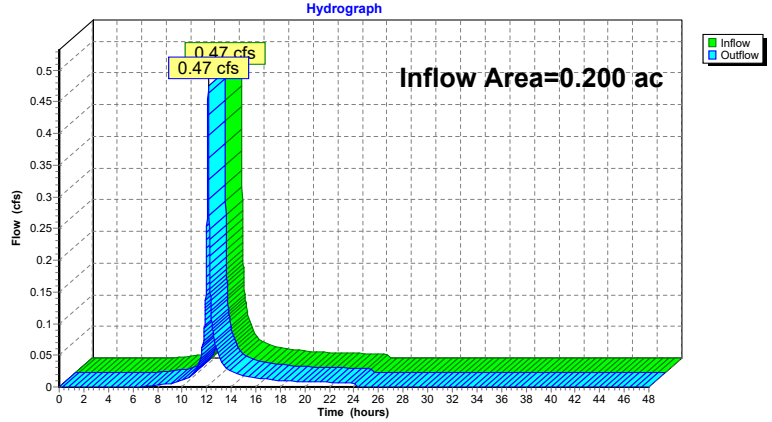
Summary for Reach 6R: 2 SW-Total

Inflow Area = 0.200 ac, 78.16% Impervious, Inflow Depth = 1.90" for 2-Year event
Inflow = 0.47 cfs @ 12.13 hrs, Volume= 0.032 af
Outflow = 0.47 cfs @ 12.13 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 6R: 2 SW-Total

Hydrograph



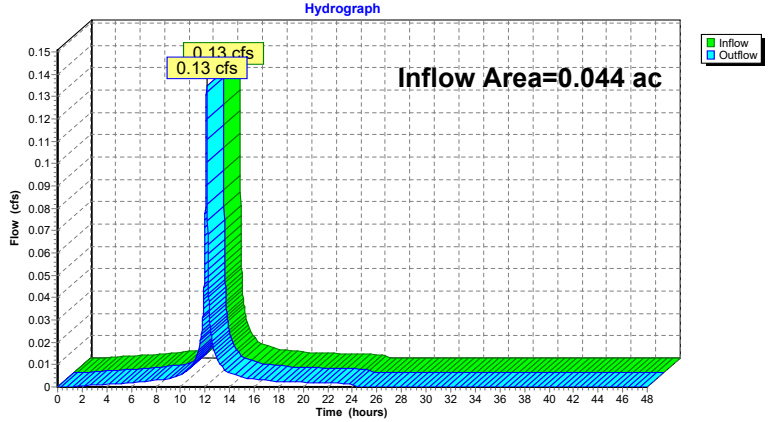
Summary for Reach 7R: 3 NE&SE-Total

Inflow Area = 0.044 ac,100.00% Impervious, Inflow Depth = 2.77" for 2-Year event
Inflow = 0.13 cfs @ 12.13 hrs, Volume= 0.010 af
Outflow = 0.13 cfs @ 12.13 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 7R: 3 NE&SE-Total

Hydrograph



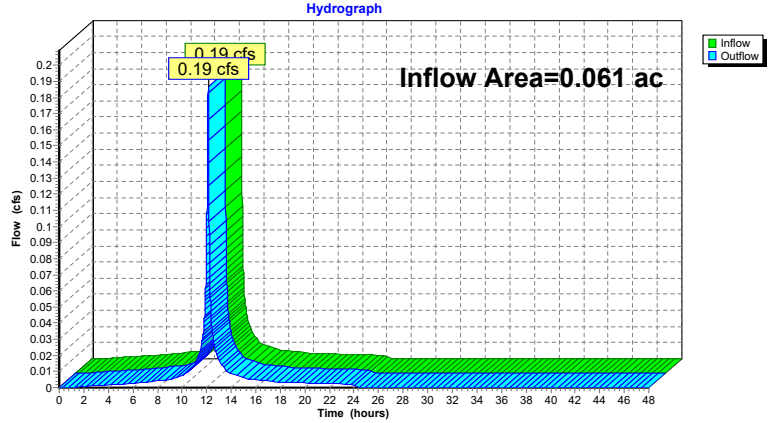
Summary for Reach 8R: 4 BRIDGE-Total

Inflow Area = 0.061 ac,100.00% Impervious, Inflow Depth = 2.77" for 2-Year event
Inflow = 0.19 cfs @ 12.13 hrs, Volume= 0.014 af
Outflow = 0.19 cfs @ 12.13 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 8R: 4 BRIDGE-Total

Hydrograph



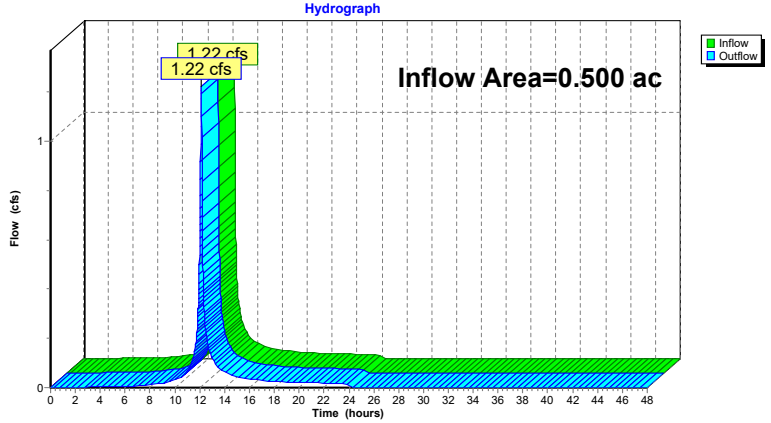
Summary for Reach 9R: Site Total

Inflow Area = 0.500 ac, 80.96% Impervious, Inflow Depth = 2.02" for 2-Year event
Inflow = 1.22 cfs @ 12.13 hrs, Volume= 0.084 af
Outflow = 1.22 cfs @ 12.13 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 9R: Site Total

Hydrograph



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 NW Runoff Area=8,489 sf 73.57% Impervious Runoff Depth=3.06"
Tc=6.0 min CN=87 Runoff=0.74 cfs 0.050 af

Subcatchment 2S: 2 SW Runoff Area=8,700 sf 78.16% Impervious Runoff Depth=3.26"
Tc=6.0 min CN=89 Runoff=0.79 cfs 0.054 af

Subcatchment 3S: 3 NE&SE Runoff Area=1,920 sf 100.00% Impervious Runoff Depth=4.22"
Tc=6.0 min CN=98 Runoff=0.20 cfs 0.016 af

Subcatchment 4S: 4 BRIDGE Runoff Area=2,660 sf 100.00% Impervious Runoff Depth=4.22"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.021 af

Reach 5R: 1 NW-Total Inflow=0.74 cfs 0.050 af
Outflow=0.74 cfs 0.050 af

Reach 6R: 2 SW-Total Inflow=0.79 cfs 0.054 af
Outflow=0.79 cfs 0.054 af

Reach 7R: 3 NE&SE-Total Inflow=0.20 cfs 0.016 af
Outflow=0.20 cfs 0.016 af

Reach 8R: 4 BRIDGE-Total Inflow=0.28 cfs 0.021 af
Outflow=0.28 cfs 0.021 af

Reach 9R: Site Total Inflow=2.01 cfs 0.141 af
Outflow=2.01 cfs 0.141 af

Total Runoff Area = 0.500 ac Runoff Volume = 0.141 af Average Runoff Depth = 3.38"
19.04% Pervious = 0.095 ac 80.96% Impervious = 0.405 ac

Summary for Subcatchment 1S: 1 NW

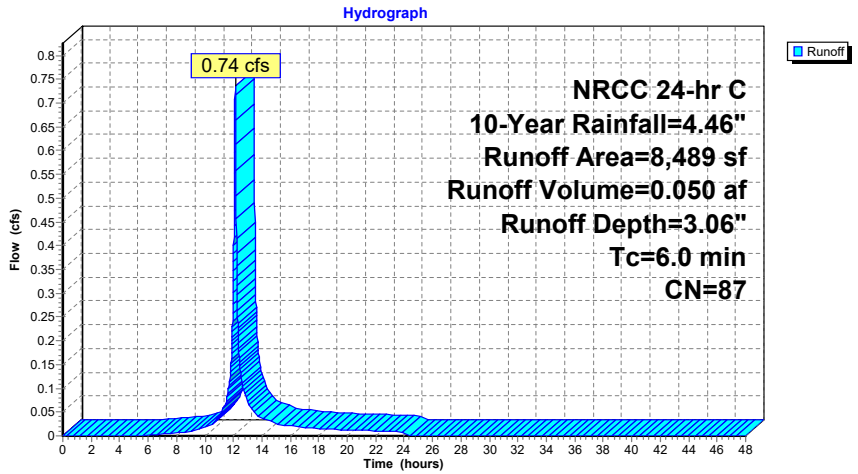
Runoff = 0.74 cfs @ 12.13 hrs, Volume= 0.050 af, Depth= 3.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
6,245	98	Paved roads w/curbs & sewers, HSG A
2,244	58	Woods/grass comb., Good, HSG B
8,489	87	Weighted Average
2,244		26.43% Pervious Area
6,245		73.57% Impervious Area

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

Subcatchment 1S: 1 NW



Summary for Subcatchment 2S: 2 SW

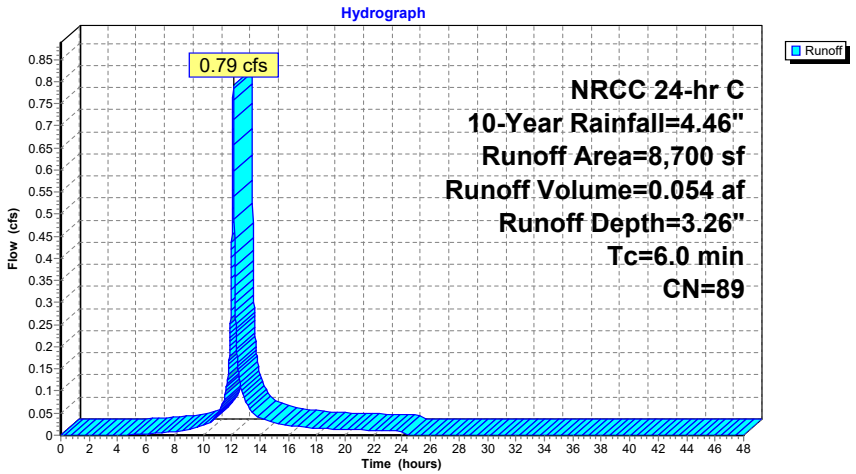
Runoff = 0.79 cfs @ 12.13 hrs, Volume= 0.054 af, Depth= 3.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
6,800	98	Paved roads w/curbs & sewers, HSG A
1,900	58	Woods/grass comb., Good, HSG B
8,700	89	Weighted Average
1,900		21.84% Pervious Area
6,800		78.16% Impervious Area

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

Subcatchment 2S: 2 SW



Summary for Subcatchment 3S: 3 NE&SE

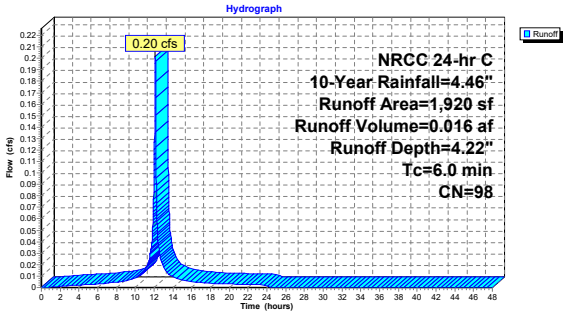
Runoff = 0.20 cfs @ 12.13 hrs, Volume= 0.016 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
1,920	98	Paved roads w/curbs & sewers, HSG A
1,920		100.00% Impervious Area

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

Subcatchment 3S: 3 NE&SE



Summary for Subcatchment 4S: 4 BRIDGE

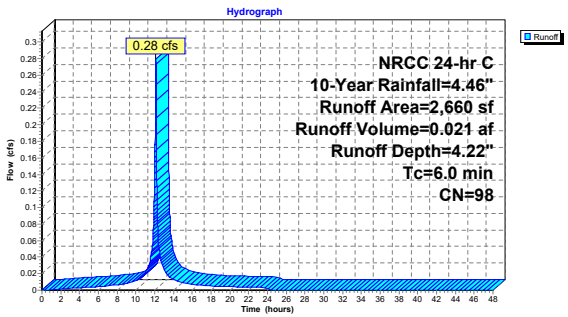
Runoff = 0.28 cfs @ 12.13 hrs, Volume= 0.021 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
2,660	98	Paved roads w/curbs & sewers, HSG A
2,660		100.00% Impervious Area

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

Subcatchment 4S: 4 BRIDGE

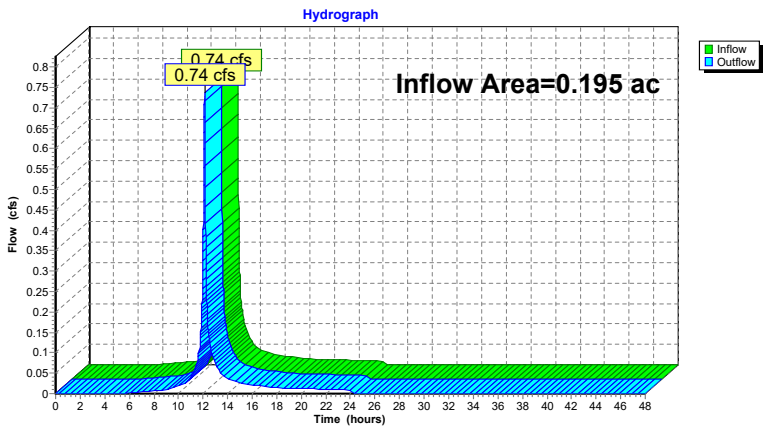


Summary for Reach 5R: 1 NW-Total

Inflow Area = 0.195 ac, 73.57% Impervious, Inflow Depth = 3.06" for 10-Year event
Inflow = 0.74 cfs @ 12.13 hrs, Volume= 0.050 af
Outflow = 0.74 cfs @ 12.13 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 5R: 1 NW-Total



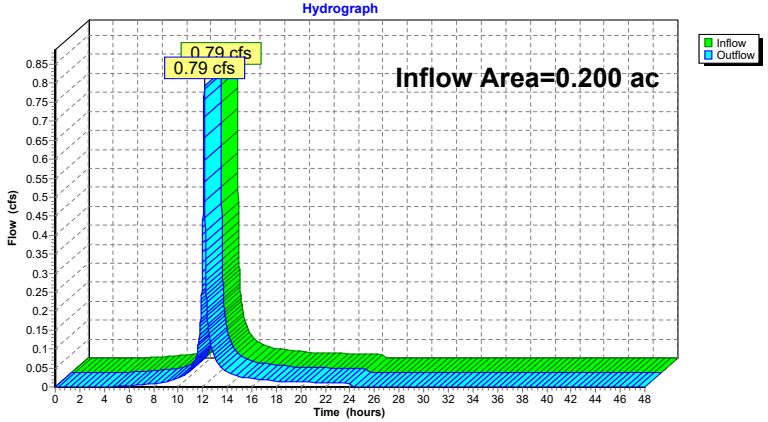
Summary for Reach 6R: 2 SW-Total

Inflow Area = 0.200 ac, 78.16% Impervious, Inflow Depth = 3.26" for 10-Year event
Inflow = 0.79 cfs @ 12.13 hrs, Volume= 0.054 af
Outflow = 0.79 cfs @ 12.13 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 6R: 2 SW-Total

Hydrograph



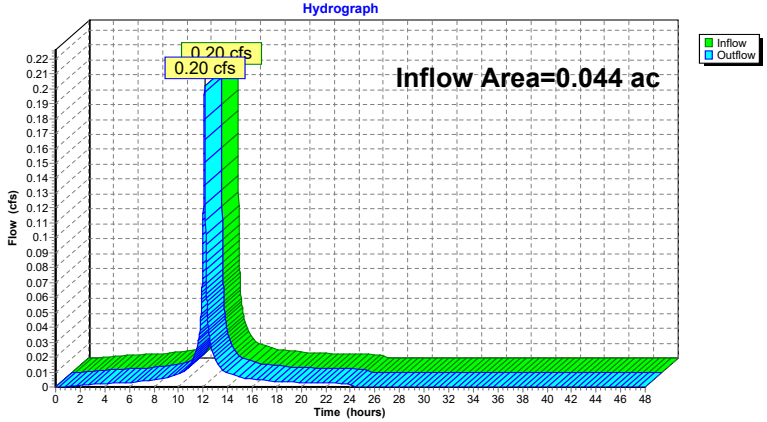
Summary for Reach 7R: 3 NE&SE-Total

Inflow Area = 0.044 ac,100.00% Impervious, Inflow Depth = 4.22" for 10-Year event
Inflow = 0.20 cfs @ 12.13 hrs, Volume= 0.016 af
Outflow = 0.20 cfs @ 12.13 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 7R: 3 NE&SE-Total

Hydrograph



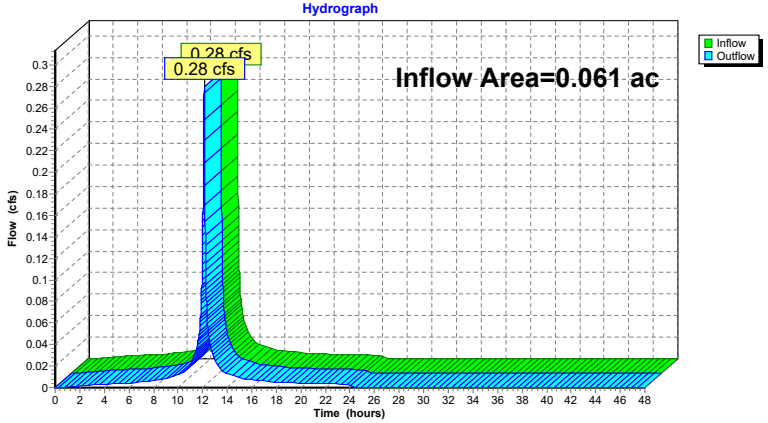
Summary for Reach 8R: 4 BRIDGE-Total

Inflow Area = 0.061 ac,100.00% Impervious, Inflow Depth = 4.22" for 10-Year event
Inflow = 0.28 cfs @ 12.13 hrs, Volume= 0.021 af
Outflow = 0.28 cfs @ 12.13 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 8R: 4 BRIDGE-Total

Hydrograph



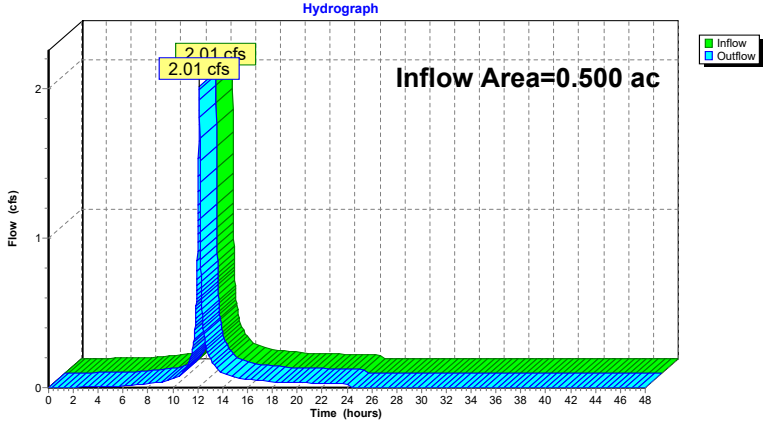
Summary for Reach 9R: Site Total

Inflow Area = 0.500 ac, 80.96% Impervious, Inflow Depth = 3.38" for 10-Year event
Inflow = 2.01 cfs @ 12.13 hrs, Volume= 0.141 af
Outflow = 2.01 cfs @ 12.13 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 9R: Site Total

Hydrograph



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 NW Runoff Area=8,489 sf 73.57% Impervious Runoff Depth=6.37"
Tc=6.0 min CN=87 Runoff=1.47 cfs 0.103 af

Subcatchment 2S: 2 SW Runoff Area=8,700 sf 78.16% Impervious Runoff Depth=6.61"
Tc=6.0 min CN=89 Runoff=1.54 cfs 0.110 af

Subcatchment 3S: 3 NE&SE Runoff Area=1,920 sf 100.00% Impervious Runoff Depth=7.68"
Tc=6.0 min CN=98 Runoff=0.36 cfs 0.028 af

Subcatchment 4S: 4 BRIDGE Runoff Area=2,660 sf 100.00% Impervious Runoff Depth=7.68"
Tc=6.0 min CN=98 Runoff=0.50 cfs 0.039 af

Reach 5R: 1 NW-Total Inflow=1.47 cfs 0.103 af
Outflow=1.47 cfs 0.103 af

Reach 6R: 2 SW-Total Inflow=1.54 cfs 0.110 af
Outflow=1.54 cfs 0.110 af

Reach 7R: 3 NE&SE-Total Inflow=0.36 cfs 0.028 af
Outflow=0.36 cfs 0.028 af

Reach 8R: 4 BRIDGE-Total Inflow=0.50 cfs 0.039 af
Outflow=0.50 cfs 0.039 af

Reach 9R: Site Total Inflow=3.87 cfs 0.281 af
Outflow=3.87 cfs 0.281 af

Total Runoff Area = 0.500 ac Runoff Volume = 0.281 af Average Runoff Depth = 6.74"
19.04% Pervious = 0.095 ac 80.96% Impervious = 0.405 ac

Summary for Subcatchment 1S: 1 NW

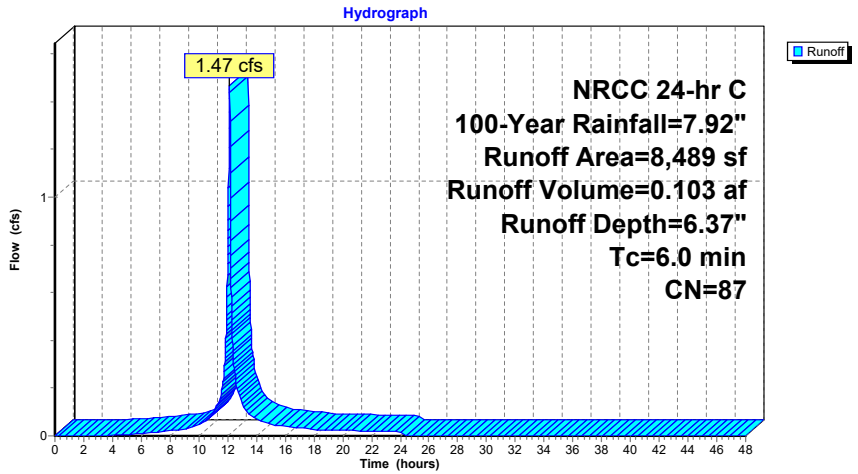
Runoff = 1.47 cfs @ 12.13 hrs, Volume= 0.103 af, Depth= 6.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
6,245	98	Paved roads w/curbs & sewers, HSG A
2,244	58	Woods/grass comb., Good, HSG B
8,489	87	Weighted Average
2,244		26.43% Pervious Area
6,245		73.57% Impervious Area

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

Subcatchment 1S: 1 NW



Summary for Subcatchment 2S: 2 SW

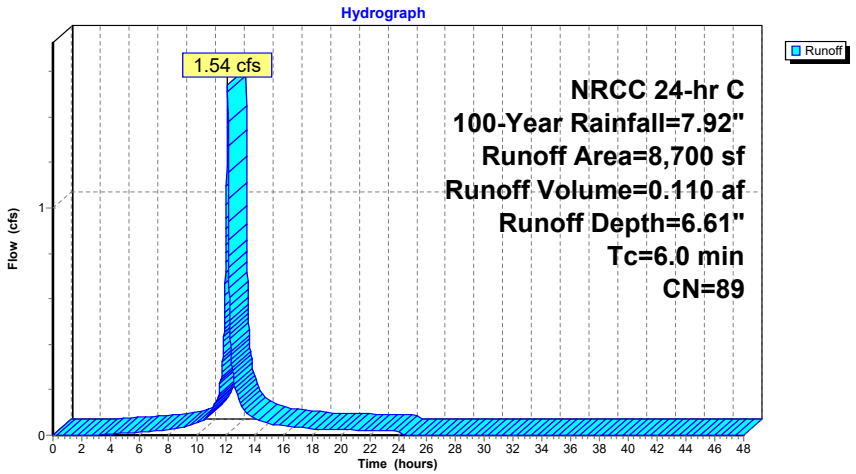
Runoff = 1.54 cfs @ 12.13 hrs, Volume= 0.110 af, Depth= 6.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
6,800	98	Paved roads w/curbs & sewers, HSG A
1,900	58	Woods/grass comb., Good, HSG B
8,700	89	Weighted Average
1,900		21.84% Pervious Area
6,800		78.16% Impervious Area

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

Subcatchment 2S: 2 SW



Summary for Subcatchment 3S: 3 NE&SE

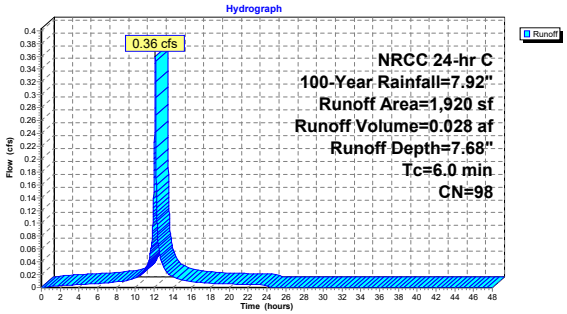
Runoff = 0.36 cfs @ 12.13 hrs, Volume= 0.028 af, Depth= 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
1,920	98	Paved roads w/curbs & sewers, HSG A
1,920		100.00% Impervious Area

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

Subcatchment 3S: 3 NE&SE



Summary for Subcatchment 4S: 4 BRIDGE

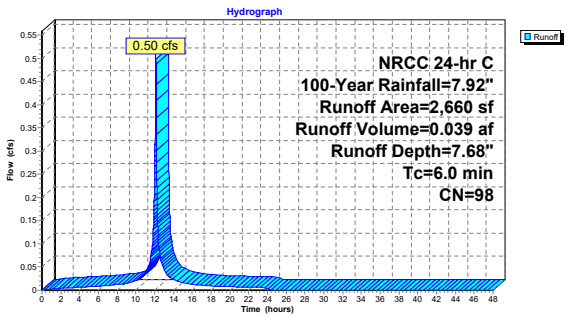
Runoff = 0.50 cfs @ 12.13 hrs, Volume= 0.039 af, Depth= 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
2,660	98	Paved roads w/curbs & sewers, HSG A
2,660		100.00% Impervious Area

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

Subcatchment 4S: 4 BRIDGE

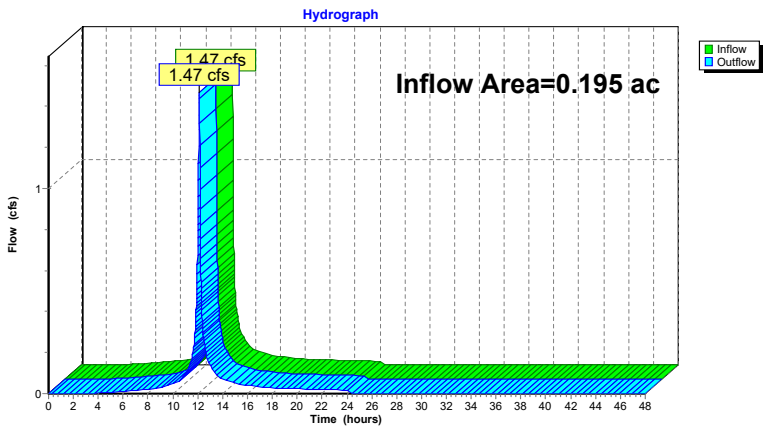


Summary for Reach 5R: 1 NW-Total

Inflow Area = 0.195 ac, 73.57% Impervious, Inflow Depth = 6.37" for 100-Year event
Inflow = 1.47 cfs @ 12.13 hrs, Volume= 0.103 af
Outflow = 1.47 cfs @ 12.13 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 5R: 1 NW-Total

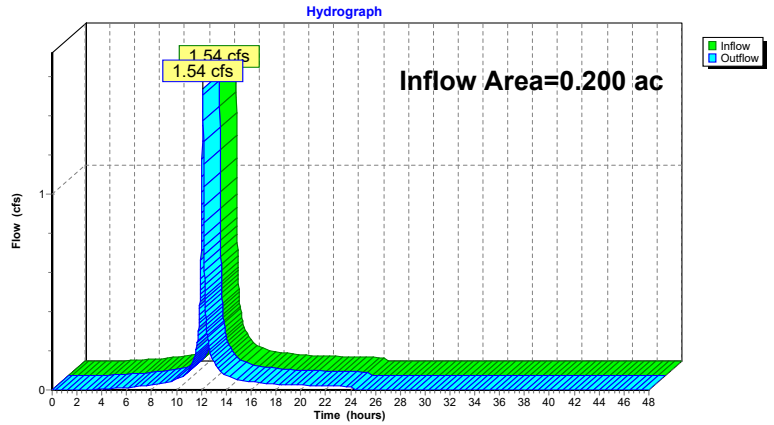


Summary for Reach 6R: 2 SW-Total

Inflow Area = 0.200 ac, 78.16% Impervious, Inflow Depth = 6.61" for 100-Year event
Inflow = 1.54 cfs @ 12.13 hrs, Volume= 0.110 af
Outflow = 1.54 cfs @ 12.13 hrs, Volume= 0.110 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 6R: 2 SW-Total

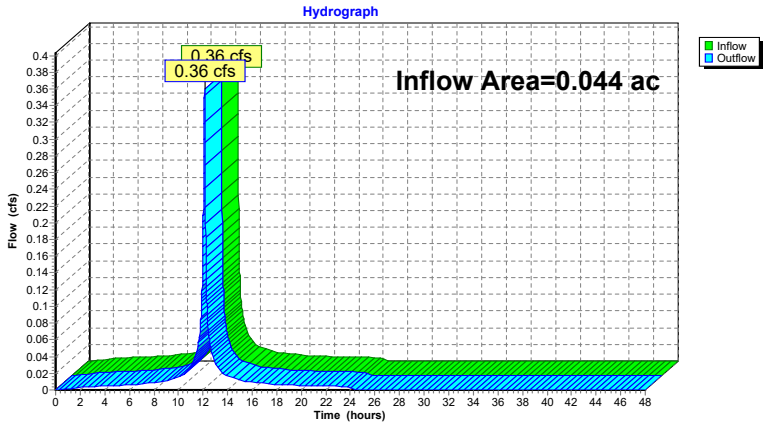


Summary for Reach 7R: 3 NE&SE-Total

Inflow Area = 0.044 ac,100.00% Impervious, Inflow Depth = 7.68" for 100-Year event
Inflow = 0.36 cfs @ 12.13 hrs, Volume= 0.028 af
Outflow = 0.36 cfs @ 12.13 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 7R: 3 NE&SE-Total

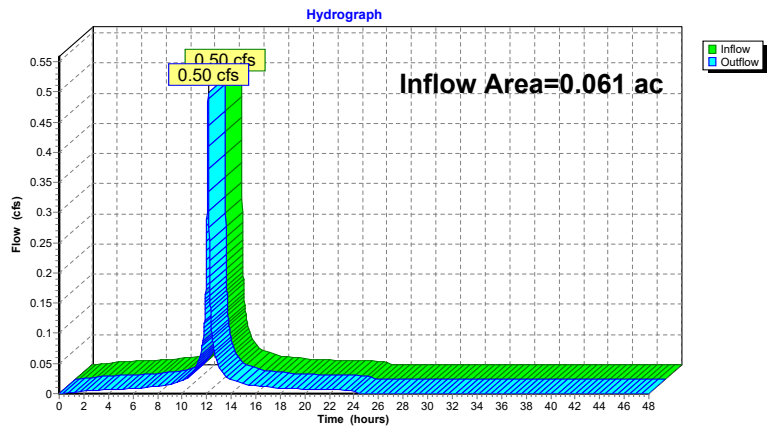


Summary for Reach 8R: 4 BRIDGE-Total

Inflow Area = 0.061 ac,100.00% Impervious, Inflow Depth = 7.68" for 100-Year event
Inflow = 0.50 cfs @ 12.13 hrs, Volume= 0.039 af
Outflow = 0.50 cfs @ 12.13 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 8R: 4 BRIDGE-Total

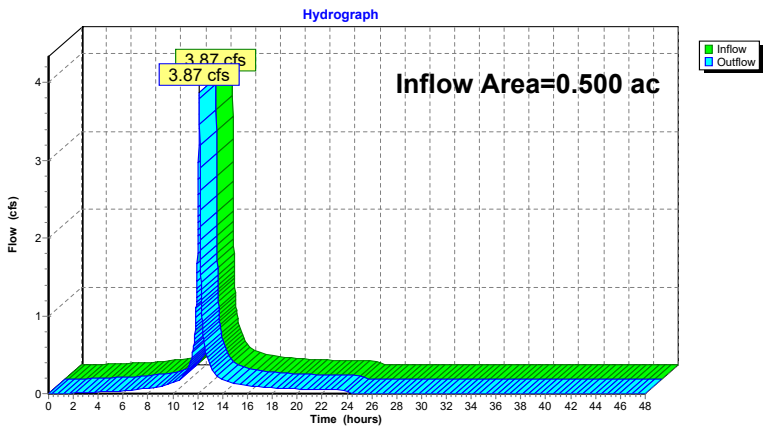


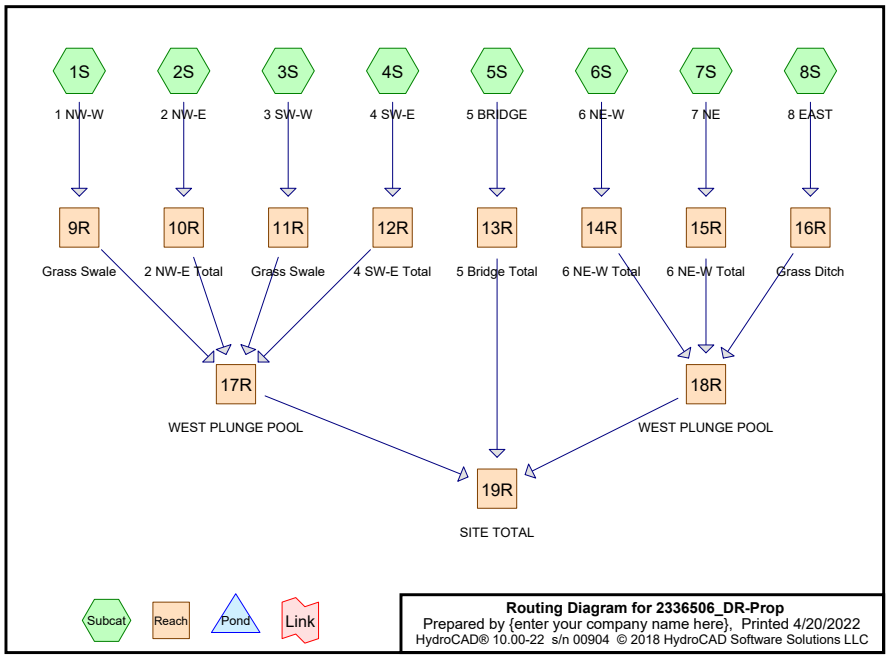
Summary for Reach 9R: Site Total

Inflow Area = 0.500 ac, 80.96% Impervious, Inflow Depth = 6.74" for 100-Year event
Inflow = 3.87 cfs @ 12.13 hrs, Volume= 0.281 af
Outflow = 3.87 cfs @ 12.13 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 9R: Site Total





Routing Diagram for 2336506_DR-Prop
Prepared by {enter your company name here}, Printed 4/20/2022
HydroCAD® 10.00-22 s/n 00904 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.485	98	Paved roads w/curbs & sewers, HSG B (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S)
0.198	58	Woods/grass comb., Good, HSG B (1S, 3S, 8S)
0.682	**86**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.682	HSG B	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.682		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.485	0.000	0.000	0.000	0.485	Paved roads w/curbs & sewers	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S
0.000	0.198	0.000	0.000	0.000	0.198	Woods/grass comb., Good	1S, 3S, 8S
0.000	**0.682**	**0.000**	**0.000**	**0.000**	**0.682**	**TOTAL AREA**	

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 NW-W Runoff Area=8,070 sf 52.23% Impervious Runoff Depth=1.19"
Tc=6.0 min CN=79 Runoff=0.28 cfs 0.018 af

Subcatchment 2S: 2 NW-E Runoff Area=1,480 sf 100.00% Impervious Runoff Depth=2.77"
Tc=6.0 min CN=98 Runoff=0.10 cfs 0.008 af

Subcatchment 3S: 3 SW-W Runoff Area=7,555 sf 58.44% Impervious Runoff Depth=1.31"
Tc=6.0 min CN=81 Runoff=0.29 cfs 0.019 af

Subcatchment 4S: 4 SW-E Runoff Area=1,435 sf 100.00% Impervious Runoff Depth=2.77"
Tc=6.0 min CN=98 Runoff=0.10 cfs 0.008 af

Subcatchment 5S: 5 BRIDGE Runoff Area=2,185 sf 100.00% Impervious Runoff Depth=2.77"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment 6S: 6 NE-W Runoff Area=330 sf 100.00% Impervious Runoff Depth=2.77"
Tc=6.0 min CN=98 Runoff=0.02 cfs 0.002 af

Subcatchment 7S: 7 NE Runoff Area=2,290 sf 100.00% Impervious Runoff Depth=2.77"
Tc=6.0 min CN=98 Runoff=0.16 cfs 0.012 af

Subcatchment 8S: 8 EAST Runoff Area=6,380 sf 74.53% Impervious Runoff Depth=1.82"
Tc=6.0 min CN=88 Runoff=0.33 cfs 0.022 af

Reach 9R: Grass Swale Avg. Flow Depth=0.15' Max Vel=0.57 fps Inflow=0.28 cfs 0.018 af
n=0.150 L=233.0' S=0.0531 '/' Capacity=8.10 cfs Outflow=0.22 cfs 0.018 af

Reach 10R: 2 NW-E Total Inflow=0.10 cfs 0.008 af
Outflow=0.10 cfs 0.008 af

Reach 11R: Grass Swale Avg. Flow Depth=0.22' Max Vel=0.64 fps Inflow=0.29 cfs 0.019 af
n=0.150 L=235.0' S=0.0529 '/' Capacity=6.07 cfs Outflow=0.23 cfs 0.019 af

Reach 12R: 4 SW-E Total Inflow=0.10 cfs 0.008 af
Outflow=0.10 cfs 0.008 af

Reach 13R: 5 Bridge Total Inflow=0.15 cfs 0.012 af
Outflow=0.15 cfs 0.012 af

Reach 14R: 6 NE-W Total Inflow=0.02 cfs 0.002 af
Outflow=0.02 cfs 0.002 af

Reach 15R: 6 NE-W Total Inflow=0.16 cfs 0.012 af
Outflow=0.16 cfs 0.012 af

Reach 16R: Grass Ditch Avg. Flow Depth=0.27' Max Vel=0.56 fps Inflow=0.33 cfs 0.022 af
n=0.150 L=190.0' S=0.0316 '/' Capacity=0.98 cfs Outflow=0.27 cfs 0.022 af

Reach 17R: WEST PLUNGE POOL Inflow=0.51 cfs 0.053 af
Outflow=0.51 cfs 0.053 af

Reach 18R: WEST PLUNGE POOL Inflow=0.34 cfs 0.036 af
Outflow=0.34 cfs 0.036 af

Reach 19R: SITE TOTAL Inflow=0.91 cfs 0.100 af
Outflow=0.91 cfs 0.100 af

Total Runoff Area = 0.682 ac Runoff Volume = 0.100 af Average Runoff Depth = 1.77"
29.00% Pervious = 0.198 ac 71.00% Impervious = 0.485 ac

Summary for Subcatchment 1S: 1 NW-W

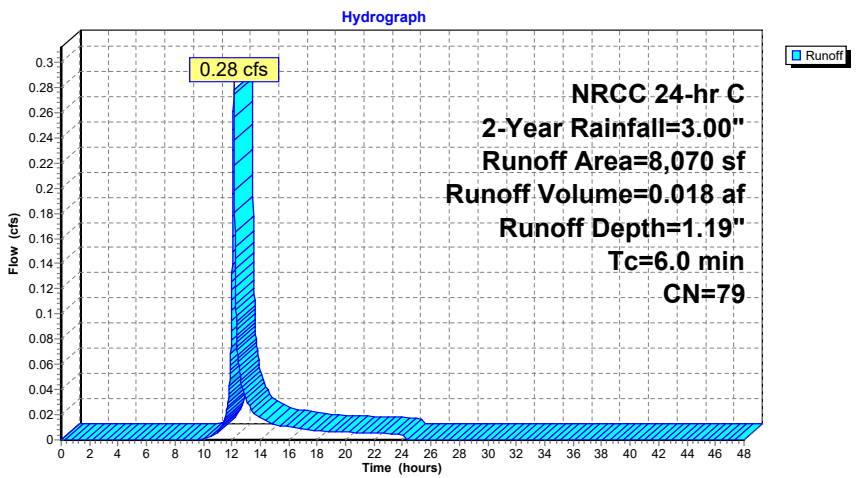
Runoff = 0.28 cfs @ 12.13 hrs, Volume= 0.018 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
4,215	98	Paved roads w/curbs & sewers, HSG B
3,855	58	Woods/grass comb., Good, HSG B
8,070	79	Weighted Average
3,855		47.77% Pervious Area
4,215		52.23% Impervious Area

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

Subcatchment 1S: 1 NW-W



Summary for Subcatchment 2S: 2 NW-E

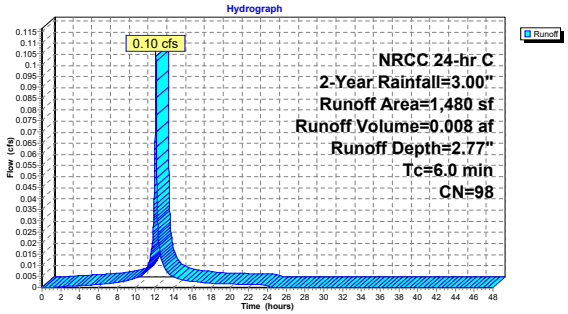
Runoff = 0.10 cfs @ 12.13 hrs, Volume= 0.008 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,480	98	Paved roads w/curbs & sewers, HSG B
1,480		100.00% Impervious Area

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

Subcatchment 2S: 2 NW-E



Summary for Subcatchment 3S: 3 SW-W

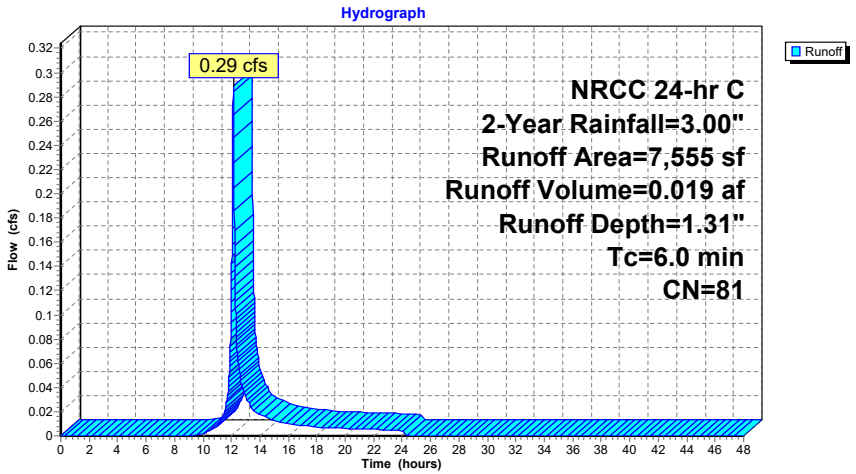
Runoff = 0.29 cfs @ 12.13 hrs, Volume= 0.019 af, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
4,415	98	Paved roads w/curbs & sewers, HSG B
3,140	58	Woods/grass comb., Good, HSG B
7,555	81	Weighted Average
3,140		41.56% Pervious Area
4,415		58.44% Impervious Area

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

Subcatchment 3S: 3 SW-W



Summary for Subcatchment 4S: 4 SW-E

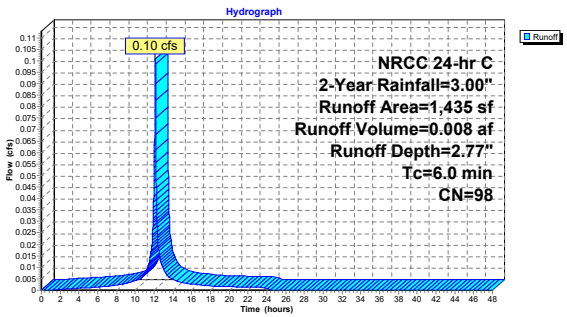
Runoff = 0.10 cfs @ 12.13 hrs, Volume= 0.008 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,435	98	Paved roads w/curbs & sewers, HSG B
1,435		100.00% Impervious Area

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

Subcatchment 4S: 4 SW-E



Summary for Subcatchment 5S: 5 BRIDGE

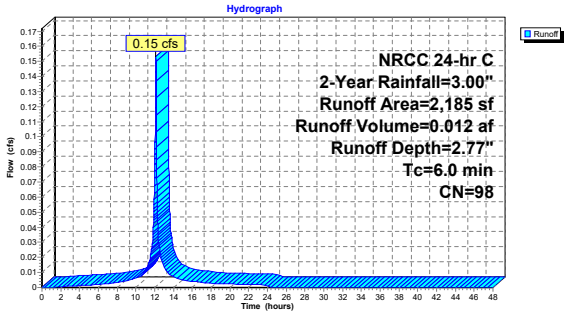
Runoff = 0.15 cfs @ 12.13 hrs, Volume= 0.012 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
2,185	98	Paved roads w/curbs & sewers, HSG B
2,185		100.00% Impervious Area

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

Subcatchment 5S: 5 BRIDGE



Summary for Subcatchment 6S: 6 NE-W

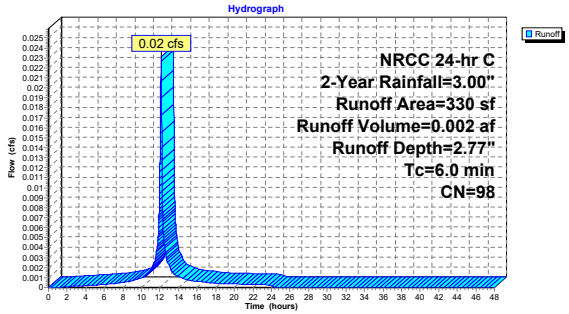
Runoff = 0.02 cfs @ 12.13 hrs, Volume= 0.002 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
330	98	Paved roads w/curbs & sewers, HSG B
330		100.00% Impervious Area

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

Subcatchment 6S: 6 NE-W



Summary for Subcatchment 7S: 7 NE

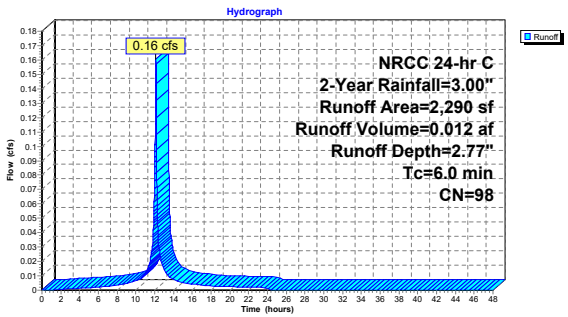
Runoff = 0.16 cfs @ 12.13 hrs, Volume= 0.012 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
2,290	98	Paved roads w/curbs & sewers, HSG B
2,290		100.00% Impervious Area

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

Subcatchment 7S: 7 NE



Summary for Subcatchment 8S: 8 EAST

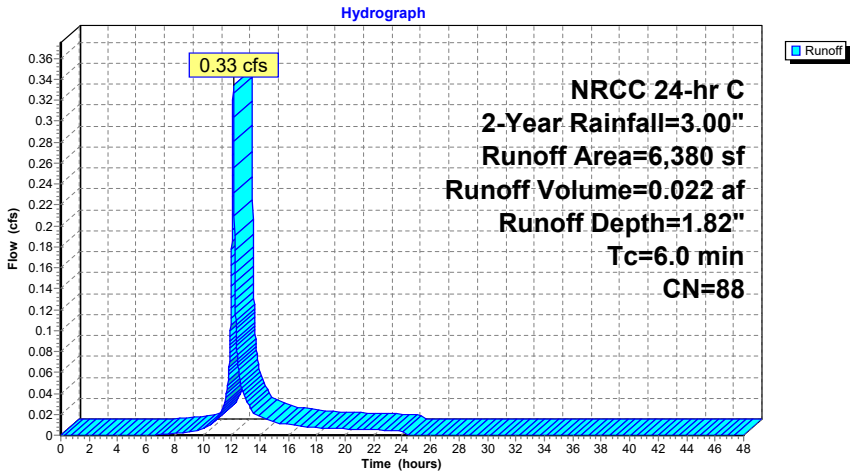
Runoff = 0.33 cfs @ 12.13 hrs, Volume= 0.022 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
4,755	98	Paved roads w/curbs & sewers, HSG B
1,625	58	Woods/grass comb., Good, HSG B
6,380	88	Weighted Average
1,625		25.47% Pervious Area
4,755		74.53% Impervious Area

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

Subcatchment 8S: 8 EAST



Summary for Reach 9R: Grass Swale

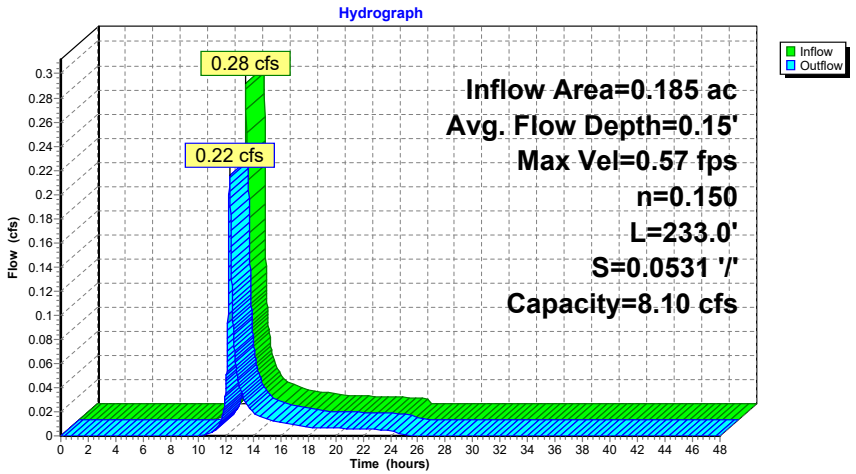
Inflow Area = 0.185 ac, 52.23% Impervious, Inflow Depth = 1.19" for 2-Year event
Inflow = 0.28 cfs @ 12.13 hrs, Volume= 0.018 af
Outflow = 0.22 cfs @ 12.29 hrs, Volume= 0.018 af, Atten= 23%, Lag= 9.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.57 fps, Min. Travel Time= 6.8 min
Avg. Velocity = 0.18 fps, Avg. Travel Time= 21.8 min

Peak Storage= 87 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 8.10 cfs

2.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 2.0 4.0 '/' Top Width= 8.00'
Length= 233.0' Slope= 0.0531 '/'
Inlet Invert= 240.75', Outlet Invert= 228.38'

Reach 9R: Grass Swale

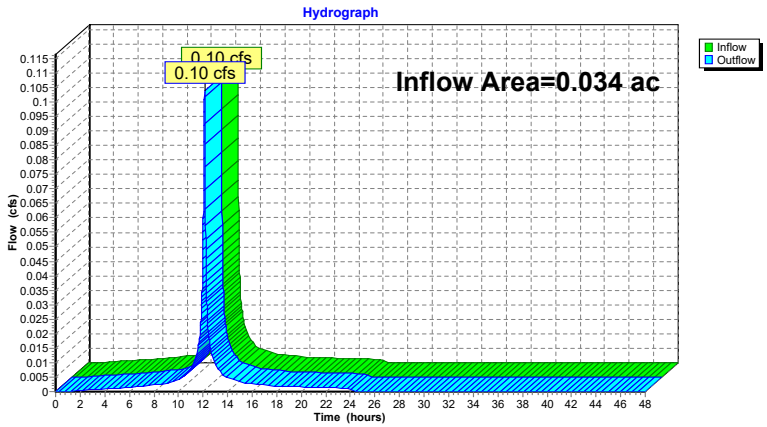


Summary for Reach 10R: 2 NW-E Total

Inflow Area = 0.034 ac,100.00% Impervious, Inflow Depth = 2.77" for 2-Year event
Inflow = 0.10 cfs @ 12.13 hrs, Volume= 0.008 af
Outflow = 0.10 cfs @ 12.13 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 10R: 2 NW-E Total



Summary for Reach 11R: Grass Swale

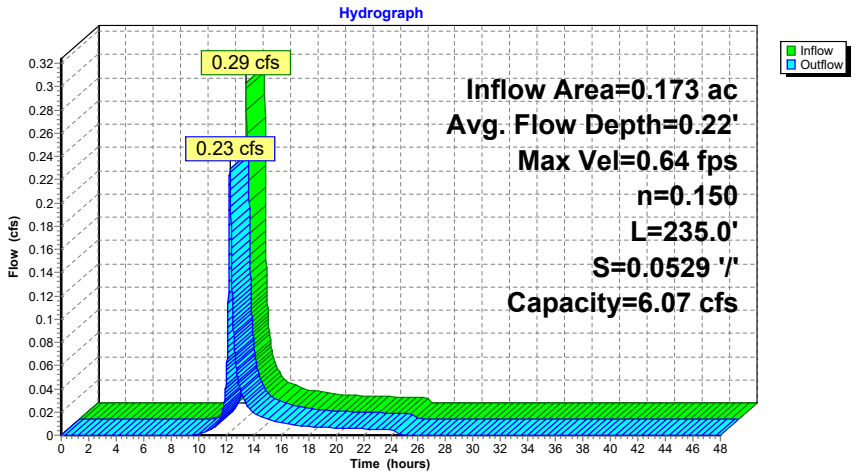
Inflow Area = 0.173 ac, 58.44% Impervious, Inflow Depth = 1.31" for 2-Year event
Inflow = 0.29 cfs @ 12.13 hrs, Volume= 0.019 af
Outflow = 0.23 cfs @ 12.28 hrs, Volume= 0.019 af, Atten= 21%, Lag= 8.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.64 fps, Min. Travel Time= 6.1 min
Avg. Velocity = 0.21 fps, Avg. Travel Time= 18.4 min

Peak Storage= 84 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 6.07 cfs

1.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 2.0 4.0 '/' Top Width= 7.00'
Length= 235.0' Slope= 0.0529 '/'
Inlet Invert= 240.74', Outlet Invert= 228.30'

Reach 11R: Grass Swale

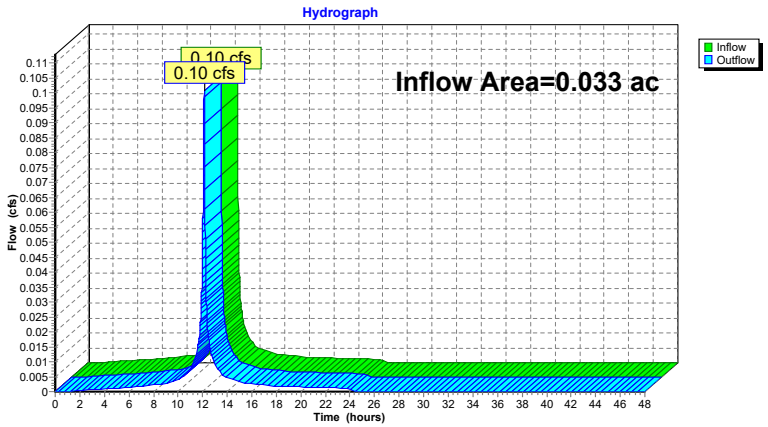


Summary for Reach 12R: 4 SW-E Total

Inflow Area = 0.033 ac,100.00% Impervious, Inflow Depth = 2.77" for 2-Year event
Inflow = 0.10 cfs @ 12.13 hrs, Volume= 0.008 af
Outflow = 0.10 cfs @ 12.13 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 12R: 4 SW-E Total

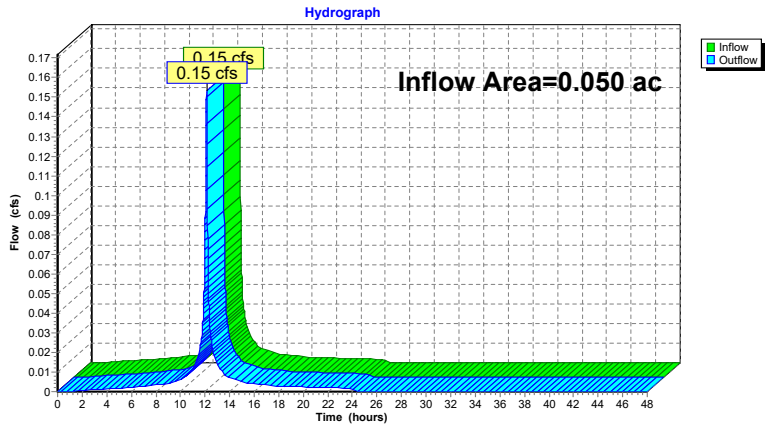


Summary for Reach 13R: 5 Bridge Total

Inflow Area = 0.050 ac,100.00% Impervious, Inflow Depth = 2.77" for 2-Year event
Inflow = 0.15 cfs @ 12.13 hrs, Volume= 0.012 af
Outflow = 0.15 cfs @ 12.13 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 13R: 5 Bridge Total



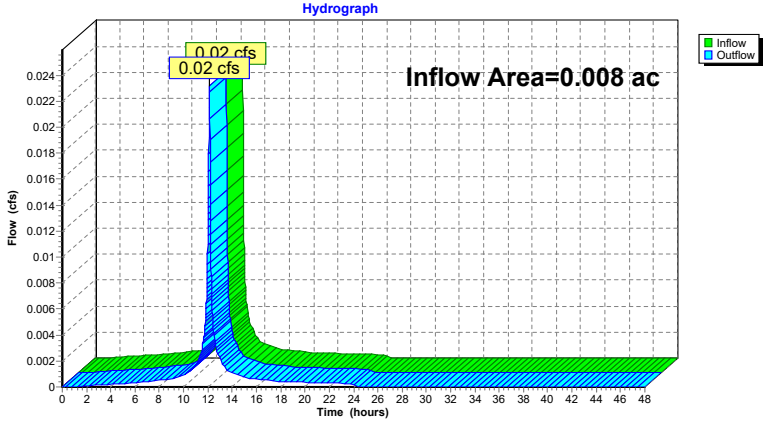
Summary for Reach 14R: 6 NE-W Total

Inflow Area = 0.008 ac,100.00% Impervious, Inflow Depth = 2.77" for 2-Year event
Inflow = 0.02 cfs @ 12.13 hrs, Volume= 0.002 af
Outflow = 0.02 cfs @ 12.13 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 14R: 6 NE-W Total

Hydrograph



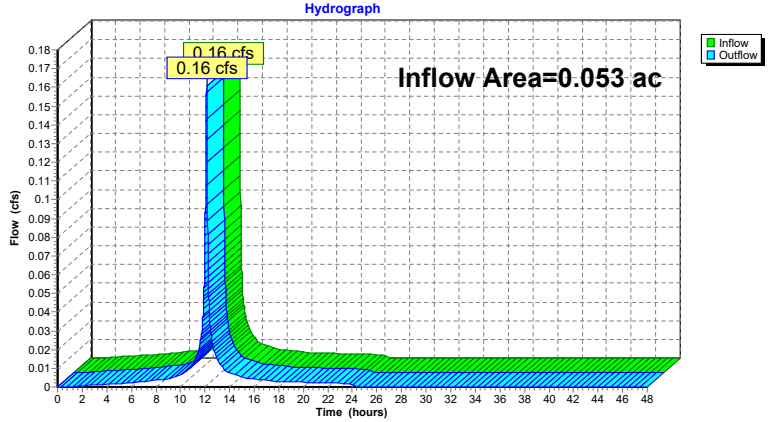
Summary for Reach 15R: 6 NE-W Total

Inflow Area = 0.053 ac,100.00% Impervious, Inflow Depth = 2.77" for 2-Year event
Inflow = 0.16 cfs @ 12.13 hrs, Volume= 0.012 af
Outflow = 0.16 cfs @ 12.13 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 15R: 6 NE-W Total

Hydrograph



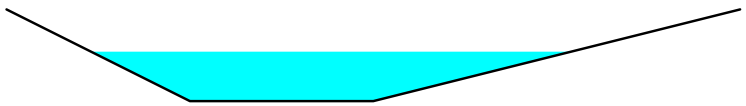
Summary for Reach 16R: Grass Ditch

Inflow Area = 0.146 ac, 74.53% Impervious, Inflow Depth = 1.82" for 2-Year event
Inflow = 0.33 cfs @ 12.13 hrs, Volume= 0.022 af
Outflow = 0.27 cfs @ 12.27 hrs, Volume= 0.022 af, Atten= 18%, Lag= 8.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.56 fps, Min. Travel Time= 5.6 min
Avg. Velocity = 0.16 fps, Avg. Travel Time= 19.6 min

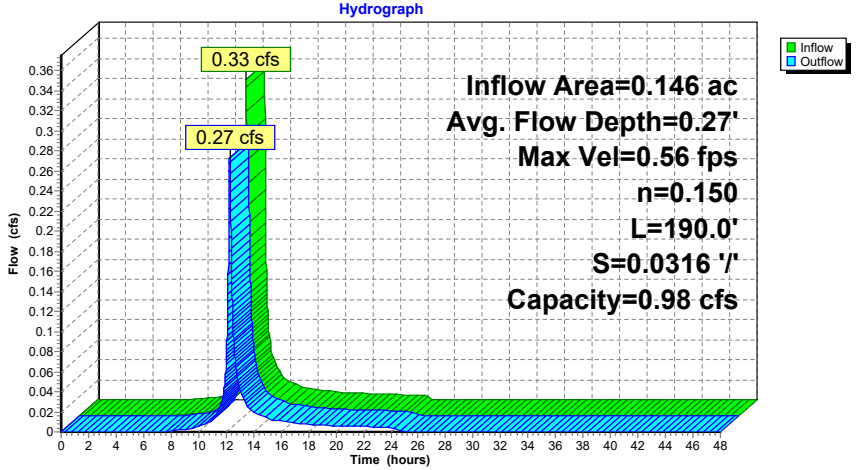
Peak Storage= 93 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 0.50' Flow Area= 1.3 sf, Capacity= 0.98 cfs

1.00' x 0.50' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 2.0 4.0 '/' Top Width= 4.00'
Length= 190.0' Slope= 0.0316 '/'
Inlet Invert= 233.00', Outlet Invert= 227.00'



Reach 16R: Grass Ditch

Hydrograph

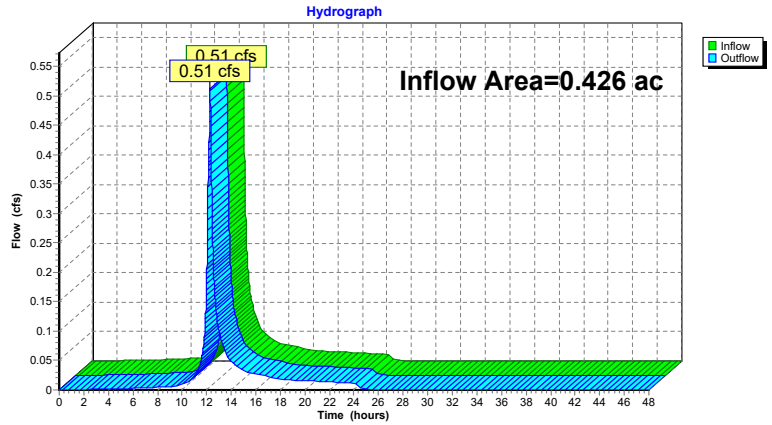


Summary for Reach 17R: WEST PLUNGE POOL

Inflow Area = 0.426 ac, 62.27% Impervious, Inflow Depth = 1.49" for 2-Year event
Inflow = 0.51 cfs @ 12.28 hrs, Volume= 0.053 af
Outflow = 0.51 cfs @ 12.28 hrs, Volume= 0.053 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 17R: WEST PLUNGE POOL

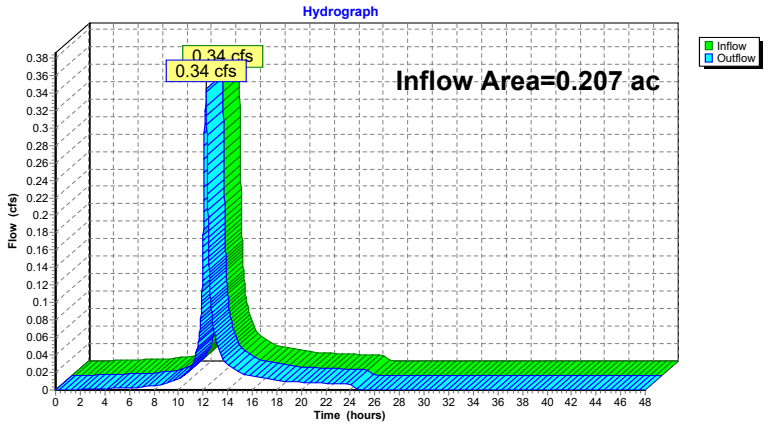


Summary for Reach 18R: WEST PLUNGE POOL

Inflow Area = 0.207 ac, 81.94% Impervious, Inflow Depth = 2.09" for 2-Year event
Inflow = 0.34 cfs @ 12.25 hrs, Volume= 0.036 af
Outflow = 0.34 cfs @ 12.25 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 18R: WEST PLUNGE POOL

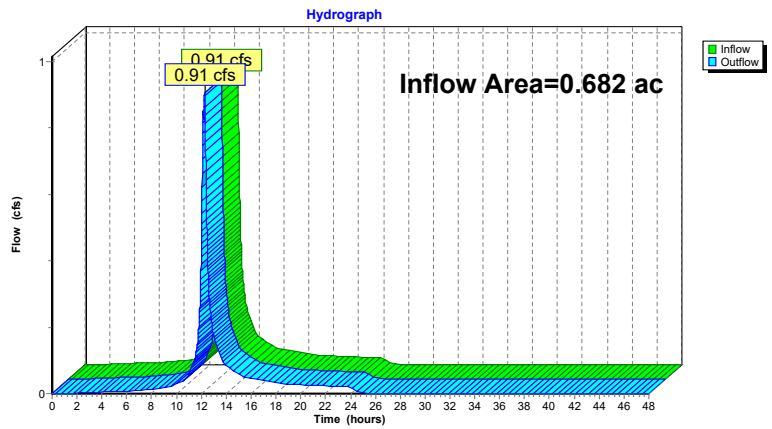


Summary for Reach 19R: SITE TOTAL

Inflow Area = 0.682 ac, 71.00% Impervious, Inflow Depth = 1.77" for 2-Year event
Inflow = 0.91 cfs @ 12.27 hrs, Volume= 0.100 af
Outflow = 0.91 cfs @ 12.27 hrs, Volume= 0.100 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 19R: SITE TOTAL



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 NW-W Runoff Area=8,070 sf 52.23% Impervious Runoff Depth=2.34"
Tc=6.0 min CN=79 Runoff=0.55 cfs 0.036 af

Subcatchment 2S: 2 NW-E Runoff Area=1,480 sf 100.00% Impervious Runoff Depth=4.22"
Tc=6.0 min CN=98 Runoff=0.16 cfs 0.012 af

Subcatchment 3S: 3 SW-W Runoff Area=7,555 sf 58.44% Impervious Runoff Depth=2.51"
Tc=6.0 min CN=81 Runoff=0.55 cfs 0.036 af

Subcatchment 4S: 4 SW-E Runoff Area=1,435 sf 100.00% Impervious Runoff Depth=4.22"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment 5S: 5 BRIDGE Runoff Area=2,185 sf 100.00% Impervious Runoff Depth=4.22"
Tc=6.0 min CN=98 Runoff=0.23 cfs 0.018 af

Subcatchment 6S: 6 NE-W Runoff Area=330 sf 100.00% Impervious Runoff Depth=4.22"
Tc=6.0 min CN=98 Runoff=0.03 cfs 0.003 af

Subcatchment 7S: 7 NE Runoff Area=2,290 sf 100.00% Impervious Runoff Depth=4.22"
Tc=6.0 min CN=98 Runoff=0.24 cfs 0.019 af

Subcatchment 8S: 8 EAST Runoff Area=6,380 sf 74.53% Impervious Runoff Depth=3.16"
Tc=6.0 min CN=88 Runoff=0.57 cfs 0.039 af

Reach 9R: Grass Swale Avg. Flow Depth=0.23' Max Vel=0.73 fps Inflow=0.55 cfs 0.036 af
n=0.150 L=233.0' S=0.0531 '/' Capacity=8.10 cfs Outflow=0.46 cfs 0.036 af

Reach 10R: 2 NW-E Total Inflow=0.16 cfs 0.012 af
Outflow=0.16 cfs 0.012 af

Reach 11R: Grass Swale Avg. Flow Depth=0.31' Max Vel=0.78 fps Inflow=0.55 cfs 0.036 af
n=0.150 L=235.0' S=0.0529 '/' Capacity=6.07 cfs Outflow=0.46 cfs 0.036 af

Reach 12R: 4 SW-E Total Inflow=0.15 cfs 0.012 af
Outflow=0.15 cfs 0.012 af

Reach 13R: 5 Bridge Total Inflow=0.23 cfs 0.018 af
Outflow=0.23 cfs 0.018 af

Reach 14R: 6 NE-W Total Inflow=0.03 cfs 0.003 af
Outflow=0.03 cfs 0.003 af

Reach 15R: 6 NE-W Total Inflow=0.24 cfs 0.019 af
Outflow=0.24 cfs 0.019 af

Reach 16R: Grass Ditch Avg. Flow Depth=0.36' Max Vel=0.65 fps Inflow=0.57 cfs 0.039 af
n=0.150 L=190.0' S=0.0316 '/' Capacity=0.98 cfs Outflow=0.48 cfs 0.039 af

Reach 17R: WEST PLUNGE POOL Inflow=1.04 cfs 0.096 af
Outflow=1.04 cfs 0.096 af

Reach 18R: WEST PLUNGE POOL Inflow=0.60 cfs 0.060 af
Outflow=0.60 cfs 0.060 af

Reach 19R: SITE TOTAL Inflow=1.74 cfs 0.173 af
Outflow=1.74 cfs 0.173 af

Total Runoff Area = 0.682 ac Runoff Volume = 0.173 af Average Runoff Depth = 3.05"
29.00% Pervious = 0.198 ac 71.00% Impervious = 0.485 ac

Summary for Subcatchment 1S: 1 NW-W

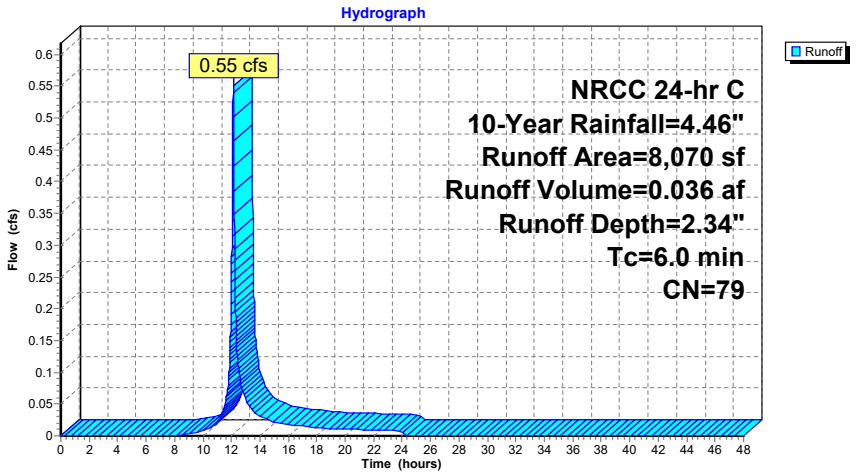
Runoff = 0.55 cfs @ 12.13 hrs, Volume= 0.036 af, Depth= 2.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
4,215	98	Paved roads w/curbs & sewers, HSG B
3,855	58	Woods/grass comb., Good, HSG B
8,070	79	Weighted Average
3,855		47.77% Pervious Area
4,215		52.23% Impervious Area

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

Subcatchment 1S: 1 NW-W



Summary for Subcatchment 2S: 2 NW-E

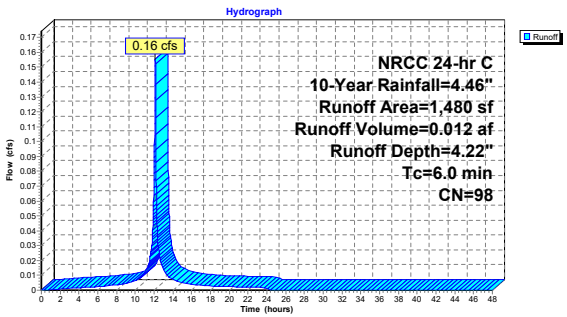
Runoff = 0.16 cfs @ 12.13 hrs, Volume= 0.012 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
1,480	98	Paved roads w/curbs & sewers, HSG B
1,480		100.00% Impervious Area

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

Subcatchment 2S: 2 NW-E



Summary for Subcatchment 3S: 3 SW-W

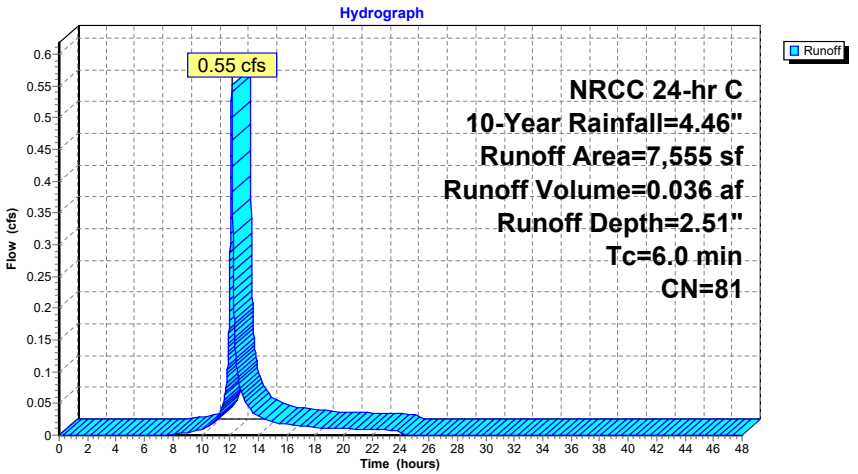
Runoff = 0.55 cfs @ 12.13 hrs, Volume= 0.036 af, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
4,415	98	Paved roads w/curbs & sewers, HSG B
3,140	58	Woods/grass comb., Good, HSG B
7,555	81	Weighted Average
3,140		41.56% Pervious Area
4,415		58.44% Impervious Area

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

Subcatchment 3S: 3 SW-W



Summary for Subcatchment 4S: 4 SW-E

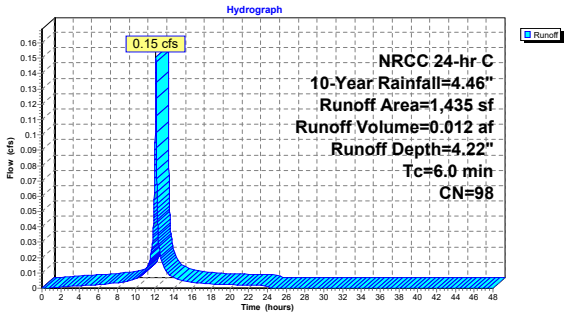
Runoff = 0.15 cfs @ 12.13 hrs, Volume= 0.012 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
1,435	98	Paved roads w/curbs & sewers, HSG B
1,435		100.00% Impervious Area

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

Subcatchment 4S: 4 SW-E



Summary for Subcatchment 5S: 5 BRIDGE

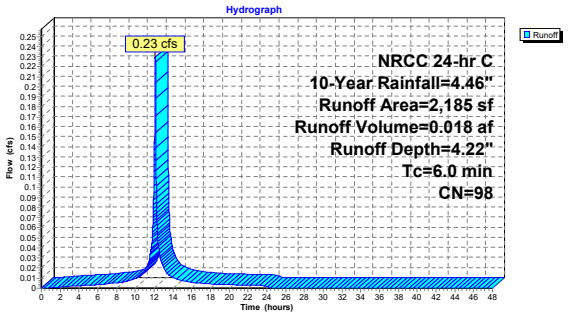
Runoff = 0.23 cfs @ 12.13 hrs, Volume= 0.018 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
2,185	98	Paved roads w/curbs & sewers, HSG B
2,185		100.00% Impervious Area

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

Subcatchment 5S: 5 BRIDGE



Summary for Subcatchment 6S: 6 NE-W

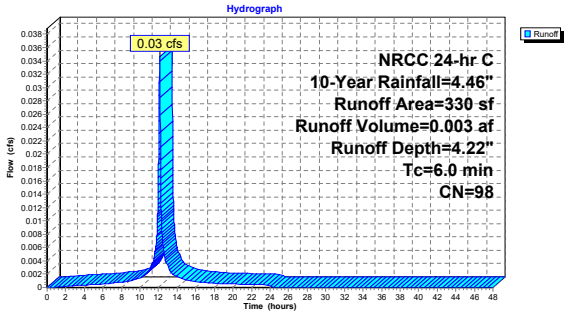
Runoff = 0.03 cfs @ 12.13 hrs, Volume= 0.003 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
330	98	Paved roads w/curbs & sewers, HSG B
330		100.00% Impervious Area

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

Subcatchment 6S: 6 NE-W



Summary for Subcatchment 7S: 7 NE

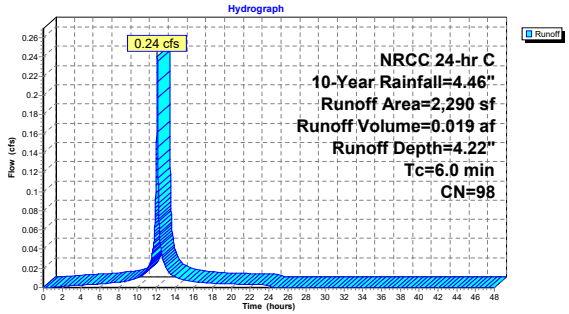
Runoff = 0.24 cfs @ 12.13 hrs, Volume= 0.019 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
2,290	98	Paved roads w/curbs & sewers, HSG B
2,290		100.00% Impervious Area

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

Subcatchment 7S: 7 NE



Summary for Subcatchment 8S: 8 EAST

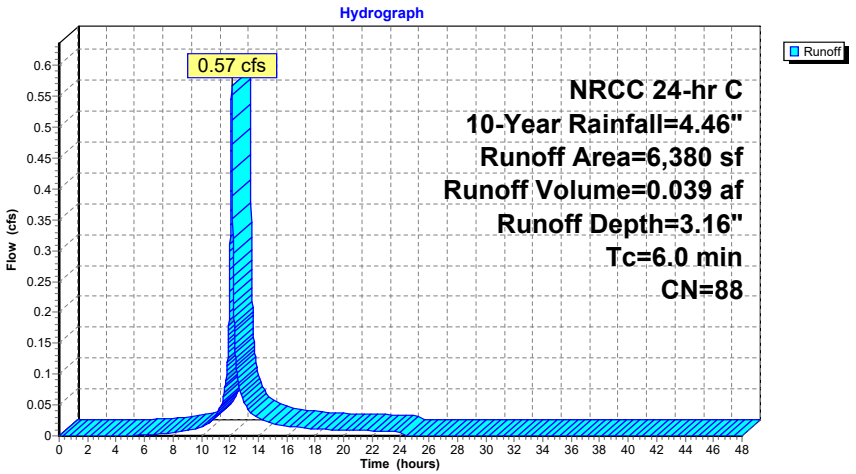
Runoff = 0.57 cfs @ 12.13 hrs, Volume= 0.039 af, Depth= 3.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
4,755	98	Paved roads w/curbs & sewers, HSG B
1,625	58	Woods/grass comb., Good, HSG B
6,380	88	Weighted Average
1,625		25.47% Pervious Area
4,755		74.53% Impervious Area

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

Subcatchment 8S: 8 EAST



Summary for Reach 9R: Grass Swale

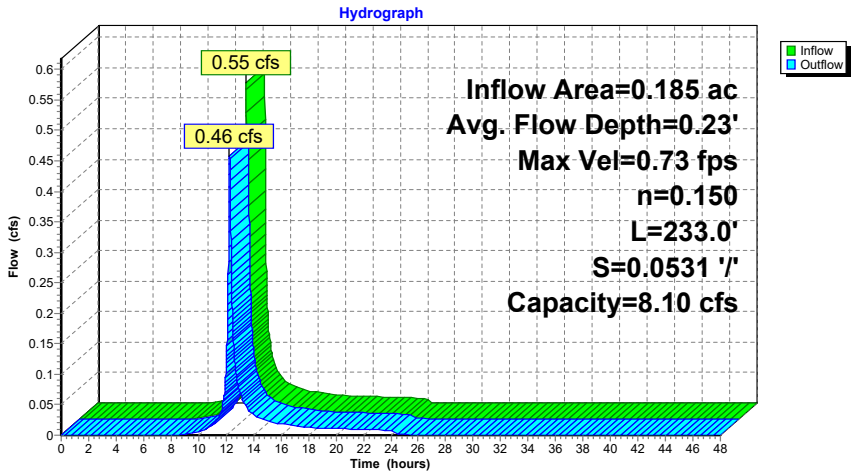
Inflow Area = 0.185 ac, 52.23% Impervious, Inflow Depth = 2.34" for 10-Year event
Inflow = 0.55 cfs @ 12.13 hrs, Volume= 0.036 af
Outflow = 0.46 cfs @ 12.26 hrs, Volume= 0.036 af, Atten= 17%, Lag= 7.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.73 fps, Min. Travel Time= 5.3 min
Avg. Velocity = 0.21 fps, Avg. Travel Time= 18.5 min

Peak Storage= 146 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 8.10 cfs

2.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 2.0 4.0 '/' Top Width= 8.00'
Length= 233.0' Slope= 0.0531 '/'
Inlet Invert= 240.75', Outlet Invert= 228.38'

Reach 9R: Grass Swale

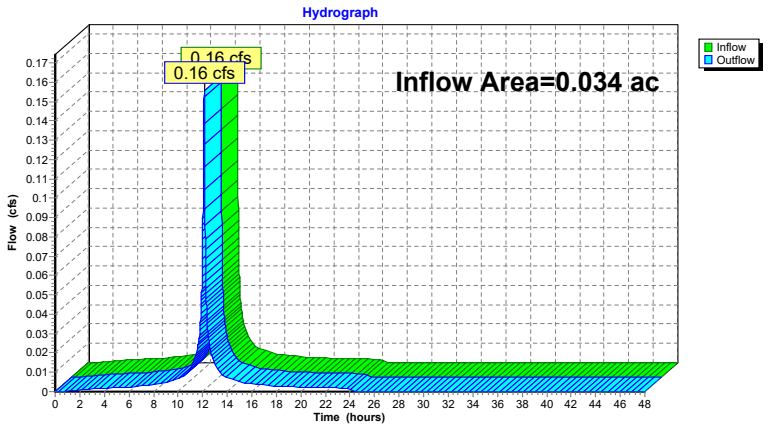


Summary for Reach 10R: 2 NW-E Total

Inflow Area = 0.034 ac,100.00% Impervious, Inflow Depth = 4.22" for 10-Year event
Inflow = 0.16 cfs @ 12.13 hrs, Volume= 0.012 af
Outflow = 0.16 cfs @ 12.13 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 10R: 2 NW-E Total



Summary for Reach 11R: Grass Swale

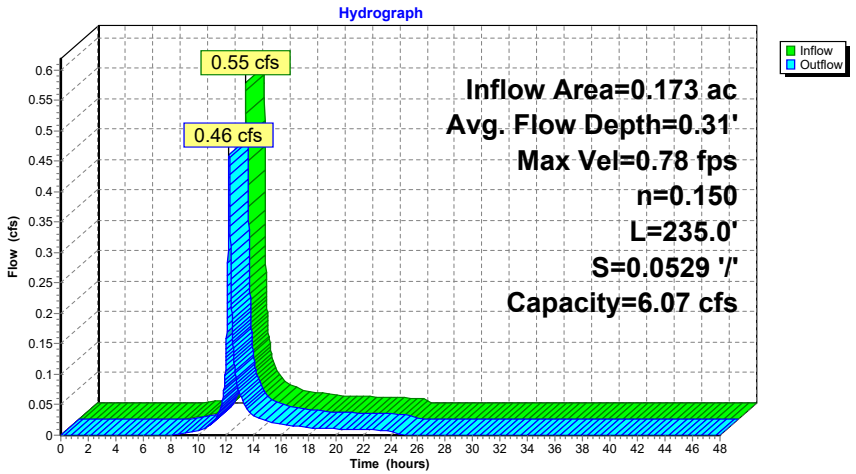
Inflow Area = 0.173 ac, 58.44% Impervious, Inflow Depth = 2.51" for 10-Year event
Inflow = 0.55 cfs @ 12.13 hrs, Volume= 0.036 af
Outflow = 0.46 cfs @ 12.25 hrs, Volume= 0.036 af, Atten= 17%, Lag= 7.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.78 fps, Min. Travel Time= 5.0 min
Avg. Velocity = 0.25 fps, Avg. Travel Time= 15.8 min

Peak Storage= 139 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 6.07 cfs

1.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 2.0 4.0 '/' Top Width= 7.00'
Length= 235.0' Slope= 0.0529 '/'
Inlet Invert= 240.74', Outlet Invert= 228.30'

Reach 11R: Grass Swale

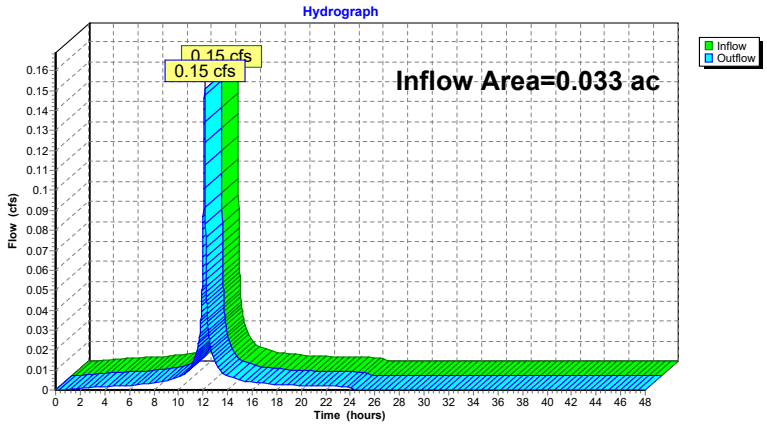


Summary for Reach 12R: 4 SW-E Total

Inflow Area = 0.033 ac,100.00% Impervious, Inflow Depth = 4.22" for 10-Year event
Inflow = 0.15 cfs @ 12.13 hrs, Volume= 0.012 af
Outflow = 0.15 cfs @ 12.13 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 12R: 4 SW-E Total

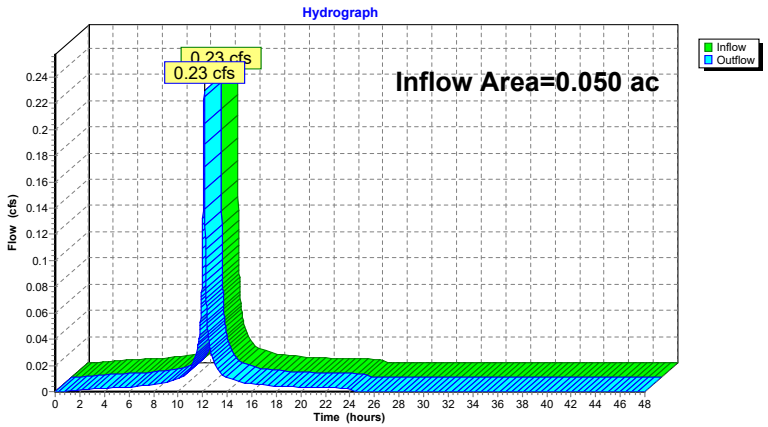


Summary for Reach 13R: 5 Bridge Total

Inflow Area = 0.050 ac,100.00% Impervious, Inflow Depth = 4.22" for 10-Year event
Inflow = 0.23 cfs @ 12.13 hrs, Volume= 0.018 af
Outflow = 0.23 cfs @ 12.13 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 13R: 5 Bridge Total

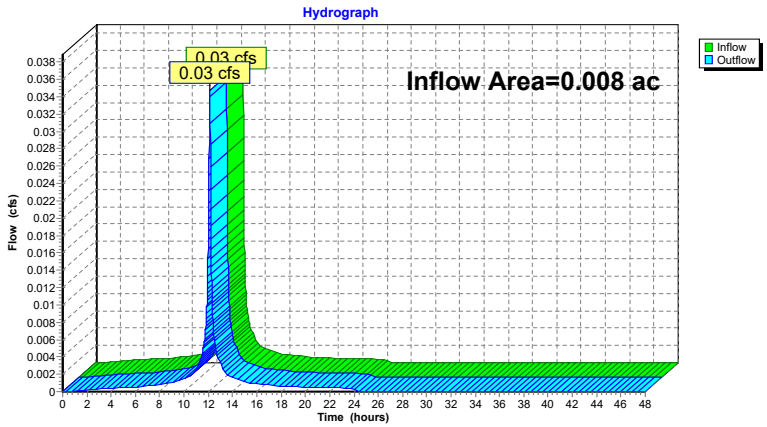


Summary for Reach 14R: 6 NE-W Total

Inflow Area = 0.008 ac,100.00% Impervious, Inflow Depth = 4.22" for 10-Year event
Inflow = 0.03 cfs @ 12.13 hrs, Volume= 0.003 af
Outflow = 0.03 cfs @ 12.13 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 14R: 6 NE-W Total

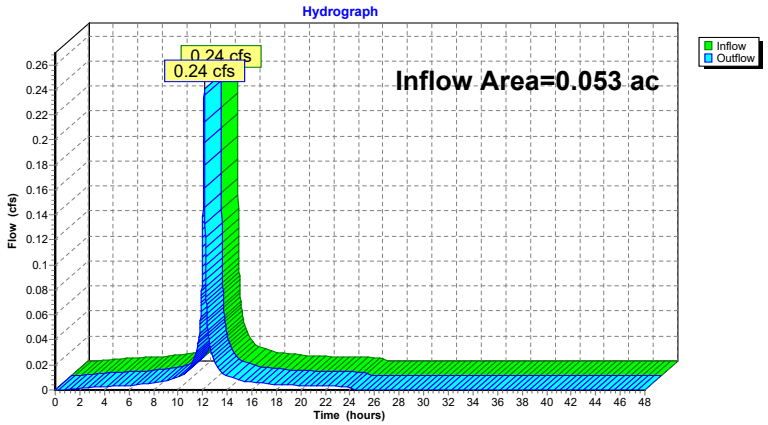


Summary for Reach 15R: 6 NE-W Total

Inflow Area = 0.053 ac,100.00% Impervious, Inflow Depth = 4.22" for 10-Year event
Inflow = 0.24 cfs @ 12.13 hrs, Volume= 0.019 af
Outflow = 0.24 cfs @ 12.13 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 15R: 6 NE-W Total



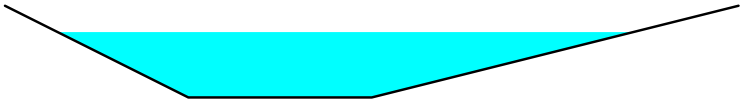
Summary for Reach 16R: Grass Ditch

Inflow Area = 0.146 ac, 74.53% Impervious, Inflow Depth = 3.16" for 10-Year event
Inflow = 0.57 cfs @ 12.13 hrs, Volume= 0.039 af
Outflow = 0.48 cfs @ 12.25 hrs, Volume= 0.039 af, Atten= 15%, Lag= 7.1 min

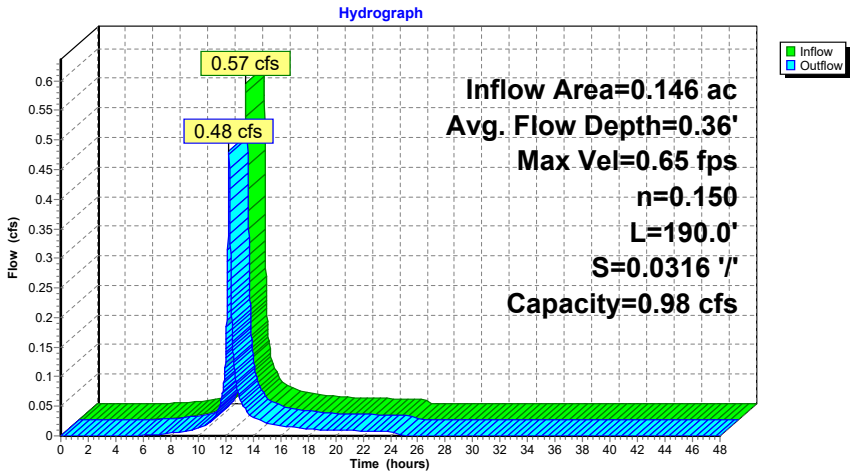
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.65 fps, Min. Travel Time= 4.9 min
Avg. Velocity = 0.19 fps, Avg. Travel Time= 17.0 min

Peak Storage= 140 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 0.50' Flow Area= 1.3 sf, Capacity= 0.98 cfs

1.00' x 0.50' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 2.0 4.0 '/' Top Width= 4.00'
Length= 190.0' Slope= 0.0316 '/'
Inlet Invert= 233.00', Outlet Invert= 227.00'



Reach 16R: Grass Ditch

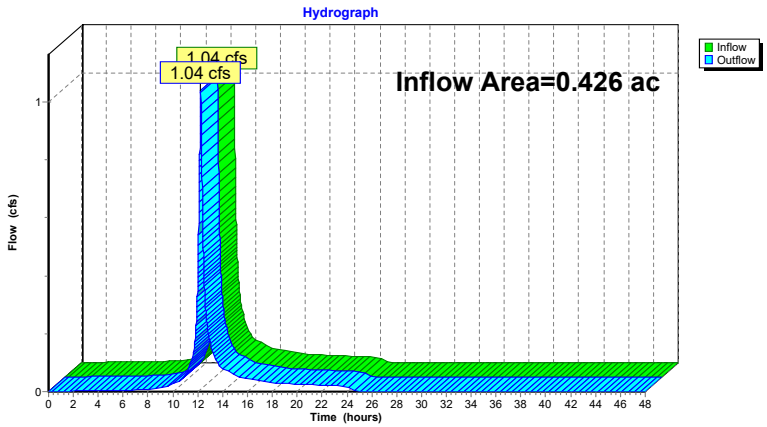


Summary for Reach 17R: WEST PLUNGE POOL

Inflow Area = 0.426 ac, 62.27% Impervious, Inflow Depth = 2.71" for 10-Year event
Inflow = 1.04 cfs @ 12.25 hrs, Volume= 0.096 af
Outflow = 1.04 cfs @ 12.25 hrs, Volume= 0.096 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 17R: WEST PLUNGE POOL

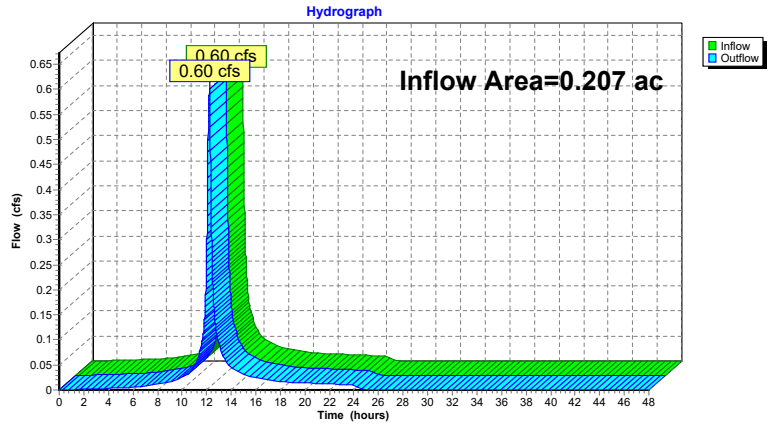


Summary for Reach 18R: WEST PLUNGE POOL

Inflow Area = 0.207 ac, 81.94% Impervious, Inflow Depth = 3.47" for 10-Year event
Inflow = 0.60 cfs @ 12.24 hrs, Volume= 0.060 af
Outflow = 0.60 cfs @ 12.24 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 18R: WEST PLUNGE POOL

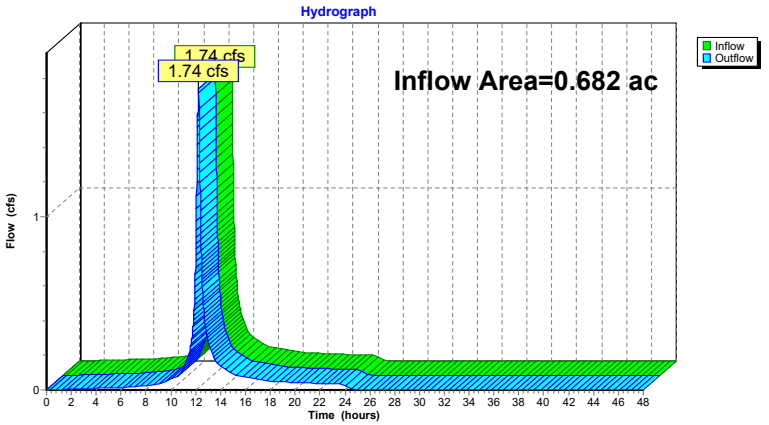


Summary for Reach 19R: SITE TOTAL

Inflow Area = 0.682 ac, 71.00% Impervious, Inflow Depth = 3.05" for 10-Year event
Inflow = 1.74 cfs @ 12.24 hrs, Volume= 0.173 af
Outflow = 1.74 cfs @ 12.24 hrs, Volume= 0.173 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 19R: SITE TOTAL



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 NW-W Runoff Area=8,070 sf 52.23% Impervious Runoff Depth=5.43"
Tc=6.0 min CN=79 Runoff=1.24 cfs 0.084 af

Subcatchment 2S: 2 NW-E Runoff Area=1,480 sf 100.00% Impervious Runoff Depth=7.68"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.022 af

Subcatchment 3S: 3 SW-W Runoff Area=7,555 sf 58.44% Impervious Runoff Depth=5.67"
Tc=6.0 min CN=81 Runoff=1.20 cfs 0.082 af

Subcatchment 4S: 4 SW-E Runoff Area=1,435 sf 100.00% Impervious Runoff Depth=7.68"
Tc=6.0 min CN=98 Runoff=0.27 cfs 0.021 af

Subcatchment 5S: 5 BRIDGE Runoff Area=2,185 sf 100.00% Impervious Runoff Depth=7.68"
Tc=6.0 min CN=98 Runoff=0.41 cfs 0.032 af

Subcatchment 6S: 6 NE-W Runoff Area=330 sf 100.00% Impervious Runoff Depth=7.68"
Tc=6.0 min CN=98 Runoff=0.06 cfs 0.005 af

Subcatchment 7S: 7 NE Runoff Area=2,290 sf 100.00% Impervious Runoff Depth=7.68"
Tc=6.0 min CN=98 Runoff=0.43 cfs 0.034 af

Subcatchment 8S: 8 EAST Runoff Area=6,380 sf 74.53% Impervious Runoff Depth=6.49"
Tc=6.0 min CN=88 Runoff=1.12 cfs 0.079 af

Reach 9R: Grass Swale Avg. Flow Depth=0.37' Max Vel=0.94 fps Inflow=1.24 cfs 0.084 af
n=0.150 L=233.0' S=0.0531 '/' Capacity=8.10 cfs Outflow=1.09 cfs 0.084 af

Reach 10R: 2 NW-E Total Inflow=0.28 cfs 0.022 af
Outflow=0.28 cfs 0.022 af

Reach 11R: Grass Swale Avg. Flow Depth=0.46' Max Vel=0.97 fps Inflow=1.20 cfs 0.082 af
n=0.150 L=235.0' S=0.0529 '/' Capacity=6.07 cfs Outflow=1.05 cfs 0.082 af

Reach 12R: 4 SW-E Total Inflow=0.27 cfs 0.021 af
Outflow=0.27 cfs 0.021 af

Reach 13R: 5 Bridge Total Inflow=0.41 cfs 0.032 af
Outflow=0.41 cfs 0.032 af

Reach 14R: 6 NE-W Total Inflow=0.06 cfs 0.005 af
Outflow=0.06 cfs 0.005 af

Reach 15R: 6 NE-W Total Inflow=0.43 cfs 0.034 af
Outflow=0.43 cfs 0.034 af

Reach 16R: Grass Ditch Avg. Flow Depth=0.50' Max Vel=0.79 fps Inflow=1.12 cfs 0.079 af
n=0.150 L=190.0' S=0.0316 '/' Capacity=0.98 cfs Outflow=0.98 cfs 0.079 af

Reach 17R: WEST PLUNGE POOL Inflow=2.40 cfs 0.209 af
Outflow=2.40 cfs 0.209 af

Reach 18R: WEST PLUNGE POOL Inflow=1.23 cfs 0.118 af
Outflow=1.23 cfs 0.118 af

Reach 19R: SITE TOTAL Inflow=3.83 cfs 0.358 af
Outflow=3.83 cfs 0.358 af

Total Runoff Area = 0.682 ac Runoff Volume = 0.358 af Average Runoff Depth = 6.30"
29.00% Pervious = 0.198 ac 71.00% Impervious = 0.485 ac

Summary for Subcatchment 1S: 1 NW-W

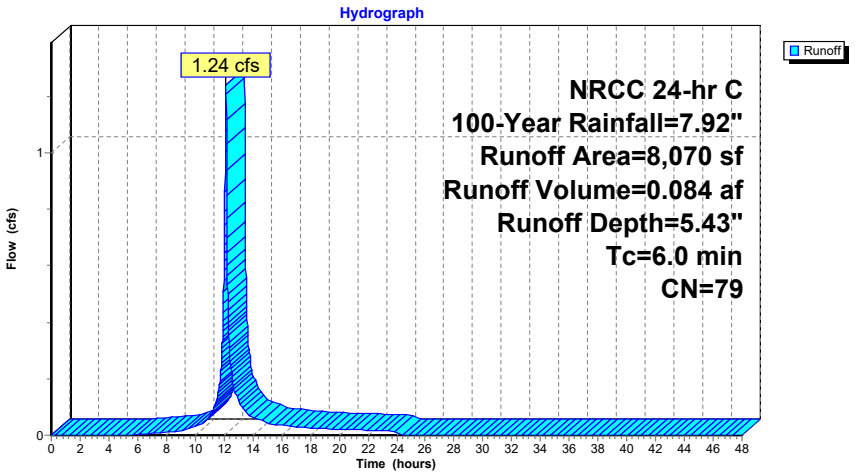
Runoff = 1.24 cfs @ 12.13 hrs, Volume= 0.084 af, Depth= 5.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
4,215	98	Paved roads w/curbs & sewers, HSG B
3,855	58	Woods/grass comb., Good, HSG B
8,070	79	Weighted Average
3,855		47.77% Pervious Area
4,215		52.23% Impervious Area

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

Subcatchment 1S: 1 NW-W



Summary for Subcatchment 2S: 2 NW-E

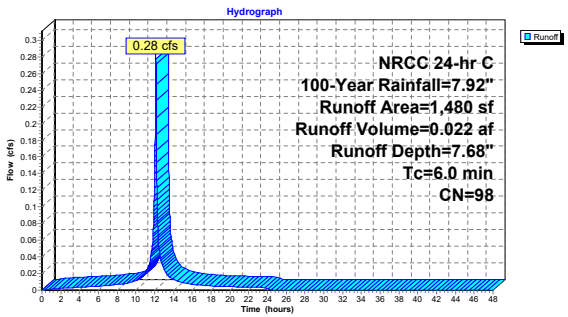
Runoff = 0.28 cfs @ 12.13 hrs, Volume= 0.022 af, Depth= 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
1,480	98	Paved roads w/curbs & sewers, HSG B
1,480		100.00% Impervious Area

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

Subcatchment 2S: 2 NW-E



Summary for Subcatchment 3S: 3 SW-W

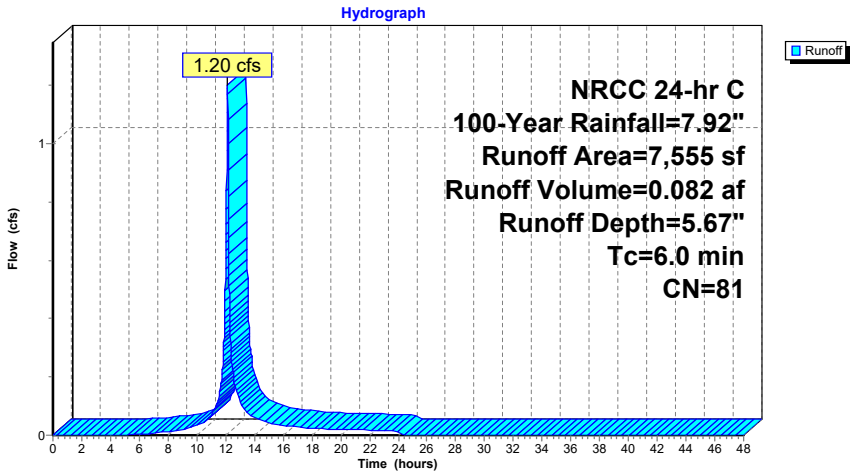
Runoff = 1.20 cfs @ 12.13 hrs, Volume= 0.082 af, Depth= 5.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
4,415	98	Paved roads w/curbs & sewers, HSG B
3,140	58	Woods/grass comb., Good, HSG B
7,555	81	Weighted Average
3,140		41.56% Pervious Area
4,415		58.44% Impervious Area

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

Subcatchment 3S: 3 SW-W



Summary for Subcatchment 4S: 4 SW-E

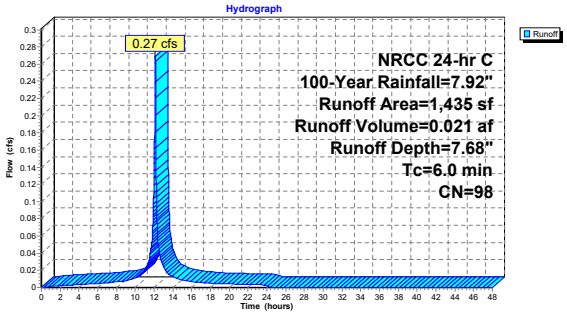
Runoff = 0.27 cfs @ 12.13 hrs, Volume= 0.021 af, Depth= 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
1,435	98	Paved roads w/curbs & sewers, HSG B
1,435		100.00% Impervious Area

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

Subcatchment 4S: 4 SW-E



Summary for Subcatchment 5S: 5 BRIDGE

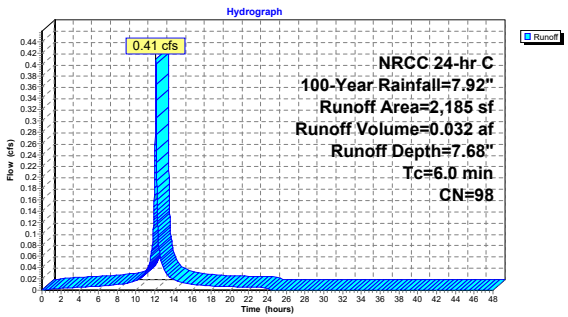
Runoff = 0.41 cfs @ 12.13 hrs, Volume= 0.032 af, Depth= 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
2,185	98	Paved roads w/curbs & sewers, HSG B
2,185		100.00% Impervious Area

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

Subcatchment 5S: 5 BRIDGE



Summary for Subcatchment 6S: 6 NE-W

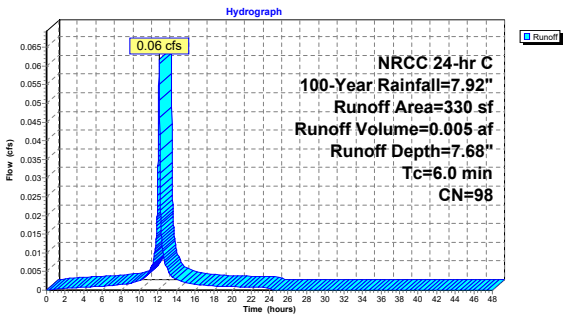
Runoff = 0.06 cfs @ 12.13 hrs, Volume= 0.005 af, Depth= 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
330	98	Paved roads w/curbs & sewers, HSG B
330		100.00% Impervious Area

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

Subcatchment 6S: 6 NE-W



Summary for Subcatchment 7S: 7 NE

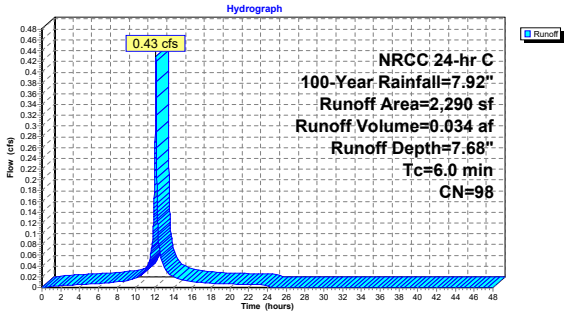
Runoff = 0.43 cfs @ 12.13 hrs, Volume= 0.034 af, Depth= 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
2,290	98	Paved roads w/curbs & sewers, HSG B
2,290		100.00% Impervious Area

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

Subcatchment 7S: 7 NE



Summary for Subcatchment 8S: 8 EAST

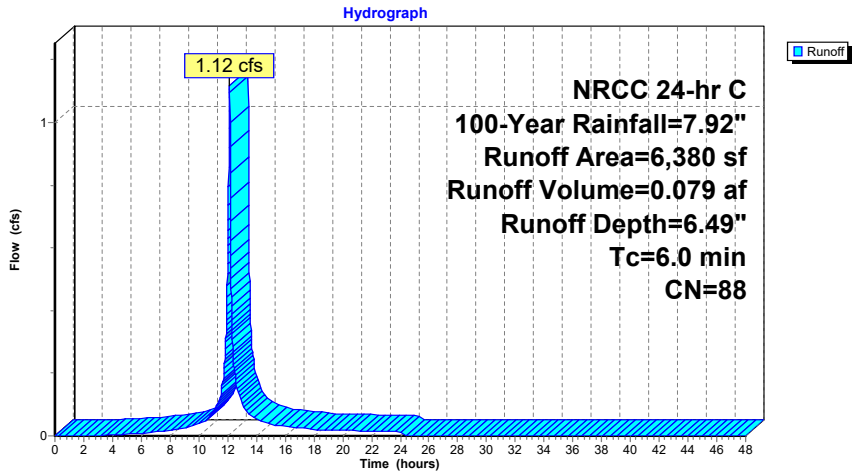
Runoff = 1.12 cfs @ 12.13 hrs, Volume= 0.079 af, Depth= 6.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
4,755	98	Paved roads w/curbs & sewers, HSG B
1,625	58	Woods/grass comb., Good, HSG B
6,380	88	Weighted Average
1,625		25.47% Pervious Area
4,755		74.53% Impervious Area

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

Subcatchment 8S: 8 EAST



Summary for Reach 9R: Grass Swale

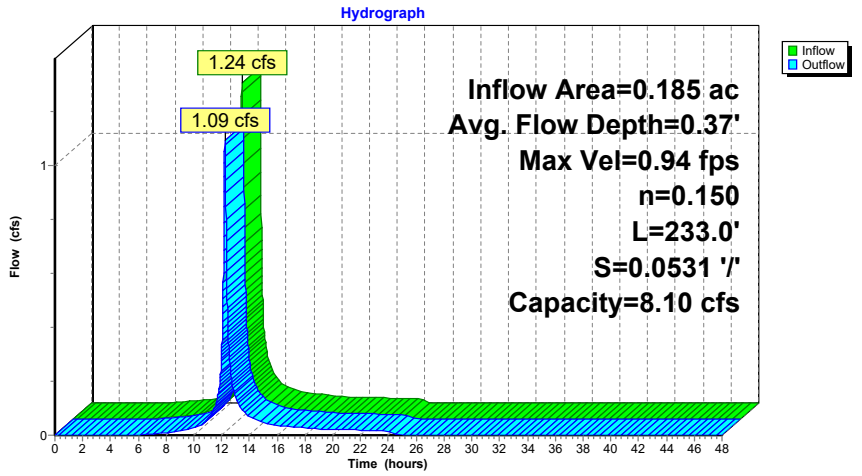
Inflow Area = 0.185 ac, 52.23% Impervious, Inflow Depth = 5.43" for 100-Year event
Inflow = 1.24 cfs @ 12.13 hrs, Volume= 0.084 af
Outflow = 1.09 cfs @ 12.23 hrs, Volume= 0.084 af, Atten= 12%, Lag= 6.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.94 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 0.26 fps, Avg. Travel Time= 14.9 min

Peak Storage= 270 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 8.10 cfs

2.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 2.0 4.0 '/' Top Width= 8.00'
Length= 233.0' Slope= 0.0531 '/'
Inlet Invert= 240.75', Outlet Invert= 228.38'

Reach 9R: Grass Swale

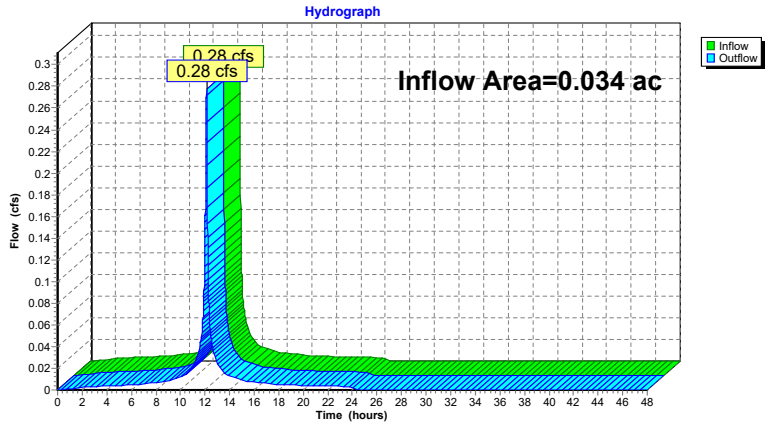


Summary for Reach 10R: 2 NW-E Total

Inflow Area = 0.034 ac,100.00% Impervious, Inflow Depth = 7.68" for 100-Year event
Inflow = 0.28 cfs @ 12.13 hrs, Volume= 0.022 af
Outflow = 0.28 cfs @ 12.13 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 10R: 2 NW-E Total



Summary for Reach 11R: Grass Swale

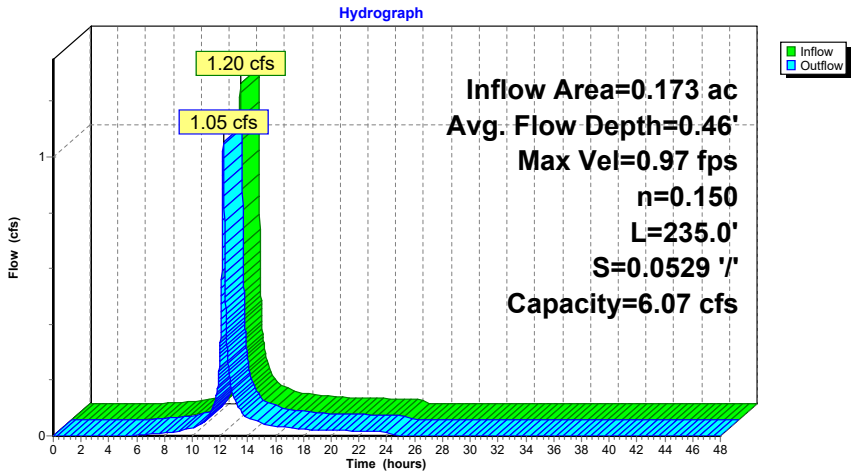
Inflow Area = 0.173 ac, 58.44% Impervious, Inflow Depth = 5.67" for 100-Year event
Inflow = 1.20 cfs @ 12.13 hrs, Volume= 0.082 af
Outflow = 1.05 cfs @ 12.23 hrs, Volume= 0.082 af, Atten= 12%, Lag= 6.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.97 fps, Min. Travel Time= 4.0 min
Avg. Velocity = 0.30 fps, Avg. Travel Time= 12.9 min

Peak Storage= 256 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 6.07 cfs

1.00' x 1.00' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 2.0 4.0 '/' Top Width= 7.00'
Length= 235.0' Slope= 0.0529 '/'
Inlet Invert= 240.74', Outlet Invert= 228.30'

Reach 11R: Grass Swale

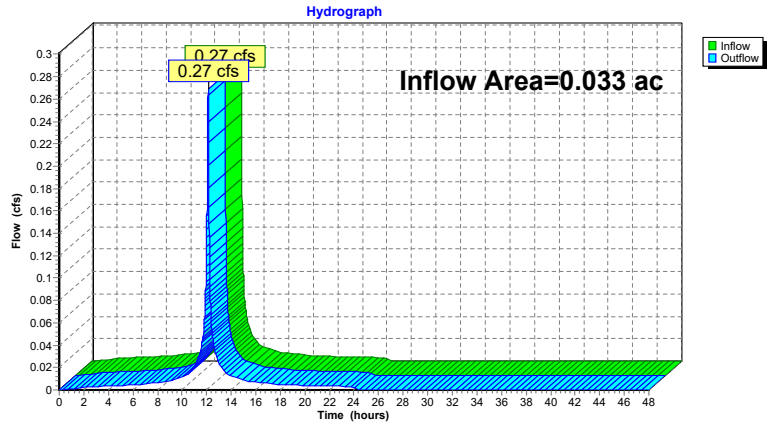


Summary for Reach 12R: 4 SW-E Total

Inflow Area = 0.033 ac,100.00% Impervious, Inflow Depth = 7.68" for 100-Year event
Inflow = 0.27 cfs @ 12.13 hrs, Volume= 0.021 af
Outflow = 0.27 cfs @ 12.13 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 12R: 4 SW-E Total

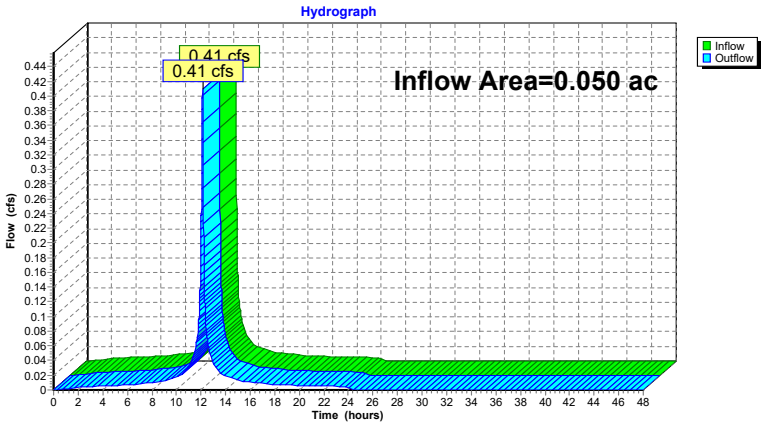


Summary for Reach 13R: 5 Bridge Total

Inflow Area = 0.050 ac,100.00% Impervious, Inflow Depth = 7.68" for 100-Year event
Inflow = 0.41 cfs @ 12.13 hrs, Volume= 0.032 af
Outflow = 0.41 cfs @ 12.13 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 13R: 5 Bridge Total

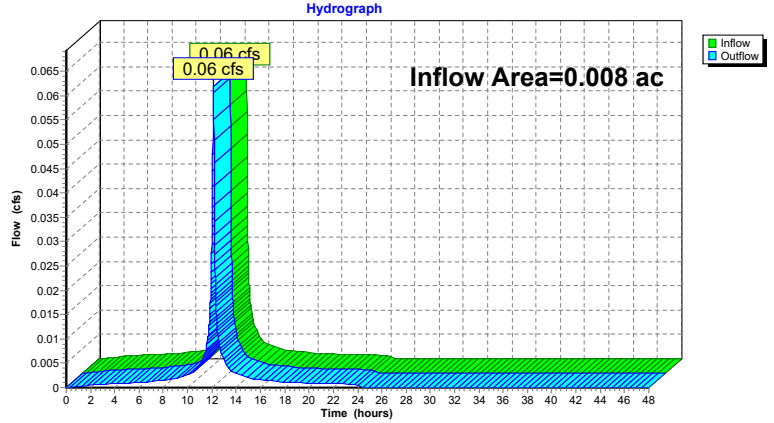


Summary for Reach 14R: 6 NE-W Total

Inflow Area = 0.008 ac,100.00% Impervious, Inflow Depth = 7.68" for 100-Year event
Inflow = 0.06 cfs @ 12.13 hrs, Volume= 0.005 af
Outflow = 0.06 cfs @ 12.13 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 14R: 6 NE-W Total

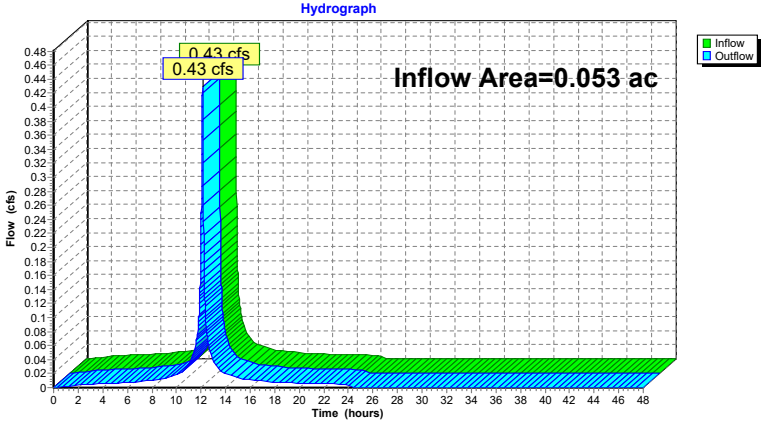


Summary for Reach 15R: 6 NE-W Total

Inflow Area = 0.053 ac,100.00% Impervious, Inflow Depth = 7.68" for 100-Year event
Inflow = 0.43 cfs @ 12.13 hrs, Volume= 0.034 af
Outflow = 0.43 cfs @ 12.13 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 15R: 6 NE-W Total



Summary for Reach 16R: Grass Ditch

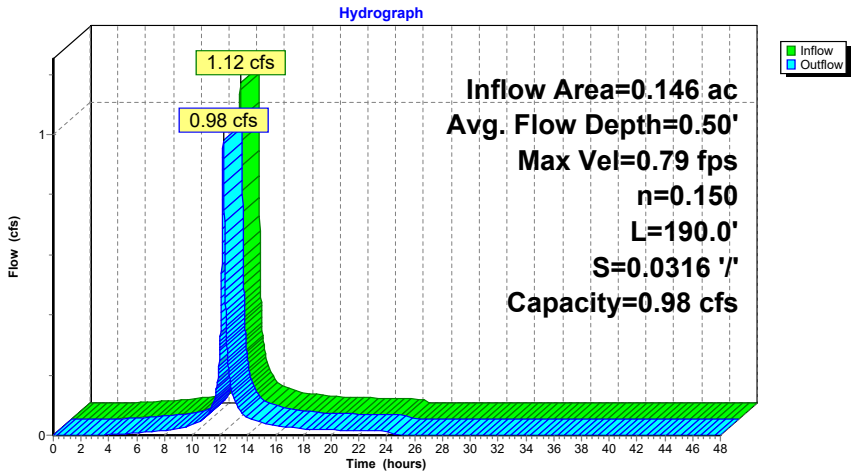
Inflow Area = 0.146 ac, 74.53% Impervious, Inflow Depth = 6.49" for 100-Year event
Inflow = 1.12 cfs @ 12.13 hrs, Volume= 0.079 af
Outflow = 0.98 cfs @ 12.23 hrs, Volume= 0.079 af, Atten= 12%, Lag= 6.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.79 fps, Min. Travel Time= 4.0 min
Avg. Velocity = 0.23 fps, Avg. Travel Time= 13.7 min

Peak Storage= 237 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 0.50' Flow Area= 1.3 sf, Capacity= 0.98 cfs

1.00' x 0.50' deep channel, n= 0.150 Sheet flow over Short Grass
Side Slope Z-value= 2.0 4.0 '/' Top Width= 4.00'
Length= 190.0' Slope= 0.0316 '/'
Inlet Invert= 233.00', Outlet Invert= 227.00'

Reach 16R: Grass Ditch

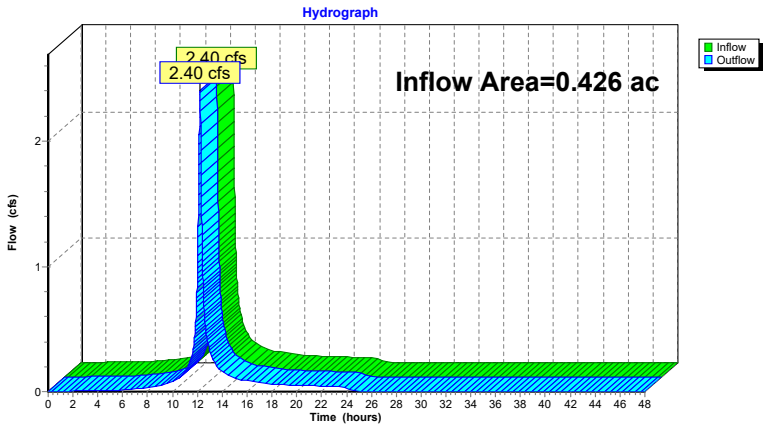


Summary for Reach 17R: WEST PLUNGE POOL

Inflow Area = 0.426 ac, 62.27% Impervious, Inflow Depth = 5.88" for 100-Year event
Inflow = 2.40 cfs @ 12.23 hrs, Volume= 0.209 af
Outflow = 2.40 cfs @ 12.23 hrs, Volume= 0.209 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 17R: WEST PLUNGE POOL

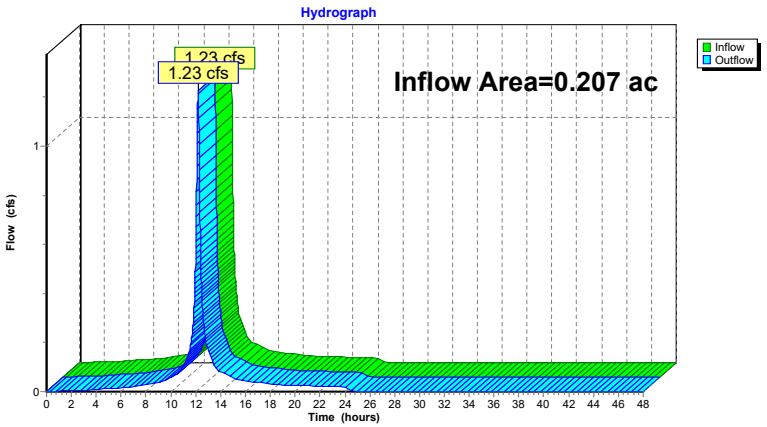


Summary for Reach 18R: WEST PLUNGE POOL

Inflow Area = 0.207 ac, 81.94% Impervious, Inflow Depth = 6.84" for 100-Year event
Inflow = 1.23 cfs @ 12.21 hrs, Volume= 0.118 af
Outflow = 1.23 cfs @ 12.21 hrs, Volume= 0.118 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 18R: WEST PLUNGE POOL



Summary for Reach 19R: SITE TOTAL

Inflow Area = 0.682 ac, 71.00% Impervious, Inflow Depth = 6.30" for 100-Year event
Inflow = 3.83 cfs @ 12.22 hrs, Volume= 0.358 af
Outflow = 3.83 cfs @ 12.22 hrs, Volume= 0.358 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Reach 19R: SITE TOTAL