BAKER DESIGN CONSULTANTS
Civil, Marine, & Structural Engineering

5/5/2020

Hannah Brazier
MaineDEP Bureau Land Resources
17 State House Station
Augusta, ME 04333-0017

Nicole Briand
Town of Bowdoinham
13 School Street
Bowdoinham, Maine 04008

LeeAnn Neal
US Army Corps of Engineers
Maine Project Office
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Subject: Town of Bowdoinham Waterfront Plan – Phase I; **NRPA Individual Permit Application** and **NRPA Permit-By Rule Application**
8 River Road; Bowdoinham, Maine

Dear Regulatory Permit Representative,

Please find enclosed a copy of the NRPA applications for a **PBR** under **Section 15 – Public Boat Ramps** and for an **Individual Permit** for the **Shoreline Stabilization** project, located at 8 River Road (Route 24) on the Cathance River in Bowdoinham, Maine.

1. MaineDEP has already received the appropriate application fees from the Town under check #18922. This included fees for the NRPA Individual Permit, a NRPA PBR for Public Boat Ramps and a Stormwater PBR. Since the Town's submission of the application fees, MaineDEP has determined that the Stormwater PBR is not required for these projects.
2. MaineDEP is being provided with electronic (PDF) copies of the NRPA Individual Permit, and NRPA PBR applications via email to DEP.LandApplication@maine.gov and to DEP.PBRNotification@maine.gov respectively. Permitting drawings for both projects are being included as developed under one design effort supported by the Maine Coastal Program. Please reference the work related to the shoreline stabilization effort and the public boat ramp effort with their respective permit applications and don't hesitate to contact us if you need clarification.
3. Separate correspondence has been submitted to Maine Historic Preservation Commission with request that they respond identifying impacts. Their response is also included.
4. The Army Corps of Engineers has been provided with a complete copy of the applications and one copy of the complete drawing set, NOAA and USF&W Threatened & Endangered Species lists, and notices to the Maine Tribal Nations and MaineHPC. Responses received to-date are also included.
5. The Town of Bowdoinham has been provided with a complete copy of the applications to have on file for public review and to support the submitted Shoreland Zoning Permit and Site Plan Review permit applications currently under review by the Town's Planning Board.
6. A Public Notice has been placed in The Times Record and abutting property owners have been notified by certified mail.
7. A Submerged Lands Lease is required for the Public Boat Ramp with portions of the ramp and seasonal float system extending below MLW. A Submerged Lands Lease is not required for the

shoreline stabilization project as it does not extend beyond MLW. A copy of the NRPA PBR application has been sent to the Submerged Lands Bureau.

On behalf of the client, we appreciate early permit consideration on the applications. Please do not hesitate to call us with any questions or comments.

Sincerely,

BAKER DESIGN CONSULTANTS, Inc.

Travis Pryor, LEED-AP
Project Manager

JN: 18-20

CC: Barney Baker, PE – BDC

NRPA Individual Permit Application

Town of Bowdoinham Waterfront Plan – Phase I

Bowdoinham, Maine

Applicant:
Town of Bowdoinham
Attn: Nicole Briand, Planning & Development Director
13 School Street
Bowdoinham, ME 04008

Submitted To:
Maine Dept. of Environmental Protection
Bureau of Land Resources
Central Maine Regional Office
17 State House Station
Augusta, ME 04333-0017

BAKER DESIGN CONSULTANTS
Civil, Marine, and Structural Engineering
7 Spruce Road, Freeport, ME 04032

Baker Design Consultants
7 Spruce Road
Freeport, Maine 04032
207-846-9724
b.baker@bakerdesignconsultants.com

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Part I – NRPA Individual Permit Application

Department of Environmental Protection
Bureau of Land & Water Quality
17 State House Station
Augusta, Maine 04333
Telephone: 207-287-7688

FOR DEP USE _____
ATS # _____
L- _____
Total Fees: _____
Date: Received _____

APPLICATION FOR A NATURAL RESOURCES PROTECTION ACT PERMIT

➔**PLEASE TYPE OR PRINT IN *BLACK INK ONLY***

1. Name of Applicant:	Town of Bowdoinham	**5. Name of Agent:**	Travis Pryor, LEED-AP Baker Design Consultants
2. Applicant's Mailing Address:	13 School St, Bowdoinham, ME 04008	**6. Agent's Mailing Address:**	7 Spruce Road Freeport, Maine 04032
3. Applicant's Daytime Phone:	Contact Agent	**7. Agent's Daytime Phone #:**	(207) 846-9724
4. Applicant's Email Address: (Required from *either* the application or agent)	Contact Agent	**8. Agent's Email Address:**	t.pryor@bakerdesignconsultants.com
9. Location of Activity: (Nearest Road, Street, Rt. #)	8 River Rd (Rte 24)	**10. Town:** Bowdoinham	**11. County:** Sagadahoc

12. Type of Resource: (Check all that apply)	☐ River, stream or brook ☐ Great Pond ☑ Coastal Wetland ☐ Freshwater Wetland ☑Wetland Special Significance ☐ Significant Wildlife Habitat ☐ Fragile Mountain	**13. Name of Resource:**	Cathance River / Adjacent Freshwater
		14. Amount of Impact: (Sq.Ft.)	**Fill:** 150 SF (Coastal) / 1,065 (Fresh)
			Dredging/Veg Removal/Other: 0 (zero)

15. Type of Wetland: (Check all that apply)	☐ Forested ☐ Scrub Shrub ☐ Emergent ☐ Wet Meadow ☐ Peatland ☑ Open Water ☑Other Mowed Lawn	**FOR FRESHWATER WETLANDS:**		
		Tier 1	*Tier 2*	*Tier 3*
		☐ 0 - 4,999 sq. ft. ☐ 5,000 – 9,999 sq. ft. ☐ 10,000 – 14,999 sq. ft.	☐ 15,000 –43,560 sq. ft.	☐ > 43,560 sq. ft. or ☐ Smaller than 43,560 sq. ft., not eligible for Tier 1

16. Proposed Start Date and Brief Activity Description:	The project is expected to start during the Summer of 2020 and be completed by the Fall of 2021. The activity is to stabilize the shoreline with a variety of restoration treatments, and to regevetate the upland areas with a mix of native perennials, shrubs and trees. A 4-ft wide pedestrian access path with overlook spurs to the shoreline meanders through the upland area.				
17. Size of Lot or Parcel & UTM Locations:	☑787,942 square ft, or ☑ acres 18.09±	UTM Northing: 428117.28	UTM Easting: 4873028.01		
18. Title, Right or Interest:	☑ own	☐ lease	☐ purchase option	☐ written agreement	
19. Deed Reference Numbers:	Book#: 1615 / 1649 Page: 321 / 157	**20. Map and Lot Numbers:**	Map #: U01	Lot #: 01	
21. DEP Staff Previously Contacted:	Hannah Brazier – Pre-App March 12, 2020.	**22. Part of a larger project:**	☑Yes ☐No	**After-the-Fact:**	☐ Yes ☑ No

23. Resubmission of Application?	☐ Yes➔ ☑ No	**If yes, previous application #**		**Previous project manager:**	None
24. Written Notice of Violation?	☐ Yes➔ ☑ No	**If yes, name of DEP enforcement staff involved:**		**25. Previous Wetland Alteration:**	☐ Yes ☑No

26. Detailed Directions to the Project Site: From I-295, take exit 37. Head east on Rte 125 1.4 mi. Turn right onto Back Hill Rd 0.1 mi. Merge onto River Road (Rte 24) and the destination is on the right.

27. TIER 1	**TIER 2/3 AND INDIVIDUAL PERMITS**	
☐ Title, right or interest documentation ☐ Topographic Map ☐ Narrative Project Description ☐ Plan or Drawing (8 1/2x11) ☐ Photos of Area ☐ Statement of Avoidance & Minimization ☐ Statement/Copy of cover letter to MHPC	☑ Title, right or interest documentation ☑ Topographic Map ☑ Copy of Public Notice/Public Information Meeting Documentation ☑ Wetlands Delineation Report (Attachment 1) that contains the Information listed under Site Conditions ☑ Alternatives Analysis (Attachment 2) including description of how wetland impacts were Avoided/Minimized	☑ Erosion Control/Construction Plan ☐ Functional Assessment (Attachment 3), if required ☐ Compensation Plan (Attachment 4), if required ☑ Appendix A and others, if required ☑Statement/Copy of cover letter to MHPC ☐ Description of Previously Mined Peatland, if required

28. FEES Amount Enclosed: $423+$106=$529 (4D – Shoreline Stabilization in a Coastal Wetland)

CERTIFICATIONS AND SIGNATURES LOCATED ON PAGE 2

Signature Page

IMPORTANT: IF THE SIGNATURE BELOW IS NOT THE APPLICANT'S SIGNATURE, ATTACH LETTER OF AGENT AUTHORIZATION SIGNED BY THE APPLICANT.

By signing below the applicant (or authorized agent), certifies that he or she has read and understood the following:

DEP SIGNATORY REQUIREMENT

PRIVACY ACT STATEMENT

Authority: 33 USC 401, Section 10; 1413, Section 404. Principal Purpose: These laws require permits authorizing activities in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Disclosure: Disclosure of requested information is voluntary. If information is not provided, however, the permit application cannot be processed nor a permit be issued.

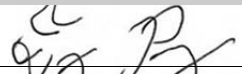
CORPS SIGNATORY REQUIREMENT

USC Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry shall be fines not more than $10,000 or imprisoned not more than five years or both. I authorize the Corps to enter the property that is subject to this application, at reasonable hours, including buildings, structures or conveyances on the property, to determine the accuracy of any information provided herein.

DEP SIGNATORY REQUIREMENT

"I certify under penalty of law that I have personally examined the information submitted in this document and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the information is true, accurate, and complete. I authorize the Department to enter the property that is the subject of this application, at reasonable hours, including buildings, structures or conveyances on the property, to determine the accuracy of any information provided herein. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Further, I hereby authorize the DEP to send me an electronically signed decision on the license I am applying for with this application by emailing the decision to the address located on the front page of this application (see #4 for the applicant and #8 for the agent)."



SIGNATURE OF AGENT/APPLICANT

Date: May 5, 2020

NOTE: Any changes in activity plans must be submitted to the DEP and the Corps in writing and must be approved by both agencies prior to implementation. Failure to do so may result in enforcement action and/or the removal of the unapproved changes to the activity.

Agent Authorization

Town of Bowdoinham
13 School Street
Bowdoinham, ME 04008

By signing below, I authorize Baker Design Consultants to act as agent for the purpose of permit communication on applications filed for proposed shoreline stabilization and hand carry boat launch as part of the Waterfront Plan – Phase I project, located at the Town's former Public Works Facility (Tax Map U01 / Lot 01), 8 River Road (Route 24), Cathance River, Bowdoinham, Maine.

Signed: Nicole Briand

Date: 1/23/2020

Public Notice Filing and Certification

Department Rules, Chapter 2, require an applicant to provide public notice for all Tier 2, Tier 3 and individual Natural Resources Protect Act projects. In the notice, the applicant must describe the proposed activity and where it is located. "Abutter" for the purposes of the notice provision means any person who owns property that is BOTH (1) adjoining and (2) within one mile of the delineated project boundary, including owners of property directly across a public or private right of way.

1. Newspaper: You must publish the Notice of Intent to File in a newspaper circulated in the area where the activity is located. The notice must appear in the newspaper within 30 days prior to the filing of the application with the Department. You may use the attached Notice of Intent to File form, or one containing identical information, for newspaper publication and certified mailing.

   Refer to Attachment 10 Notice of Intent to File.

2. Abutting Property Owners: You must send a copy of the Notice of Intent to File by certified mail to the owners of the property abutting the activity. Their names and addresses can be obtained from the town tax maps or local officials. They must receive notice within 30 days prior to the filing of the application with the Department.

   Refer to next page for a list of abutting property owners.

3. Municipal Office: You must send a copy of the Notice of Intent to File and a duplicate of the entire application to the Municipal Office.

   A Notice of Intent to File and a duplicate of the entire application has been sent to the Bowdoinham Town Office, attention Nicole Briand, Director of Planning and Development.

CERTIFICATION

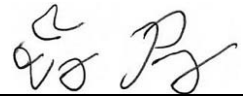
By signing below, the applicant or authorized agent certifies that:

1. A Notice of Intent to File was published in a newspaper circulated in the area where the project site is located within 30 days prior to filing the application;
2. A certified mailing of the Notice of Intent to File was sent to all abutters within 30 days of the filing of the application;
3. A certified mailing of the Notice of Intent to File, and a duplicate copy of the application was sent to the town office of the municipality in which the project is located; and
4. Provided notice of and held a public informational meeting, if required, in accordance with Chapter 2, Rules Concerning the Processing of Applications, Section 13, prior to filing the application. Notice of the meeting was sent by certified mail to abutters and to the town office of the municipality in which the project is located at least ten days prior to the meeting. Notice of the meeting was also published once in a newspaper circulated in the area where the project site is located at least seven days prior to the meeting.

The Public Informational Meeting was held on _____ (Date).

Approximately _____ members of the public attended the Public Informational Meeting.

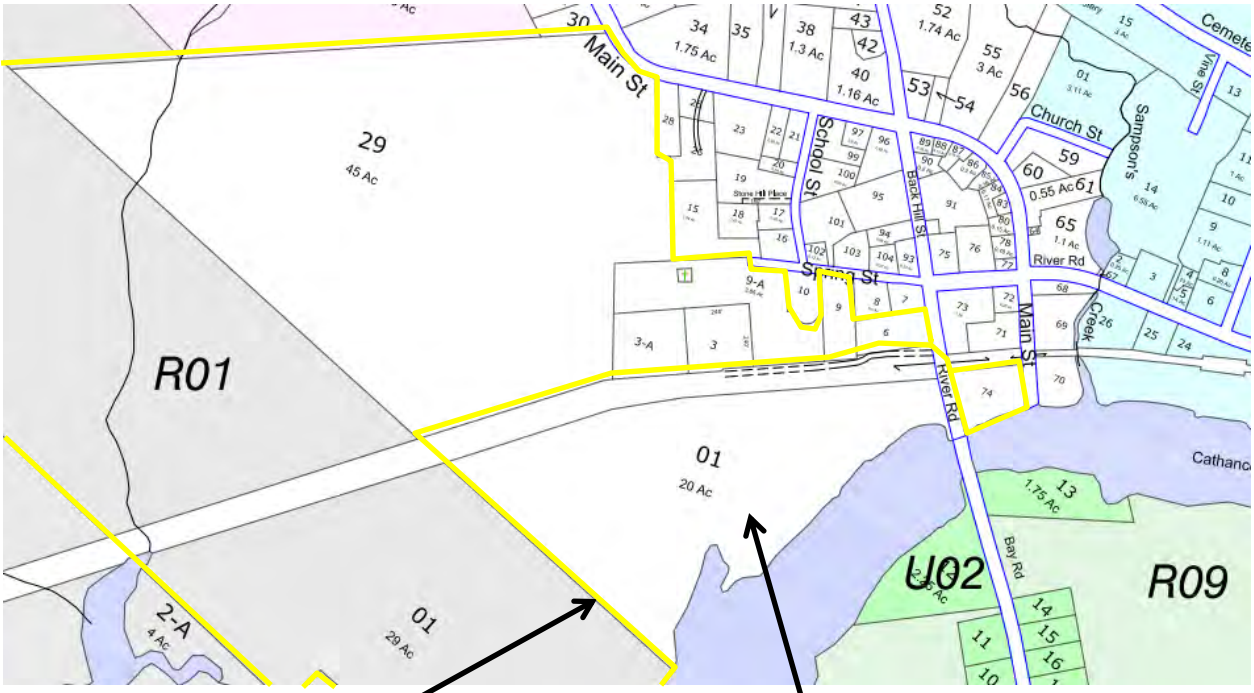
A Public Meeting is not required for this application. The project will have local review and comment as part of the Town of Bowdoinham's permit review and approval process.



May 7, 2020

Signature of Application or Authorized Agent — Date

Abutting Property Owners



Portion of Bowdoinham Tax Map U01

Name	Map	Lot	Physical Address	Mailing Address
GRAVIETT, TERRY D GRAVIETT, ELAINE JT	R01	1	(?)FISHER RD BOWDOINHAM ME 04008	P.O. BOX 59 BOWDOINHAM ME 04008
GARLAND, GEORGE GARLAND, ELSIE	U01	29	88 MAIN ST BOWDOINHAM ME 04008	10125 E LAMBERT DR SUNLAKES AZ 85248
SULLIVAN, JESSICA SULLIVAN, JOHN	U01	3-A	19 RAILROAD AVE BOWDOINHAM ME 04008	19 RAILROAD AVE BOWDOINHAM ME 04008
BENJAMIN, RAY	U01	3	17 RAILROAD AVENUE BOWDOINHAM ME 04008	17 RAILROAD AVENUE BOWDOINHAM ME 04008
TEMPLE, CALVIN W TEMPLE, JEWEL A JT	U01	9-A	28 SPRING ST BOWDOINHAM ME 04008	28 SPRING ST BOWDOINHAM ME 04008
READ, CHRISTOPHER A READ, KAREN S JT	U01	9	14 SPRING STREET BOWDOINHAM ME 04008	14 SPRING STREET BOWDOINHAM ME 04008
THOMPSON, PATRICK (JT) THOMPSON, BROOKE	U01	6	18 RIVER RD BOWDOINHAM ME 04008	18 RIVER RD BOWDOINHAM ME 04008
Town of Bowdoinham	U01	74	1 Main St	13 School St

Abutter Information

Right, Title or Interest

The following documents are provided to show right, title or interest for the project.

- Warrantee Deed: Sagadahoc County Registry of Deeds, Book 1615, Pages 321-324

WARRANTY DEED

08135

CENTRAL CHEMICAL CORPORATION (NEW ENGLAND) INC., a Connecticut corporation with a place of business at Hagerstown, County of Washington, State of Maryland, for consideration paid, grants to the INHABITANTS OF THE TOWN OF BOWDOINHAM, a municipal corporation situated in County of Sagadahoc, State of Maine, with Warranty Covenants, the land and buildings thereon situated in Bowdoinham, Sagadahoc County, Maine, described as follows:

A certain parcel of land with buildings thereon, situated on the southwesterly side of River Road (a.k.a. Route 24), and the northwesterly side of the Cathance River, in the Town of Bowdoinham, County of Sagadahoc, State of Maine, and being more particularly described as follows:

Beginning on the southwesterly sideline of River Road (a.k.a. Route 24), at the southeasterly corner of land now or formerly of the State of Maine as described in deed recorded in Sagadahoc County Registry of Deeds Book 1050, Page 86, and formerly of Maine Central Railroad Company as described in deed recorded in said Registry Book 93, Page 424, and Book 43, Page 316;

Thence southeasterly along a curve to the left, following the southwest sideline of the River Road, one hundred and one hundredth feet (100.01') to an iron rod set; said curve has a radius of one thousand nine hundred forty-three and eight hundredths feet (1943.08'), a delta angle of two degrees fifty-six minutes fifty-seven seconds (2° 56' 57"), chord bearing south twenty-four degrees forty-six minutes twenty-nine seconds east (S 24° 46' 29" E), and chord length one hundred and zero hundredths feet (100.00');

Thence continuing southeasterly along said curve to the left, following the southwest sideline of the River Road, approximately eight feet (8') to a point at the high water line of said Cathance River;

Thence continuing southeasterly along said curve to the left, following the southwest sideline of the River Road, to the low water line of Cathance River;

Thence southwesterly along the low water line of Cathance River, approximately one thousand four hundred feet (1400') to the northeasterly corner of land now or formerly of Terry D. and Elaine D. Graviett as described in deed from James L. and Beverly L. Strong, dated June 6, 1991 and recorded in said Registry Book 1066, Page 90;

BK1615PG321

TRANSFER TAX PAID

BK1615PG322

Thence north sixty degrees fifty-two minutes thirty seconds west (N 60° 52' 30" W), along the northerly line of land of said Graviett, to the high water line of said Cathance River;

Thence continuing north sixty degrees fifty-two minutes thirty seconds west (N 60° 52' 30" W), along the northerly line of land of said Graviett, approximately fifteen feet (15') to an iron rod in stone found on the westerly bank of said Cathance River; Said iron rod being south thirty-four degrees fifty-four minutes zero seconds west (S 34° 54' 00" W) of and one thousand three hundred seventy-four and eighty-eight hundredths feet (1374.88') from the last mentioned iron rod set in the southwest sideline of River Road;

Thence continuing north sixty degrees fifty-two minutes thirty seconds west (N 60° 52' 30" W), along the northerly line of land of said Graviett, one thousand one hundred twenty-one and twenty-two hundredths feet (1121.22') to the southerly side of land now or formerly of the said State of Maine;

Thence north fifty-nine degrees forty-eight minutes fifty-seven seconds east (N 59° 48' 57" E) along the southerly line of land of said State of Maine, three hundred ninety-three and twenty-six hundredths feet (393.26') to a point of tangency of a curve to the right;

Thence northeasterly along a curve to the right following the southerly sideline of land of said State of Maine, five hundred eighty-eight and seventy-one hundredths feet (588.71') to a point; said curve has a radius of two thousand eight hundred fourteen and seventy-nine hundredths feet (2814.79'), a delta angle of eleven degrees fifty-nine minutes zero seconds (11° 59' 00"), chord bearing north sixty-five degrees forty-eight minutes twenty-seven seconds east (N 65° 48' 27" E), and chord length five hundred eighty-seven and sixty-four hundredths feet (587.64');

Thence north seventy-one degrees forty-seven minutes fifty-seven seconds east (N 71° 47' 57" E), along the southerly line of land of said State of Maine, seventy-six and fifty-five hundredths feet (76.55') to a point;

Thence south thirteen degrees fifty-nine minutes thirteen seconds east (S 13° 59' 13" E), along land of said State of Maine, sixteen and four hundredths feet (16.04') to a point;

Thence north seventy-three degrees forty-one minutes seventeen seconds east (N 73° 41' 17" E), along the southerly line of land of said State of Maine, eight hundred three and ninety-seven hundredths feet (803.97') to the point of beginning;

Said parcel containing twenty and one tenth (20.1) acres above the west bank of the Cathance River.

All bearings refer to magnetic north as observed in May 1996.

Subject to a right of way from Center Street extending in a westerly direction to land of the heirs of S.D. Thorn as described in deed from William B. Kendall, et al., to Sagadahoc Fertilizer Company dated September 15, 1923 and recorded in said Registry Book 154, Page 240.

Subject to two pole line easements conveyed to Central Maine Power Company; the first by E.P. Kendall, et al. dated July 1917 and recorded in said Registry Book 137, Page 194 and the second by Sagadahoc Fertilizer Co., Inc., dated February 2, 1961 and recorded in said Registry Book 323, Page 31.

Reference is made to a plan entitled "Standard Boundary Survey & Topographic Plan, Central Chemical Corp. Property, 8 River Road, Bowdoinham, Maine, for Town of Bowdoinham", dated June 22, 1998 and prepared by Harty Land Surveying.

Meaning and intending to describe the same premises as described in Parcel One, Lot b and Parcel Five of the premises conveyed to Central Chemical Corporation by deed from Corenco Corporation, dated January 26, 1976 and recorded in Sagadahoc County Registry of Deeds, Book 427, Page 216.

Any and all other rights, easements, privileges and appurtenances belonging to the granted estate are hereby conveyed.

ALSO releasing to the Grantee all of the Grantor's right, title and interest in and to the real property and property interests as described in the Warranty Deed from Corenco Corporation to the Grantor dated January 21, 1976, recorded in the Sagadahoc Registry of Deeds in Book 427, Page 213.

IN WITNESS WHEREOF the Grantor has caused this instrument to be duly executed on its behalf this 2nd day of September, 1998.

CENTRAL CHEMICAL CORPORATION
(NEW ENGLAND) INC.

Witness

By: David S. Schwartz
Its President

BK 1615 PG 323

BK1615PG324

STATE OF MARYLAND

County of Washington, ss. September 2, 1998

Personally appeared the above-named David S. Schwartz, in his capacity as President of Central Chemical Corporation (New England) Inc. and acknowledged the foregoing instrument to be his free act and deed in said capacity and the free act and deed of said corporation.

Before me,

Date: 9/02/98

Jena K. Staley
Notary Public/Attorney at Law

Printed Name: Jena K. Staley

JENA K. STALEY
NOTARY PUBLIC STATE OF MARYLAND
My Commission Expires October 10, 2001

RECEIVED SAGADAHOC SS.
98 SEP 15 PM 2:37
ATTEST: Barbara J. Corr
REGISTER OF DEEDS

- Governor's Deed: Sagadahoc County Registry of Deeds, Book 1649, Pages 157-159

GOVERNOR'S DEED

11887

BK 1649 PG 157

KNOW ALL BY THESE PRESENTS that the **STATE OF MAINE**, acting by and through its Governor, on recommendation of the Commissioner of the Department of Transportation, under and pursuant to the provisions of 23 M.R.S.A. Section 61, in consideration of One ($1.00) Dollar and other valuable consideration paid, releases unto the Town of Bowdoinham, whose mailing address is 13 School Street, Bowdoinham, Maine 04008, its successors and assigns forever, all its right, title, and interest in and to:

A certain lot or parcel of land situated in the Town of Bowdoinham, County of Sagadahoc, and State of Maine and being as shown on a Standard Boundary Survey & Topographic Plan, prepared by Harty Land Surveying for the Town of Bowdoinham, entitled "Central Chemical Corp. Property, 8 River Road, Bowdoinham, ME", project No HLS9802, a copy of which is attached hereto, bounded and described as follows:

BEGINNING at a point located fifty feet (50.00') south of and perpendicular to railroad engineering centerline at station 1594+65.78, said point being in the southerly railroad right-of-way line;

THENCE, easterly along a line fifty feet (50.00') south of and parallel to railroad engineering centerline a distance of Seven Hundred Ninety Nine and Three Hundredths feet (799.03'), more or less, to a point on the westerly sideline of Route 24;

THENCE, southerly along said westerly sideline of Route 24 a distance of Forty Two and Sixty Three Hundredths feet (42.63'), more or less, to a point on the southerly railroad right-of-way line;

THENCE, westerly along the southerly railroad right-of-way line a distance of Eight Hundred Three and Ninety Seven Hundredths feet (803.97') to a point Sixty Six feet (66.00') south of and perpendicular to railroad engineering centerline at station 1594+64.60;

THENCE, northerly Sixteen and Four Hundredths feet (16.04') to the POINT OF BEGINNING.

The above described land being a trapezoidal shaped parcel with an area of 23,420 square feet, more or less, upon which a portion of two railroad sidings lie.

EXCEPTING AND RESERVING from the above lot or parcel of land, the railroad track lying within the above described land, and the perpetual right to operate trains for the movement of goods and/or people.

BK 1649PG158

This conveyance is subject to all above ground and underground utility easements and installations located on the above described premises, including those shown on the herein referred to Standard Boundary Survey. By acceptance of this deed, Grantee agrees to take title subject to those rights which any utility enjoys over the subject premises for maintenance, location or relocation of poles and other installations.

The State makes no representations or warranties with respect to the premises conveyed. The representations and warranties so excluded encompass, but are not limited to, those pertaining to: land use and environmental matters; fitness of the premises or any portion thereof for any particular purpose; water quality or quantity; the condition or quality of the soil; inchoate or unrecorded liens; or the existence, status, or condition of access to, or public utilities serving, the premises.

Said parcel of land was conveyed to the State of Maine by deed of Maine Central Railroad Company recorded at the Sagadahoc County Registry of Deeds in Book 1050, Page 86.

IN WITNESS WHEREOF, I, Angus S. King, Jr., Governor of the State of Maine, have caused the name and great seal of the State of Maine to be hereto affixed this 14th day of December in the year of our Lord one thousand nine hundred and ninety-eight.

STATE OF MAINE

By _____, Governor
Angus S. King, Jr.

BK 1649PG159

Affixed By: _____
acting Deputy Secretary of State

STATE OF MAINE
COUNTY OF KENNEBEC, ss

December 14, 1998

Then personally appeared the above named Angus S. King, Jr., Governor of the State of Maine, and acknowledged the above instrument to be his free act and deed in his said capacity and the free act and deed of the State of Maine.

Before me, _____
Notary Public/
~~Attorney at Law~~

Print Name: ROSEMARIE D. SMITH
Notary Public, Maine
My Commission Expires January 6, 2002

My commission expires:

Seal:

NOTARY PUBLIC MAINE

RECEIVED SAGADAHOC SS.
1998 DEC 30 PM 12:39
ATTEST: _____
REGISTER OF DEEDS

ATTACHMENTS

Attachment 1	Activity Description
Attachment 2	Alternatives Analysis
Attachment 3	Location Map
Attachment 4	Color Photographs
Attachment 5	Project Plans
Attachment 6	Additional Plans
Attachment 7	Construction Plan
Attachment 8	Erosion Control Plan
Attachment 9	Site Condition Report
Attachment 10	Notice of Intent to File
Attachment 11	Maine Historic Preservation
Attachment 12	Functional Assessment
Attachment 13	Compensation Plan

ATTACHMENT 1 Activity Description

The Town of Bowdoinham's property is located at 8 River Road (Route 24) in Bowdoinham, Maine. It was most recently used as the Town's Public Works facility and included a garage, former residential building, a few shed buildings, above ground fuel storage and several gravel and concrete pad areas for storage of sand, salt and earthwork materials on the third of the property closest to River Road. The back two-thirds of the property are mostly scrub / shrub and forested areas with some informal trails through them. The northwesterly edge of the property is bound by the Maine Central Railroad and the southeasterly edge of the property is bound by a tidal portion of the Cathance River. Reference should be made to the Location Map located in Attachment 3 – Location Map, pictures located in Attachment 4 – Color Photographs and the project drawings listed in 5 – Project Plans and Attachment 6 – Additional Plans attached to this application.

All of the existing site development conditions were done by prior owners or the Town of Bowdoinham. No records of local, state or federal permitting for these activities has been identified.

The shoreline stabilization work is part of a larger project. The Town is also constructing a new hand carry boat launch which is currently under MaineDEP NRPA PBR application review.

The project involves approximately 530 linear feet of total shoreline stabilization. A variety of treatments are proposed along the shoreline and adjacent upland buffer areas including:

- Freshwater tidal wetlands restoration which includes removal of historic fill material, regrading the embankment and replanting new intertidal area with wetlands plantings to mimic the nearby wetlands of special significance located further upstream on the property.
- Removal of historic fill and installation of vegetated retaining wall systems around existing vegetated shoreline where mature trees and shrubs are present at the shoreline and the embankment is scoured underneath.
- Removal of historic fill and construction of stone armoring extension adjacent to the stone armoring along River Road where there is increased river flow energy due to restriction at the Route 24 bridge, and at the ends of the proposed pedestrian path spurs.
- Removal of historic fill and installation of tree root wads as a living shorelines demonstration project to promote enhancement of aquatic habitat immediately adjacent to the shoreline. The tree roots will result in approximatel 115 SF of temporary fill material placed beyond the HAT line.
- Installation of gabion baskets filled with oyster shells to promote stormwater quality, treating the stormwater conveyed across the site and from the site upland areas via a subsurface piped system with an outfall in a ditch connected directly to the Cathance

River. The baskets will filter the stormwater and promote increased stability for new submersible vegetation upstream of the baskets for additional enhancement of stormwater treatment. These gabion baskets will result in approximately 150 SF of fill material placed beyond the HAT line.

Upland areas within 25 to 75 feet of the HAT line will be converted from lawn area to naturalized vegetative communities including a mixture of perennials, shrubs and trees. A 4-foot wide reclaim pedestrian path will meander through the upland buffer area with a few spurs providing limited access to the shoreline.

Beyond the 75-foot HAT line setback, a mowed freshwater wetland area of approximately 1,065 SF will be filled and re-seeded as mowed lawn.

A. OBJECTIVE CRITERIA FOR THE PROJECT

1. Project Purpose and Need

   The fundamental purpose of the project is to stabilize the shoreline, utilizing a variety of treatment measures to provide demonstration measures regarding living shoreline techniques of particular interest to the Town of Bowdoinham, the Maine Coastal Program and the Maine Geological Survey. To enhance the coastal riverine environment by improving stormwater treatment, re-establishing natural vegetative communities, improving upland buffer and aquatic habitat, removing historic fill. And to provide improved recreational and educational experience for visitors to the Town's new public park space.

B. DESCRIPTION OF PROPOSED CONSTRUCTION

A description of the main elements of the proposed construction is provided below.

1. Shoreline Stabilization

   An existing 4-ft wide wood staircased partially on abutting property with deteriotaed steps at the bottom of the staircase is being replaced with a 4-ft wide field stone staircase relocated entire on the owners property and re-establishing continuous connection to the shore below the HAT. The staircase is approximately 34-ft in length horizontally with steps and landings approximating the proposed finish grade of the adacent embankment slope restabilization. The staircase has a wood handrail on one side and a wood double rail boat slide for handcarry boats on the opposite side. A concrete block shall be placed beneath the mid-landing and all landings, steps and the concrete block shall be pinned together for stability.

2. Upland Buffer Plantings

   Large granite boulders (30" avg diameter) will be placed at the toe of the slope to a height approximately 4-ft above the cobble beach. The toe of the slope will connect the stable riprap shoreline toe to the east with the exposed ledge shoreline terminus to the west, filling approximately 210 sf beyond the HAT line to re-established the eroded riprap shoreline inbetween. The face of the toe armoring will be at a 1.5:1 slope,

approximating the stabilized riprap shoreline slope. The tow armoring will be tied into the steeper slope of the exposed ledge by pinning. The stone material will match the color and quality of the existing riprap and exposed ledge shoreline materials.

3. Storm Drainage Treatment

   A riprap plunge pool will be installed behind the top of the embankment. The riprap shall consist of existing bankrun rock material matching the existing swale material. An inlet pipe shall be set in the bottom of the plunge pool to intercept the site surface water which currently is discharged at the end of the swale over the top of the embankment, causing significant slope erosion. The intercepted stormwater will be conveyed from the plungepool to the bottom of the embankment and discharged behind the stone toe armoring. Conveyance shall be by subsurface HDPE pipe and plastic catch basins at the top and bottom of the embankment to adjust for grade changes and allow for overflow discharge at the bottom of the slope if necessary.

4. Pedestrian Access

   The eroded slope behind the toe armored shoreline will be regraded with common borrow fill and planting soil at an approximate average grade of 1.75:1. The regraded slope is intended to re-established existing grades matching abutting areas to the east and west along the shoreline that have been remained stabilized at their existing slopes. The eroded slope will be cleared of non-native invasive Japanese knotweed colonies and replanted with a mix of native shrubs, groundcovers and perennials. Areas between the plantings shall be seeded with an erosion control seed mix and the entire embankment will be covered with erosion control matting. Eroded shoreline riprap material shall be reset between the staircase and the exposed ledge shoreline to the west, and behind the stone toe armoring to the top of the exposed ledge adjacent to the staircase.

C. VISUAL IMPACT CONSIDERATIONS

Appendix A provides a Maine Department of Environmental Protection (MaineDEP) Visual Evaluation Form. The property faces the Cathance River to the east and can be seen from abutting properties, from and across the Cathance River, and by traveling along River Road (Route 24). The eroded shoreline will be revegetated, and the upland buffer areas will be restored from lawn, gravel and former building sites to naturalized vegetation colonies. (See pictures and in Attachment 4 – Color Photorgraphs).

D. CONSIDERATION OF NRPA REGULATORY STANDARDS

The applicable regulatory review standards that must be met by the project under NRPA Title 38, Article 5-A NATURAL RESOURCES PROTECTION ACT are provided below and addressed in the text that follows.

§ 480-D. Standards

The department shall grant a permit upon proper application and upon such terms as it considers necessary to fulfill the purposes of this article. The department shall grant a permit when it finds that the applicant has demonstrated that the proposed activity meets the following standards set forth in

subsections 1 to 9, except that when an activity requires a permit only because it is located in, on or over a community public water system primary protection area the department shall issue a permit when it finds that the applicant has demonstrated that the proposed activity meets the standards set forth in subsections 2 and 5.

1. Existing uses. The activity will not unreasonably interfere with existing scenic, aesthetic, recreational or navigational uses.

2. Soil erosion. The activity will not cause unreasonable erosion of soil or sediment nor unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.

3. Harm to habitats; fisheries. The activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine or marine fisheries or other aquatic life. In determining whether there is unreasonable harm to significant wildlife habitat, the department may consider proposed mitigation if that mitigation does not diminish in the vicinity of the proposed activity the overall value of significant wildlife habitat and species utilization of the habitat and if there is no specific biological or physical feature unique to the habitat that would be adversely affected by the proposed activity. For purposes of this subsection, "mitigation" means any action taken or not taken to avoid, minimize, rectify, reduce, eliminate or compensate for any actual or potential adverse impact on the significant wildlife habitat, including the following:

A. Avoiding an impact altogether by not taking a certain action or parts of an action;

B. Minimizing an impact by limiting the magnitude, duration or location of an activity or by controlling the timing of an activity;

C. Rectifying an impact by repairing, rehabilitating or restoring the affected environment;

D. Reducing or eliminating an impact over time through preservation and maintenance operations during the life of the project; or

E. Compensating for an impact by replacing the affected significant wildlife habitat.

4. Interfere with natural water flow. The activity will not unreasonably interfere with the natural flow of any surface or subsurface waters.

5. Lower water quality. The activity will not violate any state water quality law, including those governing the classification of the State's waters.

6. Flooding. The activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties.

1. Existing Uses of the Site

The proposed project is located on the Town's public property. The site is located on the Cathance River within the downtown village area of Bowdoinham and has most recently served as the Town's Public Works facility. The abutting Maine Central Railroad, which has an easement and maintains a portion of side rail on the property, has been owned by the State of Maine and has been inactive for rail service for several years. Recreation and navigation of the adjacent waters are primarily by local property owners and visitors for a variety of recreational activities. The proposed construction will not have an impact on these uses and will expand access to the river for fishing, boating, and pedestrian activities and wildlife / habitat viewing.

2. Action to avoid and minimize soil erosion

   Construction equipment can access the site from the existing public works gravel access areas and across existing mowed lawns. The shoreline can also be accessed by barge for shoreline stabilization work infront of existing vegetation to remain in place. Barge equipement and materials can be launched from the adjacent public boat ramp at the Town's Philip-Mailly Waterfront Park across River Road. As construction progresses, areas disturbed will be required to be stabilized at the end of each workday and between daily tide cycles. Materials and equipment accessing the site from onshore can be stored on the existing gravel areas that served the former Public WEorks facility operations outside of the 75-foot setback from the HAT line. Removal of historic fill material, enhancing stormwater quality treatment at the outfall pipe and re-establishing the eroded shoreline, and replanting the shoreline and upland buffer area with a mix of native shrubs, perennials and groundcovers will minimize further shoreline erosion.

3. Steps taken to avoid and minimize any harm to habitats

   This shoreline stabilization project will enhance onshore and aquatic habitates immediately adjacent to the shoreline by restoring areas previously filled and used for industrial purposes.

4. Consideration of any Interference with Natural Flow

   The shoreline stabilization will not interfere with the natural flow of tidal waters ebbing and flowing along the Cathance River and will reduce introduced flows concentrated via upland subsurface stormdrainage systems discharged into an eroded swale system prior to entering the Cathance River.

5. Consideration of project attributes that Lower Water Quality

   As noted above, the removal of historic fill materia, installation of shoreline stabilization treatments, installation of a stormwater filter system and replanting of upland vegetation provide water quality treatment of both overland surface flows and subsurface drainage system flows prior to entering the Cathance River.

   Construction Impacts are addressed in Attachment 6 Construction Plan.

6. Consideration of any Flooding

   The existing project area is entirely within the 100-year flood zone. The existing grade within the upland project areas will not be elevated. Restoration of natural planting communities will improve flood resiliency for upland portions of the site and adjacent properties.

ATTACHMENT 2 Alternatives Analysis

The Project Plans appended to this document detail the Preferred Alternative.

The project was developed to meet the Objective Criteria of the project with consideration of NRPA Regulatory Standards as presented in the previous section. The Preferred Alternative represents the most practicable solution for shoreline stabilization and safe waterfront access for the property balancing long-term stability with minimal environmental impact.

The purpose of the project is to stabilize the shoreline, enhance natural environmental communities immediately adjacent to the Cathance River, and to improve recreation pedestrian access.

Prior to the selected Preferred Alternative, the Town facilititated and extensive public input process to develop and overall master plan for reuse of the former Public Works facility. The Preferred Alternative received state and federal funding support for phase I improvements and went through an additional public input process to make sure the vision of the Master Plan was still being conveyed in the final design effort. Several options for reuse of the site were considered during the public input processes as follows:

1. Do Nothing Option

   A 'Do Nothing' option would deprive the public of the opportunity to enhance the environmental quality of the site and the Cathance River, as well as the opportunity to enhance passive outdoor recreational opportunities adjacent to the center of the Town's downtown village district. The site would remain abandoned and the former Public Works facility would be subject to further shoreline erosion and provide no opportunities for flood resiliency improvements to the site and abutting properties. The remaining gravel areas would likely be used as public overflow parking for adjacent downtown village area needed.

2. Preferred Alternative

   The preferred alternative optimizes envinronmental enhancement opportunities and passive recreation activities for the public. The shoreline treatment measures provide a variety of methods for further education and study regarding relatively new construction treatment methods in Maine involving living shoreline options along a coastal riverine environment.

   1. Other Alternatives Considered

      a. Traditional stone armoring of the shoreline.

         Consideration was given to armoring the shoreline with stone entirely and replanting disturbed areas immediately upland of the armoring. This would result in the need to replace existing mature vegetation colonies immediately along the shoreline and would minimize removal of historic fill material adjacent

to the shoreline. Subsurface stormwater flows would continue to impact the water quality of the Cathance River and aquatic habitate adjacent to the shoreline would not significantly benefit from the stabilization. Flood resiliency of the site and adjacent properties would be minimally improved.

4. Consideration for reducing the size, scope or configuration of the project.

The project considers full restoration of the shoreline portion of the property that was historically altered for a variety of industrial uses. Reduction in scope of shoreline stabilization in this area would result in phasing the project and delaying improvements as noted in the Preferred Alternative.

ATTACHMENT 3 Location Map

Section of USGS Topo Map – 2018 Bowdoinham Quadrangle

ATTACHMENT 4 Color Photographs

Looking east from proposed boat launch approach to Cathance River. Public works garage has been removed by the Town. Low Tide 7:17pm [Photo Time – Date: 4:35pm – 4/2/19; Ebb Tide]

Looking east at proposed boat ramp along Cathance River. Shed has been removed by the Town. Low Tide 7:17pm [Photo Time – Date: 4:45pm – 4/2/19; Ebb Tide]

Looking south towards proposed coastal wetland restoration area. Public works garage has been removed by the Town. Low Tide 7:17pm [Photo Time – Date: 4:30pm – 4/2/19; Ebb Tide]

Looking north at proposed root wad stabilization area. River Road (Route 24) in background. Low Tide 7:17pm [Photo Time – Date: 4:25pm – 4/2/19; Ebb Tide]

Looking east at drainage swale towards Cathance River.
Low Tide 10:40pm [Photo Time – Date: 5:40pm – 9/17/19; Ebb Tide]

Looking south across mowed wetlands area towards Cathance River.
Low Tide 10:40pm [Photo Time – Date: 5:40pm – 9/17/19; Ebb Tide]

Looking south from River Road bridge area towards proposed vegetated retaining wall stabilization area. Low Tide 9:47am [Photo Time – Date: 8:10am – 8/13/18; Flow Tide]

Looking east across Cathance River at proposed stone armored stabilization area.
Low Tide 9:47am [Photo Time – Date: 8:10am – 8/13/18; Flow Tide]

ATTACHMENT 5 Project Plans

The following project plans are included and the end of the permit application:

G-1	COVER SHEET
G-2	NOTES, SCHEDULES & EROSION CONTROL DETAILS
-	TOPOGRAPHIC SURVEY (By Little River Land Surveying, Inc.)
C-1	OVERVIEW PLAN
C-2	BOAT LAUNCH – EXISTING CONDITIONS, DEMOLITION & EROSION CONTROL PLAN
C-3	BOAT LAUNCH – LAYOUT PLAN
C-4	BOAT LAUNCH – GRADING PLAN & LAUNCH PROFILE
C-5	BOAT LAUNCH - DETAILS
C-6	SHORELINE STABILIZATION – EXISTING CONDITIONS, DEMOLITION & EROSION CONTROL PLAN
C-7	SHORELINE STABILIZATION – SITE PLAN
C-8	SHORELINE STABILIZATION – TYPICAL SECTIONS I
C-9	SHORELINE STABILIZATION – TYPICAL SECTIONS II
C-10	SHORELINE STABILIZATION – DETAILS
L-1	LANDSCAPE NOTES & SCHEDULES
L-2	LANDSCAPE & SITE AMENITIES PLAN
L-3	LANDSCAPE SITE DETAILS

ATTACHMENT 6 Additional Plans

Wetland and Watercourse Delineation and Ecological Assessment Report by Stantec, dated June 27, 2019.

Sampling & Analysis Plan by Maine Department of Environmental Protection Uncontrolled Sites Program, dated April 26, 2019.

ATTACHMENT 7 Construction Plan

Construction Access

The project occurs adjacent to the Cathance River. All material and equipment deliveries will be made to the project site by delivery truck from River Road or by barge from the adjacent public boat ramp in Philip-Mailly Park across River Road from the property. All construction staging and activities will be from the existing gravel access drive, material storage areas and former Public Works buildings with access over mowed lawn areas to the shoreline, or by barge as noted above.

Construction Notices

The owner and/or owner's agent will keep the Town of Bowdoinham informed of any changes in project schedule.

Method of Construction

Removal of historic fill material will be from onshore by excavators and will be haulted off to a site suitable for disposal of waste material in accordance with all local, state and federal regulations. Equipment and materials for shoreline stabilization treatments will be placed by barge with a small excavator and hand labor, or from shore by excavators and hand labor. Equipment and materials for plantings, stormwater filter and pedestrian access paths will be from onshore, placed by excavator and hand labor. A general summary of the construction process is provided below:

1. Install erosion control best management practice measures onshore.
2. Remove historic fill material
3. Regrade freshwater coastal wetland area
4. Construct shoreline treatments
5. Install stormwater filter
6. Removal lawn areas and replant with plant communities
7. Complete site clean-up and punch list Items.

Construction Schedule

The construction will take place between the fall of 2020 and the fall/winter of 2021. It is estimated that it will take six to eight weeks to complete the project.

ATTACHMENT 8 Erosion Control Plan

The project involves excavation and re-grading of a portion of the property shoreline immediately adjacent to and partialy within the intertidal area. Some vegetation removal exposing erodible surface areas upland of the shoreline will also take place. Excavated historic fill areas and upland revegetated areas will be stabilized with erosion control sediment barriers secure in place at the end of each work day, and by erosion control matting after regrading and planting to prevent erosion of earthwork materials from migrating into the coastal wetland. All shoreline stabilization and stormwater filter treatment work will be constructed between tide cycles and shall be secured in-place at the end of each work day.

MaineDEP Best Management Practices for erosion control will be referenced in the construction documents.

1. Application of temporary and permanent erosion control measures for the project shall be in accordance with procedures and specifications of the current Maine Erosion and Sediment Control Handbook for Construction; Best Management Practices.
2. All areas disturbed during construction shall be reconstructed and stabilized to their pre-construction conditions or better unless noted otherwise.
3. All work shall be executed from shore or by barge, using excavators and/or hand labor on the embankment slope and the upland planting areas. No tracked or wheeled equipment shall be operated or placed below the high water mark.

4. Temporary erosion control measures shall be removed upon completion of grading operations, and restoration and stabilization of all disturbed areas.
5. The Contractor shall be responsible for maintaining erosion control measures during construction.

ATTACHMENT 9 Site Condition Report

Refer to photographs provided in Attachment 4. Refer to Attachment 5 for additional environmental site assessment plans and reports. Also refer to the COASTAL WETLAND CHARACTERIZATION checklist that is provided in Appendix B.

Review and respone by the Maine Department of Inland Fisheries and Wildlife is included below:

JANET T. MILLS
GOVERNOR

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

JUDITH CAMUSO
COMMISSIONER

October 17, 2019

Nicole Briand
Town of Bowdoinham
13 School Street
Bowdoinham, ME 04008

RE: Information Request - Living Shoreline Stabilization, Bowdoinham

Dear Nicole:

Per your request received October 08, 2019, 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 fisheries habitat concerns within the vicinity of the *Living Shoreline Stabilization Project* in Bowdoinham.

Our information indicates no locations of Endangered, Threatened, or Special Concern species within the project area that would be affected by your project. Additionally, our Department has not mapped any Essential Habitats that would be directly affected by your project.

Significant Wildlife Habitat

Inland Waterfowl and Wading Bird Habitats

This project intersects with Inland Waterfowl and Wading Bird Habitat (IWWH), which are considered Significant Wildlife Habitat under Maine's Natural Resources Protection Act. These habitats provide important breeding, feeding, migration, staging, and wintering habitat for waterfowl and wading bird species. High and moderate value IWWHs within the study area includes both the wetland complex and a 250-foot upland zone. We recommend that these resources be avoided, including no additional clearing within the 250-foot upland zone from the wetland edge. To minimize impacts to breeding waterfowl, we recommend that shoreline stabilization activities not occur between April 1 and July 15.

Fisheries Habitat

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

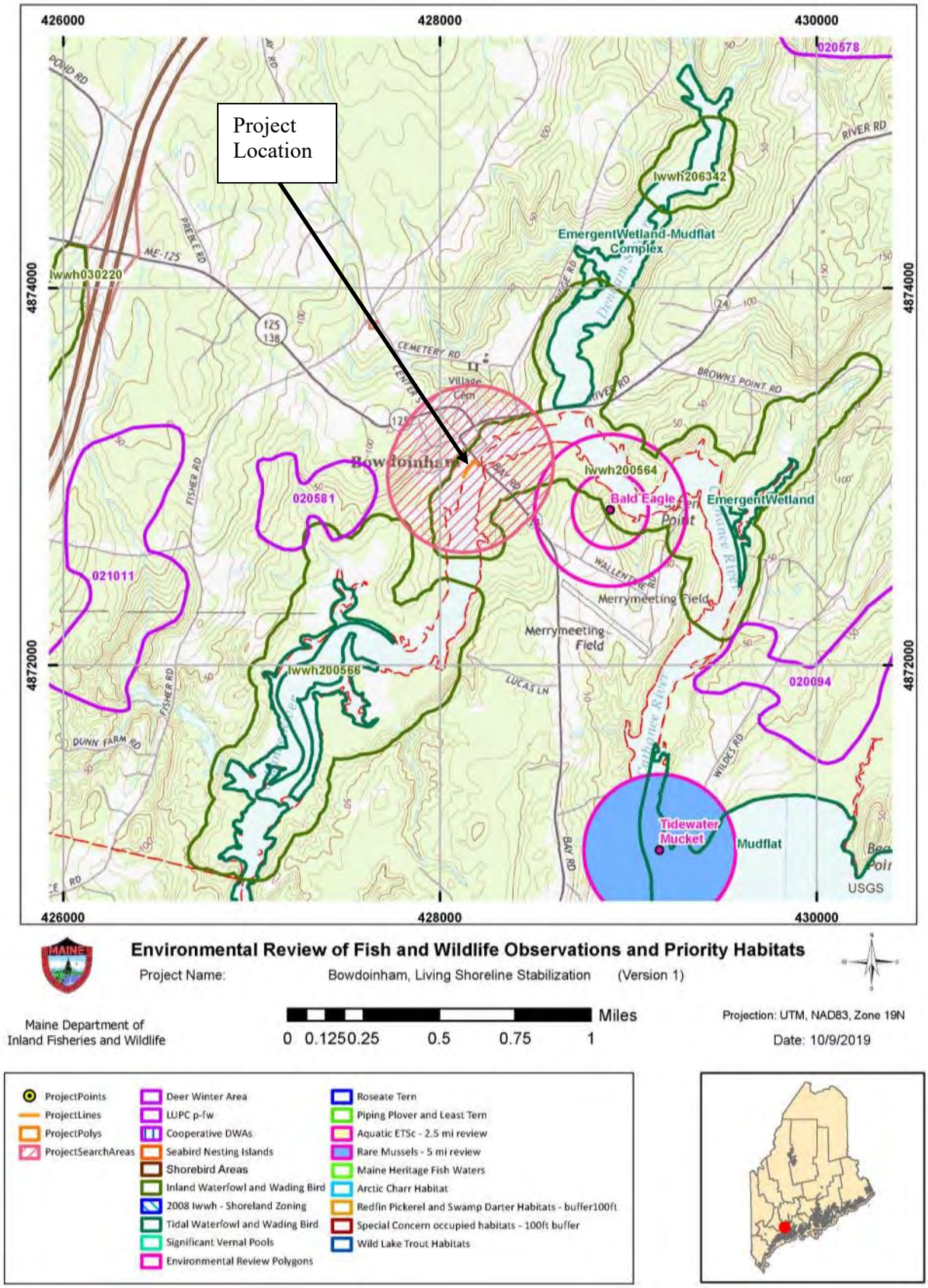
PHONE: (207) 287-5254 FISH AND WILDLIFE ON THE WEB: www.maine.gov/ifw EMAIL ADDRESS: John.Perry@maine.gov

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 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: Bowdoinham, Living Shoreline Stabilization (Version 1)

Maine Department of Inland Fisheries and Wildlife

0 0.125 0.25 0.5 0.75 1 Miles

Projection: UTM, NAD83, Zone 19N

Date: 10/9/2019

- ProjectPoints
- ProjectLines
- ProjectPolys
- ProjectSearchAreas
- Deer Winter Area
- LUPC p-fw
- Cooperative DWAs
- Seabird Nesting Islands
- Shorebird Areas
- Inland Waterfowl and Wading Bird
- 2008 lwwh - 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

ATTACHMENT 10 Notice of Intent to File

A copy of the public notice, which was published in the The Times Record on Tuesday, April 28, 2020, is provided below.

PUBLIC NOTICE OF INTENT TO FILE

Please take notice that the Town of Bowdoinham; 13 School Street; Bowdoinham, ME 04008 intends to file a Natural Resources Protection Act permit application with the Maine Department of Environmental Protection pursuant to the provisions of 38 M.R.S.A. §§ 480-A through 480-V on or about April 29, 2020.

The application is for construction of a shoreline stabilization improvements project at 8 River Road in the Town of Bowdoinham (Tax Map U01, Lot 01).

A request for a public hearing or a request that the Board of Environmental Protection assume jurisdiction over this application must be received by the Department, in writing, no later than 20 days after the application is found by the Department to be complete and is accepted for processing. A public hearing may or may not be held at the discretion of the Commissioner or Board of Environmental Protection. Public comment on the application will be accepted throughout the processing of the application.

For Federally licensed, permitted, or funded activities in the Coastal Zone, review of this application shall also constitute the State's consistency review in accordance with the Maine Coastal Program pursuant to Section 307 of the federal Coastal Zone Management Act, 16 U.S.C. §1456.

The application will be filed for public inspection at the Department of Environmental Protection's office in Augusta during normal working hours. A copy of the application may also be seen at the Bowdoinham Town Office, 13 School Street, Bowdoinham, ME 04008.

Written public comments may be sent to the regional office in Augusta where the application is filed for public inspection: MaineDEP, Central Maine Regional Office; 17 State House Station, Augusta, ME 04333-0017.

ATTACHMENT 11 Corps Review

The State office of the Maine Historic Preservation has been provided a copy of key plans with a request for comment as part of the Army Corps permit applications as evidenced below:

Town of Bowdoinham
13 School St • Bowdoinham, ME 04008
Phone 666-5531 • Fax 666-5532
www.bowdoinham.com

Thomas K. Woodin, Town Manager

March 30, 2020

Kirk F. Mohney
Director, Maine Historic Preservation Commission
55 Capitol Street, 65 State House Station,
Augusta, ME, 04333-0065

Request for Project Review

Dear Mr. Mohney,

The Town of Bowdoinham is working to redevelopment its former Public Works Property along the Cathance River. Please find enclosed our Site Master Plan, Shoreline Stabilization & Boat Launch Plan, project location map and photographs for the subject project.

The Town of Bowdoinham is submitting the necessary permit applications for the re-development of the property which requires that you be informed of the proposed project and given the opportunity to provide comment on historic or archeological impacts.

Please reply with any comments directly to me.

Sincerely,

Nicole Briand
Director of Planning & Development
Town of Bowdoinham
nbriand@bowdoinham.com
207-666-5531

Enclosed – Location Map, Site Master Plan, Shoreline Stabilization & Boat Launch Plan
Photographs

From: Spiess, Arthur <Arthur.Spiess@maine.gov>
Sent: Monday, April 27, 2020 3:29 PM
To: Nicole Briand <nbriand@bowdoinham.com>
Subject: RE: Bowdoinham - Waterfront Re-development MHPC 0480-20

Hello Nicole:

Thank you for the additional information on the Waterfront redevelopment project. I have reviewed our files for the hand-carry boat launch project review in 2019 (under a different MHPC number 1061-19). I concur that the area around the former Central Chemical Company building and the proposed hand-carry boat launch does NOT need archaeological survey (per our comment on 8/19/19). I still think it necessary to have some level of archaeological assessment for the portion of the recreational trail project as it approaches the river – the area in the field and woods toward the southern portion of the project that I have circled in (elegant) magic marker on the attached. this assessment would be most cost-effectively done by hiring an archaeologist to walk over this portion of the project and then recommend how many testpits might be necessary (if any at all). The contract archaeologist, you and I can agree based on a three-way conversation. There are a number of contract archaeologists on the Phase I and Phase II prehistoric list in the greater Portland area who are amenable to such work. In sum, we revise our request for archaeological survey. The rest of the property does NOT need archaeological survey or other assessment.

Sincerely, Art Spiess

Dr. Arthur Spiess

Senior Archaeologist, Maine Historic Preservation

State House Station 65

Augusta, ME 04333

desk phone: 207-287-2789

ATTACHMENT 12 Functional Assessment

In accordance with Chapter 310 Wetlands and Waterbodies Protection Rules, Section 5.C(6)(b) Coastal Wetlands, the proposed activites result in less than 500 square feet of impact to the coastal wetland and a functional assessment is not required for this project.

ATTACHMENT 13 Plan of Proposed Compensation

In accordance with Chapter 310 Wetlands and Waterbodies Protection Rules, Section 5.C(6)(b) Coastal Wetlands, the proposed activites result in less than 500 square feet of impact to the coastal wetland and compenstation is not required for this project.

APPENDICES

APPENDIX A MDEP Visual Evaluation Field Survey Checklist

(Natural Resources Protection Act, 38 M.R.S. §§ 480 A - Z)

Name of applicant: Town of Bowdoinham

Phone: Contact Agent: Travis Pryor - Baker Design Consultants (207) 846-9724

Application Type: NRPA Individual Permit – 4D (Shoreline Stabilization in a Coastal Wetland)

Activity Type: (brief activity description) Private residential stairs, pier & seasonal gangway/float system

Activity Location: Town: Bowdoinham County: Sagadahoc

GIS Coordinates, if known: UTM Northing: 428117.28 UTM Easting: 4873028.01

Date of Survey: 4/2/19 & 9/17/19 Observer: Travis Pryor Phone: (207) 846-9724

	Distance Between the Proposed Visibility Activity and Resource (in Miles)		
1. Would the activity be visible from:	0-¼	¼-1	1+
A. A National Natural Landmark or other outstanding natural feature?	☐	☐	☐
B. A State or National Wildlife Refuge, Sanctuary, or Preserve or a State Game Refuge?	☐	☐	☐
C. A state or federal trail?	☐	☐	☐
D. A public site or structure listed on the National Register of Historic Places?	☑	☐	☐
E. A National or State Park?	☐	☐	☐
F. 1) A municipal park or public open space?	☑	☐	☐
2) A publicly owned land visited, in part, for the use, observation, enjoyment and appreciation of natural or man-made visual qualities?	☑	☐	☐
3) A public resource, such as the Atlantic Ocean, a great pond or a navigable river?	☑	☐	☐
2. What is the closest estimated distance to a similar activity?	☑	☐	☐
3. What is the closest distance to a public facility intended for a similar use?	☑	☐	☐
4. Is the visibility of the activity seasonal? (i.e., screened by summer foliage, but visible during other seasons)		☐Yes	☑No
5. Are any of the resources checked in question 1 used by the public during the time of year during which the activity will be visible?		☑Yes	☐No

APPENDIX B MDEP Coastal Wetland Characterization

INTERTIDAL & SHALLOW SUBTIDAL FIELD SURVEY CHECKLIST

NAME OF APPLICANT: Town of Bowdoinham

PHONE: Contact Agent: Travis Pryor - Baker Design Consultants (207) 846-9724

APPLICATION TYPE: NRPA Individual Permit – 4D (Shoreline Stabilization in a Coastal Wetland)

ACTIVITY LOCATION: TOWN: Bowdoinham COUNTY: Sagadahoc

ACTIVITY DESCRIPTION: ☑ fill ☐ pier ☐ lobster pound ☑ shoreline stabilization ☐ dredge ☐ other: _____

DATE OF SURVEY: 4/2/19 & 9/17/19 OBSERVER: Travis Pryor

TIME OF SURVEY: 04:30pm / 5:00pm TIDE AT SURVEY: Ebb Tides

SIZE OF DIRECT IMPACT OR FOOTPRINT (square feet):
Intertidal area: 150 SF (Gabion Stormwater Filter) Subtidal area: None

SIZE OF INDIRECT IMPACT, if known (square feet):
Intertidal area: 115 SF (Tree Root Wads) Subtidal area: None

HABITAT TYPES PRESENT (check all that apply):
☐ sand beach ☐ boulder/cobble beach ☐ sand flat ☐ mixed coarse & fines ☐ salt marsh
☐ ledge ☐ rocky shore ☑ mudflat (sediment depth, if known: Not known)

ENERGY: ☐ protected ☐ semi-protected ☐ partially exposed ☑ exposed

DRAINAGE: ☑ drains completely ☐ standing water ☐ pools ☑ stream or channel

SLOPE: ☑ >20% ☐ 10-20% ☐ 5-10% ☐ 0-5% ☐ variable

SHORELINE CHARACTER:
☑ bluff/bank (height from spring high tide: ~1 ft) ☐ beach ☐ rocky ☑ vegetated

FRESHWATER SOURCES: ☐ stream ☑ river ☑ wetland ☑ stormwater

MARINE ORGANISMS PRESENT:

	absent	occasional	common	abundant
mussels	☑	☐	☐	☐
clams	☑	☐	☐	☐
marine worms	☑	☐	☐	☐
rockweed	☑	☐	☐	☐
eelgrass	☑	☐	☐	☐
lobsters	☑	☐	☐	☐
other	☐	☐	☐	☐

SIGNS OF SHORELINE OR INTERTIDAL EROSION? ☑ yes ☐ no

PREVIOUS ALTERATIONS? ☑ yes ☐ no

CURRENT USE OF SITE AND ADJACENT UPLAND:
☐ undeveloped ☐ residential ☐ commercial ☑ degraded ☑ recreational

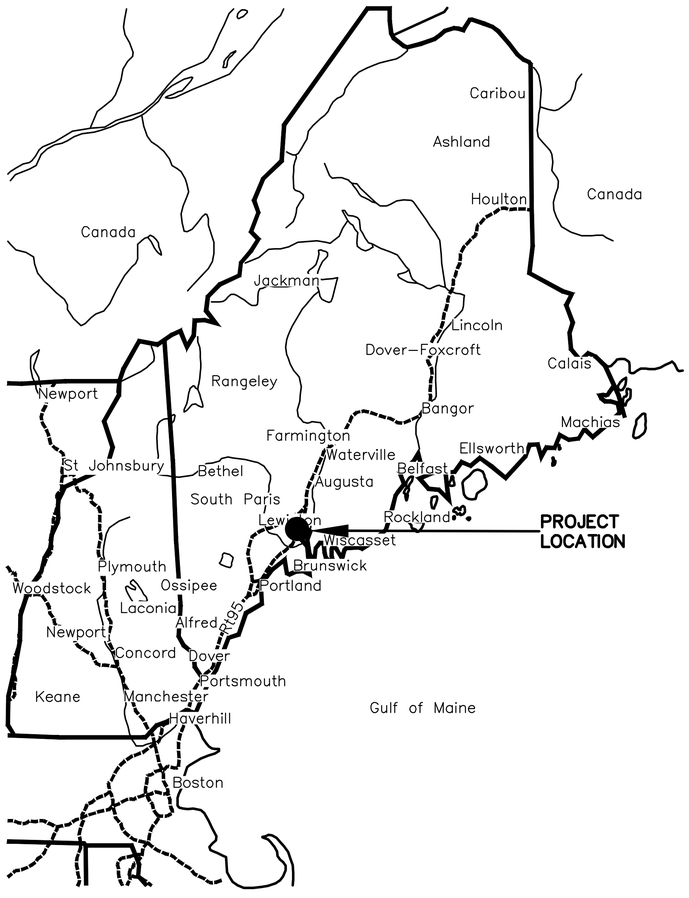
PLEASE SUBMIT THE FOLLOWING:
☑ Photographs (See Attachment 4 – Color Photographs)
☑ Overhead drawing (See attached plans)

PROJECT PLANS

G-1	COVER SHEET
G-2	NOTES, SCHEDULES & EROSION CONTROL DETAILS
-	TOPOGRAPHIC SURVEY (By Little River Land Surveying, Inc.)
C-1	OVERVIEW PLAN
C-2	BOAT LAUNCH – EXISTING CONDITIONS, DEMOLITION & EROSION CONTROL PLAN
C-3	BOAT LAUNCH – LAYOUT PLAN
C-4	BOAT LAUNCH – GRADING PLAN & LAUNCH PROFILE
C-5	BOAT LAUNCH - DETAILS
C-6	SHORELINE STABILIZATION – EXISTING CONDITIONS, DEMOLITION & EROSION CONTROL PLAN
C-7	SHORELINE STABILIZATION – SITE PLAN
C-8	SHORELINE STABILIZATION – TYPICAL SECTIONS I
C-9	SHORELINE STABILIZATION – TYPICAL SECTIONS II
C-10	SHORELINE STABILIZATION – DETAILS
L-1	LANDSCAPE NOTES & SCHEDULES
L-2	LANDSCAPE & SITE AMENITIES PLAN
L-3	LANDSCAPE SITE DETAILS

TOWN OF BOWDOINHAM
WATERFRONT PLAN - PHASE I

BOWDOINHAM, MAINE
PROJECT NO. 18-20



LOCATION MAP
NOT TO SCALE

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
G–1	COVER SHEET
G–2	NOTES, SCHEDULES & EROSION CONTROL DETAILS
–	TOPOGRAPHIC SURVEY (BY LITTLE RIVER LAND SURVEYING, INC.)
C–1	OVERVIEW PLAN
C–2	BOAT LAUNCH – EXISTING CONDITIONS, DEMOLITION & EROSION CONTROL PLAN
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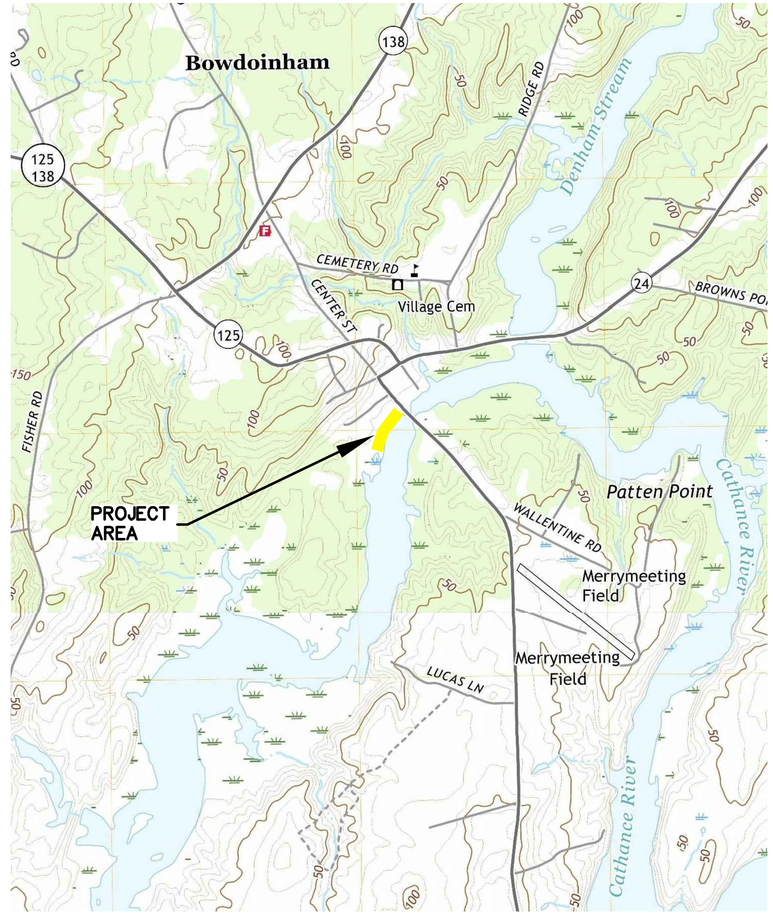
L–2	LANDSCAPE & SITE AMENITIES PLAN
L–3	LANDSCAPE SITE DETAILS

N

PRELIMINARY
FOR REVIEW ONLY

NOT FOR CONSTRUCTION



USGS TOPO MAP – BOWDOINHAM/BRUNSWICK 2018 QUADRANGLES
SCALE: 1"=1,000'

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NO.	DATE	INT.
A	04.08.20	TJP
PERMITTING SUBMISSION		

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: TJP
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: COVER SHEET

PROJECT: WATERFRONT PLAN – PHASE I
TOWN OF BOWDOINHAM
BOWDOINHAM, MAINE

DATE
APRIL 2020

CONTRACT NO.
18–20

SHEET NO. G-1
REV. A

x:\18\18-20 bowdoinham waterfront\phaseb-livingshorelines\cad\18-20-bowdoinham-gen.dwg 4/21/2020

SCOPE OF WORK SUMMARY

1. DEMOLITION OF BUILDINGS (BY TOWN OF BOWDOINHAM)
2. CONSTRUCT BOAT LAUNCH
3. CONSTRUCT SHORELINE STABILIZATION TREATMENTS
4. INSTALL LANDSCAPING AND SITE AMENITIES

PROJECT COORDINATION

1. CONTRACTOR SHALL COORDINATE ALL WORK WITH THE TOWN OF BOWDOINHAM.
2. A BRIEF LIST OF PERMIT CONDITIONS IS PROVIDE FOR CONTRACTOR REFERENCE. THIS LIST IS NOT COMPREHENSIVE. THE CONTRACTOR SHALL BE FAMILIAR WITH THE CONDITIONS OF ALL OWNER PROVIDED LOCAL, STATE AND FEDERAL PERMITS AND SHALL BE RESPONSIBLE FOR OBTAINING ALL ADDITIONAL PERMIT NECESSARY TO COMPLETE THE WORK.
   I. (TBD PENDING MaineDEP, ACOE AND TOWN OF BOWDOINHAM PERMIT APPROVALS)
3. COPIES OF ALL PERMITS SHALL BE MAINTAINED ON-SITE FOR THE DURATION OF THE CONSTRUCTION PERIOD.

GENERAL NOTES

1. THE CONTRACTOR SHALL COMPLY WITH FEDERAL, STATE AND LOCAL REGULATORY REQUIREMENTS.
2. THE CONTRACTOR SHALL BE GOVERNED BY THE CONSTRUCTION SAFETY RULES AS ADOPTED BY THE STATE BOARD OF CONSTRUCTION SAFETY, AUGUSTA, MAINE AND THE SAFETY AND HEALTH REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AS PROMULGATED BY THE US DEPARTMENT OF LABOR.
3. THE OWNER IS RESPONSIBLE FOR OBTAINING NECESSARY PERMITS, RIGHTS OF WAY AND EASEMENTS. THE CONTRACTOR IS RESPONSIBLE FOR FAMILIARIZING HIMSELF/HERSELF WITH EACH PERMIT AND RIGHTS OF OWNERSHIP/ACCESS PRIOR TO BIDDING THE WORK, AND SHALL ABIDE BY THE PROVISIONS OF EACH FOR THE DURATION OF CONSTRUCTION. COPIES OF SUCH PERMITS AND OWNERSHIP/ACCESS RIGHTS ARE AVAILABLE FOR REVIEW FROM THE OWNER.
4. THE CONTRACTOR SHALL INCLUDE IN THEIR BID, COSTS FOR COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATORY REQUIREMENTS.
5. THE CONTRACTOR SHALL TAKE PRE-CONSTRUCTION PHOTOGRAPHS AND PROVIDE COPIES TO THE OWNER PRIOR TO CONSTRUCTION. THIS WORK SHOULD INCLUDE ALL PROPERTY THAT MAY BE IMPACTED BY THE PROJECT.
6. ALL AREAS AND SITE FEATURES (INCLUDING BUT NOT LIMITED TO BUILDINGS, RETAINING WALLS, FENCES, VEGETATION, ETC.) THAT ARE DISTURBED BY THE CONTRACTOR WHICH ARE NOT TO BE PAVED, SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITION OR BETTER. THIS WORK IS CONSIDERED INCIDENTAL TO THE CONTRACT AND SHALL BE AT NO ADDITIONAL EXPENSE TO THE OWNER.
7. LOCATIONS AND LIMITS OF ALL ON-SITE WORK AND STAGING AREAS SHALL BE REVIEWED BY, COORDINATE WITH AND FOUND ACCEPTABLE TO THE OWNER AND ENGINEER. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL COORDINATE WITH THE OWNER FOR ALL STAGING AND STORAGE OF MATERIALS.

EROSION CONTROL NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR PREVENTION OF EROSION FOR THE DURATION OF THE PROJECT.
2. APPLICATION OF TEMPORARY AND PERMANENT EROSION CONTROL MEASURES FOR THE PROJECT SHALL BE IN ACCORDANCE WITH PROCEDURES AND SPECIFICATIONS OF THE CURRENT MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION; BEST MANAGEMENT PRACTICES. DETAILS OF KEY EROSION CONTROL BMPS ARE PROVIDED ON THE PLANS
3. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED BEFORE ANY EXCAVATION TAKES PLACE.
4. INSTALL EROSION CONTROL BLANKET ON ALL PROPOSED SLOPES 2:1 OR STEEPER, UNLESS SHOWN OR NOTED OTHERWISE.
5. SLOPE STABILIZATION AND RECONSTRUCTION SHALL PROCEED IN A LINEAR FASHION TO ENSURE THAT PROGRESSIVE SECTIONS CAN BE STABILIZED.
6. ALL EROSION CONTROL MEASURES, SEEDING AND MULCHING SHALL BE INSPECTED WEEKLY, AFTER RAINSTORMS AND DURING RUNOFF EVENTS. ALL MEASURES SHALL BE REPAIRED OR REPLACED WHEN NO LONGER SERVICEABLE DUE TO SEDIMENT ACCUMULATION OR DAMAGE.
7. SEEDED AND MULCHED AREAS SHALL BE MAINTAINED UNTIL FINAL ACCEPTANCE OF THE WORK BY THE ENGINEER OR OWNERS REPRESENTATIVE.
8. ALL WORK THAT EXTENDS BELOW THE HIGHEST ANNUAL TIDE ELEVATION SHALL BE COMPLETED IN THE DRY, EITHER DURING LOW TIDES OR BY UTILIZATION OF COFFER DAMS, AND SHALL BE STABILIZED AT THE END OF EACH WORK DAY DURING THE CONSTRUCTION PERIOD.
9. EQUIPMENT WHICH CANNOT ACCESS THE SITE BY BARGE WILL NOT BE ALLOWED IN THE INTERTIDAL ZONE UNLESS AUTHORIZED BY THE OWNER.
10. THE CONTRACTOR SHALL MONITOR WIND AND WAVE CONDITIONS AND SHALL TAKE APPROPRIATE ACTION TO PROTECT THE WORK FROM STORM DAMAGE DURING CONSTRUCTION.
11. THE CONTRACTOR SHALL CONTROL DUST TO TOLERABLE LIMITS OF THE OWNER AND THE STATE. NO EARTH MATERIAL OR CONSTRUCTION DEBRIS SHALL BE TRACKED OR SPILLED ON PUBLIC STREETS OUTSIDE THE PROJECT AREA.
12. TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED UPON STABILIZATION AND FINAL COMPLETION OF SITE WORK AS ACCEPTED BY THE OWNER.
13. THE CONTRACTOR SHALL BE CERTIFIED BY MaineDEP IN EROSION AND SEDIMENTATION CONTROL PRACTICES.

SURVEY NOTES

1. ALL TOPOGRAPHIC INFORMATION PROVIDED IS REFERENCED TO NAVD88 ALL TOPOGRAPHIC INFORMATION PROVIDED IS REFERENCED TO:
   - VERTICAL DATUM – NAVD88, UNLESS OTHERWISE NOTED.
   - HORIZONTAL DATUM – MAINE STATE PLANE COORDINATE SYSTEM NAD83, WEST ZONE, U.S. FEET.
2. BOUNDARY SURVEY PROVIDED FROM PLAN ENTITLED "STANDARD BOUNDARY SURVEY & TOPOGRAPHIC PLAN FOR CENTRAL CHEMICAL CORPORATION", DATED APRIL 24, 1998 AND RECORDED IN PLAN BOOK 34, PAGE 25.
3. TOPOGRAPHIC SURVEY PROVIDED FROM PLAN ENTITLED "TOPOGRAPHIC FOR TOWN OF BOWDOINHAM, 8 RIVER ROAD, BOWDOINHAM, MAINE" BY LITTLE RIVER LAND SURVEYING, INC., DATED JUNE 28, 2019.
4. PROJECT LOCATION APPEARS ON THE TOWN OF BOWDOINHAM'S TAX MAP U01 LOT 01.
5. PROJECT LOCATION IS IN THE TOWN OF BOWDOINHAM'S VILLAGE I DISTRICT & SHORELAND GENERAL I DEVELOPMENT DISTRICT ZONES.
6. THE CONTRACTOR IS RESPONSIBLE FOR RESETTING ALL EXISTING PROPERTY MONUMENTATION THAT IS DISTURBED BY HIS/HER OPERATIONS AT NO EXPENSE TO THE OWNER. THIS WORK IS TO BE DONE BY A PROFESSIONAL LAND SURVEYOR REGISTERED IN THE STATE OF MAINE.
7. BASE FLOOD / TIDAL INFORMATION IS AS NOTED ON THE FOLLOWING TABLE:

PROJECT ELEVATIONS (BY DATUM)

ELEVATION	CHART (ft)	NAVD88 (ft)	Notes
Bowdoinham Ordinance - BF +3 FT	15.5	11.0	Local Zoning Ordinance for Building Structure FFE = 3 FT Above AE Zone BFE
Base Flood Elevation	12.5	8.0	FEMA July 16, 2015 FIRM, ZONE AE
500-Year Stillwater	None Available		FEMA July 16, 2015 Flood Insurance Study
100-Year Stillwater	None Available		
50-Year Stillwater	None Available		
10-Year Stillwater	None Available		
Highest Annual Tide	7.4	2.9	2018 MEDEP Predictions (Bowdoinham, Cathance River)
USGS BM "RESET 1952" AT NW COR RTE 24 BRIDGE ABUTMENT OVER CATHANCE RIVER	13.4	8.9	Common Reference Point Between LRLS Topographic Survey (NAVD88) & 1996 Philip-Mailly Boat Launch Plans by Pine Tree Engineering (NGVD29)
MHHW	6.3	1.8	BASED ON NOAA TIDAL BM 8417391 "Bowdoinham, Cathance River, ME" Subordinate Station and 8418150 "Portland" Reference Station
MHW	6.0	1.5	
NAVD88	4.5	0.0	
MLW	0.2	-4.3	
MLLW	0.0	-4.5	

DEMOLITION NOTES

1. THE CONTRACTOR SHALL NOT MAKE ANY OPENING OR EXCAVATION WITHIN THE PROJECT AREA UNTIL CONTACT HAS BEEN MADE WITH 'DIG SAFE' AND ALL UTILITIES TO LOCATE ANY EXISTING POWER, TELEPHONE, CABLE TV, WATER OR OTHER UNDERGROUND SERVICES.
2. THE CONTRACTOR SHALL NOT HAVE ANY RIGHT OF PROPERTY IN MATERIALS TAKE FROM ANY EXCAVATION AND DEMOLITION WORK.
3. ALL SUITABLE EXCAVATED MATERIAL MAY BE INCORPORATED INTO THE PROJECT WITH WRITTEN APPROVAL FROM THE OWNER. EXCESS MATERIAL SHALL BE DISPOSED OF BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
4. THE CONTRACTOR SHALL DISPOSE OF ALL DEMOLISHED, UNSUITABLE AND EXCESS MATERIAL IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.
5. TOPSOIL STRIPPED IN AREAS OF CONSTRUCTION THAT IS SUITABLE FOR REUSE AS LOAM SHALL BE STOCKPILED AT A LOCATION TO BE DESIGNATED BY THE OWNER. UNSUITABLE SOIL SHALL BE SEPARATED, REMOVED AND DISPOSED OF AT AN APPROVED DISPOSAL LOCATION OFFSITE.

UTILITY NOTES

1. THE UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE AND ARE PROVIDED AS A GUIDE TO THE CONTRACTOR. NO GUARANTEE IS MADE THAT UTILITIES WILL BE ENCOUNTERED WHERE SHOWN OR THAT ALL UTILITIES ARE SHOWN. THE CONTRACTOR SHALL VERIFY ALL LOCATIONS IN THE FIELD AND BE RESPONSIBLE FOR REPAIR OF UTILITIES DISTURBED DURING CONSTRUCTION.
2. THE CONTRACTOR SHALL NOT MAKE ANY OPENING OR EXCAVATION WITHIN THE PROJECT AREA UNTIL CONTACT HAS BEEN MADE WITH 'DIG SAFE' AND ALL UTILITIES TO LOCATE ANY EXISTING POWER, TELEPHONE, CABLE TV, WATER OR OTHER UNDERGROUND SERVICES.
3. NO DISRUPTION TO THE EXISTING UTILITIES ADJACENT THE PROJECT SITE SHALL BE ALLOWED DURING DEMOLITION OR CONSTRUCTION ACTIVITIES.
4. ANY TEMPORARY UTILITY SERVICE, IF REQUIRED BY THE CONTRACTOR TO PERFORM HIS/HER WORK DURING THE DURATION OF CONSTRUCTION, IS THE RESPONSIBILITY OF THE CONTRACTOR.

GRADING & DRAINAGE NOTES

1. ANY SETTLEMENT OCCURING WITHIN ONE YEAR OF SUBSTANTIAL COMPLETION OF THE PROJECT WILL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER.
2. ALL PROPOSED ROAD, DRIVE, PARKING AND WALKWAY AREA SURFACES SHALL PITCH 1/4" PER FOOT (2%) MINIMUM IN ALL DIRECTIONS UNLESS OTHERWISE NOTED ON THE PLANS.
3. ALL DRAINAGE STRUCTURES SHALL BE CLEAN AND FREE OF SEDIMENT OCCURRING DURING THE CONSTRUCTION PERIOD AT NO ADDITIONAL EXPENSE TO THE OWNER.

STRUCTURAL DESIGN CRITERIA

1. HOT MIX ASPHALT PAVING
   a. PAVING MATERIALS AND PLACEMENT SHALL BE IN ACCORDANCE WITH MaineDOT AND PROJECT SPECIFICATIONS. REFER TO PLANS FOR TYPICAL PAVEMENT DETAILS.
2. CAST-IN-PLACE CONCRETE
   a. REFER TO MaineDACF SPECIFICATIONS FOR CAST-IN-PLACE CONCRETE FLOAT ABUTMENT OR APPROVED EQUAL MEETING THE FOLLOWING CRITERIA:
   b. MIX DESIGN:
      i. MDOT CLASS A: F'_C = 4,000 PSI
   c. DCI ADMIXTURE; 3-GAL/CY.
   d. MINIMUM COVER TO REINFORCEMENT = 3"
   e. REINFORCING STEEL:
      i. ASTM A615 GRADE 60; F_Y = 60,000 PSI, EPOXY COATED
   f. COAT EXPOSED CONCRETE SURFACES WITH SIKAGARD 670W CLEAR OR EQUIV. PROTECTIVE COATING.
3. PRECAST CONCRETE
   a. REFER TO MaineDACF SPECIFICATIONS FOR PRECAST CONCRETE RAMP PLANKS OR APPROVED EQUAL MEETING THE FOLLOWING CRITERIA:
   b. MIX DESIGN:
      i. MDOT CLASS A: F'_C = 4,000 PSI
   c. DCI ADMIXTURE; 3-GAL/CY.
   d. MINIMUM COVER TO REINFORCEMENT = SEE DETAILS ON SHEET S-2
   e. REINFORCING STEEL:
      i. ASTM A615 GRADE 60; F_Y = 60,000 PSI, EPOXY COATED
   f. COAT EXPOSED CONCRETE SURFACES WITH SIKAGARD 670W CLEAR OR EQUIV. PROTECTIVE COATING.
   g. ALL COMPONENTS SHALL BE SUPPORTED DURING HANDLING TO PREVENT DAMAGE. ANY DAMAGE (INCLUDING BUT NOT LIMITED TO FRACTURED, BENT OR CRACKED SECTIONS, THAT IMPACT THE STRUCTURAL, FUNCTIONAL OR VISUAL INTEGRITY WILL BE REJECTED AT THE SITE.)
4. FLOAT DESIGN
   a. PROVIDE SHOP DRAWING FOR APPROVAL.
   b. FLOATS SHALL BE HEAVY TIMBER FRAME CONSTRUCTION ON MOLDED FLOTATION CHAMBERS BY A MANUFACTURER WITH DOCUMENTED 5-YEARS SALT WATER CONSTRUCTION EXPERIENCE.
   c. PROVIDE SKIDS TO MINIMIZE FOOTPRINT ON INTERTIDAL MUD FLAT.
   d. FLOAT DESIGN CRITERIA
      i. DL FREEBOARD - 16" +/-2"
      ii. LIVE LOAD CAPACITY (FLOAT DRUMS FULLY SUBMERGED) - 20 PSF
      iii. A CONCENTRATED LIVE LOAD OF 400 LBS APPLIED AT ANY POINT SHALL NOT TILT THE DECK MORE THAN SIX DEGREES TO THE HORIZONTAL.
   e. COORDINATE CONNECTIONS AND FLOAT DESIGN REQUIREMENTS FOR MaineDACF TYPE "C" FLOATS OR APPROVED EQUAL WITH ACCUDOCK ADA LAUNCH FLOAT OR APPROVED EQUAL.
   f. FLOATS TO BE STORED IN AN UPLAND LOCATION IN THE OFFSEASON.
5. TIMBER PILES
   a. TIMBER PILES SHALL MEET ASTM D2899 DESIGN VALUES FOR TREATED ROUND TIMER PILES, WITH MINIMUM TIP CIRCUMFERENCE AND DESIGN LOAD CAPACITY AS INDICATED BELOW:

	LOCATION	TIP	P (KIPS)	MATERIAL
i.	Vertical Piles	12"	20	PINE

   b. PILES SHALL BE DRIVEN TO REFUSAL USING AN APPROVED VIBRATORY OR DROP HAMMER. A RECORD OF DRIVING CONDITIONS AND PENETRATION SHALL BE KEPT FOR EACH PILE AND REVIEWED WITH THE ENGINEER.
   c. IF LEDGE IS ENCOUNTERED WITHIN 10-FT OF SURFACE, NOTIFY ENGINEER.

PRELIMINARY
FOR REVIEW ONLY

NOT FOR CONSTRUCTION

STRUCTURAL NOTES

TIMBER PILES

1. VERTICAL TIMBER PILES SHALL BE SOUTHERN YELLOW PINE CONFORMING TO ASTM D25. PROVIDE PROTECTION TO PILE TIP AND BUTT TO AVOID DAMAGE DURING DRIVING.
2. REFER TO SPECIFICATIONS FOR PILE DRIVING CRITERIA. THE CONTRACTOR IS CAUTIONED OF ANTICIPATED RAPID INCREASE IN DRIVING RESISTANCE DUE TO ABRUPT CHANGES IN SOIL STRATA. CARE SHOULD BE TAKEN TO AVOID DAMAGE TO THE PILE.
3. THE CONTRACTOR SHALL ORDER PILES OF SUFFICIENT LENGTH TO ALLOW FOR 5 FT VARIATION IN THE TABULATED LENGTH PROVIDED. REFER TO PLANS.

MISCELLANEOUS METALS AND FASTENERS

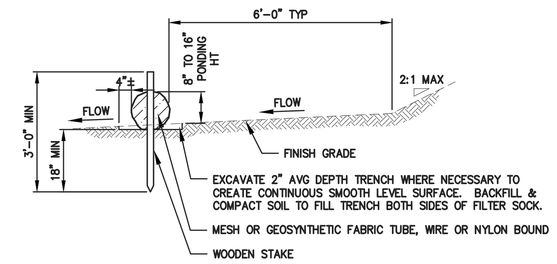
1. ALL METAL ITEMS TO BE A36 STEEL, HOT-DIP GALVANIZED AFTER FABRICATION UNLESS OTHERWISE NOTED.
2. ALL FASTENERS SHALL BE HOT DIPPED GALVANIZED OR STAINLESS STEEL TO RESIST CORROSION.
3. ALL BOLTS SHALL BE HEAVY HEX, ASTM A-307 UNLESS OTHERWISE NOTED. MINIMUM SIZE SHALL BE ¾" DIA. UNLESS OTHERWISE NOTED.
4. AT ALL TIMBER CONNECTIONS, 'DOCK' WASHERS SHALL BE PROVIDED.

TIMBER STRUCTURAL MEMBERS

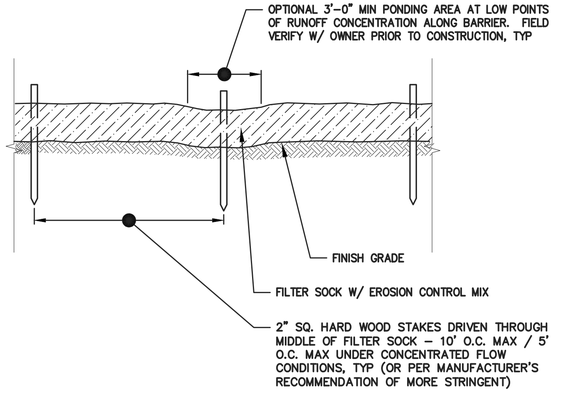
1. REFER TO TIMBER SPECIFICATION TABLE.
2. ALL EXPOSED EDGES ADJACENT TO PEDESTRIAN TRAVEL SHALL BE PLANED OR SANDED TO PROVIDE SMOOTH SURFACE FREE OF ROUGH EDGES OR DEFECTS.
3. ALL FASTENERS SHALL BE COUNTERSUNK SO AS NOT TO PROTRUDE BEYOND THE FINISHED SURFACE.

SUBMITTAL REQUIREMENTS

1. FLOAT DESIGN, INCLUDING CONSTRUCTION, HARDWARE AND PILE CONNECTION DETAILS.
2. PILE & LUMBER MATERIALS.



SECTION



ELEVATION

NOTES:
1. FILTER SOCKS SHALL BE INSTALLED IN CONTINUOUS SEGMENTS AND IN FULL CONTACT WITH THE GROUND ON A SMOOTH LEVEL SURFACE.
2. FOLLOW MANUFACTURER'S REQUIREMENTS FOR INSTALLATION, MAINTENANCE AND REMOVAL OF FILTER SOCK MATERIALS.
3. AREAS DISTURBED BY EROSION BARRIERS SHALL BE STABILIZED AFTER REMOVAL.

SEDIMENT BARRIER – FILTER SOCK
NOT TO SCALE

BAKER DESIGN CONSULTANTS
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NO.	DATE	BY
A	04.08.20	TJP
	PERMITTING SUBMISSION	

DESIGNED BY: TJP
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: NOTES, SCHEDULES & EROSION CONTROL DETAILS

PROJECT: TOWN OF BOWDOINHAM
WATERFRONT PLAN PHASE I
BOWDOINHAM, MAINE

DATE
APRIL 2020

CONTRACT NO.
18–20

SHEET NO. G-2
REV. A

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N

LR
LS

SOURCE
SPCS - 1983 MAINE WEST

NOTES

1) RECORD OWNERS: INHABITANTS OF THE TOWN OF BOWDOINHAM
REFERENCE DOCUMENTS: DEED BOOK 1615, PAGE 321 DATED SEPTEMBER 2, 1998
DEED BOOK 1649, PAGE 157 DATED DECEMBER 14, 1998
SEE ALSO: "STANDARD BOUNDARY SURVEY & TOPOGRAPHIC PLAN" FOR CENTRAL CHEMICAL CORPORATION DATED APRIL 24, 1998 BY HARTY LAND SURVEYING RECORDED IN PLAN BOOK 34, PAGE 25.

2) PROPERTY LINES AND A SIGNIFICANT PORTION OF THE AREA OUTSIDE OF THE DEFINED SCOPE OF WORK OF THIS PROJECT ARE DEPICTED ON THE HARTY PLAN CITED ABOVE. VARIOUS STORM WATER DRAINAGE STRUCTURES NOT OBSERVED BY THIS SURVEYOR DURING THE COURSE OF THE FIELD WORK CONDUCTED IN 2019 HAVE BEEN SHOWN AS DEPICTED ON THE HARTY PLAN. THE CURRENT STATUS OF SAID STRUCTURES IS UNKNOWN.

3) BEARINGS ARE REFERENCED TO THE STATE PLANE COORDINATE SYSTEM OF 1983, MAINE WEST ZONE, AS DETERMINED BY REAL TIME KINEMATIC GNSS TECHNIQUES WITH CORRECTIONS APPLIED BY THE MAINE DOT VRS NETWORK.

4) ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AS DETERMINED BY REAL TIME KINEMATIC GNSS TECHNIQUES WITH CORRECTIONS APPLIED BY THE MAINE DOT VRS NETWORK.

5) THE HIGHEST ANNUAL TIDE (HAT) ELEVATION OF 2.9 FEET (NAVD88) IS LISTED IN A TABLE PUBLISHED BY THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION AVAILABLE ONLINE. THE DATA FOR THE "BOWDOINHAM, CATHANCE RIVER" LOCATION IS DEPICTED HEREON.

6) A PORTION OF THE PROJECT AREA IS SHOWN IN A SPECIAL FLOOD HAZARD AREA, ZONE AE (AREAS OF 100 YEAR FLOOD WITH BASE FLOOD ELEVATIONS DETERMINED) AS DEPICTED ON THE FLOOD INSURANCE RATE MAP FOR SAGADAHOC COUNTY WITH MAP NUMBER 23023C0094F AND AN EFFECTIVE DATE OF JULY 16, 2015. THE BASE FLOOD ELEVATION OF 8 FEET (NAVD88) IS DEPICTED HEREON.

LEGEND

- PIPE OR ROD FOUND
- RIGHT OF WAY
- PROPERTY LINE
- BUILDING
- PAVEMENT
- CONCRETE
- GRANITE CURB
- GRAVEL
- TRAIL
- CATCH BASIN
- ELECTRIC OUTLET
- UTILITY POLE AND ANCHOR
- CONTOURS - MAJOR
- CONTOURS - MINOR

80 40 0 80 160 240
SCALE IN FEET

STATE OF MAINE
JERAMIAH RAITT
No. 2376
PROFESSIONAL LAND SURVEYOR

JERAMIAH J. RAITT PLS #2376

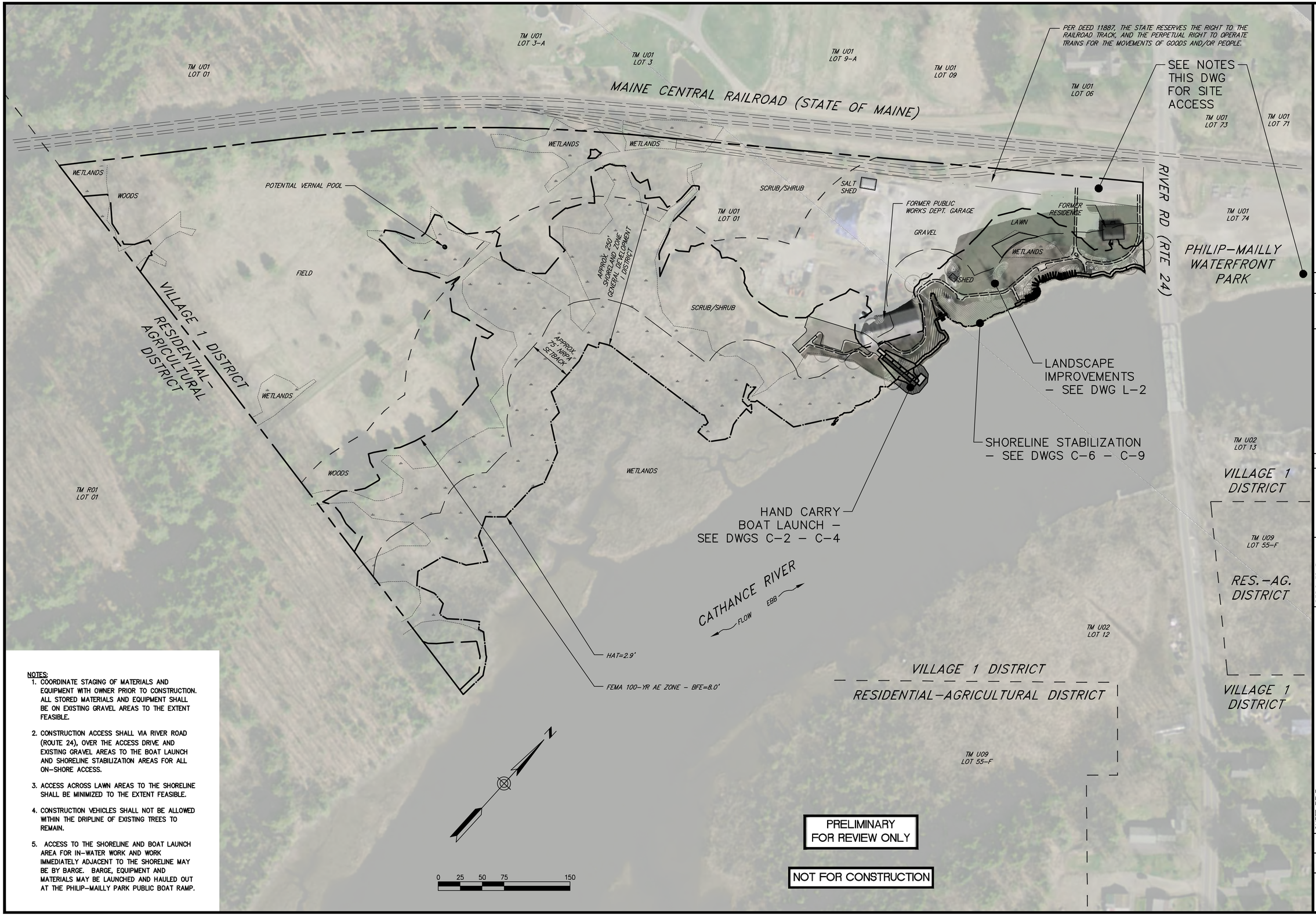
TOPOGRAPHIC SURVEY

FOR TOWN OF BOWDOINHAM
8 RIVER ROAD, BOWDOINHAM, MAINE

SITE 8 RIVER ROAD
BOWDOINHAM, MAINE

LITTLE RIVER
LAND SURVEYING, INC.
ME PLS #2376 NH LLS #957
PO BOX 332, LISBON FALLS MAINE 04252
(207) 841-0056

DATE: JUNE 28, 2019
SCALE: 1" = 80'
PROJECT #19-025
DRAWING #19-025
DRAWN BY: TJC
CHECKED BY: JJR



NOTES:

1. COORDINATE STAGING OF MATERIALS AND EQUIPMENT WITH OWNER PRIOR TO CONSTRUCTION. ALL STORED MATERIALS AND EQUIPMENT SHALL BE ON EXISTING GRAVEL AREAS TO THE EXTENT FEASIBLE.
2. CONSTRUCTION ACCESS SHALL VIA RIVER ROAD (ROUTE 24), OVER THE ACCESS DRIVE AND EXISTING GRAVEL AREAS TO THE BOAT LAUNCH AND SHORELINE STABILIZATION AREAS FOR ALL ON-SHORE ACCESS.
3. ACCESS ACROSS LAWN AREAS TO THE SHORELINE SHALL BE MINIMIZED TO THE EXTENT FEASIBLE.
4. CONSTRUCTION VEHICLES SHALL NOT BE ALLOWED WITHIN THE DRIPLINE OF EXISTING TREES TO REMAIN.
5. ACCESS TO THE SHORELINE AND BOAT LAUNCH AREA FOR IN-WATER WORK AND WORK IMMEDIATELY ADJACENT TO THE SHORELINE MAY BE BY BARGE. BARGE, EQUIPMENT AND MATERIALS MAY BE LAUNCHED AND HAULED OUT AT THE PHILIP-MAILLY PARK PUBLIC BOAT RAMP.

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NOT FOR CONSTRUCTION

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Civil, Marine, and Structural Engineering
7 Spruce Road • Freeport • Maine • 04032 • 207-846-9724 • info@bakerdesignconsultants.com

NO.	PERMITTING SUBMISSION	DATE	INT.
A		04.08.20	TJP

DESIGNED BY: TJP
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: OVERVIEW PLAN

PROJECT: WATERFRONT PLAN - PHASE I
TOWN OF BOWDOINHAM
BOWDOINHAM, MAINE

DATE
APRIL 2020

CONTRACT NO.
18-20

SHEET NO. C-1
REV. A

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N

REMOVE/DEMOLISH BUILDING (BY OTHERS)

COORDINATE REGRADING OF DEMOLISHED BUILDING W/ LANDSCAPE & BOAT LAUNCH IMPROVEMENTS

SEE DWGS C-6 – C-9 FOR SHORELINE STABILIZATION WORK

FIELD VERIFY LIMITS OF VEGETATIVE CLEARING, TYP

TREES TO BE REMOVED, TYP

REMOVE/DEMOLISH BUILDING (BY OTHERS)

REMOVE/DEMOLISH CULVERT

FEMA 100-YR AE ZONE – BFE=8.0'

GRAVEL

FORMER PUBLIC WORKS GARAGE FE 9.7'

SHED

TREES

LAWN

WETLANDS

12" CMP. CULVERT

15" BLACK WILLOW DEAD

15" GREEN ASH

(3) 4" GREEN ASH

8" RED MAPLE

8" GREEN ASH

24" BLACK WILLOW (CLUMP)

8" GREEN ASH

8" GREEN ASH

4" GREEN ASH

6" QUAKING ASPEN

4" GREEN ASH

5" GREEN ASH

5" GREEN ASH

5" PAPER BIRCH

5" BLACK CHERRY

4" QUAKING ASPEN

4" PAPER BIRCH

4" QUAKING ASPEN

HAT=2.9'

MHHW=1.8'

MLLW=(-)4.5'

APPROX. 75' NRPA SETBACK

CATHANCE RIVER

EBB FLOW

0 5 10 15 30

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NO.	DATE	INT.
A	04.08.20	TJP
PERMITTING SUBMISSION		

DESIGNED BY: TJP
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: BOAT LAUNCH – EX CONDITIONS DEMOLITION & ESC PLAN

PROJECT: WATERFRONT PLAN – PHASE I
TOWN OF BOWDOINHAM
BOWDOINHAM, MAINE

DATE: APRIL 2020

CONTRACT NO. 18-20

SHEET NO. C-2

REV. A

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FEMA 100-YR AE ZONE - BFE=8.0'

GRAVEL

PROPOSED LANDSCAPE IMPROVEMENTS - SEE DWG L-2, TYP

(2) 11'x20' ADA PARKING SPACES W/ SIGNS

(1) 10'x20' PARKING SPACE

MAINTAIN EXISTING GRAVEL FOR ACCESS DRIVE, THIS AREA

LOAM & SEED ALL DISTURBED AREAS UNLESS OTHERWISE NOTED

15'x40' ADA BOAT TRAILER PARKING SPACE W/ "HC PARKING" SIGN (FUTURE PHASE)

4' WIDE PEDESTRIAN PATH - SEE DWG L-2, TYP

INSTALL (2) "NO MOTOR BOATS" SIGNS

INSTALL (3) BOLLARDS TO DELINEATE VEHICLE/PEDESTRIAN TRAFFIC AREAS

PAVED PEDESTRIAN APPROACH (5% MAX SLOPE)

CONSTRUCT CONCRETE FLOAT ABUTMENT

LAWN

TREES

TREES

SEE DWGS C-6 - C-9 FOR SHORELINE STABILIZATION WORK

PLACE HEAVY RIPRAP (D50=30") SHORELINE STABILIZATION, TYP

INSTALL (2) TIMBER GUIDE PILES

INSTALL (4) 6'x16' FLOATS

INSTALL (1) 12'x18' ADA FLOAT W/ BOAT LAUNCH RAMP

INSTALL (2) MOORING CHAINS TO HELICAL ANCHORS

EXTEND HEAVY RIPRAP 10'-0" BEYOND END OF RAMP

RIVERBED CLEANUP AREA

INSTALL 18"x12' PRECAST CONCRETE PLANKS

INSTALL VERTICAL CURB ENTIRE LENGTH OF EACH SIDE OF RAMP (APPROX. 127 LF)

PLACE (3) 8-KAYAK TEMPORARY STORAGE RACKS. FINAL LOCATION TO BE APPROVED BY OWNER

0+00 0+25 0+50 0+75 1+00 1+25 1+50 1+75

9'-0"

R30'-0"

20'-0"

22'-9"±

15'-0", TYP

10'-0"

15'-0", TYP

5'-0"±

R5'-0"

5'-0"

R5'-0"

R3'-0"

R5'-0"

HAT=2.9'

MHHW=1.8'

MLLW=(-)4.5'

WETLANDS

APPROX. 75' NRPA SETBACK

CATHANCE RIVER

EBB FLOW

0 5 10 15 30

NOTES:

1. LANDSCAPING (OTHER THAN RESTORATION OF DISTURBED LAWN AREAS), PEDESTRIAN PATHS, SITE AMENITIES AND SHORELINE STABILIZATION WORK ADJACENT TO THE BOAT LAUNCH ARE PART OF A SEPARATE CONSTRUCTION PROJECT.
2. ALL FLOATS ARE SEASONAL AND WILL BE STORED IN UPLAND AREAS OUTSIDE OF THE FEMA FLOOD ZONE.
3. PERMANENT COASTAL WETLANDS IMPACTS (HEAVY RIPRAP & BOAT RAMP) = 590 SF
4. TEMPORARY COASTAL WETLANDS IMPACTS (RIVERBED CLEANUP AREA) = 1,815 SF

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NO.	DATE	BY
A	04.08.20	TJP
	PERMITTING SUBMISSION	INT.

DESIGNED BY: TJP
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: BOAT LAUNCH - LAYOUT PLAN

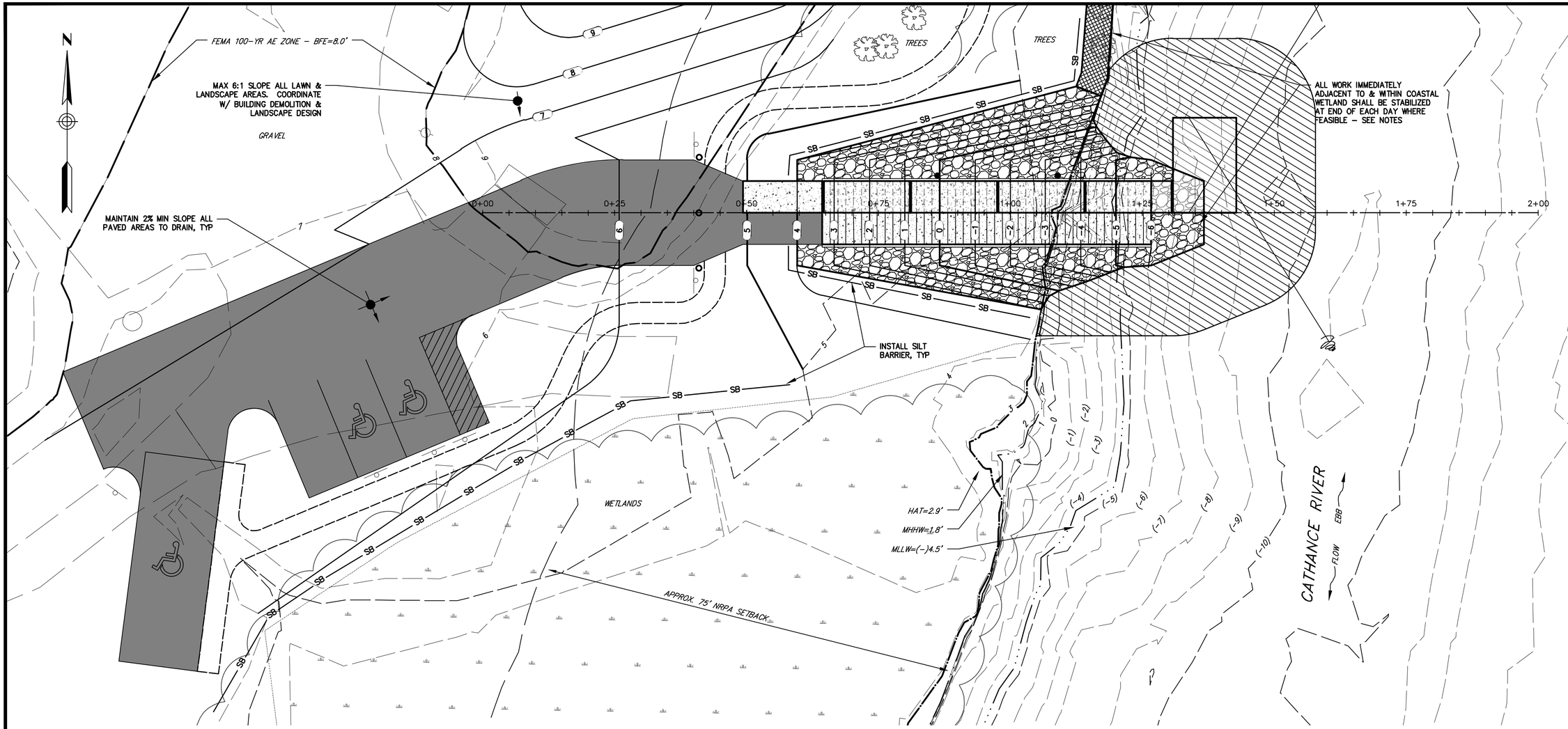
PROJECT: WATERFRONT PLAN - PHASE I
TOWN OF BOWDOINHAM
BOWDOINHAM, MAINE

DATE
APRIL 2020

CONTRACT NO.
18-20

SHEET NO. C-3

REV. A



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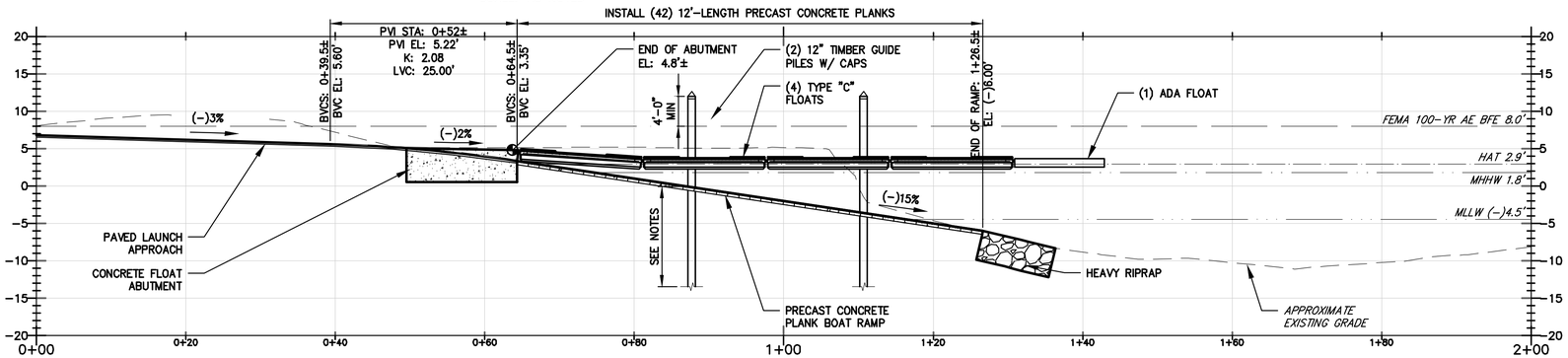
PLAN

SCALE: AS NOTED



PROFILE

VERTICAL SCALE: 1"=10'
HORIZONTAL SCALE: 1"=10'

NOTES:

1. LANDSCAPING (OTHER THAN RESTORATION OF DISTURBED LAWN AREAS), PEDESTRIAN PATHS, SITE AMENITIES AND SHORELINE STABILIZATION WORK ADJACENT TO THE BOAT LAUNCH IS PART OF A SEPARATE CONSTRUCTION PROJECT.
2. WHERE REQUIRED, INSTALL TURBIDITY CURTAIN OR SHEET PILING FOR ALL PORTIONS OF WORK THAT CANNOT BE STABILIZED COMPLETE & IN PLACE BETWEEN TIDE CYCLES, TYP.
3. DRIVE PILES TO A MINIMUM DEPTH OR 30 FEET OR REFUSAL. IF REFUSAL IS LESS THAN 10 FEET, CONTACT ENGINEER.

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NO.	DATE	INT.
A	04.08.20	TJP
	PERMITTING SUBMISSION	

DESIGNED BY: TJP
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: BOAT LAUNCH – GRADING PLAN & LAUNCH PROFILE

PROJECT: WATERFRONT PLAN – PHASE I
TOWN OF BOWDOINHAM
BOWDOINHAM, MAINE

DATE
APRIL 2020

CONTRACT NO.
18-20

SHEET NO. C-4

REV. A

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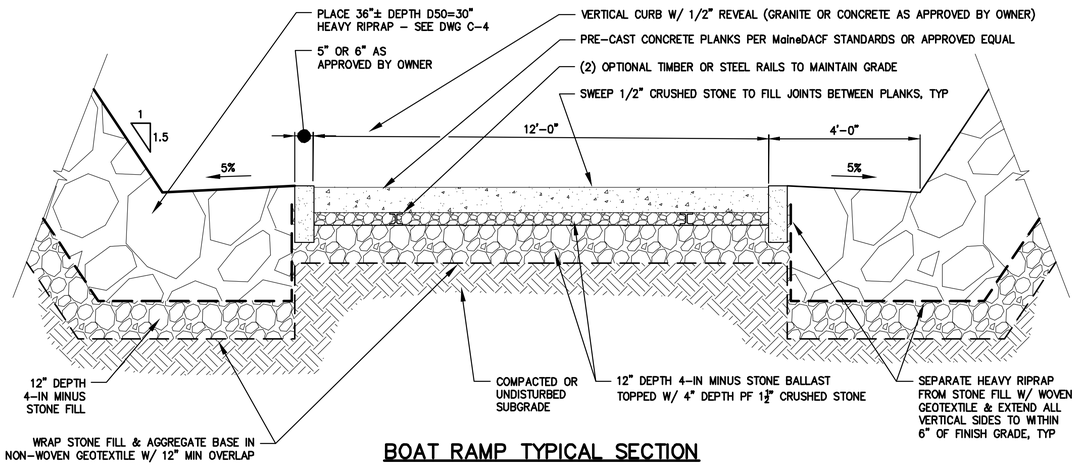
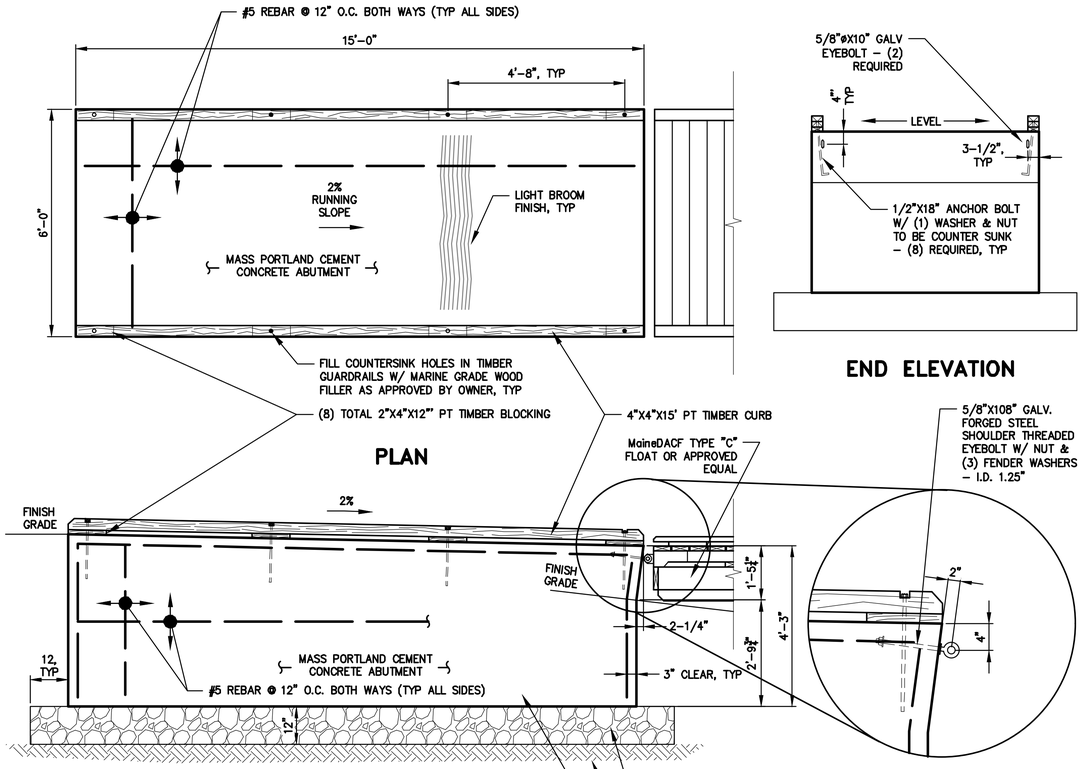


BOAT RAMP TYPICAL SECTION

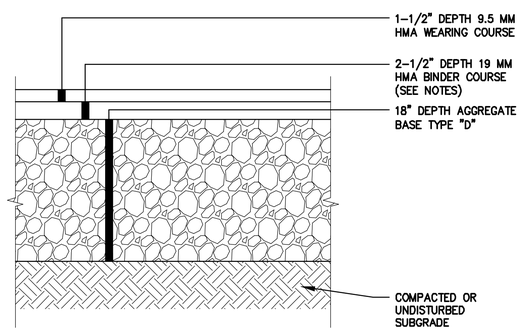
NOT TO SCALE



NOTES:
1. 3/4" CHAMFER ALL VERTICAL CONCRETE CORNER.
2. FINISH TOP EDGES OF CONCRETE WITH EDGING TOOL.
3. PROVIDE PLAIN DEFORMED REINFORCING STEEL CONFORMING TO THE REQUIREMENTS OF AASHTO M31.

CONCRETE ABUTMENT

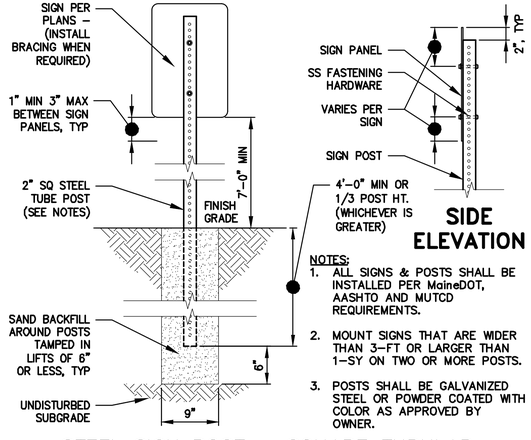
NOT TO SCALE



NOTES:
1. PAVEMENT DESIGN SHALL HAVE A MaineDOT APPROVED JOB MIX FORMULA (JMF) WITHIN THE LATEST CALENDAR YEAR UNLESS OTHERWISE APPROVED BY OWNER.
2. FOR TRENCH PAVEMENT, BINDER COURSE SHALL MEET DESIGN DEPTH OR DEPTH OF EXISTING PAVEMENT, WHICHEVER IS GREATER UP TO A TOTAL PAVEMENT DEPTH OF 6 INCHES.

HMA PARKING AREA TYPICAL SECTION

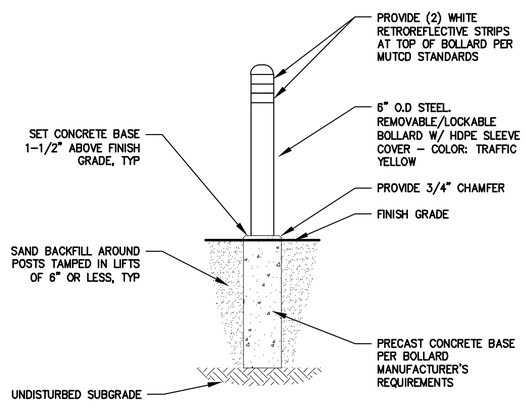
NOT TO SCALE



NOTES:
1. ALL SIGNS & POSTS SHALL BE INSTALLED PER MaineDOT, AASHTO AND MUTCD REQUIREMENTS.
2. MOUNT SIGNS THAT ARE WIDER THAN 3–FT OR LARGER THAN 1–SY ON TWO OR MORE POSTS.
3. POSTS SHALL BE GALVANIZED STEEL OR POWDER COATED WITH COLOR AS APPROVED BY OWNER.

STEEL SIGN POST – SQUARE TUBULAR

NOT TO SCALE



METAL BOLLARD

NOT TO SCALE

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NO.	DATE	INT.
A	04.08.20	TJP
	PERMITTING SUBMISSION	

DESIGNED BY: TJP
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: BOAT LAUNCH – DETAILS

PROJECT: WATERFRONT PLAN – PHASE I
TOWN OF BOWDOINHAM
BOWDOINHAM, MAINE

DATE
APRIL 2020

CONTRACT NO.
18–20

SHEET NO. C-5
REV. A

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SALT SHED
WOOD CHIP PILE
LOAM PILE
GRAVEL
SAND PILE
GRAVEL PILE
FUEL TANKS
APPROX. 250' SHORELAND ZONE - GENERAL DEVELOPMENT I DISTRICT
12" PE CULVERT
12" CMP CULVERT
SHED
APPROX. 75' NRPA SETBACK
FEMA 100-YR AE ZONE - BFE=8.0'
LAWN
WETLANDS
FORMER RESIDENCE FFE 11.7'
SEPTIC TANK
12" CMP CULVERT
RIVER RD (RTE 24)
HAT=2.9'
MHHW=1.8'
MLLW=(-)4.5'
FORMER PUBLIC WORKS GARAGE FE 9.7'
DEAD 15" GREEN ASH
15" BLACK WILLOW
TREES
6" GREEN ASH
6" QUAKING ASPEN
4" GREEN ASH
4" QUAKING ASPEN
5" PAPER BIRCH
4" PAPER BIRCH
4" QUAKING ASPEN
5" BLACK CHERRY
24" BLACK WILLOW (CLUMP)
8" GREEN ASH
(2) 5" GREEN ASH
8" RED MAPLE
(3) 4" GREEN ASH
8" GREEN ASH
6" GREEN ASH (LEANING)
(2) 8" NORWAY MAPLES
12" BLACK WILLOW
22" BLACK WILLOW
18" BLACK WILLOW
8" BLACK WILLOW
(2) 6" NORWAY MAPLE
4" NORWAY MAPLE
8" NORWAY MAPLE
4" GREEN ASH
10" GREEN ASH
(3) 4" GREEN ASH
(2) 8" NORWAY MAPLE
COORDINATE REGRADING OF DEMOLISHED BUILDING W/ LANDSCAPE & BOAT LAUNCH IMPROVEMENTS
SEE DWGS C-2 - C-4 FOR HAND CARRY BOAT LAUNCH WORK
FIELD VERIFY LIMITS OF VEGETATIVE CLEARING, TYP
REMOVE/DEMOLISH BUILDING (BY OTHERS)
TREES TO BE REMOVED, TYP
CATHANCE RIVER
FLOW
EBB
0 10 20 30 60

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NO.	DESCRIPTION	DATE	INT.
A	PERMITTING SUBMISSION	04.08.20	TJP

DESIGNED BY: TJP
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: SHORELINE STABILIZATION - EX CONDITIONS, DEMOLITION & ESC PLAN

PROJECT: WATERFRONT PLAN - PHASE I
TOWN OF BOWDOINHAM, MAINE
BOWDOINHAM, MAINE

DATE
APRIL 2020

CONTRACT NO.
18-20

SHEET NO. C-6
REV. A

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RAILROAD TRACKS

SALT SHED

WOOD CHIP PILE

LOAM PILE

GRAVEL

APPROX. 250' SHORELAND ZONE - GENERAL DEVELOPMENT I DISTRICT

MAX 6:1 / 12:1 MIN GRADE WITHIN WETLAND RESTORATION AREA. MAINTAIN 5' MEADOW BUFFER BETWEEN ACCESS PATH & WETLAND RESTORATION AREA, TYP

PROPOSED LANDSCAPE IMPROVEMENTS - SEE DWG L-2, TYP

SAND PILE

LOAM PILE

GRAVEL PILE

FUEL TANKS

12" PE CULVERT

12" CMP CULVERT

4' WIDE PEDESTRIAN PATH - SEE DWG L-2, TYP

SEE DWGS C-2 - C-4 FOR HAND CARRY BOAT LAUNCH WORK

SHED

TREES

APPROX. 75' NRPA SETBACK

GRAVEL

CONSTRUCT APPROXIMATELY 115 LF OF VEGETATED WALL SHORELINE TREATMENT - SEE TYPICAL SECTIONS

TREES

TREES

WETLANDS

INSTALL DOUBLE COIR LOG ROWS (APPROXIMATELY 140 LF EACH ROW) TO ESTABLISH PLANTINGS

GABION STORMWATER FILTER

CONSTRUCT APPROXIMATELY 4,000 SF OF FRESHWATER COASTAL WETLAND RESTORATION AREA - SEE TYPICAL SECTIONS

HAT=2.9'

MHHW=1.8'

MLLW=(-)4.5'

FEMA 100-YR AE ZONE - BFE=8.0'

LOAM & SEED APPROXIMATE 1,065 SF OF FILLED WETLAND OUTSIDE OF 75-FT NRPA SETBACK

75' NRPA SETBACK

WETLANDS

GRAVEL

12" CMP CULVERT

LAWN

VEGETATED WALL SHORELINE TREATMENT - SEE TYPICAL SECTIONS

FORMER RESIDENCE FE 11.7'

RIVER RD (RTE 24)

TREES

25 LF±

33 LF±

CONSTRUCT APPROXIMATE 115 LF OF TREE ROOT WAD SHORELINE TREATMENT - SEE TYPICAL SECTIONS

CONSTRUCT STONE ARMORED SHORELINE TREATMENT - SEE TYPICAL SECTIONS

20 LF±

CATHANCE RIVER

FLOW

EBB

0 10 20 30 60

NOTES:

1. LANDSCAPING (OTHER THAN RESTORATION OF DISTURBED LAWN AREAS), PEDESTRIAN PATHS, SITE AMENITIES AND SHORELINE STABILIZATION WORK ADJACENT TO THE BOAT LAUNCH ARE PART OF A SEPARATE CONSTRUCTION PROJECT.
2. CONTRACTOR SHALL FIELD VERIFY LIMITS OF SHORELINE TREATMENTS PRIOR TO CONSTRUCTION.
3. BOAT LAUNCH IS PART OF A SEPARATE CONSTRUCTION PROJECT.
4. PERMANENT COASTAL WETLANDS IMPACTS (GABION STORMWATER FILTER) = 150 SF
5. TEMPORARY COASTAL WETLANDS IMPACTS (TREE ROOT WAD ROOTS) = 115 SF

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A	PERMITTING SUBMISSION	04.08.20	TJP

DESIGNED BY: TJP
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: SHORELINE STABILIZATION SITE PLAN

PROJECT: WATERFRONT PLAN - PHASE I
TOWN OF BOWDOINHAM, MAINE
BOWDOINHAM, MAINE

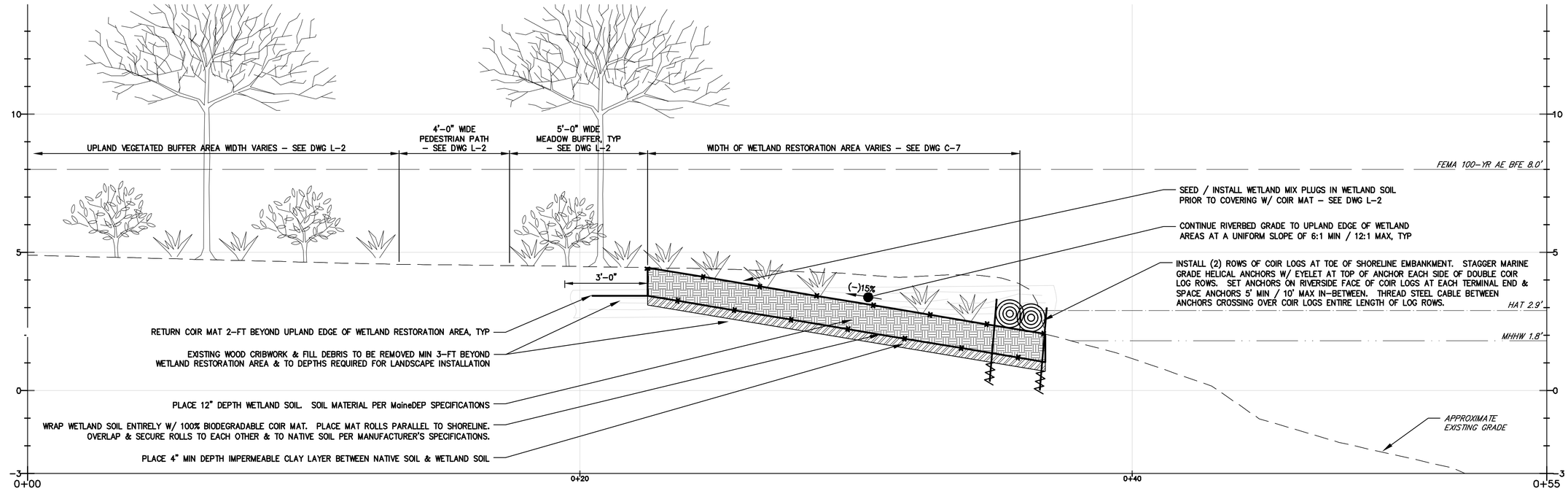
DATE
APRIL 2020

CONTRACT NO.
18-20

SHEET NO. C-7

REV. A

x:\18\18-20 bowdoinham waterfront\phaseb-livingshorelines\cad\18-20-bowdoinham-civ.dwg 5/5/2020



FRESHWATER COASTAL WETLAND SHORELINE TREATMENT

VERTICAL SCALE: 1"=2'
HORIZONTAL SCALE: 1"=2'

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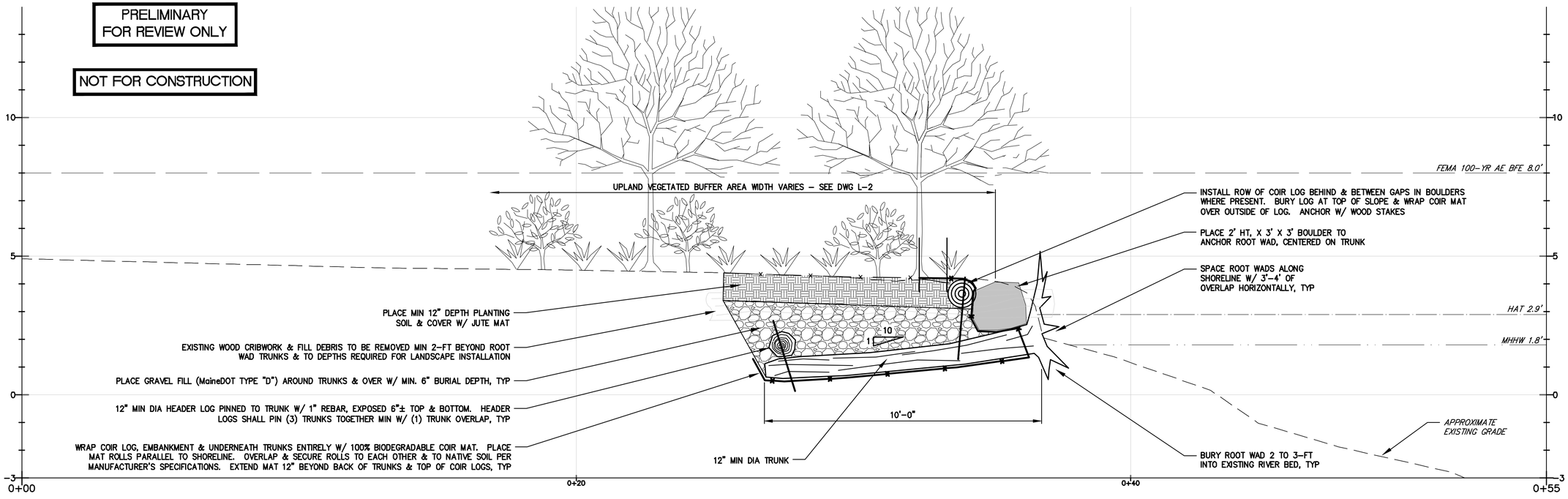

TREE ROOT WAD SHORELINE TREATMENT

VERTICAL SCALE: 1"=2'
HORIZONTAL SCALE: 1"=2'

NOTES:
1. ALL COIR AND JUTE MATTING SHALL BE STAKED OR STAPLED TO SURFACE PER MaineDEP BEST MANAGEMENT PRACTICES & PER MANUFACTURER'S REQUIREMENTS.
2. ALL SLOPE STABILIZATION WORK SHALL BE INSTALLED AND STABILIZED COMPLETE AND IN PLACE AT THE END OF EACH WORKDAY AND PRIOR TO FORECAST STORMS.

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NO.	DATE	INT.
A	04.08.20	TJP
	PERMITTING SUBMISSION	

DESIGNED BY: TJP
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: SHORELINE STABILIZATION TYPICAL SECTIONS I

PROJECT: WATERFRONT PLAN – PHASE I
TOWN OF BOWDOINHAM
BOWDOINHAM, MAINE

DATE
APRIL 2020

CONTRACT NO.
18–20

SHEET NO. C-8

REV. A

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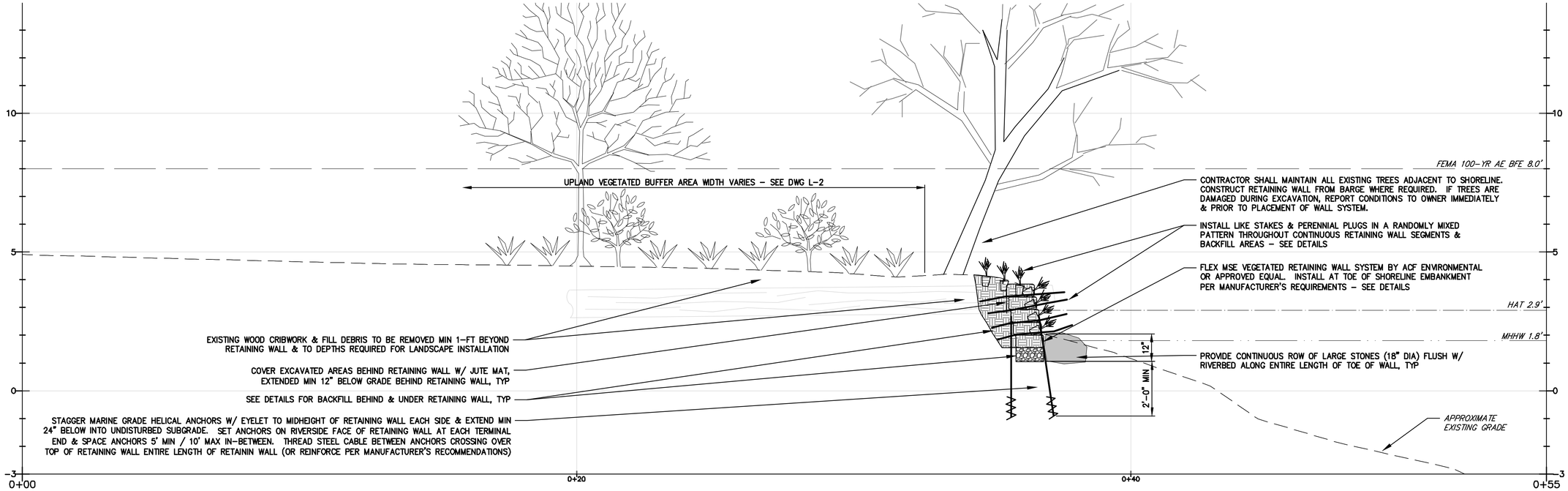

VEGETATED WALL SHORELINE TREATMENT

VERTICAL SCALE: 1"=2'
HORIZONTAL SCALE: 1"=2'

PRELIMINARY
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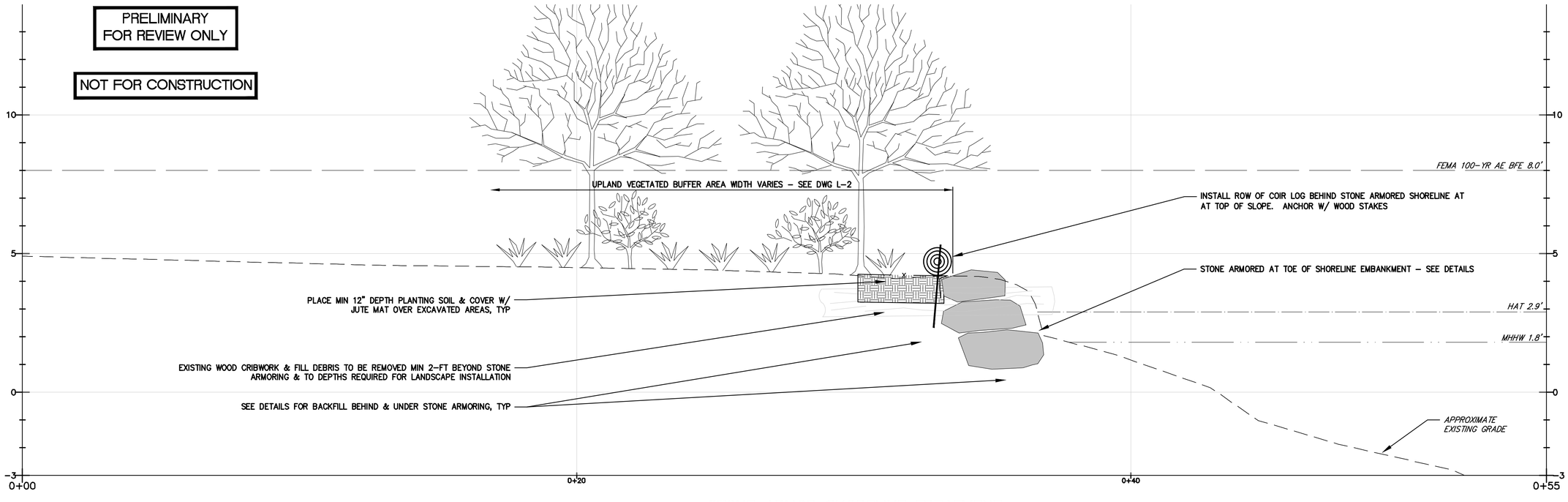

STONE ARMOR SHORELINE TREATMENT

VERTICAL SCALE: 1"=2'
HORIZONTAL SCALE: 1"=2'

NOTES:
1. ALL COIR AND JUTE MATTING SHALL BE STAKED OR STAPLED TO SURFACE PER MaineDEP BEST MANAGEMENT PRACTICES & PER MANUFACTURER'S REQUIREMENTS.
2. ALL SLOPE STABILIZATION WORK SHALL BE INSTALLED AND STABILIZED COMPLETE AND IN PLACE AT THE END OF EACH WORKDAY AND PRIOR TO FORECAST STORMS.

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DESIGNED BY: TJP
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: SHORELINE STABILIZATION OPTIONS TYPICAL SECTIONS II

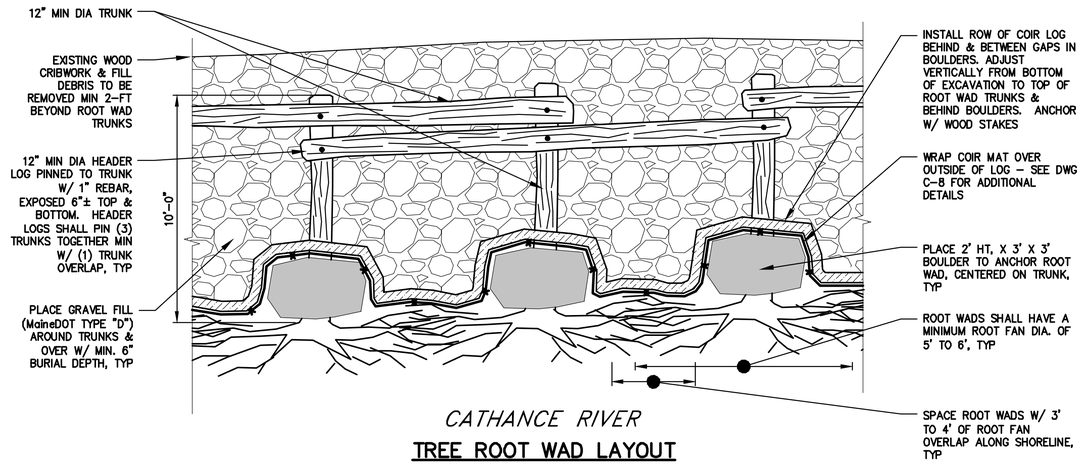
PROJECT: WATERFRONT PLAN - PHASE I
TOWN OF BOWDOINHAM
BOWDOINHAM, MAINE

DATE
APRIL 2020

CONTRACT NO.
18-20

SHEET NO. C-9 | REV. A

x:\18\18-20 bowdoinham waterfront\phaseb-livingshorelines\cad\18-20-bowdoinham-civ.dwg 5/5/2020



CATHANCE RIVER

TREE ROOT WAD LAYOUT

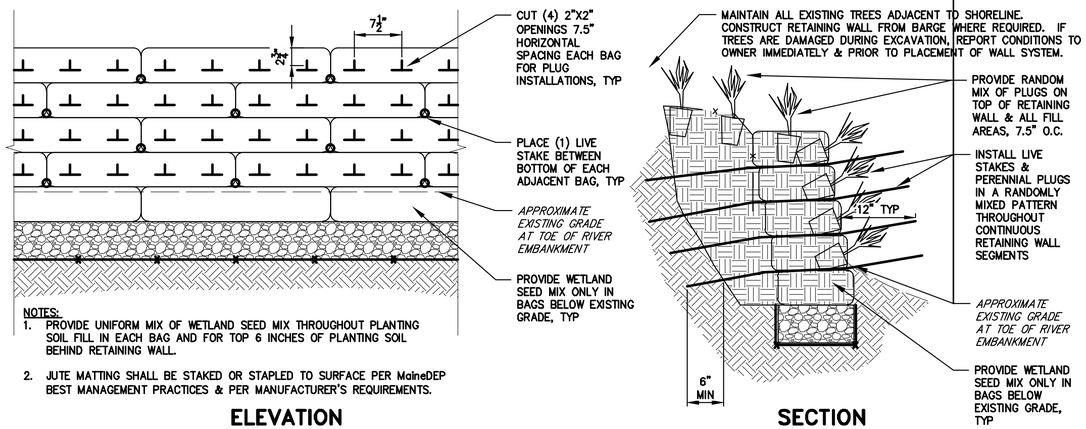
NOT TO SCALE

PRELIMINARY
FOR REVIEW ONLY

NOT FOR CONSTRUCTION

PLANT LIST

KEY	QTY	SCIENTIFIC NAME / COMMON NAME	SIZE	SPACING	ROOTING	NOTES
		LIVE STAKES				
CA	67	*CORNUS AMOMUM* SILKY DOGWOOD	1/2" TO 1-1/2" DIA	30"/ROW O.C.	BARE ROOT	SEE DETAILS
CR	66	*CORNUS RACEMOSA* GRAY DOGWOOD	1/2" TO 1-1/2" DIA	30"/ROW O.C.	BARE ROOT	SEE DETAILS
CS	67	*CORNUS SERICEA* REDOSIER DOGWOOD	1/2" TO 1-1/2" DIA	30"/ROW O.C.	BARE ROOT	SEE DETAILS
SB	66	*SALIX CINEREA* GREY WILLOW	1/2" TO 1-1/2" DIA	30"/ROW O.C.	BARE ROOT	SEE DETAILS
SD	67	*SALIX DISCOLOR* PUSSY WILLOW	1/2" TO 1-1/2" DIA	30"/ROW O.C.	BARE ROOT	SEE DETAILS
SP	67	*SALIX PUPUREA VAR. 'NANA'* *DWARF ARTIC WILLOW*	1/2" TO 1-1/2" DIA	30"/ROW O.C.	BARE ROOT	SEE DETAILS
		PLUGS				
AA	333	*CALAMAGROSTIS CANADENSIS* BLUEJOINT GRASS	5-7 PPP	7.5" O.C.	PLUG	SEE DETAILS
JC	334	*CAREX GYNANDRA* NODDING SEDGE	5-7 PPP	7.5" O.C.	PLUG	SEE DETAILS
JH	333	*CAREX VULPINOIDEA* BROWN FOX SEDGE	5-7 PPP	7.5" O.C.	PLUG	SEE DETAILS
MP	334	*SCHOENOPLECTUS AMERICANUS* THREE-SQUARE BULRUSH	5-7 PPP	7.5" O.C.	PLUG	SEE DETAILS
PM	333	*SCIRPUS CYPERINUS* COTTONGRASS BULRUSH	5-7 PPP	7.5" O.C.	PLUG	SEE DETAILS
PQ	333	*SPARTINA PECTINATA* CORD GRASS	5-7 PPP	7.5" O.C.	PLUG	SEE DETAILS
		OTHER				
		WETLAND SEED MIX	SEE DWG L-1			

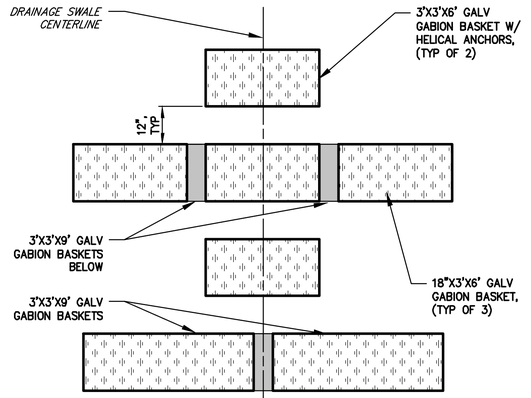


NOTES:
1. PROVIDE UNIFORM MIX OF WETLAND SEED MIX THROUGHOUT PLANTING SOIL FILL IN EACH BAG AND FOR TOP 6 INCHES OF PLANTING SOIL BEHIND RETAINING WALL.
2. JUTE MATTING SHALL BE STAKED OR STAPLED TO SURFACE PER MaineDEP BEST MANAGEMENT PRACTICES & PER MANUFACTURER'S REQUIREMENTS.

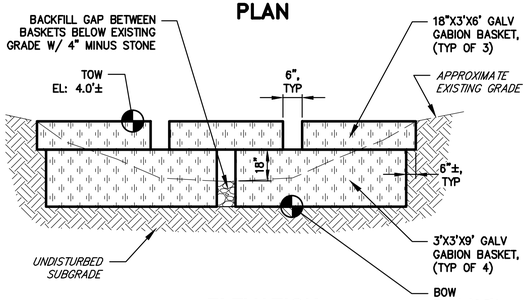
ELEVATION **SECTION**

MSE RETAINING WALL PLANTING

NOT TO SCALE



PLAN

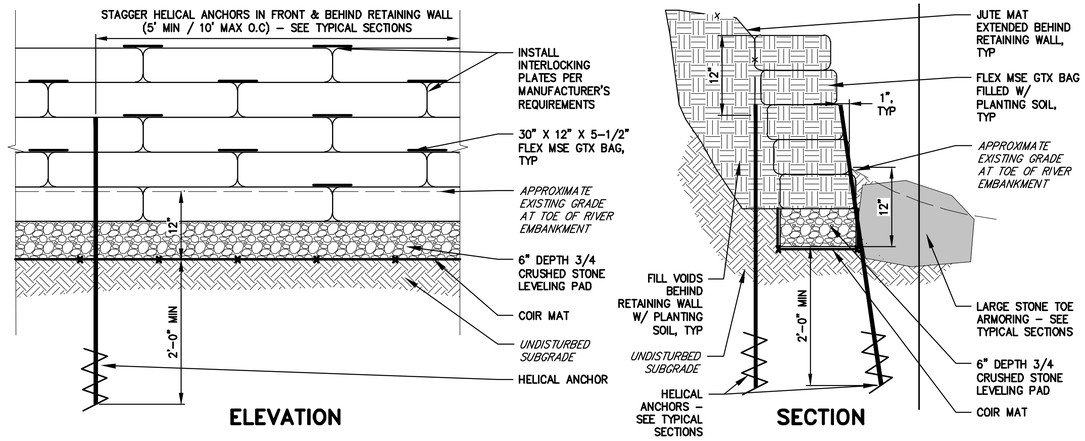


ELEVATION

NOTES:
1. CENTER WALL WITHIN DRAINAGE SWALE CROSS SECTION.
2. GALVANIZED GABIONS SHALL MEET NRCS SPECIFICATION 64 STANDARDS AT A MINIMUM.
3. ALL BASKETS SHALL BE FASTENED TO ADJACENT BASKETS PER SPECIFICATIONS
4. OYSTER SHELL FILL MATERIAL SHALL HAVE AN AVERAGE SHELL WIDTH OF 4 INCHES AND SHALL BE HARVESTED FROM MAINE COASTAL WATERS
5. 3'X3'X6' BASKETS IMMEDIATELY UPSTREAM AND DOWNSTREAM OF THE GABION WALL SHALL BE ANCHORED MIN 24" DEPTH INTO EXISTING SUBGRADE WITH (2) HELICAL ANCHORS PER BASKET.

GABION STORMWATER FILTER

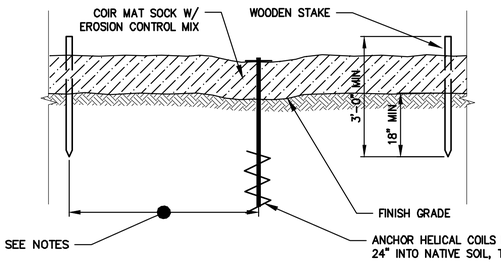
NOT TO SCALE



ELEVATION **SECTION**

MSE RETAINING WALL

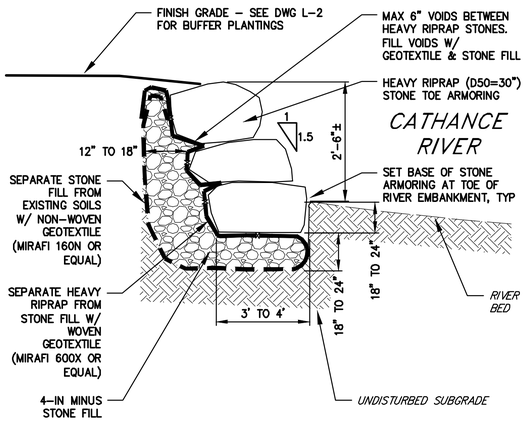
NOT TO SCALE



NOTES:
1. COIR LOGS SHALL BE INSTALLED IN CONTINUOUS SEGMENTS AND IN FULL CONTACT WITH FINISH GRADE.
2. FOLLOW MANUFACTURER'S REQUIREMENTS FOR INSTALLATION AND MAINTENANCE COIR LOG MATERIALS.
3. AREAS DISTURBED BY COIR LOGS SHALL BE VEGETATED AFTER REMOVAL.
4. ANCHOR COIR LOGS W/ 2" SQ. HARD WOOD STAKES OR HELICAL COILS DRIVEN THROUGH MIDDLE OF COIR LOG. ANCHORS SPACED 5' MIN. O.C. TO 10' O.C. MAX TO SUIT SITE CONDITIONS OF SHORELINE, TYP.

SEDIMENT BARRIER – COIR LOG

NOT TO SCALE



STONE ARMORING TYPICAL SECTION

NOT TO SCALE

BAKER DESIGN CONSULTANTS
Civil, Marine, and Structural Engineering
7 Spruce Road • Freeport • Maine • 04032 • 207-846-9724 • info@bakerdesignconsultants.com

NO.	DATE	BY
A	04.08.20	TJP
	PERMITTING SUBMISSION	INT.

DESIGNED BY: TJP
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: SHORELINE STABILIZATION DETAILS

PROJECT: WATERFRONT PLAN – PHASE I
TOWN OF BOWDOINHAM
BOWDOINHAM, MAINE

DATE
APRIL 2020

CONTRACT NO.
18-20

SHEET NO. C-10
REV. A

x:\18\18-20 bowdoinham waterfront\phaseb-livingshorelines\cad\18-20-bowdoinham-civ.dwg 5/5/2020

PLANTING SCHEDULE:

Symbol	Quantity	Scientific Name	Common Name	Size	Root Size	Notes
Trees						
NS	8	*Nyssa sylvatica*	Blackgum	1.5" - 2" dia (10'-14')	20" - 24"	
SN	2	*Salix Nigra*	Black Willow	1" dia (6'-10')	12" - 18"	
AS	7	*Acer saccharum*	Sugar Maple	2" dia (10'-14')	20" - 24"	
AR	7	*Acer rubrum*	Red Maple	2" dia (10'-14')	20" - 24"	
AC	18	*Amelanchier canadensis*	Shadblow / Serviceberry	1" dia (6'-10')	12" - 18"	
HIA	2	*Hamamelis virginiana*	Witchhazel	1" dia (6'-10')	12" - 18"	
	44					
Shrub Mix 1						
KA	195	*Kalmia angustifolia*	Sheep Laurel	3 gal	3 gal	
IVN	84	*Ilex verticillata 'Red Sprite'*	Winterberry	3 gal	3 gal	
IVJ	11	*Ilex vericillata 'Jim Dandy'*	Winterberry (male)	3 gal	3 gal	
AM	38	*Aronia melanocarpa*	Black Chokeberry	3 gal	3 gal	
	328					
Shrub Mix 2						
KA	5	*Kalmia angustifolia*	Sheep Laurel	3 gal	3 gal	Sunny/Part Shade Areas
VA	5	*Vaccinium angustifolium*	Lowbush Blueberry	1 gal	1 gal	Sunny/Part Shade Areas
GB	8	*Gaylussacia baccata*	Huckleberry	1 gal	1 gal	Sunny/Part Shade Areas
CS	15	*Cornus sericea 'Farrow'*	Red Twig Dogwood	2 gal	2 gal	
IVN	14	*Ilex verticillata 'Red Sprite'*	Winterberry	3 gal	3 gal	
IVJ	2	*Ilex vericillata 'Jim Dandy'*	Winterberry (male)	3 gal	3 gal	
CA	12	*Clethra alnifolia 'Tom's Compact'*	Summersweet Clethra	3 gal	3 gal	
VD	5	*Viburnum dentatum 'Blue Muffin'*	Arrowwood viburnum	3 gal	3 gal	
	66					
Shrub Mix 3						
LB	14	*Lindera Benzoin*	Spicebush	5 gal	5 gal	
AM	108	*Aronia melanocarpa*	Black Chokeberry	3 gal	3 gal	
AB	55	*Aronia arbutifolia 'briliantissima'*	Chokeberry	3 gal	3 gal	
VA	125	*Vaccinium angustifolia*	Lowbush Blueberry	1 gal	1 gal	Sunny/Part Shade Areas
CS	50	*Cornus sericea 'Farrow'*	Red Twig Dogwood	2 gal	2 gal	
	352					
Upland Mix						
		Festuca rubra	Red Fescue			
		Elymus virginicus	Virginia Rye			
		Heliopsis helianthoides	Smooth Oxeye			
		Spartina pectinata	Cord Grass			
		Sorghastrum nutans	Indian Grass			
		Coreopsis lanceolata	Lance-leaf Coreopsis			
		Verbena hastata	Blue Vervain			
		Solidago juncea	Early Goldenrod			
Bottomland Mix		**3740 SF.**				
		Elymus riparius	Riverbank Wild Rye			
		Spartina pectinata	Cord Grass			
		Carex vulpinoidea	Fox Sedge			
		Carex lurida	Lurid Sedge			
		Carex scoparia	Blunt Broom Sedge			
		Verbena hastata	Blue Vervain			
		Poa palustris	Fowl Bluegrass			
		Carex lupulina	Hop Sedge			
		Schoenoplectus tabernaemontani	Soft-stem bulrush			
		Acorus americanus	American Sweetflag			
		Pontederia cordata	Pickerelweed			
		Symphyotrichum puniceum	Purplestem Aster			
		Iris versicolor	Iris versicolor			
		Symphyotrichum novae-angliae	New England Aster			
		Rudbeckia hirta	Black Eyed Susan			
		Liatris spicata	Marsh Blazing Star			
		Solidago juncea	Early Goldenrod			
Wetland Mix		**3920 SF.**				
		Asclepias incarnata	Rose Milkweed			
		Bidens cernua	Nodding Bur Marigold			
		Calamagrostis canadensis	Bluejoint Grass			
		Carex bicknellii	Copper-Shouldered Oval Sedge			
		Carex lupulina	Common Hop Sedge			
		Carex lurida	Sallow Sedge			
		Carex scoparia	Lance-Fruited Oval Sedge			
		Carex vulpinoidea	Brown Fox Sedge			
		Eleocharis palustris	Great Spike Rush			
		Eutrochium maculatum	Joe-pye Weed			
		Iris versicolor	Northern Blue Flag			
		Liatris spicata	Marsh Blazing Star			
		Mimulus ringens	Monkey Flower			
		Schoenoplectus tabernaemontani	Soft-stem bulrush			
		Schoenoplectus americanus	Three-square bulrush			
		Symphyotrichum puniceum	Swamp Aster			
		Symphyotrichum novae-angliae	New England Aster			
		Spartina pectinata	Cord Grass			
		Solidago uliginosa	Bog Goldenrod			
		Verbena hastata	Blue Vervain			
Aquatic Plants						
	120	*Iris versicolor*	Blue Flag Iris	Plug	Plug	
	50	*Lobelia cardinalis*	Lobelia / Cardinal Flower	Plug	Plug	
	20	*Pontederia cordata*	Pickerel weed	Plug	Plug	
	190					
Lawn		**30825 SF.**				

General Notes:

1. All topographic and existing base information provided by David Dolan and Associates
2. Limit of work shall be at property lines unless otherwise noted.
3. No grading, construction or materials storage shall occur within tree protection areas or within drip-line of existing trees.
4. All disturbed areas not otherwise developed shall be loamed with a minimum depth of 6" of topsoil and be seeded as specified.
5. All areas not requiring grading shall be left undisturbed. Contractor shall keep out of these areas and preserve existing plantings.
6. Underground and above ground utility locations are based upon best available evidence and are not field verified. Locating and protecting any above ground or underground utilities is the sole responsibility of the contractor.
7. Utility conflicts shall be reported immediately to the landscape architect.
8. Utility information shown is approximate only. Prior to any construction, appropriate utility companies shall be contacted and Dig-Safe Center shall be called at 1-800-DIG-SAFE, at least 72 hours (3 working days) in advance.

PLANTING NOTES:

1. PLANT QUANTITIES, SIZES, SPACING, SPECIES, VARIETIES AND CULTIVARS, AS WELL AS PLANT BED EXTENTS MAY BE ADJUSTED DURING CONSTRUCTION.
2. ALL PLANT SUBSTITUTIONS SHALL BE APPROVED BY THE OWNER.
3. PLANTS TO BE INSTALLED IN A RANDOMLY MIXED DISTRIBUTED THROUGHOUT THE RESTORATION AREA.
4. WHERE POSSIBLE, SHRUB AND PERENNIAL AREAS SHOULD STRIVE TO INCLUDE GROUPINGS OF A MINIMUM OF FIVE SIMILAR SPECIES.
5. CONTRACTOR SHALL REFERENCE THE FCLLOWING RESOURCES FOR SHORELINE PLANTING MEANS, METHODS AND MATERIALS:
   - UNIVERSITY OF MAINE COOPERATIVE EXTENSION
   - THE WILD SEED PROJECT
   - CUMBERLAND COUNTY SOIL & WATER CONSERVATION DISTRICT - COASTAL PLANTING GUIDE

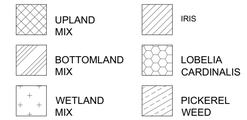
PLANTING KEY:

DECIDUOUS TREE

SMALL DECIDUOUS TREE

SHRUB (SMALL, MEDIUM, LARGE)

PLANTING PALETTE



RICHARDSON & ASSOCIATES
11 Middle Street
Saco, Maine 04072
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F. 207-286-9650
Richardsonassociates.com

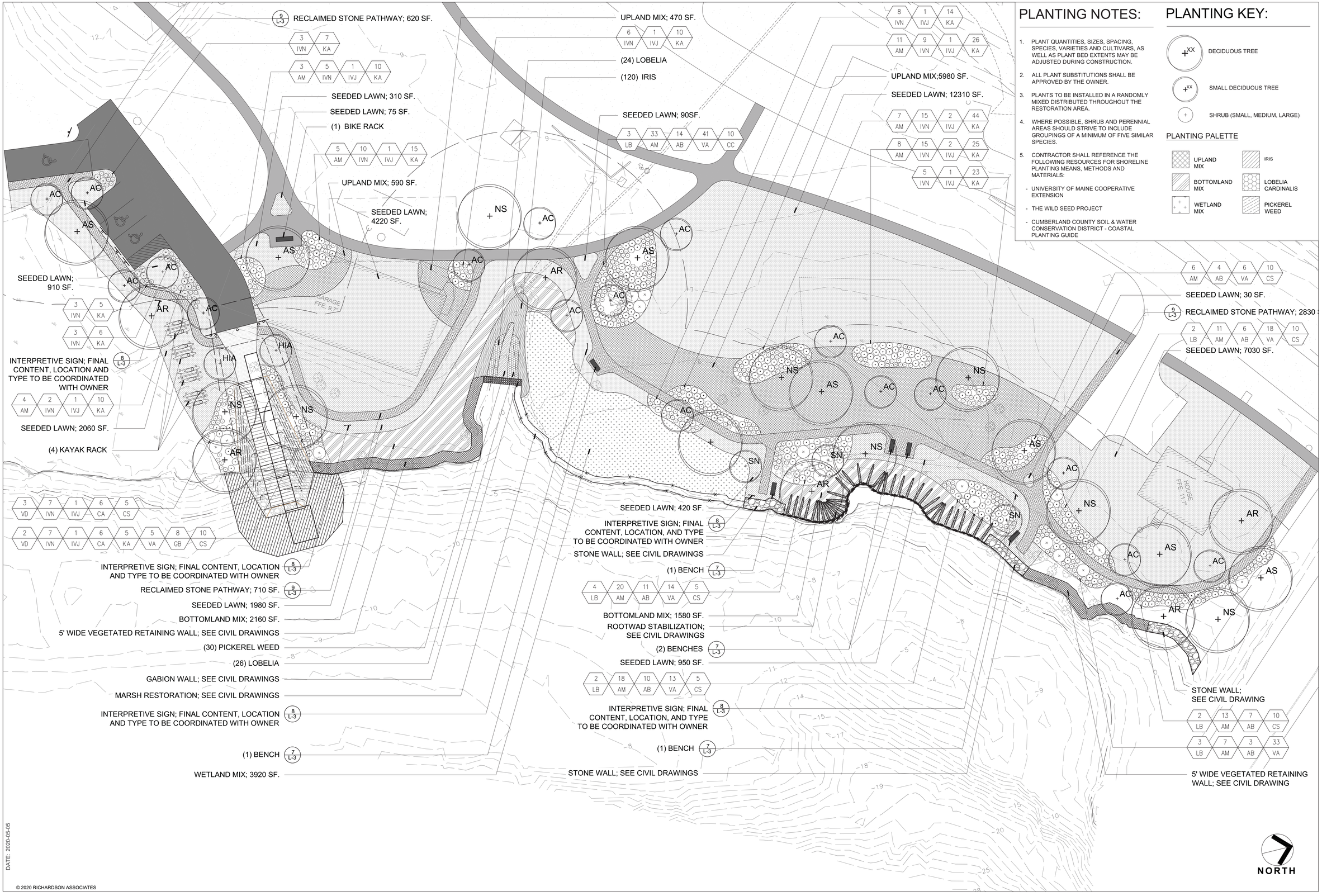
Drawn By: TK, DB
Checked By:
Date: 5.5.2020
Issued For: FOR REVIEW

LANDSCAPE NOTES & SCHEDULES

Bowdoinham Master Plan
Bowdoinham, ME

L-1

DATE: 2020-05-05



PLANTING NOTES:

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   - CUMBERLAND COUNTY SOIL & WATER CONSERVATION DISTRICT - COASTAL PLANTING GUIDE

PLANTING KEY:

- +XX — DECIDUOUS TREE
- +XX — SMALL DECIDUOUS TREE
- \+ — SHRUB (SMALL, MEDIUM, LARGE)

PLANTING PALETTE

- UPLAND MIX
- IRIS
- BOTTOMLAND MIX
- LOBELIA CARDINALIS
- WETLAND MIX
- PICKEREL WEED

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SCALE: 0 10 20 40 1" = 20'-0"

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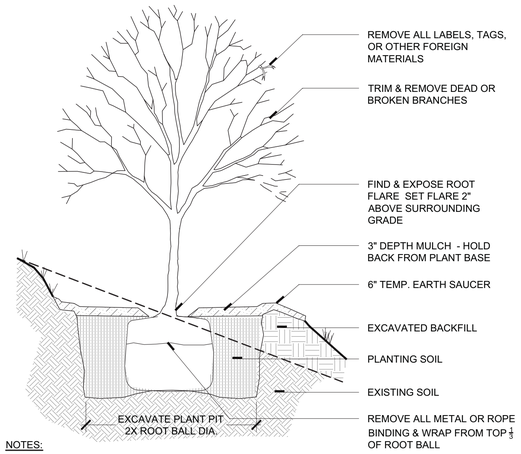
Checked By:
Date: 5.5.2020
Issued For: FOR REVIEW

LANDSCAPE & SITE AMENITIES PLAN

Bowdoinham Master Plan
Bowdoinham, ME

L-2

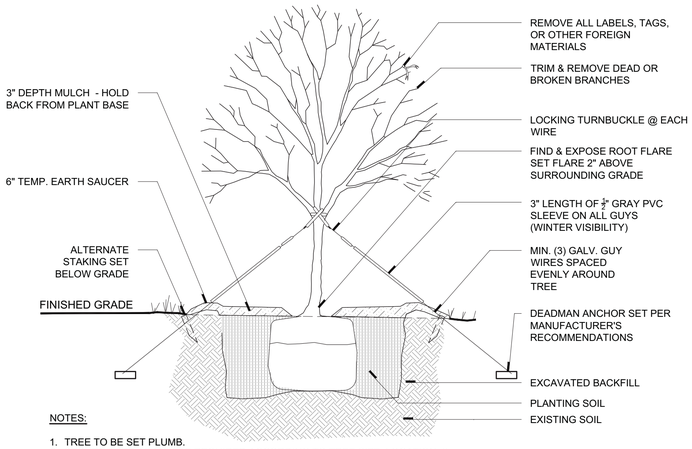
DATE: 2020-05-05



NOTES:

1. TREE TO BE SET PLUMB.
2. SECURE TREE AS MAY BE REQUIRED ACCORDING TO TREE SIZE, LOCATION, & WIND/WEATHER CONDITIONS.
3. IF USING ROOTBALL STABILIZATION, FOLLOW MANUFACTURER'S RECOMMENDATIONS.

1 TREE PLANTING ON SLOPE
NTS



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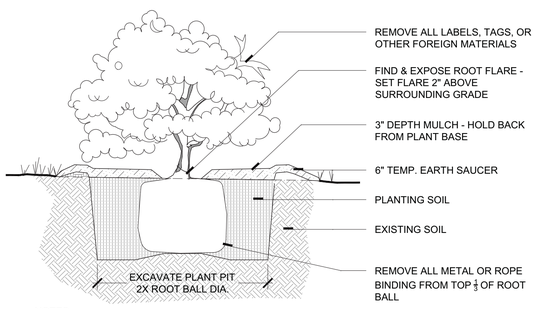
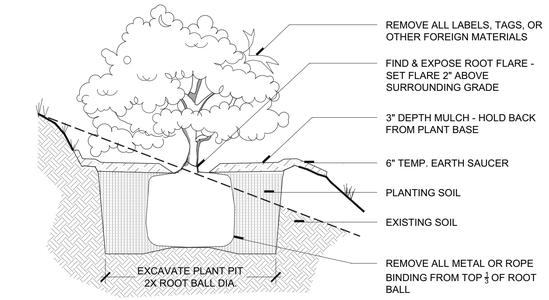
2 TREE PLANTING
NTS



NOTES:

1. SHRUB TO BE SET PLUMB.
2. SECURE SHRUB AS MAY BE REQUIRED ACCORDING TO SIZE, LOCATION, & WIND/WEATHER COND.
3. IF USING ROOTBALL STABILIZATION, FOLLOW MANUFACTURER'S RECOMMENDATIONS.

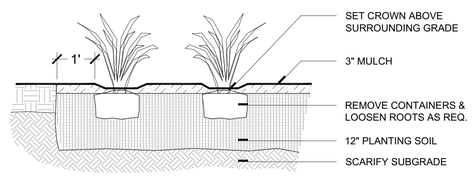
4 SHRUB PLANTING
NTS



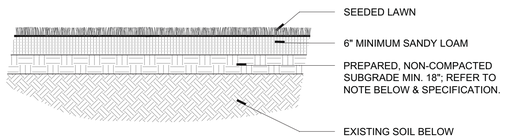
NOTES:

1. SHRUB TO BE SET PLUMB.
2. SECURE SHRUB AS MAY BE REQUIRED ACCORDING TO SIZE, LOCATION, & WIND/WEATHER COND.
3. IF USING ROOTBALL STABILIZATION, FOLLOW MANUFACTURER'S RECOMMENDATIONS.

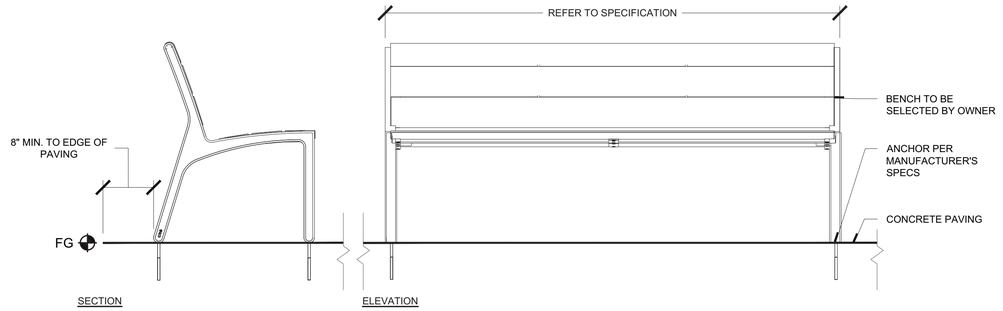
3 SHRUB PLANTING ON SLOPE
NTS



5 PERENNIAL PLANTING
1/2"=1'



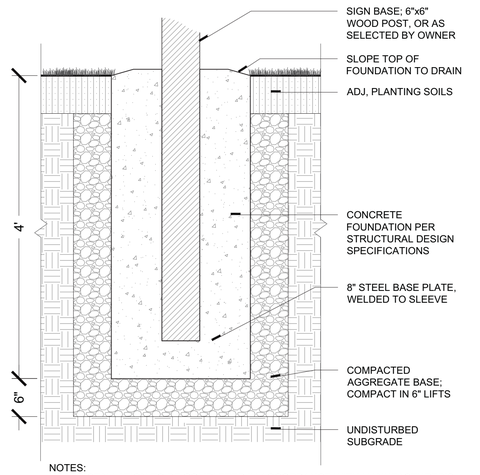
6 LAWN (SEEDED) - TYPICAL SECTION
1/2"=1'



NOTES:

1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. MODEL AND FINISH OF BENCH TO BE SELECTED BY OWNER.

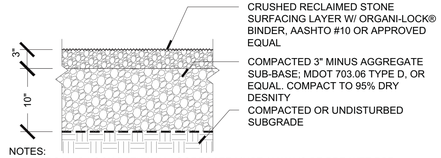
7 PREFABRICATED BENCH
1" = 1'-0"



NOTES:

1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS, OR AS DESIGNATED BY SHOP DRAWINGS
2. ALL MATERIALS SHALL CONFORM WITH THE MOST CURRENT MAINE DOT STANDARDS.
3. CONTRACTOR SHALL SUBMIT ALL MIX DESIGNS TO LANDSCAPE ARCHITECT FOR APPROVAL.
4. CONTRACTOR IS RESPONSIBLE FOR ENSURING FOOTING IS APPROPRIATELY SIZED TO MEET ALL STRUCTURAL REQUIREMENTS FOR SELECTED SIGNAGE.

8 SIGN POST BASE
1"=1'-0"



NOTES:

1. ORGANIC-LOCK PATHWAY AGGREGATE MUST ALWAYS BE PRE-WET FOR INSTALLATION.
2. ALL MATERIALS SHALL CONFORM WITH THE MOST CURRENT PREVAILING MAINE DOT/AASHTO STANDARDS.
3. CONTRACTOR SHALL SUBMIT SAMPLES OF ALL SURFACE MATERIALS AND EDGING TO LANDSCAPE ARCHITECT OR OWNER FOR APPROVAL.
4. CONTRACTOR SHALL PROVIDE IN-PLACE MOCK-UP, NO LESS THAN 5'x10' ILLUSTRATING A VARIETY OF CONDITIONS FOR REVIEW AND APPROVAL BY OWNER.

9 STABILIZED RECLAIMED STONE PATHWAY
1"=1'-0"

NOTE:

1. UPON REMOVAL OF EXISTING PAVING, SUB BASE MATERIAL OF LAWN AREAS MUST BE ASSESSED TO DETERMINE COMPOSITION, COMPACTION, AND INFILTRATION RATE.
2. PERFORM SITE TESTING TO DETERMINE COMPOSITION, COMPACTION AND INFILTRATION RATE OF EXISTING SUB-BASE.
3. SOIL STRUCTURE FOR LAWN TO BE COMPOSED OF WELL DRAINING SANDY-LOAM, WITH pH RANGE OF 6.0 to 7.0.

DATE: 2020-05-05

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Drawn By:	TK, DB
Checked By:	
Date:	5.5.2020
Issued For:	FOR REVIEW

LANDSCAPE SITE DETAILS

Bowdoinham Master Plan
Bowdoinham, ME

L-3

Wetland and Watercourse Delineation and Ecological Assessment Report

Public Works Site Redevelopment
Bowdoinham, Maine

June 27, 2019

Prepared for:

Baker Design Consultants
7 Spruce Road
Freeport, Maine 04032

Prepared by:

Stantec Consulting Services Inc.
30 Park Drive
Topsham, Maine 04086

Table of Contents

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

Baker Design Consultants (BDC) contracted Stantec Consulting Services Inc. (Stantec) to conduct wetland and watercourse delineations and an ecological and shoreline assessment of the Bowdoinham Public Works property, an approximately 20-acre site in Bowdoinham, Maine. The survey area (Site) is located west of River Road, between the Maine Central Railroad and the Cathance River (Appendix A, Figure 1). The Site consists of freshwater wetlands, forested and open-field uplands, and developed area associated with the public works facility. The following report summarizes the June 14, 2019 field surveys conducted by Stantec.

2.0 PROJECT AREA DESCRIPTION

The Site is located west of River Road between the Maine Central Railroad (west) and the Cathance River (east) in Bowdoinham, broadly within the Midcoast Level IV Ecoregion[1]. This region is characterized by an indented shoreline type of coast, or "drowned coast," with long, narrow, rocky peninsulas and intervening deep, narrow estuaries. Eroding bluffs of glaciomarine clay provide sediments in the sheltered embayments to form extensive mud flats and salt marshes. The Site and the Cathance River are connected to Merrymeeting Bay to the south, the largest freshwater tidal bay north of the Chesapeake in the eastern United States. Development within the site consists of several buildings used by the Bowdoinham Public Works, a large gravel lot with several remnant concrete slabs, and a residence in the northeast corner of the Site adjacent to River Road.

The U.S. Department of Agriculture Soil Survey of Sagadahoc County, Maine[2] has mapped three primary soil types within the site: Buxton silt loam (marine terraces/backslopes, moderately well drained), Lamoine-Buxton complex (marine terraces/backslopes, somewhat poorly drained), and Pemaquid-Todds Point-Damariscotta soils (tidal marshes, very poorly drained).

3.0 METHODS

3.1 WETLAND AND WATERCOURSE DELINEATIONS

Stantec conducted wetland and watercourse delineations within the Site on June 14, 2019. On-site wetlands and watercourses were identified in accordance with the definitions detailed in Maine's Natural Resource Protection Act (NRPA), 38 M.R.S.A. §§ 480-B. Wetland boundaries under federal and state jurisdiction were determined using the technical criteria described in the U.S. Army Corps of Engineers

[1] Bailey, R.G., P.E. Avers,T. King, T., and W.H. McNab, eds. 1994. Ecoregions and subregions of the United States (map) (supplementary table of map unit descriptions compiled and edited by McNab, W.H., and R.G. Bailey): Washington, D.C., U.S. Department of Agriculture–Forest Service, scale 1:7,500,000.
[2] Web Soil Survey, Natural Resources Conservation Service, United States Department of Agriculture. Available at: http://websoilsurvey.nrcs.usda.gov/ [accessed April 2019].

(Corps) Wetlands Delineation Manual (Corps, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regional Supplement, Version 2.0 (Corps, 2012). Data were collected on dominant vegetation, evidence of wetland hydrology, and hydric soil criteria. Wetland communities were classified according to the *Classification of wetlands and deepwater habitats of the United States* (FGDC, 2013). Representative photographs were taken as appropriate.

Concurrent with the wetland delineation, streams and other potential Waters of the United States (WoTUS) were identified using the regulatory criteria established by the Maine Department of Environmental Protection (MDEP, 2018), the Corps (2005), and the Federal Clean Water Act (USEPA, 2015). Data were recorded on apparent flow regime, substrate, bankfull widths, ordinary high-water mark widths, water depths, and presence of aquatic organisms and vegetation. Representative photographs were taken as appropriate.

Wetland boundaries and streams were located using a Global Positioning System (GPS) receiver with a stated accuracy of within one meter but were not marked in the field with any flagging.

MDEP jurisdictional streams and Wetlands of Special Significance (WoSS) determinations made during the wetland and waterbody resource delineations were based on the criteria in the NRPA and limited to observable conditions at the time of the survey.

Full identification of WoSS involves contacting natural resource agencies such as the Maine Natural Areas Program (MNAP), the Maine Department of Inland Fisheries and Wildlife, and the U.S. Fish and Wildlife Service (USFWS) to determine if there are any documented occurrences of rare, threatened, or endangered species and communities within or in the vicinity of the project area. Stantec initiated contact with these agencies. Results received to date are included in Appendix C.

3.2 POTENTIAL VERNAL POOL IDENTIFICATION

Formal vernal pool surveys must be completed during the spring (e.g., April and early May) when obligate vernal pool indicator species, such as wood frogs (*Lithobates sylvaticus*) or spotted salamanders (*Ambystoma maculatum*) may be present and breeding at the vernal pools. A vernal pool is a temporary to semi-permanent body of water occurring in a shallow depression that typically fills with water during the spring or fall and may dry during the summer. Vernal pools have no permanent inlet or outlet and no viable populations of predatory fish.

Because the wetland delineation was conducted outside of the appropriate spring survey period to identify vernal pools, Stantec surveyed for and identified potential vernal pools (PVPs) as they were encountered during the wetland delineation. Evaluation of site features as PVPs was conducted according to the Maine Association of Wetland Scientists (MAWS) Vernal Pool Survey Protocol (MAWS, 2014). Stantec identified PVPs regulated by MDEP and the Corps based on definitions provided in Chapter 335, Significant Wildlife Habitat, of the Maine NRPA and the Corps' Maine General Permit, respectively. PVPs were identified based on physical and biological characteristics that are typical of vernal pools, including evidence of standing water, topographic position in the landscape, presence (or absence) of aquatic organisms, and vegetation type.

3.3 ECOLOGICAL AND SHORELINE ASSESSMENT

During the wetland delineation, Stantec performed a general assessment of habitats and unique natural features on the Site. This assessment did not include a specific survey for any rare or exemplary natural communities or habitats, or any rare, threatened, and endangered (RTE) species. Observations were limited to those that occurred while traversing the site during the wetland delineations.

Stantec also performed a general assessment of the condition of the Cathance River shoreline along the eastern boundary of the site. The purpose of the assessment was to identify segments of the riverbank that could be locations for shoreline restoration, for BDC to consider when developing a master plan of the site. Stantec recorded general observations of the current state of the riverbank including vegetative cover, signs of erosion, and obvious areas of past disturbance or alteration. Stantec identified shoreline areas with natural/native vegetative cover versus areas with invasive plant species, and documented areas of natural riverbank versus areas with wood and/or rock material that is not endemic to this section of the Cathance River riparian corridor. The assessment was performed at high tide and observations were limited to shoreline areas that were adjacent to uplands or not inundated portions of wetlands in the northeast and southeast portions of the site.

4.0 RESULTS

4.1 WETLAND AND WATERCOURSE DELINEATIONS

Wetland and watercourse delineations were conducted at the Site on June 14, 2019. As a result of the delineations, portions of seven wetlands were identified within the Site. (Appendix A, Figure 1). Three WoSS were identified within the Site, including one wetland that contains a potentially significant vernal pool (PSVP) and two wetlands that are connected to the Cathance River. Other than the Cathance River, no other streams were identified within the project area. Table 1 summarizes the delineated wetland characteristics. Representative photographs of the delineated resources are included in Appendix B (Photos 1–10). Completed Corps Wetland Determination Data Forms are included in Appendix D for representative wetlands.

Results

Table 1. Summary of Delineated Wetlands

Wetland Identifier	Wetland Classification[1]	Dominant and Characteristic Vegetation	Hydric Soil Criteria	Evidence of Hydrology	Wetland of Special Significance	Additional Comments
W-01TTA	PEM	Trees: none Saplings / shrubs: none Herbs: bluejoint (*Calamagrostis canadensis*), sensitive fern (*Onoclea sensibilis*), king-of-the-meadow (*Thalictrum pubescens*), sweet-scented joe-pye-weed (*Eutrochium purpureum*), woodland horsetail (*Equisetum sylvaticum*)	Histic epipedon	Soil saturation	Yes – within 250-feet of Cathance River, within 100-year floodplain	Occasionally mowed.
W-01TTB	PEM/PSS	Trees: black willow (*Salix nigra*), red maple (*Acer rubrum*) Saplings / Shrubs: black willow, Morrow's honeysuckle (*Lonicera morrowii*), gray willow (*Salix bebbiana*), rambler rose (*Rosa multiflora*), silky dogwood (*Cornus amomum*) Herbs: broad-leaf cat-tail (*Typha latifolia*), sensitive fern, spotted touch-me-not (*Impatiens capensis*), nodding sedge (*Carex gynandra*), cottongrass bulrush (*Scirpus cyperinus*), bluejoint, cinnamon fern (*Osmundastrum cinnamomeum*), interrupted fern (*Osmunda claytoniana*), eastern poison ivy (*Toxicodendron radicans*)	Histic epipedon, Histosol	Surface water, High water table, Surface Water	Yes – within 250-feet of Cathance River, greater than 20,000 square feet of emergent marsh wetland, Contains S2 natural community, within 100-year floodplain, Tidal Wetland	Portions of the wetland are Freshwater Tidal Marsh along the Cathance River.
W-01TTC	PEM	Trees: none Saplings / Shrubs: none Herbs: sensitive fern, broad-leaf meadowsweet (*Spiraea latifolia*), bluejoint, common timothy (*Phleum pratense*)	Depleted matrix	Soil saturation, High water table, Surface water	No	
W-01TTD	PFO/PEM	Trees: red maple, green ash (*Fraxinus pennsylvanica*) Saplings / Shrubs: American witch-hazel (*Hamamelis viginiana*), southern arrow-wood (*Viburnum dentatum*) Herbs: sensitive fern, spotted touch-me-not, woodland horsetail, cinnamon fern	Depleted matrix	Soil saturation, Water stained leaves, Drainage patterns	No	
W-01TTE	PEM	Trees: none Saplings / Shrubs: speckled alder (*Alnus incana*), broad-leaf meadowsweet, gray willow Herbs: cottongrass bulrush, sensitive fern, bluejoint, lamp rush (*Juncus effusus*), broad-leaf cat-tail, king-of-the-meadow	Depleted matrix	Soil saturation, Surface water	Yes – Contains potential significant wildlife habitat PSVP-01TT, within 100-year floodplain	Significant vernal pool status based on observable conditions at the time of the delineation, subject to formal vernal survey during appropriate spring amphibian breeding season.
W-01TTF	PSS	Trees: none Saplings / Shrubs: broad-leaf meadowsweet, Morrow's honeysuckle, silky dogwood, rambler rose, pussy willow (*Salix discolor*) Herbs: sensitive fern, black-girdle bulrush (*Scirpus atrocinctus*), spotted touch-me-not	Depleted matrix	Soil saturation, Surface water, Drainage patterns, Water stained leaves	No	
W-01TTG	PSS	Trees: none Saplings / Shrubs: speckled alder, gray birch (*Betula populifolia*), broad-leaf meadowsweet, rambler rose Herbs: bluejoint, sensitive fern, woodland horsetail	Depleted matrix	Soil saturation, Surface water, Drainage patterns, Water stained leaves	No	

[1] Wetland classification follows FGDC (2013):

PFO = Palustrine Forested

PEM = Palustrine Emergent

PSS = Palustrine Scrub-shrub

4.2 POTENTIAL VERNAL POOL IDENTIFICATION

Stantec identified one PSVP within the Site during the wetland delineation (Appendix B, Photos 11–12). PSVP-01TT is a natural-modified vernal pool feature within wetland W-01TTE. The pool is an approximately 30-foot by 30-foot natural depression within the wetland that may be slightly impounded by the trail adjacent to the east side of the wetland. Surface water, approximately 8–12 inches deep was observed at the time of the delineation. Wood frog tadpoles were observed swimming throughout the pool. Based on this information, the PSVP-01TT could be regulated as an SVP under the NRPA. A formal vernal pool survey conducted in mid-April to early-May during the appropriate amphibian breeding season would be necessary to determine whether or not the pool is an SVP.

4.3 ECOLOGICAL AND SHORELINE ASSESSMENT RESULTS

Stantec identified one unique natural feature within the Site, a portion of wetland W-01TTB is also a Freshwater Tidal Marsh which is considered a rare wetland type in Maine according to the MNAP. Close observation of this portion of wetland W-01TTB was limited during the wetland delineation due to the high tide. MNAP's response to Stantec's request for information on the Site also confirmed the presence of the Freshwater Tidal Marsh, which has a state rarity ranking of S2. The USFWS Information, Planning, and Consultation (IPaC) tool identified two other RTE) species that may be present within the Site, the Northern Long-eared Bat (*Myotis septentrionalis*) and Atlantic Salmon (*Salmo salar*). The site is also located within Atlantic Salmon critical habitat. No other RTE species or habitats were observed during the wetland delineation but several state-listed rare plant species commonly associated with Freshwater Tidal Marshes may be present. Targeted field surveys conducted in mid to late summer would be necessary to confirm their occurrence.

Stantec also performed a general assessment of the Cathance River shoreline on the eastern boundary of the site (Appendix B, Photos 13–20). Where accessible during the high tide, Stantec made observations along the top of bank of the Cathance River to document the presence or absence of erosion, invasive species, and areas of past disturbances or shoreline alteration. Based on the observations made at the time of the visit to the Site, the shoreline in the southern half of the Site is relatively undisturbed and in its natural state. Starting near the northern boundary of wetland W-01TTB and extending to the southern delineation limit, the riverbank is generally stable and dominated by native emergent and shrub vegetation. A few scattered black willow trees are growing along the bank. Larger white pine (*Pinus strobus*) and eastern hemlock (*Tsuga canadensis*) trees are located within the upland at the southeastern corner of the Site. The shoreline in the northern half of the site shows evidence of historic disturbance and alteration but has naturalized and is currently stable. Rip-rap and larger rocks are present in the northeast corner of the Site along the shoreline immediately adjacent to River Road where a colony of Japanese knotweed (*Reynoutria japonica*) is present. Continuing south along the shoreline, exposed ends of timber cribbing were observed protruding from the bank, in and adjacent to wetland W-01TTB. Just north of the largest public works building, a trench dug into the bank extends northwest towards the center of the public works lot for approximately 75-feet. An 8- to 10-inch metal pipe outlet is located at the top of the trench to convey water to the river. The inlet location of the pipe and origin of the water are unknown. This segment of shoreline described above, as shown in yellow on Figure 1, could provide potential locations for shoreline restoration techniques to restore the riverbank to a more natural state, similar to the undisturbed portions in the southern half of the Site.

5.0 REGULATORY DISCUSSION

5.1 WETLANDS AND WATERCOURSES

The Corps, MDEP, and Town of Bowdoinham regulate the wetlands and waterbodies (e.g., streams) identified within the Project area. Under the provisions of Section 404 of the Clean Water Act, the Corps regulates dredging or filling within WoTUS, which include navigable waters and all their tributaries, adjacent wetlands, and other waters or wetlands where degradation or destruction could affect interstate or foreign commerce. The Corps has issued a General Permit (GP) for the State of Maine that merges the federal and state permit review process for many applications.

In Maine, wetlands and waterbodies, as well as other protected natural resources, are regulated under 38 M.R.S.A. §§ 480-A – 480-JJ, the NRPA. Activities that do not impact a wetland or that impact less than 4,300 square feet of wetland are usually exempt from NRPA Tier permitting requirements. This exemption does not apply if the impact is:

1. in, on, or over a coastal wetland, great pond, river, stream, or brook;
2. within 25 feet of those resources identified above, or is more than 25 feet and no erosion control is used;
3. in a shoreland zone or a wetland protected by the shoreland zone;
4. part of a wetland with more than 20,000 square feet of open water or emergent vegetation, except artificial impoundments;
5. in a peatland;
6. part of a larger project; or
7. in Significant Wildlife Habitat.

Typically, projects with cumulative impacts to freshwater wetlands between 4,300 but less 15,000 square feet are eligible for review under the Tier 1 process. The Tier 2 review process applies to alterations that affect between 15,000 and 43,560 square feet (one acre) of freshwater wetlands. Cumulative freshwater wetland impacts that exceed one acre typically require a Tier 3 review. Impacts to WoSS, rivers, streams and brooks, great ponds, and Significant Wildlife Habitat typically require an Individual Permit.

Based on Stantec's 2019 delineation, portions of 3 (W-01TTA, W-01TTB, W-01TTE) of the seven wetlands within the Project area meet the characteristics to be considered WoSS. These include portions of wetlands within 250 feet of a coastal wetland (i.e., Cathance River), wetlands within the 100-year floodplain as mapped by the Federal Emergency Management Agency, and wetlands containing potential Significant Wildlife Habitat including PSVPs. Wetland W-01TTB would also be considered a WoSS because it contains greater than 20,000 square feet of emergent vegetation and contains an imperiled (S2) natural community, a freshwater tidal marsh, as defined by MNAP.

The Town of Bowdoinham regulates activities with the Shoreland Zone, which is defined as:

1. All areas within 250 feet, horizontal distance, of the:
    1. normal high water line of any river
    2. upland edge of a coastal wetland, including all areas affected by tidal action
    3. upland edge of freshwater wetlands, which are
        1. Of ten or more contiguous acres; or of less than 10 contiguous acres and adjacent to a surface water body, excluding any river, stream or brook, such that in a natural state, the combined surface area is in excess of 10 acres; and
        2. Inundated or saturated by surface or ground water at a frequency and for a duration sufficient to support, and which under normal circumstances do support, a prevalence of wetland vegetation typically adapted for life in saturated soils.
        3. Freshwater wetlands may contain small stream channels or inclusions of land that do not conform to the criteria of this definition.
2. All land areas within 75 feet, horizontal distance, of the normal high-water line of tributary streams.
3. The Shoreland Zone includes any structure built on, over or abutting a dock, wharf or pier, or other structure extending or located below the normal high-water line of a water body or within a freshwater or coastal wetland.

Because portions of the Site are located within the 100-year floodplain, a Flood Plain Hazard Development permit may also be required by the Town of Bowdoinham. Stantec recommends consulting with the town's code enforcement officer regarding the local ordinances and permits that may be required for development at the Site.

5.2 VERNAL POOLS

Maine NRPA Chapter 335, Significant Wildlife Habitat, regulates SVPs as Significant Wildlife Habitat. Chapter 335 details specific definitions and standards regarding characterization and protection of SVPs in Maine.

Certain development projects in Maine may also be regulated under Chapter 375, Site Location of Development (Site Law). Under Site Law, MDEP may regulate vernal pools that are ecologically significant on a landscape level but do not meet the definition of an SVP. Under some circumstances, MDEP will review and possibly limit development within or beyond 250 feet of these high-functioning vernal pools.

The Corps may regulate impacts to these vernal pools if the project triggers Corps jurisdiction by filling or excavating wetlands or other WoTUS (e.g., streams). The Corps GP states that a Vernal Pool Management Area (VPMA) applies to all vernal pools identified within the Project area. The VPMA includes the vernal pool depression, the Vernal Pool Envelope (within 100 feet of the edge of the vernal pool depression), and the Critical Terrestrial Habitat (area within 100–750 feet of the edge of the vernal pool depression). Activities within 750 feet of a vernal pool may be regulated by the Corps and may require compensatory mitigation for unavoidable impacts. The amount of compensatory mitigation that

may be required typically depends on the overall pool characteristics and an assessment of its habitat and landscape value.

Based on Stantec's survey, PSVP-01TT could be considered an SVP under the NRPA based on its physical characteristics and origin. Stantec recommends a seasonally appropriate vernal pool survey to determine the status of the PSVP or to treat the pool as an SVP if the project schedule and permitting move forward before the Spring vernal pool survey window.

6.0 REFERENCES

Bailey, R.G., P.E. Avers, T. King, and W.H. McNab. 1994. *Ecoregions and subregions of the United States* (map and supplementary table). U.S. Department of Agriculture – Forest Service, Washington, D.C.

Danielson, T.J. (MDEP). 2018. *Natural Resource Protection Act (NRPA) Streams, Rivers, and Brooks*. Maine Department of Environmental Protection, Augusta, ME.

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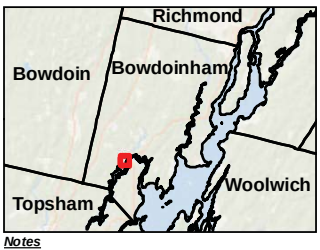
Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual. Technical Report Y 87 1*. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS.

U.S. Army Corps of Engineers (Corps). 2005. *Regulatory Guidance Letter: Ordinary High Water Mark Identification*. U.S. Army Corps of Engineers. December 7, 2005.

U.S. Army Corps of Engineers (Corps). 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)*, ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

U.S. Environmental Protection Agency (USEPA). 2015. *Clean Water Rule: Definition of Waters of the United States; Final Rule. (80 FR 37054)*. US Environmental Protection Agency, 1200 Pennsylvania Avenue NW., Washington DC.

Appendix A FIGURES



Legend

- PSVP — Potential Significant Vernal Pool Center Point
- 250' PSVP Critical Habitat
- Delineated Wetland
- Area of Potential Shoreline Restoration
- Delineation Limits/Parcel Boundary
- Tax Parcel

0 300 Feet

(At original document size of 8.5x11)
1:3,600

N

Stantec

Project Location
Bowdoinham, Maine

Prepared by REM on 2019-06-17
TR by KWH on 2019-06-00
IR Review by TT on 2019-06-00

Client/Project 195601765
Baker Design Consultants
Public Works Site Development
Bowdoinham, ME

Figure No.
1

Title
Wetland and Watercourse Delineation Results Map

Notes

1. Wetland boundaries delineated in accordance with the USACE Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regional Supplement (Version 2.0).
2. Wetland boundaries were located utilizing a Trimble GeoExplorer Series Receiver. Expected accuracy of GPS data is within 1 meter of actual position.
3. Coordinate System: NAD 1983 StatePlane Maine West FIPS 1802 Feet
4. Data Sources: Base features obtained from MEGIS.
5. Background: Aerial imagery provided by ArcGIS Online World Imagery Mapping Service (http://server.arcgisonline.com/arcgis/services/World_Imagery/MapServer).

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Appendix B REPRESENTATIVE PHOTOGRAPHS

Appendix B Representative Photographs

Photo 1. (PEM) wetland W-01TTA. Stantec. June 14, 2019.

Photo 2. Northern (PSS) portion of wetland W-01TTB. Stantec. June 14, 2019.

Photo 3. Freshwater tidal marsh portion of wetland W-01TTB. Stantec. June 14, 2019.

Photo 4. Interior PEM portion of wetland W-01TTB. Stantec. June 14, 2019.

Photo 5. Southern portion of wetland W-01TTB. Stantec. June 14, 2019.

Photo 6. PEM wetland W-01TTC. Stantec. June 14, 2019.

Photo 7. PFO portion of wetland W-01TTD. Stantec. June 14, 2019.

Photo 8. PEM wetland W-01TTE. Stantec. June 14, 2019.

Photo 9. PSS wetland W-01TTF. Stantec. June 14, 2019.

Photo 10. PSS wetland W-01TTG. Stantec. June 14, 2019.

Photo 11. PSVP-01TT in wetland W-01TTE. Stantec. June 14, 2019.

Photo 12. PSVP-01TT in wetland W-01TTE. Stantec. June 14, 2019.

Photo 13. Natural, undisturbed Cathance River shoreline in the southern half of the Site. Stantec. June 14, 2019.

Photo 14. Upland area and trail sign at the southeast corner of the Site. Stantec. June 14, 2019.

Photo 15. Japanese knotweed stand over altered, rocky shoreline in the northeast corner of the Site. Stantec. June 14, 2019.

Photo 16. Cathance River shoreline facing south from wetland W-01TTA. Stantec. June 14, 2019.

Photo 17. Exposed end of timber cribbing extending from shoreline, just south of wetland W-01TTA. Stantec. June 14, 2019.

Photo 18. Trench located just north of the public works building. Stantec. June 14, 2019.

Photo 19. Small metal pipe draining into the trench/Cathance River. Stantec. June 14, 2019.

Photo 20. View south from behind the public works building towards the more natural portions of the shoreline. Stantec. June 14, 2019.

Appendix C AGENCY RESPONSES

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

JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

June 13, 2019

Tom Tetreau
Stantec
30 Park Drive
Topsham, ME 04086

Via email: tom.tetreau@stantec.com

Re: Rare and exemplary botanical features in proximity to: Public Works Project, Map U1 Lot 1, Bowdoinham, Maine

I have searched the Maine Natural Areas Program's Biological and Conservation Data System files in response to your request received June 11, 2019 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Bowdoinham, 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, the project area includes a portion of Freshwater Tidal Marsh, a rare wetland type in Maine. Large, high quality examples of this open wetland type are rare in Maine and provide important habitat for a wide variety of plants and animals. MNAP recommends leaving an intact forested buffer around the wetlands associated with this Freshwater Tidal Marsh. If any disturbance is planned for these areas, please contact MNAP for further recommendations. Please refer to the table below, attached map, and attached factsheet for more information about this rare wetland type in Maine.

Feature	State Status	State Rank	Global Rank	Occurrence Rank	Site
Freshwater Tidal Marsh	N/A	S2	G4?	AB Excellent-Good	Cathance River

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
90 BLOSSOM LANE, DEERING BUILDING

PHONE: (207) 287-8044
WWW.MAINE.GOV/DACF/MNAP

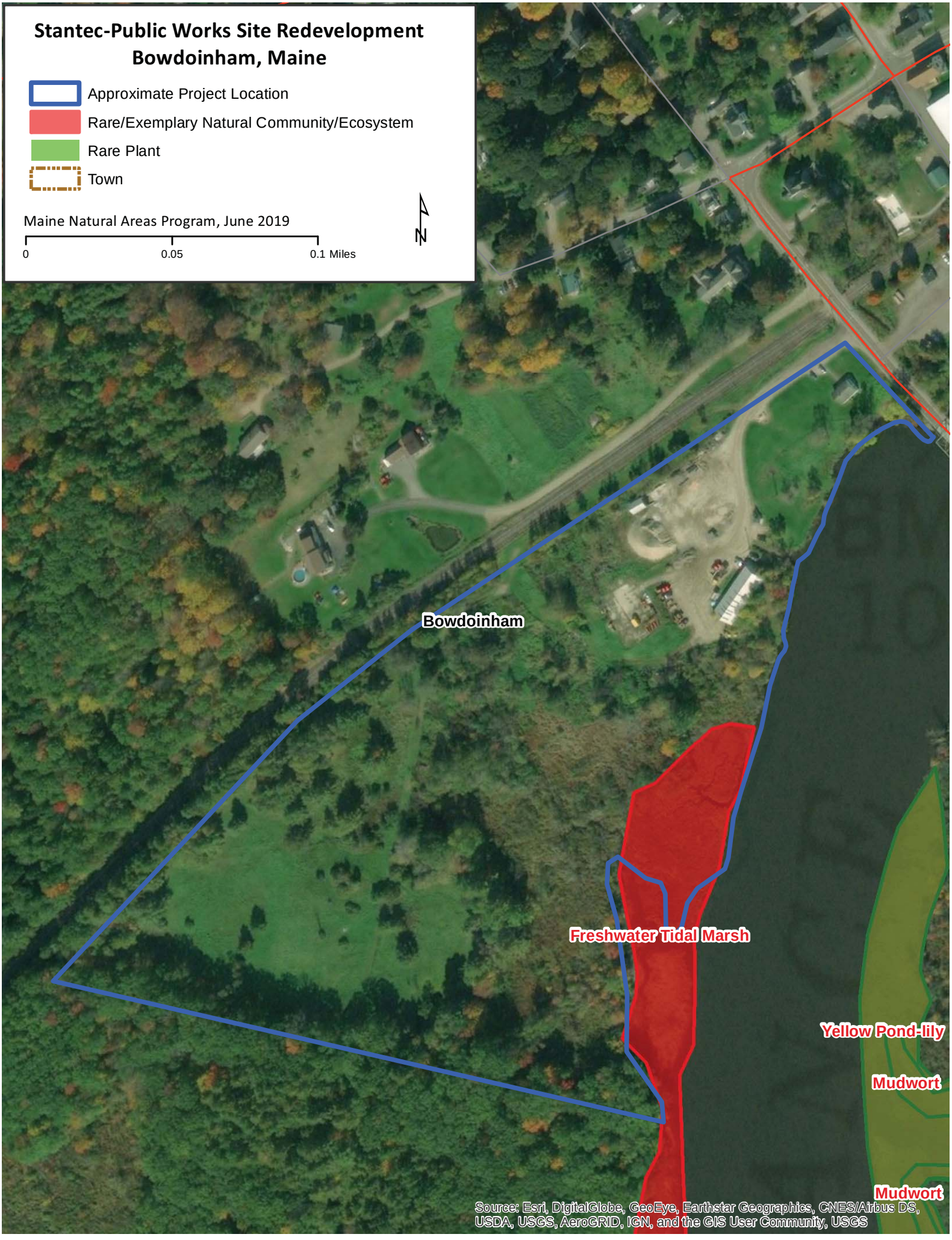
The Maine Natural Areas Program (MNAP) is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. MNAP welcomes coordination with individuals or organizations 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 $225.00 for three 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,

Kristen Puryear | Ecologist | Maine Natural Areas Program
207-287-8043 | kristen.puryear@maine.gov


Stantec-Public Works Site Redevelopment
Bowdoinham, Maine
Approximate Project Location
Rare/Exemplary Natural Community/Ecosystem
Rare Plant
Town
Maine Natural Areas Program, June 2019
0
0.05
0.1 Miles
N
Bowdoinham
Freshwater Tidal Marsh
Yellow Pond-lily
Mudwort
Mudwort
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, USGS

Freshwater Tidal Marsh

State Rank S2

Community Description

These tidal marshes are dominated by patchy stout herbs, typically a mixture of wild rice, softstem bulrush, and pickerelweed, often covering extensive areas. Mixed in with the tall herbs are lower forbs including several rare species. Some marshes may have mudflats dominated by forbs and low vegetation in patches among the graminoids; many have a very narrow band of low forbs near the high tide/upland interface. Brackish marsh species, such as chair-maker's rush, may be in these marshes as well, but at least some obligate freshwater plants such as pickerelweed, common arrowhead, sweet flag, and northern water-plantain will also be present. Bryophytes are essentially absent.

Soil and Site Characteristics

Freshwater tidal marshes are associated with major rivers, in low-gradient areas of the mid to upper tidal reaches. Freshwater inputs lower the salinity to <1 ppt. Substrate is usually mud, or mud mixed with gravel. The tidal regime affects substrate and plant zonation.

Torrey's Bulrush

Diagnostics

These graminoid dominated marshes occur along tidal rivers, with patches of forbs locally abundant. Obligate freshwater species are present, such as sweetflag, yellow water-lily, large yellow pond-lily, or pickerelweed.

Similar Types

Brackish Tidal Marshes are most similar and grade into this type as salinity decreases. Mixed Graminoid Shrub Marshes and Pickerelweed - Macrophyte Aquatic Bed types can contain several of the same species, but do not occur in tidal settings.

Conservation, Wildlife, and Management Considerations

Tidal marshes provide valuable wildlife habitat and have received considerable conservation attention. Heavy metals, sewage overflows, and other pollutants have degraded the substrate in many areas, but some have recovered as water quality has improved over the past decades. Many occur on or adjacent to public lands or private conservation lands. Some have been managed for waterfowl by planting wild rice. With development of the uplands that border these marshes, maintenance of appropriate wetland buffers can help reduce degradation that could result from adjacent land uses. Invasive species such as Japanese knotweed and purple loosestrife have invaded the upper reaches at some sites. The prospect of sea level rise may also put these systems at greater risk in the future.

Location Map

Freshwater Tidal Marsh

The tidal marshes of Maine's larger estuaries, especially Merrymeeting Bay, are important pre-migration staging habitat for thousands of waterfowl and wading birds. The rare New England siltsnail inhabits coastal marshes and small tidal rivers where the water ranges from fresh to upper brackish.

Distribution

Upper tidal reaches of major rivers: most well known from the Kennebec and Penobscot Rivers (Laurentian Mixed Forest Province).

Landscape Pattern: Large Patch, often linear.

Characteristic Plants

These plants are frequently found in this community type. Those with an asterisk are often diagnostic of this community.

Herb

Chair-maker's rush*
Common arrowhead
Eaton's bur-marigold
Nodding beggar ticks
Northern water-plantain
Parker's pipewort
Pickerelweed*
Softstem bulrush*
Tidal arrowhead
Wild rice*

Associated Rare Plants

Beaked spikerush
Eaton's bur-marigold
Long's bitter-cress
Parker's pipewort
Pygmyweed
Spongy arrowhead
Stiff arrowhead
Water-pimpernel

Associated Rare Animals

American oystercatcher
Black-crowned night-heron
Least bittern
Short-eared owl

Examples on Conservation Lands You Can Visit

- Merrymeeting Bay Wildlife Management Area – Sagadahoc Co.
- Muddy River Wildlife Management Area – Sagadahoc Co.
- Swan Island Wildlife Management Area – Sagadahoc Co.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
Phone: (207) 469-7300 Fax: (207) 902-1588
http://www.fws.gov/mainefieldoffice/index.html

In Reply Refer To: June 11, 2019
Consultation Code: 05E1ME00-2019-SLI-0840
Event Code: 05E1ME00-2019-E-02081
Project Name: Bowdoinham Public Works Redevelopment

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies the threatened, endangered, candidate, and proposed species and designated or proposed critical habitat that may occur within the boundary of your proposed project or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC Web site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the Endangered Species Consultation Handbook at: http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

This species list also identifies candidate species under review for listing and those species that the Service considers species of concern. Candidate species have no protection under the Act but are included for consideration because they could be listed prior to completion of your project. Species of concern are those taxa whose conservation status is of concern to the Service (i.e., species previously known as Category 2 candidates), but for which further information is needed.

If a proposed project may affect only candidate species or species of concern, you are not required to prepare a Biological Assessment or biological evaluation or to consult with the Service. However, the Service recommends minimizing effects to these species to prevent future conflicts. Therefore, if early evaluation indicates that a project will affect a candidate species or species of concern, you may wish to request technical assistance from this office to identify appropriate minimization measures.

Please be aware that bald and golden eagles are not protected under the Endangered Species Act but are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Projects affecting these species may require development of an eagle conservation plan: http://www.fws.gov/windenergy/eagle_guidance.html Information on the location of bald eagle nests in Maine can be found on the Maine Field Office Web site: http://www.fws.gov/mainefieldoffice/Project%20review4.html

Additionally, wind energy projects should follow the wind energy guidelines: http://www.fws.gov/windenergy/ for minimizing impacts to migratory birds and bats. Projects may require development of an avian and bat protection plan.

Migratory birds are also a Service trust resource. Under the Migratory Bird Treaty Act, construction activities in grassland, wetland, stream, woodland, and other habitats that would result in the take of migratory birds, eggs, young, or active nests should be avoided. Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g.,

cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm and at: http://www.towerkill.com; and at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
(207) 469-7300

Project Summary

Consultation Code: 05E1ME00-2019-SLI-0840

Event Code: 05E1ME00-2019-E-02081

Project Name: Bowdoinham Public Works Redevelopment

Project Type: SHORELINE USAGE FACILITIES / DEVELOPMENT

Project Description: Potential redevelopment (public use - parking, walking trails, water access) of existing ~20-acre public works parcel.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/44.00587292471877N69.89835986747991W

Counties: Sagadahoc, ME

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Fishes

NAME	STATUS
Atlantic Salmon *Salmo salar* Population: Gulf of Maine DPS There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2097	Endangered

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Atlantic Salmon *Salmo salar* https://ecos.fws.gov/ecp/species/2097#crithab	Final

Appendix D CORPS WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Bowdoinham Public Works City/County: Bowdoinham/Sagadahoc Sampling Date: 6/14/2019

Applicant/Owner: Baker Design Consultants State: ME Sampling Point: Wetland

Investigator(s): Tom Tetreau Section, Township, Range:

Landform (hillslope, terrace,etc.): Floodplain Local relief (concave, convex, none): None Slope (%) 0 - 0

Subregion (LRR or MLRA): LRR R Lat: 44.005804 Long: -69.897911 Datum: NAD83

Soil Map Unit Name: NWI Classification: PEM

Are climatic / hyrologic conditions on the site typical for this time of year? Yes X No ____ (if no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X	No ____	if yes, optional Wetland Site ID: 01TTB
Wetland Hydrology Present?	Yes X	No ____	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

____ Surface Water (A1)	____ Water-Stained Leaves (B9)	____ Surface Soil Cracks (B6)
X High Water Table (A2)	____ Aquatic Fauna (B13)	____ Drainage Patterns (B10)
X Saturation (A3)	____ Marl Deposits (B15)	____ Moss Trim Lines (B16)
____ Water Marks (B1)	____ Hydrogen Sulfide Odor (C1)	____ Dry-Season Water Table (C2)
____ Sediment Deposits (B2)	____ Oxidized Rhizospheres on Living Roots (C3)	____ Crayfish Burrows (C8)
____ Drift Deposits (B3)	____ Presence of Reduced Iron (C4)	____ Saturation Visible in Aerial Imagery (C9)
____ Algal Mat or Crust (B4)	____ Recent Iron Reduction in Tilled Soils (C6)	____ Stunted or Stressed Plants (D1)
____ Iron Deposits (B5)	____ Thin Muck Surface (C7)	____ Geomorphic Position (D2)
____ Inundation Visible on Aerial Imagery (B7)	____ Other (Explain in Remarks)	____ Shallow Aquitard (D3)
____ Sparsley Vegetated Concave Surface (B8)		____ Microtopographic Relief (D4)
		____ FAC-Neutral Test (D5)

Secondary Indicators (minimum of two required)

Surface Water Present?	Yes ____	No X	Depth (inches) ____
Water Table Present?	Yes X	No ____	Depth (inches) 0
Saturation Present?	Yes X	No ____	Depth (inches) 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants Sampling Point: **Wetland**

Tree Stratum (Plot Size: 30'radius)	Absolute % Cover	Dominant Species?	Indicator Status
Salix nigra	10	X	OBL
	10	= Total Cover	

Shrub Stratum (Plot Size: 15'radius)	Absolute % Cover	Dominant Species?	Indicator Status
Salix nigra	10	X	OBL
	10	= Total Cover	

Herb Stratum (Plot Size: 5'radius)	Absolute % Cover	Dominant Species?	Indicator Status
Typha latifolia	80	X	OBL
Onoclea sensibilis	15		FACW
Impatiens capensis	10		FACW
Carex gynandra	10		OBL
Calamagrostis canadensis	10		OBL
	125	= Total Cover	

Woody Vine Stratum (Plot Size: 30'radius)	Absolute % Cover	Dominant Species?	Indicator Status
		= Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

OBL species	120	x 1	120	
FACW species	25	x 2	50	
FAC species	0	x 3	0	
FACU species	0	x 4	0	
UPL species	0	x 5	0	
Column Totals	145	(A)	170	(B)

Prevalence Index = B/A = 1.17

Hydrophytic Vegetation Indicators:

- X 1- Rapid Test For Hydrophytic Vegetation
- X 2- Dominance Test is => 50%
- X 3- Prevalence Index is =< 3.0
- 4- Morphological Adaptations
- 5- Problematic Hydrophytic Vegetation

Definitions of Vegetation Strata:

Tree- Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub- Woody plants less than 3 in. DBH and greater than or equal to 3.28ft (1m) tall.

Herb- All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28ft tall.

Woody Vines- All woody vines greater than 3.28ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: **Wetland**

Depth (inches	Matrix Color	%	Redox Features Color	%	Type	Loc	Texture	Remarks
0-12	10YR 2/1	100					Muck	
12-18	10YR 5/1	75	10YR 4/4	25	C	M	Silt	

Hydric Soil Indicators:

- ___ Histosol (A1)
- X Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (B15)
- ___ Thin Dark Surface (S9)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matric (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Soils:

- ___ 2 cm Muck (A10)
- ___ Coast Prarie Redox (A16)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8)
- ___ Thin Dark Surface (S9)
- ___ Iron-Manganese Masses (F12)
- ___ Piedmont Floodplain Soils (F19)
- ___ Mesic Spodic (TA6)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

Restrictive Layer (if observed):

Type: Dense

Depth (inches): 18

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Bowdoinham Public Works City/County: Bowdoinham/Sagadahoc Sampling Date: 6/14/2019

Applicant/Owner: Baker Design Consultants State: ME Sampling Point: Upland

Investigator(s): Tom Tetreau Section, Township, Range:

Landform (hillslope, terrace,etc.): Shoulder Local relief (concave, convex, none): Convex Slope (%) 3 - 5

Subregion (LRR or MLRA): LRR R Lat: 44.005825 Long: -69.897941 Datum: NAD83

Soil Map Unit Name: NWI Classification: UPL

Are climatic / hyrologic conditions on the site typical for this time of year? Yes X No ____ (if no, explain in Remarks.)

Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	if yes, optional Wetland Site ID: 01TTB
Wetland Hydrology Present?	Yes ____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

Appears to be an area of old fill.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsley Vegetated Concave Surface (B8)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible in Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Surface Water Present?	Yes ____	No X	Depth (inches) ____
Water Table Present?	Yes ____	No X	Depth (inches) ____
Saturation Present?	Yes ____	No X	Depth (inches) ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants Sampling Point: **Upland**

Tree Stratum (Plot Size: 30'radius)	Absolute % Cover	Dominant Species?	Indicator Status
Fraxinus americana	15	X	FACU
	15	= Total Cover	

Shrub Stratum (Plot Size: 15'radius)	Absolute % Cover	Dominant Species?	Indicator Status
Cornus amomum	5	X	FACW
	5	= Total Cover	

Herb Stratum (Plot Size: 5'radius)	Absolute % Cover	Dominant Species?	Indicator Status
Phleum pratense	40	X	FACU
Rubus idaeus	40	X	FACU
	80	= Total Cover	

Woody Vine Stratum (Plot Size: 30'radius)	Absolute % Cover	Dominant Species?	Indicator Status
Parthenocissus quinquefolia	20	X	FACU
	20	= Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20% (A/B)

Prevalence Index Worksheet:

OBL species	0	x 1	0	
FACW species	5	x 2	10	
FAC species	0	x 3	0	
FACU species	115	x 4	460	
UPL species	0	x 5	0	
Column Totals	120	(A)	470	(B)

Prevalence Index = B/A = 3.92

Hydrophytic Vegetation Indicators:

_____ 1- Rapid Test For Hydrophytic Vegetation

_____ 2- Dominance Test is => 50%

_____ 3- Prevalence Index is =< 3.0

_____ 4- Morphological Adaptations

_____ 5- Problematic Hydrophytic Vegetation

Definitions of Vegetation Strata:

Tree- Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub- Woody plants less than 3 in. DBH and greater than or equal to 3.28ft (1m) tall.

Herb- All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28ft tall.

Woody Vines- All woody vines greater than 3.28ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: **Upland**

Depth (inches	Matrix Color	%	Redox Features Color	%	Type	Loc	Texture	Remarks
0-2	10YR 2/1	100					Loam	
2-6	10YR 3/2	100					Sandy Loam	

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (B15)
- ___ Thin Dark Surface (S9)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matric (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Soils:

- ___ 2 cm Muck (A10)
- ___ Coast Prarie Redox (A16)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8)
- ___ Thin Dark Surface (S9)
- ___ Iron-Manganese Masses (F12)
- ___ Piedmont Floodplain Soils (F19)
- ___ Mesic Spodic (TA6)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

Restrictive Layer (if observed):

Type: Gravel Fill

Depth (inches): 6

Hydric Soil Present? Yes ___ No X

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Bowdoinham Public Works City/County: Bowdoinham/Sagadahoc Sampling Date: 6/14/2019

Applicant/Owner: Baker Design Consultants State: ME Sampling Point: Wetland

Investigator(s): Tom Tetreau Section, Township, Range:

Landform (hillslope, terrace,etc.): Terrace Local relief (concave, convex, none): Concave Slope (%) 0 - 0

Subregion (LRR or MLRA): LRR R Lat: 44.004370 Long: -69.899653 Datum: NAD83

Soil Map Unit Name: NWI Classification: PEM

Are climatic / hyrologic conditions on the site typical for this time of year? Yes X No (if no, explain in Remarks.)

Are Vegetation X , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation , Soil , or Hydrology naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	if yes, optional Wetland Site ID: 01TTC
Wetland Hydrology Present?	Yes X	No	

Remarks: (Explain alternative procedures here or in a separate report.)

Occasionally mowed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

X Surface Water (A1)	Water-Stained Leaves (B9)	
X High Water Table (A2)	Aquatic Fauna (B13)	
X Saturation (A3)	Marl Deposits (B15)	
Water Marks (B1)	Hydrogen Sulfide Odor (C1)	
Sediment Deposits (B2)	Oxidized Rhizospheres on Living Roots (C3)	
Drift Deposits (B3)	Presence of Reduced Iron (C4)	
Algal Mat or Crust (B4)	Recent Iron Reduction in Tilled Soils (C6)	
Iron Deposits (B5)	Thin Muck Surface (C7)	
Inundation Visible on Aerial Imagery (B7)	Other (Explain in Remarks)	
Sparsley Vegetated Concave Surface (B8)		

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible in Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Surface Water Present?	Yes X	No	Depth (inches)	0.5
Water Table Present?	Yes X	No	Depth (inches)	0
Saturation Present?	Yes X	No	Depth (inches)	0

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants Sampling Point: **Wetland**

Tree Stratum (Plot Size: 30'radius)	Absolute % Cover	Dominant Species?	Indicator Status
	= Total Cover		

Shrub Stratum (Plot Size: 15'radius)	Absolute % Cover	Dominant Species?	Indicator Status
	= Total Cover		

Herb Stratum (Plot Size: 5'radius)	Absolute % Cover	Dominant Species?	Indicator Status
Onoclea sensibilis	50	X	FACW
Phleum pratense	40	X	FACU
Spiraea latifolia	20		FACW
	110	= Total Cover	

Woody Vine Stratum (Plot Size: 30'radius)	Absolute % Cover	Dominant Species?	Indicator Status
	= Total Cover		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index Worksheet:

OBL species	0	x 1	0	
FACW species	70	x 2	140	
FAC species	0	x 3	0	
FACU species	40	x 4	160	
UPL species	0	x 5	0	
Column Totals	110	(A)	300	(B)

Prevalence Index = B/A = 2.73

Hydrophytic Vegetation Indicators:

- ___ 1- Rapid Test For Hydrophytic Vegetation
- X 2- Dominance Test is => 50%
- X 3- Prevalence Index is =< 3.0
- ___ 4- Morphological Adaptations
- ___ 5- Problematic Hydrophytic Vegetation

Definitions of Vegetation Strata:

Tree- Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub- Woody plants less than 3 in. DBH and greater than or equal to 3.28ft (1m) tall.

Herb- All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28ft tall.

Woody Vines- All woody vines greater than 3.28ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: **Wetland**

Depth (inches	Matrix Color	%	Redox Features Color	%	Type	Loc	Texture	Remarks
0-1	10R 3/1	100					Muck	
1-9	10YR 4/2	80	10YR 4/6	20	C	M	Silt Loam	
9-19	10YR 4/1	75	10YR 4/6	25	C	M	Silt Loam	

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (B15)
- ___ Thin Dark Surface (S9)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matric (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Soils:

- ___ 2 cm Muck (A10)
- ___ Coast Prarie Redox (A16)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8)
- ___ Thin Dark Surface (S9)
- ___ Iron-Manganese Masses (F12)
- ___ Piedmont Floodplain Soils (F19)
- ___ Mesic Spodic (TA6)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

Restrictive Layer (if observed):

Type: Dense

Depth (inches): 19

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Bowdoinham Public Works City/County: Bowdoinham/Sagadahoc Sampling Date: 6/14/2019

Applicant/Owner: Baker Design Consultants State: ME Sampling Point: Upland

Investigator(s): Tom Tetreau Section, Township, Range:

Landform (hillslope, terrace,etc.): Shoulder Local relief (concave, convex, none): Convex Slope (%) 1 - 3

Subregion (LRR or MLRA): LRR R Lat: 44.004481 Long: -69.899655 Datum: NAD83

Soil Map Unit Name: NWI Classification: UPL

Are climatic / hyrologic conditions on the site typical for this time of year? Yes X No ____ (if no, explain in Remarks.)

Are Vegetation X , Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	if yes, optional Wetland Site ID: 01TTC
Wetland Hydrology Present?	Yes ____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

Ocassionally mowed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsley Vegetated Concave Surface (B8)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible in Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Surface Water Present?	Yes ____	No X	Depth (inches) ____
Water Table Present?	Yes ____	No X	Depth (inches) ____
Saturation Present?	Yes ____	No X	Depth (inches) ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants Sampling Point: **Upland**

Tree Stratum (Plot Size: 30'radius)	Absolute % Cover	Dominant Species?	Indicator Status
	= Total Cover		

Shrub Stratum (Plot Size: 15'radius)	Absolute % Cover	Dominant Species?	Indicator Status
	= Total Cover		

Herb Stratum (Plot Size: 5'radius)	Absolute % Cover	Dominant Species?	Indicator Status
Phleum pratense	90	X	FACU
Solidago rugosa	5		FAC
	95 = Total Cover		

Woody Vine Stratum (Plot Size: 30'radius)	Absolute % Cover	Dominant Species?	Indicator Status
	= Total Cover		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

OBL species	0	x 1	0	
FACW species	0	x 2	0	
FAC species	5	x 3	15	
FACU species	90	x 4	360	
UPL species	0	x 5	0	
Column Totals	95	(A)	375	(B)

Prevalence Index = B/A = 3.95

Hydrophytic Vegetation Indicators:

_____ 1- Rapid Test For Hydrophytic Vegetation

_____ 2- Dominance Test is => 50%

_____ 3- Prevalence Index is =< 3.0

_____ 4- Morphological Adaptations

_____ 5- Problematic Hydrophytic Vegetation

Definitions of Vegetation Strata:

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Herb- All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28ft tall.

Woody Vines- All woody vines greater than 3.28ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: **Upland**

Depth (inches	Matrix Color	%	Redox Features Color	%	Type	Loc	Texture	Remarks
0-12	10YR 4/3	100					Silt Loam	
12-18	10YR 4/2	100					Silt Loam	

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (B15)
- ___ Thin Dark Surface (S9)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matric (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Soils:

- ___ 2 cm Muck (A10)
- ___ Coast Prarie Redox (A16)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8)
- ___ Thin Dark Surface (S9)
- ___ Iron-Manganese Masses (F12)
- ___ Piedmont Floodplain Soils (F19)
- ___ Mesic Spodic (TA6)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

Restrictive Layer (if observed):

Type: Dense

Depth (inches): 18

Hydric Soil Present? Yes ___ No X

Remarks:

Sampling and Analysis Plan

for

Central Chemical Company

Bowdoinham, Maine

Prepared by:

Maine Department of Environmental Protection
Uncontrolled Sites Program
April 26, 2019

Projected Dates of Sampling: Spring 2019

Organization: Maine DEP

field screening using a PID and XRF will be used to screen soil conditions. Soil samples will be collected to verify field observations.

4.1 Schedule and Time Line

This work is anticipated to be completed in the spring of 2019 and is expected to take one day. Sampling personnel will mobilize to the site to conduct the test pit investigation (Figure 1: SAP Central Chemical Company) as described in section 6.0 Sampling Design.

5.0 Project Quality Objectives

5.1 Project Objectives

The following project objectives apply to the site investigation:

- To perform a screening level assessment of the potential materials of concern, relative to potential leaching of identified COCs, and their potential for impact to human health and/or the environment.

5.2 Measurement and Performance Criteria

Standard data quality measurement and performance criteria will be used to ensure that data is sufficiently sensitive, precise, accurate, and representative to support site decisions.

6.0 Sampling Design

Once a schedule is established, sampling personnel will mobilize to the site to investigate the designated areas of concern. 6-10 test pit locations will be investigated in the project area (Table 1, Sampling Locations and Sampling and Analysis Summary). Actual investigation locations will be chosen in the field based on surficial observations, topography and proximity to the site building. Confirmatory soil samples will be collected from up to four locations for herbicides, pesticides, petroleum hydrocarbons, volatile contaminants and metals.

Soil Sampling

Ten to twelve test pits will be conducted. Subsurface conditions will be documented by visual and olfactory observation, PID bag headspace screening and oleophilic dye tests. Up to four soil samples will be collected to confirm field screening results. The soil samples will be collected in areas with greatest evidence of the presence of contaminants of concern or in areas most likely to be contaminated (e.g. loading areas, outfall pipes, backdoor areas, at the water table interface, river bank area in tidal zones etc.). Soil samples will be collected in accordance with MEDEP DR006: Protocol for Collecting Soil Samples, using a trowel/shovel or bucket auger. The digging tools will be cleaned between sample locations following standard decontamination

Soil samples may be collected using non-dedicated sampling equipment that will be decontaminated between stations. Equipment will be decontaminated before and after use at each sampling location. Specific decontamination procedures are described in the sampling SOPs.

General procedures for decontaminating equipment are as follows:

1. Remove gross contamination by scraping or brushing using a stiff brush to remove all surface contaminants. Generally, paper towels and brushes are used.
2. Clean with tap water and phosphate-free laboratory detergent, such as 2% Liquinox.
3. Rinse thoroughly with tap water to remove all soap solution.
4. Visually inspect the equipment prior to use.

9.0 Sample Handling, Tracking, and Custody Procedures

All samples will be identified, handled, shipped, tracked, and maintained under chain of custody in accordance with standard protocols and procedures.

10.0 Fixed Laboratory Analytical Methods and Procedures

10.1 Fixed Laboratory Analytical Parameters

Samples collected will be analyzed for the following analytical parameters:

- VOCs
- VPH
- EPH
- SVOC's
- Metals
- Pesticides
- Herbicides
- PCB's

10.2 Fixed Laboratory Methods and Standard Operating Procedures

The following procedures and methods will be used:

- MADEP VPH
- MADEP EPH
- SVOC's
- EPA Method 1699
- EPA Method 8260

Table 1 - Sampling Locations and Sampling and Analysis Summary, Central Chemical Company

Sampling Location	Matrix	Analytical Parameter	Number of Samples (Identify field duplicates and replicates)	Sample Location Type	Rationale
SS-1 SS-2 SS-3 SS-4 SS-5 SS-6 SS-7 SS-8 SS-9 SS-10 SS-11 SS-12	Soil	PID, Dye test, field observations, VPH, EPH, VOCs, SVOCs, Metals, PCB's	12 samples	Test pit	To screen soils for potential COCs.
PW-1 PW-2 PW-3 PW-4	Water	VPH, EPH, VOC'S, SVOC's	4 samples	Porewater	To screen Porewater for potential COC's

Figure 1
Central Chemical Company
Bowdoinham, ME