SEBAGO TECHNICS

CIVIL ENGINEERING • SURVEYING • LANDSCAPE ARCHITECTURE

Town of Raymond
Preliminary
Major Subdivision Application

For:

Raymond Cape Subdivision
78 Raymond Cape Road
Raymond, Maine

Applicant:

Brandon Chase
15 Washington Court
Naples, Maine 04055

Prepared by:

Sebago Technics, Inc.
75 John Roberts Road, Suite 4A
South Portland, Maine 04106

March 2022

21397

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Alex Sirois, Code Enforcement Officer
Town of Raymond
401 Webbs Mills Road
Raymond, ME 04071

Major Subdivision Application
Raymond Cape Subdivision
Raymond Cape Road, Raymond, ME

Dear Alex:

On behalf of our client, Brandon Chase, we are submitting a Major Subdivision Application for a proposed 12-lot subdivision adjacent to Raymond Cape Road. The applicant is proposing to subdivide an approximate 37-acre parcel of undeveloped land that slopes up from Raymond Cape Road. Pursuant to the sketch plan that was reviewed by the Planning Board on December 8, 2021 and the site walk on December 9, 2021, the applicant is proposing an open space cluster subdivision.

We have prepared the enclosed Preliminary Subdivision application, plans and attachments for the subdivision of a single-family development. Of this acreage, 20.06 acres will be area that is set aside for the 12 lots with 14.85 acres proposed in two open space tracts. The balance of the parcel will be utilized for the site access/right-of-way for the development. The property exists with the Limited Residential-Recreational II Zoning District (LRR2) with a small portion of the site in the Resource Protection District (RP).

Site Location: The physical address of the property is Raymond Cape Road one half mile south of Hawthorne Road. The property is further identified on the Town's Tax Maps as Map 4, Lot 9. The land is currently unimproved and consists woodlands and wetlands and generally slopes from Raymond Cape to the northeast/north as shown on the existing conditions plan.

Natural Resources: On behalf of the applicant, Sebago Technics, Inc. (Sebago) has requested site review for historical/archaeological, botanical, wildlife and fisheries resources from the applicable state agencies. Copies of the letters of inquiry or responses are included in this submittal package. Responses received after the preliminary subdivision plan submission will be included in the final subdivision plan submission. In addition, the site has been reviewed by a Sebago Technics Wetland Scientist for delineation of the jurisdictional wetlands and the excavation of test pits were overseen and reviewed by a licensed Sebago Technics Site Evaluator for determination of suitable soils for subsurface systems.

Utilities: The proposed single family lots will be served by individual subsurface wastewater disposal systems and individual wells. Electric and telecommunications will be installed underground and extended from available infrastructure the Raymond Cape Road.

Regulatory Permitting: The applicant proposes to construct approximately 2,000 LF of roadway for a Minor Street from Raymond Cape Road to rear parcel line with two t-turn around locations. The proposed development of the roadway will include approximately 0.97 acres of new impervious area with a total developed area of 3.27 acres. The applicant is proposing to only develop the roadway and sell the lots for development. Accordingly, the project will need to meet the Maine Department of Environmental Protection (MDEP) stormwater general standards for the right-of-way development; because Sebago Lake is not considered to be severely blooming and the roadway area to be developed, the general standards will be used to satisfy the phosphorus standards. Concurrently, with the Town submission, a Maine stormwater permit application will be submitted to MDEP. The site will also be reviewed under MDEP stormwater standards that incorporate the Maine Construction General Permit (MCGP) review. Copy of the MDEP approval will be provided to the Town upon receipt.

The proposed alignment for the roadway and development for the lots are such that there will be no wetland impacts. Therefore, no submission for permits/approvals under the provisions of the MDEP Natural Resources Protection Act (NRPA) or the U.S. Army Corps of Engineers (ACOE) is anticipated.

Applicable Standards: Please refer to the attached narrative demonstrating compliance with the applicable subdivision standards.

Waivers*:* As part of the submission for subdivision approval, it is requested to waive the requirement for Article 13 – Open Space Subdivisions, c. General Requirements 4. Space Standards, paragraph c: for the dedicated open space tracts to meet or exceed the reduction in lot size for an open space cluster subdivision; the difference for the required area is 1.09 acres. This request is being made because of the substantial area of wetlands and wetland buffers that will be retained on individual lots

Closure: On behalf of Mr. Chase, we look forward to working with the staff and Planning Board to permit this project. As you consider the application, please contact us if you have any questions.

Please review and schedule this request for consideration by the Planning Board at the earliest possible meeting date. Thank you for your assistance relative to these requests.

Sincerely,

SEBAGO TECHNICS, INC.

Robert A. McSorley, P.E.
Senior Project Manager

RAM:sn

cc. Brandon Chase

Town of Raymond
Subdivision Review Requirements
Raymond Cape Subdivision

Article 9 - General Requirements

1. Conformity with Comprehensive Plan – The project is consistent with the Town's Comprehensive relative to Natural Resources; the project has been designed to avoid wetland impacts and preserve open areas. Relative to housing, the project proposes the development of a cluster subdivision which promotes the preservation of open space . Furthermore, the project has been designed to comply with the development regulations for the Town of Raymond, coordination with the appropriate state agencies relative to historical properties, natural communities and wildlife as well as meet the state stormwater standards.

2. Relationship to Community Services – The applicant shall complete the roadway construction and stabilization to first lift of pavement, construction of the roadway t-turnarounds, construction and stabilization of the stormwater systems including roadside swales, conveyance culverts for the preservation of drainage ways and the installation of stabilization for disturbed areas and slopes prior to the sale of lots. The applicant is proposing the construction of a Minor Town Street and is intending to dedicate the roadway to the Town. Until the Minor Street is accepted by the Town, the applicant shall be responsible for all maintenance and repairs including snow removal and solid waste removal. The stormwater systems will be maintained by the association of the subdivision with rights to the Town to maintain as necessary.

3. Retention of Proposed Public Sites and Open Spaces – The project proposes 14.85 acres of open retainage in two specific tracts which comprise 39.8% of the total property area. In addition, wetlands and buffers have been preserved on the individual lots beyond the areas of the open space tracts. The project has sought the review by the State Preservation Office which has indicated that no historical resources have been identified for the property. The property does not contain any public lands or trail ways.

4. Preservation of Natural and Historic Features – The roadway for the project has been designed to minimize cuts and fills and to avoid any impacts to the wetlands on the property. In addition, the project layout and expected lot development comprise less than 25% of the uplands that surround the on-site wetlands.

5. Traffic Sight Distance – Traffic site distance was reviewed for the project along the Raymond Cape Road; a memo is submitted as part of this application that indicates compliance with the standard.

6. Conformance to Shoreland Zoning – The project has been designed to meet the requirements of an open space cluster subdivision within the Limited Residential-Recreational II Zoning District (LRR2). The stormwater Best Management Practices (BMP's) have been designed in accordance with Maine Department of Environmental Protection stormwater requirements to meet the phosphorus standards for the developments.

7. Easements for Natural Drainage Ways – Culverts have been incorporated into the design and sized to provide for conveyance through the project.

8. Net Residential Density - The property is in the LRR2 Zoning District which requires 3 acres/unit of development. A net residential calculation for the property was completed by subtracting the rights-of-way, steep slopes, poor soils/wetlands and resources protection areas from the gross acreage for the property resulting in 30.56 net acres. No floodplains exist on the property and surface water bodies were included in the area for wetlands. Because the applicant is proposing an open space cluster subdivision the net area was increased by 20% and divided by allowable density resulting in 12.22 od 12 units.

9. Lots – Lots will be developed to provide adequate off-street parking for residential dwellings. Lots that have frontage on Raymond Cape Road will have access from the proposed roadway for the project. The lots will meet the minimum 1 ½ acre size for lots within an open space cluster subdivision and no lots are of a flag lot configuration. Test pits have been completed to confirm adequate soils/locations for subsurface wastewater disposal systems (SSWDS). Based upon the lot size, there is adequate suitable for the placement of wells and for SSWDS and meet the applicable setback requirements.

10. Utilities – As stated in the cover letter above, the proposed single family lots will be served by individual subsurface wastewater disposal systems and individual wells. Electric and telecommunications will be installed underground and extended from available infrastructure the Raymond Cape Road.

11. Additional Requirements – The layout of the subdivision is such that adequate buffering of adjacent properties is provided to minimize noise pollution form the development. The fact that the property is an open space cluster subdivision no further subdivision is permitted.

12. Required Improvements – The design of the proposed subdivision provides for the required improvements including monuments, street signs, streets and storm drainage. As stated above, the individual wells and SSWDS will be provided on each lot.

13. Impact on Ground Water – Based upon the number of test pits performed for the review of SSWDS, additional test pits were performed to create a soils map for the property. This soils map is the basis for the stormwater pre- and post- design plans. In addition, a Class 'C' Medium High Intensity Soil Survey Report has been prepared. Based upon the size of the proposed lots, locations for proposed systems the fact that the SSWDS will be individual systems and not a community disposal, the resulting nitrate plumes form the SSWDS are not expected to extend beyond the boundary of the project. Furthermore, sufficient lot area exists to provide adequate separate between proposed wells and SSWDS. In addition, review of wells within the vicinity of the project indicates that most of the permitted wells have significant capacity (well yield).

14. Phosphorous Control – As stated above, the subdivision has been designed in accordance with Maine Department of Environmental Protection stormwater requirements to meet the phosphorus standards for the developments.

ARTICLE 10 - DESIGN STANDARDS

1. Monuments – The proposed subdivision plan indicates the installation of property monuments to comply with the Town requirements.

2. Street Signs – A proposed street name for the project will be provided to the Town for review and approval prior to the Final Subdivision Plan submission.

3. Streets – Proposed street will be classified as a Minor Street. The street has been designed based upon the requirements of the Reymond Street Ordinance. The grade of the street has been designed to match existing grade and to minimize/eliminate impacts to on-site wetlands. As depicted on the sketch plan submitted to the Planning Board for review, the development proposes a dead-end street of approximately 1970 lf with two t-turn arounds to provide access at approximately the midpoint of the roadway as well as the end of the roadway. A waiver for the length of the street is requested with this application.

4. Driveway Construction – Driveway will be designed with individual lot construction to provide for a culvert for roadside drainage and to minimize runoff into the proposed street of the subdivision.

5. Sidewalks – The proposed street will be a minor street in the LRR2 and will not have sidewalks.

6. Water Supply – Per the sketch plan submission for the project, the proposed residential dwellings will have residential fire suppression systems as part of the building construction. Wells will be constructed for each lot that meet the Maine Department of Heath and Human Services (MDHHS) requirements.

7. Sewage Disposal – As stated above, test pits for the proposed lots were reviewed and evaluated by a Licensed Site Evaluator. Final design of the systems will be by a Licensed Site Evaluator to meet MDHHS requirements including required setbacks.

8. Surface Drainage – A part of the submission for this subdivision, a Stormwater Management Report and plan are included to meet the requirements for a drainage plan and to meet the requirements of the Maine Stormwater Law. Included in this design are construction and stormwater BMP's including stabilization to prevent soil erosion for the development.

Town of RAYMOND
Home of the Landlocked Salmon
INCORPORATED 1803

WS___Entered___Completed___

Land Development Permit Application

January 10, 2007 revision

Permit#

Issue Date _____

RE ID _____

TYPE OF DEVELOPMENT:

- ☐ Minor Subdivision
- ☒ Major Subdivision
- ☐ Minor Conditional Use
- ☐ Major Conditional Use
- ☐ Mobile Home Park
- ☐ Campground

For Town of Raymond use only:
Date Received _____
Time Received _____
Delivered by _____

APPLICATION INFORMATION:

Development Name: Raymond Cape Subdivision
Development Address: Raymond Cape Road, Raymond, ME 04071

Property Owner: Brandon Chase
Owner Address: P.O. Box 37
Raymond ME 04071

Applicant: Brandon Chase
Applicant Address: P.O. Box 37
Raymond ME 04071

Applicant Telephone: (207) 807-6576 Email: bchase02@yahoo.com

Is applicant a corporation? ○ Yes ⊗ No If yes, licensed in which state? _____ *

**If the corporation license is outside of Maine, please attach a copy of the registration.*

Applicant's Authorized Agent: Sebago Technics, Inc.
Agent Address: 75 John Roberts Road, Suite 4A
South Portland ME 04106
Agent Telephone: (207) 200-2074 Email rmcsorley@sebagotechnics.com

Design Professional: Robert McSorley, P.E. Title: Senior Project Manager
Preparers Address: See Agent, Above
_____ ME _____

Preparers Telephone: (207) 200-2074 Registration # ME 8588

Name and Address of person to receive all correspondence with regard to this application:

Application Contact: Sebago Technics, Inc. c/o Robert McSorley
Contact Address: 75 John Roberts Road, Suite 4A
South Portland ME 04106
Contact Telephone: (207) 200-2074 Email: rmcsorley@sebagotechnics.com

Permit# Issue Date _____

LAND INFORMATION:

1. The proposal is located on which City Tax Map/Lot #(s)? 4 29 _____ _____
2. How large is the subject property (in acres or square feet)? 37.33 +/- ⊗ Acres ○ Sq Ft
3. What is the current zoning of property to be developed? LLR2
4. What are the existing use(s) of the subject property? Unimproved, vacant

5. What water bodies does the parcel include? Not Applicable
6. Is any portion of the property within 250' of the normal high-water mark of a pond, river, or salt water body? ○ Yes ⊗ No or in Stream Protection? Yes ○ Yes ⊗ No
7. Is any portion of the property within a special flood hazard area as identified by the Federal Emergency Management Agency (FEMA): ○ Yes ⊗ No
8. What legal interest does the applicant have in the subject property? (Attach evidence thereof.)
   ⊗ ownership ○ option ○ purchase and sales contract ○ other
9. What legal interest does the applicant have in any abutting property? None

Please attach a list of the owners of all properties within 500' of the subject property.

10. When was the last time that the subject property was subdivided? Prior to 1993
11. What was the nature of the last subdivision? ○ building units ⊗ division of land
12. Indicate if property is in the following classifications for property tax assessment purposes:
    ○ Tree Growth ○ Farm Use ○ Open Space

NOTE: Contact the City Assessor prior to receiving subdivision approval or change of use approval to determine if there will be a withdrawal penalty from the above programs.

DEVELOPMENT INFORMATION:

13. Proposed use(s) of development:

14. Number of existing lots 1 — Number of lots to be developed: 12
    Number of existing buildings 0 — No. of buildings to be developed: 0
    Number/type of existing units 0 — No./type of units to be developed: 0
15. What is the proposed ***building gross floor area***? 0 uare feet
    What is the proposed ***impervious surface area***? 42,240 uare feet
    What is the proposed ***area of site disturbance***? 142,505 res
16. Does this development require extension of public infrastructure: ○ Yes ⊗ No
17. Estimated cost for public infrastructure improvements: $600,000.00
18. Identify method of water supply for the proposed development:
    ⊗ Individual wells
    ○ Central well with distribution lines
    ○ Connection to public water system
    ○ Other (Indicate) Other _____

19. Identify method of sewage disposal for the proposed development:
- ⊗ Individual septic systems
- ○ Central on-site disposal with distribution lines
- ○ Connection to public sewer system
- ○ Other (indicate) Other _____

20. Identify method of fire protection for the proposed development:
- ○ Hydrants connected to the public water system
- ○ Dry hydrants located on existing, pond or water body
- ○ Existing fire pond
- ⊗ Other (indicate:) Other sprinklers, well-served

21. Does the applicant propose to dedicate to the public any streets, recreation areas, or common land:
○ Yes ⊗ No If answered yes, please specify all applicable:

Description of Street(s) _____ length: _____
Description of Recreation Area(s) _____ . acreage: _____
Description of Common Land(s) _____ . acreage: _____

22. Indicate the nature of any restrictive covenants to be placed in the deeds:

23. Does the applicant intend to request waivers of any of the submission requirements?
○ Yes ⊗ No If yes, please list them and state reasons for the request)

To the best of my knowledge, all of the information submitted in this application is true and correct.

Signature of Applicant's Authorized Agent — Date: 3/9/22

Approved by — Date: 3/9/2022

Brandon Chase
P.O. Box 37
Raymond, ME 04071

March 9, 2022

Planning Board
Town of Raymond
401 Webbs Mills Rd
Raymond, Maine 04071

Re: Raymond Cape Subdivision

To Whom It Concern:

I hereby authorize Sebago Technics, Inc. to act as my agent for a subdivision submission to the Town of Raymond. If you have any questions relative to this authorization, do not hesitate to contact me.

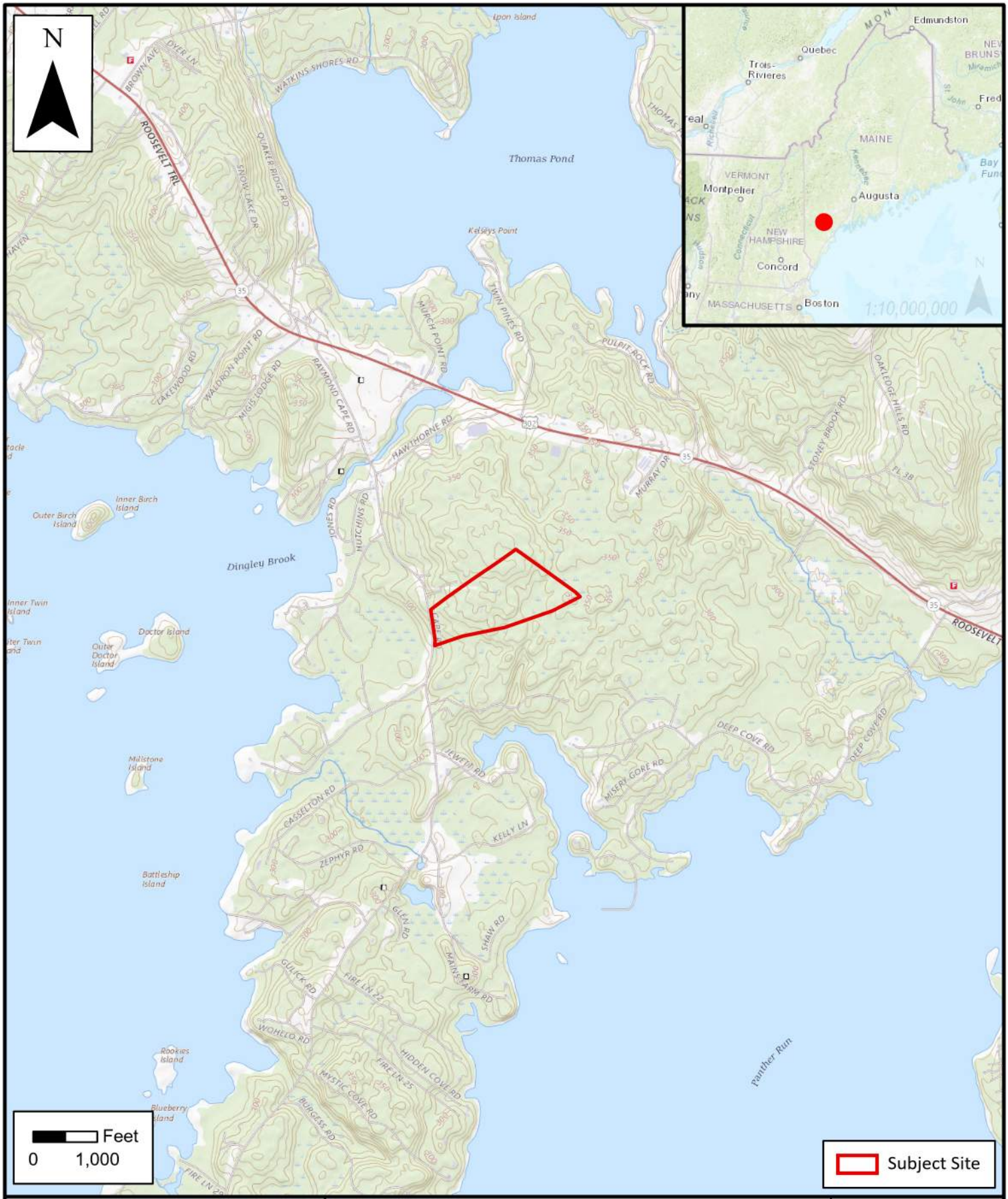
Sincerely, Brandon Chase

Exhibit 1

Location Maps

EXHIBIT 1: LOCATION MAPS

Reference is made to the USGS Site Location Map and the Town of Raymond Zoning Map excerpt included in this section. Per the official Land Use and Zoning Map, the Applicant's property is located with the Limited Residential-Recreation District II (LLR2); additionally, a portion of the parcel is located within the Resource Protection Zone. The RP will not be impacted as part of this project.



SEBAGO TECHNICS

WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd. - Suite 4A
South Portland, ME 04106
Tel. 207-200-2100

LOCATION MAP

BRANDON CHASE

SCALE: 1:24,000

DATE: 10/27/2021

LOCATION:
15 WASHINGTON COURT
NAPLES, ME 04055

INFORMATION:
TOWN OF RAYMOND, MAINE
USGS QUADRANGLE

Town of

RAYMOND, Maine

Official
Land Use Map

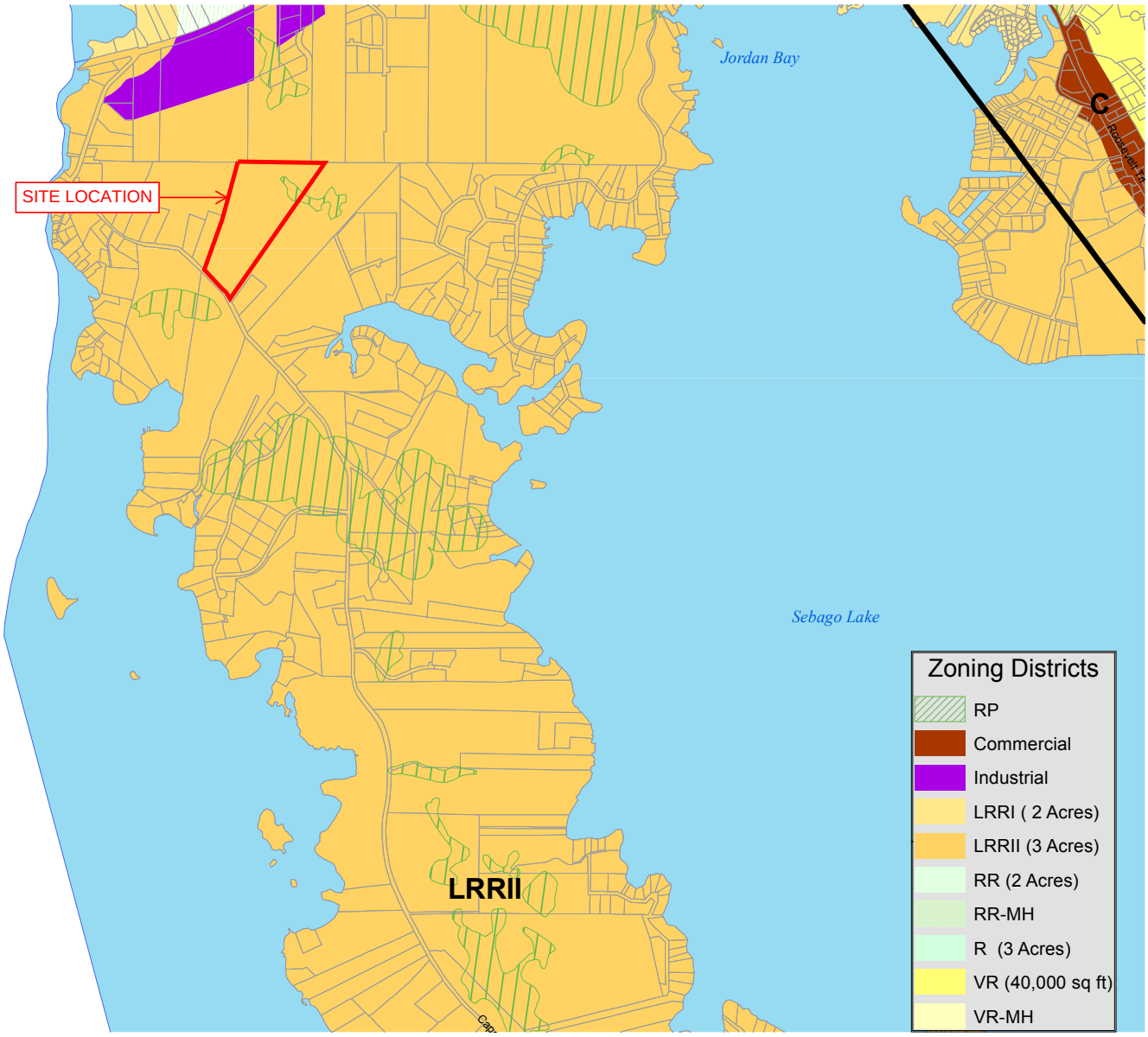


Exhibit 2

Abutter List and Tax Map

EXHIBIT 2: ABUTTER LIST AND TAX MAP

As required, we have included a 500-foot radius abutter list and accompanying tax map for Planning Board reference.

Map/Lot: 4-30-A00
GOAN, JENNIFER
PO BOX 145
RAYMOND, ME 04071

Map/Lot: 4-28-B00
FRAITES, JOHN R
FRAITES, DENISE L
359 S DOWNS WAY
FORT MILL, SC 29708

Map/Lot: 4-28-0
MARSH, ROBERT JR & COLLEEN
c/o GEORGE & KAREN MOTTA
34 CAPE ROAD
RAYMOND, ME 04071

Map/Lot: 4-20-0
SABRE CORP
PO BOX 134
SOUTH CASCO , ME 04077

Map/Lot: 3-69-0
HARRISON, ANNE S & WILLIAM B
c/o PRIVATE MANAGEMENT SERVICES INC
23 OLD KINGS HIGHWAY S, STE 200
DARIEN, CT 06831

Map/Lot: 4-28-A00
FOURQUET, VERONICA
PO BOX 1125
RAYMOND, ME 04071

Map/Lot: 4-18-0
MARTIN, RICHARD N
MARTIN, CYNTHIA
8 RIVER ROAD
NAPLES, ME 04055

Map/Lot: 73-3-0
SPALDING, HILDEGARDE S & PETER
C/O ROBERT & GRETCHEN WETZEL
PO BOX 128
LYME, NH 03768

Map/Lot: 4-30-0
POTVIN, DIANE G
8 LEDGE ROAD
CUMBERLAND FORESIDE, ME 04110

Map/Lot: 4-46-A00
ALTMAN, DIANA
SIEGEL, RICHARD H
1025 5TH AVE
NEW YORK, NY 10028

Map/Lot: 4-16-0
CHARETTE, JOYCE R
PO BOX 103
RAYMOND, ME 04071

Map/Lot: 4-31-0
POTVIN, GARY L
POTVIN, DIANE G
78 CAPE RD
RAYMOND, ME 04071

LOCUS **Map/Lot: 4-29-0**
CHASE, BRANDON
15 WASHINGTON COURT
NAPLES, ME 04055

21397

500' RADIUS ABUTTERS
Raymond Cape Subdivision

THIS MAP IS PREPARED FOR THE INVENTORY OF REAL PROPERTY WITHIN THE TOWN OF RAYMOND AND IS COMPILED FROM RECORDED DEEDS, PLATS, TAX MAPS, SURVEYS, PLANIMETRIC MAPS, AND OTHER PUBLIC RECORDS AND DATA. USERS OF THIS TAX MAP ARE HEREBY NOTIFIED THAT THE AFOREMENTIONED PUBLIC PRIMARY

INFORMATION SOURCES SHOULD BE CONSULTED FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE TOWN OF RAYMOND AND IT'S MAPPING CONTRACTORS ASSUME NO LEGAL RESPONSIBILITY FOR THE INFORMATION CONTAINED HEREIN.

TOWN OF RAYMOND
Cumberland County, Maine
2021 Property Map

Sources:
Raymond Assessors' Database
Maine Office of GIS

Prepared by:
Sebago Technics, Inc.

Effective Date: April 1, 2021

Map 04

Map Properties
Layer
Cemetery
Hook
Old Property Line
Right-of-Way
Stream
Subdivision Line
Tie line
Utilities
Wetland
Lake/Pond
Subject Map

039
050
046
040
049
058
059
060
061
007
004
006
076
077
073
074
075
002

SEBAGO LAKE
Jordan Bay
Thomas Pond
CASCO
DINGLEY BROOK
ROUTE 302
TREE GROWTH LAW

SITE

Hawthorne House NRHP, 1969

1 inch equals 500 feet
0 500 1,000 2,000 Feet

Exhibit 3

Right, Title and Interest

EXHIBIT 3: RIGHT, TITLE AND INTEREST

A copy of Cumberland County Registry of Deeds Book 38175/Page 131 indicating that the project applicant, Brandon Chase, is the record owner of the property is included in this section.

DLN: 1002140143316

WARRANTY DEED

(Maine Statutory Short Form – 33 M.R.S.A. §§ 761 *et seq.*)

MAINE REAL ESTATE TAX-Paid

KNOW ALL PERSONS BY THESE PRESENTS, that I, **Diane G. Potvin** of the Town of Cumberland, County of Cumberland and State of Maine, for valuable consideration received, hereby **GRANT** to **Brandon Chase**, of the Town of Naples, County of Cumberland and State of Maine, with **WARRANTY COVENANTS,** a certain lot or parcel of land, together with any buildings or improvements thereupon, situated in the Town of Raymond, County of Cumberland and State of Maine, and being more particularly described as follows:

See Exhibit A, attached hereto and incorporated herein.

Witness my hand and seal this 21st day of April, 2021.

Witness

Diane G. Potvin

STATE OF MAINE
COUNTY OF CUMBERLAND, SS.

Then personally appeared this 21st day of April, 2021, the above named Diane G. Potvin and acknowledged the foregoing instrument to be her free act and deed.

Before me,

Notary Public/ Attorney at Law
Printed Name: _____
My Comm. Exp: _____

Katherine G. Young
Notary Public
State of Maine
My Commission Expires 5/22/2024

21-1149 (Chase)

EXHIBIT A

(Lot 29 Cape Road-Raymond, Maine)

A certain lot or parcel of land situated in the Town of Raymond, Cumberland County, Maine, on the easterly side of Raymond Cape Road, so-called, bounded and described as follows:

Beginning at a 5/8 inch rebar set flush in the northeasterly sideline of said Raymond Cape Road, 6.61 feet northerly from an existing 1/2 inch iron pipe 20 inches high, said rebar being set at the southwesterly corner of land now or formerly of Wayne G. Whitney, et ux, and the northwesterly corner of the land herein conveyed, as shown on standard boundary survey entitled "Designed Homes, Inc. Property", revised date 1/25/94, made for Chiyung Tse by Sebago Technics, 12 Westbrook Common, Westbrook ME 04098-13395;

thence North 54° 54' 57" East, along land of said Whitney and a line blazed in 1959 as shown on survey plan entitled "Land of Peter A. Anderson and Lawrence H. Stubbs in Raymond, Maine", as recorded in Cumberland County Registry of Deeds (CCRD) in Plan Book 52, Page 14, a distance of 1,629.87 feet to a point South 54° 54' 57" West 1.54 feet from a 1.5 inch iron pipe found leaning in a stone pile, said point being on the southeasterly sideline of land formerly of Roger D. Hewson as described in deed recorded in CCRD Book 4239, Page 8, North 54° 11' 58" West, a distance of 221.88 feet from another 1.5 inch pipe set in a stone pile at the southerly corner of land of said Hewson;

thence South 54° 11' 58" East a distance of 221.88 feet to said 1.5 inch pipe set in a stone pile at the southerly corner of land of said Hewson;

thence South 53° 40' 50" East along land now or formerly of Richard N. Martin, et al., as described in deed recorded in CCRD Book 3597 Page 308, a distance of 1,025.30 feet to a 2 1/4 inch monument 5" high set in 1989 by Hardes & McAllister;

thence South 71° 25' 45" West along land now or formerly of Bruce J. Saunders, et al, as described in deed recorded in CCRD Book 3050, Page 822, a distance of 2,397.16 feet to a 2 1/4 inch monument 5" high set in 1989 by Hardes & McAllister and the assumed sideline of said Raymond Cape Road;

thence North 00° 39' 40" East by said assumed sideline of Raymond Cape Road, a distance of 130.53 feet to a point;

DOC :33485 BK:38175 PG:133
RECEIVED - RECORDED, CUMBERLAND COUNTY REGISTER OF DEEDS
05/11/2021, 08:41:30A
Register of Deeds Nancy A. Lane E-RECORDED

thence North 09° 02' 50" West by said assumed sideline of Raymond Cape Road, a distance of 438.62 feet to the point of beginning.

The legal description used herein was prepared pursuant to a standard boundary survey entitled "Designed Homes, Inc. Property", revised 1/25/94, prepared for Chiyung Tse A/K/A Jonathan Tse C. Y. by Sebago Technics, 12 Westbrook Common, Westbrook ME 04098-1339, recorded in said Registry in Plan Book 194, Page 57.

Reference may be made to a Warranty Deed from Chiyung Tse a/k/a Jonathan Tse to Diane G. Potvin dated August 13, 2014 and recorded in Book 31733, Page 231 in the Cumberland County Registry of Deeds.

* * * * * *

Reviewed and Approved:_____

Exhibit 4

Technical Capability/Financial Capacity

EXHIBIT 4: TECHNICAL CAPABILITY/FINANCIAL CAPACITY

Technical Capability: The Applicant has retained Sebago Technics to provide engineering, survey, environmental, traffic analysis, and regulatory permitting services. A firm view of Sebago Technics' list of licensed and specialized personnel and the project manager's resume is enclosed in this section.

Financial Capacity: An estimate of probable cost for the site work is $600,000.00. The Applicant intends to finance the project by a development loan for the project. A letter from the applicaint's financial institution will be provided with the Final Subdivision Plan submission.

Civil Engineering
Site Plans
Grading & Drainage Design
Utility Design (Water, Sewer)
Stormwater Management
Permitting (Local, State & Federal)
Quarry/Gravel Pit Studies & Permitting
Technical Review
Construction Inspection

Environmental Services
NRPA/NEPA Studies
Site Assessments (ESAs, VRAPs)
Septic Design & Analysis
Floodplain Studies & Permitting

Transportation Engineering
Signal Analysis, Design & Management
Traffic Analysis & Permitting
Intersection, Road & Highway Design
Alternatives Analysis & Route Design
Bicycle and Pedestrian Facilities

Landscape Architecture
Conceptual & Site Design
Park & Public Space Design
Urban Design
Master and Campus Planning
Waterfront Planning
Planting Design
Visual Impact Assessments

Land Surveying/Geomatics
Technical Deed Research
Boundary & Topographic Survey
ROW Survey & Mapping
Land Title Survey
Subdivisions
GPS Survey & Mapping
Construction Layout (Vertical & Horizontal)
As-Built Surveys
High Definition 3D Laser Scanning
Hydrographic Surveying
Forensic Surveying
Aerial Photogrammetry
Tax Map Updates
Zoning & Shoreland Zoning Map Updates

Soil Sciences
Soil Surveys & Testing
Wetland Assessment & Permitting
Vernal Pool Mapping

Planning & Permitting
Industrial/Business Parks
Feasibility Assessments
Sand, Gravel and Quarry Mining
Wetland Assessments and Mitigation
NHDES and USACOE Permitting
NRPA/NEPA Studies
Local Permitting
Ordinance Development & Amendments

SEBAGO TECHNICS

LET'S MEET TOGETHER.

75 John Roberts Road, Suite 4A
South Portland, Maine 04106
(207) 200.2100

PERSONNEL

SEBAGO TECHNICS

CIVIL ENGINEERING

Owens McCullough, PE, LEED-AP
Sr. VP., Strategy & Client Development

Shawn Frank, PE
Sr. Vice President, Commercial Development

Daniel Riley, PE, CFM
Vice President, Engineering

James Seymour, PE
Senior Project Manager

Robert McSorley, PE
Senior Project Manager

Stephen Harding, PE
Senior Project Manager

Craig Burgess, PE
Senior Project Manager

Paul Ostrowski, PE
Senior Project Engineer

Aaron Hunter, PE
Project Engineer

Christopher Taylor, PE
Senior Project Engineer

ENVIRONMENTAL

Cole Peters, CG, PWS
Environmental Services Manager

Gary Fullerton, LSS, LSE, CWS
Director of Natural Resources

Anna Biddle, LSS
Environmental Scientist/Permitting Specialist

LAND SURVEYING

Terry Bennett, PLS LPF MRICS ENV SP LEED AP
Vice President, Survey-Geomatics

Mathew Ek, PLS, LLS
Director of Survey/GIS Advancement

Jacob Bartlett, PLS
Survey Operations Manager

Charles Marchese, PLS
Director of Survey Operations

David Titcomb, PLS
Principal Surveyor

Joshua Eon, PLS
Project Surveyor/Chief sUAS Pilot

Brian Stoddard, PLS
Project Surveyor

Christopher LaMotte, PLS
Project Surveyor

David Jacques, PLS
Project Surveyor

Justin Brown, PLS
Project Surveyor

Nicholas Elliston, PLS
Project Surveyor

PERMITTING

Rebecca Gabryszewski
Permitting Coordinator

Stefanie Nichols
Permitting Specialist/Project Coordinator

LANDSCAPE ARCHITECTURE

Kylie Mason, RLA, LEED-AP
Chief Operations Officer

Stephen Doe, RLA, LEED-AP
Senior Landscape Architect

Amy Bell Segal, RLA
Senior Landscape Architect

Henry Hess, RLA
Landscape Architect

TRANSPORTATION ENGINEERING

Bradley Lyon, PE, PTOE
Director, Transportation Services

Curtis Thompson, PE, PTOE
Transportation Engineer

Derek Caldwell, PE, PTOE
Transportation/Traffic Engineer

Shane Kelly, PE
Transportation Engineer

Nicole Conant, PE
Transportation Engineer

GEOGRAPHIC INFO. SYSTEMS

Jake Hansen
GIS Specialist

Maria Morris
GIS Specialist

CONSTRUCTION INSPECTION

Mike Kane, LPA, CPESC
Senior Inspector

ROBERT A. MCSORLEY, PE

Senior Project Manager

Mr. McSorley joined Sebago Technics, Inc. (STI) in 2006. He has worked in the Civil Engineering field since 1986 and is a Senior Project Manager specializing in project management for government, commercial and residential projects. He is responsible for client contact, proposals, financial aspects of projects, preparation of reports, bid documents, permitting issues, and construction coordination on a variety of public and private projects. He is also active in the community having served on the Portland Water District Board of Trustees and on the Scarborough Sanitary District Board of Trustees and currently serves as a Board member for Camp Scarborough.

EXPERIENCE

Mr. McSorley has completed and is working on several commercial and residential projects in New Hampshire and Massachusetts. In addition, he assists in QA/QC oversight of other projects, marketing of firm's services and technical guidance and training staff.

Rob has also performed peer reviews of projects and was the Assistant District Engineer for a 4800 acre Special Services District. In that capacity, he was responsible for civil engineering and water management reviews for new projects. In addition, he was responsible for the design of the District's infrastructure including water, IQ and gravity sanitary, force mains, pump stations, drainage roadways and water management systems.

Some of his most notable work experience includes:

- Gorham Road Drainage Improvements – South Portland, ME
- Maine Mall Road Drainage Improvements – South Portland, ME
- Maine Mall Road Sanitary Sewer Replacement – South Portland, ME
- Maine Street Drainage & Sidewalk Improvements – Town of Kennebunkport, ME
- Bedford Street Sewer Separation Project & Portland Water District Main Project – Portland, ME
- Mast Road Culvert Replacement – Town of Waterboro, ME
- Pine Street Bridge Replacement (Box Culvert) – Porter, ME
- USPS FSS Building Expansion – North Reading, MA
- Sunbury Retirement Residence – Bangor, ME
- Derry Retirement Residence – Derry, NH
- Beverly Retirement Community – Beverly, MA
- Tewksbury Retirement Residence – Tewksbury, MA
- Portland Retirement Residence – Portland, ME
- Billerica Retirement Residence – Billerica, MA
- Mountain View Estates – North Conway, NH
- Veteran's Administration Medical Center Cogeneration Facility – Canandaigua, NY
- Synchronous Condenser, Green Mountain Power – Jay, VT
- Veterans Administration Hospital – Palm Beach County, FL

EDUCATION

Florida Atlantic University
Boca Raton, FL
Bachelor of Science,
Mechanical Engineering, 1995

University of Maine - Orono, ME
Majored in Mechanical Engineering
1980-1983

REGISTRATIONS

Professional Engineer: Maine, New Hampshire, Massachusetts, Vermont

National Council of Examiners for Engineering and Surveying

MEMBERSHIPS

American Society of Civil Engineers

National Society of Professional Engineers

Maine Engineering Society

CERTIFICATIONS

Maine DEP Maintenance & Inspection of Stormwater BMPs

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JEFFREY B. POLLARD, EI

Civil Engineer

Mr. Pollard joined Sebago Technics, Inc., (STI) in August of 2020. Mr. Pollard was an intern with Sebago in the summer of 2019 and is a recent graduate from UMaine with a degree in Civil Engineering. In his current role as Civil Engineer, Jeff is a member of a design team within the Project Delivery Group at Sebago Technics. He focuses on the technical aspects of site design, including complex grading, treatment and control of stormwater, utility layout, and roadway design.

EXPERIENCE

The Edge at Berwick – Berwick, ME: As one of the design engineers for the project, performed grading design, utility layout, and stormwater analysis for the project. The project is proposing a total of 12 mixed-use commercial and residential buildings with associated roadways, parking, and utility infrastructure.

The Maine Stay Inn & Cottages – Kennebunkport, ME: Design engineer for the redevelopment of the site for renovated cottages, a new parking lot, and redesigned common space. Work included grading of the site and stormwater analysis and improvements.

Bowden Point Road Extension – Prospect, ME: Design engineer for the conversion of a private gravel road to a town accepted paved road. Work included layout design and grading of dead-end turnaround and cost estimate.

Morong Falmouth Porsche – Falmouth, ME: Design engineer for the project, which includes a new dealership building and overflow parking lot. Performed grading of site, stormwater analysis and improvements, and assisted with layout of new utilities.

EDUCATION

University of Maine - Orono, ME
B.S., Civil Engineering
2020

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BRIAN A. MCMAHON

Landscape Designer

Mr. McMahon joined Sebago Technics, Inc., (STI) in July of 2021. Brian is a recent graduate from the University of Rhode Island with a degree in Landscape Architecture and a minor in Community Planning. While in college, he was part of the Sigma Lambda Alpha Honor Society and the recipient of the University of Rhode Island Centennial Scholarship and Red Sox Scholar. He is a Maine resident and interned with Sebago Technics during the winter of 2021.

EXPERIENCE

Sebago Technics Inc. - South Portland, ME
Landscape Architecture Intern
Dec. 2020 – Jan. 2021

- Range of work included rendering a variety of conceptual site plans and developing preliminary sketches for new projects.
- Familiarized with professional environment, in which multiple teams collaborated amongst one another.
- Acquired valuable skills with Adobe PhotoShop.

Gogan Landscaping & Masonry - Wells, ME
Mason & Landscape Installer
May 2018 – Aug. 2020

- Assisted in redesigns and installs of custom landscapes mostly on a residential scale.
- Facilitated landscape installs ranging from planting designs and small hardscapes.
- Led a small crew in numerous projects ranging from large patios, dry stack rock wall installations, and stone veneer applications.

Winn Contracting - Ogunquit, ME
Home Construction
Apr. 2015 – Sep. 2017

- Assisted in construction of two different houses.
- Acquired valuable skills and an understanding of contracting.

EDUCATION

University of Rhode Island,
Kingston, Rhode Island
Bachelor of Landscape Architecture
Minor: Community Planning

SKILLS

Experienced landscape installer and mason

Proficient in AutoCAD, SketchUp & Lumion

Proficient in Adobe PhotoShop, InDesign, & Illustrator

Deciduous & coniferous plant identification

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JACOB L. HANSEN

GIS Specialist

Mr. Hansen joined Sebago Technics, Inc., (STI) in October of 2020 as a GIS Specialist. Jacob is experienced in GIS, field mapping and geoscientific methods with a strong research background. He is a skilled cartographer who excels at finding innovative ways to answer problems with GIS, and has ample experience performing and troubleshooting geospatial data maintenance and analysis in various desktop and web applications. Jacob is also proficient in scientific analysis, data management, the use of specialized equipment and programs, and the production of high-quality maps and deliverables.

Providing direct support to the engineers at Sebago Technics, Jacob ensures the locational integrity of land data used in civil design. Best practice skills and resources are applied to collect, manipulate, and assemble high-accuracy geospatial data. Mr. Hansen's unique blend of field surveying, digital mapping and geoscientific training provides an excellent resource to the whole team.

EXPERIENCE

Ground Surface Modeling: With the use of remote sensing technology such as LiDAR and High-Definition Laser Scanning, ground surface models can be developed from three dimensional points clouds without the need for conventional survey. These point clouds capture ground surface elevation as well as building and vegetation heights. Mr. Hansen utilizes specialized software to create Digital Terrain Models (DTMs) and Digital Surface Models (DSMs) from the point clouds, allowing for the creation of highly-accurate models with reduced time in the field. Mr. Hansen utilizes these products to conduct various analyses, including viewshed, hydrographical and slope, and to provide surface models to the engineers.

Environmental Permitting and Services: Mr. Hansen provides maps, analyses, general information, and technical write-ups for various environmental projects, including viewshed analysis, portions of Phase I Environmental Site Assessments, and high-quality maps and deliverables for a multitude of project types.

Tax Mapping: Sebago Technics contracts with the Towns of Poland and Raymond, ME, providing tax mapping and other GIS services. This includes the routine maintenance and update of the cadastre, providing deliverables in the form of maps and digital data. Mr. Hansen brings his Land Records experience from North Carolina, where he is a Certified Property Mapper well-versed in property mapping and title research.

Broadband Connectivity Dataset – Town of Poland, ME: The Town of Poland requested the services of Mr. Hansen to map internet broadband connectivity within the town boundaries. The dataset provides street-level detail broadband availability information, including cable and DSL layers and a regional fiber optic transport route.

EDUCATION

East Tennessee State University,
Johnson City, TN
M.S. Geosciences - Geospatial Analysis Concentration, 2020

University of Maine at Farmington -
Farmington, ME
B.A., Geology, 2011

CERTIFICATIONS

North Carolina Certified Property Mapper

AWARDS

Michael D. Wilson Fellow, 2010-2011

Best Student Poster – 37th Annual Colloquium of the Atlantic Geoscience Society, 2011

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Exhibit 5

Stormwater Management/
Phosphorus Control

EXHIBIT 5: STORMWATER MANAGEMENT/PHOSPHORUS CONTROL

Per the requirements of the Town of Raymond Subdivision Regulations, Article 5-Preliminary Plan, a copy of the formal Stormwater Management Report, calculations, drawings, inspection, maintenance, housekeeping, and phosphorus control narrative is included in this section. The appended plan set shows the erosion and sedimentation control notes, details, and locations.

SEBAGO TECHNICS

CIVIL ENGINEERING • SURVEYING • LANDSCAPE ARCHITECTURE

STORMWATER MANAGEMENT REPORT

For

RAYMOND CAPE ROAD SUBDIVISION
RAYMOND, MAINE

Prepared for:

Brandon Chase
15 Washington Court
Naples, Maine 04055

Prepared by:

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

March, 2022

40 YEARS OWNERSHIP · GROWTH

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Appendices

STORMWATER MANAGEMENT REPORT
RAYMOND CAPE ROAD SUBDIVISION
RAYMOND, MAINE

1. Introduction

This Stormwater Management Plan 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.

2. Existing Conditions

The project site is an approximately 37-acre parcel of undeveloped land on Raymond Cape Road, Raymond. The parcel consists of undeveloped woodland and is located on the eastern side of Raymond Cape Road. The proposed site is identified on the Town of Raymond Tax Map 04 as lot 29. The site generally slopes up from Raymond Cape Road, and typical slopes on the site range from approximately 5-35%.

The proposed site is tributary to Sebago Lake. Sebago Lake is listed as most at risk from new development in the Maine DEP Chapter 502.

The proposed development area of the site is not located in an identified flood zone per the FEMA Flood Insurance Rate Map for the Town of Raymond, Community Panel 2302050020B with an effective date of May 5, 1981. A copy of the flood insurance rate map is attached in Appendix 5.

3. Soils

Soil information for the site was obtained via the USDS United States Department of Agriculture and Natural Resource Conservation Services (NRCS) Web Soil Survey. The Hydrologic Soil Groups (HSG) of the soils on site as classified by the Soil Conservation Service are delineated on the stormwater management plans and are as follows:

Soil Map Symbol	Soil Name	Slope (%)	HSG
BeD	Becket	15-25	C
SeA	Sebago	0-3	D
SkB	Skerry	3-8	C
SkC	Skerry	8-15	C
TuC	Tunbridge	8-15	C
TuD	Tunbridge	15-25	C
WeB	Westbury	3-8	D

A copy of the Class C, Medium-High Intensity Soil Survey performed by Sebago Technics, Inc. is included in Appendix 4.

4. Proposed Site Improvements

The proposed project is a residential subdivision consisting of 12 lots with an average lot size of approximately 1.7 acres. Access for the proposed subdivision will be provided by a dead-end private road that runs through the center of the original 37-acre parcel. The private road will extend approximately 2,000 linear feet from Raymond Cape Road to the rear boundary of the existing parcel. Stormwater runoff will be treated by two grassed underdrained soil filters. The proposed site improvements are for the construction of the subdivision road and stormwater control methods only. Development of the individual house lots is not proposed as part of this project. The proposed site improvements will result in a total developed area of approximately 142,505 square feet, and create approximately 42,240 square feet of new impervious area.

5. Existing Conditions Model

The Existing Conditions Stormwater Management Plan consists of five (5) subcatchments labeled 1.0S through 5.0S in the HydroCAD model. Five (5) locations were identified as Points of Analysis (POA) for comparing peak runoff rates.

POA-1 is located in the northwest portion of the site where runoff drains northwest towards the adjacent house lot. Subcatchment 1.0S contributes runoff to this POA with a total runoff area of approximately 4.0 acres. POA-1 and the associated drainage areas are tributary to Sebago Lake.

POA-2 is located at the southwest corner of the parcel in the ditch along Raymond Cape Road. Subcatchment 2.0S contributes runoff to this POA with an overall runoff area of approximately 7.3 acres. POA-2 and the associated drainage area is tributary to Sebago Lake.

POA-3 is located south of the parcel in the existing forested wetland complex. Subcatchment 3.0S contributes runoff to this POA with an overall runoff area of approximately 6.0 acres. POA-3 and the associated drainage area is tributary to Sebago Lake.

POA-4 is located southeast of the parcel in a large existing forested wetland. Subcatchment 4.0S contributes runoff to this POA with an overall runoff area of approximately 23.0 acres. POA-4 and the associated drainage area is tributary to Sebago Lake.

POA-5 is located at the northeast corner of the parcel in the small existing wetland. Subcatchment 5.0S contributes runoff to this POA with an overall runoff area of approximately 1.2 acres. POA-5 and the associated drainage area is tributary to Sebago Lake.

6. Proposed Conditions Model

The Proposed Conditions Stormwater Management Plan consists of the same overall area as the Existing Conditions plan, however, the proposed condition subcatchments have been broken into smaller watersheds as a result of the proposed development. Subcatchment areas have been modeled to account for the future development of each lot, with an assumed developed area of 12,500 SF, of which 3,000 SF is assumed to be impervious. The stormwater BMPs have been designed for control of peak runoff rates from this future development, however stormwater quality treatment is provided for the roadway only.

Subcatchment 10.0S is tributary to POA-1 where runoff from undeveloped woodland area drains northwest towards the adjacent property. This subcatchment is relatively unchanged from existing conditions and is approximately 3.7 acres in size.

POA-2 contains subcatchments 20.0S through 20.6S where runoff drains to the Raymond Cape Road ditch located at the southwest corner of the overall site. Subcatchments 20.0S, 20.1S, and 20.2S receive stormwater quality treatment through the proposed BMP located at the entrance to the site. The total area draining to POA-2 in the proposed conditions is approximately 8.3 acres.

POA-3 contains subcatchment 30.0S and consists of two proposed house lots and open space that drain towards the center of the southern boundary of the overall site. The total area of this subcatchment is approximately 5.2 acres.

Subcatchments 40.0S through 40.6S contribute runoff to POA-4, located near the southeast boundary of the overall site. Water quality treatment is provided to subcatchments 40.0S and 40.1S by the second proposed stormwater BMP located near the rear end of the proposed roadway. The overall area of these subcatchments is approximately 23.0 acres.

Subcatchment 50.0S contains the same 1.2-acre area as the Existing Conditions Model subcatchment 5.0S, and drains to POA-5 located at the northeast corner of the site.

The two Best Management Practices (grassed underdrained soil filters) have been designed and sized in accordance with Maine DEP BMP standards contained within Chapter 500 and the BMP Manual. Sizing calculations can be found in Appendix 1.

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 guidelines.

General Standard - Chapter 500, Section 4(C)

Since the project will create more than 20,000 square feet of impervious area in the watershed of a lake most at-risk, MDEP General Standards apply, which 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 underdrained soil filters have been implemented into the stormwater management infrastructure. Filtration BMPs are very effective at removing a wide range of pollutants through the use of organic soil filter media.

Linear Portion of a Project - Chapter 500, Section 4(C)5(c)

Since the project is for the construction of a road only, it falls under the linear portion exception of the General Standard. This exception reduces the treatment requirements to no less than 75% of the linear portion's impervious area and 50% of the linear portion's developed area. Through the use of the aforementioned BMP's 85.3% of new impervious area and 80.8% of new developed area will be receiving treatment. This meets the requirements for the Maine DEP General Standards, Linear Portion of a Project Exemption. Treatment and BMP calculations are attached to this report as Appendix 1.

Phosphorus Standard - Chapter 500, Section 4(D)

Since the proposed roadway will create less than 3 acres of impervious area and less than 5 acres of developed area in a lake watershed that is not severely blooming, the general standards may be used instead of the phosphorus standard.

Flooding Standard – Chapter 500, Section 4(F)

Since the project results in less than three acres of impervious area and less than 20 acres of developed area, DEP flooding standards do not apply. The flooding standard requires that the peak runoff rates in the proposed conditions do not exceed the existing peak runoff rates in the 24-hour storms of the 2, 10, and 25-year frequencies. However, per Town of Raymond requirements, the peak runoff rates in the fully developed subdivision conditions must be at or below the existing conditions. Since development of the lots is not proposed as part of this project, assumed areas of development had to be used for each lot to analyze these conditions. Lot development was assumed to be 12,500 square feet per lot, with 3,000 square feet assumed to be impervious area. These conditions were modeled using HydroCAD computer software to ensure the proposed stormwater control methods are adequate to maintain peak runoff rates in the fully developed condition that are at or below existing peak rates.

Runoff curve numbers were determined for each of the subcatchment by measuring the area of each hydrologic soil group within each type of land cover. Hydrologic soil groups on the site were determined by the Class C medium-high intensity soil survey performed by Sebago Technics. 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	3.4	3.4
	10-year	7.5	7.3
	25-year	11.0	10.6
POA-2	2-year	4.8	4.7
	10-year	11.3	11.3
	25-year	17.2	17.2
POA-3	2-year	4.0	3.8
	10-year	10.0	8.9
	25-year	15.5	13.5
POA-4	2-year	10.1	9.3
	10-year	24.3	24.3
	25-year	37.3	37.3
POA-5	2-year	0.6	0.6
	10-year	1.5	1.5
	25-year	2.3	2.3

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 fully developed subdivision conditions at all Points of Analysis are at or below existing peak runoff rates for the 2, 10, and 25-year storm events with implementation of the proposed stormwater management practices.

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 85.3% (75% required) of impervious areas, and 80.8% (50% required) of the total developed area associated with development of the roadway only. Control of stormwater quantity has been designed for both the proposed roadway development and the future lot development at a limit of 12,500 SF per lot (3,000 SF impervious area). Stormwater discharging from the fully developed subdivision will be at or below existing conditions for the 2, 10, and 25-year storm events at all five Points of Analysis. 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.

Robert A. McSorley, ME PE
Senior Project Manager

Jeffrey Pollard, EI
Civil Engineer

March 9, 2022

Appendix 1

Stormwater Quality Calculations

Table 1: MDEP GENERAL STANDARD CALCULATIONS

Job # 21397

AREA ID	WATERSHED SIZE (S.F.)	EXISTING ONSITE IMPERVIOUS AREA TO REMAIN (S.F.)	NEW ONSITE IMPERVIOUS AREA (S.F.)	EXISTING ONSITE LANDSCAPED AREA TO REMAIN (S.F.)	NEW ONSITE LANDSCAPED AREA (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
10.0S	162,904	0	0	0	0	0	0	NO	0	0	0	
20.0S	26,540	0	9,645	0	16,895	26,540	0	YES	9,645	16,895	26,540	UDSF-1
20.1S	31,943	0	8,979	0	22,964	31,943	0	YES	8,979	22,964	31,943	UDSF-1
20.2S	3,333	0	1,046	0	2,287	3,333	0	YES	1,046	2,287	3,333	UDSF-1
20.3S	114,936	0	0	0	0	0	0	NO	0	0	0	
20.4S	36,581	0	0	0	0	0	0	NO	0	0	0	
20.5S	111,066	0	1,301	0	3,062	4,363	0	NO	0	0	0	
20.6S	38,906	0	1,406	0	2,476	3,882	0	NO	0	0	0	
30.0S	224,629	0	1,210	0	1,144	2,354	0	NO	0	0	0	
40.0S	26,154	0	9,523	0	16,631	26,154	0	YES	9,523	16,631	26,154	UDSF-2
40.1S	27,219	0	6,830	0	20,389	27,219	0	YES	6,830	20,389	27,219	UDSF-2
40.2S	15,145	0	0	0	0	0	0	NO	0	0	0	
40.3S	313,659	0	0	0	3,467	3,467	0	NO	0	0	0	
40.4S	104,649	0	0	0	0	0	0	NO	0	0	0	
40.5S	47,186	0	518	0	2,287	2,805	0	NO	0	0	0	
40.6S	469,486	0	1,782	0	8,663	10,445	0	NO	0	0	0	
50.0S	52,286	0	0	0	0	0	0	NO	0	0	0	
TOTAL (S.F.)	**1,806,622**	**0**	**42,240**	**0**	**100,265**	**142,505**	**0**		**36,023**	**79,166**	**115,189**	

TOTAL NEW IMPERVIOUS AREA (S.F.)	**42,240**	**TOTAL DEVELOPED AREA (S.F.)**	**142,505**
TOTAL IMPERVIOUS AREA RECEIVING TREATMENT (S.F.)	**36,023**	**TOTAL AREA RECEIVING TREATMENT (S.F.)**	**115,189**
% OF IMPERVIOUS AREA RECEIVING TREATMENT	**85.28%**	**% OF AREA RECEIVING TREATMENT**	**80.83%**

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Tel. (207) 200-2100

JOB	21397		
SHEET NO.	1	OF	2
CALCULATED BY	JBP	DATE	3/11/2022
FILE NAME	21397 WQC	PRNT DATE	3/11/2022

UNDERDRAINED SOIL FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References

1. Maine DEP Chapter 500, Section 4.C.(3)(b)
   a. "must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"
2. Maine DEP Best Management Practices Stormwater Manual, Section 7.1
   a. "surface should represent 5% of impervious area and 2% of landscaped area"

Tributary to Underdrained Filter: UDSF-1

Landscaped Area	42,146.00	SF	
Impervious Area	19,670.00	SF	

Minimum Surface Area

Required (2% X Landscaped + 5%" X Impervious)

Total Landscaped Area	42,146.00	SF	Area	842.9	SF
Total Impervious Area	19,670.00	SF	Area	983.5	SF
Required Minimum Surface Area				1,826.4	SF
Provided Surface Area				2,916.0	SF

Treatment Volume

Required (0.4" X Landscaped + 1.0" X Impervious)

Landscaped Area	42,146.00	SF	Volume	1,404.9			
Impervious Area	19,670.00	SF	Volume	1,639.2			
Treatment Volume Required				3,044.0	CF	0.070	AF
Provided Treatment Volume				3,241.0	CF		

Sediment Pre-Treatment

Per Reference 2, Chapter 7.1 "Pretreatment devices shall be provided to minimize discharge of sediment to the soil filter"

Annual Sediment Load:	55 cubic feet per acre per year of sanded area						
Area to be sanded:	19,670.00	SF					
Sediment Volume	25	CF					
Provided	34	CF	6	Inch Deep Forebay	with area of	68	sf

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JOB	21397		
SHEET NO.	2	OF	2
CALCULATED BY	JBP	DATE	3/11/2022
CHECKED BY	RAM		
FILE NAME	21397 WQC	PRINT DATE	3/11/2022

ORIFICE SIZING CALCULATION

Stormwater BMP: UDSF-1

Orifice Equation $Q = CA\sqrt{(2gh)}$

Q = Rate of Discharge (cfs)
A = Orifice Area (sf)
G = Gravitational Constant (32.2 ft/s^2)
h = Depth of water above the flow line (center) of the orifice (ft)
C = 0.6 Orifice coefficient (usually assumed = 0.6)

Average discharge rate required to drawdown the treatment volume in a desired amount of time is:

$$Q = \frac{WQv}{Tcf}$$

TV = Treatment Volume (cf)
T = Target Drain Time (Hours)
cf = Conversion Factor = 3600 sec/hr

TV = 3,044 cf
t = 24 hr

$$Q = \frac{TV}{tCF}$$ 0.04 cfs Target Rate for 24 hour discharge

surface area of filter = 2,916 SF

hmax = 1.04 ft h/2= 0.52 ft

$$A = \frac{Q}{C\sqrt{(2gh)}}$$ A = 0.010 sf = 1.46 sq. in.

Diam = 1.36 in

SEBAGO TECHNICS, INC.
75 John Roberts Road Suite 4A
South Portland, Maine 04106
Tel. (207) 200-2100

JOB	21397		
SHEET NO.	1	OF	2
CALCULATED BY	JBP	DATE	3/11/2022
FILE NAME	21397 WQC	PRNT DATE	3/11/2022

UNDERDRAINED SOIL FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References

1. Maine DEP Chapter 500, Section 4.C.(3)(b)
   a. "must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"
2. Maine DEP Best Management Practices Stormwater Manual, Section 7.1
   a. "surface should represent 5% of impervious area and 2% of landscaped area"

Tributary to Underdrained Filter: UDSF-2

Landscaped Area	37,020.00	SF	
Impervious Area	16,353.00	SF	

Minimum Surface Area

Required: (2% X Landscaped + 5%" X Impervious)

Total Landscaped Area	37,020.00	SF	Area	740.4	SF
Total Impervious Area	16,353.00	SF	Area	817.7	SF
Required Minimum Surface Area				1,558.1	SF
Provided Surface Area				2,327.0	SF

Treatment Volume

Required: (0.4" X Landscaped + 1.0" X Impervious)

Landscaped Area	37,020.00	SF	Volume	1,234.0			
Impervious Area	16,353.00	SF	Volume	1,362.8			
Treatment Volume Required				2,596.8	CF	0.060	AF
Provided Treatment Volume				2,629.0	CF		

Sediment Pre-Treatment

Per Reference 2, Chapter 7.1: "Pretreatment devices shall be provided to minimize discharge of sediment to the soil filter"

Annual Sediment Load:	55 cubic feet per acre per year of sanded area						
Area to be sanded:	16,353.00	SF					
Sediment Volume	21	CF					
Provided	54	CF	6	Inch Deep Forebay	with area of	107	sf

SEBAGO TECHNICS, INC.
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South Portland, Maine 04106
(207) 856-0277 FAX (207) 856-2206

JOB	21397		
SHEET NO.	2	OF	2
CALCULATED BY	JBP	DATE	3/11/2022
CHECKED BY	RAM		
FILE NAME	21397 WQC	PRINT DATE	3/11/2022

ORIFICE SIZING CALCULATION

Stormwater BMP: UDSF-2

Orifice Equation $Q = CA\sqrt{(2gh)}$

Q = Rate of Discharge (cfs)
A = Orifice Area (sf)
G = Gravitational Constant (32.2 ft/s^2)
h = Depth of water above the flow line (center) of the orifice (ft)
C = 0.6 Orifice coefficient (usually assumed = 0.6)

Average discharge rate required to drawdown the treatment volume in a desired amount of time is:

$$Q = \frac{WQv}{Tcf}$$

TV = Treatment Volume (cf)
T = Target Drain Time (Hours)
cf = Conversion Factor = 3600 sec/hr

TV = 2,597 cf
t = 24 hr

$$Q = \frac{TV}{tCF}$$ 0.03 cfs Target Rate for 24 hour discharge

surface area of filter = 2,327 SF

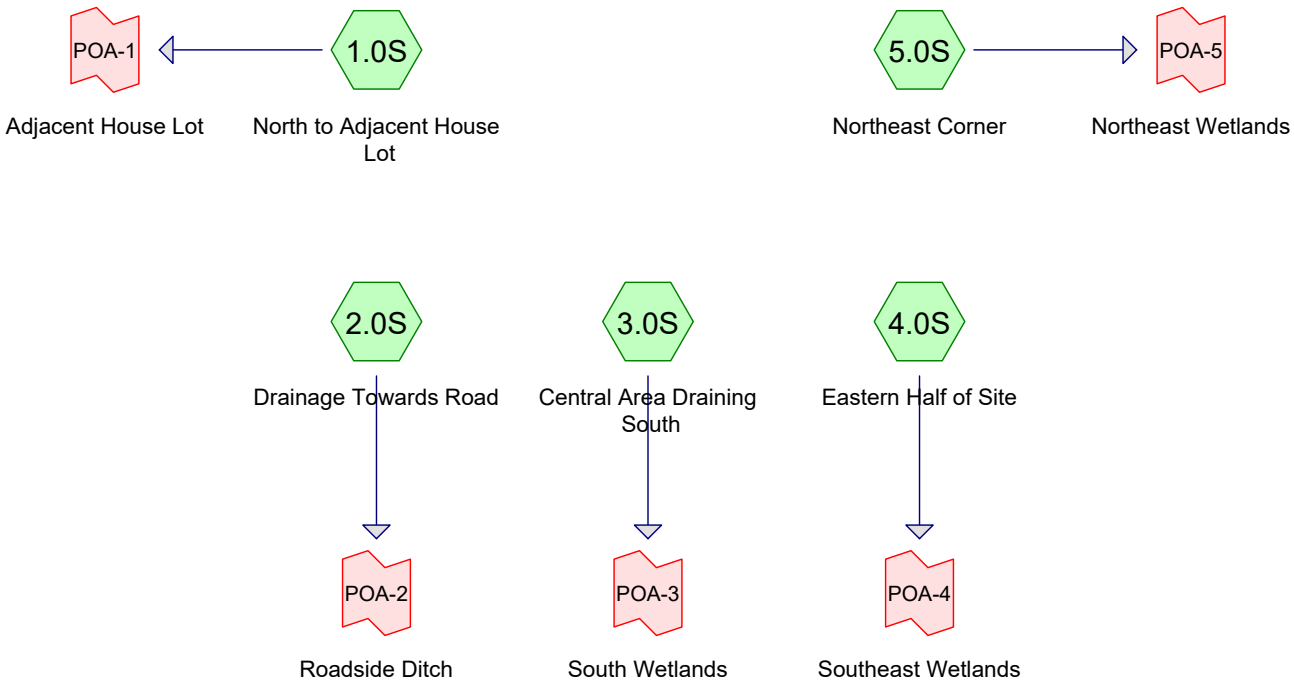
hmax = 1.12 ft h/2= 0.56 ft

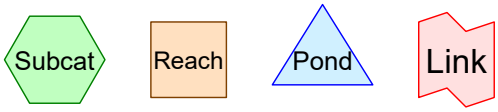
$$A = \frac{Q}{C\sqrt{(2gh)}}$$ A = 0.008 sf = 1.20 sq. in.

Diam = 1.24 in

Appendix 2A

Existing Conditions
HydroCAD Summary





Routing Diagram for 21397 Existing Conditions
Prepared by Sebago Technics, Inc, Printed 3/11/2022

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
33.359	70	Woods, Good, HSG C (1.0S, 2.0S, 3.0S, 4.0S, 5.0S)
8.115	77	Woods, Good, HSG D (1.0S, 2.0S, 3.0S, 4.0S)
41.474	**71**	**TOTAL AREA**

Summary for Subcatchment 1.0S: North to Adjacent House Lot

Runoff = 11.0 cfs @ 12.21 hrs, Volume= 1.033 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
41,519	70	Woods, Good, HSG C
131,893	77	Woods, Good, HSG D
173,412	75	Weighted Average
173,412		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.1500	0.12		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 3.10"
0.8	80	0.1211	1.74		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
2.7	110	0.0180	0.67		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
0.7	65	0.1000	1.58		**Shallow Concentrated Flow, D to E** Woodland Kv= 5.0 fps
6.2	190	0.0105	0.51		**Shallow Concentrated Flow, E to F** Woodland Kv= 5.0 fps
0.5	55	0.1640	2.02		**Shallow Concentrated Flow, F to G** Woodland Kv= 5.0 fps
1.4	60	0.0210	0.72		**Shallow Concentrated Flow, G to H** Woodland Kv= 5.0 fps
15.0	580	Total			

Summary for Subcatchment 2.0S: Drainage Towards Road

Runoff = 17.2 cfs @ 12.24 hrs, Volume= 1.722 af, Depth= 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
228,817	70	Woods, Good, HSG C
89,136	77	Woods, Good, HSG D
317,953	72	Weighted Average
317,953		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	15	0.1200	0.11		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 3.10"
8.3	675	0.0741	1.36		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
3.5	105	0.0100	0.50		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
1.1	115	0.1220	1.75		**Shallow Concentrated Flow, D to E** Woodland Kv= 5.0 fps
2.2	235	0.0640	1.77		**Shallow Concentrated Flow, E to F** Short Grass Pasture Kv= 7.0 fps
17.4	1,145	Total			

Summary for Subcatchment 3.0S: Central Area Draining South

Runoff = 15.5 cfs @ 12.16 hrs, Volume= 1.322 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
244,072	70	Woods, Good, HSG C
16,877	77	Woods, Good, HSG D
260,949	70	Weighted Average
260,949		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	30	0.0750	0.10		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 3.10"
1.6	160	0.1125	1.68		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
1.5	45	0.0100	0.50		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
0.6	60	0.1167	1.71		**Shallow Concentrated Flow, D to E** Woodland Kv= 5.0 fps
2.6	145	0.0357	0.94		**Shallow Concentrated Flow, E to F** Woodland Kv= 5.0 fps
11.2	440	Total			

Summary for Subcatchment 4.0S: Eastern Half of Site

Runoff = 37.3 cfs @ 12.53 hrs, Volume= 5.249 af, Depth= 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
886,427	70	Woods, Good, HSG C
115,595	77	Woods, Good, HSG D
1,002,022	71	Weighted Average
1,002,022		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	25	0.0500	0.08		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 3.10"
1.4	135	0.1038	1.61		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
2.2	110	0.0273	0.83		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
0.8	65	0.0769	1.39		**Shallow Concentrated Flow, D to E** Woodland Kv= 5.0 fps
13.7	290	0.0050	0.35		**Shallow Concentrated Flow, E to F** Woodland Kv= 5.0 fps
7.5	560	0.0625	1.25		**Shallow Concentrated Flow, F to G** Woodland Kv= 5.0 fps
7.1	150	0.0050	0.35		**Shallow Concentrated Flow, G to H** Woodland Kv= 5.0 fps
37.7	1,335	Total			

Summary for Subcatchment 5.0S: Northeast Corner

Runoff = 2.3 cfs @ 12.35 hrs, Volume= 0.265 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
52,286	70	Woods, Good, HSG C
52,286		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	50	0.0200	0.07		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 3.10"
1.8	155	0.0840	1.45		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
9.4	200	0.0050	0.35		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
23.7	405	Total			

Summary for Link POA-1: Adjacent House Lot

Inflow Area = 3.981 ac, 0.00% Impervious, Inflow Depth = 3.11" for 25-YR event
Inflow = 11.0 cfs @ 12.21 hrs, Volume= 1.033 af
Primary = 11.0 cfs @ 12.21 hrs, Volume= 1.033 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link POA-2: Roadside Ditch

Inflow Area = 7.299 ac, 0.00% Impervious, Inflow Depth = 2.83" for 25-YR event
Inflow = 17.2 cfs @ 12.24 hrs, Volume= 1.722 af
Primary = 17.2 cfs @ 12.24 hrs, Volume= 1.722 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link POA-3: South Wetlands

Inflow Area = 5.991 ac, 0.00% Impervious, Inflow Depth = 2.65" for 25-YR event
Inflow = 15.5 cfs @ 12.16 hrs, Volume= 1.322 af
Primary = 15.5 cfs @ 12.16 hrs, Volume= 1.322 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link POA-4: Southeast Wetlands

Inflow Area = 23.003 ac, 0.00% Impervious, Inflow Depth = 2.74" for 25-YR event
Inflow = 37.3 cfs @ 12.53 hrs, Volume= 5.249 af
Primary = 37.3 cfs @ 12.53 hrs, Volume= 5.249 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link POA-5: Northeast Wetlands

Inflow Area = 1.200 ac, 0.00% Impervious, Inflow Depth = 2.65" for 25-YR event
Inflow = 2.3 cfs @ 12.35 hrs, Volume= 0.265 af
Primary = 2.3 cfs @ 12.35 hrs, Volume= 0.265 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 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 1.0S: North to Adjacent Runoff Area=173,412 sf 0.00% Impervious Runoff Depth=1.03"
Flow Length=580' Tc=15.0 min CN=75 Runoff=3.4 cfs 0.341 af

Subcatchment 2.0S: Drainage Towards Runoff Area=317,953 sf 0.00% Impervious Runoff Depth=0.87"
Flow Length=1,145' Tc=17.4 min CN=72 Runoff=4.8 cfs 0.528 af

Subcatchment 3.0S: Central Area Draining Runoff Area=260,949 sf 0.00% Impervious Runoff Depth=0.77"
Flow Length=440' Tc=11.2 min CN=70 Runoff=4.0 cfs 0.385 af

Subcatchment 4.0S: Eastern Half of Site Runoff Area=1,002,022 sf 0.00% Impervious Runoff Depth=0.82"
Flow Length=1,335' Tc=37.7 min CN=71 Runoff=10.1 cfs 1.569 af

Subcatchment 5.0S: Northeast Corner Runoff Area=52,286 sf 0.00% Impervious Runoff Depth=0.77"
Flow Length=405' Tc=23.7 min CN=70 Runoff=0.6 cfs 0.077 af

Link POA-1: Adjacent House Lot Inflow=3.4 cfs 0.341 af
Primary=3.4 cfs 0.341 af

Link POA-2: Roadside Ditch Inflow=4.8 cfs 0.528 af
Primary=4.8 cfs 0.528 af

Link POA-3: South Wetlands Inflow=4.0 cfs 0.385 af
Primary=4.0 cfs 0.385 af

Link POA-4: Southeast Wetlands Inflow=10.1 cfs 1.569 af
Primary=10.1 cfs 1.569 af

Link POA-5: Northeast Wetlands Inflow=0.6 cfs 0.077 af
Primary=0.6 cfs 0.077 af

Total Runoff Area = 41.474 ac Runoff Volume = 2.900 af Average Runoff Depth = 0.84"
100.00% Pervious = 41.474 ac 0.00% Impervious = 0.000 ac

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 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 1.0S: North to Adjacent Runoff Area=173,412 sf 0.00% Impervious Runoff Depth=2.13"
Flow Length=580' Tc=15.0 min CN=75 Runoff=7.5 cfs 0.706 af

Subcatchment 2.0S: Drainage Towards Runoff Area=317,953 sf 0.00% Impervious Runoff Depth=1.89"
Flow Length=1,145' Tc=17.4 min CN=72 Runoff=11.3 cfs 1.152 af

Subcatchment 3.0S: Central Area Draining Runoff Area=260,949 sf 0.00% Impervious Runoff Depth=1.74"
Flow Length=440' Tc=11.2 min CN=70 Runoff=10.0 cfs 0.871 af

Subcatchment 4.0S: Eastern Half of Site Runoff Area=1,002,022 sf 0.00% Impervious Runoff Depth=1.82"
Flow Length=1,335' Tc=37.7 min CN=71 Runoff=24.3 cfs 3.487 af

Subcatchment 5.0S: Northeast Corner Runoff Area=52,286 sf 0.00% Impervious Runoff Depth=1.74"
Flow Length=405' Tc=23.7 min CN=70 Runoff=1.5 cfs 0.175 af

Link POA-1: Adjacent House Lot Inflow=7.5 cfs 0.706 af
Primary=7.5 cfs 0.706 af

Link POA-2: Roadside Ditch Inflow=11.3 cfs 1.152 af
Primary=11.3 cfs 1.152 af

Link POA-3: South Wetlands Inflow=10.0 cfs 0.871 af
Primary=10.0 cfs 0.871 af

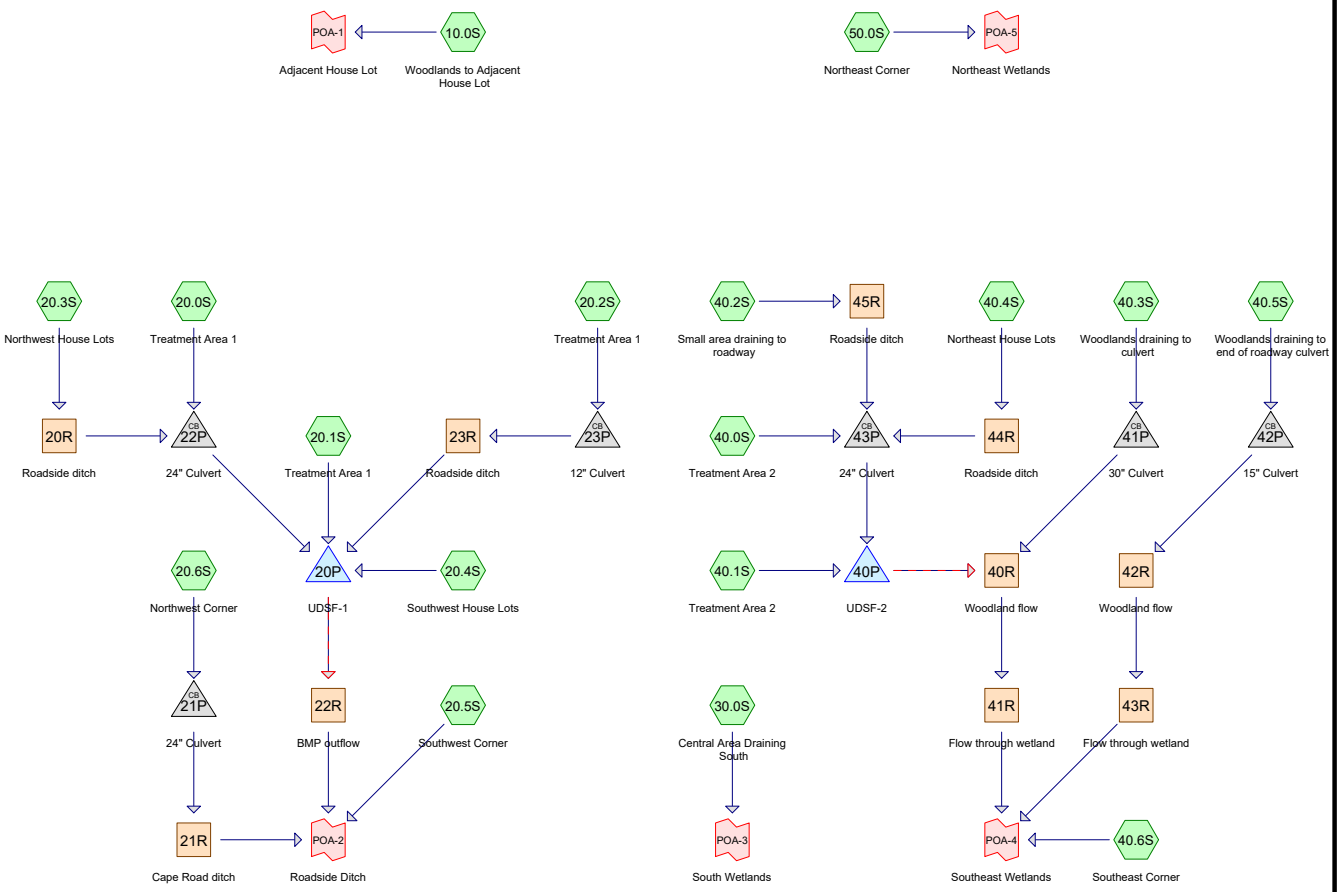
Link POA-4: Southeast Wetlands Inflow=24.3 cfs 3.487 af
Primary=24.3 cfs 3.487 af

Link POA-5: Northeast Wetlands Inflow=1.5 cfs 0.175 af
Primary=1.5 cfs 0.175 af

Total Runoff Area = 41.474 ac Runoff Volume = 6.391 af Average Runoff Depth = 1.85"
100.00% Pervious = 41.474 ac 0.00% Impervious = 0.000 ac

Appendix 2B

Proposed Conditions
HydroCAD Summary



Routing Diagram for 21397 Proposed Conditions
Prepared by Sebago Technics, Inc, Printed 3/11/2022

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.053	74	House lot >75% Grass cover, Good, HSG C (20.3S, 20.4S, 30.0S, 40.4S, 40.6S)
0.564	80	House lot >75% Grass cover, Good, HSG D (20.3S, 20.4S, 30.0S)
0.826	98	House lot impervious (20.3S, 20.4S, 30.0S, 40.4S, 40.6S)
0.970	98	Pavement (20.0S, 20.1S, 20.2S, 20.5S, 20.6S, 30.0S, 40.0S, 40.1S, 40.5S, 40.6S)
27.676	70	Woods, Good, HSG C (10.0S, 20.3S, 20.4S, 20.5S, 20.6S, 30.0S, 40.2S, 40.3S, 40.4S, 40.5S, 40.6S, 50.0S)
7.083	77	Woods, Good, HSG D (10.0S, 20.3S, 20.5S, 20.6S, 30.0S, 40.3S, 40.6S)
1.981	72	Woods/grass comb., Good, HSG C (20.0S, 20.1S, 20.2S, 20.5S, 20.6S, 40.0S, 40.1S, 40.3S, 40.5S, 40.6S)
0.321	79	Woods/grass comb., Good, HSG D (20.0S, 20.1S, 30.0S)
41.474	**73**	**TOTAL AREA**

Summary for Subcatchment 10.0S: Woodlands to Adjacent House Lot

Runoff = 10.6 cfs @ 12.21 hrs, Volume= 1.000 af, Depth= 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
31,151	70	Woods, Good, HSG C
131,753	77	Woods, Good, HSG D
162,904	76	Weighted Average
162,904		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.1500	0.12		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 3.10"
0.8	80	0.1211	1.74		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
2.7	110	0.0180	0.67		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
0.7	65	0.1000	1.58		**Shallow Concentrated Flow, D to E** Woodland Kv= 5.0 fps
6.2	190	0.0105	0.51		**Shallow Concentrated Flow, E to F** Woodland Kv= 5.0 fps
0.5	55	0.1640	2.02		**Shallow Concentrated Flow, F to G** Woodland Kv= 5.0 fps
1.4	60	0.0210	0.72		**Shallow Concentrated Flow, G to H** Woodland Kv= 5.0 fps
15.0	580	Total			

Summary for Subcatchment 20.0S: Treatment Area 1

Runoff = 2.4 cfs @ 12.14 hrs, Volume= 0.198 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (sf)	CN	Description
*	9,645	98	Pavement
	10,780	72	Woods/grass comb., Good, HSG C
	6,115	79	Woods/grass comb., Good, HSG D
	26,540	83	Weighted Average
	16,895		63.66% Pervious Area
	9,645		36.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0200	0.93		**Sheet Flow, A to B**
					Smooth surfaces n= 0.011 P2= 3.10"
5.0	335	0.0250	1.11		**Shallow Concentrated Flow, B to C**
					Short Grass Pasture Kv= 7.0 fps
5.3	625	0.0800	1.98		**Shallow Concentrated Flow, C to D**
					Short Grass Pasture Kv= 7.0 fps
10.6	975	Total			

Summary for Subcatchment 20.1S: Treatment Area 1

Runoff = 2.9 cfs @ 12.12 hrs, Volume= 0.226 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (sf)	CN	Description
*	8,979	98	Pavement
	16,259	72	Woods/grass comb., Good, HSG C
	6,705	79	Woods/grass comb., Good, HSG D
	31,943	81	Weighted Average
	22,964		71.89% Pervious Area
	8,979		28.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	40	0.0300	1.33		**Sheet Flow, A to B**
					Smooth surfaces n= 0.011 P2= 3.10"
2.5	165	0.0250	1.11		**Shallow Concentrated Flow, B to C**
					Short Grass Pasture Kv= 7.0 fps
5.6	670	0.0800	1.98		**Shallow Concentrated Flow, C to D**
					Short Grass Pasture Kv= 7.0 fps
8.6	875	Total			

Summary for Subcatchment 20.2S: Treatment Area 1

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 0.023 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (sf)	CN	Description
*	1,046	98	Pavement
	2,287	72	Woods/grass comb., Good, HSG C
	3,333	80	Weighted Average
	2,287		68.62% Pervious Area
	1,046		31.38% Impervious Area

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

Summary for Subcatchment 20.3S: Northwest House Lots

Runoff = 8.7 cfs @ 12.15 hrs, Volume= 0.727 af, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (sf)	CN	Description
*	12,000	98	House lot impervious
*	23,750	74	House lot >75% Grass cover, Good, HSG C
*	14,250	80	House lot >75% Grass cover, Good, HSG D
	39,742	70	Woods, Good, HSG C
	25,194	77	Woods, Good, HSG D
	114,936	77	Weighted Average
	102,936		89.56% Pervious Area
	12,000		10.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	80	0.0500	0.16		**Sheet Flow, A to B** Grass: Dense n= 0.240 P2= 3.10"
2.3	145	0.0430	1.04		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
10.7	225	Total			

Summary for Subcatchment 20.4S: Southwest House Lots

Runoff = 3.0 cfs @ 12.13 hrs, Volume= 0.238 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (sf)	CN	Description
*	6,000	98	House lot impervious
*	13,489	74	House lot >75% Grass cover, Good, HSG C
*	5,511	80	House lot >75% Grass cover, Good, HSG D
	11,581	70	Woods, Good, HSG C
	36,581	78	Weighted Average
	30,581		83.60% Pervious Area
	6,000		16.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	30	0.0667	0.10		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 3.10"
1.8	170	0.0500	1.57		**Shallow Concentrated Flow, B to C** Short Grass Pasture Kv= 7.0 fps
0.2	35	0.2800	2.65		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
1.9	115	0.0200	0.99		**Shallow Concentrated Flow, D to E** Short Grass Pasture Kv= 7.0 fps
9.0	350	Total			

Summary for Subcatchment 20.5S: Southwest Corner

Runoff = 7.5 cfs @ 12.12 hrs, Volume= 0.582 af, Depth= 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (sf)	CN	Description
*	1,301	98	Pavement
	3,062	72	Woods/grass comb., Good, HSG C
	103,003	70	Woods, Good, HSG C
	3,700	77	Woods, Good, HSG D
	111,066	71	Weighted Average
	109,765		98.83% Pervious Area
	1,301		1.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	15	0.0667	0.08		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 3.10"
1.9	215	0.1440	1.90		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
1.8	65	0.0150	0.61		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
1.7	165	0.1091	1.65		**Shallow Concentrated Flow, D to E** Woodland Kv= 5.0 fps
8.4	460	Total			

Summary for Subcatchment 20.6S: Northwest Corner

Runoff = 2.9 cfs @ 12.14 hrs, Volume= 0.232 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (sf)	CN	Description
*	1,406	98	Pavement
	2,476	72	Woods/grass comb., Good, HSG C
	16,182	70	Woods, Good, HSG C
	18,842	77	Woods, Good, HSG D
	38,906	75	Weighted Average
	37,500		96.39% Pervious Area
	1,406		3.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	25	0.0400	0.08		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 3.10"
0.4	60	0.2333	2.42		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
2.0	70	0.0143	0.60		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
0.2	40	0.3333	4.04		**Shallow Concentrated Flow, D to E** Short Grass Pasture Kv= 7.0 fps
1.6	105	0.0238	1.08		**Shallow Concentrated Flow, E to F** Short Grass Pasture Kv= 7.0 fps
9.7	300	Total			

Summary for Subcatchment 30.0S: Central Area Draining South

Runoff = 13.5 cfs @ 12.19 hrs, Volume= 1.216 af, Depth= 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (sf)	CN	Description
*	1,210	98	Pavement
	1,144	79	Woods/grass comb., Good, HSG D
*	6,000	98	House lot impervious
*	14,173	74	House lot >75% Grass cover, Good, HSG C
*	4,827	80	House lot >75% Grass cover, Good, HSG D
	183,821	70	Woods, Good, HSG C
	13,454	77	Woods, Good, HSG D
	224,629	72	Weighted Average
	217,419		96.79% Pervious Area
	7,210		3.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	55	0.1091	0.13		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 3.10"
2.5	130	0.0308	0.88		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
0.9	95	0.1263	1.78		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
2.9	155	0.0323	0.90		**Shallow Concentrated Flow, D to E** Woodland Kv= 5.0 fps
13.2	435	Total			

Summary for Subcatchment 40.0S: Treatment Area 2

Runoff = 2.2 cfs @ 12.15 hrs, Volume= 0.185 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (sf)	CN	Description
*	9,523	98	Pavement
	16,631	72	Woods/grass comb., Good, HSG C
	26,154	81	Weighted Average
	16,631		63.59% Pervious Area
	9,523		36.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.85		**Sheet Flow, A to B** Smooth surfaces n= 0.011 P2= 3.10"
10.6	445	0.0100	0.70		**Shallow Concentrated Flow, B to C** Short Grass Pasture Kv= 7.0 fps
11.4	485	Total			

Summary for Subcatchment 40.1S: Treatment Area 2

Runoff = 2.6 cfs @ 12.09 hrs, Volume= 0.182 af, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (sf)	CN	Description
*	6,830	98	Pavement
	20,389	72	Woods/grass comb., Good, HSG C
	27,219	79	Weighted Average
	20,389		74.91% Pervious Area
	6,830		25.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0200	0.93		**Sheet Flow, A to B** Smooth surfaces n= 0.011 P2= 3.10"
1.2	100	0.0400	1.40		**Shallow Concentrated Flow, B to C** Short Grass Pasture Kv= 7.0 fps
2.2	250	0.0700	1.85		**Shallow Concentrated Flow, C to D** Short Grass Pasture Kv= 7.0 fps
2.3					**Direct Entry, Direct Entry**
6.0	365	Total			

Summary for Subcatchment 40.2S: Small area draining to roadway

Runoff = 0.9 cfs @ 12.16 hrs, Volume= 0.077 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
15,145	70	Woods, Good, HSG C
15,145		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	60	0.1000	0.13		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 3.10"
3.4	160	0.0250	0.79		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
11.0	220	Total			

Summary for Subcatchment 40.3S: Woodlands draining to culvert

Runoff = 12.1 cfs @ 12.49 hrs, Volume= 1.643 af, Depth= 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
3,467	72	Woods/grass comb., Good, HSG C
262,666	70	Woods, Good, HSG C
47,526	77	Woods, Good, HSG D
313,659	71	Weighted Average
313,659		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	50	0.0300	0.08		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 3.10"
0.6	55	0.1000	1.58		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
7.1	400	0.0350	0.94		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
0.7	65	0.1000	1.58		**Shallow Concentrated Flow, D to E** Woodland Kv= 5.0 fps
13.7	290	0.0050	0.35		**Shallow Concentrated Flow, E to F** Woodland Kv= 5.0 fps
1.7	165	0.1000	1.58		**Shallow Concentrated Flow, F to G** Woodland Kv= 5.0 fps
34.5	1,025	Total			

Summary for Subcatchment 40.4S: Northeast House Lots

Runoff = 6.4 cfs @ 12.19 hrs, Volume= 0.585 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (sf)	CN	Description
*	9,000	98	House lot impervious
*	28,500	74	House lot >75% Grass cover, Good, HSG C
	67,149	70	Woods, Good, HSG C
	104,649	73	Weighted Average
	95,649		91.40% Pervious Area
	9,000		8.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	45	0.0300	0.08		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 3.10"
2.2	175	0.0714	1.34		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
1.6	110	0.0500	1.12		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
13.6	330	Total			

Summary for Subcatchment 40.5S: Woodlands draining to end of roadway culvert

Runoff = 2.6 cfs @ 12.19 hrs, Volume= 0.239 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (sf)	CN	Description
*	518	98	Pavement
	2,287	72	Woods/grass comb., Good, HSG C
	44,381	70	Woods, Good, HSG C
	47,186	70	Weighted Average
	46,668		98.90% Pervious Area
	518		1.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	50	0.0400	0.09		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 3.10"
4.2	350	0.0771	1.39		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
13.7	400	Total			

Summary for Subcatchment 40.6S: Southeast Corner

Runoff = 18.9 cfs @ 12.47 hrs, Volume= 2.460 af, Depth= 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (sf)	CN	Description
*	1,782	98	Pavement
	8,663	72	Woods/grass comb., Good, HSG C
*	3,000	98	House lot impervious
*	9,500	74	House lot >75% Grass cover, Good, HSG C
	378,473	70	Woods, Good, HSG C
	68,068	77	Woods, Good, HSG D
	469,486	71	Weighted Average
	464,704		98.98% Pervious Area
	4,782		1.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	40	0.0250	0.07		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 3.10"
1.0	80	0.0690	1.31		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
1.5	60	0.0167	0.65		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
1.8	150	0.0733	1.35		**Shallow Concentrated Flow, D to E** Woodland Kv= 5.0 fps
17.9	380	0.0050	0.35		**Shallow Concentrated Flow, E to F** Woodland Kv= 5.0 fps
31.8	710	Total			

Summary for Subcatchment 50.0S: Northeast Corner

Runoff = 2.3 cfs @ 12.35 hrs, Volume= 0.265 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
52,286	70	Woods, Good, HSG C
52,286		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	50	0.0200	0.07		**Sheet Flow, A to B** Woods: Light underbrush n= 0.400 P2= 3.10"
1.8	155	0.0840	1.45		**Shallow Concentrated Flow, B to C** Woodland Kv= 5.0 fps
9.4	200	0.0050	0.35		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
23.7	405	Total			

Summary for Reach 20R: Roadside ditch

Inflow Area = 2.639 ac, 10.44% Impervious, Inflow Depth = 3.31" for 25-YR event
Inflow = 8.7 cfs @ 12.15 hrs, Volume= 0.727 af
Outflow = 8.7 cfs @ 12.16 hrs, Volume= 0.727 af, Atten= 1%, Lag= 0.9 min

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.09 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 2.21 fps, Avg. Travel Time= 3.9 min

Peak Storage= 629 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 0.50' Flow Area= 1.8 sf, Capacity= 14.3 cfs

2.00' x 0.50' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 '/' Top Width= 5.00'
Length= 515.0' Slope= 0.0796 '/'
Inlet Invert= 355.00', Outlet Invert= 314.00'

‡

Summary for Reach 21R: Cape Road ditch

Inflow Area = 0.893 ac, 3.61% Impervious, Inflow Depth = 3.11" for 25-YR event
Inflow = 2.9 cfs @ 12.14 hrs, Volume= 0.232 af
Outflow = 2.8 cfs @ 12.15 hrs, Volume= 0.232 af, Atten= 1%, Lag= 0.9 min

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.32 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.29 fps, Avg. Travel Time= 4.6 min

Peak Storage= 234 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 66.1 cfs

3.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 9.00'
Length= 355.0' Slope= 0.0479 '/'
Inlet Invert= 307.00', Outlet Invert= 290.00'

‡

Summary for Reach 22R: BMP outflow

Inflow Area = 4.897 ac, 17.66% Impervious, Inflow Depth = 3.46" for 25-YR event
Inflow = 11.0 cfs @ 12.29 hrs, Volume= 1.412 af
Outflow = 11.0 cfs @ 12.30 hrs, Volume= 1.412 af, Atten= 0%, Lag= 0.5 min

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.89 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.18 fps, Avg. Travel Time= 3.0 min

Peak Storage= 471 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 0.50' Flow Area= 3.3 sf, Capacity= 18.9 cfs

5.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 8.00'
Length= 210.0' Slope= 0.0643 '/'
Inlet Invert= 304.50', Outlet Invert= 291.00'

‡

Summary for Reach 23R: Roadside ditch

Inflow Area = 0.077 ac, 31.38% Impervious, Inflow Depth = 3.60" for 25-YR event
Inflow = 0.3 cfs @ 12.09 hrs, Volume= 0.023 af
Outflow = 0.3 cfs @ 12.14 hrs, Volume= 0.023 af, Atten= 17%, Lag= 3.3 min

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.10 fps, Min. Travel Time= 6.5 min
Avg. Velocity = 0.60 fps, Avg. Travel Time= 22.7 min

Peak Storage= 104 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.50' Flow Area= 1.8 sf, Capacity= 12.6 cfs

2.00' x 0.50' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 '/' Top Width= 5.00'
Length= 820.0' Slope= 0.0622 '/'
Inlet Invert= 365.00', Outlet Invert= 314.00'

‡

Summary for Reach 40R: Woodland flow

Inflow Area = 11.176 ac, 5.21% Impervious, Inflow Depth = 2.87" for 25-YR event
Inflow = 18.2 cfs @ 12.46 hrs, Volume= 2.673 af
Outflow = 18.1 cfs @ 12.48 hrs, Volume= 2.673 af, Atten= 1%, Lag= 1.2 min

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.95 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 0.43 fps, Avg. Travel Time= 12.3 min

Peak Storage= 2,923 cf @ 12.48 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 0.50' Flow Area= 12.5 sf, Capacity= 28.3 cfs

20.00' x 0.50' deep channel, n= 0.070 Sluggish weedy reaches w/pools
Side Slope Z-value= 10.0 '/' Top Width= 30.00'
Length= 315.0' Slope= 0.0365 '/'
Inlet Invert= 343.50', Outlet Invert= 332.00'

‡

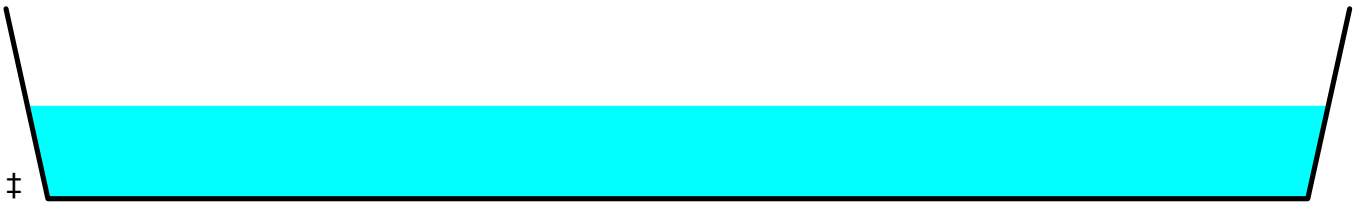
Summary for Reach 41R: Flow through wetland

Inflow Area = 11.176 ac, 5.21% Impervious, Inflow Depth = 2.87" for 25-YR event
Inflow = 18.1 cfs @ 12.48 hrs, Volume= 2.673 af
Outflow = 17.7 cfs @ 12.55 hrs, Volume= 2.673 af, Atten= 2%, Lag= 4.4 min

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.47 fps, Min. Travel Time= 5.3 min
Avg. Velocity = 0.09 fps, Avg. Travel Time= 27.8 min

Peak Storage= 5,600 cf @ 12.55 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 0.50' Flow Area= 77.5 sf, Capacity= 58.6 cfs

150.00' x 0.50' deep channel, n= 0.070 Sluggish weedy reaches w/pools
Side Slope Z-value= 10.0 '/' Top Width= 160.00'
Length= 150.0' Slope= 0.0033 '/'
Inlet Invert= 332.00', Outlet Invert= 331.50'



Summary for Reach 42R: Woodland flow

Inflow Area = 1.083 ac, 1.10% Impervious, Inflow Depth = 2.65" for 25-YR event
Inflow = 2.6 cfs @ 12.19 hrs, Volume= 0.239 af
Outflow = 2.6 cfs @ 12.22 hrs, Volume= 0.239 af, Atten= 2%, Lag= 1.5 min

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.05 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 0.57 fps, Avg. Travel Time= 7.7 min

Peak Storage= 331 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 0.25' Flow Area= 3.1 sf, Capacity= 10.3 cfs

10.00' x 0.25' deep channel, n= 0.040 Mountain streams
Side Slope Z-value= 10.0 '/' Top Width= 15.00'
Length= 265.0' Slope= 0.0642 '/'
Inlet Invert= 350.00', Outlet Invert= 333.00'

Summary for Reach 43R: Flow through wetland

Inflow Area = 1.083 ac, 1.10% Impervious, Inflow Depth = 2.65" for 25-YR event
Inflow = 2.6 cfs @ 12.22 hrs, Volume= 0.239 af
Outflow = 1.2 cfs @ 12.56 hrs, Volume= 0.239 af, Atten= 54%, Lag= 20.4 min

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.14 fps, Min. Travel Time= 44.1 min
Avg. Velocity = 0.03 fps, Avg. Travel Time= 186.8 min

Peak Storage= 3,104 cf @ 12.56 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 0.50' Flow Area= 52.5 sf, Capacity= 24.7 cfs

100.00' x 0.50' deep channel, n= 0.070 Sluggish weedy reaches w/pools
Side Slope Z-value= 10.0 '/' Top Width= 110.00'
Length= 380.0' Slope= 0.0013 '/'
Inlet Invert= 332.00', Outlet Invert= 331.50'

‡

Summary for Reach 44R: Roadside ditch

Inflow Area = 2.402 ac, 8.60% Impervious, Inflow Depth = 2.92" for 25-YR event
Inflow = 6.4 cfs @ 12.19 hrs, Volume= 0.585 af
Outflow = 6.4 cfs @ 12.21 hrs, Volume= 0.585 af, Atten= 1%, Lag= 1.2 min

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.93 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 4.9 min

Peak Storage= 640 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 29.6 cfs

2.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 8.00'
Length= 395.0' Slope= 0.0152 '/'
Inlet Invert= 357.00', Outlet Invert= 351.00'

‡

Summary for Reach 45R: Roadside ditch

Inflow Area = 0.348 ac, 0.00% Impervious, Inflow Depth = 2.65" for 25-YR event
Inflow = 0.9 cfs @ 12.16 hrs, Volume= 0.077 af
Outflow = 0.9 cfs @ 12.16 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.57 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.15 fps, Avg. Travel Time= 2.0 min

Peak Storage= 35 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 61.4 cfs

2.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 8.00'
Length= 138.0' Slope= 0.0652 '/'
Inlet Invert= 361.00', Outlet Invert= 352.00'

‡

Summary for Pond 20P: UDSF-1

Inflow Area = 4.897 ac, 17.66% Impervious, Inflow Depth = 3.46" for 25-YR event
Inflow = 16.9 cfs @ 12.15 hrs, Volume= 1.412 af
Outflow = 11.0 cfs @ 12.29 hrs, Volume= 1.412 af, Atten= 35%, Lag= 8.9 min
Primary = 8.1 cfs @ 12.29 hrs, Volume= 1.369 af
Secondary = 2.8 cfs @ 12.29 hrs, Volume= 0.043 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Peak Elev= 311.43' @ 12.29 hrs Surf.Area= 5,382 sf Storage= 14,067 cf

Plug-Flow detention time= 80.3 min calculated for 1.412 af (100% of inflow)
Center-of-Mass det. time= 80.3 min (904.2 - 823.9)

Volume	Invert	Avail.Storage	Storage Description
#1	308.00'	17,244 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
308.00	2,916	0	0
309.00	3,565	3,241	3,241
309.50	3,910	1,869	5,109
310.00	4,270	2,045	7,154
311.00	5,033	4,652	11,806
311.50	5,435	2,617	14,423
312.00	5,851	2,822	17,244

Device	Routing	Invert	Outlet Devices
#1	Primary	305.17'	**12.0" Round Culvert** L= 65.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 305.17' / 304.50' S= 0.0102 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	305.67'	**1.4" Vert. Header Pipe Orifice** C= 0.600
#3	Device 1	309.00'	**18.0" W x 8.0" H Vert. OCS Orifice** C= 0.600
#4	Device 1	311.00'	**2.5" x 2.5" Horiz. OCS Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	311.20'	**10.0' long x 10.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=8.1 cfs @ 12.29 hrs HW=311.43' (Free Discharge)
└**1=Culvert** (Barrel Controls 8.1 cfs @ 10.36 fps)
  ├**2=Header Pipe Orifice** (Passes < 0.1 cfs potential flow)
  ├**3=OCS Orifice** (Passes < 7.0 cfs potential flow)
  └**4=OCS Grate** (Passes < 5.0 cfs potential flow)

Secondary OutFlow Max=2.8 cfs @ 12.29 hrs HW=311.43' (Free Discharge)
└**5=Emergency Spillway** (Weir Controls 2.8 cfs @ 1.21 fps)

Summary for Pond 21P: 24" Culvert

Inflow Area = 0.893 ac, 3.61% Impervious, Inflow Depth = 3.11" for 25-YR event
Inflow = 2.9 cfs @ 12.14 hrs, Volume= 0.232 af
Outflow = 2.9 cfs @ 12.14 hrs, Volume= 0.232 af, Atten= 0%, Lag= 0.0 min
Primary = 2.9 cfs @ 12.14 hrs, Volume= 0.232 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Peak Elev= 308.81' @ 12.14 hrs
Flood Elev= 311.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	308.00'	**24.0" Round Culvert** L= 57.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 308.00' / 307.40' S= 0.0105 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.9 cfs @ 12.14 hrs HW=308.81' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.9 cfs @ 2.42 fps)

Summary for Pond 22P: 24" Culvert

Inflow Area = 3.248 ac, 15.30% Impervious, Inflow Depth = 3.42" for 25-YR event
Inflow = 11.0 cfs @ 12.16 hrs, Volume= 0.925 af
Outflow = 11.0 cfs @ 12.16 hrs, Volume= 0.925 af, Atten= 0%, Lag= 0.0 min
Primary = 11.0 cfs @ 12.16 hrs, Volume= 0.925 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Peak Elev= 312.84' @ 12.16 hrs
Flood Elev= 315.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	311.00'	**24.0" Round Culvert** L= 56.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 311.00' / 310.50' S= 0.0089 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=11.0 cfs @ 12.16 hrs HW=312.84' (Free Discharge)
1=Culvert (Inlet Controls 11.0 cfs @ 3.64 fps)

Summary for Pond 23P: 12" Culvert

Inflow Area = 0.077 ac, 31.38% Impervious, Inflow Depth = 3.60" for 25-YR event
Inflow = 0.3 cfs @ 12.09 hrs, Volume= 0.023 af
Outflow = 0.3 cfs @ 12.09 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min
Primary = 0.3 cfs @ 12.09 hrs, Volume= 0.023 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Peak Elev= 366.32' @ 12.09 hrs
Flood Elev= 368.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	366.00'	**12.0" Round Culvert** L= 58.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 366.00' / 365.50' S= 0.0086 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.3 cfs @ 12.09 hrs HW=366.32' (Free Discharge)
1=Culvert (Inlet Controls 0.3 cfs @ 1.51 fps)

Summary for Pond 40P: UDSF-2

Inflow Area = 3.975 ac, 14.64% Impervious, Inflow Depth = 3.11" for 25-YR event
Inflow = 10.9 cfs @ 12.17 hrs, Volume= 1.030 af
Outflow = 6.4 cfs @ 12.42 hrs, Volume= 1.030 af, Atten= 42%, Lag= 14.6 min
Primary = 6.4 cfs @ 12.42 hrs, Volume= 1.030 af
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Peak Elev= 350.29' @ 12.42 hrs Surf.Area= 4,525 sf Storage= 11,092 cf

Plug-Flow detention time= 88.9 min calculated for 1.029 af (100% of inflow)
Center-of-Mass det. time= 89.0 min (923.3 - 834.3)

Volume	Invert	Avail.Storage	Storage Description
#1	347.00'	14,521 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
347.00	2,327	0	0
348.00	2,930	2,629	2,629
348.50	3,252	1,546	4,174
349.00	3,589	1,710	5,884
350.00	4,304	3,947	9,831
351.00	5,076	4,690	14,521

Device	Routing	Invert	Outlet Devices
#1	Primary	344.17'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 344.17' / 343.75' S= 0.0105 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	344.67'	**1.2" Vert. Header Pipe Orifice** C= 0.600
#3	Device 1	348.00'	**15.0" W x 8.0" H Vert. OCS Orifice** C= 0.600
#4	Device 1	350.25'	**2.5" x 2.5" Horiz. OCS Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads
#5	Secondary	350.30'	**10.0' long x 10.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=6.3 cfs @ 12.42 hrs HW=350.29' (Free Discharge)
└**1=Culvert** (Passes 6.3 cfs of 8.9 cfs potential flow)
  ├**2=Header Pipe Orifice** (Orifice Controls 0.1 cfs @ 11.36 fps)
  ├**3=OCS Orifice** (Orifice Controls 5.6 cfs @ 6.72 fps)
  └**4=OCS Grate** (Weir Controls 0.7 cfs @ 0.62 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=347.00' (Free Discharge)
└**5=Emergency Spillway** (Controls 0.0 cfs)

Summary for Pond 41P: 30" Culvert

Inflow Area = 7.201 ac, 0.00% Impervious, Inflow Depth = 2.74" for 25-YR event
Inflow = 12.1 cfs @ 12.49 hrs, Volume= 1.643 af
Outflow = 12.1 cfs @ 12.49 hrs, Volume= 1.643 af, Atten= 0%, Lag= 0.0 min
Primary = 12.1 cfs @ 12.49 hrs, Volume= 1.643 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Peak Elev= 349.17' @ 12.49 hrs
Flood Elev= 354.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	347.50'	**30.0" Round Culvert** L= 105.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.50' / 346.00' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=12.1 cfs @ 12.49 hrs HW=349.17' (Free Discharge)
└**1=Culvert** (Inlet Controls 12.1 cfs @ 3.48 fps)

Summary for Pond 42P: 15" Culvert

Inflow Area = 1.083 ac, 1.10% Impervious, Inflow Depth = 2.65" for 25-YR event
Inflow = 2.6 cfs @ 12.19 hrs, Volume= 0.239 af
Outflow = 2.6 cfs @ 12.19 hrs, Volume= 0.239 af, Atten= 0%, Lag= 0.0 min
Primary = 2.6 cfs @ 12.19 hrs, Volume= 0.239 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Peak Elev= 355.45' @ 12.19 hrs
Flood Elev= 357.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	354.50'	**15.0" Round Culvert** L= 53.4' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 354.50' / 352.30' S= 0.0412 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.6 cfs @ 12.19 hrs HW=355.45' (Free Discharge)
1=Culvert (Inlet Controls 2.6 cfs @ 2.62 fps)

Summary for Pond 43P: 24" Culvert

Inflow Area = 3.351 ac, 12.69% Impervious, Inflow Depth = 3.03" for 25-YR event
Inflow = 9.3 cfs @ 12.19 hrs, Volume= 0.847 af
Outflow = 9.3 cfs @ 12.19 hrs, Volume= 0.847 af, Atten= 0%, Lag= 0.0 min
Primary = 9.3 cfs @ 12.19 hrs, Volume= 0.847 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Peak Elev= 351.59' @ 12.19 hrs
Flood Elev= 353.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	350.20'	**24.0" Round Culvert** L= 56.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 350.20' / 349.50' S= 0.0124 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=9.2 cfs @ 12.19 hrs HW=351.59' (Free Discharge)
1=Culvert (Barrel Controls 9.2 cfs @ 5.57 fps)

Summary for Link POA-1: Adjacent House Lot

Inflow Area = 3.740 ac, 0.00% Impervious, Inflow Depth = 3.21" for 25-YR event
Inflow = 10.6 cfs @ 12.21 hrs, Volume= 1.000 af
Primary = 10.6 cfs @ 12.21 hrs, Volume= 1.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link POA-2: Roadside Ditch

Inflow Area = 8.340 ac, 11.11% Impervious, Inflow Depth = 3.20" for 25-YR event
Inflow = 17.2 cfs @ 12.27 hrs, Volume= 2.226 af
Primary = 17.2 cfs @ 12.27 hrs, Volume= 2.226 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link POA-3: South Wetlands

Inflow Area = 5.157 ac, 3.21% Impervious, Inflow Depth = 2.83" for 25-YR event
Inflow = 13.5 cfs @ 12.19 hrs, Volume= 1.216 af
Primary = 13.5 cfs @ 12.19 hrs, Volume= 1.216 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link POA-4: Southeast Wetlands

Inflow Area = 23.037 ac, 3.05% Impervious, Inflow Depth = 2.80" for 25-YR event
Inflow = 37.3 cfs @ 12.50 hrs, Volume= 5.371 af
Primary = 37.3 cfs @ 12.50 hrs, Volume= 5.371 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Summary for Link POA-5: Northeast Wetlands

Inflow Area = 1.200 ac, 0.00% Impervious, Inflow Depth = 2.65" for 25-YR event
Inflow = 2.3 cfs @ 12.35 hrs, Volume= 0.265 af
Primary = 2.3 cfs @ 12.35 hrs, Volume= 0.265 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 10.0S: Woodlands to Runoff Area=162,904 sf 0.00% Impervious Runoff Depth=1.08"
Flow Length=580' Tc=15.0 min CN=76 Runoff=3.4 cfs 0.338 af

Subcatchment 20.0S: Treatment Area 1 Runoff Area=26,540 sf 36.34% Impervious Runoff Depth=1.53"
Flow Length=975' Tc=10.6 min CN=83 Runoff=0.9 cfs 0.078 af

Subcatchment 20.1S: Treatment Area 1 Runoff Area=31,943 sf 28.11% Impervious Runoff Depth=1.39"
Flow Length=875' Tc=8.6 min CN=81 Runoff=1.1 cfs 0.085 af

Subcatchment 20.2S: Treatment Area 1 Runoff Area=3,333 sf 31.38% Impervious Runoff Depth=1.33"
Tc=6.0 min CN=80 Runoff=0.1 cfs 0.008 af

Subcatchment 20.3S: Northwest House Runoff Area=114,936 sf 10.44% Impervious Runoff Depth=1.14"
Flow Length=225' Tc=10.7 min CN=77 Runoff=2.9 cfs 0.251 af

Subcatchment 20.4S: Southwest House Runoff Area=36,581 sf 16.40% Impervious Runoff Depth=1.20"
Flow Length=350' Tc=9.0 min CN=78 Runoff=1.0 cfs 0.084 af

Subcatchment 20.5S: Southwest Corner Runoff Area=111,066 sf 1.17% Impervious Runoff Depth=0.82"
Flow Length=460' Tc=8.4 min CN=71 Runoff=2.0 cfs 0.174 af

Subcatchment 20.6S: Northwest Corner Runoff Area=38,906 sf 3.61% Impervious Runoff Depth=1.03"
Flow Length=300' Tc=9.7 min CN=75 Runoff=0.9 cfs 0.076 af

Subcatchment 30.0S: Central Area Runoff Area=224,629 sf 3.21% Impervious Runoff Depth=0.87"
Flow Length=435' Tc=13.2 min CN=72 Runoff=3.8 cfs 0.373 af

Subcatchment 40.0S: Treatment Area 2 Runoff Area=26,154 sf 36.41% Impervious Runoff Depth=1.39"
Flow Length=485' Slope=0.0100 '/' Tc=11.4 min CN=81 Runoff=0.8 cfs 0.070 af

Subcatchment 40.1S: Treatment Area 2 Runoff Area=27,219 sf 25.09% Impervious Runoff Depth=1.26"
Flow Length=365' Tc=6.0 min CN=79 Runoff=0.9 cfs 0.066 af

Subcatchment 40.2S: Small area draining to Runoff Area=15,145 sf 0.00% Impervious Runoff Depth=0.77"
Flow Length=220' Tc=11.0 min CN=70 Runoff=0.2 cfs 0.022 af

Subcatchment 40.3S: Woodlands draining Runoff Area=313,659 sf 0.00% Impervious Runoff Depth=0.82"
Flow Length=1,025' Tc=34.5 min CN=71 Runoff=3.3 cfs 0.491 af

Subcatchment 40.4S: Northeast House Lots Runoff Area=104,649 sf 8.60% Impervious Runoff Depth=0.92"
Flow Length=330' Tc=13.6 min CN=73 Runoff=1.9 cfs 0.184 af

Subcatchment 40.5S: Woodlands draining Runoff Area=47,186 sf 1.10% Impervious Runoff Depth=0.77"
Flow Length=400' Tc=13.7 min CN=70 Runoff=0.7 cfs 0.070 af

Subcatchment 40.6S: Southeast Corner Runoff Area=469,486 sf 1.02% Impervious Runoff Depth=0.82"
Flow Length=710' Tc=31.8 min CN=71 Runoff=5.1 cfs 0.735 af

Subcatchment 50.0S: Northeast Corner Runoff Area=52,286 sf 0.00% Impervious Runoff Depth=0.77"
Flow Length=405' Tc=23.7 min CN=70 Runoff=0.6 cfs 0.077 af

Reach 20R: Roadside ditch Avg. Flow Depth=0.21' Max Vel=5.10 fps Inflow=2.9 cfs 0.251 af
n=0.025 L=515.0' S=0.0796 '/' Capacity=14.3 cfs Outflow=2.9 cfs 0.251 af

Reach 21R: Cape Road ditch Avg. Flow Depth=0.09' Max Vel=2.87 fps Inflow=0.9 cfs 0.076 af
n=0.022 L=355.0' S=0.0479 '/' Capacity=66.1 cfs Outflow=0.9 cfs 0.076 af

Reach 22R: BMP outflow Avg. Flow Depth=0.18' Max Vel=3.16 fps Inflow=3.1 cfs 0.506 af
n=0.035 L=210.0' S=0.0643 '/' Capacity=18.9 cfs Outflow=3.1 cfs 0.506 af

Reach 23R: Roadside ditch Avg. Flow Depth=0.03' Max Vel=1.38 fps Inflow=0.1 cfs 0.008 af
n=0.025 L=820.0' S=0.0622 '/' Capacity=12.6 cfs Outflow=0.1 cfs 0.008 af

Reach 40R: Woodland flow Avg. Flow Depth=0.18' Max Vel=1.24 fps Inflow=5.0 cfs 0.833 af
n=0.070 L=315.0' S=0.0365 '/' Capacity=28.3 cfs Outflow=4.9 cfs 0.833 af

Reach 41R: Flow through wetland Avg. Flow Depth=0.11' Max Vel=0.28 fps Inflow=4.9 cfs 0.833 af
n=0.070 L=150.0' S=0.0033 '/' Capacity=58.6 cfs Outflow=4.6 cfs 0.833 af

Reach 42R: Woodland flow Avg. Flow Depth=0.05' Max Vel=1.23 fps Inflow=0.7 cfs 0.070 af
n=0.040 L=265.0' S=0.0642 '/' Capacity=10.3 cfs Outflow=0.6 cfs 0.070 af

Reach 43R: Flow through wetland Avg. Flow Depth=0.03' Max Vel=0.07 fps Inflow=0.6 cfs 0.070 af
n=0.070 L=380.0' S=0.0013 '/' Capacity=24.7 cfs Outflow=0.2 cfs 0.070 af

Reach 44R: Roadside ditch Avg. Flow Depth=0.24' Max Vel=2.74 fps Inflow=1.9 cfs 0.184 af
n=0.022 L=395.0' S=0.0152 '/' Capacity=29.6 cfs Outflow=1.8 cfs 0.184 af

Reach 45R: Roadside ditch Avg. Flow Depth=0.05' Max Vel=2.20 fps Inflow=0.2 cfs 0.022 af
n=0.022 L=138.0' S=0.0652 '/' Capacity=61.4 cfs Outflow=0.2 cfs 0.022 af

Pond 20P: UDSF-1 Peak Elev=309.74' Storage=6,060 cf Inflow=5.9 cfs 0.506 af
Primary=3.1 cfs 0.506 af Secondary=0.0 cfs 0.000 af Outflow=3.1 cfs 0.506 af

Pond 21P: 24" Culvert Peak Elev=308.44' Inflow=0.9 cfs 0.076 af
24.0" Round Culvert n=0.013 L=57.0' S=0.0105 '/' Outflow=0.9 cfs 0.076 af

Pond 22P: 24" Culvert Peak Elev=311.94' Inflow=3.8 cfs 0.328 af
24.0" Round Culvert n=0.013 L=56.0' S=0.0089 '/' Outflow=3.8 cfs 0.328 af

Pond 23P: 12" Culvert Peak Elev=366.19' Inflow=0.1 cfs 0.008 af
12.0" Round Culvert n=0.013 L=58.0' S=0.0086 '/' Outflow=0.1 cfs 0.008 af

Pond 40P: UDSF-2 Peak Elev=348.55' Storage=4,329 cf Inflow=3.3 cfs 0.342 af
Primary=1.7 cfs 0.342 af Secondary=0.0 cfs 0.000 af Outflow=1.7 cfs 0.342 af

Pond 41P: 30" Culvert Peak Elev=348.31' Inflow=3.3 cfs 0.491 af
30.0" Round Culvert n=0.013 L=105.0' S=0.0143 '/' Outflow=3.3 cfs 0.491 af

Pond 42P: 15" Culvert Peak Elev=354.93' Inflow=0.7 cfs 0.070 af
15.0" Round Culvert n=0.013 L=53.4' S=0.0412 '/' Outflow=0.7 cfs 0.070 af

Pond 43P: 24" Culvert Peak Elev=350.90' Inflow=2.8 cfs 0.276 af
24.0" Round Culvert n=0.013 L=56.5' S=0.0124 '/' Outflow=2.8 cfs 0.276 af

Link POA-1: Adjacent House Lot Inflow=3.4 cfs 0.338 af
Primary=3.4 cfs 0.338 af

Link POA-2: Roadside Ditch Inflow=4.7 cfs 0.756 af
Primary=4.7 cfs 0.756 af

Link POA-3: South Wetlands Inflow=3.8 cfs 0.373 af
Primary=3.8 cfs 0.373 af

Link POA-4: Southeast Wetlands Inflow=9.3 cfs 1.638 af
Primary=9.3 cfs 1.638 af

Link POA-5: Northeast Wetlands Inflow=0.6 cfs 0.077 af
Primary=0.6 cfs 0.077 af

Total Runoff Area = 41.474 ac Runoff Volume = 3.182 af Average Runoff Depth = 0.92"
95.67% Pervious = 39.678 ac 4.33% Impervious = 1.796 ac

Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 10.0S: Woodlands to Runoff Area=162,904 sf 0.00% Impervious Runoff Depth=2.21"
Flow Length=580' Tc=15.0 min CN=76 Runoff=7.3 cfs 0.689 af

Subcatchment 20.0S: Treatment Area 1 Runoff Area=26,540 sf 36.34% Impervious Runoff Depth=2.81"
Flow Length=975' Tc=10.6 min CN=83 Runoff=1.7 cfs 0.143 af

Subcatchment 20.1S: Treatment Area 1 Runoff Area=31,943 sf 28.11% Impervious Runoff Depth=2.63"
Flow Length=875' Tc=8.6 min CN=81 Runoff=2.1 cfs 0.161 af

Subcatchment 20.2S: Treatment Area 1 Runoff Area=3,333 sf 31.38% Impervious Runoff Depth=2.55"
Tc=6.0 min CN=80 Runoff=0.2 cfs 0.016 af

Subcatchment 20.3S: Northwest House Runoff Area=114,936 sf 10.44% Impervious Runoff Depth=2.29"
Flow Length=225' Tc=10.7 min CN=77 Runoff=6.0 cfs 0.504 af

Subcatchment 20.4S: Southwest House Runoff Area=36,581 sf 16.40% Impervious Runoff Depth=2.38"
Flow Length=350' Tc=9.0 min CN=78 Runoff=2.1 cfs 0.166 af

Subcatchment 20.5S: Southwest Corner Runoff Area=111,066 sf 1.17% Impervious Runoff Depth=1.82"
Flow Length=460' Tc=8.4 min CN=71 Runoff=4.9 cfs 0.387 af

Subcatchment 20.6S: Northwest Corner Runoff Area=38,906 sf 3.61% Impervious Runoff Depth=2.13"
Flow Length=300' Tc=9.7 min CN=75 Runoff=2.0 cfs 0.158 af

Subcatchment 30.0S: Central Area Runoff Area=224,629 sf 3.21% Impervious Runoff Depth=1.89"
Flow Length=435' Tc=13.2 min CN=72 Runoff=8.9 cfs 0.814 af

Subcatchment 40.0S: Treatment Area 2 Runoff Area=26,154 sf 36.41% Impervious Runoff Depth=2.63"
Flow Length=485' Slope=0.0100 '/' Tc=11.4 min CN=81 Runoff=1.6 cfs 0.132 af

Subcatchment 40.1S: Treatment Area 2 Runoff Area=27,219 sf 25.09% Impervious Runoff Depth=2.46"
Flow Length=365' Tc=6.0 min CN=79 Runoff=1.8 cfs 0.128 af

Subcatchment 40.2S: Small area draining to Runoff Area=15,145 sf 0.00% Impervious Runoff Depth=1.74"
Flow Length=220' Tc=11.0 min CN=70 Runoff=0.6 cfs 0.051 af

Subcatchment 40.3S: Woodlands draining Runoff Area=313,659 sf 0.00% Impervious Runoff Depth=1.82"
Flow Length=1,025' Tc=34.5 min CN=71 Runoff=7.9 cfs 1.092 af

Subcatchment 40.4S: Northeast House Lots Runoff Area=104,649 sf 8.60% Impervious Runoff Depth=1.97"
Flow Length=330' Tc=13.6 min CN=73 Runoff=4.3 cfs 0.395 af

Subcatchment 40.5S: Woodlands draining Runoff Area=47,186 sf 1.10% Impervious Runoff Depth=1.74"
Flow Length=400' Tc=13.7 min CN=70 Runoff=1.7 cfs 0.158 af

Subcatchment 40.6S: Southeast Corner Runoff Area=469,486 sf 1.02% Impervious Runoff Depth=1.82"
Flow Length=710' Tc=31.8 min CN=71 Runoff=12.4 cfs 1.634 af

Subcatchment 50.0S: Northeast Corner Runoff Area=52,286 sf 0.00% Impervious Runoff Depth=1.74"
Flow Length=405' Tc=23.7 min CN=70 Runoff=1.5 cfs 0.175 af

Reach 20R: Roadside ditch Avg. Flow Depth=0.32' Max Vel=6.37 fps Inflow=6.0 cfs 0.504 af
n=0.025 L=515.0' S=0.0796 '/' Capacity=14.3 cfs Outflow=6.0 cfs 0.504 af

Reach 21R: Cape Road ditch Avg. Flow Depth=0.15' Max Vel=3.78 fps Inflow=2.0 cfs 0.158 af
n=0.022 L=355.0' S=0.0479 '/' Capacity=66.1 cfs Outflow=1.9 cfs 0.158 af

Reach 22R: BMP outflow Avg. Flow Depth=0.26' Max Vel=4.00 fps Inflow=6.0 cfs 0.990 af
n=0.035 L=210.0' S=0.0643 '/' Capacity=18.9 cfs Outflow=6.0 cfs 0.990 af

Reach 23R: Roadside ditch Avg. Flow Depth=0.05' Max Vel=1.83 fps Inflow=0.2 cfs 0.016 af
n=0.025 L=820.0' S=0.0622 '/' Capacity=12.6 cfs Outflow=0.2 cfs 0.016 af

Reach 40R: Woodland flow Avg. Flow Depth=0.31' Max Vel=1.70 fps Inflow=12.2 cfs 1.797 af
n=0.070 L=315.0' S=0.0365 '/' Capacity=28.3 cfs Outflow=12.1 cfs 1.797 af

Reach 41R: Flow through wetland Avg. Flow Depth=0.19' Max Vel=0.41 fps Inflow=12.1 cfs 1.797 af
n=0.070 L=150.0' S=0.0033 '/' Capacity=58.6 cfs Outflow=11.9 cfs 1.797 af

Reach 42R: Woodland flow Avg. Flow Depth=0.09' Max Vel=1.75 fps Inflow=1.7 cfs 0.158 af
n=0.040 L=265.0' S=0.0642 '/' Capacity=10.3 cfs Outflow=1.6 cfs 0.158 af

Reach 43R: Flow through wetland Avg. Flow Depth=0.06' Max Vel=0.11 fps Inflow=1.6 cfs 0.158 af
n=0.070 L=380.0' S=0.0013 '/' Capacity=24.7 cfs Outflow=0.6 cfs 0.158 af

Reach 44R: Roadside ditch Avg. Flow Depth=0.38' Max Vel=3.50 fps Inflow=4.3 cfs 0.395 af
n=0.022 L=395.0' S=0.0152 '/' Capacity=29.6 cfs Outflow=4.2 cfs 0.395 af

Reach 45R: Roadside ditch Avg. Flow Depth=0.08' Max Vel=3.07 fps Inflow=0.6 cfs 0.051 af
n=0.022 L=138.0' S=0.0652 '/' Capacity=61.4 cfs Outflow=0.6 cfs 0.051 af

Pond 20P: UDSF-1 Peak Elev=310.85' Storage=11,062 cf Inflow=11.8 cfs 0.990 af
Primary=6.0 cfs 0.990 af Secondary=0.0 cfs 0.000 af Outflow=6.0 cfs 0.990 af

Pond 21P: 24" Culvert Peak Elev=308.66' Inflow=2.0 cfs 0.158 af
24.0" Round Culvert n=0.013 L=57.0' S=0.0105 '/' Outflow=2.0 cfs 0.158 af

Pond 22P: 24" Culvert Peak Elev=312.42' Inflow=7.7 cfs 0.647 af
24.0" Round Culvert n=0.013 L=56.0' S=0.0089 '/' Outflow=7.7 cfs 0.647 af

Pond 23P: 12" Culvert Peak Elev=366.26' Inflow=0.2 cfs 0.016 af
12.0" Round Culvert n=0.013 L=58.0' S=0.0086 '/' Outflow=0.2 cfs 0.016 af

Pond 40P: UDSF-2 Peak Elev=349.45' Storage=7,579 cf Inflow=7.4 cfs 0.705 af
Primary=4.3 cfs 0.705 af Secondary=0.0 cfs 0.000 af Outflow=4.3 cfs 0.705 af

Pond 41P: 30" Culvert Peak Elev=348.80' Inflow=7.9 cfs 1.092 af
30.0" Round Culvert n=0.013 L=105.0' S=0.0143 '/' Outflow=7.9 cfs 1.092 af

Pond 42P: 15" Culvert Peak Elev=355.22' Inflow=1.7 cfs 0.158 af
15.0" Round Culvert n=0.013 L=53.4' S=0.0412 '/' Outflow=1.7 cfs 0.158 af

Pond 43P: 24" Culvert Peak Elev=351.29' Inflow=6.2 cfs 0.577 af
24.0" Round Culvert n=0.013 L=56.5' S=0.0124 '/' Outflow=6.2 cfs 0.577 af

Link POA-1: Adjacent House Lot Inflow=7.3 cfs 0.689 af
Primary=7.3 cfs 0.689 af

Link POA-2: Roadside Ditch Inflow=11.3 cfs 1.535 af
Primary=11.3 cfs 1.535 af

Link POA-3: South Wetlands Inflow=8.9 cfs 0.814 af
Primary=8.9 cfs 0.814 af

Link POA-4: Southeast Wetlands Inflow=24.3 cfs 3.588 af
Primary=24.3 cfs 3.588 af

Link POA-5: Northeast Wetlands Inflow=1.5 cfs 0.175 af
Primary=1.5 cfs 0.175 af

Total Runoff Area = 41.474 ac Runoff Volume = 6.801 af Average Runoff Depth = 1.97"
95.67% Pervious = 39.678 ac 4.33% Impervious = 1.796 ac

Appendix 3

Inspection, Maintenance and Housekeeping Plan

INSPECTION, MAINTENANCE, AND HOUSEKEEPING PLAN

For:
Raymond Cape Road Subdivision
Raymond, 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.

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. Grassed Underdrained Soil Filter:

- The soil filter outlet structure and outlet of the soil filter should be checked periodically to ensure that flow structures are not blocked by debris. All ditches or pipes connecting soil filters in series should be checked for debris that may obstruct flow. Inspections should be conducted monthly during wet weather conditions from March to November.
- The soil filter and outlet should be inspected bi-annually for erosion, destabilization of side slopes, embankment settling and other signs of structural failure. Any signs of erosion shall be immediately repaired to assure stability and proper function.
- The soil filter will be inspected on a bi-annual basis to assure that significant sediment accumulation has not occurred in the pond outlet structure. Whenever the filter bed is inundated with sediment, the accumulated sediment shall be removed and property disposed of.

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.

Attachments:

Attachment 1 – Sample Stormwater Inspection and Maintenance Forms

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:	
Inspection Notes			
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)		
Catch Basins	Remove sediment/debris from sump (annually)		
	Remove accumulated debris from inlet grate		
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)		
Inspector shall reference the current edition of the Maine Erosion and Sediment Control Best Management Practices (BMPs) Manual for Designers and Engineers for a full list of inspection items.			
Additional Notes/Observations:			

Grass Underdrained Soil Filter

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:	

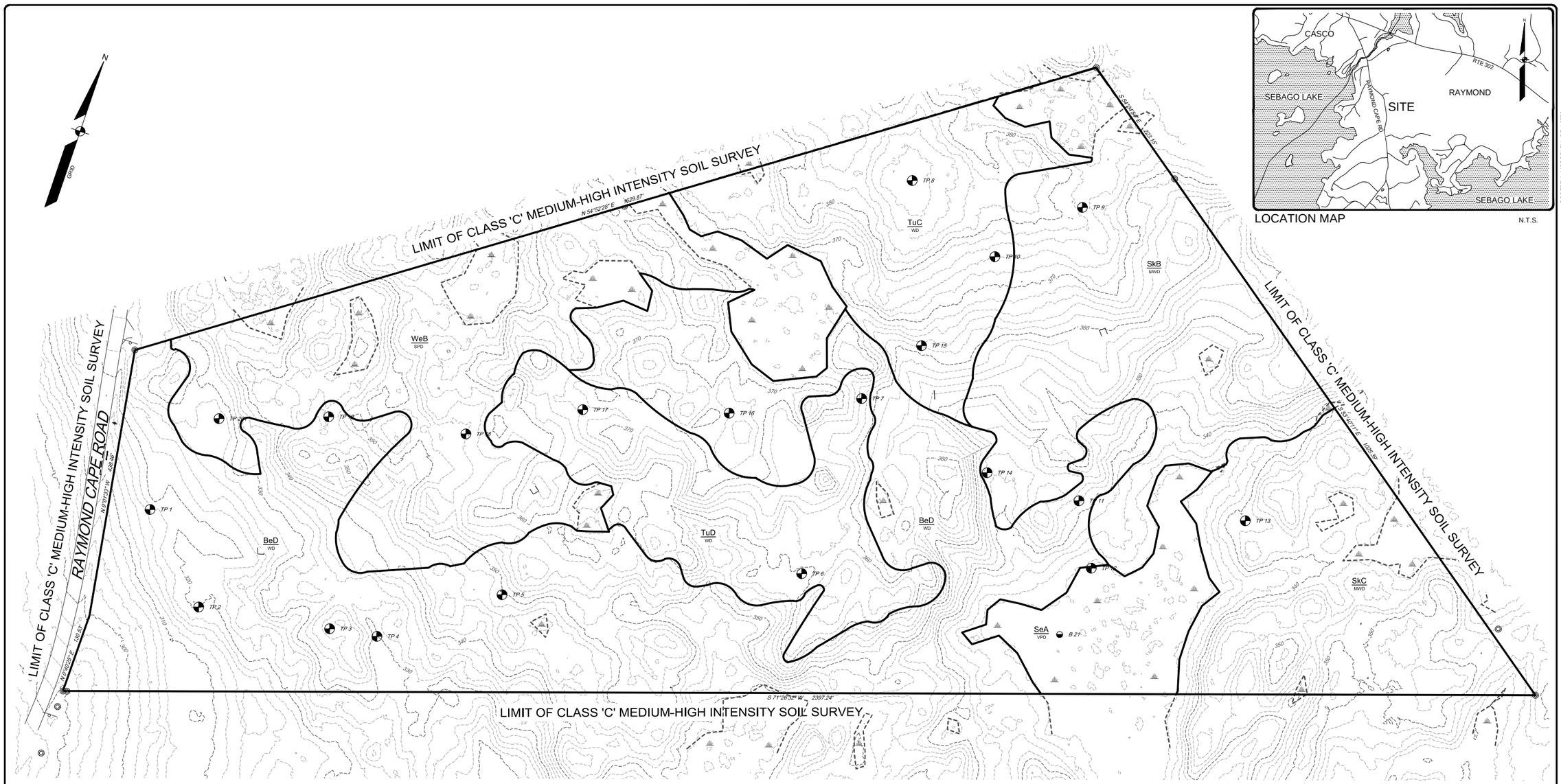
Inspection Notes			
BMP Element	**Suggested Maintenance (recm'd frequency)**	**Observations**	**Inspection Notes/Recommended Action**
Forebay/Pretreatment	Sediment/Debris Removal (Annually)		
	Inspect for bare areas or rill erosion (Annually)		
Outlet Control Structure	Sediment Depth (Annually)		
	Floatables/Debris (Annually)		
Discharge Pipe	Ground Stabilized (>1" rain, Annually)		
Emergency Spillway	Review for signs of erosion (Twice Annually)		
	Review for signs of discharge (>1" rain, twice annually)		
Embankments	Review for signs of erosion (Twice Annually)		
Filter Bed	Trim overgrown vegetation with string trimmer (annually)		
	Review basin for evidence of vehicular traffic or storage of snow within footprint (annually)		
	Confirm pond drains in 24-48 hours for water quality volume (annually)		

Inspector shall reference the current edition of the Maine Erosion and Sediment Control Best Management Practices (BMPs) Manual for Designers and Engineers for a full list of inspection items.

Additional Notes/Observations:

Appendix 4

Subsurface Investigations



LOCATION MAP N.T.S.

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

LEGEND

EXISTING	DESCRIPTION	PROPOSED
	PROPERTY LINE/R.O.W.	
	ABUTTER LINE/R.O.W.	
	EASEMENT	
	SOIL MAP UNITS	
TP 1	TEST PIT	
B-1	BORING	
	BUILDING	
	EDGE WETLAND	
	WETLANDS	
	EDGE PAVEMENT	
	EDGE GRAVEL	
	TREELINE	
120	CONTOURS	118

SOIL LEGEND

SYMBOL	SOIL SERIES	PHASE	SLOPE	HSG	DRAINAGE CLASS
BeD	BECKET	SANDY LOAM	15-25%	C	WD (WELL DRAINED)
SeA	SEBAGO	MUCKY PEAT	0-3%	D	VPD (VERY POORLY DRAINED)
SkB	SKERRY	FINE SANDY LOAM	3-8%	C	MWD (MODERATELY WELL DRAINED)
SkC	SKERRY	FINE SANDY LOAM	8-15%	C	MWD (MODERATELY WELL DRAINED)
TuC	TUNBRIDGE	FINE SANDY LOAM	8-15%	C	WD (WELL DRAINED)
TuD	TUNBRIDGE	FINE SANDY LOAM	15-25%	C	WD (WELL DRAINED)
WeB	WESTBURY	SANDY LOAM	3-8%	D	SPD (SOMEWHAT POORLY DRAINED)

NOTE

THIS CLASS 'C' MEDIUM- HIGH INTENSITY SOIL MAP CONFORMS TO THE GUIDELINES FOR MAINE CERTIFIED SOIL SCIENTISTS FOR SOIL IDENTIFICATION AND MAPPING, DATED MARCH 2009 FOR CLASS 'C' MEDIUM-HIGH INTENSITY SOIL SURVEYS. THE SOIL MAP UNITS AS DEPICTED WERE IN PART INFLUENCED BY THE INTENDED USE FOR A PROPOSED RESIDENTIAL SUBDIVISION AND THE SOILS WHICH WERE NON-LIMITING FOR ONE USE MAY BE CONSIDERED LIMITING FOR ANOTHER USE. THEREFORE, THIS CLASS 'C' MEDIUM-HIGH INTENSITY SOILS MAP MAY NOT BE ADEQUATE FOR ANOTHER USE. (REFER TO SOIL NARRATIVE REPORT DATED MARCH 11, 2022 AND SOIL PROFILE DESCRIPTIONS.)

ANNA K. BIDDLE
LICENSED SOIL SCIENTIST #639

03/11/22
DATE

ROBERT A. MCSORLEY, PE # 8558

PROGRESS PRINT

NOT FOR CONSTRUCTION
03/11/2022

REV.	BY	DATE	STATUS
A	RAM	03/11/2022	SUBMISSION TO TOWN OF RAYMOND

SEBAGO TECHNICS
WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd.
Suite 4A
South Portland, ME 04106
Tel 207-200-2100

CLASS 'C' MEDIUM-HIGH INTENSITY SOIL SURVEY
OF:
78 RAYMOND CAPE ROAD
78 RAYMOND CAPE ROAD
RAYMOND, ME 04071
FOR:
BRANDON CHASE
15 WASHINGTON COURT
NAPLES, ME 04055

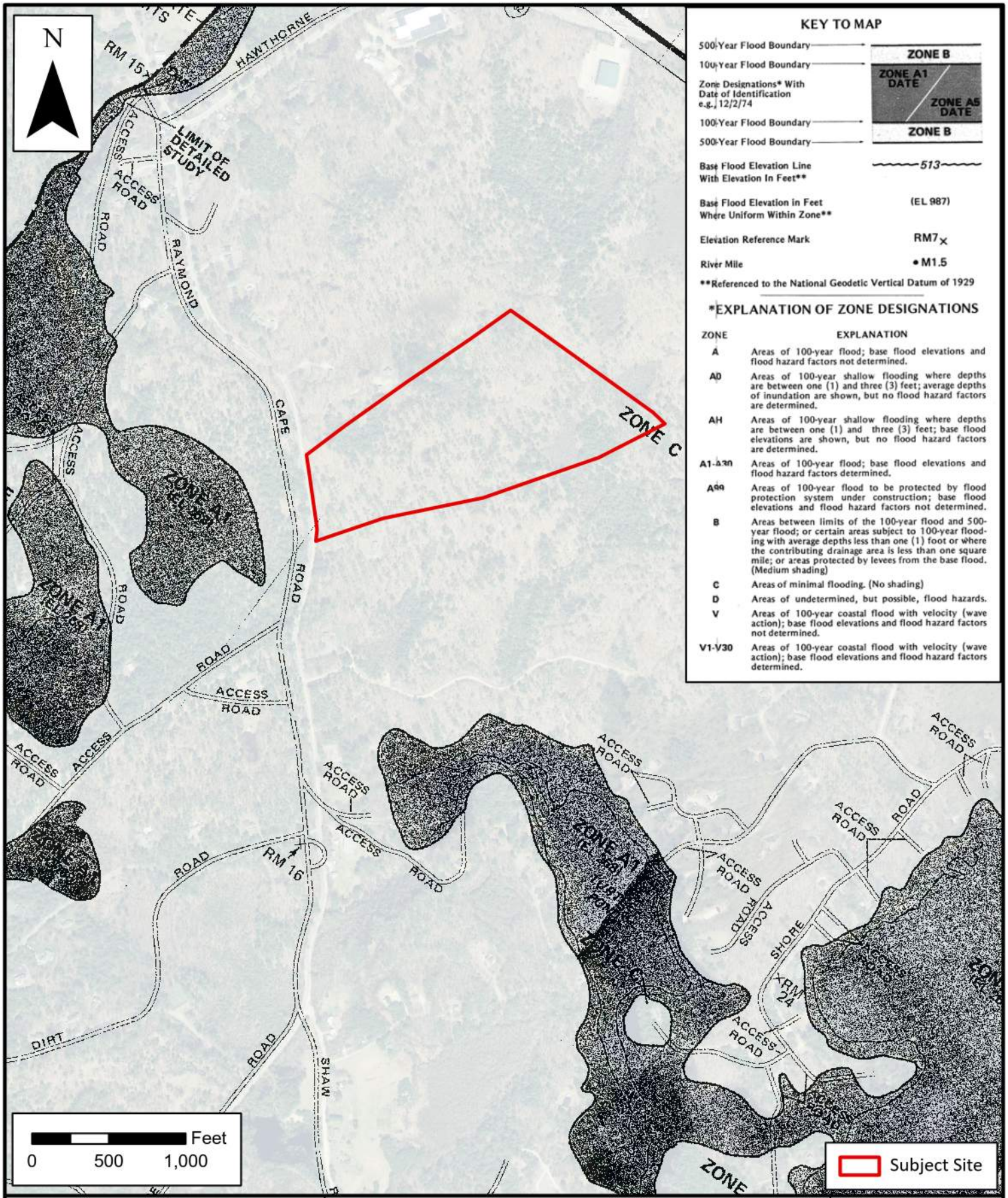
DESIGNED	AKB
DRAWN	DAB
CHECKED	AKB
DATE	11/19/21
SCALE	1" = 80'
PROJECT	21397

SHEET 1 OF 1

21397 SL.dwg TAB:Soils Map

Appendix 5

Flood Insurance Rate Map



SEBAGO TECHNICS

WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd. - Suite 4A
South Portland, ME 04106
Tel. 207-200-2100

FEMA NATIONAL FLOOD HAZARDS

RAYMOND CAPE ROAD SUBDIVISION

SCALE: 1:10,000

DATE: 3/7/2022

LOCATION:
RAYMOND CAPE ROAD
RAYMOND, MAINE 04071

INFORMATION:
2018 ORTHOREGIONAL IMAGERY
FEMA FIRM PANEL 230205 0020 B 1981

Appendix 6

Stormwater Management Plans

SOIL LEGEND

SYMBOL	SOIL SERIES	PHASE	SLOPE	HSG	DRAINAGE CLASS
BeD	BECKET	SANDY LOAM	15–25%	C	WD (WELL DRAINED)
SeA	SEBAGO	MUCKY PEAT	0–3%	D	VPD (VERY POORLY DRAINED)
SkB	SKERRY	FINE SANDY LOAM	3–8%	C	MWD (MODERATELY WELL DRAINED)
SkC	SKERRY	FINE SANDY LOAM	8–15%	C	MWD (MODERATELY WELL DRAINED)
TuC	TUNBRIDGE	FINE SANDY LOAM	8–15%	C	WD (WELL DRAINED)
TuD	TUNBRIDGE	FINE SANDY LOAM	15–25%	C	WD (WELL DRAINED)
WeB	WESTBURY	SANDY LOAM	3–8%	D	SPD (SOMEWHAT POORLY DRAINED)

NOTE

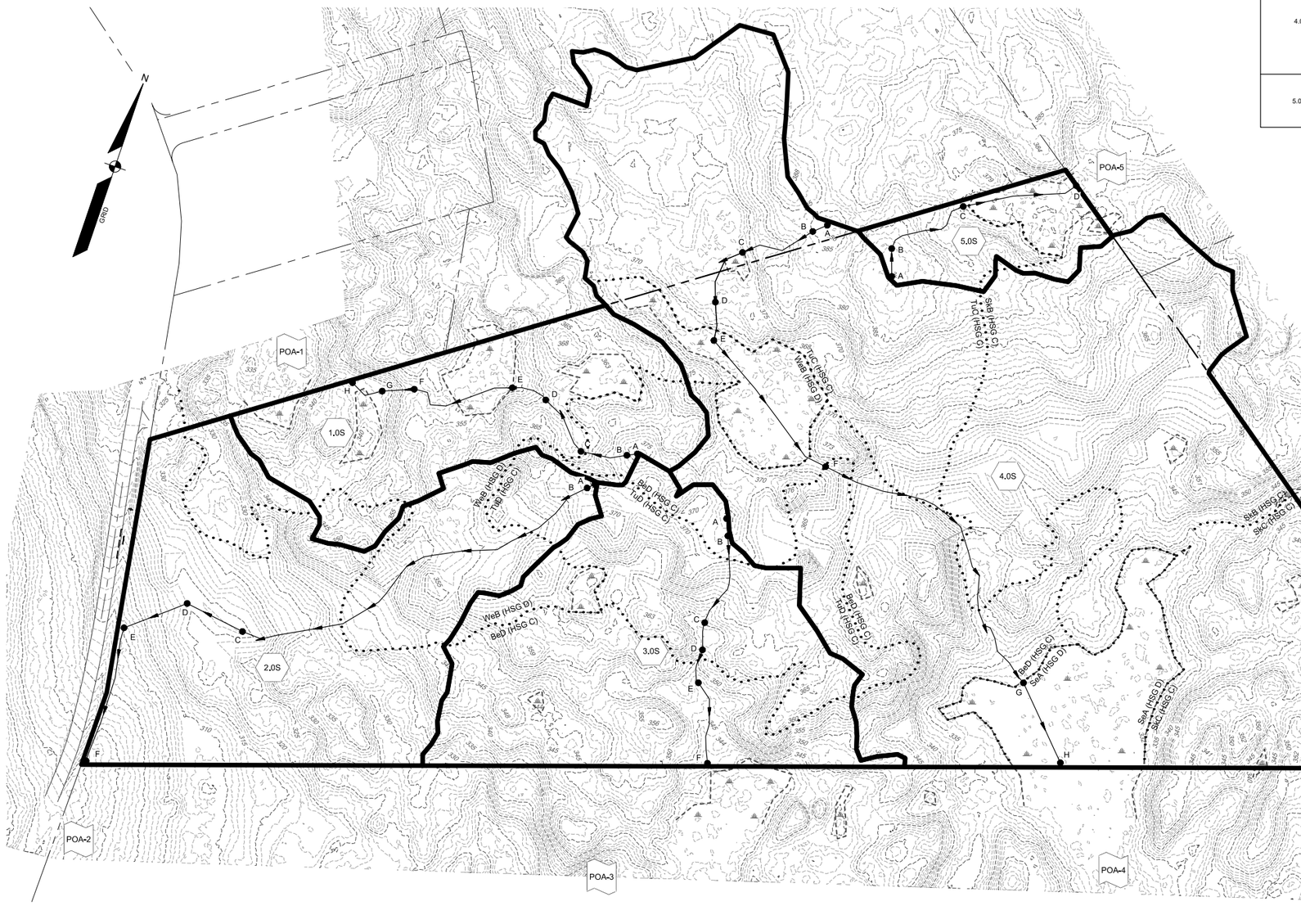
THIS CLASS 'C' MEDIUM–HIGH INTENSITY SOIL MAP CONFORMS TO THE GUIDELINES FOR MAINE CERTIFIED SOIL SCIENTISTS FOR SOIL IDENTIFICATION AND MAPPING, DATED MARCH 2009 FOR CLASS 'C' MEDIUM–HIGH INTENSITY SOIL SURVEYS. THE SOIL MAP UNITS AS DEPICTED WERE IN PART INFLUENCED BY THE INTENDED USE FOR A PROPOSED RESIDENTIAL SUBDIVISION AND THE SOILS WHICH WERE NON–LIMITING FOR ONE USE MAY BE CONSIDERED LIMITING FOR ANOTHER USE. THEREFORE, THIS CLASS 'C' MEDIUM–HIGH INTENSITY SOILS MAP MAY NOT BE ADEQUATE FOR ANOTHER USE. (REFER TO SOIL NARRATIVE REPORT DATED MARCH 11, 2022 AND SOIL PROFILE DESCRIPTIONS.)

STORMWATER PEAK DISCHARGE SUMMARY TABLE

POINT OF ANALYSIS	2-YEAR STORM		10-YEAR STORM		25-YEAR STORM	
	PRE (CFS)	POST (CFS)	PRE (CFS)	POST (CFS)	PRE (CFS)	POST (CFS)
POA-1	3.4	3.4	7.5	7.3	11.0	10.6
POA-2	4.8	4.7	11.3	11.3	17.2	17.2
POA-3	4.0	3.8	10.0	8.9	15.5	13.5
POA-4	10.1	9.3	24.3	24.3	37.3	37.3
POA-5	0.6	0.6	1.5	1.5	2.3	2.3

TIME OF CONCENTRATION PATH TABLE

SUBCATCHMENT	PATH	FLOW TYPE	LENGTH	SLOPE	TIME OF CONCENTRATION (MINUTES)
1.0S	A TO B	SHEET	20	15.00%	2.7
	B TO C	SHALLOW	80	12.11%	0.8
	C TO D	SHALLOW	110	1.80%	2.7
	D TO E	SHALLOW	65	10.00%	0.7
	E TO F	SHALLOW	190	1.05%	6.2
	F TO G	SHALLOW	55	16.40%	0.5
	G TO H	SHALLOW	60	2.10%	1.4
	TOTAL	-	-	-	**15.0**
2.0S	A TO B	SHEET	15	12.00%	2.3
	B TO C	SHALLOW	675	7.41%	8.3
	C TO D	SHALLOW	105	10.00%	3.5
	D TO E	SHALLOW	115	12.20%	1.1
	E TO F	SHALLOW	235	6.40%	2.2
	TOTAL	-	-	-	**17.4**
3.0S	A TO B	SHEET	30	7.50%	4.9
	B TO C	SHALLOW	160	11.25%	1.6
	C TO D	SHALLOW	45	1.00%	1.5
	D TO E	SHALLOW	60	11.67%	0.6
	E TO F	SHALLOW	145	3.57%	2.6
	TOTAL	-	-	-	**11.2**
4.0S	A TO B	SHEET	25	5.00%	5.0
	B TO C	SHALLOW	135	10.38%	1.4
	C TO D	SHALLOW	110	2.73%	2.2
	D TO E	SHALLOW	65	7.69%	0.8
	E TO F	SHALLOW	290	0.50%	13.7
	F TO G	SHALLOW	560	6.25%	7.5
	G TO H	SHALLOW	150	0.50%	7.1
	TOTAL	-	-	-	**37.7**
5.00S	A TO B	SHEET	50	2.00%	12.5
	B TO C	SHALLOW	155	8.40%	1.8
	C TO D	SHALLOW	200	0.50%	9.4
	TOTAL	-	-	-	**23.7**



EXISTING CONDITIONS LEGEND

- SUBCATCHMENT BOUNDARY
- TIME OF CONCENTRATION (A — B)
- REACH
- X.XS — SUBCATCHMENT LABEL
- POA-X — POINT OF ANALYSIS
- SYMBOL (HSG) / SYMBOL (HSG) — SOILS BOUNDARY

GRAPHIC SCALE
100 0 50 100 200
(IN FEET)
1 INCH = 100FT.

PROGRESS PRINT

NOT FOR CONSTRUCTION 03/11/2022

ROBERT A. MCSORLEY, PE # 8558

REV.	BY:	DATE:	STATUS
A	RAM	03/11/2022	SUBMISSION TO TOWN OF RAYMOND

SEBAGO TECHNICS
WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd.
Suite A
South Portland, ME 04106
Tel. 207-200-2100

EXISTING CONDITIONS SWM PLAN
OF:
RAYMOND CAPE ROAD SUBDIVISION
RAYMOND CAPE ROAD
RAYMOND, ME 04071
FOR:
BRANDON CHASE
15 WASHINGTON COURT
NAPLES, ME 04055

DESIGNED	JBP
DRAWN	MRS
CHECKED	RAM
DATE	11/19/21
SCALE	1" = 100'
PROJECT	21397

21397 SWP-dwg_TAB EXISTING CONDITIONS

SHEET 1 OF 2

SOIL LEGEND

SYMBOL	SOIL SERIES	PHASE	SLOPE	HSG	DRAINAGE CLASS
BeD	BECKET	SANDY LOAM	15–25%	C	WD (WELL DRAINED)
SeA	SEBAGO	MUCKY PEAT	0–3%	D	VPD (VERY POORLY DRAINED)
SkB	SKERRY	FINE SANDY LOAM	3–8%	C	MWD (MODERATELY WELL DRAINED)
SkC	SKERRY	FINE SANDY LOAM	8–15%	C	MWD (MODERATELY WELL DRAINED)
TuC	TUNBRIDGE	FINE SANDY LOAM	8–15%	C	WD (WELL DRAINED)
TuD	TUNBRIDGE	FINE SANDY LOAM	15–25%	C	WD (WELL DRAINED)
WeB	WESTBURY	SANDY LOAM	3–8%	D	SPD (SOMEWHAT POORLY DRAINED)

NOTE

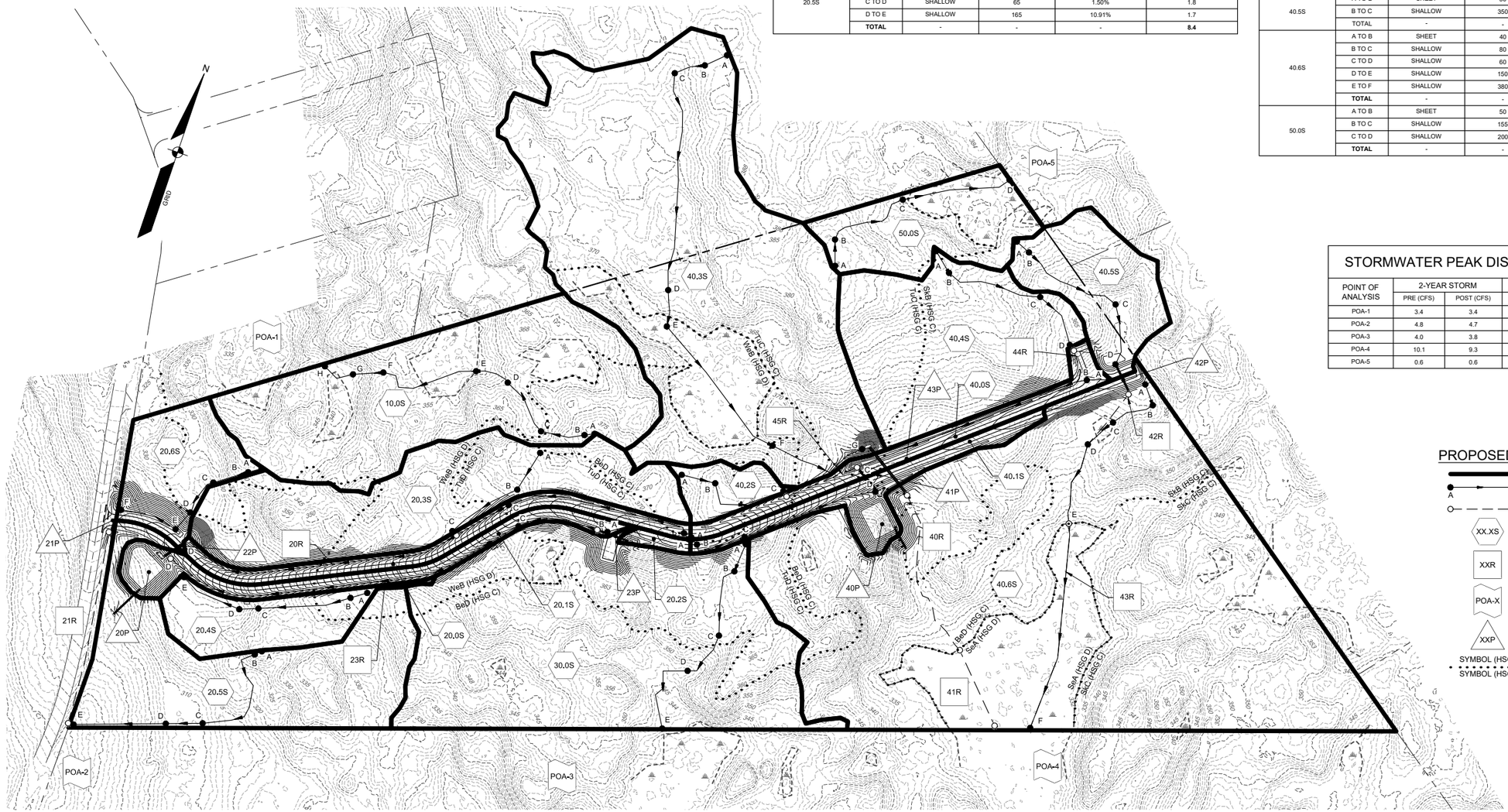
THIS CLASS 'C' MEDIUM–HIGH INTENSITY SOIL MAP CONFORMS TO THE GUIDELINES FOR MAINE CERTIFIED SOIL SCIENTISTS FOR SOIL IDENTIFICATION AND MAPPING, DATED MARCH 2009 FOR CLASS 'C' MEDIUM–HIGH INTENSITY SOIL SURVEYS. THE SOIL MAP UNITS AS DEPICTED WERE IN PART INFLUENCED BY THE INTENDED USE FOR A PROPOSED RESIDENTIAL SUBDIVISION AND THE SOILS WHICH WERE NON–LIMITING FOR ONE USE MAY BE CONSIDERED LIMITING FOR ANOTHER USE. THEREFORE, THIS CLASS 'C' MEDIUM–HIGH INTENSITY SOILS MAP MAY NOT BE ADEQUATE FOR ANOTHER USE. (REFER TO SOIL NARRATIVE REPORT DATED MARCH 11, 2022 AND SOIL PROFILE DESCRIPTIONS.)

TIME OF CONCENTRATION PATH TABLE

SUBCATCHMENT	PATH	FLOW TYPE	LENGTH	SLOPE	TIME OF CONCENTRATION (MINUTES)
10.0S	A TO B	SHEET	20	15.00%	2.7
	B TO C	SHALLOW	80	12.11%	0.8
	C TO D	SHALLOW	110	1.80%	2.7
	D TO E	SHALLOW	65	10.00%	0.7
	E TO F	SHALLOW	190	1.05%	6.2
	F TO G	SHALLOW	55	16.40%	0.5
	G TO H	SHALLOW	60	2.10%	1.4
	TOTAL	-	-	-	**15.0**
20.0S	A TO B	SHEET	15	2.00%	0.3
	B TO C	SHALLOW	335	2.50%	5.0
	C TO D	SHALLOW	625	8.00%	5.3
	TOTAL	-	-	-	**10.6**
20.1S	A TO B	SHEET	40	3.00%	0.5
	B TO C	SHALLOW	165	2.50%	2.5
	C TO D	SHALLOW	670	8.00%	5.6
	TOTAL	-	-	-	**8.6**
20.2S	DIRECT	DIRECT	-	-	6.0
	TOTAL	-	-	-	**6.0**
20.3S	A TO B	SHEET	80	5.00%	8.4
	B TO C	SHALLOW	145	4.30%	2.3
	TOTAL	-	-	-	**10.7**
20.4S	A TO B	SHEET	30	6.67%	5.1
	B TO C	SHALLOW	170	5.00%	1.8
	C TO D	SHALLOW	35	28.00%	0.2
	D TO E	SHALLOW	115	2.00%	1.9
	TOTAL	-	-	-	**9.0**
20.5S	A TO B	SHEET	15	6.67%	3.0
	B TO C	SHALLOW	215	14.40%	1.9
	C TO D	SHALLOW	65	1.50%	1.8
	D TO E	SHALLOW	165	10.91%	1.7
	TOTAL	-	-	-	**8.4**
20.6S	A TO B	SHEET	25	4.00%	5.5
	B TO C	SHALLOW	60	23.33%	0.4
	C TO D	SHALLOW	70	1.43%	2.0
	D TO E	SHALLOW	40	33.33%	0.2
	E TO F	SHALLOW	105	2.38%	1.6
	TOTAL	-	-	-	**9.7**
30.0S	A TO B	SHEET	55	10.91%	6.9
	B TO C	SHALLOW	130	3.08%	2.5
	C TO D	SHALLOW	95	12.63%	0.9
	D TO E	SHALLOW	155	3.23%	2.9
	TOTAL	-	-	-	**13.2**
40.0S	A TO B	SHEET	40	1.00%	0.8
	B TO C	SHALLOW	350	1.00%	8.3
	TOTAL	-	-	-	**9.1**
40.1S	A TO B	SHEET	15	2.00%	0.3
	B TO C	SHALLOW	100	4.00%	1.2
	C TO D	SHALLOW	250	7.00%	2.2
	DIRECT	DIRECT	-	-	2.3
	TOTAL	-	-	-	**6.0**
40.2S	A TO B	SHEET	60	10.00%	7.6
	B TO C	SHALLOW	160	2.50%	3.4
	TOTAL	-	-	-	**11.0**
40.3S	A TO B	SHEET	50	3.00%	10.7
	B TO C	SHALLOW	55	10.00%	0.6
	C TO D	SHALLOW	400	3.50%	7.1
	D TO E	SHALLOW	65	10.00%	0.7
	E TO F	SHALLOW	290	0.50%	13.7
	F TO G	SHALLOW	165	10.00%	1.7
	TOTAL	-	-	-	**34.5**
40.4S	A TO B	SHEET	45	3.00%	9.8
	B TO C	SHALLOW	175	7.14%	2.2
	C TO D	SHALLOW	110	5.00%	1.6
	TOTAL	-	-	-	**13.6**
40.5S	A TO B	SHEET	50	4.00%	9.5
	B TO C	SHALLOW	350	7.71%	4.2
	TOTAL	-	-	-	**13.7**
40.6S	A TO B	SHEET	40	2.50%	9.6
	B TO C	SHALLOW	80	6.90%	1.0
	C TO D	SHALLOW	60	1.67%	1.5
	D TO E	SHALLOW	150	7.33%	1.8
	E TO F	SHALLOW	380	0.50%	17.9
	TOTAL	-	-	-	**31.8**
50.0S	A TO B	SHEET	50	2.00%	12.5
	B TO C	SHALLOW	155	8.40%	1.8
	C TO D	SHALLOW	200	0.50%	9.4
	TOTAL	-	-	-	**23.7**

STORMWATER PEAK DISCHARGE SUMMARY TABLE

POINT OF ANALYSIS	2-YEAR STORM		10-YEAR STORM		25-YEAR STORM	
	PRE (CFS)	POST (CFS)	PRE (CFS)	POST (CFS)	PRE (CFS)	POST (CFS)
POA-1	3.4	3.4	7.5	7.3	11.0	10.6
POA-2	4.8	4.7	11.3	11.3	17.2	17.2
POA-3	4.0	3.8	10.0	8.9	15.5	13.5
POA-4	10.1	9.3	24.3	24.3	37.3	37.3
POA-5	0.6	0.6	1.5	1.5	2.3	2.3



PROPOSED CONDITIONS LEGEND

- SUBCATCHMENT BOUNDARY
- A — B : TIME OF CONCENTRATION
- REACH
- XX.XS : SUBCATCHMENT LABEL
- XXR : REACH
- POA-X : POINT OF ANALYSIS
- XXP : STORMWATER TREATMENT/DETENTION POND
- SYMBOL (HSG) / SYMBOL (HSG) : SOILS BOUNDARY

GRAPHIC SCALE
100 0 50 100 200
(IN FEET)
1 INCH = 100FT.

PROGRESS PRINT

NOT FOR CONSTRUCTION 03/11/2022

ROBERT A. MCSORLEY, PE # 8558

REV	BY	DATE	STATUS
A	RAM	03/11/2022	SUBMISSION TO TOWN OF RAYMOND

SEBAGO TECHNICS
WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd.
Suite 4A
South Portland, ME 04106
Tel: 207-200-2100

PROPOSED CONDITIONS SWM PLAN
OF:
RAYMOND CAPE ROAD SUBDIVISION
RAYMOND CAPE ROAD
RAYMOND, ME 04071
FOR:
BRANDON CHASE
15 WASHINGTON COURT
NAPLES, ME 04055

DESIGNED	JBP
DRAWN	MRS
CHECKED	RAM
DATE	11/19/21
SCALE	1" = 100'
PROJECT	21397

21397 SWP dwg TAB PROPOSED CONDITIONS

SHEET 2 OF 2

Exhibit 6

Hydrogeologic Assessment

EXHIBIT 6: HYDROGEOLIC ASSESSMENT

Based upon the size of the proposed lots, locations for proposed systems the fact that the SSWDS will be individual systems and not a community disposal, the resulting nitrate plumes from the SSWDS are not expected to extend beyond the boundary of the project. A hydrogeolic assessment will be provided to the Town as part of the Final Subdivision review documentation.

Exhibit 7

Traffic Memorandum

EXHIBIT 7: TRAFFIC MEMORANDUM

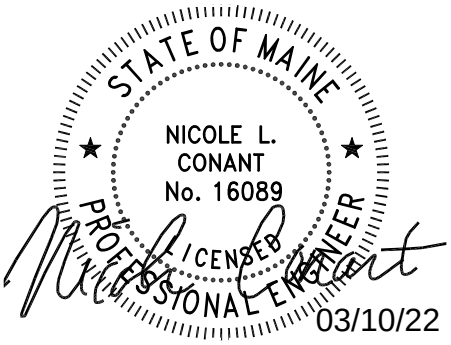
Please the attached Traffic Memorandum dated March 10, 2022 prepared by Sebago Technics, the project will not create trip ends that require a MDOT Traffic Movement Permit and the proposed road has the required sight distances required by the assigned speed limits.

SEBAGO TECHNICS

CIVIL ENGINEERING • SURVEYING • LANDSCAPE ARCHITECTURE

Memorandum

21397



To: Robert A. McSorley, P.E., Sebago Technics

From: Nikki Conant, P.E., Sebago Technics

Date: March 10, 2022

Subject: Trip Generation Assessment, Raymond Cape Road Residential Subdivision, Raymond

Introduction

The purpose of this memorandum is to provide a trip generation assessment for a proposed residential development in Raymond, Maine. The development is proposed to be made up of 12 single-family lots. Access to the subdivision is proposed via a full movement access to Raymond Cape Road. As such, this assessment details estimated trip generation, provides a crash data review, and evaluates sight distance for the proposed driveway.

Trip Generation

The 11th Edition of the Institute of Transportation Engineer's (ITE) *Trip Generation Manual* was utilized to estimate the trip generation for the single-family homes. Land use code (LUC) 210 – Single-Family Detached Housing was utilized on the basis of 12 dwelling units. The trip generation results are summarized in Table 1:

Table 1 – ITE Trip Generation
Land Use Code 210 – Single-Family Detached Housing
12 Dwelling Units

Time Period	*Fitted Curve Equation*	*Trips*	*Entering*	*Exiting*
Weekday	Ln(T) = 0.92Ln(X) + 2.68	143	71 (50%)	72 (50%)
AM Peak Hour – Adjacent Street (7 – 9 AM)	Ln(T) = 0.91Ln(X) + 0.12	11	3 (26%)	8 (74%)
AM Peak Hour – Generator	T = 0.71(X) + 7.23	16	4 (26%)	12 (74%)
PM Peak Hour – Adjacent Street (4 – 6 PM)	Ln(T) = 0.94Ln(X) + 0.27	14	9 (63%)	5 (37%)
PM Peak Hour – Generator	Ln(T) = 0.93Ln(X) + 0.36	14	9 (64%)	5 (36%)

As shown in Table 1, the single-family detached housing is estimated to generate 16 trips and 14 trips during the AM and PM peak hour periods of the generator, respectively. Given this level of trip generation, a Traffic Movement Permit (TMP) will not be required from the Maine Department of Transportation (MaineDOT) as project trip generation does not exceed the 100-trip threshold to require a permit. Additionally, this level of trip generation would not be expected to have impacts off-site on the adjacent roadway system as the project is estimated to generate a maximum of 12 new trips in a lane in an hour. As such, no additional analysis is recommended.

Crash Data

The MaineDOT Public Crash Query was utilized to determine if there are any high crash locations within the immediate vicinity of the site. An intersection or section of roadway is deemed an HCL if two criteria are met: a Critical Rate Factor (CRF) greater than 1.0 and a minimum of eight (8) crashes in a three-year period. Crash data for Raymond Cape Road was reviewed from Hawthorne Road south to Shaw Road for the most recent three-year study period from 2018 – 2020. Based on the crash information, Raymond Cape Road in the immediate vicinity of the site, is not designated as a high crash location. As such, there are no recommendations for improvements in conjunction with this project.

Sight Distance Analysis

Sight distance at the proposed site driveway location on Raymond Cape Road was measured in the field on March 8, 2022. Measurements were conducted from a point 12 feet behind the curb line or edge of the travelway, considering a height of eye of 3.5 feet and a height of object of 4.25 feet, as outlined in the Town of Raymond Subdivision Ordinance. The Ordinance requires a minimum sight distance in each direction of 10 feet per each mile per hour of posted speed limit.

As noted during the field visit, it appears the posted speed limit zones on Raymond Cape Road change in the imemdiate vicinity of the proposed site driveway. This results in a speed limit of 40 MPH south of the site and 25 MPH north of the site, thus requiring 400 feet of sight distance to the left (south) and 250 feet of sight distance to the right (north).

Sight distance to the left, as shown in Figure 1 was measured to be in excess of 600 feet. Sight distance to the right, as shown in Figure 2, was measured to be 350 feet. As such, sight distance from the driveway access location is adequate for the posted speed limit. It is important to note that no landscaping, signage, or other features shall be located within the sight triangle of the proposed driveway.

75 John Roberts Road – Suite 4A, South Portland, ME 04106-6963 • 207.200.2100 • Fax: 207.856.2206

Figure 1: Sight Distance Looking Left

Figure 2: Sight Distance Looking Right

Conclusion

- The residential development on Raymond Cape Road is estimated to generate 16 trips and 14 trips during the AM and PM peak hour periods of the generator, respectively. As such, a TMP would not be required by the MaineDOT, as estimated trip generation for the development does not exceed the 100-trip threshold.
- There were no high crash locations along Raymond Cape Road within the immediate vicinity of the site. As such, there are no recommendations for improvements.
- Sight distance from the proposed driveway location on Raymond Cape Road meets required sight distance, per the Town of Raymond Subdivision Ordinance.

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Exhibit 8

Natural Resources-Reports, Maps, Inquiries

EXHIBIT 8: NATURAL RESOURCES

Per Town requirements, the Applicant solicited input from regulatory agencies, provided wetland and protected natural resource information and maps regarding regulated site conditions as follows:

a. Wetlands
Sebago Technics environmental staff identified natural resources, including freshwater wetlands, and performed soils test pits necessary for septic designs. A copy of the memo is included in this section

b. On behalf of the Applicant, Sebago Technics requested a formal site review by the Maine Department of Inland Fisheries & Wildlife. The enclosed response letter dated February 24, 2022, indicates the presence of a deer wintering area (DWA) and requests that the Applicant avoid impact to the coniferous winter shelter area. No development or other site improvements are located within the mapped wintering area as shown on the appended site plans.

c. The formal response from the Maine Natural Areas Program dated February 22, 2022, included in this section indicates that there are no rare botanical features documented specifically within the project area.

d. To date, a response from the Maine Historic Preservation Commission regarding potential impact to areas or structures of historical value has not been received. A copy of the inquiry letter dated February 21, 2022, is enclosed in this section, and the response will be copied to the Town when available. While there is one historic structure (Nathaniel Hawthorne's childhood home) nearby, we note that there are no views to or from the homestead to proposed subdivision.

e. A copy of the Class 'C' Medium High Intensity Soil Survey Report is included in this section. Suitable test pits were located on each proposed lot in support of subsurface wastewater disposal (septic), and the soils are generally categorized as suitable for the proposed street and residential development.

f. A FEMA Flood Map exhibit indicates that the proposed development site is located in a "C Zone" identified as an area of minimal flooding. The proposed improvements, as proposed, will not cause an increase in flooding or other changes to flood-related conditions.

SEBAGO TECHNICS

Wetland Memo

To: **Dan Danvers, RLA ASLA**

From: **Gary Fullerton, Director, Natural Resources**

Date: **12/6/2021**

Project: **#21397 – Raymond Cape Subdivision, Raymond**

Methods of Investigation:
The wetlands on the site were delineated by Gary Fullerton and Anna Biddle of Sebago Technics, Inc. on 6/16/2021 and 6/21/2021. This delineation conforms to the standards and methods outlined in the 1987 Wetlands Delineation Manual and 2012 Northeast Regional Supplement authored and published by the U.S. Army Corps of Engineers. The wetlands were marked in the field with alpha numeric pink "wetland delineation" flagging. The flags were then located using a Trimble GPS backpack unit capable of submeter accuracy.

Location and Description:
The entire parcel in Raymond, east of the Raymond Cape Road, was surveyed for wetlands. The total site was approximately 40 acres.

Results of Wetland Survey:
Several wetlands were found on site, mostly located in the eastern portion of the parcel. The most common wetland type found was Palustrine, forested, deciduous as defined by the Classification of Wetlands and Deepwater Habitats (Cowardin, et al., 1979). The dominant vegetation in the wetlands was red maple, cinnamon fern, and sphagnum moss.

None of the wetlands delineated on site appear to be a Wetland of Special Significance (WOSS) per the Maine Department of Environmental Protection. WOSS is defined in the Natural Resources Protection Act, Chapter 310 – Wetlands and Waterbodies Protection, Section 4.

No streams were found on the site. No vernal pool survey has been completed by Sebago Technics, Inc.

Please contact me if you have any questions or need additional information.

JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
353 WATER STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

JUDITH CAMUSO
COMMISSIONER

February 24, 2022

Stefanie Nichols
Sebago Technics
75 John Roberts Road, Suite 1A
Portland, ME 04101

RE: Information Request – Raymond Cape Road Subdivision Project, Raymond

Dear Stefanie:

Per your request received on February 22, 2022, we have reviewed current Maine Department of Inland Fisheries and Wildlife (MDIFW) information for known locations of Endangered, Threatened, and Special Concern species; designated Essential and Significant Wildlife Habitats; and inland fisheries habitat concerns within the vicinity of the *Raymond Cape Road Subdivision* project in Raymond.

Our Department has not mapped any Essential Habitats that would be directly affected by your project.

Endangered, Threatened, and Special Concern Species

Bat Species – Of the eight species of bats that occur in Maine, the three *Myotis* species are protected under Maine's Endangered Species Act (MESA) and are afforded special protection under 12 M.R.S §12801 - §12810. The three *Myotis* species include little brown bat (State Endangered), northern long-eared bat (State Endangered), and eastern small-footed bat (State Threatened). The five remaining bat species are listed as Special Concern: big brown bat, red bat, hoary bat, silver-haired bat, and tri-colored bat. While a comprehensive statewide inventory for bats has not been completed, based on historical evidence it is likely that several of these species occur within the project area during migration and/or the breeding season. However, our Agency does not anticipate significant impacts to any of the bat species as a result of this project.

Significant Wildlife Habitat

Deer Wintering Areas (DWAs) – The project search area intersects with a DWA. DWAs contain habitat cover components that provide conditions where deer find protection from deep snow and cold wind, which is important for overwinter survival. MDIFW recommends that development projects be designed to avoid losses or impacts to the continued availability of coniferous winter shelter. Any removal of vegetation should be conducted in such a way that improves the quality and vigor of the coniferous species providing this winter shelter.

Significant Vernal Pools - At this time, MDIFW Significant Wildlife Habitat maps indicate no known presence of Significant Vernal Pools in the project search area; however, a comprehensive statewide inventory for Significant Vernal Pools has not been completed. Therefore, we recommend that surveys for vernal pools be conducted within the project boundary by qualified wetland scientists prior to final project design to determine whether there are Significant Vernal Pools present in the area. These surveys should extend up to 250 feet beyond the anticipated project footprint because of potential performance

standard requirements for off-site Significant Vernal Pools, assuming such pools are located on land owned or controlled by the applicant. Once surveys are completed, survey forms should be submitted to our Agency for review well before to the submission of any necessary permits. Our Department will need to review and verify any vernal pool data prior to final determination of significance.

Fisheries Habitat

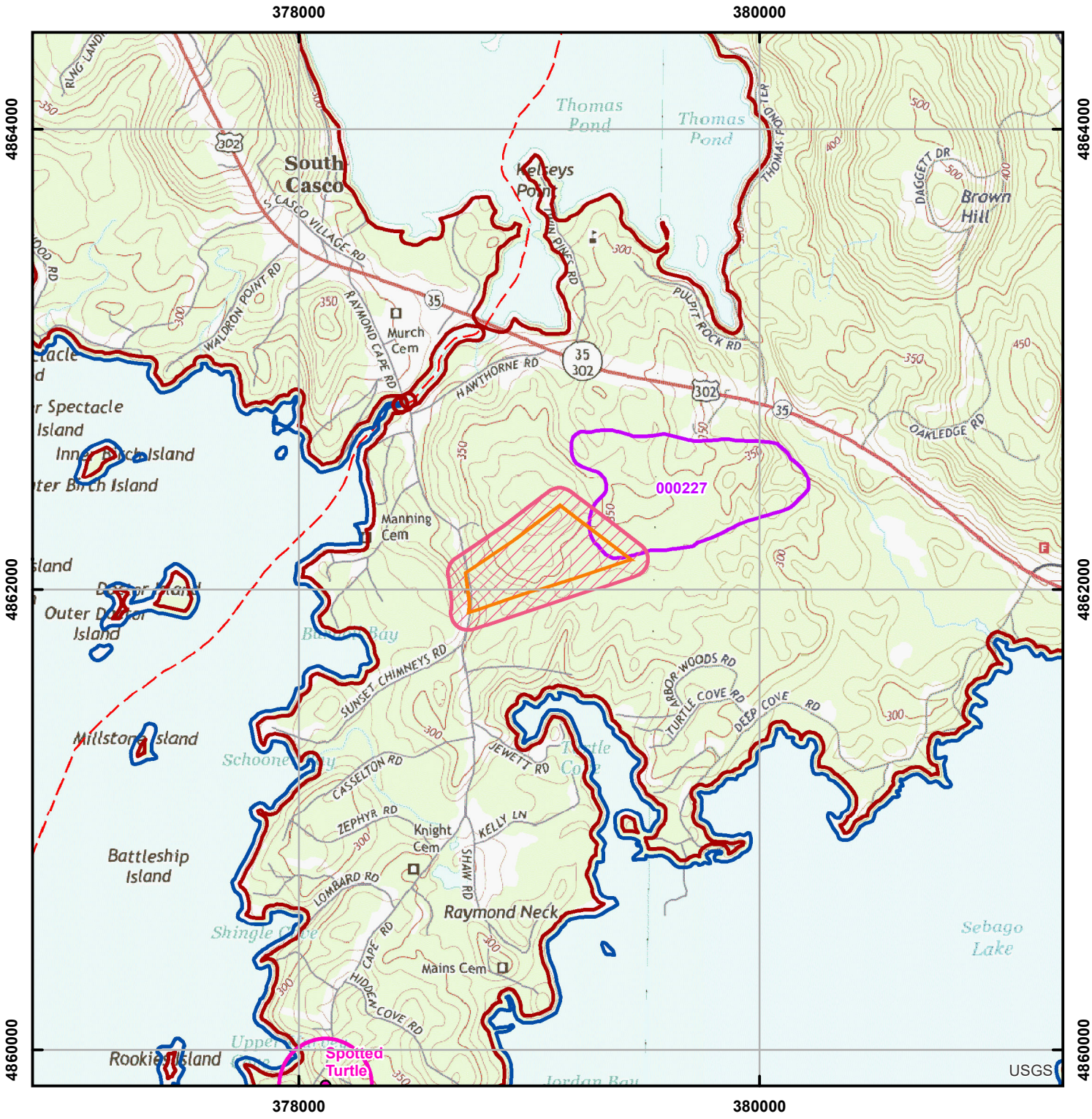
We recommend that 100-foot undisturbed vegetated buffers be maintained along streams. Buffers should be measured from the edge of stream or associated fringe and floodplain wetlands. Maintaining and enhancing buffers along streams that support coldwater fisheries is critical to the protection of water temperatures, water quality, natural inputs of coarse woody debris, and various forms of aquatic life necessary to support conditions required by many fish species. Stream crossings should be avoided, but if a stream crossing is necessary, or an existing crossing needs to be modified, it should be designed to provide full fish passage. Small streams, including intermittent streams, can provide crucial rearing habitat, cold water for thermal refugia, and abundant food for juvenile salmonids on a seasonal basis and undersized crossings may inhibit these functions. Generally, MDIFW recommends that all new, modified, and replacement stream crossings be sized to span at least 1.2 times the bankfull width of the stream. In addition, we generally recommend that stream crossings be open bottomed (i.e. natural bottom), although embedded structures which are backfilled with representative streambed material have been shown to be effective in not only providing habitat connectivity for fish but also for other aquatic organisms. Construction Best Management Practices should be closely followed to avoid erosion, sedimentation, alteration of stream flow, and other impacts as eroding soils from construction activities can travel significant distances as well as transport other pollutants resulting in direct impacts to fish and fisheries habitat. In addition, we recommend that any necessary instream work occur between July 15 and October 1.

This consultation review has been conducted specifically for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area. Prior to the start of any future site disturbance we recommend additional consultation with the municipality, and other state resource agencies including the Maine Natural Areas Program, Maine Department of Marine Resources, and Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,

Becca Settele
Wildlife Biologist



Environmental Review of Fish and Wildlife Observations and Priority Habitats

Project Name: Raymond Cape Road Subdivision, Raymond (Version 2)

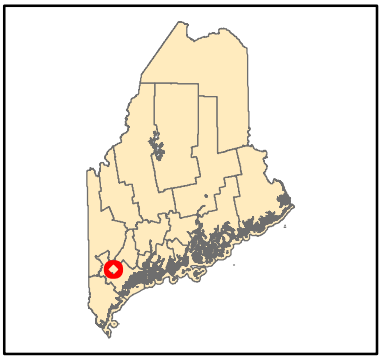
Maine Department of Inland Fisheries and Wildlife

0 0.125 0.25 0.5 0.75 1 Miles

Projection: UTM, NAD83, Zone 19N

Date: 2/23/2022

- ProjectSearchAreas - All Versions
- Maine Cliff and Talus Areas
- Deer Winter Area
- LUPC p-fw
- Cooperative DWAs
- Seabird Nesting Islands
- Shorebird Areas
- Inland Waterfowl and Wading Bird
- 2008 Iwwh - Shoreland Zoning
- Tidal Waterfowl and Wading Bird
- Significant Vernal Pools
- Environmental Review Polygons
- Roseate Tern
- Piping Plover and Least Tern
- Aquatic ETSc - 2.5 mi review
- Rare Mussels - 5 mi review
- Maine Heritage Fish Waters
- Arctic Charr Habitat
- Redfin Pickerel and Swamp Darter Habitats - buffer100ft
- Special Concern occupied habitats - 100ft buffer
- Wild Lake Trout Habitats



STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
177 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

8c

February 22, 2022

Stefanie Nichols
Sebago Technics
75 John Roberts Road, Suite 4A
South Portland, ME 04106

Via email: rgabryszewski@sebagotechnics.com

Re: Rare and exemplary botanical features in proximity to: #21397, 13-Lot Residential Subdivision, Cape Road, Raymond, Maine

Dear Ms. Nichols:

I have searched the Maine Natural Areas Program's Biological and Conservation Data System files in response to your request received February 21, 2022 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Raymond, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. This lack of data may indicate minimal survey efforts rather than confirm the absence of rare botanical features. You may want to have the site inventoried by a qualified field biologist to ensure that no undocumented rare features are inadvertently harmed.

If a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features that have been known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

MOLLY DOCHERTY, DIRECTOR
MAINE NATURAL AREAS PROGRAM
BLOSSOM LANE, DEERING BUILDING

DEPARTMENT OF Agriculture Conservation & Forestry

PHONE: (207) 287-804490
WWW.MAINE.GOV/DACF/MNAP

The Maine Natural Areas Program (MNAP) is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. MNAP welcomes coordination with individuals or organizations proposing environmental alteration or conducting environmental assessments. If, however, data provided by MNAP are to be published in any form, the Program should be informed at the outset and credited as the source.

The Maine Natural Areas Program has instituted a fee structure of $75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for $150.00 for two hours of our services.

Thank you for using MNAP in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,

Lisa St. Hilaire

Lisa St. Hilaire | Information Manager | Maine Natural Areas Program
207-287-8044 | lisa.st.hilaire@maine.gov

Rare and Exemplary Botanical Features within 4 miles of
Project: #21397, 13-Lot Residential Subdivision, Cape Road, Raymond, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Nodding Pogonia						
	T	S2	G4?	2010-08-18	5	Hardwood to mixed forest (forest, upland)
	T	S2	G4?	2010-08-18	11	Hardwood to mixed forest (forest, upland)
Scarlet Oak						
	E	S1	G5	1916-08	2	Hardwood to mixed forest (forest, upland)
Wild Coffee						
	E	S1	G5	1933-08-17	4	Non-tidal rivershore (non-forested, seasonally

Date Exported: 2022-02-22 15:58

Conservation Status Ranks

State and Global Ranks: This ranking system facilitates a quick assessment of a species' or habitat type's rarity and is the primary tool used to develop conservation, protection, and restoration priorities for individual species and natural habitat types. Each species or habitat is assigned both a state (S) and global (G) rank on a scale of critically imperiled (1) to secure (5). Factors such as range extent, the number of occurrences, intensity of threats, etc., contribute to the assignment of state and global ranks. The definitions for state and global ranks are comparable but applied at different geographic scales; something that is state imperiled may be globally secure.

The information supporting these ranks is developed and maintained by the Maine Natural Areas Program (state ranks) and NatureServe (global ranks).

Rank	Definition
S1 **G1**	**Critically Imperiled** – At very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.
S2 **G2**	**Imperiled** – At high risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
S3 **G3**	**Vulnerable** – At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
S4 **G4**	**Apparently Secure** – At fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
S5 **G5**	**Secure** – At very low risk or extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.
SX **GX**	**Presumed Extinct** – Not located despite intensive searches and virtually no likelihood of rediscovery.
SH **GH**	**Possibly Extinct** – Known from only historical occurrences but still some hope of rediscovery.
S#S# **G#G#**	**Range Rank** – A numeric range rank (e.g., S2S3 or S1S3) is used to indicate any range of uncertainty about the status of the species or ecosystem.
SU **GU**	**Unrankable** – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
GNR **SNR**	**Unranked** – Global or subnational conservation status not yet assessed.
SNA **GNA**	**Not Applicable** – A conservation status rank is not applicable because the species or ecosystem is not a suitable target for conservation activities (e.g., non-native species or ecosystems.
Qualifier	**Definition**
S#? **G#?**	**Inexact Numeric Rank** – Denotes inexact numeric rank.
Q	**Questionable taxonomy that may reduce conservation priority** – Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable. The "Q" modifier is only used at a global level.
T#	**Infraspecific Taxon (trinomial)** – The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank.

State Status: Endangered and Threatened are legal status designations authorized by statute. Please refer to MRSA Title 12, §544 and §544-B.

Status	Definition
E	**Endangered** – Any native plant species in danger of extinction throughout all or a significant portion of its range within the State or Federally listed as Endangered.
T	**Threatened** – Any native plant species likely to become endangered within the foreseeable future throughout all or a significant portion of its range in the State or Federally listed as Threatened.
SC	**Special Concern** – A native plant species that is rare in the State, but not rare enough to be considered Threatened or Endangered.
PE	**Potentially Extirpated** – A native plant species that has not been documented in the State in over 20 years, or loss of the last known occurrence.

Element Occurrence (EO) Ranks: Quality assessments that designate viability of a population or integrity of habitat. These ranks are based on size, condition, and landscape context. Range ranks (e.g., AB, BC) and uncertainty ranks (e.g., B?) are allowed. The Maine Natural Areas Program tracks all occurrences of rare plants and natural communities/ecosystems (S1-S3) as well as exemplary common natural community types (S4-S5 with EO ranks A/B).

Rank	Definition
A	**Excellent** – Excellent estimated viability/ecological integrity.
B	**Good** – Good estimated viability/ecological integrity.
C	**Fair** – Fair estimated viability/ecological integrity.
D	**Poor** – Poor estimated viability/ecological integrity.
E	**Extant** – Verified extant, but viability/ecological integrity not assessed.
H	**Historical** – Lack of field information within past 20 years verifying continued existence of the occurrence, but not enough to document extirpation.
X	**Extirpated** – Documented loss of population/destruction of habitat.
U	**Unrankable** – Occurrence unable to be ranked due to lack of sufficient information (e.g., possible mistaken identification).
NR	**Not Ranked** – An occurrence rank has not been assigned.

Visit the Maine Natural Areas Program website for more information
http://www.maine.gov/dacf/mnap

maine DEPARTMENT OF Agriculture Conservation & Forestry
NATURAL AREAS

8d

February 21, 2022
21397

Mr. Kirk Mohney, Director and State Historic Preservation Officer
Maine Historic Preservation Commission
65 State House Station
Augusta, Maine 04333

Email submittal: claudette.coyne@maine.gov

Re: Proposed Residential Subdivision
78 Cape Road, Raymond
Tax Map 4/Lot 29

Dear Mr. Mohney:

On behalf of our client, Brandon Chase, Sebago Technics respectfully requests a site review for a proposed 13-lot residential subdivision on a 37-acre parcel at 78 Raymond Cape Road, Raymond. The site improvements will consist of a private road, electrical/communications infrastructure, drainage, stormwater management features, and other associated site improvements. Development of the individual house lots is not part of this project phase. As part of the site permitting due diligence, we request a review by the Maine Historic Preservation Commission for any properties, structures, or other areas of historical significance in the vicinity of the proposed site.

The site is primarily wooded and located in a rural area. A review of the Town Comprehensive Plan (2004) and other historical resources identified a boyhood home of Nathaniel Hawthorne (NRHP 1969) located nearby at 40 Hawthorne Road, Raymond (Map 75/Lot 36). No views to the site improvements at 78 Cape Road from the Hawthorne House or other neighboring buildings are anticipated due to the wooded location.

Reference is made to the enclosed USGS Site Location Map, Town of Raymond Comprehensive Plan, *Historic, and Archaeological Resources Map,* and an annotated 11x17 Tax Map.

Please review the material and let me know your findings at your earliest convenience. If you have any questions or require additional information, please do not hesitate to contact me at (207) 200-2120 or directly at snichols@sebagotechnics.com. I look forward to hearing from you.

Sincerely,
SEBAGO TECHNICS, INC.

Stefanie Nichols
Permitting Specialist/Project Coordinator

enc. USGS Site Location Map
Town Historic and Archaeological Map
Image Sheet
11x17 Tax Map 4

SEBAGO TECHNICS

CIVIL ENGINEERING ▪ SURVEYING ▪ LANDSCAPE ARCHITECTURE

CLASS 'C' MEDIUM HIGH INTENSITY SOIL SURVEY REPORT

Prepared for:

Brandon Chase

15 Washington Court

Naples, Maine 04055

Prepared by:

Sebago Technics, Inc.
75 John Roberts Road Suite 4A
South Portland, Maine 04106

March 11, 2022

CLASS 'C' MEDIUM HIGH INTENSITY SOIL SURVEY

Residential Development

TABLE OF CONTENTS

Section 1

Introduction

Sebago Technics has completed a Class 'C' Medium High Intensity Soil Survey for the proposed Residential Development, located adjacent to Raymond Cape Road in Raymond, Maine. The soils found on the above referenced site have been observed in the field using test pits dug by an excavator, and one boring with a hand auger (see Soil Map for Survey Limits in Appendix E). The test pits were located by Global Positioning Systems (GPS) technology and incorporated into the soil map. The soil map has been merged into the existing base plan prepared by Sebago Technics. Topography is based on 2-foot contour intervals prepared using Lidar DEM from Maine GIS.

The soil map units and soil boundaries have been drawn, reviewed, and forwarded to the Project Manager, Robert McSorley, PE, for consideration during engineering design and layout of the proposed Residential Development. Soils found at the site are described below and were examined and classified to identify potential soil limitations relating to the development of the property. This report has been prepared as part of the project requirements for the Town of Raymond, and may be used to support permitting procedures as required under the Site Location of Development Act, Natural Resources Protection Act (NRPA), Stormwater Management Law, or other pertinent regulation.

Section 2

Purpose of Soil Survey

The purpose of this Class 'C' Medium High Intensity Soil Survey was to investigate, identify, describe, and map the soils on the above referenced site for the proposed Residential Development. The accompanying soil survey map depicts the location and types of soil found on the project site. The soil information may be used to obtain hydrologic soil group ratings to assist in the calculations for stormwater runoff curve values required by the Maine Department of Environmental Protection (MDEP). This soil information may also be used to evaluate soil suitability relating to development for the proposed Residential site. A separate geotechnical report may be required to address engineering requirements for the construction of the site and structures.

Section 3

Site Location and Description

The site is located adjacent to Raymond Cape Road in Raymond, Maine. The abutting properties are generally wooded and residential properties. The proposed development area includes approximately 40 acres of land. Wetlands were delineated during June 2021 by Sebago Technics, Inc. The entire site was a previously harvested woodlot.

Section 4

Site Investigation

We collected site-specific soil information at various locations across the site on February 10, 2022. The areas examined were designated with letters from TP 1 to TP 20, and BOR 21. All test pits were dug by an excavator, and the boring was hand augured. Test pit locations were selected based on disturbance areas and topographic relief, which typically are indicative of soil type variations. Excavated test pits were examined for soil colors, rock content, texture, consistence, root depths, redoximorphic features, and depth to restrictive horizons. From this information, soil logs were completed and are included in Appendix E.

The test pits observed in the field were located by a GPS unit capable of submeter accuracy on the date that they were excavated. These points were then incorporated into the topographic survey to aid in the preparation of a soil map of the project area. The provided base map has a scale of 1 inch = 80 feet, with two-foot contour intervals on the site.

Drainage classifications of the soils on the site were determined by parameters found in the Guidelines for Maine Certified Soil Scientists for Soil Identification and Mapping, published by the Maine Association of Professional Soil Scientists in April 1989 and revised in March 2009.

Section 5

Soil Characteristics

The soils found on the site are developed from lodgment glacial till, ablation glacial till, and organic materials. The landforms typically associated with these soils are drumlins, uplands, hills, and swamps. They are generally made up of fine sandy loam or sandy loam, with gravel, stones, or boulders.

The lodgment till soils include the well drained Becket, the moderately well drained Skerry, and the somewhat poorly drained Westbury. These soils are all very deep to bedrock. These soils were found on land with slopes of 3 to 25 percent.

The ablation till soils include the well drained and moderately deep Tunbridge. These soils were found on land with slopes of mostly 15 to 25%

The organic soils include the very poorly drained Sebago mucky peat. These soils were found on level land with slopes of 0 to 3 percent.

These soils should respond to use and management as determined and described in the Soil Series of Maine Soil Interpretations published by the Maine Association of Professional Soil Scientists in cooperation with the USDA Natural Resources Conservation Service, dated January 1987 and revised January 1988 and 1989. Soil survey interpretations are enclosed in Appendix C of this report.

This site may contain inclusions of soil types that differ from the soil map units. The areas where these soils were found are too small to be mapped and, for the purpose of this soil survey, there appears to be less than 5 contiguous acres of this soil in any part of the site. It also appears that the total area of this soil type in any given map unit is less than 25 percent, therefore classifying these soil types as inclusions.

One known inclusion is the small wetlands mapped within the upland map units. The soils in these wetlands may be Naumburg variant, Sebago mucky peat, or a poorly or very poorly drained till soil. The areas of wetland soils are very dissimilar to the upland map units, due to lower runoff and greater infiltration, among other characteristics.

Section 6

Soil Map and Map Unit Descriptions

The attached soil survey map depicts the size and location of the soil map units relative to each other and existing site features. Each soil map unit typically consists of three letters (e.g., AdB), with the first two letters representing a phase of the established soil series found within soil map unit areas as shown on the soil map. This soil map unit phase name is a representation of the soil characteristics, such as texture, stoniness, drainage, and depth to bedrock, all of which may affect the use and management of the soil. The third capitalized letter represents the surface slope gradient of the area within the soil map unit (e.g., B represents 3 to 8 percent slopes). Therefore, in this example "AdB" is interpreted as Adams loamy fine sand on a 3 to 8 percent slope. There may be small areas of different soils within a soil map unit, known as inclusions. Inclusions may exist within a delineated soil map unit, although the size of the inclusion may be too small to stand as a soil map unit alone (<5 acres). The soil map units found at the site are listed with soil potential rating classes in Appendix C of this report.

Section 7

Conclusions

The soils found on site consist of lodgment glacial till, ablation till, and organic materials. The landforms typically associated with the lodgment till are drumlins, hills, and uplands. They are generally made up of fine sandy loam and sandy loam, and contain rock fragments ranging in size from gravel to boulders. The landforms associated with the ablation till are uplands and ridges. They are made up of fine sandy loam and sandy loam, and contain gravel, cobbles, and stones. The landforms associated with the organic soils are swamps. They are made up of low-pH, moderately decomposed organic materials with no mineral soil nor rock fragments.

All of these soils are generally suitable for the proposed development. The exception to this is the Sebago mucky peat map unit, which is located within the Open Space 2 parcel of the subdivision, with no disturbance planned. Given the size of the soil survey and extent of the development, soil and topographical conditions may vary across the development area.

Site investigations suggest some limitations typical of glacial till soils and site topography/setting will be encountered. These limitations may be overcome by appropriate planning, engineering and site preparation in these areas. Such site features as the depth to restrictive layers, runoff volumes, seasonal soil saturation depths, potential for frost and erosion activity, and jurisdictional wetland areas were examined. The following is a summary of areas and on-site features identified in the field with potential effects relating to the development of this parcel:

1. Jurisdictional wetland areas were identified on the property. Alteration to wetland areas will require regulatory permitting together with appropriate engineering to support buildings, septic systems, and roads. Some of these soils contain deep organic deposits, with ponded water or saturated conditions at or near the surface throughout much of the year.

2. Moderately deep to deep bedrock classification areas exist in areas throughout the property. These soils include Tunbridge, Becket Variant, and Skerry Variant soils. Bedrock excavation will typically require blasting to achieve design and subgrade elevations, when encountered.

Section 8

Limitations

The scope of this investigation has been limited to this Class 'C' Medium High Intensity Soil Survey in general accordance with standards and guidelines established by the Maine Association of Professional Soil Scientists. The soil survey report and soil map have been prepared for the exclusive use of Brandon Chase and Sebago Technics, Inc. for specific application for the proposed Residential Development on this site located on Raymond Cape Road in Raymond, Maine.

No other warranty, expressed or implied, is made. The conclusions and recommendations presented in this soil report are based on data obtained at the referenced site and our interpretations of this information. This report and soil map may not reflect soil variations that may occur between our observation test pits. Data from this soil report and soil map should not be used for any other purpose. Soils which are considered non-limiting for one use may be considered limiting for another use. The soil mapping units used in the soil report and on the soil map are at least in part influenced by the intended use of the soil survey and information provided may not always be adequate for uses other than that which the soil survey was originally developed.

APPENDICES

APPENDIX A

SOIL NARRATIVE REPORT

SOIL NARRATIVE REPORT

Brandon Chase

March 11, 2022

Date: Soil profiles observed February 10, 2022

Base Map: Lidar topography

2- (two) foot contour intervals on-site

Map Scale 1 inch = 80 feet

Ground Control: Test pits located by GPS with sub-meter accuracy

The Maine Association of Professional Soil Scientists has adopted standards for soil surveys. Soil surveys are divided into four classes of survey, which are dependent upon the amount of information required for the project. The following is a summary of requirements for this Medium High Intensity Soil Survey.

Class C (Medium High Intensity)

1. Map units will not contain dissimilar limiting individual inclusions larger than 5 acres. Dissimilar limiting inclusions may total more than 5 acres per map unit delineation, in the aggregate, if not contiguous.
2. Scale of 1 inch equals 500 feet or larger (e.g. 1" = 400').
3. Ground control—as determined by the mapper.
4. Base map—as determined by the mapper.

The accompanying soil profile descriptions, soil survey map and this soil narrative report were done in accordance with the standards adopted by the Maine Association of Professional Soil Scientists, March 2009.

This Soil Survey was prepared in relation to a proposed residential development.

Anna K. Biddle, L.S.S. #639

March 11, 2022
Date

APPENDIX B

SOIL LEGEND/MDEP FORM E

CLASS 'C' MEDIUM HIGH INTENSITY SOIL SURVEY

SOIL LEGEND

Brandon Chase

Raymond, Maine

March 11, 2022

SOIL LEGEND

SYMBOL	SOIL SERIES	PHASE	SLOPE	HSG	DRAINAGE CLASS
BeD	BECKET	SANDY LOAM	15-25%	C	WD (WELL DRAINED)
SeA	SEBAGO	MUCKY PEAT	0-3%	D	VPD (VERY POORLY DRAINED)
SkB	SKERRY	FINE SANDY LOAM	3-8%	C	MWD (MODERATELY WELL DRAINED)
SkC	SKERRY	FINE SANDY LOAM	8-15%	C	MWD (MODERATELY WELL DRAINED)
TuC	TUNBRIDGE	FINE SANDY LOAM	8-15%	C	WD (WELL DRAINED)
TuD	TUNBRIDGE	FINE SANDY LOAM	15-25%	C	WD (WELL DRAINED)
WeB	WESTBURY	SANDY LOAM	3-8%	D	SPD (SOMEWHAT POORLY DRAINED)

FORM E Rev. 07/11

SOIL CONDITIONS SUMMARY TABLE

SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
78 RAYMOND CAPE ROAD	BRANDON CHASE	RAYMOND

Lot No.	Exploration Symbol *(TP 1, B 2, etc.)*	☒ if at SSWD Field	Description of subsurface materials by: ● Soil profile/condition *(if by S.E.),* ● Soil series name *(if by C.S.S.),* or by ● Geologic unit *(if by C.G.)*	Depths to *(inches)*: Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration	Ground Surface Slope (%)	Ground Surface Elevation
n/a	TP-1	☐	HERMON / 4B	--	108	--	108	8-15	317
13	TP-2	☒	BECKET / 3C	--	--	35	65	3-8	320
12	TP-3	☒	BECKET / 3C	--	--	22	60	3-8	337
12	TP-4	☒	BECKET VARIANT / 3C	--	52	26	52	3-8	330
11	TP-5	☒	BECKET / 3C	--	--	28	60	3-8	350
10	TP-6	☒	TUNBRIDGE / 2AIII	--	38	--	38	3-8	361
n/a	TP-7	☐	BECKET VARIANT / 3C	--	56	16	56	3-8	363
6	TP-8	☒	TUNBRIDGE / 2AIII	--	24	--	24	0-3	389
8	TP-9	☒	SKERRY / 3C	32	--	26	60	3-8	373
7	TP-10	☒	TUNBRIDGE / 2AIII	--	27	--	27	3-8	374
9	TP-11	☒	BECKET / 3C	--	--	30	60	3-8	343
n/a	TP-12	☐	NAUMBURG VARIANT / 5E	0	--	26	42	0-3	332
n/a	TP-13	☐	SKERRY / 3C	32	--	28	60	3-8	341
n/a	TP-14	☐	SKERRY / 3C	16	--	26	92	3-8	343
6	TP-15	☒	TUNBRIDGE / 2AIII	--	26	--	26	8-15	362
5	TP-16	☒	BECKET / 3C	--	--	30	60	3-8	372
4	TP-17	☒	TUNBRIDGE / 2AIII	--	30	--	30	3-8	367
3	TP-18	☒	SKERRY VARIANT / 3C	24	38	24	38	3-8	354
2	TP-19	☒	BECKET / 3C	--	--	24	54	3-8	344
1	TP-20	☒	WESTBURY / 3D	13	--	24	48	3-8	328
n/a	BOR-21	☐	SEBAGO / 10E	--	--	--	48	0-3	331
		☐							
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INVESTIGATOR INFORMATION AND SIGNATURE

Signature		Date
		2/22/22
Name Printed		**Cert/Lic/Reg. #**
ANNA K. BIDDLE		639

Qualification

☐ Licensed Site Evaluator ☒ Certified Soil Scientist
☐ Certified Geologist ☐ Other:

STATE OF MAINE ANNA K. BIDDLE NO. 639 LICENSED SOIL SCIENTIST

affix professional seal

APPENDIX C

SOIL SURVEY INTERPRETATIONS

SOIL SURVEY INTERPRETATIONS

Soil survey interpretations are derived from the inherent soil characteristics found within the soil profile. The interpretations are predictions (numeric and descriptive) of soil suitability for a specific use, based on the soil's characteristics. These interpretations have many practical applications, such as estimating costs for land development, calculating storm water runoff, determining structural bearing strengths, estimating erodibility, etc. Soil potential ratings have been developed using soil survey interpretations to compare soil series, based on limitations or potentials, for a given use.

Limitations of Soil Interpretations

Soil interpretations are very useful for many purposes and projects, although they do have limitations, including:

1. An interpretation for a specific purpose is rarely adaptable for another use without management considerations.
2. Use of interpretations for specific areas has an inherent limitation relating to variability of the soil map unit. As the size of the soil survey area and the soil map units increase, soil interpretations provide a less reliable prediction of actual soil conditions.
3. Interpretations are also limited by the natural variability within a soil profile, which directly affects the precision of the soil interpretation.
4. Soil interpretations are predictions of potentials or limitations based on soil properties. A soil may possess several limiting factors and therefore all site-specific soil properties must be known for accurate interpretations.
5. Soil interpretations are used to predict the costs of development and to ultimately determine feasibility of a project. It should be noted that most soil limitations can be overcome with engineering solutions to make a soil suitable for a proposed use.

Soil Potential Rating Factors

Soil potential ratings have been developed as a useful form of soil interpretations. These ratings are based on local conditions, local experience and expertise, and laws, codes and rules governing the use of soils for various purposes. Potential ratings include the feasibility of a soil for a particular use relative to other soils within a given area. Factors considered in preparing soil potential ratings are the feasibility of using certain technology and practices to overcome limiting factors and the relative cost of implementing these practices. Some examples of unfavorable soil qualities inherent in Maine soils are listed below:

1. **Depth to Water Table** – The depth to water table affects the natural drainage of the soil in which in turn affects the soils potential for development. A soil with a shallow depth to seasonal high water table requires construction methods such as added fill and artificial drainage to overcome this limitation. A soil with a seasonal high water table deeper than 6 feet below the soil surface would have higher potential than a soil with a seasonal high water table at 18 inches.
2. **Flooding** – Soils are rated on the basis of whether they are subject to flooding or not. Flooding is separated into three categories: none, occasional (floods at least once in ten years), and frequent (floods at least once every two years). Soils subject to flooding have less potential for development than those that do not flood.

3. **Slope** – Soils are rated on the basis of slope. The less sloping areas require fewer corrective measures than the steeper areas and thus have a greater potential for development.

4. **Depth to Bedrock** – The presence of bedrock affects the use of soils for development. Soils with shallow depth over bedrock have less potential for development than deep soils.

5. **Surface Stones** – The presence of stones and boulders on the soil surface affect the use of the soil for development. In preparing a site for a dwelling or septic sewage disposal area, surface stones have to be removed.

6. **Depth to Restrictive Layer** – Some soils have a restrictive layer that begins at a shallow depth. This layer can impede natural drainage and permeability. This soil factor is important when designing a septic sewage disposal system.

7. **Soil Profile and Condition** – The Maine Subsurface Wastewater Disposal Rules provides a table by which each soil can be categorized by profile group and soil condition. The profile group is based on parent material or origin of the soil, texture of the soil, and the presence of any restricting layer within the soil profile. The soil condition refers to the depth to bedrock or drainage class.

Low density development includes single family unit residences with basements and comparable buildings and septic tank absorption fields, with or without on-site sources of water. Development may be as a single unit or as a cluster of units in a development. Paved roads in a development are also included in the rating. Soil potentials have been developed by selecting the best soil in a county for low density development. This "reference soil" is the best because it has all the best characteristics for all rated uses with regards to development. For low density urban development, a reference soil has the following properties:

- A water table level greater than 6 feet
- The soil does not flood
- Slope is 0-3 percent
- The soil lacks a restrictive layer
- The depth to bedrock is more than 5 feet
- Surface stone cover is 0.1 to 15 percent
- The soil requires a medium sized rating for a septic sewage disposal field
- There is low potential for groundwater contamination from septic field effluent

This reference soil is assigned a value of 100 index points. Costs are also developed for all other soils in the county for overcoming the various soil limitations. These costs are converted to index points and subtracted from the reference soil. The result is a method of comparing development costs for the soils in a county. Environmental constraints as well as long term maintenance costs are also a factor in developing soil potentials.

The Soil Potential index is a mathematical expression of a soil's position in the overall range of potentials which is 100 to 0. Since the entire range is large, these numerical ratings are separated into Soil Potential Rating Classes of very low to very high.

The composite rating for development was determined by a weighted average of individual soil potential indices as follows: septic tank absorption fields, 45 percent; dwellings with basements, 20 percent; and local roads and streets, 35 percent.

Soil Potential Rating Classes

Soil Potential Rating Classes are based on the expected performance of a soil if feasible measures are taken to overcome its limitations, the cost of such measures, and the magnitude of the limitations that remain after measures have been applied. The development rating (fourth column in the rating tables) is a weighted sum of the septic, dwelling, and road indices. The septic system has the most restrictive site requirements and the dwelling has the least restrictive site requirements.

Very High Potential – Site conditions and soil properties are favorable. Installation costs are lowest for that use and there are no soil limitations. Soils in the group have soil properties similar to the reference soil. The Soil Potential Index for this rating class is 100 for each soil use.

High Potential – Site conditions and soil properties are not as favorable as the reference soil condition. The cost of measures for overcoming soil limitations is slight. The index for this rating class ranges from 83 to 99 for each soil use.

Medium Potential – Site conditions and soil properties are below soils with high potential. Costs of the measures for overcoming soil limitations are significant. The index for this rating class ranges from 60 to 82.

Low Potential – Site conditions and soil properties are significantly below soils with medium potential. Costs of measures required to overcome soil limitations are very high. The index for this rating class ranges from 40 to 59 for each soil use.

Very Low Potential – There are severe soil limitations for which economical corrective measures are prohibitive or unavailable and costs of these measures are extremely high. Also, soil limitations which detract from environmental quality may continue even after installation of corrective measures. The index for this rating class is less than 40. They may also be prohibited for use by local or state laws.

Drainage Classes

Drainage classes are the relative wetness that a soil under normal conditions has relating to the soil water table. The following seven drainage classes are used for the soils found in Maine:

1. **Excessively Drained (ED)** soils with water that is removed very rapidly. The occurrence of internal free water is very rare or very deep.
2. **Somewhat Excessively Drained (SWED)** soils with water that is removed rapidly through the soil. Internal free water occurrence is very rare or very deep.
3. **Well Drained (WD)** soils with water that is removed from the soil readily but not rapidly. Internal free water occurrence commonly is deep or very deep.
4. **Moderately Well Drained (MWD)** soils with water that is moved somewhat slowly during some periods of the year. Internal free water is moderately deep and transitory to permanent throughout the soil profile.
5. **Somewhat Poorly Drained (SWPD)** soils with water that is removed from the soil slowly and remains wet from significant periods of time during the growing season. The depth to internal free water is shallow to moderately deep, transitory to permanent.
6. **Poorly Drained (PD)** soils with water that is removed so slowly that the soil is wet at shallow depths during the growing season or remains in a wet state for long periods.

7. **Very Poorly Drained (VPD)** soils with water that is removed from the soil so slowly that the free water remains at or near the ground surface during the growing season. Internal free water is very shallow and persistent or permanent.

Slope Class

A	**Level and nearly level**	0-3 percent
B	**Gently sloping (undulating)**	3-8 percent
C	**Strongly sloping (rolling)**	8-15 percent
D	**Moderately steep (hilly)**	15-25 percent
E	**Steep**	25-45 percent
F	**Very Steep**	45+ percent

Depth to Bedrock

1.	**Very Shallow**	Less than 10-inches to bedrock
2.	**Shallow**	10-inches to less than 20-inches to bedrock
3.	**Moderately Deep**	20-inches to less than 40-inches to bedrock
4.	**Deep**	40-inches to less than 60-inches to bedrock
5.	**Very Deep**	Greater than 60-inches to bedrock

Classes of Surface Stones

1.	**Stony or bouldery**	0.01 to 0.1 percent surface coverage
2.	**Very stony/ boulder**	0.1 to 3.0 percent surface coverage
3.	**Extremely stony/ bouldery**	3.0 to 15 percent surface coverage
4.	**Rubbly**	15 to 50 percent surface coverage
5.	**Very Rubbly**	More than 50 percent surface coverage

CLASS 'C' MEDIUM HIGH INTENSITY SOIL SURVEY

SOIL POTENTIAL RATINGS

Brandon Chase

Raymond, Maine

March 11, 2022

SOIL POTENTIAL RATING CLASSES

MAP UNIT	SEPTICS	BUILDINGS	ROADS	DEVELOPMENT
BeD BECKET, 15-25%	VERY LOW	MEDIUM	LOW	LOW
SeA SEBAGO, 0-3%	VERY LOW	VERY LOW	VERY LOW	VERY LOW
SkB SKERRY, 3-8%	HIGH	HIGH	HIGH	HIGH
SkC SKERRY, 8-15%	MEDIUM	MEDIUM	MEDIUM	MEDIUM
TuC TUNBRIDGE, 8-15%	MEDIUM	MEDIUM	MEDIUM	MEDIUM
TuD TUNBRIDGE, 15-25%	VERY LOW	LOW	LOW	VERY LOW
WeB WESTBURY, 3-8%	VERY LOW	MEDIUM	MEDIUM	LOW

BECKET (BeD)

(Frigid Oxyaquic Haplorthods)

SETTING

Parent Material: Glacial till

Landform: Drumlins and glaciated uplands

Position in Landscape: High and intermediate positions

Slope Gradient Ranges: (D) 15-25%

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Well drained

Typical Profile:

- **Surface layer:** Dark brown sandy loam, 8”
- **Subsurface layer:** Reddish brown, friable, gravelly loamy sand, 24”
- **Subsoil layer:** Light olive brown, friable, gravelly sandy loam, 33”
- **Substratum:** Olive, firm, gravelly sandy loam and sand, 65”

Hydrologic Group: C

Surface Runoff: Slow

Permeability: Moderate in the solum, moderately slow to slow in the substratum

Depth to Bedrock: Very deep, greater than 60”

Hazard to Flooding: None

INCLUSIONS WITHIN MAPPING UNIT

Similar: Hermon, Becket Variant (with bedrock less than 60”)

Contrasting: Naumburg

USE AND MANAGEMENT

Development with subsurface wastewater disposal is rated “fair” due to the restrictive layer in the substratum. A “fair” rating may be used for building site development. Compaction in this soil is rated “good”.

SEBAGO (SeA)

(Frigid Fibric Haplohemists)

SETTING

Parent Material:	Herbaceous and woody organic deposits
Landform:	Bogs, swamps
Position in Landscape:	Depressions on glaciated uplands, glaciofluvial deposits
Slope Gradient Ranges:	(A) 0-3%

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class:	Very poorly drained	
Typical Profile:	**Surface layer:**	Black mucky peat, massive, 24”
	Subsoil layer:	Black mucky peat, massive, 36”
	Substratum:	Very dark gray peat, massive, 65”
Hydrologic Group:	D	
Surface Runoff:	Ponded or very slow	
Permeability:	Moderately rapid	
Depth to Bedrock:	Very deep, >60”	
Hazard to Flooding:	None	

INCLUSIONS WITHIN MAPPING UNIT

Similar:	Naumburg
Contrasting:	Skerry

USE AND MANAGEMENT

Development with subsurface wastewater disposal is “unsuitable” due to wetness and organic soils. A limiting factor for building site development is that the organic soil is unstable and saturated for all or most of the year. Sebago soils are rated “unsuitable” for road fill materials. These soils have “severe” limitations for foundations, underground piping, and roadways due to wetness and unstable organic soils.

SKERRY (SkB, SkC)

(Frigid Aquic Haplorthods)

SETTING

Parent Material: Glacial till

Landform: Level to moderately steep uplands

Position in Landscape: Higher to intermediate positions

Slope Gradient Ranges: (B) 3-8% (C) 8-15%

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Moderately well drained

Typical Profile:

- **Surface layer:** Dark brown fine sandy loam, 8”
- **Subsurface layer:** Reddish brown and dark reddish brown gravelly fine sandy loam, 20”
- **Subsoil layer:** Yellowish brown gravelly fine sandy loam, mottled, 25”
- **Substratum:** Grayish brown firm gravelly fine sandy loam, lenses of light olive brown loose sand, 60”

Hydrologic Group: C

Surface Runoff: Moderate

Permeability: Moderate in the solum, slow or very slow in the compact substratum

Depth to Bedrock: Very deep, >60”

Hazard to Flooding: None

INCLUSIONS WITHIN MAPPING UNIT

Similar: Becket

Contrasting: Naumburg

USE AND MANAGEMENT

Subsurface wastewater disposal is “fair” due to wetness and slow percolation rates in the substratum. A limiting factor for building site development is wetness of the soil. Skerry soils also possess large stones and dense compact substratum layers that may require blasting or large construction equipment. Use of this soil for roadways is “fair” due to the large stones and wetness. Underground piping has “moderate” limitations due to wetness and restrictive layer.

TUNBRIDGE (TuC, TuD)

(Frigid Coarse-loamy Typic Haplorthods)

SETTING

Parent Material: Loamy glacial till

Landform: Glaciated uplands

Position in Landscape: Uppermost landforms, sideslopes, shoulders, ridge crests

Slope Gradient Ranges: (C) 8-15% (D) 15-25%

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Well drained

Typical Profile :

Surface layer:	Dark brown fine sandy loam, 2”
Subsurface layer:	Grayish brown fine sandy loam, 3”
Subsoil layer:	Dark reddish brown loam, 14”
Substratum:	Dark grayish brown gravelly fine sandy loam, 28”

Hydrologic Group: C

Surface Runoff: Slow to rapid, depending upon slope gradient

Permeability: Moderate to moderately rapid

Depth to Bedrock: Moderately deep, 20 to 40” to bedrock surface

Hazard to Flooding: None

INCLUSIONS WITHIN MAPPING UNIT

Similar: Lyman, Abram, Becket Variant (with less than 60” to bedrock)

Contrasting: Dixfield

USE AND MANAGEMENT

The limiting factor for building site development is the depth to bedrock (<40”) within this complex. Blasting or ripping of the bedrock is necessary for deep excavation. This unit also possesses field stones of various sizes which may require special management practices to work in these areas.

WESTBURY (WeB)

(Frigid Typic Fragiaquods)

SETTING

Parent Material: Glacial till materials

Landform: Low areas on glaciated uplands

Position in Landscape: Low to intermediate positions

Slope Gradient Ranges: (B) 3-8%

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Somewhat poorly drained

Typical Profile:

Surface layer:	Very dark gray gravelly sandy loam, 8”
Subsurface layer:	Yellowish brown gravelly sandy loam, 15”
Subsoil layer:	Gray gravelly sandy loam, 20”; Brown firm gravelly sandy loam, 41”
Substratum:	Yellowish brown firm gravelly loamy sand, 60”

Hydrologic Group: D

Surface Runoff: Low to moderate

Permeability: Moderately in the solum, slow to very slow in the substratum

Depth to Bedrock: Very deep, >60”

Hazard to Flooding: None

INCLUSIONS WITHIN MAPPING UNITS

Similar: Skerry Variant (with bedrock less than 60”), Becket

Contrasting: Naumburg

USE AND MANAGEMENT

Development with subsurface wastewater disposal is “poor” due to a seasonal high water table within 15 inches. Westbury soils also possess large stones that may require blasting or large construction equipment to remove for building site construction. Proper foundation drainage or site modification is recommended for construction. Use of this soil for roadways is “fair” due to the large stones and wetness.

APPENDIX D

SOIL TEST PITS

FORM F

21397

SOIL PROFILE/CLASSIFICATION INFORMATION

Detailed Description of Subsurface Conditions at Project Sites

Project Name:	Applicant Name:	Project Location (municipality):
78 RAYMOND CAPE ROAD	BRANDON CHASE	RAYMOND

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: **TP-1** ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
GRAVELLY SANDY LOAM	FRIABLE	10YR 4/6 DARK YELLOWISH BROWN	NONE OBSERVED
COARSE SAND WITH STONES		2.5Y 5/6 LIGHT OLIVE BROWN	
MEDIUM SAND WITH STONES		2.5Y 5/4 LIGHT OLIVE BROWN	
FINE SAND WITH STONES		2.5Y 6/3 LIGHT YELLOWISH BROWN	

LEDGE AT 108"

hydric	non-hydric	Slope %	Limiting factor	ground water	restrictive layer	bedrock
☐	■	8-15	108"	☐	■	☐

L.S.S Soil Series / phase name: HERMON | SED (Drainage Class) | A (Hydrologic Group)

L.S.E. Soil Classification: 4 (Profile) | B (Drainage Class)

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: **TP-2** ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
SANDY LOAM	FRIABLE	10YR 4/6 DARK YELLOWISH BROWN	NONE OBSERVED
GRAVELLY LOAMY SAND		2.5Y 5/6 LIGHT OLIVE BROWN	
LOAMY FINE SAND WITH ROTTEN ROCK	FIRM	5Y 6/2 LIGHT OLIVE GRAY	

LIMIT OF EXCAVATION = 65"

hydric	non-hydric	Slope %	Limiting factor	ground water	restrictive layer	bedrock
☐	■	3-8	35"	☐	■	☐

L.S.S Soil Series / phase name: BECKET | WD (Drainage Class) | C (Hydrologic Group)

L.S.E. Soil Classification: 3 (Profile) | C (Drainage Class)

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: **TP-3** ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
SANDY LOAM	FRIABLE	10YR 4/6 DARK YELLOWISH BROWN	NONE OBSERVED
		10YR 5/6 YELLOWISH BROWN	
LOAMY SAND	FIRM	2.5Y 6/2 LIGHT BROWNISH GRAY	

LIMIT OF EXCAVATION = 60"

hydric	non-hydric	Slope %	Limiting factor	ground water	restrictive layer	bedrock
☐	■	3-8	22"	☐	■	☐

L.S.S Soil Series / phase name: BECKET | WD (Drainage Class) | C (Hydrologic Group)

L.S.E. Soil Classification: 3 (Profile) | C (Drainage Class)

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: **TP-4** ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
FINE SANDY LOAM	FRIABLE	10YR 4/6 DARK YELLOWISH BROWN	NONE OBSERVED
LOAMY SAND		2.5Y 5/6 LIGHT OLIVE BROWN	
	FIRM	2.5Y 6/2 LIGHT BROWNISH GRAY	

LEDGE AT 52"

hydric	non-hydric	Slope %	Limiting factor	ground water	restrictive layer	bedrock
☐	■	3-8	26"	☐	■	☐

L.S.S Soil Series / phase name: BECKET VARIANT | WD (Drainage Class) | C (Hydrologic Group)

L.S.E. Soil Classification: 3 (Profile) | C (Drainage Class)

Professional Endorsements *(as applicable)*

L.S.S	signature: Anna K. Biddle	Date:	2/10/22
	name printed/typed: Anna K. Biddle	Lic.#:	639
L.S.E.	signature: Gary M. Fullerton	Date:	2/10/22
	name printed/typed: Gary M. Fullerton	Lic.#:	355

affix professional seal

FORM F 21397

SOIL PROFILE/CLASSIFICATION INFORMATION

Detailed Description of Subsurface Conditions at Project Sites

Project Name:	Applicant Name:	Project Location (municipality):
78 RAYMOND CAPE ROAD	BRANDON CHASE	RAYMOND

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-5 ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
FINE SANDY LOAM	FRIABLE	10YR 5/4 YELLOWISH BROWN	NONE OBSERVED
GRAVELLY SANDY LOAM		2.5Y 5/6 LIGHT OLIVE BROWN	
GRAVELLY LOAMY FINE SAND	FIRM	2.5Y 6/4 LIGHT YELLOWISH BROWN	
		2.5Y 6/1 GRAY	
LIMIT OF EXCAVATION = 60"			

hydric	non-hydric	Slope %	Limiting factor	ground water	restrictive layer	bedrock
☐	■	3-8	28"	☐	■	☐

L.S.S Soil Series / phase name: BECKET | Drainage Class: WD | Hydrologic Group: C

L.S.E. Soil Classification: 3 (Profile) | C (Drainage Class)

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-6 ■ Test Pit ☐ Boring

2-3 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
FINE SANDY LOAM	FRIABLE	10YR 4/4 DARK YELLOWISH BROWN	NONE OBSERVED
GRAVELLY FINE SANDY LOAM		10YR 5/4 YELLOWISH BROWN	
GRAVELLY SANDY LOAM WITH STONES		2.5Y 5/4 LIGHT OLIVE BROWN	
LEDGE AT 38"			

hydric	non-hydric	Slope %	Limiting factor	ground water	restrictive layer	bedrock
☐	■	3-8	38"	☐	☐	■

L.S.S Soil Series / phase name: TUNBRIDGE | Drainage Class: WD | Hydrologic Group: C

L.S.E. Soil Classification: 2 (Profile) | AIII (Drainage Class)

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-7 ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
SANDY LOAM	FRIABLE	10YR 5/4 YELLOWISH BROWN	NONE OBSERVED
FINE SANDY LOAM		10YR 4/4 DARK YELLOWISH BROWN	
GRAVELLY SANDY LOAM WITH STONES	FIRM	2.5Y 5/6 (VARIES) LIGHT OLIVE BROWN	
ASSUMED LEDGE AT 56"			

hydric	non-hydric	Slope %	Limiting factor	ground water	restrictive layer	bedrock
☐	■	3-8	16"	☐	■	☐

L.S.S Soil Series / phase name: BECKET VARIANT | Drainage Class: WD | Hydrologic Group: C

L.S.E. Soil Classification: 3 (Profile) | C (Drainage Class)

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-8 ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
FINE SANDY LOAM	FRIABLE	7.5YR 3/3 DARK BROWN	NONE OBSERVED
GRAVELLY SANDY LOAM WITH STONES		10YR 4/4 DARK YELLOWISH BROWN	
LEDGE AT 24"			

hydric	non-hydric	Slope %	Limiting factor	ground water	restrictive layer	bedrock
☐	■	0-3	24"	☐	☐	■

L.S.S Soil Series / phase name: TUNBRIDGE | Drainage Class: WD | Hydrologic Group: C

L.S.E. Soil Classification: 2 (Profile) | AIII (Drainage Class)

Professional Endorsements *(as applicable)*

L.S.S	signature: Anna K. Biddle	Date:	2/10/22
	name printed/typed: Anna K. Biddle	Lic.#:	639
L.S.E.	signature: Gary M. Fullerton	Date:	2/10/22
	name printed/typed: Gary M. Fullerton	Lic.#:	355

STATE OF MAINE ANNA K. BIDDLE NO. 639 LICENSED SOIL SCIENTIST

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FORM F 21397

SOIL PROFILE/CLASSIFICATION INFORMATION

Detailed Description of Subsurface Conditions at Project Sites

Project Name:	Applicant Name:	Project Location (municipality):
78 RAYMOND CAPE ROAD	BRANDON CHASE	RAYMOND

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-9 ■ Test Pit ☐ Boring

2-3 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
SANDY LOAM	FRIABLE	10YR 4/4 DARK YELLOWISH BROWN	
GRAVELLY SANDY LOAM		2.5Y 5/6 LIGHT OLIVE BROWN	
	FIRM	2.5Y 5/4 LIGHT OLIVE BROWN	COMMON, MEDIUM, AND DISTINCT
LOAMY SAND		2.5Y 6/2 LIGHT BROWNISH GRAY	
LIMIT OF EXCAVATION = 60"			

hydric	non-hydric	Slope %	Limiting factor	ground water	restrictive layer	bedrock
☐	■	3-8	26"	☐	■	☐

L.S.S Soil Series / phase name: SKERRY — Drainage Class: MWD — Hydrologic Group: C

L.S.E. Soil Classification: 3 (Profile) — C (Drainage Class)

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-10 ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
FINE SANDY LOAM	FRIABLE	10YR 4/3 BROWN	NONE OBSERVED
GRAVELLY FINE SANDY LOAM		10YR 5/4 YELLOWISH BROWN	
LEDGE AT 27"			

hydric	non-hydric	Slope %	Limiting factor	ground water	restrictive layer	bedrock
☐	■	3-8	27"	☐	☐	■

L.S.S Soil Series / phase name: TUNBRIDGE — Drainage Class: WD — Hydrologic Group: C

L.S.E. Soil Classification: 2 (Profile) — AIII (Drainage Class) — (Design Class)

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-11 ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
SANDY LOAM	FRIABLE	10R 4/6 DARK YELLOWISH BROWN	NONE OBSERVED
GRAVELLY SANDY LOAM WITH STONES		2.5Y 5/6 LIGHT OLIVE BROWN	
	FIRM	2.5Y 6/3 LIGHT YELLOWISH BROWN	
LOAMY SAND		2.5Y 5/4 LIGHT OLIVE BROWN	
LIMIT OF EXCAVATION = 60"			

hydric	non-hydric	Slope %	Limiting factor	ground water	restrictive layer	bedrock
☐	■	3-8	30"	☐	■	☐

L.S.S Soil Series / phase name: BECKET — Drainage Class: WD — Hydrologic Group: C

L.S.E. Soil Classification: 3 (Profile) — C (Drainage Class)

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-12 ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
COARSE SAND WITH STONES	FRIABLE	2.5Y 5/2 GRAYISH BROWN	MANY, COARSE, AND PROMINENT
VERY FINE SAND			
FINE SANDY LOAM	FIRM		
LIMIT OF EXCAVATION = 42"			

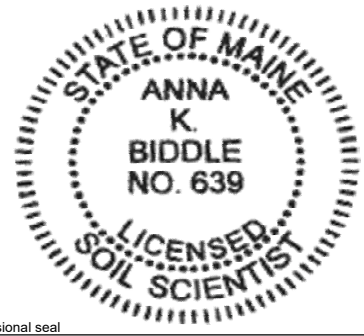
hydric	non-hydric	Slope %	Limiting factor	ground water	restrictive layer	bedrock
■	☐	0-3	0"	■	☐	☐

L.S.S Soil Series / phase name: NAUMBURG VARIANT — Drainage Class: PD — Hydrologic Group: D

L.S.E. Soil Classification: 5 (Profile) — E (Drainage Class)

Professional Endorsements *(as applicable)*

L.S.S	signature: Anna K. Biddle	Date: 2/10/22
	name printed/typed: Anna K. Biddle	Lic.#: 639
L.S.E.	signature: Gary M. Fullerton	Date: 2/10/22
	name printed/typed: Gary M. Fullerton	Lic.#: 355



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FORM F 21397

SOIL PROFILE/CLASSIFICATION INFORMATION

Detailed Description of Subsurface Conditions at Project Sites

Project Name:	Applicant Name:	Project Location (municipality):
78 RAYMOND CAPE ROAD	BRANDON CHASE	RAYMOND

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-13 ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
FINE SANDY LOAM	FRIABLE	10YR 5/6 YELLOWISH BROWN	
SANDY LOAM WITH STONES	FIRM	2.5Y 5/4 LIGHT OLIVE BROWN	COMMON, MEDIUM, AND DISTINCT

LIMIT OF EXCAVATION = 60"

hydric	non-hydric	Slope %	Limiting factor	ground water	restrictive layer	bedrock
☐	■	3-8	28"	☐	■	☐

L.S.S Soil Series / phase name: SKERRY — Drainage Class: MWD — Hydrologic Group: C

L.S.E. Soil Classification: Profile: 3 — Drainage Class: C

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-14 ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
FINE SANDY LOAM WITH STONES	FRIABLE	10YR 5/6 YELLOWISH BROWN	
		2.5Y 5/4 LIGHT OLIVE BROWN	COMMON, MEDIUM, AND DISTINCT
SANDY LOAM WITH STONES	FIRM	5Y 5/2 OLIVE GRAY	MANY, COARSE, AND PROMINENT

LIMIT OF EXCAVATION = 92"

hydric	non-hydric	Slope %	Limiting factor	ground water	restrictive layer	bedrock
☐	■	3-8	16"	■	☐	☐

L.S.S Soil Series / phase name: SKERRY — Drainage Class: MWD — Hydrologic Group: D

L.S.E. Soil Classification: Profile: 3 — Drainage Class: C

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-15 ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
COBBLY FINE SANDY LOAM	FRIABLE	10YR 4/6 DARK YELLOWISH BROWN	NONE OBSERVED

LEDGE AT 26"

hydric	non-hydric	Slope %	Limiting factor	ground water	restrictive layer	bedrock
☐	■	8-15	26"	☐	☐	■

L.S.S Soil Series / phase name: TUNBRIDGE — Drainage Class: WD — Hydrologic Group: C

L.S.E. Soil Classification: Profile: 2 — Drainage Class: AIII

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-16 ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
FINE SANDY LOAM	FRIABLE	10YR 4/6 DARK YELLOWISH BROWN	NONE OBSERVED
SANDY LOAM WITH STONES		2.5Y 5/6 LIGHT OLIVE BROWN	
	FIRM	5Y 5/2 OLIVE GRAY	

LIMIT OF EXCAVATION = 60"

hydric	non-hydric	Slope %	Limiting factor	ground water	restrictive layer	bedrock
☐	■	3-8	30"	☐	■	☐

L.S.S Soil Series / phase name: BECKET — Drainage Class: WD — Hydrologic Group: C

L.S.E. Soil Classification: Profile: 3 — Drainage Class: C

Professional Endorsements *(as applicable)*

L.S.S signature: Anna K. Biddle — Date: 2/10/22

name printed/typed: Anna K. Biddle — Lic.#: 639

L.S.E. signature: Gary M. Fullerton — Date: 2/10/22

name printed/typed: Gary M. Fullerton — Lic.#: 355

STATE OF MAINE ANNA K. BIDDLE NO. 639 LICENSED SOIL SCIENTIST

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FORM F 21397

SOIL PROFILE/CLASSIFICATION INFORMATION

Detailed Description of Subsurface Conditions at Project Sites

Project Name:	Applicant Name:	Project Location (municipality):
78 RAYMOND CAPE ROAD	BRANDON CHASE	RAYMOND

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-17 ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
FINE SANDY LOAM	FRIABLE	10YR 4/6 DARK YELLOWISH BROWN	NONE OBSERVED
SANDY LOAM WITH STONES		2.5Y 5/4 LIGHT OLIVE BROWN	
LEDGE AT 30"			

☐ hydric ■ non-hydric | Slope %: 3-8 | Limiting factor: 30" | ☐ ground water ☐ restrictive layer ■ bedrock

L.S.S Soil Series / phase name: TUNBRIDGE | Drainage Class: WD | Hydrologic Group: C

L.S.E. Soil Classification: Profile: 2 | Drainage Class: AIII

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-18 ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
FINE SANDY LOAM	FRIABLE	10YR 4/6 DARK YELLOWISH BROWN	
		2.5Y 5/4 LIGHT OLIVE BROWN	
LOAMY SAND	SOMEWHAT FIRM	2.5Y 5/2 GRAYISH BROWN	COMMON, MEDIUM, AND DISTINCT
LEDGE AT 38"			

☐ hydric ■ non-hydric | Slope %: 3-8 | Limiting factor: 24" | ■ ground water ☐ restrictive layer ☐ bedrock

L.S.S Soil Series / phase name: SKERRY VARIANT | Drainage Class: MWD | Hydrologic Group: D

L.S.E. Soil Classification: Profile: 3 | Drainage Class: C

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-19 ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
SANDY LOAM	FRIABLE	10YR 4/6 DARK YELLOWISH BROWN	NONE OBSERVED
GRAVELLY SANDY LOAM WITH STONES		2.5Y 5/6 LIGHT OLIVE BROWN	
	FIRM	2.5Y 5/2 GRAYISH BROWN	
LIMIT OF EXCAVATION = 54"			

☐ hydric ■ non-hydric | Slope %: 3-8 | Limiting factor: 24" | ☐ ground water ■ restrictive layer ☐ bedrock

L.S.S Soil Series / phase name: BECKET | Drainage Class: WD | Hydrologic Group: C

L.S.E. Soil Classification: Profile: 3 | Drainage Class: C

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-20 ■ Test Pit ☐ Boring

2-3 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
SANDY LOAM WITH COARSE SAND LENSES	FRIABLE	2.5Y 5/3 LIGHT OLIVE BROWN	
		2.5Y 5/4 LIGHT OLIVE BROWN	MANY, COARSE, AND PROMINENT
	FIRM	2.5Y 5/2 GRAYISH BROWN	
LIMIT OF EXCAVATION = 48"			

☐ hydric ■ non-hydric | Slope %: 3-8 | Limiting factor: 13" | ■ ground water ☐ restrictive layer ☐ bedrock

L.S.S Soil Series / phase name: WESTBURY | Drainage Class: SPD | Hydrologic Group: D

L.S.E. Soil Classification: Profile: 3 | Drainage Class: D

Professional Endorsements *(as applicable)*

L.S.S signature: Anna K. Biddle | Date: 2/10/22

name printed/typed: Anna K. Biddle | Lic.#: 639

L.S.E. signature: Gary M. Fullerton | Date: 2/10/22

name printed/typed: Gary M. Fullerton | Lic.#: 355

STATE OF MAINE ANNA K. BIDDLE NO. 639 LICENSED SOIL SCIENTIST

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FORM F 21397

SOIL PROFILE/CLASSIFICATION INFORMATION

Detailed Description of Subsurface Conditions at Project Sites

Project Name:	Applicant Name:	Project Location (municipality):
78 RAYMOND CAPE ROAD	BRANDON CHASE	RAYMOND

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: BOR-21 ☐ Test Pit ■ Boring

>48" " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Depth	Texture	Consistence	Color	Redox
0–48	SAPRIC ORGANIC	FRIABLE	2.5Y 2.5/1 BLACK	NONE OBSERVED

LIMIT OF EXCAVATION = 48"

■ hydric ☐ non-hydric	Slope %	Limiting factor	■ ground water ☐ restrictive layer ☐ bedrock
	0-3	0"	

L.S.S Soil Series / phase name: SEBAGO — VPD (Drainage Class) — D (Hydrologic Group)

L.S.E. Soil Classification: 10 (Profile) — E (Drainage Class)

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: ______ ☐ Test Pit ☐ Boring

______" Depth of Organic Horizon Above Mineral Soil

Texture	Consistence	Color	Redox

☐ hydric ☐ non-hydric — Slope % ______ — Limiting factor ______ — ☐ ground water ☐ restrictive layer ☐ bedrock

L.S.S Soil Series / phase name: ______ Drainage Class ______ Hydrologic Group

L.S.E. Soil Classification: ______ Profile ______ Drainage Class ______ Design Class

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: ______ ☐ Test Pit ☐ Boring

______" Depth of Organic Horizon Above Mineral Soil

Texture	Consistence	Color	Redox

☐ hydric ☐ non-hydric — Slope % ______ — Limiting factor ______ — ☐ ground water ☐ restrictive layer ☐ bedrock

L.S.S Soil Series / phase name: ______ Drainage Class ______ Hydrologic Group

L.S.E. Soil Classification: ______ Profile ______ Drainage Class ______ Design Class

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: ______ ☐ Test Pit ☐ Boring

______" Depth of Organic Horizon Above Mineral Soil

Texture	Consistence	Color	Redox

☐ hydric ☐ non-hydric — Slope % ______ — Limiting factor ______ — ☐ ground water ☐ restrictive layer ☐ bedrock

L.S.S Soil Series / phase name: ______ Drainage Class ______ Hydrologic Group

L.S.E. Soil Classification: ______ Profile ______ Drainage Class ______ Design Class

Professional Endorsements *(as applicable)*

L.S.S	signature: [signature]	Date: 2/10/22
	name printed/typed: Anna K. Biddle	Lic.#: 639
L.S.E.	signature: [signature]	Date: 2/10/22
	name printed/typed: Gary M. Fullerton	Lic.#: 355

STATE OF MAINE ANNA K. BIDDLE NO. 639 LICENSED SOIL SCIENTIST

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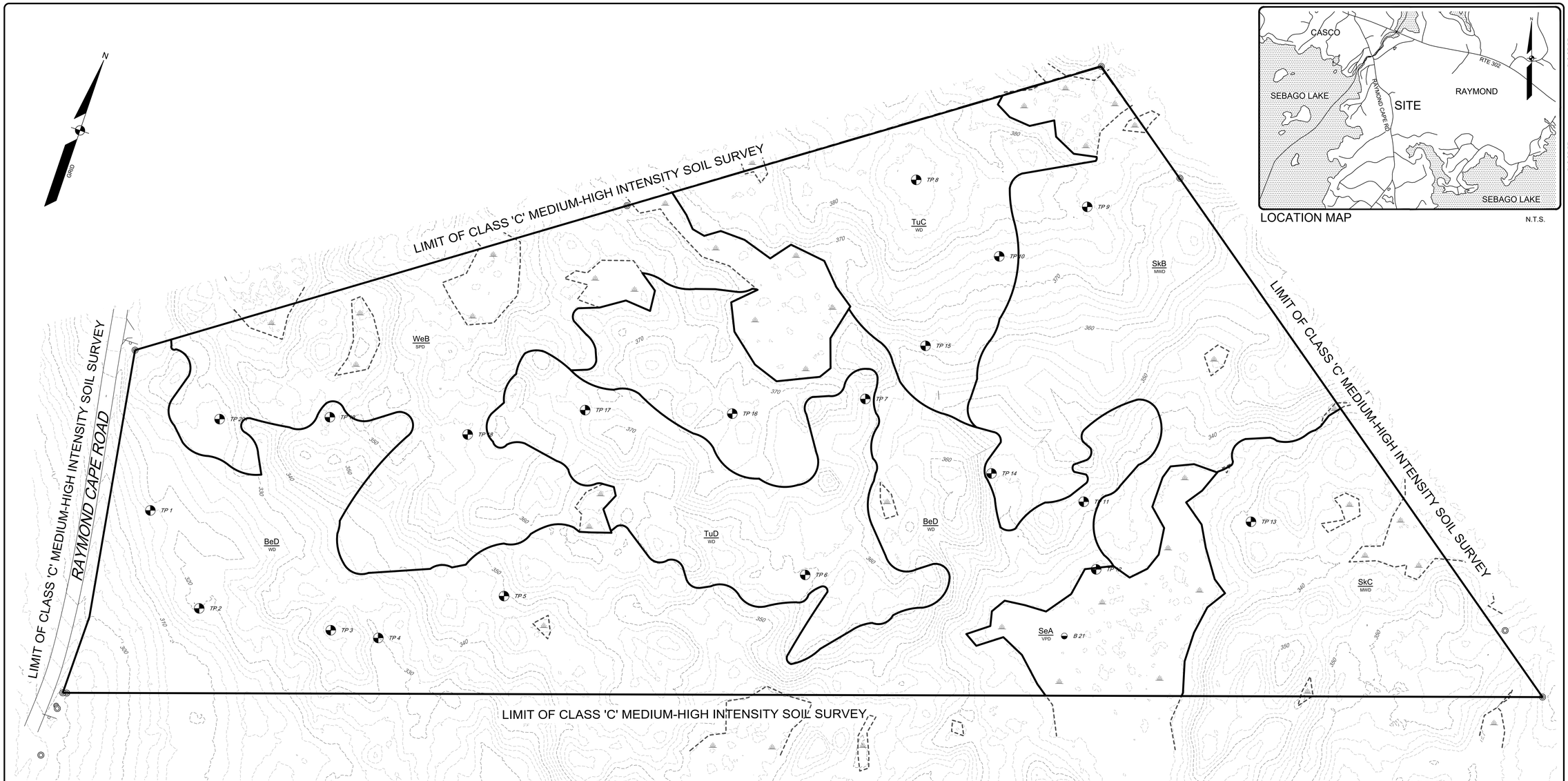
Sebago Technics, Inc.

APPENDIX E

CLASS ‘C’ MEDIUM HIGH INTENSITY SOIL MAP



LOCATION MAP N.T.S.

GRAPHIC SCALE

80 0 40 80 160

(IN FEET)
1 INCH = 80 FT.

LEGEND

EXISTING	DESCRIPTION	PROPOSED
	PROPERTY LINE/R.O.W.	
	ABUTTER LINE/R.O.W.	
	EASEMENT	
	SOIL MAP UNITS	
TP 1	TEST PIT	
B-1	BORING	
	BUILDING	
	EDGE WETLAND	
	WETLANDS	
	EDGE PAVEMENT	
	EDGE GRAVEL	
	TREELINE	
120	CONTOURS	118

SOIL LEGEND

SYMBOL	SOIL SERIES	PHASE	SLOPE	HSG	DRAINAGE CLASS
BeD	BECKET	SANDY LOAM	15-25%	C	WD (WELL DRAINED)
SeA	SEBAGO	MUCKY PEAT	0-3%	D	VPD (VERY POORLY DRAINED)
SkB	SKERRY	FINE SANDY LOAM	3-8%	C	MWD (MODERATELY WELL DRAINED)
SkC	SKERRY	FINE SANDY LOAM	8-15%	C	MWD (MODERATELY WELL DRAINED)
TuC	TUNBRIDGE	FINE SANDY LOAM	8-15%	C	WD (WELL DRAINED)
TuD	TUNBRIDGE	FINE SANDY LOAM	15-25%	C	WD (WELL DRAINED)
WeB	WESTBURY	SANDY LOAM	3-8%	D	SPD (SOMEWHAT POORLY DRAINED)

NOTE

THIS CLASS 'C' MEDIUM- HIGH INTENSITY SOIL MAP CONFORMS TO THE GUIDELINES FOR MAINE CERTIFIED SOIL SCIENTISTS FOR SOIL IDENTIFICATION AND MAPPING, DATED MARCH 2009 FOR CLASS 'C' MEDIUM-HIGH INTENSITY SOIL SURVEYS. THE SOIL MAP UNITS AS DEPICTED WERE IN PART INFLUENCED BY THE INTENDED USE FOR A PROPOSED RESIDENTIAL SUBDIVISION AND THE SOILS WHICH WERE NON-LIMITING FOR ONE USE MAY BE CONSIDERED LIMITING FOR ANOTHER USE. THEREFORE, THIS CLASS 'C' MEDIUM-HIGH INTENSITY SOILS MAP MAY NOT BE ADEQUATE FOR ANOTHER USE. (REFER TO SOIL NARRATIVE REPORT DATED MARCH 11, 2022 AND SOIL PROFILE DESCRIPTIONS.)

STATE OF MAINE
ANNA K. BIDDLE
NO. 639
LICENSED SOIL SCIENTIST

ANNA K. BIDDLE
LICENSED SOIL SCIENTIST #639

03/11/22
DATE

PLS OR PE

PLS OR PE

PROGRESS PRINT

NOT FOR CONSTRUCTION

REV.	BY	DATE	STATUS
A	AKB	03/11/2022	ISSUED TO CLIENT
REV.	BY	DATE	STATUS

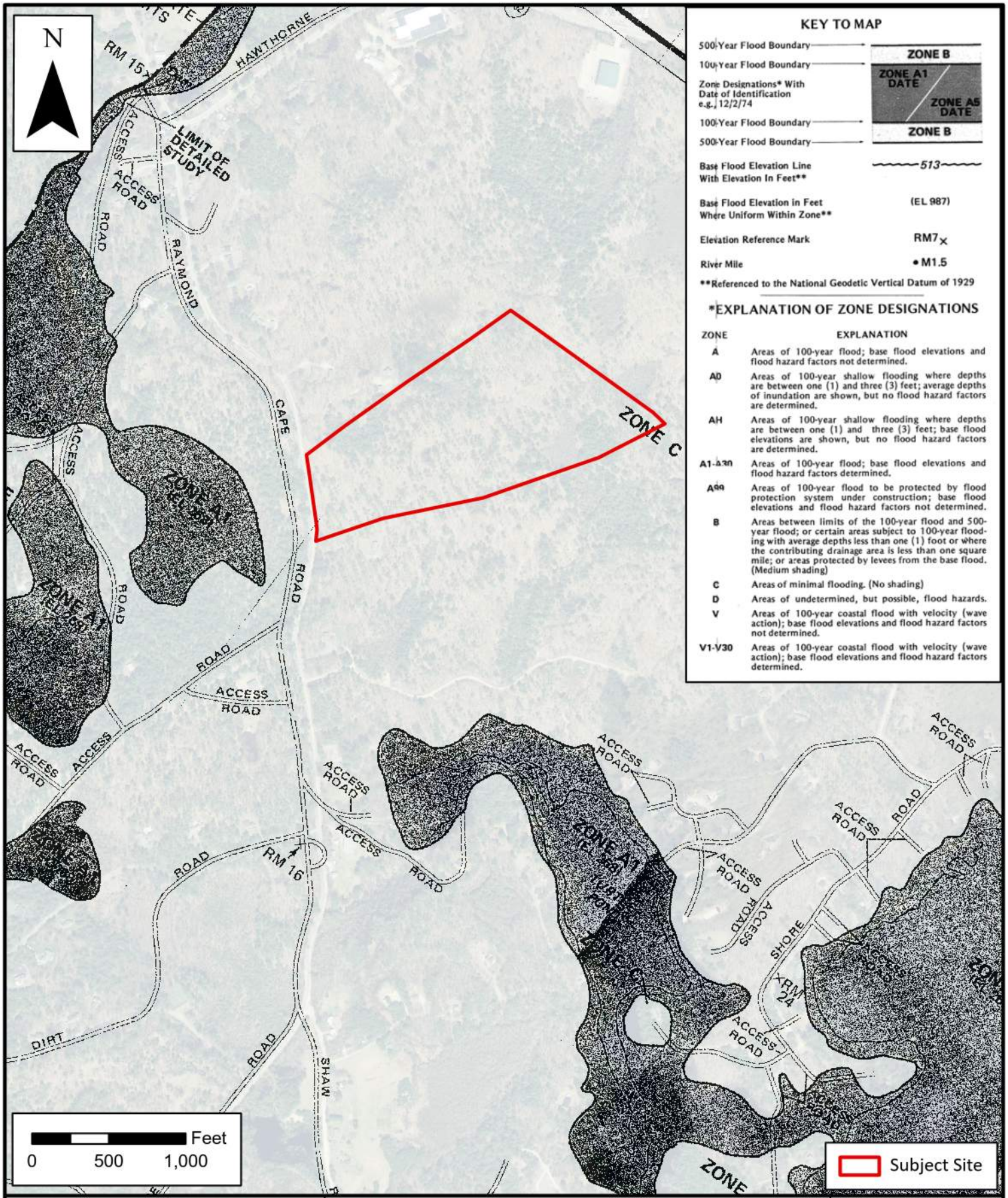
SEBAGO TECHNICS
WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd.
Suite A
South Portland, ME 04106
Tel. 207-200-2100

CLASS 'C' MEDIUM-HIGH INTENSITY SOIL SURVEY
OF:
78 RAYMOND CAPE ROAD
78 RAYMOND CAPE ROAD
RAYMOND, ME 04071
FOR:
BRANDON CHASE
15 WASHINGTON COURT
NAPLES, ME 04055

DESIGNED	AKB
DRAWN	DAB
CHECKED	AKB
DATE	11/19/21
SCALE	1" = 80'
PROJECT	21397

SHEET 1 OF 1

21397 SL.dwg, TAB Soils Map



SEBAGO TECHNICS

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75 John Roberts Rd. - Suite 4A
South Portland, ME 04106
Tel. 207-200-2100

FEMA NATIONAL FLOOD HAZARDS

RAYMOND CAPE ROAD SUBDIVISION

SCALE: 1:10,000

DATE: 3/7/2022

LOCATION:
RAYMOND CAPE ROAD
RAYMOND, MAINE 04071

INFORMATION:
2018 ORTHOREGIONAL IMAGERY
FEMA FIRM PANEL 230205 0020 B 1981