Central Pond/Sawmill Brook Restoration Project
Central Street, Manchester-by-the-Sea

NOTICE OF INTENT

Town of Manchester-by-the-Sea
10 Central Street
Manchester-by-the-Sea, Massachusetts

March 30, 2020

Tighe&Bond

M-14760-014-02
March 30, 2020

Chris Bertoni, Conservation Agent
Manchester-by-the-Sea Conservation Commission
10 Central Street
Manchester-by-the-Sea, MA 01944-1399

Re: **Ecological Restoration Notice of Intent (NOI)**
Central Pond and Sawmill Brook Restoration Project

Dear Agent Bertoni and Conservation Commissioners,

On the behalf of the Town of Manchester-by-the-Sea, Tighe & Bond is submitting an Ecological Restoration Notice of Intent (NOI) for the Central Pond and Sawmill Brook Restoration Project. This proposed project is part of tidal restoration of Central Pond and includes the repair and replacement of failing retaining walls, the construction of living shoreline stabilization elements, and native plantings. The goal of this project to is improve the stability of the shoreline of Central Pond and Sawmill Brook to enhance both ecological conditions and coastal resiliency. Additional elements of the tidal restoration include the replacement of the Central Street bridge and removal of the existing tide gate structure which will occur under a separate application.

This NOI is being filed under the Massachusetts Wetlands Protection Act (WPA; M.G.L. c. 131 § 40) and the Town of Manchester-by-the-Sea Wetlands Regulations (Article XVII) and its implementing regulations. Proposed work will occur within Land Under Ocean (LUO), Coastal Beach, Coastal Bank, the 200-foot Riverfront Area associated with Sawmill Brook, as well as the 100-foot Buffer Zone to Coastal Bank and Land Subject to Coastal Storm Flowage (LSCSF). The work will also occur within the locally regulated 30-foot No-Disturbance Zone and 50-foot No-Build Zone. This project is submitted as an Ecological Restoration Limited Project and falls under the Tidal Restoration Project category (310 CMR 10.24(8)(e)(1)).

We look forward to having the opportunity to discuss this project with the Manchester-by-the-Sea Conservation Commission at the April 14, 2020 public hearing. We understand that public hearings may need to be held using alternate methods given the current COVID19 crisis. Should you have any questions or require additional information please contact Gabrielle Belfit at (508) 304-6362 or GCBelfit@tighebond.com or me at (508) 471-9631 or RCanavan@tighebond.com .

Very truly yours,

TIGHE & BOND, INC.

Richard Canavan, PWS, PhD
Principal Environmental Scientist

Copy: Greg Federspiel, Town Administrator, Manchester-by-the-Sea
MassDEP NERO
Division of Marine Fisheries

Tighe&Bond

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WPA Form 3 and Form 3a

Town NOI Checklist

Transmittal Form

Additional Information – Bound Separately

Project Plans – Central Pond Restoration (Prepared by: Tighe & Bond; Dated: March 2020)

WPA FORM 3 and 3A

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

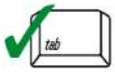
Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Manchester-by-the-Sea
City/Town

Important:
When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Note:
Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

Central Street, east of Elm Street — a. Street Address
Manchester-by-the-Sea — b. City/Town
01944 — c. Zip Code

Latitude and Longitude:
42.575316 — d. Latitude
-70.772875 — e. Longitude

53/0 — f. Assessors Map/Plat Number
28 — g. Parcel /Lot Number

2. Applicant:

Gregory — a. First Name
Federspiel — b. Last Name
Town of Manchester-by-the-Sea — c. Organization
10 Central Street — d. Street Address
Manchester-by-the-Sea — e. City/Town
MA — f. State
01944 — g. Zip Code
(978) 526-2000 — h. Phone Number
(978) 526-2001 — i. Fax Number
federspielg@manchester.ma.us — j. Email Address

3. Property owner (required if different from applicant): ☐ Check if more than one owner

a. First Name
b. Last Name
c. Organization
d. Street Address
e. City/Town
f. State
g. Zip Code
h. Phone Number
i. Fax Number
j. Email address

4. Representative (if any):

Richard — a. First Name
Canavan — b. Last Name
Tighe & Bond, Inc. — c. Company
120 Front Street, Suite 7 — d. Street Address
Worcester — e. City/Town
MA — f. State
01608 — g. Zip Code
(508) 471-9631 — h. Phone Number
i. Fax Number
RCanavan@tighebond.com — j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

N/A- Municipal Project — a. Total Fee Paid
N/A- Fee Exempt — b. State Fee Paid
N/A- Fee Exempt — c. City/Town Fee Paid

Massachusetts Department of Environmental Protection
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A. General Information (continued)

6. General Project Description:

The project is part of a restoration of tidal flows to Central Pond. The work proposed in this application is to stabilize the shore of Central Pond with retaining wall repair/ replacement and construction of a living shoreline to improve ecological conditions and coastal resiliency.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

1. ☐ Single Family Home
2. ☐ Residential Subdivision
3. ☐ Commercial/Industrial
4. ☐ Dock/Pier
5. ☐ Utilities
6. ☐ Coastal engineering Structure
7. ☐ Agriculture (e.g., cranberries, forestry)
8. ☐ Transportation
9. ☐ Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☒ Yes ☐ No

If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

310 CMR 10.24(8)(e)(1)
2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

Essex
a. County

b. Certificate # (if registered land)

881
c. Book

173
d. Page Number

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1. ☐ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
2. ☐ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Bank	1. linear feet	2. linear feet
b. ☐ Bordering Vegetated Wetland	1. square feet	2. square feet
c. ☐ Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☐ Bordering Land Subject to Flooding	1. square feet 3. cubic feet of flood storage lost	2. square feet 4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet 2. cubic feet of flood storage lost	3. cubic feet replaced

f. ☒ Riverfront Area

Sawmill Brook (coastal)
1. Name of Waterway (if available) - **specify coastal or inland**

2. Width of Riverfront Area (check one):

☐ 25 ft. - Designated Densely Developed Areas only

☐ 100 ft. - New agricultural projects only

☒ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: 314,437 square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet	b. square feet within 100 ft.	c. square feet between 100 ft. and 200 ft.
25,062	23,594	1,468

5. Has an alternatives analysis been done and is it attached to this NOI? ☒ Yes ☐ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☒ Yes ☐ No

3. ☒ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f**. above.

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☒ Land Under the Ocean	1,280 (permanent), 750 (temporary) 3,046 2. cubic yards dredged	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☒ Coastal Beaches	14,245 (permanent), 10,247 (temporary)	0 2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment

	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☒ Coastal Banks	1,525 1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above	
	1. cubic yards dredged	
l. ☒ Land Subject to Coastal Storm Flowage	39,000 (temporary) 1. square feet	

4. ☒ Restoration/Enhancement

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

0
a. square feet of BVW

0 (The project proposes salt marsh plantings; however, the total area is pending trial plantings)
b. square feet of Salt Marsh

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5. ☐ Project Involves Stream Crossings

a. number of new stream crossings | b. number of replacement stream crossings

C. Other Applicable Standards and Requirements

☒ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

a. ☐ Yes ☒ No

If yes, include proof of mailing or hand delivery of NOI to:

Natural Heritage and Endangered Species Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

August 1, 2017
b. Date of map

If *yes*, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

c. Submit Supplemental Information for Endangered Species Review*

1. ☐ Percentage/acreage of property to be altered:

(a) within wetland Resource Area — percentage/acreage

(b) outside Resource Area — percentage/acreage

2. ☐ Assessor's Map or right-of-way plan of site

2. ☒ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

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tree/vegetation clearing line, and clearly demarcated limits of work **

(a) ☒ Project description (including description of impacts outside of wetland resource area & buffer zone)

(b) ☒ Photographs representative of the site

C. Other Applicable Standards and Requirements (cont'd)

(c) ☐ MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_fee_schedule.htm). Make check payable to "Commonwealth of Massachusetts - NHESP" and ***mail to NHESP*** at above address

*Projects altering **10 or more acres** of land, also submit:*

(d) ☐ Vegetation cover type map of site

(e) ☐ Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_exemptions.htm; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing. a. NHESP Tracking # b. Date submitted to NHESP

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

a. ☐ Not applicable – project is in inland resource area only b. ☒ Yes ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: DMF.EnvReview-South@state.ma.us

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF.EnvReview-North@state.ma.us

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.

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Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.

C. Other Applicable Standards and Requirements (cont'd)

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

b. ACEC

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

a. ☐ Yes ☒ No

6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

a. ☐ Yes ☒ No

7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

a. ☐ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)
2. ☐ A portion of the site constitutes redevelopment
3. ☐ Proprietary BMPs are included in the Stormwater Management System.

b. ☐ No. Check why the project is exempt:

1. ☐ Single-family house
2. ☐ Emergency road repair
3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

☒ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

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1. ☐ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)

2. ☐ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

D. Additional Information (cont'd)

3. ☐ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

Central Pond Restoration
a. Plan Title

Tighe & Bond, Inc. | David Loring, PE
b. Prepared By | c. Signed and Stamped by

March 28, 2020 | 1" = 20'
d. Final Revision Date | e. Scale

f. Additional Plan or Document Title | g. Date

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.

6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7. ☒ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8. ☒ Attach NOI Wetland Fee Transmittal Form

9. ☐ Attach Stormwater Report, if needed.

E. Fees

1. ☒ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number | 3. Check date

4. State Check Number | 5. Check date

6. Payor name on check: First Name | 7. Payor name on check: Last Name

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F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

Gregory Federspiel, Town Administrator
1. Signature of Applicant

March 27, 2020
2. Date

3. Signature of Property Owner (if different)

4. Date

5. Signature of Representative (if any)

March 30, 2020
6. Date

For Conservation Commission:
Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Massachusetts Department of Environmental Protection
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NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A. Applicant Information

1. Location of Project:

Central Street east of Elm Street	Manchester-by-the-Sea
a. Street Address	b. City/Town
	N/A Fee Exempt as a Municipal Project
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Gregory		Federspiel
a. First Name		b. Last Name
Town of Manchester-by-the-Sea		
c. Organization		
10 Central Street		
d. Mailing Address		
Manchester-by-the-Sea	MA	01944
e. City/Town	f. State	g. Zip Code
(978) 526-2000	(978) 526-2001	federspielg@manchester.ma.us
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

a. First Name		b. Last Name
c. Organization		
d. Mailing Address		
e. City/Town	f. State	g. Zip Code
h. Phone Number	i. Fax Number	j. Email Address

B. Fees

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).

Fee should be calculated using the following process & worksheet. ***Please see Instructions before filling out worksheet.***

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract $12.50. To calculate the city/town share of the fee, divide the total fee in half and add $12.50.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Category 2(j)	1.5	$500	N/A-Exempt

Step 5/Total Project Fee: N/A- Exempt

Step 6/Fee Payments:

Total Project Fee:	N/A- Exempt a. Total Fee from Step 5
State share of filing Fee:	N/A- Exempt b. 1/2 Total Fee **less $**12.50
City/Town share of filling Fee:	N/A- Exempt c. 1/2 Total Fee **plus** $12.50

C. Submittal Requirements

a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

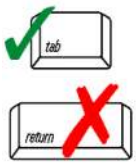
WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Manchester-by-the-Sea
City or Town

Project Type

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Check the Ecological Restoration type that applies:

☐ 1. Dam Removal

☐ 2. Freshwater Stream Crossing Repair and Replacement*

☐ 3. Stream Daylighting

☒ 4. Tidal Restoration

☐ 5. Rare Species Habitat Restoration

☐ 6. Restoring Fish Passageways

Eligibility Criteria:

☒ I am applying for a Restoration Order of Conditions and meet the General Eligibility Criteria [310 CMR 10.13(1)] as described in Section C1 and the Additional Eligibility Criteria for this Ecological Restoration Project type [310 CMR 10.13(2) through (7)] as described in Section C2.

☒ This Notice of Intent includes the required supporting documents as specified in [310 CMR 10.11, 10.12] and outlined in Appendix 1 and Appendix 2 respectively. The NOI also includes a signed Certification of Eligibility in Section G. Signatures and Submittal Requirements.

A. General Information

1. Project Location:

Central Street, east of Elm Street
a. Street Address

Manchester-by-the-Sea | 01944
b. City/Town | c. Zip Code

Latitude and Longitude*: 42.575316 | -70.772875
d. Latitude | e. Longitude

53/0 | 28
f. Assessors Map/Plat Number | g. Parcel/Lot Number

2. Applicant:

Greg | Federspiel
a. First Name | b. Last Name

Town of Manchester-by-the-Sea
c. Organization

* *If the Ecological Restoration Project involves work on a stream crossing, baseline photo-points that capture longitudinal views of the crossing inlet, the crossing outlet and the upstream and downstream channel beds during low flow conditions. The latitude and longitude coordinates of the photo-points shall be included in the baseline data.*

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A. General Information (cont.)

10 Central Street
d. Street Address

Manchester-by-the-Sea | MA | 01944
e. City/Town | f. State | g. Zip Code

(978) 526-2000 | (978) 526-2001 | federspielg@manchester.ma.us
h. Phone Number | i. Fax Number | j. Email Address

3. Property Owner (required if different from applicant): ☐ Check and attach list if more than one owner

a. First Name | b. Last Name

c. Organization

d. Street Address

e. City/Town | f. State | g. Zip Code

h. Phone Number | i. Fax Number | j. Email Address

4. Representative (if any):

Richard | Canavan
a. First Name | b. Last Name

Tighe & Bond, Inc.
c. Organization

120 Front Street, Suite 7
d. Street Address

Worcester | MA | 01608
e. City/Town | f. State | g. Zip Code

(508) 471-9631 | | RCanavan@tighebond.com
h. Phone Number | i. Fax Number | j. Email Address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form): Category 2 - $500

N/A-Fee Exempt | Fee Exempt | Fee Exempt
a. Total Fee Paid | b. State Fee Paid | c. City/Town Fee Paid

6. Property recorded at the Registry of Deeds for:

Essex |
a. County | b. Certificate # (if registered land)

881 | 173
c. Book | d. Page Number

7. Project Narrative: Describe the project's ecological restoration goals and how it furthers at least one of the interests of the Wetland Protection Act (WPA) M.G.L. c. 131, § 40.

The project is part of a restoration of tidal flows to Central Pond. The work proposed in this application is to stabilize the shore of Central Pond with retaining wall repair/replacement and construction of a living shoreline to improve ecological conditions and coastal resiliency.

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B. Resource Area Impacts (Temporary & Permanent)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

1. ☐ **Inland Resource Areas**: (See 310 CMR 10.54-10.58)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Bank	1. linear feet	2. linear feet
b. ☐ Bordering Vegetated Wetland	1. square feet	2. square feet
c. ☐ Land Under Waterbodies and Waterways	1. square feet	2. square feet
	3. cubic yards dredged	
d. ☐ Bordering Land Subject to Flooding	1. square feet	2. square feet
	3. cubic feet of flood storage lost	4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet	
	2. cubic feet of flood storage lost	3. cubic feet replaced
f. ☒ Riverfront Area	Sawmill Brook (Coastal) 1. Name of Waterway (if available) - **specify inland or coastal**	
2. Proposed alteration of the riverfront area:		23,594 (temporary) a. total square feet

2. ☒ **Coastal Resource Areas:** (see 310 CMR 10.25-10.35)

Check all that apply below. **For coastal riverfront area, see B.1.f. above.**

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☒ Land Under the Ocean	1,280 (permanent), 750 (temporary)	
	3,046 2. cubic yards dredged	
c. ☐ Barrier Beach**	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☒ Coastal Beaches	14,245 (permanent), 10,247 (temporary)	0 2. cubic yards beach nourishment
e. ☐ Coastal Dunes**	1. square feet	2. cubic yards dune nourishment

** *Note: No armoring of a Coastal Dune or Barrier Beach is permitted.*

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B. Resource Area Impacts (Temporary & Permanent) (cont.)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☒ Coastal Banks	1,525 1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. ☒ Land Subject to Coastal Storm Flowage	39,000 1. square feet	

3. ☒ **Restoration/Enhancement**

In addition to the square footage that has been entered in Section B1.b for BVW and B 2.h for Salt Marsh above, please enter the additional amount here for restoration/enhancement.

The project proposes salt marsh plantings; however, the total area is pending trial plantings.
a. Identify the appropriate resource area(s) type/name — Square feet or linear feet

b. Identify the appropriate resource area(s) type/name — Square feet or linear feet

C. Ecological Restoration Project Description

1. Check each box below to confirm that the project complies with each Eligibility Criteria required to obtain a Restoration Order of Conditions and provide the appropriate documentation.

☒ This project will have no short term or long-term adverse effects on Estimated Habitat sites of Rare Species located within resource areas that may be affected by the project or will be carried out according to a habitat management plan approved by NHESP.

☒ The project avoids and minimizes adverse impacts to Resource Areas and the interests identified in the WPA, without impeding the achievement of the ecological restoration goals

☒ The project will utilize best management practices to prevent and minimize adverse impacts to Resource Areas and the WPA interests.

☒ This Project will cause NO significant adverse effects on the interests of flood control and storm damage prevention in relation to the built environment (i.e., the project will not result in a

significant increase in flooding or storm damage affecting buildings, wells, septic systems, roads or other man-made structures or infrastructure) **and** documentation on how this is

C. Ecological Restoration Project Description (cont.)

☒ If the Project involves the dredging of 100 cubic yards of sediment or more or dredging in an ORW, a 401 Water Quality Certification is required and attached. Requires a 401 Water Quality Certification.

☒ The Project will not substantially reduce the capacity of a Resource Area to serve the wildlife habitat functions identified in 310 CMR 10.60(2). A project will be **presumed** to meet this eligibility criteria if the NOI will be carried out in accordance with any Time of Year (TOY) restrictions or other conditions recommended by the DMF for coastal waters, and by the DFW for inland waters in accordance with 310 CMR 10.11(3), (4) and (5). A NOI for an Ecological Restoration Project that meets the requirements of 310 CMR 10.12(1) and (2) it ***is exempt from performing a wildlife habitat evaluation.***

N/A ☐ If the project involves work on a **stream crossing**, the stream crossing has been designed in accordance with 310 CMR 10.24(10) for work in coastal resource areas and 310 CMR 10.53(8) for work in inland resource areas, as applicable. See additional requirements below for Freshwater Stream Crossing Repair and Replacement Projects.

☒ The project will not result in a discharge of dredged or fill material within 400 feet of the high water mark of a Class A surface water (exclusive of its tributaries) unless the project is conducted by a public water system under 310 CMR 22.00 or a public agency or authority for the maintenance or repair of existing public roads or railways in accordance with 314 CMR 4.06(1)(d)1.

☒ The project will not result in a discharge of dredged or fill material to a vernal pool certified by the Massachusetts Division of Fisheries and Wildlife (DFW).

☒ The project will not result in a point source discharge to an Outstanding Resource Water.

☒ The project will not involve the armoring of a Coastal Dune or Barrier Beach.

☒ Describe in detail the project plan for invasive species prevention and control.

☒ Provide any TOY restrictions and/or other conditions recommended by the Division of Marine Fisheries or the Division of Fisheries and Wildlife in accordance with 310 CMR 10.11(3), (4) and (5) with attached copies of their written determinations.

☒ If the project involves the construction, repair, replacement or expansion of infrastructure, a proposed operation and maintenance plan is provided to ensure that the infrastructure will continue to function as designed;

2. Check each box as appropriate to confirm that the project complies with the Eligibility Criteria required for this Ecological Restoration Project type.

Dam Removal

N/A ☐ The Ecological Restoration Project is a dam removal project. The project meets the eligibility criteria set forth in 310 CMR 10.13(1)(d).

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C. Ecological Restoration Project Description (cont.)

☐ The Project **is** consistent with the MassDEP guidance entitled *Dam Removal and the Wetlands Regulations*, dated December 2007, and meets the eligibility criteria set forth in 310 CMR 10.13(1).

☐ The Project is NOT consistent with MassDEP's guidance entitled Dam Removal and the Wetlands Regulations, dated December 2007 and meets the eligibility criteria set forth in 310 CMR 10.13(1).

☐ The project will not involve the removal of a dam that was constructed or is managed for flood control by a municipal, state or federal agency.

☐ The project will not adversely impact public water supply wells or water withdrawals permitted or registered under the Water Management Act, M.G.L. c. 21G, and 310 CMR 36.00 within the reach of the stream impacted by the impoundment.

☐ The project will not adversely impact private water supply wells including agricultural or aquacultural wells or surface water withdrawal points.

☐ The project provides for the removal of the full vertical extent of the dam such that no remnant of the dam will remain at or below the streambed as determined prior to commencement of the dam removal project, or if such determination cannot be made at that time, as determined during construction of the project.

☐ The project provides for the removal of enough of the horizontal extent of the dam such that after removal no water will be impounded during the 500 year flood event.

☐ The project will not involve a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license.

☐ The applicant has obtained from the Department of Conservation and Recreation Office of Dam Safety a written determination in accordance to the General Applicability requirements prior to submitting this NOI.

☐ If the project is exempt from the requirement to obtain a license or permit under 310 CMR 9.05(3)(n), the project will not have an adverse effect on navigation or on any docks, piers or boat ramps authorized under 310 CMR 9.00.

Freshwater Stream Crossing Repair and Replacement (310 CMR 10.13(3))

N/A ☐ The Ecological Restoration Project is a freshwater stream crossing repair or replacement project. In addition to the eligibility criteria set forth in 310 CMR 10.13(1), the project meets all of the following eligibility criteria that will meet the MA Stream Crossing (SC) Standards that is completely described below or in the attached:

☐ The width of the structure will be at least 1.2 times bankfull width to facilitate the movement of fish and other aquatic organisms and wildlife species that may utilize riparian corridors.

☐ The structure will be an open-bottom span where practicable or if an open-bottom span is not practicable, the structure bottom will be embedded in a substrate that matches the substrate of the stream channel and that shall be designed to maintain continuity of aquatic and benthic elements of the stream including appropriate substrates and hydraulic

characteristics within the culvert (water depths, slope, turbulence, velocities, and flow patterns).

C. Ecological Restoration Project Description (cont.)

☐ The structure will have an Openness Ratio of at least 0.82 feet, or as close to 0.82 feet as is practicable.

☐ The project includes considerations for site constraints in meeting the SC standards, undesirable effects or risk in meeting the standard, the environmental benefit of meeting the standard compared to the cost in evaluating:

- ☐ The potential for downstream flooding
- ☐ Upstream and downstream habitat (in-stream habitat, wetlands);
- ☐ Potential for erosion and head-cutting;
- ☐ Stream stability;
- ☐ Habitat fragmentation caused by the crossing;
- ☐ The amount of stream mileage made accessible by the improvements;
- ☐ Storm flow conveyance;
- ☐ Engineering design constraints specific to the crossing;
- ☐ Hydrologic constraints specific to the crossing;
- ☐ Impacts to wetlands that would occur by improving the crossing;
- ☐ Potential to affect property and infrastructure; and
- ☐ Cost of replacement.

Stream Daylighting

N/A ☐ The Ecological Restoration Project is a stream daylighting project. In addition to the eligibility criteria set forth in 310 CMR 10.13(1), the project meets all of the following eligibility criteria and is completely described narrative below/attached:

☐ The project will meet the applicable performance standards for Bank, 310 CMR 10.54, and Land Under Water Bodies and Waterways, 310 CMR 10.56. As set forth in 10.12(3), a person submitting a Notice of Intent that meets the requirements of 310 CMR 10.12 (1) and (2) for a stream daylighting project is exempt from the requirement to perform a wildlife habitat evaluation in accordance with 310 CMR 10.60, notwithstanding the provisions of 310 CMR 10.54(4)(a)5., 310 CMR 10.56(4)(a)4., and 310 CMR 10.60.

☐ To the maximum extent practicable, the project is designed to include the revegetation of all disturbed areas with noninvasive indigenous species appropriate to the site.

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C. Ecological Restoration Project Description (cont.)

Tidal Restoration Project (310 CMR 10.13(5))

☒ The Ecological Restoration Project is a Tidal Restoration Project designed to restore tidal flow that has been restricted or blocked by a man-made structure. In addition to the eligibility criteria set forth in 310 CMR 10.13(1), the project meets all of the following eligibility criteria that is completely described below or in the attached:

- ☒ If the project will involve work in a Coastal Dune and/or a Coastal Beach, the project meets the applicable performance standard(s) at 310 CMR 10.27 and/or 10.28.
- ☒ The project will not include a new or relocated tidal inlet/breach through a Barrier Beach or additional armoring of a Barrier Beach, but may include the modification, replacement or enlargement of an existing culvert or inlet through a Barrier Beach.
- ☒ The project will not involve installation of new water control devices (i.e., tide gates, flash boards and adjustable weirs) or a change in the management of existing water control devices, when the existing or proposed function of said devices is to prevent flooding or storm damage impacts to the built environment, including without limitation, buildings, wells, septic systems, roads or other man-made structures or infrastructure.
- ☒ The project's physical specifications are compatible with passage requirements for diadromous fish runs identified at the project location by the Division of Marine Fisheries.

N/A ☐ Did the project include considerations for site constraints in meeting the SC standards, undesirable effects or risk in meeting the standard, the environmental benefit of meeting the standard compared to the cost in evaluating:

- ☐ The potential for downstream flooding
- ☐ Upstream and downstream habitat (in-stream habitat, wetlands);
- ☐ Potential for erosion and head-cutting;
- ☐ Stream stability;
- ☐ Habitat fragmentation caused by the crossing;
- ☐ The amount of stream mileage made accessible by the improvements;
- ☐ Storm flow conveyance;
- ☐ Engineering design constraints specific to the crossing;
- ☐ Hydrologic constraints specific to the crossing;
- ☐ Impacts to wetlands that would occur by improving the crossing;

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☐ Potential to affect property and infrastructure; and

C. Ecological Restoration Project Description (cont.)

☐ Cost of replacement.

Rare Species Habitat Restoration (310 CMR 10.13(6))

☐ The Ecological Restoration Project is a Rare Species habitat restoration project. In addition to the eligibility criteria set forth in 310 CMR 10.13(1), the project meets all of the following eligibility criteria that is completely described below or in the attached:

☐ The project is exempt from review under 321 CMR 10.00 as a project that involves the active management of Rare Species habitat for the purpose of maintaining or enhancing the habitat for the benefit of Rare Species. A project that involves the active management of Rare Species habitat and is exempt from review under 321 CMR 10.00 may include without limitation the mowing, cutting, burning or pruning of vegetation or the removal of exotic or invasive species.

☐ The project is carried out in accordance with a Habitat Management Plan that has been approved in writing by the Natural Heritage and Endangered Species Program and submitted with this Notice of Intent.

Restoring Fish Passageways (310 CMR 10.13(7))

☐ The Ecological Restoration Project involves the restoration or repair of a fish passageway as identified by the Division of Marine Fisheries in its Marine Fisheries Technical Reports, TR 15 through 18, dated 2004. In addition to the eligibility criteria set forth in 310 CMR 10.13(1), the project meets all of the following eligibility criteria that is completely described below or in the attached:

☐ Proof of submission of a Fishway Permit Application to the Division of Marine Fisheries, pursuant to M.G.L. c. 130, §§ 1 and 19, and 322 CMR 7.01(4)(f) and (14)(m); and

☐ The fish passageway will be operated and maintained in accordance with an Operation and Maintenance Plan approved by the Division of Marine Fisheries.

D. Other Applicable Standards and Requirements

A person submitting a Notice of Intent for an Ecological Restoration Project that meets the requirements of 310 CMR 10.12(1) and (2) and that contains either a written determination from the Natural Heritage Endangered Species Program (NHESP) that the project will have no short or long term adverse effects on the habitat of the local population of state-listed species, or a Conservation and Management Permit issued by NHESP pursuant to the Massachusetts Endangered Species Act (MESA) Regulations at 321 CMR 10.00 for the project, or a habitat management plan for the project approved in writing by NHESP, will be deemed to have satisfied the requirements in 310 CMR 10.37 and 310 CMR 10.59 of sending the Notice of Intent for the same project for a determination by NHESP. For the purposes of this guidance, the “same project” means either there have been no changes to the project reviewed by NHESP in making its determination or that any subsequent changes to the project since the initial review by NHESP have been reviewed and approved in writing by NHESP.

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D. Other Applicable Standards and Requirements (cont.)

Compliance with the above NHESP-related requirements may be demonstrated by providing the following applicable documentation. See Appendix 1 for a complete description of these requirements. Check the applicable box below.

☒ The project is not within Estimated Habitat of State-Listed Rare Wetlands Wildlife as shown on the most recent Estimated Habitat Maps of State-Listed Rare Wetlands Wildlife published by the Natural Heritage and Endangered Species Program.

☐ The NHESP has issued the attached written determination that the project will have no short or long term adverse effects on the habitat of the local population of state-listed species.

☐ The NHESP has issued the attached written approval of the attached habitat management plan for this project, which makes it an eligible Rare Species habitat restoration project under 310 CMR 10.13(6).

☐ The NHESP has issued pursuant to the MESA Regulations at 321 CMR 10.00 the attached Conservation and Management Permit for this project.

☐ There have been no changes to the project reviewed by NHESP in making its determination, or if so, any subsequent changes to the project have been reviewed and approved in writing by NHESP and attached hereto.

1. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

   a. ☐ Not applicable – project is in inland resource area only

   b. ☒ Yes ☐ No

   If yes, include proof of mailing, hand delivery, or electronic delivery of written determination to

   South Shore – Cohasset to Rhode Island border, and the Cape & Islands:
   Division of Marine Fisheries –
   South Coast Field Station
   Attn: Environmental Reviewer
   836 South Rodney French Blvd
   New Bedford, MA 02744
   Email: DMF.EnvReview-South@state.ma.us

   North Shore – Hull to New Hampshire border:
   Division of Marine Fisheries –
   North Shore Field Station
   Attn: Environmental Reviewer
   30 Emerson Avenue
   Gloucester, MA 01930
   Email: DMF.EnvReview-North@state.ma.us

2. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

   a. ☐ Yes ☒ No

   If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP website for ACEC locations).

   b. ACEC

3. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

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a. ☐ Yes ☒ No

D. Other Applicable Standards and Requirements (cont.)

4. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, §

   a. ☐ Yes ☒ No

5. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

   a. ☐ Yes ☒ No

   If yes, attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

   ☐ Proprietary BMPs are included in the Stormwater Management System.

6. ☒ If the Ecological Restoration Project involves the construction, repair, replacement or expansion of infrastructure, an operation and maintenance plan has been submitted to ensure that the infrastructure will continue to function as designed.

7. ☒ The project involves the dredging of 100 cubic yards or more of sediment, or dredging of any amount in an Outstanding Resource Water, and a Water Quality Certification issued by the Department pursuant to 314 CMR 9.00 is attached.

8. ☐ The Ecological Restoration Project involves work on a stream crossing. Sufficient information has been provided to demonstrate that the design meets the requirements in 310 CMR 10.24(10) for work in coastal resources, and 310 CMR 10.53 (8) for work in an inland resource area.

E. Additional Information

Check each box for required documents that are attached to this Notice of Intent (NOI). See instructions for details.

1. ☒ Maps and Plans identifying the location of proposed activities relative to the boundaries of each affected resource area [http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/nwi.html]

2. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

   Central Pond Restoration
   a. Plan Title

   Tighe & Bond, Inc.
   b. Prepared By

   David Loring, PE
   c. Signed and Stamped by

   March 28, 2020
   d. Final Revision Date

   1” = 20’
   e. Scale

   f. Additional Plan or Document Title

   g. Date

3. ☐ Attach proof of Natural Heritage and Endangered Species Program written determination, if needed.

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4. ☒ Attach proof of mailing for Massachusetts Division of Marine Fisheries Time of Year written determination, if needed.

E. Additional Information (cont.)

5. ☒ Attach NOI Wetland Fee Transmittal Form.

6. ☒ Attach Stormwater Report, if needed.

F. Fees

1. ☒ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

   Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number	3. Check date
4. State Check Number	5. Check date
6. Payor Name on Check: First Name	7. Payor Name on Check: Last Name

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G. Signatures and Submittal Requirements

Certification of Ecological Restoration Project Notice of Intent

I hereby certify under penalties of perjury that **the Ecological Restoration Project Notice of Intent application meets the Eligibility Criteria set forth in 310 CMR 10.13.** I also certify that I am familiar with the information contained in this Notice of Intent application and that the accompanying plans, documents, and supporting data are to the best of my knowledge and belief true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.

I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

Gregory T Federspiel

1. Signature of Applicant or Authorized Agent

Gregory T Federspiel, Town Admin — March 30, 2020

2. Printed Name of Applicant or Authorized Agent — 3. Date

Gregory T Federspiel — March 27, 2020

4. Signature of Property Owner (if different) — 5. Date

Michael Cannon — March 30, 2020

6. Signature of Representative (if any) — 7. Date

The certification must be signed by the applicant; however, it may be signed by a duly authorized agent (named in Item 6) if this form is accompanied by a statement by the applicant designating the agent and agreeing to furnish upon request, supplemental information in support of the application

For Conservation Commission:
Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:
The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

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Appendix 1: Ecological Restoration Notice of Intent (WPA 3a) - Required Actions (310 CMR 10.11)

Complete the Required Actions before submitting a Notice of Intent Application for an Ecological Restoration Project and submit a completed copy of this Checklist with the Notice of Intent.

☒ **Environmental Monitor /Massachusetts Environmental Policy Act (MEPA)**
http://www.mass.gov/eea/agencies/mepa/submitting-notices-to-the-environmental-monitor.html

☒ Submit written notification at least 14 days **prior** to the filing of a Notice of Intent (NOI) to the *Environmental Monitor* for publication. A copy of the written notification is attached and provides at minimum:

- ☒ A brief description of the proposed project.
- ☒ The anticipated NOI submission date to the conservation commission.
- ☒ The name and address of the conservation commission that will review the NOI.
- ☒ Specific details as to where copies of the NOI may be examined or acquired **and** where to obtain the date, time, and location of the public hearing.

☐ **Massachusetts Endangered Species Act (MESA) /Wetlands Protection Act Review**

- ☐ Preliminary Massachusetts Endangered Species Act Review from the Natural Heritage and Endangered Species Program (NHESP) has been met and the written determination is
  - ☐ Supplemental Information for Endangered Species Review has been submitted.
    1. ☐ Percentage/acreage of property to be altered:
       a. Within Wetland Resource Area _____ Percentage/acreage
       b. Outside Wetland Resource Area _____ Percentage/acreage
    2. ☐ Assessor's Map or right-of-way plan of site
    3. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work.
    4. ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)
    5. ☐ Photographs representative of the site
    6. ☐ MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_fee_schedule.htm)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Manchester-by-the-Sea
City or Town

Appendix 1: Ecological Restoration Notice of Intent (WPA 3a) - Required Actions (310 CMR 10.11)

Make check payable to "Commonwealth of Massachusetts - NHESP" and mail to NHESP:

Natural Heritage & Endangered Species Program
MA Division of Fisheries & Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

7. Projects altering 10 or more acres of land, also submit:

   a. ☐ Vegetation cover type map of site

   b. ☐ Project plans showing Priority & Estimated Habitat boundaries

OR Check One of the Following:

1. ☒ Project is exempt from MESA review.

Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/mass-endangered-species-act-mesa/; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59 – see C4 below)

2. ☐ Separate MESA review ongoing.

   a. NHESP Tracking # _____ b. Date submitted to NHESP _____

3. ☐ Separate MESA review completed. Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

☐ **Estimated Habitat Map of State-Listed Rare Wetlands Wildlife**

If a portion of the proposed project is located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP), complete the portion below. To view habitat maps, see the **Massachusetts Natural Heritage Atlas** or view the maps electronically at: http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review

☐ A preliminary written determination from Natural Heritage and Endangered Species Program (NHESP) must be obtained indicating that:

- ☐ Project will NOT impact an area located within estimated habitat indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetlands Wildlife published by *NHESP.*
- ☐ Project will impact an area located within estimated habitat indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetlands Wildlife published by NHESP. A copy of NHESP's written preliminary determination in accordance with 310 CMR 10.11(2) is attached. This specifies:
  - ☐ Date of the map: August 1, 2017

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

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Appendix 1: Ecological Restoration Notice of Intent (WPA 3a) - Required Actions (310 CMR 10.11)

☐ If the Rare Species identified is/are likely to continue to be located on or near the project, and if so, whether the Resource Area to be altered is in fact part of the habitat of the Rare Species.

☐ That if the project alters Resource Area(s) within the habitat of a Rare Species:

☐ The Rare Species is identified;

☐ NHESP's recommended changes or conditions necessary to ensure that the project will have **no** short or long term adverse effect on the habitat of the local population of the Rare Species is provided; **or**

☐ An approved NHESP habitat management plan is attached with this Notice of Intent.

Send the request for a preliminary determination to:
Natural Heritage & Endangered Species Program
MA Division of Fisheries & Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

☒ **Division of Marine Fisheries**

☒ If the project will occur within a coastal waterbody with a restricted Time of Year, [see Appendix B of the Division of Marine Fisheries (DMF) Technical Report TR 47 "Marine Fisheries Time of Year Restrictions (TOYs) for Coastal Alteration Projects" dated April 2011 http://www.nae.usace.army.mil/Portals/74/docs/regulatory/StateGeneralPermits/NEGP/MADMFTR-47.pdf].

☒ Obtain a DMF written determination stating:

☐ The proposed work does NOT require a TOY restriction.

☒ The proposed work requires a TOY restriction. Specific recommended TOY restriction and recommended conditions on the proposed work is attached.

☐ If the project may affect a diadromous fish run [re: Division of Marine Fisheries (DMF) Technical Reports TR 15 through 18, dated 2004: http://www.mass.gov/eea/agencies/dfg/dmf/publications/technical.html]

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Appendix 1: Ecological Restoration Notice of Intent (WPA 3a) - Required Actions (310 CMR 10.11)

☐ Obtain a DMF written determination stating:

☐ The design specifications and operational plan for the project are compatible with the passage requirements of the fish run.

☐ The design specifications and operational plan for the project are not compatible with the passage requirements of the fish run.

Send the request for a written determination to**:**

South Shore – Cohasset to Rhode Island border, and the Cape & Islands:
Division of Marine Fisheries –
South Coast Field Station
Attn: Environmental Reviewer
836 South Rodney French Blvd
New Bedford, MA 02744
Email: DMF_EnvReview.South@state.ma.us

North Shore – Hull to New Hampshire border:

Division of Marine Fisheries –
North Shore Field Station
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF_EnvReview.North@state.ma.us

☐ **Division of Fisheries and Wildlife –** http://www.mass.gov/eea/agencies/dfg/dfw/

☐ Projects that involve silt-generating, in-water work that will impact a non-tidal perennial river or stream and the in-water work will ***not*** occur between May 1 and August 30.

☐ Obtain a written determination from the Division of Fisheries and Wildlife (DFW) as to whether the proposed work requires a TOY restriction.

☐ The proposed work does NOT require a TOY restriction.

☐ The proposed work requires a TOY restriction. The DFW determination with TOY restriction and other conditions is attached.

☒ **MassDEP Water Quality Certification**

☒ Project involves dredging of 100 cubic yards or more in a Resource Area or dredging of any amount in an Outstanding Resource Water (ORW). A copy and proof of the MassDEP Water Quality Certification pursuant to 314 CMR 9.00 is attached to the NOI.

☐ This project is a Combined Permit Application for 401 Dredging and Restoration (BRP WW 26).

☒ **MassDEP Wetlands Restriction Order**

Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, §

☐ Yes ☒ No

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

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Appendix 1: Ecological Restoration Notice of Intent (WPA 3a) - Required Actions (310 CMR 10.11)

☐ **Department of Conservation and Recreation**

Office of Dam Safety

☐ For Dam Removal Projects, obtain a written determination from the Department of Conservation and Recreation Office of Dam Safety that the dam is not subject to the jurisdiction of the Office under 302 CMR 10.00, a written determination that the dam removal does not require a permit under 302 CMR 10.00 or a permit authorizing the dam removal in accordance with 302 CMR 10.00 has been issued.

Areas of Critical Environmental Concern (ACECs)

Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations).

Massachusetts Department of Environmental Protection
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WPA Form 3A - Notice of Intent for an Ecological Restoration Project

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Manchester-by-the-Sea
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Appendix 2: Ecological Restoration Notice of Intent (WPA 3a) - Minimum Required Documents (310 CMR 10.12)

Complete the Required Documents Checklist below and provide supporting materials before submitting a Notice of Intent Application for an Ecological Restoration Project.

☒ This Notice of Intent meets all applicable requirements outlined in for Ecological Restoration Projects in 310 CMR 10.12. Use the checklist below to insure that all documentation is included

At a minimum, a Notice of Intent for an Ecological Restoration Project shall include the following:

☒ Description of the project's ecological restoration goals;

☒ The location of the Ecological Restoration Project;

☒ Description of the construction sequence for completing the project;

☒ A map of the Areas Subject to Protection Under M.G.L. c. 131, § 40, that will be temporarily or permanently altered by the project or include habitat for Rare Species, Habitat of Potential Regional and Statewide Importance, eel grass beds, or Shellfish Suitability Areas.

☐ The method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.) is attached with documentation methodology.

☒ List the titles and dates for all plans and other materials submitted with this NOI.

Central Pond Restoration
a. Plan Title

Tighe & Bond, Inc.	David Loring, PE
b. Prepared by	c. Signed and Stamped by
March 28, 2020	1"= 20'
d. Final Revision Date	e. Scale

f. Additional Plan or Document Title | g. Date

☐ If there is more than one property owner, attach a list of these property owners not listed on this form.

☒ Attach NOI Wetland Fee Transmittal Form.

☒ An evaluation of any flood impacts that may affect the built environment, including without limitation, buildings, wells, septic systems, roads or other man-made structures or infrastructure as well as any proposed flood impact mitigation measures;

☒ A plan for invasive species prevention and control;

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

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Appendix 2: Ecological Restoration Notice of Intent (WPA 3a) - Minimum Required Documents (310 CMR 10.12)

- ☐ The Natural Heritage and Endangered Species Program written determination in accordance with 310 CMR 10.11(2), if needed;
- ☒ Any Time of Year restrictions and/or other conditions recommended by the Division of Marine Fisheries or the Division of Fisheries and Wildlife in accordance with 310 CMR 10.11(3), (4), (5), if needed;
- ☒ Proof that notice was published in the *Environmental Monitor* as required by 310 CMR 10.11(1;
- ☒ A certification by the applicant under the penalties of perjury that the project meets the eligibility criteria set forth in 310 CMR 10.13;
- ☒ If the Ecological Restoration Project involves the construction, repair, replacement or expansion of infrastructure, an operation and maintenance plan to ensure that the infrastructure will continue to function as designed;
- ☒ If the project involves dredging of 100 cubic yards or more or dredging of any amount in an Outstanding Resource Water, a Water Quality Certification issued by the Department pursuant to 314 CMR 9.00;
- ☐ If the Ecological Restoration Project involves work on a stream crossing, information sufficient to make the showing required by 310 CMR 10.24(10) for work in a coastal resource area and 310 CMR 10.53(8) for work in an inland resource area; and
- ☐ If the Ecological Restoration Project involves work on a stream crossing, baseline photo-points that capture longitudinal views of the crossing inlet, the crossing outlet and the upstream and downstream channel beds during low flow conditions. The latitude and longitude coordinates of the photo-points shall be included in the baseline data.
- ☐ This project is subject to provisions of the MassDEP Stormwater Management Standards. A copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) is attached.
- ☐ Provide information as the whether the project has the potential to impact private water supply wells including agricultural or aquacultural wells or surface water withdrawal points.

Manchester Conservation Commission
Instruction Checklist for Notices of Intent

REVISION DATE: 6/23/15

1. Fill out the "WPA Form 3 - Notice of Intent" and the "NOI Wetland Fee Transmittal Form." These can be found at: http://www.mass.gov/eea/agencies/massdep/service/approvals/wpa-form-3.html. (Please note that the property owner MUST sign the NOI.)
2. Calculate the Manchester Wetlands Filing Fee. The fee schedule can be found at: Manchester Fee Schedule.
3. In addition to the filing fees, submit $50.00 to place the hearing notice in the Manchester Cricket (make check out to the Town of Manchester).
4. Applications must be accompanied by a narrative of the project, addressing how the project will meet the performance standards of the affected resource areas under both the Wetlands Protection Act (WPA) *and* the Manchester Wetlands By-Law. Be sure to include details of any mitigating measures such as erosion controls, wetlands plantings, etc. In addition, if you are proposing work in the 30-foot No-Disturb Zone or 50-foot No-Build Zone, you may have to submit an Alternatives Analysis per the local bylaw. Check with the Conservation Administrator.
5. Include engineered plans* that show all resource areas including the following buffer zones:
    a. 100 foot buffer
    b. 50 foot No-Build Zone (local bylaw)
    c. 30-foot No-Disturbance Zone (local bylaw)
6. Obtain a certified abutter's list from the Assessor's Office. This includes all abutters within 300 feet of your property line. (Make a copy for submittal with your application.)
7. Fill out the Notification to Abutters Under the Massachusetts Wetland Protection Act form, including the hearing date, and make one copy for each abutter. Send the "Notification to Abutters" form certified mail or by certificates of mailing to all abutters. Keep receipts of each certified mailing and submit these with your Notice of Intent application or at the first hearing. (Be sure to include the name and address of the abutter on each receipt or certificate.)
8. After notifying abutters, complete the Affidavit of Service form and submit it with your application.
9. Make packets (and copies) as described under "Submissions" below. Note that materials MUST BE collated into packets including *folded* plans.
10. Create electronic copies for submittal to the Conservation Office of all forms, plans and documentation (PDFs are preferred). Electronic copies may be submitted on a CD or e-mailed to the Conservation Administrator at: bertonic@manchester.ma.us. You may also use "DropBox" for large files (contact the Administrator for more info).

*See details of plan requirements in Appendix B (Section 1.6) of the Manchester Wetlands By-Law Regulations.

eDEP Filing

Consider using DEP's online filing system (eDEP). This allows you to file *Notice of Intent* and *Abbreviated Notice of Resource Area Delineation* applications electronically with the state.

You may print a copy of your online filing and submit it as part of your application package as outlined below. Note that you must continue to submit hard-copy packages to the Manchester Conservation Office even if you file electronically with eDEP.

Go to: www.mass.gov/dep/service/compliance/edeponlf.htm for more information.

Submissions

NOTE: Copies should be double-sided on recycled paper (at least 30% post-consumer content if possible). Do *not* include plastic covers or bindings.

Please deliver the following to the Conservation Office by 1:00 pm on the Deadline Date:

1. Two (2) Full Packages as described below, plus one additional set for MassDEP.
2. Six (6) Abbreviated Packages as described below.
3. An electronic version of the package (e-mailed, on a CD or via DropBox).
4. Three checks made out to the "Town of Manchester" for the following:
   - ☐ Town portion of State Filing Fee Fee Exempt
   - ☐ By-Law Filing Fee Fee Exempt
   - ☑ $50.00 fee for the hearing notice to be placed in the Manchester Cricket

FULL Package includes:

☑ Completed and signed NOI Form	☑ Detailed narrative of the project and an Alternatives Analysis (if applicable)*	☐ Stormwater Report and Checklist (if applicable)*
☑ Completed NOI Wetland Fee Transmittal Form and copy of all checks	☑ Any other supporting information to help describe the project*	☑ Receipts of certified mailing or certificates of mailing (due by first hearing)
☑ Full size plans, stamped and signed by a Professional Engineer or Land Surveyor*	☑ Certified abutters list from the Assessor's office	☑ Fees: 1. Town portion of WPA fee 2. Town by-law filing fee 3. Check to town for hearing notice
☑ Affidavit of Service for abutter notification	☐ Wetland delineation forms (if applicable)*	☐ Stormwater Calculations (if applicable)

Abbreviated Package should include:

*All of the asterisked items shown under "FULL Package" above.

MassDEP Submittal

Mail a Full Package to Mass DEP Northeast Regional Office:

MassDEP Northeast Regional Office
205B Lowell Street
Wilmington, Massachusetts 01887

Mail the completed "NOI Wetland Fee Transmittal Form" and check to:

Commonwealth of Massachusetts
Department of Environmental Protection, Box 4062
Boston, MA 02211

Please direct any questions to:

Chris Bertoni, Manchester Conservation Administrator
bertonic@manchester.ma.us or 978-526-4397

PLEASE ENSURE THAT ALL ITEMS ARE INCLUDED.
INCOMPLETE APPLICATIONS MAY DELAY YOUR HEARING DATE!

PROJECT NARRATIVE

Tighe&Bond

SECTION 1

Section 1
Introduction

This project is part of an ecological restoration at Sawmill Brook and Central Pond in Manchester by the Sea. The work proposed in this Ecological Restoration Notice of Intent includes the rehabilitation and/or replacement of existing retaining wall sections on Central Pond and Sawmill Brook, construction of living shoreline in other areas of the Pond for slope protection and ecological enhancement, structural elements in the Pond to improve stability, habitat, and to promote natural stream geomorphologic processes, and planting native tidal wetland plants. This work is part of a larger tidal restoration project that also includes the replacement of the Central Street Bridge and removal of the tide gate structure at that bridge. The tide gate has been fully open since February 27, 2018 which has partially restored tidal flushing to Central Pond; however, the removal of the structure will allow for additional tidal flushing. The work proposed in this application as well as the bridge replacement and tide gate removal were the subject of a single Environmental Notification Form under the Massachusetts Environmental Policy Act (certificate issued January 10, 2020). These projects are associated but require separate permit applications based on funding sources for the bridge replacement which are limited to transportation infrastructure.

1.1 Project Background and Purpose

The Town of Manchester-by-the-Sea is a vibrant coastal community with an abundance of natural coastal resources, a stable population, and thriving year-round and seasonal businesses. Flooding events have severely impacted these assets in the past, including economic loss from businesses closed due to floods and disrupted utilities, flood related safety concerns due to impassable roadways and restrained access for emergency vehicles, inoperable wastewater and stormwater systems, and environmental concerns due to loss of habitat from tidal restrictions and erosion by flood waters.

Historically and during recent years, property and infrastructure have been damaged, water quality and habitat of inland and coastal waterways have been degraded, and fish passage has been impeded in the watershed. Flooding and water quality problems will be magnified in coming years due to climate change related increased frequency and duration of storms, sea level rise, and the expansion of impervious areas from future development.

Flooding is a particular problem within the Sawmill Brook watershed. Flood events during extreme storm events are due to the combination of storm surge, hydraulic restrictions from undersized culverts and the tide gate, stormwater runoff from impervious areas, the channelized stream system in the lower portion of the watershed, and poor infiltration conditions. Flooding is most intense in the lower reaches of the Brook. There, undersized culverts and an improperly functioning tide gate have caused stream banks to overtop, leading to stream bank erosion. Based on watershed modeling developed as part of Manchester-by-the-Sea's 2018 Hazard Mitigation Plan, the greatest flood reductions would be accomplished by widening the opening at the Central Street Bridge, removing the tide gate there, restoring marsh and riparian wetlands, and restoring the stream channel within Central Pond.

The Town is planning a multi-phase project to address a number of these conditions, this project includes the following work:

- **Improvements to the retaining walls along Central Pond.** The deteriorated conditions along the edge of Central Pond will be improved through a combination of wall repairs, wall replacement, and stabilization of sloped banks with stream bioengineering techniques. The replacement sections of wall will have a stone appearance consistent with the aesthetics of the adjacent walls to the extent possible.
- **Sawmill Brook / Central Pond Restoration.** Sawmill Brook stream restoration is proposed to include natural establishment of a channel through the sediments in Central Pond through natural in-stream processes and bioengineering methods.

Numerous State and Federal agencies are supporting partners in this project, providing grant funding, technical guidance, and public outreach support. These include the Massachusetts Coastal Zone Management (CZM), Division of Ecological Restoration (DER), the Massachusetts Environmental Trust (MET), the Massachusetts Division of Marine Fisheries (DMF), and the National Oceanic and Atmosphere Administration (NOAA) Restoration Center. The project has been further supported by dedicated Town Staff, the Board of Selectmen, the Manchester Coastal Resilience Advisory Group (CRAG), and Manchester Stream Team volunteers.

A Site Locus Map (Figure 1), Massachusetts Department of Environmental Protection (MassDEP) Priority Resource Area Map (Figure 2), and Site Orthophotograph (Figure 3) are provided in Appendix A. Photographs of the existing site are provided in Appendix B. Project plans showing existing and proposed conditions are provided in Appendix A.

Tighe&Bond

SECTION 2

Section 2
Existing Conditions

This section provides a description of the project area and a characterization of the wetland resources present at the site. Land use in the general vicinity of the project area was determined based on a review of information available through Massachusetts Geographic Information Systems (MassGIS) and site observations.

2.1 General Site Description

Sawmill Brook and associated tributaries have a watershed area of approximately five square miles which drains much of the central portion of Manchester-by-the-Sea. The mouth of Sawmill Brook drains through a narrow small bridge and tide gate under Central Street. Historical documentation suggests that activity in this area by early European settlers included the relocation of the Sawmill Brook channel, filling of salt marsh and other areas for development. The current tide gate structure was added around 1900 to impound Central Pond, creating a fire reservoir and a winter skating pond. The tide gate and bridge are currently not functioning properly, creating a hydraulic restriction during storm events and impeding the passage of fish such as rainbow smelt (*Osmerus mordax*).

2.1.1 Central Pond/Sawmill Brook

The main area known as Central Pond extends upstream from Central Street Bridge to Knights Circle. The Pond is relatively flat, with a shallow gradient from ranging from three feet (NAVD88) where Sawmill Brook enters Central Pond to 0.2 feet at the Central Street bridge inlet. Two main "islands" are present at low tide; one triangular feature at the entrance to the pond and one kidney shaped feature in approximately the center.

Historically, the flow of water through Central Pond has been restricted by the closed tide gate for significant portions of each tidal cycle. The tide gate has been routinely opened during the spring to allow for fish passage and during the winter and spring seasons to alleviate upstream flooding during periods of greater stream flow. When the tide gate is closed the pond fluctuates between an average of 4.25 to 4.90 feet from low to high tide. When the tide gate is open the depth ranges from 1.01 to 5.04 feet from low to high tide. The tide gate has been open since February 27, 2018.

Sediment accumulation has been noted along the shoreline on the western bank of the pond and to the north of the pond, and eroded banks have been observed predominantly along the eastern bank of the pond, due to collapse of retaining walls. Wall types found around Central Pond include granite block, poured concrete, brick, field stone and shale revetment and combinations of the above. The eastern shoreline is cut sharply into the Pond, with the wall defining the eastern bank boundary. The eastern shoreline is completely lined with wall structures ranging from three to five feet in height, with the tallest walls adjacent to Central Street along the channel that parallels Elm Street. The majority of the eastern bank is Town owned with the exception of two parcels at the southeast end of Central Pond.

The western shoreline has a more gradual slope, and includes several shoals formed from finer sediments deposited as Sawmill Brook flows under low water flow, gathering in pockets along the shore. Three stormwater discharge outfalls along the western shore

are also sources of sediment. Walls along the western shoreline vary from loose cobbles and revetment to low fieldstone. The western shoreline is almost entirely under private ownership with the exception of a Town-owned parcel at the southwest end of the Pond and a narrow drainage easement on Elm Street.

Based on a field survey conducted on April 18, 2018, the worst wall conditions were observed in the southeastern section of the Pond, extending from behind 19 Central Street to the Fire Station, where two wall sections have entirely collapsed, and approximately 400 feet is in need of extensive repair (see photos in Appendix B). Wall conditions have continued to deteriorate since then. Virtually all cap stone has fallen into the pond. Land subsidence behind the wall and bank erosion have increased creating public safety issues. Other issues include lack of stabilizing vegetation and lack of public access. Furthermore, the transition between the wall structure on a Town owned parcel on Elm Street to the rock rubble on the adjacent privately owned parcel is problematic, due to the high velocity where the wider channel narrows upstream of Central Street.

2.1.2 Areas Adjacent to Central Pond

The area surrounding Central Pond is developed with a mix of uses including residential, commercial buildings with parking and lawns, and the Town Fire Station. The area around the Pond is within Riverfront Area and, in some cases, Land Subject to Coastal Storm Flowage (see Section 2.2 below). Access will be required in these upland areas adjacent to Central Pond to construct the project and will include work from Town owned parcels and on existing easements where available. If additional access agreements and construction easements are needed to construct the wall repairs and living shoreline elements than the Town will obtain them from the property owners.

2.2 Wetland Resource Area Delineation Methodology

Tighe & Bond wetland scientists conducted an evaluation of wetland resource areas on April 18 and 19, 2019. Wetland resource areas regulated by the Massachusetts Wetland Protection Act (WPA) and the Manchester-by-the-Sea General Wetlands Bylaw (Article XVII) and regulations in the vicinity of the proposed work were delineated in accordance with 310 CMR 10.00 and MassDEP guidelines.

The following wetland resource areas were identified within the project area per WPA and the Town of Manchester-by-the-Sea Wetlands Bylaw:

- Coastal Bank
- Coastal Beach
- Land Under Ocean (LUO)
- Riverfront Area
- 100-foot Buffer Zone
- Land Subject to Coastal Storm Flowage (LSCSF)
- 50-foot No Build Zone (Local Bylaw)
- 30-foot No Disturbance Zone (Local Bylaw)

Descriptions of these resource areas are provided in the following sections.

2.3 Wetland Resource Areas

As noted above, resources areas subject to jurisdiction under the WPA and Article XVII were identified at the project site. Mean High Water (MHW) boundaries are shown on the project plans based on the elevation 3.1 feet (NAVD88). Note that the Sawmill Brook and Central Pond are both in transition from inland wetland resource areas to coastal resource areas and that as the restoration of tidal influence improves with removal of the tide gate, areas that may have previously been inland resource areas are now being characterized as coastal resource areas.

2.3.1 Land Under Ocean

Land Under Ocean (LUO) consists of the land beneath Sawmill Brook and Central Pond. The upper limit of LUO is the Mean Low Water (MLW). Mean Lowest Low Water (MLLW) in the bay is estimated to be approximately -5.51 feet (NAVD88) based on the NOAA long-term tide water level monitoring station (ID 8443970). With the tide gate open the upstream bridge invert would become the control, so MLLW would need to be greater than the elevation of the upstream bridge invert, -0.2 feet. Tighe & Bond used data loggers upstream of Central Street from November 27, 2017 to May 4, 2018 to monitor water levels. Based on available data when the tide gate was open, MLW would be at approximately one foot within the pond. Land Under Ocean in the pond is limited to areas of flow in the thalweg of Sawmill Brook that remain permanently inundated.

2.3.2 Coastal Beach

A regulatory definition of Coastal Beach (310 CMR 10.27) includes tidal flats, which are areas of land at elevations between MLW and MHW. At low tide much of Central Pond is currently functioning as a tidal flat and is therefore classified as Coastal Beach under the WPA. The Coastal Beach within Central Pond consists of a mixture of fine-grained sandy sediment and organic muck. The Coastal Beach within Sawmill Brook, south of Central Pond, consist of primarily rock, gravel, and cobble with limited deposits of coarse sand.

2.3.3 Coastal Bank

Sawmill Brook is a tidal river. The banks confining this tidal waterway constitute a regulatory Coastal Bank consisting of elevated landforms abutting land subject to tidal action. The toe of the Coastal Bank is located along the MHW line of Sawmill Brook. The upper boundary (*i.e.,* top) of Coastal Bank was determined utilizing cross-sectional transects based upon field survey data as outlined in the *Massachusetts Department of Environmental Protection Coastal Banks Policy (*Wetlands Program Policy 92-1) and the *Applying the Massachusetts Coastal Wetlands Regulations* ("Coastal Manual") prepared by the CZM and MassDEP.

A two-tiered Coastal Bank is located on the eastern and western banks on the southern edge of Central Pond. The Coastal Bank continues along the western bank, while the eastern edge has no regulatory WPA Coastal Bank based on the cross-sectional transect. For the purpose of an impact number, the landform behind the retaining wall will be considered Coastal Bank in this section of the pond. The southern Coastal Bank parallel to Elm Street is vegetated with a variety of grass species and trees. Trees commonly observed on the bank included choke cherry (*Prunus virginiana*), eastern red cedar (*Juniperus virginiana*), red maple (*Acer rubrum*). The Coastal Bank is armored with riprap on the southwest section of the pond that transitions into a wall around the north west and eastern edges of the Pond.

The Coastal Bank transitions to a single tier around the condo association on the northwest section of Central Pond. The Bank is armored with a wall in this section. The Coastal Bank is vegetated with a managed lawn.

2.3.4 Riverfront Area

The Sawmill Brook is shown as a perennial stream on the USGS topographic map (Marblehead North, Massachusetts; 1985); therefore, this river is afforded a 200-foot Riverfront Area. The Riverfront Area extends horizontally from the MHW line of Sawmill Brook. Riverfront Area at this site consists of commercial and residential development with maintained lawns. The mouth of coastal rivers mapping for Sawmill Brook (referred to Causeway Brook in the MA DEP mapping dated 3/1/2005, Figure 4) indicates that the tide gate and bridge at Central Street is the mouth of the coastal river and end of Riverfront Area.

2.3.5 Land Subject to Coastal Storm Flowage

According to the FEMA Flood Insurance Rate Map (FIRM) No. 25009C0434G (revised to reflect Letter of Map Revision (LOMR) effective 1/2/2017), the project area is within Zone A (1% Chance Flood with No Base Flood Elevation (BFE)). A Zone AE flood area is designated downstream of the project area with a BFE of 10 feet (NAVD88). The adjacent Zone AE elevation of 10 feet is used to provide the limit of Land Subject to Coastal Storm Flowage (LSCSF) within the project area. A detail map of the FIRM at the project area is provided in Appendix A (Figure 5).

2.4 Rare Species

The Massachusetts Natural Heritage and Endangered Species Program (NHESP) Atlas, 14th Edition, effective August 1, 2017, was consulted during preparation of this application. According to this source, the proposed project area is not located within designated *Priority Habitats of Rare Species* or *Estimated Habitats of Rare Wildlife* and therefore will not require review pursuant to the Massachusetts Endangered Species Act.

Tighe&Bond

SECTION 3

Section 3
Project Description

3.1 Proposed Activities

The proposed ecological restoration design for the Central Pond area of Sawmill Brook includes construction of a living shoreline at the western side of the Pond, planting native tidal wetland and salt marsh plants, and replacing existing retaining walls along the eastern shore. The goals of the design include:

- Facilitating the ecological restoration of the area as tidal exchange increases following the tide gate removal and Central Street Bridge replacement
- Allowing for natural processes to occur within Central Pond including geomorphic changes in the stream channel width and potential elevation changes through the reach, and for the establishment of native wetland vegetation
- Resiliency for the surrounding built environmental during storm events

These measures are made in coordination with the anticipated Central Street Bridge replacement and tide gate removal project. The increased connectivity from Sawmill Brook to Manchester Harbor is expected to improve fish passage through the project area.

3.1.1 Stream Restoration

The goal of the design is to encourage the use of the natural in-stream flows and resulting processes to reestablish a channel through the sediments in Central Pond, followed by adaptive management, if needed. This process is currently in progress with the partial restoration of tidal flows and will continue with the eventual removal of the tide gate structure and bridge replacement. Stream restoration features in this design include apex jam wood features and rootwads. Additional discussion of stream restoration is also provided in the Western Shoreline bioengineering discussion below and in the living shoreline concept discussion attached in Appendix D.

One of the main goals of the entire tidal restoration project is to improve fish passage and connectivity between Sawmill Brook and Manchester Harbor. The stream restoration components of this project are an important part of meeting that restoration objective.

3.1.2 Bank Stabilization

Alternatives for embankment stabilization/restoration along the east side of Central Pond include reconstruction of the existing retaining walls with gravity block. Poor wall drainage is likely one of the factors contributing to the existing wall failures, so improved drainage features are included in the replacement wall design with the goal of improved wall performance and longevity. The west side will implement a hybrid of bioengineered solutions to stabilize the western shoreline.

3.1.2.1 Western Shoreline- Bioengineering

A living shoreline is planned for sections on the western shore to help stabilize the shoreline and restore the stream channel through Central Pond. The shoreline erosion and instability at this edge of the Pond are likely caused from stream flows where the

channel of Sawmill Brook abuts the existing wall and from runoff over poorly vegetated areas at the top of the Bank. The adjacent surface conditions at the top of the bank include, impervious surfaces, shading, and maintained lawns, which combined, can result increased erosion at the top of the bank.

Given project constraints and existing infrastructure, Sawmill Brook will not be able fully return to a pre-settlement condition; however, the stream will be guided towards a more natural salt marsh versus the current tidal flat state altered by inundation. The design strives to decrease width/depth ratio within the low flow channel, improve instream cover and spawning habitat, reduce bank erosion, and improve sediment transport. Below is a brief description of the living shoreline characteristics. Further detail can be found in the living shoreline conceptual memo in Appendix D and the project plans in Appendix A.

Sheet C-100 in Appendix A depicts the proposed plantings within Central Pond including those associated with the western shoreline stabilization. Over time, the channel will migrate, therefore the plantings will occur at appropriate elevations to provide root mass, soil stabilization, and to enhance the habitat within the pond. Select locations along the western shoreline areas were identified to establish living shorelines. The technique will include the use of rootwads, coir logs and/or mesh to stabilize undercut or dissipate energy in high-energy sections of the stream channel. Native plants appropriate for the planting zones will be inserted into these logs and/or mesh. The proposed plantings include plantings at the top of the slope, at elevations above MHHW, to reduce the existing top of bank erosion. This will increase the vegetated buffer between the adjacent development and Sawmill Brook.

Habitat complexity will be encouraged through rootwads to help create deep scour pools and near bank shear dissipation. Large rootwads will extend into the channel on an outside bend of the western shoreline. Rootwads are placed roughly thirty-five degrees from bank facing upstream to the channel atop the toe, or inserting a key log placed longitudinally in the channel toe (rootwad facing upward). The bank will require some excavation to bury the trees using buried rock ballast and native backfill. The bank will then be regraded and planted with native woody plants installed to encourage riparian vegetation. Appropriate structures are necessary to allow time for riparian and marsh vegetation to establish, prevent later channel movement, dissipate flow energy, and provide instream and overhead cover for fish.

3.1.2.2 Eastern Shoreline- Replacement Wall

The existing retaining wall on the eastern bank will be replaced with a segmented gravity block wall. The wall replacement will involve the excavation to the elevation of -4 feet (NAVD88). A foot of crushed stone base will be wrapped in a non-woven geotextile fabric below the gravity wall segments. Sediment from the Pond will be temporally stockpiled for backfill following wall construction. Final backfill at the face of the wall will be protected with coir logs and planted with *Spartina alterniflora*. Final design elements to be determined through consultation with Town agencies include the size of the blocks, the color, and the finish. This type of wall was selected due in large part to its flexibility in addressing variable site conditions and the service life of the materials. Sheet C-504 in Appendix A includes a detail for the proposed replacement segmental gravity block wall. The wall will be periodically inspected for structural integrity following the completion of construction.

A public access to the Pond is proposed behind the Fire House Station. The stairway will be protected with a safety railing due to safety concerns. The railing consists of a timber post and rail design to blend in with the surrounding area. The railing will be placed three feet from the edge of the replacement wall for public safety.

3.1.3 Tidal Marsh Plantings

The project site plan (C-100) shows a significant area of the tidal flat in Central Pond to be planted with smooth cordgrass (*Spartina alterniflora*). The establishment of tidal marsh vegetation has been a long-term goal of the tidal restoration project. Comments from CZM on the project ENF included significant discussion of the uncertainty of changes in sediment deposition and transport in Central Pond once the bridge replacement and tide gate structure removal has occurred. Those comments recommend delaying a final planting plant until after the full restoration of tidal flows has been completed. While the area is already self-seeding with spartina, the application requests permission for planting throughout the tidal flat but will ensure that success of large area plantings is reasonable by utilizing test plots with follow up monitoring to document success. Planting in the living shoreline areas will occur during construction of those elements as a critical component of those structures. Planting on the tidal flats will include smaller areas of initial planting (test plots) to determine if the elevation of the tidal flat is high enough to allow for *Spartina alterniflora* to survive the high tide inundation periods. Smaller planting area can also be used to determine if the addition of plants helps retain sediment in Central Pond.

3.2 Anticipated Construction Sequence

The following is a broad overview of a typical construction sequence for a project of this nature. The sequence may vary depending on the contractor's proposed schedule and means and methods.

- Notify pertinent regulatory agencies of the construction schedule
- Post MassDEP File Number sign at the entrance to the work areas
- Install erosion and sedimentation controls and establish work areas
- Schedule and conduct site walks with pertinent regulatory agencies to inspect construction-phase BMPs
- Complete site preparation on east and west sides of the pond prior to initiating in-pond work, including temporary and permanent access routes
- Install apex jam, utilizing approved matting
- Install coffer dams, turbidity curtain, and oil booms for water control
- Perform grading and install bank habitat features as shown in the plans while removing the existing upstream bank
- Construct wood structures in main channel as shown in plans
- Restore and rebuild the wall in segments
- Remove coffer dam, temporary stream access points and in-channel BMPs
- Restore disturbed areas in-kind and revegetate areas with plantings as described above and depicted on the plantings plan
- Remove erosion and sedimentation controls pending approval from the Manchester-by-the-Sea Conservation Commission

- Manual planting of tidal marsh grasses on tidal flat beginning with test plots

3.3 Time of Year Restrictions and Work Windows

The Massachusetts Division of Marine Fisheries (DMF) requested in their comment letter on the ENF (dated December 30, 2019) that no in-water work be conducted from March 1st through June 30th to protect migratory fish habitat for the rainbow smelt and American eel (*Anguilla rostrata*). Work will be conducted accordingly within this recommended timeframe. Work will occur behind coffer dams as much as possible to limit unconfined in-water work. A copy of this NOI will be provided to DMF for additional comment and review. We anticipate that, if requested, additional fisheries-related construction restrictions will be provided as permit conditions of the 401 Water Quality Certificate and Pre-Construction Notification. A copy of the ENF comment letter is provided in Appendix F.

3.4 Construction Period Protective Measures

The following Best Management Practices (BMPs) will be implemented during construction to minimize the potential for impacts to jurisdictional resource areas. The Town will reserve the right to require supplemental and/or alternative construction BMPs during work depending on site and weather conditions.

3.4.1 Erosion and Sedimentation Control

Best Management Practices (BMPs) will be implemented for the project to confine the areas project disturbance from surrounding wetland resource areas. BMPs will include:

- Erosion control barriers, such as compost filter tubes, or silt fence and straw bale barriers, between upland limits of work and sensitive resource areas. Note that much of the separation of work area will be provided by cofferdams described below. Turbidity curtain is proposed to further isolate work areas from stream and tidal flows.
- If excavation dewatering is required, dewatering wastewater will require treatment for sediment removal before discharge to an upland area. This may occur by using filter bags at pump discharges or frac tanks if required. The work will seek to minimize dewatering through the use of the cofferdams and avoiding work at high tides
- Limiting footprint of work to the minimum necessary to safely construct the proposed structures
- Project contractors will be required to maintain reserve supplies of erosion control barriers on-site to make repairs as necessary

Supplemental and/or alternative construction BMPs may be required during work, depending on site and weather conditions. All erosion and sedimentation control measures will be inspected, cleaned, or replaced during construction and will remain in place until areas they are protecting are stabilized.

3.4.2 Construction mats/Ground protection

Streambank stabilization measures required along the western portion of the pond and the proposed apex jam structures may require heavy machinery access from the Pond. All rootwads along the western bank will be installed from upland position, no in-stream matting is required. The stabilization for the apex jam structure is proposed by operating

equipment from anchored timber or composite mats placed on the surface of the tidal flat. Areas disturbed for construction access will be restored to pre-construction conditions. Equipment will used on the timber mats within the pond during low-tide to protect the surface of the tidal flat. Following the completion of construction in areas requiring pond access, mats will be removed from the pond to prevent damage by floating to other areas of the pond and by repeated floating and bottoming out during tidal cycles. Plantings in the pond bottom will be performed by hand during low tide and will not require heavy equipment.

3.4.3 Cofferdams

Temporary cofferdams will be necessary to isolate the work area from normal flows. The cofferdam installation is anticipated to occur during low tide to limit the amount of water within the isolated work area. The material composition of the cofferdam will be left to the contractor's discretion but could include such devices as Port-A-Dams, sandbags, sheet piles, and water filled bladders. Regardless of the measures implemented, the footprint and phased approach to work in Central Pond will be limited to the area approved by all environmental permits. The cofferdam installation will be limited to 250 linear feet at a time to limit the risk of damage by a significant storm during construction. The locations of cofferdams and example details of types of coffer dams are depicted on the project plans (Appendix A).

3.4.4 Spill Prevention and Control

The contractor(s) will be required to conduct the work in an environmentally safe manner and in accordance with applicable regulations for the management of fuels, waste oils, and hazardous substances. A spill response kit will be kept onsite. Refueling will not be allowed within jurisdictional areas to the extent practicable.

3.4.5 Stockpile Sediment or Soil

Stockpiles are to be located as far as possible from Central Pond and will be surrounded by erosion controls to prevent washing of sediment out of the stockpiles. If sediment or soil is wet when excavated wet then it will be placed behind a sediment barrier while dewatering or be live-loaded and hauled for disposal.

3.4.6 Site Stabilization

The final site stabilization will seek to maintain existing conditions or increase vegetative stabilization. The work on the wall replacement will include coir logs and planting for stabilization. Upland areas adjacent to the wall will be protected from construction material as much as possible with matting or geotextile. Repairs to existing conditions (pavement, lawn *etc*.) will be made as necessary to restore stabile conditions. Stabilization adjacent to the living shoreline features will be made with erosion control blankets and plantings.

3.5 Invasive Species Control

Invasive species management elements have been incorporated into the project plans to reduce the potential for introduction of invasive plants into the project area. Measures will include the following:

- Construction equipment, including machinery and construction matting, will be cleaned of loose soils and plant matter before mobilization to the site.

- On-site soils, which are likely to carry non-native/invasive species seed, will not be used for grading and restoration activities.
- Work materials which enter the pond, including the containment system and cofferdam materials, will be checked for aquatic invasive plants and cleaned prior to placement in the pond. Any aquatic plants on construction equipment should be removed, bagged, and disposed of in an appropriate off-site location.

Under existing conditions, invasive species at this site include Norway maple (*Acer platanoides*). Given that this species is providing stabilization on the bank, complete eradication is not preferred. This plan will seek to reduce the spread of invasive species from this site to other areas and to limit the establishment of invasive species following construction. There is the potential for the establishment of common reed (*Phragmites australis*) in the disturbed areas of the project site. The increase of tidal flushing and planting of native plants will help minimize potential establishment of *Phragmites* in the project area.

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SECTION 4

Section 4
Alternative Analysis

A number of alternatives were considered for the restoration of Central Pond/Sawmill Brook during the planning phase and engineering design based on input received from the Town. The alternatives presented below represent a higher-level summary of the alternatives explored during this process and as detailed in the previous alternatives report. In addition to a "No Action" alternative that would not meet the town's objectives of restoring Central Pond/Sawmill Brook, other design alternatives that explore the installation methods are described below, in no particular order. As the existing Central Street bridge is in deteriorating condition and is physically associated with the tide gate and adjacent Central Pond/Sawmill Brook, off-site alternatives would not meet project goals and were not considered.

4.1 Alternative Analysis

4.1.1 No Action

The no action scenario would result in no immediate direct costs, but will result in increasing safety and functionality concerns over time. Impacts from flooding associated with the tide gate and lack of stormwater improvements would continue to negatively affect adjacent property owners and rainbow smelt spawning conditions. As the no action alternative does not meet project goals of reducing flooding and increasing resiliency, and improving habitat conditions and possibility for rainbow smelt, it is not preferred.

4.1.2 Bank Stabilization

The wall along the south-eastern section of the Pond, extending from behind 19 Central Street to the Fire Station, is in poor condition, with two wall sections that have collapsed, and approximately 400 feet in need of extensive repair. In other areas, there is land subsidence, erosion, and deterioration of the existing wall. Bank stabilization is proposed to occur during the overall restoration of Central Pond/Sawmill Brook, with the goals of protecting existing residences and buildings, preventing wall collapse and subsidence, decreasing sedimentation into the Pond, improving public access where possible, and implementing green solutions where feasible.

Bank stabilization alternatives considered include green gabions, segmental block wall, and living shoreline, which are summarized in Table 4-1 below. As noted above this analysis was conducted at a conceptual phase only.

Table 4-1
Summary of Central Pond / Sawmill Brook Bank Treatment Alternatives

	Living Shoreline	Segmental Block Wall	Green Gabions
Public Access	Open	Limited – access can be provided at key spots	Limited
Permitting	Moderate	Complex	Moderate
Cost per LF	$300	$900	$700
Resiliency / Sustainability	Small storm erosion	50–75 year service life	50-75 year service life
Maintenance Requirements	Debris/litter, plant maintenance, shoreline grading	Debris/litter	Debris/litter, growth maintenance
Feasibility	East bank – low West bank - high	East bank – high West bank - moderate	East bank – moderate West bank - moderate
Environmental Impacts (Narrative)	Temporary and permanent impacts from installation of bioengineered stabilization solution	Temporary impacts from wall repairs and reconstruction access Permanent impacts from installation of rip-rap wall erosion protection	Temporary impacts from construction access Permanent impacts from installation of rip-rap wall erosion protection
Environmental Impacts	Living shoreline: approximately 200 ft long by 5 ft wide – Permanent: 1,000 lf (Coastal Bank)	Temporary: 1,925 lf (Coastal Bank) 39,000 sf (LSCSF/Riverfront Area) Permanent: 7,600 (Land Under Water)	Temporary: 1,925 lf (Coastal Bank) 39,000 sf (LSCSF/Riverfront Area) Permanent: 7,600 (Land Under Water)

Based on site conditions that include the presence of existing houses and buildings directly abutting the existing stone wall on the east bank, the repair of the existing wall is preferred on the east side, and installation of a living shoreline is preferred for the west bank due to the low slope and feasibility of use.

4.1.3 Central Pond/Sawmill Brook Restoration Alternatives

The goals of the proposed Central Pond / Sawmill Brook restoration portion of the project include improving conditions relative to flood mitigation, fish passage, aesthetics, channel conditions, wildlife habitat, wall stability, and public access.

During the feasibility study for restoration of Central Pond performed under a grant from MET, alternatives for the restoration of Central Pond were developed based on bank stabilization, stormwater drainage, stream bed improvements, wetland and riparian impacts and restoration, diadromous fish run and habitat improvement, and public access considerations. All potential alternatives provide for full passage tidal exchange.

4.1.4 Maintain Low-Level Impoundment at Central Pond

In this alternative, Central Pond would be improved in order to maintain a permanent low-level water impoundment with a cross-channel berm upstream of Central Street bridge where the channel expands. This alternative would maintain the surface water feature, but would likely require high construction and maintenance costs with a high level of permitting complexity and relatively low ecological benefits relative to restoration of Sawmill Brook as a tidal stream.

4.1.5 Restore Sawmill Brook to Low-Level Pools with Low Level Riffles

In this alternative, Sawmill Brook would be restored to low-level pools impounded by low-level riffle structures. The pool and riffle alternative would provide fish passage improvements, a naturalized landscape, flood mitigation, an increased water feature, and some sediment management, and is between the tidal stream and pond alternatives in terms of construction maintenance and maintenance costs. Permitting for this alternative is anticipated to be complex, with high potential ecological benefits and moderate project complexity.

Feedback received from project partners during the planning process is that the results of this alternative would be uncharacteristic of more natural streams in the area, and should be avoided.

4.1.6 Restore Sawmill Brook to Unrestricted Tidal Stream (Preferred)

Restoring Sawmill Brook to an unrestricted tidal stream would provide free flowing water in a continuous stream, and would require:

- Replacement of the retaining wall along the east side of the pond
- Spot treatment of areas susceptible to erosion along the west side of the pond with soft bank toe protection measures and living shoreline components
- Planting of vegetation in the pond bottom to stabilize sediment and encourage establishment of a healthy plant community

This alternative would require relatively low construction and maintenance costs relative to Central Pond improvements, would have high ecological benefits in terms of maximizing fish passage, improving water quality, providing flood mitigation, providing diverse wildlife habitat, and resulting in a restored naturalized landscape.

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SECTION 5

Section 5
Regulatory Compliance

This section summarizes the project's compliance with the Wetlands Protection Act (WPA) regulations (310 CMR 10.00) and the Town of Manchester-by-the-Sea Wetlands Protection Regulations (Article XVII). A discussion of other pertinent state and Federal regulations is also provided.

5.1 Massachusetts Wetlands Protection Act

Portions of the proposed activities will occur within areas subject to protection and jurisdiction under the WPA. These areas include Coastal Bank, LUO, Coastal Beach, Riverfront Area, LSCSF, and the 100-foot Buffer Zone. Both temporary and permanent impacts will occur in these areas. Table 5.1 provides a breakdown of temporary and permanent impact areas by resource area, as regulated under the WPA and Article XVII. The figures and project plans in Appendix A also depict the proposed activities and Resource Areas.

Table 5-1
Summary of Temporary and Permanent Impacts to Wetland Resource Areas

Resource Area	Activity	Temporary Impacts (sf)	Permanent Impacts (sf)	Total Disturbance
Coastal Bank[1]	Wall Replacement	95	730	
	Living Shoreline		700	**1,525**
Land Under Ocean	Wall Replacement	0	30	
	Living Shoreline	750	1,250	**2,030**
	Dredging[2]		3,047	
Coastal Beach	Wall Replacement		4,195	
	Living Shoreline	10,247	10,050	**24,492**
Riverfront Area – Inner 100 ft	Construction Access	12,746	10,848	**25,062**
Riverfront Area – Outer 200 ft[3]	Construction Access	1,468	--	
LSCSF[4]	Construction Access	39,000	--	**39,000**
Total[5]		**64,211**	**26,373**	**90,584**

[1] Coastal Bank impacts are given in linear feet (lf), not square feet (sf)

[2] Coastal Beach dredging was included in the Land Under Ocean dredging, dredging in cubic yards (cy), not sf

[3] Riverfront Area – Outer 200 ft impacts are inclusive of inner 100 ft impacts

[4]LSCSF is located within the 200 ft Riverfront Area

[5]Total impacts do not include Coastal Bank

5.1.1 Ecological Restoration Project Status

This project is submitted as an Ecological Restoration Project under the criteria of Tidal Restoration Project 310 CMR 10.13(3)(5). The project is proposed to repair existing retaining wall and improve ecological conditions in Coastal Bank and Coastal Beach as part of the restoration of greater tidal flushing in the project area. As stated at 310 CMR 10.13, *Ecological Restoration Projects permitted by a Restoration Order of Conditions may result in the temporary or permanent loss of Resource Areas and/or the conversion of one Resource Area to another when such loss and/or conversion is necessary to the achievement of the project's ecological restoration goals*.

In addition, the project qualifies as a Limited Project Ecological Project under the Tidal Restoration Project category (310 CMR 10.24(8)(e)(1)). The work proposed is part of a planned tidal restoration on-going at this location and includes activities for ecological improvement and for the protection of the adjacent built environment from flooding.

5.1.2 WPA Riverfront Area Exemption

The proposed wall replacement is considered to be exempt from the requirements of the Riverfront Area performance standards in accordance with 310 CMR 10.02(2)(a)(2) as it consists of:

> "activities conducted to maintain, repair or replace, but not substantially change or enlarge an existing and lawfully located structure… provided said work utilizes the best practical measures to avoid or minimize impacts to wetland resource areas outside the footprint of said structure or facility."

These activities within Riverfront Area are exempt under the WPA.

5.1.3 WPA Performance Standards

The following sections present the WPA performance standards for the impacted wetland resource areas (in *italic* font) and the proposed activities' compliance with these standards (in normal font). Impact areas presented in this section were calculated in AutoCAD using surveyed topography, delineated resource areas, and other site features.

5.1.4 Land Under Ocean

The proposed wall replacement and living shoreline will result in both temporary and permanent impacts to LUO, totaling approximately 2,030 square feet (sf). Approximately 30 sf of LUO will be temporarily impacted as a result of the wall replacement. Approximately 1,250 sf of LUO will be permanently impacted from the bioengineering construction. The performance standards for LUO are set forth at 310 CMR 10.25(2), and a discussion of how the proposed project complies with these standards follows. Performance standards at 10.25(3) and (4) address navigation dredging and are not applicable to this project.

> *(5) Projects not included in 310 CMR 10.25(3) or (4) which affect nearshore areas of land under the ocean shall not cause adverse effects by altering the bottom topography so as to increase storm damage or erosion of coastal beaches, coastal banks, coastal dunes, or salt marshes.*
>
> The proposed project is designed to minimize alterations of the LUO topography, only altering the areas necessary to improve resiliency for storm damage. The project involves the excavation of material to replace the existing wall in-kind

and the installation rootwads for the bioengineering elements. The stone blocks of the existing wall may be installed within the Pond to protect the proposed plantings. This impact will help stabilize the plantings and minimize future erosion along the eastern wall.

(6) Projects not included in 310 CMR 10.25(3) which affect land under the ocean shall if water-dependent be designed and constructed, using best available measures, so as to minimize adverse effects, and if non-water-dependent, have no adverse effects, on marine fisheries habitat or wildlife habitat caused by:

(a) alterations in water circulation; (b) destruction of eelgrass (Zostera marina) or widgeon grass (Rupia maritina) beds; (c) alterations in the distribution of sediment grain size; (d) changes in water quality, including, but not limited to, other than natural fluctuations in the level of dissolved oxygen, temperature or turbidity, or the addition of pollutants; or (e) alterations of shallow submerged lands with high densities of polychaetes, mollusks or macrophytic algae.

The project is water dependent due to the placement of the existing infrastructure for the wall replacement and the nature of the bioengineering project. The goal of the project is to improve natural tidal flow conditions in the project area. Construction period impacts the conditions and resources listed in this performance standard will be minimized by limiting the open work area and by isolating in water work from stream and tidal flows. Best management practices outlined in Section 3.4 will be utilized during construction to minimize impacting the resource areas.

(7) Notwithstanding the provisions of 310 CMR 10.25(3) through (6), no project may be permitted which will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.37.

The proposed project is intended to improve the existing habitat of Central Pond. The impacts to the resource area are necessary to accomplish this goal. In addition, this area is not located within *Estimated Habitat of Rare Wildlife* or *Priority Habitat of Rare Species*.

5.1.5 Coastal Beach

The proposed bioengineering slope stabilization and wall replacement will result in both temporary and permanent impacts to Coastal Beach, totaling approximately 24,492 sf. Approximately 4,195 sf of Coastal Beach will be permanently impacted as a result of the wall replacement. Approximately 10,247 sf of Coastal Beach will be permanently impacted from construction of bioengineering elements. The performance standards for Coastal Beach are set forth at 310 CMR 10.27(2), and a discussion of how the proposed project complies with these standards follows.

(3) Any project on a coastal beach, except any project permitted under 310 CMR 10.30(3)(a), shall not have an adverse effect by increasing erosion, decreasing the volume or changing the form of any such coastal beach or an adjacent or downdrift coastal beach.

The goal of the project is to allow for natural processes to occur in the existing tidal flat (regulated as Coastal Beach) in the project area. This may include

shifting position, width, and depth of the thalweg (channel) of Sawmill Brook through Central Pond and the growth of salt marsh vegetation on the tidal flat if favorable conditions remain following the tide gate removal. The project's alteration of Coastal Beach is limited and seek to promote natural processes in Central Pond while protecting surrounding developed areas. The planting proposed will help minimize erosion within the area.

(4) Any groin, jetty, solid pier, or other such solid fill structure which will interfere with littoral drift, in addition to complying with 310 CMR 10.27(3), shall be constructed as follows:

(a) It shall be the minimum length and height demonstrated to be necessary to maintain beach form and volume. In evaluating necessity, coastal engineering, physical oceanographic and/or coastal geologic information shall be considered.

(b) Immediately after construction any groin shall be filled to entrapment capacity in height and length with sediment of grain size compatible with that of the adjacent beach.

(c) Jetties trapping littoral drift material shall contain a sand by-pass system to transfer sediments to the downdrift side of the inlet or shall be periodically redredged to provide beach nourishment to ensure that downdrift or adjacent beaches are not starved of sediments.

This standard is not applicable to our project because the project is not in a littoral drift area.

(5) Notwithstanding 310 CMR 10.27(3), beach nourishment with clean sediment of a grain size compatible with that on the existing beach may be permitted.

Beach nourishment is not proposed as part of the project. Thus, this standard does not apply to the project.

5.1.6 Coastal Bank

The Coastal Bank at the project site is a structural bank and does not serve as a source of sediment supply to an adjacent Coastal Beach, Coastal Dune, or Barrier Beach. The proposed eastern wall replacement will modify the existing Coastal Bank, with the replacement of the existing retaining wall. This will include 730 lf of work at Coastal Bank, with restoration to similar conditions as proposed following construction. On the west of the Pond an additional 700 lf of Coastal Bank will be altered by the installation bioengineering slope stabilization measures and planting. The total work in Coastal Bank will be 1,525 lf, work will not result in the net loss of Coastal Bank. The performance standards for structural Coastal Bank are set forth at 310 CMR 10.30(6) through (8) and are addressed below.

The regulations at 310 CMR 10.30 state, "*When a Coastal Bank is determined to be significant to storm damage prevention or flood control because it is a vertical buffer to storm waters, 310 CMR 10.30(6) through (8) shall apply:*"

(6) Any project on such a coastal bank or within 100 feet landward of the top of such coastal bank shall have no adverse effects on the stability of the coastal bank.

The Coastal Bank is armored around Central Pond. Currently the eastern wall is failing and the stability of the Coastal Bank is threatened. The proposed work will protect physical stability of the bank within these areas through the replacement of the existing wall, installing coir logs and plants to reinforce and stabilize these sections of bank. The plantings at the wall should serve as further scour protection. The bank stability within the project area is not anticipated to be adversely affected by the bioengineering or the wall replacement.

(7) Bulkheads, revetments, seawalls, groins or other coastal engineering structures may be permitted on such a coastal bank except when such bank is significant to storm damage prevention or flood control because it supplies sediment to coastal beaches, coastal dunes, and barrier beaches.

The Coastal Bank within the project area is classified as a structural bank as it serves as a vertical buffer to tidal water. The bank does abut a regulatory Coastal Beach, but it is not a significant supplier of sediment to those resource areas as the existing Coastal Bank is armored. The proposed project is not anticipated to interfere with the bank's function in terms of flood control and/or storm damage protection. It is intended to improve the flood conditions within the area. As this Coastal Bank is not a sediment supply to beach and is a structural bank, the placement of coir logs along the toe of the bank is not anticipated to adversely affect the functions of this bank relative to sediment supply.

(8) Notwithstanding the provisions of 310 CMR 10.30(3) through (7), no project may be permitted which will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.37.

The proposed project will not adversely affect the quality or degree of habitat on-site. One of the project's goals is to improve the existing habitat within the Pond. The temporary impacts to this area will be restored following the completion of construction. As mentioned above, this area is not located within *Estimated Habitat of Rare Wildlife* or *Priority Habitat of Rare Species*.

5.2 Public Notice

Abutters were notified in accordance with the requirements set forth by the WPA and Article XVII. The abutter notification form and a copy of the certified list of abutters prepared by the Manchester-by-the-Sea Assessors Office is provided in Appendix C. A public notice of the Ecological Restoration Project was posted in the March 25, 2020 (Volume 94, Issue 6) *Environmental Monitor*. A copy of the notice is provided in Appendix E.

5.3 Manchester-by-the-Sea Bylaw

The proposed activities are also subject to the Town of Manchester-by-the-Sea Wetlands Protection Regulations (Article XVII). The proposed work will occur within Riverfront Area, Coastal Bank, LUO, Coastal Beach, the No-Disturbance Zone, and the No-Build Zone. The following sections will discuss the resource areas with stricter performance standards than are set forth under the WPA.

5.3.1 Coastal Bank

Section 9.6 of Article XVII establishes additional Coastal Bank performance standards from the WPA. The existing Bank is currently failing with two wall sections that have collapsed and approximately 400 feet in need of extensive repair. In other areas, there is land subsidence, erosion, and deterioration of the existing wall. Due to the existing placement of the infrastructure, work needs to be performed on the Coastal Bank in order to repair the existing wall and stabilize the area. As discussed in Section 4.1.2, several alternatives were considered for the Bank stabilization around Central Pond. The western Coastal Bank was determined to be an ideal location for a hybrid bioengineering solution, while the eastern Coastal Bank was determined to require wall replacement. The existing wall on the eastern bank will be replaced in-kind with a design life of 50-75 years. The combined approach will allow the existing infrastructure on the east bank to be protected, while the living shoreline elements are established. The conceptual memo in Appendix D provides additional detail regarding the bioengineering approach.

5.3.2 No Disturbance Zone

Section 10.1 of Article XVII establishes a 30-foot No-Disturbance Zone (NDZ). The NDZ consists of residential and commercial lawns and a small area of forested riverbank. As the project is designed to improve the existing conditions within Central Pond, it requires an impact to the NDZ. The project has been designed to minimize impacts to resource areas to the extent practicable. There will be approximately 8,317 sf of impacts to the 30-foot NDZ. Approximately 1,224 sf are associated with temporary impacts that consist of safe construction access for the wall replacement. Approximately 2,513 sf of temporary impacts will occur as a result of the bioengineering. As discussed in Section 3.4.8. this area will be restored with native plantings following the completion of construction.

5.3.2.1 No Disturbance Zone Waiver Request

Due to the location of the existing infrastructure, it is not possible to move the project outside of the NDZ to avoid impacts to this area. The project has been designed to limit the impacts to the NDZ to the extent practicable. The nature of the project (*i.e.,* replacing an existing wall and bioengineering within the Pond) warrants consideration that Town is acting in the best interest of the resource areas by allowing natural processes to occur to improve the ecological conditions and coastal resiliency in the area. The current conditions involve frequent flooding of the nearby infrastructure, including the Fire Department. By improving the conditions within the Pond and promoting flood resiliency, there is an overwhelming benefit for the public and natural resources. The temporary disturbance would be negligible compared to the continued deterioration of the wall and subsequent slope failure and the benefit of implementing living shoreline elements within the Pond. Therefore, the Town respectfully requests a variance to conduct work within the NDZ.

5.3.3 No Build Zone

The No-Build Zone is defined as the 50-foot area landward of resource areas, in accordance with Section 10.1 of Article XVII. Approximately 2,086 sf of temporary impacts will occur within the No Build Zone in addition to the 8,317 sf within the No Disturbance Zone, as a result of the construction of the gravel access road. No other structures are proposed within the No-Build Zone.

5.3.3.1 No-Build Zone Waiver Request

Due to the location of the existing infrastructure, it is not possible to move the project to another location. The gravel access road will minimize disturbance to resource areas and the No-Build Zone through the presence of a well-defined access route. The access road will be removed following the completion of construction. The Town respectfully requests a variance to conduct work within the No-Build Zone.

5.4 Other Regulatory Programs

This project is subject to review and approval not only by the Manchester Conservation Commission but also several state and federal agencies. There have been multi-agency pre-application meetings held to discuss the project's progress in the design process and comments have been submitted during the MEPA review described below. We anticipate that design review as part of this on-going permit application process will result in additional comments and may require design revisions. We will inform the Commission about the approval process as additional applications are submitted.

5.4.1 Massachusetts Environmental Policy Act (MEPA)

The project was subject to MEPA review as it requires state permits and exceeds MEPA review thresholds as defined by 301 CMR 11.00. An Environmental Notification Form (ENF) was submitted for review on December 2, 2019 and was published in the Environmental Monitor on December 11, 2019 (EEA #16127). The Certificate of the Secretary of Energy and Environmental Affairs on the Environmental Notification Form was issued on January 10, 2020 and determined that no additional MEPA review was warranted.

5.4.2 Chapter 91 License

Based on a review of the jurisdictional tidelands mapping provided by MassGIS, the proposed project area is located within filled and flowed tidelands under Chapter 91 jurisdiction. There are two existing license plans in the vicinity of the project area for Manchester Harbor:

- License Plan #197, recorded January 17, 1922, authorized building retaining walls and riprap slopes and filling in Manchester Harbor
- License Plan #650, recorded April 12, 1926, authorized building a pile pier and bulkhead and filling for an extension of an existing pier in Manchester Harbor

Chapter 91 license applications will be submitted to MassDEP for review and approval for the restoration of Central Pond, retaining wall rehabilitation, bridge replacement, and tide gate removal.

5.4.3 401 Water Quality Certification

This project requires a Section 401 Water Quality Certification because it requires authorization under Section 404 of the Clean Water Act and proposes dredging greater than 100 cubic yards (cy). Note that dredging required is for the replacement of the existing wall and all area of dredge will be backfilled to existing grade. Dredging to lower elevations in the channel or tidal flat is not proposed. A 401 Water Quality Certification application will be submitted to MassDEP for review and approval. The Water Quality Certification will be provided to the Conservation Commission upon receipt.

5.4.4 Army Corps Section 404/10 Pre-Construction Notification

The proposed project is subject to jurisdiction under the United States Army Corps of Engineers (Corps) authorization under Section 404 of the Clean Water Act, due to work within Waters of the United States. Corps authorization is also required under Section 10 of the Rivers and Harbors Act for work within waters subject to the ebb and flow of the tide. The project will be reviewed as a Pre-Construction Notification under the Massachusetts General Permits (GPs). A permit application will be prepared and submitted to the Corps, and will be concurrently reviewed by other Federal agencies, including the U.S. Environmental Protection Agency (EPA), the National Oceanic and Atmospheric Administration (NOAA)/ National Marine Fisheries Service (NMFS), and the U.S. Fish & Wildlife Service (USFWS).

5.4.5 Coastal Zone Management Federal Consistency Review

The project is subject to Federal Consistency Review (MA Federal Consistency Rules, 301 CMR 20.00 and Coastal Zone Management Act, 16 U.S.C. § 14560) because it is being conducted by a non-Federal entity within the Coastal Zone and requires a permit from a Federal Agency (Corps). MA Coastal Zone Management Federal Consistency Review through the Corps review process is anticipated.

APPENDIX A

FIGURES

Legend

Limit of Work

Tighe&Bond
Engineers | Environmental Specialists

Based on USGS Topographic Map for Marblehead North, MA Revised 1985.
Contour Interval Equals 3-Meters.
Circles indicate 500-foot and half-mile radii

1:24,000
0 1,000 2,000
Feet

N

FIGURE 1
SITE LOCATION

Central Street Bridge Replacement/
Sawmill Brook Restoration Project
Manchester-by-the-Sea, Massachusetts

September 2019

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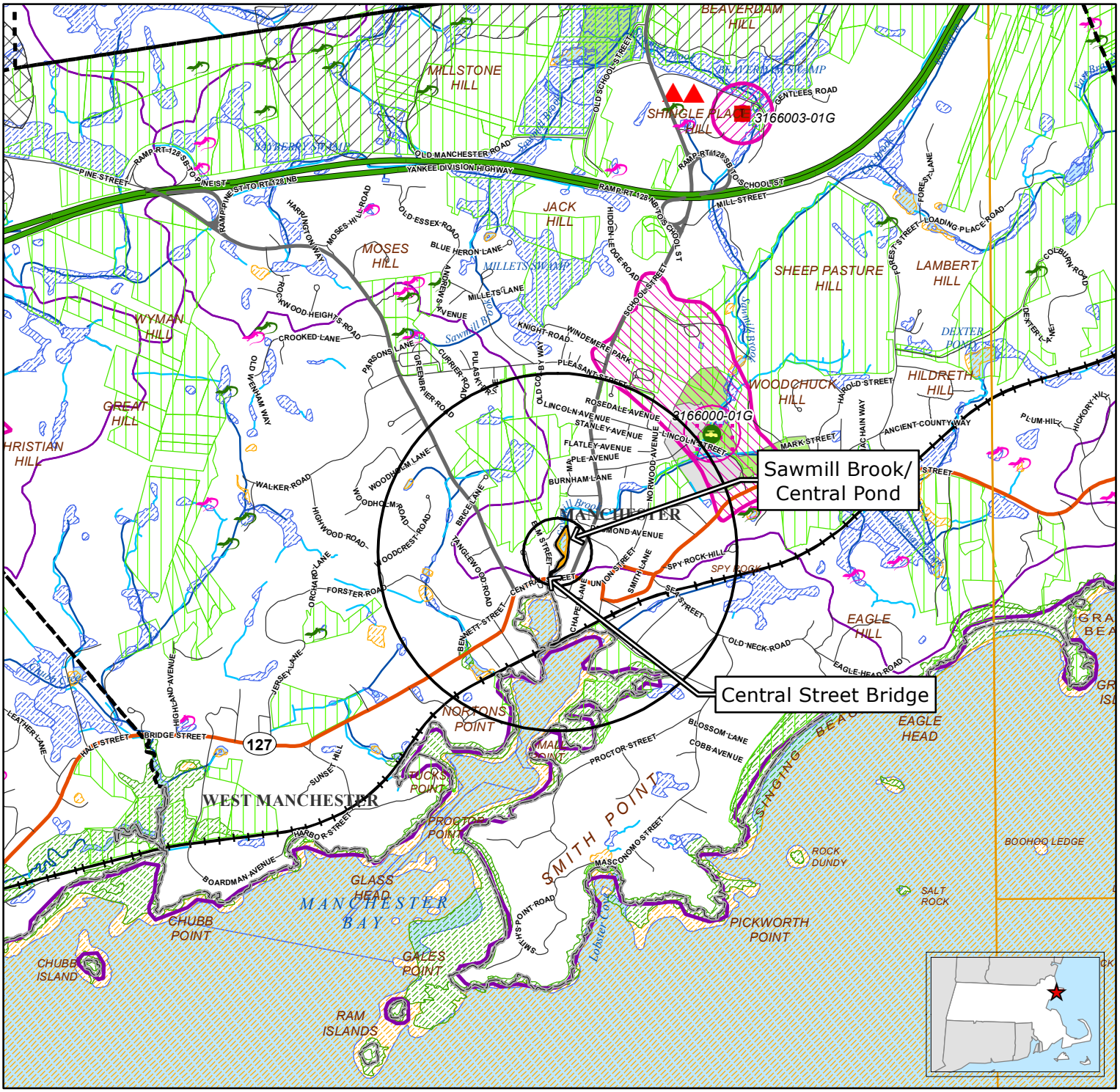
M-1476



Legend

- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools
- Non-Landfill Solid Waste Sites
- Proposed Well
- Emergency Surface Water
- Community Public Water Supply - Surface Water
- Community Public Water Supply - Groundwater
- Non-Community Non-Transient Public Water Supply
- Non-Community Transient Public Water Supply
- Limited Access Highway
- Multi-Lane Highway, NOT Limited Access
- Other Numbered Highway
- Major Road - Collector
- Minor Street or Road
- Aquaducts
- Hydrologic Connections
- Stream/Intermittent Stream
- Powerline
- Pipeline
- Track or Trail
- Trains
- Public Surface Water Supply Protection Area (Zone A)
- DEP Approved Wellhead Protection Area (Zone I)
- DEP Approved Wellhead Protection Area (Zone II)
- DEP Interim Wellhead Protection Area (IWPA)
- Protected and Recreational Open Space
- Solid Waste Landfill
- Area of Critical Environmental Concern (ACEC)
- NHESP Priority Habitats for Rare Species
- NHESP Estimated Habitats for Rare Wildlife
- EPA Designated Sole Source Aquifer
- Major Drainage Basin
- Sub Drainage Basin
- MassDEP Open Water
- MassDEP Inland Wetlands
- MassDEP Coastal Wetlands
- MassDEP Not Interpreted Wetlands
- Public Surface Water Supply (PSWS)
- Water Bodies
- Non-Potential Drinking Water Source Area - High Yield
- Non-Potential Drinking Water Source Area - Medium Yield
- Potentially Productive Medium Yield Aquifer
- Potentially Productive High Yield Aquifer
- County Boundary
- Town Boundary
- USGS Quadrangle Sheet Boundary
- Limit of Work

FIGURE 2
PRIORITY RESOURCES

Central Street Bridge Replacement/
Sawmill Brook Restoration Project
Manchester-by-the-Sea, Massachusetts

Data source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology
Circles indicate 500-foot and half-mile radii.
Data valid as of September 2019.

September 2019

Tighe&Bond
Engineers | Environmental Specialists

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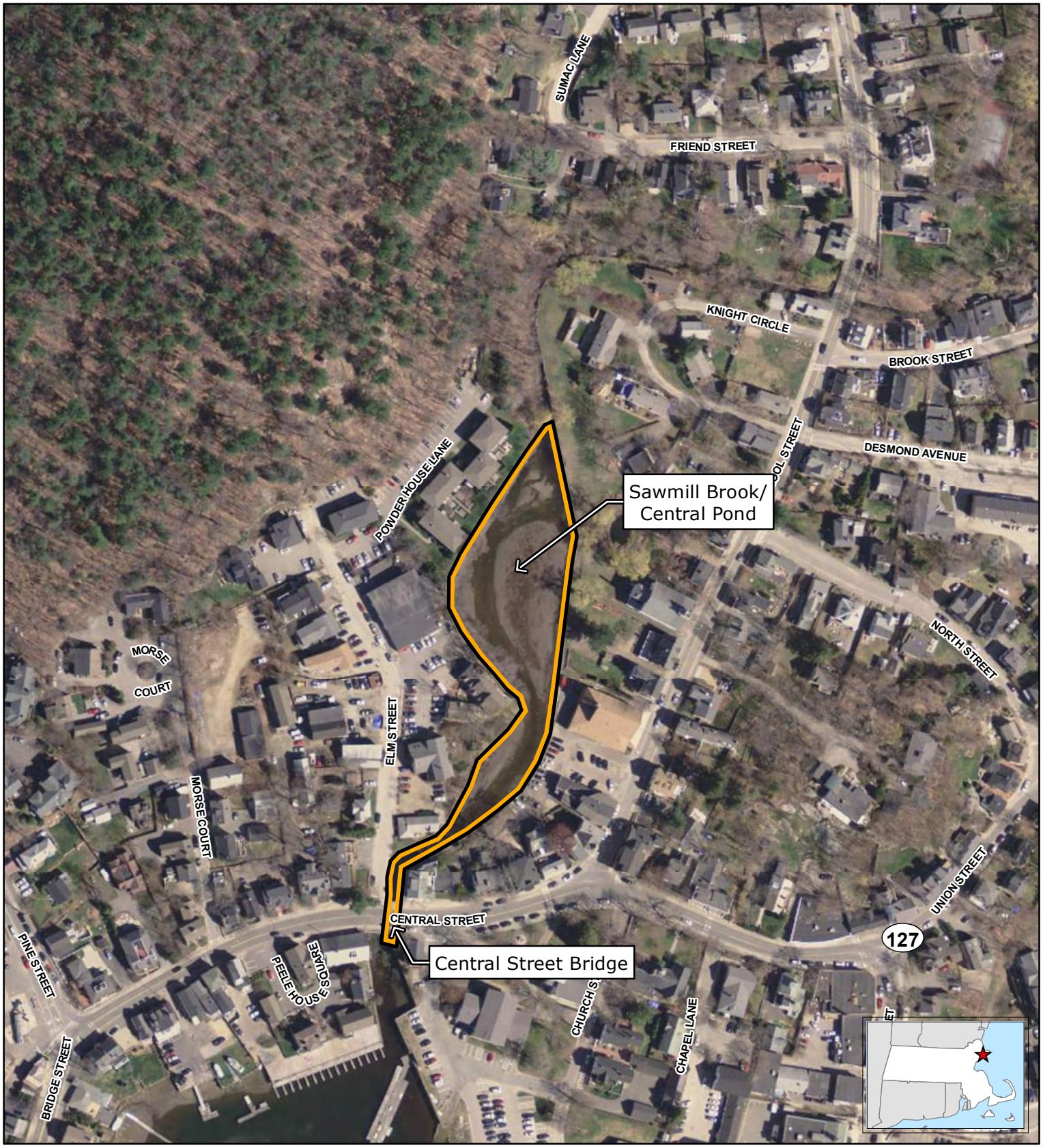

Legend

Limit of Work

Tighe&Bond
Engineers | Environmental Specialists

Based on MassGIS Color Orthophotography (2013)

1:2,400
0 100 200
Feet

N

FIGURE 3
ORTHOPHOTOGRAPH

Central Street Bridge Replacement/
Sawmill Brook Restoration Project
Manchester-by-the-Sea, Massachusetts

September 2019

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M-1476

Massachusetts
Mouth of Coastal River Maps

M.G.L. c.131, s.40
310 CMR 10.58

Town: MANCHESTER
River: CAUSEWAY BROOK
ID: MANCHESTER MOR-1

March 1, 2005

Mitt Romney, Governor
Ellen Roy Herzfelder, Secretary

1:3,000

0 100 200 400 600 Feet

1 inch equals 250 feet

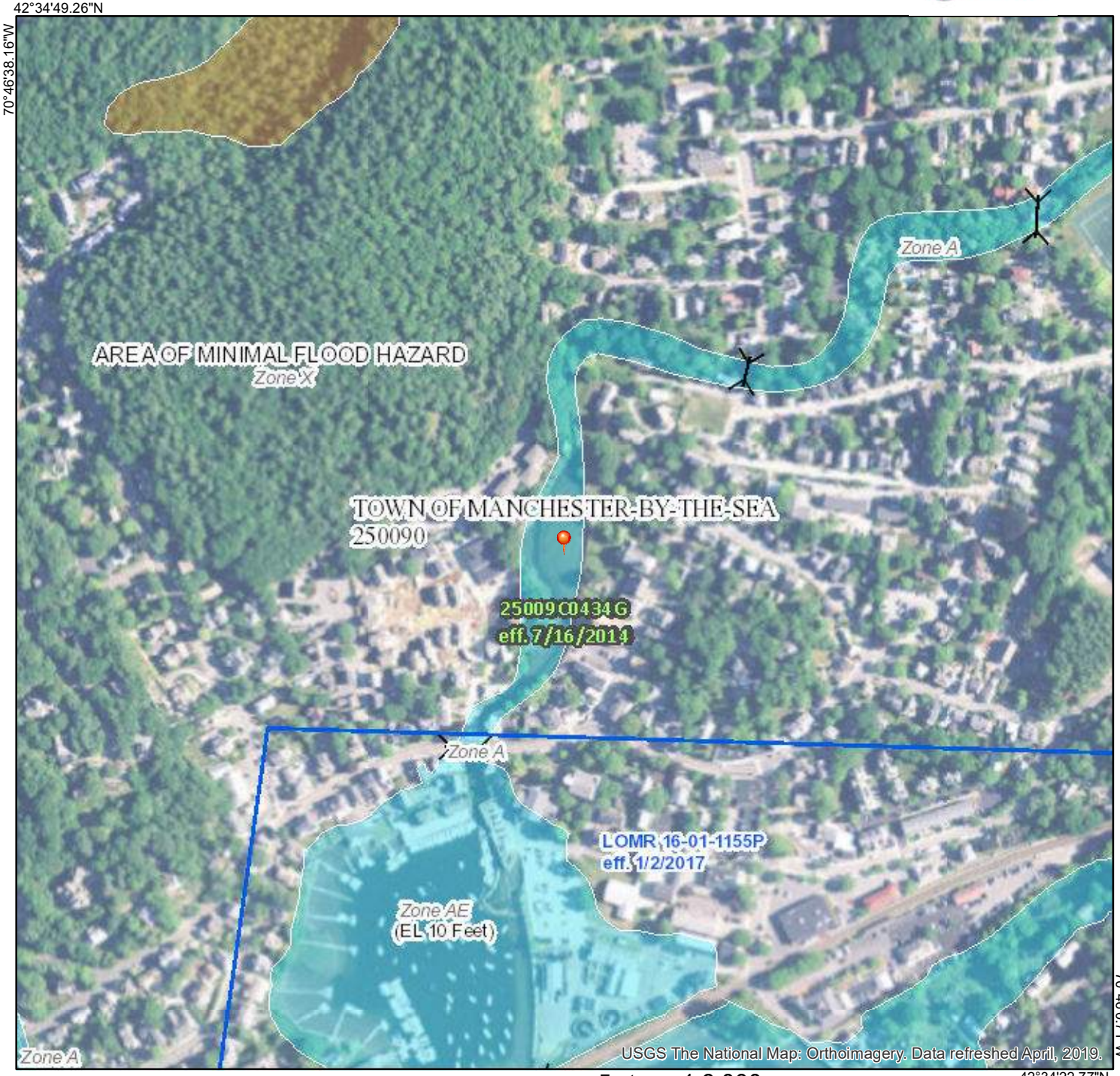
Mouth of River lines delineated by DEP Wetlands Program.

Color OrthoPhoto base map from MassGIS, 2001-2003.

Mass DEP GIS Program

National Flood Hazard Layer FIRMette

FEMA



Feet

0 250 500 1,000 1,500 2,000

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- **SPECIAL FLOOD HAZARD AREAS**
  - Without Base Flood Elevation (BFE) *Zone A, V, A99*
  - With BFE or Depth *Zone AE, AO, AH, VE, AR*
  - Regulatory Floodway
- **OTHER AREAS OF FLOOD HAZARD**
  - 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
  - Future Conditions 1% Annual Chance Flood Hazard *Zone X*
  - Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
  - Area with Flood Risk due to Levee *Zone D*
- **OTHER AREAS**
  - NO SCREEN Area of Minimal Flood Hazard *Zone X*
  - Effective LOMRs
  - Area of Undetermined Flood Hazard *Zone D*
- **GENERAL STRUCTURES**
  - Channel, Culvert, or Storm Sewer
  - Levee, Dike, or Floodwall
- **OTHER FEATURES**
  - 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
  - Coastal Transect
  - Base Flood Elevation Line (BFE)
  - Limit of Study
  - Jurisdiction Boundary
  - Coastal Transect Baseline
  - Profile Baseline
  - Hydrographic Feature
- **MAP PANELS**
  - Digital Data Available
  - No Digital Data Available
  - Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/26/2020 at 2:47:02 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

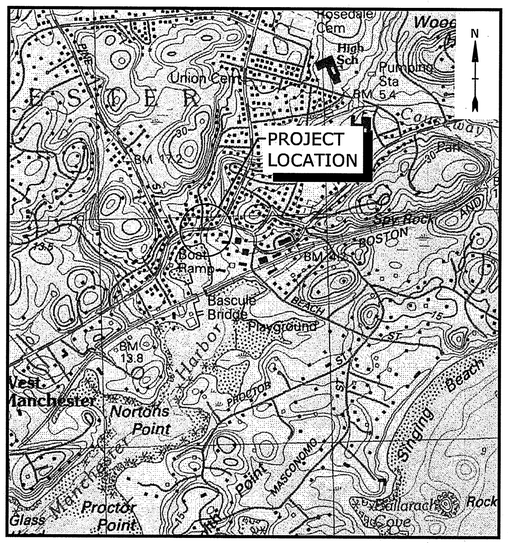
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

TOWN OF MANCHESTER-BY-THE-SEA, MASSACHUSETTS

CENTRAL POND RESTORATION

MARCH 28, 2020

LIST OF DRAWINGS	
SHEET NO.	SHEET TITLE
	COVER
G-001	GENERAL NOTES, LEGEND & ABBREVIATIONS
C-001	EXISTING CONDITIONS & DEMOLITION PLAN
C-002	EXISTING CROSS SECTIONS
C-003	EXISTING CROSS SECTIONS
C-101	SITE PLAN
C-102	PROPOSED CROSS SECTIONS
C-103	PROPOSED CROSS SECTIONS
C-501	CONTROL OF WATER NOTES
C-502	TYPICAL BANK DETAILS
C-503	CONTROL OF WATER DETAILS
C-504	CONTROL OF WATER DETAILS
C-505	CONSTRUCTION DETAILS
C-601	TRANSECT PLAN
C-602	TRANSECT CROSS SECTIONS
C-603	TRANSECT CROSS SECTIONS



LOCATION MAP
SCALE: 1" = 1000'

PREPARED FOR:

TOWN OF MANCHESTER-BY-THE-SEA
GREG FEDERSPIEL, TOWN ADMINISTRATOR
CHUCK DAM, PE, DEPARTMENT OF PUBLIC WORKS DIRECTOR
MARY REILLY, GRANTS ADMINISTRATOR

BOARD OF SELECTMEN
MARGARET F. DRISCOLL, VICE CHAIR
ELI G. BOLING, CHAIR
BECKY JAQUES
ARTHUR STEINERT
JEFFREY H. BODMER-TURNER

PREPARED BY:

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
CIVIL
No. 39818
REGISTERED PROFESSIONAL ENGINEER
3/28/2020

PERMIT SET
NOT FOR CONSTRUCTION

COMPLETE SET 16 SHEETS

Last Saved: 3/28/2020
Plotted On: Mar 28, 2020 - 3:05pm By: DWBradshaw
Tighe & Bond: I:\W\W14\76 Manchester MA Hydro Study\014-Sawmill_Central Pond\Permit\Task 4 - Final Design\AutoCad\Sheet\W14764012-G-000_Cover.dwg

GENERAL NOTES:

1. BASE PLAN ENTITLED "TOPOGRAPHIC PLAN FOR TIGHE & BOND OF SAWMILL BROOK BRIDGE STREET TO NORWOOD AVE, MANCHESTER-BY-THE-SEA, MASSACHUSETTS" PREPARED BY DOUCET SURVEY INC. IN DECEMBER 2017.
2. THE HORIZONTAL DATUM IS BASED ON THE NORTH AMERICAN DATUM OF 1983 (NAD83). THE VERTICAL DATUM IS BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. BOLD TEXT AND LINES INDICATES PROPOSED WORK. LIGHT TEXT AND LINES INDICATES APPROXIMATE EXISTING CONDITIONS.
4. WETLAND RESOURCE AREAS WERE DELINEATED BY TIGHE & BOND ON 4/18/2018.
5. SOIL BORINGS WERE ADVANCED BY NEW ENGLAND BORING CONTRACTORS ON NOVEMBER 28, 2018.
6. NOTIFY "DIGSAFE" AT 1-888-344-7233 TO ARRANGE FOR MARKING OUT EXISTING UNDERGROUND UTILITIES AT LEAST 72 HOURS (EXCLUDING SATURDAYS, SUNDAYS, AND HOLIDAYS) PRIOR TO BEGINNING EXCAVATION AT ANY GIVEN LOCATION. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR BE ALLOWED TO START ANY KIND OF EXCAVATION WORK PRIOR TO OBTAINING ALL THE NECESSARY INFORMATION REGARDING THE LOCATION OF UNDERGROUND UTILITIES AT THE SITE. ACCOMPLISH ALL EXCAVATION SO THAT UNDERGROUND UTILITIES OR STRUCTURES ARE NOT DAMAGED. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE INCURRED DURING EXCAVATION OPERATIONS. REPAIR ANY EXISTING PIPE OR UTILITY DAMAGED DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.
7. THE OWNER AND ENGINEER ASSUME NO RESPONSIBILITY FOR THE LOCATION OF EXISTING UTILITIES. THE ENGINEER AND OWNER MAKE NO GUARANTEE AS TO THE UNDERGROUND CONDITIONS THAT MAY BE ENCOUNTERED.
8. FIELD MEASURE TO VERIFY EXISTING AND CONTRACT INTERFACE DIMENSIONS, LOCATIONS, AND OTHER CONDITIONS.
9. TEST PITS TO LOCATE EXISTING UTILITIES ARE STRONGLY ENCOURAGED AND MAY BE ORDERED BY THE ENGINEER.
10. IF CHANGES TO THE DESIGN ARE PROPOSED, THE CHANGES SHALL BE SUBMITTED TO THE OWNER/ENGINEER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
11. MAKE NECESSARY ARRANGEMENTS TO PERFORM ANY WORK NEAR OVERHEAD UTILITIES PRIOR TO THE START OF CONSTRUCTION.
12. EXISTING UTILITY POLES IN CLOSE PROXIMITY TO CONSTRUCTION MAY REQUIRE TEMPORARY SUPPORT BY THE UTILITY COMPANY. INCLUDE COST UNDER THE PRICES BID FOR THE VARIOUS ITEMS OF WORK.
13. NO OPEN TRENCHES WILL BE ALLOWED OVERNIGHT. THE USE OF ROAD PLATES TO PROTECT THE EXCAVATION WILL BE CONSIDERED UPON REQUEST, BUT BACKFILLING IS PREFERRED.
14. STORE FUEL, OIL, PAINT, OR OTHER HAZARDOUS MATERIALS IN A SECONDARY CONTAINER AND REMOVE FROM THE SITE TO A LOCKED INDOOR AREA WITH AN IMPERVIOUS FLOOR DURING NON-WORK HOURS.
15. IMMEDIATELY REPORT SPILLS OF OIL AND/OR HAZARDOUS MATERIALS (OHM) TO THE MASSDEP.
16. PROVIDE A SUFFICIENT SUPPLY OF ABSORBENT SPILL RESPONSE MATERIALS, SUCH AS BOOMS OR BLANKETS, AT THE CONSTRUCTION SITE AT ALL TIMES TO CLEAN UP POTENTIAL SPILLS OF HAZARDOUS MATERIALS.
17. FURNISH AND INSTALL TRAFFIC CONTROL/SAFETY DEVICES TO ENSURE SAFE VEHICULAR TRAFFIC THROUGH THE WORK AREA OR FOR SAFELY IMPLEMENTING DETOURS AROUND THE WORK AREA.
18. SAWMILL BROOK IS RECOGNIZED AS A RAINBOW SMELT SPANNING AREA. NO INWATER WORK WILL BE PERMITTED DURING SPAWNING SEASON.

PROJECT INFORMATION:

1. NATURE OF CONSTRUCTION: EXCAVATION AND REPLACEMENT OF AN EXISTING RETAINING WALL, EXCAVATION AND REPAIR OF SECOND RETAINING WALL AND INSTALLATION OF ENGINEERED LOG TOE WOOD HABITAT STRUCTURES, FLOODPLAIN BENCHING, BIO-STABILIZATION, AND REVEGETATION.
2. LOCATION: 42°34'34.98"° N, 70°46'19.36° W
3. TOTAL AREA OF PROJECT: 1.3 ACRES, AREA TO BE DISTURBED: 0.34 ACRES
4. DESIGNER - TIGHE & BOND. POC: DAVID LORING, P.E. - CONTACT # 413.572.3296
5. SWPPP IMPLEMENTATION - CONTRACTOR WILL BE RESPONSIBLE FOR IMPLEMENTATION OF THE PROJECT'S ESCP. POC: ______, - CONTACT # ________.
6. RECEIVING WATERS - SAWMILL BROOK.
7. APPROXIMATE SEQUENCE OF EVENTS:
   1) INSTALL EROSION AND SEDIMENT CONTROLS BMP'S AND TEMPORARY CONSTRUCTION ACCESS POINTS.
   2) INSTALL COFFER DAMS, TURBIDITY CURTAIN FOR STAGE 1 WATER CONTROL (WEST BANK TOE WOOD) PERFORM GRADING AND INSTALL TOE WOOD AS SHOWN IN PLANS (STAGE 1), RETAIN EXISTING BANK AND PROTECT EXISTING VEGETATION. PROVIDE WATER CONTROL FOR CONSTRUCTION ACTIVITIES (STAGE 1 WATER CONTROL).
   3) INSTALL TEMPORARY ACCESS ROAD & LOG MATT, APEX JAM CONSTRUCTION.
   4) REMOVE EXISTING UPSTREAM BANK OF HABITAT CHANNEL.
   5) INSTALL COFFER DAMS AND TURBIDITY CURTAIN FOR STAGE 2 WATER CONTROL (EAST BANK RETAINING WALL).
   6) REMOVE AND REPLACE EXISTING RETAINING WALL, RETAINING WALL MUST BE CONSTRUCTED IN SEGMENTS, MAXIMUM 250 LINER FEET COFFERDAM & ISOLATION AT ONCE (STAGE 2)
   7) REMOVE COFFER DAM, TEMPORARY RIVER ACCESS POINTS AND IN-CHANNEL BMP'S STREAM.
   8) INSTALL EROSION CONTROL MATTING AND SEEDING.
   9) REMOVE ACCESS ROAD AND REVEGETATE.
   10) REMOVE STAGING AREAS AND OTHER TEMPORARY BMP'S.
   11) PLANTING IN CENTRAL POND TO BE CONDUCTED BY HAND LABOR AT LOW TIDE AFTER CONSTRUCTION.

CONSTRUCTION NOTES:
1. SEE SHEET C-501 AND TECHNICAL SPECIFICATIONS FOR A DETAILED DESCRIPTION OF CONTRACTOR REQUIREMENTS CONCERNING EROSION CONTROL (NPDES) AND CARE OF WATER (USACE 401).
2. WATER HANDLING PLAN IS SHOWN FOR PERMITTING AND COST ESTIMATING PURPOSES ONLY. CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING A CONTROL OF WATER PLAN TO MEET PERMITTING REQUIREMENTS AND CONSTRUCTION NEEDS. CONTRACTOR IS WHOLLY RESPONSIBLE FOR MONITORING RIVER LEVELS AND WEATHER FORECASTS AND MAKING ADJUSTMENTS TO THE PROJECT'S COFFER DAM SYSTEM OR DEMOBILIZING OUT OF THE RIVER IF FLOW CONDITIONS EXCEEDS OR IS PREDICTED TO EXCEED THE ISOLATION SYSTEM CAPACITY.

DESCRIPTION OF WORK:
1. EXCAVATION
2. INSTALLATION OF EROSION CONTROL ADJACENT TO SAWMILL BROOK.
3. REVEGETATION (LIVE STAKES AND SEEDING) OF NATIVE SPECIES WITHIN RIPARIAN AND UPLAND ZONES.

GENERAL REQUIREMENTS:
1. CONSTRUCTION STAKING
2. SITE PREPARATION - INSTALL CONSTRUCTION ENTRANCE AND EROSION & SEDIMENT CONTROL MEASURES
3. LOCATE AND CONSTRUCT CONSTRUCTION ACCESS ROUTES
4. PLACE COFFERDAMS, DEWATER PROJECT AREA
5. EARTHWORK AND CONSTRUCTION OF RETAINING WALLS AND LIVING SHORELINE
6. CHECK GRADES AND OBTAIN APPROVAL OF ALL HABITAT
7. REMOVE COFFERDAMS
8. RECLAIM CONSTRUCTION ACCESS AND STAGING AREAS

WORK SCHEDULE:
1. THE APPROVED IN-WATER WORK WINDOW FOR THIS PROJECT IS FROM MARCH 1 TO JUNE 20; ALL IN-WATER WORK SHALL BE COMPLETED DURING THIS PERIOD. WORK REQUIRING EQUIPMENT TO OPERATE PARTLY, OR WHOLLY, BELOW THE ORDINARY HIGH WATER LINE SHALL BE COMPLETED DURING THE IN-WATER WORK WINDOW.
2. THE CONTRACTOR MAY NOT LEAVE THE WORK SITE OR SUSPEND ACTIVITY FOR MORE THAN FIVE (5) CONSECUTIVE DAYS AFTER MOBILIZING TO THE SITE AND PRIOR TO REACHING SUBSTANTIAL COMPLETION UNLESS OTHERWISE APPROVED BY THE CONTRACTING OFFICER.

LOCATION:
1. ALL WORK IS ON THE SAWMILL BROOK AND ADJACENT FLOODPLAIN
2. ACCESS TO THE PROJECT SITE: SITE IMPROVEMENTS WILL BE REQUIRED TO CREATE ACCESS POINTS SUITABLE FOR MOBILIZATION OF CONSTRUCTION EQUIPMENT AND DELIVERY OF PROJECT MATERIALS.

CONTRACTORS USE OF PREMISES:
1. PRIOR TO PERFORMING WORK, THE CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH THE PROJECT SITE, PROJECT SITE CONDITIONS, AND ALL PORTIONS OF THE WORK.
2. CONTRACTOR MUST COORDINATE ALL WORK AND ACCESS TO THE SITE WITH THE CONTRACTING OFFICER. THE CONTRACTING OFFICER WILL BE RESPONSIBLE FOR COORDINATION WITH THE PROPERTY OWNER.
3. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING PUBLIC SAFETY IN AND AROUND THE PROJECT SITE, AND WILL PROVIDE ANY SAFETY PRECAUTIONS SUCH AS TEMPORARY FENCING OR OTHER METHODS AT THE CONTRACTOR'S DISCRETION WHERE DEEMED NECESSARY. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE OSHA STANDARDS, IN THE CONSTRUCTION PRACTICES FOR ALL EMPLOYEES DIRECTLY ENGAGED IN THE CONSTRUCTION OF THIS PROJECT.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE SECURITY OF PROPERTY AT THE PROJECT SITE AND WILL PROVIDE REASONABLE PROTECTION TO PREVENT DAMAGE OR LOSS TO EQUIPMENT, MATERIALS, AND SUPPLIES INCORPORATED IN THE PROJECT AND TO THE PROPERTY OWNER.
5. THE CONTRACTOR SHALL ONLY ACCESS THE PROJECT SITE AS SHOWN ON THE DRAWINGS.
6. CONTRACTOR SHALL ONLY USE DESIGNATED ACCESS ROUTES AND STREAM CROSSING LOCATIONS AS INDICATED ON THE DRAWINGS.
7. AREAS FOR CLEARING AND GRUBBING SHALL BE THE MINIMUM NECESSARY AND WITHIN THE LIMITS OF DISTURBANCE (GRADING LIMITS) SHOWN ON THE PLANS AND INCLUDING TEMPORARY CONSTRUCTION ACCESS ROUTES, STAGING AREAS, STOCKPILE AREAS, STORAGE AREAS, AND CONTRACTOR PARKING AREAS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE INCURRED TO ANY UTILITY LINES AT NO COST OR OBLIGATION TO THE SPONSOR OR THE PROPERTY OWNER.
9. MOVEMENT OF CONSTRUCTION EQUIPMENT OVER PIPES, BRIDGES, UTILITIES OR INFRASTRUCTURE DURING CONSTRUCTION SHALL BE AT THE CONTRACTOR'S RISK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE INCURRED TO INFRASTRUCTURE AT NO COST OR OBLIGATION TO THE SPONSOR OR THE PROPERTY OWNER.
10. CONTRACTOR IS EXPECTED TO KEEP A NEAT AND TIDY CONSTRUCTION SITE, FREE OF ACCUMULATED WASTE MATERIALS AND TRASH.
11. CONTRACTOR SHALL TAKE ALL MEASURES NECESSARY TO MINIMIZE DAMAGE TO EXISTING VEGETATION DURING CONSTRUCTION ACTIVITIES.
12. THE CONTRACTOR SHALL ONLY REMOVE TREES AND SHRUBS THAT ARE ABSOLUTELY NECESSARY FOR THE EXECUTION OF THE WORK AND SHALL MAKE ALL EFFORTS TO MINIMIZE TREE REMOVAL. IN THE EVENT THAT A TREE OR SHRUB OUTSIDE THE IMMEDIATE WORK AREAS MUST BE REMOVED OR DAMAGED, THE CONTRACTOR SHALL OBTAIN PRIOR APPROVAL FROM THE CONTRACTING OFFICER. ANY TREE OR SHRUB UNNECESSARILY REMOVED FROM THE WORK SITE SHALL BE REPLACED BY A NEW TREE OR SHRUB OF EQUAL OR GREATER VALUE AT THE SOLE EXPENSE OF THE CONTRACTOR AS APPROVED BY THE CONTRACTING OFFICER.
13. THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EQUIPMENT AND FACILITIES UPON COMPLETION OF WORK UNDER THIS CONTRACT.

EQUIPMENT:
1. CONTRACTOR IS REQUIRED TO PRESSURE WASH AND REMOVE ALL DIRT, GREASE, OIL, FUEL, VEGETATION AND WEED SEEDS BEFORE BRINGING EQUIPMENT AND CONSTRUCTION MATTING ON SITE TO LIMIT INTRODUCTION OF NOXIOUS WEEDS, AQUATIC INVASIVES AND POLLUTANTS TO THE SITE.
2. COMPLETE VEHICLE AND EQUIPMENT STAGING, CLEANING, MAINTENANCE, REFUELING, AND FUEL STORAGE IN THE DESIGNATED CONSTRUCTION STAGING AND MATERIAL STORAGE AREA A MINIMUM OF 150 FEET AWAY OR AS APPROVED BY CONTRACTING OFFICER FROM ANY NATURAL WATER BODY.
3. INSPECT ALL VEHICLES AND EQUIPMENT OPERATED WITHIN 150 FEET OF LIVE WATER DAILY FOR FLUID LEAKS BEFORE LEAVING THE CONSTRUCTION STAGING AND MATERIAL STORAGE AREA. REPAIR ANY LEAKS DETECTED IN THE CONSTRUCTION STAGING AND MATERIAL STORAGE AREA BEFORE RESUMING OPERATION. DOCUMENT INSPECTIONS IN A RECORD THAT IS AVAILABLE FOR REVIEW ON REQUEST BY THE CONTRACTING OFFICER AND REGULATORY AGENCIES.
4. USE OF EQUIPMENT IN FLOWING WATER IS LIMITED BY APPLICABLE PERMITS. EQUIPMENT MUST BE THOROUGHLY CLEANED BEFORE ENTERING THE WATER. CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH APPLICABLE REGULATIONS FOR IN-WATER EQUIPMENT USE.
5. ABSORBENT PADS TO SOAK UP LEAKS AND A FUEL SPILL RESPONSE KIT (INCLUDING RAG PADS AND BOOMS) OF APPROPRIATE SIZE FOR THE EQUIPMENT USED SHALL BE ON SITE AT ALL TIMES AND READILY AVAILABLE THROUGHOUT THE CONSTRUCTION PERIOD.

HOURS OF WORK:
1. THE NORMAL WORK HOURS SHALL BE 8:00 AM TO 4:00 PM, MONDAY THROUGH FRIDAY. NO WORK SHALL BE PERFORMED OUTSIDE THE NORMAL WORK HOURS, OR ON SATURDAYS, SUNDAYS, OR HOLIDAYS UNLESS AUTHORIZED BY THE CONTRACTING OFFICER. THE CONTRACTOR SHALL REQUEST WORK HOUR VARIATIONS IN WRITING VIA EMAIL AND OBTAIN WRITTEN APPROVAL FROM THE CONTRACTING OFFICER PRIOR TO WORKING OUTSIDE NORMAL WORK HOURS.

SPECIAL PROCEDURES:
IN-STREAM WORK
1. IN-STREAM WORK IS ALLOWED ONLY AS SPECIFIED IN THE PERMIT DOCUMENTS.
2. TURBIDITY CRITERIA SHALL BE STRICTLY ADHERED TO WHILE COMPLETING ALL INSTREAM WORK. COFFERDAMS, FLOW DIVERSION STRUCTURES AND BYPASS CHANNELS SHALL BE INSTALLED AT ALL LOCATIONS INDICATED ON THE DRAWINGS OR AT LOCATIONS SHOWN ON THE APPROVED "COFFERDAM AND FLOW DIVERSION PLAN." SOME ASPECTS OF THE PROJECT MAY NOT REQUIRE THE USE OF A COFFERDAM TO COMPLETE THE WORK.
3. DEWATERING WITHIN COFFERDAMS SHALL BE PERFORMED TO THE EXTENT NECESSARY TO CONSTRUCT THE PROJECT AS SHOWN ON THESE PLANS AS FOLLOWS: DEWATERING AT WOOD STRUCTURE LOCATIONS SHALL BE CONDUCTED SUCH THAT WATER IS NO DEEPER THAN THE DIAMETER OF THE LOG(S) ON THE LOWEST LAYER OF THE STRUCTURE, AND WITHIN CONSTRUCTION EXCAVATIONS SUCH THAT WATER IS SHALLOW ENOUGH TO ALLOW THE CONTRACTING OFFICER TO EASILY INSPECT FINISHED ELEVATIONS OF THE WORK. DISCHARGE FROM PUMPING SHALL BE ROUTED TO THE FLOODPLAIN AREAS SO AS TO ALLOW THE REMOVAL OF FINE SEDIMENTS PRIOR TO REENTERING SURFACE WATERS OR WETLANDS.

ABBREVIATIONS

BIT	BITUMINOUS
CONC	CONCRETE
CMP	CORRUGATED METAL PIPE
ELEV	ELEVATION
EOP	EDGE OF PAVEMENT
EOW	EDGE OF WATER
HMA	HOT MIXED ASPHALT
MHHW	MEAN HIGH HIGH WATER
MLW	MEAN LOW WATER
MLLW	MEAN LOW LOW WATER
R&D	REMOVE AND DISPOSE
R&S	REMOVE AND STACK
RET	RETAIN
SPK	SPIKE
TBM	TEMPORARY BENCHMARK
TYP	TYPICAL
UP	UTILITY POLE

LEGEND

Symbol	Description
992	INTERMEDIATE CONTOURS
990	INDEX CONTOURS
578	PROPOSED CONTOURS
OE	OVERHEAD WIRES
	EXISTING GUARD RAIL
	PROPOSED GUARD RAIL
	100-FOOT BUFFER ZONE
	200-FOOT RIVERFRONT AREA
	30-FOOT DISTURBANCE ZONE
	50-FOOT DISTURBANCE ZONE
	LAND SUBJECT TO COASTAL STORM FLOODING (LSCSF)
	VEGETATED WETLAND BOUNDARY (BVW)
	TOP OF BANK
	COASTAL BANK
	EDGE OF WATER
	EROSION CONTROL BARRIER
	PROPOSED COFFERDAM
	LIMIT OF WORK
	PROPERTY BOUNDARY
	REVETMENT/COBBLE BOTTOM
WF3B-4	WETLAND FLAG
UP	UTILITY POLE
	DECIDUOUS/CONIFER TREE
	BOLLARD
	BORING
	PIPING, STRUCTURES, etc. TO BE REMOVED

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CIVIL
No. 39818
REGISTERED
PROFESSIONAL ENGINEER

PERMIT SET

CENTRAL POND RESTORATION

Central Street to Knight Circle

Manchester -by-the-Sea, MA

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PROJECT NO:	22-1467
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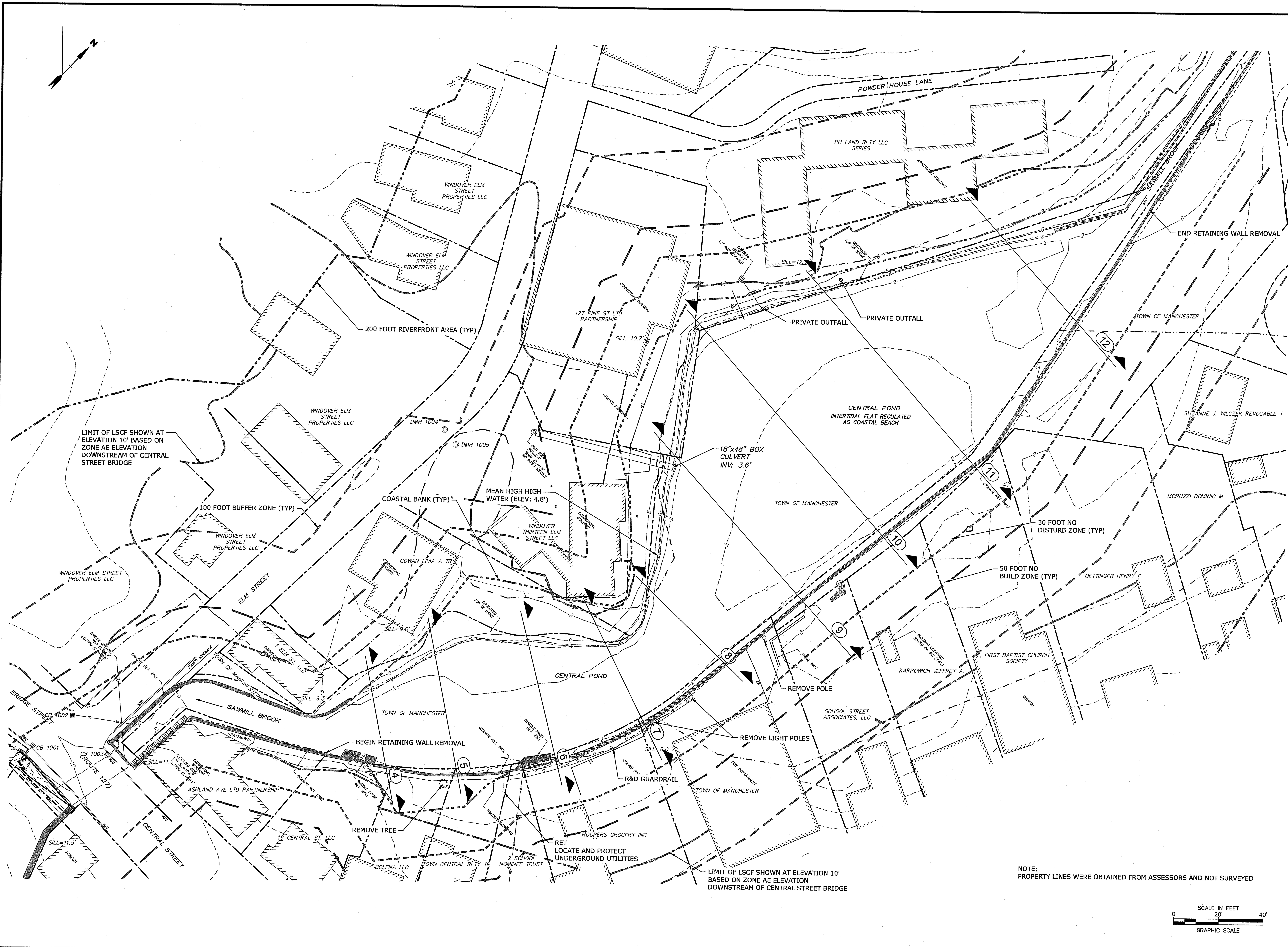
CHECKED:	DRB
APPROVED:	DLL

GENERAL NOTES, LEGEND & ABBREVIATIONS

SCALE: NO SCALE

G-001



POWDER HOUSE LANE
PH LAND RLTY LLC SERIES
APARTMENT BUILDING
WINDOVER ELM STREET PROPERTIES LLC
127 PINE ST LTD PARTNERSHIP
COMMERCIAL BUILDING
SILL=10.7'
SILL=12.3'
SAWMILL BROOK
END RETAINING WALL REMOVAL
PRIVATE OUTFALL
PRIVATE OUTFALL
TOWN OF MANCHESTER
200 FOOT RIVERFRONT AREA (TYP)
CENTRAL POND
INTERTIDAL FLAT REGULATED AS COASTAL BEACH
SUZANNE J. WILCZEK REVOCABLE T
DMH 1004
DMH 1005
LIMIT OF LSCF SHOWN AT ELEVATION 10' BASED ON ZONE AE ELEVATION DOWNSTREAM OF CENTRAL STREET BRIDGE
18"x48" BOX CULVERT INV: 3.6'
MEAN HIGH HIGH WATER (ELEV: 4.8')
COASTAL BANK (TYP)
100 FOOT BUFFER ZONE (TYP)
WINDOVER THIRTEEN ELM STREET LLC
COWAN LIVIA A TR
MORUZZI DOMINIC M
30 FOOT NO DISTURB ZONE (TYP)
50 FOOT NO BUILD ZONE (TYP)
OETTINGER HENRY F
ELM STREET
1 ELM ST. LLC
SILL=9.0'
SILL=9.3'
FIRST BAPTIST CHURCH SOCIETY
CHURCH
KARPOWICH JEFFREY A.
REMOVE POLE
BRIDGE STREET
CB 1002
CB 1001
CB 1003
SCHOOL STREET ASSOCIATES, LLC
REMOVE LIGHT POLES
BEGIN RETAINING WALL REMOVAL
SILL=8.0'
FIRE DEPARTMENT
(ROUTE 127)
SILL=11.5'
ASHLAND AVE LTD PARTNERSHIP
R&D GUARDRAIL
CENTRAL STREET
REMOVE TREE
19 CENTRAL ST. LLC
RET
LOCATE AND PROTECT UNDERGROUND UTILITIES
HOOPERS GROCERY INC
BOLENA LLC
TOWN CENTRAL RLTY TR
2 SCHOOL NOMINEE TRUST
LIMIT OF LSCF SHOWN AT ELEVATION 10' BASED ON ZONE AE ELEVATION DOWNSTREAM OF CENTRAL STREET BRIDGE
NOTE:
PROPERTY LINES WERE OBTAINED FROM ASSESSORS AND NOT SURVEYED
SCALE IN FEET
0 20' 40'
GRAPHIC SCALE
4
5
6
7
8
9
10
11
12

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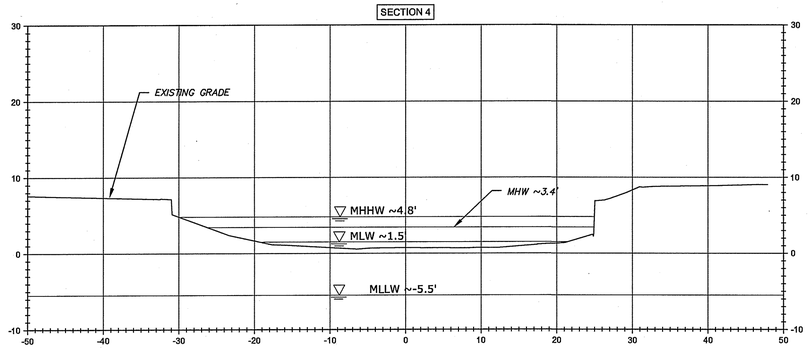
EXISTING CONDITIONS & DEMOLITION PLAN

SCALE: 1" = 20'

C-001

SECTION 4



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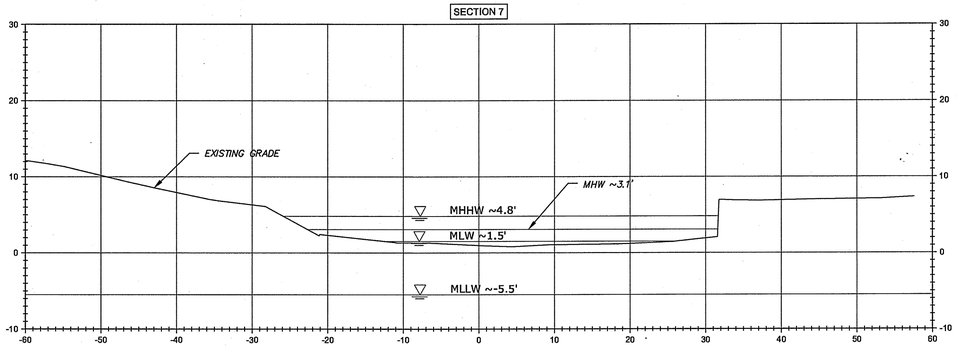
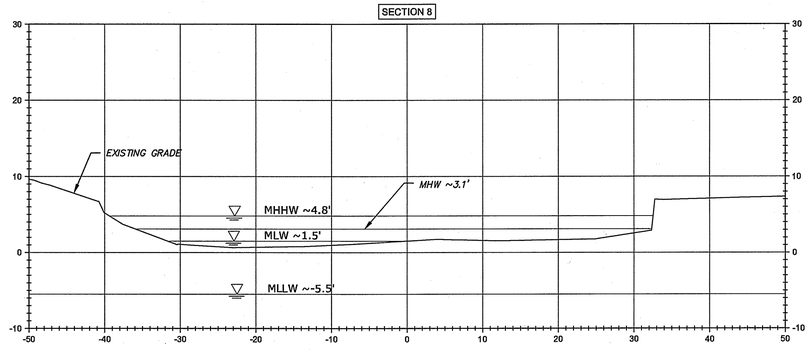


SECTION 5

SECTION 8



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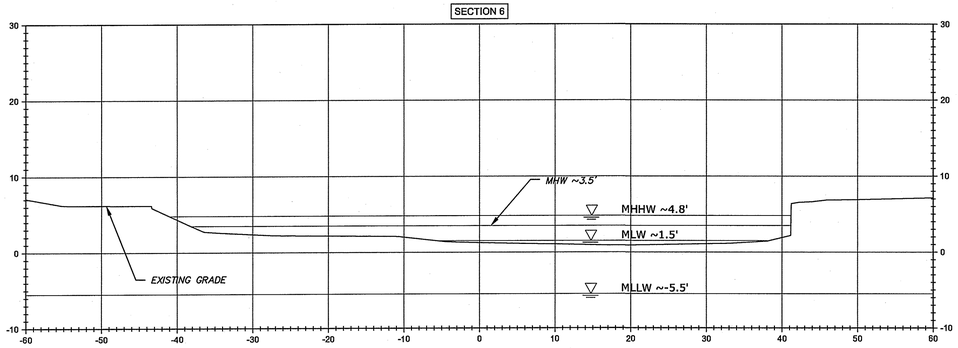

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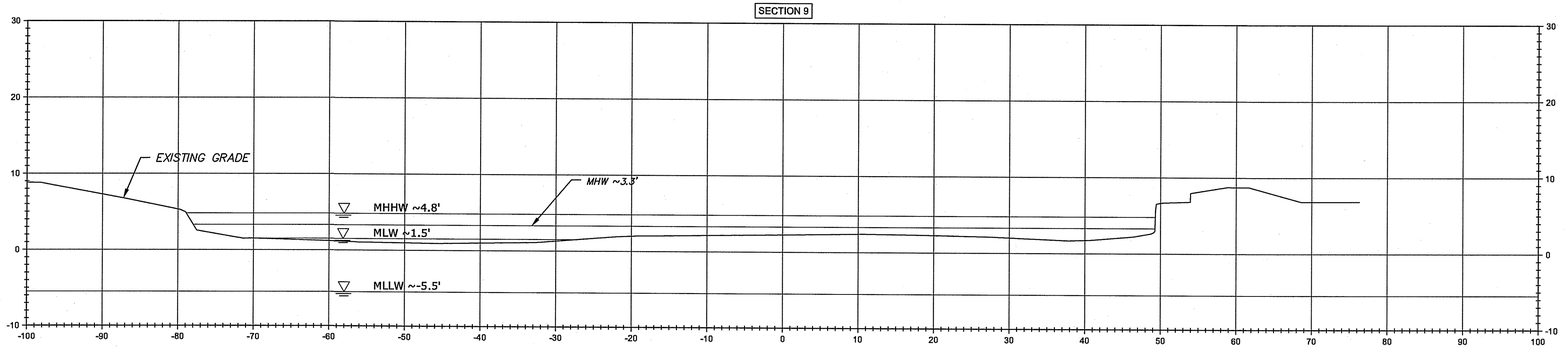
EXISTING CROSS SECTIONS

SCALE: HOR: 1"=10'; VER: 1"=10'

C-002

SECTION 9



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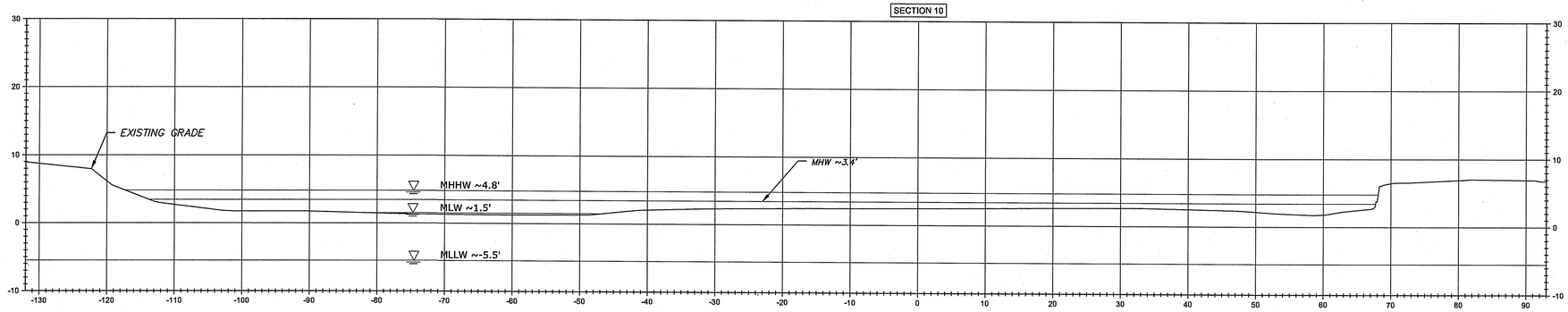

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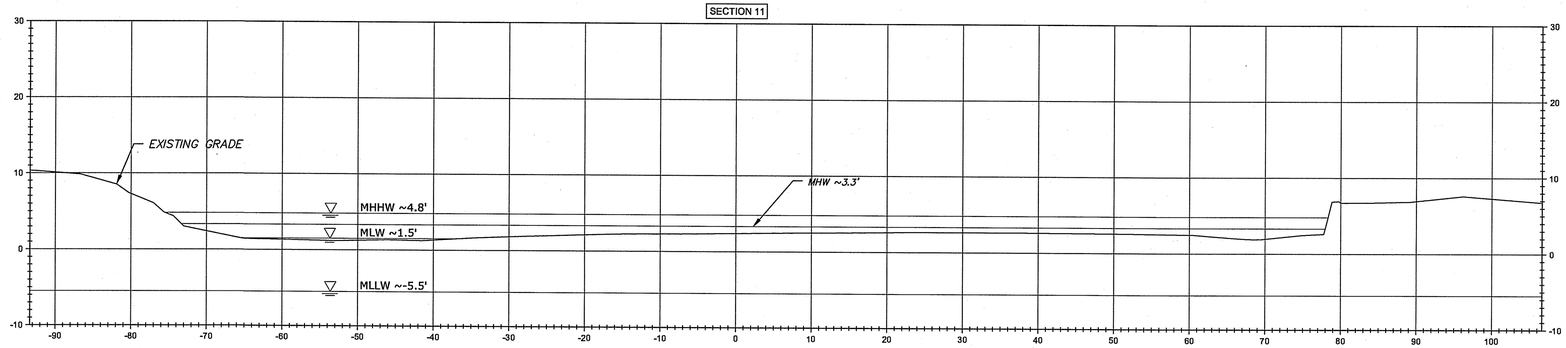

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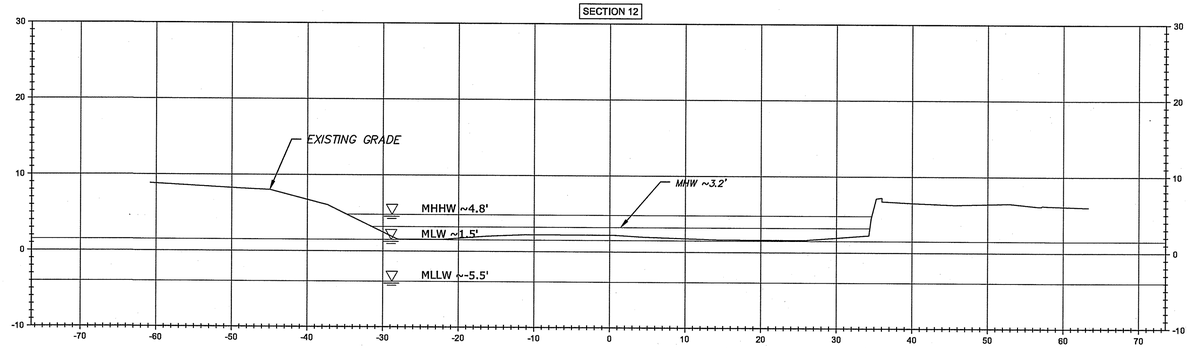

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EXISTING CROSS SECTIONS

SCALE: HOR: 1"=10'; VER: 1"=10'

C-003

LEGEND			
HATCH	**AREA (SF)**	**ZONE**	**PLANTS**
	7,720	Sc	SPARTINA ALTERNIFLORA SCHOENOPLECTUS PUNGENS
	590	FW	CLETHRA ALNIFOLIA IVA FRUTESCENS
	825	BR	SCHOENOPLECTUS PUNGENS
			PANICUM VIRGATUM
			SOLIDAGO SEMPERVIRENS
			BACCHARIS HALIMIFOLIA
			IVA FRUTESCENS
			HIBISCUS MOSHEUTOS
	9,330	Sa1	SPARTINA ALTERNIFLORA SPACED 2' O.C.
	27,400	Sa2	SPARTINA ALTERNIFLORA SPACED 3' O.C.

N

POWDER HOUSE LANE
SAWMILL BROOK
APARTMENT BUILDING
PROTECT PRIVATE OUTFALLS
END RETAIN WALL TIE INTO EXISTING WALL WITH A 5' CORNER
APEX JAM (TYP)
SAWMILL BROOK CHANNEL
STAGE 1 - INSTALL APEX JAM AND WALL REMOVAL FOR ACCESS TO STREAM. UTILIZE MATT DURING LOW TIDE FOR INSTALLATION OF STRUCTURES
200 FOOT RIVERFRONT AREA (TYP)
COMMERCIAL BUILDING
SILL=10.7'
ROOTWAD LOGS (TYP)
CONSTRUCTION ACCESS
DMH 1004
DMH 1005
12" CLAY INV.=2.0'
12" PVC PIPE TO EXTEND BEYOND RETAINING WALL
CENTRAL POND
18" X 48" BOX CULVERT INV.=3.6'
STAGE 2 - REMOVE AND REPLACE EXISTING RETAINING WALL. MAXIMUM OF 250 LF COFFERDAM ALLOWED FOR WALL REPLACEMENT
EROSION CONTROL BARRIER
LIMIT OF LSCF SHOWN AT ELEVATION 10' BASED ON ZONE AE ELEVATION DOWNSTREAM OF CENTRAL STREET BRIDGE
100 FOOT WETLAND BUFFER (TYP)
COASTAL BANK (TYP)
30 FOOT NO DISTURB ZONE (TYP)
50 FOOT NO BUILD ZONE (TYP)
SUPPLEMENT EXISTING WALL TOE PROTECTION WITH EMBEDDED BOULDERS 2'-3' DIA
ELM STREET
SPLIT RAIL FENCE
HISTORIC HIGH WATER (ELEV: 8.9')
SILL=9.0'
SILL=9.3'
TIMBER RAILING FENCE AT STAIRS
BRIDGE STREET
6" CIP INV.=5.0'
CB 1002
SAWMILL BROOK
INSTALL STAIR ACCESS WITH FREESTANDING BOND BEAM AT TOP OF WALL ALONG STAIR SECTION
CB 1001
DMH 1003
(ROUTE 127)
SILL=12" UNK. INV.=6.7'
PROP BOLLARD (TYP)
STAGE 1 - INSTALL APEX JAM AND WALL REMOVAL FOR ACCESS TO STREAM. UTILIZE MATT DURING LOW TIDE FOR INSTALLATION OF STRUCTURES
SILL=11.5'
CENTRAL STREET
BEGIN RETAIN WALL TIE INTO EXISTING WALL WITH A 5' CORNER
12" PVC PIPE TO EXTEND BEYOND RETAINING WALL
COFFERDAM OR TURBIDITY CURTAIN (TYP)
PROP GUARDRAIL (TYP)
SCHOOL STREET
LIMIT OF LSCF SHOWN AT ELEVATION 10' BASED ON ZONE AE ELEVATION DOWNSTREAM OF CENTRAL STREET BRIDGE
CONSTRUCTION ACCESS

NOTES:
1. SAWMILL BROOK IS RECOGNIZED AS A RAINBOW SMELT SPAWNING AREA. NO IN-WATER WORK WILL BE PERMITTED DURING SPAWNING SEASON.

SCALE IN FEET
0 30' 60'
GRAPHIC SCALE

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3/28/2020

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CENTRAL POND RESTORATION

Central Street to Knight Circle

Manchester
-by-the-Sea, MA

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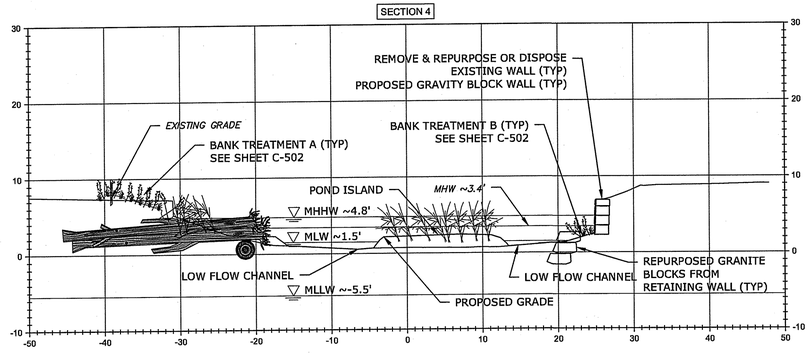
SITE PLAN

SCALE: 1" = 30'

C-101

SECTION 4



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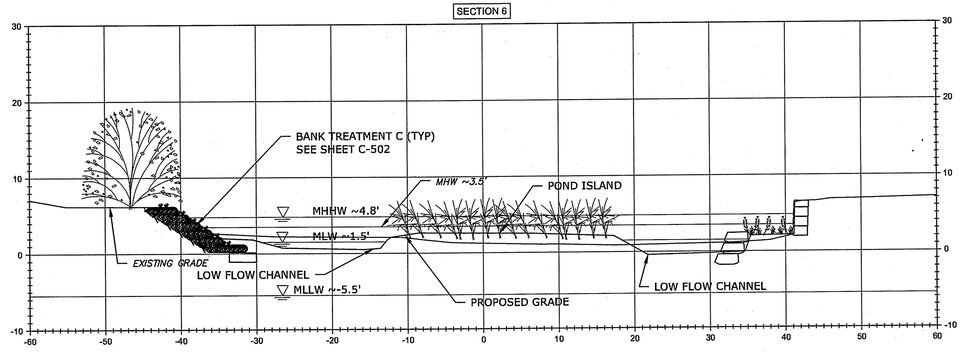

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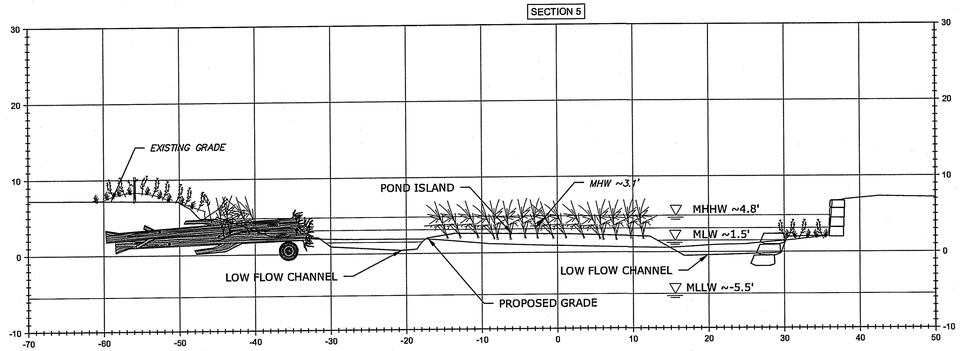

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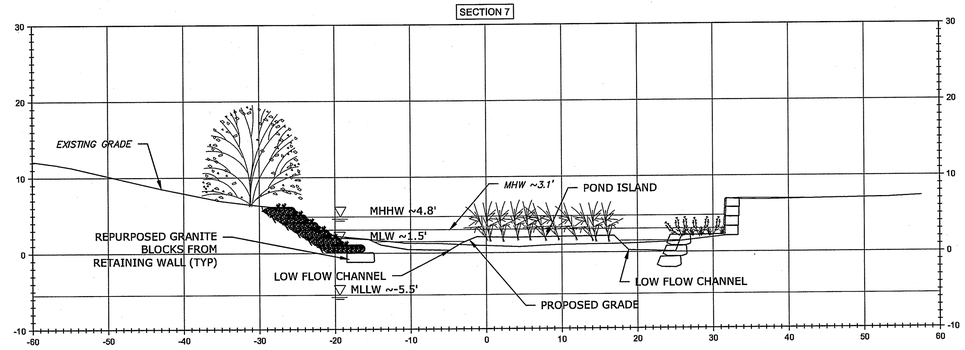

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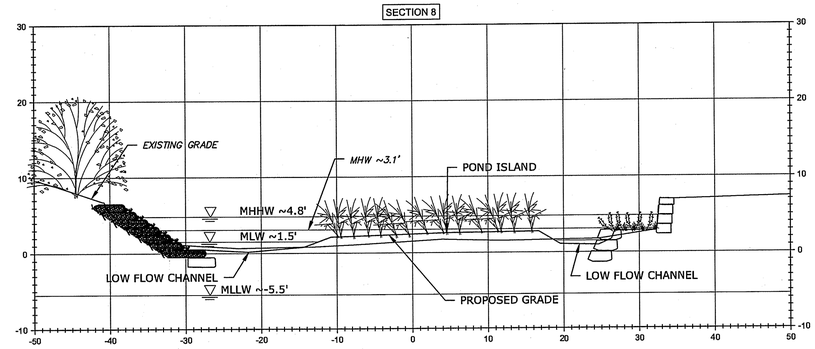

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PROPOSED CROSS SECTIONS

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C-102

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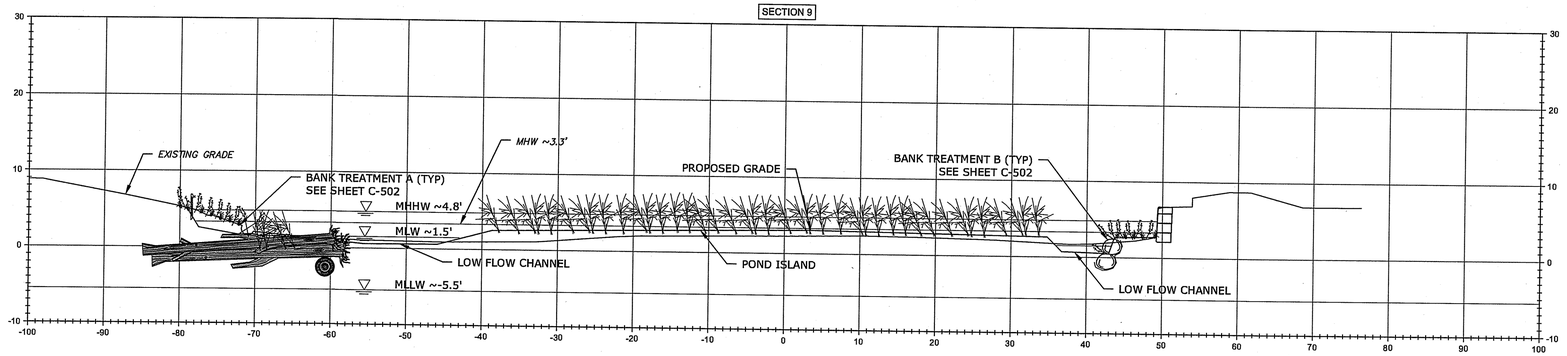
SECTION 9



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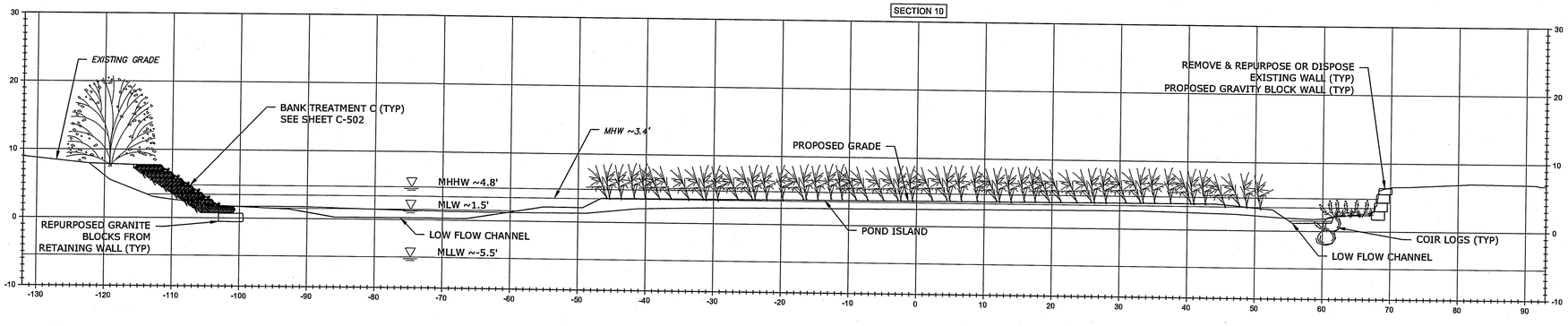

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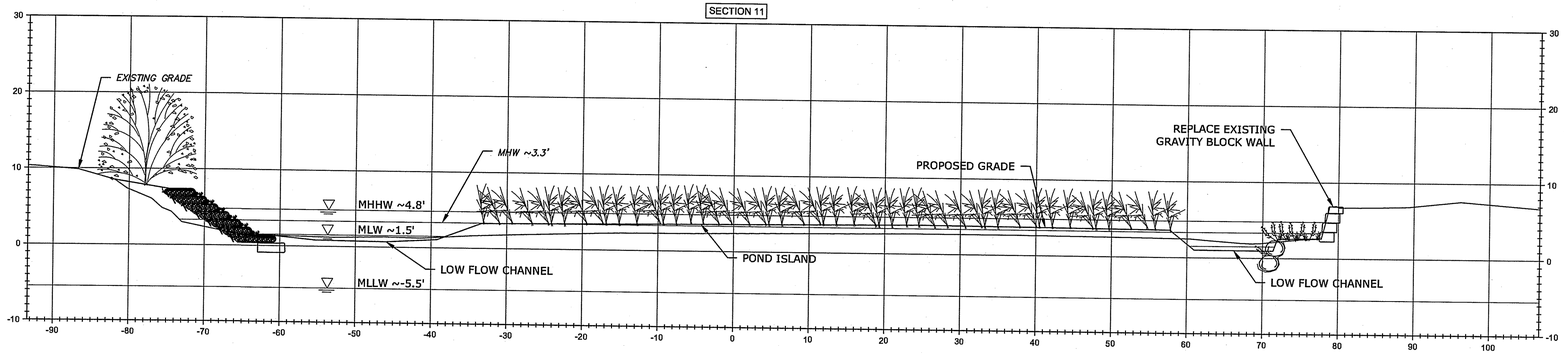

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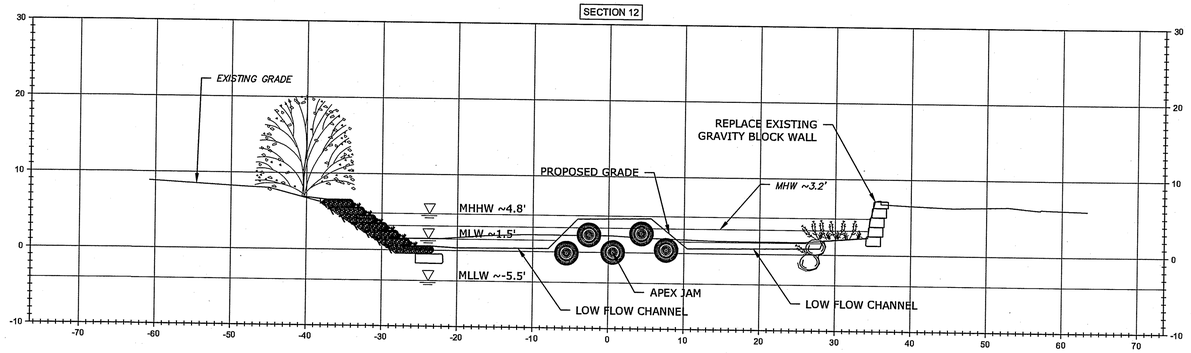

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BEST MANAGEMENT PRACTICES

INSPECTION AND MAINTENANCE

- SEDIMENT, EROSION CONTROLS, AND BEST MANAGEMENT PRACTICES (BMPS) SHALL BE INSTALLED PRIOR TO COMMENCING CONSTRUCTION AT THE SITE. NO WORK WHICH SHALL DISTURB THE SITE OR CREATE THE POTENTIAL FOR SEDIMENT RELEASE SHALL COMMENCE UNTIL THE SEDIMENT AND EROSION CONTROLS HAVE BEEN INSPECTED AND APPROVED BY THE OWNER, ENGINEER, AND REGULATORY AGENCIES. ALL CONTROLS AND BMPS SHALL BE SUBJECT TO INSPECTION BY THE OWNER, HIS REPRESENTATIVE, AND REGULATORY AGENCIES AT ANYTIME THEREAFTER.

- PERIODIC INSPECTION, MAINTENANCE, AND CLEANING OF TEMPORARY EROSION OF SEDIMENT CONTROL MEASURES AND BMPS SHALL BE REQUIRED. ALL CONTROLS AND BMPS SHALL BE INSPECTED EVERY 7 DAYS AND WITHIN 24 HOURS OF RAINFALL EVENTS OF 0.25 INCHES OR GREATER. ROUTINE INSPECTION AND MAINTENANCE WILL REDUCE THE CHANCE OF POLLUTING STORMWATER BY FINDING AND CORRECTING PROBLEMS BEFORE THE NEXT RAIN EVENT. THE FOCUS OF THE INSPECTION WILL BE TO DETERMINE:
  1. WHETHER OR NOT THE MEASURE WAS INSTALLED / PERFORMED CORRECTLY;
  2. WHETHER OR NOT THERE HAS BEEN ANY DAMAGE TO THE MEASURE SINCE IT WAS INSTALLED OR PERFORMED; AND
  3. WHAT SHOULD BE DONE TO CORRECT ANY PROBLEMS WITH THE MEASURE. EACH MEASURE IS TO BE OBSERVED TO DETERMINE IF IT IS STILL EFFECTIVE.

IN SOME CASES, SPECIFIC MEASUREMENTS MAY BE TAKEN TO DETERMINE IF MAINTENANCE OF THE MEASURES IS REQUIRED.

SITE MANAGER

- PRIOR TO CONSTRUCTION, A SITE MANAGER WILL BE DESIGNATED BY THE CONTRACTOR TO BE RESPONSIBLE FOR INSTALLATION, MONITORING, INSPECTION, AND CORRECTION OF EROSION AND SEDIMENT CONTROL MEASURES.

CONSTRUCTION SITE ENTRANCE

- TO REDUCE THE TRACKING OF SEDIMENT FROM THE CONSTRUCTION SITE ONTO OTHER AREAS OF THE PROPERTY AND/OR PUBLIC ROADS, AS WELL AS THE PRODUCTION OF AIRBORNE DUST, A STABILIZED CONSTRUCTION ENTRANCE IS TO BE ESTABLISHED AT ANY PERMANENT CONSTRUCTION STAGING AREA. THE ENTRANCE IS TO CONSIST OF A 6-INCH THICK PAD OF CRUSHED STONE UNDERLAIN WITH FILTER FABRIC OR A BITUMINOUS CONCRETE APRON. IT IS TO BE REMOVED AND THE AREA RESTORED FOLLOWING CONSTRUCTION.

SITE CLEARING

- DURING SITE CLEARING, EXISTING VEGETATION WITHIN THE OVERALL LIMITS OF CLEARING AND GRUBBING SHALL BE REMOVED, EXCEPT AS OTHERWISE DIRECTED. PRIOR TO ANY SITE CLEARING ACTIVITIES, SEDIMENT CONTROL BARRIERS SHALL BE PLACED ALONG THE OUTER LIMIT OF DISTURBANCE. CLEARING IS TO BE LIMITED TO THOSE AREAS OF PROPOSED WORK. DISTURBED AREAS ARE TO BE KEPT TO A MINIMUM. NO TREE WITH A BREAST HEIGHT DIAMETER OF GREATER THAN 6 INCHES SHALL BE CLEARED FROM AREAS OUTSIDE THE LIMITS OF CLEARING AND GRUBBING WITHOUT PRIOR APPROVAL FROM THE OWNER.

DUST CONTROL

- STANDARD DUST CONTROL MEASURES, INCLUDING SPRAYING AND MISTING SHALL BE USED AS NECESSARY. CALCIUM CHLORIDE SHALL NOT BE ALLOWED ON THIS PROJECT.

STAGING AREAS

- THE CONTRACTOR SHALL COORDINATE LAYDOWN STAGING AREAS FOR STORING EQUIPMENT AND MATERIALS WITH THE OWNER.
- STAGING AREAS SHALL BE SURROUNDED WITH COMPOST FILTER TUBE EROSION BARRIERS ON THE DOWNHILL SIDE.
- DURING AND AFTER CONSTRUCTION, ALL PAVED ROAD AND DRIVEWAY SURFACES ARE TO BE SCRAPED AND BROOMED FREE OF EXCAVATED MATERIALS ON A DAILY BASIS, UNLESS APPROVED BY THE OWNER.

STOCKPILED MATERIALS

- STOCKPILES OF SOIL CREATED DURING CONSTRUCTION ACTIVITIES ARE TO BE SURROUNDED WITH AN EROSION CONTROL BARRIER AROUND THE PERIMETER OF THE STOCKPILE. STOCKPILES OF ERODIBLE MATERIAL ARE TO BE COVERED PRIOR TO INCLEMENT WEATHER WITH A MINIMUM OF 20 MIL POLYETHYLENE SHEETING. STOCKPILES LEFT UNDISTURBED LONGER THAN 14 DAYS SHALL BE SEEDED OR COVERED.

EQUIPMENT FUELING

- EQUIPMENT FUELING AND OTHER ACTIVITIES INVOLVING PETROLEUM, OIL, OR OTHER POTENTIALLY HAZARDOUS SUBSTANCES ARE TO BE PERFORMED AT PRE-APPROVED, DESIGNATED AREAS WITH APPROPRIATE SPILL PREVENTION AND CONTROL MEASURES. PORTABLE SECONDARY CONTAINMENT IS TO BE USED, AND SORBENT MATERIALS ARE TO BE PLACED AROUND THE PERIMETER OF THE FUELING AREA.

CONSTRUCTION DEWATERING

- CONSTRUCTION DEWATERING SHALL BE REQUIRED DURING PORTIONS OF CONSTRUCTION WHICH REQUIRE EXCAVATION OR OTHER ACTIVITIES WHERE GROUNDWATER MAY INTERFERE WITH THE WORK.
- CONSTRUCTION DEWATERING DISCHARGES SHALL BE PRE-TREATED FOR SEDIMENT REMOVAL BY PASSING THROUGH AN APPROPRIATELY SIZED FILTER SOCK, SILT BAG, FRACTIONATION / SEDIMENTATION TANK, OR SEDIMENT TRAP PRIOR TO DISCHARGE, AS NECESSARY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING DEWATERING TECHNIQUES AND MAINTAINING DEWATERING PROCEDURES THROUGHOUT THE DURATION OF THE PROJECT.

OUTLET PROTECTION

- APPROPRIATE OUTLET PROTECTION, CONSISTING OF RIPRAP CHANNEL LINING, A LEVEL SPREADER, OR OTHER SUCH MEASURE SHALL BE PROVIDED AT THE OUTLET OF ANY DEWATERING CONDUIT OR STORMWATER CULVERT OR CHANNEL OUTFALL TO REDUCE VELOCITIES AND ENHANCE SEDIMENTATION PRIOR TO DISCHARGE.

LIMITS OF WORK

- THE CONTRACTOR SHALL LINE THE UPGRADIENT BOUNDARY OF WORK AREAS WITH ORANGE SAFETY FENCING BEFORE THE START OF SITE CLEARING ACTIVITIES EXCEPT WHERE CHAIN-LINK FENCING IS NEEDED TO RESTRICT PUBLIC ACCESS.

SURFACE WATER CONTROL

- THE CONTRACTOR MUST MAINTAIN THE SITE FLOWAGE OF SURFACE WATER THROUGH THE WORK AREA IN ACCORDANCE WITH THE SPECIFICATIONS. ALL COFFERDAMS SHALL CONSIST OF NON-ERODIBLE MATERIAL. THE CONTRACTOR SHALL SUBMIT A WATER CONTROL PLAN THAT WILL ADDRESS EMERGENCY MEASURES TO IMPLEMENT IN THE EVENT A STORM OCCURS DURING CONSTRUCTION.

TURBIDITY MONITORING AND CONTROL

- TURBIDITY SHALL BE MONITORED AND CONTROLLED BY THE CONTRACTOR. A TURBIDITY CURTAIN SHALL BE INSTALLED SURROUNDING AREAS OF EXCAVATION AT AND BELOW THE IMPOUNDMENT WATER LINE.
- IF TURBIDITY LEVELS ARE UNACCEPTABLE AS JUDGED BY THE OWNER, ENGINEER, OR REGULATORY AGENCY, ADDITIONAL MEASURES SHALL BE IMPLEMENTED AT NO EXPENSE TO THE OWNER.

TEMPORARY STABILIZATION

- WHEN NECESSARY, TEMPORARY SLOPE PROTECTION SHALL BE PROVIDED BY INSTALLING SEDIMENT TRAP BARRIERS AT THE TOE OF FILLS OR CUT SLOPES. IF ADDITIONAL STABILIZATION IS NEEDED, THEN THE CONTRACTOR SHALL INSTALL MULCH LOGS, MATTING, SUCH AS STRAW, JUTE, WOOD FIBER, OR BIODEGRADABLE MESH. A TACKIFIER SHALL BE USED ON LOOSE MATERIALS USED FOR TEMPORARY EROSION CONTROL.
- IN THE EVENT THAT DISTURBED AREAS AT THE SITE ARE TO BE LEFT UN-WORKED FOR MORE THAN TWO WEEKS, THE AREAS SHALL BE MULCHED WITH STRAW AT A RATE OF 100 LBS. PER 1,000 S.F. TO HELP CONTROL EROSION. 100% BIODEGRADABLE EROSION CONTROL BLANKETS OR TWO INCHES OF WOOD CHIP MULCH MAY ALSO BE USED AS TEMPORARY COVER.
- IN THE EVENT THAT DISTURBED AREAS AT THE SITE ARE TO BE LEFT UN-WORKED FOR MORE THAN ONE MONTH, THE AREAS SHALL BE TOPSOILED AND SEEDED AS PER THE SPECIFICATIONS AND AT NO ADDITIONAL COST TO THE OWNER.
- LEAVE THE SURFACE OF ALL EXCAVATIONS AND FILLS IN A FIRM AND STABLE CONDITION AT THE END OF EACH DAY. ROLL OR OTHERWISE TREAT THE SURFACE AS NEEDED.

SITE RESTORATION

- STABILIZATION OF DISTURBED AREAS OR NEW SOIL FILLS SHALL BE IMPLEMENTED WITHIN 14 DAYS AFTER GRADING OR CONSTRUCTION ACTIVITIES HAVE PERMANENTLY CEASED. APPROPRIATE VEGETATIVE SOIL STABILIZATION IS TO BE USED TO MINIMIZE EROSION. TEMPORARY AND PERMANENT VEGETATIVE COVER IS TO BE ESTABLISHED IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORATION OF PREVIOUSLY VEGETATED UPLAND AREAS DISTURBED BY CONSTRUCTION ACTIVITIES. RESTORATION OF UPLAND AREAS CONSIST OF REPLACEMENT OF TOPSOIL OR PLACEMENT OF IMPORTED LOAM AS NEEDED SUCH THAT A MINIMUM OF 4 INCHES OF SUITABLE MATERIAL IS PRESENT AND APPROPRIATELY LIMED, FERTILIZED, GRADED, AND SCARIFIED. FIELDS DISTURBED OR COMPACTED BY CONSTRUCTION ACTIVITIES SHALL BE PLOWED TO LOOSEN THE SOIL, HARROWED TO PROVIDE AN EVEN SURFACE, AND APPROPRIATELY PREPARED FOR PLANTING.
- DISTURBED UPLAND AREAS SHALL THEN BE HYDROSEEDED WITH AN APPROVED SEED MIX AT THE RATE RECOMMENDED BY THE MANUFACTURER. SEEDING RATE SHALL BE DOUBLED FOR DORMANT SEEDING. SEED MIX SHALL BE DRY SITE RESTORATION SEED MIX UNLESS OTHERWISE NOTED OR AS APPROVED BY THE ENGINEER.
- 100% BIODEGRADABLE EROSION CONTROL BLANKETS MUST BE USED FOR STABILIZATION OF SLOPES IN EXCESS OF 3H:1V AND MAY BE USED IN LIEU OF HYDROSEEDING AT THE CONTRACTOR'S DISCRETION TO PROVIDE ADDITIONAL EROSION PROTECTION.
- FINAL STABILIZATION SHALL BE CONSIDERED COMPLETE WHEN ALL SOIL-DISTURBING ACTIVITIES HAVE BEEN COMPLETED AND A UNIFORM, PERENNIAL VEGETATIVE COVER WITH A DENSITY OF EIGHTY PERCENT HAS BEEN ESTABLISHED OR EQUIVALENT STABILIZATION MEASURES (SUCH AS THE USE OF MULCHES OR EROSION CONTROL MATTING) HAVE BEEN EMPLOYED ON ALL UNPAVED AREAS AND AREAS NOT COVERED BY PERMANENT STRUCTURES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF ALL VEGETATED SURFACES, INCLUDING WATERING, FERTILIZING, REPAIRING EROSION, INVASIVE PLANT REMOVAL, AND RE-SEEDING UNTIL ESTABLISHMENT CONDITIONS ARE MET AND UNTIL THE END OF THE CONTRACTUAL MAINTENANCE PERIOD.

EROSION CONTROL NOTES:

1. CONTRACTOR MUST FINALIZE AND IMPLEMENT THE EROSION AND SEDIMENT CONTROL PLAN (ESCP).
2. THE ESCP SHALL BE UPDATED AS CONSTRUCTION PROGRESSES. IT SHOULD REFLECT CURRENT OWNERSHIP, RESPONSIBILITIES, OPERATIONS AND FINDINGS. THE PLAN SHALL BE REVISED NO LATER THAN 7 DAYS AFTER THE INSPECTION. IF HAZARDOUS CONDITIONS OCCUR THE PLAN NEEDS TO BE MODIFIED BEFORE PROCEEDING WITH WORK. STEPS TO PREVENT THE REOCCURRENCE OF SUCH RELEASES WILL BE IDENTIFIED IN A PLAN REVISION AND IMPLEMENTED.
3. MAINTAIN AN ADDITIONAL SUPPLY OF EROSION CONTROL MEASURES THROUGHOUT THE CONSTRUCTION PERIOD.
4. MAINTAIN ALL EROSION CONTROL MEASURES IN GOOD WORKING CONDITION. THIS MAY REQUIRE CLEANING, REPAIRING, REPLACEMENT, AND SEDIMENT DISPOSAL. MAINTENANCE SHALL BE INITIATED WITHIN 24 HOURS OF IDENTIFICATION. SEDIMENT BARRIERS SHOULD HAVE SEDIMENT CLEANED OUT WHEN THE BARRIER IS 50% OF CAPACITY. SOIL AND DEBRIS ON ADJOINING PROPERTIES OR STREETS SHALL BE MINIMIZED. HAZARDOUS MATERIAL SPILLS SHOULD BE REMOVED IMMEDIATELY AND REMEDIAL ACTIONS FOR PREVENTION MUST BE TAKEN. HAZARDOUS MATERIALS SHALL BE CLEANED UP BY REMOVING AND DISPOSING OF CONTAMINATED MATERIALS PROPERLY.
5. SILT TRAPPED AT BARRIERS SHALL BE REMOVED AND DISPOSED OF IN UPLAND AREAS OUTSIDE BUFFER ZONES. MATERIALS DEPOSITED IN ANY TEMPORARY SETTLING BASIN SHALL BE REMOVED AT THE COMPLETION OF THE PROJECT. ALL DISTURBED AREAS SHALL BE RESTORED.
6. THE ESCP MEASURES SHOWN ON THIS PLAN ARE THE BASE REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, UPGRADE THESE MEASURES AS NEEDED TO COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL EROSION AND SEDIMENT CONTROL REGULATIONS.
7. EROSION AND SEDIMENT CONTROL MEASURES INCLUDING PERIMETER SEDIMENT CONTROL MUST BE IN PLACE BEFORE VEGETATION IS DISTURBED AND MUST REMAIN IN PLACE AND BE MAINTAINED, CLEANED, REPAIRED OR REPLACED, AND PROMPTLY IMPLEMENTED FOLLOWING PROCEDURES ESTABLISHED FOR THE DURATION OF CONSTRUCTION, INCLUDING PROTECTION FOR ACTIVE STORM DRAIN INLETS AND CATCH BASINS AND APPROPRIATE NON-STORMWATER POLLUTION CONTROLS.
8. PHASE CLEARING AND GRADING TO THE MAXIMUM EXTENT PRACTICAL TO PREVENT EXPOSED INACTIVE AREAS FROM BECOMING A SOURCE OF EROSION. CONSTRUCTION ACTIVITIES MUST AVOID OR MINIMIZE UNSTABILIZED EXCAVATION AND CREATION OF BARE GROUND DURING WET WEATHER.
9. PROTECT NEW WORK FROM FLOODING. PROPERLY SLOPE GRADING IN THE AREAS SURROUNDING ALL EXCAVATIONS TO PREVENT WATER FROM RUNNING INTO THE EXCAVATED AREA OR TO ADJACENT PROPERTIES. UPON COMPLETION OF THE WORK, RESTORE ALL AREAS IN A SATISFACTORY MANNER.
10. IDENTIFY, MARK, AND PROTECT (BY FENCING OFF OR OTHER MEANS) CRITICAL RIPARIAN AREAS AND VEGETATION INCLUDING ALL TREES AND ASSOCIATED ROOTING ZONES, AND VEGETATION AREAS NOT SPECIFICALLY IDENTIFIED FOR REMOVAL. MARK IN THE FIELD VEGETATIVE BUFFER ZONES BETWEEN THE SITE AND SENSITIVE AREAS (E.G., WETLANDS), AND OTHER AREAS TO BE PRESERVED, ESPECIALLY IN PERIMETER AREAS.
11. THE INTENTIONAL WASHING OF SEDIMENT INTO SAWMILL BROOK MUST NOT OCCUR. VACUUMING OR DRY SWEEPING AND MATERIAL PICKUP MUST BE USED TO CLEANUP SEDIMENTS.
12. STABILIZE THE AREAS OF CONSTRUCTION ACTIVITIES AT THE CLOSE OF EACH CONSTRUCTION DAY. CHECK EROSION CONTROLS AT THIS TIME AND MAINTAIN OR REINFORCE IF NECESSARY.
13. APPLY TEMPORARY AND/OR PERMANENT SOIL STABILIZATION MEASURES ON ALL DISTURBED AREAS AS GRADING PROGRESSES AND FOR ALL ROADWAYS INCLUDING GRAVEL ROADWAYS.
14. ESTABLISH CONCRETE TRUCK AND OTHER CONCRETE EQUIPMENT CONTAINED WASHOUT AREAS BEFORE BEGINNING CONCRETE WORK. CONCRETE WASHOUT MUST BE CONTAINED AWAY FROM DRAINAGE AREAS. IT MUST BE CLEARLY MARKED AND ACCESSIBLE.
15. ESTABLISH MATERIAL AND WASTE STORAGE AREAS, AND OTHER NON-STORMWATER CONTROLS. DISPOSAL OF MATERIALS AND WASTE SHALL COMPLY WITH STATE AND LOCAL WASTE DISPOSAL. SANITARY WASTE AND OTHER HAZARDOUS WASTE SHALL BE DISPOSED OF IN COMPLIANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.
16. DEWATER AS NECESSARY TO KEEP CONSTRUCTION AREAS FREE OF WATER, DISCHARGE WATER FROM DEWATERING TO THE APPROPRIATE LOCATION AND WITHOUT SEDIMENT.
17. ALL SILT-LADEN WATER MUST BE SETTLED OR FILTERED TO REMOVE ALL SEDIMENTS IN A SEDIMENTATION BASIN OR FILTER BAG LOCATED DOWNSTREAM, PRIOR TO RELEASE TO A WATERWAY OR EXISTING DRAINAGE SYSTEM.
18. PREVENT TRACKING OF SEDIMENT OUTSIDE OF PROJECT LIMITS USING BMPS SUCH AS: GRAVELED (OR PAVED) EXITS AND PARKING AREAS, GRAVEL ALL UNPAVED ROADS LOCATED ONSITE, OR USE AN EXIT TIRE WASH. THESE BMPS MUST BE IN PLACE PRIOR TO LAND-DISTURBING ACTIVITIES. AT THE END OF EACH WORK DAY, ANY SEDIMENTS TRACKED ONTO PUBLIC RIGHT-OF-WAYS BEYOND THE PROJECT LIMITS SHALL BE SWEPT AWAY.
19. WHEN TRUCKING SATURATED SOILS FROM THE SITE, EITHER USE WATER-TIGHT TRUCKS OR DEWATER LOADS ON SITE.
20. BMP'S SHOULD BE IMPLEMENTED AND MONITORED THROUGHOUT THE PROJECT. USE BMPS TO PREVENT OR MINIMIZE STORMWATER EXPOSURE TO POLLUTANTS FROM SPILLS; VEHICLE AND EQUIPMENT FUELING, MAINTENANCE, AND STORAGE; OTHER CLEANING AND MAINTENANCE ACTIVITIES; AND WASTE HANDLING ACTIVITIES. THESE POLLUTANTS INCLUDE FUEL, HYDRAULIC FLUID, AND OTHER OILS FROM VEHICLES AND MACHINERY, AS WELL AS DEBRIS, LEFTOVER PAINTS, SOLVENTS, AND GLUES FROM CONSTRUCTION OPERATIONS.
21. WRITTEN SPILL PREVENTION AND RESPONSE PROCEDURES, EMPLOYEE TRAINING ON SPILL PREVENTION AND PROPER DISPOSAL PROCEDURES, SPILL KITS IN ALL VEHICLES, REGULAR MAINTENANCE SCHEDULE FOR VEHICLES AND MACHINERY, MATERIAL DELIVERY AND STORAGE CONTROLS, TRAINING AND SIGNAGE, AND COVERED STORAGE AREAS FOR WASTE AND SUPPLIES. HAZARDOUS MATERIALS SHOULD BE STORED AWAY FROM THE STREAM TO ELIMINATE CHANCES FOR ACCIDENTAL SPILL SHALL BE IMPLEMENTED.
22. IF A TREATMENT (FOR EXAMPLE, ELECTRO-COAGULATION, FLOCCULATION, FILTRATION, ETC.) FOR SEDIMENT OR OTHER POLLUTANT REMOVAL IS EMPLOYED, SUBMIT AN OPERATION AND MAINTENANCE PLAN (INCLUDING SYSTEM SCHEMATIC, LOCATION OF SYSTEM, LOCATION OF INLET, LOCATION OF DISCHARGE, DISCHARGE DISPERSION DEVICE DESIGN, AND A SAMPLING PLAN AND FREQUENCY) BEFORE OPERATING THE TREATMENT SYSTEM. OBTAIN ENGINEER'S PLAN REVIEW BEFORE OPERATING THE TREATMENT SYSTEM. OPERATE AND MAINTAIN THE TREATMENT SYSTEM ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
23. TEMPORARILY STABILIZE SOILS AT THE END OF THE SHIFT BEFORE HOLIDAYS AND WEEKENDS. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT SOILS ARE STABLE DURING EVENTS AT ANY TIME.
24. STABILIZING PRACTICES : SEEDING WITH MULCH AND ROLLED EROSION CONTROL MATTING. ANY AREAS NOT SUBJECT TO CONSTRUCTION ACTIVITY FOR 14 DAYS MUST BE STABILIZED IMMEDIATELY. PRESERVE EXISTING VEGETATION IN AREAS NOT DISTURBED DURING CONSTRUCTION. ANY ON SITE STOCK PILES SHALL BE STABILIZED WITHIN 14 DAYS AFTER CONSTRUCTION ACTIVITY HAS CEASED WITH SEDIMENT BARRIERS INSTALLED.
25. FINAL STABILIZATION: MEANS THAT ALL SOIL DISTURBING ACTIVITIES AT THE SITE HAVE BEEN COMPLETED AND THAT A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF 70% FOR THE AREA HAS BEEN ESTABLISHED OR EQUIVALENT STABILIZATION MEASURES HAVE BEEN EMPLOYED.

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COMMONWEALTH OF MASSACHUSETTS
DAVID L LORING
CIVIL
No. 38516
REGISTERED PROFESSIONAL ENGINEER
3/27/2020

PERMIT SET

CENTRAL POND RESTORATION

Central Street to Knight Circle

Manchester
-by-the-Sea, MA

VERIFY SCALE
BAR IS 1 INCH ON ORIGINAL DRAWING
0 1 INCH
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

MARK	DATE	DESCRIPTION

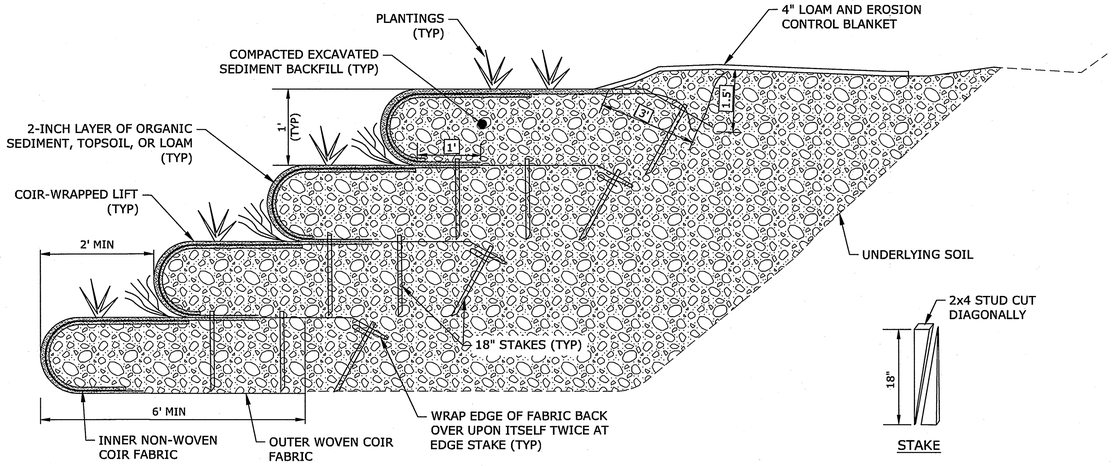
PROJECT NO:	22-1467
DATE:	2018/01
FILE:	M1476-012-C-500_Details.dwg
DRAWN BY:	DWB
CHECKED:	DRB
APPROVED:	DLL

CONTROL OF WATER NOTES

SCALE: AS NOTED

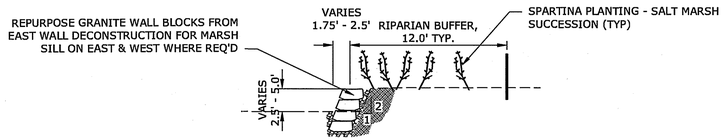
C-501

Last Saved: 3/26/2020
Plotted On:Mar 26, 2020-3:12pm By: DWBradshaw
Tighe & Bond, Inc. J:\VM\M1476 Manchester MA Hydro Study\01-Sawmill_Central Pond\Permit\Task 4- Final Design\AutoCad\Sheet\M1476-012-C-500_Details.dwg

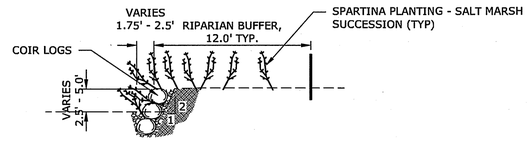


NOTES:
1. INSTALL ENCAPSULATED SOIL LIFTS FROM DOWNSTREAM TO UPSTREAM, WITH UPSTREAM COIR FABRIC OVERLAPPING DOWNSTREAM FABRIC BY 18" MINIMUM.
2. USE SANDBAGS, TIMBER FORM, OR OTHER AS NECESSARY TO FORM FACE OF LIFT AND KEEP LOWER LIFTS SUFFICIENTLY DRY FOR INSTALLATION AND COMPACTION.
3. PROTECT FROM DAMAGE WHEN CONSTRUCTED BELOW TEMPORARY ACCESS ROAD OR NEAR OTHER WORK.

BANK TREATMENT C
ENCAPSULATED SOIL LIFT
NO SCALE

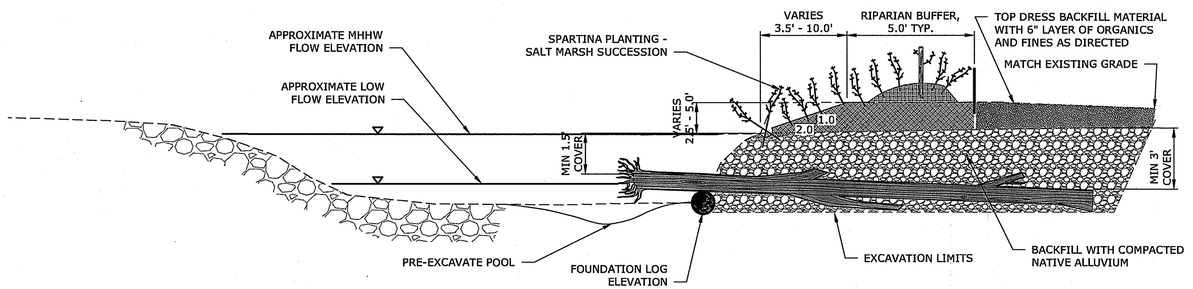


REPURPOSED GRANITE BLOCK TREATMENT



COIR LOG TREATMENT

BANK TREATMENT B
NO SCALE



BANK TREATMENT A
ROOTWAD DETAIL
NO SCALE

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COMMONWEALTH OF MASSACHUSETTS
DAVID L LORING
CIVIL
No. 33818
REGISTERED PROFESSIONAL ENGINEER

PERMIT SET

CENTRAL POND RESTORATION

Central Street to Knight Circle

Manchester -by-the-Sea, MA

VERIFY SCALE
BAR IS 1 INCH ON ORIGINAL DRAWING
0 — 1 INCH
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

MARK	DATE	DESCRIPTION

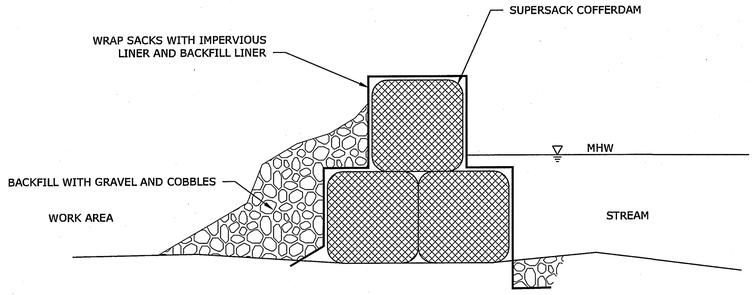
PROJECT NO:	22-1467
DATE:	2018/01
FILE:	M1476-012-C-500_Details.dwg
DRAWN BY:	DWB
CHECKED:	DRB
APPROVED:	DLL

TYPICAL BANK DETAILS

SCALE: AS NOTED

C-502

Last Saved: 3/28/2020
Plotted On:Mar 28, 2020-3:12pm By: DWBradshaw
Tighe & Bond, Inc. J:\VM\M1476 Manchester MA Hydro Study\014-Sawmill_Central Pond\Permit\Task 4- Final Design\AutoCad\Sheet\M1476-012-C-500_Details.dwg

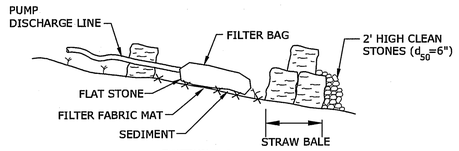


COFFERDAMS NOTES:
1. WRAP "SUPER SACKS" WITH IMPERVIOUS PLASTIC LINER TO PREVENT SEEPAGE.
2. BACKFILL THE ISOLATED SIDE OF THE COFFERDAM WITH NATIVE ALLUVIUM.
3. USE "SUPER SACKS" AS A BUTRESS AS REQUIRED.

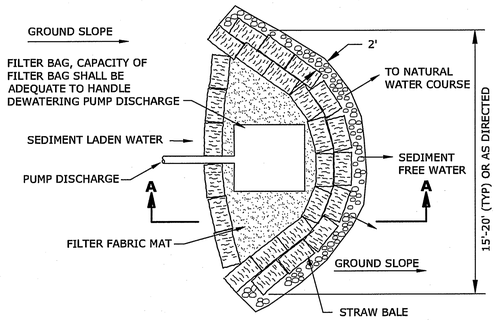
COFFERDAM SECTION
NO SCALE

COFFERDAMS, PUMPING, DEWATERING, AND STREAM BYPASS NOTES:

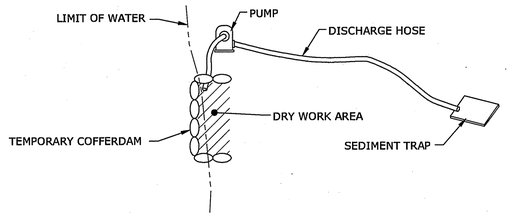
1. THE DETAILS SHOWN ON THIS SHEET ARE AN EXAMPLE OF ACCEPTABLE METHODS TO USE DURING CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING AND SUBMITTING A COFFERDAM PLAN, PUMPING AND DEWATERING PLAN FOR REVIEW AND APPROVAL BY THE CONTRACTING AGENCY OR ENGINEER. THE PLAN SHALL INCLUDE SUFFICIENT DETAIL OF MEANS AND METHODS TO SATISFY THE PROJECT SPECIFICATIONS AND PERMIT REQUIREMENTS. IF APPROVED, OTHER METHODS MAY BE USED SUCH AS UTILIZING INFLATABLE BLADDERS, PLATES, OR BARRIERS OF VARIOUS MATERIALS. COFFERDAMS SHALL INCLUDE PLASTIC LINER OR FINE MESH SILT FENCE TO REDUCE TURBIDITY AND FINES FROM ENTERING THE FREE FLOWING PORTION OF LIVE WATER.
2. THE CONTRACTING AGENCY IS RESPONSIBLE FOR MEASURING TURBIDITY HOWEVER THE CONTRACTOR SHALL ADHERE TO THE SPECIAL PROCEDURES REGARDING IN-STREAM WORK, TURBIDITY, AND DEWATERING IN THE DESIGN DRAWINGS.
3. CONSERVATION MEASURES ARE SUMMARIZED IN THE PLANS AND SHALL BE STRICTLY ADHERED TO.
4. THE CONTRACTOR SHALL NOTIFY THE OWNER AND CONTRACTING OFFICER AT LEAST 5 DAYS BEFORE EACH COFFERDAM INSTALLATION DATE. ANTICIPATED COFFERDAM LOCATIONS ARE SHOWN IN THE PLANS.
5. FILL MATERIAL FOR BULK BAGS FOR "SUPER SACKS", IF USED, SHALL BE CLEAN, WASHED, AND ROUNDED MATERIAL MEETING STANDARD SPECIFICATIONS FOR DRAIN ROCK, STREAMBED AGGREGATES, STREAMBED SEDIMENTS, OR STREAMBED COBBLES. MATERIAL USED TO FILL BULK BAGS SHALL BE DISPOSED OF IN ACCORDANCE WITH THE PERMITS. IF PERMITS ALLOW, MATERIAL MAY BE DISPOSED OF IN UPLAND AREAS AS DIRECTED BY THE CONTRACTING OFFICER.
6. DEWATERING PUMP DISCHARGE FROM WITHIN COFFERDAM WORK AREAS SHALL BE RELEASED INTO SEDIMENT TRAPS AWAY FROM WETLANDS AND CONSTRUCTION ACTIVITIES. DISCHARGE SHALL BE COMPLETELY INFILTRATED PRIOR TO REACHING WETLANDS OR SURFACE WATERS UNLESS APPROVED BY THE CONTRACTING OFFICER. ALL RETURN FLOWS MUST MEET PERMIT REQUIREMENTS FOR TURBIDITY.
7. EXCAVATIONS ASSOCIATED WITH CHANNEL, FLOODPLAIN, AND WOOD HABITAT STRUCTURES SHALL BE DEWATERED.
8. WATER SHALL BE PUMPED AND DISCHARGED AWAY FROM THE WORK AREAS TO SEDIMENT TRAPS.
9. DEWATERING PUMP DISCHARGE FROM WITHIN COFFERDAM WORK AREAS SHALL BE RELEASED INTO SEDIMENT TRAPS AWAY FROM WETLANDS AND CONSTRUCTION ACTIVITIES. DISCHARGE SHALL BE COMPLETELY INFILTRATED PRIOR TO REACHING WETLANDS OR SURFACE WATERS UNLESS APPROVED BY THE CONTRACTING OFFICER. ALL RETURN FLOWS MUST MEET PERMIT REQUIREMENTS FOR TURBIDITY.
10. ALL PUMP INTAKES SHALL BE SCREENED FOR FISH PROTECTION AS REQUIRED BY NOAA.
11. ALL EARTHWORK ACTIVITES AND WOOD HABITAT STRUCTURE CONSTRUCTION WITHIN THE ORDINARY HIGH WATER CHANNEL SHALL CONFORM TO THE WATER QUALITY STANDARDS ESTABLISHED BY REGULATORY AGENCY PERMITS FOR THIS PROJECT.



SECTION A-A

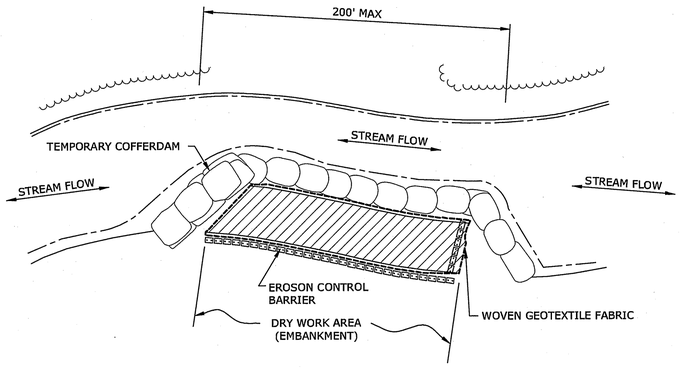


10'-15' (TYP) OR AS DIRECTED

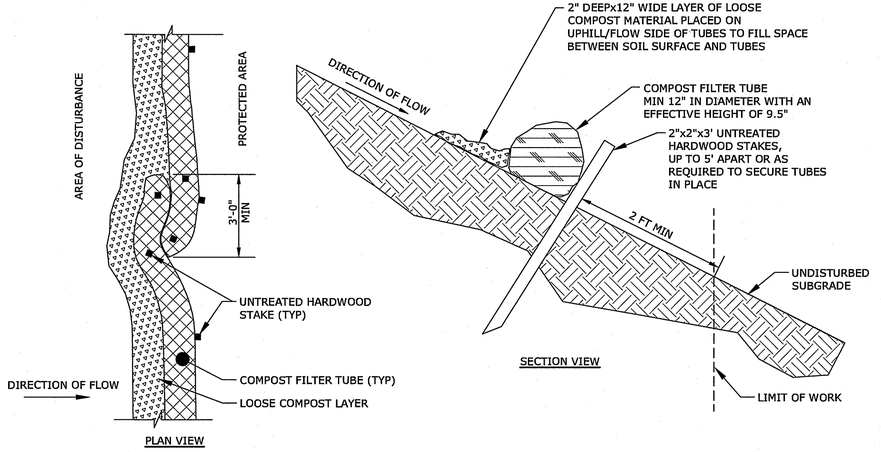


NOTES:
1. DEWATERING EQUIPMENT SHALL REMAIN WITHIN THE PERMANENTLY IMPACTED AREAS AND SHALL DISCHARGE OUTSIDE OF THE WETLAND BOUNDARY AS SHOWN ON SHEET C-001.
2. DISCHARGE HOSE SHALL NOT CROSS THE STREAM AT ANY LOCATION.

SEDIMENT TRAP AND DEWATERING
NO SCALE



DIVERSION DETAIL
NO SCALE



COMPOST FILTER TUBE
NO SCALE

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COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
CIVIL
No. 35818
REGISTERED
PROFESSIONAL ENGINEER

PERMIT SET

CENTRAL POND RESTORATION

Central Street to Knight Circle

Manchester -by-the-Sea, MA

VERIFY SCALE
BAR IS 1 INCH ON ORIGINAL DRAWING
0 — 1 INCH
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

MARK	DATE	DESCRIPTION

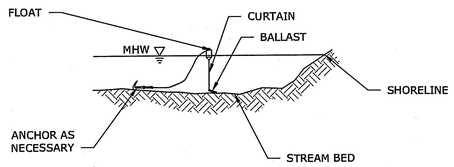
PROJECT NO:	22-1467
DATE:	2018/01
FILE:	M1476-012-C-500_Details.dwg
DRAWN BY:	DWB
CHECKED:	DRB
APPROVED:	DLL

CONTROL OF WATER DETAILS

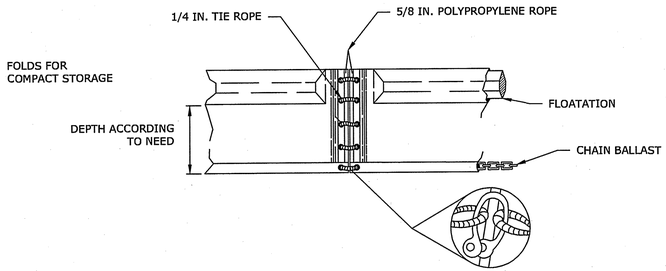
SCALE: AS NOTED

C-503

Last Saved: 3/28/2020
Plotted On:Mar 28, 2020-3:12pm By: DWBradshaw
Tighe & Bond, Inc. J:\WW\1476 Manchester MA Hydro Study\014-Sawmill_Central Pond\Permit\Task 4- Final Design\AutoCad\Sheet\M1476-012-C-500_Details.dwg



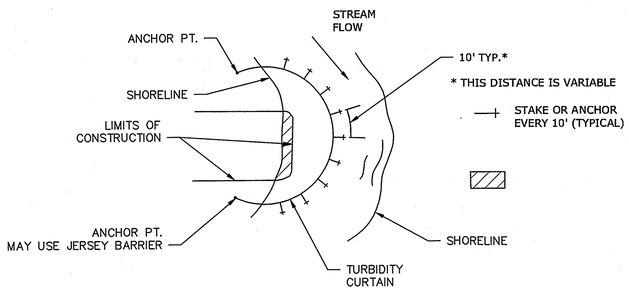
TURBIDITY CURTAIN (TYP)
SECTION VIEW
NO SCALE



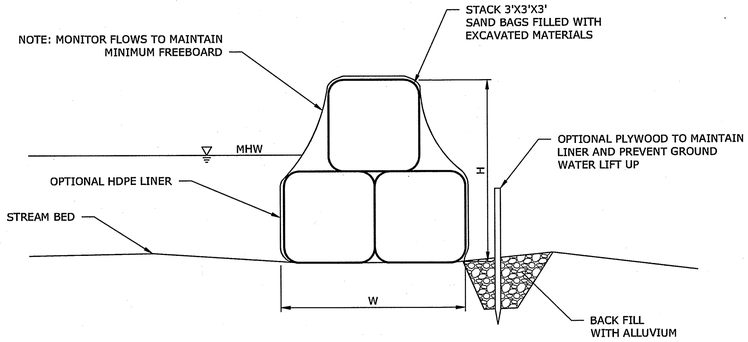
SILTMASTER II PERMEABLE GEOTEXTILE DREDGE BARRIER NON-WOVEN DBNW BY PARKER SYSTEMS OR EQUIVALENT

TURBIDITY CURTAIN (TYP)
PROFILE VIEW
NO SCALE

TYPICAL LAYOUTS
STREAMS, PONDS, AND LAKES (PROTECTED AND NON-TIDAL)

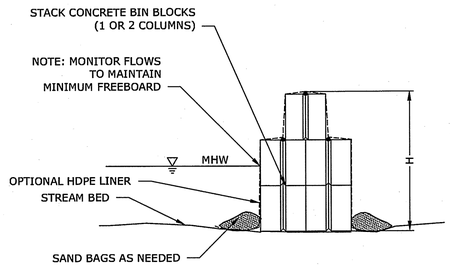


TURBIDITY CURTAIN (TYP)
PLAN VIEW
NO SCALE



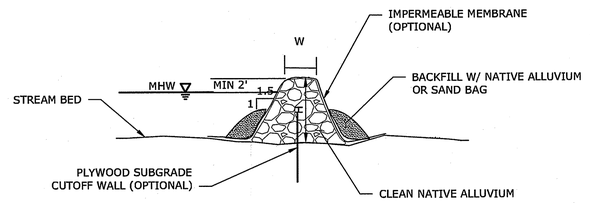
NOTE:
W > H
H MAX = 9.0'
MIN FREEBOARD = 0.25H
MAX DEPTH = 6.0'

SAND BAG COFFERDAM (TYP)
NO SCALE



NOTE:
SINGLE COLUMN - HMAX = 4.5'
DOUBLE COLUMN - HMAX = 7.0'
MIN FREEBOARD = 0.25 H
MAX DEPTH = 6.0'

CONCRETE BARRIER COFFERDAM (TYP)
NO SCALE



NOTE:
MIN FREEBOARD = 0.25 H
H MAX = 10 '
W = 0.5 x H
MAX DEPTH = 7'

ALLUVIAL COFFER (TYP)
NO SCALE

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DAVID L. LORING
CIVIL
No. 39816
REGISTERED PROFESSIONAL ENGINEER
3/05/2020

PERMIT SET

CENTRAL POND RESTORATION

Central Street to Knight Circle

Manchester -by-the-Sea, MA

VERIFY SCALE
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0 — 1 INCH
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MARK	DATE	DESCRIPTION

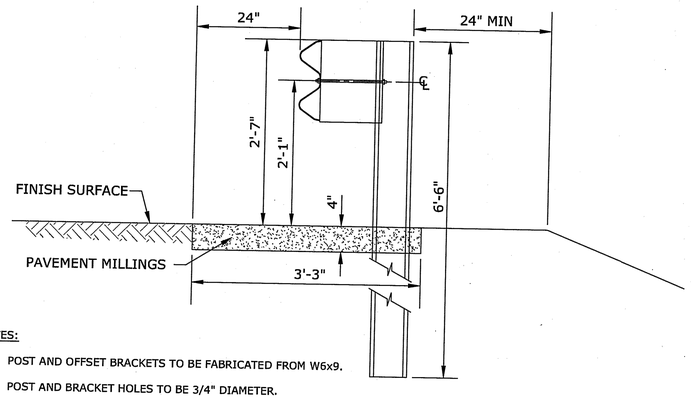
PROJECT NO:	22-1467
DATE:	2018/01
FILE:	M1476-012-C-500_Details.dwg
DRAWN BY:	DWB
CHECKED:	DRB
APPROVED:	DLL

CONTROL OF WATER DETAILS

SCALE: AS NOTED

C-504

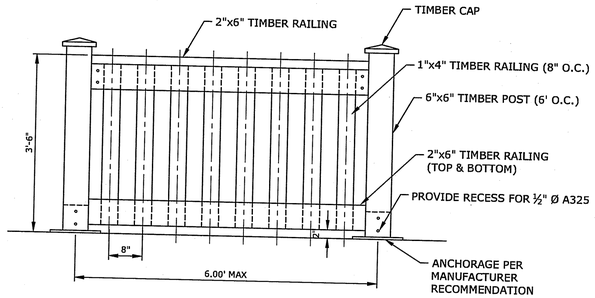
Last Saved: 3/05/2020
Plotted: October 28, 2020 at 2:52pm By: DWBradshaw
Tighe & Bond, Inc. J:\M\M1476 Manchester MA Hydro Study\014-Sawmill_Central Pond\Permit\Task 4- Final Design\AutoCad\Sheet\M1476-012-C-500_Details.dwg



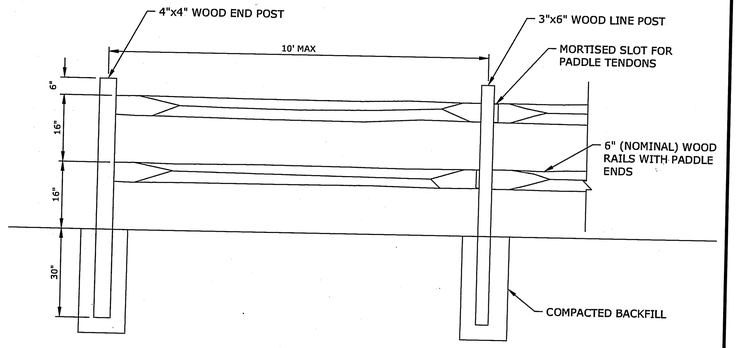
NOTES:

1. POST AND OFFSET BRACKETS TO BE FABRICATED FROM W6x9.
2. POST AND BRACKET HOLES TO BE 3/4" DIAMETER.
3. BACK-UP PLATE TO BE USED ON POSTS WHERE NO SPLICE OCCURS.
4. FABRICATION DIMENSIONS ALSO APPLY TO "C" POSTS AND BRACKETS.
5. MAXIMUM POST SPACING IS 6'-3" CENTER TO CENTER.
6. WHEN THE MAXIMUM POST SPACING IS EXCEEDED, NEST UP GUARDRAIL WITH 25' RAIL SEGMENT. MAXIMUM SPIN IS 12'-6" CENTER TO CENTER.
7. PROVIDE A TL2 RATED TERMINAL END SECTION AT EACH W RAIL TERMINUS.

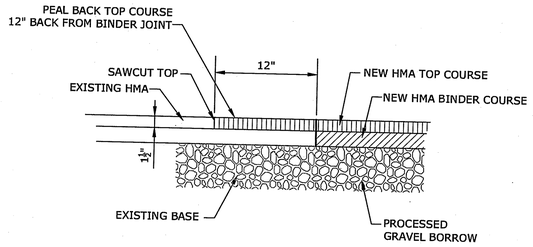
STEEL BEAM HIGHWAY GUARD W RAIL
NO SCALE



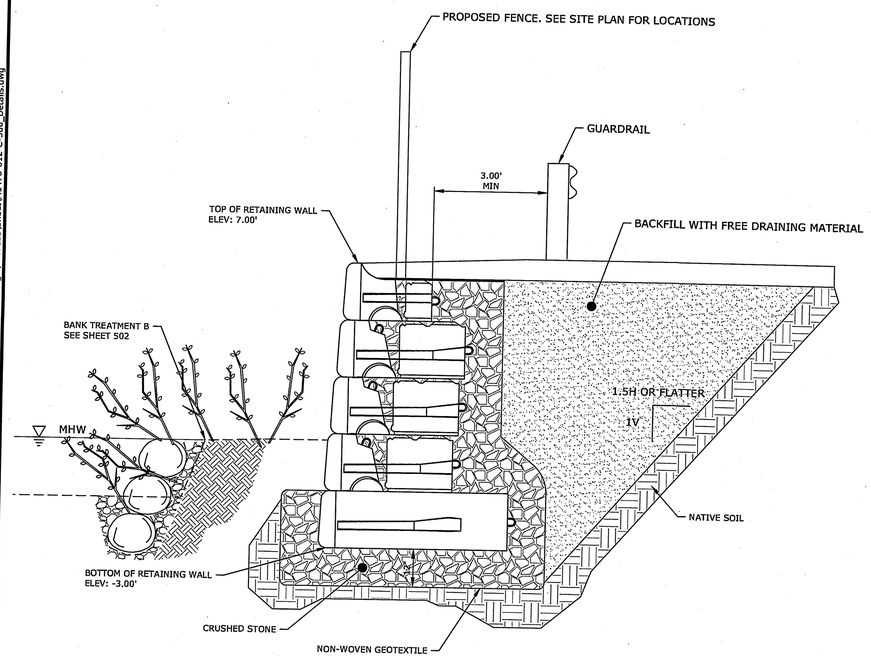
TIMBER RAILING
NO SCALE



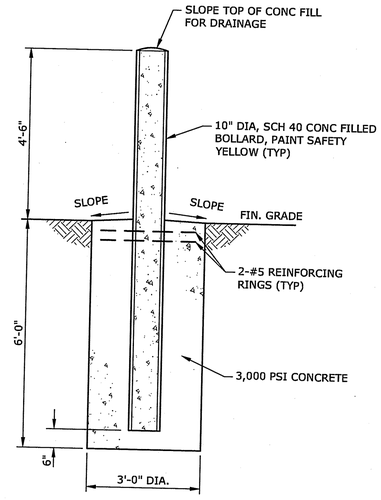
SPLIT RAIL FENCE
NO SCALE



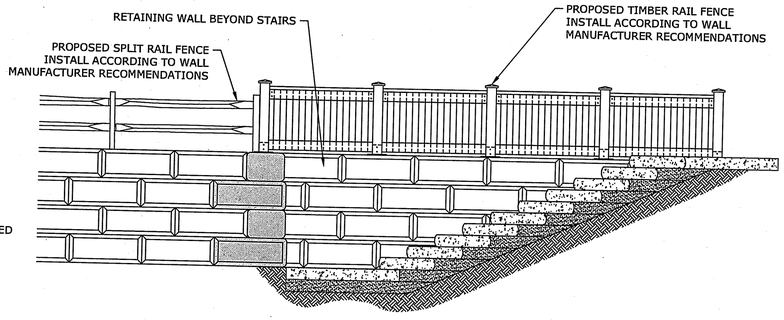
PARKING LOT PAVEMENT REPAIR DETAIL
NO SCALE



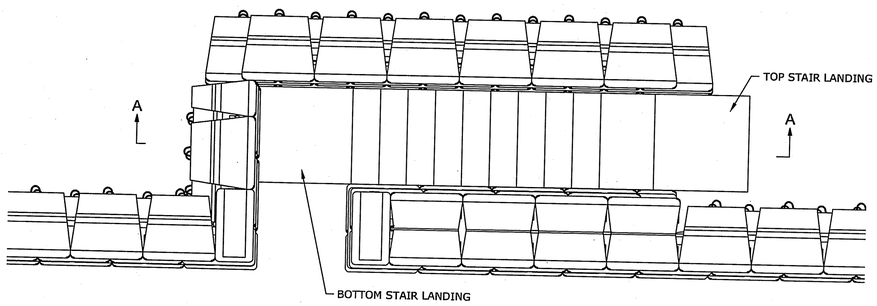
GRAVITY BLOCK WALL
NO SCALE



10" DIAMETER STEEL BOLLARD
NO SCALE



SECTION A-A



PLAN

STAIR ACCESS
NO SCALE

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CIVIL
No. 39818
REGISTERED PROFESSIONAL ENGINEER
3/28/2020

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Central Street to Knight Circle

Manchester -by-the-Sea, MA

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DATE:	2018/01
FILE:	M1476-012-C-500_Details.dwg
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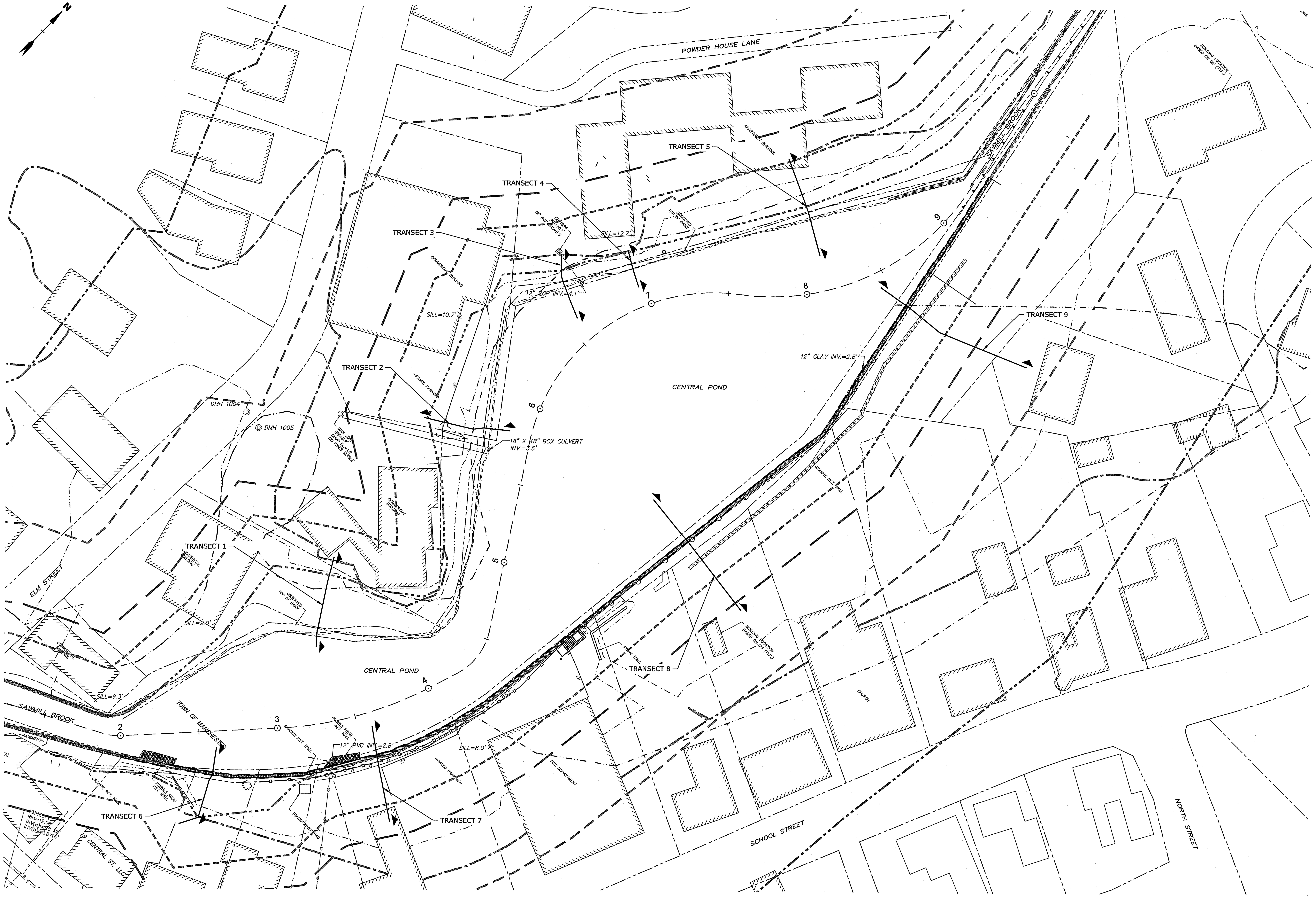
CHECKED:	DRB
APPROVED:	DLL

CONSTRUCTION DETAILS

SCALE: AS NOTED

C-505

Last Saved: 3/28/2020
Plotted On: Mar 28, 2020-3:13pm By: DWBradshaw
Tighe & Bond, Inc.: J:\MW\1476 Manchester MA Hydro Study\014-Sawmill_Central PondPermit\Task 4- Final Design\AutoCad\Sheet\M1476-012-C-500_Details.dwg



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MARK	DATE	DESCRIPTION

PROJECT NO:	22-1467
DATE:	2018/01
FILE: M1476-012_Design.dwg	
DRAWN BY:	DWB
CHECKED:	DRB
APPROVED:	DLL

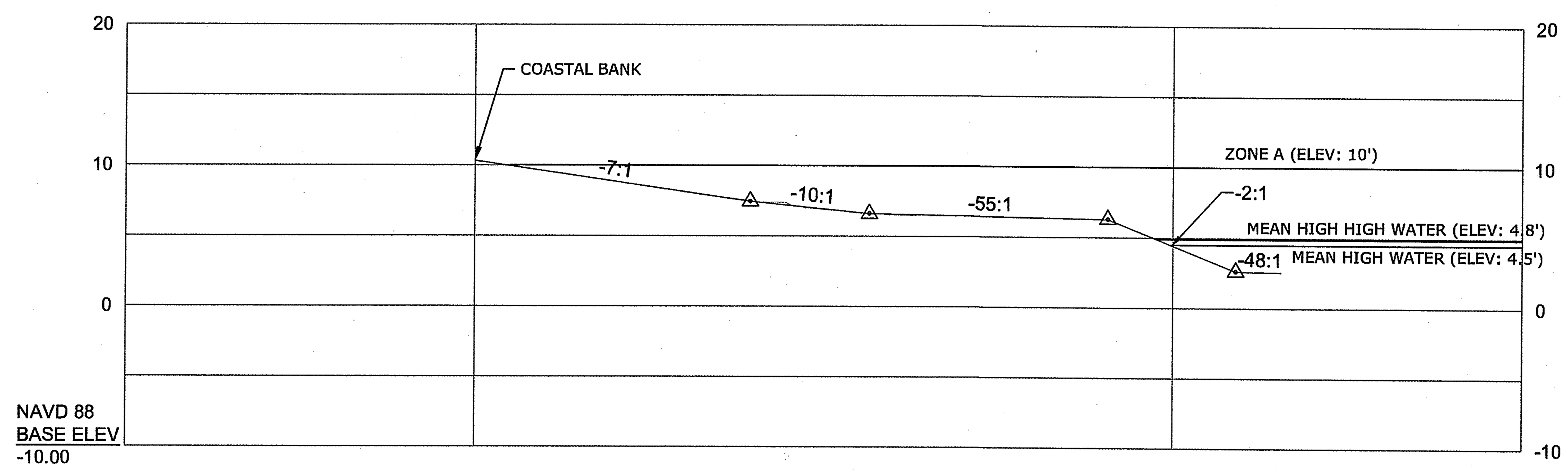
TRANSECT PLAN

SCALE: 1" = 30'

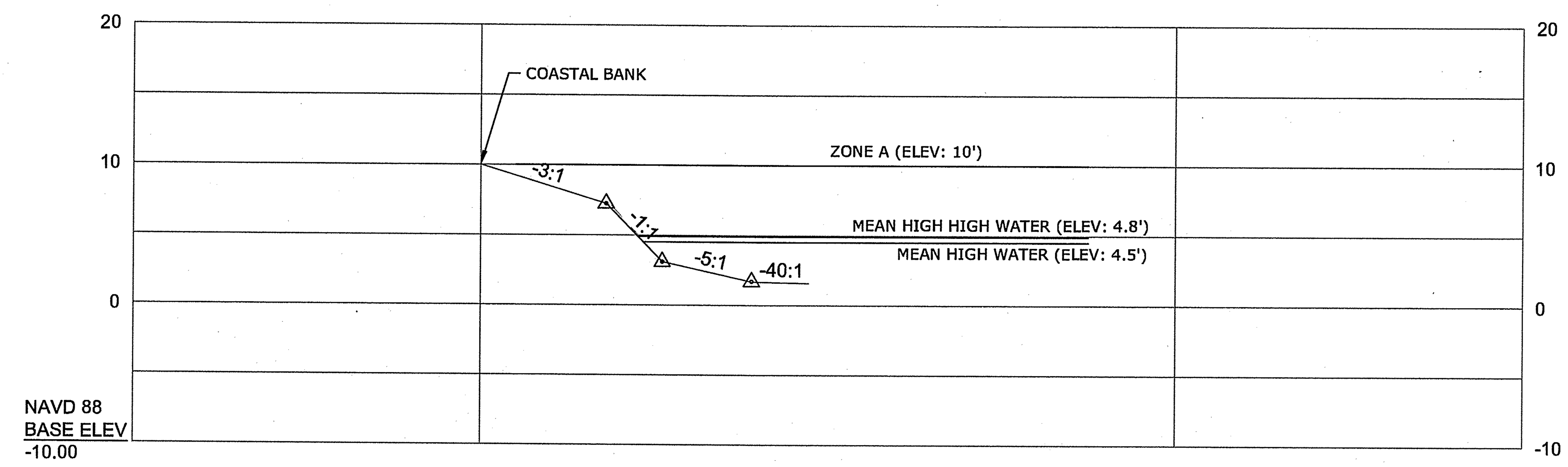
C-601

Last Saved: 3/28/2020
Plotted On:Mar 28, 2020-3:12pm By: DWBradshaw
Tighe & Bond, Inc. J:\M\M1476 Manchester MA Hydro Study\014-Sawmill_Central Pond\Permit\Task 4- Final Design\AutoCad\Xref\M1476-012_Design.dwg

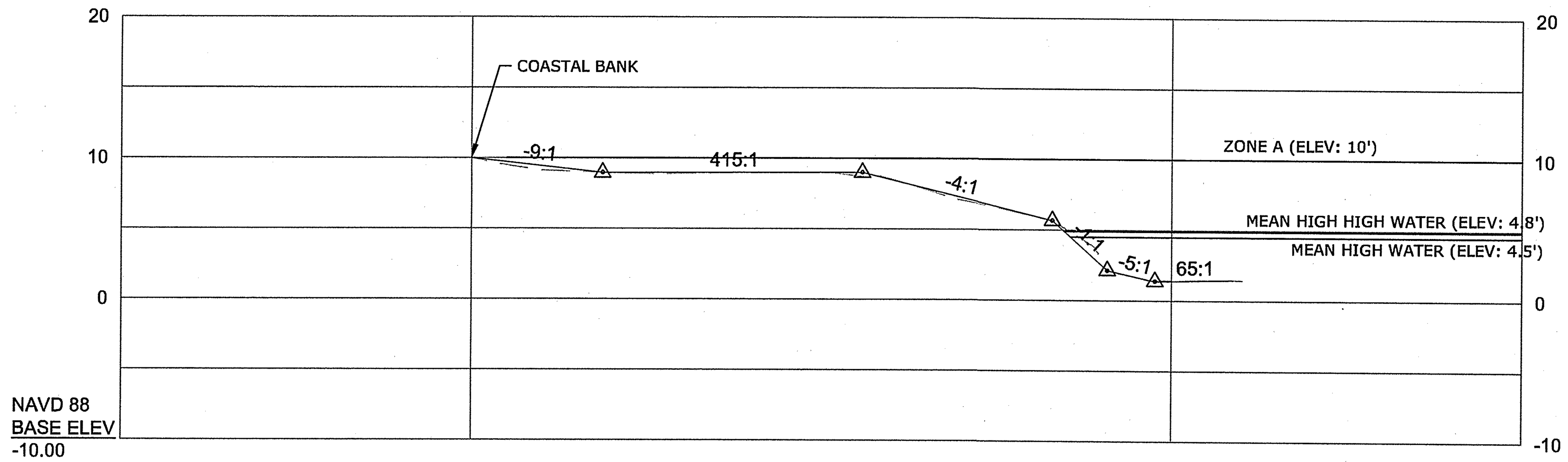
TRANSECT 1



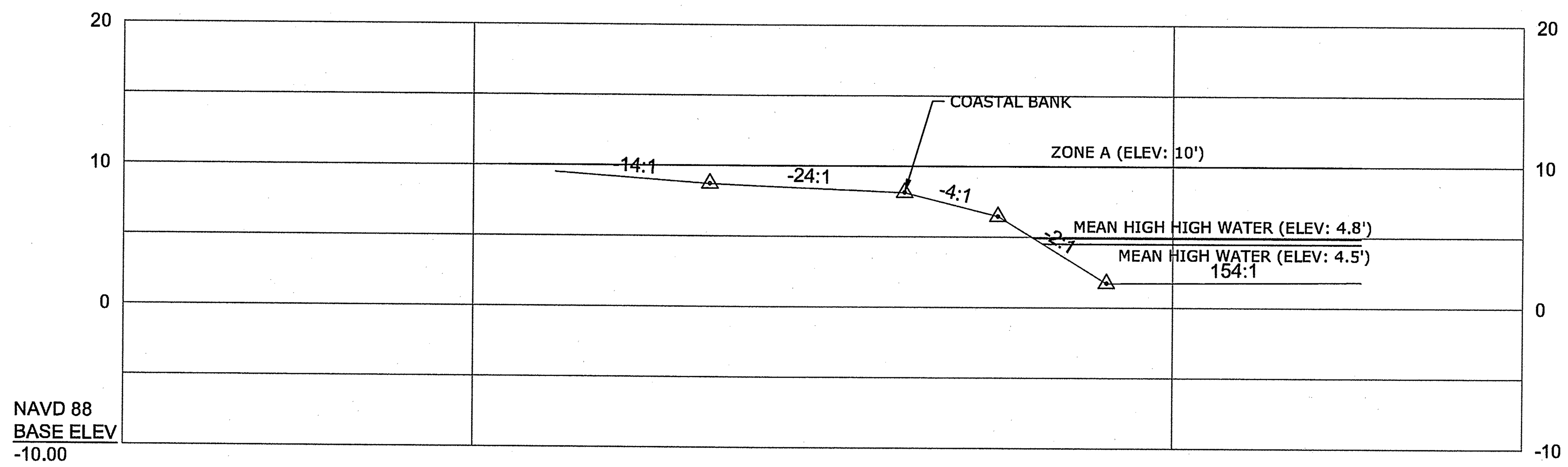
TRANSECT 4



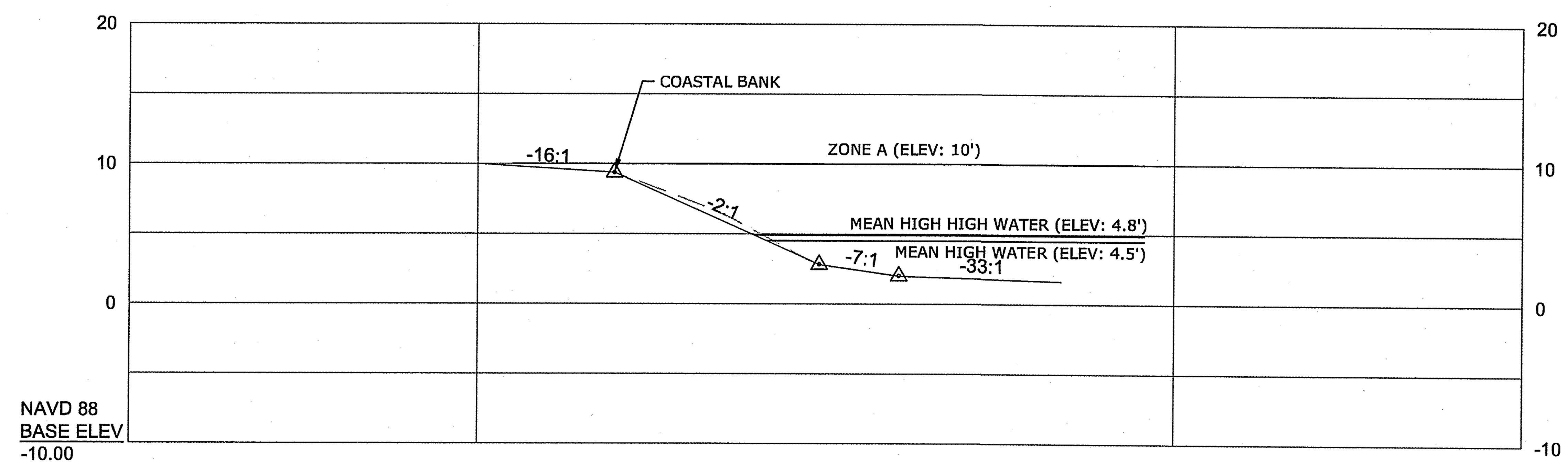
TRANSECT 2



TRANSECT 5



TRANSECT 3



Last Saved: 3/28/2020
Plotted On:Mar 28, 2020-3:12pm By: DWBradshaw
Tighe & Bond, Inc. J:\M\M1476 Manchester MA Hydro Study\014-Sawmill_Central Pond\Permit\Task 4- Final Design\AutoCad\Xref\M1476-012_Design.dwg

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Central Street to Knight Circle

Manchester -by-the-Sea, MA

VERIFY SCALE
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MARK	DATE	DESCRIPTION

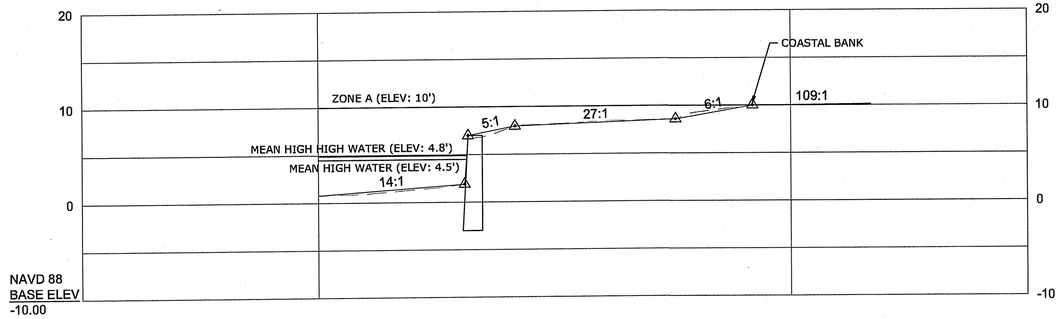
PROJECT NO:	22-1467
DATE:	2018/01
FILE: M1476-012_Design.dwg	
DRAWN BY:	DWB
CHECKED:	DRB
APPROVED:	DLL

TRANSECT CROSS SECTIONS

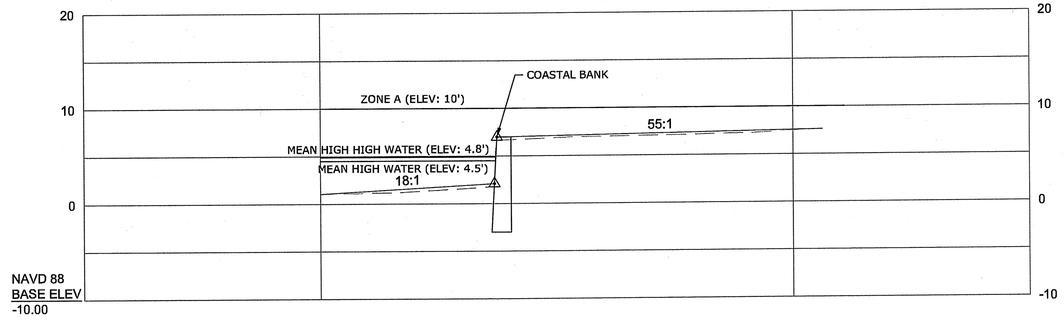
SCALE: HOR: 1"=8'; VER: 1"=8'

C-602

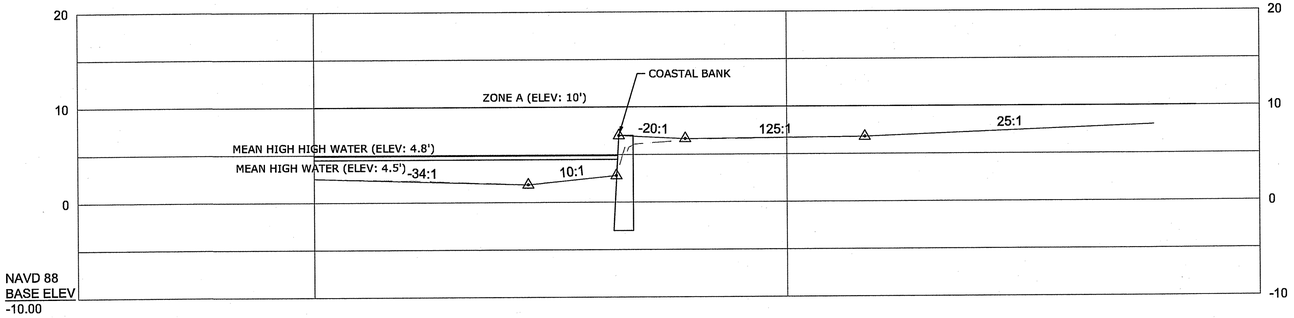
TRANSECT 6



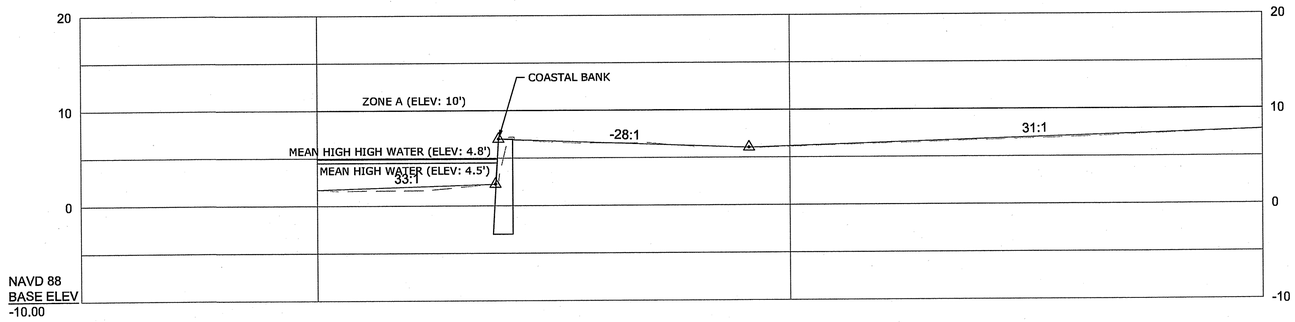
TRANSECT 7



TRANSECT 8



TRANSECT 9



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PROJECT NO:	22–1467
DATE:	2018/01
FILE:	M1476-012_Design.dwg
DRAWN BY:	DWB
CHECKED:	DRB
APPROVED:	DLL

TRANSECT CROSS SECTIONS

SCALE: HOR: 1"=8'; VER: 1"=8'

C-603

APPENDIX B

SITE PHOTOGRAPHS

Appendix B - Photographic Log

Client: Town of Manchester-by-the-Sea **Job Number:** M-1476-014A-01

Site: Central Pond, 0 Elm Street

Photograph No.: 1	**Date:** 9/12/2018	**Direction Taken:** South
Description: The existing condition of the retaining wall on the eastern shoreline of Central Pond. The wall is currently missing gravity sectional blocks.		

Photograph No.: 2	**Date:** 8/13/2018	**Direction Taken:** North
Description: An overview of the existing condition of the retaining wall on the eastern shoreline of Central Pond.		

Appendix B - Photographic Log

Client: Town of Manchester-by-the-Sea **Job Number:** M-1476-014A-01
Site: Central Pond, 0 Elm Street

Photograph No.: 3	**Date:** 12/3/2017	**Direction Taken:** East
Description: A view of the high water level on the eastern portion of Central Pond.		

Photograph No.: 4	**Date:** 1/23/2018	**Direction Taken:** Northwest
Description: A view of Central Pond during low tide. The pond includes an intertidal flat that is exposed during low tide.		

Photograph No.: 5	**Date:** 9/13/2018	**Direction Taken:** Southwest
Description: Since the removal of the tide gate flap some cordgrass (*Spartina alterniflora*) has grown in the tidal flat at Central Pond.		

Photograph No.: 6	**Date:** 6/11/2015	**Direction Taken:** North
Description: An overview of the Central Pond project area.		

APPENDIX C

ABUTTER NOTIFICATION INFORMATION

Town of ManchesterByTheSea
Abutters List

Subject Parcel ID:

Subject Property Location:

ParcelID	Location	Owner	Co-Owner	Mailing Address	City	State	Zip
42 0 28	3 POWDER HOUSE LN	PH LANE RLTY LLC SERIES 2-5 P		5C PEELE HOUSE SQUARE	MANCHESTER	MA	01944
45 0 2	5 PEELE HOUSE SQ	SEA ROCK ESTATE INC		5C PEELE HOUSE SQUARE	MANCHESTER	MA	01944
45 0 23	10 CENTRAL ST	MANCHESTER TOWN OF	TOWN HALL + POLICE STA	10 CENTRAL ST	MANCHESTER	MA	01944
45 0 3	26 CENTRAL ST	WOOD DAVID N & MARYANN A		6 HIGHWOOD RD	MANCHESTER	MA	01944
45 0 4	TOWN COMMON	FIRST PARISH CHURCH	CONGREGATIONAL	P.O. BOX 187	MANCHESTER	MA	01944
45 0 4A	TOWN COMMON	T MOBILE	PROPERTY TAX DEPT	12920 SE 38TH ST	BELLEVUE	WA	98006
51 0 3	26 SCHOOL ST	MORUZZI DOMINIC M	MORUZZI AZARA	26 SCHOOL ST	MANCHESTER	MA	01944
51 0 4	22 SCHOOL ST	OETTINGER HENRY F	OETTINGER JANA T	22 SCHOOL ST	MANCHESTER	MA	01944
51 0 80	4 KNIGHT CR	SUZANNE J. WILCZEK REVOCABL		4 KNIGHT CIRCLE	MANCHESTER	MA	01944
53 0 11	35 CENTRAL ST	HALGREN DONALD & NANCY	NANCY W. HALGREN REVO	35 CENTRAL ST.	MANCHESTER	MA	01944
53 0 12	33 CENTRAL ST	JONATHAN B. LEAVITT TRUST OF	C/O PARISI MANAGEMENT C	75 NORTH MAIN ST. SUITE 1	EAST LONGMEAD	MA	01028
53 0 13	31 CENTRAL ST	PETER LEIGH, LLC		5 ANCIENT COUNTY WAY	MANCHESTER	MA	01944
53 0 14	5 MORSE CT	OMARA W KEVIN		5 MORSE COURT	MANCHESTER	MA	01944
53 0 15	7 MORSE CT	STEACH ROBERT	STEACH PATRICIA	11 PULASKI DR	MANCHESTER	MA	01944
53 0 17A	29 UNIT 1 CENTRAL ST	MEGA, LLC		40 BEACH ST, UNIT 304	MANCHESTER	MA	01944
53 0 17B	29 UNIT 2 CENTRAL ST	MEGA, LLC		40 BEACH ST, UNIT 304	MANCHESTER	MA	01944
53 0 17C	29 UNIT 3 CENTRAL ST	MEGA, LLC		40 BEACH ST, UNIT 304	MANCHESTER	MA	01944
53 0 18A	0 ELM ST A	WADIA-ELLS SUSAN		0 ELM ST, UNIT A	MANCHESTER	MA	01944
53 0 18B	0 ELM ST B	MARTIN KRISTIN	HODGES, JR. JONATHAN B.	0 ELM ST., UNIT B	MANCHESTER	MA	01944
53 0 18C	0 ELM ST C	TORY ANTHONY D.	TORY JEMMA	27 CENTRAL ST., UNIT C	MANCHESTER	MA	01944
53 0 18D	27 CENTRAL ST D	DUNGENESS MANCHESTER REA	CHARLES P. CLAPP, TR	10 COUNTRY RD	BOYNTON BEACH	FL	33436
53 0 19	2 ELM ST	MANCHESTER SAW MILL REALTY	ADAM M. ZAIGER, TRUSTE	40 BEACH ST, UNIT 304	MANCHESTER	MA	01944
53 0 20	21 23 SAW MILL CR	MANCHESTER SAW MILL REALTY	ADAM M ZAIGER, CHOATE,	40 BEACH ST, UNIT 304	MANCHESTER	MA	01944
53 0 21	22 ELM ST	PETER LEIGH, LLC.		5 ANCIENT COUNTY WAY	MANCHESTER	MA	01944
53 0 23	1 ELM ST	1 ELM ST LLC		5 ELM ST	MANCHESTER	MA	01944
53 0 24	ELM ST	MANCHESTER TOWN OF		10 CENTRAL ST	MANCHESTER	MA	01944
53 0 25	5 ELM ST	COWAN LIVIA A TR	C/O 5 ELM ST RLTY TR	5 ELM ST	MANCHESTER	MA	01944
53 0 26	17 23 ELM ST	127 PINE ST LTD PARTNERSHIP	C/O SUSAN WILENSKI	P.O. BOX 413	LONG KEY	FL	33001-0413
53 0 28	ELM ST	MANCHESTER TOWN OF		10 CENTRAL ST	MANCHESTER	MA	01944
53 0 30	21 CENTRAL ST	ASHLAND AVE LTD PARTNERSHI	C/O ROLANDA STURTEVAN	PO BOX 1522	MANCHESTER	MA	01944
53 0 31	11 CENTRAL ST	BOLENA LLC		40 BEACH ST, UNIT 304	MANCHESTER	MA	01944
53 0 32	7 CENTRAL ST	7 CENTRAL NOMINEE TRUST ADA	C/O CHOATE, HALL, & STEW	40 BEACH ST, UNIT 304	MANCHESTER	MA	01944
53 0 33	2 SCHOOL ST	2 SCHOOL NOMINEE TRUST	C/O MEGA, LLC ADAM ZAIG	40 BEACH ST., UNIT 304	MANCHESTER	MA	01944
53 0 34	6 SCHOOL ST	HOOPERS GROCERY INC	C/O JAMIE KNEISEL TYLER I	14 EAGLE HEAD RD	MANCHESTER	MA	01944
53 0 36	12 SCHOOL ST	MANCHESTER TOWN OF	FIRE DEPARTMENT	12 SCHOOL ST	MANCHESTER	MA	01944
53 0 37	16 SCHOOL ST	SCHOOL STREET ASSOCIATES, L		16 SCHOOL ST.	MANCHESTER	MA	01944
53 0 38	18 SCHOOL ST	KARPOWICH JEFFREY A.	KARPOWICH RACHAEL M.	18 SCHOOL ST	MANCHESTER	MA	01944
53 0 39	20 SCHOOL ST	FIRST BAPTIST CHURCH SOCIET	C/O TOM CARPENTER	20 SCHOOL ST	MANCHESTER	MA	01944
53 0 41	19 CENTRAL ST	19 CENTRAL ST. LLC	C/O CHARLES BENEVENTO	PO BOX 85	PRIDES CROSSIN	MA	01965
53 0 45A	24 A ELM ST	DILLON WENDY H		24 ELM ST. UNIT A	MANCHESTER	MA	01944

Town of ManchesterByTheSea
Abutters List

Subject Parcel ID:

Subject Property Location:

ParcelID	Location	Owner	Co-Owner	Mailing Address	City	State	Zip
53 0 45B	24 B ELM ST	SUSAN R. JACKSON TRUST	SUSAN R. JACKSON, TR	24 ELM ST, UNIT B	MANCHESTER	MA	01944
53 0 45C	24 C ELM ST	HELLIWELL FABYAN HOLLY		1 OLD ESSEX RD.	MANCHESTER	MA	01944
53 0 45D	24 D ELM ST	MORGAN SUSAN		4 CANAL PARK #306	CAMBRIDGE	MA	02141
53 0 46	1 3 SAW MILL CR	MANCHESTER SAW MILL REALTY	ADAM M ZAIGER, CHOATE,	40 BEACH ST., UNIT 304	MANCHESTER	MA	01944
53 0 47	13 ELM ST	MBTS 13 ELM STREET LLC		100 CUMMINGS CENTER ST	BEVERLY	MA	01915
53 0 54	17 19 SAW MILL CR	MANCHESTER SAW MILL REALTY	ADAM M ZAIGER, CHOATE,	40 BEACH ST, UNIT 304	MANCHESTER	MA	01944
53 0 57	13 15 SAW MILL CR	MANCHESTER SAW MILL REALTY	ADAM M ZAIGER, CHOATE,	40 BEACH ST, UNIT 304	MANCHESTER	MA	01944
53 0 58	9 11 SAW MILL CR	MANCHESTER SAW MILL REALTY	ADAM M ZAIGER, CHOATE,	40 BEACH ST, UNIT 304	MANCHESTER	MA	01944
54 0 28	OFF KNIGHT CR	MANCHESTER TOWN OF	ADJOINING CENTRAL PON	TOWN HALL	MANCHESTER	MA	01944

Parcel Count: **49**

End of Report

"Certified Abutters and Abutters to the Abutters at Central Pond within 300ft. for the Conservation Commission as of March 2, 2020."
Liz Dukes
Board of Assessors

Notification to Abutters under the Massachusetts Wetlands Protection Act and the Manchester-by-the-Sea General Wetlands By-Law

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40 and the Town of Manchester's Wetlands By-Law, you are hereby notified of the following public hearing on the matter described below.

A. The name of the applicant is Town of Manchester-by-the-Sea

B. The address of the lot where the activity is proposed is:

Central Pond located at 0 Elm Street located between Elm Street and School Street

C. The work proposed is in the jurisdiction of the Wetlands Protection Act and/or Manchester Wetlands By-Law is as follows:

The proposed Central Pond/Sawmill Brook restoration project is intended to stabilize the shoreline of the Pond through the restoration and replacement of the retaining wall, and construction of living shoreline stabilization elements. The project includes components to enhance both ecological conditions and coastal resiliency.

D. Copies of the Notice of Intent or the Request to Amend an Existing Order of Conditions may be examined at Manchester Town Hall in the Conservation Commission office between the hours of 2:00pm and 5:00pm Monday through Thursday.

E. Copies of the Notice of Intent or the Request to Amend an Existing Order of Conditions may be obtained from either (check one) the applicant_____ or the applicant's representative ✓, by calling this telephone number (508) 471-9631 between the hours of 8:00 and 5:00, on the following days of the week: Monday through Friday.

F. The Public Hearing will be held on April 14, 2020 at 6:30 pm at Manchester Town Hall, located at 10 Central Street.

NOTE: Notice of the public hearing, including its date, time, and place, will be published at least five (5) days in advance in the Manchester Cricket or the Gloucester Times.

NOTE: Notice of the public hearing, including its date, time, and place, will be posted in the Manchester Town Hall not less than forty-eight (48) hours in advance.

NOTE: You also may contact the Manchester Conservation Commission or the Department of Environmental Protection Northeast Regional Office for more information about this application. To contact the Manchester Conservation Commission, please call the Conservation Administrator at 978-526-4397.

AFFIDAVIT OF SERVICE

Under the Massachusetts Wetlands Protection Act and the Manchester General Wetlands By-Law

To be submitted to the Massachusetts Department of Environmental Protection and the Manchester-by-the-Sea Conservation Commission when filing a Notice of Intent or a Request to Amend an Order of Conditions.

I, Richard Canavan, Tighe & Bond, hereby certify under the pains and penalties of perjury that on March 30, 2020 I gave notification to abutters in compliance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, and the Manchester-by-the-Sea General Wetlands By-Law.

A Notice of Intent ✓ or a Request to Amend an existing Order of Conditions ____ was filed under the Massachusetts Wetlands Protection Act and the Manchester General Wetlands By-Law by the Town of Manchester-by-the-Sea with the Town of Manchester on March 30, 2020 for property located at:

Central Pond, 0 Elm Street.

The form of the notification, and a list of the abutters to whom it was given and their addresses are attached to this Affidavit of Service.

March 30, 2020

Signature Date

APPENDIX D

LIVING SHORELINE MEMO

Task 2: Living Shoreline Design
Sawmill Brook Central Pond Restoration Project

TO: Mary Reilly, Manchester-by-the-Sea Grants Administrator

FROM: Troy Barry

THROUGH: David L. Loring, PE, ENV SP, LEED AP

DATE: March 25, 2020

1. Introduction

The proposed restoration design for the Central Pond area of Sawmill Brook includes reestablishing the native salt marsh within the interior sections of the mud flats; replacing and repairing existing retaining walls along the eastern shore; and implementing a hybrid of bioengineered solutions to stabilize the western shoreline. The goal of the design is to take advantage of the natural in-stream processes to reestablish a natural channel through the sediments in Central Pond, followed by adaptive management, as needed.

This memorandum describes the modeled existing conditions, constraints, and conceptual design for the living shoreline proposed for the western bank of the Central Pond. This memorandum also discussed the restoration approach utilizing biomimicry and bioengineering methods. These methods will combine living and nonliving plant materials together with the goal of uplifting the ecological function in the system. The discussion includes each concept role, function, and recommendations for development of the living shoreline that will be part of the restoration of Central Pond and Lower Sawmill Brook.

2. Existing Geomorphic Conditions and Constraints on Physical Processes

2.1 Geomorphology of Sawmill Brook

Geomorphological concepts have been considered and integrated into the "restoration" of the aggraded tidal/freshwater channel of Sawmill Brook. A range of restoration design concepts are presented including allowing the channel bed to return to an elevation that is in equilibrium with the existing stream bank edge. Equilibrium in this case is one which over a period of years, slope adjusts to provide approximate balance between the channel and the water and sediment it must transport. While many combinations of parameters occur, the tendency is toward a "probable state" through conservation of energy and distribution of energy expenditure (Leopold 1994). Restoration in this case is associated with restoring natural function, stability, and ecological function to the probable state of biological uplift within the boundaries provided. To be implemented properly, restoration designs must consider a wide range of objectives including morphological potential, habitat, and stabilization. Single purpose objectives often lead to instability resulting in loss of physical and ecological function contrary to the restoration goals.

Using dimensional geometry gathered during the field survey of Central Pond we assessed the governing geomorphic criteria: 1) the cause of any instability or disequilibrium through assessment of the watershed due to hydraulic constriction of the tide gate, hardening of the stream banks to contain the stream to a post development boundary, stream stability, and evidence of change (fine sediment aggradation, stormwater runoff); 2) potential morphological adjustment of the channel form through change of width, mean depth, width/depth ratio, maximum depth, as well as pattern and profile due to hydromodification of storm water runoff reporting to the channel.

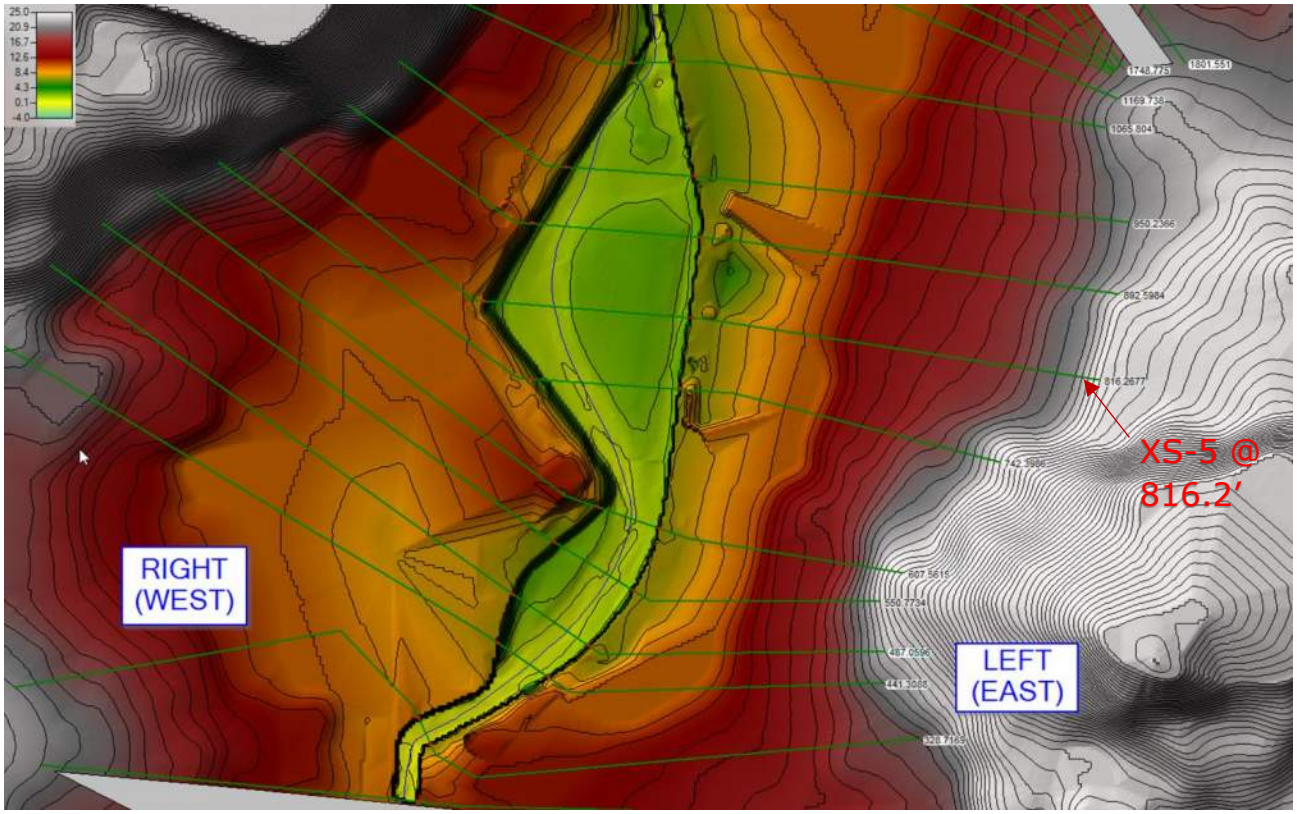


Figure 1. Cross-section locations for stream and tidal modeling, note XS-5.

2.2 Velocity and Shear modeling

The channel forming characteristics due to velocity and shear must consider both the tidal and freshwater systems. The bankfull discharge is the primary channel forming condition for terrestrial rivers. In this case, terrestrial channel flow is considered the primary morphology during Mean Lower Low Water (MLLW) or zero tidal influence. The primary channel forming condition changes to tidal during flood and ebb tide cycles. For tidal systems with wide circulation in the channel like Central Pond, the ebb flow (down estuary) cycle has been shown to drive surface enhanced currents resulting in increased velocities and shear at the surface, while the flood flow (up estuary) tidal cycle drives bottom enhanced currents (Schulz 2015). Velocities and shear were modeled for Central Pond and found that the tidal shear stresses are lower than the stream shear stresses, freshwater terrestrial stream bankfull runoff event. Tidal velocity and shear stresses were modeled through Central Pond for the maximum velocity/shear conditions for both tidal flows entering (flood) the pond and when leaving (ebb) the pond. Velocity/shear was found to be slightly higher during tidal inflow versus tidal outflow.

Thus, the stresses for the bankfull stream condition governs the biomimicry design at the toe of the stream bank. Meanwhile, the higher flood and ebb tidal stresses will govern the elevation at which the highest shear stress will occur on the bank, see Figure 2 and 3.

The bankfull elevation evaluated for shear and velocity occurs at cross-section 816.2' (typical cross-section 5) at approximately 1.8 feet NAVD88, see Figure 1. The peak Mean Higher High Water (MHHW) elevation during the tide model occurs at 4.8 feet NAVD88 corresponding to the recorded tide peak of 02.25.2018.

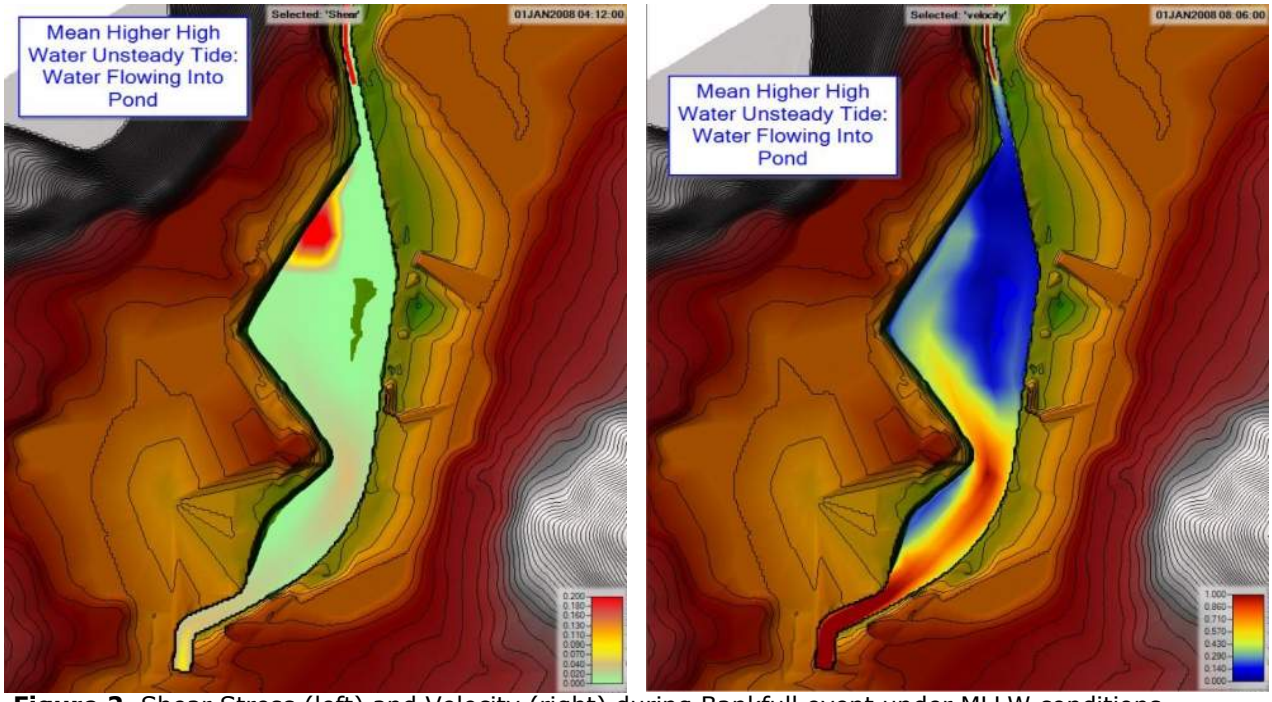


Figure 2. Shear Stress (left) and Velocity (right) during Bankfull event under MLLW conditions

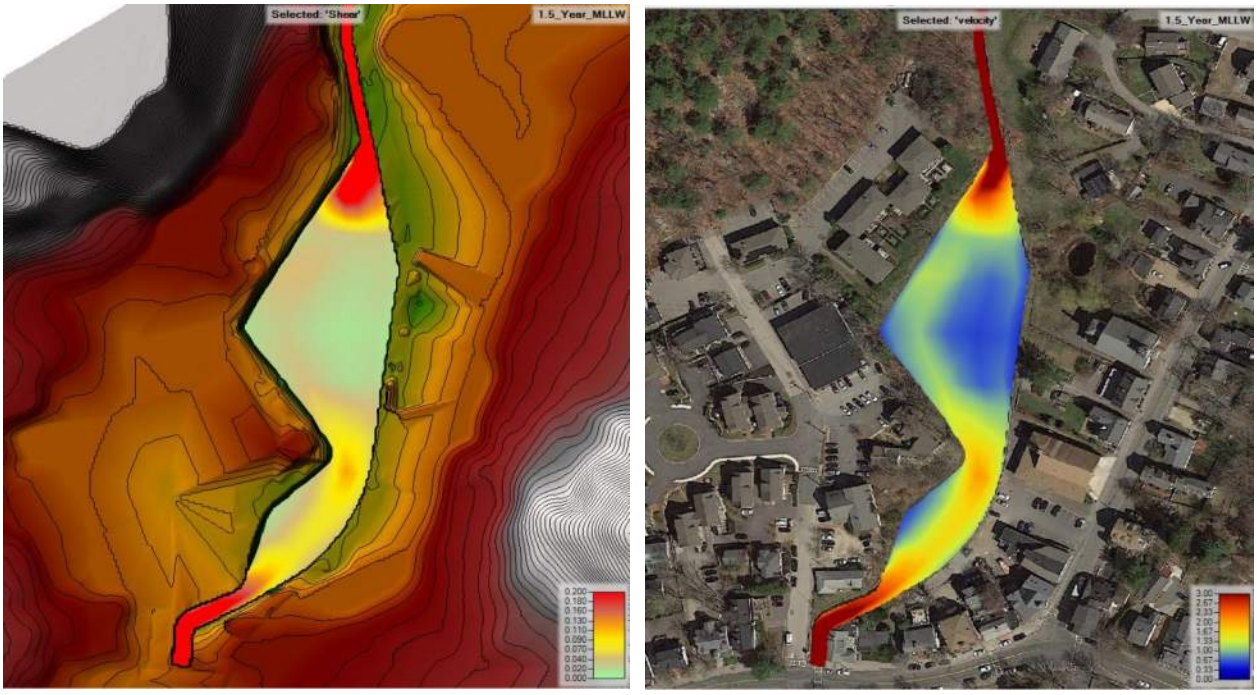


Figure 3. Shear Stress (left) and Velocity (right) during upstream tide flow MHHW event

2.3 Geomorphic Succession

The proposed dimensions, pattern, and profile of Sawmill Brook are based on bankfull discharge of the 1.5-year event at Mean Lower Low Water (MLLW) and a defined low flow (inner berm) channel. The defined, low flow channel provides better habitat for fish during MLLW and increases the sediment transport capacity to prevent channel aggradation and excess sedimentation deposition. Currently, the low flow channel is in flux with the change from an impoundment or "pond" to a more historic tidal influenced channel. Through the Central Pond reach, the impoundment era has created increased bed aggradation and widening of the stream causing an unbalanced sediment transport condition, the deposition is apparent during MLLW. The geomorphic succession through Central Pond is anticipated to be a low flow channel driven by the terrestrial stream flow with marsh flow and fine sediment nourishment provided during tidal flow.

Evidence of a relic low flow channel is seen from sediment depth survey in the in the pond reach of Sawmill Brook, see Fig. 4. The gap graded soils in the pond area implies that there has been a significant contribution of occasional sediment-laden river discharge during the closed dam era. Without the dam, tidal flow will provide occasional sediment nourishment and scour to the influence zone of Sawmill Brook.

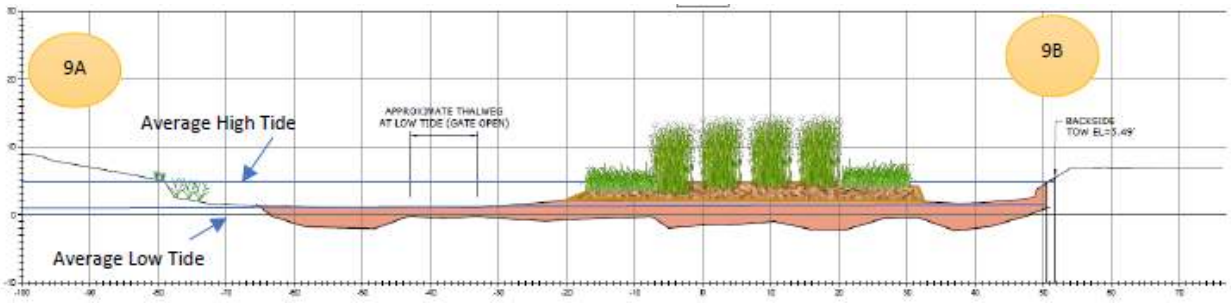


Figure 4. Conceptual Marsh Cross-Section with High and Low Tide

3. Proposed Concepts; Geomorphology & Bank Vegetation

The general consensus by the stakeholders and technical review agencies is to return the stream to a more natural and less altered state. This includes moving the stream towards forms and processes that include more regular and longer duration floodplain and tidal interaction than is currently the case. Since the stream is relatively small in comparison to the stream valley and because the valley has a thick sediment layer, there are no large boulders or bedrock to develop "hard spots" to create strong hydraulics that develop deep pools. The stream was also altered during the late 1700's that included lateral constraint or levying and dredging to accommodate diversion for local hydro power. Wood loading, mostly from the immediate or near upstream area, likely would have been the main resistant force to create deep scour pools and encourage habitat complexity. Helical meander-bend hydraulics and ledge would have also developed pools and slightly larger-scale habitat zones. There is agreement that, given stream boundary constraints, we may not be able fully return the stream to a pre-settlement condition. In fact, the shoreline of Central Pond requires threshold design approach due to infrastructure encroachment. The eastern stream bank will be met with a replacement retaining wall to hold this bank line. However, from the center of the pond to the western bank line the stream has more width freedom to allow natural process. This area provides the best opportunity to move towards a pre-settlement stream condition.

This includes directly adding features, where possible, and allowing for and promoting positive change in other areas. Examples include adding large wood structures and pieces to develop immediate habitat and near bank shear dissipation. This approach will also allow some channel migration towards the center of the relic pond area for the channel to establish natural equilibrium. This area will also provide floodplain area for higher storm and tidal events. It is expected that any channel migration will likely be slow and over long periods of time. Therefore, riparian and tidal planting, at appropriate elevations, in these areas will provide root mass, depth, and density creating soil stability through the use of native vegetation and enhance habitat creation. See conceptual site plan C-01 and typical bank treatment cross-sections, C-02.

The conceptual layout is primarily designed to decrease width/depth ratio, improve instream cover and spawning habitat, reduce streambank erosion, and improve sediment transport. Toe wood and various bank treatments are proposed to decrease the current high width/depth ratio on the west bank while allowing a natural channel succession through the flooded tidal area or inner salt marsh berm.

Granite block, poured concrete, field stone and revetment, and various combinations are the dominant existing shoreline around Central Pond. The eastern shoreline is completely lined with a gravity wall ranging from 3-5 feet in height. The western shoreline is more gradual and reveals a history of shoring varying from a distinct block wall line that has succeeded into a revetment slope to river cobble and fieldstone. Two stormwater outfalls are also found daylighting along the bank.

The proposed concept incorporates large root wads extending into the channel on an outside bend of the western shoreline. Root wads are placed roughly thirty-five degrees from bank facing upstream to the channel atop a toe or inserting a key log longitudinally in the channel toe (root wad facing upward). The bank will require some excavation (and BMPs) to bury the trees using buried rock ballast and native backfill. The bank will then be regraded and planted with willow cuttings installed to encourage riparian vegetation.

3.1 Applications and Effectiveness

The purpose of the root wads is to increase roughness along the outside bend where shear stress distribution is concentrated. This will create slower pool habitat with varied velocities while allowing the bank to repair its floodplain terraces. The bank roughening is installed in locations to decrease marginal shear stress towards the actively eroding outside banks. Force/balance calculations for toe wood (root wad) sizing will be considered during the 90% design process. See typical bank treatment cross-sections, C-02.

The large wood apex jam proposed at the confluence of the pond and Sawmill Brook is designed to dissipate velocity and shear stresses that can be seen in the initial modeling, see Figure 2 left. This channel roughness element will assist in encouraging the geomorphic channel form succession through the pond, see C-01. The geomorphic succession in the channel requires a variety of high and low velocities to promote more natural sediment transport and positive ecological changes. This includes island and bar development that promote positive changes in channel form and slope.

The proposed cross-sections of Sawmill Brook include a shoreline vegetation continuum that starts at the tidal marsh vegetation and rising vertically through the riparian zone, and ultimately to the upland vegetation. The proposed dimensional cross-section of the low flow channel is important for fish passage and will become the channel thalweg, located along the outer meander bend. The current width/depth ratio of the stream low flow channel here is high, likely due to the decades of impoundment and finer sediments depositing in this reach under backwater conditions. When the tide gate was closed the water level in the pond

fluctuated between 4.25 and 4.90 feet from low to high tide. With the tide gate open the depths ranged from 1.0' to 5.0' from low to high tide. With the reach being freed from its perpetual backwater condition, sediment transport will increase initially until equilibrium in the system is reached.

Temporal and spatial channel succession will occur resulting in a more predictable low flow channel planform through the reach; i.e. riffle, run, pool, and glide. Once the pool(s) are established along the western meander bend the stream velocities and shear will be greatest in the deepest sections; pools. When the pools reach their scour depth potential these forces will increase laterally to the banks resulting in lateral migration of the channel. Bank treatments have been designed to address velocity dissipation and will provide the channel with the ability to flood the center of the pond area during storm and higher tidal events.

The east and west bank treatments are considered to dissipate near bank stresses to protect private properties and existing infrastructure outside of the existing banks. Although considered threshold, the west bank treatment approach is a combination of living shoreline and bio-stabilization with the goal of reducing the traditional hardened "rip-rap" or "block wall" conventions. The east bank treatment is a threshold replace in-kind approach that will be a replace the gravity block wall with a new gravity wall.

Appropriate structures are necessary to allow time for riparian and marsh vegetation to establish, prevent later channel movement, dissipate flow energy, and provide instream and overhead cover for fish. Toe wood uses appropriately sized wood to stabilize streambanks at high velocity high shear locations on outer bends. The structure will dissipate the anticipated high bank shear once the stream planform stabilizes with the pools anticipated to develop along the outer bank. Toe wood design uses embedded large wood as structure to dissipate bank stresses. Wood is often found in systems that have deposited themselves from upper watershed riparian recruitment. These structures add flow resistance to prevent streambank erosion and contains native planted vegetation on the upper part of the bank. The logs are buried deep and counter-buttressed with fill and vegetation to avoid the buoyancy factor ensuring that the wood remains intact throughout the various flow regimes. The top cover of the toe wood can vary depending on the availability of materials. In the concept provided, a soil wrap of coir fabric is used to protect the plantings until a root system and wood vegetation has established.

The near-bank region immediately adjacent to the toe wood is associated with low velocity even during high flows and tidal interchange. Monitoring of fish populations in toe wood project installations shows increases in biomass and abundance.

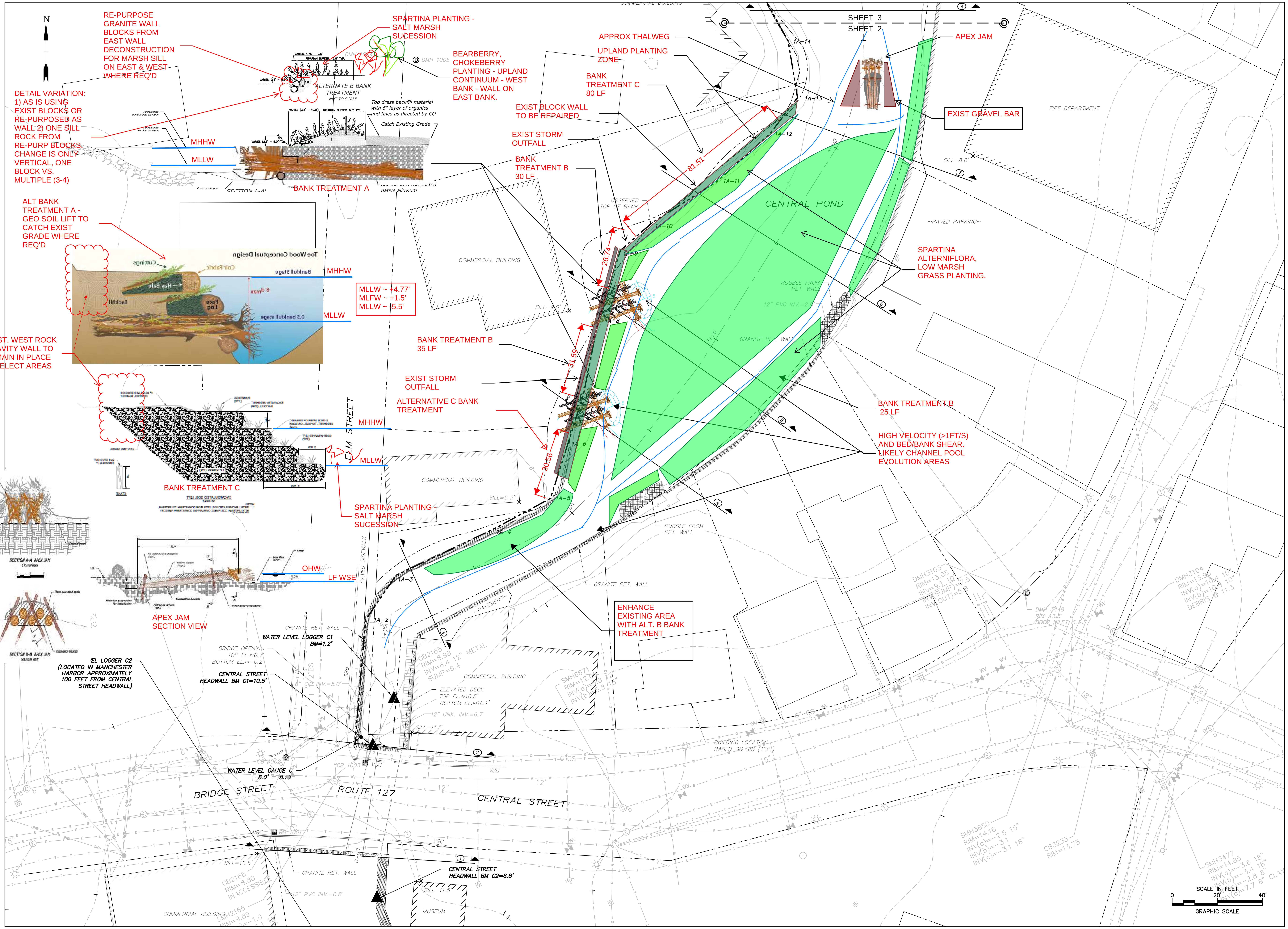
The bank treatment on the west consists of living and nonliving plant materials together with natural materials to reduce erosion, establish vegetation that will create stabilization of the shoreline through various runoff and tidal regimes. The nonliving plant material or in some cases a block sill provides enough hardening through biomimicry. This provides the needed time for root density and depth to establish from woody species as well as grass from the tidal zone up through the riparian zone. Native species will be specified providing naturally occurring vegetation while providing access to the resource.

4. Conclusion

In general, the project will be designed with the intent of promoting natural channel process and migration. The risk nature of the project site, stakeholder, and landowner goals allow this as an overall performance goal. Certain project elements have stringent design criteria. For example, large wood and vegetation are being designed to promote floodplain interaction with 1.5-year reoccurrence interval and sized to withstand larger intensity and frequency associated with MHHW tidal events. Wood loading and stability calculations will be provided

later in the design phase and will be designed to withstand 20-year events or larger as well as sea level rise under collaboration of technical committee feedback.

J:\M\M1476 Manchester MA Hydro Study\014-Sawmill_Central PondPermit\Task 2- Living Shoreline\Narrative\LIving Shoreline Concept Memo 2.25.20.docx



RE-PURPOSE GRANITE WALL BLOCKS FROM EAST WALL DECONSTRUCTION FOR MARSH SILL ON EAST & WEST WHERE REQ'D
SPARTINA PLANTING - SALT MARSH SUCESSION
BEARBERRY, CHOKEBERRY PLANTING - UPLAND CONTINUUM - WEST BANK - WALL ON EAST BANK.
DETAIL VARIATION: 1) AS IS USING EXIST BLOCKS OR RE-PURPOSED AS WALL 2) ONE SILL ROCK FROM RE-PURP BLOCKS. CHANGE IS ONLY VERTICAL, ONE BLOCK VS. MULTIPLE (3-4)
ALTERNATE B BANK TREATMENT
NOT TO SCALE
Top dress backfill material with 6" layer of organics and fines as directed by CO
Catch Existing Grade
MHHW
MLLW
SECTION A-A'
BANK TREATMENT A
ALT BANK TREATMENT A - GEO SOIL LIFT TO CATCH EXIST GRADE WHERE REQ'D
Toe Wood Conceptual Design
MLLW ~ -4.77'
MLFW ~ +1.5'
MLLW ~ 5.5'
EXIST. WEST ROCK GRAVITY WALL TO REMAIN IN PLACE IN SELECT AREAS
BANK TREATMENT C
SPARTINA PLANTING - SALT MARSH SUCESSION
OHW
LF WSE
APEX JAM SECTION VIEW
SECTION A-A APEX JAM
SECTION B-B APEX JAM
APPROX THALWEG
UPLAND PLANTING ZONE
BANK TREATMENT C 80 LF
EXIST BLOCK WALL TO BE REPAIRED
EXIST STORM OUTFALL
BANK TREATMENT B 30 LF
BANK TREATMENT B 35 LF
EXIST STORM OUTFALL
ALTERNATIVE C BANK TREATMENT
SHEET 3
SHEET 2
APEX JAM
EXIST GRAVEL BAR
CENTRAL POND
SPARTINA ALTERNIFLORA, LOW MARSH GRASS PLANTING.
BANK TREATMENT B 25 LF
HIGH VELOCITY (>1FT/S) AND BED/BANK SHEAR. LIKELY CHANNEL POOL EVOLUTION AREAS
ENHANCE EXISTING AREA WITH ALT. B BANK TREATMENT
ELM STREET
COMMERCIAL BUILDING
FIRE DEPARTMENT
~PAVED PARKING~
WATER LEVEL LOGGER C1 BM=1.2'
CENTRAL STREET HEADWALL BM C1=10.5'
WATER LEVEL GAUGE C 8.0' = 8.15
BRIDGE STREET
ROUTE 127
CENTRAL STREET
CENTRAL STREET HEADWALL BM C2=6.8'
MUSEUM
SCALE IN FEET
0 20' 40'
GRAPHIC SCALE

Tighe&Bond
www.tighebond.com

NOT FOR CONSTRUCTION

Sawmill Brook Existing Conditions & Topographic Plan

Central Street to Norwood Ave

Manchester -by-the-Sea, MA

VERIFY SCALE
BAR IS 1 INCH ON ORIGINAL DRAWING
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IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

May 2018

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CHECKED:	XX
APPROVED:	GCB

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C-01

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NOT FOR CONSTRUCTION

Sawmill Brook Existing Conditions & Topographic Plan

Central Street to Norwood Ave

Manchester -by-the-Sea, MA

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May 2018

MARK	DATE	DESCRIPTION

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DATE:	2018/01
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CHECKED:	XX
APPROVED:	GCB

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C-02

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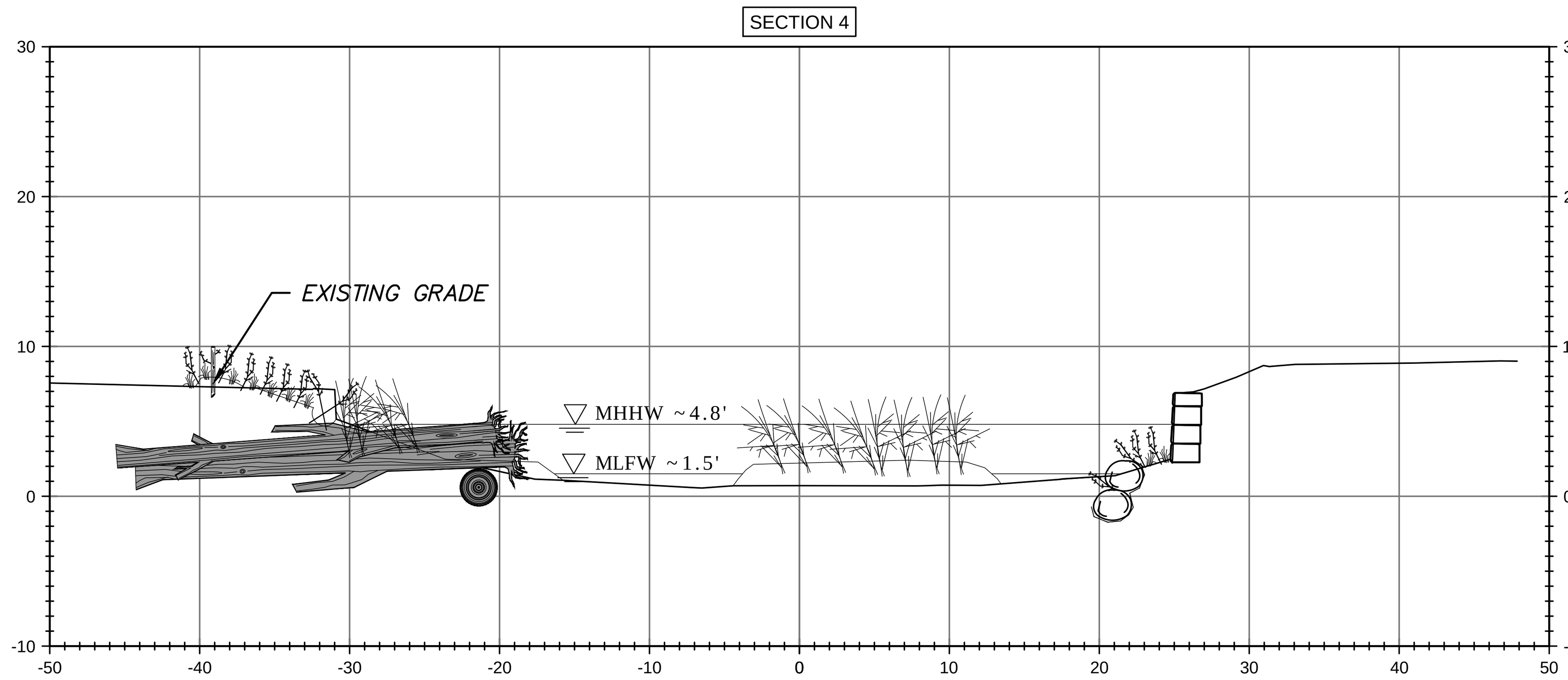

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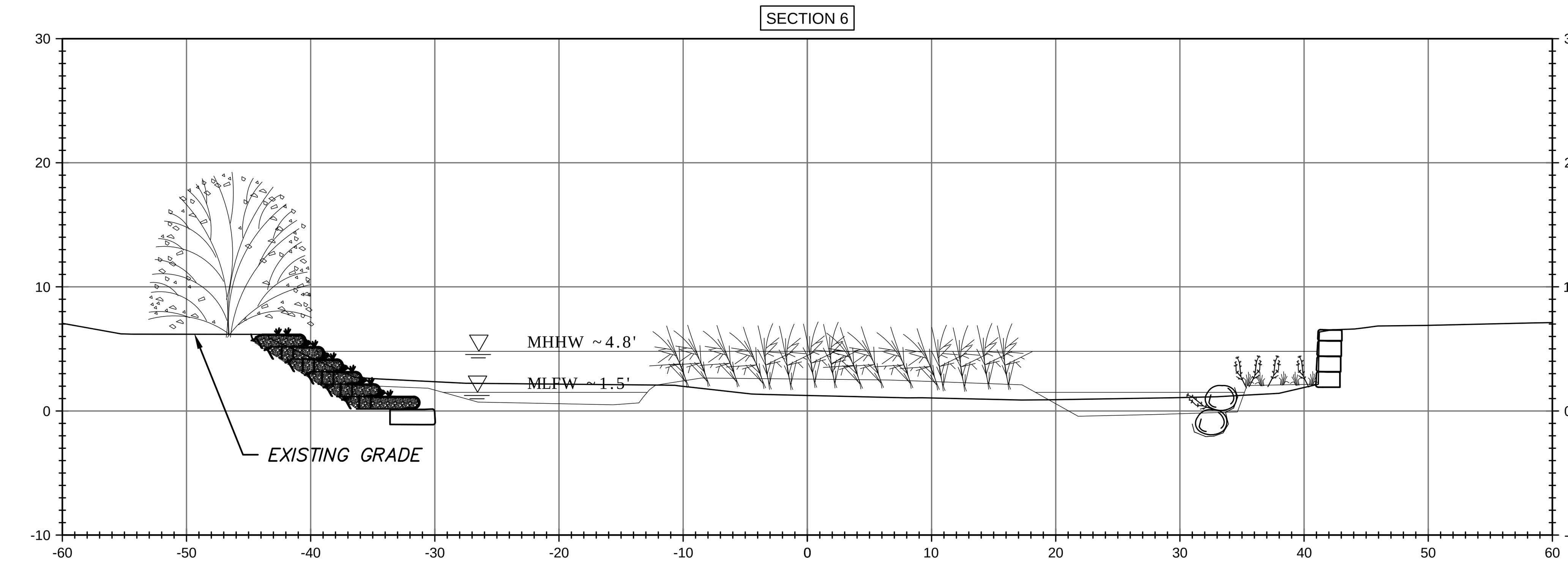

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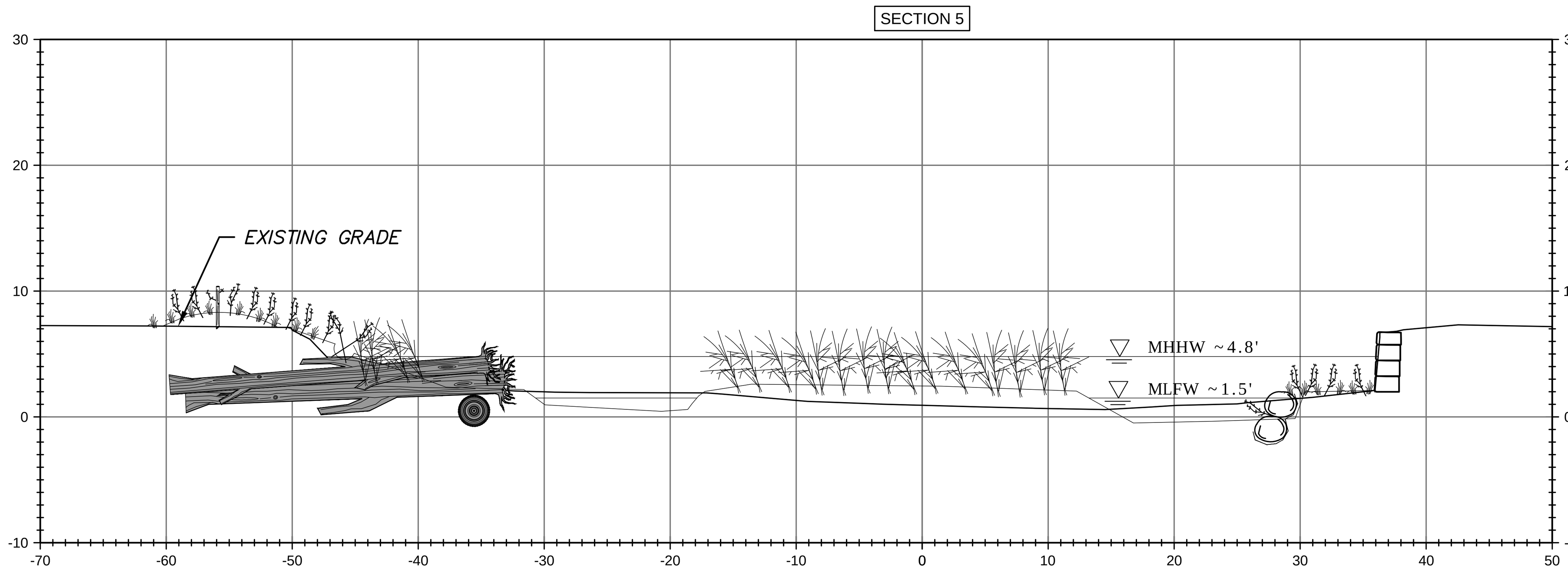

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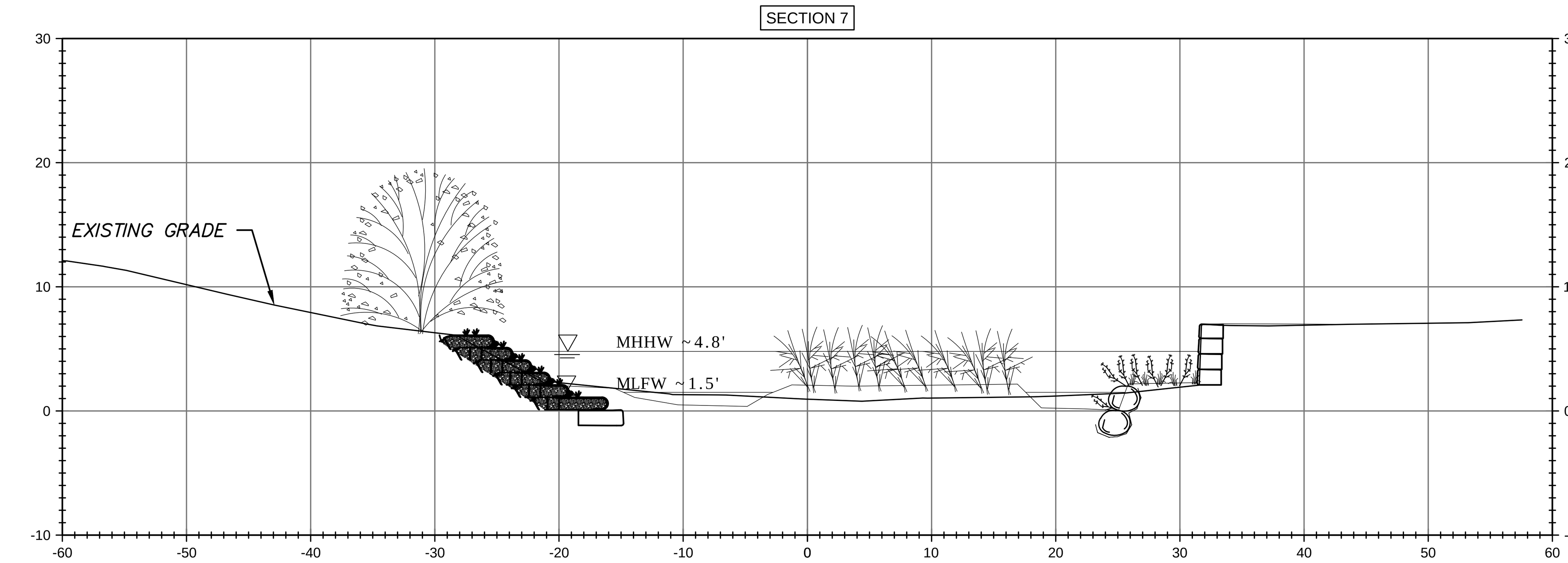

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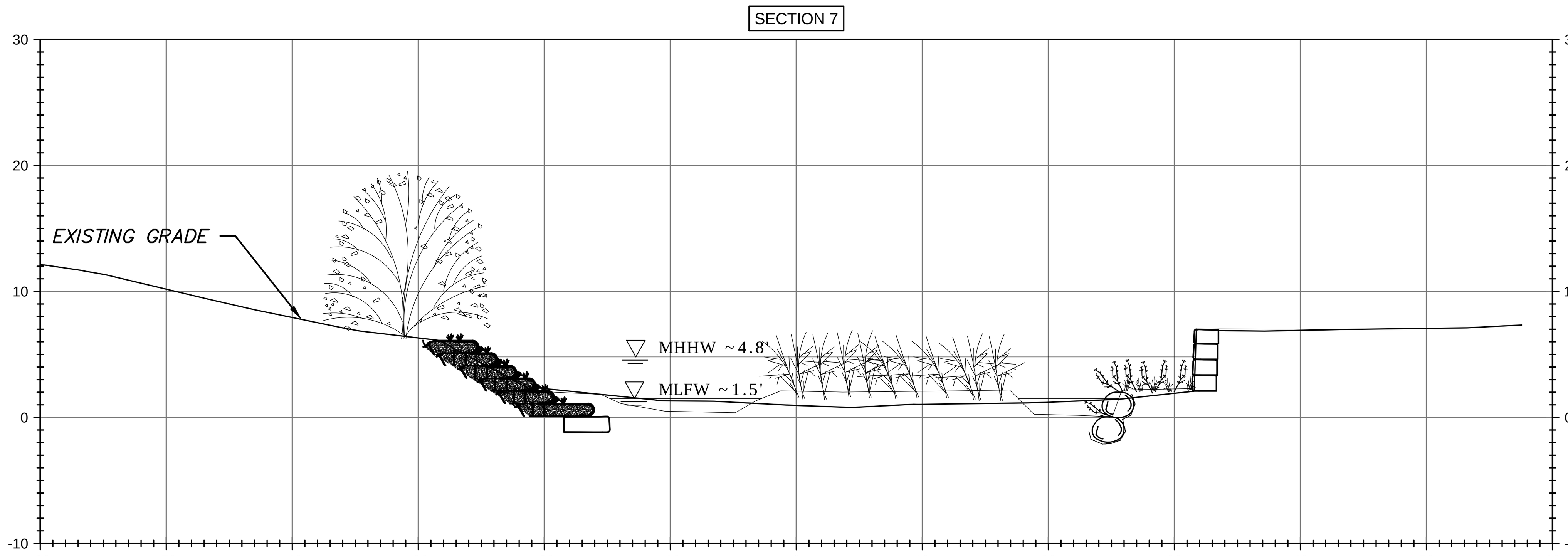

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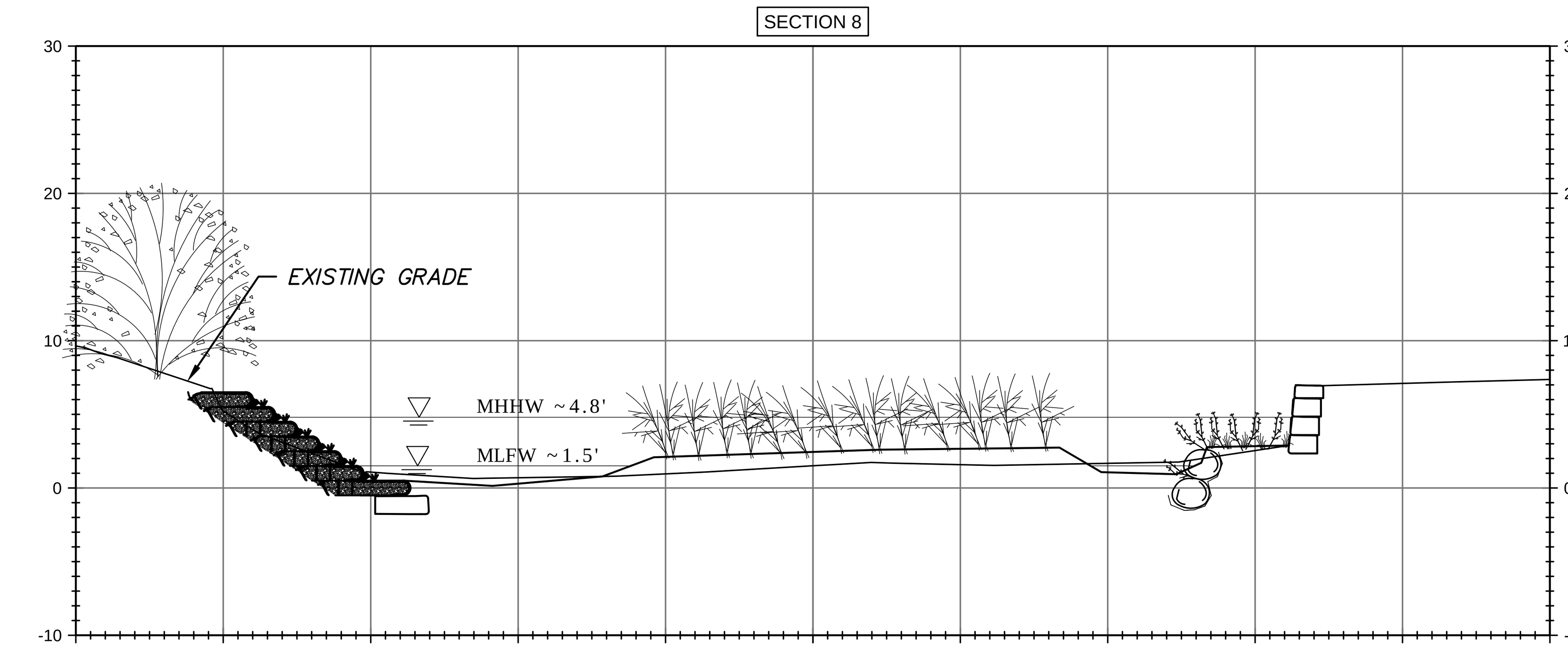

Tighe&Bond
www.tighebond.com

PERMIT SET

CENTRAL POND RESTORATION

Central Street to Knight Circle

Manchester -by-the-Sea, MA

VERIFY SCALE
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0 1 INCH
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

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DATE:	2018/01
FILE:	M1476-012-C-102_xsec.dwg
DRAWN BY:	DWB
CHECKED:	DRB
APPROVED:	DLL

TYPICAL CROSS SECTION
PROPOSED BANK TREATMENT

SCALE: HOR: 1"=10'; VER: 1"=10'

C-102

Last Saved: 3/26/2020
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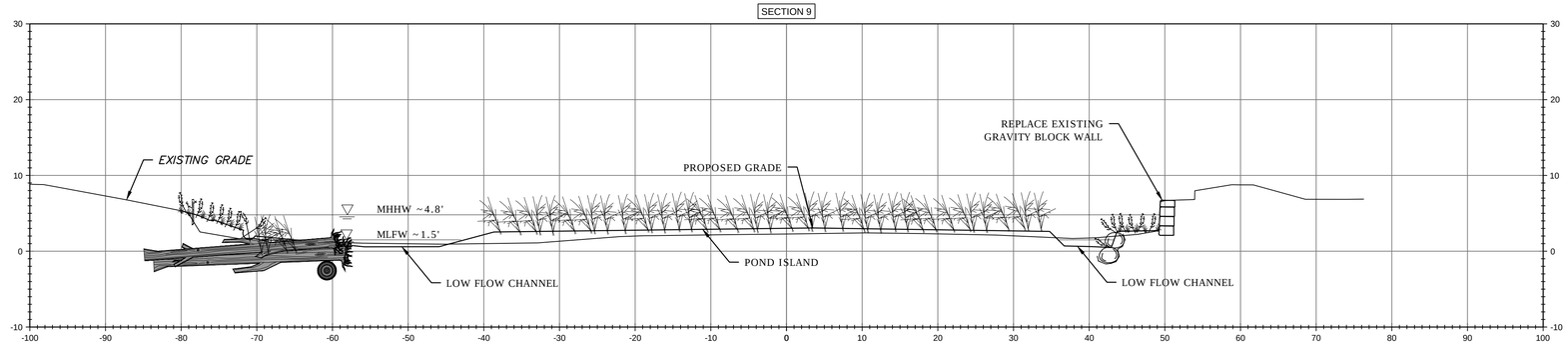
SECTION 9



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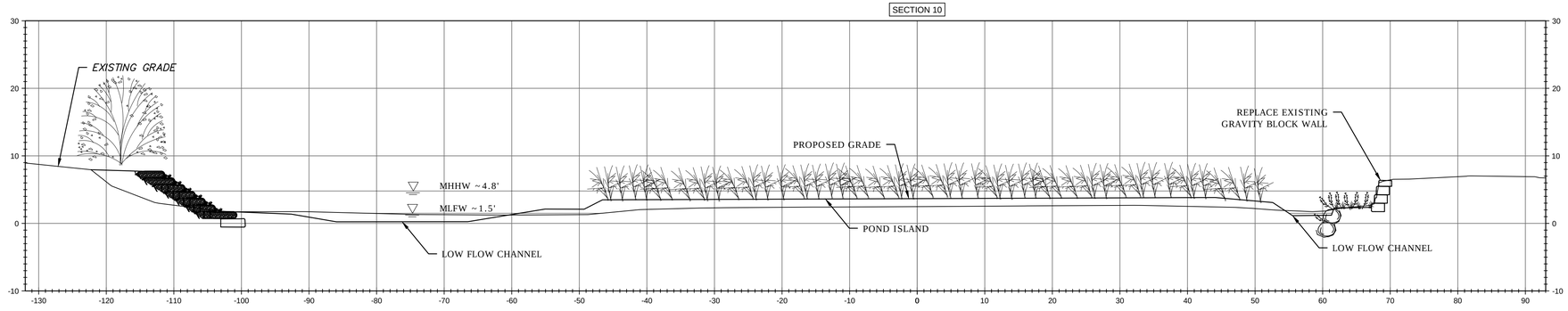

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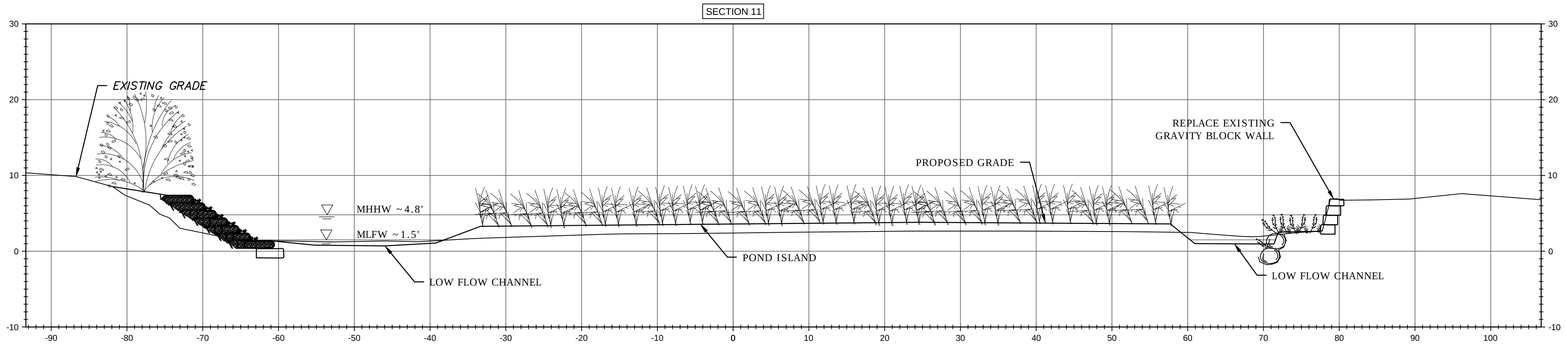

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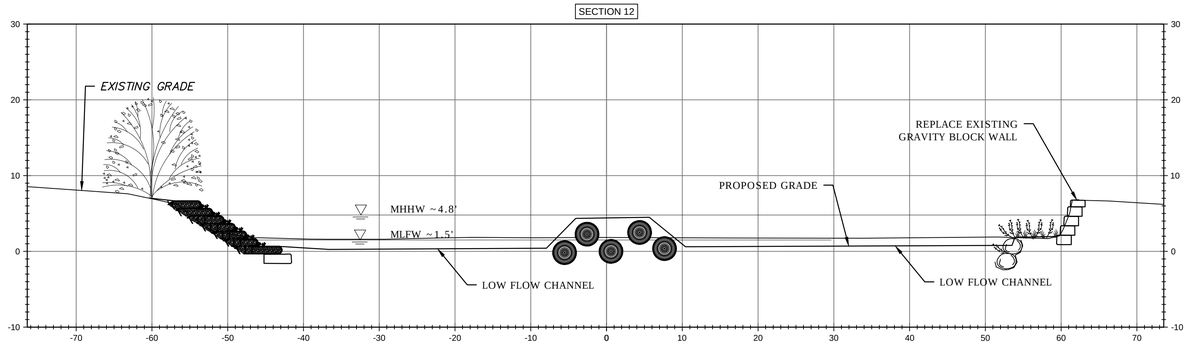

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Plotted On: Mar 26, 2020 - 9:53am By: DWBradshaw
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Tighe&Bond
www.tighebond.com

PERMIT SET

CENTRAL POND RESTORATION

Central Street to Knight Circle

Manchester
-by-the-Sea, MA

VERIFY SCALE
BAR IS 1 INCH ON ORIGINAL DRAWING
0 1 INCH
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

MARK	DATE	DESCRIPTION

PROJECT NO:	22-1467
DATE:	2018/01
FILE:	M1476-012-C-102_xsec.dwg
DRAWN BY:	DWB
CHECKED:	DRB
APPROVED:	DLL

TYPICAL CROSS SECTION
PROPOSED BANK TREATMENT

SCALE: HOR: 1"=10'; VER: 1"=10'

C-103

APPENDIX E

PUBLIC NOTICE

Environmental Monitor Public Notice

To: Josephine Wixon, MEPA Office

From: Tighe & Bond, Inc.

Date: March 13, 2020

Re: Notification of filing an NOI proposing activities as an Ecological Restoration Project

Applicant: Town of Manchester-by-the-Sea

Project Location: Central Pond, Manchester-by-the-Sea, MA

NOI Submission Date: March 30, 2020

Project Description: The Town of Manchester-by-the-Sea has filed a Notice of Intent (NOI) for an Ecological Restoration Project with the Manchester-by-the-Sea Conservation Commission for the Central Pond/Sawmill Brook restoration project. The project is part of the planned restoration of tidal flows to Central Pond currently in progress. The purpose of this project is to stabilize sources of erosion through the rehabilitation or replacement of existing retaining wall and the construction of a living shoreline in areas of Central Pond.

Reviewing Conservation Commission: Manchester-by-the-Sea Conservation Commission, Town Hall, 10 Central Street, Manchester-by-the-Sea, MA 01944 and can be reached by phoine at: (978) 526-4397.

Public Hearing Info: The public hearing schedule and agendas can be viewed on the Town of Manchester-by-the-Sea's Conservation Commission website located at: https://www.manchester.ma.us/DocumentCenter/View/2990/Manchester-Conservation-Meeting-Schedule-2020

The public hearing is anticipated to open on April 14, 2020.

Copies of the Notice of Intent may be obtained from the applicant's representative, Richard Canavan, Tighe & Bond, Inc., Email: RCanavan@tighebond.com, Phone: (508) 471-9631.

APPENDIX F

TIME OF YEAR

Commonwealth of Massachusetts

Division of Marine Fisheries

251 Causeway Street, Suite 400
Boston, Massachusetts 02114
(617)626-1520
fax (617)626-1509

Daniel J. McKiernan
Acting Director

Charles D. Baker
Governor
Karyn E. Polito
Lieutenant Governor
Kathleen Theoharides
Secretary
Ronald S. Amidon
Commissioner
Mary-Lee King
Deputy Commissioner

December 30, 2019

Kathleen Theoharides, Secretary
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office, Alex Strysky
100 Cambridge Street, suite 900
Boston, MA 02114

RE: EEA# 16127 Environmental Notification Form

Dear Secretary Theoharides:

Division of Marine Fisheries (MA DMF) staff have reviewed the ENF for the Central Street Bridge Reconstruction and Central Pond and Sawmill Brook restoration project. MA DMF has been involved with the development of this project and we will continue to provide technical support where needed.

The Sawmill Brook, including Central Pond, is migratory habitat for rainbow smelt (*Osmerus mordax*), and habitat for American eel (*Anguilla rostrata*) (Chase 2006). The proposed work may impact passage and a time of year restriction is recommended to avoid in-water and silt-producing work from March 1 to June 30 of any year (Evans et al. 2011). We recommend designing upstream substrate improvements to enhance smelt spawning riffles. Expanding the present spawning riffle to encompass a larger area upstream will be important if the tidal intrusion reaches further upstream with the removal of the tidegate. Overall, MA DMF expects this project will be a positive improvement to the ecology, stormwater management and resiliency of the Sawmill Brook.

Thank you for considering our comments. Please contact Tay Evans at 978-282-0308 x168 or tay.evans@state.ma.us if you have any questions about this review.

Sincerely,

Daniel J. McKiernan
Acting Director

cc. R. Lehan, DFG
K. Ford, DMF
B. Gahegan, DMF
E. Tully, Tighe&Bond
C. Bertoni, Manchester
B. Boeri, CZM
D. Wong, DEP

DM/TE/sd

References:

Chase, BC (2006) Rainbow smelt (*Osmerus mordax*) spawning habitat on the Gulf of Maine coast of Massachusetts. Massachusetts Division of Marine Fisheries Technical Report, 2006. Tr-30: p. 1-173.

Evans, NT, KH Ford, BC Chase and JJ Sheppard (2011) Recommended Time of Year Restrictions (TOYs) for Coastal Alteration Projects to Protect Marine Fisheries Resources in Massachusetts Technical Report DMF TR-47.

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