Major Site Plan Application

Smith Cemetery Expansion

September 2, 2025

List of Attachments

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PROJECT NARRATIVE

The existing 3.1-acre Smith cemetery is out of space for new burial plots, and as the Town of Windham grows, and ages, there is a need to expand the cemetery. The Town owns a large (23.95 ac) parcel that abuts the existing Smith Cemetery; most of the area proposed for expansion is already cleared and has suitable soils and grades for this use. The proposed expansion will provide space for 298 new family plots and 800 single burials, the latter in a Veterans Niche Wall and a Columbarium Niche Wall (see Attachment A for potential designs). A small (540 sf) building is also proposed to store maintenance equipment such as a mower and other landscaping equipment and materials.

Some modifications to the Sketch Plan for this project submitted in March have been made including:

- Elimination of the proposed access drive just to the south of the existing Smith Cemetery entrance because of its unnecessary length and the steep grades entering the expansion area
- Replacement of the initially proposed access drive with the existing informal access on the north side of the existing Smith Cemetery. The Town has obtained an access easement from the abutter to allow use of this piece of their property.

OWNER'S NAME, ADDRESS, AND PHONE NUMBER

The Town of Windham, 8 School Road, Windham, is the owner of the 23.95-acre property as documented in the attached deed (attachment C) as well as the 3.11-acre existing Smith Cemetery.

ABUTTING PROPERTY OWNERS

A list of abutting property owners is provided below. The site survey also shows the ownership of the abutting parcels.

Parcel Number	Property Address	Owner Name	Co-Owner Name	Owner Address	Owner City	Owner State	Owner Zip
012-049-000-000	509 GRAY RD	DAGNESE WILLIAM D III		509 GRAY ROAD	WINDHAM	ME	04062
012-049-002-000	513 GRAY RD	TOWN OF WINDHAM	SMITH CEMETERY	8 SCHOOL ROAD	WINDHAM	ME	04062
012-051-000-000	15 ROBERTS DR	GRANT TIMOTHY F &	GRANT CYNTHIA A	15 ROBERTS DRIVE	WINDHAM	ME	04062
012-051-A00-000	8 ROBERTS DR	ROBERTS BRIAN L &	ROBERTS SUSAN M	8 ROBERTS DRIVE	WINDHAM	ME	04062
012-052-000-000	270 WINDHAM CTR RD	PRESUMPSCOT REGIONAL	LAND TRUST INC	PO BOX 33	GORHAM	ME	04038
012-059-000-000	370 ROOSEVELT TR	CHURCH OF GOD		370 ROOSEVELT TRAIL	WINDHAM	ME	04062
012-059-L00-000	370 ROOSEVELT TR	CHURCH OF GOD		370 ROOSEVELT TR	WINDHAM	ME	04062
012-060-000-000	382 ROOSEVELT TR	WESCOTT STEVEN &	WESCOTT KAREN	382 ROOSEVELT TRAIL	WINDHAM	ME	04062
012-061-000-000	392 ROOSEVELT TR	HOPE KENNETH & AREE TRUSTEES	KENNETH & AREE HOPE REVOC LIV TRUST	4480 NORTH BUHACH ROAD	ATWATER	CA	95301
012-062-000-000	402 ROOSEVELT TR	PHUNSAWAT KHACHAPORN		402 ROOSEVELT TR	WINDHAM	ME	04062
046-013-000-000	408 ROOSEVELT TR	BABB BARRY O &	BABB KIMBERLY H	408 ROOSEVELT TRAIL	WINDHAM	ME	04062
046-013-A00-000	530 GRAY RD	WEBSTER STACEY H &	BABB KIMBERLY H	413 ROOSEVELT TRAIL	WINDHAM	ME	04062

COVENANTS OR DEED RESTRICTIONS

There are no known covenants or deed restrictions on the property.

EASEMENTS

The Town has an easement to use the existing gravel drive off Route 202 (Gray Rd.) to access the cemetery. A copy of this easement is included as Attachment D.

FINANCIAL CAPACITY

The estimated cost of constructing this project is $414,000 including a 20% contingency as detailed in the attached estimate (Attachment E). The Town of Windham has set aside funds for this project in its Capital Improvement Plan (CIP)

TECHNICAL CAPACITY

The team of professionals that have prepared this application includes Mark Arienti, P.E. Town Engineer for Windham and Amy Bell Segal, RLA, Senior Project Manager and Paul Ostrowski, P.E. Senior Project Engineer, both of Sebago Technics.

Sebago Technics, Inc. is a multi-disciplinary engineering firm that offers a wide range of services specializing in land development, planning, permitting, and engineering design services. Sebago maintains a staff of professionals to provide services in the areas of general civil engineering, road and utility design, construction management, permitting, landscape architecture, environmental services, and soil and wetlands science. Resumes of key personnel at Sebago are also enclosed within this Section (Attachment F).

UTILITIES

There is an existing 1-inch water service line to the existing Smith cemetery that is used for filling watering cans to water plantings at grave sites. It is not used for watering the lawns. A new seasonal 1.5-inch water service is proposed to be installed to provide water for the expansion area. Extension of the existing service is not feasible because it would bring water through an existing burial area. The water service is proposed to come off the water main along Rte. 302 where the subject property has frontage between 402 and 408 Roosevelt Trail (see attached Plan Set). The Town has received an ability to server letter from the Portland Water District (Attachment G).

There is no wastewater currently generated at the cemetery, and none will be generated by the expansion.

PROVISIONS FOR HANDLING SOLID WASTES

The only solid waste that may be generated is from flowers or other items periodically placed at the graves sites that required disposal after use. The existing cemetery has a couple trash cans that people can put waste material in that the Town maintenance personnel empty

and bring to the Public Works facility for dumpster disposal. A couple of extra containers will be located in the expansion area, and a 30'x18' maintenance shed that will be constructed to store lawn maintenance equipment, and there will be a bin to temporarily store cemetery waste prior to pickup for off-site disposal. The cemetery will not have any operations that produce hazardous or special waste.

LIGHTING

The proposed lighting for this project is limited to lighting for the flagpoles that will be installed for the Veteran's Columbarium and at the entrance to the maintenance shed. Electric service will be accessed from a utility pole between 402 and 408 Roosevelt Trail and then run underground first to the maintenance shed and then to the flagpoles. Another option that is being considered for the flagpole light is solar lighting.

LANDSCAPING

Sheet L-101 of the plan set is a Landscaping Plan that shows the location and type of plantings that will be installed as part of the project. Evergreens (such as fir, spruce or Juniper) will be planted along the property boundary where its closest to residences and a selection shade trees (red maple, linden, oak) and ornamentals shrubs (serviceberry, flowering dogwood, Hawthorne) will be planted along the access drives.

TRAFFIC

The ITE Trip Generation Manual, 11th Edition, indicates 1.23 trips per acre in the AM peak hour and 1.26 trips per acre for the AP Peak hour for the cemetery land category. With the proposed expansion having an area of about 2.75 acres, the peak hour traffic would be 3.38 trips in the AM hour and 3.46 in the PM hour. Based on experience, it is known that the traffic would be very minimal most of the time with the exceptions being Memorial Day, Veterans Day and Christmas Day.

The primary access to the proposed cemetery expansion will be via the existing gravel drive that is on the parcel that abuts the northwest corner of the existing cemetery (Map 46 Lot 13A). This access has been historically used as a secondary informal access to the existing cemetery. The access drive will be improved as part of this project per the attached plans. The Town has obtained an access easement with the owners of this property (Webster & Babb) to utilize this as an entrance. Trimming of limbs and other vegetation will be performed on the north-east bound side of Rte. 202 to ensure the sight distance when exiting the access drive is greater than the required 305 feet in this direction. The Sight Distance when exiting to the right is approximately 425 feet.

The existing main entrance to Smith Cemetery located just south of the proposed entrance to the expansion will also provide access to the new cemetery as well.

UNIQUE NATURAL AREAS AND SITE FEATURES

There is a large wetland area on the far eastern side of the project site that abuts Black Brook, but no development is proposed in or near to that area, and no other unique natural areas are shown in the project area. A Beginning with Habitat Map is attached (Attachment H). None of the proposed work is located in the wetland areas mapped on the site.

The proposed development is not located in an identified flood zone per the FEMA Flood Insurance Rate Map for the Town of Windham, 23005C0492F, 6/20/2024.

STORMWATER MANAGEMENT

The development is intended to expand the existing Smith Cemetery to provide additional burial and cremation storage areas. The proposed development will consist of constructing a 14-foot-wide paved roadway for approximately 1,300 linear feet. The development also proposes constructing landscaped areas, a veteran's memorial and columbaria. Construction will include grade changes to accommodate the design of the road and stormwater management. The disturbed area for the project is approximately 1.7 acres. A Stormwater Permit by Rule (PBR) from Maine DEP will be required for this project.

The site is tributary to Black Brook on the southeast side of the project area. Black Brook is tributary to the Presumpscot River which is tributary to Casco Bay. The site is not tributary to any Urban Impaired Streams or Lakes Most at Risk identified by the Maine Department of Environmental Protection (MDEP).

A Stormwater Management Report (Attachment I) has been prepared to address the standards of the Town of Windham Site Plan Approval Ordinance 120-802(A)(4). The project classifies as a Major Site Development per Town ordinance 120-805(A)(2)(c) as it will develop more than 1 acre of land. For stormwater treatment the proposed development includes two meadow buffers that meet the Maine Department of Environmental Protection (MDEP) Chapter 500 standards. The project will result in the creation of approximately 0.5 acres impervious area and a reduction of approximately 0.4 acres of developed area as a section of the property will be returned to a meadow condition.

The proposed development has been designed to manage stormwater runoff through Best Management Practices approved by MDEP. The proposed Stormwater BMP's will provide treatment to 98% (95% required) of the new impervious areas and 100% (80% required) of the new developed area. Runoff discharging from the site will be similar to the existing development conditions for the 2, 10 and 25-year storm events. The impact for any increase in peak flow rates is insignificant, as it does not change the peak elevation more than 2" in a 2-year storm and the areas with increased peak rates are all transferred to sheet flow before entering the wetlands. Additionally, erosion and sedimentation controls along with associated maintenance and

housekeeping procedures have been outlined to prevent unreasonable impacts on the site and to the surrounding environment.

ATTACHMENT A

APPLICATION FORM

Town of Windham
Planning Department:
8 School Road
Windham, Maine 04062
Tel: (207) 894-5960 ext. 2
Fax: (207) 892-1916 -
www.windhammaine.us

MAJOR SITE PLAN REVIEW APPLICATION

FEES FOR MAJOR SITE PLAN REVIEW	**APPLICATION FEE:** (No Bldg.) (W/Bldg.: $25/1,000 SF up to 5,000 SF) **REVIEW ESCROW: (GFA)** 2,000 SF - 5,000 SF = $2,000 5,000 SF - 15,000 SF = $3,000 15,000 SF - 35,000 SF = $4,000 Over 35,000 SF = $5,000 No Building = $2,000	☐ $1,3000.00 ☐ $_____ ☐ $_____ ☐ $_____ ☐ $_____ ☐ $_____ ☐ $_____	**TOTAL AMOUNT PAID:** $_____ DATE: _____ *Office Use:*	*Office Stamp:*	
☐ **Amended Site Plan – (Each Revision)**	**AMENDED APPLICATION FEE:** **AMENDED REVIEW ESCROW:**	☐ $350.00 ☑ $250.00			

PROPERTY DESCRIPTION	**Parcel Information:**	**Map(s):**		**Lot(s):**		**Zoning District(s):**	**Size of the Parcel in SF:** 23.59
	Total Disturbance. >1Ac	☑ **Y** ☐ **N**		**Estimated. Building SF:**	540	**IF NO BUILDING; Estimated SF of Total Development:**	
	Physical Address:	513 Gray Road				**Watershed:**	Black Brook

PROPERTY OWNER'S INFORMATION	**Name:**	Town of WIndham	**Name of the Business:**	
	Phone:	207-892-1907	**Mailing Address:**	
	Fax or Cell:	207-892-1910		
	Email:	mtarienti@windhammaine.us		
APPLICANT'S INFORMATION (*IF DIFFERENT FROM OWNER*)	**Name:**		**Name of Business:**	same as above
	Phone		**Mailing Address:**	
	Fax or Cell			
	Email:			
APPLICANT'S AGENT INFORMATION	**Name:**	Mark Arienti	**Name of Business:**	same as above
	Phone:	207-892-1909	**Mailing Address:**	
	Fax or Cell:	207-894-4107		
	Email:	mtarienti@windhammaine.us		

PROJECT INFORMATION

Existing Land Use ***(Use extra paper, if necessary)*****:**

Currently the land is mostly open field that is mowed several times per year. A portion of the land that the proposed project will occur on is the existing Smith Cemetery, a Town-owned Windham cemetery.

Provide a narrative description of the Proposed Project ***(Use extra paper, if necessary)*****:**

The existing 3.1-acre Smith cemetery is out of space for new burial plots, and as the Town of Windham grows, and ages, there is a need to expand the cemetery. The Town owns a large (23.95 ac) parcel that abuts the existing Smith Cemetery; most of the area proposed for expansion is already cleared and has suitable soils and grades for this use. The proposed expansion will provide space for 298 new family plots and 800 single burials, the latter in a Veterans Niche Wall and a Columbarium Niche Wall. A small (600 sf) building is also proposed to store maintenance equipment such as a mower and other landscaping equipment and materials.

Provide a narrative description of construction constraints (wetlands, shoreland zone, flood plain, non-conformance, etc.):

There are no construction constraints in the area of the proposed work.

MAJOR SITE PLAN REVIEW APPLICATION REQUIREMENTS

Section 120-811 of the Land Use Ordinance

The submission shall contain five (5) copies of the following information, including full plan sets. Along with one (1) electronic version of the entire submission, unless waiver of a submission requirement is granted, and one (1) complete plan set.

The Major Plan document/map:

A) Plan size: 24" X 36"
B) Plan Scale: No greater 1":100'
C) Title block: Applicant's name, project name, and address

- Name of the preparer of plans with professional information
- Parcel's tax map identification (map and lot) and street address, if available

- Complete application submission deadline: three (3) weeks (21-days) before the desired Planning Board meeting.
  - Five copies of the application and plans
  - Application Payment and Review Escrow
- A pre-submission meeting with the Town staff is required.
- Contact information:

Windham Planning Department (207) 894-5960, ext. 2
Steve Puleo, Town Planner sjpuleo@windhammaine.us
Amanda Lessard, Planning Director allessard@windhammaine.us

APPLICANT/PLANNER'S CHECKLIST FOR MAJOR SITE PLAN REVIEW

SUBMITTALS THAT THE TOWN PLANNER DEEMS SUFFICIENTLY LACKING IN CONTENT WILL NOT BE SCHEDULED FOR PLANNING BOARD REVIEW.

The following checklist includes items generally required for development by the Town of Windham's LAND USE ORDINANCE, Sections 120-811, 120-812, 120-813 & 120-814. Due to projects specifics, the applicant is required to provide a complete and accurate set of plans, reports, and supporting documentation (as listed in the checklist below).

IT IS THE RESPONSIBILITY OF THE APPLICANT TO PRESENT A CLEAR UNDERSTANDING OF THE PROJECT.

Column #1.			Column #2.		
1. Final Plan -Major Site Plan: Submission Requirements	**Applicant**	**Staff**	**Plan Requirements – Existing Conditions (Continued):**	**Applicant**	**Staff**
A. Completed Major Site Plan Application form	☑	☐	vii. Zoning classification(s), including overlay and/or subdistricts, of the property and the location of zoning district boundaries if the property is located in 2 or more districts or abuts a different district	☑	☐
B. Evidence of Payment of application & escrow fees	NA ☐	☐	viii. Bearings and lengths of all property lines of the property to be developed, and the stamp of the surveyor that performed the survey	☑	☐
C. Written information – submitted in a **bounded and tabbed** report			ix. Existing topography of the site at 2-foot contour intervals.	☑	☐
1. A narrative describing the proposed use or activity.	☑	☐	x. Location and size of any existing sewer and water mains, culverts and drains, on-site sewage disposal systems, wells, underground tanks or installations, and power and telephone lines and poles on the property and on abutting streets or land that may serve the development.	☑	☐
2. Name, address, & phone number of record owner, and applicant if different (see Agent Autorotation form).	☑	☐	xi. Location, names, and present widths of existing public and/or private streets and rights-of-way within or adjacent to the proposed development.	☑	☐
3. Names and addresses of all abutting property owners	☑	☐	xii. Location, dimensions, and ground floor elevation of all existing buildings.	☑	☐
4. Documentation demonstrating right, title, or interest in the property	☑	☐	xiii. Location and dimensions of existing driveways, parking and loading areas, walkways, and sidewalks on or adjacent to the site.	☑	☐
5. Copies of existing proposed covenants or deed restrictions.	☑	☐	xiv. Location of intersecting roads or driveways within 200 feet of the site.	☑	☐
6. Copies of existing or proposed easements on the property.	☑	☐	xv. Location of the following		
7. Name, registration number, and seal of the licensed professional who prepared the plan, if applicable.	☑	☐	a. Open drainage courses	☑	☐
8. Evidence of applicant's technical capability to carry out the project.	☑	☐	b. Wetlands	☑	☐
			c. Stone walls	☑	☐
9. Assessment of the adequacy of any existing sewer and water mains, culverts and drains, on-site sewage disposal systems, wells, underground tanks or installations, and power and telephone lines and poles on the property.	☑	☐	d. Graveyards	☑	☐

Continued from Column #1. (Page 2)			Continued from Column #2. (Page 2)		
10. Estimated demands for water and sewage disposal.	☑	☐	e. Fences	☑	☐
			f. Stands of trees or treeline, and	☑	☐
			g. Other important or unique natural areas and site features, including but not limited to, floodplains, deer wintering areas, significant wildlife habitats, fisheries, scenic areas, habitat for rare and endangered plants and animals, unique natural communities and natural areas, sand and gravel aquifers, and historic and/or archaeological resources.	☑	☐
11. Provisions for handling all solid wastes, including hazardous and special wastes.	☑	☐	xvi. Direction of existing surface water drainage across the site	☑	☐
12. Detail sheets of proposed light fixtures.	☑	☐	xvii. Location, front view, dimensions, & lighting of exsiting signs.	☑	☐
13. Listing of proposed trees or shrubs to be used for landscaping	☑	☐			
14. Estimate weekday AM and PM and Saturday peak hours and daily traffic to be generated by the project.	☑	☐	xviii. Location & dimensions of existing easements that encumber or benefit the site.	☑	☐
15. Description of important or unique natural areas and site features, including floodplains, deer wintering areas, significant wildlife habitats, fisheries, scenic areas, habitat for rare and endangered plants and	☑	☐	xix. Location of the nearest fire hydrant, dry hydrant, or other water supply.	☑	☐
16. If the project requires a stormwater permit from MaineDEP or if the Planning Board or if the Staff Review Committee determines that such information is required, submit the following.			**E. Plan Requirements - Proposed Development Activity**		
			i. Location and dimensions of all provisions for water supply and wastewater disposal, and evidence of their adequacy for the proposed use, including soils test pit data if on-site sewage disposal is proposed	☑	☐
a. stormwater calculations.	☑	☐	ii. Grading plan showing the proposed topography of the site at 2-foot contour intervals	☑	☐
b. erosion and sedimentation control measures.	☑	☐	iii. The direction of proposed surface water drainage across the site and from the site, with an assessment of impacts on downstream properties.	☑	☐
c. water quality and/or phosphorous export management provisions.	☑	☐	iv. Location and proposed screening of any on-site collection or storage facilities	☑	☐
17. If public water or sewerage will be utilized, provide a statement from the utility district regarding the adequacy of water supply in terms of quantity and pressure for both domestic and fire flows, and the capacity of the sewer system to accommodate additional wastewater.	☑	☐	v. Location, dimensions, and materials to be used in the construction of proposed driveways, parking, and loading areas, and walkways, and any changes in traffic flow onto or off-site	☑	☐
18. Financial Capacity			vi. Proposed landscaping and buffering	☑	☐
i. Estimated costs of development and itemize estimated major expenses.	☑	☐	vii. Location, dimensions, and ground floor elevation of all buildings or expansions	☑	☐
ii. Financing (submit one of the following)			viii. Location, front view, materials, and dimensions of proposed signs together with a method for securing sign	☑	☐
a. Letter of commitment to fund	☐	☐	ix. Location and type of exterior lighting. Photometric plan to demonstrate the coverage area of all lighting may be required by the Planning Board.	☑	☐
b. Self-financing	☑	☐	x. Location of all utilities, including fire protection systems	☑	☐
1. Annual corporate report	☐	☐	xi. Approval block: Provide space on the plan drawing for the following words, "Approved: Town of Windham Planning Board" along with space for signatures and date	☑	☐
2. Bank Statement	☐	☐	**2. Major Final Site Plan Requirements as Exhibits to the Application**		
c. Other			a. Narrative and/or plan describing how the proposed development plan relates to the sketch plan.	☑	☐
1. Cash equity commitment of 20% of the total cost of development	☑	☐	b. Stormwater drainage and erosion control program shows:		
2. Financial plan for remaining financing.	☑	☐	1. The existing and proposed method of handling stormwater runoff	☑	☐

Continued from Column #1. (Page 3)		
3. Letter from institution indicating intent to finance.	☐	☐
iii. If a registered corporation a Certificate of Good Standing from: NA		
- Secretary of State, or	☐	☐
- the statement signed by a corporate officer	☐	☐
19. Technical Capacity (address both).		
i. Prior experience relating to developments in the Town.	☑	☐
ii. Personnel resumes or documents showing experience and qualification of development designers	☑	☐
D. Plan Requirements – Existing Conditions		
i. Location Map adequate to locate project within the municipality	☑	☐
ii. Vicinity Plan. Drawn to a scale of not over 400 feet to the inch, and showing area within 250 feet of the property line, and shall show the following:	☑	☐
a. Approximate location of all property lines and acreage of the parcel(s).	☑	☐
b. Locations, widths, and names of existing, filed, or proposed streets, easements, or building footprints.	☑	☐
c. Location and designations of any public spaces.	☑	☐
d. Outline of the proposed site plan, together with its street system and an indication of the future probable street system of the remaining portion of the tract.	☐	☐
iii. North Arrow identifying Grid North; Magnetic North with the declination between Grid and Magnetic; and whether Magnetic or Grid bearings were used.	☑	☐
iv. Location of all required building setbacks, yards, and buffers.	☑	☐
v. Boundaries of all contiguous property under the total or partial control of the owner or applicant.	☑	☐
vi. Tax map and lot number of the parcel(s) on which the project is located	☑	☐

Continued from Column #2. (Page 3)		
2. The direction of the flow of the runoff, through the use of arrows and a description of the type of flow (e.g., sheet flow, concentrated flow, etc.)	☑	☐
3. Location, elevation, and size of all catch basins, dry wells, drainage ditches, swales, retention basins, and storm sewers	☑	☐
4. Engineering calculations were used to determine drainage requirements based on the 25-year, 24-hour storm frequency.	☑	☐
5. Methods of minimizing erosion and controlling sedimentation during and after construction.	☑	☐
c. A groundwater impact analysis prepared by a groundwater hydrologist for projects involving on-site water supply or sewage disposal facilities with a capacity of 2,000 gallons or more per day	☐	☐
d. Name, registration number, and seal of the Maine Licensed Professional Architect, Engineer, Surveyor, Landscape Architect, and/or similar professional who prepared the plan.	☑	☐
e. A utility plan showing, in addition to provisions for water supply and wastewater disposal, the location and nature of electrical, telephone, cable TV, and any other utility services to be installed on the site.	☑	☐
f. A planting schedule keyed to the site plan indicating the general varieties and sizes of trees, shrubs, and other vegetation to be planted on the site, as well as information of provisions that will be made to retain and protect existing trees, shrubs, and other vegetation.	☑	☐
g. Digital transfer of any site plan data to the town (GIS format)	☑	☐
h. A traffic impact study if the project expansion will generate 50 or more trips during the AM or PM peak hour, or if required by the Planning Board)	☐ NA	☐
PDF\Electronic Submission.	☑	☐

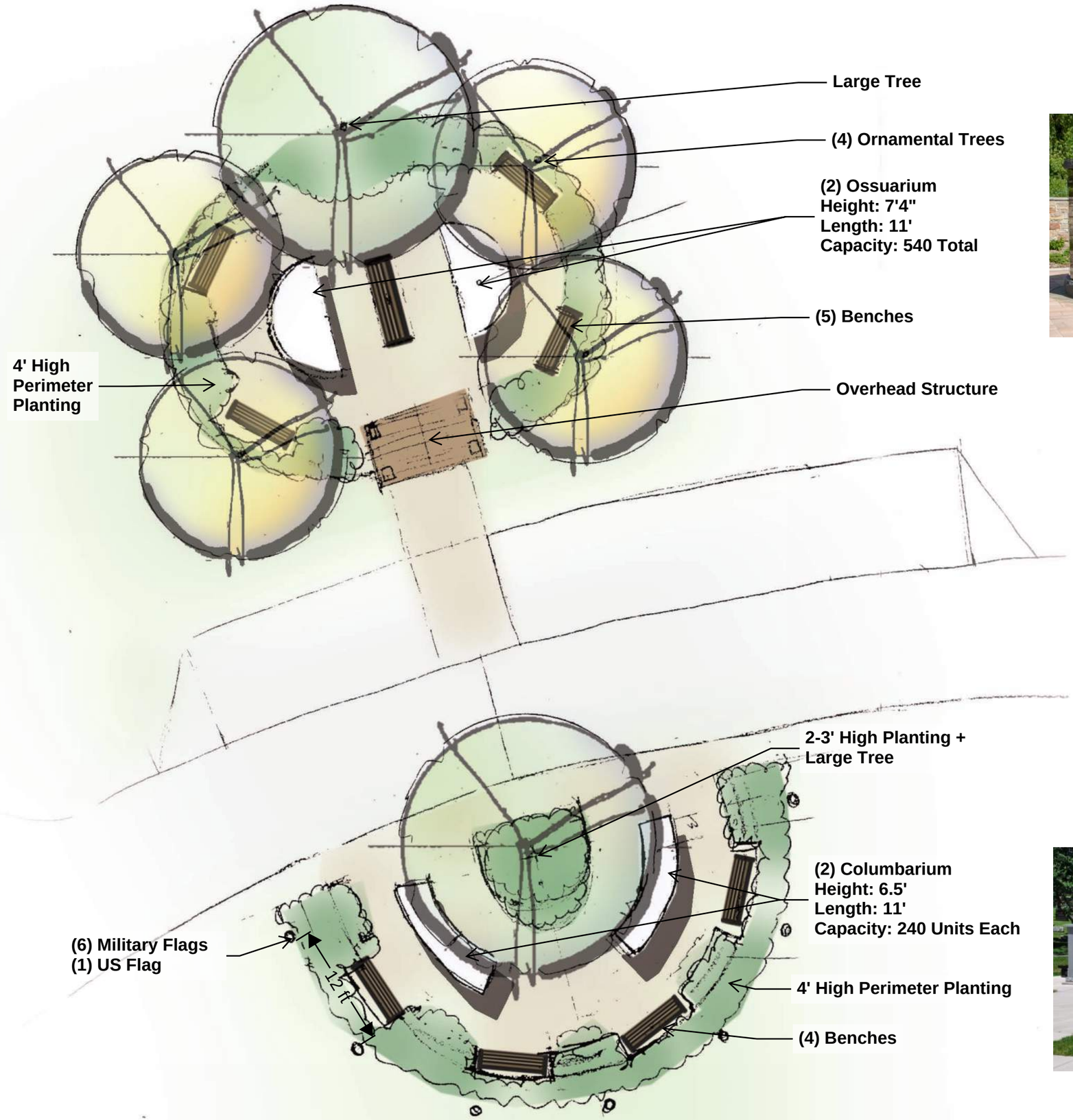
The undersigned *hereby makes an application to the Town of Windham for approval of the proposed project and declares the foregoing to be true and accurate to the best of his/her knowledge.*

		Mark Arienti
APPLICANT OR AGENT'S SIGNATURE	DATE	PLEASE TYPE OR PRINT NAME

ATTACHMENT B

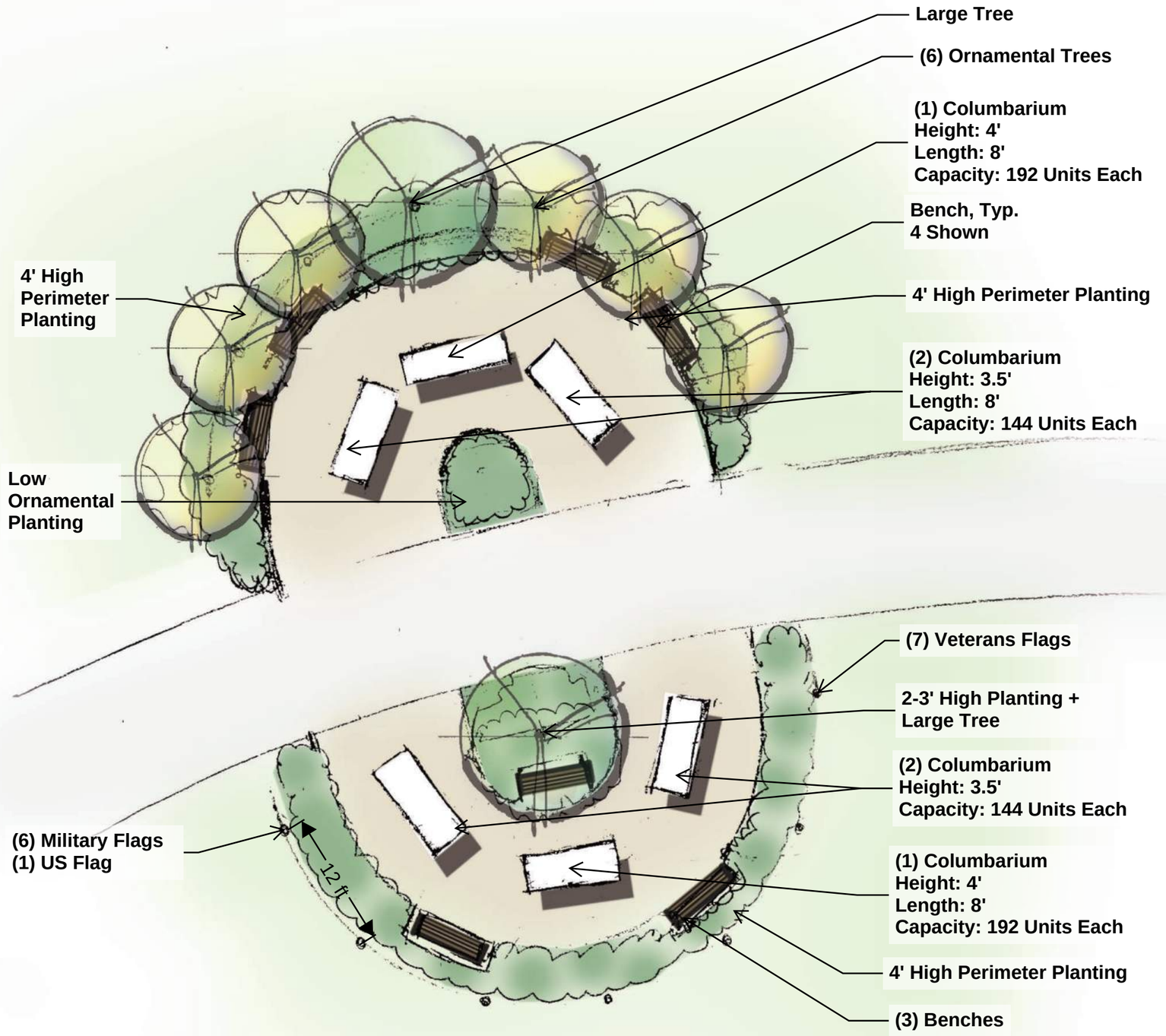
COLUMBARIA DESIGN

Smith Cemetery
Concept 1
1" = 10'



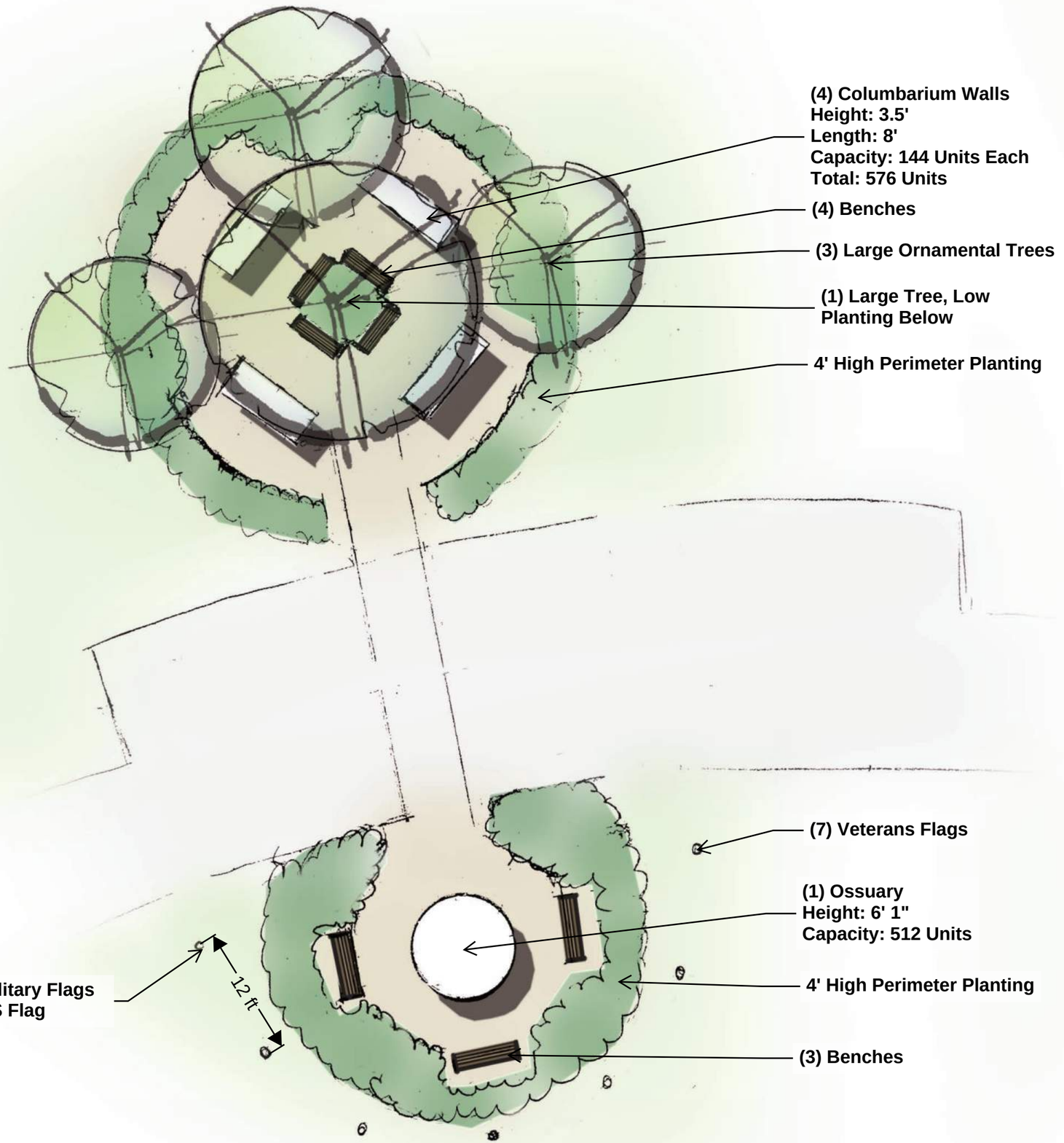
Sebago Technics
June, 2025

Smith Cemetery
Concept 2
1" = 10'



Sebago Technics
June, 2025

Smith Cemetery
Concept 3
1" = 10'



Sebago Technics
June, 2025

ATTACHMENT C

PROPERTY DEED

QUITCLAIM DEED
(With Covenant)

KNOW ALL PERSONS BY THESE PRESENTS, that I, **LYNN MORRELL** of Windham, County of Cumberland and State of Maine, in consideration of One Dollar and other valuable consideration paid by **TOWN OF WINDHAM,** a municipal corporation, of Windham, County of Cumberland and State of Maine, whose mailing address is 8 School Road, Windham, ME 04062, the receipt whereof is hereby acknowledged, do hereby REMISE, RELEASE, BARGAIN, SELL AND CONVEY and forever QUITCLAIM unto the said **TOWN OF WINDHAM**, its successors and assigns forever, the Grantor's interest as the former wife of Stephen J. Morrell, pursuant to Divorce Decree filed in the Cumberland County District Court, Southern Division, Docket No. FM-00-197, and Order subsequent thereto dated October 7, 2004 in said Case, in and to the following described real estate:

A certain lot or parcel of land situate in the Town of Windham, County of Cumberland and State of Maine, being more particularly described as follows:

Beginning at a point on the easterly side of Gray Road, also known as Route 202, and at the most northeasterly corner of land of Stephen J. Morrell described in the deed from Grace L. Morrell dated March 20, 1978 and recorded in the Cumberland County Registry of Deeds in Book 4189, Page 287, said point being the most northerly corner of Smith Cemetery, so-called;

Thence South 43° 30' 00" East, 18 feet to a point;
Thence North 46° 30' 00" East, 23 feet to a point, along the perimeter of said Smith Cemetery;
Thence continuing along said Smith Cemetery South 44° 30 27" East, 174.43 feet to a point;
Thence North 46° 30' 00" East, 660 feet along said Smith Cemetery to a point;
Thence North 41° 40' 16" West, 171.39 feet along said Cemetery to a point;
Thence North 50° 00' 00" East, 347 feet to a point;
Thence South 51° 50' 10" East, 223.92 feet to a point;
Thence North 68° 11' 34" East, 36.45 feet to a point on the westerly sideline of Route 302, also known as the Roosevelt Trail;
Thence South 14° 30' 00" East, 18 feet along the westerly sideline of said Route 302 to a point;
Thence South 75° 30' 00" West, 200 feet to a point;

Thence South 14° 30' 00" East parallel to the westerly sideline of said Route 302, 750 feet to a point;

Thence North 75° 30' 00" East, 200 feet to a point on the westerly sideline of Route 302;

Thence South 14° 30' 00" East, 57.50 feet along the westerly sideline of said Route 302 to a point;

Thence South 75° 30' 00" West, 200 feet to a point;

Thence South 14° 30' 00" East, 400 feet and parallel to the westerly sideline of Route 302 to a point;

Thence South 54° 00' 00" West, 645 feet to a point;

Thence North 40° 00' 00" West, 662.74 feet along land of Brian L. Roberts, et al. to a point;

Thence North 50° 00' 00" East, 108 feet to a point;

Thence North 71° 00' 00" West, 377.98 feet to a point on the easterly sideline of said Gray Road, also known as Route 202;

Thence North 18° 13' 24" East by the easterly sideline of said Gray Road, 375.38 feet to the point of beginning, being 23.95 acres, more or less, as set forth in the plans of a Proposed Lot Division drawn by Owen Haskell, Inc., dated June 30, 2005.

Being a portion of the premises conveyed to Stephen J. Morrell by deed of Grace L. Morrell dated March 20, 1978 and recorded in said Registry of Deeds in Book 4189, Page 287.

Subject to utility easements of record.

TO HAVE AND TO HOLD, the same, together with all the privileges and appurtenances thereunto belonging, to the said **TOWN OF WINDHAM**, its successors and assigns forever, to use and behoof forever.

AND I **COVENANT** with the said Grantee, its successors and assigns forever, that I will **WARRANT AND FOREVER DEFEND** the premises to the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons claiming by, through, or under it.

IN WITNESS WHEREOF, the said **LYNN MORRELL** has hereunto set her hand and seal this 22 day of July, 2005.

WITNESS:

Peter Forbes

Lynn Morrell

LYNN MORRELL

STATE OF MAINE
Cumberland County ss.

July 20, 2005

Then personally appeared the above-named **LYNN** MORRELL and acknowledged the foregoing instrument to be her free act and deed.

Before me,

Suzanne R. Scott
Notary Public ~~Public~~ Attorney
Print Name Suzanne R. Scott
Commission Expires _____
Affix Notarial Seal Here

Received
Recorded Register of Deeds
Jul 25,2005 10:24:23A
Cumberland County
John B OBrien

ATTACHMENT D

EASEMENTS

EASEMENT DEED

STACEY H. WEBSTER AND BABB, KIMBERLY H., ("OWNER") for consideration paid, hereby grants to the **TOWN OF WINDHAM**, A municipality in Cumberland County, Maine ("TOWN"), with quit-claim covenants an easement on property in the Town of Windham, Cumberland County, Maine, bounded and described as follows:

Beginning at a point located at the northwesterly corner of land now or formerly of Kenneth W. Spink in a deed recorded in the Cumberland County Registry of Deeds in Book 39749, Page 299 and the easterly sideline of Route 202 (Gray Road),

Thence, a distance of 221feet more or less easterly to a point at the northeasterly corner of the Spink property along the westerly sideline of the TOWN's Smith Cemetery property described in a deed recorded in the Cumberland County Registry of Deeds in Book 1611, Page 445,

Thence northerly a distance of twenty-five (25) feet to a point at the southeasterly corner of Grantor's abutting TOWN's Smith Cemetery property.

Thence a distance of two hundred thirty (230) feet, more or less, westerly along the southerly sideline of land of GRANTOR to the easterly sideline of Route 202,

Thence a distance of twenty-five (25) feet, more or less, to the point of beginning.

The TOWN shall have the following permanent easement rights in the easement area described above:

1. The right to improve the existing gravel drive for the purpose of access to Smith Cemetery
2. the right to enter on the easement area at any and all times for use and maintenance of Smith Cemetery.
3. the right to trim, cut down, and/or remove bushes, grass, crops, trees or any other vegetation, to such extent as is necessary for any of these purposes in the sole judgment of the TOWN.

OWNER reserves the use and enjoyment of the easement area for any purpose that does not interfere with the use of the easement area by the TOWN for its own purposes; provided that none of the following improvements may be made by OWNER in the easement area, without the written permission of the TOWN:

1. No buildings or any other permanent structures are allowed.

This easement deed is signed as a document under seal.

Dated: , 2025

STACEY H. WEBSTER AND BABB, KIMBERLY

Stacey H Webster Kimberly Babb

By:

Its:

State of Maine
County of Cumberland, ss. , 2025

Stacey Webster and Kimberly Babb personally appeared before me and acknowledged that his/her signature on this document was his/her free act.

Kellie J Sampson

Notary Public/Attorney at Law

Printed Name: Kellie J Sampson

Commission Expires:

KELLIE J. SAMPSON
Notary Public, State of Maine
My Commission Expires Dec 09, 2029

ATTACHMENT E

COST ESTIMATE

COST ESTIMATE FOR SMITH CEMETERY EXPANSION

Prepared by: MTA

Date: 8/12/25

Item	Unit of Measure	Amount	Unit Cost	Subtotal
Mobilization	LS	1	10000	$10,000.00
Clear, Grub, Site Prep.	LS	1	15,000.00	$15,000.00
Construction Entrance	LS	1	$ 2,500.00	$2,500.00
Granular Borrow	CY	300	$ 26.60	$7,980.00
Rip-rap	CY	45	$ 115.00	$5,175.00
Base Gravel MDOT Type A	CY	194	$ 45.00	$8,750.00
Subbase Gravel MDOT Type D	CY	519	$ 40.00	$20,740.74
Asphalt Pavement	Tons	394	$ 135.00	$53,156.25
15" Drainage Culvert	LF	350	$ 98.00	$34,300.00
12' Drainage Culvert	LF	230	$ 62.00	$14,260.00
1.5" Water Service	LF	630	$ 40.00	$25,200.00
Guard Rail	LF	150	$ 78.00	$11,700.00
Erosion Control Mulch Berm	LF	800	$ 5.00	$4,000.00
Loam, Seed, Mulch	SY	3200	$ 3.00	$9,600.00
Trees	Each	75	$ 300.00	$22,500.00
Allowance for Columbarium and Veteran's Niche Wall	LS	1	$ 100,000.00	$100,000.00
				$344,861.99
Contingency (20%)				$68,972.40
Total				**$413,834.39**

Notes:

ATTACHMENT F

TECHNICAL ABILITY

AMY BELL SEGAL, RLA

Senior Project Manager/Senior Landscape Architect

In the course of her 30 year career, Amy has worked on a great variety of projects in the public and private sectors across Maine and New England. Her work has included site planning, permitting and construction management for residential, commercial, institutional, and industrial properties as well as recreation, trail, and community planning. She has earned a wonderful reputation through great work, relationships and communication.

EXPERIENCE

- **Portland Harbor Common Lot (Phase 1) Portland, ME:** Part of design team working with City staff and community working group to transform an oceanfront parking lot between Ocean Gateway and Maine State Pier into a park amenity for residents and visitors.
- **Portland Tree Canopy Project, Portland, ME**: Working with Parks and Forestry Staff to plan and implement tree planting strategies to increase the canopy within Bayside and Downtown neighborhoods.
- **Acadia Hospital, Northern Light Health, Bangor, ME**: Design of children, adolescent, and adult outdoor courtyard spaces to promote mental and physical well being in a safe environment. *With Lavallee Brensinger*
- **Shore Road Improvement Project, Cape Elizabeth, ME:** Working with transportation engineers and town staff to provide pedestrian and bicyclist amenities within road reconstruction design. Prepared visualizations from key locations for public outreach.
- **Deering Corner Roundabout, Portland, ME:** Designed pedestrian and landscape amenities adjacent to roundabout and within stormwater infrastructure. Collaboration with Metro and University of Southern Maine gateway planning. Worked with artist on sculpture placement and lighting. *Designed at TJD&A with Ransom Engineering, oversaw implementation at Sebago*
- **Lakeside Norway, ME.** Working with Left Turn Enterprises to develop a 6-acre four season event and recreation center and new brewery for Norway Brewing Company on Lake Pennesseewassee within the Downtown Gateway Area.
- **Arthur P. Girard Columbarium Garden,Westbrook, ME:** Conceptual design through construction documentation for a 400 niche columbarium garden in Woodlawn Cemetery. The Garden includes public and veterans sections, extensive landscaping, and a pergola for outdoor funeral services.
- **Red Cross Park Renovation, Greenville, ME:** Master Plan for renovation of 6-acre park on Moosehead Lake that provides swimming and boating access. Plan includes shoreland stabilization, improved parking, accessibility, playspace, trails, and a pump track. Park applying for funding through the Land & Water Conservation Fund Grant program.
- **Evergreen Cemetery Expansion, Rangeley, ME:** Master Plan for a multi generation expansion for Town-owned cemetery. Highlights of initial phases include a 500 in ground plots, 250 cremains plots, columbarium niche walls and a gathering space that overlooks Rangeley Lake and the western mountains.
- **Bonney Park, Androscoggin Riverwalk, Riverpark, Moulton Park Rail Trail, and Little Andy Park, Auburn, ME:** A series of linked open spaces along the Androscoggin River. Design, permitting, and construction management. *With TJD&A*

EDUCATION

BSLA, Cornell University
Denmark International Study, 1992

REGISTRATIONS

Maine Licensed Landscape Architect #2265
CLARB Certified
Maine DOT LPA Certified 2019 - 2023

SPECIAL TRAINING

MeDEP Low Impact Development Stormwater BMP training
Courses in ADA standards, Complete Streets, Sustainable Sites (ASLA LEED equiv)

PROFESSIONAL EMPLOYMENT

2020 - Present: Sebago Technics, Inc.
South Portland, ME

1992 - 2020: TJD&A
Landscape Architects & Planners
Yarmouth, ME

1988 - 1992: Bell & Spina Architects
Camillus, NY

SEBAGO TECHNICS

207.200.2055 ABSEGAL@SEBAGOTECHNICS.COM

ATTACHMENT G

ABILITY TO SERVE LETTER FROM PORTLAND WATER DISTRICT

Portland Water District

FROM SEBAGO LAKE TO CASCO BAY

August 28, 2025

Mark Arienti
Town Engineer
Public Works Department

Re: 513 Gray Rd, WI
Ability to Serve with PWD Water

Dear Mr. Arienti:

The Portland Water District has received your request for an Ability to Serve Determination for the noted site submitted on August 5, 2025. Based on the information provided on the plan dated August 26, 2025, we can confirm that the District will be able to serve the proposed project as further described in this letter. **Please note that this letter constitutes approval of the water system as currently designed and is valid for eighteen (18) months after the date of issue. Any changes affecting the approved water system will require further review and approval by PWD.**

Conditions of Service

The following conditions of service apply:

- A new 1.5-inch seasonal irrigation service with a 5/8-inch meter in an irrigation/meter box may be installed from the water main in the Roosevelt Trail. The service should enter through the property's frontage on Roosevelt Trail at least 10ft from any side property lines.

- An approved testable Reduced Pressure Zone backflow prevention device must be installed on the service line directly after the meter located in the irrigation/meter box prior to service activation. Please refer to the PWD website for more information on cross-connection control policies.

- Since the length of this service line will be seasonal for irrigation purpose and exceeds 300-feet, a new irrigation/ meter box will be acceptable for the service. The irrigation/ meter box should be located on a private property within 10-20 feet of the property line at Roosevelt Trail unless otherwise approved by PWD. It is recommended that the service size on private after the meter box be increased in order to avoid significant pressure loss due to pipe friction.

- The site is currently served with a 3/4-inch irrigation seasonal water service with a 5/8-inch meter; This service shall remain to provide water for irrigation services.

- Please note that PWD's Terms and Conditions require that a service to one parcel cannot serve another parcel. If in the future this parcel is subdivided, a separate service will be required.

225 DOUGLASS STREET P.O. BOX 3553 PORTLAND, MAINE 04104-3553
PHONE: 207.774.5961 FAX: 207.761.8307 WEB: WWW.PWD.ORG

Prior to construction, the owner or contractor will need to complete a Service Application and pay all necessary fees for each proposed service. When the project is ready for construction, an Application for each service can be requested by contacting the MEANS Group at MEANS@pwd.org or 207-774-5961 ext. 3199. Once a completed Application has been submitted with payment, please allow seven (7) days for processing.

Existing Site Service
According to District records, the project site does currently have existing seasonal water service. A 3/4-inch diameter copper irrigation service line provides water service to the site. Please refer to the "Conditions of Service" section of this letter for requirements related to the use of this service.

Water System Characteristics
According to District records, there is a 12-inch Ductile Iron water main in Roosevelt Trail and a public fire hyd rant located across the road from the site. The estimated static pressure in the area is 66 psi.

Public Fire Protection
The installation of new public hydrants to be accepted into the District water system will most likely not be required. It is your responsibility to contact the Town of Windham Fire Department to ensure that this project is adequately served by existing and/or proposed hydrants.

Domestic Water Needs
The data noted above indicates there should be adequate pressure and volume of water to serve the domestic water needs of your proposed project.

Private Fire Protection Water Needs
You have indicated that this project will not require water service to provide private fire protection to the site.

Should you disagree with this determination, you may request a review by the District's Internal Review Team. Your request for review must be in writing and state the reason for your disagreement with the determination. The request must be sent to MEANS@PWD.org or mailed to 225 Douglass Street, Portland Maine, 04104 c/o MEANS. The Internal Review Team will undertake review as requested within 2 weeks of receipt of a request for review.

If the District can be of further assistance in this matter, please let us know.

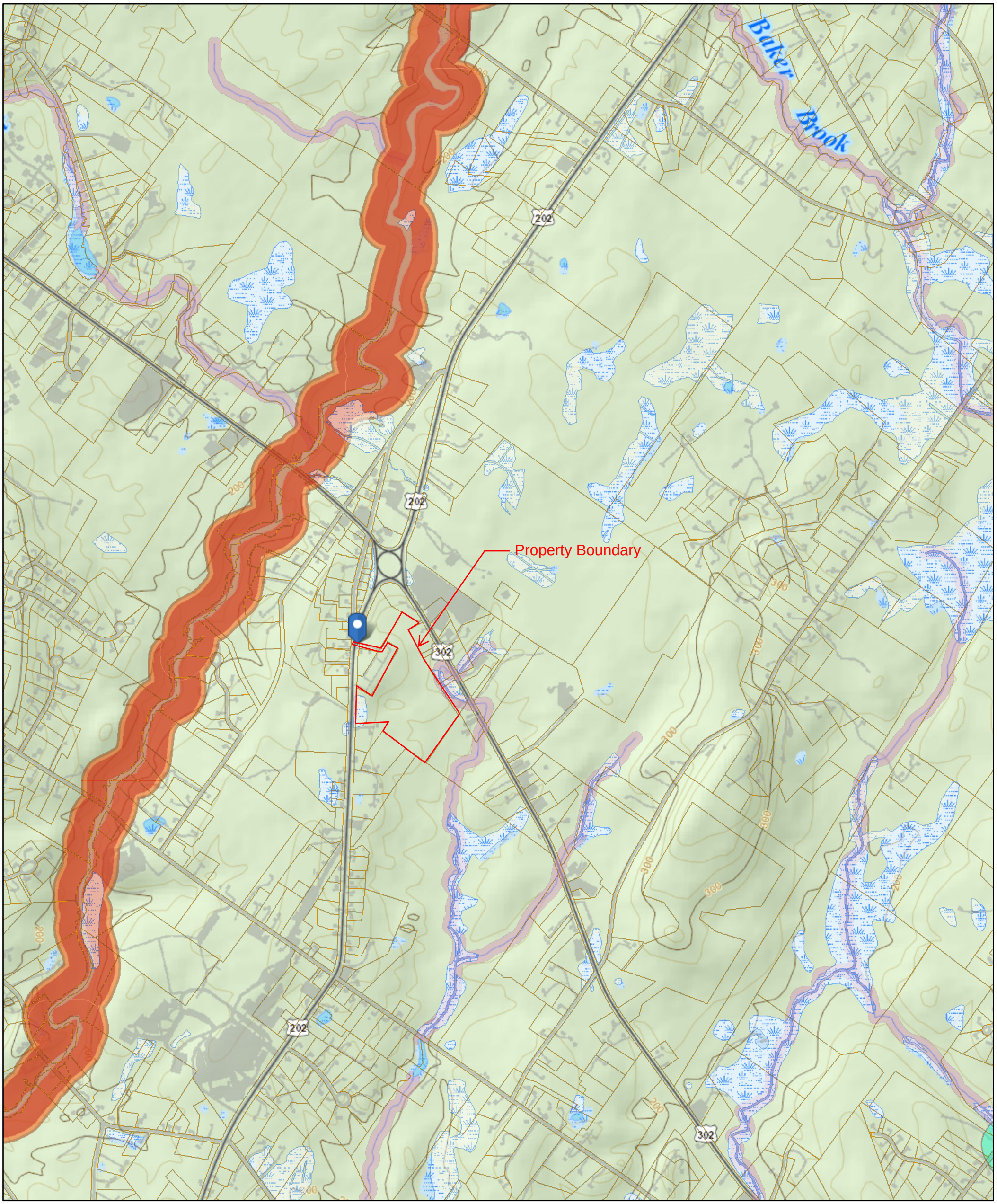
Sincerely,
Portland Water District

Robert A. Bartels, P.E.
Senior Project Engineer

ATTACHMENT H

BEGINNING WITH HABITAT MAP

Beginning With Habitat



February 9, 2025

- Parcels- Unorganized Townships
- Parcels- Organized Towns\Cities
- National Wetlands Inventory Wetlands
- Shellfish Beds
- Stream Buffer (75 feet)
- Great Ponds, Rivers and Coastal Buffer (250 feet)
- Atlantic Salmon Habitat
- Wild Brook Trout Habitat
- Shorebird Habitat
- Seabird Nesting Island
- Tidal Waterfowl / Wading Bird Habitat
- Inland Waterfowl / Wading Bird Habitat
- Significant Vernal Pools
- Deer Wintering Areas
- Essential Wildlife Habitats
- Endangered, Threatened, and Special Concern Species
- Natural Communities
- Rare Plants and Natural Communities

1:18,056

0	0.15	0.3	0.6 mi
0	0.23	0.45	0.9 km

Beginning with Habitat Program for Planning Purposes Only
Map Created With BWH Map Viewer

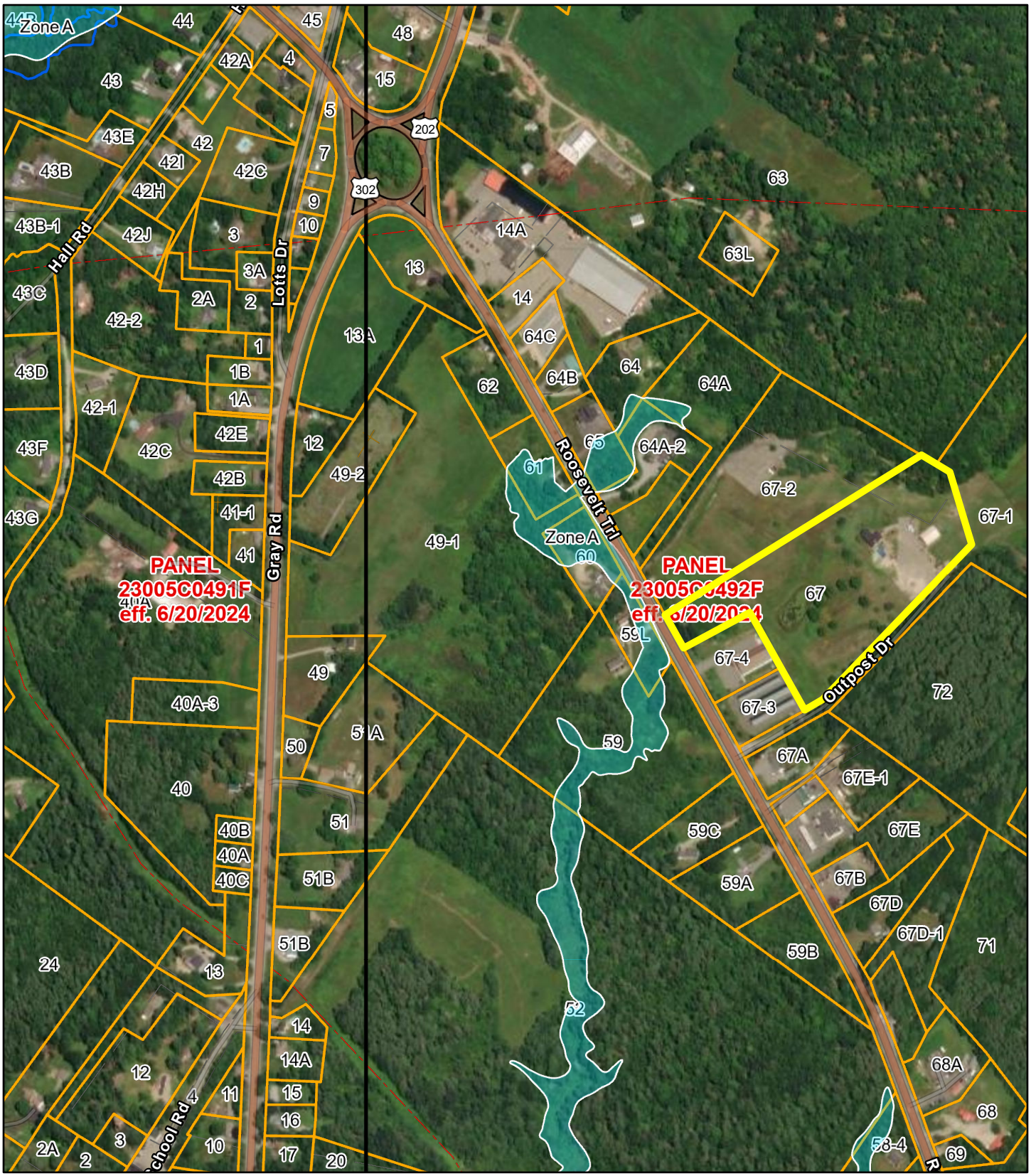
Town of Windham, ME

1 inch = 544 Feet

0 544 1088 1632

CAI Technologies
Precision Mapping. Geospatial Solutions.
www.cai-tech.com

September 2, 2025



Data shown on this map is provided for planning and informational purposes only. The municipality and CAI Technologies are not responsible for any use for other purposes or misuse or misrepresentation of this map.

ATTACHMENT I

STORMWATER MANAGEMENT REPORT

SEBAGO TECHNICS

CIVIL ENGINEERING • SURVEYING • LANDSCAPE ARCHITECTURE

STORMWATER MANAGEMENT REPORT

For

SMITH CEMETERY
WINDHAM, MAINE

Prepared for:

TOWN OF WINDHAM
185 Windham Center Road
Windham, Maine 04062

Prepared by:

Sebago Technics, Inc.
75 John Roberts Rd, Suite 4A
South Portland, ME 04106

AUGUST, 2025

Table of Contents

Contents

Appendices

STORMWATER MANAGEMENT REPORT
SMITH CEMETERY
WINDHAM, MAINE

1. Introduction

This Stormwater Management Report has been prepared to present analyses performed to address the potential impacts associated with the project due to proposed modification in stormwater runoff characteristics and land cover changes. The stormwater management controls that are outlined in this report have been designed to suit the proposed development and to comply with applicable regulatory requirements.

This Stormwater Report has been prepared to address the standards of the Town of Windham Site Plan Approval Ordinance 120-802(A)(4). The project classifies as a Major Site Development per Town ordinance 120-805(A)(2)(c) as it will develop more than 1 acre of land.

2. Existing and Proposed Conditions

The project site consists of a developed field located at 513 Gray Road in Windham Maine. The property is approximately 24 acres and contains a cemetery, paved areas, lawn areas (mowed more than twice a year) and wetland area. The disturbed area for the project is approximately 1.7 acres. The site is bound by US Route 302 and an existing house lot to the North; the existing house lot and a field to the East; Wetlands and an existing cemetery to the South; An existing field to the West.

Slopes on the existing site generally range from 1% to 20%. The runoff from the property generally flows from east to west and enters the wetlands to the west of the project site. The ground cover consists of mostly grass area with some wooded sections along the property edge and paved sections in the existing cemetery.

Slopes on the proposed property generally remain the same, with some sections as steep as 33%. The watershed flow path generally remains the same as in the existing condition with runoff flowing to the western wetlands. The ground cover remains the same as in the existing condition with the addition of approximately 0.5 acres of impervious paved area.

The site is tributary to Black Brook on the southeast side of the project area. Black Brook is tributary to the Presumpscot River which is tributary to Casco Bay. The site is not tributary to any Urban Impaired Streams or Lakes Most at Risk identified by the Maine Department of Environmental Protection (MDEP).

The proposed development is not located in an identified flood zone per the FEMA Flood Insurance Rate Map for the Town of Windham, 23005C0492F, 6/20/2024.

3. Soils

Soil characteristics were obtained from the USDA NRCS Web Soil Survey. The Hydrologic Groups (HSG) of the soils is classified by Technical Release TR-55 of the Soil Conservation Service as follows:

Soil Map Symbol	Soil Name	Slope (%)	HSG
BGB	Nicholville very fine sandy loam	0-8	C
HIC	Hinkley loamy sand	8-15	A
HIB	Hinkley loamy sand	3-8	A
HnC	Hinckley-Suffield complex	8-15	A
HrB	Lyman-Tunbridge complex	0-8	D
HnB	Hinckley-Suffield complex	3-8	A
MkB	Merrimac fine sandy loam	3-8	A
PbB	Paxton fine sandy loam	3-8	C
PbC	Paxton fine sandy loam	8-15	C
Sn	Scantic silt loam	0-3	D

Hydrologic Soil Group boundaries are delineated on the Watershed Map. A copy of the Class D Intensity Soil Survey is included as Appendix 4.

4. Proposed Site Improvements

The development is intended to expand the existing Smith Cemetery to provide additional burial and cremation storage areas. The proposed development will consist of constructing a 14-foot-wide paved roadway for approximately 1,300 linear feet. The development also proposes constructing landscaped areas, a veteran's memorial and columbaria. Construction will include grade changes to accommodate the design of the road and stormwater management. For stormwater treatment the proposed development includes two meadow buffers that meet the Maine Department of Environmental Protection (MDEP) Chapter 500 standards. The proposed development includes installation of electrical and water lines to the site and building a small equipment shed. The project will result in the creation of approximately 0.5 acres of non-vegetated area and a reduction of approximately 0.4 acres of developed area as a section of the property will be returned to a meadow condition.

5. Existing Conditions Model

The existing conditions watershed plan consists of three subcatchments labeled 1.1S, 1.2S and 1.3S in the HydroCAD model. Four locations were identified as Points of Analysis (POA) for comparing peak runoff rates. POAs' 1 through 3 represent locations where flow leaves

the site. POA's 2 and 3 flow through reaches and then into a section of Black Brook which is represented by a pond labeled POA-4. POA 1 flows through a reach into Black Brook (POA-4). POA 4 represents the flow from the modeled area reaching a culvert at the downstream end of Black Brook near 382 Roosevelt Trail.

POA-1: This point of analysis is located in the southerly corner of the lot where runoff leaves the site via a wetland complex represented by 1.1R. Watershed 1.1S contributes runoff to this study point with an overall runoff area of approximately 2.3 acres.

POA-2: This point of analysis is located along the eastern edge of the lot where runoff leaves the property and enters a wooded flow path via a small depression represented by 1.2R. Watershed 1.2S contributes runoff to this study pint with an overall runoff area of approximately 1.4 acres.

POA-3: This point of analysis is located along the eastern corner of the property near US Route 302 and the existing house lot, where runoff leaves the property and enters a wooded flow path via a depression represented by 1.3R. Watershed 1.3S contributes runoff to this study point. Watershed 1.3S contributes runoff to this study pint with an overall runoff area of approximately 7.6 acres.

POA-4: All subcatchment areas flow to POA-4 which represents the ponded section of Black Brook. POA's 1, 2 and 3 flow through a series of reaches to POA 4 where it enters Black Brook and exits the property via a culvert. The overall modeled area to POA 4 is approximately 11 acres.

6. Proposed Conditions Model

The proposed condition watershed area consists of the same overall area as the existing condition plan, however, the existing condition subcatchments have been broken into smaller watersheds as a result of the proposed development.

POA-1: Proposed condition subcatchment 1.1S represents a portion of the existing and proposed cemetery, as well as a portion of the proposed roadway. This subcatchment has a drainage area of approximately 1.9 acres. This subcatchment is directed to a swale along the edge of the roadway and then to a culvert inlet modeled as a reach 1.1R. 1.1R is modeled as a 12" pipe that outlets into a level spreader and enters Meadow Buffer 1. The flow through the buffer is modeled as another reach, 2.1R. The runoff from 1.1S is treated by the BMP before exiting the site to the Black Brook wetlands via reach 3.1R. Subcatchment 2.1S represents a portion of the existing cemetery and a section of field. Subcatchment 2.1S has an area of 2.1 acres and flows to POA-1. Subcatchment 3.1S represents the runoff areas of field and roadway that are directed by a swale to Meadow Buffer 2. Subcatchment 3.1S has an approximate area of 0.6 acres. Flow from subcatchment 3.1S is directed to the meadow buffer and sent to POA-1.

Subcatchment 2.3S represents the lower section of the roadway and associated grassed areas. It has an area of approximately 1.4 acres. Subcatchment 2.3S is tributary to pond 2.3P which is a depression with a 15" stormdrain inlet that flows to Meadow Buffer 2 and then to POA-1. Pond 2.3P is designed so that overtopping of the depression is able to spill out into POA-3. The overall tributary area associated with POA-1 is approximately 5.9 acres which is an increase from the existing condition.

POA-2: Proposed condition subcatchment 1.2S represents a portion of the proposed cemetery and discharges to POA-2. 1.2S has a runoff area of approximately 0.2 acres. The overall tributary area associated with POA-2 is 0.20 acres which is a reduction from the existing condition.

POA-3: Proposed condition subcatchments 1.3S, 2.3S, 3.3S and 4.3S contribute runoff to POA-3. Subcatchment 1.3S consists of grass and gravel areas from the abutting property to the west and has an area of 4.3 acres. 1.3S is collected in a series of reach' and sent to pond 4.3P. 4.3P is a small depression with a 0.3 foot berm at the outlet. The small pond flows to POA-3. Subcatchment 2.3S is directed to a 15" stormdrain (2.3P) and piped to Meadow Buffer 2 but in high flow events 2.3P will flood and overflow directly into POA-3. Subcatchment 3.3S consists of pavement, roof, developed and undeveloped areas and flow directly to POA-3. Subcatchment 3.3S has an area of 0.65 acres. Subcatchment 4.3 has a tributary area of 0.16 acres and consists of landscaped area. 4.3S flows directly into pond 4.3P which flows to POA-3. The overall tributary area associated with POA-3 is 5.2 acres. Which is less than the existing condition.

The Best Management Practices (Meadow Buffers) have been designed and sized in accordance with DEP BMP standards contained within Chapter 500 and the BMP Manual. Sizing calculations can be found in Appendix 1.

POA-4: All subcatchment areas flow to POA-4 which represents Black Brook exiting the site through a culvert downstream near 382 Roosevelt Trail. POA's 1, 2 and 3 flow through a series of reaches to POA-4 where it exits the site via a culvert. POA-4 is modeled as a pond using the existing topography and field survey. The overall modeled area to POA 4 is approximately 11.3 acres.

7. Stormwater Management

Basic Standard - Chapter 500, Section 4(B)

Since the project will disturb more than one (1) acre of land area, MDEP Basic Standards apply, requiring that grading or other construction activities on the site do not impede or otherwise alter drainage ways to have an unreasonable adverse impact. We have avoided adverse impacts by providing an Erosion & Sedimentation Control Plan, and an Inspection, Maintenance and Housekeeping Plan (Appendix 3) to be implemented during construction and post-construction stabilization of the site. These construction requirements have been developed following Best Management Practice (BMP) guidelines.

General Standard - Chapter 500, Section 4(C)

The proposed project does not trigger MDEP General Standards, however since the site is classified as a Major development in the Town of Windham Ordinance, MDEP General Standards apply. The standards require a project's stormwater management system to include treatment measures that will mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms, provide for effective treatment of pollutants in stormwater, and mitigate potential temperature impacts. The General Standards require treatment of no less than 95% of the site's created impervious area and no less than 80% of the site's created developed area (landscaped area and impervious area combined). To mitigate the changes in hydrologic patterns due to the development of this project, two meadow buffers have been implemented into the stormwater management infrastructure. Buffer BMPs are very effective at removing a wide range of pollutants.

BMP sizing and treatment calculations are provided in Appendix 1.

Through the use of the aforementioned BMP's 98% of new impervious area will be receiving treatment and there will be a net reduction in developed area due to the addition of the meadow buffer. This meets the requirements for the Maine DEP General Standards.

Flooding Standard – Windham Town Ordinance 120-812(E)(a)

The Flooding Standard through the Maine Department of Environmental Protection does not apply to this project as the site does not require a Site Law permit and does not result in more than 3 acres of impervious area or 20 acres of developed area. The town ordinance for Windham requires that stormwater management systems, for minor and major site plans, detain, retain, or result in the infiltration of stormwater from 24-hour storms of the 2, 10, and 25-year frequencies such that the peak flows of stormwater from the project site does not exceed the peak flows of stormwater prior to undertaking the project. This standard was not able to be met by reasonable changes in project layout. Therefore, the project attempted to meet the Discharge to a Wetland standard of MDEP Chapter 500 Section 4(I). This standard requires "the applicant to demonstrate that the project's discharges into wetlands

will not significantly alter the flow of stormwater to the wetland from that which occurred. In general, new or increased stormwater discharges into wetlands must be put into sheet flow using level spreaders designed to meet the requirements in MDEP Chapter 500 Section 4(H)." The standard also requires "the discharge of runoff to a wetland due to a 2-year storm may not increase the mean storage depth within a wetland more than two inches above pre-development levels for more than 24 hours from the end of the storm event, unless otherwise approved by the Department. The Department may consider cumulative impacts due to runoff from other projects when applying this standard to any wetland." As such, a runoff evaluation was performed using the methodology outlined in the USDA Soil Conservation Service's "Urban Hydrology for Small Watersheds - Technical Release #55 (TR-55)". HydroCAD computer software was utilized to perform the calculations.

HydroCAD Stormwater Analysis

Runoff curve numbers were determined for each of the watersheds by measuring the area of each hydrologic soil group within each type of land cover. The type of land cover was determined based on survey data, field reconnaissance and aerial photography. Times of concentration were determined from site topographic maps in accordance with SCS procedures.

The 24-hour rainfall values utilized in the hydrologic model were obtained from Appendix H of MDEP's Chapter 500: Stormwater Management (effective date August 2015). Rainfall values for Cumberland County are listed in the table below.

Storm Frequency Precipitation (in./24 hr) Cumberland County	
2-year	3.1
10-year	4.6
25-year	5.8

The following table presents the results of the peak runoff calculations at the analysis points for the existing and proposed conditions.

Peak Runoff Rate Summary Table			
Analysis Point	**Storm Event**	**Existing Conditions (cfs)**	**Proposed Conditions (cfs)**
POA-1	2-year	0.2	0.5
	10-year	1.3	2.9
	25-year	2.6	8.0
POA-2	2-year	0.00	0.00
	10-year	0.05	0.00
	25-year	0.30	0.03
POA-3	2-year	0.7	0.7
	10-year	4.2	3.5
	25-year	8.5	4.8
POA-4	2-year	0.5	0.6
	10-year	3.9	4.4
	25-year	8.8	10.2

	Storm Event	**Pond Elevation Existing Condition**	**Pond Elevation Proposed Condition**	**Change in Elevation, ft (in)**
POA-4	2-year	230.33	230.38	0.05 (0.6”)
	10-year	230.72	230.75	0.03 (0.36”)
	25-year	230.93	230.94	0.01 (0.12”)

The HydroCAD Data output sheets from this analysis are appended to this report (Appendix 2) along with the Stormwater Management Plans (Appendix 5). The model predicts that the peak runoff rates in the proposed condition at Points of Analysis 2 and 3 are at or below the existing condition runoff rates for the 2, 10, and 25-year storm events with implementation of the proposed stormwater management practices. The model suggests POA-1 and POA-4 have an increase in flow rates for the 2, 10, and 25-year storm events. POA-1, 2 and 3 flow to POA-4 which represents Black Brook. POA-4 does not change elevation more than 2 inches during the 2, 10, or 25 year storm events, which meets the wetland standard. With the aforementioned use of meadow buffers, stormwater runoff is returned to sheet flow component which represents a thin and slow flow of water through the vegetated area. Soil conditions present on-site and in particular in the area of the propsoed meadow buffers have been mapped moderately well drained to excessively well drained. These soils conditions will infiltrate runoff, which has not been modeled, prior to reaching POA-4.

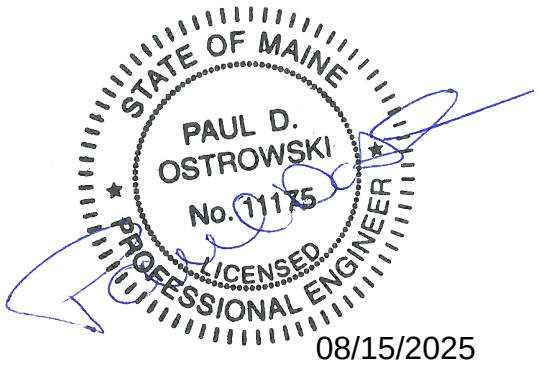
8. Summary

The proposed development has been designed to manage stormwater runoff through Best Management Practices approved by MDEP. Stormwater BMP's provide treatment to 98% (95% required) of the new impervious areas, over 100% (80% required) of the new developed area. Runoff discharging from the site will be similar to the existing development conditions for the 2, 10 and 25-year storm events. The impact for any increase in peak flow rates is insignificant, as it does not change the peak elevation more than 2" in a 2-year storm and the areas with increased peak rates are all transferred to sheet flow before entering the wetlands. Additionally, erosion and sedimentation controls along with associated maintenance and housekeeping procedures have been outlined to prevent unreasonable impacts on the site and to the surrounding environment.

Prepared by:

SEBAGO TECHNICS, INC.

Paul D. Ostrowski, P.E.
Engineering and Design Manager
PDO/NTB



08/15/2025

Nicholas T. Boyd, P.E.
Project Engineer

Appendix 1

Stormwater Quality Calculations

Table 1: MDEP GENERAL STANDARD CALCULATIONS

Job # 240666

AREA ID	WATERSHED SIZE (S.F.)	EXISTING ONSITE IMPERVIOUS AREA TO REMAIN (S.F.)	NEW ONSITE IMPERVIOUS AREA (S.F.)	% of Impervious onsite	EXISTING ONSITE LANDSCAPED AREA TO REMAIN (S.F.)	NEW ONSITE LANDSCAPED AREA (S.F.)	NEW MEADOW AREA (S.F.)	EXISTING UNDEVELOPED TO REMAIN (S.F.)	NET NEW DEVELOPED AREA (S.F.)	NET EXISTING DEVELOPED AREAS (S.F.)	TREATMENT PROVIDED?	IMPERVIOUS AREA TREATED (S.F.)	LANDSCAPED AREA TREATED (S.F.)	DEVELOPED AREA TREATED (S.F.)	TREATMENT BMP
1.1S	81,030	3,160	9,090	0.52	68,780	0	0	0	9,090	71,940	YES	12,250	68,780	81,030	Meadow 1
2.1S	90,530	160	0	0.01	74,330	0	16,040	0	0	74,490	NO	0	0	0	None
3.1S	26,360	0	2,820	0.12	23,540	0	0	0	2,820	23,540	YES	2,820	23,540	26,360	Meadow 2
1.2S	10,140	0	0	0.00	10,140	0	0	0	0	10,140	NO	0	0	0	None
1.3S	189,660	4,530	1,240	0.24	183,890	0	0	0	1,240	188,420	NO	0	0	0	None
2.3S	59,520	0	8,210	0.35	47,420	0	0	3,890	8,210	47,420	YES	8,210	47,420	55,630	Meadow 2
3.3S	28,230	0	850	0.04	13,220	0	0	14,160	850	13,220	NO	0	0	0	None
4.3S	6,910	0	1,380	0.06	5,530	0	0	0	1,380	5,530	NO	0	0	0	None
									0	0	NO	0	0	0	
									0	0	NO	0	0	0	
									0	0	NO	0	0	0	
									0	0	NO	0	0	0	
									0	0	NO	0	0	0	
									0	0	NO	0	0	0	
									0	0	NO	0	0	0	
									0	0	NO	0	0	0	
									0	0	NO	0	0	0	
TOTAL (S.F.)	**492,380**	**7,850**	**23,590**		**426,850**	**0**	**16,040**	**18,050**	**23,590**	**434,700**		**23,280**	**139,740**	**163,020**	

TOTAL NEW IMPERVIOUS AREA (S.F.)	**23,590**	**TOTAL NEW DEVELOPED AREA (S.F.)**	**23,590**
TOTAL IMPERVIOUS AREA RECEIVING TREATMENT (S.F.)	**23,280**	**TOTAL AREA RECEIVING TREATMENT (S.F.)**	**163,020**
% OF IMPERVIOUS AREA RECEIVING TREATMENT	**98.69%**	**% OF AREA RECEIVING TREATMENT**	**691.06%**

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JOB					
SHEET NO.	1	OF			
JOB	240666				
SHEET NO.	1	OF			
CALCULATED BY	NTB	DATE	8/13/2025		
CHECKED BY					
FILE NAME	240666 WQC 8-5-25.xlsx	PRINT DATE	8/15/2025		

Note: Buffers are sized in accordance with Chapter 5 of the Maine Department of Environmental Protection BMPs Technical Design Manual, latest revision.

Wooded Buffer 1 (WB-1)								
Type of Buffer :		Buffer with Stone Bermed Level Spreader						
Existing Cover :		Meadow						
Soils :		Nicholville Very Fine Sandy Loam						
Buffer Slope :		7.8%						
Buffer Length :		180	feet					
Tributary Area								
Impervious :		12,250	sf					
Landscaped :		68,780	sf					
Per Table 5-4 of Manual for Soil Group A Fine Sandy Loam:								
Berm Length per acre of impervious :				100	ft			
Berm Length per acre of landscaped :				30	ft			
Required Level Spreader Berm Length :				75.5	ft	(BMP_{ST})		
Provided Level Spreader Berm Length :				76.0	ft	(BMP_{TF})		
Treatment Factor Calculation								
TF=0.4 * (BMP_{ST}/BMP_{TF})=	**0.40**							

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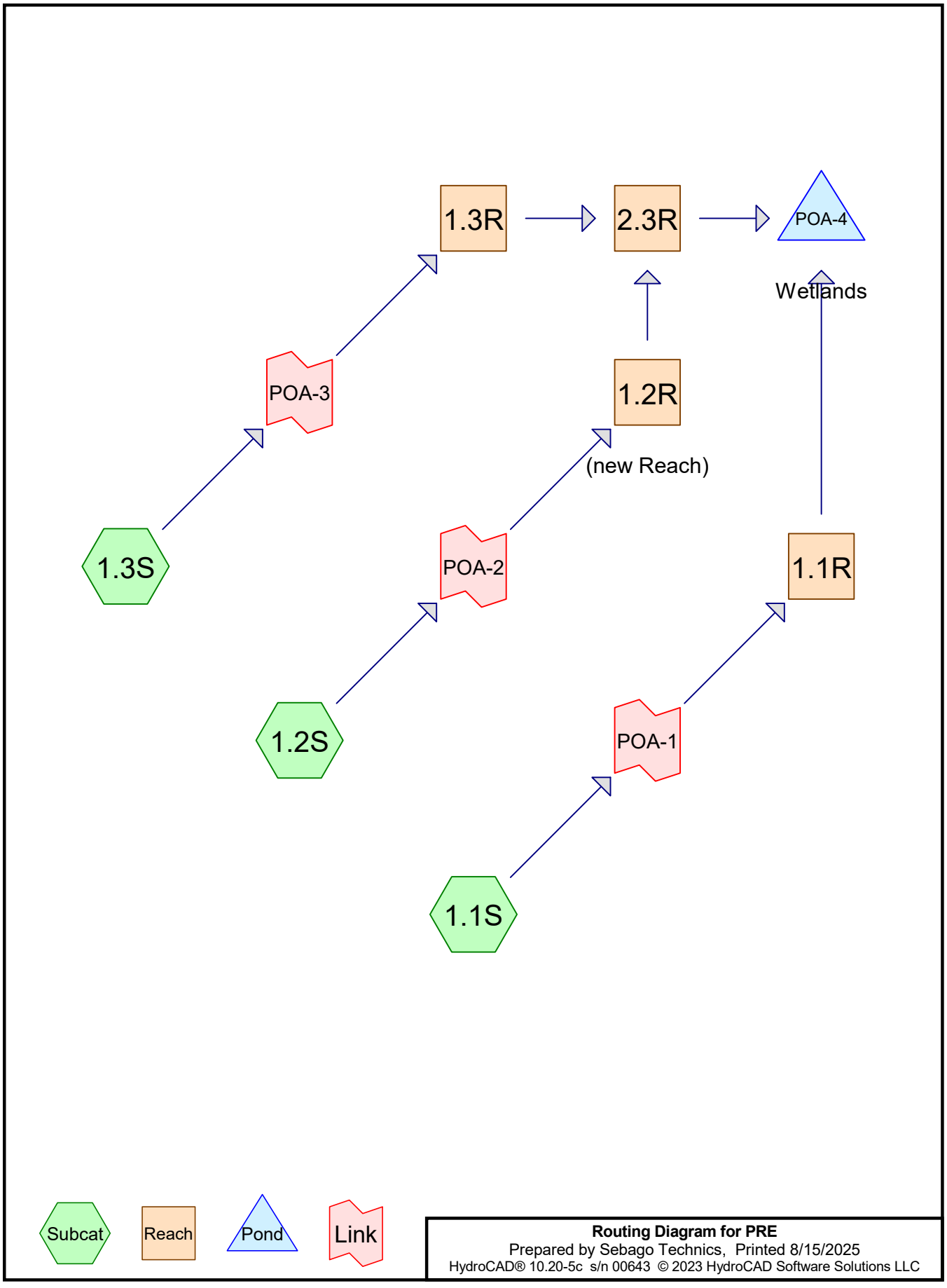
SHEET NO.	1	OF	
CALCULATED BY	NTB	DATE	8/13/2025
CHECKED BY			
FILE NAME	240666 WQC 8-5-25.xlsx	PRINT DATE	8/15/2025

Note: Buffers are sized in accordance with Chapter 5 of the Maine Department of Environmental Protection BMPs Technical Design Manual, latest revision.

Wooded Buffer 1 (WB-1)						
Type of Buffer :	Buffer with Stone Bermed Level Spreader					
Existing Cover :	Meadow					
Soils :	Nicholville Very Fine Sandy Loam					
Buffer Slope :	6.5%					
Buffer Length :	100	feet				
Tributary Area						
Impervious :	8,210	sf				
Landscaped :	47,420	sf				
Per Table 5-4 of Manual for Soil Group A Fine Sandy Loam:						
Berm Length per acre of impervious :			125	ft		
Berm Length per acre of landscaped :			35	ft		
Required Level Spreader Berm Length :			61.7	ft	(BMP_{ST})	
Provided Level Spreader Berm Length :			62.0	ft	(BMP_{TF})	
Treatment Factor Calculation						
TF=0.4 * (BMPST/BMPTF)=	**0.40**					

Appendix 2A

Existing Conditions HydroCAD Summary



Routing Diagram for PRE
Prepared by Sebago Technics, Printed 8/15/2025

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
299,330	39	>75% Grass cover, Good, HSG A (1.1S, 1.2S, 1.3S)
84,550	74	>75% Grass cover, Good, HSG C (1.1S, 1.2S, 1.3S)
82,410	80	>75% Grass cover, Good, HSG D (1.1S, 1.3S)
530	96	Gravel surface, HSG A (1.3S)
2,170	96	Gravel surface, HSG D (1.3S)
5,340	98	Paved parking, HSG A (1.1S, 1.3S)
18,050	70	Woods, Good, HSG C (1.3S)
492,380	**54**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
305,200	HSG A	1.1S, 1.2S, 1.3S
0	HSG B	
102,600	HSG C	1.1S, 1.2S, 1.3S
84,580	HSG D	1.1S, 1.3S
0	Other	
492,380		**TOTAL AREA**

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.1S: Runoff Area=98,880 sf 0.26% Impervious Runoff Depth=0.25"
Flow Length=419' Tc=14.8 min CN=56 Runoff=0.22 cfs 2,051 cf

Subcatchment 1.2S: Runoff Area=61,190 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=437' Tc=8.1 min CN=41 Runoff=0.00 cfs 17 cf

Subcatchment 1.3S: Runoff Area=332,310 sf 1.53% Impervious Runoff Depth=0.25"
Flow Length=987' Tc=16.4 min CN=56 Runoff=0.71 cfs 6,894 cf

Reach 1.1R: Avg. Flow Depth=0.02' Max Vel=0.21 fps Inflow=0.22 cfs 2,051 cf
n=0.080 L=200.0' S=0.0300 '/' Capacity=174.02 cfs Outflow=0.17 cfs 2,051 cf

Reach 1.2R: (new Reach) Avg. Flow Depth=0.00' Max Vel=0.14 fps Inflow=0.00 cfs 17 cf
n=0.100 L=372.0' S=0.0430 '/' Capacity=166.69 cfs Outflow=0.00 cfs 17 cf

Reach 1.3R: Avg. Flow Depth=0.06' Max Vel=0.47 fps Inflow=0.71 cfs 6,894 cf
n=0.080 L=707.0' S=0.0255 '/' Capacity=186.57 cfs Outflow=0.46 cfs 6,894 cf

Reach 2.3R: Avg. Flow Depth=0.03' Max Vel=0.29 fps Inflow=0.46 cfs 6,911 cf
n=0.035 L=450.0' S=0.0056 '/' Capacity=531.82 cfs Outflow=0.36 cfs 6,911 cf

Pond POA-4: Wetlands Peak Elev=230.33' Storage=8,962 cf Inflow=0.46 cfs 8,962 cf
36.0" Round Culvert n=0.013 L=50.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf

Link POA-1: Inflow=0.22 cfs 2,051 cf
Primary=0.22 cfs 2,051 cf

Link POA-2: Inflow=0.00 cfs 17 cf
Primary=0.00 cfs 17 cf

Link POA-3: Inflow=0.71 cfs 6,894 cf
Primary=0.71 cfs 6,894 cf

Total Runoff Area = 492,380 sf Runoff Volume = 8,962 cf Average Runoff Depth = 0.22"
98.92% Pervious = 487,040 sf 1.08% Impervious = 5,340 sf

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.1S: Runoff Area=98,880 sf 0.26% Impervious Runoff Depth=0.84"
Flow Length=419' Tc=14.8 min CN=56 Runoff=1.30 cfs 6,943 cf

Subcatchment 1.2S: Runoff Area=61,190 sf 0.00% Impervious Runoff Depth=0.18"
Flow Length=437' Tc=8.1 min CN=41 Runoff=0.05 cfs 938 cf

Subcatchment 1.3S: Runoff Area=332,310 sf 1.53% Impervious Runoff Depth=0.84"
Flow Length=987' Tc=16.4 min CN=56 Runoff=4.20 cfs 23,334 cf

Reach 1.1R: Avg. Flow Depth=0.05' Max Vel=0.44 fps Inflow=1.30 cfs 6,943 cf
n=0.080 L=200.0' S=0.0300 '/' Capacity=174.02 cfs Outflow=1.15 cfs 6,943 cf

Reach 1.2R: (new Reach) Avg. Flow Depth=0.00' Max Vel=0.14 fps Inflow=0.05 cfs 938 cf
n=0.100 L=372.0' S=0.0430 '/' Capacity=166.69 cfs Outflow=0.03 cfs 938 cf

Reach 1.3R: Avg. Flow Depth=0.21' Max Vel=1.01 fps Inflow=4.20 cfs 23,334 cf
n=0.080 L=707.0' S=0.0255 '/' Capacity=186.57 cfs Outflow=3.44 cfs 23,334 cf

Reach 2.3R: Avg. Flow Depth=0.09' Max Vel=0.65 fps Inflow=3.45 cfs 24,272 cf
n=0.035 L=450.0' S=0.0056 '/' Capacity=531.82 cfs Outflow=3.01 cfs 24,272 cf

Pond POA-4: Wetlands Peak Elev=230.72' Storage=22,637 cf Inflow=3.87 cfs 31,215 cf
36.0" Round Culvert n=0.013 L=50.0' S=0.0100 '/' Outflow=0.29 cfs 13,522 cf

Link POA-1: Inflow=1.30 cfs 6,943 cf
Primary=1.30 cfs 6,943 cf

Link POA-2: Inflow=0.05 cfs 938 cf
Primary=0.05 cfs 938 cf

Link POA-3: Inflow=4.20 cfs 23,334 cf
Primary=4.20 cfs 23,334 cf

Total Runoff Area = 492,380 sf Runoff Volume = 31,215 cf Average Runoff Depth = 0.76"
98.92% Pervious = 487,040 sf 1.08% Impervious = 5,340 sf

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.1S: Runoff Area=98,880 sf 0.26% Impervious Runoff Depth=1.48"
Flow Length=419' Tc=14.8 min CN=56 Runoff=2.64 cfs 12,191 cf

Subcatchment 1.2S: Runoff Area=61,190 sf 0.00% Impervious Runoff Depth=0.49"
Flow Length=437' Tc=8.1 min CN=41 Runoff=0.30 cfs 2,515 cf

Subcatchment 1.3S: Runoff Area=332,310 sf 1.53% Impervious Runoff Depth=1.48"
Flow Length=987' Tc=16.4 min CN=56 Runoff=8.52 cfs 40,971 cf

Reach 1.1R: Avg. Flow Depth=0.08' Max Vel=0.60 fps Inflow=2.64 cfs 12,191 cf
n=0.080 L=200.0' S=0.0300 '/' Capacity=174.02 cfs Outflow=2.44 cfs 12,191 cf

Reach 1.2R: (new Reach) Avg. Flow Depth=0.02' Max Vel=0.21 fps Inflow=0.30 cfs 2,515 cf
n=0.100 L=372.0' S=0.0430 '/' Capacity=166.69 cfs Outflow=0.16 cfs 2,515 cf

Reach 1.3R: Avg. Flow Depth=0.33' Max Vel=1.33 fps Inflow=8.52 cfs 40,971 cf
n=0.080 L=707.0' S=0.0255 '/' Capacity=186.57 cfs Outflow=7.37 cfs 40,971 cf

Reach 2.3R: Avg. Flow Depth=0.15' Max Vel=0.89 fps Inflow=7.46 cfs 43,486 cf
n=0.035 L=450.0' S=0.0056 '/' Capacity=531.82 cfs Outflow=6.84 cfs 43,486 cf

Pond POA-4: Wetlands Peak Elev=230.91' Storage=30,705 cf Inflow=8.77 cfs 55,677 cf
36.0" Round Culvert n=0.013 L=50.0' S=0.0100 '/' Outflow=1.00 cfs 37,569 cf

Link POA-1: Inflow=2.64 cfs 12,191 cf
Primary=2.64 cfs 12,191 cf

Link POA-2: Inflow=0.30 cfs 2,515 cf
Primary=0.30 cfs 2,515 cf

Link POA-3: Inflow=8.52 cfs 40,971 cf
Primary=8.52 cfs 40,971 cf

Total Runoff Area = 492,380 sf Runoff Volume = 55,677 cf Average Runoff Depth = 1.36"
98.92% Pervious = 487,040 sf 1.08% Impervious = 5,340 sf

Summary for Subcatchment 1.1S:

Runoff = 2.64 cfs @ 12.22 hrs, Volume= 12,191 cf, Depth= 1.48"
Routed to Link POA-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
51,450	39	>75% Grass cover, Good, HSG A
44,070	74	>75% Grass cover, Good, HSG C
3,100	80	>75% Grass cover, Good, HSG D
260	98	Paved parking, HSG A
98,880	56	Weighted Average
98,620		99.74% Pervious Area
260		0.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	66	0.0380	0.20		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.10"
8.1	202	0.1360	0.41		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.10"
1.2	151	0.0840	2.03		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
14.8	419	Total			

Summary for Subcatchment 1.2S:

Runoff = 0.30 cfs @ 12.34 hrs, Volume= 2,515 cf, Depth= 0.49"
Routed to Link POA-2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
58,200	39	>75% Grass cover, Good, HSG A
2,990	74	>75% Grass cover, Good, HSG C
61,190	41	Weighted Average
61,190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	66	0.0454	0.21		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.10"
0.9	90	0.0610	1.73		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
2.1	281	0.1032	2.25		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
8.1	437	Total			

Summary for Subcatchment 1.3S:

Runoff = 8.52 cfs @ 12.26 hrs, Volume= 40,971 cf, Depth= 1.48"
Routed to Link POA-3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
5,080	98	Paved parking, HSG A
189,680	39	>75% Grass cover, Good, HSG A
37,490	74	>75% Grass cover, Good, HSG C
79,310	80	>75% Grass cover, Good, HSG D
530	96	Gravel surface, HSG A
2,170	96	Gravel surface, HSG D
18,050	70	Woods, Good, HSG C
332,310	56	Weighted Average
327,230		98.47% Pervious Area
5,080		1.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	67	0.0700	0.26		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.10"
0.9	101	0.0740	1.90		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.6	87	0.1150	2.37		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
4.9	261	0.0160	0.89		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
2.9	207	0.0280	1.17		**Shallow Concentrated Flow, E-F** Short Grass Pasture Kv= 7.0 fps
2.7	264	0.0549	1.64		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
16.4	987	Total			

Summary for Reach 1.1R:

Inflow Area = 98,880 sf, 0.26% Impervious, Inflow Depth = 1.48" for 25-yr event
Inflow = 2.64 cfs @ 12.22 hrs, Volume= 12,191 cf
Outflow = 2.44 cfs @ 12.30 hrs, Volume= 12,191 cf, Atten= 7%, Lag= 4.4 min
Routed to Pond POA-4 : Wetlands

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.60 fps, Min. Travel Time= 5.6 min
Avg. Velocity = 0.21 fps, Avg. Travel Time= 16.1 min

Peak Storage= 820 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.08' , Surface Width= 51.61'
Bank-Full Depth= 1.00' Flow Area= 60.0 sf, Capacity= 174.02 cfs

50.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 10.0 '/' Top Width= 70.00'
Length= 200.0' Slope= 0.0300 '/'
Inlet Invert= 235.00', Outlet Invert= 229.00'

‡

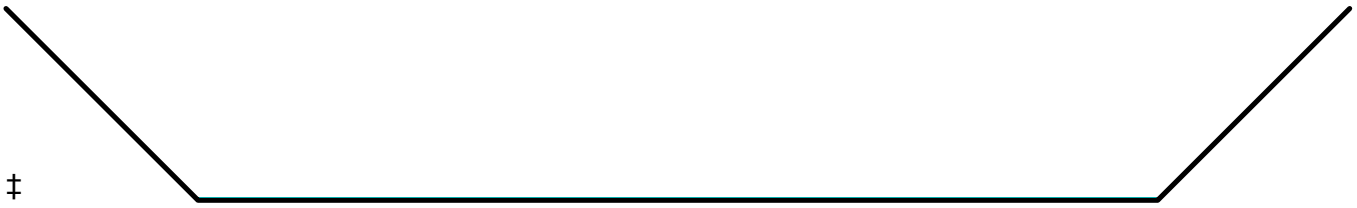
Summary for Reach 1.2R: (new Reach)

Inflow Area = 61,190 sf, 0.00% Impervious, Inflow Depth = 0.49" for 25-yr event
Inflow = 0.30 cfs @ 12.34 hrs, Volume= 2,515 cf
Outflow = 0.16 cfs @ 12.62 hrs, Volume= 2,515 cf, Atten= 45%, Lag= 16.7 min
Routed to Reach 2.3R :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.21 fps, Min. Travel Time= 30.2 min
Avg. Velocity = 0.15 fps, Avg. Travel Time= 41.9 min

Peak Storage= 297 cf @ 12.62 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 50.32'
Bank-Full Depth= 1.00' Flow Area= 60.0 sf, Capacity= 166.69 cfs

50.00' x 1.00' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 10.0 '/' Top Width= 70.00'
Length= 372.0' Slope= 0.0430 '/'
Inlet Invert= 247.50', Outlet Invert= 231.50'



‡

Summary for Reach 1.3R:

Inflow Area = 332,310 sf, 1.53% Impervious, Inflow Depth = 1.48" for 25-yr event
Inflow = 8.52 cfs @ 12.26 hrs, Volume= 40,971 cf
Outflow = 7.37 cfs @ 12.37 hrs, Volume= 40,971 cf, Atten= 14%, Lag= 7.0 min
Routed to Reach 2.3R :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.33 fps, Min. Travel Time= 8.9 min
Avg. Velocity = 0.41 fps, Avg. Travel Time= 28.5 min

Peak Storage= 3,912 cf @ 12.37 hrs
Average Depth at Peak Storage= 0.33' , Surface Width= 18.32'
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 186.57 cfs

15.00' x 2.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 5.0 '/' Top Width= 35.00'
Length= 707.0' Slope= 0.0255 '/'
Inlet Invert= 249.50', Outlet Invert= 231.50'

‡

Summary for Reach 2.3R:

Inflow Area = 393,500 sf, 1.29% Impervious, Inflow Depth = 1.33" for 25-yr event
Inflow = 7.46 cfs @ 12.38 hrs, Volume= 43,486 cf
Outflow = 6.84 cfs @ 12.50 hrs, Volume= 43,486 cf, Atten= 8%, Lag= 7.3 min
Routed to Pond POA-4 : Wetlands

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.89 fps, Min. Travel Time= 8.4 min
Avg. Velocity = 0.31 fps, Avg. Travel Time= 23.9 min

Peak Storage= 3,445 cf @ 12.50 hrs
Average Depth at Peak Storage= 0.15' , Surface Width= 51.21'
Bank-Full Depth= 2.00' Flow Area= 116.0 sf, Capacity= 531.82 cfs

50.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 5.0 '/' Top Width= 66.00'
Length= 450.0' Slope= 0.0056 '/'
Inlet Invert= 231.50', Outlet Invert= 229.00'

Summary for Pond POA-4: Wetlands

Inflow Area = 492,380 sf, 1.08% Impervious, Inflow Depth = 1.36" for 25-yr event
Inflow = 8.77 cfs @ 12.47 hrs, Volume= 55,677 cf
Outflow = 1.00 cfs @ 16.15 hrs, Volume= 37,569 cf, Atten= 89%, Lag= 220.7 min
Primary = 1.00 cfs @ 16.15 hrs, Volume= 37,569 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 230.91' @ 16.15 hrs Surf.Area= 44,471 sf Storage= 30,705 cf

Plug-Flow detention time= 427.3 min calculated for 37,569 cf (67% of inflow)
Center-of-Mass det. time= 305.8 min (1,224.7 - 918.9)

Volume	Invert	Avail.Storage	Storage Description
#1	230.00'	98,025 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
230.00	23,000	0	0
231.00	46,590	34,795	34,795
232.00	79,870	63,230	98,025

Device	Routing	Invert	Outlet Devices
#1	Primary	230.50'	**36.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 230.50' / 230.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=1.00 cfs @ 16.15 hrs HW=230.91' (Free Discharge)
1=Culvert (Inlet Controls 1.00 cfs @ 1.72 fps)

Summary for Link POA-1:

Inflow Area = 98,880 sf, 0.26% Impervious, Inflow Depth = 1.48" for 25-yr event
Inflow = 2.64 cfs @ 12.22 hrs, Volume= 12,191 cf
Primary = 2.64 cfs @ 12.22 hrs, Volume= 12,191 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach 1.1R :

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link POA-2:

Inflow Area = 61,190 sf, 0.00% Impervious, Inflow Depth = 0.49" for 25-yr event
Inflow = 0.30 cfs @ 12.34 hrs, Volume= 2,515 cf
Primary = 0.30 cfs @ 12.34 hrs, Volume= 2,515 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach 1.2R : (new Reach)

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

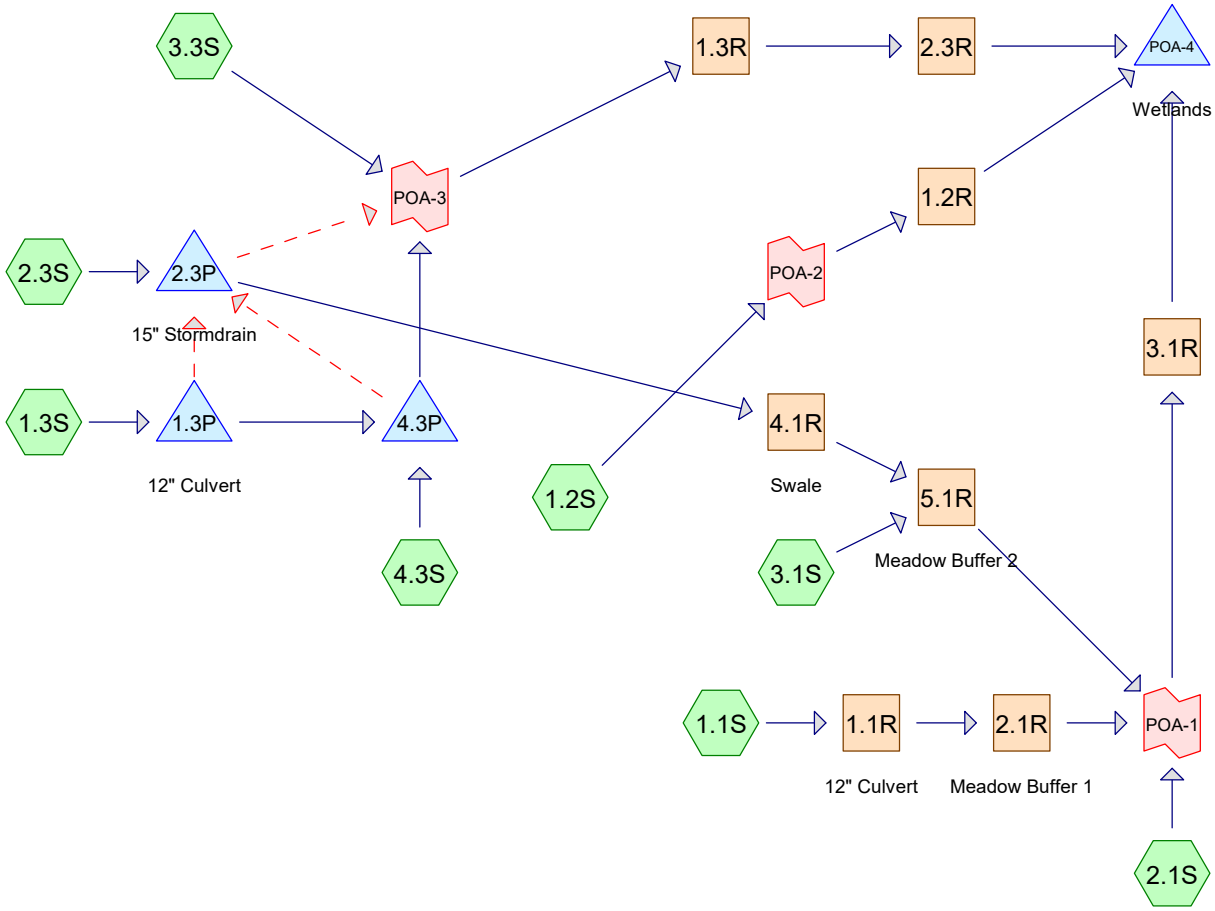
Summary for Link POA-3:

Inflow Area = 332,310 sf, 1.53% Impervious, Inflow Depth = 1.48" for 25-yr event
Inflow = 8.52 cfs @ 12.26 hrs, Volume= 40,971 cf
Primary = 8.52 cfs @ 12.26 hrs, Volume= 40,971 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach 1.3R :

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Appendix 2B

Proposed Conditions
HydroCAD Summary



Subcat Reach Pond Link

Routing Diagram for POST

Prepared by Sebago Technics, Printed 8/15/2025

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
284,680	39	>75% Grass cover, Good, HSG A (1.1S, 1.2S, 1.3S, 2.1S, 2.3S, 3.1S, 3.3S, 4.3S)
60,770	74	>75% Grass cover, Good, HSG C (1.3S, 2.1S, 2.3S, 3.1S, 3.3S, 4.3S)
81,400	80	>75% Grass cover, Good, HSG D (1.3S, 2.1S)
760	96	Gravel surface, HSG A (1.3S)
3,180	96	Gravel surface, HSG D (1.3S)
1,320	30	Meadow, non-grazed, HSG A (2.1S)
14,720	71	Meadow, non-grazed, HSG C (2.1S)
18,440	98	Paved parking, HSG A (1.1S, 1.3S, 2.1S, 3.1S, 4.3S)
8,520	98	Paved parking, HSG C (2.3S, 3.3S)
540	98	Roofs, HSG C (3.3S)
18,050	70	Woods, Good, HSG C (2.3S, 3.3S)
492,380	**56**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
305,200	HSG A	1.1S, 1.2S, 1.3S, 2.1S, 2.3S, 3.1S, 3.3S, 4.3S
0	HSG B	
102,600	HSG C	1.3S, 2.1S, 2.3S, 3.1S, 3.3S, 4.3S
84,580	HSG D	1.3S, 2.1S
0	Other	
492,380		**TOTAL AREA**

Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.1S: Runoff Area=81,030 sf 15.12% Impervious Runoff Depth=0.07"
Flow Length=204' Tc=6.0 min CN=48 Runoff=0.02 cfs 500 cf

Subcatchment 1.2S: Runoff Area=10,140 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=122' Slope=0.0656 '/' Tc=7.3 min CN=39 Runoff=0.00 cfs 0 cf

Subcatchment 1.3S: Runoff Area=189,660 sf 0.96% Impervious Runoff Depth=0.31"
Flow Length=753' Tc=14.0 min CN=58 Runoff=0.60 cfs 4,849 cf

Subcatchment 2.1S: Runoff Area=90,530 sf 0.18% Impervious Runoff Depth=0.28"
Flow Length=419' Tc=14.8 min CN=57 Runoff=0.24 cfs 2,091 cf

Subcatchment 2.3S: Runoff Area=59,520 sf 13.79% Impervious Runoff Depth=0.40"
Flow Length=374' Tc=8.5 min CN=61 Runoff=0.34 cfs 2,003 cf

Subcatchment 3.1S: Runoff Area=26,360 sf 10.70% Impervious Runoff Depth=0.07"
Flow Length=285' Tc=6.2 min CN=48 Runoff=0.01 cfs 163 cf

Subcatchment 3.3S: Runoff Area=28,230 sf 3.01% Impervious Runoff Depth=0.34"
Flow Length=383' Tc=17.9 min CN=59 Runoff=0.10 cfs 795 cf

Subcatchment 4.3S: Runoff Area=6,910 sf 19.97% Impervious Runoff Depth=0.31"
Tc=0.0 min CN=58 Runoff=0.03 cfs 177 cf

Reach 1.1R: 12" Culvert Avg. Flow Depth=0.05' Max Vel=1.25 fps Inflow=0.02 cfs 500 cf
12.0" Round Pipe n=0.013 L=190.0' S=0.0116 '/' Capacity=3.83 cfs Outflow=0.02 cfs 500 cf

Reach 1.2R: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf
n=0.100 L=372.0' S=0.0430 '/' Capacity=166.69 cfs Outflow=0.00 cfs 0 cf

Reach 1.3R: Avg. Flow Depth=0.06' Max Vel=0.46 fps Inflow=0.71 cfs 5,716 cf
n=0.080 L=707.0' S=0.0255 '/' Capacity=186.57 cfs Outflow=0.44 cfs 5,716 cf

Reach 2.1R: Meadow Buffer 1 Avg. Flow Depth=0.00' Max Vel=0.35 fps Inflow=0.02 cfs 500 cf
n=0.035 L=193.0' S=0.0803 '/' Capacity=385.67 cfs Outflow=0.02 cfs 500 cf

Reach 2.3R: Avg. Flow Depth=0.02' Max Vel=0.28 fps Inflow=0.44 cfs 5,716 cf
n=0.035 L=450.0' S=0.0056 '/' Capacity=531.82 cfs Outflow=0.33 cfs 5,716 cf

Reach 3.1R: Avg. Flow Depth=0.03' Max Vel=0.30 fps Inflow=0.51 cfs 4,756 cf
n=0.080 L=200.0' S=0.0300 '/' Capacity=174.02 cfs Outflow=0.44 cfs 4,756 cf

Reach 4.1R: Swale Avg. Flow Depth=0.11' Max Vel=1.36 fps Inflow=0.34 cfs 2,003 cf
n=0.030 L=84.0' S=0.0179 '/' Capacity=23.56 cfs Outflow=0.34 cfs 2,003 cf

Reach 5.1R: Meadow Buffer 2 Avg. Flow Depth=0.03' Max Vel=0.17 fps Inflow=0.34 cfs 2,166 cf
n=0.240 L=100.0' S=0.0750 '/' Capacity=28.29 cfs Outflow=0.27 cfs 2,166 cf

Pond 1.3P: 12" Culvert Peak Elev=251.44' Storage=25 cf Inflow=0.60 cfs 4,849 cf
Primary=0.60 cfs 4,849 cf Secondary=0.00 cfs 0 cf Outflow=0.60 cfs 4,849 cf

Pond 2.3P: 15" Stormdrain Peak Elev=248.80' Storage=2 cf Inflow=0.34 cfs 2,003 cf
Primary=0.34 cfs 2,003 cf Secondary=0.00 cfs 0 cf Outflow=0.34 cfs 2,003 cf

Pond 4.3P: Peak Elev=250.39' Storage=120 cf Inflow=0.61 cfs 5,025 cf
Primary=0.61 cfs 4,921 cf Secondary=0.00 cfs 0 cf Outflow=0.61 cfs 4,921 cf

Pond POA-4: Wetlands Peak Elev=230.38' Storage=10,472 cf Inflow=0.56 cfs 10,472 cf
36.0" Round Culvert n=0.013 L=50.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf

Link POA-1: Inflow=0.51 cfs 4,756 cf
Primary=0.51 cfs 4,756 cf

Link POA-2: Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link POA-3: Inflow=0.71 cfs 5,716 cf
Primary=0.71 cfs 5,716 cf

Total Runoff Area = 492,380 sf Runoff Volume = 10,576 cf Average Runoff Depth = 0.26"
94.41% Pervious = 464,880 sf 5.59% Impervious = 27,500 sf

Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.1S: Runoff Area=81,030 sf 15.12% Impervious Runoff Depth=0.45"
Flow Length=204' Tc=6.0 min CN=48 Runoff=0.39 cfs 3,014 cf

Subcatchment 1.2S: Runoff Area=10,140 sf 0.00% Impervious Runoff Depth=0.13"
Flow Length=122' Slope=0.0656 '/' Tc=7.3 min CN=39 Runoff=0.00 cfs 107 cf

Subcatchment 1.3S: Runoff Area=189,660 sf 0.96% Impervious Runoff Depth=0.96"
Flow Length=753' Tc=14.0 min CN=58 Runoff=3.07 cfs 15,106 cf

Subcatchment 2.1S: Runoff Area=90,530 sf 0.18% Impervious Runoff Depth=0.90"
Flow Length=419' Tc=14.8 min CN=57 Runoff=1.31 cfs 6,778 cf

Subcatchment 2.3S: Runoff Area=59,520 sf 13.79% Impervious Runoff Depth=1.14"
Flow Length=374' Tc=8.5 min CN=61 Runoff=1.46 cfs 5,632 cf

Subcatchment 3.1S: Runoff Area=26,360 sf 10.70% Impervious Runoff Depth=0.45"
Flow Length=285' Tc=6.2 min CN=48 Runoff=0.13 cfs 980 cf

Subcatchment 3.3S: Runoff Area=28,230 sf 3.01% Impervious Runoff Depth=1.01"
Flow Length=383' Tc=17.9 min CN=59 Runoff=0.45 cfs 2,386 cf

Subcatchment 4.3S: Runoff Area=6,910 sf 19.97% Impervious Runoff Depth=0.96"
Tc=0.0 min CN=58 Runoff=0.18 cfs 550 cf

Reach 1.1R: 12" Culvert Avg. Flow Depth=0.22' Max Vel=3.15 fps Inflow=0.39 cfs 3,014 cf
12.0" Round Pipe n=0.013 L=190.0' S=0.0116 '/' Capacity=3.83 cfs Outflow=0.39 cfs 3,014 cf

Reach 1.2R: Avg. Flow Depth=0.00' Max Vel=0.14 fps Inflow=0.00 cfs 107 cf
n=0.100 L=372.0' S=0.0430 '/' Capacity=166.69 cfs Outflow=0.00 cfs 107 cf

Reach 1.3R: Avg. Flow Depth=0.19' Max Vel=0.94 fps Inflow=3.52 cfs 17,939 cf
n=0.080 L=707.0' S=0.0255 '/' Capacity=186.57 cfs Outflow=2.80 cfs 17,939 cf

Reach 2.1R: Meadow Buffer 1 Avg. Flow Depth=0.01' Max Vel=0.49 fps Inflow=0.39 cfs 3,014 cf
n=0.035 L=193.0' S=0.0803 '/' Capacity=385.67 cfs Outflow=0.37 cfs 3,014 cf

Reach 2.3R: Avg. Flow Depth=0.08' Max Vel=0.59 fps Inflow=2.80 cfs 17,939 cf
n=0.035 L=450.0' S=0.0056 '/' Capacity=531.82 cfs Outflow=2.36 cfs 17,939 cf

Reach 3.1R: Avg. Flow Depth=0.09' Max Vel=0.62 fps Inflow=2.95 cfs 16,405 cf
n=0.080 L=200.0' S=0.0300 '/' Capacity=174.02 cfs Outflow=2.76 cfs 16,405 cf

Reach 4.1R: Swale Avg. Flow Depth=0.24' Max Vel=2.18 fps Inflow=1.46 cfs 5,632 cf
n=0.030 L=84.0' S=0.0179 '/' Capacity=23.56 cfs Outflow=1.45 cfs 5,632 cf

Reach 5.1R: Meadow Buffer 2 Avg. Flow Depth=0.08' Max Vel=0.32 fps Inflow=1.58 cfs 6,612 cf
n=0.240 L=100.0' S=0.0750 '/' Capacity=28.29 cfs Outflow=1.39 cfs 6,612 cf

Pond 1.3P: 12" Culvert Peak Elev=252.18' Storage=205 cf Inflow=3.07 cfs 15,106 cf
Primary=2.99 cfs 15,106 cf Secondary=0.00 cfs 0 cf Outflow=2.99 cfs 15,106 cf

Pond 2.3P: 15" Stormdrain Peak Elev=249.17' Storage=15 cf Inflow=1.46 cfs 5,632 cf
Primary=1.46 cfs 5,632 cf Secondary=0.00 cfs 0 cf Outflow=1.46 cfs 5,632 cf

Pond 4.3P: Peak Elev=250.54' Storage=150 cf Inflow=3.07 cfs 15,656 cf
Primary=3.07 cfs 15,552 cf Secondary=0.00 cfs 0 cf Outflow=3.07 cfs 15,552 cf

Pond POA-4: Wetlands Peak Elev=230.75' Storage=23,734 cf Inflow=4.41 cfs 34,450 cf
36.0" Round Culvert n=0.013 L=50.0' S=0.0100 '/' Outflow=0.37 cfs 18,936 cf

Link POA-1: Inflow=2.95 cfs 16,405 cf
Primary=2.95 cfs 16,405 cf

Link POA-2: Inflow=0.00 cfs 107 cf
Primary=0.00 cfs 107 cf

Link POA-3: Inflow=3.52 cfs 17,939 cf
Primary=3.52 cfs 17,939 cf

Total Runoff Area = 492,380 sf Runoff Volume = 34,554 cf Average Runoff Depth = 0.84"
94.41% Pervious = 464,880 sf 5.59% Impervious = 27,500 sf

Time span=1.00-72.00 hrs, dt=0.01 hrs, 7101 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.1S: Runoff Area=81,030 sf 15.12% Impervious Runoff Depth=0.91"
Flow Length=204' Tc=6.0 min CN=48 Runoff=1.38 cfs 6,162 cf

Subcatchment 1.2S: Runoff Area=10,140 sf 0.00% Impervious Runoff Depth=0.39"
Flow Length=122' Slope=0.0656 '/' Tc=7.3 min CN=39 Runoff=0.03 cfs 329 cf

Subcatchment 1.3S: Runoff Area=189,660 sf 0.96% Impervious Runoff Depth=1.63"
Flow Length=753' Tc=14.0 min CN=58 Runoff=5.88 cfs 25,818 cf

Subcatchment 2.1S: Runoff Area=90,530 sf 0.18% Impervious Runoff Depth=1.56"
Flow Length=419' Tc=14.8 min CN=57 Runoff=2.58 cfs 11,738 cf

Subcatchment 2.3S: Runoff Area=59,520 sf 13.79% Impervious Runoff Depth=1.87"
Flow Length=374' Tc=8.5 min CN=61 Runoff=2.60 cfs 9,290 cf

Subcatchment 3.1S: Runoff Area=26,360 sf 10.70% Impervious Runoff Depth=0.91"
Flow Length=285' Tc=6.2 min CN=48 Runoff=0.45 cfs 2,005 cf

Subcatchment 3.3S: Runoff Area=28,230 sf 3.01% Impervious Runoff Depth=1.71"
Flow Length=383' Tc=17.9 min CN=59 Runoff=0.84 cfs 4,028 cf

Subcatchment 4.3S: Runoff Area=6,910 sf 19.97% Impervious Runoff Depth=1.63"
Tc=0.0 min CN=58 Runoff=0.34 cfs 941 cf

Reach 1.1R: 12" Culvert Avg. Flow Depth=0.41' Max Vel=4.48 fps Inflow=1.38 cfs 6,162 cf
12.0" Round Pipe n=0.013 L=190.0' S=0.0116 '/' Capacity=3.83 cfs Outflow=1.38 cfs 6,162 cf

Reach 1.2R: Avg. Flow Depth=0.00' Max Vel=0.14 fps Inflow=0.03 cfs 329 cf
n=0.100 L=372.0' S=0.0430 '/' Capacity=166.69 cfs Outflow=0.01 cfs 329 cf

Reach 1.3R: Avg. Flow Depth=0.23' Max Vel=1.06 fps Inflow=4.83 cfs 28,528 cf
n=0.080 L=707.0' S=0.0255 '/' Capacity=186.57 cfs Outflow=3.96 cfs 28,528 cf

Reach 2.1R: Meadow Buffer 1 Avg. Flow Depth=0.02' Max Vel=0.76 fps Inflow=1.38 cfs 6,162 cf
n=0.035 L=193.0' S=0.0803 '/' Capacity=385.67 cfs Outflow=1.19 cfs 6,162 cf

Reach 2.3R: Avg. Flow Depth=0.11' Max Vel=0.70 fps Inflow=3.96 cfs 28,528 cf
n=0.035 L=450.0' S=0.0056 '/' Capacity=531.82 cfs Outflow=3.74 cfs 28,528 cf

Reach 3.1R: Avg. Flow Depth=0.16' Max Vel=0.93 fps Inflow=7.99 cfs 31,349 cf
n=0.080 L=200.0' S=0.0300 '/' Capacity=174.02 cfs Outflow=7.75 cfs 31,349 cf

Reach 4.1R: Swale Avg. Flow Depth=0.42' Max Vel=2.95 fps Inflow=4.10 cfs 11,444 cf
n=0.030 L=84.0' S=0.0179 '/' Capacity=23.56 cfs Outflow=4.10 cfs 11,444 cf

Reach 5.1R: Meadow Buffer 2 Avg. Flow Depth=0.17' Max Vel=0.50 fps Inflow=4.46 cfs 13,449 cf
n=0.240 L=100.0' S=0.0750 '/' Capacity=28.29 cfs Outflow=4.33 cfs 13,449 cf

Pond 1.3P: 12" Culvert Peak Elev=252.28' Storage=238 cf Inflow=5.88 cfs 25,818 cf
Primary=3.23 cfs 23,438 cf Secondary=2.65 cfs 2,380 cf Outflow=5.88 cfs 25,818 cf

Pond 2.3P: 15" Stormdrain Peak Elev=249.90' Storage=187 cf Inflow=4.80 cfs 11,670 cf
Primary=4.10 cfs 11,444 cf Secondary=0.69 cfs 225 cf Outflow=4.79 cfs 11,670 cf

Pond 4.3P: Peak Elev=250.56' Storage=153 cf Inflow=3.38 cfs 24,378 cf
Primary=3.38 cfs 24,274 cf Secondary=0.00 cfs 0 cf Outflow=3.38 cfs 24,274 cf

Pond POA-4: Wetlands Peak Elev=230.94' Storage=32,224 cf Inflow=10.25 cfs 60,206 cf
36.0" Round Culvert n=0.013 L=50.0' S=0.0100 '/' Outflow=1.17 cfs 44,655 cf

Link POA-1: Inflow=7.99 cfs 31,349 cf
Primary=7.99 cfs 31,349 cf

Link POA-2: Inflow=0.03 cfs 329 cf
Primary=0.03 cfs 329 cf

Link POA-3: Inflow=4.83 cfs 28,528 cf
Primary=4.83 cfs 28,528 cf

Total Runoff Area = 492,380 sf Runoff Volume = 60,310 cf Average Runoff Depth = 1.47"
94.41% Pervious = 464,880 sf 5.59% Impervious = 27,500 sf

Summary for Subcatchment 1.1S:

Runoff = 1.38 cfs @ 12.12 hrs, Volume= 6,162 cf, Depth= 0.91"
Routed to Reach 1.1R : 12" Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
68,780	39	>75% Grass cover, Good, HSG A
12,250	98	Paved parking, HSG A
81,030	48	Weighted Average
68,780		84.88% Pervious Area
12,250		15.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	65	0.0461	0.21		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.10"
0.6	71	0.0915	2.12		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.3	68	0.2206	3.29		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
6.0	204	Total			

Summary for Subcatchment 1.2S:

Runoff = 0.03 cfs @ 12.39 hrs, Volume= 329 cf, Depth= 0.39"
Routed to Link POA-2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
10,140	39	>75% Grass cover, Good, HSG A
10,140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	122	0.0656	0.28		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.10"

Summary for Subcatchment 1.3S:

Runoff = 5.88 cfs @ 12.21 hrs, Volume= 25,818 cf, Depth= 1.63"
Routed to Pond 1.3P : 12" Culvert

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
101,440	39	>75% Grass cover, Good, HSG A
4,150	74	>75% Grass cover, Good, HSG C
78,300	80	>75% Grass cover, Good, HSG D
1,830	98	Paved parking, HSG A
760	96	Gravel surface, HSG A
3,180	96	Gravel surface, HSG D
189,660	58	Weighted Average
187,830		99.04% Pervious Area
1,830		0.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	50	0.0800	0.25		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.10"
1.0	141	0.1206	2.43		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
5.8	388	0.0258	1.12		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
3.9	174	0.0115	0.75		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
14.0	753	Total			

Summary for Subcatchment 2.1S:

Runoff = 2.58 cfs @ 12.22 hrs, Volume= 11,738 cf, Depth= 1.56"
Routed to Link POA-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
41,030	39	>75% Grass cover, Good, HSG A
14,720	71	Meadow, non-grazed, HSG C
160	98	Paved parking, HSG A
1,320	30	Meadow, non-grazed, HSG A
30,200	74	>75% Grass cover, Good, HSG C
3,100	80	>75% Grass cover, Good, HSG D
90,530	57	Weighted Average
90,370		99.82% Pervious Area
160		0.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	66	0.0380	0.20		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.10"
8.1	202	0.1360	0.41		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.10"
1.2	151	0.0840	2.03		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
14.8	419	Total			

Summary for Subcatchment 2.3S:

Runoff = 2.60 cfs @ 12.13 hrs, Volume= 9,290 cf, Depth= 1.87"
Routed to Pond 2.3P : 15" Stormdrain

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
26,840	39	>75% Grass cover, Good, HSG A
20,580	74	>75% Grass cover, Good, HSG C
8,210	98	Paved parking, HSG C
3,890	70	Woods, Good, HSG C
59,520	61	Weighted Average
51,310		86.21% Pervious Area
8,210		13.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	112	0.0669	0.28		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.10"
0.6	72	0.0903	2.10		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.2	190	0.1320	2.54		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
8.5	374	Total			

Summary for Subcatchment 3.1S:

Runoff = 0.45 cfs @ 12.12 hrs, Volume= 2,005 cf, Depth= 0.91"
Routed to Reach 5.1R : Meadow Buffer 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
21,260	39	>75% Grass cover, Good, HSG A
2,280	74	>75% Grass cover, Good, HSG C
2,820	98	Paved parking, HSG A
26,360	48	Weighted Average
23,540		89.30% Pervious Area
2,820		10.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	52	0.0770	0.25		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.10"
2.8	233	0.0386	1.38		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
6.2	285	Total			

Summary for Subcatchment 3.3S:

Runoff = 0.84 cfs @ 12.27 hrs, Volume= 4,028 cf, Depth= 1.71"
Routed to Link POA-3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
11,080	39	>75% Grass cover, Good, HSG A
14,160	70	Woods, Good, HSG C
2,140	74	>75% Grass cover, Good, HSG C
310	98	Paved parking, HSG C
540	98	Roofs, HSG C
28,230	59	Weighted Average
27,380		96.99% Pervious Area
850		3.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	139	0.0860	0.32		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
10.7	244	0.0230	0.38		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
17.9	383	Total			

Summary for Subcatchment 4.3S:

Runoff = 0.34 cfs @ 12.00 hrs, Volume= 941 cf, Depth= 1.63"
Routed to Pond 4.3P :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.80"

Area (sf)	CN	Description
1,380	98	Paved parking, HSG A
4,110	39	>75% Grass cover, Good, HSG A
1,420	74	>75% Grass cover, Good, HSG C
6,910	58	Weighted Average
5,530		80.03% Pervious Area
1,380		19.97% Impervious Area

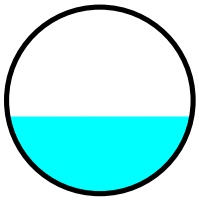
Summary for Reach 1.1R: 12" Culvert

Inflow Area = 81,030 sf, 15.12% Impervious, Inflow Depth = 0.91" for 25-yr event
Inflow = 1.38 cfs @ 12.12 hrs, Volume= 6,162 cf
Outflow = 1.38 cfs @ 12.12 hrs, Volume= 6,162 cf, Atten= 1%, Lag= 0.6 min
Routed to Reach 2.1R : Meadow Buffer 1

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.48 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.05 fps, Avg. Travel Time= 1.5 min

Peak Storage= 58 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.41' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.83 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 190.0' Slope= 0.0116 '/'
Inlet Invert= 252.20', Outlet Invert= 250.00'



Summary for Reach 1.2R:

Inflow Area = 10,140 sf, 0.00% Impervious, Inflow Depth = 0.39" for 25-yr event
Inflow = 0.03 cfs @ 12.39 hrs, Volume= 329 cf
Outflow = 0.01 cfs @ 13.06 hrs, Volume= 329 cf, Atten= 56%, Lag= 40.5 min
Routed to Pond POA-4 : Wetlands

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.14 fps, Min. Travel Time= 43.4 min
Avg. Velocity = 0.14 fps, Avg. Travel Time= 43.4 min

Peak Storage= 38 cf @ 13.06 hrs
Average Depth at Peak Storage= 0.00' , Surface Width= 50.04'
Bank-Full Depth= 1.00' Flow Area= 60.0 sf, Capacity= 166.69 cfs

50.00' x 1.00' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 10.0 '/' Top Width= 70.00'
Length= 372.0' Slope= 0.0430 '/'
Inlet Invert= 247.50', Outlet Invert= 231.50'

‡

Summary for Reach 1.3R:

Inflow Area = 224,800 sf, 1.81% Impervious, Inflow Depth = 1.52" for 25-yr event
Inflow = 4.83 cfs @ 12.20 hrs, Volume= 28,528 cf
Outflow = 3.96 cfs @ 12.40 hrs, Volume= 28,528 cf, Atten= 18%, Lag= 12.1 min
Routed to Reach 2.3R :

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 1.06 fps, Min. Travel Time= 11.1 min
Avg. Velocity = 0.37 fps, Avg. Travel Time= 31.6 min

Peak Storage= 2,631 cf @ 12.40 hrs
Average Depth at Peak Storage= 0.23' , Surface Width= 17.30'
Bank-Full Depth= 2.00' Flow Area= 50.0 sf, Capacity= 186.57 cfs

15.00' x 2.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 5.0 '/' Top Width= 35.00'
Length= 707.0' Slope= 0.0255 '/'
Inlet Invert= 249.50', Outlet Invert= 231.50'

‡

Summary for Reach 2.1R: Meadow Buffer 1

Inflow Area = 81,030 sf, 15.12% Impervious, Inflow Depth = 0.91" for 25-yr event
Inflow = 1.38 cfs @ 12.12 hrs, Volume= 6,162 cf
Outflow = 1.19 cfs @ 12.18 hrs, Volume= 6,162 cf, Atten= 13%, Lag= 3.4 min
Routed to Link POA-1 :

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.76 fps, Min. Travel Time= 4.2 min
Avg. Velocity = 0.37 fps, Avg. Travel Time= 8.6 min

Peak Storage= 303 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 100.31'
Bank-Full Depth= 0.50' Flow Area= 52.5 sf, Capacity= 385.67 cfs

100.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 10.0 '/' Top Width= 110.00'
Length= 193.0' Slope= 0.0803 '/'
Inlet Invert= 250.00', Outlet Invert= 234.50'

Summary for Reach 2.3R:

Inflow Area = 224,800 sf, 1.81% Impervious, Inflow Depth = 1.52" for 25-yr event
Inflow = 3.96 cfs @ 12.40 hrs, Volume= 28,528 cf
Outflow = 3.74 cfs @ 12.59 hrs, Volume= 28,528 cf, Atten= 5%, Lag= 11.0 min
Routed to Pond POA-4 : Wetlands

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.70 fps, Min. Travel Time= 10.6 min
Avg. Velocity = 0.28 fps, Avg. Travel Time= 26.5 min

Peak Storage= 2,390 cf @ 12.59 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 50.84'
Bank-Full Depth= 2.00' Flow Area= 116.0 sf, Capacity= 531.82 cfs

50.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 5.0 '/' Top Width= 66.00'
Length= 450.0' Slope= 0.0056 '/'
Inlet Invert= 231.50', Outlet Invert= 229.00'

Summary for Reach 3.1R:

Inflow Area = 257,440 sf, 9.11% Impervious, Inflow Depth = 1.46" for 25-yr event
Inflow = 7.99 cfs @ 12.23 hrs, Volume= 31,349 cf
Outflow = 7.75 cfs @ 12.29 hrs, Volume= 31,349 cf, Atten= 3%, Lag= 3.2 min
Routed to Pond POA-4 : Wetlands

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.93 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 0.26 fps, Avg. Travel Time= 12.6 min

Peak Storage= 1,662 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.16' , Surface Width= 53.22'
Bank-Full Depth= 1.00' Flow Area= 60.0 sf, Capacity= 174.02 cfs

50.00' x 1.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 10.0 '/' Top Width= 70.00'
Length= 200.0' Slope= 0.0300 '/'
Inlet Invert= 235.00', Outlet Invert= 229.00'

‡

Summary for Reach 4.1R: Swale

Inflow Area = 59,520 sf, 13.79% Impervious, Inflow Depth = 2.31" for 25-yr event
Inflow = 4.10 cfs @ 12.19 hrs, Volume= 11,444 cf
Outflow = 4.10 cfs @ 12.20 hrs, Volume= 11,444 cf, Atten= 0%, Lag= 0.4 min
Routed to Reach 5.1R : Meadow Buffer 2

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.95 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.94 fps, Avg. Travel Time= 1.5 min

Peak Storage= 117 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.42' , Surface Width= 4.55'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 23.56 cfs

2.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 8.00'
Length= 84.0' Slope= 0.0179 '/'
Inlet Invert= 242.50', Outlet Invert= 241.00'

‡

Summary for Reach 5.1R: Meadow Buffer 2

Inflow Area = 85,880 sf, 12.84% Impervious, Inflow Depth = 1.88" for 25-yr event
Inflow = 4.46 cfs @ 12.19 hrs, Volume= 13,449 cf
Outflow = 4.33 cfs @ 12.26 hrs, Volume= 13,449 cf, Atten= 3%, Lag= 4.0 min
Routed to Link POA-1 :

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 0.50 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 0.12 fps, Avg. Travel Time= 14.3 min

Peak Storage= 872 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 54.98'
Bank-Full Depth= 0.50' Flow Area= 28.8 sf, Capacity= 28.29 cfs

50.00' x 0.50' deep channel, n= 0.240 Sheet flow over Dense Grass
Side Slope Z-value= 15.0 '/' Top Width= 65.00'
Length= 100.0' Slope= 0.0750 '/'
Inlet Invert= 241.00', Outlet Invert= 233.50'

‡

Summary for Pond 1.3P: 12" Culvert

Inflow Area = 189,660 sf, 0.96% Impervious, Inflow Depth = 1.63" for 25-yr event
Inflow = 5.88 cfs @ 12.21 hrs, Volume= 25,818 cf
Outflow = 5.88 cfs @ 12.21 hrs, Volume= 25,818 cf, Atten= 0%, Lag= 0.1 min
Primary = 3.23 cfs @ 12.21 hrs, Volume= 23,438 cf
Routed to Pond 4.3P :
Secondary = 2.65 cfs @ 12.21 hrs, Volume= 2,380 cf
Routed to Pond 2.3P : 15" Stormdrain

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 252.28' @ 12.21 hrs Surf.Area= 315 sf Storage= 238 cf

Plug-Flow detention time= 0.8 min calculated for 25,814 cf (100% of inflow)
Center-of-Mass det. time= 0.8 min (878.8 - 878.1)

Volume	Invert	Avail.Storage	Storage Description
#1	251.05'	465 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
251.05	0	0	0
252.00	315	150	150
253.00	315	315	465

Device	Routing	Invert	Outlet Devices
#1	Primary	251.05'	**12.0" Round Culvert** L= 49.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 251.05' / 250.00' S= 0.0214 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	252.20'	**40.0' long + 66.0 '/' SideZ x 14.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.64 2.67 2.70 2.65 2.64 2.65 2.65 2.63

Primary OutFlow Max=3.23 cfs @ 12.21 hrs HW=252.28' TW=250.56' (Dynamic Tailwater)
↑└**1=Culvert** (Inlet Controls 3.23 cfs @ 4.11 fps)

Secondary OutFlow Max=2.65 cfs @ 12.21 hrs HW=252.28' TW=249.89' (Dynamic Tailwater)
↑└**2=Broad-Crested Rectangular Weir** (Weir Controls 2.65 cfs @ 0.73 fps)

Summary for Pond 2.3P: 15" Stormdrain

Inflow Area = 59,520 sf, 13.79% Impervious, Inflow Depth = 2.35" for 25-yr event
Inflow = 4.80 cfs @ 12.18 hrs, Volume= 11,670 cf
Outflow = 4.79 cfs @ 12.19 hrs, Volume= 11,670 cf, Atten= 0%, Lag= 0.6 min
Primary = 4.10 cfs @ 12.19 hrs, Volume= 11,444 cf
Routed to Reach 4.1R : Swale
Secondary = 0.69 cfs @ 12.19 hrs, Volume= 225 cf
Routed to Link POA-3 :

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 249.90' @ 12.19 hrs Surf.Area= 379 sf Storage= 187 cf

Plug-Flow detention time= 0.3 min calculated for 11,668 cf (100% of inflow)
Center-of-Mass det. time= 0.3 min (838.7 - 838.4)

Volume	Invert	Avail.Storage	Storage Description
#1	248.50'	333 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
248.50	0	0	0
249.00	24	6	6
250.00	420	222	228
250.25	420	105	333

Device	Routing	Invert	Outlet Devices
#1	Primary	248.50'	**15.0" Round Culvert** L= 345.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 248.50' / 242.50' S= 0.0174 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Secondary	249.80'	**9.0' long + 3.0 '/' SideZ x 2.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32

Primary OutFlow Max=4.10 cfs @ 12.19 hrs HW=249.90' TW=242.92' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 4.10 cfs @ 3.34 fps)

Secondary OutFlow Max=0.69 cfs @ 12.19 hrs HW=249.90' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.69 cfs @ 0.77 fps)

Summary for Pond 4.3P:

Inflow Area = 196,570 sf, 1.63% Impervious, Inflow Depth = 1.49" for 25-yr event
Inflow = 3.38 cfs @ 12.19 hrs, Volume= 24,378 cf
Outflow = 3.38 cfs @ 12.20 hrs, Volume= 24,274 cf, Atten= 0%, Lag= 0.2 min
Primary = 3.38 cfs @ 12.20 hrs, Volume= 24,274 cf
Routed to Link POA-3 :
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 2.3P : 15" Stormdrain

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 250.56' @ 12.20 hrs Surf.Area= 189 sf Storage= 153 cf

Plug-Flow detention time= 3.7 min calculated for 24,274 cf (100% of inflow)
Center-of-Mass det. time= 1.3 min (893.5 - 892.2)

Volume	Invert	Avail.Storage	Storage Description
#1	249.50'	331 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
249.50	0	0	0
250.00	189	47	47
250.50	189	95	142
251.50	189	189	331

Device	Routing	Invert	Outlet Devices
#1	Primary	250.30'	**10.0' long + 3.0 '/' SideZ x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Secondary	251.00'	**15.0' long + 3.0 '/' SideZ x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=3.38 cfs @ 12.20 hrs HW=250.56' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 3.38 cfs @ 1.21 fps)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=249.50' TW=248.50' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond POA-4: Wetlands

Inflow Area = 492,380 sf, 5.59% Impervious, Inflow Depth = 1.47" for 25-yr event
Inflow = 10.25 cfs @ 12.35 hrs, Volume= 60,206 cf
Outflow = 1.17 cfs @ 15.76 hrs, Volume= 44,655 cf, Atten= 89%, Lag= 204.9 min
Primary = 1.17 cfs @ 15.76 hrs, Volume= 44,655 cf
Routed to nonexistent node POA 4

Routing by Dyn-Stor-Ind method, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 230.94' @ 15.76 hrs Surf.Area= 45,269 sf Storage= 32,224 cf

Plug-Flow detention time= 488.4 min calculated for 44,655 cf (74% of inflow)
Center-of-Mass det. time= 384.3 min (1,292.2 - 907.9)

Volume	Invert	Avail.Storage	Storage Description
#1	230.00'	98,025 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
230.00	23,000	0	0
231.00	46,590	34,795	34,795
232.00	79,870	63,230	98,025

Device	Routing	Invert	Outlet Devices
#1	Primary	230.50'	**36.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 230.50' / 230.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=1.17 cfs @ 15.76 hrs HW=230.94' (Free Discharge)
1=Culvert (Inlet Controls 1.17 cfs @ 1.79 fps)

Summary for Link POA-1:

Inflow Area = 257,440 sf, 9.11% Impervious, Inflow Depth = 1.46" for 25-yr event
Inflow = 7.99 cfs @ 12.23 hrs, Volume= 31,349 cf
Primary = 7.99 cfs @ 12.23 hrs, Volume= 31,349 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach 3.1R :

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Link POA-2:

Inflow Area = 10,140 sf, 0.00% Impervious, Inflow Depth = 0.39" for 25-yr event
Inflow = 0.03 cfs @ 12.39 hrs, Volume= 329 cf
Primary = 0.03 cfs @ 12.39 hrs, Volume= 329 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach 1.2R :

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Summary for Link POA-3:

Inflow Area = 224,800 sf, 1.81% Impervious, Inflow Depth = 1.52" for 25-yr event
Inflow = 4.83 cfs @ 12.20 hrs, Volume= 28,528 cf
Primary = 4.83 cfs @ 12.20 hrs, Volume= 28,528 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach 1.3R :

Primary outflow = Inflow, Time Span= 1.00-72.00 hrs, dt= 0.01 hrs

Appendix 3

Inspection, Maintenance and Housekeeping Plan

INSPECTION, MAINTENANCE, AND HOUSEKEEPING PLAN

For:
Smith Cemetery
Windham, Maine

By:
Sebago Technics, Inc.
75 John Roberts Road, Suite 4A
South Portland, Maine

Introduction

The following plan outlines the anticipated inspection and maintenance procedures for the erosion and sedimentation control measures as well as stormwater management facilities for the project. This plan also outlines several housekeeping requirements that shall be followed during and after construction. These procedures shall be followed in order to ensure the intended function of the designed measures and to prevent unreasonably adverse impacts to the surrounding environment.

The procedures outlined in this Inspection, Maintenance and Housekeeping Plan are provided as an overview of the anticipated practices to be used on this site. In some instances, additional measures may be required due to unexpected conditions. For additional detail on any of the erosion and sedimentation control measures or stormwater management devices to be utilized on this project, refer to the most recently revised edition of the "Maine Erosion and Sedimentation Control BMP" manual and/or the "Stormwater Management for Maine: Best Management Practices" manual as published by the Maine Department of Environmental Protection (MDEP).

During Construction

1. **Inspection:** During the construction process, it is the Contractor's responsibility to comply with the inspection and maintenance procedures outlined in this section. These responsibilities include inspecting disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. These areas shall be inspected at least once a week as well as before and after a storm event (0.5" of rainfall), and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in any applicable permits, shall conduct the inspections.

2. **Maintenance:** All measures shall be maintained in an effective operating condition until areas are permanently stabilized. If Best Management Practices (BMPs) need to be maintained or modified, additional BMPs are necessary, or other corrective action is needed, implementation must be completed within 7 calendar days and prior to any storm event (0.5" of rainfall).

3. **Documentation:** A log summarizing the inspections and any corrective action taken must be maintained on-site. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, material storage areas, and vehicle access points to the site. Major observations must include BMPs that need maintenance, BMPs that failed

to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken. The log must be made accessible to the appropriate regulatory agency upon request. The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

4. **Specific Inspection and Maintenance Tasks:** The following is a list of erosion control and stormwater management measures and the specific inspection and maintenance tasks to be performed during construction.

A. Sediment Barriers:

- Hay bale barriers, silt fences, and filter berms shall be inspected immediately after each rainfall and at least daily during prolonged rainfall.
- If the fabric on a silt fence or filter barrier should decompose or become ineffective prior to the end of the expected usable life and the barrier is still necessary, it shall be replaced.
- Sediment deposits should be removed after each storm event (0.5" of rainfall). They must be removed before deposits reach approximately one-half the height of the barrier.
- Filter berms shall be reshaped as needed.
- Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required should be dressed to conform to the existing grade, prepared, and seeded.

B. Riprap Materials:

- Once a riprap installation has been completed, it should require very little maintenance. It shall, however, be inspected periodically to determine if high flows have caused scour beneath the riprap or dislodged any of the stone.

C. Erosion Control Blankets:

- Inspect these reinforced areas semi-annually and after significant rainfall events for slumping, sliding, seepage, and scour. Pay close attention to unreinforced areas adjacent to the erosion control blankets, which may experience accelerated erosion.
- Review all applicable inspection and maintenance procedures recommended by the specific blanket manufacturer. These tasks shall be included in addition to the requirements of this plan.

D. Stabilized Construction Entrances/Exits:

- The exit shall be maintained in a condition that will prevent tracking of sediment onto public rights-of-way.
- When the control pad becomes ineffective, the stone shall be removed along with the collected soil material. The entrance should then be reconstructed.
- Areas that have received mud-tracking or sediment deposits shall be swept or washed. Washing shall be done on an area stabilized with aggregate, which drains

into an approved sediment-trapping device (not into storm drains, ditches, or waterways).

E. Temporary Seed and Mulch:

- Mulched areas should be inspected after rain events to check for rill erosion.
- If less than 90% of the soil surface is covered by mulch, additional mulch shall be applied in bare areas.
- In applications where seeding and mulch have been applied in conjunction with erosion control blankets, the blankets must be inspected after rain events for dislocation or undercutting.
- Mulch shall continue to be reapplied until 95% of the soil surface has established temporary vegetative cover.

F. Stabilized Temporary Drainage Swales:

- Sediment accumulation in the swale shall be removed once the cross section of the swale is reduced by 25%.
- The swales shall be inspected after rainfall events. Any evidence of sloughing of the side slopes or channel erosion shall be repaired and corrective action should be taken to prevent reoccurrence of the problem.
- In addition to the stabilized lining of the channel (i.e. erosion control blankets), stone check dams may be needed to further reduce channel velocity.

G. BMP Specific Inspection and Maintenance During Construction

- Meadow buffer areas shall be staked out prior to construction to define the limit of disturbance.
- Contractors shall be informed of the limit of disturbance and buffer limits.

5. **Housekeeping:** The following general performance standards apply to the proposed project.

A. Spill prevention: Controls must be used to prevent pollutants from being discharged from materials on-site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

B. Groundwater protection: During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors, accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.

C. Fugitive sediment and dust: Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.

D. Debris and other materials: Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.

E. Trench or foundation dewatering: Trench dewatering is the removal of water from trenches, foundations, cofferdams, ponds, and other areas within the construction area that retain water after excavation. In most cases, the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved.

Post-Construction

1. **Inspection:** After construction, it is the responsibility of the owner or assigned heirs to comply with the inspection and maintenance procedures outlined in this section. All measures must be maintained in effective operating condition. The owner shall inspect and maintain the BMPs, including but not limited to any parking areas, catch basins, drainage swales, detention basins and ponds, pipes and related structures, in accordance with all municipal and state inspection, cleaning and maintenance requirements of the approved post-construction stormwater management plan.

2. **Specific Inspection and Maintenance Tasks:** The following is a list of permanent erosion control and stormwater management measures and the inspection and maintenance tasks to be performed after construction. If the BMP requires maintenance, repair or replacement to function as intended by the approved post-construction stormwater management plan, the owner or operator of the BMP shall take corrective action(s) to address the deficiency or deficiencies as soon as possible after the deficiency is discovered and shall provide a record of the deficiency and corrective action(s) to the local municipality in the annual report.

   A. Vegetated Areas:

   - Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains (>0.5") to identify active or potential erosion problems.
   - Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.

   B. Ditches, Swales and Other Open Channels:

   - Inspect ditches, swales, level spreaders and other open stormwater channels in the spring, in the late fall, and after heavy rains to remove any obstructions to flow. Remove accumulated sediments and debris, remove woody vegetative growth that could obstruct flow, and repair any erosion of the ditch lining.
   - Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity.

- Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable.
- If the ditch has a riprap lining, replace riprap in areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged.

C. Culverts:

- Inspect culverts in the spring, in the late fall, and after heavy rains (>0.5") to remove any obstructions to flow.
- Remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit.
- Inspect and repair any erosion damage at the culvert's inlet and outlet.

D. Removal of Winter Sand:

- Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring.
- Accumulations on pavement may be removed by pavement sweeping.
- Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader or other acceptable method.

E. Level Spread to Meadow Buffer:

- Buffer should be inspected annually for evidence of erosion or concentrated flows through or around the buffer. All eroded areas should be repaired, seeded and mulched.
- Meadow buffers may be mown no more than twice per year. They may not be maintained as a lawn.
- Buffers should not be traversed by all-terrain vehicles or other vehicles. Activities within buffers should be conducted so as not to damage vegetation, disturb any organic duff layer, or expose soil.
- Level spreader shall be inspected at least once a year and following major storms, the level spreader pool should be inspected for sand accumulation and debris that may reduce its capacity.
- Sediment build-up within the swale should be removed when it has accumulated to approximately 25% of design volume or channel capacity. Dispose of the sediments appropriately.
- Remove debris such as leaf litter, branches and tree growth from the spreader.
- Do not store snow within the area of the level spreader.
- The reconstruction of the level spreader may be necessary when sheet flow from the spreader channelize into the buffer.

3. Documentation:

A. The owner or operator of a BMP or a qualified post-construction stormwater inspector hired by that person, shall, as required by the local municipality, provide a completed and signed certification on a form provided by the local municipality, certifying that the person has inspected the BMP(s) and that they are adequately maintained and functioning as intended by the approved post-construction stormwater management plan, or that they required maintenance or repair, including the record of the deficiency and corrective action(s) taken.

B. A log summarizing the inspections and any corrective action taken must be maintained. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of controls. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken. The log must be made accessible to the appropriate regulatory agency upon request. A sample "Stormwater Inspection and Maintenance Form" has been included as Attachment 1 of this Inspection, Maintenance, and Housekeeping Plan.

4. Duration of Maintenance: Perform maintenance as described and required for any associated permits unless and until the system is formally accepted by a municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system. If a municipality or quasi-municipal district chooses to accept a stormwater management system, or a component of a stormwater system, it must provide a letter to the MDEP stating that it assumes responsibility for the system. The letter must specify the components of the system for which the municipality or district will assume responsibility, and that the municipality or district agrees to maintain those components of the system in compliance with MDEP standards. Upon such assumption of responsibility, and approval by the MDEP, the municipality, quasi-municipal district, or association becomes a co-permittee for this purpose only and must comply with all terms and conditions of the permit.

ATTACHMENT 1 – STORMWATER INSPECTION AND MAINTENANCE LOG

Smith Cemetery
513 Gray Road
Windham, Maine

This log is intended to accompany the Inspection, Maintenance, and Housekeeping Plan for the [brief project description] in [Town, State]. The following items shall be checked, cleaned, and maintained on a regular basis as specified in the Maintenance Plan and as described in the sections below. This log shall be kept on file for a minimum of five (5) years and shall be available for review by the [Municipality] and the Maine DEP. Qualified personnel familiar with the drainage systems and soils shall perform all inspections. A copy of the construction and post-construction maintenance logs are provided.

INSPECTION MAINTENANCE AND HOUSEKEEPING FORM			
General Information			
Project Name:		**Inspection Date:**	
Project Location:		**Current Weather:**	
		Date / Amount Last Precip:	
BMP Owner:		**Company conducting inspection:**	
Owner Mailing Address:		**Company Mailing Address**	
Owner Phone #:		**Company Phone #:**	
Owner Email:		**Inspector Name:**	
		Inspector Email:	

Site Element	Suggested Maintenance (recm'd frequency)	Observations	Inspection Notes/Recommended Action
Vegetated Areas	Inspect Slopes/Embankments for erosion (annually)		
	Replant bare areas or areas of sparse growth (annually)		
Ditches/Swales	Remove obstructions/debris/sediment (monthly)		
	Inspect for erosion/repair as needed (annually)		
	Remove woody vegetation (annually)		
	Mow vegetated ditches (annually)		
Culverts	Remove sediment/debris from inlet/outlet aprons (annually)		
	Inspect inlet/outlet aprons for erosion, repair as needed (annually)		
	Inspect, repair as needed, riprap aprons for dislodged/sparse coverage (annually)		
Pipe Outlets	Remove sediment/debris from outlet aprons (annually)		
	Inspect outlet aprons for erosion, repair as needed (annually)		
	Inspect, repair as needed, riprap aprons for dislodged/sparse coverage (annually)		

Additional Notes/Observations:

Vegetated Buffer

INSPECTION MAINTENANCE AND HOUSEKEEPING FORM			
General Information			
Project Name:		**Inspection Date:**	
Project Location:		**Current Weather:**	
		Date / Amount Last Precip:	
BMP Owner:		**Company conducting inspection:**	
Owner Mailing Address:		**Company Mailing Address**	
Owner Phone #:		**Company Phone #:**	
Owner Email:		**Inspector Name:**	
		Inspector Email:	

BMP Element	Suggested Maintenance (recm'd frequency)	Observations	Inspection Notes/Recommended Action
Forebay/Pretreatment	Sediment/Debris Removal (Annually)		
	Inspect for bare areas or rill erosion (Annually)		
Level Spreader	Sediment Depth (Annually)		
	Check for evidence of channelized flow (monthly)		
	Mow/Remove excessive vegetative growth (semi annually)		
Vegetated Buffer	Remove dead/fallen tree limbs (monthly)		
	Check for evidence of channelized flow (monthly)		

Additional Notes/Observations:

Appendix 4

Subsurface Investigations

United States Department of Agriculture

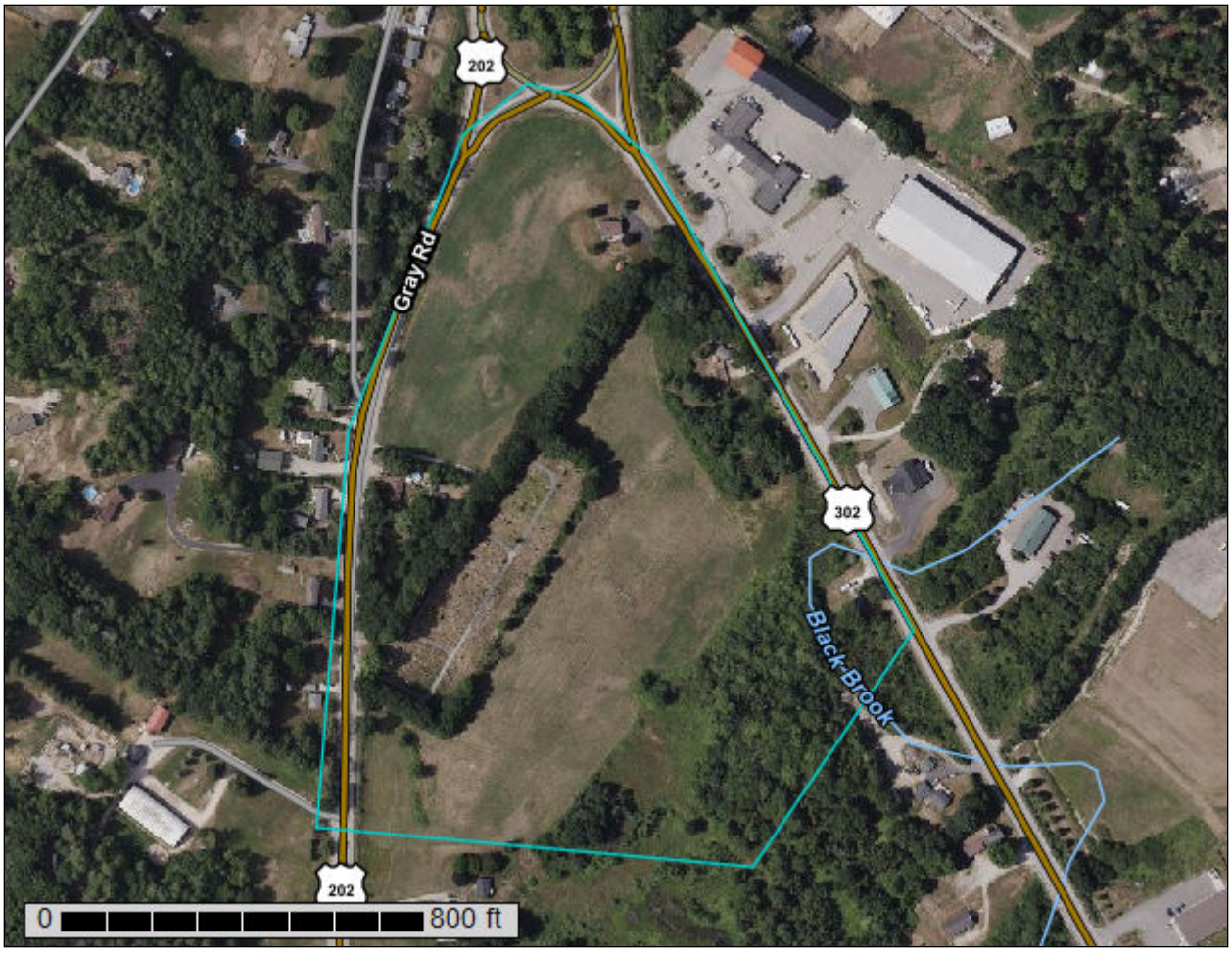
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Cumberland County and Part of Oxford County, Maine

Smith Cemetery



August 15, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

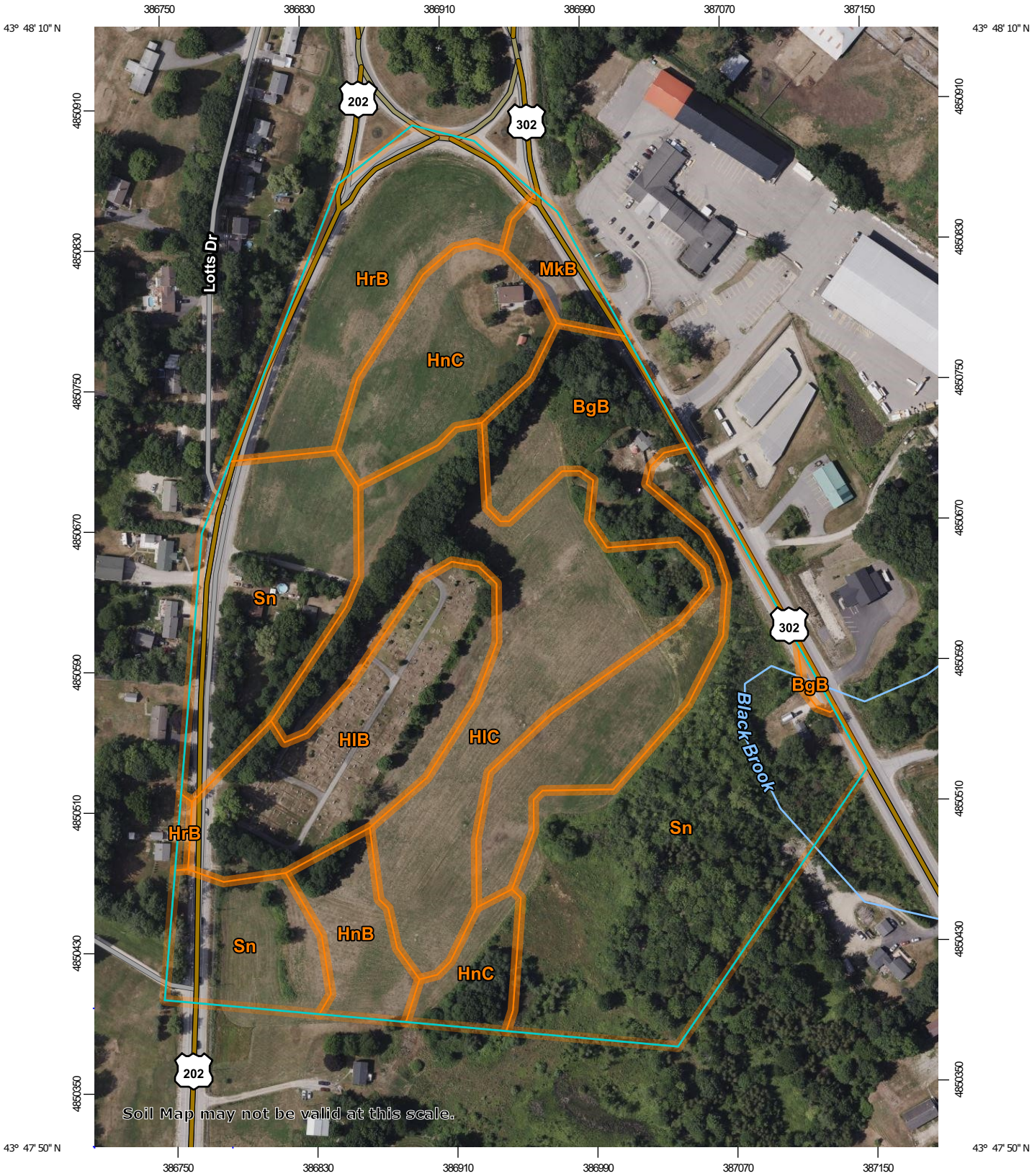
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



Map Scale: 1:3,110 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

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

MAP LEGEND

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

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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: Cumberland County and Part of Oxford County, Maine
Survey Area Data: Version 21, Aug 26, 2024

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

Date(s) aerial images were photographed: Mar 1, 2022—Jul 1, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BgB	Nicholville very fine sandy loam, 0 to 8 percent slopes	4.5	12.8%
HlB	Hinckley loamy sand, 3 to 8 percent slopes	3.6	10.3%
HlC	Hinckley loamy sand, 8 to 15 percent slopes	6.3	18.0%
HnB	Hinckley-Suffield complex, 3 to 8 percent slopes	1.1	3.2%
HnC	Hinckley-Suffield complex, 8 to 15 percent slopes	3.1	9.0%
HrB	Lyman-Tunbridge complex, 0 to 8 percent slopes, rocky	3.4	9.6%
MkB	Merrimac fine sandy loam, 3 to 8 percent slopes	0.6	1.8%
Sn	Scantic silt loam, 0 to 3 percent slopes	12.3	35.1%
Totals for Area of Interest		**35.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas

are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Cumberland County and Part of Oxford County, Maine

BgB—Nicholville very fine sandy loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2yjg5
Elevation: 20 to 2,300 feet
Mean annual precipitation: 34 to 50 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Nicholville and similar soils: 85 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nicholville

Setting

Landform: Lakebeds (relict)
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-silty glaciomarine deposits

Typical profile

Ap - 0 to 7 inches: very fine sandy loam
Bs - 7 to 19 inches: very fine sandy loam
BC - 19 to 30 inches: very fine sandy loam
C - 30 to 65 inches: loamy very fine sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F144BY501ME - Loamy Slope (Northern Hardwoods)
Hydric soil rating: No

Minor Components

Roundabout

Percent of map unit: 2 percent

Landform: Lakebeds (relict)
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

HIB—Hinckley loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svm8
Elevation: 0 to 1,430 feet
Mean annual precipitation: 36 to 53 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hinckley and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Outwash plains, eskers, moraines, kame terraces, kames, outwash terraces, outwash deltas
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

HIC—Hinckley loamy sand, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2svm9
Elevation: 0 to 1,480 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

Hinckley and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Kame terraces, outwash plains, kames, eskers, moraines, outwash terraces, outwash deltas
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

HnB—Hinckley-Suffield complex, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svlw
Elevation: 0 to 270 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hinckley and similar soils: 65 percent
Suffield and similar soils: 25 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Kames, eskers, moraines, outwash terraces, outwash deltas, kame terraces, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

A - 0 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144BY601ME - Dry Sand
Hydric soil rating: No

Description of Suffield

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Silty glaciolacustrine deposits over clayey glaciolacustrine deposits

Typical profile

Ap - 0 to 6 inches: silt loam
Bw - 6 to 18 inches: silt loam
2C - 18 to 65 inches: silty clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 39 inches to strongly contrasting textural stratification
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F144BY402ME - Clay Hills
Hydric soil rating: No

Minor Components

Scitico

Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

HnC—Hinckley-Suffield complex, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2svlx
Elevation: 0 to 470 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

Hinckley and similar soils: 60 percent
Suffield and similar soils: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Kame terraces, outwash plains, kames, eskers, moraines, outwash terraces, outwash deltas
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

A - 0 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F144BY601ME - Dry Sand
Hydric soil rating: No

Description of Suffield

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Silty glaciolacustrine deposits over clayey glaciolacustrine deposits

Typical profile

Ap - 0 to 6 inches: silt loam
Bw - 6 to 18 inches: silt loam
2C - 18 to 65 inches: silty clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 18 to 39 inches to strongly contrasting textural stratification
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F144BY402ME - Clay Hills
Hydric soil rating: No

HrB—Lyman-Tunbridge complex, 0 to 8 percent slopes, rocky

Map Unit Setting

National map unit symbol: 2x1cx
Elevation: 0 to 520 feet
Mean annual precipitation: 36 to 65 inches
Mean annual air temperature: 36 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Lyman and similar soils: 50 percent
Tunbridge and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lyman

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loam
E - 3 to 5 inches: fine sandy loam
Bhs - 5 to 7 inches: loam
Bs1 - 7 to 11 inches: loam
Bs2 - 11 to 18 inches: channery loam
R - 18 to 79 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.5 percent
Depth to restrictive feature: 11 to 24 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.03 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144BY702ME - Shallow and Moderately-deep Till
Hydric soil rating: No

Description of Tunbridge

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist

Typical profile

Oe - 0 to 3 inches: moderately decomposed plant material
Oa - 3 to 5 inches: highly decomposed plant material
E - 5 to 8 inches: fine sandy loam
Bhs - 8 to 11 inches: fine sandy loam
Bs - 11 to 26 inches: fine sandy loam
BC - 26 to 28 inches: fine sandy loam
R - 28 to 79 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.5 percent
Depth to restrictive feature: 21 to 41 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.03 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: F144BY702ME - Shallow and Moderately-deep Till
Hydric soil rating: No

MkB—Merrimac fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqs
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Merrimac and similar soils: 86 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Kames, eskers, moraines, outwash terraces, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Walpole

Percent of map unit: 1 percent
Landform: Depressions
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave

Ecological site: F144AY028MA - Wet Outwash
Hydric soil rating: Yes

Sn—Scantic silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2slv3
Elevation: 10 to 900 feet
Mean annual precipitation: 33 to 60 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Farmland of local importance

Map Unit Composition

Scantic and similar soils: 85 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scantic

Setting

Landform: Marine terraces, river valleys
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciomarine deposits

Typical profile

Ap - 0 to 9 inches: silt loam
Bg1 - 9 to 16 inches: silty clay loam
Bg2 - 16 to 29 inches: silty clay
Cg - 29 to 65 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Ecological site: F144BY304ME - Wet Clay Flat
Hydric soil rating: Yes

Minor Components

Biddeford

Percent of map unit: 3 percent
Landform: Marine terraces, river valleys
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave, linear
Ecological site: F144BY002ME - Marine Terrace Depression
Hydric soil rating: Yes

Roundabout

Percent of map unit: 2 percent
Landform: River valleys, marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

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:

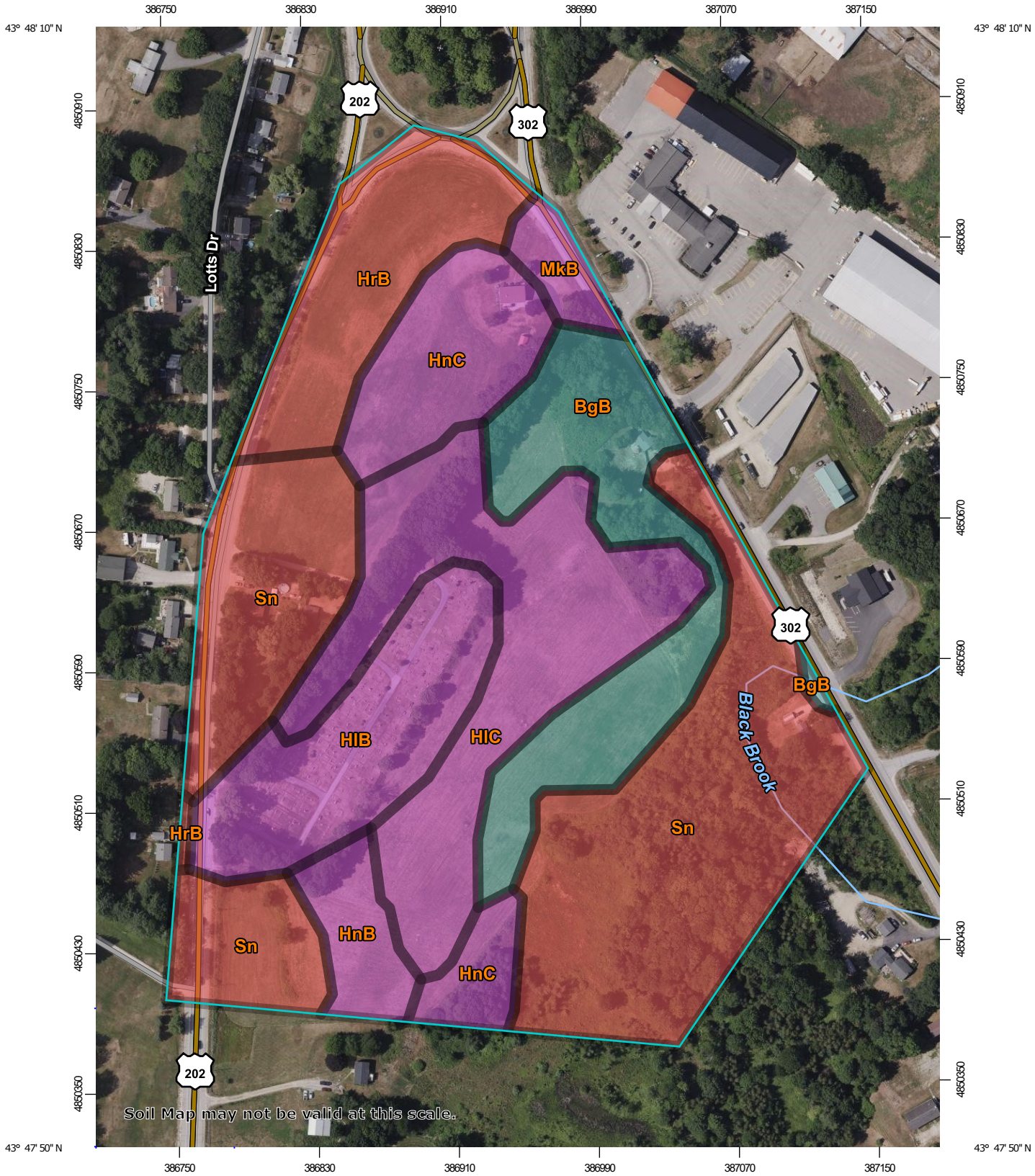
Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

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.



Map Scale: 1:3,110 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

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

MAP LEGEND

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

Soils

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 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: Cumberland County and Part of Oxford County, Maine
Survey Area Data: Version 21, Aug 26, 2024

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

Date(s) aerial images were photographed: Mar 1, 2022—Jul 1, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BgB	Nicholville very fine sandy loam, 0 to 8 percent slopes	C	4.5	12.8%
HlB	Hinckley loamy sand, 3 to 8 percent slopes	A	3.6	10.3%
HlC	Hinckley loamy sand, 8 to 15 percent slopes	A	6.3	18.0%
HnB	Hinckley-Suffield complex, 3 to 8 percent slopes	A	1.1	3.2%
HnC	Hinckley-Suffield complex, 8 to 15 percent slopes	A	3.1	9.0%
HrB	Lyman-Tunbridge complex, 0 to 8 percent slopes, rocky	D	3.4	9.6%
MkB	Merrimac fine sandy loam, 3 to 8 percent slopes	A	0.6	1.8%
Sn	Scantic silt loam, 0 to 3 percent slopes	D	12.3	35.1%
Totals for Area of Interest			**35.0**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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Appendix 5

Stormwater Management Plans

SYM	SOIL SERIES	PHASE	SLOPE	DRAINAGE CLASS
BgB	NICHOLVILLE	VERY FINE SANDY LOAM	0-8%	MODERATELY WELL DRAINED
HIC	HINKLEY	LOAMY SAND	8-15%	EXCESSIVELY DRAINED
HIB	HINKLEY	LOAMY SAND	3-8%	EXCESSIVELY DRAINED
HnC	HERMON SANDY LOAM	EXTREMLY STONY	3-15%	SOMEWHAT EXCESSIVELY DRAINED
HrB	LYMAN-TURNBRIDGE COMPLEX	ROCKY	0-8%	SOMEWHAT EXCESSIVELY DRAINED
HrC	LYMAN-TURNBRIDGE COMPLEX	ROCKY	8-15%	SOMEWHAT EXCESSIVELY DRAINED
MkB	MERRIMAC	FINE SANDY LOAM	3-8%	SOMEWHAT EXCESSIVELY DRAINED
PbB	PAXTON	FINE SANDY LOAM	3-8%	WELL DRAINED
PbC	PAXTON	FINE SANDY LOAM	8-15%	WELL DRAINED
Sn	SCANTIC SILT LOAM		0-3%	POORLY DRAINED

EXISTING CONDITIONS LEGEND

- WATERSHED BOUNDARY
- TIME OF CONCENTRATION (A, B)
- REACH
- 1.0S — SUBCATCHMENT LABEL
- 1R — REACH
- POA-1 — POINT OF ANALYSIS
- 1P — STORMWATER TREATMENT/DETENTION POND
- HSG # / HSG # — SOILS BOUNDARY

GRAPHIC SCALE
80 0 40 80 160
(IN FEET)
1 INCH = 80 FT.

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REV	BY	DATE	STATUS
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75 John Roberts Road, Suite 4A
South Portland, ME 04106
207-200-2100
South Portland, Bridgton, Sanford and Bath

EXISTING CONDITIONS STORMWATER PLAN
OF:
SMITH CEMETERY
513 GRAY ROAD
WINDHAM, MAINE
FOR:
TOWN OF WINDHAM
185 WINDHAM CENTER ROAD
WINDHAM, ME 04062

DESIGNED	AKH
DRAWN	MRW
CHECKED	ABS
DATE	03/19/2025
SCALE	1" = 80'
PROJECT	240666-01

SHEET 1 OF 2

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240666-01 SWP EC.dwg, TAB1 1 OF 2 EXISTING CONDITIONS STORMWATER PLAN

SYM	SOIL SERIES	PHASE	SLOPE	DRAINAGE CLASS
BgB	NICHOLVILLE	VERY FINE SANDY LOAM	0-8%	MODERATELY WELL DRAINED
HIC	HINKLEY	LOAMY SAND	8-15%	EXCESSIVELY DRAINED
HIB	HINKLEY	LOAMY SAND	3-8%	EXCESSIVELY DRAINED
HnC	HERMON SANDY LOAM	EXTREMLY STONY	3-15%	SOMEWHAT EXCESSIVELY DRAINED
HrB	LYMAN-TURNBRIDGE COMPLEX	ROCKY	0-8%	SOMEWHAT EXCESSIVELY DRAINED
HrC	LYMAN-TURNBRIDGE COMPLEX	ROCKY	8-15%	SOMEWHAT EXCESSIVELY DRAINED
MkB	MERRIMAC	FINE SANDY LOAM	3-8%	SOMEWHAT EXCESSIVELY DRAINED
PbB	PAXTON	FINE SANDY LOAM	3-8%	WELL DRAINED
PbC	PAXTON	FINE SANDY LOAM	8-15%	WELL DRAINED
Sn	SCANTIC SILT LOAM		0-3%	POORLY DRAINED

PROPOSED CONDITIONS LEGEND

- WATERSHED BOUNDARY
- TIME OF CONCENTRATION (A, B)
- REACH
- 10.0S — SUBCATCHMENT LABEL
- 10R — REACH
- POA-1 — POINT OF ANALYSIS
- 10P — STORMWATER TREATMENT/DETENTION POND
- HSG # / HSG # — SOILS BOUNDARY

GRAPHIC SCALE
80 0 40 80 160
(IN FEET)
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South Portland, Bridgton, Sanford and Bath

PROPOSED STORMWATER PLAN
OF:
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DESIGNED	AKH
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SCALE	1" = 80'
PROJECT	240666-01

SHEET 2 OF 2

240666-01 SWP PR.dwg, TAB:2 OF 2 PROPOSED STORMWATER PLAN

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