GRADY CONSULTING, L.L.C.
Civil Engineers ♦ Land Surveyors ♦ Landscape Architects

May 16, 2023

Planning Board
Town Hall
Pembroke, MA 02359

RE: Site Plan Approval & Special Permit – Peer Review Response
Address: 0 & 74 Congress Street – Assessor Lots F9-12C & F9-11
Applicant: Whatbarn LLC, Owner: Kevin St. George

Dear Board Members:

On behalf of the applicant, we hereby submit our response to the peer review dated April 25, 2023. Enclosed please find the following:

1. 9 copies of the Response to Peer Review Comments
2. 2 – 24” x 36” Copies of Engineering Drawings.
3. 9 – 11” x 17” Copies of Engineering Drawings.
4. 2 copies of Stormwater Calculations
5. 9 copies of the draft SWPPP
6. 9 copies of Unit 5 Floor Plan
7. 9 copies of the Cultec 150XLHD specifications

If you have any questions please do not hesitate to call.

Sincerely,

GRADY CONSULTING, L.L.C.

Kevin Grady, P.E.
Project Engineer

Cc: Whatbarn, LLC

\\GC-DCFS\JobData\2022\22-286\Planning\Peer Review\Planning - Cover Sheet.doc

GRADY CONSULTING, L.L.C.
Civil Engineers ♦ Land Surveyors ♦ Landscape Architects

May 10, 2023

Planning Board
Town Hall
Pembroke, MA 02359

RE: Response to Peer Review Comments on a Site Plan approval & Special Permit
Address: 0 & 74 Congress Street – Assessor Lots F9-12C & F9-11
Applicant: Whatbarn LLC, Owner: Kevin St. George

On behalf of the applicant, we hereby submit responses to comments dated April 25, 2023.
The plans and documents were reviewed by Ms. Deborah W. Keller, PE, Director of Engineering at Merrill Engineers and Land Surveyors. We utilized the review outline and have provided our responses in **bold** and Ms. Keller's comments in *italics*.

April 25, 2023

Pembroke Planning Board
Town Hall
100 Center Street
Pembroke, MA 02359

ATTN: Matthew Heins, Planning Board Assistant

RE: Site Plan Review – Multi Dwelling Residential Development
0 & 74 Congress Street
Pembroke, Massachusetts

Dear Matthew and Board Members:

As requested, Merrill Engineers and Land Surveyors has performed a site inspection and reviewed the submission for consistency with the Pembroke Zoning Bylaws and the Planning Board Rules and Regulations Governing the Issuance of Site Plan Approval for the above-referenced project. The information submitted to this office and reviewed is as follows:

TITLE:	*Multi Dwelling Residential Development 0 & 74 Congress Street Pembroke, Massachusetts*
APPLICANT:	*Whatbarn LLC, 29 Duck Hill Rd, Duxbury MA 02332*
OWNERS:	*Kevin St. George, P.O. Box 174, No. Pembroke, MA 02368*

SITE PLANS:	*Site Plan* *0 & 74 Congress Street* *Pembroke, Massachusetts* *Engineer: Grady Consulting,* *LLC* *Dated: March 13, 2023, revised March 15, 2023 (21 Sheets)*
DRAINAGE CALCULATIONS:	*Stormwater Management Design Calculations* *0 & 74 Congress Street* *Pembroke, Massachusetts* *Engineer: Grady Consulting,* *LLC Dated: March 9, 2023*
ADDITIONAL DOCUMENTS:	*Applications for Site Plan Approval and Special Permit* *Project Summary* *Memorandum Development* *Impact Statement* *Site Photos, ZBA Variance decision, ORAD*

The site is located on the northerly side of Congress Street (Route 14) just east of the Route 53 intersection. The property is located within the Residential-Commercial Zoning District and consists of two parcels with approximately 143,515 square feet or 3.29 acres. Bordering vegetated wetlands and an intermittent stream have been identified surrounding the property. The wetland resources have been reviewed and the boundaries approved by the Pembroke Conservation Commission as accurate through an Order of Resource Area Delineation. The project will require approval from the Pembroke Conservation Commission. The site is currently developed consisting of a single-story building to the rear (north) of the site, several building remains/foundations and open gravel lawn area with debris surrounding the existing building from previous use as a contractor's yard.

The project proposes the construction of ten (10) new single-family homes and the renovation of the existing structure for a total of eleven (11) new dwellings. The project also includes the construction of 24 ft wide roadway servicing nine (9) dwellings and a shared driveway to access two (2) additional dwellings, parking areas, underground utilities, stormwater management facilities and a connection to a shared onsite septic system. The stormwater management system for this project consists of catch basins which will direct both surface and roof runoff to two (2) stormwater infiltration/detention basins and one (1) subsurface infiltration chamber system.

The following report summarizes our review with respect to the Zoning Bylaws and the Planning Board Rules and Regulations Governing the Issuance of Site Plan Approval. The format of this report will follow the format and sections outlined in the Zoning Bylaw and the Planning Board Rules and Regulations Governing the Issuance of Site Plan Approval. The report does not include a review of the proposed septic system design.

<u>ZONING BYLAWS</u>

<u>Summary of Requested Variances</u>

The multiunit dwelling use is allowed by special permit and the following variances have been granted by the Board of Appeals from the Zoning By-laws, Case No. 24-22, dated October 24, 2022.

Section IV.2.D. – Dimensional Regulations

IV.2.D.1. Lot Size Upland Area & One Dwelling Unit Per 10,000 Square Feet of Upland Lot Area
IV.2.D.4. *Front Yard Setback*
IV.2.D.5. *Side Yard Setback*
IV.2.D.6. *Rear Yard Setback*

Variances which have been granted are provided in the Notes on the Cover Plan, 1 of 21.

Clarification should be provided for the Lot Size variance noted as approved for 113,735 sf. and the lot area, exclusive of wetlands as 112,951 sf which is less than the granted minimum lot size.

<u>Section V. Special Provisions, Standards and Procedures</u>

1. *<u>Signs:</u> No project signage is shown on the site plans.*

- **No signs are proposed at this time.**

7F. <u>Procedure:</u> Should the Planning Board approve the project, the approved site plans shall be recorded with the Plymouth County Registry of Deeds within 30 days of the expiration of the appeal period. Proper recording information should be provided on the plans meeting recording requirements.

- **No action required.**

<u>RULES AND REGULATIONS GOVERNING SITE PLAN APPROVAL</u>

<u>Summary of Requested Waivers</u>

Two waivers are requested and are noted on the Cover Plan, 1 of 21.

- *Waiver for the submittal of a traffic study*
- *Waiver for the use of curbing on both sides of the proposed road and the use of cape cod berm*

We recommend that all waivers that are granted by the Planning Board be specified on the cover sheet of the approved Site Plans.

- **No action required.**

Section IV. Site Plan Content

4.7 A stamped Landscape Plan is provided. There is a notation on the landscape plan to retain the existing stone wall along the site frontage as well as a proposed retaining wall along the septic leaching fields within 5 ft of the existing retaining walls with proposed trees between the two walls.

Please verify the limits of the existing walls that will be retained.

- **Stone wall limits have been noted on sheet 8 as requested.**

The roof runoff collection system should be shown on the Landscape Plan to ensure no conflicts with the proposed landscaping.

- **Roof runoff collection system has been added to the LS sheet as requested.**

4.8. The project is proposed to be serviced by the existing water main within Route 53. Has the DPW reviewed or commented on the water connection, main sizing, and hydrant location including materials etc. The proposed main runs within the shoulder of Congress Street to the main entrance curb cut and tees into the project site to service the proposed development. There will be a short section of water main plugged at the entrance. The applicant should review the water main layout with DPW to determine whether an additional hydrant or blow off valve should be proposed to eliminate any potential for stagnant water locations. Along with DPW coordination, the water connection within Route 53 shall require a Utility State Access Permit. Is there any future plan to extend the proposed water main along Congress Street to the east to Taylor Street?

- **The water department is reviewing the proposed water main.**

4.10 *A typical schematic view and floor plans have been provided for the new dwellings. No architectural plans have been provided for the renovations of the existing structure. Further detail is required for the review.*

- **A floor plan for the barn has been attached to this response letter.**

4.11 *It is indicated that two (2) parking spaces are provided for each unit plus 5 additional parking spaces at the rear of the property near unit 5. It is assumed that this would be one garage space and one space within the individual driveways. It is unclear how Unit 5 will be configured for parking spaces. Please clarify the parking spaces on the plans, especially with respect to Unit 5, the extra spaces, and the emergency turnaround area.*

- **Parking space designations have been added to sheet 3 the plan for unit 5. Other units will have a parking in the garage and another parking in front of the building.**

4.12 *A breakdown of the building lot coverage and percentage of paved (impervious) area used for parking, loading, access within the property and percent of open space are provided on the Cover Plan, but it seems the building area does not match the drainage analysis and the site coverage calculation looks to be incorrect with the total site area. Please review and correct area coverage calculations.*

- **The driveway entrances within the Congress Street layout are not considered in the zoning analysis but they are included in the stormwater as they do contribute to the runoff to the stormwater system. The additional area is approximately 600 S.F..**

4.13 *The sight triangles for the driveways are provided on the plans, sheet 16, although the sight triangles measurements do not match the sight distance shown as proposed in the tables of 340 ft., the plan shows approximately 238 ft look west from both entrances. Please indicate the limits of retaining wall and or any vegetation that will need to be removed within the sight triangles. The emergency vehicle movement should be reviewed with the landscape plan to ensure plantings are not proposed within their vehicle envelope. It seems the vehicle overhangs the proposed driveway a few feet and will conflict with a proposed street tree.*

- **238' is to the intersection. The road ends there and a longer sight distance is not feasible. We have reviewed the landscape plan and have adjusted the plantings to allow for emergency vehicle turning.**

4.15 A Development Impact Statement has been submitted as required. The Planning Board should determine if it is acceptable. Please clarify why there would be no cost to the Town vs revenue as shown in the Five Year Project table.

- **We defer this to the Planning Board to determine if they require additional information.**

4.18 *The proposed building locations are shown on the plans. The minimum building setbacks shown on the site layout plan are not consistent with the zoning table on the Cover Sheet. Please correct.*

- **The plan has been revised as requested.**

4.19 *We recommend the Site Plan be reviewed with the Fire Department to confirm the hydrant location and emergency vehicle accessibility.*

- **Site plan has been sent to the fire department.**

Since there is an existing structure on site, please verify if there is an existing septic system and its location so that it can be properly abandoned or removed per the Board of Health regulations. Also, please verify/locate any wells located on site.

- **A request for information has been sent to the Board of Health, a plan was received, test pit data has been added to sheet 13.**

It is noted that no dumpsters are proposed on site and refuse shall be collected by trash pick-up and the responsibility of the individual homeowners.

- **No response necessary**

An Erosion Control Plan and details are provided on sheet 15. It is recommended to note that the stormwater basins and subsurface infiltration chamber system not be utilized for temporary sediment traps and be protected from heavy construction traffic so as not to compromise the soil conditions. The project will disturb more than 1 acre of land and will be required to submit an EPA Notice of Intent to obtain a Construction General Permit and prepare a Stormwater Pollution Prevention Plan (SWPPP). It is recommended that a draft SWPPP be submitted to the Town.

- **A draft SWPPP is attached to this response.**

4.20 *No sign location is shown on the site plan. Should signage be proposed, information regarding the location, height, size, color, etc. should be submitted to the Planning Board for review.*

- **A detail has been added to sheet 17 for house signage**

4.21 *Please provide a photometric plan illustrating how the proposed lighting will meet the lighting requirements.*

- **The applicant intends to install typical residential lighting on the individual units, no commercial site lighting is proposed lighting requirements are shown on sheet 3.**

4.22 *A waiver has been requested from the requirement of a Traffic Impact Study. Anticipated trip generation estimates have been prepared to support the project.*

- **No response required**

Section V. Requirements

5.1 *A stamped Landscaping Plan and Details are provided. The Planning Board should determine if this plan is satisfactory.*

- **No response required**

5.2 *The location of the proposed lighting should be presented on the plans and a photometric plan should be provided. A cut sheet of the lighting fixtures proposed is provided. Additional information on proper shielding and light pole heights should be provided.*

- **The applicant intends to install typical residential lighting on the individual units, no commercial site lighting is proposed, lighting requirements are shown on sheet 3.**

5.3 *Stormwater Management Design Calculations indicate that the overall stormwater management system will attenuate the post development stormwater flows to a level not exceeding the existing conditions. We offer the following comments regarding the drainage design and analysis:*

  - *As specified in the Mass DEP Stormwater Management Handbook, the following setbacks to infiltration systems shall be provided:*

- *Other surface waters, including wetland areas – 50 ft*
- *Property Lines – 10 ft*
- *Building foundations, including slabs – 10 ft min.*

We recommend that the stormwater basin locations be reviewed and adjusted to provide the appropriate setbacks.

- **Setback dimensions have been added to the plan. A callout and hatch have been added to clearly show the limits of the proposed infiltration within the basin.**

- *A test pit is required within the subsurface infiltration chamber system to confirm groundwater and soil conditions.*

  - **A test pit has been added within the subsurface infiltration chamber and its data is shown on sheet 13.**

- *The two inspection ports for the subsurface infiltration chamber system included in the drainage analysis should be provided on the plans and subsurface chamber detail as they are used for overflow discharge. The outlet pipe length should be reviewed as the plan conflicts with the drainage model.*

  - **The inspection ports are now shown on the plan, the model has been updated to eliminate conflicts.**

- *We recommend that the infiltration basins be modeled such that the entire basin is considered infiltration. There is no separation of storage vs infiltration function. The entire basin should be considered as an infiltration basin. The basins will require the appropriate setback from the wetland resource areas.*

  - **A 6" layer of bentonite clay is being proposed in areas not meant to infiltrate. The areas that do not have bentonite clay will infiltrate the storage volume of the areas that are above the bentonite clay.**

The infiltration basins should be provided with a minimum of 15 ft wide berm to access the outlet control structures and emergency outlets. The drainage model indicates a 24"x24" horizontal orifice as the secondary or emergency outlet and the detail shows a grate opening. The grate configuration should be included in the model and modeled as a separate 100-yr model shutting off the outlets to ensure that should the outlets get clogged, and all flow is routed through the 24x24 grate opening, the basin will not overtop the berm in a flood condition. The flood condition should be evaluated for both basins.

- **The outlet control structure has been moved to the end of the driveway for better access. A hydroCAD summary is being provided on page 312 of the stormwater report which shows both infiltration basins without overtopping in a clogged OCS event (outflow is only routed through the grate opening).**

Please update the remove and replace note for the infiltration basin detail as it references a different test pit.

- **The note has been updated and references the soil requirements for area of no infiltration within the basin.**

The outlet control structure details are inconsistent with the drainage model and should be reviewed and corrected.

- **The outlet control structure details have been updated and reflect the model.**

- *The Checklist for Stormwater Report stamped by the Registered Professional Engineer is included in the Stormwater Management Design Calculations. The checklist should be corrected as it indicates that a sand filter will be used as an LID measure. There looks to be checked items under Standard 5 that don't apply to this project, please update. Standard 8 should be marked as the project is covered by a NPDES CGP and a SWPPP shall be submitted prior to construction.*
    - **The sand filter text has been removed, the additional checkmark on Standard 5 has been removed, Standard 8 now has the appropriate checkmark.**

It is general practice to design sites to comply with Massachusetts DEP Stormwater Management Regulations. The following section describes the 10 Standards for compliance with Stormwater Management Regulations and the status of the submittal relative to each standard.

Standard 1 – Untreated Stormwater
Rip rap pad sizing calculations including stone sizing have not been provided.

- **Rip rap sizing calculations are provided on page 320 of the stormwater report.**

Standard 2 – Post Development Peak Discharge Rates
As shown in the Drainage Report submitted by the design engineer this Standard appears to be met although we have requested additional information regarding stormwater basins and chamber system that may change the analysis and should be considered. This standard is not met.

- **Infiltration basin #1 now shows areas where a 6" bentonite clay layer is proposed which are areas within the basin that will not infiltrate. The model shows that peak discharge rates have been reduced.**

Standard 3 – Recharge to Groundwater
As shown in the Drainage Report submitted, this standard is met, although we have requested additional information regarding stormwater basins and chamber system that may change the analysis and should be considered. This standard is not met.

- **Infiltration basin #1 now shows areas where a 6" bentonite clay layer is proposed which are areas within the basin that will not infiltrate. The model shows that peak discharge rates have been reduced.**

Standard 4 – 80% Total Suspended Solids (TSS) Removal

TSS calculations have been submitted demonstrating that a TSS removal rate of 85% is proposed. The DEP Stormwater Management Regulations require pretreatment be provided prior to the infiltration basins/chamber system to obtain the 80% TSS removal rate. No pretreatment BMP is proposed. This standard is not met as proposed.

- **The TSS removal sheet has been updated to remove the deep sump catch basin from the list.**

Standard 5 – Higher Potential Pollutant Loads

This project is not considered a source of higher pollutant loads. This standard is not applicable.

- **No response required**

Standard 6 – Protection of Critical Areas

Based on information presented on MassGIS and the Town of Pembroke GIS web page, the project site is not in a Critical Area.

- **No response required**

Standard 7 – Redevelopment Projects

This project is not considered a redevelopment project. This standard is not applicable.

- **No response required**

Standard 8 – Erosion/Sediment Control

Erosion Control Plan including details has been provided. This standard has been met. The project will require to file for a Construction General Permit (CGP) with the US EPA and implement a Stormwater Pollution Prevention Plan (SWPPP). We recommend a copy of the CGP and SWPPP be provided to the Town prior to the start of construction.

- **A draft SWPPP is being provided in this response.**

Standard 9 – Operation and Maintenance Plan

An Operation and Maintenance Plan has been provided as required. This standard has been met. Please include inspection and maintenance for roadway pavement maintenance, crushed stone swale and outlet protection BMPs. The procedures for repairing the infiltration basins should also be included in the O&M plan. It is also helpful to include the manufacturer's maintenance documentation for the subsurface chamber system.

- **Inspection and maintenance information for pavement, crushed stone swale, and outlets have been added to the O&M. The specification sheet for the Cultec 150XLHD has been provided with this response.**

Standard 10 – Illicit Discharges

An "Illicit Discharge Compliance Statement" meeting the requirements specified in the Stormwater Management Regulations has been submitted. This standard is met.

- **No response required.**

5.4 *The site development proposes the use of two driveway curb cuts for site access and circulation. The main driveway will access 9 dwelling units while the second driveway will provide access to the remaining two dwellings.*

- **No response required.**

5.5 *We recommend if other utility services such as HVAC units or generators are being proposed that they are shown on the plans to ensure no conflicts with other utilities or landscaping. Will Units 10 and 11 have gas service provided?*

- **AC units on all units and gas services to units 10 and 11 are now shown in the plan.**

5.9 *Additional detail should be provided for the existing structure and how it would be converted into a residential unit.*

- **A proposed floor plan for the barn is attached in this response.**

Section VI. Development Impact Statement

A Development Impact Statement has been submitted as required. The Planning Board should determine if it is acceptable.

ADDITIONAL COMMENTS

1. *Will the development have a common mail kiosk or bus stop near the main entrance? Is so, should a sidewalk be considered rather than vehicles and pedestrians sharing the driveway?*
   - **A common mail box has been added to the plan close to unit 5.**

2. *Please correct the pipe size from DMH-2 to the basin, the drainage model indicates it should be 18" rather than 12" shown on the drain profile.*
   - **Pipe size has been changed from 12" to 18" in the plan.**

3. *Please verify the roadway grading at the entrance, as it is indicated that the roadway will be superelevated toward the westerly side, but the contours illustrate a crown roadway condition. Also, the roadway detail should be corrected to be consistent with the superelevated condition.*
   - **The roadway grading at the entrance has been superelevated. The detail now shows the proposed superelevation.**

4. *Rim elevations should be provided at the roof drain manholes on the Utilities – Drain Plan, sheet 6.*
   - **Rim elevations on the roof drain manholes is now shown.**

5. *Please correct the drain inlet invert into the subsurface chamber system as it enters the chamber system below the chamber unit within the stone base layer.*
   - **The pipe has been adjusted to enter the chamber above the stone base layer.**

6. *Catch basin CB-5 has approx. 1.4 ft of cover, a shallow catch basin detail should be provided.*
   - **A shallow catch basin detail has been added to the details on sheet 18.**

7. *Please correct plan sheet references within plan labels, there seems to be several referencing the wrong plan sheet.*
   - **Plan references have been updated accordingly.**

8. *Please provide a turning movement analysis for the driveway for Units 10 and 11 to ensure that vehicles will not back out onto Congress Street.*
   - **Turnarounds and a turning template have been placed on the driveway for units 10 & 11, see sheet 16.**

STORMWATER MANAGEMENT DESIGN CALCULATIONS

0 & 74 Congress St.

Assessors Map
Map F9 Lot 11
Pembroke, Massachusetts

Prepared for

Whatbarn, LLC
29 Duck Hill Rd
Duxbury, MA 02332

March 9, 2023

71 Evergreen Street, Suite 1 ◆ Kingston, MA 02364 ◆ Tel (781) 585-2300 ◆ Fax (781) 585-2378

Table of Contents

SUMMARY

This analysis was prepared to demonstrate Compliance with the Town of Pembroke Stormwater Regulations. The proposed project is for the construction of 10 residential structures with an associated driveway, grading, infiltration basins, subsurface infiltration systems, drainage, and sewer.

The area of the proposed work is currently developed with a single family home, wooded, and grassed areas. Stormwater currently flows overland from the site towards the wetland at the rear.

The attenuation of storm water flows has been achieved by routing the driveway and roof runoff into an infiltration basin and subsurface infiltration, which outfalls to the surrounding wetland.

The post development runoff is broken up into 18 catchment areas

1) **Units 10-11 Entrance** – Runoff from the front yard and driveway for units 10 & 11 which are routed to a catch basin, into an infiltration basin, then outfalls to the wetland.
2) **Units 8-11 Backyard -** Runoff from the backyards for units 10 & 11 which are routed to a catch basin, into an infiltration basin, then outfalls to the wetland.
3) **Outer Border** – Outer border of the lot which captures runoff from grass and wooded areas which outfall directly into the wetland.
4) **Unit 5 Backyard and Basin #1 –** Runoff from grassed areas which drain into the proposed infiltration basin, which are routed to an outlet control structure that outfalls into the wetland.
5) **Unit 5 Parking –** Runoff from grassed areas and pavement to a catch basin, into the infiltration basin, to an outlet control structure that outfalls into the wetland.
6) **Driveway Center Section –** Runoff from grass and paved areas to a catch basin, into the infiltration basin, to an outlet control structure that outfalls into the wetland.
7) **Driveway Entrance -** Runoff from grass and paved areas to a catch basin, into the infiltration basin, to an outlet control structure that outfalls into the wetland

U1-U4) Building Units 1 to 4– Runoff from roofs that connect to a roof drain carrier pipe which is routed into the infiltration basin, to an outlet control structure that outfalls into the wetland.

U5) Existing Building 5 - Runoff from roof which is routed into the infiltration basin, to an outlet control structure that outfalls into the wetland.

U6-U7) Building units 6 & 7- Runoff from roofs that connect to a roof drain carrier pipe which is routed into the infiltration basin, to an outlet control structure that outfalls into the wetland.

U8-U11) Building Units 8-11 - Runoff from roofs that connect to a subsurface drainage structure that outfalls into the wetland.

This analysis is divided into the following sections:

Section I	Overall Site Analysis
Section II	Compliance with Massachusetts Storm water Management Regulations
Section III	Operation And Maintenance Plan

The calculations have been performed for the 2, 10, 25, 100-year 24 hour storm event, using the HydroCAD computer program. This computer program is based upon the Soils Conservation Service (SCS) TR-20 and TR-55 computer models and uses the SCS Curvilinear Unit rainfall distribution.

SUMMARY OF STORMWATER FLOWS

PRE-DEVELOPMENT

	100 YR	25 YR	10 YR	2 YR
DP1	12.74	7.73	5.34	2.52

POST-DEVELOPMENT

	100 YR	25 YR	10 YR	2 YR
DP1	12.72	7.49	5.02	2.46

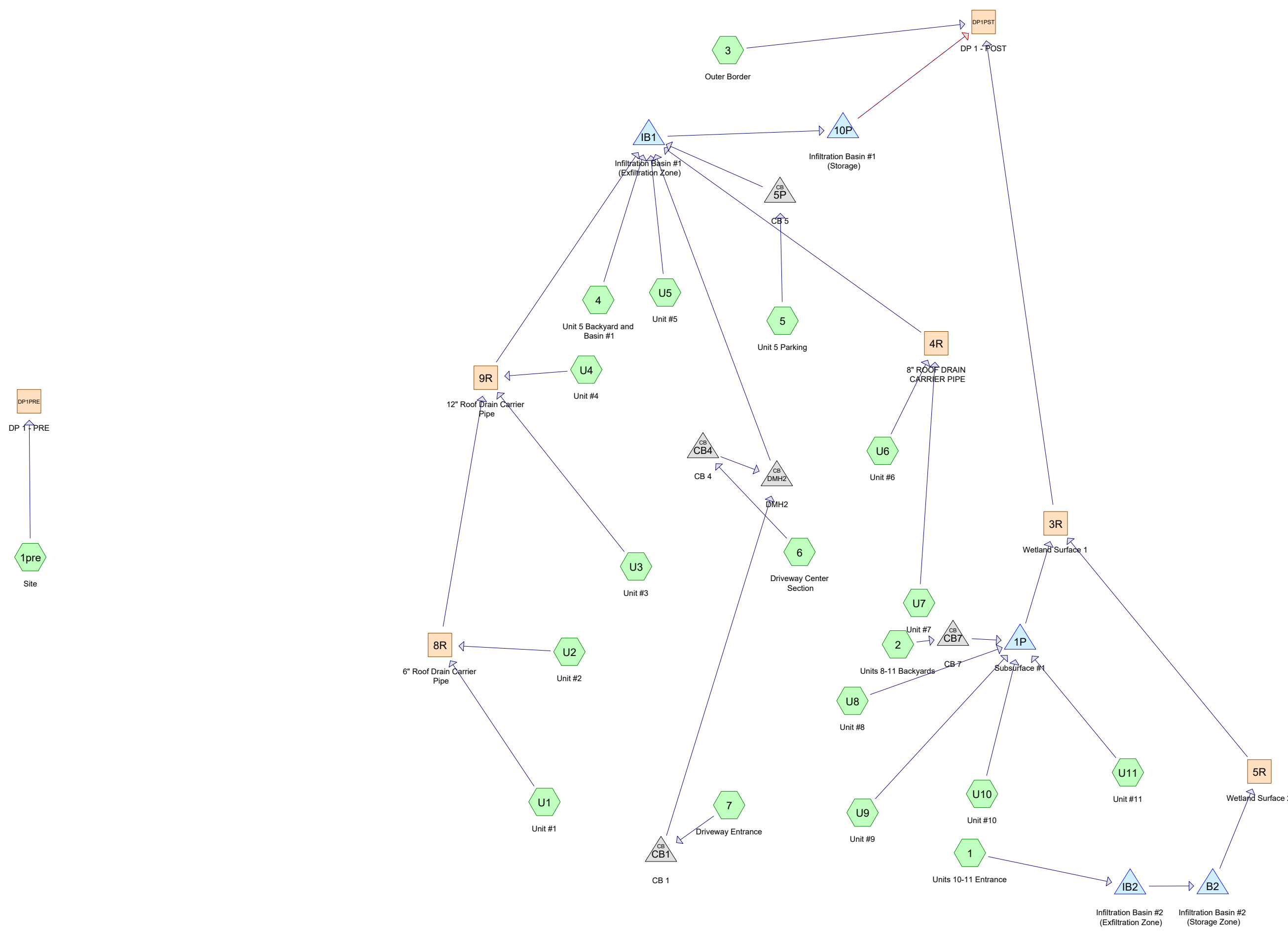
DIFFERENCE

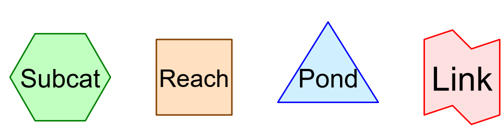
	100 YR	25 YR	10 YR	2 YR
DP1	0.02	0.24	0.32	0.06

Infiltration Basin #1
Top of basin = 92.0
Bottom of Basin = 88.0
2 yr el = 89.60
10 yr el = 90.07
25 yr el = 90.37
100 yr el = 90.91

Infiltration Basin #2
Top of basin = 99.0
Bottom of Basin = 97.1
2 yr el = 97.64
10 yr el = 97.77
25 yr el = 97.85
100 yr el = 97.99

Section I
Overall Site Analysis





Routing Diagram for 0-74 Congress St
Prepared by Grady Consulting LLC
HydroCAD® 10.20-2g s/n 09955 © 2022 HydroCAD Software Solutions LLC

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Units 10-11 Entrance Runoff Area=13,032 sf 17.40% Impervious Runoff Depth>1.25"
Flow Length=190' Tc=12.6 min CN=78 Runoff=0.40 cfs 1,354 cf

Subcatchment 1pre: Site Runoff Area=134,756 sf 4.57% Impervious Runoff Depth>1.01"
Flow Length=451' Tc=22.8 min UI Adjusted CN=74 Runoff=2.52 cfs 11,326 cf

Subcatchment 2: Units 8-11 Backyards Runoff Area=7,232 sf 0.00% Impervious Runoff Depth>1.01"
Flow Length=84' Tc=11.3 min CN=74 Runoff=0.19 cfs 612 cf

Subcatchment 3: Outer Border Runoff Area=53,130 sf 0.00% Impervious Runoff Depth>0.91"
Flow Length=87' Tc=7.9 min CN=72 Runoff=1.38 cfs 4,028 cf

Subcatchment 4: Unit 5 Backyard and Basin Runoff Area=8,967 sf 0.00% Impervious Runoff Depth>1.02"
Flow Length=110' Tc=7.7 min CN=74 Runoff=0.27 cfs 760 cf

Subcatchment 5: Unit 5 Parking Runoff Area=8,830 sf 71.11% Impervious Runoff Depth>2.23"
Flow Length=100' Tc=7.9 min CN=91 Runoff=0.54 cfs 1,639 cf

Subcatchment 6: Driveway Center Section Runoff Area=14,952 sf 43.75% Impervious Runoff Depth>1.65"
Flow Length=163' Tc=10.8 min CN=84 Runoff=0.64 cfs 2,060 cf

Subcatchment 7: Driveway Entrance Runoff Area=9,350 sf 31.22% Impervious Runoff Depth>1.44"
Flow Length=88' Slope=0.0400 '/' Tc=9.8 min CN=81 Runoff=0.36 cfs 1,124 cf

Subcatchment U1: Unit #1 Runoff Area=1,676 sf 100.00% Impervious Runoff Depth>2.85"
Tc=5.0 min CN=98 Runoff=0.13 cfs 398 cf

Subcatchment U10: Unit #10 Runoff Area=1,676 sf 100.00% Impervious Runoff Depth>2.85"
Tc=5.0 min CN=98 Runoff=0.13 cfs 398 cf

Subcatchment U11: Unit #11 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>2.85"
Tc=5.0 min CN=98 Runoff=0.13 cfs 398 cf

Subcatchment U2: Unit #2 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>2.85"
Tc=5.0 min CN=98 Runoff=0.13 cfs 398 cf

Subcatchment U3: Unit #3 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>2.85"
Tc=5.0 min CN=98 Runoff=0.13 cfs 398 cf

Subcatchment U4: Unit #4 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>2.85"
Tc=5.0 min CN=98 Runoff=0.13 cfs 398 cf

Subcatchment U5: Unit #5 Runoff Area=2,510 sf 100.00% Impervious Runoff Depth>2.85"
Tc=5.0 min CN=98 Runoff=0.20 cfs 596 cf

Subcatchment U6: Unit #6 Runoff Area=1,676 sf 100.00% Impervious Runoff Depth>2.85"
Tc=5.0 min CN=98 Runoff=0.13 cfs 398 cf

Subcatchment U7: Unit #7 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>2.85"
Tc=5.0 min CN=98 Runoff=0.13 cfs 398 cf

Subcatchment U8: Unit #8 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>2.85"
Tc=5.0 min CN=98 Runoff=0.13 cfs 398 cf

Subcatchment U9: Unit #9 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>2.85"
Tc=5.0 min CN=98 Runoff=0.13 cfs 398 cf

Reach 3R: Wetland Surface 1 Avg. Flow Depth=0.05' Max Vel=0.27 fps Inflow=0.20 cfs 1,124 cf
n=0.100 L=344.0' S=0.0291 '/' Capacity=20.30 cfs Outflow=0.16 cfs 1,110 cf

Reach 4R: 8" ROOF DRAIN CARRIER PIPE Avg. Flow Depth=0.18' Max Vel=3.46 fps Inflow=0.26 cfs 796 cf
8.0" Round Pipe n=0.013 L=206.0' S=0.0194 '/' Capacity=1.68 cfs Outflow=0.26 cfs 795 cf

Reach 5R: Wetland Surface 2 Avg. Flow Depth=0.06' Max Vel=0.16 fps Inflow=0.24 cfs 773 cf
n=0.100 L=245.0' S=0.0082 '/' Capacity=10.76 cfs Outflow=0.13 cfs 760 cf

Reach 8R: 6" Roof Drain Carrier Pipe Avg. Flow Depth=0.20' Max Vel=3.54 fps Inflow=0.26 cfs 796 cf
6.0" Round Pipe n=0.013 L=113.0' S=0.0195 '/' Capacity=0.78 cfs Outflow=0.26 cfs 796 cf

Reach 9R: 12" Roof Drain Carrier Pipe Avg. Flow Depth=0.26' Max Vel=3.20 fps Inflow=0.52 cfs 1,591 cf
12.0" Round Pipe n=0.013 L=212.0' S=0.0099 '/' Capacity=3.55 cfs Outflow=0.51 cfs 1,590 cf

Reach DP1PRE: DP 1 - PRE Inflow=2.52 cfs 11,326 cf
Outflow=2.52 cfs 11,326 cf

Reach DP1PST: DP 1 - POST Inflow=2.46 cfs 11,365 cf
Outflow=2.46 cfs 11,365 cf

Pond 1P: Subsurface #1 Peak Elev=97.16' Storage=896 cf Inflow=0.66 cfs 2,203 cf
Discarded=0.03 cfs 1,254 cf Primary=0.07 cfs 364 cf Outflow=0.10 cfs 1,618 cf

Pond 5P: CB 5 Peak Elev=89.63' Inflow=0.54 cfs 1,639 cf
12.0" Round Culvert n=0.013 L=13.0' S=0.0192 '/' Outflow=0.54 cfs 1,639 cf

Pond 10P: Infiltration Basin #1 (Storage) Peak Elev=89.59' Storage=1,639 cf Inflow=2.18 cfs 6,954 cf
Primary=1.25 cfs 6,227 cf Secondary=0.00 cfs 0 cf Outflow=1.25 cfs 6,227 cf

Pond B2: Infiltration Basin #2 (Storage Zone) Peak Elev=97.64' Storage=116 cf Inflow=0.26 cfs 840 cf
Outflow=0.24 cfs 773 cf

Pond CB1: CB 1 Peak Elev=93.05' Inflow=0.36 cfs 1,124 cf
12.0" Round Culvert n=0.013 L=228.0' S=0.0121 '/' Outflow=0.36 cfs 1,124 cf

Pond CB4: CB 4 Peak Elev=90.61' Inflow=0.64 cfs 2,060 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0083 '/' Outflow=0.64 cfs 2,060 cf

Pond CB7: CB 7 Peak Elev=97.16' Inflow=0.19 cfs 612 cf
12.0" Round Culvert n=0.013 L=26.0' S=0.0038 '/' Outflow=0.19 cfs 612 cf

Pond DMH2: DMH2 Peak Elev=90.46' Inflow=1.00 cfs 3,184 cf
18.0" Round Culvert n=0.013 L=128.0' S=0.0078 '/' Outflow=1.00 cfs 3,184 cf

Pond IB1: Infiltration Basin #1 (Exfiltration Peak Elev=89.60' Storage=1,175 cf Inflow=2.70 cfs 8,564 cf
Discarded=0.02 cfs 916 cf Primary=2.18 cfs 6,954 cf Outflow=2.20 cfs 7,869 cf

Pond IB2: Infiltration Basin #2 (Exfiltration Peak Elev=97.64' Storage=228 cf Inflow=0.40 cfs 1,354 cf
Discarded=0.01 cfs 343 cf Primary=0.26 cfs 840 cf Outflow=0.27 cfs 1,183 cf

Total Runoff Area = 269,512 sf Runoff Volume = 27,479 cf Average Runoff Depth = 1.22"
83.89% Pervious = 226,087 sf 16.11% Impervious = 43,425 sf

Summary for Subcatchment 1: Units 10-11 Entrance

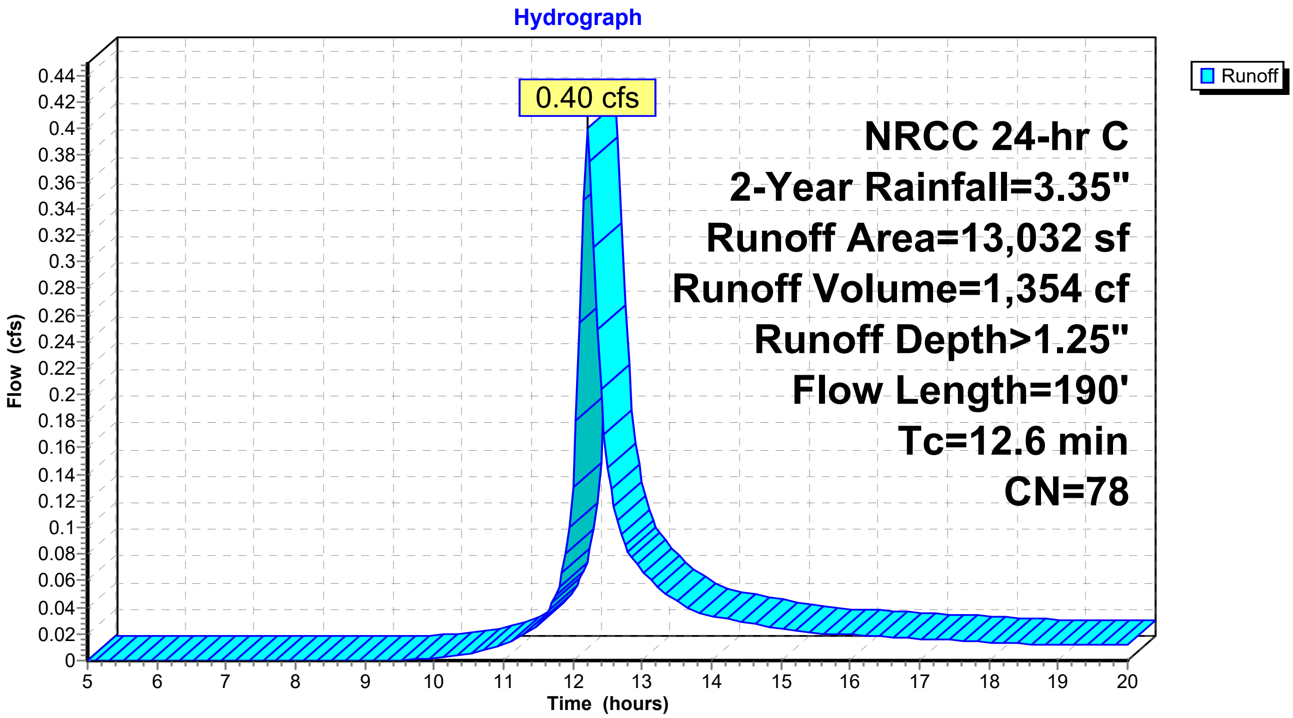
Runoff = 0.40 cfs @ 12.21 hrs, Volume= 1,354 cf, Depth> 1.25"
Routed to Pond IB2 : Infiltration Basin #2 (Exfiltration Zone)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
9,762	74	>75% Grass cover, Good, HSG C
1,003	70	Woods, Good, HSG C
2,267	98	Paved roads w/curbs & sewers, HSG C
13,032	78	Weighted Average
10,765		82.60% Pervious Area
2,267		17.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.8	55	0.0300	1.21		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.1	17	0.0100	2.03		**Shallow Concentrated Flow, Driveway** Paved Kv= 20.3 fps
1.2	68	0.0180	0.94		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
12.6	190	Total			

Subcatchment 1: Units 10-11 Entrance



Summary for Subcatchment 1pre: Site

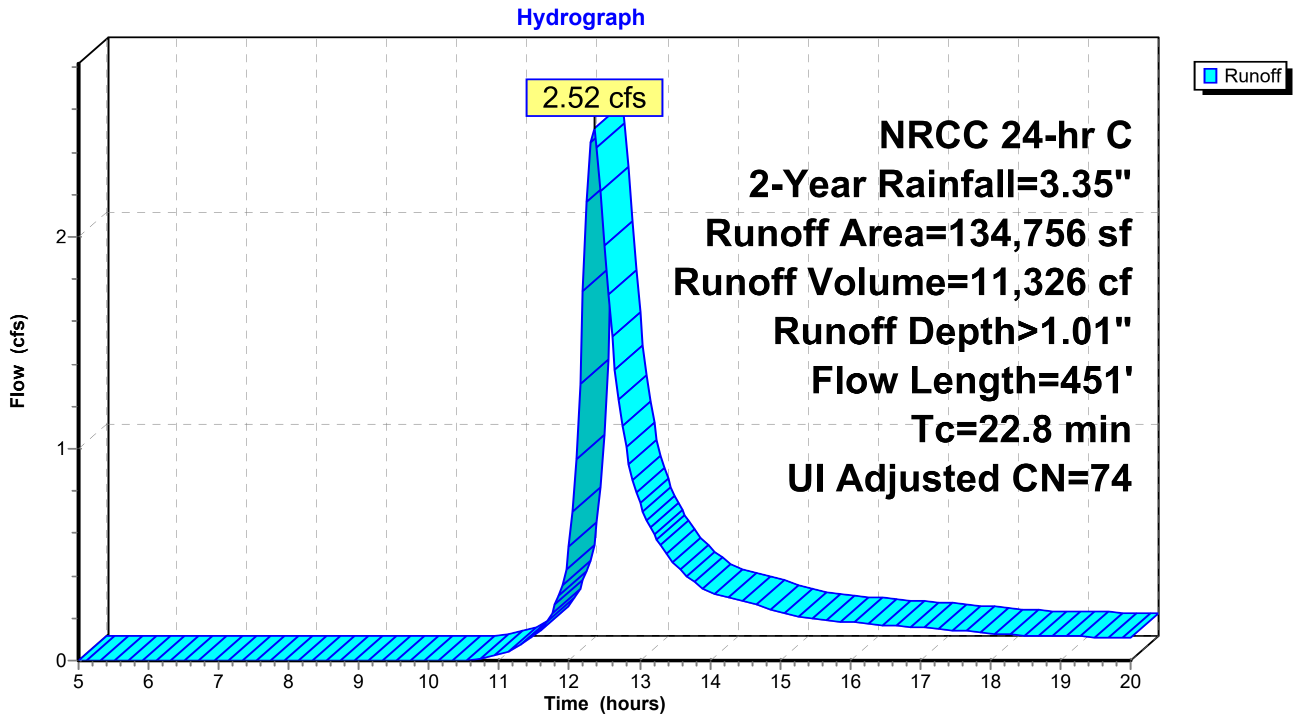
Runoff = 2.52 cfs @ 12.35 hrs, Volume= 11,326 cf, Depth> 1.01"
Routed to Reach DP1PRE : DP 1 - PRE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Adj	Description
56,945	70		Woods, Good, HSG C
2,937	98		Paved parking, HSG C
3,219	98		Unconnected roofs, HSG C
10,003	89		Gravel roads, HSG C
61,652	74		>75% Grass cover, Good, HSG C
134,756	75	74	Weighted Average, UI Adjusted
128,600			95.43% Pervious Area
6,156			4.57% Impervious Area
3,219			52.29% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	25	0.0110	0.03		**Sheet Flow, Woods** Woods: Dense underbrush n= 0.800 P2= 3.35"
0.5	25	0.0110	0.84		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.35"
0.2	20	0.0110	2.13		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
1.5	65	0.0110	0.73		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
2.2	159	0.0290	1.19		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
2.0	52	0.0040	0.44		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.7	60	0.0370	1.35		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.4	45	0.1660	2.04		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
22.8	451	Total			

Subcatchment 1pre: Site



Summary for Subcatchment 2: Units 8-11 Backyards

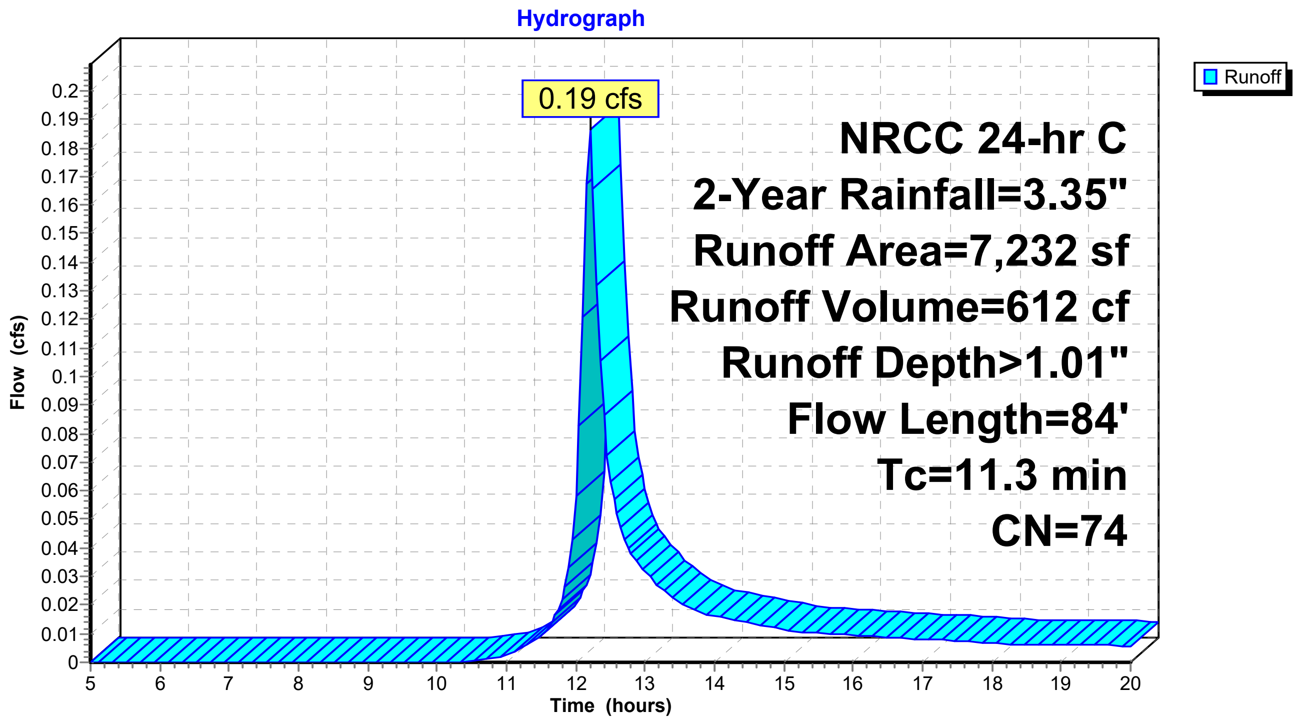
Runoff = 0.19 cfs @ 12.20 hrs, Volume= 612 cf, Depth> 1.01"
Routed to Pond CB7 : CB 7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
7,232	74	>75% Grass cover, Good, HSG C
7,232		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	50	0.0280	0.08		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.6	34	0.0200	0.99		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
11.3	84	Total			

Subcatchment 2: Units 8-11 Backyards



Summary for Subcatchment 3: Outer Border

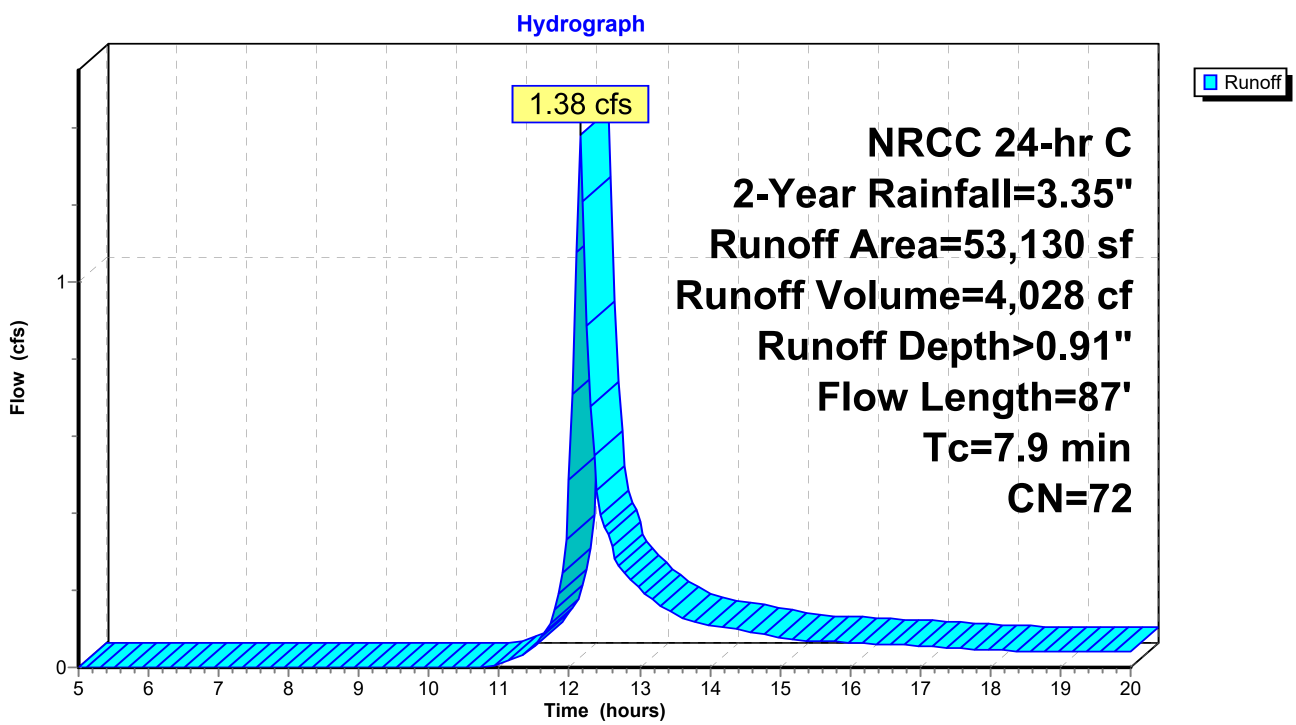
Runoff = 1.38 cfs @ 12.16 hrs, Volume= 4,028 cf, Depth> 0.91"
Routed to Reach DP1PST : DP 1 - POST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
21,967	74	>75% Grass cover, Good, HSG C
31,163	70	Woods, Good, HSG C
53,130	72	Weighted Average
53,130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0670	0.11		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.35"
0.5	37	0.0600	1.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
7.9	87	Total			

Subcatchment 3: Outer Border



Summary for Subcatchment 4: Unit 5 Backyard and Basin #1

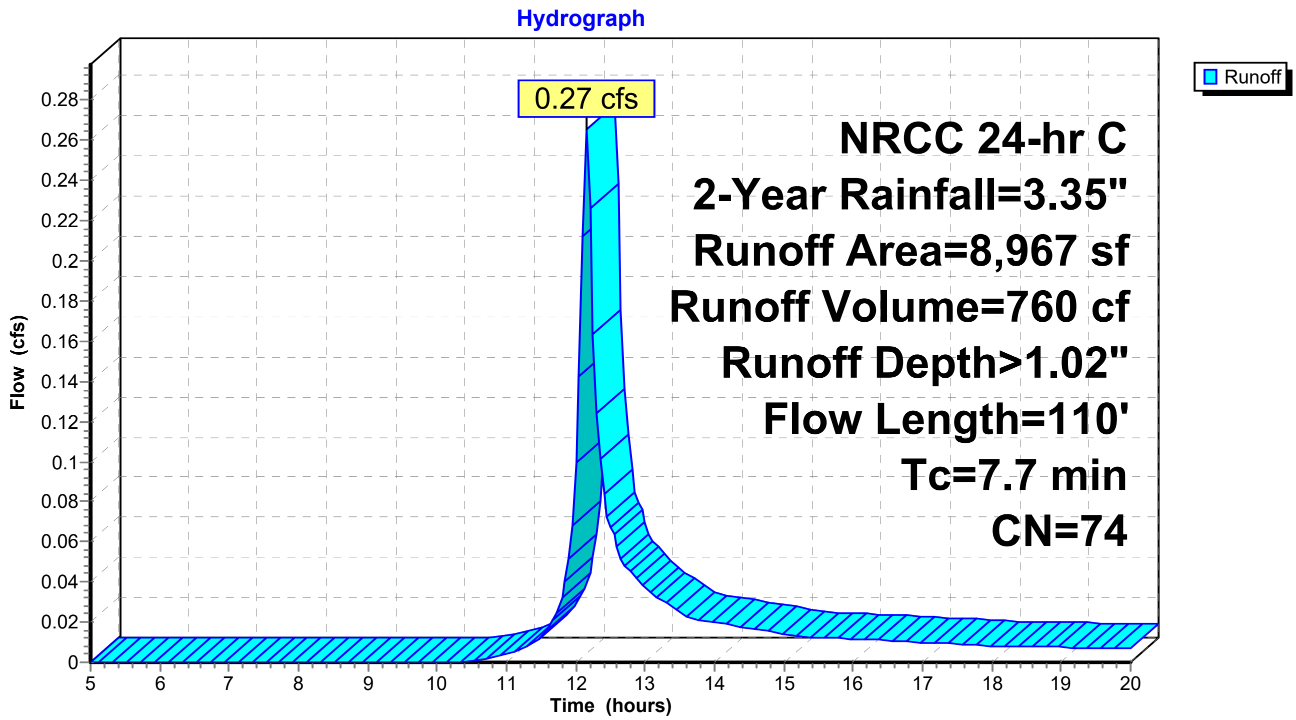
Runoff = 0.27 cfs @ 12.15 hrs, Volume= 760 cf, Depth> 1.02"
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
8,967	74	>75% Grass cover, Good, HSG C
8,967		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0780	0.12		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.6	60	0.0670	1.81		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
7.7	110	Total			

Subcatchment 4: Unit 5 Backyard and Basin #1



Summary for Subcatchment 5: Unit 5 Parking

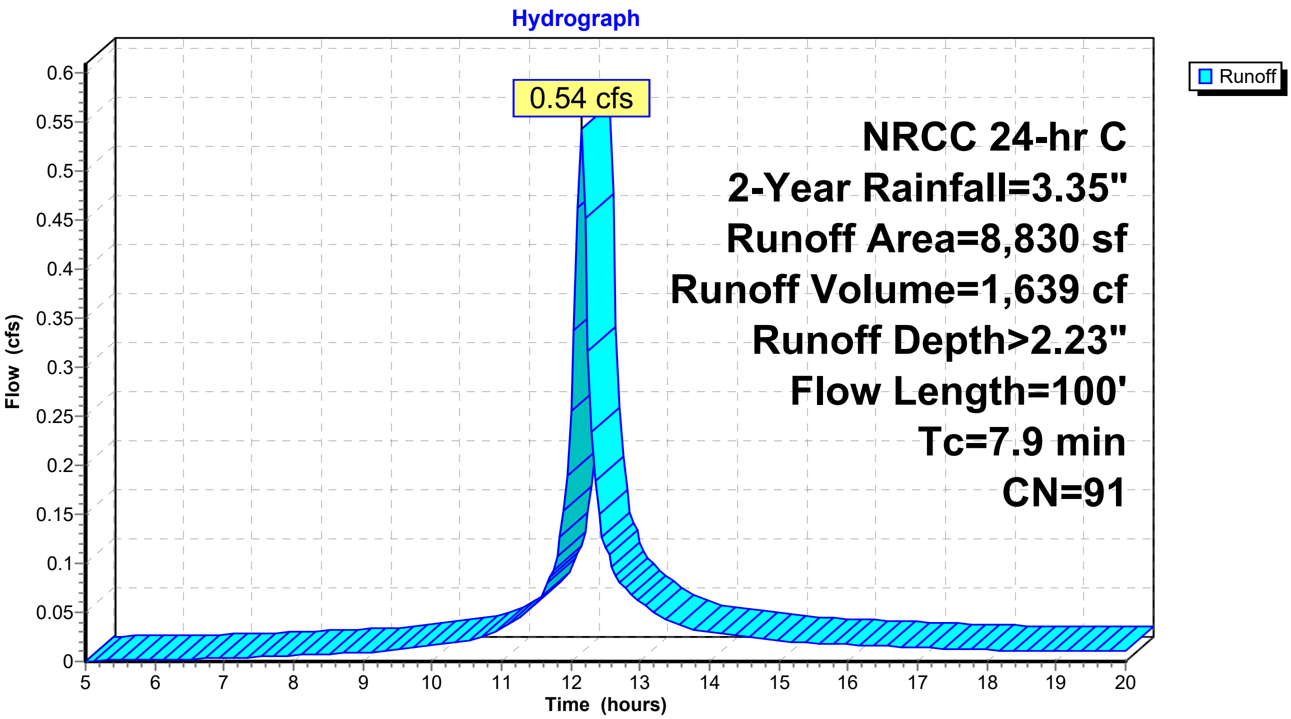
Runoff = 0.54 cfs @ 12.15 hrs, Volume= 1,639 cf, Depth> 2.23"
Routed to Pond 5P : CB 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
2,551	74	>75% Grass cover, Good, HSG C
6,279	98	Paved roads w/curbs & sewers, HSG C
8,830	91	Weighted Average
2,551		28.89% Pervious Area
6,279		71.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	40	0.0450	0.09		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.3	10	0.0067	0.57		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.35"
0.2	50	0.0280	3.40		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
7.9	100	Total			

Subcatchment 5: Unit 5 Parking



Summary for Subcatchment 6: Driveway Center Section

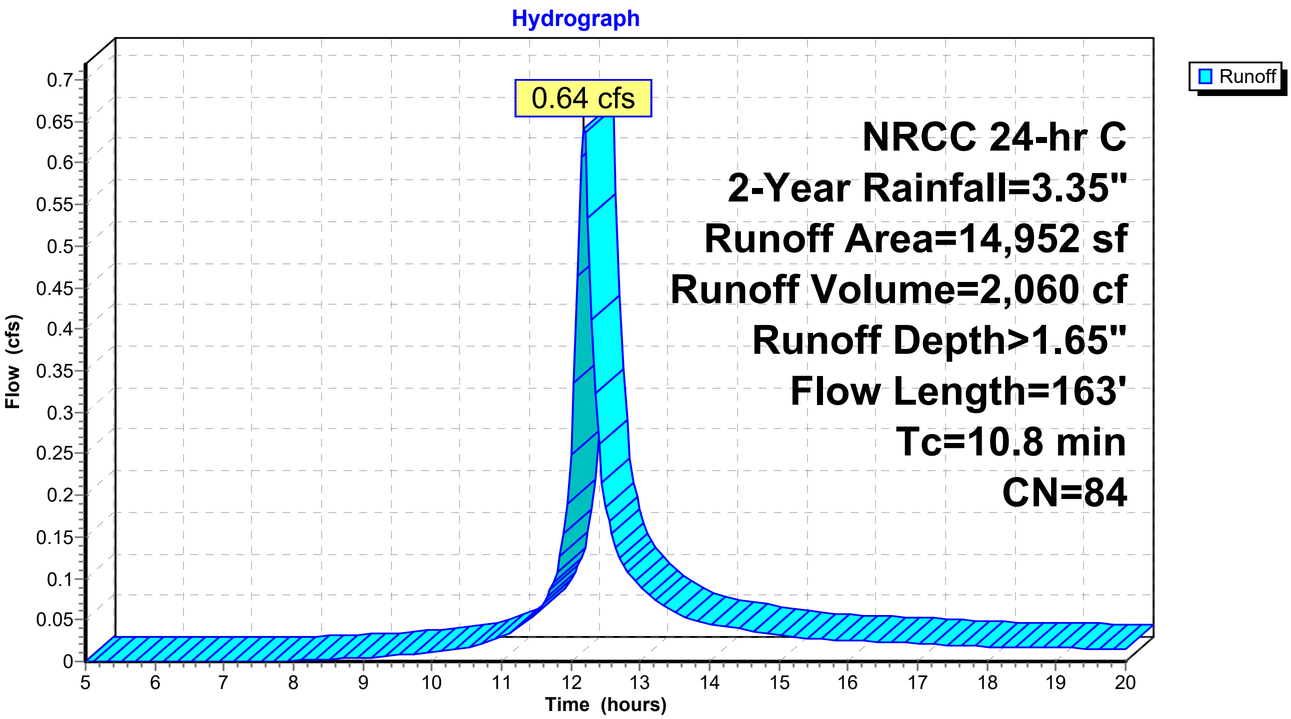
Runoff = 0.64 cfs @ 12.19 hrs, Volume= 2,060 cf, Depth> 1.65"
Routed to Pond CB4 : CB 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
8,411	74	>75% Grass cover, Good, HSG C
6,541	98	Paved roads w/curbs & sewers, HSG C
14,952	84	Weighted Average
8,411		56.25% Pervious Area
6,541		43.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0320	0.08		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.2	18	0.0300	1.21		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.4	95	0.0360	3.85		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
10.8	163	Total			

Subcatchment 6: Driveway Center Section



Summary for Subcatchment 7: Driveway Entrance

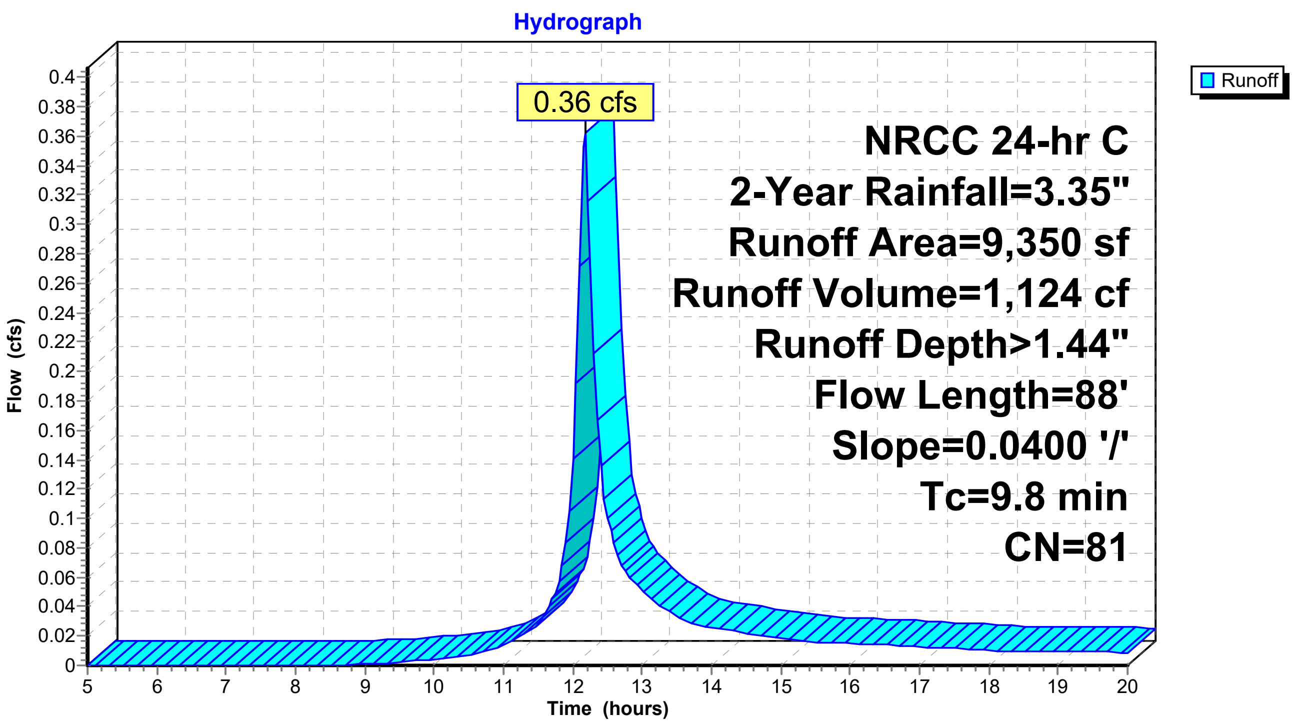
Runoff = 0.36 cfs @ 12.17 hrs, Volume= 1,124 cf, Depth> 1.44"
Routed to Pond CB1 : CB 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
2,919	98	Paved roads w/curbs & sewers, HSG C
6,431	74	>75% Grass cover, Good, HSG C
9,350	81	Weighted Average
6,431		68.78% Pervious Area
2,919		31.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.5	38	0.0400	1.40		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
9.8	88	Total			

Subcatchment 7: Driveway Entrance



Summary for Subcatchment U1: Unit #1

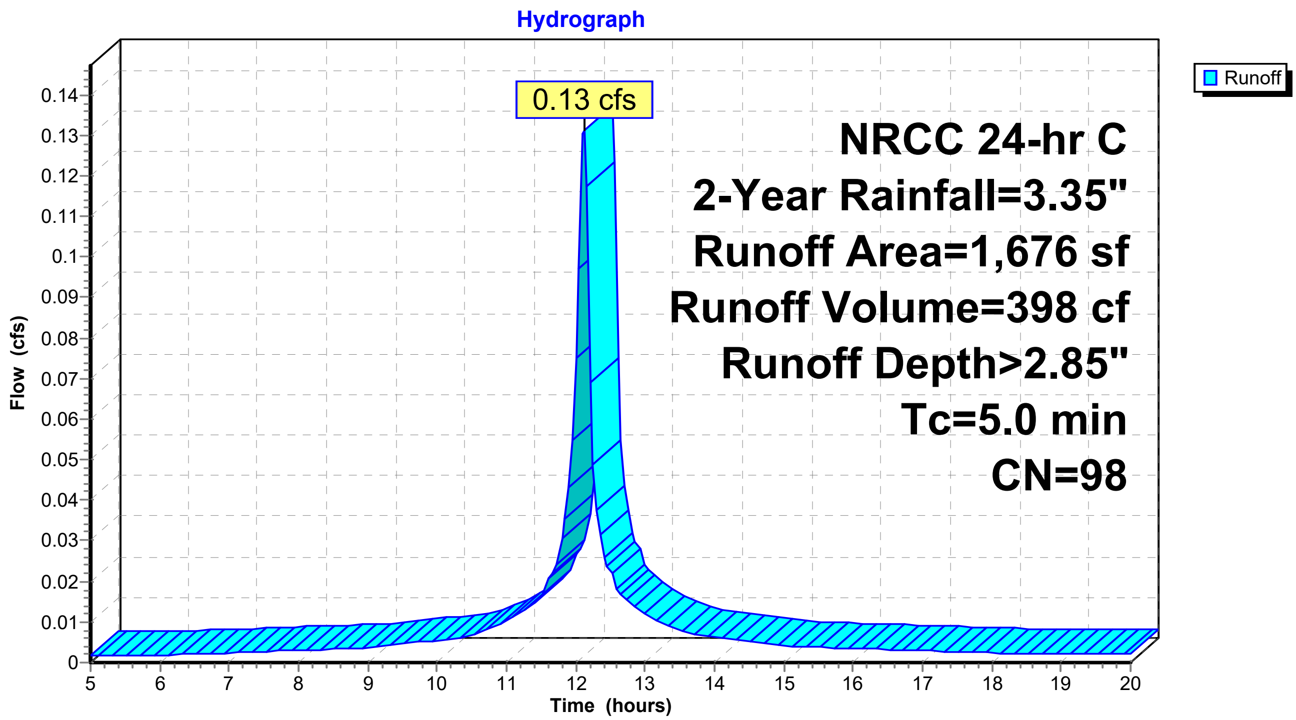
Runoff = 0.13 cfs @ 12.11 hrs, Volume= 398 cf, Depth> 2.85"
Routed to Reach 8R : 6" Roof Drain Carrier Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
1,676	98	Unconnected roofs, HSG C
1,676		100.00% Impervious Area
1,676		100.00% Unconnected

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

Subcatchment U1: Unit #1



Summary for Subcatchment U10: Unit #10

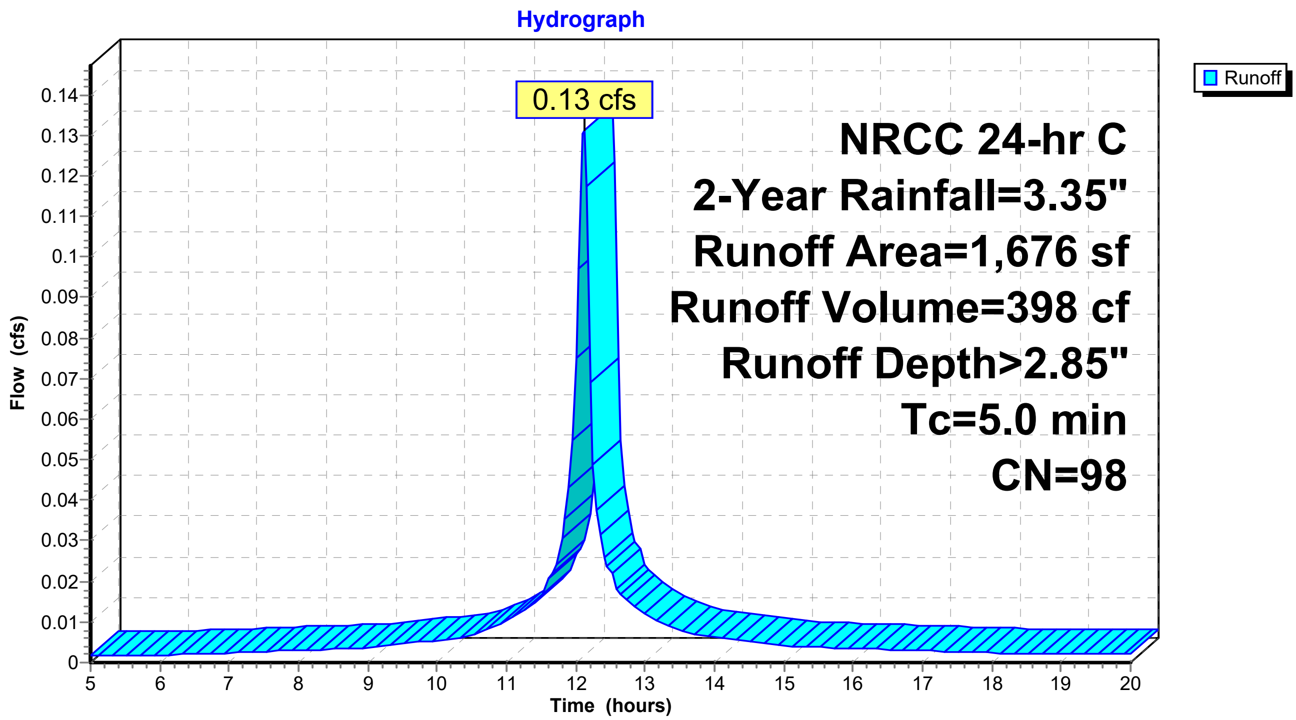
Runoff = 0.13 cfs @ 12.11 hrs, Volume= 398 cf, Depth> 2.85"
Routed to Pond 1P : Subsurface #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
1,676	98	Unconnected roofs, HSG C
1,676		100.00% Impervious Area
1,676		100.00% Unconnected

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

Subcatchment U10: Unit #10



Summary for Subcatchment U11: Unit #11

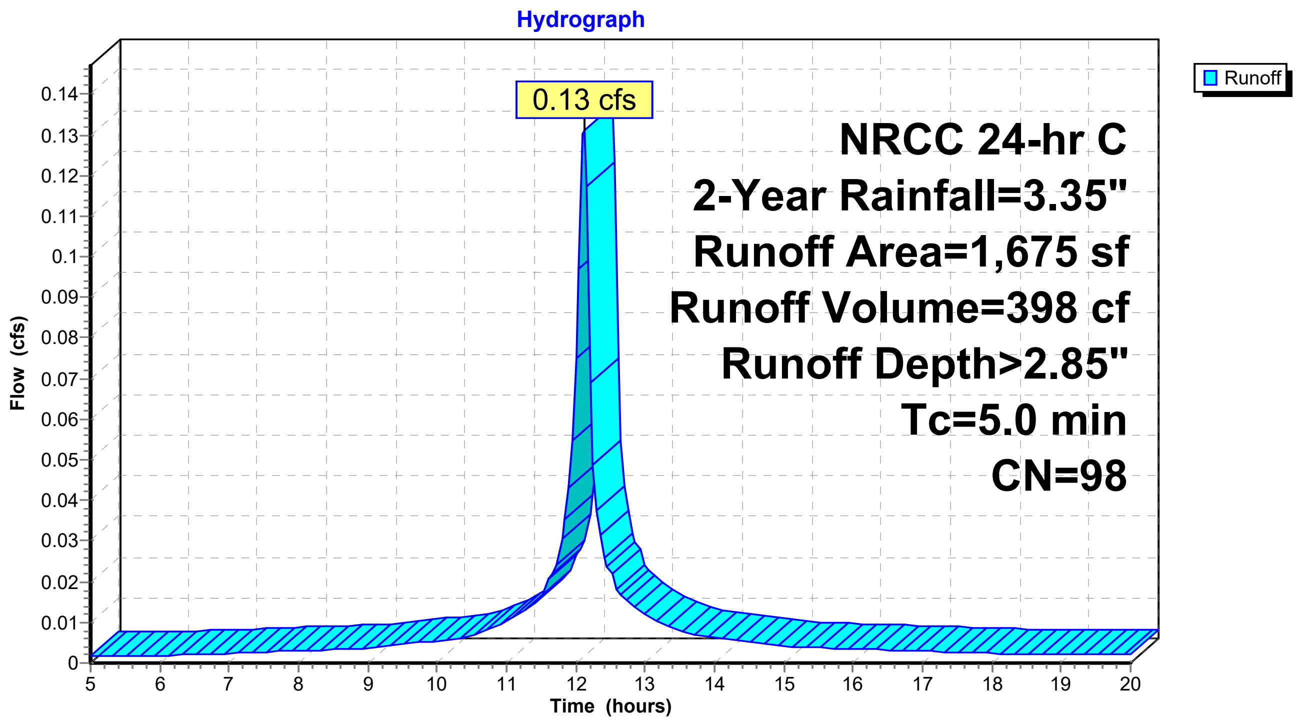
Runoff = 0.13 cfs @ 12.11 hrs, Volume= 398 cf, Depth> 2.85"
Routed to Pond 1P : Subsurface #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U11: Unit #11



Summary for Subcatchment U2: Unit #2

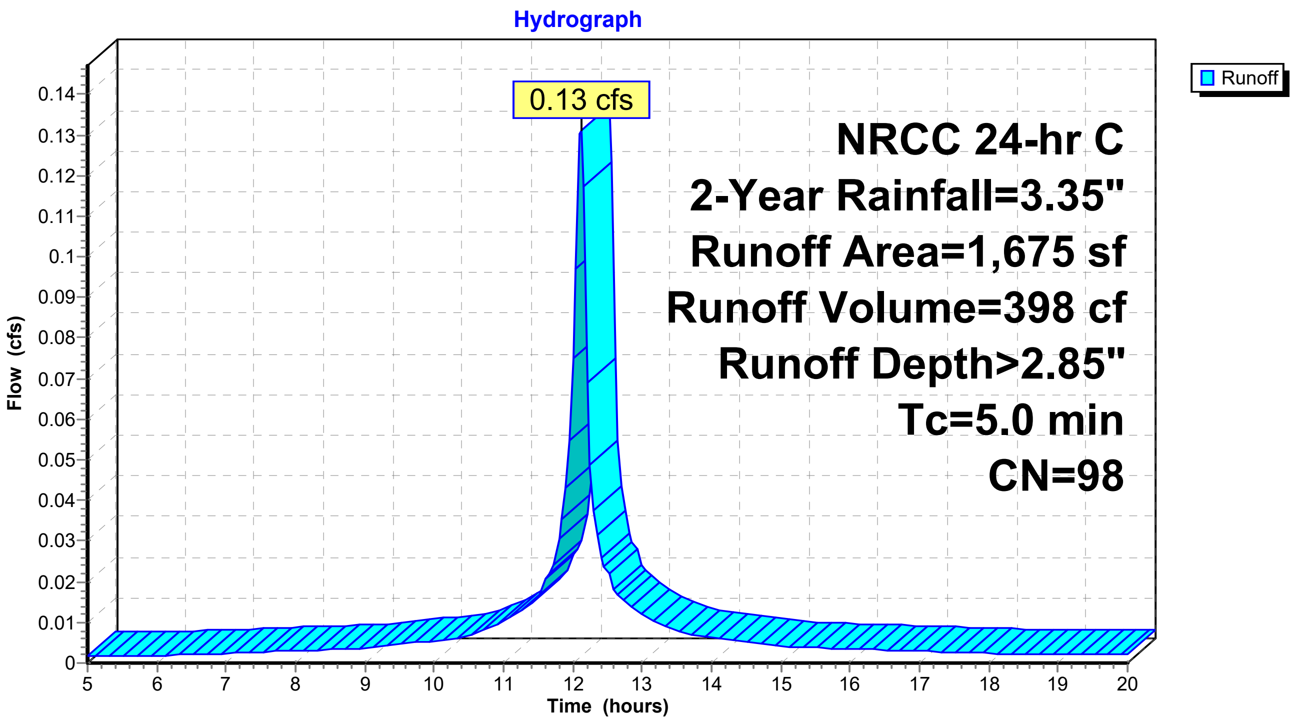
Runoff = 0.13 cfs @ 12.11 hrs, Volume= 398 cf, Depth> 2.85"
Routed to Reach 8R : 6" Roof Drain Carrier Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U2: Unit #2



Summary for Subcatchment U3: Unit #3

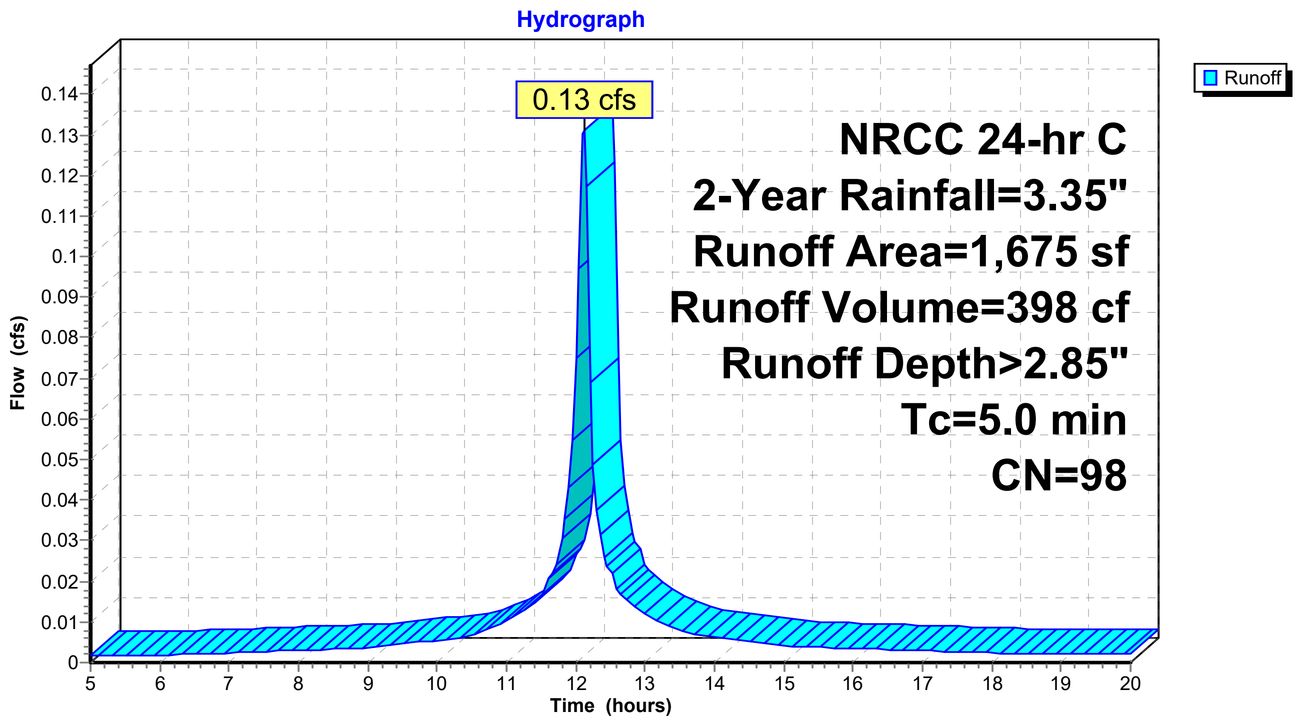
Runoff = 0.13 cfs @ 12.11 hrs, Volume= 398 cf, Depth> 2.85"
Routed to Reach 9R : 12" Roof Drain Carrier Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U3: Unit #3



Summary for Subcatchment U4: Unit #4

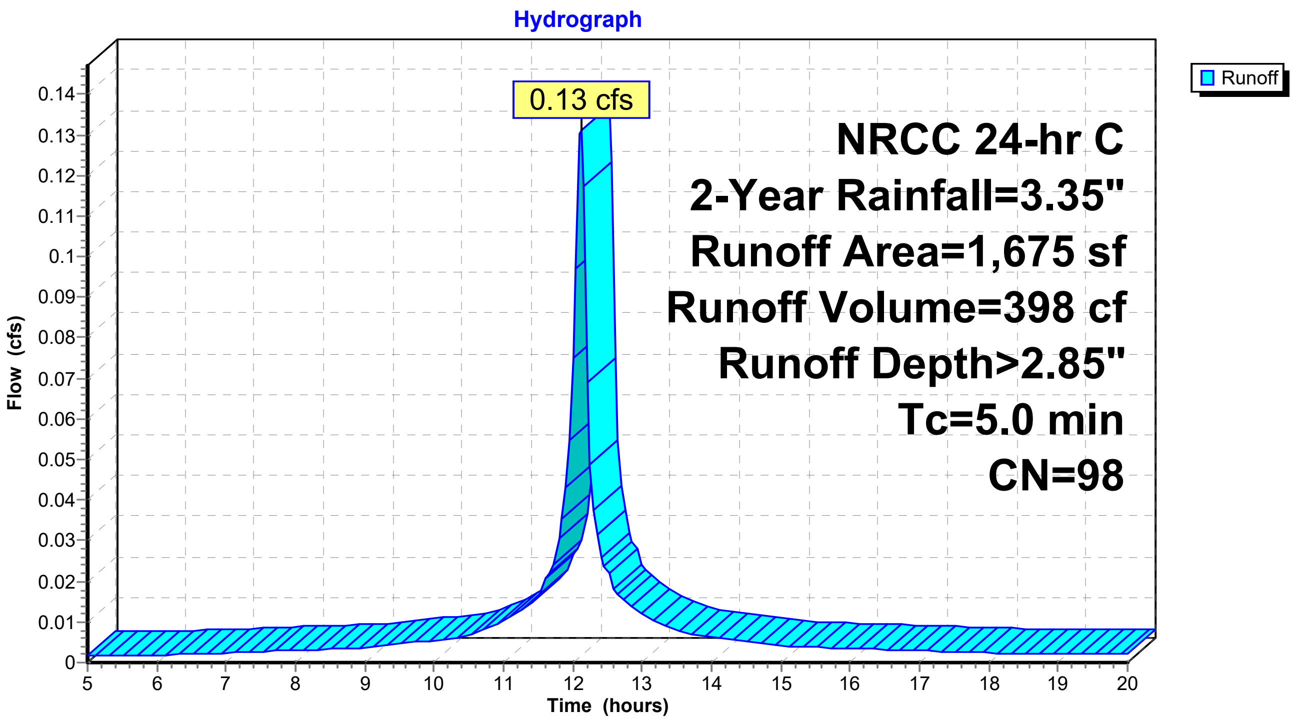
Runoff = 0.13 cfs @ 12.11 hrs, Volume= 398 cf, Depth> 2.85"
Routed to Reach 9R : 12" Roof Drain Carrier Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U4: Unit #4



Summary for Subcatchment U5: Unit #5

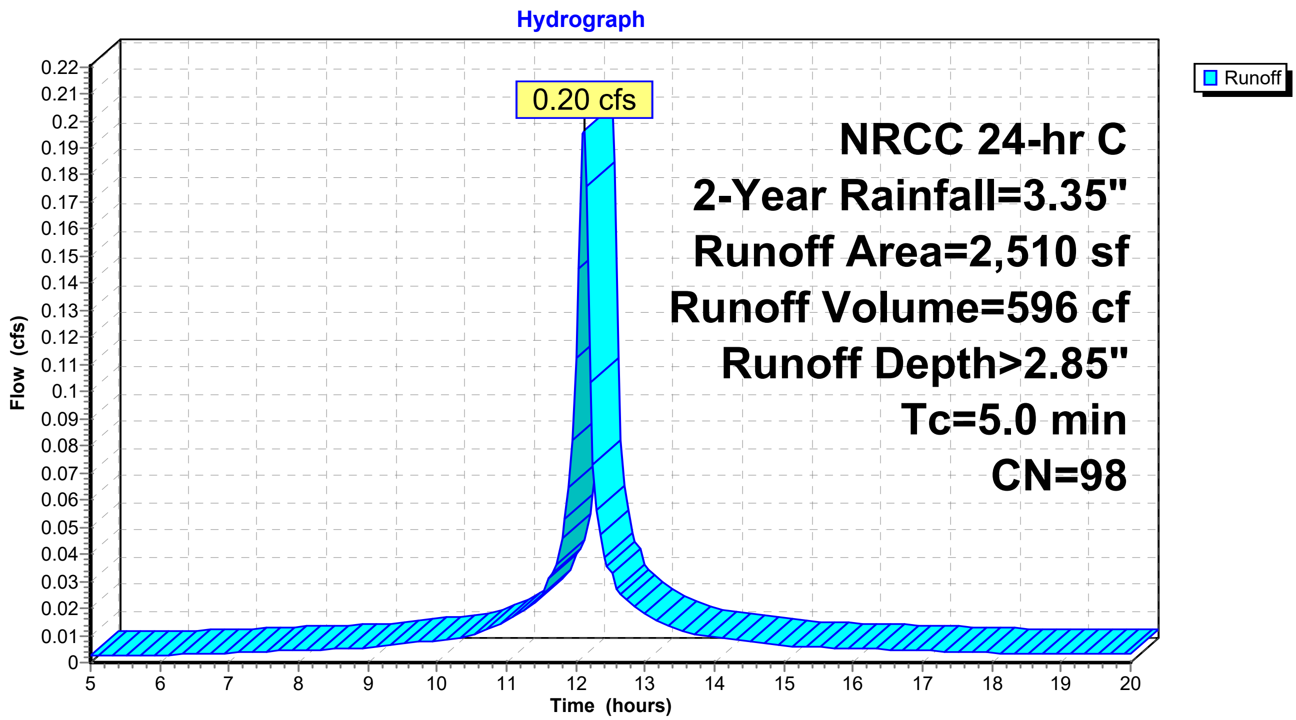
Runoff = 0.20 cfs @ 12.11 hrs, Volume= 596 cf, Depth> 2.85"
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
2,510	98	Unconnected roofs, HSG C
2,510		100.00% Impervious Area
2,510		100.00% Unconnected

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

Subcatchment U5: Unit #5



Summary for Subcatchment U6: Unit #6

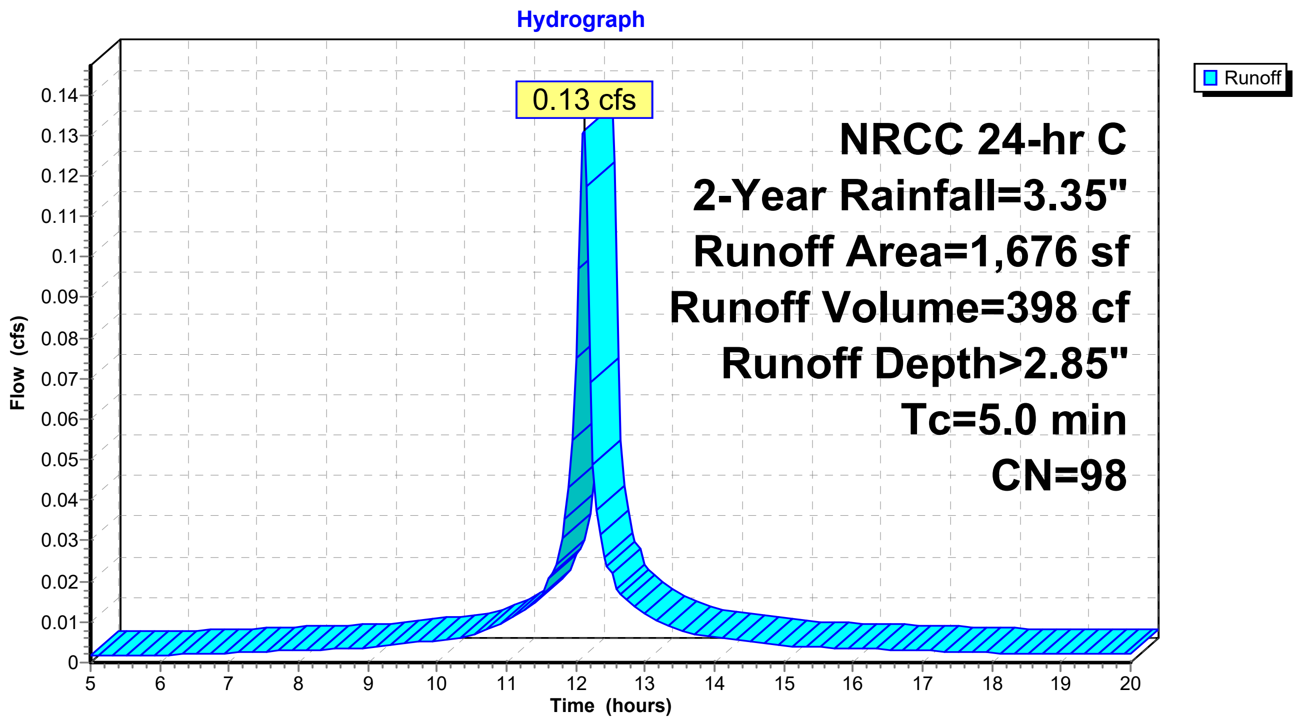
Runoff = 0.13 cfs @ 12.11 hrs, Volume= 398 cf, Depth> 2.85"
Routed to Reach 4R : 8" ROOF DRAIN CARRIER PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
1,676	98	Unconnected roofs, HSG C
1,676		100.00% Impervious Area
1,676		100.00% Unconnected

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

Subcatchment U6: Unit #6



Summary for Subcatchment U7: Unit #7

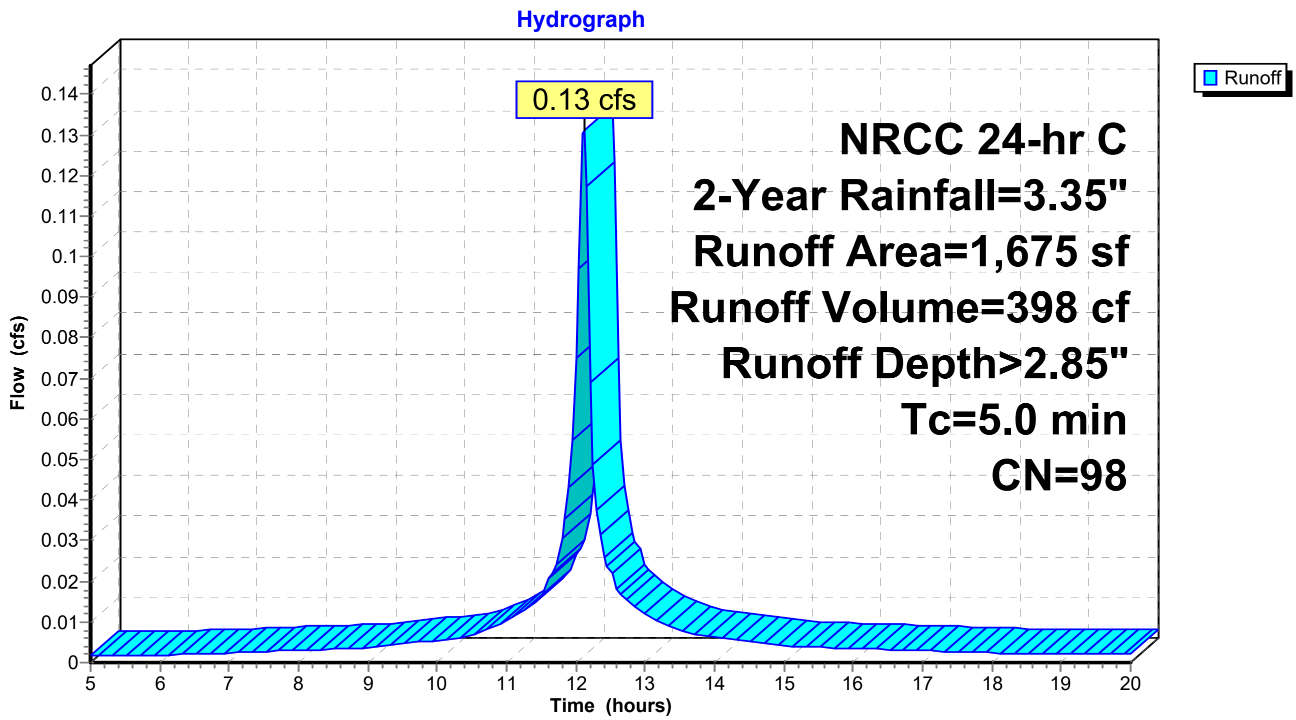
Runoff = 0.13 cfs @ 12.11 hrs, Volume= 398 cf, Depth> 2.85"
Routed to Reach 4R : 8" ROOF DRAIN CARRIER PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U7: Unit #7



Summary for Subcatchment U8: Unit #8

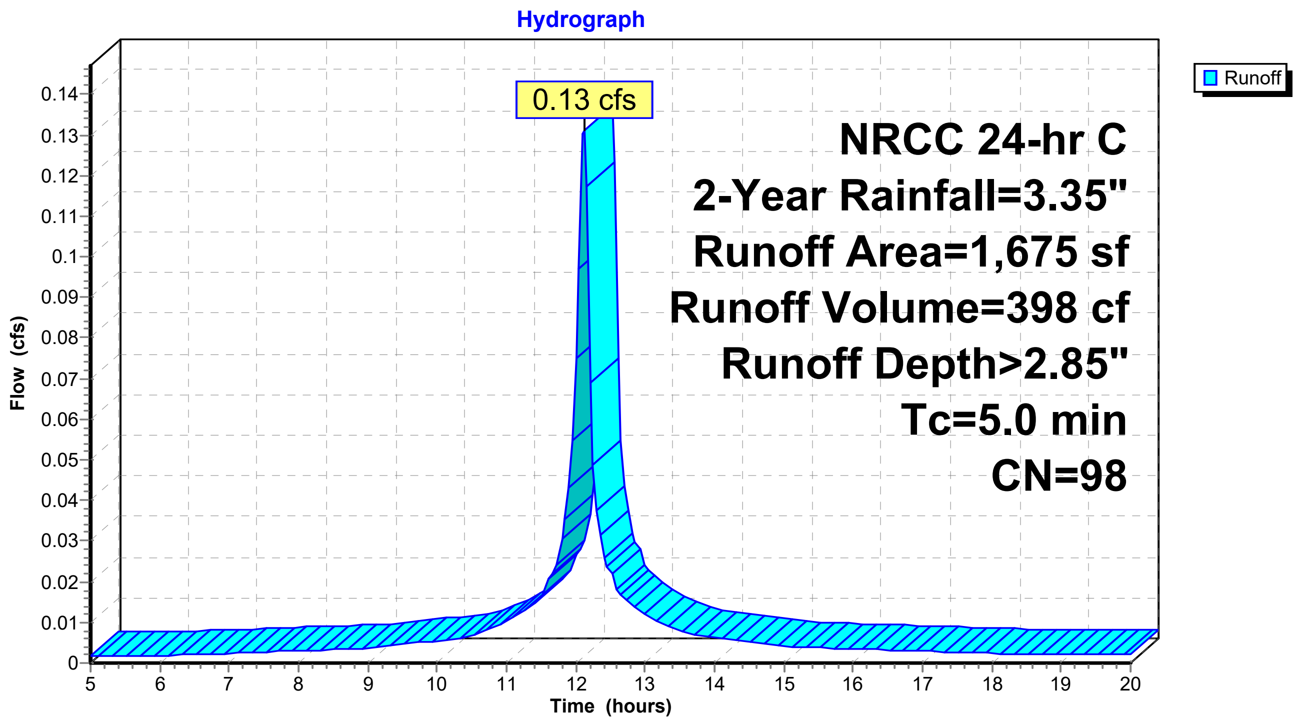
Runoff = 0.13 cfs @ 12.11 hrs, Volume= 398 cf, Depth> 2.85"
Routed to Pond 1P : Subsurface #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U8: Unit #8



Summary for Subcatchment U9: Unit #9

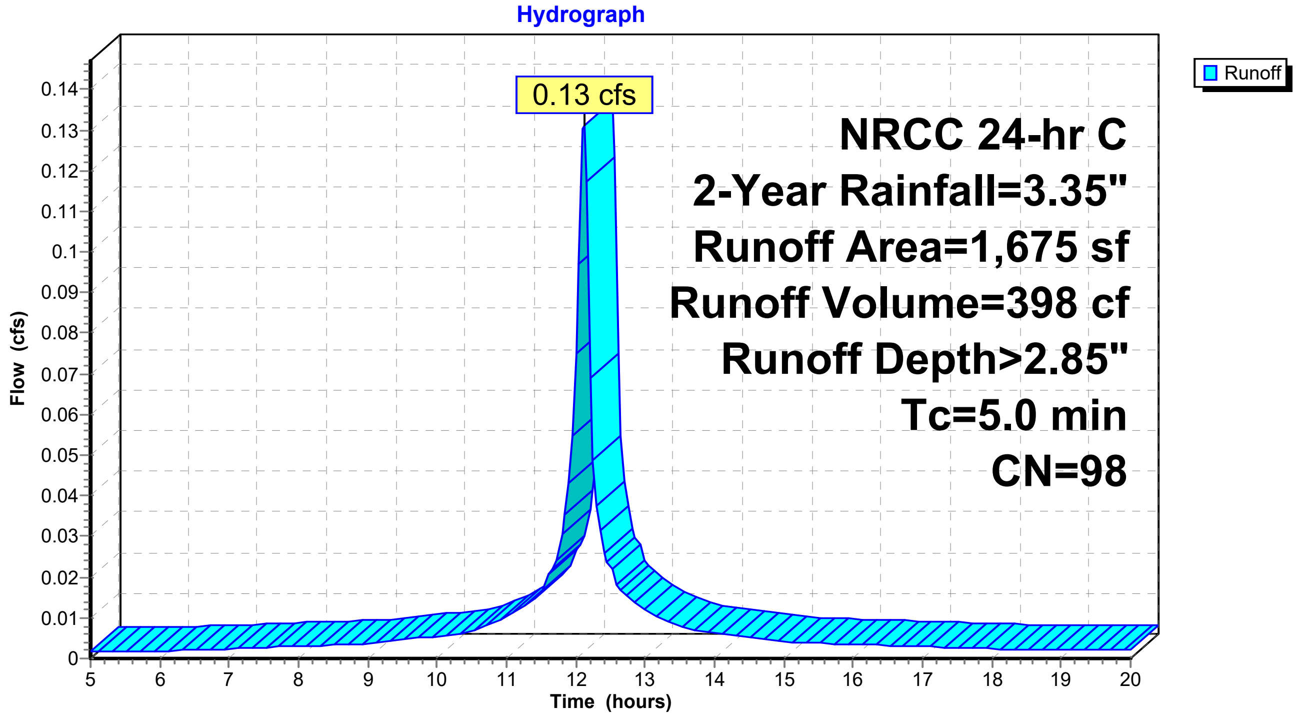
Runoff = 0.13 cfs @ 12.11 hrs, Volume= 398 cf, Depth> 2.85"
Routed to Pond 1P : Subsurface #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 2-Year Rainfall=3.35"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U9: Unit #9



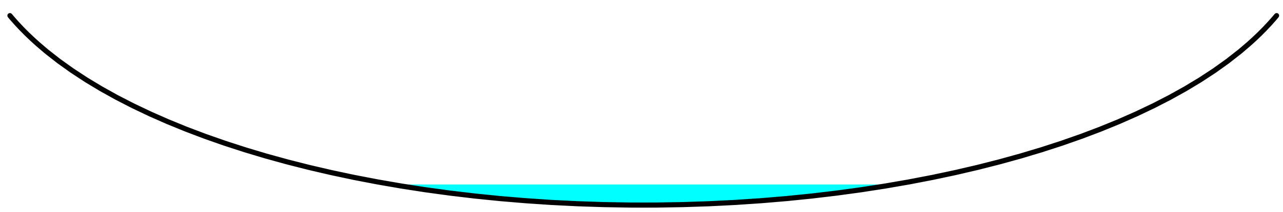
Summary for Reach 3R: Wetland Surface 1

Inflow Area = 26,965 sf, 33.26% Impervious, Inflow Depth > 0.50" for 2-Year event
Inflow = 0.20 cfs @ 12.68 hrs, Volume= 1,124 cf
Outflow = 0.16 cfs @ 13.03 hrs, Volume= 1,110 cf, Atten= 20%, Lag= 21.4 min
Routed to Reach DP1PST : DP 1 - POST

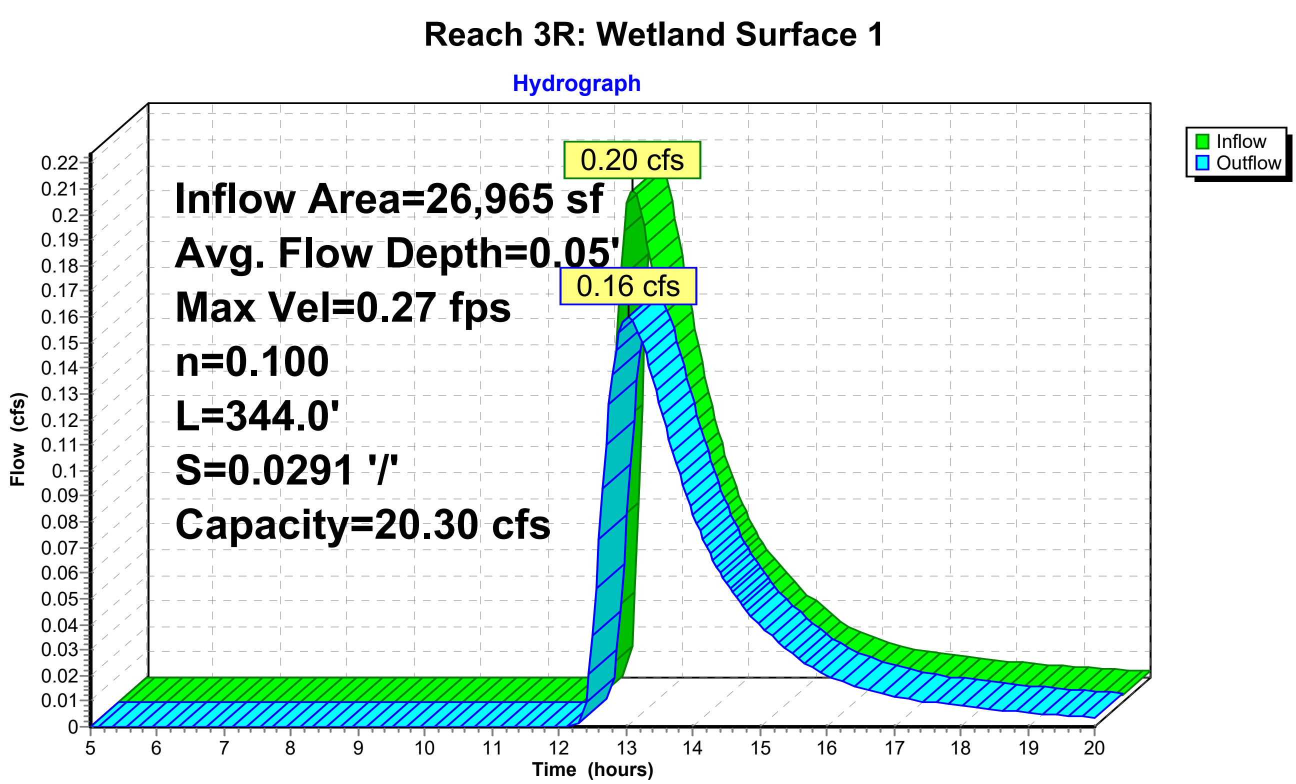
Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.27 fps, Min. Travel Time= 20.9 min
Avg. Velocity = 0.16 fps, Avg. Travel Time= 37.0 min

Peak Storage= 200 cf @ 13.03 hrs
Average Depth at Peak Storage= 0.05' , Surface Width= 16.34'
Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 20.30 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 344.0' Slope= 0.0291 '/'
Inlet Invert= 94.00', Outlet Invert= 84.00'



‡



Stage-Discharge for Reach 3R: Wetland Surface 1

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
94.00	0.00	0.00
94.01	0.09	0.00
94.02	0.14	0.02
94.03	0.19	0.05
94.04	0.23	0.09
94.05	0.26	0.14
94.06	0.30	0.21
94.07	0.33	0.29
94.08	0.36	0.38
94.09	0.39	0.49
94.10	0.42	0.62
94.11	0.44	0.76
94.12	0.47	0.92
94.13	0.50	1.10
94.14	0.52	1.29
94.15	0.55	1.49
94.16	0.57	1.72
94.17	0.59	1.96
94.18	0.62	2.22
94.19	0.64	2.49
94.20	0.66	2.79
94.21	0.68	3.10
94.22	0.70	3.43
94.23	0.73	3.77
94.24	0.75	4.14
94.25	0.77	4.52
94.26	0.79	4.92
94.27	0.81	5.34
94.28	0.83	5.78
94.29	0.85	6.24
94.30	0.87	6.71
94.31	0.89	7.21
94.32	0.90	7.72
94.33	0.92	8.25
94.34	0.94	8.80
94.35	0.96	9.37
94.36	0.98	9.96
94.37	1.00	10.57
94.38	1.01	11.20
94.39	1.03	11.85
94.40	1.05	12.52
94.41	1.07	13.20
94.42	1.08	13.91
94.43	1.10	14.64
94.44	1.12	15.39
94.45	1.14	16.15
94.46	1.15	16.94
94.47	1.17	17.75
94.48	1.19	18.58
94.49	1.20	19.43
94.50	**1.22**	**20.30**

Stage-Area-Storage for Reach 3R: Wetland Surface 1

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
94.00	0.0	0
94.01	0.0	16
94.02	0.1	46
94.03	0.2	84
94.04	0.4	130
94.05	0.5	181
94.06	0.7	238
94.07	0.9	300
94.08	1.1	367
94.09	1.3	438
94.10	1.5	513
94.11	1.7	592
94.12	2.0	674
94.13	2.2	760
94.14	2.5	849
94.15	2.7	942
94.16	3.0	1,038
94.17	3.3	1,137
94.18	3.6	1,238
94.19	3.9	1,343
94.20	4.2	1,450
94.21	4.5	1,561
94.22	4.9	1,673
94.23	5.2	1,789
94.24	5.5	1,907
94.25	5.9	2,027
94.26	6.2	2,150
94.27	6.6	2,275
94.28	7.0	2,403
94.29	7.4	2,532
94.30	7.7	2,665
94.31	8.1	2,799
94.32	8.5	2,935
94.33	8.9	3,074
94.34	9.3	3,215
94.35	9.8	3,358
94.36	10.2	3,503
94.37	10.6	3,650
94.38	11.0	3,799
94.39	11.5	3,950
94.40	11.9	4,102
94.41	12.4	4,257
94.42	12.8	4,414
94.43	13.3	4,573
94.44	13.8	4,733
94.45	14.2	4,895
94.46	14.7	5,059
94.47	15.2	5,225
94.48	15.7	5,393
94.49	16.2	5,562
94.50	**16.7**	**5,733**

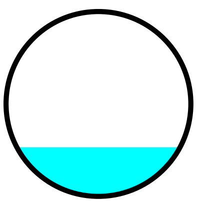
Summary for Reach 4R: 8" ROOF DRAIN CARRIER PIPE

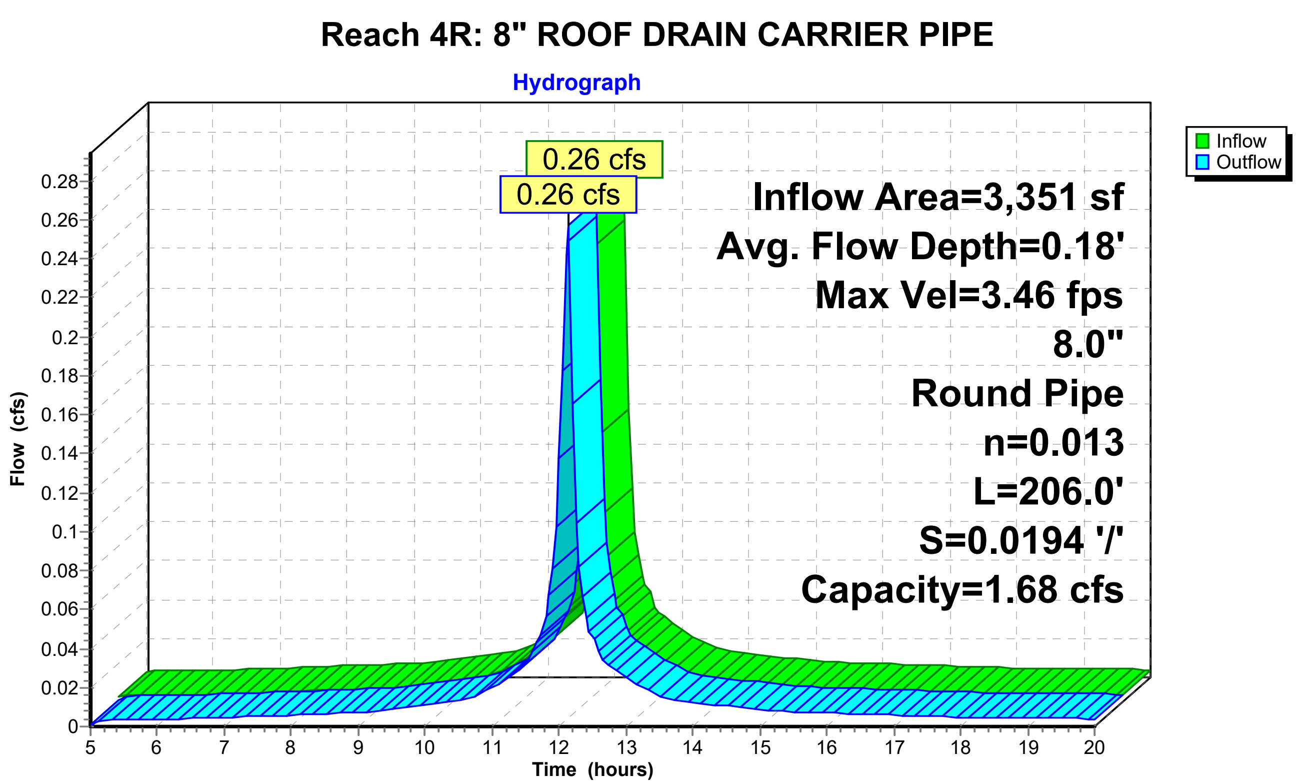
Inflow Area = 3,351 sf,100.00% Impervious, Inflow Depth > 2.85" for 2-Year event
Inflow = 0.26 cfs @ 12.11 hrs, Volume= 796 cf
Outflow = 0.26 cfs @ 12.13 hrs, Volume= 795 cf, Atten= 2%, Lag= 1.1 min
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.46 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.31 fps, Avg. Travel Time= 2.6 min

Peak Storage= 15 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 0.59'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.68 cfs

8.0" Round Pipe
n= 0.013
Length= 206.0' Slope= 0.0194 '/'
Inlet Invert= 93.00', Outlet Invert= 89.00'





Stage-Discharge for Reach 4R: 8" ROOF DRAIN CARRIER PIPE

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
93.00	0.00	0.00
93.01	0.55	0.00
93.02	0.89	0.00
93.03	1.16	0.01
93.04	1.39	0.01
93.05	1.61	0.02
93.06	1.81	0.03
93.07	2.00	0.04
93.08	2.17	0.05
93.09	2.34	0.07
93.10	2.49	0.08
93.11	2.64	0.10
93.12	2.79	0.12
93.13	2.92	0.14
93.14	3.05	0.16
93.15	3.18	0.19
93.16	3.30	0.21
93.17	3.42	0.24
93.18	3.53	0.27
93.19	3.64	0.30
93.20	3.74	0.33
93.21	3.84	0.36
93.22	3.94	0.40
93.23	4.04	0.43
93.24	4.13	0.47
93.25	4.21	0.50
93.26	4.30	0.54
93.27	4.38	0.58
93.28	4.46	0.62
93.29	4.53	0.66
93.30	4.60	0.70
93.31	4.67	0.74
93.32	4.74	0.79
93.33	4.80	0.83
93.34	4.86	0.87
93.35	4.92	0.91
93.36	4.98	0.96
93.37	5.03	1.00
93.38	5.08	1.04
93.39	5.13	1.09
93.40	5.17	1.13
93.41	5.22	1.17
93.42	5.25	1.22
93.43	5.29	1.26
93.44	5.33	1.30
93.45	5.36	1.34
93.46	5.38	1.38
93.47	5.41	1.42
93.48	5.43	1.46
93.49	5.45	1.50
93.50	5.47	1.54
93.51	5.48	1.57
93.52	5.49	1.60

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
93.53	5.50	1.64
93.54	**5.50**	1.67
93.55	5.50	1.69
93.56	5.49	1.72
93.57	5.48	1.74
93.58	5.47	1.76
93.59	5.45	1.78
93.60	5.42	1.79
93.61	5.39	1.80
93.62	5.35	**1.81**
93.63	5.30	1.81
93.64	5.24	1.80
93.65	5.15	1.79
93.66	5.03	1.75
93.67	4.72	1.65

Stage-Area-Storage for Reach 4R: 8" ROOF DRAIN CARRIER PIPE

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
93.00	0.0	0
93.01	0.0	0
93.02	0.0	1
93.03	0.0	1
93.04	0.0	2
93.05	0.0	2
93.06	0.0	3
93.07	0.0	4
93.08	0.0	5
93.09	0.0	6
93.10	0.0	7
93.11	0.0	8
93.12	0.0	9
93.13	0.0	10
93.14	0.1	11
93.15	0.1	12
93.16	0.1	13
93.17	0.1	14
93.18	0.1	16
93.19	0.1	17
93.20	0.1	18
93.21	0.1	19
93.22	0.1	21
93.23	0.1	22
93.24	0.1	23
93.25	0.1	25
93.26	0.1	26
93.27	0.1	27
93.28	0.1	29
93.29	0.1	30
93.30	0.2	31
93.31	0.2	33
93.32	0.2	34
93.33	0.2	35
93.34	0.2	37
93.35	0.2	38
93.36	0.2	40
93.37	0.2	41
93.38	0.2	42
93.39	0.2	44
93.40	0.2	45
93.41	0.2	46
93.42	0.2	48
93.43	0.2	49
93.44	0.2	50
93.45	0.3	52
93.46	0.3	53
93.47	0.3	54
93.48	0.3	55
93.49	0.3	57
93.50	0.3	58
93.51	0.3	59
93.52	0.3	60
93.53	0.3	61
93.54	0.3	62
93.55	0.3	63
93.56	0.3	64
93.57	0.3	65
93.58	0.3	66
93.59	0.3	67
93.60	0.3	68
93.61	0.3	69
93.62	0.3	70
93.63	0.3	70
93.64	0.3	71
93.65	0.3	71
93.66	0.3	72
93.67	**0.3**	**72**

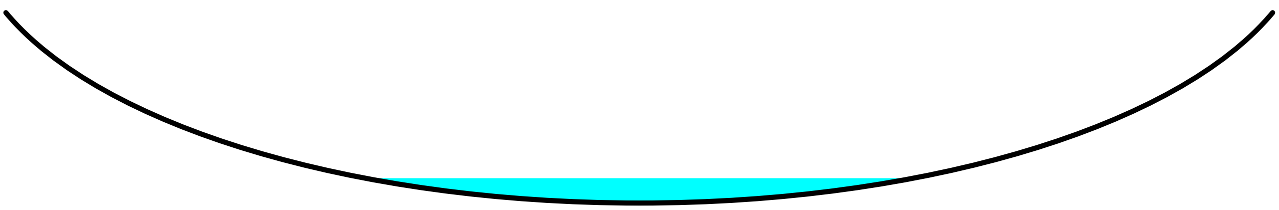
Summary for Reach 5R: Wetland Surface 2

Inflow Area = 13,032 sf, 17.40% Impervious, Inflow Depth > 0.71" for 2-Year event
Inflow = 0.24 cfs @ 12.32 hrs, Volume= 773 cf
Outflow = 0.13 cfs @ 12.65 hrs, Volume= 760 cf, Atten= 47%, Lag= 19.8 min
Routed to Reach 3R : Wetland Surface 1

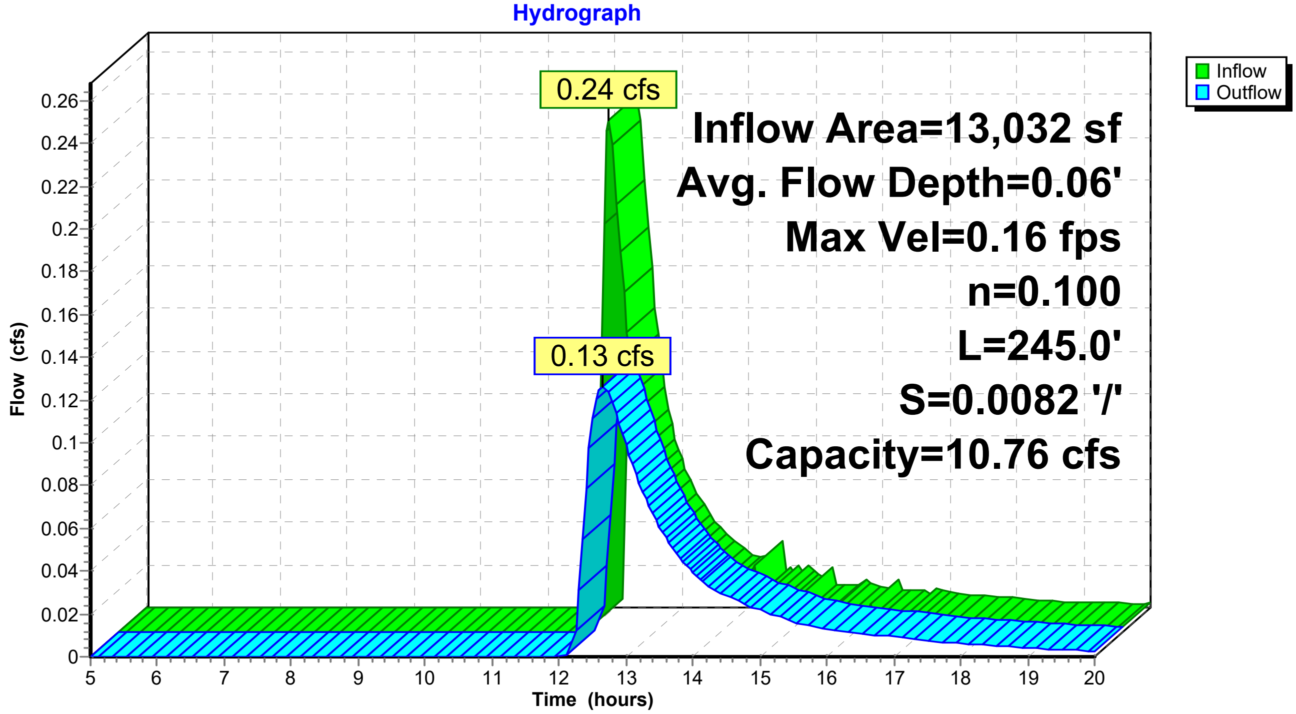
Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.16 fps, Min. Travel Time= 24.8 min
Avg. Velocity = 0.09 fps, Avg. Travel Time= 45.6 min

Peak Storage= 188 cf @ 12.65 hrs
Average Depth at Peak Storage= 0.06' , Surface Width= 17.93'
Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 10.76 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 245.0' Slope= 0.0082 '/'
Inlet Invert= 96.00', Outlet Invert= 94.00'



‡



Stage-Discharge for Reach 5R: Wetland Surface 2

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
96.00	0.00	0.00
96.01	0.05	0.00
96.02	0.08	0.01
96.03	0.10	0.02
96.04	0.12	0.05
96.05	0.14	0.07
96.06	0.16	0.11
96.07	0.17	0.15
96.08	0.19	0.20
96.09	0.21	0.26
96.10	0.22	0.33
96.11	0.24	0.40
96.12	0.25	0.49
96.13	0.26	0.58
96.14	0.28	0.68
96.15	0.29	0.79
96.16	0.30	0.91
96.17	0.31	1.04
96.18	0.33	1.18
96.19	0.34	1.32
96.20	0.35	1.48
96.21	0.36	1.64
96.22	0.37	1.82
96.23	0.38	2.00
96.24	0.40	2.19
96.25	0.41	2.40
96.26	0.42	2.61
96.27	0.43	2.83
96.28	0.44	3.06
96.29	0.45	3.30
96.30	0.46	3.56
96.31	0.47	3.82
96.32	0.48	4.09
96.33	0.49	4.37
96.34	0.50	4.66
96.35	0.51	4.97
96.36	0.52	5.28
96.37	0.53	5.60
96.38	0.54	5.94
96.39	0.55	6.28
96.40	0.56	6.63
96.41	0.57	7.00
96.42	0.57	7.37
96.43	0.58	7.76
96.44	0.59	8.15
96.45	0.60	8.56
96.46	0.61	8.98
96.47	0.62	9.41
96.48	0.63	9.85
96.49	0.64	10.30
96.50	**0.65**	**10.76**

Stage-Area-Storage for Reach 5R: Wetland Surface 2

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
96.00	0.0	0
96.01	0.0	12
96.02	0.1	33
96.03	0.2	60
96.04	0.4	92
96.05	0.5	129
96.06	0.7	170
96.07	0.9	214
96.08	1.1	261
96.09	1.3	312
96.10	1.5	365
96.11	1.7	421
96.12	2.0	480
96.13	2.2	541
96.14	2.5	605
96.15	2.7	671
96.16	3.0	739
96.17	3.3	810
96.18	3.6	882
96.19	3.9	957
96.20	4.2	1,033
96.21	4.5	1,111
96.22	4.9	1,192
96.23	5.2	1,274
96.24	5.5	1,358
96.25	5.9	1,444
96.26	6.2	1,531
96.27	6.6	1,620
96.28	7.0	1,711
96.29	7.4	1,804
96.30	7.7	1,898
96.31	8.1	1,993
96.32	8.5	2,091
96.33	8.9	2,189
96.34	9.3	2,290
96.35	9.8	2,391
96.36	10.2	2,495
96.37	10.6	2,599
96.38	11.0	2,705
96.39	11.5	2,813
96.40	11.9	2,922
96.41	12.4	3,032
96.42	12.8	3,144
96.43	13.3	3,257
96.44	13.8	3,371
96.45	14.2	3,486
96.46	14.7	3,603
96.47	15.2	3,721
96.48	15.7	3,841
96.49	16.2	3,961
96.50	**16.7**	**4,083**

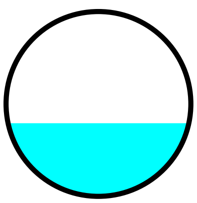
Summary for Reach 8R: 6" Roof Drain Carrier Pipe

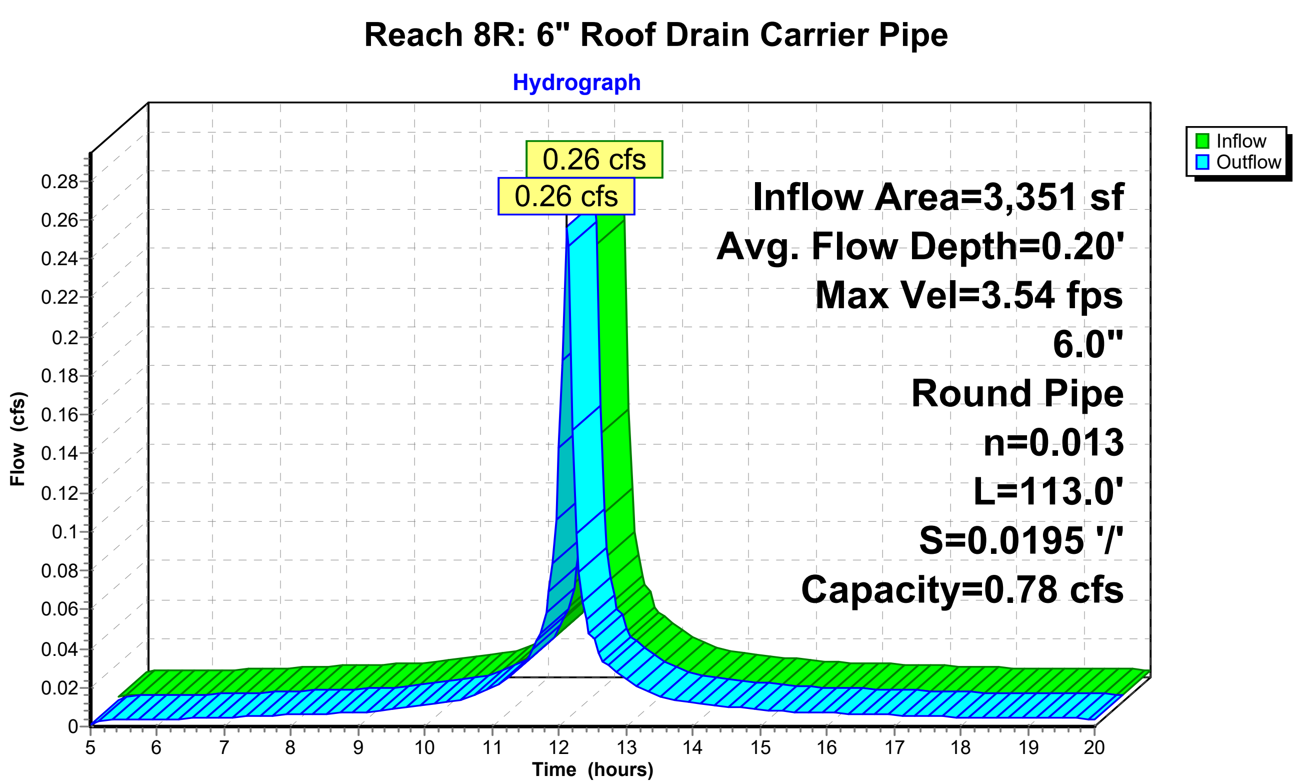
Inflow Area = 3,351 sf,100.00% Impervious, Inflow Depth > 2.85" for 2-Year event
Inflow = 0.26 cfs @ 12.11 hrs, Volume= 796 cf
Outflow = 0.26 cfs @ 12.12 hrs, Volume= 796 cf, Atten= 2%, Lag= 0.7 min
Routed to Reach 9R : 12" Roof Drain Carrier Pipe

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.54 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 1.4 min

Peak Storage= 8 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.20' , Surface Width= 0.49'
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 0.78 cfs

6.0" Round Pipe
n= 0.013
Length= 113.0' Slope= 0.0195 '/'
Inlet Invert= 94.50', Outlet Invert= 92.30'





Stage-Discharge for Reach 8R: 6" Roof Drain Carrier Pipe

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
94.50	0.00	0.00
94.51	0.56	0.00
94.52	0.89	0.00
94.53	1.15	0.01
94.54	1.39	0.01
94.55	1.60	0.02
94.56	1.79	0.02
94.57	1.97	0.03
94.58	2.14	0.04
94.59	2.30	0.06
94.60	2.45	0.07
94.61	2.59	0.08
94.62	2.73	0.10
94.63	2.86	0.12
94.64	2.98	0.13
94.65	3.09	0.15
94.66	3.21	0.17
94.67	3.31	0.19
94.68	3.41	0.22
94.69	3.51	0.24
94.70	3.60	0.26
94.71	3.68	0.29
94.72	3.77	0.31
94.73	3.84	0.34
94.74	3.92	0.37
94.75	3.99	0.39
94.76	4.05	0.42
94.77	4.11	0.45
94.78	4.17	0.47
94.79	4.23	0.50
94.80	4.28	0.53
94.81	4.32	0.55
94.82	4.36	0.58
94.83	4.40	0.61
94.84	4.44	0.63
94.85	4.46	0.66
94.86	4.49	0.68
94.87	4.51	0.70
94.88	4.53	0.72
94.89	4.54	0.75
94.90	4.54	0.77
94.91	**4.55**	0.78
94.92	4.54	0.80
94.93	4.53	0.81
94.94	4.51	0.83
94.95	4.48	0.83
94.96	4.45	0.84
94.97	4.40	**0.84**
94.98	4.33	0.84
94.99	4.23	0.83
95.00	3.99	0.78

Stage-Area-Storage for Reach 8R: 6" Roof Drain Carrier Pipe

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
94.50	0.0	0
94.51	0.0	0
94.52	0.0	0
94.53	0.0	1
94.54	0.0	1
94.55	0.0	1
94.56	0.0	2
94.57	0.0	2
94.58	0.0	2
94.59	0.0	3
94.60	0.0	3
94.61	0.0	4
94.62	0.0	4
94.63	0.0	5
94.64	0.0	5
94.65	0.0	6
94.66	0.1	6
94.67	0.1	7
94.68	0.1	7
94.69	0.1	8
94.70	0.1	8
94.71	0.1	9
94.72	0.1	9
94.73	0.1	10
94.74	0.1	11
94.75	0.1	11
94.76	0.1	12
94.77	0.1	12
94.78	0.1	13
94.79	0.1	13
94.80	0.1	14
94.81	0.1	14
94.82	0.1	15
94.83	0.1	16
94.84	0.1	16
94.85	0.1	17
94.86	0.2	17
94.87	0.2	18
94.88	0.2	18
94.89	0.2	19
94.90	0.2	19
94.91	0.2	19
94.92	0.2	20
94.93	0.2	20
94.94	0.2	21
94.95	0.2	21
94.96	0.2	21
94.97	0.2	22
94.98	0.2	22
94.99	0.2	22
95.00	**0.2**	**22**

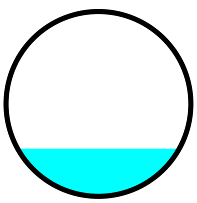
Summary for Reach 9R: 12" Roof Drain Carrier Pipe

Inflow Area = 6,701 sf,100.00% Impervious, Inflow Depth > 2.85" for 2-Year event
Inflow = 0.52 cfs @ 12.12 hrs, Volume= 1,591 cf
Outflow = 0.51 cfs @ 12.13 hrs, Volume= 1,590 cf, Atten= 1%, Lag= 1.1 min
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

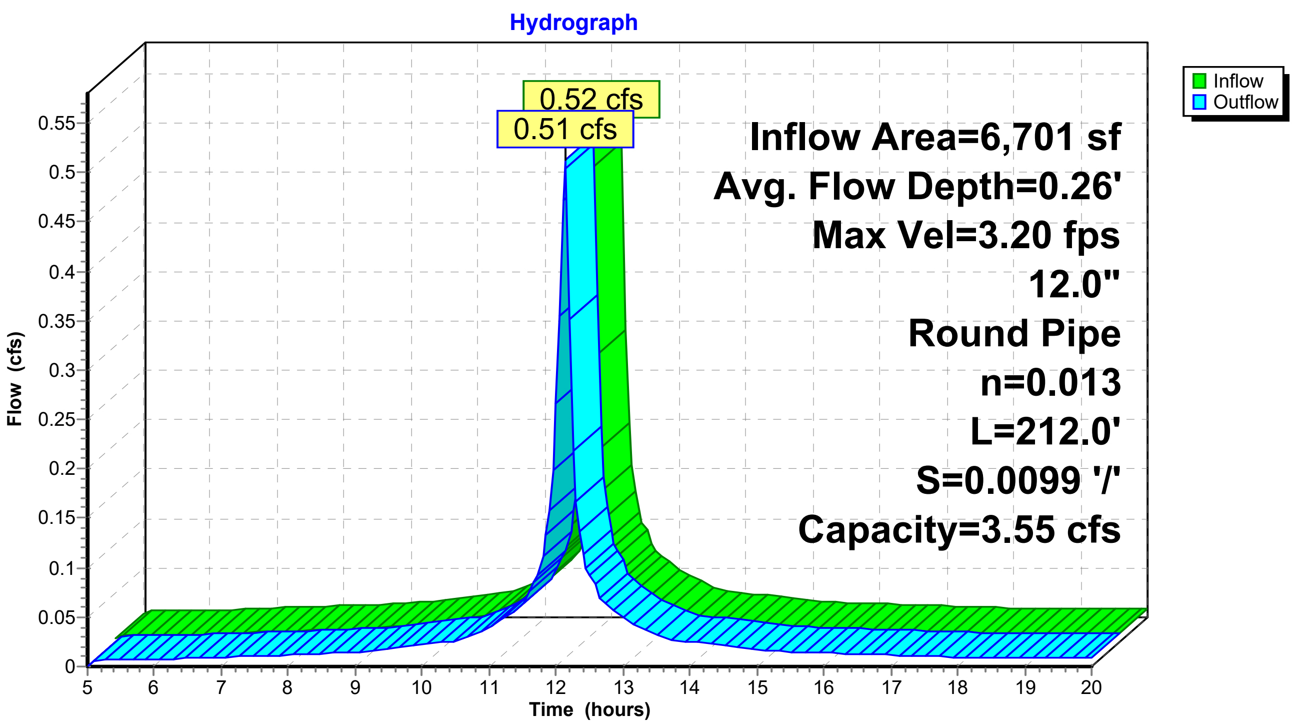
Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.20 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.21 fps, Avg. Travel Time= 2.9 min

Peak Storage= 34 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.26' , Surface Width= 0.87'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.55 cfs

12.0" Round Pipe
n= 0.013
Length= 212.0' Slope= 0.0099 '/'
Inlet Invert= 91.10', Outlet Invert= 89.00'



Reach 9R: 12" Roof Drain Carrier Pipe



Stage-Discharge for Reach 9R: 12" Roof Drain Carrier Pipe

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)	Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
91.10	0.00	0.00	91.63	4.62	1.95
91.11	0.40	0.00	91.64	4.66	2.02
91.12	0.64	0.00	91.65	4.69	2.08
91.13	0.83	0.01	91.66	4.72	2.14
91.14	1.00	0.01	91.67	4.76	2.20
91.15	1.16	0.02	91.68	4.79	2.26
91.16	1.31	0.03	91.69	4.81	2.32
91.17	1.44	0.03	91.70	4.84	2.38
91.18	1.57	0.05	91.71	4.87	2.44
91.19	1.69	0.06	91.72	4.89	2.50
91.20	1.81	0.07	91.73	4.92	2.56
91.21	1.92	0.09	91.74	4.94	2.62
91.22	2.03	0.11	91.75	4.96	2.68
91.23	2.14	0.13	91.76	4.98	2.74
91.24	2.24	0.15	91.77	5.00	2.80
91.25	2.33	0.17	91.78	5.02	2.86
91.26	2.43	0.20	91.79	5.04	2.91
91.27	2.52	0.22	91.80	5.06	2.97
91.28	2.61	0.25	91.81	5.07	3.02
91.29	2.69	0.28	91.82	5.08	3.08
91.30	2.78	0.31	91.83	5.10	3.13
91.31	2.86	0.34	91.84	5.11	3.18
91.32	2.94	0.38	91.85	5.12	3.23
91.33	3.01	0.41	91.86	5.13	3.28
91.34	3.09	0.45	91.87	5.13	3.33
91.35	3.16	0.49	91.88	5.14	3.38
91.36	3.23	0.52	91.89	5.14	3.42
91.37	3.30	0.57	91.90	5.15	3.47
91.38	3.37	0.61	91.91	**5.15**	3.51
91.39	3.44	0.65	91.92	5.15	3.55
91.40	3.50	0.69	91.93	5.14	3.59
91.41	3.57	0.74	91.94	5.14	3.62
91.42	3.63	0.79	91.95	5.14	3.65
91.43	3.69	0.83	91.96	5.13	3.68
91.44	3.75	0.88	91.97	5.12	3.71
91.45	3.81	0.93	91.98	5.11	3.74
91.46	3.86	0.98	91.99	5.09	3.76
91.47	3.92	1.03	92.00	5.08	3.78
91.48	3.97	1.09	92.01	5.06	3.79
91.49	4.02	1.14	92.02	5.03	3.81
91.50	4.07	1.19	92.03	5.01	3.81
91.51	4.12	1.25	92.04	4.98	**3.81**
91.52	4.17	1.31	92.05	4.94	3.81
91.53	4.22	1.36	92.06	4.90	3.80
91.54	4.26	1.42	92.07	4.85	3.78
91.55	4.31	1.48	92.08	4.79	3.75
91.56	4.35	1.54	92.09	4.71	3.69
91.57	4.39	1.59	92.10	4.51	3.55
91.58	4.44	1.65			
91.59	4.48	1.71			
91.60	4.51	1.77			
91.61	4.55	1.83			
91.62	4.59	1.89			

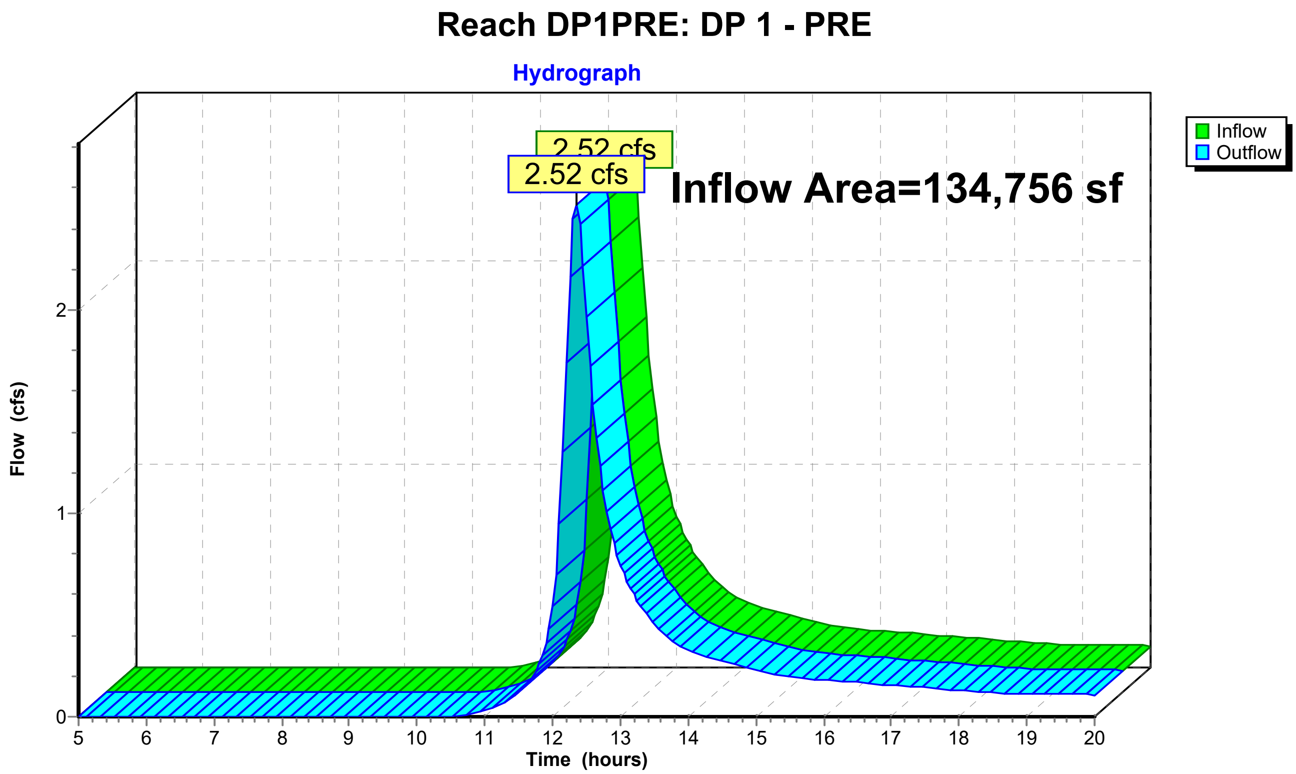
Stage-Area-Storage for Reach 9R: 12" Roof Drain Carrier Pipe

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
91.10	0.0	0
91.11	0.0	0
91.12	0.0	1
91.13	0.0	1
91.14	0.0	2
91.15	0.0	3
91.16	0.0	4
91.17	0.0	5
91.18	0.0	6
91.19	0.0	7
91.20	0.0	9
91.21	0.0	10
91.22	0.1	11
91.23	0.1	13
91.24	0.1	14
91.25	0.1	16
91.26	0.1	17
91.27	0.1	19
91.28	0.1	20
91.29	0.1	22
91.30	0.1	24
91.31	0.1	25
91.32	0.1	27
91.33	0.1	29
91.34	0.1	31
91.35	0.2	33
91.36	0.2	34
91.37	0.2	36
91.38	0.2	38
91.39	0.2	40
91.40	0.2	42
91.41	0.2	44
91.42	0.2	46
91.43	0.2	48
91.44	0.2	50
91.45	0.2	52
91.46	0.3	54
91.47	0.3	56
91.48	0.3	58
91.49	0.3	60
91.50	0.3	62
91.51	0.3	64
91.52	0.3	66
91.53	0.3	68
91.54	0.3	71
91.55	0.3	73
91.56	0.4	75
91.57	0.4	77
91.58	0.4	79
91.59	0.4	81
91.60	0.4	83
91.61	0.4	85
91.62	0.4	87
91.63	0.4	90
91.64	0.4	92
91.65	0.4	94
91.66	0.5	96
91.67	0.5	98
91.68	0.5	100
91.69	0.5	102
91.70	0.5	104
91.71	0.5	106
91.72	0.5	108
91.73	0.5	110
91.74	0.5	113
91.75	0.5	115
91.76	0.5	117
91.77	0.6	119
91.78	0.6	121
91.79	0.6	123
91.80	0.6	124
91.81	0.6	126
91.82	0.6	128
91.83	0.6	130
91.84	0.6	132
91.85	0.6	134
91.86	0.6	136
91.87	0.6	138
91.88	0.7	139
91.89	0.7	141
91.90	0.7	143
91.91	0.7	144
91.92	0.7	146
91.93	0.7	148
91.94	0.7	149
91.95	0.7	151
91.96	0.7	152
91.97	0.7	154
91.98	0.7	155
91.99	0.7	157
92.00	0.7	158
92.01	0.8	159
92.02	0.8	160
92.03	0.8	161
92.04	0.8	162
92.05	0.8	163
92.06	0.8	164
92.07	0.8	165
92.08	0.8	166
92.09	0.8	166
92.10	**0.8**	**167**

Summary for Reach DP1PRE: DP 1 - PRE

Inflow Area = 134,756 sf, 4.57% Impervious, Inflow Depth > 1.01" for 2-Year event
Inflow = 2.52 cfs @ 12.35 hrs, Volume= 11,326 cf
Outflow = 2.52 cfs @ 12.35 hrs, Volume= 11,326 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

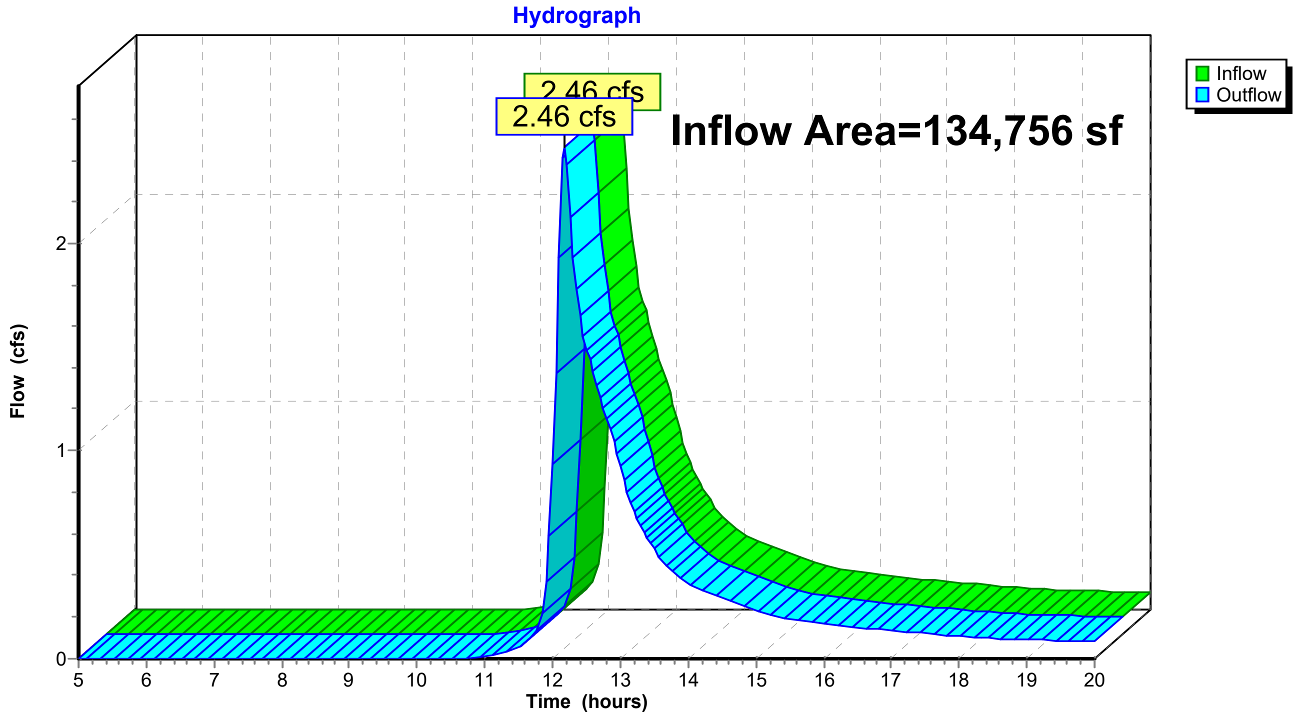


Summary for Reach DP1PST: DP 1 - POST

Inflow Area =	134,756 sf, 27.66% Impervious,	Inflow Depth > 1.01"	for 2-Year event
Inflow =	2.46 cfs @ 12.17 hrs, Volume=	11,365 cf	
Outflow =	2.46 cfs @ 12.17 hrs, Volume=	11,365 cf, Atten= 0%, Lag= 0.0 min	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach DP1PST: DP 1 - POST



Summary for Pond 1P: Subsurface #1

Inflow Area = 13,933 sf, 48.09% Impervious, Inflow Depth > 1.90" for 2-Year event
Inflow = 0.66 cfs @ 12.12 hrs, Volume= 2,203 cf
Outflow = 0.10 cfs @ 12.73 hrs, Volume= 1,618 cf, Atten= 84%, Lag= 36.1 min
Discarded = 0.03 cfs @ 11.05 hrs, Volume= 1,254 cf
Primary = 0.07 cfs @ 12.73 hrs, Volume= 364 cf
Routed to Reach 3R : Wetland Surface 1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.16' @ 12.73 hrs Surf.Area= 1,248 sf Storage= 896 cf

Plug-Flow detention time= 134.8 min calculated for 1,613 cf (73% of inflow)
Center-of-Mass det. time= 66.5 min (828.0 - 761.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	96.00'	902 cf	**37.25'W x 33.50'L x 2.54'H Field A** 3,172 cf Overall - 918 cf Embedded = 2,254 cf x 40.0% Voids
#2A	96.50'	918 cf	**Cultec R-150XLHD** x 33 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 11 rows
		1,819 cf	Total Available Storage

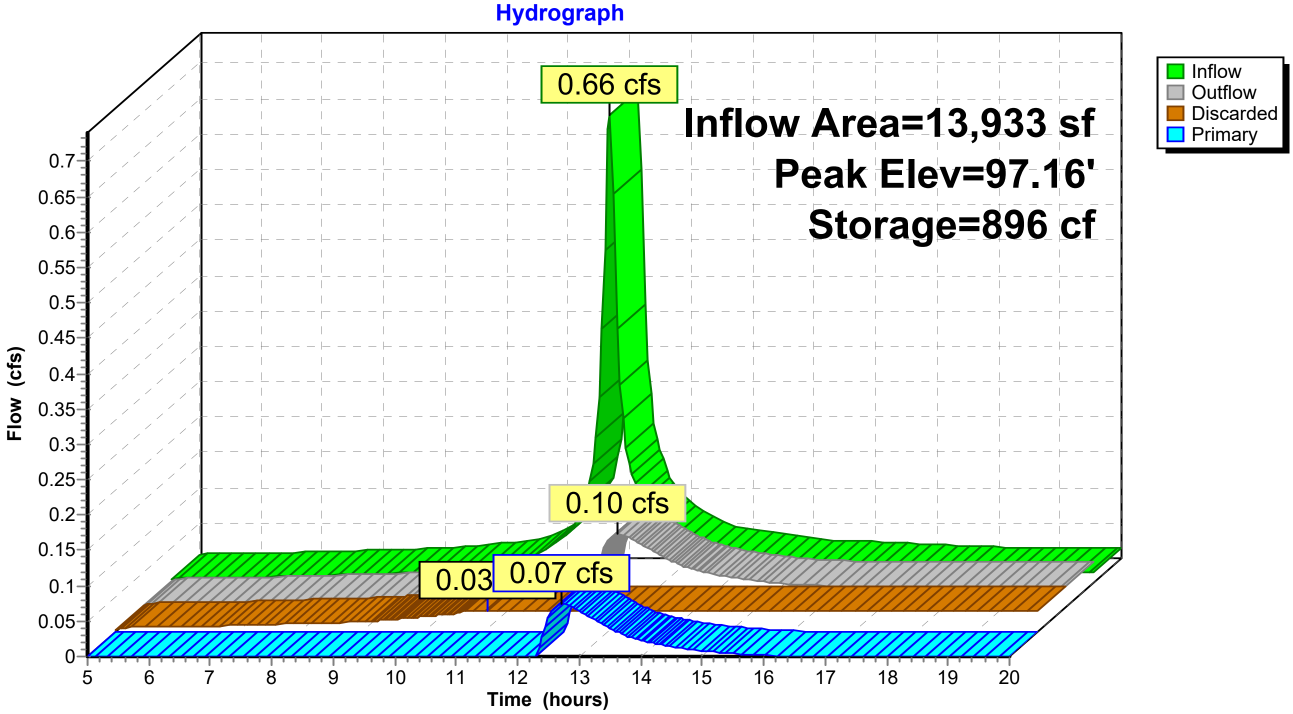
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	96.00'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	99.00'	**6.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	97.00'	**8.0" Round Culvert** L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 97.00' / 96.75' S= 0.0083 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf

Discarded OutFlow Max=0.03 cfs @ 11.05 hrs HW=96.03' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.07 cfs @ 12.73 hrs HW=97.16' TW=94.05' (Dynamic Tailwater)
├─**2=Orifice/Grate** (Controls 0.00 cfs)
└─**3=Culvert** (Barrel Controls 0.07 cfs @ 1.72 fps)

Pond 1P: Subsurface #1



Stage-Discharge for Pond 1P: Subsurface #1

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
96.00	0.00	**0.00**	0.00
96.05	0.03	**0.03**	0.00
96.10	0.03	0.03	0.00
96.15	0.03	0.03	0.00
96.20	0.03	0.03	0.00
96.25	0.03	0.03	0.00
96.30	0.03	0.03	0.00
96.35	0.03	0.03	0.00
96.40	0.03	0.03	0.00
96.45	0.03	0.03	0.00
96.50	0.03	0.03	0.00
96.55	0.03	0.03	0.00
96.60	0.03	0.03	0.00
96.65	0.03	0.03	0.00
96.70	0.03	0.03	0.00
96.75	0.03	0.03	0.00
96.80	0.03	0.03	0.00
96.85	0.03	0.03	0.00
96.90	0.03	0.03	0.00
96.95	0.03	0.03	0.00
97.00	0.03	0.03	0.00
97.05	0.04	0.03	0.01
97.10	0.06	0.03	0.03
97.15	0.09	0.03	0.06
97.20	0.14	0.03	0.11
97.25	0.20	0.03	0.17
97.30	0.27	0.03	0.24
97.35	0.35	0.03	0.32
97.40	0.43	0.03	0.40
97.45	0.52	0.03	0.49
97.50	0.61	0.03	0.58
97.55	0.70	0.03	0.67
97.60	0.79	0.03	0.76
97.65	0.88	0.03	0.85
97.70	0.96	0.03	0.93
97.75	1.04	0.03	1.01
97.80	1.10	0.03	1.07
97.85	1.14	0.03	1.11
97.90	1.13	0.03	1.10
97.95	1.19	0.03	1.16
98.00	1.24	0.03	1.21
98.05	1.29	0.03	1.26
98.10	1.34	0.03	1.31
98.15	1.39	0.03	1.36
98.20	1.43	0.03	1.40
98.25	1.48	0.03	1.45
98.30	1.52	0.03	1.49
98.35	1.56	0.03	1.53
98.40	1.60	0.03	1.57
98.45	1.64	0.03	1.61
98.50	1.68	0.03	1.65
98.55	1.72	0.03	1.69
98.60	1.76	0.03	1.73
98.65	1.79	0.03	1.76
98.70	1.83	0.03	1.80
98.75	1.86	0.03	1.83
98.80	1.90	0.03	1.87
98.85	1.93	0.03	1.90
98.90	1.96	0.03	1.93
98.95	1.99	0.03	1.96
99.00	**2.03**	0.03	**2.00**

Stage-Area-Storage for Pond 1P: Subsurface #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
96.00	**1,248**	0	98.65	1,248	1,819
96.05	1,248	25	98.70	1,248	1,819
96.10	1,248	50	98.75	1,248	1,819
96.15	1,248	75	98.80	1,248	1,819
96.20	1,248	100	98.85	1,248	1,819
96.25	1,248	125	98.90	1,248	1,819
96.30	1,248	150	98.95	1,248	1,819
96.35	1,248	175	99.00	1,248	1,819
96.40	1,248	200			
96.45	1,248	225			
96.50	1,248	250			
96.55	1,248	300			
96.60	1,248	350			
96.65	1,248	400			
96.70	1,248	450			
96.75	1,248	499			
96.80	1,248	548			
96.85	1,248	597			
96.90	1,248	646			
96.95	1,248	694			
97.00	1,248	742			
97.05	1,248	790			
97.10	1,248	838			
97.15	1,248	885			
97.20	1,248	932			
97.25	1,248	978			
97.30	1,248	1,024			
97.35	1,248	1,069			
97.40	1,248	1,113			
97.45	1,248	1,157			
97.50	1,248	1,200			
97.55	1,248	1,242			
97.60	1,248	1,283			
97.65	1,248	1,322			
97.70	1,248	1,361			
97.75	1,248	1,398			
97.80	1,248	1,433			
97.85	1,248	1,465			
97.90	1,248	1,495			
97.95	1,248	1,522			
98.00	1,248	1,549			
98.05	1,248	1,574			
98.10	1,248	1,599			
98.15	1,248	1,624			
98.20	1,248	1,649			
98.25	1,248	1,674			
98.30	1,248	1,699			
98.35	1,248	1,724			
98.40	1,248	1,749			
98.45	1,248	1,774			
98.50	1,248	1,799			
98.55	1,248	**1,819**			
98.60	1,248	1,819			

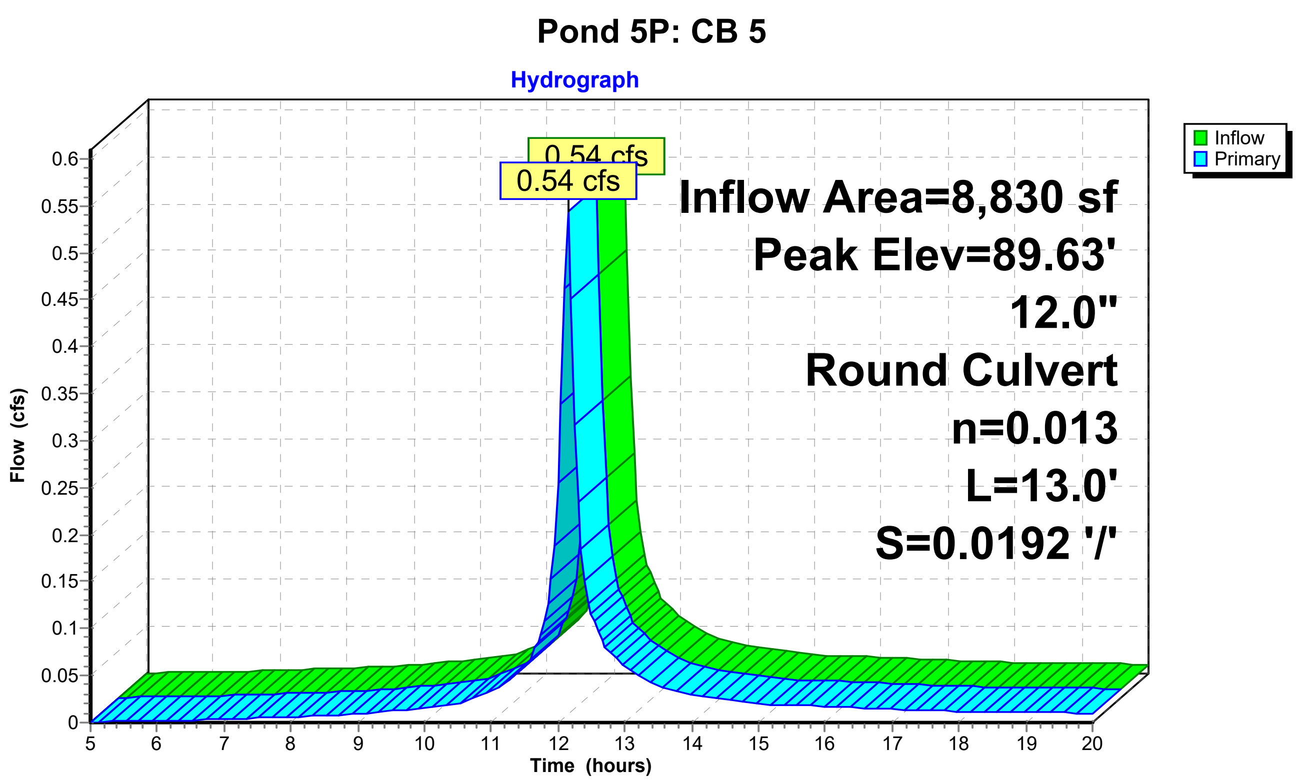
Summary for Pond 5P: CB 5

Inflow Area = 8,830 sf, 71.11% Impervious, Inflow Depth > 2.23" for 2-Year event
Inflow = 0.54 cfs @ 12.15 hrs, Volume= 1,639 cf
Outflow = 0.54 cfs @ 12.15 hrs, Volume= 1,639 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.54 cfs @ 12.15 hrs, Volume= 1,639 cf
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 89.63' @ 12.36 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	89.25'	**12.0" Round Culvert** L= 13.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.25' / 89.00' S= 0.0192 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.51 cfs @ 12.15 hrs HW=89.62' TW=89.33' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.51 cfs @ 2.87 fps)



Stage-Discharge for Pond 5P: CB 5

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
89.25	0.00	89.78	1.02
89.26	0.00	89.79	1.05
89.27	0.00	89.80	1.08
89.28	0.00	89.81	1.12
89.29	0.01	89.82	1.15
89.30	0.01	89.83	1.18
89.31	0.02	89.84	1.21
89.32	0.02	89.85	1.25
89.33	0.03	89.86	1.28
89.34	0.04	89.87	1.31
89.35	0.04	89.88	1.35
89.36	0.05	89.89	1.38
89.37	0.06	89.90	1.42
89.38	0.07	89.91	1.45
89.39	0.09	89.92	1.48
89.40	0.10	89.93	1.52
89.41	0.11	89.94	1.55
89.42	0.12	89.95	1.59
89.43	0.14	89.96	1.62
89.44	0.15	89.97	1.66
89.45	0.17	89.98	1.69
89.46	0.19	89.99	1.73
89.47	0.20	90.00	1.77
89.48	0.22	90.01	1.80
89.49	0.24	90.02	1.84
89.50	0.26	90.03	1.87
89.51	0.28	90.04	1.91
89.52	0.30	90.05	1.94
89.53	0.32	90.06	1.98
89.54	0.35	90.07	2.02
89.55	0.37	90.08	2.05
89.56	0.39	90.09	2.09
89.57	0.42	90.10	2.13
89.58	0.44	90.11	2.16
89.59	0.47	90.12	2.20
89.60	0.49	90.13	2.23
89.61	0.52	90.14	2.27
89.62	0.55	90.15	2.31
89.63	0.57	90.16	2.34
89.64	0.60	90.17	2.38
89.65	0.63	90.18	2.41
89.66	0.66	90.19	2.45
89.67	0.69	90.20	2.48
89.68	0.72	90.21	2.52
89.69	0.75	90.22	2.55
89.70	0.78	90.23	2.59
89.71	0.81	90.24	2.62
89.72	0.84	90.25	**2.66**
89.73	0.87		
89.74	0.90		
89.75	0.93		
89.76	0.96		
89.77	0.99		

Stage-Area-Storage for Pond 5P: CB 5

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
89.25	**0**	89.78	0
89.26	0	89.79	0
89.27	0	89.80	0
89.28	0	89.81	0
89.29	0	89.82	0
89.30	0	89.83	0
89.31	0	89.84	0
89.32	0	89.85	0
89.33	0	89.86	0
89.34	0	89.87	0
89.35	0	89.88	0
89.36	0	89.89	0
89.37	0	89.90	0
89.38	0	89.91	0
89.39	0	89.92	0
89.40	0	89.93	0
89.41	0	89.94	0
89.42	0	89.95	0
89.43	0	89.96	0
89.44	0	89.97	0
89.45	0	89.98	0
89.46	0	89.99	0
89.47	0	90.00	0
89.48	0	90.01	0
89.49	0	90.02	0
89.50	0	90.03	0
89.51	0	90.04	0
89.52	0	90.05	0
89.53	0	90.06	0
89.54	0	90.07	0
89.55	0	90.08	0
89.56	0	90.09	0
89.57	0	90.10	0
89.58	0	90.11	0
89.59	0	90.12	0
89.60	0	90.13	0
89.61	0	90.14	0
89.62	0	90.15	0
89.63	0	90.16	0
89.64	0	90.17	0
89.65	0	90.18	0
89.66	0	90.19	0
89.67	0	90.20	0
89.68	0	90.21	0
89.69	0	90.22	0
89.70	0	90.23	0
89.71	0	90.24	0
89.72	0	90.25	0
89.73	0		
89.74	0		
89.75	0		
89.76	0		
89.77	0		

Summary for Pond 10P: Infiltration Basin #1 (Storage)

Inflow Area = 54,661 sf, 51.78% Impervious, Inflow Depth > 1.53" for 2-Year event
Inflow = 2.18 cfs @ 12.15 hrs, Volume= 6,954 cf
Outflow = 1.25 cfs @ 12.29 hrs, Volume= 6,227 cf, Atten= 43%, Lag= 8.7 min
Primary = 1.25 cfs @ 12.29 hrs, Volume= 6,227 cf
Routed to Reach DP1PST : DP 1 - POST
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf
Routed to Reach DP1PST : DP 1 - POST

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 89.59' @ 12.29 hrs Surf.Area= 1,665 sf Storage= 1,639 cf

Plug-Flow detention time= 56.5 min calculated for 6,206 cf (89% of inflow)
Center-of-Mass det. time= 24.3 min (818.3 - 794.1)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	8,689 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

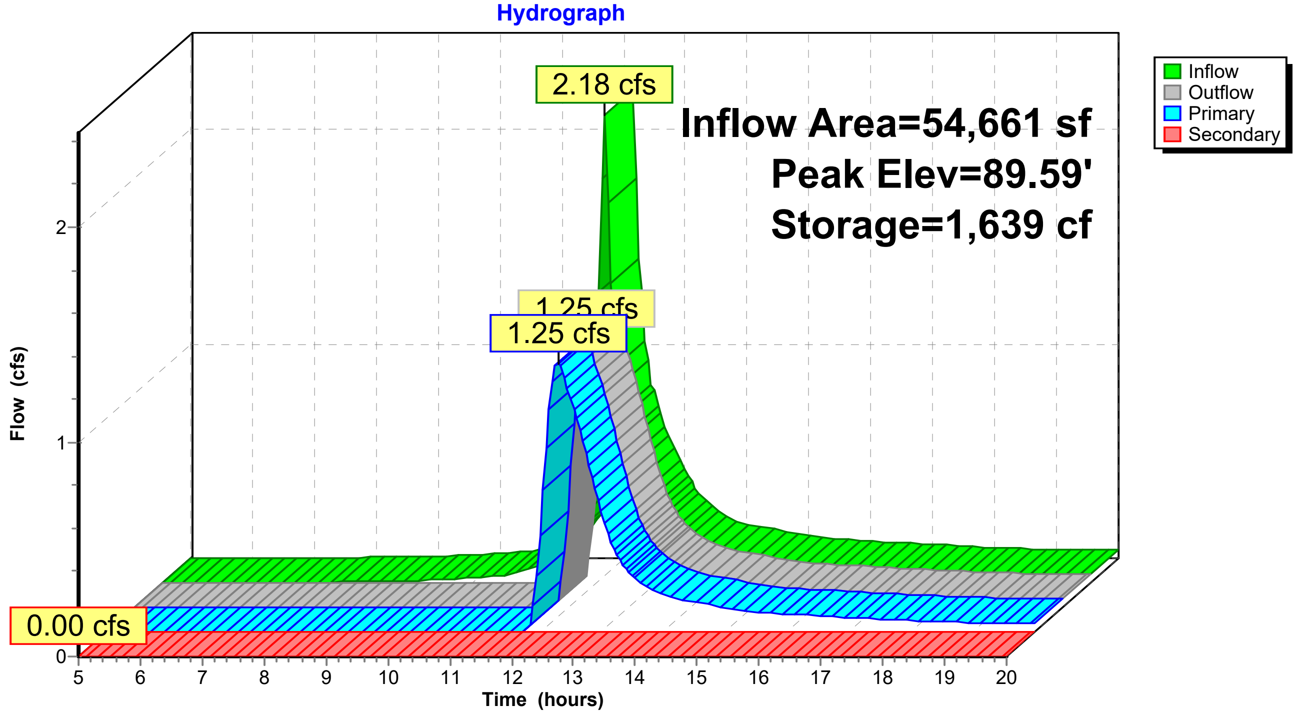
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	392	0	0
90.00	1,990	2,382	2,382
92.00	4,317	6,307	8,689

Device	Routing	Invert	Outlet Devices
#1	Secondary	91.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	87.50'	**12.0" Round Culvert** L= 37.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 87.50' / 87.25' S= 0.0068 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	88.90'	**16.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	89.50'	**6.0" W x 15.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.25 cfs @ 12.29 hrs HW=89.59' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 1.25 cfs of 4.48 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.21 cfs @ 3.62 fps)
  └─**4=Orifice/Grate** (Orifice Controls 0.04 cfs @ 0.97 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' TW=0.00' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 10P: Infiltration Basin #1 (Storage)



Stage-Discharge for Pond 10P: Infiltration Basin #1 (Storage)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
88.00	0.00	0.00	0.00	90.65	4.02	4.02	0.00
88.05	0.00	0.00	0.00	90.70	4.19	4.19	0.00
88.10	0.00	0.00	0.00	90.75	4.35	4.35	0.00
88.15	0.00	0.00	0.00	90.80	4.50	4.50	0.00
88.20	0.00	0.00	0.00	90.85	4.63	4.63	0.00
88.25	0.00	0.00	0.00	90.90	4.76	4.76	0.00
88.30	0.00	0.00	0.00	90.95	4.89	4.89	0.00
88.35	0.00	0.00	0.00	91.00	5.00	5.00	0.00
88.40	0.00	0.00	0.00	91.05	5.41	5.12	0.29
88.45	0.00	0.00	0.00	91.10	6.05	5.23	0.83
88.50	0.00	0.00	0.00	91.15	6.85	5.34	1.52
88.55	0.00	0.00	0.00	91.20	7.78	5.44	2.34
88.60	0.00	0.00	0.00	91.25	8.81	5.54	3.27
88.65	0.00	0.00	0.00	91.30	9.94	5.64	4.30
88.70	0.00	0.00	0.00	91.35	11.16	5.74	5.42
88.75	0.00	0.00	0.00	91.40	12.45	5.84	6.62
88.80	0.00	0.00	0.00	91.45	13.83	5.93	7.90
88.85	0.00	0.00	0.00	91.50	15.27	6.02	9.25
88.90	0.00	0.00	0.00	91.55	16.78	6.11	10.67
88.95	0.05	0.05	0.00	91.60	18.36	6.20	12.16
89.00	0.14	0.14	0.00	91.65	20.00	6.29	13.71
89.05	0.25	0.25	0.00	91.70	21.70	6.38	15.32
89.10	0.38	0.38	0.00	91.75	23.14	6.46	16.68
89.15	0.53	0.53	0.00	91.80	23.77	6.54	17.23
89.20	0.66	0.66	0.00	91.85	24.38	6.63	17.76
89.25	0.75	0.75	0.00	91.90	24.98	6.71	18.27
89.30	0.83	0.83	0.00	91.95	25.56	6.79	18.77
89.35	0.91	0.91	0.00	92.00	**26.13**	**6.87**	**19.26**
89.40	0.98	0.98	0.00				
89.45	1.04	1.04	0.00				
89.50	1.10	1.10	0.00				
89.55	1.18	1.18	0.00				
89.60	1.27	1.27	0.00				
89.65	1.36	1.36	0.00				
89.70	1.46	1.46	0.00				
89.75	1.57	1.57	0.00				
89.80	1.68	1.68	0.00				
89.85	1.79	1.79	0.00				
89.90	1.91	1.91	0.00				
89.95	2.03	2.03	0.00				
90.00	2.15	2.15	0.00				
90.05	2.28	2.28	0.00				
90.10	2.41	2.41	0.00				
90.15	2.54	2.54	0.00				
90.20	2.68	2.68	0.00				
90.25	2.82	2.82	0.00				
90.30	2.96	2.96	0.00				
90.35	3.10	3.10	0.00				
90.40	3.25	3.25	0.00				
90.45	3.40	3.40	0.00				
90.50	3.55	3.55	0.00				
90.55	3.71	3.71	0.00				
90.60	3.87	3.87	0.00				

Stage-Area-Storage for Pond 10P: Infiltration Basin #1 (Storage)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
88.00	392	0
88.05	432	21
88.10	472	43
88.15	512	68
88.20	552	94
88.25	592	123
88.30	632	154
88.35	672	186
88.40	712	221
88.45	752	257
88.50	792	296
88.55	831	336
88.60	871	379
88.65	911	424
88.70	951	470
88.75	991	519
88.80	1,031	569
88.85	1,071	622
88.90	1,111	676
88.95	1,151	733
89.00	1,191	792
89.05	1,231	852
89.10	1,271	915
89.15	1,311	979
89.20	1,351	1,046
89.25	1,391	1,114
89.30	1,431	1,185
89.35	1,471	1,257
89.40	1,511	1,332
89.45	1,551	1,408
89.50	1,591	1,487
89.55	1,630	1,567
89.60	1,670	1,650
89.65	1,710	1,734
89.70	1,750	1,821
89.75	1,790	1,909
89.80	1,830	2,000
89.85	1,870	2,092
89.90	1,910	2,187
89.95	1,950	2,283
90.00	1,990	2,382
90.05	2,048	2,483
90.10	2,106	2,587
90.15	2,165	2,694
90.20	2,223	2,803
90.25	2,281	2,916
90.30	2,339	3,031
90.35	2,397	3,150
90.40	2,455	3,271
90.45	2,514	3,395
90.50	2,572	3,522
90.55	2,630	3,652
90.60	2,688	3,785
90.65	2,746	3,921
90.70	2,804	4,060
90.75	2,863	4,202
90.80	2,921	4,346
90.85	2,979	4,494
90.90	3,037	4,644
90.95	3,095	4,798
91.00	3,154	4,954
91.05	3,212	5,113
91.10	3,270	5,275
91.15	3,328	5,440
91.20	3,386	5,608
91.25	3,444	5,778
91.30	3,503	5,952
91.35	3,561	6,129
91.40	3,619	6,308
91.45	3,677	6,491
91.50	3,735	6,676
91.55	3,793	6,864
91.60	3,852	7,055
91.65	3,910	7,249
91.70	3,968	7,446
91.75	4,026	7,646
91.80	4,084	7,849
91.85	4,142	8,055
91.90	4,201	8,263
91.95	4,259	8,475
92.00	**4,317**	**8,689**

Summary for Pond B2: Infiltration Basin #2 (Storage Zone)

Inflow Area = 13,032 sf, 17.40% Impervious, Inflow Depth > 0.77" for 2-Year event
Inflow = 0.26 cfs @ 12.26 hrs, Volume= 840 cf
Outflow = 0.24 cfs @ 12.32 hrs, Volume= 773 cf, Atten= 9%, Lag= 3.6 min
Primary = 0.24 cfs @ 12.32 hrs, Volume= 773 cf
Routed to Reach 5R : Wetland Surface 2

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.64' @ 12.32 hrs Surf.Area= 435 sf Storage= 116 cf

Plug-Flow detention time= 31.7 min calculated for 771 cf (92% of inflow)
Center-of-Mass det. time= 11.2 min (809.8 - 798.5)

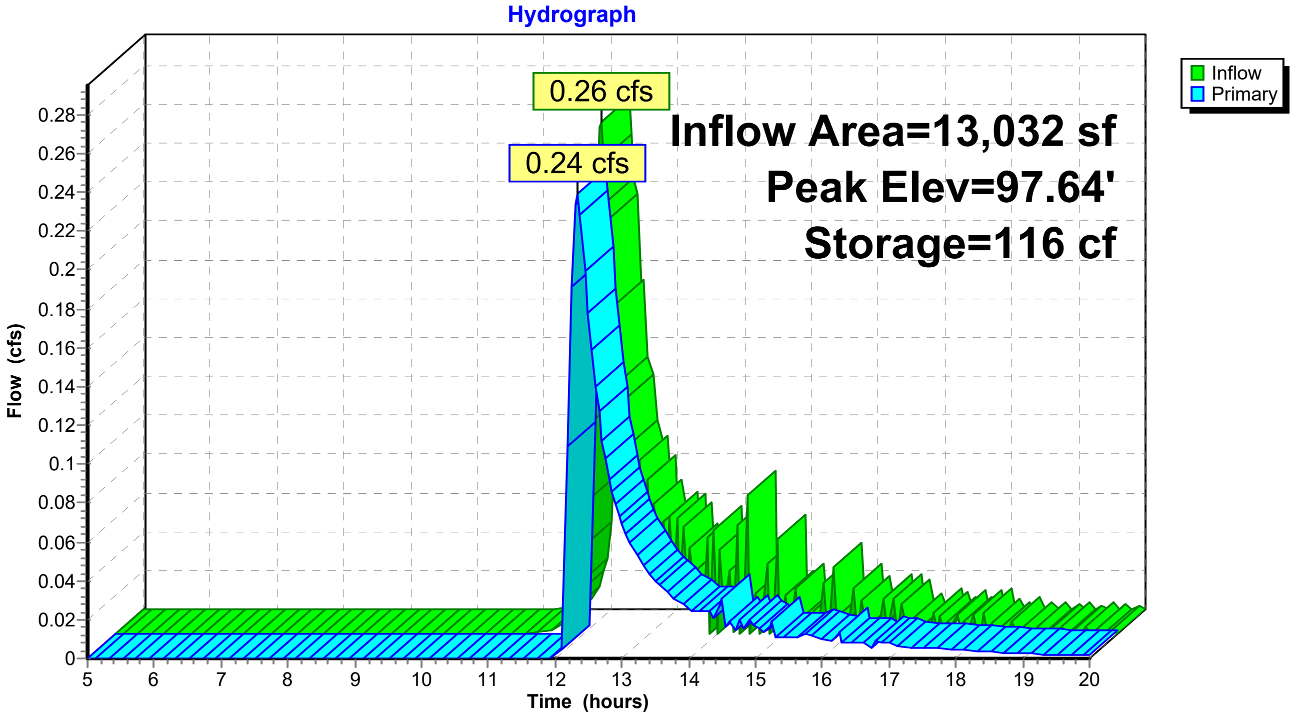
Volume	Invert	Avail.Storage	Storage Description
#1	97.10'	329 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.10	0	0	0
98.00	731	329	329

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 96.25' / 96.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	97.50'	**18.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.23 cfs @ 12.32 hrs HW=97.63' TW=96.04' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.23 cfs of 2.86 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 0.23 cfs @ 1.17 fps)

Pond B2: Infiltration Basin #2 (Storage Zone)



Stage-Discharge for Pond B2: Infiltration Basin #2 (Storage Zone)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
97.10	0.00	97.63	0.23
97.11	0.00	97.64	0.25
97.12	0.00	97.65	0.28
97.13	0.00	97.66	0.31
97.14	0.00	97.67	0.34
97.15	0.00	97.68	0.37
97.16	0.00	97.69	0.40
97.17	0.00	97.70	0.43
97.18	0.00	97.71	0.46
97.19	0.00	97.72	0.50
97.20	0.00	97.73	0.53
97.21	0.00	97.74	0.57
97.22	0.00	97.75	0.60
97.23	0.00	97.76	0.64
97.24	0.00	97.77	0.68
97.25	0.00	97.78	0.71
97.26	0.00	97.79	0.75
97.27	0.00	97.80	0.79
97.28	0.00	97.81	0.83
97.29	0.00	97.82	0.87
97.30	0.00	97.83	0.91
97.31	0.00	97.84	0.95
97.32	0.00	97.85	1.00
97.33	0.00	97.86	1.04
97.34	0.00	97.87	1.08
97.35	0.00	97.88	1.13
97.36	0.00	97.89	1.17
97.37	0.00	97.90	1.22
97.38	0.00	97.91	1.26
97.39	0.00	97.92	1.31
97.40	0.00	97.93	1.36
97.41	0.00	97.94	1.41
97.42	0.00	97.95	1.45
97.43	0.00	97.96	1.50
97.44	0.00	97.97	1.55
97.45	0.00	97.98	1.60
97.46	0.00	97.99	1.65
97.47	0.00	98.00	**1.70**
97.48	0.00		
97.49	0.00		
97.50	0.00		
97.51	0.00		
97.52	0.01		
97.53	0.03		
97.54	0.04		
97.55	0.05		
97.56	0.07		
97.57	0.09		
97.58	0.11		
97.59	0.13		
97.60	0.15		
97.61	0.18		
97.62	0.20		

Stage-Area-Storage for Pond B2: Infiltration Basin #2 (Storage Zone)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
97.10	0	0	97.63	430	114
97.11	8	0	97.64	439	118
97.12	16	0	97.65	447	123
97.13	24	0	97.66	455	127
97.14	32	1	97.67	463	132
97.15	41	1	97.68	471	137
97.16	49	1	97.69	479	141
97.17	57	2	97.70	487	146
97.18	65	3	97.71	495	151
97.19	73	3	97.72	504	156
97.20	81	4	97.73	512	161
97.21	89	5	97.74	520	166
97.22	97	6	97.75	528	172
97.23	106	7	97.76	536	177
97.24	114	8	97.77	544	182
97.25	122	9	97.78	552	188
97.26	130	10	97.79	560	193
97.27	138	12	97.80	569	199
97.28	146	13	97.81	577	205
97.29	154	15	97.82	585	211
97.30	162	16	97.83	593	216
97.31	171	18	97.84	601	222
97.32	179	20	97.85	609	228
97.33	187	21	97.86	617	235
97.34	195	23	97.87	625	241
97.35	203	25	97.88	634	247
97.36	211	27	97.89	642	253
97.37	219	30	97.90	650	260
97.38	227	32	97.91	658	266
97.39	236	34	97.92	666	273
97.40	244	37	97.93	674	280
97.41	252	39	97.94	682	287
97.42	260	42	97.95	690	293
97.43	268	44	97.96	699	300
97.44	276	47	97.97	707	307
97.45	284	50	97.98	715	314
97.46	292	53	97.99	723	322
97.47	301	56	98.00	**731**	**329**
97.48	309	59			
97.49	317	62			
97.50	325	65			
97.51	333	68			
97.52	341	72			
97.53	349	75			
97.54	357	79			
97.55	366	82			
97.56	374	86			
97.57	382	90			
97.58	390	94			
97.59	398	98			
97.60	406	102			
97.61	414	106			
97.62	422	110			

Summary for Pond CB1: CB 1

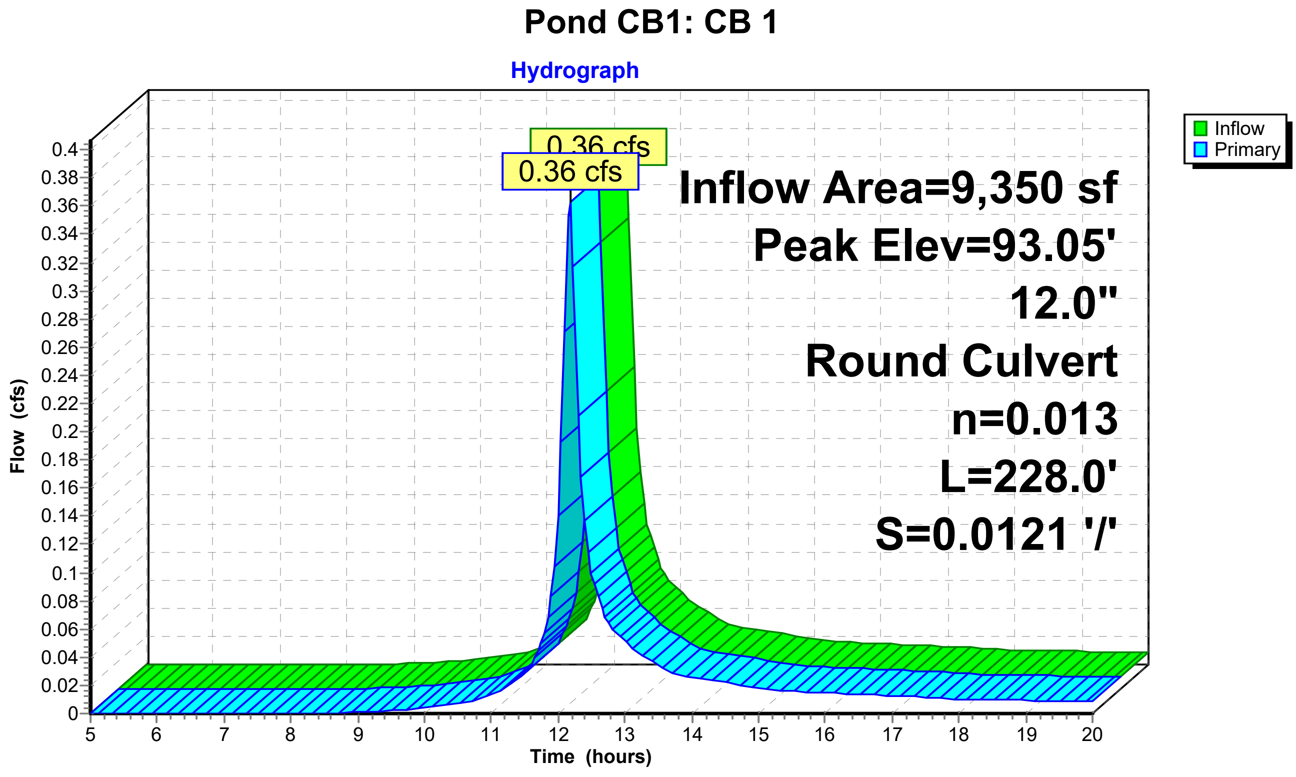
Inflow Area =	9,350 sf,	31.22% Impervious,	Inflow Depth > 1.44"	for 2-Year event	
Inflow =	0.36 cfs @	12.17 hrs,	Volume=	1,124 cf	
Outflow =	0.36 cfs @	12.17 hrs,	Volume=	1,124 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.36 cfs @	12.17 hrs,	Volume=	1,124 cf	

Routed to Pond DMH2 : DMH2

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 93.05' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	92.75'	**12.0" Round Culvert** L= 228.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 92.75' / 90.00' S= 0.0121 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.35 cfs @ 12.17 hrs HW=93.04' TW=90.45' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.35 cfs @ 1.84 fps)



Stage-Discharge for Pond CB1: CB 1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
92.75	0.00	93.28	1.05
92.76	0.00	93.29	1.08
92.77	0.00	93.30	1.12
92.78	0.00	93.31	1.15
92.79	0.01	93.32	1.19
92.80	0.01	93.33	1.22
92.81	0.01	93.34	1.26
92.82	0.02	93.35	1.30
92.83	0.03	93.36	1.33
92.84	0.04	93.37	1.37
92.85	0.04	93.38	1.41
92.86	0.05	93.39	1.45
92.87	0.06	93.40	1.48
92.88	0.07	93.41	1.52
92.89	0.09	93.42	1.56
92.90	0.10	93.43	1.60
92.91	0.11	93.44	1.63
92.92	0.12	93.45	1.67
92.93	0.14	93.46	1.71
92.94	0.15	93.47	1.75
92.95	0.17	93.48	1.79
92.96	0.19	93.49	1.83
92.97	0.20	93.50	1.86
92.98	0.22	93.51	1.90
92.99	0.24	93.52	1.94
93.00	0.26	93.53	1.98
93.01	0.28	93.54	2.01
93.02	0.30	93.55	2.05
93.03	0.32	93.56	2.09
93.04	0.35	93.57	2.13
93.05	0.37	93.58	2.16
93.06	0.39	93.59	2.20
93.07	0.42	93.60	2.23
93.08	0.44	93.61	2.27
93.09	0.47	93.62	2.30
93.10	0.49	93.63	2.34
93.11	0.52	93.64	2.37
93.12	0.55	93.65	2.40
93.13	0.57	93.66	2.44
93.14	0.60	93.67	2.47
93.15	0.63	93.68	2.50
93.16	0.66	93.69	2.53
93.17	0.69	93.70	2.56
93.18	0.72	93.71	2.58
93.19	0.75	93.72	2.61
93.20	0.78	93.73	2.63
93.21	0.81	93.74	2.66
93.22	0.85	93.75	**2.67**
93.23	0.88		
93.24	0.91		
93.25	0.95		
93.26	0.98		
93.27	1.01		

Stage-Area-Storage for Pond CB1: CB 1

Elevation (feet)	Storage (cubic-feet)
92.75	**0**
92.76	0
92.77	0
92.78	0
92.79	0
92.80	0
92.81	0
92.82	0
92.83	0
92.84	0
92.85	0
92.86	0
92.87	0
92.88	0
92.89	0
92.90	0
92.91	0
92.92	0
92.93	0
92.94	0
92.95	0
92.96	0
92.97	0
92.98	0
92.99	0
93.00	0
93.01	0
93.02	0
93.03	0
93.04	0
93.05	0
93.06	0
93.07	0
93.08	0
93.09	0
93.10	0
93.11	0
93.12	0
93.13	0
93.14	0
93.15	0
93.16	0
93.17	0
93.18	0
93.19	0
93.20	0
93.21	0
93.22	0
93.23	0
93.24	0
93.25	0
93.26	0
93.27	0
93.28	0
93.29	0
93.30	0
93.31	0
93.32	0
93.33	0
93.34	0
93.35	0
93.36	0
93.37	0
93.38	0
93.39	0
93.40	0
93.41	0
93.42	0
93.43	0
93.44	0
93.45	0
93.46	0
93.47	0
93.48	0
93.49	0
93.50	0
93.51	0
93.52	0
93.53	0
93.54	0
93.55	0
93.56	0
93.57	0
93.58	0
93.59	0
93.60	0
93.61	0
93.62	0
93.63	0
93.64	0
93.65	0
93.66	0
93.67	0
93.68	0
93.69	0
93.70	0
93.71	0
93.72	0
93.73	0
93.74	0
93.75	0

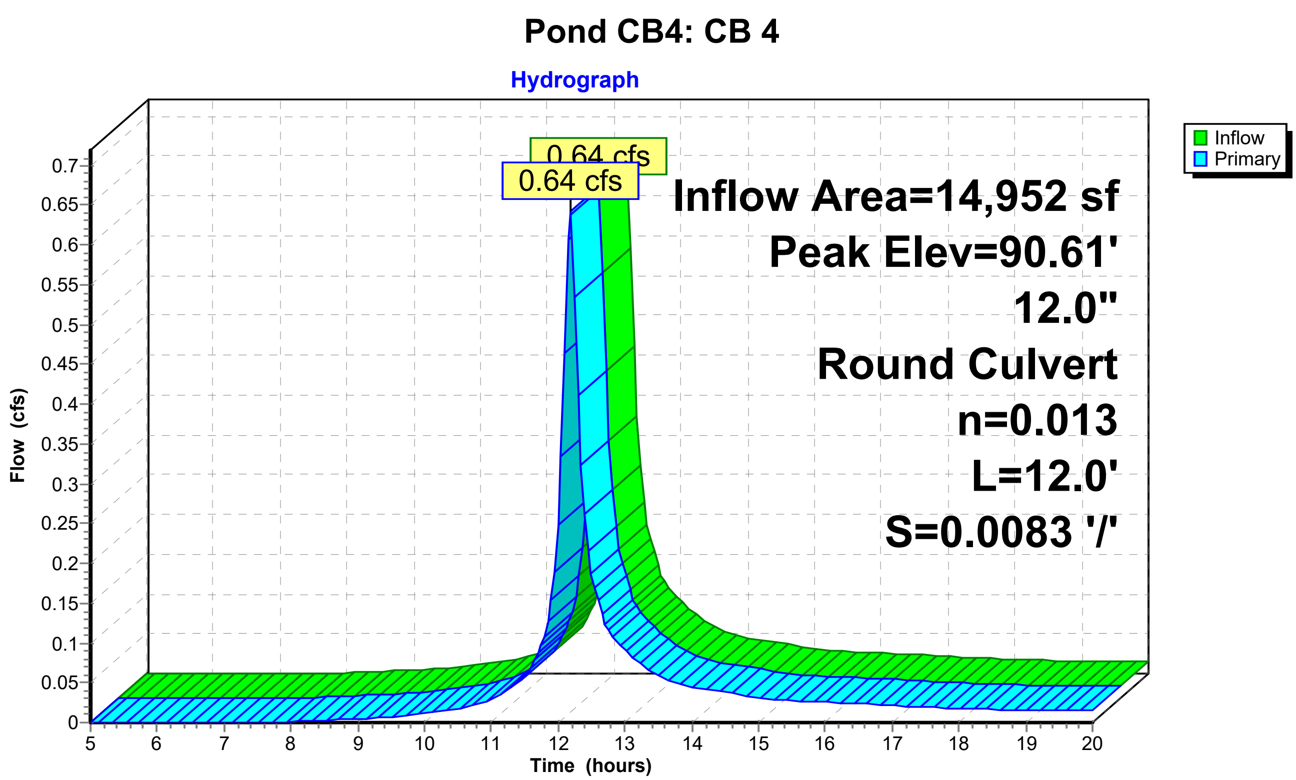
Summary for Pond CB4: CB 4

Inflow Area = 14,952 sf, 43.75% Impervious, Inflow Depth > 1.65" for 2-Year event
Inflow = 0.64 cfs @ 12.19 hrs, Volume= 2,060 cf
Outflow = 0.64 cfs @ 12.19 hrs, Volume= 2,060 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.64 cfs @ 12.19 hrs, Volume= 2,060 cf
Routed to Pond DMH2 : DMH2

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.61' @ 12.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	90.10'	**12.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 90.10' / 90.00' S= 0.0083 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.59 cfs @ 12.19 hrs HW=90.60' TW=90.46' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.59 cfs @ 2.18 fps)



Stage-Discharge for Pond CB4: CB 4

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
90.10	0.00	90.63	0.80
90.11	0.00	90.64	0.83
90.12	0.00	90.65	0.86
90.13	0.00	90.66	0.88
90.14	0.01	90.67	0.91
90.15	0.01	90.68	0.94
90.16	0.01	90.69	0.97
90.17	0.02	90.70	0.99
90.18	0.02	90.71	1.02
90.19	0.03	90.72	1.05
90.20	0.03	90.73	1.08
90.21	0.04	90.74	1.11
90.22	0.05	90.75	1.14
90.23	0.06	90.76	1.17
90.24	0.07	90.77	1.20
90.25	0.08	90.78	1.23
90.26	0.09	90.79	1.26
90.27	0.10	90.80	1.29
90.28	0.11	90.81	1.32
90.29	0.12	90.82	1.35
90.30	0.13	90.83	1.38
90.31	0.15	90.84	1.41
90.32	0.16	90.85	1.44
90.33	0.18	90.86	1.47
90.34	0.19	90.87	1.50
90.35	0.21	90.88	1.54
90.36	0.22	90.89	1.57
90.37	0.24	90.90	1.60
90.38	0.25	90.91	1.63
90.39	0.27	90.92	1.66
90.40	0.29	90.93	1.70
90.41	0.31	90.94	1.73
90.42	0.33	90.95	1.76
90.43	0.34	90.96	1.79
90.44	0.36	90.97	1.82
90.45	0.38	90.98	1.86
90.46	0.40	90.99	1.89
90.47	0.42	91.00	1.92
90.48	0.44	91.01	1.95
90.49	0.47	91.02	1.98
90.50	0.49	91.03	2.02
90.51	0.51	91.04	2.05
90.52	0.53	91.05	2.08
90.53	0.56	91.06	2.11
90.54	0.58	91.07	2.15
90.55	0.60	91.08	2.18
90.56	0.63	91.09	2.21
90.57	0.65	91.10	**2.24**
90.58	0.68		
90.59	0.70		
90.60	0.73		
90.61	0.75		
90.62	0.78		

Stage-Area-Storage for Pond CB4: CB 4

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
90.10	**0**	90.63	0
90.11	0	90.64	0
90.12	0	90.65	0
90.13	0	90.66	0
90.14	0	90.67	0
90.15	0	90.68	0
90.16	0	90.69	0
90.17	0	90.70	0
90.18	0	90.71	0
90.19	0	90.72	0
90.20	0	90.73	0
90.21	0	90.74	0
90.22	0	90.75	0
90.23	0	90.76	0
90.24	0	90.77	0
90.25	0	90.78	0
90.26	0	90.79	0
90.27	0	90.80	0
90.28	0	90.81	0
90.29	0	90.82	0
90.30	0	90.83	0
90.31	0	90.84	0
90.32	0	90.85	0
90.33	0	90.86	0
90.34	0	90.87	0
90.35	0	90.88	0
90.36	0	90.89	0
90.37	0	90.90	0
90.38	0	90.91	0
90.39	0	90.92	0
90.40	0	90.93	0
90.41	0	90.94	0
90.42	0	90.95	0
90.43	0	90.96	0
90.44	0	90.97	0
90.45	0	90.98	0
90.46	0	90.99	0
90.47	0	91.00	0
90.48	0	91.01	0
90.49	0	91.02	0
90.50	0	91.03	0
90.51	0	91.04	0
90.52	0	91.05	0
90.53	0	91.06	0
90.54	0	91.07	0
90.55	0	91.08	0
90.56	0	91.09	0
90.57	0	91.10	0
90.58	0		
90.59	0		
90.60	0		
90.61	0		
90.62	0		

Summary for Pond CB7: CB 7

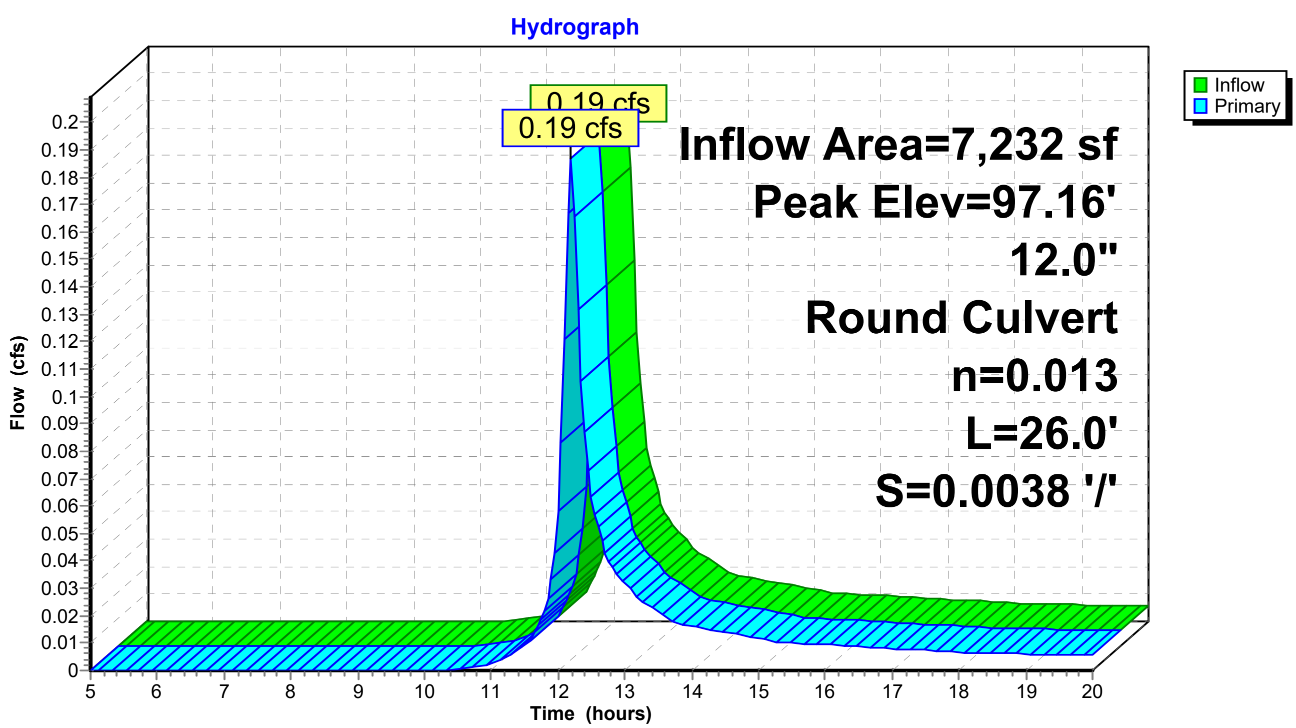
Inflow Area = 7,232 sf, 0.00% Impervious, Inflow Depth > 1.01" for 2-Year event
Inflow = 0.19 cfs @ 12.20 hrs, Volume= 612 cf
Outflow = 0.19 cfs @ 12.20 hrs, Volume= 612 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.19 cfs @ 12.20 hrs, Volume= 612 cf
Routed to Pond 1P : Subsurface #1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.16' @ 12.77 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	96.60'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.60' / 96.50' S= 0.0038 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.03 cfs @ 12.20 hrs HW=96.90' TW=96.90' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.03 cfs @ 0.25 fps)

Pond CB7: CB 7



Stage-Discharge for Pond CB7: CB 7

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
96.60	0.00	97.13	0.71
96.61	0.00	97.14	0.74
96.62	0.00	97.15	0.76
96.63	0.00	97.16	0.79
96.64	0.00	97.17	0.81
96.65	0.01	97.18	0.84
96.66	0.01	97.19	0.86
96.67	0.01	97.20	0.89
96.68	0.02	97.21	0.91
96.69	0.02	97.22	0.94
96.70	0.03	97.23	0.97
96.71	0.03	97.24	1.00
96.72	0.04	97.25	1.02
96.73	0.04	97.26	1.05
96.74	0.05	97.27	1.08
96.75	0.06	97.28	1.11
96.76	0.07	97.29	1.13
96.77	0.08	97.30	1.16
96.78	0.09	97.31	1.19
96.79	0.10	97.32	1.22
96.80	0.11	97.33	1.25
96.81	0.12	97.34	1.28
96.82	0.13	97.35	1.31
96.83	0.14	97.36	1.34
96.84	0.16	97.37	1.37
96.85	0.17	97.38	1.40
96.86	0.18	97.39	1.43
96.87	0.20	97.40	1.45
96.88	0.21	97.41	1.48
96.89	0.23	97.42	1.51
96.90	0.24	97.43	1.54
96.91	0.26	97.44	1.57
96.92	0.27	97.45	1.60
96.93	0.29	97.46	1.63
96.94	0.31	97.47	1.66
96.95	0.33	97.48	1.69
96.96	0.34	97.49	1.72
96.97	0.36	97.50	1.75
96.98	0.38	97.51	1.79
96.99	0.40	97.52	1.82
97.00	0.42	97.53	1.85
97.01	0.44	97.54	1.88
97.02	0.46	97.55	1.90
97.03	0.48	97.56	1.93
97.04	0.50	97.57	1.96
97.05	0.53	97.58	1.99
97.06	0.55	97.59	2.02
97.07	0.57	97.60	**2.05**
97.08	0.59		
97.09	0.62		
97.10	0.64		
97.11	0.66		
97.12	0.69		

Stage-Area-Storage for Pond CB7: CB 7

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
96.60	**0**	97.13	0
96.61	0	97.14	0
96.62	0	97.15	0
96.63	0	97.16	0
96.64	0	97.17	0
96.65	0	97.18	0
96.66	0	97.19	0
96.67	0	97.20	0
96.68	0	97.21	0
96.69	0	97.22	0
96.70	0	97.23	0
96.71	0	97.24	0
96.72	0	97.25	0
96.73	0	97.26	0
96.74	0	97.27	0
96.75	0	97.28	0
96.76	0	97.29	0
96.77	0	97.30	0
96.78	0	97.31	0
96.79	0	97.32	0
96.80	0	97.33	0
96.81	0	97.34	0
96.82	0	97.35	0
96.83	0	97.36	0
96.84	0	97.37	0
96.85	0	97.38	0
96.86	0	97.39	0
96.87	0	97.40	0
96.88	0	97.41	0
96.89	0	97.42	0
96.90	0	97.43	0
96.91	0	97.44	0
96.92	0	97.45	0
96.93	0	97.46	0
96.94	0	97.47	0
96.95	0	97.48	0
96.96	0	97.49	0
96.97	0	97.50	0
96.98	0	97.51	0
96.99	0	97.52	0
97.00	0	97.53	0
97.01	0	97.54	0
97.02	0	97.55	0
97.03	0	97.56	0
97.04	0	97.57	0
97.05	0	97.58	0
97.06	0	97.59	0
97.07	0	97.60	0
97.08	0		
97.09	0		
97.10	0		
97.11	0		
97.12	0		

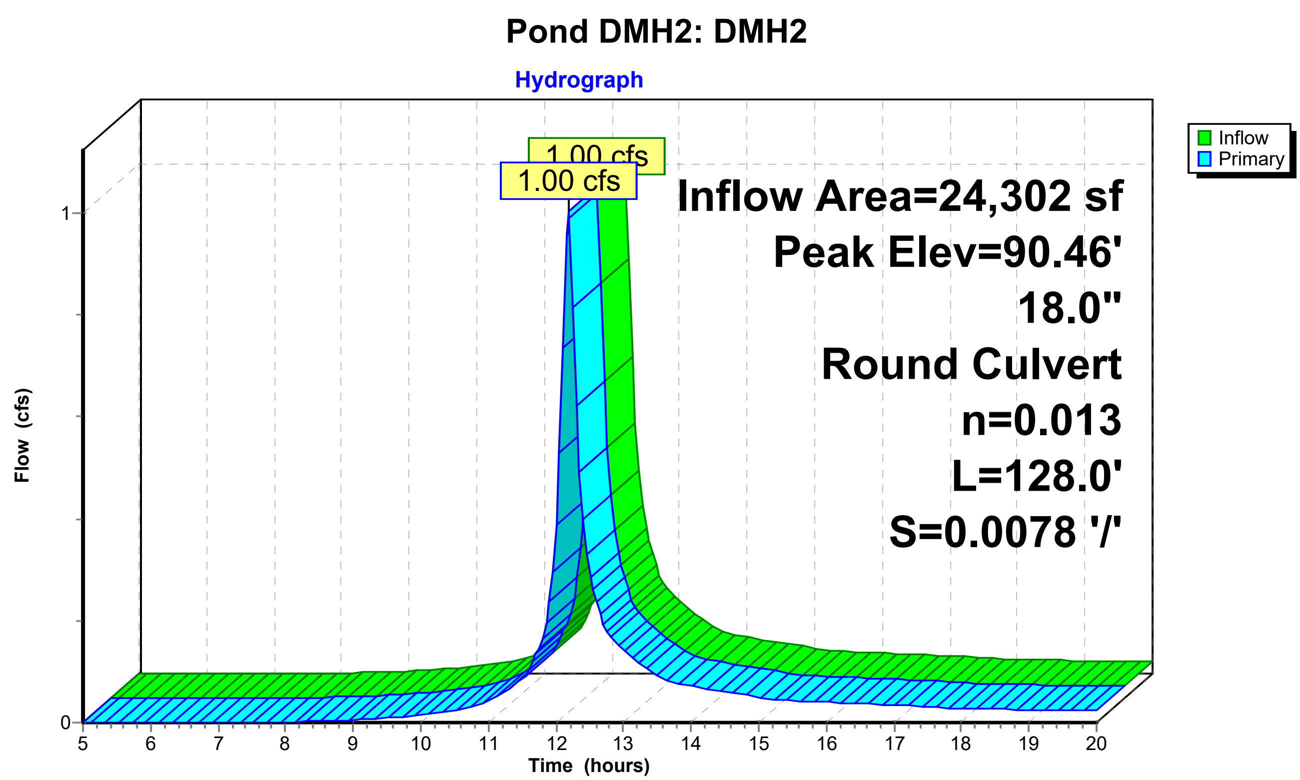
Summary for Pond DMH2: DMH2

Inflow Area = 24,302 sf, 38.93% Impervious, Inflow Depth > 1.57" for 2-Year event
Inflow = 1.00 cfs @ 12.18 hrs, Volume= 3,184 cf
Outflow = 1.00 cfs @ 12.18 hrs, Volume= 3,184 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.00 cfs @ 12.18 hrs, Volume= 3,184 cf
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.46' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	**18.0" Round Culvert** L= 128.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 90.00' / 89.00' S= 0.0078 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=0.95 cfs @ 12.18 hrs HW=90.45' TW=89.41' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.95 cfs @ 3.14 fps)



Stage-Discharge for Pond DMH2: DMH2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
90.00	0.00	90.53	1.31	91.06	4.44
90.01	0.00	90.54	1.36	91.07	4.51
90.02	0.00	90.55	1.41	91.08	4.58
90.03	0.00	90.56	1.45	91.09	4.65
90.04	0.01	90.57	1.50	91.10	4.71
90.05	0.01	90.58	1.55	91.11	4.78
90.06	0.01	90.59	1.60	91.12	4.85
90.07	0.02	90.60	1.65	91.13	4.91
90.08	0.03	90.61	1.70	91.14	4.98
90.09	0.04	90.62	1.76	91.15	5.05
90.10	0.04	90.63	1.81	91.16	5.12
90.11	0.05	90.64	1.86	91.17	5.18
90.12	0.06	90.65	1.92	91.18	5.25
90.13	0.08	90.66	1.97	91.19	5.32
90.14	0.09	90.67	2.02	91.20	5.39
90.15	0.10	90.68	2.08	91.21	5.45
90.16	0.12	90.69	2.13	91.22	5.52
90.17	0.13	90.70	2.19	91.23	5.59
90.18	0.15	90.71	2.25	91.24	5.66
90.19	0.17	90.72	2.30	91.25	5.72
90.20	0.19	90.73	2.36	91.26	5.79
90.21	0.21	90.74	2.42	91.27	5.86
90.22	0.23	90.75	2.48	91.28	5.93
90.23	0.25	90.76	2.54	91.29	5.99
90.24	0.27	90.77	2.59	91.30	6.06
90.25	0.30	90.78	2.65	91.31	6.12
90.26	0.32	90.79	2.71	91.32	6.19
90.27	0.35	90.80	2.77	91.33	6.26
90.28	0.38	90.81	2.83	91.34	6.32
90.29	0.40	90.82	2.90	91.35	6.39
90.30	0.43	90.83	2.96	91.36	6.45
90.31	0.46	90.84	3.02	91.37	6.52
90.32	0.49	90.85	3.08	91.38	6.58
90.33	0.52	90.86	3.14	91.39	6.65
90.34	0.55	90.87	3.21	91.40	6.71
90.35	0.59	90.88	3.27	91.41	6.78
90.36	0.62	90.89	3.33	91.42	6.84
90.37	0.66	90.90	3.40	91.43	6.91
90.38	0.69	90.91	3.46	91.44	6.97
90.39	0.73	90.92	3.52	91.45	7.03
90.40	0.76	90.93	3.59	91.46	7.09
90.41	0.80	90.94	3.65	91.47	7.16
90.42	0.84	90.95	3.72	91.48	7.22
90.43	0.88	90.96	3.78	91.49	7.28
90.44	0.92	90.97	3.85	91.50	**7.34**
90.45	0.96	90.98	3.91		
90.46	1.00	90.99	3.98		
90.47	1.04	91.00	4.05		
90.48	1.09	91.01	4.11		
90.49	1.13	91.02	4.18		
90.50	1.17	91.03	4.24		
90.51	1.22	91.04	4.31		
90.52	1.27	91.05	4.38		

Stage-Area-Storage for Pond DMH2: DMH2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
90.00	**0**	90.53	0	91.06	0
90.01	0	90.54	0	91.07	0
90.02	0	90.55	0	91.08	0
90.03	0	90.56	0	91.09	0
90.04	0	90.57	0	91.10	0
90.05	0	90.58	0	91.11	0
90.06	0	90.59	0	91.12	0
90.07	0	90.60	0	91.13	0
90.08	0	90.61	0	91.14	0
90.09	0	90.62	0	91.15	0
90.10	0	90.63	0	91.16	0
90.11	0	90.64	0	91.17	0
90.12	0	90.65	0	91.18	0
90.13	0	90.66	0	91.19	0
90.14	0	90.67	0	91.20	0
90.15	0	90.68	0	91.21	0
90.16	0	90.69	0	91.22	0
90.17	0	90.70	0	91.23	0
90.18	0	90.71	0	91.24	0
90.19	0	90.72	0	91.25	0
90.20	0	90.73	0	91.26	0
90.21	0	90.74	0	91.27	0
90.22	0	90.75	0	91.28	0
90.23	0	90.76	0	91.29	0
90.24	0	90.77	0	91.30	0
90.25	0	90.78	0	91.31	0
90.26	0	90.79	0	91.32	0
90.27	0	90.80	0	91.33	0
90.28	0	90.81	0	91.34	0
90.29	0	90.82	0	91.35	0
90.30	0	90.83	0	91.36	0
90.31	0	90.84	0	91.37	0
90.32	0	90.85	0	91.38	0
90.33	0	90.86	0	91.39	0
90.34	0	90.87	0	91.40	0
90.35	0	90.88	0	91.41	0
90.36	0	90.89	0	91.42	0
90.37	0	90.90	0	91.43	0
90.38	0	90.91	0	91.44	0
90.39	0	90.92	0	91.45	0
90.40	0	90.93	0	91.46	0
90.41	0	90.94	0	91.47	0
90.42	0	90.95	0	91.48	0
90.43	0	90.96	0	91.49	0
90.44	0	90.97	0	91.50	0
90.45	0	90.98	0		
90.46	0	90.99	0		
90.47	0	91.00	0		
90.48	0	91.01	0		
90.49	0	91.02	0		
90.50	0	91.03	0		
90.51	0	91.04	0		
90.52	0	91.05	0		

Summary for Pond IB1: Infiltration Basin #1 (Exfiltration Zone)

Inflow Area = 54,661 sf, 51.78% Impervious, Inflow Depth > 1.88" for 2-Year event
Inflow = 2.70 cfs @ 12.15 hrs, Volume= 8,564 cf
Outflow = 2.20 cfs @ 12.15 hrs, Volume= 7,869 cf, Atten= 18%, Lag= 0.0 min
Discarded = 0.02 cfs @ 8.05 hrs, Volume= 916 cf
Primary = 2.18 cfs @ 12.15 hrs, Volume= 6,954 cf
Routed to Pond 10P : Infiltration Basin #1 (Storage)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 89.60' @ 12.34 hrs Surf.Area= 736 sf Storage= 1,175 cf

Plug-Flow detention time= 44.3 min calculated for 7,843 cf (92% of inflow)
Center-of-Mass det. time= 15.5 min (790.3 - 774.9)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	2,944 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

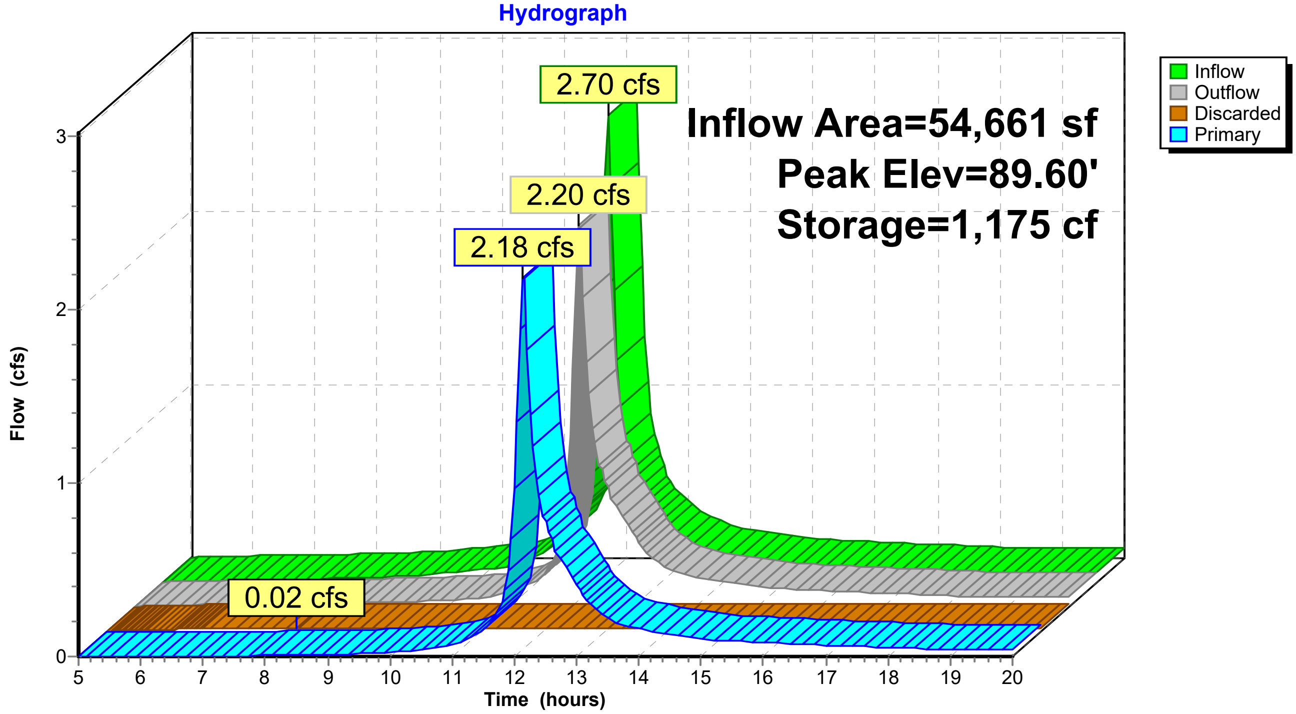
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	736	0	0
92.00	736	2,944	2,944

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.00'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	88.00'	**48.0" Round Culvert** L= 2.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 88.00' / 88.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf

Discarded OutFlow Max=0.02 cfs @ 8.05 hrs HW=88.04' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 12.15 hrs HW=89.32' TW=89.44' (Dynamic Tailwater)
└─**2=Culvert** (Controls 0.00 cfs)

Pond IB1: Infiltration Basin #1 (Exfiltration Zone)



Stage-Discharge for Pond IB1: Infiltration Basin #1 (Exfiltration Zone)

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
88.00	0.00	**0.00**	0.00
88.05	0.03	**0.02**	0.01
88.10	0.07	0.02	0.05
88.15	0.13	0.02	0.11
88.20	0.23	0.02	0.21
88.25	0.35	0.02	0.33
88.30	0.50	0.02	0.48
88.35	0.68	0.02	0.66
88.40	0.88	0.02	0.86
88.45	1.11	0.02	1.09
88.50	1.37	0.02	1.35
88.55	1.65	0.02	1.63
88.60	1.96	0.02	1.94
88.65	2.29	0.02	2.27
88.70	2.65	0.02	2.63
88.75	3.03	0.02	3.01
88.80	3.44	0.02	3.42
88.85	3.87	0.02	3.85
88.90	4.33	0.02	4.31
88.95	4.81	0.02	4.79
89.00	5.31	0.02	5.29
89.05	5.84	0.02	5.82
89.10	6.39	0.02	6.37
89.15	6.96	0.02	6.94
89.20	7.56	0.02	7.54
89.25	8.17	0.02	8.16
89.30	8.81	0.02	8.79
89.35	9.47	0.02	9.45
89.40	10.15	0.02	10.14
89.45	10.86	0.02	10.84
89.50	11.58	0.02	11.56
89.55	12.32	0.02	12.30
89.60	13.09	0.02	13.07
89.65	13.87	0.02	13.85
89.70	14.67	0.02	14.65
89.75	15.49	0.02	15.48
89.80	16.33	0.02	16.32
89.85	17.19	0.02	17.17
89.90	18.07	0.02	18.05
89.95	18.96	0.02	18.94
90.00	19.87	0.02	19.86
90.05	20.80	0.02	20.79
90.10	21.75	0.02	21.73
90.15	22.71	0.02	22.69
90.20	23.69	0.02	23.67
90.25	24.68	0.02	24.66
90.30	25.69	0.02	25.67
90.35	26.71	0.02	26.70
90.40	27.75	0.02	27.74
90.45	28.81	0.02	28.79
90.50	29.87	0.02	29.86
90.55	30.95	0.02	30.93
90.60	32.05	0.02	32.03
90.65	33.15	0.02	33.13
90.70	34.27	0.02	34.25
90.75	35.40	0.02	35.38
90.80	36.54	0.02	36.52
90.85	37.69	0.02	37.67
90.90	38.85	0.02	38.84
90.95	40.03	0.02	40.01
91.00	41.21	0.02	41.19
91.05	42.40	0.02	42.38
91.10	43.60	0.02	43.58
91.15	44.81	0.02	44.79
91.20	46.02	0.02	46.01
91.25	47.25	0.02	47.23
91.30	48.48	0.02	48.46
91.35	49.71	0.02	49.69
91.40	50.95	0.02	50.94
91.45	52.20	0.02	52.18
91.50	53.45	0.02	53.44
91.55	54.71	0.02	54.69
91.60	55.97	0.02	55.95
91.65	57.23	0.02	57.21
91.70	58.49	0.02	58.48
91.75	59.76	0.02	59.74
91.80	61.03	0.02	61.01
91.85	62.29	0.02	62.28
91.90	63.56	0.02	63.54
91.95	64.83	0.02	64.81
92.00	**66.09**	0.02	**66.07**

Stage-Area-Storage for Pond IB1: Infiltration Basin #1 (Exfiltration Zone)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
88.00	**736**	0	90.65	736	1,950
88.05	736	37	90.70	736	1,987
88.10	736	74	90.75	736	2,024
88.15	736	110	90.80	736	2,061
88.20	736	147	90.85	736	2,098
88.25	736	184	90.90	736	2,134
88.30	736	221	90.95	736	2,171
88.35	736	258	91.00	736	2,208
88.40	736	294	91.05	736	2,245
88.45	736	331	91.10	736	2,282
88.50	736	368	91.15	736	2,318
88.55	736	405	91.20	736	2,355
88.60	736	442	91.25	736	2,392
88.65	736	478	91.30	736	2,429
88.70	736	515	91.35	736	2,466
88.75	736	552	91.40	736	2,502
88.80	736	589	91.45	736	2,539
88.85	736	626	91.50	736	2,576
88.90	736	662	91.55	736	2,613
88.95	736	699	91.60	736	2,650
89.00	736	736	91.65	736	2,686
89.05	736	773	91.70	736	2,723
89.10	736	810	91.75	736	2,760
89.15	736	846	91.80	736	2,797
89.20	736	883	91.85	736	2,834
89.25	736	920	91.90	736	2,870
89.30	736	957	91.95	736	2,907
89.35	736	994	92.00	736	**2,944**
89.40	736	1,030			
89.45	736	1,067			
89.50	736	1,104			
89.55	736	1,141			
89.60	736	1,178			
89.65	736	1,214			
89.70	736	1,251			
89.75	736	1,288			
89.80	736	1,325			
89.85	736	1,362			
89.90	736	1,398			
89.95	736	1,435			
90.00	736	1,472			
90.05	736	1,509			
90.10	736	1,546			
90.15	736	1,582			
90.20	736	1,619			
90.25	736	1,656			
90.30	736	1,693			
90.35	736	1,730			
90.40	736	1,766			
90.45	736	1,803			
90.50	736	1,840			
90.55	736	1,877			
90.60	736	1,914			

Summary for Pond IB2: Infiltration Basin #2 (Exfiltration Zone)

Inflow Area = 13,032 sf, 17.40% Impervious, Inflow Depth > 1.25" for 2-Year event
Inflow = 0.40 cfs @ 12.21 hrs, Volume= 1,354 cf
Outflow = 0.27 cfs @ 12.26 hrs, Volume= 1,183 cf, Atten= 32%, Lag= 3.3 min
Discarded = 0.01 cfs @ 11.35 hrs, Volume= 343 cf
Primary = 0.26 cfs @ 12.26 hrs, Volume= 840 cf
Routed to Pond B2 : Infiltration Basin #2 (Storage Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.64' @ 12.37 hrs Surf.Area= 424 sf Storage= 228 cf

Plug-Flow detention time= 57.4 min calculated for 1,179 cf (87% of inflow)
Center-of-Mass det. time= 18.2 min (832.4 - 814.2)

Volume	Invert	Avail.Storage	Storage Description
#1	97.10'	382 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

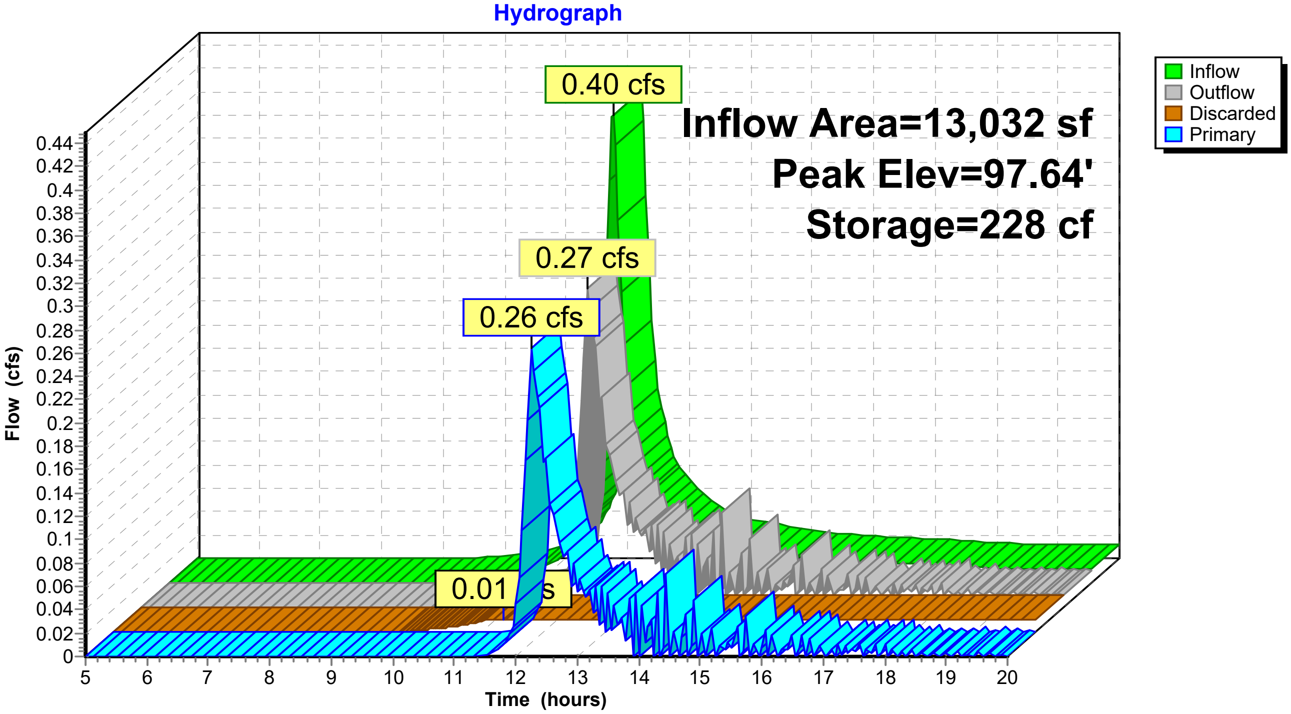
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.10	424	0	0
98.00	424	382	382

Device	Routing	Invert	Outlet Devices
#1	Discarded	97.10'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	97.10'	**36.0" Round Culvert** L= 2.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 97.10' / 97.10' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf

Discarded OutFlow Max=0.01 cfs @ 11.35 hrs HW=97.13' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 12.26 hrs HW=97.60' TW=97.62' (Dynamic Tailwater)
└─**2=Culvert** (Controls 0.00 cfs)

Pond IB2: Infiltration Basin #2 (Exfiltration Zone)



Stage-Discharge for Pond IB2: Infiltration Basin #2 (Exfiltration Zone)

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
97.10	0.00	**0.00**	0.00
97.15	0.02	**0.01**	0.01
97.20	0.05	0.01	0.04
97.25	0.11	0.01	0.10
97.30	0.19	0.01	0.18
97.35	0.30	0.01	0.29
97.40	0.42	0.01	0.41
97.45	0.58	0.01	0.57
97.50	0.75	0.01	0.74
97.55	0.95	0.01	0.94
97.60	1.17	0.01	1.16
97.65	1.41	0.01	1.40
97.70	1.67	0.01	1.66
97.75	1.95	0.01	1.94
97.80	2.25	0.01	2.24
97.85	2.58	0.01	2.57
97.90	2.92	0.01	2.91
97.95	3.29	0.01	3.28
98.00	3.67	0.01	3.66
98.05	4.07	0.01	4.06
98.10	4.49	0.01	4.48
98.15	4.93	0.01	4.92
98.20	5.39	0.01	5.38
98.25	5.87	0.01	5.86
98.30	6.36	0.01	6.35
98.35	6.87	0.01	6.86
98.40	7.40	0.01	7.39
98.45	7.94	0.01	7.93
98.50	8.50	0.01	8.49
98.55	9.07	0.01	9.06
98.60	9.66	0.01	9.65
98.65	10.27	0.01	10.26
98.70	10.89	0.01	10.88
98.75	11.52	0.01	11.51
98.80	12.17	0.01	12.16
98.85	12.83	0.01	12.82
98.90	13.50	0.01	13.49
98.95	14.18	0.01	14.17
99.00	14.88	0.01	14.87
99.05	15.59	0.01	15.58
99.10	16.31	0.01	16.30
99.15	17.04	0.01	17.03
99.20	17.77	0.01	17.76
99.25	18.52	0.01	18.51
99.30	19.28	0.01	19.27
99.35	20.05	0.01	20.04
99.40	20.82	0.01	20.81
99.45	21.60	0.01	21.59
99.50	22.39	0.01	22.38
99.55	23.19	0.01	23.18
99.60	23.99	0.01	23.98
99.65	24.79	0.01	24.78
99.70	25.60	0.01	25.59
99.75	26.42	0.01	26.41
99.80	27.23	0.01	27.22
99.85	28.05	0.01	28.04
99.90	28.87	0.01	28.86
99.95	29.69	0.01	29.68
100.00	30.52	0.01	30.51
100.05	31.34	0.01	31.33
100.10	**32.16**	0.01	**32.15**

Stage-Area-Storage for Pond IB2: Infiltration Basin #2 (Exfiltration Zone)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
97.10	**424**	0
97.15	424	21
97.20	424	42
97.25	424	64
97.30	424	85
97.35	424	106
97.40	424	127
97.45	424	148
97.50	424	170
97.55	424	191
97.60	424	212
97.65	424	233
97.70	424	254
97.75	424	276
97.80	424	297
97.85	424	318
97.90	424	339
97.95	424	360
98.00	424	**382**
98.05	424	382
98.10	424	382
98.15	424	382
98.20	424	382
98.25	424	382
98.30	424	382
98.35	424	382
98.40	424	382
98.45	424	382
98.50	424	382
98.55	424	382
98.60	424	382
98.65	424	382
98.70	424	382
98.75	424	382
98.80	424	382
98.85	424	382
98.90	424	382
98.95	424	382
99.00	424	382
99.05	424	382
99.10	424	382
99.15	424	382
99.20	424	382
99.25	424	382
99.30	424	382
99.35	424	382
99.40	424	382
99.45	424	382
99.50	424	382
99.55	424	382
99.60	424	382
99.65	424	382
99.70	424	382

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
99.75	424	382
99.80	424	382
99.85	424	382
99.90	424	382
99.95	424	382
100.00	424	382
100.05	424	382
100.10	424	382

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Units 10-11 Entrance Runoff Area=13,032 sf 17.40% Impervious Runoff Depth>2.44"
Flow Length=190' Tc=12.6 min CN=78 Runoff=0.78 cfs 2,648 cf

Subcatchment 1pre: Site Runoff Area=134,756 sf 4.57% Impervious Runoff Depth>2.10"
Flow Length=451' Tc=22.8 min UI Adjusted CN=74 Runoff=5.34 cfs 23,567 cf

Subcatchment 2: Units 8-11 Backyards Runoff Area=7,232 sf 0.00% Impervious Runoff Depth>2.11"
Flow Length=84' Tc=11.3 min CN=74 Runoff=0.39 cfs 1,271 cf

Subcatchment 3: Outer Border Runoff Area=53,130 sf 0.00% Impervious Runoff Depth>1.96"
Flow Length=87' Tc=7.9 min CN=72 Runoff=3.03 cfs 8,657 cf

Subcatchment 4: Unit 5 Backyard and Basin Runoff Area=8,967 sf 0.00% Impervious Runoff Depth>2.11"
Flow Length=110' Tc=7.7 min CN=74 Runoff=0.56 cfs 1,579 cf

Subcatchment 5: Unit 5 Parking Runoff Area=8,830 sf 71.11% Impervious Runoff Depth>3.66"
Flow Length=100' Tc=7.9 min CN=91 Runoff=0.87 cfs 2,691 cf

Subcatchment 6: Driveway Center Section Runoff Area=14,952 sf 43.75% Impervious Runoff Depth>2.98"
Flow Length=163' Tc=10.8 min CN=84 Runoff=1.13 cfs 3,709 cf

Subcatchment 7: Driveway Entrance Runoff Area=9,350 sf 31.22% Impervious Runoff Depth>2.70"
Flow Length=88' Slope=0.0400 '/' Tc=9.8 min CN=81 Runoff=0.67 cfs 2,106 cf

Subcatchment U1: Unit #1 Runoff Area=1,676 sf 100.00% Impervious Runoff Depth>4.28"
Tc=5.0 min CN=98 Runoff=0.20 cfs 597 cf

Subcatchment U10: Unit #10 Runoff Area=1,676 sf 100.00% Impervious Runoff Depth>4.28"
Tc=5.0 min CN=98 Runoff=0.20 cfs 597 cf

Subcatchment U11: Unit #11 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>4.28"
Tc=5.0 min CN=98 Runoff=0.20 cfs 597 cf

Subcatchment U2: Unit #2 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>4.28"
Tc=5.0 min CN=98 Runoff=0.20 cfs 597 cf

Subcatchment U3: Unit #3 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>4.28"
Tc=5.0 min CN=98 Runoff=0.20 cfs 597 cf

Subcatchment U4: Unit #4 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>4.28"
Tc=5.0 min CN=98 Runoff=0.20 cfs 597 cf

Subcatchment U5: Unit #5 Runoff Area=2,510 sf 100.00% Impervious Runoff Depth>4.28"
Tc=5.0 min CN=98 Runoff=0.29 cfs 895 cf

Subcatchment U6: Unit #6 Runoff Area=1,676 sf 100.00% Impervious Runoff Depth>4.28"
Tc=5.0 min CN=98 Runoff=0.20 cfs 597 cf

Subcatchment U7: Unit #7 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>4.28"
Tc=5.0 min CN=98 Runoff=0.20 cfs 597 cf

Subcatchment U8: Unit #8 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>4.28"
Tc=5.0 min CN=98 Runoff=0.20 cfs 597 cf

Subcatchment U9: Unit #9 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>4.28"
Tc=5.0 min CN=98 Runoff=0.20 cfs 597 cf

Reach 3R: Wetland Surface 1 Avg. Flow Depth=0.11' Max Vel=0.43 fps Inflow=0.88 cfs 3,519 cf
n=0.100 L=344.0' S=0.0291 '/' Capacity=20.30 cfs Outflow=0.70 cfs 3,487 cf

Reach 4R: 8" ROOF DRAIN CARRIER Avg. Flow Depth=0.22' Max Vel=3.87 fps Inflow=0.39 cfs 1,194 cf
8.0" Round Pipe n=0.013 L=206.0' S=0.0194 '/' Capacity=1.68 cfs Outflow=0.38 cfs 1,193 cf

Reach 5R: Wetland Surface 2 Avg. Flow Depth=0.11' Max Vel=0.24 fps Inflow=0.64 cfs 2,002 cf
n=0.100 L=245.0' S=0.0082 '/' Capacity=10.76 cfs Outflow=0.43 cfs 1,967 cf

Reach 8R: 6" Roof Drain Carrier Pipe Avg. Flow Depth=0.25' Max Vel=3.94 fps Inflow=0.39 cfs 1,194 cf
6.0" Round Pipe n=0.013 L=113.0' S=0.0195 '/' Capacity=0.78 cfs Outflow=0.38 cfs 1,194 cf

Reach 9R: 12" Roof Drain Carrier Pipe Avg. Flow Depth=0.32' Max Vel=3.58 fps Inflow=0.77 cfs 2,388 cf
12.0" Round Pipe n=0.013 L=212.0' S=0.0099 '/' Capacity=3.55 cfs Outflow=0.76 cfs 2,385 cf

Reach DP1PRE: DP 1 - PRE Inflow=5.34 cfs 23,567 cf
Outflow=5.34 cfs 23,567 cf

Reach DP1PST: DP 1 - POST Inflow=5.02 cfs 24,303 cf
Outflow=5.02 cfs 24,303 cf

Pond 1P: Subsurface #1 Peak Elev=97.47' Storage=1,178 cf Inflow=1.09 cfs 3,659 cf
Discarded=0.03 cfs 1,384 cf Primary=0.53 cfs 1,552 cf Outflow=0.56 cfs 2,935 cf

Pond 5P: CB 5 Peak Elev=90.08' Inflow=0.87 cfs 2,691 cf
12.0" Round Culvert n=0.013 L=13.0' S=0.0192 '/' Outflow=0.87 cfs 2,691 cf

Pond 10P: Infiltration Basin #1 (Storage) Peak Elev=90.07' Storage=2,521 cf Inflow=3.79 cfs 12,912 cf
Primary=2.33 cfs 12,160 cf Secondary=0.00 cfs 0 cf Outflow=2.33 cfs 12,160 cf

Pond B2: Infiltration Basin #2 (Storage Zone) Peak Elev=97.76' Storage=178 cf Inflow=0.71 cfs 2,072 cf
Outflow=0.64 cfs 2,002 cf

Pond CB1: CB 1 Peak Elev=93.16' Inflow=0.67 cfs 2,106 cf
12.0" Round Culvert n=0.013 L=228.0' S=0.0121 '/' Outflow=0.67 cfs 2,106 cf

Pond CB4: CB 4 Peak Elev=90.82' Inflow=1.13 cfs 3,709 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0083 '/' Outflow=1.13 cfs 3,709 cf

Pond CB7: CB 7 Peak Elev=97.48' Inflow=0.39 cfs 1,271 cf
12.0" Round Culvert n=0.013 L=26.0' S=0.0038 '/' Outflow=0.39 cfs 1,271 cf

Pond DMH2: DMH2 Peak Elev=90.66' Inflow=1.79 cfs 5,815 cf
18.0" Round Culvert n=0.013 L=128.0' S=0.0078 '/' Outflow=1.79 cfs 5,815 cf

Pond IB1: Infiltration Basin #1 (Exfiltration Peak Elev=90.07' Storage=1,526 cf Inflow=4.54 cfs 14,559 cf
Discarded=0.02 cfs 935 cf Primary=3.79 cfs 12,912 cf Outflow=3.81 cfs 13,847 cf

Pond IB2: Infiltration Basin #2 (Exfiltration Peak Elev=97.77' Storage=285 cf Inflow=0.78 cfs 2,648 cf
Discarded=0.01 cfs 401 cf Primary=0.71 cfs 2,072 cf Outflow=0.72 cfs 2,473 cf

Total Runoff Area = 269,512 sf Runoff Volume = 53,093 cf Average Runoff Depth = 2.36"
83.89% Pervious = 226,087 sf 16.11% Impervious = 43,425 sf

Summary for Subcatchment 1: Units 10-11 Entrance

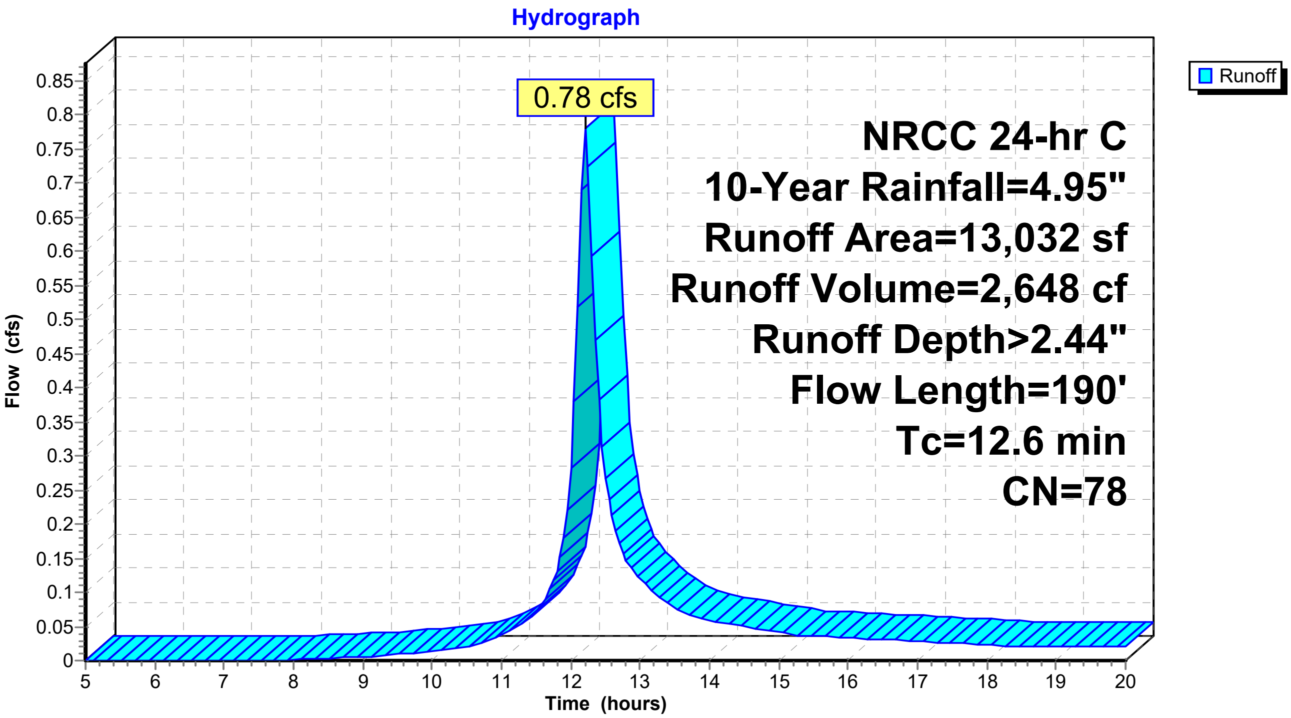
Runoff = 0.78 cfs @ 12.21 hrs, Volume= 2,648 cf, Depth> 2.44"
Routed to Pond IB2 : Infiltration Basin #2 (Exfiltration Zone)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
9,762	74	>75% Grass cover, Good, HSG C
1,003	70	Woods, Good, HSG C
2,267	98	Paved roads w/curbs & sewers, HSG C
13,032	78	Weighted Average
10,765		82.60% Pervious Area
2,267		17.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.8	55	0.0300	1.21		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.1	17	0.0100	2.03		**Shallow Concentrated Flow, Driveway** Paved Kv= 20.3 fps
1.2	68	0.0180	0.94		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
12.6	190	Total			

Subcatchment 1: Units 10-11 Entrance



Summary for Subcatchment 1pre: Site

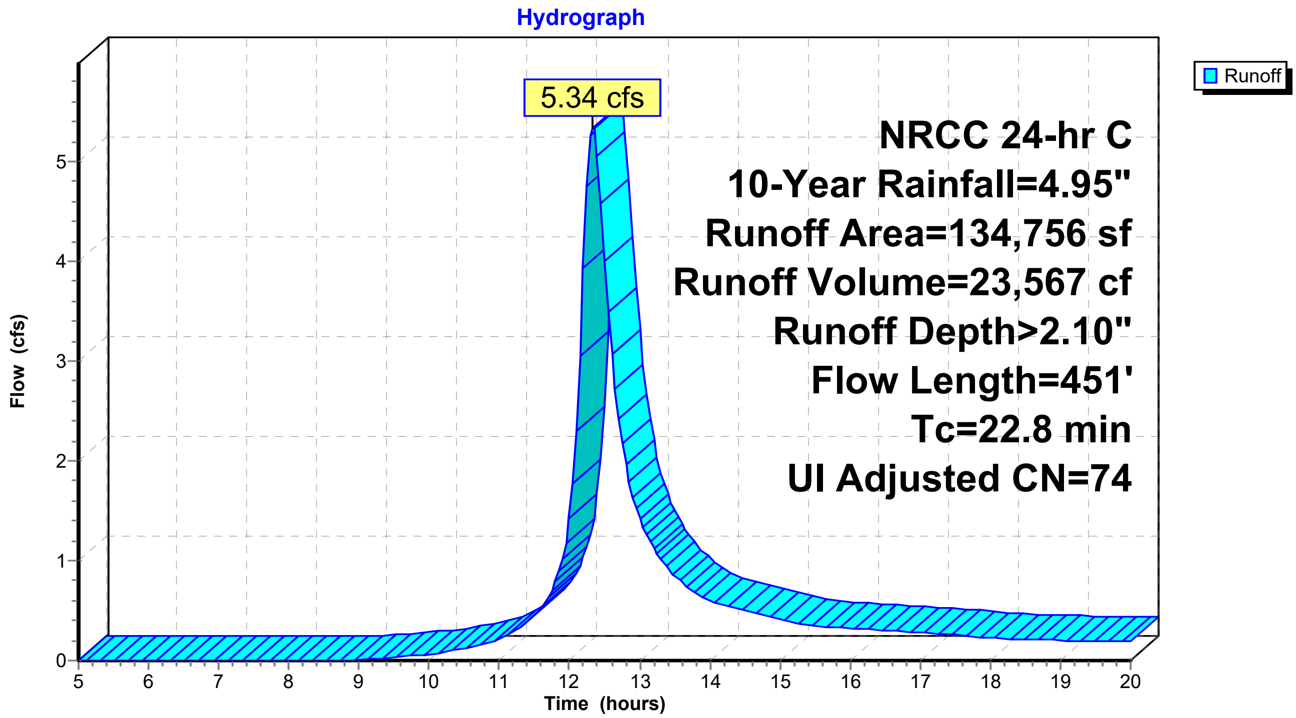
Runoff = 5.34 cfs @ 12.34 hrs, Volume= 23,567 cf, Depth> 2.10"
Routed to Reach DP1PRE : DP 1 - PRE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Adj	Description
56,945	70		Woods, Good, HSG C
2,937	98		Paved parking, HSG C
3,219	98		Unconnected roofs, HSG C
10,003	89		Gravel roads, HSG C
61,652	74		>75% Grass cover, Good, HSG C
134,756	75	74	Weighted Average, UI Adjusted
128,600			95.43% Pervious Area
6,156			4.57% Impervious Area
3,219			52.29% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	25	0.0110	0.03		**Sheet Flow, Woods** Woods: Dense underbrush n= 0.800 P2= 3.35"
0.5	25	0.0110	0.84		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.35"
0.2	20	0.0110	2.13		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
1.5	65	0.0110	0.73		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
2.2	159	0.0290	1.19		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
2.0	52	0.0040	0.44		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.7	60	0.0370	1.35		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.4	45	0.1660	2.04		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
22.8	451	Total			

Subcatchment 1pre: Site



Summary for Subcatchment 2: Units 8-11 Backyards

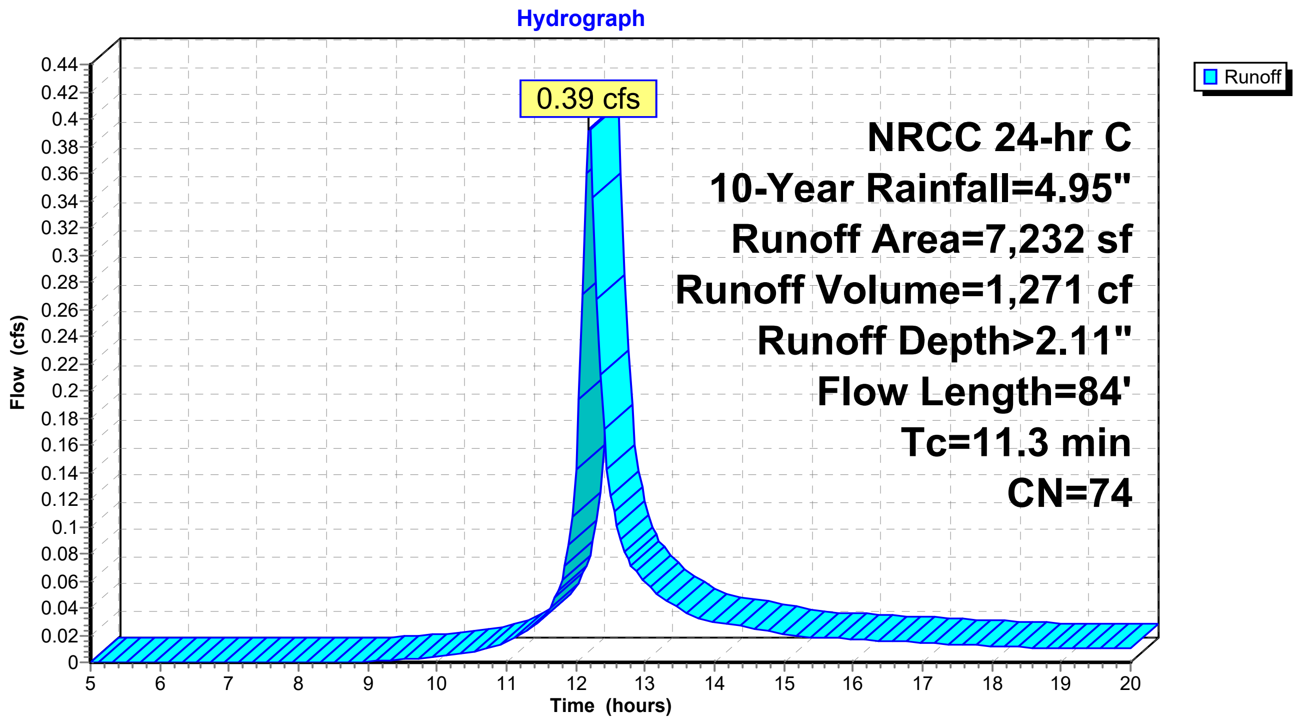
Runoff = 0.39 cfs @ 12.19 hrs, Volume= 1,271 cf, Depth> 2.11"
Routed to Pond CB7 : CB 7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
7,232	74	>75% Grass cover, Good, HSG C
7,232		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	50	0.0280	0.08		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.6	34	0.0200	0.99		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
11.3	84	Total			

Subcatchment 2: Units 8-11 Backyards



Summary for Subcatchment 3: Outer Border

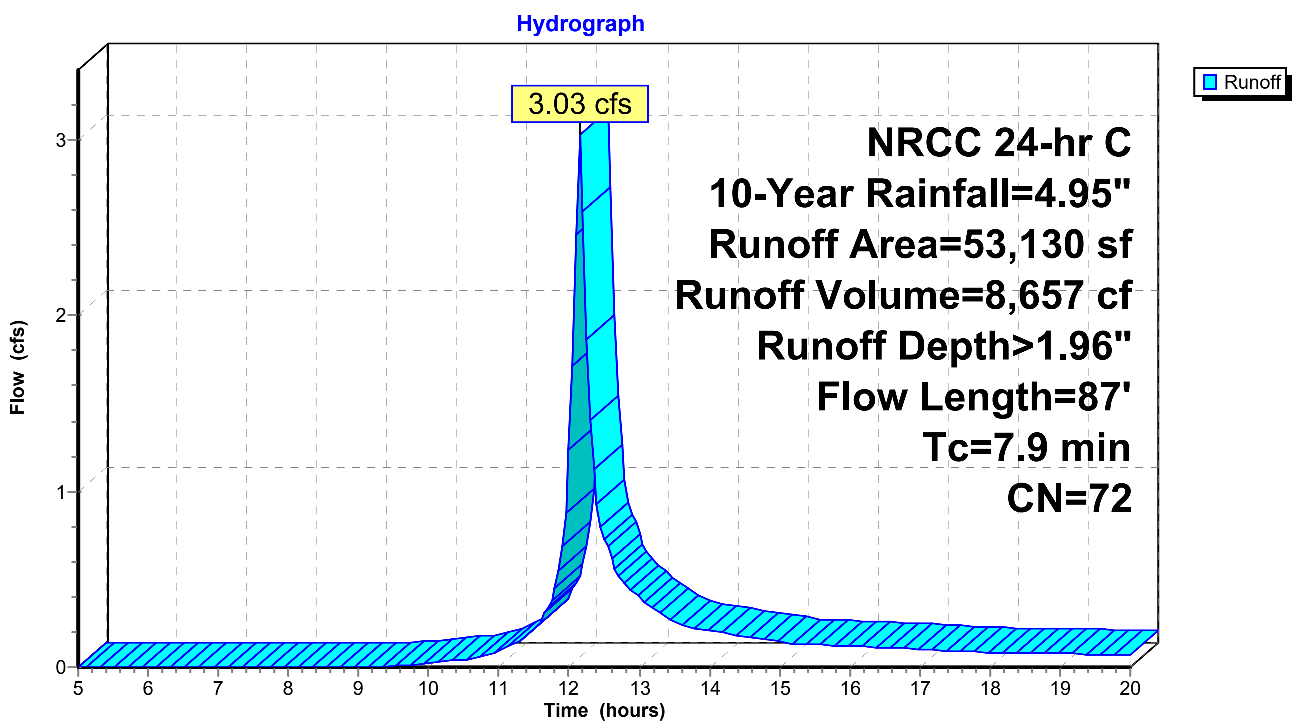
Runoff = 3.03 cfs @ 12.15 hrs, Volume= 8,657 cf, Depth> 1.96"
Routed to Reach DP1PST : DP 1 - POST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
21,967	74	>75% Grass cover, Good, HSG C
31,163	70	Woods, Good, HSG C
53,130	72	Weighted Average
53,130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0670	0.11		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.35"
0.5	37	0.0600	1.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
7.9	87	Total			

Subcatchment 3: Outer Border



Summary for Subcatchment 4: Unit 5 Backyard and Basin #1

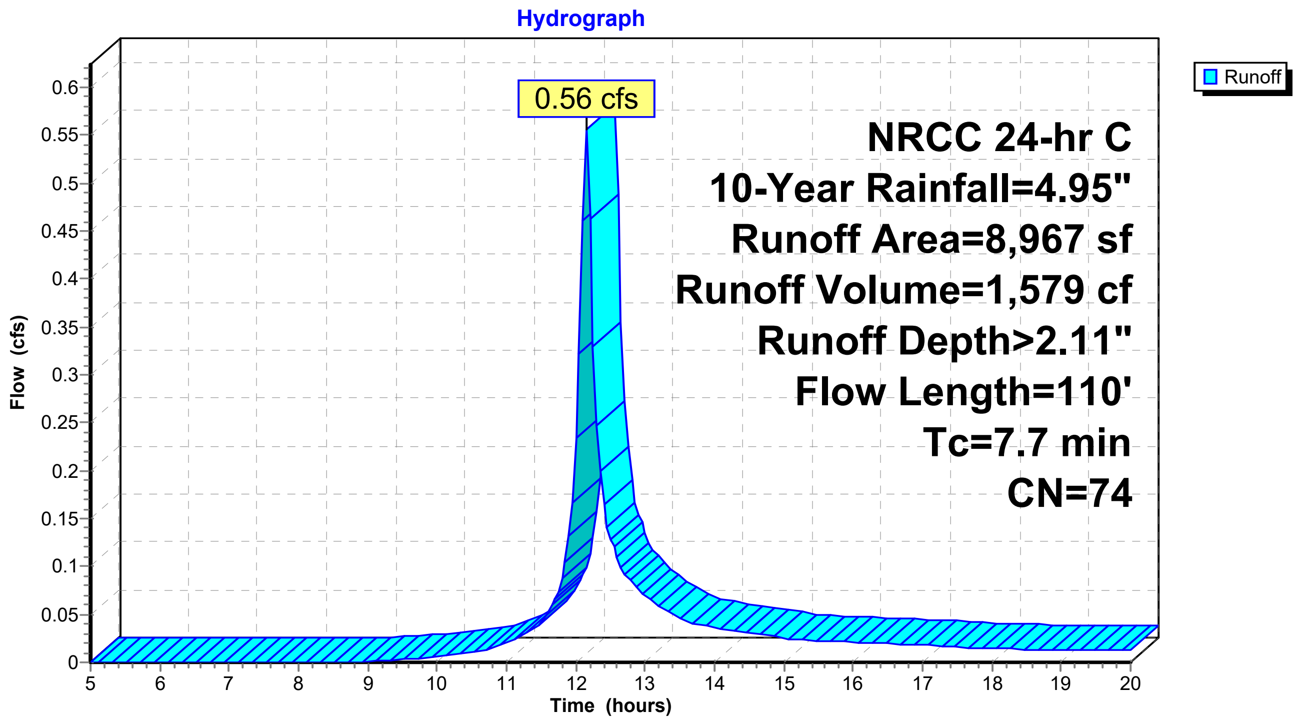
Runoff = 0.56 cfs @ 12.15 hrs, Volume= 1,579 cf, Depth> 2.11"
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
8,967	74	>75% Grass cover, Good, HSG C
8,967		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0780	0.12		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.6	60	0.0670	1.81		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
7.7	110	Total			

Subcatchment 4: Unit 5 Backyard and Basin #1



Summary for Subcatchment 5: Unit 5 Parking

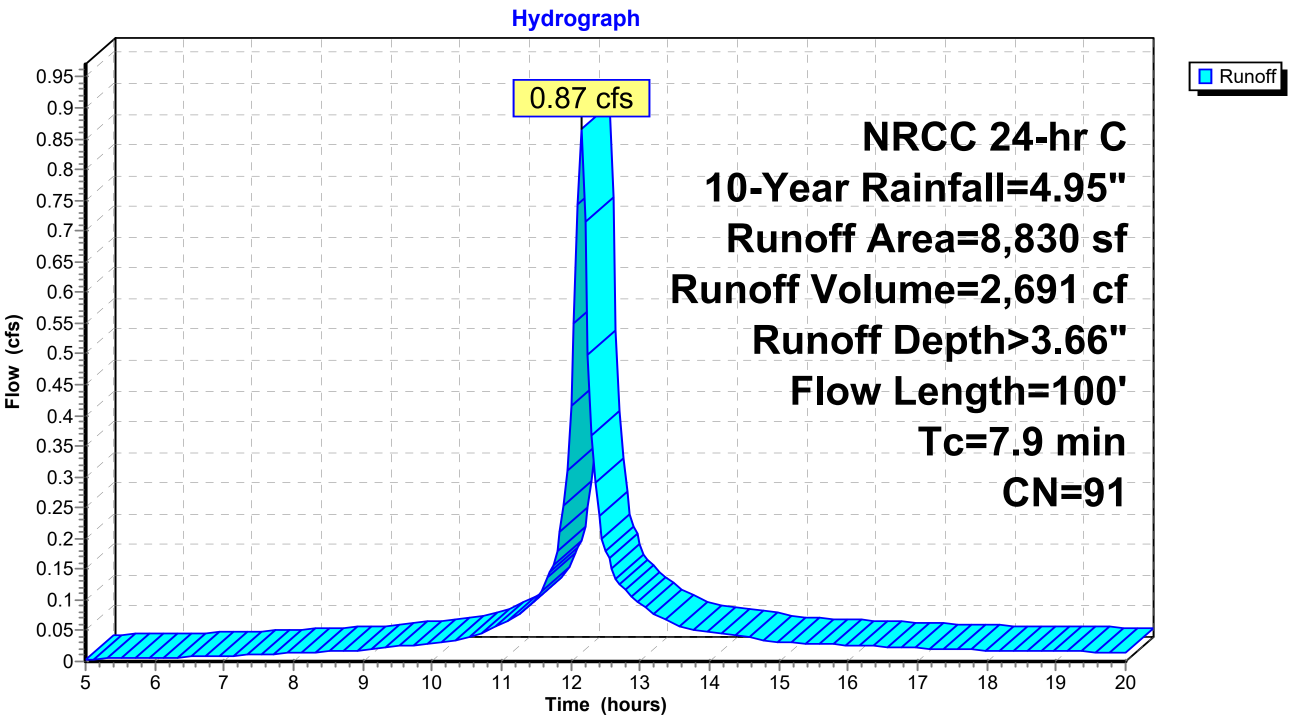
Runoff = 0.87 cfs @ 12.15 hrs, Volume= 2,691 cf, Depth> 3.66"
Routed to Pond 5P : CB 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
2,551	74	>75% Grass cover, Good, HSG C
6,279	98	Paved roads w/curbs & sewers, HSG C
8,830	91	Weighted Average
2,551		28.89% Pervious Area
6,279		71.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	40	0.0450	0.09		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.3	10	0.0067	0.57		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.35"
0.2	50	0.0280	3.40		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
7.9	100	Total			

Subcatchment 5: Unit 5 Parking



Summary for Subcatchment 6: Driveway Center Section

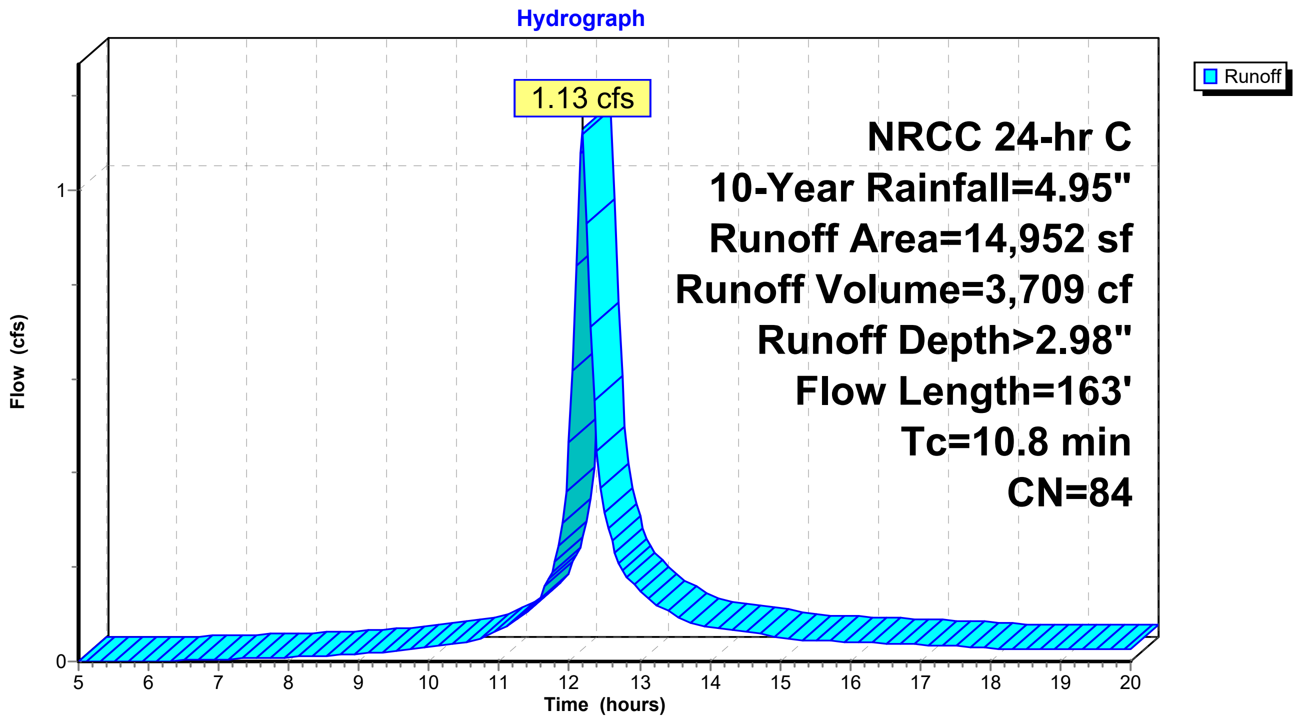
Runoff = 1.13 cfs @ 12.18 hrs, Volume= 3,709 cf, Depth> 2.98"
Routed to Pond CB4 : CB 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
8,411	74	>75% Grass cover, Good, HSG C
6,541	98	Paved roads w/curbs & sewers, HSG C
14,952	84	Weighted Average
8,411		56.25% Pervious Area
6,541		43.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0320	0.08		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.2	18	0.0300	1.21		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.4	95	0.0360	3.85		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
10.8	163	Total			

Subcatchment 6: Driveway Center Section



Summary for Subcatchment 7: Driveway Entrance

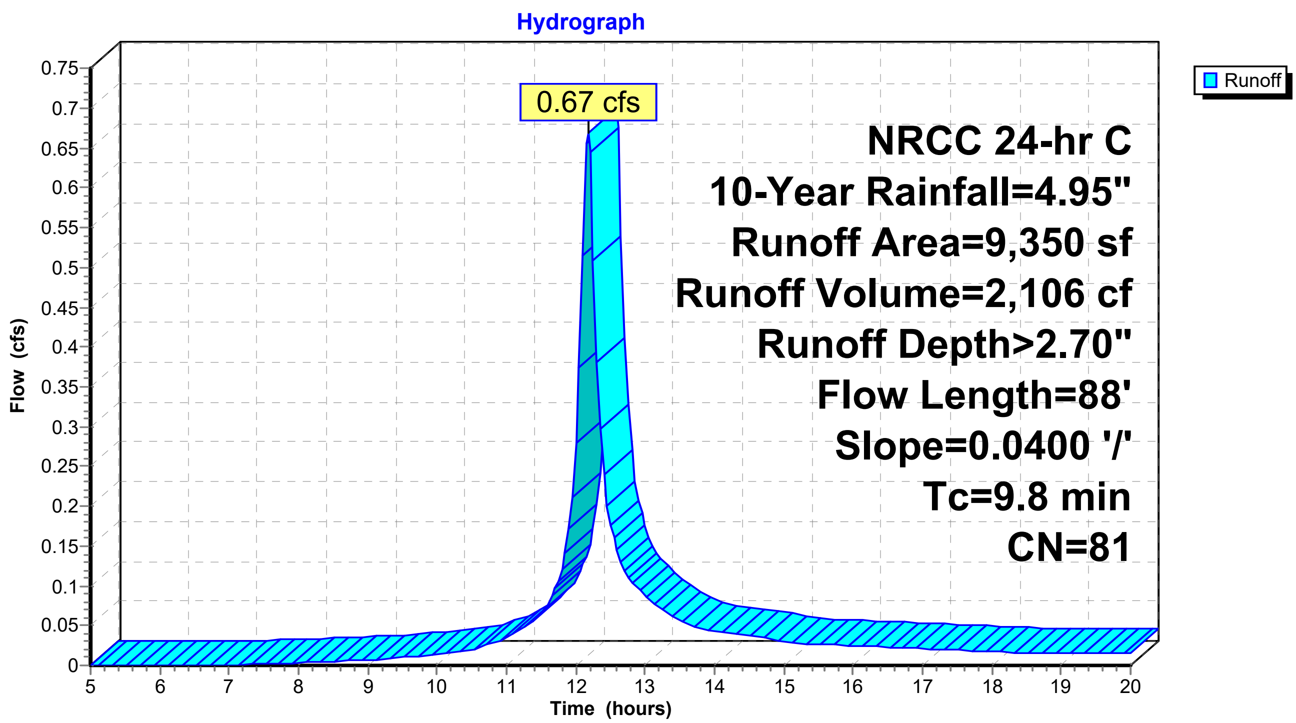
Runoff = 0.67 cfs @ 12.17 hrs, Volume= 2,106 cf, Depth> 2.70"
Routed to Pond CB1 : CB 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
2,919	98	Paved roads w/curbs & sewers, HSG C
6,431	74	>75% Grass cover, Good, HSG C
9,350	81	Weighted Average
6,431		68.78% Pervious Area
2,919		31.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.5	38	0.0400	1.40		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
9.8	88	Total			

Subcatchment 7: Driveway Entrance



Summary for Subcatchment U1: Unit #1

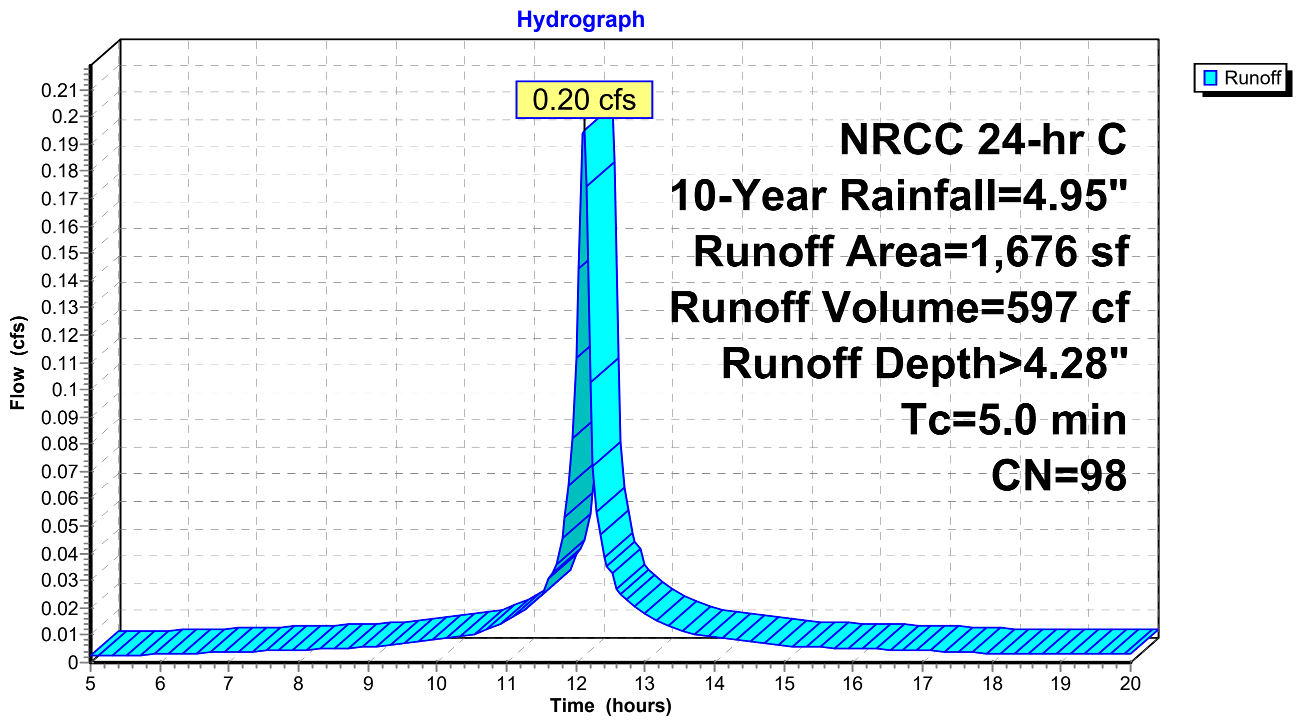
Runoff = 0.20 cfs @ 12.11 hrs, Volume= 597 cf, Depth> 4.28"
Routed to Reach 8R : 6" Roof Drain Carrier Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
1,676	98	Unconnected roofs, HSG C
1,676		100.00% Impervious Area
1,676		100.00% Unconnected

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

Subcatchment U1: Unit #1



Summary for Subcatchment U10: Unit #10

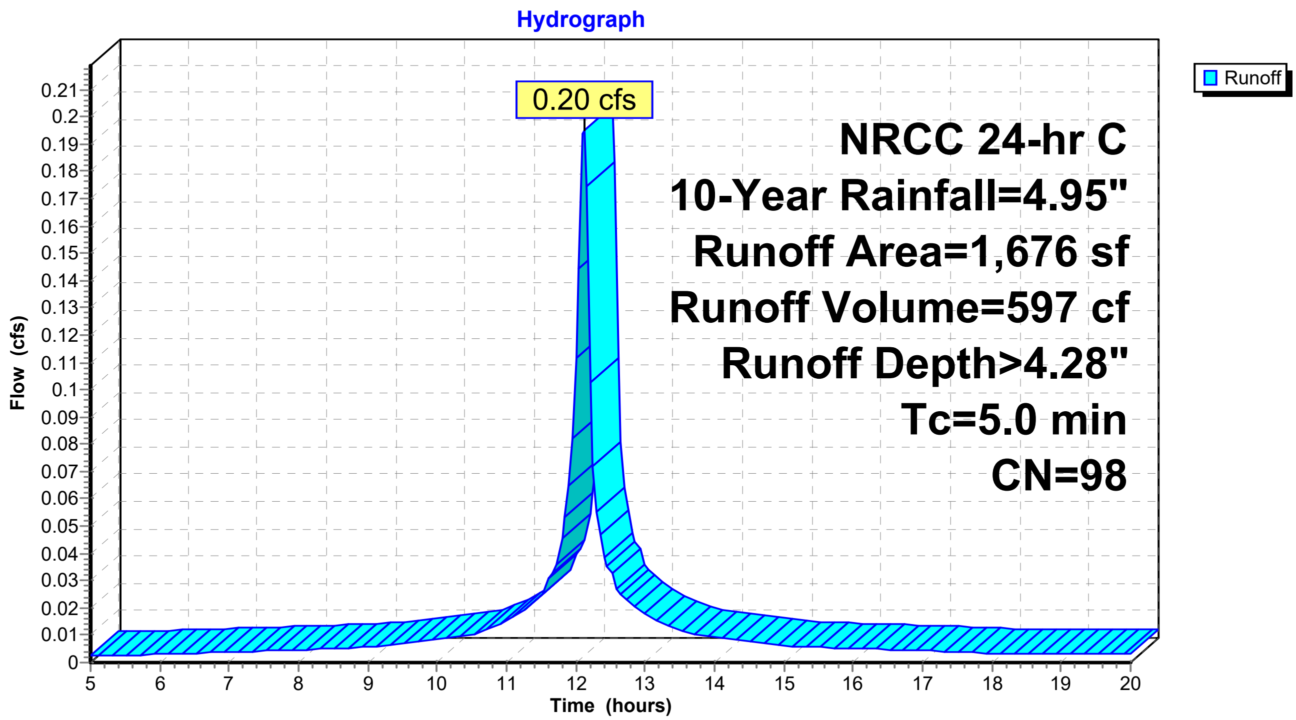
Runoff = 0.20 cfs @ 12.11 hrs, Volume= 597 cf, Depth> 4.28"
Routed to Pond 1P : Subsurface #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
1,676	98	Unconnected roofs, HSG C
1,676		100.00% Impervious Area
1,676		100.00% Unconnected

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

Subcatchment U10: Unit #10



Summary for Subcatchment U11: Unit #11

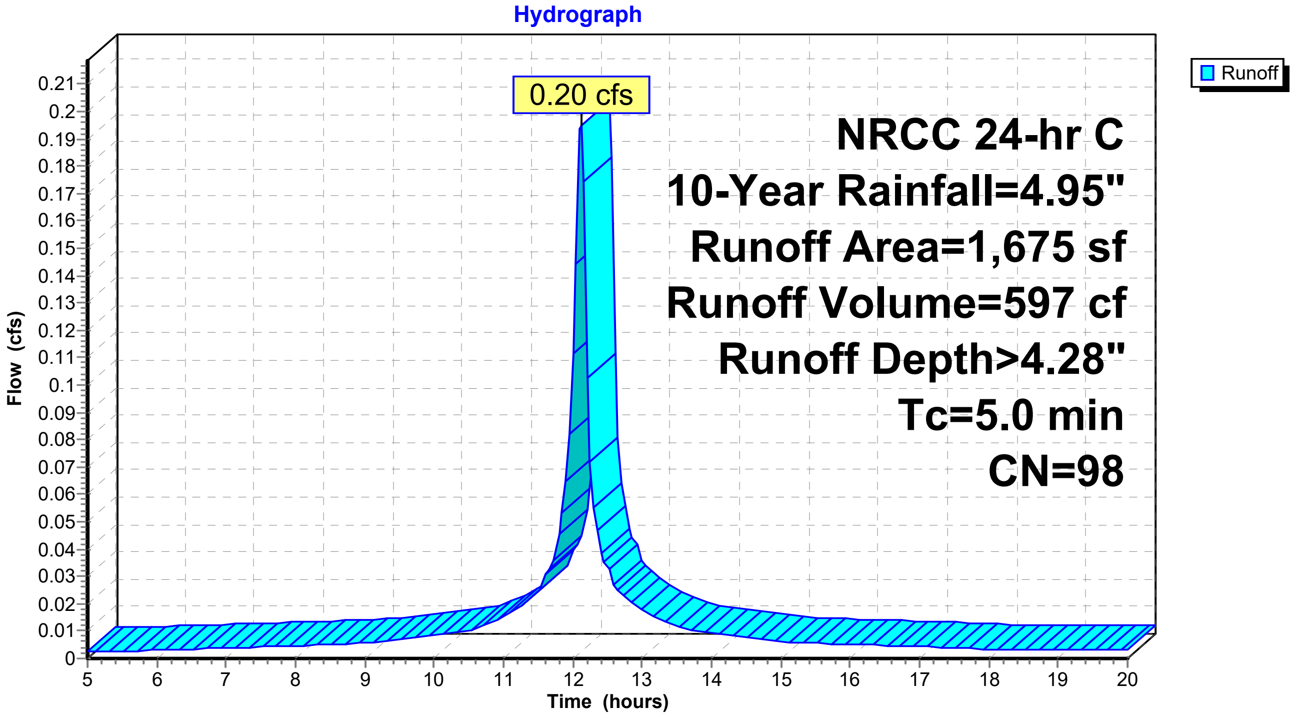
Runoff = 0.20 cfs @ 12.11 hrs, Volume= 597 cf, Depth> 4.28"
Routed to Pond 1P : Subsurface #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U11: Unit #11



Summary for Subcatchment U2: Unit #2

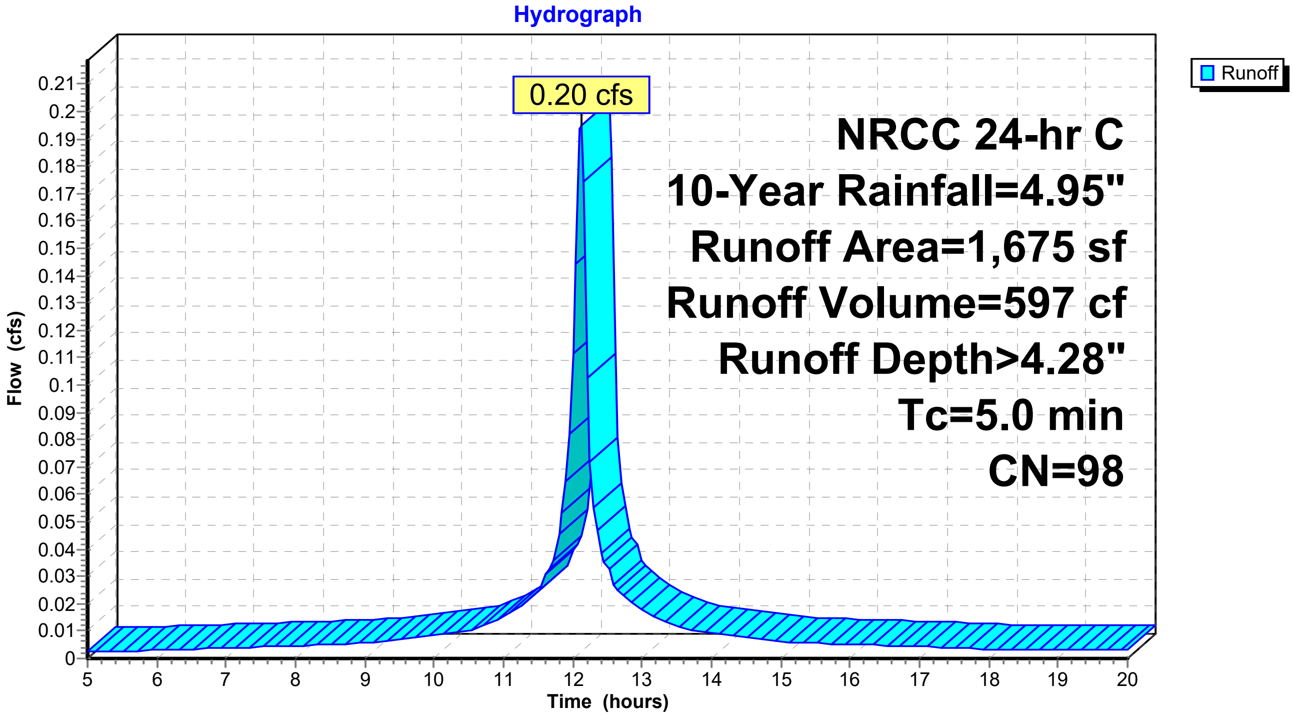
Runoff = 0.20 cfs @ 12.11 hrs, Volume= 597 cf, Depth> 4.28"
Routed to Reach 8R : 6" Roof Drain Carrier Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U2: Unit #2



Summary for Subcatchment U3: Unit #3

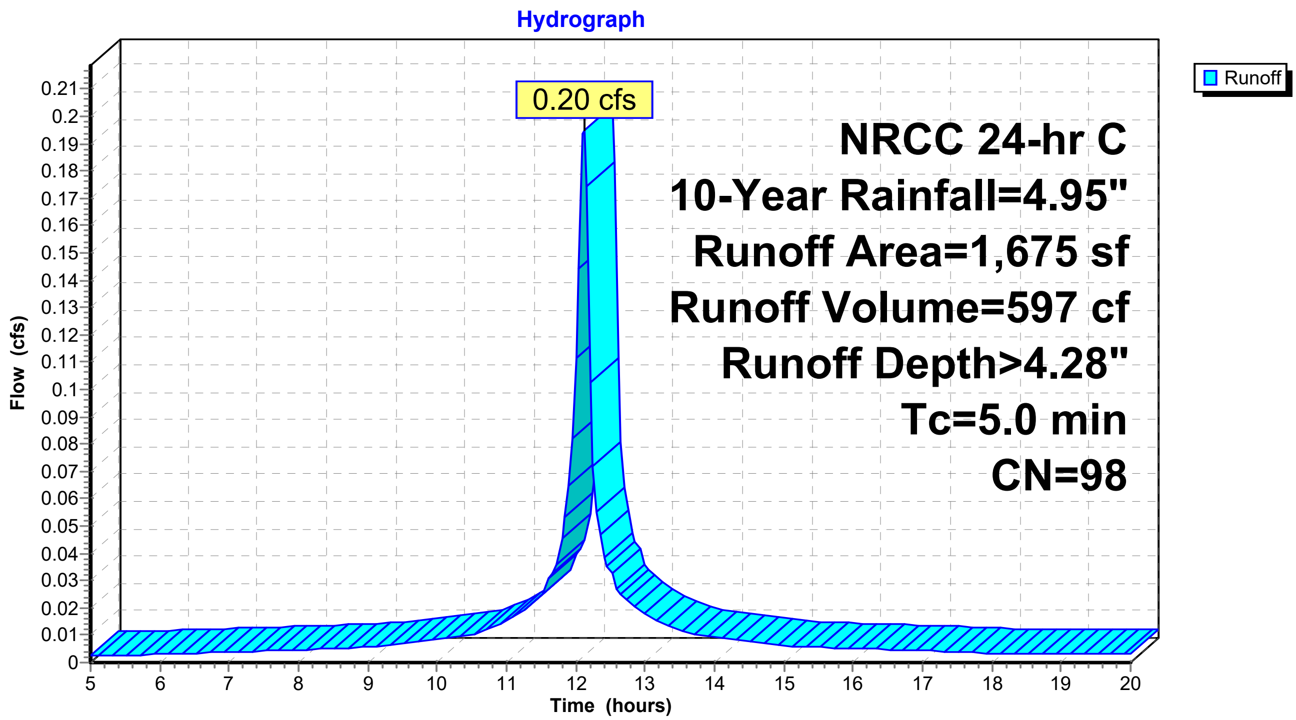
Runoff = 0.20 cfs @ 12.11 hrs, Volume= 597 cf, Depth> 4.28"
Routed to Reach 9R : 12" Roof Drain Carrier Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U3: Unit #3



Summary for Subcatchment U4: Unit #4

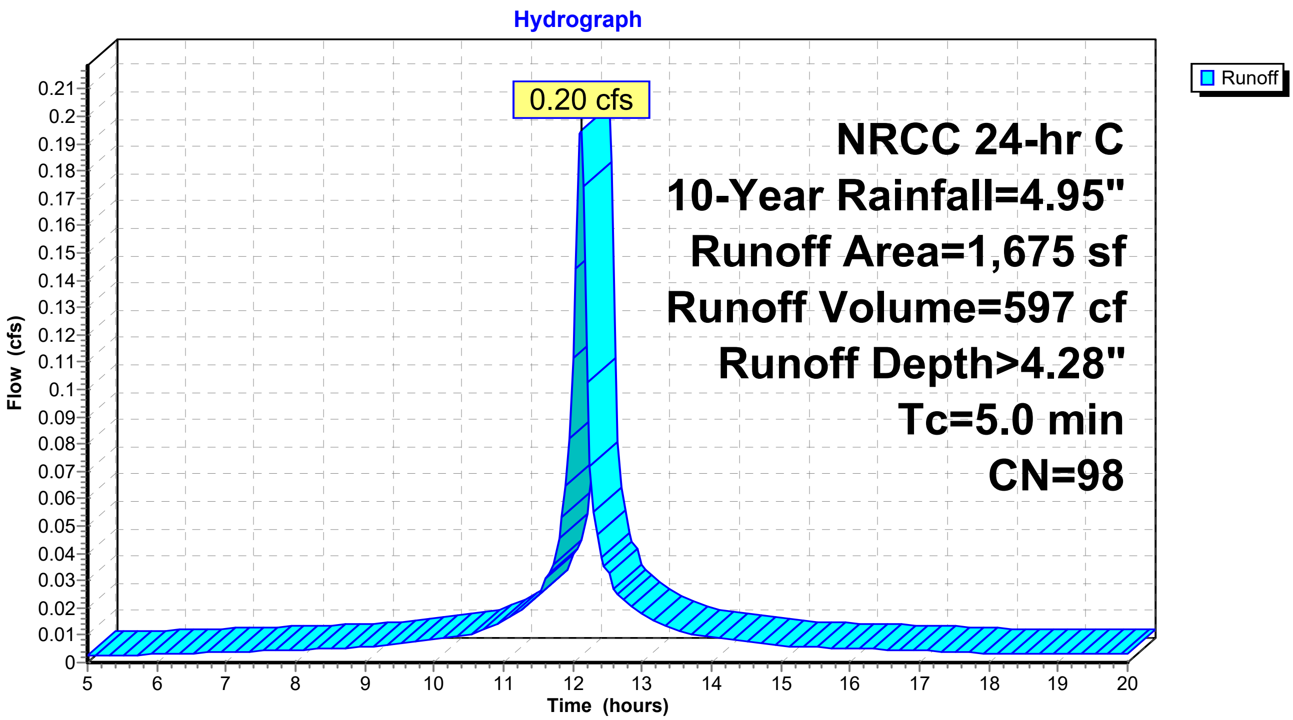
Runoff = 0.20 cfs @ 12.11 hrs, Volume= 597 cf, Depth> 4.28"
Routed to Reach 9R : 12" Roof Drain Carrier Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U4: Unit #4



Summary for Subcatchment U5: Unit #5

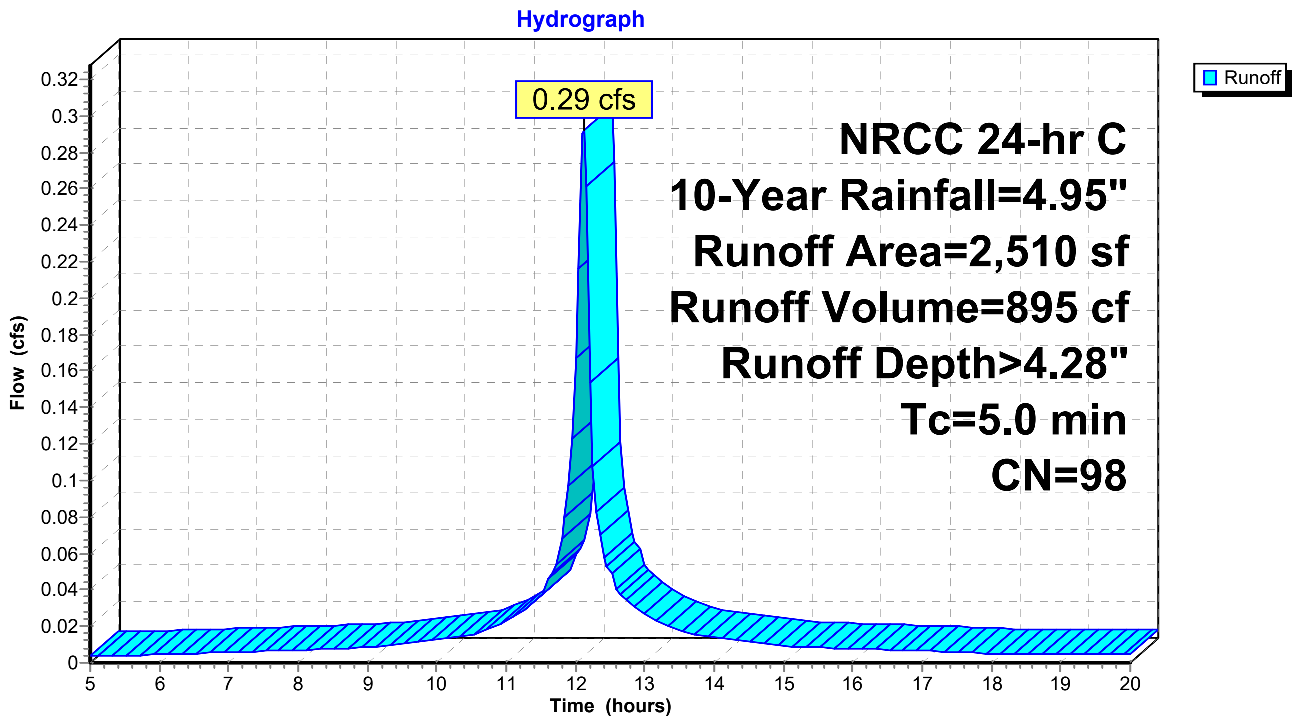
Runoff = 0.29 cfs @ 12.11 hrs, Volume= 895 cf, Depth> 4.28"
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
2,510	98	Unconnected roofs, HSG C
2,510		100.00% Impervious Area
2,510		100.00% Unconnected

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

Subcatchment U5: Unit #5



Summary for Subcatchment U6: Unit #6

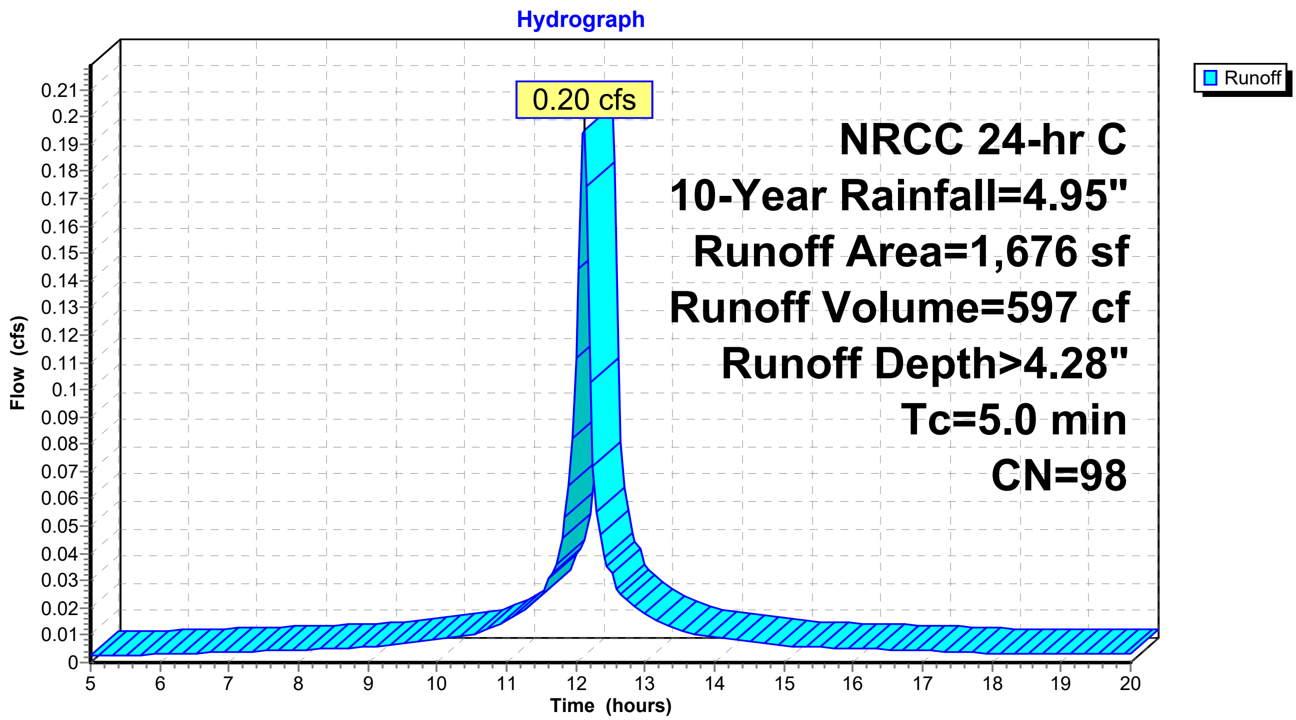
Runoff = 0.20 cfs @ 12.11 hrs, Volume= 597 cf, Depth> 4.28"
Routed to Reach 4R : 8" ROOF DRAIN CARRIER PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
1,676	98	Unconnected roofs, HSG C
1,676		100.00% Impervious Area
1,676		100.00% Unconnected

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

Subcatchment U6: Unit #6



Summary for Subcatchment U7: Unit #7

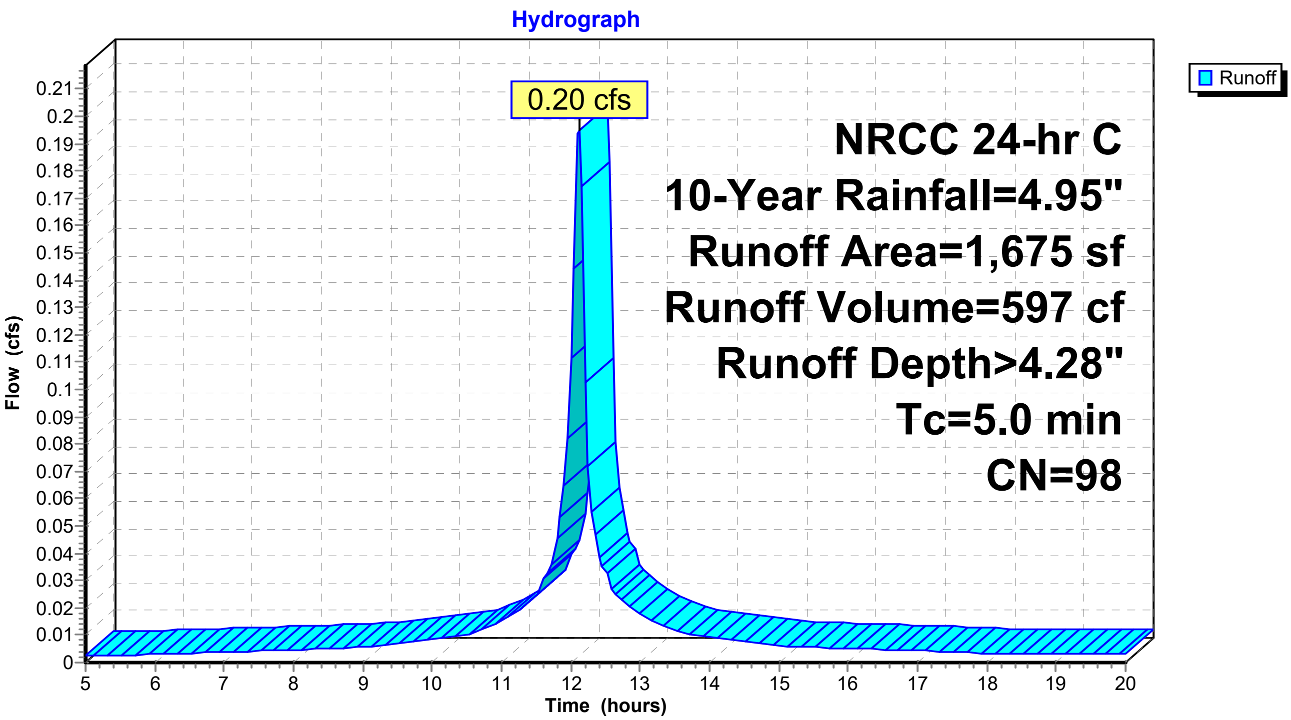
Runoff = 0.20 cfs @ 12.11 hrs, Volume= 597 cf, Depth> 4.28"
Routed to Reach 4R : 8" ROOF DRAIN CARRIER PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U7: Unit #7



Summary for Subcatchment U8: Unit #8

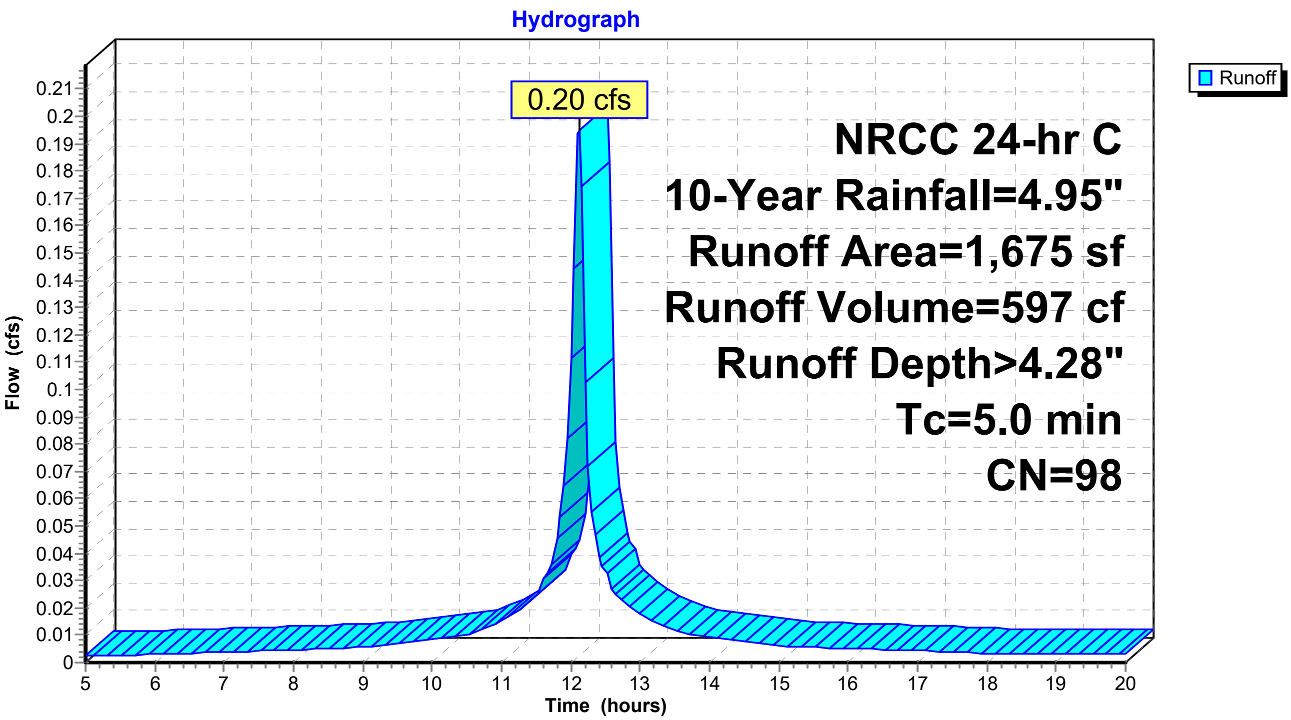
Runoff = 0.20 cfs @ 12.11 hrs, Volume= 597 cf, Depth> 4.28"
Routed to Pond 1P : Subsurface #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U8: Unit #8



Summary for Subcatchment U9: Unit #9

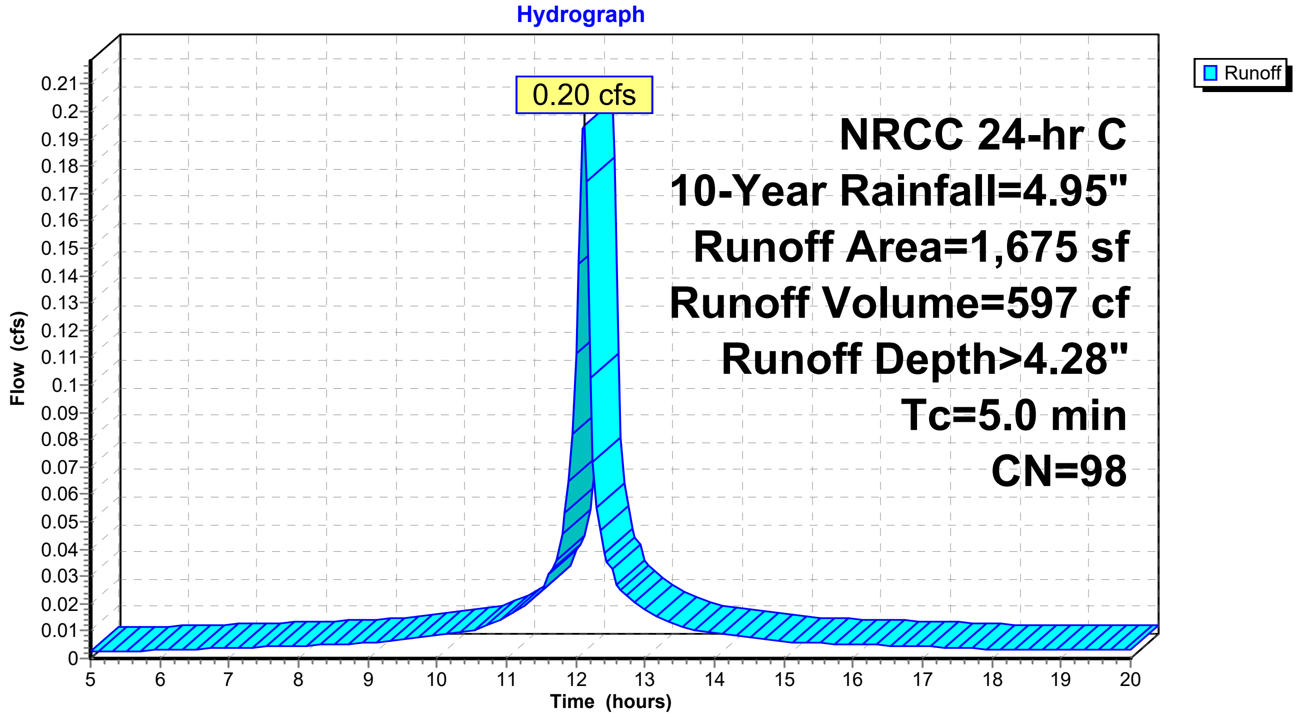
Runoff = 0.20 cfs @ 12.11 hrs, Volume= 597 cf, Depth> 4.28"
Routed to Pond 1P : Subsurface #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 10-Year Rainfall=4.95"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U9: Unit #9



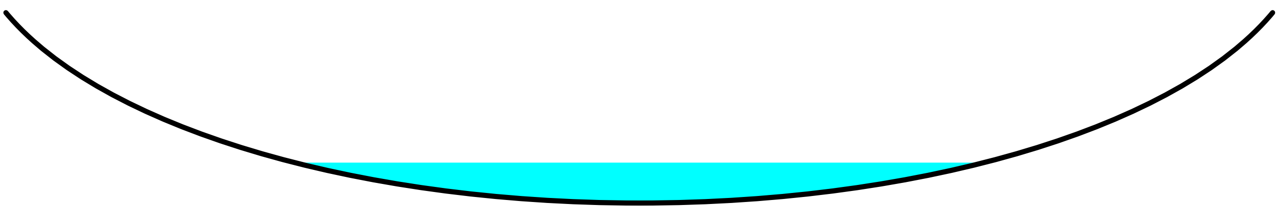
Summary for Reach 3R: Wetland Surface 1

Inflow Area = 26,965 sf, 33.26% Impervious, Inflow Depth > 1.57" for 10-Year event
Inflow = 0.88 cfs @ 12.35 hrs, Volume= 3,519 cf
Outflow = 0.70 cfs @ 12.56 hrs, Volume= 3,487 cf, Atten= 20%, Lag= 12.6 min
Routed to Reach DP1PST : DP 1 - POST

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.43 fps, Min. Travel Time= 13.3 min
Avg. Velocity = 0.21 fps, Avg. Travel Time= 27.1 min

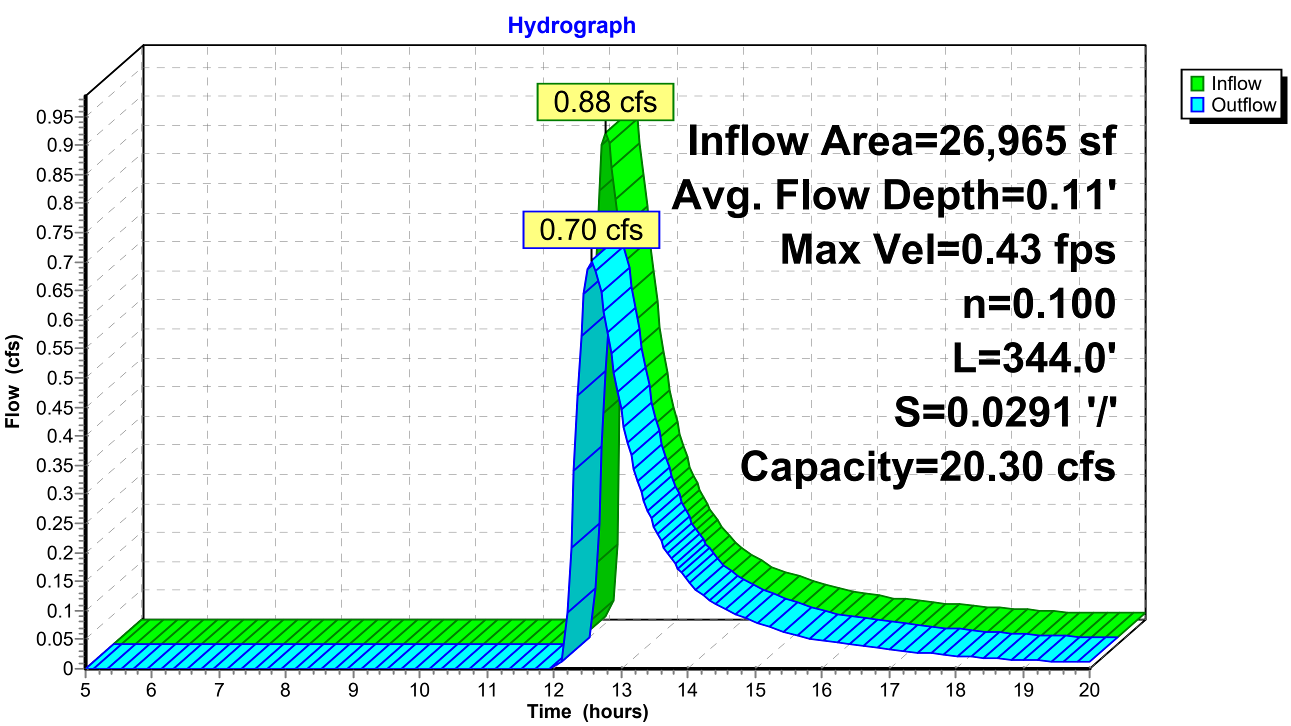
Peak Storage= 558 cf @ 12.56 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 22.99'
Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 20.30 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 344.0' Slope= 0.0291 '/'
Inlet Invert= 94.00', Outlet Invert= 84.00'



‡

Reach 3R: Wetland Surface 1



Stage-Discharge for Reach 3R: Wetland Surface 1

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
94.00	0.00	0.00
94.01	0.09	0.00
94.02	0.14	0.02
94.03	0.19	0.05
94.04	0.23	0.09
94.05	0.26	0.14
94.06	0.30	0.21
94.07	0.33	0.29
94.08	0.36	0.38
94.09	0.39	0.49
94.10	0.42	0.62
94.11	0.44	0.76
94.12	0.47	0.92
94.13	0.50	1.10
94.14	0.52	1.29
94.15	0.55	1.49
94.16	0.57	1.72
94.17	0.59	1.96
94.18	0.62	2.22
94.19	0.64	2.49
94.20	0.66	2.79
94.21	0.68	3.10
94.22	0.70	3.43
94.23	0.73	3.77
94.24	0.75	4.14
94.25	0.77	4.52
94.26	0.79	4.92
94.27	0.81	5.34
94.28	0.83	5.78
94.29	0.85	6.24
94.30	0.87	6.71
94.31	0.89	7.21
94.32	0.90	7.72
94.33	0.92	8.25
94.34	0.94	8.80
94.35	0.96	9.37
94.36	0.98	9.96
94.37	1.00	10.57
94.38	1.01	11.20
94.39	1.03	11.85
94.40	1.05	12.52
94.41	1.07	13.20
94.42	1.08	13.91
94.43	1.10	14.64
94.44	1.12	15.39
94.45	1.14	16.15
94.46	1.15	16.94
94.47	1.17	17.75
94.48	1.19	18.58
94.49	1.20	19.43
94.50	**1.22**	**20.30**

Stage-Area-Storage for Reach 3R: Wetland Surface 1

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
94.00	0.0	0
94.01	0.0	16
94.02	0.1	46
94.03	0.2	84
94.04	0.4	130
94.05	0.5	181
94.06	0.7	238
94.07	0.9	300
94.08	1.1	367
94.09	1.3	438
94.10	1.5	513
94.11	1.7	592
94.12	2.0	674
94.13	2.2	760
94.14	2.5	849
94.15	2.7	942
94.16	3.0	1,038
94.17	3.3	1,137
94.18	3.6	1,238
94.19	3.9	1,343
94.20	4.2	1,450
94.21	4.5	1,561
94.22	4.9	1,673
94.23	5.2	1,789
94.24	5.5	1,907
94.25	5.9	2,027
94.26	6.2	2,150
94.27	6.6	2,275
94.28	7.0	2,403
94.29	7.4	2,532
94.30	7.7	2,665
94.31	8.1	2,799
94.32	8.5	2,935
94.33	8.9	3,074
94.34	9.3	3,215
94.35	9.8	3,358
94.36	10.2	3,503
94.37	10.6	3,650
94.38	11.0	3,799
94.39	11.5	3,950
94.40	11.9	4,102
94.41	12.4	4,257
94.42	12.8	4,414
94.43	13.3	4,573
94.44	13.8	4,733
94.45	14.2	4,895
94.46	14.7	5,059
94.47	15.2	5,225
94.48	15.7	5,393
94.49	16.2	5,562
94.50	**16.7**	**5,733**

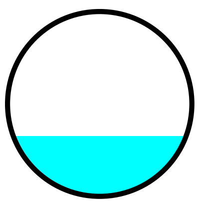
Summary for Reach 4R: 8" ROOF DRAIN CARRIER PIPE

Inflow Area = 3,351 sf,100.00% Impervious, Inflow Depth > 4.28" for 10-Year event
Inflow = 0.39 cfs @ 12.11 hrs, Volume= 1,194 cf
Outflow = 0.38 cfs @ 12.13 hrs, Volume= 1,193 cf, Atten= 2%, Lag= 1.0 min
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

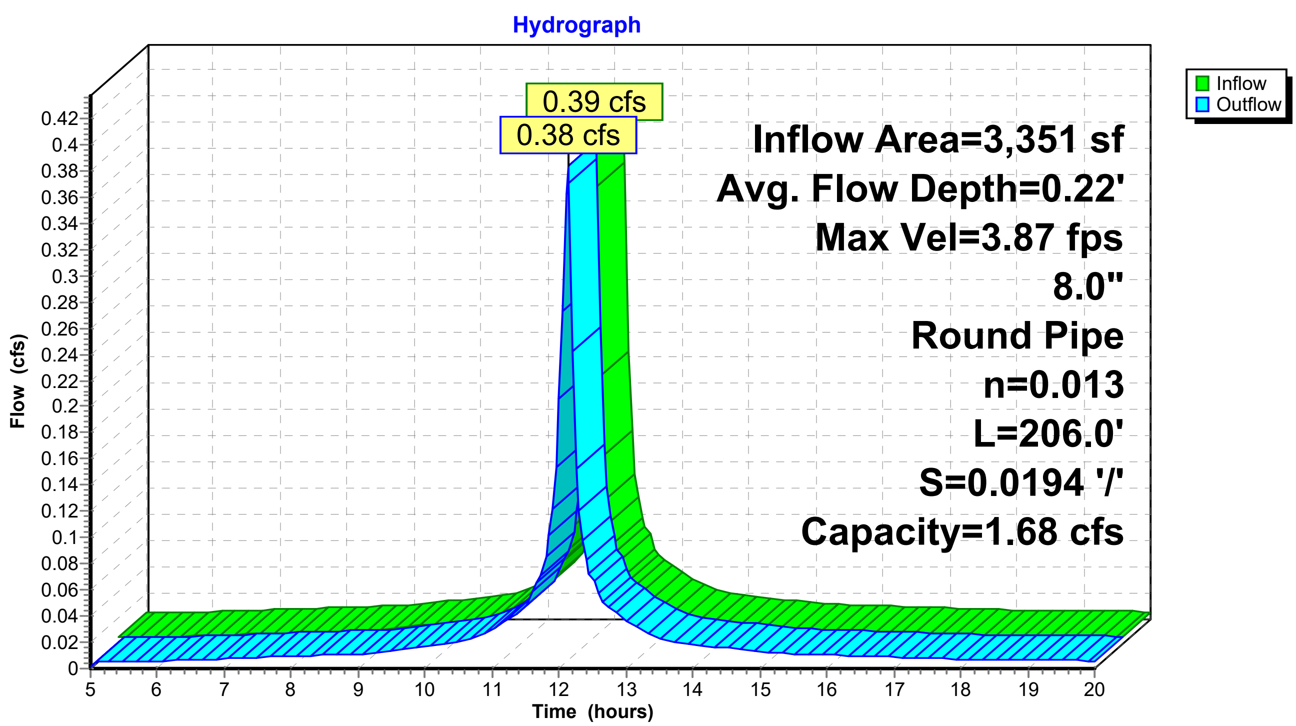
Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.87 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 2.3 min

Peak Storage= 20 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.22' , Surface Width= 0.62'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.68 cfs

8.0" Round Pipe
n= 0.013
Length= 206.0' Slope= 0.0194 '/'
Inlet Invert= 93.00', Outlet Invert= 89.00'



Reach 4R: 8" ROOF DRAIN CARRIER PIPE



Stage-Discharge for Reach 4R: 8" ROOF DRAIN CARRIER PIPE

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
93.00	0.00	0.00
93.01	0.55	0.00
93.02	0.89	0.00
93.03	1.16	0.01
93.04	1.39	0.01
93.05	1.61	0.02
93.06	1.81	0.03
93.07	2.00	0.04
93.08	2.17	0.05
93.09	2.34	0.07
93.10	2.49	0.08
93.11	2.64	0.10
93.12	2.79	0.12
93.13	2.92	0.14
93.14	3.05	0.16
93.15	3.18	0.19
93.16	3.30	0.21
93.17	3.42	0.24
93.18	3.53	0.27
93.19	3.64	0.30
93.20	3.74	0.33
93.21	3.84	0.36
93.22	3.94	0.40
93.23	4.04	0.43
93.24	4.13	0.47
93.25	4.21	0.50
93.26	4.30	0.54
93.27	4.38	0.58
93.28	4.46	0.62
93.29	4.53	0.66
93.30	4.60	0.70
93.31	4.67	0.74
93.32	4.74	0.79
93.33	4.80	0.83
93.34	4.86	0.87
93.35	4.92	0.91
93.36	4.98	0.96
93.37	5.03	1.00
93.38	5.08	1.04
93.39	5.13	1.09
93.40	5.17	1.13
93.41	5.22	1.17
93.42	5.25	1.22
93.43	5.29	1.26
93.44	5.33	1.30
93.45	5.36	1.34
93.46	5.38	1.38
93.47	5.41	1.42
93.48	5.43	1.46
93.49	5.45	1.50
93.50	5.47	1.54
93.51	5.48	1.57
93.52	5.49	1.60
93.53	5.50	1.64
93.54	**5.50**	1.67
93.55	5.50	1.69
93.56	5.49	1.72
93.57	5.48	1.74
93.58	5.47	1.76
93.59	5.45	1.78
93.60	5.42	1.79
93.61	5.39	1.80
93.62	5.35	**1.81**
93.63	5.30	1.81
93.64	5.24	1.80
93.65	5.15	1.79
93.66	5.03	1.75
93.67	4.72	1.65

Stage-Area-Storage for Reach 4R: 8" ROOF DRAIN CARRIER PIPE

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
93.00	0.0	0
93.01	0.0	0
93.02	0.0	1
93.03	0.0	1
93.04	0.0	2
93.05	0.0	2
93.06	0.0	3
93.07	0.0	4
93.08	0.0	5
93.09	0.0	6
93.10	0.0	7
93.11	0.0	8
93.12	0.0	9
93.13	0.0	10
93.14	0.1	11
93.15	0.1	12
93.16	0.1	13
93.17	0.1	14
93.18	0.1	16
93.19	0.1	17
93.20	0.1	18
93.21	0.1	19
93.22	0.1	21
93.23	0.1	22
93.24	0.1	23
93.25	0.1	25
93.26	0.1	26
93.27	0.1	27
93.28	0.1	29
93.29	0.1	30
93.30	0.2	31
93.31	0.2	33
93.32	0.2	34
93.33	0.2	35
93.34	0.2	37
93.35	0.2	38
93.36	0.2	40
93.37	0.2	41
93.38	0.2	42
93.39	0.2	44
93.40	0.2	45
93.41	0.2	46
93.42	0.2	48
93.43	0.2	49
93.44	0.2	50
93.45	0.3	52
93.46	0.3	53
93.47	0.3	54
93.48	0.3	55
93.49	0.3	57
93.50	0.3	58
93.51	0.3	59
93.52	0.3	60
93.53	0.3	61
93.54	0.3	62
93.55	0.3	63
93.56	0.3	64
93.57	0.3	65
93.58	0.3	66
93.59	0.3	67
93.60	0.3	68
93.61	0.3	69
93.62	0.3	70
93.63	0.3	70
93.64	0.3	71
93.65	0.3	71
93.66	0.3	72
93.67	**0.3**	**72**

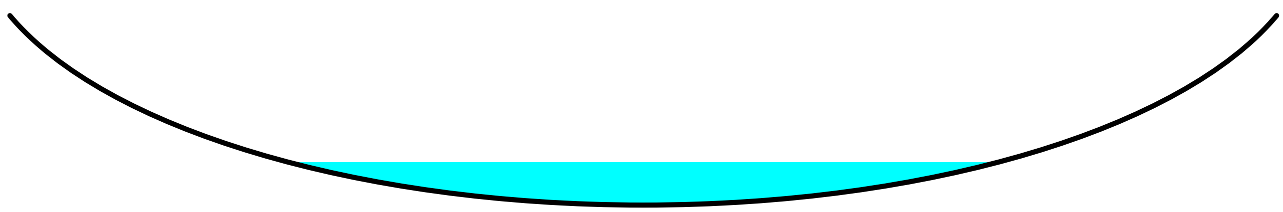
Summary for Reach 5R: Wetland Surface 2

Inflow Area = 13,032 sf, 17.40% Impervious, Inflow Depth > 1.84" for 10-Year event
Inflow = 0.64 cfs @ 12.27 hrs, Volume= 2,002 cf
Outflow = 0.43 cfs @ 12.45 hrs, Volume= 1,967 cf, Atten= 34%, Lag= 10.8 min
Routed to Reach 3R : Wetland Surface 1

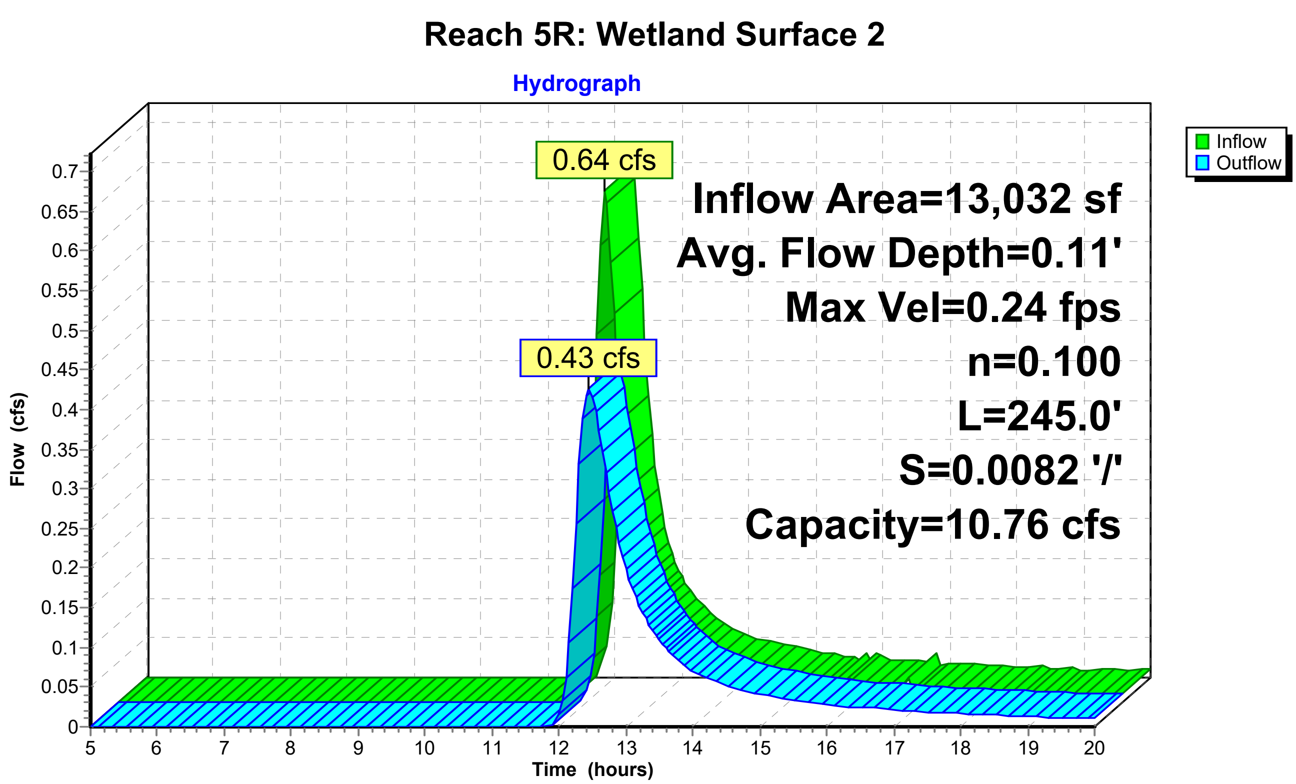
Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.24 fps, Min. Travel Time= 17.1 min
Avg. Velocity = 0.12 fps, Avg. Travel Time= 35.0 min

Peak Storage= 436 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 23.72'
Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 10.76 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 245.0' Slope= 0.0082 '/'
Inlet Invert= 96.00', Outlet Invert= 94.00'



‡



Stage-Discharge for Reach 5R: Wetland Surface 2

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
96.00	0.00	0.00
96.01	0.05	0.00
96.02	0.08	0.01
96.03	0.10	0.02
96.04	0.12	0.05
96.05	0.14	0.07
96.06	0.16	0.11
96.07	0.17	0.15
96.08	0.19	0.20
96.09	0.21	0.26
96.10	0.22	0.33
96.11	0.24	0.40
96.12	0.25	0.49
96.13	0.26	0.58
96.14	0.28	0.68
96.15	0.29	0.79
96.16	0.30	0.91
96.17	0.31	1.04
96.18	0.33	1.18
96.19	0.34	1.32
96.20	0.35	1.48
96.21	0.36	1.64
96.22	0.37	1.82
96.23	0.38	2.00
96.24	0.40	2.19
96.25	0.41	2.40
96.26	0.42	2.61
96.27	0.43	2.83
96.28	0.44	3.06
96.29	0.45	3.30
96.30	0.46	3.56
96.31	0.47	3.82
96.32	0.48	4.09
96.33	0.49	4.37
96.34	0.50	4.66
96.35	0.51	4.97
96.36	0.52	5.28
96.37	0.53	5.60
96.38	0.54	5.94
96.39	0.55	6.28
96.40	0.56	6.63
96.41	0.57	7.00
96.42	0.57	7.37
96.43	0.58	7.76
96.44	0.59	8.15
96.45	0.60	8.56
96.46	0.61	8.98
96.47	0.62	9.41
96.48	0.63	9.85
96.49	0.64	10.30
96.50	**0.65**	**10.76**

Stage-Area-Storage for Reach 5R: Wetland Surface 2

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
96.00	0.0	0
96.01	0.0	12
96.02	0.1	33
96.03	0.2	60
96.04	0.4	92
96.05	0.5	129
96.06	0.7	170
96.07	0.9	214
96.08	1.1	261
96.09	1.3	312
96.10	1.5	365
96.11	1.7	421
96.12	2.0	480
96.13	2.2	541
96.14	2.5	605
96.15	2.7	671
96.16	3.0	739
96.17	3.3	810
96.18	3.6	882
96.19	3.9	957
96.20	4.2	1,033
96.21	4.5	1,111
96.22	4.9	1,192
96.23	5.2	1,274
96.24	5.5	1,358
96.25	5.9	1,444
96.26	6.2	1,531
96.27	6.6	1,620
96.28	7.0	1,711
96.29	7.4	1,804
96.30	7.7	1,898
96.31	8.1	1,993
96.32	8.5	2,091
96.33	8.9	2,189
96.34	9.3	2,290
96.35	9.8	2,391
96.36	10.2	2,495
96.37	10.6	2,599
96.38	11.0	2,705
96.39	11.5	2,813
96.40	11.9	2,922
96.41	12.4	3,032
96.42	12.8	3,144
96.43	13.3	3,257
96.44	13.8	3,371
96.45	14.2	3,486
96.46	14.7	3,603
96.47	15.2	3,721
96.48	15.7	3,841
96.49	16.2	3,961
96.50	**16.7**	**4,083**

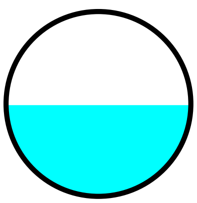
Summary for Reach 8R: 6" Roof Drain Carrier Pipe

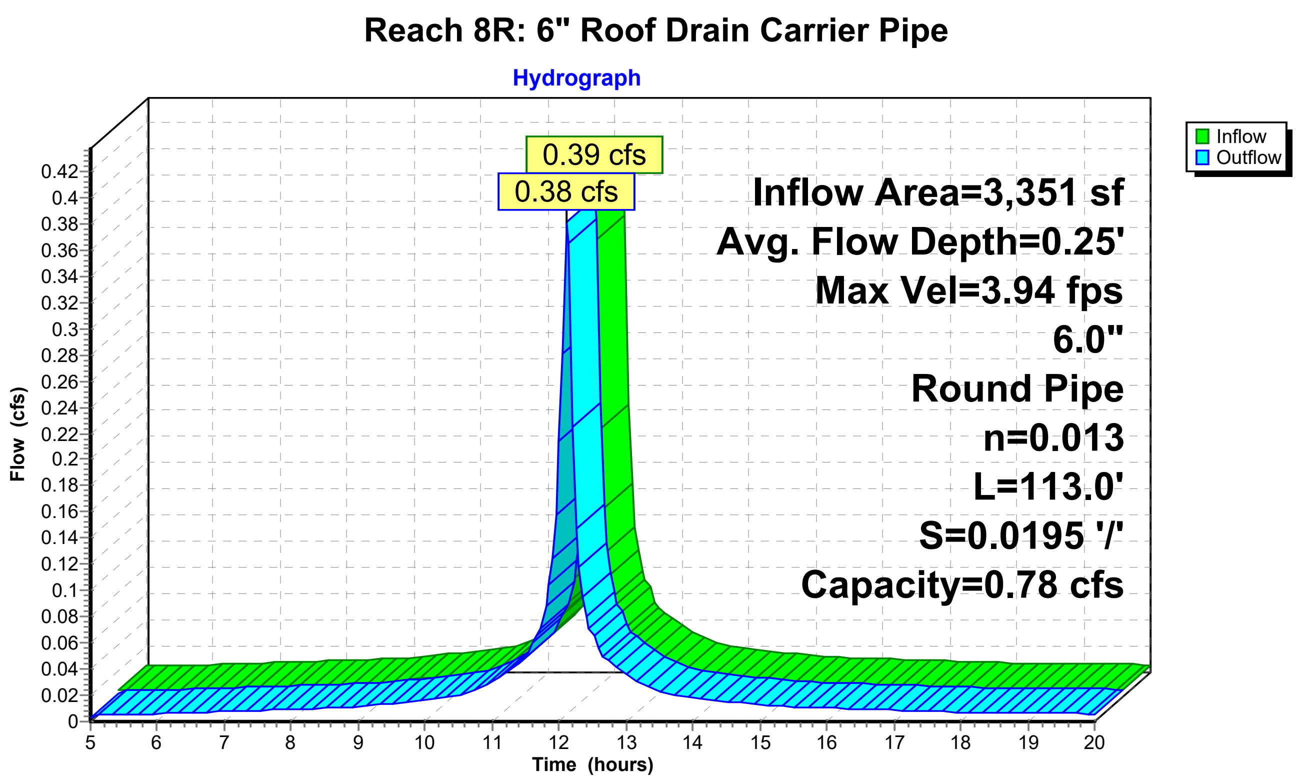
Inflow Area = 3,351 sf,100.00% Impervious, Inflow Depth > 4.28" for 10-Year event
Inflow = 0.39 cfs @ 12.11 hrs, Volume= 1,194 cf
Outflow = 0.38 cfs @ 12.12 hrs, Volume= 1,194 cf, Atten= 2%, Lag= 0.6 min
Routed to Reach 9R : 12" Roof Drain Carrier Pipe

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.94 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.54 fps, Avg. Travel Time= 1.2 min

Peak Storage= 11 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.25' , Surface Width= 0.50'
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 0.78 cfs

6.0" Round Pipe
n= 0.013
Length= 113.0' Slope= 0.0195 '/'
Inlet Invert= 94.50', Outlet Invert= 92.30'





Stage-Discharge for Reach 8R: 6" Roof Drain Carrier Pipe

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
94.50	0.00	0.00
94.51	0.56	0.00
94.52	0.89	0.00
94.53	1.15	0.01
94.54	1.39	0.01
94.55	1.60	0.02
94.56	1.79	0.02
94.57	1.97	0.03
94.58	2.14	0.04
94.59	2.30	0.06
94.60	2.45	0.07
94.61	2.59	0.08
94.62	2.73	0.10
94.63	2.86	0.12
94.64	2.98	0.13
94.65	3.09	0.15
94.66	3.21	0.17
94.67	3.31	0.19
94.68	3.41	0.22
94.69	3.51	0.24
94.70	3.60	0.26
94.71	3.68	0.29
94.72	3.77	0.31
94.73	3.84	0.34
94.74	3.92	0.37
94.75	3.99	0.39
94.76	4.05	0.42
94.77	4.11	0.45
94.78	4.17	0.47
94.79	4.23	0.50
94.80	4.28	0.53
94.81	4.32	0.55
94.82	4.36	0.58
94.83	4.40	0.61
94.84	4.44	0.63
94.85	4.46	0.66
94.86	4.49	0.68
94.87	4.51	0.70
94.88	4.53	0.72
94.89	4.54	0.75
94.90	4.54	0.77
94.91	**4.55**	0.78
94.92	4.54	0.80
94.93	4.53	0.81
94.94	4.51	0.83
94.95	4.48	0.83
94.96	4.45	0.84
94.97	4.40	**0.84**
94.98	4.33	0.84
94.99	4.23	0.83
95.00	3.99	0.78

Stage-Area-Storage for Reach 8R: 6" Roof Drain Carrier Pipe

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
94.50	0.0	0
94.51	0.0	0
94.52	0.0	0
94.53	0.0	1
94.54	0.0	1
94.55	0.0	1
94.56	0.0	2
94.57	0.0	2
94.58	0.0	2
94.59	0.0	3
94.60	0.0	3
94.61	0.0	4
94.62	0.0	4
94.63	0.0	5
94.64	0.0	5
94.65	0.0	6
94.66	0.1	6
94.67	0.1	7
94.68	0.1	7
94.69	0.1	8
94.70	0.1	8
94.71	0.1	9
94.72	0.1	9
94.73	0.1	10
94.74	0.1	11
94.75	0.1	11
94.76	0.1	12
94.77	0.1	12
94.78	0.1	13
94.79	0.1	13
94.80	0.1	14
94.81	0.1	14
94.82	0.1	15
94.83	0.1	16
94.84	0.1	16
94.85	0.1	17
94.86	0.2	17
94.87	0.2	18
94.88	0.2	18
94.89	0.2	19
94.90	0.2	19
94.91	0.2	19
94.92	0.2	20
94.93	0.2	20
94.94	0.2	21
94.95	0.2	21
94.96	0.2	21
94.97	0.2	22
94.98	0.2	22
94.99	0.2	22
95.00	**0.2**	**22**

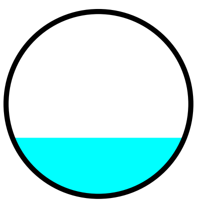
Summary for Reach 9R: 12" Roof Drain Carrier Pipe

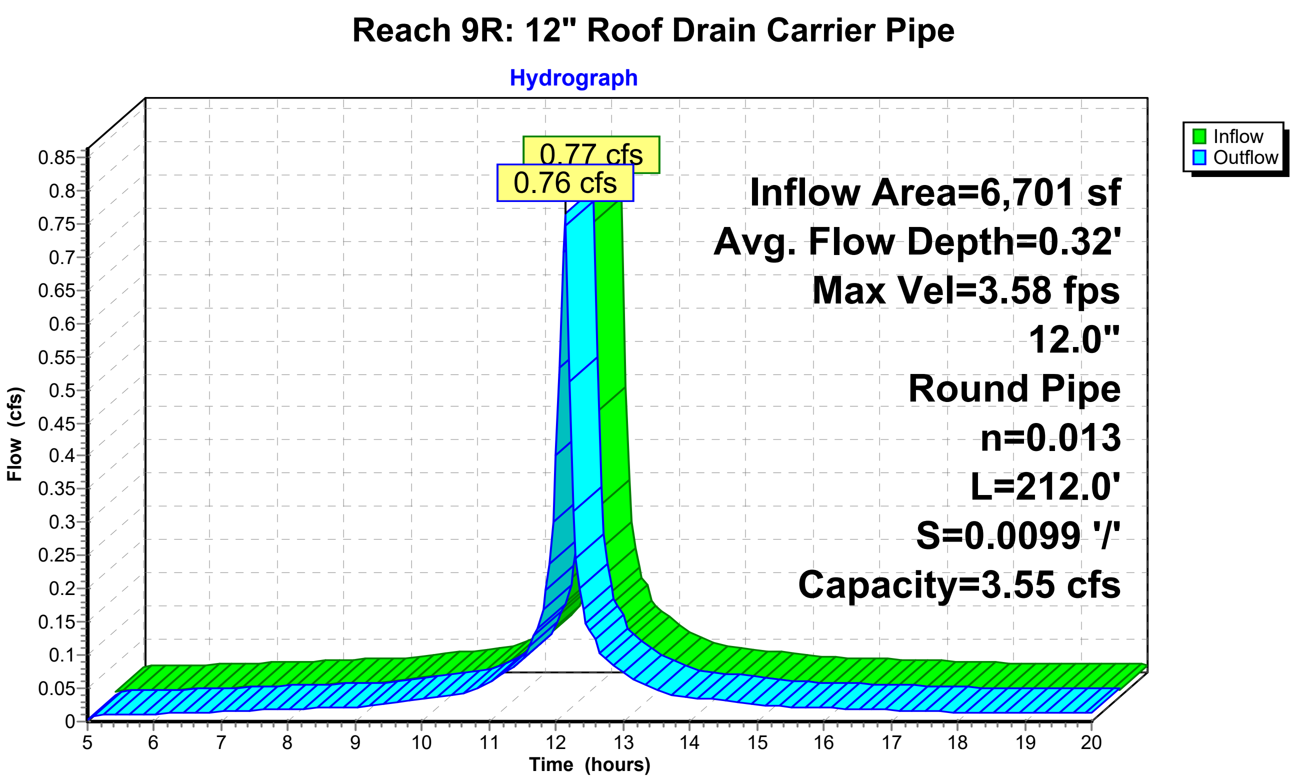
Inflow Area = 6,701 sf,100.00% Impervious, Inflow Depth > 4.28" for 10-Year event
Inflow = 0.77 cfs @ 12.12 hrs, Volume= 2,388 cf
Outflow = 0.76 cfs @ 12.13 hrs, Volume= 2,385 cf, Atten= 1%, Lag= 1.0 min
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.58 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 2.6 min

Peak Storage= 45 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.32' , Surface Width= 0.93'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.55 cfs

12.0" Round Pipe
n= 0.013
Length= 212.0' Slope= 0.0099 '/'
Inlet Invert= 91.10', Outlet Invert= 89.00'





Stage-Discharge for Reach 9R: 12" Roof Drain Carrier Pipe

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)	Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
91.10	0.00	0.00	91.63	4.62	1.95
91.11	0.40	0.00	91.64	4.66	2.02
91.12	0.64	0.00	91.65	4.69	2.08
91.13	0.83	0.01	91.66	4.72	2.14
91.14	1.00	0.01	91.67	4.76	2.20
91.15	1.16	0.02	91.68	4.79	2.26
91.16	1.31	0.03	91.69	4.81	2.32
91.17	1.44	0.03	91.70	4.84	2.38
91.18	1.57	0.05	91.71	4.87	2.44
91.19	1.69	0.06	91.72	4.89	2.50
91.20	1.81	0.07	91.73	4.92	2.56
91.21	1.92	0.09	91.74	4.94	2.62
91.22	2.03	0.11	91.75	4.96	2.68
91.23	2.14	0.13	91.76	4.98	2.74
91.24	2.24	0.15	91.77	5.00	2.80
91.25	2.33	0.17	91.78	5.02	2.86
91.26	2.43	0.20	91.79	5.04	2.91
91.27	2.52	0.22	91.80	5.06	2.97
91.28	2.61	0.25	91.81	5.07	3.02
91.29	2.69	0.28	91.82	5.08	3.08
91.30	2.78	0.31	91.83	5.10	3.13
91.31	2.86	0.34	91.84	5.11	3.18
91.32	2.94	0.38	91.85	5.12	3.23
91.33	3.01	0.41	91.86	5.13	3.28
91.34	3.09	0.45	91.87	5.13	3.33
91.35	3.16	0.49	91.88	5.14	3.38
91.36	3.23	0.52	91.89	5.14	3.42
91.37	3.30	0.57	91.90	5.15	3.47
91.38	3.37	0.61	91.91	**5.15**	3.51
91.39	3.44	0.65	91.92	5.15	3.55
91.40	3.50	0.69	91.93	5.14	3.59
91.41	3.57	0.74	91.94	5.14	3.62
91.42	3.63	0.79	91.95	5.14	3.65
91.43	3.69	0.83	91.96	5.13	3.68
91.44	3.75	0.88	91.97	5.12	3.71
91.45	3.81	0.93	91.98	5.11	3.74
91.46	3.86	0.98	91.99	5.09	3.76
91.47	3.92	1.03	92.00	5.08	3.78
91.48	3.97	1.09	92.01	5.06	3.79
91.49	4.02	1.14	92.02	5.03	3.81
91.50	4.07	1.19	92.03	5.01	3.81
91.51	4.12	1.25	92.04	4.98	**3.81**
91.52	4.17	1.31	92.05	4.94	3.81
91.53	4.22	1.36	92.06	4.90	3.80
91.54	4.26	1.42	92.07	4.85	3.78
91.55	4.31	1.48	92.08	4.79	3.75
91.56	4.35	1.54	92.09	4.71	3.69
91.57	4.39	1.59	92.10	4.51	3.55
91.58	4.44	1.65			
91.59	4.48	1.71			
91.60	4.51	1.77			
91.61	4.55	1.83			
91.62	4.59	1.89			

Stage-Area-Storage for Reach 9R: 12" Roof Drain Carrier Pipe

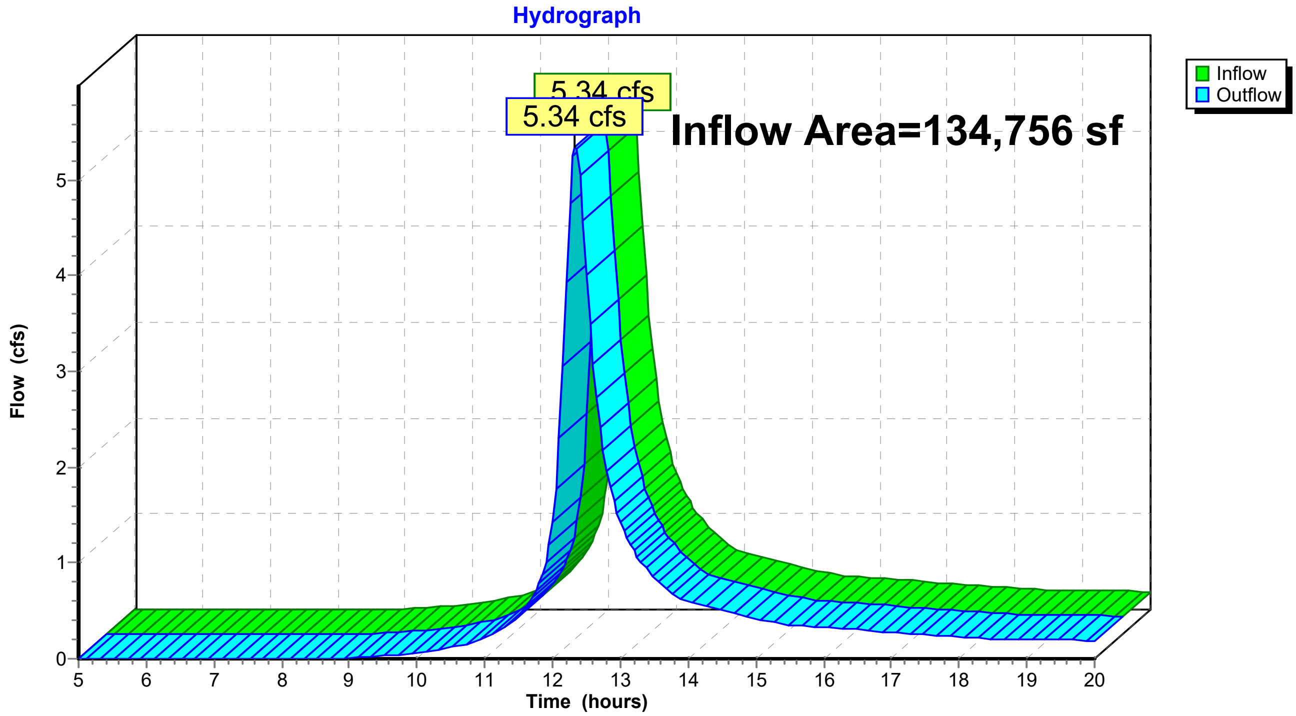
Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
91.10	0.0	0
91.11	0.0	0
91.12	0.0	1
91.13	0.0	1
91.14	0.0	2
91.15	0.0	3
91.16	0.0	4
91.17	0.0	5
91.18	0.0	6
91.19	0.0	7
91.20	0.0	9
91.21	0.0	10
91.22	0.1	11
91.23	0.1	13
91.24	0.1	14
91.25	0.1	16
91.26	0.1	17
91.27	0.1	19
91.28	0.1	20
91.29	0.1	22
91.30	0.1	24
91.31	0.1	25
91.32	0.1	27
91.33	0.1	29
91.34	0.1	31
91.35	0.2	33
91.36	0.2	34
91.37	0.2	36
91.38	0.2	38
91.39	0.2	40
91.40	0.2	42
91.41	0.2	44
91.42	0.2	46
91.43	0.2	48
91.44	0.2	50
91.45	0.2	52
91.46	0.3	54
91.47	0.3	56
91.48	0.3	58
91.49	0.3	60
91.50	0.3	62
91.51	0.3	64
91.52	0.3	66
91.53	0.3	68
91.54	0.3	71
91.55	0.3	73
91.56	0.4	75
91.57	0.4	77
91.58	0.4	79
91.59	0.4	81
91.60	0.4	83
91.61	0.4	85
91.62	0.4	87
91.63	0.4	90
91.64	0.4	92
91.65	0.4	94
91.66	0.5	96
91.67	0.5	98
91.68	0.5	100
91.69	0.5	102
91.70	0.5	104
91.71	0.5	106
91.72	0.5	108
91.73	0.5	110
91.74	0.5	113
91.75	0.5	115
91.76	0.5	117
91.77	0.6	119
91.78	0.6	121
91.79	0.6	123
91.80	0.6	124
91.81	0.6	126
91.82	0.6	128
91.83	0.6	130
91.84	0.6	132
91.85	0.6	134
91.86	0.6	136
91.87	0.6	138
91.88	0.7	139
91.89	0.7	141
91.90	0.7	143
91.91	0.7	144
91.92	0.7	146
91.93	0.7	148
91.94	0.7	149
91.95	0.7	151
91.96	0.7	152
91.97	0.7	154
91.98	0.7	155
91.99	0.7	157
92.00	0.7	158
92.01	0.8	159
92.02	0.8	160
92.03	0.8	161
92.04	0.8	162
92.05	0.8	163
92.06	0.8	164
92.07	0.8	165
92.08	0.8	166
92.09	0.8	166
92.10	**0.8**	**167**

Summary for Reach DP1PRE: DP 1 - PRE

Inflow Area = 134,756 sf, 4.57% Impervious, Inflow Depth > 2.10" for 10-Year event
Inflow = 5.34 cfs @ 12.34 hrs, Volume= 23,567 cf
Outflow = 5.34 cfs @ 12.34 hrs, Volume= 23,567 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach DP1PRE: DP 1 - PRE

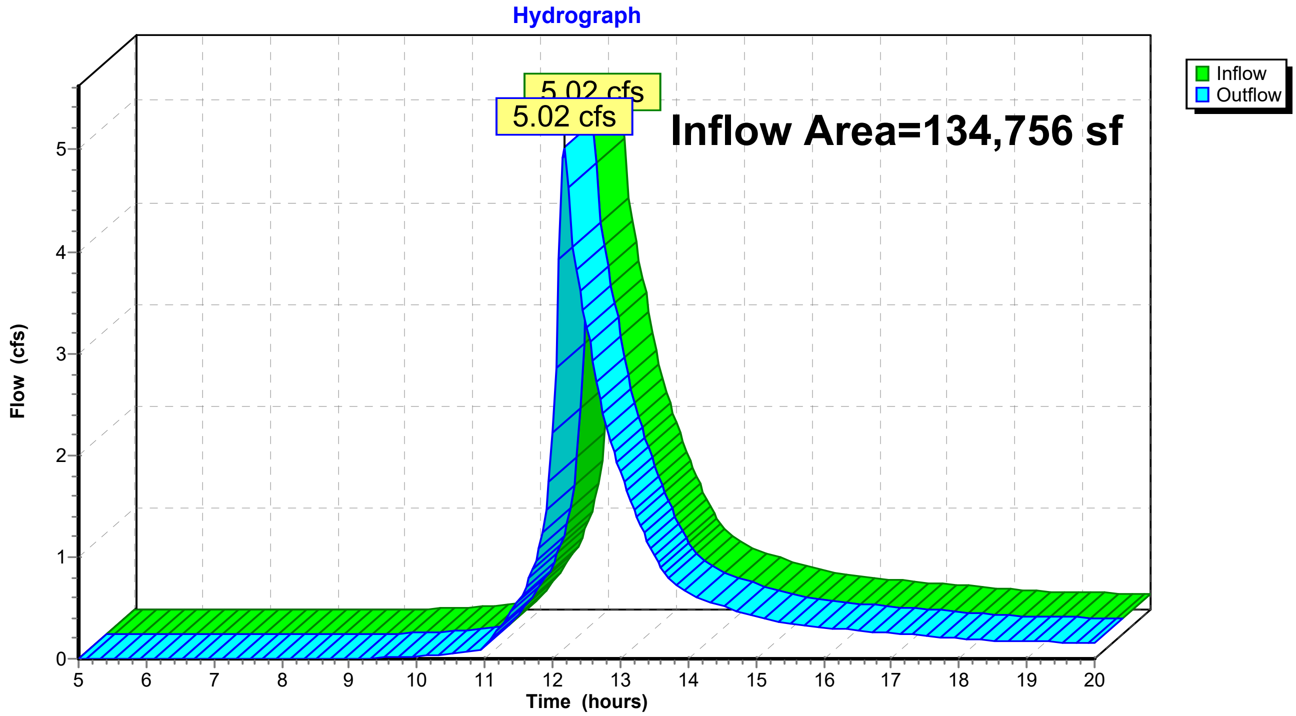


Summary for Reach DP1PST: DP 1 - POST

Inflow Area = 134,756 sf, 27.66% Impervious, Inflow Depth > 2.16" for 10-Year event
Inflow = 5.02 cfs @ 12.17 hrs, Volume= 24,303 cf
Outflow = 5.02 cfs @ 12.17 hrs, Volume= 24,303 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach DP1PST: DP 1 - POST



Summary for Pond 1P: Subsurface #1

Inflow Area = 13,933 sf, 48.09% Impervious, Inflow Depth > 3.15" for 10-Year event
Inflow = 1.09 cfs @ 12.13 hrs, Volume= 3,659 cf
Outflow = 0.56 cfs @ 12.28 hrs, Volume= 2,935 cf, Atten= 48%, Lag= 9.0 min
Discarded = 0.03 cfs @ 10.10 hrs, Volume= 1,384 cf
Primary = 0.53 cfs @ 12.28 hrs, Volume= 1,552 cf
Routed to Reach 3R : Wetland Surface 1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.47' @ 12.28 hrs Surf.Area= 1,248 sf Storage= 1,178 cf

Plug-Flow detention time= 91.6 min calculated for 2,935 cf (80% of inflow)
Center-of-Mass det. time= 34.3 min (794.1 - 759.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	96.00'	902 cf	**37.25'W x 33.50'L x 2.54'H Field A** 3,172 cf Overall - 918 cf Embedded = 2,254 cf x 40.0% Voids
#2A	96.50'	918 cf	**Cultec R-150XLHD** x 33 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 11 rows
		1,819 cf	Total Available Storage

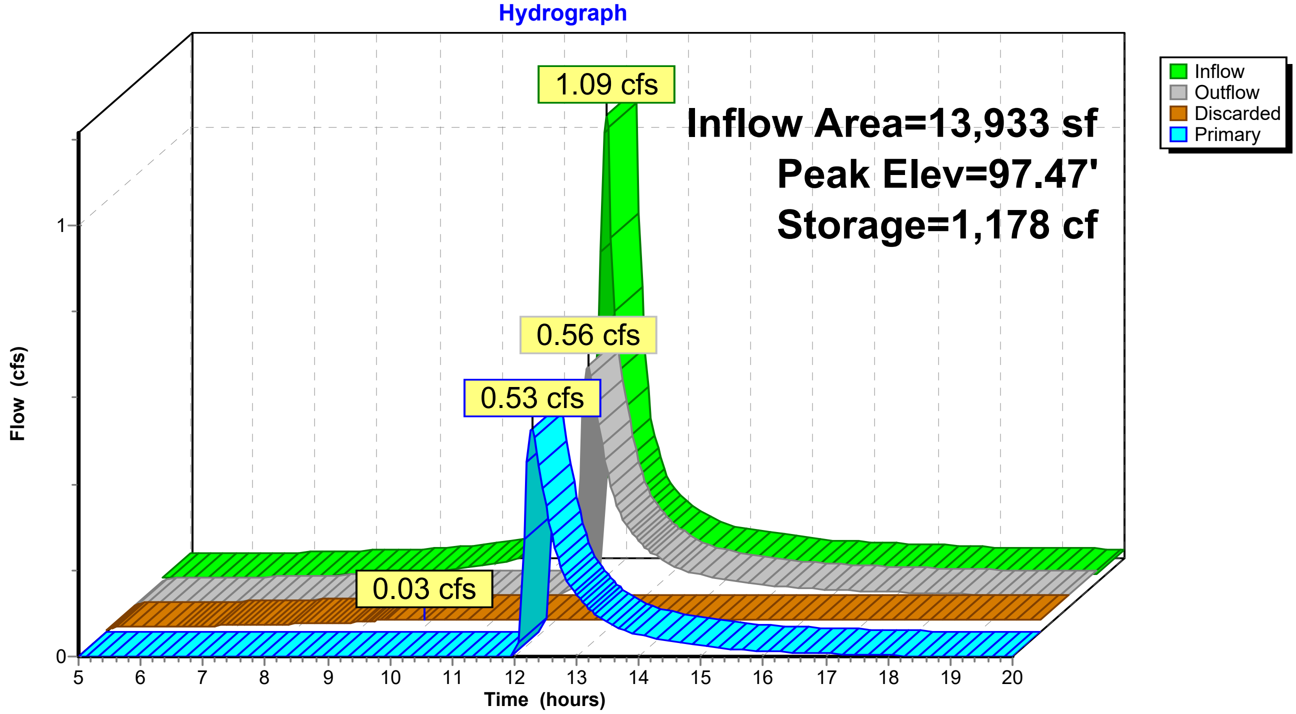
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	96.00'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	99.00'	**6.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	97.00'	**8.0" Round Culvert** L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 97.00' / 96.75' S= 0.0083 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf

Discarded OutFlow Max=0.03 cfs @ 10.10 hrs HW=96.03' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.53 cfs @ 12.28 hrs HW=97.47' TW=94.07' (Dynamic Tailwater)
├─**2=Orifice/Grate** (Controls 0.00 cfs)
└─**3=Culvert** (Barrel Controls 0.53 cfs @ 2.79 fps)

Pond 1P: Subsurface #1



Stage-Discharge for Pond 1P: Subsurface #1

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
96.00	0.00	**0.00**	0.00
96.05	0.03	**0.03**	0.00
96.10	0.03	0.03	0.00
96.15	0.03	0.03	0.00
96.20	0.03	0.03	0.00
96.25	0.03	0.03	0.00
96.30	0.03	0.03	0.00
96.35	0.03	0.03	0.00
96.40	0.03	0.03	0.00
96.45	0.03	0.03	0.00
96.50	0.03	0.03	0.00
96.55	0.03	0.03	0.00
96.60	0.03	0.03	0.00
96.65	0.03	0.03	0.00
96.70	0.03	0.03	0.00
96.75	0.03	0.03	0.00
96.80	0.03	0.03	0.00
96.85	0.03	0.03	0.00
96.90	0.03	0.03	0.00
96.95	0.03	0.03	0.00
97.00	0.03	0.03	0.00
97.05	0.04	0.03	0.01
97.10	0.06	0.03	0.03
97.15	0.09	0.03	0.06
97.20	0.14	0.03	0.11
97.25	0.20	0.03	0.17
97.30	0.27	0.03	0.24
97.35	0.35	0.03	0.32
97.40	0.43	0.03	0.40
97.45	0.52	0.03	0.49
97.50	0.61	0.03	0.58
97.55	0.70	0.03	0.67
97.60	0.79	0.03	0.76
97.65	0.88	0.03	0.85
97.70	0.96	0.03	0.93
97.75	1.04	0.03	1.01
97.80	1.10	0.03	1.07
97.85	1.14	0.03	1.11
97.90	1.13	0.03	1.10
97.95	1.19	0.03	1.16
98.00	1.24	0.03	1.21
98.05	1.29	0.03	1.26
98.10	1.34	0.03	1.31
98.15	1.39	0.03	1.36
98.20	1.43	0.03	1.40
98.25	1.48	0.03	1.45
98.30	1.52	0.03	1.49
98.35	1.56	0.03	1.53
98.40	1.60	0.03	1.57
98.45	1.64	0.03	1.61
98.50	1.68	0.03	1.65
98.55	1.72	0.03	1.69
98.60	1.76	0.03	1.73

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
98.65	1.79	0.03	1.76
98.70	1.83	0.03	1.80
98.75	1.86	0.03	1.83
98.80	1.90	0.03	1.87
98.85	1.93	0.03	1.90
98.90	1.96	0.03	1.93
98.95	1.99	0.03	1.96
99.00	**2.03**	0.03	**2.00**

Stage-Area-Storage for Pond 1P: Subsurface #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
96.00	**1,248**	0
96.05	1,248	25
96.10	1,248	50
96.15	1,248	75
96.20	1,248	100
96.25	1,248	125
96.30	1,248	150
96.35	1,248	175
96.40	1,248	200
96.45	1,248	225
96.50	1,248	250
96.55	1,248	300
96.60	1,248	350
96.65	1,248	400
96.70	1,248	450
96.75	1,248	499
96.80	1,248	548
96.85	1,248	597
96.90	1,248	646
96.95	1,248	694
97.00	1,248	742
97.05	1,248	790
97.10	1,248	838
97.15	1,248	885
97.20	1,248	932
97.25	1,248	978
97.30	1,248	1,024
97.35	1,248	1,069
97.40	1,248	1,113
97.45	1,248	1,157
97.50	1,248	1,200
97.55	1,248	1,242
97.60	1,248	1,283
97.65	1,248	1,322
97.70	1,248	1,361
97.75	1,248	1,398
97.80	1,248	1,433
97.85	1,248	1,465
97.90	1,248	1,495
97.95	1,248	1,522
98.00	1,248	1,549
98.05	1,248	1,574
98.10	1,248	1,599
98.15	1,248	1,624
98.20	1,248	1,649
98.25	1,248	1,674
98.30	1,248	1,699
98.35	1,248	1,724
98.40	1,248	1,749
98.45	1,248	1,774
98.50	1,248	1,799
98.55	1,248	**1,819**
98.60	1,248	1,819
98.65	1,248	1,819
98.70	1,248	1,819
98.75	1,248	1,819
98.80	1,248	1,819
98.85	1,248	1,819
98.90	1,248	1,819
98.95	1,248	1,819
99.00	1,248	1,819

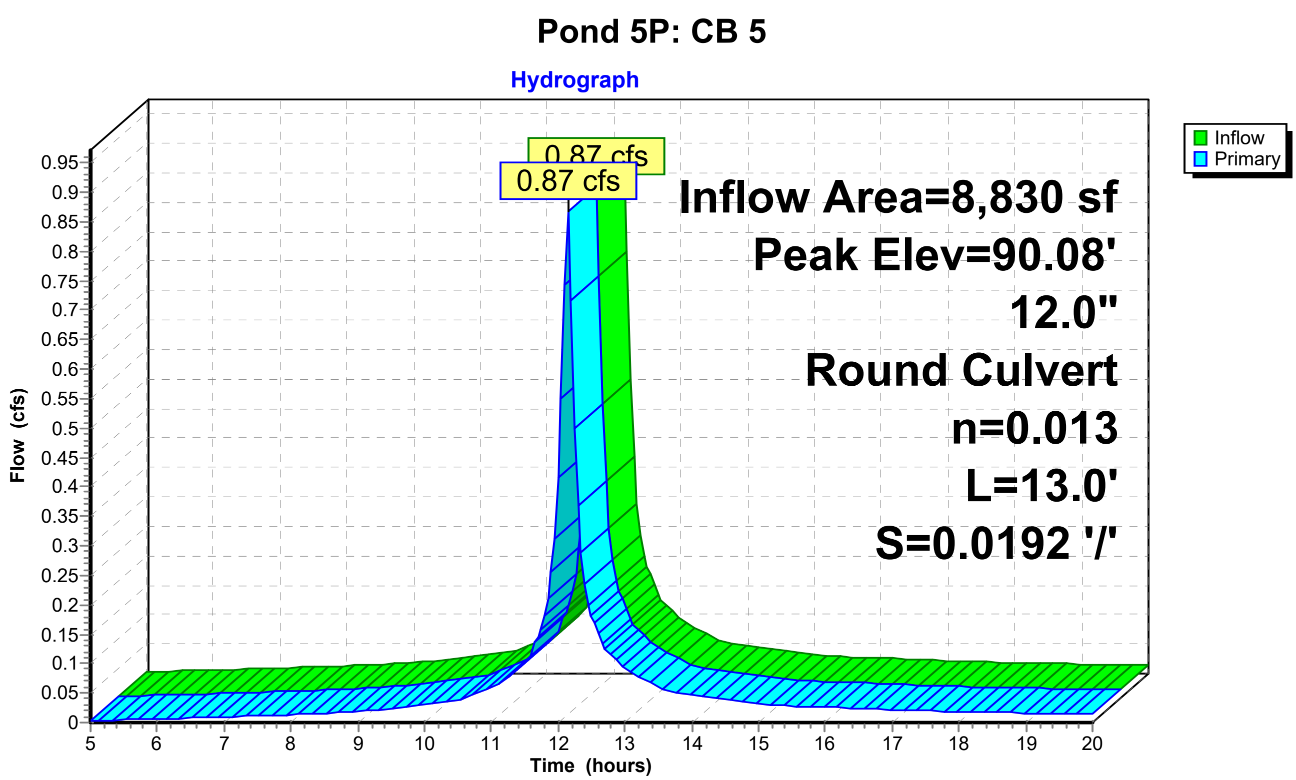
Summary for Pond 5P: CB 5

Inflow Area = 8,830 sf, 71.11% Impervious, Inflow Depth > 3.66" for 10-Year event
Inflow = 0.87 cfs @ 12.15 hrs, Volume= 2,691 cf
Outflow = 0.87 cfs @ 12.15 hrs, Volume= 2,691 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.87 cfs @ 12.15 hrs, Volume= 2,691 cf
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.08' @ 12.37 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	89.25'	**12.0" Round Culvert** L= 13.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.25' / 89.00' S= 0.0192 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.50 cfs @ 12.15 hrs HW=89.80' TW=89.71' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.50 cfs @ 1.65 fps)



Stage-Discharge for Pond 5P: CB 5

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
89.25	0.00	89.78	1.02
89.26	0.00	89.79	1.05
89.27	0.00	89.80	1.08
89.28	0.00	89.81	1.12
89.29	0.01	89.82	1.15
89.30	0.01	89.83	1.18
89.31	0.02	89.84	1.21
89.32	0.02	89.85	1.25
89.33	0.03	89.86	1.28
89.34	0.04	89.87	1.31
89.35	0.04	89.88	1.35
89.36	0.05	89.89	1.38
89.37	0.06	89.90	1.42
89.38	0.07	89.91	1.45
89.39	0.09	89.92	1.48
89.40	0.10	89.93	1.52
89.41	0.11	89.94	1.55
89.42	0.12	89.95	1.59
89.43	0.14	89.96	1.62
89.44	0.15	89.97	1.66
89.45	0.17	89.98	1.69
89.46	0.19	89.99	1.73
89.47	0.20	90.00	1.77
89.48	0.22	90.01	1.80
89.49	0.24	90.02	1.84
89.50	0.26	90.03	1.87
89.51	0.28	90.04	1.91
89.52	0.30	90.05	1.94
89.53	0.32	90.06	1.98
89.54	0.35	90.07	2.02
89.55	0.37	90.08	2.05
89.56	0.39	90.09	2.09
89.57	0.42	90.10	2.13
89.58	0.44	90.11	2.16
89.59	0.47	90.12	2.20
89.60	0.49	90.13	2.23
89.61	0.52	90.14	2.27
89.62	0.55	90.15	2.31
89.63	0.57	90.16	2.34
89.64	0.60	90.17	2.38
89.65	0.63	90.18	2.41
89.66	0.66	90.19	2.45
89.67	0.69	90.20	2.48
89.68	0.72	90.21	2.52
89.69	0.75	90.22	2.55
89.70	0.78	90.23	2.59
89.71	0.81	90.24	2.62
89.72	0.84	90.25	**2.66**
89.73	0.87		
89.74	0.90		
89.75	0.93		
89.76	0.96		
89.77	0.99		

Stage-Area-Storage for Pond 5P: CB 5

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
89.25	**0**	89.78	0
89.26	0	89.79	0
89.27	0	89.80	0
89.28	0	89.81	0
89.29	0	89.82	0
89.30	0	89.83	0
89.31	0	89.84	0
89.32	0	89.85	0
89.33	0	89.86	0
89.34	0	89.87	0
89.35	0	89.88	0
89.36	0	89.89	0
89.37	0	89.90	0
89.38	0	89.91	0
89.39	0	89.92	0
89.40	0	89.93	0
89.41	0	89.94	0
89.42	0	89.95	0
89.43	0	89.96	0
89.44	0	89.97	0
89.45	0	89.98	0
89.46	0	89.99	0
89.47	0	90.00	0
89.48	0	90.01	0
89.49	0	90.02	0
89.50	0	90.03	0
89.51	0	90.04	0
89.52	0	90.05	0
89.53	0	90.06	0
89.54	0	90.07	0
89.55	0	90.08	0
89.56	0	90.09	0
89.57	0	90.10	0
89.58	0	90.11	0
89.59	0	90.12	0
89.60	0	90.13	0
89.61	0	90.14	0
89.62	0	90.15	0
89.63	0	90.16	0
89.64	0	90.17	0
89.65	0	90.18	0
89.66	0	90.19	0
89.67	0	90.20	0
89.68	0	90.21	0
89.69	0	90.22	0
89.70	0	90.23	0
89.71	0	90.24	0
89.72	0	90.25	0
89.73	0		
89.74	0		
89.75	0		
89.76	0		
89.77	0		

Summary for Pond 10P: Infiltration Basin #1 (Storage)

Inflow Area = 54,661 sf, 51.78% Impervious, Inflow Depth > 2.83" for 10-Year event
Inflow = 3.79 cfs @ 12.15 hrs, Volume= 12,912 cf
Outflow = 2.33 cfs @ 12.27 hrs, Volume= 12,160 cf, Atten= 39%, Lag= 7.5 min
Primary = 2.33 cfs @ 12.27 hrs, Volume= 12,160 cf
Routed to Reach DP1PST : DP 1 - POST
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf
Routed to Reach DP1PST : DP 1 - POST

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.07' @ 12.27 hrs Surf.Area= 2,070 sf Storage= 2,521 cf

Plug-Flow detention time= 42.1 min calculated for 12,120 cf (94% of inflow)
Center-of-Mass det. time= 21.5 min (805.6 - 784.0)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	8,689 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

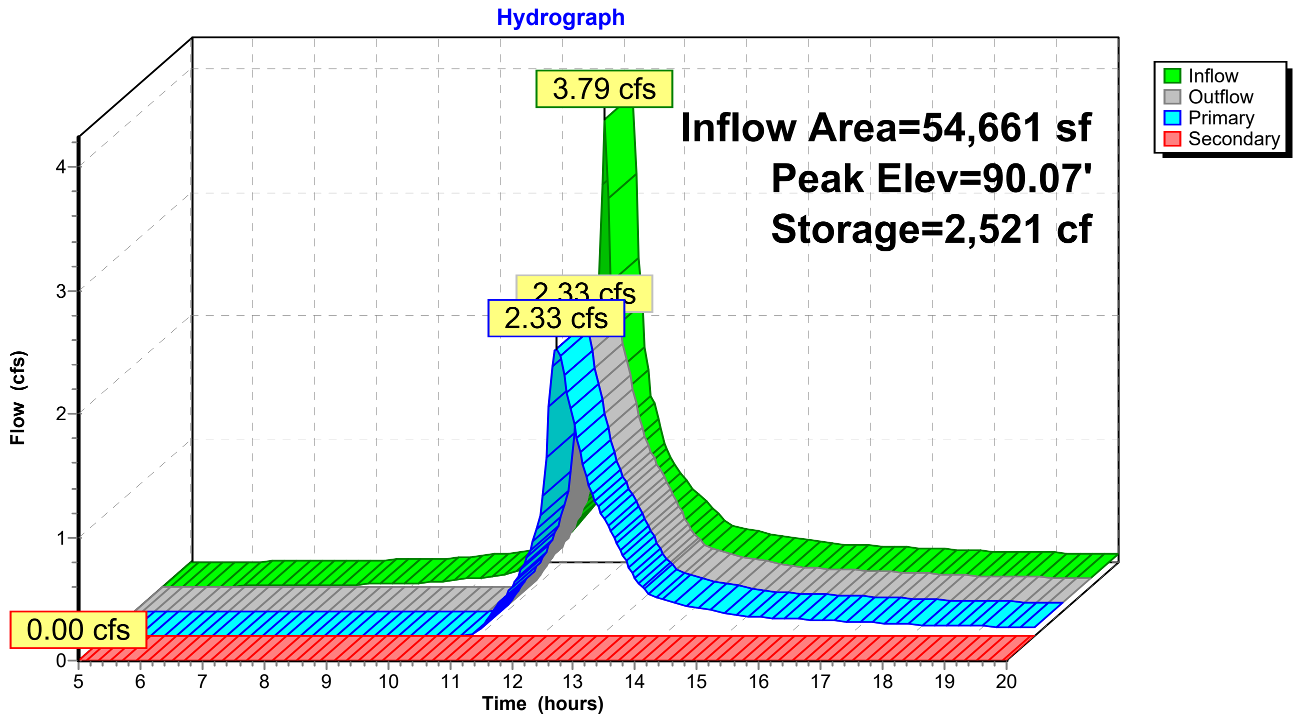
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	392	0	0
90.00	1,990	2,382	2,382
92.00	4,317	6,307	8,689

Device	Routing	Invert	Outlet Devices
#1	Secondary	91.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	87.50'	**12.0" Round Culvert** L= 37.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 87.50' / 87.25' S= 0.0068 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	88.90'	**16.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	89.50'	**6.0" W x 15.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.31 cfs @ 12.27 hrs HW=90.06' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 2.31 cfs of 5.20 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.63 cfs @ 4.90 fps)
  └─**4=Orifice/Grate** (Orifice Controls 0.68 cfs @ 2.41 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' TW=0.00' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 10P: Infiltration Basin #1 (Storage)



Stage-Discharge for Pond 10P: Infiltration Basin #1 (Storage)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
88.00	0.00	0.00	0.00	90.65	4.02	4.02	0.00
88.05	0.00	0.00	0.00	90.70	4.19	4.19	0.00
88.10	0.00	0.00	0.00	90.75	4.35	4.35	0.00
88.15	0.00	0.00	0.00	90.80	4.50	4.50	0.00
88.20	0.00	0.00	0.00	90.85	4.63	4.63	0.00
88.25	0.00	0.00	0.00	90.90	4.76	4.76	0.00
88.30	0.00	0.00	0.00	90.95	4.89	4.89	0.00
88.35	0.00	0.00	0.00	91.00	5.00	5.00	0.00
88.40	0.00	0.00	0.00	91.05	5.41	5.12	0.29
88.45	0.00	0.00	0.00	91.10	6.05	5.23	0.83
88.50	0.00	0.00	0.00	91.15	6.85	5.34	1.52
88.55	0.00	0.00	0.00	91.20	7.78	5.44	2.34
88.60	0.00	0.00	0.00	91.25	8.81	5.54	3.27
88.65	0.00	0.00	0.00	91.30	9.94	5.64	4.30
88.70	0.00	0.00	0.00	91.35	11.16	5.74	5.42
88.75	0.00	0.00	0.00	91.40	12.45	5.84	6.62
88.80	0.00	0.00	0.00	91.45	13.83	5.93	7.90
88.85	0.00	0.00	0.00	91.50	15.27	6.02	9.25
88.90	0.00	0.00	0.00	91.55	16.78	6.11	10.67
88.95	0.05	0.05	0.00	91.60	18.36	6.20	12.16
89.00	0.14	0.14	0.00	91.65	20.00	6.29	13.71
89.05	0.25	0.25	0.00	91.70	21.70	6.38	15.32
89.10	0.38	0.38	0.00	91.75	23.14	6.46	16.68
89.15	0.53	0.53	0.00	91.80	23.77	6.54	17.23
89.20	0.66	0.66	0.00	91.85	24.38	6.63	17.76
89.25	0.75	0.75	0.00	91.90	24.98	6.71	18.27
89.30	0.83	0.83	0.00	91.95	25.56	6.79	18.77
89.35	0.91	0.91	0.00	92.00	**26.13**	**6.87**	**19.26**
89.40	0.98	0.98	0.00				
89.45	1.04	1.04	0.00				
89.50	1.10	1.10	0.00				
89.55	1.18	1.18	0.00				
89.60	1.27	1.27	0.00				
89.65	1.36	1.36	0.00				
89.70	1.46	1.46	0.00				
89.75	1.57	1.57	0.00				
89.80	1.68	1.68	0.00				
89.85	1.79	1.79	0.00				
89.90	1.91	1.91	0.00				
89.95	2.03	2.03	0.00				
90.00	2.15	2.15	0.00				
90.05	2.28	2.28	0.00				
90.10	2.41	2.41	0.00				
90.15	2.54	2.54	0.00				
90.20	2.68	2.68	0.00				
90.25	2.82	2.82	0.00				
90.30	2.96	2.96	0.00				
90.35	3.10	3.10	0.00				
90.40	3.25	3.25	0.00				
90.45	3.40	3.40	0.00				
90.50	3.55	3.55	0.00				
90.55	3.71	3.71	0.00				
90.60	3.87	3.87	0.00				

Stage-Area-Storage for Pond 10P: Infiltration Basin #1 (Storage)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
88.00	392	0	90.65	2,746	3,921
88.05	432	21	90.70	2,804	4,060
88.10	472	43	90.75	2,863	4,202
88.15	512	68	90.80	2,921	4,346
88.20	552	94	90.85	2,979	4,494
88.25	592	123	90.90	3,037	4,644
88.30	632	154	90.95	3,095	4,798
88.35	672	186	91.00	3,154	4,954
88.40	712	221	91.05	3,212	5,113
88.45	752	257	91.10	3,270	5,275
88.50	792	296	91.15	3,328	5,440
88.55	831	336	91.20	3,386	5,608
88.60	871	379	91.25	3,444	5,778
88.65	911	424	91.30	3,503	5,952
88.70	951	470	91.35	3,561	6,129
88.75	991	519	91.40	3,619	6,308
88.80	1,031	569	91.45	3,677	6,491
88.85	1,071	622	91.50	3,735	6,676
88.90	1,111	676	91.55	3,793	6,864
88.95	1,151	733	91.60	3,852	7,055
89.00	1,191	792	91.65	3,910	7,249
89.05	1,231	852	91.70	3,968	7,446
89.10	1,271	915	91.75	4,026	7,646
89.15	1,311	979	91.80	4,084	7,849
89.20	1,351	1,046	91.85	4,142	8,055
89.25	1,391	1,114	91.90	4,201	8,263
89.30	1,431	1,185	91.95	4,259	8,475
89.35	1,471	1,257	92.00	**4,317**	**8,689**
89.40	1,511	1,332			
89.45	1,551	1,408			
89.50	1,591	1,487			
89.55	1,630	1,567			
89.60	1,670	1,650			
89.65	1,710	1,734			
89.70	1,750	1,821			
89.75	1,790	1,909			
89.80	1,830	2,000			
89.85	1,870	2,092			
89.90	1,910	2,187			
89.95	1,950	2,283			
90.00	1,990	2,382			
90.05	2,048	2,483			
90.10	2,106	2,587			
90.15	2,165	2,694			
90.20	2,223	2,803			
90.25	2,281	2,916			
90.30	2,339	3,031			
90.35	2,397	3,150			
90.40	2,455	3,271			
90.45	2,514	3,395			
90.50	2,572	3,522			
90.55	2,630	3,652			
90.60	2,688	3,785			

Summary for Pond B2: Infiltration Basin #2 (Storage Zone)

Inflow Area = 13,032 sf, 17.40% Impervious, Inflow Depth > 1.91" for 10-Year event
Inflow = 0.71 cfs @ 12.24 hrs, Volume= 2,072 cf
Outflow = 0.64 cfs @ 12.27 hrs, Volume= 2,002 cf, Atten= 9%, Lag= 1.5 min
Primary = 0.64 cfs @ 12.27 hrs, Volume= 2,002 cf
Routed to Reach 5R : Wetland Surface 2

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.76' @ 12.27 hrs Surf.Area= 538 sf Storage= 178 cf

Plug-Flow detention time= 18.6 min calculated for 1,995 cf (96% of inflow)
Center-of-Mass det. time= 7.0 min (806.0 - 799.0)

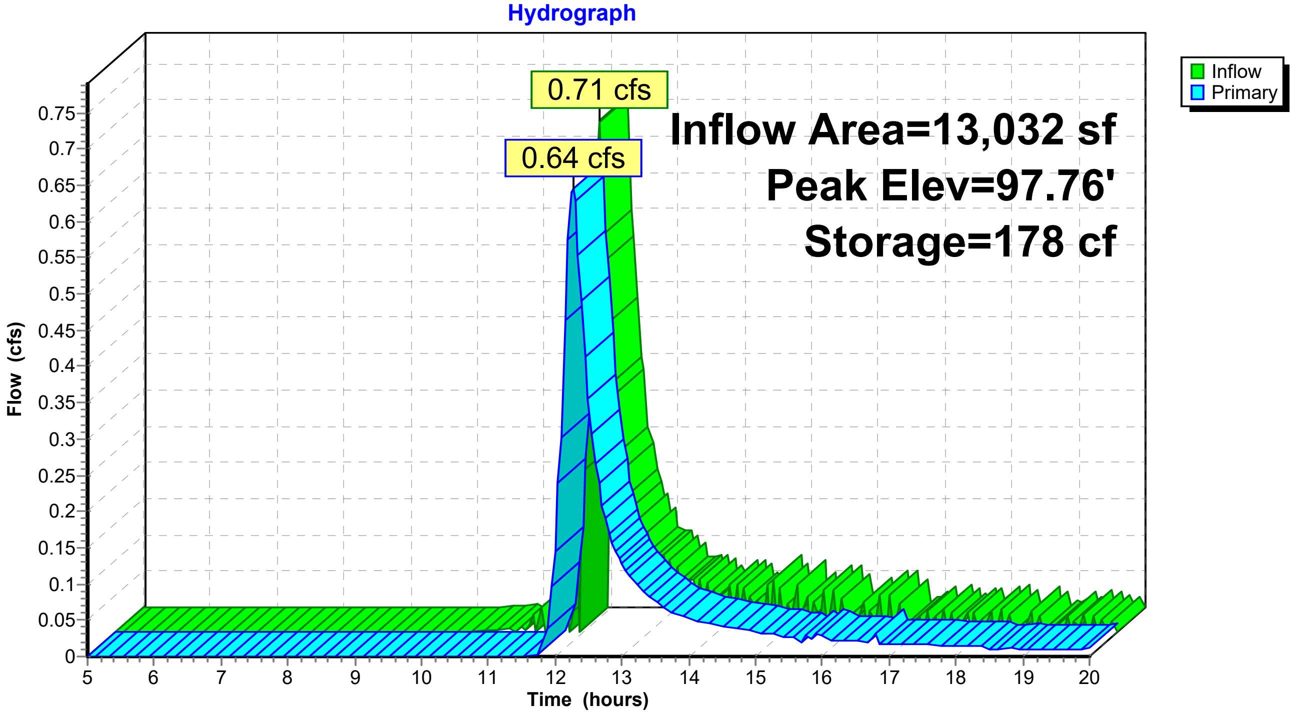
Volume	Invert	Avail.Storage	Storage Description
#1	97.10'	329 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.10	0	0	0
98.00	731	329	329

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 96.25' / 96.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	97.50'	**18.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.64 cfs @ 12.27 hrs HW=97.76' TW=96.09' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.64 cfs of 3.13 cfs potential flow)
└─**2=Orifice/Grate** (Orifice Controls 0.64 cfs @ 1.63 fps)

Pond B2: Infiltration Basin #2 (Storage Zone)



Stage-Discharge for Pond B2: Infiltration Basin #2 (Storage Zone)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
97.10	0.00	97.63	0.23
97.11	0.00	97.64	0.25
97.12	0.00	97.65	0.28
97.13	0.00	97.66	0.31
97.14	0.00	97.67	0.34
97.15	0.00	97.68	0.37
97.16	0.00	97.69	0.40
97.17	0.00	97.70	0.43
97.18	0.00	97.71	0.46
97.19	0.00	97.72	0.50
97.20	0.00	97.73	0.53
97.21	0.00	97.74	0.57
97.22	0.00	97.75	0.60
97.23	0.00	97.76	0.64
97.24	0.00	97.77	0.68
97.25	0.00	97.78	0.71
97.26	0.00	97.79	0.75
97.27	0.00	97.80	0.79
97.28	0.00	97.81	0.83
97.29	0.00	97.82	0.87
97.30	0.00	97.83	0.91
97.31	0.00	97.84	0.95
97.32	0.00	97.85	1.00
97.33	0.00	97.86	1.04
97.34	0.00	97.87	1.08
97.35	0.00	97.88	1.13
97.36	0.00	97.89	1.17
97.37	0.00	97.90	1.22
97.38	0.00	97.91	1.26
97.39	0.00	97.92	1.31
97.40	0.00	97.93	1.36
97.41	0.00	97.94	1.41
97.42	0.00	97.95	1.45
97.43	0.00	97.96	1.50
97.44	0.00	97.97	1.55
97.45	0.00	97.98	1.60
97.46	0.00	97.99	1.65
97.47	0.00	98.00	**1.70**
97.48	0.00		
97.49	0.00		
97.50	0.00		
97.51	0.00		
97.52	0.01		
97.53	0.03		
97.54	0.04		
97.55	0.05		
97.56	0.07		
97.57	0.09		
97.58	0.11		
97.59	0.13		
97.60	0.15		
97.61	0.18		
97.62	0.20		

Stage-Area-Storage for Pond B2: Infiltration Basin #2 (Storage Zone)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
97.10	0	0	97.63	430	114
97.11	8	0	97.64	439	118
97.12	16	0	97.65	447	123
97.13	24	0	97.66	455	127
97.14	32	1	97.67	463	132
97.15	41	1	97.68	471	137
97.16	49	1	97.69	479	141
97.17	57	2	97.70	487	146
97.18	65	3	97.71	495	151
97.19	73	3	97.72	504	156
97.20	81	4	97.73	512	161
97.21	89	5	97.74	520	166
97.22	97	6	97.75	528	172
97.23	106	7	97.76	536	177
97.24	114	8	97.77	544	182
97.25	122	9	97.78	552	188
97.26	130	10	97.79	560	193
97.27	138	12	97.80	569	199
97.28	146	13	97.81	577	205
97.29	154	15	97.82	585	211
97.30	162	16	97.83	593	216
97.31	171	18	97.84	601	222
97.32	179	20	97.85	609	228
97.33	187	21	97.86	617	235
97.34	195	23	97.87	625	241
97.35	203	25	97.88	634	247
97.36	211	27	97.89	642	253
97.37	219	30	97.90	650	260
97.38	227	32	97.91	658	266
97.39	236	34	97.92	666	273
97.40	244	37	97.93	674	280
97.41	252	39	97.94	682	287
97.42	260	42	97.95	690	293
97.43	268	44	97.96	699	300
97.44	276	47	97.97	707	307
97.45	284	50	97.98	715	314
97.46	292	53	97.99	723	322
97.47	301	56	98.00	**731**	**329**
97.48	309	59			
97.49	317	62			
97.50	325	65			
97.51	333	68			
97.52	341	72			
97.53	349	75			
97.54	357	79			
97.55	366	82			
97.56	374	86			
97.57	382	90			
97.58	390	94			
97.59	398	98			
97.60	406	102			
97.61	414	106			
97.62	422	110			

Summary for Pond CB1: CB 1

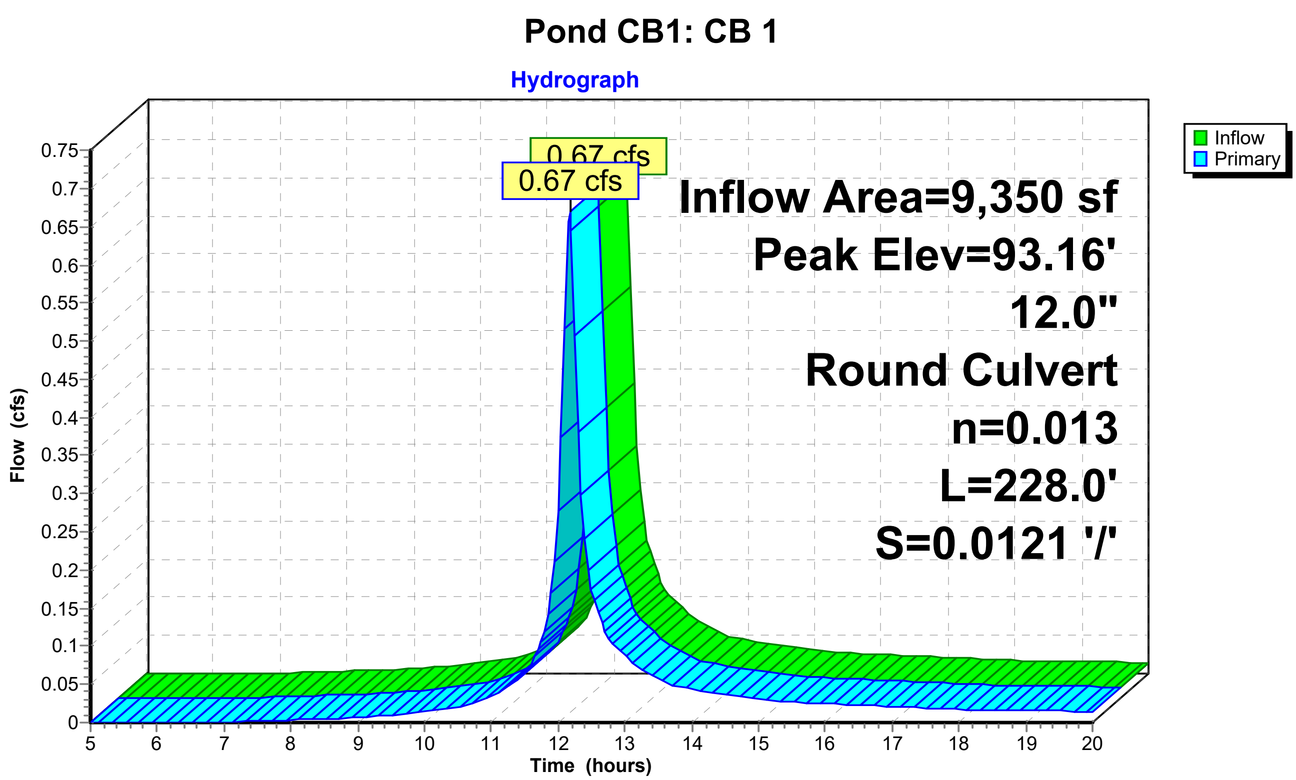
Inflow Area =	9,350 sf,	31.22% Impervious,	Inflow Depth > 2.70"		for 10-Year event
Inflow =	0.67 cfs @	12.17 hrs,	Volume=	2,106 cf	
Outflow =	0.67 cfs @	12.17 hrs,	Volume=	2,106 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.67 cfs @	12.17 hrs,	Volume=	2,106 cf	

Routed to Pond DMH2 : DMH2

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 93.16' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	92.75'	**12.0" Round Culvert** L= 228.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 92.75' / 90.00' S= 0.0121 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.65 cfs @ 12.17 hrs HW=93.16' TW=90.64' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.65 cfs @ 2.17 fps)



Stage-Discharge for Pond CB1: CB 1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
92.75	0.00	93.28	1.05
92.76	0.00	93.29	1.08
92.77	0.00	93.30	1.12
92.78	0.00	93.31	1.15
92.79	0.01	93.32	1.19
92.80	0.01	93.33	1.22
92.81	0.01	93.34	1.26
92.82	0.02	93.35	1.30
92.83	0.03	93.36	1.33
92.84	0.04	93.37	1.37
92.85	0.04	93.38	1.41
92.86	0.05	93.39	1.45
92.87	0.06	93.40	1.48
92.88	0.07	93.41	1.52
92.89	0.09	93.42	1.56
92.90	0.10	93.43	1.60
92.91	0.11	93.44	1.63
92.92	0.12	93.45	1.67
92.93	0.14	93.46	1.71
92.94	0.15	93.47	1.75
92.95	0.17	93.48	1.79
92.96	0.19	93.49	1.83
92.97	0.20	93.50	1.86
92.98	0.22	93.51	1.90
92.99	0.24	93.52	1.94
93.00	0.26	93.53	1.98
93.01	0.28	93.54	2.01
93.02	0.30	93.55	2.05
93.03	0.32	93.56	2.09
93.04	0.35	93.57	2.13
93.05	0.37	93.58	2.16
93.06	0.39	93.59	2.20
93.07	0.42	93.60	2.23
93.08	0.44	93.61	2.27
93.09	0.47	93.62	2.30
93.10	0.49	93.63	2.34
93.11	0.52	93.64	2.37
93.12	0.55	93.65	2.40
93.13	0.57	93.66	2.44
93.14	0.60	93.67	2.47
93.15	0.63	93.68	2.50
93.16	0.66	93.69	2.53
93.17	0.69	93.70	2.56
93.18	0.72	93.71	2.58
93.19	0.75	93.72	2.61
93.20	0.78	93.73	2.63
93.21	0.81	93.74	2.66
93.22	0.85	93.75	**2.67**
93.23	0.88		
93.24	0.91		
93.25	0.95		
93.26	0.98		
93.27	1.01		

Stage-Area-Storage for Pond CB1: CB 1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
92.75	**0**	93.28	0
92.76	0	93.29	0
92.77	0	93.30	0
92.78	0	93.31	0
92.79	0	93.32	0
92.80	0	93.33	0
92.81	0	93.34	0
92.82	0	93.35	0
92.83	0	93.36	0
92.84	0	93.37	0
92.85	0	93.38	0
92.86	0	93.39	0
92.87	0	93.40	0
92.88	0	93.41	0
92.89	0	93.42	0
92.90	0	93.43	0
92.91	0	93.44	0
92.92	0	93.45	0
92.93	0	93.46	0
92.94	0	93.47	0
92.95	0	93.48	0
92.96	0	93.49	0
92.97	0	93.50	0
92.98	0	93.51	0
92.99	0	93.52	0
93.00	0	93.53	0
93.01	0	93.54	0
93.02	0	93.55	0
93.03	0	93.56	0
93.04	0	93.57	0
93.05	0	93.58	0
93.06	0	93.59	0
93.07	0	93.60	0
93.08	0	93.61	0
93.09	0	93.62	0
93.10	0	93.63	0
93.11	0	93.64	0
93.12	0	93.65	0
93.13	0	93.66	0
93.14	0	93.67	0
93.15	0	93.68	0
93.16	0	93.69	0
93.17	0	93.70	0
93.18	0	93.71	0
93.19	0	93.72	0
93.20	0	93.73	0
93.21	0	93.74	0
93.22	0	93.75	0
93.23	0		
93.24	0		
93.25	0		
93.26	0		
93.27	0		

Summary for Pond CB4: CB 4

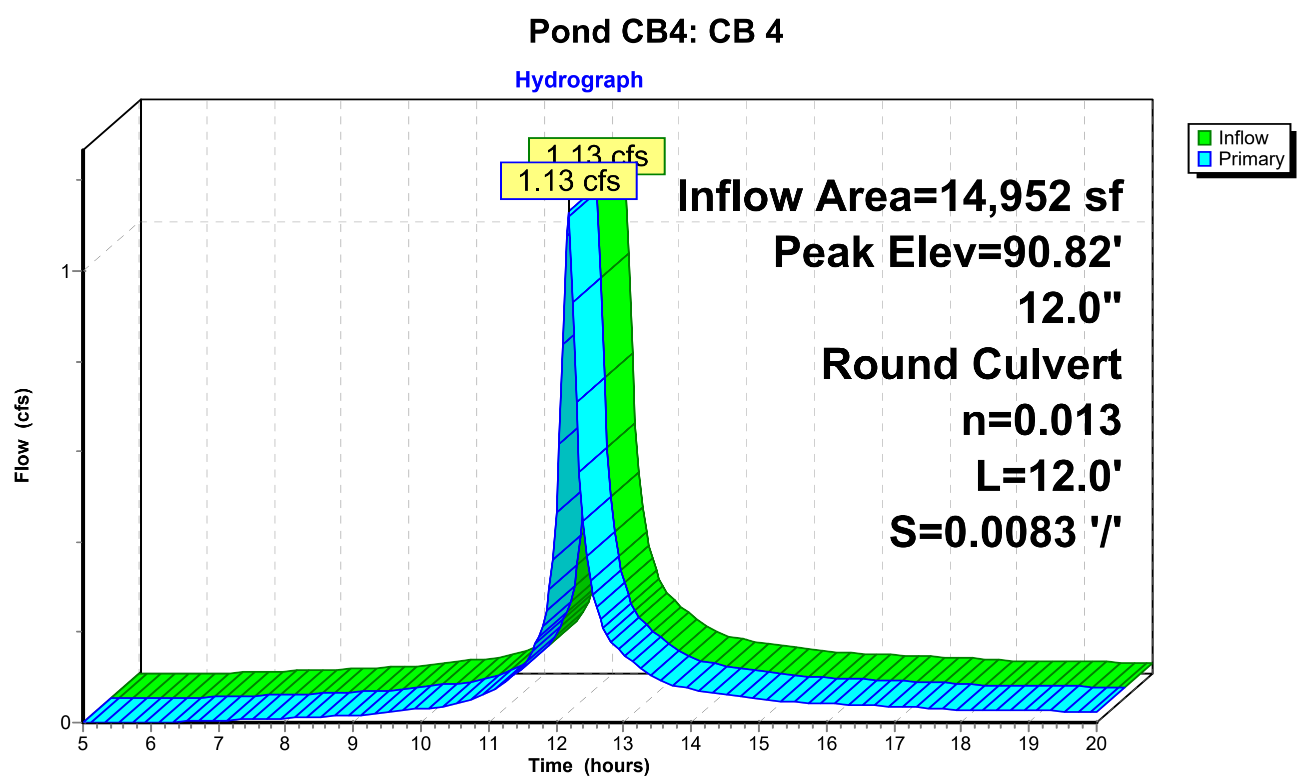
Inflow Area =	14,952 sf,	43.75% Impervious,	Inflow Depth > 2.98"	for 10-Year event	
Inflow =	1.13 cfs @	12.18 hrs,	Volume=	3,709 cf	
Outflow =	1.13 cfs @	12.18 hrs,	Volume=	3,709 cf,	Atten= 0%, Lag= 0.0 min
Primary =	1.13 cfs @	12.18 hrs,	Volume=	3,709 cf	

Routed to Pond DMH2 : DMH2

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.82' @ 12.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	90.10'	**12.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 90.10' / 90.00' S= 0.0083 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.96 cfs @ 12.18 hrs HW=90.80' TW=90.65' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.96 cfs @ 2.30 fps)



Stage-Discharge for Pond CB4: CB 4

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
90.10	0.00	90.63	0.80
90.11	0.00	90.64	0.83
90.12	0.00	90.65	0.86
90.13	0.00	90.66	0.88
90.14	0.01	90.67	0.91
90.15	0.01	90.68	0.94
90.16	0.01	90.69	0.97
90.17	0.02	90.70	0.99
90.18	0.02	90.71	1.02
90.19	0.03	90.72	1.05
90.20	0.03	90.73	1.08
90.21	0.04	90.74	1.11
90.22	0.05	90.75	1.14
90.23	0.06	90.76	1.17
90.24	0.07	90.77	1.20
90.25	0.08	90.78	1.23
90.26	0.09	90.79	1.26
90.27	0.10	90.80	1.29
90.28	0.11	90.81	1.32
90.29	0.12	90.82	1.35
90.30	0.13	90.83	1.38
90.31	0.15	90.84	1.41
90.32	0.16	90.85	1.44
90.33	0.18	90.86	1.47
90.34	0.19	90.87	1.50
90.35	0.21	90.88	1.54
90.36	0.22	90.89	1.57
90.37	0.24	90.90	1.60
90.38	0.25	90.91	1.63
90.39	0.27	90.92	1.66
90.40	0.29	90.93	1.70
90.41	0.31	90.94	1.73
90.42	0.33	90.95	1.76
90.43	0.34	90.96	1.79
90.44	0.36	90.97	1.82
90.45	0.38	90.98	1.86
90.46	0.40	90.99	1.89
90.47	0.42	91.00	1.92
90.48	0.44	91.01	1.95
90.49	0.47	91.02	1.98
90.50	0.49	91.03	2.02
90.51	0.51	91.04	2.05
90.52	0.53	91.05	2.08
90.53	0.56	91.06	2.11
90.54	0.58	91.07	2.15
90.55	0.60	91.08	2.18
90.56	0.63	91.09	2.21
90.57	0.65	91.10	**2.24**
90.58	0.68		
90.59	0.70		
90.60	0.73		
90.61	0.75		
90.62	0.78		

Stage-Area-Storage for Pond CB4: CB 4

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
90.10	**0**	90.63	0
90.11	0	90.64	0
90.12	0	90.65	0
90.13	0	90.66	0
90.14	0	90.67	0
90.15	0	90.68	0
90.16	0	90.69	0
90.17	0	90.70	0
90.18	0	90.71	0
90.19	0	90.72	0
90.20	0	90.73	0
90.21	0	90.74	0
90.22	0	90.75	0
90.23	0	90.76	0
90.24	0	90.77	0
90.25	0	90.78	0
90.26	0	90.79	0
90.27	0	90.80	0
90.28	0	90.81	0
90.29	0	90.82	0
90.30	0	90.83	0
90.31	0	90.84	0
90.32	0	90.85	0
90.33	0	90.86	0
90.34	0	90.87	0
90.35	0	90.88	0
90.36	0	90.89	0
90.37	0	90.90	0
90.38	0	90.91	0
90.39	0	90.92	0
90.40	0	90.93	0
90.41	0	90.94	0
90.42	0	90.95	0
90.43	0	90.96	0
90.44	0	90.97	0
90.45	0	90.98	0
90.46	0	90.99	0
90.47	0	91.00	0
90.48	0	91.01	0
90.49	0	91.02	0
90.50	0	91.03	0
90.51	0	91.04	0
90.52	0	91.05	0
90.53	0	91.06	0
90.54	0	91.07	0
90.55	0	91.08	0
90.56	0	91.09	0
90.57	0	91.10	0
90.58	0		
90.59	0		
90.60	0		
90.61	0		
90.62	0		

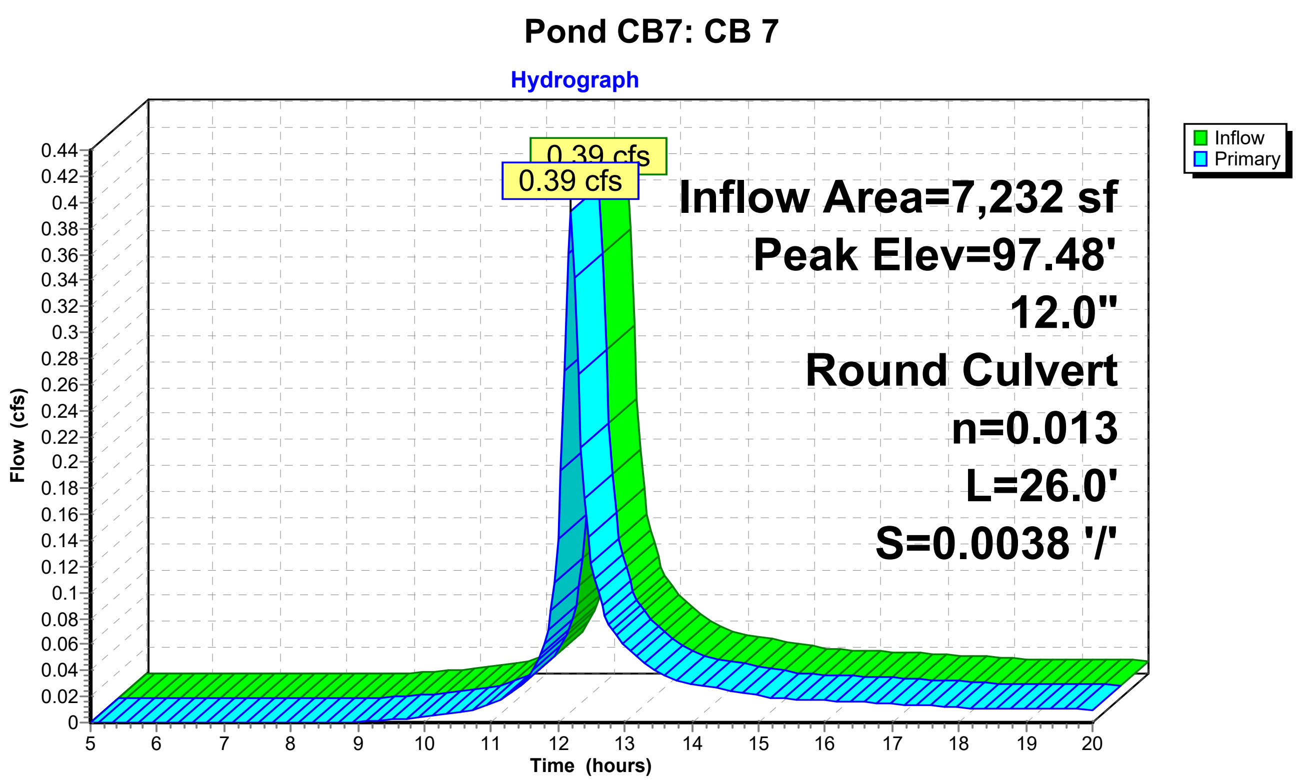
Summary for Pond CB7: CB 7

Inflow Area = 7,232 sf, 0.00% Impervious, Inflow Depth > 2.11" for 10-Year event
Inflow = 0.39 cfs @ 12.19 hrs, Volume= 1,271 cf
Outflow = 0.39 cfs @ 12.19 hrs, Volume= 1,271 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.39 cfs @ 12.19 hrs, Volume= 1,271 cf
Routed to Pond 1P : Subsurface #1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.48' @ 12.32 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	96.60'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.60' / 96.50' S= 0.0038 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.19 hrs HW=97.33' TW=97.42' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)



Stage-Discharge for Pond CB7: CB 7

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
96.60	0.00	97.13	0.71
96.61	0.00	97.14	0.74
96.62	0.00	97.15	0.76
96.63	0.00	97.16	0.79
96.64	0.00	97.17	0.81
96.65	0.01	97.18	0.84
96.66	0.01	97.19	0.86
96.67	0.01	97.20	0.89
96.68	0.02	97.21	0.91
96.69	0.02	97.22	0.94
96.70	0.03	97.23	0.97
96.71	0.03	97.24	1.00
96.72	0.04	97.25	1.02
96.73	0.04	97.26	1.05
96.74	0.05	97.27	1.08
96.75	0.06	97.28	1.11
96.76	0.07	97.29	1.13
96.77	0.08	97.30	1.16
96.78	0.09	97.31	1.19
96.79	0.10	97.32	1.22
96.80	0.11	97.33	1.25
96.81	0.12	97.34	1.28
96.82	0.13	97.35	1.31
96.83	0.14	97.36	1.34
96.84	0.16	97.37	1.37
96.85	0.17	97.38	1.40
96.86	0.18	97.39	1.43
96.87	0.20	97.40	1.45
96.88	0.21	97.41	1.48
96.89	0.23	97.42	1.51
96.90	0.24	97.43	1.54
96.91	0.26	97.44	1.57
96.92	0.27	97.45	1.60
96.93	0.29	97.46	1.63
96.94	0.31	97.47	1.66
96.95	0.33	97.48	1.69
96.96	0.34	97.49	1.72
96.97	0.36	97.50	1.75
96.98	0.38	97.51	1.79
96.99	0.40	97.52	1.82
97.00	0.42	97.53	1.85
97.01	0.44	97.54	1.88
97.02	0.46	97.55	1.90
97.03	0.48	97.56	1.93
97.04	0.50	97.57	1.96
97.05	0.53	97.58	1.99
97.06	0.55	97.59	2.02
97.07	0.57	97.60	**2.05**
97.08	0.59		
97.09	0.62		
97.10	0.64		
97.11	0.66		
97.12	0.69		

Stage-Area-Storage for Pond CB7: CB 7

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
96.60	**0**	97.13	0
96.61	0	97.14	0
96.62	0	97.15	0
96.63	0	97.16	0
96.64	0	97.17	0
96.65	0	97.18	0
96.66	0	97.19	0
96.67	0	97.20	0
96.68	0	97.21	0
96.69	0	97.22	0
96.70	0	97.23	0
96.71	0	97.24	0
96.72	0	97.25	0
96.73	0	97.26	0
96.74	0	97.27	0
96.75	0	97.28	0
96.76	0	97.29	0
96.77	0	97.30	0
96.78	0	97.31	0
96.79	0	97.32	0
96.80	0	97.33	0
96.81	0	97.34	0
96.82	0	97.35	0
96.83	0	97.36	0
96.84	0	97.37	0
96.85	0	97.38	0
96.86	0	97.39	0
96.87	0	97.40	0
96.88	0	97.41	0
96.89	0	97.42	0
96.90	0	97.43	0
96.91	0	97.44	0
96.92	0	97.45	0
96.93	0	97.46	0
96.94	0	97.47	0
96.95	0	97.48	0
96.96	0	97.49	0
96.97	0	97.50	0
96.98	0	97.51	0
96.99	0	97.52	0
97.00	0	97.53	0
97.01	0	97.54	0
97.02	0	97.55	0
97.03	0	97.56	0
97.04	0	97.57	0
97.05	0	97.58	0
97.06	0	97.59	0
97.07	0	97.60	0
97.08	0		
97.09	0		
97.10	0		
97.11	0		
97.12	0		

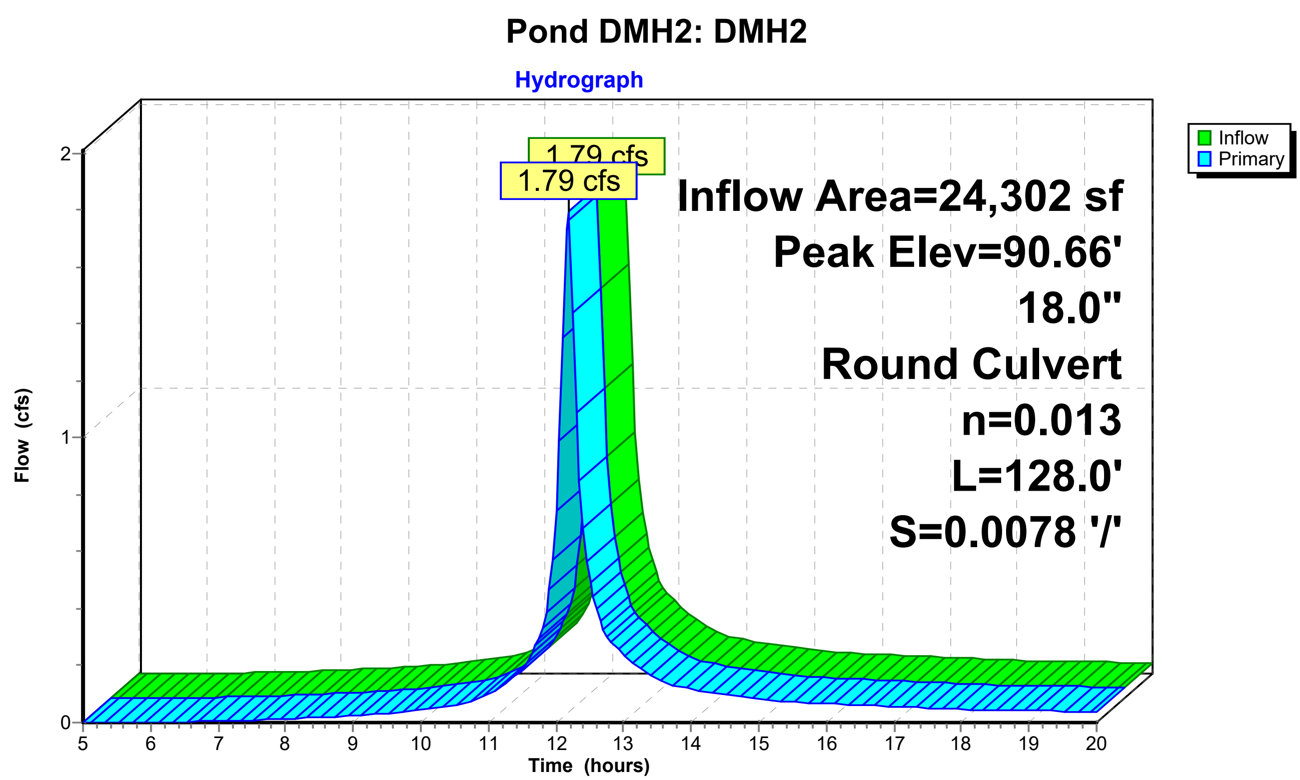
Summary for Pond DMH2: DMH2

Inflow Area = 24,302 sf, 38.93% Impervious, Inflow Depth > 2.87" for 10-Year event
Inflow = 1.79 cfs @ 12.18 hrs, Volume= 5,815 cf
Outflow = 1.79 cfs @ 12.18 hrs, Volume= 5,815 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.79 cfs @ 12.18 hrs, Volume= 5,815 cf
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.66' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	**18.0" Round Culvert** L= 128.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 90.00' / 89.00' S= 0.0078 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=1.60 cfs @ 12.18 hrs HW=90.65' TW=89.82' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.60 cfs @ 3.23 fps)



Stage-Discharge for Pond DMH2: DMH2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
90.00	0.00	90.53	1.31	91.06	4.44
90.01	0.00	90.54	1.36	91.07	4.51
90.02	0.00	90.55	1.41	91.08	4.58
90.03	0.00	90.56	1.45	91.09	4.65
90.04	0.01	90.57	1.50	91.10	4.71
90.05	0.01	90.58	1.55	91.11	4.78
90.06	0.01	90.59	1.60	91.12	4.85
90.07	0.02	90.60	1.65	91.13	4.91
90.08	0.03	90.61	1.70	91.14	4.98
90.09	0.04	90.62	1.76	91.15	5.05
90.10	0.04	90.63	1.81	91.16	5.12
90.11	0.05	90.64	1.86	91.17	5.18
90.12	0.06	90.65	1.92	91.18	5.25
90.13	0.08	90.66	1.97	91.19	5.32
90.14	0.09	90.67	2.02	91.20	5.39
90.15	0.10	90.68	2.08	91.21	5.45
90.16	0.12	90.69	2.13	91.22	5.52
90.17	0.13	90.70	2.19	91.23	5.59
90.18	0.15	90.71	2.25	91.24	5.66
90.19	0.17	90.72	2.30	91.25	5.72
90.20	0.19	90.73	2.36	91.26	5.79
90.21	0.21	90.74	2.42	91.27	5.86
90.22	0.23	90.75	2.48	91.28	5.93
90.23	0.25	90.76	2.54	91.29	5.99
90.24	0.27	90.77	2.59	91.30	6.06
90.25	0.30	90.78	2.65	91.31	6.12
90.26	0.32	90.79	2.71	91.32	6.19
90.27	0.35	90.80	2.77	91.33	6.26
90.28	0.38	90.81	2.83	91.34	6.32
90.29	0.40	90.82	2.90	91.35	6.39
90.30	0.43	90.83	2.96	91.36	6.45
90.31	0.46	90.84	3.02	91.37	6.52
90.32	0.49	90.85	3.08	91.38	6.58
90.33	0.52	90.86	3.14	91.39	6.65
90.34	0.55	90.87	3.21	91.40	6.71
90.35	0.59	90.88	3.27	91.41	6.78
90.36	0.62	90.89	3.33	91.42	6.84
90.37	0.66	90.90	3.40	91.43	6.91
90.38	0.69	90.91	3.46	91.44	6.97
90.39	0.73	90.92	3.52	91.45	7.03
90.40	0.76	90.93	3.59	91.46	7.09
90.41	0.80	90.94	3.65	91.47	7.16
90.42	0.84	90.95	3.72	91.48	7.22
90.43	0.88	90.96	3.78	91.49	7.28
90.44	0.92	90.97	3.85	91.50	**7.34**
90.45	0.96	90.98	3.91		
90.46	1.00	90.99	3.98		
90.47	1.04	91.00	4.05		
90.48	1.09	91.01	4.11		
90.49	1.13	91.02	4.18		
90.50	1.17	91.03	4.24		
90.51	1.22	91.04	4.31		
90.52	1.27	91.05	4.38		

Stage-Area-Storage for Pond DMH2: DMH2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
90.00	**0**	90.53	0	91.06	0
90.01	0	90.54	0	91.07	0
90.02	0	90.55	0	91.08	0
90.03	0	90.56	0	91.09	0
90.04	0	90.57	0	91.10	0
90.05	0	90.58	0	91.11	0
90.06	0	90.59	0	91.12	0
90.07	0	90.60	0	91.13	0
90.08	0	90.61	0	91.14	0
90.09	0	90.62	0	91.15	0
90.10	0	90.63	0	91.16	0
90.11	0	90.64	0	91.17	0
90.12	0	90.65	0	91.18	0
90.13	0	90.66	0	91.19	0
90.14	0	90.67	0	91.20	0
90.15	0	90.68	0	91.21	0
90.16	0	90.69	0	91.22	0
90.17	0	90.70	0	91.23	0
90.18	0	90.71	0	91.24	0
90.19	0	90.72	0	91.25	0
90.20	0	90.73	0	91.26	0
90.21	0	90.74	0	91.27	0
90.22	0	90.75	0	91.28	0
90.23	0	90.76	0	91.29	0
90.24	0	90.77	0	91.30	0
90.25	0	90.78	0	91.31	0
90.26	0	90.79	0	91.32	0
90.27	0	90.80	0	91.33	0
90.28	0	90.81	0	91.34	0
90.29	0	90.82	0	91.35	0
90.30	0	90.83	0	91.36	0
90.31	0	90.84	0	91.37	0
90.32	0	90.85	0	91.38	0
90.33	0	90.86	0	91.39	0
90.34	0	90.87	0	91.40	0
90.35	0	90.88	0	91.41	0
90.36	0	90.89	0	91.42	0
90.37	0	90.90	0	91.43	0
90.38	0	90.91	0	91.44	0
90.39	0	90.92	0	91.45	0
90.40	0	90.93	0	91.46	0
90.41	0	90.94	0	91.47	0
90.42	0	90.95	0	91.48	0
90.43	0	90.96	0	91.49	0
90.44	0	90.97	0	91.50	0
90.45	0	90.98	0		
90.46	0	90.99	0		
90.47	0	91.00	0		
90.48	0	91.01	0		
90.49	0	91.02	0		
90.50	0	91.03	0		
90.51	0	91.04	0		
90.52	0	91.05	0		

Summary for Pond IB1: Infiltration Basin #1 (Exfiltration Zone)

Inflow Area = 54,661 sf, 51.78% Impervious, Inflow Depth > 3.20" for 10-Year event
Inflow = 4.54 cfs @ 12.15 hrs, Volume= 14,559 cf
Outflow = 3.81 cfs @ 12.15 hrs, Volume= 13,847 cf, Atten= 16%, Lag= 0.0 min
Discarded = 0.02 cfs @ 6.15 hrs, Volume= 935 cf
Primary = 3.79 cfs @ 12.15 hrs, Volume= 12,912 cf
Routed to Pond 10P : Infiltration Basin #1 (Storage)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.07' @ 12.32 hrs Surf.Area= 736 sf Storage= 1,526 cf

Plug-Flow detention time= 33.6 min calculated for 13,800 cf (95% of inflow)
Center-of-Mass det. time= 14.8 min (782.0 - 767.1)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	2,944 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

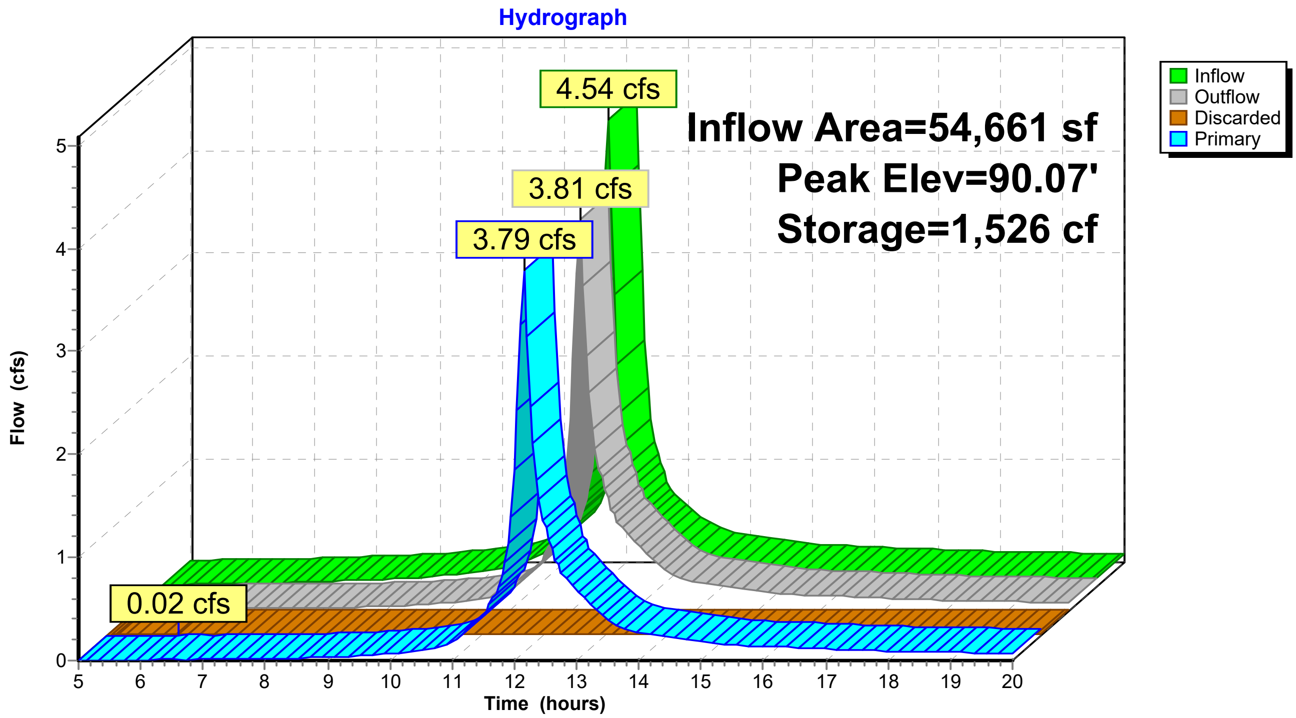
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	736	0	0
92.00	736	2,944	2,944

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.00'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	88.00'	**48.0" Round Culvert** L= 2.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 88.00' / 88.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf

Discarded OutFlow Max=0.02 cfs @ 6.15 hrs HW=88.04' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 12.15 hrs HW=89.71' TW=89.87' (Dynamic Tailwater)
└─**2=Culvert** (Controls 0.00 cfs)

Pond IB1: Infiltration Basin #1 (Exfiltration Zone)



Stage-Discharge for Pond IB1: Infiltration Basin #1 (Exfiltration Zone)

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
88.00	0.00	**0.00**	0.00
88.05	0.03	**0.02**	0.01
88.10	0.07	0.02	0.05
88.15	0.13	0.02	0.11
88.20	0.23	0.02	0.21
88.25	0.35	0.02	0.33
88.30	0.50	0.02	0.48
88.35	0.68	0.02	0.66
88.40	0.88	0.02	0.86
88.45	1.11	0.02	1.09
88.50	1.37	0.02	1.35
88.55	1.65	0.02	1.63
88.60	1.96	0.02	1.94
88.65	2.29	0.02	2.27
88.70	2.65	0.02	2.63
88.75	3.03	0.02	3.01
88.80	3.44	0.02	3.42
88.85	3.87	0.02	3.85
88.90	4.33	0.02	4.31
88.95	4.81	0.02	4.79
89.00	5.31	0.02	5.29
89.05	5.84	0.02	5.82
89.10	6.39	0.02	6.37
89.15	6.96	0.02	6.94
89.20	7.56	0.02	7.54
89.25	8.17	0.02	8.16
89.30	8.81	0.02	8.79
89.35	9.47	0.02	9.45
89.40	10.15	0.02	10.14
89.45	10.86	0.02	10.84
89.50	11.58	0.02	11.56
89.55	12.32	0.02	12.30
89.60	13.09	0.02	13.07
89.65	13.87	0.02	13.85
89.70	14.67	0.02	14.65
89.75	15.49	0.02	15.48
89.80	16.33	0.02	16.32
89.85	17.19	0.02	17.17
89.90	18.07	0.02	18.05
89.95	18.96	0.02	18.94
90.00	19.87	0.02	19.86
90.05	20.80	0.02	20.79
90.10	21.75	0.02	21.73
90.15	22.71	0.02	22.69
90.20	23.69	0.02	23.67
90.25	24.68	0.02	24.66
90.30	25.69	0.02	25.67
90.35	26.71	0.02	26.70
90.40	27.75	0.02	27.74
90.45	28.81	0.02	28.79
90.50	29.87	0.02	29.86
90.55	30.95	0.02	30.93
90.60	32.05	0.02	32.03
90.65	33.15	0.02	33.13
90.70	34.27	0.02	34.25
90.75	35.40	0.02	35.38
90.80	36.54	0.02	36.52
90.85	37.69	0.02	37.67
90.90	38.85	0.02	38.84
90.95	40.03	0.02	40.01
91.00	41.21	0.02	41.19
91.05	42.40	0.02	42.38
91.10	43.60	0.02	43.58
91.15	44.81	0.02	44.79
91.20	46.02	0.02	46.01
91.25	47.25	0.02	47.23
91.30	48.48	0.02	48.46
91.35	49.71	0.02	49.69
91.40	50.95	0.02	50.94
91.45	52.20	0.02	52.18
91.50	53.45	0.02	53.44
91.55	54.71	0.02	54.69
91.60	55.97	0.02	55.95
91.65	57.23	0.02	57.21
91.70	58.49	0.02	58.48
91.75	59.76	0.02	59.74
91.80	61.03	0.02	61.01
91.85	62.29	0.02	62.28
91.90	63.56	0.02	63.54
91.95	64.83	0.02	64.81
92.00	**66.09**	0.02	**66.07**

Stage-Area-Storage for Pond IB1: Infiltration Basin #1 (Exfiltration Zone)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
88.00	**736**	0	90.65	736	1,950
88.05	736	37	90.70	736	1,987
88.10	736	74	90.75	736	2,024
88.15	736	110	90.80	736	2,061
88.20	736	147	90.85	736	2,098
88.25	736	184	90.90	736	2,134
88.30	736	221	90.95	736	2,171
88.35	736	258	91.00	736	2,208
88.40	736	294	91.05	736	2,245
88.45	736	331	91.10	736	2,282
88.50	736	368	91.15	736	2,318
88.55	736	405	91.20	736	2,355
88.60	736	442	91.25	736	2,392
88.65	736	478	91.30	736	2,429
88.70	736	515	91.35	736	2,466
88.75	736	552	91.40	736	2,502
88.80	736	589	91.45	736	2,539
88.85	736	626	91.50	736	2,576
88.90	736	662	91.55	736	2,613
88.95	736	699	91.60	736	2,650
89.00	736	736	91.65	736	2,686
89.05	736	773	91.70	736	2,723
89.10	736	810	91.75	736	2,760
89.15	736	846	91.80	736	2,797
89.20	736	883	91.85	736	2,834
89.25	736	920	91.90	736	2,870
89.30	736	957	91.95	736	2,907
89.35	736	994	92.00	736	**2,944**
89.40	736	1,030			
89.45	736	1,067			
89.50	736	1,104			
89.55	736	1,141			
89.60	736	1,178			
89.65	736	1,214			
89.70	736	1,251			
89.75	736	1,288			
89.80	736	1,325			
89.85	736	1,362			
89.90	736	1,398			
89.95	736	1,435			
90.00	736	1,472			
90.05	736	1,509			
90.10	736	1,546			
90.15	736	1,582			
90.20	736	1,619			
90.25	736	1,656			
90.30	736	1,693			
90.35	736	1,730			
90.40	736	1,766			
90.45	736	1,803			
90.50	736	1,840			
90.55	736	1,877			
90.60	736	1,914			

Summary for Pond IB2: Infiltration Basin #2 (Exfiltration Zone)

Inflow Area = 13,032 sf, 17.40% Impervious, Inflow Depth > 2.44" for 10-Year event
Inflow = 0.78 cfs @ 12.21 hrs, Volume= 2,648 cf
Outflow = 0.72 cfs @ 12.24 hrs, Volume= 2,473 cf, Atten= 8%, Lag= 2.2 min
Discarded = 0.01 cfs @ 10.20 hrs, Volume= 401 cf
Primary = 0.71 cfs @ 12.24 hrs, Volume= 2,072 cf
Routed to Pond B2 : Infiltration Basin #2 (Storage Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.77' @ 12.31 hrs Surf.Area= 424 sf Storage= 285 cf

Plug-Flow detention time= 34.9 min calculated for 2,464 cf (93% of inflow)
Center-of-Mass det. time= 11.7 min (810.0 - 798.3)

Volume	Invert	Avail.Storage	Storage Description
#1	97.10'	382 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

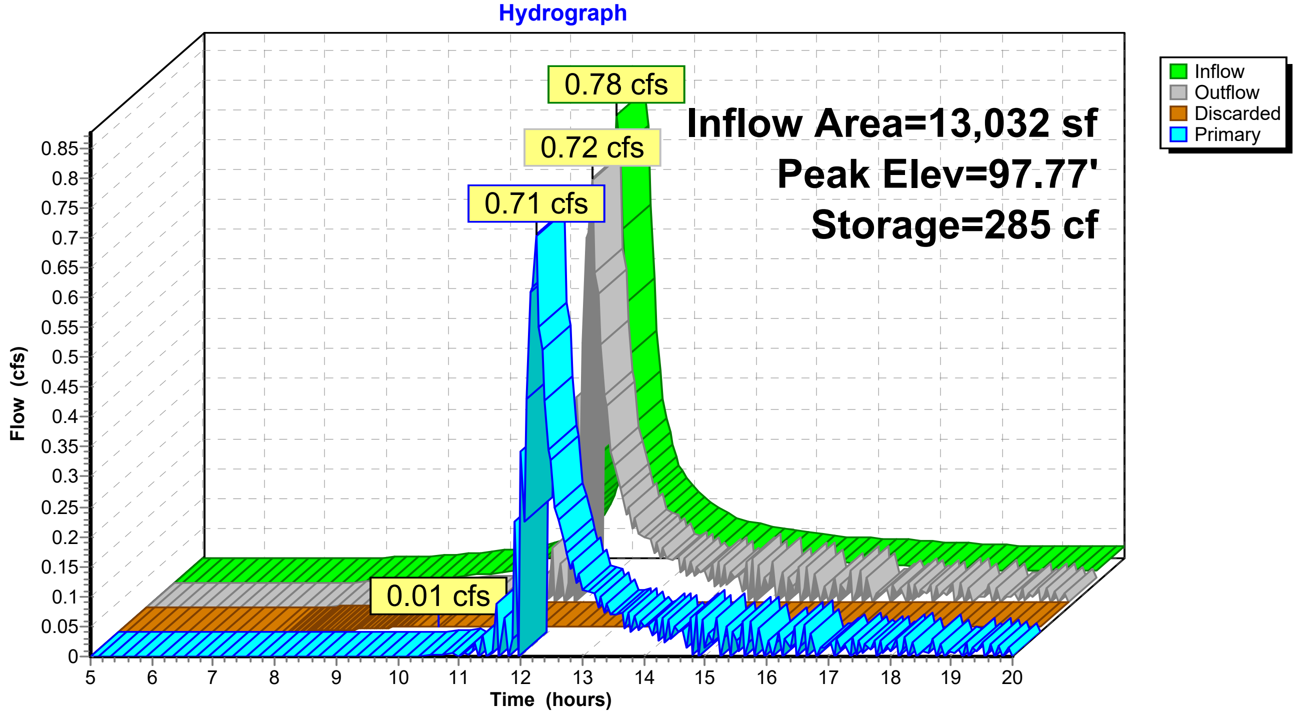
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.10	424	0	0
98.00	424	382	382

Device	Routing	Invert	Outlet Devices
#1	Discarded	97.10'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	97.10'	**36.0" Round Culvert** L= 2.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 97.10' / 97.10' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf

Discarded OutFlow Max=0.01 cfs @ 10.20 hrs HW=97.13' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.05 cfs @ 12.24 hrs HW=97.76' TW=97.76' (Dynamic Tailwater)
└**2=Culvert** (Outlet Controls 0.05 cfs @ 0.06 fps)

Pond IB2: Infiltration Basin #2 (Exfiltration Zone)



Stage-Discharge for Pond IB2: Infiltration Basin #2 (Exfiltration Zone)

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
97.10	0.00	**0.00**	0.00
97.15	0.02	**0.01**	0.01
97.20	0.05	0.01	0.04
97.25	0.11	0.01	0.10
97.30	0.19	0.01	0.18
97.35	0.30	0.01	0.29
97.40	0.42	0.01	0.41
97.45	0.58	0.01	0.57
97.50	0.75	0.01	0.74
97.55	0.95	0.01	0.94
97.60	1.17	0.01	1.16
97.65	1.41	0.01	1.40
97.70	1.67	0.01	1.66
97.75	1.95	0.01	1.94
97.80	2.25	0.01	2.24
97.85	2.58	0.01	2.57
97.90	2.92	0.01	2.91
97.95	3.29	0.01	3.28
98.00	3.67	0.01	3.66
98.05	4.07	0.01	4.06
98.10	4.49	0.01	4.48
98.15	4.93	0.01	4.92
98.20	5.39	0.01	5.38
98.25	5.87	0.01	5.86
98.30	6.36	0.01	6.35
98.35	6.87	0.01	6.86
98.40	7.40	0.01	7.39
98.45	7.94	0.01	7.93
98.50	8.50	0.01	8.49
98.55	9.07	0.01	9.06
98.60	9.66	0.01	9.65
98.65	10.27	0.01	10.26
98.70	10.89	0.01	10.88
98.75	11.52	0.01	11.51
98.80	12.17	0.01	12.16
98.85	12.83	0.01	12.82
98.90	13.50	0.01	13.49
98.95	14.18	0.01	14.17
99.00	14.88	0.01	14.87
99.05	15.59	0.01	15.58
99.10	16.31	0.01	16.30
99.15	17.04	0.01	17.03
99.20	17.77	0.01	17.76
99.25	18.52	0.01	18.51
99.30	19.28	0.01	19.27
99.35	20.05	0.01	20.04
99.40	20.82	0.01	20.81
99.45	21.60	0.01	21.59
99.50	22.39	0.01	22.38
99.55	23.19	0.01	23.18
99.60	23.99	0.01	23.98
99.65	24.79	0.01	24.78
99.70	25.60	0.01	25.59
99.75	26.42	0.01	26.41
99.80	27.23	0.01	27.22
99.85	28.05	0.01	28.04
99.90	28.87	0.01	28.86
99.95	29.69	0.01	29.68
100.00	30.52	0.01	30.51
100.05	31.34	0.01	31.33
100.10	**32.16**	0.01	**32.15**

Stage-Area-Storage for Pond IB2: Infiltration Basin #2 (Exfiltration Zone)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
97.10	**424**	0
97.15	424	21
97.20	424	42
97.25	424	64
97.30	424	85
97.35	424	106
97.40	424	127
97.45	424	148
97.50	424	170
97.55	424	191
97.60	424	212
97.65	424	233
97.70	424	254
97.75	424	276
97.80	424	297
97.85	424	318
97.90	424	339
97.95	424	360
98.00	424	**382**
98.05	424	382
98.10	424	382
98.15	424	382
98.20	424	382
98.25	424	382
98.30	424	382
98.35	424	382
98.40	424	382
98.45	424	382
98.50	424	382
98.55	424	382
98.60	424	382
98.65	424	382
98.70	424	382
98.75	424	382
98.80	424	382
98.85	424	382
98.90	424	382
98.95	424	382
99.00	424	382
99.05	424	382
99.10	424	382
99.15	424	382
99.20	424	382
99.25	424	382
99.30	424	382
99.35	424	382
99.40	424	382
99.45	424	382
99.50	424	382
99.55	424	382
99.60	424	382
99.65	424	382
99.70	424	382
99.75	424	382
99.80	424	382
99.85	424	382
99.90	424	382
99.95	424	382
100.00	424	382
100.05	424	382
100.10	424	382

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Units 10-11 Entrance Runoff Area=13,032 sf 17.40% Impervious Runoff Depth>3.44"
Flow Length=190' Tc=12.6 min CN=78 Runoff=1.09 cfs 3,740 cf

Subcatchment 1pre: Site Runoff Area=134,756 sf 4.57% Impervious Runoff Depth>3.04"
Flow Length=451' Tc=22.8 min UI Adjusted CN=74 Runoff=7.73 cfs 34,177 cf

Subcatchment 2: Units 8-11 Backyards Runoff Area=7,232 sf 0.00% Impervious Runoff Depth>3.06"
Flow Length=84' Tc=11.3 min CN=74 Runoff=0.57 cfs 1,843 cf

Subcatchment 3: Outer Border Runoff Area=53,130 sf 0.00% Impervious Runoff Depth>2.87"
Flow Length=87' Tc=7.9 min CN=72 Runoff=4.43 cfs 12,724 cf

Subcatchment 4: Unit 5 Backyard and Basin Runoff Area=8,967 sf 0.00% Impervious Runoff Depth>3.06"
Flow Length=110' Tc=7.7 min CN=74 Runoff=0.80 cfs 2,288 cf

Subcatchment 5: Unit 5 Parking Runoff Area=8,830 sf 71.11% Impervious Runoff Depth>4.78"
Flow Length=100' Tc=7.9 min CN=91 Runoff=1.12 cfs 3,514 cf

Subcatchment 6: Driveway Center Section Runoff Area=14,952 sf 43.75% Impervious Runoff Depth>4.06"
Flow Length=163' Tc=10.8 min CN=84 Runoff=1.51 cfs 5,053 cf

Subcatchment 7: Driveway Entrance Runoff Area=9,350 sf 31.22% Impervious Runoff Depth>3.75"
Flow Length=88' Slope=0.0400 '/' Tc=9.8 min CN=81 Runoff=0.92 cfs 2,920 cf

Subcatchment U1: Unit #1 Runoff Area=1,676 sf 100.00% Impervious Runoff Depth>5.38"
Tc=5.0 min CN=98 Runoff=0.24 cfs 751 cf

Subcatchment U10: Unit #10 Runoff Area=1,676 sf 100.00% Impervious Runoff Depth>5.38"
Tc=5.0 min CN=98 Runoff=0.24 cfs 751 cf

Subcatchment U11: Unit #11 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>5.38"
Tc=5.0 min CN=98 Runoff=0.24 cfs 751 cf

Subcatchment U2: Unit #2 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>5.38"
Tc=5.0 min CN=98 Runoff=0.24 cfs 751 cf

Subcatchment U3: Unit #3 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>5.38"
Tc=5.0 min CN=98 Runoff=0.24 cfs 751 cf

Subcatchment U4: Unit #4 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>5.38"
Tc=5.0 min CN=98 Runoff=0.24 cfs 751 cf

Subcatchment U5: Unit #5 Runoff Area=2,510 sf 100.00% Impervious Runoff Depth>5.38"
Tc=5.0 min CN=98 Runoff=0.37 cfs 1,125 cf

Subcatchment U6: Unit #6 Runoff Area=1,676 sf 100.00% Impervious Runoff Depth>5.38"
Tc=5.0 min CN=98 Runoff=0.24 cfs 751 cf

Subcatchment U7: Unit #7 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>5.38"
Tc=5.0 min CN=98 Runoff=0.24 cfs 751 cf

Subcatchment U8: Unit #8 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>5.38"
Tc=5.0 min CN=98 Runoff=0.24 cfs 751 cf

Subcatchment U9: Unit #9 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>5.38"
Tc=5.0 min CN=98 Runoff=0.24 cfs 751 cf

Reach 3R: Wetland Surface 1 Avg. Flow Depth=0.14' Max Vel=0.51 fps Inflow=1.47 cfs 5,617 cf
n=0.100 L=344.0' S=0.0291 '/' Capacity=20.30 cfs Outflow=1.23 cfs 5,569 cf

Reach 4R: 8" ROOF DRAIN CARRIER Avg. Flow Depth=0.24' Max Vel=4.12 fps Inflow=0.49 cfs 1,502 cf
8.0" Round Pipe n=0.013 L=206.0' S=0.0194 '/' Capacity=1.68 cfs Outflow=0.48 cfs 1,500 cf

Reach 5R: Wetland Surface 2 Avg. Flow Depth=0.14' Max Vel=0.28 fps Inflow=0.93 cfs 3,048 cf
n=0.100 L=245.0' S=0.0082 '/' Capacity=10.76 cfs Outflow=0.68 cfs 3,001 cf

Reach 8R: 6" Roof Drain Carrier Pipe Avg. Flow Depth=0.28' Max Vel=4.16 fps Inflow=0.49 cfs 1,502 cf
6.0" Round Pipe n=0.013 L=113.0' S=0.0195 '/' Capacity=0.78 cfs Outflow=0.48 cfs 1,501 cf

Reach 9R: 12" Roof Drain Carrier Pipe Avg. Flow Depth=0.36' Max Vel=3.81 fps Inflow=0.97 cfs 3,002 cf
12.0" Round Pipe n=0.013 L=212.0' S=0.0099 '/' Capacity=3.55 cfs Outflow=0.96 cfs 2,999 cf

Reach DP1PRE: DP 1 - PRE Inflow=7.73 cfs 34,177 cf
Outflow=7.73 cfs 34,177 cf

Reach DP1PST: DP 1 - POST Inflow=7.49 cfs 35,265 cf
Outflow=7.49 cfs 35,265 cf

Pond 1P: Subsurface #1 Peak Elev=97.72' Storage=1,373 cf Inflow=1.43 cfs 4,846 cf
Discarded=0.03 cfs 1,461 cf Primary=0.96 cfs 2,616 cf Outflow=0.99 cfs 4,076 cf

Pond 5P: CB 5 Peak Elev=90.38' Inflow=1.12 cfs 3,514 cf
12.0" Round Culvert n=0.013 L=13.0' S=0.0192 '/' Outflow=1.12 cfs 3,514 cf

Pond 10P: Infiltration Basin #1 (Storage) Peak Elev=90.37' Storage=3,197 cf Inflow=5.11 cfs 17,741 cf
Primary=3.16 cfs 16,972 cf Secondary=0.00 cfs 0 cf Outflow=3.16 cfs 16,972 cf

Pond B2: Infiltration Basin #2 (Storage Zone) Peak Elev=97.83' Storage=219 cf Inflow=0.97 cfs 3,120 cf
Outflow=0.93 cfs 3,048 cf

Pond CB1: CB 1 Peak Elev=93.24' Inflow=0.92 cfs 2,920 cf
12.0" Round Culvert n=0.013 L=228.0' S=0.0121 '/' Outflow=0.92 cfs 2,920 cf

Pond CB4: CB 4 Peak Elev=90.98' Inflow=1.51 cfs 5,053 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0083 '/' Outflow=1.51 cfs 5,053 cf

Pond CB7: CB 7 Peak Elev=97.73' Inflow=0.57 cfs 1,843 cf
12.0" Round Culvert n=0.013 L=26.0' S=0.0038 '/' Outflow=0.57 cfs 1,843 cf

Pond DMH2: DMH2 Peak Elev=90.81' Inflow=2.42 cfs 7,973 cf
18.0" Round Culvert n=0.013 L=128.0' S=0.0078 '/' Outflow=2.42 cfs 7,973 cf

Pond IB1: Infiltration Basin #1 (Exfiltration Peak Elev=90.37' Storage=1,748 cf Inflow=5.99 cfs 19,401 cf
Discarded=0.02 cfs 937 cf Primary=5.11 cfs 17,741 cf Outflow=5.13 cfs 18,678 cf

Pond IB2: Infiltration Basin #2 (Exfiltration Peak Elev=97.85' Storage=319 cf Inflow=1.09 cfs 3,740 cf
Discarded=0.01 cfs 441 cf Primary=0.97 cfs 3,120 cf Outflow=0.98 cfs 3,560 cf

Total Runoff Area = 269,512 sf Runoff Volume = 74,892 cf Average Runoff Depth = 3.33"
83.89% Pervious = 226,087 sf 16.11% Impervious = 43,425 sf

Summary for Subcatchment 1: Units 10-11 Entrance

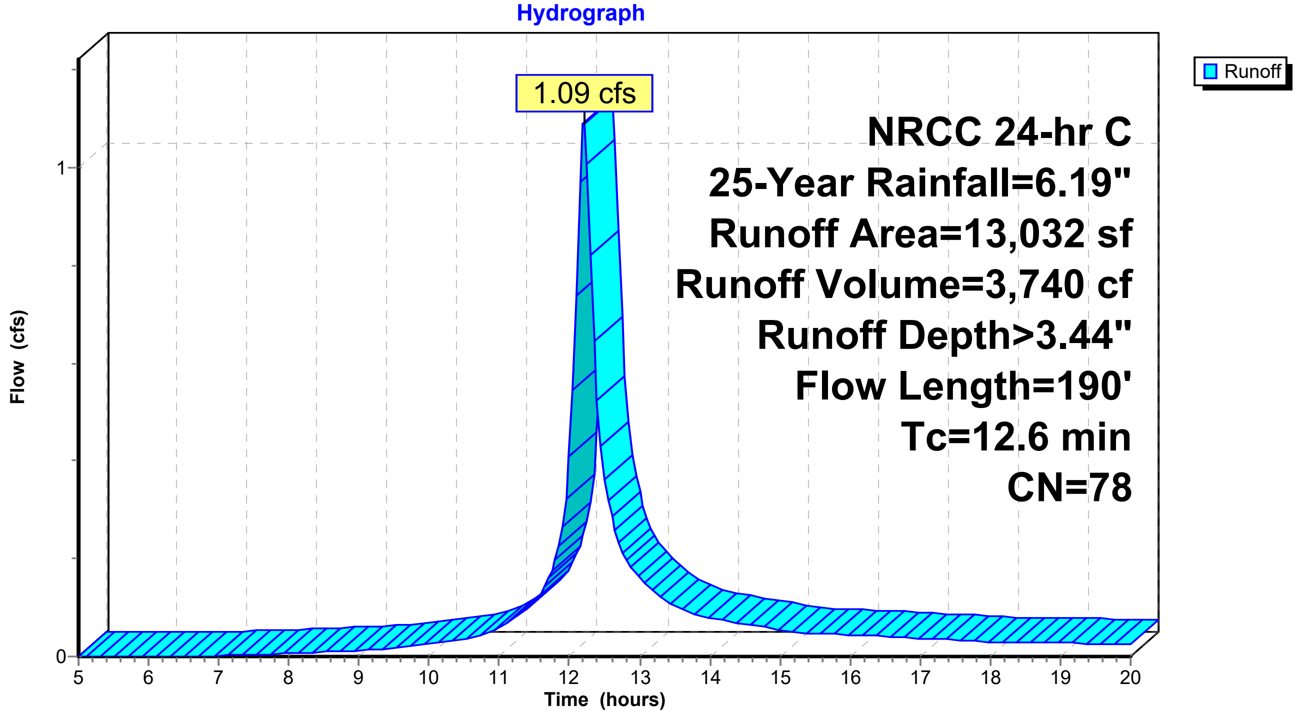
Runoff = 1.09 cfs @ 12.20 hrs, Volume= 3,740 cf, Depth> 3.44"
Routed to Pond IB2 : Infiltration Basin #2 (Exfiltration Zone)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
9,762	74	>75% Grass cover, Good, HSG C
1,003	70	Woods, Good, HSG C
2,267	98	Paved roads w/curbs & sewers, HSG C
13,032	78	Weighted Average
10,765		82.60% Pervious Area
2,267		17.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.8	55	0.0300	1.21		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.1	17	0.0100	2.03		**Shallow Concentrated Flow, Driveway** Paved Kv= 20.3 fps
1.2	68	0.0180	0.94		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
12.6	190	Total			

Subcatchment 1: Units 10-11 Entrance



Summary for Subcatchment 1pre: Site

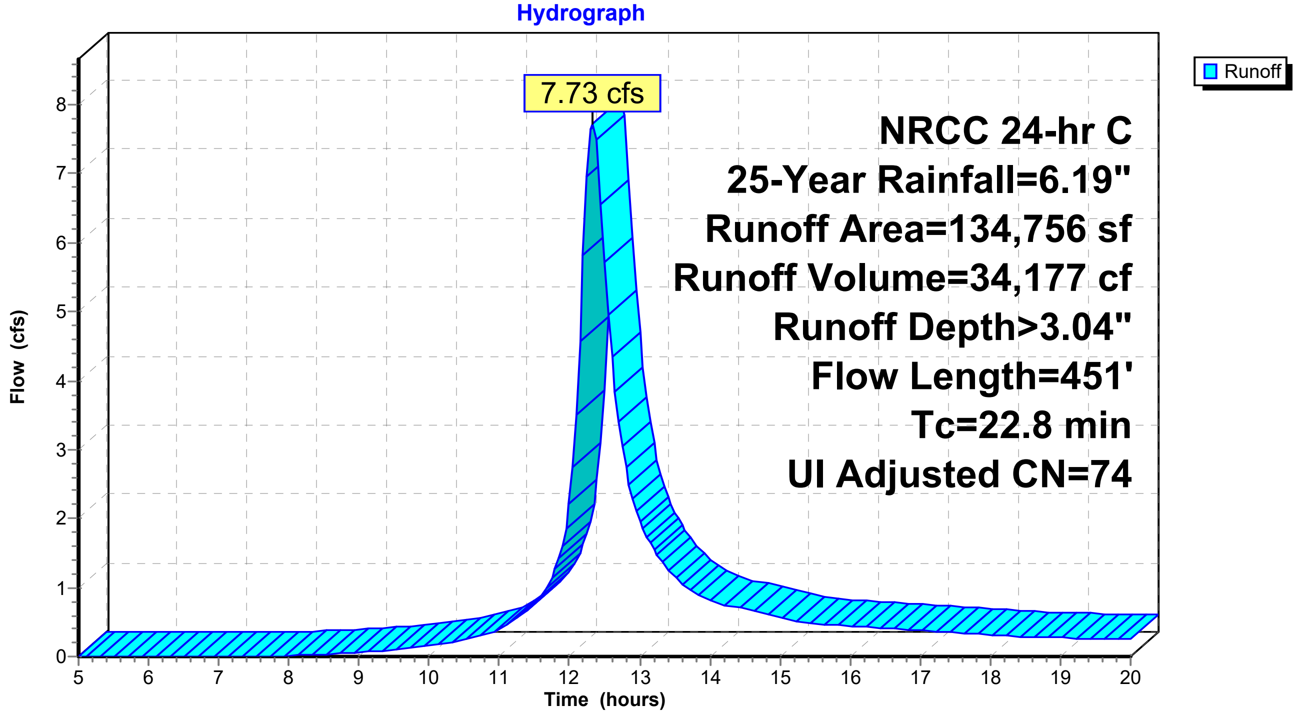
Runoff = 7.73 cfs @ 12.33 hrs, Volume= 34,177 cf, Depth> 3.04"
Routed to Reach DP1PRE : DP 1 - PRE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Adj	Description
56,945	70		Woods, Good, HSG C
2,937	98		Paved parking, HSG C
3,219	98		Unconnected roofs, HSG C
10,003	89		Gravel roads, HSG C
61,652	74		>75% Grass cover, Good, HSG C
134,756	75	74	Weighted Average, UI Adjusted
128,600			95.43% Pervious Area
6,156			4.57% Impervious Area
3,219			52.29% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	25	0.0110	0.03		**Sheet Flow, Woods** Woods: Dense underbrush n= 0.800 P2= 3.35"
0.5	25	0.0110	0.84		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.35"
0.2	20	0.0110	2.13		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
1.5	65	0.0110	0.73		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
2.2	159	0.0290	1.19		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
2.0	52	0.0040	0.44		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.7	60	0.0370	1.35		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.4	45	0.1660	2.04		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
22.8	451	Total			

Subcatchment 1pre: Site



Summary for Subcatchment 2: Units 8-11 Backyards

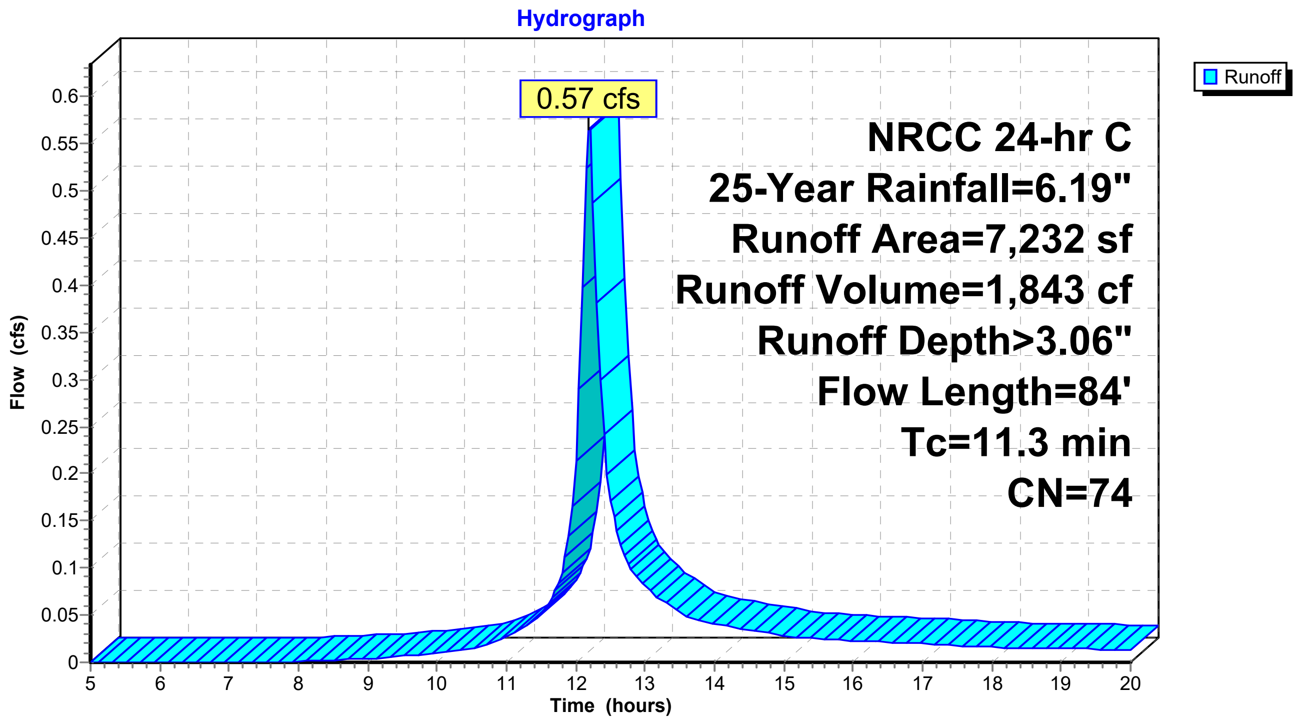
Runoff = 0.57 cfs @ 12.19 hrs, Volume= 1,843 cf, Depth> 3.06"
Routed to Pond CB7 : CB 7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
7,232	74	>75% Grass cover, Good, HSG C
7,232		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	50	0.0280	0.08		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.6	34	0.0200	0.99		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
11.3	84	Total			

Subcatchment 2: Units 8-11 Backyards



Summary for Subcatchment 3: Outer Border

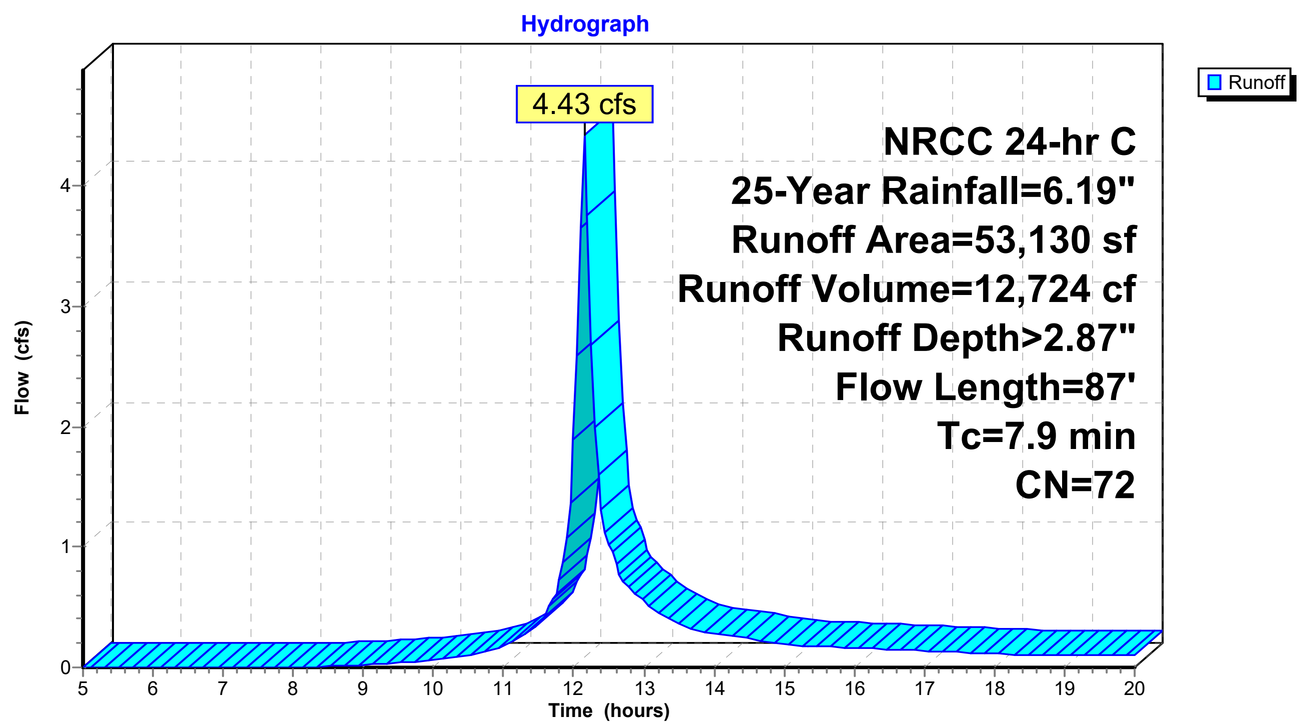
Runoff = 4.43 cfs @ 12.15 hrs, Volume= 12,724 cf, Depth> 2.87"
Routed to Reach DP1PST : DP 1 - POST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
21,967	74	>75% Grass cover, Good, HSG C
31,163	70	Woods, Good, HSG C
53,130	72	Weighted Average
53,130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0670	0.11		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.35"
0.5	37	0.0600	1.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
7.9	87	Total			

Subcatchment 3: Outer Border



Summary for Subcatchment 4: Unit 5 Backyard and Basin #1

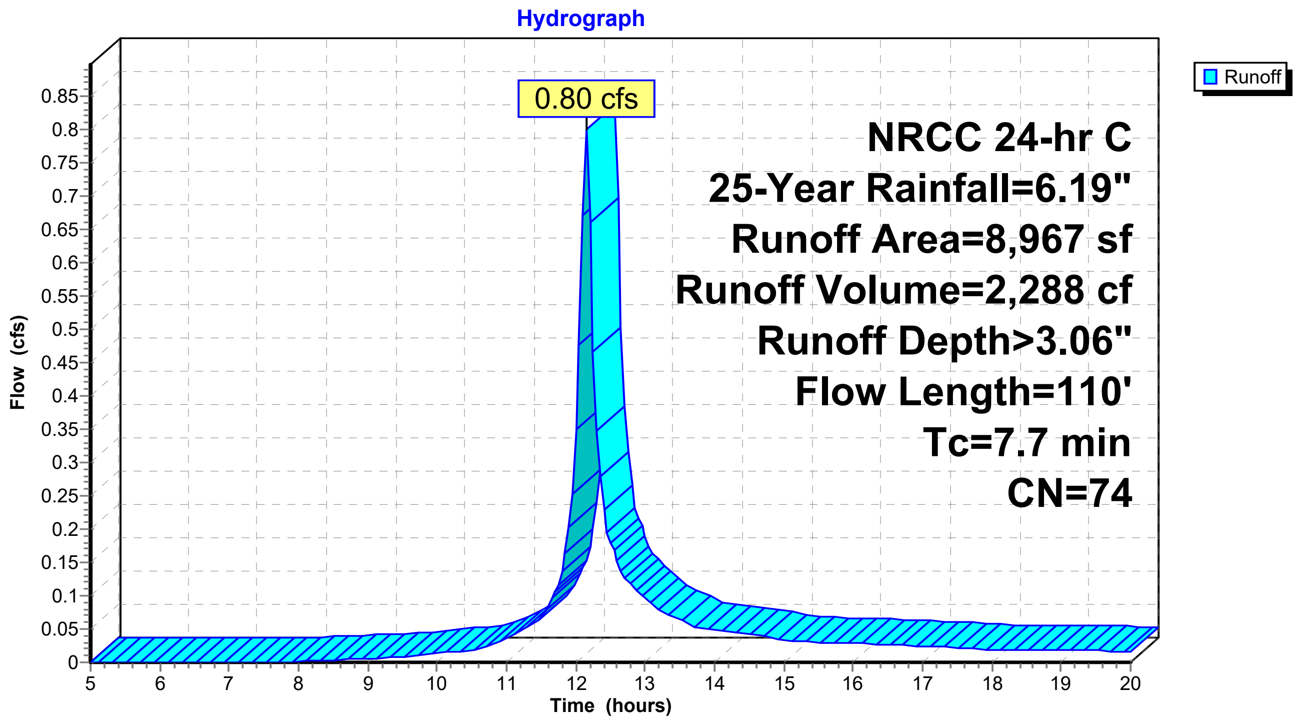
Runoff = 0.80 cfs @ 12.15 hrs, Volume= 2,288 cf, Depth> 3.06"
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
8,967	74	>75% Grass cover, Good, HSG C
8,967		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0780	0.12		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.6	60	0.0670	1.81		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
7.7	110	Total			

Subcatchment 4: Unit 5 Backyard and Basin #1



Summary for Subcatchment 5: Unit 5 Parking

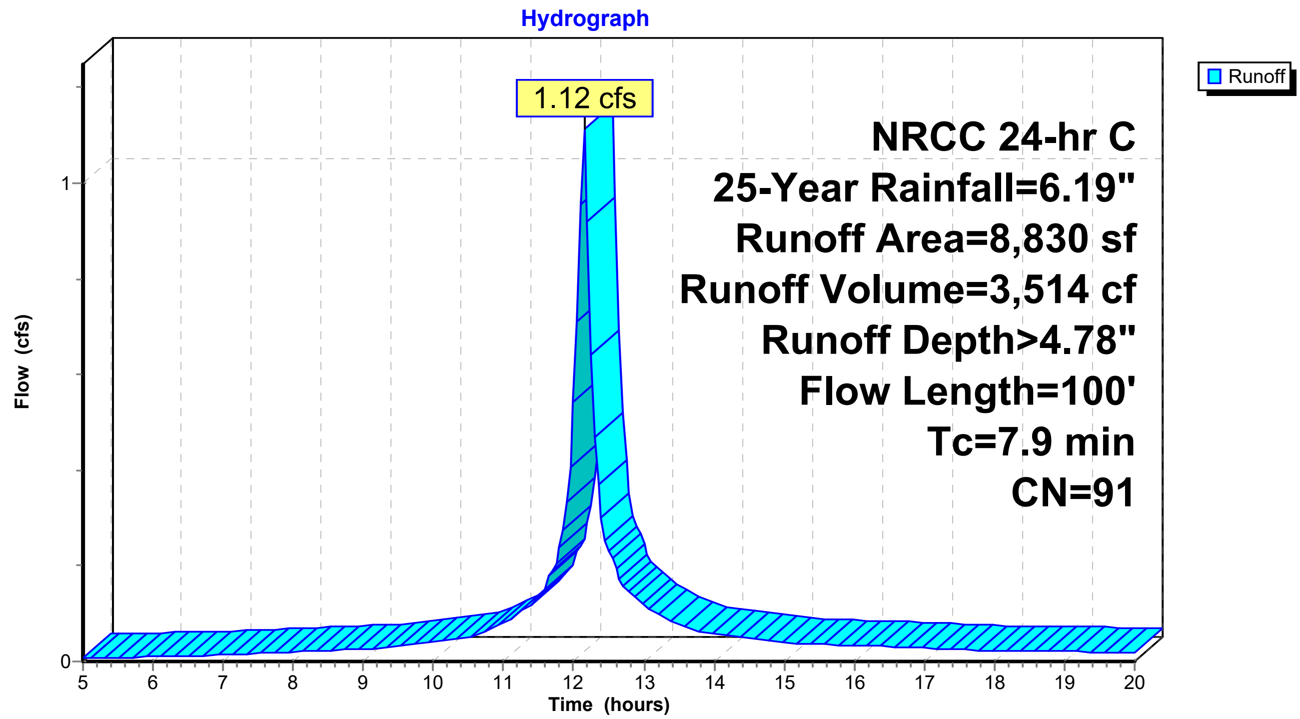
Runoff = 1.12 cfs @ 12.15 hrs, Volume= 3,514 cf, Depth> 4.78"
Routed to Pond 5P : CB 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
2,551	74	>75% Grass cover, Good, HSG C
6,279	98	Paved roads w/curbs & sewers, HSG C
8,830	91	Weighted Average
2,551		28.89% Pervious Area
6,279		71.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	40	0.0450	0.09		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.3	10	0.0067	0.57		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.35"
0.2	50	0.0280	3.40		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
7.9	100	Total			

Subcatchment 5: Unit 5 Parking



Summary for Subcatchment 6: Driveway Center Section

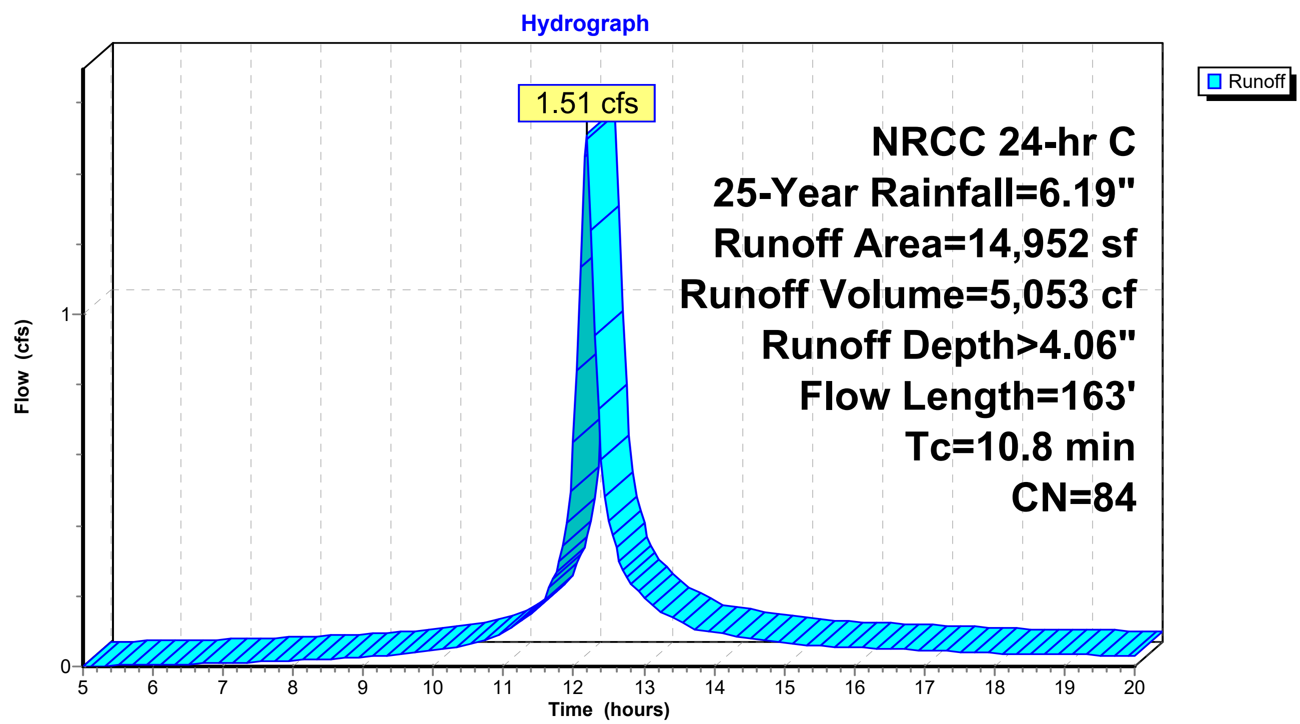
Runoff = 1.51 cfs @ 12.18 hrs, Volume= 5,053 cf, Depth> 4.06"
Routed to Pond CB4 : CB 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
8,411	74	>75% Grass cover, Good, HSG C
6,541	98	Paved roads w/curbs & sewers, HSG C
14,952	84	Weighted Average
8,411		56.25% Pervious Area
6,541		43.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0320	0.08		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.2	18	0.0300	1.21		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.4	95	0.0360	3.85		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
10.8	163	Total			

Subcatchment 6: Driveway Center Section



Summary for Subcatchment 7: Driveway Entrance

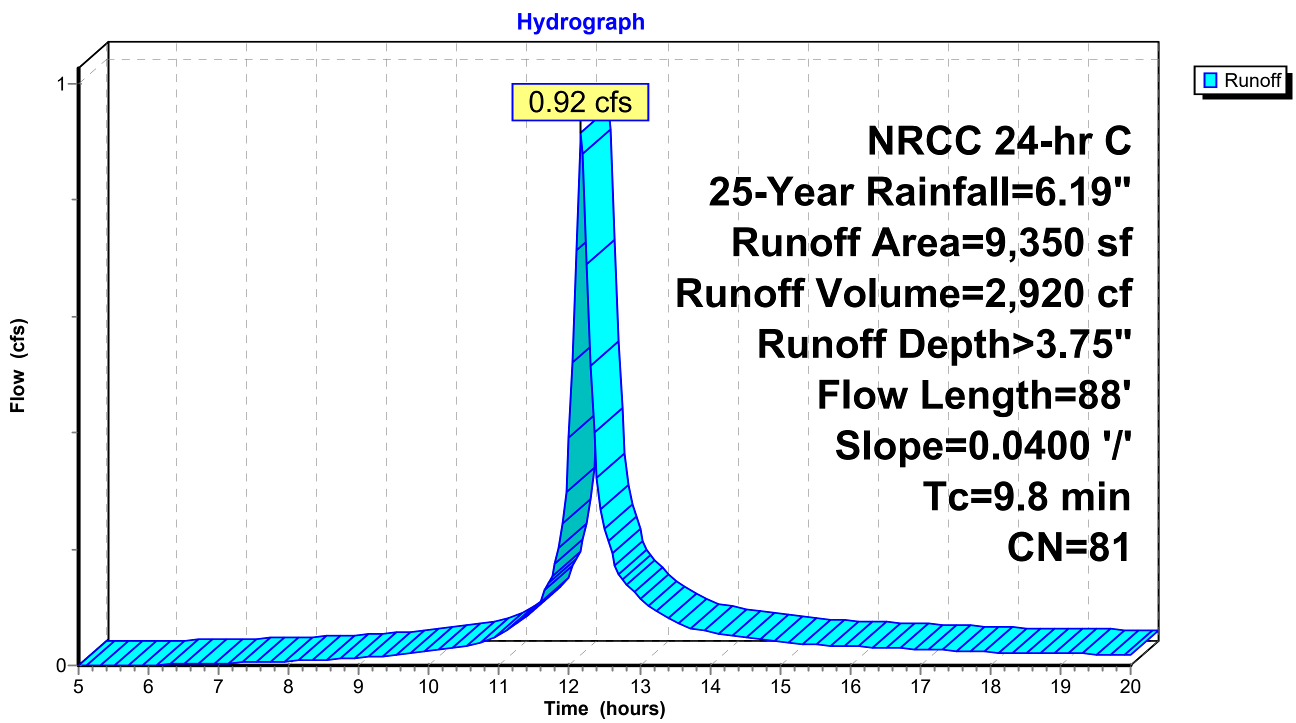
Runoff = 0.92 cfs @ 12.17 hrs, Volume= 2,920 cf, Depth> 3.75"
Routed to Pond CB1 : CB 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
2,919	98	Paved roads w/curbs & sewers, HSG C
6,431	74	>75% Grass cover, Good, HSG C
9,350	81	Weighted Average
6,431		68.78% Pervious Area
2,919		31.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.5	38	0.0400	1.40		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
9.8	88	Total			

Subcatchment 7: Driveway Entrance



Summary for Subcatchment U1: Unit #1

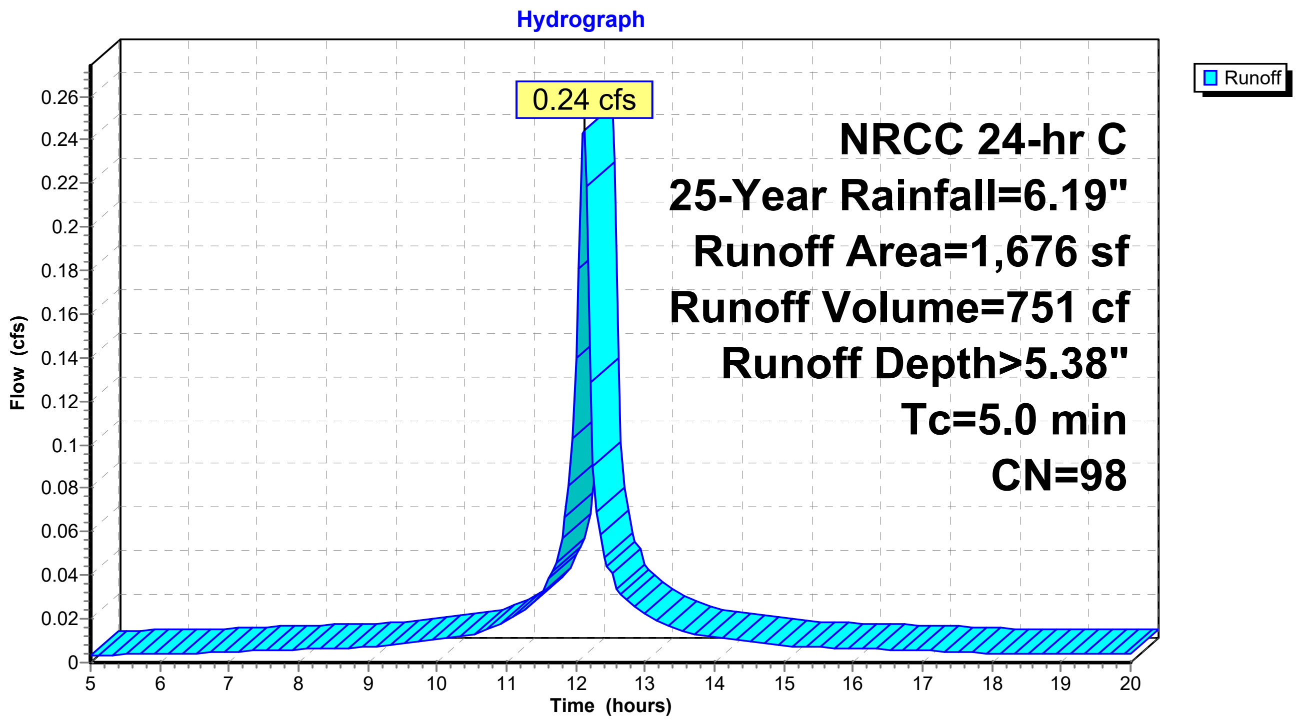
Runoff = 0.24 cfs @ 12.11 hrs, Volume= 751 cf, Depth> 5.38"
Routed to Reach 8R : 6" Roof Drain Carrier Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
1,676	98	Unconnected roofs, HSG C
1,676		100.00% Impervious Area
1,676		100.00% Unconnected

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

Subcatchment U1: Unit #1



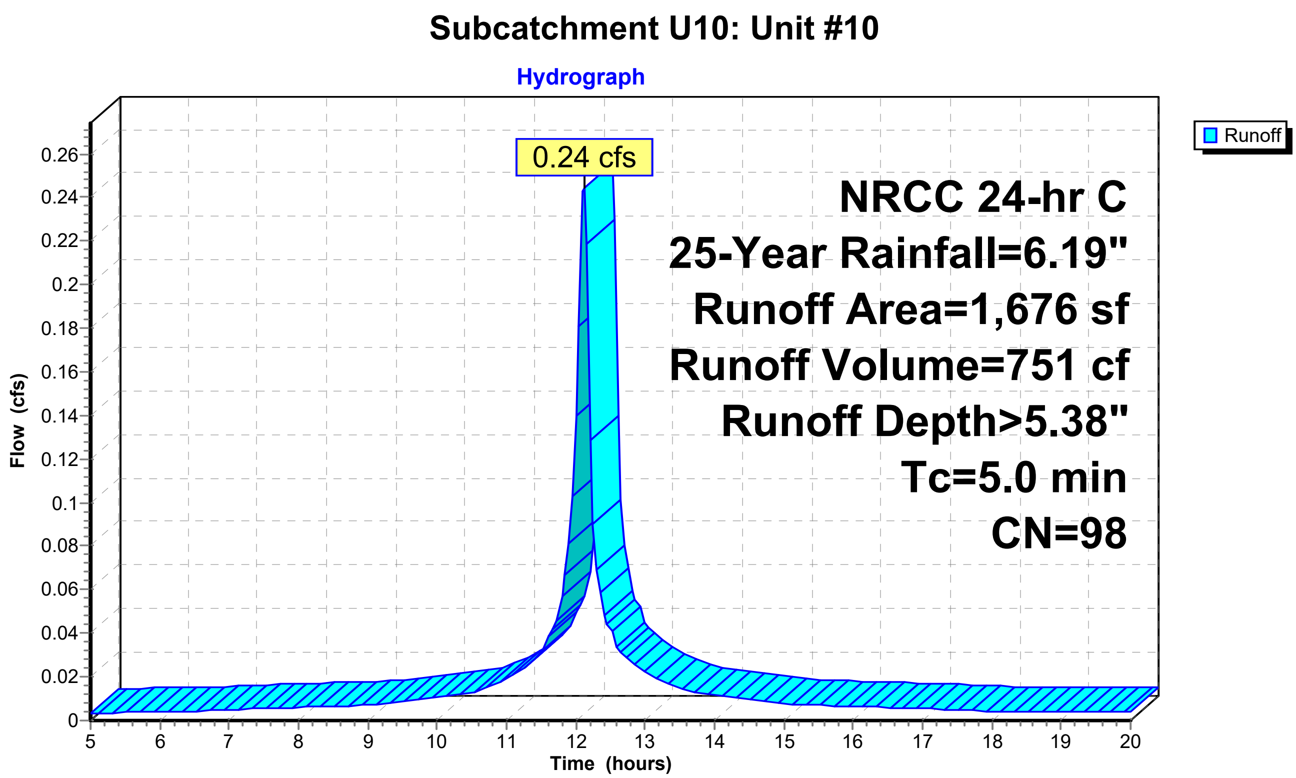
Summary for Subcatchment U10: Unit #10

Runoff = 0.24 cfs @ 12.11 hrs, Volume= 751 cf, Depth> 5.38"
Routed to Pond 1P : Subsurface #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
1,676	98	Unconnected roofs, HSG C
1,676		100.00% Impervious Area
1,676		100.00% Unconnected

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



Summary for Subcatchment U11: Unit #11

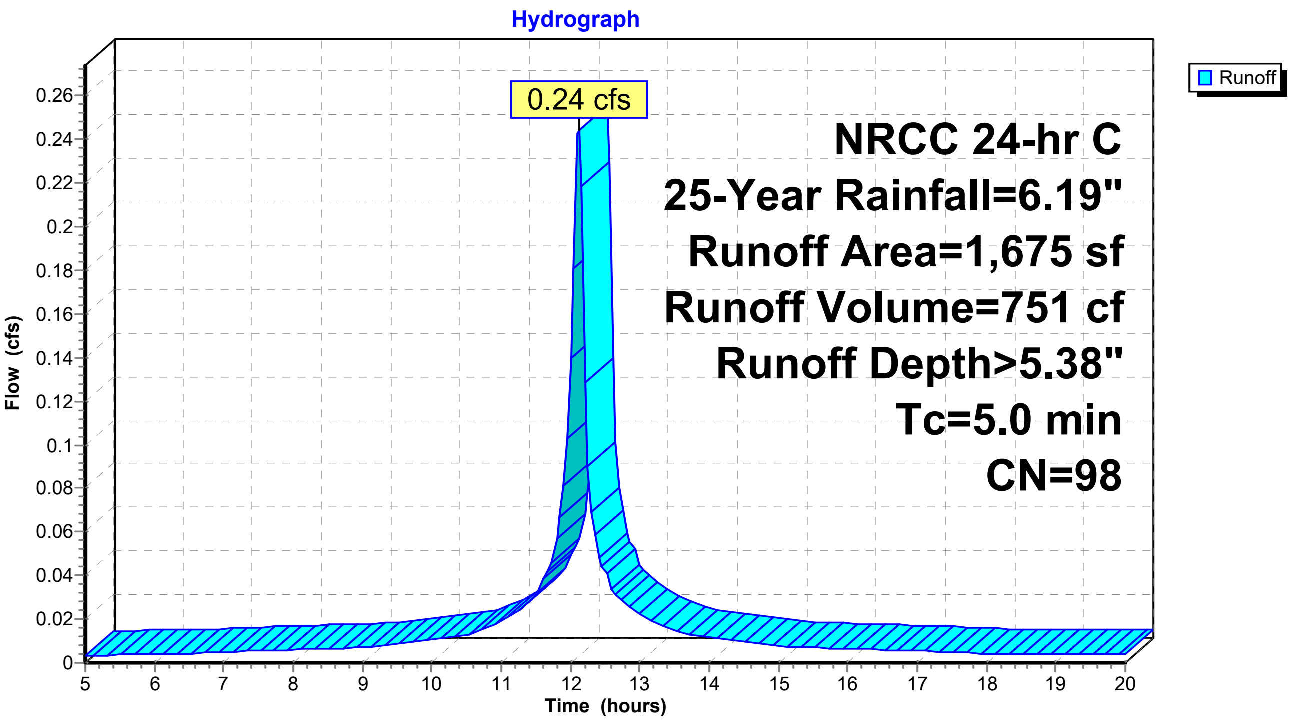
Runoff = 0.24 cfs @ 12.11 hrs, Volume= 751 cf, Depth> 5.38"
Routed to Pond 1P : Subsurface #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U11: Unit #11



Summary for Subcatchment U2: Unit #2

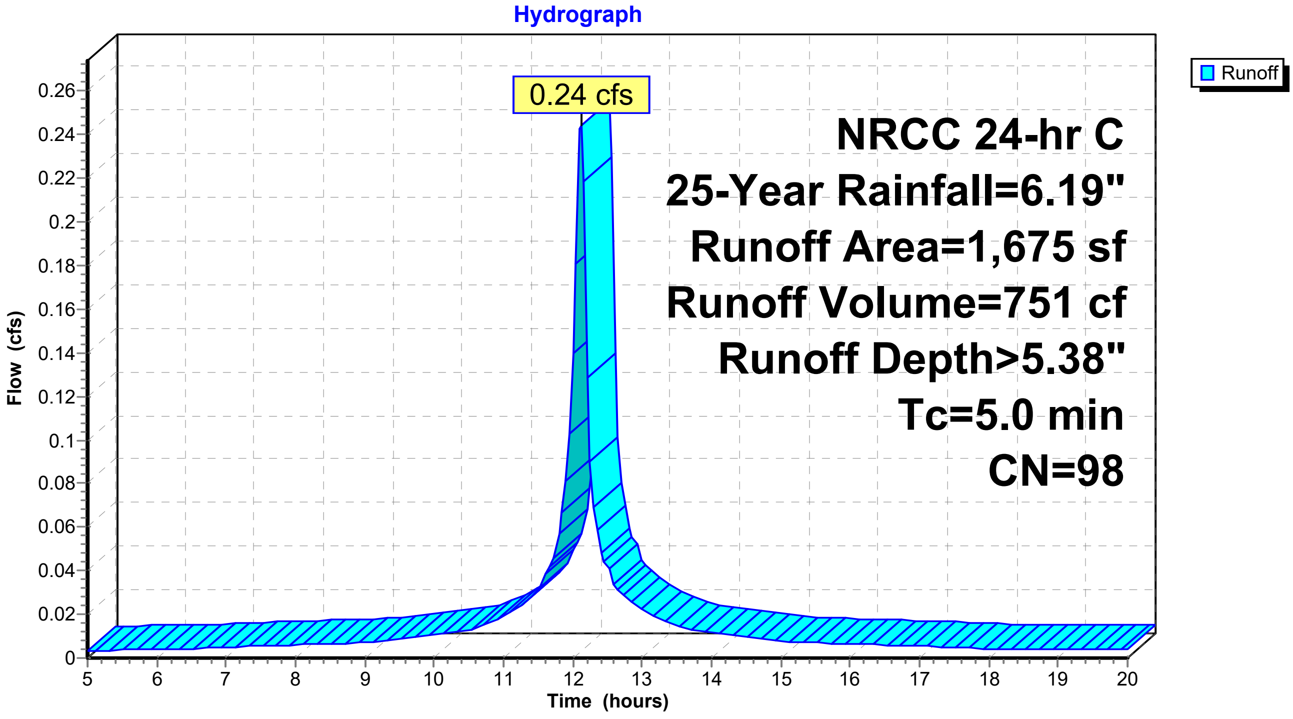
Runoff = 0.24 cfs @ 12.11 hrs, Volume= 751 cf, Depth> 5.38"
Routed to Reach 8R : 6" Roof Drain Carrier Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U2: Unit #2



Summary for Subcatchment U3: Unit #3

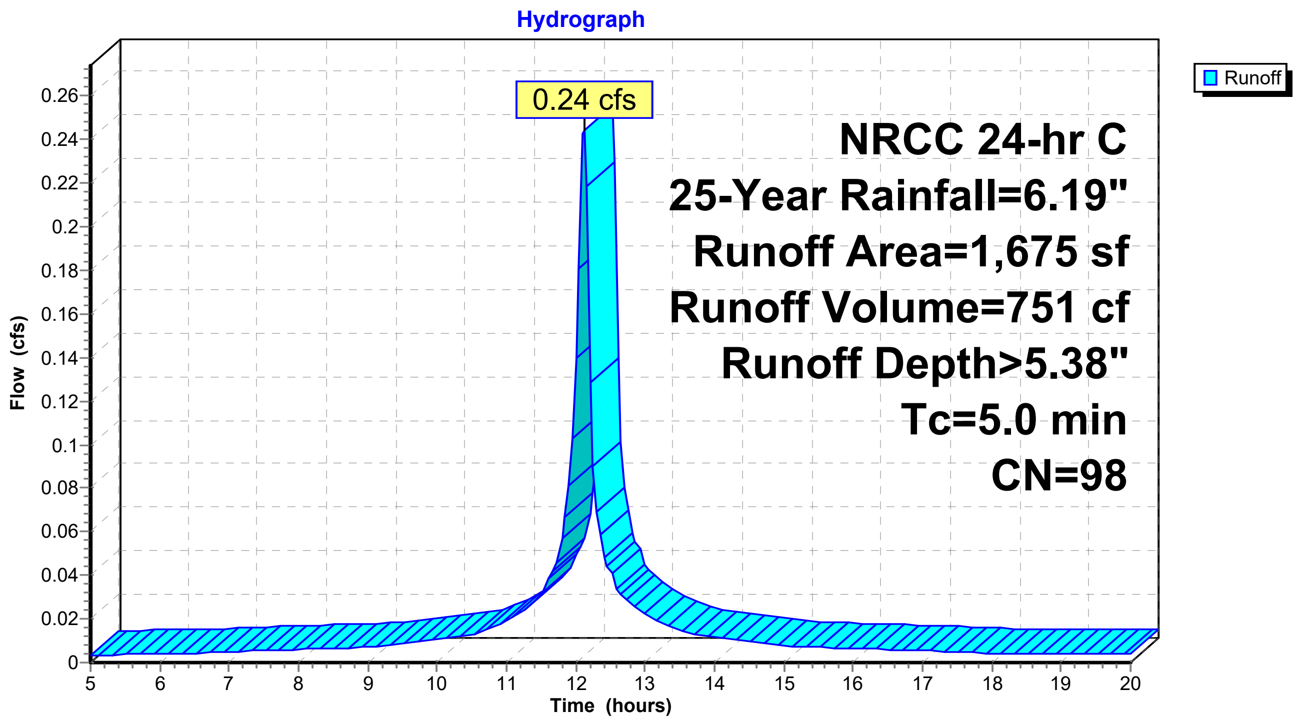
Runoff = 0.24 cfs @ 12.11 hrs, Volume= 751 cf, Depth> 5.38"
Routed to Reach 9R : 12" Roof Drain Carrier Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U3: Unit #3



Summary for Subcatchment U4: Unit #4

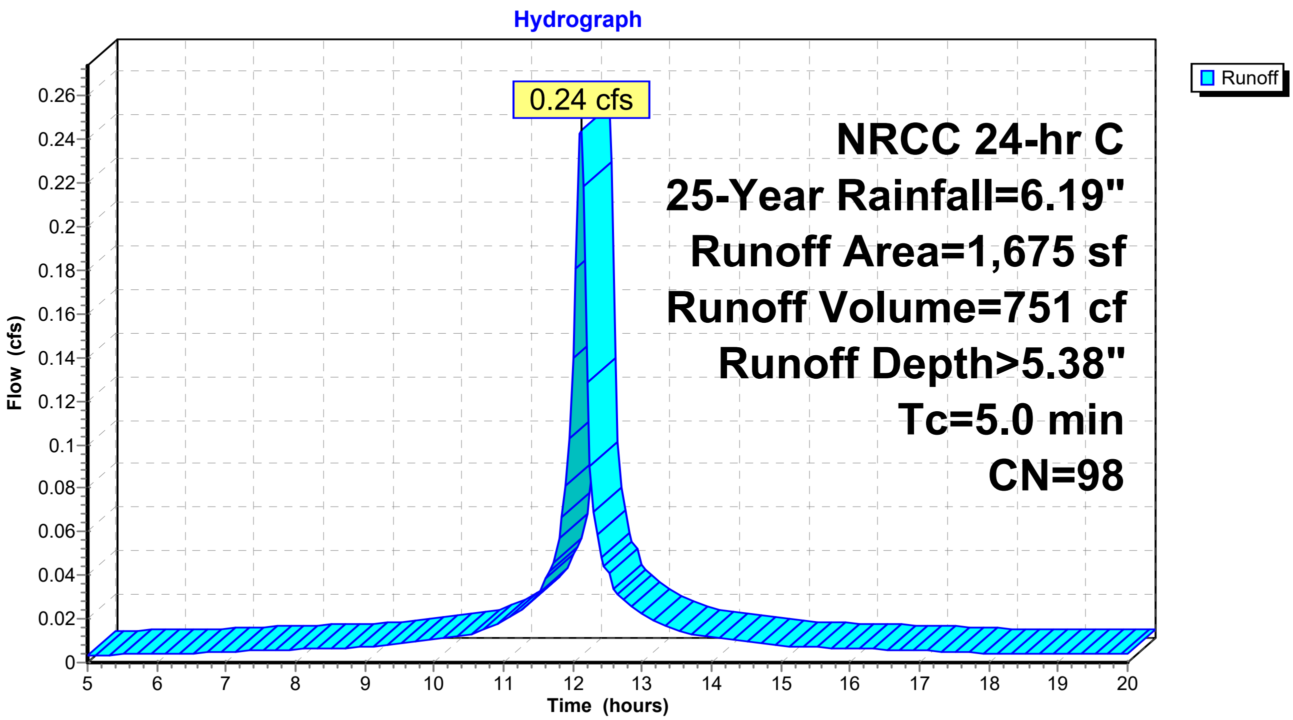
Runoff = 0.24 cfs @ 12.11 hrs, Volume= 751 cf, Depth> 5.38"
Routed to Reach 9R : 12" Roof Drain Carrier Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U4: Unit #4



Summary for Subcatchment U5: Unit #5

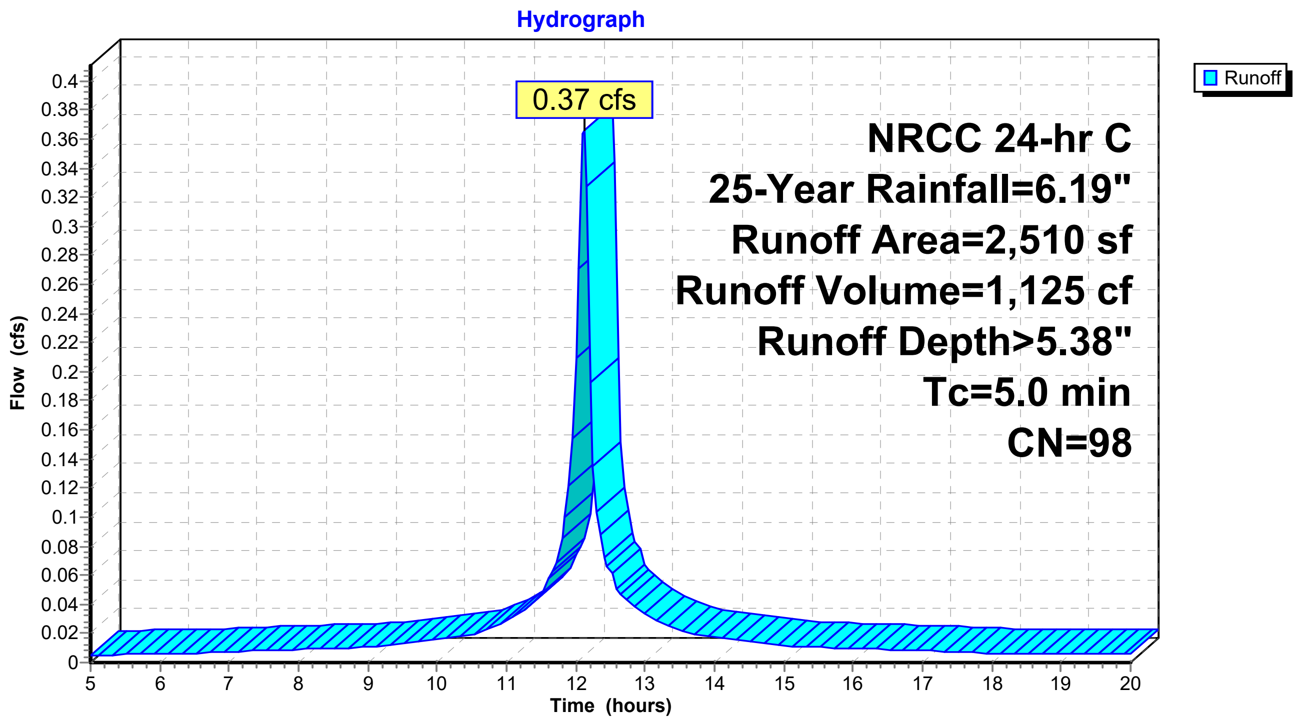
Runoff = 0.37 cfs @ 12.11 hrs, Volume= 1,125 cf, Depth> 5.38"
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
2,510	98	Unconnected roofs, HSG C
2,510		100.00% Impervious Area
2,510		100.00% Unconnected

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

Subcatchment U5: Unit #5



Summary for Subcatchment U6: Unit #6

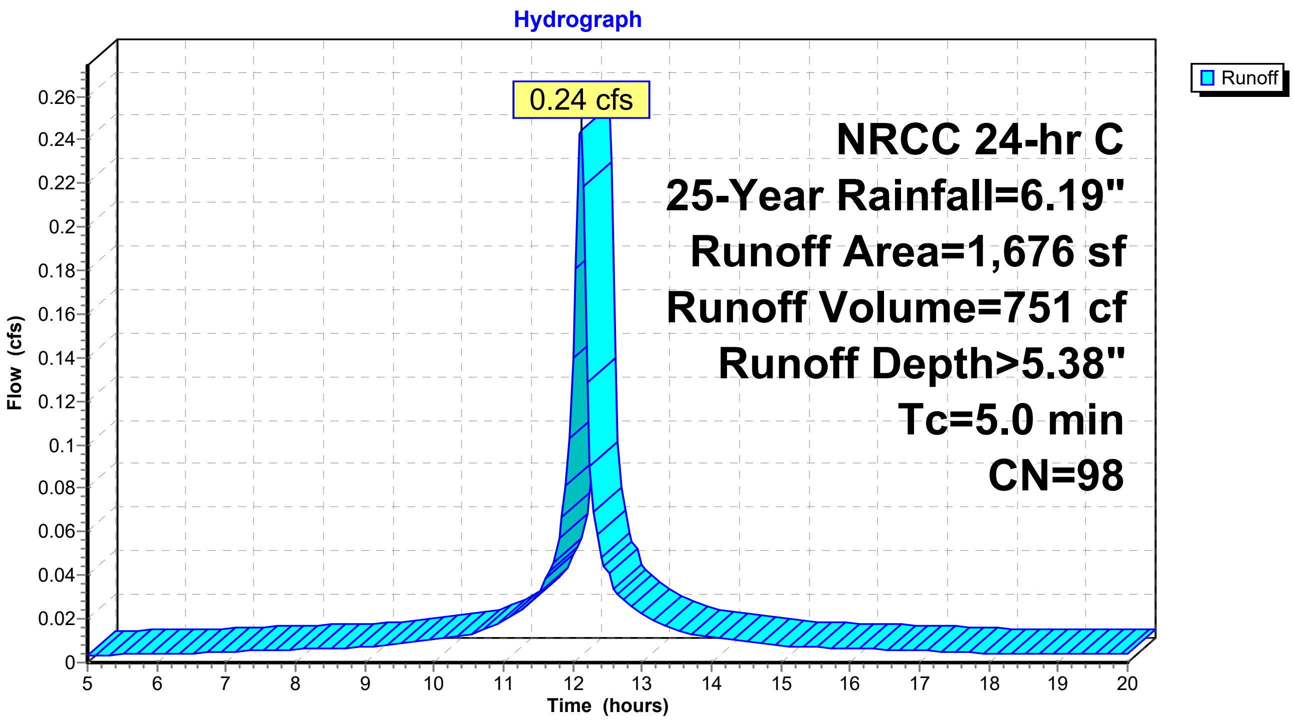
Runoff = 0.24 cfs @ 12.11 hrs, Volume= 751 cf, Depth> 5.38"
Routed to Reach 4R : 8" ROOF DRAIN CARRIER PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
1,676	98	Unconnected roofs, HSG C
1,676		100.00% Impervious Area
1,676		100.00% Unconnected

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

Subcatchment U6: Unit #6



Summary for Subcatchment U7: Unit #7

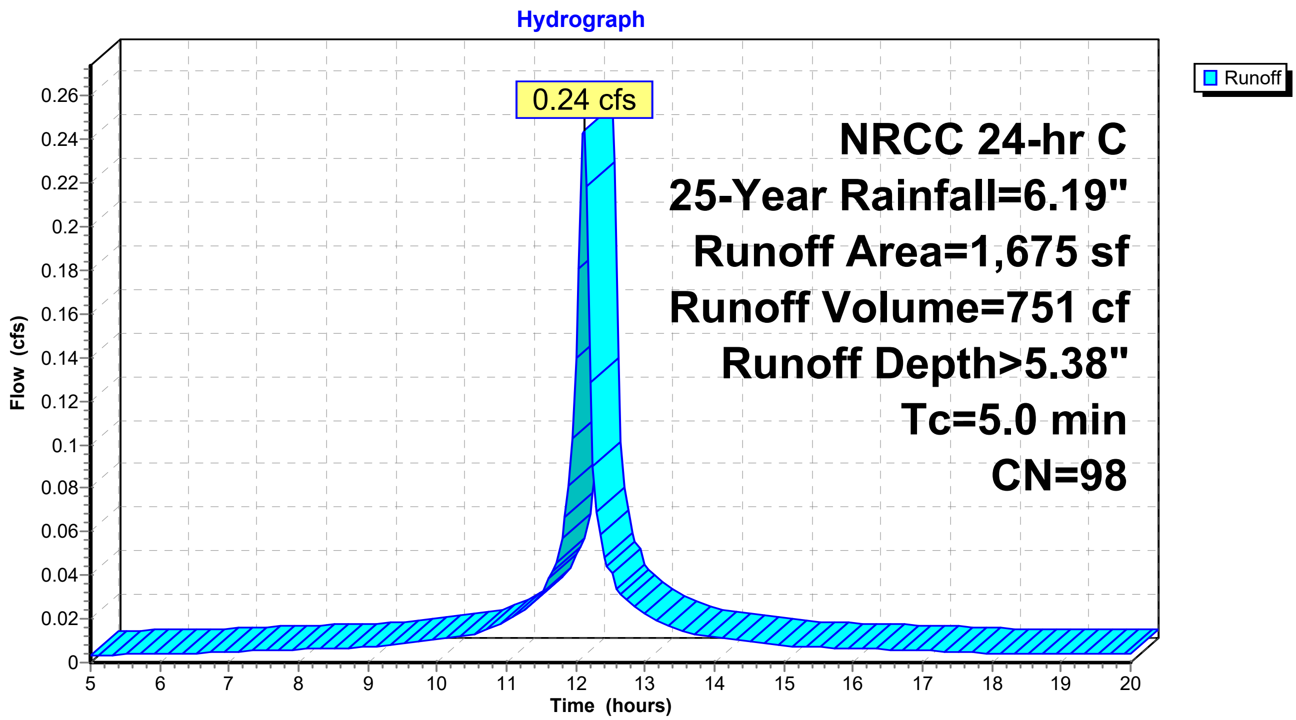
Runoff = 0.24 cfs @ 12.11 hrs, Volume= 751 cf, Depth> 5.38"
Routed to Reach 4R : 8" ROOF DRAIN CARRIER PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U7: Unit #7



Summary for Subcatchment U8: Unit #8

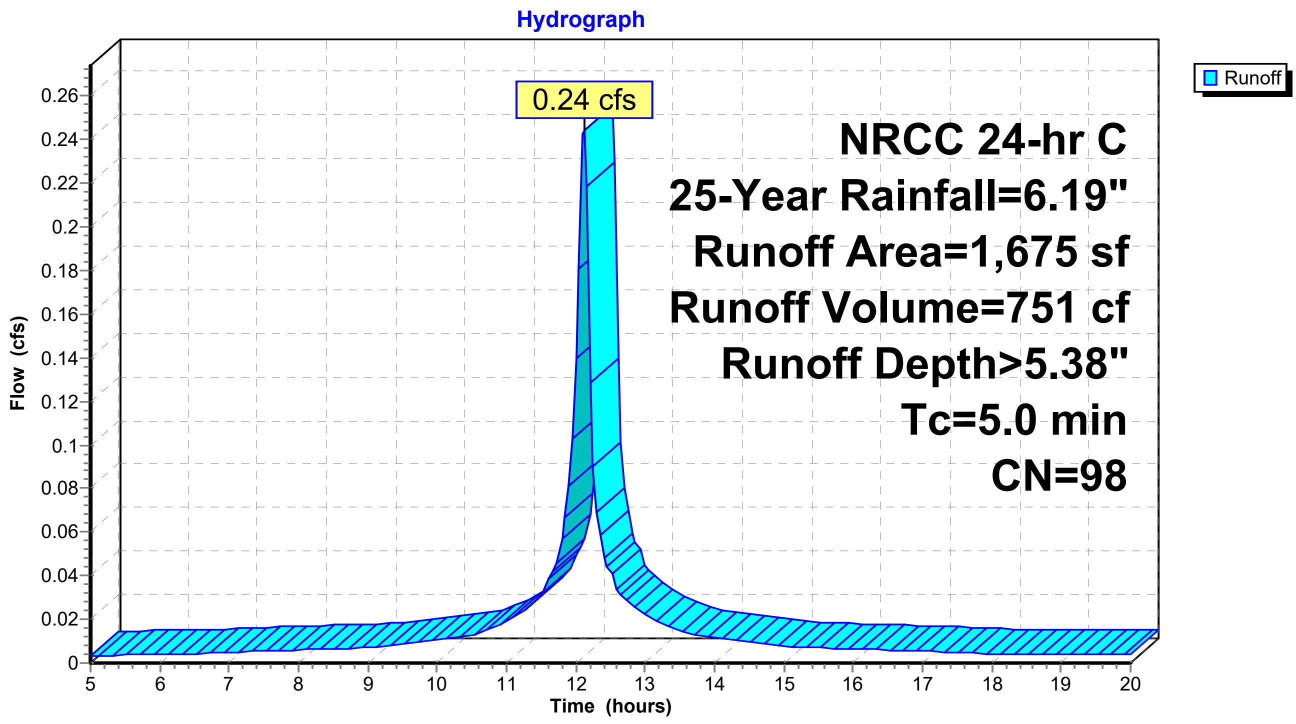
Runoff = 0.24 cfs @ 12.11 hrs, Volume= 751 cf, Depth> 5.38"
Routed to Pond 1P : Subsurface #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U8: Unit #8



Summary for Subcatchment U9: Unit #9

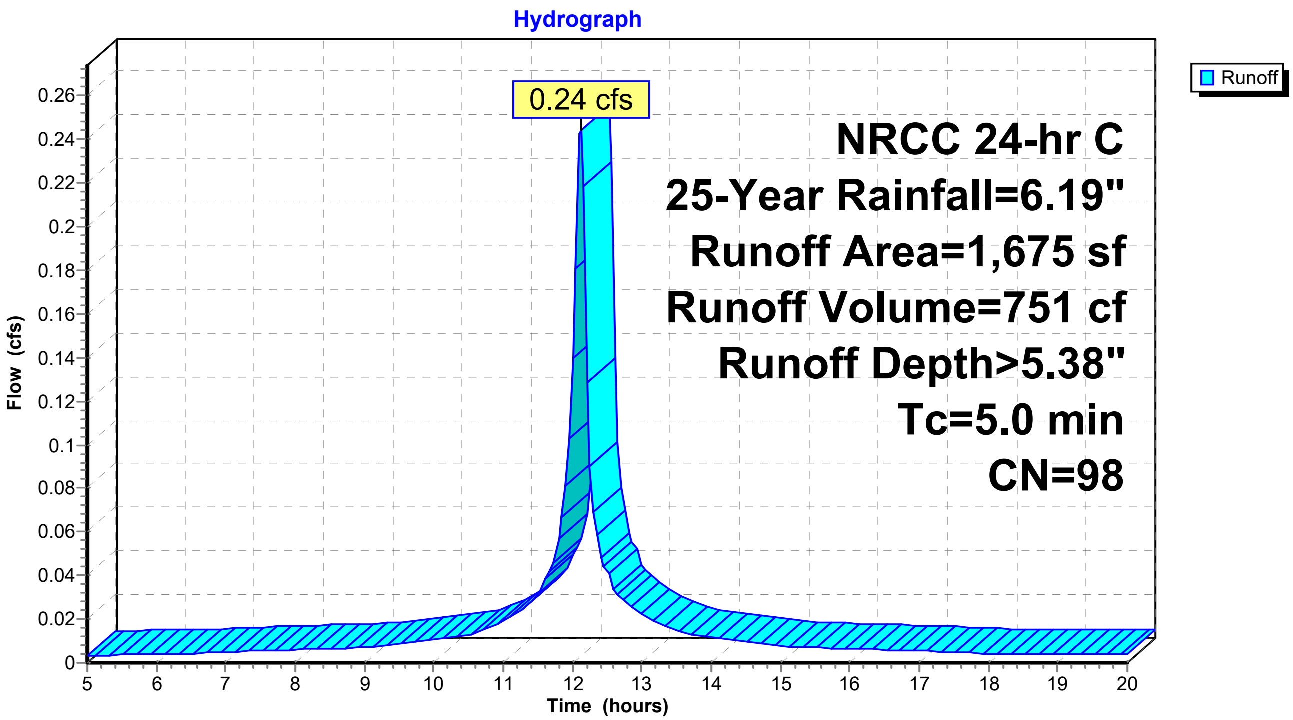
Runoff = 0.24 cfs @ 12.11 hrs, Volume= 751 cf, Depth> 5.38"
Routed to Pond 1P : Subsurface #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 25-Year Rainfall=6.19"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U9: Unit #9



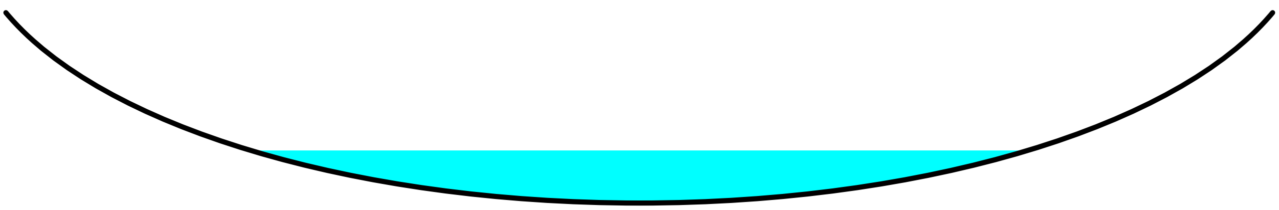
Summary for Reach 3R: Wetland Surface 1

Inflow Area = 26,965 sf, 33.26% Impervious, Inflow Depth > 2.50" for 25-Year event
Inflow = 1.47 cfs @ 12.30 hrs, Volume= 5,617 cf
Outflow = 1.23 cfs @ 12.45 hrs, Volume= 5,569 cf, Atten= 16%, Lag= 9.5 min
Routed to Reach DP1PST : DP 1 - POST

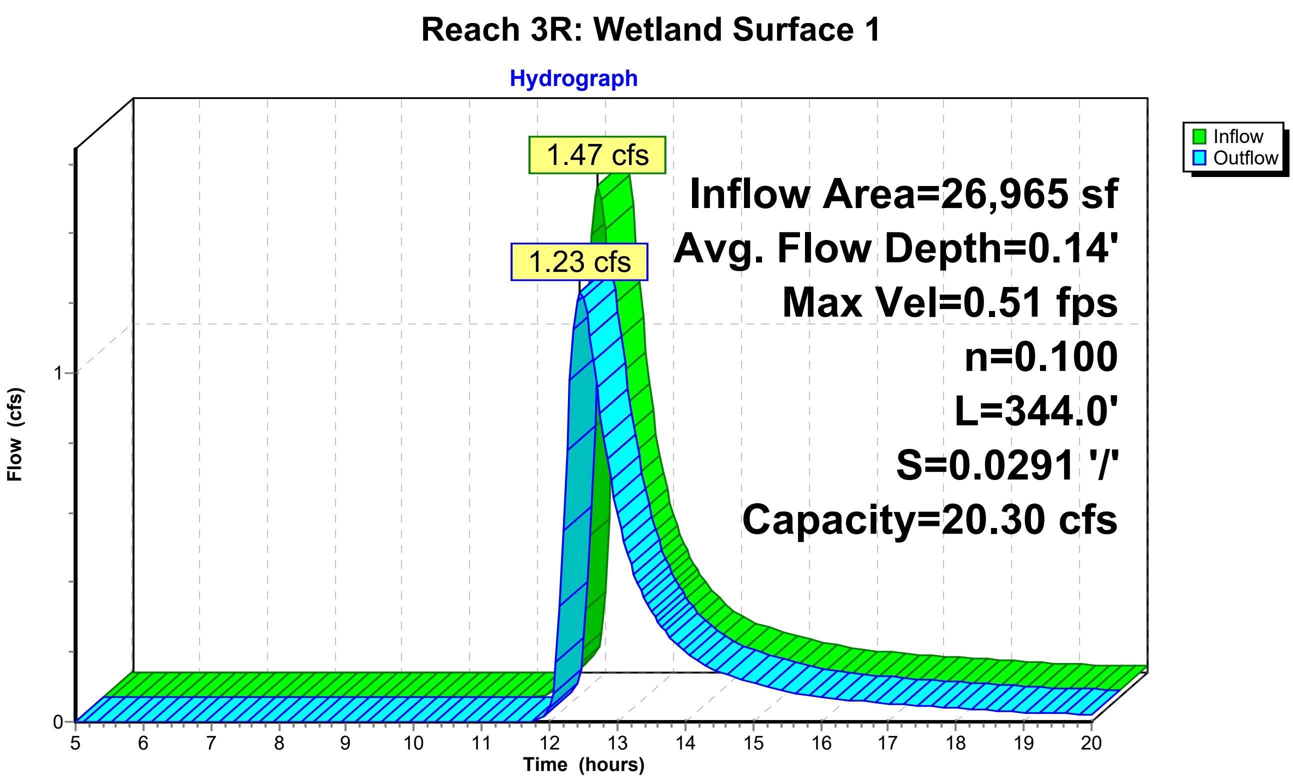
Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.51 fps, Min. Travel Time= 11.1 min
Avg. Velocity = 0.24 fps, Avg. Travel Time= 24.2 min

Peak Storage= 824 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.14' , Surface Width= 26.19'
Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 20.30 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 344.0' Slope= 0.0291 '/'
Inlet Invert= 94.00', Outlet Invert= 84.00'



‡



Stage-Discharge for Reach 3R: Wetland Surface 1

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
94.00	0.00	0.00
94.01	0.09	0.00
94.02	0.14	0.02
94.03	0.19	0.05
94.04	0.23	0.09
94.05	0.26	0.14
94.06	0.30	0.21
94.07	0.33	0.29
94.08	0.36	0.38
94.09	0.39	0.49
94.10	0.42	0.62
94.11	0.44	0.76
94.12	0.47	0.92
94.13	0.50	1.10
94.14	0.52	1.29
94.15	0.55	1.49
94.16	0.57	1.72
94.17	0.59	1.96
94.18	0.62	2.22
94.19	0.64	2.49
94.20	0.66	2.79
94.21	0.68	3.10
94.22	0.70	3.43
94.23	0.73	3.77
94.24	0.75	4.14
94.25	0.77	4.52
94.26	0.79	4.92
94.27	0.81	5.34
94.28	0.83	5.78
94.29	0.85	6.24
94.30	0.87	6.71
94.31	0.89	7.21
94.32	0.90	7.72
94.33	0.92	8.25
94.34	0.94	8.80
94.35	0.96	9.37
94.36	0.98	9.96
94.37	1.00	10.57
94.38	1.01	11.20
94.39	1.03	11.85
94.40	1.05	12.52
94.41	1.07	13.20
94.42	1.08	13.91
94.43	1.10	14.64
94.44	1.12	15.39
94.45	1.14	16.15
94.46	1.15	16.94
94.47	1.17	17.75
94.48	1.19	18.58
94.49	1.20	19.43
94.50	**1.22**	**20.30**

Stage-Area-Storage for Reach 3R: Wetland Surface 1

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
94.00	0.0	0
94.01	0.0	16
94.02	0.1	46
94.03	0.2	84
94.04	0.4	130
94.05	0.5	181
94.06	0.7	238
94.07	0.9	300
94.08	1.1	367
94.09	1.3	438
94.10	1.5	513
94.11	1.7	592
94.12	2.0	674
94.13	2.2	760
94.14	2.5	849
94.15	2.7	942
94.16	3.0	1,038
94.17	3.3	1,137
94.18	3.6	1,238
94.19	3.9	1,343
94.20	4.2	1,450
94.21	4.5	1,561
94.22	4.9	1,673
94.23	5.2	1,789
94.24	5.5	1,907
94.25	5.9	2,027
94.26	6.2	2,150
94.27	6.6	2,275
94.28	7.0	2,403
94.29	7.4	2,532
94.30	7.7	2,665
94.31	8.1	2,799
94.32	8.5	2,935
94.33	8.9	3,074
94.34	9.3	3,215
94.35	9.8	3,358
94.36	10.2	3,503
94.37	10.6	3,650
94.38	11.0	3,799
94.39	11.5	3,950
94.40	11.9	4,102
94.41	12.4	4,257
94.42	12.8	4,414
94.43	13.3	4,573
94.44	13.8	4,733
94.45	14.2	4,895
94.46	14.7	5,059
94.47	15.2	5,225
94.48	15.7	5,393
94.49	16.2	5,562
94.50	**16.7**	**5,733**

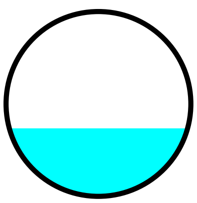
Summary for Reach 4R: 8" ROOF DRAIN CARRIER PIPE

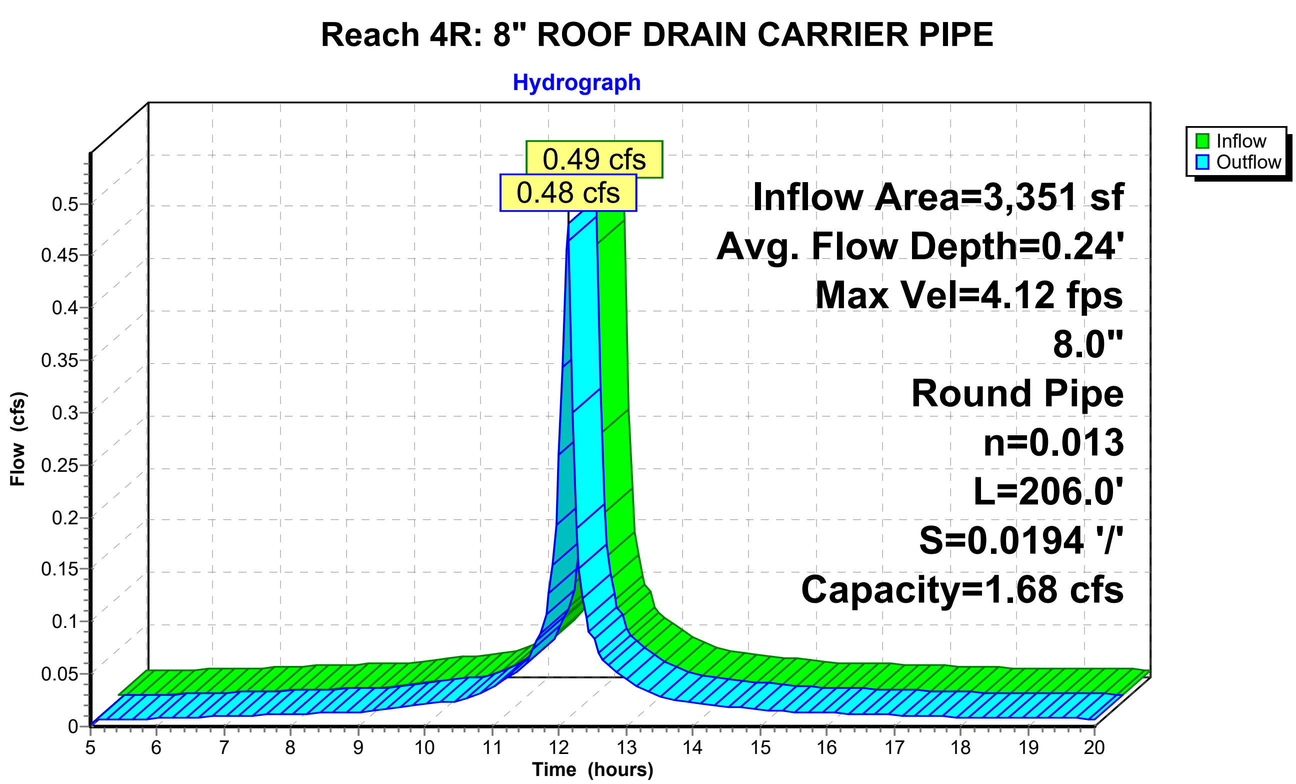
Inflow Area = 3,351 sf,100.00% Impervious, Inflow Depth > 5.38" for 25-Year event
Inflow = 0.49 cfs @ 12.11 hrs, Volume= 1,502 cf
Outflow = 0.48 cfs @ 12.13 hrs, Volume= 1,500 cf, Atten= 2%, Lag= 1.0 min
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.12 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.59 fps, Avg. Travel Time= 2.2 min

Peak Storage= 24 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.24' , Surface Width= 0.64'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.68 cfs

8.0" Round Pipe
n= 0.013
Length= 206.0' Slope= 0.0194 '/'
Inlet Invert= 93.00', Outlet Invert= 89.00'





Stage-Discharge for Reach 4R: 8" ROOF DRAIN CARRIER PIPE

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
93.00	0.00	0.00
93.01	0.55	0.00
93.02	0.89	0.00
93.03	1.16	0.01
93.04	1.39	0.01
93.05	1.61	0.02
93.06	1.81	0.03
93.07	2.00	0.04
93.08	2.17	0.05
93.09	2.34	0.07
93.10	2.49	0.08
93.11	2.64	0.10
93.12	2.79	0.12
93.13	2.92	0.14
93.14	3.05	0.16
93.15	3.18	0.19
93.16	3.30	0.21
93.17	3.42	0.24
93.18	3.53	0.27
93.19	3.64	0.30
93.20	3.74	0.33
93.21	3.84	0.36
93.22	3.94	0.40
93.23	4.04	0.43
93.24	4.13	0.47
93.25	4.21	0.50
93.26	4.30	0.54
93.27	4.38	0.58
93.28	4.46	0.62
93.29	4.53	0.66
93.30	4.60	0.70
93.31	4.67	0.74
93.32	4.74	0.79
93.33	4.80	0.83
93.34	4.86	0.87
93.35	4.92	0.91
93.36	4.98	0.96
93.37	5.03	1.00
93.38	5.08	1.04
93.39	5.13	1.09
93.40	5.17	1.13
93.41	5.22	1.17
93.42	5.25	1.22
93.43	5.29	1.26
93.44	5.33	1.30
93.45	5.36	1.34
93.46	5.38	1.38
93.47	5.41	1.42
93.48	5.43	1.46
93.49	5.45	1.50
93.50	5.47	1.54
93.51	5.48	1.57
93.52	5.49	1.60
93.53	5.50	1.64
93.54	**5.50**	1.67
93.55	5.50	1.69
93.56	5.49	1.72
93.57	5.48	1.74
93.58	5.47	1.76
93.59	5.45	1.78
93.60	5.42	1.79
93.61	5.39	1.80
93.62	5.35	**1.81**
93.63	5.30	1.81
93.64	5.24	1.80
93.65	5.15	1.79
93.66	5.03	1.75
93.67	4.72	1.65

Stage-Area-Storage for Reach 4R: 8" ROOF DRAIN CARRIER PIPE

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
93.00	0.0	0	93.53	0.3	61
93.01	0.0	0	93.54	0.3	62
93.02	0.0	1	93.55	0.3	63
93.03	0.0	1	93.56	0.3	64
93.04	0.0	2	93.57	0.3	65
93.05	0.0	2	93.58	0.3	66
93.06	0.0	3	93.59	0.3	67
93.07	0.0	4	93.60	0.3	68
93.08	0.0	5	93.61	0.3	69
93.09	0.0	6	93.62	0.3	70
93.10	0.0	7	93.63	0.3	70
93.11	0.0	8	93.64	0.3	71
93.12	0.0	9	93.65	0.3	71
93.13	0.0	10	93.66	0.3	72
93.14	0.1	11	93.67	**0.3**	**72**
93.15	0.1	12			
93.16	0.1	13			
93.17	0.1	14			
93.18	0.1	16			
93.19	0.1	17			
93.20	0.1	18			
93.21	0.1	19			
93.22	0.1	21			
93.23	0.1	22			
93.24	0.1	23			
93.25	0.1	25			
93.26	0.1	26			
93.27	0.1	27			
93.28	0.1	29			
93.29	0.1	30			
93.30	0.2	31			
93.31	0.2	33			
93.32	0.2	34			
93.33	0.2	35			
93.34	0.2	37			
93.35	0.2	38			
93.36	0.2	40			
93.37	0.2	41			
93.38	0.2	42			
93.39	0.2	44			
93.40	0.2	45			
93.41	0.2	46			
93.42	0.2	48			
93.43	0.2	49			
93.44	0.2	50			
93.45	0.3	52			
93.46	0.3	53			
93.47	0.3	54			
93.48	0.3	55			
93.49	0.3	57			
93.50	0.3	58			
93.51	0.3	59			
93.52	0.3	60			

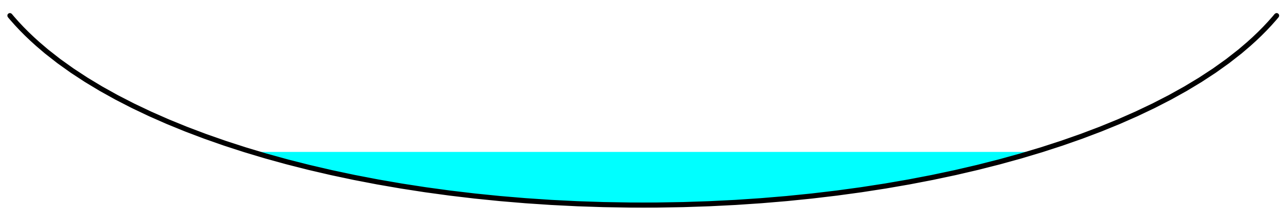
Summary for Reach 5R: Wetland Surface 2

Inflow Area = 13,032 sf, 17.40% Impervious, Inflow Depth > 2.81" for 25-Year event
Inflow = 0.93 cfs @ 12.26 hrs, Volume= 3,048 cf
Outflow = 0.68 cfs @ 12.40 hrs, Volume= 3,001 cf, Atten= 27%, Lag= 8.8 min
Routed to Reach 3R : Wetland Surface 1

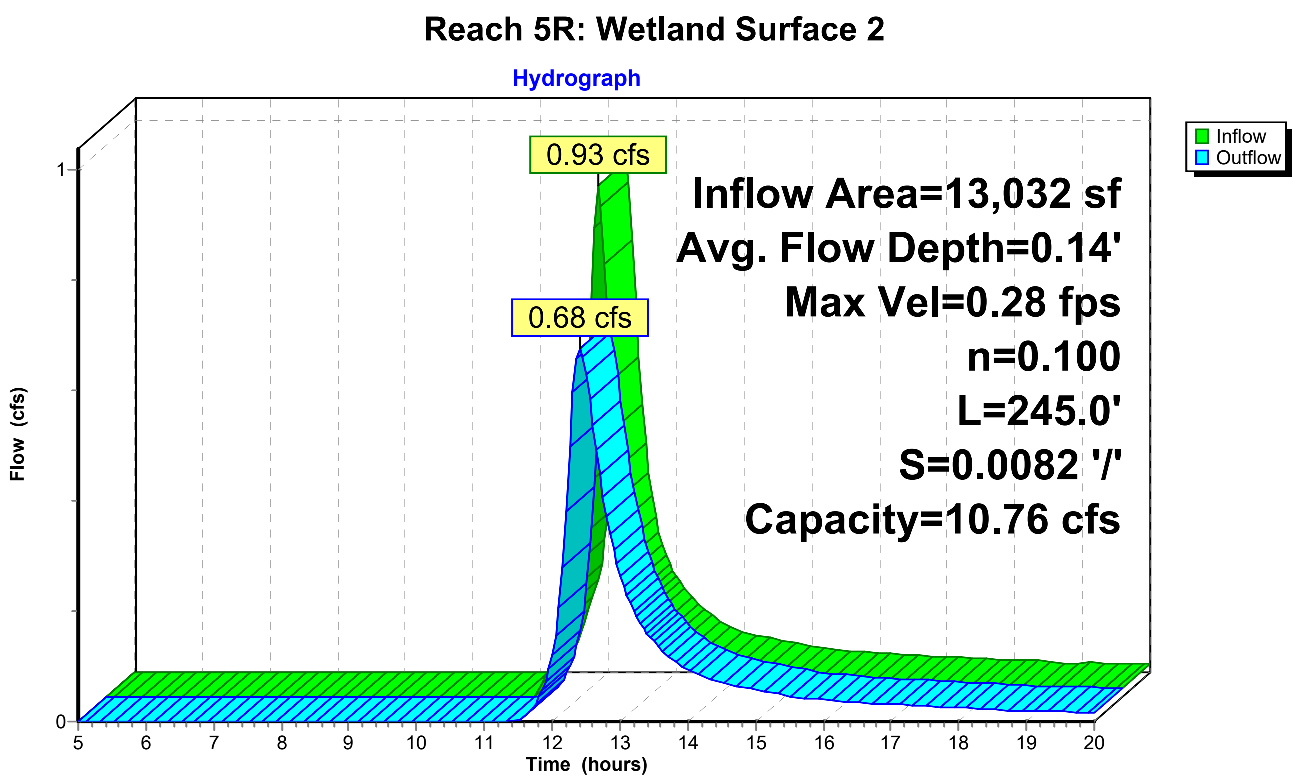
Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.28 fps, Min. Travel Time= 14.8 min
Avg. Velocity = 0.13 fps, Avg. Travel Time= 31.3 min

Peak Storage= 601 cf @ 12.40 hrs
Average Depth at Peak Storage= 0.14' , Surface Width= 26.39'
Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 10.76 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 245.0' Slope= 0.0082 '/'
Inlet Invert= 96.00', Outlet Invert= 94.00'



‡



Stage-Discharge for Reach 5R: Wetland Surface 2

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
96.00	0.00	0.00
96.01	0.05	0.00
96.02	0.08	0.01
96.03	0.10	0.02
96.04	0.12	0.05
96.05	0.14	0.07
96.06	0.16	0.11
96.07	0.17	0.15
96.08	0.19	0.20
96.09	0.21	0.26
96.10	0.22	0.33
96.11	0.24	0.40
96.12	0.25	0.49
96.13	0.26	0.58
96.14	0.28	0.68
96.15	0.29	0.79
96.16	0.30	0.91
96.17	0.31	1.04
96.18	0.33	1.18
96.19	0.34	1.32
96.20	0.35	1.48
96.21	0.36	1.64
96.22	0.37	1.82
96.23	0.38	2.00
96.24	0.40	2.19
96.25	0.41	2.40
96.26	0.42	2.61
96.27	0.43	2.83
96.28	0.44	3.06
96.29	0.45	3.30
96.30	0.46	3.56
96.31	0.47	3.82
96.32	0.48	4.09
96.33	0.49	4.37
96.34	0.50	4.66
96.35	0.51	4.97
96.36	0.52	5.28
96.37	0.53	5.60
96.38	0.54	5.94
96.39	0.55	6.28
96.40	0.56	6.63
96.41	0.57	7.00
96.42	0.57	7.37
96.43	0.58	7.76
96.44	0.59	8.15
96.45	0.60	8.56
96.46	0.61	8.98
96.47	0.62	9.41
96.48	0.63	9.85
96.49	0.64	10.30
96.50	**0.65**	**10.76**

Stage-Area-Storage for Reach 5R: Wetland Surface 2

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
96.00	0.0	0
96.01	0.0	12
96.02	0.1	33
96.03	0.2	60
96.04	0.4	92
96.05	0.5	129
96.06	0.7	170
96.07	0.9	214
96.08	1.1	261
96.09	1.3	312
96.10	1.5	365
96.11	1.7	421
96.12	2.0	480
96.13	2.2	541
96.14	2.5	605
96.15	2.7	671
96.16	3.0	739
96.17	3.3	810
96.18	3.6	882
96.19	3.9	957
96.20	4.2	1,033
96.21	4.5	1,111
96.22	4.9	1,192
96.23	5.2	1,274
96.24	5.5	1,358
96.25	5.9	1,444
96.26	6.2	1,531
96.27	6.6	1,620
96.28	7.0	1,711
96.29	7.4	1,804
96.30	7.7	1,898
96.31	8.1	1,993
96.32	8.5	2,091
96.33	8.9	2,189
96.34	9.3	2,290
96.35	9.8	2,391
96.36	10.2	2,495
96.37	10.6	2,599
96.38	11.0	2,705
96.39	11.5	2,813
96.40	11.9	2,922
96.41	12.4	3,032
96.42	12.8	3,144
96.43	13.3	3,257
96.44	13.8	3,371
96.45	14.2	3,486
96.46	14.7	3,603
96.47	15.2	3,721
96.48	15.7	3,841
96.49	16.2	3,961
96.50	**16.7**	**4,083**

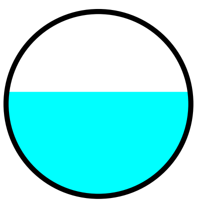
Summary for Reach 8R: 6" Roof Drain Carrier Pipe

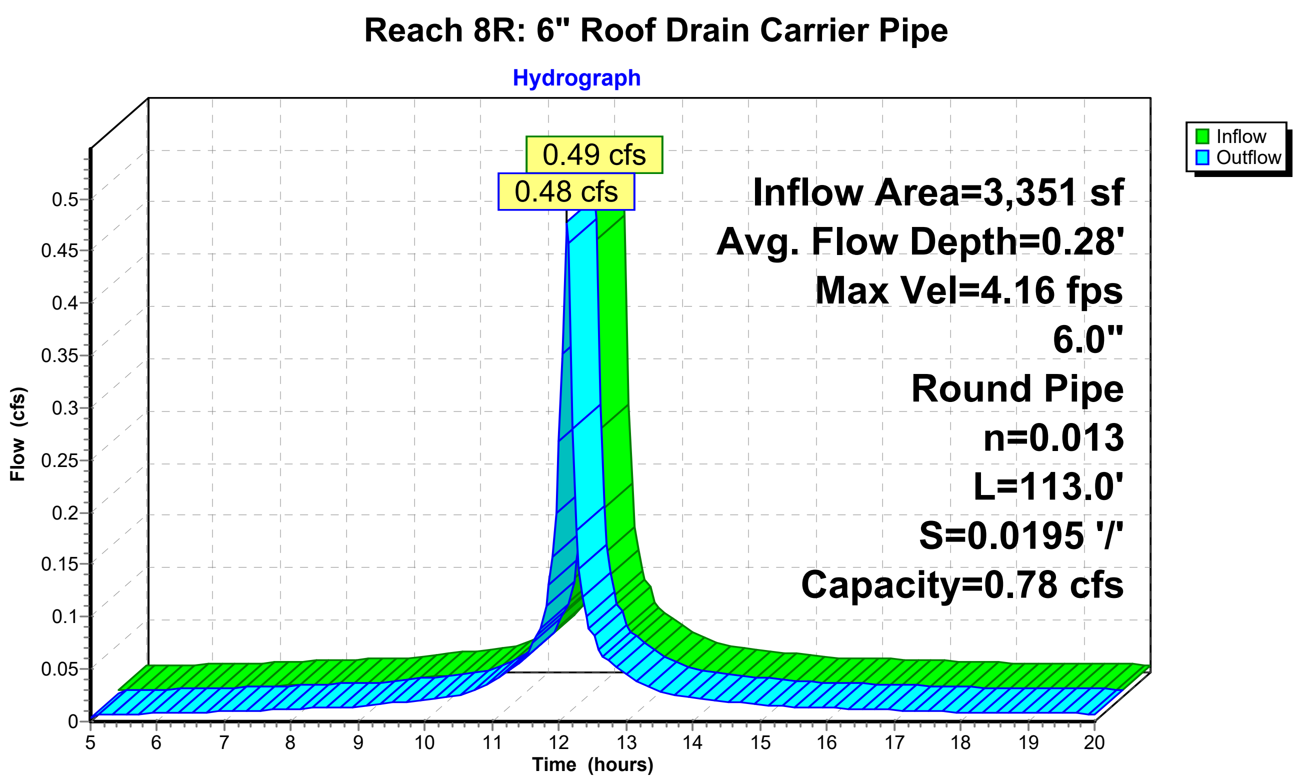
Inflow Area = 3,351 sf,100.00% Impervious, Inflow Depth > 5.38" for 25-Year event
Inflow = 0.49 cfs @ 12.11 hrs, Volume= 1,502 cf
Outflow = 0.48 cfs @ 12.12 hrs, Volume= 1,501 cf, Atten= 2%, Lag= 0.6 min
Routed to Reach 9R : 12" Roof Drain Carrier Pipe

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.16 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.65 fps, Avg. Travel Time= 1.1 min

Peak Storage= 13 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.28' , Surface Width= 0.50'
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 0.78 cfs

6.0" Round Pipe
n= 0.013
Length= 113.0' Slope= 0.0195 '/'
Inlet Invert= 94.50', Outlet Invert= 92.30'





Stage-Discharge for Reach 8R: 6" Roof Drain Carrier Pipe

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
94.50	0.00	0.00
94.51	0.56	0.00
94.52	0.89	0.00
94.53	1.15	0.01
94.54	1.39	0.01
94.55	1.60	0.02
94.56	1.79	0.02
94.57	1.97	0.03
94.58	2.14	0.04
94.59	2.30	0.06
94.60	2.45	0.07
94.61	2.59	0.08
94.62	2.73	0.10
94.63	2.86	0.12
94.64	2.98	0.13
94.65	3.09	0.15
94.66	3.21	0.17
94.67	3.31	0.19
94.68	3.41	0.22
94.69	3.51	0.24
94.70	3.60	0.26
94.71	3.68	0.29
94.72	3.77	0.31
94.73	3.84	0.34
94.74	3.92	0.37
94.75	3.99	0.39
94.76	4.05	0.42
94.77	4.11	0.45
94.78	4.17	0.47
94.79	4.23	0.50
94.80	4.28	0.53
94.81	4.32	0.55
94.82	4.36	0.58
94.83	4.40	0.61
94.84	4.44	0.63
94.85	4.46	0.66
94.86	4.49	0.68
94.87	4.51	0.70
94.88	4.53	0.72
94.89	4.54	0.75
94.90	4.54	0.77
94.91	**4.55**	0.78
94.92	4.54	0.80
94.93	4.53	0.81
94.94	4.51	0.83
94.95	4.48	0.83
94.96	4.45	0.84
94.97	4.40	**0.84**
94.98	4.33	0.84
94.99	4.23	0.83
95.00	3.99	0.78

Stage-Area-Storage for Reach 8R: 6" Roof Drain Carrier Pipe

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
94.50	0.0	0
94.51	0.0	0
94.52	0.0	0
94.53	0.0	1
94.54	0.0	1
94.55	0.0	1
94.56	0.0	2
94.57	0.0	2
94.58	0.0	2
94.59	0.0	3
94.60	0.0	3
94.61	0.0	4
94.62	0.0	4
94.63	0.0	5
94.64	0.0	5
94.65	0.0	6
94.66	0.1	6
94.67	0.1	7
94.68	0.1	7
94.69	0.1	8
94.70	0.1	8
94.71	0.1	9
94.72	0.1	9
94.73	0.1	10
94.74	0.1	11
94.75	0.1	11
94.76	0.1	12
94.77	0.1	12
94.78	0.1	13
94.79	0.1	13
94.80	0.1	14
94.81	0.1	14
94.82	0.1	15
94.83	0.1	16
94.84	0.1	16
94.85	0.1	17
94.86	0.2	17
94.87	0.2	18
94.88	0.2	18
94.89	0.2	19
94.90	0.2	19
94.91	0.2	19
94.92	0.2	20
94.93	0.2	20
94.94	0.2	21
94.95	0.2	21
94.96	0.2	21
94.97	0.2	22
94.98	0.2	22
94.99	0.2	22
95.00	**0.2**	**22**

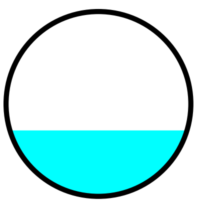
Summary for Reach 9R: 12" Roof Drain Carrier Pipe

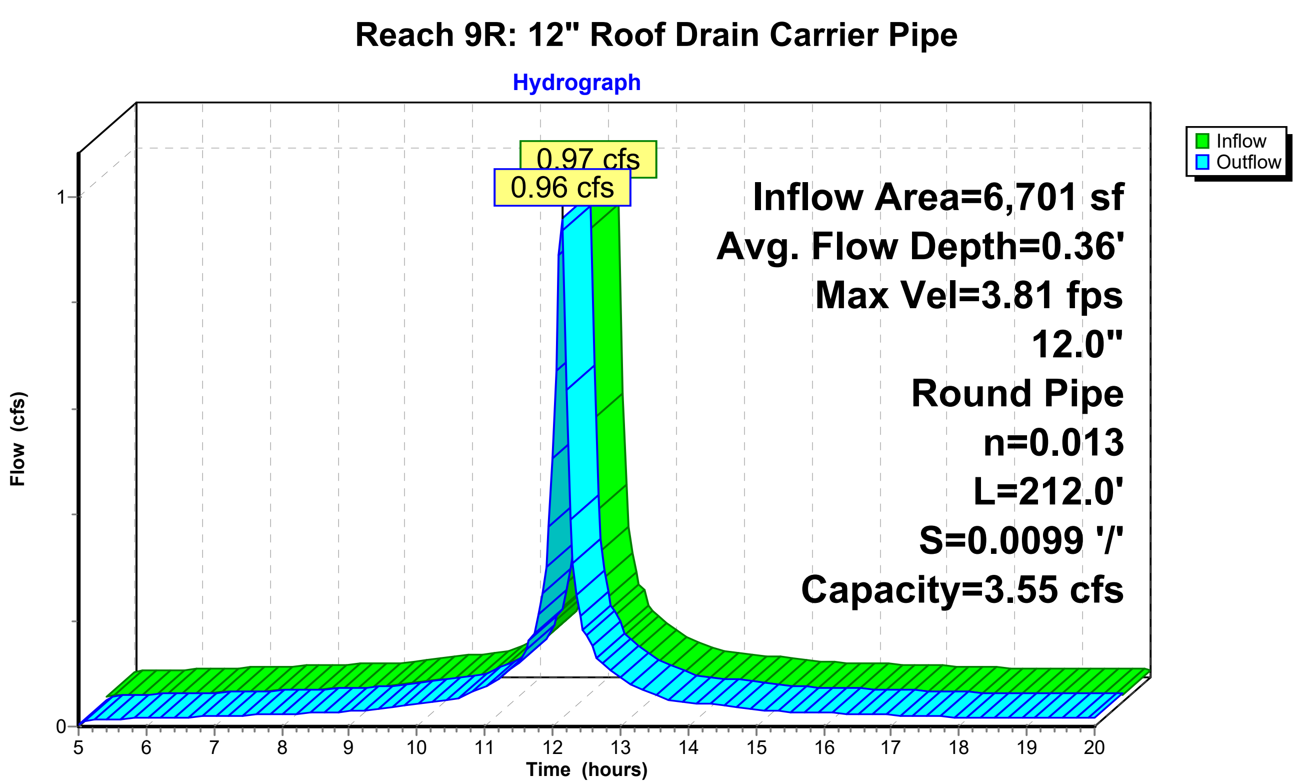
Inflow Area = 6,701 sf,100.00% Impervious, Inflow Depth > 5.38" for 25-Year event
Inflow = 0.97 cfs @ 12.12 hrs, Volume= 3,002 cf
Outflow = 0.96 cfs @ 12.13 hrs, Volume= 2,999 cf, Atten= 1%, Lag= 1.0 min
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.81 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.47 fps, Avg. Travel Time= 2.4 min

Peak Storage= 53 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.36' , Surface Width= 0.96'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.55 cfs

12.0" Round Pipe
n= 0.013
Length= 212.0' Slope= 0.0099 '/'
Inlet Invert= 91.10', Outlet Invert= 89.00'





Stage-Discharge for Reach 9R: 12" Roof Drain Carrier Pipe

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
91.10	0.00	0.00
91.11	0.40	0.00
91.12	0.64	0.00
91.13	0.83	0.01
91.14	1.00	0.01
91.15	1.16	0.02
91.16	1.31	0.03
91.17	1.44	0.03
91.18	1.57	0.05
91.19	1.69	0.06
91.20	1.81	0.07
91.21	1.92	0.09
91.22	2.03	0.11
91.23	2.14	0.13
91.24	2.24	0.15
91.25	2.33	0.17
91.26	2.43	0.20
91.27	2.52	0.22
91.28	2.61	0.25
91.29	2.69	0.28
91.30	2.78	0.31
91.31	2.86	0.34
91.32	2.94	0.38
91.33	3.01	0.41
91.34	3.09	0.45
91.35	3.16	0.49
91.36	3.23	0.52
91.37	3.30	0.57
91.38	3.37	0.61
91.39	3.44	0.65
91.40	3.50	0.69
91.41	3.57	0.74
91.42	3.63	0.79
91.43	3.69	0.83
91.44	3.75	0.88
91.45	3.81	0.93
91.46	3.86	0.98
91.47	3.92	1.03
91.48	3.97	1.09
91.49	4.02	1.14
91.50	4.07	1.19
91.51	4.12	1.25
91.52	4.17	1.31
91.53	4.22	1.36
91.54	4.26	1.42
91.55	4.31	1.48
91.56	4.35	1.54
91.57	4.39	1.59
91.58	4.44	1.65
91.59	4.48	1.71
91.60	4.51	1.77
91.61	4.55	1.83
91.62	4.59	1.89
91.63	4.62	1.95
91.64	4.66	2.02
91.65	4.69	2.08
91.66	4.72	2.14
91.67	4.76	2.20
91.68	4.79	2.26
91.69	4.81	2.32
91.70	4.84	2.38
91.71	4.87	2.44
91.72	4.89	2.50
91.73	4.92	2.56
91.74	4.94	2.62
91.75	4.96	2.68
91.76	4.98	2.74
91.77	5.00	2.80
91.78	5.02	2.86
91.79	5.04	2.91
91.80	5.06	2.97
91.81	5.07	3.02
91.82	5.08	3.08
91.83	5.10	3.13
91.84	5.11	3.18
91.85	5.12	3.23
91.86	5.13	3.28
91.87	5.13	3.33
91.88	5.14	3.38
91.89	5.14	3.42
91.90	5.15	3.47
91.91	**5.15**	3.51
91.92	5.15	3.55
91.93	5.14	3.59
91.94	5.14	3.62
91.95	5.14	3.65
91.96	5.13	3.68
91.97	5.12	3.71
91.98	5.11	3.74
91.99	5.09	3.76
92.00	5.08	3.78
92.01	5.06	3.79
92.02	5.03	3.81
92.03	5.01	3.81
92.04	4.98	**3.81**
92.05	4.94	3.81
92.06	4.90	3.80
92.07	4.85	3.78
92.08	4.79	3.75
92.09	4.71	3.69
92.10	4.51	3.55

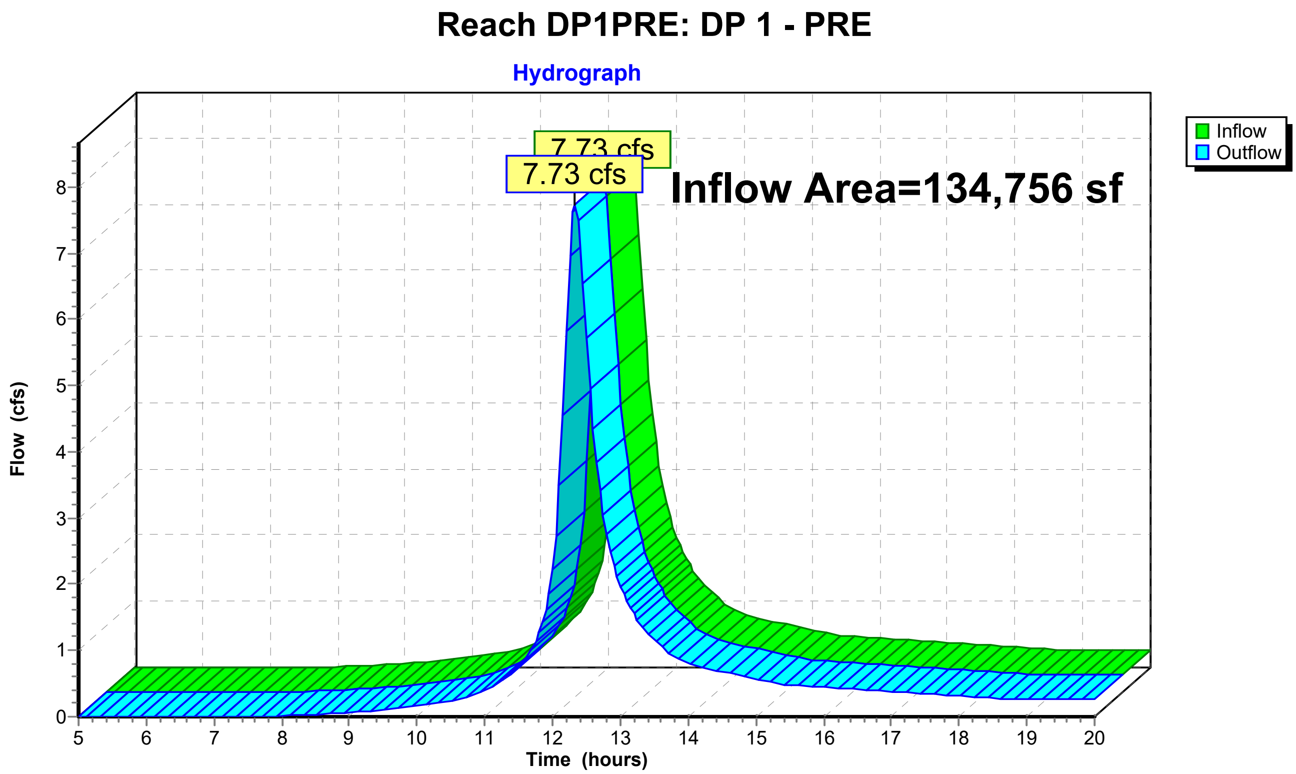
Stage-Area-Storage for Reach 9R: 12" Roof Drain Carrier Pipe

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
91.10	0.0	0	91.63	0.4	90
91.11	0.0	0	91.64	0.4	92
91.12	0.0	1	91.65	0.4	94
91.13	0.0	1	91.66	0.5	96
91.14	0.0	2	91.67	0.5	98
91.15	0.0	3	91.68	0.5	100
91.16	0.0	4	91.69	0.5	102
91.17	0.0	5	91.70	0.5	104
91.18	0.0	6	91.71	0.5	106
91.19	0.0	7	91.72	0.5	108
91.20	0.0	9	91.73	0.5	110
91.21	0.0	10	91.74	0.5	113
91.22	0.1	11	91.75	0.5	115
91.23	0.1	13	91.76	0.5	117
91.24	0.1	14	91.77	0.6	119
91.25	0.1	16	91.78	0.6	121
91.26	0.1	17	91.79	0.6	123
91.27	0.1	19	91.80	0.6	124
91.28	0.1	20	91.81	0.6	126
91.29	0.1	22	91.82	0.6	128
91.30	0.1	24	91.83	0.6	130
91.31	0.1	25	91.84	0.6	132
91.32	0.1	27	91.85	0.6	134
91.33	0.1	29	91.86	0.6	136
91.34	0.1	31	91.87	0.6	138
91.35	0.2	33	91.88	0.7	139
91.36	0.2	34	91.89	0.7	141
91.37	0.2	36	91.90	0.7	143
91.38	0.2	38	91.91	0.7	144
91.39	0.2	40	91.92	0.7	146
91.40	0.2	42	91.93	0.7	148
91.41	0.2	44	91.94	0.7	149
91.42	0.2	46	91.95	0.7	151
91.43	0.2	48	91.96	0.7	152
91.44	0.2	50	91.97	0.7	154
91.45	0.2	52	91.98	0.7	155
91.46	0.3	54	91.99	0.7	157
91.47	0.3	56	92.00	0.7	158
91.48	0.3	58	92.01	0.8	159
91.49	0.3	60	92.02	0.8	160
91.50	0.3	62	92.03	0.8	161
91.51	0.3	64	92.04	0.8	162
91.52	0.3	66	92.05	0.8	163
91.53	0.3	68	92.06	0.8	164
91.54	0.3	71	92.07	0.8	165
91.55	0.3	73	92.08	0.8	166
91.56	0.4	75	92.09	0.8	166
91.57	0.4	77	92.10	**0.8**	**167**
91.58	0.4	79			
91.59	0.4	81			
91.60	0.4	83			
91.61	0.4	85			
91.62	0.4	87			

Summary for Reach DP1PRE: DP 1 - PRE

Inflow Area = 134,756 sf, 4.57% Impervious, Inflow Depth > 3.04" for 25-Year event
Inflow = 7.73 cfs @ 12.33 hrs, Volume= 34,177 cf
Outflow = 7.73 cfs @ 12.33 hrs, Volume= 34,177 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

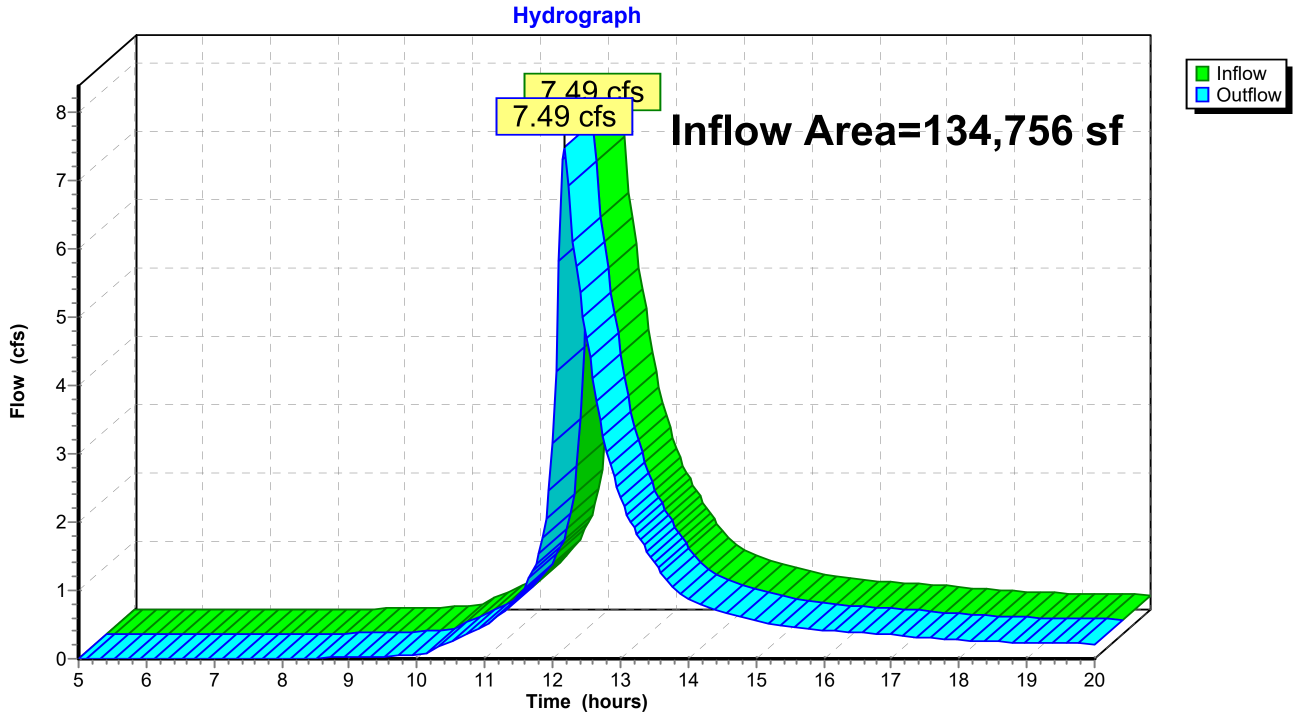


Summary for Reach DP1PST: DP 1 - POST

Inflow Area = 134,756 sf, 27.66% Impervious, Inflow Depth > 3.14" for 25-Year event
Inflow = 7.49 cfs @ 12.17 hrs, Volume= 35,265 cf
Outflow = 7.49 cfs @ 12.17 hrs, Volume= 35,265 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach DP1PST: DP 1 - POST



Summary for Pond 1P: Subsurface #1

Inflow Area = 13,933 sf, 48.09% Impervious, Inflow Depth > 4.17" for 25-Year event
Inflow = 1.43 cfs @ 12.13 hrs, Volume= 4,846 cf
Outflow = 0.99 cfs @ 12.22 hrs, Volume= 4,076 cf, Atten= 31%, Lag= 5.7 min
Discarded = 0.03 cfs @ 9.40 hrs, Volume= 1,461 cf
Primary = 0.96 cfs @ 12.22 hrs, Volume= 2,616 cf
Routed to Reach 3R : Wetland Surface 1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.72' @ 12.22 hrs Surf.Area= 1,248 sf Storage= 1,373 cf

Plug-Flow detention time= 76.7 min calculated for 4,062 cf (84% of inflow)
Center-of-Mass det. time= 28.0 min (786.1 - 758.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	96.00'	902 cf	**37.25'W x 33.50'L x 2.54'H Field A**
			3,172 cf Overall - 918 cf Embedded = 2,254 cf x 40.0% Voids
#2A	96.50'	918 cf	**Cultec R-150XLHD** x 33 Inside #1
			Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf
			Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap
			Row Length Adjustment= +0.75' x 2.65 sf x 11 rows
		1,819 cf	Total Available Storage

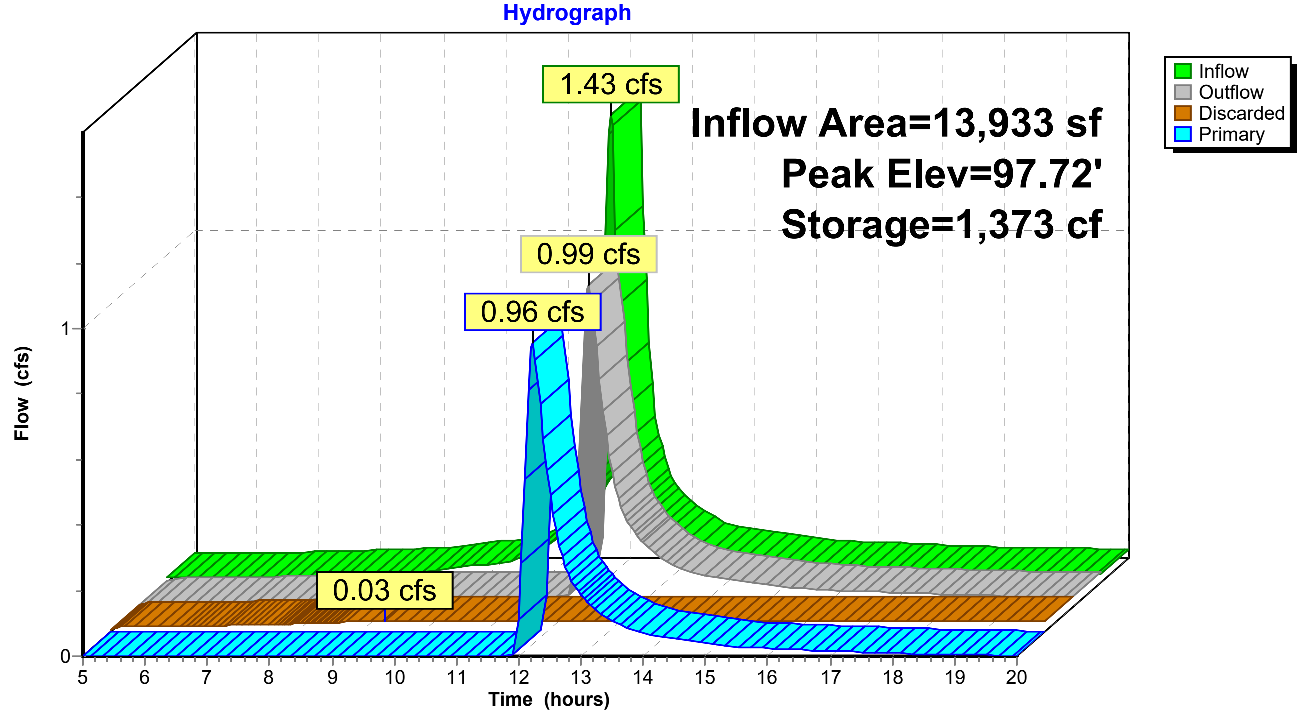
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	96.00'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	99.00'	**6.0" Horiz. Orifice/Grate X 2.00** C= 0.600
			Limited to weir flow at low heads
#3	Primary	97.00'	**8.0" Round Culvert**
			L= 30.0' RCP, sq.cut end projecting, Ke= 0.500
			Inlet / Outlet Invert= 97.00' / 96.75' S= 0.0083 '/' Cc= 0.900
			n= 0.013, Flow Area= 0.35 sf

Discarded OutFlow Max=0.03 cfs @ 9.40 hrs HW=96.03' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.94 cfs @ 12.22 hrs HW=97.71' TW=94.10' (Dynamic Tailwater)
├─**2=Orifice/Grate** (Controls 0.00 cfs)
└─**3=Culvert** (Barrel Controls 0.94 cfs @ 3.16 fps)

Pond 1P: Subsurface #1



Stage-Discharge for Pond 1P: Subsurface #1

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
96.00	0.00	**0.00**	0.00
96.05	0.03	**0.03**	0.00
96.10	0.03	0.03	0.00
96.15	0.03	0.03	0.00
96.20	0.03	0.03	0.00
96.25	0.03	0.03	0.00
96.30	0.03	0.03	0.00
96.35	0.03	0.03	0.00
96.40	0.03	0.03	0.00
96.45	0.03	0.03	0.00
96.50	0.03	0.03	0.00
96.55	0.03	0.03	0.00
96.60	0.03	0.03	0.00
96.65	0.03	0.03	0.00
96.70	0.03	0.03	0.00
96.75	0.03	0.03	0.00
96.80	0.03	0.03	0.00
96.85	0.03	0.03	0.00
96.90	0.03	0.03	0.00
96.95	0.03	0.03	0.00
97.00	0.03	0.03	0.00
97.05	0.04	0.03	0.01
97.10	0.06	0.03	0.03
97.15	0.09	0.03	0.06
97.20	0.14	0.03	0.11
97.25	0.20	0.03	0.17
97.30	0.27	0.03	0.24
97.35	0.35	0.03	0.32
97.40	0.43	0.03	0.40
97.45	0.52	0.03	0.49
97.50	0.61	0.03	0.58
97.55	0.70	0.03	0.67
97.60	0.79	0.03	0.76
97.65	0.88	0.03	0.85
97.70	0.96	0.03	0.93
97.75	1.04	0.03	1.01
97.80	1.10	0.03	1.07
97.85	1.14	0.03	1.11
97.90	1.13	0.03	1.10
97.95	1.19	0.03	1.16
98.00	1.24	0.03	1.21
98.05	1.29	0.03	1.26
98.10	1.34	0.03	1.31
98.15	1.39	0.03	1.36
98.20	1.43	0.03	1.40
98.25	1.48	0.03	1.45
98.30	1.52	0.03	1.49
98.35	1.56	0.03	1.53
98.40	1.60	0.03	1.57
98.45	1.64	0.03	1.61
98.50	1.68	0.03	1.65
98.55	1.72	0.03	1.69
98.60	1.76	0.03	1.73
98.65	1.79	0.03	1.76
98.70	1.83	0.03	1.80
98.75	1.86	0.03	1.83
98.80	1.90	0.03	1.87
98.85	1.93	0.03	1.90
98.90	1.96	0.03	1.93
98.95	1.99	0.03	1.96
99.00	**2.03**	0.03	**2.00**

Stage-Area-Storage for Pond 1P: Subsurface #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
96.00	**1,248**	0	98.65	1,248	1,819
96.05	1,248	25	98.70	1,248	1,819
96.10	1,248	50	98.75	1,248	1,819
96.15	1,248	75	98.80	1,248	1,819
96.20	1,248	100	98.85	1,248	1,819
96.25	1,248	125	98.90	1,248	1,819
96.30	1,248	150	98.95	1,248	1,819
96.35	1,248	175	99.00	1,248	1,819
96.40	1,248	200			
96.45	1,248	225			
96.50	1,248	250			
96.55	1,248	300			
96.60	1,248	350			
96.65	1,248	400			
96.70	1,248	450			
96.75	1,248	499			
96.80	1,248	548			
96.85	1,248	597			
96.90	1,248	646			
96.95	1,248	694			
97.00	1,248	742			
97.05	1,248	790			
97.10	1,248	838			
97.15	1,248	885			
97.20	1,248	932			
97.25	1,248	978			
97.30	1,248	1,024			
97.35	1,248	1,069			
97.40	1,248	1,113			
97.45	1,248	1,157			
97.50	1,248	1,200			
97.55	1,248	1,242			
97.60	1,248	1,283			
97.65	1,248	1,322			
97.70	1,248	1,361			
97.75	1,248	1,398			
97.80	1,248	1,433			
97.85	1,248	1,465			
97.90	1,248	1,495			
97.95	1,248	1,522			
98.00	1,248	1,549			
98.05	1,248	1,574			
98.10	1,248	1,599			
98.15	1,248	1,624			
98.20	1,248	1,649			
98.25	1,248	1,674			
98.30	1,248	1,699			
98.35	1,248	1,724			
98.40	1,248	1,749			
98.45	1,248	1,774			
98.50	1,248	1,799			
98.55	1,248	**1,819**			
98.60	1,248	1,819			

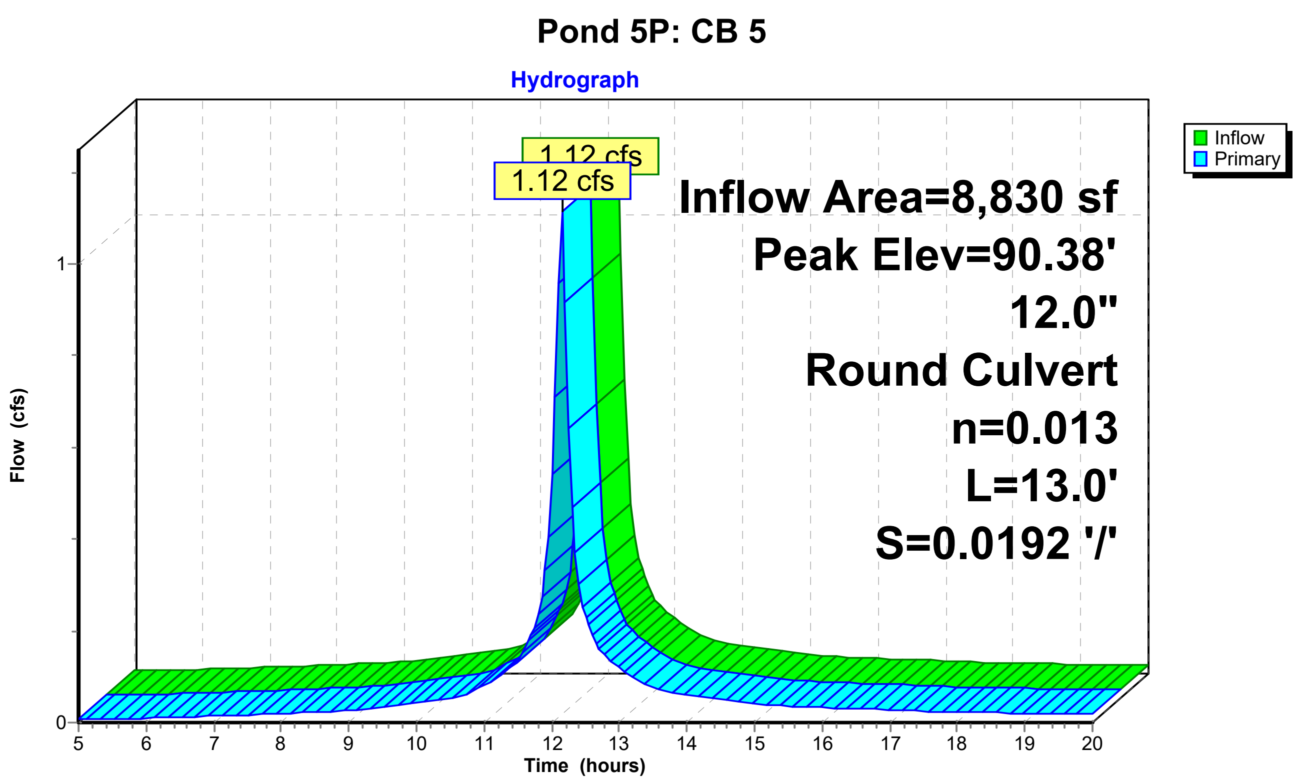
Summary for Pond 5P: CB 5

Inflow Area = 8,830 sf, 71.11% Impervious, Inflow Depth > 4.78" for 25-Year event
Inflow = 1.12 cfs @ 12.15 hrs, Volume= 3,514 cf
Outflow = 1.12 cfs @ 12.15 hrs, Volume= 3,514 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.12 cfs @ 12.15 hrs, Volume= 3,514 cf
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.38' @ 12.37 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	89.25'	**12.0" Round Culvert** L= 13.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.25' / 89.00' S= 0.0192 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.07 cfs @ 12.15 hrs HW=89.96' TW=89.96' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.07 cfs @ 0.17 fps)



Stage-Discharge for Pond 5P: CB 5

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
89.25	0.00	89.78	1.02	90.31	2.83
89.26	0.00	89.79	1.05	90.32	2.86
89.27	0.00	89.80	1.08	90.33	2.88
89.28	0.00	89.81	1.12	90.34	2.90
89.29	0.01	89.82	1.15	90.35	2.93
89.30	0.01	89.83	1.18	90.36	2.95
89.31	0.02	89.84	1.21	90.37	2.98
89.32	0.02	89.85	1.25	90.38	3.00
89.33	0.03	89.86	1.28	90.39	**3.03**
89.34	0.04	89.87	1.31		
89.35	0.04	89.88	1.35		
89.36	0.05	89.89	1.38		
89.37	0.06	89.90	1.42		
89.38	0.07	89.91	1.45		
89.39	0.09	89.92	1.48		
89.40	0.10	89.93	1.52		
89.41	0.11	89.94	1.55		
89.42	0.12	89.95	1.59		
89.43	0.14	89.96	1.62		
89.44	0.15	89.97	1.66		
89.45	0.17	89.98	1.69		
89.46	0.19	89.99	1.73		
89.47	0.20	90.00	1.77		
89.48	0.22	90.01	1.80		
89.49	0.24	90.02	1.84		
89.50	0.26	90.03	1.87		
89.51	0.28	90.04	1.91		
89.52	0.30	90.05	1.94		
89.53	0.32	90.06	1.98		
89.54	0.35	90.07	2.02		
89.55	0.37	90.08	2.05		
89.56	0.39	90.09	2.09		
89.57	0.42	90.10	2.13		
89.58	0.44	90.11	2.16		
89.59	0.47	90.12	2.20		
89.60	0.49	90.13	2.23		
89.61	0.52	90.14	2.27		
89.62	0.55	90.15	2.31		
89.63	0.57	90.16	2.34		
89.64	0.60	90.17	2.38		
89.65	0.63	90.18	2.41		
89.66	0.66	90.19	2.45		
89.67	0.69	90.20	2.48		
89.68	0.72	90.21	2.52		
89.69	0.75	90.22	2.55		
89.70	0.78	90.23	2.59		
89.71	0.81	90.24	2.62		
89.72	0.84	90.25	2.66		
89.73	0.87	90.26	2.69		
89.74	0.90	90.27	2.73		
89.75	0.93	90.28	2.75		
89.76	0.96	90.29	2.78		
89.77	0.99	90.30	2.80		

Stage-Area-Storage for Pond 5P: CB 5

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
89.25	**0**	89.78	0	90.31	0
89.26	0	89.79	0	90.32	0
89.27	0	89.80	0	90.33	0
89.28	0	89.81	0	90.34	0
89.29	0	89.82	0	90.35	0
89.30	0	89.83	0	90.36	0
89.31	0	89.84	0	90.37	0
89.32	0	89.85	0	90.38	0
89.33	0	89.86	0	90.39	0
89.34	0	89.87	0		
89.35	0	89.88	0		
89.36	0	89.89	0		
89.37	0	89.90	0		
89.38	0	89.91	0		
89.39	0	89.92	0		
89.40	0	89.93	0		
89.41	0	89.94	0		
89.42	0	89.95	0		
89.43	0	89.96	0		
89.44	0	89.97	0		
89.45	0	89.98	0		
89.46	0	89.99	0		
89.47	0	90.00	0		
89.48	0	90.01	0		
89.49	0	90.02	0		
89.50	0	90.03	0		
89.51	0	90.04	0		
89.52	0	90.05	0		
89.53	0	90.06	0		
89.54	0	90.07	0		
89.55	0	90.08	0		
89.56	0	90.09	0		
89.57	0	90.10	0		
89.58	0	90.11	0		
89.59	0	90.12	0		
89.60	0	90.13	0		
89.61	0	90.14	0		
89.62	0	90.15	0		
89.63	0	90.16	0		
89.64	0	90.17	0		
89.65	0	90.18	0		
89.66	0	90.19	0		
89.67	0	90.20	0		
89.68	0	90.21	0		
89.69	0	90.22	0		
89.70	0	90.23	0		
89.71	0	90.24	0		
89.72	0	90.25	0		
89.73	0	90.26	0		
89.74	0	90.27	0		
89.75	0	90.28	0		
89.76	0	90.29	0		
89.77	0	90.30	0		

Summary for Pond 10P: Infiltration Basin #1 (Storage)

Inflow Area = 54,661 sf, 51.78% Impervious, Inflow Depth > 3.89" for 25-Year event
Inflow = 5.11 cfs @ 12.15 hrs, Volume= 17,741 cf
Outflow = 3.16 cfs @ 12.27 hrs, Volume= 16,972 cf, Atten= 38%, Lag= 7.3 min
Primary = 3.16 cfs @ 12.27 hrs, Volume= 16,972 cf
Routed to Reach DP1PST : DP 1 - POST
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf
Routed to Reach DP1PST : DP 1 - POST

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.37' @ 12.27 hrs Surf.Area= 2,420 sf Storage= 3,197 cf

Plug-Flow detention time= 36.7 min calculated for 16,972 cf (96% of inflow)
Center-of-Mass det. time= 20.3 min (798.2 - 777.9)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	8,689 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

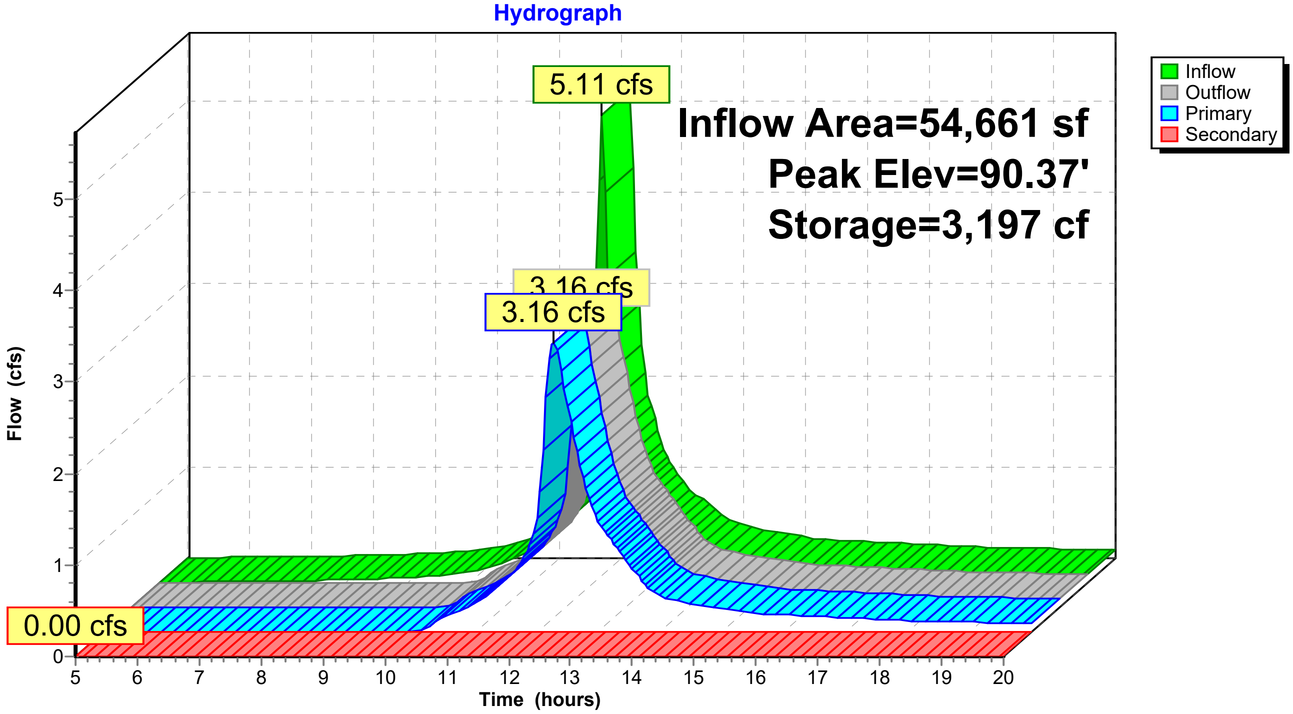
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	392	0	0
90.00	1,990	2,382	2,382
92.00	4,317	6,307	8,689

Device	Routing	Invert	Outlet Devices
#1	Secondary	91.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	87.50'	**12.0" Round Culvert** L= 37.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 87.50' / 87.25' S= 0.0068 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	88.90'	**16.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	89.50'	**6.0" W x 15.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.14 cfs @ 12.27 hrs HW=90.36' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 3.14 cfs of 5.61 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.86 cfs @ 5.57 fps)
  └─**4=Orifice/Grate** (Orifice Controls 1.28 cfs @ 2.98 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' TW=0.00' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 10P: Infiltration Basin #1 (Storage)



Stage-Discharge for Pond 10P: Infiltration Basin #1 (Storage)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
88.00	0.00	0.00	0.00
88.05	0.00	0.00	0.00
88.10	0.00	0.00	0.00
88.15	0.00	0.00	0.00
88.20	0.00	0.00	0.00
88.25	0.00	0.00	0.00
88.30	0.00	0.00	0.00
88.35	0.00	0.00	0.00
88.40	0.00	0.00	0.00
88.45	0.00	0.00	0.00
88.50	0.00	0.00	0.00
88.55	0.00	0.00	0.00
88.60	0.00	0.00	0.00
88.65	0.00	0.00	0.00
88.70	0.00	0.00	0.00
88.75	0.00	0.00	0.00
88.80	0.00	0.00	0.00
88.85	0.00	0.00	0.00
88.90	0.00	0.00	0.00
88.95	0.05	0.05	0.00
89.00	0.14	0.14	0.00
89.05	0.25	0.25	0.00
89.10	0.38	0.38	0.00
89.15	0.53	0.53	0.00
89.20	0.66	0.66	0.00
89.25	0.75	0.75	0.00
89.30	0.83	0.83	0.00
89.35	0.91	0.91	0.00
89.40	0.98	0.98	0.00
89.45	1.04	1.04	0.00
89.50	1.10	1.10	0.00
89.55	1.18	1.18	0.00
89.60	1.27	1.27	0.00
89.65	1.36	1.36	0.00
89.70	1.46	1.46	0.00
89.75	1.57	1.57	0.00
89.80	1.68	1.68	0.00
89.85	1.79	1.79	0.00
89.90	1.91	1.91	0.00
89.95	2.03	2.03	0.00
90.00	2.15	2.15	0.00
90.05	2.28	2.28	0.00
90.10	2.41	2.41	0.00
90.15	2.54	2.54	0.00
90.20	2.68	2.68	0.00
90.25	2.82	2.82	0.00
90.30	2.96	2.96	0.00
90.35	3.10	3.10	0.00
90.40	3.25	3.25	0.00
90.45	3.40	3.40	0.00
90.50	3.55	3.55	0.00
90.55	3.71	3.71	0.00
90.60	3.87	3.87	0.00
90.65	4.02	4.02	0.00
90.70	4.19	4.19	0.00
90.75	4.35	4.35	0.00
90.80	4.50	4.50	0.00
90.85	4.63	4.63	0.00
90.90	4.76	4.76	0.00
90.95	4.89	4.89	0.00
91.00	5.00	5.00	0.00
91.05	5.41	5.12	0.29
91.10	6.05	5.23	0.83
91.15	6.85	5.34	1.52
91.20	7.78	5.44	2.34
91.25	8.81	5.54	3.27
91.30	9.94	5.64	4.30
91.35	11.16	5.74	5.42
91.40	12.45	5.84	6.62
91.45	13.83	5.93	7.90
91.50	15.27	6.02	9.25
91.55	16.78	6.11	10.67
91.60	18.36	6.20	12.16
91.65	20.00	6.29	13.71
91.70	21.70	6.38	15.32
91.75	23.14	6.46	16.68
91.80	23.77	6.54	17.23
91.85	24.38	6.63	17.76
91.90	24.98	6.71	18.27
91.95	25.56	6.79	18.77
92.00	**26.13**	**6.87**	**19.26**

Stage-Area-Storage for Pond 10P: Infiltration Basin #1 (Storage)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
88.00	392	0	90.65	2,746	3,921
88.05	432	21	90.70	2,804	4,060
88.10	472	43	90.75	2,863	4,202
88.15	512	68	90.80	2,921	4,346
88.20	552	94	90.85	2,979	4,494
88.25	592	123	90.90	3,037	4,644
88.30	632	154	90.95	3,095	4,798
88.35	672	186	91.00	3,154	4,954
88.40	712	221	91.05	3,212	5,113
88.45	752	257	91.10	3,270	5,275
88.50	792	296	91.15	3,328	5,440
88.55	831	336	91.20	3,386	5,608
88.60	871	379	91.25	3,444	5,778
88.65	911	424	91.30	3,503	5,952
88.70	951	470	91.35	3,561	6,129
88.75	991	519	91.40	3,619	6,308
88.80	1,031	569	91.45	3,677	6,491
88.85	1,071	622	91.50	3,735	6,676
88.90	1,111	676	91.55	3,793	6,864
88.95	1,151	733	91.60	3,852	7,055
89.00	1,191	792	91.65	3,910	7,249
89.05	1,231	852	91.70	3,968	7,446
89.10	1,271	915	91.75	4,026	7,646
89.15	1,311	979	91.80	4,084	7,849
89.20	1,351	1,046	91.85	4,142	8,055
89.25	1,391	1,114	91.90	4,201	8,263
89.30	1,431	1,185	91.95	4,259	8,475
89.35	1,471	1,257	92.00	**4,317**	**8,689**
89.40	1,511	1,332			
89.45	1,551	1,408			
89.50	1,591	1,487			
89.55	1,630	1,567			
89.60	1,670	1,650			
89.65	1,710	1,734			
89.70	1,750	1,821			
89.75	1,790	1,909			
89.80	1,830	2,000			
89.85	1,870	2,092			
89.90	1,910	2,187			
89.95	1,950	2,283			
90.00	1,990	2,382			
90.05	2,048	2,483			
90.10	2,106	2,587			
90.15	2,165	2,694			
90.20	2,223	2,803			
90.25	2,281	2,916			
90.30	2,339	3,031			
90.35	2,397	3,150			
90.40	2,455	3,271			
90.45	2,514	3,395			
90.50	2,572	3,522			
90.55	2,630	3,652			
90.60	2,688	3,785			

Summary for Pond B2: Infiltration Basin #2 (Storage Zone)

Inflow Area = 13,032 sf, 17.40% Impervious, Inflow Depth > 2.87" for 25-Year event
Inflow = 0.97 cfs @ 12.22 hrs, Volume= 3,120 cf
Outflow = 0.93 cfs @ 12.26 hrs, Volume= 3,048 cf, Atten= 4%, Lag= 2.5 min
Primary = 0.93 cfs @ 12.26 hrs, Volume= 3,048 cf
Routed to Reach 5R : Wetland Surface 2

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.83' @ 12.26 hrs Surf.Area= 596 sf Storage= 219 cf

Plug-Flow detention time= 14.5 min calculated for 3,038 cf (97% of inflow)
Center-of-Mass det. time= 6.2 min (801.3 - 795.1)

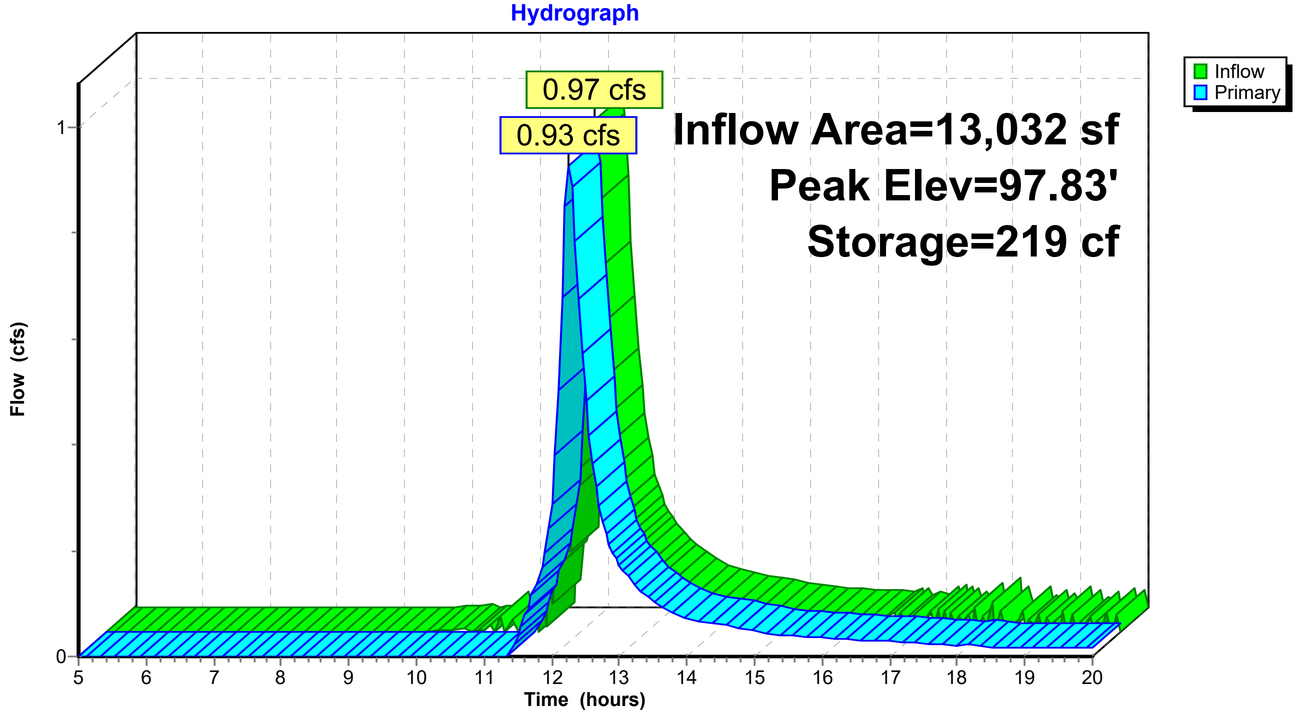
Volume	Invert	Avail.Storage	Storage Description
#1	97.10'	329 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.10	0	0	0
98.00	731	329	329

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 96.25' / 96.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	97.50'	**18.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.92 cfs @ 12.26 hrs HW=97.83' TW=96.12' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.92 cfs of 3.28 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 0.92 cfs @ 1.85 fps)

Pond B2: Infiltration Basin #2 (Storage Zone)



Stage-Discharge for Pond B2: Infiltration Basin #2 (Storage Zone)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
97.10	0.00	97.63	0.23
97.11	0.00	97.64	0.25
97.12	0.00	97.65	0.28
97.13	0.00	97.66	0.31
97.14	0.00	97.67	0.34
97.15	0.00	97.68	0.37
97.16	0.00	97.69	0.40
97.17	0.00	97.70	0.43
97.18	0.00	97.71	0.46
97.19	0.00	97.72	0.50
97.20	0.00	97.73	0.53
97.21	0.00	97.74	0.57
97.22	0.00	97.75	0.60
97.23	0.00	97.76	0.64
97.24	0.00	97.77	0.68
97.25	0.00	97.78	0.71
97.26	0.00	97.79	0.75
97.27	0.00	97.80	0.79
97.28	0.00	97.81	0.83
97.29	0.00	97.82	0.87
97.30	0.00	97.83	0.91
97.31	0.00	97.84	0.95
97.32	0.00	97.85	1.00
97.33	0.00	97.86	1.04
97.34	0.00	97.87	1.08
97.35	0.00	97.88	1.13
97.36	0.00	97.89	1.17
97.37	0.00	97.90	1.22
97.38	0.00	97.91	1.26
97.39	0.00	97.92	1.31
97.40	0.00	97.93	1.36
97.41	0.00	97.94	1.41
97.42	0.00	97.95	1.45
97.43	0.00	97.96	1.50
97.44	0.00	97.97	1.55
97.45	0.00	97.98	1.60
97.46	0.00	97.99	1.65
97.47	0.00	98.00	**1.70**
97.48	0.00		
97.49	0.00		
97.50	0.00		
97.51	0.00		
97.52	0.01		
97.53	0.03		
97.54	0.04		
97.55	0.05		
97.56	0.07		
97.57	0.09		
97.58	0.11		
97.59	0.13		
97.60	0.15		
97.61	0.18		
97.62	0.20		

Stage-Area-Storage for Pond B2: Infiltration Basin #2 (Storage Zone)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
97.10	0	0
97.11	8	0
97.12	16	0
97.13	24	0
97.14	32	1
97.15	41	1
97.16	49	1
97.17	57	2
97.18	65	3
97.19	73	3
97.20	81	4
97.21	89	5
97.22	97	6
97.23	106	7
97.24	114	8
97.25	122	9
97.26	130	10
97.27	138	12
97.28	146	13
97.29	154	15
97.30	162	16
97.31	171	18
97.32	179	20
97.33	187	21
97.34	195	23
97.35	203	25
97.36	211	27
97.37	219	30
97.38	227	32
97.39	236	34
97.40	244	37
97.41	252	39
97.42	260	42
97.43	268	44
97.44	276	47
97.45	284	50
97.46	292	53
97.47	301	56
97.48	309	59
97.49	317	62
97.50	325	65
97.51	333	68
97.52	341	72
97.53	349	75
97.54	357	79
97.55	366	82
97.56	374	86
97.57	382	90
97.58	390	94
97.59	398	98
97.60	406	102
97.61	414	106
97.62	422	110

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
97.63	430	114
97.64	439	118
97.65	447	123
97.66	455	127
97.67	463	132
97.68	471	137
97.69	479	141
97.70	487	146
97.71	495	151
97.72	504	156
97.73	512	161
97.74	520	166
97.75	528	172
97.76	536	177
97.77	544	182
97.78	552	188
97.79	560	193
97.80	569	199
97.81	577	205
97.82	585	211
97.83	593	216
97.84	601	222
97.85	609	228
97.86	617	235
97.87	625	241
97.88	634	247
97.89	642	253
97.90	650	260
97.91	658	266
97.92	666	273
97.93	674	280
97.94	682	287
97.95	690	293
97.96	699	300
97.97	707	307
97.98	715	314
97.99	723	322
98.00	**731**	**329**

Summary for Pond CB1: CB 1

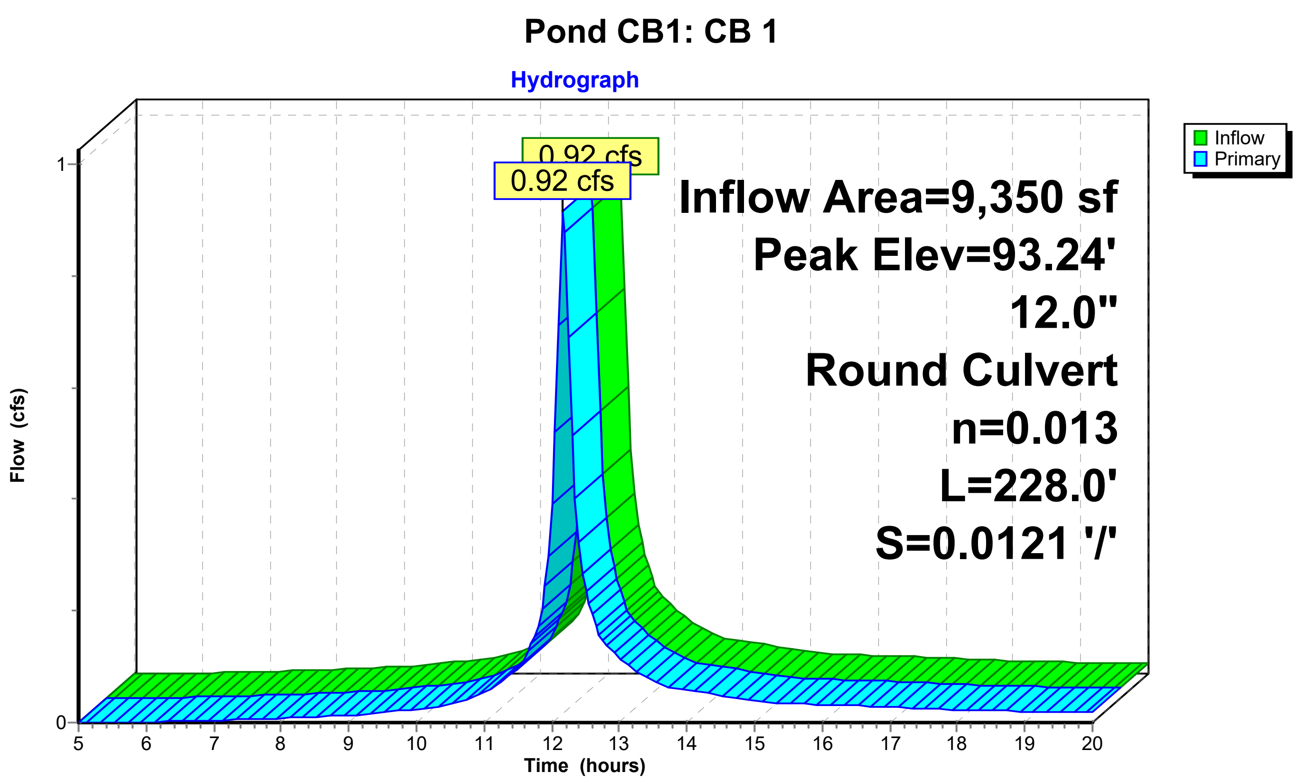
Inflow Area =	9,350 sf, 31.22% Impervious,	Inflow Depth > 3.75"	for 25-Year event
Inflow =	0.92 cfs @ 12.17 hrs, Volume=	2,920 cf	
Outflow =	0.92 cfs @ 12.17 hrs, Volume=	2,920 cf, Atten= 0%, Lag= 0.0 min	
Primary =	0.92 cfs @ 12.17 hrs, Volume=	2,920 cf	

Routed to Pond DMH2 : DMH2

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 93.24' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	92.75'	**12.0" Round Culvert** L= 228.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 92.75' / 90.00' S= 0.0121 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.89 cfs @ 12.17 hrs HW=93.23' TW=90.78' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.89 cfs @ 2.37 fps)



Stage-Discharge for Pond CB1: CB 1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
92.75	0.00	93.28	1.05
92.76	0.00	93.29	1.08
92.77	0.00	93.30	1.12
92.78	0.00	93.31	1.15
92.79	0.01	93.32	1.19
92.80	0.01	93.33	1.22
92.81	0.01	93.34	1.26
92.82	0.02	93.35	1.30
92.83	0.03	93.36	1.33
92.84	0.04	93.37	1.37
92.85	0.04	93.38	1.41
92.86	0.05	93.39	1.45
92.87	0.06	93.40	1.48
92.88	0.07	93.41	1.52
92.89	0.09	93.42	1.56
92.90	0.10	93.43	1.60
92.91	0.11	93.44	1.63
92.92	0.12	93.45	1.67
92.93	0.14	93.46	1.71
92.94	0.15	93.47	1.75
92.95	0.17	93.48	1.79
92.96	0.19	93.49	1.83
92.97	0.20	93.50	1.86
92.98	0.22	93.51	1.90
92.99	0.24	93.52	1.94
93.00	0.26	93.53	1.98
93.01	0.28	93.54	2.01
93.02	0.30	93.55	2.05
93.03	0.32	93.56	2.09
93.04	0.35	93.57	2.13
93.05	0.37	93.58	2.16
93.06	0.39	93.59	2.20
93.07	0.42	93.60	2.23
93.08	0.44	93.61	2.27
93.09	0.47	93.62	2.30
93.10	0.49	93.63	2.34
93.11	0.52	93.64	2.37
93.12	0.55	93.65	2.40
93.13	0.57	93.66	2.44
93.14	0.60	93.67	2.47
93.15	0.63	93.68	2.50
93.16	0.66	93.69	2.53
93.17	0.69	93.70	2.56
93.18	0.72	93.71	2.58
93.19	0.75	93.72	2.61
93.20	0.78	93.73	2.63
93.21	0.81	93.74	2.66
93.22	0.85	93.75	**2.67**
93.23	0.88		
93.24	0.91		
93.25	0.95		
93.26	0.98		
93.27	1.01		

Stage-Area-Storage for Pond CB1: CB 1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
92.75	**0**	93.28	0
92.76	0	93.29	0
92.77	0	93.30	0
92.78	0	93.31	0
92.79	0	93.32	0
92.80	0	93.33	0
92.81	0	93.34	0
92.82	0	93.35	0
92.83	0	93.36	0
92.84	0	93.37	0
92.85	0	93.38	0
92.86	0	93.39	0
92.87	0	93.40	0
92.88	0	93.41	0
92.89	0	93.42	0
92.90	0	93.43	0
92.91	0	93.44	0
92.92	0	93.45	0
92.93	0	93.46	0
92.94	0	93.47	0
92.95	0	93.48	0
92.96	0	93.49	0
92.97	0	93.50	0
92.98	0	93.51	0
92.99	0	93.52	0
93.00	0	93.53	0
93.01	0	93.54	0
93.02	0	93.55	0
93.03	0	93.56	0
93.04	0	93.57	0
93.05	0	93.58	0
93.06	0	93.59	0
93.07	0	93.60	0
93.08	0	93.61	0
93.09	0	93.62	0
93.10	0	93.63	0
93.11	0	93.64	0
93.12	0	93.65	0
93.13	0	93.66	0
93.14	0	93.67	0
93.15	0	93.68	0
93.16	0	93.69	0
93.17	0	93.70	0
93.18	0	93.71	0
93.19	0	93.72	0
93.20	0	93.73	0
93.21	0	93.74	0
93.22	0	93.75	0
93.23	0		
93.24	0		
93.25	0		
93.26	0		
93.27	0		

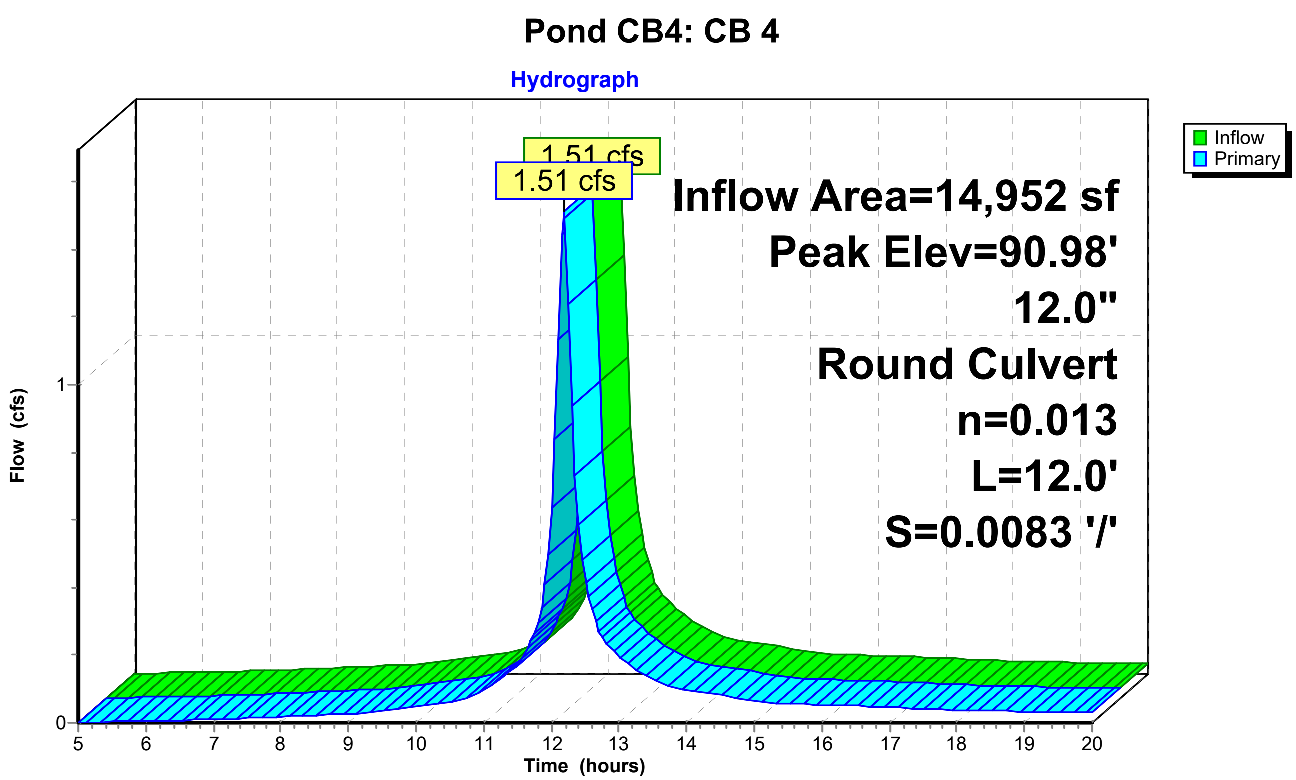
Summary for Pond CB4: CB 4

Inflow Area = 14,952 sf, 43.75% Impervious, Inflow Depth > 4.06" for 25-Year event
Inflow = 1.51 cfs @ 12.18 hrs, Volume= 5,053 cf
Outflow = 1.51 cfs @ 12.18 hrs, Volume= 5,053 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.51 cfs @ 12.18 hrs, Volume= 5,053 cf
Routed to Pond DMH2 : DMH2

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.98' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	90.10'	**12.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 90.10' / 90.00' S= 0.0083 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.24 cfs @ 12.18 hrs HW=90.95' TW=90.80' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.24 cfs @ 2.34 fps)



Stage-Discharge for Pond CB4: CB 4

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
90.10	0.00	90.63	0.80
90.11	0.00	90.64	0.83
90.12	0.00	90.65	0.86
90.13	0.00	90.66	0.88
90.14	0.01	90.67	0.91
90.15	0.01	90.68	0.94
90.16	0.01	90.69	0.97
90.17	0.02	90.70	0.99
90.18	0.02	90.71	1.02
90.19	0.03	90.72	1.05
90.20	0.03	90.73	1.08
90.21	0.04	90.74	1.11
90.22	0.05	90.75	1.14
90.23	0.06	90.76	1.17
90.24	0.07	90.77	1.20
90.25	0.08	90.78	1.23
90.26	0.09	90.79	1.26
90.27	0.10	90.80	1.29
90.28	0.11	90.81	1.32
90.29	0.12	90.82	1.35
90.30	0.13	90.83	1.38
90.31	0.15	90.84	1.41
90.32	0.16	90.85	1.44
90.33	0.18	90.86	1.47
90.34	0.19	90.87	1.50
90.35	0.21	90.88	1.54
90.36	0.22	90.89	1.57
90.37	0.24	90.90	1.60
90.38	0.25	90.91	1.63
90.39	0.27	90.92	1.66
90.40	0.29	90.93	1.70
90.41	0.31	90.94	1.73
90.42	0.33	90.95	1.76
90.43	0.34	90.96	1.79
90.44	0.36	90.97	1.82
90.45	0.38	90.98	1.86
90.46	0.40	90.99	1.89
90.47	0.42	91.00	1.92
90.48	0.44	91.01	1.95
90.49	0.47	91.02	1.98
90.50	0.49	91.03	2.02
90.51	0.51	91.04	2.05
90.52	0.53	91.05	2.08
90.53	0.56	91.06	2.11
90.54	0.58	91.07	2.15
90.55	0.60	91.08	2.18
90.56	0.63	91.09	2.21
90.57	0.65	91.10	**2.24**
90.58	0.68		
90.59	0.70		
90.60	0.73		
90.61	0.75		
90.62	0.78		

Stage-Area-Storage for Pond CB4: CB 4

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
90.10	**0**	90.63	0
90.11	0	90.64	0
90.12	0	90.65	0
90.13	0	90.66	0
90.14	0	90.67	0
90.15	0	90.68	0
90.16	0	90.69	0
90.17	0	90.70	0
90.18	0	90.71	0
90.19	0	90.72	0
90.20	0	90.73	0
90.21	0	90.74	0
90.22	0	90.75	0
90.23	0	90.76	0
90.24	0	90.77	0
90.25	0	90.78	0
90.26	0	90.79	0
90.27	0	90.80	0
90.28	0	90.81	0
90.29	0	90.82	0
90.30	0	90.83	0
90.31	0	90.84	0
90.32	0	90.85	0
90.33	0	90.86	0
90.34	0	90.87	0
90.35	0	90.88	0
90.36	0	90.89	0
90.37	0	90.90	0
90.38	0	90.91	0
90.39	0	90.92	0
90.40	0	90.93	0
90.41	0	90.94	0
90.42	0	90.95	0
90.43	0	90.96	0
90.44	0	90.97	0
90.45	0	90.98	0
90.46	0	90.99	0
90.47	0	91.00	0
90.48	0	91.01	0
90.49	0	91.02	0
90.50	0	91.03	0
90.51	0	91.04	0
90.52	0	91.05	0
90.53	0	91.06	0
90.54	0	91.07	0
90.55	0	91.08	0
90.56	0	91.09	0
90.57	0	91.10	0
90.58	0		
90.59	0		
90.60	0		
90.61	0		
90.62	0		

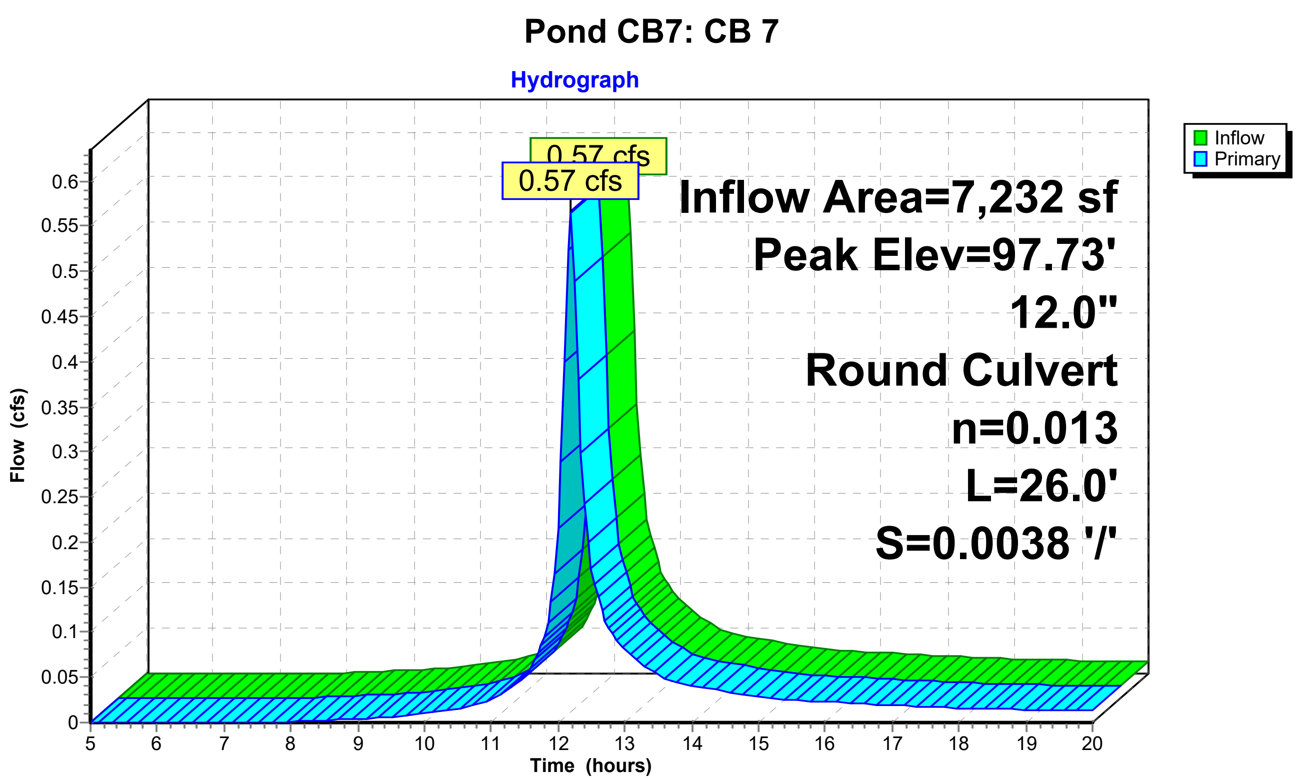
Summary for Pond CB7: CB 7

Inflow Area = 7,232 sf, 0.00% Impervious, Inflow Depth > 3.06" for 25-Year event
Inflow = 0.57 cfs @ 12.19 hrs, Volume= 1,843 cf
Outflow = 0.57 cfs @ 12.19 hrs, Volume= 1,843 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.57 cfs @ 12.19 hrs, Volume= 1,843 cf
Routed to Pond 1P : Subsurface #1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.73' @ 12.27 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	96.60'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.60' / 96.50' S= 0.0038 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.19 hrs HW=97.63' TW=97.69' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)



Stage-Discharge for Pond CB7: CB 7

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
96.60	0.00	97.13	0.71	97.66	2.22
96.61	0.00	97.14	0.74	97.67	2.25
96.62	0.00	97.15	0.76	97.68	2.28
96.63	0.00	97.16	0.79	97.69	2.31
96.64	0.00	97.17	0.81	97.70	2.33
96.65	0.01	97.18	0.84	97.71	2.36
96.66	0.01	97.19	0.86	97.72	2.39
96.67	0.01	97.20	0.89	97.73	**2.41**
96.68	0.02	97.21	0.91		
96.69	0.02	97.22	0.94		
96.70	0.03	97.23	0.97		
96.71	0.03	97.24	1.00		
96.72	0.04	97.25	1.02		
96.73	0.04	97.26	1.05		
96.74	0.05	97.27	1.08		
96.75	0.06	97.28	1.11		
96.76	0.07	97.29	1.13		
96.77	0.08	97.30	1.16		
96.78	0.09	97.31	1.19		
96.79	0.10	97.32	1.22		
96.80	0.11	97.33	1.25		
96.81	0.12	97.34	1.28		
96.82	0.13	97.35	1.31		
96.83	0.14	97.36	1.34		
96.84	0.16	97.37	1.37		
96.85	0.17	97.38	1.40		
96.86	0.18	97.39	1.43		
96.87	0.20	97.40	1.45		
96.88	0.21	97.41	1.48		
96.89	0.23	97.42	1.51		
96.90	0.24	97.43	1.54		
96.91	0.26	97.44	1.57		
96.92	0.27	97.45	1.60		
96.93	0.29	97.46	1.63		
96.94	0.31	97.47	1.66		
96.95	0.33	97.48	1.69		
96.96	0.34	97.49	1.72		
96.97	0.36	97.50	1.75		
96.98	0.38	97.51	1.79		
96.99	0.40	97.52	1.82		
97.00	0.42	97.53	1.85		
97.01	0.44	97.54	1.88		
97.02	0.46	97.55	1.90		
97.03	0.48	97.56	1.93		
97.04	0.50	97.57	1.96		
97.05	0.53	97.58	1.99		
97.06	0.55	97.59	2.02		
97.07	0.57	97.60	2.05		
97.08	0.59	97.61	2.08		
97.09	0.62	97.62	2.11		
97.10	0.64	97.63	2.14		
97.11	0.66	97.64	2.17		
97.12	0.69	97.65	2.20		

Stage-Area-Storage for Pond CB7: CB 7

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
96.60	**0**	97.13	0	97.66	0
96.61	0	97.14	0	97.67	0
96.62	0	97.15	0	97.68	0
96.63	0	97.16	0	97.69	0
96.64	0	97.17	0	97.70	0
96.65	0	97.18	0	97.71	0
96.66	0	97.19	0	97.72	0
96.67	0	97.20	0	97.73	0
96.68	0	97.21	0		
96.69	0	97.22	0		
96.70	0	97.23	0		
96.71	0	97.24	0		
96.72	0	97.25	0		
96.73	0	97.26	0		
96.74	0	97.27	0		
96.75	0	97.28	0		
96.76	0	97.29	0		
96.77	0	97.30	0		
96.78	0	97.31	0		
96.79	0	97.32	0		
96.80	0	97.33	0		
96.81	0	97.34	0		
96.82	0	97.35	0		
96.83	0	97.36	0		
96.84	0	97.37	0		
96.85	0	97.38	0		
96.86	0	97.39	0		
96.87	0	97.40	0		
96.88	0	97.41	0		
96.89	0	97.42	0		
96.90	0	97.43	0		
96.91	0	97.44	0		
96.92	0	97.45	0		
96.93	0	97.46	0		
96.94	0	97.47	0		
96.95	0	97.48	0		
96.96	0	97.49	0		
96.97	0	97.50	0		
96.98	0	97.51	0		
96.99	0	97.52	0		
97.00	0	97.53	0		
97.01	0	97.54	0		
97.02	0	97.55	0		
97.03	0	97.56	0		
97.04	0	97.57	0		
97.05	0	97.58	0		
97.06	0	97.59	0		
97.07	0	97.60	0		
97.08	0	97.61	0		
97.09	0	97.62	0		
97.10	0	97.63	0		
97.11	0	97.64	0		
97.12	0	97.65	0		

Summary for Pond DMH2: DMH2

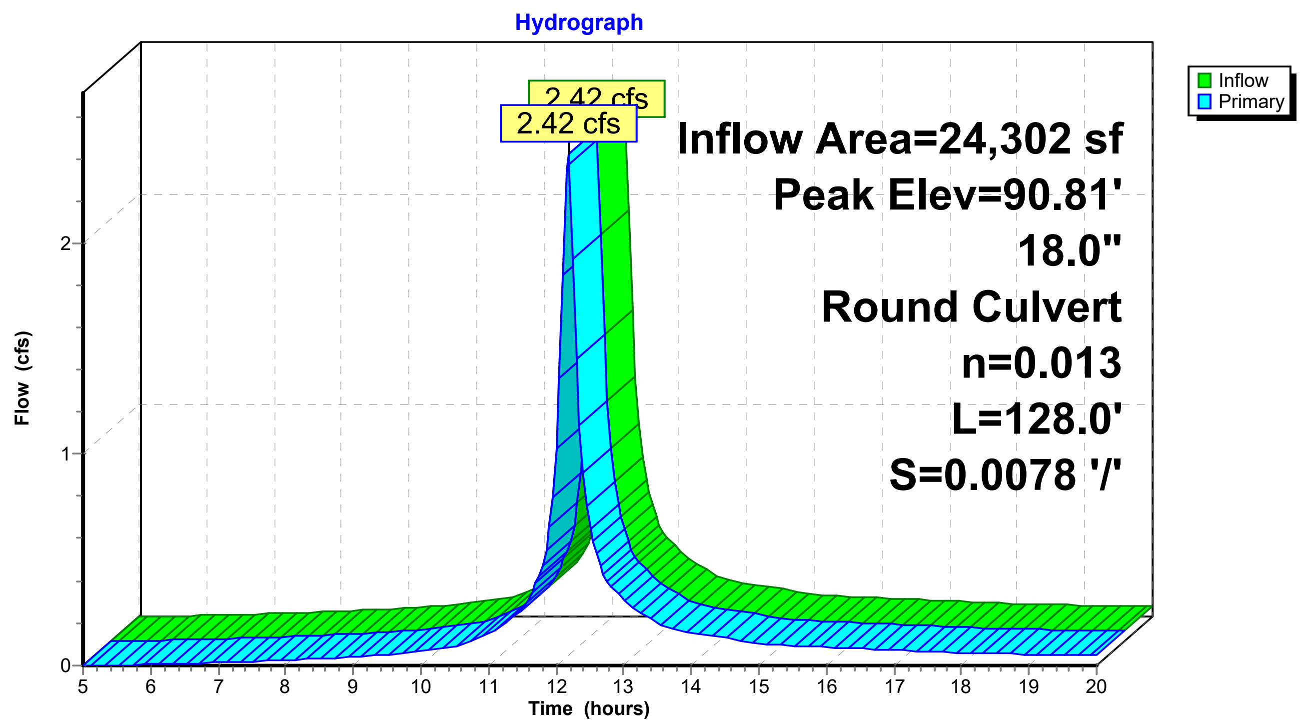
Inflow Area = 24,302 sf, 38.93% Impervious, Inflow Depth > 3.94" for 25-Year event
Inflow = 2.42 cfs @ 12.18 hrs, Volume= 7,973 cf
Outflow = 2.42 cfs @ 12.18 hrs, Volume= 7,973 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.42 cfs @ 12.18 hrs, Volume= 7,973 cf
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.81' @ 12.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	**18.0" Round Culvert** L= 128.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 90.00' / 89.00' S= 0.0078 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=2.09 cfs @ 12.18 hrs HW=90.79' TW=90.08' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 2.09 cfs @ 3.21 fps)

Pond DMH2: DMH2



Stage-Discharge for Pond DMH2: DMH2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
90.00	0.00	90.53	1.31	91.06	4.44
90.01	0.00	90.54	1.36	91.07	4.51
90.02	0.00	90.55	1.41	91.08	4.58
90.03	0.00	90.56	1.45	91.09	4.65
90.04	0.01	90.57	1.50	91.10	4.71
90.05	0.01	90.58	1.55	91.11	4.78
90.06	0.01	90.59	1.60	91.12	4.85
90.07	0.02	90.60	1.65	91.13	4.91
90.08	0.03	90.61	1.70	91.14	4.98
90.09	0.04	90.62	1.76	91.15	5.05
90.10	0.04	90.63	1.81	91.16	5.12
90.11	0.05	90.64	1.86	91.17	5.18
90.12	0.06	90.65	1.92	91.18	5.25
90.13	0.08	90.66	1.97	91.19	5.32
90.14	0.09	90.67	2.02	91.20	5.39
90.15	0.10	90.68	2.08	91.21	5.45
90.16	0.12	90.69	2.13	91.22	5.52
90.17	0.13	90.70	2.19	91.23	5.59
90.18	0.15	90.71	2.25	91.24	5.66
90.19	0.17	90.72	2.30	91.25	5.72
90.20	0.19	90.73	2.36	91.26	5.79
90.21	0.21	90.74	2.42	91.27	5.86
90.22	0.23	90.75	2.48	91.28	5.93
90.23	0.25	90.76	2.54	91.29	5.99
90.24	0.27	90.77	2.59	91.30	6.06
90.25	0.30	90.78	2.65	91.31	6.12
90.26	0.32	90.79	2.71	91.32	6.19
90.27	0.35	90.80	2.77	91.33	6.26
90.28	0.38	90.81	2.83	91.34	6.32
90.29	0.40	90.82	2.90	91.35	6.39
90.30	0.43	90.83	2.96	91.36	6.45
90.31	0.46	90.84	3.02	91.37	6.52
90.32	0.49	90.85	3.08	91.38	6.58
90.33	0.52	90.86	3.14	91.39	6.65
90.34	0.55	90.87	3.21	91.40	6.71
90.35	0.59	90.88	3.27	91.41	6.78
90.36	0.62	90.89	3.33	91.42	6.84
90.37	0.66	90.90	3.40	91.43	6.91
90.38	0.69	90.91	3.46	91.44	6.97
90.39	0.73	90.92	3.52	91.45	7.03
90.40	0.76	90.93	3.59	91.46	7.09
90.41	0.80	90.94	3.65	91.47	7.16
90.42	0.84	90.95	3.72	91.48	7.22
90.43	0.88	90.96	3.78	91.49	7.28
90.44	0.92	90.97	3.85	91.50	**7.34**
90.45	0.96	90.98	3.91		
90.46	1.00	90.99	3.98		
90.47	1.04	91.00	4.05		
90.48	1.09	91.01	4.11		
90.49	1.13	91.02	4.18		
90.50	1.17	91.03	4.24		
90.51	1.22	91.04	4.31		
90.52	1.27	91.05	4.38		

Stage-Area-Storage for Pond DMH2: DMH2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
90.00	**0**	90.53	0	91.06	0
90.01	0	90.54	0	91.07	0
90.02	0	90.55	0	91.08	0
90.03	0	90.56	0	91.09	0
90.04	0	90.57	0	91.10	0
90.05	0	90.58	0	91.11	0
90.06	0	90.59	0	91.12	0
90.07	0	90.60	0	91.13	0
90.08	0	90.61	0	91.14	0
90.09	0	90.62	0	91.15	0
90.10	0	90.63	0	91.16	0
90.11	0	90.64	0	91.17	0
90.12	0	90.65	0	91.18	0
90.13	0	90.66	0	91.19	0
90.14	0	90.67	0	91.20	0
90.15	0	90.68	0	91.21	0
90.16	0	90.69	0	91.22	0
90.17	0	90.70	0	91.23	0
90.18	0	90.71	0	91.24	0
90.19	0	90.72	0	91.25	0
90.20	0	90.73	0	91.26	0
90.21	0	90.74	0	91.27	0
90.22	0	90.75	0	91.28	0
90.23	0	90.76	0	91.29	0
90.24	0	90.77	0	91.30	0
90.25	0	90.78	0	91.31	0
90.26	0	90.79	0	91.32	0
90.27	0	90.80	0	91.33	0
90.28	0	90.81	0	91.34	0
90.29	0	90.82	0	91.35	0
90.30	0	90.83	0	91.36	0
90.31	0	90.84	0	91.37	0
90.32	0	90.85	0	91.38	0
90.33	0	90.86	0	91.39	0
90.34	0	90.87	0	91.40	0
90.35	0	90.88	0	91.41	0
90.36	0	90.89	0	91.42	0
90.37	0	90.90	0	91.43	0
90.38	0	90.91	0	91.44	0
90.39	0	90.92	0	91.45	0
90.40	0	90.93	0	91.46	0
90.41	0	90.94	0	91.47	0
90.42	0	90.95	0	91.48	0
90.43	0	90.96	0	91.49	0
90.44	0	90.97	0	91.50	0
90.45	0	90.98	0		
90.46	0	90.99	0		
90.47	0	91.00	0		
90.48	0	91.01	0		
90.49	0	91.02	0		
90.50	0	91.03	0		
90.51	0	91.04	0		
90.52	0	91.05	0		

Summary for Pond IB1: Infiltration Basin #1 (Exfiltration Zone)

Inflow Area =	54,661 sf, 51.78% Impervious,	Inflow Depth > 4.26"	for 25-Year event	
Inflow =	5.99 cfs @ 12.15 hrs,	Volume=	19,401 cf	
Outflow =	5.13 cfs @ 12.15 hrs,	Volume=	18,678 cf,	Atten= 14%, Lag= 0.0 min
Discarded =	0.02 cfs @ 5.50 hrs,	Volume=	937 cf	
Primary =	5.11 cfs @ 12.15 hrs,	Volume=	17,741 cf	

Routed to Pond 10P : Infiltration Basin #1 (Storage)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.37' @ 12.32 hrs Surf.Area= 736 sf Storage= 1,748 cf

Plug-Flow detention time= 29.0 min calculated for 18,677 cf (96% of inflow)
Center-of-Mass det. time= 14.0 min (776.6 - 762.6)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	2,944 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

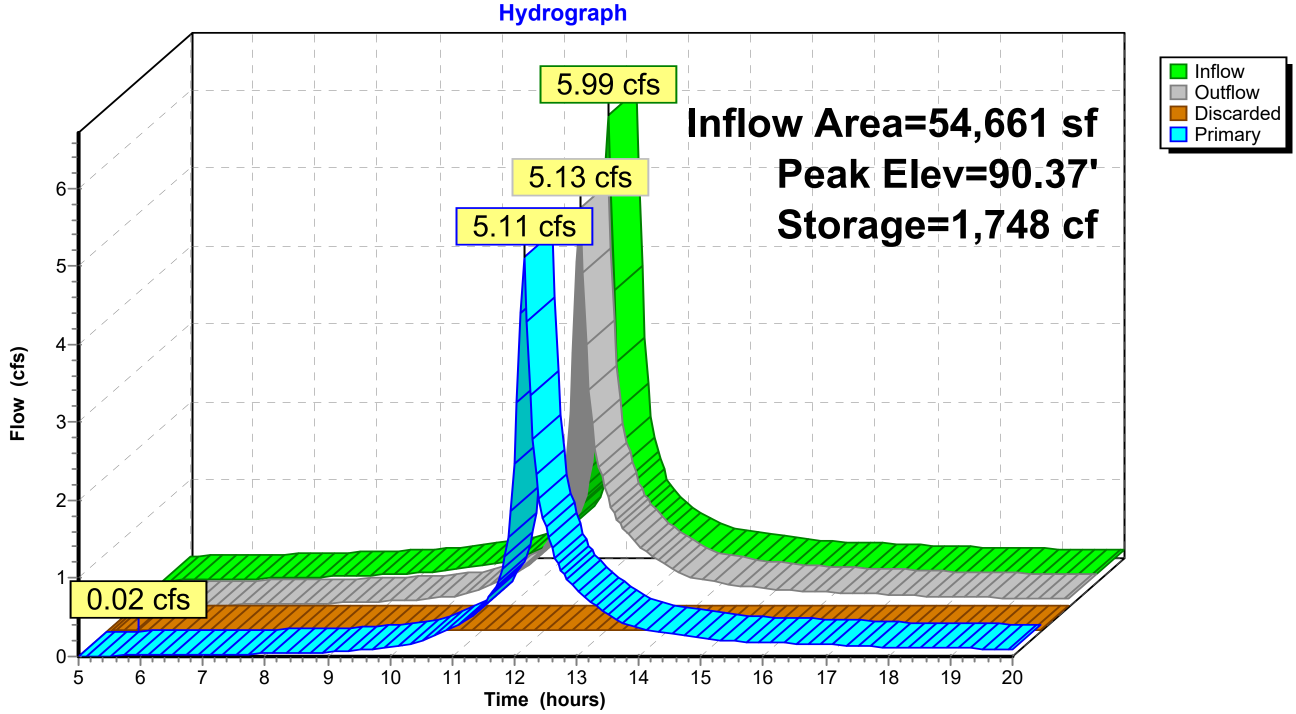
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	736	0	0
92.00	736	2,944	2,944

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.00'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	88.00'	**48.0" Round Culvert** L= 2.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 88.00' / 88.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf

Discarded OutFlow Max=0.02 cfs @ 5.50 hrs HW=88.04' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 12.15 hrs HW=89.96' TW=90.15' (Dynamic Tailwater)
└─**2=Culvert** (Controls 0.00 cfs)

Pond IB1: Infiltration Basin #1 (Exfiltration Zone)



Stage-Discharge for Pond IB1: Infiltration Basin #1 (Exfiltration Zone)

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
88.00	0.00	**0.00**	0.00
88.05	0.03	**0.02**	0.01
88.10	0.07	0.02	0.05
88.15	0.13	0.02	0.11
88.20	0.23	0.02	0.21
88.25	0.35	0.02	0.33
88.30	0.50	0.02	0.48
88.35	0.68	0.02	0.66
88.40	0.88	0.02	0.86
88.45	1.11	0.02	1.09
88.50	1.37	0.02	1.35
88.55	1.65	0.02	1.63
88.60	1.96	0.02	1.94
88.65	2.29	0.02	2.27
88.70	2.65	0.02	2.63
88.75	3.03	0.02	3.01
88.80	3.44	0.02	3.42
88.85	3.87	0.02	3.85
88.90	4.33	0.02	4.31
88.95	4.81	0.02	4.79
89.00	5.31	0.02	5.29
89.05	5.84	0.02	5.82
89.10	6.39	0.02	6.37
89.15	6.96	0.02	6.94
89.20	7.56	0.02	7.54
89.25	8.17	0.02	8.16
89.30	8.81	0.02	8.79
89.35	9.47	0.02	9.45
89.40	10.15	0.02	10.14
89.45	10.86	0.02	10.84
89.50	11.58	0.02	11.56
89.55	12.32	0.02	12.30
89.60	13.09	0.02	13.07
89.65	13.87	0.02	13.85
89.70	14.67	0.02	14.65
89.75	15.49	0.02	15.48
89.80	16.33	0.02	16.32
89.85	17.19	0.02	17.17
89.90	18.07	0.02	18.05
89.95	18.96	0.02	18.94
90.00	19.87	0.02	19.86
90.05	20.80	0.02	20.79
90.10	21.75	0.02	21.73
90.15	22.71	0.02	22.69
90.20	23.69	0.02	23.67
90.25	24.68	0.02	24.66
90.30	25.69	0.02	25.67
90.35	26.71	0.02	26.70
90.40	27.75	0.02	27.74
90.45	28.81	0.02	28.79
90.50	29.87	0.02	29.86
90.55	30.95	0.02	30.93
90.60	32.05	0.02	32.03
90.65	33.15	0.02	33.13
90.70	34.27	0.02	34.25
90.75	35.40	0.02	35.38
90.80	36.54	0.02	36.52
90.85	37.69	0.02	37.67
90.90	38.85	0.02	38.84
90.95	40.03	0.02	40.01
91.00	41.21	0.02	41.19
91.05	42.40	0.02	42.38
91.10	43.60	0.02	43.58
91.15	44.81	0.02	44.79
91.20	46.02	0.02	46.01
91.25	47.25	0.02	47.23
91.30	48.48	0.02	48.46
91.35	49.71	0.02	49.69
91.40	50.95	0.02	50.94
91.45	52.20	0.02	52.18
91.50	53.45	0.02	53.44
91.55	54.71	0.02	54.69
91.60	55.97	0.02	55.95
91.65	57.23	0.02	57.21
91.70	58.49	0.02	58.48
91.75	59.76	0.02	59.74
91.80	61.03	0.02	61.01
91.85	62.29	0.02	62.28
91.90	63.56	0.02	63.54
91.95	64.83	0.02	64.81
92.00	**66.09**	0.02	**66.07**

Stage-Area-Storage for Pond IB1: Infiltration Basin #1 (Exfiltration Zone)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
88.00	**736**	0	90.65	736	1,950
88.05	736	37	90.70	736	1,987
88.10	736	74	90.75	736	2,024
88.15	736	110	90.80	736	2,061
88.20	736	147	90.85	736	2,098
88.25	736	184	90.90	736	2,134
88.30	736	221	90.95	736	2,171
88.35	736	258	91.00	736	2,208
88.40	736	294	91.05	736	2,245
88.45	736	331	91.10	736	2,282
88.50	736	368	91.15	736	2,318
88.55	736	405	91.20	736	2,355
88.60	736	442	91.25	736	2,392
88.65	736	478	91.30	736	2,429
88.70	736	515	91.35	736	2,466
88.75	736	552	91.40	736	2,502
88.80	736	589	91.45	736	2,539
88.85	736	626	91.50	736	2,576
88.90	736	662	91.55	736	2,613
88.95	736	699	91.60	736	2,650
89.00	736	736	91.65	736	2,686
89.05	736	773	91.70	736	2,723
89.10	736	810	91.75	736	2,760
89.15	736	846	91.80	736	2,797
89.20	736	883	91.85	736	2,834
89.25	736	920	91.90	736	2,870
89.30	736	957	91.95	736	2,907
89.35	736	994	92.00	736	**2,944**
89.40	736	1,030			
89.45	736	1,067			
89.50	736	1,104			
89.55	736	1,141			
89.60	736	1,178			
89.65	736	1,214			
89.70	736	1,251			
89.75	736	1,288			
89.80	736	1,325			
89.85	736	1,362			
89.90	736	1,398			
89.95	736	1,435			
90.00	736	1,472			
90.05	736	1,509			
90.10	736	1,546			
90.15	736	1,582			
90.20	736	1,619			
90.25	736	1,656			
90.30	736	1,693			
90.35	736	1,730			
90.40	736	1,766			
90.45	736	1,803			
90.50	736	1,840			
90.55	736	1,877			
90.60	736	1,914			

Summary for Pond IB2: Infiltration Basin #2 (Exfiltration Zone)

Inflow Area = 13,032 sf, 17.40% Impervious, Inflow Depth > 3.44" for 25-Year event
Inflow = 1.09 cfs @ 12.20 hrs, Volume= 3,740 cf
Outflow = 0.98 cfs @ 12.22 hrs, Volume= 3,560 cf, Atten= 11%, Lag= 0.7 min
Discarded = 0.01 cfs @ 9.20 hrs, Volume= 441 cf
Primary = 0.97 cfs @ 12.22 hrs, Volume= 3,120 cf
Routed to Pond B2 : Infiltration Basin #2 (Storage Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.85' @ 12.30 hrs Surf.Area= 424 sf Storage= 319 cf

Plug-Flow detention time= 27.9 min calculated for 3,549 cf (95% of inflow)
Center-of-Mass det. time= 10.2 min (799.9 - 789.7)

Volume	Invert	Avail.Storage	Storage Description
#1	97.10'	382 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

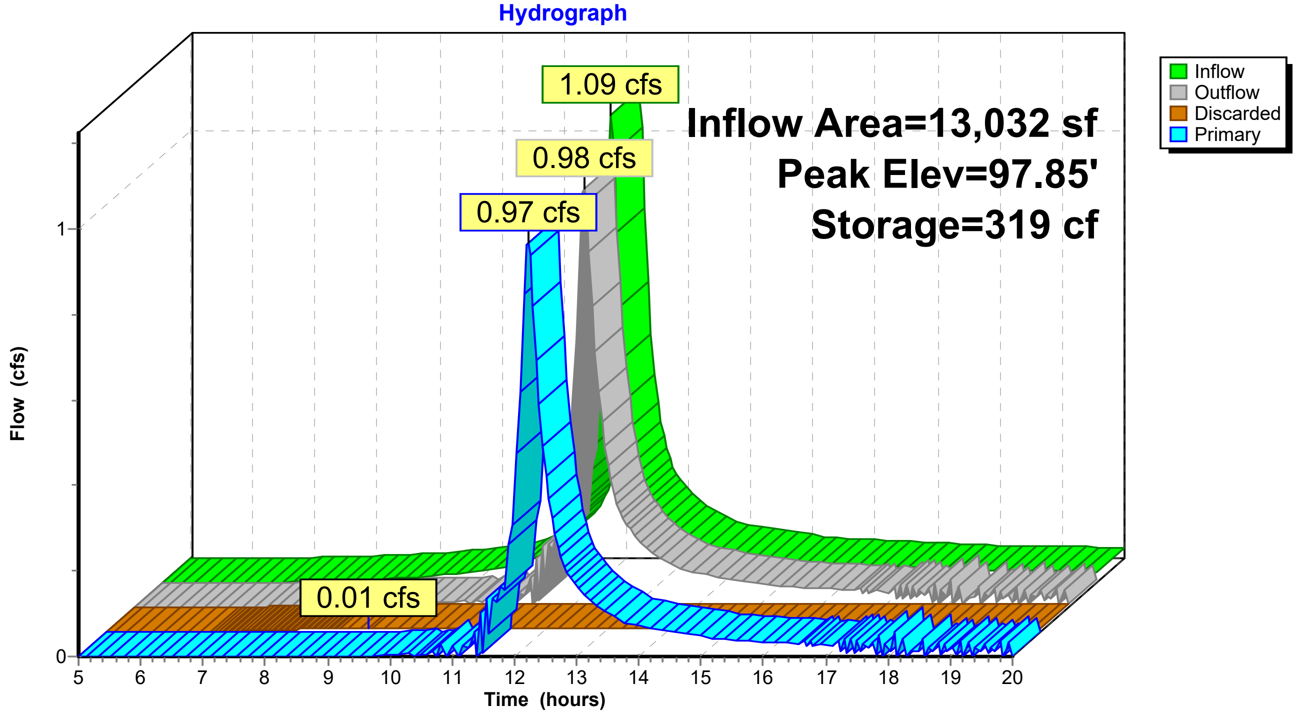
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.10	424	0	0
98.00	424	382	382

Device	Routing	Invert	Outlet Devices
#1	Discarded	97.10'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	97.10'	**36.0" Round Culvert** L= 2.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 97.10' / 97.10' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf

Discarded OutFlow Max=0.01 cfs @ 9.20 hrs HW=97.12' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 12.22 hrs HW=97.81' TW=97.82' (Dynamic Tailwater)
2=Culvert (Controls 0.00 cfs)

Pond IB2: Infiltration Basin #2 (Exfiltration Zone)



Stage-Discharge for Pond IB2: Infiltration Basin #2 (Exfiltration Zone)

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
97.10	0.00	**0.00**	0.00
97.15	0.02	**0.01**	0.01
97.20	0.05	0.01	0.04
97.25	0.11	0.01	0.10
97.30	0.19	0.01	0.18
97.35	0.30	0.01	0.29
97.40	0.42	0.01	0.41
97.45	0.58	0.01	0.57
97.50	0.75	0.01	0.74
97.55	0.95	0.01	0.94
97.60	1.17	0.01	1.16
97.65	1.41	0.01	1.40
97.70	1.67	0.01	1.66
97.75	1.95	0.01	1.94
97.80	2.25	0.01	2.24
97.85	2.58	0.01	2.57
97.90	2.92	0.01	2.91
97.95	3.29	0.01	3.28
98.00	3.67	0.01	3.66
98.05	4.07	0.01	4.06
98.10	4.49	0.01	4.48
98.15	4.93	0.01	4.92
98.20	5.39	0.01	5.38
98.25	5.87	0.01	5.86
98.30	6.36	0.01	6.35
98.35	6.87	0.01	6.86
98.40	7.40	0.01	7.39
98.45	7.94	0.01	7.93
98.50	8.50	0.01	8.49
98.55	9.07	0.01	9.06
98.60	9.66	0.01	9.65
98.65	10.27	0.01	10.26
98.70	10.89	0.01	10.88
98.75	11.52	0.01	11.51
98.80	12.17	0.01	12.16
98.85	12.83	0.01	12.82
98.90	13.50	0.01	13.49
98.95	14.18	0.01	14.17
99.00	14.88	0.01	14.87
99.05	15.59	0.01	15.58
99.10	16.31	0.01	16.30
99.15	17.04	0.01	17.03
99.20	17.77	0.01	17.76
99.25	18.52	0.01	18.51
99.30	19.28	0.01	19.27
99.35	20.05	0.01	20.04
99.40	20.82	0.01	20.81
99.45	21.60	0.01	21.59
99.50	22.39	0.01	22.38
99.55	23.19	0.01	23.18
99.60	23.99	0.01	23.98
99.65	24.79	0.01	24.78
99.70	25.60	0.01	25.59
99.75	26.42	0.01	26.41
99.80	27.23	0.01	27.22
99.85	28.05	0.01	28.04
99.90	28.87	0.01	28.86
99.95	29.69	0.01	29.68
100.00	30.52	0.01	30.51
100.05	31.34	0.01	31.33
100.10	**32.16**	0.01	**32.15**

Stage-Area-Storage for Pond IB2: Infiltration Basin #2 (Exfiltration Zone)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
97.10	**424**	0
97.15	424	21
97.20	424	42
97.25	424	64
97.30	424	85
97.35	424	106
97.40	424	127
97.45	424	148
97.50	424	170
97.55	424	191
97.60	424	212
97.65	424	233
97.70	424	254
97.75	424	276
97.80	424	297
97.85	424	318
97.90	424	339
97.95	424	360
98.00	424	**382**
98.05	424	382
98.10	424	382
98.15	424	382
98.20	424	382
98.25	424	382
98.30	424	382
98.35	424	382
98.40	424	382
98.45	424	382
98.50	424	382
98.55	424	382
98.60	424	382
98.65	424	382
98.70	424	382
98.75	424	382
98.80	424	382
98.85	424	382
98.90	424	382
98.95	424	382
99.00	424	382
99.05	424	382
99.10	424	382
99.15	424	382
99.20	424	382
99.25	424	382
99.30	424	382
99.35	424	382
99.40	424	382
99.45	424	382
99.50	424	382
99.55	424	382
99.60	424	382
99.65	424	382
99.70	424	382
99.75	424	382
99.80	424	382
99.85	424	382
99.90	424	382
99.95	424	382
100.00	424	382
100.05	424	382
100.10	424	382

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Units 10-11 Entrance Runoff Area=13,032 sf 17.40% Impervious Runoff Depth>5.57"
Flow Length=190' Tc=12.6 min CN=78 Runoff=1.73 cfs 6,054 cf

Subcatchment 1pre: Site Runoff Area=134,756 sf 4.57% Impervious Runoff Depth>5.08"
Flow Length=451' Tc=22.8 min UI Adjusted CN=74 Runoff=12.74 cfs 57,094 cf

Subcatchment 2: Units 8-11 Backyards Runoff Area=7,232 sf 0.00% Impervious Runoff Depth>5.11"
Flow Length=84' Tc=11.3 min CN=74 Runoff=0.93 cfs 3,077 cf

Subcatchment 3: Outer Border Runoff Area=53,130 sf 0.00% Impervious Runoff Depth>4.88"
Flow Length=87' Tc=7.9 min CN=72 Runoff=7.39 cfs 21,596 cf

Subcatchment 4: Unit 5 Backyard and Basin Runoff Area=8,967 sf 0.00% Impervious Runoff Depth>5.11"
Flow Length=110' Tc=7.7 min CN=74 Runoff=1.31 cfs 3,820 cf

Subcatchment 5: Unit 5 Parking Runoff Area=8,830 sf 71.11% Impervious Runoff Depth>7.03"
Flow Length=100' Tc=7.9 min CN=91 Runoff=1.61 cfs 5,170 cf

Subcatchment 6: Driveway Center Section Runoff Area=14,952 sf 43.75% Impervious Runoff Depth>6.27"
Flow Length=163' Tc=10.8 min CN=84 Runoff=2.28 cfs 7,815 cf

Subcatchment 7: Driveway Entrance Runoff Area=9,350 sf 31.22% Impervious Runoff Depth>5.93"
Flow Length=88' Slope=0.0400 '/' Tc=9.8 min CN=81 Runoff=1.41 cfs 4,621 cf

Subcatchment U1: Unit #1 Runoff Area=1,676 sf 100.00% Impervious Runoff Depth>7.58"
Tc=5.0 min CN=98 Runoff=0.34 cfs 1,059 cf

Subcatchment U10: Unit #10 Runoff Area=1,676 sf 100.00% Impervious Runoff Depth>7.58"
Tc=5.0 min CN=98 Runoff=0.34 cfs 1,059 cf

Subcatchment U11: Unit #11 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>7.58"
Tc=5.0 min CN=98 Runoff=0.34 cfs 1,058 cf

Subcatchment U2: Unit #2 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>7.58"
Tc=5.0 min CN=98 Runoff=0.34 cfs 1,058 cf

Subcatchment U3: Unit #3 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>7.58"
Tc=5.0 min CN=98 Runoff=0.34 cfs 1,058 cf

Subcatchment U4: Unit #4 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>7.58"
Tc=5.0 min CN=98 Runoff=0.34 cfs 1,058 cf

Subcatchment U5: Unit #5 Runoff Area=2,510 sf 100.00% Impervious Runoff Depth>7.58"
Tc=5.0 min CN=98 Runoff=0.51 cfs 1,586 cf

Subcatchment U6: Unit #6 Runoff Area=1,676 sf 100.00% Impervious Runoff Depth>7.58"
Tc=5.0 min CN=98 Runoff=0.34 cfs 1,059 cf

Subcatchment U7: Unit #7 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>7.58"
Tc=5.0 min CN=98 Runoff=0.34 cfs 1,058 cf

Subcatchment U8: Unit #8 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>7.58"
Tc=5.0 min CN=98 Runoff=0.34 cfs 1,058 cf

Subcatchment U9: Unit #9 Runoff Area=1,675 sf 100.00% Impervious Runoff Depth>7.58"
Tc=5.0 min CN=98 Runoff=0.34 cfs 1,058 cf

Reach 3R: Wetland Surface 1 Avg. Flow Depth=0.18' Max Vel=0.62 fps Inflow=2.46 cfs 10,177 cf
n=0.100 L=344.0' S=0.0291 '/' Capacity=20.30 cfs Outflow=2.23 cfs 10,093 cf

Reach 4R: 8" ROOF DRAIN CARRIER Avg. Flow Depth=0.29' Max Vel=4.51 fps Inflow=0.69 cfs 2,117 cf
8.0" Round Pipe n=0.013 L=206.0' S=0.0194 '/' Capacity=1.68 cfs Outflow=0.68 cfs 2,115 cf

Reach 5R: Wetland Surface 2 Avg. Flow Depth=0.18' Max Vel=0.33 fps Inflow=1.51 cfs 5,295 cf
n=0.100 L=245.0' S=0.0082 '/' Capacity=10.76 cfs Outflow=1.17 cfs 5,226 cf

Reach 8R: 6" Roof Drain Carrier Pipe Avg. Flow Depth=0.36' Max Vel=4.47 fps Inflow=0.69 cfs 2,117 cf
6.0" Round Pipe n=0.013 L=113.0' S=0.0195 '/' Capacity=0.78 cfs Outflow=0.67 cfs 2,116 cf

Reach 9R: 12" Roof Drain Carrier Pipe Avg. Flow Depth=0.43' Max Vel=4.18 fps Inflow=1.36 cfs 4,232 cf
12.0" Round Pipe n=0.013 L=212.0' S=0.0099 '/' Capacity=3.55 cfs Outflow=1.35 cfs 4,229 cf

Reach DP1PRE: DP 1 - PRE Inflow=12.74 cfs 57,094 cf
Outflow=12.74 cfs 57,094 cf

Reach DP1PST: DP 1 - POST Inflow=12.72 cfs 58,565 cf
Outflow=12.72 cfs 58,565 cf

Pond 1P: Subsurface #1 Peak Elev=98.31' Storage=1,701 cf Inflow=2.13 cfs 7,311 cf
Discarded=0.03 cfs 1,551 cf Primary=1.50 cfs 4,950 cf Outflow=1.53 cfs 6,501 cf

Pond 5P: CB 5 Peak Elev=90.92' Inflow=1.61 cfs 5,170 cf
12.0" Round Culvert n=0.013 L=13.0' S=0.0192 '/' Outflow=1.61 cfs 5,170 cf

Pond 10P: Infiltration Basin #1 (Storage) Peak Elev=90.90' Storage=4,645 cf Inflow=7.88 cfs 27,676 cf
Primary=4.76 cfs 26,876 cf Secondary=0.00 cfs 0 cf Outflow=4.76 cfs 26,876 cf

Pond B2: Infiltration Basin #2 (Storage Zone) Peak Elev=97.96' Storage=302 cf Inflow=1.59 cfs 5,374 cf
Outflow=1.51 cfs 5,295 cf

Pond CB1: CB 1 Peak Elev=93.38' Inflow=1.41 cfs 4,621 cf
12.0" Round Culvert n=0.013 L=228.0' S=0.0121 '/' Outflow=1.41 cfs 4,621 cf

Pond CB4: CB 4 Peak Elev=91.41' Inflow=2.28 cfs 7,815 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0083 '/' Outflow=2.28 cfs 7,815 cf

Pond CB7: CB 7 Peak Elev=98.34' Inflow=0.93 cfs 3,077 cf
12.0" Round Culvert n=0.013 L=26.0' S=0.0038 '/' Outflow=0.93 cfs 3,077 cf

Pond DMH2: DMH2 Peak Elev=91.13' Inflow=3.68 cfs 12,437 cf
18.0" Round Culvert n=0.013 L=128.0' S=0.0078 '/' Outflow=3.68 cfs 12,437 cf

Pond IB1: Infiltration Basin #1 (Exfiltration Peak Elev=90.91' Storage=2,140 cf Inflow=8.93 cfs 29,357 cf
Discarded=0.02 cfs 940 cf Primary=7.88 cfs 27,676 cf Outflow=7.90 cfs 28,615 cf

Pond IB2: Infiltration Basin #2 (Exfiltration Peak Elev=97.99' Storage=378 cf Inflow=1.73 cfs 6,054 cf
Discarded=0.01 cfs 500 cf Primary=1.59 cfs 5,374 cf Outflow=1.60 cfs 5,874 cf

Total Runoff Area = 269,512 sf Runoff Volume = 121,417 cf Average Runoff Depth = 5.41"
83.89% Pervious = 226,087 sf 16.11% Impervious = 43,425 sf

Summary for Subcatchment 1: Units 10-11 Entrance

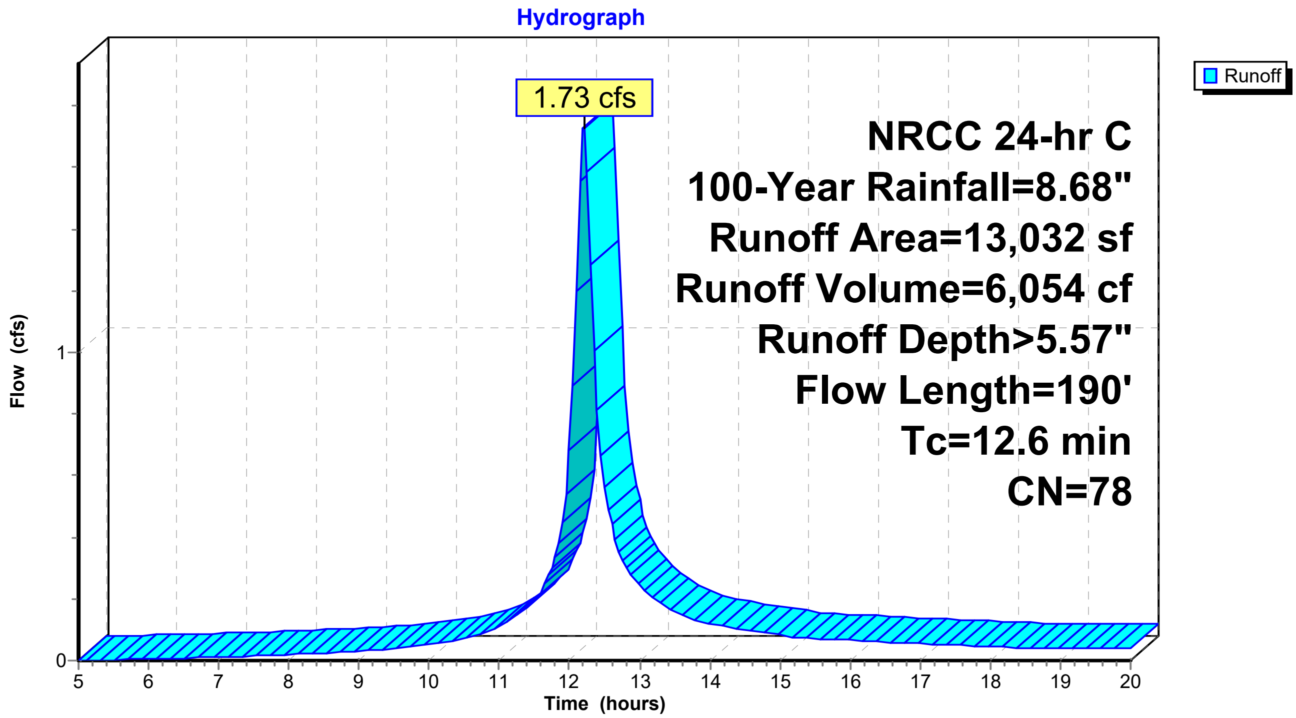
Runoff = 1.73 cfs @ 12.20 hrs, Volume= 6,054 cf, Depth> 5.57"
Routed to Pond IB2 : Infiltration Basin #2 (Exfiltration Zone)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
9,762	74	>75% Grass cover, Good, HSG C
1,003	70	Woods, Good, HSG C
2,267	98	Paved roads w/curbs & sewers, HSG C
13,032	78	Weighted Average
10,765		82.60% Pervious Area
2,267		17.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.8	55	0.0300	1.21		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.1	17	0.0100	2.03		**Shallow Concentrated Flow, Driveway** Paved Kv= 20.3 fps
1.2	68	0.0180	0.94		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
12.6	190	Total			

Subcatchment 1: Units 10-11 Entrance



Summary for Subcatchment 1pre: Site

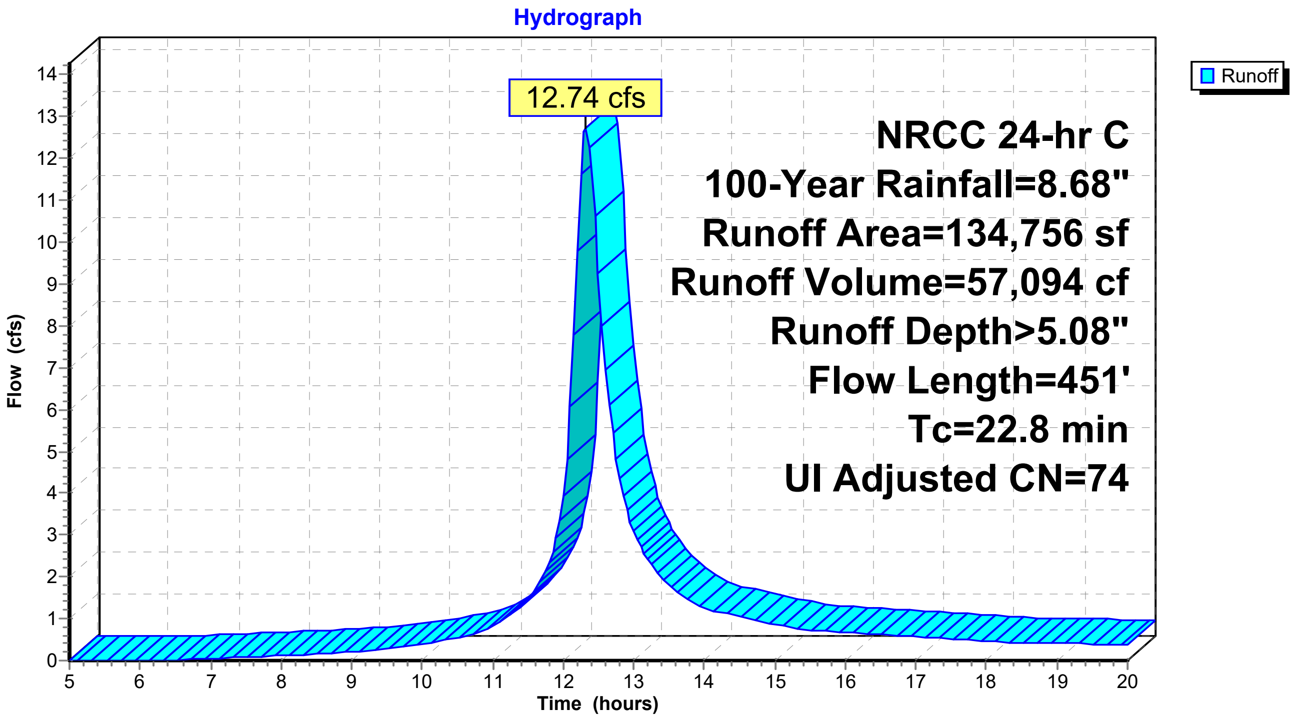
Runoff = 12.74 cfs @ 12.33 hrs, Volume= 57,094 cf, Depth> 5.08"
Routed to Reach DP1PRE : DP 1 - PRE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Adj	Description
56,945	70		Woods, Good, HSG C
2,937	98		Paved parking, HSG C
3,219	98		Unconnected roofs, HSG C
10,003	89		Gravel roads, HSG C
61,652	74		>75% Grass cover, Good, HSG C
134,756	75	74	Weighted Average, UI Adjusted
128,600			95.43% Pervious Area
6,156			4.57% Impervious Area
3,219			52.29% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	25	0.0110	0.03		**Sheet Flow, Woods** Woods: Dense underbrush n= 0.800 P2= 3.35"
0.5	25	0.0110	0.84		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.35"
0.2	20	0.0110	2.13		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
1.5	65	0.0110	0.73		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
2.2	159	0.0290	1.19		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
2.0	52	0.0040	0.44		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.7	60	0.0370	1.35		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.4	45	0.1660	2.04		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
22.8	451	Total			

Subcatchment 1pre: Site



Summary for Subcatchment 2: Units 8-11 Backyards

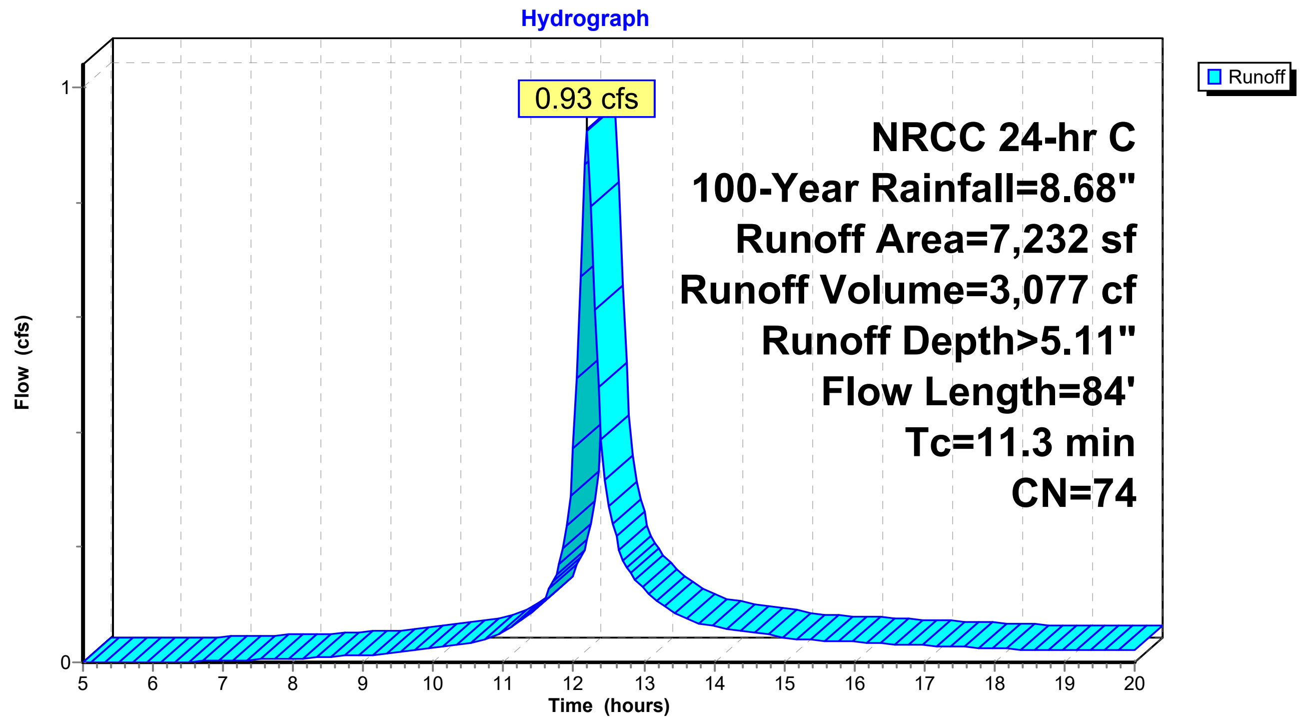
Runoff = 0.93 cfs @ 12.19 hrs, Volume= 3,077 cf, Depth> 5.11"
Routed to Pond CB7 : CB 7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
7,232	74	>75% Grass cover, Good, HSG C
7,232		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	50	0.0280	0.08		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.6	34	0.0200	0.99		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
11.3	84	Total			

Subcatchment 2: Units 8-11 Backyards



Summary for Subcatchment 3: Outer Border

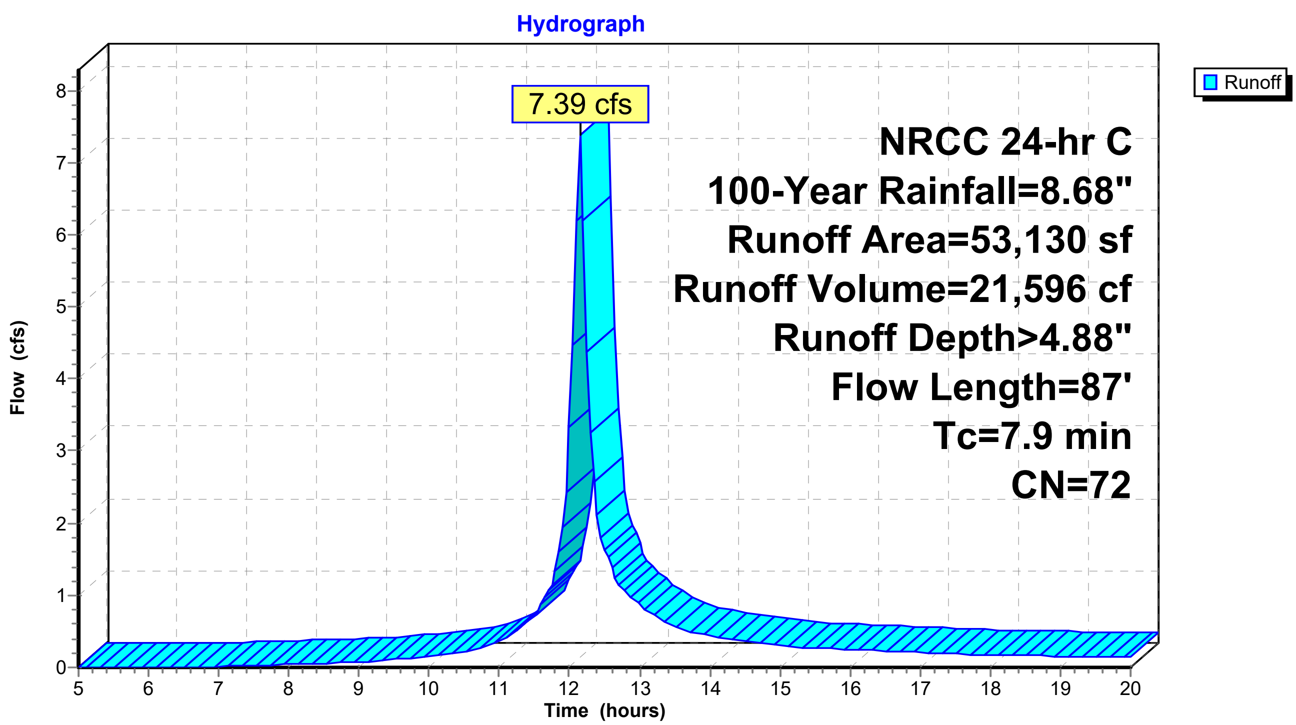
Runoff = 7.39 cfs @ 12.15 hrs, Volume= 21,596 cf, Depth> 4.88"
Routed to Reach DP1PST : DP 1 - POST

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
21,967	74	>75% Grass cover, Good, HSG C
31,163	70	Woods, Good, HSG C
53,130	72	Weighted Average
53,130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0670	0.11		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.35"
0.5	37	0.0600	1.22		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
7.9	87	Total			

Subcatchment 3: Outer Border



Summary for Subcatchment 4: Unit 5 Backyard and Basin #1

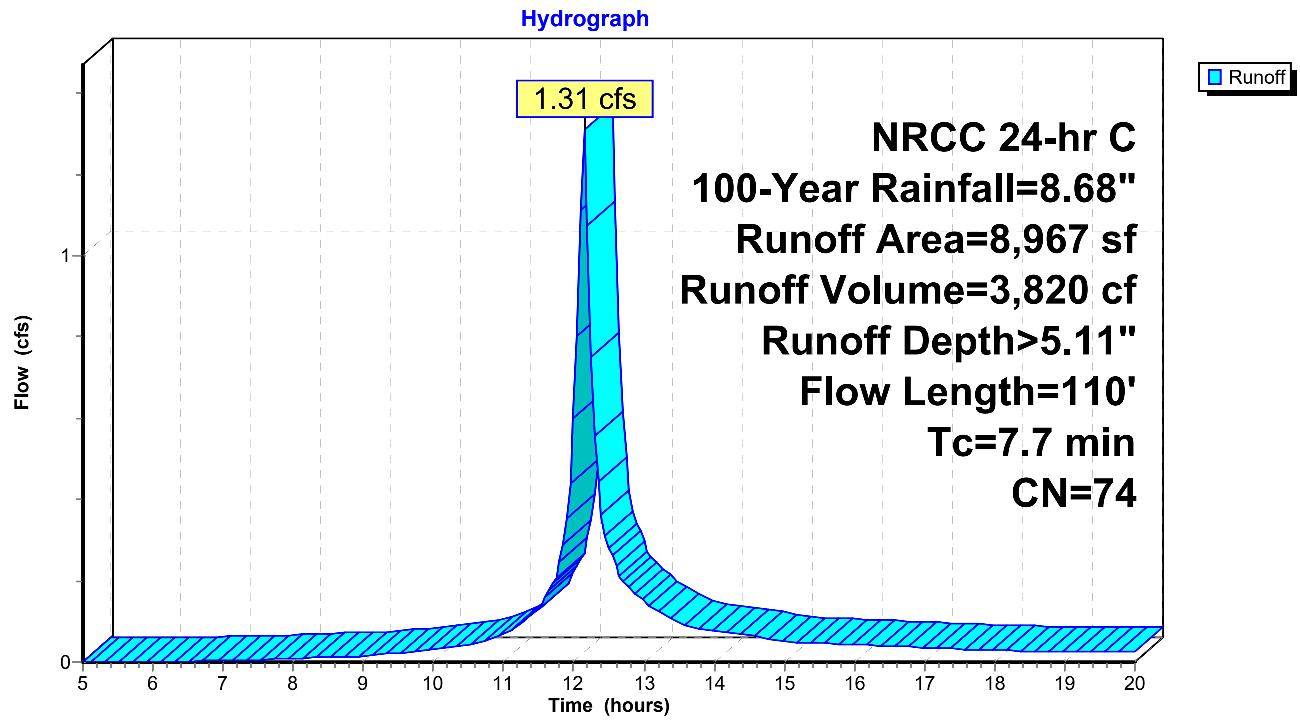
Runoff = 1.31 cfs @ 12.15 hrs, Volume= 3,820 cf, Depth> 5.11"
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
8,967	74	>75% Grass cover, Good, HSG C
8,967		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0780	0.12		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.6	60	0.0670	1.81		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
7.7	110	Total			

Subcatchment 4: Unit 5 Backyard and Basin #1



Summary for Subcatchment 5: Unit 5 Parking

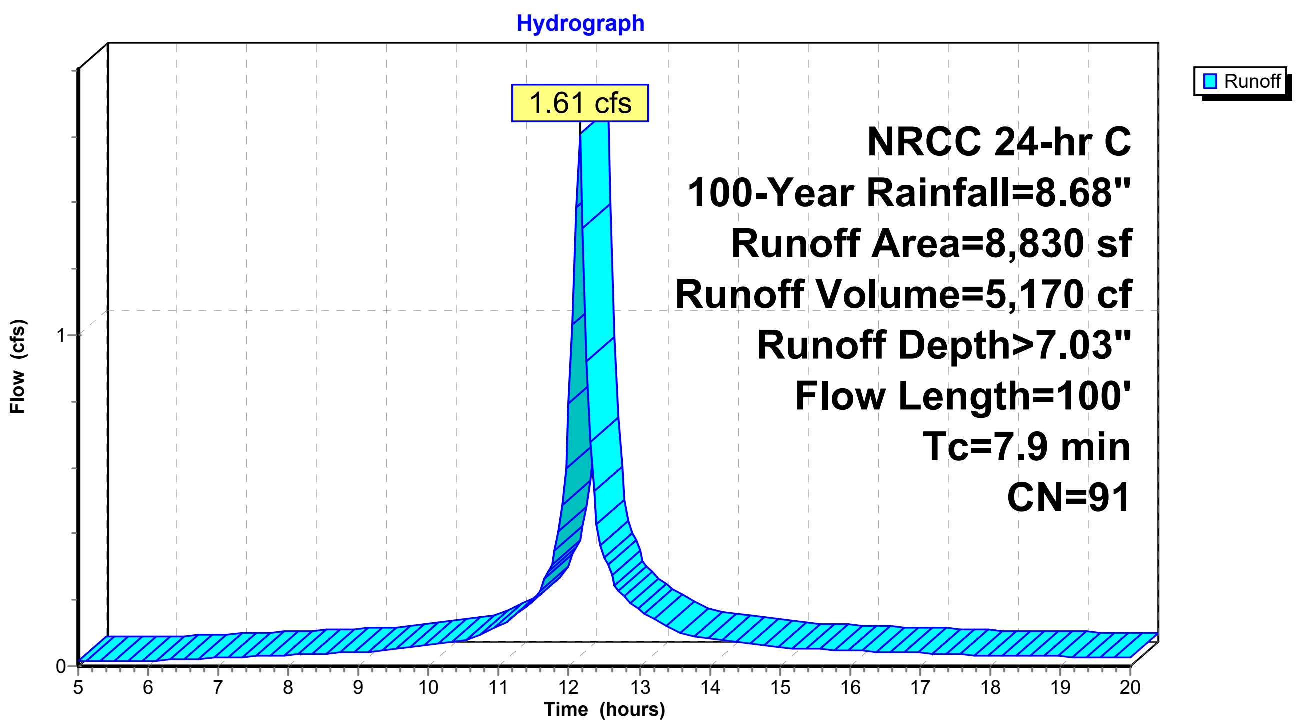
Runoff = 1.61 cfs @ 12.15 hrs, Volume= 5,170 cf, Depth> 7.03"
Routed to Pond 5P : CB 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
2,551	74	>75% Grass cover, Good, HSG C
6,279	98	Paved roads w/curbs & sewers, HSG C
8,830	91	Weighted Average
2,551		28.89% Pervious Area
6,279		71.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	40	0.0450	0.09		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.3	10	0.0067	0.57		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.35"
0.2	50	0.0280	3.40		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
7.9	100	Total			

Subcatchment 5: Unit 5 Parking



Summary for Subcatchment 6: Driveway Center Section

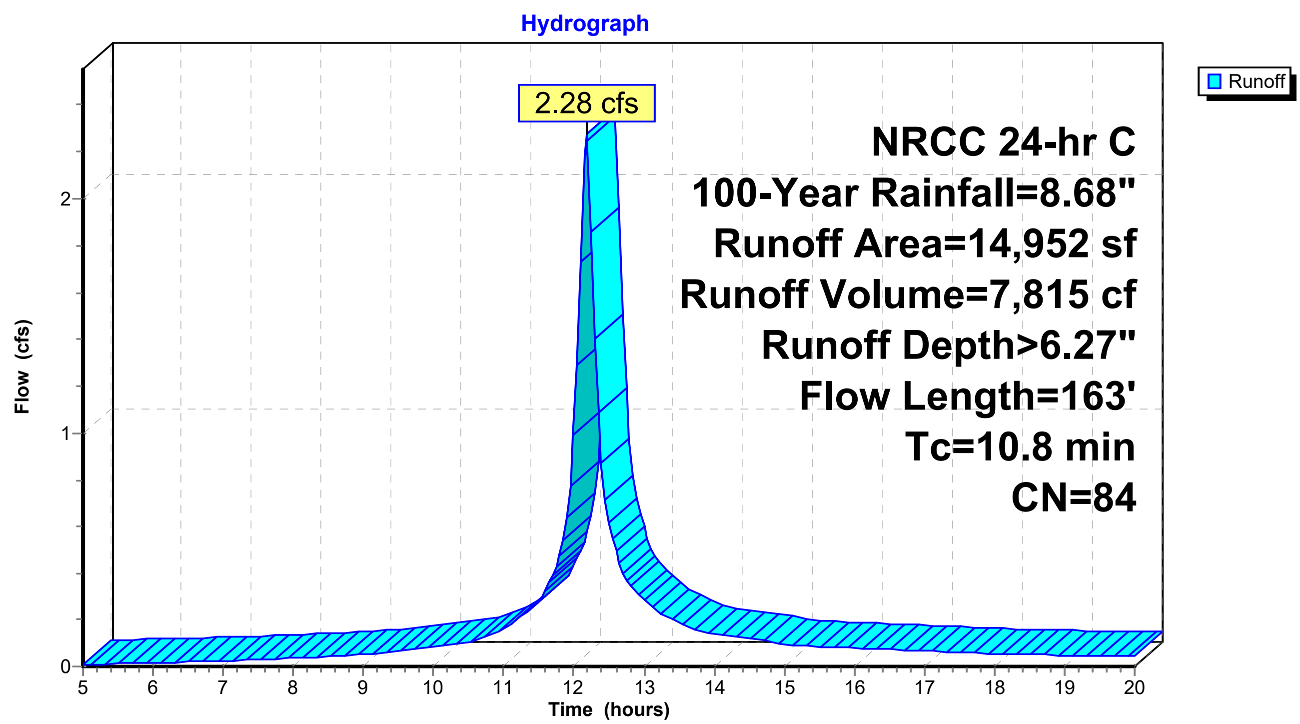
Runoff = 2.28 cfs @ 12.18 hrs, Volume= 7,815 cf, Depth> 6.27"
Routed to Pond CB4 : CB 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
8,411	74	>75% Grass cover, Good, HSG C
6,541	98	Paved roads w/curbs & sewers, HSG C
14,952	84	Weighted Average
8,411		56.25% Pervious Area
6,541		43.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	50	0.0320	0.08		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.2	18	0.0300	1.21		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.4	95	0.0360	3.85		**Shallow Concentrated Flow, Pavement** Paved Kv= 20.3 fps
10.8	163	Total			

Subcatchment 6: Driveway Center Section



Summary for Subcatchment 7: Driveway Entrance

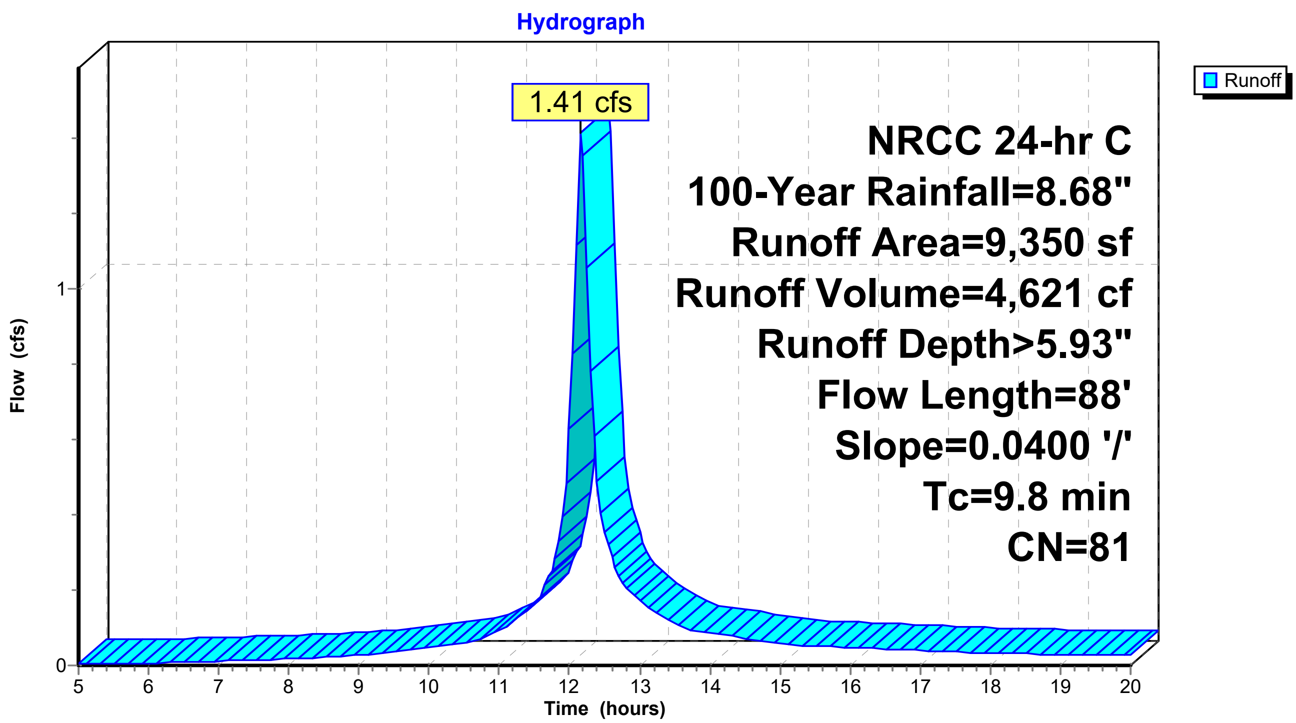
Runoff = 1.41 cfs @ 12.17 hrs, Volume= 4,621 cf, Depth> 5.93"
Routed to Pond CB1 : CB 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
2,919	98	Paved roads w/curbs & sewers, HSG C
6,431	74	>75% Grass cover, Good, HSG C
9,350	81	Weighted Average
6,431		68.78% Pervious Area
2,919		31.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow, Grass** Grass: Bermuda n= 0.410 P2= 3.35"
0.5	38	0.0400	1.40		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
9.8	88	Total			

Subcatchment 7: Driveway Entrance



Summary for Subcatchment U1: Unit #1

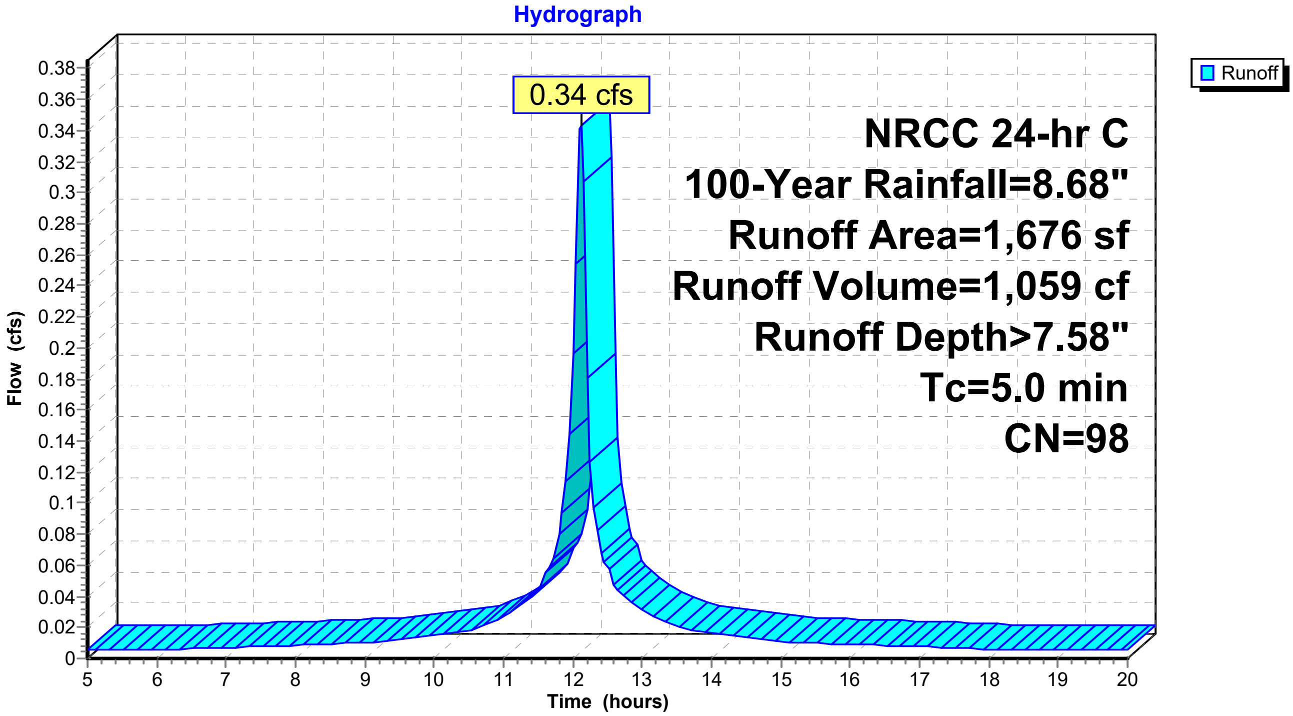
Runoff = 0.34 cfs @ 12.11 hrs, Volume= 1,059 cf, Depth> 7.58"
Routed to Reach 8R : 6" Roof Drain Carrier Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
1,676	98	Unconnected roofs, HSG C
1,676		100.00% Impervious Area
1,676		100.00% Unconnected

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

Subcatchment U1: Unit #1



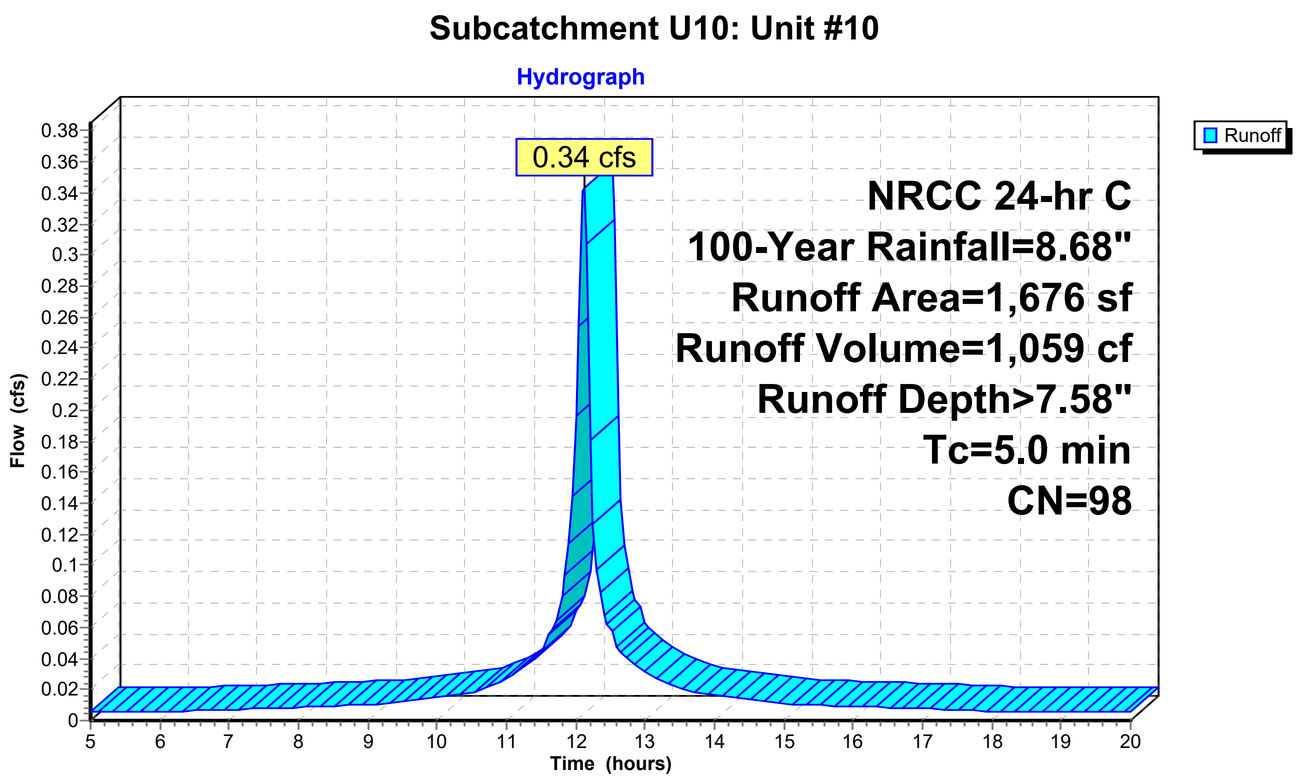
Summary for Subcatchment U10: Unit #10

Runoff = 0.34 cfs @ 12.11 hrs, Volume= 1,059 cf, Depth> 7.58"
Routed to Pond 1P : Subsurface #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
1,676	98	Unconnected roofs, HSG C
1,676		100.00% Impervious Area
1,676		100.00% Unconnected

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



Summary for Subcatchment U11: Unit #11

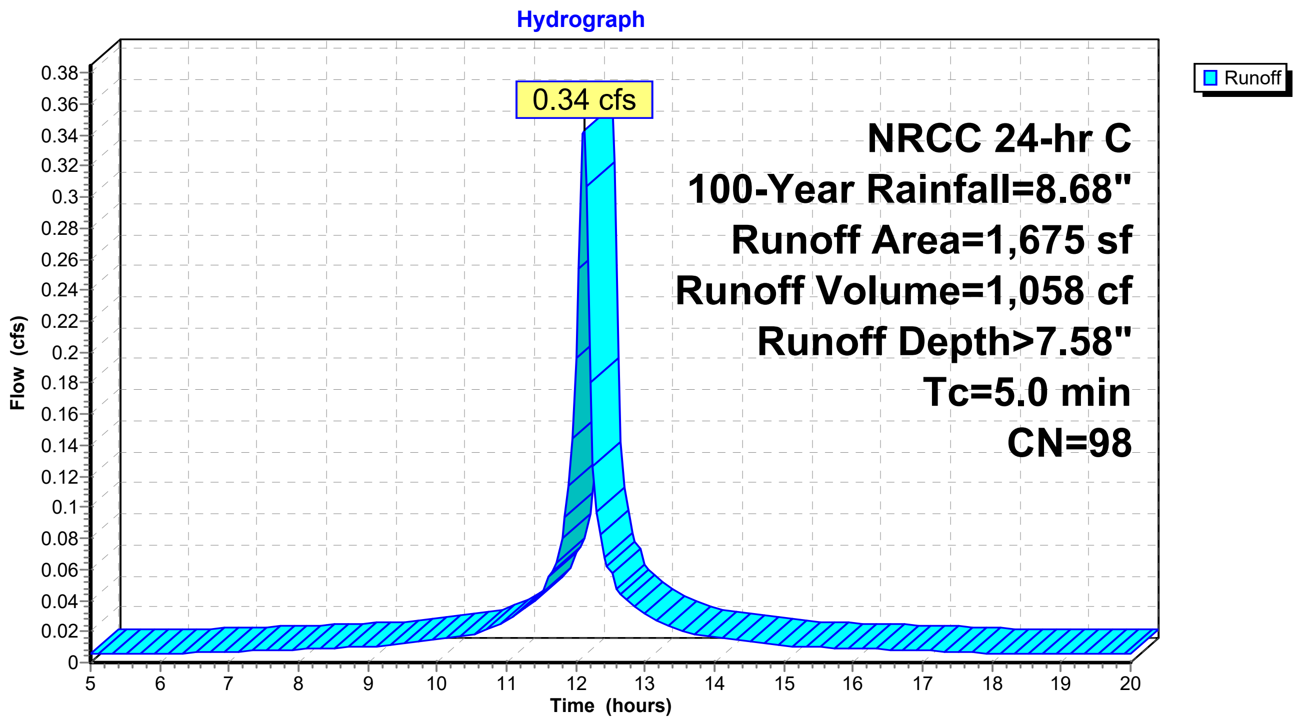
Runoff = 0.34 cfs @ 12.11 hrs, Volume= 1,058 cf, Depth> 7.58"
Routed to Pond 1P : Subsurface #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U11: Unit #11



Summary for Subcatchment U2: Unit #2

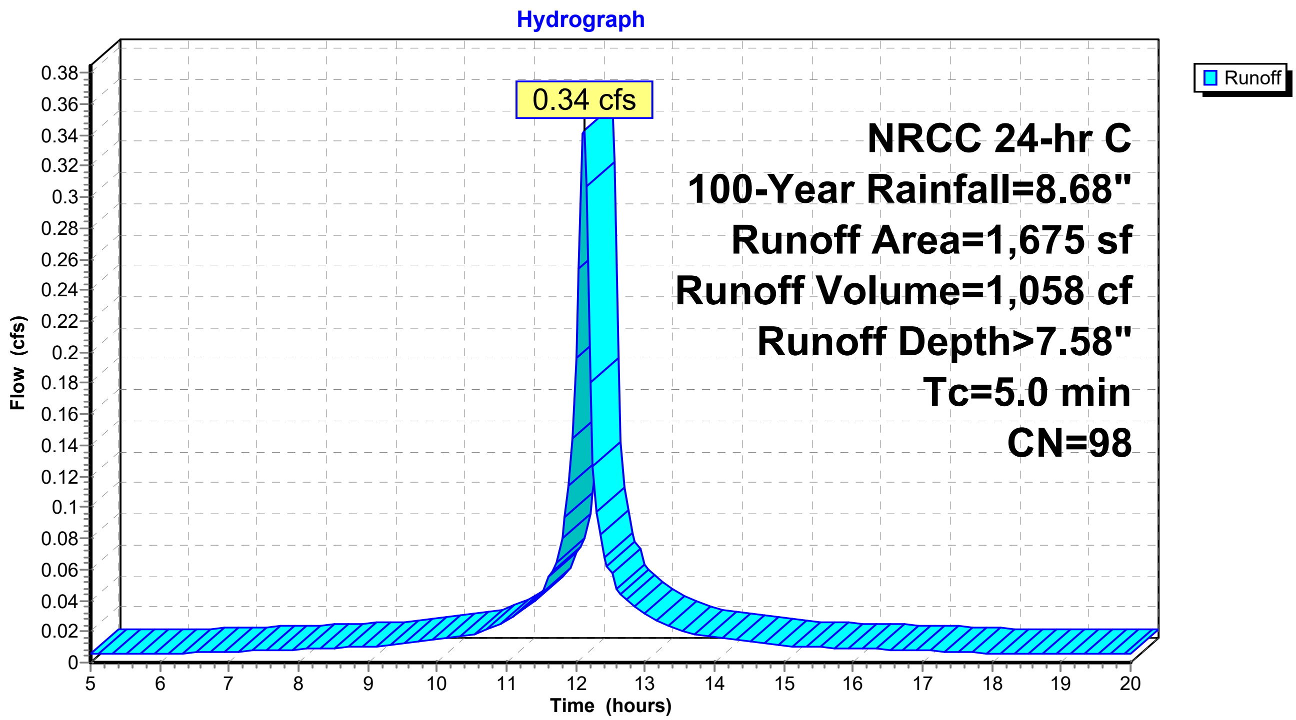
Runoff = 0.34 cfs @ 12.11 hrs, Volume= 1,058 cf, Depth> 7.58"
Routed to Reach 8R : 6" Roof Drain Carrier Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U2: Unit #2



Summary for Subcatchment U3: Unit #3

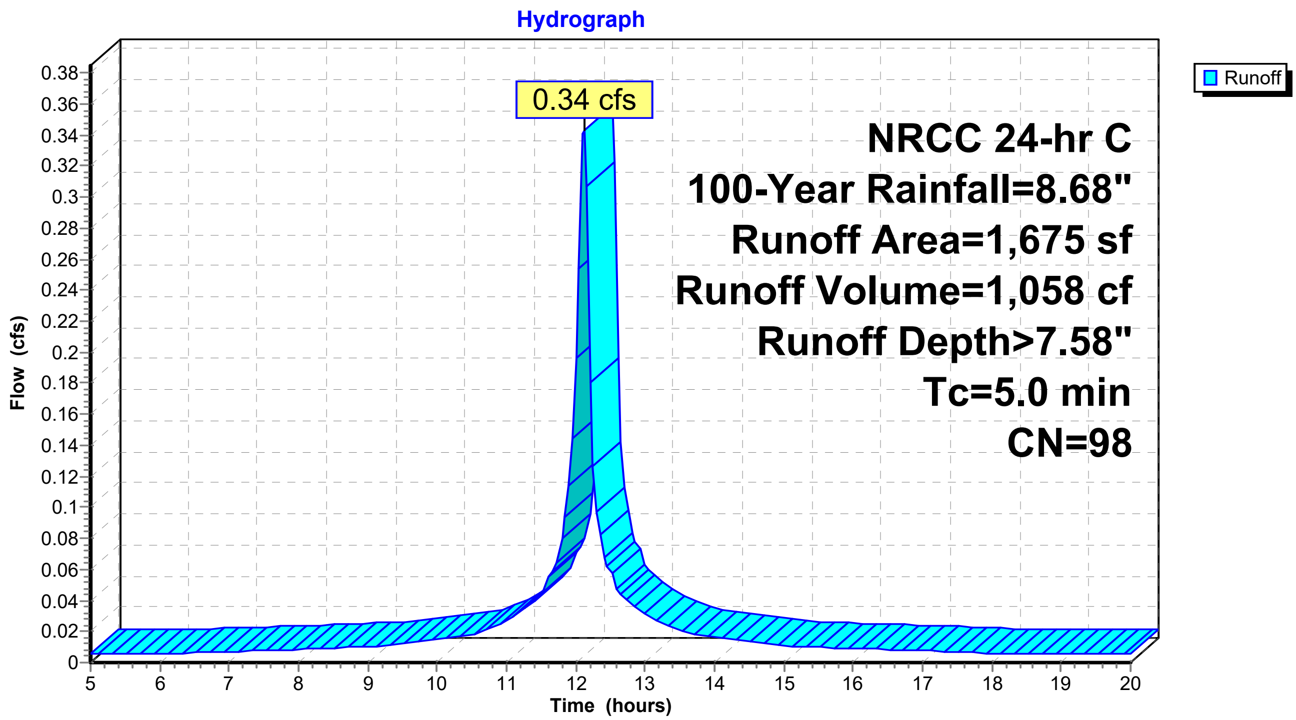
Runoff = 0.34 cfs @ 12.11 hrs, Volume= 1,058 cf, Depth> 7.58"
Routed to Reach 9R : 12" Roof Drain Carrier Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U3: Unit #3



Summary for Subcatchment U4: Unit #4

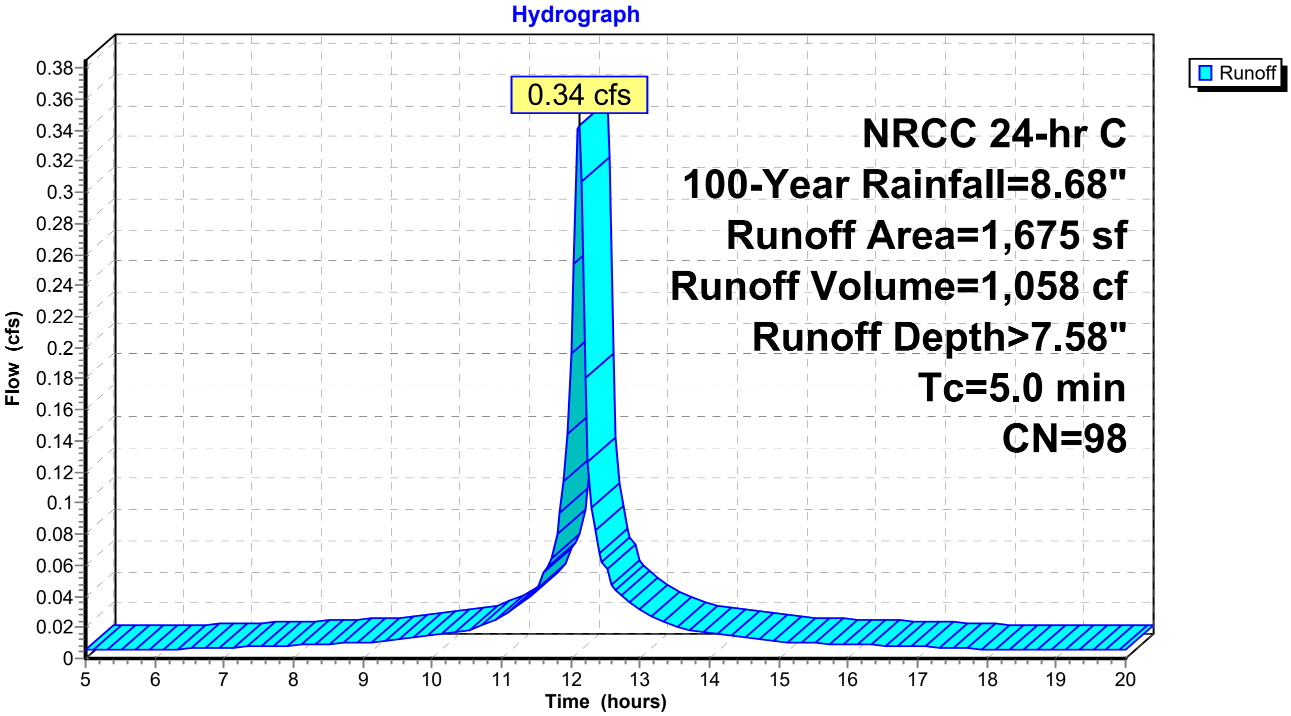
Runoff = 0.34 cfs @ 12.11 hrs, Volume= 1,058 cf, Depth> 7.58"
Routed to Reach 9R : 12" Roof Drain Carrier Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U4: Unit #4



Summary for Subcatchment U5: Unit #5

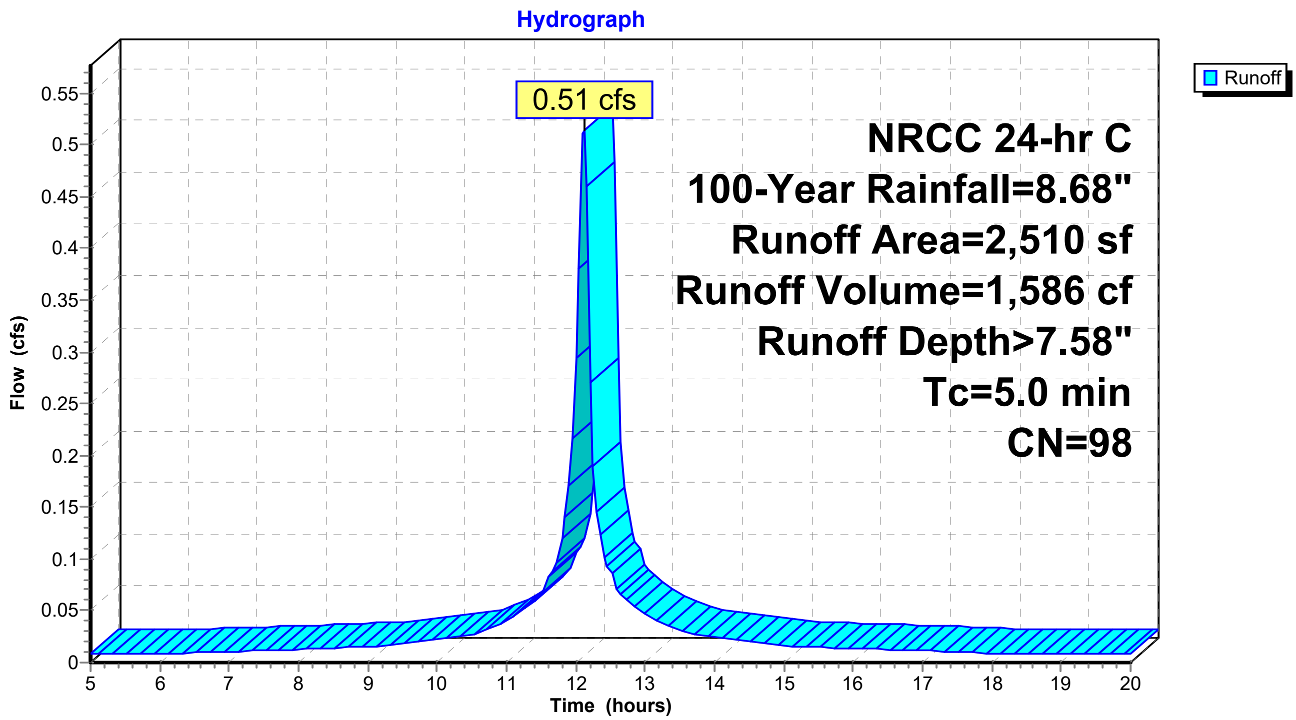
Runoff = 0.51 cfs @ 12.11 hrs, Volume= 1,586 cf, Depth> 7.58"
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
2,510	98	Unconnected roofs, HSG C
2,510		100.00% Impervious Area
2,510		100.00% Unconnected

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

Subcatchment U5: Unit #5



Summary for Subcatchment U6: Unit #6

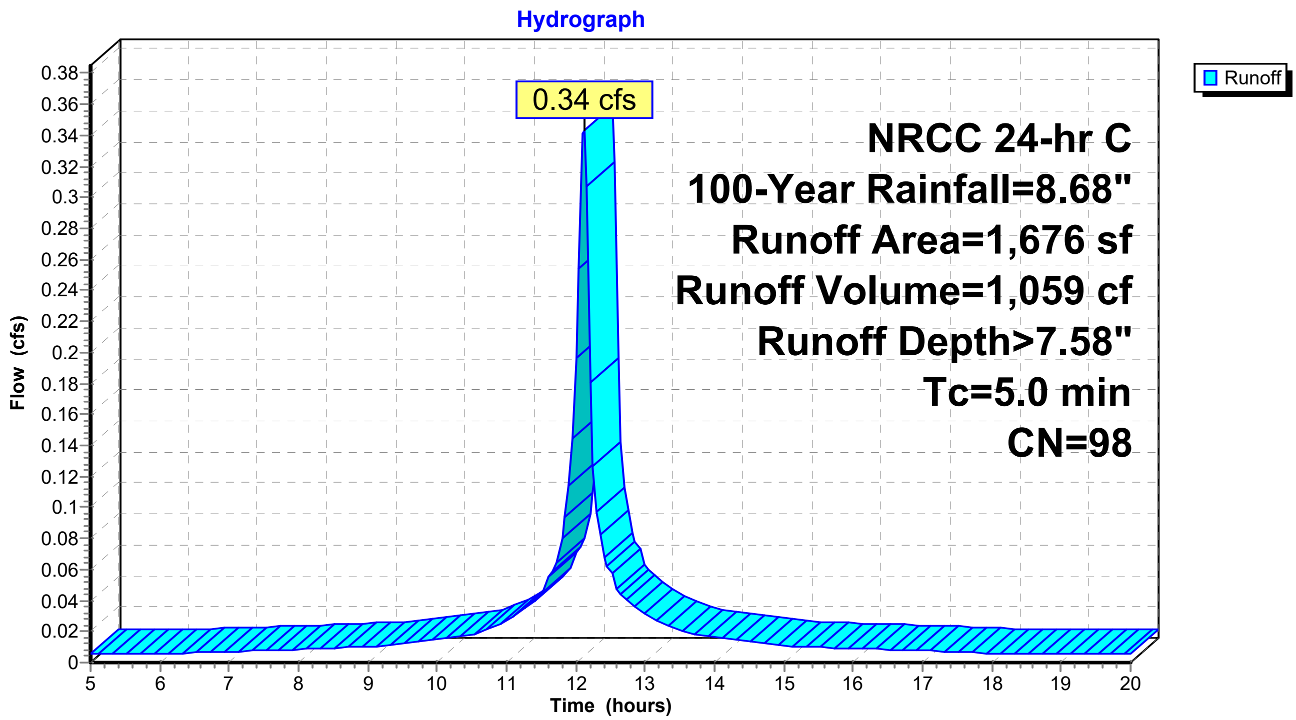
Runoff = 0.34 cfs @ 12.11 hrs, Volume= 1,059 cf, Depth> 7.58"
Routed to Reach 4R : 8" ROOF DRAIN CARRIER PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
1,676	98	Unconnected roofs, HSG C
1,676		100.00% Impervious Area
1,676		100.00% Unconnected

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

Subcatchment U6: Unit #6



Summary for Subcatchment U7: Unit #7

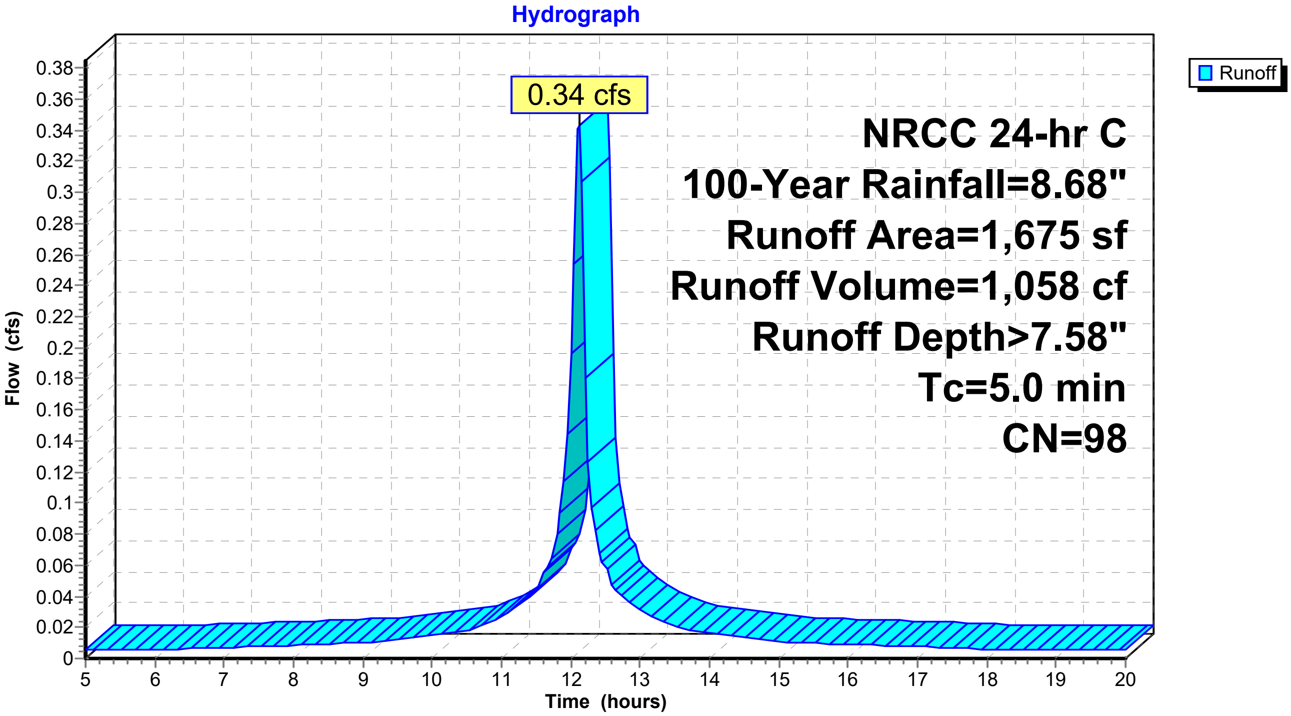
Runoff = 0.34 cfs @ 12.11 hrs, Volume= 1,058 cf, Depth> 7.58"
Routed to Reach 4R : 8" ROOF DRAIN CARRIER PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U7: Unit #7



Summary for Subcatchment U8: Unit #8

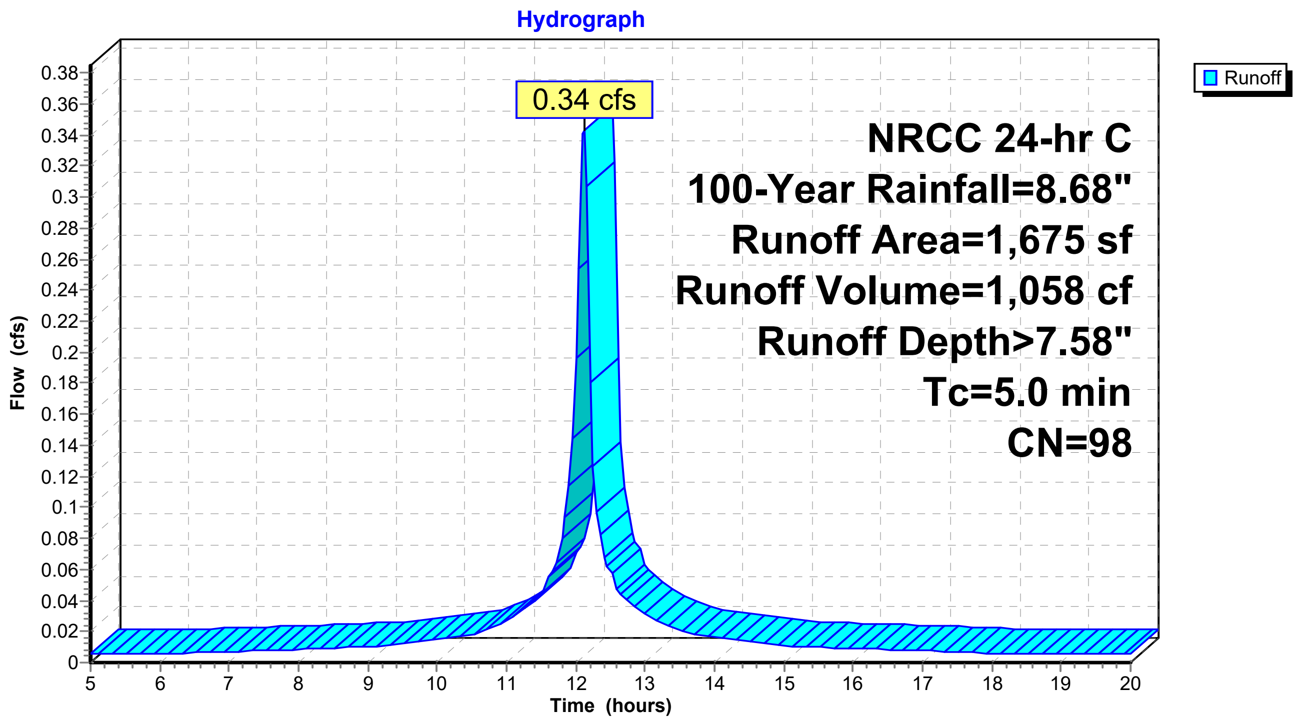
Runoff = 0.34 cfs @ 12.11 hrs, Volume= 1,058 cf, Depth> 7.58"
Routed to Pond 1P : Subsurface #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U8: Unit #8



Summary for Subcatchment U9: Unit #9

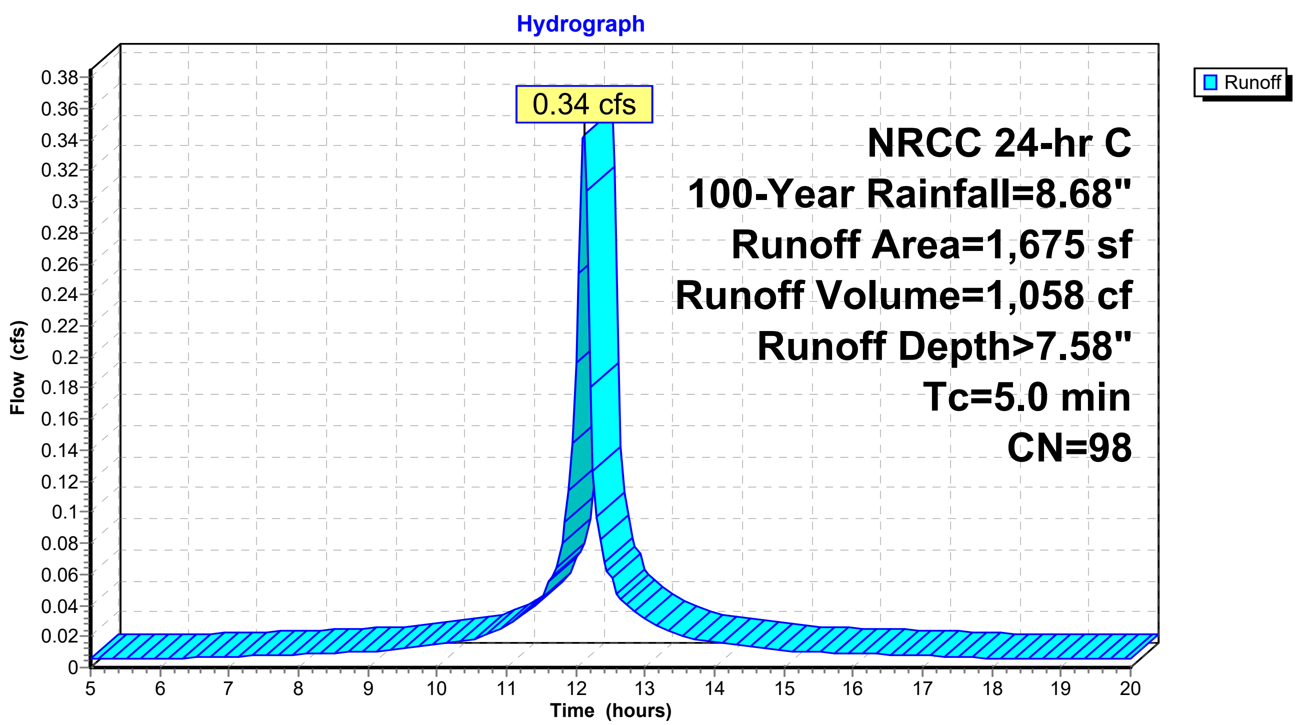
Runoff = 0.34 cfs @ 12.11 hrs, Volume= 1,058 cf, Depth> 7.58"
Routed to Pond 1P : Subsurface #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.68"

Area (sf)	CN	Description
1,675	98	Unconnected roofs, HSG C
1,675		100.00% Impervious Area
1,675		100.00% Unconnected

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

Subcatchment U9: Unit #9



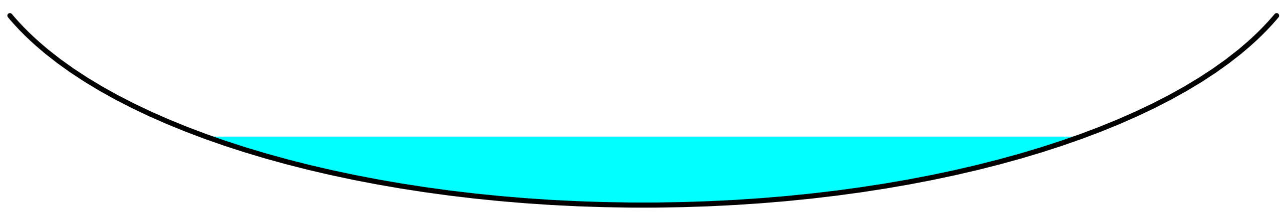
Summary for Reach 3R: Wetland Surface 1

Inflow Area = 26,965 sf, 33.26% Impervious, Inflow Depth > 4.53" for 100-Year event
Inflow = 2.46 cfs @ 12.30 hrs, Volume= 10,177 cf
Outflow = 2.23 cfs @ 12.41 hrs, Volume= 10,093 cf, Atten= 10%, Lag= 7.1 min
Routed to Reach DP1PST : DP 1 - POST

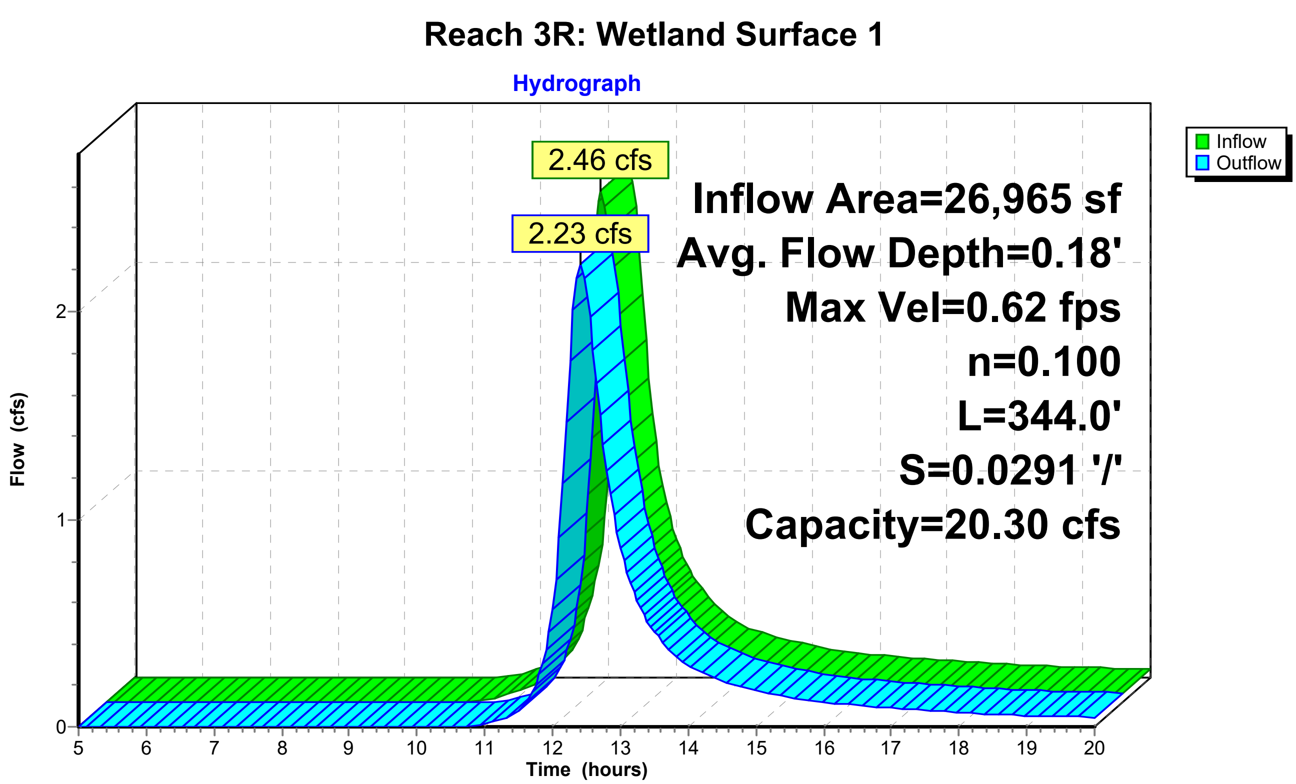
Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.62 fps, Min. Travel Time= 9.3 min
Avg. Velocity = 0.27 fps, Avg. Travel Time= 21.0 min

Peak Storage= 1,242 cf @ 12.41 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 30.03'
Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 20.30 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 344.0' Slope= 0.0291 '/'
Inlet Invert= 94.00', Outlet Invert= 84.00'



‡



Stage-Discharge for Reach 3R: Wetland Surface 1

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
94.00	0.00	0.00
94.01	0.09	0.00
94.02	0.14	0.02
94.03	0.19	0.05
94.04	0.23	0.09
94.05	0.26	0.14
94.06	0.30	0.21
94.07	0.33	0.29
94.08	0.36	0.38
94.09	0.39	0.49
94.10	0.42	0.62
94.11	0.44	0.76
94.12	0.47	0.92
94.13	0.50	1.10
94.14	0.52	1.29
94.15	0.55	1.49
94.16	0.57	1.72
94.17	0.59	1.96
94.18	0.62	2.22
94.19	0.64	2.49
94.20	0.66	2.79
94.21	0.68	3.10
94.22	0.70	3.43
94.23	0.73	3.77
94.24	0.75	4.14
94.25	0.77	4.52
94.26	0.79	4.92
94.27	0.81	5.34
94.28	0.83	5.78
94.29	0.85	6.24
94.30	0.87	6.71
94.31	0.89	7.21
94.32	0.90	7.72
94.33	0.92	8.25
94.34	0.94	8.80
94.35	0.96	9.37
94.36	0.98	9.96
94.37	1.00	10.57
94.38	1.01	11.20
94.39	1.03	11.85
94.40	1.05	12.52
94.41	1.07	13.20
94.42	1.08	13.91
94.43	1.10	14.64
94.44	1.12	15.39
94.45	1.14	16.15
94.46	1.15	16.94
94.47	1.17	17.75
94.48	1.19	18.58
94.49	1.20	19.43
94.50	**1.22**	**20.30**

Stage-Area-Storage for Reach 3R: Wetland Surface 1

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
94.00	0.0	0
94.01	0.0	16
94.02	0.1	46
94.03	0.2	84
94.04	0.4	130
94.05	0.5	181
94.06	0.7	238
94.07	0.9	300
94.08	1.1	367
94.09	1.3	438
94.10	1.5	513
94.11	1.7	592
94.12	2.0	674
94.13	2.2	760
94.14	2.5	849
94.15	2.7	942
94.16	3.0	1,038
94.17	3.3	1,137
94.18	3.6	1,238
94.19	3.9	1,343
94.20	4.2	1,450
94.21	4.5	1,561
94.22	4.9	1,673
94.23	5.2	1,789
94.24	5.5	1,907
94.25	5.9	2,027
94.26	6.2	2,150
94.27	6.6	2,275
94.28	7.0	2,403
94.29	7.4	2,532
94.30	7.7	2,665
94.31	8.1	2,799
94.32	8.5	2,935
94.33	8.9	3,074
94.34	9.3	3,215
94.35	9.8	3,358
94.36	10.2	3,503
94.37	10.6	3,650
94.38	11.0	3,799
94.39	11.5	3,950
94.40	11.9	4,102
94.41	12.4	4,257
94.42	12.8	4,414
94.43	13.3	4,573
94.44	13.8	4,733
94.45	14.2	4,895
94.46	14.7	5,059
94.47	15.2	5,225
94.48	15.7	5,393
94.49	16.2	5,562
94.50	**16.7**	**5,733**

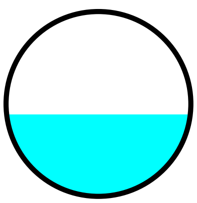
Summary for Reach 4R: 8" ROOF DRAIN CARRIER PIPE

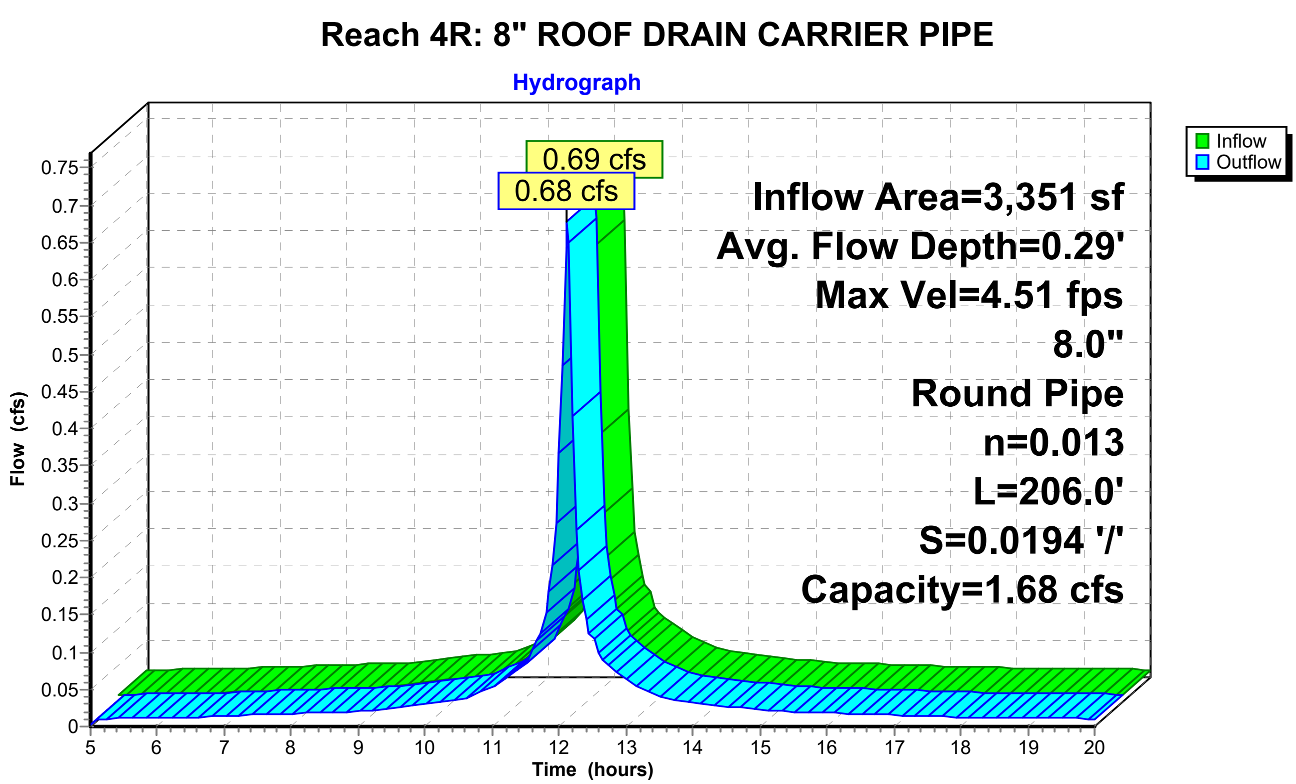
Inflow Area = 3,351 sf,100.00% Impervious, Inflow Depth > 7.58" for 100-Year event
Inflow = 0.69 cfs @ 12.11 hrs, Volume= 2,117 cf
Outflow = 0.68 cfs @ 12.13 hrs, Volume= 2,115 cf, Atten= 2%, Lag= 0.9 min
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.51 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 1.9 min

Peak Storage= 31 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.29' , Surface Width= 0.66'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.68 cfs

8.0" Round Pipe
n= 0.013
Length= 206.0' Slope= 0.0194 '/'
Inlet Invert= 93.00', Outlet Invert= 89.00'





Stage-Discharge for Reach 4R: 8" ROOF DRAIN CARRIER PIPE

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
93.00	0.00	0.00
93.01	0.55	0.00
93.02	0.89	0.00
93.03	1.16	0.01
93.04	1.39	0.01
93.05	1.61	0.02
93.06	1.81	0.03
93.07	2.00	0.04
93.08	2.17	0.05
93.09	2.34	0.07
93.10	2.49	0.08
93.11	2.64	0.10
93.12	2.79	0.12
93.13	2.92	0.14
93.14	3.05	0.16
93.15	3.18	0.19
93.16	3.30	0.21
93.17	3.42	0.24
93.18	3.53	0.27
93.19	3.64	0.30
93.20	3.74	0.33
93.21	3.84	0.36
93.22	3.94	0.40
93.23	4.04	0.43
93.24	4.13	0.47
93.25	4.21	0.50
93.26	4.30	0.54
93.27	4.38	0.58
93.28	4.46	0.62
93.29	4.53	0.66
93.30	4.60	0.70
93.31	4.67	0.74
93.32	4.74	0.79
93.33	4.80	0.83
93.34	4.86	0.87
93.35	4.92	0.91
93.36	4.98	0.96
93.37	5.03	1.00
93.38	5.08	1.04
93.39	5.13	1.09
93.40	5.17	1.13
93.41	5.22	1.17
93.42	5.25	1.22
93.43	5.29	1.26
93.44	5.33	1.30
93.45	5.36	1.34
93.46	5.38	1.38
93.47	5.41	1.42
93.48	5.43	1.46
93.49	5.45	1.50
93.50	5.47	1.54
93.51	5.48	1.57
93.52	5.49	1.60

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
93.53	5.50	1.64
93.54	**5.50**	1.67
93.55	5.50	1.69
93.56	5.49	1.72
93.57	5.48	1.74
93.58	5.47	1.76
93.59	5.45	1.78
93.60	5.42	1.79
93.61	5.39	1.80
93.62	5.35	**1.81**
93.63	5.30	1.81
93.64	5.24	1.80
93.65	5.15	1.79
93.66	5.03	1.75
93.67	4.72	1.65

Stage-Area-Storage for Reach 4R: 8" ROOF DRAIN CARRIER PIPE

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
93.00	0.0	0
93.01	0.0	0
93.02	0.0	1
93.03	0.0	1
93.04	0.0	2
93.05	0.0	2
93.06	0.0	3
93.07	0.0	4
93.08	0.0	5
93.09	0.0	6
93.10	0.0	7
93.11	0.0	8
93.12	0.0	9
93.13	0.0	10
93.14	0.1	11
93.15	0.1	12
93.16	0.1	13
93.17	0.1	14
93.18	0.1	16
93.19	0.1	17
93.20	0.1	18
93.21	0.1	19
93.22	0.1	21
93.23	0.1	22
93.24	0.1	23
93.25	0.1	25
93.26	0.1	26
93.27	0.1	27
93.28	0.1	29
93.29	0.1	30
93.30	0.2	31
93.31	0.2	33
93.32	0.2	34
93.33	0.2	35
93.34	0.2	37
93.35	0.2	38
93.36	0.2	40
93.37	0.2	41
93.38	0.2	42
93.39	0.2	44
93.40	0.2	45
93.41	0.2	46
93.42	0.2	48
93.43	0.2	49
93.44	0.2	50
93.45	0.3	52
93.46	0.3	53
93.47	0.3	54
93.48	0.3	55
93.49	0.3	57
93.50	0.3	58
93.51	0.3	59
93.52	0.3	60
93.53	0.3	61
93.54	0.3	62
93.55	0.3	63
93.56	0.3	64
93.57	0.3	65
93.58	0.3	66
93.59	0.3	67
93.60	0.3	68
93.61	0.3	69
93.62	0.3	70
93.63	0.3	70
93.64	0.3	71
93.65	0.3	71
93.66	0.3	72
93.67	**0.3**	**72**

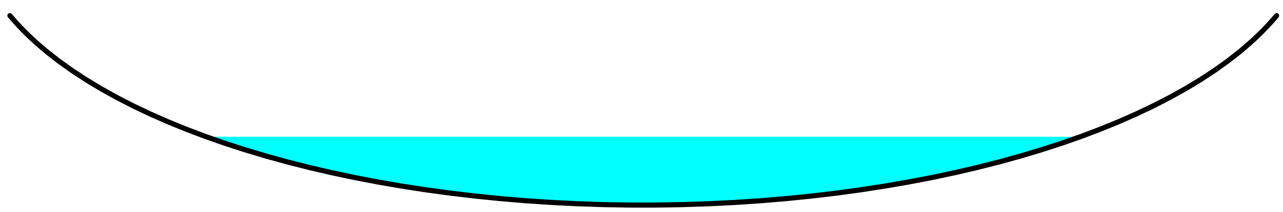
Summary for Reach 5R: Wetland Surface 2

Inflow Area = 13,032 sf, 17.40% Impervious, Inflow Depth > 4.88" for 100-Year event
Inflow = 1.51 cfs @ 12.25 hrs, Volume= 5,295 cf
Outflow = 1.17 cfs @ 12.37 hrs, Volume= 5,226 cf, Atten= 23%, Lag= 7.2 min
Routed to Reach 3R : Wetland Surface 1

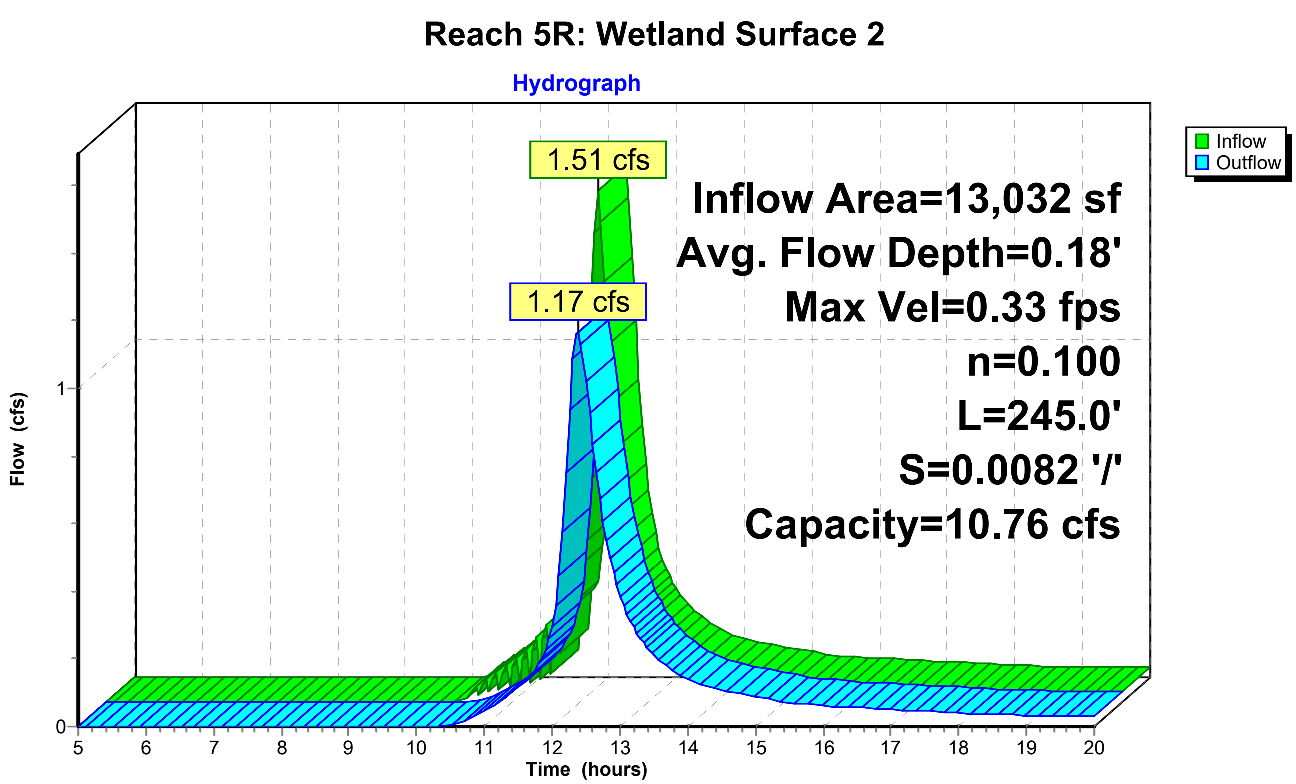
Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.33 fps, Min. Travel Time= 12.6 min
Avg. Velocity = 0.15 fps, Avg. Travel Time= 27.4 min

Peak Storage= 877 cf @ 12.37 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 29.95'
Bank-Full Depth= 0.50' Flow Area= 16.7 sf, Capacity= 10.76 cfs

50.00' x 0.50' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage
Length= 245.0' Slope= 0.0082 '/'
Inlet Invert= 96.00', Outlet Invert= 94.00'



‡



Stage-Discharge for Reach 5R: Wetland Surface 2

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
96.00	0.00	0.00
96.01	0.05	0.00
96.02	0.08	0.01
96.03	0.10	0.02
96.04	0.12	0.05
96.05	0.14	0.07
96.06	0.16	0.11
96.07	0.17	0.15
96.08	0.19	0.20
96.09	0.21	0.26
96.10	0.22	0.33
96.11	0.24	0.40
96.12	0.25	0.49
96.13	0.26	0.58
96.14	0.28	0.68
96.15	0.29	0.79
96.16	0.30	0.91
96.17	0.31	1.04
96.18	0.33	1.18
96.19	0.34	1.32
96.20	0.35	1.48
96.21	0.36	1.64
96.22	0.37	1.82
96.23	0.38	2.00
96.24	0.40	2.19
96.25	0.41	2.40
96.26	0.42	2.61
96.27	0.43	2.83
96.28	0.44	3.06
96.29	0.45	3.30
96.30	0.46	3.56
96.31	0.47	3.82
96.32	0.48	4.09
96.33	0.49	4.37
96.34	0.50	4.66
96.35	0.51	4.97
96.36	0.52	5.28
96.37	0.53	5.60
96.38	0.54	5.94
96.39	0.55	6.28
96.40	0.56	6.63
96.41	0.57	7.00
96.42	0.57	7.37
96.43	0.58	7.76
96.44	0.59	8.15
96.45	0.60	8.56
96.46	0.61	8.98
96.47	0.62	9.41
96.48	0.63	9.85
96.49	0.64	10.30
96.50	**0.65**	**10.76**

Stage-Area-Storage for Reach 5R: Wetland Surface 2

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
96.00	0.0	0
96.01	0.0	12
96.02	0.1	33
96.03	0.2	60
96.04	0.4	92
96.05	0.5	129
96.06	0.7	170
96.07	0.9	214
96.08	1.1	261
96.09	1.3	312
96.10	1.5	365
96.11	1.7	421
96.12	2.0	480
96.13	2.2	541
96.14	2.5	605
96.15	2.7	671
96.16	3.0	739
96.17	3.3	810
96.18	3.6	882
96.19	3.9	957
96.20	4.2	1,033
96.21	4.5	1,111
96.22	4.9	1,192
96.23	5.2	1,274
96.24	5.5	1,358
96.25	5.9	1,444
96.26	6.2	1,531
96.27	6.6	1,620
96.28	7.0	1,711
96.29	7.4	1,804
96.30	7.7	1,898
96.31	8.1	1,993
96.32	8.5	2,091
96.33	8.9	2,189
96.34	9.3	2,290
96.35	9.8	2,391
96.36	10.2	2,495
96.37	10.6	2,599
96.38	11.0	2,705
96.39	11.5	2,813
96.40	11.9	2,922
96.41	12.4	3,032
96.42	12.8	3,144
96.43	13.3	3,257
96.44	13.8	3,371
96.45	14.2	3,486
96.46	14.7	3,603
96.47	15.2	3,721
96.48	15.7	3,841
96.49	16.2	3,961
96.50	**16.7**	**4,083**

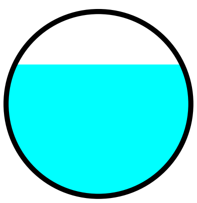
Summary for Reach 8R: 6" Roof Drain Carrier Pipe

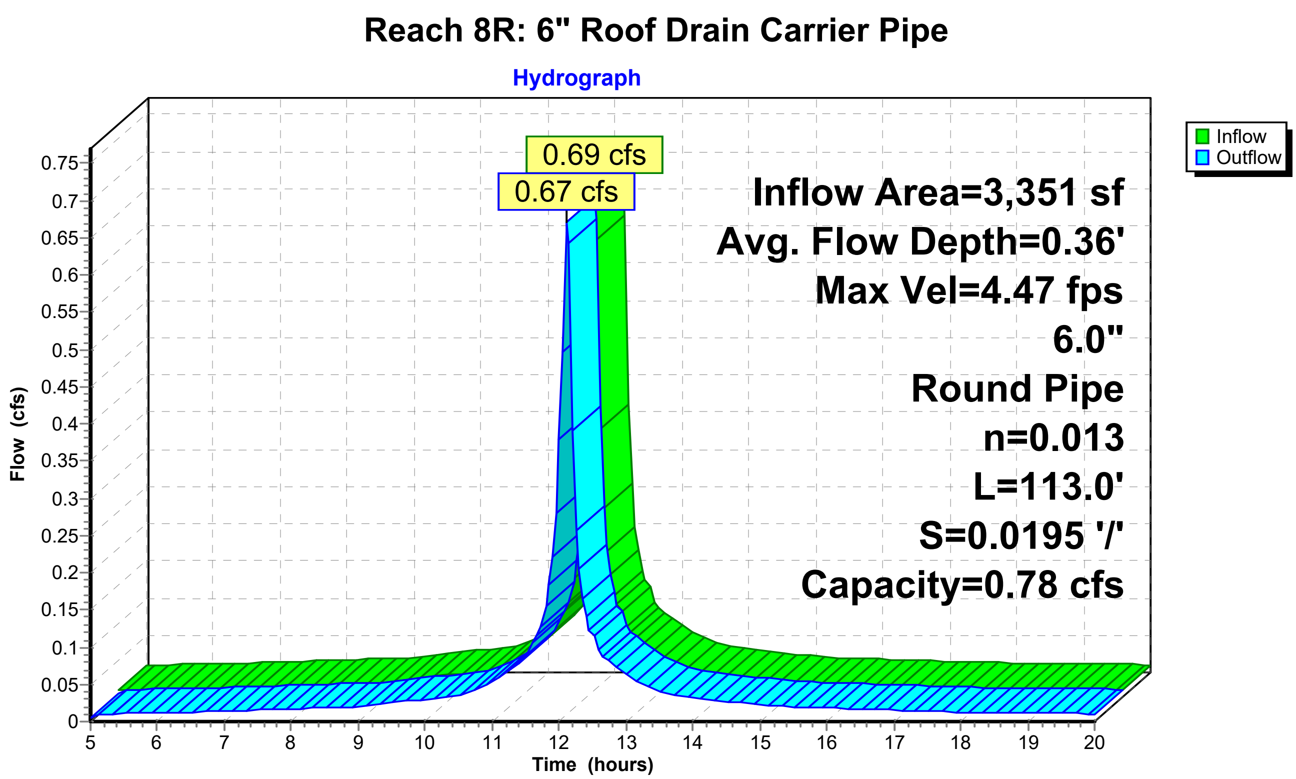
Inflow Area = 3,351 sf,100.00% Impervious, Inflow Depth > 7.58" for 100-Year event
Inflow = 0.69 cfs @ 12.11 hrs, Volume= 2,117 cf
Outflow = 0.67 cfs @ 12.12 hrs, Volume= 2,116 cf, Atten= 2%, Lag= 0.6 min
Routed to Reach 9R : 12" Roof Drain Carrier Pipe

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.47 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.83 fps, Avg. Travel Time= 1.0 min

Peak Storage= 17 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.36' , Surface Width= 0.45'
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 0.78 cfs

6.0" Round Pipe
n= 0.013
Length= 113.0' Slope= 0.0195 '/'
Inlet Invert= 94.50', Outlet Invert= 92.30'





Stage-Discharge for Reach 8R: 6" Roof Drain Carrier Pipe

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
94.50	0.00	0.00
94.51	0.56	0.00
94.52	0.89	0.00
94.53	1.15	0.01
94.54	1.39	0.01
94.55	1.60	0.02
94.56	1.79	0.02
94.57	1.97	0.03
94.58	2.14	0.04
94.59	2.30	0.06
94.60	2.45	0.07
94.61	2.59	0.08
94.62	2.73	0.10
94.63	2.86	0.12
94.64	2.98	0.13
94.65	3.09	0.15
94.66	3.21	0.17
94.67	3.31	0.19
94.68	3.41	0.22
94.69	3.51	0.24
94.70	3.60	0.26
94.71	3.68	0.29
94.72	3.77	0.31
94.73	3.84	0.34
94.74	3.92	0.37
94.75	3.99	0.39
94.76	4.05	0.42
94.77	4.11	0.45
94.78	4.17	0.47
94.79	4.23	0.50
94.80	4.28	0.53
94.81	4.32	0.55
94.82	4.36	0.58
94.83	4.40	0.61
94.84	4.44	0.63
94.85	4.46	0.66
94.86	4.49	0.68
94.87	4.51	0.70
94.88	4.53	0.72
94.89	4.54	0.75
94.90	4.54	0.77
94.91	**4.55**	0.78
94.92	4.54	0.80
94.93	4.53	0.81
94.94	4.51	0.83
94.95	4.48	0.83
94.96	4.45	0.84
94.97	4.40	**0.84**
94.98	4.33	0.84
94.99	4.23	0.83
95.00	3.99	0.78

Stage-Area-Storage for Reach 8R: 6" Roof Drain Carrier Pipe

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
94.50	0.0	0
94.51	0.0	0
94.52	0.0	0
94.53	0.0	1
94.54	0.0	1
94.55	0.0	1
94.56	0.0	2
94.57	0.0	2
94.58	0.0	2
94.59	0.0	3
94.60	0.0	3
94.61	0.0	4
94.62	0.0	4
94.63	0.0	5
94.64	0.0	5
94.65	0.0	6
94.66	0.1	6
94.67	0.1	7
94.68	0.1	7
94.69	0.1	8
94.70	0.1	8
94.71	0.1	9
94.72	0.1	9
94.73	0.1	10
94.74	0.1	11
94.75	0.1	11
94.76	0.1	12
94.77	0.1	12
94.78	0.1	13
94.79	0.1	13
94.80	0.1	14
94.81	0.1	14
94.82	0.1	15
94.83	0.1	16
94.84	0.1	16
94.85	0.1	17
94.86	0.2	17
94.87	0.2	18
94.88	0.2	18
94.89	0.2	19
94.90	0.2	19
94.91	0.2	19
94.92	0.2	20
94.93	0.2	20
94.94	0.2	21
94.95	0.2	21
94.96	0.2	21
94.97	0.2	22
94.98	0.2	22
94.99	0.2	22
95.00	**0.2**	**22**

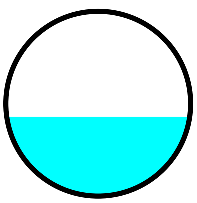
Summary for Reach 9R: 12" Roof Drain Carrier Pipe

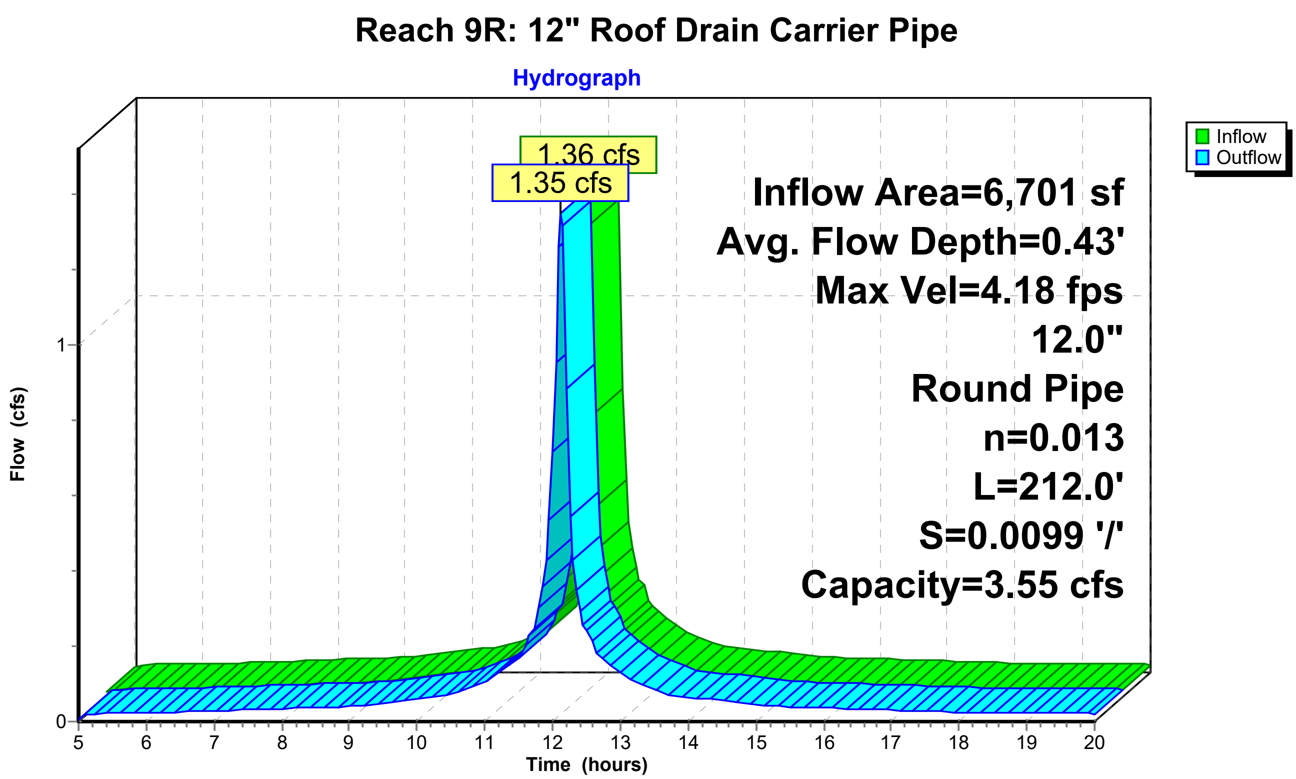
Inflow Area = 6,701 sf,100.00% Impervious, Inflow Depth > 7.58" for 100-Year event
Inflow = 1.36 cfs @ 12.12 hrs, Volume= 4,232 cf
Outflow = 1.35 cfs @ 12.13 hrs, Volume= 4,229 cf, Atten= 1%, Lag= 0.9 min
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.18 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 2.2 min

Peak Storage= 68 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.43' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.55 cfs

12.0" Round Pipe
n= 0.013
Length= 212.0' Slope= 0.0099 '/'
Inlet Invert= 91.10', Outlet Invert= 89.00'





Stage-Discharge for Reach 9R: 12" Roof Drain Carrier Pipe

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)	Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
91.10	0.00	0.00	91.63	4.62	1.95
91.11	0.40	0.00	91.64	4.66	2.02
91.12	0.64	0.00	91.65	4.69	2.08
91.13	0.83	0.01	91.66	4.72	2.14
91.14	1.00	0.01	91.67	4.76	2.20
91.15	1.16	0.02	91.68	4.79	2.26
91.16	1.31	0.03	91.69	4.81	2.32
91.17	1.44	0.03	91.70	4.84	2.38
91.18	1.57	0.05	91.71	4.87	2.44
91.19	1.69	0.06	91.72	4.89	2.50
91.20	1.81	0.07	91.73	4.92	2.56
91.21	1.92	0.09	91.74	4.94	2.62
91.22	2.03	0.11	91.75	4.96	2.68
91.23	2.14	0.13	91.76	4.98	2.74
91.24	2.24	0.15	91.77	5.00	2.80
91.25	2.33	0.17	91.78	5.02	2.86
91.26	2.43	0.20	91.79	5.04	2.91
91.27	2.52	0.22	91.80	5.06	2.97
91.28	2.61	0.25	91.81	5.07	3.02
91.29	2.69	0.28	91.82	5.08	3.08
91.30	2.78	0.31	91.83	5.10	3.13
91.31	2.86	0.34	91.84	5.11	3.18
91.32	2.94	0.38	91.85	5.12	3.23
91.33	3.01	0.41	91.86	5.13	3.28
91.34	3.09	0.45	91.87	5.13	3.33
91.35	3.16	0.49	91.88	5.14	3.38
91.36	3.23	0.52	91.89	5.14	3.42
91.37	3.30	0.57	91.90	5.15	3.47
91.38	3.37	0.61	91.91	**5.15**	3.51
91.39	3.44	0.65	91.92	5.15	3.55
91.40	3.50	0.69	91.93	5.14	3.59
91.41	3.57	0.74	91.94	5.14	3.62
91.42	3.63	0.79	91.95	5.14	3.65
91.43	3.69	0.83	91.96	5.13	3.68
91.44	3.75	0.88	91.97	5.12	3.71
91.45	3.81	0.93	91.98	5.11	3.74
91.46	3.86	0.98	91.99	5.09	3.76
91.47	3.92	1.03	92.00	5.08	3.78
91.48	3.97	1.09	92.01	5.06	3.79
91.49	4.02	1.14	92.02	5.03	3.81
91.50	4.07	1.19	92.03	5.01	3.81
91.51	4.12	1.25	92.04	4.98	**3.81**
91.52	4.17	1.31	92.05	4.94	3.81
91.53	4.22	1.36	92.06	4.90	3.80
91.54	4.26	1.42	92.07	4.85	3.78
91.55	4.31	1.48	92.08	4.79	3.75
91.56	4.35	1.54	92.09	4.71	3.69
91.57	4.39	1.59	92.10	4.51	3.55
91.58	4.44	1.65			
91.59	4.48	1.71			
91.60	4.51	1.77			
91.61	4.55	1.83			
91.62	4.59	1.89			

Stage-Area-Storage for Reach 9R: 12" Roof Drain Carrier Pipe

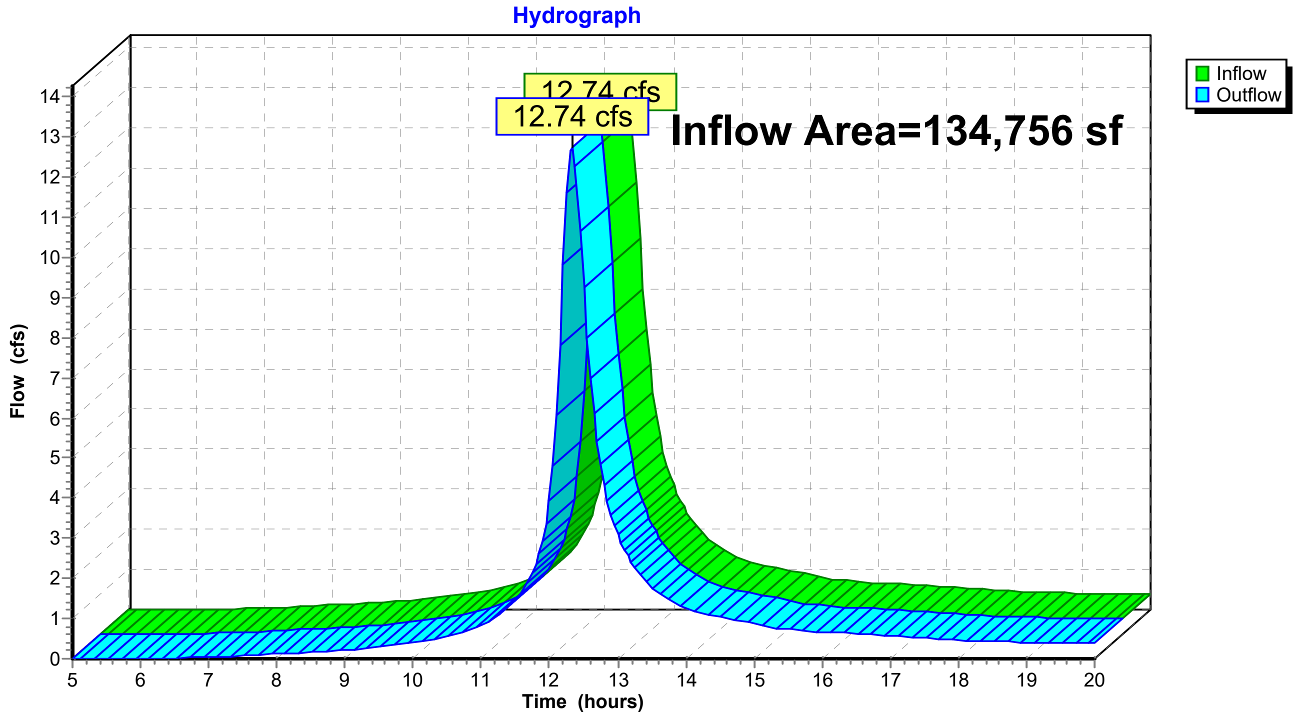
Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
91.10	0.0	0	91.63	0.4	90
91.11	0.0	0	91.64	0.4	92
91.12	0.0	1	91.65	0.4	94
91.13	0.0	1	91.66	0.5	96
91.14	0.0	2	91.67	0.5	98
91.15	0.0	3	91.68	0.5	100
91.16	0.0	4	91.69	0.5	102
91.17	0.0	5	91.70	0.5	104
91.18	0.0	6	91.71	0.5	106
91.19	0.0	7	91.72	0.5	108
91.20	0.0	9	91.73	0.5	110
91.21	0.0	10	91.74	0.5	113
91.22	0.1	11	91.75	0.5	115
91.23	0.1	13	91.76	0.5	117
91.24	0.1	14	91.77	0.6	119
91.25	0.1	16	91.78	0.6	121
91.26	0.1	17	91.79	0.6	123
91.27	0.1	19	91.80	0.6	124
91.28	0.1	20	91.81	0.6	126
91.29	0.1	22	91.82	0.6	128
91.30	0.1	24	91.83	0.6	130
91.31	0.1	25	91.84	0.6	132
91.32	0.1	27	91.85	0.6	134
91.33	0.1	29	91.86	0.6	136
91.34	0.1	31	91.87	0.6	138
91.35	0.2	33	91.88	0.7	139
91.36	0.2	34	91.89	0.7	141
91.37	0.2	36	91.90	0.7	143
91.38	0.2	38	91.91	0.7	144
91.39	0.2	40	91.92	0.7	146
91.40	0.2	42	91.93	0.7	148
91.41	0.2	44	91.94	0.7	149
91.42	0.2	46	91.95	0.7	151
91.43	0.2	48	91.96	0.7	152
91.44	0.2	50	91.97	0.7	154
91.45	0.2	52	91.98	0.7	155
91.46	0.3	54	91.99	0.7	157
91.47	0.3	56	92.00	0.7	158
91.48	0.3	58	92.01	0.8	159
91.49	0.3	60	92.02	0.8	160
91.50	0.3	62	92.03	0.8	161
91.51	0.3	64	92.04	0.8	162
91.52	0.3	66	92.05	0.8	163
91.53	0.3	68	92.06	0.8	164
91.54	0.3	71	92.07	0.8	165
91.55	0.3	73	92.08	0.8	166
91.56	0.4	75	92.09	0.8	166
91.57	0.4	77	92.10	**0.8**	**167**
91.58	0.4	79			
91.59	0.4	81			
91.60	0.4	83			
91.61	0.4	85			
91.62	0.4	87			

Summary for Reach DP1PRE: DP 1 - PRE

Inflow Area = 134,756 sf, 4.57% Impervious, Inflow Depth > 5.08" for 100-Year event
Inflow = 12.74 cfs @ 12.33 hrs, Volume= 57,094 cf
Outflow = 12.74 cfs @ 12.33 hrs, Volume= 57,094 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

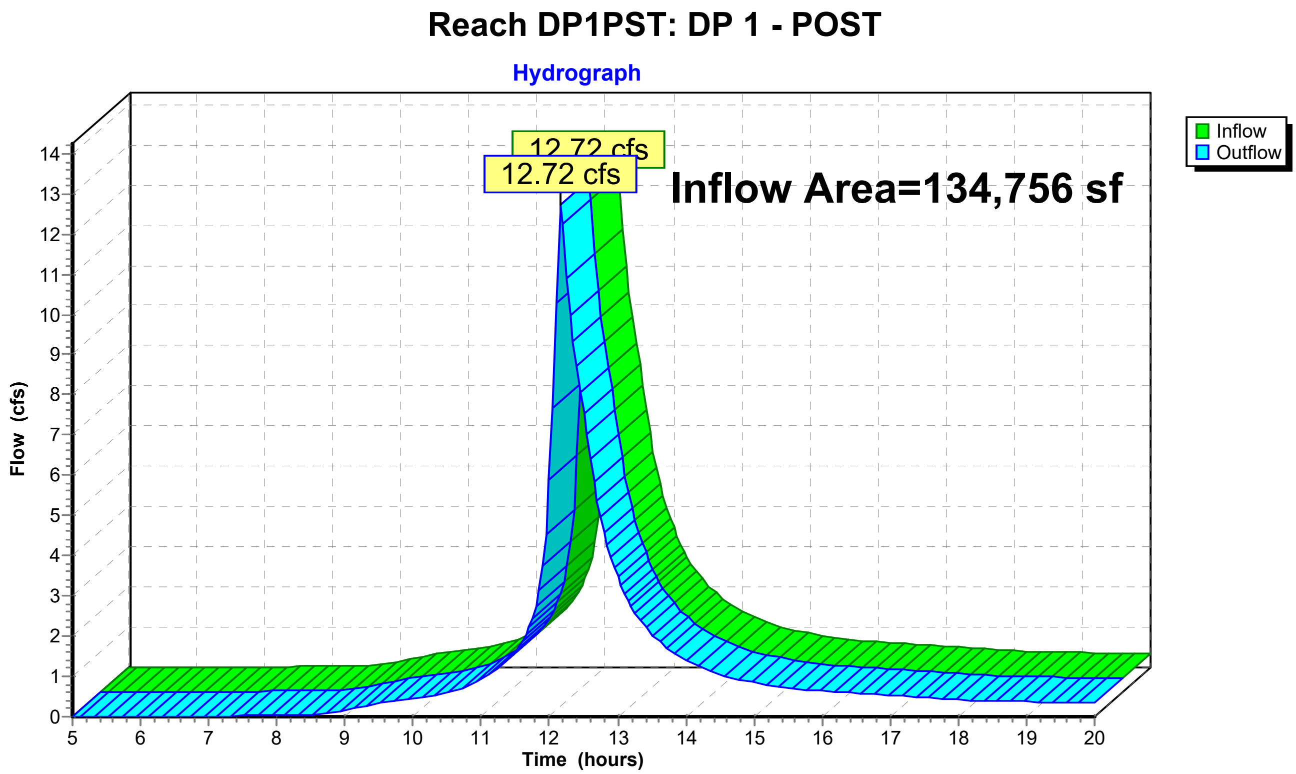
Reach DP1PRE: DP 1 - PRE



Summary for Reach DP1PST: DP 1 - POST

Inflow Area =	134,756 sf,	27.66% Impervious,	Inflow Depth > 5.22"	for 100-Year event
Inflow =	12.72 cfs @	12.17 hrs, Volume=	58,565 cf	
Outflow =	12.72 cfs @	12.17 hrs, Volume=	58,565 cf, Atten= 0%, Lag= 0.0 min	

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Summary for Pond 1P: Subsurface #1

Inflow Area = 13,933 sf, 48.09% Impervious, Inflow Depth > 6.30" for 100-Year event
Inflow = 2.13 cfs @ 12.13 hrs, Volume= 7,311 cf
Outflow = 1.53 cfs @ 12.22 hrs, Volume= 6,501 cf, Atten= 28%, Lag= 5.4 min
Discarded = 0.03 cfs @ 7.60 hrs, Volume= 1,551 cf
Primary = 1.50 cfs @ 12.22 hrs, Volume= 4,950 cf
Routed to Reach 3R : Wetland Surface 1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.31' @ 12.22 hrs Surf.Area= 1,248 sf Storage= 1,701 cf

Plug-Flow detention time= 63.8 min calculated for 6,479 cf (89% of inflow)
Center-of-Mass det. time= 26.3 min (780.9 - 754.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	96.00'	902 cf	**37.25'W x 33.50'L x 2.54'H Field A** 3,172 cf Overall - 918 cf Embedded = 2,254 cf x 40.0% Voids
#2A	96.50'	918 cf	**Cultec R-150XLHD** x 33 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 11 rows
		1,819 cf	Total Available Storage

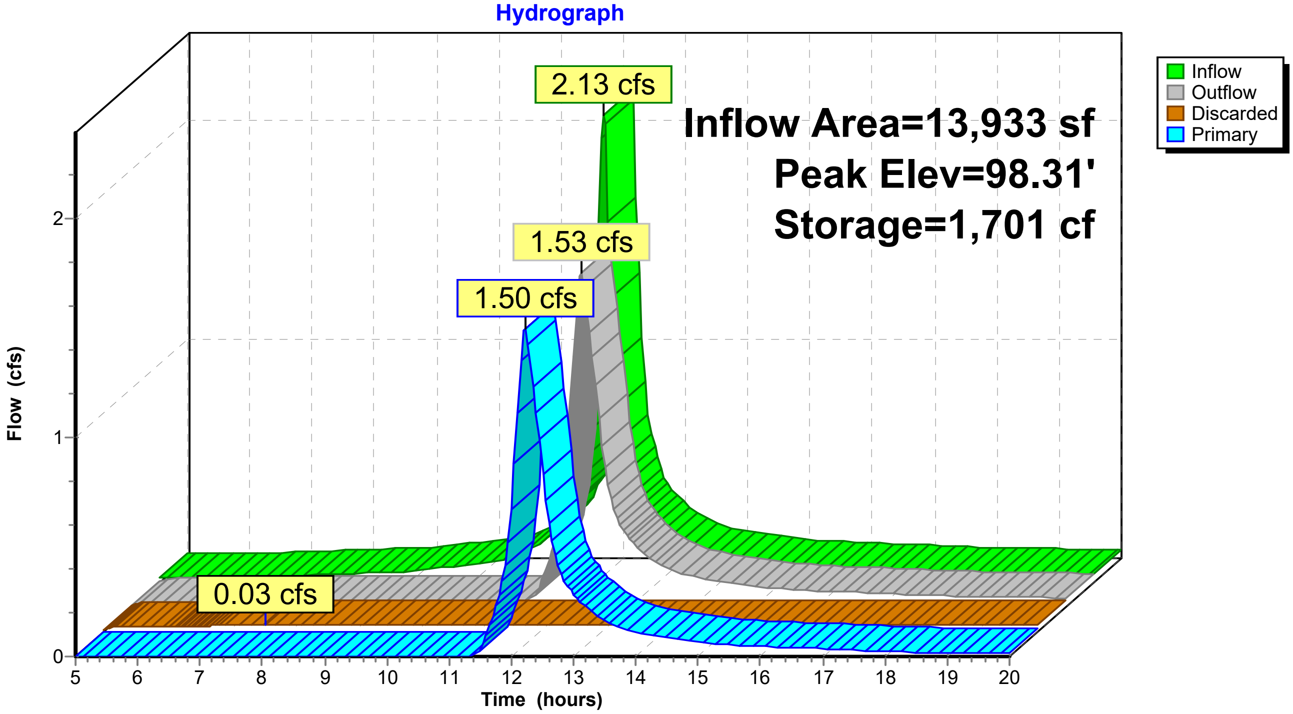
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	96.00'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	99.00'	**6.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Primary	97.00'	**8.0" Round Culvert** L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 97.00' / 96.75' S= 0.0083 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf

Discarded OutFlow Max=0.03 cfs @ 7.60 hrs HW=96.03' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=1.48 cfs @ 12.22 hrs HW=98.29' TW=94.15' (Dynamic Tailwater)
├─**2=Orifice/Grate** (Controls 0.00 cfs)
└─**3=Culvert** (Barrel Controls 1.48 cfs @ 4.24 fps)

Pond 1P: Subsurface #1



Stage-Discharge for Pond 1P: Subsurface #1

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
96.00	0.00	**0.00**	0.00
96.05	0.03	**0.03**	0.00
96.10	0.03	0.03	0.00
96.15	0.03	0.03	0.00
96.20	0.03	0.03	0.00
96.25	0.03	0.03	0.00
96.30	0.03	0.03	0.00
96.35	0.03	0.03	0.00
96.40	0.03	0.03	0.00
96.45	0.03	0.03	0.00
96.50	0.03	0.03	0.00
96.55	0.03	0.03	0.00
96.60	0.03	0.03	0.00
96.65	0.03	0.03	0.00
96.70	0.03	0.03	0.00
96.75	0.03	0.03	0.00
96.80	0.03	0.03	0.00
96.85	0.03	0.03	0.00
96.90	0.03	0.03	0.00
96.95	0.03	0.03	0.00
97.00	0.03	0.03	0.00
97.05	0.04	0.03	0.01
97.10	0.06	0.03	0.03
97.15	0.09	0.03	0.06
97.20	0.14	0.03	0.11
97.25	0.20	0.03	0.17
97.30	0.27	0.03	0.24
97.35	0.35	0.03	0.32
97.40	0.43	0.03	0.40
97.45	0.52	0.03	0.49
97.50	0.61	0.03	0.58
97.55	0.70	0.03	0.67
97.60	0.79	0.03	0.76
97.65	0.88	0.03	0.85
97.70	0.96	0.03	0.93
97.75	1.04	0.03	1.01
97.80	1.10	0.03	1.07
97.85	1.14	0.03	1.11
97.90	1.13	0.03	1.10
97.95	1.19	0.03	1.16
98.00	1.24	0.03	1.21
98.05	1.29	0.03	1.26
98.10	1.34	0.03	1.31
98.15	1.39	0.03	1.36
98.20	1.43	0.03	1.40
98.25	1.48	0.03	1.45
98.30	1.52	0.03	1.49
98.35	1.56	0.03	1.53
98.40	1.60	0.03	1.57
98.45	1.64	0.03	1.61
98.50	1.68	0.03	1.65
98.55	1.72	0.03	1.69
98.60	1.76	0.03	1.73

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
98.65	1.79	0.03	1.76
98.70	1.83	0.03	1.80
98.75	1.86	0.03	1.83
98.80	1.90	0.03	1.87
98.85	1.93	0.03	1.90
98.90	1.96	0.03	1.93
98.95	1.99	0.03	1.96
99.00	**2.03**	0.03	**2.00**

Stage-Area-Storage for Pond 1P: Subsurface #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
96.00	**1,248**	0	98.65	1,248	1,819
96.05	1,248	25	98.70	1,248	1,819
96.10	1,248	50	98.75	1,248	1,819
96.15	1,248	75	98.80	1,248	1,819
96.20	1,248	100	98.85	1,248	1,819
96.25	1,248	125	98.90	1,248	1,819
96.30	1,248	150	98.95	1,248	1,819
96.35	1,248	175	99.00	1,248	1,819
96.40	1,248	200			
96.45	1,248	225			
96.50	1,248	250			
96.55	1,248	300			
96.60	1,248	350			
96.65	1,248	400			
96.70	1,248	450			
96.75	1,248	499			
96.80	1,248	548			
96.85	1,248	597			
96.90	1,248	646			
96.95	1,248	694			
97.00	1,248	742			
97.05	1,248	790			
97.10	1,248	838			
97.15	1,248	885			
97.20	1,248	932			
97.25	1,248	978			
97.30	1,248	1,024			
97.35	1,248	1,069			
97.40	1,248	1,113			
97.45	1,248	1,157			
97.50	1,248	1,200			
97.55	1,248	1,242			
97.60	1,248	1,283			
97.65	1,248	1,322			
97.70	1,248	1,361			
97.75	1,248	1,398			
97.80	1,248	1,433			
97.85	1,248	1,465			
97.90	1,248	1,495			
97.95	1,248	1,522			
98.00	1,248	1,549			
98.05	1,248	1,574			
98.10	1,248	1,599			
98.15	1,248	1,624			
98.20	1,248	1,649			
98.25	1,248	1,674			
98.30	1,248	1,699			
98.35	1,248	1,724			
98.40	1,248	1,749			
98.45	1,248	1,774			
98.50	1,248	1,799			
98.55	1,248	**1,819**			
98.60	1,248	1,819			

Summary for Pond 5P: CB 5

Inflow Area =	8,830 sf, 71.11% Impervious,	Inflow Depth > 7.03"	for 100-Year event
Inflow =	1.61 cfs @ 12.15 hrs,	Volume=	5,170 cf
Outflow =	1.61 cfs @ 12.15 hrs,	Volume=	5,170 cf, Atten= 0%, Lag= 0.0 min
Primary =	1.61 cfs @ 12.15 hrs,	Volume=	5,170 cf

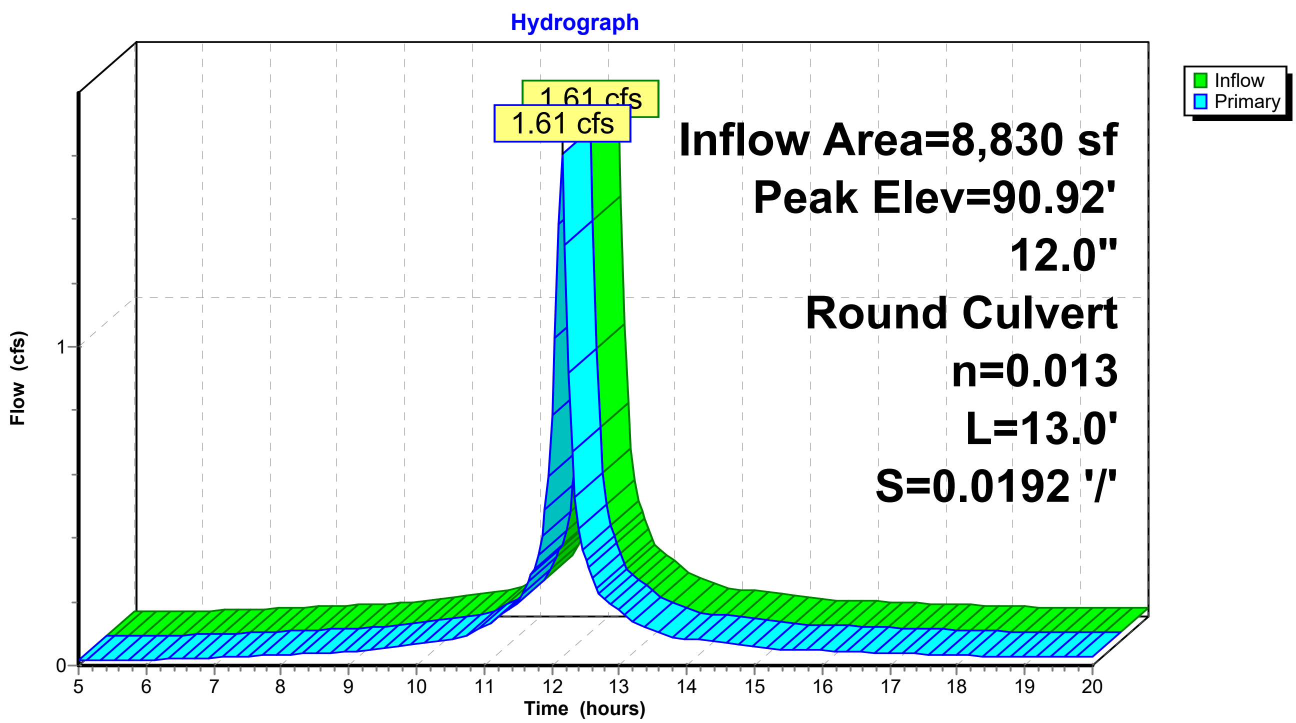
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.92' @ 12.36 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	89.25'	**12.0" Round Culvert** L= 13.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.25' / 89.00' S= 0.0192 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.15 hrs HW=90.34' TW=90.40' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)

Pond 5P: CB 5



Stage-Discharge for Pond 5P: CB 5

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
89.25	0.00	89.78	1.02	90.31	2.83	90.84	3.95
89.26	0.00	89.79	1.05	90.32	2.86	90.85	3.97
89.27	0.00	89.80	1.08	90.33	2.88	90.86	3.98
89.28	0.00	89.81	1.12	90.34	2.90	90.87	4.00
89.29	0.01	89.82	1.15	90.35	2.93	90.88	4.02
89.30	0.01	89.83	1.18	90.36	2.95	90.89	4.04
89.31	0.02	89.84	1.21	90.37	2.98	90.90	4.06
89.32	0.02	89.85	1.25	90.38	3.00	90.91	4.07
89.33	0.03	89.86	1.28	90.39	3.03	90.92	4.09
89.34	0.04	89.87	1.31	90.40	3.05	90.93	**4.11**
89.35	0.04	89.88	1.35	90.41	3.07		
89.36	0.05	89.89	1.38	90.42	3.10		
89.37	0.06	89.90	1.42	90.43	3.12		
89.38	0.07	89.91	1.45	90.44	3.14		
89.39	0.09	89.92	1.48	90.45	3.16		
89.40	0.10	89.93	1.52	90.46	3.19		
89.41	0.11	89.94	1.55	90.47	3.21		
89.42	0.12	89.95	1.59	90.48	3.23		
89.43	0.14	89.96	1.62	90.49	3.25		
89.44	0.15	89.97	1.66	90.50	3.28		
89.45	0.17	89.98	1.69	90.51	3.30		
89.46	0.19	89.99	1.73	90.52	3.32		
89.47	0.20	90.00	1.77	90.53	3.34		
89.48	0.22	90.01	1.80	90.54	3.36		
89.49	0.24	90.02	1.84	90.55	3.38		
89.50	0.26	90.03	1.87	90.56	3.40		
89.51	0.28	90.04	1.91	90.57	3.42		
89.52	0.30	90.05	1.94	90.58	3.45		
89.53	0.32	90.06	1.98	90.59	3.47		
89.54	0.35	90.07	2.02	90.60	3.49		
89.55	0.37	90.08	2.05	90.61	3.51		
89.56	0.39	90.09	2.09	90.62	3.53		
89.57	0.42	90.10	2.13	90.63	3.55		
89.58	0.44	90.11	2.16	90.64	3.57		
89.59	0.47	90.12	2.20	90.65	3.59		
89.60	0.49	90.13	2.23	90.66	3.61		
89.61	0.52	90.14	2.27	90.67	3.63		
89.62	0.55	90.15	2.31	90.68	3.65		
89.63	0.57	90.16	2.34	90.69	3.67		
89.64	0.60	90.17	2.38	90.70	3.69		
89.65	0.63	90.18	2.41	90.71	3.71		
89.66	0.66	90.19	2.45	90.72	3.72		
89.67	0.69	90.20	2.48	90.73	3.74		
89.68	0.72	90.21	2.52	90.74	3.76		
89.69	0.75	90.22	2.55	90.75	3.78		
89.70	0.78	90.23	2.59	90.76	3.80		
89.71	0.81	90.24	2.62	90.77	3.82		
89.72	0.84	90.25	2.66	90.78	3.84		
89.73	0.87	90.26	2.69	90.79	3.86		
89.74	0.90	90.27	2.73	90.80	3.88		
89.75	0.93	90.28	2.75	90.81	3.89		
89.76	0.96	90.29	2.78	90.82	3.91		
89.77	0.99	90.30	2.80	90.83	3.93		

Stage-Area-Storage for Pond 5P: CB 5

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
89.25	**0**	90.31	0
89.27	0	90.33	0
89.29	0	90.35	0
89.31	0	90.37	0
89.33	0	90.39	0
89.35	0	90.41	0
89.37	0	90.43	0
89.39	0	90.45	0
89.41	0	90.47	0
89.43	0	90.49	0
89.45	0	90.51	0
89.47	0	90.53	0
89.49	0	90.55	0
89.51	0	90.57	0
89.53	0	90.59	0
89.55	0	90.61	0
89.57	0	90.63	0
89.59	0	90.65	0
89.61	0	90.67	0
89.63	0	90.69	0
89.65	0	90.71	0
89.67	0	90.73	0
89.69	0	90.75	0
89.71	0	90.77	0
89.73	0	90.79	0
89.75	0	90.81	0
89.77	0	90.83	0
89.79	0	90.85	0
89.81	0	90.87	0
89.83	0	90.89	0
89.85	0	90.91	0
89.87	0	90.93	0
89.89	0		
89.91	0		
89.93	0		
89.95	0		
89.97	0		
89.99	0		
90.01	0		
90.03	0		
90.05	0		
90.07	0		
90.09	0		
90.11	0		
90.13	0		
90.15	0		
90.17	0		
90.19	0		
90.21	0		
90.23	0		
90.25	0		
90.27	0		
90.29	0		

Summary for Pond 10P: Infiltration Basin #1 (Storage)

Inflow Area = 54,661 sf, 51.78% Impervious, Inflow Depth > 6.08" for 100-Year event
Inflow = 7.88 cfs @ 12.15 hrs, Volume= 27,676 cf
Outflow = 4.76 cfs @ 12.27 hrs, Volume= 26,876 cf, Atten= 40%, Lag= 7.3 min
Primary = 4.76 cfs @ 12.27 hrs, Volume= 26,876 cf
Routed to Reach DP1PST : DP 1 - POST
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf
Routed to Reach DP1PST : DP 1 - POST

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.90' @ 12.27 hrs Surf.Area= 3,037 sf Storage= 4,645 cf

Plug-Flow detention time= 29.9 min calculated for 26,787 cf (97% of inflow)
Center-of-Mass det. time= 18.5 min (787.3 - 768.8)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	8,689 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

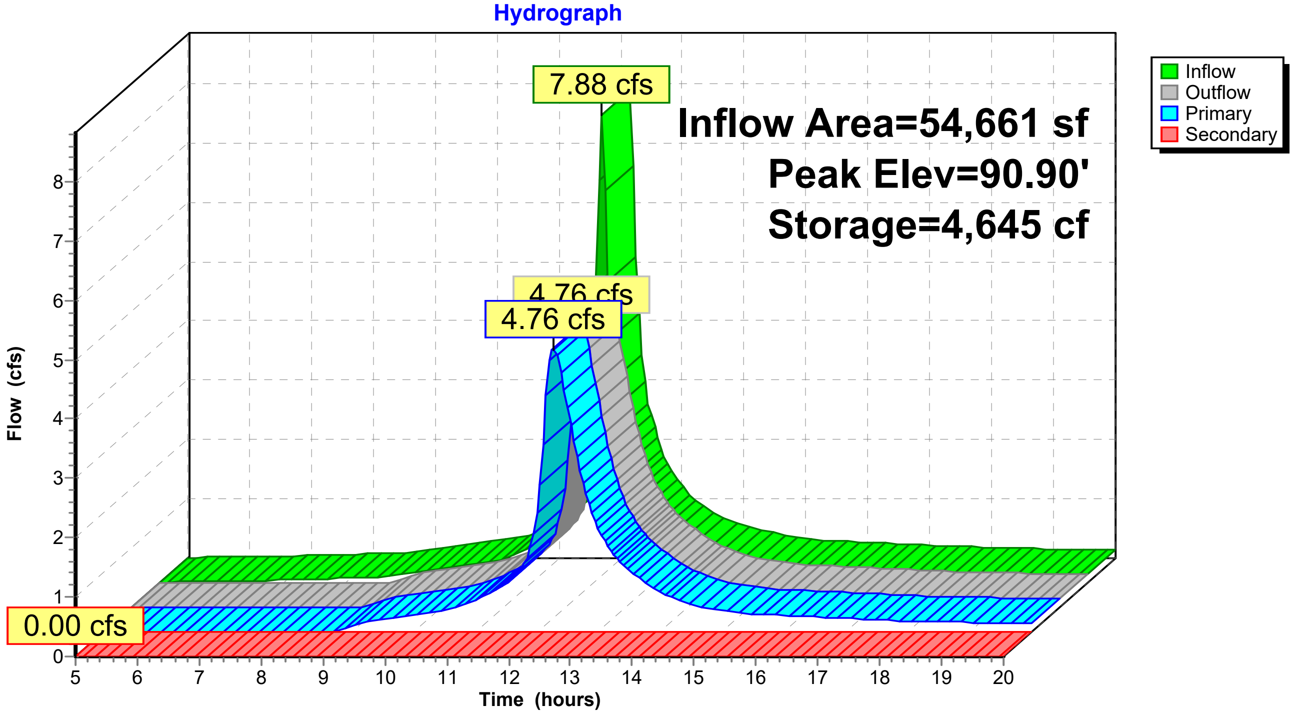
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	392	0	0
90.00	1,990	2,382	2,382
92.00	4,317	6,307	8,689

Device	Routing	Invert	Outlet Devices
#1	Secondary	91.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	87.50'	**12.0" Round Culvert** L= 37.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 87.50' / 87.25' S= 0.0068 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	88.90'	**16.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	89.50'	**6.0" W x 15.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.74 cfs @ 12.27 hrs HW=90.89' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 4.74 cfs of 6.28 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 2.19 cfs @ 6.58 fps)
  └─**4=Orifice/Grate** (Orifice Controls 2.55 cfs @ 4.08 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' TW=0.00' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 10P: Infiltration Basin #1 (Storage)



Stage-Discharge for Pond 10P: Infiltration Basin #1 (Storage)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
88.00	0.00	0.00	0.00	90.65	4.02	4.02	0.00
88.05	0.00	0.00	0.00	90.70	4.19	4.19	0.00
88.10	0.00	0.00	0.00	90.75	4.35	4.35	0.00
88.15	0.00	0.00	0.00	90.80	4.50	4.50	0.00
88.20	0.00	0.00	0.00	90.85	4.63	4.63	0.00
88.25	0.00	0.00	0.00	90.90	4.76	4.76	0.00
88.30	0.00	0.00	0.00	90.95	4.89	4.89	0.00
88.35	0.00	0.00	0.00	91.00	5.00	5.00	0.00
88.40	0.00	0.00	0.00	91.05	5.41	5.12	0.29
88.45	0.00	0.00	0.00	91.10	6.05	5.23	0.83
88.50	0.00	0.00	0.00	91.15	6.85	5.34	1.52
88.55	0.00	0.00	0.00	91.20	7.78	5.44	2.34
88.60	0.00	0.00	0.00	91.25	8.81	5.54	3.27
88.65	0.00	0.00	0.00	91.30	9.94	5.64	4.30
88.70	0.00	0.00	0.00	91.35	11.16	5.74	5.42
88.75	0.00	0.00	0.00	91.40	12.45	5.84	6.62
88.80	0.00	0.00	0.00	91.45	13.83	5.93	7.90
88.85	0.00	0.00	0.00	91.50	15.27	6.02	9.25
88.90	0.00	0.00	0.00	91.55	16.78	6.11	10.67
88.95	0.05	0.05	0.00	91.60	18.36	6.20	12.16
89.00	0.14	0.14	0.00	91.65	20.00	6.29	13.71
89.05	0.25	0.25	0.00	91.70	21.70	6.38	15.32
89.10	0.38	0.38	0.00	91.75	23.14	6.46	16.68
89.15	0.53	0.53	0.00	91.80	23.77	6.54	17.23
89.20	0.66	0.66	0.00	91.85	24.38	6.63	17.76
89.25	0.75	0.75	0.00	91.90	24.98	6.71	18.27
89.30	0.83	0.83	0.00	91.95	25.56	6.79	18.77
89.35	0.91	0.91	0.00	92.00	**26.13**	**6.87**	**19.26**
89.40	0.98	0.98	0.00				
89.45	1.04	1.04	0.00				
89.50	1.10	1.10	0.00				
89.55	1.18	1.18	0.00				
89.60	1.27	1.27	0.00				
89.65	1.36	1.36	0.00				
89.70	1.46	1.46	0.00				
89.75	1.57	1.57	0.00				
89.80	1.68	1.68	0.00				
89.85	1.79	1.79	0.00				
89.90	1.91	1.91	0.00				
89.95	2.03	2.03	0.00				
90.00	2.15	2.15	0.00				
90.05	2.28	2.28	0.00				
90.10	2.41	2.41	0.00				
90.15	2.54	2.54	0.00				
90.20	2.68	2.68	0.00				
90.25	2.82	2.82	0.00				
90.30	2.96	2.96	0.00				
90.35	3.10	3.10	0.00				
90.40	3.25	3.25	0.00				
90.45	3.40	3.40	0.00				
90.50	3.55	3.55	0.00				
90.55	3.71	3.71	0.00				
90.60	3.87	3.87	0.00				

Stage-Area-Storage for Pond 10P: Infiltration Basin #1 (Storage)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
88.00	392	0
88.05	432	21
88.10	472	43
88.15	512	68
88.20	552	94
88.25	592	123
88.30	632	154
88.35	672	186
88.40	712	221
88.45	752	257
88.50	792	296
88.55	831	336
88.60	871	379
88.65	911	424
88.70	951	470
88.75	991	519
88.80	1,031	569
88.85	1,071	622
88.90	1,111	676
88.95	1,151	733
89.00	1,191	792
89.05	1,231	852
89.10	1,271	915
89.15	1,311	979
89.20	1,351	1,046
89.25	1,391	1,114
89.30	1,431	1,185
89.35	1,471	1,257
89.40	1,511	1,332
89.45	1,551	1,408
89.50	1,591	1,487
89.55	1,630	1,567
89.60	1,670	1,650
89.65	1,710	1,734
89.70	1,750	1,821
89.75	1,790	1,909
89.80	1,830	2,000
89.85	1,870	2,092
89.90	1,910	2,187
89.95	1,950	2,283
90.00	1,990	2,382
90.05	2,048	2,483
90.10	2,106	2,587
90.15	2,165	2,694
90.20	2,223	2,803
90.25	2,281	2,916
90.30	2,339	3,031
90.35	2,397	3,150
90.40	2,455	3,271
90.45	2,514	3,395
90.50	2,572	3,522
90.55	2,630	3,652
90.60	2,688	3,785
90.65	2,746	3,921
90.70	2,804	4,060
90.75	2,863	4,202
90.80	2,921	4,346
90.85	2,979	4,494
90.90	3,037	4,644
90.95	3,095	4,798
91.00	3,154	4,954
91.05	3,212	5,113
91.10	3,270	5,275
91.15	3,328	5,440
91.20	3,386	5,608
91.25	3,444	5,778
91.30	3,503	5,952
91.35	3,561	6,129
91.40	3,619	6,308
91.45	3,677	6,491
91.50	3,735	6,676
91.55	3,793	6,864
91.60	3,852	7,055
91.65	3,910	7,249
91.70	3,968	7,446
91.75	4,026	7,646
91.80	4,084	7,849
91.85	4,142	8,055
91.90	4,201	8,263
91.95	4,259	8,475
92.00	**4,317**	**8,689**

Summary for Pond B2: Infiltration Basin #2 (Storage Zone)

Inflow Area = 13,032 sf, 17.40% Impervious, Inflow Depth > 4.95" for 100-Year event
Inflow = 1.59 cfs @ 12.21 hrs, Volume= 5,374 cf
Outflow = 1.51 cfs @ 12.25 hrs, Volume= 5,295 cf, Atten= 5%, Lag= 2.4 min
Primary = 1.51 cfs @ 12.25 hrs, Volume= 5,295 cf
Routed to Reach 5R : Wetland Surface 2

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.96' @ 12.25 hrs Surf.Area= 700 sf Storage= 302 cf

Plug-Flow detention time= 11.4 min calculated for 5,295 cf (99% of inflow)
Center-of-Mass det. time= 5.2 min (792.1 - 787.0)

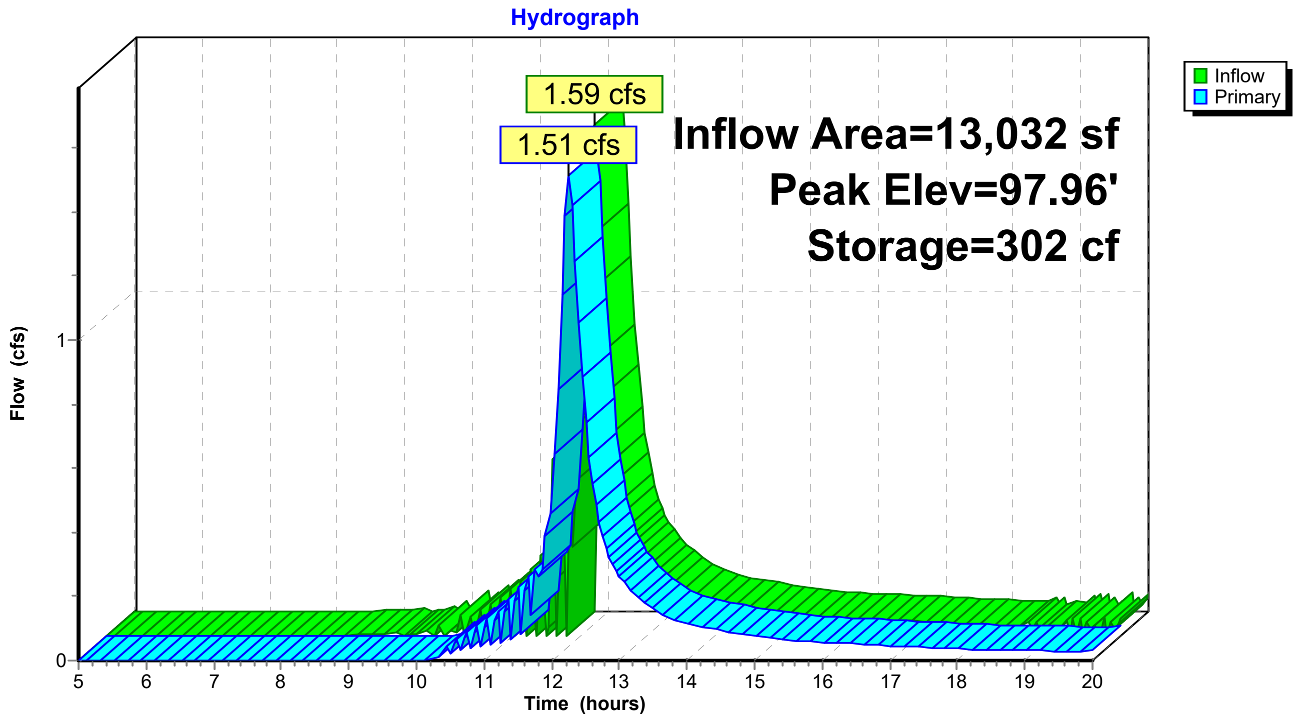
Volume	Invert	Avail.Storage	Storage Description
#1	97.10'	329 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.10	0	0	0
98.00	731	329	329

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 96.25' / 96.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	97.50'	**18.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.50 cfs @ 12.25 hrs HW=97.96' TW=96.16' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.50 cfs of 3.53 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 1.50 cfs @ 2.18 fps)

Pond B2: Infiltration Basin #2 (Storage Zone)



Stage-Discharge for Pond B2: Infiltration Basin #2 (Storage Zone)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
97.10	0.00	97.63	0.23
97.11	0.00	97.64	0.25
97.12	0.00	97.65	0.28
97.13	0.00	97.66	0.31
97.14	0.00	97.67	0.34
97.15	0.00	97.68	0.37
97.16	0.00	97.69	0.40
97.17	0.00	97.70	0.43
97.18	0.00	97.71	0.46
97.19	0.00	97.72	0.50
97.20	0.00	97.73	0.53
97.21	0.00	97.74	0.57
97.22	0.00	97.75	0.60
97.23	0.00	97.76	0.64
97.24	0.00	97.77	0.68
97.25	0.00	97.78	0.71
97.26	0.00	97.79	0.75
97.27	0.00	97.80	0.79
97.28	0.00	97.81	0.83
97.29	0.00	97.82	0.87
97.30	0.00	97.83	0.91
97.31	0.00	97.84	0.95
97.32	0.00	97.85	1.00
97.33	0.00	97.86	1.04
97.34	0.00	97.87	1.08
97.35	0.00	97.88	1.13
97.36	0.00	97.89	1.17
97.37	0.00	97.90	1.22
97.38	0.00	97.91	1.26
97.39	0.00	97.92	1.31
97.40	0.00	97.93	1.36
97.41	0.00	97.94	1.41
97.42	0.00	97.95	1.45
97.43	0.00	97.96	1.50
97.44	0.00	97.97	1.55
97.45	0.00	97.98	1.60
97.46	0.00	97.99	1.65
97.47	0.00	98.00	**1.70**
97.48	0.00		
97.49	0.00		
97.50	0.00		
97.51	0.00		
97.52	0.01		
97.53	0.03		
97.54	0.04		
97.55	0.05		
97.56	0.07		
97.57	0.09		
97.58	0.11		
97.59	0.13		
97.60	0.15		
97.61	0.18		
97.62	0.20		

Stage-Area-Storage for Pond B2: Infiltration Basin #2 (Storage Zone)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
97.10	0	0	97.63	430	114
97.11	8	0	97.64	439	118
97.12	16	0	97.65	447	123
97.13	24	0	97.66	455	127
97.14	32	1	97.67	463	132
97.15	41	1	97.68	471	137
97.16	49	1	97.69	479	141
97.17	57	2	97.70	487	146
97.18	65	3	97.71	495	151
97.19	73	3	97.72	504	156
97.20	81	4	97.73	512	161
97.21	89	5	97.74	520	166
97.22	97	6	97.75	528	172
97.23	106	7	97.76	536	177
97.24	114	8	97.77	544	182
97.25	122	9	97.78	552	188
97.26	130	10	97.79	560	193
97.27	138	12	97.80	569	199
97.28	146	13	97.81	577	205
97.29	154	15	97.82	585	211
97.30	162	16	97.83	593	216
97.31	171	18	97.84	601	222
97.32	179	20	97.85	609	228
97.33	187	21	97.86	617	235
97.34	195	23	97.87	625	241
97.35	203	25	97.88	634	247
97.36	211	27	97.89	642	253
97.37	219	30	97.90	650	260
97.38	227	32	97.91	658	266
97.39	236	34	97.92	666	273
97.40	244	37	97.93	674	280
97.41	252	39	97.94	682	287
97.42	260	42	97.95	690	293
97.43	268	44	97.96	699	300
97.44	276	47	97.97	707	307
97.45	284	50	97.98	715	314
97.46	292	53	97.99	723	322
97.47	301	56	98.00	**731**	**329**
97.48	309	59			
97.49	317	62			
97.50	325	65			
97.51	333	68			
97.52	341	72			
97.53	349	75			
97.54	357	79			
97.55	366	82			
97.56	374	86			
97.57	382	90			
97.58	390	94			
97.59	398	98			
97.60	406	102			
97.61	414	106			
97.62	422	110			

Summary for Pond CB1: CB 1

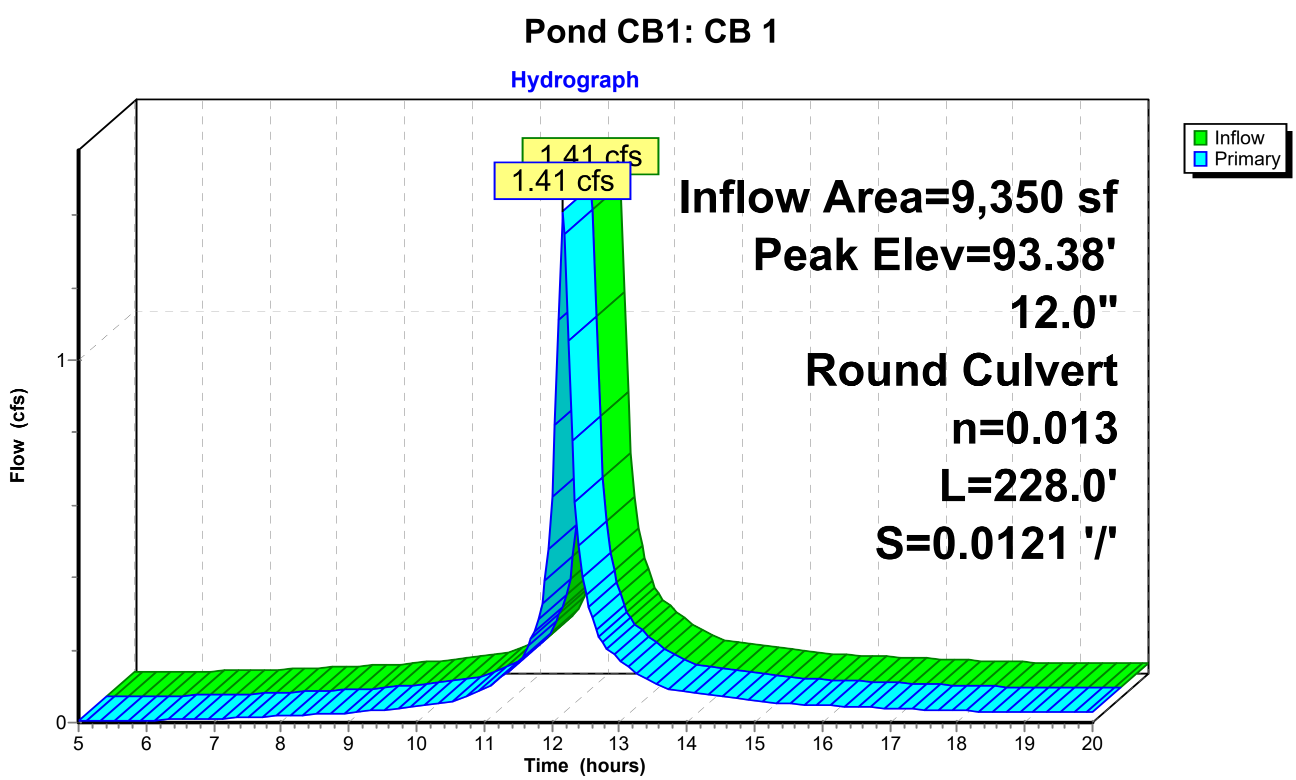
Inflow Area =	9,350 sf,	31.22% Impervious,	Inflow Depth > 5.93"	for 100-Year event	
Inflow =	1.41 cfs @	12.17 hrs,	Volume=	4,621 cf	
Outflow =	1.41 cfs @	12.17 hrs,	Volume=	4,621 cf,	Atten= 0%, Lag= 0.0 min
Primary =	1.41 cfs @	12.17 hrs,	Volume=	4,621 cf	

Routed to Pond DMH2 : DMH2

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 93.38' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	92.75'	**12.0" Round Culvert** L= 228.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 92.75' / 90.00' S= 0.0121 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.38 cfs @ 12.17 hrs HW=93.37' TW=91.07' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.38 cfs @ 2.68 fps)



Stage-Discharge for Pond CB1: CB 1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
92.75	0.00	93.28	1.05
92.76	0.00	93.29	1.08
92.77	0.00	93.30	1.12
92.78	0.00	93.31	1.15
92.79	0.01	93.32	1.19
92.80	0.01	93.33	1.22
92.81	0.01	93.34	1.26
92.82	0.02	93.35	1.30
92.83	0.03	93.36	1.33
92.84	0.04	93.37	1.37
92.85	0.04	93.38	1.41
92.86	0.05	93.39	1.45
92.87	0.06	93.40	1.48
92.88	0.07	93.41	1.52
92.89	0.09	93.42	1.56
92.90	0.10	93.43	1.60
92.91	0.11	93.44	1.63
92.92	0.12	93.45	1.67
92.93	0.14	93.46	1.71
92.94	0.15	93.47	1.75
92.95	0.17	93.48	1.79
92.96	0.19	93.49	1.83
92.97	0.20	93.50	1.86
92.98	0.22	93.51	1.90
92.99	0.24	93.52	1.94
93.00	0.26	93.53	1.98
93.01	0.28	93.54	2.01
93.02	0.30	93.55	2.05
93.03	0.32	93.56	2.09
93.04	0.35	93.57	2.13
93.05	0.37	93.58	2.16
93.06	0.39	93.59	2.20
93.07	0.42	93.60	2.23
93.08	0.44	93.61	2.27
93.09	0.47	93.62	2.30
93.10	0.49	93.63	2.34
93.11	0.52	93.64	2.37
93.12	0.55	93.65	2.40
93.13	0.57	93.66	2.44
93.14	0.60	93.67	2.47
93.15	0.63	93.68	2.50
93.16	0.66	93.69	2.53
93.17	0.69	93.70	2.56
93.18	0.72	93.71	2.58
93.19	0.75	93.72	2.61
93.20	0.78	93.73	2.63
93.21	0.81	93.74	2.66
93.22	0.85	93.75	**2.67**
93.23	0.88		
93.24	0.91		
93.25	0.95		
93.26	0.98		
93.27	1.01		

Stage-Area-Storage for Pond CB1: CB 1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
92.75	**0**	93.28	0
92.76	0	93.29	0
92.77	0	93.30	0
92.78	0	93.31	0
92.79	0	93.32	0
92.80	0	93.33	0
92.81	0	93.34	0
92.82	0	93.35	0
92.83	0	93.36	0
92.84	0	93.37	0
92.85	0	93.38	0
92.86	0	93.39	0
92.87	0	93.40	0
92.88	0	93.41	0
92.89	0	93.42	0
92.90	0	93.43	0
92.91	0	93.44	0
92.92	0	93.45	0
92.93	0	93.46	0
92.94	0	93.47	0
92.95	0	93.48	0
92.96	0	93.49	0
92.97	0	93.50	0
92.98	0	93.51	0
92.99	0	93.52	0
93.00	0	93.53	0
93.01	0	93.54	0
93.02	0	93.55	0
93.03	0	93.56	0
93.04	0	93.57	0
93.05	0	93.58	0
93.06	0	93.59	0
93.07	0	93.60	0
93.08	0	93.61	0
93.09	0	93.62	0
93.10	0	93.63	0
93.11	0	93.64	0
93.12	0	93.65	0
93.13	0	93.66	0
93.14	0	93.67	0
93.15	0	93.68	0
93.16	0	93.69	0
93.17	0	93.70	0
93.18	0	93.71	0
93.19	0	93.72	0
93.20	0	93.73	0
93.21	0	93.74	0
93.22	0	93.75	0
93.23	0		
93.24	0		
93.25	0		
93.26	0		
93.27	0		

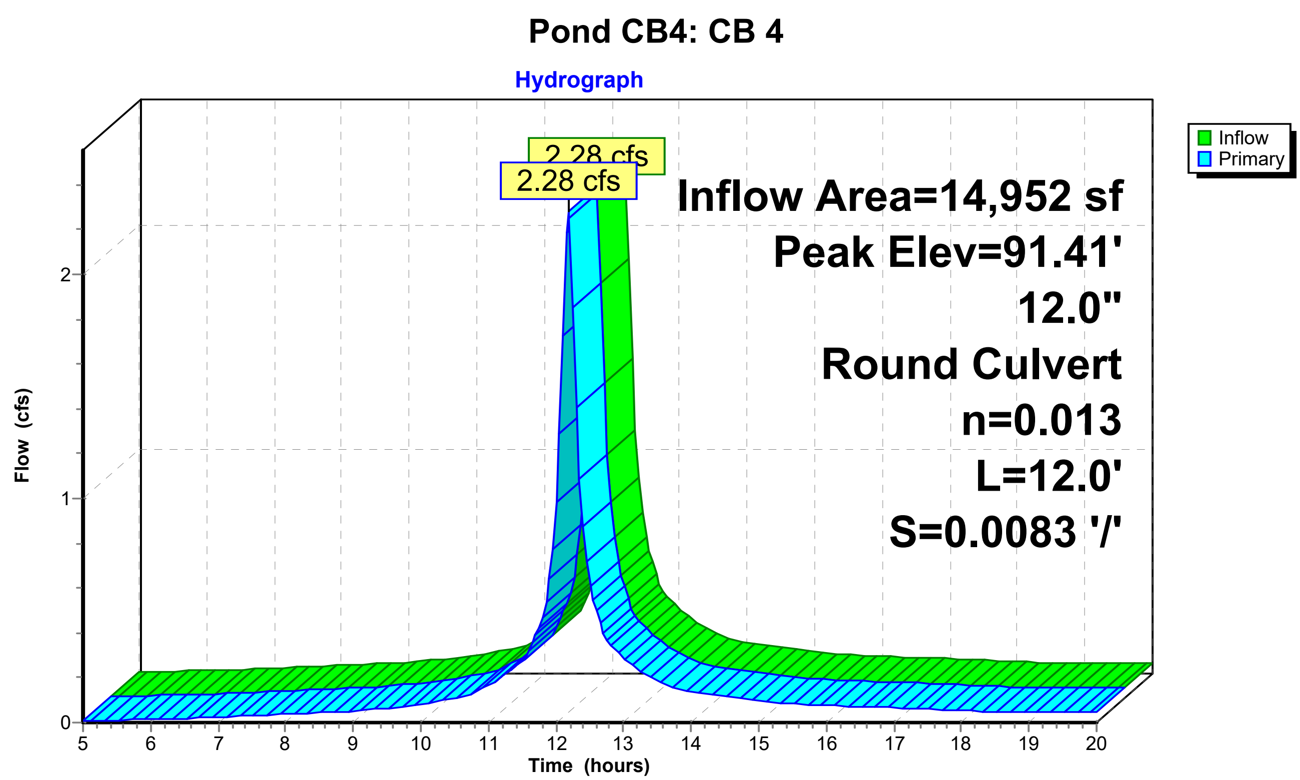
Summary for Pond CB4: CB 4

Inflow Area = 14,952 sf, 43.75% Impervious, Inflow Depth > 6.27" for 100-Year event
Inflow = 2.28 cfs @ 12.18 hrs, Volume= 7,815 cf
Outflow = 2.28 cfs @ 12.18 hrs, Volume= 7,815 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.28 cfs @ 12.18 hrs, Volume= 7,815 cf
Routed to Pond DMH2 : DMH2

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 91.41' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	90.10'	**12.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 90.10' / 90.00' S= 0.0083 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.85 cfs @ 12.18 hrs HW=91.33' TW=91.09' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.85 cfs @ 2.35 fps)



Stage-Discharge for Pond CB4: CB 4

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
90.10	0.00	90.63	0.80	91.16	2.43
90.11	0.00	90.64	0.83	91.17	2.46
90.12	0.00	90.65	0.86	91.18	2.49
90.13	0.00	90.66	0.88	91.19	2.52
90.14	0.01	90.67	0.91	91.20	2.55
90.15	0.01	90.68	0.94	91.21	2.57
90.16	0.01	90.69	0.97	91.22	2.60
90.17	0.02	90.70	0.99	91.23	2.63
90.18	0.02	90.71	1.02	91.24	2.66
90.19	0.03	90.72	1.05	91.25	2.69
90.20	0.03	90.73	1.08	91.26	2.71
90.21	0.04	90.74	1.11	91.27	2.74
90.22	0.05	90.75	1.14	91.28	2.77
90.23	0.06	90.76	1.17	91.29	2.79
90.24	0.07	90.77	1.20	91.30	2.82
90.25	0.08	90.78	1.23	91.31	2.84
90.26	0.09	90.79	1.26	91.32	2.87
90.27	0.10	90.80	1.29	91.33	2.89
90.28	0.11	90.81	1.32	91.34	2.91
90.29	0.12	90.82	1.35	91.35	2.93
90.30	0.13	90.83	1.38	91.36	2.95
90.31	0.15	90.84	1.41	91.37	2.97
90.32	0.16	90.85	1.44	91.38	2.99
90.33	0.18	90.86	1.47	91.39	3.00
90.34	0.19	90.87	1.50	91.40	**3.02**
90.35	0.21	90.88	1.54		
90.36	0.22	90.89	1.57		
90.37	0.24	90.90	1.60		
90.38	0.25	90.91	1.63		
90.39	0.27	90.92	1.66		
90.40	0.29	90.93	1.70		
90.41	0.31	90.94	1.73		
90.42	0.33	90.95	1.76		
90.43	0.34	90.96	1.79		
90.44	0.36	90.97	1.82		
90.45	0.38	90.98	1.86		
90.46	0.40	90.99	1.89		
90.47	0.42	91.00	1.92		
90.48	0.44	91.01	1.95		
90.49	0.47	91.02	1.98		
90.50	0.49	91.03	2.02		
90.51	0.51	91.04	2.05		
90.52	0.53	91.05	2.08		
90.53	0.56	91.06	2.11		
90.54	0.58	91.07	2.15		
90.55	0.60	91.08	2.18		
90.56	0.63	91.09	2.21		
90.57	0.65	91.10	2.24		
90.58	0.68	91.11	2.27		
90.59	0.70	91.12	2.30		
90.60	0.73	91.13	2.33		
90.61	0.75	91.14	2.36		
90.62	0.78	91.15	2.40		

Stage-Area-Storage for Pond CB4: CB 4

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
90.10	**0**	90.63	0	91.16	0
90.11	0	90.64	0	91.17	0
90.12	0	90.65	0	91.18	0
90.13	0	90.66	0	91.19	0
90.14	0	90.67	0	91.20	0
90.15	0	90.68	0	91.21	0
90.16	0	90.69	0	91.22	0
90.17	0	90.70	0	91.23	0
90.18	0	90.71	0	91.24	0
90.19	0	90.72	0	91.25	0
90.20	0	90.73	0	91.26	0
90.21	0	90.74	0	91.27	0
90.22	0	90.75	0	91.28	0
90.23	0	90.76	0	91.29	0
90.24	0	90.77	0	91.30	0
90.25	0	90.78	0	91.31	0
90.26	0	90.79	0	91.32	0
90.27	0	90.80	0	91.33	0
90.28	0	90.81	0	91.34	0
90.29	0	90.82	0	91.35	0
90.30	0	90.83	0	91.36	0
90.31	0	90.84	0	91.37	0
90.32	0	90.85	0	91.38	0
90.33	0	90.86	0	91.39	0
90.34	0	90.87	0	91.40	0
90.35	0	90.88	0		
90.36	0	90.89	0		
90.37	0	90.90	0		
90.38	0	90.91	0		
90.39	0	90.92	0		
90.40	0	90.93	0		
90.41	0	90.94	0		
90.42	0	90.95	0		
90.43	0	90.96	0		
90.44	0	90.97	0		
90.45	0	90.98	0		
90.46	0	90.99	0		
90.47	0	91.00	0		
90.48	0	91.01	0		
90.49	0	91.02	0		
90.50	0	91.03	0		
90.51	0	91.04	0		
90.52	0	91.05	0		
90.53	0	91.06	0		
90.54	0	91.07	0		
90.55	0	91.08	0		
90.56	0	91.09	0		
90.57	0	91.10	0		
90.58	0	91.11	0		
90.59	0	91.12	0		
90.60	0	91.13	0		
90.61	0	91.14	0		
90.62	0	91.15	0		

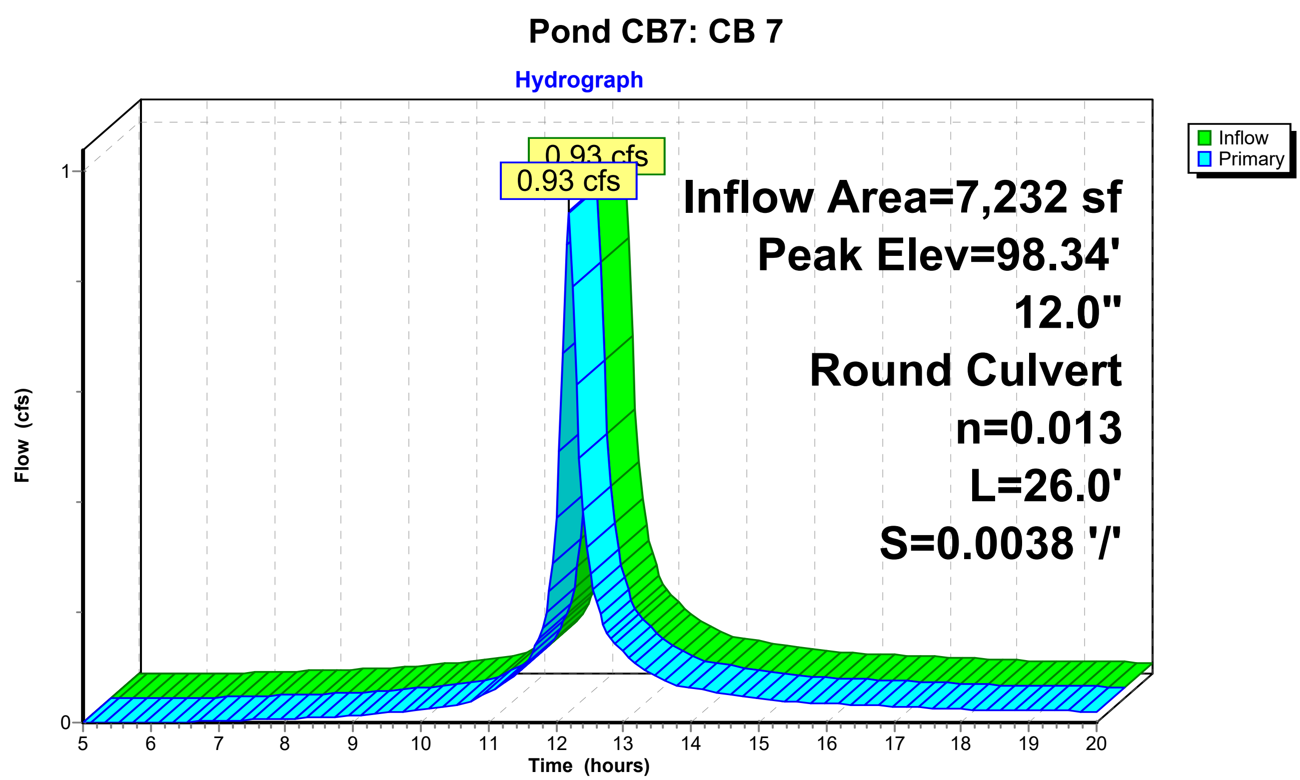
Summary for Pond CB7: CB 7

Inflow Area = 7,232 sf, 0.00% Impervious, Inflow Depth > 5.11" for 100-Year event
Inflow = 0.93 cfs @ 12.19 hrs, Volume= 3,077 cf
Outflow = 0.93 cfs @ 12.19 hrs, Volume= 3,077 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.93 cfs @ 12.19 hrs, Volume= 3,077 cf
Routed to Pond 1P : Subsurface #1

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.34' @ 12.27 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	96.60'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.60' / 96.50' S= 0.0038 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.19 hrs HW=98.14' TW=98.26' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)



Stage-Discharge for Pond CB7: CB 7

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
96.60	0.00	97.13	0.71	97.66	2.22	98.19	3.44
96.61	0.00	97.14	0.74	97.67	2.25	98.20	3.46
96.62	0.00	97.15	0.76	97.68	2.28	98.21	3.49
96.63	0.00	97.16	0.79	97.69	2.31	98.22	3.51
96.64	0.00	97.17	0.81	97.70	2.33	98.23	3.54
96.65	0.01	97.18	0.84	97.71	2.36	98.24	3.56
96.66	0.01	97.19	0.86	97.72	2.39	98.25	3.59
96.67	0.01	97.20	0.89	97.73	2.41	98.26	3.61
96.68	0.02	97.21	0.91	97.74	2.44	98.27	3.63
96.69	0.02	97.22	0.94	97.75	2.46	98.28	3.66
96.70	0.03	97.23	0.97	97.76	2.49	98.29	3.68
96.71	0.03	97.24	1.00	97.77	2.51	98.30	3.70
96.72	0.04	97.25	1.02	97.78	2.54	98.31	3.73
96.73	0.04	97.26	1.05	97.79	2.56	98.32	3.75
96.74	0.05	97.27	1.08	97.80	2.58	98.33	3.77
96.75	0.06	97.28	1.11	97.81	2.60	98.34	**3.80**
96.76	0.07	97.29	1.13	97.82	2.62		
96.77	0.08	97.30	1.16	97.83	2.64		
96.78	0.09	97.31	1.19	97.84	2.66		
96.79	0.10	97.32	1.22	97.85	2.68		
96.80	0.11	97.33	1.25	97.86	2.69		
96.81	0.12	97.34	1.28	97.87	2.71		
96.82	0.13	97.35	1.31	97.88	2.72		
96.83	0.14	97.36	1.34	97.89	2.73		
96.84	0.16	97.37	1.37	97.90	2.74		
96.85	0.17	97.38	1.40	97.91	2.75		
96.86	0.18	97.39	1.43	97.92	2.75		
96.87	0.20	97.40	1.45	97.93	2.74		
96.88	0.21	97.41	1.48	97.94	2.75		
96.89	0.23	97.42	1.51	97.95	2.78		
96.90	0.24	97.43	1.54	97.96	2.81		
96.91	0.26	97.44	1.57	97.97	2.84		
96.92	0.27	97.45	1.60	97.98	2.87		
96.93	0.29	97.46	1.63	97.99	2.90		
96.94	0.31	97.47	1.66	98.00	2.93		
96.95	0.33	97.48	1.69	98.01	2.96		
96.96	0.34	97.49	1.72	98.02	2.99		
96.97	0.36	97.50	1.75	98.03	3.01		
96.98	0.38	97.51	1.79	98.04	3.04		
96.99	0.40	97.52	1.82	98.05	3.07		
97.00	0.42	97.53	1.85	98.06	3.10		
97.01	0.44	97.54	1.88	98.07	3.13		
97.02	0.46	97.55	1.90	98.08	3.15		
97.03	0.48	97.56	1.93	98.09	3.18		
97.04	0.50	97.57	1.96	98.10	3.21		
97.05	0.53	97.58	1.99	98.11	3.23		
97.06	0.55	97.59	2.02	98.12	3.26		
97.07	0.57	97.60	2.05	98.13	3.29		
97.08	0.59	97.61	2.08	98.14	3.31		
97.09	0.62	97.62	2.11	98.15	3.34		
97.10	0.64	97.63	2.14	98.16	3.36		
97.11	0.66	97.64	2.17	98.17	3.39		
97.12	0.69	97.65	2.20	98.18	3.41		

Stage-Area-Storage for Pond CB7: CB 7

Elevation (feet)	Storage (cubic-feet)
96.60	**0**
96.62	0
96.64	0
96.66	0
96.68	0
96.70	0
96.72	0
96.74	0
96.76	0
96.78	0
96.80	0
96.82	0
96.84	0
96.86	0
96.88	0
96.90	0
96.92	0
96.94	0
96.96	0
96.98	0
97.00	0
97.02	0
97.04	0
97.06	0
97.08	0
97.10	0
97.12	0
97.14	0
97.16	0
97.18	0
97.20	0
97.22	0
97.24	0
97.26	0
97.28	0
97.30	0
97.32	0
97.34	0
97.36	0
97.38	0
97.40	0
97.42	0
97.44	0
97.46	0
97.48	0
97.50	0
97.52	0
97.54	0
97.56	0
97.58	0
97.60	0
97.62	0
97.64	0
97.66	0
97.68	0
97.70	0
97.72	0
97.74	0
97.76	0
97.78	0
97.80	0
97.82	0
97.84	0
97.86	0
97.88	0
97.90	0
97.92	0
97.94	0
97.96	0
97.98	0
98.00	0
98.02	0
98.04	0
98.06	0
98.08	0
98.10	0
98.12	0
98.14	0
98.16	0
98.18	0
98.20	0
98.22	0
98.24	0
98.26	0
98.28	0
98.30	0
98.32	0
98.34	0

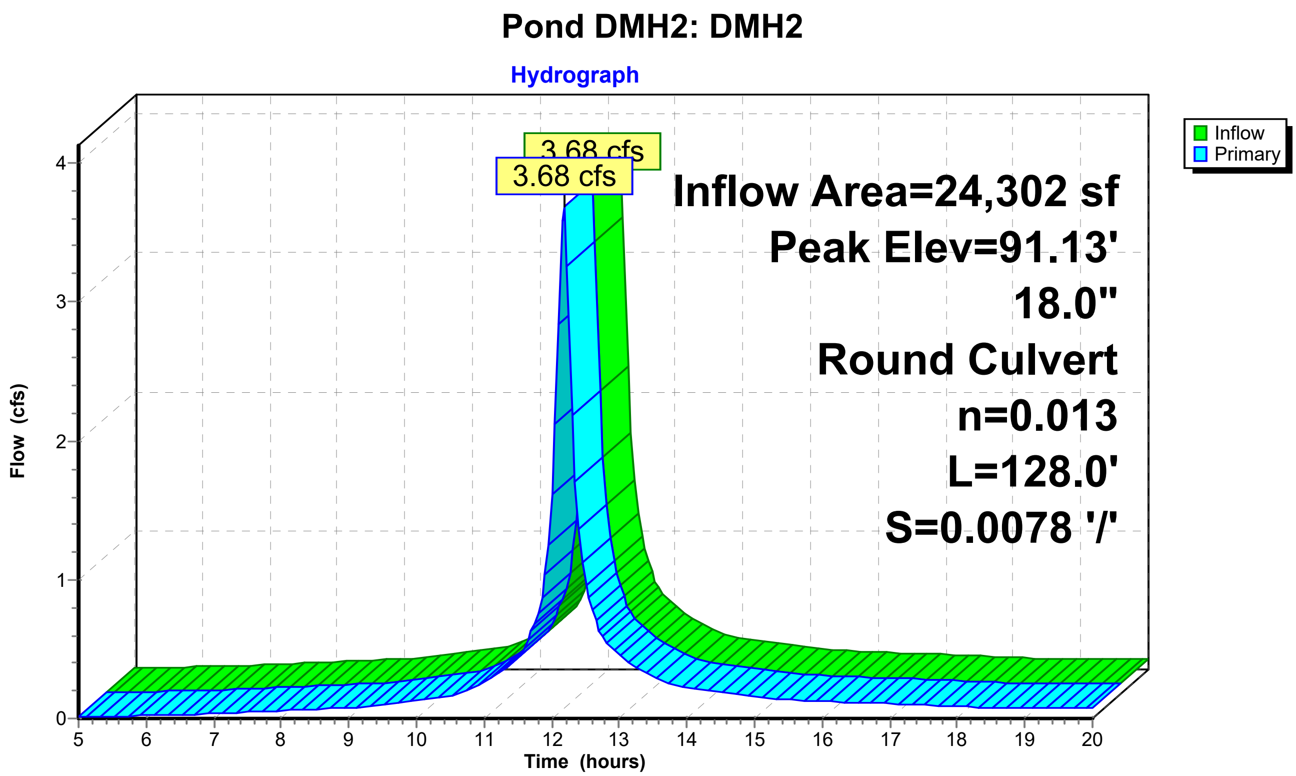
Summary for Pond DMH2: DMH2

Inflow Area = 24,302 sf, 38.93% Impervious, Inflow Depth > 6.14" for 100-Year event
Inflow = 3.68 cfs @ 12.18 hrs, Volume= 12,437 cf
Outflow = 3.68 cfs @ 12.18 hrs, Volume= 12,437 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.68 cfs @ 12.18 hrs, Volume= 12,437 cf
Routed to Pond IB1 : Infiltration Basin #1 (Exfiltration Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 91.13' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	**18.0" Round Culvert** L= 128.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 90.00' / 89.00' S= 0.0078 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=3.00 cfs @ 12.18 hrs HW=91.08' TW=90.55' (Dynamic Tailwater)
1=Culvert (Outlet Controls 3.00 cfs @ 3.06 fps)



Stage-Discharge for Pond DMH2: DMH2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
90.00	0.00	90.53	1.31	91.06	4.44
90.01	0.00	90.54	1.36	91.07	4.51
90.02	0.00	90.55	1.41	91.08	4.58
90.03	0.00	90.56	1.45	91.09	4.65
90.04	0.01	90.57	1.50	91.10	4.71
90.05	0.01	90.58	1.55	91.11	4.78
90.06	0.01	90.59	1.60	91.12	4.85
90.07	0.02	90.60	1.65	91.13	4.91
90.08	0.03	90.61	1.70	91.14	4.98
90.09	0.04	90.62	1.76	91.15	5.05
90.10	0.04	90.63	1.81	91.16	5.12
90.11	0.05	90.64	1.86	91.17	5.18
90.12	0.06	90.65	1.92	91.18	5.25
90.13	0.08	90.66	1.97	91.19	5.32
90.14	0.09	90.67	2.02	91.20	5.39
90.15	0.10	90.68	2.08	91.21	5.45
90.16	0.12	90.69	2.13	91.22	5.52
90.17	0.13	90.70	2.19	91.23	5.59
90.18	0.15	90.71	2.25	91.24	5.66
90.19	0.17	90.72	2.30	91.25	5.72
90.20	0.19	90.73	2.36	91.26	5.79
90.21	0.21	90.74	2.42	91.27	5.86
90.22	0.23	90.75	2.48	91.28	5.93
90.23	0.25	90.76	2.54	91.29	5.99
90.24	0.27	90.77	2.59	91.30	6.06
90.25	0.30	90.78	2.65	91.31	6.12
90.26	0.32	90.79	2.71	91.32	6.19
90.27	0.35	90.80	2.77	91.33	6.26
90.28	0.38	90.81	2.83	91.34	6.32
90.29	0.40	90.82	2.90	91.35	6.39
90.30	0.43	90.83	2.96	91.36	6.45
90.31	0.46	90.84	3.02	91.37	6.52
90.32	0.49	90.85	3.08	91.38	6.58
90.33	0.52	90.86	3.14	91.39	6.65
90.34	0.55	90.87	3.21	91.40	6.71
90.35	0.59	90.88	3.27	91.41	6.78
90.36	0.62	90.89	3.33	91.42	6.84
90.37	0.66	90.90	3.40	91.43	6.91
90.38	0.69	90.91	3.46	91.44	6.97
90.39	0.73	90.92	3.52	91.45	7.03
90.40	0.76	90.93	3.59	91.46	7.09
90.41	0.80	90.94	3.65	91.47	7.16
90.42	0.84	90.95	3.72	91.48	7.22
90.43	0.88	90.96	3.78	91.49	7.28
90.44	0.92	90.97	3.85	91.50	**7.34**
90.45	0.96	90.98	3.91		
90.46	1.00	90.99	3.98		
90.47	1.04	91.00	4.05		
90.48	1.09	91.01	4.11		
90.49	1.13	91.02	4.18		
90.50	1.17	91.03	4.24		
90.51	1.22	91.04	4.31		
90.52	1.27	91.05	4.38		

Stage-Area-Storage for Pond DMH2: DMH2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
90.00	**0**	90.53	0	91.06	0
90.01	0	90.54	0	91.07	0
90.02	0	90.55	0	91.08	0
90.03	0	90.56	0	91.09	0
90.04	0	90.57	0	91.10	0
90.05	0	90.58	0	91.11	0
90.06	0	90.59	0	91.12	0
90.07	0	90.60	0	91.13	0
90.08	0	90.61	0	91.14	0
90.09	0	90.62	0	91.15	0
90.10	0	90.63	0	91.16	0
90.11	0	90.64	0	91.17	0
90.12	0	90.65	0	91.18	0
90.13	0	90.66	0	91.19	0
90.14	0	90.67	0	91.20	0
90.15	0	90.68	0	91.21	0
90.16	0	90.69	0	91.22	0
90.17	0	90.70	0	91.23	0
90.18	0	90.71	0	91.24	0
90.19	0	90.72	0	91.25	0
90.20	0	90.73	0	91.26	0
90.21	0	90.74	0	91.27	0
90.22	0	90.75	0	91.28	0
90.23	0	90.76	0	91.29	0
90.24	0	90.77	0	91.30	0
90.25	0	90.78	0	91.31	0
90.26	0	90.79	0	91.32	0
90.27	0	90.80	0	91.33	0
90.28	0	90.81	0	91.34	0
90.29	0	90.82	0	91.35	0
90.30	0	90.83	0	91.36	0
90.31	0	90.84	0	91.37	0
90.32	0	90.85	0	91.38	0
90.33	0	90.86	0	91.39	0
90.34	0	90.87	0	91.40	0
90.35	0	90.88	0	91.41	0
90.36	0	90.89	0	91.42	0
90.37	0	90.90	0	91.43	0
90.38	0	90.91	0	91.44	0
90.39	0	90.92	0	91.45	0
90.40	0	90.93	0	91.46	0
90.41	0	90.94	0	91.47	0
90.42	0	90.95	0	91.48	0
90.43	0	90.96	0	91.49	0
90.44	0	90.97	0	91.50	0
90.45	0	90.98	0		
90.46	0	90.99	0		
90.47	0	91.00	0		
90.48	0	91.01	0		
90.49	0	91.02	0		
90.50	0	91.03	0		
90.51	0	91.04	0		
90.52	0	91.05	0		

Summary for Pond IB1: Infiltration Basin #1 (Exfiltration Zone)

Inflow Area = 54,661 sf, 51.78% Impervious, Inflow Depth > 6.44" for 100-Year event
Inflow = 8.93 cfs @ 12.15 hrs, Volume= 29,357 cf
Outflow = 7.90 cfs @ 12.15 hrs, Volume= 28,615 cf, Atten= 12%, Lag= 0.0 min
Discarded = 0.02 cfs @ 5.20 hrs, Volume= 940 cf
Primary = 7.88 cfs @ 12.15 hrs, Volume= 27,676 cf
Routed to Pond 10P : Infiltration Basin #1 (Storage)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.91' @ 12.32 hrs Surf.Area= 736 sf Storage= 2,140 cf

Plug-Flow detention time= 22.9 min calculated for 28,612 cf (97% of inflow)
Center-of-Mass det. time= 12.2 min (768.3 - 756.0)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	2,944 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

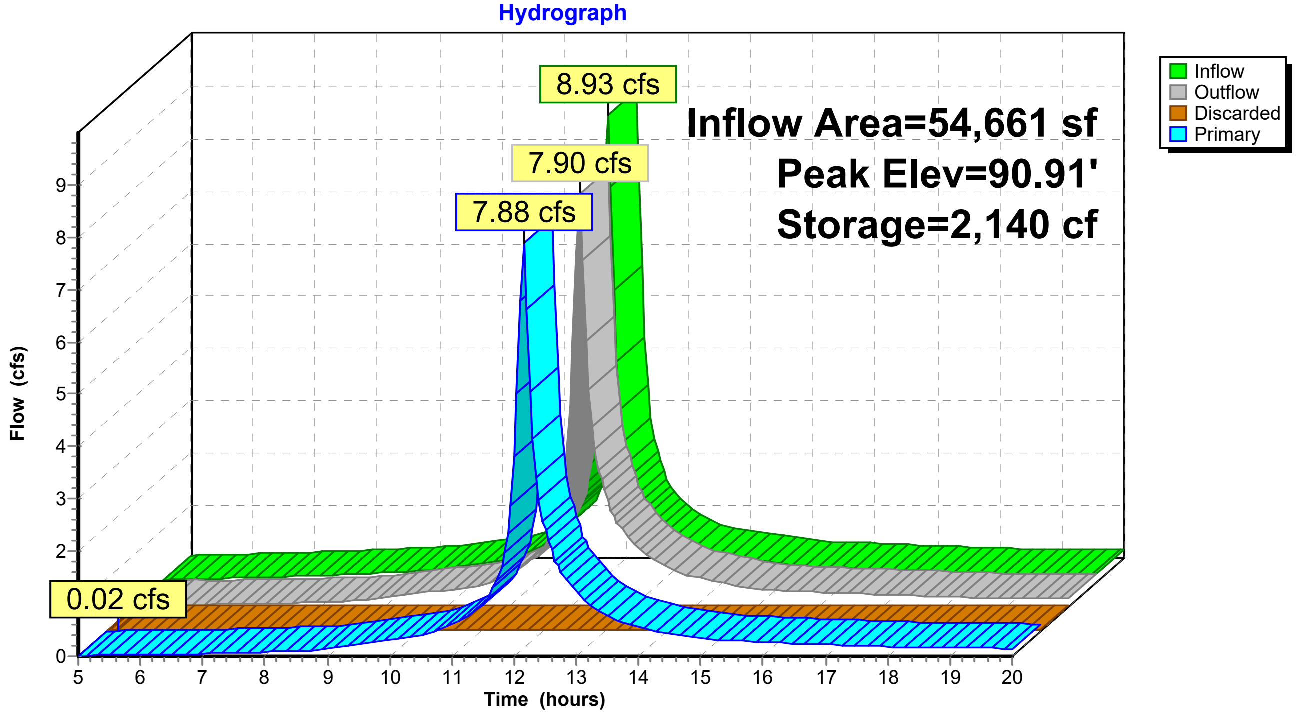
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	736	0	0
92.00	736	2,944	2,944

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.00'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	88.00'	**48.0" Round Culvert** L= 2.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 88.00' / 88.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 12.57 sf

Discarded OutFlow Max=0.02 cfs @ 5.20 hrs HW=88.04' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 12.15 hrs HW=90.41' TW=90.62' (Dynamic Tailwater)
└─**2=Culvert** (Controls 0.00 cfs)

Pond IB1: Infiltration Basin #1 (Exfiltration Zone)



Stage-Discharge for Pond IB1: Infiltration Basin #1 (Exfiltration Zone)

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
88.00	0.00	**0.00**	0.00
88.05	0.03	**0.02**	0.01
88.10	0.07	0.02	0.05
88.15	0.13	0.02	0.11
88.20	0.23	0.02	0.21
88.25	0.35	0.02	0.33
88.30	0.50	0.02	0.48
88.35	0.68	0.02	0.66
88.40	0.88	0.02	0.86
88.45	1.11	0.02	1.09
88.50	1.37	0.02	1.35
88.55	1.65	0.02	1.63
88.60	1.96	0.02	1.94
88.65	2.29	0.02	2.27
88.70	2.65	0.02	2.63
88.75	3.03	0.02	3.01
88.80	3.44	0.02	3.42
88.85	3.87	0.02	3.85
88.90	4.33	0.02	4.31
88.95	4.81	0.02	4.79
89.00	5.31	0.02	5.29
89.05	5.84	0.02	5.82
89.10	6.39	0.02	6.37
89.15	6.96	0.02	6.94
89.20	7.56	0.02	7.54
89.25	8.17	0.02	8.16
89.30	8.81	0.02	8.79
89.35	9.47	0.02	9.45
89.40	10.15	0.02	10.14
89.45	10.86	0.02	10.84
89.50	11.58	0.02	11.56
89.55	12.32	0.02	12.30
89.60	13.09	0.02	13.07
89.65	13.87	0.02	13.85
89.70	14.67	0.02	14.65
89.75	15.49	0.02	15.48
89.80	16.33	0.02	16.32
89.85	17.19	0.02	17.17
89.90	18.07	0.02	18.05
89.95	18.96	0.02	18.94
90.00	19.87	0.02	19.86
90.05	20.80	0.02	20.79
90.10	21.75	0.02	21.73
90.15	22.71	0.02	22.69
90.20	23.69	0.02	23.67
90.25	24.68	0.02	24.66
90.30	25.69	0.02	25.67
90.35	26.71	0.02	26.70
90.40	27.75	0.02	27.74
90.45	28.81	0.02	28.79
90.50	29.87	0.02	29.86
90.55	30.95	0.02	30.93
90.60	32.05	0.02	32.03
90.65	33.15	0.02	33.13
90.70	34.27	0.02	34.25
90.75	35.40	0.02	35.38
90.80	36.54	0.02	36.52
90.85	37.69	0.02	37.67
90.90	38.85	0.02	38.84
90.95	40.03	0.02	40.01
91.00	41.21	0.02	41.19
91.05	42.40	0.02	42.38
91.10	43.60	0.02	43.58
91.15	44.81	0.02	44.79
91.20	46.02	0.02	46.01
91.25	47.25	0.02	47.23
91.30	48.48	0.02	48.46
91.35	49.71	0.02	49.69
91.40	50.95	0.02	50.94
91.45	52.20	0.02	52.18
91.50	53.45	0.02	53.44
91.55	54.71	0.02	54.69
91.60	55.97	0.02	55.95
91.65	57.23	0.02	57.21
91.70	58.49	0.02	58.48
91.75	59.76	0.02	59.74
91.80	61.03	0.02	61.01
91.85	62.29	0.02	62.28
91.90	63.56	0.02	63.54
91.95	64.83	0.02	64.81
92.00	**66.09**	0.02	**66.07**

Stage-Area-Storage for Pond IB1: Infiltration Basin #1 (Exfiltration Zone)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
88.00	**736**	0	90.65	736	1,950
88.05	736	37	90.70	736	1,987
88.10	736	74	90.75	736	2,024
88.15	736	110	90.80	736	2,061
88.20	736	147	90.85	736	2,098
88.25	736	184	90.90	736	2,134
88.30	736	221	90.95	736	2,171
88.35	736	258	91.00	736	2,208
88.40	736	294	91.05	736	2,245
88.45	736	331	91.10	736	2,282
88.50	736	368	91.15	736	2,318
88.55	736	405	91.20	736	2,355
88.60	736	442	91.25	736	2,392
88.65	736	478	91.30	736	2,429
88.70	736	515	91.35	736	2,466
88.75	736	552	91.40	736	2,502
88.80	736	589	91.45	736	2,539
88.85	736	626	91.50	736	2,576
88.90	736	662	91.55	736	2,613
88.95	736	699	91.60	736	2,650
89.00	736	736	91.65	736	2,686
89.05	736	773	91.70	736	2,723
89.10	736	810	91.75	736	2,760
89.15	736	846	91.80	736	2,797
89.20	736	883	91.85	736	2,834
89.25	736	920	91.90	736	2,870
89.30	736	957	91.95	736	2,907
89.35	736	994	92.00	736	**2,944**
89.40	736	1,030			
89.45	736	1,067			
89.50	736	1,104			
89.55	736	1,141			
89.60	736	1,178			
89.65	736	1,214			
89.70	736	1,251			
89.75	736	1,288			
89.80	736	1,325			
89.85	736	1,362			
89.90	736	1,398			
89.95	736	1,435			
90.00	736	1,472			
90.05	736	1,509			
90.10	736	1,546			
90.15	736	1,582			
90.20	736	1,619			
90.25	736	1,656			
90.30	736	1,693			
90.35	736	1,730			
90.40	736	1,766			
90.45	736	1,803			
90.50	736	1,840			
90.55	736	1,877			
90.60	736	1,914			

Summary for Pond IB2: Infiltration Basin #2 (Exfiltration Zone)

Inflow Area = 13,032 sf, 17.40% Impervious, Inflow Depth > 5.57" for 100-Year event
Inflow = 1.73 cfs @ 12.20 hrs, Volume= 6,054 cf
Outflow = 1.60 cfs @ 12.21 hrs, Volume= 5,874 cf, Atten= 7%, Lag= 0.7 min
Discarded = 0.01 cfs @ 7.30 hrs, Volume= 500 cf
Primary = 1.59 cfs @ 12.21 hrs, Volume= 5,374 cf
Routed to Pond B2 : Infiltration Basin #2 (Storage Zone)

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.99' @ 12.29 hrs Surf.Area= 424 sf Storage= 378 cf

Plug-Flow detention time= 21.3 min calculated for 5,874 cf (97% of inflow)
Center-of-Mass det. time= 9.4 min (786.8 - 777.3)

Volume	Invert	Avail.Storage	Storage Description
#1	97.10'	382 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

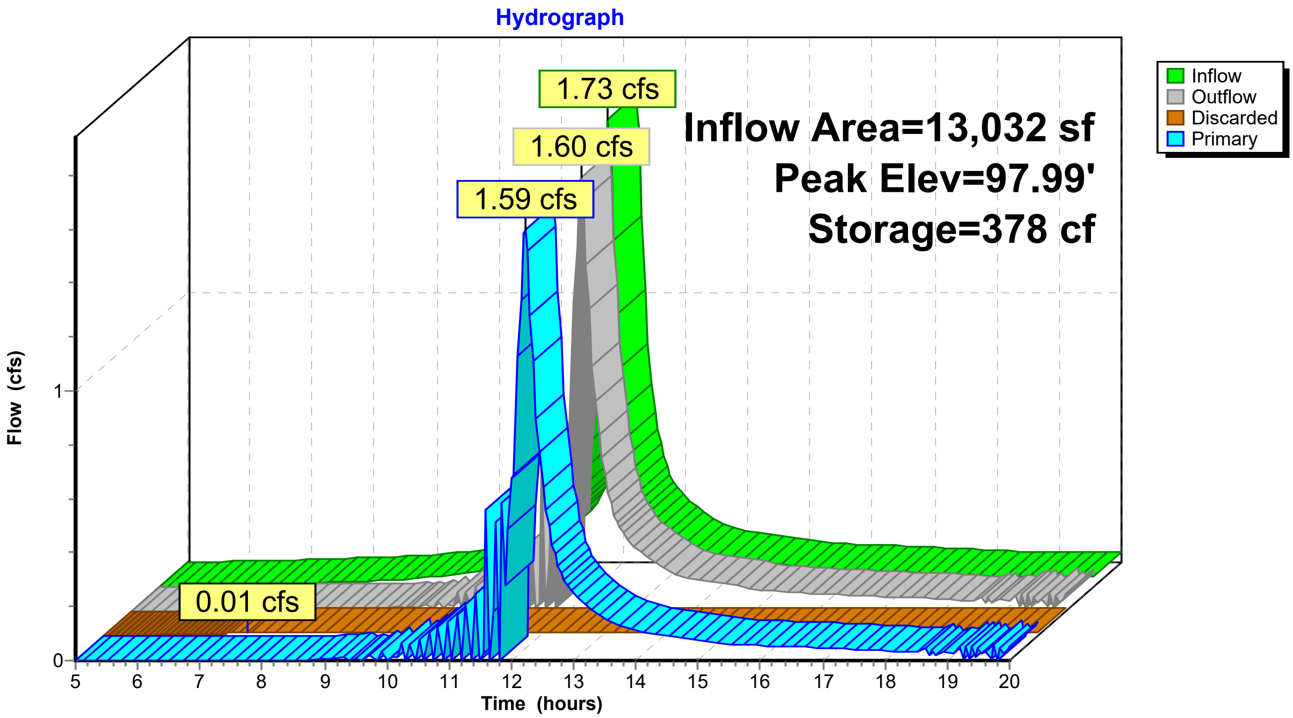
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.10	424	0	0
98.00	424	382	382

Device	Routing	Invert	Outlet Devices
#1	Discarded	97.10'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	97.10'	**36.0" Round Culvert** L= 2.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 97.10' / 97.10' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf

Discarded OutFlow Max=0.01 cfs @ 7.30 hrs HW=97.11' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.44 cfs @ 12.21 hrs HW=97.95' TW=97.94' (Dynamic Tailwater)
2=Culvert (Outlet Controls 0.44 cfs @ 0.41 fps)

Pond IB2: Infiltration Basin #2 (Exfiltration Zone)



Stage-Discharge for Pond IB2: Infiltration Basin #2 (Exfiltration Zone)

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
97.10	0.00	**0.00**	0.00
97.15	0.02	**0.01**	0.01
97.20	0.05	0.01	0.04
97.25	0.11	0.01	0.10
97.30	0.19	0.01	0.18
97.35	0.30	0.01	0.29
97.40	0.42	0.01	0.41
97.45	0.58	0.01	0.57
97.50	0.75	0.01	0.74
97.55	0.95	0.01	0.94
97.60	1.17	0.01	1.16
97.65	1.41	0.01	1.40
97.70	1.67	0.01	1.66
97.75	1.95	0.01	1.94
97.80	2.25	0.01	2.24
97.85	2.58	0.01	2.57
97.90	2.92	0.01	2.91
97.95	3.29	0.01	3.28
98.00	3.67	0.01	3.66
98.05	4.07	0.01	4.06
98.10	4.49	0.01	4.48
98.15	4.93	0.01	4.92
98.20	5.39	0.01	5.38
98.25	5.87	0.01	5.86
98.30	6.36	0.01	6.35
98.35	6.87	0.01	6.86
98.40	7.40	0.01	7.39
98.45	7.94	0.01	7.93
98.50	8.50	0.01	8.49
98.55	9.07	0.01	9.06
98.60	9.66	0.01	9.65
98.65	10.27	0.01	10.26
98.70	10.89	0.01	10.88
98.75	11.52	0.01	11.51
98.80	12.17	0.01	12.16
98.85	12.83	0.01	12.82
98.90	13.50	0.01	13.49
98.95	14.18	0.01	14.17
99.00	14.88	0.01	14.87
99.05	15.59	0.01	15.58
99.10	16.31	0.01	16.30
99.15	17.04	0.01	17.03
99.20	17.77	0.01	17.76
99.25	18.52	0.01	18.51
99.30	19.28	0.01	19.27
99.35	20.05	0.01	20.04
99.40	20.82	0.01	20.81
99.45	21.60	0.01	21.59
99.50	22.39	0.01	22.38
99.55	23.19	0.01	23.18
99.60	23.99	0.01	23.98
99.65	24.79	0.01	24.78
99.70	25.60	0.01	25.59
99.75	26.42	0.01	26.41
99.80	27.23	0.01	27.22
99.85	28.05	0.01	28.04
99.90	28.87	0.01	28.86
99.95	29.69	0.01	29.68
100.00	30.52	0.01	30.51
100.05	31.34	0.01	31.33
100.10	**32.16**	0.01	**32.15**

Stage-Area-Storage for Pond IB2: Infiltration Basin #2 (Exfiltration Zone)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
97.10	**424**	0
97.15	424	21
97.20	424	42
97.25	424	64
97.30	424	85
97.35	424	106
97.40	424	127
97.45	424	148
97.50	424	170
97.55	424	191
97.60	424	212
97.65	424	233
97.70	424	254
97.75	424	276
97.80	424	297
97.85	424	318
97.90	424	339
97.95	424	360
98.00	424	**382**
98.05	424	382
98.10	424	382
98.15	424	382
98.20	424	382
98.25	424	382
98.30	424	382
98.35	424	382
98.40	424	382
98.45	424	382
98.50	424	382
98.55	424	382
98.60	424	382
98.65	424	382
98.70	424	382
98.75	424	382
98.80	424	382
98.85	424	382
98.90	424	382
98.95	424	382
99.00	424	382
99.05	424	382
99.10	424	382
99.15	424	382
99.20	424	382
99.25	424	382
99.30	424	382
99.35	424	382
99.40	424	382
99.45	424	382
99.50	424	382
99.55	424	382
99.60	424	382
99.65	424	382
99.70	424	382
99.75	424	382
99.80	424	382
99.85	424	382
99.90	424	382
99.95	424	382
100.00	424	382
100.05	424	382
100.10	424	382

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 10P: Infiltration Basin #1 (Storage) Peak Elev=91.50' Storage=6,672 cf Inflow=8.59 cfs 26,142 cf
Outflow=6.96 cfs 21,087 cf

Pond B2: Infiltration Basin #2 (Storage Zone) Peak Elev=98.16' Storage=329 cf Inflow=1.68 cfs 5,171 cf
Outflow=1.75 cfs 4,846 cf

Summary for Pond 10P: Infiltration Basin #1 (Storage)

Inflow Area = 54,661 sf, 51.78% Impervious, Inflow Depth > 5.74" for 100-Year event
Inflow = 8.59 cfs @ 12.15 hrs, Volume= 26,142 cf
Outflow = 6.96 cfs @ 12.21 hrs, Volume= 21,087 cf, Atten= 19%, Lag= 3.5 min
Primary = 6.96 cfs @ 12.21 hrs, Volume= 21,087 cf
Routed to Reach DP1PST : DP 1 - POST

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 91.50' @ 12.21 hrs Surf.Area= 3,734 sf Storage= 6,672 cf

Plug-Flow detention time= 89.2 min calculated for 21,017 cf (80% of inflow)
Center-of-Mass det. time= 38.1 min (809.3 - 771.3)

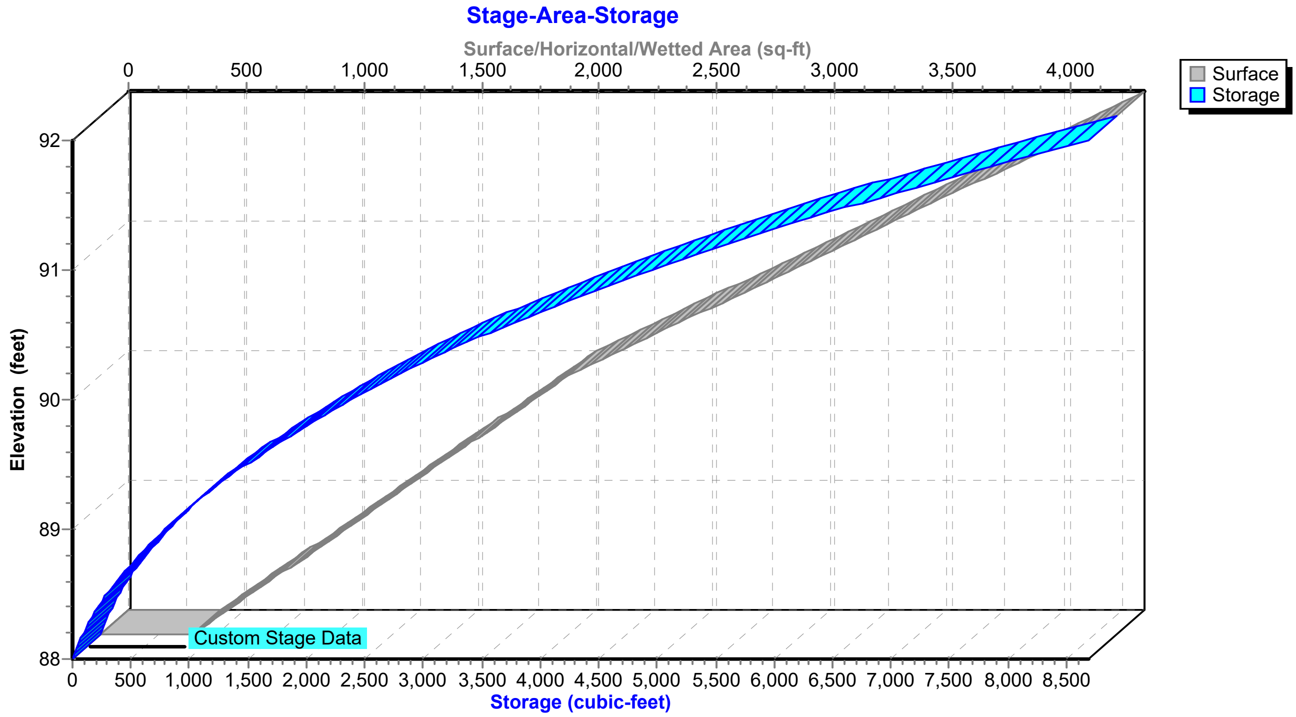
Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	8,689 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	392	0	0
90.00	1,990	2,382	2,382
92.00	4,317	6,307	8,689

Device	Routing	Invert	Outlet Devices
#1	Primary	87.50'	**12.0" Round Culvert** L= 37.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 87.50' / 87.25' S= 0.0068 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	91.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 in 24.0" x 24.0" Grate (100% open area) Limited to weir flow at low heads

Primary OutFlow Max=6.96 cfs @ 12.21 hrs HW=91.49' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 6.96 cfs @ 8.86 fps)
└─**2=Orifice/Grate** (Passes 6.96 cfs of 9.09 cfs potential flow)

Pond 10P: Infiltration Basin #1 (Storage)



Summary for Pond B2: Infiltration Basin #2 (Storage Zone)

Inflow Area = 13,032 sf, 17.40% Impervious, Inflow Depth > 4.76" for 100-Year event
Inflow = 1.68 cfs @ 12.20 hrs, Volume= 5,171 cf
Outflow = 1.75 cfs @ 12.20 hrs, Volume= 4,846 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.75 cfs @ 12.20 hrs, Volume= 4,846 cf
Routed to Reach 5R : Wetland Surface 2

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.16' @ 12.20 hrs Surf.Area= 731 sf Storage= 329 cf

Plug-Flow detention time= 31.5 min calculated for 4,830 cf (93% of inflow)
Center-of-Mass det. time= 9.9 min (798.6 - 788.7)

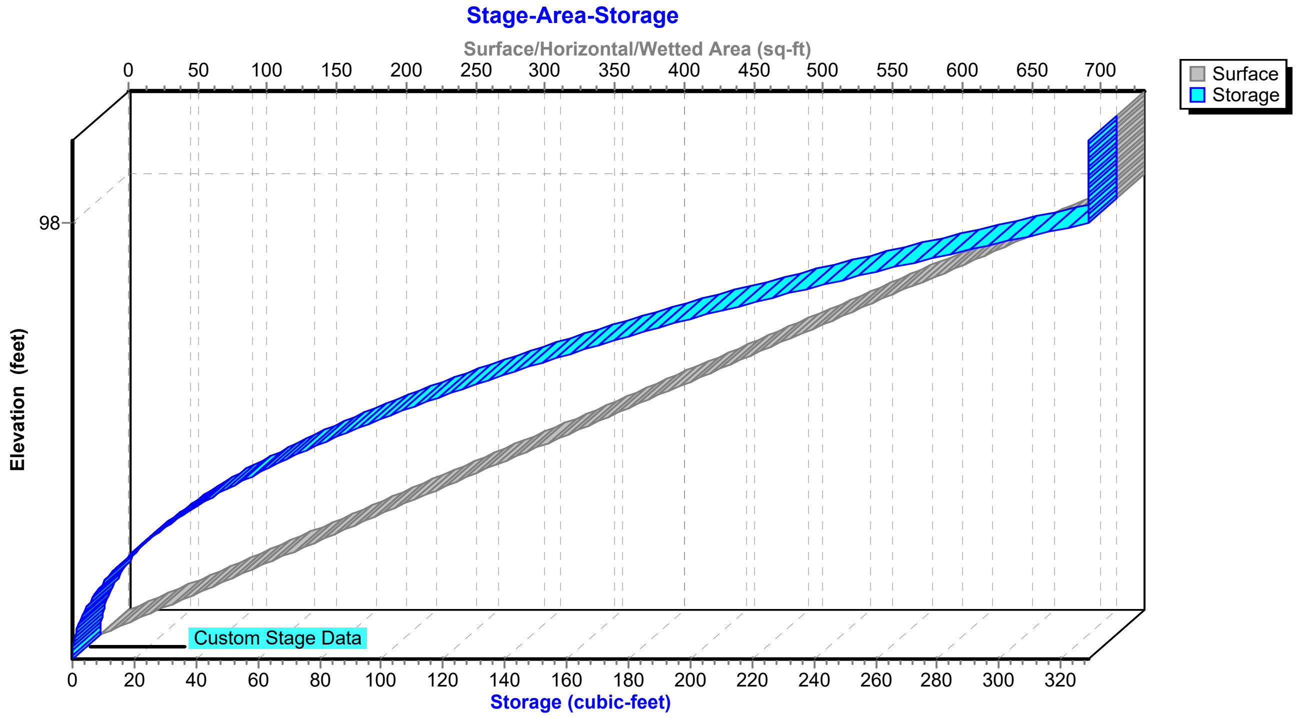
Volume	Invert	Avail.Storage	Storage Description
#1	97.10'	329 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.10	0	0	0
98.00	731	329	329

Device	Routing	Invert	Outlet Devices
#1	Primary	96.25'	**12.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 96.25' / 96.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	98.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 in 24.0" x 24.0" Grate (100% open area) Limited to weir flow at low heads

Primary OutFlow Max=1.74 cfs @ 12.20 hrs HW=98.16' TW=96.17' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.74 cfs of 3.88 cfs potential flow)
  └─**2=Orifice/Grate** (Weir Controls 1.74 cfs @ 1.33 fps)

Pond B2: Infiltration Basin #2 (Storage Zone)



Section II
Stormwater Management

♦ STANDARD #1 No New Stormwater Conveyances

The proposed development proposes no new stormwater conveyances that discharge untreated stormwater off-site or cause down gradient erosion.

♦ STANDARD #2 Post Development Peak Discharge

The overall site analysis demonstrates that the stormwater management system has been designed so that the post-development peak discharge rates do not exceed the pre-development discharge rate for the 2 yr, 10 yr, 25yr & 100 yr 24 hr storm events.

♦ STANDARD #3 RECHARGE TO GROUNDWATER

Total impervious areas:

Pavement = 18,006 SF
Roof = 19,263 SF
Soil group = C

37,269 SF * 0.25 *1' / 12" = 776.4 CF

Proposed infiltration (Basin #1) = 1,338 CF
Proposed infiltration (Basin #2) = 235 CF
Proposed infiltration (Subsurface #1) = 742 CF
Proposed infiltration (Total) = 2,315 CF

<u>Drawdown Within 72 Hours</u>

$$Time_{drawdown} = \frac{Rv}{(K)(Bottom\ Area)}$$

Where:
Rv = Storage Volume (required recharge volume)
K = Saturated Hydraulic Conductivity For "Static" and "Simple Dynamic" Methods, use Rawls Rate (see Table 2.3.3). For "Dynamic Field" Method, use 50% of the in-situ saturated hydraulic conductivity.
Bottom Area = Bottom Area of Recharge Structure

Infiltration Basin #1
Storage Volume = 1,338 CF stored below outlet

$$\text{Time} = \frac{1{,}338\text{ CF}}{(1.02")(1'/12")(736\text{ SF})} = 21.4\text{ hours} < 72\text{ hours}$$

Infiltration Basin #2
Storage Volume = 235 CF stored below outlet

$$\text{Time} = \frac{235\text{ CF}}{(1.02")(1'/12")(424\text{ SF})} = 6.5\text{ hours} < 72\text{ hours}$$

Subsurface Basin
Storage Volume = 742 CF stored below outlet

$$\text{Time} = \frac{742\text{ CF}}{(1.02")(1'/12")(1{,}275\text{ SF})} = 6.8\text{ hours} < 72\text{ hours}$$

- **STANDARD #4 WATER QUALITY**

Total impervious areas:

Pavement = 18,006 SF

Roof = 19,263 SF

Total impervious area = 37,269 SF

0.5" * 36,269 SF 1' / 12" = 1,512 CF

Proposed water quality volume (Basin #1) = 1,338 CF
Proposed water quality volume (Basin #2) = 235 CF
Proposed water quality volume (Subsurface #1) = 742 CF
Proposed water quality volume (Total) = 2,315 CF

- **STANDARD #5 Land Uses With Higher Potential Pollutant Loads**

This site will not produce a higher potential pollutant load.

- **STANDARD #6 Critical Areas**

The site is not located within a Zone I or Zone II Area.

- **STANDARD #7 Redevelopment**

The project is not a redevelopment.

- **STANDARD #8 Erosion & Sediment Control Plan**

Erosion and sediment controls are detailed within the plan.

- **STANDARD #9 Operation & Maintenance Plan**

See O&M plan attached hereto.

- **STANDARD #10 Illicit Discharge Statement**

"All illicit discharges to the stormwater management system are prohibited."

This statement is intended to meet Standard #10 of the Stormwater Management requirements

Illicit discharges to the stormwater management system are discharges that are not entirely comprised of stormwater.

Except for the potential for deliberate criminal act of discharge by an unauthorized entity for which the property owner has no control, there are to be no illicit discharges into the stormwater system.

____
Applicant\Owner

D	1.00	ft	(Diameter)	
Q	4.74	cfs	(Flow (100 yr))	
TW	0.40	ft	(0.4*Diameter)	
g	32.20	ft/s2	(Gravity)	
D50	0.39	FT	(Ave rip rap size)	Use 1/2" min. crushed stone
Length	3.00	ft	(6 * Culvert Rise)	
depth	0.87	ft	(D50 * 2.2)	

Several relationships have been proposed for riprap sizing for culvert aprons and several of these are discussed in greater detail in Appendix D. The independent variables in these relationships include one or more of the following variables: outlet velocity, rock specific gravity, pipe dimension (e.g. diameter), outlet Froude number, and tailwater. The following equation (Fletcher and Grace, 1972) is recommended for circular culverts:

$$D_{50} = 0.2\,D\left(\frac{Q}{\sqrt{g}D^{2.5}}\right)^{4/3}\left(\frac{D}{TW}\right) \tag{10.4}$$

where,

D_{50} = riprap size, m (ft)
Q = design discharge, m^3/s (ft^3/s)
D = culvert diameter (circular), m (ft)
TW = tailwater depth, m (ft)
g = acceleration due to gravity, 9.81 m/s^2 (32.2 ft/s^2)

Infiltration Basin #1

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

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

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

Input Values		
0.5400	***R***	**Recharge (infiltration) rate (feet/day)**
0.210	**Sy**	**Specific yield, Sy (dimensionless, between 0 and 1)**
6.56	**K**	**Horizontal hydraulic conductivity, Kh (feet/day)***
36.000	**x**	**1/2 length of basin (x direction, in feet)**
6.000	**y**	**1/2 width of basin (y direction, in feet)**
0.888	**t**	**duration of infiltration period (days)**
20.000	**hi(0)**	**initial thickness of saturated zone (feet)**
20.531	**h(max)**	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
0.531	**Δh(max)**	**maximum groundwater mounding (beneath center of basin at end of infiltration period)**

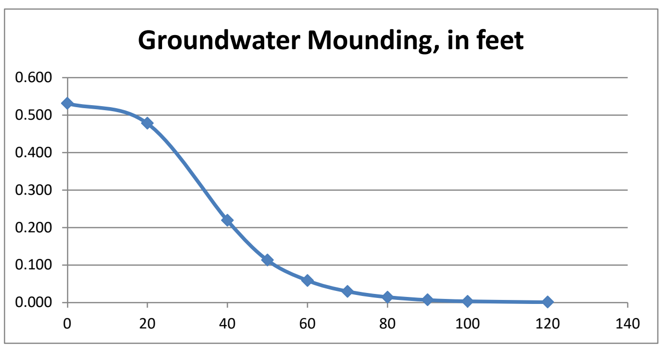
Conversion Table

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

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

Ground-water Mounding, in feet	**Distance from center of basin in x direction, in feet**
0.531	**0**
0.478	**20**
0.219	**40**
0.113	**50**
0.059	**60**
0.030	**70**
0.015	**80**
0.007	**90**
0.003	**100**
0.001	**120**

Re-Calculate Now



Disclaimer

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

Infiltration Basin #2

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

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

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

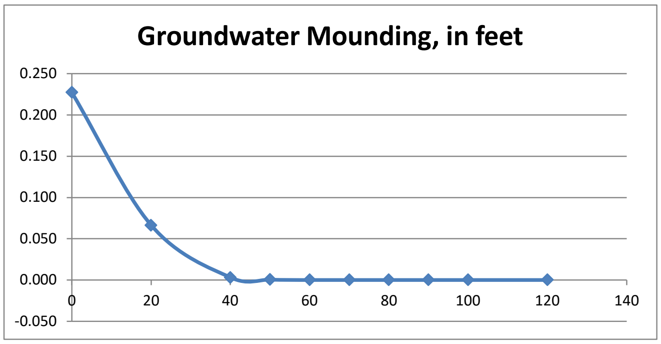
Input Values				**Conversion Table**	
				inch/hour	**feet/day**
0.5400	***R***	**Recharge (infiltration) rate (feet/day)**		0.67	1.33
0.210	**Sy**	**Specific yield, Sy (dimensionless, between 0 and 1)**			
6.56	**K**	**Horizontal hydraulic conductivity, Kh (feet/day)***		2.00	4.00
15.000	**x**	**1/2 length of basin (x direction, in feet)**			
7.000	**y**	**1/2 width of basin (y direction, in feet)**		**hours**	**days**
0.183	**t**	**duration of infiltration period (days)**		36	1.50
20.000	**hi(0)**	**initial thickness of saturated zone (feet)**			

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

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

Ground-water Mounding, in feet	**Distance from center of basin in x direction, in feet**
0.227	**0**
0.066	**20**
0.003	**40**
0.001	**50**
0.000	**60**
0.000	**70**
0.000	**80**
0.000	**90**
0.000	**100**
0.000	**120**

Re-Calculate Now



Disclaimer

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

Subsurface Basin #1

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

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

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

Input Values

0.5400	***R***	**Recharge (infiltration) rate (feet/day)**
0.210	**Sy**	**Specific yield, Sy (dimensionless, between 0 and 1)**
6.56	**K**	**Horizontal hydraulic conductivity, Kh (feet/day)***
18.500	**x**	**1/2 length of basin (x direction, in feet)**
17.000	**y**	**1/2 width of basin (y direction, in feet)**
0.283	**t**	**duration of infiltration period (days)**
20.000	**hi(0)**	**initial thickness of saturated zone (feet)**

Conversion Table

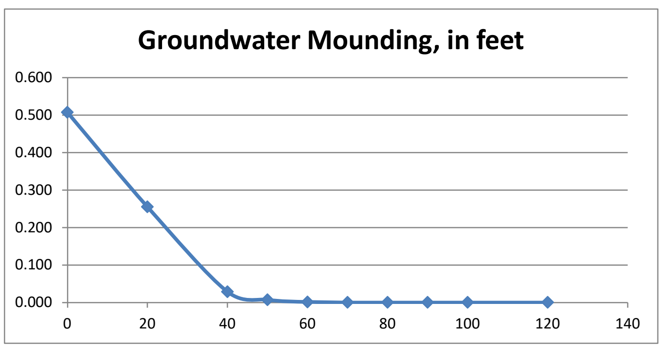
inch/hour	**feet/day**
0.67	1.33
2.00	4.00
hours	**days**
36	1.50

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

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

Ground-water Mounding, in feet	**Distance from center of basin in x direction, in feet**
0.507	**0**
0.255	**20**
0.029	**40**
0.008	**50**
0.002	**60**
0.001	**70**
0.000	**80**
0.000	**90**
0.000	**100**
0.000	**120**

Re-Calculate Now



Disclaimer

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

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: 0 & 74 Congress St

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Infiltration Basin	**0.80**	**1.00**	**0.80**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**

Total TSS Removal = 80%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: 22-286
Prepared By: **GAP**
Date: **5/11/2023**

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet
must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: 0 & 74 Congress St

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Subsurface Infiltration Structure	**0.80**	**0.75**	**0.60**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**

Total TSS Removal = 85%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: 22-286
Prepared By: **GAP**
Date: **3/9/2023**

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet
must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

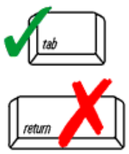
Mass. Dept. of Environmental Protection

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.

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

Signature and Date

Checklist

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

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

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

☒ No disturbance to any Wetland Resource Areas

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

☐ Reduced Impervious Area (Redevelopment Only)

☒ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

  ☐ Credit 1

  ☐ Credit 2

  ☐ Credit 3

☐ Use of "country drainage" versus curb and gutter conveyance and pipe

☐ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☐ Grass Channel

☐ Green Roof

☐ Other (describe): ______________________

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

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

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

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

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

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

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

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

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

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

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

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

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

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

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

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

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

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

Checklist (continued)

Standard 3: Recharge (continued)

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

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

Standard 4: Water Quality

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

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

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

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

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

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

Checklist (continued)

Standard 4: Water Quality (continued)

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

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

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

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

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

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

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

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

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

☐ All exposure has been eliminated.

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

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

Standard 6: Critical Areas

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

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

Checklist (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 (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.

OPERATION AND MAINTENANCE PLAN

PROPOSED SITE WORK – DURING CONSTRUCTION

Map F9 Lot 11
0 & 74 Congress St.
Pembroke, Massachusetts

Owner:

Kevin St. George
PO BOX 174
No. Pembroke, MA 02358

Party Responsible for Operation and Maintenance:

Whatbarn, LLC
29 Duck Hill Rd
Duxbury, MA 02332

Source of Funding:

Operation and Maintenance of this stormwater management system will be the responsibility of the property owner to include its successor and/or assigns, as the same may appear on record with the appropriate register of deeds.

During Construction:

Construction activities shall follow the Construction Sequence shown on the approved plans. During periods of active construction the stormwater management system shall be inspected on a weekly basis and within 24 hours of a storm event of greater than ½”. Maintenance tasks shall be performed monthly or after significant rainfall events of 1” of rain or greater. During construction, silt-laden runoff shall be prevented from entering the drainage system and off-site properties. Temporary swales shall be constructed as needed during construction to direct runoff to sediment traps. Infiltration systems and subsurface storage systems shall not be placed in service until after the installation of base course pavement and vegetative stabilization of the areas contributing to the systems.

During dewatering operations, all water pumped from the dewatering shall be directed to a “dirt bag” pumped sediment removal system (or approved equal) as manufactured by ACF Environmental. Water from construction dewatering activities should not be directed into any of the existing or proposed stormwater management facilities system unless it is fully treated prior to discharge. The unit shall be placed on a crushed stone blanket. Disposal of such “dirt bag” shall occur when the device is full and can no longer effectively filter sediment or allow water to pass at a reasonable flow rate. Disposal of this unit shall be the responsibility of the contractor and shall be as directed by the owner in accordance with applicable local, state, and federal guidelines and regulations.

Stabilized construction entrances shall be placed at the entrances and shall consist of 1½" to 2" stone and be constructed as shown on the approved plans.

All erosion and sedimentation control measures shall be in place prior to the commencement of any site work or earthwork operations, and shall be maintained during construction, and shall remain in place until all site work is complete and ground cover is established.

Heavy equipment shall not be used on basin bottoms.

All exposed soils not to be paved shall be stabilized as soon as practical. Seed mixes shall only be applied during appropriate periods as recommended by the seed supplier, typically May 1 to October 15. Any exposed soils that cannot be stabilized by vegetation during these dates shall be stabilized with hay bales, hay mulch, check dams, jute netting or other acceptable means.

Once each structure is in place, it should be maintained in accordance with the procedures described in the post-construction Operations and Maintenance Plan.

During dry periods where dust is created by construction activities the following control measures should be implemented.

- Sprinkling – The contractor may sprinkle the ground along haul roads and traffic areas until moist.
- Vegetative cover – Areas that are not expected to be disturbed regularly may be stabilized with vegetative cover.
- Mulch – Mulching can be used as a quick and effective means of dust control in recently disturbed areas.
- Spray on chemical soil treatments may be utilized. Application rates shall conform to manufacturers recommendations.

Illicit Discharges

Illicit discharges to the stormwater management system are discharges that are not entirely comprised of stormwater. Illicit discharges are prohibited from the stormwater management system and the stormwater management system shall be inspected for illicit discharges annually.

The following is a list of discharges that are allowed under the EPA Construction General Permit (CGP) provided that appropriate stormwater controls are designed, installed, and maintained:
a. Stormwater discharges, including stormwater runoff, snowmelt runoff, and surface runoff and drainage, associated with construction activity under 40 CFR §122.26(b)(14) or § 122.26(b)(15)(i);
b. Stormwater discharges designated by EPA as needing a permit under 40 CFR § 122.26(a)(1)(v) or §122.26(b)(15)(ii);
c. Stormwater discharges from construction support activities *(e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas)* provided:
i. The support activity is directly related to the construction site required to have permit coverage for stormwater discharges;
ii. The support activity is not a commercial operation, nor does it serve multiple unrelated construction projects;
iii. The support activity does not continue to operate beyond the completion of the construction activity at the project it supports; and

iv. Stormwater controls are implemented in accordance with Part 2 of the CGP and, if applicable, Part 3 of the CGP, for discharges from the support activity areas.

The following non-stormwater discharges from your construction activity, provided that, with the exception of water used to control dust and to irrigate areas to be vegetatively stabilized, these discharges are not routed to areas of exposed soil on your site and you comply with any applicable requirements for these discharges in Part 2 of the CGP:

i. Discharges from emergency fire-fighting activities;
ii. Fire hydrant flushings;
iii. Landscape irrigation;
iv. Water used to wash vehicles and equipment, provided that there is no discharge of soaps, solvents, or detergents used for such purposes;
v. Water used to control dust;
vi. Potable water including uncontaminated water line flushings;
vii. Routine external building washdown that does not use detergents;
viii. Pavement wash waters provided spills or leaks of toxic or hazardous materials have not occurred (unless all spill material has been removed) and where detergents are not used. You are prohibited from directing pavement wash waters directly into any surface water, storm drain inlet, or stormwater conveyance, unless the conveyance is connected to a sediment basin, sediment trap, or similarly effective control;
ix. Uncontaminated air conditioning or compressor condensate;
x. Uncontaminated, non-turbid discharges of ground water or spring water;
xi. Foundation or footing drains where flows are not contaminated with process materials such as solvents or contaminated ground water; and
xii. Construction dewatering water that has been treated by an appropriate control under Part 2.1.3.4 of the CGP; and

e. Discharges of stormwater listed above in Parts a, b, and c, or authorized nonstormwater discharges in Part d above, commingled with a discharge authorized by a different NPDES permit and/or a discharge that does not require NPDES permit authorization.

For additional information, refer to Performance, Standards and Guidelines for Stormwater Management in Massachusetts, published by the Department of Environmental Protection.

STORMWATER MANAGEMENT
BEST MANAGEMENT PRACTICES
INSPECTION SCHEDULE AND EVALUATION CHECKLIST – CONSTRUCTION PHASE

PROJECT LOCATION: 0 & 74 Congress St., Pembroke   Latest Revision: March 9, 2023

Stormwater Control Manager: _____   **Stamp**

Best Management Practice	Inspection Frequency (1)	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/ Repair Needed yes/no List items	Date of Cleaning/Repair	Performed By	Water Level in Detention System
Silt socks & swales and silt traps	After every major storm event							
Dewatering Operations	Daily- during actual dewatering							
Temporary Construction Entrance	Daily or as needed.							

(1) Refer to the Massachusetts Stormwater Management, Volume Two: Stormwater Technical Handbook for recommendations regarding frequency for inspection and maintenance of specific BMPs.

Limited or no use of sodium chloride salts, fertilizers or pesticides recommended. Slow release fertilizer recommended.
Other notes:(Include deviations from: Con Com Order of Conditions, PB Approval, Construction Sequence and Approved Plan)

OPERATION AND MAINTENANCE PLAN
PROPOSED DRAINAGE SYSTEM – POST CONSTRUCTION
Map F9 Lot 11
0 & 74 Congress St.
Pembroke, Massachusetts

Owner:

Kevin St. George
PO BOX 174
No. Pembroke, MA 02358

After construction is complete the owner will be the party responsible for operation and maintenance of the drainage system. When the property is conveyed, the new owner will be the party responsible for operation and maintenance.

Source of Funding:

Operation and Maintenance of this stormwater management system will be the responsibility of the owner. The estimated annual budget for the operation and maintenance of the stormwater system is $1,000.

Schedule for Inspection and Maintenance:

Deep Sump Catch Basins & Drain Manholes

Deep sump catch basins shall become part of the roadway system and shall be inspected after every major storm event during construction and cleaned when sediment exceeds 24" depth. After construction when all slopes have been stabilized, basins shall be cleaned a minimum of 4 times per year or whenever the depth of deposits is greater than or equal to on half the depth from the bottom of the invert (2 ft). Disposal of the accumulated sediment shall be in accordance with applicable local, state, and federal guidelines and regulations.

Infiltration Basin

The Infiltration BMP's should be inspected on a quarterly basis: additional inspections should be scheduled during the first few months to make sure the vegetation is established adequately and also following major storm events. Additional inspections are required following any storm event that exceeds 2.5 inches in 24-hour period (the one-year frequency storm). Evidence of standing water for more than 48 hours following a storm would indicate possible failure of the infiltration surface. In that case, a qualified professional engineer should be retained to assess the cause of failure and recommend corrective action, which should be immediately implemented to restore the function of the system. The basin should be inspected for slope integrity, soil moisture, vegetative health, soil stability, soil compaction, soil erosion, ponding and sedimentation. The basin should be mowed twice per year.

Regular maintenance tasks include mowing, watering, and weed and pest control. Only organic fertilizers, weed and pest control will be utilized.

Sediment and debris should be removed manually, at least twice per year, before the vegetation is impacted adversely. Periodic mowing (Twice per year) may be required to maintain the dense growth of vegetation. Care should be taken to protect basin from snow removal procedures and off street parking.

Subsurface Drainage Systems Maintenance Schedule
Inspect Inlets and access manholes twice per year. Remove any debris that might clog the system.

After construction, the systems should be inspected for standing water 1-2 days after any significant rainfall exceeding 1" of rainfall in 24 hours or major storm event. If the system is continuing to hold standing water after 2 days the owner should have it inspected and repaired. The systems should also be inspected to verify whether infiltration function has been lost. If infiltration capacity has become degraded, it should be restored under the direction of a qualified professional.

The subsurface systems should be inspected twice per year and at least once per year by a drainage system professional to ensure that the system is operating as intended. The owner shall implement and pay for the inspector's recommendations.

Crushed Stone Swale
Inspect swale after every significant rainfall event. Repair damage as needed. Remove sediment as needed. Replace worn or missing stones and repair filter fabric if exposed and worn.

Outlet
Examine the outlet structure for evidence of clogging or outflow release velocities that are greater than design flow. Inspect for structural integrity, replace worn or missing stones and repair filter fabric if exposed and worn.

Street Sweeping
Monthly Average, with sweeping scheduled primarily in spring and fall with a mechanical sweeper (rotary broom).

Lawn Fertilization

Lawn fertilizer shall be slow release and limited to 3 lbs per 1000 s.f. per year.

Stormwater Contamination Prevention

Exterior storage of hazardous materials including deicing chemicals, fertilizers, herbicides, pesticides, and other hazardous materials is prohibited. All materials are to be stored inside of the buildings no exterior storage of materials is allowed. No fueling of equipment is allowed on the premises and is prohibited.

Individual storage unit users shall be notified of the prohibition of illicit discharges to the stormwater management system.

Snow Removal and De-icing

Snow removal will be the responsibility of the Owner. Snow will be plowed from Parking areas and driveways and shoveled or removed with a snow blower from walkways. Snow will be stored along roadways and walkways as shown on the Site Plan. If additional stockpiling area is needed, excess snow will be removed from the site with proper off-site disposal. Snow shall be stockpiled in areas where melting will be directed through the drainage systems and not directly to the wetlands. Stockpiling within any rain garden and infiltration areas is prohibited.

Pet Waste Management

Individual dog owners shall pick up after their dogs on their own lawns and dispose of the waste either in the trash or in some cases flushing it down the toilet. Plastic baggies to can be provided through dispensers such as Mutt-Mitt stations, to encourage pick-up of waste. Individuals can also utilize various waste disposal products like Doggie Dooleys (miniature septic tanks for pet waste) or dog waste disposal units.

Inspections

Yearly inspections of the stormwater management system shall be performed and an Inspection Schedule and Evaluation Checklist shall be maintained by the Owner and made available to regulatory officials if requested. Copies of the receipts for cleaning of the systems shall also be maintained.

The Owner shall be responsible to secure the services of a Licensed Engineer on an on-going basis. The inspector shall review the project with respect to the following:

- Proper installation and performance of the Stormwater Management System.
- Review of the controls to determine any damaged or ineffective controls.
- Corrective actions.

The Engineer shall prepare, stamp and submit, to the Owner, a report documenting the findings and should request the required maintenance or repair for the pollution prevention controls when the inspector finds that it is necessary for the control to be effective (see attached Inspection Schedule and Evaluation Checklist). The inspector shall notify the Owner to make the changes.

The owner and/or their employees responsible for the O&M of the stormwater management system shall be trained annually. Records of trained individuals shall be kept and submitted to the town with the check list. The records shall indicate the latest training date.

The attached inspection form shall be retained and kept available for a minimum of three years.

For additional information, refer to Performance, Standards and Guidelines for Stormwater Management in Massachusetts, published by the Department of Environmental Protection

Definition of Major Storm Event

For the purposes of this operation and maintenance plan a major storm event should be defined as a rainfall of such intensity or duration that causes observable movement of sediment on the roadway or site. It is the intent of this plan to prevent this sediment from entering the drainage system. Prior to stabilization of the site this may occur more frequently with less intense storms. As the site is stabilized with ground cover the movement of sediment will only occur during more severe storms.

Illicit Discharges

Illicit discharges to the stormwater management system are discharges that are not entirely comprised of stormwater. Illicit discharges are prohibited from the stormwater management system and the stormwater management system shall be inspected for illicit discharges annually.

This Standard prohibits illicit discharges to stormwater management systems. The stormwater management system is the system for conveying, treating, and infiltrating stormwater on-site, including stormwater best management practices and any pipes intended to transport stormwater to the groundwater, a surface water, or municipal separate storm sewer system. Illicit discharges to the stormwater management system are discharges that are not entirely comprised of stormwater. Notwithstanding the foregoing, an illicit discharge does not include discharges from the following activities or facilities: firefighting, water line flushing, landscape irrigation, uncontaminated groundwater, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated water from swimming pools, water used for street washing and water used to clean residential buildings without detergents.

For additional information, refer to Performance Standards and Guidelines for Stormwater Management in Massachusetts, published by the Department of Environmental Protection.

STORMWATER MANAGEMENT
BEST MANAGEMENT PRACTICES

INSPECTION SCHEDULE AND EVALUATION CHECKLIST – POST CONSTRUCTION PHASE

PROJECT LOCATION 0 & 74 Congress St.
Latest Revision: March 9, 2023

Best Managemen t Practice	Inspection Frequency (1)	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/ Repair Needed yes/no List items	Date of Cleaning/ Repair	Performed By	Water Level in Drainage System
Deep Sump Hooded Catch Basins	4 times per year							
Subsurface Structure	Quarterly							
Infiltration Basin	Twice per year							
Street Sweeping	Monthly							
Outlets	Twice per year							
Crushed stone swale	Twice per year							

(1) Refer to the Massachusetts Stormwater Management, Volume Two: Stormwater Technical Handbook for recommendations regarding frequency for inspection and maintenance of specific BMPs.
(2) records shall be kept for a minimum of three years.

Limited or no use of sodium chloride salts, fertilizers or pesticides recommended. Slow release fertilizer recommended.
Other notes:(Include deviations from: Con Com Order of Conditions, PB Approval, Construction Sequence and Approved Plan)

Stormwater Control Manager: _____ **Stamp**

Deep Sump Catch Basin

Description: Deep sump catch basins, also known as oil and grease or hooded catch basins, are underground retention systems designed to remove trash, debris, and coarse sediment from stormwater runoff, and serve as temporary spill containment devices for floatables such as oils and greases.

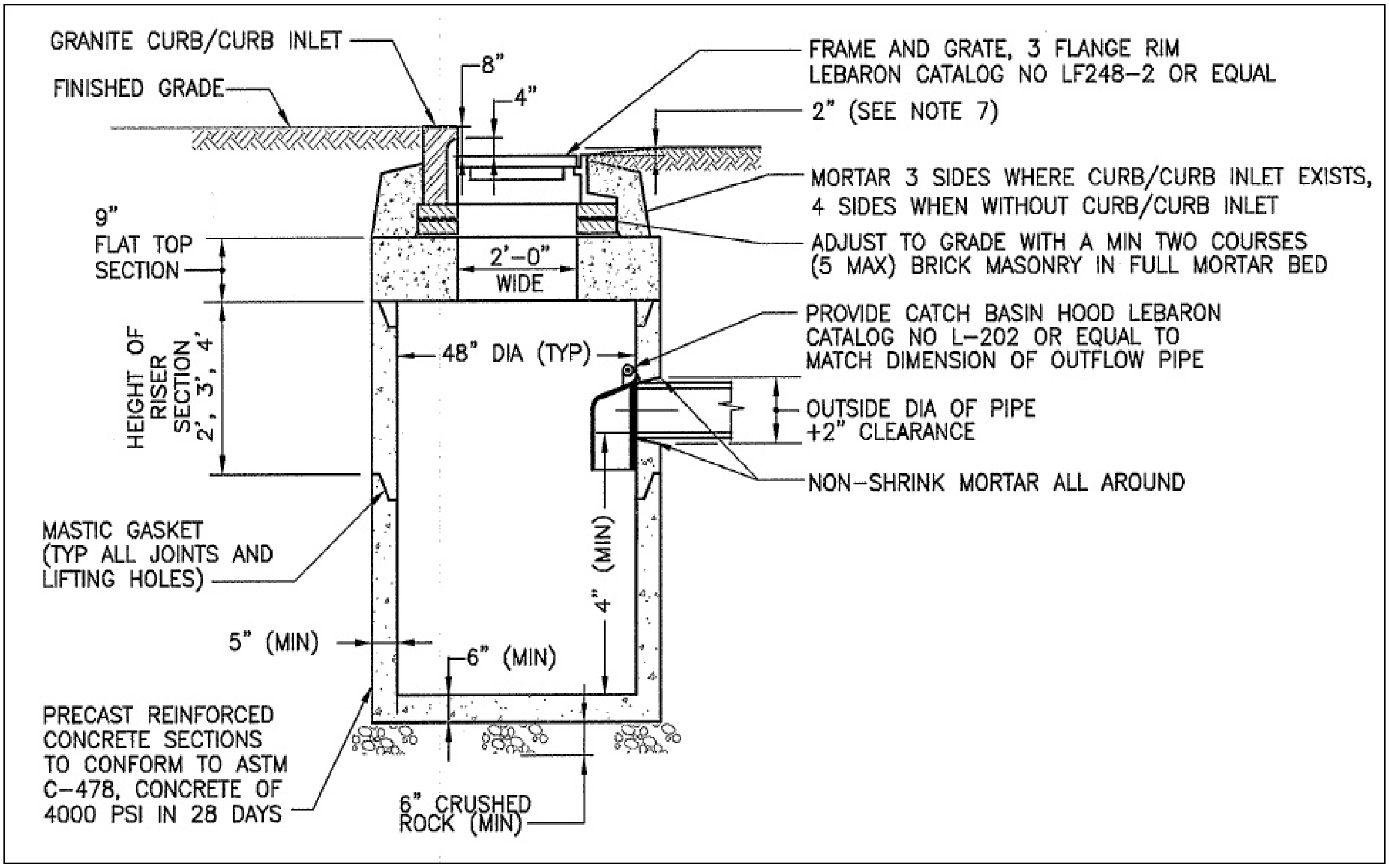
Ability to meet specific standards

Standard	Description
2 - Peak Flow	Provides no peak flow attenuation
3 - Recharge	Provides no groundwater recharge
4 - TSS Removal	25% TSS removal credit when used for pretreatment. Because of their limited effectiveness and storage capacity, deep sump catch basins receive credit for removing TSS only if they are used for pretreatment and designed as off-line systems.
5 - Higher Pollutant Loading	Recommended as pretreatment BMP. Although provides some spill control capability, a deep sump catch basin may not be used in place of an oil grit separator or sand filter for land uses that have the potential to generate runoff with high concentrations of oil and grease such as: high-intensity-use parking lots, gas stations, fleet storage areas, vehicle and/or equipment maintenance and service areas.
6 - Discharges near or to Critical Areas	May be used as pretreatment BMP. not an adequate spill control device for discharges near or to critical areas.
7 - Redevelopment	Highly suitable.

Advantages/Benefits:
- Located underground, so limited lot size is not a deterrent.
- Compatible with subsurface storm drain systems.
- Can be used for retrofitting small urban lots where larger BMPs are not feasible.
- Provide pretreatment of runoff before it is delivered to other BMPs.
- Easily accessed for maintenance.
- Longevity is high with proper maintenance.

Disadvantages/Limitations:
- Limited pollutant removal.
- Expensive to install and maintain, resulting in high cost per unit area treated.
- No ability to control volume of stormwater
- Frequent maintenance is essential
- Requires proper disposal of trapped sediment and oil and grease
- Entrapment hazard for amphibians and other small animals

Pollutant Removal Efficiencies
- Total Suspended Solids (TSS) - 25% (for regulatory purposes)
- Nutrients (Nitrogen, phosphorus) - Insufficient data
- Metals (copper, lead, zinc, cadmium) - Insufficient data
- Pathogens (coliform, e coli) - Insufficient data



adapted from the University of New Hampshire

Maintenance

Activity	Frequency
Inspect units	Four times per year
Clean units	Four times per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the basin.

Special Features

All deep sump catch basins must include hoods. For MassHighway projects, consult the Stormwater Handbook for Highways and Bridges for hood requirements.

LID Alternative

Reduce Impervious Surface
Disconnect rooftop and non-rooftop runoff
Vegetated Filter Strip

Deep Sump Catch Basin

Suitable Applications

- Pretreatment
- Residential subdivisions
- Office
- Retail

Design Considerations

- The contributing drainage area to any deep sump catch basin should not exceed ¼ acre of impervious cover.
- Design and construct deep sump catch basins as off-line systems.
- Size the drainage area so that the flow rate does not exceed the capacity of the inlet grate.
- Divert excess flows to another BMP intended to meet the water quantity requirements (peak rate attenuation) or to a storm drain system. An off-line design enhances pollutant removal efficiency, because it prevents the resuspension of sediments in large storms.

Make the sump depth (distance from the bottom of the outlet pipe to the bottom of the basin) at least four feet times the diameter of the outlet pipe and more if the contributing drainage area has a high sediment load. The minimum sump depth is 4 feet. Double catch basins, those with 2 inlet grates, may require deeper sumps. Install the invert of the outlet pipe at least 4 feet from the bottom of the catch basin grate.

The inlet grate serves to prevent larger debris from entering the sump. To be effective, the grate must have a separation between the grates of one square inch or less. The inlet openings must not allow flows greater than 3 cfs to enter the deep sump catch basin. If the inlet grate is designed with a curb cut, the grate must reach the back of the curb cut to prevent bypassing. The inlet grate must be constructed of a durable material and fit tightly into the frame so it won't be dislodged by automobile traffic. The inlet grate must not be welded to the frame so that sediments may be easily removed. To facilitate maintenance, the inlet grate must be placed along the road shoulder or curb line rather than a traffic lane.

Note that within parking garages, the State Plumbing Code regulates inlet grates and other stormwater management controls. Inlet grates inside parking garages are currently required to have much smaller openings than those described herein.

To receive the 25% removal credit, hoods must be used in deep sump catch basins. Hoods also help contain oil spills. MassHighway may install catch basins without hoods provided they are designed, constructed, operated, and maintained in accordance with the Mass Highway Stormwater Handbook.

Install the weep hole above the outlet pipe. Never install the weep hole in the bottom of the catch basin barrel.

Site Constraints

A proponent may not be able to install a deep sump catch basin because of:

- Depth to bedrock;
- High groundwater;
- Presence of utilities; or
- Other site conditions that limit depth of excavation because of stability.

Maintenance

Regular maintenance is essential. Deep sump catch basins remain effective at removing pollutants only if they are cleaned out frequently. One study found that once 50% of the sump volume is filled, the catch basin is not able to retain additional sediments.

Inspect or clean deep sump basins at least four times per year and at the end of the foliage and snow-removal seasons. Sediments must also be removed four times per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the basin. If handling runoff from land uses with higher potential pollutant loads or discharging runoff near or to a critical area, more frequent cleaning may be necessary.

Clamshell buckets are typically used to remove sediment in Massachusetts. However, vacuum trucks are preferable, because they remove more trapped sediment and supernatant than clamshells. Vacuuming is also a speedier process and is less likely to snap the cast iron hood within the deep sump catch basin.

Always consider the safety of the staff cleaning deep sump catch basins. Cleaning a deep sump catch basin within a road with active traffic or even within a parking lot is dangerous, and a police detail may be necessary to safeguard workers.

Although catch basin debris often contains concentrations of oil and hazardous materials such as petroleum hydrocarbons and metals, MassDEP classifies them as solid waste. Unless there is evidence that they have been contaminated by a spill or other means, MassDEP does not routinely require catch basin cleanings to be tested before disposal. Contaminated catch basin cleanings must be evaluated in accordance with the Hazardous Waste Regulations, 310 CMR 30.000, and handled as hazardous waste.

In the absence of evidence of contamination, catch basin cleanings may be taken to a landfill or other facility permitted by MassDEP to accept solid waste, without any prior approval by MassDEP. However, some landfills require catch basin cleanings to be tested before they are accepted.

With prior MassDEP approval, catch basin cleanings may be used as grading and shaping materials at landfills undergoing closure (see Revised Guidelines for Determining Closure Activities at Inactive Unlined Landfill Sites) or as daily cover at active landfills. MassDEP also encourages the beneficial reuse of catch basin cleanings whenever possible. A Beneficial Reuse Determination is required for such use.

MassDEP regulations prohibit landfills from accepting materials that contain free-draining liquids. One way to remove liquids is to use a hydraulic lift truck during cleaning operations so that the material can be decanted at the site. After loading material from several catch basins into a truck, elevate the truck so that any free-draining liquid can flow back into the structure. If there is no free water in the truck, the material may be deemed to be sufficiently dry. Otherwise the catch basin cleanings must undergo a Paint Filter Liquids Test. Go to www. Mass.gov/dep/recycle/laws/cafacts.doc for information on all of the MassDEP requirements pertaining to the disposal of catch basin cleanings.

Infiltration Basins

Description: Infiltration basins are stormwater runoff impoundments that are constructed over permeable soils. Pretreatment is critical for effective performance of infiltration basins. Runoff from the design storm is stored until it exfiltrates through the soil of the basin floor.

Ability to meet specific standards

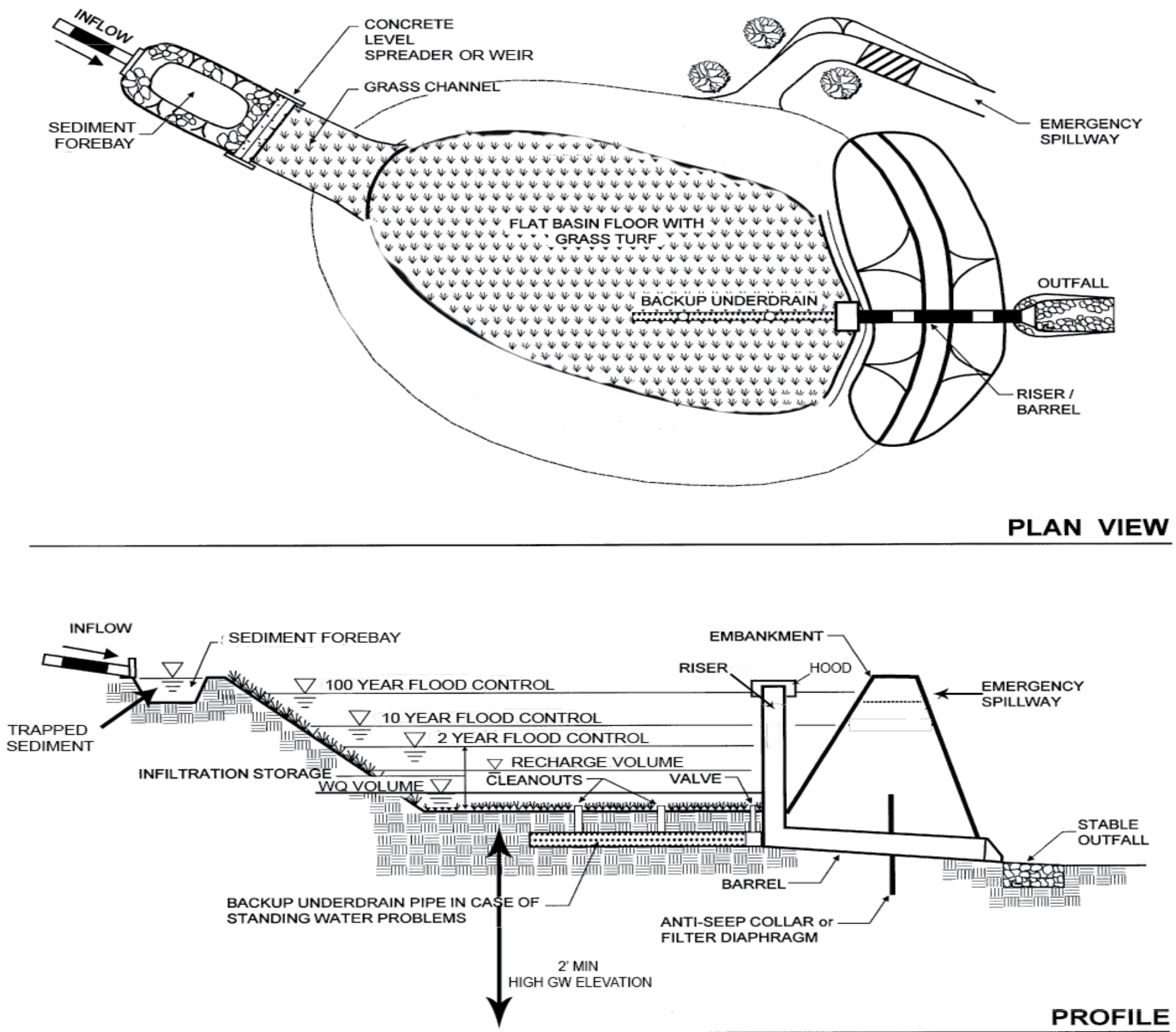
Standard	Description
2 - Peak Flow	Can be designed to provide peak flow attenuation.
3 - Recharge	Provides groundwater recharge.
4 - TSS Removal	80% TSS removal, with adequate pretreatment
5 - Higher Pollutant Loading	May be used if 44% of TSS is removed with a pretreatment BMP prior to infiltration. For some land uses with higher potential pollutant loads, use an oil grit separator, sand filter or equivalent for pretreatment prior to discharge to the infiltration basin. Infiltration must be done in compliance with 314 CMR 5.00
6 - Discharges near or to Critical Areas	Highly recommended, especially for discharges near cold-water fisheries. Requires 44% removal of TSS prior to discharge to infiltration basin
7 - Redevelopment	Typically not an option due to land area constraints

Advantages/Benefits:
- Provides groundwater recharge.
- Reduces local flooding.
- Preserves the natural water balance of the site.
- Can be used for larger sites than infiltration trenches or structures.

Disadvantages/Limitations:
- High failure rates due to improper siting, inadequate pretreatment, poor design and lack of maintenance.
- Restricted to fairly small drainage areas.
- Not appropriate for treating significant loads of sediment and other pollutants.
- Requires frequent maintenance.
- Can serve as a “regional” stormwater treatment facility

Pollutant Removal Efficiencies

• Total Suspended Solids (TSS)	80% with pretreatment
• Total Nitrogen	50% to 60%
• Total Phosphorus	60% to 70%
• Metals (copper, lead, zinc, cadmium)	85% to 90%
• Pathogens (coliform, e coli)	90%



adapted from the Vermont Stormwater Manual

Maintenance

Activity	Frequency
Preventative maintenance	Twice a year
Inspect to ensure proper functioning	After every major storm during first 3 months of operation and twice a year thereafter and when there are discharges through the high outlet orifice.
Mow the buffer area, side slopes, and basin bottom if grassed floor; rake if stone bottom; remove trash and debris; remove grass clippings and accumulated organic matter	Twice a year
Inspect and clean pretreatment devices	Every other month recommended and at least twice a year and after every major storm event.

Special Features: High failure rate without adequate pretreatment and regular maintenance.

LID Alternative: Reduce impervious surfaces. Bioretention areas

Infiltration Basins

The following are variations of the infiltration basin design.

Full Exfiltration Basin Systems

These basin systems are sized to provide storage and exfiltration of the required recharge volume and treatment of the required water quality volume. They also attenuate peak discharges. Designs typically include an emergency overflow channel to discharge runoff volumes in excess of the design storm.

Partial or Off-line Exfiltration Basin Systems

Partial basin systems exfiltrate a portion of the runoff (usually the first flush or the first half inch), with the remaining runoff being directed to other BMPs. Flow splitters or weirs divert flows containing the first flush into the infiltration basin. This design is useful at sites where exfiltration cannot be achieved by downstream detention BMPs because of site condition limitations.

Applicability

The suitability of infiltration basins at a given site is restricted by several factors, including soils, slope, depth to water table, depth to bedrock, the presence of an impermeable layer, contributing watershed area, proximity to wells, surface waters, and foundations. Generally, infiltration basins are suitable at sites with gentle slopes, permeable soils, relatively deep bedrock and groundwater levels, and a contributing watershed area of approximately 2 to 15 acres. Table IB.1 presents the recommended site criteria for infiltration basins.

Pollution prevention and pretreatment are particularly important at sites where infiltration basins are located. A pollution prevention program that separates contaminated and uncontaminated runoff is essential. Uncontaminated runoff can be infiltrated directly, while contaminated runoff must be collected and pretreated using an appropriate combination of BMPs and then rerouted to the infiltration basin. This approach allows uncontaminated stormwater to be infiltrated during and immediately after the storm and permits the infiltration of contaminated stormwater after an appropriate detention time. The Pollution Prevention and Source Control Plan required by Stormwater Standard 4 must take these factors into account. For land uses with higher potential pollutant loads, provide a bypass to divert contaminated stormwater from the infiltration basin in storms larger than the design storm.

Table IB.1 - Site Criteria for Infiltration Basins
1. The contributing drainage area to any individual infiltration basin should be restricted to 15 acres or less.
2. The minimum depth to the seasonal high water table, bedrock, and/or impermeable layer should be 2 ft. from the bottom of the basin.
3. The minimum infiltration rate is 0.17 inches per hour. Infiltration basins must be sized in accordance with the procedures set forth in Volume 3.
4. One soil sample for every 5000 ft. of basin area is recommended, with a minimum of three samples for each infiltration basin. Samples should be taken at the actual location of the proposed infiltration basin so that any localized soil conditions are detected.
5. Infiltration basins should not be used at sites where soil have 30% or greater clay content, or 40% or greater silt clay content.
6. Infiltration basins should not be placed over fill materials.
7. The following setback requirements should apply to infiltration basin installations: • Distance from any slope greater than 15% - Minimum of 50 ft. • Distance from any soil absorption system- Minimum of 50 ft. • Distance from any private well - Minimum of 100 ft., additional setback distance may be required depending on hydrogeological conditions. • Distance from any public groundwater drinking supply wells - Zone I radius, additional setback distance may be required depending on hydrogeological conditions. • Distance from any surface drinking water supply - Zone A • Distance from any surface water of the commonwealth (other than surface water supplies and their tributaries) - Minimum of 50 ft. • Distance from any building foundations including slab foundations without basements - Minimum of 10 ft. downslope and 100 ft. upslope.

Prior to pretreatment, implement the pollution prevention and source control program specified in the Pollution Prevention and Source Control Plan to reduce the concentration of pollutants in the discharge. Program components include careful management of snow and deicing chemicals, fertilizers, herbicides, and pest control. The Plan must prohibit snow disposal in the basin and include measures to prevent runoff of stockpiled snow from entering the basin. Stockpiled snow contains concentrations of sand and deicing chemicals. At industrial sites, keep raw materials and wastes from being exposed to precipitation. Select pretreatment BMPs that remove coarse sediments, oil and grease, and floatable organic and inorganic materials, and soluble pollutants.

Effectiveness

Infiltration basins are highly effective treatment systems that remove many contaminants, including TSS. However, infiltration basins are not intended to remove coarse particulate pollutants. Use a pretreatment device to remove them before they enter the basin. The pollutant removal efficiency of the basin depends on how much runoff is exfiltrated by the basin.

Infiltration basins can be made to control peak discharges by incorporating additional stages in the design. To do this, design the riser outlet structure or weir with multiple orifices, with the lowest orifice set to achieve storage of the full recharge volume required by Standard 3. Design the upper orifices using the same procedures as extended detention basins. The basins can also be designed to achieve exfiltration of storms greater than the required recharge volume. However, in such cases, make sure the soils are permeable enough to allow the basin to exfiltrate the entire volume in a 72-hour period. This may necessitate increasing the size of the floor area of the basin. Generally, it is not economically feasible to provide storage for large infrequent storms, such as the 100-year 24-hour storm.

Planning Considerations

Carefully evaluate sites before planning infiltration basins, including investigating soils, depth to bedrock, and depth to water table. Suitable parent soils should have a minimum infiltration rate of 0.17 inches per hour. Infiltration basis must be sized in accordance with the procedures set forth in Volume 3. The slopes of the contributing drainage area for the infiltration basin must be less than 5%.

Design

Infiltration basins are highly effective treatment and disposal systems when designed properly. The first step before design is providing source control and implementing pollution prevention measures to minimize sediment and other contaminants in runoff discharged to the infiltration basin. Next, consider the appropriate pretreatment BMPs.

Design pretreatment BMPs to pretreat runoff before stormwater reaches the infiltration basin. For Critical Areas, land uses with potentially higher pollutant loads, and soils with rapid infiltration rates (greater than 2.4 inches/hour), pretreatment must remove at least 44% of the TSS. Proponents may comply with this requirement by proposing two pretreatment BMPs capable of removing 25% TSS. However, the issuing authorities (i.e., Conservation Commissions or MassDEP) may require additional pretreatment for other constituents beyond TSS for land uses with higher potential pollutant loads. If the land use has the potential to generate stormwater runoff with high concentrations of oil and grease, treatment by an oil grit separator or equivalent is required before discharge to the infiltration basin.

For discharges from areas other than Critical Areas, land uses with potentially higher pollutant loads, and soils with rapid infiltration rates, MassDEP also requires some TSS pretreatment. Common pretreatment for infiltration basins includes aggressive street sweeping, deep sump catch basins, oil/grit separators, vegetated filter strips, water quality swales, or sediment forebays. Fully stabilize all land surfaces contributing drainage to the infiltration practice after construction is complete to reduce the amount of sediment in runoff that flows to the pretreatment devices.

Always investigate site conditions. Infiltration basins must have a minimum separation from seasonal high groundwater of at least 2 feet. Greater separation is necessary for bedrock. If there is bedrock on the site, conduct an analysis to determine the appropriate vertical separation. The greater the distance from the bottom of the basin media to the seasonal high groundwater elevation, the less likely the basin will fail to drain in the 72-hour period following precipitation.

Determine soil infiltration rates using samples collected at the proposed location of the basin. Take one soil boring or dig one test pit for every 5,000 feet of basin area, with a minimum of three borings for each infiltration basin. Conduct the borings or test pits in the layer where infiltration is proposed. For example, if the A and B horizons are to be removed and the infiltration will be through the C horizon, conduct the borings or test pits through the C horizon. MassDEP requires that borings be at least 20 feet deep or extend to the depth of the limiting layer.

For each bore hole or test pit, evaluate the saturated hydraulic conductivity of the soil, depth to seasonal high groundwater, NRCS soil textural class, NRCS Hydrologic Soil Group, and the presence of fill materials in accordance with Volume 3. Never locate infiltration basins above fill. Never locate infiltration basins in Hydrologic Soil Group "D" soils. The minimum acceptable final soil infiltration rate is 0.17 inches per hour. Design the infiltration basin based on the soil evaluation set forth in Volume 3.

If the proposed basin is determined to be in Hydrologic Soil Group "C" soils, incorporate measures in the design to reduce the potential for clogging, such as providing more pretreatment or greater media depth to provide additional storage. Never use the results of a Title 5 percolation test to estimate a saturated hydraulic conductivity rate, because it tends to greatly overestimate the rate that water will infiltrate into the subsurface.

Estimate seasonal high groundwater based on soil mottles or through direct observation when borings are conducted in April or May, when groundwater levels are likely to be highest. If it is difficult to determine the seasonal high groundwater elevation from the borings or test pits, then use the Frimpter method developed by the USGS (Massachusetts/ Rhode Island District Office) to estimate seasonal high groundwater. After estimating the seasonal high groundwater using the Frimpter method, re-examine the bore holes or test pits to determine if there are any field indicators that corroborate the Frimpter method estimate.

Stabilize inlet channels to prevent incoming flow velocities from reaching erosive levels, which can scour the basin floor. Riprap is an excellent inlet stabilizer. Design the riprap so it terminates in a broad apron, thereby distributing runoff more evenly over the basin surface to promote better infiltration.

At a minimum, size the basin to hold the required recharge volume. Determine the required recharge volume using either the static or dynamic methods set forth in Volume 3. Remember that the required storage volume of an infiltration basin is the sum of the quantity of runoff entering the basin from the contributing area and the precipitation directly entering the basin. Include one foot of freeboard above the total of the required recharge volume and the direct precipitation volume to account for design uncertainty. When applying the dynamic method to size the basin, use only the bottom of the basin (i.e., do not include side wall exfiltration) for the effective infiltration area.

Design the infiltration basin to exfiltrate in no less than 72 hours. Consider only the basin floor as the effective infiltration area when determining whether the basin meets this requirement.

Design the basin floor to be as flat as possible to provide uniform ponding and exfiltration of the runoff. Design the basin floor to have as close to a 0% slope as possible. In no case shall the longitudinal slope exceed 1%. Enhanced deposition of sediment in low areas may clog the surface soils, resulting in reduced infiltration and wet areas. Design the side slopes of the basin to be no steeper than 3:1 (horizontal: vertical) to allow for proper vegetative stabilization, easier mowing, easier access, and better public safety.

For basins with a 1% longitudinal slope, it will be necessary to incorporate cells into the design, making sure that the depth of ponded water does not exceed 2 feet, because sloped basin floors cause water to move downhill, thereby decreasing the likelihood of infiltration. Make lateral slopes flat (i.e., 0% slope).

After the basin floor is shaped, place soil additives on the basin floor to amend the soil. The soil additives shall include compost, properly aged to kill any seed stock contained within the compost. Do not put biosolids in the compost. Mix native soils that were excavated from the A or B horizons to create the basin with the compost, and then scarify the native materials and compost into the parent material using a chisel plow or rotary device to a depth of 12 inches. Immediately after constructing the basin, stabilize its bottom and side slopes with a dense turf of water-tolerant grass. Use low-maintenance, rapidly germinating grasses, such as fescues. The selected grasses must be capable of surviving in both wet and dry conditions. Do not use sod, which can prevent roots from directly contacting the underlying soil. During the first two months, inspect the newly established vegetation several times to determine if any remedial actions (e.g., reseeding, irrigating) are necessary.

Never plant trees or shrubs within the basin or on the impounding embankments as they increase the chance of basin failure due to root decay or subsurface disturbance. The root penetration and thatch formation of the turf helps to maintain and may even enhance the original infiltration capacity. Soluble nutrients are taken up by the turf for growth, improving the pollutant removal capacity. Dense turf will impede soil erosion and scouring of the basin floor.

In place of turf, use a basin liner of 6 to 12 inches of fill material, such as coarse sand. Clean and replace this material as needed. Do not use loose stone, riprap, and other irregular materials requiring hand removal of debris and weeds.

Design embankments and spillways to conform to the regulatory guidelines of the state's Office of Dam Safety (302 CMR 10.00). Design infiltration basins to be below surrounding grade to avoid issues related to potential embankment failure. All infiltration basins must have an emergency spillway capable of bypassing runoff from large storms without damage to the impounding structure. Design the emergency spillway to divert the storm associated with brimful conditions without impinging upon the structural integrity of the basin. The brimful condition could be the required recharge volume or a design storm (such as the 2-year, 10-year, or 100-year storm if the basin is designed to provide peak rate attenuation in addition to exfiltration). The storm associated with the brimful conditions should not include the one foot of freeboard required to account for design uncertainty. Design the emergency spillway to shunt water toward a location where the water will not damage wetlands or buildings. A common error is to direct the spillway runoff toward an adjoining property not owned by an applicant. If the emergency spillway is designed to drain the emergency overflow toward an adjoining property, obtain a drainage easement and submit it to the Conservation Commission as part of the Wetlands NOI submission. Place vegetative buffers around the perimeter of the basin for erosion control and additional sediment and nutrient removal.

Monitoring wells: Install one monitoring well in the basin floor per every 5,000 square feet of basin floor. Make sure the monitoring well(s) extend 20 feet beneath the basin floor or to the limiting layer, whichever is higher.

Access: Include access in the basin design. The area at the top of the basin must provide unimpeded vehicular access around the entire basin perimeter. The access area shall be no less than 15 feet.

Inlet Structures: Place inlet structures at one longitudinal end of the basin, to maximize the flow path from the inlet to the overflow outlet. A common error is to design multiple inlet points around the entire basin perimeter.

Outlet structures: Infiltration basins must include an overflow outlet in addition to an emergency spillway. Whether using a single orifice or multiple orifices in the design, at a minimum, set the lowest orifice at or above the required recharge volume.

Drawdown device: Include a device to draw the basin down for maintenance purposes. If the basin includes multiple cells, include a drawdown device for each cell.

Fences: Do not place fences around basins located in Riverfront Areas, as required by 310 CMR 10.58(4)(d)1.d. to avoid impeding wildlife movement. In such cases, consider including a safety bench as part of the design.

Construction

Prior to construction, rope or fence off the area selected for the infiltration basin. Never allow construction equipment to drive across the area intended to serve as the infiltration basin.

Never use infiltration basins as temporary sediment traps for construction activities.

To limit smearing or compacting soils, never construct the basin in winter or when it is raining. Use light earth-moving equipment to excavate the infiltration basin because heavy equipment compacts the soils beneath the basin floor and side slopes and reduces infiltration capacity. Because some compaction of soils is inevitable during construction, add the required soil amendments and deeply till the basin floor with a rotary tiller or a disc harrow to a depth of 12 inches to restore infiltration rates after final grading.

Use proper erosion/sediment control during construction. Immediately following basin construction, stabilize the floor and side slopes of the basin with a dense turf of water-tolerant grass. Use low maintenance, rapidly germinating grasses, such as fescues. Do not sod the basin floor or side slopes. After the basin is completed, keep the basin roped or fenced off while construction proceeds on other parts of the site. Never direct construction period drainage to the infiltration basin. After construction is completed, do not direct runoff into the basin until the bottom and side slopes are fully stabilized.

Maintenance

Infiltration basins are prone to clogging and failure, so it is imperative to develop and implement aggressive maintenance plans and schedules. Installing the required pretreatment BMPs will significantly reduce maintenance requirements for the basin.

The Operation and Maintenance Plan required by Standard 9 must include inspections and preventive maintenance at least twice a year, and after every time drainage discharges through the high outlet orifice. The Plan must require inspecting the pretreatment BMPs in accordance with the minimal requirements specified for those practices and after every major storm event. A major storm event is defined as a storm that is equal to or greater than the 2-year, 24-hour storm (generally 2.9 to 3.6 inches in a 24-hour period, depending in geographic location in Massachusetts).

Once the basin is in use, inspect it after every major storm for the first few months to ensure it is stabilized and functioning properly and if necessary take corrective action. Note how long water remains standing in the basin after a storm; standing water within the basin 48 to 72 hours after a storm indicates that the infiltration capacity may have been overestimated. If the ponding is due to clogging, immediately address the reasons for the clogging (such as upland sediment erosion, excessive compaction of soils, or low spots).
Thereafter, inspect the infiltration basin at least twice per year. Important items to check during the inspection include:

- Signs of differential settlement,
- Cracking,
- Erosion,
- Leakage in the embankments
- Tree growth on the embankments
- Condition of riprap,
- Sediment accumulation and
- The health of the turf.

At least twice a year, mow the buffer area, side slopes, and basin bottom. Remove grass clippings and accumulated organic matter to prevent an impervious organic mat from forming. Remove trash and debris at the same time. Use deep tilling to break up clogged surfaces, and revegetate immediately.

Remove sediment from the basin as necessary, but wait until the floor of the basin is thoroughly dry. Use light equipment to remove the top layer so as to not compact the underlying soil. Deeply till the remaining soil, and revegetate as soon as possible. Inspect and clean pretreatment devices associated with basins at least twice a year, and ideally every other month.

References:

Center for Watershed Protection, http://www.stormwatercenter.net/Manual_Builder/Construction%20Specifications/Infiltration%20Trench%20Specifications.htm

Center for Watershed Protection, http://www.stormwatercenter.net/Manual_Builder/Performance%20Criteria/Infiltration.htm

Center for Watershed Protection, Stormwater Management Fact Sheet, Infiltration Basin, http://www.stormwatercenter.net/Assorted%20Fact%20Sheets/Tool6_Stormwater_Practices/Infiltration%20Practice/Infiltration%20Basin.htm

Ferguson, B.K., 1994. Stormwater Infiltration. CRC Press, Ann Arbor, MI.

Galli, J. 1992. Analysis of Urban BMP Performance and Longevity in Prince George's County, Maryland. Metropolitan Washington Council of Governments, Washington, DC.

Maryland Department of the Environment, 2000, Maryland Stormwater Design Manual, Appendix B-2, Construction Specifications for Infiltration Practices, http://www.mde.state.md.us/assets/document/appendixb2.pdf

Pitt, R., et al. 1994, Potential Groundwater Contamination from Intentional and
Nonintentional Stormwater Infiltration, EPA/600/R-94/051, Risk Reduction Engineering Laboratory, U.S. EPA, Cincinnati, OH

Schroeder, R.A., 1995, Potential For Chemical Transport Beneath a Storm-Runoff Recharge (Retention) Basin for an Industrial Catchment in Fresno, CA, USGS Water-Resource Investigations Report 93-4140.

Wisconsin Department of Natural Resources, 2004, Conservation Practice Standard 1003, Infiltration Basin, http://www.dnr.state.wi.us/org/water/wm/nps/stormwater/technote.htm

Winiarski, T. Bedell, J.P., Delolme, C., and Perrodin, Y., 2006, The impact of stormwater on a soil profile in an infiltration basin, Hydrogeology Journal (2006) 14: 1244–1251

Subsurface Structures

Description: Subsurface structures are underground systems that capture runoff, and gradually infiltrate it into the groundwater through rock and gravel. There are a number of underground infiltration systems that can be installed to enhance groundwater recharge. The most common types include pre-cast concrete or plastic pits, chambers (manufactured pipes), perforated pipes, and galleys.

Ability to meet specific standards

Standard	Description
2 - Peak Flow	N/A
3 - Recharge	Provides groundwater recharge
4 - TSS Removal	80%
5 - Higher Pollutant Loading	May be used if 44% of TSS is removed with a pretreatment BMP prior to infiltration. Land uses with the potential to generate runoff with high concentrations of oil and grease require an oil grit separator or equivalent prior to discharge to the infiltration structure. Infiltration must be done in accordance with 314 CMR 5.00.
6 - Discharges near or to Critical Areas	Highly recommended
7 - Redevelopment	Suitable with pretreatment

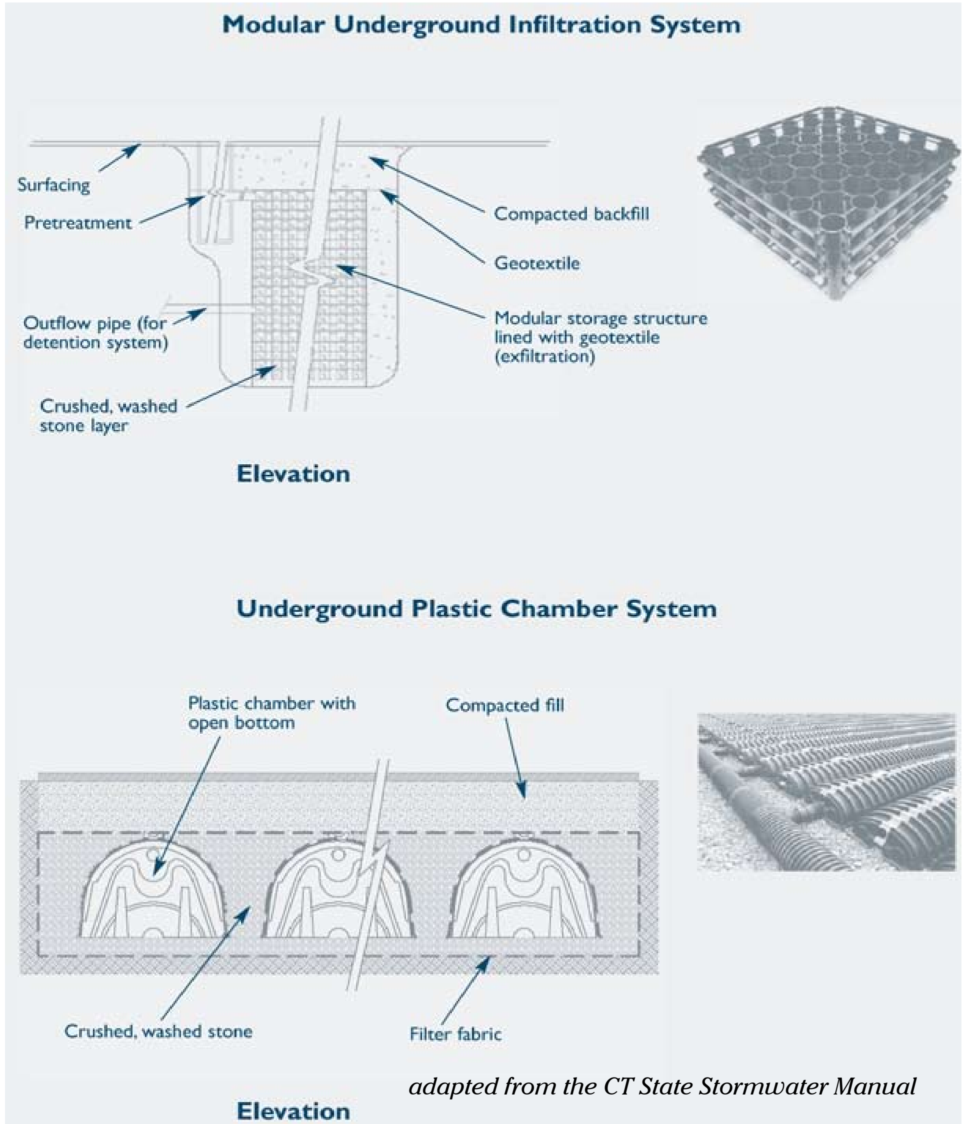
Advantages/Benefits:
- Provides groundwater recharge
- Reduces downstream flooding
- Preserves the natural water balance of the site
- Can remove other pollutants besides TSS
- Can be installed on properties with limited space
- Useful in stormwater retrofit applications

Disadvantages/Limitations:
- Limited data on field performance
- Susceptible to clogging by sediment
- Potential for mosquito breeding due to standing water if system fails

Pollutant Removal Efficiencies

• Total Suspended Solids (TSS)	80%
• Nutrients (Nitrogen, phosphorus)	Insufficient data
• Metals (copper, lead, zinc, cadmium)	Insufficient data
• Pathogens (coliform, e coli)	Insufficient data

Subsurface Structures



adapted from the CT State Stormwater Manual

There are different types of subsurface structures:

Infiltration Pit: A pre-cast concrete or plastic barrel with uniform perforations. The bottom of the pit should be closed with the lowest row of perforations at least 6 inches above the bottom, to serve as a sump. Infiltration pits typically include an observation well. The pits may be placed linearly, so that as the infiltrative surfaces in the first pit clog, the overflow moves to the second pit for exfiltration. Place an outlet near the top of the infiltration pit to accommodate emergency overflows. MassDEP provides recharge credit for storage below the emergency outflow invert. To make an infiltration pit, excavate the pit, wrap fabric around the barrel, place stone in the bottom of the pit, place the barrel in the pit, and then backfill stone around the barrel. Take a boring or dig an observation trench at the site of each proposed pit.

Chambers: These are typically manufactured pipes containing open bottoms and sometimes perforations. The chambers are placed atop a stone bed. Take the same number of borings or observation pits as for infiltration trenches. Do not confuse these systems with underground detention systems (UDS) that use similar chambers. UDS are designed to attenuate peak rates of runoff--not to recharge groundwater.

Perforated Pipes: In this system, pipes containing perforations are placed in a leaching bed, similar to a Title 5 soil absorption system (SAS). The pipes dose the leaching bed. Take the same number of borings or observation pits as for infiltration trenches. Perforated pipes by themselves do not constitute a stormwater recharge system and receive no credit pursuant to Stormwater Standard No. 3. Do not confuse recharge systems that use perforated pipes with perforated pipes installed to lower the water table or divert groundwater flows.

Galleys: Similar to infiltration pits. Some designs consist of concrete perforated rectangular vaults. Others are modular systems usually placed under parking lots. When the galley design consists of a single rectangular perforated vault, conduct one boring or observation trench per galley. When the galleys consist of interlocking modular units, take the same number of borings or observation pits as for infiltration trenches. Do not confuse these galleys with vaults storing water for purposes of underground detention, which do not contain perforations.

Applicability

Subsurface structures are constructed to store stormwater temporarily and let it percolate into the underlying soil. These structures are used for small drainage areas (typically less than 2 acres). They are feasible only where the soil is adequately permeable and the maximum water table and/or bedrock elevation is sufficiently low. They can be used to control the quantity as well as quality of stormwater runoff, if properly designed and constructed. The structures serve as storage chambers for captured stormwater, while the soil matrix provides treatment.

Without adequate pretreatment, subsurface structures are not suitable for stormwater runoff from land uses or activities with the potential for high sediment or pollutant loads. Structural pretreatment BMPs for these systems include, but are not limited to, deep sump catch basins, proprietary separators, and oil/grit separators. They are suitable alternatives to traditional infiltration trenches and basins for space-limited sites. These systems can be installed beneath parking lots and other developed areas provided the systems can be accessed for routine maintenance.

Subsurface systems are highly prone to clogging. Pretreatment is always required unless the runoff is strictly from residential rooftops.

Effectiveness

Performance of subsurface systems varies by manufacturer and system design. Although there are limited field performance data, pollutant removal efficiency is expected to be similar to those of infiltration trenches and basins (i.e., up to 80% of TSS removal). MassDEP awards a TSS removal credit of 80% for systems designed in accordance with the specifications in this handbook.

Planning Considerations

Subsurface structures are excellent groundwater recharge alternatives where space is limited. Because infiltration systems discharge runoff to groundwater, they are inappropriate for use in areas with potentially higher pollutant loads (such as gas stations), unless adequate pretreatment is provided. In that event, oil grit separators, sand filters or equivalent BMPs must be used to remove sediment, floatables and grease prior to discharge to the subsurface structure.

Design

Unlike infiltration basins, widely accepted design standards and procedures for designing subsurface structures are not available. Generally, a subsurface structure is designed to store a "capture volume" of runoff for a specified period of "storage time." The definition of capture volume differs depending on the purpose of the subsurface structure and the stormwater management program being used. Subsurface structures should infiltrate good quality runoff only. Pretreatment prior to infiltration is essential.
The composition, configuration and layout of subsurface structures varies considerably depending on the manufacturer. Follow the design criteria specified by vendors or system manufacturers. Install subsurface structures in areas that are easily accessible for routine and non-routine maintenance.

As with infiltration trenches and basins, install subsurface structures only in soils having suitable infiltration capacities as determined through field testing. Determine the infiltrative capacity of the underlying native soil through the soil evaluation set forth in Volume 3. Never use a standard septic system percolation test to determine soil permeability because this test tends to greatly overestimate the infiltration capacity of soils.

Subsurface structures are typically designed to function off-line. Place a flow bypass structure upgradient of the infiltration structure to convey high flows around the structure during large storms.

Design the subsurface structure so that it drains within 72 hours after the storm event and completely dewaters between storms. Use a minimum draining time of 6 hours to ensure adequate pollutant removal. Design all ports to be mosquito-proof, i.e., to inhibit or reduce the number of mosquitoes able to breed within the BMP.

The minimum acceptable field infiltration rate is 0.17 inches per hour. Subsurface structures must be sized in accordance with the procedures set forth in Volume 3. Manufactured structures must also be sized in accordance with the manufacturers' specifications. Design the system to totally exfiltrate within 72 hours.

Design the subsurface structure for live and dead loads appropriate for their location. Provide measures to dissipate inlet flow velocities and prevent channeling of the stone media. Generally, design the system so that inflow velocities are less than 2 feet per second (fps).
All of these devices must have an appropriate number of observation wells, to monitor the water surface elevation within the well, and to serve as a sampling port.

Each of these different types of structures, with the exception of perforated pipes in leaching fields similar to Title 5 systems, must have entry ports to allow worker access for maintenance, in accordance with OSHA requirements.

Construction

Stabilize the site prior to installing the subsurface structure. Do not allow runoff from any disturbed areas on the site to flow to the structure. Rope off the area where the subsurface structures are to be placed. Accomplish any required excavation with equipment placed just outside of this area. If the size of the area intended for exfiltration is too large to accommodate this approach, use trucks with low-pressure tires to minimize compaction. Do not allow any other vehicles within the area to be excavated. Keep the area above and immediately surrounding the subsurface structure roped off to all construction vehicles until the final top surface is installed (either paving or landscaping). This prevents additional compaction. When installing the final top surface, work from the edges to minimize compaction of the underlying soils.

Before installing the top surface, implement erosion and sediment controls to prevent sheet flow or wind blown sediment from entering the leach field. This includes, but is not limited to, minimizing land disturbances at any one time, placing stockpiles away from the area intended for infiltration, stabilizing any stockpiles through use of vegetation or tarps, and placing sediment fences around the perimeter of the infiltration field.

Provide an access port, man-way, and observation well to enable inspection of water levels within the system. Make the observation well pipe visible at grade (i.e., not buried).

Maintenance

Because subsurface structures are installed underground, they are extremely difficult to maintain. Inspect inlets at least twice a year. Remove any debris that might clog the system. Include mosquito controls in the Operation and Maintenance Plan.

Adapted from:
Connecticut Department of Environmental Conservation. Connecticut Stormwater Quality Manual. 2004.
MassHighway. Storm Water Handbook for Highways and Bridges. May 2004.

TITLE 5 ON-SITE REVIEW

Deep Hole # D-1 **Date** 8/11/22 **Time** 12:00 **Weather** showers 75°
Location(identify on Site Plan)
Land Use Res / Com **Slope(%)** 0-2 **Surface Stones** Stonewalls
Vegetation Gravel **Landform**

Distances from: Open Water Body – ft. Possible Wet Area 80 ft. Drinking Water Well – ft.

Drainageway – ft. Propertyline 140 ft Other

DEEP OBSERVATION HOLE LOG

Depth From Surface (Inches)	Soil Horizon (USDA	Soil Texture (Munsell)	Soil Color	Soil Mottling	Other: Structures, Stones, Boulders, Consistency,%Gravel
0"-8"	Fill				
8"-14"	A	Loam	10YR3/3		Friable
14"-20"	B	Loamy Sand	10YR5/6		Friable
20"-72"	C1	Loamy Sand	2.5Y6/4	36"	Firm-Friable
72"-108"	C2	Medium Loamy Sand	2.5Y6/4		several cobbles 5%gravel Friable

Parent Material (geologic) Glacial Till **Depth to Bedrock**
Depth to Groundwater: **Standing Water in Hole:** **Weeping from Pit Face** 106
Estimated Seasonal High Groundwater

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method Used:
___ **Depth observed standing in observation hole:** ____ **inches** ____ **Depth to soil mottles:** ______ **inches**
___ **Depth to weeping from side of observation hole:** 106 **inches** ____ **Groundwater adjustment** ____ **ft**
Index Well # _____ **Reading Date** _____ **Index well level** _____ **Adj.factor** _____ **Adj.Groundwater level** ____

PERCOLATION TEST

Date **Time**

Observation Hole # **Time at 9"**
Depth of Perc **Time at 6"**
Start Presoak **Time (9"-6")**
End Presoak **Rate Min/Inch**

Site Suitability Assessment: Site Passed _____ **Site Failed** _____ **Additional Testing Needed:**

Performed By **Certification #**

Witnessed By

Comments: no water or mottles in the C2 Layer
not sure if mottles @ 36" is true water table
try to avoid putting stormwater in mottles

TITLE 5 ON-SITE REVIEW

Deep Hole # D-2 **Date** 8\11\22 **Time** 12:30 **Weather** showers 75°
Location(identify on Site Plan)______
Land Use Res / com **Slope(%)** 0-2 **Surface Stones**______
Vegetation weeds **Landform**______

Distances from: Open Water Body_____ ft. Possible Wet Area 65 ft. Drinking Water Well – ft.

Drainageway – ft. Propertyline 70 ft Other______

DEEP OBSERVATION HOLE LOG

Depth From Surface (Inches)	Soil Horizon (USDA	Soil Texture (Munsell)	Soil Color	Soil Mottling	Other: Structures, Stones, Boulders, Consistency,%Gravel
0" - 120		Fill			Sandy Fill no gravel scent of organics @ top

Parent Material (geologic) Fill **Depth to Bedrock**______
Depth to Groundwater: **Standing Water in Hole:**______ **Weeping from Pit Face**______
Estimated Seasonal High Groundwater______

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method Used:
___ **Depth observed standing in observation hole:** ____**inches** ____**Depth to soil mottles:**______ **inches**
___ **Depth to weeping from side of observation hole:**____**inches** ____ **Groundwater adjustment**____**ft**
Index Well #_____ **Reading Date**_____ **Index well level**_____ **Adj.factor**_____ **Adj.Groundwater level**____

PERCOLATION TEST **Date**______ **Time**______

Observation Hole #			**Time at 9"**		
Depth of Perc			**Time at 6"**		
Start Presoak			**Time (9"-6")**		
End Presoak			**Rate Min/Inch**		

Site Suitability Assessment: **Site Passed**_____ **Site Failed**_____ **Additional Testing Needed:**

Performed By______ **Certification #**______

Witnessed By______

Comments:

TITLE 5 ON-SITE REVIEW

Deep Hole # D-3 Date 8/11/22 Time 12:30 Weather Showers 75°

Location(identify on Site Plan)______

Land Use Res/Com Slope(%) 0-2 Surface Stones Stonewalls

Vegetation Grass Landform______

Distances from: Open Water Body — ft. Possible Wet Area 75 ft. Drinking Water Well — ft.

Drainageway — ft. Propertyline 20 ft Other______

DEEP OBSERVATION HOLE LOG

Depth From Surface (Inches)	Soil Horizon (USDA	Soil Texture (Munsell)	Soil Color	Soil Mottling	Other: Structures, Stones, Boulders, Consistency,%Gravel
0"-20"	Fill				
20"-76"	C1	sandy loam	2.5Y 6/4	36"	
76"-108"	C2	Med-Coarse Sand	2.5Y 4/4		

Parent Material (geologic)______ Depth to Bedrock______

Depth to Groundwater: Standing Water in Hole: 72 Weeping from Pit Face______

Estimated Seasonal High Groundwater 3'-0"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method Used:

___ Depth observed standing in observation hole: ___ inches X Depth to soil mottles: 36 inches

___ Depth to weeping from side of observation hole: ___ inches ___ Groundwater adjustment ___ ft

Index Well #___ Reading Date___ Index well level___ Adj.factor___ Adj.Groundwater level___

PERCOLATION TEST Date______ Time______

Observation Hole #			Time at 9"		
Depth of Perc			Time at 6"		
Start Presoak			Time (9"-6")		
End Presoak			Rate Min/Inch		

Site Suitability Assessment: Site Passed___ Site Failed___ Additional Testing Needed:

Performed By______ Certification #______

Witnessed By______

Comments:

TITLE 5 ON-SITE REVIEW

Deep Hole # D-4 **Date** 8/11/22 **Time** 1500 **Weather** Showers 75°
Location(identify on Site Plan)
Land Use Res / Com **Slope(%)** 0-2 **Surface Stones** Stonewalls
Vegetation Gravel **Landform**

Distances from: Open Water Body — ft. Possible Wet Area 70 ft. Drinking Water Well — ft.

Drainageway — ft. Propertyline 30 ft Other

DEEP OBSERVATION HOLE LOG

Depth From Surface (Inches)	Soil Horizon (USDA	Soil Texture (Munsell)	Soil Color	Soil Mottling	Other: Structures, Stones, Boulders, Consistency, %Gravel
0"-80"		Fill			
80"-110"	C1	Medium Sand	2.5Y 6/4		
110-126"	C2	Loamy Sand	2.5Y 6/4	114"	Firm in place clumps of silt loam

Parent Material (geologic) Glacial Till **Depth to Bedrock**
Depth to Groundwater: **Standing Water in Hole:** none **Weeping from Pit Face** none
Estimated Seasonal High Groundwater 9'-6"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method Used:
___ **Depth observed standing in observation hole:** ___ **inches** X **Depth to soil mottles:** 114 **inches**
___ **Depth to weeping from side of observation hole:** ___ **inches** ___ **Groundwater adjustment** ___ **ft**
Index Well # ___ **Reading Date** ___ **Index well level** ___ **Adj.factor** ___ **Adj.Groundwater level** ___

PERCOLATION TEST

Date ___ **Time** ___

Observation Hole # ___ ___ **Time at 9"** ___ ___
Depth of Perc ___ ___ **Time at 6"** ___ ___
Start Presoak ___ ___ **Time (9"-6")** ___ ___
End Presoak ___ ___ **Rate Min/Inch** ___ ___

Site Suitability Assessment: **Site Passed** ___ **Site Failed** ___ **Additional Testing Needed:**

Performed By ___ **Certification #** ___

Witnessed By ___

Comments:

TITLE 5 ON-SITE REVIEW

Deep Hole # D-5 **Date** 5/15/23 **Time** 8:00 **Weather** Sunny 65°
Location(identify on Site Plan)
Land Use Residential **Slope(%)** 2 **Surface Stones** stonewall
Vegetation None **Landform**

Distances from: Open Water Body – ft. Possible Wet Area 80 ft. Drinking Water Well ____ ft.

Drainageway – ft. Propertyline 170 ft Other

DEEP OBSERVATION HOLE LOG

Depth From Surface (Inches)	Soil Horizon (USDA	Soil Texture (Munsell)	Soil Color	Soil Mottling	Other: Structures, Stones, Boulders, Consistency, %Gravel
0"-20"	Fill				Loam
20-48	Fill	Sand		none	Pea Sand (Caving)

Parent Material (geologic) Fill **Depth to Bedrock**
Depth to Groundwater: **Standing Water in Hole:** ____ **Weeping from Pit Face** 40"
Estimated Seasonal High Groundwater

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method Used:
___ **Depth observed standing in observation hole:** ____ **inches** ____ **Depth to soil mottles:** ____ **inches**
___ **Depth to weeping from side of observation hole:** ____ **inches** ____ **Groundwater adjustment** ____ **ft**
Index Well # ____ **Reading Date** ____ **Index well level** ____ **Adj.factor** ____ **Adj.Groundwater level** ____

PERCOLATION TEST **Date** ____ **Time** ____

Observation Hole #			**Time at 9"**		
Depth of Perc			**Time at 6"**		
Start Presoak			**Time (9"-6")**		
End Presoak			**Rate Min/Inch**		

Site Suitability Assessment: **Site Passed** ____ **Site Failed** ____ **Additional Testing Needed:**

Performed By ____ **Certification #** ____

Witnessed By ____

Comments:

TITLE 5 ON-SITE REVIEW

Deep Hole # D-6 **Date** 5\15\23 **Time** 8:00 **Weather** Sunny 65
Location(identify on Site Plan)
Land Use Residential **Slope(%)** 2 **Surface Stones** Stonewall
Vegetation none **Landform**

Distances from: Open Water Body – ft. Possible Wet Area 80 ft. Drinking Water Well – ft.

Drainageway – ft. Propertyline 150 ft Other

DEEP OBSERVATION HOLE LOG

Depth From Surface (Inches)	Soil Horizon (USDA	Soil Texture (Munsell)	Soil Color	Soil Mottling	Other: Structures, Stones, Boulders, Consistency,%Gravel
0-9"	Fill	Loam	10YR 3/3		Friable
9"-24"	B	Sandy Loam	10YR 5/6		Friable
24-54"	C | Fill	Loamy Sand – Perc Sand	2.5Y 5/4	34"	Friable

Parent Material (geologic) **Depth to Bedrock**
Depth to Groundwater: **Standing Water in Hole:** **Weeping from Pit Face** 56"
Estimated Seasonal High Groundwater

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method Used:
___ **Depth observed standing in observation hole:** ____**inches** ____**Depth to soil mottles:**______ **inches**
___ **Depth to weeping from side of observation hole:**____**inches** ____ **Groundwater adjustment**____**ft**
Index Well #_____ **Reading Date**_____ **Index well level**_____ **Adj.factor**_____ **Adj.Groundwater level**____

PERCOLATION TEST **Date** **Time**

Observation Hole # **Time at 9"**
Depth of Perc **Time at 6"**
Start Presoak **Time (9"-6")**
End Presoak **Rate Min/Inch**

Site Suitability Assessment: **Site Passed**_____ **Site Failed**_____ **Additional Testing Needed:**

Performed By **Certification #**

Witnessed By

Comments:

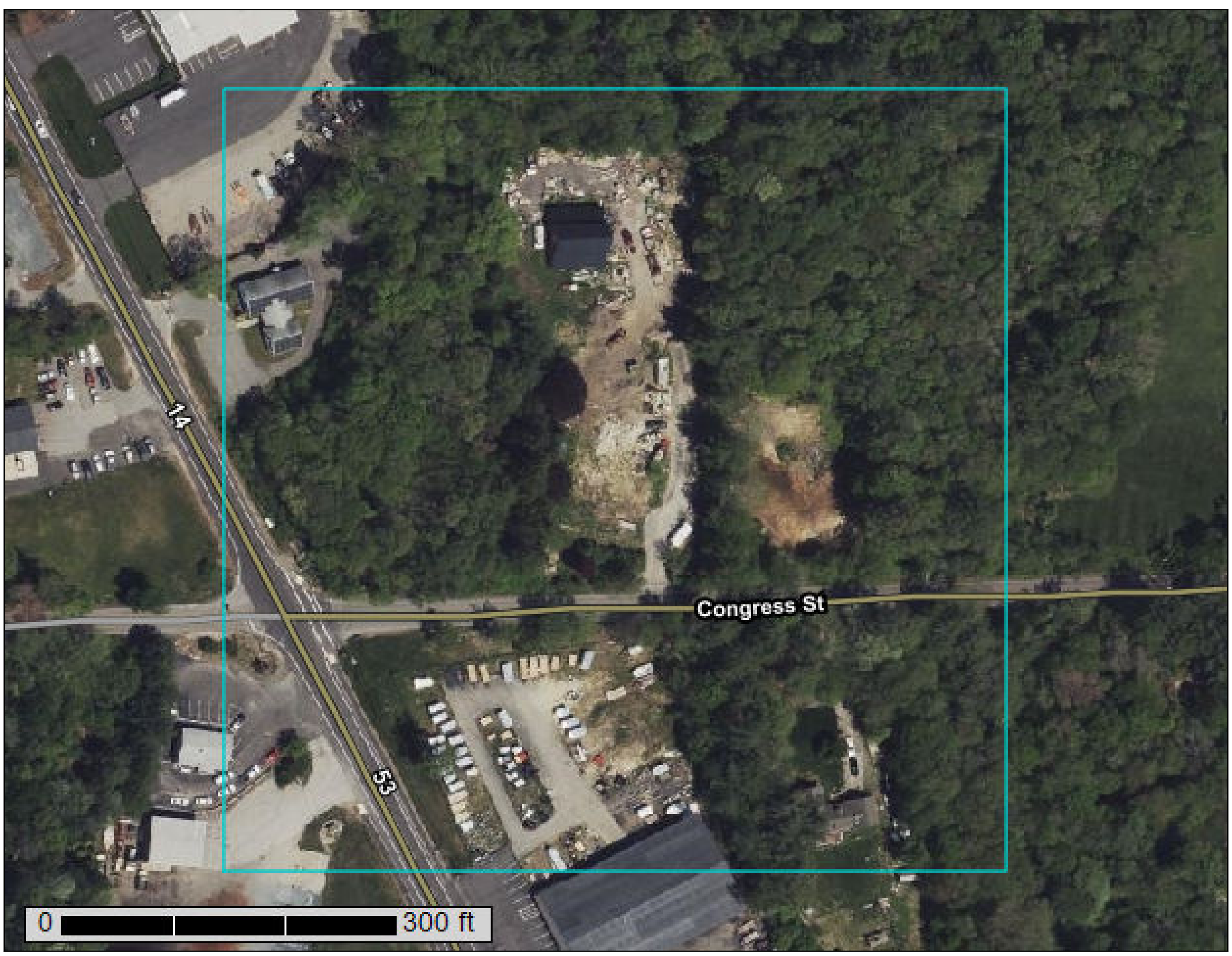
USDA United States Department of Agriculture

NRCS Natural Resources Conservation Service

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

Custom Soil Resource Report for

Plymouth County, Massachusetts



March 10, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

9

MAP LEGEND

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

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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: Plymouth County, Massachusetts
Survey Area Data: Version 15, Sep 9, 2022

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
48A	Brockton sandy loam, 0 to 3 percent slopes, extremely stony	4.8	42.9%
49A	Norwell mucky fine sandy loam, 0 to 3 percent slopes, extremely stony	1.3	11.4%
316B	Scituate gravelly sandy loam, 3 to 8 percent slopes, very stony	0.5	4.3%
321A	Birchwood sand, 0 to 3 percent slopes, very stony	2.4	21.7%
636B	Montauk-Urban land complex, 0 to 8 percent slopes	2.2	19.7%
656B	Udorthents - Urban land complex, 0 to 8 percent slopes	0.0	0.0%
Totals for Area of Interest		**11.3**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

Plymouth County, Massachusetts

48A—Brockton sandy loam, 0 to 3 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: bqt8
Elevation: 0 to 400 feet
Mean annual precipitation: 41 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Brockton, extremely stony, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brockton, Extremely Stony

Setting

Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy lodgment till

Typical profile

Oe - 0 to 5 inches: moderately decomposed plant material
A - 5 to 14 inches: sandy loam
Cg - 14 to 20 inches: gravelly loamy sand
Cdg - 20 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 14 to 28 inches to densic material
Drainage class: Very poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C/D
Ecological site: F149BY008MA - Very Wet Outwash
Hydric soil rating: Yes

Minor Components

Swansea

Percent of map unit: 4 percent
Landform: Marshes, swamps, bogs, kettles, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Mattapoisett, extremely stony

Percent of map unit: 4 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Whitman, extremely stony

Percent of map unit: 4 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Norwell, extremely stony

Percent of map unit: 4 percent
Landform: Depressions, drainageways
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Ridgebury, extremely stony

Percent of map unit: 4 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

49A—Norwell mucky fine sandy loam, 0 to 3 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: bd1w
Elevation: 10 to 400 feet
Mean annual precipitation: 41 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Norwell, extremely stony, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Norwell, Extremely Stony

Setting

Landform: Depressions, drainageways
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy supraglacial meltout till over coarse-loamy lodgment till

Typical profile

Oe - 0 to 4 inches: moderately decomposed plant material
A - 4 to 8 inches: mucky fine sandy loam
Bg1 - 8 to 14 inches: gravelly sandy loam
Bg2 - 14 to 19 inches: loamy fine sand
Cdg - 19 to 29 inches: gravelly coarse sandy loam
Cd - 29 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 12 to 20 inches to densic material
Drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D
Ecological site: F144AY041MA - Very Wet Till Depressions
Hydric soil rating: Yes

Minor Components

Scituate, very stony

Percent of map unit: 5 percent
Landform: Drumlins, ridges
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Brockton, extremely stony

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Mattapoisett, extremely stony

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Ridgebury, extremely stony

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

316B—Scituate gravelly sandy loam, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: bczw
Elevation: 10 to 400 feet
Mean annual precipitation: 41 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Scituate, very stony, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scituate, Very Stony

Setting

Landform: Drumlins, ridges
Landform position (two-dimensional): Shoulder, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy eolian deposits over sandy lodgment till

Typical profile

Ap - 0 to 11 inches: gravelly sandy loam
Bw1 - 11 to 15 inches: gravelly sandy loam
Bw2 - 15 to 20 inches: sandy loam
BC1 - 20 to 25 inches: gravelly sandy loam
BC2 - 25 to 35 inches: sandy loam
Cd1 - 35 to 46 inches: loamy coarse sand
Cd2 - 46 to 60 inches: loamy coarse sand

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.5 percent
Depth to restrictive feature: 20 to 35 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 15 to 20 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C/D
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Birchwood, very stony

Percent of map unit: 5 percent
Landform: Till plains, ground moraines, drumlins
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Woodbridge, very stony

Percent of map unit: 5 percent
Landform: Till plains, hills, drumlins
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Norwell, extremely stony

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Montauk, very stony

Percent of map unit: 5 percent
Landform: Ground moraines, drumlins, till plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

321A—Birchwood sand, 0 to 3 percent slopes, very stony

Map Unit Setting

National map unit symbol: 9y46
Elevation: 0 to 400 feet
Mean annual precipitation: 41 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Birchwood, very stony, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Birchwood, Very Stony

Setting

Landform: Till plains, ground moraines, drumlins
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Concave

Parent material: Sandy eolian deposits and/or sandy glaciofluvial deposits over coarse-loamy lodgment till

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Oe - 1 to 3 inches: moderately decomposed plant material
Oa - 3 to 4 inches: highly decomposed plant material
E - 4 to 5 inches: sand
Ap - 5 to 8 inches: loamy sand
Bs - 8 to 13 inches: loamy sand
Bw1 - 13 to 19 inches: loamy sand
Bw2 - 19 to 29 inches: loamy sand
BC - 29 to 40 inches: sand
Cd1 - 40 to 55 inches: gravelly sandy loam
Cd2 - 55 to 75 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Surface area covered with cobbles, stones or boulders: 1.0 percent
Depth to restrictive feature: 35 to 59 inches to densic material
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 12 to 29 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5s
Hydrologic Soil Group: B/D
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Poquonock, very stony

Percent of map unit: 6 percent
Landform: Till plains, ground moraines, drumlins
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Mattapoisett, extremely stony

Percent of map unit: 6 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scituate, very stony

Percent of map unit: 5 percent
Landform: Drumlins, ridges
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Newfields, extremely stony

Percent of map unit: 3 percent
Landform: Till plains, hills, moraines
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

636B—Montauk-Urban land complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w7zx
Elevation: 0 to 230 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Montauk and similar soils: 50 percent
Urban land: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Montauk

Setting

Landform: Recessionial moraines, ground moraines, hills, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 4 inches: fine sandy loam
Bw1 - 4 to 26 inches: fine sandy loam
Bw2 - 26 to 34 inches: sandy loam
2Cd - 34 to 72 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 1.42 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F149BY009MA - Well Drained Dense Till Uplands
Hydric soil rating: No

Description of Urban Land

Typical profile

M - 0 to 10 inches: cemented material

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: 0 inches to manufactured layer
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Scituate

Percent of map unit: 5 percent
Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Udorthents, loamy

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

656B—Udorthents - Urban land complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: bd08
Elevation: 0 to 390 feet
Mean annual precipitation: 41 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents, loamy, and similar soils: 45 percent
Urban land: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Loamy

Setting

Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy human transported material

Typical profile

^A - 0 to 5 inches: loam
^C1 - 5 to 21 inches: gravelly loam
^C2 - 21 to 80 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.01 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F149BY100NY - Urban Site Complex
Hydric soil rating: No

Minor Components

Udipsamments, wet substratum

Percent of map unit: 5 percent
Landform: Dikes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

Udipsamments

Percent of map unit: 5 percent
Landform: Dikes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

Udorthents, wet substratum

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

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Stormwater Pollution Prevention Plan (SWPPP)

For Construction Activities At:

0 & 74 Congress St.
Pembroke, MA 02359

SWPPP Prepared For:

Whatbarn, LLC
29 Duck Hill Rd.
Duxbury, MA 02332

SWPPP Prepared By:

Grady Consulting, LLC
Gabriel A. Padilla
71 Evergreen St. Suite 1
Kingston, MA 02364
(781) 585-2300
GPadilla@gradyconsulting.com

SWPPP Preparation Date:

May 4th, 2023

Estimated Project Dates:

Project Start Date: 10/01/2023

Project Completion Date: 09/30/2024

Contents

SECTION 1: CONTACT INFORMATION/RESPONSIBLE PARTIES

1.1 Operator(s) / Subcontractor(s)

Operator(s):

Whatbarn LLC
Insert Name
29 Duck Hill Rd.
Duxbury, MA 02359
Insert Telephone Number
Insert Fax/Email

[Repeat as necessary.]

Subcontractor(s):

TBD

[Repeat as necessary.]

Emergency 24-Hour Contact:

Insert Company or Organization Name
Insert Name
Insert Telephone Number

1.2 Stormwater Team

Stormwater Team

Name and/or Position, and Contact	Responsibilities	I Have Completed Training Required by CGP Part 6.2	I Have Read the CGP and Understand the Applicable Requirements
Insert Position Insert Telephone Number Insert Email	General Contractor	☐ Yes ☐ No	☐ Yes Date: Click here to enter a date.
Grady Consulting, LLC Kevin Grady Principal Engineer kevin@gradyconsulting.com 781-585-2300	Site Plans and Specifications	☒ Yes ☐ No	☒ Yes Date: 5/4/2023

[Insert or delete rows as necessary.]

Stormwater Team Members Who Conduct Inspections Pursuant to CGP Part 4

Name and/or Position and Contact	Training(s) Received	Date Training(s) Completed	If Training is a Non-EPA Training, Confirm that it Satisfies the Minimum Elements of CGP Part 6.3.b
Gabriel Padilla Grady Consulting, LLC (781) 585-2300 Gpadilla@gradyconsulting.com	NPDES Stormwater Permit Compliance Training	Date: 4/22/2022	☐ Principles and practices of erosion and sediment control and pollution prevention practices at construction sites ☐ Proper installation and maintenance of erosion and sediment controls and pollution prevention practices used at construction sites ☐ Performance of inspections, including the proper completion of required reports and documentation, consistent with the requirements of Part 4

[Insert or delete rows as necessary.]

SECTION 2: SITE EVALUATION, ASSESSMENT, AND PLANNING

2.1 Project/Site Information

Project Name and Address

Project/Site Name: 0 & 74 Congress St
Street/Location: 0 & 74 Congress St
City: Pembroke
State: Massachusetts
ZIP Code: 02364
County or Similar Government Division: Plymouth County

Project Latitude/Longitude

Latitude: 42º04'00" N
(decimal degrees)

Longitude: - 70 °46'28" W
(decimal degrees)

Latitude/longitude data source: ☐ Map ☐ GPS ☒ Other (please specify):
Google Earth

Horizontal Reference Datum: ☐ NAD 27 ☒ NAD 83 ☐ WGS 84

Additional Site Information

Is your site located on Indian country lands, or on a property of religious or cultural significance to an Indian Tribe? ☐ Yes ☒ No

If yes, provide the name of the Indian Tribe associated with the area of Indian country (including the name of Indian reservation if applicable), or if not in Indian country, provide the name of the Indian Tribe associated with the property: Insert Text Here

2.2 Discharge Information

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? ☐ Yes ☒ No

Are there any waters of the U.S. within 50 feet of your project's earth disturbances? ☒ Yes ☒ No

For each point of discharge, provide a point of discharge ID (a unique 3-digit ID, e.g., 001, 002), the name of the first receiving water that receives stormwater directly from the point of discharge and/or from the MS4 that the point of discharge discharges to, and the following receiving water information, if applicable:

Point of Discharge ID	Name of receiving water that receives stormwater discharge:	Is the receiving water impaired (on the CWA 303(d) list)?	If yes, list the pollutants that are causing the impairment:	Has a TMDL been completed for this receiving waterbody?	If yes, list TMDL Name and ID:	Pollutant(s) for which there is a TMDL:	Is this receiving water designated as a Tier 2, Tier 2.5, or Tier 3 water?	If yes, specify which Tier (2, 2.5, or 3)?
[001]	McFarland Brook	☐ Yes ☒ No		☐ Yes ☒ No			☐ Yes ☒ No	

2.3 Nature of the Construction Activities

General Description of Project

Provide a general description of the nature of your construction activities, including the age or dates of past renovations for structures that are undergoing demolition:

Construction of 10 detached single family dwelling units and the remodeling of an existing structure for a total of 11 separate single-family dwellings with an associated driveway, grading and drainage.

If you are conducting earth-disturbing activities in response to a public emergency, document the cause of the public emergency *(e.g., mud slides, earthquake, extreme flooding conditions, widespread disruption in essential public services)*, information substantiating its occurrence *(e.g., State disaster declaration or similar State or local declaration)*, and a description of the construction necessary to reestablish affected public services:

N/A

Business days and hours for the project: M-F 8-5

Size of Construction Site

Size of Property	3.29 acres
Total Area Expected to be Disturbed by Construction Activities	1.48 acres
Maximum Area Expected to be Disturbed at Any One Time, Including On-site and Off-site Construction Support Areas	1.48 acres

[Repeat as necessary for individual project phases.]

Type of Construction Site *(check all that apply)*:

☐ Single-Family Residential ☒ Multi-Family Residential ☐ Commercial ☐ Industrial

☐ Institutional ☐ Highway or Road ☐ Utility ☐ Other ______________

Will you be discharging dewatering water from your site? ☐ Yes ☒ No

If yes, will you be discharging dewatering water from a current or former Federal or State remediation site? ☐ Yes ☐ No

Pollutant-Generating Activities

List and describe all pollutant-generating activities and indicate for each activity the associated pollutants or pollutant constituents that could be discharged in stormwater from your construction site. Take into account where potential spills and leaks could occur that contribute pollutants to stormwater discharges, and any known hazardous or toxic substances, such as PCBs and asbestos, that will be disturbed during construction.

Pollutant-Generating Activity (e.g., paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering operations)	**Pollutants or Pollutant Constituents** (e.g., sediment, fertilizers, pesticides, paints, caulks, sealants, fluorescent light ballasts, contaminated substrates, solvents, fuels)
Pesticides (insecticides, herbicides)	Chlorinated hydrocarbons, organophosphates
Fertilizer	Nitrogen, Phosphorous
Asphalt	Oil, petroleum distillates
Concrete	Limestone, sand, pH, chromium
Paints	Metal Oxides, talc, calcium carbonate, arsenic
Hydraulic oil/fluids	Mineral oil
Gasoline	Benzene, ethyl benzene, toluene, xylene, MTBE
Diesel Fuel	Petroleum distillate, oil & grease, naphthalene, xylenes
Antifreeze/coolant	Ethylene glycol, propylene glycol, heavy metals (copper, lead, zinc.)

[Include additional rows or delete as necessary.]

Construction Support Activities *(only provide if applicable)*

Describe any construction support activities for the project (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas):

N/A

2.4 *Sequence and Estimated Dates of Construction Activities*

Phase I

Construction of Stormwater BMP's and driveway	
Estimated Start Date of Construction Activities for this Phase	10/1/2023
Estimated End Date of Construction Activities for this Phase	9/30/2024
Estimated Date(s) of Application of Stabilization Measures for Areas of the Site Required to be Stabilized	10/1/2023 *[Add additional dates as necessary]*
Estimated Date(s) when Stormwater Controls will be Removed	9/30/2024 *[Add additional dates as necessary]*

Phase II

Construct single family dwellings	
Estimated Start Date of Construction Activities for this Phase	3/1/2024
Estimated End Date of Construction Activities for this Phase	9/30/2024
Estimated Date(s) of Application of Stabilization Measures for Areas of the Site Required to be Stabilized	10/1/2023 *[Add additional dates as necessary]*
Estimated Date(s) when Stormwater Controls will be Removed	9/30/2024 *[Add additional dates as necessary]*

2.5 Authorized Non-Stormwater Discharges

List of Authorized Non-Stormwater Discharges Present at the Site

Authorized Non-Stormwater Discharge	Will or May Occur at Your Site?
Discharges from emergency fire-fighting activities	☒ Yes ☐ No
Fire hydrant flushings	☐ Yes ☒ No
Landscape irrigation	☒ Yes ☐ No
Water used to wash vehicles and equipment	☒ Yes ☐ No
Water used to control dust	☐ Yes ☒ No
Potable water including uncontaminated water line flushings	☐ Yes ☒ No
External building washdown (soaps/solvents are not used and external surfaces do not contain hazardous substances)	☐ Yes ☒ No
Pavement wash waters	☐ Yes ☒ No
Uncontaminated air conditioning or compressor condensate	☒ Yes ☐ No
Uncontaminated, non-turbid discharges of ground water or spring water	☐ Yes ☒ No
Foundation or footing drains	☐ Yes ☒ No
Uncontaminated construction dewatering water	☐ Yes ☒ No

(Note: You are required to identify the likely locations of these authorized non-stormwater discharges on your site map. See Section 2.6, below, of this SWPPP Template.)

2.6 Site Maps

SEE APPENDIX A

SECTION 3: DOCUMENTATION OF COMPLIANCE WITH OTHER FEDERAL REQUIREMENTS

3.1 Endangered Species Protection

Eligibility Criterion

Following the process outlined in Appendix D, under which criterion are you eligible for coverage under this permit?

☐ **Criterion A**: No ESA-listed species and/or designated critical habitat present in action area. Using the process outlined in Appendix D of the CGP, you certify that ESA-listed species and designated critical habitat(s) under the jurisdiction of the USFWS or NMFS are not likely to occur in your site's "action area" as defined in Appendix A of the CGP. *Please Note: NMFS' jurisdiction includes ESA-listed marine and estuarine species that spawn in inland rivers.*

☐ Check to confirm you have provided documentation in your SWPPP as required by CGP Appendix D (Note: reliance on State resources is not acceptable; see CGP Appendix D).

Documentation: Insert Text Here

☐ **Criterion B:** Eligibility requirements met by another operator under the 2022 CGP. The construction site's discharges and discharge-related activities were already addressed in another operator's valid certification of eligibility for your "action area" under eligibility Criterion A, C, D, E, or F of the 2022 CGP and you have confirmed that no additional ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS not considered in the that certification may be present or located in the "action area." To certify your eligibility under this criterion, there must be no lapse of NPDES permit coverage in the other CGP operator's certification. By certifying eligibility under this criterion, you agree to comply with any conditions upon which the other CGP operator's certification was based. You must include in your NOI the NPDES ID from the other 2022 CGP operator's notification of authorization under this permit and list any measures that you must comply with. If your certification is based on another 2022 CGP operator's certification under criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in Criterion C.

☐ Check to confirm you have provided documentation in your SWPPP as required by CGP Appendix D.

Documentation: Insert Text Here

Eligibility Criterion

Following the process outlined in Appendix D, under which criterion are you eligible for coverage under this permit?

☒ **Criterion C:** Discharges not likely to result in any short- or long-term adverse effects to ESA-listed species and/or designated critical habitat. ESA-listed species and/or designated critical habitat(s) under the jurisdiction of the USFWS and/or NMFS are likely to occur in or near your site's "action area," and you certify to EPA that your site's discharges and discharge-related activities are not likely to result in any short- or long-term adverse effects to ESA-listed threatened or endangered species and/or designated critical habitat. This certification may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to result in any short- or long-term adverse effects to ESA-listed species and/or designated critical habitat. To certify your eligibility under this criterion, indicate 1) the ESA-listed species and/or designated habitat located in your "action area" using the process outlined in Appendix D of this permit; 2) the distance between the site and the listed species and/or designated critical habitat in the action area (in miles); and 3) a rationale describing specifically how short- or long-term adverse effects to ESA-listed species will be avoided from the discharges and discharge-related activities. (Note: You must include a copy of your site map from your SWPPP showing the upland and in-water extent of your "action area" with your NOI.)

☒ Check to confirm you have provided documentation in your SWPPP as required by CGP Appendix D.

Documentation: IPaC and NOAA Fisheries list have been attached

☐ **Criterion D**: Coordination with USFWS and/or NMFS has successfully concluded. Coordination between you and the USFWS and/or NMFS has concluded. The coordination must have addressed the effects of your site's discharges and discharge-related activities on ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS, and resulted in a written confirmation from USFWS and/or NMFS that the effects of your site's discharges and discharge-related activities are not likely to result in any short- or long-term adverse effects. By certifying eligibility under this criterion, you agree to comply with any conditions you must meet for your site's discharges and discharge-related activities to not likely result in any short- or long-term adverse effects. You must include copies of the correspondence with the participating agencies in your SWPPP and this NOI.

☐ Check to confirm you have provided documentation in your SWPPP as required by CGP Appendix D.

Documentation: Insert Text Here

Eligibility Criterion

Following the process outlined in Appendix D, under which criterion are you eligible for coverage under this permit?

☐ **Criterion E:** ESA Section 7 consultation has successfully concluded. Consultation between a Federal agency and the USFWS and/or NMFS under section 7 of the ESA has concluded. Consultations can be either formal or informal, and would have occurred only as a result of a separate Federal action (e.g., during application for an individual wastewater discharge permit or the issuance of a wetlands dredge and fill permit), and the consultation must have addressed the effects of your construction activity's discharges and discharge-related activities on all ESA-listed threatened or endangered species and all designated critical habitat under the jurisdiction of each Service, as appropriate, in your action area. The result of this consultation must be either:

i. A biological opinion currently in effect that determined that the action in question (taking into account the effects of your facility's discharges and discharge-related activities) is likely to adversely affect, but is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The biological opinion must have included the effects of your facility's discharges and discharge-related activities on all the listed species and designated critical habitat in your action area under the jurisdiction of each Service, as appropriate. To be eligible under (i), any reasonable and prudent measures specified in the incidental take statement must be implemented;

ii. Written concurrence (e.g., letter of concurrence) from the applicable Service(s) with a determination that your facility's discharges and discharge-related activities are not likely to adversely affect ESA-listed species and/or designated critical habitat. The concurrence letter must have included the effects of your facility's discharges and discharge-related activities on all the ESA-listed species and/or designated critical habitat on your species list(s) acquired from USFWS and/or NMFS as part of this worksheet.

The consultation does not warrant reinitiation under 50 CFR §402.16; or, if reinitiation of consultation is required (e.g., due to a new species listing, critical habitat designation, or new information), the Federal action agency has reinitiated the consultation and the result of the consultation is consistent with the statements above. (Note: you must include any reinitiation documentation from the Services or consulting Federal agency with your NOI.) -

☐ Check to confirm you have provided documentation in your SWPPP as required by CGP Appendix D.

Documentation: Insert Text Here

Eligibility Criterion
Following the process outlined in Appendix D, under which criterion are you eligible for coverage under this permit?

☐ **Criterion F:** Issuance of section 10 permit. Potential take is authorized through the issuance of a permit under section 10 of the ESA by the USFWS and/or NMFS, and this authorization addresses the effects of the site's discharges and discharge-related activities on ESA-listed species and designated critical habitat. You must include copies of the correspondence between yourself and the participating agencies in your SWPPP and your NOI.

☐ Check to confirm you have provided documentation in your SWPPP as required by CGP Appendix D.

Documentation: Insert Text Here

3.2 *Historic Property Screening Process*

Appendix E, Step 1
Do you plan on installing any stormwater controls that require subsurface earth disturbance, including, but not limited to, any of the following stormwater controls at your site? Check all that apply below, and proceed to Appendix E, Step 2.

☐ Dike

☐ Berm

☒ Catch Basin

☒ Pond

☐ Constructed Site Drainage Feature (e.g., ditch, trench, perimeter drain, swale, etc.)

☐ Culvert

☐ Channel

☐ Other type of ground-disturbing stormwater control: Insert Specific Type of Stormwater Control

(Note: If you will not be installing any subsurface earth-disturbing stormwater controls, no further documentation is required for Section 3.2 of the Template.)

Appendix E, Step 2
If you answered yes in Step 1, have prior professional cultural resource surveys or other evaluations determined that historic properties do not exist, or have prior disturbances at the site have precluded the existence of historic properties? ☒ YES ☐ NO

- If yes, no further documentation is required for Section 3.2 of the Template and you may provide the prior documentation in your SWPPP.
  - Insert references and information sources relied upon to determine that prior to your project, no historic properties exist at your site based on available information, including information that may be provided by your applicable SHPO, THPO, or other Tribal representative or references and information sources

relied upon to determine that prior earth disturbances may have eliminated he possibility that historic properties exist on your site.

- If no, proceed to Appendix E, Step 3.

Appendix E, Step 3

If you answered no in Step 2, have you determined that your installation of subsurface earth-disturbing stormwater controls will have no effect on historic properties? ☐ YES ☐ NO

- If yes, provide documentation of the basis for your determination. Insert references to documents, studies, or other sources relied upon
- If no, proceed to Appendix E, Step 4.

Appendix E, Steps 4 and 5

If you answered no in Step 3, did the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Office (THPO), or other Tribal representative (whichever applies) respond to you within 15 calendar days to indicate their views as to the likelihood that historic properties are potentially present on your site and may be impacted by the installation of stormwater controls that require subsurface earth disturbance? ☐ YES ☐ NO

- If yes, describe the nature of their response:
  - ☐ Written indication that no historic properties will be affected by the installation of stormwater controls. Insert copies of letters, emails, or other communication between you and the applicable SHPO, THPO, or other Tribal representative
  - ☐ Written indication that adverse effects to historic properties from the installation of stormwater controls can be mitigated by agreed upon actions. Insert copies of letters, emails, or other communication between you and the applicable SHPO, THPO, or other Tribal representative
  - ☐ No agreement has been reached regarding measures to mitigate effects to historic properties from the installation of stormwater controls. Provide a description of any significant remaining disagreements regarding mitigation measures and insert copies of letters, emails, or other communication between you and the applicable SHPO, THPO, or other Tribal representative
  - ☐ Other: Insert copies of letters, emails, or other communication between you and the applicable SHPO, THPO, or other Tribal representative
- If no, no further documentation is required for Section 3.2 of the Template.

3.3 Safe Drinking Water Act Underground Injection Control Requirements

Do you plan to install any of the following controls? Check all that apply below.

- ☐ Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)
- ☐ Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow
- ☐ Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

If yes, insert copies of letters, emails, or other communication between you and the State agency or EPA regional office.

SECTION 4: EROSION AND SEDIMENT CONTROLS AND DEWATERING PRACTICES

4.1 Natural Buffers or Equivalent Sediment Controls

Buffer Compliance Alternatives

Are there any receiving waters within 50 feet of your project's earth disturbances? ☒ YES ☐ NO

(Note: If no, no further documentation is required for Section 4.1 in the SWPPP Template. Continue to Section 4.2.)

Check the compliance alternative that you have chosen:

☐ (i) I will provide and maintain a 50-foot undisturbed natural buffer.

(Note 1: You must show the 50-foot boundary line of the natural buffer on your site map.)

(Note 2: You must show on your site map how all discharges from your construction disturbances through the natural buffer area will first be treated by the site's erosion and sediment controls. Also, show on the site map any velocity dissipation devices used to prevent erosion within the natural buffer area.)

☒ (ii) I will provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by additional erosion and sediment controls that achieve, in combination, the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

(Note 1: You must show the boundary line of the natural buffer on your site map.)

(Note 2: You must show on your site map how all discharges from your construction disturbances through the natural buffer area will first be treated by the site's erosion and sediment controls. Also, show on the site map any velocity dissipation devices used to prevent erosion within the natural buffer area.)

- Insert width of natural buffer to be retained
- Insert either of the following:

  (1) The estimated sediment removal from a 50-foot buffer using applicable tables in Appendix F, Attachment 1. Include information about the buffer vegetation and soil type that predominate at your site

  OR

  (2) If you conducted a site-specific calculation for the estimated sediment removal of a 50-foot buffer, provide the specific removal efficiency, and information you relied upon to make your site-specific calculation
- Insert description of additional erosion and sediment controls to be used in combination with natural buffer area
- Insert the following information:
  - (1) Specify the model or other tool used to estimate sediment load reductions from the combination of the buffer area and additional erosion and sediment controls installed at your site, and
  - (2) Include the results of calculations showing that the combination of your buffer area and the additional erosion and sediment controls installed at your site will meet or exceed the sediment removal efficiency of a 50-foot buffer

☐ (iii) It is infeasible to provide and maintain an undisturbed natural buffer of any size, therefore I will implement erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

- Insert rationale for concluding that it is infeasible to provide and maintain a natural buffer of any size
- Insert either one of the following:

  (1) The estimated sediment removal from a 50-foot buffer using applicable tables in Appendix F, Attachment 1. Include information about the buffer vegetation and soil type that predominate at your site

  OR

  (2) If you conducted a site-specific calculation for the estimated sediment removal of a 50-foot buffer, provide the specific removal efficiency, and information you relied upon to make your site-specific calculation
- Insert description of additional erosion and sediment controls to be used in combination with natural buffer area
- Insert the following information:
  - (1) Specify the model or other tool used to estimate sediment load reductions from the combination of the buffer area and additional erosion and sediment controls installed at your site, and
  - (2) Include the results of calculations showing that the combination of your buffer area and the additional erosion and sediment controls installed at your site will meet or exceed the sediment removal efficiency of a 50-foot buffer

☐ I qualify for one of the exceptions in Part 2.2.1.b. (If you have checked this box, provide information on the applicable buffer exception that applies, below.)

Buffer Exceptions
Which of the following exceptions to the buffer requirements applies to your site?

☐ There is no discharge of stormwater to waters of the U.S. through the area between the disturbed portions of the site and any waters of the U.S. located within 50 feet of your site .

(Note: If this exception applies, no further documentation is required for Section 4.1 of the Template.)

☐ No natural buffer exists due to preexisting development disturbances (e.g., structures, impervious surfaces) that occurred prior to the initiation of planning for this project.

(Note 1: If this exception applies, no further documentation is required for Section 4.1 of the Template.)

(Note 2: Where some natural buffer exists but portions of the area within 50 feet of the surface water are occupied by preexisting development disturbances, you must still comply with the one of the CGP Part 2.2.1.a compliance alternatives.)

☐ For "linear construction sites" (defined in Appendix A), site constraints (e.g., limited right-of-way) make it infeasible to meet any of the CGP Part 2.2.1.a compliance alternatives, provided that, to the extent feasible, you limit disturbances within 50 feet of the receiving water. Include documentation here of the following: (1) why it is infeasible for you to meet one of the buffer compliance alternatives, and (2) buffer width retained and/or supplemental erosion and sediment controls to treat discharges to the surface water

☐ The project qualifies as "small residential lot" construction (defined in Appendix A as "a lot being developed for residential purposes that will disturb less than 1 acre of land, but is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre") (see Appendix F, Part F.3.2).

☐ For Alternative 1:
- Insert width of natural buffer to be retained
- Insert applicable requirements based on Table F-1
- Insert description of how you will comply with these requirements

☐ For Alternative 2:
- Insert (1) the assigned risk level based on Appendix F Applicable Table F-2 through F-6 and (2) the predominant soil type and average slope at your site
- Insert applicable requirements based on Appendix F, Table F-7
- Insert description of how you will comply with these requirements

(Note 1: If you alternatively choose to comply with any of the options that are available to other sites in Part 2.2.1.a and F.2.1 of this Appendix, then additional documentation may be needed.)

☐ Buffer disturbances are authorized under a CWA Section 404 permit. Insert description of any earth disturbances that will occur within the buffer area

(Note 1: If this exception applies, no further documentation is required for Section 4.1 of the Template.)

(Note 2: This exception only applies to the limits of disturbance authorized under the Section 404 permit and does not apply to any disturbances within 50 feet of a receiving water that are adjacent to the disturbances authorized under Section 404 and that are covered by this permit.)

☐ Buffer disturbances will occur for the construction of a water-dependent structure or water access area (e.g., pier, boat ramp, and trail). Insert description of any earth disturbances that will occur within the buffer area

(Note: If this exception applies, no further documentation is required for Section 4.1 of the Template.)

4.2 Perimeter Controls

Specific Perimeter Controls

Silt sock	
Description: Silt sock is proposed at the limit of work in areas that could route stormwater into a wetland	
Installation	10/1/2023
Maintenance Requirements	Silt sock shall be inspected once every fourteen days and after every major storm event while work is being performed. After these areas are stabilized and approved by the Engineer and for other areas on site, the frequency of inspection may be performed monthly and after every major storm event
Design Specifications	See detail on the site construction drawings attached.

[Repeat as needed for individual perimeter controls.]

4.3 Sediment Track-Out

Instructions (see CGP Parts 2.2.4 and 7.2.6.b.iii):

- Describe stormwater controls that will be used to minimize sediment track-out.
- Describe location(s) of vehicle exit(s), procedures to remove accumulated sediment off-site (e.g., vehicle tracking), and stabilization practices (e.g., stone pads or wash racks or both) to minimize off-site vehicle tracking of sediment. Also include the design, installation, and maintenance specifications for each control.

Specific Track-Out Controls

CRUSHED STONE CONSTRUCTION ENTRANCE	
Description: A crushed stone construction entrance consisting of 4"-8" quarry spalls is proposed to trap sediment from vehicular access and egress for construction of the site.	
Installation	10/1/2023
Maintenance Requirements	The crushed stone construction entrance shall be inspected daily. Accumulated sediment outside the crushed stone construction entrance shall be swept, shoveled, and disposed.
Design Specifications	See detail on the site construction drawings attached

[Repeat as needed for individual track-out controls.]

4.4 Stockpiles or Land Clearing Debris Piles Comprised of Sediment or Soil

General

- Stockpiling of sediment and soil shall be located outside the 100' buffer zone to the wetlands. Contractor shall utilize silt sock or silt fence to prevent migration of sediment and soil.

Specific Stockpile Controls

Silt Sock of Silt Fence	
Stockpiling of sediment and soil shall be located outside the 100' buffer zone to the wetlands. Contractor shall utilize silt sock or silt fence to prevent migration of sediment and soil. Silt socks shall be 12" diameter biodegradable silt sack filled with wood chip compost blend.	
Installation	10/1/2023
Maintenance Requirements	The contractor shall not hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance.
Design Specifications	See detail on the site construction drawings attached.

[Repeat as needed for individual stockpile controls.]

4.5 Minimize Dust

N/A

[Repeat as needed for individual dust controls.]

4.6 Minimize Steep Slope Disturbances

General

- N/A

Specific Steep Slope Controls

SILT SOCK or SILT FENCE	
Description: Erosion controls shall be installed for stabilization of soils on steep slopes greater than 3 to 1 slope. Silt socks shall be 12" diameter biodegradable silt sack filled with wood chip compost blend.	
Installation	10/1/2023
Maintenance Requirements	Steep slopes shall be inspected for migrating soils. After the slope has 70 percent coverage the erosion controls may be removed. Vegetative and other stabilization coverages shall be maintained for the duration of the project.
Design Specifications	See detail on the site construction drawings attached.

[Repeat as needed for individual steep slope controls.]

4.7 Topsoil

Specific Topsoil Controls

TOPSOIL RE-USE	
Description: Topsoil shall be stockpiled for re-use on site. Topsoil shall be stockpiled outside 100 feet to any wetland. The stockpile shall be protected using silt fence or silt sock.	
Installation	10/1/2023
Maintenance Requirements	Silt sock or fence protecting stockpile shall be inspected weekly. Any damage shall be repaired or replaced.
Design Specifications	See detail on the site construction drawings attached.

[Repeat as needed for individual topsoil controls.]

4.8 Soil Compaction

General

- Infiltration basin bottoms shall not be compacted.

Specific Soil Compaction Controls

SOIL COMPACTION CONTROL 1	
Description: Heavy equipment shall not be used on the bottoms of infiltration basins	
Installation	10/1/2023
Maintenance Requirements	Compacted soil that has lost its ability to infiltrate water shall be removed and replaced to restore the infiltration properties as designed.
Design Specifications	See detail on the site construction drawings attached.

[Repeat as needed for individual soil compaction controls.]

4.9 Storm Drain Inlets

General

Specific Storm Drain Inlet Controls

[Repeat as needed for individual storm drain inlet controls.]

4.10 Constructed Site Drainage Feature

Instructions (see CGP Parts 2.2.11 and 7.2.6):

If you will be installing a constructed site drainage feature, describe control practices (e.g., erosion controls and/or velocity dissipation devices such as check dams and sediment traps), including design specifications and details (volume, dimensions, outlet structure), that will be implemented at the construction site.

General

- Insert general description of how you will comply with CGP Part 2.2.11

Specific Constructed Site Drainage Features

INFILTRATION BASIN	
Description: Infiltration basins allow stormwater to infiltrate into the groundwater, reducing flow downstream.	
Installation	11/15/2023
Maintenance Requirements	Infiltration Basins shall be inspected after every storm occurrence. Sediment accumulated in the basin shall be removed to encourage infiltration.
Design Specifications	See detail on the site construction drawings attached.

[Repeat as needed for individual constructed site drainage features.]

4.11 Sediment Basins or Similar Impoundments

Specific Sediment Basin Controls

Deep Sump Catch Basin	
Description: Underground retention systems designed to remove trash, debris, and coarse sediment from stormwater runoff, and serve as temporary spill containment devices for floatables such as oils and greases.	
Installation	10/1/2023
Maintenance Requirements	Inspect or clean deep sump basins at least four times per year and at the end of the foliage and snow removal seasons. Sediments must also be removed four times per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the basin. If handling runoff from land uses with higher potential pollutant loads or discharging runoff near or to a critical area, more frequent cleaning may be necessary.
Design Specifications	See attached site plan

[Repeat as needed for individual sediment basin controls.]

4.12 Chemical Treatment

Soil Types
List all the soil types including soil types expected to be exposed during construction in areas of the project that will drain to chemical treatment systems and those expected to be found in fill material: Insert text here

Treatment Chemicals
List all treatment chemicals that will be used at the site and explain why these chemicals are suited to the soil characteristics: Insert text here
Describe the dosage of all treatment chemicals you will use at the site or the methodology you will use to determine dosage: Insert text here

Provide information from any applicable Safety Data Sheets (SDS): Insert text here

Describe how each of the chemicals will be stored consistent with CGP Part 2.2.13c: Insert text here

Include references to applicable State or local requirements affecting the use of treatment chemicals, and copies of applicable manufacturer's specifications regarding the use of your specific treatment chemicals and/or chemical treatment systems: Insert text here

Special Controls for Cationic Treatment Chemicals (if applicable)
If the applicable EPA Regional Office authorized you to use cationic treatment chemicals, include the official EPA authorization letter or other communication, and identify the specific controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a discharge that does not meet water quality standards: Insert (1) any letters or other documents sent from the EPA regional office concerning your use of cationic treatment chemicals, and (2) description of any specific controls you are required to implement

Schematic Drawings of Stormwater Controls/Chemical Treatment Systems
Provide schematic drawings of any chemically-enhanced stormwater controls or chemical treatment systems to be used for application of treatment chemicals: Insert drawings here

Training
Describe the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to the use of treatment chemicals: Insert text here

4.13 Dewatering Practices

- N/A

[Repeat as needed for individual dewatering practices.]

4.14 Other Stormwater Controls

- N/A

[Repeat as needed.

4.15 Site Stabilization

Total Amount of Land Disturbance Occurring at Any One Time

☒ *Five Acres or less*

☐ *More than Five Acres*

Use this template box if you are <u>not</u> located in an arid, semi-arid, or drought-stricken area and are not discharging to a sediment- or nutrient-impaired water or Tier 2, Tier 2.5, or Tier 3 water.

<table>
<tr><th colspan="2">Loam & Seed</th></tr>
<tr><td colspan="2">☒ Vegetative ☐ Non-Vegetative
☐ Temporary ☐ Permanent</td></tr>
<tr><td colspan="2">Description:
▪ Loam and seed shall be used on disturbed areas of the site outside paved and landscaped areas. Mulch or an equivalent measure shall be used in landscape areas.
▪ Disturbed areas shall be stabilized as soon as practicable. If construction is permanently or temporarily ceased, disturbed areas shall be stabilized.</td></tr>
<tr><td>Installation</td><td>8/1/2024</td></tr>
<tr><td>Completion</td><td>9/30/2024</td></tr>
<tr><td>Maintenance Requirements</td><td>Stabilized areas shall be inspected to ensure that growth is evenly distributed and that 70 percent density coverage is obtained. Areas not meeting the 70 percent density standard shall be repaired. Stabilized areas shall be maintained throughout construction.</td></tr>
</table>

[Repeat as needed for additional stabilization practices.]

[Repeat as needed for additional stabilization practices.]

SECTION 5: POLLUTION PREVENTION CONTROLS

5.1 Potential Sources of Pollution

Construction Site Pollutants

Pollutant-Generating Activity	**Pollutants or Pollutant Constituents** (That could be discharged if exposed to stormwater)	**Location on Site** (Or reference SWPPP site map where this is shown)
Pesticides (insecticides, herbicides)	Chlorinated hydrocarbons, organophosphates	No pesticides shall be allowed within the project limits.
Fertilizer	Nitrogen, Phosphorous	Newly seeded areas
Asphalt	Oil, petroleum distillates	Drives and roofing
Concrete	Limestone, sand, pH, chromium	Building construction
Paints	Metal Oxides, talc, calcium carbonate, arsenic	Building construction
Hydraulic oil/fluids	Mineral oil	Equipment leaks
Gasoline	Benzene, ethyl benzene, toluene, xylene, MTBE	Equipment leaks, staging area
Diesel Fuel	Petroleum distillate, oil & grease, naphthalene, xylenes	Equipment leaks, staging area
Antifreeze/coolant	Ehtylene glycol, proplene glycol, heavy metals (copper, lead, zinc.)	Equipment leaks, staging area

[Include additional rows as necessary.]

5.2 Spill Prevention and Response

- Two spill kits (total) shall be kept on site at all times throughout the project duration at a minimum of 500 feet from the excavation area. The spill kits shall contain:
  - A Plastic, removeable top, 55-gallon drum filled with absorbent rags
  - drain pans.
  - Kits shall be labeled "EMERGENCY SPILL KIT" and have contact telephone number for the contractor
- One spill kit shall be located at the access end of the site.
- One spill kit shall be located in the vicinity of the excavation as work progresses.
- Spill kits shall be inspected on a monthly basis. Inspections shall ensure that the rags and drain pans are dry and free from contaminants. Rags shall be replaced and the drain pans shall be cleaned as needed.

Procedure for equipment operators:

1. Contain spill and stop source of spill
2. Contact first responder
3. Contact second responder

First responder and second responder shall document any spills and actions taken to contain and remove spill.
FIRST RESPONDER: Pembroke FIRE DEPARTMENT (781)-293-2300
SECOND RESPONDER: To be determined

DEP EMERGENCY RESPONSE 1-(888)-304-1133

5.3 Fueling and Maintenance of Equipment or Vehicles

General

- Spill Response Plan – See above

Specific Pollution Prevention Practices

POLLUTION PREVENTION PRACTICE	
Description: Spill Response Plan – See above	
Implementation	10/1/2023
Maintenance Requirements	Spill kits shall be inspected on a monthly basis. Inspections shall ensure that the rags and drain pans are dry and free from contaminants. Rags shall be replaced and drain pans cleaned as needed
Design Specifications	See detail on the site construction drawings attached.

[Repeat as needed.]

5.4 Washing of Equipment and Vehicles

- N/A

[Repeat as needed.]

5.5 Storage, Handling, and Disposal of Building Products, Materials, and Wastes

5.5.1 Building Materials and Building Products

(Note: Examples include asphalt sealants, copper flashing, roofing materials, adhesives, concrete admixtures, and gravel and mulch stockpiles.)

General

- Storage of building products shall be conducted to minimize exposure to stormwater

Specific Pollution Prevention Practices

BUILDING PRODUCT POLLUTION PREVENTION PRACTICE	
Description: A portable storage container shall be provided and utilized to store hand tools, small parts, and building materials.	
Implementation	10/1/2023
Maintenance Requirements	The portable storage container shall be inspected visually for potential leaks that may allow spills to exit the container. Any potential leaks shall be repaired
Design Specifications	See detail on the site construction drawings attached.

5.5.2 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscape Materials

- N/A

5.5.3 Diesel Fuel, Oil, Hydraulic Fluids, Other Petroleum Products, and Other Chemicals

General

- Diesel fuel, oil, Hydraulic Fluids, and other petroleum products shall not be stored on site. All major equipment/vehicle fueling and maintenance will be performed off-site. When fueling must occur on-site, the fueling activity will be conducted in the staging area adjacent to the spill kits for the site.

Specific Pollution Prevention Practices

PETROLEUM & CHEMICAL POLLUTION PREVENTION PRACTICE	
Description: See above Spill Response Plan	
Implementation	10/1/2023
Maintenance Requirements	Spill kits shall be inspected on a monthly basis. Inspections shall ensure that the rags and drain pans are dry and free from contaminants. Rags shall be replaced and drain pans cleaned as needed.
Design Specifications	See detail on the site construction drawings attached.

[Repeat as needed.]

5.5.4 Hazardous or Toxic Waste

(Note: Examples include paints, caulks, sealants, fluorescent light ballasts, solvents, petroleum-based products, wood preservatives, additives, curing compounds, and acids.)

General

- Hazardous or Toxic Waste shall not be stored on site.

Specific Pollution Prevention Practices

HAZARDOUS TOXIC WASTE POLLUTION PREVENTION PRACTICE	
Description: Any paints, solvents, petroleum-based products, wood preservatives, additives, curing compounds, acids that are required to be utilized shall be brought to the site in suitable sealed containers and removed from the site the same day	
Implementation	N/A
Maintenance Requirements	N/A
Design Specifications	N/A

[Repeat as needed.]

5.5.5 *Construction and Domestic Waste*

(Note: Examples include packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, styrofoam, concrete, demolition debris, and other trash or discarded materials.)

General

- The site shall be kept clean and organized. Dumpsters shall be provided for construction and domestic waste. Portable toilets shall be provided for sanitary waste.

Specific Pollution Prevention Practices

CONSTRUCTION AND DOMESTIC POLLUTION PREVENTION PRACTICE	
Description: Clean up and dispose of waste in designated waste containers daily. Dumpsters shall be emptied to prevent overflow	
Implementation	10/1/2023
Maintenance Requirements	Dumpsters shall be emptied to prevent overflow
Design Specifications	See detail on the site construction drawings attached.

[Repeat as needed.]

5.5.6 *Sanitary Waste*

General

- The site shall be kept clean and organized. Dumpsters shall be provided for construction and domestic waste. Portable toilets shall be provided for sanitary waste.

Specific Pollution Prevention Practices

Sanitary Waste Prevention Practice	
Description: Portable toilets shall be provided for sanitary waste during construction	
Implementation	10/1/2023
Maintenance Requirements	Portable toilets shall be cleaned daily, inspected weekly, and emptied as needed.
Design Specifications	See detail on the site construction drawings attached.

[Repeat as needed.]

5.6 Washing of Applicators and Containers used for Stucco, Paint, Concrete, Form Release Oils, Cutting Compounds, or Other Materials

General

- Subcontractors shall submit information for washing of applicators and containers used for paint, concrete, or other materials

5.7 Application of Fertilizers

General

- Fertilizer applications shall be done in accordance with manufacturers specifications to minimize discharges.

Specific Pollution Prevention Practices

Fertilizer Pollution Prevention Practice	
Description: The fertilizer specification sheets shall be provided and approved prior to any application	
Implementation	After new lawn is installed
Maintenance Requirements	Fertilizer shall not be directly discharged into stormwater conveyance, or on frozen ground. Fertilizer shall not be stored on site.
Design Specifications	See detail on the site construction drawings attached.

[Repeat as needed for individual fertilizer practices.]

5.8 Other Pollution Prevention Practices

N/A
[Repeat as needed.]

SECTION 6: INSPECTION, MAINTENANCE, AND CORRECTIVE ACTION

6.1 *Inspection Personnel and Procedures*

Site Inspection Schedule

Select the inspection frequency(ies) that applies, based on CGP Parts 4.2, 4.3, or 4.4

(Note: you may be subject to different inspection frequencies in different areas of the site. Check all that apply and indicate which portion(s) of the site it applies to.)

Standard Frequency:
☐ Every 7 calendar days ☒ Every 14 calendar days and within 24 hours of either: ▪ A storm event that produces 0.25 inches or more of rain within a 24-hour period (including when there are multiple, smaller storms that alone produce less than 0.25 inches but together produce 0.25 inches or more in 24 hours), or ▪ A storm event that produces 0.25 inches or more of rain within a 24-hour period on the first day of a storm and continues to produce 0.25 inches or more of rain on subsequent days (you conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the last day of the storm that produces 0.25 inches or more of rain (i.e., only two inspections would be required for such a storm event)), or ▪ A discharge caused by snowmelt from a storm event that produces 3.25 inches or more of snow within a 24-hour period.
Increased Frequency (if applicable):
For areas of sites discharging to sediment or nutrient-impaired waters or to waters designated as Tier 2, Tier 2.5, or Tier 3 ☐ Every 7 days and within 24 hours of either: ▪ A storm event that produces 0.25 inches or more of rain within a 24-hour period, or ▪ A discharge caused by snowmelt from a storm event that produces 3.25 inches or more of snow within a 24-hour period.
Reduced Frequency (if applicable)
For stabilized areas ☐ Twice during first month, no more than 14 calendar days apart; then once per month after first month until permit coverage is terminated consistent with Part 9 in any area of your site where the stabilization steps in 2.2.14.a have been completed. ▪ Specify locations where stabilization steps have been completed ▪ Insert date that they were completed (Note: It is likely that you will not be able to include this in your initial SWPPP. If you qualify for this reduction (see CGP Part 4.4.1), you will need to modify your SWPPP to include this information. If construction activity resumes in this portion of the site at a later date, the inspection frequency immediately increases to that required in Parts 4.2 and 4.3, as applicable.)

For stabilized areas on "linear construction sites" (as defined in Appendix A)

☐ Twice during first month, no more than 14 calendar days apart; then once more within 24 hours of a storm event that produces 0.25 inches or more of rain within a 24-hour period, or within 24 hours of a snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period

- Specify locations where stabilization steps have been completed
- Insert date that they were completed

(Note: It is likely that you will not be able to include this in your initial SWPPP. If you qualify for this reduction (see CGP Part 4.4.1), you will need to modify your SWPPP to include this information.)

For arid, semi-arid, or drought-stricken areas during seasonally dry periods or during drought

☐ Once per month and within 24 hours of either:

- A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
- A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period.

Insert beginning and ending month identified as the seasonally dry period for your area or the valid period of drought:

- Beginning month of the seasonally dry period: Insert approximate date
- Ending month of the seasonally dry period: Insert approximate date

For frozen conditions where construction activities are being conducted

☐ Once per month

Insert beginning and ending dates of frozen conditions on your site:

- Beginning date of frozen conditions: Insert approximate date
- Ending date of frozen conditions: Insert approximate date

For frozen conditions where construction activities are suspended

☐ Inspections are temporarily suspended

Insert beginning and ending dates of frozen conditions on your site:

- Beginning date of frozen conditions: Insert approximate date
- Ending date of frozen conditions: Insert approximate date

Dewatering Inspection Schedule

Select the inspection frequency that applies based on CGP Part 4.3.2

Dewatering Inspection
☒ Once per day on which the discharge of dewatering water occurs.

Rain Gauge Location (if applicable)

Specify location(s) of rain gauge to be used for determining whether a rain event of 0.25 inches or greater has occured (only applies to inspections conducted for Part 4.2.2, 4.3, or 4.4.2)

Inspection Report Forms

Insert a copy of any inspection report forms you will use here or in Appendix D of this SWPPP template

(Note: EPA has developed a sample inspection form that CGP operators can use. The form is available at https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources)

6.2 *Corrective Action*

Personnel Responsible for Corrective Actions
Insert names of personnel or types of personnel responsible for corrective actions

Corrective Action Logs
Insert a copy of any corrective action forms you will use here or in Appendix E of this SWPPP Template

(Note: EPA has developed a sample corrective action log that CGP operators can use. The form is available at https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources)

6.3 *Delegation of Authority*

Duly Authorized Representative(s) or Position(s):

TO BE DETERMINED
Insert Name
Insert Position
Insert Address
Insert City, State, Zip Code
Insert Telephone Number
Insert Fax/Email

SECTION 7: TURBIDITY BENCHMARK MONITORING FOR DEWATERING DISCHARGES

N/A

SECTION 8: CERTIFICATION AND NOTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: ______________________________ Title: ______________________________

Signature: ____ Date: __________________

[Repeat as needed for multiple construction operators at the site.]

SWPPP APPENDICES

Attach the following documentation to the SWPPP:

Appendix A – Site Maps

Appendix B – Copy of 2022 CGP
(Note: The 2022 CGP is available at https://www.epa.gov/npdes/2022-construction-general-permit-cgp)

Appendix C – NOI and EPA Authorization Email

Appendix D – Site Inspection Form and Dewatering Inspection Form (if applicable)

Appendix E – Corrective Action Log

Appendix F – SWPPP Amendment Log

Appendix G – Subcontractor Certifications/Agreements

Appendix H – Grading and Stabilization Activities Log

Appendix I – Training Documentation

Appendix J – Delegation of Authority

Appendix K – Endangered Species Documentation

Appendix L – Historic Preservation Documentation

Appendix M – Rainfall Gauge Recording

Appendix N – Turbidity Meter Manual and Manufacturer's Instructions

Appendix A – Site Maps

INSERT SITE MAPS CONSISTENT WITH TEMPLATE SECTION 2.6

Appendix B – Copy of 2022 CGP

INSERT COPY OF 2022 CGP

(Note: The 2022 CGP is available at https://www.epa.gov/npdes/2022-construction-general-permit-cgp)

Appendix C – Copy of NOI and EPA Authorization Email

INSERT COPY OF NOI AND EPA'S AUTHORIZATION EMAIL PROVIDING COVERAGE UNDER THE CGP

Appendix D – Copy of Site and Dewatering Inspection Forms

INSERT COPIES OF SITE AND DEWATERING INSPECTION FORMS YOU WILL USE TO PREPARE INSPECTION REPORTS

(Note: EPA has developed a sample site inspection and dewatering inspection form templates that CGP operators can use. The template is available at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates)

Appendix E – Copy of Corrective Action Log

INSERT COPY OF CORRECTIVE ACTION LOG YOU WILL USE

(Note: EPA has developed a sample corrective action log that CGP operators can use. The form is available at https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources)

Appendix F – *Sample* SWPPP Amendment Log

No.	Description of the Amendment	Date of Amendment	Amendment Prepared by [Name(s) and Title]
		INSERT DATE	
		INSERT DATE	
		INSERT DATE	
		INSERT DATE	
		INSERT DATE	
		INSERT DATE	
		INSERT DATE	
		INSERT DATE	

Appendix G – *Sample* Subcontractor Certifications/Agreements

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

Project Number: ____

Project Title: ____

Operator(s): ____

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: ____

Address: ____

Telephone Number: ______________________

Type of construction service to be provided: ______________________________

____

____

Signature: ______________________

Title: ______________________

Date: ______________________

Appendix H – *Sample* Grading and Stabilization Activities Log

Date Grading Activity Initiated	Description of Grading Activity	Description of Stabilization Measure and Location	Date Grading Activity Ceased (Indicate Temporary or Permanent)	Date When Stabilization Measures Initiated
INSERT DATE			INSERT DATE ☐ Temporary ☐ Permanent	INSERT DATE
INSERT DATE			INSERT DATE ☐ Temporary ☐ Permanent	INSERT DATE
INSERT DATE			INSERT DATE ☐ Temporary ☐ Permanent	INSERT DATE
INSERT DATE			INSERT DATE ☐ Temporary ☐ Permanent	INSERT DATE
INSERT DATE			INSERT DATE ☐ Temporary ☐ Permanent	INSERT DATE
INSERT DATE			INSERT DATE ☐ Temporary ☐ Permanent	INSERT DATE
INSERT DATE			INSERT DATE ☐ Temporary ☐ Permanent	INSERT DATE
INSERT DATE			INSERT DATE ☐ Temporary ☐ Permanent	INSERT DATE

Appendix I –Training Documentation

INSERT DOCUMENTATION CONSISTENT WITH SWPPP TEMPLATE SECTION 1.2 AND CGP PART 7.2.2

Appendix J – *Sample* Delegation of Authority Form

Delegation of Authority

I, ______________________ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the EPA's Construction General Permit (CGP), at the __________________________________ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

______________________________________ (name of person or position)
______________________________________ (company)
______________________________________ (address)
______________________________________ (city, State, zip)
______________________________________ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in Appendix G of EPA's CGP, and that the designee above meets the definition of a "duly authorized representative" as set forth in Appendix G.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: ____

Company: ____

Title: ____

Signature: ____

Date: ____

Appendix K – Endangered Species Documentation

INSERT DOCUMENTATION CONSISTENT WITH SWPPP TEMPLATE SECTION 3.1 AND CGP APPENDIX D

Appendix L – Historic Properties Documentation

INSERT DOCUMENTATION CONSISTENT WITH SWPPP TEMPLATE SECTION 3.2 AND CGP APPENDIX E

Appendix M – Rainfall Gauge Recording

Use the table below to record the rainfall gauge readings at the beginning and end of each work day. An example table follows.

Month/Year			Month/Year			Month/Year		
Day	Start time	End time	Day	Start time	End time	Day	Start time	End time
1			1			1		
2			2			2		
3			3			3		
4			4			4		
5			5			5		
6			6			6		
7			7			7		
8			8			8		
9			9			9		
10			10			10		
11			11			11		
12			12			12		
13			13			13		
14			14			14		
15			15			15		
16			16			16		
17			17			17		
18			18			18		
19			19			19		
20			20			20		
21			21			21		
22			22			22		
23			23			23		
24			24			24		
25			25			25		
26			26			26		
27			27			27		
28			28			28		
29			29			29		
30			30			30		
31			31			31		

Example Rainfall Gauge Recording

April 2022			May 2022			June 2022		
Day	7:00 am	4:400 pm	Day	7:00 am	4:00 pm	Day	7:00 am	4:00 pm
1	--	--	1	0.2	0	1	0	0.4
2	--	--	2	0	0	2	0	0
3	0	0	3	0.1	0.3	3	--	--
4	0	0.3	4	0	0	4	--	--
5	0	0	5	0	0	5	0	0

In this example (for only partial months), 0.25-inch rainfall inspections would have been conducted on April 4 and June 1.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Plymouth County, Massachusetts

Local office

New England Ecological Services Field Office

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME STATUS

Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Oct 15 to Aug 31
Black-billed Cuckoo Coccyzus erythropthalmus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Blue-winged Warbler Vermivora pinus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 1 to Jun 30
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Canada Warbler Cardellina canadensis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Chimney Swift Chaetura pelagica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Lesser Yellowlegs Tringa flavipes This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31

Rusty Blackbird Euphagus carolinus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

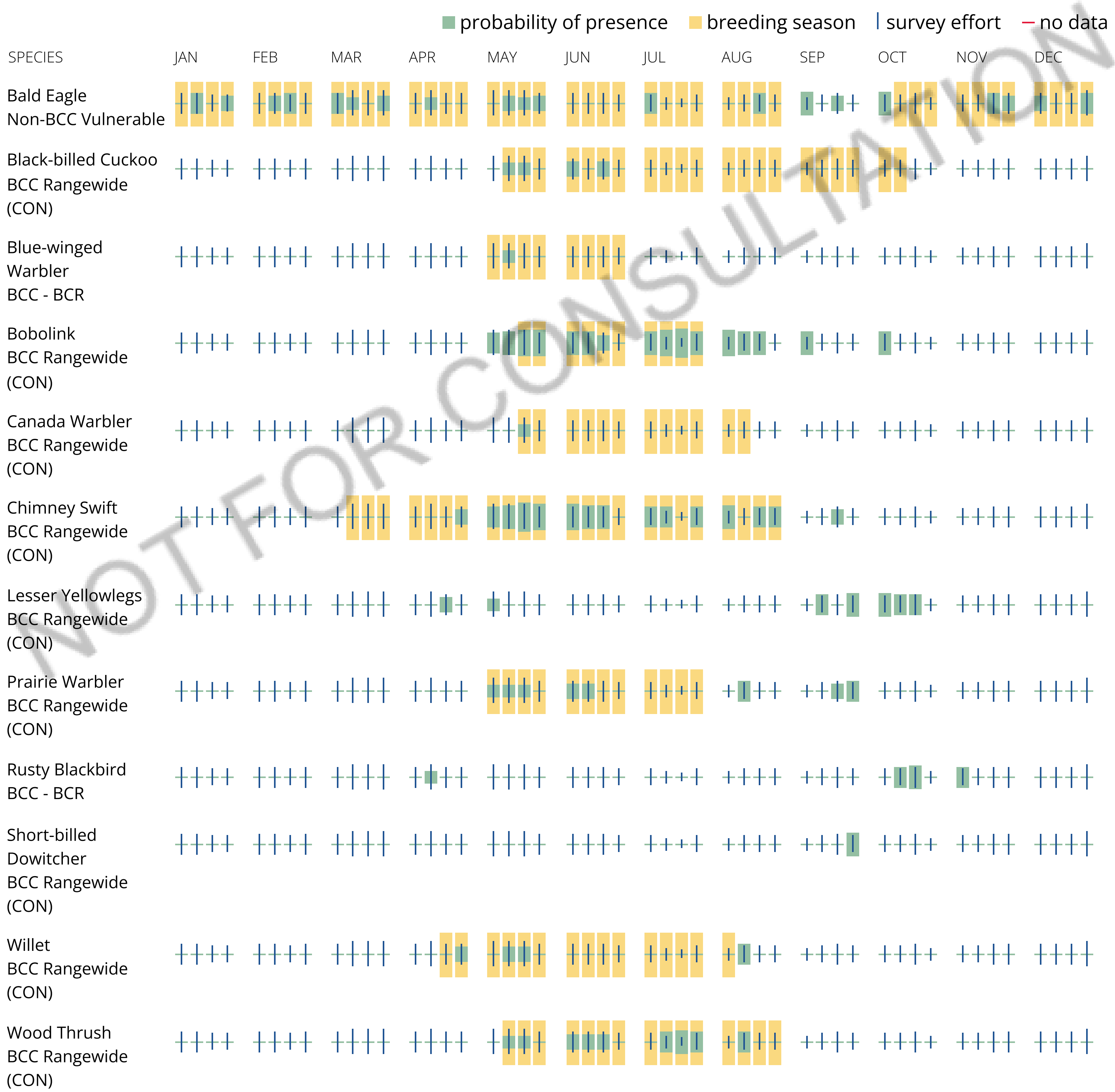
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER FORESTED/SHRUB WETLAND

PFO1B

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

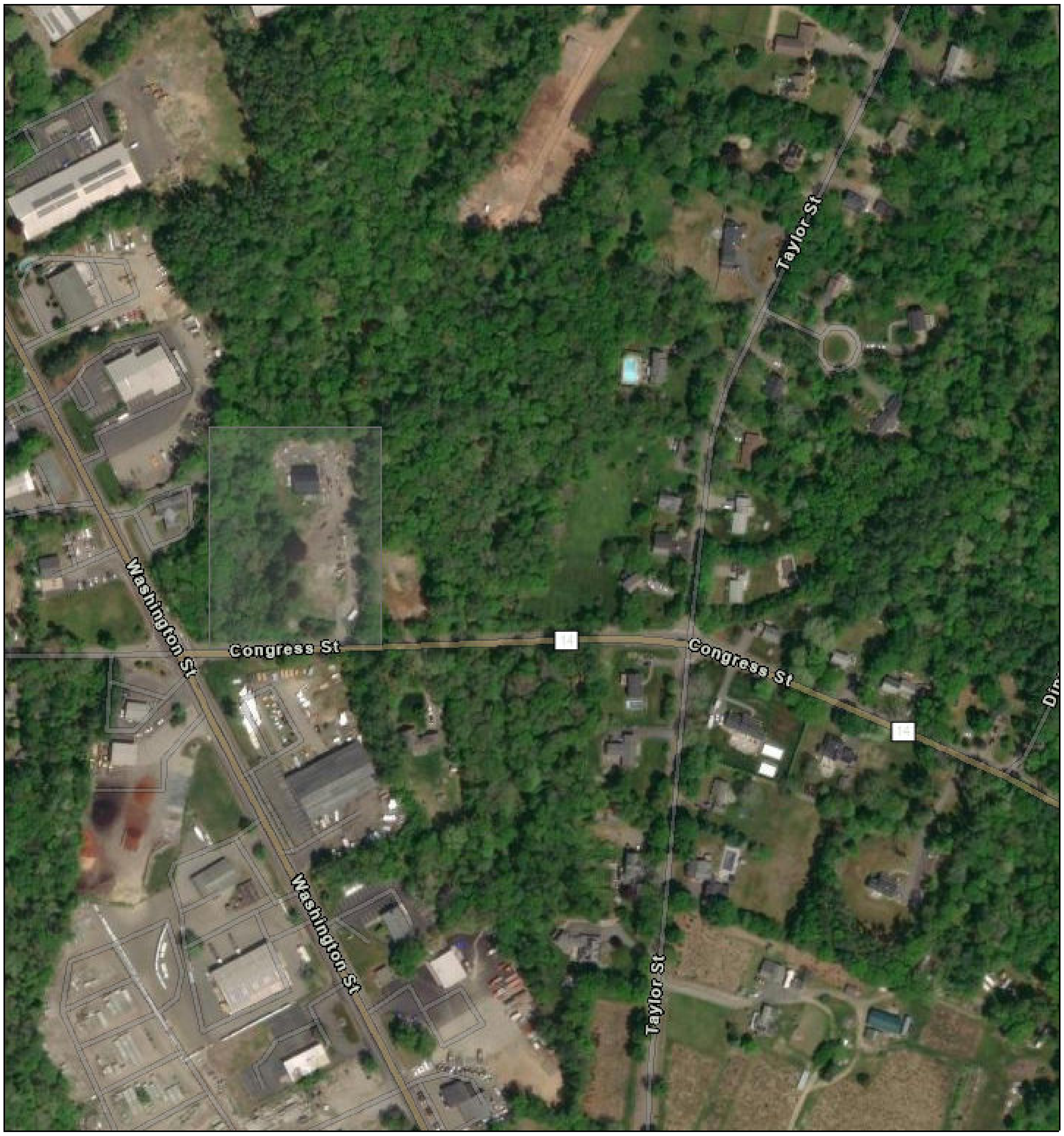
Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Drawn Action Area & Overlapping S7 Consultation Areas

Area of Interest (AOI) Information

Area : 2,201.36 acres

May 5 2023 16:24:05 Eastern Daylight Time



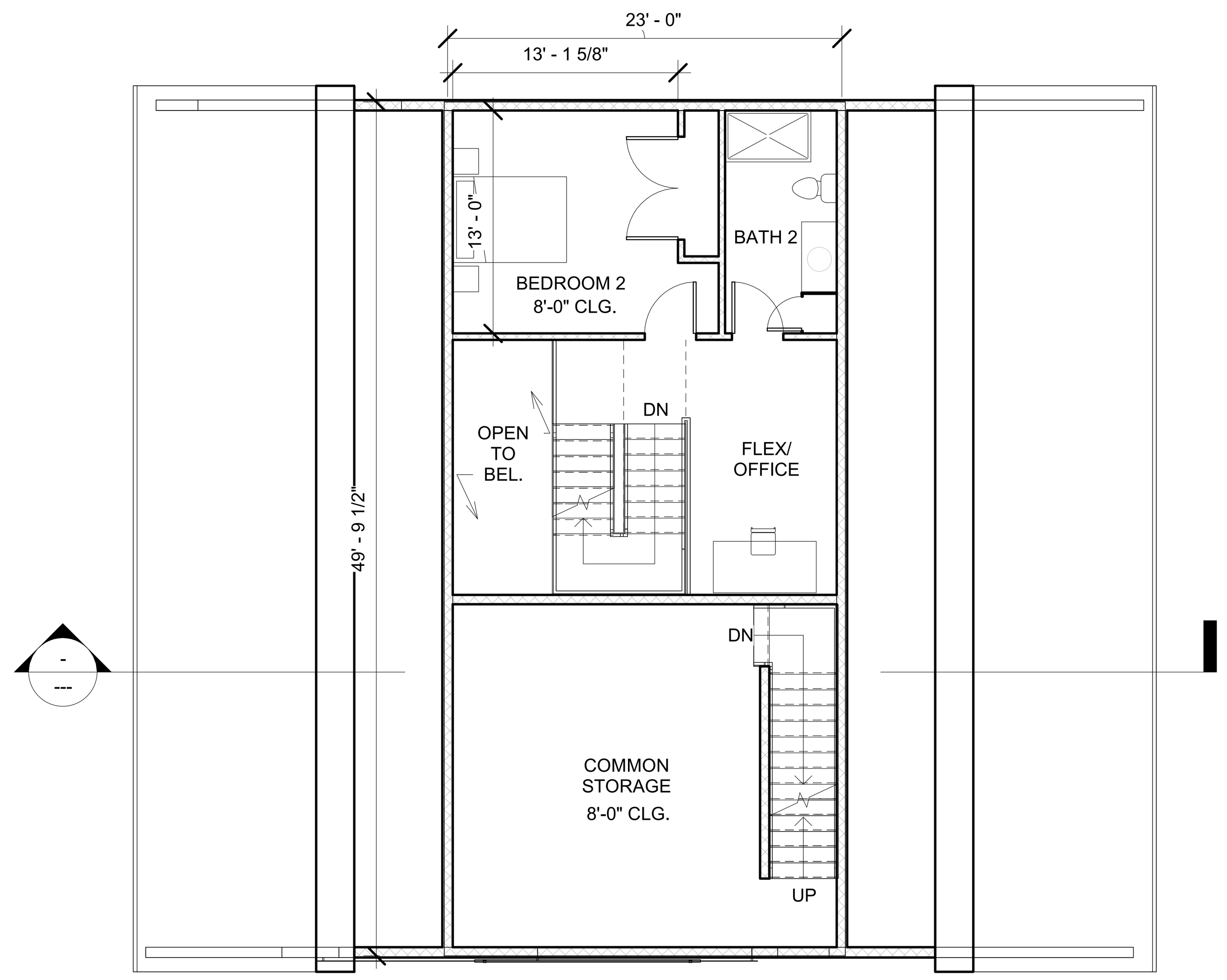
1:4,514

0	0.03	0.06	0.11 mi
0	0.04	0.09	0.18 km

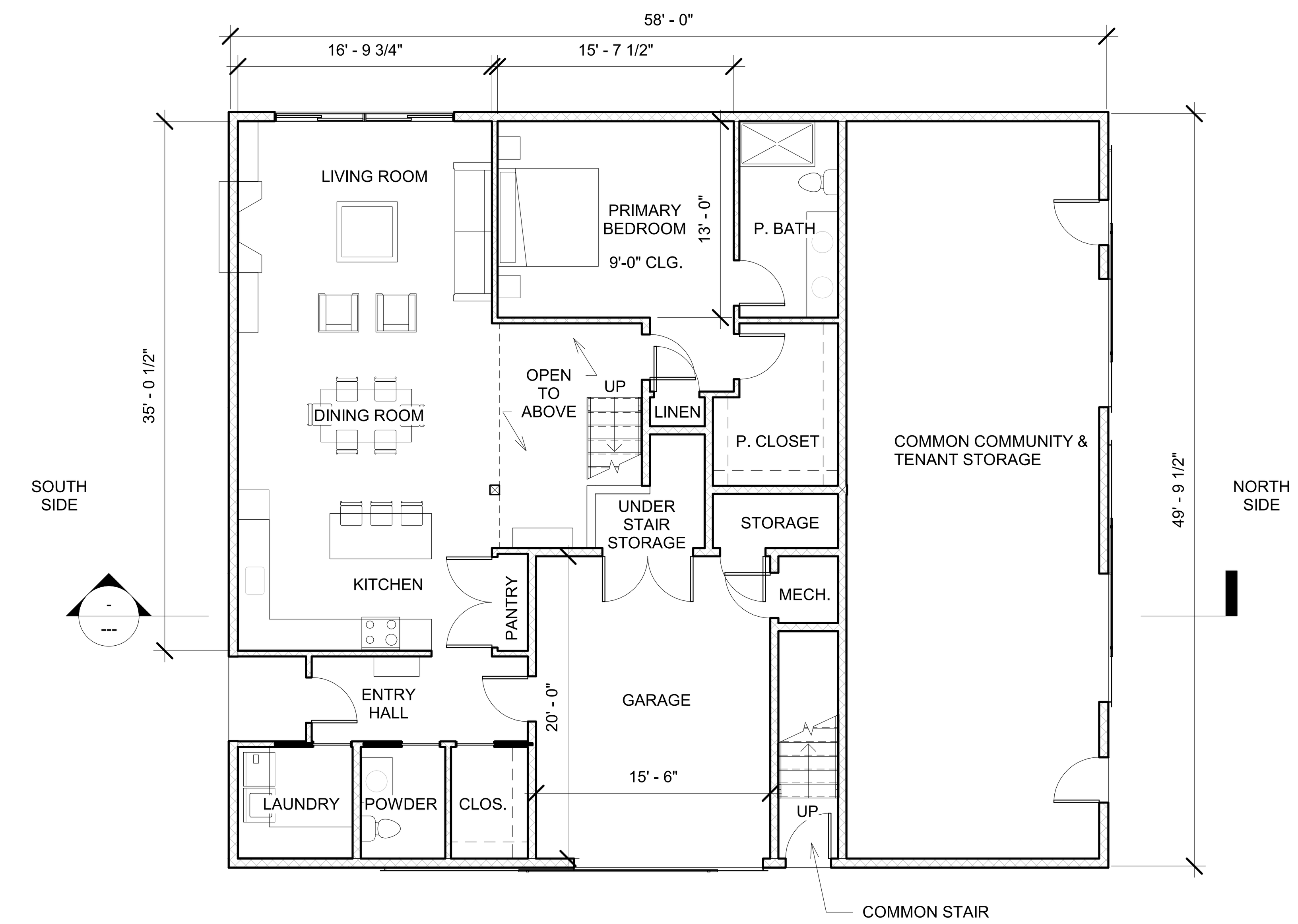
Esri Community Maps Contributors, MassGIS, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, Maxar

Summary

Name	Count	Area(acres)	Length(mi)
Atlantic Sturgeon	0	0	N/A
Shortnose Sturgeon	0	0	N/A
Atlantic Salmon	0	0	N/A
Sea Turtles	0	0	N/A
Atlantic Large Whales	0	0	N/A
In or Near Critical Habitat	0	0	N/A



2 Second Floor Plan
1/8" = 1'-0"



1 First Floor Plan
1/8" = 1'-0"

SAIL ARCHITECTS

289 St GEORGE STREET, STE. 210, DUXBURY, MA, 02332
PHONE:617-675-3200, EMAIL:INFO@SAILARCHITECTS
SAILARCHITECTS.COM

74 CONGRESS STREET, PEMBROKE MA

No.	Description	Date

BARN AT 74 CONGRESS
RENOVATION

Floor Plans

Project number	2226
Date	2/27/2023
Drawn by	ARV
Checked by	Checker

A1

Scale	1/8" = 1'-0"

3/17/2023 8:46:00 AM

CULTEC Recharger® 150XLHD Stormwater Chamber

The Recharger® 150XLHD is an 18.5" (470 mm) tall, lower profile chamber and is typically used for installations with depth restrictions or when a larger infiltrative area is required. The Recharger® 150XLHD has the side portal internal manifold feature. HVLV® FC-24 Feed Connectors are inserted into the side portals to create the internal manifold.

Size (L x W x H)	11' x 33" x 18.5" 3.35 m x 838 mm x 470 mm
Installed Length	10.25' 3.12 m
Length Adjustment per Run	0.75' 0.23 m
Chamber Storage	2.65 ft^3/ft 0.25 m^3/m 27.16 ft^3/unit 0.77 m^3/unit
Min. Installed Storage	4.89 ft^3/ft 0.45 m^3/m 50.17 ft^3/unit 1.42 m^3/unit
Min. Area Required	33.31 ft^2 3.09 m^2
Chamber Weight	51.0 lbs 23.13 kg
Shipping	34 chambers/skid 1,860 lbs/skid 12 skids/48' flatbed
Min. Center-to-Center Spacing	3.25' 0.99 m
Max. Allowable Cover	12' 3.66 m
Max. Inlet Opening in End Wall	12" HDPE, 15" PVC 300 mm HDPE, 375 mm PVC
Max. Allowable O.D. in Side Portal	10" HDPE, 10" PVC 250 mm HDPE, 250 mm PVC
Compatible Feed Connector	HVLV FC-24 Feed Connector

Calculations are based on installed chamber length.
All above values are nominal.
Min. installed storage includes 6" (152 mm) stone base, 6" (152 mm) stone above crown of chamber and typical stone surround at 39"(991 mm) center-to-center spacing.

	Stone Foundation Depth		
	6"	12"	18"
	152 mm	305 mm	457 mm
Chamber and Stone Storage Per Chamber	50.17 ft^3 1.42 m^3	56.83 ft^3 1.61 m^3	63.49 ft^3 1.80 m^3
Min. Effective Depth	2.54' 0.77 m	3.04' 0.93 m	3.54' 1.08 m
Stone Required Per Chamber	2.13 yd^3 1.63 m^3	2.75 yd^3 2.10 m^3	3.36 yd^3 2.57 m^3

Calculations are based on installed chamber length.
Includes 6" (305 mm) stone above crown of chamber and typical stone surround at 39"(991 mm) center-to-center spacing and stone foundation as listed in table.
Stone void calculated at 40%.

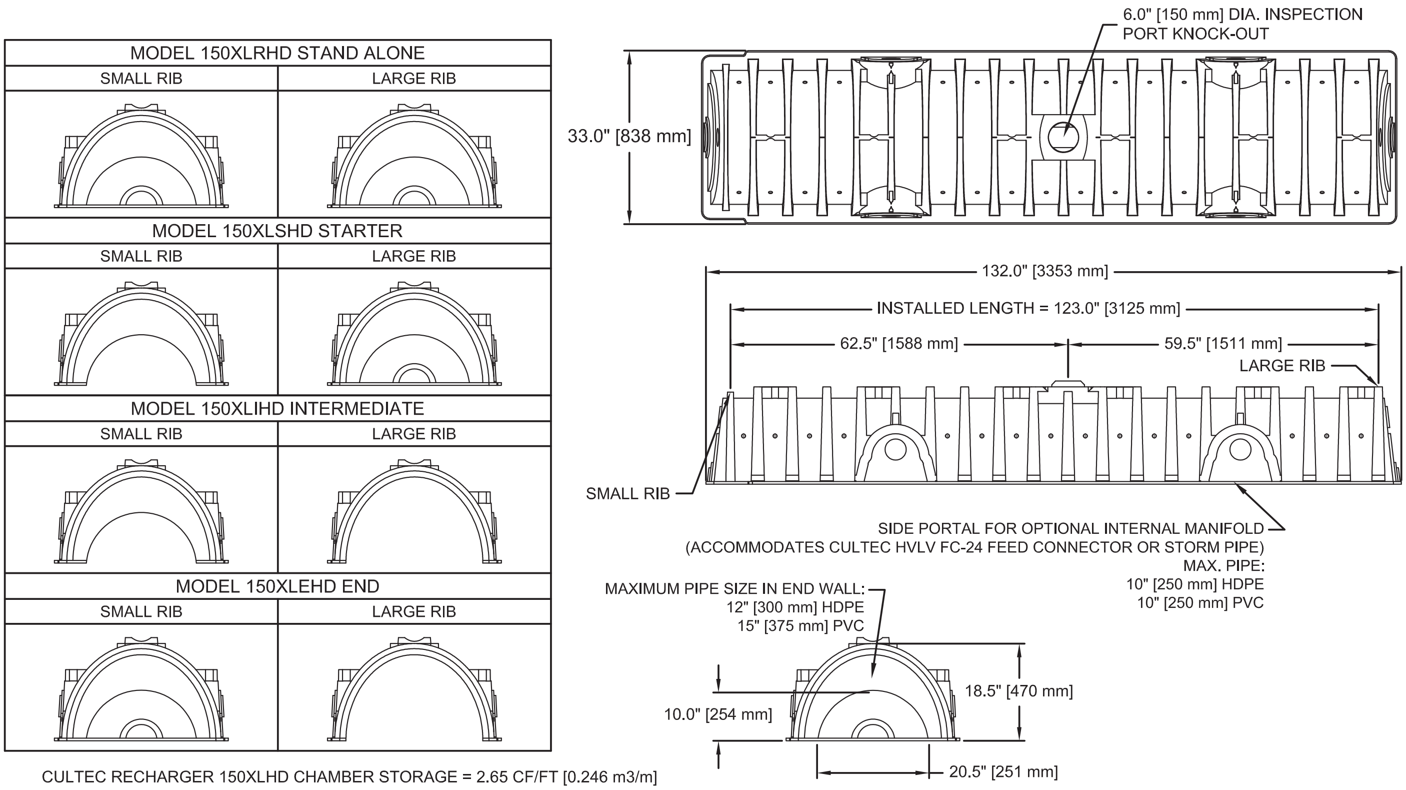
Recharger® 150XLHD Bare Chamber Storage Volumes

Elevation		Incremental Storage Volume				Cumulative Storage	
in.	mm	ft^3/ft	m^3/m	ft^3	m^3	ft^3	m^3
18.5	470	0.006	0.001	0.062	0.002	27.193	0.770
18	457	0.010	0.001	0.103	0.003	27.132	0.768
17	432	0.032	0.003	0.328	0.009	27.029	0.765
16	406	0.077	0.007	0.789	0.022	26.701	0.756
15	381	0.102	0.009	1.046	0.030	25.912	0.734
14	356	0.119	0.009	1.220	0.035	24.867	0.704
13	330	0.134	0.011	1.374	0.039	23.647	0.670
12	305	0.146	0.012	1.497	0.042	22.273	0.631
11	279	0.156	0.014	1.599	0.045	20.777	0.588
10	254	0.165	0.015	1.691	0.048	19.178	0.543
9	229	0.172	0.016	1.763	0.050	17.487	0.495
8	203	0.179	0.017	1.835	0.052	15.724	0.445
7	178	0.184	0.017	1.886	0.053	13.889	0.393
6	152	0.188	0.017	1.927	0.055	12.003	0.340
5	127	0.191	0.018	1.958	0.055	10.076	0.285
4	102	0.193	0.018	1.978	0.056	8.118	0.230
3	76	0.195	0.018	1.999	0.057	6.140	0.174
2	51	0.197	0.018	2.019	0.057	4.141	0.117
1	25	0.207	0.019	2.122	0.060	2.122	0.060
Total		**2.650**	**0.246**	**27.193**	**0.770**	**27.193**	**0.770**

Calculations are based on installed chamber length.

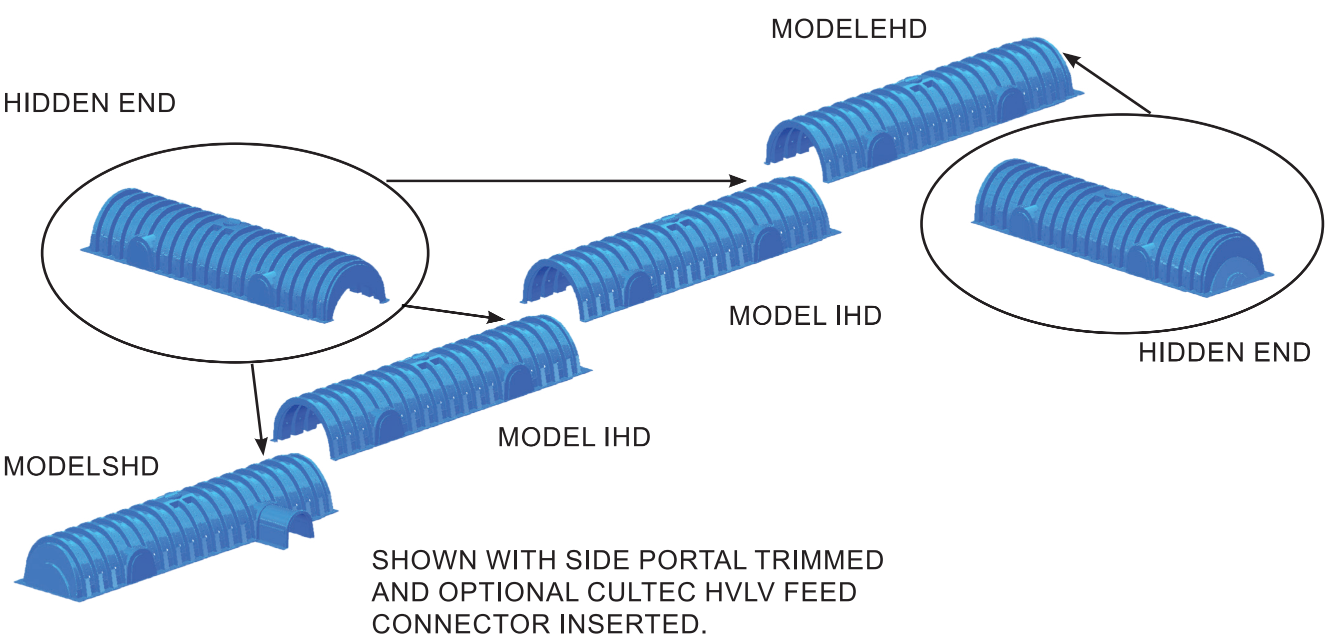
Visit www.cultec.com/downloads.html
for Product Downloads and CAD details.

Three View Drawing

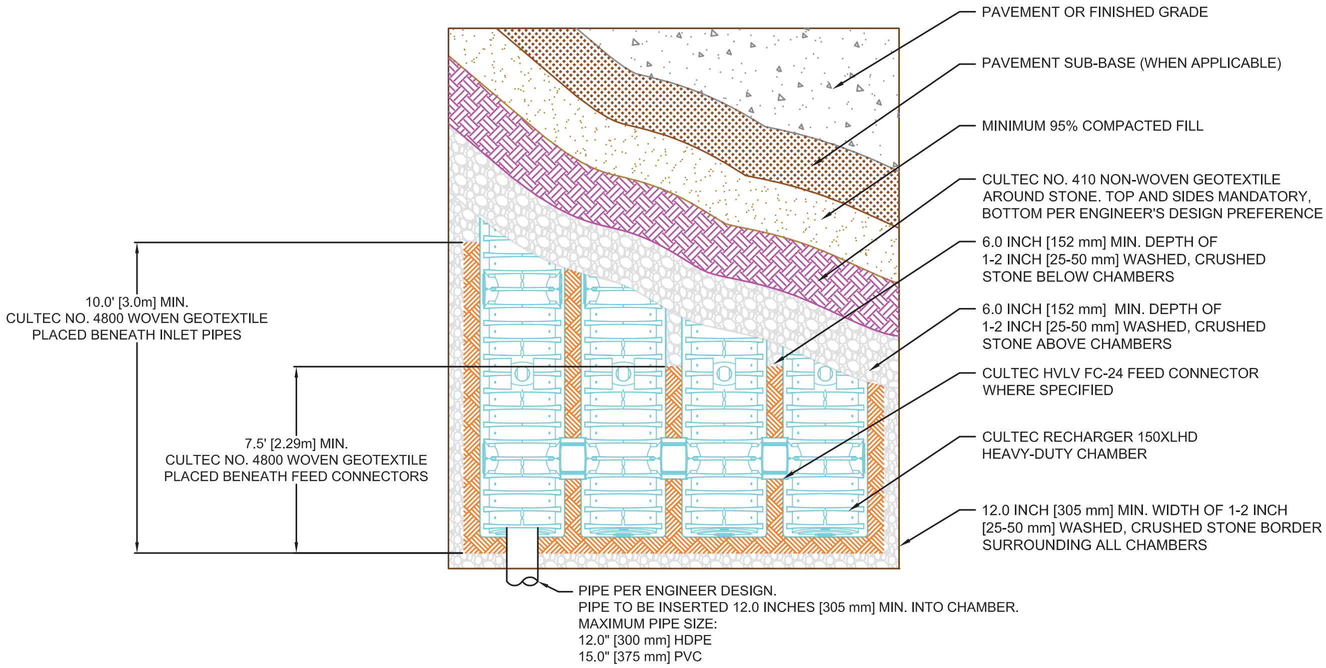


CULTEC RECHARGER 150XLHD CHAMBER STORAGE = 2.65 CF/FT [0.246 m3/m]
INSTALLED LENGTH ADJUSTMENT = 0.75' [0.23 m]

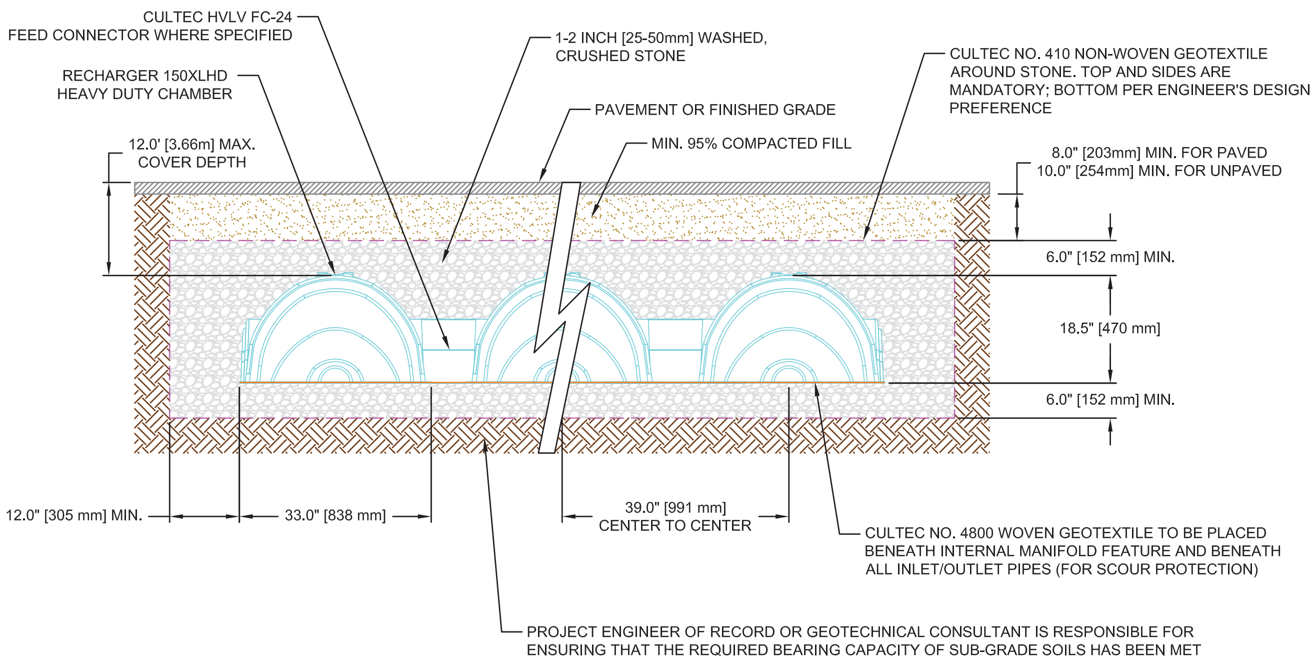
Typical Interlock Installation



Plan View Drawing



Typical Cross Section for Traffic Application



CULTEC Recharger® 150XLHD Specifications

GENERAL

CULTEC Recharger® 150XLHD chambers are designed for underground stormwater management. The chambers may be used for retention, recharging, detention or controlling the flow of on-site stormwater runoff.

CHAMBER PARAMETERS

1. The chambers shall be manufactured in the U.S.A. by CULTEC, Inc. of Brookfield, CT (cultec.com, 203-775-4416).
2. The chamber shall be vacuum thermoformed of polyethylene with a black interior and blue exterior.
3. The chamber shall be arched in shape.
4. The chamber shall be open-bottomed.
5. The chamber shall be joined using an interlocking overlapping rib method. Connections must be fully shouldered overlapping ribs, having no separate couplings or separate end walls.
6. The nominal chamber dimensions of the CULTEC Recharger® 150XLHD shall be 18.5 inches (470 mm) tall, 33 inches (838 mm) wide and 11 feet (3.35 m) long. The installed length of a joined Recharger® 150XLHD shall be 10.25 feet (3.12 m).
7. Maximum inlet opening on the chamber end wall is 12 inches (300 mm) HDPE and 15 inches (375 mm) PVC.
8. The chamber shall have two side portals to accept CULTEC HVLV® FC-24 Feed Connectors to create an internal manifold. The nominal I.D. dimensions of each side portal shall be 8.5 inches (216 mm) high by 12 inches (304 mm) wide. Maximum allowable O.D. in the side portal is 10 inches (250 mm) HDPE, PVC.
9. The nominal chamber dimensions of the CULTEC HVLV® FC-24 Feed Connector shall be 12 inches (305 mm) tall, 16 inches (406 mm) wide and 24.2 inches (615 mm) long.
10. The nominal storage volume of the Recharger® 150XLHD chamber shall be 2.650 ft^3 / ft (0.246 m^3 / m) - without stone. The nominal storage volume of a single Recharger 150XLRHD Stand Alone unit shall be 29.15 ft^3 (0.83 m^3) - without stone. The nominal storage volume of a joined Recharger® 150XLIHD Intermediate unit shall be 27.16 ft^3 (0.77 m^3) - without stone. The nominal storage volume of the length adjustment amount per run shall be 1.99 ft^3 (0.18 m^3) - without stone.
11. The nominal storage volume of the HVLV® FC-24 Feed Connector shall be 0.913 ft^3 / ft (0.085 m^3 / m) - without stone.
12. The Recharger® 150XLHD chamber shall have thirty discharge holes bored into the sidewalls of the unit's core to promote lateral conveyance of water.
13. The Recharger® 150XLHD chamber shall have 20 corrugations.
14. The end wall of the chamber, when present, shall be an integral part of the continuously formed unit. Separate end plates cannot be used with this unit.
15. The Recharger® 150XLRHD Stand Alone unit must be formed as a whole chamber having two fully formed integral end walls and having no separate end plates or separate end walls.
16. The Recharger® 150XLSHD Starter unit must be formed as a whole chamber having one fully formed integral end wall and one partially formed integral end wall with a lower transfer opening of 10 inches (254 mm) high x 20.5 inches (521 mm) wide.
17. The Recharger® 150XLIHD Intermediate unit must be formed as a whole chamber having one fully open end wall and one partially formed integral end wall with a lower transfer opening of 10 inches (254 mm) high x 20.5 inches (521 mm) wide.
18. The Recharger® 150XLEHD End unit must be formed as a whole chamber having one fully formed integral end wall and one fully open end wall and having no separate end plates or end walls.
19. The HVLV® FC-24 Feed Connector must be formed as a whole chamber having two open end walls and having no separate end plates or separate end walls. The unit shall fit into the side portals of the Recharger® 150XLHD and act as cross feed connections.
20. Chambers must have horizontal stiffening flex reduction steps between the ribs.
21. The chamber shall have a raised integral cap at the top of the arch in the center of each unit to be used as an optional inspection port or clean-out.
22. The units may be trimmed to custom lengths by cutting back to any corrugation on the large rib end.
23. The chamber shall be manufactured in an ISO 9001:2015 certified facility.
24. The chamber shall be designed and manufactured to meet the material and structural requirements of IAPMO PS 63-2019, including resistance to AASHTO H-10 and H-20 highway live loads, when installed in accordance with CULTEC's installation instructions.
25. The chamber shall be designed and manufactured in accordance with the specifications of NSAI Irish Agrement Board Certificate for Cultec Attenuation and Infiltration.
26. Maximum allowable cover over the top of the chamber shall be 12' (3.66 m).
27. The chamber shall be designed to withstand traffic loads when installed according to CULTEC's recommended installation instructions.