FUSS & O'NEILL
50 Commercial Street, Suite 2S
Manchester, NH 03101
603.668.8223
www.fando.com

May 20, 2026

Mr. Alec Bass
Assistant City Planner
City of Concord Planning Development
41 Green Street
Concord, New Hampshire 03301

Re: Subdivision Application Package Submittal Letter
Tax Map 711Z Lot 6, 48 Currier Road Subdivision
Fuss & O'Neill Reference No. 120.2600125.000

Dear Alec:

On behalf of the Applicant, Fuss and O'Neill has prepared the enclosed materials in support of a Minor Subdivision and Conditional Use Permit application of 48 Currier Road.

The parent parcel, Tax Map 711Z Lot 6 contains 641,298 square feet (14.722 acres) of land in the RO (Open Space Residential) zoning district and currently contains one single family home that is currently under construction. The project proposes to subdivide the property into three parcels for single family residential development with driveway access from Currier Road. This project requires a conditional use permit for the proposed encroachment for grading within the 50-foot non-disturbance wetland buffers proposed Lots 6-1 and 6-2 and after-the-fact incidental wetland buffer impacts on Lot 6. A NHDES wetland permit has been granted to allow direct wetland impacts associated with the proposed driveway for proposed Lot 6-2. No other zoning variance are anticipated.

Subdivision Plan

The existing property is 641,298 square feet (14.722-acres) with frontages on Currier Road and Reserve Place. The property is partially developed with one single family home on the western portion of the property. The existing single-family home includes a driveway off Currier Road, a septic system, well and private electric and data communication utilities. The remainder of the parcel is undeveloped and is primarily wooded with gentle to moderate slopes. There are wetlands including an intermittent stream, a vernal pool and a manmade ditch along Currier Road. The manmade ditch is the narrower portion of the wetland, and the natural wetlands extend further into the site on both ends.

The subdivision proposes three single-family house lots, Lot 6, 6-1 and 6-2. Lot 6 will contain the existing house and related improvements and Lots 6-1 and 6-2 will be developed with new single-family houses, driveways from Currier Road, individual septic systems and private wells. A well radius easement is proposed as the well radii for each new well overlaps one another and extends onto the respective abutting property. A wetland dredge and fill permit with NHDES was granted for permanent and temporary wetland impacts associated with the Lot 6-2 driveway.

The Subdivision plans show the existing dwelling and associated improvements along with the 4,000 square foot receiving areas for septic and proposed individual wells and well radii, dwellings and driveways. The

following is a Tabulation Table for each lot. This table is also provided on the subdivision plans.

LOT	6	6–1	6–2
ZONING	RO	RO	RO
ORIGINAL LOT AREA	641,299 Sq.Ft. (14.722 Ac.)		
NEW LOT AREA	123,021 Sq.Ft. (2.824 Ac.)	149,540 Sq.Ft. (3.433 Ac.)	368,738 Sq.Ft. (8.465 Ac.)
WETLAND AREA	20,911 Sq.Ft.	38,284 Sq.Ft.	64,635 Sq.Ft.
15%–25% SLOPES	39,800 Sq.Ft.	45,203 Sq.Ft.	124,645 Sq.Ft.
>25% SLOPES	23,907 Sq.Ft.	44,102 Sq.Ft.	99,511
BUILDABLE AREA	72,526 Sq.Ft.	34,052 Sq.Ft.	122,398 Sq.Ft.
USABLE AREA	28,962 Sq.Ft.	16,150 Sq.Ft.	72,679 Sq.Ft.
DWELLING FOOTPRINT	1,356 Sq.Ft.	1,735 Sq.Ft.	1,735 Sq.Ft.
*BASEMENT	0 Sq.Ft.	253 Sq.Ft.	253 Sq.Ft.
FIRST FLOOR	996 Sq.Ft.	1,735 Sq.Ft.	1,735 Sq.Ft.
SECOND FLOOR	996 Sq.Ft.	1,111 Sq.Ft.	1,111 Sq.Ft.
BUILDING USE	RESIDENTIAL (SINGLE–FAMILY)	RESIDENTIAL (SINGLE–FAMILY)	RESIDENTIAL (SINGLE–FAMILY)
IMPERVIOUS COVERAGE	3,944± Sq.Ft. (3.21%±)	5,455± Sq.Ft. (3.65%±)	5,989± Sq.Ft. (1.62%±)

* = FINISHED PORTION

Sight Distance Plan and Sight Distance Profile Plan

Sight distances and associated profiles for the existing driveway and the proposed driveways for Lots 6-1 and 6-2 are provided that demonstrates the required 400-foot sight distance at each driveway can be accommodated.

Expedited Minimum Impact

This subdivision proposes a total of 422 square feet of impact to the wetland along Currier Road. This impact is for the construction of the Lot 6-2 driveway and the associated driveway culvert, flared end sections and related grading. The total impact includes 103 square feet of temporary impacts and 319 square feet of permanent impacts.

Site Grading and Drainage Plan and Driveway Plan and Profile Plans

The site layout, grading and drainage for proposed Lots 6-1 and 6-2, shows the grading related to the proposed driveway, residential home, propane, well and septic system. The septic system requires review and approval by NHDES. Underground electric and data communications will be extended to each home. The driveway will be paved, and the homes will include overhead garage doors and a pedestrian door on the basement level and a path with stairs to a porch at the front entrance on the first floor. A deck is included at the rear of each home on the first level. The garage entrance is approximately 17 feet above the elevation of Currier Road for Lot 6-1 and 22 feet above the elevation for Lot 6-2. Each driveway slopes away from Currier Road for approximately 10 feet, then slopes up to the garage at a maximum grade of 10%.

Driveway ditches are provided along the driveways and stone lined where appropriate. Driveway culverts are proposed at both driveway crossings. Lot 6-1 proposes a 12-inch culvert and Lot 6-2 proposes a 15-inch culvert. Both culverts are double walled HDPE and include flared end sections with 1-foot minimum cover.

A State of New Hampshire (NHDOT) driveway permit was granted on April 2, 2024.

Stormwater

A stormwater analysis was performed calculating the peak flow rates for each design storm to an analysis point chosen as the existing Currier Road culvert between the proposed driveways of Lot 6-1 and 6-2. A stormwater infiltration pond with outlet control structure is proposed on Lot 6-2 that has been designed to successfully mitigate the peak flow rates of each design storm. Section 5, Design Summary in the Stormwater Report shows the peak flow values for the pre and post-development conditions and shows no increase in peak flow rates for any design storm.

The required Water Quality Volume (WQV) and Groundwater Recharge Volume (GRV) for the infiltration pond and the project was calculated per NHDES Best Management Practices (BMP's) and are 497 cubic feet and 110 cubic feet, respectively. The infiltration basin provides 648 cubic feet of storage below the lowest pond outlet and will infiltrate that volume of stormwater. Therefore, both the WQV and GRV requirements are met.

Waivers

Section 23.08(2) Stormwater Recharge:
The City of Concord requires a separation of 4-feet from groundwater while separation from Estimated Seasonal High Water Table (ESHWT) varies between 1-foot and 4-feet per NHDES 1500 rules. The proposed infiltration basin provides approximately 1.5-feet of separation from the ESHWT. NHDES does not typically require stormwater treatment for single family lot development, and single-family driveways typically have less overall volume and lower concentrations of pollutants compared to commercial parking lots and roads. Therefore, a waiver from this requirement is requested.

Per Section 23.08(3), Offsite Flows:
The City of Concord requires the volume of discharge after-project development to not exceed the volume of discharge before development for the 10-Year storm event. Table 5.3.1 of the stormwater report indicates a minor increase of 0.011 ac-feet to the analysis point.

Runoff from this development flows offsite to a large wetland complex on the south side of Currier Road. This very minor increase will not have a significant or measurable impact on the wetland complex and will therefore not have a negative impact offsite. For these reasons, a waiver from this requirement is requested.

Erosion and Sediment Control Plan

Typical erosion and sediment controls are proposed including perimeter controls such as silt fence and filter sock. Inlet controls are to be provided at all headwalls and flared end section, stockpile areas are to be contained within a double row of perimeter controls, and a stabilized construction entrance will be provided at each driveway. Erosion and Sediment controls will be provided as needed on site and maintained in good working order.

These plans also identifies the wetland buffer impacts for the project. This project proposes a total of 13,903 square feet of proposed and after-the fact wetland buffer impacts. Proposed impacts include 5,935 square feet for Lot 6-1 and 5,230 square feet for Lot 6-2, and 2,738 square feet of after-the fact wetland buffer impacts on

Lot 6. The wetland buffer impact areas on Lot 6-2 include the natural wetlands only and not inclusive of the manmade roadside drainage ditches wetland.

The after-the-fact wetland buffer impacts on lot 6 will be restored with native vegetation.

Conditional Use Permit

A conditional Use Permit (CUP) is requested for the proposed and after-the-fact wetland buffer impacts. The proposed wetland buffer impacts are fully related to the driveway access for each lot, the associated grading and the required stormwater management. See attached application and related correspondence related to this permit request.

Application Fee

The subdivision application fee is anticipated to be $1,235 as calculated below. Please confirm the fee amount and it will be provided to the City by the applicant. The breakdown is as follows.

- $85 Notification Fees ($5 x 17 notifications)
- $300 Application Fee
- $300 Per lot fee ($100 x 3 lots)
- $550 CUP Application Fee ($250 application + $300 disturbance > 1,000 sf)

Enclosures

The following information to complete our Site Plan application will be uploaded to the portal:

- Submittal Letter
- Subdivision Application Checklist
- Signed Authorization Form
- CUP Application Checklist
- CUP responses to Article 28-9-4, a through g and 28-4-3(d), 1 through5
- Wetland Buffer Impact Photos
- Abutter List
- Property Deed
- Subdivision Plan Set
- Stormwater Management Report
- Wetland Permit approval
- NHDOT Driveway Permit approval

Please reach out to me via email brian.pratt@fando.com or telephone at 603-222-3491 with any questions you may have during your review.

Sincerely,

Brian Pratt, PE
Senior Project Manager

ARS:BAP:mjt

Enclosures

cc w/ enclosures via email: Keith Martel and Brandon Wing

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May 20, 2026

Mr. Alec Bass
Assistant City Planner
City of Concord
Planning Development
41 Green Street
Concord, New Hampshire 03301

Re: Conditional Use Permit Responses to 28-9-4, a through g and 28-4-3(d), 1 through 5
Tax Map 711Z Lot 6
48 Currier Road Subdivision
Fuss & O'Neill Reference No. 120.2600125.000

Dear Alec:

On behalf of the Applicant, Fuss and O'Neill has prepared the enclosed materials in support of a Minor Subdivision and Conditional Use Permit Application of 48 Currier Road.

Responses to Article 28-9-4, a through g

a. *The use is specifically authorized in this ordinance as a conditional use;*
The use is authorized as a conditional use per 28-4-3(c)(7).

b. *If completed as proposed by the applicant, the development in its proposed location will comply with all requirements of this Article, and with the specific conditions or standards established in this ordinance for the particular use;*
Care has been taken to limit direct wetland impacts for this subdivision application. Direct wetland impacts are only related to safe driveway access to the proposed residential home on proposed lot 6-2. The wetland buffer impacts are related to the safe driveway access of proposed lots 6-1 and 6-2 and it's associated grading for the driveway and stormwater management and treatment of the residential roof and driveway. The buffer impacts have been minimized to the maximum extent practicable. Incidental buffer impacts were done on lot 6 during construction related to the existing house and driveway access. Those buffer impacts are proposed to be restored with native vegetation except for the portion of the paved driveway access and associated retaining wall.

c. *The use will not materially endanger the public health or safety;*
For proposed lots 6-1 and 6, the proposed driveway, associated grading and stormwater management and treatment are all necessary for the reasonable use of this property and for responsible residential development. It aids in providing safe access to the proposed residential homes and mitigates stormwater peak flows from the development. For lot 6, the incidental wetland buffer impacts are also related to site access and general lot grading/ clearing/ construction. These buffers will be restored with native vegetation. These reasonable uses of the buffer, in a responsible way, will not materially endanger the public health or safety.

d. *The use will be compatible with the neighborhood and with adjoining or abutting uses in the area in which it is to be located;*
The impacts are the minimum necessary to allow reasonable access and development of the properties while preserving the majority of the existing wetland buffer, wetland functions and natural character of the property. Additionally, the stormwater infiltration basin provides mitigation to limit post-development peak flows to pre-development peak flow rates. Drainage patterns have been preserved so as not to disturb neighboring properties.

e. *The use will not have an adverse effect on highway or pedestrian safety;*
A stormwater infiltration pond is proposed to control stormwater peak flows for all design storms. This ensures that the development will not negatively impact the existing drainage infrastructure. Additionally, proper erosion and sediment controls such as perimeter controls, like silt socks or silt fence, stabilized construction entrances, inlet controls and check dams will be provided. Therefore, the project will not have an adverse impact on highway or pedestrian safety.

f. *The use will not have an adverse effect on the natural, environmental, and historic resources of the City; and*
Impacts to the wetland buffer have been reduced to the maximum extent possible and the design includes an infiltration basin for stormwater management and treatment and erosion and sediment control measures. By providing these measures, adverse effects on the natural or environmental resources of the City are not anticipated. There are no known historic resources that will be impacted.

g. *The use will be adequately serviced by necessary public utilities and by community facilities and services of a sufficient capacity to ensure the proper operation of the proposed use, and will not necessitate excessive public expenditures to provide facilities and services with sufficient additional capacity.*
A water well and individual septic system will be provided for all lots. Excessive public expenditures to provide facilities and services is not anticipated.

Responses to Article 28-4-3(d), 1 through 5

1. *The disturbance of the buffer is necessary to the establishment of an allowable principal or accessory use on the buildable land area of the lot;*
The disturbance of the buffer is specifically necessary to provide reasonable and safe access to the proposed homes. Incidental buffer disturbance on lot 6 will be restored with natural vegetation.

2. *The proposed disturbance to the buffer cannot practicably be located otherwise on the lot to eliminate or reduce the impact to the buffer and represents the minimum extent of disturbance necessary to achieve the reasonable use of those portions of the lot consisting of buildable land;*
The proposed access is from the existing road and the buffers that are being impacted are along the road access it is from. Additionally, the proposed stormwater infiltration basin is needed down slope of the development to capture stormwater flows from the development and to offer

stormwater treatment from the development. As such, the impacts to the buffers cannot practicably be located elsewhere on the lot to eliminate or reduce the impact to the buffer.

3. *The proposed disturbance to the buffer minimizes the environmental impact to the abutting wetland, and to downstream property and hydrologically connected water and wetland resources;*
   The introduction of the stormwater infiltration basin, within the buffer, acts to mitigate environmental impacts to the abutting wetland and downstream properties.

4. *Where applicable, wetland permit(s) have been received or are obtained from the NHDES and USACOE; and*
   The wetland permit is approved. NHDES Wetland Permit #2026-0624, approved May 15, 2026.

5. *Where applicable, permits or proof of compliance with all other state and/or federal regulations have been received or are obtained.*
   NHDOT driveway permit has been granted approval. The septic system permit will be applied for after subdivision and CUP permit approval is granted.

Please reach out to me via email brian.pratt@fando.com or telephone at 603-222-3491 with any questions you may have during your review.

Sincerely,

Brian Pratt, PE
Senior Project Manager

ARS:BAP:mjt

LOT 6
LOOKING NORTHEASTERLY AT
1,680 SF WETLAND BUFFER IMPACT

LOT 6
LOOKING SOUTH ALONG THE 13 SF WETLAND BUFFER IMPACT LOCATED TO THE EAST OF THE EXISTING DRIVEWAY

LOT 6
LOOKING SOUTH ALONG THE 1,045 SF WETLAND BUFFER IMPACT LOCATED TO THE WEST OF THE EXISTING HOUSE

LOT 6-1-
LOOKING WEST WITH THE PROPOSED DRIVEWAY AND 5,935 SF WETLAND BUFFER IMPACTS TO THE NORTH

LOT 6-2
LOOKING EAST WITH THE PROPOSED DRIVEWAY AND 5,230 SF WETLAND BUFFER IMPACTS TO THE NORTH

The State of New Hampshire
Department of Environmental Services

Robert R. Scott, Commissioner

May 15, 2026

LIBERTY WOODS LLC
PO BOX 299
CANDIA, NH 03034

Re: Approved Standard Dredge and Fill Wetlands Permit Application (RSA 482-A)
NHDES File Number: 2026-00624
Subject Property: 48 Currier Rd, Concord, Tax Map/Lot: 711Z/6

Dear Applicant:

On May 15, 2026, the New Hampshire Department of Environmental Services (NHDES) Wetlands Bureau approved the above-referenced Standard Dredge and Fill Wetlands Permit Application. Enclosed please find Wetlands Permit # 2026-00624 to dredge and fill 422 square feet (SF) of palustrine forested wetlands for the construction of a single-family residential driveway crossing. The project includes 319 SF of permanent impacts and 103 SF of temporary impact to install a 25-foot HDPE 15-inch culvert and erosion control measures. The permittee shall notify the department in writing at least one week prior to commencing any work under this permit and shall file a notice of completion of work and certificate of compliance with the department within 10 working days of completion of the work authorized by this permit.

This permit is not valid unless signed by the permittee and the principal contractor, if any, who will build or install the project. Prior to start of construction, a copy of this permit shall be posted in a secure manner in a prominent place at the site of the approved project**.** It shall remain posted until the project is completed. Transfer of this permit to a new owner shall require notification to, and approval of, the NHDES. **This permit does not convey any property right, nor does it preclude the need to meet any other applicable state, federal, or municipal legal requirements.**

In accordance with RSA 482-A:10, RSA 21-O:14, and Rules Ec-Wet 100-200, **any person aggrieved by this decision may file a Notice of Appeal directly with the NH Wetlands Council (Council) within 30 days of the decision date, May 15, 2026.** Every ground claiming the decision is unlawful or unreasonable must be fully set forth in the Notice of Appeal. Only the grounds set forth in the Notice of Appeal are considered by the Council. Information about the Council, including Council Rules, is available at https://www.nhec.nh.gov/wetlands-council/about. For appeal related issues, contact the Council Appeals Clerk at (603) 271-3650.

This approval is based on the following findings:
1. This is classified as a minimum impact project per Env-Wt 524.06(a), as the project is for residential access and impacts to jurisdictional areas other than a watercourse are less than 3,000 square feet.
2. DataCheck letter DCT26-0192 identified the presence of protected species. The applicant has included recommendations from the Ecological Review Section on the plan set per Env-Wt 310.01(b)(5) and Env-Wt 306.05 to avoid and minimize project-related impacts to protected species.
3. The applicant has demonstrated avoidance and minimization in accordance with Env-Wt 313.03 by:
a. Restoring all temporary impacts to pre-existing conditions and locating impacts to wetlands in the narrowest and safest section possible.
b. Upsizing the originally proposed 12-inch culvert to a 15-inch culvert.

4. An abutter communicated concerns regarding flooding during heavy storm events and provided a photo of the area of concern. NHDES staff conducted a routine site inspection of the project. NHDES determined that the area of concern was not within this project's scope, and this was communicated to the abutter. No further concerns were raised.
5. The agent provided a narrative summary informed by the engineer addressing the culvert sizing and flooding concerns, stating that an "existing downstream culvert beneath Currier Road is smaller than the proposed driveway culvert... Future backup, if any, will not be the result of the proposed culvert but a result of the existing culvert size."

If you have any questions, please contact me at alani.ramas@des.nh.gov.

Sincerely,

Alani Ramas
Permit Reviewer, Wetlands Bureau
Land Resources Management, Water Division

Enclosure

Copied: Brandon Wing, Promised Land Survey
Concord Municipal Clerk/Conservation Commission

The State of New Hampshire
Department of Environmental Services

Robert R. Scott, Commissioner

WETLANDS PERMIT 2026-00624

NOTE CONDITIONS

PERMITTEE:	**LIBERTY WOODS LLC** **PO BOX 299** **CANDIA, NH 03034**
PROJECT LOCATION:	**48 CURRIER RD, CONCORD** **Tax Map/Lot): 711Z/6**
WATERBODY:	
APPROVAL DATE:	**MAY 15, 2026**
EXPIRATION DATE:	**MAY 15, 2031**

The New Hampshire Department of Environmental Services' (NHDES) review of permit application 2026-00624 has found that it is consistent with RSA 482-A. NHDES hereby issues this Wetlands Permit authorizing the impacts described provided the Conditions imposed are met. To validate this Permit, the Permittee and the Principal Contractor are required to sign below.

PERMIT DESCRIPTION:
Dredge and fill 422 square feet (SF) of palustrine forested wetlands for the construction of a single-family residential driveway crossing. The project includes 319 SF of permanent impacts and 103 SF of temporary impact to install a 25-foot HDPE 15-inch culvert and erosion control measures.

THIS PERMIT IS SUBJECT TO THE FOLLOWING PROJECT-SPECIFIC CONDITIONS:
1. All work shall be done in accordance with the approved plans titled "Expedited Minimum Impact Overview Plan," per Env-Wt 307.16 and Env-Wt 314.03(b) dated April 13, 2026, revised through May 14, 2026, and provided to NHDES on May 13, 2026.
2. The permittee shall submit a construction notice with NHDES at least one week prior to commencing work, in accordance with Env-Wt 314.03(a). "Wetlands Initiation of Construction Notification Form" available at https://onlineforms.nh.gov/.
3. A standard permit shall be signed by the permittee and principal contractor who will build or install the project prior to start of construction and not be valid until signed as required by Env-Wt 314.01 (a) and (b).
4. Water quality control measures shall be installed prior to start of work and in accordance with the manufacturer's recommended specifications, per Env-Wt 307.03(c)(3).
5. Water quality control measures shall be maintained to ensure continued effectiveness in minimizing erosion and retaining sediment on-site during and after construction, in accordance with Env-Wt 307.03(c)(5).
6. The person in charge of construction equipment shall inspect such equipment for leaking fuel, oil, and hydraulic fluid each day prior to entering surface waters or wetlands or operating in an area where such fluids could reach groundwater, surface waters, or wetlands, in accordance with Env-Wt 307.03(g)(1).
7. Equipment shall be staged and refueled outside of jurisdictional areas, in accordance with Env-Wt 307.03(h) and Env-Wt 307.15.
8. Fill shall be clean sand, gravel, rock, or other material that meets the project's specifications for its use and does not contain any material that could contaminate surface or groundwater or otherwise adversely affect the ecosystem in which it is used, in accordance with Env-Wt 307.11(a).

9. To prevent the use of soil or seed stock containing nuisance or invasive species, the contractor responsible for work shall follow Best Management Practices for the Control of Invasive and Noxious Plant Species (Invasive Plant BMPs), in accordance with Env-Wt 307.05(e).
10. All work, including management of soil stockpiles, shall be conducted so as to minimize erosion, minimize sediment transfer to surface waters or wetlands, and minimize turbidity in surface waters and wetlands, in accordance with Env-Wt 307.03(b).
11. Slopes shall be immediately stabilized to prevent erosion into adjacent wetlands or surface waters in accordance with Env-Wt 307.11(c).
12. All exposed soils and other fills shall be permanently stabilized within 3 days following final grading in accordance with Env-Wt 307.03(e).
13. If any temporary impact area that is stabilized with seeding or plantings does not have at least 75% successful establishment of wetlands vegetation after 2 growing seasons, the area shall be replanted or reseeded, as applicable, in accordance with Env-Wt 307.12(f).
14. The permittee shall file a notice of completion and certificate of compliance with NHDES within 10 working days of completing the work authorized by the permit in accordance with Env-Wt 314.08(a). "Wetlands Completion of Construction Notice and Certificate of Compliance Form," can be access at https://onlineforms.nh.gov/.

ANY INDIVIDUAL CONDUCTING WORK UNDER THIS PERMIT IS ADVISED OF THE FOLLOWING:

1. This permit does not preclude the need to meet any other applicable state, federal, or municipal legal requirements.
2. The permit holder is responsible for reading, and ensuring compliance with, the applicable general conditions established in Env-Wt 307.
3. This permit does not in any way authorize the take of threatened or endangered species, as defined by RSA 212-A:2, or of any protected species or exemplary natural communities, as defined in RSA 217-A:3.
4. This approval does not convey any property right. The permittee is responsible for ensuring that they have the legal authority to access the subject lands and conduct the impacts described.

APPROVED:

Alani Ramas
Permit Review, Wetlands Bureau
Land Resources Management, Water Division

THE SIGNATURES BELOW ARE REQUIRED TO VALIDATE THIS PERMIT (Env-Wt 314.01).

_____ _____

PERMITTEE SIGNATURE (required) PRINCIPAL CONTRACTOR SIGNATURE (required)

New Hampshire DOT
Department of Transportation

William Cass, P.E.
Commissioner

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

District 5 Office, 16 East Point Drive, Bedford, NH 03110 603-666-3336

David Rodrigue, P.E.
Assistant Commissioner

DRIVEWAY PERMIT

To: Keith Martel
Liberty Woods, LLC
118 Palmer Rd.
Candia, NH 03034

City/Town: Concord
Route/Road: Currier Rd (N2270086)
Patrol Section: 505
Tax Map: 711Z
Lot: 6
Development: 3-Lot Residential Subdivision

Permit #: 05-099-0036
District: 05
Permit Date 4/2/2024

Permission is hereby granted to construct (alter) a driveway, entrance, exit or approach adjoining Currier Rd (N2270086), pursuant to the location and specifications as described below. Failure to adhere to the standards and engineering drawings previously approved shall render this instrument null and void. Failure to start or complete construction of said facility within one calendar year of the date of this permit shall require application for permit extension or renewal in accordance with the Driveway Access Rules. Facilities constructed in violation of the permit specifications or the rules, shall be corrected immediately upon notification by a Department representative. Any cost by the State to correct deficiencies shall be fully borne by the landowner. The landowner shall defend, indemnify and hold harmless the Department and its duly appointed agents and employees against any action for personal injury and/or property damage sustained by reason of the exercise of this permit.

Drive 1

Location: Approximately 0.1761 miles east of Reserve Pl. on the north side of Currier Rd (N2270086).
SLD Station: 4515 (left) GPS: 43.19952 N 71.6119 W.

Specifications: This permit authorizes a paved access to be used as a Single Family Residential drive. Any change in use, increase in use or reconstruction of the driveway requires reapplication.

The right-of-way line is located (see plan).
The entrance shall be graded so that the surface of the drive drops (see plan) at a point (see plan) from Currier Rd (N2270086) edge of pavement to create a drainage swale.

The driveway shall not exceed (see plan) in width. The entrance of the drive may be flared; typically the flare radius is one half the driveway width.

Other Conditions:
No structures, including buildings, permanent or portable signs, lights, displays, fences, walls, etc. shall be permitted on, over or under the Highway Right of Way.

No parking, catering or servicing shall be conducted within the Highway Right of Way.

The applicant shall comply with all applicable ordinances and regulations of the municipality or other State Agencies.

The Department has relied on the title and subdivision information provided by the landowner. The Department has not performed additional title research and makes no warranty or representation concerning landowner's legal right to access. In the event of a dispute about the landowner's legal right to the access provided herein, the landowner will defend and indemnify the Department.

All excavated topsoil, or in the absence of topsoil the top 6 inches of soil, within the limits of state ROW shall be properly re-used within the limits of the state ROW. All temporary stockpiles of the re-use material shall be located within the state ROW, or as otherwise approved by the District Engineer.

The Contractor shall be solely responsible for the handling, transport and disposal of any surplus material generated by their project and shall comply with all federal, state and local laws, ordinances and rules in doing so.

I/We, the contractor/Owner, certify that the property will not have any illicit unauthorized drainage connections to the NHDOT storm water drainage system. An illicit discharge is any direct or indirect discharge to the NHDOT drainage system that is not composed entirely of storm water. Illicit discharges include, without limitation, sewage, process wastewater, or wash water and any connections from floor drains, sinks, or toilets.

Highway and driveway modifications are to be constructed as shown on plans prepared by Promised Land Survey, LLC date last revised 3/18/24 for Liberty Woods, LLC, on file in the District Five Office. No additional surface drainage will enter upon the highway.

This permit to act relates solely to the use of the State right-of-way, and is not determinative of any rights of flowage between private land owners.

A copy of this permit shall be present at the site during construction of the drive(s). All work is to be done by the applicant at no cost to the State of New Hampshire.

This permit does not include or approve the location or installation of underground utilities. Drive(s) shall approach the highway at or about 90 degrees.

All materials and structures shall conform to the current version of the NHDOT Standard Specifications for Road and Bridge Construction, as amended.

During construction within the highway right-of-way, traffic shall be maintained in accordance with MUTCD standards and as directed by the District Engineer.

Copies: District, Town, Patrolman

Promised Land Survey, LLC
Timothy Peloquin
P. O. Box 447
Derry, NH 03038

Approved

Assistant District Engineer
For Director of Administration

New Hampshire DOT
Department of Transportation

William Cass, P.E.
Commissioner

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

District 5 Office, 16 East Point Drive, Bedford, NH 03110 603-666-3336

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DRIVEWAY PERMIT

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Liberty Woods, LLC
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Candia, NH 03034

City/Town: Concord
Route/Road: Currier Rd (N2270086)
Patrol Section: 505
Tax Map: 711Z
Lot: 6-1
Development: 3-Lot Residential Subdivision

Permit #: 05-099-0037
District: 05
Permit Date 4/8/2024

Permission is hereby granted to construct (alter) a driveway, entrance, exit or approach adjoining Currier Rd (N2270086), pursuant to the location and specifications as described below. Failure to adhere to the standards and engineering drawings previously approved shall render this instrument null and void. Failure to start or complete construction of said facility within one calendar year of the date of this permit shall require application for permit extension or renewal in accordance with the Driveway Access Rules. Facilities constructed in violation of the permit specifications or the rules, shall be corrected immediately upon notification by a Department representative. Any cost by the State to correct deficiencies shall be fully borne by the landowner. The landowner shall defend, indemnify and hold harmless the Department and its duly appointed agents and employees against any action for personal injury and/or property damage sustained by reason of the exercise of this permit.

Drive 1

Location: Approximately 0.2932 miles east of Reserve Pl. on the north side of Currier Rd (N2270086).
SLD Station: 4915 (left) GPS: 43.19953 N 71.61032 W.

Specifications: This permit authorizes a paved access to be used as a Single Family Residential drive. Any change in use, increase in use or reconstruction of the driveway requires reapplication.

The right-of-way line is located (see plan).
The entrance shall be graded so that the surface of the drive drops (see plan) at a point (see plan) from Currier Rd (N2270086) edge of pavement to create a drainage swale.

The driveway shall not exceed (see plan) in width. The entrance of the drive may be flared; typically the flare radius is one half the driveway width.

Other Conditions:
No structures, including buildings, permanent or portable signs, lights, displays, fences, walls, etc. shall be permitted on, over or under the Highway Right of Way.

No parking, catering or servicing shall be conducted within the Highway Right of Way.

The applicant shall comply with all applicable ordinances and regulations of the municipality or other State Agencies.

The Department has relied on the title and subdivision information provided by the landowner. The Department has not performed additional title research and makes no warranty or representation concerning landowner's legal right to access. In the event of a dispute about the landowner's legal right to the access provided herein, the landowner will defend and indemnify the Department.

All excavated topsoil, or in the absence of topsoil the top 6 inches of soil, within the limits of state ROW shall be properly re-used within the limits of the state ROW. All temporary stockpiles of the re-use material shall be located within the state ROW, or as otherwise approved by the District Engineer.

The Contractor shall be solely responsible for the handling, transport and disposal of any surplus material generated by their project and shall comply with all federal, state and local laws, ordinances and rules in doing so.

I/We, the contractor/Owner, certify that the property will not have any illicit unauthorized drainage connections to the NHDOT storm water drainage system. An illicit discharge is any direct or indirect discharge to the NHDOT drainage system that is not composed entirely of storm water. Illicit discharges include, without limitation, sewage, process wastewater, or wash water and any connections from floor drains, sinks, or toilets.

Highway and driveway modifications are to be constructed as shown on plans prepared by Promised Land Survey, LLC date last revised 3/18/24 for Liberty Woods, LLC, on file in the District Five Office. No additional surface drainage will enter upon the highway.

This permit to act relates solely to the use of the State right-of-way, and is not determinative of any rights of flowage between private land owners.

A copy of this permit shall be present at the site during construction of the drive(s). All work is to be done by the applicant at no cost to the State of New Hampshire.

This permit does not include or approve the location or installation of underground utilities. Drive(s) shall approach the highway at or about 90 degrees.

All materials and structures shall conform to the current version of the NHDOT Standard Specifications for Road and Bridge Construction, as amended.

During construction within the highway right-of-way, traffic shall be maintained in accordance with MUTCD standards and as directed by the District Engineer.

Copies: District, Town, Patrolman

Promised Land Survey, LLC
Timothy Peloquin
P. O. Box 447
Derry, NH 03038

Approved _____

Assistant District Engineer
For Director of Administration

William Cass, P.E.
Commissioner

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

District 5 Office, 16 East Point Drive, Bedford, NH 03110 603-666-3336

David Rodrigue, P.E.
Assistant Commissioner

DRIVEWAY PERMIT

To: Keith Martel
Liberty Woods, LLC
118 Palmer Rd.
Candia, NH 03034

City/Town:	Concord	Permit #:	05-099-0038
Route/Road:	Currier Rd (N2270086)	District:	05
Patrol Section:	505	Permit Date	4/8/2024
Tax Map:	711Z		
Lot:	6-2		
Development:	3-Lot Residential Subdivision		

Permission is hereby granted to construct (alter) a driveway, entrance, exit or approach adjoining Currier Rd (N2270086), pursuant to the location and specifications as described below. Failure to adhere to the standards and engineering drawings previously approved shall render this instrument null and void. Failure to start or complete construction of said facility within one calendar year of the date of this permit shall require application for permit extension or renewal in accordance with the Driveway Access Rules. Facilities constructed in violation of the permit specifications or the rules, shall be corrected immediately upon notification by a Department representative. Any cost by the State to correct deficiencies shall be fully borne by the landowner. The landowner shall defend, indemnify and hold harmless the Department and its duly appointed agents and employees against any action for personal injury and/or property damage sustained by reason of the exercise of this permit.

Drive 1

Location: Approximately 0.3037 miles east of Reserve Pl. on the north side of Currier Rd (N2270086).
SLD Station: 5115 (left) GPS: 43.19933 N 71.60933 W.

Specifications: This permit authorizes a paved access to be used as a Single Family Residential drive. Any change in use, increase in use or reconstruction of the driveway requires reapplication.

The right-of-way line is located (see plan).
The entrance shall be graded so that the surface of the drive drops (see plan) at a point (see plan) from Currier Rd (N2270086) edge of pavement to create a drainage swale.

The driveway shall not exceed (see plan) in width. The entrance of the drive may be flared; typically the flare radius is one half the driveway width.
A new 15 inch diameter plastic culvert is required for drainage.

Other Conditions:

No structures, including buildings, permanent or portable signs, lights, displays, fences, walls, etc. shall be permitted on, over or under the Highway Right of Way.

No parking, catering or servicing shall be conducted within the Highway Right of Way.

The applicant shall comply with all applicable ordinances and regulations of the municipality or other State Agencies.

The Department has relied on the title and subdivision information provided by the landowner. The Department has not performed additional title research and makes no warranty or representation concerning landowner's legal right to access. In the event of a dispute about the landowner's legal right to the access provided herein, the landowner will defend and indemnify the Department.

All excavated topsoil, or in the absence of topsoil the top 6 inches of soil, within the limits of state ROW shall be properly re-used within the limits of the state ROW. All temporary stockpiles of the re-use material shall be located within the state ROW, or as otherwise approved by the District Engineer.

The Contractor shall be solely responsible for the handling, transport and disposal of any surplus material generated by their project and shall comply with all federal, state and local laws, ordinances and rules in doing so.

I/We, the contractor/Owner, certify that the property will not have any illicit unauthorized drainage connections to the NHDOT storm water drainage system. An illicit discharge is any direct or indirect discharge to the NHDOT drainage system that is not composed entirely of storm water. Illicit discharges include, without limitation, sewage, process wastewater, or wash water and any connections from floor drains, sinks, or toilets.

Highway and driveway modifications are to be constructed as shown on plans prepared by Promised Land Survey, LLC date last revised 3/18/24 for Liberty Woods, LLC, on file in the District Five Office. No additional surface drainage will enter upon the highway.

This permit to act relates solely to the use of the State right-of-way, and is not determinative of any rights of flowage between private land owners.

A copy of this permit shall be present at the site during construction of the drive(s). All work is to be done by the applicant at no cost to the State of New Hampshire.

This permit does not include or approve the location or installation of underground utilities. Drive(s) shall approach the highway at or about 90 degrees.

All materials and structures shall conform to the current version of the NHDOT Standard Specifications for Road and Bridge Construction, as amended.

During construction within the highway right-of-way, traffic shall be maintained in accordance with MUTCD standards and as directed by the District Engineer.

Copies: District, Town, Patrolman

Promised Land Survey, LLC
Timothy Peloquin
P. O. Box 447
Derry, NH 03038

Approved _____

Assistant District Engineer
For Director of Administration

The State of New Hampshire
Department of Environmental Services

Robert R. Scott, Commissioner

NOTICE OF ACCEPTANCE OF PERMIT APPLICATION

JUNE 2, 2026

ASSESSING DEPARTMENT
CITY OF CONCORD
41 GREEN ST
CONCORD NH 03301

RE: Subsurface Systems Bureau Application for Subdivision of Land (RSA 485:A)
Work Number: 202602438
Subject Property: 48 CURRIER ROAD
CONCORD NH 03301
TAX MAP: 711Z, TAX LOT: 6

Dear Municipal Clerk:

Pursuant to RSA 541-A:39, please be advised that the Department of Environmental Services (NHDES) accepted an application for Subdivision of Land on June 1, 2026 for the subject property referenced above.

This is not an authorization to proceed or permit to do work.

Please provide a copy of this notice to all interested departments, boards and commissions. Also note that under current state law and regulations, NHDES is not authorized to consider local zoning and regulatory issues pertaining to a project; these must be addressed at the local level.

If you have any questions, please contact the NHDES Subsurface Systems Bureau at (603) 271-3501.

Sincerely,

Subsurface Systems Bureau
Land Resources Management

FUSS & O'NEILL
50 Commercial Street, Suite 2S
Manchester, NH 03101
603.668.8223
www.fando.com

Stormwater Management Report
Subdivision

Liberty Woods, LLC

Tax Map 711Z Lot 6
48 Currier Road
Concord, NH

May 7, 2026
Revised May 20, 2026

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Stormwater Management Report
Subdivision – 48 Currier Road, Concord, NH

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End of Report

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Extreme Precipitation Table

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Pre-Development

- Drainage Diagram
- Full Summary 2, 10, 25 and 100-Year
- Volume, 10-year

Post-Development

- Drainage Diagram
- Full Summary 2, 10, 25 and 100-Year
- Infiltration Pond, 50-Year Summary

Appendix C **Additional Calculations**

WQV Calculation

GRV Calculation

Appendix D **Plans**

Pre-Development Drainage Area Plan – (DA-101)

Post-Development Drainage Area Plan – (DA-102)

1 Narrative

1.1 Introduction

The Applicant, Liberty Woods, LLC, c/o our client, Keith Martel, has contracted with Fuss and O'Neill to subdivide their 14.7-acre property known as Tax Map 711Z Lot 6, located at 48 Currier Road in Concord, New Hampshire.

The proposed subdivision intends to subdivide the property into 3 single family lots with frontage and driveway access from Currier Road. Design plans include driveway and house lot grading and stormwater management.

1.2 Site Location and Topography

The site is located along the north side of Currier Road between Reservation Way and Timberline Drive in Concord, New Hampshire. The property generally slopes down from the north to the south with moderate slopes.

1.3 Site Soils, Vegetative Cover and Ksat Values

1.3.1 Site Soils

The NRCS Web Soils Survey, prepared by the USDA-SCS, indicates the following soil types within the project watershed:

Symbol	Soils Name	Hydrologic Soil Group
480C	Millsite-Woodstock-Henniker complex, 8 to 15 percent slopes	C
43B	Canton fine sandy loam, 0 to 8 percent slopes	B

Vegetated Cover
The majority of the property is wooded with a small portion of upland developed with single family homes, lawn, walkways and driveways.

See Appendix A for the NRCS Web Soil Survey maps.

1.3.2 Ksat Values

The infiltration pond is located within the Millsite-Woodstock-Henniker soil complex. Reviewing the Ksat values for each soil of this complex, combined with the soil's description from the closest test pit, TP 5., the default minimum Ksat value for the Henniker soil type of 2 in/hr was selected. Adding a factor of safety of 2 results in a design infiltration rate of 1 in/hr.

2 Figures

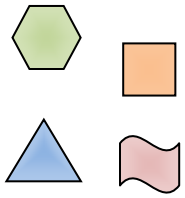
2.1 USGS Map

3 Design Methodology

A computer-aided software package, HydroCAD (v 10.20-8a), was used to perform an intensive series of calculations to determine peak runoff flow rate, peak runoff flow velocity, and other relevant values for the post-development watershed model. The model is based on the SCS TR-20 program and is subject to cumulative rainfall/volume dependent routing calculations. Hydrographs are prepared for each element of the watershed and routed through the dynamic storage-indication method to produce various time-based results. Drainage summaries for the 1-inch, 1-, 2-, 10-, 25-, 50- and 100-Year storm events are provided in Appendix B of this report.

Labeling on drainage plans and diagrams is as follows:

- Reaches/ Analysis Points – Represented by a Rectangle or Square
- Subcatchment - Represented by a Hexagon
- Ponds/Catch Basin – Represented by a Triangle
- Links– Represented by an Irregular Octagon



3.1 Design Criteria

The stormwater calculations have been designed based on the following design criteria.

3.1.1 Rainfall Depths

Rainfall depths for this design are based on the 24-hour rainfall intensity as published by the Northeast Regional Climate Center Extreme Precipitation (NRCC) tables as summarized below.

Design Storm	Intensity	Publication
2-year	2.81 inches	NRCC
10-year	4.11 inches	NRCC
25-year	5.11 inches	NRCC
50-year	6.03 inches	NRCC
100-year	7.12 inches	NRCC

3.1.2 Infiltration Pond

The infiltration pond has been designed as best practicable to meet the NHDES Alteration of Terrain, design standards in that the required Water Quality Volume (WQV) is provided below the lowest outlet. The pond has been designed to mitigate stormwater increases by limiting the post-development peak flow rates of the required design storms, 2, 10, 25 and 100-year, 24-hour, to pre-development peak flow rates at the analysis point, AP1.

3.1.3 Erosion and Sediment Control

Temporary and permanent erosion and sediment control measures are designed using Best Management Practices described by the New Hampshire Department of Environmental Services Stormwater Manual (Latest Revision). Additionally, temporary erosion control will be provided using wildlife friendly means such as mulch berms, Filtrexx Degradable woven silt socks and North American Green SC150BN filter fabric, consistent with New Hampshire Fish and Game typical requirements.

4 Watershed Analysis

4.1 Pre-Development Watershed Conditions

The pre-development watershed consists of one subcatchments area. This subcatchment is inclusive of the proposed development areas of lots 6-1 and 6-2 and their associated upland area. Subcatchment 1S is predominately undeveloped woodland, but is inclusive of some paved surfaces including Currier Road, offsite driveways, residential roofs, lawns and wetlands. Subcatchment 1S flows overland to analysis point AP1, the road culvert that crosses Currier Road between the lot 6-1 and 6-2 driveways.

See Appendix D for the Pre-Development Watershed Plan.

4.2 Post-development Watershed Conditions

The post-development watershed is divided into two subcatchments area, 10S and 11S. Subcatchment 11S includes the land and associated runoff that is directed to the proposed infiltration pond, 1P. The infiltration pond includes an outlet control structure that has been designed to control stormwater outflow so that the post-development peak flow rate to the analysis point, AP1, is at or below the pre-development peak flow rate for all design storms. The detention pond has also been designed to allow for freeboard between the top of the pond and the peak elevation of the 50-year storm. Subcatchment 10S is the remainder of pre-development subcatchment 1S that flows overland to the analysis point and is not routed to the infiltration basin. Both 10S and 11S include the lot development of lots 6-1 and 6-2 including the paved driveways, residential roofs and lawns. These subcatchments also include the upland areas of the pre-development conditions.

See Appendix D for the Post-Development Watershed Plan.

5 Design Summary

5.1 Peak Flows

Tables 5.1.1 through 5.1.4 below summarize the stormwater management data found in Appendix B. These tables compare the results of the HydroCAD stormwater calculations for the 2, 10, 25, and 100-Year 24-hour storm events.

5.1.1 Table – 2-year Storm, Summary of Peak Flows (cfs)

Analysis Point	Pre-Development	Post-Development	Difference
AP1	3.1	2.9	-0.2

5.1.2 Table – 10-year Storm, Summary of Peak flows (cfs)

Analysis Point	Pre-Development	Post-Development	Difference
AP1	7.2	7.2	0.0

5.1.3 Table – 25-year Storm, Summary of Peak flows (cfs)

Analysis Point	Pre-Development	Post-Development	Difference
AP1	10.8	10.7	-0.1

5.1.4 Table – 100-year Storm, Summary of Peak flows (cfs)

Analysis Point	Pre-Development	Post-Development	Difference
AP1	18.6	18.6	0.0

As indicated by Tables 5.1.1 through 5.1.4, the post-development peak flow rate is equal to or less than the pre-development peak flow rate for all required design storms.

5.2 Peak Freeboard Depths

Table 5.2.1 summarizes the freeboard depth for each proposed stormwater practice.

5.2.1 Table – 50-year Storm, Peak Pond Elevations (Feet)

Pond	Top Berm El (ft)	Peak Elevation (ft)	Freeboard (ft)
1P	360.0	359.1	0.9

The pond's peak elevation compared to the top berm elevation indicates a freeboard depth of 0.9-feet is provided for the infiltration pond (1P). Therefore the pond has been designed to not over top and meets NHDES requirements. An emergency spillway is also provided at elevation 359.5', above the pond's peak elevation of the 50-year storm.

5.3 Peak Volume, 10-year Storm

Table 5.3.1 shows the pre versus post 10-year, 24-hour storm volume at analysis point AP1 and indicates a minor increase of 0.011 ac-ft. Given the peak flow rate is not increased and given that this stormwater flows to a large wetland complex on the south side Currier Road, this increase will not have a significant measurable impact. A waiver to allow the increase is requested.

5.3.1 Table – 10 year Storm, Volume (Ac-ft)

Analysis Point	Pre-Development	Post-Development	Difference
AP1	0.743	0.754	0.011

5.4 Stormwater Treatment

Stormwater treatment is provided by the infiltration basin which has been designed to contain the water quality volume (WQV), as required by NHDES. The required WQV per NHDES BMP's is 497 cf, WQV provided is 648 cf, therefore the required WQV provided exceeds what is required by 151 cf. Similarly, the Groundwater Recharge Volume (GRV) per NHDES BMP's is 110 cf, the full WQV will of 648 cf will infiltrate, therefore the GRV requirement is met and exceeded by 538 cf. A waiver is requested to reduce the separation requirement between the bottom of the pond and the estimated seasonal high-water table. A minimum separation of 1.5 feet is

provided. This separation appears reasonable considering the treatment is for residential lot development. The separations noted in the NHDES requirements are generally for commercial use, where residential roofs do not require treatment.

6 Construction Sequence | Erosion Control

Silt fence/filter socks shall be placed prior to any construction activities being undertaken on-site. Erosion control measures shall utilize wildlife friendly options, as noted in Section 2.A of this report. Site construction activities shall be limited to construction of any temporary diversions or sedimentation basins necessary to provide stormwater control during construction. All catch basins will be equipped with dandy socks prior to construction activities. All conveyances shall be seeded and stabilized prior to full-scale site construction activities and the direction of stormwater flows. Use jute matting to stabilize all ditch lines and disturbed soils receiving concentrated runoff prior to the establishment of vegetation.

All stockpile areas are to be stabilized with temporary seeding and silt fencing, as necessary, to control and prevent the erosion of these materials.

During construction and immediately following a rain event, an inspection shall be made of all erosion control measures to verify integrity and perform repairs. Repairs shall be made within 24 hours of the event.

Dewatering operations shall be controlled to avoid erosion or sedimentation of abutting properties and wetland areas by implementing temporary settling basins with gravel check dams, the proposed detention basin, or commercially available dewatering products.

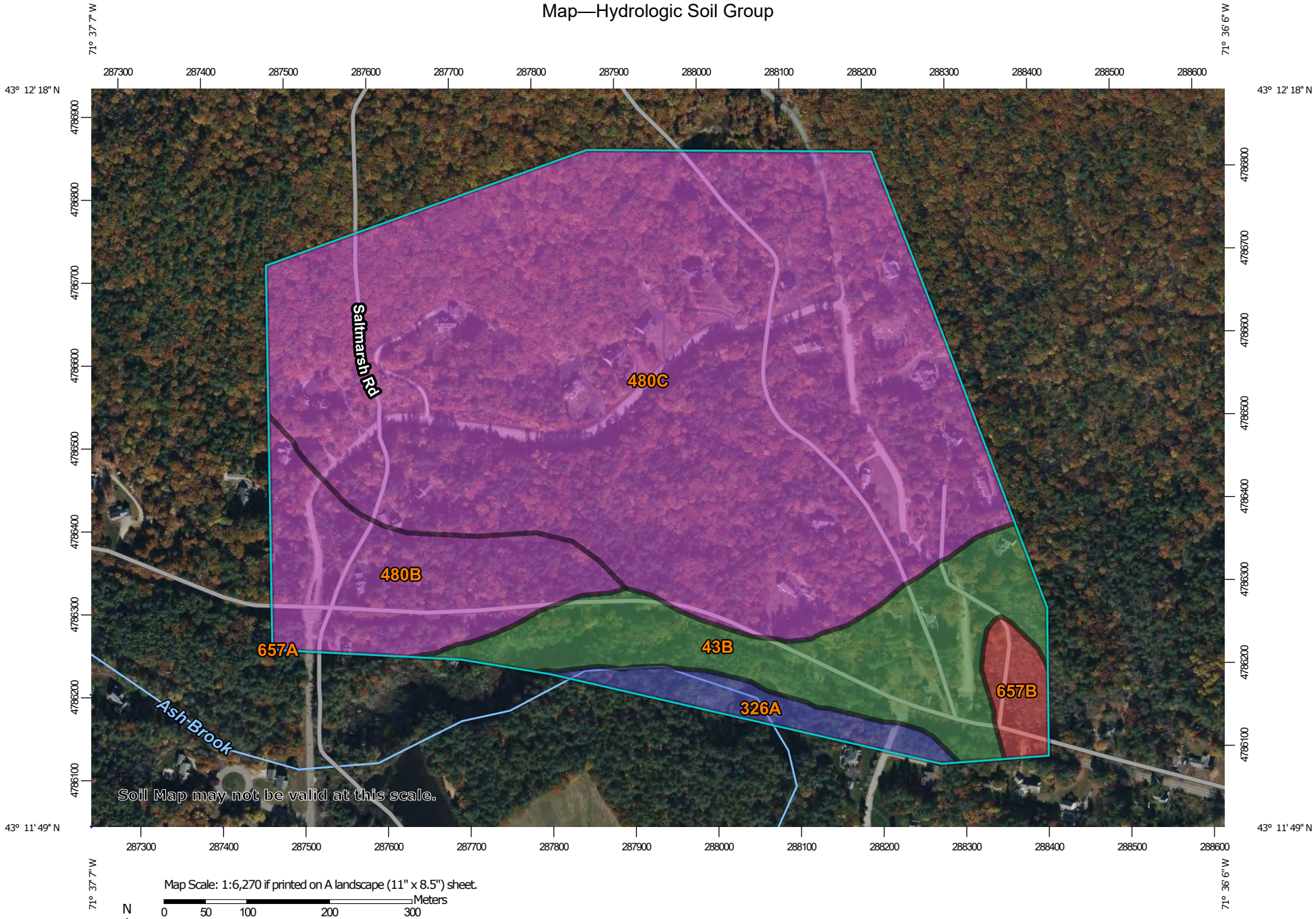
All drainage pretreatment, filtration and detention areas are to be stabilized prior to directing stormwater flows to them.

Refer to this project's Site Plan Set for additional information regarding the Construction Sequence, Erosion Control notes and related construction details.

Appendix A – Soil and Rainfall Data

NRCS Web Soil Survey Map
Extreme Precipitation Table

Custom Soil Resource Report
Map—Hydrologic Soil Group



Map Scale: 1:6,270 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 300 600 1200 1800

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

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
43B	Canton fine sandy loam, 0 to 8 percent slopes, very stony	B	18.2	13.5%
326A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	A/D	4.1	3.1%
480B	Millsite-Woodstock-Henniker complex, 3 to 8 percent slopes, very stony	C	14.6	10.8%
480C	Millsite-Woodstock-Henniker complex, 8 to 15 percent slopes, very stony	C	95.2	70.7%
657A	Ridgebury fine sandy loam, 0 to 3 percent slopes, very stony	D	0.0	0.0%
657B	Ridgebury fine sandy loam, 3 to 8 percent slopes, very stony	D	2.6	1.9%
Totals for Area of Interest			**134.7**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Metadata for Point	
Smoothing	Yes
State	
Location	
Latitude	43.200 degrees North
Longitude	71.61 degrees West
Elevation	110 feet
Date/Time	Thu May 07 2026 12:39:31 GMT-0400 (Eastern Daylight Time)

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	0.49	0.65	0.81	1.02	**1yr**	0.70	0.99	1.18	1.48	1.87	2.37	2.55	**1yr**	2.10	2.45	2.89	3.59	4.12	**1yr**
2yr	0.31	0.48	0.60	0.79	0.99	1.25	**2yr**	0.86	1.15	1.44	1.81	2.25	2.81	3.14	**2yr**	2.49	3.02	3.50	4.18	4.78	**2yr**
5yr	0.37	0.58	0.73	0.97	1.24	1.58	**5yr**	1.07	1.44	1.83	2.28	2.82	3.49	3.97	**5yr**	3.09	3.82	4.41	5.19	5.89	**5yr**
10yr	0.42	0.66	0.83	1.13	1.47	1.88	**10yr**	1.27	1.71	2.18	2.72	3.35	4.11	4.76	**10yr**	3.64	4.57	5.27	6.11	6.90	**10yr**
25yr	0.50	0.79	1.01	1.39	1.85	2.37	**25yr**	1.59	2.15	2.75	3.42	4.21	5.11	6.03	**25yr**	4.52	5.80	6.65	7.60	8.50	**25yr**
50yr	0.57	0.91	1.17	1.63	2.19	2.83	**50yr**	1.89	2.55	3.29	4.08	4.99	6.03	7.23	**50yr**	5.34	6.95	7.94	8.95	9.97	**50yr**
100yr	0.64	1.04	1.34	1.91	2.60	3.38	**100yr**	2.24	3.03	3.94	4.88	5.93	7.12	8.66	**100yr**	6.30	8.33	9.49	10.56	11.69	**100yr**
200yr	0.74	1.21	1.57	2.24	3.09	4.03	**200yr**	2.66	3.61	4.70	5.81	7.04	8.41	10.38	**200yr**	7.44	9.99	11.33	12.47	13.71	**200yr**
500yr	0.89	1.46	1.91	2.77	3.87	5.08	**500yr**	3.34	4.54	5.93	7.32	8.83	10.49	13.21	**500yr**	9.29	12.70	14.34	15.53	16.94	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.22	0.33	0.41	0.55	0.67	0.86	**1yr**	0.58	0.84	1.02	1.34	1.58	1.98	2.38	**1yr**	1.75	2.28	2.62	3.21	3.73	**1yr**
2yr	0.30	0.46	0.57	0.77	0.95	1.14	**2yr**	0.82	1.12	1.30	1.72	2.20	2.72	3.03	**2yr**	2.41	2.91	3.38	4.03	4.63	**2yr**
5yr	0.34	0.52	0.65	0.89	1.13	1.35	**5yr**	0.98	1.32	1.53	1.99	2.56	3.23	3.65	**5yr**	2.86	3.51	4.04	4.80	5.48	**5yr**
10yr	0.37	0.57	0.71	0.99	1.27	1.52	**10yr**	1.10	1.49	1.72	2.22	2.86	3.65	4.21	**10yr**	3.23	4.05	4.61	5.44	6.21	**10yr**
25yr	0.42	0.64	0.80	1.14	1.50	1.77	**25yr**	1.29	1.73	2.01	2.56	3.30	4.30	5.06	**25yr**	3.81	4.87	5.46	6.45	7.33	**25yr**
50yr	0.46	0.70	0.87	1.25	1.69	1.98	**50yr**	1.45	1.94	2.27	2.87	3.69	4.88	5.82	**50yr**	4.32	5.60	6.21	7.34	8.14	**50yr**
100yr	0.51	0.77	0.96	1.39	1.90	2.23	**100yr**	1.64	2.18	2.56	3.22	4.13	5.53	6.70	**100yr**	4.90	6.44	7.07	8.35	9.18	**100yr**
200yr	0.56	0.84	1.06	1.53	2.14	2.49	**200yr**	1.85	2.44	2.86	3.62	4.64	6.27	7.70	**200yr**	5.55	7.40	8.03	9.53	10.35	**200yr**
500yr	0.63	0.94	1.21	1.76	2.50	2.88	**500yr**	2.16	2.82	3.36	4.23	5.41	7.39	9.26	**500yr**	6.54	8.91	9.43	11.37	12.13	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.45	0.55	0.74	0.91	1.10	**1yr**	0.79	1.08	1.20	1.60	1.98	2.54	2.77	**1yr**	2.25	2.67	3.19	3.90	4.42	**1yr**
2yr	0.33	0.51	0.63	0.85	1.04	1.25	**2yr**	0.90	1.22	1.41	1.83	2.34	2.92	3.27	**2yr**	2.58	3.14	3.65	4.34	4.97	**2yr**
5yr	0.41	0.64	0.79	1.08	1.38	1.59	**5yr**	1.19	1.56	1.80	2.30	2.90	3.77	4.32	**5yr**	3.33	4.16	4.82	5.57	6.31	**5yr**
10yr	0.50	0.76	0.95	1.32	1.71	1.95	**10yr**	1.47	1.90	2.18	2.73	3.44	4.61	5.36	**10yr**	4.08	5.16	5.99	6.75	7.63	**10yr**
25yr	0.64	0.97	1.21	1.73	2.27	2.54	**25yr**	1.96	2.48	2.81	3.42	4.28	5.99	7.14	**25yr**	5.30	6.87	7.96	8.70	9.77	**25yr**
50yr	0.77	1.17	1.46	2.10	2.82	3.12	**50yr**	2.44	3.05	3.40	4.07	5.06	7.32	8.87	**50yr**	6.48	8.53	9.89	10.55	12.05	**50yr**
100yr	0.94	1.42	1.78	2.56	3.52	3.83	**100yr**	3.04	3.74	4.13	4.84	5.99	8.95	11.04	**100yr**	7.92	10.62	12.29	12.80	14.61	**100yr**
200yr	1.14	1.71	2.17	3.14	4.38	4.70	**200yr**	3.78	4.59	5.00	5.76	7.09	10.94	13.74	**200yr**	9.68	13.21	15.31	15.52	17.73	**200yr**
500yr	1.49	2.21	2.84	4.13	5.88	6.18	**500yr**	5.07	6.04	6.47	7.25	8.88	14.31	18.37	**500yr**	12.66	17.66	20.49	20.03	22.91	**500yr**

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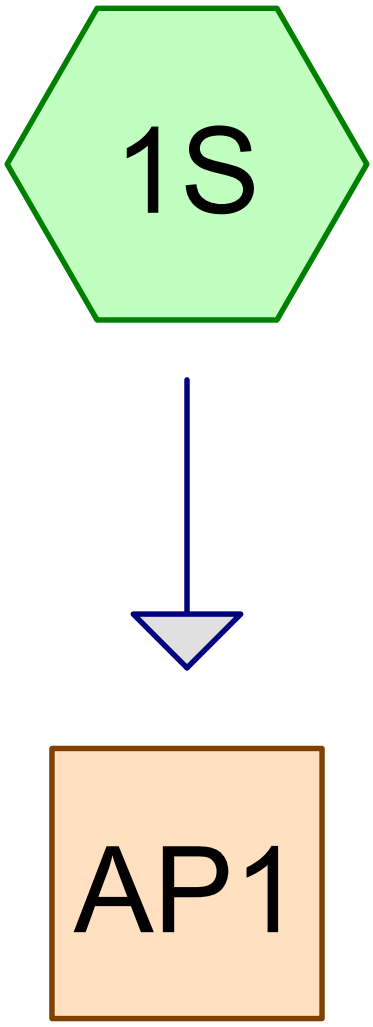
Appendix B – Drainage Analysis

Pre-Development

- Drainage Diagram
- Full Summary 2, 10, 25 and 100-Year

Volume, 10-year

- Post-Development
- Drainage Diagram
- Full Summary 2, 10, 25 and 100-Year
- Infiltration Pond, 50-Year Summary



Subcat Reach Pond Link

Routing Diagram for Pre Development
Prepared by Fuss & O'Neill, Printed 5/7/2026

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	2.81	2
2	10-Year	Type III 24-hr		Default	24.00	1	4.11	2
3	25-Year	Type III 24-hr		Default	24.00	1	5.11	2
4	100-Year	Type III 24-hr		Default	24.00	1	7.12	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.173	61	>75% Grass cover, Good, HSG B (1S)
0.945	74	>75% Grass cover, Good, HSG C (1S)
0.293	98	Paved Driveway (1S)
0.128	98	Roof (1S)
0.202	98	Water Surface, 0% imp, HSG C (1S)
0.229	55	Woods, Good, HSG B (1S)
4.107	70	Woods, Good, HSG C (1S)
6.077	**73**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.402	HSG B	1S
5.254	HSG C	1S
0.000	HSG D	
0.421	Other	1S
6.077		**TOTAL AREA**

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

Subcatchment1S: Runoff Area=264,695 sf 6.92% Impervious Runoff Depth>0.67"
Flow Length=851' Tc=21.9 min CN=73 Runoff=3.07 cfs 0.337 af

Reach AP1: Inflow=3.07 cfs 0.337 af
Outflow=3.07 cfs 0.337 af

Total Runoff Area = 6.077 ac Runoff Volume = 0.337 af Average Runoff Depth = 0.67"
93.08% Pervious = 5.656 ac 6.92% Impervious = 0.421 ac

Summary for Subcatchment 1S:

Runoff = 3.07 cfs @ 12.35 hrs, Volume= 0.337 af, Depth> 0.67"
Routed to Reach AP1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=2.81"

	Area (sf)	CN	Description
	7,537	61	>75% Grass cover, Good, HSG B
	41,169	74	>75% Grass cover, Good, HSG C
	9,954	55	Woods, Good, HSG B
	178,902	70	Woods, Good, HSG C
	8,812	98	Water Surface, 0% imp, HSG C
*	12,747	98	Paved Driveway
*	5,574	98	Roof
	264,695	73	Weighted Average
	246,374		93.08% Pervious Area
	18,321		6.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	94	0.1276	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.81"
7.1	209	0.0095	0.49		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	118	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	219	0.1280	1.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	211	0.0190	4.68	46.76	**Channel Flow,** Area= 10.0 sf Perim= 14.0' r= 0.71' n= 0.035 Earth, dense weeds
21.9	851	Total			

Summary for Reach AP1:

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

Inflow Area = 6.077 ac, 6.92% Impervious, Inflow Depth > 0.67" for 2-Year event
Inflow = 3.07 cfs @ 12.35 hrs, Volume= 0.337 af
Outflow = 3.07 cfs @ 12.35 hrs, Volume= 0.337 af, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment1S: Runoff Area=264,695 sf 6.92% Impervious Runoff Depth>1.47"
Flow Length=851' Tc=21.9 min CN=73 Runoff=7.21 cfs 0.743 af

Reach AP1: Inflow=7.21 cfs 0.743 af
Outflow=7.21 cfs 0.743 af

Total Runoff Area = 6.077 ac Runoff Volume = 0.743 af Average Runoff Depth = 1.47"
93.08% Pervious = 5.656 ac 6.92% Impervious = 0.421 ac

Summary for Subcatchment 1S:

Runoff = 7.21 cfs @ 12.32 hrs, Volume= 0.743 af, Depth> 1.47"
Routed to Reach AP1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.11"

	Area (sf)	CN	Description
	7,537	61	>75% Grass cover, Good, HSG B
	41,169	74	>75% Grass cover, Good, HSG C
	9,954	55	Woods, Good, HSG B
	178,902	70	Woods, Good, HSG C
	8,812	98	Water Surface, 0% imp, HSG C
*	12,747	98	Paved Driveway
*	5,574	98	Roof
	264,695	73	Weighted Average
	246,374		93.08% Pervious Area
	18,321		6.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	94	0.1276	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.81"
7.1	209	0.0095	0.49		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	118	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	219	0.1280	1.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	211	0.0190	4.68	46.76	**Channel Flow,** Area= 10.0 sf Perim= 14.0' r= 0.71' n= 0.035 Earth, dense weeds
21.9	851	Total			

Summary for Reach AP1:

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

Inflow Area = 6.077 ac, 6.92% Impervious, Inflow Depth > 1.47" for 10-Year event
Inflow = 7.21 cfs @ 12.32 hrs, Volume= 0.743 af
Outflow = 7.21 cfs @ 12.32 hrs, Volume= 0.743 af, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment1S: Runoff Area=264,695 sf 6.92% Impervious Runoff Depth>2.18"
Flow Length=851' Tc=21.9 min CN=73 Runoff=10.83 cfs 1.103 af

Reach AP1: Inflow=10.83 cfs 1.103 af
Outflow=10.83 cfs 1.103 af

Total Runoff Area = 6.077 ac Runoff Volume = 1.103 af Average Runoff Depth = 2.18"
93.08% Pervious = 5.656 ac 6.92% Impervious = 0.421 ac

Summary for Subcatchment 1S:

Runoff = 10.83 cfs @ 12.31 hrs, Volume= 1.103 af, Depth> 2.18"
Routed to Reach AP1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.11"

	Area (sf)	CN	Description
	7,537	61	>75% Grass cover, Good, HSG B
	41,169	74	>75% Grass cover, Good, HSG C
	9,954	55	Woods, Good, HSG B
	178,902	70	Woods, Good, HSG C
	8,812	98	Water Surface, 0% imp, HSG C
*	12,747	98	Paved Driveway
*	5,574	98	Roof
	264,695	73	Weighted Average
	246,374		93.08% Pervious Area
	18,321		6.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	94	0.1276	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.81"
7.1	209	0.0095	0.49		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	118	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	219	0.1280	1.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	211	0.0190	4.68	46.76	**Channel Flow,** Area= 10.0 sf Perim= 14.0' r= 0.71' n= 0.035 Earth, dense weeds
21.9	851	Total			

Summary for Reach AP1:

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

Inflow Area = 6.077 ac, 6.92% Impervious, Inflow Depth > 2.18" for 25-Year event
Inflow = 10.83 cfs @ 12.31 hrs, Volume= 1.103 af
Outflow = 10.83 cfs @ 12.31 hrs, Volume= 1.103 af, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment1S: Runoff Area=264,695 sf 6.92% Impervious Runoff Depth>3.75"
Flow Length=851' Tc=21.9 min CN=73 Runoff=18.64 cfs 1.899 af

Reach AP1: Inflow=18.64 cfs 1.899 af
Outflow=18.64 cfs 1.899 af

Total Runoff Area = 6.077 ac Runoff Volume = 1.899 af Average Runoff Depth = 3.75"
93.08% Pervious = 5.656 ac 6.92% Impervious = 0.421 ac

Summary for Subcatchment 1S:

Runoff = 18.64 cfs @ 12.30 hrs, Volume= 1.899 af, Depth> 3.75"
Routed to Reach AP1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.12"

	Area (sf)	CN	Description
	7,537	61	>75% Grass cover, Good, HSG B
	41,169	74	>75% Grass cover, Good, HSG C
	9,954	55	Woods, Good, HSG B
	178,902	70	Woods, Good, HSG C
	8,812	98	Water Surface, 0% imp, HSG C
*	12,747	98	Paved Driveway
*	5,574	98	Roof
	264,695	73	Weighted Average
	246,374		93.08% Pervious Area
	18,321		6.92% Impervious Area

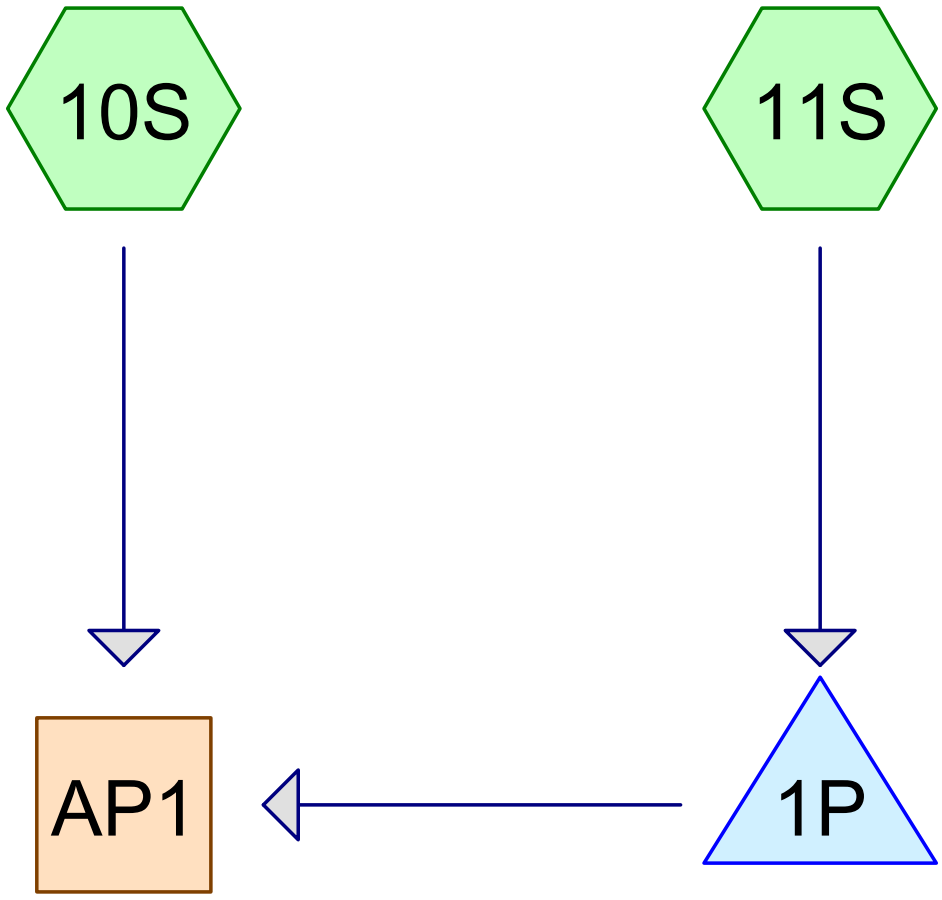
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	94	0.1276	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.81"
7.1	209	0.0095	0.49		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	118	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	219	0.1280	1.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	211	0.0190	4.68	46.76	**Channel Flow,** Area= 10.0 sf Perim= 14.0' r= 0.71' n= 0.035 Earth, dense weeds
21.9	851	Total			

Summary for Reach AP1:

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

Inflow Area = 6.077 ac, 6.92% Impervious, Inflow Depth > 3.75" for 100-Year event
Inflow = 18.64 cfs @ 12.30 hrs, Volume= 1.899 af
Outflow = 18.64 cfs @ 12.30 hrs, Volume= 1.899 af, Atten= 0%, Lag= 0.0 min

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



Subcat Reach Pond Link

Routing Diagram for Post Development
Prepared by Fuss & O'Neill, Printed 5/7/2026

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	2.81	2
2	10-Year	Type III 24-hr		Default	24.00	1	4.11	2
3	25-Year	Type III 24-hr		Default	24.00	1	5.11	2
4	100-Year	Type III 24-hr		Default	24.00	1	7.12	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.224	61	>75% Grass cover, Good, HSG B (10S)
1.926	74	>75% Grass cover, Good, HSG C (10S, 11S)
0.473	98	Paved Driveway (10S, 11S)
0.213	98	Roof (10S, 11S)
0.184	98	Water Surface, 0% imp, HSG C (10S)
0.160	55	Woods, Good, HSG B (10S)
2.901	70	Woods, Good, HSG C (10S, 11S)
6.080	**75**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.384	HSG B	10S
5.010	HSG C	10S, 11S
0.000	HSG D	
0.687	Other	10S, 11S
6.080		**TOTAL AREA**

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

Subcatchment10S: Runoff Area=227,961 sf 11.11% Impervious Runoff Depth>0.71"
Flow Length=851' Tc=21.9 min CN=74 Runoff=2.86 cfs 0.310 af

Subcatchment11S: Runoff Area=36,893 sf 12.40% Impervious Runoff Depth>0.80"
Flow Length=857' Tc=20.9 min CN=76 Runoff=0.55 cfs 0.057 af

Reach AP1: Inflow=2.86 cfs 0.336 af
Outflow=2.86 cfs 0.336 af

Pond 1P: Peak Elev=358.26' Storage=899 cf Inflow=0.55 cfs 0.057 af
Discarded=0.03 cfs 0.015 af Primary=0.22 cfs 0.026 af Outflow=0.24 cfs 0.041 af

Total Runoff Area = 6.080 ac Runoff Volume = 0.367 af Average Runoff Depth = 0.72"
88.71% Pervious = 5.394 ac 11.29% Impervious = 0.687 ac

Summary for Subcatchment 10S:

Runoff = 2.86 cfs @ 12.34 hrs, Volume= 0.310 af, Depth> 0.71"
Routed to Reach AP1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=2.81"

	Area (sf)	CN	Description
	9,758	61	>75% Grass cover, Good, HSG B
	64,766	74	>75% Grass cover, Good, HSG C
	6,948	55	Woods, Good, HSG B
	113,161	70	Woods, Good, HSG C
	7,995	98	Water Surface, 0% imp, HSG C
*	17,897	98	Paved Driveway
*	7,436	98	Roof
	227,961	74	Weighted Average
	202,628		88.89% Pervious Area
	25,333		11.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	94	0.1276	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.81"
7.1	209	0.0095	0.49		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	118	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	219	0.1280	1.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	211	0.0190	4.68	46.76	**Channel Flow,** Area= 10.0 sf Perim= 14.0' r= 0.71' n= 0.035 Earth, dense weeds
21.9	851	Total			

Summary for Subcatchment 11S:

Runoff = 0.55 cfs @ 12.32 hrs, Volume= 0.057 af, Depth> 0.80"
Routed to Pond 1P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=2.81"

	Area (sf)	CN	Description
	0	61	>75% Grass cover, Good, HSG B
	19,117	74	>75% Grass cover, Good, HSG C
	0	55	Woods, Good, HSG B
	13,202	70	Woods, Good, HSG C
	0	98	Water Surface, 0% imp, HSG C
*	2,712	98	Paved Driveway
*	1,862	98	Roof
	36,893	76	Weighted Average
	32,319		87.60% Pervious Area
	4,574		12.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.1870	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.81"
7.1	209	0.0095	0.49		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	118	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	219	0.1280	1.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	211	0.0190	4.68	46.76	**Channel Flow,** Area= 10.0 sf Perim= 14.0' r= 0.71' n= 0.035 Earth, dense weeds
20.9	857	Total			

Summary for Reach AP1:

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

Inflow Area = 6.080 ac, 11.29% Impervious, Inflow Depth > 0.66" for 2-Year event
Inflow = 2.86 cfs @ 12.34 hrs, Volume= 0.336 af
Outflow = 2.86 cfs @ 12.34 hrs, Volume= 0.336 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P:

Inflow Area = 0.847 ac, 12.40% Impervious, Inflow Depth > 0.80" for 2-Year event
Inflow = 0.55 cfs @ 12.32 hrs, Volume= 0.057 af
Outflow = 0.24 cfs @ 12.75 hrs, Volume= 0.041 af, Atten= 56%, Lag= 25.7 min
Discarded = 0.03 cfs @ 12.75 hrs, Volume= 0.015 af
Primary = 0.22 cfs @ 12.75 hrs, Volume= 0.026 af
Routed to Reach AP1 :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 358.26' @ 12.75 hrs Surf.Area= 1,093 sf Storage= 899 cf

Plug-Flow detention time= 117.9 min calculated for 0.041 af (73% of inflow)
Center-of-Mass det. time= 52.6 min (883.3 - 830.7)

Volume	Invert	Avail.Storage	Storage Description
#1	357.00'	4,153 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
357.00	440	0	0
358.00	855	648	648
359.00	1,775	1,315	1,963
360.00	2,605	2,190	4,153

Device	Routing	Invert	Outlet Devices
#1	Primary	356.19'	**15.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 356.19' / 356.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	358.00'	**8.0" Vert. Orifice/Grate-Side** C= 0.600 Limited to weir flow at low heads
#3	Device 1	359.00'	**15.0" Horiz. Orifice/Grate-Top** C= 0.600 Limited to weir flow at low heads
#4	Discarded	357.00'	**1.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 12.75 hrs HW=358.26' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.22 cfs @ 12.75 hrs HW=358.26' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.22 cfs of 7.09 cfs potential flow)
  ├**2=Orifice/Grate-Side** (Orifice Controls 0.22 cfs @ 1.73 fps)
  └**3=Orifice/Grate-Top** (Controls 0.00 cfs)

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

Subcatchment10S: Runoff Area=227,961 sf 11.11% Impervious Runoff Depth>1.54"
Flow Length=851' Tc=21.9 min CN=74 Runoff=6.52 cfs 0.669 af

Subcatchment11S: Runoff Area=36,893 sf 12.40% Impervious Runoff Depth>1.68"
Flow Length=857' Tc=20.9 min CN=76 Runoff=1.18 cfs 0.118 af

Reach AP1: Inflow=7.15 cfs 0.754 af
Outflow=7.15 cfs 0.754 af

Pond 1P: Peak Elev=358.58' Storage=1,305 cf Inflow=1.18 cfs 0.118 af
Discarded=0.03 cfs 0.018 af Primary=0.85 cfs 0.084 af Outflow=0.88 cfs 0.102 af

Total Runoff Area = 6.080 ac Runoff Volume = 0.788 af Average Runoff Depth = 1.55"
88.71% Pervious = 5.394 ac 11.29% Impervious = 0.687 ac

Summary for Subcatchment 10S:

Runoff = 6.52 cfs @ 12.32 hrs, Volume= 0.669 af, Depth> 1.54"
Routed to Reach AP1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.11"

	Area (sf)	CN	Description
	9,758	61	>75% Grass cover, Good, HSG B
	64,766	74	>75% Grass cover, Good, HSG C
	6,948	55	Woods, Good, HSG B
	113,161	70	Woods, Good, HSG C
	7,995	98	Water Surface, 0% imp, HSG C
*	17,897	98	Paved Driveway
*	7,436	98	Roof
	227,961	74	Weighted Average
	202,628		88.89% Pervious Area
	25,333		11.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	94	0.1276	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.81"
7.1	209	0.0095	0.49		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	118	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	219	0.1280	1.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	211	0.0190	4.68	46.76	**Channel Flow,** Area= 10.0 sf Perim= 14.0' r= 0.71' n= 0.035 Earth, dense weeds
21.9	851	Total			

Summary for Subcatchment 11S:

Runoff = 1.18 cfs @ 12.30 hrs, Volume= 0.118 af, Depth> 1.68"
Routed to Pond 1P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.11"

	Area (sf)	CN	Description
	0	61	>75% Grass cover, Good, HSG B
	19,117	74	>75% Grass cover, Good, HSG C
	0	55	Woods, Good, HSG B
	13,202	70	Woods, Good, HSG C
	0	98	Water Surface, 0% imp, HSG C
*	2,712	98	Paved Driveway
*	1,862	98	Roof
	36,893	76	Weighted Average
	32,319		87.60% Pervious Area
	4,574		12.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.1870	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.81"
7.1	209	0.0095	0.49		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	118	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	219	0.1280	1.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	211	0.0190	4.68	46.76	**Channel Flow,** Area= 10.0 sf Perim= 14.0' r= 0.71' n= 0.035 Earth, dense weeds
20.9	857	Total			

Summary for Reach AP1:

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

Inflow Area = 6.080 ac, 11.29% Impervious, Inflow Depth > 1.49" for 10-Year event
Inflow = 7.15 cfs @ 12.34 hrs, Volume= 0.754 af
Outflow = 7.15 cfs @ 12.34 hrs, Volume= 0.754 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P:

Inflow Area = 0.847 ac, 12.40% Impervious, Inflow Depth > 1.68" for 10-Year event
Inflow = 1.18 cfs @ 12.30 hrs, Volume= 0.118 af
Outflow = 0.88 cfs @ 12.51 hrs, Volume= 0.102 af, Atten= 26%, Lag= 12.3 min
Discarded = 0.03 cfs @ 12.51 hrs, Volume= 0.018 af
Primary = 0.85 cfs @ 12.51 hrs, Volume= 0.084 af
Routed to Reach AP1 :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 358.58' @ 12.51 hrs Surf.Area= 1,393 sf Storage= 1,305 cf

Plug-Flow detention time= 68.1 min calculated for 0.102 af (86% of inflow)
Center-of-Mass det. time= 27.9 min (842.5 - 814.6)

Volume	Invert	Avail.Storage	Storage Description
#1	357.00'	4,153 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
357.00	440	0	0
358.00	855	648	648
359.00	1,775	1,315	1,963
360.00	2,605	2,190	4,153

Device	Routing	Invert	Outlet Devices
#1	Primary	356.19'	**15.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 356.19' / 356.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	358.00'	**8.0" Vert. Orifice/Grate-Side** C= 0.600 Limited to weir flow at low heads
#3	Device 1	359.00'	**15.0" Horiz. Orifice/Grate-Top** C= 0.600 Limited to weir flow at low heads
#4	Discarded	357.00'	**1.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 12.51 hrs HW=358.58' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.84 cfs @ 12.51 hrs HW=358.58' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.84 cfs of 7.86 cfs potential flow)
  ├**2=Orifice/Grate-Side** (Orifice Controls 0.84 cfs @ 2.60 fps)
  └**3=Orifice/Grate-Top** (Controls 0.00 cfs)

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

Subcatchment10S: Runoff Area=227,961 sf 11.11% Impervious Runoff Depth>2.26"
Flow Length=851' Tc=21.9 min CN=74 Runoff=9.68 cfs 0.986 af

Subcatchment11S: Runoff Area=36,893 sf 12.40% Impervious Runoff Depth>2.43"
Flow Length=857' Tc=20.9 min CN=76 Runoff=1.72 cfs 0.171 af

Reach AP1: Inflow=10.74 cfs 1.121 af
Outflow=10.74 cfs 1.121 af

Pond 1P: Peak Elev=358.85' Storage=1,714 cf Inflow=1.72 cfs 0.171 af
Discarded=0.04 cfs 0.019 af Primary=1.21 cfs 0.135 af Outflow=1.25 cfs 0.155 af

Total Runoff Area = 6.080 ac Runoff Volume = 1.157 af Average Runoff Depth = 2.28"
88.71% Pervious = 5.394 ac 11.29% Impervious = 0.687 ac

Summary for Subcatchment 10S:

Runoff = 9.68 cfs @ 12.31 hrs, Volume= 0.986 af, Depth> 2.26"
Routed to Reach AP1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.11"

	Area (sf)	CN	Description
	9,758	61	>75% Grass cover, Good, HSG B
	64,766	74	>75% Grass cover, Good, HSG C
	6,948	55	Woods, Good, HSG B
	113,161	70	Woods, Good, HSG C
	7,995	98	Water Surface, 0% imp, HSG C
*	17,897	98	Paved Driveway
*	7,436	98	Roof
	227,961	74	Weighted Average
	202,628		88.89% Pervious Area
	25,333		11.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	94	0.1276	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.81"
7.1	209	0.0095	0.49		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	118	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	219	0.1280	1.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	211	0.0190	4.68	46.76	**Channel Flow,** Area= 10.0 sf Perim= 14.0' r= 0.71' n= 0.035 Earth, dense weeds
21.9	851	Total			

Summary for Subcatchment 11S:

Runoff = 1.72 cfs @ 12.29 hrs, Volume= 0.171 af, Depth> 2.43"
Routed to Pond 1P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.11"

	Area (sf)	CN	Description
	0	61	>75% Grass cover, Good, HSG B
	19,117	74	>75% Grass cover, Good, HSG C
	0	55	Woods, Good, HSG B
	13,202	70	Woods, Good, HSG C
	0	98	Water Surface, 0% imp, HSG C
*	2,712	98	Paved Driveway
*	1,862	98	Roof
	36,893	76	Weighted Average
	32,319		87.60% Pervious Area
	4,574		12.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.1870	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.81"
7.1	209	0.0095	0.49		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	118	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	219	0.1280	1.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	211	0.0190	4.68	46.76	**Channel Flow,** Area= 10.0 sf Perim= 14.0' r= 0.71' n= 0.035 Earth, dense weeds
20.9	857	Total			

Summary for Reach AP1:

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

Inflow Area = 6.080 ac, 11.29% Impervious, Inflow Depth > 2.21" for 25-Year event
Inflow = 10.74 cfs @ 12.32 hrs, Volume= 1.121 af
Outflow = 10.74 cfs @ 12.32 hrs, Volume= 1.121 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P:

Inflow Area = 0.847 ac, 12.40% Impervious, Inflow Depth > 2.43" for 25-Year event
Inflow = 1.72 cfs @ 12.29 hrs, Volume= 0.171 af
Outflow = 1.25 cfs @ 12.50 hrs, Volume= 0.155 af, Atten= 27%, Lag= 12.4 min
Discarded = 0.04 cfs @ 12.50 hrs, Volume= 0.019 af
Primary = 1.21 cfs @ 12.50 hrs, Volume= 0.135 af
Routed to Reach AP1 :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 358.85' @ 12.50 hrs Surf.Area= 1,641 sf Storage= 1,714 cf

Plug-Flow detention time= 54.8 min calculated for 0.155 af (90% of inflow)
Center-of-Mass det. time= 23.9 min (830.3 - 806.4)

Volume	Invert	Avail.Storage	Storage Description
#1	357.00'	4,153 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
357.00	440	0	0
358.00	855	648	648
359.00	1,775	1,315	1,963
360.00	2,605	2,190	4,153

Device	Routing	Invert	Outlet Devices
#1	Primary	356.19'	**15.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 356.19' / 356.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	358.00'	**8.0" Vert. Orifice/Grate-Side** C= 0.600 Limited to weir flow at low heads
#3	Device 1	359.00'	**15.0" Horiz. Orifice/Grate-Top** C= 0.600 Limited to weir flow at low heads
#4	Discarded	357.00'	**1.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 12.50 hrs HW=358.85' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=1.21 cfs @ 12.50 hrs HW=358.85' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.21 cfs of 8.44 cfs potential flow)
  ├**2=Orifice/Grate-Side** (Orifice Controls 1.21 cfs @ 3.48 fps)
  └**3=Orifice/Grate-Top** (Controls 0.00 cfs)

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

Subcatchment10S: Runoff Area=227,961 sf 11.11% Impervious Runoff Depth>3.85"
Flow Length=851' Tc=21.9 min CN=74 Runoff=16.48 cfs 1.681 af

Subcatchment11S: Runoff Area=36,893 sf 12.40% Impervious Runoff Depth>4.07"
Flow Length=857' Tc=20.9 min CN=76 Runoff=2.86 cfs 0.287 af

Reach AP1: Inflow=18.60 cfs 1.928 af
Outflow=18.60 cfs 1.928 af

Pond 1P: Peak Elev=359.18' Storage=2,291 cf Inflow=2.86 cfs 0.287 af
Discarded=0.04 cfs 0.023 af Primary=2.51 cfs 0.247 af Outflow=2.55 cfs 0.270 af

Total Runoff Area = 6.080 ac Runoff Volume = 1.968 af Average Runoff Depth = 3.88"
88.71% Pervious = 5.394 ac 11.29% Impervious = 0.687 ac

Summary for Subcatchment 10S:

Runoff = 16.48 cfs @ 12.30 hrs, Volume= 1.681 af, Depth> 3.85"
Routed to Reach AP1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.12"

	Area (sf)	CN	Description
	9,758	61	>75% Grass cover, Good, HSG B
	64,766	74	>75% Grass cover, Good, HSG C
	6,948	55	Woods, Good, HSG B
	113,161	70	Woods, Good, HSG C
	7,995	98	Water Surface, 0% imp, HSG C
*	17,897	98	Paved Driveway
*	7,436	98	Roof
	227,961	74	Weighted Average
	202,628		88.89% Pervious Area
	25,333		11.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	94	0.1276	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.81"
7.1	209	0.0095	0.49		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	118	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	219	0.1280	1.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	211	0.0190	4.68	46.76	**Channel Flow,** Area= 10.0 sf Perim= 14.0' r= 0.71' n= 0.035 Earth, dense weeds
21.9	851	Total			

Summary for Subcatchment 11S:

Runoff = 2.86 cfs @ 12.29 hrs, Volume= 0.287 af, Depth> 4.07"
Routed to Pond 1P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=7.12"

	Area (sf)	CN	Description
	0	61	>75% Grass cover, Good, HSG B
	19,117	74	>75% Grass cover, Good, HSG C
	0	55	Woods, Good, HSG B
	13,202	70	Woods, Good, HSG C
	0	98	Water Surface, 0% imp, HSG C
*	2,712	98	Paved Driveway
*	1,862	98	Roof
	36,893	76	Weighted Average
	32,319		87.60% Pervious Area
	4,574		12.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.1870	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.81"
7.1	209	0.0095	0.49		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	118	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	219	0.1280	1.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	211	0.0190	4.68	46.76	**Channel Flow,** Area= 10.0 sf Perim= 14.0' r= 0.71' n= 0.035 Earth, dense weeds
20.9	857	Total			

Summary for Reach AP1:

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

Inflow Area = 6.080 ac, 11.29% Impervious, Inflow Depth > 3.80" for 100-Year event
Inflow = 18.60 cfs @ 12.33 hrs, Volume= 1.928 af
Outflow = 18.60 cfs @ 12.33 hrs, Volume= 1.928 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P:

Inflow Area = 0.847 ac, 12.40% Impervious, Inflow Depth > 4.07" for 100-Year event
Inflow = 2.86 cfs @ 12.29 hrs, Volume= 0.287 af
Outflow = 2.55 cfs @ 12.40 hrs, Volume= 0.270 af, Atten= 11%, Lag= 6.7 min
Discarded = 0.04 cfs @ 12.40 hrs, Volume= 0.023 af
Primary = 2.51 cfs @ 12.40 hrs, Volume= 0.247 af
Routed to Reach AP1 :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 359.18' @ 12.40 hrs Surf.Area= 1,923 sf Storage= 2,291 cf

Plug-Flow detention time= 42.2 min calculated for 0.270 af (94% of inflow)
Center-of-Mass det. time= 21.1 min (815.7 - 794.7)

Volume	Invert	Avail.Storage	Storage Description
#1	357.00'	4,153 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
357.00	440	0	0
358.00	855	648	648
359.00	1,775	1,315	1,963
360.00	2,605	2,190	4,153

Device	Routing	Invert	Outlet Devices
#1	Primary	356.19'	**15.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 356.19' / 356.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	358.00'	**8.0" Vert. Orifice/Grate-Side** C= 0.600 Limited to weir flow at low heads
#3	Device 1	359.00'	**15.0" Horiz. Orifice/Grate-Top** C= 0.600 Limited to weir flow at low heads
#4	Discarded	357.00'	**1.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 12.40 hrs HW=359.18' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=2.51 cfs @ 12.40 hrs HW=359.18' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 2.51 cfs of 9.08 cfs potential flow)
  ├**2=Orifice/Grate-Side** (Orifice Controls 1.54 cfs @ 4.42 fps)
  └**3=Orifice/Grate-Top** (Weir Controls 0.96 cfs @ 1.38 fps)

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	50-Year	Type III 24-hr		Default	24.00	1	6.03	2

Summary for Pond 1P:

Inflow Area = 0.847 ac, 12.40% Impervious, Inflow Depth > 3.16" for 50-Year event
Inflow = 2.23 cfs @ 12.29 hrs, Volume= 0.223 af
Outflow = 1.74 cfs @ 12.47 hrs, Volume= 0.206 af, Atten= 22%, Lag= 10.6 min
Discarded = 0.04 cfs @ 12.47 hrs, Volume= 0.021 af
Primary = 1.70 cfs @ 12.47 hrs, Volume= 0.185 af
Routed to Reach AP1 :

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 359.07' @ 12.47 hrs Surf.Area= 1,836 sf Storage= 2,095 cf

Plug-Flow detention time= 48.2 min calculated for 0.206 af (92% of inflow)
Center-of-Mass det. time= 22.7 min (823.1 - 800.4)

Volume	Invert	Avail.Storage	Storage Description
#1	357.00'	4,153 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

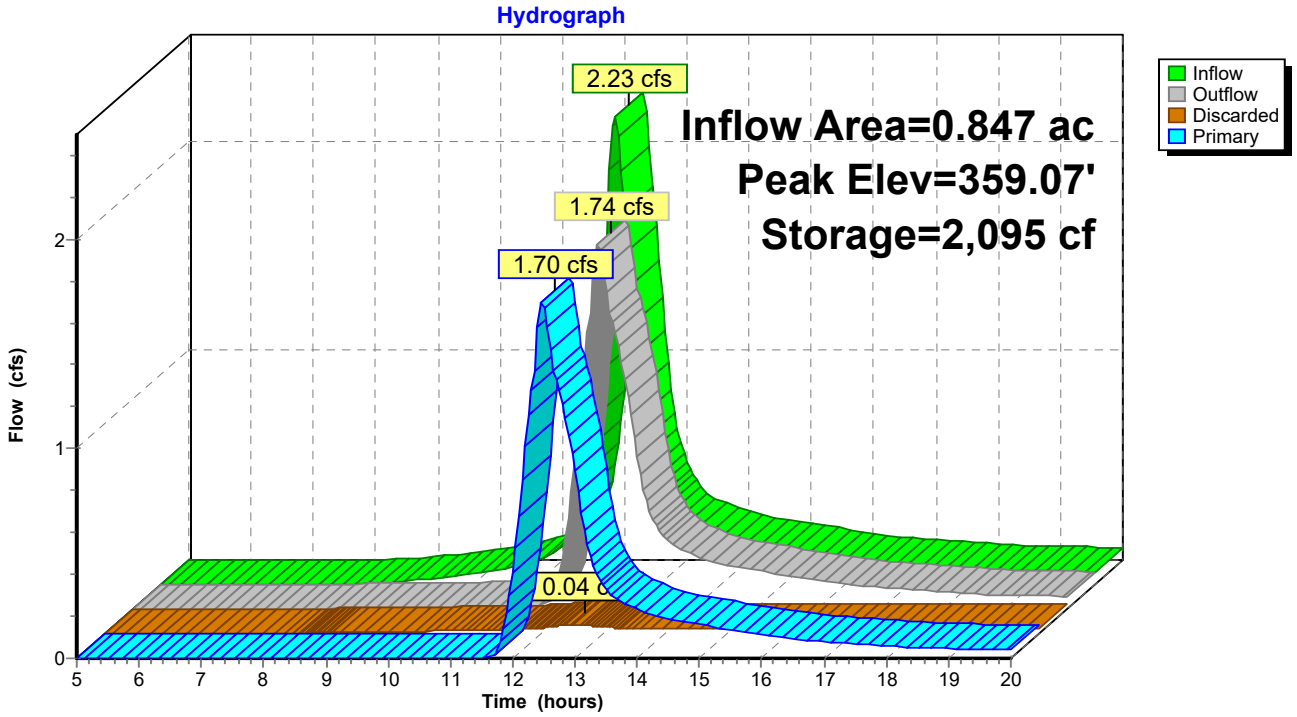
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
357.00	440	0	0
358.00	855	648	648
359.00	1,775	1,315	1,963
360.00	2,605	2,190	4,153

Device	Routing	Invert	Outlet Devices
#1	Primary	356.19'	**15.0" Round Culvert** L= 19.0' Ke= 0.500 Inlet / Outlet Invert= 356.19' / 356.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	358.00'	**8.0" Vert. Orifice/Grate-Side** C= 0.600 Limited to weir flow at low heads
#3	Device 1	359.00'	**15.0" Horiz. Orifice/Grate-Top** C= 0.600 Limited to weir flow at low heads
#4	Discarded	357.00'	**1.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 12.47 hrs HW=359.07' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=1.68 cfs @ 12.47 hrs HW=359.07' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.68 cfs of 8.87 cfs potential flow)
  ├**2=Orifice/Grate-Side** (Orifice Controls 1.44 cfs @ 4.13 fps)
  └**3=Orifice/Grate-Top** (Weir Controls 0.24 cfs @ 0.87 fps)

Pond 1P:


Hydrograph
2.23 cfs
1.74 cfs
1.70 cfs
0.04 cfs
Inflow Area=0.847 ac
Peak Elev=359.07'
Storage=2,095 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
0
1
2
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Time (hours)

Appendix C – Additional Calculations

Water Quality Volume (WQV) Calculation
Groundwater Recharge Volume (GRV) Calculation

GENERAL CALCULATIONS - WQV and WQF
(optional worksheet)

This worksheet may be useful when designing a BMP that does not fit into one of the specific worksheets already provided (such as for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

0.85	ac	A = Area draining to the practice
0.11	ac	A_I = Impervious area draining to the practice
0.12	decimal	I = Percent impervious area draining to the practice, in decimal form
0.16	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
0.14	ac-in	WQV= 1" x Rv x A
497	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.16	inches	Q = Water quality depth. Q = WQV/A
84	unitless	CN = Unit peak discharge curve number. CN =1000/(10+5P+10Q–10*[Q^2 + 1.25*Q*P] $^{0.5}$)
1.8	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.368	inches	Ia = Initial abstraction. Ia = 0.2S
	minutes	T_c = Time of Concentration
	cfs/mi^2/in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
-	cfs	WQF = q_u x WQV. Conversion: to convert "cfs/mi^2/in * ac-in" to "cfs" multiply by 1mi^2/640ac.

Designer's Notes:

Lowest Outlet elevation = 358.00

Storage at 358.00 = 648 cf

Required WQV = 497 cf, therefore required WQV exceeded by 151 cf.

GROUNDWATER RECHARGE VOLUME (GRV)
(Env-Wq 1504.12)

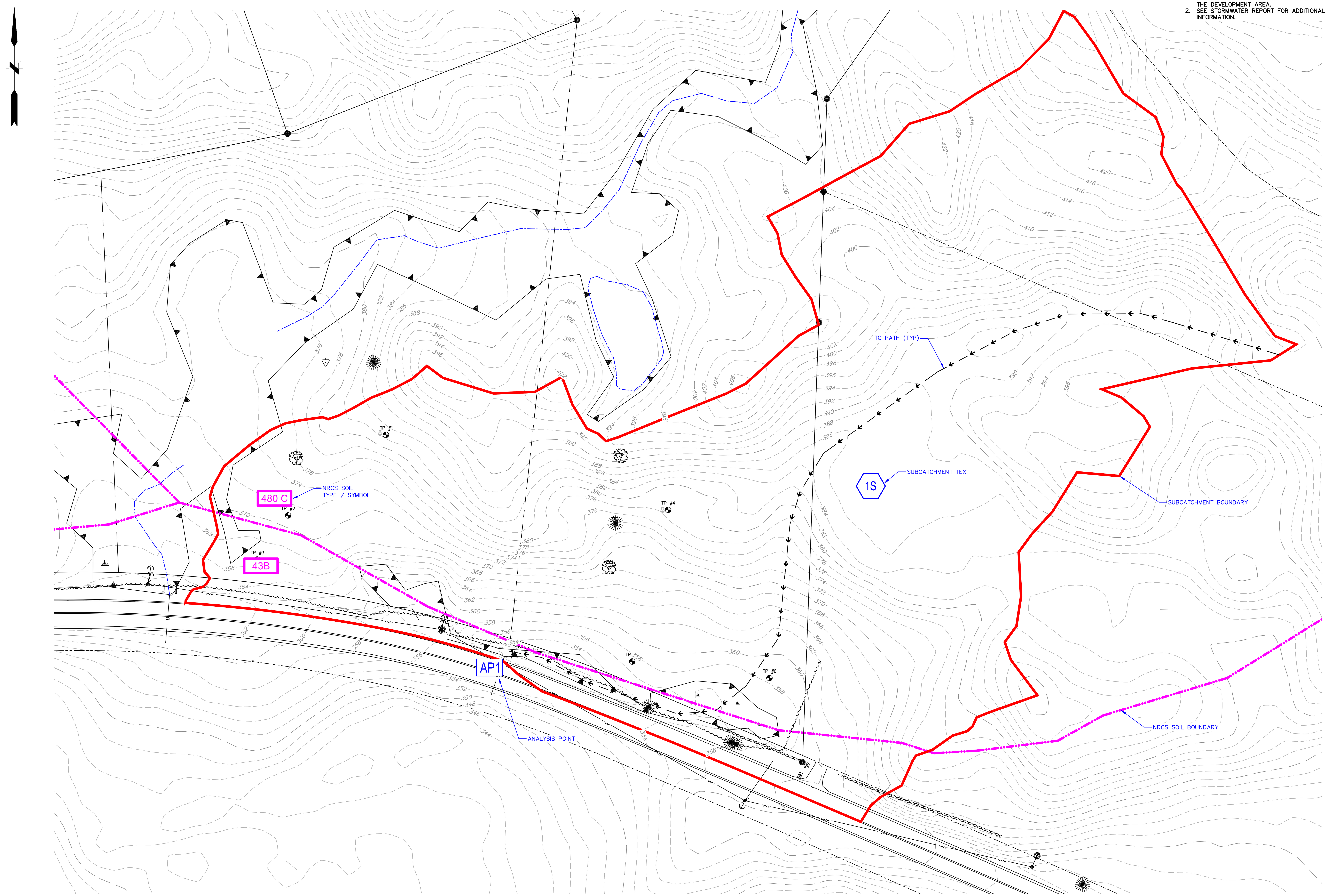
-	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
0.02	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
0.25	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
-	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.11	inches	Rd = Weighted groundwater recharge depth	
0.0302	ac-in	GRV = AI * Rd	
110	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	
	← Y/N	Is a stage-storage table attached showing that the GRV can be stored below the lowest invert of the outlet structure (if applicable)? Multiple stormwater control measures may be used to meet the GRV requirements.	

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

The required GRV is 110 cf, the full WQV of 648 cf will infiltrate therefore this GRV is met and exceeded.

Appendix D – Plans

Pre-Development Drainage Area Plan - (DA-101)
Post-Development Drainage Area Plan - (DA-102)



PRE-DEVELOPMENT DRAINAGE AREA PLAN NOTES

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE SUBCATCHMENT AREAS AND ANALYSIS POINTS FOR THE DEVELOPMENT AREA.
2. SEE STORMWATER REPORT FOR ADDITIONAL INFORMATION.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

STATE OF NEW HAMPSHIRE BRIAN ANDREW PRATT No. 12091 PROFESSIONAL ENGINEER

SCALE:
HORZ.: 1" = 80'
VERT.: -
DATUM:
HORZ.: -
VERT.: -

GRAPHIC SCALE: 0 20' 40' 80'

FUSS & O'NEILL
50 COMMERCIAL STREET
MANCHESTER, NH 03101
603.668.8223
www.fando.com

TM 711Z LOT 6
LIBERTY WOODS, LLC

PRE-DEVELOPMENT DRAINAGE AREA PLAN

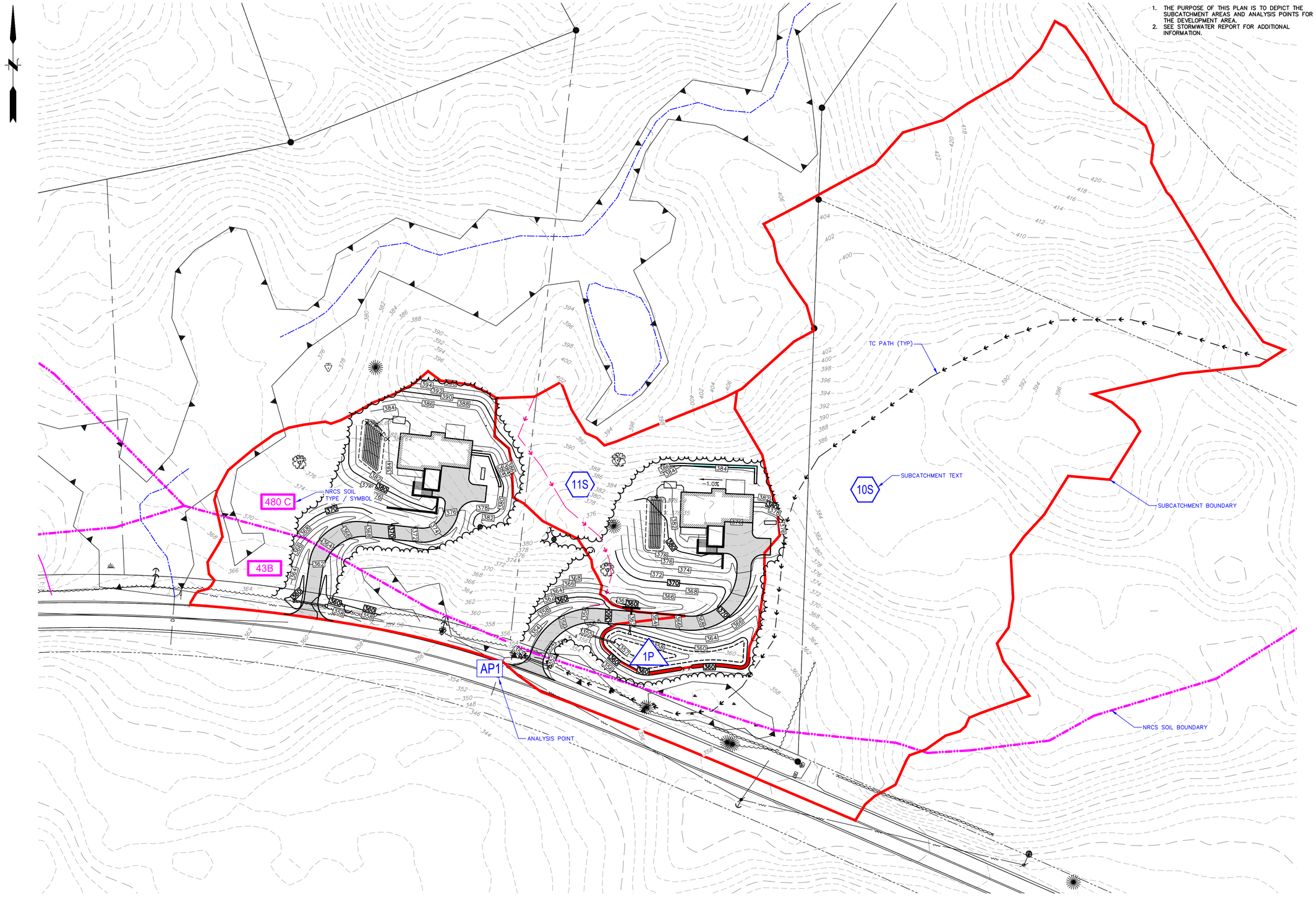
48 CURRIER ROAD SUBDIVISION
CONCORD NEW HAMPSHIRE

PROJ. No.:120.26000125.000
DATE: 5.20.2026

DA-101

POST-DEVELOPMENT DRAINAGE AREA PLAN NOTES

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE SUBCATCHMENT AREAS AND ANALYSIS POINTS FOR THE DEVELOPMENT AREA.
2. SEE STORMWATER REPORT FOR ADDITIONAL INFORMATION.



No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

STATE OF NEW HAMPSHIRE
BRIAN ANDREW PRATT
No. 12091
LICENSED PROFESSIONAL ENGINEER

SCALE: HORZ.: 1" = 20'
VERT.: -
DATUM: HORZ.: -
VERT.: -
0 20' 40' 80'
GRAPHIC SCALE

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LIBERTY WOODS, LLC

POST-DEVELOPMENT DRAINAGE AREA PLAN

48 CURRIER ROAD SUBDIVISION
CONCORD NEW HAMPSHIRE

PROJ. No.:120.26000125.000
DATE: 5.20.2026

DA-102

File: J:\DWG_Trilon1VP\120.26000125.000\Civil\Plan\120.26000125.000_STP01.dwg Layout: DA-102 Plotted: 2026-05-20 9:38 AM Saved: 2026-05-15 12:34 PM User: Amy.Sanders
MS VIEW: | LAYER STATE: | PC3: NONE STB/CTB: FO.STB