CATCH Neighborhood Housing
43 Fisherville Road
Concord, New Hampshire

PROJECT NARRATIVE

The approximately 1.86-acre site (Site) is located at 43 Fisherville Road in Concord, New Hampshire, identified as Tax Map 303Z, Lot 68. The Site is located in the General Commercial (CG) Zoning District and is currently developed as a small commercial retail facility, including associated access and parking. The proposed CATCH Neighborhood Housing project involves demolition of the existing buildings and related improvements with subsequent construction of a new multi-family residential building containing 34 units, along with associated access, parking, and amenities. The project will be served by municipal water and sewer systems, underground utilities, and will incorporate a stormwater collection, storage, and treatment system prior to discharge to the existing municipal system.

The new three-story building will occupy approximately 11,900 square feet, with a total gross floor area of 35,886 square feet. The building will be situated towards the rear of the property with parking along the loop driveway located between the building and Fisherville Road. The development includes a total of 43 parking spaces (3 ADA-accessible), arranged along the outer edge of the driveway and central landscape area. Parking is provided in accordance with RSA 674:16, VII, which requires a minimum of one parking space per residential unit. Pedestrian access is provided from Fisherville Road to the proposed building.

The property abuts the High-Density Residential (RH) Zoning District and a gas station/convenience store on the northwest side. It is bordered by commercial development to the southeast and undeveloped land to the south (rear). Topography of the site is fairly flat, with existing slopes of 2%-3%. Stormwater runoff from the proposed impervious surfaces will be directed to infiltration systems for treatment and mitigation. The building roof drain connects to a subsurface chamber gallery which is equipped with an overflow outlet to the raingarden located in the center of the loop driveway. The raingarden will collect stormwater from the driveway and parking areas and is designed with an overflow outlet to the municipal stormwater system in Fisherville Road. These stormwater control measures will improve the quality of stormwater discharging from the Site, as there are no existing formal systems for treatment.

Nobis Group®
18 Chenell Drive
Concord, NH 03301
T (603) 224-4182

June 12, 2026
File No. 101148.000

City of Concord – Planning Board
41 Green Street
Concord, NH 03301

Re: CATCH Neighborhood Housing
Waiver Request for Major Site Plan Application
Tax Map 303Z Lot 68
43 Fisherville Road, Concord, NH 03303

On behalf of CATCH Neighborhood Housing, Nobis requests a waiver from the following sections of the City of Concord Site Plan Regulations:

1) Section 6.03(c)
2) Section 11.05
3) Section 12.02(1)(a)(b)
4) Section 22.02
5) Section 22.07(2)
6) Section 24.03

Waiver Criteria:

1) *The granting of the waiver will not be detrimental to the public safety, health, or welfare or injurious to other property;*

A waiver of Site Plan Regulations Sections 6.03(c) and 11.05 is requested to allow Determination of Completeness and Public Hearing in the same night. The applicant is applying for Low Income Tax Credits with New Hampshire Housing Finance Authority and there is only one round per year with applications being due in September. Local Site Plan approval is required in order to score the maximum points for award (in a very competitive market). The project schedule was impacted due to the need to obtain density and use variances from the Zoning Board of Adjustment prior to submission of the Site Plan application. Without the necessary approvals, the project will be ineligible to apply during this year's funding round, resulting in at least a one-year delay in the opportunity to secure financing for the development and deliver much-needed housing units. Granting of this waiver, therefore, is in fact beneficial to the public health and welfare.

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A waiver of Site Plan Regulations Section 12.02(1)(a)(b) is requested to allow the Existing Conditions Plat to reflect information for the current property owner rather than for the applicant, which does not impact the public interest.

A waiver of Site Plan Regulations Sections 22.02, 22.07(2), and 24.03 is requested to allow some flexibility of standard design requirements. Alternative equivalent protections are provided over shallow piping and at infiltration systems in order to meet the design criteria.

2) *The conditions upon which the request for a waiver is based are unique to the property for which waiver is sought and are not applicable generally to other property;*

   The site is unique due to fairly flat existing topography and a somewhat shallow estimated Seasonal High-Water Table (SHWT), both of which impose design limitations.

3) *Because of the particular physical surroundings, shape, or topographical conditions of the specific property involved, a particular and unnecessary hardship to the owner would result, as distinguished from a mere inconvenience, if the strict letter of these regulations are carried out;*

   The existing topographical conditions and estimated Seasonal High-Water Table elevation would result in significant import of material to raise site grades to strictly comply with standard design criteria for piping and stormwater infiltration systems. Strict adherence to the regulations would impose a substantial and unnecessary hardship on the property owner.

4) *Specific circumstances relative to the site plan or conditions of the land where a site plan is proposed indicate that the waiver will properly carry out, or not be contrary to, the spirit and intent of these regulations;*

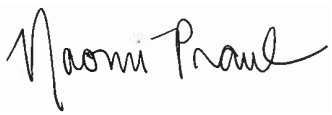
   Granting the waivers will nonetheless allow the Board and the public to conduct a full review of the project, meeting the spirit and intent of the regulations.

5) *The waivers will not in any manner vary the provisions of the Zoning Ordinance, Master Plan Reports, or Zoning Map.*

   The waivers do not vary from the Zoning Ordinance, Master Plan or Zoning Map.

If you have questions or require additional information, please contact me at (603) 513-1014 or at npraul@nobis-group.com.

Sincerely,
NOBIS GROUP®



Naomi Praul
Senior Project Engineer

CATCH Neighborhood Housing - Site Plan Waiver Requests 6/12/2026			
No.	**Section**	**Regulation Wording**	**Waiver Request**
1	6.03(c)	**Site Plan:** The Site Plan Phase is a two-step process. The first step is a determination by the Board, after recommendation by the Clerk, that a site plan is complete or incomplete. When determined complete, a site plan is then scheduled for a public hearing by the Board at the next regular meeting.	A waiver is requested to allow Determination of Completeness and Public Hearing in the same night. The applicant is applying for Low Income Tax Credits with New Hampshire Housing Finance Authority and there is only one round per year with applications being due in September. Local Site Plan approval is required in order to score the maximum points for award (in a very competitive market). Without the necessary approvals, the project would be ineligible to apply during this year's funding round, resulting in at least a one-year delay in the opportunity to secure financing for the development and deliver much-needed housing units.
2	11.05	**Determination of Completeness:** Upon receipt of a site plan application, the Board shall determine if the application is complete. The next available published deadline date shall constitute the official submittal date of the application from which the statutory period for determination of completeness shall be calculated as set forth in NH RSA 676:4. Applications received prior to the deadline date shall be considered for completeness at the next scheduled regular meeting of the Planning Board after the deadline date. If it is determined that theapplication is complete, the Board shall accept the application for consideration and set a date for the public hearing on the complete application no sooner than the next regular meeting of the Board.	A waiver is requested to allow Determination of Completeness and Public Hearing in the same night. The applicant is applying for Low Income Tax Credits with New Hampshire Housing Finance Authority and there is only one round per year with applications being due in September. Local Site Plan approval is required in order to score the maximum points for award (in a very competitive market). Without the necessary approvals, the project would be ineligible to apply during this year's funding round, resulting in at least a one-year delay in the opportunity to secure financing for the development and deliver much-needed housing units.
3	12.02(1)(a),(b)	**All Applications:** The following information shall be required on all plans and drawings except for the Preliminary Conceptual Consultation Phase: (1) Title Block: (a) Title of plan; (b) Name and address of the owner and applicant	A waiver is requested for the Existing Conditions Plat. The title and name/address of owner/applicant are provided for the Owner of Record rather than for the current project application and therefore are not consistent with the rest of the civil plan set.
4	22.02	**Construction Standards:** All public and private storm water drainage facilities shall be constructed to the standards contained herein and the Construction Standards and Details of the City of Concord.	A waiver is requested to allow less than 4-feet over storm drain piping. 2-feet of cover with rigid insulation is proposed in order to allow for the necessary connections/discharge elevations to the proposed infiltration systems.
5	22.07(2)	**Storm Water Design Standards for Site Plans with Significant Impact:** A minimum separation of four (4) feet shall be maintained between the bottom of an infiltration system and the groundwater.	A waiver is requested to allow less than 4 feet of separation between the bottom of the proposed raingarden and the seasonal high water table (SHWT). The bottom elevation of the raingarden is dictated by the inverts of the incoming stormwater discharge piping. 3 feet of separation between is provided between the bottom of the raingarden and SHWT in accordance with NHDES standard requirements.
6	24.03	**Design Standards for Municipal Sanitary Sewers:** Where extensions of the municipal sanitary sewers are required, said facilities shall be constructed in a manner set forth in Section 24, Sanitary Sewage Disposal of the City of Concord Subdivision Regulations and the City of Concord Construction Standards and Details.	A waiver is requested to allow less than 6 feet of cover over sewer piping under pavement. Rigid insulation over piping is proposed as an equivalent protection.

CITY OF CONCORD

New Hampshire's Main Street™

Community Development Department

Zoning Board of Adjustment

May 11, 2026

Philip Hastings
2 Capital Plaza, 5th Floor
Concord, NH 03301

RE: Notice of Decision – ZBA 0401-2026

Dear Mr.Hastings:

At a meeting of the Concord Zoning Board of Adjustment, held on May 6, 2026 , the Board voted 3-2 to grant the requested variance from ***Section 28-4-5(d)(2)*** **to permit density of approximately 18.4 multi-family dwelling units per acre where a maximum density of 12 dwelling units per acre is permitted** on Tax Map 303/Z Lot 68 located at 43 Fisherville Rd in the General Commercial (CG) District. (ZBA-0401-2026)

The adopted Findings of Fact are on file with the Planning Division of the Commuity Development Department.

If there is a significant change proposed to the project at any time in the future, you are hereby advised to discuss any proposed changes with the City Planner. If the use or construction authorized by this approval has not commenced within the two-year anniversary date of the original decision (or by **May 6, 2028**), it shall be deemed to have expired and authorization shall be considered null and void as specified in Section 28-9-3(b)(5) of the Zoning Ordinance.

Granting of this variance does not authorize construction or use prior to the application for and approval of site plan review, architectural design review, and/or subdivision review by the Planning Board, as applicable. Additionally, granting of this variance does not authorize construction or use prior to the application for and issuance of applicable building permits, following receipt of necessary approvals from the Planning Board.

Zoning Board of Adjustment

Kearsten O'Brien
Senior Planner

CITY OF CONCORD

New Hampshire's Main Street™

Community Development Department

Zoning Board of Adjustment

May 11, 2026

Philip Hastings
2 Capital Plaza, 5th Floor
Concord, NH 03301

RE: Notice of Decision – ZBA 0403-2026

Dear Mr. Hastings:

At a meeting of the Concord Zoning Board of Adjustment, held on May 6, 2026 , the Board voted to unanomousily grant the requested variance from ***Section 28-4-5(d)(5) to permit multi-family buildings within 30 feet and 39 feet of the property lines and parking facilities to within eight(8) feet, 24 feet and 34 feet of the property line where a 75-foot perimeter buffer is required*** on Tax Map 303/Z Lot 68 located at 43 Fisherville Rd in the General Commercial (CG) District. (ZBA-0403-2026)

The adopted Findings of Fact are on file with the Planning Division of the Commuity Development Department.

If there is a significant change proposed to the project at any time in the future, you are hereby advised to discuss any proposed changes with the City Planner. If the use or construction authorized by this approval has not commenced within the two-year anniversary date of the original decision (or by **May 6, 2028**), it shall be deemed to have expired and authorization shall be considered null and void as specified in Section 28-9-3(b)(5) of the Zoning Ordinance.

Granting of this variance does not authorize construction or use prior to the application for and approval of site plan review, architectural design review, and/or subdivision review by the Planning Board, as applicable. Additionally, granting of this variance does not authorize construction or use prior to the application for and issuance of applicable building permits, following receipt of necessary approvals from the Planning Board.

Zoning Board of Adjustment

Kearsten O'Brien
Senior Planner

CITY OF CONCORD

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Community Development Department

Zoning Board of Adjustment

May 11, 2026

Philip Hastings
2 Capital Plaza, 5th Floor
Concord, NH 03301

RE: Notice of Decision – ZBA 0404-2026

Dear Mr. Hastings:

At a meeting of the Concord Zoning Board of Adjustment, held on May 6, 2026 , the Board voted to unanomisly grant the requested variance from ***Section 28-7-7(g)(3) Parking Area and Design Standards, Setbacks and Restrictions, Parking to be located to the side or rear of a building*** **to permit off-street parking to be located in front of the building where it is otherwise not allowed** on Tax Map 303/Z Lot 68 located at 43 Fisherville Rd in the General Commercial (CG) District. (ZBA-0404-2026)

The adopted Findings of Fact are on file with the Planning Division of the Commuity Development Department.

If there is a significant change proposed to the project at any time in the future, you are hereby advised to discuss any proposed changes with the City Planner. If the use or construction authorized by this approval has not commenced within the two-year anniversary date of the original decision (or by **May 6, 2028**), it shall be deemed to have expired and authorization shall be considered null and void as specified in Section 28-9-3(b)(5) of the Zoning Ordinance.

Granting of this variance does not authorize construction or use prior to the application for and approval of site plan review, architectural design review, and/or subdivision review by the Planning Board, as applicable. In addition, granting of this variance does not authorize construction or use prior to the application for and issuance of applicable building permits, following receipt of necessary approvals from the Planning Board.

Zoning Board of Adjustment

Kearsten O'Brien
Senior Planner

CITY OF CONCORD

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Community Development Department

Zoning Board of Adjustment

May 11, 2026

Philip Hastings
2 Capital Plaza, 5th Floor
Concord, NH 03301

RE: Notice of Decision – ZBA 0405-2026

Dear Mr.Hastings:

At a meeting of the Concord Zoning Board of Adjustment, held on May 6, 2026 , the Board voted unanomousily to grant the requested variacne from ***Section 28-7-13(a) Table of Off- Street Loading Requirements to allow no off-street loading spaces where one space is required*** on Tax Map 303/Z Lot 68 located at 43 Fisherville Rd in the General Commercial (CG) District. (ZBA-0405-2026)

The adopted Findings of Fact are on file with the Planning Division of the Commuity Development Department.

If there is a significant change proposed to the project at any time in the future, you are hereby advised to discuss any proposed changes with the City Planner. If the use or construction authorized by this approval has not commenced within the two-year anniversary date of the original decision (or by **May 6, 2028**), it shall be deemed to have expired and authorization shall be considered null and void as specified in Section 28-9-3(b)(5) of the Zoning Ordinance.

Granting of this variance does not authorize construction or use prior to the application for and approval of site plan review, architectural design review, and/or subdivision review by the Planning Board, as applicable. Additionally, granting of this variance does not authorize construction or use prior to the application for and issuance of applicable building permits, following receipt of necessary approvals from the Planning Board.

Zoning Board of Adjustment

Kearsten O'Brien
Senior Planner

CITY OF CONCORD

New Hampshire's Main Street™

Community Development Department

Zoning Board of Adjustment

May 11, 2026

Philip Hastings
2 Capital Plaza, 5th Floor
Concord, NH 03301

RE: Notice of Decision – ZBA 0402-2026

Dear Mr.Hastings:

At a meeting of the Concord Zoning Board of Adjustment, held on May 6, 2026 , the Board voted unanomousily to grant the requested variacne from ***Section 28-4-5(d)(3) to permit a building of up to 186 feet in length where a maximum of 160 feet is permitted*** on Tax Map 303/Z Lot 68 located at 43 Fisherville Rd in the General Commercial (CG) District. (ZBA-0402-2026)

The adopted Findings of Fact are on file with the Planning Division of the Commuity Development Department.

If there is a significant change proposed to the project at any time in the future, you are hereby advised to discuss any proposed changes with the City Planner. If the use or construction authorized by this approval has not commenced within the two-year anniversary date of the original decision (or by **May 6, 2028**), it shall be deemed to have expired and authorization shall be considered null and void as specified in Section 28-9-3(b)(5) of the Zoning Ordinance.

Granting of this variance does not authorize construction or use prior to the application for and approval of site plan review, architectural design review, and/or subdivision review by the Planning Board, as applicable. Additionally, granting of this variance does not authorize construction or use prior to the application for and issuance of applicable building permits, following receipt of necessary approvals from the Planning Board.

Zoning Board of Adjustment

Kearsten O'Brien
Senior Planner

DEED REFERENCE:

TAX MAP 303Z LOT 68 BOOK 1207 PAGE 444

KEVIN F. SEIGEL & GEORGE J. SEIGEL, JR., P.O. BOX 1148, NORTH HAMPTON, NEW HAMPSHIRE, 03862

ZONING ANALYSIS

TAX MAP:		303Z/68
ADDRESS:		43 FISHERVILLE ROAD CONCORD, NH
ZONING DISTRICT:		GENERAL COMMERCIAL DISTRICT (CG)
MINIMUM LOT AREA 25,000 SF		PROVIDED 80,940 SF
MINIMUM BUILDABLE LAND 12,500 SF (0.29 ACRES)		PROVIDED 80,940 SF (1.86 ACRES)
DENSITY (12 UNITS/ACRE BUILDABLE LAND) ALLOWED = 22 UNITS		PROVIDED 34 UNITS
MINIMUM LOT FRONTAGE 150'		PROVIDED 155'
BUILDING SETBACKS	REQUIRED	PROVIDED
FRONT YARD	30'	>30'
SIDE YARD	25'	30'
REAR YARD	30'	30'
BUFFERS		
MULTI-FAMILY (3-STORY)	75'	7'
RESIDENTIAL BUFFER	30'	34'
MAXIMUM LOT COVERAGE 80%		PROVIDED 37,711 SF (46.6%)
MAXIMUM HEIGHT 45'		PROVIDED <45'

REQUIRED PARKING SPACES
MULTI-FAMILIY = 2 SPACE /DWELLING UNIT
34 DWELLING UNITS X 2 SPACE = 68 SPACES REQUIRED

	REQUIRED	EXISTING	PROPOSED
TOTAL SPACES:	68	N/A	43
ACCESSIBLE SPACES:	2	N/A	3 (INCL. ONE VAN ACCESSIBLE)

CITY OF CONCORD APPROVALS:

THE ZONING BOARD OF ADJUSTMENT OF THE CITY OF CONCORD GRANTED THE FOLLOWING VARIANCES ON MAY 6, 2026. (ZBA-0402-2026)

ARTICLE 28-4-5(d)(2) - MAXIMUM LOT COVERAGE AND DENSITY
TO PERMIT DENSITY OF APPROXIMATELY 18.4 MULTI-FAMILY DWELLING UNITS PER ACRE WHERE A MAXIMUM DENSITY OF 12 DWELLING UNITS PER ACRE IS PERMITTED

ARTICLE 28-4-5(d)(3) - BUILDING DIMENSIONS AND SEPARATION
TO ALLOW A BUILDING OF UP TO 186 FEET IN LENGTH WHERE A MAXIMUM OF 160 FEET IS PERMITTED

ARTICLE 28-4-5(d)(5) - PERIMETER BUFFER REQUIRED
TO PERMIT MULTI-FAMILY BUILDINGS WITHIN 30 FEET AND 39 FEET OF THE PROPERTY LINES AND PARKING FACILITIES TO WITHIN EIGHT(8) FEET, 24 FEET AND 34 FEET OF THE PROPERTY LINE WHERE A 75-FOOT PERIMETER BUFFER IS REQUIRED

ARTICLE 28-7-7(g)(3) - PARKING TO BE LOCATED TO THE SIDE OR REAR OF A BUILDING
TO PERMIT OFF-STREET PARKING TO BE LOCATED IN FRONT OF THE BUILDING WHERE IT IS OTHERWISE NOT ALLOWED

ARTICLE 28-7-13(a) - TABLE OF OFF-STREET LOADING REQUIREMENTS
TO ALLOW NO OFF-STREET LOADING SPACES WHERE ONE SPACE IS REQUIRED

PLAN REFERENCES:

1. EXISTING CONDITIONS, TOPOGRAPHICAL INFORMATION, NORTH ORIENTATION, NORTH ARROW, AND COORDINATE VALUES DEPICTED ON THESE DRAWINGS ARE BASED ON PLANS TITLED "EXISTING CONDTIONS PLAT OF THE LAND OF KEVIN F. SEIGEL & GEORGE J. SEIGEL, JR.", DATED APRIL 2025, BY RICHARD D. BARTLETT AND ASSOCIATES, LLC.
2. BUILDING FOOTPRINT PROVIDED TO NOBIS GROUP BY WARRENSTREET ARCHITECTS, INC. ON MARCH 31, 2026. THE FOOTPRINT SHOULD NOT BE USED FOR LAYOUT OF BUILDING CORNERS. REFER TO ARCHITECTURAL/STRUCTURAL PLANS FOR FOUNDATION AND BUILDING DIMENSIONS TO BE USED FOR LAYOUT OF NEW BUILDINGS.

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT A PROPOSED MULTI-FAMILY RESIDENTIAL BUILDING WITH ASSOCIATED AMENITIES, ACCESS, PARKING, STORMWATER CONTROLS, AND UTILITIES.
2. ALL BUILDING AND SITE CONSTRUCTION SHALL COMPLY WITH THE RULES AND REGULATIONS OF THE AMERICANS WITH DISABILITY ACT (ADA) LATEST EDITION.
3. DIMENSIONS SHOWN TAKE PRECEDENCE OVER SCALED DIMENSIONS. CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN THE EVENT OF A CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWINGS AND / OR SPECIFICATIONS, THE ENGINEER WILL BE NOTIFIED BY THE CONTRACTOR.
4. NO JURISDICTIONAL WETLANDS WERE FOUND ON THE SUBJECT PARCEL BASED ON AN INSPECTION MADE BY CERTIFIED WETLAND SCIENTIST JOHN ST. JOHN, CWS #221, ON MAY 27, 2026.
5. THE PROPERTY IS NOT WITHIN THE AQUIFER PROTECTION DISTRICT.
6. THE PROPERTY IS NOT WITHIN THE FLOOD HAZARD OVERLAY DISTRICT OR THE MERRIMACK RIVER F1 DISTRICT.
7. THE PROPERTY IS NOT WITHIN THE SHORELAND PROTECTION (SP) OVERLAY DISTRICT.
8. THERE ARE NO PUBLIC SPACES, PARKS, OR HISTORIC STRUCTURES ON SITE.
9. THERE ARE NO WELLS OR SEPTIC SYSTEMS IN THE VICINITY THAT THE SURVEYOR IS AWARE IS AWARE OF.
10. PROPOSED BUILDING WILL BE SERVICED BY MUNICIPAL WATER AND SEWER.
11. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING DIG SAFE (1-888-DIG-SAFE) AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF WORK. THE CONTRACTOR WILL COORDINATE WORK WITH THE CITY FIRE, POLICE, AND COMMUNITY DEVELOPMENT DEPARTMENTS.
12. A MANDATORY PRE-CONSTRUCTION MEETING WILL NEED TO BE HELD PRIOR TO ISSUANCE OF ANY PERMITS TO DISCUSS INSPECTION FEES, CONSTRUCTION SCHEDULE, ETC.
13. REFER TO CONSTRUCTION DETAIL SHEETS FOR ALL APPLICABLE SITE DETAILS.
14. CONTRACTOR WILL NOTIFY ENGINEERS IMMEDIATELY IF SITE CONDITIONS DIFFER FROM WHAT IS SHOWN ON PLAN.
15. TEST PITS WERE PERFORMED BY NOBIS GROUP ON MAY 27, 2026.
16. REFER TO SHEET G-1 FOR GENERAL NOTES AND LEGEND.

nobis
Nobis Group®
18 Chenell Drive
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www.nobis-group.com

NOT ISSUED FOR CONSTRUCTION

CATCH NEIGHBORHOOD HOUSING

43 FISHERVILLE ROAD
CONCORD, NEW HAMPSHIRE

TAX MAP 303/Z LOT 68

APPLICANT:
CATCH NEIGHBORHOOD HOUSING
105 LOUDON ROAD, UNIT #1
CONCORD, NEW HAMPSHIRE

OWNER:
KEVIN F. SEIGEL
& GEORGE J. SEIGEL, JR.
P.O. BOX 1148
NORTH HAMPTON,
NEW HAMPSHIRE

NO.	DATE	DESCRIPTION

REVISIONS

0 20' 40'
GRAPHIC SCALE

DATE:	JUNE 12, 2026
NOBIS PROJECT NO.	101148.00
DRAWN BY:	NCP
CHECKED BY:	JCA
CAD DRAWING FILE:	101148.00-C-200-SITE.dwg

SHEET TITLE

PROPOSED SITE PLAN

SHEET
C-2

J:\101148.000 CATCH 43 Fisherville Rd Concord, NH\CAD\DWG\101148.00-C-200-SITE.dwg 6/14/2026 8:14 PM

May 29, 2026

NEX-2600237.00

Mr. J. Chris Nadeau, P.E.
Nobis Group
18 Chenell Drive
Concord, NH 03301

SUBJECT: Proposed Residential Development
43 Fisherville Road (US Route 3)
Map 303 / Lot Z 68
Concord, New Hampshire

Dear Mr. Nadeau:

Greenman-Pedersen, Inc. (GPI) has prepared this trip generation letter in support of the proposed residential development to be located at 43 Fisherville Road (Map 303 / Lot Z 68) in Concord, New Hampshire. The site is currently occupied by a 7,258 square foot (SF) commercial building, Concord Carpet Center, as well as an abandoned 1-story residential dwelling. The project consists of razing all existing structures on site and constructing a 3-story, 34-unit multi-family residential development, with associated parking. Access and egress are currently provided to the site via two curb cuts on Fisherville Road. As proposed, the existing driveways will be closed, and access and egress will be provided via one new full-access driveway on the west side of Fisherville Road, approximately 120-feet north of the Tire Warehouse northerly driveway.

Traffic generated by the proposed residential development was forecasted using trip rates contained in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*[1] for LUC 220 (Multifamily Housing [Low-Rise]) for 34 dwelling units.

For comparative purposes, the trip generation characteristics of the existing Carpet Center were developed by applying ITE trip rates based on LUC 890 (Furniture/Flooring Store) for 7.258 KSF based on the information provided on the property record card, enclosed with this letter for reference. No credit was taken for the residential dwelling. Table 1 summarizes the results of the trip-generation estimates and demonstrates the comparative trip characteristics of both the proposed and existing sites. All trip generation calculations are attached to this letter.

As shown in Table 1 on the following page, the proposed residential development is expected to generate 14 vehicle trips (3 entering and 11 exiting) during the weekday AM peak hour, 18 vehicle trips (11 entering and 7 exiting) during the weekday PM peak hour, and 17 vehicle trips (6 entering and 11 exiting) during the Saturday midday peak hour. On a daily basis, the proposed residential development is expected to generate 212 vehicle trips per day on a weekday and 154 vehicle trips per day on a Saturday.

By way of comparison with the existing carpet store, the proposed redevelopment is expected to generate 11 *additional* vehicle trips (1 additional entering and 10 additional exiting) during the weekday AM peak hour, 14 *additional* vehicle trips (9 additional entering and 5 additional exiting) during the weekday PM peak hour, and 8 *additional* vehicle trips (1 additional entering and 7 additional exiting) during the Saturday midday peak hour. On a daily basis, the proposed redevelopment is expected to generate 166 *additional* vehicle trips per day on a weekday and 60 *additional* vehicle trips per day on a Saturday.

1 *Trip Generation Manual, 12th* Edition; Institute of Transportation Engineers; Washington, DC; 2025.

Table 1
Trip-Generation Summary

Peak Hour/Direction	Proposed Trips [a]	Existing Trips [b]	Trip Increase [c]
Weekday Daily:	212	46	166
Weekday AM Peak Hour:			
Enter	3	2	1
Exit	11	1	10
Total	14	3	11
Weekday PM Peak Hour:			
Enter	11	2	9
Exit	7	2	5
Total	18	4	14
Saturday Daily:	154	94	60
Saturday Midday Peak Hour:			
Enter	6	5	1
Exit	11	4	7
Total	17	9	8

[a] ITE LUC 220 (Multifamily Housing [Low-Rise]) for 34 dwelling units.
[b] ITE LUC 890 (Furniture/Flooring Store) for 7.258 KSF.
[c] Proposed Trips minus Existing Trips.

Based on a review of the City of Concord, NH Site Plan Regulations (Section 32 – Traffic Impacts and Traffic Studies), the additional trips associated with the proposed residential redevelopment are not expected to surpass either the daily or peak hour trip thresholds, and would typically not require further study.

We hope you find this information useful, and should you have any questions or require additional information, please feel free contact me at (603) 766-5229 or bbollinger@gpinet.com.

Sincerely,

GREENMAN-PEDERSEN, INC.

Robert E. Bollinger, P.E., PTOE
Assistant Vice President / Traffic Engineering Department Head
116 S. River Road, Bldg. B., Suite 1
Bedford, NH 03110

Enclosures
1. Property Record Card
2. Trip Generation Calculations

cc: H. Monticup, GPI

43 FISHERVILLE RD

Location	43 FISHERVILLE RD	**Mblu**	303/Z 68/ / /
Owner	SEIGEL KEVIN F & SEIGEL GEORGE J JR	**Total Market Value**	$435,600
		Appraisal	$435,600
PID	4901	**Building Count**	2
Tract #	6387-D-1	**Tract #**	6387-F
Tract #		**Tract #**	
Tract #		**Tract #**	

Current Value

Appraisal					
Valuation Year	**Building**	**Extra Features**	**Outbuildings**	**Land**	**Total**
2025	$157,500	$1,400	$9,300	$267,400	$435,600
Assessment					
Valuation Year	**Building**	**Extra Features**	**Outbuildings**	**Land**	**Total**
2025	$157,500	$1,400	$9,300	$267,400	$435,600

Owner of Record

Owner	SEIGEL KEVIN F & SEIGEL GEORGE J JR	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	PO BOX 1148 NORTH HAMPTON, NH 03862-1148	**Book & Page**	0/0
		Sale Date	03/09/2018
		Instrument	38

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
SEIGEL KEVIN F & SEIGEL GEORGE J JR	$0		0/0	38	03/09/2018
SEIGEL GEORGE J	$0		3571/1634	38	09/28/2017
SEIGEL GEORGE J & BETTY M	$0		1207/0444		04/19/1974

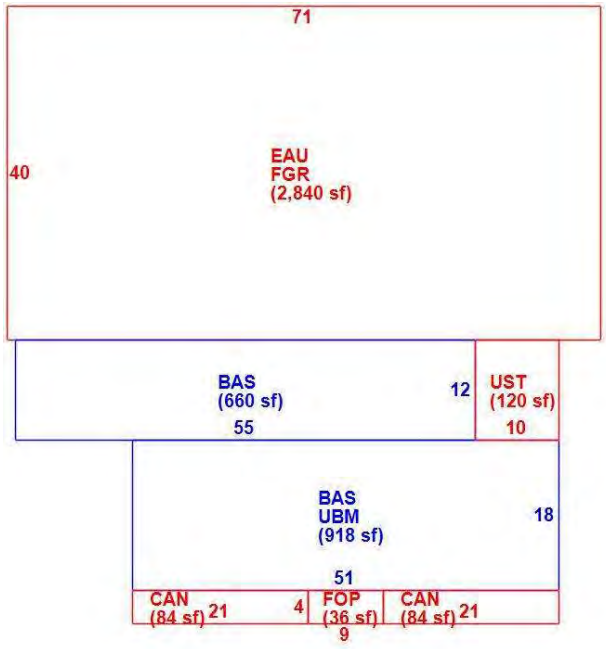
Building Information

Building 1 : Section 1

Year Built: 1945
Living Area: 1,578
Replacement Cost: $222,599
Replacement Cost Less Depreciation: $129,100

Building Attributes	
Field	**Description**
Style:	Store
Model	Commercial
Grade	Average
Stories:	1
Occupancy	1.00
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	Brick/Masonry
Roof Structure	Gable/Hip
Roof Cover	Asph/F Gls/Cmp
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Hot Water
AC Type	None
Bldg Use	STORE/SHOP MDL-94
Total Rooms	
Total Bedrms	00
Total Baths	2
Heat/AC	NONE
Frame Type	MASONRY
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	11.00
% Comn Wall	0.00

Building Layout



(ParcelSketch.ashx?pid=4901&bid=5123)

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,578	1,578
CAN	Canopy	168	0
EAU	Attic, Expansion, Unfinished	2,840	0
FGR	Garage	2,840	0
FOP	Porch, Open	36	0
UBM	Basement, Unfinished	918	0
UST	Utility, Storage, Unfinished	120	0
		8,500	1,578

7,258 SF GFA

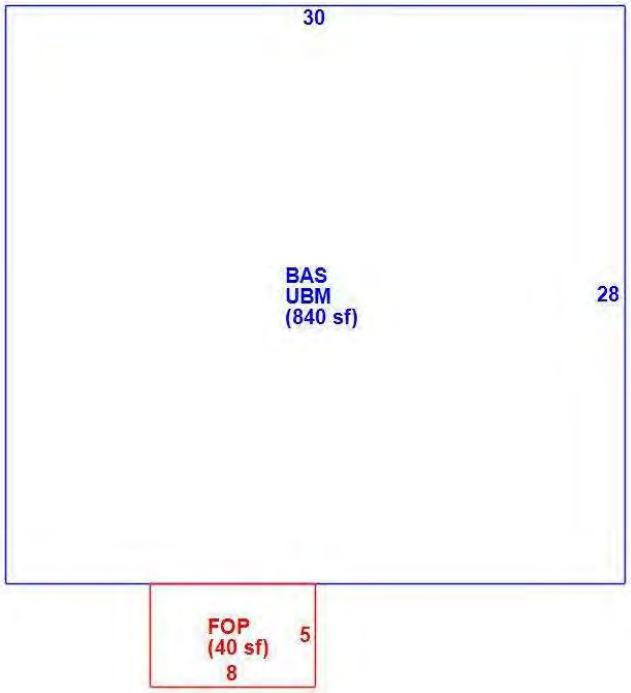
Building 2 : Section 1

Year Built: 1945
Living Area: 840
Replacement Cost: $94,790

Replacement Cost
Less Depreciation: $28,400

Building Attributes : Bldg 2 of 2	
Field	**Description**
Style:	Ranch
Model	Residential
Grade:	Average
Stories:	1 Story
Occupancy	1
Exterior Wall 1	Asbest Shingle
Exterior Wall 2	
Roof Structure:	Shed
Roof Cover	Asph/F Gls/Cmp
Interior Wall 1	Plywood Panel
Interior Wall 2	
Interior Flr 1	Carpet
Interior Flr 2	
Heat Fuel	Gas
Heat Type:	Forced Air-Duc
AC Type:	None
Total Bedrooms:	2 Bedrooms
Total Bthrms:	1
Total Half Baths:	0
Total Xtra Fixtrs:	
Total Rooms:	5
Trend	

Building Layout



(ParcelSketch.ashx?pid=4901&bid=5124)

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	840	840
FOP	Porch, Open	40	0
UBM	Basement, Unfinished	840	0
		1,720	840

Extra Features

Extra Features						Legend
Code	**Description**	**Size**	**Value**	**Assessed Value**	**Bldg #**	**Comment**
A/C	AC COMERCIAL	918.00 S.F.	$1,400	$1,400	1	

Land

Land Use

Use Code 3220
Description STORE/SHOP MDL-94
Zone CG
Neighborhood 0407
Category

Land Line Valuation

Size (Acres) 1.85
Total Market Land $267,400
Appraised Value $267,400

Outbuildings

Outbuildings								Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Assessed Value**	**Bldg #**	**Comment**
PAV1	PAVING-ASPHALT			10000.00 S.F.	$9,300	$9,300	1	

Institute of Transportation Engineers (ITE) - 12th Edition

Land Use Code (LUC) 220 - Multifamily Housing (Low-Rise)

General Urban/Suburban

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 34

AVERAGE WEEKDAY DAILY

T = 6.21 * (X)
T = 6.21 * 34
T = 211.14
T = 212 vehicle trips
with 50% (106 vpd) entering and 50% (106 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.41 * (X)
T = 0.41 * 34
T = 13.94
T = 14 vehicle trips
with 24% (3 vph) entering and 76% (11 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.52 * (X)
T = 0.52 * 34
T = 17.68
T = 18 vehicle trips
with 62% (11 vph) entering and 38% (7 vph) exiting.

SATURDAY DAILY

T = 4.55 * (X)
T = 4.55 * 34
T = 154.70
T = 154 vehicle trips
with 50% (77 vpd) entering and 50% (77 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

T = 0.49 * (X)
T = 0.49 * 34
T = 16.66
T = 17 vehicle trips
with 38% (6 vph) entering and 62% (11 vph) exiting.

Institute of Transportation Engineers (ITE) - 12th Edition

Land Use Code (LUC) 890 - Furniture/Flooring Store

General Urban/Suburban

Average Vehicle Trips Ends vs: 1000 Sq. Ft. Gross Floor Area
Independent Variable (X): 7.258

AVERAGE WEEKDAY DAILY

T = 6.32 * (X)
T = 6.32 * 7.258
T = 45.87
T = 46 vehicle trips
with 50% (23 vph) entering and 50% (23 vph) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.35 * (X) + 0.67
T = 0.35 * 7.258 + 0.67
T = 3.21
T = 3 vehicle trips
with 66% (2 vph) entering and 34% (1 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

Ln T = 0.92 Ln (X) - 0.38
Ln T = 0.92 Ln(7.258) - 0.38
Ln T = 1.44
T = 4.24
T = 4 vehicle trips
with 48% (2 vph) entering and 52% (2 vph) exiting.

SATURDAY DAILY

$$\frac{\text{ITE LUC 890 Weekday Daily Trip Rate}}{\text{ITE LUC 890 Weekday PM Peak Hour Trip Rate}} = \frac{\text{ITE LUC 890 Saturday Daily Trip Rate}}{\text{ITE LUC 890 Saturday Peak Hour Trip Rate}}$$

$$\frac{6.32}{0.57} = \frac{(Y)}{1.18} \qquad Y = 13.08$$

T = Y * 7.258
T = 94.93
T = 94 vehicle trips
with 50% (47 vpd) entering and 50% (47 vpd) exiting.

(same distribution split as ITE LUC 821 during the Saturday Daily)

SATURDAY PEAK HOUR OF GENERATOR

T = 1.18 * (X)
T = 1.18 * 7.258
T = 8.56
T = 9 vehicle trips
with 53% (5 vph) entering and 47% (4 vph) exiting.

nobis

STORMWATER MANAGEMENT PLAN

43 FISHERVILLE ROAD
CONCORD, NH 03301

FOR

CATCH NEIGHBORHOOD HOUSING

105 LOUDON ROAD, UNIT #1
CONCORD, NH 03301

BY
NOBIS GROUP®

(800) 394-4182

www.nobis-group.com

Nobis Project No. 101148.000
JUNE 12, 2026

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NARRATIVE

Project Description

The approximately 1.86-acre site (Site) is located at 43 Fisherville Road in Concord, New Hampshire, identified as Tax Map 303Z, Lot 68. The Site is within the General Commercial (CG) District and is bordered by commercial development to the southeast, undeveloped land to the south and a housing cooperative and gas station/convenience store to the northwest. It is currently developed as a small commercial retail facility, including associated access and parking areas.

The proposed CATCH Neighborhood Housing project involves the demolition of the existing commercial buildings and related infrastructure and the construction of a new three-story multi-family residential building. The new building will be situated towards the rear of the property with a loop driveway and parking located between the building and Fisherville Road. Driveway access will be from Fisherville Road. The project will be served by municipal water and sewer systems and will incorporate a stormwater collection, storage, and treatment system prior to discharge to the existing municipal system.

The purpose of this report is to demonstrate that the proposed Site improvements will not adversely affect surrounding resources by implementing measures to control stormwater quality and quantity.

Existing Site Conditions

The Site is currently developed as a small commercial facility with two buildings and paved access/parking. The area behind the commercial development (northwestern portion of the property) is wooded. Topography is fairly flat, with existing slopes of approximately 2%-3%. Stormwater sheds from a high point at the interior of the Site towards all four property lines. There is an existing municipal closed drainage system east of the property in Fisherville Road. The existing development does not include any systems for collection or treatment of stormwater. The total area of existing impervious cover on the property is 23,430 square feet, of which 10,214 square feet contributes untreated stormwater runoff to the existing municipal system.

Proposed Site Conditions

The proposed development includes construction of a new multi-family residential building. The proposed building footprint is approximately 11,900 square feet, with a total gross floor area of 35,886 square feet. A loop driveway is proposed from Fisherville Road for access to the building. Resident parking including ADA accessible spaces is provided along the outer edge of the loop; the central area will be open green space containing a raingarden for treatment and control of stormwater runoff. Pedestrian access is provided from Fisherville Road to the proposed building.

The proposed development will result in a net increase of approximately 19,719 square feet of impervious area.

The Site has been designed such that stormwater runoff from the building, parking, and majority of the driveway is captured and directed to infiltration systems for control and treatment. Runoff from only 872 square feet (vs. 10,214 square feet currently) of impervious cover will flow untreated to the collection system in Fisherville Road. The proposed Stormwater Control Measures (SCMs) include a subsurface chamber gallery for infiltration of stormwater runoff from the proposed building and a shallow raingarden located in the center of the loop driveway for infiltration of stormwater runoff from the driveway and parking. Although physical curbing is not proposed at the center landscaped area, catch basins are proposed at three points around the perimeter to facilitate conveyance of stormwater in the event of "snow curb" during winter months. The gallery is designed with an overflow outlet to the raingarden, which in turn is designed with an overflow outlet to the municipal stormwater system in Fisherville Road. Stormwater runoff from the landscaped areas surrounding the development will sheet flow to the property lines as in the current condition. The existing overall drainage patterns will be maintained, and stormwater mitigation and treatment will be provided by the proposed SCMs.

Soils

Based on the Natural Resources Conservation Service (NRCS) Web Soil Survey, the soils on the Site consist of Croghan loamy fine sand and Champlain-Urban land complex, which are both considered Hydrologic Soil Group (HSG) A. Due to the rapid infiltration rates of the native soils, which are faster than 10 inches per hour, soil amendments are proposed under the proposed stormwater infiltration systems. Two feet of soil beneath each infiltration system will be amended to achieve infiltration rates sufficient to provide adequate treatment of stormwater prior to reintroduction to the groundwater table.

Points of Interest

Stormwater runoff generally flows from the middle of the Site to the southern, northwest, and southeast property lines, and east to Fisherville Road where there is an existing municipal closed drainage system. The overall Site topography will remain largely unchanged after the proposed development, and existing stormwater flow patterns will be preserved. There are four points of interest (POIs) evaluated in the stormwater analysis, located where stormwater runoff from the development discharges from the property.

POI1 represents sheet flow across the southern portion of the Site toward the southern property line. POI2 represents sheet flow across the northwestern portion of the Site toward the northwestern property line. POI3 represents sheet flow across the eastern portion of the Site toward Fisherville Road and the existing municipal stormwater collection system. POI4

represents sheet flow across the southeastern portion of the Site toward the southeastern property line.

Erosion and Sediment Control Practices / Site Stabilization

Temporary erosion/sediment control during construction will include use of silt fence, sediment logs, hydroseeding, and inlet protection at catch basins, along with a tracking control pad at the construction entrance in accordance with best management practices.

The contractor will be responsible for all temporary erosion and sediment control measures during construction, while the project owner will be responsible for maintaining all permanent erosion and sediment control measures as may be required.

Summary of Results

The following tables summarize the peak stormwater discharge rates for both existing and proposed conditions at the Points of Interest (POIs) across multiple storm events, as well as the total volume of stormwater runoff generated during a 10-year storm event.

PEAK RATES (cfs)					
POI DESCRIPTION	STORM EVENT				
		2 Yr	10 Yr	25 Yr	100 Yr
POI1: Southern Property Line	EXIST. =	0.0	0.0	0.0	0.2
	PROP. =	0.0	0.0	0.0	0.1
POI2: Northwest Property Line	EXIST. =	0.0	0.2	0.4	1.2
	PROP. =	0.0	0.0	0.0	0.2
POI3: Fisherville Road	EXIST. =	0.6	0.9	1.2	1.7
	PROP. =	0.0	0.0	0.1	1.4
POI4: Southeast Property Line	EXIST. =	0.0	0.0	0.0	0.1
	PROP. =	0.0	0.0	0.0	0.1

VOLUMES (ac-ft)		
POI DESCRIPTION	10 Year STORM EVENT	
POI1: Southern Property Line	EXIST. = PROP. =	0.003 0.001
POI2: Northwest Property Line	EXIST. = PROP. =	0.034 0.002
POI3: Fisherville Road	EXIST. = PROP. =	0.067 0.003
POI4: Southeast Property Line	EXIST. = PROP. =	0.001 0.002
NET OFF-SITE DISCHARGE	**EXIST.** = **PROP.** =	**0.106** **0.008**

Conclusions

The preceding table and following calculations reflect the results of the proposed Site improvements on the peak stormwater discharge rates. The peak flow has been retained on the Site and therefore will not impact off-site systems or downgradient properties in the modeled storm events. The post-development peak flow rates and volume of stormwater leaving the property will be less than or equal to the existing flow rates and volume as a result of attenuation provided by the proposed subsurface gallery and raingarden.

Calculations are included for the 2-year, 10-year, 25-year, and 100-year storm events.

EXTREME PRECIPITATION TABLE

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	43.253 degrees North
Longitude	71.576 degrees West
Elevation	100 feet
Date/Time	Tue Jun 02 2026 12:30:27 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	0.39	0.49	0.64	0.80	1.01	**1yr**	0.69	0.98	1.17	1.48	1.86	2.36	2.56	**1yr**	2.09	2.46	2.90	3.58	4.11	**1yr**
2yr	0.31	0.48	0.60	0.79	1.00	1.25	**2yr**	0.86	1.15	1.45	1.81	2.25	2.80	3.13	**2yr**	2.48	3.01	3.49	4.16	4.76	**2yr**
5yr	0.37	0.58	0.73	0.98	1.25	1.58	**5yr**	1.08	1.45	1.83	2.28	2.82	3.48	3.95	**5yr**	3.08	3.80	4.40	5.16	5.87	**5yr**
10yr	0.42	0.66	0.84	1.14	1.48	1.89	**10yr**	1.28	1.72	2.19	2.72	3.35	4.10	4.73	**10yr**	3.63	4.55	5.24	6.08	6.88	**10yr**
25yr	0.50	0.80	1.01	1.39	1.85	2.38	**25yr**	1.60	2.17	2.76	3.43	4.20	5.10	5.99	**25yr**	4.51	5.76	6.62	7.55	8.49	**25yr**
50yr	0.57	0.91	1.17	1.63	2.20	2.84	**50yr**	1.90	2.59	3.30	4.09	4.99	6.02	7.17	**50yr**	5.33	6.89	7.91	8.89	9.95	**50yr**
100yr	0.65	1.05	1.35	1.91	2.61	3.39	**100yr**	2.25	3.08	3.95	4.88	5.93	7.11	8.58	**100yr**	6.29	8.25	9.44	10.49	11.68	**100yr**
200yr	0.75	1.21	1.57	2.25	3.10	4.04	**200yr**	2.67	3.68	4.71	5.82	7.04	8.40	10.28	**200yr**	7.44	9.89	11.27	12.36	13.70	**200yr**
500yr	0.89	1.47	1.92	2.78	3.89	5.10	**500yr**	3.36	4.64	5.95	7.34	8.84	10.49	13.06	**500yr**	9.29	12.56	14.27	15.39	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	0.34	0.41	0.56	0.68	0.88	**1yr**	0.59	0.87	1.02	1.36	1.59	1.99	2.39	**1yr**	1.76	2.30	2.64	3.26	3.81	**1yr**
2yr	0.30	0.47	0.57	0.78	0.96	1.14	**2yr**	0.83	1.12	1.31	1.72	2.20	2.73	3.03	**2yr**	2.42	2.91	3.39	4.05	4.63	**2yr**
5yr	0.34	0.53	0.66	0.90	1.15	1.36	**5yr**	0.99	1.33	1.53	1.99	2.56	3.26	3.67	**5yr**	2.88	3.53	4.09	4.83	5.50	**5yr**
10yr	0.38	0.58	0.72	1.01	1.30	1.54	**10yr**	1.12	1.50	1.73	2.23	2.87	3.74	4.24	**10yr**	3.31	4.07	4.71	5.50	6.26	**10yr**
25yr	0.43	0.66	0.82	1.17	1.54	1.80	**25yr**	1.33	1.76	2.04	2.58	3.34	4.47	5.12	**25yr**	3.96	4.92	5.65	6.55	7.42	**25yr**
50yr	0.48	0.73	0.91	1.30	1.75	2.02	**50yr**	1.51	1.97	2.31	2.89	3.75	5.13	5.90	**50yr**	4.54	5.67	6.49	7.48	8.46	**50yr**
100yr	0.53	0.80	1.01	1.46	2.00	2.27	**100yr**	1.72	2.22	2.61	3.23	4.21	5.90	6.82	**100yr**	5.22	6.55	7.47	8.53	9.64	**100yr**
200yr	0.59	0.88	1.12	1.62	2.26	2.54	**200yr**	1.95	2.49	2.95	3.61	4.73	6.79	7.87	**200yr**	6.01	7.57	8.58	9.77	10.98	**200yr**
500yr	0.68	1.01	1.30	1.88	2.68	2.95	**500yr**	2.31	2.88	3.47	4.20	5.53	8.19	9.54	**500yr**	7.25	9.17	10.28	11.69	13.06	**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	0.54	0.73	0.90	1.09	**1yr**	0.78	1.06	1.20	1.59	1.97	2.53	2.74	**1yr**	2.24	2.64	3.14	3.84	4.36	**1yr**
2yr	0.33	0.51	0.62	0.84	1.04	1.24	**2yr**	0.90	1.22	1.40	1.83	2.34	2.88	3.23	**2yr**	2.55	3.11	3.61	4.29	4.92	**2yr**
5yr	0.41	0.63	0.78	1.07	1.36	1.60	**5yr**	1.18	1.57	1.82	2.33	2.95	3.70	4.25	**5yr**	3.27	4.09	4.73	5.50	6.25	**5yr**
10yr	0.49	0.75	0.93	1.30	1.68	1.96	**10yr**	1.45	1.91	2.20	2.76	3.50	4.48	5.25	**10yr**	3.96	5.04	5.83	6.63	7.53	**10yr**
25yr	0.63	0.96	1.19	1.70	2.24	2.57	**25yr**	1.94	2.52	2.87	3.49	4.42	5.75	6.92	**25yr**	5.09	6.66	7.67	8.51	9.62	**25yr**
50yr	0.76	1.15	1.44	2.06	2.78	3.18	**50yr**	2.40	3.11	3.49	4.19	5.27	6.96	8.55	**50yr**	6.16	8.22	9.45	10.28	11.59	**50yr**
100yr	0.92	1.39	1.75	2.52	3.46	3.92	**100yr**	2.98	3.83	4.27	5.01	6.29	8.43	10.56	**100yr**	7.46	10.16	11.66	12.42	13.96	**100yr**
200yr	1.12	1.68	2.13	3.08	4.29	4.84	**200yr**	3.71	4.74	5.21	6.01	7.50	10.19	13.05	**200yr**	9.02	12.54	14.41	15.02	16.82	**200yr**
500yr	1.45	2.16	2.78	4.03	5.73	6.43	**500yr**	4.95	6.29	6.81	7.64	9.50	13.13	17.26	**500yr**	11.62	16.60	19.05	19.31	21.52	**500yr**

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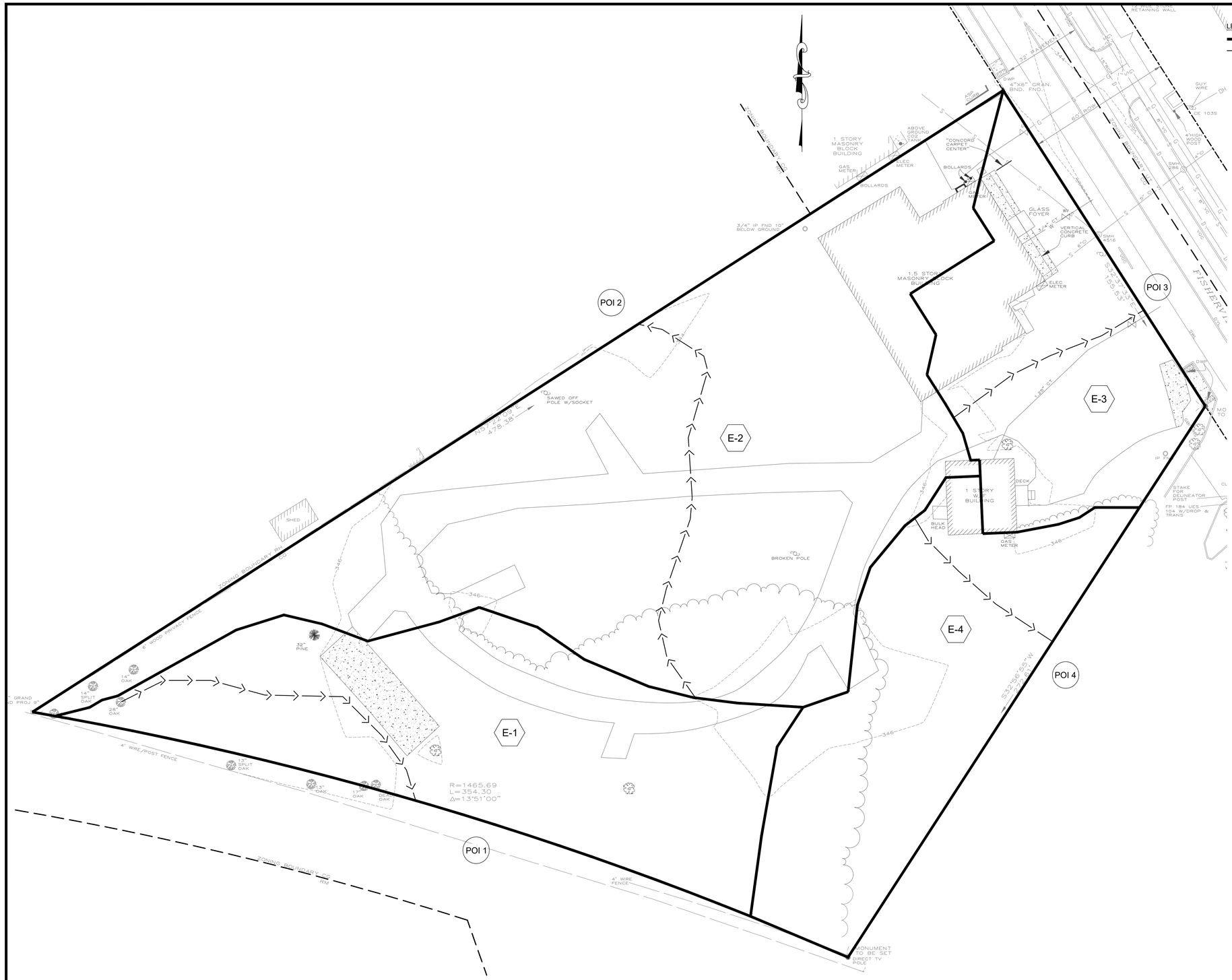
Northeast Regional Climate Center

DRAINAGE AREA PLANS



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Concord, NH 03301
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www.nobis-group.com

NOT ISSUED FOR CONSTRUCTION

CATCH NEIGHBORHOOD HOUSING

43 FISHERVILLE ROAD
CONCORD, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION

REVISIONS

0 20' 40'
GRAPHIC SCALE

DATE:	JUNE 1, 2026
NOBIS PROJECT NO.	101148.00
DRAWN BY:	NCP
CHECKED BY:	CN
CAD DRAWING FILE:	101148.00-C-310-DAP.dwg

SHEET TITLE

EXISTING DRAINAGE AREA PLAN

FIGURE
1

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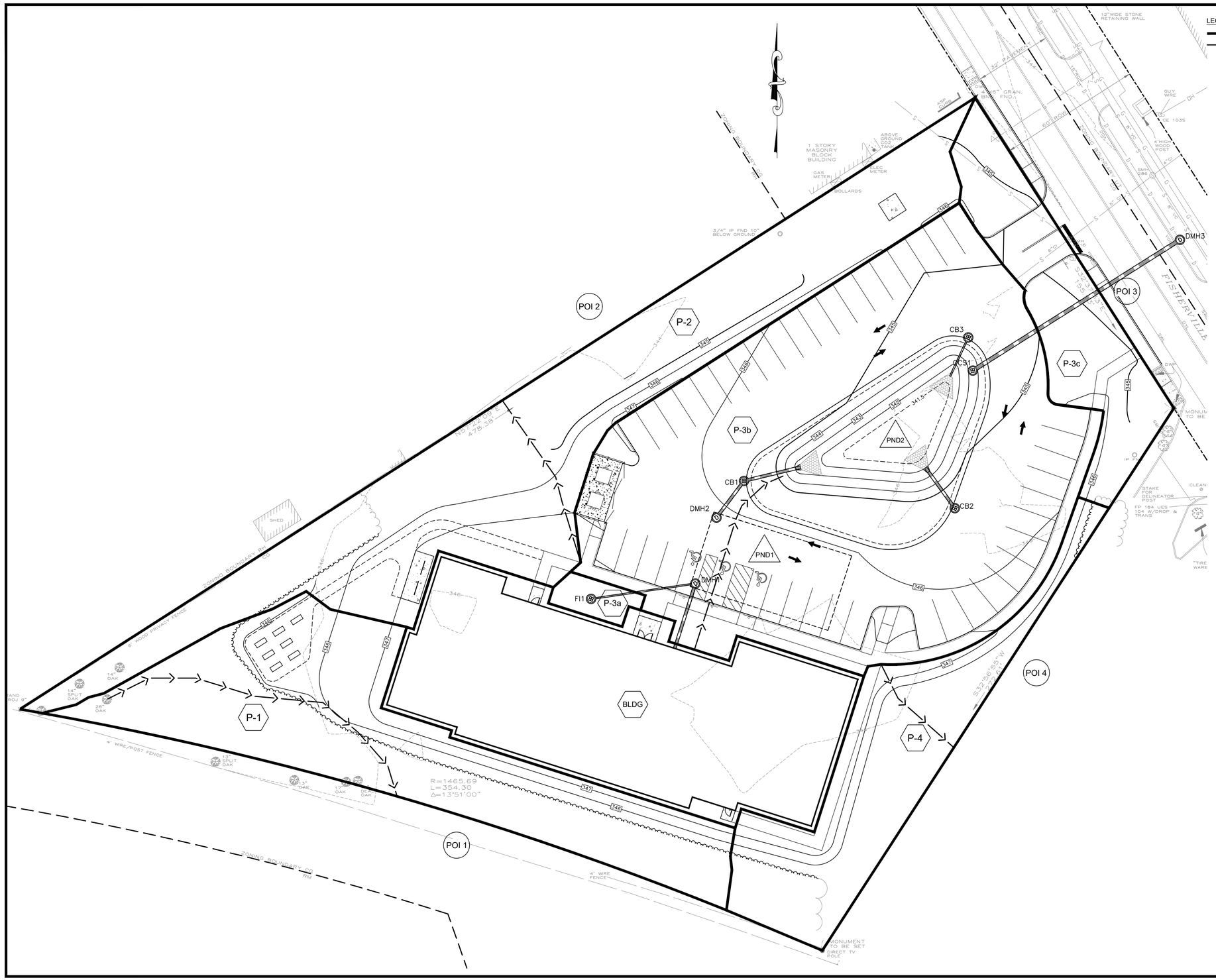

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NOT ISSUED FOR CONSTRUCTION

CATCH NEIGHBORHOOD HOUSING

43 FISHERVILLE ROAD
CONCORD, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION

REVISIONS

0 20' 40'
GRAPHIC SCALE

DATE:	JUNE 1, 2026
NOBIS PROJECT NO.	101148.00
DRAWN BY:	NCP
CHECKED BY:	CN
CAD DRAWING FILE:	101148.00-C-310-DAP.dwg

SHEET TITLE

PROPOSED DRAINAGE AREA PLAN

FIGURE
2

J:\101148.000 CATCH 43 Fisherville Rd Concord, NH\CAD\DWG\101148.00-C-310-DAP.dwg 6/8/2026 9:37 PM

HYDRAULIC CALCULATIONS

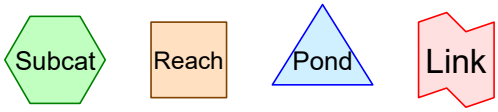
Existing Conditions

POI1 southern PL

POI2 northwest PL

POI3 Fisherville Rd

POI4 southeast PL



Routing Diagram for CATCH Existing

Prepared by Nobis Engineering Inc, Printed 6/8/2026

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.725	39	>75% Grass cover, Good, HSG A (E-1, E-2, E-3, E-4)
0.033	98	Concrete, HSG A (E-1, E-2, E-3)
0.369	98	Paved parking, HSG A (E-1, E-2, E-3, E-4)
0.136	98	Roofs, HSG A (E-2, E-3, E-4)
0.595	30	Woods, Good, HSG A (E-1, E-2, E-3, E-4)
1.858	**53**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.858	HSG A	E-1, E-2, E-3, E-4
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
1.858		**TOTAL AREA**

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: POI1 southern PL Runoff Area=18,468 sf 14.56% Impervious Runoff Depth=0.00"
Flow Length=150' Tc=27.5 min CN=40 Runoff=0.00 cfs 0.000 af

Subcatchment E-2: POI2 northwest PL Runoff Area=37,019 sf 26.96% Impervious Runoff Depth=0.11"
Flow Length=180' Tc=23.4 min CN=53 Runoff=0.01 cfs 0.008 af

Subcatchment E-3: POI3 Fisherville Rd Runoff Area=11,688 sf 87.39% Impervious Runoff Depth=1.80"
Tc=6.0 min CN=90 Runoff=0.55 cfs 0.040 af

Subcatchment E-4: POI4 southeast PL Runoff Area=13,770 sf 3.98% Impervious Runoff Depth=0.00"
Flow Length=75' Slope=0.0100 '/' Tc=11.0 min CN=39 Runoff=0.00 cfs 0.000 af

Total Runoff Area = 1.858 ac Runoff Volume = 0.048 af Average Runoff Depth = 0.31"
71.05% Pervious = 1.320 ac 28.95% Impervious = 0.538 ac

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: POI1 southern PL Runoff Area=18,468 sf 14.56% Impervious Runoff Depth=0.08"
Flow Length=150' Tc=27.5 min CN=40 Runoff=0.00 cfs 0.003 af

Subcatchment E-2: POI2 northwest PL Runoff Area=37,019 sf 26.96% Impervious Runoff Depth=0.48"
Flow Length=180' Tc=23.4 min CN=53 Runoff=0.18 cfs 0.034 af

Subcatchment E-3: POI3 Fisherville Rd Runoff Area=11,688 sf 87.39% Impervious Runoff Depth=3.01"
Tc=6.0 min CN=90 Runoff=0.91 cfs 0.067 af

Subcatchment E-4: POI4 southeast PL Runoff Area=13,770 sf 3.98% Impervious Runoff Depth=0.06"
Flow Length=75' Slope=0.0100 '/' Tc=11.0 min CN=39 Runoff=0.00 cfs 0.001 af

Total Runoff Area = 1.858 ac Runoff Volume = 0.106 af Average Runoff Depth = 0.68"
71.05% Pervious = 1.320 ac 28.95% Impervious = 0.538 ac

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: POI1 southern PL Runoff Area=18,468 sf 14.56% Impervious Runoff Depth=0.26"
Flow Length=150' Tc=27.5 min CN=40 Runoff=0.02 cfs 0.009 af

Subcatchment E-2: POI2 northwest PL Runoff Area=37,019 sf 26.96% Impervious Runoff Depth=0.91"
Flow Length=180' Tc=23.4 min CN=53 Runoff=0.44 cfs 0.064 af

Subcatchment E-3: POI3 Fisherville Rd Runoff Area=11,688 sf 87.39% Impervious Runoff Depth=3.97"
Tc=6.0 min CN=90 Runoff=1.18 cfs 0.089 af

Subcatchment E-4: POI4 southeast PL Runoff Area=13,770 sf 3.98% Impervious Runoff Depth=0.22"
Flow Length=75' Slope=0.0100 '/' Tc=11.0 min CN=39 Runoff=0.01 cfs 0.006 af

Total Runoff Area = 1.858 ac Runoff Volume = 0.168 af Average Runoff Depth = 1.09"
71.05% Pervious = 1.320 ac 28.95% Impervious = 0.538 ac

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: POI1 southern PL Runoff Area=18,468 sf 14.56% Impervious Runoff Depth=0.88"
Flow Length=150' Tc=27.5 min CN=40 Runoff=0.16 cfs 0.031 af

Subcatchment E-2: POI2 northwest PL Runoff Area=37,019 sf 26.96% Impervious Runoff Depth=2.00"
Flow Length=180' Tc=23.4 min CN=53 Runoff=1.15 cfs 0.142 af

Subcatchment E-3: POI3 Fisherville Rd Runoff Area=11,688 sf 87.39% Impervious Runoff Depth=5.93"
Tc=6.0 min CN=90 Runoff=1.72 cfs 0.133 af

Subcatchment E-4: POI4 southeast PL Runoff Area=13,770 sf 3.98% Impervious Runoff Depth=0.81"
Flow Length=75' Slope=0.0100 '/' Tc=11.0 min CN=39 Runoff=0.13 cfs 0.021 af

Total Runoff Area = 1.858 ac Runoff Volume = 0.327 af Average Runoff Depth = 2.11"
71.05% Pervious = 1.320 ac 28.95% Impervious = 0.538 ac

Summary for Subcatchment E-1: POI1 southern PL

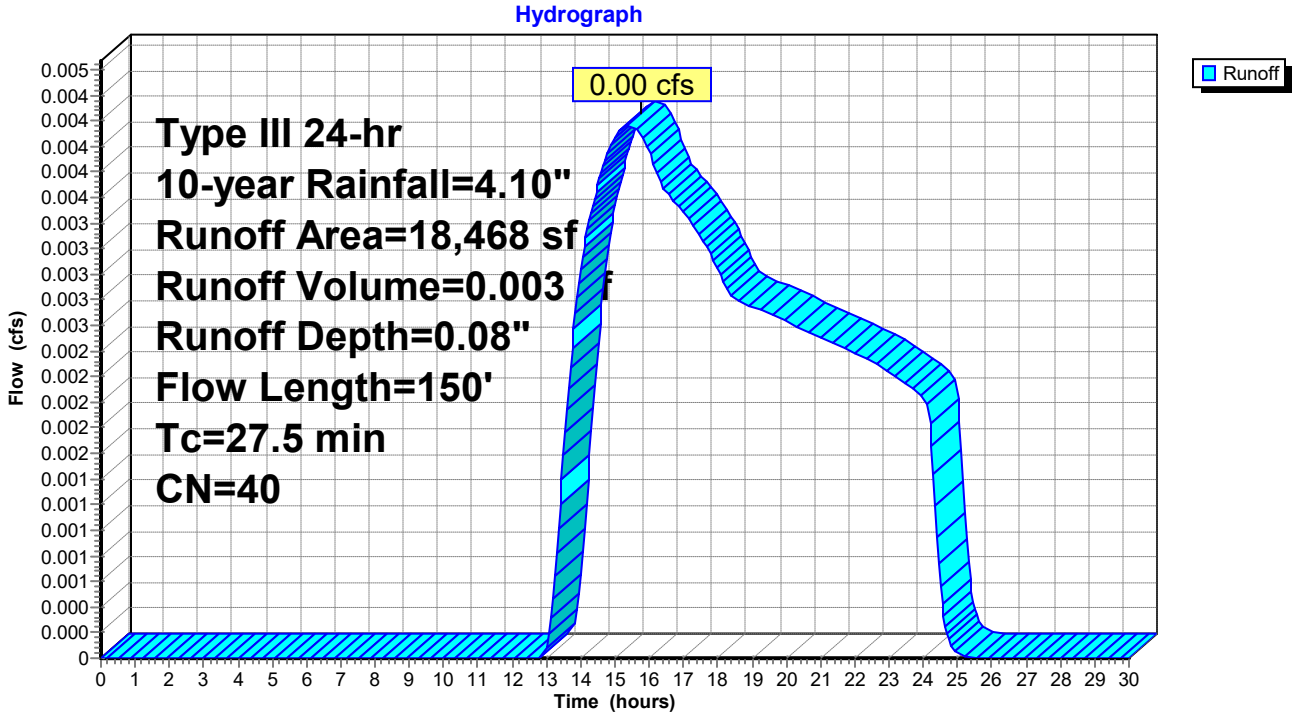
Runoff = 0.00 cfs @ 15.37 hrs, Volume= 0.003 af, Depth= 0.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.10"

	Area (sf)	CN	Description
	14,506	30	Woods, Good, HSG A
	780	30	Woods, Good, HSG A
*	975	98	Concrete, HSG A
	1,714	98	Paved parking, HSG A
	493	39	>75% Grass cover, Good, HSG A
	18,468	40	Weighted Average
	15,779		85.44% Pervious Area
	2,689		14.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.8	100	0.0150	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.80"
1.7	50	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
27.5	150	Total			

Subcatchment E-1: POI1 southern PL



Summary for Subcatchment E-2: POI2 northwest PL

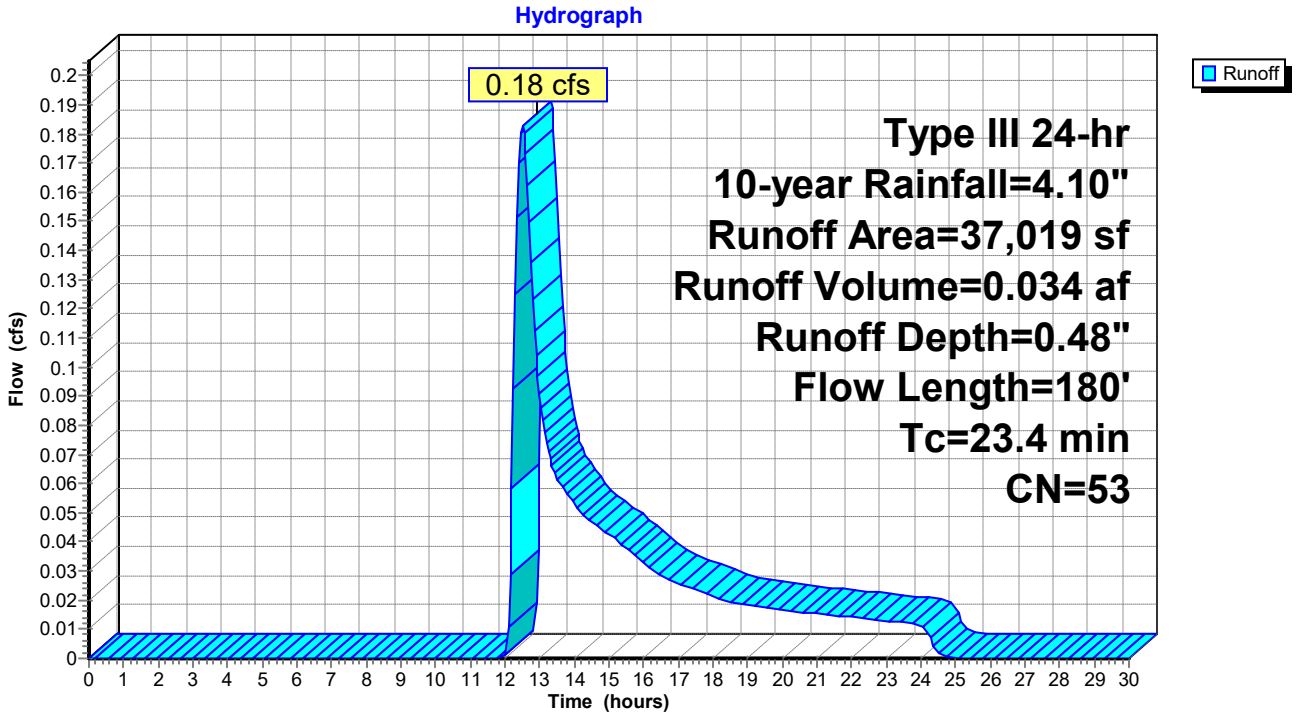
Runoff = 0.18 cfs @ 12.50 hrs, Volume= 0.034 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.10"

	Area (sf)	CN	Description
	2,804	98	Roofs, HSG A
	95	98	Roofs, HSG A
	659	98	Paved parking, HSG A
	6,408	98	Paved parking, HSG A
*	13	98	Concrete, HSG A
	7,210	39	>75% Grass cover, Good, HSG A
	12,681	39	>75% Grass cover, Good, HSG A
	443	39	>75% Grass cover, Good, HSG A
	402	30	Woods, Good, HSG A
	2,854	30	Woods, Good, HSG A
	3,334	30	Woods, Good, HSG A
	116	30	Woods, Good, HSG A
	37,019	53	Weighted Average
	27,040		73.04% Pervious Area
	9,979		26.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	40	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.80"
7.9	50	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.80"
0.1	10	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	80	0.0140	1.77		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
23.4	180	Total			

Subcatchment E-2: POI2 northwest PL



Summary for Subcatchment E-3: POI3 Fisherville Rd

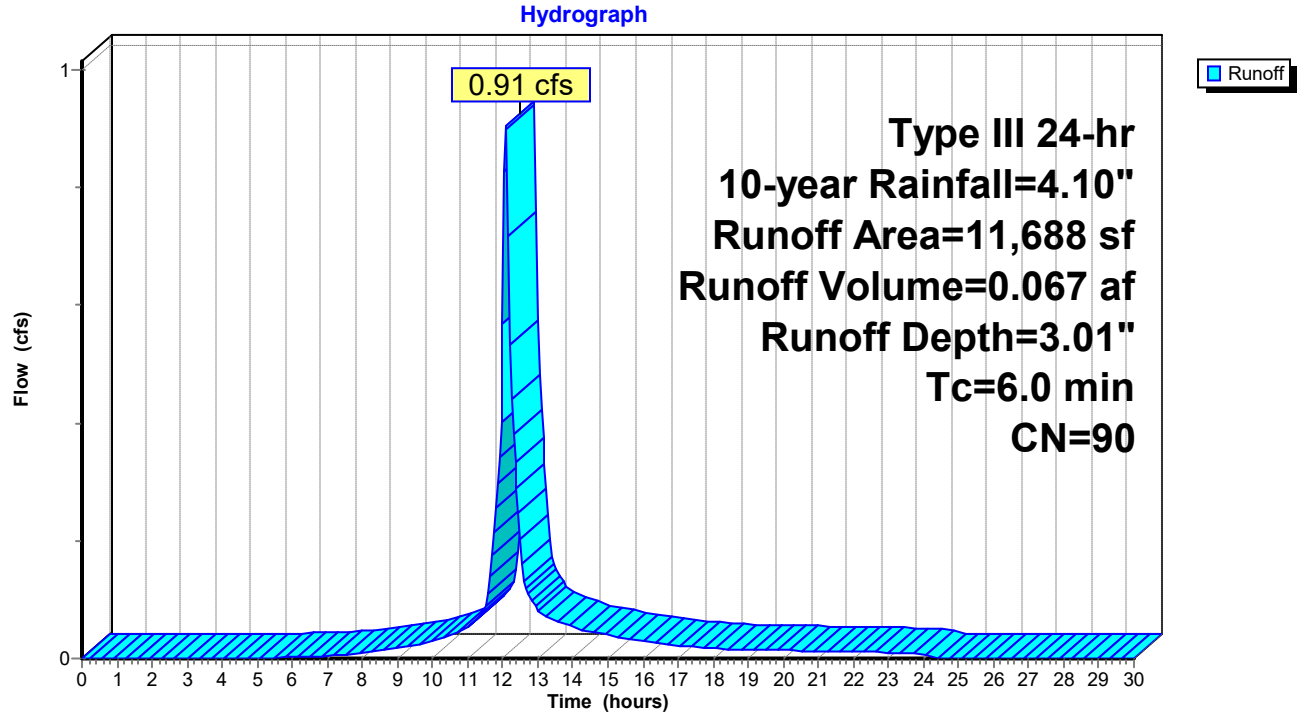
Runoff = 0.91 cfs @ 12.09 hrs, Volume= 0.067 af, Depth= 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.10"

	Area (sf)	CN	Description
	491	98	Roofs, HSG A
	2,161	98	Roofs, HSG A
	171	30	Woods, Good, HSG A
	67	39	>75% Grass cover, Good, HSG A
	279	39	>75% Grass cover, Good, HSG A
	957	39	>75% Grass cover, Good, HSG A
*	188	98	Concrete, HSG A
*	138	98	Concrete, HSG A
*	137	98	Concrete, HSG A
	7,099	98	Paved parking, HSG A
	11,688	90	Weighted Average
	1,474		12.61% Pervious Area
	10,214		87.39% Impervious Area

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

Subcatchment E-3: POI3 Fisherville Rd



Summary for Subcatchment E-4: POI4 southeast PL

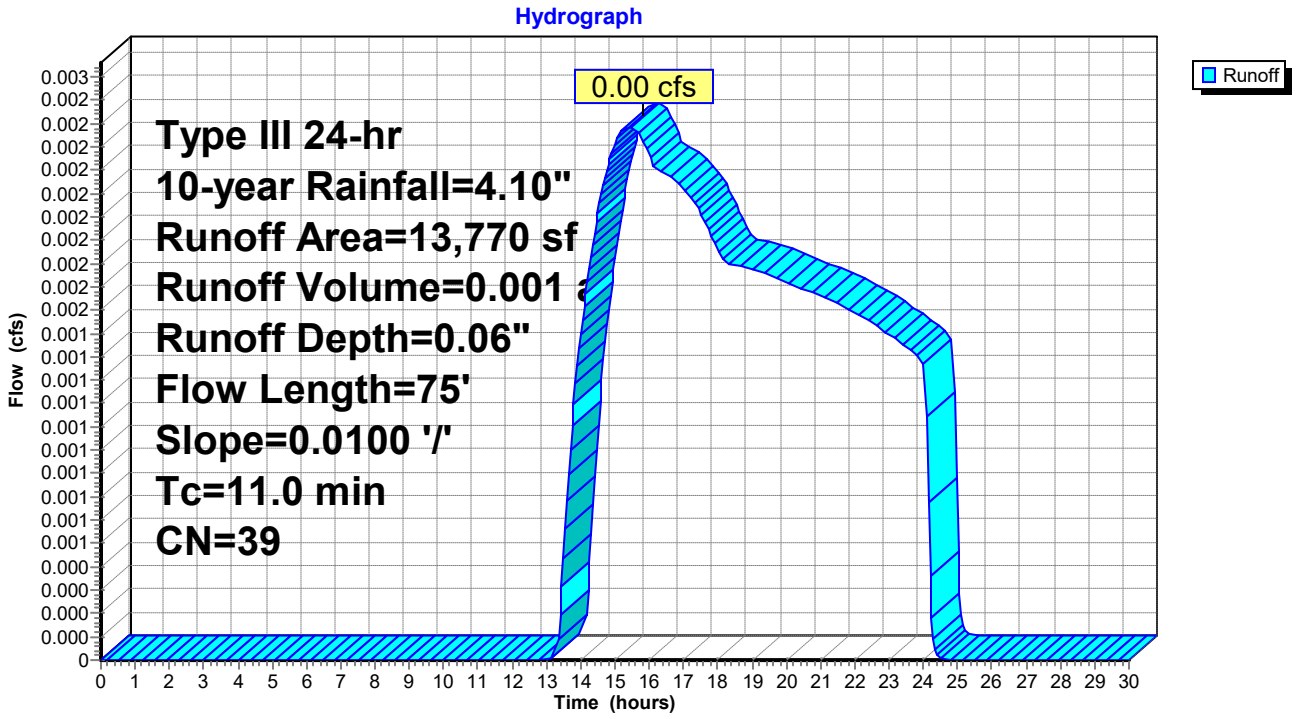
Runoff = 0.00 cfs @ 15.42 hrs, Volume= 0.001 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.10"

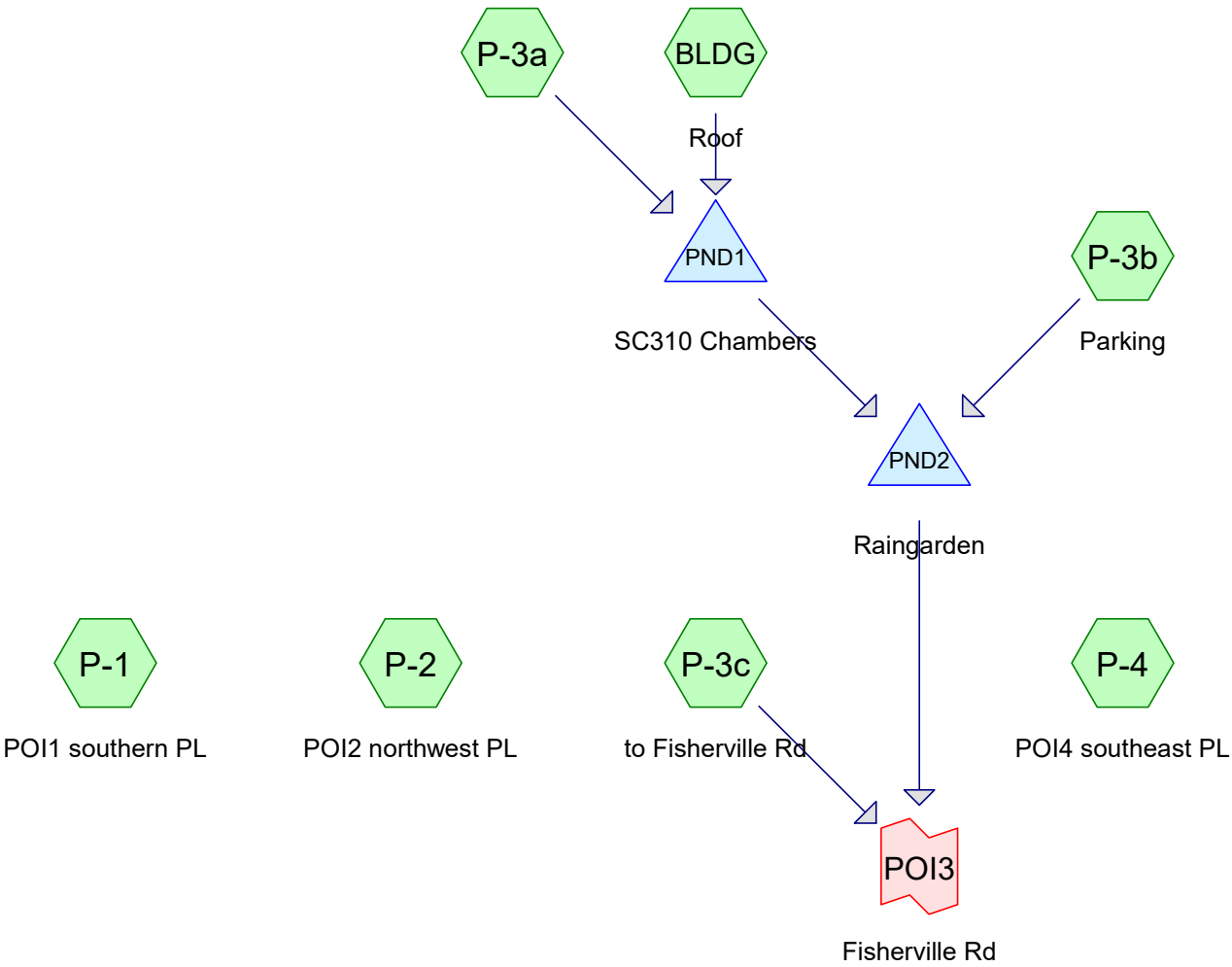
Area (sf)	CN	Description
375	98	Roofs, HSG A
3,771	30	Woods, Good, HSG A
173	98	Paved parking, HSG A
9,451	39	>75% Grass cover, Good, HSG A
13,770	39	Weighted Average
13,222		96.02% Pervious Area
548		3.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	75	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.80"

Subcatchment E-4: POI4 southeast PL



Proposed Conditions



Subcat Reach Pond Link

Routing Diagram for CATCH Proposed
Prepared by Nobis Engineering Inc, Printed 6/14/2026

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.749	39	>75% Grass cover, Good, HSG A (P-1, P-2, P-3a, P-3b, P-3c, P-4)
0.012	98	Concrete, HSG A (P-2, P-3b)
0.040	96	Gravel surface, HSG A (P-1, P-2, P-3b)
0.449	98	Paved parking, HSG A (P-3b, P-3c)
0.306	98	Roofs, HSG A (BLDG)
0.059	98	Walkway, HSG A (P-2, P-3b, P-3c, P-4)
0.244	30	Woods, Good, HSG A (P-1, P-2, P-3c, P-4)
1.858	**65**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.858	HSG A	BLDG, P-1, P-2, P-3a, P-3b, P-3c, P-4
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
1.858		**TOTAL AREA**

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment BLDG: Roof Runoff Area=13,342 sf 100.00% Impervious Runoff Depth=2.57"
Tc=6.0 min CN=98 Runoff=0.81 cfs 0.066 af

Subcatchment P-1: POI1 southern PL Runoff Area=11,438 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=145' Tc=21.6 min CN=37 Runoff=0.00 cfs 0.000 af

Subcatchment P-2: POI2 northwest PL Runoff Area=15,935 sf 1.78% Impervious Runoff Depth=0.00"
Flow Length=75' Slope=0.0450 '/' Tc=6.0 min CN=40 Runoff=0.00 cfs 0.000 af

Subcatchment P-3a: Runoff Area=521 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment P-3b: Parking Runoff Area=27,840 sf 75.05% Impervious Runoff Depth=1.35"
Tc=6.0 min CN=84 Runoff=0.99 cfs 0.072 af

Subcatchment P-3c: to Fisherville Rd Runoff Area=5,025 sf 17.35% Impervious Runoff Depth=0.05"
Tc=6.0 min CN=49 Runoff=0.00 cfs 0.000 af

Subcatchment P-4: POI4 southeast PL Runoff Area=6,844 sf 8.33% Impervious Runoff Depth=0.00"
Flow Length=50' Slope=0.0200 '/' Tc=6.0 min CN=42 Runoff=0.00 cfs 0.000 af

Pond PND1: SC310 Chambers Peak Elev=343.05' Storage=473 cf Inflow=0.81 cfs 0.066 af
Discarded=0.24 cfs 0.066 af Primary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.066 af

Pond PND2: Raingarden Peak Elev=342.27' Storage=886 cf Inflow=0.99 cfs 0.072 af
Discarded=0.23 cfs 0.072 af Primary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.072 af

Link POI3: Fisherville Rd Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 1.858 ac Runoff Volume = 0.138 af Average Runoff Depth = 0.89"
55.57% Pervious = 1.033 ac 44.43% Impervious = 0.826 ac

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment BLDG: Roof Runoff Area=13,342 sf 100.00% Impervious Runoff Depth=3.86"
Tc=6.0 min CN=98 Runoff=1.20 cfs 0.099 af

Subcatchment P-1: POI1 southern PL Runoff Area=11,438 sf 0.00% Impervious Runoff Depth=0.03"
Flow Length=145' Tc=21.6 min CN=37 Runoff=0.00 cfs 0.001 af

Subcatchment P-2: POI2 northwest PL Runoff Area=15,935 sf 1.78% Impervious Runoff Depth=0.08"
Flow Length=75' Slope=0.0450 '/' Tc=6.0 min CN=40 Runoff=0.00 cfs 0.002 af

Subcatchment P-3a: Runoff Area=521 sf 0.00% Impervious Runoff Depth=0.06"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment P-3b: Parking Runoff Area=27,840 sf 75.05% Impervious Runoff Depth=2.46"
Tc=6.0 min CN=84 Runoff=1.80 cfs 0.131 af

Subcatchment P-3c: to Fisherville Rd Runoff Area=5,025 sf 17.35% Impervious Runoff Depth=0.33"
Tc=6.0 min CN=49 Runoff=0.02 cfs 0.003 af

Subcatchment P-4: POI4 southeast PL Runoff Area=6,844 sf 8.33% Impervious Runoff Depth=0.12"
Flow Length=50' Slope=0.0200 '/' Tc=6.0 min CN=42 Runoff=0.00 cfs 0.002 af

Pond PND1: SC310 Chambers Peak Elev=343.38' Storage=986 cf Inflow=1.20 cfs 0.099 af
Discarded=0.25 cfs 0.099 af Primary=0.00 cfs 0.000 af Outflow=0.25 cfs 0.099 af

Pond PND2: Raingarden Peak Elev=342.88' Storage=1,953 cf Inflow=1.80 cfs 0.131 af
Discarded=0.30 cfs 0.131 af Primary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.131 af

Link POI3: Fisherville Rd Inflow=0.02 cfs 0.003 af
Primary=0.02 cfs 0.003 af

Total Runoff Area = 1.858 ac Runoff Volume = 0.237 af Average Runoff Depth = 1.53"
55.57% Pervious = 1.033 ac 44.43% Impervious = 0.826 ac

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment BLDG: Roof Runoff Area=13,342 sf 100.00% Impervious Runoff Depth=4.86"
Tc=6.0 min CN=98 Runoff=1.49 cfs 0.124 af

Subcatchment P-1: POI1 southern PL Runoff Area=11,438 sf 0.00% Impervious Runoff Depth=0.15"
Flow Length=145' Tc=21.6 min CN=37 Runoff=0.01 cfs 0.003 af

Subcatchment P-2: POI2 northwest PL Runoff Area=15,935 sf 1.78% Impervious Runoff Depth=0.26"
Flow Length=75' Slope=0.0450 '/' Tc=6.0 min CN=40 Runoff=0.03 cfs 0.008 af

Subcatchment P-3a: Runoff Area=521 sf 0.00% Impervious Runoff Depth=0.22"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment P-3b: Parking Runoff Area=27,840 sf 75.05% Impervious Runoff Depth=3.36"
Tc=6.0 min CN=84 Runoff=2.45 cfs 0.179 af

Subcatchment P-3c: to Fisherville Rd Runoff Area=5,025 sf 17.35% Impervious Runoff Depth=0.68"
Tc=6.0 min CN=49 Runoff=0.05 cfs 0.007 af

Subcatchment P-4: POI4 southeast PL Runoff Area=6,844 sf 8.33% Impervious Runoff Depth=0.34"
Flow Length=50' Slope=0.0200 '/' Tc=6.0 min CN=42 Runoff=0.02 cfs 0.004 af

Pond PND1: SC310 Chambers Peak Elev=343.64' Storage=1,364 cf Inflow=1.49 cfs 0.124 af
Discarded=0.25 cfs 0.122 af Primary=0.07 cfs 0.002 af Outflow=0.32 cfs 0.125 af

Pond PND2: Raingarden Peak Elev=343.35' Storage=2,980 cf Inflow=2.45 cfs 0.181 af
Discarded=0.35 cfs 0.181 af Primary=0.00 cfs 0.000 af Outflow=0.35 cfs 0.181 af

Link POI3: Fisherville Rd Inflow=0.05 cfs 0.007 af
Primary=0.05 cfs 0.007 af

Total Runoff Area = 1.858 ac Runoff Volume = 0.326 af Average Runoff Depth = 2.10"
55.57% Pervious = 1.033 ac 44.43% Impervious = 0.826 ac

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment BLDG: Roof Runoff Area=13,342 sf 100.00% Impervious Runoff Depth=6.87"
Tc=6.0 min CN=98 Runoff=2.09 cfs 0.175 af

Subcatchment P-1: POI1 southern PL Runoff Area=11,438 sf 0.00% Impervious Runoff Depth=0.66"
Flow Length=145' Tc=21.6 min CN=37 Runoff=0.07 cfs 0.014 af

Subcatchment P-2: POI2 northwest PL Runoff Area=15,935 sf 1.78% Impervious Runoff Depth=0.88"
Flow Length=75' Slope=0.0450 '/' Tc=6.0 min CN=40 Runoff=0.21 cfs 0.027 af

Subcatchment P-3a: Runoff Area=521 sf 0.00% Impervious Runoff Depth=0.81"
Tc=6.0 min CN=39 Runoff=0.01 cfs 0.001 af

Subcatchment P-3b: Parking Runoff Area=27,840 sf 75.05% Impervious Runoff Depth=5.24"
Tc=6.0 min CN=84 Runoff=3.75 cfs 0.279 af

Subcatchment P-3c: to Fisherville Rd Runoff Area=5,025 sf 17.35% Impervious Runoff Depth=1.64"
Tc=6.0 min CN=49 Runoff=0.19 cfs 0.016 af

Subcatchment P-4: POI4 southeast PL Runoff Area=6,844 sf 8.33% Impervious Runoff Depth=1.04"
Flow Length=50' Slope=0.0200 '/' Tc=6.0 min CN=42 Runoff=0.12 cfs 0.014 af

Pond PND1: SC310 Chambers Peak Elev=344.01' Storage=1,849 cf Inflow=2.09 cfs 0.176 af
Discarded=0.26 cfs 0.160 af Primary=0.42 cfs 0.016 af Outflow=0.68 cfs 0.176 af

Pond PND2: Raingarden Peak Elev=343.89' Storage=4,369 cf Inflow=3.75 cfs 0.296 af
Discarded=0.40 cfs 0.256 af Primary=1.33 cfs 0.040 af Outflow=1.73 cfs 0.296 af

Link POI3: Fisherville Rd Inflow=1.42 cfs 0.056 af
Primary=1.42 cfs 0.056 af

Total Runoff Area = 1.858 ac Runoff Volume = 0.526 af Average Runoff Depth = 3.40"
55.57% Pervious = 1.033 ac 44.43% Impervious = 0.826 ac

Summary for Subcatchment BLDG: Roof

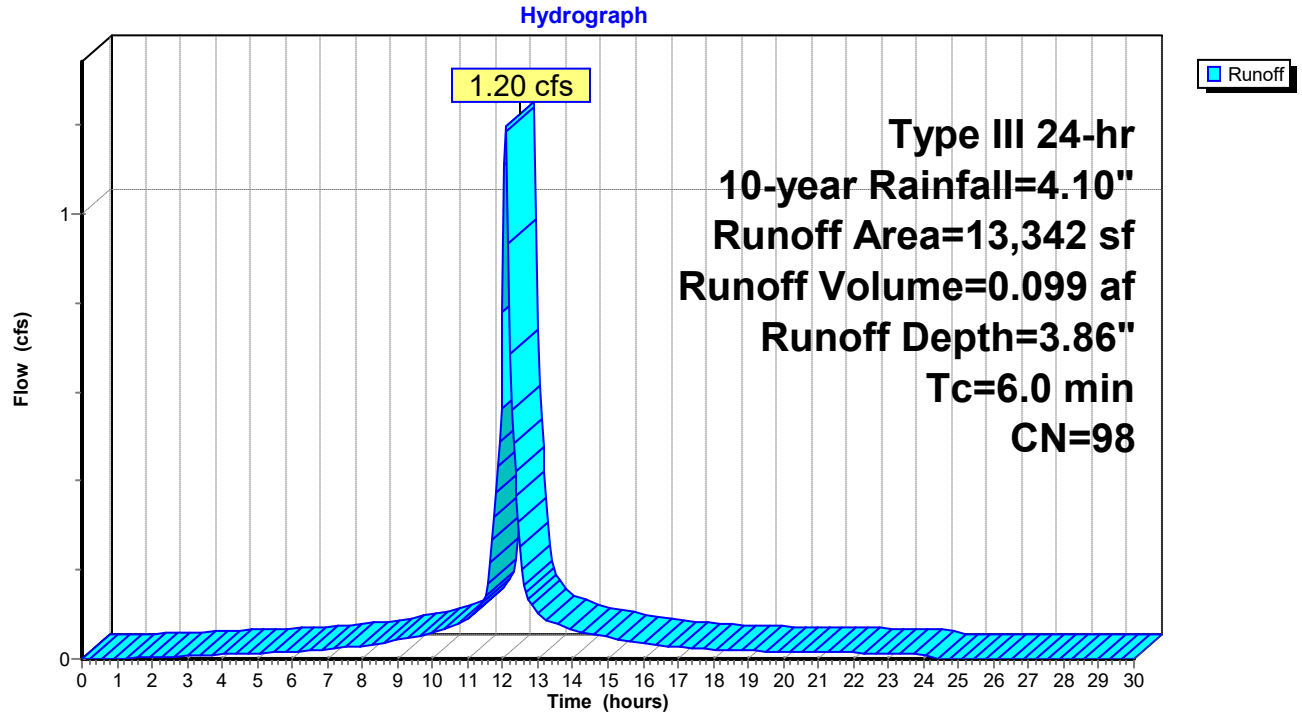
Runoff = 1.20 cfs @ 12.09 hrs, Volume= 0.099 af, Depth= 3.86"
Routed to Pond PND1 : SC310 Chambers

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.10"

Area (sf)	CN	Description
13,342	98	Roofs, HSG A
13,342		100.00% Impervious Area

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

Subcatchment BLDG: Roof



Summary for Subcatchment P-1: POI1 southern PL

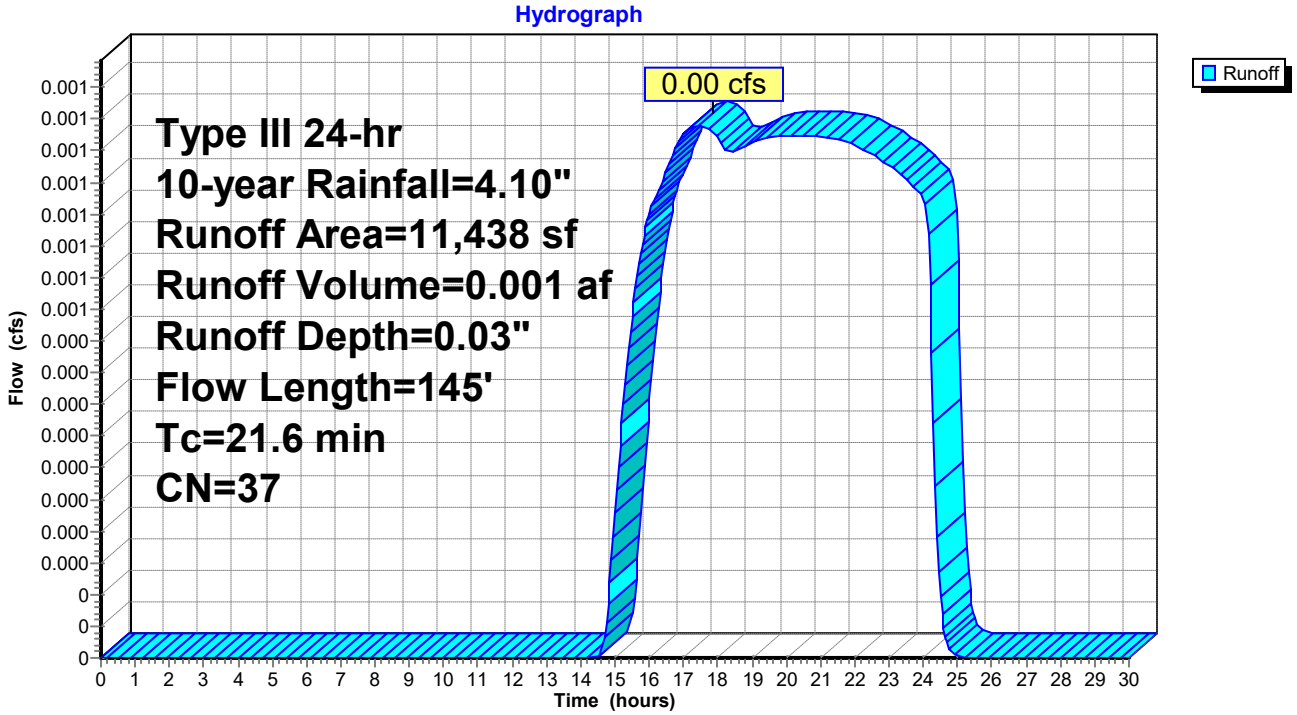
Runoff = 0.00 cfs @ 17.45 hrs, Volume= 0.001 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.10"

Area (sf)	CN	Description
6,790	30	Woods, Good, HSG A
4,025	39	>75% Grass cover, Good, HSG A
623	96	Gravel surface, HSG A
11,438	37	Weighted Average
11,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	70	0.0150	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.80"
1.0	40	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.2	35	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.6	145	Total			

Subcatchment P-1: POI1 southern PL



Summary for Subcatchment P-2: POI2 northwest PL

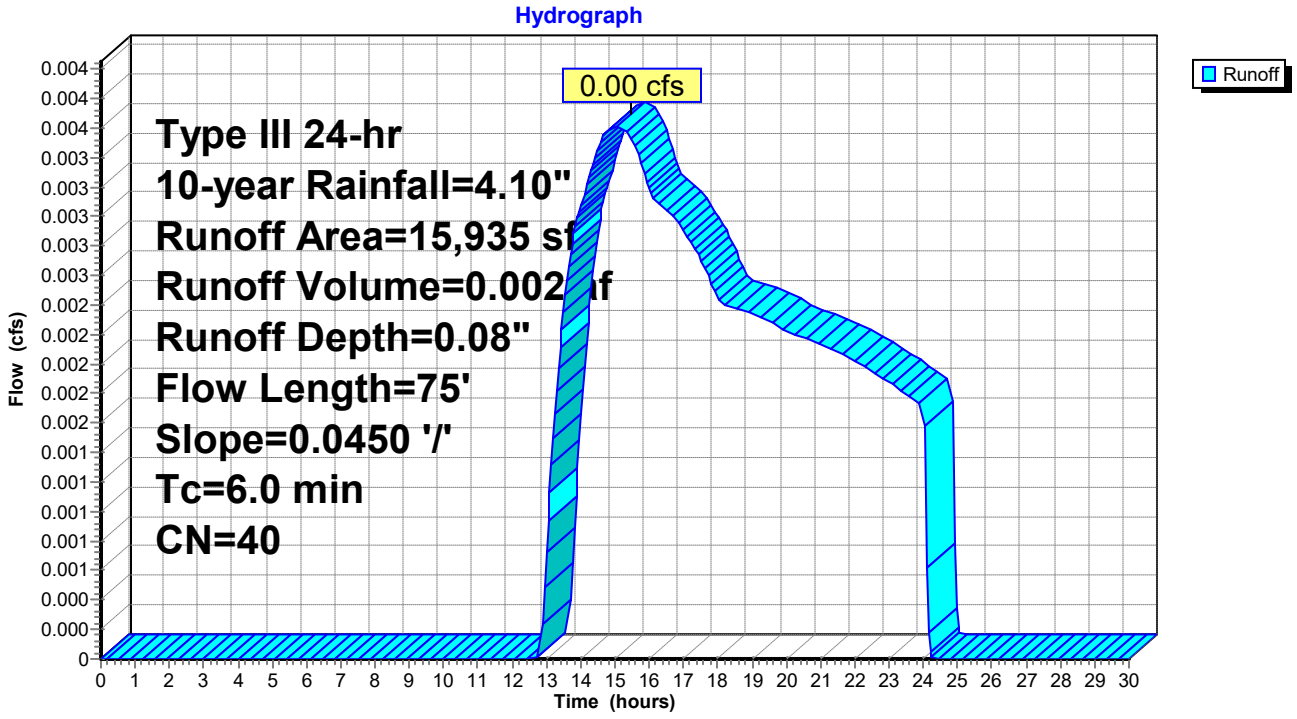
Runoff = 0.00 cfs @ 15.04 hrs, Volume= 0.002 af, Depth= 0.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.10"

	Area (sf)	CN	Description
*	168	98	Concrete, HSG A
*	116	98	Walkway, HSG A
	543	96	Gravel surface, HSG A
	11,274	39	>75% Grass cover, Good, HSG A
	518	39	>75% Grass cover, Good, HSG A
	570	39	>75% Grass cover, Good, HSG A
	49	39	>75% Grass cover, Good, HSG A
	2,697	30	Woods, Good, HSG A
	15,935	40	Weighted Average
	15,651		98.22% Pervious Area
	284		1.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	75	0.0450	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.80"

Subcatchment P-2: POI2 northwest PL



Summary for Subcatchment P-3a:

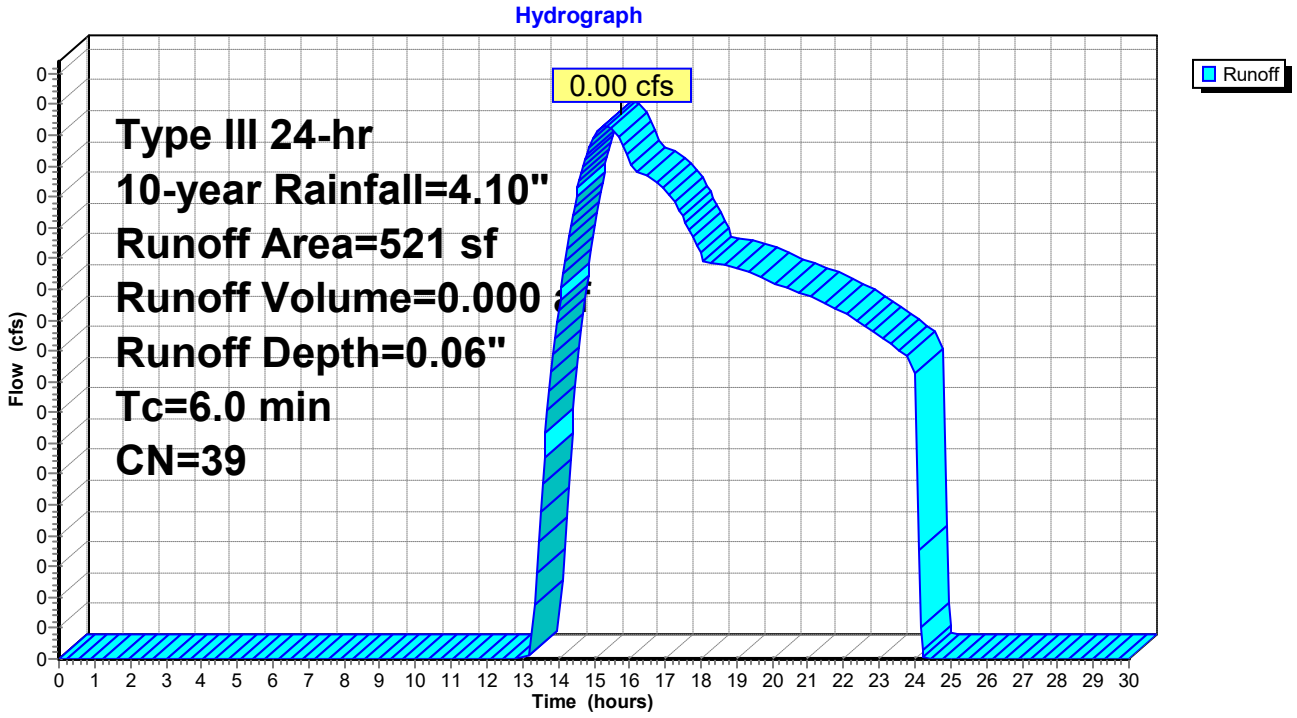
Runoff = 0.00 cfs @ 15.35 hrs, Volume= 0.000 af, Depth= 0.06"
Routed to Pond PND1 : SC310 Chambers

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.10"

Area (sf)	CN	Description
521	39	>75% Grass cover, Good, HSG A
521		100.00% Pervious Area

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

Subcatchment P-3a:



Summary for Subcatchment P-3b: Parking

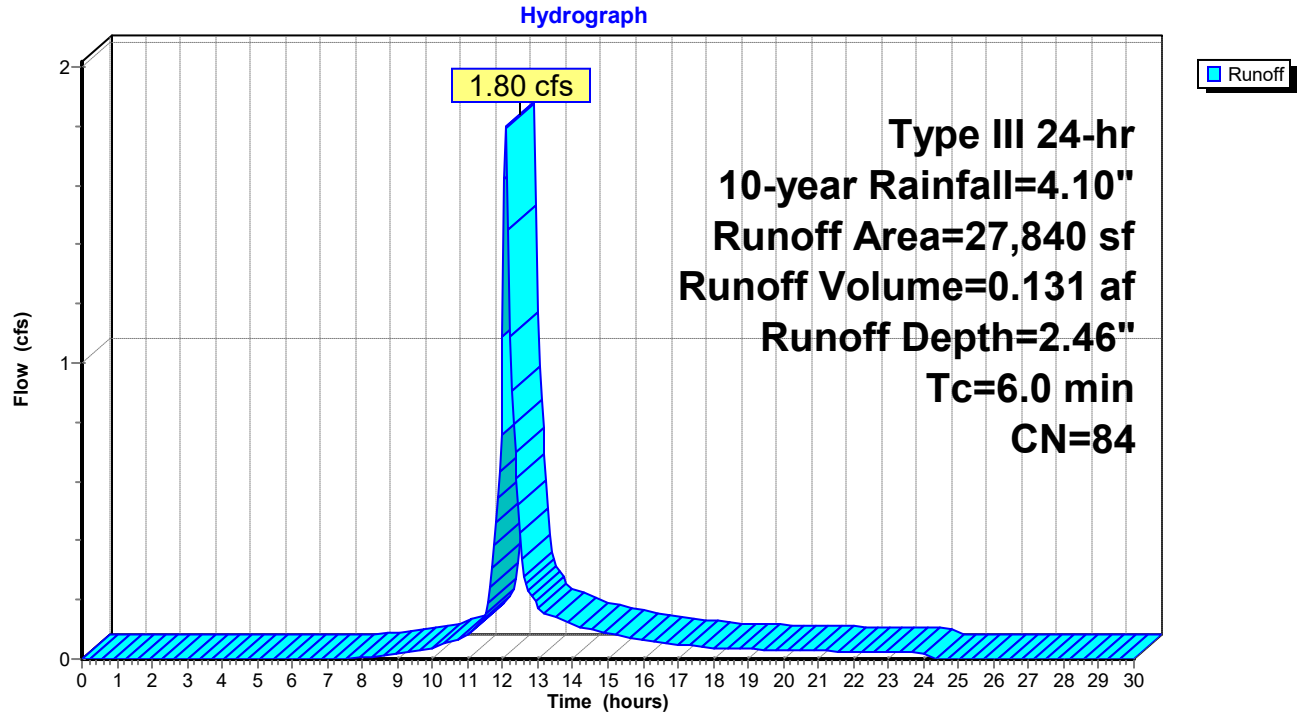
Runoff = 1.80 cfs @ 12.09 hrs, Volume= 0.131 af, Depth= 2.46"
Routed to Pond PND2 : Raingarden

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.10"

	Area (sf)	CN	Description
	179	39	>75% Grass cover, Good, HSG A
	85	39	>75% Grass cover, Good, HSG A
	703	39	>75% Grass cover, Good, HSG A
	95	39	>75% Grass cover, Good, HSG A
	179	39	>75% Grass cover, Good, HSG A
	5,122	39	>75% Grass cover, Good, HSG A
	583	96	Gravel surface, HSG A
	18,854	98	Paved parking, HSG A
*	1,702	98	Walkway, HSG A
*	338	98	Concrete, HSG A
	27,840	84	Weighted Average
	6,946		24.95% Pervious Area
	20,894		75.05% Impervious Area

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

Subcatchment P-3b: Parking



Summary for Subcatchment P-3c: to Fisherville Rd

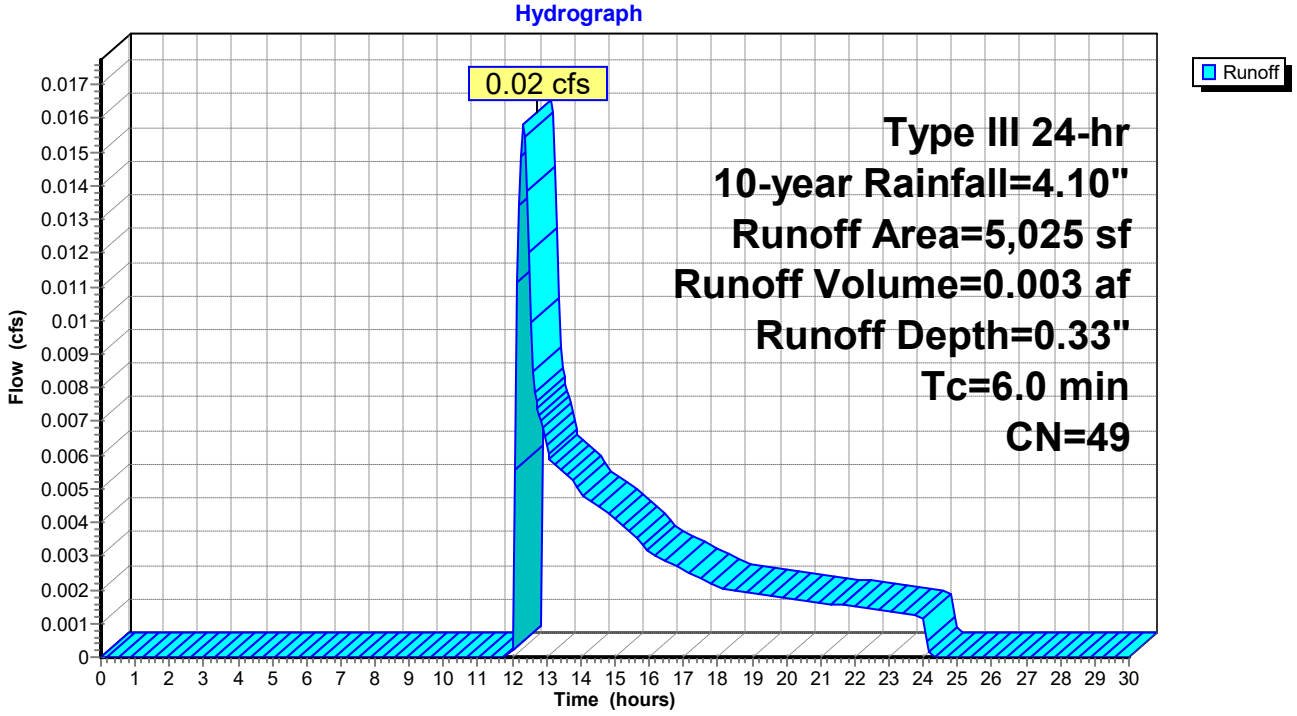
Runoff = 0.02 cfs @ 12.33 hrs, Volume= 0.003 af, Depth= 0.33"
Routed to Link POI3 : Fisherville Rd

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.10"

	Area (sf)	CN	Description
	25	30	Woods, Good, HSG A
	1,189	39	>75% Grass cover, Good, HSG A
	1,705	39	>75% Grass cover, Good, HSG A
	1,234	39	>75% Grass cover, Good, HSG A
	709	98	Paved parking, HSG A
*	163	98	Walkway, HSG A
	5,025	49	Weighted Average
	4,153		82.65% Pervious Area
	872		17.35% Impervious Area

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

Subcatchment P-3c: to Fisherville Rd



Summary for Subcatchment P-4: POI4 southeast PL

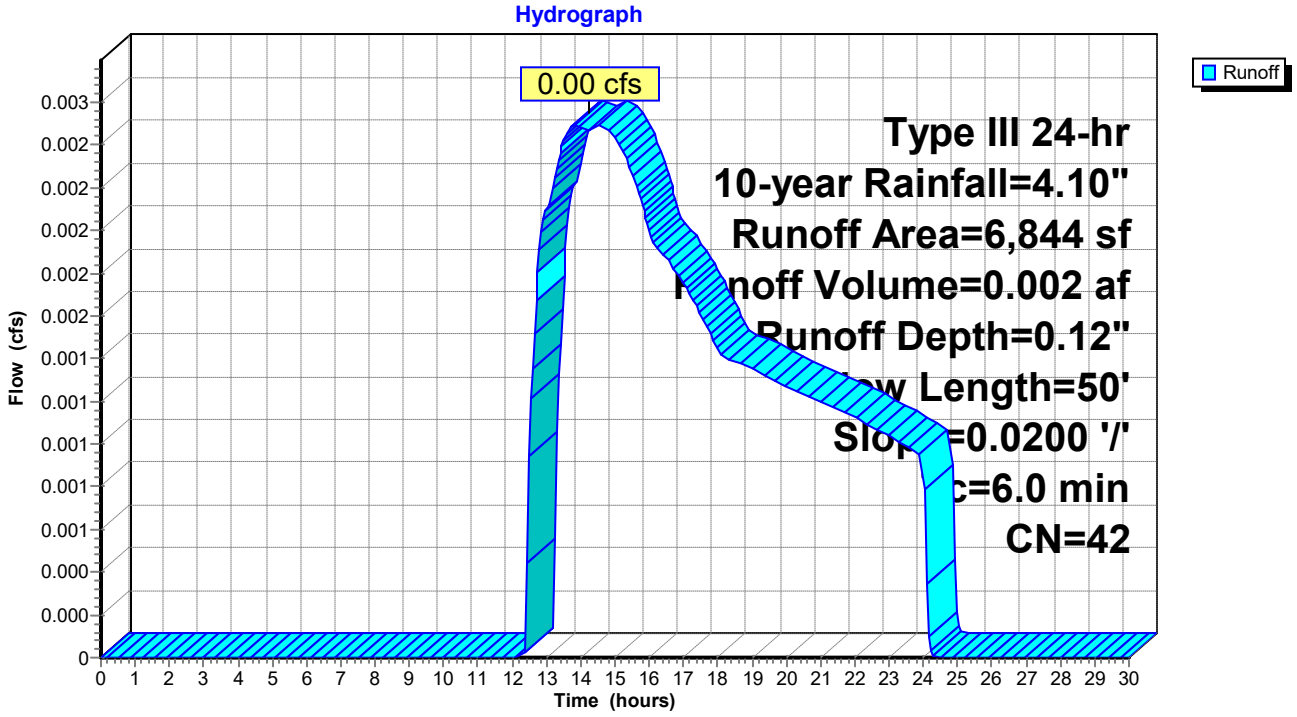
Runoff = 0.00 cfs @ 13.81 hrs, Volume= 0.002 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.10"

	Area (sf)	CN	Description
	1,041	30	Woods, Good, HSG A
	72	30	Woods, Good, HSG A
*	570	98	Walkway, HSG A
	5,086	39	>75% Grass cover, Good, HSG A
	75	39	>75% Grass cover, Good, HSG A
	6,844	42	Weighted Average
	6,274		91.67% Pervious Area
	570		8.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0200	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.80"

Subcatchment P-4: POI4 southeast PL



Summary for Pond PND1: SC310 Chambers

Inflow Area = 0.318 ac, 96.24% Impervious, Inflow Depth = 3.72" for 10-year event
Inflow = 1.20 cfs @ 12.09 hrs, Volume= 0.099 af
Outflow = 0.25 cfs @ 12.51 hrs, Volume= 0.099 af, Atten= 79%, Lag= 25.2 min
Discarded = 0.25 cfs @ 12.51 hrs, Volume= 0.099 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond PND2 : Raingarden

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 343.38' @ 12.51 hrs Surf.Area= 1,960 sf Storage= 986 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 20.3 min (772.0 - 751.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	342.50'	1,358 cf	**32.58'W x 60.16'L x 2.33'H Field A** 4,574 cf Overall - 1,179 cf Embedded = 3,394 cf x 40.0% Voids
#2A	343.00'	1,179 cf	**ADS_StormTech SC-310 +Cap** x 80 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 80 Chambers in 10 Rows
		2,537 cf	Total Available Storage

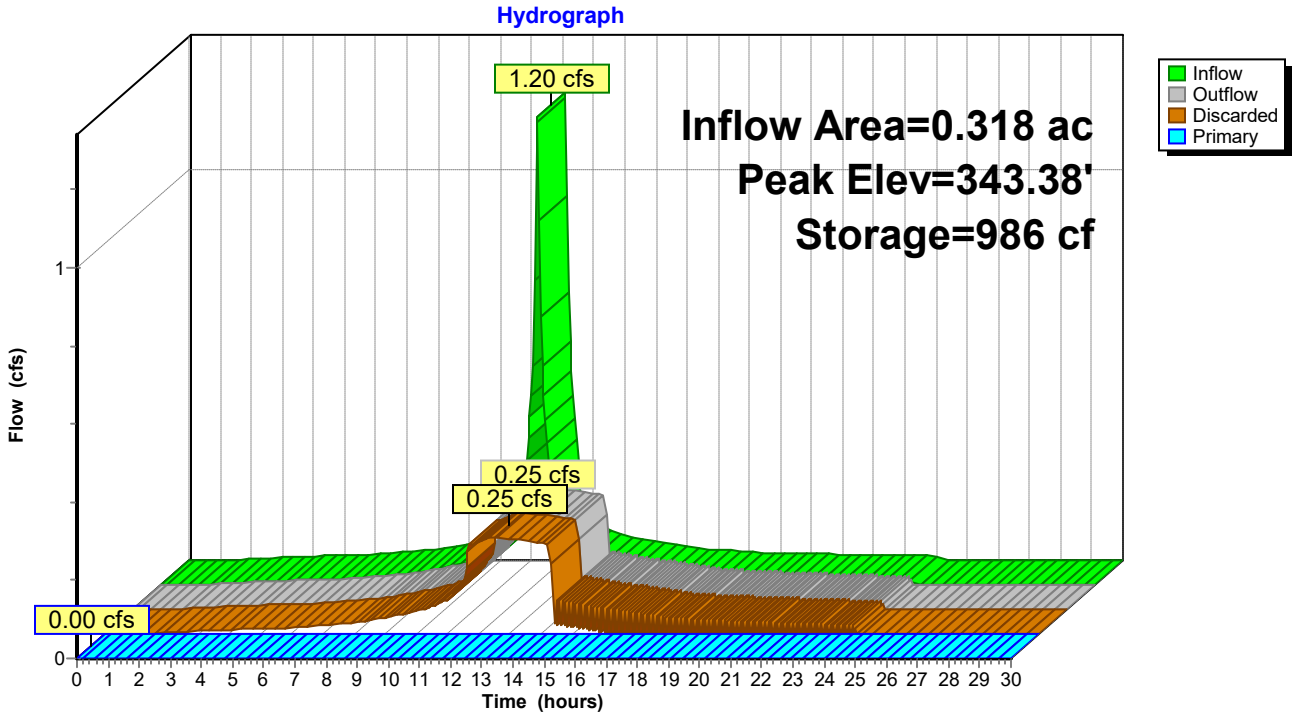
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	342.50'	**5.000 in/hr Exfiltration over Wetted area**
#2	Primary	343.10'	**12.0" Round Culvert** L= 17.0' Ke= 0.500 Inlet / Outlet Invert= 343.10' / 342.70' S= 0.0235 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	343.48'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.25 cfs @ 12.51 hrs HW=343.38' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=342.50' TW=341.50' (Dynamic Tailwater)
↑**2=Culvert** (Controls 0.00 cfs)
↑**3=Orifice/Grate** (Controls 0.00 cfs)

Pond PND1: SC310 Chambers



Summary for Pond PND2: Raingarden

Inflow Area = 0.957 ac, 82.09% Impervious, Inflow Depth = 1.64" for 10-year event
Inflow = 1.80 cfs @ 12.09 hrs, Volume= 0.131 af
Outflow = 0.30 cfs @ 12.58 hrs, Volume= 0.131 af, Atten= 83%, Lag= 29.5 min
Discarded = 0.30 cfs @ 12.58 hrs, Volume= 0.131 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link POI3 : Fisherville Rd

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 342.88' @ 12.58 hrs Surf.Area= 1,988 sf Storage= 1,953 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 55.4 min (874.1 - 818.7)

Volume	Invert	Avail.Storage	Storage Description
#1	341.50'	4,694 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

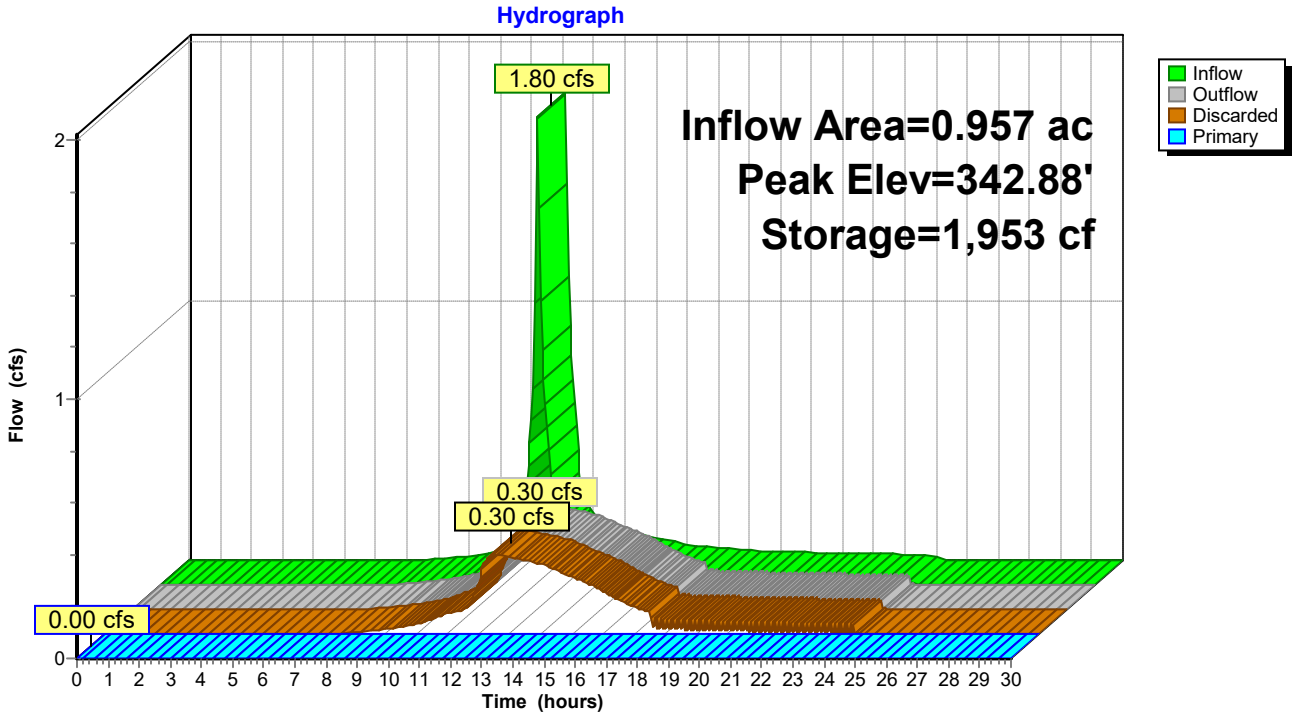
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
341.50	711	123.0	0	0	711
342.00	1,319	163.0	500	500	1,624
342.50	1,695	187.0	752	1,251	2,298
343.00	2,083	200.0	943	2,194	2,710
343.50	2,497	213.0	1,143	3,338	3,150
344.00	2,935	225.0	1,357	4,694	3,582

Device	Routing	Invert	Outlet Devices
#1	Primary	339.00'	**15.0" Round Culvert** L= 99.0' Ke= 0.500 Inlet / Outlet Invert= 339.00' / 338.50' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	343.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	341.50'	**5.000 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.30 cfs @ 12.58 hrs HW=342.88' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.30 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=341.50' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.00 cfs of 6.68 cfs potential flow)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond PND2: Raingarden

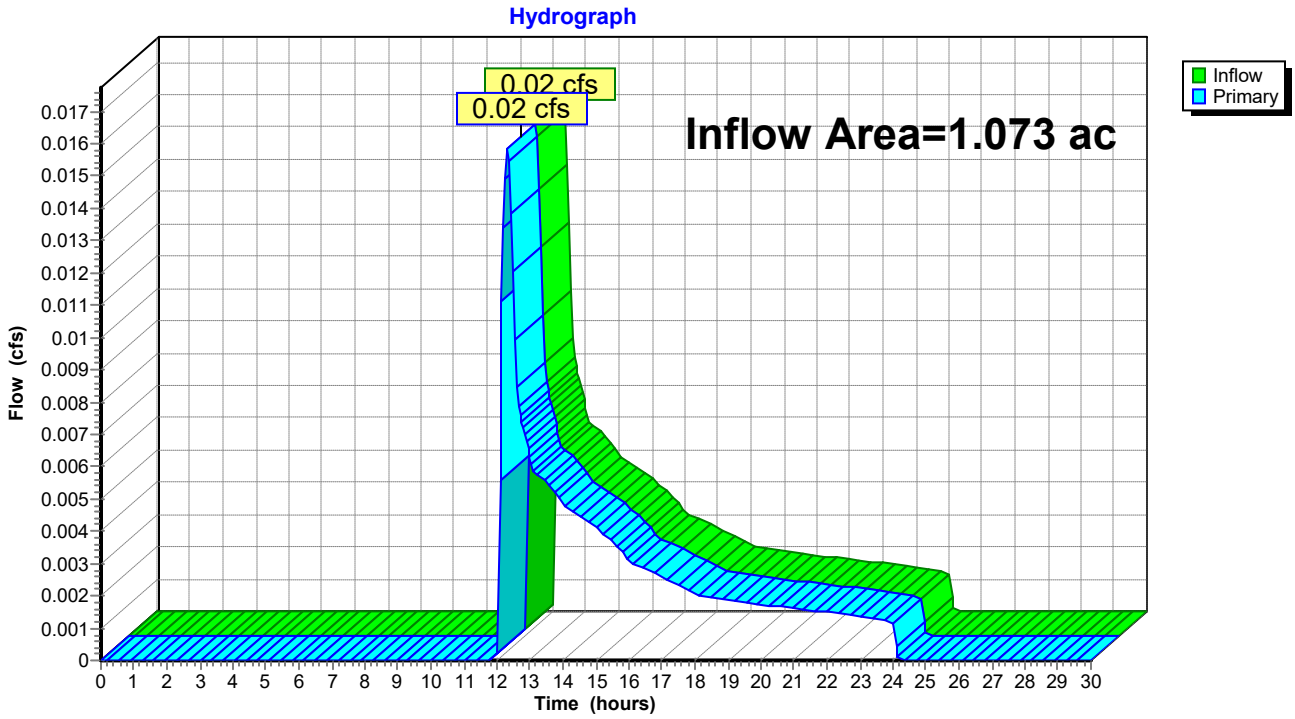


Summary for Link POI3: Fisherville Rd

Inflow Area = 1.073 ac, 75.13% Impervious, Inflow Depth = 0.04" for 10-year event
Inflow = 0.02 cfs @ 12.33 hrs, Volume= 0.003 af
Primary = 0.02 cfs @ 12.33 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link POI3: Fisherville Rd



BMP WORKSHEETS

INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **PND1 - Subsurface Gallery (Stormtech SC-310)**

Enter the type of infiltration practice (such as basin, trench) and the node name in the drainage analysis, if applicable.

yes		Have you reviewed Env-Wq 1508.07(a) to ensure that infiltration is allowed?	**← yes**
0.32	ac	A = Area draining to the practice	
0.31	ac	A_I = Impervious area draining to the practice	
0.96	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.92	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.29	ac-in	WQV= 1" x Rv x A	
1,058	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
264	cf	25% x WQV (check calc for sediment forebay volume)	
not required		Method of pretreatment? (not required for clean or roof runoff)	
N/A	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
1,139	cf	V = Volume[1] (attach a stage-storage table)	**≥ WQV**
1,960	sf	A_{SA} = Surface area of the bottom of the pond	
5.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
1.3	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
342.50	feet	E_{BTM} = Elevation of the bottom of the basin	
338.50	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
337.00	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
4.00	feet	D_{SHWT} = Separation from SHWT	**≥ *** [3]
5.5	feet	D_{ROCK} = Separation from bedrock	**≥ *** [3]
2.0	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	**≥ 24"**
N/A	ft	D_T = Depth of trench, if trench proposed	**4 - 10 ft**
N/A	Yes/No	If a trench or underground system is proposed, has observation well been provided?	**←yes**
N/A		If a trench is proposed, does material meet Env-Wq 1508.07(k)(2) requirements.[4]	**← yes**
N/A	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	**← yes**
N/A	:1	If a basin is proposed, pond side slopes.	**≥3:1**
343.38	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
343.80	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
344.83	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	**← yes**
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	**← yes**

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Stage-Area-Storage for Pond PND1: SC310 Chambers

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
342.50	1,960	0
342.55	1,969	39
342.60	1,979	78
342.65	1,988	118
342.70	1,997	157
342.75	2,007	196
342.80	2,016	235
342.85	2,025	274
342.90	2,034	314
342.95	2,044	353
343.00	2,053	392
343.05	2,062	472
343.10	2,072	552
343.15	2,081	632
343.20	2,090	711
343.25	2,099	789
343.30	2,109	867
343.35	2,118	944
343.40	2,127	1,019
343.45	2,136	1,094
343.50	2,146	1,168
343.55	2,155	1,241
343.60	2,164	1,313
343.65	2,174	1,383
343.70	2,183	1,453
343.75	2,192	1,521
343.80	2,201	1,587
343.85	2,211	1,652
343.90	2,220	1,715
343.95	2,229	1,775
344.00	2,238	1,834
344.05	2,248	1,889
344.10	2,257	1,941
344.15	2,266	1,989
344.20	2,276	2,034
344.25	2,285	2,077
344.30	2,294	2,118
344.35	2,303	2,158
344.40	2,313	2,197
344.45	2,322	2,237
344.50	2,331	2,276
344.55	2,340	2,315
344.60	2,350	2,354
344.65	2,359	2,393
344.70	2,368	2,433
344.75	2,378	2,472
344.80	**2,387**	**2,511**

INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **PND2 - Raingarden**

Enter the type of infiltration practice (such as basin, trench) and the node name in the drainage analysis, if applicable.

yes		Have you reviewed Env-Wq 1508.07(a) to ensure that infiltration is allowed?	**← yes**
0.64	ac	A = Area draining to the practice	
0.48	ac	A_I = Impervious area draining to the practice	
0.75	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.73	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.46	ac-in	WQV= 1" x Rv x A	
1,683	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
421	cf	25% x WQV (check calc for sediment forebay volume)	
2'Wx9"D stone apron		Method of pretreatment? (not required for clean or roof runoff)	
N/A	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
4,125	cf	V = Volume[1] (attach a stage-storage table)	**≥ WQV**
663	sf	A_{SA} = Surface area of the bottom of the pond	
5.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
6.1	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
341.50	feet	E_{BTM} = Elevation of the bottom of the basin	
338.50	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
337.00	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
3.00	feet	D_{SHWT} = Separation from SHWT	**≥ *** [3]
4.5	feet	D_{ROCK} = Separation from bedrock	**≥ *** [3]
2.0	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	**≥ 24"**
N/A	ft	D_T = Depth of trench, if trench proposed	**4 - 10 ft**
N/A	Yes/No	If a trench or underground system is proposed, has observation well been provided?	**←yes**
N/A		If a trench is proposed, does material meet Env-Wq 1508.07(k)(2) requirements.[4]	**← yes**
Yes	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	**← yes**
4.0	:1	If a basin is proposed, pond side slopes.	**≥3:1**
342.88	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
343.78	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
344.00	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	**← yes**
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	**← yes**

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Stage-Area-Storage for Pond PND2: Raingarden

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
341.50	711	711	0
341.55	763	791	37
341.60	818	873	76
341.65	874	958	119
341.70	932	1,046	164
341.75	992	1,136	212
341.80	1,053	1,228	263
341.85	1,117	1,323	317
341.90	1,182	1,421	375
341.95	1,250	1,521	436
342.00	1,319	1,624	500
342.05	1,354	1,687	567
342.10	1,390	1,752	635
342.15	1,427	1,817	706
342.20	1,464	1,883	778
342.25	1,501	1,950	852
342.30	1,539	2,018	928
342.35	1,577	2,086	1,006
342.40	1,616	2,156	1,086
342.45	1,655	2,227	1,168
342.50	1,695	2,298	1,251
342.55	1,732	2,338	1,337
342.60	1,769	2,378	1,424
342.65	1,807	2,419	1,514
342.70	1,845	2,460	1,605
342.75	1,884	2,501	1,698
342.80	1,923	2,542	1,794
342.85	1,962	2,584	1,891
342.90	2,002	2,626	1,990
342.95	2,042	2,668	2,091
343.00	2,083	2,710	2,194
343.05	2,123	2,753	2,299
343.10	2,163	2,796	2,406
343.15	2,203	2,839	2,516
343.20	2,244	2,883	2,627
343.25	2,285	2,927	2,740
343.30	2,327	2,971	2,855
343.35	2,369	3,015	2,973
343.40	2,411	3,060	3,092
343.45	2,454	3,105	3,214
343.50	2,497	3,150	3,338
343.55	2,539	3,192	3,463
343.60	2,582	3,234	3,591
343.65	2,625	3,277	3,722
343.70	2,668	3,320	3,854
343.75	2,712	3,363	3,988
343.80	2,756	3,406	4,125
343.85	2,800	3,450	4,264
343.90	2,845	3,494	4,405
343.95	2,890	3,538	4,548
344.00	**2,935**	**3,582**	**4,694**

NRCS WEB SOIL SURVEY

Map Scale: 1:978 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 45 90 180 270

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Merrimack and Belknap Counties, New Hampshire
Survey Area Data: Version 31, Sep 10, 2025

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

Date(s) aerial images were photographed: Oct 6, 2022—Oct 22, 2022

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
613A	Croghan loamy fine sand, 0 to 8 percent slopes, wooded	A	0.8	36.3%
789B	Champlain-Urban land complex, 0 to 8 percent slopes	A	1.4	63.7%
Totals for Area of Interest			**2.2**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

TEST PIT RESULTS

EcoSystems
LAND PLANNING

May 28, 2026

Nobis Group
18 Chenell Drive
Concord, New Hampshire

Via Email to: cnadeau@nobis-group.com

Re: Estimation of Seasonal High Water Table (ESHWT) for Soil Test Pits Located at 43 Fisherville Road, Concord, NH

On May 27, 2026, the undersigned observed the soil test pits excavated at the locations provided by your office. The purpose of the investigation was to estimate the Seasonal High Water Table (ESHWT) at each test pit location. Our findings are summarized below.

The upper approximately 3 feet of Test Pits 1, 2, and 3 showed evidence of substantial prior disturbance, including buried debris and abandoned utilities, such as water and electric lines. Determining the full limits or extent of this disturbed or augmented soil was outside the scope of this investigation. As a result, the upper portions of these test pits could not be reliably described using standard USDA soil profile characteristics, and complete soil horizon descriptions are not provided for those disturbed intervals.

Below the disturbed zone, TP-1, TP-2, and TP-3 exhibited soil conditions generally similar to those observed in TP-4 and TP-5. TP-6 differed from the other test pits due to the coarser sand observed, as documented in the table below.

Test Pit	4	ESHWT:	7.5'	Obs. Water:	None	Date:	05/27/26
Depth	**Horizon**	**Color**	**Texture**	**Structure**	**Consistence**	**Roots/Redox**	**Comments**
1.6'	A	10YR 3/2	Organic	Massive	Very Friable	Roots	Many/Fine
2.8'	B1	10YR 4/6	Loamy Sand	Massive	Very Friable	Roots	Few/Fine
3.8'	B2	10YR 6/4	Sandy Loam	S.A. Blocky	Friable	Roots	Common/Coarse
7.5'	C	10YR 5/2	Fine Sand	Massive	Very Friable		Few/Medium
9'	C	10YR 5/2	Silt	A. Blocky	Firm	Redox: 10YR4/6	Many/Medium

EcoSystems
LAND PLANNING

Test Pit	5	ESHWT:	7.5'	Obs. Water:	None	Date:	05/27/26
Depth	**Horizon**	**Color**	**Texture**	**Structure**	**Consistence**	**Roots/Redox**	**Comments**
1.1'	A	10YR 3/2	Organic	Massive	Very Friable	Roots	Many/Fine
2'	B1	10YR 4/6	Loamy Sand	Massive	Very Friable	Roots	Few/Fine
3.8'	B2	10YR 6/4	Sandy Loam	S.A. Blocky	Friable	Roots	Common/Coarse
7.5'	C	10YR 5/2	Fine Sand	Massive	Very Friable		Few/Medium
9'	C	10YR 5/2	Silt	A. Blocky	Firm	Redox: 10YR4/6	Many/Medium

Test Pit	6	ESHWT:	8'	Obs. Water:	None	Date:	05/27/26
Depth	**Horizon**	**Color**	**Texture**	**Structure**	**Consistence**	**Roots/Redox**	**Comments**
1.3'	A	10YR 3/1	Organic	Massive	Very Friable	Roots	Many/Fine
2.4'	B1	10YR 4/6	Loamy Sand	Massive	Loose	Roots	Few/Fine
8'	B2	10YR 5/4	Sand	Massive	Loose	Roots	Common/Coarse

We trust that this information is adequate for your purposes. If you have any questions or concerns, please do not hesitate to contact us.

Sincerely,

John St. John

NEW HAMPSHIRE
Designer
of
Subsurface Disposal
Systems
* * *
John St. John
No. 1332
Water Supply & Pollution Control

INSPECTION AND MAINTENANCE MANUAL

INSPECTION AND MAINTENANCE PROCEDURES

RESPONSIBLE PARTIES

CATCH Neighborhood Housing
105 Loudon Road, Unit #1
Concord, NH 03301
(603) 223-0810

INSPECTION SCHEDULE

Catch Basins, Drain Manholes, and Drain Piping	Each catch basin and drain manhole will be inspected when the system is installed and prior to directing storm water to it. Structure inverts will be measured and documented at this time as a baseline reference for future inspections. Catch basins, drain manholes, and connecting piping will be inspected annually (minimum). Inspection results will be recorded using the Inspection Forms included at the end of this document.
Subsurface Gallery	The subsurface gallery will be inspected when the system is installed and prior to directing storm water to it. The isolator row will be inspected via the inspection port annually (minimum). If, upon visual inspection, it is found that sediment has accumulated, a stadia rod will be inserted to determine the depth of sediment. Inlet/outlet structures and manifolds will be inspected annually (minimum). Inspection results will be recorded using the Inspection Forms included at the end of this document.
Raingarden/ Infiltration Basin	Inlets, outlets, and riprap outlet protection will be inspected annually (minimum). Infiltration basin will be inspected at least twice annually for erosion, sediment accumulation, vegetation loss, and presence of invasive species. At least once annually the system should be inspected for drawdown time. Inspection results will be recorded using the Inspection Forms included at the end of this document.

MAINTENANCE PROCEDURES

Catch Basins, Drain Manholes, and Drain Piping	Debris will be removed from catch basin inlet grates, and inlet/outlet pipes inside the structures. Sediment will be removed from the interior of the structures and connecting pipes by vactor truck. Water and sediment from cleanout procedures must be disposed of in accordance with federal, state, and local regulations at an approved off-site disposal facility, and must not be discharged into sanitary sewer systems. Maintenance will be recorded in the Inspection and Maintenance Log included at the end of this document.
Subsurface Gallery	The subsurface chamber gallery shall be maintained in accordance with the attached manufacturer recommendations. When the average depth of sediment in the isolator row exceeds 3 inches, clean out will be performed with the JetVac process. Trash and debris will be removed from the inlet/outlet structures when observed during inspections. Maintenance will be recorded in the Inspection and Maintenance Log included at the end of this document.
Raingarden/ Infiltration Basin	The interior side slope vegetation shall be maintained in a healthy condition. Trash and debris will be removed from the basin when observed during inspection. Accumulated sediment will be removed when it affects the capacity of the basin. Repairs to inlet/outlet structures, rip rap outlets, and side slopes will be made when required. During the drawdown inspection, if drawdown is greater than 72 hours, a qualified professional will be consulted to restore infiltration function of the system. At a minimum, 85% of the soil surface should be vegetated. If erosion is evident, eroded areas will be repaired and reseeded with permanent seed mix. Invasive species will be removed as required. Maintenance will be recorded in the Inspection and Maintenance Log included at the end of this document.

RECORD KEEPING

Record keeping and inspection/maintenance activity will begin upon completion of all terrain activities that direct storm water to the practices described herein. All records, including records from maintenance subcontractors, will be maintained by CATCH Neighborhood Housing. Photo documentation of inspections is required.

Should invasive species begin to grow in the Infiltration Basin or Sediment Forebay, refer to the guidance regarding “Methods for Disposing of Non-Native Invasive Plants” prepared by the University of New Hampshire Cooperative Extension included at the end of this document. Herbicides will not be applied. Winter maintenance activities will include plowing snow and applying sand in operation areas.

Inspection Checklist

General Information	
Date of Inspection	
Inspector's Name(s)	
Inspector's Title(s)	
Type of Inspection: ❑ Routine (annual) ❑ Post-storm event _____inches	

❑ Inspection of Catch Basins/Drain Manholes/Drain Piping Performed

❑ No Follow Up Action Required ❑ Follow Up Action Required as Detailed Below

Location	Visible Damage?	Maintenance Required? Provide detail below
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No

Corrective Action Needed and Notes

❑ Inspection of Subsurface Gallery

❑ No Follow Up Action Required ❑ Follow Up Action Required as Detailed Below

Location	Visible Damage?	Maintenance Required? Provide detail below
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No

Corrective Action Needed and Notes

❑ Inspection of Raingarden/Infiltration Basin ❑ No Follow Up Action Required ❑ Follow Up Action Required as Detailed Below		
Location	Visible Damage?	Maintenance Required? Provide detail below
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
	❑Yes ❑No	❑Yes ❑No
Corrective Action Needed and Notes		

Inspection and Maintenance Log

Date:		
Performed by:		
Catch Basins /Drain Manholes/Piping ❑Inspection ❑Maintenance	Subsurface Gallery ❑Inspection ❑Maintenance	Infiltration Basin ❑Inspection ❑Maintenance

Date:		
Performed by:		
Catch Basins /Drain Piping/Outlet Rip Rap ❑Inspection ❑Maintenance	Subsurface Gallery ❑Inspection ❑Maintenance	Infiltration Basin ❑Inspection ❑Maintenance

Date:		
Performed by:		
Catch Basins /Drain Piping/Outlet Rip Rap ❑Inspection ❑Maintenance	Subsurface Gallery ❑Inspection ❑Maintenance	Infiltration Basin ❑Inspection ❑Maintenance

Date:		
Performed by:		
Catch Basins /Drain Piping/Outlet Rip Rap ❑Inspection ❑Maintenance	Subsurface Gallery ❑Inspection ❑Maintenance	Infiltration Basin ❑Inspection ❑Maintenance

Isolator® Row Plus
O&M Manual

ADS StormTech™

The Isolator® Row Plus

Introduction

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row Plus is a technique to inexpensively enhance Total Suspended Solids (TSS), Total Phosphorus (TP), Total Petroluem Hydrocarbons (TPH) and Total Nitrogen (TN) removal with easy access for inspection and maintenance.

The Isolator Row Plus

The Isolator Row Plus is a row of StormTech chambers, either SC-160, SC-310, DC-780, SC-800, MC-3500, MC-4500 or MC-7200 models, are lined with filter fabric and connected to a closely located manhole for easy access. The fabric lined chambers provide for sediment settling and filtration as stormwater rises in the Isolator Row Plus and passes through the filter fabric. The open bottom chambers allow stormwater to flow vertically out of the chambers. Sediments are captured in the Isolator Row Plus protecting the adjacent stone and chambers storage areas from sediment accumulation.

ADS Isolator Row and Plus fabric are placed between the stone and the Isolator Row Plus chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during high pressure jetting.

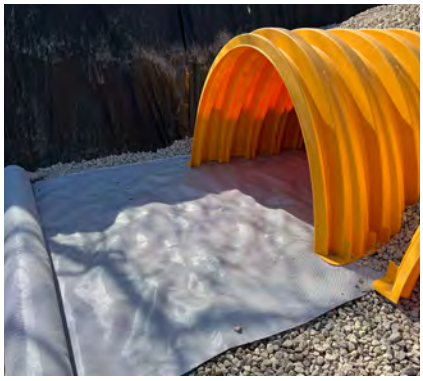
The Isolator Row Plus is designed to capture the “first flush” runoff and offers the versatility to be sized on a volume basis or a flow-rate basis. An upstream manhole provides access to the Isolator Row Plus and includes a high/low concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row Plus bypass through a manifold to the other chambers. This is achieved with an elevated bypass manifold or a high-flow weir. This creates a differential between the Isolator Row Plus row of chambers and the manifold to the rest of the system, thus allowing for settlement time in the Isolator Row Plus. After Stormwater flows through the Isolator Row Plus and into the rest of the chamber system it is either exfiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

The Isolator Row Plus Flamp™ is a flared end ramp apparatus attached to the inlet pipe on the inside of the chamber end cap. The FLAMP provides a smooth transition from pipe invert to fabric bottom. It is configured to improve chamber function performance by enhancing outflow of solid debris that would otherwise collect at the chamber's end, or more difficult to remove and require confined space entry into the chamber area. It also serves to improve the fluid and solid flow into the access pipe during maintenance and cleaning and to guide cleaning and inspection equipment back into the inlet pipe when complete.

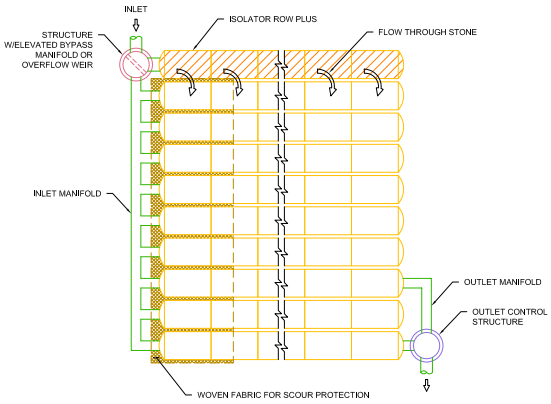
The Isolator Row Plus may be part of a treatment train system. The treatment train design and pretreatment device selection by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, StormTech recommend using the Isolator Row Plus to minimize maintenance requirements and maintenance costs.

Note: *See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row Plus.*

Looking down the Isolator Row Plus from the manhole opening, ADS Plus Fabric is shown between the chamber and stone base.



StormTech Isolator Row Plus with Overflow Structure (not to scale)



Isolator Row Plus Inspection/Maintenance

Inspection

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row Plus should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

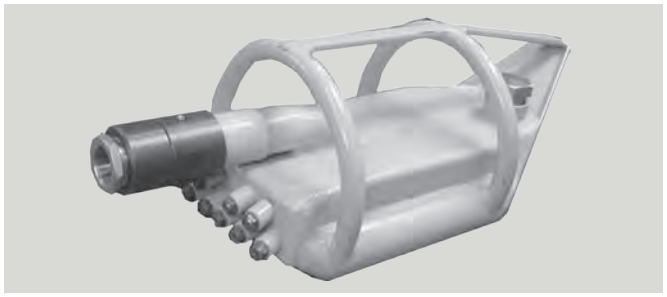
The Isolator Row Plus incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3" (75 mm) throughout the length of the Isolator Row Plus, clean-out should be performed.

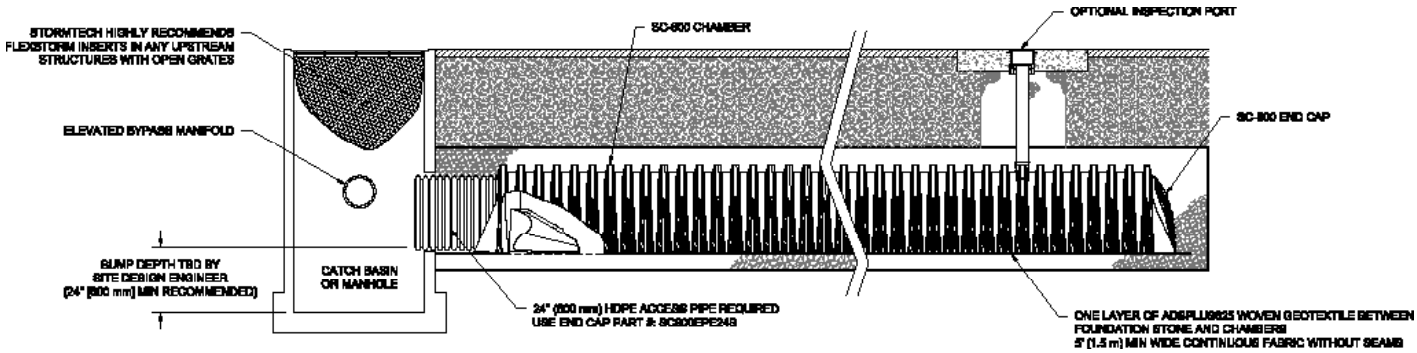
Maintenance

The Isolator Row Plus was designed to reduce the cost of periodic maintenance. By “isolating” sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entry.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row Plus while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45” are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. JetVac reels can vary in length. For ease of maintenance, ADS recommends Isolator Row Plus lengths up to 200' (61 m). **The JetVac process shall only be performed on StormTech Isolator Row Plus that have ADS Plus Fabric (as specified by StormTech) over their angular base stone.**



StormTech Isolator Row Plus (*not to scale*)



Isolator Row Plus Step By Step Maintenance Procedures

Step 1

Inspect Isolator Row Plus for sediment.

A) Inspection ports (if present)
   i. Remove lid from floor box frame
   ii. Remove cap from inspection riser
   iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.
   iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.

B) All Isolator Row Plus
   i. Remove cover from manhole at upstream end of Isolator Row Plus
   ii. Using a flashlight, inspect down Isolator Row Plus through outlet pipe
      1. Mirrors on poles or cameras may be used to avoid a confined space entry
      2. Follow OSHA regulations for confined space entry if entering manhole
   iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2.
   If not, proceed to Step 3.

Step 2

Clean out Isolator Row Plus using the JetVac process.

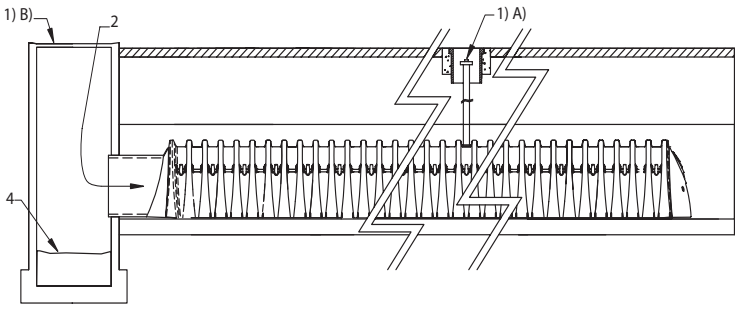
A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required

Step 3

Replace all caps, lids and covers, record observations and actions.

Step 4

Inspect & clean catch basins and manholes upstream of the StormTech system.



Sample Maintenance Log

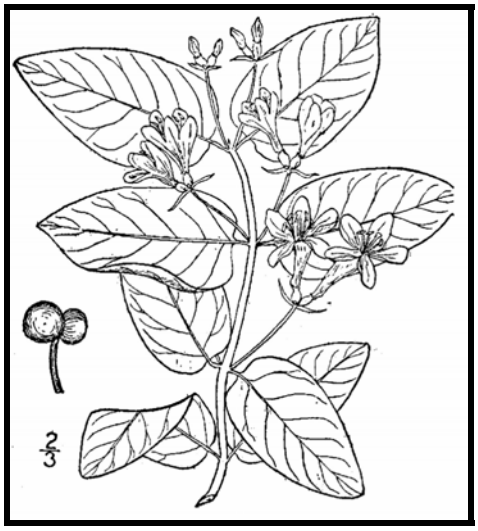
Date	Stadia Rod Readings		Sediment Depth (1)–(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row Plus, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

adspipe.com
800-821-6710

University of New Hampshire Cooperative Extension

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle
Lonicera tatarica
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

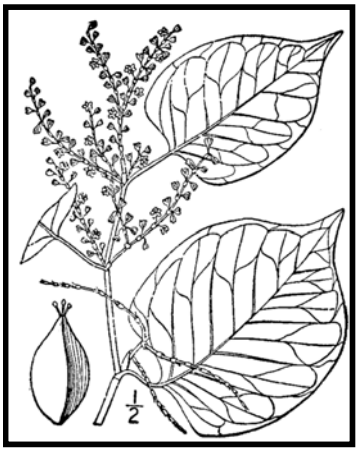
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag "head first" at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don't reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.

Be diligent looking for seedlings for *years* in areas where removal and disposal took place.

Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

<table>
<tr><th>Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">Norway maple
(Acer platanoides)
European barberry
(Berberis vulgaris)
Japanese barberry
(Berberis thunbergii)
autumn olive
(Elaeagnus umbellata)
burning bush
(Euonymus alatus)
Morrow's honeysuckle
(Lonicera morrowii)
Tatarian honeysuckle
(Lonicera tatarica)
showy bush honeysuckle
(Lonicera x bella)
common buckthorn
(Rhamnus cathartica)
glossy buckthorn
(Frangula alnus)</td><td rowspan="2">Fruit and Seeds
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Use as firewood.
▪ Make a brush pile.
▪ Chip.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip once all fruit has dropped from branches.
▪ Leave resulting chips on site and monitor.</td></tr>
<tr><td rowspan="2">oriental bittersweet
(Celastrus orbiculatus)
multiflora rose
(Rosa multiflora)</td><td rowspan="2">Fruits, Seeds, Plant Fragments
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Make a brush pile.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.</td></tr>
</table>

<table>
<tr><th>Non-Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">garlic mustard
(Alliaria petiolata)
spotted knapweed
(Centaurea maculosa)
▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling.
black swallow-wort
(Cynanchum nigrum)
▪ May cause skin rash. Wear gloves and long sleeves when handling.
pale swallow-wort
(Cynanchum rossicum)
giant hogweed
(Heracleum mantegazzianum)
▪ Can cause major skin rash. Wear gloves and long sleeves when handling.
dame’s rocket
(Hesperis matronalis)
perennial pepperweed
(Lepidium latifolium)
purple loosestrife
(Lythrum salicaria)
Japanese stilt grass
(Microstegium vimineum)
mile-a-minute weed
(Polygonum perfoliatum)</td><td rowspan="2">Fruits and Seeds
  </td><td>Prior to flowering
Depends on scale of infestation
Small infestation
▪ Pull or cut plant and leave on site with roots exposed.

Large infestation
▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting).
▪ Monitor. Remove any re-sprouting material.</td></tr>
<tr><td>During and following flowering
Do nothing until the following year or remove flowering heads and bag and let rot.

Small infestation
▪ Pull or cut plant and leave on site with roots exposed.

Large infestation
▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting).
▪ Monitor. Remove any re-sprouting material.</td></tr>
<tr><td>common reed
(Phragmites australis)
Japanese knotweed
(Polygonum cuspidatum)
Bohemian knotweed
(Polygonum x bohemicum)</td><td>Fruits, Seeds, Plant Fragments
Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn’t materially influence disposal activities.</td><td>Small infestation
▪ Bag all plant material and let rot.
▪ Never pile and use resulting material as compost.
▪ Burn.

Large infestation
▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile.
▪ Monitor and remove any sprouting material.
▪ Pile, let dry, and burn.</td></tr>
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