Wetland Permit Application for:
Peirce Island Road, Parking Area, Recreational Trail, Pipeline Replacement, and Sliplining

City of Portsmouth, NH

Prepared For:
City of Portsmouth
Department of Public Works
680 Peverly Hill Road
Portsmouth, NH 03801

and **AECOM**
250 Apollo Drive
Chelmsford, MA 01824

Date:
April 21, 2021

Prepared By:
Normandeau Associates, Inc. 25 Nashua Road
Bedford, NH 03110

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EXHIBIT 28 - FUNCTIONAL ASSESSMENT WORKSHEET

*Exhibit 3 and 6 - Planning actions and materials required by Env-Wt 311.01(a)-(c), Env-Wt 311.03(b)(3), and 311.06 are provided in various other portions of this application.

+Exhibit 24 - After-the-fact application is not applicable

EXHIBIT 1

STANDARD DREDGE AND FILL WETLAND PERMIT APPLICATION FORM

STANDARD DREDGE AND FILL WETLANDS PERMIT APPLICATION

Water Division/Land Resources Management
Wetlands Bureau

Check the Status of your Application

RSA/Rule: RSA 482-A/Env-Wt 100-900

APPLICANT'S NAME: Terry Desmarais, PE, City Engineer **TOWN NAME: Portsmouth**

Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.:
			Check No.:
			Amount:
			Initials:

A person may request a waiver of the requirements in Rules Env-Wt 100-900 to accommodate situations where strict adherence to the requirements would not be in the best interest of the public or the environment but is still in compliance with RSA 482-A. A person may also request a waiver of the standards for existing dwellings over water pursuant to RSA 482-A:26, III(b). For more information, please consult the Waiver Request Form.

SECTION 1 - REQUIRED PLANNING FOR ALL PROJECTS (Env-Wt 306.05; RSA 482-A:3, I(d)(2))

Please use the Wetland Permit Planning Tool (WPPT), the Natural Heritage Bureau (NHB) DataCheck Tool, the Aquatic Restoration Mapper, or other sources to assist in identifying key features such as: priority resource areas (PRAs), protected species or habitats, coastal areas, designated rivers, or designated prime wetlands.

Has the required planning been completed?	☒ Yes ☐ No
Does the property contain a PRA? If yes, provide the following information:	☒ Yes ☐ No
• Does the project qualify for an Impact Classification Adjustment (e.g. NH Fish and Game Department (NHF&G) and NHB agreement for a classification downgrade) or a Project-Type Exception (e.g. Maintenance or Statutory Permit-by-Notification (SPN) project)? See Env-Wt 407.02 and Env-Wt 407.04.	☐ Yes ☒ No
• Protected species or habitat? o If yes, species or habitat name(s): *Iva frutescens* o NHB Project ID #: NHB21-1136	☒ Yes ☐ No
• Bog?	☐ Yes ☒ No
• Floodplain wetland contiguous to a tier 3 or higher watercourse?	☐ Yes ☒ No
• Designated prime wetland or duly-established 100-foot buffer?	☐ Yes ☒ No
• Sand dune, tidal wetland, tidal water, or undeveloped tidal buffer zone?	☒ Yes ☐ No
Is the property within a Designated River corridor? If yes, provide the following information: • Name of Local River Management Advisory Committee (LAC): • A copy of the application was sent to the LAC on Month: Day: Year:	☐ Yes ☒ No

For dredging projects, is the subject property contaminated? • If yes, list contaminant:	☐ Yes ☒ No
Is there potential to impact impaired waters, class A waters, or outstanding resource waters?	☐ Yes ☒ No
For stream crossing projects, provide watershed size (see WPPT or Stream Stats): N/A	

SECTION 2 - PROJECT DESCRIPTION (Env-Wt 311.04(i))

Provide a **brief** description of the project and the purpose of the project, outlining the scope of work to be performed and whether impacts are temporary or permanent. DO NOT reply "See attached"; please use the space provided below.

The City of Portsmouth is nearing completion of a major upgrade to the Peirce Island Wastewater Treatement Facility (WWTF; DES Wetland Permits 2015-1866 and 2015-1878). Several additional improvements are proposed to enhance access reliability to the WWTF, and the public's access to the island. These improvements include raising the access road approximately 3 feet at its lowest point to elevate it above the 100-year flood line and to address sea level rise; converting a former informal public parking area and natural lands; and extending a public walking trail around the northeastern perimeter of the island. At the same time, the City is planning to permanently replace the two sewer force mains on Peirce Island between the Peirce Island Road Bridge and the Peirce Island WWTF, the water main on Peirce Island between the Peirce Island Road Bridge and the Peirce Island Pool, and slip line one of the force mains under the Peirce Island Road. The majority of the work lies within the Tidal Buffer Zone (TBZ).

SECTION 3 - PROJECT LOCATION

Separate wetland permit applications must be submitted for each municipality within which wetland impacts occur.

ADDRESS: 200 Peirce Island Road

TOWN/CITY: Portsmouth

TAX MAP/BLOCK/LOT/UNIT: 208/1

US GEOLOGICAL SURVEY (USGS) TOPO MAP WATERBODY NAME: Piscataqua River
☐ N/A

(Optional) LATITUDE/LONGITUDE in decimal degrees (to five decimal places): 43.07509° North
-70.74582° West

SECTION 4 - APPLICANT (DESIRED PERMIT HOLDER) INFORMATION (Env-Wt 311.04(a)) If the applicant is a trust or a company, then complete with the trust or company information.		
NAME: Terry Desmarais, P.E., City Engineer		
MAILING ADDRESS: 680 Peverly Hill Road		
TOWN/CITY: Portsmouth	STATE: NH	ZIP CODE: 03801
EMAIL ADDRESS: tldesmarais@cityofportsmouth.com		
FAX: N/A	PHONE: (603) 766-1421	
ELECTRONIC COMMUNICATION: By initialing here: TD, I hereby authorize NHDES to communicate all matters relative to this application electronically.		
SECTION 5 - AUTHORIZED AGENT INFORMATION (Env-Wt 311.04(c)) ☐ N/A		
LAST NAME, FIRST NAME, M.I.: Meserve, Erik		
COMPANY NAME: AECOM		
MAILING ADDRESS: 250 Apollo Drive		
TOWN/CITY: Chelmsford	STATE: MA	ZIP CODE: 01824
EMAIL ADDRESS: erik.meserve@aecom.com		
FAX: N/A	PHONE: (978) 905-3145	
ELECTRONIC COMMUNICATION: By initialing here ____, I hereby authorize NHDES to communicate all matters relative to this application electronically.		
SECTION 6 - PROPERTY OWNER INFORMATION (IF DIFFERENT THAN APPLICANT) (Env-Wt 311.04(b)) If the owner is a trust or a company, then complete with the trust or company information. ☐ Same as applicant		
NAME: City of Portsmouth		
MAILING ADDRESS: 1 Junkins Avenue		
TOWN/CITY: Portsmouth	STATE: NH	ZIP CODE: 03801
EMAIL ADDRESS: N/A		
FAX: M/A	PHONE: N/A	
ELECTRONIC COMMUNICATION: By initialing here ____, I hereby authorize NHDES to communicate all matters relative to this application electronically.		

SECTION 7 - RESOURCE-SPECIFIC CRITERIA ESTABLISHED IN Env-Wt 400, Env-Wt 500, Env-Wt 600, Env-Wt 700, OR Env-Wt 900 HAVE BEEN MET (Env-Wt 313.01(a)(3))

Describe how the resource-specific criteria have been met for each chapter listed above (please attach information about stream crossings, coastal resources, prime wetlands, or non-tidal wetlands and surface waters):
Peirce Island is located in the City of Portsmouth on the Piscataqua River. It is owned by the City and the State of NH, and provides multiple public services, including the WWTF, the State Fish Pier, and a public outdoor pool, boat ramp, park, and numerous walking trails. The Project Area occupies the Peirce Island Road Bridge, the eastern end of the island, and the road between Peirce Island Road Bridge and the WWTF. The Project Area is bordered by estuarine habitats, including rocky shore (E2RS1/2) and salt marsh (E2EM1). Most of the work lies within the 100-foot TBZ, although a small portion of the parking area lies within protected shoreline. No freshwater resources are within or adjacent to the impact area. A protected plant, *Iva frutescens*, occurs in the project vicinity. Please see Exhibit 25 - Coastal Resource Worksheet attached to this application for further discussion of the areas coastal resources and the proposed mitigation for the planned temporary and permanent impacts to the undistrubed TBZ. Please see Exhibit 8 - Permittee Responsible Mitigation Project Worksheet attached to this application for further discussion of the proposed mitigation for impacts to the protected plant, *Iva frutescens*.

SECTION 8 - AVOIDANCE AND MINIMIZATION

Impacts within wetland jurisdiction must be avoided to the maximum extent practicable (Env-Wt 313.03(a)).* Any project with unavoidable jurisdictional impacts must then be minimized as described in the Wetlands Best Management Practice Techniques For Avoidance and Minimization and the Wetlands Permitting: Avoidance, Minimization and Mitigation Fact Sheet. For minor or major projects, a functional assessment of all wetlands on the project site is required (Env-Wt 311.03(b)(10)).*

Please refer to the application checklist to ensure you have attached all documents related to avoidance and minimization, as well as functional assessment (where applicable). Use the Avoidance and Minimization Checklist, the Avoidance and Minimization Narrative, or your own avoidance and minimization narrative.

**See Env-Wt 311.03(b)(6) and Env-Wt 311.03(b)(10) for shoreline structure exemptions.*

SECTION 9 - MITIGATION REQUIREMENT (Env-Wt 311.02)

If unavoidable jurisdictional impacts require mitigation, a mitigation pre-application meeting must occur at least 30 days but not more than 90 days prior to submitting this Standard Dredge and Fill Permit Application.

Mitigation Pre-Application Meeting Date: Month: 8 Day: 19 Year: 2020

(☐ N/A - Mitigation is not required)

SECTION 10 - THE PROJECT MEETS COMPENSATORY MITIGATION REQUIREMENTS (Env-Wt 313.01(a)(1)c)

Confirm that you have submitted a compensatory mitigation proposal that meets the requirements of Env-Wt 800 for all permanent unavoidable impacts that will remain after avoidance and minimization techniques have been exercised to the maximum extent practicable: ☒ I confirm submittal.

(☐ N/A – Compensatory mitigation is not required)

SECTION 11 - IMPACT AREA (Env-Wt 311.04(g))

For each jurisdictional area that will be/has been impacted, provide square feet (SF) and, if applicable, linear feet (LF) of impact, and note whether the impact is after-the-fact (ATF; i.e., work was started or completed without a permit).

For intermittent and ephemeral streams, the linear footage of impact is measured along the thread of the channel. *Please note, installation of a stream crossing in an ephemeral stream may be undertaken without a permit per Rule Env-Wt 309.02(d), however other dredge or fill impacts should be included below.*

For perennial streams/rivers, the linear footage of impact is calculated by summing the lengths of disturbances to the channel and banks.

Permanent impacts are impacts that will remain after the project is complete (e.g., changes in grade or surface materials).

Temporary impacts are impacts not intended to remain (and will be restored to pre-construction conditions) after the project is completed.

JURISDICTIONAL AREA		PERMANENT			TEMPORARY		
		SF	LF	ATF	SF	LF	ATF
Wetlands	Forested Wetland			☐			☐
	Scrub-shrub Wetland			☐			☐
	Emergent Wetland			☐			☐
	Wet Meadow			☐			☐
	Vernal Pool			☐			☐
	Designated Prime Wetland			☐			☐
	Duly-established 100-foot Prime Wetland Buffer			☐			☐
Surface Water	Intermittent / Ephemeral Stream			☐			☐
	Perennial Stream or River			☐			☐
	Lake / Pond			☐			☐
	Docking - Lake / Pond			☐			☐
	Docking - River			☐			☐
Banks	Bank - Intermittent Stream			☐			☐
	Bank - Perennial Stream / River			☐			☐
	Bank / Shoreline - Lake / Pond			☐			☐
Tidal	Tidal Waters			☐			☐
	Tidal Marsh			☐			☐
	Sand Dune			☐			☐
	Undeveloped Tidal Buffer Zone (TBZ)	890		☐	1803		☐
	Previously-developed TBZ	12951		☐	55624		☐
	Docking - Tidal Water			☐			☐
TOTAL		13841			**57427**		

SECTION 12 - APPLICATION FEE (RSA 482-A:3, I)

☐ **MINIMUM IMPACT FEE:** Flat fee of $400.

☐ **NON-ENFORCEMENT RELATED, PUBLICLY-FUNDED AND SUPERVISED RESTORATION PROJECTS, REGARDLESS OF IMPACT CLASSIFICATION:** Flat fee of $400 (refer to RSA 482-A:3, 1(c) for restrictions).

☐ **MINOR OR MAJOR IMPACT FEE:** Calculate using the table below:

Permanent and temporary (non-docking):	71268 SF	× $0.40 =	$	28507.20
Seasonal docking structure:	SF	× $2.00 =	$	
Permanent docking structure:	SF	× $4.00 =	$	
Projects proposing shoreline structures (including docks) add $400 =			$	

Total =	$ 28507.20
The application fee for minor or major impact is the above calculated total or $400, whichever is greater =	$ 28507.20

SECTION 13 - PROJECT CLASSIFICATION (Env-Wt 306.05)

Indicate the project classification.

☐ Minimum Impact Project	☐ Minor Project	☒ Major Project

SECTION 14 - REQUIRED CERTIFICATIONS (Env-Wt 311.11)

Initial each box below to certify:

Initials:	
TD	To the best of the signer's knowledge and belief, all required notifications have been provided.
TD	The information submitted on or with the application is true, complete, and not misleading to the best of the signer's knowledge and belief.
TD	The signer understands that: • The submission of false, incomplete, or misleading information constitutes grounds for NHDES to: 1. Deny the application. 2. Revoke any approval that is granted based on the information. 3. If the signer is a certified wetland scientist, licensed surveyor, or professional engineer licensed to practice in New Hampshire, refer the matter to the joint board of licensure and certification established by RSA 310-A:1. • The signer is subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641. • The signature shall constitute authorization for the municipal conservation commission and the Department to inspect the site of the proposed project, except for minimum impact forestry SPN projects and minimum impact trail projects, where the signature shall authorize only the Department to inspect the site pursuant to RSA 482-A:6, II.
TD	If the applicant is not the owner of the property, each property owner signature shall constitute certification by the signer that he or she is aware of the application being filed and does not object to the filing.

SECTION 15 - REQUIRED SIGNATURES (Env-Wt 311.04(d); Env-Wt 311.11)

SIGNATURE (OWNER):	PRINT NAME LEGIBLY:	DATE:
	Terry Desmarais, P.E., City Engineer	5/13/21
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER):	PRINT NAME LEGIBLY:	DATE:
SIGNATURE (AGENT, IF APPLICABLE):	PRINT NAME LEGIBLY:	DATE:

SECTION 16 - TOWN / CITY CLERK SIGNATURE (Env-Wt 311.04(f))

As required by RSA 482-A:3, I(a)(1), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.	
TOWN/CITY CLERK SIGNATURE: Kelli L Barnaby	PRINT NAME LEGIBLY: Kelli L. Barnaby
TOWN/CITY: Portsmouth	DATE: May 13, 2021

DIRECTIONS FOR TOWN/CITY CLERK:
Per RSA 482-A:3, I(a)(1)

1. IMMEDIATELY sign the original application form and four copies in the signature space provided above.
2. Return the signed original application form and attachments to the applicant so that the applicant may submit the application form and attachments to NHDES by mail or hand delivery.
3. IMMEDIATELY distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board.
4. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:
Submit the original permit application form bearing the signature of the Town/City Clerk, additional materials, and the application fee to NHDES by mail or hand delivery at the address at the bottom of this page. Make check or money order payable to "Treasurer – State of NH".

EXHIBIT 2

FEES/CHECK

VENDOR 28555 TREASURER STATE OF NH **City of Portsmouth,NH** 05/13/21 CHECK NO. 201424

ACCOUNT	PURCH. ORDER	INVOICE NUMBER	AMOUNT	DESCRIPTION
3122193000100001 073104		51121-2	28,507.20	PI FORCEMAIN WETLAND
			****28,507.20*	

THE FACE OF THIS CHECK IS PRINTED BLUE - THE BACK CONTAINS A SIMULATED WATERMARK

CITY OF PORTSMOUTH
NEW HAMPSHIRE
ACCOUNTS PAYABLE

CITIZENS BANK
NEW HAMPSHIRE

54-153
114

CHECK DATE 05/13/21
CHECK NO. 201424

AMOUNT $****28,507.20*

PAY THE SUM OF *****28507* DOLLARS AND *20* CENTS

TO THE ORDER OF
TREASURER STATE OF NH
ENVIRONMENTAL SERVICES PO BOX 95
29 HAZEN DRIVE
CONCORD NH 03302

AUTHORIZED SIGNATURE

Void after 180 Days

⑈201424⑈ ⑆011401533⑆ 33030106000⑈

EXHIBIT 3

Required Planning Actions
required by Env-Wt 311.01(a)-(c) and Env-Wt 311.03(b)(3)

Required Planning Actions

All Required Planning actions required by Env-Wt 311.01(a)-(c) and Env-Wt 311.03(b)(3) have been done. See results in Exhibits 4 and 19.

EXHIBIT 4

USACE APPENDIX B – NH GENERAL PERMITS REQUIRED INFORMATION AND CORPS SECONDARY IMPACTS CHECKLIST

US Army Corps of Engineers ®
New England District

Appendix B

New Hampshire General Permits (GPs)
Required Information and Corps Secondary Impacts Checklist

In order for the Corps of Engineers to properly evaluate your application, applicants must submit the following information along with the New Hampshire DES Wetlands Bureau application or permit notification forms. Some projects may require more information. For a more comprehensive checklist, go to https://www.nae.usace.army.mil/Missions/Regulatory/ "Useful Documents, Forms and Publications" and then "Corps Application Form and Guidance." Check with the Corps at (978) 318-8832 for project-specific requirements. For your convenience, this Appendix B is also attached to the State of New Hampshire DES Wetlands Bureau application and Permit by Notification forms.

All Projects:

- New Hampshire Department of Environmental Services (DES) Wetlands Permit Application.
- Request for Project Review Form by the New Hampshire Division of Historical Resources (DHR) https://www.nh.gov/nhdhr/review/rpr.htm.
- Photographs of wetland/waterway to be impacted.
- Purpose of the project.
- Legible, reproducible plans no larger than 11"x17" with bar scale. Provide locus map and plan views of the entire property.
- Typical cross-section views of all wetland and waterway fill areas and wetland replication areas.
- In navigable waters, show mean low water (MLW) and mean high water (MHW) elevations. Show the high tide line (HTL) elevations when fill is involved. In other waters, show ordinary high water (OHW) elevation.
- On each plan, show the following for the project:
    - Vertical datum and the NAVD 1988 equivalent with the vertical units as U.S. feet. In coastal waters this may be mean higher high water (MHHW), mean high water (MHW), mean low water (MLW), mean lower low water (MLLW) or other tidal datum with the vertical units as U.S. feet. MLLW and MHHW are preferred. Provide the correction factor detailing how the vertical datum (e.g., MLLW) was derived using the latest National Tidal Datum Epoch for that area, typically 1983-2001.
    - Horizontal state plane coordinates in U.S. survey feet based on the Traverse Mercator Grid system for the State of New Hampshire (Zone 2800) NAD 83.
    - Project limits with existing and proposed conditions.
    - Limits of any Federal Navigation Project in the vicinity of the project area and horizontal State Plane Coordinates in U.S. survey feet for the limits of the proposed work closest to the Federal Navigation Project;
    - Volume, type, and source of fill material to be discharged into waters and wetlands, including the area(s) (in square feet or acres) of fill in wetlands, below the OHW in inland waters and below the HTL in coastal waters.
    - Delineation of all waterways and wetlands on the project site,:
- Use Federal delineation methods and include Corps wetland delineation data sheets (GC 2).
- For activities involving discharges of dredged or fill material into waters of the U.S., include a statement describing how impacts to waters of the U.S. are to be avoided and minimized, and either a statement describing how impacts to waters of the U.S. are to be compensated for (or a conceptual or detailed mitigation plan) or a statement explaining why compensatory mitigation should not be required for the proposed impacts. Please contact the Corps for guidance.

US Army Corps of Engineers ®
New England District

New Hampshire General Permits (GPs)
Appendix B - Corps Secondary Impacts Checklist
(for inland wetland/waterway fill projects in New Hampshire)

1. Attach any explanations to this checklist. Lack of information could delay a Corps permit determination.
2. All references to "work" include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See GC 5, regarding single and complete projects.
4. Contact the Corps at (978) 318-8832 with any questions.

1. Impaired Waters	Yes	No
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm to determine if there is an impaired water in the vicinity of your work area.*	X	
2. Wetlands	Yes	No
2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?	X	
2.2 Are there proposed impacts to SAS, special wetlands. Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) DataCheck Tool for information about resources located on the property at https://www2.des.state.nh.us/nhb_datacheck/. The book Natural Community Systems of New Hampshire also contains specific information about the natural communities found in NH.		X
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?		N/A
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)		X
2.5 The overall project site is more than 40 acres?		X
2.6 What is the area of the previously filled wetlands?	0	
2.7 What is the area of the proposed fill in wetlands?	0	
2.8 What is the % of previously and proposed fill in wetlands to the overall project site?	0	
3. Wildlife	Yes	No
3.1 Has the NHB & USFWS determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require an NHB ID number & a USFWS IPAC determination.) NHB DataCheck Tool: https://www2.des.state.nh.us/nhb_datacheck/ USFWS IPAC website: https://ecos.fws.gov/ipac/location/index	X	

3.2 Would work occur in any area identified as either "Highest Ranked Habitat in N.H." or "Highest Ranked Habitat in Ecological Region"? (These areas are colored magenta and green, respectively, on NH Fish and Game's map, "2010 Highest Ranked Wildlife Habitat by Ecological Condition.") Map information can be found at: • PDF: https://wildlife.state.nh.us/wildlife/wap-high-rank.html. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html.		X
3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?		X
3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?		X
3.5 Are stream crossings designed in accordance with the GC 21?		N/A
4. Flooding/Floodplain Values	Yes	No
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?	X	
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?		X
5. Historic/Archaeological Resources		
For a minimum, minor or major impact project - a copy of the Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) with your DES file number shall be sent to the NH Division of Historical Resources as required on Page 11 GC 8(d) of the GP document**	X	

*Although this checklist utilizes state information, its submittal to the Corps is a Federal requirement.
** If your project is not within Federal jurisdiction, coordination with NH DHR is not required under Federal law.

Section 1.1

Peirce Island lies in the Lower Piscataqua River –South water quality assessment unit (AUID: NHEST600031001-02-02). It is listed as Severe for Aquatic Life and Swimming, and Poor for Boating and Fish Consumption. The constituents of concern are mercury, fecal coliform, enterococcus, dioxins and PCBs. The project will result in a net benefit to water quality by stabilizing the parking area (reduce sedimentation) and adding grass and native vegetation to treat runoff before it reaches the river (further reduce sedimentation and nutrient/pollutant abatement).

Section 2.1

This project is located within 200 feet of the tidal Piscataqua River. Much of the area to be impacted has been previously disturbed by the on-site essential infrastructure (WWTF) and an existing informal walking trail. Minor clearing of vegetation will occur during trail construction, but there will be a net benefit to the river in the parking area as a result of conversion from compacted gravel to a mix of grass, native shrubs, and pervious grass pavers.

Section 3.1

The NH State threatened intertidal shrub, marsh elder (*Iva frutescens),* is present on site. A survey was conducted identifying the current locations of marsh elder within the project area. During installation of the temporary sewer force mains in October, 2020 under Emergency Authorization 2020-02873, two areas of the adjacent marsh elder stands were inadvertently impacted, with some of the plants crushed and minor soil disturbance. After consultation with NHDES and NH Natural Bureau (NHNHB), several steps were prescribed by NHDES to mitigate the impacts. These included hand-raking and mulching the impact areas, erecting construction fencing between the marsh elder stands and the work area as future protection, monitoring the areas for one growing season to determine restoration success, and provide NHDES and NHNHB with documentation of the restoration work and the results of the monitoring effect.

Section 3.2

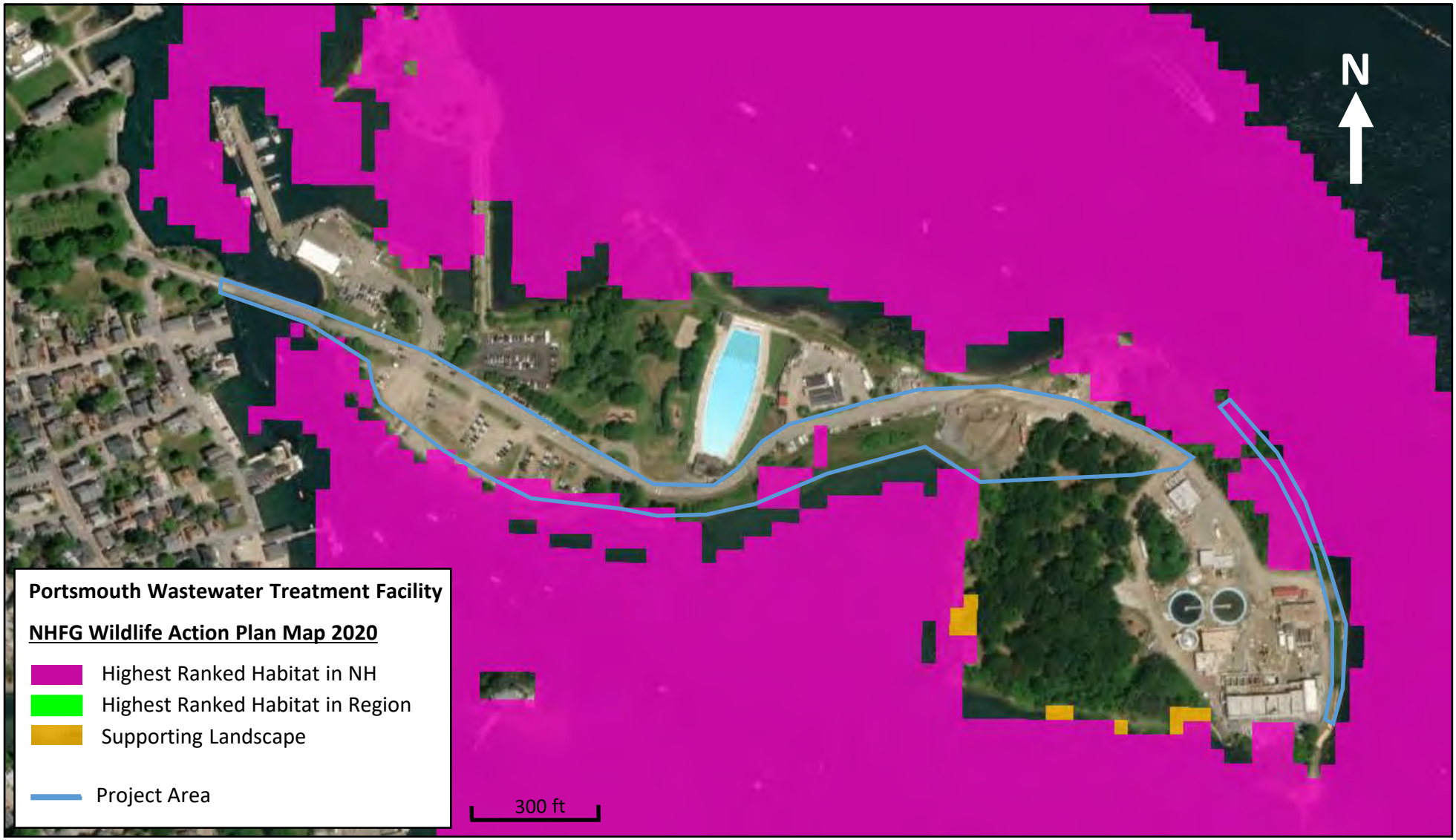
The 2020 Wildlife Action Plan map designates portions of the proposed work areas as Highest Ranked Habitat in N.H. (See attached map). We believe the designation of these areas as Highest Ranked Habitat in N.H. is a map scale issue, in which the extent of the adjacent estuarine area was over-estimated. These areas are more likely a mixture of Unranked and Supporting Landscape.

Section 4.1

Portions of the proposed parking area are within the mapped 100-year FEMA floodplain. There will be a net loss of 80 cubic yards of flood storage due to elevating the road. The Piscataqua River is tidal in this location, therefore this minor loss of flood storage is highly unlikely to affect adjacent properties or impact water levels, and the increased elevations are necessary to ensure access to critical infrastructure during high water.

Section 5

The NH Division of Historical Resources (NHDHR) review determined no historical properties will be affected by the proposed project. Please see responses from NHDHR attached to the end of this Exhibit.


N
Portsmouth Wastewater Treatment Facility
NHFG Wildlife Action Plan Map 2020
Highest Ranked Habitat in NH
Highest Ranked Habitat in Region
Supporting Landscape
Project Area
300 ft

NH DIVISION OF HISTORICAL RESOURCES

Date: 3/1/21 **Site No.** **DHR Review No.** 12424

Project: Peirce Island Force Main Replacement Project

Report: Phase IB Archaeological Investigation, Piece Island Force Main Project, Portsmouth, NH

Other Parties IAC, NHDES

NEPA and Sec. 106 of the NHPA require consultation with the SHPO to ensure the review of all actions covered by these acts relative to historical and cultural properties. The review should focus on the project's impacts pertinent to this act.

FOR MORE INFORMATION CONTACT: David Trubey, Review & Compliance Coordinator, (603-271-2813)

COMMENTS: Please check one. Additional comments should be included below or on a separate sheet.

✓ **CONCUR** WITH RESULTS OF SURVEY & RECOMMENDATION OF NO FURTHER STUDY.

____ **CONCUR WITH CONDITION** (Indicate major reservations about the project and the specific substantive changes or modifications desired.)

____ **TECHNICAL COMMENTS** (No formal position, technical comments may be attached.)

____ **NO COMMENTS**

Date: 3-4-2021

Reviewer's signature: David Trubey **Title:** R+C Coordinator

Amended RPR

After consultation with DHR, an amended RPR was prepared to address the excavation in the road on the west side of Peirce Island Road Bridge for sliplining the pipe under the bridge. This location is within the Nationally Registered Historic District and in close proximity to registered archaeological sites. The RPR amendment was submitted on April 15, 2021. DHR has indicated they will require a monitor be present during the excavation.

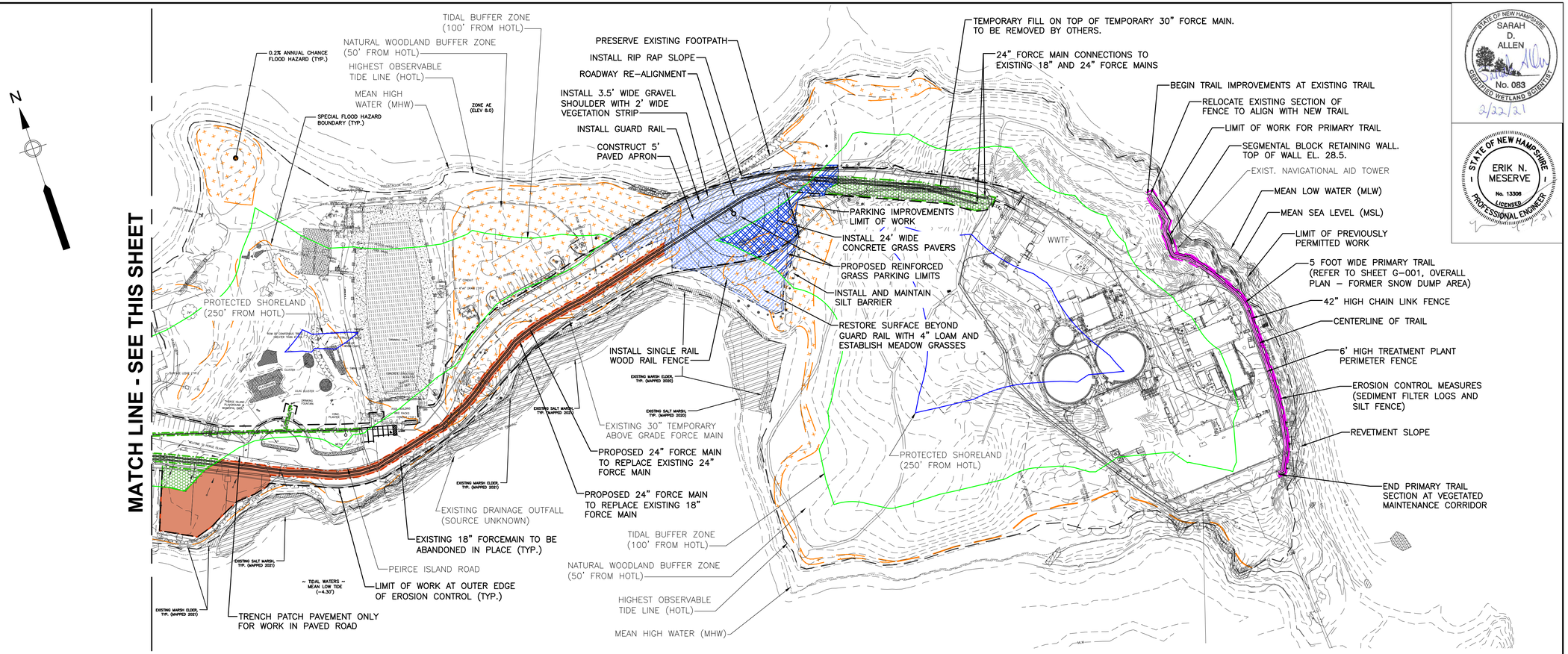
EXHIBIT 5

PROJECT PLANS

Project Plans

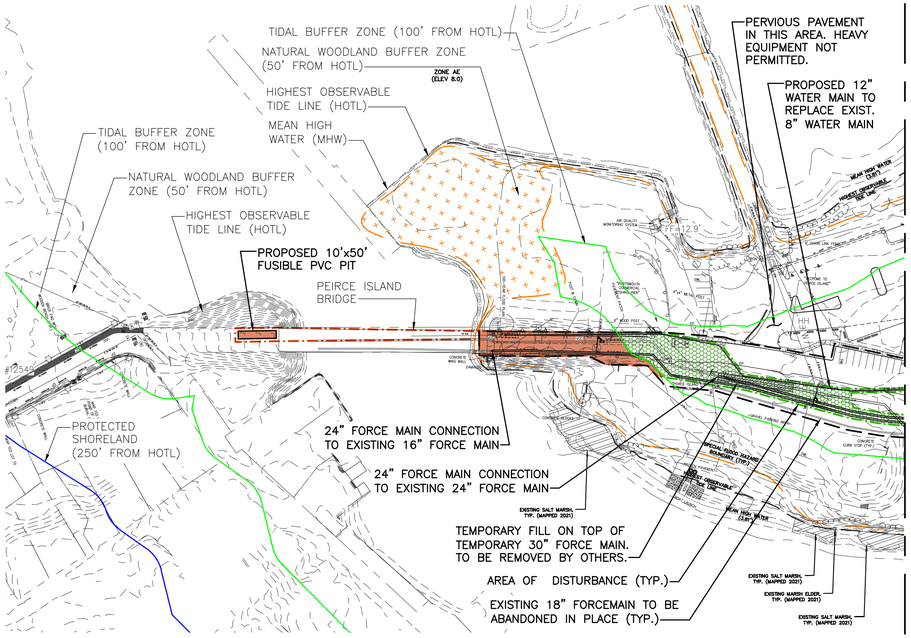
The following submittal is for multiple projects, including the Peirce Island Force Main and Water Main Replacement Project, Peirce Island Roadway and Snow Dump Improvements, and the Peirce Island Trail Extension. The following drawings are included to illustrate these projects:

- Overall Site Plan (All Projects) Sheet 00 G-003-P OSP
- Peirce Island Force Main and Water Main Replacement Project Plans (12 sheets)
- Peirce Island Roadway and Snow Dump Improvements and Peirce Island Trail Extension Plans (7 sheets)



PLAN

SCALE: 1"=100'



PLAN

SCALE: 1"=100'

LEGEND

- MEAN HIGH WATER (MHW)
- HIGHEST OBSERVABLE TIDE LINE (HOTL)
- SPECIAL FLOOD HAZARD BOUNDARY
- NATURAL WOODLAND BUFFER ZONE – 50' FROM HOTL
- TIDAL BUFFER ZONE – 100' FROM HOTL
- PROTECTED SHORELAND – 250' FROM HOTL
- LIMIT OF WORK (L.O.W.)
- AREA OF DISTURBANCE BOUNDARY
- SALT MARSH AREA
- MARSH ELDER
- .2% ANNUAL CHANCE OF FLOOD HAZARD AREA
- PIPELINE AREA OF DISTURBANCE 0–100 FEET FROM HOTL
- PIPELINE AREA OF DISTURBANCE 100–250 FEET FROM HOTL
- PARKING AREA OF DISTURBANCE 0–100 FEET FROM HOTL
- PARKING AREA OF DISTURBANCE 100–250 FEET FROM HOTL
- DUPLICATE AREA OF DISTURBANCE 0–100 FEET FROM HOTL
- DUPLICATE AREA OF DISTURBANCE 100–250 FEET FROM HOTL
- TRAIL IMPROVEMENTS AREA OF DISTURBANCE 0–100 FEET FROM HOTL

Peirce Island WWTF Wetlands Impact

	Temp (s.f.)	Perm (s.f.)	Total (s.f.)
Pipeline			
PDTBZ	52,500	0	52,500
Road & Grass Parking ^			
Previously Disturbed Tidal Buffer Zone	26,346	11,438	37,784
Duplicate Area between Pipeline& Parking	-16,928	0	-16,928
Restoration Area in Parking +	-7,464	0	-7,464
Fee Subtotal	1,954	11,438	13,392
Recreational Trail ^			
Undisturbed Tidal Buffer Zone	1,803	890	2,693
Previously Disturbed Tidal Buffer Zone	1,170	1,513	2,683
Previously Disturbed Tidal Buffer Zone *	(512)	(553)	(1,065)
Fee Subtotal	2,973	2,403	5,376
Fee Total	57,427	13,841	71,268

^ See Sheet G-001 for total impact area
+ To be restored to native habitat & excluded from fee (See Sheet G-001)
* Previously permitted & excluded from fee

Peirce Island WWTF Shoreland Impact

	Temp (s.f.)	Perm (s.f.)	Total (s.f.)
Pipeline Temporary Impacts 100-250'			
Previously Disturbed Tidal Buffer Zone	35,900	0	35,900
Duplicate Area between Pipeline& Parking	-8,415	0	-8,415
Subtotal	27,485	0	27,485
Recreational Trail			
Impervious Area within 100' Tidal Buffer Zone			
Previously Disturbed Tidal Buffer Zone	0	2,956	2,956
Total	27,485	2,956	30,441

1" = 100' SCALE: 0 100 200 300 FEET

STATE OF NEW HAMPSHIRE — SARAH D. ALLEN — No. 083 — CERTIFIED WETLAND SCIENTIST — 2/22/21

STATE OF NEW HAMPSHIRE — ERIK N. MESERVE — No. 13306 — LICENSED PROFESSIONAL ENGINEER — 2/22/21

AECOM

PROJECT

PEIRCE ISLAND FORCE MAIN AND WATER MAIN REPLACEMENT

Peirce Island, Portsmouth NH

OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE

680 Peverly Hill Road
Portsmouth, NH 03801

ENGINEER

AECOM TECHNICAL SERVICES, INC.
250 APOLLO DRIVE
CHELMSFORD, MA 01824
PHONE: (978) 905-2100
www.aecom.com

ALTUS ENGINEERING, INC.

STATE OF NEW HAMPSHIRE — ERIC D. WEINRIEB — No. 7634 — LICENSED PROFESSIONAL ENGINEER — 4/9/21

REGISTRATION

PERMIT SUBMITTAL

PERMIT APPLICATION DRAWING NOT FOR CONSTRUCTION

ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60649477

Designed By:	S. HE
Drawn By:	M. THIBODEAU
Dept Check:	C. BENZIGER
Proj Check:	E. MESERVE
Date:	APRIL 13, 2021
Scale:	AS NOTED

DISCIPLINE

CIVIL

SHEET TITLE

OVERALL SITE PLAN (ALL PROJECTS)

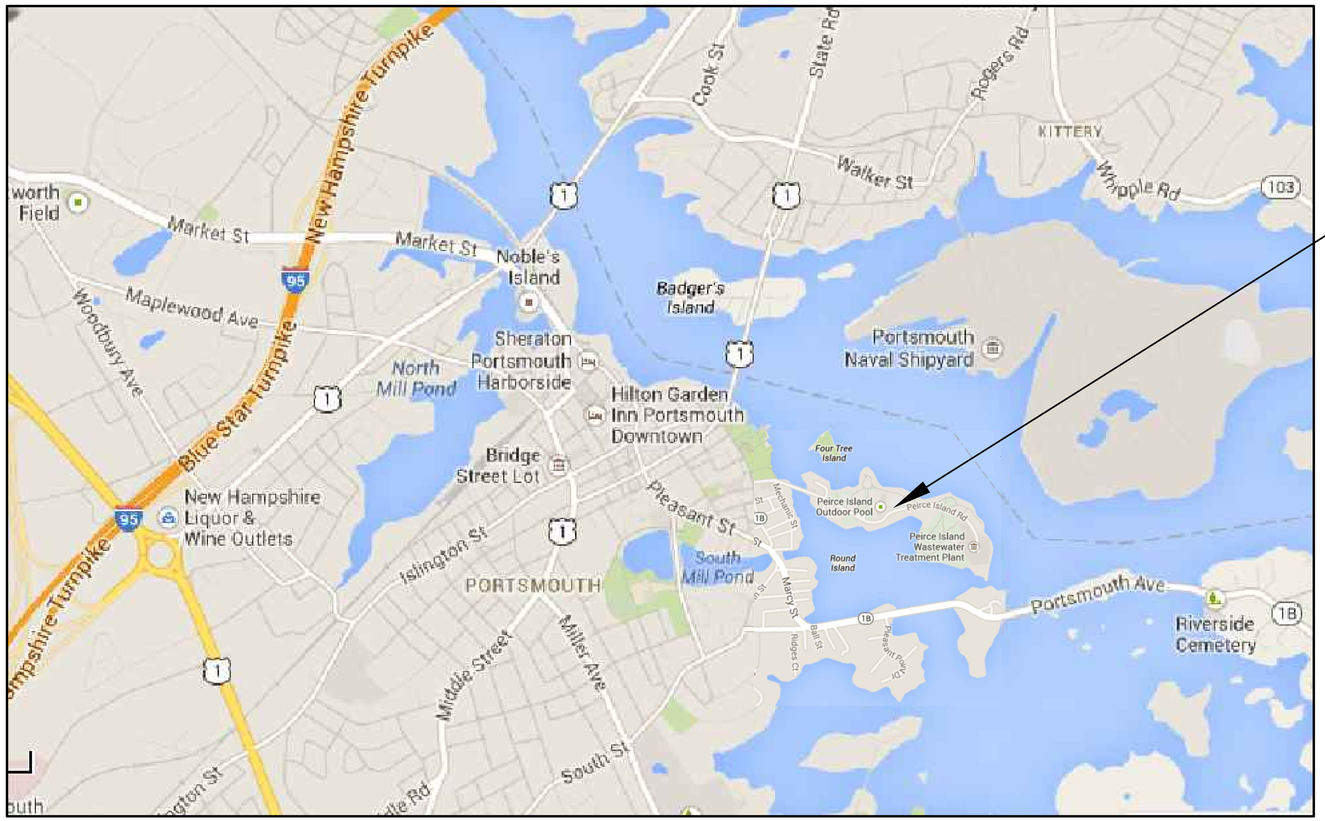
SHEET NUMBER

00 G-003-P OSP

PATH/FILENAME: C:\JOBS\DRAWINGS\4507 PWFP\4507.07 WATERLINE REPLACEMENT\INCOMING\210406 COMPLETE UPDATE\00 G-003-P OSP.DWG
LAST UPDATE: Tuesday, April 13, 2021 12:58:24 PM
PLOT DATE: Monday, April 19, 2021 9:04:45 AM

CITY OF PORTSMOUTH, NEW HAMPSHIRE

PEIRCE ISLAND
FORCE MAIN AND WATER MAIN REPLACEMENT
APRIL 2021



LOCATION PLAN

APPROXIMATE SCALE: 1" = 1000'

0 1000 2000 3000

SCALE: 1"=1000'

INDEX OF DRAWINGS

AECOM

PROJECT

PEIRCE ISLAND
FORCE MAIN AND
WATER MAIN
REPLACEMENT

Peirce Island, Portsmouth NH

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CITY OF PORTSMOUTH
NEW HAMPSHIRE

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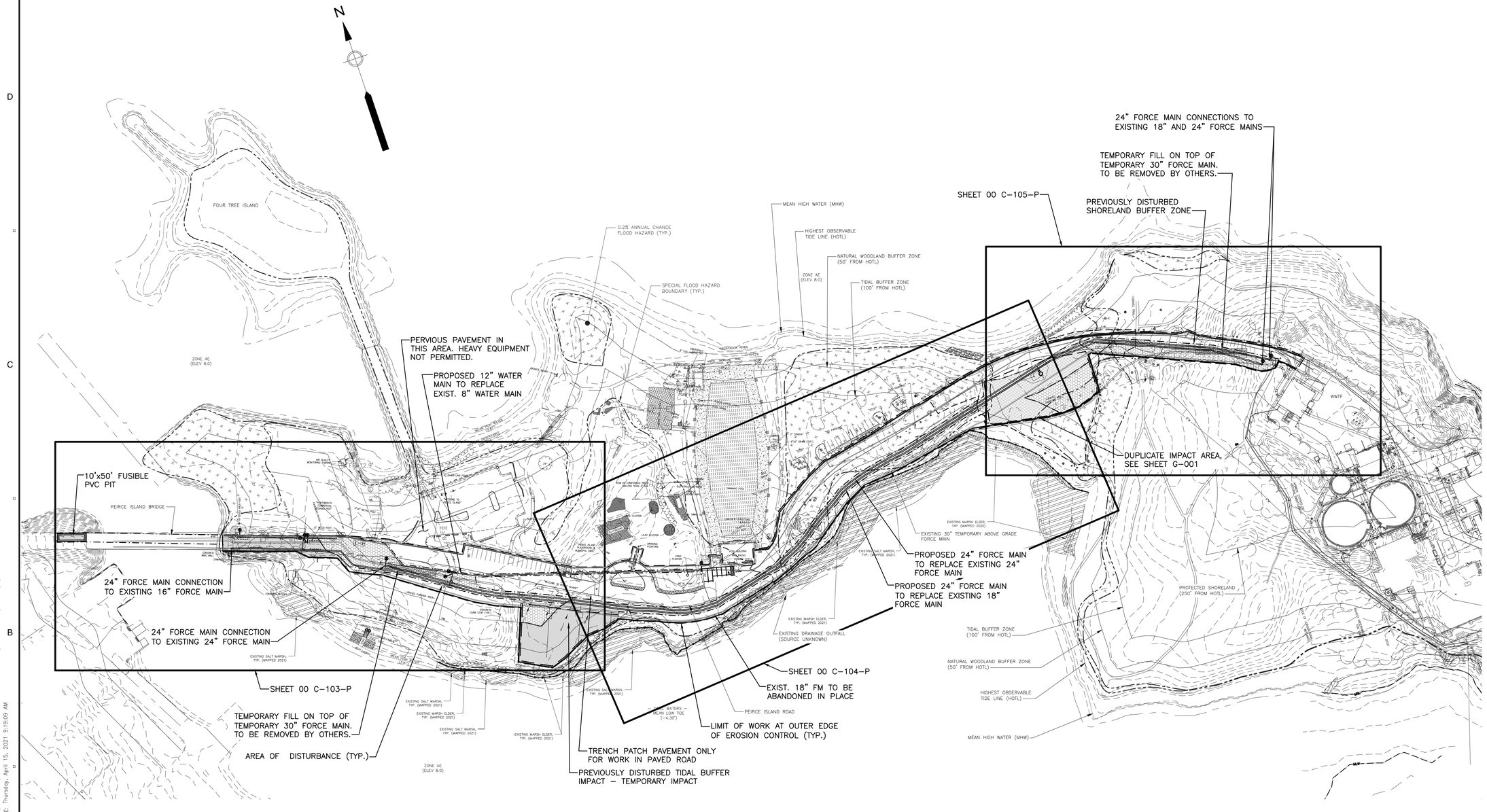
CIVIL

SHEET TITLE

COVER SHEET, LOCATION PLAN AND INDEX OF DRAWINGS

SHEET NUMBER

00 G-001-P



PLAN

SCALE: 1"=100'

LIMIT OF TEMPORARY DISTURBANCE AREAS:

52,500 S.F.	0–100 FOOT PREVIOUSLY DISTURBED TIDAL BUFFER ZONE
35,900 S.F.	100–250 FOOT PREVIOUSLY DISTURBED SHORELAND BUFFER ZONE

NOTES:

1. FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET 00 C–001–P.

1" = 100' SCALE 0 100 200 300 FEET

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LAST UPDATE: Wednesday, April 14, 2021 8:48:30 AM
PLOT DATE: Thursday, April 15, 2021 9:19:09 AM

AECOM

PROJECT

PEIRCE ISLAND FORCE MAIN AND WATER MAIN REPLACEMENT

Peirce Island, Portsmouth NH

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CITY OF PORTSMOUTH NEW HAMPSHIRE

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Date:	APRIL 2021
Scale:	AS NOTED

DISCIPLINE

CIVIL

SHEET TITLE

OVERALL SITE AND KEY PLAN

SHEET NUMBER

00 G-002-P

GENERAL NOTES

1. IT IS THE INTENT OF THE CONTRACT DOCUMENTS TO PRESCRIBE A COMPLETE WORK OR IMPROVEMENT. THE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND ANY REQUIREMENTS INDICATED IN ONE OF THE DOCUMENTS IS AS BINDING AS HAVING BEEN INDICATED IN ALL.
2. HORIZONTAL LOCATIONS SHOWN ARE REFERENCED TO THE NH STATE PLANE COORDINATE SYSTEM, NAD83.
3. VERTICAL DATUM IS NAVD 88 AND IS BASED ON NATIONAL GEODETIC SURVEY FIRST ORDER CLASS I BENCHMARKS "V31 USGS" (PID:OC0289) HAVING A PUBLISHED ELEVATION OF 29.19' AND "W31" (PID:OC0413) HAVING A PUBLISHED ELEVATION OF 20.54'. REFER ALSO TO VERTICAL DATUM CONVERSION NOTE BELOW.
4. TOPOGRAPHIC INFORMATION SHOWN IS THE RESULT OF A SURVEY MADE IN JULY 2013, AUGUST 2020 AND JANUARY 2021 BY DOUCET SURVEY, INC., 102 KENT PLACE, NEWMARKET, NH 03857. WETLAND BOUNDARIES, HIGHEST OBSERVABLE TIDE LINE (HOTL) AND EXISTING TREE SURVEY WERE DELINEATED BY NORMANDEAU ASSOCIATES, INC. ON JANUARY 14, 2021.
5. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS BASED ON RECORD DRAWINGS AND IS APPROXIMATE. THE OWNER DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF UNDERGROUND UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE AT 1-888-344-7233.
6. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL EXISTING CONDITIONS AT THE SITE.
7. THE CONTRACTOR SHALL ERECT EROSION CONTROL MEASURES PRIOR TO COMMENCING ANY CLEARING, EXCAVATION OR STORAGE OF BACKFILL MATERIAL ON-SITE. REFER TO SPECIFICATION SECTION 01568 AND DETAILS.
8. THE ENGINEER MAY DIRECT THE CONTRACTOR TO VARY THE PROPOSED WORK DURING CONSTRUCTION TO MEET EXISTING CONDITIONS.
9. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES AND SHALL PROVIDE ALL NECESSARY CONTINUOUS BARRIERS OF SUFFICIENT TYPE, SIZE AND STRENGTH TO PREVENT ACCESS TO ALL OPEN EXCAVATIONS AT THE COMPLETION OF EACH DAYS WORK. REFER TO SPECIFICATION SECTION 01046 FOR ADDITIONAL REQUIREMENTS
10. INTERRUPTION TO WATER AND OTHER EXISTING UTILITIES SHALL BE REQUESTED IN WRITING BY THE CONTRACTOR 3 DAYS IN ADVANCE OF THE WORK AND REVIEWED BY THE ENGINEER.
11. CONTRACTOR SHALL MAINTAIN FLOW OF SEWAGE IN ACCORDANCE WITH SECTION 01063.
12. EXISTING UTILITIES INTERFERING WITH THE WORK SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
13. PIPE SHALL BE AS INDICATED IN THE PIPING SCHEDULE AND SPECIFICATIONS. PROVIDE RESTRAINED MECHANICAL JOINT FITTINGS FOR CONNECTIONS TO EXISTING PIPING AS SPECIFIED .
14. PIPING WHICH IS EXPOSED DURING EXCAVATION, INCLUDING TEE'S, VALVES, AND FITTINGS, AND IS NOT TO BE DEMOLISHED, SHALL BE SUPPORTED, BRACED OR OTHERWISE PROTECTED DURING CONSTRUCTION ACTIVITIES.
15. ALL PIPING SHALL BE CONSTRUCTED WITH A MINIMUM OF 5 FEET OF COVER.
16. ALL PIPES SHALL SLOPE UNIFORMLY BETWEEN ELEVATIONS SHOWN UNLESS OTHERWISE INDICATED ON THE DRAWINGS OR DIRECTED BY THE ENGINEER. NO SAGS OR CRESTS IN PIPING WILL BE PERMITTED.
17. WHERE NEW PIPING IS TO BE CONNECTED TO EXISTING PIPING, THE CONTRACTOR SHALL FURNISH AND INSTALL ALL ADAPTERS, FITTINGS, AND ADDITIONAL PIPE WHICH MAY NOT BE SHOWN IN DETAILS (REQUIRED AS A RESULT OF CUTTING THE EXISTING PIPE BACK) IN ORDER TO COMPLETE THE CONNECTION AS REQUIRED.
18. ALL SIGNAGE, HEADWALLS, GUARD RAILS, GUARD POSTS, FENCES, CURBS, ROADWAYS, SIDEWALKS AND ANY OTHER OBJECTS DISTURBED BY CONTRACTOR ACTIVITIES SHALL BE RETURNED TO PRE-CONSTRUCTION CONDITION OR BETTER AS DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
19. ALL AREAS OF EXCAVATION, BACKFILL, FILL AND GRADING SHALL BE RETURNED TO THE ORIGINAL GRADE UNLESS SHOWN ON THE DRAWINGS.
20. ALL UTILITY BOXES, FRAMES, GRATES, ETC. DISTURBED BY CONTRACTOR AND NOT TO BE ABANDONED SHALL BE RESET TO THE PROPER GRADE AT NO ADDITIONAL COST TO THE OWNER.
21. UNPAVED AREAS DISTURBED BY THE CONTRACTOR SHALL BE CLEARED AND GRUBBED IF REQUIRED, AND RESTORED WITH LOAM AND SEED.
22. ALL EXISTING PIPES TO BE ABANDONED SHALL BE PLUGGED AT OPEN ENDS. SEE PIPE PLUGGING DETAIL ON SHEET 99 C-502-P.
23. RECORD DRAWINGS FOR EXISTING FACILITIES CAN BE FOUND IN THE SPECIFICATIONS.

VERTICAL DATUM CONVERSION NOTE:

SURVEY BY DOUCET ASSOCIATES IS BASED ON NAVD 88 DATUM. EXISTING PLANT AND FORCE MAIN RECORD DRAWINGS ARE BASED ON NGVD 29 DATUM. TO CONVERT NAVD 88 ELEVATIONS TO NGVD 29, ADD 0.77 FEET. TO CONVERT NGVD ELEVATIONS TO NAVD 88 SUBTRACT 0.77 FEET.

GEOTECHNICAL NOTES

1. FOR EARTH EXCAVATION, BACKFILL, FILL AND GRADING SEE SPECIFICATION 02210.
2. FOR DEWATERING SEE SPECIFICATION 02140.
3. FOR EXCAVATION SUPPORT SYSTEM SEE SPECIFICATION 02160.
4. BORING LOCATIONS ARE SHOWN ON THE PLANS AND BORING LOGS ARE BOUND IN THE SPECIFICATIONS.
5. BORINGS WERE TAKEN FOR PURPOSES OF DESIGN AND INDICATE SUBSURFACE CONDITIONS AT BORING LOCATION ONLY. SUBSURFACE CONDITIONS MAY VARY FROM THOSE SHOWN IN THE LOG.
6. IN ALL AREAS WHERE DEWATERING IS NECESSARY, MEASURES SHALL BE TAKEN TO ENSURE THE PRESERVATION OF WATERCOURSES AND COMPLIANCE WITH ALL REGULATIONS AND LAWS. ALL DEWATERING MUST BE DISCHARGED INTO SEDIMENT TRAPS AS INDICATED IN THE DETAILS AND AS SPECIFIED IN SPECIFICATION SECTION 01568.
7. FOR ROCK EXCAVATION AND DISPOSAL, SEE SPECIFICATION SECTION 02211.

ABBREVIATIONS

APPROX.	APPROXIMATE	TS&V	TAPPING SLEEVE AND VALVE
B&B	BALL AND BURLAP	TYP.	TYPICAL
BLDG.	BUILDING	UE	UNDERGROUND ELECTRIC
CB	CATCH BASIN	V	VENT
CONC.	CONCRETE	VERT.	VERTICAL
C.I.	CAST IRON	VGC	VERTICAL GRANITE CURB
CLF	CHAIN LINK FENCE	W	WIDTH
C.O. OR CO	CLEANOUT	WSO	WATER SHUT OFF
CW	CITY WATER OR CROSS WALK	WV	WATER VALVE
D	DRAIN		
DI	DUCTILE IRON		
DIA.	DIAMETER		
DIM.	DIMENSION		
DMH	DRAIN MANHOLE		
DWGS	DRAWINGS		
DYL OR DYCL	DOUBLE YELLOW CENTER LINE		
E	ELECTRICAL		
ECC.	ECCENTRIC		
EL. OR ELEV.	ELEVATION		
EMERG.	EMERGENCY		
EOP	EDGE OF PAVEMENT		
EXIST.	EXISTING		
FES	FLARED END SECTION		
FF OR F.F.E.	FINISHED FLOOR ELEVATION		
FM	FORCE MAIN		
GAL.	GALLON		
GP	GUARD POST		
GRAN.	GRANITE		
GV	GATE VALVE		
HOTL	HIGHEST OBSERVABLE TIDE LINE		
INV.	INVERT		
L	LENGTH		
LF	LINEAR FOOT		
L.O.W.	LIMIT OF WORK		
MECH.	MECHANICAL		
MH	MANHOLE		
MHW	MEAN HIGH WATER		
MLW	MEAN LOW WATER		
MJ	MECHANICAL JOINT		
MSL	MEAN SEA LEVEL		
N.C.	NORMALLY CLOSED		
PBS	PRINTED BOTH SIDES		
PSNH	PUBLIC SERVICE OF NEW HAMPSHIRE		
PVC	POLYVINYL CHLORIDE		
RCP	REINFORCED CONCRETE PIPE		
RED.	REDUCER		
RET.	RETAIN OR RETAINING		
SAN	SANITARY DRAIN		
SD	STORM DRAIN		
SL	SLUDGE OR STOP LINE		
SMH	SEWER MANHOLE		
SWL	SINGLE WHITE LINE		
SYL	SINGLE YELLOW LINE		
TBM	TEMPORARY BENCHMARK		
TP	TEST PIT		

LEGEND

EXISTING

- UTILITY POLE & GUY WIRE
- UTILITY POLE W/ LIGHT
- SIGN
- YARD HYDRANT
- UNIDENTIFIED PIPE
- WOODEN POST
- FIRE HYDRANT
- WATER METER
- WATER GATE VALVE
- VENT PIPE
- WATER SHUTOFF VALVE
- CLEANOUT
- TRAFFIC DIRECTION ARROW
- ELECTRIC BOX
- CATCH BASIN (ROUND)
- CATCH BASIN
- DRAIN MANHOLE
- ELECTRIC MANHOLE
- CHEMICAL MANHOLE
- WATER MANHOLE
- SEWER MANHOLE
- UNIDENTIFIED MANHOLE
- JURISDICTIONAL WETLAND SYMBOL
- FLAG POLE
- CONIFEROUS TREE
- DECIDUOUS TREE
- SHRUB
- CONCRETE
- BOULDER
- ROW OF BOULDERS
- LANDSCAPED AREA
- GRAVEL
- LEDGE OUTCROP
- BOLLARD
- DRAINAGE FLOW DIRECTION ARROW
- CHAINLINK FENCE
- OVERHEAD WIRES
- DRAIN LINE
- TREE LINE
- SHRUB LINE
- GUARDRAIL
- CONTOUR LINE
- EDGE OF JURISDICTIONAL WETLAND
- AREA OF STONE RIPRAP
- BORING
- MONITORING WELL
- TEST PIT
- MEAN HIGH WATER
- HIGHEST OBSERVABLE TIDE LINE
- SPECIAL FLOOD HAZARD BOUNDARY
- SALT MARSH AREA
- MARSH ELDER
- .2% ANNUAL CHANCE OF FLOOD HAZARD AREA
- AREA OF DISTURBANCE BOUNDARY
- AREA OF DISTURBANCE 0-100 FEET FROM HOTL
- AREA OF DISTURBANCE 100-250 FEET FROM HOTL
- DUPLICATE IMPACT AREA

PROPOSED

- LIMIT OF WORK
- AREA OF DISTURBANCE
- STRUCTURE
- PIPE PLUG OR CAP
- DEMOLITION
- ABANDON IN PLACE
- TREE REMOVAL
- TEE
- REDUCER
- BEND
- GATE VALVE
- PIPE - ≤ 6" DIAM.
- PIPE - > 6" DIAM.
- DIRECTION OF FLOW
- MANHOLE
- CLEANOUT
- GUARD POST OR BOLLARD
- CHAIN LINK FENCE
- TEMPORARY FENCE
- SEDIMENT FILTER LOG EROSION CONTROL
- CONTOUR
- SPOT ELEVATION
- TOP OF SLOPE
- CRUSHED STONE MOWING STRIP
- CONCRETE
- CURB
- POINT OF CONNECTION, NEW WORK TO EXIST.
- LIMIT OF DISTURBANCE

AECOM

PROJECT

PEIRCE ISLAND FORCE MAIN AND WATER MAIN REPLACEMENT

Peirce Island, Portsmouth NH

OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE

680 Peverly Hill Road
Portsmouth, NH 03801

ENGINEER

AECOM TECHNICAL SERVICES, INC.
250 APOLLO DRIVE
CHELMSFORD, MA 01824
PHONE: (978) 905-2100
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REGISTRATION

PERMIT SUBMITTAL

PERMIT APPLICATION DRAWING
NOT FOR CONSTRUCTION

ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60649477

Designed By:	S. HE
Drawn By:	M. THIBODEAU
Dept Check:	C. BENZIGER
Proj Check:	E. MESERVE
Date:	MARCH 2021
Scale:	AS NOTED

DISCIPLINE

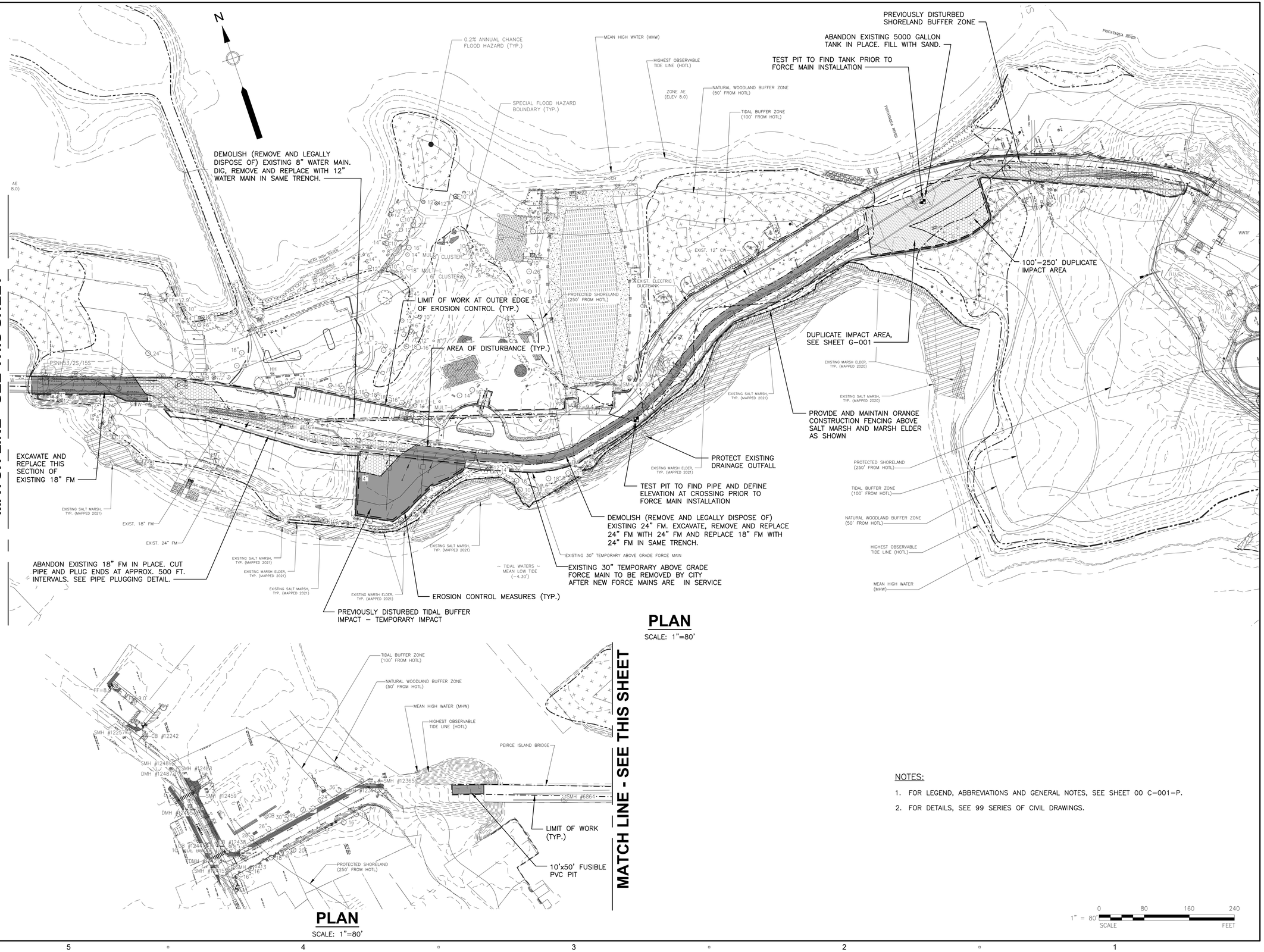
CIVIL

SHEET TITLE

LEGEND, ABBREVIATIONS AND GENERAL NOTES

SHEET NUMBER

00 C-001-P



PLAN
SCALE: 1"=80'

PLAN
SCALE: 1"=80'

NOTES:

1. FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET 00 C-001-P.
2. FOR DETAILS, SEE 99 SERIES OF CIVIL DRAWINGS.

1" = 80' SCALE: 0 80 160 240 FEET

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LAST UPDATE: Tuesday, April 13, 2021 2:01:14 PM
PLOT DATE: Tuesday, April 13, 2021 4:46:43 PM

AECOM

PROJECT

PEIRCE ISLAND FORCE MAIN AND WATER MAIN REPLACEMENT

Peirce Island, Portsmouth NH

OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE

680 Peverly Hill Road
Portsmouth, NH 03801

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Scale:	AS NOTED

DISCIPLINE

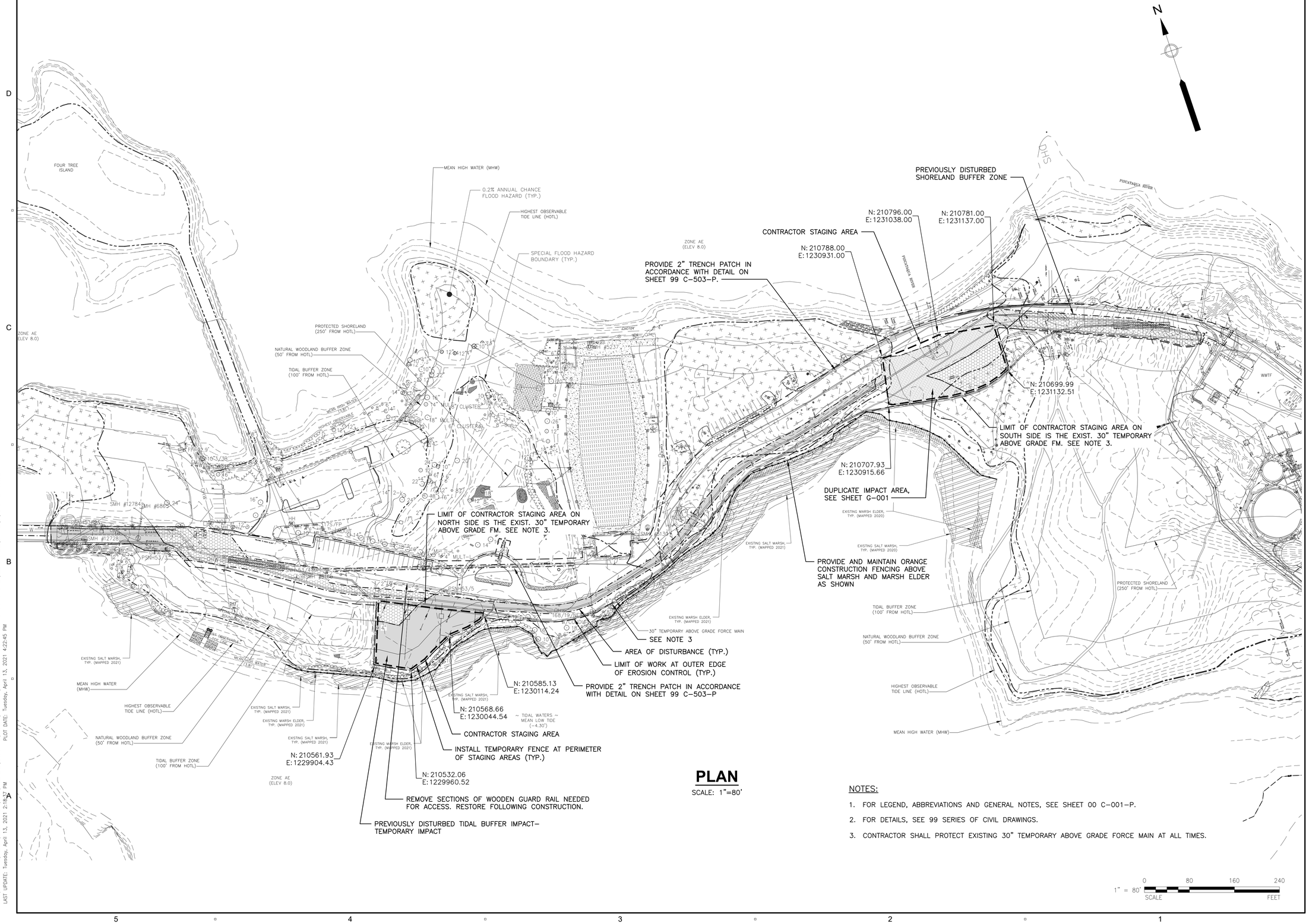
CIVIL

SHEET TITLE

EXISTING CONDITIONS, EROSION CONTROL AND DEMOLITION PLAN

SHEET NUMBER

00 C-101-P



PLAN

SCALE: 1"=80'

NOTES:

1. FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET 00 C-001-P.
2. FOR DETAILS, SEE 99 SERIES OF CIVIL DRAWINGS.
3. CONTRACTOR SHALL PROTECT EXISTING 30" TEMPORARY ABOVE GRADE FORCE MAIN AT ALL TIMES.

PATH/FILENAME: L:\LEGACY\USCHL1FP001\DATA\PROJECTS\WAKEFIELD\DATA_2\EVERYONE\PORTSMOUTH PEIRCE ISLAND FM REPLACEMENT\900 CAD-GIS\SHEETS\C\00 C-102-P.DWG
LAST UPDATE: Tuesday, April 13, 2021 2:18:37 PM PLOT DATE: Tuesday, April 13, 2021 4:22:45 PM

AECOM

PROJECT

PEIRCE ISLAND
FORCE MAIN AND
WATER MAIN
REPLACEMENT
Peirce Island, Portsmouth NH

OWNER

CITY OF PORTSMOUTH
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DISCIPLINE

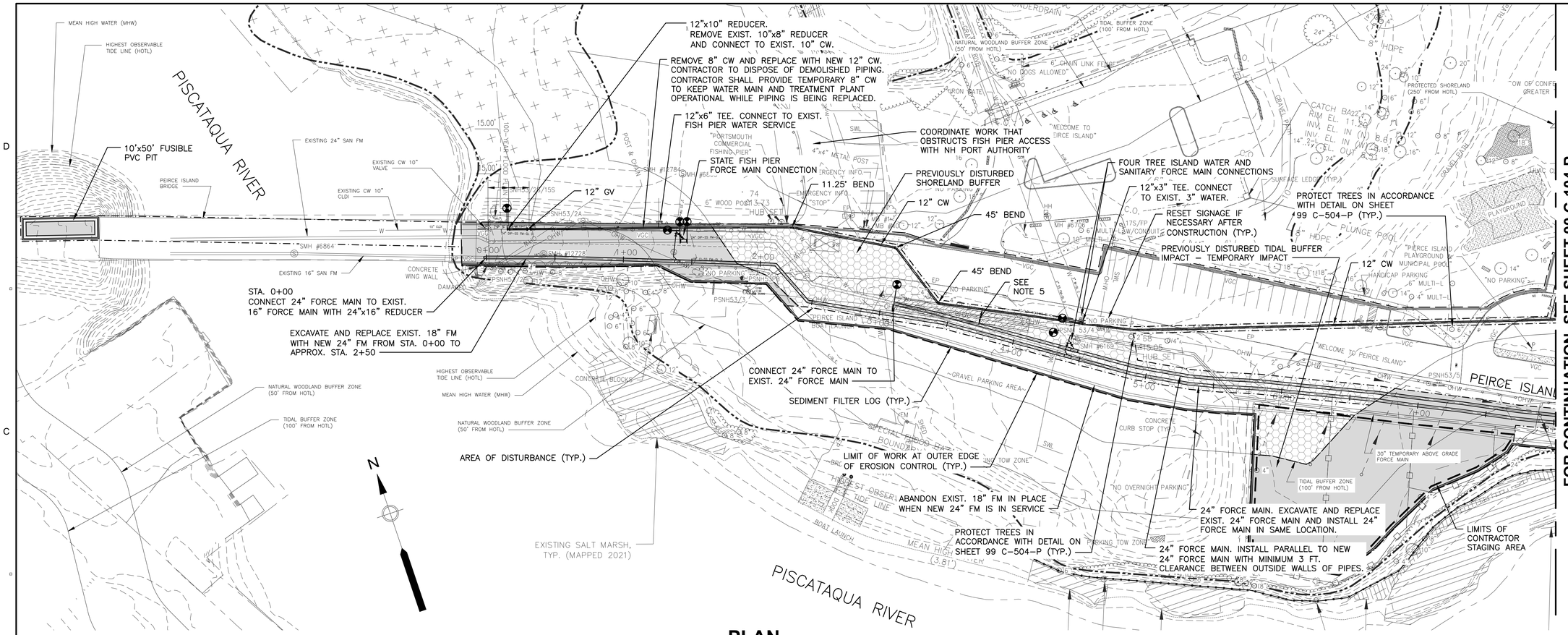
CIVIL

SHEET TITLE

CONTRACTOR ACCESS AND STAGING AREA AND SITE RESTORATION PLAN

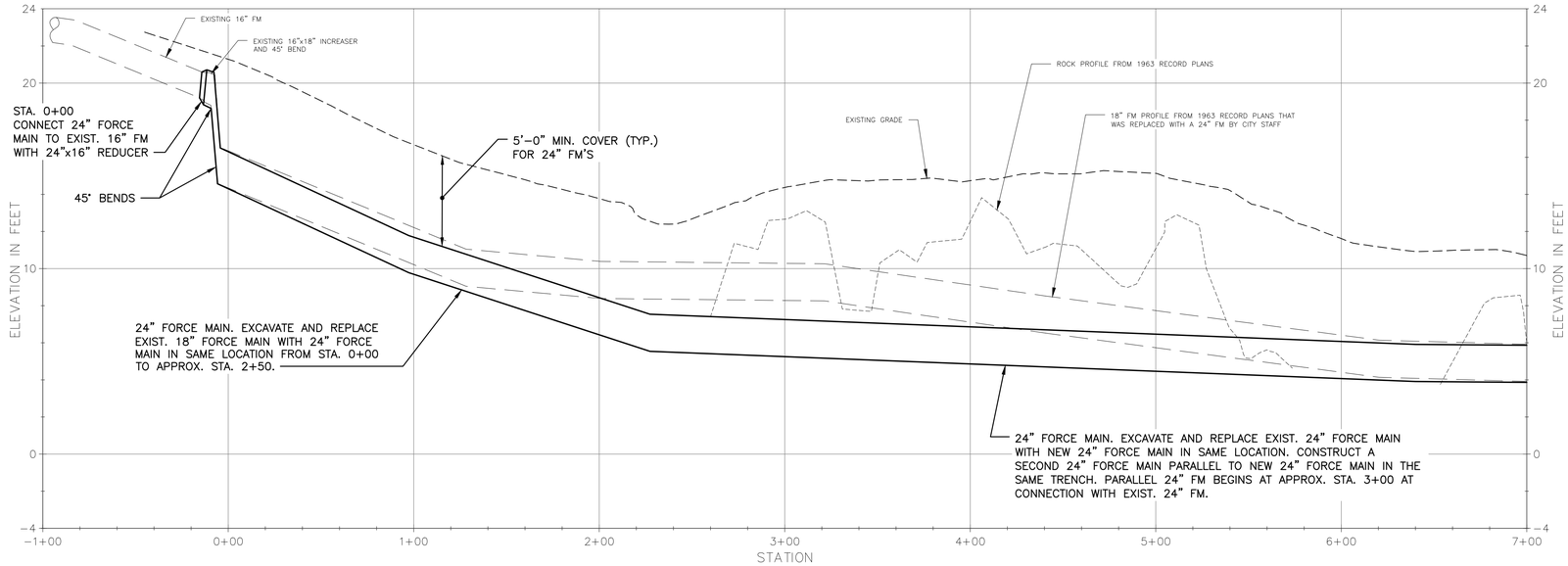
SHEET NUMBER

00 C-102-P



PLAN

SCALE: 1"=40'



PROFILE

SCALE: 1"=40' (HORIZ.)
1"=4' (VERT.)

1" = 40' HORIZONTAL SCALE 0 40 80 120 FEET

1" = 4' VERTICAL SCALE 0 4 8 12 FEET

NOTES:

1. FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET 00 C-001-P.
2. FOR DETAILS, SEE 99 SERIES OF CIVIL SHEETS.
3. MOVE SEDIMENT FILTER LOGS ON AND OFF ROAD DAILY AS NEEDED TO ALLOW TRAFFIC TO FLOW. ONE LANE OF ROAD TO REMAIN OPEN FOR TRAFFIC AT ALL TIMES.
4. CONTRACTOR TO PERFORM VACUUM TEST EXCAVATIONS TO DETERMINE THE LOCATION OF THE EXISTING SANITARY FORCE MAINS PRIOR TO CONSTRUCTION OF REPLACEMENT WATER MAIN.
5. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 10 FEET OF SEPARATION BETWEEN NEW SANITARY FORCE MAIN AND NEW WATER MAIN WHERE POSSIBLE.

FOR CONTINUATION, SEE SHEET 00 C-104-P

AECOM

PROJECT

PEIRCE ISLAND FORCE MAIN AND WATER MAIN REPLACEMENT

Peirce Island, Portsmouth NH

OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE

680 Peverly Hill Road
Portsmouth, NH 03801

ENGINEER

AECOM TECHNICAL SERVICES, INC.
250 APOLLO DRIVE
CHELMSFORD, MA 01824
PHONE: (978) 905-2100
www.aecom.com

REGISTRATION

PERMIT SUBMITTAL

PERMIT APPLICATION DRAWING
NOT FOR CONSTRUCTION

ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60649477

Designed By:	S. HE
Drawn By:	M. THIBODEAU
Dept Check:	C. BENZIGER
Proj Check:	E. MESERVE
Date:	APRIL 2021
Scale:	AS NOTED

DISCIPLINE

CIVIL

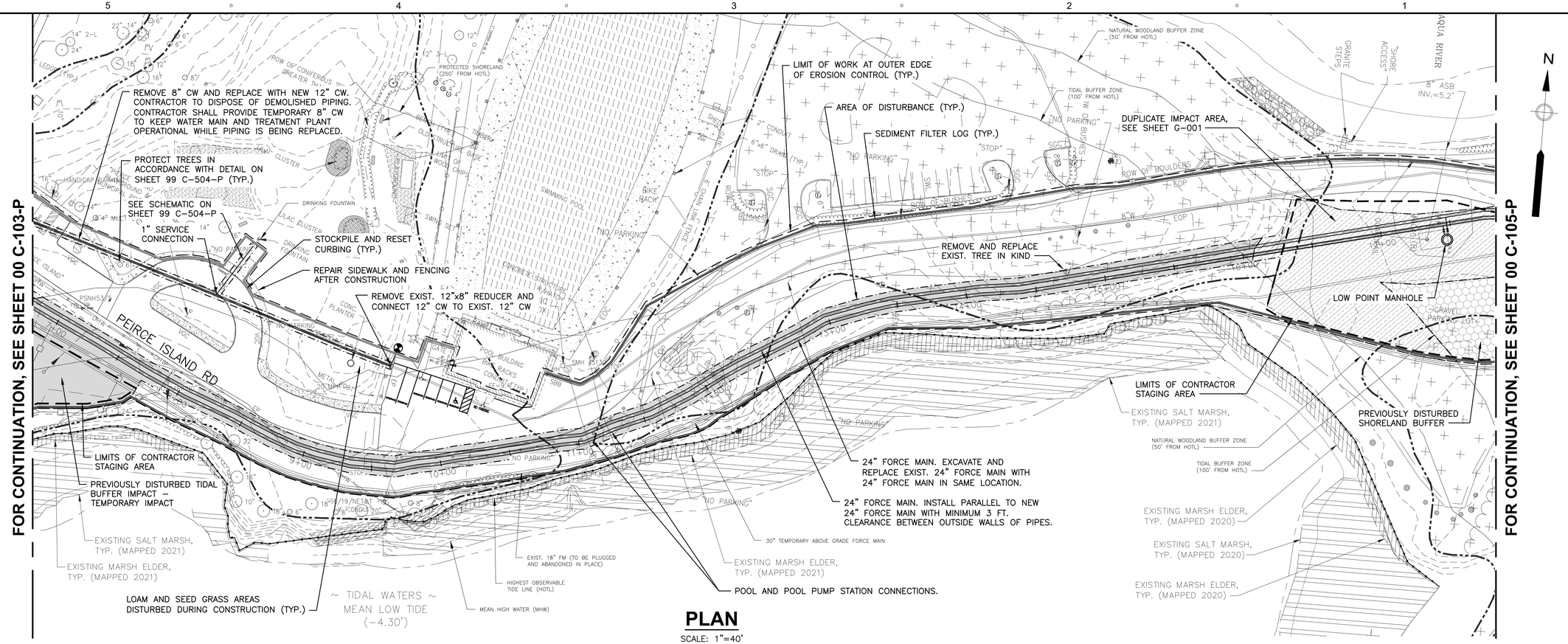
SHEET TITLE

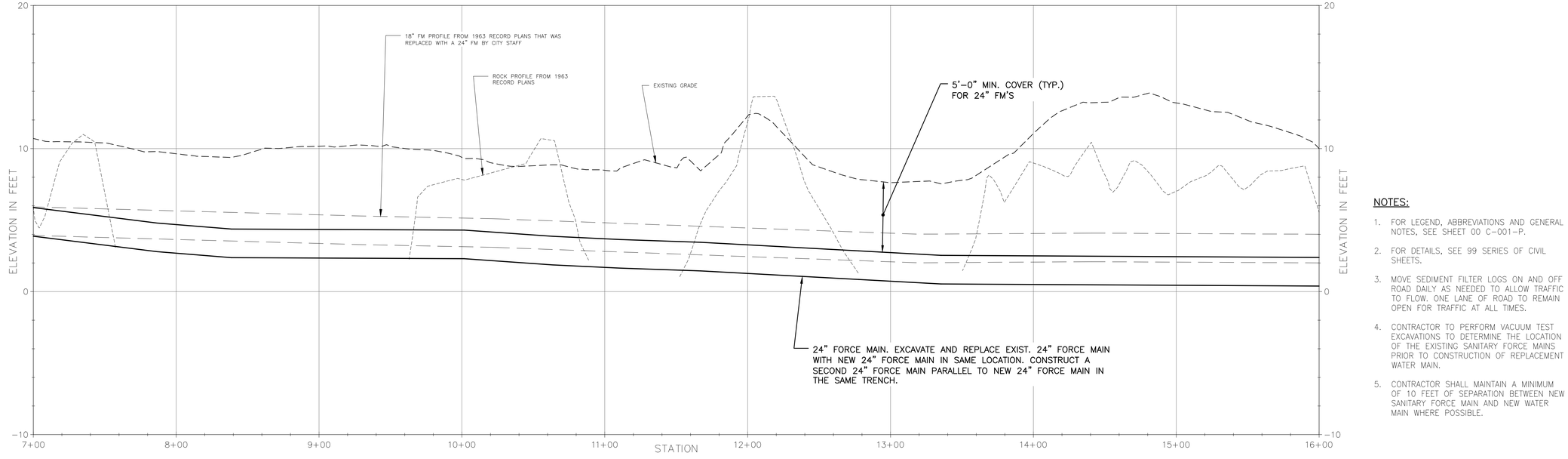
PIPING PLAN AND PROFILE I

SHEET NUMBER

00 C-103-P

PATH/FILENAME: L:\LEGACY\USCHL1FP001\DATA\PROJECTS\WAKEFIELD\DATA_2\OVERTONE\PORTSMOUTH PEIRCE ISLAND FM REPLACEMENT\900 CAD-GIS\SHEETS\C\00 C-103-P.DWG
LAST UPDATE: Tuesday, April 13, 2021 3:25:15 PM
PLOT DATE: Tuesday, April 13, 2021 4:25:58 PM





PROFILE

SCALE: 1"=40' (HORIZ.)
1"=4' (VERT.)

NOTES:

1. FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET 00 C-001-P.
2. FOR DETAILS, SEE 99 SERIES OF CIVIL SHEETS.
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5. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 10 FEET OF SEPARATION BETWEEN NEW SANITARY FORCE MAIN AND NEW WATER MAIN WHERE POSSIBLE.

1" = 40' HORIZONTAL SCALE: 0, 40, 80, 120 FEET

1" = 4' VERTICAL SCALE: 0, 4, 8, 12 FEET

AECOM

PROJECT

PEIRCE ISLAND FORCE MAIN AND WATER MAIN REPLACEMENT

Peirce Island, Portsmouth NH

OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE

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Dept Check:	C. BENZIGER
Proj Check:	E. MESERVE
Date:	APRIL 2021
Scale:	AS NOTED

DISCIPLINE

CIVIL

SHEET TITLE

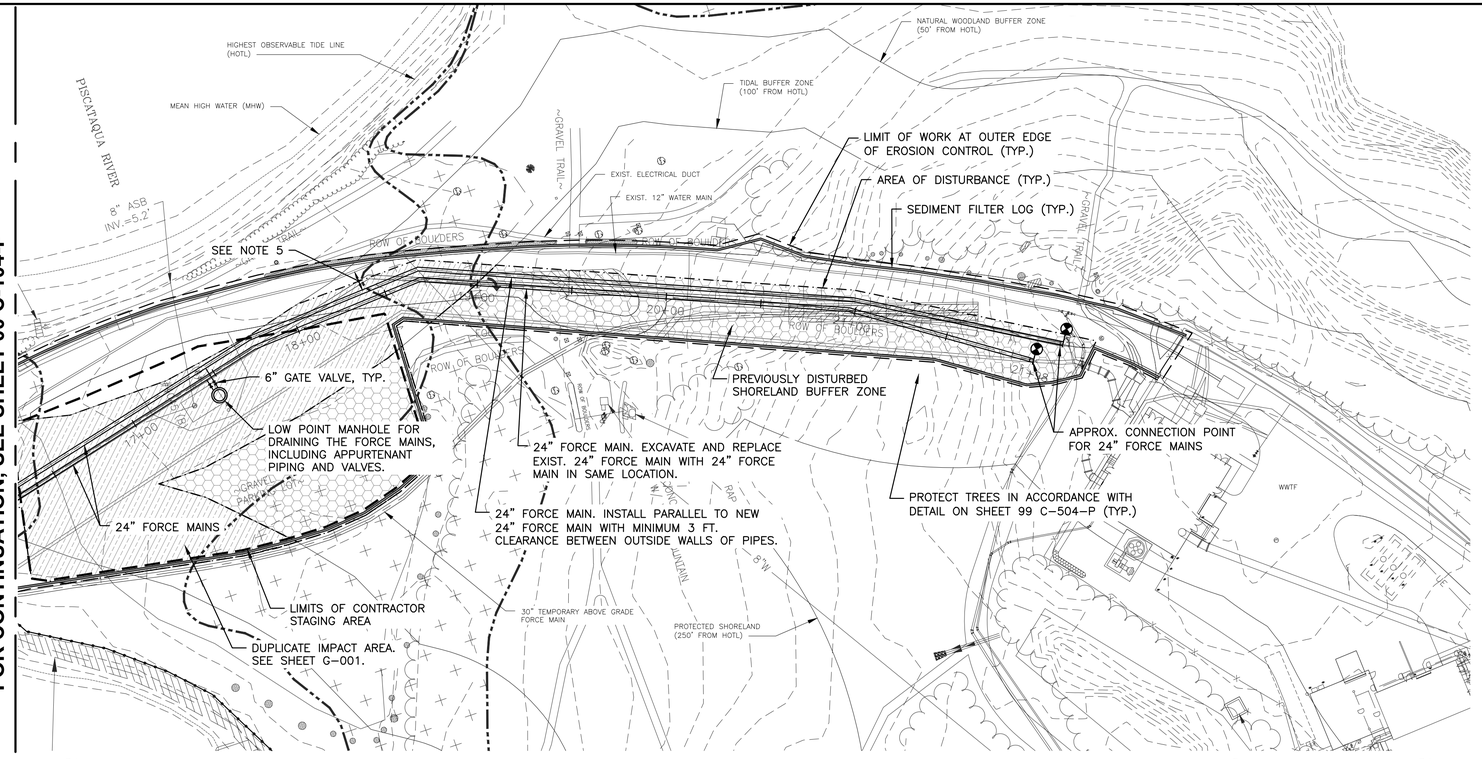
PIPING PLAN AND PROFILE II

SHEET NUMBER

00 C-104-P

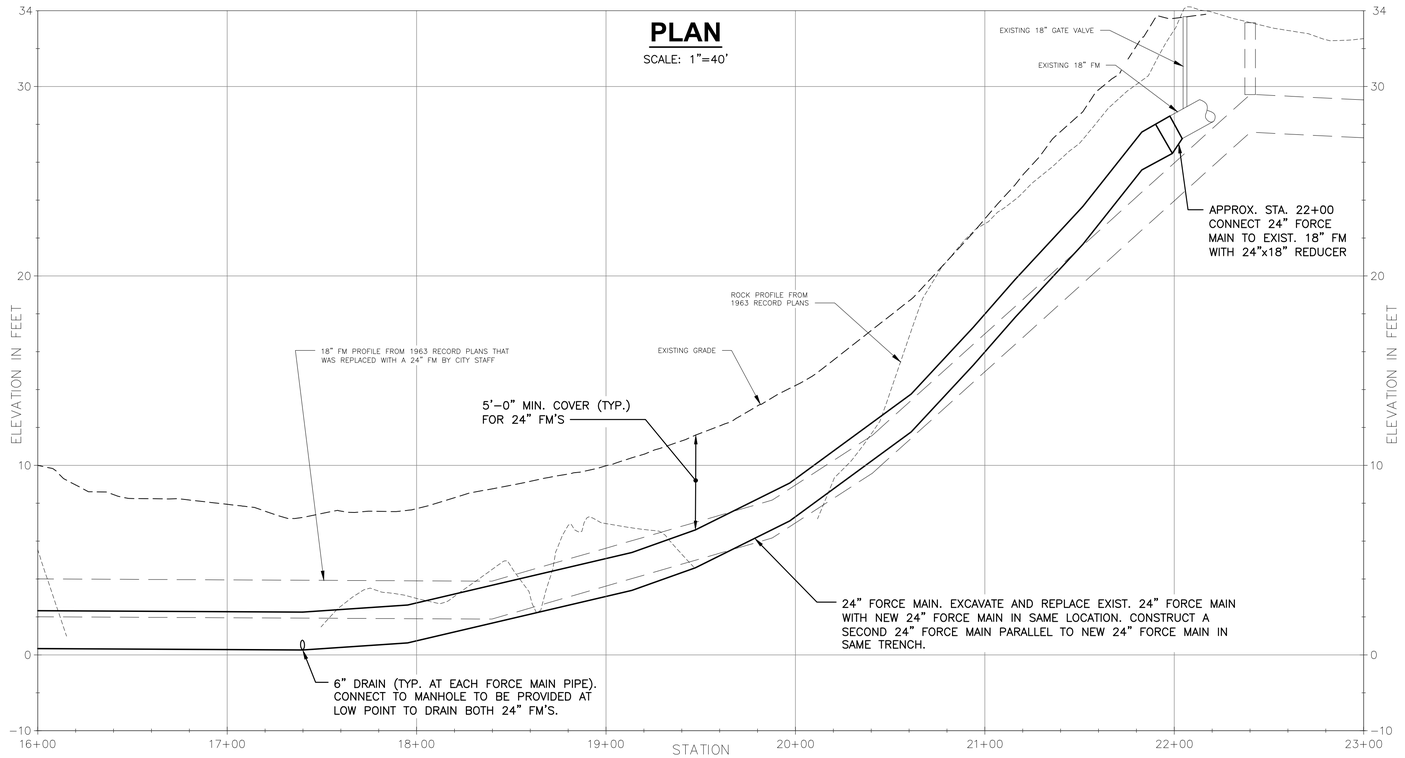
PATH/FILENAME: I:\LEGACY\USCHLTP0001\DATA\PROJECTS\WAKEFIELD\DATA_2\EVERYONE\PORTSMOUTH PEIRCE ISLAND FM REPLACEMENT\900 CAD-GIS\SHEETS\C\00 C-104-P.DWG
LAST UPDATE: Tuesday, April 13, 2021 3:34:14 PM
PLOT DATE: Tuesday, April 13, 2021 4:27:19 PM

FOR CONTINUATION, SEE SHEET 00 C-104-P



PLAN

SCALE: 1"=40'



PROFILE

SCALE: 1"=40' (HORIZ.)
1"=4' (VERT.)

1" = 40' HORIZONTAL SCALE 0 40 80 120 FEET

1" = 4' VERTICAL SCALE 0 4 8 12 FEET

NOTES:

1. FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET 00 C-001-P.
2. FOR DETAILS, SEE 99 SERIES OF CIVIL SHEETS.
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4. CONTRACTOR TO PERFORM VACUUM TEST EXCAVATIONS TO DETERMINE THE LOCATION OF THE EXISTING SANITARY FORCE MAINS PRIOR TO CONSTRUCTION OF REPLACEMENT WATER MAIN.
5. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 10 FEET OF SEPARATION BETWEEN EXISTING WATER MAIN AND NEW SEWER FORCE MAINS WHERE POSSIBLE.

AECOM

PROJECT

PEIRCE ISLAND FORCE MAIN AND WATER MAIN REPLACEMENT
Peirce Island, Portsmouth NH

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Dept Check:	C. BENZIGER
Proj Check:	E. MESERVE
Date:	APRIL 2021
Scale:	AS NOTED

DISCIPLINE

CIVIL

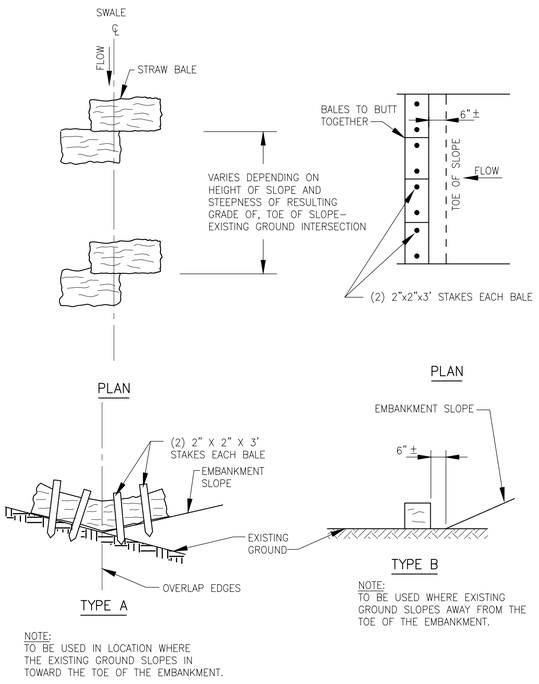
SHEET TITLE

PIPING PLAN AND PROFILE III

SHEET NUMBER

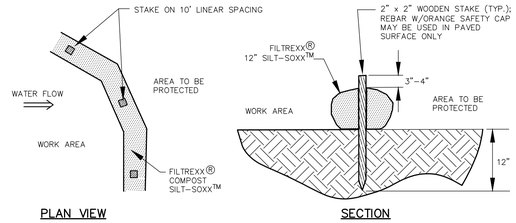
00 C-105-P

PATH/FILENAME: L:\LEGACY\USCHL1TP001\DATA\PROJECTS\WAKEFIELD\DATA_2\EVERYONE\PORTSMOUTH PEIRCE ISLAND FM REPLACEMENT\900 CAD-GIS\SHEETS\C\00 C-105-P.DWG
LAST UPDATE: Tuesday, April 13, 2021 3:42:15 PM
PLOT DATE: Tuesday, April 13, 2021 4:28:12 PM



STRAW BALE EROSION CONTROL

NTS
2-1.60.4 (REV. 09-29-95)

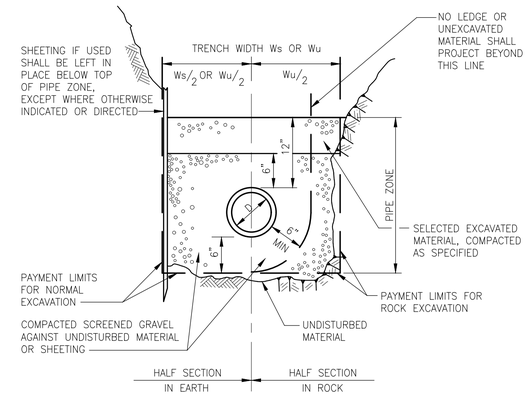


NOTES:

1. SILTSOXX MAY BY USED IN PLACE OF SILT FENCE OR OTHER SEDIMENT BARRIERS FOR AREAS OF REVETMENT CONSTRUCTION.
2. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
3. SILTSOXX COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY SILTSOXX SHALL BE DISPOSED OF PROPERLY.

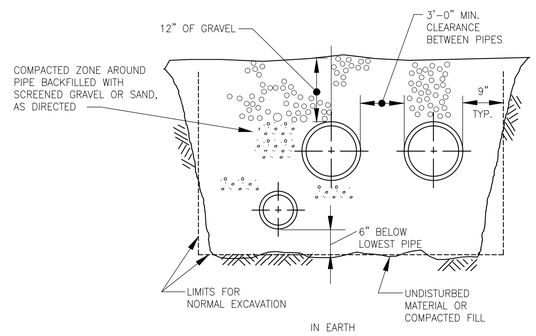
SEDIMENT FILTER LOG STAKING DETAIL

NOT TO SCALE



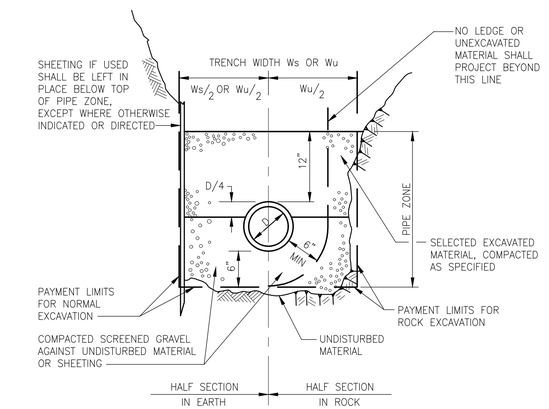
TRENCH SECTION FOR PIPE 18 INCH DIAMETER AND SMALLER

NOT TO SCALE



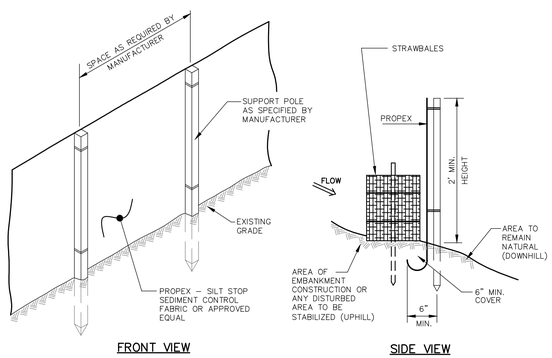
MULTIPLE PIPE TRENCH SECTION

NOT TO SCALE



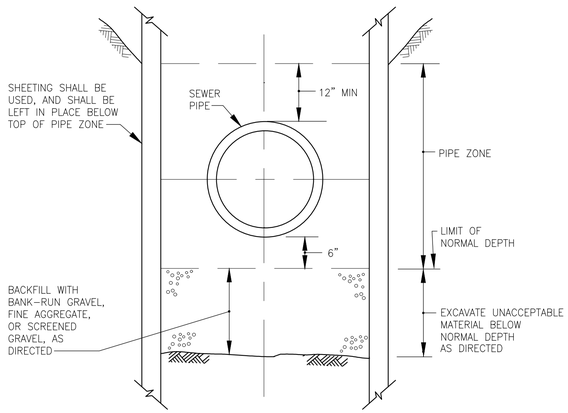
TRENCH SECTION FOR DI OR PVC PIPE 20 INCH DIAMETER AND LARGER

NOT TO SCALE
2-1.1.2 (REV. 03-15-95)



SILT FENCE/STRAWBALE DETAIL

NOT TO SCALE



DETAILS NOT SHOWN ARE SAME AS TRENCH SECTIONS SHOWN ELSEWHERE

TRENCH SECTION IN UNACCEPTABLE MATERIAL

NOT TO SCALE
2-1.1.21 (REV. 03-15-95)

TRENCH WIDTH Ws OR Wu

NOMINAL PIPE DIAMETER D	DEPTH OF PIPE INVERT BELOW GROUND SURFACE		
	0 TO 12'	12' TO 20'	>20'
24" AND SMALLER	5'-0"	7'-0"	9'-0"
OVER 24"	D + 3'-0"	D + 5'-0"	D + 7-0"

1. PIPE TRENCHES MAY BE EXCAVATED WIDER THAN TRENCH WIDTH Ws (SHEETED) OR Wu (UNSHEETED) ABOVE THE TOP OF PIPE ZONE.
2. TRENCHES SHALL NOT BE EXCAVATED BEYOND THE TRENCH WIDTH Wu BELOW THE TOP OF PIPE ZONE.
3. SHEETING MUST BE USED IF EXCAVATION AND BACKFILL, BELOW NORMAL DEPTH, IS REQUIRED. SHEETING SHALL BE LEFT IN PLACE BELOW A LINE 1'-0" ABOVE THE TOP OF PIPE.

GENERAL NOTES FOR PIPE TRENCHES

NOT TO SCALE
2-1.1.11 (REV. 10-23-95)

AECOM

PROJECT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60649477

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Drawn By:	M. THIBODEAU
Dept Check:	C. BENZIGER
Proj Check:	E. MESERVE
Date:	APRIL 2021
Scale:	AS NOTED

DISCIPLINE

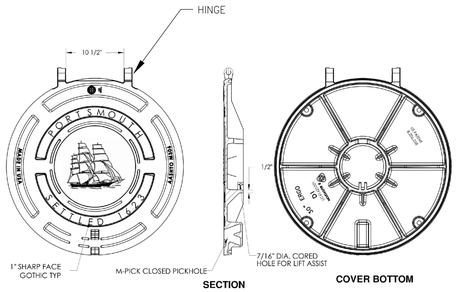
CIVIL

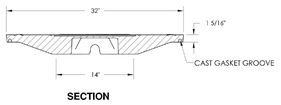
SHEET TITLE

DETAILS I

SHEET NUMBER

99 C-501-P





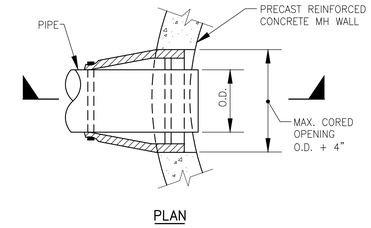
SECTION

NOTES:

1. CITY TO PROVIDE MANHOLE COVERS. CONTRACTOR TO INSTALL COVERS.

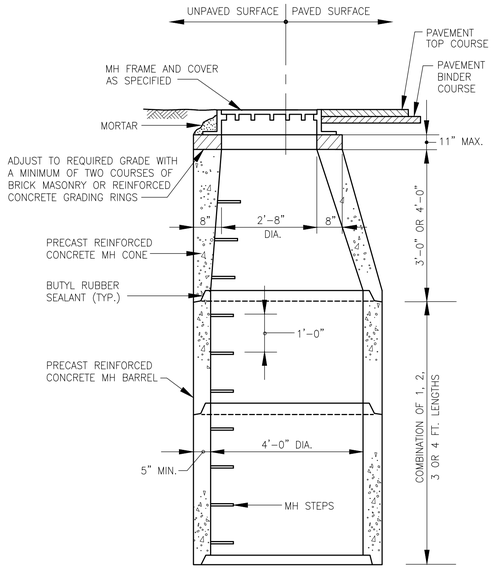
MANHOLE COVER

NOT TO SCALE



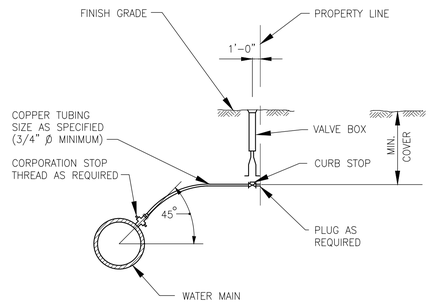
WATERTIGHT RESILIENT CONNECTOR FOR CONNECTING PIPES TO PRECAST CONCRETE MANHOLES

NOT TO SCALE
2-1.5.62.1 (REV. 4-5-96)



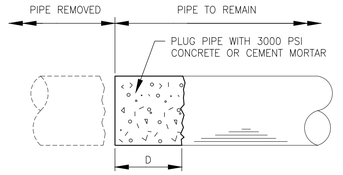
4'-0" SEWER/DRAIN MANHOLE RISER WITH ECCENTRIC CONE TOP

NOT TO SCALE



SERVICE CONNECTION

NTS
2-1.20 (REV. 12-15-94)

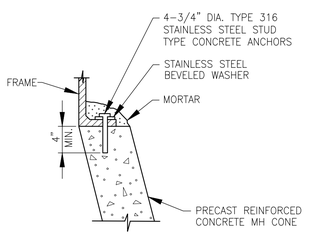


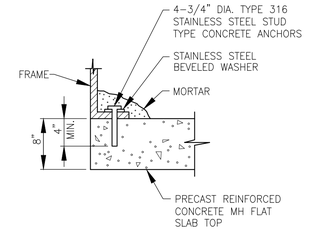
NOTES:

1. PLUG ALL ABANDONED PIPES AT THEIR TERMINATIONS.
2. DEPTH OF PLUG (D) SHALL BE EQUAL TO DIAMETER OF PIPE (12" MIN.).

TYPICAL PIPE PLUGGING DETAIL

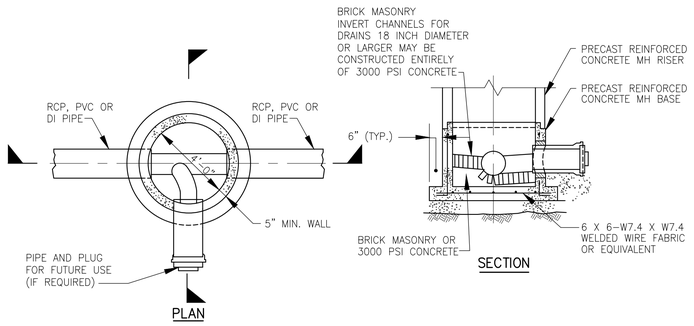
NTS

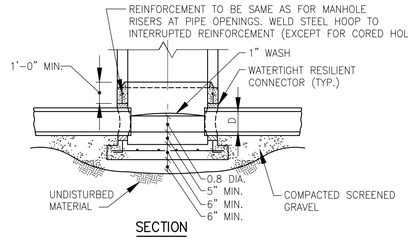




ANCHOR BOLT DETAILS FOR FRAMES FOR MANHOLE TOPS

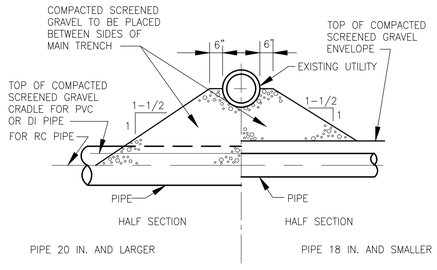
NOT TO SCALE



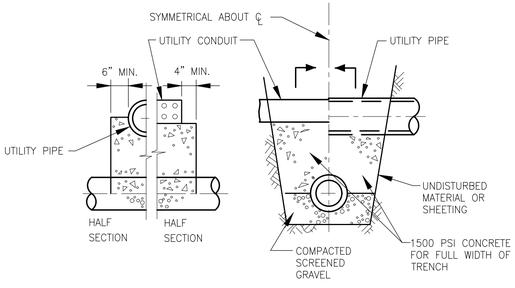


4'-0" PRECAST REINFORCED CONCRETE MANHOLE BASE FOR SEWER/DRAIN MANHOLES

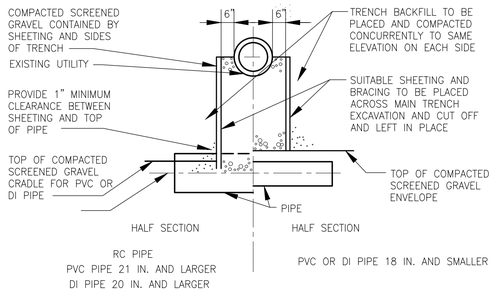
NOT TO SCALE



TYPE A



TYPE C



TYPE B

TYPICAL SUPPORTS FOR UTILITIES

NOT TO SCALE
2-1.8 (REV. 03-15-95)

AECOM

PROJECT

PEIRCE ISLAND FORCE MAIN AND WATER MAIN REPLACEMENT

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OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE

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Proj Check:	E. MESERVE
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Scale:	AS NOTED

DISCIPLINE

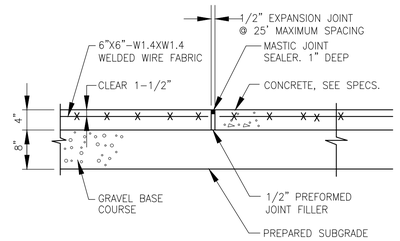
CIVIL

SHEET TITLE

DETAILS Ii

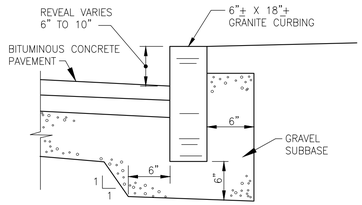
SHEET NUMBER

99 C-502-P



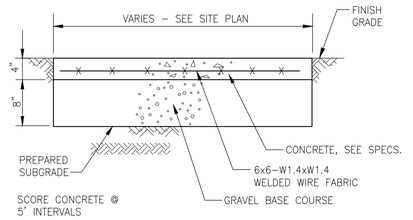
EXPANSION JOINT FOR CONCRETE WALKWAYS

NOT TO SCALE
2-1.41.1.1 (REV. 12-15-94)



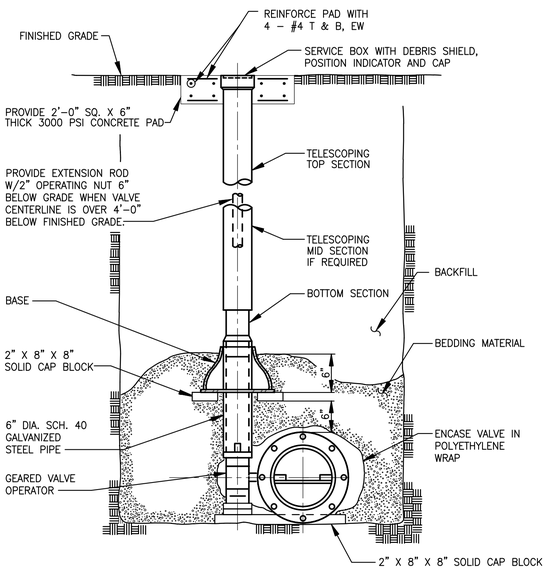
GRANITE CURB

NOT TO SCALE
2-1.42.1 (REV. 12-15-94)



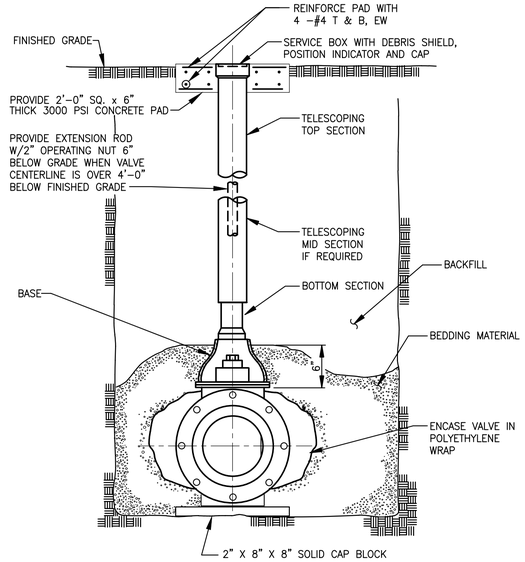
CONCRETE WALKWAY SECTION

NOT TO SCALE
2-1.41.1 (REV. 12-15-94)



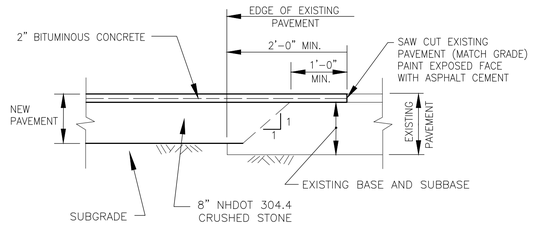
BURIED BUTTERFLY OR PLUG VALVE

NTS



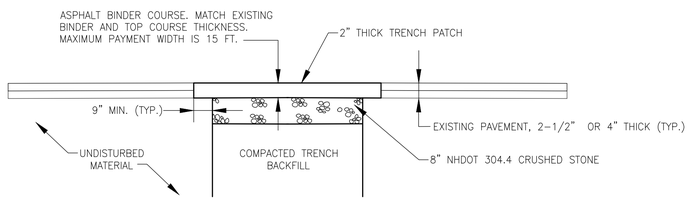
BURIED GATE VALVE

NTS



TYPICAL FORMAT OF PAVEMENT MATCHING DETAIL

N.T.S.



NOTE:

1. REMOVE AND DISPOSE OF EXCESS MATERIAL TO LOCATION AS DIRECTED BY THE ENGINEER.

PAVEMENT TRENCH REPAIR

NOT TO SCALE

AECOM

PROJECT

PEIRCE ISLAND
FORCE MAIN AND
WATER MAIN
REPLACEMENT

Peirce Island, Portsmouth NH

OWNER

CITY OF PORTSMOUTH
NEW HAMPSHIRE

680 Peverly Hill Road
Portsmouth, NH 03801

ENGINEER

AECOM TECHNICAL SERVICES, INC.
250 APOLLO DRIVE
CHELMSFORD, MA 01824
PHONE: (978) 905-2100
www.aecom.com

REGISTRATION

PERMIT
SUBMITTAL
PERMIT APPLICATION
DRAWING
NOT FOR
CONSTRUCTION

ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60649477

Designed By:	S. HE
Drawn By:	M. THIBODEAU
Dept Check:	C. BENZIGER
Proj Check:	E. MESERVE
Date:	APRIL 2021
Scale:	AS NOTED

DISCIPLINE

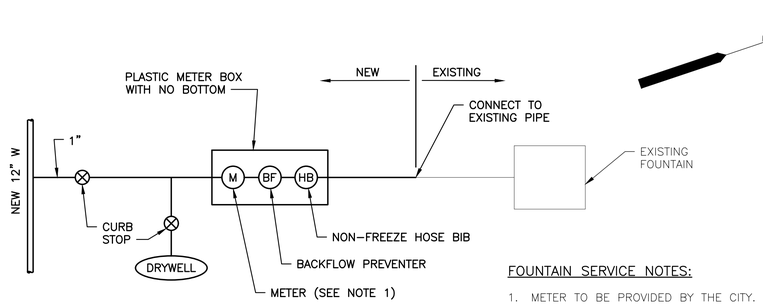
CIVIL

SHEET TITLE

DETAILS III

SHEET NUMBER

99 C-503-P

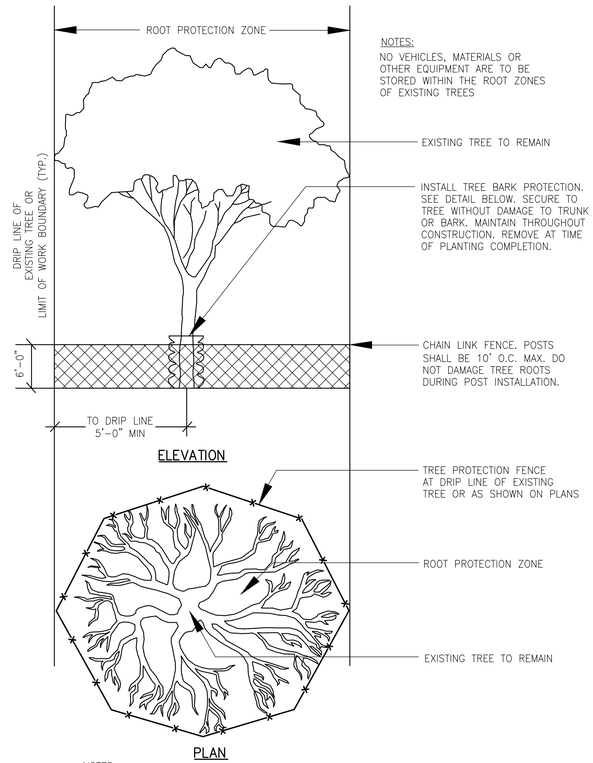


FOUNTAIN SERVICE NOTES:

1. METER TO BE PROVIDED BY THE CITY.

FOUNTAIN SERVICE CONNECTION SCHEMATIC

SCALE: NONE



NOTES:

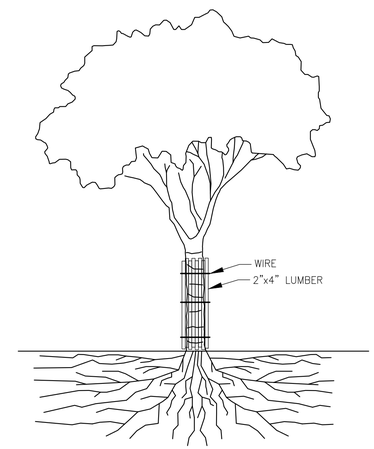
1. THIS DETAIL APPLIES FOR THE PROTECTION OF ALL TREES ON THE WWTF SITE, CONTRACTOR STAGING AREAS AND RESTRICTED USE CONSTRUCTION STAGING AREAS.
2. NO VEHICLES, MATERIALS OR OTHER EQUIPMENT ARE TO BE STORED WITHIN THE ROOT ZONES OF EXISTING TREES.

TREE PROTECTION

NTS

LANDSCAPING NOTES:

1. THE CONTRACTOR SHALL LOCATE AND VERIFY ALL UTILITIES PRIOR TO STARTING WORK. CONTRACTOR TO VERIFY THAT ADEQUATE DRAINAGE EXISTS PRIOR TO PLANTING.
2. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTING SHOWN ON ALL DRAWINGS. PLANT COUNTS ARE FOR CONVENIENCE ONLY. CONTRACTOR SHALL USE SUFFICIENT PLANT MATERIALS TO FULFILL DESIGN INTENT, BUT IN NO CASE SHALL CONTRACTOR USE FEWER PLANTS THAN LISTED.
3. ALL MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE "AMERICAN STANDARD FOR NURSERY STOCK", PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. ALL PLANT MATERIALS ARE SUBJECT TO THE APPROVAL OF THE ENGINEER AT THE NURSERY AND AT THE SITE. ALL TREES SHALL HAVE A SINGLE LEADER UNLESS SPECIFIED OTHERWISE. NO UN-APPROVED SUBSTITUTIONS WILL BE ACCEPTED. PLANT SPECIES AND CULTIVAR, SIZE AND QUANTITY SHALL NOT CHANGE WITHOUT APPROVAL OF LANDSCAPE ARCHITECT.
5. LOCATION OF ALL TREES AND SHRUBS SHALL BE MARKED FOR THE APPROVAL OF THE PROJECT ENGINEER. MARKING SHALL BE COMPLETED THE DAY PRIOR TO COMMENCEMENT OF PLANTING.
6. ALL PLANTS SHALL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS ORIGINAL GRADE BEFORE DIGGING. PLANT TO BE TRANSPLANTED SHALL BE DUG CAREFULLY, WITH ADEQUATE ROOT-BALLS AND PRUNED ACCORDING TO ANA STANDARD PRACTICE. TREES WITH ROOT FLARE COVERED BY MORE THAN 1.5" OF SOIL WILL BE REJECTED PRIOR TO INSTALLATION. SET PLANTS PLUMB.
7. ALL TREES AND SHRUBS SHALL BE BALLED IN BURLAP OR CONTAINERIZED, UNLESS SPECIFIED OTHERWISE. NO ROOT-BOUND CONTAINER GROWN STOCK WILL BE ACCEPTED. ALL PLASTIC ROOT WRAPPING AND METAL WIRE BASKETS SHALL BE CAREFULLY REMOVED AT THE TIME OF PLANTINGS, EXCEPT WIRE THAT IS DIRECTLY UNDER THE ROOT-BALLS.
8. AFTER CONDUCTING SOIL TESTS WITHIN PLANTING AREAS, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING PLANTING TOPSOIL AND/OR AMENDMENTS FOR BACKFILLING AT ALL PLANTS, AS NECESSARY. SUBMIT WRITTEN CONTENT ANALYSIS TO OWNER/REP. FOR APPROVAL. ADD 'PHC HEALTHY START 3-4-3' AND 'MYCOR TREE OR PLANT SAVER 4-7-4', OR EQUAL. FOLLOW MANUFACTURER'S GUIDELINES. THE PLANTING TOPSOIL IS TO BE SANDY LOAM MODIFIED WITH ORGANIC COMPONENT TO HAVE AT LEAST 4% ORGANIC MATTER BUT NOT MORE THAN 8% ORGANIC MATTER, DRY WEIGHT BASIS, A COMPACTED MINIMUM INFILTRATION RATE OF 2.5 CM/HR, PH RANGE OF 5.5 TO 6.5, AND NO COARSE FRAGMENTS OVER 2.5 CM IN SIZE.
9. CONTRACTOR SHALL PLACE 2" TO 3" OF FINE SHREDDED, AGED 2 YEARS, DARK BROWN PINE BARK MULCH THROUGHOUT THE BED AREAS. DO NOT PLACE MULCH IN CONTACT WITH TREE TRUNK. SUBMIT SAMPLE OF MULCH FOR APPROVAL.
10. ALL EVERGREEN PLANTS SHALL BE SPRAYED WITH AN ANTI-DESICCANT THE FIRST WEEK OF NOVEMBER, THE FIRST WINTER FOLLOWING PLANTING.
11. FLOOD PLANTS THOROUGHLY ONCE IMMEDIATELY AFTER PLANTING AND TWICE DURING THE FIRST TWENTY-FOUR HOUR PERIOD AFTER PLANTING.
12. EXTREME CARE SHALL BE TAKEN NOT TO DISTURB EXISTING PLANT MATERIALS, EXCEPT THOSE SPECIFICALLY NOTED "TO BE TRANSPLANTED OR REMOVED". ANY PLANT INJURED OR DESTROYED SHALL BE REPLACED WITH A PLANT OF EQUAL OR GREATER SIZE AND SPECIES AT THE CONTRACTORS EXPENSE.
13. IF NECESSARY, NEW PLANTING SHOULD BE PLACED OUTSIDE OF THE CRITICAL ROOT ZONE (CRZ) OF EXISTING TREES. CRZ RADIUS EQUALS ONE-FOOT TIMES THE DBH (DIAMETER-AT-BREAST-HEIGHT) OF THE TREES, MEASURED FROM THE TREE TRUNK. TREE FENCING IS NECESSARY TO PROTECT EXISTING VEGETATION TO BE PRESERVED FROM BOTH FOOT AND VEHICULAR TRAFFIC. TREE FENCING TO BE LOCATED AT THE EDGE OF THE CRZ.
14. DO NOT WRAP TRUNK OF TREE.
15. THE CONTRACTOR SHALL MAINTAIN THE PLANTS FOR A MINIMUM OF 90 DAYS FOLLOWING INSTALLATION, OR LONGER IF CONTRACTED BY THE OWNER. BEFORE THE END OF THE 90-DAY PERIOD, THE CONTRACTOR SHALL PROVIDE A WRITTEN MAINTENANCE OUTLINES TO THE OWNERS AND THE CONTRACTOR SHALL BE AVAILABLE TO ANSWER QUESTIONS OR CONCERNS AT THAT TIME.
16. THE CONTRACTOR SHALL GUARANTEE ALL PLANTS FOR A MINIMUM OF ONE YEAR FROM FINAL ACCEPTANCE BY OWNER/REP. THE CONTRACTOR SHALL REPLACE ANY DEAD MATERIALS AT HIS/HER OWN EXPENSE.



NOTES:

1. THIS DETAIL APPLIES FOR THE PROTECTION OF ALL TREES ON THE WWTF SITE, CONTRACTOR STAGING AREAS AND RESTRICTED USE CONSTRUCTION STAGING AREAS.
2. IN SITUATIONS WHERE A PROTECTED TREE REMAINS IN THE IMMEDIATE AREA OF INTENDED CONSTRUCTION AND THE TREE MAY BE IN DANGER OF BEING DAMAGED BY CONSTRUCTION EQUIPMENT OR OTHER ACTIVITY, THE CONTRACTOR OR SUBCONTRACTOR SHALL PROTECT THE TREE WITH 2"x4" LUMBER ENCIRCLED WITH WIRE OR OTHER MEANS THAT DO NOT DAMAGE THE TREE. THE INTENT IS TO PROTECT THE TRUNK OF THE TREE AGAINST INCIDENTAL CONTACT BY LARGE CONSTRUCTION EQUIPMENT.

TREE BARK PROTECTION

NTS

AECOM

PROJECT

PEIRCE ISLAND FORCE MAIN AND WATER MAIN REPLACEMENT

Peirce Island, Portsmouth NH

OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE

680 Peverly Hill Road
Portsmouth, NH 03801

ENGINEER

AECOM TECHNICAL SERVICES, INC.
250 APOLLO DRIVE
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PHONE: (978) 905-2100
www.aecom.com

REGISTRATION

PERMIT SUBMITTAL
PERMIT APPLICATION DRAWING
NOT FOR CONSTRUCTION

ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60649477

Designed By:	S. HE
Drawn By:	M. THIBODEAU
Dept Check:	C. BENZIGER
Proj Check:	E. MESERVE
Date:	APRIL 2021
Scale:	AS NOTED

DISCIPLINE

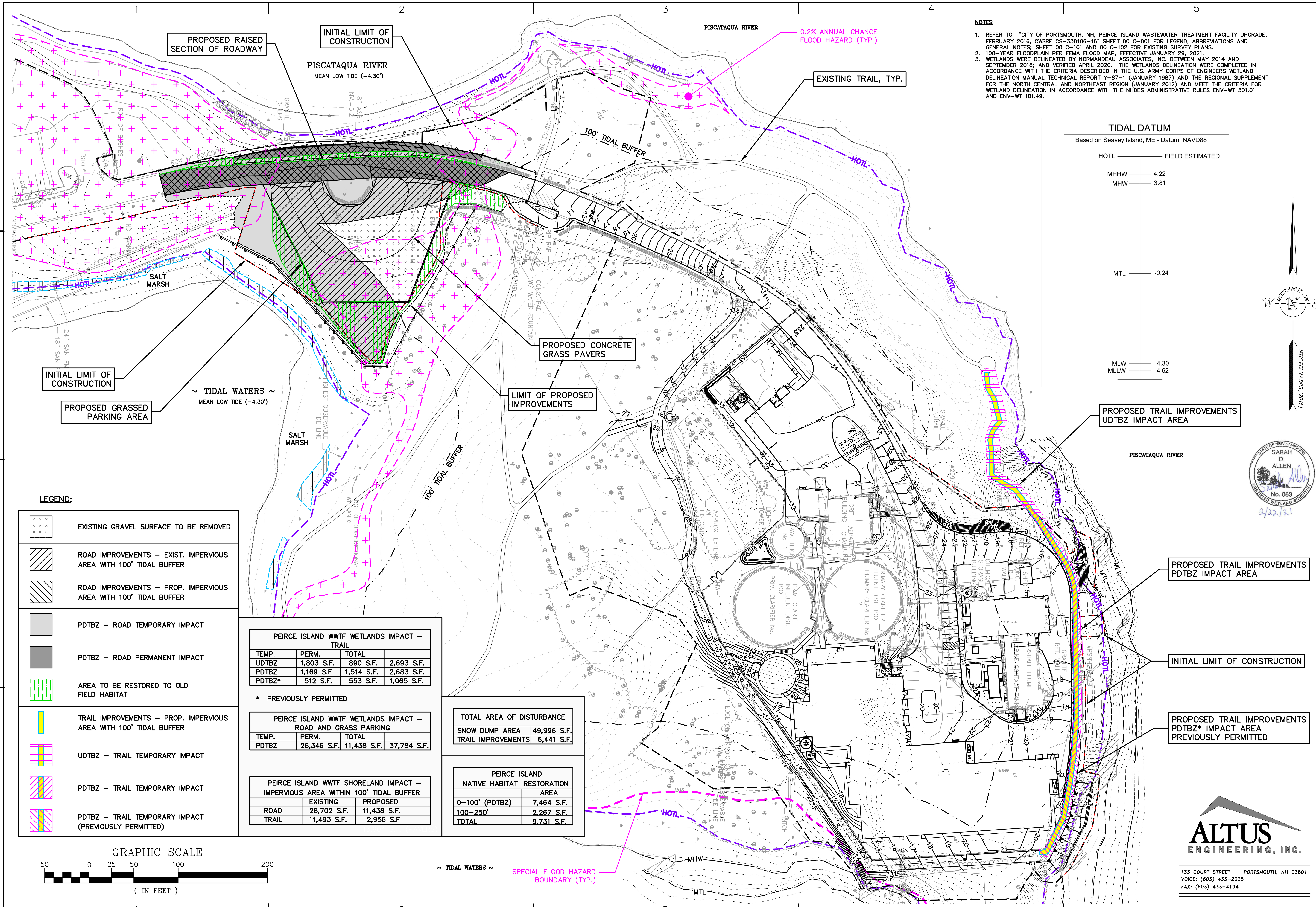
CIVIL

SHEET TITLE

DETAILS IV

SHEET NUMBER

99 C-504-P



NOTES:

1. REFER TO "CITY OF PORTSMOUTH, NH, PEIRCE ISLAND WASTEWATER TREATMENT FACILITY UPGRADE, FEBRUARY 2016, CWSRF CS-330106-16" SHEET 00 C-001 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES; SHEET 00 C-101 AND 00 C-102 FOR EXISTING SURVEY PLANS.
2. 100-YEAR FLOODPLAIN PER FEMA FLOOD MAP, EFFECTIVE JANUARY 29, 2021.
3. WETLANDS WERE DELINEATED BY NORMANDEAU ASSOCIATES, INC. BETWEEN MAY 2014 AND SEPTEMBER 2016; AND VERIFIED APRIL 2020. THE WETLANDS DELINEATION WERE COMPLETED IN ACCORDANCE WITH THE CRITERIA DESCRIBED IN THE U.S. ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL TECHNICAL REPORT Y-87-1 (JANUARY 1987) AND THE REGIONAL SUPPLEMENT FOR THE NORTH CENTRAL AND NORTHEAST REGION (JANUARY 2012) AND MEET THE CRITERIA FOR WETLAND DELINEATION IN ACCORDANCE WITH THE NHDES ADMINISTRATIVE RULES ENV-WT 301.01 AND ENV-WT 101.49.

TIDAL DATUM

Based on Seavey Island, ME - Datum, NAVD88

HOTL	FIELD ESTIMATED
MHHW	4.22
MHW	3.81
MTL	-0.24
MLW	-4.30
MLLW	-4.62

LEGEND:

- EXISTING GRAVEL SURFACE TO BE REMOVED
- ROAD IMPROVEMENTS – EXIST. IMPERVIOUS AREA WITH 100' TIDAL BUFFER
- ROAD IMPROVEMENTS – PROP. IMPERVIOUS AREA WITH 100' TIDAL BUFFER
- PDTBZ – ROAD TEMPORARY IMPACT
- PDTBZ – ROAD PERMANENT IMPACT
- AREA TO BE RESTORED TO OLD FIELD HABITAT
- TRAIL IMPROVEMENTS – PROP. IMPERVIOUS AREA WITH 100' TIDAL BUFFER
- UDTBZ – TRAIL TEMPORARY IMPACT
- PDTBZ – TRAIL TEMPORARY IMPACT
- PDTBZ – TRAIL TEMPORARY IMPACT (PREVIOUSLY PERMITTED)

PEIRCE ISLAND WWTF WETLANDS IMPACT – TRAIL

TEMP.	PERM.	TOTAL	
UDTBZ	1,803 S.F.	890 S.F.	2,693 S.F.
PDTBZ	1,169 S.F	1,514 S.F.	2,683 S.F.
PDTBZ*	512 S.F.	553 S.F.	1,065 S.F.

* PREVIOUSLY PERMITTED

PEIRCE ISLAND WWTF WETLANDS IMPACT – ROAD AND GRASS PARKING

TEMP.	PERM.	TOTAL	
PDTBZ	26,346 S.F.	11,438 S.F.	37,784 S.F.

PEIRCE ISLAND WWTF SHORELAND IMPACT – IMPERVIOUS AREA WITHIN 100' TIDAL BUFFER

	EXISTING	PROPOSED
ROAD	28,702 S.F.	11,438 S.F.
TRAIL	11,493 S.F.	2,956 S.F

TOTAL AREA OF DISTURBANCE

SNOW DUMP AREA	49,996 S.F.
TRAIL IMPROVEMENTS	6,441 S.F.

PEIRCE ISLAND NATIVE HABITAT RESTORATION

	AREA
0–100' (PDTBZ)	7,464 S.F.
100–250'	2,267 S.F.
TOTAL	9,731 S.F.

STATE OF NEW HAMPSHIRE
SARAH D. ALLEN
No. 083
CERTIFIED WETLAND SCIENTIST
2/22/21

STATE OF NEW HAMPSHIRE
JEFFREY K. CLIFFORD
No. 6524
LICENSED PROFESSIONAL ENGINEER

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433-2335
FAX: (603) 433-4194

PERMIT APPLICATION DRAWING NOT FOR CONSTRUCTION

MARK	DATE	MADE BY	CHECKED	DESCRIPTION
1	10/14/20	RMB	JKC	PORTSMOUTH CON. COMM. COMMENTS

REVISIONS

AECOM
AECOM TECHNICAL SERVICES, INC.
701 EDGEWATER DRIVE
WAKEFIELD, MA 01880
PHONE (781) 246-5200

CITY OF PORTSMOUTH, NH - DEPARTMENT OF PUBLIC WORKS
PEIRCE ISLAND WWTF UPGRADE

OVERVIEW PLAN

(FORMER SNOW DUMP AREA & TRAIL IMPROVEMENTS)

PROJECT NO:	4507.04
CAD DWG FILE:	4507.04.SITE
DESIGNED BY:	RMB
DRAWN BY:	RMB
DEPT CHECK:	JKC
PROJ CHECK:	JKC
DATE:	APRIL 13, 2021
SCALE:	1" = 50'

G - 001

PISCATAQUA RIVER
MEAN LOW TIDE (−4.30')

MEAN HIGH WATER (3.81')

HIGHEST OBSERVABLE TIDE LINE

LIMIT OF WORK PER NHDES WETLANDS PERMIT 2015-01866

EXISTING EDGE OF PAVEMENT (TRAVEL WAY)

LIMIT OF ROADWAY RE-ALIGNMENT

PARKING IMPROVEMENTS – LIMIT OF WORK

REMOVE EXIST. GUARDRAIL

ADJUST RIM TO FINISH GRADE (TYP.)

INSTALL 3.5' WIDE GRAVEL SHOULDER WITH 2' WIDE VEGETATION STRIP (SEE ROAD CROSS SECTION DETAIL)

INSTALL GUARDRAIL

CONSTRUCT 5' PAVED APRON

ROADWAY RE-ALIGNMENT

INSTALL RIP RAP SLOPE

PRESERVE EXISTING FOOTPATH

INSTALL AND MAINTAIN SILT BARRIER (TYP)

CONSTRUCT 5' PAVED APRON

EXISTING GRAVEL LOT

RIPRAP SLOPE

"SHORE ACCESS"

GRANITE STEPS

HOTL

~GRAVEL TRAIL~

100 YEAR FEMA FLOODPLAIN (2005)

50' NATURAL WOODLAND BUFFER

100' TIDAL BUFFER

150' NATURAL WOODLAND BUFFER

R=850' (C.L.)

R=475' (C.L.)

CROSS SECTION

SALT MARSH

MEAN HIGH WATER (3.81')

EXISTING MARSH ELDER, TYP. (MAPPED 2021)

~ TIDAL WATERS ~
MEAN LOW TIDE (−4.30')

EXISTING LIMITS OF GRAVEL LOT

INSTALL 24'-WIDE CONCRETE GRASS PAVERS (TYP)

INSTALL SINGLE RAIL WOOD RAIL FENCE (TYP)

INSTALL AND MAINTAIN DOUBLE ROW SILT BARRIER (TYP)

PROVIDE 5'-WIDE FENCE OPENING

RESTORE SURFACE BEYOND GUARDRAIL WITH 6" LOAM AND ESTABLISH MEADOW GRASSES (TYP)

SALT MARSH

EXISTING MARSH ELDER, TYP (MAPPED 2021)

EXISTING GRAVEL LOT

SALT MARSH BOUNDARY

ESTUARINE, INTERTIDAL, PERSISTENT EMERGENT VEGETATION (E2EM1)

50' NATURAL WOODLAND BUFFER

100' TIDAL BUFFER

150' NATURAL WOODLAND BUFFER

50.00' WATERFRONT BUFFER

PALUSTRINE, SCRUB-SCRUB, BROAD-LEAFED DECIDUOUS (PSS1)

PROP. BOULDER (TYP)

PARKING IMPROVEMENTS – LIMIT OF WORK

INSTALL WHEEL STOP (TYP)

EXISTING GRAVEL LOT LIMITS

LIMIT OF WORK PER NHDES WETLANDS PERMIT 2015-01866

PROPOSED REINFORCED GRASS PARKING LIMITS (TYP)

INSTALL AND MAINTAIN SINGLE ROW SILT BARRIER (TYP)

LIMIT OF ROADWAY RE-ALIGNMENT

SUMMARY:

FILL TO RAISE ROADWAY AND PARKING	2,000 C.Y.
FILL BELOW ELEV. 8 (100 YR FEMA ZONE AE – NAVD 1988)	80 C.Y.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433-2335
FAX: (603) 433-4194

PERMIT APPLICATION DRAWING
NOT FOR CONSTRUCTION

MARK	DATE	MADE BY	CHECKED	DESCRIPTION
1	10/14/20	RMB	JKC	PORTSMOUTH CON. COMM. COMMENTS

REVISIONS

AECOM TECHNICAL SERVICES, INC.
1 TECHNOLOGY PARK DRIVE
WESTFIELD, MA 01085
PHONE (781) 246-3200

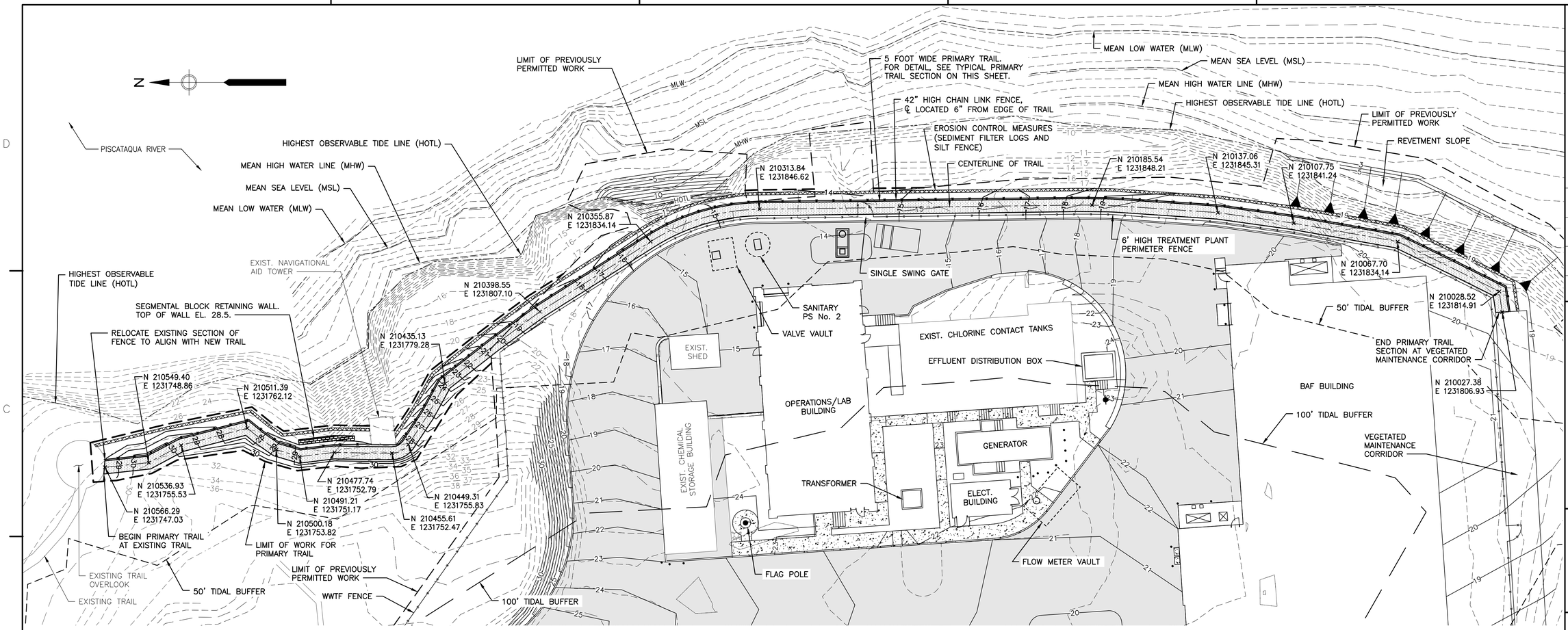
AECOM

JEFFREY K. CLIFFORD No. 6524 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE

CITY OF PORTSMOUTH, NH - DEPARTMENT OF PUBLIC WORKS
PEIRCE ISLAND WWTF UPGRADE
PARKING IMPROVEMENTS
(FORMER SNOW DUMP AREA)

PROJECT NO:	4507.04
CAD DWG FILE:	4507.04.SITE
DESIGNED BY:	RMB
DRAWN BY:	RMB
DEPT CHECK:	JKC
PROJ CHECK:	JKC
DATE:	APRIL 13, 2021
SCALE:	1" = 20'

C - 001

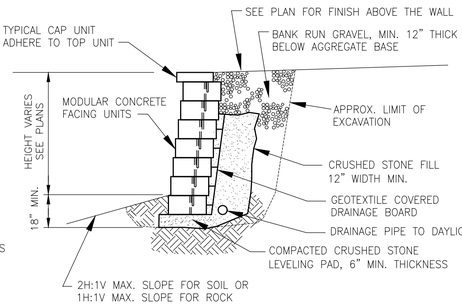


PLAN

SCALE: 1"=20'

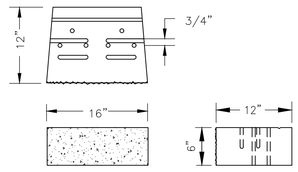
RETAINING WALL NOTES:

1. STRIP ALL VEGETATION AND ORGANIC SOIL FROM THE WALL ALIGNMENT.
2. FINAL WALL ALIGNMENT SHALL BE LOCATED IN THE FIELD.
3. DO NOT OVER EXCAVATE UNLESS DIRECTED BY THE ENGINEER TO REMOVE UNACCEPTABLE SOIL.
4. THE RETAINING WALL DESIGN ENGINEER SHALL VERIFY FOUNDATION SOILS AS BEING COMPETENT.
5. BASE SHALL CONSIST OF 95% COMPACTED CRUSHED STONE, MINIMUM 6" THICK.
6. FOLLOW APPLICABLE PROVISIONS OF THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND SPECIFICATIONS.
7. BACKFILL AND COMPACT BEHIND THE WALL AS WALL IS INSTALLED UNDER PAVEMENT.
8. COMPACTION TESTS SHALL BE TAKEN AS THE WALL IS INSTALLED.
9. BACKFILL COMPACTION SHALL BE TO 95% OF MAXIMUM PROCTOR DENSITY.
10. PROVIDE A DRAINAGE SWALE TO DIRECT FLOWS AROUND THE ENDS OF THE WALL.
11. ESTABLISH TURF AS SOON AS THE WALL IS COMPLETED.
12. CAPS SHALL BE PLACED AS REQUIRED BY CONTRACT.
13. CAPS SHALL BE ADHERED TO WALL USING CONCRETE ADHESIVE.
14. WHEN CUTTING CAP UNIT FOR WALL END DO NOT USE A CAP SECTION LESS THAN 6" WIDE.
15. CAPS MAY BE PLACED FLUSH OR WITH A 1/2" TO 3/4" OVERHANG ON TOP OF WALL.



PRECAST CONC. BLOCK RETAINING WALL SECTION

SCALE: NONE

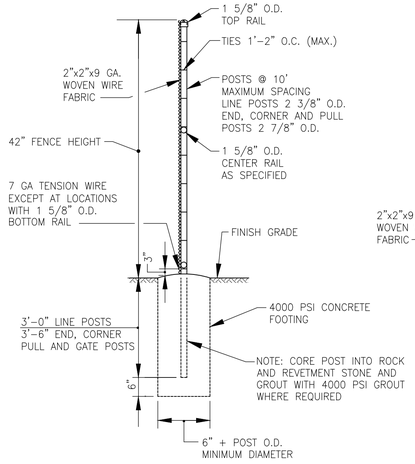


TYPICAL UNIT

UNIT DIMENSIONS

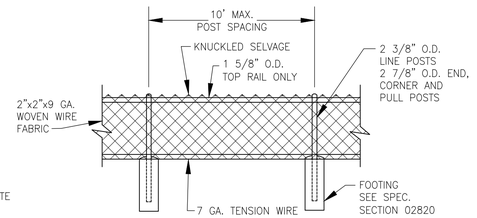
RETAINING WALL DETAIL

SCALE: NONE



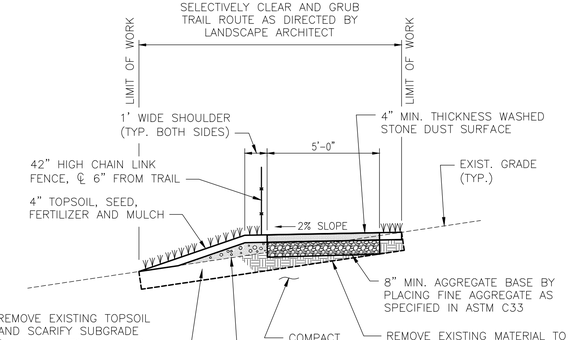
CHAIN LINK FENCE SECTION

NOT TO SCALE



3'-6" HEIGHT CHAIN LINK FENCE ELEVATION

NOT TO SCALE



TYPICAL PRIMARY TRAIL SECTION

NOT TO SCALE

NOTES:

1. FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET 00 C-001.

1" = 20'

0 20 40 60

SCALE FEET

MARK	DATE	MADE BY	CHECKED	DESCRIPTION
				REVISIONS

PERMIT APPLICATION DRAWING
NOT FOR CONSTRUCTION

AECOM TECHNICAL SERVICES, INC.
257 SIMARANO DRIVE, SUITE 102
CHELMSFORD, MA 01824
PHONE: (978) 905-2100
www.aecom.com

AECOM

STATE OF NEW HAMPSHIRE – ERIK N. MESERVE – No. 13306 LICENSED PROFESSIONAL ENGINEER

CITY OF PORTSMOUTH, NH - DEPARTMENT OF PUBLIC WORKS
PEIRCE ISLAND WWTF UPGRADE

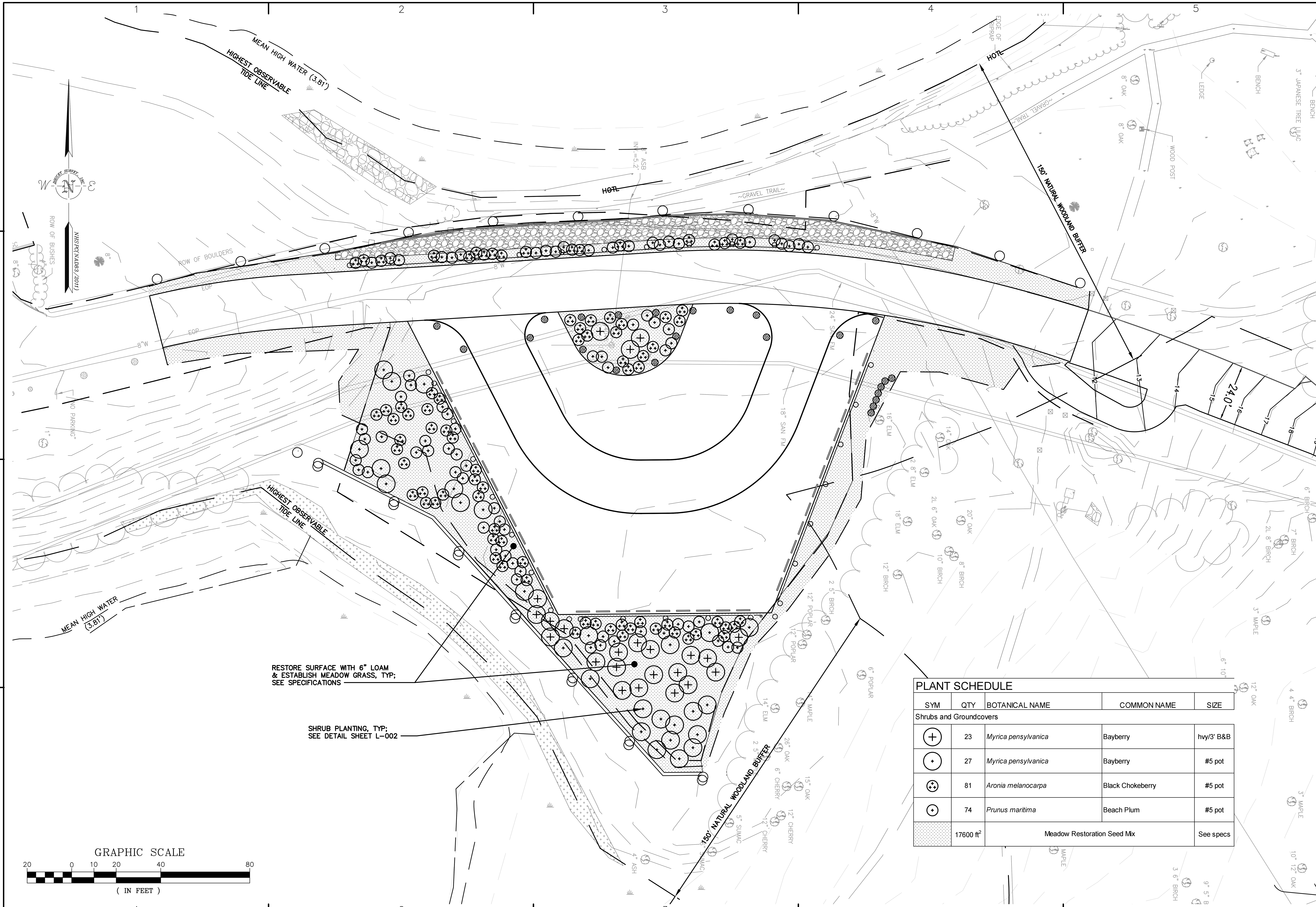
PROPOSED WALKING TRAIL

WALKING PATH

PROJECT NO:	60301525
CAD DWG FILE:	~~00 C-701 AS~~ C-002 8-31-20
DESIGNED BY:	E. MESERVE
DRAWN BY:	C. BENZIGER
DEPT CHECK:	C. BENZIGER
PROJ CHECK:	E. MESERVE
DATE:	APRIL 2020
SCALE:	AS NOTED

C-002

PATH/FILENAME: P:\PRO\60301525 - PORTSMOUTH WWTF UPGRADE\SHEETS\BP-2\C\00 C-701 AS C-002 8-31-20.DWG
LAST UPDATE: Tuesday, September 01, 2020 12:44:09 PM
PLOT DATE: Tuesday, September 01, 2020 12:56:48 PM
ANSI D – 1-Sep-20



PLANT SCHEDULE

SYM	QTY	BOTANICAL NAME	COMMON NAME	SIZE
Shrubs and Groundcovers				
(large circle, +)	23	*Myrica pensylvanica*	Bayberry	hvy/3' B&B
(large circle, dot)	27	*Myrica pensylvanica*	Bayberry	#5 pot
(circle, three +)	81	*Aronia melanocarpa*	Black Chokeberry	#5 pot
(small circle, +)	74	*Prunus maritima*	Beach Plum	#5 pot
(stipple)	17600 ft^2	Meadow Restoration Seed Mix		See specs

MARK | DATE | MADE BY | CHECKED | DESCRIPTION

REVISIONS

AECOM

AECOM TECHNICAL SERVICES, INC.
701 EDGEWATER DRIVE
WAKEFIELD, MA 01880
PHONE (781) 246-5200

CITY OF PORTSMOUTH, NH - DEPARTMENT OF PUBLIC WORKS

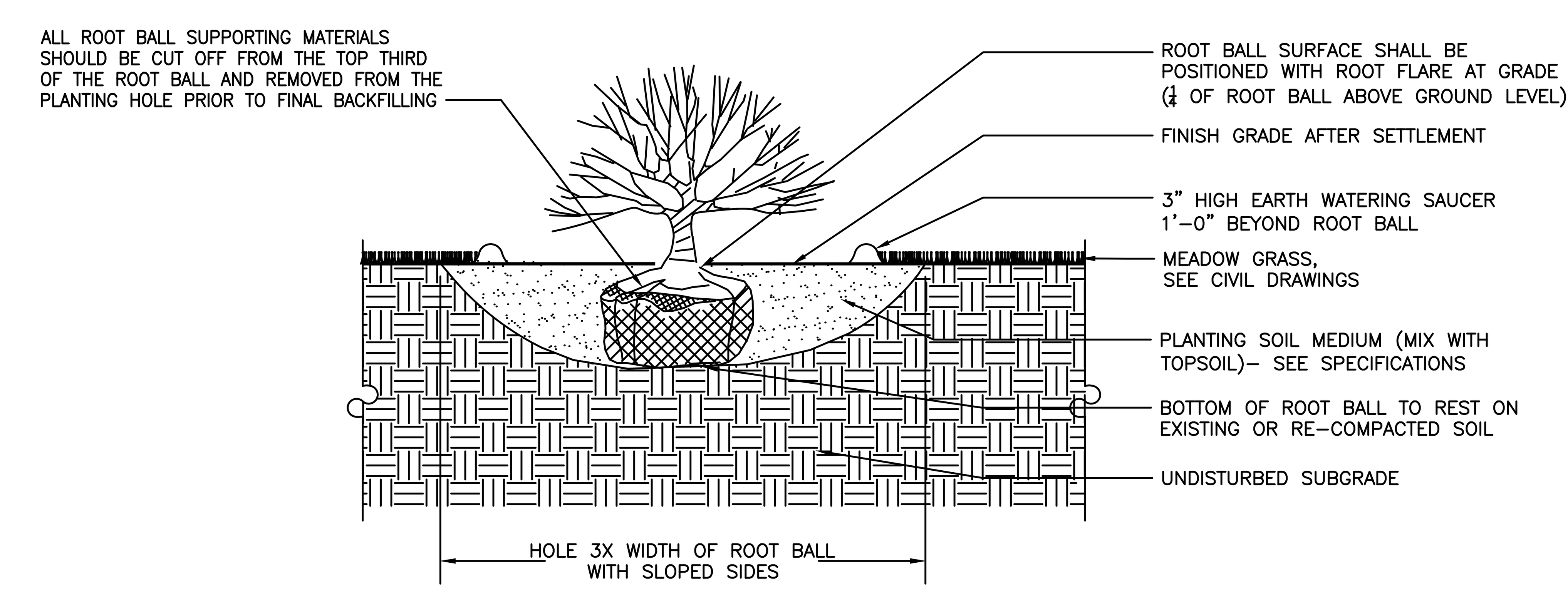
PEIRCE ISLAND WWTF UPGRADE

PARKING IMPROVEMENTS

(FORMER SNOW DUMP AREA)

PROJECT NO:	4507.04
CAD DWG FILE:	4507.04.SITE
DESIGNED BY:	SS
DRAWN BY:	SS
DEPT CHECK:	XX
PROJ CHECK:	XX
DATE:	AUGUST 6, 2020
SCALE:	1" = 20'

L - 001



SECTION

SHRUB PLANTING

NOT TO SCALE

NOTES:

1. SCARIFY SOILS CONTINUOUSLY TO A DEPTH OF 6" AT INTERFACE BETWEEN SOIL TYPES AND LIFTS TO PROMOTE BLENDING OF SOILS.
2. ALL PLANTING TO BE DONE AS PER ANSI A300 (PART 6) 2012.

PRELIMINARY COPY

NOTE: This document is preliminary only and is not intended for any purpose except review and comment by the owner and its agents.

MARK	DATE	MADE BY	CHECKED	DESCRIPTION

REVISIONS

AECOM

AECOM TECHNICAL SERVICES, INC.
701 EDGEWATER DRIVE
WAKEFIELD, MA 01880
PHONE (781) 246-5200

CITY OF PORTSMOUTH, NH - DEPARTMENT OF PUBLIC WORKS
PEIRCE ISLAND WWTF UPGRADE

PARKING IMPROVEMENT DETAILS
(FORMER SNOW DUMP AREA)

PROJECT NO:	4507.04
CAD DWG FILE:	4507.04.SITE
DESIGNED BY:	SS
DRAWN BY:	SS
DEPT CHECK:	XX
PROJ CHECK:	XX
DATE:	AUGUST 6, 2020
SCALE:	AS SHOWN

L - 002

SEDIMENT AND EROSION CONTROL NOTES

PROJECT NAME AND LOCATION

ROAD, PARKING AREA AND RECREATION TRAIL IMPROVEMENTS
TAX MAP 208 LOT 1
PORTSMOUTH, NEW HAMPSHIRE

LATITUDE: 043° 04' 29" N
LONGITUDE: 070° 44' 35" W

APPLICANT:
CITY OF PORTSMOUTH
DEPARTMENT OF PUBLIC WORKS
680 PEVERLY HILL ROAD
PORTSMOUTH, NEW HAMPSHIRE

DESCRIPTION

The project consists of improvements to raise the access road above anticipated 2100 100–year flood elevation; to convert an informal parking area the former snow dump, currently used as laydown area, to a formal grassed public parking area; and to extend the public walking trail 600 feet around the northeastern perimeter of the island.

DISTURBED AREA

The total area to be disturbed for the development improvements is approximately 55,738 SF (1.3 acres).

PROJECT PHASING

The proposed project will be completed in two phase. Phase I is the trail extension; Phase II is the road and grass parking improvements.

NAME OF RECEIVING WATER

The site drains directly to the Piscataqua River (tidal).

NPDES CONSTRUCTION GENERAL PERMIT

Contractor shall prepare a Stormwater Pollution Prevention Plan (SWPPP) is accordance with federal storm water permit requirements. The SWPPP must be prepared in a format acceptable to the Owner and three (3) copies provided to the City at least fourteen (14) days prior to initiating construction. Contractor is responsible for all cost associated with preparation and implementation of SWPPP including any temporary erosion control measures (whether indicated or not on these drawings) as required for the contractor's sequence of activities.

The Contractor and Owner shall each file a Notice of Intent (NOI) with the U.S.E.P.A. under the NPDES Construction General Permit. (U.S.E.P.A., 1200 Pennsylvania Avenue NW, Washington, DC 20460) All work shall be in accordance with NPDES General Permit: NHR120000, including NOI requirements, effluent limitations, standards and management for construction. The Contractor shall be responsible for obtaining a USEPA Construction Dewatering Permit, if required.

SEQUENCE OF MAJOR ACTIVITIES

1. Prepare SWPPP and file NPDES Notice of Intent, prior to any construction activities. The Contractor and Owner shall each file a Notice of Intent (N.O.I.) to U.S.E.P.A.
2. Install temporary erosion control measures including silt fences, stabilized construction entrance and inlet sediment filters as noted on the plan. All temporary erosion control measures shall be maintained in good working condition for the duration of the project.
3. Upon completion of Items 1 through 2, clear and grub wooded areas (some stumps may require grinding). Dispose of stumps in an approved offsite location.
4. Strip and stockpile loam. Stockpiles shall be temporarily stabilized with hay bales, mulch and surrounded by a hay bale or silt fence barrier until material is removed and final grading is complete.
5. Reclaim/remove existing paved surfaces.
6. Perform all required demolition activities.
7. Initiate facility construction.
8. Construct ditches and swales early in construction sequence; stabilize them prior to directing flow to them.
9. Ditches and swales shall have sides and bottom reinforced with excelsior matting, Permanent turf reinforcement shall be installed at swale sloped greater than 5%.
10. Rough grade site including placement of borrow materials.
21. Construct drainage structures, parking area & road base materials. All roadways and parking lots shall be stabilized within 72 hours of achieving finished grade
19. Install base course paving, pavers & curbing.
20. Install top course paving.
21. Loam (6" min) and seed all disturbed areas not paved or otherwise stabilized within 72 hours of achieving finished grade.
22. When all construction activity is complete and site is stabilized, remove all hay bales, storm check dams, silt fences and sediment that has been trapped by these devices.
23. File a Notice of Termination (N.O.T.) with U.S.E.P.A.

TEMPORARY EROSION & SEDIMENT CONTROL AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "New Hampshire Stormwater Manual, Volumes 1 – 3", issued December 2008, as amended. As indicated in the sequence of Major Activities, the silt fences shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area, silt fences and any earth/dikes will be removed once permanent measures are established.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through hay bale barriers, stone check dams, and silt fences. All storm drain inlets shall be provided with hay bale filters or stone check dams. Stone rip rap shall be provided at the outlets of drain pipes and culverts where shown on the drawings.

Stabilize all ditches, swales and their contributing areas prior to directing flow to them.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion and sediment control measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL
These are general inspection and maintenance practices that shall be used to implement the plan:

1. The smallest practical portion of the site shall be denuded at one time, but in no case shall it exceed 5 acres at one time.
2. All control measures shall be inspected at least once each week and following any storm event of 0.5 inches or greater.
3. All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
4. Built–up sediment shall be removed from silt fence or other barriers when it has reached one–third the height of the fence or bale, or when "bulges" occur.
5. All diversion dikes shall be inspected and any breaches promptly repaired.
6. Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
7. The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the Plans'
8. All roadways and parking lots shall be stabilized within 72 hours of achieving finished grade.
9. All cut and fill slopes shall be seeded/loamed within 72 hours of achieving finished grade.
10. An area shall be considered stable if one of the following has occurred:
    a. Base coarse gravels have been installed in areas to be paved;
    b. A minimum of 85% vegetated growth as been established;
    c. A minimum of 3 inches of non–erosive material such as stone of riprap has been installed; – or –
    d. Erosion control blankets have been properly installed.
11. The length of time of exposure of area disturbed during construction shall not exceed 45 days.

B. MULCHING
Mulch shall be used on highly erodible soils, on critically eroding areas, on areas where conservation of moisture will facilitate plant establishment, and where shown on the plans.

1. Timing – In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards which shall be used to assure this:
    a. Apply mulch prior to any storm event. This is applicable when working within 100 feet of wetlands. It will be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.
    b. Required Mulching within a specified time period. The time period can range from 21 to 28 days of inactivity on a area, the length of time varying with site conditions. Professional judgment shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.
2. Guidelines for Winter Mulch Application –

Type	Rate per 1,000 s.f.	Use and Comments
Hay or Straw	70 to 90 lbs.	Must be dry and free from mold. May be used with plantings.
Wood Chips or Bark Mulch	460 to 920 lbs.	Used mostly with trees and shrub plantings.
Jute and Fibrous Matting (Erosion Blanket	As per manufacturer Specifications	Used in slope areas, water courses and other Control areas.
Crushed Stone 1/4" to 1–1/2" dia.	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Erosion Control Mix	2" thick (min)	* The organic matter content is between 80 and 100%, dry weight basis. * Particle size by weight is 100% passing a 6" screen and a minimum of 70 %, maximum of 85%, passing a 0.75" screen. * The organic portion needs to be fibrous and elongated. * Large portions of silts, clays or fine sands are not acceptable in the mix. * Soluble salts content is less than 4.0 mmhos/cm. * The pH should fall between 5.0 and 8.0.

3. Maintenance – All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied.

C. TEMPORARY GRASS COVER

1. Seedbed Preparation –
   Apply fertilizer at the rate of 600 pounds per acre of 10–10–10. Apply limestone (equivalent to 50 percent calcium plus magnesium oxide) at a rate of three (3) tons per acre.
2. Seeding –
    a. Utilize annual rye grass at a rate of 40 lbs/acre.
    b. Where the soil has been compacted by construction operations, loosen soil to a depth of two (2) inches before applying fertilizer, lime and seed.
    c. Apply seed uniformly by hand, cyclone seeder, or hydroseeder (slurry including seed and fertilizer). Hydroseedings, which include mulch, may be left on soil surface. Seeding rates must be increased 10% when hydroseeding.
3. Maintenance –
   Temporary seedings shall be periodically inspected. At a minimum, 95% of the soil surface should be covered by vegetation. If any evidence of erosion or sedimentation is apparent, repairs shall be made and other temporary measures used in the interim (mulch, filter barriers, check dams, etc.).

D. FILTERS

1. Silt Fence
    a. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

Physical Property	Test	Requirements
Filtering Efficiency	VTM–51	75% minimum
Tensile Strength at 20% Maximum Elongation*	VTM–52	Extra Strength 50 lb/lin in (min) Standard Strength 30 lb/lin in (min)
Flow Rate	VTM–51	0.3 gal/sf/min (min)

    * Requirements reduced by 50 percent after six (6) months of installation.

    Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizer to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0 degrees F to 120° F.
    b. Posts shall be spaced a maximum of ten (10) feet apart at the barrier location or as recommended by the manufacturer and driven securely into the ground (minimum of 16 inches).
    c. A trench shall be excavated approximately six (6) inches wide and eight (8) inches deep along the line of posts and upslope from the barrier.
    d. When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least one (1) inch long, tie wires or hog rings. The wire shall extend no more than 36 inches above the original ground surfaces.
    e. The "standard strength" filter fabric shall be stapled or wired to the fence, and eight (8) inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
    f. When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of item (g) applying.
    g. The trench shall be backfilled and the soil compacted over the filter fabric.
    h. Silt fences shall be removed when they have served their useful purpose but not before the upslope areas has been permanently stabilized.
2. Sequence of Installation –
   Sediment barriers shall be installed prior to any soil disturbance of the contributing upslope drainage area.
3. Maintenance –
    a. Silt fence barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired if there are any signs of erosion or sedimentation below them. Any required repairs shall be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water, the sediment barriers shall be replaced with a temporary stone check dam.
    b. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.
    c. Sediment deposits must be removed when deposits reach approximately one–third (1/3) the height of the barrier.
    d. Any sediment deposits remaining in place after the silt fence or other barrier is no longer required shall be removed. The area shall be prepared and seeded.
    e. Additional stone may have to be added to the construction entrance, rock barrier and riprap lined swales, etc., periodically to maintain proper function of the erosion control structure.
4. Alternative Method
   Filtrexx Siltsoxx or approved equal – install per manufacturer specifications.

E. PERMANENT SEEDING –

1. Bedding – stones larger than $1\frac{1}{2}$", trash, roots, and other debris that will interfere with seeding and future maintenance of the area should be removed. Where feasible, the soil should be tilled to a depth of 5" to prepare a seedbed and mix fertilizer into the soil.
2. Fertilizer – lime and fertilizer should be applied evenly over the area prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and fertilizer should be based on an evaluation of soil tests. When a soil test is not available, the following minimum amounts should be applied:
   Agricultural Limestone @ 100 lbs. per 1,000 s.f.
   10–20–20 fertilizer @ 12 lbs. per 1,000 s.f.
3. Seed Mixture (recommended):
   SEE LANDSCAPE PLANS
4. Sodding – sodding is done where it is desirable to rapidly establish cover on a disturbed area. Sodding an area may be substituted for permanent seeding procedures anywhere on site. Bed preparation, fertilizing, and placement of sod shall be performed according to the S.C.S. Handbook. Sodding is recommended for steep sloped areas, areas immediately adjacent to sensitive water courses, easily erodible soils (fine sand/silt), etc.

WINTER CONSTRUCTION NOTES

1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events;
2. All ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions; and
3. After November 15th, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT Item 304.3.

SPILL PREVENTION MEASURED AND SPILL MITIGATION

Spill prevention and spill mitigation measures shall be implemented to prevent the release of fuel and other related substances to the environment. The measures shall be included at a minimum:

a) The storage requirements shall include:
   i. Storage of regulated substances on an impervious surface.
   ii. Secure storage areas against unauthorized entry.
   iii. Label regulated containers clearly and visibly.
   iv. Inspect stage areas weekly.
   v. Cover regulated containers in outside storage areas.
   vi. Whenever possible, keep regulated containers that are stored outside more than 50 feet from surface water and storm drains, 75 feet from private wells, and 400 feet from public well.
   vii. Secondary containment is required for containers containing regulated substances stored outside, except for on premise use fuel tanks or aboveground or underground storage tanks otherwise regulated.

b) The fuel handling requirements shall include:
   i. Except when in use, keep containers containing regulated substances closed and sealed.
   ii. Place drip pans under spigots, valves, and pumps.
   iii. Have spill control and containment equipment readily available in all work areas.
   iv. Use funnel and drip pans when transferring regulated substances.
   v. Perform transfers of regulated substances over an impervious surface.

c) The training of on–site employees and on–site posting of release response information describing what to do in the event of regulated substances.

d) Fueling and maintenance of excavation, earthmoving and other construction related equipment will comply with regulation of New Hampshire Department of Environmental Services (see WD–DWGB–22–6 Best management Practices for Fueling and Maintenance of Excavation and Earthmoving Equipment.
http://des.nh.gov/organization/ommissioner/pip/factsheets/dwgb/documents/dwgb–22–6.pdf

NOTE:
ALL FACILITIES SHOULD BE INSPECTED ON AN ANNUAL BASIS AT A MINIMUM. IN ADDITION, ALL FACILITIES SHOULD BE INSPECTED AFTER A SIGNIFICANT PRECIPITATION EVENT TO ENSURE THE FACILITY IS DRAINING APPROPRIATELY AND TO IDENTIFY ANY DAMAGE THAT OCCURRED AS A RESULT OF THE INCREASED RUNOFF. FOR THE PURPOSE OF THIS STORMWATER MANAGEMENT PROGRAM, A SIGNIFICANT RAINFALL EVENT IS CONSIDERED AN EVENT OF THREE (3) INCHES IN A 24–HOUR PERIOD OR 0.5 INCHES IN A ONE–HOUR PERIOD. IT IS ANTICIPATED THAT A SHORT, INTENSE EVENT IS LIKELY TO HAVE A HIGHER POTENTIAL OF EROSION FOR THIS SITE THAN A LONGER, HIGH VOLUME EVENT.

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433–2335
FAX: (603) 433–4194

PERMIT APPLICATION DRAWING
NOT FOR CONSTRUCTION

MARK	DATE	MADE BY	CHECKED	DESCRIPTION

REVISIONS

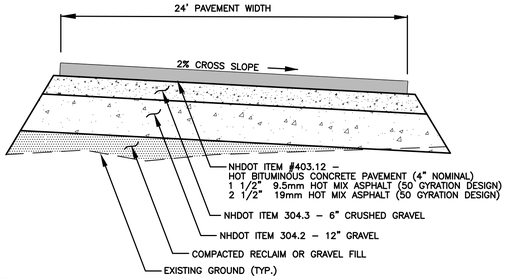
AECOM
AECOM TECHNICAL SERVICES, INC.
701 EDGEWATER DRIVE
WAKEFIELD, MA 01880
PHONE (781) 246–5200

STATE OF NEW HAMPSHIRE
JEFFREY K. CLIFFORD
No. 6524
LICENSED PROFESSIONAL ENGINEER

CITY OF PORTSMOUTH, NH - DEPARTMENT OF PUBLIC WORKS
PEIRCE ISLAND WWTF UPGRADE
EROSION CONTROL NOTES
(FORMER SNOW DUMP AREA)

PROJECT NO:	4507.04
CAD DWG FILE:	4507.04.SITE
DESIGNED BY:	RMB
DRAWN BY:	RMB
DEPT CHECK:	JKC
PROJ CHECK:	JKC
DATE:	APRIL 13, 2021
SCALE:	AS SHOWN

C - 003

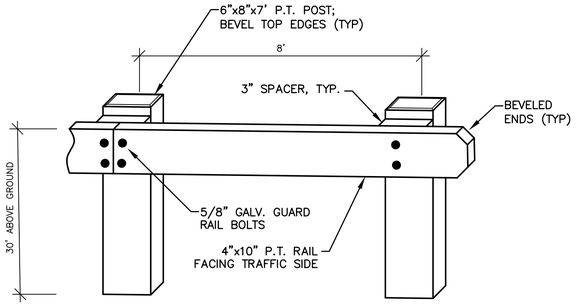


NOTES

1. ALL PAVEMENT, LOAM, CLAY, MUCK, ORGANIC AND/OR YIELDING MATERIAL SHALL BE REMOVED TO A DEPTH OF NO LESS THAN 22" BELOW FINISH GRADE. INSTALL COMPACTED SAND OR GRAVEL BORROW TO SUBGRADE, AS NECESSARY.
2. THOROUGHLY COMPACT THE SUBGRADE WITH A VIBRATORY ROLLER. PROOF ROLL THE SUBGRADE WITH A FULLY LOADED 10-WHEEL DUMP TRUCK AND REMOVE ANY UNSTABLE SUBGRADE SOILS.
3. SUBGRADE SHALL BE FREE OF VOIDS THAT ALLOW MOVEMENT/SETTLEMENT OF MATERIALS. REMOVE ANY VISIBLE ORGANICS AT SUBGRADE, REPLACE WITH COMPACTED COMMON OR STRUCTURAL FILL.
4. EACH GRAVEL BASE COURSE TO BE CONSTRUCTED AT THE PAVEMENT CROSS SLOPE.
5. COMPACT ALL MATERIALS TO 95% MAXIMUM PROCTOR DENSITY.

PAVEMENT SECTION

NOT TO SCALE

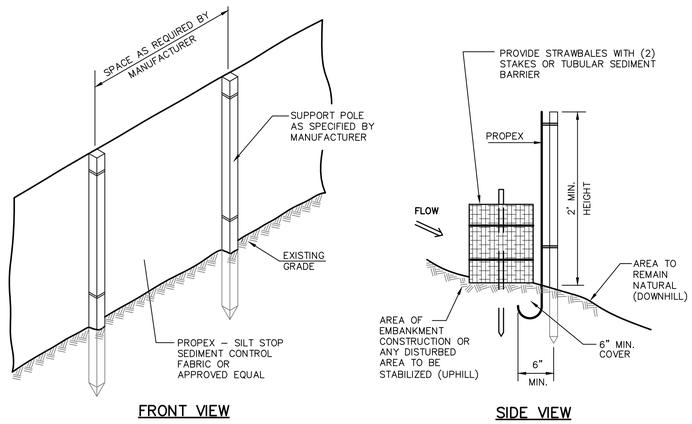


NOTE:

FENCE BY GC/AAA FENCE COMPANY, DOVER, NH, TEL. (800) 660-0833 OR APPROVED EQUAL

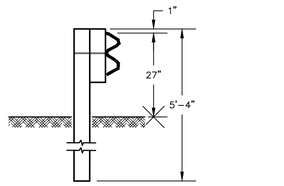
SINGLE RAIL WOOD BARRIER

NOT TO SCALE



DOUBLE SILT BARRIER DETAIL

NOT TO SCALE

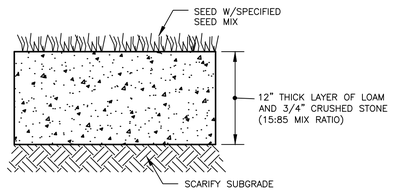


AASHTO DESIGNATION	G4(2W)
NH STANDARD BEAM GUARD RAIL DETAIL, SECTION 606	
POST SPACING	6'-3"
DEFLECTION DISTANCE *	3'
POST TYPE	6" x 8" TREATED WOOD POST
BEAM TYPE	"W" SECTION, 12 GA., "CORTEN" STEEL, NHDOT 606.2
OFFSET BRACKETS	6" x 8" x 14" TREATED BLOCK

PROVIDE TERMINAL SECTION AT EACH END

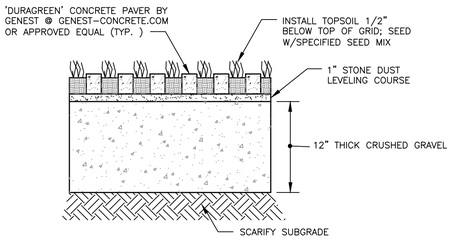
"W" BEAM GUARDRAIL DETAIL (WOOD POSTS)

NOT TO SCALE



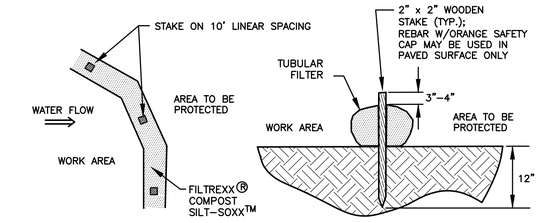
REINFORCED GRASSED PARKING DETAIL

NOT TO SCALE



CONCRETE GRASS PAVER DETAIL

NOT TO SCALE



NOTES:

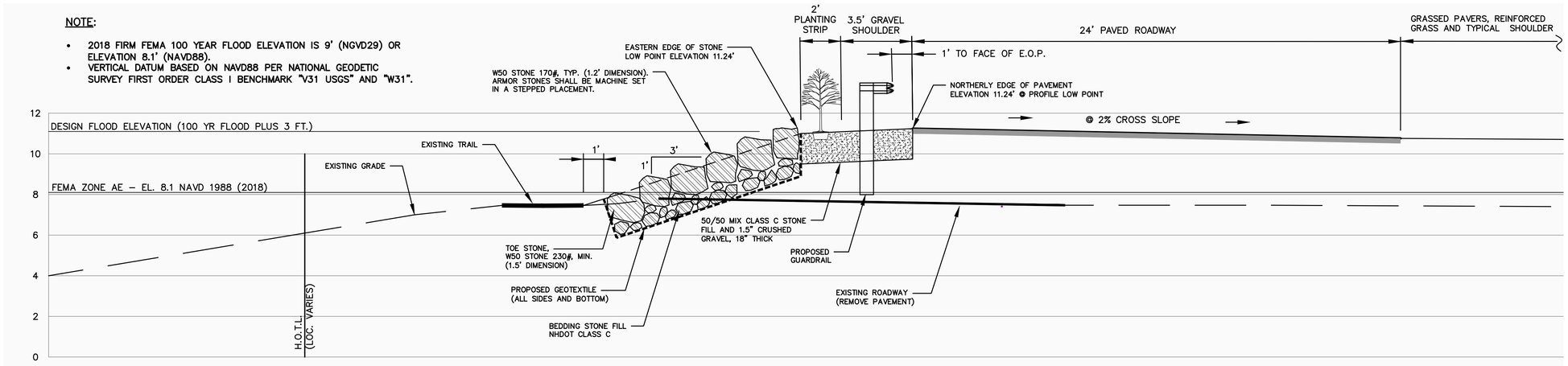
1. SILTSOXX OR APPROVED EQUAL SHALL BE USED FOR TUBULAR SEDIMENT BARRIERS.
2. ALL MATERIAL TO MEET MANUFACTURER'S SPECIFICATIONS.
3. COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY BARRIER SHALL BE DISPOSED OF PROPERLY.

TUBULAR SEDIMENT BARRIER DETAIL

NOT TO SCALE

NOTE:

- 2018 FIRM FEMA 100 YEAR FLOOD ELEVATION IS 9' (NGVD29) OR ELEVATION 8.1' (NAVD88).
- VERTICAL DATUM BASED ON NAVD88 PER NATIONAL GEODETIC SURVEY FIRST ORDER CLASS I BENCHMARK "V31 USGS" AND "W31".



ROADWAY CROSS SECTION DETAIL

SCALE: 1" = 3'

PERMIT APPLICATION DRAWING
NOT FOR CONSTRUCTION

MARK	DATE	MADE BY	CHECKED	DESCRIPTION

REVISIONS

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AECOM

STATE OF NEW HAMPSHIRE – JEFFREY K. CLIFFORD No. 6524 LICENSED PROFESSIONAL ENGINEER

CITY OF PORTSMOUTH, NH - DEPARTMENT OF PUBLIC WORKS
PEIRCE ISLAND WWTF UPGRADE

PARKING IMPROVEMENT DETAILS

(FORMER SNOW DUMP AREA)

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433-2335
FAX: (603) 433-4194

PROJECT NO:	4507.04
CAD DWG FILE:	4507.04.SITE
DESIGNED BY:	RMB
DRAWN BY:	RMB
DEPT CHECK:	JKC
PROJ CHECK:	JKC
DATE:	APRIL 13, 2021
SCALE:	AS SHOWN

C - 004

EXHIBIT 7

PROJECT NARRATIVE

(EXPLANATION OF METHODS, TIMING, AND MANNER OF HOW THE PROJECT WILL MEET STANDARD PERMIT CONDITIONS (ENV-WT 307))

Peirce Island Wastewater Treatment Facility

Project Narrative

Section 1. Required Information

a. Project Purpose and Description (Env-Wt 603.02)

The City of Portsmouth is nearing completion of a major upgrade to the Peirce Island Wastewater Treatment Facility (WWTF; DES Wetland Permits 2015-1866 and 2015-1878). Several additional improvements are proposed to enhance access reliability to the WWTF, and the public's access to the island. These improvements include raising the access road approximately 3 feet at its lowest point to elevate it above the 100-year flood line; converting a former informal public parking area and permitted snow dump, currently used as the Project's construction laydown area, to a formal grassed public parking area and natural lands; and extending a public walking trail around the northeastern perimeter of the island. At the same time, the City is planning to permanently replace the two sewer force mains on Peirce Island between Peirce Island Road Bridge and the Peirce Island WWTF, replace the water main on Peirce Island between Peirce Island Road Bridge and the Peirce Island Pool, and slipline one of the force mains under the Peirce Island Road Bridge. The majority of the impacts will be temporary, associated with burial of the new water and sewer lines and the recreational path. Portions of the access road and the parking area will require permanent fill as described below.

Most of the work will occur in the tidal buffer zone, most of which is previously developed. Smaller portions associated with the parking area and the pipeline replacement work lie in the protected shoreland zone.

The specifics of the project are as follows:

Raising the Access Road

The access road currently floods during spring high tides and storm events. Since this is the only access and egress point for the WWTF, the road is considered critical infrastructure. Raising the road approximately 3 feet above its lowest point will elevate it out of the current 100-year flood line, and protect it against a sea level rise predicted to be 1.6 ft (See Coastal Vulnerability Assessment, Exhibit 25). The road will be shifted slightly to the south to accommodate the additional fill required.

No impacts to the rocky shore, salt marsh, or marsh elder (*Iva frutescens*; a NH Threatened species) are anticipated. Runoff from the road will be directed into the grassed parking area (described below) for treatment before before infiltrating and potentially draining as sheetflow to the south into Portsmouth Harbor. The existing walking trail and vegetation north of the road will be maintained, and a narrow buffer of stone and upland plantings is proposed between the trail and the road to protect the road from high water and wave action during storms.

Improving the Public Parking Area

Prior to the WWTF improvements, the current construction laydown area was an informal grassed parking area during the warmer months, and used as a permitted snow dump during the winter by the City. The City is proposing to restore a portion of the laydown area back to grassed parking to

accommodate up to 55 cars (Sheet C-001, Parking Improvements). A 24-foot wide travel lane of concrete grass pavers will provide a more stable corridor for vehicle travel. Both the grass parking area (approximately 14,148 sf) and the concrete grass pavers (approximately 5,478 sf) will be permeable to minimize runoff to the harbor. A low wooden fence will border the grass parking area to contain vehicles. The remainder of the gravel lot, approximately 8,120 sf, will be restored to an old field habitat using native species as shown on Sheet C-001.

The project will not adversely impact the adjacent tidal flats, salt marsh, or marsh elder. Because of the low volume of traffic, the permeable nature of the surfaces proposed in the parking area, and the restored herbaceous vegetation, the project will benefit adjacent resources by reducing the volume and improving the quality of runoff.

Recreational Trail

The proposed recreational trail follows an informal path currently used by pedestrians to circumnavigate the island (Exhibit 5, Sheet G-001). The trail extends a section of established walking trails and runs approximately 590 feet from the west end, starting at an existing overlook/"look out", to the east end of the WWTF where it joins a vegetated maintenance corridor leading back to the parking area. The trail will be 5 feet wide with a packed stone dust surface, and a 42-inch chain link fence downslope of the trail to protect walkers and vegetation. Any disturbed sideslope grades will be loamed and seeded.

All of this trail lies within the 50-foot waterfront buffer. Adverse impacts from the construction or use of the trail are expected to be minimal, due to the minor amount of tree clearing needed in the undisturbed tidal buffer and the existing cleared surfaces available for the path for the portion of the route to the east of the WWTF.

Sewer Force Main Replacement

The 24" sewer force main failed in September 2020. An Emergency Authorization (NHDES 2020-2873) was obtained to implement a temporary above-grade repair. The permanent solution is to replace both the existing 18" and 24" sewer force mains between the Peirce Island Road Bridge and the WWTF. The existing 18" sewer force main is closer to the adjacent tidal flats, salt marsh and marsh elder and will be drained and abandoned in place. The existing 24" sewer force main will be dug up, the trench widened, and the two new 24" sewer force mains will be placed in this trench. The areas that are disturbed as part of this work will be restored to pre-construction conditions.

Water Main Replacement

The existing 8" water main will be replaced with a 12" water main between the Peirce Island Road Bridge and the Peirce Island Pool, much of it within the Peirce Island roadway. The existing water main will be dug up and the new water main installed in its place. The areas that are disturbed as part of this work will be restored to pre-construction conditions. Upon completion of the pipe replacements, the road between Peirce Island Road Bridge and the WWTF will be regraded and receive a full width, 1-1/2" top course of pavement.

Sewer Force Main Sliplining

The 24" sewer force main under Peirce Island Road Bridge is showing signs of corrosion. To avoid unexpected failure of this pipeline, it will be sliplined with a 20" fusible PVC pipeline. Access pits will be excavated at either end of the bridge, and the 20" fusible PVC slipliner will be pulled through the

existing pipeline. The areas that are disturbed as part of this work will be in the roadway and will be restored to pre-construction conditions.

Description of Natural Resources

Peirce Island is located in the City of Portsmouth on the Piscataqua River. It is owned by the City and the State of NH, and provides multiple public services, including the WWTF, the State Fish Pier, a public outdoor pool, boat ramp, park and numerous walking trails. The slipline portion of the Project Area is contained to the Peirce Island Road Bridge. The pipeline replacement portion of the Project Area is linear on the west end of the island, widens out near the parking area, and narrows again for the recreational area at the east end near the wastewater treatment facility. The shoreline of the Piscataqua River adjacent the west end of Peirce Island Road Bridge and Peirce Island is bordered by estuarine habitats, including rocky shore (E2RS1/2) and salt marsh (E2EM1). No impacts to these wetland resources are proposed. Most of the work area lies within the 100-foot tidal buffer zone, with a smaller section of the pipeline corridor and of the parking area lying within protected shoreland. Based on consultation with DES Shoreland, a Permit-By-Notification application was submitted concurrently with the Wetlands application for temporary pipeline impacts in the protected shoreland outside of the tidal buffer zone. No freshwater resources are within or adjacent to the impact areas. Marsh elder, a State Threatened plant species, forms a narrow band along the southern shore of much of the island.

Tidal Buffer Zone

Most of the proposed work occurs within the jurisdictional tidal buffer zone (TBZ), the majority of which is previously developed (PDTBZ). The PDTBZ includes the paved road for the pipelines and slipline work on the bridge, grassed lawns and unpaved parking area in the vicinity of the pipeline work, paved areas and structures within the wastewater treatment facility, the access road, and the gravel lot used as a construction laydown area and snow dump. A smaller section of the TBZ in the proposed project area is undisturbed TBZ, primarily in the vicinity of the recreational trail. This section is dominated by small trees and vines: staghorn sumac (*Rhus typhina*), oriental bittersweet (*Celastrus orbiculatus*), black cherry (*Prunus serotina*) and gray birch *(Betula populifolia*). The ground cover is a mix of perennial grasses and some forbs.

Salt marsh

Several sections of salt marsh occur on the southern, more protected side of the island. The marshes are a mix of high marsh and low marsh with typical *Spartina* species (*S. alterniflora* in the low marsh and *S. patens* dominating the high marsh). Typical salt marsh forbs dominate in the upper marsh and marsh elder, *Iva frutescens*, (NH state-Threatened; see NHB21-1136) occurs in multiple stands along the upland border. This shrub is common in southern New England, and is reaching the northern edge of its geographic range in NH. No salt marsh will be impacted by the project. As partial mitigation for accidental impacts to marsh elder, a construction fence has been erected between the work area and the marsh elder to protect against encroachment.

Rocky shore

The western shoreline of the Piscataqua River adjacent Peirce Island Road Bridge and the eastern portion of Peirce Island below the Highest Observable Tide Line is predominantly bedrock outcrop and cobble gravel/shore. Rockweeds (*Ascophyllum* and *Fucus* spp) are prevalent in the lower intertidal zone on boulders and ledge. Much of the remaining rocky shore is unvegetated. The sections on which the bridge and WWTF are located is steep-sided exposed ledge and riprap. By the gravel lot and access road, the rocky shore is more gradual in slope and of finer gravel and cobble. Off the northwestern corner of the Peirce Island Rd. bridge, a shelf of cobble gravel occurs between the grassed upland bank and steep-sloped riprap. Much of the cobble gravel areas are unvegetated with minor occurrences of salt tolerant species such as *Spartina patens*, *Limonium carolinianum*, and *Solidago sempervirens*. No rocky shore will be impacted by the project.

Protected Shoreland

Approximately a third of the pipeline replacement work will occur in the protected shoreland zone above the PDTBZ at the west end of the island, and two small pieces lie outside of the previously permitted area near the WWTF. These areas of the island are developed and maintained, and includes Peirce Island Road, the boat ramp parking area, and mowed parkland.

State-Listed Species

The NHB data review (NHB21-1136; Exhibit 19) indicates eelgrass (*Zostera maritima*) and Atlantic and Shortnose Sturgeon (*Acipenser oxyrinchus* and *A. brevirostrum*) occur in the subtidal waters off Peirce Island. The proposed work will have no adverse impacts to those marine species. The project does not impact any estuarine or marine wetland resources, nor does it include in-water work that would adversely effect marine biota or their habitats.

b. Proposed Mitigation

Mitigation for impacts in the Undisturbed Tidal Buffer Zone

Mitigation for 890 sf of permanent impact to Undisturbed TBZ is provided by re-establishing approximately 9,730 sf of native grass and shrub habitat (Exhibit 5, Sheet C-001 and details) in the restored snow dump area. All other permanent impacts are associated with modifying the road and improving the parking area within Previously Developed TBZ. Additional water quality benefits will be gained by converting approximately 20,020 sf of impervious surface in the laydown/ parking area to grassed permeable substrates that will both infiltrate runoff, and remove nutrients and sediment from sheetflow prior to entering the Piscataqua River. On the north side of the road, the existing path and vegetation will remain intact, and additional stone and vegetation will be added to buffer scour and wave action to the road.

The re-establishment of native species around the perimeter of the parking area will enhance water quality treatment of any sheetflow that does not infiltrate from the parking area, thereby buffering the salt marsh and Piscataqua River from any surplus nutrients and sediments. Once final grading is completed, the enhancement area will receive a minimum of 4 inches of loam, and planted with a mix of the following shrubs: bayberry (*Myrica pensylvanica*), beach plum (*Prunus maritimus*), and black chokeberry (*Aronia melanocarpa*) (See landscaping details in Exhibit 5, Sheets L-001 and L-002). All of these species are native to the area and tolerant of periodic inundation by salt water, therefore should

be appropriate for this site. Once planted, the area will be seeded using a native upland conservation mix. The City agrees to monitor the site for 3 years to evaluate the stability of the area and to ensure at least 80% of the plantings or their ecological equivilents have successfully established.

Mitigation for Impacts to Marsh Elder

During installation of the temporary sewer force mains in October, 2020 under Emergency Authorization 2020-02873, two areas of the adjacent marsh elder stands (*Iva frutescens;* NH State Threatened) were inadvertently impacted, with some of the plants crushed and minor soil disturbance. After consultation with NHDES and NH Natural Heritage Bureau (NHNHB), several steps were prescribed by NHDES to mitigate the impacts. These included hand-raking and mulching the impact areas, erecting construction fencing between the marsh elder stands and the work area as future protection, monitoring the areas for one growing season to determine restoration success, and providing NHDES and NHNHB with documentation of the restoration work and the results of the monitoring effort. The City of Portsmouth completed the restoration work on November 14, 2020 and a letter documenting the work was sent to David Price, NHDES, on December 11, 2020. The City will be monitoring the recovery of the marsh elder during the 2021 growing season and will provide documentation of the monitoring results by October 1, 2021. The letter and accompanying photographs are attached.

Section 8. How Project meets Relevant Standard Conditions and Approval Criteria

Env-WT 307.03 Protection of Water Quality

a) Water quality will be protected during construction using Best Management Practices (BMP) for controlling runoff and stabilizing sediments.
b) Soil stockpiles will be managed to minimize risk of erosion and sedimentation to tidal waters or wetlands. See Exhibit 5, Sheet 99 C-501-P for erosion and sediment controls.
c) All water quality measures are designed to provide maximum protection during storm events during construction, and will be removed from the site when construction is complete, and vegetated areas are stable.
d) During construction, erosion and sedimentation control structures will be inspected daily, and any sediments accumulated behind erosion control structures will be removed and disposed at a stable and suitable site.
e) Substrates exposed during construction will be permanently stabilized within 3 days of completion of final grades.
f) No work requiring a coffer dam or turbidity barrier is proposed in or near open water.
g) The contractor will be required to inspect equipment daily for leaking fuel, oil and hydraulic fluid prior to initiating work. All leaks shall be contained and repaired to prevent fluids from reaching groundwater, surface water or wetlands. Kits for oil and diesel spills will be readily accessible at each work site, and equipment operators will be trained in their use.
h) Equipment shall be staged and refueled in accordance to Env-Wt 307.15.

Env-Wt 307.05 Protection Against Invasive Species

a) through d) do not apply.
e) To prevent the use of soil or seed stock containing nuisance or invasive species, the contractor shall follow the Invasive Plant BMPs.

Env-Wt 307.06 Protection of Rare, Threatened or Endangered Species or Critical Habitat

a) through c) No direct impacts to the marsh elder bordering the southern edge of the island shall occur. All work activities will be directed to avoid and minimize adverse impacts to soils upgradient of the plants. The construction fencing erected in 2020 shall be maintained for the duration of the project to protect the marsh elder and saltmarsh.

Env-Wt 307.07 Consistency with Shoreland Water Quality Protection Act

All project activities shall be conducted in compliance with the applicable requirements of RSA 483-B and Env-Wq 1400 during and after construction.

Env-Wt 307.11 Filling Activities

a) Fill shall be clean sand, gravel, rock, or other material that:
   (1) Meets the project's specifications for its use; and
   (2) Does not contain any material that could contaminate surface or groundwater or otherwise adversely affect the ecosystem in which it is used;.
b) Limits of fill shall be clearly identified prior to commencement of work and controlled in accordance with Env-Wt 307.03 to ensure that fill does not spill over or erode into any area where filling is not authorized
c) Slopes shall be immediately stabilized by a method specified in Env-Wq 1506 or Env-Wq 1508, as applicable, to prevent erosion into adjacent wetlands or surface waters
d) through k) do not apply
l) This permit is requesting approximately 80 cy of fill to be placed in the TBZ, a PRA, to raise the access road to the WWTF as a critical infrastructure project.

Env-Wt 307.12 Restoring Temporary Impacts; Site Stabilization. In addition to all other applicable conditions in this part, the following conditions shall apply to restoring all temporary impacts:

a) Within 3 days of final grading or temporary suspension of work in an area that is in or adjacent to surface waters, all exposed soil areas shall be stabilized by:
   (1) Seeding and mulching, if during the growing season; or
   (2) mulching with tackifiers on slopes less than 3:1 or netting and pinning on slopes steeper than 3:1 if not within the growing season
b) Any seed mix used shall not contain plant species that are exotic aquatic weeds;
c) Mulch used within an area being restored shall be natural straw or equivalent non-toxic, non-seedbearing organic material;
d) If any temporary impact area that is stabilized with seeding or plantings does not have at least 75% successful establishment of wetlands vegetation after 2 growing seasons, the area shall be replanted or reseeded, as applicable;
e) Does not apply.
f) If a temporary impact area is restored by seeding or plantings, then:

(1) The work shall not be deemed successful if the area is invaded by nuisance species such as common reed or purple loosestrife during the first full growing season following the completion of construction; and
(2) The person responsible for the work shall submit a remediation plan to the department that proposes measures to be taken to eradicate nuisance species during this same period;

g) Unless otherwise authorized, any trees cut in an area of authorized temporary impacts shall be cut at ground level with the shrub and tree roots left intact, to prevent disruption to the Tidal Buffer Zone soil structure and to allow stump sprouts to revegetate the work area.

Env-Wt 313.01 Criteria for Approving Standard Permit Applications

a) The department shall not approve an application for a standard permit and issue a permit unless:
(1a) The project has provided a functional assessment and demonstrated there will be no adverse impacts to surrounding wetlands and waters, and the Tidal Buffer Zone.
(1b) Avoidance and minimization criteria have been met to the degree feasible;
(1c) A proposal for appropriate mitigation for impacts in the Tidal Buffer Zone demonstrates that there will be a net benefit for water quality and natural habitats.
(2) Recommended applicable conditions are provided above.
(3) All resource-specific criteria in Env-Wt 600 have been met.
(4) All project-specific criteria in Env-Wt 600 have been met.
(5) The work does not infringe on abutting properties, and provides public parking and recreational trail access.

b) Does not apply.

c) The requirements to avoid and minimize have been met:
(1) There are no practicable alternative that would have a less adverse impact on the area or the environment, and still meet the critical infrastructure needs and public benefits proposed.
(2) The project does not impact State wetlands or waters
(3) The project will enhance water quality and result in a net gain in permeable surfaces and stormwater treatment within the Tidal Buffer Zone.

EXHIBIT 8

PERMITTEE RESPONSIBLE MITIGATION PROJECT WORKSHEET

PERMITTEE RESPONSIBLE MITIGATION PROJECT WORKSHEET

Water Division/Land Resources Management
Wetlands Bureau

Check the Status of your Application

RSA/Rule: 482-A: / Env-Wt 800

SECTION 1. PROPOSED PERMITTEE RESPONSIBLE MITIGATION PROJECT TYPE		
UPLAND BUFFER PRESERVATION: ☒ AQUATIC RESOURCE RESTORATION: ☒ MITIGATION PAYMENT: ☐		
SECTION 2. PROPOSED MITIGATION PROJECT LOCATION INFORMATION (if applicable)		
STREET/ROAD: Peirce Island Road	TOWN/CITY: Portsmouth	TAX MAP/LOT #: 208/1
SECTION 3. APPLICANT INFORMATION		
APPLICANT NAME: City of Portsmouth		
APPLICANT MAILING ADDRESS: 680 Peverly Hill Road		
CONTACT INDIVIDUAL: Terry Desmarais, PE		
DAYTIME TELEPHONE: (603) 766-1421	EMAIL (IF ANY): tldesmarais@cityofportsmouth.com	
SECTION 4. RESOURCE WORKSHEET SUMMARY		
AQUATIC RESOURCES INVOLVED IN PROJECT: See Table Below. **N/A. See Text Below**.		
TOTAL PRESERVATION PROPOSED: Upland: Acres Wetland: Acres		
TOTAL LENGTH OF STREAM ON PROPERTY: Linear Feet % having 100-ft wooded zone: in direction % upland: in direction		
# CONFIRMED VERNAL POOLS:	# POTENTIAL VERNAL POOLS:	
AREA OF WETLAND RESTORATION PROPOSED: acres	AREA OF WETLAND CREATION PROPOSED: acres	
AREA OF WETLAND ENHANCEMENT PROPOSED: acres	AREA OF UPLAND ENHANCEMENT PROPOSED: 0.20 acres	
SECTION 5. BRIEF NARRATIVE DESCRIBING PROPOSED PERMITTEE RESPONSIBLE MITIGATION		
See Text Below, and Exhibit 7 - Project Narrative		
SECTION 6. SIGNATURE AND CERTIFICATION		
- I hereby certify that: ▪ The information contained in or otherwise submitted with this application is true, complete, and not misleading to the best of my knowledge and belief; ▪ **I understand that:** - Submitting false, incomplete, or misleading information is grounds for denying the application or revoking any award of ARM Funds that is made based on such information; and - I am subject to the penalties for making unsworn false statements specified RSA 641:3 or any successor New Hampshire statute.		
SIGNATURE: _____	**DATE:** 05 / 14 / 21	

Lori.Sommer@des.nh.gov or (603) 271-4059
NHDES Wetlands Bureau, Concord, NH 03303-0095
www.des.nh.gov

Summary of Aquatic Resource(s) Involved in Project

The following information is required to be provided about the aquatic resources found on the proposed impact site and the mitigation site. New Hampshire RSA 482-A:3 requires a wetland permit for any proposed project that involves dredging and filling wetlands or impacts to the bed or bank surface waters such as rivers and streams. Before NHDES will issue a permit, applicants must demonstrate that their project proposal will avoid adverse impacts to aquatic resources and will minimize and mitigate those impacts that are unavoidable. When impacts to aquatic resources are unavoidable, applicants must identify the wetland and stream(s) resource types that will be lost during the development of the project. Identifying the functions and values of the aquatic resource that will be lost at the project site better ensures that they can be recreated and transferred to the proposed mitigation site. Please use the table formats provided below to document all aquatic resources types on the impact site and the mitigation site. A separate table should be prepared for each site. *Additional rows may be required for projects proposing impacts to multiple resource types.*

Wetland Resources: Wetlands shall be classified by US Fish and Wildlife Service Manual WS/OBS-79/31 Classification of Wetlands and Deepwater Habitats of the United States, Cowardin et al, 1979, reprinted 1992.

Stream Resources: For permittee responsible mitigation projects to restore or improve stream systems, the streams on the project site shall be reviewed and the following information collected to the best extent possible:

Stream order according to New Hampshire Hydrography Dataset (NHHD)	Geomorphology including degradation
Rosgen stream type	Position within the surrounding landscape
Impacts to upstream and downstream flooding	Connectivity improvement for aquatic organism passage
Stream bed materials	Fisheries presence
Sediment Transport capacity	Characterization of the adjacent buffers in terms of vegetative coverage
Channel form	Floodplain connectivity

These general principals are described within the New Hampshire Stream Crossing Guidelines, University of New Hampshire, May 2009.

Wetland Functions & Values: A wetland evaluation is the process of determining the values of a wetland based on an assessment of the functions it performs. The evaluation of wetland functions and values should be determined through use of the *Method for Inventorying and Evaluating Freshwater Wetlands in New Hampshire*, 2015 edition (2015 NH Method) –*OR*– U.S. Army Corps of Engineers (USACE) New England District *Highway Methodology Workbook Supplement*, 1999 edition (1999 US ACE Highway Workbook Supplement). The evaluation should focus on the following:

Ecological Integrity (EI), Wetland-Dependent Wildlife Habitat (WH), Fish and Aquatic Habitat (FH), Scenic Quality (SQ), Educational Potential (EP), Wetland-based Recreation (WR), Flood Storage (FS), Groundwater (GW), Sediment Trapping (ST), Nutrient Trapping/Retention/Transformation (NT), Shoreline Anchoring (SA), Noteworthiness (NW).

Secondary Impacts: The USACE federal mitigation guidance should be consulted if the project involves conversion of forested wetlands to scrub-shrub or emergent wetlands, cutting of riparian buffer and impacts within the buffer to vernal pools.

WETLAND/STREAM RESOURCE SUMMARY

Wetland ID or Stream Number	**Cowardin Wetland Class** (list all that apply) **or Stream Type**	**Principal Functions & Values**	**Project Impacts**						**Vernal Pool Present? ID or Number**	**Other Comments**
			Permanent Wetland (sq.ft.)	**Permanent Stream Bank** (lin.ft.)			**Temporary** (sq.ft.)	**Secondary** (sq.ft.)		
				Bank Left	Bank Right	Channel				

MITIGATION RESOURCE SUMMARY

Wetland ID or Stream Number	**Cowardin Wetland Class** (list all that apply) **or Stream Type**	**Principal Functions & Values**	**Wetland/Stream Resources**			**Vernal Pool Present? ID or Number**	**Other Comments**
			Area of Wetland (sq.ft. or acres)	**Streams** (lin.ft.)			
				Length on Property	% having 100 foot wooded zone		

Peirce Island Wastewater Treatment Facility

Mitigation for impacts in the Undisturbed Tidal Buffer Zone

Mitigation for 890 sf of permanent impact to Undisturbed TBZ is provided by re-establishing 9,730 sf of native grass and shrub habitat (Exhibit 5, Sheet C-001 and details). All other permanent impacts are associated with modifying the road and improving the parking area within Previously Developed TBZ. Additional water quality benefits will be gained by converting approximately 20,020 sf of impervious surface in the laydown/ parking area to grassed permeable substrates that will both infiltrate runoff, and remove nutrients and sediment from sheetflow prior to entering the Piscataqua River. On the north side of the road, the existing path and vegetation will remain intact, and additional stone and vegetation will be added to buffer the road from scour and wave action.

The re-establishment of native species around the perimeter of the parking area will enhance water quality treatment of sheetflow from the parking area, thereby buffering the salt marsh and Piscataqua River from any surplus nutrients and sediments. Once final grading is completed, the enhancement area will receive a minimum of 6 inches of loam, and planted with a mix of the following shrubs: bayberry (*Myrica pennsylvanica*), beach plum (*Prunus maritimus*), and black chokeberry (*Aronia melanocarpa*) (See landscaping details in Exhibit 5, Sheets L-001 and L-002). All of these species are native to the area and tolerant of periodic inundation by salt water, therefore should be appropriate for this site. Once planted, the area will be seeded using a native upland conservation mix. The City agrees to monitor the site for 3 years to evaluate the stability of the area and to ensure at least 80% of the plantings or their ecological equivilents have successfully established.

Mitigation for Impacts to Marsh Elder

During installation of the temporary sewer force mains in October, 2020 under Emergency Authorization 2020-02873, two areas of the adjacent marsh elder stands (*Iva frutescens;* NH State Threatened) were inadvertently impacted, with some of the plants crushed and minor soil disturbance. After consultation with NHDES and NH Natural Heritage Bureau (NHNHB), several steps were prescribed by NHDES to mitigate the impacts. These included hand-raking and mulching the impact areas, erecting construction fencing between the marsh elder stands and the work area as future protection, monitoring the areas for one growing season to determine restoration success, and providing NHDES and NHNHB with documentation of the restoration work and the results of the monitoring effort. The City of Portsmouth completed the restoration work on November 14, 2020 and a letter documenting the work was sent to David Price, NHDES, on December 11, 2020. The City will be monitoring the recovery of the marsh elder during the 2021 growing season and will provide documentation of the monitoring results by October 1, 2021. The letter and accompanying photographs are attached.

PUBLIC WORKS DEPARTMENT

CITY OF PORTSMOUTH
680 Peverly Hill Road
Portsmouth N.H. 03801
(603) 427-1530 FAX (603) 427-1539

December 11, 2020

Via Email
David Price
Wetlands Bureau, Land Resources Manager
Water Division, NH Department of Environmental Services
222 International Drive – Suite 175
Portsmouth, NH 03801

Re: Marsh Elder Restoration
Peirce Island, Portsmouth, New Hampshire

Dear Mr. Price:

On October 23, 2020 there was damage to some Marsh Elder plants on Peirce Island during installation of a temporary sewer force main. The temporary force main was installed on the ground as an emergency replacement to a leaking 24-inch sewer force main between the Mechanic Street Wastewater Pump Station and the Peirce Island Wastewater Treatment Facility. On November 2, 2020 the NH Wetlands Bureau outlined steps the City of Portsmouth needed to take to restore the Marsh Elder population on Peirce Island. The steps are outlines below:

1. Hand rake the existing ruts and place either weed-free straw or saltmarsh hay over exposed soil areas.
2. Appropriately fence (construction fence) off the existing populations to minimize any further impacts during construction.
3. Monitor the area to determine restoration success for a minimum of one (1) growing season.
4. Please provide DES and NHB with photographic documentation within 30 days of completion of Items 1 and 2 above.
5. By October 1, 2021, please provide DES and NHB with photographic documentation of the area to determine restoration success and the possible need for additional monitoring.

This letter is a formal notification of the completion of Items 1 and 2, as well as providing the photographic documentation stated in Item 4. The ruts were raked out and weed-free straw was installed over the exposed soil on November 13, 2020. The installation of construction fence to protect the Marsh Elder was completed on December 7, 2020. Please see Attachment A: Locations of Damaged Marsh Elder Plants, Attachment B: Weed-Free Straw Installation and Attachment C: Construction Fencing for photographic documentation.

If you need any more information or have any questions please contact me by phone at 603-766-1421 or by email at tldesmarais@cityofportsmouth.com.

Sincerely,

Terry Desmarais
City Engineer
Enclosures

ec: Amy Lamb, Natural Heritage Bureau
Peter Britz, Environmental Planner
Zachary Cronin, Assistant City Engineer
James Tow, General Foreman Utilities

Attachment A: Locations of Damaged Marsh Elder Plants

Attachment B: Weed-Free Straw Installation

Photo 1: Straw Restoration at Area A

Photo 2: Straw Restoration at Area A

Photo 3: Staw Restoration in Area B

Photo 4: Straw Restoration in Area B

Attachment C: Construction Fencing

Photo 1: Construction Fencing Area A

Photo 2: Construction Fencing Area B

Photo 3: Construction Fencing Along the Length of Temporary Sewer Force Main

EXHIBIT 9

ADDITIONAL RESOURCE INFORMATION

(TREE INVENTORY REPORT)

Shoreland Tree Inventory Report
Peirce Island Wastewater Treatment Facility
City of Portsmouth, NH

Prepared For:
Altus Engineering
133 Court Street
Portsmouth, NH 03801

Prepared On:
April 12, 2021

Prepared By:
Normandeau Associates, Inc.
25 Nashua Road
Bedford, NH 03110

www.normandeau.com

Table of Contents

List of Tables

Introduction

Normandeau Associates, Inc. (Normandeau), completed two tree inventories in the vicinity of the Pierce Island Wastewater Treatment Facility (WWTF) on Peirce Island in Portsmouth, New Hampshire. The first was performed to document existing vegetative conditions within the protected shoreland area by the proposed recreational trail along the eastern edge of the island, following a currently existing unofficial path. A second tree inventory assessment was performed in support of the replacement of the sewer force mains and water line on the southwestern edge of Peirce Island. The reference line for each inventory, in both cases the HOTL, was established on July 3, 2013 and surveyed by Doucet Survey, Inc. This line was verified during both the April 23, 2020 and January 14, 2021 field visits. This report outlines the results of these tree inventories, methods used, and the basic regulatory requirements associated with the removal of vegetation from the site.

Vegetation is an important component in preserving and protecting water quality. Well vegetated shorelands that are comprised of native trees, shrubs, and ground cover provide significant benefits in terms of stormwater runoff. The Shoreland Water Quality Protection Act (SWQPA), RSA 483-B, serves to protect the water quality of New Hampshire's surface waters by managing the disturbance of shoreland areas. The protected shoreland area includes lands located within 250 feet from the reference line of public waters. The reference line for coastal waters is the highest observable tide line (HOTL), which means a line defining the furthest landward limit of tidal flow. The HOTL was previously delineated by Normandeau.

The SWQPA attempts to maintain a shoreland buffer of natural vegetation to reduce the transportation of excess nutrients, sediments, and other pollutants into waterbodies. The SWQPA protects a 150-foot wide vegetated buffer adjacent to public waters such as lakes, ponds, rivers, and tidal waters. The vegetated buffer area is divided into two zones: the waterfront buffer and the natural woodland buffer. The waterfront buffer encompasses the first 50 feet beginning at the reference line, and the natural woodland buffer includes the area between 50 feet and 150 feet from the reference line.

Trees and saplings can be removed from the protected shoreland area, though different vegetation removal limitations apply within the two zones described above. Removal of trees and saplings within the waterfront buffer must be performed in accordance with a grid and point system. Removal of trees and saplings within the natural woodland buffer must comply with the unaltered state requirement. There are no limitations on tree removal in areas extending beyond 150 feet from the reference line.

Most of the work associated with the recreational trail and pipeline projects will occur in the 100-foot tidal buffer zone (TBZ), most of which was previously developed. However, approximately one-third of the pipeline replacement work falls outside of the TBZ but lies within the natural woodland buffer portion of the protected shoreland zone.

Methods

Normandeau wetland scientists performed the tree inventories on April 23, 2020 and January 14, 2021. All trees and saplings were included in the inventories, as well as large shrub species as measured at a height of 4.5 feet above the ground (on the uphill side). Vegetation was located using

a differential GPS unit capable of sub-meter accuracy. Each specimen was identified to the species level, if possible, and a diameter at breast height (DBH) measurement recorded. When a cluster of trees or saplings were growing from one individual plant, a diameter was recorded for each stem within the grouping. In addition to performing the inventory of individual trees and saplings, a general description of understory vegetation within the survey areas was also documented.
After conducting the field inventories, trees and saplings within the waterfront buffer (first 50 feet beginning at the reference line) were assigned a score based on DBH. Tree and sapling scores were calculated using the following guidelines:

- Diameter of one to three inches = 1 point
- Diameter greater than 3 inches and including 6 inches = 5 points
- Diameter greater than 6 inches and including 12 inches = 10 points
- Diameter greater than 12 inches = 15 points

For specimens with multiple stems greater than 1 inch, a diameter was recorded for each individual stem as described above. To calculate the score for plants with multiple stems, the score for each stem was determined, and then a sum of all scores for the plant resulted in a total score for that specimen. For example, a plant with three stems measuring diameters of 3 inches (1 point), 5 inches (5 points), and 6 inches (5 points) was assigned a total score of 11 points.

To complete each tree inventory assessment, the waterfront buffer in each surveyed area was divided into 25-foot by 50-foot grid segments. The purpose of the grid segments was to determine the tree and sapling score within each grid. Under the SWQPA, a minimum tree and sapling score of 25 points must be maintained within each grid segment. A general characterization of the percent shrub cover within the waterfront buffer was also recorded during each survey. This included an account of dominant species as well as the presence of any invasive species that were not recorded during the tree inventories.

Results

The results of the tree inventories are reported separately as the Trail inventory conducted on April 23, 2020 and the Pipeline tree inventory conducted on January 14, 2021. A total of 25 and 81 grid segments were located in the Trail and Pipeline Survey areas, respectively.

Trail Survey

The overall vegetative site conditions in the Trail Survey area at the eastern end of Peirce Island consisted of a relatively densely spaced canopy of predominantly deciduous trees with significant occurrence of Asian bittersweet (*Celastrus orbiculatus*) in various portions of the site. The tree species observed within the 50-foot waterfront buffer are displayed in Table 1 below. The most dominant species within the waterfront buffer were staghorn sumac (*Rhus hirta*) and black cherry (*Prunus serotina*). A total of 60 stems of staghorn sumac were measured within the waterfront buffer with an average

diameter of 2.5 inches. A total of 54 stems of black cherry were documented within the waterfront buffer with an average diameter of 3.8 inches.

Table 1. Trees and sapling inventoried within the Trail Survey waterfront buffer.

Scientific Name	Common Name
Amelanchier sp.	Serviceberry
Betula papyrifera	Paper birch
Betula populifolia	Gray birch
Juniperus virginiana	Eastern red cedar
Malus sp.	Apple
Pinus strobus	Eastern white pine
Populus sp.	Aspen
Prunus serotina	Black cherry
Quercus rubra	Northern red oak
Rhus hirta	Staghorn sumac
Sorbus americana	American mountain ash

As detailed in the methods section of this report, the waterfront buffer was divided into 25-foot by 50-foot grid segments, with a total of 25 grids located in the Trail Survey area. The scores within these grid segments ranged from a low of 0 points in eight grids to a high of 81 points in grids 8 and 9 (Table 2). All grid segments and the location of each tree and shrub inventoried are depicted in the Trail Survey Tree Inventory Map provided in Appendix A. A complete table of the identified trees and shrubs for the Trail Survey is provided in Appendix B, Table 6.

Table 2. Protected Waterfront Buffer Grid Segment scores in the Trail Survey area. Bolded values do not meet the minimum 25 point score specified in RSA 483. Shaded segments are those whose score will be lowered below the minimum 25 point score due to tree removal necessary for the work.

Segment	Score	Shrub Cover	Score Post-Construction
1	52	90	52
2	62	90	56
3	47	90	35
4	32	90	29
5	29	90	**2**
6	35	90	35
7	33	90	32
8	81	90	70
9	81	50	79
10	**6**	40	**6**
11	**1**	10	**1**
12	**0**	0	**0**
13	**0**	10	**0**
14	**11**	20	**11**
15	**8**	20	**8**
16	**3**	15	**3**
17	**12**	15	**12**
18	**0**	15	**0**
19	**0**	10	**0**
20	**6**	10	**6**
21	**10**	5	**10**
22	**0**	0	**0**
23	**0**	0	**0**
24	**0**	0	**0**
25	**0**	0	**0**

Understory woody vegetation was estimated through the Trail Survey area. The northern end of survey area exhibits an understory consisting of sprouting deciduous tree saplings (many small staghorn sumac and black cherry), dense patches of the invasive Asian bittersweet. The understory

in this portion of the project area is approximately 90% cover. Vegetative cover within the eastern project area decreases southward and is 0% in certain sections (Table 2).

Although it was too early in the season to fully characterize the herbaceous vegetation, outside of the WWTF, it was generally undisturbed and unmaintained, and inside the WWTF footprint it was generally absent, replaced by constructed materials and fencing.

Pipeline Survey

The overall vegetative site conditions in the Pipeline Survey area consisted of small stands with relatively densely spaced canopy of predominately deciduous trees interrupted by stretches of open grassy areaThe tree species observed within the 50-foot waterfront buffer are displayed in Table 3 below. The most dominant species within the waterfront buffer were staghorn sumac (*Rhus hirta*) and crabapple (*Malus* sp.). A total of 105 stems of staghorn sumac were measured within the waterfront buffer with an average diameter of 1.3 inches. A total of 66 stems of crabapple were documented within the waterfront buffer with an average diameter of 2.6 inches.

Table 3. Trees and sapling inventoried within the Pipeline Survey waterfront buffer.

Scientific Name	Common Name
Abies balsamea	Balsam fir
Acer platanoides	Norway maple
Acer rubrum	Red maple
Amelanchier sp.	Serviceberry
Cornus florida	Dogwood
Juniperus virginiana	Eastern red cedar
Malus sp.	Apple
Myrica pensylvanica	Bayberry
Populus tremoloides	Quaking aspen
Prunus serotina	Black cherry
Quercus palustris	Pin oak
Quercus rubra	Northern red oak
Rhus hirta	Staghorn sumac
Sorbus americana	American mountain ash
N/A	Unknown

The scores within the 81 grid segments in the Pipeline Survey area ranged from a low of 0 points in 36 grids to a high of 98 points in grid 67 (Table 4). All grid segments and the location of each tree and shrub inventoried are depicted in the Pipeline Survey Tree Inventory Map provided in Appendix A. A complete table of the identified trees and shrubs for the Pipeline Survey is provided in Appendix B, Table 6.

Understory vegetation was estimated through the Pipeline Survey area. The western end exhibits an understory consisting of open grass and sparsely populated deciduous tree saplings (primarily small staghorn sumac). From Grids 15 to 23 there is little to no vegetative cover due to the boat ramp, parking area and paved road. In the central and eastern portions of the Pipeline Survey area (Grids 24 to 81) vegetative cover returns, with stretches of shrub cover ranging from 5 to 90%, again primarily small staghorn sumac, interspersed with stretches of open grassy area (Table 4).

Table 4. Protected Waterfront Buffer Grid Segment scores in the Pipeline Survey area. Bolded values do not meet the minimum 25 point score specified in RSA 483. Shaded segments are those whose score will be lowered below the minimum 25 point score due to tree removal necessary for the work.

Segment	Score	Shrub Cover	Score Post-Construction
1	**6**	0	**6**
2	59	0	59
3	30	0	30
4	**0**	5	**0**
5	28	5	28
6	**13**	5	**13**
7	**11**	5	**11**
8	75	5	75
9	48	5	48
10	**21**	5	**21**
11	50	5	50
12	**0**	0	**0**
13	**0**	0	**0**
14	30	0	30
15	**0**	0	**0**
16	**0**	0	**0**
17	**0**	0	**0**
18	**0**	0	**0**
19	**0**	0	**0**
20	**0**	0	**0**
21	**0**	0	**0**
22	**0**	0	**0**
23	**0**	0	**0**
24	35	0	35
25	**0**	5	**0**
26	**1**	5	**1**
27	31	5	31
28	**0**	0	**0**
29	32	25	32
30	51	25	51
31	27	25	27
32	**16**	25	**16**
33	36	25	36
34	36	25	36
35	**19**	25	**19**
36	**1**	25	**1**
37	**8**	75	**8**
38	**16**	75	**16**
39	**0**	75	**0**
40	**21**	75	**21**
41	35	75	35
42	25	75	25
43	**15**	75	**15**
44	25	75	25
45	**10**	75	**10**
46	**16**	75	**16**
47	**17**	75	**17**
48	**22**	50	**22**
49	**21**	50	**21**
50	**0**	0	**0**
51	**0**	0	**0**
52	**0**	0	**0**
53	**0**	0	**0**
54	33	25	33
55	**0**	0	**0**
56	**0**	0	**0**
57	**23**	30	**23**
58	56	30	56
59	25	30	25
60	**0**	0	**0**
61	**0**	0	**0**
62	**10**	0	**0**
63	**0**	0	**0**
64	**0**	0	**0**
65	**0**	0	**0**
66	**8**	35	**8**
67	98	35	98
68	**6**	35	**6**
69	29	35	29
70	**11**	35	**11**
71	**6**	35	**6**
72	**0**	0	**0**
73	**0**	0	**0**
74	**0**	0	**0**
75	**0**	0	**0**
76	**0**	0	**0**
77	**0**	0	**0**
78	**0**	0	**0**
79	**2**	0	**2**
80	**0**	0	**0**
81	27	90	27

The portion of the work area for the pipeline replacement that falls outside of the TBZ but within the natural woodland buffer consists of Peirce Island Road and a dirt and gravel parking area with grass medians associated with a public boat ramp. This area was cleared of trees and developed prior to July 1, 2008 and has been maintained as such since its development.

Discussion

As much of the total project area lies within the 100-ft tidal buffer zone (TBZ) (Figure 1 and 2), wetland regulations take precedence over much of the project area.

For the recreational trail, the majority of the work is proposed adjacent to the current footprint of the WWTF plant (Segments 10-25). No additional clearing will be required in those segments. For Segments 2-9, the trail will follow an existing informal path which will be graded and widened. In those segments, the resulting segment scores mostly do not drop below 25, with the exception of Segment 5. For this segment, impacts are mitigated by restoring pervious conditions and native shrub cover to over 9,000 SF in the parking area.

For the pipeline project, the majority of the work falls within the roadbed of Peirce Island Road, and will not require clearing natural vegetation. Segment 35 contains a tree located within the planned area of disturbance, specifically a laydown/staging area. Care will be taken to not remove or damage this tree. In Segment 62 a tree is located directly adjacent the area of disturbance for the pipeline and likely will need to be removed. This tree will be replaced at the end of the project. A few other individual trees may need to be cut outside of the waterfront buffer, but the City is committed to minimizing the need for impacting trees and replacing those that are unavoidably impacted. See construction plans for tree protection and planting details.

Appendix A – Tree Inventory Map

Project No: 23264.002

Drawn By: eolliver

Date : 4/9/2021

Tree DBH

- 1 to 3 in.
- >3 to 6 in.
- >6 to 12 in.
- >12 in.
- Limit of Disturbance

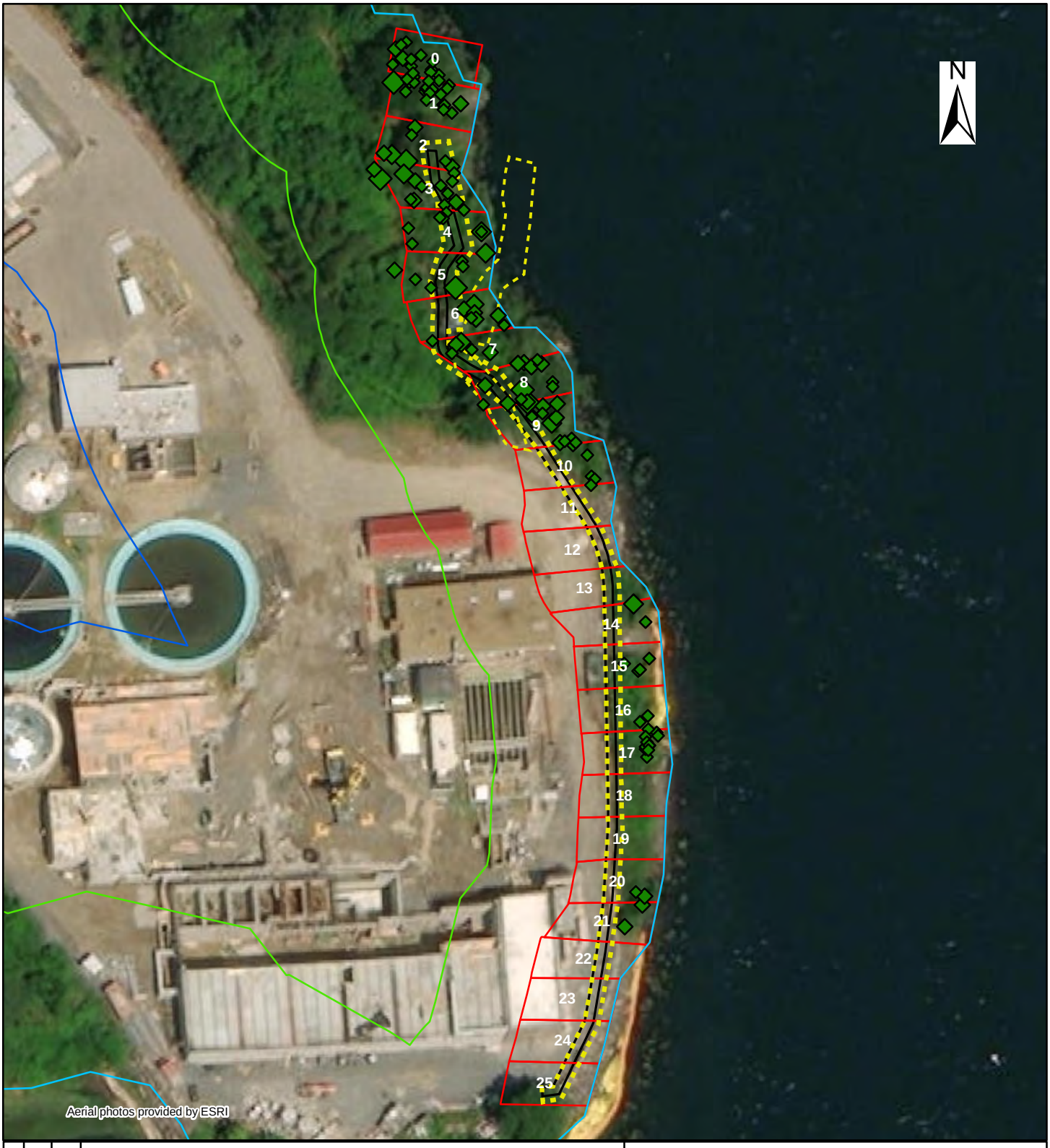
- 100ft Tidal Buffer
- 250ft Shoreland Buffer
- Highest Observable Tide Line
- Shoreland 25'x50' Grid

0 50 100 Feet

Pipeline Tree Inventory
Portsmouth Wastewater Treatment Facility
Peirce Island
Portsmouth, NH

NORMANDEAU ASSOCIATES
Environmental Consultants
25 Nashua Road Bedford, NH 03110
(603) 472-5191 www.normandeau.com

Path: J:\Projects\Portsmouth Wastewater Treatment Facility_Pierce Island\MXD\Pipeline_TreeInventory_040921.mxd



Project No: 23264.002

Drawn By: eoliver

Date : 4/9/2021

Tree DBH

- 1 to 3 in.
- >3 to 6 in.
- >6 to 12 in.
- >12 in.
- Limit of Disturbance
- 100ft Tidal Buffer
- 250ft Shoreland Buffer
- Highest Observable Tide Line
- Proposed Trail
- Shoreland 25'x50' Grid

0 50 100 Feet

Trail Tree Inventory
Portsmouth Wastewater Treatment Facility
Peirce Island
Portsmouth, NH

NORMANDEAU ASSOCIATES
Environmental Consultants
25 Nashua Road Bedford, NH 03110
(603) 472-5191 www.normandeau.com

Path: J:\Projects\Portsmouth Wastewater Treatment Facility_Pierce Island\MXD\Trail_TreeInventory_040921.mxd

Appendix B – Tree Inventory Data

Table 5. Trees and shrubs identified in Trail Survey area. Trees to be cut are shaded.

Tree ID	Grid	Species	Stem Diameter (in.)					Tree and Sapling Score
			1	2	3	4	5	
3	1	*Rhus hirta*	1	-	-	-	-	1
4	1	*Rhus hirta*	1	-	-	-	-	1
5	1	*Rhus hirta*	1	-	-	-	-	1
6	1	*Prunus serotina*	2	-	-	-	-	1
7	1	*Prunus serotina*	3	-	-	-	-	1
8	1	*Prunus serotina*	1	-	-	-	-	1
9	1	*Rhus hirta*	3	-	-	-	-	1
10	1	*Prunus serotina*	1	1	-	-	-	2
11	1	*Prunus serotina*	1	1	1	1	1	5
12	1	*Rhus hirta*	1	-	-	-	-	1
13	1	*Prunus serotina*	1	-	-	-	-	1
16	1	*Prunus serotina*	2	-	-	-	-	1
17	1	*Rhus hirta*	3	-	-	-	-	1
18	1	*Rhus hirta*	1	-	-	-	-	1
19	1	*Rhus hirta*	1	-	-	-	-	1
20	1	*Rhus hirta*	1	1	-	-	-	2
21	1	*Prunus serotina*	3	-	-	-	-	1
22	1	*Prunus serotina*	4	3	2	1	-	8
58	1	*Quercus rubra*	20	-	-	-	-	15
59	1	*Prunus serotina*	2	1	-	-	-	2
72	1	*Rhus hirta*	1	1	-	-	-	2
73	1	*unknown shrub*	1	1	-	-	-	2
1	2	*Prunus serotina*	5	-	-	-	-	5
2	2	*Rhus hirta*	1	-	-	-	-	1
23	2	*Rhus hirta*	2	-	-	-	-	1
24	2	*Prunus serotina*	4	-	-	-	-	5
74	2	*Malus* sp.	4	-	-	-	-	5
77	2	*Betula populifolia*	10	-	-	-	-	10
78	2	*Betula populifolia*	16	12	10	-	-	35
25	3	Unidentified	3	-	-	-	-	1

Tree ID	Grid	Species	Stem Diameter (in.)					Tree and Sapling Score
			1	2	3	4	5	
26	3	*Malus* sp.	1	-	-	-	-	1
27	3	*Rhus hirta*	1	-	-	-	-	1
28	3	*Rhus hirta*	1	1	-	-	-	2
29	3	*Sorbus americana*	4	-	-	-	-	5
79	3	*Betula populifolia*	5	7	3	3	2	18
80	3	*Pinus strobus*	5	-	-	-	-	5
81	3	*Pinus strobus*	2	-	-	-	-	1
82	3	*Amelanchier* sp.	3	4	2	2	-	8
83	3	*Amelanchier* sp.	2	2	-	-	-	2
88	3	*Rhus hirta*	2	-	-	-	-	1
92	3	*Prunus serotina*	2	2	-	-	-	2
84	4	*Rhus hirta*	2	2	-	-	-	2
85	4	*Prunus serotina*	3	-	-	-	-	1
89	4	*Rhus hirta*	2	-	-	-	-	1
90	4	*Rhus hirta*	1	-	-	-	-	1
91	4	*Rhus hirta*	1	-	-	-	-	1
93	4	*Sorbus americana*	3	2	-	-	-	6
94	4	*Juniperus virginiana*	7	-	-	-	-	10
95	4	*Juniperus virginiana*	7	-	-	-	-	10
30	5	*Rhus hirta*	1	-	-	-	-	1
31	5	*Rhus hirta*	1	-	-	-	-	1
32	5	*Rhus hirta*	1	-	-	-	-	1
87	5	*Rhus hirta*	3	-	-	-	-	1
96	5	*Prunus serotina*	14	8	-	-	-	25
98	6	*Prunus serotina*	5	3	-	-	-	6
99	6	*Prunus serotina*	8	-	-	-	-	10
100	6	*Prunus serotina*	4	-	-	-	-	5
101	6	*Prunus serotina*	4	-	-	-	-	5
102	6	*Prunus serotina*	2	-	-	-	-	1
103	6	*Prunus serotina*	4	-	-	-	-	5

Tree ID	Grid	Species	Stem Diameter (in.)					Tree and Sapling Score
			1	2	3	4	5	
104	6	*Sorbus americana*	3	1	1	-	-	3
97	7	*Rhus hirta*	2	-	-	-	-	1
105	7	*Betula populifolia*	2	-	-	-	-	1
106	7	*Betula populifolia*	4	-	-	-	-	5
107	7	*Betula populifolia*	4	7	4	-	-	20
108	7	*Betula popuifolia*	2	-	-	-	-	1
109	7	*Sorbus americana*	4	-	-	-	-	5
33	8	*Betula papyrifera*	5	-	-	-	-	5
35	8	*Populus* sp.	5	-	-	-	-	5
36	8	*Prunus serotina*	3	-	-	-	-	1
37	8	*Prunus serotina*	19	19	-	-	-	30
39	8	*Populus* sp.	5	-	-	-	-	5
110	8	*Rhus hirta*	1	2	3	4	2	9
111	8	*Rhus hirta*	2	4	-	-	-	6
112	8	*Rhus hirta*	5	-	-	-	-	5
113	8	*Rhus hirta*	5	2	-	-	-	6
114	8	*Rhus hirta*	4	-	-	-	-	5
115	8	*Prunus serotina*	2	2	-	-	-	2
116	8	*Prunus serotina*	3	-	-	-	-	1
117	8	*Amelanchier*	2	-	-	-	-	1
38	9	*Prunus serotina*	19	22	-	-	-	30
118	9	*Sorbus americana*	2	4	3	-	-	7
119	9	*Populus* sp.	7	4	-	-	-	15
120	9	*Populus* sp.	5	-	-	-	-	5
121	9	*Amelanchier* sp.	4	-	-	-	-	5
122	9	*Prunus serotina*	1	-	-	-	-	1
123	9	*Populus* sp.	2	-	-	-	-	1
124	9	*Populus* sp.	2	-	-	-	-	1
125	9	*Prunus serotina*	4	1	-	-	-	6

Tree ID	Grid	Species	Stem Diameter (in.)					Tree and Sapling Score
			1	2	3	4	5	
126	9	*Prunus serotina*	1	1	-	-	-	2
128	9	*Prunus serotina*	1	1	-	-	-	2
129	9	*Sorbus americana*	4	2	-	-	-	6
41	10	*Prunus serotina*	3	-	-	-	-	1
42	10	*Rhus hirta*	3	-	-	-	-	1
127	10	*Prunus serotina*	1	2	-	-	-	2
130	10	*Prunus serotina*	2	2	-	-	-	2
40	11	*Prunus serotina*	1	-	-	-	-	1
131	14	*Rhus hirta*	10	-	-	-	-	10
132	14	*Rhus hirta*	2	-	-	-	-	1
43	15	*Rhus hirta*	3	-	-	-	-	5
44	15	*Rhus hirta*	3	-	-	-	-	1
45	15	*Rhus hirta*	1	-	-	-	-	1
46	15	*Rhus hirta*	2	-	-	-	-	1
47	16	*Juniperus virginiana*	2	-	-	-	-	1
48	16	*Rhus hirta*	3	-	-	-	-	1
49	16	*Rhus hirta*	2	-	-	-	-	1
50	17	*Rhus hirta*	3	-	-	-	-	1
51	17	*Rhus hirta*	3	-	-	-	-	1
52	17	*Rhus hirta*	2	-	-	-	-	1
53	17	*Rhus hirta*	1	-	-	-	-	1
54	17	*Rhus hirta*	1	-	-	-	-	1
55	17	*Rhus hirta*	1	-	-	-	-	1
56	17	*Rhus hirta*	1	-	-	-	-	1
57	17	*Rhus hirta*	2	-	-	-	-	1
133	17	*Rhus hirta*	2	1	-	-	-	2
134	17	*Rhus hirta*	2	1	-	-	-	2
135	20	*Juniperus virginiana*	1	-	-	-	-	1
136	20	*Quercus rubra*	4	-	-	-	-	5
137	21	*Quercus rubra*	6	-	-	-	-	5
138	21	*Quercus rubra*	6	-	-	-	-	5

Table 6. Trees and shrubs identified in Pipeline Survey area.

Tree ID	GRID	Species	Stem Diameter (in.)					Tree and Sapling Scores
			1	2	3	4	5	
313	1	*Abies balsamea*	1	-	-	-	-	1
314	1	Unknown shrub	1.5	1.4	1.1	1.1	1	5
309	2	*Malus* sp.	11	2.5	1.5	-	-	12
311	2	*Acer platanoides*	11.1	10.9	10.3	9.5	-	40
312	2	*Betula populifera*	11.9	3.4	-	-	-	15
315	2	Unknown	2.5	-	-	-	-	1
316	2	Unknown	1.6	-	-	-	-	1
310	3	Prunus serotina	8.1	7.8	7.4	-	-	30
298	5	*Malus* sp.	3.2	-	-	-	-	5
301	5	*Malus* sp.	2.6	-	-	-	-	1
302	5	*Juniperus virginiana*	2.1	-	-	-	-	1
297	5	*Acer platanoides*	6	9	-	-	-	15
299	5	*Acer platanoides*	3.6	-	-	-	-	5
300	5	*Acer platanoides*	2.4	-	-	-	-	1
293	6	*Malus* sp.	1.5	-	-	-	-	1
295	6	*Malus* sp.	1.5	1.3	-	-	-	2
294	6	*Acer platanoides*	7.3	-	-	-	-	10
296	7	*Juniperus virginiana*	-	3	-	-	-	1
292	7	*Quercus rubra*	8	-	-	-	-	10
287	8	*Prunus serotina*	5.4	-	-	-	-	5
285	8	*Malus* sp.	3.1	1.3	1.2	3.2	-	12
291	8	*Acer platanoides*	8	-	-	-	-	10
288	8	*Acer platanoides*	5.6	-	-	-	-	5
289	8	*Acer platanoides*	5.6	5.4	10	10	-	30
290	8	*Acer platanoides*	2.1	-	-	-	-	1
281	8	*Populus tremoloides*	3	-	-	-	-	1
282	8	*Populus tremoloides*	5.2	-	-	-	-	5
283	8	*Populus tremoloides*	4.2	-	-	-	-	5

Tree ID	GRID	Species	Stem Diameter (in.)					Tree and Sapling Scores
			1	2	3	4	5	
284	8	*Populus tremoloides*	2	-	-	-	-	1
275	9	*Prunus serotina*	5.1	3.2	3	-	-	11
276	9	*Malus* sp.	2	-	-	-	-	1
279	9	*Juniperus virginiana*	2	-	-	-	-	1
270	9	*Acer platanoides*	4	4.7	3.5	-	-	15
271	9	*Acer platanoides*	3.3	-	-	-	-	5
274	9	*Acer platanoides*	3	-	-	-	-	1
273	9	*Acer platanoides*	2.2	-	-	-	-	1
272	9	*Acer platanoides*	2.2	-	-	-	-	1
277	9	*Acer platanoides*	3.6	-	-	-	-	5
278	9	*Acer platanoides*	2.9	-	-	-	-	1
280	9	*Acer platanoides*	5.2	3	-	-	-	6
267	10	*Acer platanoides*	8	-	-	-	-	10
268	10	*Acer platanoides*	10	-	-	-	-	10
269	10	*Acer platanoides*	2	-	-	-	-	1
266	11	*Prunus serotina*	11	9	7	14	4.5	50
265	14	*Acer platanoides*	8	-	-	-	-	10
263	14	*Amelanchier* sp.	5.4	1.9	2	2.1	2.8	9
264	14	*Amelanchier* sp.	2.7	6.5	-	-	-	11
262	24	*Acer rubrum*	4	8	7	10	-	35
261	26	*Juniperus virginiana*	3	-	-	-	-	1
258	27	*Malus* sp.	3.5	5.5	4	-	-	15
260	27	*Malus* sp.	4	7	-	-	-	15
259	27	*Juniperus virginiana*	2	-	-	-	-	1
256	29	*Malus* sp.	1.5	2.5	3.1	1	-	8
254	29	*Juniperus virginiana*	4.2	10	5.5	2.5	2	22
255	29	*Juniperus virginiana*	1	-	-	-	-	1

Tree ID	GRID	Species	Stem Diameter (in.)					Tree and Sapling Scores
			1	2	3	4	5	
257	29	*Rhus hirta*	1.1	-	-	-	-	1
251	30	*Prunus serotina*	9.6	6.6	6.3	-	-	30
252	30	*Malus* sp.	3	3.7	2.6	3	2	9
253	30	*Malus* sp.	4.5	-	-	-	-	5
248	30	*Rhus hirta*	1.5	1.6	2	-	-	3
249	30	*Rhus hirta*	1.5	-	-	-	-	1
250	30	*Rhus hirta*	1.8	1.6	1.5	-	-	3
242	31	*Cornus florida*	2	2	2	2	2	5
243	31	*Cornus florida*	2	2	2	1	1	5
244	31	*Cornus florida*	1	-	-	-	-	1
245	31	*Rhus hirta*	2.5	-	-	-	-	1
241	31	*Rhus hirta*	1.6	1.3	-	-	-	2
246	31	*Rhus hirta*	2.1	-	-	-	-	1
247	31	*Rhus hirta*	2.3	4	3.3	2.8	-	12
237	32	*Rhus hirta*	2.7	3.1	-	-	-	6
239	32	*Rhus hirta*	2	2.7	-	-	-	2
240	32	*Rhus hirta*	1.5	2.2	1.2	-	-	3
238	32	*Rhus hirta*	3.9	-	-	-	-	5
223	33	*Malus* sp.	2	2	2	2	2	5
224	33	*Malus* sp.	2	2	2	1	1	5
225	33	*Malus* sp.	1	-	-	-	-	1
234	33	*Rhus hirta*	2.7	-	-	-	-	1
232	33	*Rhus hirta*	2.3	-	-	-	-	1
233	33	*Rhus hirta*	1.6	-	-	-	-	1
229	33	*Rhus hirta*	3	-	-	-	-	1
236	33	*Rhus hirta*	3.8	1.2	-	-	-	6
230	33	*Rhus hirta*	2.9	1.1	-	-	-	2
231	33	*Rhus hirta*	2.2	-	-	-	-	1
235	33	*Rhus hirta*	2.2	-	-	-	-	1
228	33	*Rhus hirta*	3.9	-	-	-	-	5
227	33	*Rhus hirta*	2.9	-	-	-	-	1
226	33	*Rhus hirta*	3.1	-	-	-	-	5
222	34	*Prunus serotina*	11.9	-	-	-	-	10

Tree ID	GRID	Species	Stem Diameter (in.)					Tree and Sapling Scores
			1	2	3	4	5	
220	34	*Malus* sp.	6.6	2.3	6.1	3	1.9	23
221	34	*Malus* sp.	1.3	2.2	2	-	-	3
219	35	*Malus* sp.	3.3	1	1.4	1.8	1.6	9
218	35	*Sorbus americana*	6.1	-	-	-	-	10
217	36	*Malus* sp.	2	-	-	-	-	1
215	37	*Quercus rubra*	1.2	1.7	1.8	1.6	1.3	5
216	37	*Quercus rubra*	1.6	1.8	1.3	-	-	3
213	38	*Malus* sp.	2	-	-	-	-	1
214	38	*Quercus rubra*	26.1	-	-	-	-	15
210	40	*Quercus palustris*	15.1	-	-	-	-	15
212	40	*Quercus rubra*	3.2	-	-	-	-	5
211	40	*Amelanchier* sp.	1.2	-	-	-	-	1
307	41	*Prunus serotina*	2	2	1	1	1	5
209	41	*Quercus rubra*	17.9	-	-	-	-	15
208	41	*Quercus rubra*	24.5	-	-	-	-	15
206	42	*Prunus serotina*	12	-	-	-	-	10
207	42	*Quercus rubra*	22	-	-	-	-	15
205	43	*Quercus rubra*	21.5	-	-	-	-	15
204	44	*Quercus rubra*	6.7	-	-	-	-	10
203	44	*Quercus rubra*	21.5	-	-	-	-	15
202	45	*Quercus rubra*	10.8	-	-	-	-	10
201	46	*Quercus rubra*	25	-	-	-	-	15
200	46	Unknown	1.4	-	-	-	-	1
196	47	*Acer platanoides*	2.8	2.3	1.9	-	-	3
197	47	*Quercus palustris*	11.2	-	-	-	-	10
198	47	*Rhus hirta*	2.1	1.4	-	-	-	2
199	47	*Rhus hirta*	2.5	-	-	-	-	1
195	47	*Rhus hirta*	2.9	-	-	-	-	1
194	48	*Rhus hirta*	3.3	-	-	-	-	5
193	48	*Rhus hirta*	3.8	3.2	2.5	3.8	2.8	17
192	49	*Rhus hirta*	4.6	-	-	-	-	5
191	49	*Rhus hirta*	4.2	3.7	4.1	2.7	-	16

Tree ID	GRID	Species	Stem Diameter (in.)					Tree and Sapling Scores
			1	2	3	4	5	
188	54	*Prunus serotina*	5.8	9.3	9.5	1.8	5.5	31
189	54	*Prunus serotina*	1.5	-	-	-	-	1
190	54	*Rhus hirta*	2.4	-	-	-	-	1
184	57	*Myrica pensylvanica*	1.8	3.7	-	-	-	6
187	57	*Malus* sp.	1.5	1.2	-	-	-	2
185	57	*Malus* sp.	3	2.1	3	1	2	5
186	57	*Juniperus virginiana*	4.7	3.5	-	-	-	10
179	58	*Prunus serotina*	3.4	1.9	5.7	2.3	5.2	17
180	58	*Prunus serotina*	8	-	-	-	-	10
183	58	*Malus* sp.	4.3	3.1	4.7	1.7	1	17
178	58	*Juniperus virginiana*	5.4	-	-	-	-	5
182	58	*Amelanchier* sp.	1.5	2.6	-	-	-	2
181	58	*Amelanchier* sp.	3.1	-	-	-	-	5
176	59	*Prunus serotina*	6.2	5.7	-	-	-	15
177	59	*Juniperus virginiana*	8.1	-	-	-	-	10
306	62	*Quercus rubra*	11.2	-	-	-	-	10
175	66	*Rhus hirta*	2.7	-	-	-	-	1
174	66	*Rhus hirta*	1	2	4	-	-	7
168	67	*Amelanchier* sp.	1	2.5	1	1	2.9	5
169	67	*Amelanchier* sp.	3.3	2.9	4.3	-	-	11
165	67	*Rhus hirta*	2.5	-	-	-	-	1
167	67	*Rhus hirta*	1.9	2.1	2.1	-	-	3
164	67	*Rhus hirta*	3.9	-	-	-	-	5
166	67	*Rhus hirta*	3.5	-	-	-	-	5
163	67	*Rhus hirta*	2.7	-	-	-	-	1

Tree ID	GRID	Species	Stem Diameter (in.)					Tree and Sapling Scores
			1	2	3	4	5	
170	67	*Rhus hirta*	4.3	5	-	-	-	10
162	67	*Rhus hirta*	4.2	-	-	-	-	5
171	67	*Rhus hirta*	5.1	-	-	-	-	5
173	67	*Rhus hirta*	3.5	6.4	4	-	-	20
172	67	*Rhus hirta*	4.2	5.5	4.3	4	-	20
161	67	*Rhus hirta*	2.5	-	-	-	-	1
160	67	*Rhus hirta*	4.7	2.9	-	-	-	6
159	68	*Rhus hirta*	3.5	2	-	-	-	6
156	69	*Rhus hirta*	2	-	-	-	-	1
157	69	*Rhus hirta*	6.5	3	-	-	-	11
154	69	*Rhus hirta*	3.5	2	-	-	-	6
155	69	*Rhus hirta*	4	3	-	-	-	6
158	69	*Rhus hirta*	4	-	-	-	-	5
153	70	*Rhus hirta*	2	3.5	5	-	-	11
150	71	*Rhus hirta*	2	-	-	-	-	1
151	71	*Rhus hirta*	3.5	-	-	-	-	5
138	79	*Amelanchier* sp.	1	1	-	-	-	2
141	81	*Malus* sp.	1	1	1	-	-	3
140	81	*Sorbus americana*	2	2	1	1	1	5
142	81	*Rhus hirta*	1	1	3	-	-	3
143	81	*Rhus hirta*	3	2	-	-	-	2
145	81	*Rhus hirta*	3.5	-	-	-	-	5
144	81	*Rhus hirta*	2	-	-	-	-	1
148	81	*Rhus hirta*	1	1	1	-	-	3
146	81	*Rhus hirta*	1	1	-	-	-	2
147	81	*Rhus hirta*	1	1	-	-	-	2
149	81	*Rhus hirta*	1	-	-	-	-	1

EXHIBIT 10

PROJECT SPECIFIC INFORMATION REQUIRED BY ENV-WT 500, 600, AND 900

(SEE EXHIBIT 7 – PROJECT NARRATIVE)

EXHIBIT 11

ABUTTERS LIST

Abutters List

Pease Development Authority
c/o Portsmouth Fish Cooperative
1 Peirce Island Road
Portsmouth, NH 03801

EXHIBIT 12

CERTIFIED MAILING RECEIPTS

ALTUS
ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

May 14, 2021

Subject: **NHDES Wetlands Permit Application**
Tax Map 208 Lot 1
City of Portsmouth WWTP
200 Peirce Island Road
Portsmouth, NH
P4507

Dear Abutter:

Pursuant to State of New Hampshire RSA Chapter 482-A, this letter is to notify you that the City of Portsmouth (Tax Map 208, Lot 1), owner and applicant, is submitting a Wetland Permit Application to the NHDES Wetlands Bureau.

The application proposes to replace force mains in connection with the improvements previously approved for the Wastewater Treatment Plant. The utility installations and other site improvements will impact areas within the previously disturbed 100' tidal buffer zone. There are additional impacts located between the 100-foot and 250-foot zones of the Shoreland Protection Buffer.

This letter is for the notification of abutting property owners only. The work is greater than 20-feet from abutting your parcel therefore no further action by you is required.

Once filed, the plans that show the proposed project are available for viewing during normal business hours at the City of Portsmouth City Clerk's office (603) 610-7245 or at the office of the DES Wetlands Bureau (603) 271-2147, 6 Hazen Drive, Concord, N.H. (8am to 4pm). It is suggested the appropriate office is contacted to verify availability of the documents prior to visiting them. Please feel free to contact the project Authorized Agent, Erik Meserve (AECOM), at (978) 905-3145, or the City Engineer, Terry Desmarais at (603) 766-1421 if you have any questions.

Sincerely,

Eric D. Weinrieb
President

wde\4507.001.abutter-notify-wetland.ltr.doc
CERTIFIED MAIL

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U.S. Postal Service™
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Portsmouth, NH 03801

OFFICIAL USE

Certified Mail Fee	$3.60
$	$0.00
Extra Services & Fees *(check box, add fee as appropriate)*	$0.00
☐ Return Receipt (hardcopy)	$ $0.00
☐ Return Receipt (electronic)	$ $0.00
☐ Certified Mail Restricted Delivery	$ $0.00
☐ Adult Signature Required	$
☐ Adult Signature Restricted Delivery	$
Postage	$0.55
$	
Total Postage and Fees	$4.15
$	

0801
15
Postmark Here
MAY 14 2021
05/14/2021

Sent To PEASE DEVELOPMENT AUTHORITY C/O PORTSMOUTH FISH CO-OPERATIVE
Street and Apt. No., or PO Box No. 1 PIERCE ISLAND ROAD
City, State, ZIP+4® PORTSMOUTH, NH 03801

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

EXHIBIT 13

PROJECT DESIGN CONSIDERATION REQUIRED BY ENV-WT 313

(SEE EXHIBIT 7 - PROJECT NARRATIVE)

EXHIBIT 14

TAX MAP

Partial Legend

See the cover sheet for the complete legend.

7-5A	Lot or lot-unit number
2.56 ac	Parcel area in acres (ac) or square feet (sf)
25	Address number
233-137	Parcel number from a neighboring map
68'	Parcel line dimension
SIMS AVE	Street name

Parcel/Parcel boundary

Parcel/ROW boundary

Water boundary

Structure (1994 data)

Parcel covered by this map

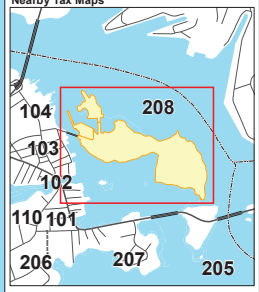
Parcel from a neighboring map (see other map for current status)

0 50 100 200 300 Feet

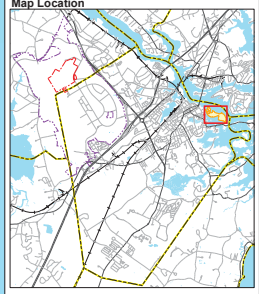
0 20 40 80 Meters

This map is for assessment purposes only. It is not intended for legal description or conveyance. Parcels are mapped as of April 1. Building footprints are 2006 data and may not represent current structures. Streets appearing on this map may be paper (unbuilt) streets. Lot numbers take precedence over address numbers. Address numbers shown on this map may not represent posted or legal addresses.

Nearby Tax Maps



Map Location



Portsmouth, New Hampshire

2019

Tax Map 208

EXHIBIT 15

PHOTOS OF JURISDICTIONAL AREAS AND SHORELINE STRUCTURES

Photo 1. Gravel shoreline on north side of island near the proposed parking area, looking east. (04-23-20)

Photo 2. Construction laydown area in developed Tidal Buffer Zone, looking north from salt marsh. (04-23-20)

Photo 3. Salt marsh with Iva frutescens *at upland edge on southern side of island looking west. (04-23-20)*

Photo 4. Iva frutescens *at upland edge of tidal wetland with narrow saltmarsh band, looking east. (04-23-20)*

Photo 5. Staghorn sumac and Asian bittersweet growing in Protected Waterfront Buffer east of wastewater treatment facility along proposed path, looking north. (04-23-20)

Photo 6. Staghorn sumac dominated shrubland in densely covered portion of proposed path, facing south. (04-23-20)

Photo 7. Dense vegetation surrounding existing staghorn sumac and black cherry dominated portion of the proposed path, looking south. (04-23-20)

Photo 8. Dense bittersweet along the west side of the communications tower on portion of proposed path, looking south. (04-23-20)

Photo 9. Spoil pile in construction laydown area at the proposed parking site, looking south. (04-23-20)

Photo 10. Rip-rap along the edge of the proposed path east of wastewater treatment facility, looking south. (04-23-20)

Photo 11. Southern end of the proposed path that curves around the southeastern corner of the wastewater treatment facility, bordered by rip-rap to the east, looking south. (04-23-20)

Photo 12. From eastern end of the boat ramp parking area, looking east. (01-14-21)

Photo 13. From bridge at western end of the pipeline replacement, looking east. (01-14-21)

Photo 14. From northern embankment off east end of Peirce Island Road Bridge, looking west. (04-06-21)

Photo 15. From the western end of the boat launch parking area along the pipeline replacement, looking east. (01-14-21)

Photo 16. From laydown area at eastern end of the boat launch parking area, looking east. (01-14-21)

Photo 17. Along the pipeline replacement near Grid 42 of the tree inventory for the Pipeline Survey, looking east. (01-14-21)

Photo 18. Along the pipeline replacement near Grid 46 of the tree inventory for the Pipeline Survey, looking east. (01-14-21)

Photo 19. From the vicinity of the USACE Corps in the eastern portion of the pipeline replacement, looking west. (01-14-21)

Photo 20. From the vicinity of the USACE Corps in the eastern portion of the pipeline replacement, looking east. (01-14-21)

Photo 21. From eastern end of the pipeline replacement near the planned parking area, looking west. (01-14-21)

Photo 22. Shoreline off southwestern corner of Peirce Island bridge looking west. (03-23-21)

Photo 23. Shoreline off southwestern corner of Peirce Island bridge looking northeast. (03-23-21)

Photo 24. Shoreline off northwestern corner of Peirce Island Road Bridge looking west. (03-23-21)

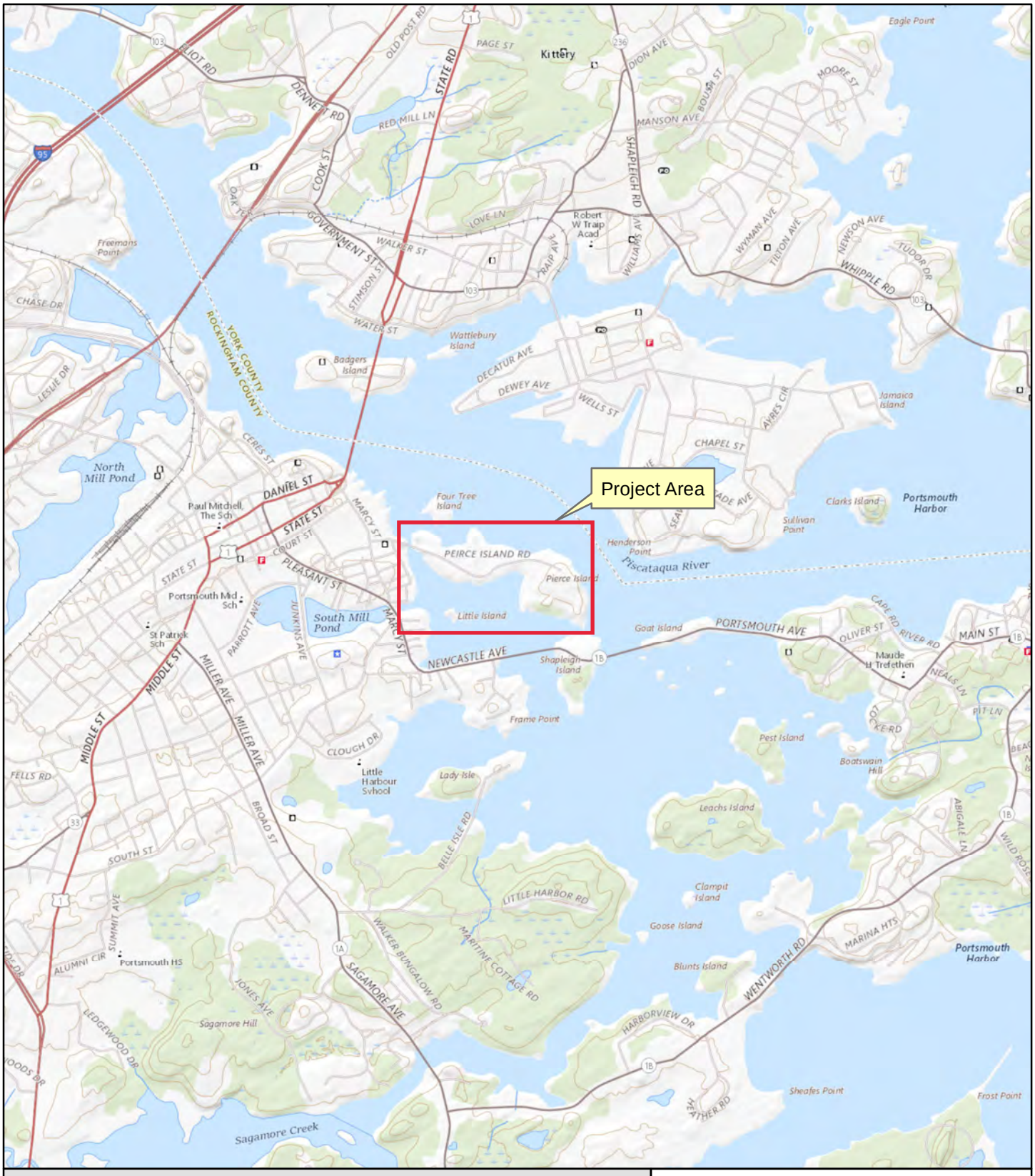
Photo 25. From west end of rocky shore shelf off the northwestern corner of Peirce Island bridge looking northwest. (03-23-21)

Photo 26. From the north side of the Peirce Island Bridge Rd. Bridge facing east. (04-15-21)

Photo 27. From the south side of the Peirce Island Road Bridge facing east. (04-15-21)

EXHIBIT 16

USGS MAP



Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed December, 2019.

Portsmouth WWTF
Peirce Island Improvements
Project Locus

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

Path: J:\Projects\Portsmouth Wastewater Treatment Facility_Pierce Island\MXD\Permitting2020Locus.mxd

EXHIBIT 17

CONSTRUCTION NARRATIVE

(NARRATIVE OF WORK SEQUENCE, INCLUDING PRE- AND POST-CONSTRUCTION, AND RELATIVE TIMING AND PROGRESSION OF ALL WORK)

Construction Narrative

The proposed site improvements adjacent to the Peirce Island Wastewater Treatment Facility project will be constructed in three phases over the next 5 years, beginning with installation of the water main and sewer force mains in 2021 as Phase 1. The sewer force mains will improve the reliability of the City's wastewater collection system, maximize flow to the WWTF, and allow removal of the temporary, above ground force main that is currently in use. The water main replacement will take place at the same time. Prior to the start of work construction fencing will be erected between the work area and adjacent marsh elder stands, and erosion and sediment best management practices will be installed (see Erosion BMPs, Exhibit 5, Sheet C-101 P and detail sheets). Trenches will be dug, one of the existing force mains and the existing water main removed, and new pipelines installed. The two force mains will be installed in the same trench, approximately 3' apart. The existing force main that is not removed will be drained, plugged with grout, and abandoned in place. When both of the new force mains are operational, the temporary above-ground force main will be removed. The project will also include sliplining the existing 24" force main under the Peirce Island Rd. Bridge to address corrosion in the existing pipe. Pits will be excavated within the road bed on either end of the bridge, and a smaller diameter pipeline pulled through the existing force main before being connected at either end. The construction period is expected to be 5 months. Erosion and sedimentation controls will remain in place until the vegetation in the grassy areas that are disturbed as part of construction is established (at least 80% cover), after which the areas will be re-opened to the public.

It is expected that the foot trail extension (Phase 2), will also take place in 2021. The trail extension will improve public access and recreation by formalizing a looped trail around the east end of Peirce Island. Upon installation of erosion and sediment best management practices, clearing and grubbing operations will commence. The work will be performed within an approximate 12-ft-wide limit of work, using small tracked construction vehicles. Details for the trail construction are provided in Exhibit 5, Sheet C-002. Construction of the trail and stabilization of the site is expected to take 4 to 6 weeks to complete.

To address logistical and funding considerations, the Phase 3 work, proposed improvements to Peirce Island Road (to address tidal flooding) and the conversion of the former snow dump to a grassed parking area, will be constructed after 2021. The start time will be dependent on funding and completion of the current work at the WWTF, but the work will be complete within the 5-year limit of the permit (2026). Work will begin with the installation of erosion and sediment control best management practices. It is anticipated that much of initial earth moving for the road and parking area will be done simultaneously. Vehicular traffic must be maintained at all times to the Peirce Island Wastewater Treatment Plant, therefore completion of the roadway improvements will be a priority. Once the roadway is functional, the project will proceed with installation of the proposed revetment along the roadway and the establishment of turf at the grassed parking area, and creation of the vegetated buffer around the parking area. Details for the Phase 3 work are provided in Exhibit 5, Sheets C-001.

The Phase 3 construction period is expected to be 6 to 8 weeks. Erosion and sedimentation controls will remain in place until the vegetation in the grassed parking area is established (at least 80% cover), after which the area will be open to the public.

EXHIBIT 18/19

COPY OF DEED

175

Warranty
Pierce et al
to
City of Portsmouth
Del. to
J.D. Sullivan

Know All Men By These Presents, that we, Joseph B. Pierce of Brookline in the County of Norfolk, Elizabeth W. Macmahon, otherwise known as Elizabeth W. Macmahon of Boston in the County of Suffolk and Ann B. Pratt, otherwise known as Annie B. Pratt, of Wenham in the County of Plymouth, all in the Commonwealth of Massachusetts, for and in consideration of the sum of one dollar and other valuable considerations, to us in hand before the delivery hereof, well and truly paid by the City of Portsmouth, a municipal corporation located in the County of Rockingham and State of New Hampshire, the receipt whereof we do hereby acknowledge, have granted, bargained and sold and by these presents do give, grant, bargain, sell, alien, enfeoff, convey and confirm unto the said City of Portsmouth, its successors or assigns forever, the following described tracts of land with the building thereon, and all rights and privileges appurtenant and belonging thereto, situate in the said City of Portsmouth, and bounded and described as follows, to wit:

The Island situated in Piscataqua River, within the limits of the said City of Portsmouth, with the buildings thereon, containing twenty-seven acres, more or less, known as Pierce's Island and formerly known as Partridge's Island and Jaurrin's Island, together with the flats adjoining to the same; being the same premises devised by Joshua W. Peirce to Joseph W. Peirce by will executed July 22, 1859 and allowed by the Court of Probate, May 12, 1876, and devised by the said Joseph W. Peirce by will executed June 4, 1910 and proven and allowed March 7, 1916, to the Grantors herein as residuary legatees; also,

A certain tract or parcel of land with the buildings thereon, situate on Mechanic Street in said Portsmouth, and bounded and described as follows, to wit, — Beginning at the northwesterly corner of land now or formerly of Addie A. Curtis and Mechanic Street, and running in a northerly direction along said Mechanic Street, one hundred forty-six feet, two inches, (146.2) to land now or formerly of John C. Beasley; thence turning and running in an easterly direction along land of said Beasley, thirty (30), feet more or less to the Piscataqua River; thence turning and running in a southerly direction along said River, one hundred forty-five feet six inches (145.6) to land of the said Addie A. Curtis; thence turning and running in a westerly direction, along land of the said Curtis, sixteen (16), feet, to the point begun at. Said tract containing three thousand twelve square feet, more or less, and being the premises described as being Lot #63 on Plan #7 of the "Plan of the City of Portsmouth" on file at the Assessor's Office in said City; also

101

All rights, privileges and grants vested in the grantors or their devisors or grantors by the State of New Hampshire, authorizing and permitting the construction of a bridge from the Southerly part of said City of Portsmouth to Peirce's Island hereinbefore referred to.

To Have And To Hold the said granted premises, with all the privileges and appurtenances to the same belonging, to it the said City of Portsmouth and its successors and assigns forever. And we, the said Joseph B. Pierce, Elizabeth W. Macmahon and Ann B. Pratt and our heirs executors and administrators do hereby

covenant, grant and agree to and with the said City of Portsmouth and its successors and assigns, that until the delivery hereof we were the lawful owners of the said premises and were seized and possessed thereof in our own right in fee simple; and have full power and lawful authority to grant and convey the same in manner aforesaid; and that we will and our heirs, executors and administrators shall and will Warrant And Defend the same to the said City of Portsmouth and its successors and assigns against the lawful claims and demands of any person or persons whomsoever.

And we, Sara L. Peirce, wife of the said Joseph B. Peirce, Charles C., husband of the said Elisabeth W. Macmahon and C. Barton, husband of the said Ann B. Pratt, for the consideration aforesaid, do hereby relinquish our respective rights of dower and curtesy in the before mentioned premises.

In Witness Whereof, we have hereunto set our hands and seals this 9th day of August in the year of our Lord, one thousand nine hundred and twenty-three.

Signed, sealed and delivered in the presence of us

Chas. N. Baxter — Joseph B. Peirce (L S)
witness to all — Sara L. Peirce (L S)
Elisabeth W. Macmahon (L S)
Charles C. Macmahon (L S)
Anne B. Pratt (L S)
C. Barton Pratt (L S)

Commonwealth of Massachusetts,
Norfolk ss. August 9th 1923.

Personally appeared the above named Joseph B. and Sara L. Peirce and acknowledged the foregoing instrument to be their voluntary act and deed,

Before me,

Chas N. Baxter
Notary Public (-)
Justice of the Peace
My Commission expires June 11/1927.

Commonwealth of Massachusetts,
Suffolk ss. August 9th. 1923.

Personally appeared the above named Elisabeth W. Macmahon and Charles C. Macmahon and acknowledged the foregoing instrument to be their voluntary act and deed.

Before me,

Chas N. Baxter
Justice of the Peace

Commonwealth of Massachusetts, Plymouth ss. August 9th. 1923.

Personally appeared the above named Ann B. and C. Barton Pratt and acknowledged the foregoing instrument to be their voluntary act and deed, Before me,

Chas N. Baxter Justice of the Peace and Notary Public (-)

Received and Recorded Sept. 26-9:25 A.M. 1923.
John McGillen Register

EXHIBIT 20

NHB CORRESPONDENCE

CONFIDENTIAL – NH Dept. of Environmental Services review

Memo

NH Natural Heritage Bureau
NHB Datacheck Results Letter

To: Elizabeth Olliver, Normandeau Associates, Inc.
25 Nashua Road
Bedford, NH 03110

From: Amy Lamb, NH Natural Heritage Bureau
Date: 4/6/2021 (valid until 04/06/2022)
Re: Review by NH Natural Heritage Bureau
Permits: NHDES - Wetland Standard Dredge & Fill - Major

NHB ID: NHB21-1136 Town: Portsmouth Location: 200 Peirce Island Road
Description: Replace failed sewer force mains from western bridge abutment to WWTF, and water main to swimming pool. Work will include removal of 1 existing sewer force main, burial of 2 new force mains in its place, and abandoning a second force main in place . The existing lines hung under Peirce Island Road Bridge will be slip lined to ensure integrity. All work will be confined to the existing footprint - a mix of in-road, and off road. Work is an amendment to NHB13-3237 and NHB15-1528, and NHB20-1059.

cc: Kim Tuttle

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments NHB: Please confirm that all shoreline impact areas have been surveyed for marsh elder, and that the conditions on the attached 2016 memo are still valid. Please send the final plan for the proposed plantings discussed in relation to the NHB20-1059 project segment. The eelgrass record, newly added to the NHB database, was included for your information.
F&G: Please contact the NHFG Marine Division to address impacts to Atlantic and Shortnose Sturgeon and anadromous fish species. Please contact Mike Dionne or Cheri Patterson at (603) 868-1095.

Natural Community	**State[1]**	**Federal**	**Notes**
Eelgrass bed	--	--	

Plant species	**State[1]**	**Federal**	**Notes**
marsh elder (*Iva frutescens*)	T	--	Threats are primarily alterations to the hydrology of the wetland, such as ditching or tidal restrictions that might affect the sheet flow of tidal waters across the intertidal flat, activities that eliminate plants, and increased input of nutrients and pollutants in storm runoff.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

CONFIDENTIAL – NH Dept. of Environmental Services review

Memo

NH Natural Heritage Bureau
NHB Datacheck Results Letter

Vertebrate species	State[1]	Federal	Notes
Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*)	T	T	Contact the NH Fish & Game Dept and the US Fish & Wildlife Service (see below).
Shortnose Sturgeon (*Acipenser brevirostrum*)	E	E	Contact the NH Fish & Game Dept and the US Fish & Wildlife Service (see below).

[1]Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

Contact for all animal reviews: Kim Tuttle, NH F&G, (603) 271-6544.

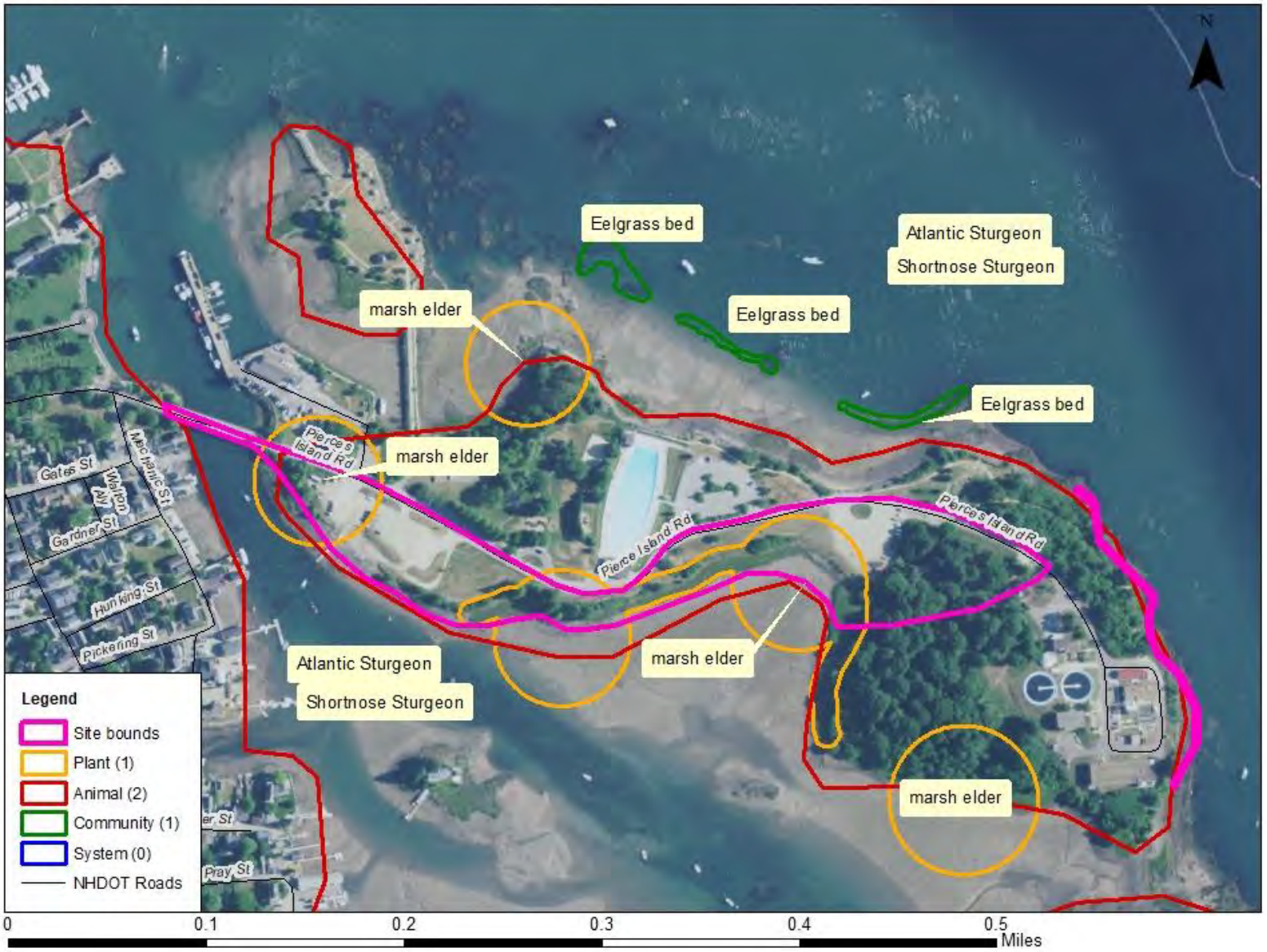
A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

CONFIDENTIAL – NH Dept. of Environmental Services review

NHB21-1136



New Hampshire Natural Heritage Bureau - Community Record

Eelgrass bed

Legal Status

Federal: Not listed
State: Not listed

Conservation Status

Global: Not ranked (need more information)
State: Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2017: 174.6 acres of eelgrass bed mapped over 90 individual patches.
General Area: 2017: In permanently inundated tidal waters from Little Bay down to the mouth of Portsmouth Harbor. Often occurred with macroalgae.
General Comments: 2017: Data derived from report on annual mapping of eelgrass extent in the Great Bay estuary.
Management Comments: --

Location

Survey Site Name: Piscataqua River
Managed By:

County:
Town(s): Out-Of-State
Size: 183.6 acres
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2017: Eelgrass beds in portions of Portsmouth Harbor, the Piscataqua River, and Little Bay. Includes areas in Maine state waters.

Dates documented

First reported: 2017
Last reported: 2017

New Hampshire Natural Heritage Bureau - Plant Record

marsh elder (*Iva frutescens*)

Legal Status	Conservation Status
Federal: Not listed	Global: Demonstrably widespread, abundant, and secure
State: Listed Threatened	State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank:	Excellent quality, condition and landscape context ('A' on a scale of A-D).
Comments on Rank:	This rank may be for the state rather than relative to others in the region.
Detailed Description:	2020: Tidal Pool: Species observed in flower. 2017: Leachs Island: Several thousand plants spread along 800+ feet of shoreline. 10-20% dieback, 10-15% yellowing, 65-80% normal to vigorous. Aphids observed on 80% of clumps. 2016: Peirce Island: Additional subpopulations located, raising total number of plants to over 600. Plants appear to be in much better health than 2014, with all individuals in fruit and in good vigor. Shaws Hill: Several clumps over an area approximately 30 x 15 feet. Estimated at over 200 individuals. Tidal Pool: Plants in 3 areas along shoreline near tidal pool. 2014 Peirce Island: Over 500 plants were observed, all stunted, with approximately 50-60% dead stems, mostly confined to the upper portions of the plants. 1996: Constant observation since 1953 reported, including all stages of phenology and age structure. 1982: Good clump observed.
General Area:	2017: Leachs Island: Upper edge of brackish marsh/rocky shore. Plants absent from areas with broader expanse of marsh. Rocks present in most areas where the plants are growing. Associated species include black oak (*Quercus velutina*), saltmarsh rush (*Juncus gerardii*), sea-blite (*Suaeda* sp.), hastate-leaved orache (*Atriplex* cf. *prostrata*), smooth cordgrass (*Spartina alterniflora*), Carolina sea-lavender (*Limonium carolinianum*), and seaside plantain (*Plantago maritima* ssp. *juncoides*). 2016: Peirce Island: Population forms a narrow band immediately above the highest observed wrack line along the shore. Associated upland species include staghorn sumac (*Rhus hirta*), autumn-olive (*Elaeagnus umbellata* var. *parvifolia*), Asian bittersweet (*Celastrus orbiculatus*), and speckled alder (*Alnus incana* ssp. *rugosa*). The saline areas downslope of the marsh elder contained over 50% unvegetated substrate, as well as a mixture of cordgrass (*Spartina* sp.) and saltgrass (*Distichlis spicata*). Shaws Hill: Surrounding land use is developed. All plants below highest observable tide line in ***high salt marsh***, located among saltmeadow cordgrass (*Spartina patens*), smooth cordgrass (*Spartina alterniflora*), and seaside goldenrod (*Solidago sempervirens*). Tidal Pool: Sagamore Creek/Great Bay shoreline, with smooth cordgrass (*Spartina alterniflora*), saltmarsh rush (*Juncus gerardii*), saltmeadow cordgrass (*Spartina patens*), seaside goldenrod (*Solidago sempervirens*), and sea-blite (*Suaeda* spp.). 1996: On shores of several islands and peninsulas in the more or less enclosed bay system. Associated plant species: *Solidago sempervirens* (seaside goldenrod), *Juncus gerardii* (salt marsh rush), *Spartina patens* (salt-meadow cord-grass), *Triglochin maritimum* (arrow-grass), *Elymus virginicus* (Virginia wild rye), *Atriplex patula* (narrow-leaved orach), and *Artemisia vulgaris* (common mugwort). Substrate: gravel and marsh peat and muck. 1982: On shore at Pleasant Point.
General Comments:	2016: Peirce Island: "The population currently appears to be in good health, although the results of the June 2014 surveys indicated that there may be some intermittent pressure on this population. The propensity of this species to grow in a very narrow band along the tide line does not allow for rapid adaptation to changing sea levels, storm events, or polluted runoff that a larger, robust population may resist. If sea levels gradually rise as expected, the marsh elder will be unable to move inland due to a small but steep cut bank that forms the upland break adjacent to the marsh elder population. The remaining subpopulations may also be getting shaded by the adjacent upland vegetation, which appears to be encroaching on the shoreline. This vegetation is comprised of large shrub species and the invasive Oriental bittersweet that is capable of overtaking the native plants in the area."
Management Comments:	--

CONFIDENTIAL – NH Dept. of Environmental Services review

Location

Survey Site Name: Little Harbor, back channel
Managed By: Little Harbor Trust

County: Rockingham
Town(s): Portsmouth
Size: 59.9 acres Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2017: Leachs Island: Island in New Castle only accessible by boat. Plants observed on south shore of island 2016: Peirce Island: Along the southern shore of Peirce Island, along the edge of a small cove west of the wastewater treatment facility. Shaws Hill: Take Laurel Lane off New Castle Avenue, bear left onto driveway right-of-way servicing 51A and 51B Laurel Lane. At end of right-of-way, 51B will be located on the right. Tidal Pool: Along Sagamore Creek shoreline on Creek Farm Reservation property in Portsmouth. In the vicinity of Rte. 1B which encircles the Little Harbor back channel from Portsmouth to New Castle and Rye. Many of the sites are visible only by boat.

Dates documented

First reported: 1953 Last reported: 2020-08-02

New Hampshire Natural Heritage Bureau - Animal Record

Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*)

Legal Status		**Conservation Status**	
Federal:	Listed Threatened	Global:	Rare or uncommon
State:	Listed Threatened	State:	Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2016: 1 individual, sex unknown, detected in the lower Piscataqua River. 2015: 1 individual, sex unknown, detected in Portsmouth Harbor. 2012: 1 individual, sex unknown, detected in Little Bay.
General Area: 2016: Tidal waters in Portsmouth Harbor, Little Bay, and the Piscataqua River.
General Comments: --
Management Comments: --

Location

Survey Site Name: Piscataqua River
Managed By:

County:
Town(s): Out-Of-State
Size: 7749.3 acres Elevation:

Precision: Within 1.5 miles of the area indicated on the map (location information is vague or uncertain).

Directions: 2016: Tidal waters of Portsmouth Harbor, Little Bay, and the Piscataqua River.

Dates documented

First reported: 2012-06-02 Last reported: 2016-05-27

The U.S. Fish & Wildlife Service has jurisdiction over Federally listed species. Please contact them at 70 Commercial Street, Suite 300, Concord NH 03301 or at (603) 223-2541.

New Hampshire Natural Heritage Bureau - Animal Record

Shortnose Sturgeon (*Acipenser brevirostrum*)

Legal Status		Conservation Status	
Federal:	Listed Endangered	Global:	Rare or uncommon
State:	Listed Endangered	State:	Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2016: 2 individuals, 1 female and 1 sex unknown, detected in Portsmouth Harbor and the lower Piscataqua River. 2015: 3 females and 2 other individuals, sex unknown detected in Portsmouth Harbor. 2014: 1 female detected moving from Portsmouth Harbor up the Piscataqua River to the mouth of the Cocheco River. 2012: 1 female detected in Little Bay. 2011: 1 female detected in Little Bay. 2010: 1 female detected in Little Bay.
General Area: 2016: Tidal waters in Portsmouth Harbor, Little Bay, and the Piscataqua River.
General Comments: --
Management Comments: --

Location

Survey Site Name: Piscataqua River
Managed By:

County:
Town(s): Out-Of-State
Size: 7749.3 acres Elevation:

Precision: Within 1.5 miles of the area indicated on the map (location information is vague or uncertain).

Directions: 2016: Tidal waters of Portsmouth Harbor, Little Bay, and the Piscataqua River.

Dates documented

First reported: 2010-11-03 Last reported: 2016-10-20

The U.S. Fish & Wildlife Service has jurisdiction over Federally listed species. Please contact them at 70 Commercial Street, Suite 300, Concord NH 03301 or at (603) 223-2541.

EXHIBIT 21

CONSERVATION COMISSION CORRESPONDENCE

Conservation Commission Correspondence

The City of Portsmouth Engineer and Environmental Planner conducted a site walk with the Conservation Commission on September 9, 2020. They walked the entire project and introduced the plan to apply for an Emergency Authorization due to a pipeline failure within the project area.

EXHIBIT 22

FEDERAL AGENCY CORRESPONDENCE

Federal Agency Correspondence

No federal natural or cultural resources are directly or indirectly impacted by this project, therefore no federal agency review is anticipated.

EXHIBIT 23

AVOIDANCE AND MINIMIZATION NARRATIVE

AVOIDANCE AND MINIMIZATION WRITTEN NARRATIVE

Water Division/Land Resources Management

Wetlands Bureau

Check the Status of your Application

RSA/ Rule: RSA 482-A/ Env-Wt 311.04(j); Env-Wt 311.07; Env-Wt 313.01(a)(1)b; Env-Wt 313.01(c)

APPLICANT'S NAME: Terry Demarais, PE, City of Portsmouth **TOWN NAME:** Portsmouth

An applicant for a standard permit shall submit with the permit application a written narrative that explains how all impacts to functions and values of all jurisdictional areas have been avoided and minimized to the maximum extent practicable. This attachment can be used to guide the narrative (attach additional pages if needed). Alternatively, the applicant may attach a completed Avoidance and Minimization Checklist (NHDES-W-06-050) to the permit application.

SECTION 1 - WATER ACCESS STRUCTURES (Env-Wt 311.07(b)(1))

Is the primary purpose of the proposed project to construct a water access structure?

The primary purpose of this project does not involve a water access structure.

SECTION 2 - BUILDABLE LOT (Env-Wt 311.07(b)(1))

Does the proposed project require access through wetlands to reach a buildable lot or portion thereof?

The proposed project does not require access through wetlands to reach a buildable lot.

SECTION 3 - AVAILABLE PROPERTY (Env-Wt 311.07(b)(2))*

For any project that proposes permanent impacts of more than one acre, or that proposes permanent impacts to a PRA, or both, are any other properties reasonably available to the applicant, whether already owned or controlled by the applicant or not, that could be used to achieve the project's purpose without altering the functions and values of any jurisdictional area, in particular wetlands, streams, and PRAs?

**Except as provided in any project-specific criteria and except for NH Department of Transportation projects that qualify for a categorical exclusion under the National Environmental Policy Act.*

The proposed project has impacts to the developed and undeveloped tidal buffer zone. The project is intended to provide improvements to the access road to the Wastewater Treatment Facility, public access to the island, extend the existing walking path located within the tidal buffer zone, replace sewer force and water mains, and work to avoid unexpected pipeline failure. No other property can provide access to the island. Improvements to the road necessarily must take place on this property as it is the sole property providing access to the Wastewater Treatment Facility. The parking area is intended for public access to recreational opportunities on this end of Peirce Island, and would be ineffective on adjacent other city-owned properties. Installation of the sewer force and water mains will improve the reliability of the City's wastewater collection system, maximize flow to the WWTF, and allow removal of the temporary, above ground force main currently in use. The sewer force main under Peirce Island Road Bridge is showing signs of corrosion; sliplining it will help avoid unexpected failure of this pipeline.

SECTION 4 - ALTERNATIVES (Env-Wt 311.07(b)(3))

Could alternative designs or techniques, such as different layouts, different construction sequencing, or alternative technologies be used to avoid impacts to jurisdictional areas or their functions and values as described in the Wetlands Best Management Practice Techniques For Avoidance and Minimization?

The proposed project includes a walking trail extending from an existing trail located within the tidal buffer zone. The Wastewater Treatment Facility limits the location of the path within the tidal buffer zone. The path is located at the site of an existing informal path, and it thus requires the least disturbance to the site of any possible alternative path location. This path configuration also requires the least amount of grading of any potential path configuration. Placement of the raised road maximizes use of its present configuration and will also result in lower impacts than any other placement. The parking area will result in a net improvement to existing conditions. The installation of the new sewer force and water mains, as well as the sliplining of the sewer force main under the bridge, are in situ.

SECTION 5 - CONFORMANCE WITH Env-Wt 311.10(c) (Env-Wt 311.07(b)(4))**

How does the project conform to Env-Wt 311.10(c)?

***Except for projects solely limited to construction or modification of non-tidal shoreline structures only need to complete relevant sections of Attachment A.*

The trail portions of the project have been sited at the maximum practicable distance from the tidal wetland (rocky shore). The road will be co-located with the existing road to minimize new impacts, and the parking area is located in a previously degraded tidal buffer and will result in an improvement to current conditions. The sewer force and water main installations and sliplining of the sewer force main under the bridge are sited at pre-existing locations of infrastructure associated with the WWTF.

EXHIBIT 25

COASTAL RESOURCE WORKSHEET AS REQUIRED BY ENV-WT 600

(ALSO SEE EXHIBIT 7 – PROJECT NARRATIVE)

COASTAL RESOURCE WORKSHEET

Water Division/Land Resources Management
Wetlands Bureau

Check the Status of your Application

RSA/Rule: RSA 482-A/ Env-Wt 600

APPLICANT LAST NAME, FIRST NAME, M.I.: Desmarais, Terry, PE, City of Portsmouth

This worksheet may be used to present the information required for projects in coastal areas, in addition to the information required for Lower-Scrutiny Approvals, Expedited Permits, and Standard Permits under Env-Wt 603.01.

Please refer to Env-Wt 605.03 for impacts requiring compensatory mitigation.

SECTION 1 - REQUIRED INFORMATION (Env-Wt 603.02; Env-Wt 603.06; Env-Wt 603.09)

The following information is required for projects in coastal areas.

Describe the purpose of the proposed project, including the overall goal of the project, the core project purpose consisting of a concise description of the facilities and work that could impact jurisdictional areas, and the intended project outcome. Specifically identify all natural resource assets in the area proposed to be impacted and include maps created through a data screening in accordance with Env-Wt 603.03 (refer to Section 2) and Env-Wt 603.04 (refer to Section 3) as attachments.

The City of Portsmouth is nearing completion of a major upgrade to the Peirce Island Wastewater Treatment Facility (WWTF; DES Wetland Permits 2015-1866 and 2015-1878). Several additional improvements are proposed to enhance access reliability to the WWTF, and the public's access to the island. These improvements include raising the access road approximately 3 feet at its lowest point to elevate it above the 100-year flood line and to address sea level rise; converting a former informal public parking area and permitted snow dump, currently used as the Project's construction laydown area, to a formal grassed public parking area and natural lands; and extending a public recreational trail around the northeastern perimeter of the island. At the same time, the City is planning to permanently replace the two sewer force mains on Peirce Island between the Peirce Island Road Bridge and the Peirce Island WWTF, replace the water main on Peirce Island between the Peirce Island Road Bridge and the Peirce Island Pool, and slipline one of the force mains under the Peirce Island Road Bridge. The majority of the work lies within Previously Developed Tidal Buffer Zone (TBZ).

The specifics of the project and a detailed description of the Tidal Buffer Zone and surrounding natural resources are included in Exhibit 7 - Project Narrative.

For standard permit projects, provide:

☒ A Coastal Functional Assessment (CFA) report in accordance with Env-Wt 603.04 (refer to Section 3).

☒ A vulnerability assessment in accordance with Env-Wt 603.05 (refer to Section 4).

Explain all recommended methods and other considerations to protect the natural resource assets during and as a result of project construction in accordance with Env-Wt 311.07, Env-Wt 313, and Env-Wt 603.04.

All impacts are confined to the Tidal Buffer Zone. No impacts to tidal wetlands or waters, including the rocky shore, salt marshes, or *Iva frutescens* (a NH Threatened species) are anticipated. Runoff from the road will be directed into the grassed parking area for sediment, nutrient and contaminant removal before draining as sheetflow to the south into Portsmouth Harbor. The existing walking trail north of the road will be maintained, and a narrow buffer of stone and upland plantings is proposed between the trail and the road to protect the road from high water and wave action during storms.

See additional detail in Exhibit 7 - Project Narrative.

Provide a narrative showing how the project meets the standard conditions in Env-Wt 307 and the approval criteria in Env-Wt 313.01.

The appropriate standard conditions and approval criteria are provided in Exhibit 7 - Project Narrative.

Provide a project design narrative that includes the following:

☒ A discussion of how the proposed project:

- Uses best management practices and standard conditions in Env-Wt 307;
- Meets all avoidance and minimization requirements in Env-Wt 311.07 and Env-Wt 313.03;
- Meets approval criteria in Env-Wt 313.01;
- Meets evaluation criteria in Env-Wt 313.01(c);
- Meets CFA requirements in Env-Wt 603.04; and
- Considers sea-level rise and potential flooding evaluated pursuant to Env-Wt 603.05;

☒ A construction sequence, erosion/siltation control methods to be used, and a dewatering plan; and

☒ A discussion of how the completed project will be maintained and managed.

Upon completion the project will be maintained as part of the City's Department of Public Works management of lands.

☒ Provide design plans that meet the requirements of Env-Wt 603.07 (refer to Section 5);

☒ Provide water depth supporting information required by Env-Wt 603.08 (refer to Section 6); and

☐ For any major project that proposes to construct a structure in tidal waters/wetlands or to extend an existing structure seaward, provide a statement from the Pease Development Authority Division of Ports and Harbors (DP&H) chief harbormaster, or designee, for the subject location relative to the proposed structure's impact on navigation. If the proposed structure might impede existing public passage along the subject shoreline on foot or by non-motorized watercraft, the applicant shall explain how the impediments have been minimized to the greatest extent practicable.

Not applicable.

SECTION 2 - DATA SCREENING (Env-Wt 603.03, in addition to Env-Wt 306.05)

Please use the Wetland Permit Planning Tool, or any other database or source, to indicate the presence of:

☒ Existing salt marsh and salt marsh migration pathways;

☒ Eelgrass beds;

☒ Documented shellfish sites;

☒ Projected sea-level rise; and

☒ 100-year floodplain.

Conduct data screening as described to identify documented essential fish habitat, and tides and currents that may be impacted by the proposed project, by using the following links:

☒ National Oceanic and Atmospheric Administration (NOAA) Tides & Currents; and

☒ NOAA Essential Fish Habitat Mapper.

☒ Verify or correct the information collected from the data screenings by conducting an on-site assessment of the subject property in accordance with Env-Wt 406 and Env-Wt 603.04.

SECTION 3 - COASTAL FUNCTIONAL ASSESSMENT/ AVOIDANCE AND MINIMIZATION (Env-Wt 603.04; Env-Wt 605.01; Env-Wt 605.02; Env-Wt 605.03)

Projects in coastal areas shall:

☒ Not impair the navigation, recreation, or commerce of the general public; and

☒ Minimize alterations in prevailing currents.

An applicant for a permit for work in or adjacent to tidal waters/wetlands or the tidal buffer zone shall demonstrate that the following have been avoided or minimized as required by Env-Wt 313.04:

☒ Adverse impacts to beach or tidal flat sediment replenishment;

☒ Adverse impacts to the movement of sediments along a shore;

☒ Adverse impacts on a tidal wetland's ability to dissipate wave energy and storm surge; and

☒ Adverse impacts of project runoff on salinity levels in tidal environments.

For standard permit applications submitted for minor or major projects:

☒ Attach a CFA based on the data screening information and on-site evaluation required by Env-Wt 603.03. The CFA for tidal wetlands or tidal waters shall be:

- Performed by a qualified coastal professional; and
- Completed using one of the following methods:

  a. The US Army Corps of Engineers (USACE) Highway Methodology Workbook, dated 1993, together with the USACE New England District *Highway Methodology Workbook Supplement*, dated 1999; or

  b. An alternative scientifically-supported method with cited reference and the reasons for the alternative method substantiated.

For any project that would impact tidal wetlands, tidal waters, or associated sand dunes, the applicant shall:

☒ Use the results of the CFA to select the location of the proposed project having the least impact to tidal wetlands, tidal waters, or associated sand dunes;

☒ Design the proposed project to have the least impact to tidal wetlands, tidal waters, or associated sand dunes;

☒ Where impact to wetland and other coastal resource functions is unavoidable, limit the project impacts to the least valuable functions, avoiding and minimizing impact to the highest and most valuable functions; and

☒ Include on-site minimization measures and construction management practices to protect coastal resource areas.

Projects in coastal areas shall use results of this CFA to:

☒ Minimize adverse impacts to finfish, shellfish, crustacean, and wildlife;

☒ Minimize disturbances to groundwater and surface water flow;

☒ Avoid impacts that could adversely affect fish habitat, wildlife habitat, or both; and

☒ Avoid impacts that might cause erosion to shoreline properties.

SECTION 4 - VULNERABILITY ASSESSMENT (Env-Wt 603.05)

Refer to the New Hampshire Coastal Flood Risk Summary Part 1: Science and New Hampshire Coastal Flood Risk Summary Part II: Guidance for Using Scientific Projections or other best available science to:

Determine the time period over which the project is designed to serve.

The useful life of the Peirce Island Wastewater Treatment Facility structures are 50 years, however upgrades to major components of treatment works are typically performed every 20 to 30 years as identified in the 2016 revision of TR-16 Guides for the Design of Wastewater Treatment Works. In consideration of the WWTF's next major upgrade and varying projections for sea level rise, the proposed roadway improvements are based on an "incremental action point" at 2050 (30 year design period).

Identify the project's relative risk tolerance to flooding and potential damage or loss likely to result from flooding to buildings, infrastructure, salt marshes, sand dunes and other valuable coastal resource areas.

The road providing access to the WWTF currently floods several times a year at its low point in the proposed project area and is at risk of wave wash-over from the north side (Piscataqua River), which has the potential to cause erosion and undermine the existing road. Thus, the road is considered to have a low relative flood risk tolerance. The road also provides access to critical infrastructure at the WWTF, allowing operations and maintenance access to continue during storms and high water.

The proposed parking area (current laydown area) has a moderate risk tolerance as no structural damage from flooding is likely.

The proposed sewer force and water main installations have a high risk tolerance as these installations will be buried and will not be located close to high risk areas. The pipe to be sliplined under the Peirce Island Rd. Bridge has a high risk tolerance because its elevation is well above the projected flood zone. The walking path extension also has a high risk tolerance because its elevation is well above the projected flood zone and it is a minor landscape feature.

The salt marshes on the south side of the island in the project vicinity, including the stand of *Iva frutescens*, have a high risk tolerance since they can survive prolonged flooding by seawater and are protected from the higher-impact fetch and wave action generated on the north side.

Reference the projected sea-level rise (SLR) scenario that most closely matches the end of the project design life and the project's tolerance to risk or loss.

TR-16 recommends that wastewater works be designed for flood levels 2-3 feet above the current 100 flood elevation to address "storm surge, wave action and anticipated sea-level rise". The proposed access road improvements have been designed to be at least 3 feet above the current 100 year flood elevation which provides a conservative approach for the 30 year incremental action point.

The proposed roadway elevation also addresses sea-level analysis specific to the New Hampshire seacoast for the 30 year incremental action point. The anticipated 2050 sea-level rise (SLR) at this location is approximately 0.9 feet, based on the RCP4.5 projection (1.15 feet) and the Corps' intermediate sea level rise projection (0.6 feet). The calculations for this work were performed by a coastal engineer, based on the RCP 4.5 projection curve, which anticipates a 3.0' rise at this location by 2100. See attached memorandum re "Coastal Resiliency Basis of Design".

Identify areas of the proposed project site subject to flooding from SLR.

Much of the work area for the road, sewer force and water mains, and parking area currently lies within the predicted 9.0 foot elevation for RSLR at 2050. After construction, all of the road will be elevated above that contour.

Identify areas currently located within the 100-year floodplain and subject to coastal flood risk.

The current FEMA flood map for this site has the 100 year flood elevation at 9 feet NGVD29. The more precise NOAA 100-year flood elevation for 2018 based on tide data is 8.1 feet NAVD88 from the datum for the nearby Seavey Island, Maine (Portsmouth Naval Shipyard). Approximately 12,650 square feet of the road and parking area lie below elevation 8.1 (see Exhibit 5, Sheet C-001).

Describe how the project design will consider and address the selected SLR scenario within the project design life, including in the design plans.

The project proposes to raise the road approximately 3 feet at its lowest elevation, to bring it to Elev. 11.24 NAVD88 (see Exhibit 5, Sheet C-001). This will raise the road approximately 3 feet above the current 100 year floodplain and 2 feet above the projected 100-year floodplain for 2050 (Elev. 8.9). The northern edge of the road will be a 3:1 slope of a mix of stone and vegetation, approximately 2.5 feet high. Seaward of the toe of slope, the existing path and vegetation will remain intact.

The parking area will be sloped down to Elev 8.0 to minimize filling. Permeable grass and concrete-grass pavers will improve water quality of the parking area over its current packed gravel condition. Minimal fill (80 cubic yards) is proposed in the existing floodplain. The pipeline work area, including the bridge crossing, is entirely above the 100-year floodplain for 2100.

The proposed recreational path extension is entirely above the floodplain, at a minimum elevation of 27 feet NAVD88.

Where there are conflicts between the project's purpose and the vulnerability assessment results, schedule a pre-application meeting with the department to evaluate design alternatives, engineering approaches, and use of the best available science.

☐ Pre-application meeting date held: N/A

SECTION 5 - DESIGN PLANS (Env-Wt 603.07, in addition to Env-Wt 311)

Submit design plans for the project in both plan and elevation views that clearly depict and identify all required elements.

The plan view shall depict the following:

☒ The engineering scale used, which shall be no larger than one inch equals 50 feet;

☒ The location of tidal datum lines depicted as lines with the associated elevation noted, based on North American Vertical Datum of 1988 (NAVD 88), derived from https://tidesandcurrents.noaa.gov/datum_options.html, as described in Section 6.

☒ An imaginary extension of property boundary lines into the waterbody and a 20-foot setback from those property line extensions;

☒ The location of all special aquatic sites at or within 100 feet of the subject property;

☒ Existing bank contours;

☒ The name and license number, if applicable, of each individual responsible for the plan, including:

a. The agent for tidal docking structures who determined elevations represented on plans; and

b. The qualified coastal professional who completed the CFA report and located the identified resources on the plan;

☒ The location and dimensions of all existing and proposed structures and landscape features on the property;

☒ Tidal datum(s) with associated elevations noted, based on NAVD 88; and

☒ Location of all special aquatic sites within 100-feet of the property.

The elevation view shall depict the following:

☒ The nature and slope of the shoreline;

☒ The location and dimensions of all proposed structures, including permanent piers, pilings, float stop structures, ramps, floats, and dolphins; and

☒ Water depths depicted as a line with associated elevation at highest observable tide, mean high tide, and mean low tide, and the date and tide height when the depths were measured. Refer to Section 6 for more instructions regarding water depth supporting information.

See specific design and plan requirements for certain types of coastal projects:

- Overwater structures (Env-Wt 606).
- Dredging activities (Env-Wt 607).
- Tidal shoreline stabilization (Env-Wt 609).
- Protected tidal zone (Env-Wt 610).

- Tidal beach maintenance (Env-Wt 608).
- Sand Dunes (Env-Wt 611).

SECTION 6 - WATER DEPTH SUPPORTING INFORMATION REQUIRED (Env-Wt 603.08)

Using current predicted NOAA tidal datum for the location, and tying field measurements to NAVD 88, field observations of at least three tide events, including at least one minus tide event, shall be located to document the range of the tide in the proposed location showing the following levels:

☒ Mean lower low water;
☒ Mean low water;
☒ Mean high water;
☒ Mean tide level;
☒ Mean higher high water;
☒ Highest observable tide line; and
☒ Predicted sea-level rise as identified in the vulnerability assessment in Env-Wt 603.05.

The following data shall be presented in the application project narrative to support how water depths were determined:

☐ The date, time of day, and weather conditions when water depths were recorded; and
☐ The name and license number of the licensed land surveyor who conducted the field measurements.

For tidal stream crossing projects, provide:

☐ Water depth information to show how the tier 4 stream crossing is designed to meet Env-Wt 904.07(c) and (d).

For repair, rehabilitation or replacement of tier 4 stream crossings:

☐ Demonstrate how the requirements of Env-Wt 904.09 are met.

SECTION 7 - GENERAL CRITERIA FOR TIDAL BEACHES, TIDAL SHORELINE, AND SAND DUNES (Env-Wt 604.01)

Any person proposing a project in or on a tidal beach, tidal shoreline, or sand dune, or any combination thereof, shall evaluate the proposed project based on:

☐ The standard conditions in Env-Wt 307;
☐ The avoidance and minimization requirements in Env-Wt 311.07 and Env-Wt 313.03;
☐ The approval criteria in Env-Wt 313.01;
☐ The evaluation criteria in Env-Wt 313.05;
☐ The project specific criteria in Env-Wt 600;
☐ The CFA required by Env-Wt 603.04; and
☐ The vulnerability assessment required by Env-Wt 603.05.

Section 7 does not apply.

New permanent impacts to sand dunes that provide coastal storm surge protection for protected species or habitat shall not be allowed except:

☐ To protect public safety; and
☐ Only if constructed by a state agency, coastal resiliency project, or for a federal homeland security project.

Projects in or on a tidal beach, tidal shoreline, or sand dune shall support integrated shoreline management that:

☐ Optimizes the natural function of the shoreline, including protection or restoration of habitat, water quality, and self-sustaining stability to flooding and storm surge; and

☐ Protects upland infrastructure from coastal hazards with a preference for living shorelines over hardened shoreline practices.

SECTION 8 - GENERAL CRITERIA FOR TIDAL BUFFER ZONES (Env-Wt 604.02)

The 100-foot statutory limit on the extent of the tidal buffer zone shall be measured horizontally. Any person proposing a project in or on an undeveloped tidal buffer zone shall evaluate the proposed project based on:

☒ The standard conditions in Env-Wt 307;

☒ The avoidance and minimization requirements in Env-Wt 311.07 and Env-Wt 313.03;

☒ The approval criteria in Env-Wt 313.01;

☒ The evaluation criteria in Env-Wt 313.05;

☒ The project specific criteria in Env-Wt 600;

☒ The CFA required by Env-Wt 603.04; and

☒ The vulnerability assessment required by Env-Wt 603.05.

Projects in or on a tidal buffer zone shall preserve the self-sustaining ability of the buffer area to:

☒ Provide habitat values;

☒ Protect tidal environments from potential sources of pollution;

☒ Provide stability of the coastal shoreline; and

☒ Maintain existing buffers intact where the lot has disturbed area defined under RSA 483-B:4, IV.

SECTION 9 - GENERAL CRITERIA FOR TIDAL WATERS/WETLANDS (Env-Wt 604.03)

Except as allowed under Env-Wt 606, permanent new impacts to tidal wetlands shall be allowed only to protect public safety or homeland security. Evaluation of impacts to tidal wetlands and tidal waters shall be based on:

☐ The standard conditions in Env-Wt 307;

☐ The avoidance and minimization requirements in Env-Wt 311.07 and Env-Wt 313.03;

☐ The approval criteria in Env-Wt 313.01;

☐ The evaluation criteria in Env-Wt 313.05;

☐ The project specific criteria in Env-Wt 600;

☐ The CFA required by Env-Wt 603.04; and

☐ The vulnerability assessment required by Env-Wt 603.05.

Section 9 does not apply.

Projects in tidal surface waters or tidal wetlands shall:

☐ Optimize the natural function of the tidal wetland, including protection or restoration of habitat, water quality, and self-sustaining stability to storm surge;

☐ Be designed with a preference for living shorelines over hardened stabilization practices; and

☐ Be limited to public infrastructure or restoration projects that are in the interest of the general public, including a road, a bridge, energy infrastructure, or a project that addresses predicted sea-level rise and coastal flood risk.

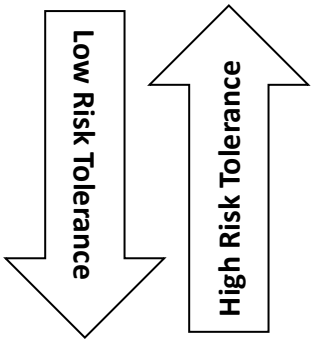
SECTION 10 – GUIDANCE

Your application must follow the New Hampshire Coastal Risk and Hazards Commission's Guiding Principles or other best available science. Below are some of these guidance principles:

- Incorporate science-based coastal flood risk projections into planning;
- Apply risk tolerance* to assessment, planning, design, and construction;
- Protect natural resources and public access;
- Create a bold vision, start immediately, and respond incrementally and opportunistically as projected coastal flood risks increase over time; and
- Consider the full suite of actions including effectiveness and consequences of actions.

*Risk tolerance is a project's willingness to accept a higher or lower probability of flooding impacts. The diagram below gives examples of project with lower and higher risk tolerance:

Critical infrastructures, historic sites, essential ecosystems, and high value assets typically have lower risk tolerance, and thus should be planned, designed, and constructed using higher coastal flood risk projections.



Sheds, pathways, and small docks typically have higher risk tolerance and thus may be planned, designed, and constructed using less protective coastal flood risk projections.

CIVILWORKS NEW ENGLAND

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MEMORANDUM

Date: February 12, 2021

To: Eric Weinrieb, PE

Altus Engineering, Inc.

From: Duncan Mellor, PE
Principal Coastal Engineer

Re: Peirce Island WWTF Access Road Coastal Resiliency Basis of Design

The wastewater treatment facility (WWTF) access road crosses a low area on Peirce Island before rising to the higher elevation of the treatment plant. The access road here is proposed to be raised to maintain facility access during storm surges and in anticipation of sea level rise over time. This low area section of road is adjacent to the main Piscataqua channel with a wind wave fetch of 3,000' from Badgers Island.

WAVE CONDITIONS:

A typical engineering design code for wind criteria is a reference by the American Society of Civil Engineers, ASCE 7-10, which includes maps showing design wind speed (3 second gust, 7% probability of exceedance in 50 years) in the US. This design wind speed when used for wave generation is reduced to remove the added load factor and adjusted down to fit the minimum wind duration to grow these waves to fully developed waves for the wind fetch and water depth. Transforming the wave into shore/shallows gives a 2.6' breaking wave (far in excess of limits for vegetated shoreline). For riprap sizing the W_{50} mean size is 170# (about 1.2' dimension), based on a 2:1 slope. Minimum toe stone size is 230# (about 1.5' size). From a public safety, walking on the rocks standpoint, larger stone is generally more stable when properly set.

Per the NOAA Seavey Island extreme tides data (surge without wave action), the 100-yr flood level is EL 8.1' NAVD88 for 2018 (latest data), which does match the FEMA AE zone elevation of EL 8' NAVD88. With a surge and wave action you may still get some waves washing over the road with wave runup to EL 10.2' with no future sea level rise allowance.

As the wave fetch from Badger's Island would be a northwesterly wind, this design wave condition might not occur during extreme storm surges in a Northeaster or hurricane.

Design guides for alternative road edge wave erosion protection included *Living Shorelines: The Science and Management of Nature-Based Coastal Protection*[1]. Chapter 11 discusses living/planted shoreline design, and multiple cited references indicate a maximum wave height for salt marsh without toe stone berm armoring, is about a 1 foot wave. As the site design wave condition significantly exceed 1 foot, and wave breaking on the shore is expected, some level of stone armoring is needed to ensure that access to the WWTF survives storm conditions.

The State of New Jersey has a well written living shoreline guideline[2] that provides recommended sill stone sizes as a function of wind fetch length (design wind speed and duration not mentioned). For this site with a 0.6 mile fetch, they recommend 300 to 900 pound stones with 1.4' to 2.0' size. This is in good agreement with the site specific wave forecasting and revetment stone sizing performed.

Wave runup, with and without sea level rise projections, will overtop a stone sill/berm if utilized as a toe for a planted slope. There are several well recognized coastal engineering guidelines that indicate bioengineered slopes at this site will fail due to wave action overtopping the seawall.

The Army Corps of Engineers EM-1110-2-1100[3] for grassed sea dikes subject to wave action will have no damage at overtopping of 0.001 cfs/LF (0.6 cups of water per 5 seconds/LF of embankment). Damage will begin at overtopping rates between 0.01 and 0.1 cfs/LF (1 foot of erosion per hour).

Practical case study experience in Europe has been incorporated into EurOtop software[4]. Table 3.1 in the EurOtop manual for calculating wave overtopping volumes provides a discharge limit of 0.001 (cfs/LF) for grass covered slopes. For this site the wave forecasting and runup in storm events and with sea level rise allowance, indicate that stone armoring is needed up to road surface elevation due to wave overtopping.

ROAD ELEVATION & RESILIENCY:

TR-16 Guides for the Design of Wastewater Treatment Works (2016 rev)[5] is a standard for evaluation and design of wastewater treatment facilities with general guidance for coastal resiliency provisions and climate change. The TR-16 coastal resilience allowances follow the former Obama Executive Order that federally funded projects be designed for flood resistance to 2 or 3 feet above the FEMA 100 yr flood (1% annual chance) elevation depending on how critical the structure is to maintaining service. The FEMA flood hazard elevations do not currently include provisions for future sea level rise, so TR-16 added elevation increase allowances for climate change flood protection design extending 2 or 3

feet above the FEMA 100 yr flood elevation, based on how critical the structure is to the facility function. The FEMA flood map for this site has the 100 year flood elevation (AE zone) at 8 feet NAVD88 datum, following FEMA policy to only provide flood elevations to the nearest foot. The more precise NOAA 100-year flood elevation for 2018 based on tide data is 8.1 feet NAVD88 datum for the adjacent Seavey Island, Maine (Portsmouth Naval Shipyard across the channel).

TR-16 recommends that future sea level rise allowances are added to existing flood study elevations. TR-16 provides generalized added freeboard allowances for sea level rise, however these design criteria do not include a timeline for design life and do not consider site-specific considerations[6].

The Portsmouth Harbor NOAA tide station (Seavey Island) has extensive data gaps (years) where no data were collected. The NOAA tide station in Portland, Maine, however does have observed tide levels with over 100 years of data. The Portland tide station has sea level record since 1912 with an average rise of 1.89+/- 0.14 mm/year at 95% confidence. Looking at the Portland tide data over the last 38 years (two tidal epochs) the rate of sea level rise is about 2.6 mm/year (with a larger standard deviation). It is reasonable to use this 2.6 mm/year (10 inches /100 years) rise rate as a lower limit of anticipated sea level rise near term.

There are recent reports presenting projections for accelerating sea level rise caused by global warming. The latest federal government guide is 2017 NOAA Tech Report 083[7,] Sweet et.al. with tabulated values for relative sea level every 10 years starting in the year 2000, with consideration of land/earth crust vertical movement at selected tide gauge cities, and changes in local sea level including by gravitational changes associated with anticipated ice cap melting. This NOAA report does provide eighteen different decadal projections for local sea level rise at Portland, Maine, but did not relate these to the carbon emissions Representative Concentration Pathway (RCP) models developed by the Intergovernmental Panel on Climate Change (IPCC). Interpolation between the NOAA projection values for RCP4.5 sea level rise values, is plotted in green on Figure 1. The RCP4.5 interpolation between NOAA curves for Portland, indicates about 2.5 feet of sea level rise by year 2100. It is apparent that the actual observed rates of sea level rise from tide data in Portland, from a global average to 20 distributed tide stations and from satellite altimetry measurements (global), that the actual rate of sea level rise is significantly less than the NOAA report projected rate of rise. For early 2020, the NOAA projection curve which started in year 2000, is about 2.7 inches higher than observations and the trends are diverging. Thus the RCP4.5 carbon model and associated global warming sea level rise are not supported by observed data for Maine and New Hampshire.

The US Army Corps of Engineers sea level rise projection curves are shown in yellow and red in Figure 1. The “high” red curve has already diverged from observations. The

"intermediate" yellow curve has much better agreement with observations to date, and suggests 1.6 feet of sea level rise by 2100 above 1992 sea level.

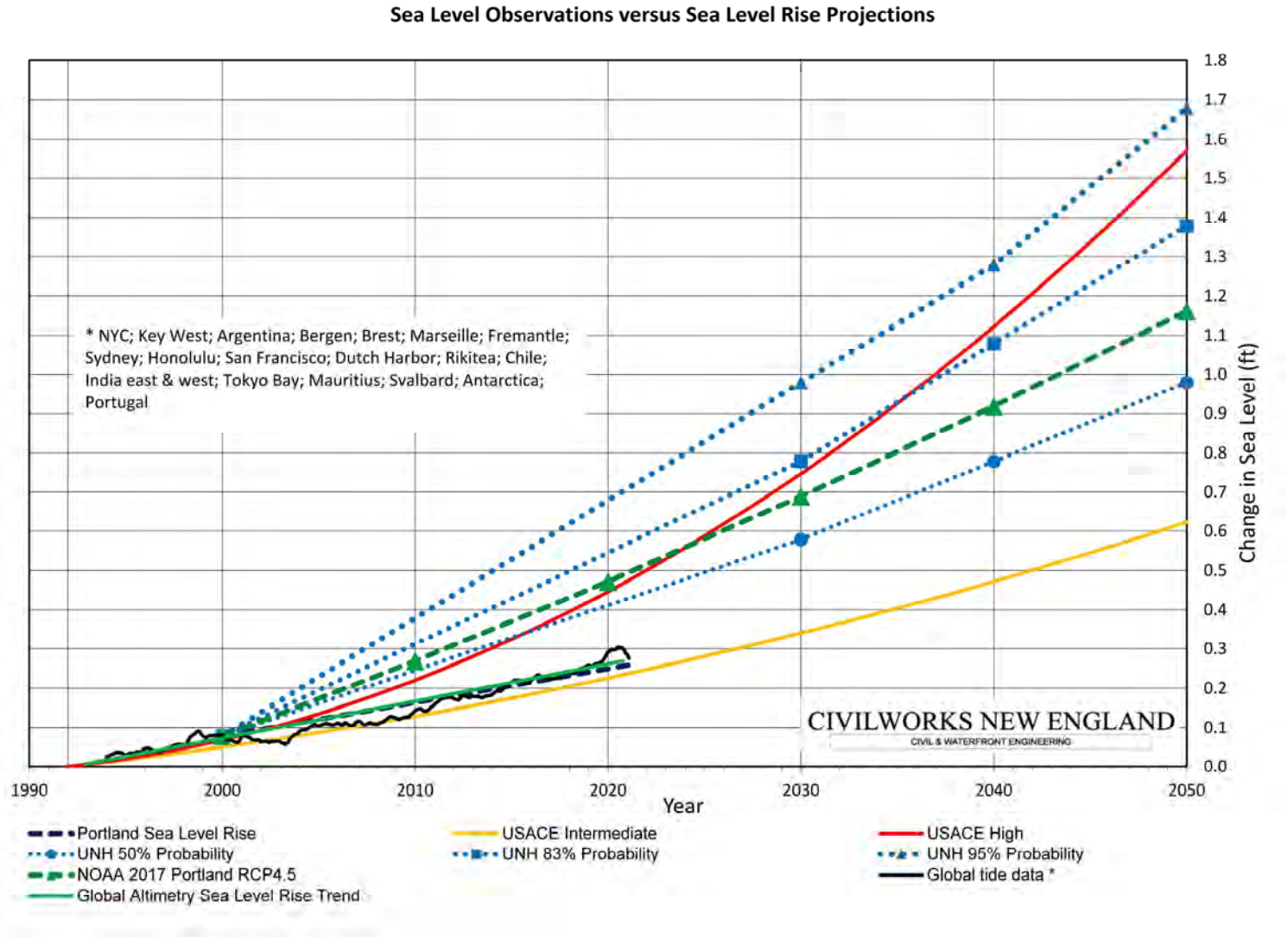

Figure 1 Comparison of Sea Level Rise Projections to Observations

The University of New Hampshire (UNH) issued a two part report *New Hampshire Coastal Flood Risk Summary*[9] in 2019 and 2020, which has been adopted by the state of New Hampshire and is the recommended policy in regulatory permitting by the NH Department of Environmental Services. Both the NOAA projections and the UNH projections use sea level rise projections starting from a sea level in the year 2000, developed by Kopp et. al. (2014)[10]. The UNH report does list probabilities for multiple sea level rise curves, using different probabilities for different projects tolerance for risk. It is important to understand

that these probabilities are Bayesian probabilities, based on future expectations, not traditional probabilities calculated from observational data, such as FEMA flood levels.

The 50% UNH probability sea level rise curve (lower dotted blue line) is plotted from the UNH Part I science report, and it is not used in the Part II guidance report. The Part II guidance report uses the 83% probability curve for the low end of design for projects with a high tolerance for sea level rise. The 95% probability curve is recommended for design of projects with a medium tolerance for sea level rise. UNH does recommend higher 99% and 99.9% probability curves, recommended for design of projects with low and very low tolerance for sea level rise, however these were not plotted given the greater divergence from observed data. For early 2020, the UNH 83% projection curve is about 3.5 inches higher than observations, for UNH 95% projection curve is about 5.2 inches higher than observations and both trends are diverging. The UNH guidance projection curves are based on older rise projections and the UNH model was not calibrated in consideration of actual sea level rise observations and trend over the last 20 years. Since the UNH sea level rise projections are already significantly in higher than observations with a steeper rise trend, they are not recommended for project design.

The design guidance in TR-16 for 100 year flood level plus 3 feet of sea level rise allowance is reasonable and conservative relative to observations, relative to a NOAA RCP4.5 sea level rise projection and relative to the Army Corps of Engineers intermediate sea level rise projection until at least year 2100.

REFERENCES:

1 *Living Shorelines: The Science and Management of Nature-Based Coastal Protection,* CRC Press, 2017, ISBN 9781315151465.

2 *Living Shorelines Engineering Guidelines*, New Jersey Department of Environmental Protection, revised Feb., 2016, SIT-DL-14-9-2942.

3 EM-1110-2-1100, Part 6, Table VI-5-6, Coastal Engineering Manual, US Army Corps of Engineers 2011.

4 *EurOtop*, 2018. Manual on wave overtopping of sea defences and related structures. Van der Meer, J.W., Allsop, N.W.H., Bruce, T., De Rouck, J., Kortenhaus, A., Pullen, T., Schüttrumpf, H., Troch, P. and Zanuttigh, B.

5 *TR-16 Guides For The Design of Wastewater Treatment Works*, NEIWPCC, 2011 Ed., rev 2016.

6 *Coastal Flood Protection: TR-16 Criteria Versus Site Specific Analysis*, D. Mellor, NEWEA Journal, Summer 2020, Vol. 54, No. 2, ISSN 1077-3002.

7 *Global and Regional Sea Level Rise Scenarios for the United States*. NOAA Technical Report NOS CO-OPS 083, Sweet, W.V., R.E. Kopp, C.P. Weaver, J. Obeysekera, R.M. Horton, E.R. Thieler, and C. Zervas, NOAA/NOS Center for Operational Oceanographic Products and Services, 2017.

8 *Procedures to Evaluate Sea Level Change: Impacts, Responses, and Adaptation*, ETL 1100-2-1, June 30, 2014, US Army Corps of Engineers.

9 *New Hampshire Coastal Flood Risk Summary – Part I: Science; Part II: Guidance for Using Scientific Projections*, NH Coastal Flood Risk Science and Technical Advisory Panel (2020), Univ. of New Hampshire, 2019/2020.

10 *Probabilistic 21st and 22nd Century Sea-Level Projections at a Global Network of Tide Gauge Sites.* Earth's Future, Kopp, R.E., Horton, R.M., Little, C.M., Mitrovica, J.X., Oppenheimer, M., Rasmussen, D.J., Strauss, B.H., & Tebaldi, C. (2014).

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TIDAL DATUM

Based on Seavey Island, ME - Datum, NAVD88

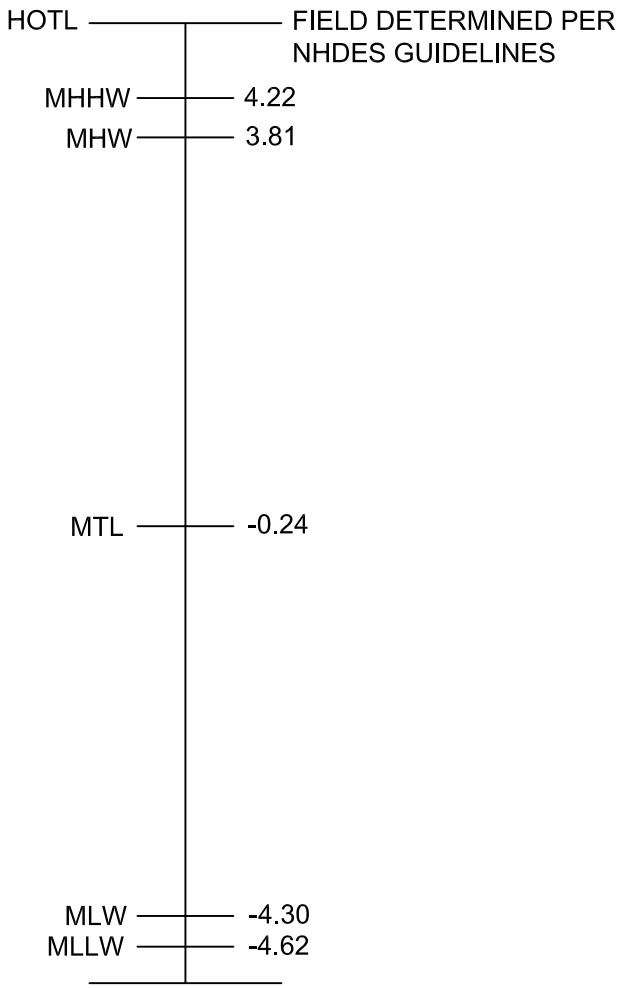
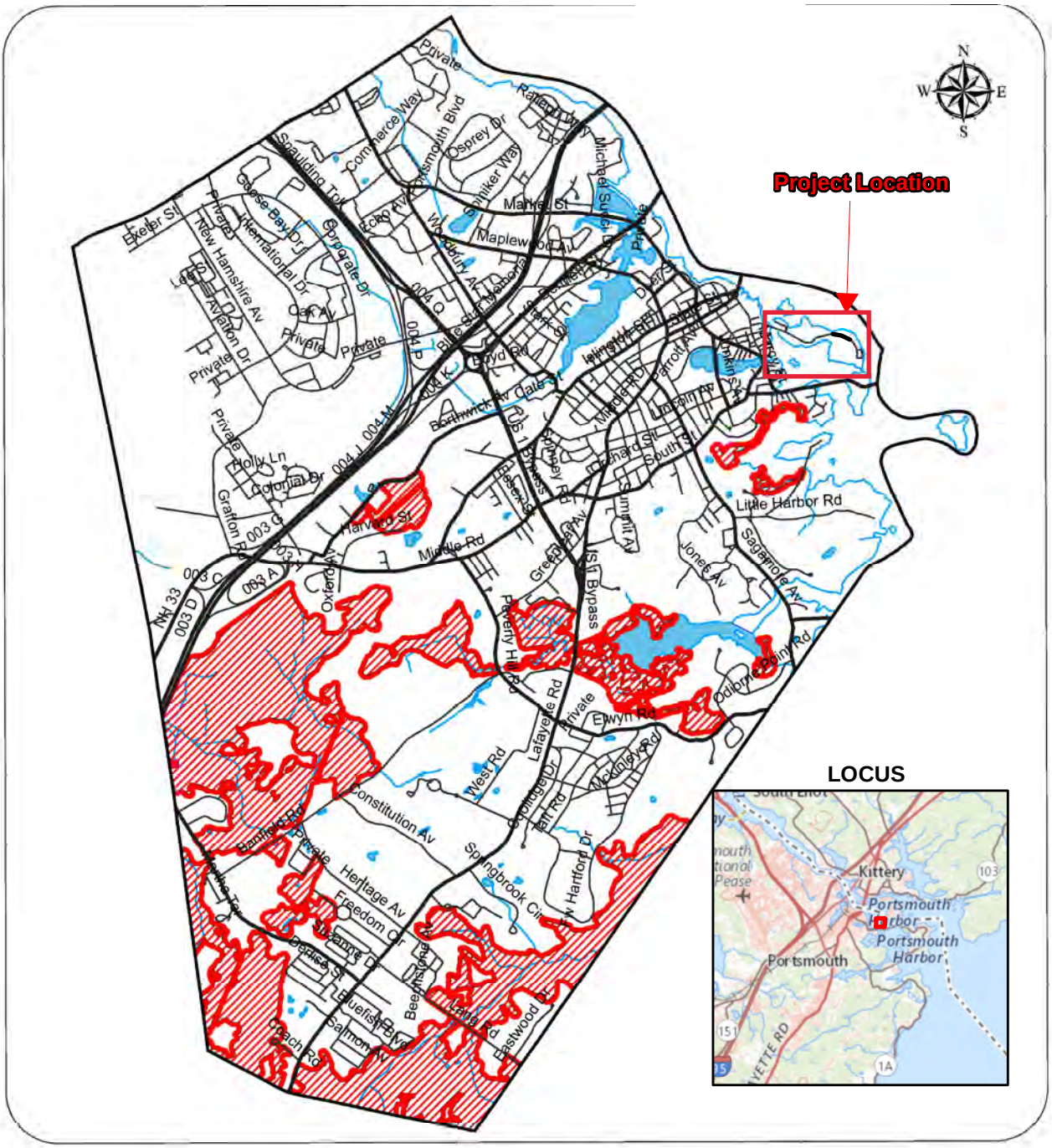


EXHIBIT 26

PRIME WETLANDS



Prime Wetlands in Portsmouth, NH

New Hampshire State Plane Coordinate System
North American Datum 1983 (feet)

The coverages presented are under constant revision as new sites or facilities are added, and may not contain all potential or existing sites or facilities. These maps were prepared using data supplied by the municipality and the information was digitized to the best of our ability. For prime wetland and prime wetland buffer locations for a specific site, please contact the municipal office where the project is proposed. NHDES is not responsible for the use or interpretation of this information by third parties.

New Hampshire Department of Environmental Services
Wetlands Bureau
29 Hazen Drive
P.O. Box 95
Concord, NH 03302-0095

DATE PRODUCED
October, 2012

EXHIBIT 27

ATTACHMENT A – MINOR AND MAJOR PROJECTS

STANDARD DREDGE AND FILL WETLANDS PERMIT APPLICATION ATTACHMENT A: MINOR AND MAJOR PROJECTS

Water Division/Land Resources Management
Wetlands Bureau

Check the Status of your Application

RSA/ Rule: RSA 482-A/ Env-Wt 311.10; Env-Wt 313.01(a)(1); Env-Wt 313.03

APPLICANT'S NAME: **Terry Demarais, PE** **TOWN NAME:** Portsmouth

Attachment A is required for *all minor and major projects*, and must be completed *in addition* to the Avoidance and Minimization Narrative or Checklist that is required by Env-Wt 307.11.

For projects involving construction or modification of non-tidal shoreline structures over areas of surface waters having an absence of wetland vegetation, only Sections I.X through I.XV are required to be completed.

PART I: AVOIDANCE AND MINIMIZATION

In accordance with Env-Wt 313.03(a), the Department shall not approve any alteration of any jurisdictional area unless the applicant demonstrates that the potential impacts to jurisdictional areas have been avoided to the maximum extent practicable and that any unavoidable impacts have been minimized, as described in the Wetlands Best Management Practice Techniques For Avoidance and Minimization.

SECTION I.I - ALTERNATIVES (Env-Wt 313.03(b)(1))

Describe how there is no practicable alternative that would have a less adverse impact on the area and environments under the Department's jurisdiction.

This project necessarily requires disturbance of a portion of Undeveloped Tidal Buffer Zone in which an unofficial trail will be converted to a walking path. The path connects existing trails located within the Undeveloped and Developed Tidal Buffer Zone and no alternative exists while providing shoreline views that are otherwise obstructed by the existing wastewater treatment facility. Additional work within the Developed Tidal Buffer Zone will be improvements to an existing road providing the sole access to the wastewater treatment facility; replacement of a gravel parking area with a pervious grass surface and vegetated buffer, resulting in improvements to existing environmental conditions; installation of new sewer force and water mains which will improve the reliability of the City's wastewater collection system, maximize flow to the WWTF, and allow removal of the temporary, above ground force main currently in use; and sliplining of one of the sewer force mains under the Peirce Island Road Bridge which will help avoid unexpected failure of the pipeline.

SECTION I.II - MARSHES (Env-Wt 313.03(b)(2))

Describe how the project avoids and minimizes impacts to tidal marshes and non-tidal marshes where documented to provide sources of nutrients for finfish, crustacean, shellfish, and wildlife of significant value.

No jurisdictional wetlands providing sources of nutrients for finfish, crustaceans, shellfish, and wildlife of significant value are being impacted as part of this project.

SECTION I.III - HYDROLOGIC CONNECTION (Env-Wt 313.03(b)(3))

Describe how the project maintains hydrologic connections between adjacent wetland or stream systems.

No hydrologic connections exist between adjacent wetland or stream systems within the area for this project.

SECTION I.IV - JURISDICTIONAL IMPACTS (Env-Wt 313.03(b)(4))

Describe how the project avoids and minimizes impacts to wetlands and other areas of jurisdiction under RSA 482-A, especially those in which there are exemplary natural communities, vernal pools, protected species and habitat, documented fisheries, and habitat and reproduction areas for species of concern, or any combination thereof.

There is no proposed impact to jurisdictional wetlands, exemplary natural communities, vernal pools, documented fisheries, and habitat and reproduction areas for species of concern. The environment to be impacted by this project is predominately Previously Disturbed Tidal Buffer Zone and a lesser amount of Undeveloped Tidal Buffer Zone.

There is a protected species, *Iva frutescens*, in the vicinity of the proposed grass parking area and the sewer force and water main replacements. NH Natural Heritage Bureau (NHNHB) has been consulted and has determined the parking area as planned will have no adverse impact on populations of this species. During installation of temporary sewer force mains in October, 2020 under Emergency Authorization 2020-02873, two areas of the adjacent marsh elder stands (*Iva frutescens*; NH State Threatened) were inadvertently impacted. After consultation with NHDES and NHNHB, several steps were prescribed by NHDES to mitigate the impacts. To prevent future impacts, construction fencing will be erected between the marsh elder stands and the work area prior to the start of work.

SECTION I.V - PUBLIC COMMERCE, NAVIGATION, OR RECREATION (Env-Wt 313.03(b)(5))

Describe how the project avoids and minimizes impacts that eliminate, depreciate or obstruct public commerce, navigation, or recreation.

There is no potential for impacts that would eliminate, depreciate, or obstruct public commerce in relation to this project. No businesses will be closed as a result of road construction, and the project will have a long term benefit to accessibility to the Peirce Island area and reliability of the WWTF. The project includes a recreational trail which will provide a public benefit to the community.

SECTION I.VI - FLOODPLAIN WETLANDS (Env-Wt 313.03(b)(6))

Describe how the project avoids and minimizes impacts to floodplain wetlands that provide flood storage.

The road and parking area improvements will result in 80 CY of fill in the coastal 100-year floodplain to raise the elevation of the road providing the only access to the wastewater treatment facility. This impact will have negligible effect on tidal elevations during storms, and will be mitigated by improvements to water quality by replacing the currently unvegetated sand and gravel substrate in the parking area with grassed pavers and a vegetated buffer to treat runoff from the parking area and stabilize the substrates.

SECTION I.VII - RIVERINE FORESTED WETLAND SYSTEMS AND SCRUB-SHRUB – MARSH COMPLEXES (Env-Wt 313.03(b)(7))

Describe how the project avoids and minimizes impacts to natural riverine forested wetland systems and scrub-shrub – marsh complexes of high ecological integrity.

There are no natural riverine forested wetland systems or scrub-shrub marsh complexes affected by the proposed project.

SECTION I.VIII - DRINKING WATER SUPPLY AND GROUNDWATER AQUIFER LEVELS (Env-Wt 313.03(b)(8))

Describe how the project avoids and minimizes impacts to wetlands that would be detrimental to adjacent drinking water supply and groundwater aquifer levels.

This project is located immediately upstream of the tidal system, thus impacts to the site will not affect drinking water supplies or groundwater aquifers.

SECTION I.IX - STREAM CHANNELS (Env-Wt 313.03(b)(9))

Describe how the project avoids and minimizes adverse impacts to stream channels and the ability of such channels to handle runoff of waters.

There are no stream channels in the area to be impacted by the project.

SECTION I.X - SHORELINE STRUCTURES - CONSTRUCTION SURFACE AREA (Env-Wt 313.03(c)(1))

Describe how the project has been designed to use the minimum construction surface area over surface waters necessary to meet the stated purpose of the structures.

There is no planned construction of shoreline structures for this project.

SECTION I.XI - SHORELINE STRUCTURES - LEAST INTRUSIVE UPON PUBLIC TRUST (Env-Wt 313.03(c)(2))

Describe how the type of construction proposed is the least intrusive upon the public trust that will ensure safe docking on the frontage.

There is no planned construction of shoreline structures for this project.

SECTION I.XII - SHORELINE STRUCTURES – ABUTTING PROPERTIES (Env-Wt 313.03(c)(3))

Describe how the structures have been designed to avoid and minimize impacts on ability of abutting owners to use and enjoy their properties.

There is no planned construction of shoreline structures for this project.

SECTION I.XIII - SHORELINE STRUCTURES – COMMERCE AND RECREATION (Env-Wt 313.03(c)(4))

Describe how the structures have been designed to avoid and minimize impacts to the public's right to navigation, passage, and use of the resource for commerce and recreation.

There is no planned construction of shoreline structures for this project.

SECTION I.XIV - SHORELINE STRUCTURES – WATER QUALITY, AQUATIC VEGETATION, WILDLIFE AND FINFISH HABITAT (Env-Wt 313.03(c)(5))

Describe how the structures have been designed, located, and configured to avoid impacts to water quality, aquatic vegetation, and wildlife and finfish habitat.

There is no planned construction of shoreline structures for this project.

SECTION I.XV - SHORELINE STRUCTURES – VEGETATION REMOVAL, ACCESS POINTS, AND SHORELINE STABILITY (Env-Wt 313.03(c)(6))

Describe how the structures have been designed to avoid and minimize the removal of vegetation, the number of access points through wetlands or over the bank, and activities that may have an adverse effect on shoreline stability.

There is no planned construction of shoreline structures for this project.

PART II: FUNCTIONAL ASSESSMENT
REQUIREMENTS Ensure that project meets the requirements of Env-Wt 311.10 regarding functional assessment (Env-Wt 311.04(j); Env-Wt 311.10).
FUNCTIONAL ASSESSMENT METHOD USED: This project does not have any direct impacts to wetlands or waters. The US Army Corps of Engineers highway methodology was used to evaluate the functions of the tidal wetlands adjacent to impacted Tidal Buffer Zone.
NAME OF CERTIFIED WETLAND SCIENTIST (FOR NON-TIDAL PROJECTS) OR QUALIFIED COASTAL PROFESSIONAL (FOR TIDAL PROJECTS) WHO COMPLETED THE ASSESSMENT: Sarah Allen, NH CWS 083
DATE OF ASSESSMENT: 04/07/2021
Check this box to confirm that the application includes a NARRATIVE ON FUNCTIONAL ASSESSMENT: ☒
For minor or major projects requiring a standard permit without mitigation, the applicant shall submit a wetland evaluation report that includes completed checklists and information demonstrating the RELATIVE FUNCTIONS AND VALUES OF EACH WETLAND EVALUATED. Check this box to confirm that the application includes this information, if applicable: ☒ Note: The Wetlands Functional Assessment worksheet can be used to compile the information needed to meet functional assessment requirements.

EXHIBIT 28

FUNCTIONAL ASSESSMENT WORKSHEET

WETLANDS FUNCTIONAL ASSESSMENT WORKSHEET

Water Division/Land Resource Management
Wetlands Bureau

Check the Status of your Application

RSA/Rule: RSA 482-A / Env-Wt 311.03(b)(10); Env-Wt 311.10

APPLICANT LAST NAME, FIRST NAME, M.I.: Terry Demarais, PE, City of Portsmouth

As required by Env-Wt 311.03(b)(10), an application for a standard permit for minor and major projects must include a functional assessment of all wetlands on the project site as specified in Env-Wt 311.10. This worksheet will help you compile data for the functional assessment needed to meet federal (US Army Corps of Engineers (USACE); if applicable) and NHDES requirements. Additional requirements are needed for projects in tidal area; please refer to the Coastal Area Worksheet (NHDES-W-06-079) for more information.

Both a desktop review and a field examination are needed to accurately determine surrounding land use, hydrology, hydroperiod, hydric soils, vegetation, structural complexity of wetland classes, hydrologic connections between wetlands or stream systems or wetland complex, position in the landscape, and physical characteristics of wetlands and associated surface waters. The results of the evaluation are to be used to select the location of the proposed project having the least impact to wetland functions and values (Env-Wt 311.10). This worksheet can be used in conjunction with the Avoidance and Minimization Written Narrative (NHDES-W-06-089) and the Avoidance and Minimization Checklist (NHDES-W-06-050) to address Env-Wt 313.03 (Avoidance and Minimization). If more than one wetland/ stream resource is identified, multiple worksheets can be attached to the application. All wetland, vernal pools, and stream identification (ID) numbers are to be displayed and located on the wetlands delineation of the subject property.

SECTION 1 - LOCATION (USACE HIGHWAY METHODOLOGY)	
ADJACENT LAND USE: Maintained parkland, shrub border, old field, access road, and construction laydown	
CONTIGUOUS UNDEVELOPED BUFFER ZONE PRESENT? ☐ Yes ☒ No	
DISTANCE TO NEAREST ROADWAY OR OTHER DEVELOPMENT (in feet): 30 ft	
SECTION 2 - DELINEATION (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)	
CERTIFIED WETLAND SCIENTIST (if in a non-tidal area) or QUALIFIED COASTAL PROFESSIONAL (if in a tidal area) who prepared this assessment: Sarah Allen , NHCWS 083	
DATE(S) OF SITE VISIT(S): 04/23/21; 01/14/21	DELINEATION PER ENV-WT 406 COMPLETED? ☒ Yes ☐ No
CONFIRM THAT THE EVALUATION IS BASED ON: ☒ Office and ☒ Field examination.	
METHOD USED FOR FUNCTIONAL ASSESSMENT (check one and fill in blank if “other”): ☒ USACE Highway Methodology. ☐ Other scientifically supported method (enter name/ title):	

SECTION 3 - WETLAND RESOURCE SUMMARY (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)	
WETLAND ID: Salt marsh south of laydown	LOCATION: (LAT/ LONG) 43.074282/-70.744530
WETLAND AREA: 0.5 ac	DOMINANT WETLAND SYSTEMS PRESENT: Fringe salt marsh
HOW MANY TRIBUTARIES CONTRIBUTE TO THE WETLAND? None	COWARDIN CLASS: E2EM1
IS THE WETLAND A SEPARATE HYDRAULIC SYSTEM? ☐ Yes ☒ No if not, where does the wetland lie in the drainage basin? Lower	IS THE WETLAND PART OF: ☐ A wildlife corridor or ☒ A habitat island?
	IS THE WETLAND HUMAN-MADE? ☐ Yes ☒ No
IS THE WETLAND IN A 100-YEAR FLOODPLAIN? ☒ Yes ☐ No	ARE VERNAL POOLS PRESENT? ☐ Yes ☒ No (If yes, complete the Vernal Pool Table)
ARE ANY WETLANDS PART OF A STREAM OR OPEN-WATER SYSTEM? ☒ Yes ☐ No	ARE ANY PUBLIC OR PRIVATE WELLS DOWNSTREAM/ DOWNGRADIENT? ☐ Yes ☒ No
PROPOSED WETLAND IMPACT TYPE: None	PROPOSED WETLAND IMPACT AREA: None

SECTION 4 - WETLANDS FUNCTIONS AND VALUES (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)

The following table can be used to compile data on wetlands functions and values. The reference numbers indicated in the "Functions/ Values" column refer to the following functions and values:

1. Ecological Integrity (from RSA 482-A:2, XI)
2. Educational Potential (from USACE Highway Methodology: Educational/Scientific Value)
3. Fish & Aquatic Life Habitat (from USACE Highway Methodology: Fish & Shellfish Habitat)
4. Flood Storage (from USACE Highway Methodology: Floodflow Alteration)
5. Groundwater Recharge (from USACE Highway Methodology: Groundwater Recharge/Discharge)
6. Noteworthiness (from USACE Highway Methodology: Threatened or Endangered Species Habitat)
7. Nutrient Trapping/Retention & Transformation (from USACE Highway Methodology: Nutrient Removal)
8. Production Export (Nutrient) (from USACE Highway Methodology)
9. Scenic Quality (from USACE Highway Methodology: Visual Quality/Aesthetics)
10. Sediment Trapping (from USACE Highway Methodology: Sediment /Toxicant Retention)
11. Shoreline Anchoring (from USACE Highway Methodology: Sediment/Shoreline Stabilization)
12. Uniqueness/Heritage (from USACE Highway Methodology)
13. Wetland-based Recreation (from USACE Highway Methodology: Recreation)
14. Wetland-dependent Wildlife Habitat (from USACE Highway Methodology: Wildlife Habitat)

First, determine if a wetland is suitable for a particular function and value ("Suitability" column) and indicate the rationale behind your determination ("Rationale" column). Please use the rationale reference numbers listed in Appendix A of USACE *The Highway Methodology Workbook Supplement*. Second, indicate which functions and values are principal ("Principal Function/value?" column). As described in *The Highway Methodology Workbook Supplement*, "functions and values can be principal if they are an important physical component of a wetland ecosystem (function only) and/or are considered of special value to society, from a local, regional, and/or national perspective". "Important Notes" are to include characteristics the evaluator used to determine the principal function and value of the wetland.

FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE (Reference #)	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	☒ Yes ☐ No	Fringing salt marsh on lee of island provides physical and biological value to area	☐ Yes ☒ No	Patchy, has strip of marsh elder along upland edge, often above HOTL
2	☒ Yes ☐ No	1,2,8,9,14	☐ Yes ☒ No	Marsh is of limited value due to small size and fringe nature.
3	☒ Yes ☐ No	1,2,3,4,5,6	☒ Yes ☐ No	Site is adjacent to Piscataqua River, with anadromous fish migration. Offers nursery and forage to multiple fish species.
4	☒ Yes ☐ No	6,10,11,13,18	☐ Yes ☒ No	Fringe marsh provides minor storage and buffer during storms and flooding
5	☐ Yes ☒ No	4,8,15	☐ Yes ☒ No	Borders tidal waters, minor seepage visible, underlain by gravel and bedrock
6	☒ Yes ☐ No	1	☒ Yes ☐ No	Marsh supports *Iva frutescens*, a State-Threatened species.
7	☒ Yes ☐ No	3,5,7,8,9,11,12,14	☐ Yes ☒ No	Fring marsh vegetation provides limited nutrient removal opportunities of runoff from access road and parking areas.
8	☒ Yes ☐ No	2,5,6,7,9,11,13	☐ Yes ☒ No	Fringe marsh vegetation supports invertebrates and exports detritus for food web support.
9	☒ Yes ☐ No	2,7,12	☐ Yes ☒ No	Fringe marsh adds visual benefit in developed Portsmouth landscape.
10	☒ Yes ☐ No	1,3,4,8,16	☐ Yes ☒ No	Fringe marsh provides modest sediment removal function from runoff from access road and parking area.
11	☒ Yes ☐ No	1,6,7,10,11,12,13,15	☒ Yes ☐ No	Fringe marsh provides important energy absorbing action to protect shoreline from scour.
12	☒ Yes ☐ No	1,10,13,14,22,24,28	☒ Yes ☐ No	Marsh is adjacent to the Peirce Island trail system and supports the rare shrub, *Iva frutescens*.
13	☐ Yes ☒ No	7,9,10,12	☐ Yes ☒ No	Marsh in close proximity to proposed parking area, but access will be discouraged by fencing.

14	☒ Yes ☐ No	3,6,8,13,19	☐ Yes ☒ No	Fringe marsh provides modest wildlife habitat on island in developed Portsmouth harbor.

SECTION 5 - VERNAL POOL SUMMARY (Env-Wt 311.10)

Delineations of vernal pools shall be based on the characteristics listed in the definition of "vernal pool" in Env-Wt 104.44. To assist in the delineation, individuals may use either of the following references:

- *Identifying and Documenting Vernal Pools in New Hampshire 3rd Ed.*, 2016, published by the New Hampshire Fish and Game Department; or
- The USACE *Vernal Pool Assessment* draft guidance dated 9-10-2013 and form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

All vernal pool ID numbers are to be displayed and located on the wetland delineation of the subject property.

"Important Notes" are to include documented reproductive and wildlife values, landscape context, and relationship to other vernal pools/wetlands.

Note: For projects seeking federal approval from the USACE, please attach a completed copy of The USACE "Vernal Pool Assessment" form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

VERNAL POOL ID NUMBER	DATE(S) OBSERVED	PRIMARY INDICATORS PRESENT (LIST)	SECONDARY INDICATORS PRESENT (LIST)	LENGTH OF HYDROPERIOD	IMPORTANT NOTES
1					
2					
3					
4					
5					

SECTION 6 - STREAM RESOURCES SUMMARY

DESCRIPTION OF STREAM:	STREAM TYPE (ROSGEN):
HAVE FISHERIES BEEN DOCUMENTED? ☐ Yes ☐ No	DOES THE STREAM SYSTEM APPEAR STABLE? ☐ Yes ☐ No
OTHER KEY ON-SITE FUNCTIONS OF NOTE:	

The following table can be used to compile data on stream resources. "Important Notes" are to include characteristics the evaluator used to determine principal function and value of each stream. The functions and values reference number are defined in Section 4.

FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	☐ Yes ☐ No		☐ Yes ☐ No	
2	☐ Yes ☐ No		☐ Yes ☐ No	
3	☐ Yes ☐ No		☐ Yes ☐ No	
4	☐ Yes ☐ No		☐ Yes ☐ No	
5	☐ Yes ☐ No		☐ Yes ☐ No	
6	☐ Yes ☐ No		☐ Yes ☐ No	
7	☐ Yes ☐ No		☐ Yes ☐ No	
8	☐ Yes ☐ No		☐ Yes ☐ No	
9	☐ Yes ☐ No		☐ Yes ☐ No	
10	☐ Yes ☐ No		☐ Yes ☐ No	
11	☐ Yes ☐ No		☐ Yes ☐ No	
12	☐ Yes ☐ No		☐ Yes ☐ No	
13	☐ Yes ☐ No		☐ Yes ☐ No	
14	☐ Yes ☐ No		☐ Yes ☐ No	

SECTION 7 - ATTACHMENTS (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)

☒ Wildlife and vegetation diversity/abundance list.

☒ Photograph of wetland.

☒ Wetland delineation plans showing wetlands, vernal pools, and streams in relation to the impact area and surrounding landscape. Wetland IDs, vernal pool IDs, and stream IDs must be indicated on the plans.

☒ For projects in tidal areas only: additional information required by Env-Wt 603.03/603.04. Please refer to the Coastal Area Worksheet (NHDES-W-06-079) for more information.

WETLANDS FUNCTIONAL ASSESSMENT WORKSHEET

Water Division/Land Resource Management
Wetlands Bureau

Check the Status of your Application

RSA/Rule: RSA 482-A / Env-Wt 311.03(b)(10); Env-Wt 311.10

APPLICANT LAST NAME, FIRST NAME, M.I.: Terry Demarais, PE, City of Portsmouth

As required by Env-Wt 311.03(b)(10), an application for a standard permit for minor and major projects must include a functional assessment of all wetlands on the project site as specified in Env-Wt 311.10. This worksheet will help you compile data for the functional assessment needed to meet federal (US Army Corps of Engineers (USACE); if applicable) and NHDES requirements. Additional requirements are needed for projects in tidal area; please refer to the Coastal Area Worksheet (NHDES-W-06-079) for more information.

Both a desktop review and a field examination are needed to accurately determine surrounding land use, hydrology, hydroperiod, hydric soils, vegetation, structural complexity of wetland classes, hydrologic connections between wetlands or stream systems or wetland complex, position in the landscape, and physical characteristics of wetlands and associated surface waters. The results of the evaluation are to be used to select the location of the proposed project having the least impact to wetland functions and values (Env-Wt 311.10). This worksheet can be used in conjunction with the Avoidance and Minimization Written Narrative (NHDES-W-06-089) and the Avoidance and Minimization Checklist (NHDES-W-06-050) to address Env-Wt 313.03 (Avoidance and Minimization). If more than one wetland/ stream resource is identified, multiple worksheets can be attached to the application. All wetland, vernal pools, and stream identification (ID) numbers are to be displayed and located on the wetlands delineation of the subject property.

SECTION 1 - LOCATION (USACE HIGHWAY METHODOLOGY)	
ADJACENT LAND USE: Upland shrub/forest, walking trail, access road and wastewater treatment facility	
CONTIGUOUS UNDEVELOPED BUFFER ZONE PRESENT? ☐ Yes ☒ No	
DISTANCE TO NEAREST ROADWAY OR OTHER DEVELOPMENT (in feet): 10	
SECTION 2 - DELINEATION (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)	
CERTIFIED WETLAND SCIENTIST (if in a non-tidal area) or QUALIFIED COASTAL PROFESSIONAL (if in a tidal area) who prepared this assessment: Sarah Allen, NHCWS 083	
DATE(S) OF SITE VISIT(S): 04/23/21; 01/14/21	DELINEATION PER ENV-WT 406 COMPLETED? ☒ Yes ☐ No
CONFIRM THAT THE EVALUATION IS BASED ON: ☒ Office and ☒ Field examination.	
METHOD USED FOR FUNCTIONAL ASSESSMENT (check one and fill in blank if "other"): ☒ USACE Highway Methodology. ☐ Other scientifically supported method (enter name/ title):	

SECTION 3 - WETLAND RESOURCE SUMMARY (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)	
WETLAND ID: Rocky shore on north side of island	LOCATION: (LAT/ LONG) 43o4'23/70o44'23.6
WETLAND AREA: 0.5 ac	DOMINANT WETLAND SYSTEMS PRESENT: Rocky shore
HOW MANY TRIBUTARIES CONTRIBUTE TO THE WETLAND? NA	COWARDIN CLASS: E2RS
IS THE WETLAND A SEPARATE HYDRAULIC SYSTEM? ☐ Yes ☒ No if not, where does the wetland lie in the drainage basin? Lower	IS THE WETLAND PART OF: ☐ A wildlife corridor or ☒ A habitat island? IS THE WETLAND HUMAN-MADE? ☐ Yes ☒ No
IS THE WETLAND IN A 100-YEAR FLOODPLAIN? ☒ Yes ☐ No	ARE VERNAL POOLS PRESENT? ☐ Yes ☒ No (If yes, complete the Vernal Pool Table)
ARE ANY WETLANDS PART OF A STREAM OR OPEN-WATER SYSTEM? ☒ Yes ☐ No	ARE ANY PUBLIC OR PRIVATE WELLS DOWNSTREAM/ DOWNGRADIENT? ☐ Yes ☒ No
PROPOSED WETLAND IMPACT TYPE: None	PROPOSED WETLAND IMPACT AREA: None

SECTION 4 - WETLANDS FUNCTIONS AND VALUES (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)

The following table can be used to compile data on wetlands functions and values. The reference numbers indicated in the "Functions/ Values" column refer to the following functions and values:

1. Ecological Integrity (from RSA 482-A:2, XI)
2. Educational Potential (from USACE Highway Methodology: Educational/Scientific Value)
3. Fish & Aquatic Life Habitat (from USACE Highway Methodology: Fish & Shellfish Habitat)
4. Flood Storage (from USACE Highway Methodology: Floodflow Alteration)
5. Groundwater Recharge (from USACE Highway Methodology: Groundwater Recharge/Discharge)
6. Noteworthiness (from USACE Highway Methodology: Threatened or Endangered Species Habitat)
7. Nutrient Trapping/Retention & Transformation (from USACE Highway Methodology: Nutrient Removal)
8. Production Export (Nutrient) (from USACE Highway Methodology)
9. Scenic Quality (from USACE Highway Methodology: Visual Quality/Aesthetics)
10. Sediment Trapping (from USACE Highway Methodology: Sediment /Toxicant Retention)
11. Shoreline Anchoring (from USACE Highway Methodology: Sediment/Shoreline Stabilization)
12. Uniqueness/Heritage (from USACE Highway Methodology)
13. Wetland-based Recreation (from USACE Highway Methodology: Recreation)
14. Wetland-dependent Wildlife Habitat (from USACE Highway Methodology: Wildlife Habitat)

First, determine if a wetland is suitable for a particular function and value ("Suitability" column) and indicate the rationale behind your determination ("Rationale" column). Please use the rationale reference numbers listed in Appendix A of USACE *The Highway Methodology Workbook Supplement*. Second, indicate which functions and values are principal ("Principal Function/value?" column). As described in *The Highway Methodology Workbook Supplement*, "functions and values can be principal if they are an important physical component of a wetland ecosystem (function only) and/or are considered of special value to society, from a local, regional, and/or national perspective". "Important Notes" are to include characteristics the evaluator used to determine the principal function and value of the wetland.

FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE (Reference #)	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	☒ Yes ☐ No	Porvides buffer from wave action and habitat for marine species	☐ Yes ☒ No	Undisturbed habitat on steep sections, more level sections are used by walkers
2	☐ Yes ☒ No	2	☐ Yes ☒ No	Steep rocky slopes prohibit access.
3	☒ Yes ☐ No	3,4,5,6	☒ Yes ☐ No	Adjacent to Piscataqua River, with anadromous fish migration. Offers nursery and forage to multiple fish species.
4	☐ Yes ☒ No	3,9,13	☐ Yes ☒ No	Steep gradient provides minimal storage during storms and flooding.
5	☐ Yes ☒ No	7	☐ Yes ☒ No	Steep ledge limits discharge potential.
6	☐ Yes ☒ No	None	☐ Yes ☒ No	Mapped as high value on WAP, but appears to be spillover from estuary
7	☐ Yes ☒ No	2,4,5	☐ Yes ☒ No	Rockweed provides minimal nutrient removal opportunities from runoff.
8	☒ Yes ☐ No	2,5,6	☐ Yes ☒ No	Rockweed provides some forage and shelter for higher trophic organisms, occasional detritus.
9	☒ Yes ☐ No	6,7,12	☐ Yes ☒ No	Path will allow public viewing.
10	☐ Yes ☒ No	8	☐ Yes ☒ No	Hard, steep substrate provides minimal sediment removal function.
11	☒ Yes ☐ No	2,8,10,11,16	☒ Yes ☐ No	Ledge protects against erosion, rockweed dissipates wave energy.
12	☒ Yes ☐ No	14,18,22	☐ Yes ☒ No	Typical rocky shore of Piscataqua River, but path will allow public viewing.
13	☐ Yes ☒ No	6,7,9	☐ Yes ☒ No	Steep rocky slopes prohibit access.
14	☒ Yes ☐ No	24	☐ Yes ☒ No	Marine invertebrates and rockweed provide forage for seaducks.

SECTION 5 - VERNAL POOL SUMMARY (Env-Wt 311.10)

Delineations of vernal pools shall be based on the characteristics listed in the definition of "vernal pool" in Env-Wt 104.44. To assist in the delineation, individuals may use either of the following references:

- *Identifying and Documenting Vernal Pools in New Hampshire 3rd Ed.*, 2016, published by the New Hampshire Fish and Game Department; or
- The USACE *Vernal Pool Assessment* draft guidance dated 9-10-2013 and form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

All vernal pool ID numbers are to be displayed and located on the wetland delineation of the subject property.

"Important Notes" are to include documented reproductive and wildlife values, landscape context, and relationship to other vernal pools/wetlands.

Note: For projects seeking federal approval from the USACE, please attach a completed copy of The USACE "Vernal Pool Assessment" form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

VERNAL POOL ID NUMBER	DATE(S) OBSERVED	PRIMARY INDICATORS PRESENT (LIST)	SECONDARY INDICATORS PRESENT (LIST)	LENGTH OF HYDROPERIOD	IMPORTANT NOTES
1					
2					
3					
4					
5					

SECTION 6 - STREAM RESOURCES SUMMARY

DESCRIPTION OF STREAM:	STREAM TYPE (ROSGEN):
HAVE FISHERIES BEEN DOCUMENTED? ☐ Yes ☐ No	DOES THE STREAM SYSTEM APPEAR STABLE? ☐ Yes ☐ No
OTHER KEY ON-SITE FUNCTIONS OF NOTE:	

The following table can be used to compile data on stream resources. "Important Notes" are to include characteristics the evaluator used to determine principal function and value of each stream. The functions and values reference number are defined in Section 4.

FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	☐ Yes ☐ No		☐ Yes ☐ No	
2	☐ Yes ☐ No		☐ Yes ☐ No	
3	☐ Yes ☐ No		☐ Yes ☐ No	
4	☐ Yes ☐ No		☐ Yes ☐ No	
5	☐ Yes ☐ No		☐ Yes ☐ No	
6	☐ Yes ☐ No		☐ Yes ☐ No	
7	☐ Yes ☐ No		☐ Yes ☐ No	
8	☐ Yes ☐ No		☐ Yes ☐ No	
9	☐ Yes ☐ No		☐ Yes ☐ No	
10	☐ Yes ☐ No		☐ Yes ☐ No	
11	☐ Yes ☐ No		☐ Yes ☐ No	
12	☐ Yes ☐ No		☐ Yes ☐ No	
13	☐ Yes ☐ No		☐ Yes ☐ No	
14	☐ Yes ☐ No		☐ Yes ☐ No	

SECTION 7 - ATTACHMENTS (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)

☒ Wildlife and vegetation diversity/abundance list.

☒ Photograph of wetland.

☒ Wetland delineation plans showing wetlands, vernal pools, and streams in relation to the impact area and surrounding landscape. Wetland IDs, vernal pool IDs, and stream IDs must be indicated on the plans.

☒ For projects in tidal areas only: additional information required by Env-Wt 603.03/603.04. Please refer to the Coastal Area Worksheet (NHDES-W-06-079) for more information.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Portsmouth Wastewater Treatment Facility City/County: Portsmouth/Rockingham Sampling Date: 1/14/2020

Applicant/Owner: City of Portsmouth State: NH Sampling Point: HOT-UPL

Investigator(s): B. Griffith Section, Township, Range:

Landform (hillside, terrace, etc.): shoreline Local relief (concave, convex, none): Slope %: 3

Subregion (LRR or MLRA): LRR R Lat: 43.074354 Long: -70.744328 Datum: WGS 1984

Soil Map Unit Name: Urban land-Canton complex, 3 to 15 percent slopes NWI classification: None

Are climatic / hydrologic 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	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes	No X	**within a Wetland?** **Yes** **No** X
Wetland Hydrology Present?	Yes	No X	If yes, optional Wetland Site ID:

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)
- 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)
- Sparsely 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 on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No	Depth (inches):
Water Table Present?	Yes	No	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No	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: HOT-UPL

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15' R)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Herb Stratum (Plot size: 5' R)			
1. *Digitaria sanguinalis*	70	Yes	FACU
2. *Festuca rubra*	20	Yes	FACU
3. *Plantago lanceolata*	10	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 30' R)			
1.			
2.			
3.			
4.			
	=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: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) 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 3.28 ft (1 m) tall.

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

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

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

SOIL

Sampling Point HOT-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/4	100					Sandy	
6-10	10YR 4/4	80	10YR 5/6	20	C	M	Sandy	Distinct redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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 (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Portsmouth Wastewater Treatment Facility City/County: Portsmouth/Rockingham Sampling Date: 1/14/2020

Applicant/Owner: City of Portsmouth State: NH Sampling Point: HOT-Wet

Investigator(s): B. Griffith Section, Township, Range:

Landform (hillside, terrace, etc.): shoreline Local relief (concave, convex, none): Slope %: 3

Subregion (LRR or MLRA): LRR R Lat: 43.074282 Long: -70.744530 Datum: WGS 1984

Soil Map Unit Name: Urban land-Caton complex, 3 to 15 percent slopes NWI classification: E2EM1

Are climatic / hydrologic 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**
Hydric Soil Present?	Yes X	No	**within a Wetland?** **Yes** X **No**
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID:

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)

- X Surface Water (A1)
- X 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)
- Sparsely 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 on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No	Depth (inches): 3
Water Table Present?	Yes X	No	Depth (inches): 0
Saturation Present? (includes capillary fringe)	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: HOT-Wet

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15' R)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Herb Stratum (Plot size: 5' R)			
1. *Spartina patens*	95	Yes	FACW
2. *Salicornia depressa*	5	No	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 30' R)			
1.			
2.			
3.			
4.			
	=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: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	95	x 2 =	190
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		195 (B)

Prevalence Index = B/A = 1.95

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

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

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point HOT-Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10y 4/1	100					Sandy	
1-3	10YR 3/1	100					Peat	
3-19	10Y 4/1	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- X Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ? 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

Peirce Island Wastewater Treatment Facility

Wetland Narrative

Section 1. Required Information

Peirce Island is located in the City of Portsmouth on the Piscataqua River. It is owned by the City and the State of NH, and provides multiple public services, including the WWTF, the State Fish Pier, a public outdoor pool, boat ramp, park and numerous walking trails. The slip lined portion of the Project Area is contained to the Peirce Island Road Bridge. The pipeline replacement portion of the Project Area is linear on the west end of the island, widens out near the parking area, and narrows again for the recreational area at the east end near the wastewater treatment facility. Peirce Island is bordered by estuarine habitats, including rocky shore (E2RS1/2) and salt marsh (E2EM1). No impacts to these wetland resources are proposed. Most of the work area lies within the 100-foot tidal buffer zone, with a smaller section of the pipeline corridor and of the parking area lying within protected shoreland. Based on consultation with DES Shoreland, a Permit-By-Notification application was submitted concurrently with the Wetlands application for pipeline impacts in the protected shoreland, but outside of the tidal buffer zone. No freshwater resources are within or adjacent to the impact areas. Marsh elder, a State Threatened plant species, forms a narrow band along much of the southern shore of the island.

See representative photographs of resources in Exhibit 15.

Tidal Buffer Zone

Most of the proposed work occurs within the jurisdictional tidal buffer zone (TBZ), the majority of which is previously developed (PDTBZ). The PDTBZ includes the paved road in the vicinity of the pipeline and slipline work, grassed lawns and unpaved parking area in the vicinity of the pipeline work, paved areas and structures within the wastewater treatment facility, and the gravel lot used as a construction laydown area and snow dump. A smaller section of the TBZ in the proposed project area is undisturbed TBZ, primarily in the vicinity of the recreational trail. This section is dominated by small trees and vines: staghorn sumac (*Rhus typhina*), oriental bittersweet (*Celastrus orbiculatus*), black cherry (*Prunus serotina*) and gray birch *(Betula populifolia*). The ground cover is a mix of perennial grasses and some forbs.

Salt Marsh

Several sections of salt marsh occur on the southern, more protected side of the island. The marshes are a mix of high marsh and low marsh with typical *Spartina* species (*S. alterniflora* in the low marsh and *S. patens* dominating the high marsh). Typical salt marsh forbs dominate in the upper marsh and marsh elder, *Iva frutescens*, (NH state-Threatened) occurs along the upland border. This shrub is common in southern New England, and is reaching the northern edge of its geographic range in NH.

Rocky Shore

The eastern portion of Peirce Island and the shoreline of the Piscataqua River adjacent Peirce Island Road Bridge below the Highest Observable Tide Line are predominantly bedrock outcrop and cobble gravel/shore. Rockweeds (*Ascophyllum* and *Fucus* spp) are prevalent in the lower intertidal zone on boulders and ledge. Much of the remaining rocky shore is unvegetated. The sections on which the bridge and the WWTF are located are steep-sided exposed ledge or boulders, with abundant rockweeds. By the gravel lot and access road, the rocky shore is more gradual in slope and of finer gravel and cobble. Off the northwestern corner of the Peirce Island Rd. Bridge, a narrow shelf of cobble and gravel occurs between the grassed upland bank and steep-sloped riprap. The cobble gravel areas are generally unvegetated with minor occurrences of salt tolerant species such as *Spartina patens*, *Limonium carolinianum*, and *Solidago sempervirens*.

Protected Shoreland

Approximately a third of the pipeline replacement work will occur in the protected shoreland zone above the PDTBZ. These areas of the island are developed and maintained, and includes Peirce Island Road, the boat ramp parking area and mowed parkland. A Shoreland PBN for utility maintenance was submitted concurrently with this Wetlands application.

State-Listed Species

The NHB data review (NHB21-1136; Exhibit 19) indicates eelgrass (*Zostera maritima*) and Atlantic and Shortnose Sturgeon (*Acipenser oxyrinchus* and *A. brevirostrum*) occur in the subtidal waters off Peirce Island. The proposed work will have no adverse impacts to those marine species. The project does not impact any estuarine or marine wetland resources, nor does it include in-water work that would adversely affect marine biota or their habitats.