DRAINAGE REPORT

Site plan for
Proposed Day Care Facility
Map 2, Lot 151-2-4
Iron Horse Drive
Fremont, NH

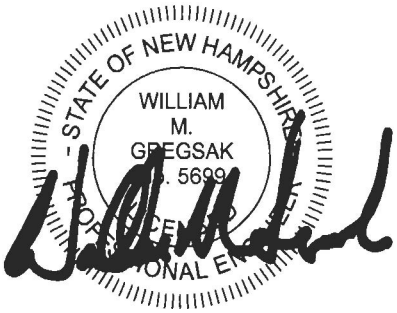
Prepared for:

Play Laugh N Grow Childcare & Preschool
9 Essex Drive
Raymond, NH 03077

Prepared by:

Gregsak & Sons, Inc.
Engineers, Architects & Construction Managers
P.O. Box 271
Chester, New Hampshire 03036
603-887-6979
www.gregsak.com

June 28, 2023



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APPLICATION DOCUMENTS:

Copy of Signed Application
Copy of check
Copy of Proof of Town Delivery
Copy of USGS map
Narrative and Drainage Summary Table
Web GIS OneStop printouts
NHB Datacheck letter
NRCS Web soil Survey
Aerial photograph
Site photos
GRV calculation worksheet
BMP worksheets for Infiltration Recharge Basin
Rainfall Amount chart
Drainage Analysis (HydroCad)
Riprap sizing calculation worksheet
Site Specific Soils Report
Test Pit data
Infiltration Feasibility Report
Inspection and Maintenance Manual

PLANS:

BMP Maintenance Plan
Color coded Pre Development soils plan 11 x 17
Color coded Post Development soils plan 11 x 17
Pre Development Drainage Plan 22 x 34
Post Development Drainage Plan 22 x 34
One set of Design Plans *(separate – not bound within this report)*

ALTERATION OF TERRAIN PERMIT APPLICATION

Water Division/ Alteration of Terrain Bureau/ Land Resources Management
Check the Status of your Application: www.des.nh.gov/onestop

RSA/ Rule: RSA 485-A:17, Env-Wq 1500

Administrative Use Only	Administrative Use Only	Administrative Use Only	File Number:
			Check No.
			Amount:
			Initials:

1. APPLICANT INFORMATION (INTENDED PERMIT HOLDER)		
Applicant Name: Play Laugh & Grow Childcare & Preschoo, LLCl	Contact Name: Kevin DEcesare	
Email: wgregsak@gregsak.com	Daytime Telephone: 603-235-2667	
Mailing Address: 9 Essex Drive		
Town/City: Raymond	State: NH	Zip Code: 03077
2. APPLICANT'S AGENT INFORMATION If none, check here: ☒		
Business Name:	Contact Name:	
Email:	Daytime Telephone:	
Address:		
Town/City:	State:	Zip Code:
3. PROPERTY OWNER INFORMATION (IF DIFFERENT FROM APPLICANT)		
Applicant Name: Same	Contact Name:	
Email:	Daytime Telephone:	
Mailing Address:		
Town/City:	State:	Zip Code:
4. PROPERTY OWNER'S AGENT INFORMATION If none, check here: ☒		
Business Name:	Contact Name:	
Email:	Daytime Telephone:	
Address:		
Town/City:	State:	Zip Code:
5. CONSULTANT INFORMATION If none, check here: ☐		
Engineering Firm: Gregsak & Sons, Inc.	Contact Name: William Gregsak, PE	
Email: wgregsak@gregsak.com	Daytime Telephone: 603-887-6979	
Address: P.O. Box 271		
Town/City: Chester	State: NH	Zip Code: 03036

6. PROJECT TYPE

☐ Excavation Only ☐ Residential ☒ Commercial ☐ Golf Course ☐ School ☐ Municipal
☐ Agricultural ☐ Land Conversion ☐ Other:

7. PROJECT LOCATION INFORMATION

Project Name: Play Laugh N Grow Childcare & Preschool

Street/Road Address: Iron Horse Drive

Town/City: Fremont | County: Rockingham

Tax Map: 2 | Block: | Lot Number: 151-2-4 | Unit:

Location Coordinates: 42.9793/-71.1227 ☒ Latitude/Longitude ☐ UTM ☐ State Plane

Post-development, will the proposed project withdraw from or directly discharge to any of the following? If yes, identify the purpose.

1. Stream or Wetland Purpose:	☐ Yes ☒ No	☐ Withdrawal	☐ Discharge
2. Man-made pond created by impounding a stream or wetland Purpose:	☐ Yes ☒ No	☐ Withdrawal	☐ Discharge
3. Unlined pond dug into the water table Purpose:	☐ Yes ☒ No	☐ Withdrawal	☐ Discharge

Post-development, will the proposed project discharge to:

- A surface water impaired for phosphorus and/or nitrogen? ☒ No ☐ **Yes - include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen**
- A Class A surface water or Outstanding Resource Water? ☒ No ☐ **Yes - include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen**
- A lake or pond not covered previously? ☒ No ☐ **Yes - include information to demonstrate that project will not cause net increase in phosphorus in the lake or pond**

Is the project a High Load area? ☐ Yes ☒ No
If yes, specify the type of high load land use or activity: _____

Is the project within a Water Supply Intake Protection Area (WSIPA)? ☐ Yes ☒ No
Is the project within a Groundwater Protection Area (GPA)? ☐ Yes ☒ No
Will the well setbacks identified in Env-Wq 1508.02 be met? ☐ Yes ☒ No

Note: Guidance document titled "*Using NHDES's OneStop WebGIS to Locate Protection Areas*" is available online. For more details on the restrictions in these areas, read Chapter 3.1 in Volume 2 of the NH Stormwater Manual.

Is any part of the property within the 100-year floodplain? ☒ Yes ☐ No
If yes: Cut volume: 0 cubic feet within the 100-year floodplain
Fill volume: 0 cubic feet within the 100-year floodplain

☐ Project **IS** within **¼ mile of a designated river** Name of River:
☒ Project is **NOT** within ¼ mile of a designated river

☐ Project **IS** within **a Coastal/Great Bay Region community - include info required by Env-Wq 1503.08(l) if applicable**
☒ Project is **NOT** within a Coastal/Great Bay Region community

8. BRIEF PROJECT DESCRIPTION (PLEASE DO NOT REPLY "SEE ATTACHED")

Proposal is to develop an existing lot in "iron Horse Park". The purpose is to construct a child daycare and preschool facility with parking and an outdoor play area. Proposed is allowed under current town zoning regulations

9. IF APPLICABLE, DESCRIBE ANY WORK STARTED PRIOR TO RECEIVING PERMIT

No work has been started on the subject lot

10. ADDITIONAL REQUIRED INFORMATION

A. Date a copy of the application was sent to the municipality as required by Env-Wq 1503.05(e)[1]: __/__/____.

(Attach proof of delivery)

B. Date a copy of the application was sent to the local river advisory committee if required by Env-Wq 1503.05(e)[2]: __/__/N/A.

(Attach proof of delivery)

C. Type of plan required: ☐ Land Conversion ☒ Detailed Development ☐ Excavation, Grading & Reclamation ☐ Steep Slope

D. Additional plans required: ☒ Stormwater Drainage & Hydrologic Soil Groups ☐ Source Control ☐ Chloride Management

E. Total area of disturbance: 72450 square feet

F. Additional impervious cover as a result of the project: 17,551 square feet (use the "-" symbol to indicate a net reduction in impervious coverage).

Total final impervious cover: 17551 square feet

G. Total undisturbed cover: 102314 square feet

H. Number of lots proposed: 0

I. Total length of roadway: N/A linear feet

J. Name(s) of receiving water(s): Exeter River

K. Identify all other NHDES permits required for the project, and for each indicate whether an application has been filed and is pending, or if the required approval has been issued provide the permit number, registration date, or approval letter number, as applicable.

Type of Approval	Application Filed?	Status	
		Pending	If Issued:
1. Water Supply Approval	☐ Yes ☐ No ☒ N/A	☐	Permit number:
2. Wetlands Permit	☐ Yes ☐ No ☒ N/A	☐	Permit number:
3. Shoreland Permit	☐ Yes ☐ No ☒ N/A	☐	Permit number:
4. UIC Registration	☐ Yes ☐ No ☒ N/A	☐	Registration date:
5. Large/Small Community Well Approval	☐ Yes ☐ No ☒ N/A	☐	Approval letter date:
6. Large Groundwater Withdrawal Permit	☐ Yes ☐ No ☒ N/A	☐	Permit number:
7. Other:	☐ Yes ☐ No	☐	Permit number:

L. List all species identified by the Natural Heritage Bureau as threatened or endangered or of concern: Blandings Turtle & Spotted Turtle

M. Using NHDES's Web GIS OneStop program (www2.des.state.nh.us/gis/onestop/), with the Surface Water Impairment layer turned on, list the impairments identified for each receiving water. If no pollutants are listed, enter "N/A."

N/A

N. Did the applicant/applicant's agent have a pre-application meeting with AOT staff? ☐ Yes ☒ No

If yes, name of staff member:

O. Will blasting of bedrock be required? ☐ Yes ☒ No If yes, estimated quantity of blast rock: _____ cubic yards

If yes, standard blasting BMP notes must be placed on the plans, available at:
http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-10-12.pdf

NOTE: If greater than 5,000 cubic yards of blast rock will be generated, a groundwater monitoring program must be developed and submitted to NHDES. Contact AOT staff for additional detail.

[1] Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the governing body of each municipality in which the project is proposed.

[2] Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the Local River Advisory Committee, if the project is within ¼ mile of a designated river.

11. CHECK ALL APPLICATION ATTACHMENTS THAT APPLY (SUBMIT WITH APPLICATION IN ORDER LISTED)

LOOSE:

- ☒ Signed application form: des.nh.gov/organization/divisions/water/aot/index.htm (with attached proof(s) of delivery)
- ☒ Check for the application fee: des.nh.gov/organization/divisions/water/aot/fees.htm
- ☒ Color copy of a USGS map with the property boundaries outlined (1" = 2,000' scale)
- ☐ If Applicant is not the property owner, proof that the applicant will have a legal right to undertake the project on the property if a permit is issued to the applicant.

BIND IN A REPORT IN THE FOLLOWING ORDER:

- ☒ Copy of the signed application form & application checklist (des.nh.gov/organization/divisions/water/aot/index.htm)
- ☒ Copy of the check
- ☒ Copy of the USGS map with the property boundaries outlined (1" = 2,000' scale)
- ☒ Narrative of the project with a summary table of the peak discharge rate for the off-site discharge points
- ☒ Web GIS printout with the "Surface Water Impairments" layer turned on - http://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx
- ☒ Web GIS printouts with the AOT screening layers turned on - http://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx
- ☒ NHB letter using DataCheck Tool – www.nhdfl.org/about-forests-and-lands/bureaus/natural-heritage-bureau/
- ☒ The Web Soil Survey Map with project's watershed outlined – websoilsurvey.nrcs.usda.gov
- ☒ Aerial photograph (1" = 2,000' scale with the site boundaries outlined)
- ☒ Photographs representative of the site
- ☒ Groundwater Recharge Volume calculations (one worksheet for each permit application): des.nh.gov/organization/divisions/water/aot/documents/bmp_worksh.xls
- ☒ BMP worksheets (one worksheet for each treatment system): des.nh.gov/organization/divisions/water/aot/documents/bmp_worksh.xls
- ☒ Drainage analysis, stamped by a professional engineer (see Application Checklist for details)
- ☒ Riprap apron or other energy dissipation or stability calculations
- ☒ Site Specific Soil Survey report, stamped and with a certification note prepared by the soil scientist that the survey was done in accordance with the Site Specific Soil Mapping standards, *Site-Specific Soil Mapping Standards for NH & VT, SSSNNE Special Publication No. 3*.
- ☒ Infiltration Feasibility Report (example online) [Env-Wq 1503.08(f)(3)]
- ☐ Registration and Notification Form for Storm Water Infiltration to Groundwater (UIC Registration-for underground systems only, including drywells and trenches): (http://des.nh.gov/organization/divisions/water/dwgb/dwspp/gw_discharge)
- ☒ Inspection and maintenance manual with, if applicable, long term maintenance agreements [Env-Wq 1503.08(g)]
- ☐ Source control plan

PLANS:

- ☒ One set of design plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)
- ☒ Pre & post-development color coded soil plans on 11" x 17" (see Application Checklist for details)
- ☒ Pre & post-development drainage area plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)

100-YEAR FLOODPLAIN REPORT:

- ☐ All information required in Env-Wq 1503.09, submitted as a separate report.

ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE

- ☐ See Checklist for Details

☐ **REVIEW APPLICATION FOR COMPLETENESS & CONFIRM INFORMATION LISTED ON THE APPLICATION IS INCLUDED WITH SUBMITTAL.**

12. REQUIRED SIGNATURES

_____ By initialing here, I acknowledge that I am required by Env-Wq 1503.20(e) to submit a copy of all approved documents to the department in PDF format on a CD within one week after permit approval.

By signing below, I certify that:

- The information contained in or otherwise submitted with this application is true, complete, and not misleading to the best of my knowledge and belief;
- I understand that the submission of false, incomplete, or misleading information constitutes grounds for the department to deny the application, revoke any permit that is granted based on the information, and/or refer the matter to the board of professional engineers established by RSA 310-A:3 if I am a professional engineer; and
- I understand that I am subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641.

☐ **APPLICANT** ☐ **APPLICANT'S AGENT**:

Signature:_____ Date: _____

Name (print or type): _____ Title: _____

☑ PROPERTY OWNER ☐ PROPERTY OWNER'S AGENT:

Signature:_____ Date: 8-9-23

Name (print or type): Kevin Delosare Title: owner

ATTACHMENT A:
ALTERATION OF TERRAIN PERMIT APPLICATION CHECKLIST

Check the box to indicate the item has been provided or provide an explanation why the item does not apply.

DESIGN PLANS

- ☐ Plans printed on 34 - 36" by 22 - 24" white paper
- ☐ PE stamp
- ☐ Wetland delineation
- ☐ Temporary erosion control measures
- ☐ Treatment for all stormwater runoff from impervious surfaces such as roadways (including gravel roadways), parking areas, and non-residential roof runoff. Guidance on treatment BMPs can be found in Volume 2, Chapter 4 of the NH Stormwater Management Manual.
- ☐ Pre-existing 2-foot contours
- ☐ Proposed 2-foot contours
- ☐ Drainage easements protecting the drainage/treatment structures
- ☐ Compliance with the Wetlands Bureau, RSA 482- A http://des.nh.gov/organization/divisions/water/wetlands/index.htm. Note that artificial detention in wetlands is not allowed.
- ☐ Compliance with the Comprehensive Shoreland Protection Act, RSA 483-B. http://des.nh.gov/organization/divisions/water/wetlands/cspa
- ☐ Benches. Benching is needed if you have more than 20 feet change in elevation on a 2:1 slope, 30 feet change in elevation on a 3:1 slope, 40 feet change in elevation on a 4:1 slope.
- ☐ Check to see if any proposed ponds need state Dam permits. http://des.nh.gov/organization/divisions/water/dam/documents/damdef.pdf

DETAILS

- ☐ Typical roadway x-section
- ☐ Detention basin with inverts noted on the outlet structure
- ☐ Stone berm level spreader
- ☐ Outlet protection – riprap aprons
- ☐ A general installation detail for an erosion control blanket
- ☐ Silt fences or mulch berm
- ☐ Storm drain inlet protection. Note that since hay bales must be embedded 4 inches into the ground, they are not to be used on hard surfaces such as pavement.
- ☐ Hay bale barriers
- ☐ Stone check dams
- ☐ Gravel construction exit
- ☐ Temporary sediment trap
- ☐ The treatment BMP's proposed
- ☐ Any innovative BMP's proposed

CONSTRUCTION SEQUENCE/EROSION CONTROL

☐ Note that the project is to be managed in a manner that meets the requirements and intent of RSA 430:53 and Chapter Agr 3800 relative to invasive species.

☐ Note that perimeter controls shall be installed prior to earth moving operations.

☐ Note that temporary water diversion (swales, basins, etc) must be used as necessary until areas are stabilized.

☐ Note that ponds and swales shall be installed early on in the construction sequence (before rough grading the site).

☐ Note that all ditches and swales shall be stabilized prior to directing runoff to them.

☐ Note that all roadways and parking lots shall be stabilized within 72 hours of achieving finished grade.

☐ Note that all cut and fill slopes shall be seeded/loamed within 72 hours of achieving finished grade

☐ Note that all erosion controls shall be inspected weekly AND after every half-inch of rainfall.

☐ Note the limits on the open area allowed, see Env-Wq 1505.02 for detailed information.

Example note: The smallest practical area shall be disturbed during construction, but in no case shall exceed 5 acres at any one time before disturbed areas are stabilized.

☐ Note the definition of the word "stable"

Example note: An area shall be considered stable if one of the following has occurred:

- Base course gravels have been installed in areas to be paved.
- A minimum of 85 percent vegetated growth has been established.
- A minimum of 3 inches of non-erosive material such stone or riprap has been installed.
- Or, erosion control blankets have been properly installed.

☐ Note the limit of time an area may be exposed
Example note: All areas shall be stabilized within 45 days of initial disturbance.

☐ Provide temporary and permanent seeding specifications. (Reed canary grass is listed in the Green Book; however, this is a problematic species according to the Wetlands Bureau and therefore should not be specified)

☐ Provide winter construction notes that meet or exceed our standards.

Standard Winter Notes:

- All proposed vegetated areas that do not exhibit a minimum of 85 percent vegetative growth by October 15, or which are disturbed after October 15, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting, elsewhere. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events.
- All ditches or swales which do not exhibit a minimum of 85 percent vegetative growth by October 15, or which are disturbed after October 15, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions.
- After October 15, incomplete road or parking surfaces, where work has stopped for the winter season, shall be protected with a minimum of 3 inches of crushed gravel per NHDOT item 304.3.

☐ Note at the end of the construction sequence that "Lot disturbance, other than that shown on the approved plans, shall not commence until after the roadway has the base course to design elevation and the associated drainage is complete and stable." – This note is applicable to single/duplex family subdivisions, when lot development is not part of the permit.

DRAINAGE ANALYSES

Please double-side 8 ½" × 11" sheets where possible but, **do not** reduce the text such that more than one page fits on one side.

☐ PE stamp

☐ Rainfall amount obtained from the Northeast Regional Climate Center- http://precip.eas.cornell.edu/. Include extreme precipitation table as obtained from the above referenced website.

☐ Drainage analyses, in the following order:

- Pre-development analysis: Drainage diagram.
- Pre-development analysis: Area Listing and Soil Listing.
- Pre-development analysis: Node listing 1-year (if applicable), 2-year, 10-year and 50-year.
- Pre-development analysis: Full summary of the 10-year storm.
- Post-development analysis: Drainage diagram.
- Post-development analysis: Area Listing and Soil Listing.
- Post-development analysis: Node listing for the 2-year, 10-year and 50-year.
- Post-development analysis: Full summary of the 10-year storm.

☐ Review the Area Listing and Soil Listing reports

- Hydrologic soil groups (HSG) match the HSGs on the soil maps provided.
- There is the same or less HSG A soil area after development (check for each HSG).
- There is the same or less "woods" cover in the post-development.
- Undeveloped land was assumed to be in "good" condition.
- The amount of impervious cover in the analyses is correct.

Note: A good check is to subtract the total impervious area used in the pre analysis from the total impervious area used in the post-analysis. For residential projects without demolition occurring, a good check is to take this change in impervious area, subtract out the roadway and divide the remaining by the number of houses/units proposed. Do these numbers make sense?

☐ Check the storage input used to model the ponds.

☐ Check to see if the artificial berms pass the 50-year storm, i.e., make sure the constructed berms on ponds are not overtopped.

☐ Check the outlet structure proposed and make sure it matches that modeled.

☐ Check to see if the total areas in the pre and post analyses are same.

☐ Confirm the correct NRCS storm type was modeled (Coos, Carroll & Grafton counties are Type II, all others Type III).

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PRE- AND POST-DEVELOPMENT DRAINAGE AREA PLANS

☐ Plans printed on 34 - 36" by 22 - 24" on white paper.

☐ Submit these plans separate from the soil plans.

☐ A north arrow.

☐ A scale.

☐ Labeled subcatchments, reaches and ponds.

☐ Tc lines.

☐ A clear delineation of the subcatchment boundaries.

☐ Roadway station numbers.

☐ Culverts and other conveyance structures.

PRE AND POST-DEVELOPMENT COLOR-CODED SOIL PLANS

☐ 11" × 17"sheets suitable, as long as it is readable.

☐ Submit these plans separate from the drainage area plans.

☐ A north arrow.

☐ A scale.

☐ Name of the soil scientist who performed the survey and date the soil survey took place.

☐ 2-foot contours (5-foot contours if application is for a gravel pit) as well as other surveyed features.

☐ Delineation of the soil boundaries and wetland boundaries.

☐ Delineation of the subcatchment boundaries.

☐ Soil series symbols (e.g., 26).

☐ A key or legend which identifies each soil series symbol and its associated soil series name (e.g., 26 = Windsor).

☐ The hydrologic soil group color coding (A = Green, B = yellow, C= orange, D=red, Water=blue, & Impervious = gray).

Please note that excavation projects (e.g., gravel pits) have similar requirements to that above, however the following are common exceptions/additions:

☐ Drainage report is not needed if site does not have off-site flow.

☐ 5 foot contours allowed rather than 2 foot.

☐ No PE stamp needed on the plans.

☐ Add a note to the plans that the applicant must submit to the Department of Environmental Services a written update of the project and revised plans documenting the project status every five years from the date of the Alteration of Terrain permit.

☐ Add reclamation notes.

See NRCS publication titled: *Vegetating New Hampshire Sand and Gravel Pits* for a good resource, it is posted online at: http://des.nh.gov/organization/divisions/water/aot/categories/publications.

ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE

☐ If project will discharge stormwater to a surface water impaired for phosphorus and/or nitrogen, include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen.

☐ If project will discharge stormwater to a Class A surface water or Outstanding Resource Water, include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen.

☐ If project will discharge stormwater to a lake or pond not covered previously, include information to demonstrate that project will not cause net increase in phosphorus in the lake or pond.

☐ If project is within a Coastal/Great Bay Region community, include info required by Env-Wq 1503.08(l) if applicable.

54-210/114

597

PLAY LAUGH N GROW CHILDCARE & PRESCHOOL
41 FREETOWN RD.
RAYMOND, NH 03077

DATE 8-10-23

PAY TO THE ORDER OF Treasurer State of NH $ 862.25

Eight Hundred sixty TWO — .25 DOLLARS

Heat Reactive Ink

PrimaryBank
207 Route 101, Bedford, NH 03110

MEMO Alteration Terrain

⑆011402105⑆ 221002472 21⑈ 0597

LOOK FOR FRAUD-DETERRING FEATURES INCLUDING THE SECURITY SQUARE AND HEAT-REACTIVE INK. DETAILS ON BACK.

© DELUXE deluxe.com/checks SAFETY PAPER HIGH SECURITY

To: Town of Fremont, NH

Date: _____

This is to certify that a copy of the NHDES submittal for the proposed "Day Care Facility" project on Tax Map 2 Lot 151-2-4 was delivered to the town as a record of the submission to NHDES Alteration of Terrain for review.

_____ _____

Town Official Signature Title

INTRODUCTION

This project is a proposed design for a children's day care facility. Proposed is a 7,456 s.f. building to be located on a 4.012 acre parcel along Iron Horse Drive in Fremont, NH, known as Tax Map 2 Lot 1-151-2-4. The lot will be serviced by an on-site well and septic system and underground public electrical utilities. Iron Horse Drive is a paved public roadway. The total area to be disturbed during construction of the site is approximately 72,450 SF. There are no proposed wetland impacts associated with the improvements.

The intent of this drainage report is to provide calculations for the proposed drainage improvements and evaluate pre and post development conditions in accordance with the Town of Fremont Subdivision Regulations and NHDES Alteration of Terrain requirements.

EXISTING CONDITIONS

The property is currently unoccupied and is predominantly cleared of vegetation. On average the slopes vary from 3% to 15%. The predominant soils on the property are 12-Hinckley and 313-Deerfield as derived from NRCS Web soil Survey, and a Site specific report has determined that the soils are a Hydrologic class B soil.

The property is located on the easterly side of Iron Horse Drive. There is one overall drainage area within the proposed developed area. This drainage area flows to the east and eventually into an existing wetland that flows to the southeast off the parcel.

PROPOSED IMPROVEMENTS

The proposed improvements for this development include the construction of one building, a paved parking area and open drainage methods. The proposed parking will have a finished paved surface. The drainage for the project is designed with open roadside swales leading to a recharge basin.

The drainage routing was designed to maintain existing storm-water runoff patterns. Storm-water flows were evaluated to ensure that post-development are flows would not exceed predevelopment flows. One (1) recharge/detention basin is proposed to mitigate the additional runoff.

METHODOLOGY:

The quantity of runoff and the conveyance of the flow through the site are determined using the software package HydroCAD r10.00.22 by HydroCAD Software Solutions, LLC. HydroCAD is a computer aided design program for modeling storm water hydrology based on the Soil Conservation Service (SCS) TR-20 method combined with standard hydraulics calculations used to model detention basins and culverts.

Storm water management systems are designed in accordance with the methodology for the "Best Management Practices" (BMP's), as outlined in the New Hampshire Storm water Manual, Volume 2.

DRAINAGE DESIGN:

In accordance with the Town of Fremont requirements, the two (2), ten (10) and fifty (50) year frequency storm events will be evaluated.

The proposed drainage system is designed as a self-contained system without any concentrated discharge points from the site.

Rainfall distribution: Type III.
2 year rainfall: 3.08 in.
10 year rainfall: 4.68 in.
50 year rainfall: 7.12 in.

DRAINAGE SUMMARY:

The following table is a summary of the attached calculations and shows a comparison of the peak flow rates at the outlet points for the site. The values presented are based on pre and post development conditions.

To mitigate the increased run-off from the site, this project has been designed to adequately reduce the rate of run-off from the site

Drainage Summary Table

STORMS	2 YEAR (CFS)	10 YEAR (CFS)	25 YEAR (CFS)	50 YEAR (CFS)
Location	PRE / POST / DIFF.	PRE / POST / DIFF.	PRE / POST / DIFF.	PRE / POST / DIFF.
POA 1	1.12 / 0.00 / -0.00	5.00 / 0.34 / -4.66	8.87 / 3.88 / -4.99	12.90 / 9.19 /-3.71

Drainage Summary Table

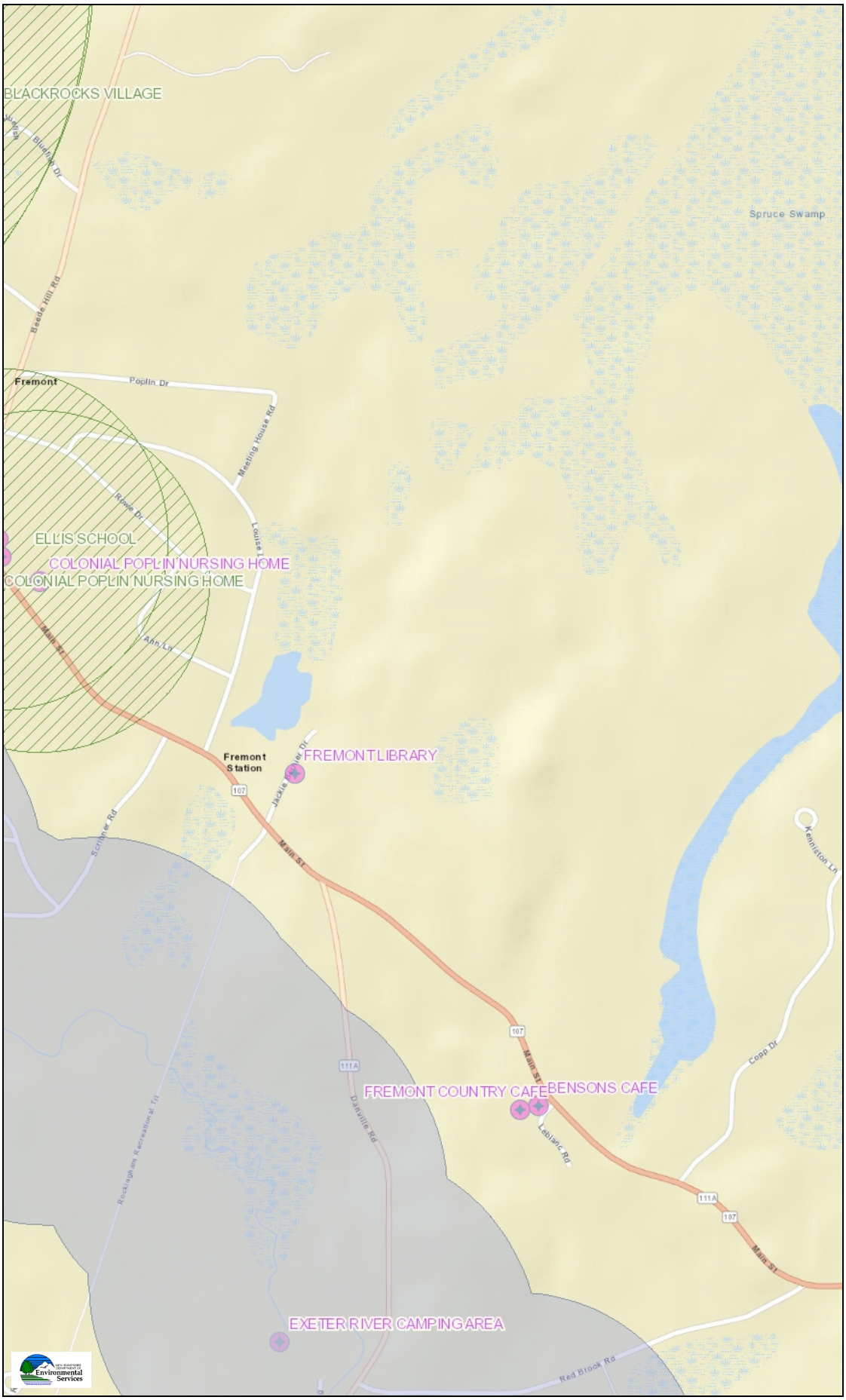
Storm water treatment is provided to improve water quality by the removal of sediments and pollutants from the run-off before discharging into the natural drainage systems. This project provides treatment by providing several “Best Management Practices” included in the design. And they are outlined in the “Storm Water Management and Erosion Control Handbook” by NHDES.

Erosion Control

Several “Best Management Practices” (BMP's) are proposed to minimize erosion control during construction and after construction is complete. The following BMP's are proposed for this project and are also designed in accordance with the “Storm Water Management and Erosion Control Handbook” by NHDES.

- Loaming and seeding
- Stone-lined swales
- Silt fence or mulch sock
- Stone check dams
- Proper construction sequencing

ROI project



Legend

- Coastal and Great Bay Regi Communities
- Designated Rivers Quarterm Buffer
- Public Water Supply Wells
- Groundwater Classification / GA1
- Groundwater Classification / GA2
- Water Supply Intake Protect Areas
- Wellhead Protection Areas
- Lakes with a Quarter Mile Bu
- All Features
- All Lakes, with a Quarter Mil Buffer
- Outstanding Resource Wate Watersheds
- Surface Waters with Impairn 2016 with Quarter Mile Buffe
- Watersheds with Chloride Impairments 2016

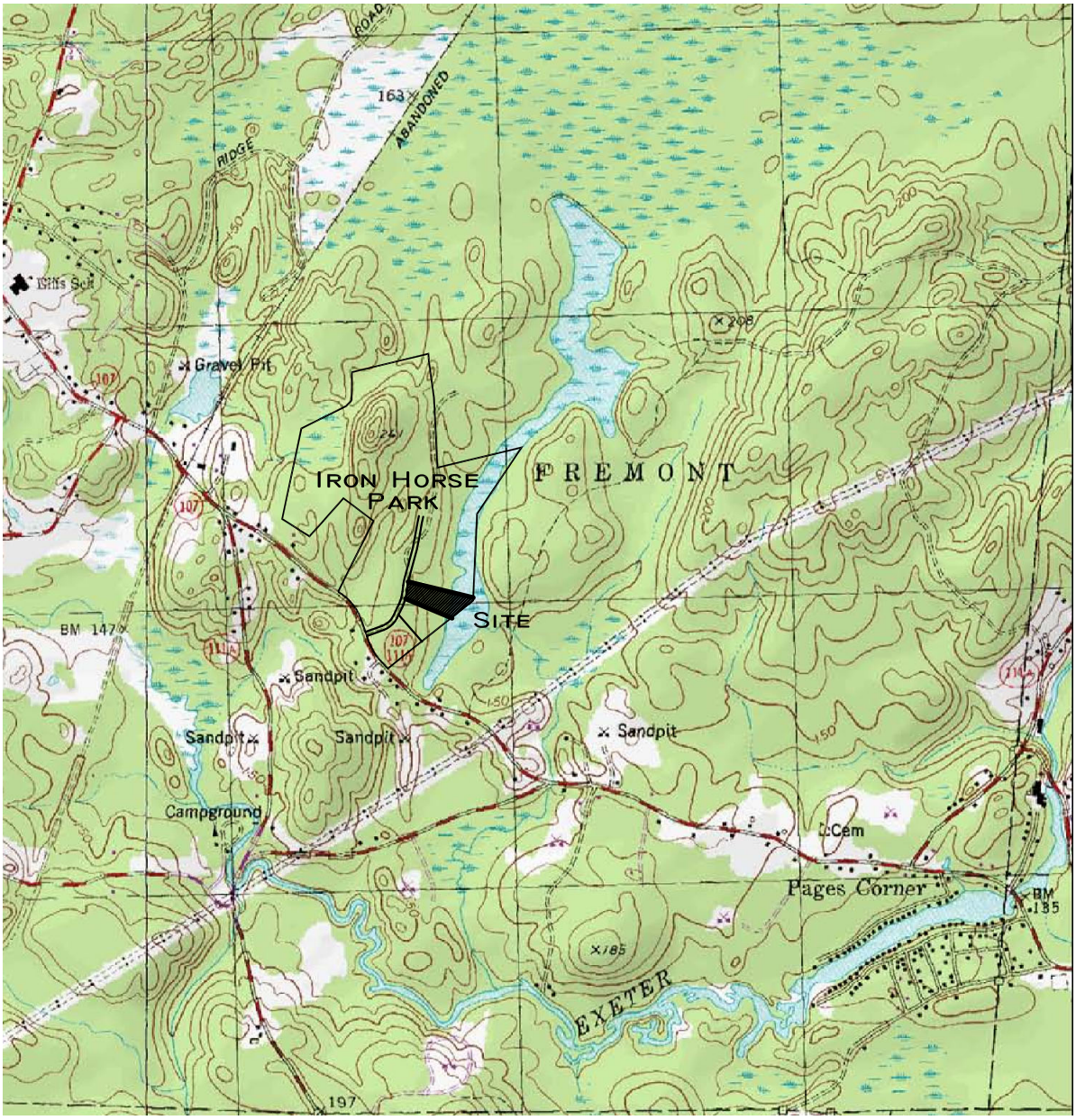
Map Scale

1: 12,988

© NH DES, http://des.nh.gov

Map Generated: 10/31/2018

Notes



NORTH

Graphic Scale

2000 1000 0 2000

SCALE: 1"=2000'

TAX MAP 2 LOT 2-151-4

JUNE 28, 2023

USGS TOPOGRAPHIC MAP

PROPOSED

DAY CARE FACILITY

IRON HORSE PARK
662 MAIN STREET
FREMONT, NEW HAMPSHIRE

GREGSAK & SONS, INC.

ENGINEERING, ARCHITECTURE & CONSTRUCTION MANAGEMENT

P.O. BOX 271
CHESTER, NEW HAMPSHIRE 03036
PH: (603) 887-6979
WWW.GREGSAK.COM

J.N. 3208

CONFIDENTIAL – NH Dept. of Environmental Services review

Memo

NH Natural Heritage Bureau
NHB Datacheck Results Letter

To: William Gregsak, Gregsak Engineering, Inc.
P.O. Box 271
Chester, NH 03036

From: Amy Lamb, NH Natural Heritage Bureau
Date: 10/1/2018 (valid for one year from this date)
Re: Review by NH Natural Heritage Bureau
NHB File ID: NHB18-2982 Town: Fremont Location: Tax Maps: Map 2, Lot 151-2
Description: Proposed project is the construction of two light manufacturing and assembly buildings.
cc: Kim Tuttle

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments: Please contact the NH Fish & Game Department to address wildlife concerns.

Vertebrate species	State[1]	Federal	Notes
Blanding's Turtle (*Emydoidea blandingii*)	E	--	Contact the NH Fish & Game Dept (see below).
Spotted Turtle (*Clemmys guttata*)	T	--	Contact the NH Fish & Game Dept (see below).

[1]Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

Contact for all animal reviews: Kim Tuttle, NH F&G, (603) 271-6544.

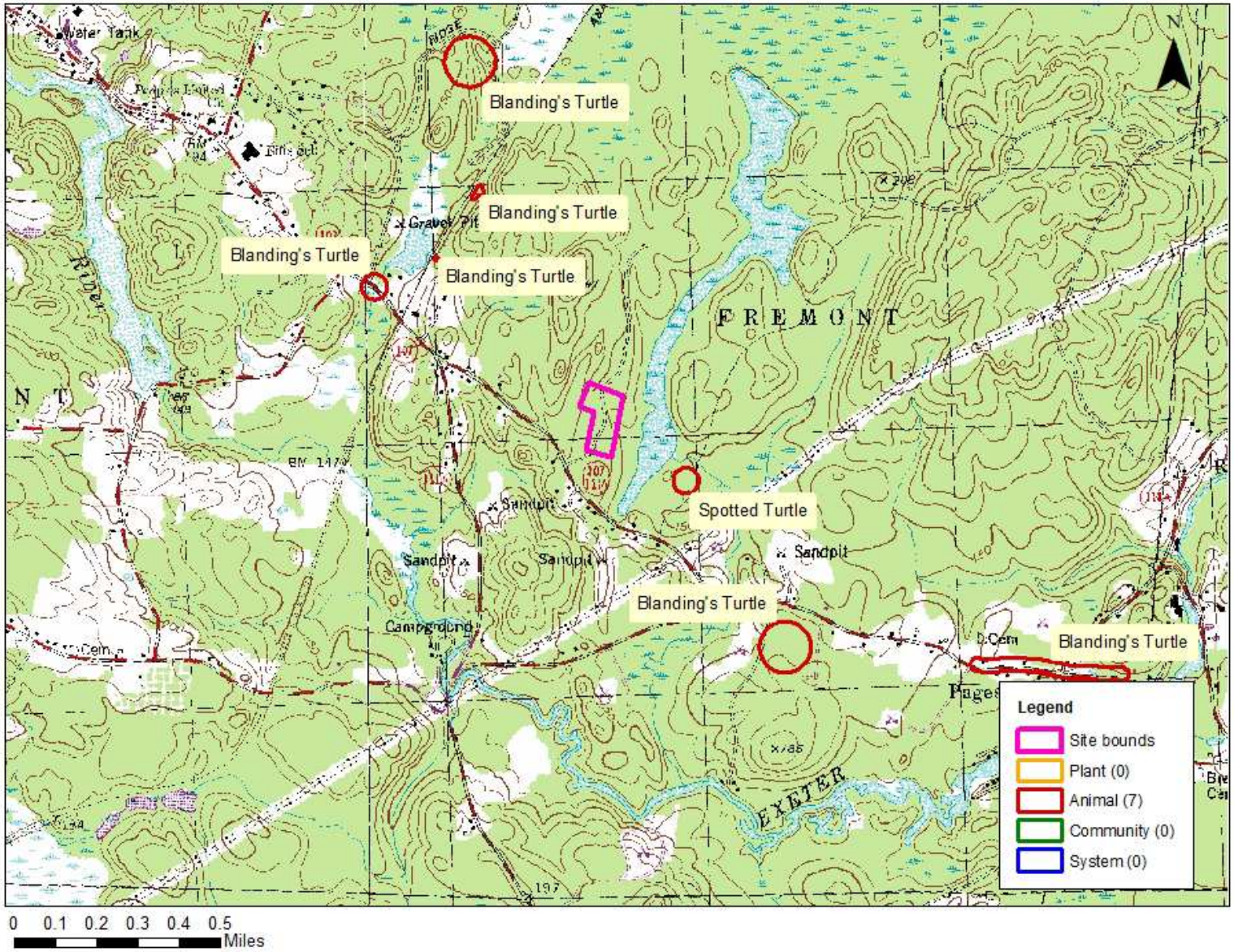
A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

CONFIDENTIAL – NH Dept. of Environmental Services review

NHB18-2982



New Hampshire Natural Heritage Bureau - Animal Record

Blanding's Turtle (*Emydoidea blandingii*)

Legal Status		**Conservation Status**	
Federal:	Not listed	Global:	Apparently secure but with cause for concern
State:	Listed Endangered	State:	Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Good quality, condition and landscape context ('B' on a scale of A-D).
Comments on Rank:

Detailed Description: 2005: Area 9324: 1 adult turtle.
General Area:
General Comments:
Management Comments:

Location

Survey Site Name: Spruce Swamp
Managed By: Oak Ridge Conservation Land

County: Rockingham
Town(s): Fremont
Size: 7.7 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2005: Area 9324: [From junction of Rte. 107 and Beede Hill Road, travel ca. 0.2 miles north on Beede Hill Road and turn right onto Poplin Drive. Site is less than 0.2 miles east of the end of Poplin Drive]. Oak Ridge Conservation Area wetlands. Found on logging skidder road about 15 to 20 feet from a lush wetland.

Dates documented

First reported: 2005-07-13 Last reported: 2005-07-13

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

New Hampshire Natural Heritage Bureau - Animal Record

Blanding's Turtle (*Emydoidea blandingii*)

Legal Status		**Conservation Status**	
Federal:	Not listed	Global:	Apparently secure but with cause for concern
State:	Listed Endangered	State:	Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Fair quality, condition and/or landscape context ('C' on a scale of A-D).
Comments on Rank:

Detailed Description: 2008: Area 11550: 1 adult seen. 5 1/2" x 3 1/2". This individual was hit by a car and died.
General Area: 2008: Area 11550: Route 107.
General Comments:
Management Comments:

Location

Survey Site Name: Spruce Swamp
Managed By:

County: Rockingham
Town(s): Fremont
Size: 7.5 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2008: Area 11550: Route 107 near intersection with Brentwood Road.

Dates documented

First reported: 2008-07-15 Last reported: 2008-07-15

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Animal Record

Blanding's Turtle (*Emydoidea blandingii*)

Legal Status

Federal: Not listed
State: Listed Endangered

Conservation Status

Global: Apparently secure but with cause for concern
State: Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank:

Detailed Description: 2011: Area 12959: 1 adult observed.
General Area: 2011: Area 12959: On the side of the road. There are wetland areas on both sides of the road that dry up in the summer time.
General Comments:
Management Comments:

Location

Survey Site Name: Greenwood Pond
Managed By:

County: Rockingham
Town(s): Fremont
Size: 7.7 acres
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2011: Area 12959: Walker Lane, Fremont, 100 ft. from the intersection with Rte. 107.

Dates documented

First reported: 2011-06-27
Last reported: 2011-06-27

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Animal Record

Blanding's Turtle (*Emydoidea blandingii*)

Legal Status		**Conservation Status**	
Federal:	Not listed	Global:	Apparently secure but with cause for concern
State:	Listed Endangered	State:	Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank:

Detailed Description: 2012: 1 turtle observed on 4/16. 1 turtle observed on 5/18.
General Area:
General Comments:
Management Comments:

Location

Survey Site Name: Spruce Swamp
Managed By: Manchester-Portsmouth RR Bed

County: Rockingham
Town(s): Fremont
Size: .0 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions:

Dates documented

First reported: 2012-04-16 Last reported: 2012-05-18

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Animal Record

Blanding's Turtle (*Emydoidea blandingii*)

Legal Status

Federal: Not listed
State: Listed Endangered

Conservation Status

Global: Apparently secure but with cause for concern
State: Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank:

Detailed Description: 2013: Area 13537: 1 adult observed, sex unknown.
General Area: 2013: Area 13537: Little stream with culvert under roadway.
General Comments:
Management Comments:

Location

Survey Site Name: Spruce Swamp
Managed By:

County: Rockingham
Town(s): Fremont
Size: 1.9 acres
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2013: Area 13537: Crossing Route 107 in Fremont.

Dates documented

First reported: 2013-07-03
Last reported: 2013-07-03

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Animal Record

Blanding's Turtle (*Emydoidea blandingii*)

Legal Status

Federal: Not listed
State: Listed Endangered

Conservation Status

Global: Apparently secure but with cause for concern
State: Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank:

Detailed Description: 2012: 1 individual observed.
General Area:
General Comments:
Management Comments:

Location

Survey Site Name: Spruce Swamp
Managed By:

County: Rockingham
Town(s): Fremont
Size: .3 acres
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions:

Dates documented

First reported: 2012-05-18
Last reported: 2012-05-18

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review

New Hampshire Natural Heritage Bureau - Animal Record

Spotted Turtle (*Clemmys guttata*)

Legal Status		**Conservation Status**	
Federal:	Not listed	Global:	Demonstrably widespread, abundant, and secure
State:	Listed Threatened	State:	Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Excellent quality, condition and landscape context ('A' on a scale of A-D).
Comments on Rank:

Detailed Description: 2013: Area 13438: 1 adult observed, sex unknown, crossing road.
 2012: FR_Ref_3_1: 1 turtle observed on 4/19. 1 turtle observed on 5/18. Observations made through binoculars.
 2008: Area 11621: 1 turtle seen. Area 11641: 5 turtles seen.
 2007: Area 12457: 1 female observed.

General Area: 2013: Area 13438: Roadside, coniferous forest.
 2008: Area 11641: All the turtles were in the wetland west of the RR tracks
 2007: Area 12457: Crossing from upland oak - pine woods toward pond in open gravelly area and large wetland complex.

General Comments:
Management Comments:

Location

Survey Site Name: Spruce Swamp
Managed By: Manchester-Portsmouth RR Bed

County: Rockingham
Town(s): Fremont
Size: 16.3 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

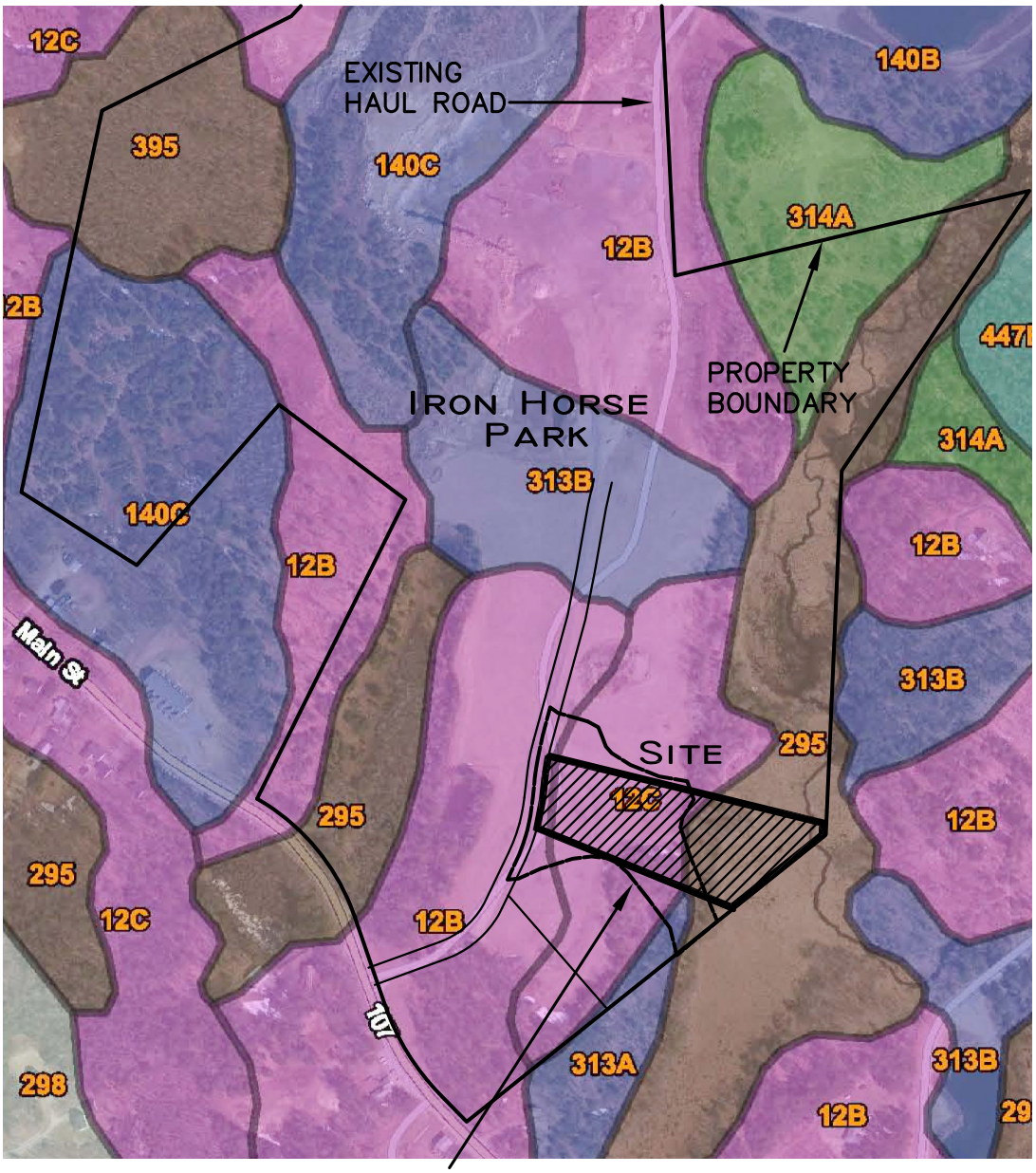
Directions: 2013: Area 13438: Beede Hill Road, Fremont.
 2008: Area 11621: Wetlands west of old RR bed through Spruce Swamp.
 2007: Area 12457: Copp Drive at fire pond near Red Brook.

Dates documented

First reported: 2007-05-10 Last reported: 2013-05-10

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

CONFIDENTIAL – NH Dept. of Environmental Services review



NORTH

AREA OF MODELED WATERSHED
(CONSTRUCTION AREA)

Graphic Scale

500 250 0 500

SCALE: 1"=500'

TAX MAP 2 LOT 2– 151–4

JUNE 28, 2023

NRCS HSG SOILS MAP

PROPOSED

DAY CARE FACILITY

IRON HORSE PARK

662 MAIN STREET

FREMONT, NEW HAMPSHIRE

GREGSAK & SONS, INC.

ENGINEERING, ARCHITECTURE & CONSTRUCTION MANAGEMENT

P.O. BOX 271
CHESTER, NEW HAMPSHIRE 03036
PH: (603) 887–6979
WWW.GREGSAK.COM

J.N. 3208

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

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

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Rockingham County, New Hampshire
Survey Area Data: Version 18, Sep 15, 2016

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

Date(s) aerial images were photographed: Mar 30, 2011—Apr 8, 2011

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

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Rockingham County, New Hampshire (NH015)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
12B	Hinckley loamy sand, 3 to 8 percent slopes	A	66.1	30.6%
12C	Hinckley loamy sand, 8 to 15 percent slopes	A	25.6	11.9%
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	B	6.5	3.0%
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	B	32.8	15.2%
295	Freetown mucky peat, 0 to 2 percent slopes	B/D	34.3	15.9%
298	Pits, sand and gravel		3.5	1.6%
313A	Deerfield fine sandy loam, 0 to 3 percent slopes	B	3.4	1.6%
313B	Deerfield fine sandy loam, 3 to 8 percent slopes	B	19.0	8.8%
314A	Pipestone sand, 0 to 5 percent slopes	A/D	11.8	5.5%
395	Swansea mucky peat, 0 to 2 percent slopes	B/D	10.2	4.7%
447B	Scituate-Newfields complex, 3 to 8 percent slopes, very stony	C	2.5	1.2%
Totals for Area of Interest			**215.7**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Graphic Scale

500 250 0 500

SCALE: 1"=500'

TAX MAP 2 LOT 2-151-4

JUNE 28, 2023

AERIAL MAP

PROPOSED

DAY CARE FACILITY

IRON HORSE PARK

662 MAIN STREET

FREMONT, NEW HAMPSHIRE

GREGSAK & SONS, INC.

ENGINEERING, ARCHITECTURE & CONSTRUCTION MANAGEMENT

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J.N. 3208

Photographs

Groundwater Recharge Volume (GRV) Calculation

-	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
0.55	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
-	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
-	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.25	inches	Rd = weighted groundwater recharge depth	
0.1375	ac-in	GRV = AI * Rd	
499	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12")	

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

AT ELEVATION 438.0 (WEIR) POND HAS 7.027 CU.FT. OF STORAGE
MINUS 780 CU.FT. FOR TOTAL FOREBAY VOLUME = 6,247 CU FT. OF INFILTRATION
THERE IS NO PIPE OUTLET.

design meets criteria

INFILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.05)

Type/Node Name: **Infiltration Basin 1P**

Enter the type of infiltration practice (e.g., trench) and the node name in the drainage analysis, if applicable

YES		Have you reviewed Env-Wq 1508.05(a) to ensure that infiltration is allowed?	
4.02	ac	A = Area draining to the practice	
0.70	ac	A_I = Impervious area draining to the practice	
0.17	decimal	I = percent impervious area draining to the practice, in decimal form	
0.21	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.83	ac-in	WQV= 1" x Rv x A	
3,017	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
754	cf	25% x WQV (check calc for sediment forebay volume)	
FOREBAY		Method of pretreatment? (not required for clean or roof runoff)	
780	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← **≥ 25%WQV**
6,247	cf	V = volume[1] (attach a stage-storage table)	← **≥ WQV**
3,872	sf	A_{SA} = surface area of the bottom of the pond	
3.00	iph	I_{DESIGN} = design infiltration rate[2]	
6.5	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← **≤ 72-hrs**
136.50	feet	E_{BTM} = elevation of the bottom of the practice	
132.50	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
132.50	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
4.00	feet	D_{SHWT} = separation from SHWT[3]	← **≥ *[3]**
4.0	feet	D_{ROCK} = separation from bedrock[3]	← **≥ *[3]**
	ft	D_T = depth of trench, if trench proposed	← **4 - 10 ft**
	Yes/No	If a trench or underground system is proposed, observation well provided	
		If a trench is proposed, material in trench	
LOAM AND SEED		If a basin is proposed, basin floor material	
YES	Yes/No	If a basin is proposed, the perimeter should be curvilinear.	
3.0	:1	If a basin is proposed, pond side slopes	← **≥3:1**
438.05	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
438.47	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
438.50	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?	← **yes**
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← **yes**

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. See NH Stormwater Manual, Vol.2, Ch.2-4, for guidance on determining the infiltration rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.

Designer's Notes: AT ELEVATION 438.0 (WEIR) POND HAS 7.027 CU.FT. OF STORAGE
MINUS 780 CU.FT. FOR TOTAL FOREBAY VOLUME = 6,247 CU FT. OF INFILTRATION
THERE IS NO PIPE OUTLET.

Summary for Pond 1P: Infiltration Basin 1P

Inflow Area = 3.764 ac, 13.34% Impervious, Inflow Depth > 3.09" for 50YR event
Inflow = 13.54 cfs @ 12.08 hrs, Volume= 0.969 af
Outflow = 9.61 cfs @ 12.17 hrs, Volume= 0.869 af, Atten= 29%, Lag= 5.5 min
Discarded = 0.42 cfs @ 12.17 hrs, Volume= 0.418 af
Secondary = 9.19 cfs @ 12.17 hrs, Volume= 0.450 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 438.47' @ 12.17 hrs Surf.Area= 5,976 sf Storage= 9,746 cf
Flood Elev= 438.50' Surf.Area= 6,002 sf Storage= 9,914 cf

Plug-Flow detention time= 109.3 min calculated for 0.867 af (89% of inflow)
Center-of-Mass det. time= 59.7 min (901.7 - 841.9)

Volume	Invert	Avail.Storage	Storage Description
#1	436.50'	9,914 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

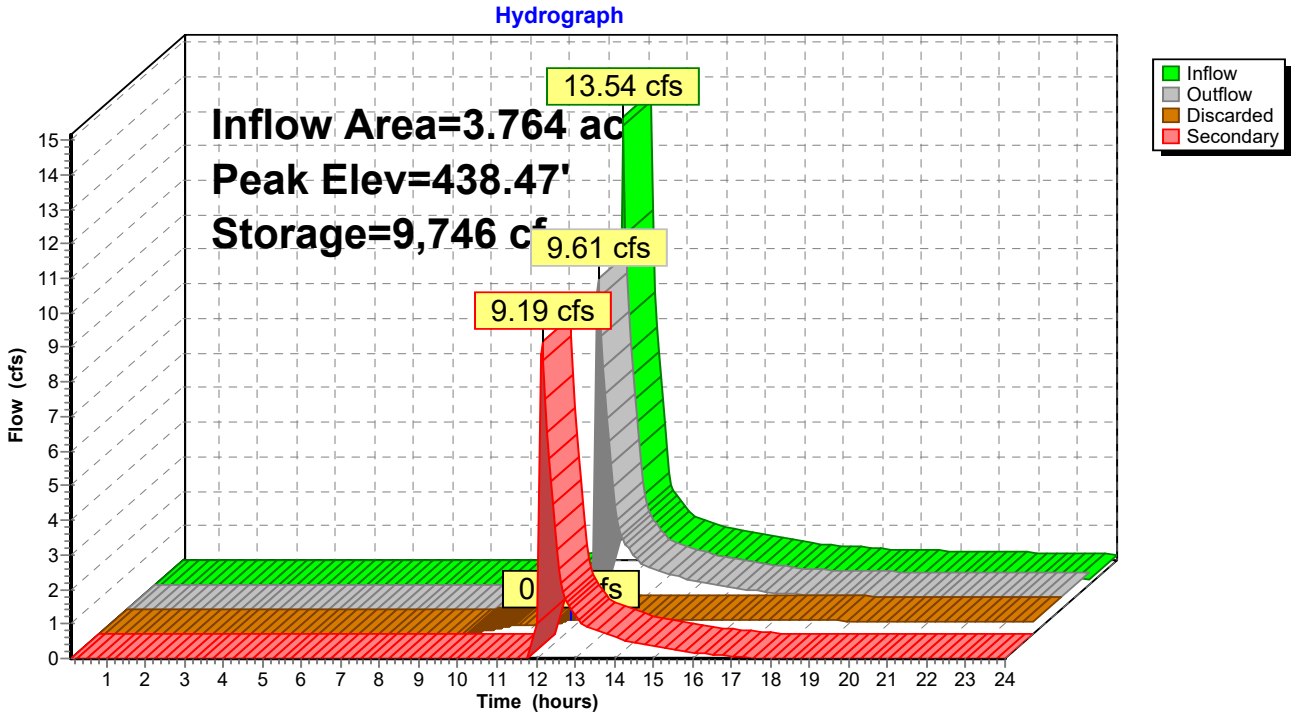
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
436.50	3,872	260.0	0	0	3,872
438.00	5,548	298.0	7,027	7,027	5,610
438.50	6,002	308.0	2,887	9,914	6,116

Device	Routing	Invert	Outlet Devices
#1	Secondary	438.00'	**11.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	436.50'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.41 cfs @ 12.17 hrs HW=438.45' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.41 cfs)

Secondary OutFlow Max=8.70 cfs @ 12.17 hrs HW=438.45' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 8.70 cfs @ 1.74 fps)

Pond 1P: Infiltration Basin 1P



Stage-Area-Storage for Pond 1P: Infiltration Basin 1P

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
436.50	3,872	0
436.52	3,892	78
436.54	3,913	156
436.56	3,933	234
436.58	3,954	313
436.60	3,974	392
436.62	3,995	472
436.64	4,016	552
436.66	4,036	633
436.68	4,057	714
436.70	4,078	795
436.72	4,099	877
436.74	4,120	959
436.76	4,141	1,041
436.78	4,162	1,125
436.80	4,183	1,208
436.82	4,204	1,292
436.84	4,226	1,376
436.86	4,247	1,461
436.88	4,268	1,546
436.90	4,290	1,632
436.92	4,311	1,718
436.94	4,332	1,804
436.96	4,354	1,891
436.98	4,376	1,978
437.00	4,397	2,066
437.02	4,419	2,154
437.04	4,441	2,243
437.06	4,463	2,332
437.08	4,484	2,421
437.10	4,506	2,511
437.12	4,528	2,601
437.14	4,550	2,692
437.16	4,572	2,783
437.18	4,595	2,875
437.20	4,617	2,967
437.22	4,639	3,060
437.24	4,661	3,153
437.26	4,684	3,246
437.28	4,706	3,340
437.30	4,728	3,434
437.32	4,751	3,529
437.34	4,774	3,625
437.36	4,796	3,720
437.38	4,819	3,816
437.40	4,842	3,913
437.42	4,864	4,010
437.44	4,887	4,108
437.46	4,910	4,206
437.48	4,933	4,304
437.50	4,956	4,403
437.52	4,979	4,502
437.54	5,002	4,602
437.56	5,025	4,702
437.58	5,048	4,803
437.60	5,072	4,904
437.62	5,095	5,006
437.64	5,118	5,108
437.66	5,142	5,211
437.68	5,165	5,314
437.70	5,189	5,417
437.72	5,212	5,521
437.74	5,236	5,626
437.76	5,260	5,731
437.78	5,283	5,836
437.80	5,307	5,942
437.82	5,331	6,048
437.84	5,355	6,155
437.86	5,379	6,263
437.88	5,403	6,370
437.90	5,427	6,479
437.92	5,451	6,587
437.94	5,475	6,697
437.96	5,499	6,806
437.98	5,524	6,917
438.00	5,548	7,027
438.02	5,566	7,139
438.04	5,584	7,250
438.06	5,602	7,362
438.08	5,619	7,474
438.10	5,637	7,587
438.12	5,655	7,700
438.14	5,673	7,813
438.16	5,691	7,927
438.18	5,709	8,041
438.20	5,727	8,155
438.22	5,746	8,270
438.24	5,764	8,385
438.26	5,782	8,500
438.28	5,800	8,616
438.30	5,818	8,732
438.32	5,837	8,849
438.34	5,855	8,966
438.36	5,873	9,083
438.38	5,891	9,201
438.40	5,910	9,319
438.42	5,928	9,437
438.44	5,947	9,556
438.46	5,965	9,675
438.48	5,983	9,794
438.50	**6,002**	**9,914**

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	71.143 degrees West
Latitude	42.991 degrees North
Elevation	0 feet
Date/Time	Sun, 06 Aug 2017 06:33:05 -0400

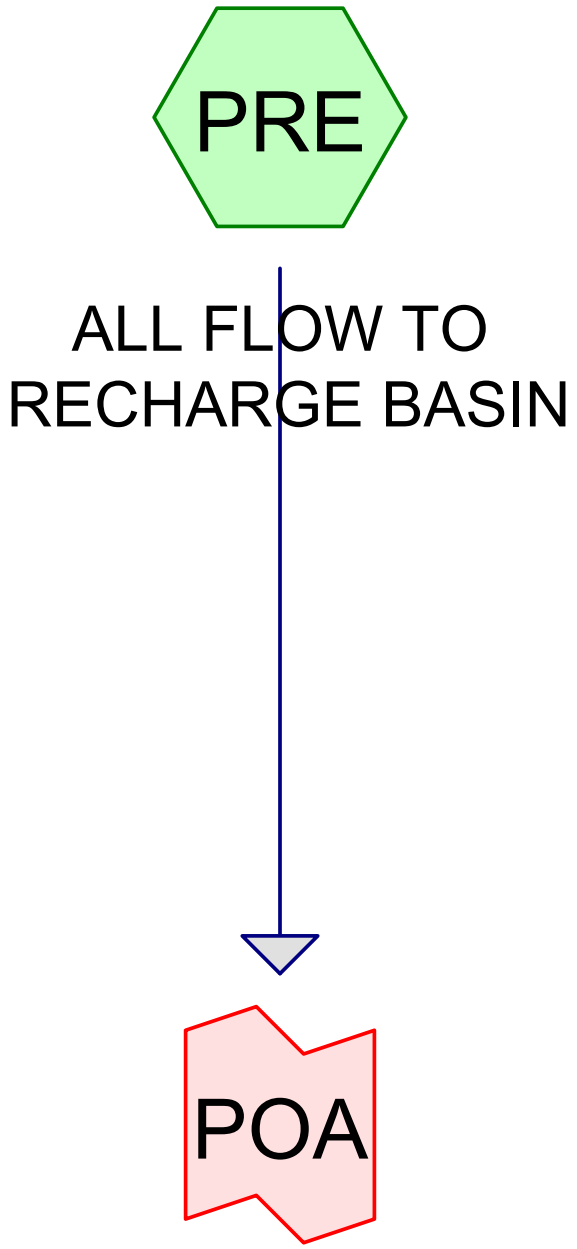
Extreme Precipitation Estimates

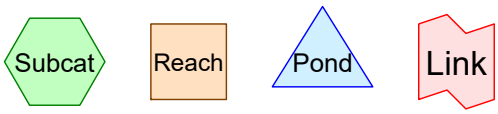
	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.66	0.82	1.04	**1yr**	0.71	0.99	1.21	1.55	1.99	2.58	2.77	**1yr**	2.28	2.66	3.08	3.76	4.37	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.29	**2yr**	0.88	1.18	1.50	1.90	2.42	3.08	3.42	**2yr**	2.73	3.29	3.80	4.51	5.14	**2yr**
5yr	0.38	0.59	0.74	0.99	1.26	1.62	**5yr**	1.09	1.47	1.89	2.41	3.06	3.91	4.39	**5yr**	3.46	4.22	4.84	5.74	6.49	**5yr**
10yr	0.42	0.66	0.84	1.14	1.48	1.92	**10yr**	1.28	1.74	2.25	2.88	3.67	4.68	5.30	**10yr**	4.14	5.1[illegible]	5.81	6.91	7.75	**10yr**
25yr	0.49	0.79	1.00	1.38	1.83	2.40	**25yr**	1.58	2.17	2.83	3.64	4.66	5.94	6.81	**25yr**	5.26	6.55	7.40	8.83	9.80	**25yr**
50yr	0.56	0.90	1.15	1.60	2.16	2.85	**50yr**	1.86	2.56	3.37	4.35	5.59	7.12	8.24	**50yr**	6.30	7.92	8.89	10.63	11.71	**50yr**
100yr	0.63	1.02	1.31	1.86	2.54	3.39	**100yr**	2.19	3.03	4.03	5.22	6.70	8.54	9.97	**100yr**	7.56	9.59	10.69	12.81	14.01	**100yr**
200yr	0.72	1.17	1.52	2.17	2.99	4.02	**200yr**	2.58	3.60	4.79	6.23	8.02	10.25	12.07	**200yr**	9.07	11.60	12.85	15.46	16.77	**200yr**
500yr	0.85	1.40	1.83	2.66	3.72	5.05	**500yr**	3.21	4.50	6.05	7.90	10.20	13.05	15.54	**500yr**	11.55	14.95	16.39	19.83	21.30	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.72	0.88	**1yr**	0.62	0.86	1.01	1.30	1.56	2.10	2.54	**1yr**	1.86	2.44	2.83	3.42	3.90	**1yr**
2yr	0.31	0.48	0.60	0.81	1.00	1.18	**2yr**	0.86	1.15	1.35	1.79	2.29	2.97	3.26	**2yr**	2.63	3.14	3.65	4.30	4.91	**2yr**
5yr	0.36	0.55	0.68	0.93	1.19	1.41	**5yr**	1.03	1.38	1.60	2.08	2.68	3.54	3.89	**5yr**	3.14	3.74	4.30	5.37	5.83	**5yr**
10yr	0.39	0.61	0.75	1.05	1.36	1.61	**10yr**	1.17	1.57	1.81	2.35	3.01	4.02	4.40	**10yr**	3.56	4.23	4.87	6.27	6.57	**10yr**
25yr	0.45	0.69	0.86	1.23	1.62	1.91	**25yr**	1.39	1.87	2.11	2.73	3.50	4.72	5.18	**25yr**	4.18	4.98	5.76	7.69	8.49	**25yr**
50yr	0.50	0.77	0.95	1.37	1.85	2.18	**50yr**	1.59	2.14	2.38	3.07	3.94	5.32	5.83	**50yr**	4.71	5.61	6.53	8.98	9.79	**50yr**
100yr	0.57	0.86	1.07	1.55	2.12	2.50	**100yr**	1.83	2.44	2.69	3.44	4.41	5.69	6.55	**100yr**	5.04	6.30	7.43	10.51	11.28	**100yr**
200yr	0.63	0.95	1.21	1.75	2.43	2.85	**200yr**	2.10	2.78	3.02	3.85	4.96	6.30	9.09	**200yr**	5.58	8.74	8.45	12.30	13.01	**200yr**
500yr	0.74	1.10	1.42	2.06	2.93	3.40	**500yr**	2.53	3.33	3.54	4.48	5.79	7.18	11.09	**500yr**	6.35	10.67	10.04	15.18	15.70	**500yr**

DRAINAGE ANALYSIS
PRE-DEVELOPMENT CONDITION





Routing Diagram for 3208 DAY CARE SITE PRE 6-28-23
Prepared by GREGSAK AND SONS, INC, Printed 6/23/2023
HydroCAD® 10.00-22 s/n 01787 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.712	61	>75% Grass cover, Good, HSG B (PRE)
0.149	98	Paved roadway, HSG B (PRE)
1.159	55	Woods, Good, HSG B (PRE)
4.020	**61**	**TOTAL AREA**

Time span=1.00-36.00 hrs, dt=0.05 hrs, 701 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 PRE: ALL FLOW TO Runoff Area=4.020 ac 3.71% Impervious Runoff Depth=0.40"
Flow Length=706' Tc=5.0 min CN=61 Runoff=1.12 cfs 0.133 af

Link POA: Inflow=1.12 cfs 0.133 af
Primary=1.12 cfs 0.133 af

Total Runoff Area = 4.020 ac Runoff Volume = 0.133 af Average Runoff Depth = 0.40"
96.29% Pervious = 3.871 ac 3.71% Impervious = 0.149 ac

Summary for Subcatchment PRE: ALL FLOW TO RECHARGE BASIN

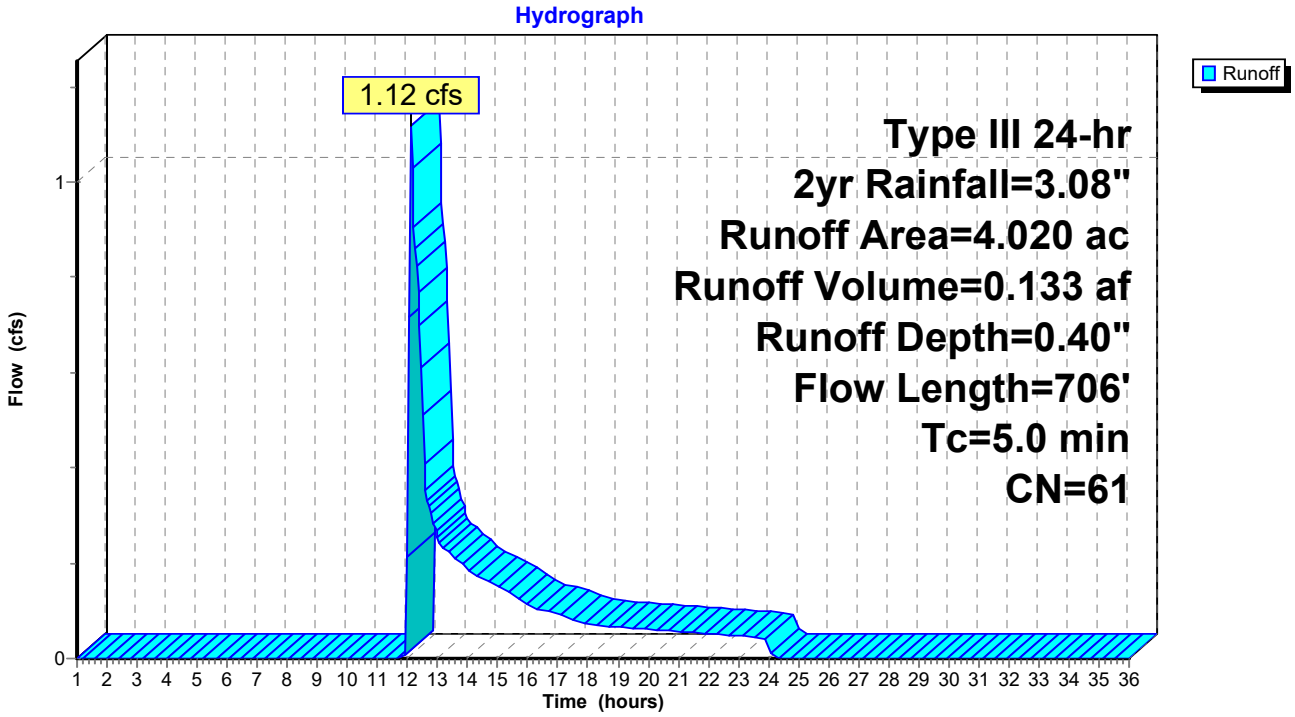
Runoff = 1.12 cfs @ 12.12 hrs, Volume= 0.133 af, Depth= 0.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2yr Rainfall=3.08"

	Area (ac)	CN	Description
*	0.149	98	Paved roadway, HSG B
	2.712	61	>75% Grass cover, Good, HSG B
	1.159	55	Woods, Good, HSG B
	4.020	61	Weighted Average
	3.871		96.29% Pervious Area
	0.149		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0200	0.88		**Sheet Flow, ROAD** Smooth surfaces n= 0.011 P2= 2.90"
0.1	22	0.2500	3.50		**Shallow Concentrated Flow, GRASS ROAD SIDE SLOPE** Short Grass Pasture Kv= 7.0 fps
0.5	145	0.0220	4.47	13.41	**Trap/Vee/Rect Channel Flow, GRASS SWALE** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.030 Earth, grassed & winding
2.7	525	0.0190	3.28	27.33	**Parabolic Channel, FLOW ACROSS SITE** W=25.00' D=0.50' Area=8.3 sf Perim=25.0' n= 0.030 Earth, grassed & winding
3.6	706	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PRE: ALL FLOW TO RECHARGE BASIN

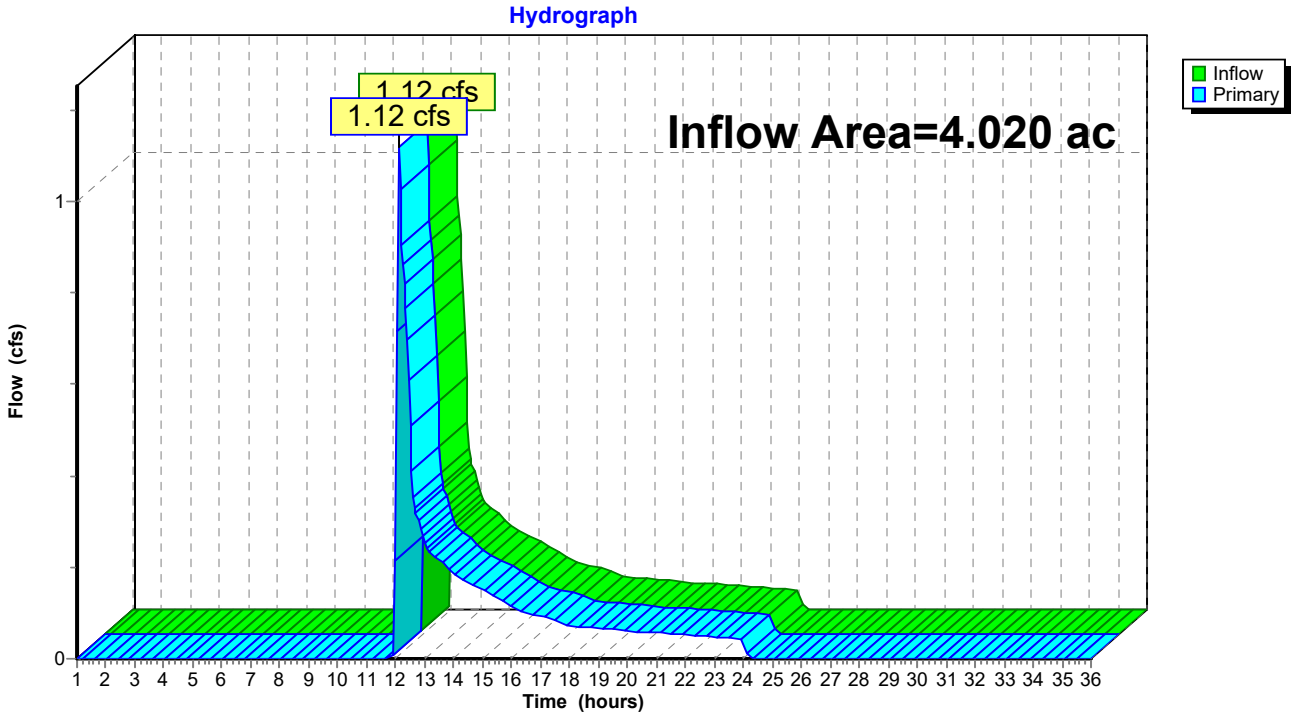


Summary for Link POA:

Inflow Area = 4.020 ac, 3.71% Impervious, Inflow Depth = 0.40" for 2yr event
Inflow = 1.12 cfs @ 12.12 hrs, Volume= 0.133 af
Primary = 1.12 cfs @ 12.12 hrs, Volume= 0.133 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Link POA:



Time span=1.00-36.00 hrs, dt=0.05 hrs, 701 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 PRE: ALL FLOW TO Runoff Area=4.020 ac 3.71% Impervious Runoff Depth=1.18"
Flow Length=706' Tc=5.0 min CN=61 Runoff=5.00 cfs 0.396 af

Link POA: Inflow=5.00 cfs 0.396 af
Primary=5.00 cfs 0.396 af

Total Runoff Area = 4.020 ac Runoff Volume = 0.396 af Average Runoff Depth = 1.18"
96.29% Pervious = 3.871 ac 3.71% Impervious = 0.149 ac

Summary for Subcatchment PRE: ALL FLOW TO RECHARGE BASIN

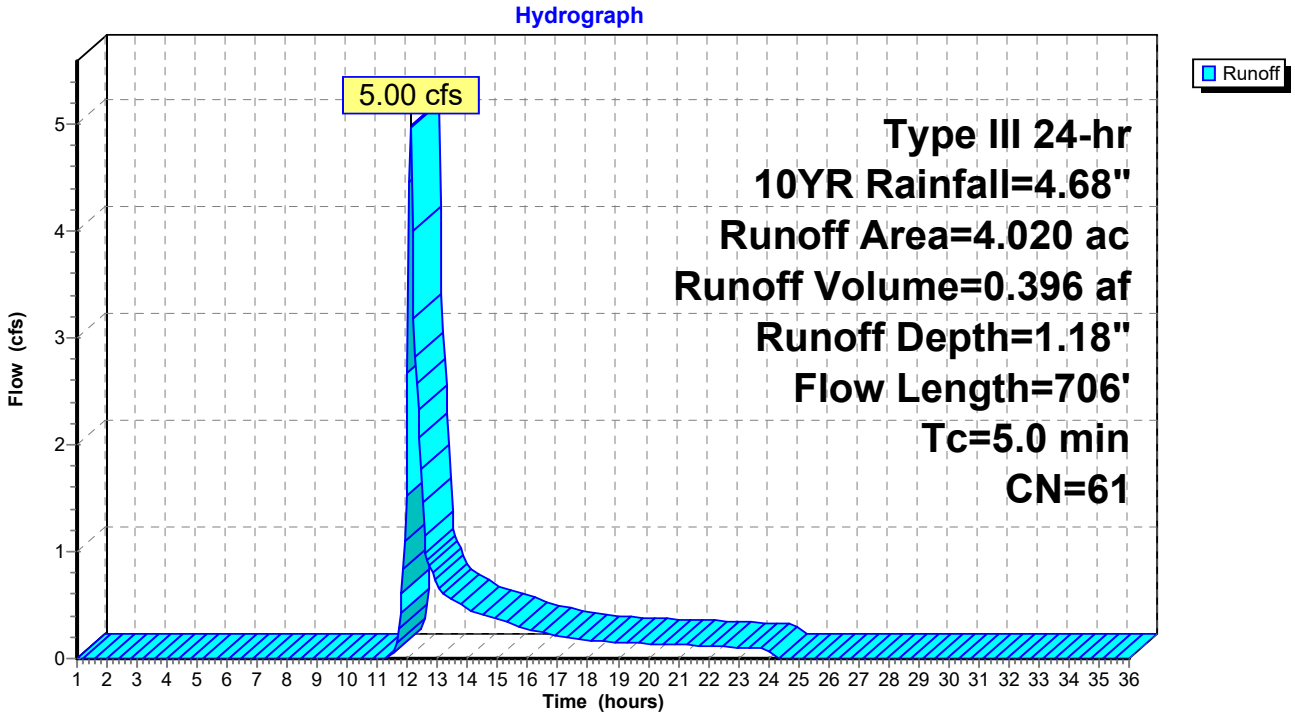
Runoff = 5.00 cfs @ 12.09 hrs, Volume= 0.396 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=4.68"

	Area (ac)	CN	Description
*	0.149	98	Paved roadway, HSG B
	2.712	61	>75% Grass cover, Good, HSG B
	1.159	55	Woods, Good, HSG B
	4.020	61	Weighted Average
	3.871		96.29% Pervious Area
	0.149		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0200	0.88		**Sheet Flow, ROAD** Smooth surfaces n= 0.011 P2= 2.90"
0.1	22	0.2500	3.50		**Shallow Concentrated Flow, GRASS ROAD SIDE SLOPE** Short Grass Pasture Kv= 7.0 fps
0.5	145	0.0220	4.47	13.41	**Trap/Vee/Rect Channel Flow, GRASS SWALE** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.030 Earth, grassed & winding
2.7	525	0.0190	3.28	27.33	**Parabolic Channel, FLOW ACROSS SITE** W=25.00' D=0.50' Area=8.3 sf Perim=25.0' n= 0.030 Earth, grassed & winding
3.6	706	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PRE: ALL FLOW TO RECHARGE BASIN

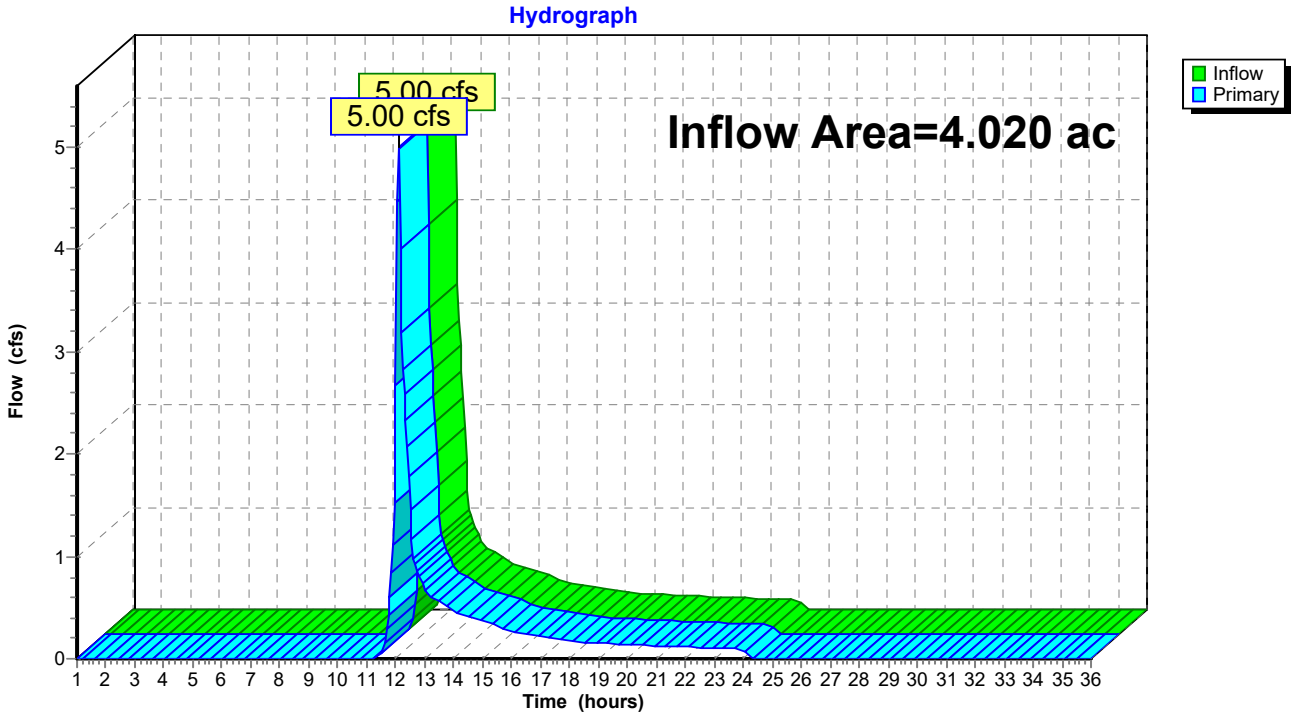


Summary for Link POA:

Inflow Area = 4.020 ac, 3.71% Impervious, Inflow Depth = 1.18" for 10YR event
Inflow = 5.00 cfs @ 12.09 hrs, Volume= 0.396 af
Primary = 5.00 cfs @ 12.09 hrs, Volume= 0.396 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Link POA:



Time span=1.00-36.00 hrs, dt=0.05 hrs, 701 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 PRE: ALL FLOW TO Runoff Area=4.020 ac 3.71% Impervious Runoff Depth=1.97"
Flow Length=706' Tc=5.0 min CN=61 Runoff=8.87 cfs 0.658 af

Link POA: Inflow=8.87 cfs 0.658 af
Primary=8.87 cfs 0.658 af

Total Runoff Area = 4.020 ac Runoff Volume = 0.658 af Average Runoff Depth = 1.97"
96.29% Pervious = 3.871 ac 3.71% Impervious = 0.149 ac

Summary for Subcatchment PRE: ALL FLOW TO RECHARGE BASIN

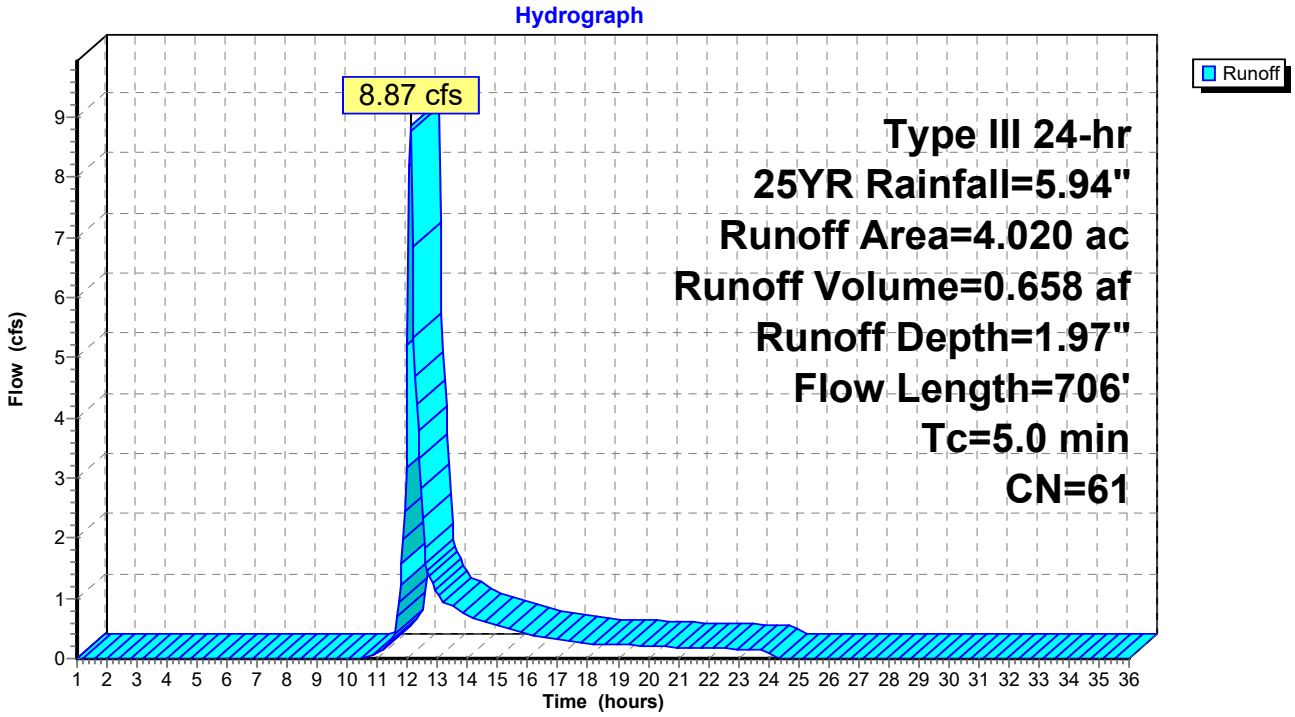
Runoff = 8.87 cfs @ 12.09 hrs, Volume= 0.658 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=5.94"

	Area (ac)	CN	Description
*	0.149	98	Paved roadway, HSG B
	2.712	61	>75% Grass cover, Good, HSG B
	1.159	55	Woods, Good, HSG B
	4.020	61	Weighted Average
	3.871		96.29% Pervious Area
	0.149		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0200	0.88		**Sheet Flow, ROAD** Smooth surfaces n= 0.011 P2= 2.90"
0.1	22	0.2500	3.50		**Shallow Concentrated Flow, GRASS ROAD SIDE SLOPE** Short Grass Pasture Kv= 7.0 fps
0.5	145	0.0220	4.47	13.41	**Trap/Vee/Rect Channel Flow, GRASS SWALE** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.030 Earth, grassed & winding
2.7	525	0.0190	3.28	27.33	**Parabolic Channel, FLOW ACROSS SITE** W=25.00' D=0.50' Area=8.3 sf Perim=25.0' n= 0.030 Earth, grassed & winding
3.6	706	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PRE: ALL FLOW TO RECHARGE BASIN

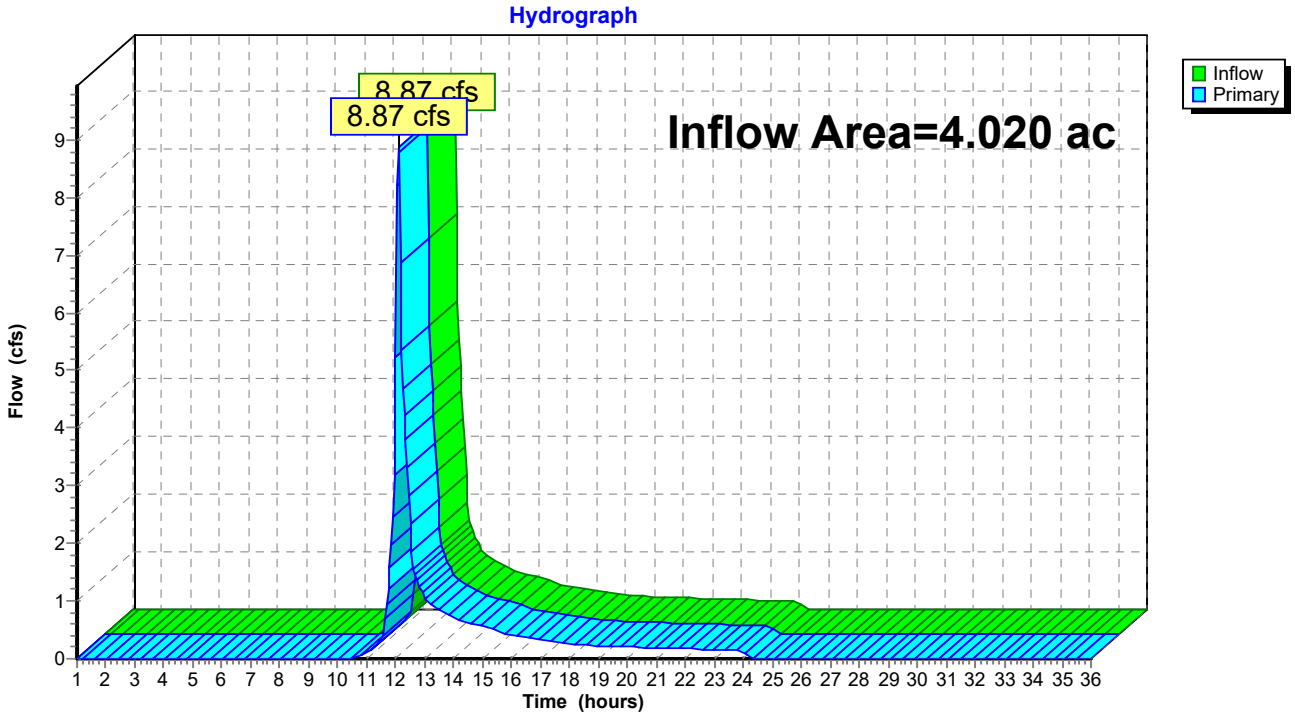


Summary for Link POA:

Inflow Area = 4.020 ac, 3.71% Impervious, Inflow Depth = 1.97" for 25YR event
Inflow = 8.87 cfs @ 12.09 hrs, Volume= 0.658 af
Primary = 8.87 cfs @ 12.09 hrs, Volume= 0.658 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Link POA:



Time span=1.00-36.00 hrs, dt=0.05 hrs, 701 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 PRE: ALL FLOW TO Runoff Area=4.020 ac 3.71% Impervious Runoff Depth=2.79"
Flow Length=706' Tc=5.0 min CN=61 Runoff=12.90 cfs 0.934 af

Link POA: Inflow=12.90 cfs 0.934 af
Primary=12.90 cfs 0.934 af

Total Runoff Area = 4.020 ac Runoff Volume = 0.934 af Average Runoff Depth = 2.79"
96.29% Pervious = 3.871 ac 3.71% Impervious = 0.149 ac

Summary for Subcatchment PRE: ALL FLOW TO RECHARGE BASIN

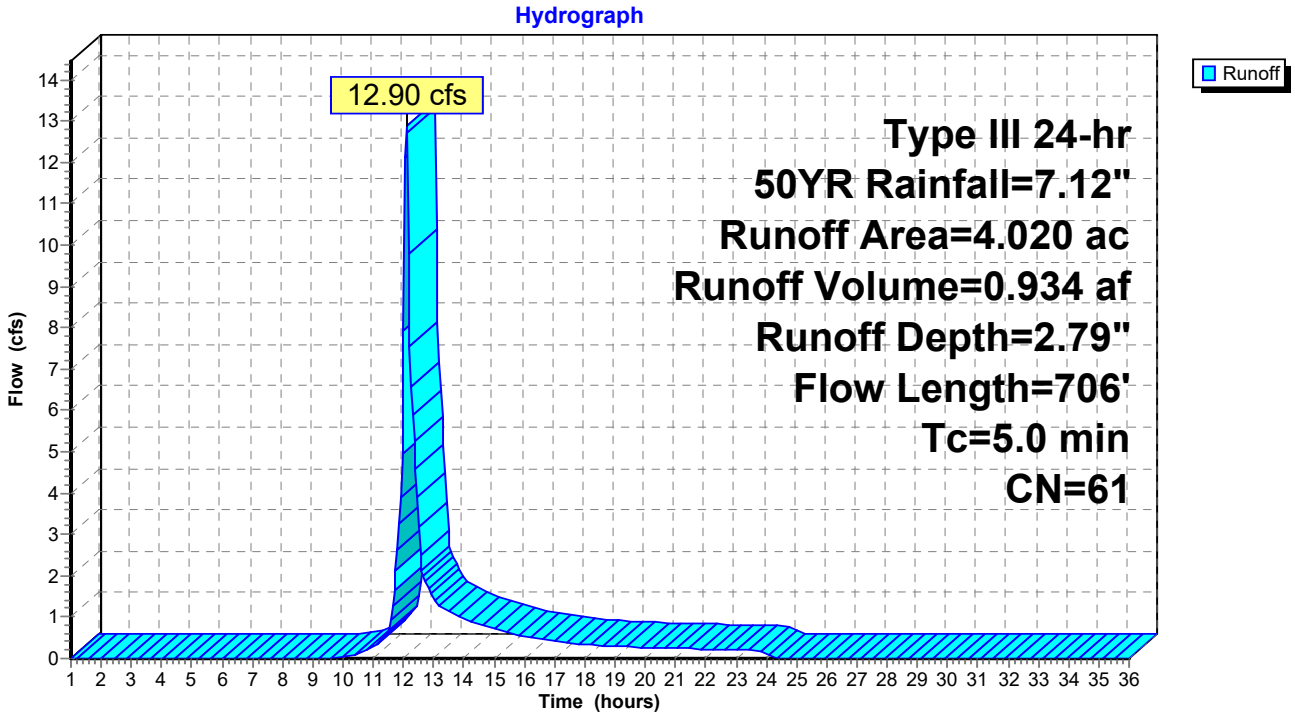
Runoff = 12.90 cfs @ 12.08 hrs, Volume= 0.934 af, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 50YR Rainfall=7.12"

	Area (ac)	CN	Description
*	0.149	98	Paved roadway, HSG B
	2.712	61	>75% Grass cover, Good, HSG B
	1.159	55	Woods, Good, HSG B
	4.020	61	Weighted Average
	3.871		96.29% Pervious Area
	0.149		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0200	0.88		**Sheet Flow, ROAD** Smooth surfaces n= 0.011 P2= 2.90"
0.1	22	0.2500	3.50		**Shallow Concentrated Flow, GRASS ROAD SIDE SLOPE** Short Grass Pasture Kv= 7.0 fps
0.5	145	0.0220	4.47	13.41	**Trap/Vee/Rect Channel Flow, GRASS SWALE** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.030 Earth, grassed & winding
2.7	525	0.0190	3.28	27.33	**Parabolic Channel, FLOW ACROSS SITE** W=25.00' D=0.50' Area=8.3 sf Perim=25.0' n= 0.030 Earth, grassed & winding
3.6	706	Total, Increased to minimum Tc = 5.0 min			

Subcatchment PRE: ALL FLOW TO RECHARGE BASIN

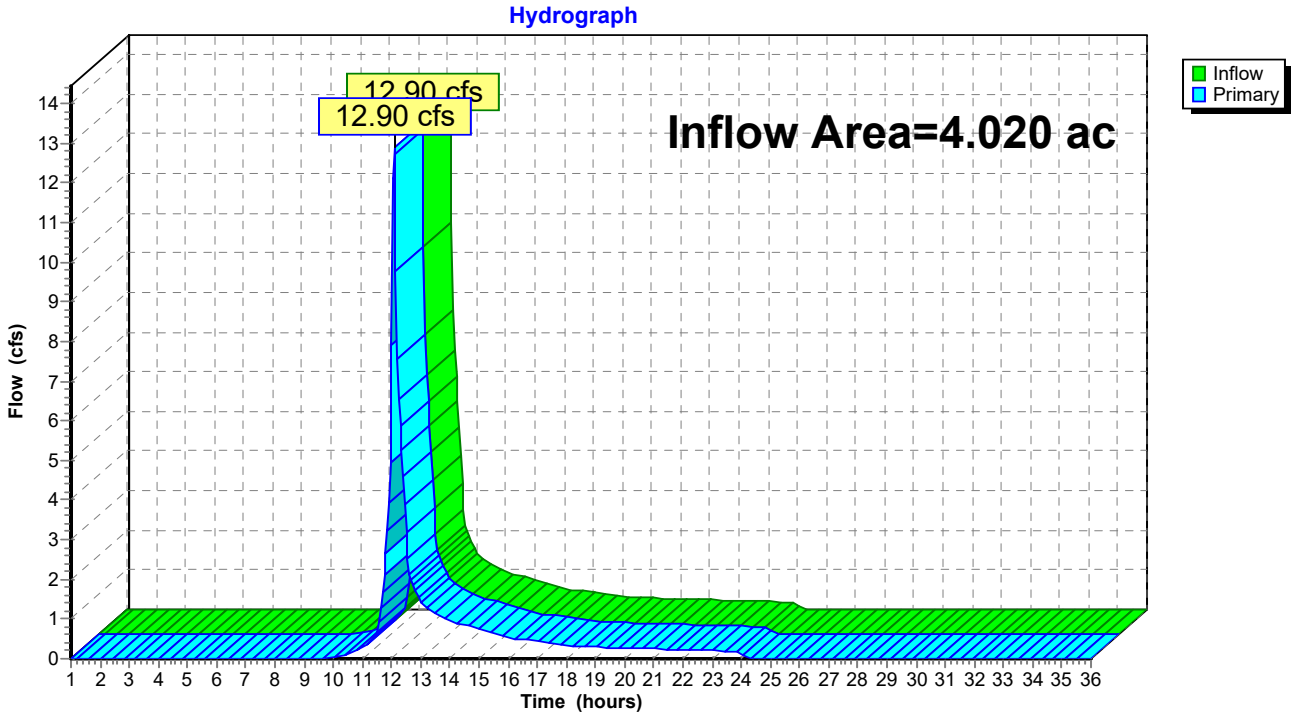


Summary for Link POA:

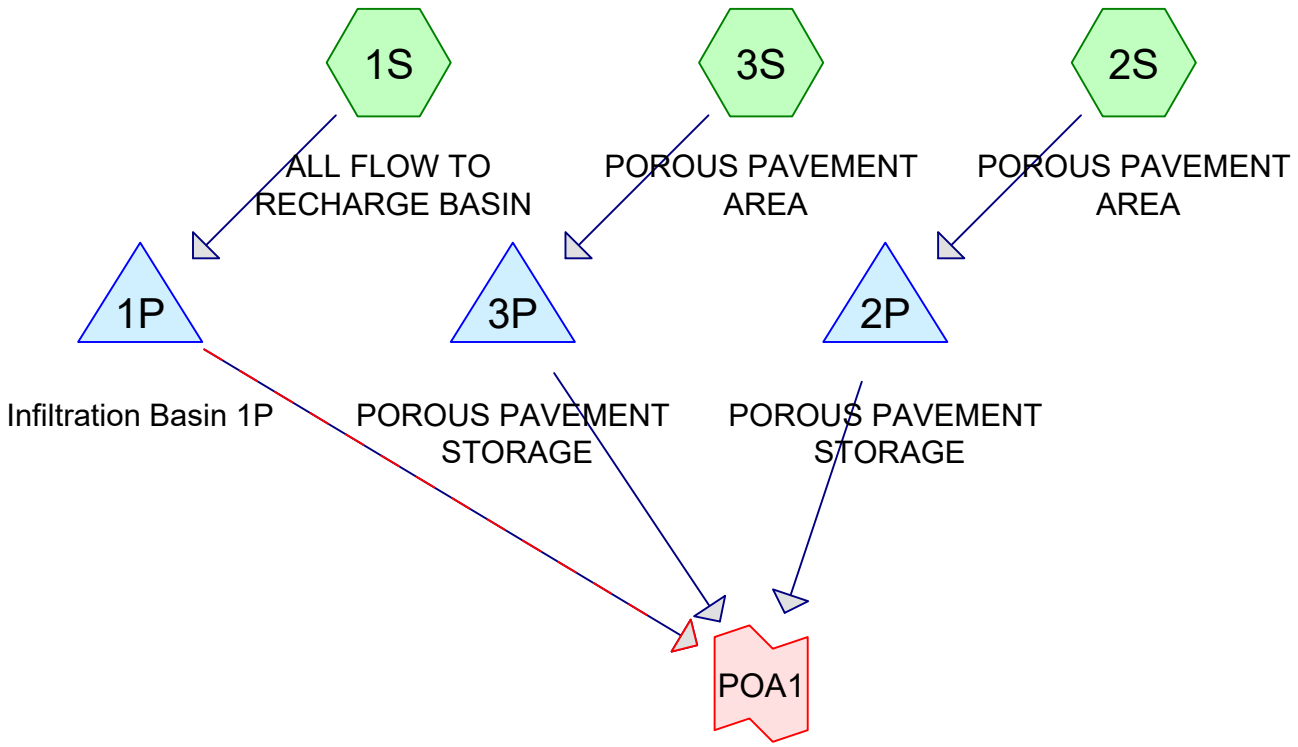
Inflow Area = 4.020 ac, 3.71% Impervious, Inflow Depth = 2.79" for 50YR event
Inflow = 12.90 cfs @ 12.08 hrs, Volume= 0.934 af
Primary = 12.90 cfs @ 12.08 hrs, Volume= 0.934 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-36.00 hrs, dt= 0.05 hrs

Link POA:



DRAINAGE ANALYSIS
POST-DEVELOPMENT CONDITION



Subcat Reach Pond Link

Routing Diagram for 3208 DAY CARE SITE POST 6-28-23
Prepared by GREGSAK AND SONS, INC, Printed 6/23/2023
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.163	61	>75% Grass cover, Good, HSG B (1S, 3S)
0.231	98	Paved parking, HSG B (1S, 2S, 3S)
0.149	98	Paved roadway, HSG B (1S, 3S)
0.147	98	Porous Pavement, HSG B (2S, 3S)
0.171	98	Roofs, HSG B (1S)
1.159	55	Woods, Good, HSG B (1S)
4.020	**66**	**TOTAL AREA**

Soil Listing (all nodes)

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

Time span=0.10-24.00 hrs, dt=0.05 hrs, 479 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 1S: ALL FLOW TO Runoff Area=3.764 ac 13.34% Impervious Runoff Depth>0.50"
Flow Length=634' Tc=5.0 min CN=64 Runoff=1.64 cfs 0.158 af

Subcatchment 2S: POROUS PAVEMENT Runoff Area=0.145 ac 100.00% Impervious Runoff Depth>2.85"
Tc=6.0 min CN=98 Runoff=0.42 cfs 0.034 af

Subcatchment 3S: POROUS PAVEMENT Runoff Area=0.111 ac 45.95% Impervious Runoff Depth>1.18"
Tc=6.0 min CN=78 Runoff=0.15 cfs 0.011 af

Pond 1P: Infiltration Basin 1P Peak Elev=436.89' Storage=1,602 cf Inflow=1.64 cfs 0.158 af
Discarded=0.30 cfs 0.158 af Secondary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.158 af

Pond 2P: POROUS PAVEMENT STORAGE Peak Elev=139.15' Storage=122 cf Inflow=0.42 cfs 0.034 af
Discarded=0.20 cfs 0.035 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.035 af

Pond 3P: POROUS PAVEMENT STORAGE Peak Elev=142.10' Storage=18 cf Inflow=0.15 cfs 0.011 af
Discarded=0.10 cfs 0.011 af Primary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.011 af

Link POA1: Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 4.020 ac Runoff Volume = 0.203 af Average Runoff Depth = 0.61"
82.64% Pervious = 3.322 ac 17.36% Impervious = 0.698 ac

Summary for Subcatchment 1S: ALL FLOW TO RECHARGE BASIN

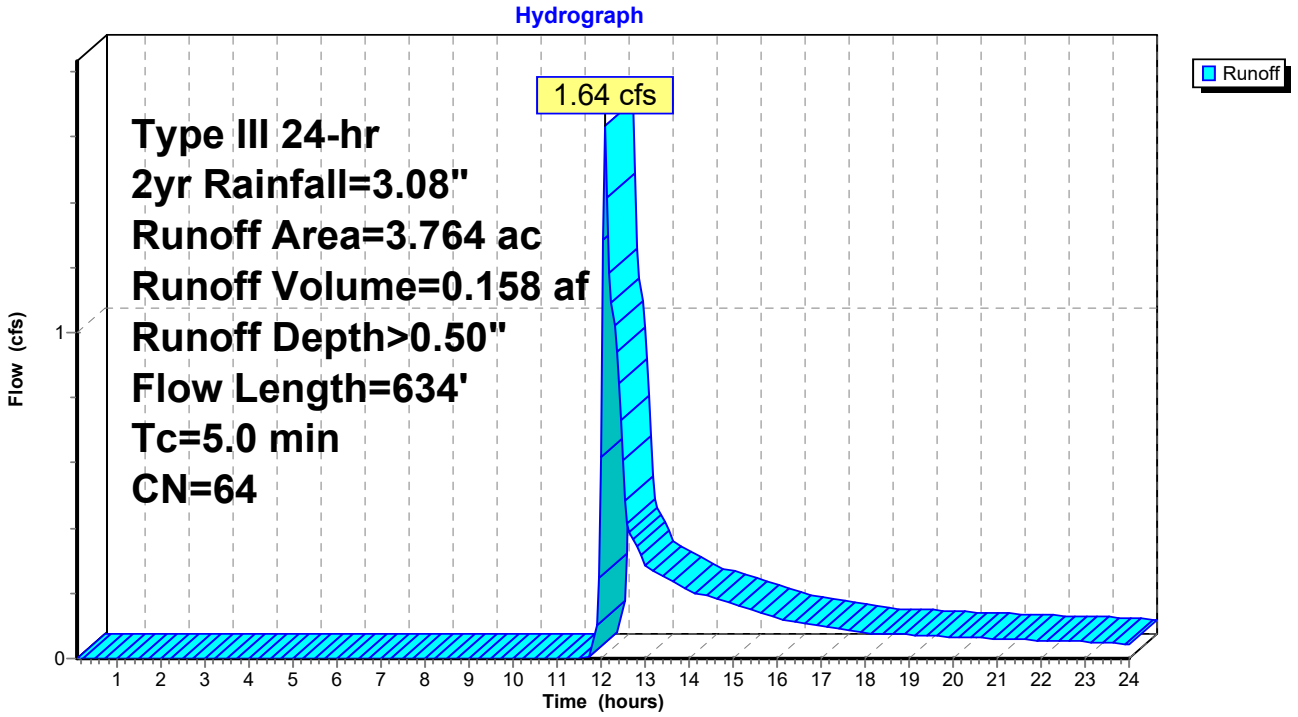
Runoff = 1.64 cfs @ 12.11 hrs, Volume= 0.158 af, Depth> 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2yr Rainfall=3.08"

	Area (ac)	CN	Description
	0.171	98	Roofs, HSG B
*	0.148	98	Paved roadway, HSG B
*	0.183	98	Paved parking, HSG B
	2.103	61	>75% Grass cover, Good, HSG B
	1.159	55	Woods, Good, HSG B
	3.764	64	Weighted Average
	3.262		86.66% Pervious Area
	0.502		13.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0200	0.88		**Sheet Flow, ROAD** Smooth surfaces n= 0.011 P2= 2.90"
0.1	22	0.2500	3.50		**Shallow Concentrated Flow, ROADWAY SIDE SLOPE** Short Grass Pasture Kv= 7.0 fps
0.5	145	0.0220	4.47	13.41	**Trap/Vee/Rect Channel Flow, GRASS SWALE** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.030 Earth, grassed & winding
0.9	288	0.0300	5.22	15.65	**Trap/Vee/Rect Channel Flow, GRASS SWALE** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.030 Earth, grassed & winding
0.0	15	0.3300	17.31	51.92	**Trap/Vee/Rect Channel Flow, POND SIDE SLOPE** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.030 Earth, grassed & winding
1.3	150	0.0070	1.99	16.59	**Parabolic Channel, TRAVEL TIME TO POA1** W=25.00' D=0.50' Area=8.3 sf Perim=25.0' n= 0.030 Earth, grassed & winding
3.1	634	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: ALL FLOW TO RECHARGE BASIN



Summary for Subcatchment 2S: POROUS PAVEMENT AREA

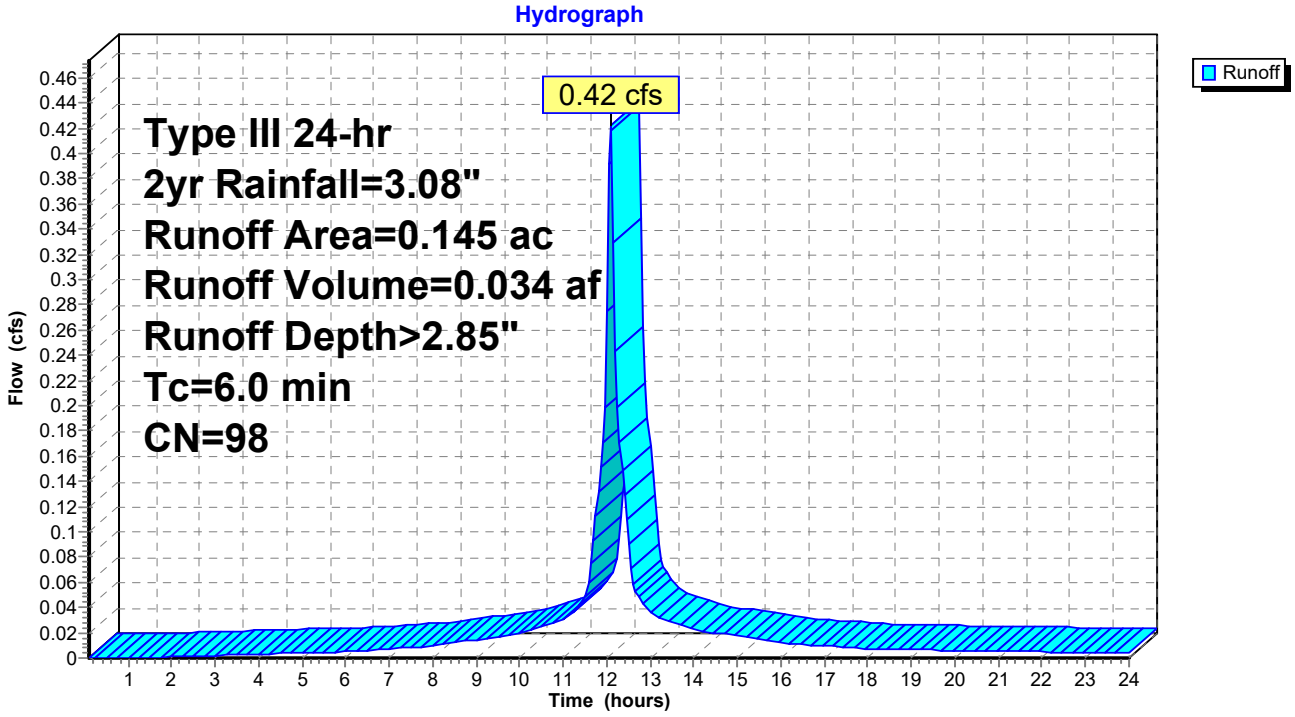
Runoff = 0.42 cfs @ 12.09 hrs, Volume= 0.034 af, Depth> 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2yr Rainfall=3.08"

	Area (ac)	CN	Description
	0.047	98	Paved parking, HSG B
*	0.098	98	Porous Pavement, HSG B
	0.145	98	Weighted Average
	0.145		100.00% Impervious Area

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

Subcatchment 2S: POROUS PAVEMENT AREA



Summary for Subcatchment 3S: POROUS PAVEMENT AREA

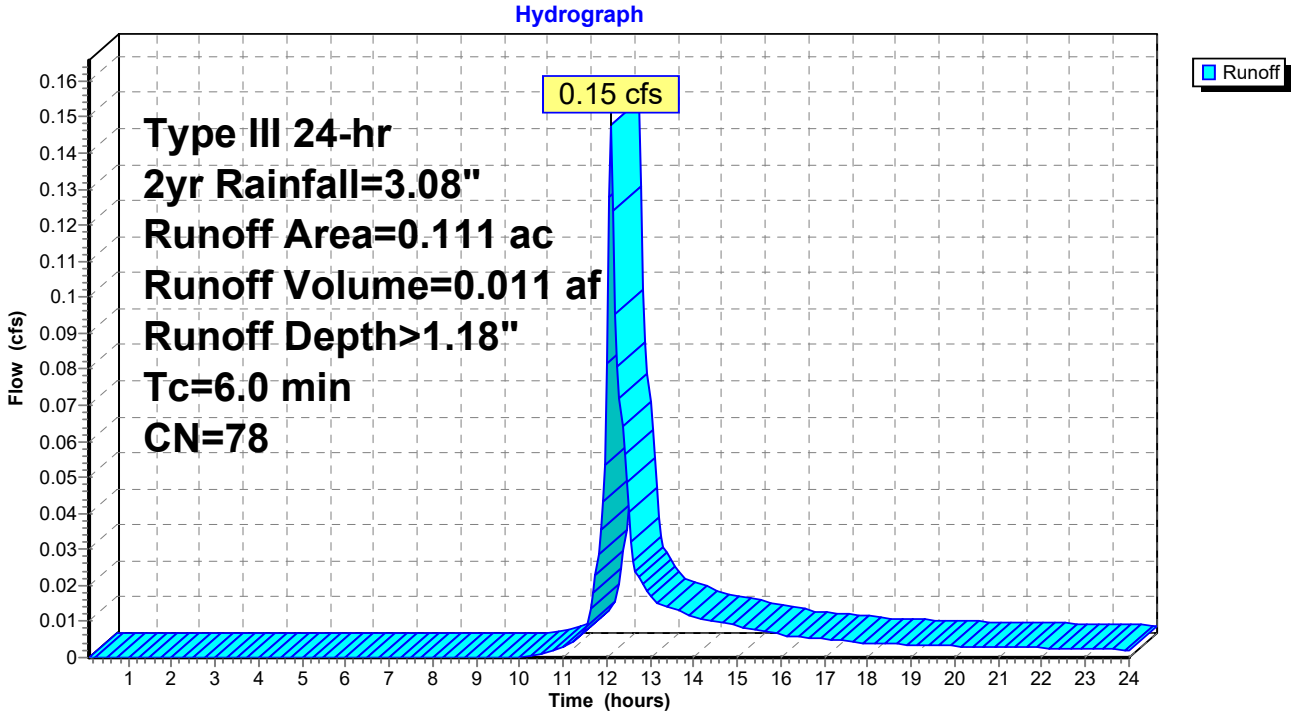
Runoff = 0.15 cfs @ 12.10 hrs, Volume= 0.011 af, Depth> 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2yr Rainfall=3.08"

	Area (ac)	CN	Description
*	0.049	98	Porous Pavement, HSG B
*	0.001	98	Paved roadway, HSG B
	0.001	98	Paved parking, HSG B
	0.060	61	>75% Grass cover, Good, HSG B
	0.111	78	Weighted Average
	0.060		54.05% Pervious Area
	0.051		45.95% Impervious Area

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

Subcatchment 3S: POROUS PAVEMENT AREA



Summary for Pond 1P: Infiltration Basin 1P

Inflow Area = 3.764 ac, 13.34% Impervious, Inflow Depth > 0.50" for 2yr event
Inflow = 1.64 cfs @ 12.11 hrs, Volume= 0.158 af
Outflow = 0.30 cfs @ 12.99 hrs, Volume= 0.158 af, Atten= 82%, Lag= 53.0 min
Discarded = 0.30 cfs @ 12.99 hrs, Volume= 0.158 af
Secondary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 436.89' @ 12.99 hrs Surf.Area= 4,282 sf Storage= 1,602 cf
Flood Elev= 438.50' Surf.Area= 6,002 sf Storage= 9,914 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 44.1 min (946.4 - 902.4)

Volume	Invert	Avail.Storage	Storage Description
#1	436.50'	9,914 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

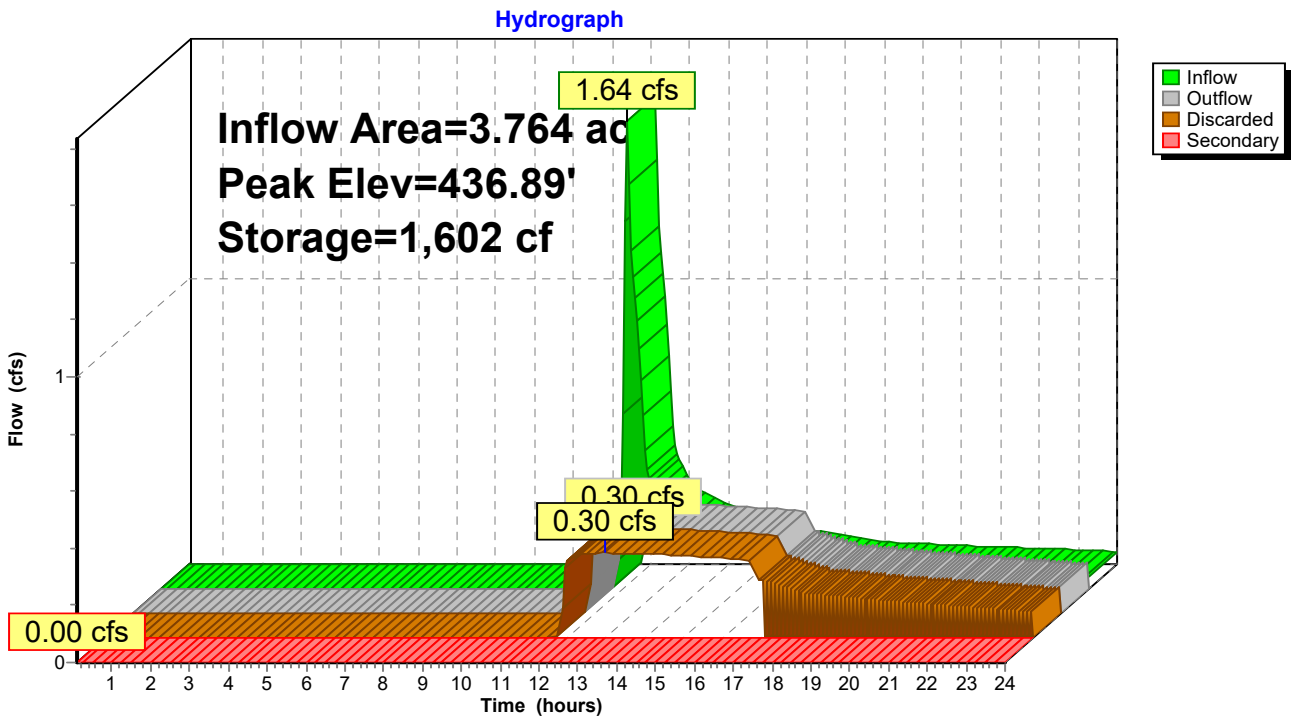
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
436.50	3,872	260.0	0	0	3,872
438.00	5,548	298.0	7,027	7,027	5,610
438.50	6,002	308.0	2,887	9,914	6,116

Device	Routing	Invert	Outlet Devices
#1	Secondary	438.00'	**11.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	436.50'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.30 cfs @ 12.99 hrs HW=436.89' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.30 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.10 hrs HW=436.50' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Infiltration Basin 1P



Summary for Pond 2P: POROUS PAVEMENT STORAGE

Inflow Area = 0.145 ac,100.00% Impervious, Inflow Depth > 2.85" for 2yr event
Inflow = 0.42 cfs @ 12.09 hrs, Volume= 0.034 af
Outflow = 0.20 cfs @ 12.10 hrs, Volume= 0.035 af, Atten= 53%, Lag= 0.8 min
Discarded = 0.20 cfs @ 12.10 hrs, Volume= 0.035 af
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 139.15' @ 12.26 hrs Surf.Area= 4,268 sf Storage= 122 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 2.2 min (759.0 - 756.8)

Volume	Invert	Avail.Storage	Storage Description
#1	139.08'	1,707 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 4,268 cf Overall x 40.0% Voids

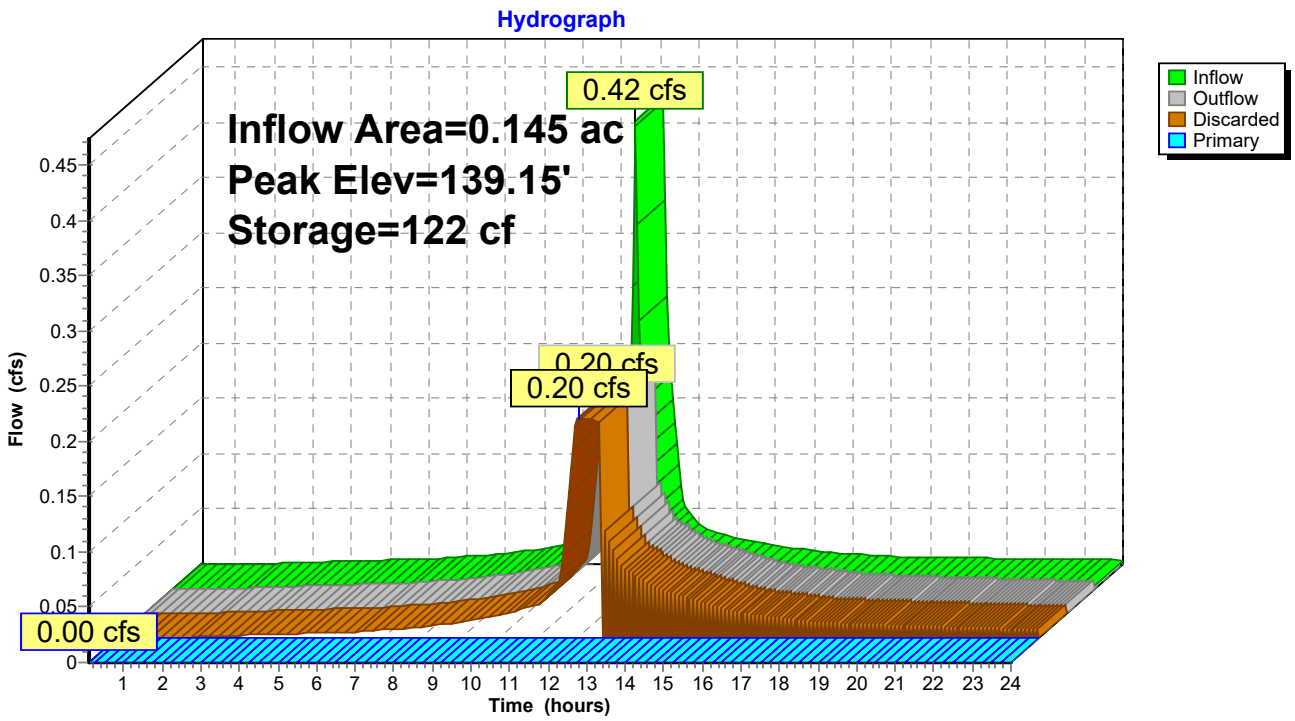
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
139.08	4,268	0	0
140.08	4,268	4,268	4,268

Device	Routing	Invert	Outlet Devices
#1	Discarded	139.08'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	142.00'	**102.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.20 cfs @ 12.10 hrs HW=139.12' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=139.08' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: POROUS PAVEMENT STORAGE



Summary for Pond 3P: POROUS PAVEMENT STORAGE

Inflow Area = 0.111 ac, 45.95% Impervious, Inflow Depth > 1.18" for 2yr event
Inflow = 0.15 cfs @ 12.10 hrs, Volume= 0.011 af
Outflow = 0.10 cfs @ 12.35 hrs, Volume= 0.011 af, Atten= 33%, Lag= 15.1 min
Discarded = 0.10 cfs @ 12.35 hrs, Volume= 0.011 af
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 142.10' @ 12.20 hrs Surf.Area= 2,135 sf Storage= 18 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.6 min (851.3 - 850.6)

Volume	Invert	Avail.Storage	Storage Description
#1	142.08'	854 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 2,135 cf Overall x 40.0% Voids

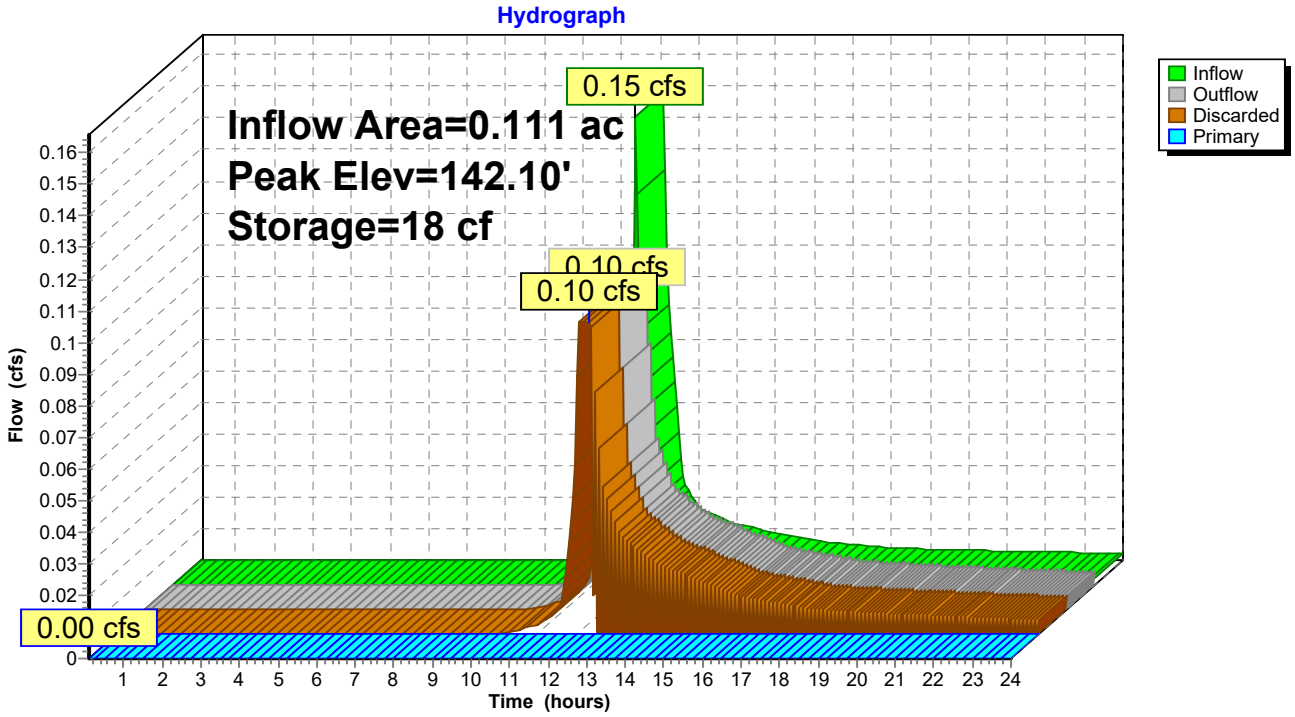
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
142.08	2,135	0	0
143.08	2,135	2,135	2,135

Device	Routing	Invert	Outlet Devices
#1	Discarded	142.08'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	145.00'	**102.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.10 cfs @ 12.35 hrs HW=142.09' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=142.08' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: POROUS PAVEMENT STORAGE

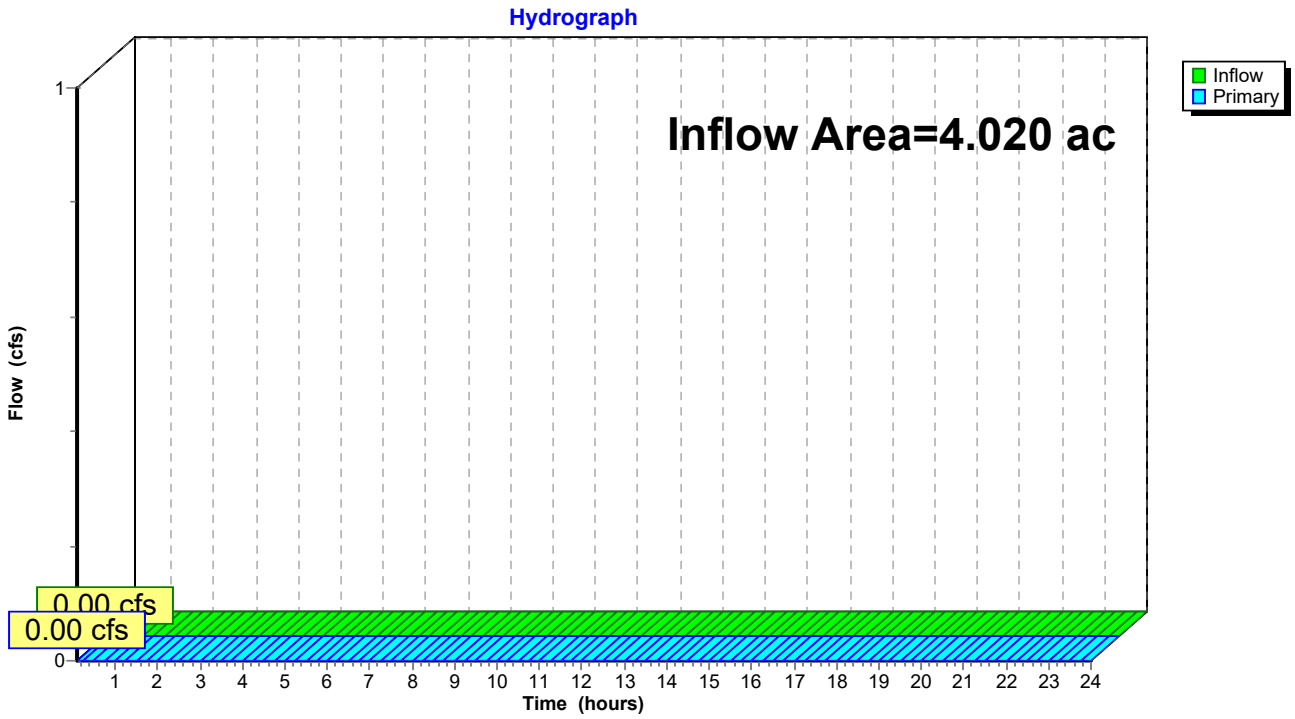


Summary for Link POA1:

Inflow Area = 4.020 ac, 17.36% Impervious, Inflow Depth = 0.00" for 2yr event
Inflow = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link POA1:



Time span=0.10-24.00 hrs, dt=0.05 hrs, 479 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 1S: ALL FLOW TO Runoff Area=3.764 ac 13.34% Impervious Runoff Depth>1.38"
Flow Length=634' Tc=5.0 min CN=64 Runoff=5.68 cfs 0.431 af

Subcatchment 2S: POROUS PAVEMENT Runoff Area=0.145 ac 100.00% Impervious Runoff Depth>4.44"
Tc=6.0 min CN=98 Runoff=0.65 cfs 0.054 af

Subcatchment 3S: POROUS PAVEMENT Runoff Area=0.111 ac 45.95% Impervious Runoff Depth>2.44"
Tc=6.0 min CN=78 Runoff=0.31 cfs 0.023 af

Pond 1P: Infiltration Basin 1P Peak Elev=438.05' Storage=7,333 cf Inflow=5.68 cfs 0.431 af
Discarded=0.39 cfs 0.366 af Secondary=0.34 cfs 0.032 af Outflow=0.72 cfs 0.399 af

Pond 2P: POROUS PAVEMENT STORAGE Peak Elev=139.29' Storage=354 cf Inflow=0.65 cfs 0.054 af
Discarded=0.20 cfs 0.054 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.054 af

Pond 3P: POROUS PAVEMENT STORAGE Peak Elev=142.27' Storage=161 cf Inflow=0.31 cfs 0.023 af
Discarded=0.10 cfs 0.023 af Primary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.023 af

Link POA1: Inflow=0.34 cfs 0.032 af
Primary=0.34 cfs 0.032 af

Total Runoff Area = 4.020 ac Runoff Volume = 0.508 af Average Runoff Depth = 1.52"
82.64% Pervious = 3.322 ac 17.36% Impervious = 0.698 ac

Summary for Subcatchment 1S: ALL FLOW TO RECHARGE BASIN

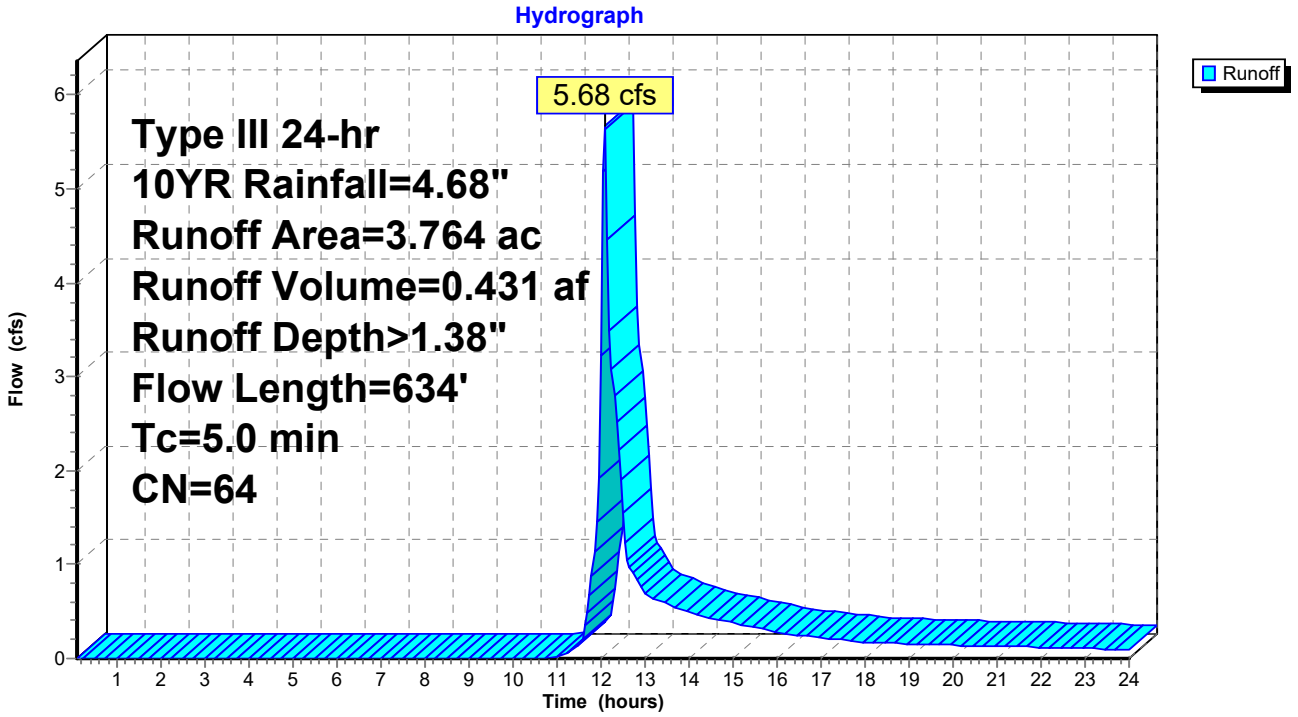
Runoff = 5.68 cfs @ 12.09 hrs, Volume= 0.431 af, Depth> 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=4.68"

	Area (ac)	CN	Description
	0.171	98	Roofs, HSG B
*	0.148	98	Paved roadway, HSG B
*	0.183	98	Paved parking, HSG B
	2.103	61	>75% Grass cover, Good, HSG B
	1.159	55	Woods, Good, HSG B
	3.764	64	Weighted Average
	3.262		86.66% Pervious Area
	0.502		13.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0200	0.88		**Sheet Flow, ROAD** Smooth surfaces n= 0.011 P2= 2.90"
0.1	22	0.2500	3.50		**Shallow Concentrated Flow, ROADWAY SIDE SLOPE** Short Grass Pasture Kv= 7.0 fps
0.5	145	0.0220	4.47	13.41	**Trap/Vee/Rect Channel Flow, GRASS SWALE** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.030 Earth, grassed & winding
0.9	288	0.0300	5.22	15.65	**Trap/Vee/Rect Channel Flow, GRASS SWALE** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.030 Earth, grassed & winding
0.0	15	0.3300	17.31	51.92	**Trap/Vee/Rect Channel Flow, POND SIDE SLOPE** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.030 Earth, grassed & winding
1.3	150	0.0070	1.99	16.59	**Parabolic Channel, TRAVEL TIME TO POA1** W=25.00' D=0.50' Area=8.3 sf Perim=25.0' n= 0.030 Earth, grassed & winding
3.1	634	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: ALL FLOW TO RECHARGE BASIN



Summary for Subcatchment 2S: POROUS PAVEMENT AREA

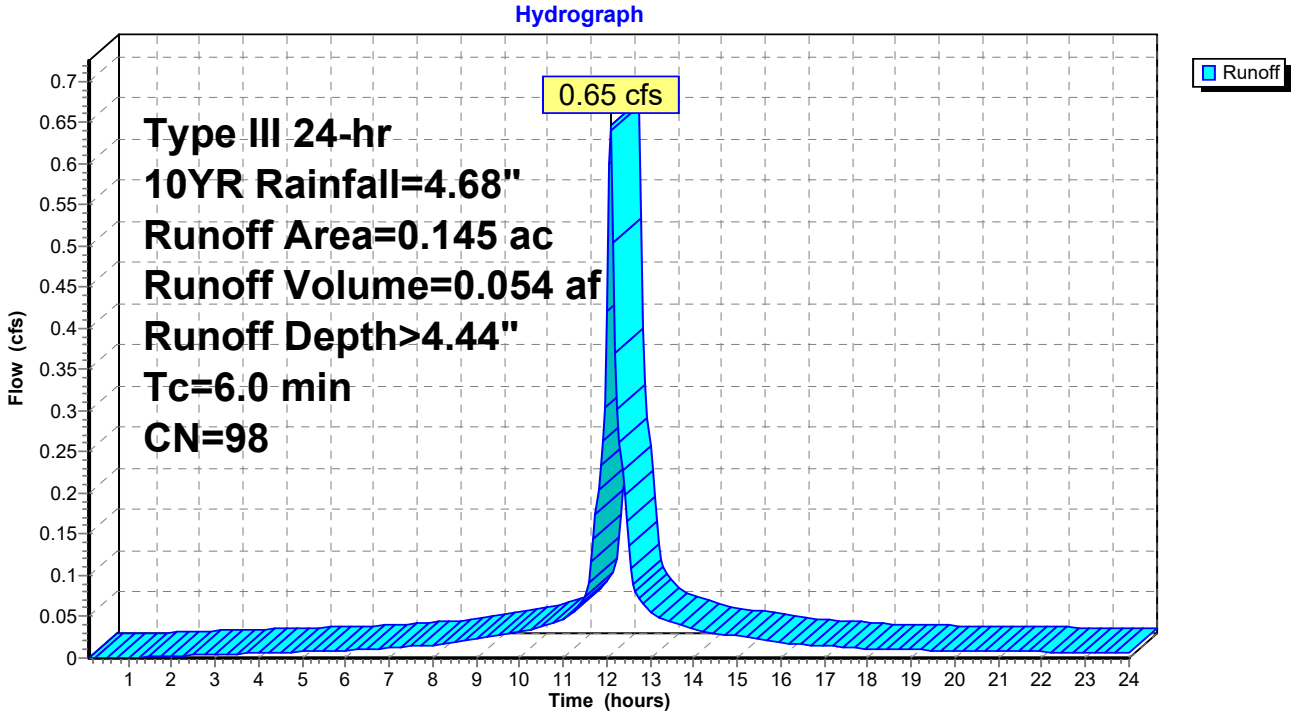
Runoff = 0.65 cfs @ 12.09 hrs, Volume= 0.054 af, Depth> 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=4.68"

	Area (ac)	CN	Description
	0.047	98	Paved parking, HSG B
*	0.098	98	Porous Pavement, HSG B
	0.145	98	Weighted Average
	0.145		100.00% Impervious Area

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

Subcatchment 2S: POROUS PAVEMENT AREA



Summary for Subcatchment 3S: POROUS PAVEMENT AREA

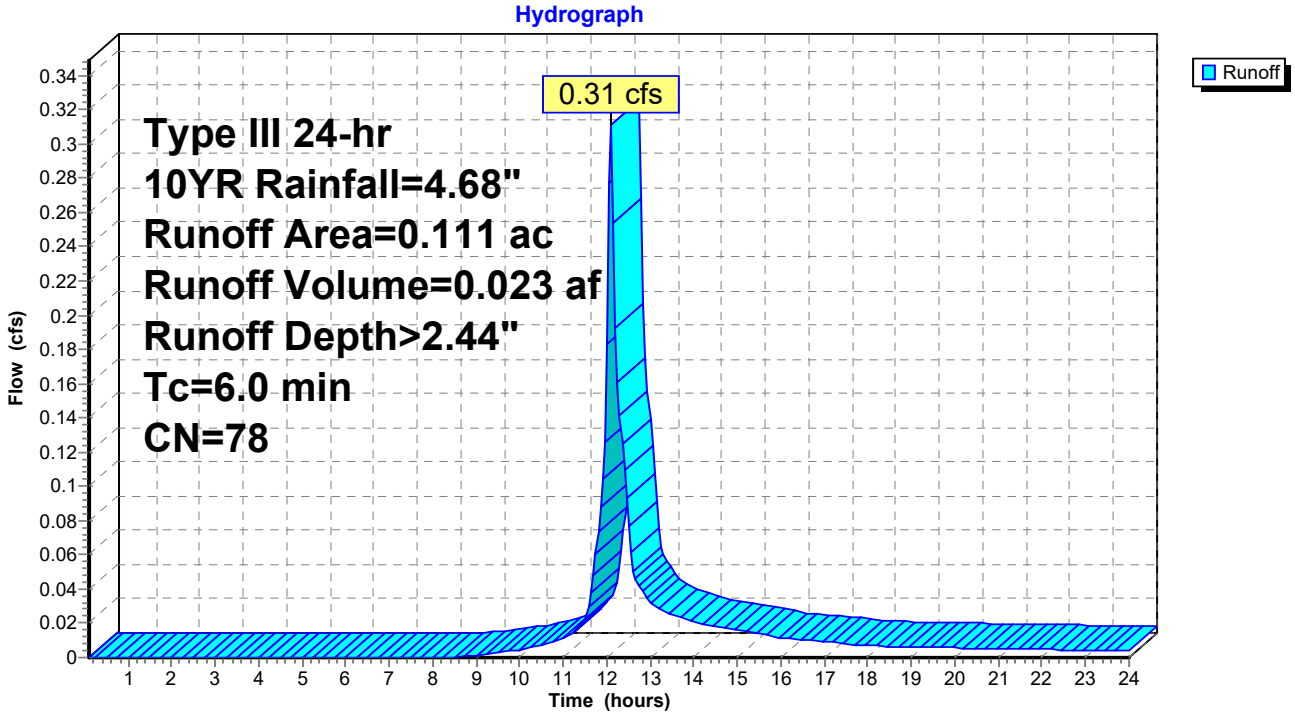
Runoff = 0.31 cfs @ 12.09 hrs, Volume= 0.023 af, Depth> 2.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10YR Rainfall=4.68"

	Area (ac)	CN	Description
*	0.049	98	Porous Pavement, HSG B
*	0.001	98	Paved roadway, HSG B
	0.001	98	Paved parking, HSG B
	0.060	61	>75% Grass cover, Good, HSG B
	0.111	78	Weighted Average
	0.060		54.05% Pervious Area
	0.051		45.95% Impervious Area

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

Subcatchment 3S: POROUS PAVEMENT AREA



Summary for Pond 1P: Infiltration Basin 1P

Inflow Area = 3.764 ac, 13.34% Impervious, Inflow Depth > 1.38" for 10YR event
Inflow = 5.68 cfs @ 12.09 hrs, Volume= 0.431 af
Outflow = 0.72 cfs @ 12.99 hrs, Volume= 0.399 af, Atten= 87%, Lag= 54.2 min
Discarded = 0.39 cfs @ 12.99 hrs, Volume= 0.366 af
Secondary = 0.34 cfs @ 12.99 hrs, Volume= 0.032 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 438.05' @ 12.99 hrs Surf.Area= 5,597 sf Storage= 7,333 cf
Flood Elev= 438.50' Surf.Area= 6,002 sf Storage= 9,914 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 166.1 min (1,032.6 - 866.5)

Volume	Invert	Avail.Storage	Storage Description
#1	436.50'	9,914 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

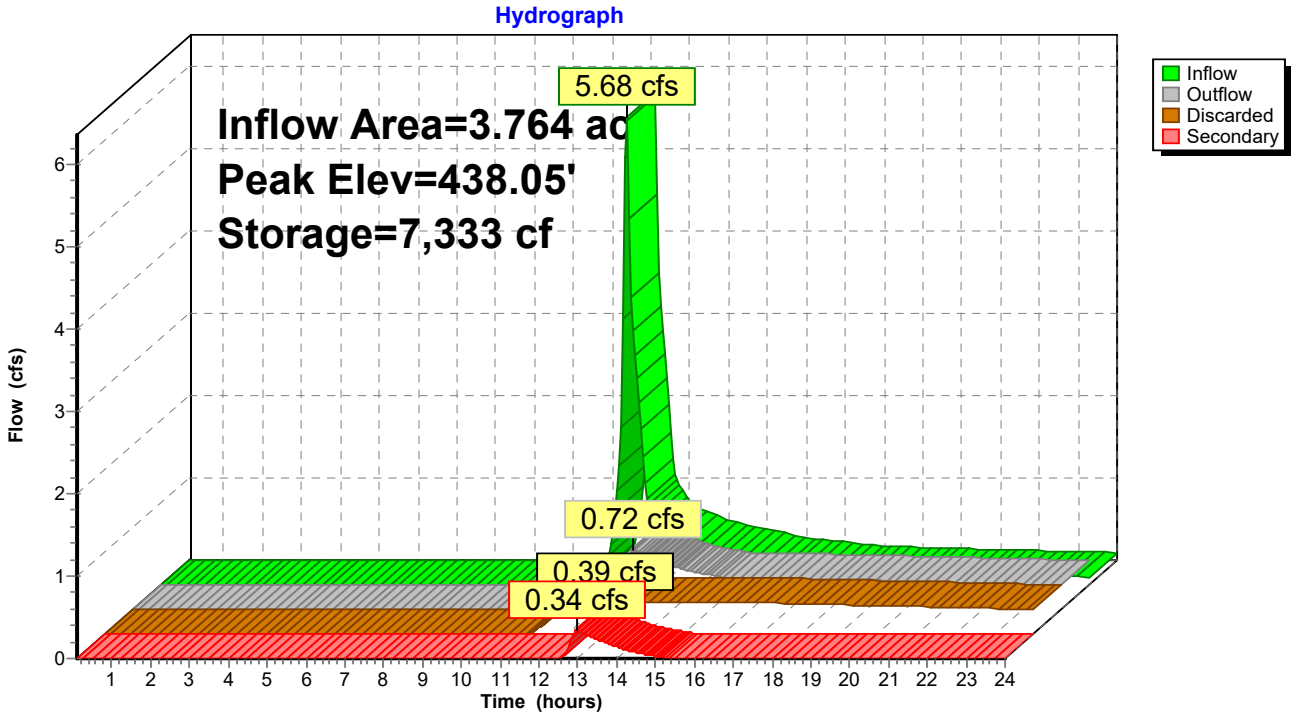
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
436.50	3,872	260.0	0	0	3,872
438.00	5,548	298.0	7,027	7,027	5,610
438.50	6,002	308.0	2,887	9,914	6,116

Device	Routing	Invert	Outlet Devices
#1	Secondary	438.00'	**11.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	436.50'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.39 cfs @ 12.99 hrs HW=438.05' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.39 cfs)

Secondary OutFlow Max=0.34 cfs @ 12.99 hrs HW=438.05' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.34 cfs @ 0.56 fps)

Pond 1P: Infiltration Basin 1P



Summary for Pond 2P: POROUS PAVEMENT STORAGE

Inflow Area =	0.145 ac,100.00% Impervious, Inflow Depth > 4.44" for 10YR event				
Inflow =	0.65 cfs @	12.09 hrs,	Volume=	0.054 af	
Outflow =	0.20 cfs @	12.00 hrs,	Volume=	0.054 af,	Atten= 69%, Lag= 0.0 min
Discarded =	0.20 cfs @	12.00 hrs,	Volume=	0.054 af	
Primary =	0.00 cfs @	0.10 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 139.29' @ 12.40 hrs Surf.Area= 4,268 sf Storage= 354 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 7.4 min (756.1 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1	139.08'	1,707 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 4,268 cf Overall x 40.0% Voids

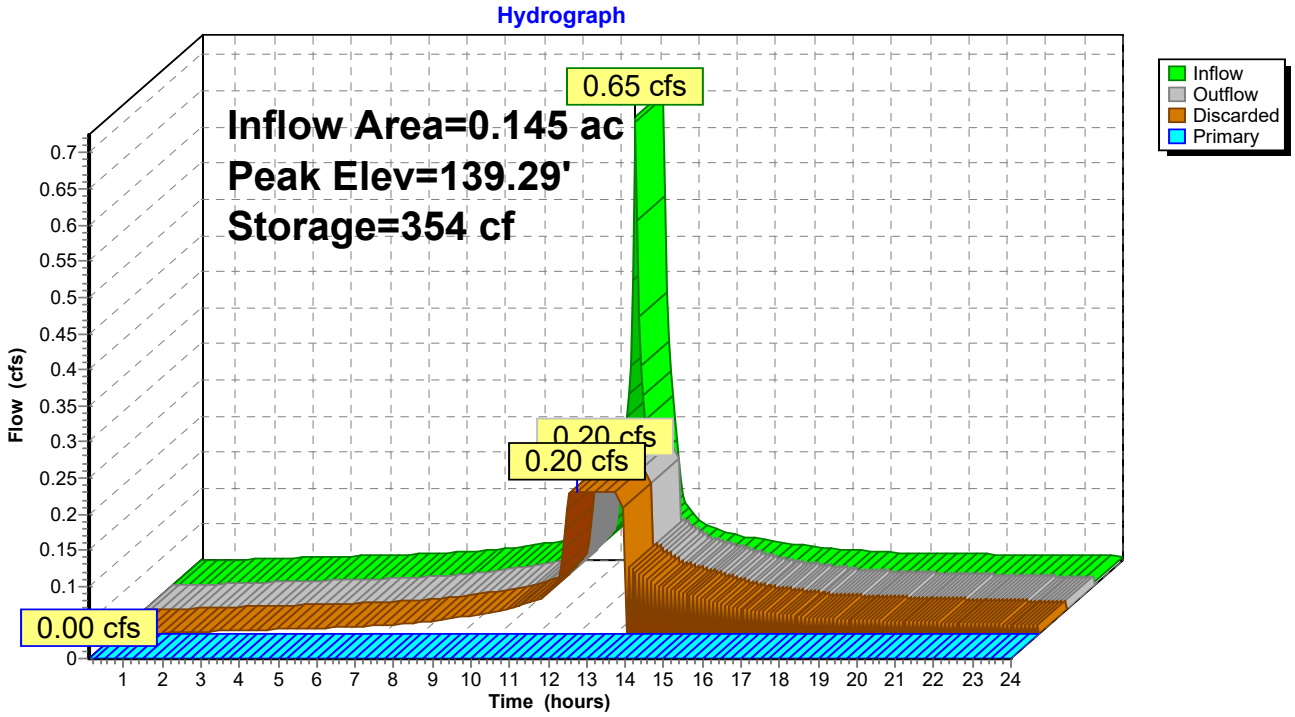
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
139.08	4,268	0	0
140.08	4,268	4,268	4,268

Device	Routing	Invert	Outlet Devices
#1	Discarded	139.08'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	142.00'	**102.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.20 cfs @ 12.00 hrs HW=139.11' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=139.08' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: POROUS PAVEMENT STORAGE



Summary for Pond 3P: POROUS PAVEMENT STORAGE

Inflow Area =	0.111 ac, 45.95% Impervious, Inflow Depth > 2.44" for 10YR event				
Inflow =	0.31 cfs @	12.09 hrs,	Volume=	0.023 af	
Outflow =	0.10 cfs @	12.05 hrs,	Volume=	0.023 af,	Atten= 68%, Lag= 0.0 min
Discarded =	0.10 cfs @	12.05 hrs,	Volume=	0.023 af	
Primary =	0.00 cfs @	0.10 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 142.27' @ 12.43 hrs Surf.Area= 2,135 sf Storage= 161 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 7.6 min (837.2 - 829.6)

Volume	Invert	Avail.Storage	Storage Description
#1	142.08'	854 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 2,135 cf Overall x 40.0% Voids

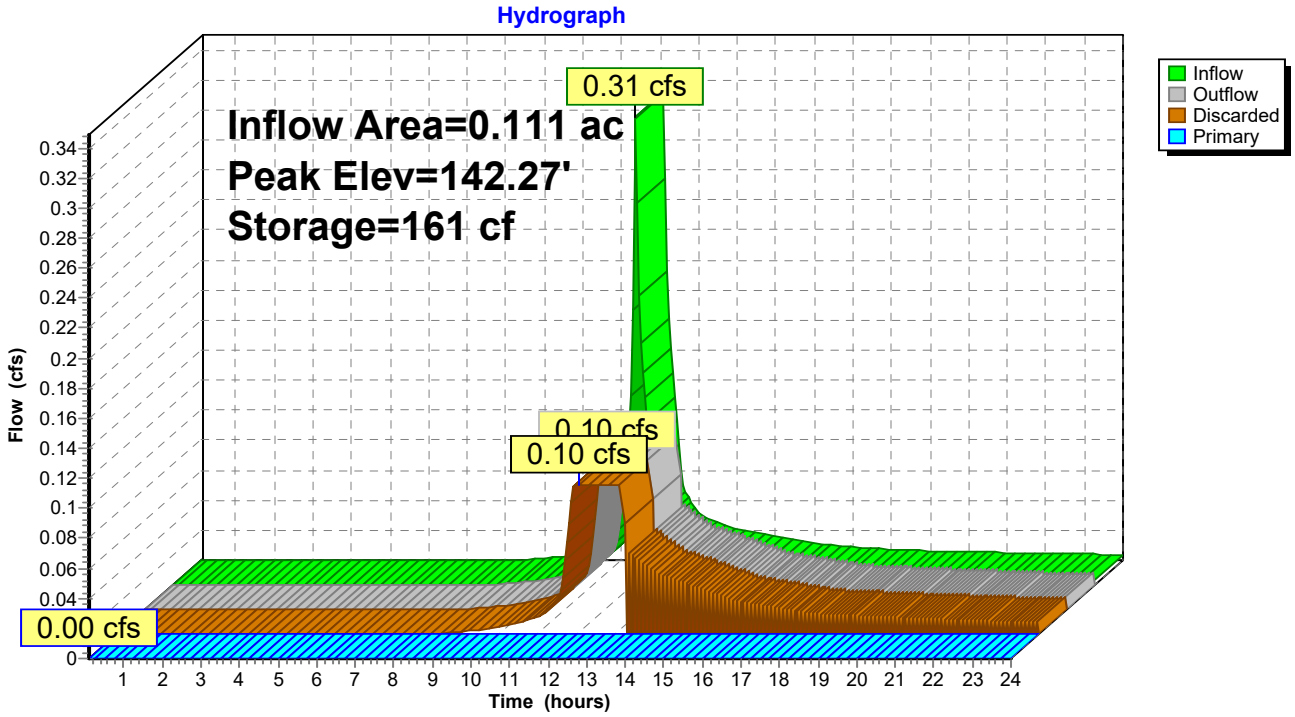
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
142.08	2,135	0	0
143.08	2,135	2,135	2,135

Device	Routing	Invert	Outlet Devices
#1	Discarded	142.08'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	145.00'	**102.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.10 cfs @ 12.05 hrs HW=142.12' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=142.08' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: POROUS PAVEMENT STORAGE

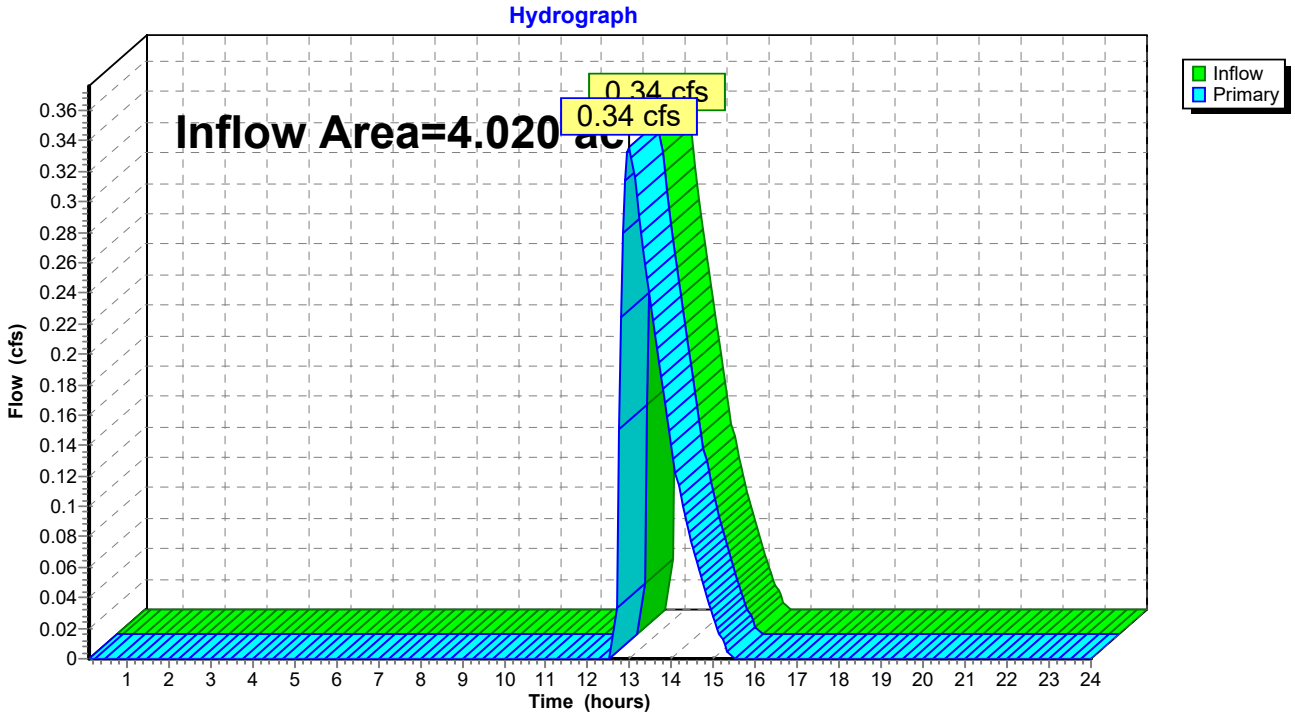


Summary for Link POA1:

Inflow Area = 4.020 ac, 17.36% Impervious, Inflow Depth = 0.10" for 10YR event
Inflow = 0.34 cfs @ 12.99 hrs, Volume= 0.032 af
Primary = 0.34 cfs @ 12.99 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link POA1:



Time span=0.10-24.00 hrs, dt=0.05 hrs, 479 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 1S: ALL FLOW TO Runoff Area=3.764 ac 13.34% Impervious Runoff Depth>2.22"
Flow Length=634' Tc=5.0 min CN=64 Runoff=9.56 cfs 0.696 af

Subcatchment 2S: POROUS PAVEMENT Runoff Area=0.145 ac 100.00% Impervious Runoff Depth>5.70"
Tc=6.0 min CN=98 Runoff=0.82 cfs 0.069 af

Subcatchment 3S: POROUS PAVEMENT Runoff Area=0.111 ac 45.95% Impervious Runoff Depth>3.52"
Tc=6.0 min CN=78 Runoff=0.45 cfs 0.033 af

Pond 1P: Infiltration Basin 1P Peak Elev=438.28' Storage=8,589 cf Inflow=9.56 cfs 0.696 af
Discarded=0.40 cfs 0.395 af Secondary=3.88 cfs 0.229 af Outflow=4.28 cfs 0.625 af

Pond 2P: POROUS PAVEMENT STORAGE Peak Elev=139.42' Storage=582 cf Inflow=0.82 cfs 0.069 af
Discarded=0.20 cfs 0.069 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.069 af

Pond 3P: POROUS PAVEMENT STORAGE Peak Elev=142.47' Storage=334 cf Inflow=0.45 cfs 0.033 af
Discarded=0.10 cfs 0.033 af Primary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.033 af

Link POA1: Inflow=3.88 cfs 0.229 af
Primary=3.88 cfs 0.229 af

Total Runoff Area = 4.020 ac Runoff Volume = 0.797 af Average Runoff Depth = 2.38"
82.64% Pervious = 3.322 ac 17.36% Impervious = 0.698 ac

Summary for Subcatchment 1S: ALL FLOW TO RECHARGE BASIN

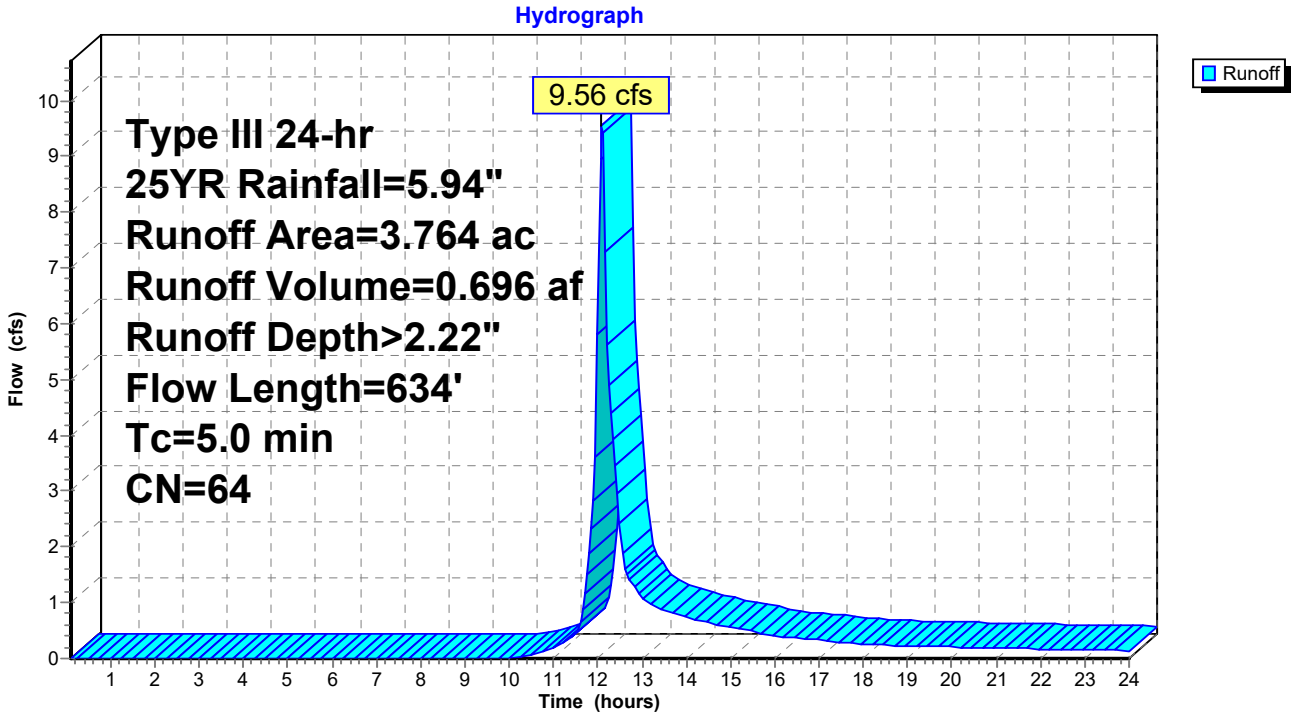
Runoff = 9.56 cfs @ 12.08 hrs, Volume= 0.696 af, Depth> 2.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=5.94"

	Area (ac)	CN	Description
	0.171	98	Roofs, HSG B
*	0.148	98	Paved roadway, HSG B
*	0.183	98	Paved parking, HSG B
	2.103	61	>75% Grass cover, Good, HSG B
	1.159	55	Woods, Good, HSG B
	3.764	64	Weighted Average
	3.262		86.66% Pervious Area
	0.502		13.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0200	0.88		**Sheet Flow, ROAD** Smooth surfaces n= 0.011 P2= 2.90"
0.1	22	0.2500	3.50		**Shallow Concentrated Flow, ROADWAY SIDE SLOPE** Short Grass Pasture Kv= 7.0 fps
0.5	145	0.0220	4.47	13.41	**Trap/Vee/Rect Channel Flow, GRASS SWALE** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.030 Earth, grassed & winding
0.9	288	0.0300	5.22	15.65	**Trap/Vee/Rect Channel Flow, GRASS SWALE** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.030 Earth, grassed & winding
0.0	15	0.3300	17.31	51.92	**Trap/Vee/Rect Channel Flow, POND SIDE SLOPE** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.030 Earth, grassed & winding
1.3	150	0.0070	1.99	16.59	**Parabolic Channel, TRAVEL TIME TO POA1** W=25.00' D=0.50' Area=8.3 sf Perim=25.0' n= 0.030 Earth, grassed & winding
3.1	634	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: ALL FLOW TO RECHARGE BASIN



Summary for Subcatchment 2S: POROUS PAVEMENT AREA

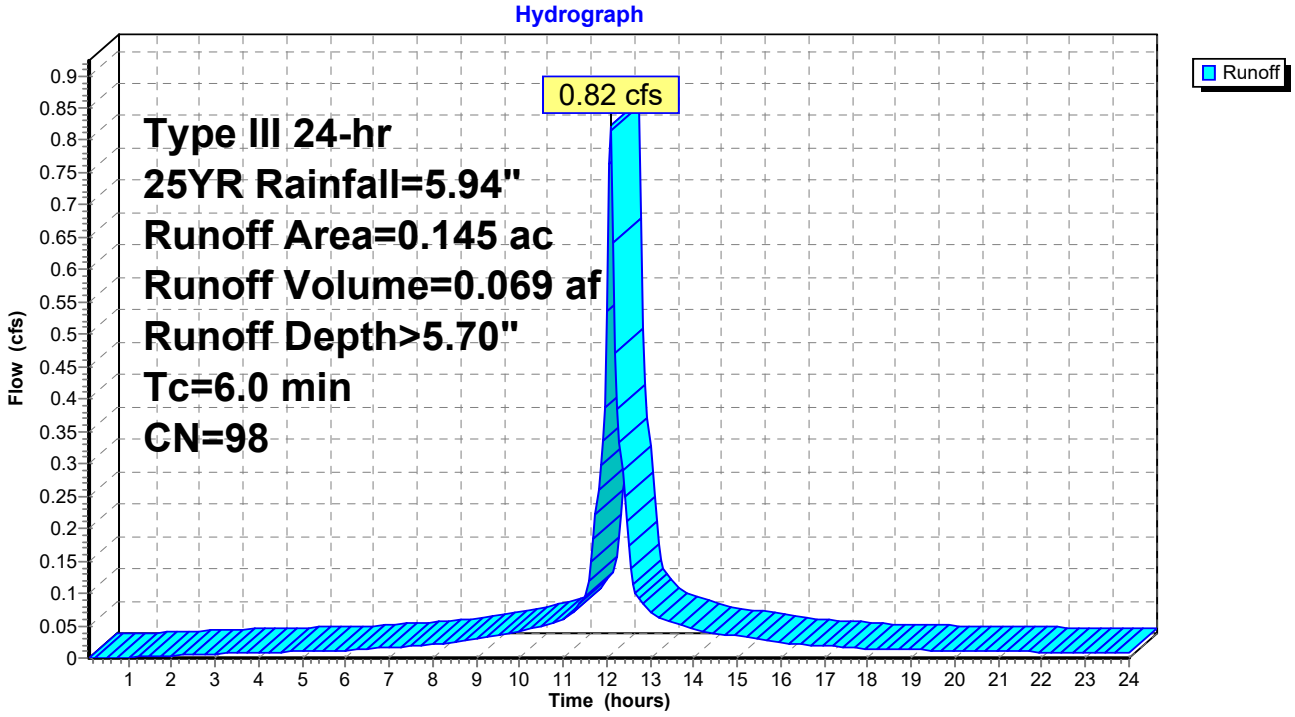
Runoff = 0.82 cfs @ 12.09 hrs, Volume= 0.069 af, Depth> 5.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=5.94"

	Area (ac)	CN	Description
	0.047	98	Paved parking, HSG B
*	0.098	98	Porous Pavement, HSG B
	0.145	98	Weighted Average
	0.145		100.00% Impervious Area

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

Subcatchment 2S: POROUS PAVEMENT AREA



Summary for Subcatchment 3S: POROUS PAVEMENT AREA

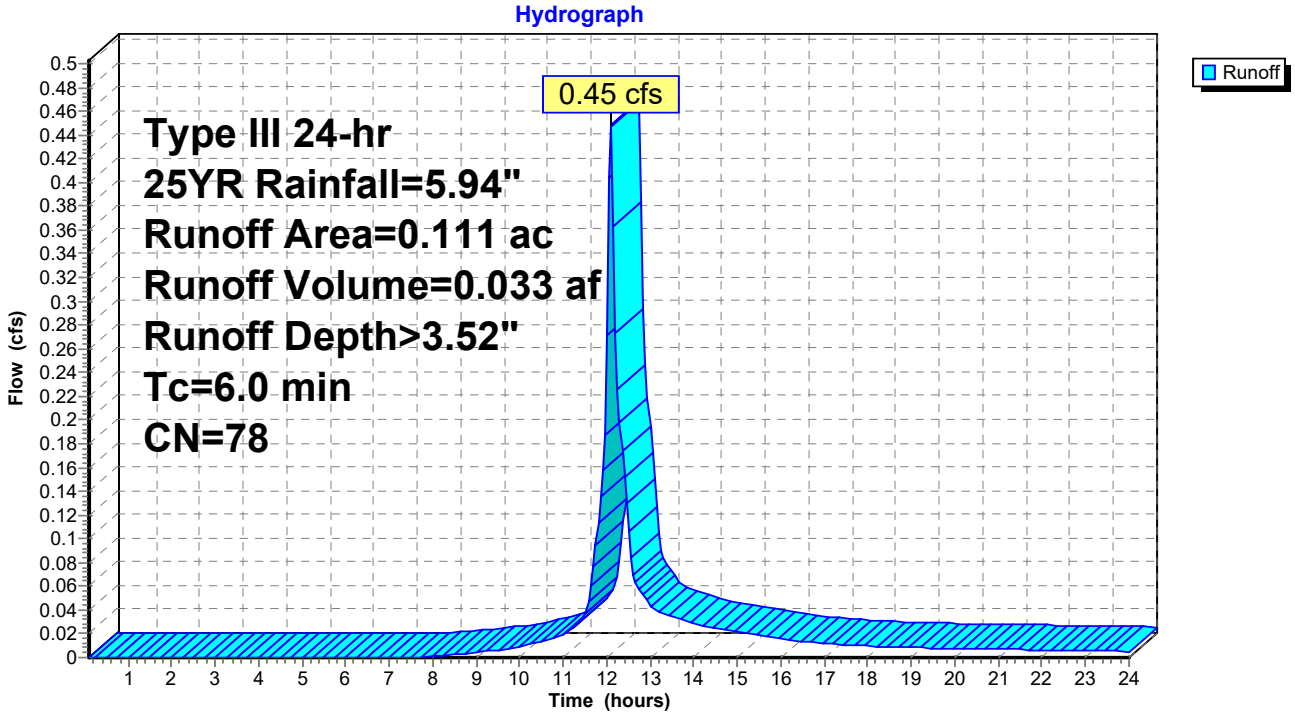
Runoff = 0.45 cfs @ 12.09 hrs, Volume= 0.033 af, Depth> 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=5.94"

	Area (ac)	CN	Description
*	0.049	98	Porous Pavement, HSG B
*	0.001	98	Paved roadway, HSG B
	0.001	98	Paved parking, HSG B
	0.060	61	>75% Grass cover, Good, HSG B
	0.111	78	Weighted Average
	0.060		54.05% Pervious Area
	0.051		45.95% Impervious Area

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

Subcatchment 3S: POROUS PAVEMENT AREA



Summary for Pond 1P: Infiltration Basin 1P

Inflow Area =	3.764 ac, 13.34% Impervious, Inflow Depth > 2.22" for 25YR event				
Inflow =	9.56 cfs @	12.08 hrs,	Volume=	0.696 af	
Outflow =	4.28 cfs @	12.32 hrs,	Volume=	0.625 af,	Atten= 55%, Lag= 14.2 min
Discarded =	0.40 cfs @	12.32 hrs,	Volume=	0.395 af	
Secondary =	3.88 cfs @	12.32 hrs,	Volume=	0.229 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 438.28' @ 12.32 hrs Surf.Area= 5,796 sf Storage= 8,589 cf
Flood Elev= 438.50' Surf.Area= 6,002 sf Storage= 9,914 cf

Plug-Flow detention time= 144.9 min calculated for 0.625 af (90% of inflow)
Center-of-Mass det. time= 95.4 min (947.2 - 851.8)

Volume	Invert	Avail.Storage	Storage Description
#1	436.50'	9,914 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

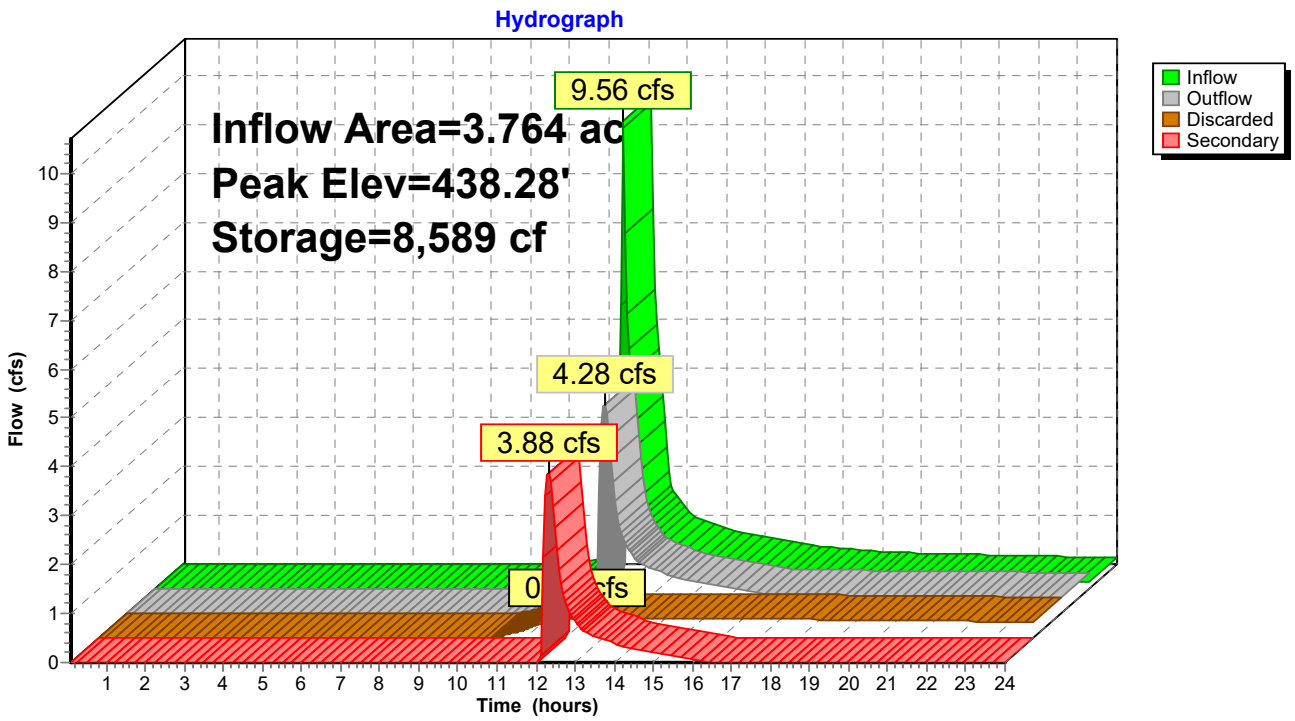
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
436.50	3,872	260.0	0	0	3,872
438.00	5,548	298.0	7,027	7,027	5,610
438.50	6,002	308.0	2,887	9,914	6,116

Device	Routing	Invert	Outlet Devices
#1	Secondary	438.00'	**11.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	436.50'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.40 cfs @ 12.32 hrs HW=438.27' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.40 cfs)

Secondary OutFlow Max=3.82 cfs @ 12.32 hrs HW=438.27' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 3.82 cfs @ 1.27 fps)

Pond 1P: Infiltration Basin 1P



Summary for Pond 2P: POROUS PAVEMENT STORAGE

Inflow Area = 0.145 ac,100.00% Impervious, Inflow Depth > 5.70" for 25YR event
Inflow = 0.82 cfs @ 12.09 hrs, Volume= 0.069 af
Outflow = 0.20 cfs @ 11.95 hrs, Volume= 0.069 af, Atten= 76%, Lag= 0.0 min
Discarded = 0.20 cfs @ 11.95 hrs, Volume= 0.069 af
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 139.42' @ 12.47 hrs Surf.Area= 4,268 sf Storage= 582 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.6 min (758.5 - 744.9)

Volume	Invert	Avail.Storage	Storage Description
#1	139.08'	1,707 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 4,268 cf Overall x 40.0% Voids

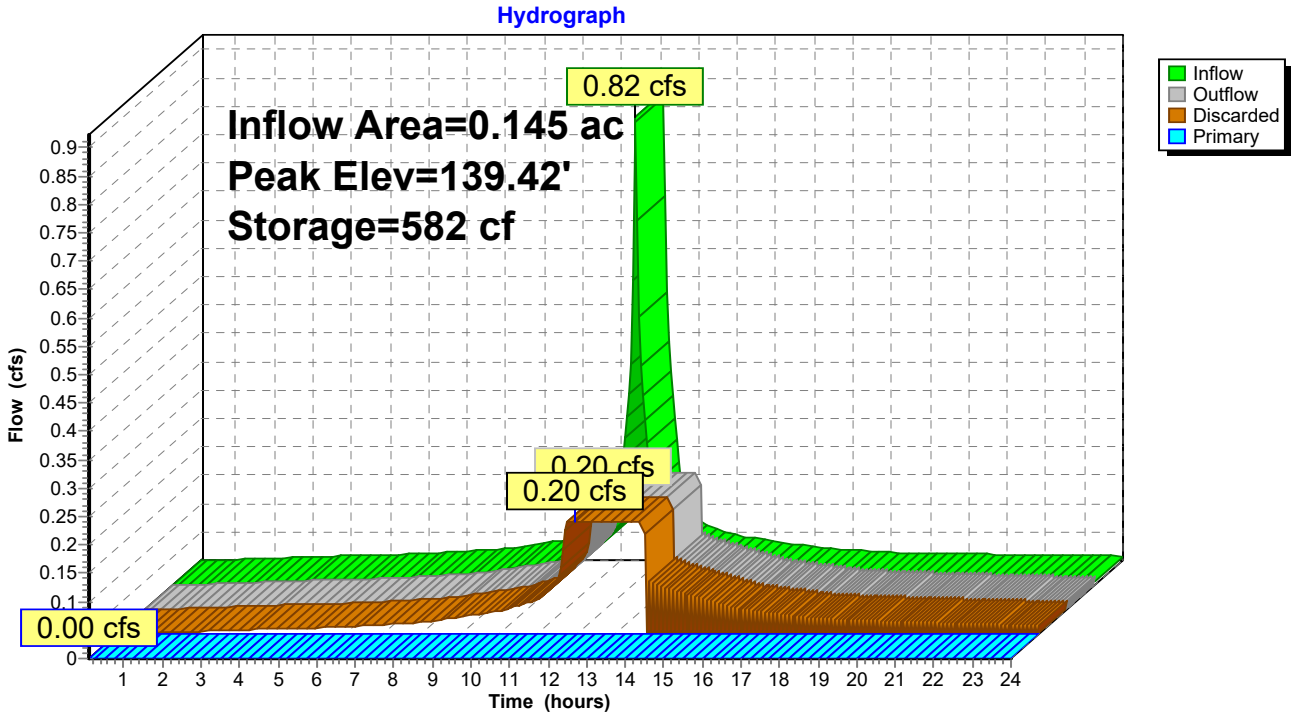
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
139.08	4,268	0	0
140.08	4,268	4,268	4,268

Device	Routing	Invert	Outlet Devices
#1	Discarded	139.08'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	142.00'	**102.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.20 cfs @ 11.95 hrs HW=139.12' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=139.08' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: POROUS PAVEMENT STORAGE



Summary for Pond 3P: POROUS PAVEMENT STORAGE

Inflow Area =	0.111 ac, 45.95% Impervious, Inflow Depth > 3.52" for 25YR event				
Inflow =	0.45 cfs @	12.09 hrs,	Volume=	0.033 af	
Outflow =	0.10 cfs @	11.95 hrs,	Volume=	0.033 af,	Atten= 78%, Lag= 0.0 min
Discarded =	0.10 cfs @	11.95 hrs,	Volume=	0.033 af	
Primary =	0.00 cfs @	0.10 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 142.47' @ 12.52 hrs Surf.Area= 2,135 sf Storage= 334 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 18.5 min (837.5 - 819.0)

Volume	Invert	Avail.Storage	Storage Description
#1	142.08'	854 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 2,135 cf Overall x 40.0% Voids

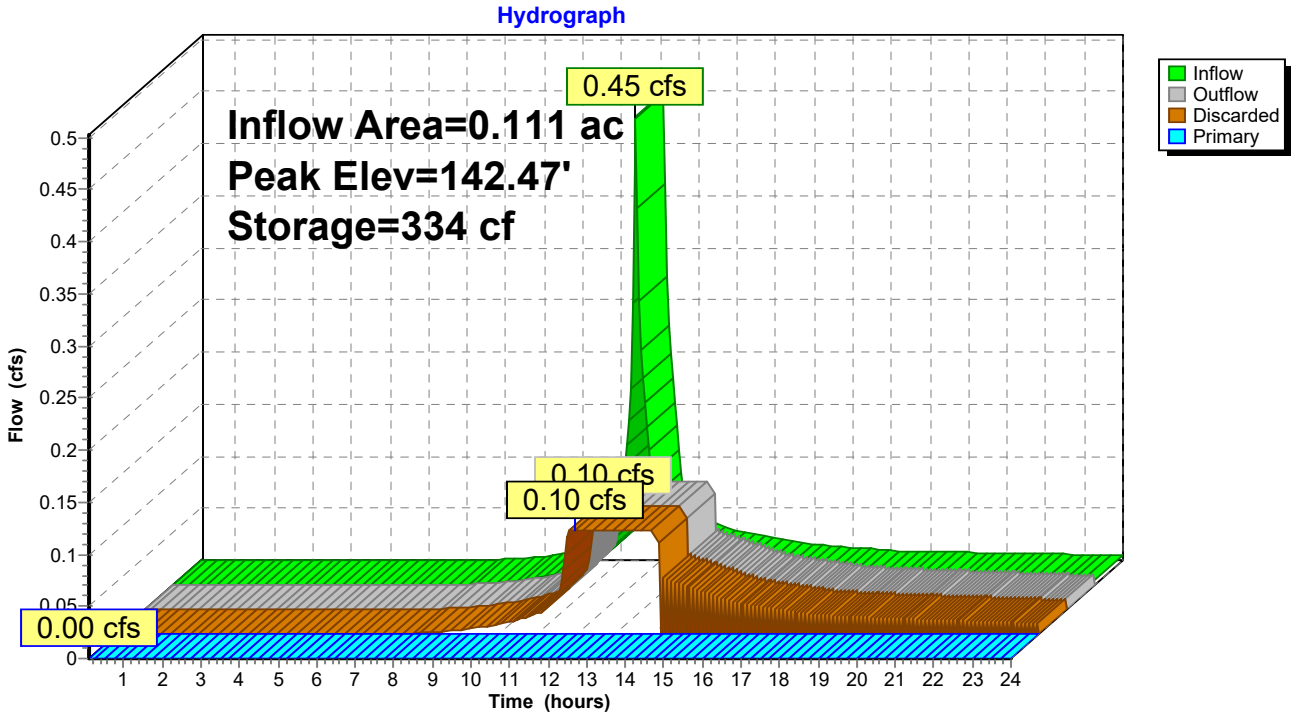
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
142.08	2,135	0	0
143.08	2,135	2,135	2,135

Device	Routing	Invert	Outlet Devices
#1	Discarded	142.08'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	145.00'	**102.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.10 cfs @ 11.95 hrs HW=142.11' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=142.08' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: POROUS PAVEMENT STORAGE

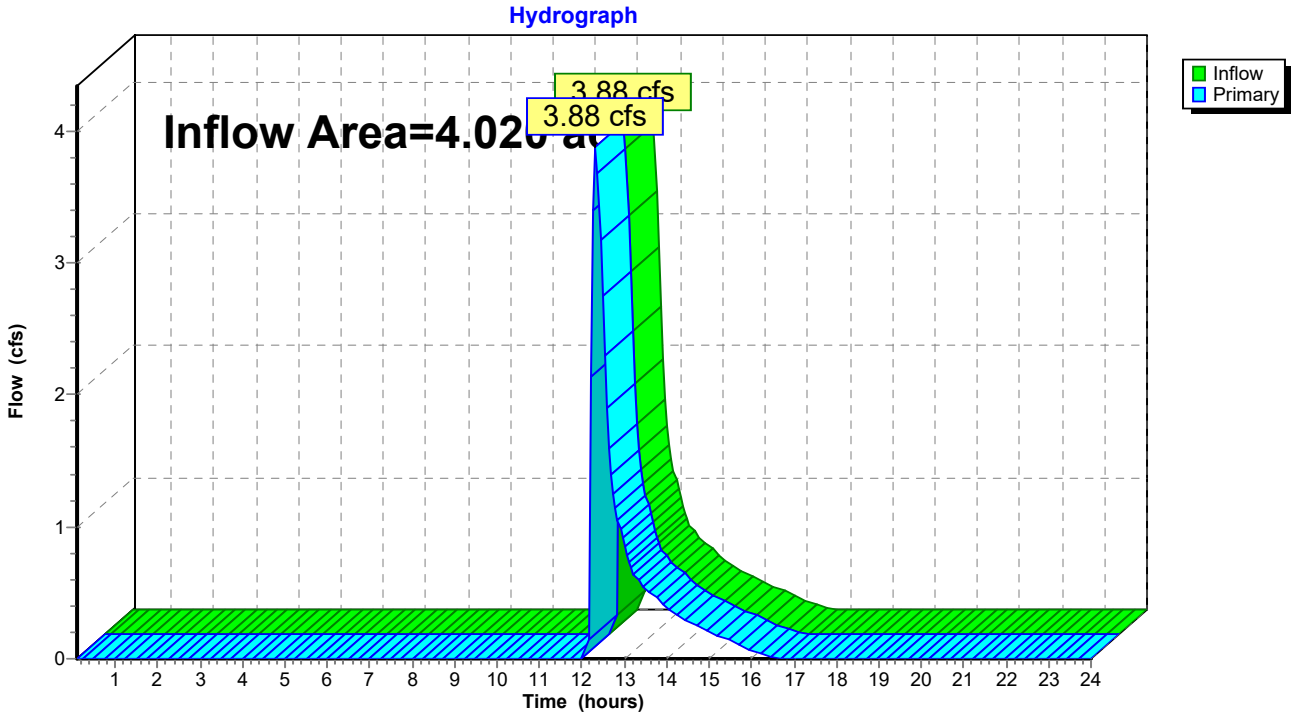


Summary for Link POA1:

Inflow Area = 4.020 ac, 17.36% Impervious, Inflow Depth = 0.68" for 25YR event
Inflow = 3.88 cfs @ 12.32 hrs, Volume= 0.229 af
Primary = 3.88 cfs @ 12.32 hrs, Volume= 0.229 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link POA1:



Time span=0.10-24.00 hrs, dt=0.05 hrs, 479 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 1S: ALL FLOW TO Runoff Area=3.764 ac 13.34% Impervious Runoff Depth>3.09"
Flow Length=634' Tc=5.0 min CN=64 Runoff=13.54 cfs 0.969 af

Subcatchment 2S: POROUS PAVEMENT Runoff Area=0.145 ac 100.00% Impervious Runoff Depth>6.88"
Tc=6.0 min CN=98 Runoff=0.99 cfs 0.083 af

Subcatchment 3S: POROUS PAVEMENT Runoff Area=0.111 ac 45.95% Impervious Runoff Depth>4.58"
Tc=6.0 min CN=78 Runoff=0.58 cfs 0.042 af

Pond 1P: Infiltration Basin 1P Peak Elev=438.47' Storage=9,746 cf Inflow=13.54 cfs 0.969 af
Discarded=0.42 cfs 0.418 af Secondary=9.19 cfs 0.450 af Outflow=9.61 cfs 0.869 af

Pond 2P: POROUS PAVEMENT STORAGE Peak Elev=139.56' Storage=812 cf Inflow=0.99 cfs 0.083 af
Discarded=0.20 cfs 0.083 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.083 af

Pond 3P: POROUS PAVEMENT STORAGE Peak Elev=142.69' Storage=518 cf Inflow=0.58 cfs 0.042 af
Discarded=0.10 cfs 0.042 af Primary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.042 af

Link POA1: Inflow=9.19 cfs 0.450 af
Primary=9.19 cfs 0.450 af

Total Runoff Area = 4.020 ac Runoff Volume = 1.095 af Average Runoff Depth = 3.27"
82.64% Pervious = 3.322 ac 17.36% Impervious = 0.698 ac

Summary for Subcatchment 1S: ALL FLOW TO RECHARGE BASIN

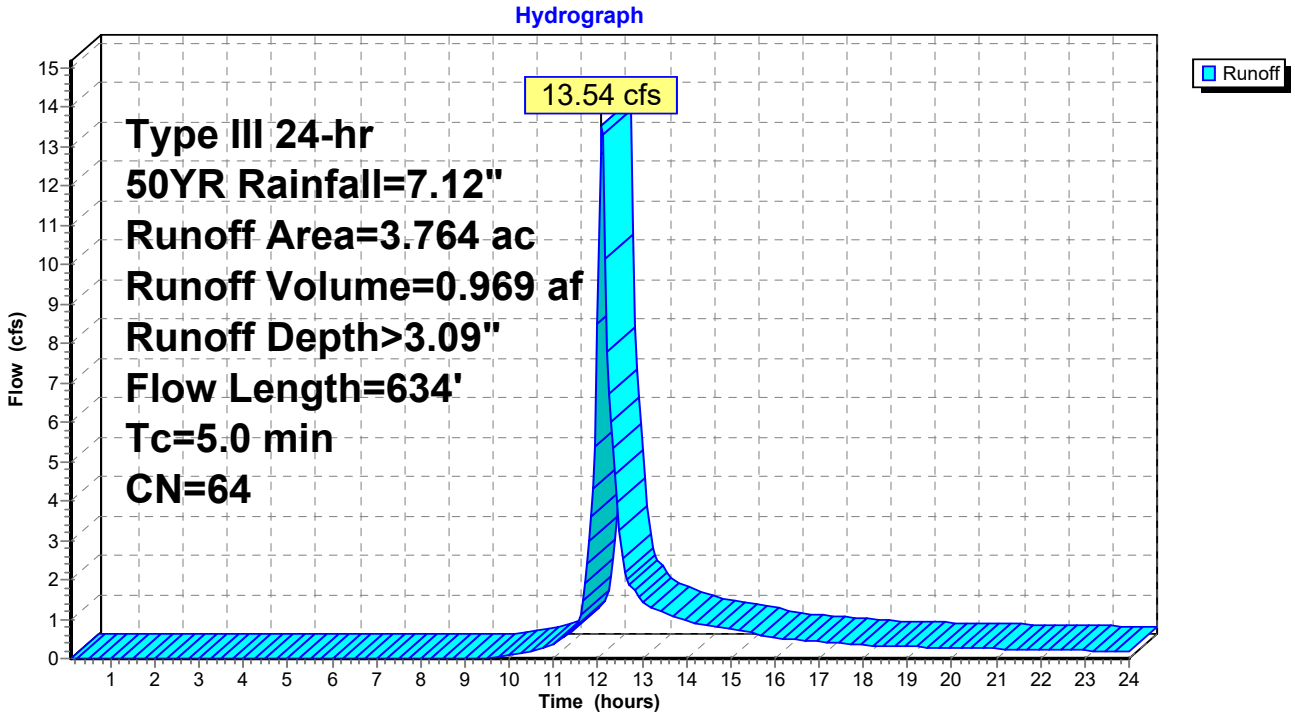
Runoff = 13.54 cfs @ 12.08 hrs, Volume= 0.969 af, Depth> 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50YR Rainfall=7.12"

	Area (ac)	CN	Description
	0.171	98	Roofs, HSG B
*	0.148	98	Paved roadway, HSG B
*	0.183	98	Paved parking, HSG B
	2.103	61	>75% Grass cover, Good, HSG B
	1.159	55	Woods, Good, HSG B
	3.764	64	Weighted Average
	3.262		86.66% Pervious Area
	0.502		13.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0200	0.88		**Sheet Flow, ROAD** Smooth surfaces n= 0.011 P2= 2.90"
0.1	22	0.2500	3.50		**Shallow Concentrated Flow, ROADWAY SIDE SLOPE** Short Grass Pasture Kv= 7.0 fps
0.5	145	0.0220	4.47	13.41	**Trap/Vee/Rect Channel Flow, GRASS SWALE** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.030 Earth, grassed & winding
0.9	288	0.0300	5.22	15.65	**Trap/Vee/Rect Channel Flow, GRASS SWALE** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.030 Earth, grassed & winding
0.0	15	0.3300	17.31	51.92	**Trap/Vee/Rect Channel Flow, POND SIDE SLOPE** Bot.W=0.00' D=1.00' Z= 3.0 '/' Top.W=6.00' n= 0.030 Earth, grassed & winding
1.3	150	0.0070	1.99	16.59	**Parabolic Channel, TRAVEL TIME TO POA1** W=25.00' D=0.50' Area=8.3 sf Perim=25.0' n= 0.030 Earth, grassed & winding
3.1	634	Total, Increased to minimum Tc = 5.0 min			

Subcatchment 1S: ALL FLOW TO RECHARGE BASIN



Summary for Subcatchment 2S: POROUS PAVEMENT AREA

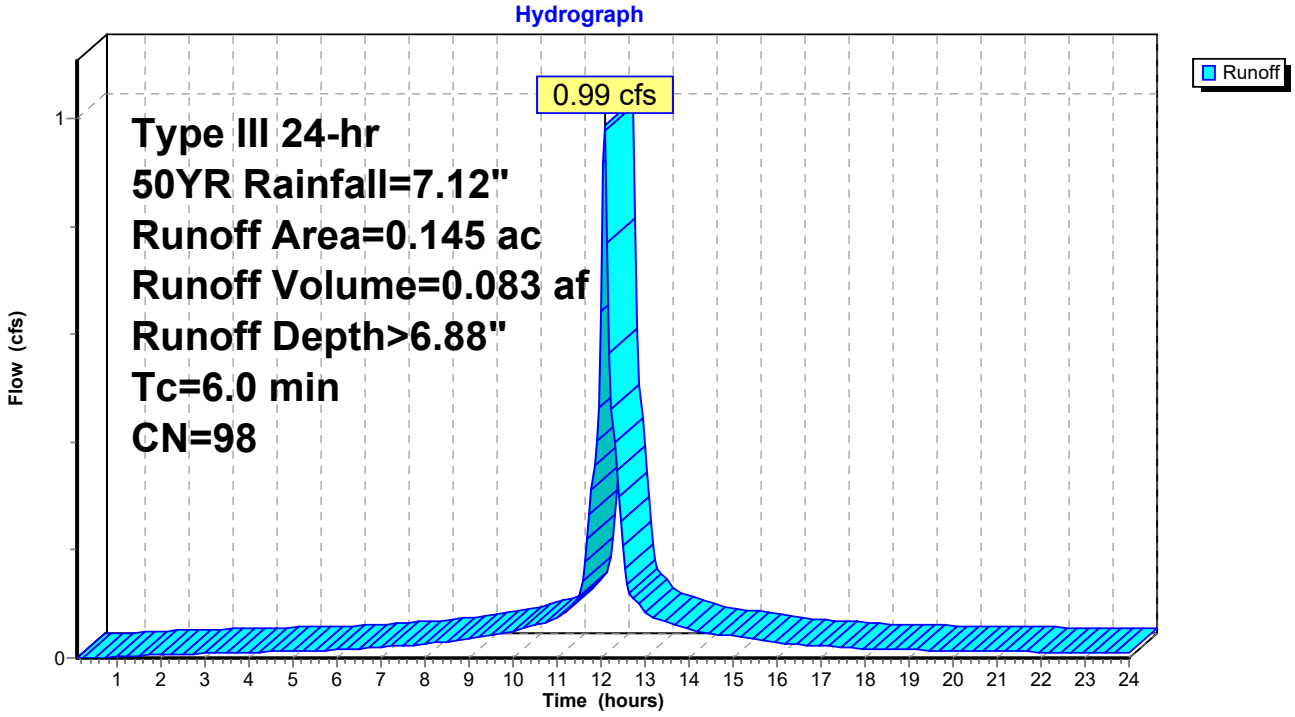
Runoff = 0.99 cfs @ 12.09 hrs, Volume= 0.083 af, Depth> 6.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50YR Rainfall=7.12"

	Area (ac)	CN	Description
	0.047	98	Paved parking, HSG B
*	0.098	98	Porous Pavement, HSG B
	0.145	98	Weighted Average
	0.145		100.00% Impervious Area

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

Subcatchment 2S: POROUS PAVEMENT AREA



Summary for Subcatchment 3S: POROUS PAVEMENT AREA

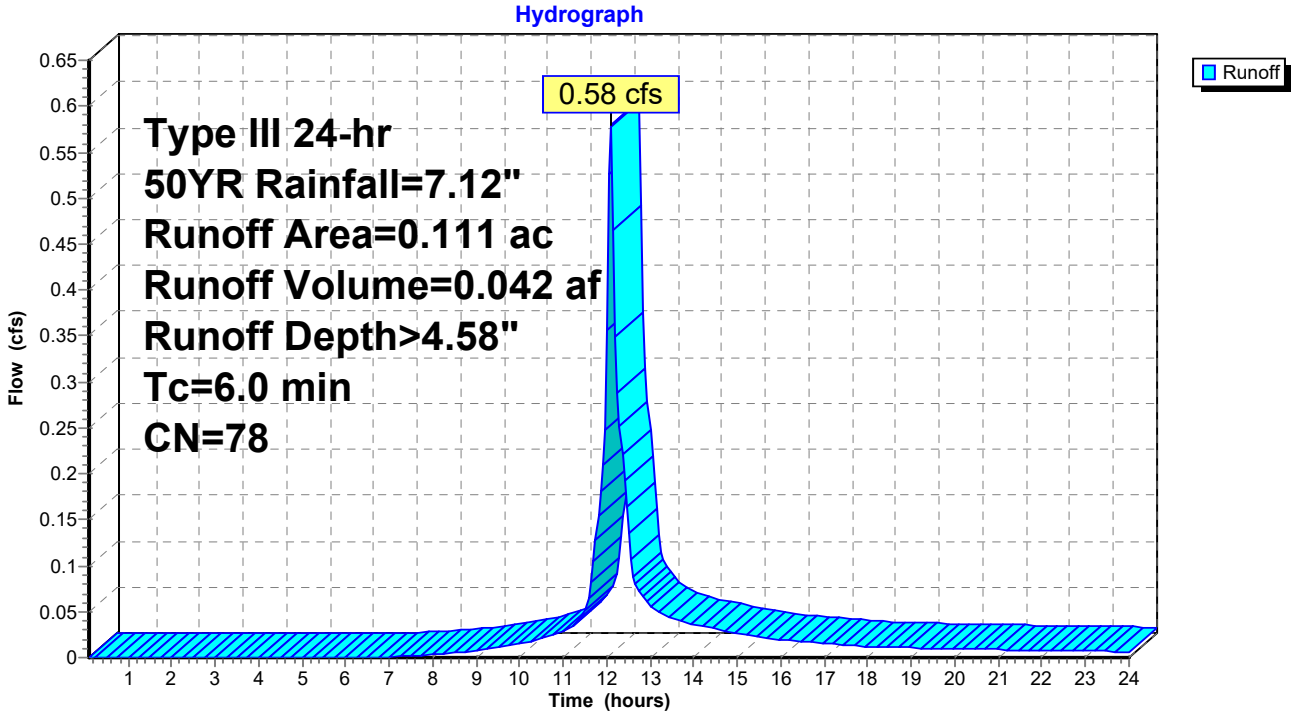
Runoff = 0.58 cfs @ 12.09 hrs, Volume= 0.042 af, Depth> 4.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50YR Rainfall=7.12"

	Area (ac)	CN	Description
*	0.049	98	Porous Pavement, HSG B
*	0.001	98	Paved roadway, HSG B
	0.001	98	Paved parking, HSG B
	0.060	61	>75% Grass cover, Good, HSG B
	0.111	78	Weighted Average
	0.060		54.05% Pervious Area
	0.051		45.95% Impervious Area

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

Subcatchment 3S: POROUS PAVEMENT AREA



Summary for Pond 1P: Infiltration Basin 1P

Inflow Area = 3.764 ac, 13.34% Impervious, Inflow Depth > 3.09" for 50YR event
Inflow = 13.54 cfs @ 12.08 hrs, Volume= 0.969 af
Outflow = 9.61 cfs @ 12.17 hrs, Volume= 0.869 af, Atten= 29%, Lag= 5.5 min
Discarded = 0.42 cfs @ 12.17 hrs, Volume= 0.418 af
Secondary = 9.19 cfs @ 12.17 hrs, Volume= 0.450 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 438.47' @ 12.17 hrs Surf.Area= 5,976 sf Storage= 9,746 cf
Flood Elev= 438.50' Surf.Area= 6,002 sf Storage= 9,914 cf

Plug-Flow detention time= 109.3 min calculated for 0.867 af (89% of inflow)
Center-of-Mass det. time= 59.7 min (901.7 - 841.9)

Volume	Invert	Avail.Storage	Storage Description
#1	436.50'	9,914 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

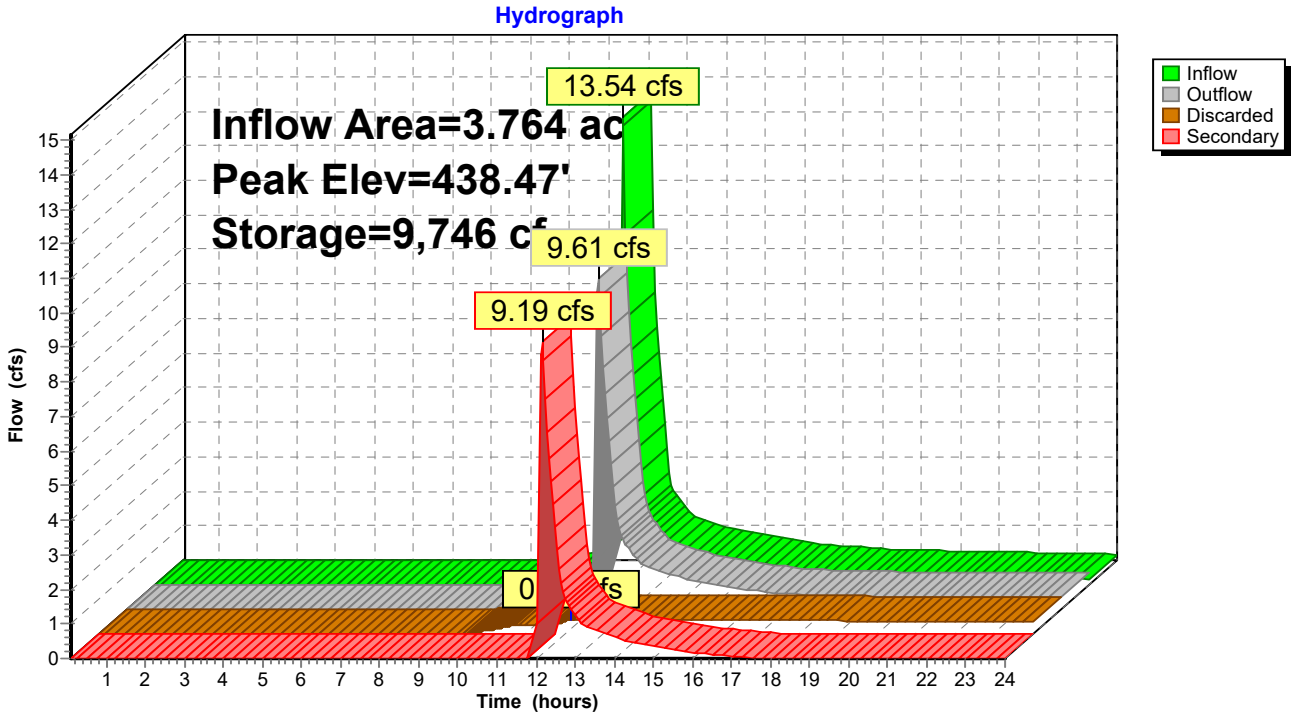
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
436.50	3,872	260.0	0	0	3,872
438.00	5,548	298.0	7,027	7,027	5,610
438.50	6,002	308.0	2,887	9,914	6,116

Device	Routing	Invert	Outlet Devices
#1	Secondary	438.00'	**11.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	436.50'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.41 cfs @ 12.17 hrs HW=438.45' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.41 cfs)

Secondary OutFlow Max=8.70 cfs @ 12.17 hrs HW=438.45' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 8.70 cfs @ 1.74 fps)

Pond 1P: Infiltration Basin 1P



Summary for Pond 2P: POROUS PAVEMENT STORAGE

Inflow Area = 0.145 ac,100.00% Impervious, Inflow Depth > 6.88" for 50YR event
Inflow = 0.99 cfs @ 12.09 hrs, Volume= 0.083 af
Outflow = 0.20 cfs @ 11.85 hrs, Volume= 0.083 af, Atten= 80%, Lag= 0.0 min
Discarded = 0.20 cfs @ 11.85 hrs, Volume= 0.083 af
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 139.56' @ 12.51 hrs Surf.Area= 4,268 sf Storage= 812 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 19.7 min (762.0 - 742.3)

Volume	Invert	Avail.Storage	Storage Description
#1	139.08'	1,707 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 4,268 cf Overall x 40.0% Voids

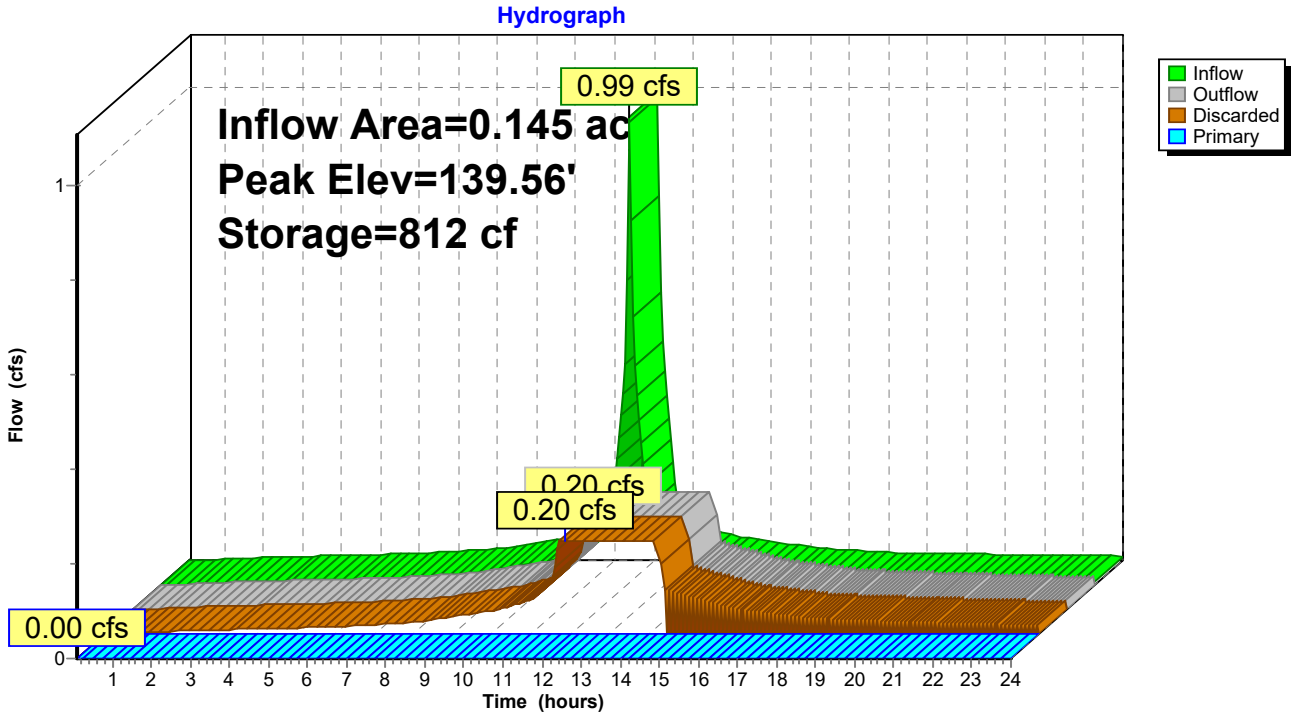
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
139.08	4,268	0	0
140.08	4,268	4,268	4,268

Device	Routing	Invert	Outlet Devices
#1	Discarded	139.08'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	142.00'	**102.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.20 cfs @ 11.85 hrs HW=139.11' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=139.08' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: POROUS PAVEMENT STORAGE



Summary for Pond 3P: POROUS PAVEMENT STORAGE

Inflow Area = 0.111 ac, 45.95% Impervious, Inflow Depth > 4.58" for 50YR event
Inflow = 0.58 cfs @ 12.09 hrs, Volume= 0.042 af
Outflow = 0.10 cfs @ 11.90 hrs, Volume= 0.042 af, Atten= 83%, Lag= 0.0 min
Discarded = 0.10 cfs @ 11.90 hrs, Volume= 0.042 af
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 142.69' @ 12.57 hrs Surf.Area= 2,135 sf Storage= 518 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 32.0 min (843.5 - 811.6)

Volume	Invert	Avail.Storage	Storage Description
#1	142.08'	854 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 2,135 cf Overall x 40.0% Voids

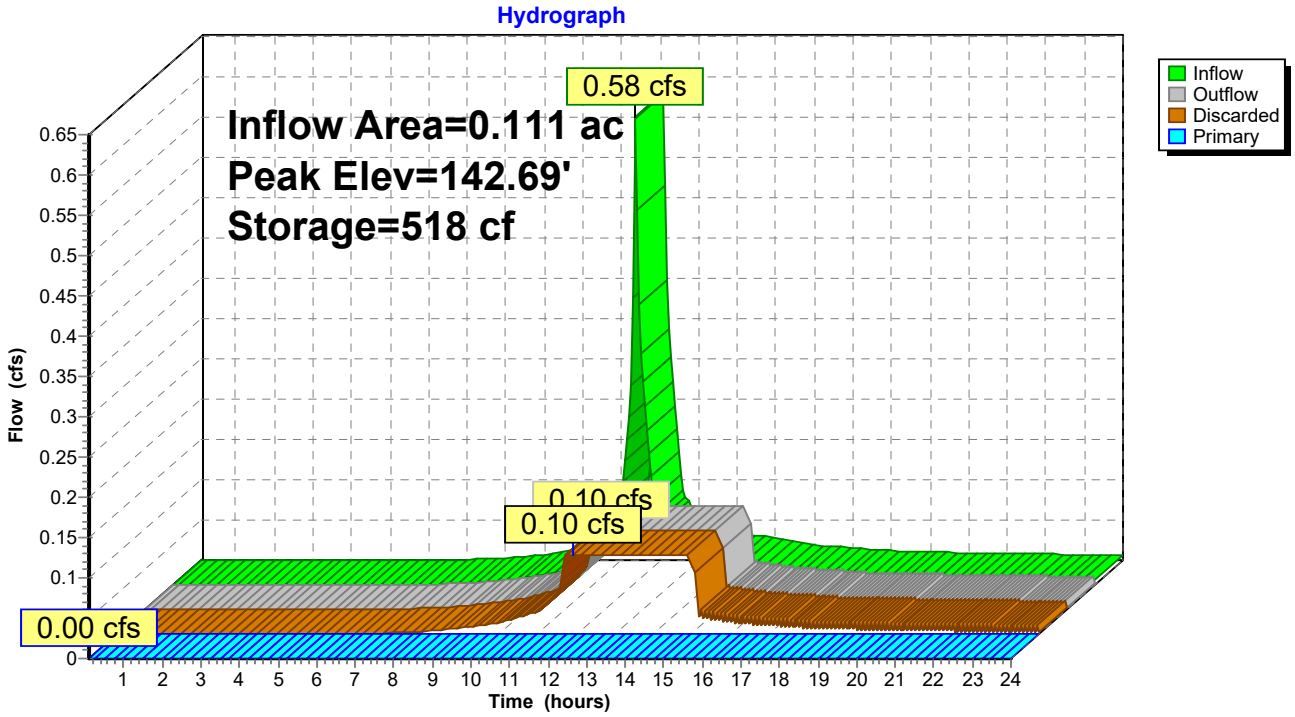
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
142.08	2,135	0	0
143.08	2,135	2,135	2,135

Device	Routing	Invert	Outlet Devices
#1	Discarded	142.08'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	145.00'	**102.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.10 cfs @ 11.90 hrs HW=142.13' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.10 hrs HW=142.08' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: POROUS PAVEMENT STORAGE

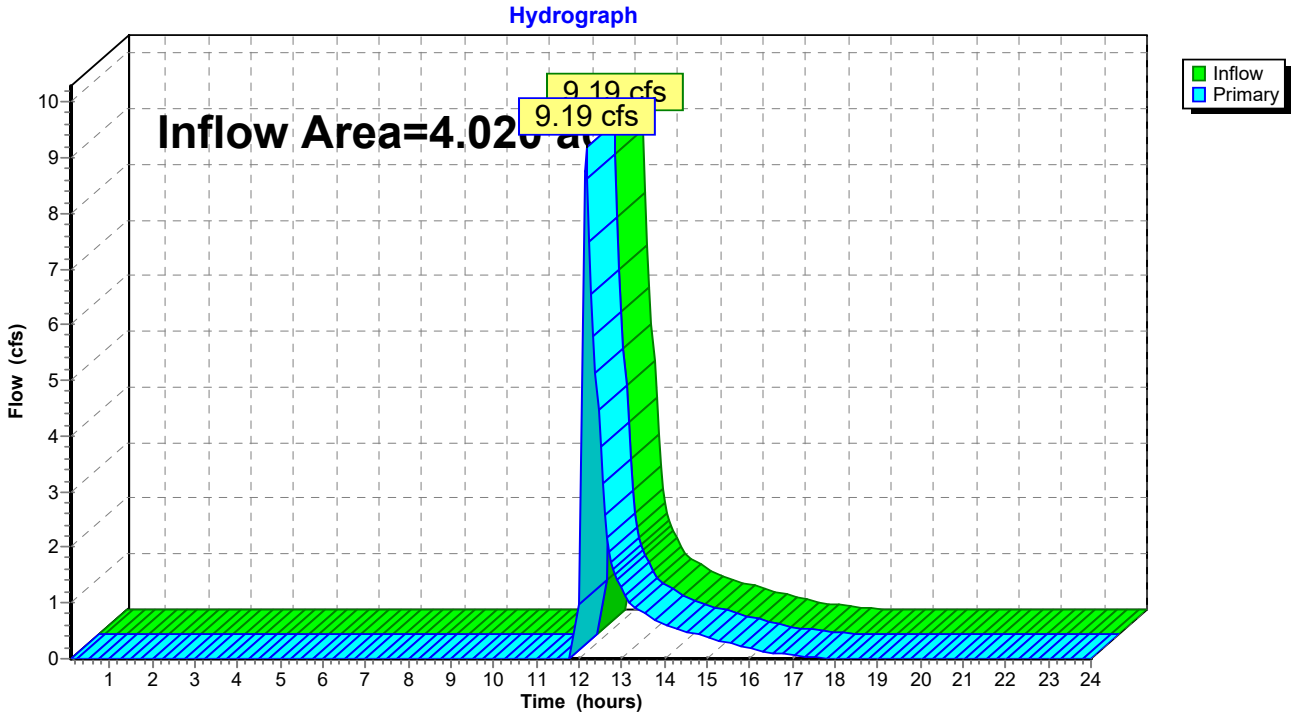


Summary for Link POA1:

Inflow Area = 4.020 ac, 17.36% Impervious, Inflow Depth = 1.34" for 50YR event
Inflow = 9.19 cfs @ 12.17 hrs, Volume= 0.450 af
Primary = 9.19 cfs @ 12.17 hrs, Volume= 0.450 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link POA1:



SOILS INFORMATION

INFILTRATION FEASIBILITY STUDY

Re: Alteration of Terrain Permit Application 6/28/23
Applicant: Play Laugh N Grow Childcare and Preschool
Proposed Improvements for a Day Care Facility
Tax Map 2 Lot 151-2-4
Iron Horse Drive
Fremont, NH

TEST PIT 4-2 (RECHARGE BASIN)

This project is a proposed design for a children's day care facility. Proposed is a 7,456 s.f. building to be located on a 4.012 acre parcel along Iron Horse Drive in Fremont, NH, known as Tax Map 2 Lot 1-151-2-4. The lot will be serviced by an on-site well and septic system and underground public electrical utilities. Iron Horse Drive is a paved public roadway. The total area disturbed during construction of the site is approximately 72,450 SF. There are no proposed wetland impacts associated with the improvements.

The intent of this drainage report is to provide calculations for the proposed drainage improvements and evaluate pre and post development conditions in accordance with the Town of Fremont Subdivision Regulations and NHDES Alteration of Terrain requirements.

EXISTING CONDITIONS

The property is currently unoccupied and is predominantly cleared of vegetation. On average the slopes vary from 3% to 15%. The predominant soils on the property are 12-Hinckley and 313-Deerfield as derived from NRCS Web soil Survey, and a Site specific report has determined that the soils are a Hydrologic class B soil instead of an A class soil.

The property is located on the easterly side of Iron Horse Drive. There is one overall drainage area within the proposed developed area. This drainage area flows to the east and eventually into an existing wetland that flows to the southeast off the parcel.

PROPOSED IMPROVEMENTS

The proposed improvements for this development include the construction of one building, a paved parking area and open drainage methods. The proposed parking will have a finished paved surface. The drainage for the project is designed with open roadside swales leading to a recharge basin.

The drainage routing was designed to maintain existing storm-water runoff patterns. Storm-water flows were evaluated to ensure that post-development are flows would not exceed predevelopment flows. One (1) recharge/detention basin is proposed to mitigate the additional runoff.

TEST PIT LOCATIONS

Test pits were performed on the site in the locations shown on the project plans and the attached sketches. The test pits were located in areas chosen for storm water recharge and infiltration practices. The test pits were performed on during May of 2023 and were dug on-site to review the soil conditions and establish the estimated seasonal high water table. The attached test pits logs show an organic topsoil layer with underlying sandy and gravelly soil. The soil types are highly suited for infiltration practices. There was no refusal encountered in the test pits and seasonal high water table depths varied throughout the site. In some areas no water table evidence was found.in

SITE SPECIFIC SOILS

Site specific soils were determined by a certified soil scientist. The report and plan are attached (in this Alteration of Terrain Application).

INFILTRATION CALCULATIONS

The proposed design utilizes one infiltration practice in basins 1P. The rate determined was 6.0 inches per hour or with a safety factor of 2, the infiltration that has been used is 3.0 inches per hour although much of the site the results are better.

The required groundwater recharge volume was calculated in accordance with the Alteration of Terrain BMP worksheet provided earlier in this drainage report. Adequate storage for groundwater recharge is available in all storm water management areas.

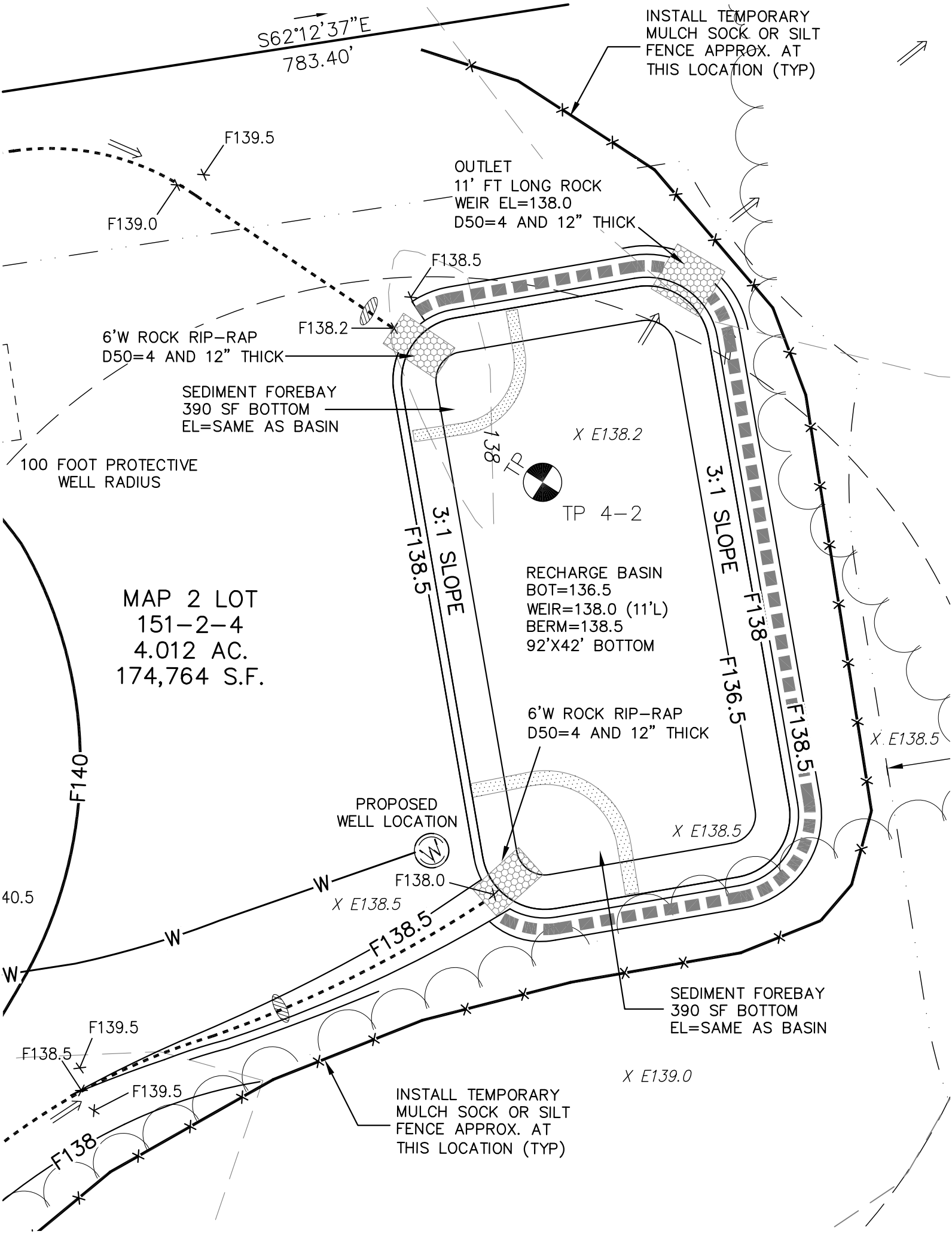
TEST PIT DATA

Re: Alteration of Terrain Permit Application 6/28/23
Applicant: Play Laugh N Grow Childcare and Preschool
Proposed Improvements for a Day Care Facility
Tax Map 2 Lot 151-2-4
Iron Horse Drive
Fremont, NH

TEST PIT 4-2 (RECHARGE BASIN)

0-8 " SANDY LOAM 10YR 3/2
8-48 " LOAMY SAND 10YR 4/4
48-96 " GRAVELLY SAND WITH STONES 10YR 5/4

REFUSAL: NONE
ESHWT: 72"
ROOTS TO 60"
H20: NONE OBSERVED
PERC RATE: 2 MIN/INCH


S62°12'37"E
783.40'
INSTALL TEMPORARY MULCH SOCK OR SILT FENCE APPROX. AT THIS LOCATION (TYP)
F139.5
F139.0
OUTLET
11' FT LONG ROCK
WEIR EL=138.0
D50=4 AND 12" THICK
F138.5
F138.2
6'W ROCK RIP-RAP
D50=4 AND 12" THICK
SEDIMENT FOREBAY
390 SF BOTTOM
EL=SAME AS BASIN
100 FOOT PROTECTIVE
WELL RADIUS
X E138.2
138
TP
TP 4-2
3:1 SLOPE
F138.5
3:1 SLOPE
F138
F136.5
F138.5
RECHARGE BASIN
BOT=136.5
WEIR=138.0 (11'L)
BERM=138.5
92'X42' BOTTOM
MAP 2 LOT
151-2-4
4.012 AC.
174,764 S.F.
6'W ROCK RIP-RAP
D50=4 AND 12" THICK
X E138.5
F140
PROPOSED
WELL LOCATION
W
F138.0
X E138.5
X E138.5
40.5
W
W
W
F138.5
SEDIMENT FOREBAY
390 SF BOTTOM
EL=SAME AS BASIN
F139.5
F138.5
F139.5
X E139.0
INSTALL TEMPORARY MULCH SOCK OR SILT FENCE APPROX. AT THIS LOCATION (TYP)
F138

SITE-SPECIFIC SOIL SURVEY REPORT
Main Street, Fremont, Phase 2

1. MAPPING STANDARDS

Site-Specific Soil Mapping Standards for New Hampshire and Vermont. SSSNNE Special Publication No. 3, Version 4.0, February 2011. This map product is within the technical standards of the National Cooperative Soil Survey. It is a special product, intended for the submission to NH DES Alteration of Terrain. It was produced by a professional soil scientist and is not a product of the USDA Natural Resource Conservation Service.

2. DATE SOIL MAP PRODUCED
December 5, 2018

3. GEOGRAPHIC LOCATION AND SIZE OF SITE

Approximately 30 acres. The site is comprised of open fields, woodland edge and wetland areas. The area mapped is only a small portion of the site.

4. PURPOSE OF THE SOIL MAP

The preparation of this map was requested by Gregsack Engineering, Inc. The purpose was to meet the subdivision requirements of NH AoT.

5. SOIL IDENTIFICATION LEGEND

SYMBOL	SOIL TAXONOMIC NAME	Hydrologic Soil Group
12	Hinckley	A
313	Deerfield	B
546P	Walpole	C
115VP	Scarboro	D

12 The Hinckley series consists of very deep, excessively drained soils formed in glaciofluvial materials. They are nearly level through very steep soils on outwash terraces, outwash plains, outwash deltas, kames, kame terraces, and eskers. Saturated hydraulic conductivity is high or very high.

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz
www.gesinc.biz

In this location the soils are typical of the Hinckley profile and average ESHWT was around 68".

313 The Deerfield series consists of very deep, moderately well drained soils formed in glaciofluvial deposits. They are nearly level to strongly sloping soils on terraces, deltas, and outwash plains. Slope ranges from 0 to 15 percent. Saturated hydraulic conductivity is high or very high.

In this location the soils are typical of the Deerfield profile. ESHWT averaged around 36-38".

546P The Walpole Series consists of very deep, poorly drained sandy soils formed in outwash and stratified drift. They are nearly level to gently sloping soils in low-lying positions on terraces and plains. Slope ranges from 0 to 8 percent. Saturated hydraulic conductivity is moderately high or high in the surface layer and subsoil, and high or very high in the substratum.

115VP The Scarboro series consists of very deep, very poorly drained soils in sandy glaciofluvial deposits on outwash plains, deltas, and terraces. They are nearly level soils in depressions. Slope ranges from 0 through 3 percent. Saturated hydraulic conductivity is high or very high.

6. OTHER DISTINGUISHING FEATURES OF SITE

No distinguishing features were noted.

7. MAXIMUM SIZE OF LIMITING INCLUSIONS

No inclusions were mapped.

8. SPECIAL FEATURE SYMBOLS

No special feature symbols were used.

9. RESPONSIBLE SOIL SCIENTIST

Luke D. Hurley, C.S.S.

STATE OF NEW HAMPSHIRE
LUKE
D.
HURLEY
NO. 095
CERTIFIED SOIL SCIENTIST

Rip rap calculations

OPEN CHANNEL FLOW DESIGN/ANALYSIS

D_{50} RIPRAP SIZING-FLOW REGIME-FILTER GRADATION CHECK

PROJECT NAME :	FREMONT DAY CARE FACILITY
PROJECT # :	3208
BY :	WMG
DATE :	1/11/2023
STORM:	25-Yr

UNIFORM STEADY CHANNEL FLOW:

PEAK DISCHARGE REQUIRED =	4.1	CFS
CHANNEL BOTTOM WIDTH =	11.0	FT (USE 0 IF SECTION IS A "V" DITCH)
HYDRAULIC GRADIENT =	0.05000	FT/FT
LEFT SIDE SLOPE =	3.0	:1
RIGHT SIDE SLOPE =	3.0	:1
DEPTH OF FLOW =	0.290	FT
MANNINGS "n" =	0.0540	(CHECK RIPRAP SIZING "n" BELOW)
AREA =	3.44	SQ FT
WETTED PERIMETER =	12.83	FT
HYDRAULIC RADIUS =	0.27	FT
TOP WIDTH =	12.74	FT
VELOCITY =	2.56	FT/SEC
PEAK DISC. DETERMINED =	8.8	CFS

RIPRAP SIZING, TRAPEZOIDAL SECTION:

D_{50} =	0.2554	FT
NEW "n" =	0.0536	(ADJUST DESIGN/ANALYSIS "n" ABOVE)

RIPRAP SIZING, "V" DITCH:

D_{50} =	0.5819	FT
NEW "n" =	0.1600	(ADJUST DESIGN/ANALYSIS "n" ABOVE)

FLOW REGIME:

		Nf <=0.7, SUB CRITICAL FLOW
Nf =	0.868	Nf >0.7 BUT <1.3, CRITICAL FLOW ZONE
		Nf >1.3, SUPER CRITICAL FLOW

IF Nf>=0.7 A HYDRAULIC JUMP WILL PROBABLY OCCUR, DESIGN ACCORDINGLY

TO AVOID MOVEMENT OF PARTICLES:

D_{15} FILTER =	1.0	|
D_{50} FILTER =	1.0	|
D_{15} BASE =	1.0	| in or mm BUT BE CONSISTENT
D_{50} BASE =	1.0	|
D_{85} BASE =	1.0	|

D_{15} FILTER/D_{85} BASE =	1.0	IF <= 5, OK
D_{50} FILTER/D_{50} BASE =	1.0	IF <= 25, OK
D_{15} FILTER/D_{15} BASE =	1.0	IF <= 20, OK (IF Cu > 4, USE 40)

FORMULAS USED:

UNIFORM CHANNEL FLOW,	Q = (A X 1.486 X R^(2/3) X S^(1/2))/"n"
FLOW REGIME,	Nf= (Q X T^(1/2))/(A^(3/2) X g^(1/2))
RIPRAP SIZING, TRAPEZDL.,	((118 X Q X S^(13/6) X R/P)^(2/5)
RIPRAP SIZING, "V",	((64.4 X Q X S^(13/6) X (Z/(Z^2 + 1))^(2/5)
NEW RIPRAP "n",	(D. OF F.^(1/6)/(21.6 X LOG(D. OF F./D50)+14)

REFERENCES: KING'S HANDBOOK OF HYDRAULICS AND NCHRP-REPORT 108

INSPECTION AND MAINTENANCE MANUAL

PROPOSED DAY CARE FACILITY - STORM WATER SYSTEMS

FREMONT, NH
INSPECTION AND MAINTENANCE MANUAL

January 11, 2023

Prepared by

Gregsak and Sons, Inc.
Chester, NH 03036

This manual has been prepared to assist in the long-term functionality of the storm water system and BMP's.

The owner (or lessee or responsible party listing below) is responsible to construct and maintain the storm water system in accordance with the approved site plan, and for implementing the requirements of this document. The approved site plan is considered part of this manual.

This site utilizes a storm water infiltration basin and grass lined swales to regulate the peak discharge, and to treat runoff prior to site discharge.

1. Owner:

   Play Laugh N Grow Childcare & Preschool
   9 Essex Drive
   Raymond NH 03077

   Applicant and Responsible Party:

   Play Laugh N Grow Childcare & Preschool
   9 Essex Drive
   Raymond NH 03077

Play Laugh N Grow Childcare & Preschool will be responsible for submittal of inspection documentation upon NHDES request.

2. Responsibility:

The storm water management facilities that are proposed to be constructed Lot 2-152-2-4 on Iron Horse Drive in Fremont NH will remain under private ownership. The owner listed above will remain responsible for all maintenance and operation of the systems within the project after construction. The site will have an on-site manager responsible for the maintenance schedule and for overseeing any outside contractors hired to perform the work involved.

3. Inspection & Maintenance Schedule

The storm water management system at the Day Care Facility will consist of drainage grass lined swales, and an infiltration pond.

<u>Inspections</u>

All of the system's elements must be inspected after a heavy storm event. In addition the infiltration basin will be inspected bi-monthly for accumulated debris and siltation.

Maintenance

Debris found in any of the storm water management system elements shall be immediately removed. Wherever damage to slopes or basins is discovered, such damage shall be repaired immediately. In addition, a regular schedule of maintenance shall be followed:

Catch Basins, Drainage Manholes, Pipes and Outlets (if constructed) – Remove accumulated sediment from the structures and the outlets every year during late winter or early spring. Accumulated sediment shall be disposed of off-site in accordance with applicable local, State and/or Federal guidelines.

Infiltration Basin Area- Check basin areas for accumulated debris or sediment. Check vegetation in treatment swales (if proposed) in late spring and replant as needed to maintain healthy vegetation.

If the infiltration basin does not drain out within a 72 hour period following a heavy rain event, then a qualified professional assess the conditions to determines measures required to restore infiltration function, including but not limited to the removal of accumulated sediments or reconstruction of the infiltration pond bottom

Inspection Frequency at least twice annually and following any rainfall event exceeding 2.5 inches within a 24 hour period.

Remove debris from inlet and outlet structures (if any), remove accumulated sediment in basin bottom and forebay area.
Remove debris and sediment every year during early spring.
Inspect pretreatment areas.
Inspect and repair outlet structures (if any) and appurtenances.
Inspect infiltration components after a 2.5 inch rainfall.
Remove woody vegetation from embankments and perform periodic mowing.
Inspect and repair embankments and spillways.

4. Invasive Species Identification and removal

Invasive species in New Hampshire has become an increasing problem. If invasive species are identified within the storm water practices or on the site in general the owner should contact the New Hampshire Department of Environmental Services and obtain instructions on the proper removal procedures

INSPECTION CHECKLIST

At least one inspection annually is to be conducted while storm water discharges are occurring. Inspections shall be performed by qualified personnel. Records of all inspections shall be maintained as a part of this manual for a period of three years.

Annually, copies of the completed inspection checklists are to be provided to the Town of Fremont Department of Public Works or Planning Dept.

INSPECTION DATE: _____ **TIME:** _____

WEATHER: _____ **TEMPERATURE** _____

INSPECTOR'S NAME: _____ **SIGNATURE** _____

Sediment forebay at Detention Basin Inlets (if constructed)**:**
Inspection Frequency at least twice annually

Inspection checklist:

Inlet swales from parking areas stable	yes	no
Runoff from parking area directed to forebay	yes	no
Sediment in Forebay greater than 1' deep	yes	no
Stone Rip Rap at the inlet stable	yes	no

Stormwater Detention Basins (if constructed)**:**
Inspection Frequency at least twice annually and following any rainfall event exceeding 2.5 inches within a 24 hour period.

Removed debris from inlet and outlet structures	yes	no
Removed accumulated sediment	yes	no
Inspected pretreatment areas	yes	no
Inspected and repaired outlet structures and appurtenances	yes	no
Inspected infiltration components after a 2.5 inch rainfall	yes	no
Removed woody vegetation from embankments / periodic mowing	yes	no
Inspected / repaired embankments and spillways	yes	no

Inspection checklist:

Outlet Grate free from debris	yes	no
Outlet Structure functioning properly	yes	no
Embankment stable	yes	no
Embankment free of woody vegetation	yes	no
Sediment forebay functioning	yes	no
Secondary spillway (stone rip rap) stable	yes	no

Treatment Swales (if constructed)**:**
Inspection Frequency at least twice annually, and following any rainfall event > 2.5" in a 24 hr. period

Inspection checklist:

Outlet to swale stable	yes	no

Outlet free of debris	yes	no
Vegetated Swale stable	yes	no

MAINTENANCE LOG

Any required or completed maintenance is to be recorded and maintained with this manual for a minimum period of three years.

Annually, copies of the completed maintenance logs are to be provided to the Town of Fremont Department of Public Works or Planning Dept.

Refer to BMP Maintenance Plan in the Approved NHDES Alteration of Terrain Drainage Report for all required maintenance items.

Sediment Forebays (if constructed)

Maintenance Required: Mow embankments at least annually to control woody vegetation
Remove debris
Install gage / measuring device to indicate sediment depth
Remove accumulated sediment when gage indicates more than 1 foot.

Maintenance Competed: Work performed by: _____

Date Completed: _____

Stormwater Detention Basin (if constructed)

Maintenance Required: Mow embankments at least annually to control woody vegetation
Remove accumulated sediment
Removed any debris at the inlet and outlet

Maintenance Competed: Work performed by: _____

Date Completed: _____

Treatment Swales (if constructed)

Maintenance Required: Mow embankments at least annually to control woody vegetation
Remove accumulated sediment
Removed any debris at the inlet and outlet
Remove woody vegetation from embankments

Maintenance Competed: Work performed by: _____

Date Completed: _____

Riprap Outlets and Riprap Swales (if constructed)

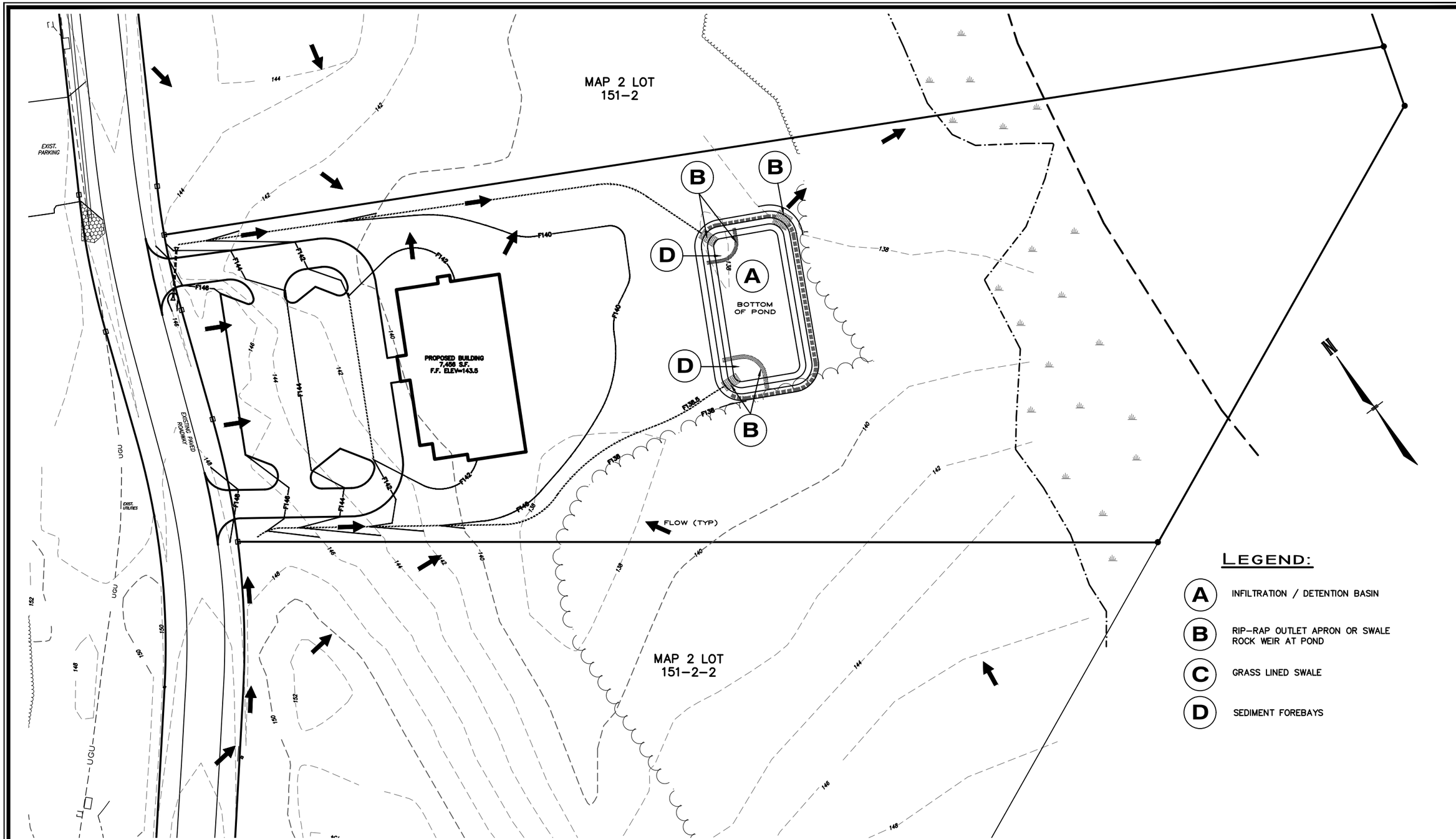
Maintenance Required:	Inspect the stone area annually for any damage and deterioration Repair and any immediately Remove and debris from area
Maintenance Competed:	Work performed by: _____
	Date Completed: _____

Deicing Log

Date Applied	Type of Deicing Material	Amount Applied

Inspection and Maintenance Log

Date	Inspection (Yes or No)	Maintenance (Yes or No)	List BMPs inspected and/or Provide Maintenance Comments



REVISIONS		
NO.	DESCRIPTION	DATE
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BMP MAINTENANCE PLAN

TAX MAP 2 – LOT 151-4

PROPOSED DAYCARE FACILITY
IRON HORSE PARK
662 MAIN STREET
FREMONT, NEW HAMPSHIRE

PREPARED FOR:
OWNER:

PLAY LAUGH N GROW
CHILDCARE & PRESCHOOL, LLC
9 ESSEX DRIVE
RAYMOND, NH 03077

603-235-2667

PREPARED BY DESIGN ENGINEER

GREGSAK & SONS, INC.
ENGINEERING, ARCHITECTURE & CONSTRUCTION MANAGEMENT
P.O. BOX 271
CHESTER, NEW HAMPSHIRE 03036
PH: (603) 887-6979
WWW.GREGSAK.COM

REGISTRATION

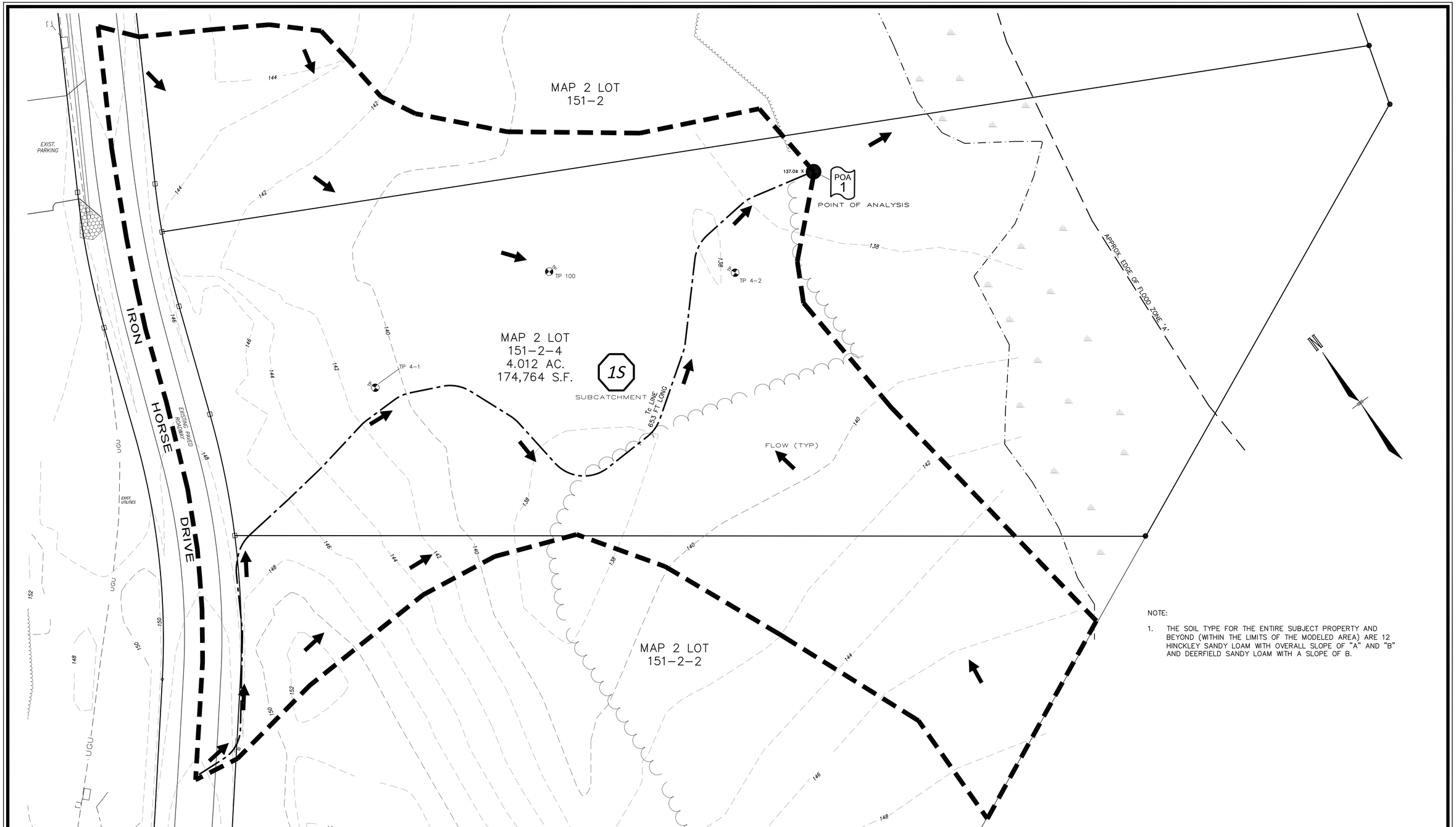
STATE OF NEW HAMPSHIRE
WILLIAM M. GREGSAK
No. 5699
LICENSED
PROFESSIONAL ENGINEER

AUG. 1, 2023

SCALE
15 0 30
1"=30'

SHEET 1 OF 1

JOB # 3208



NOTE:

1. THE SOIL TYPE FOR THE ENTIRE SUBJECT PROPERTY AND BEYOND (WITHIN THE LIMITS OF THE MODELED AREA) ARE 12 HINCKLEY SANDY LOAM WITH OVERALL SLOPE OF "A" AND "B" AND DEERFIELD SANDY LOAM WITH A SLOPE OF B.

REVISIONS

NO.	DESCRIPTION	DATE

PRE DEVELOPED CONDITION

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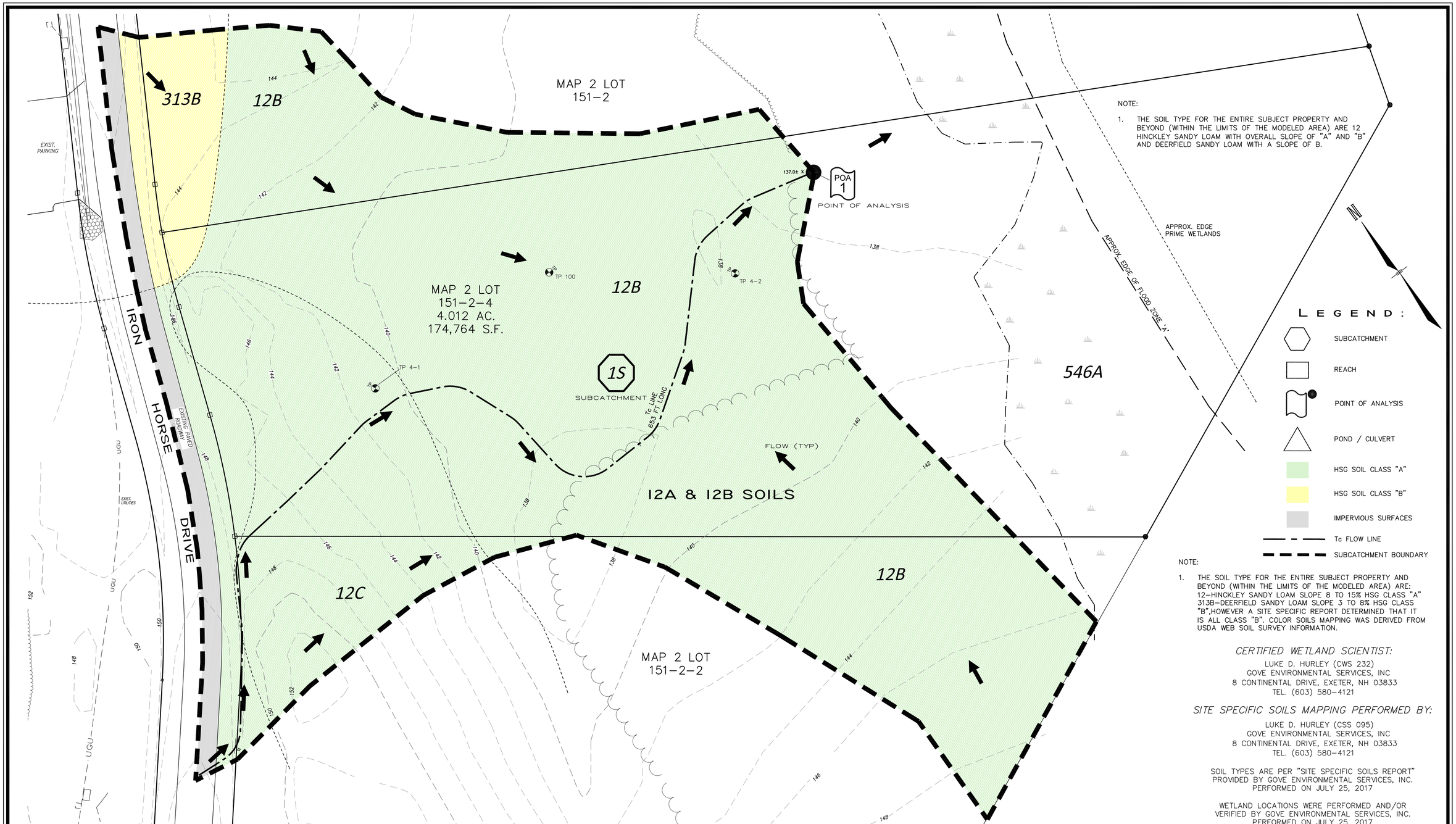
SHEET 1 OF 1

JOB # 3208



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LEGEND:

- SUBCATCHMENT
- REACH
- POINT OF ANALYSIS
- POND / CULVERT
- HSG SOIL CLASS "A"
- HSG SOIL CLASS "B"
- IMPERVIOUS SURFACES
- Tc FLOW LINE
- SUBCATCHMENT BOUNDARY

NOTE:

1. THE SOIL TYPE FOR THE ENTIRE SUBJECT PROPERTY AND BEYOND (WITHIN THE LIMITS OF THE MODELED AREA) ARE: 12–HINCKLEY SANDY LOAM SLOPE 8 TO 15% HSG CLASS "A" 313B–DEERFIELD SANDY LOAM SLOPE 3 TO 8% HSG CLASS "B",HOWEVER A SITE SPECIFIC REPORT DETERMINED THAT IT IS ALL CLASS "B". COLOR SOILS MAPPING WAS DERIVED FROM USDA WEB SOIL SURVEY INFORMATION.

CERTIFIED WETLAND SCIENTIST:

LUKE D. HURLEY (CWS 232)
GOVE ENVIRONMENTAL SERVICES, INC
8 CONTINENTAL DRIVE, EXETER, NH 03833
TEL. (603) 580–4121

SITE SPECIFIC SOILS MAPPING PERFORMED BY:

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TEL. (603) 580–4121

SOIL TYPES ARE PER "SITE SPECIFIC SOILS REPORT" PROVIDED BY GOVE ENVIRONMENTAL SERVICES, INC. PERFORMED ON JULY 25, 2017

WETLAND LOCATIONS WERE PERFORMED AND/OR VERIFIED BY GOVE ENVIRONMENTAL SERVICES, INC. PERFORMED ON JULY 25, 2017

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PRE DEVELOPMENT COLOR SOILS PLAN

TAX MAP 2 – LOT 151–4

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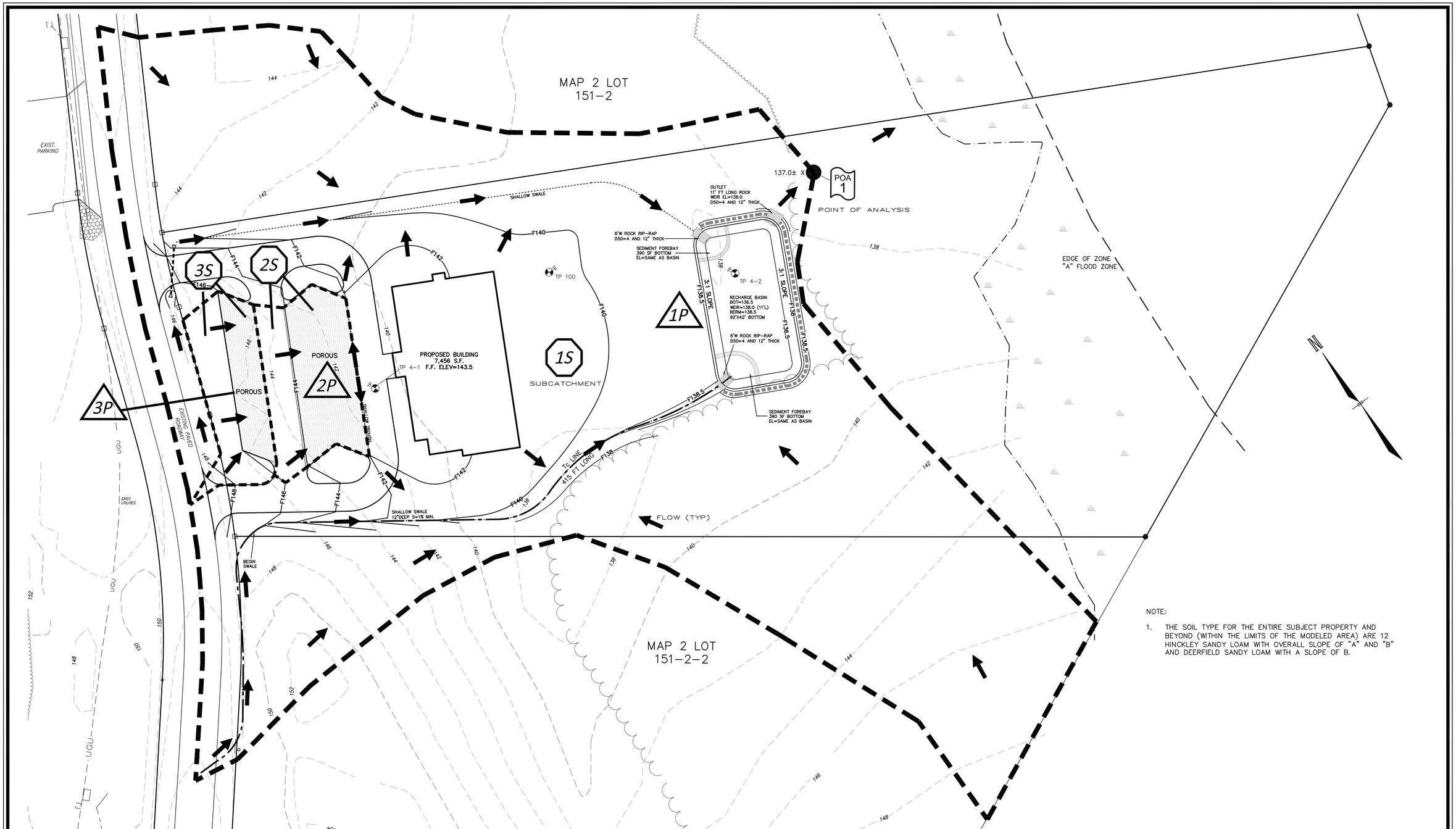
JOB # 3208



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POST DEVELOPED CONDITION

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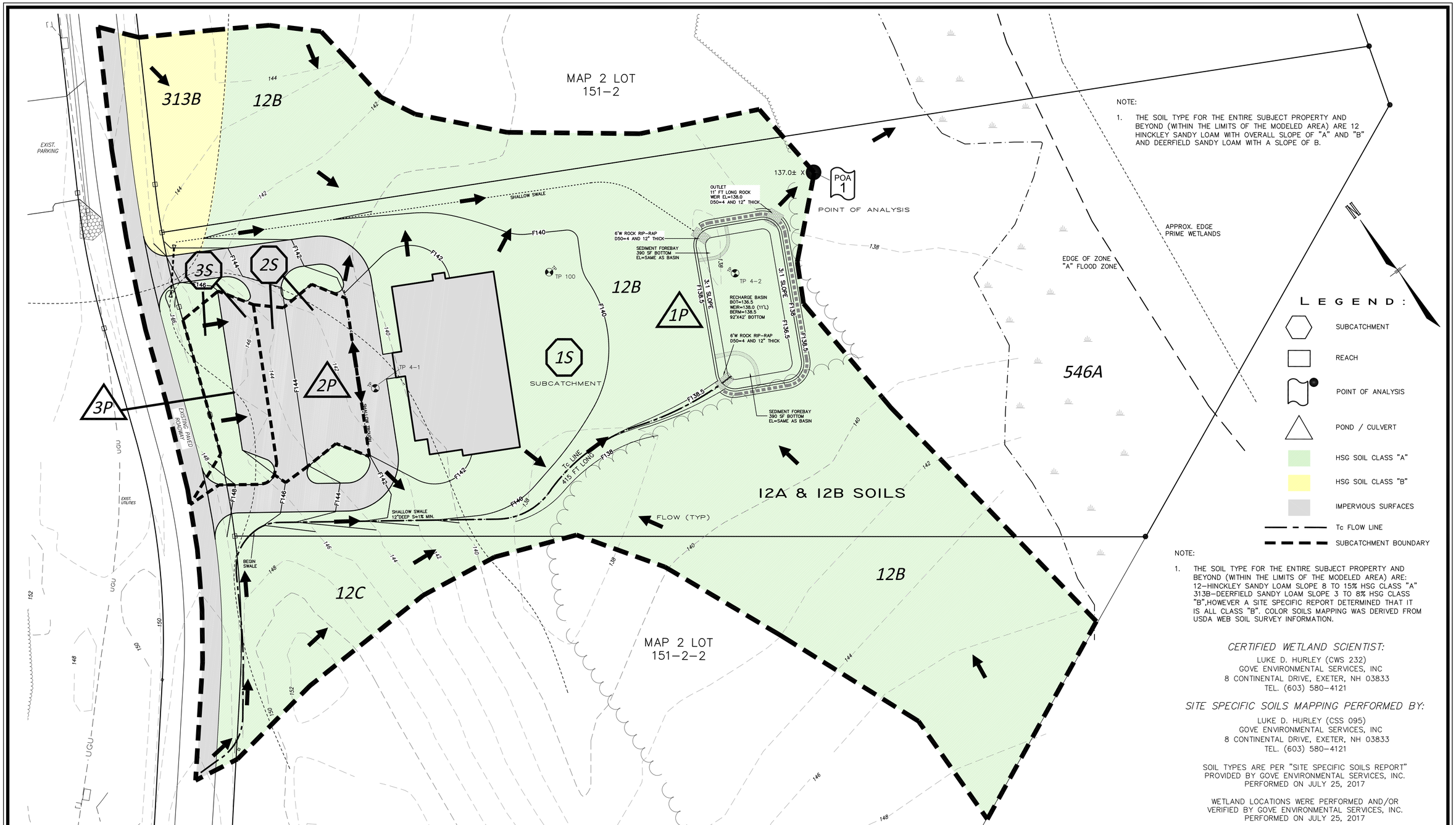

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