Central Street Bridge Replacement Project
Central Street, Manchester-by-the-Sea

Notice of Intent

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

September 2020

Tighe&Bond

M-14760-011
September 11, 2020

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

Re: **Notice of Intent (NOI)**
Central Street Bridge Replacement Project

Dear Agent Bertoni and Conservation Commissioners,

On the behalf of the Town of Manchester-by-the-Sea, Tighe & Bond is submitting a Notice of Intent (NOI) for the Central Street Bridge Replacement Project. This proposed project includes the replacement of the Central Street bridge, the removal of the tide gate structure in Sawmill Brook, and roadway improvements at Central Street.

This NOI is being filed under the Massachusetts Wetlands Protection Act (MA WPA, MGL c. 131 § 40) and its implementing regulations (310 CMR 10.00) and the Town of Manchester-by-the-Sea Wetlands Regulations (Article XVII). Wetland resources within the limit of work include Land Under Ocean (LUO), Coastal Beach, Coastal Bank, the 200-foot Riverfront Area associated with Sawmill Brook, Land Subject to Coastal Storm Flowage (LSCSF), and the 100-foot Buffer Zone to Coastal Bank. The work will also occur within the locally regulated 30-foot No-Disturbance Zone and 50-foot No-Build Zone. A copy of this NOI has been submitted to the Massachusetts Department of Environmental Protection (MassDEP) Northeast Regional Wetlands Program (NERO) and Division of Marine Fisheries (DMF). As a municipal project, there is no filing fee associated with the regulatory review. In compliance with the MA WPA and Manchester-by-the-Sea Wetlands Protection Regulations, notification to abutters regarding this NOI will be made by certified mail at least one week prior to the hearing.

We look forward to having the opportunity to discuss this project with the Manchester-by-the-Sea Conservation Commission at the October 13, 2020 public hearing. We understand that public hearings may need to be held using alternate methods given the current COVID-19 crisis. Should you have any questions or require additional information please contact me at (860) 933-1369 or RCanavan@tighebond.com.

Very truly yours,

TIGHE & BOND, INC.

Richard Canavan, PWS, PhD
Principal Environmental Scientist

Copy: MassDEP NERO
DMF - North Shore Office
Greg Federspiel, Town Administrator, Manchester-by-the-Sea

Tighe&Bond

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Appendices

J:\M\M1476 Manchester MA Hydro Study\011-Central Street Bridge\Permitting\NOI\Word Docs\3 - Draft Central Street Bridge NOI Narrative.docx

WPA FORM 3

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:
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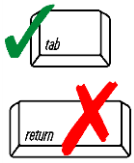

Note:
Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

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

Central Street (MA-127) and Elm Street — a. Street Address
Manchester-by-the-Sea — b. City/Town
01944 — c. Zip Code

Latitude and Longitude:
42.575262 — d. Latitude
-70.772963 — e. Longitude

f. Assessors Map/Plat Number
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
Bureau of Resource Protection - Wetlands

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A. General Information (continued)

6. General Project Description:

The Central Street bridge replacement project includes removing the tide gate and replacing the existing Central Street culvert with a 20-foot wide arch culvert. In addition, Central Street will have minimal roadway improvements conducted.

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(7)(c)(2) and 310 CMR 10.24(7)(c)(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.

Massachusetts Department of Environmental Protection
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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	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 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: 4,414 (in limit-of-work) 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.
4,414 (temporary)	4,414	0

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.

Massachusetts Department of Environmental Protection
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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	0 (alteration), 353 sf (restoration) 80 2. cubic yards dredged	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☒ Coastal Beaches	900 (temporary) 1. square feet	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	80 (temporary), 10 (permanent)	
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	6,058 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.

a. square feet of BVW

b. square feet of Salt Marsh

5. ☒ Project Involves Stream Crossings

a. number of new stream crossings

1
b. number of replacement stream crossings

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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 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

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see https://www.mass.gov/ma-endangered-species-act-mesa-regulatory-review).
Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.
** 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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C. Other Applicable Standards and Requirements (cont'd)

(c) ☐ MESA filing fee (fee information available at https://www.mass.gov/how-to/how-to-file-for-a-mesa-project-review).
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, https://www.mass.gov/service-details/exemptions-from-review-for-projectsactivities-in-priority-habitat; 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@mass.gov

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@mass.gov

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. ☐ Is this an aquaculture project? d. ☐ Yes ☒ No

If yes, include a copy of the Division of Marine Fisheries Certification Letter (M.G.L. c. 130, § 57).

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

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

4. 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). **Note:** electronic filers click on Website.

b. ACEC

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

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.

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.

Massachusetts Department of Environmental Protection
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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 Street Bridge Replacement
a. Plan Title

Tighe & Bond, Inc.
b. Prepared By

David Loring, PE
c. Signed and Stamped by

d. Final Revision Date

Varies
e. Scale

f. Additional Plan or Document Title

September 2020
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

Massachusetts Department of Environmental Protection
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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.

1. Signature of Applicant	2. Date: 9/1/2020
3. Signature of Property Owner (if different)	4. Date: 9/3/2020
5. Signature of Representative (if any)	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

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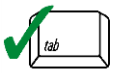

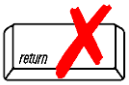

A. Applicant Information

1. Location of Project:

Central Street (MA-127) and 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 4.f.	1	$1,450	N/A - Fee Exempt

Step 5/Total Project Fee:

Step 6/Fee Payments:

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

Manchester Conservation Commission
Instruction Checklist for Notices of Intent

REVISION DATE: 6/18/20

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 on the Conservation webpage. 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).
3. 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.
4. 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)
5. 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.)
6. 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.)
7. After notifying abutters, complete the Affidavit of Service form and submit it with your application.
8. Make packets (and copies) as described under "Submissions" below. Note that materials MUST BE collated into packets including *folded* plans.
9. 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. For files too large to email, 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 NOON pm on the Deadline Date:

1. Eight (8) Full Packages as described below, plus one additional set for MassDEP.
2. An electronic version of the package (e-mailed or contact the Conservation Administrator).
3. Three checks made out to the "Town of Manchester" for the following:

N/A ☐ Town portion of State Filing Fee (Fee Exempt-Municipal Project)

N/A ☐ By-Law Filing Fee (Fee Exempt- Municipal Project)

☑ $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)

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

Email a full Package to NERO_NOI@mass.gov with the required subject line:

MANCHESTER – NOI – *Street Address – Applicant name*

(Note: the maximum file size MassDEP can receive is 15MB. For emailed submissions that exceed 15MB (e.g. NOIs), please break them into more than one email, with each email having the same subject line shown above, with 1, 2, 3...etc. at the end.)

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

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SECTION 1

Section 1
Introduction

This Notice of Intent (NOI) is being submitted on behalf of the Town of Manchester-by-the-Sea (Town) for the Central Street Bridge Replacement Project (Project). The proposed project consists of the replacement of the Central Street Bridge through demolition of the existing 16-foot span and replacement with a 20-foot pre-cast concrete arch bridge. During the demolition of the exiting bridge an existing tide gate structure at the downstream face of the bridge will also be demolished and removed. The tide gate removal and increased hydraulic opening of the replacement bridge will significantly improve the tidal flushing at Sawmill Brook and Central Pond upstream of this road crossing and restore fish passage for the rainbow smelt; a "Species of Concern."

The bridge replacement includes roadway improvements at Central Street, including new ADA compliant sidewalks and curb ramps to enhance the walkability and accessibility of downtown Manchester-by-the-Sea.

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 constrained 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.

Many areas of the Town of Manchester-by-the-Sea are subject to flooding during extreme storm events. Flooding is a particular problem within the Sawmill Brook watershed, particularly in the lower reaches of the Brook. 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. In the lower reaches of Sawmill Brook, undersized culverts and an improperly functioning tide gate have caused stream banks to overtop, leading to stream bank erosion. The Fire Station and several residential and business properties surrounding Central Pond are periodically impacted by minor property flooding.

The Central Street tide gate and related structures are in need of modification to provide better functionality for drainage and fish passage. The tide gate and bridge at Central Street impede stream flows in Sawmill Brook, especially during coastal storm events, resulting in localized flooding. The Central Street Bridge structure currently overtops during extreme storm events and is structurally deficient. Seepage through the seawall due to hydrostatic pressure from the tide gate is damaging the roadbed. Culvert arch stones are becoming unstable. The tide gate and weir at the Central Street Bridge have been identified by the Division of Marine Fisheries as an impediment to fish passage, notably impacting rainbow smelt (*Osmerus mordax*), a diadromous fish species designated by the National Marine Fisheries Service as a "Species of Concern", a precursor to listing under the Federal Endangered Species Act.

Numerous State and Federal agencies are supporting partners in the work to improve fish passage at the Central Street crossing of Sawmill Brook, providing grant funding, technical guidance, and public outreach support. These include 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.

An Ecological Restoration Notice of Intent for the Central Pond and Sawmill Brook Restoration Project (MassDEP File number 039-0824), that includes the repair and replacement of failing retaining walls, the construction of living shoreline stabilization elements, and native plantings in order to enhance ecological conditions and coastal resiliency upstream of Central Street Bridge was issued an Order of Conditions on June 4, 2020. Additional approvals for the restoration project are pending review. An Environmental Notification Form (ENF, EEA #16127) was submitted to MEPA in December 2019 for both the Central Street Bridge Replacement Project and the Central Pond/Sawmill Brook Restoration Project, and a Certificate of the Secretary of Energy and Environmental Affairs on the ENF was received on January 10, 2020. These projects were separated in permit applications following the ENF because it is anticipated that funding sources for the bridge replacement will not be applicable to the ecological restoration and slope stabilization work.

A Site Locus Map (Figure 1), MassDEP Priority Resource Area Map (Figure 2), and Existing Conditions Map (Figure 3) are provided in Appendix A, that also includes project plans showing existing and proposed conditions. Photographs of the existing site are provided in Appendix B.

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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 Project Site Conditions

Sawmill Brook and associated tributaries have a five square mile watershed in the central portion of the Town of Manchester-by-the-Sea. Sawmill Brook flows to Manchester Harbor through a 16-foot wide bridge at Central Street (Route 127) that has a tide gate at the downstream face of the bridge. The crossing is constructed of three integrated parts including a bridge, tide gate and coastal wingwall. The bridge consists of a 16-foot span mortared stone masonry circular arch bridge with stone masonry wingwalls and headwalls. Timber cribs functioning as weirs are imbedded into the bottom of the stream bed. A concrete and iron tide gate abuts the bridge to the south. The bridge was rebuilt around the mid 1900's and a tide gate was installed to control the Brook and create Central Pond just upstream. A stone and masonry wingwall abuts the bridge in the southwest quadrant, functioning as a seawall.

Tighe & Bond evaluated the bridge and tide gate in June 2015. The passage under the bridge discharges flow from Sawmill Brook via a narrow, channelized reach, with 12-foot high granite walls and buildings abutting either side. The bridge has historically suffered due to the tide gate impound waters upstream of the bridge, causing seepage and loss of backfill material when large precipitation events and high tide elevations are concurrent. Multiple hydrologic and hydraulic models of the watershed and bridge indicate that the bridge opening is undersized to pass current design storm events without over-topping with concurrent tail water impacts due to storm surge.

In June of 2016, the bridge underwent interim repairs intended to temporarily stabilize the structure. The open joints were grouted using a pressure injection method and the void below the footing was formed and filled with cast-in-place concrete. An August 13, 2018 site visit confirmed the conditions observed in the 2015 site visit, including water seepage paths, damming conditions caused by the tide gate, separation and settlement of culvert arch stones, and concrete degradation.

The bridge is referenced in the Manchester Village National Register of Historic Places registration form as appearing to be of modern construction, and marks the entrance to downtown Manchester-by-the-Sea. Water, drainage, sewer, electric, and gas utilities are located within the roadbed over the arch bridge.

Downstream of the Central Street Bridge is the tide gate that consists of a concrete gravity weir surrounding the Sawmill Brook outlet. The Sawmill Brook passes through an opening in the weir restricted by a 6.5 by 5.5 foot cast iron slide gate controlled with an electric actuator. The actuator is located on a modern galvanized catwalk above the gate.

The tide gate serves as a major hydraulic restriction for Sawmill Brook. When the tide gate is closed, it reduces tidal fluctuations within Sawmill Brook and Central Pond,

although it is overtopped during very high tides. During rainstorms, it causes flooding of low-lying properties abutting Central Pond. To alleviate this flooding the slide gate has been left open, partially restoring upstream tidal flows.

The existing tide gate structure has a top of wall elevation just above mean higher high water level (MHHW), making this a significant obstruction to rainbow smelt passage during many high tides. Tidal water levels will rise over these walls on spring high tides (full moon or new moon) and during higher than predicted tides associated with atmospheric low pressure or wind setup, and such conditions will periodically allow rainbow smelt to swim over the walls when the tide gate is closed. This tide gate wall overtopping on spring high tides and storm surge tides does indicate that the tide gate is not effective in preventing seawater flooding.

Recent preliminary topographic survey indicates Central Street at this location is within about 1 foot of tidal flooding, based on recorded high tides from the storm of 1978 (NOAA Boston tide record at 93% height correction for Manchester). This was confirmed during the January 4, 2018 record high tide event during Winter Storm Grayson. The frequency of tidal flooding of the roadway will be increasing based on the current mean sea level rise relative to land (including land subsidence) of 0.92 feet per 100 years recorded in Boston (NOAA), and also based on forecast predictions of an increasing rate of relative sea level rise (IPCC).

This tide gate is a bottom opening gate that is not suitable to partial opening for smelt passage due to the head pressure and high flow velocities associated with a limited gate opening needed to maintain the impoundment pond. Full opening of the gate during smelt migration is feasible, though velocities during rainfall events would need to be checked relative to smelt swimming speeds. Even with the tide gate open to allow for fish passage, there are two more weirs inside the stone arch culvert. Since the smelt are not able to jump up weirs, the tide will need to rise to at least 2/3 of mean high tide to allow smelt to swim upstream past these weirs. The DER has selected this area as a provisional Massachusetts Priority Project due to the potential restoration benefits that can be realized in this location, and the level of commitment demonstrated by the community to accomplish these goals.

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
- Riverfront Area
- 100-foot Buffer Zone

- Land Subject to Coastal Storm Flowage (LSCSF)
- 50-foot No Build Zone (Local Bylaw)
- 30-foot No Disturb 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 as it flows to Manchester Harbor. The upper limit of LUO is the Mean Low Water (MLW). Mean Lowest Low Water (MLLW) in the bay is estimated to be approximately -5.5 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 and upstream areas of Sawmill Brook.

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. The intertidal area within Sawmill Brook in the project area includes a range of substrates from bedrock through cobbles and coarse sand. This area was classified in the delineation as Coastal Beach and not Rocky Intertidal Shore because the area is not limited only to rocky substrates. The increased velocity of flows in Sawmill Brook at the relatively narrow bridge reduce the amount of fine grained sediment in the project area relative to the harbor or Central Pond.

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.

The eastern and western banks by the bridge have no regulatory WPA Coastal Bank based on the cross-sectional transect. Due to the location of the current infrastructure and nearby development, the transects encountered buildings. The transects stopped at the

base of the buildings. The landform behind the retaining wall is considered Coastal Bank in this area. The Bank is armored with a wall in this section. The top of Bank generally consists of impervious surfaces associated with roadways, sidewalks, and parking lots, as well as maintained commercial lawns.

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 5) 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 detailed map of the FIRM at the project area is provided in Appendix A (Figure 4).

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.

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SECTION 3

Section 3
Project Description

3.1 Alternatives Analysis

During a June 2015 in-water walk-through to view existing conditions evidence of advanced deterioration were observed at the Central Street bridge, including separation of joints, cracked blocks, wall seepage, and foundation undermining. Emergency repairs were made in June 2016 to temporarily stabilize the existing arch barrel and footing, but continued deterioration due to water seepage, scour, settling, and stone separation is inevitable without major repairs or replacement. The existing tide gate and bridge at Central Street impede flow from Sawmill Brook, especially during coastal storm events, resulting in localized flooding.

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 therefore not considered. On-site alternatives considered for the project included a no action alternative, repair, or replacement of the Central Street culvert/bridge. Factors considered in the evaluation of alternatives include environmental impacts, public safety, climate change resiliency, and rainbow smelt spawning condition improvements.

In both the repair and replacement alternatives, the existing tide gate is proposed to be removed as it has been identified by DMF, DER, and NOAA as an impediment to rainbow smelt fish passage. The existing deteriorated bridge is proposed to be rehabilitated or replaced to address public safety concerns. Alternatives for the bridge structure are limited by depth to bedrock, the presence of buildings immediately adjacent to the bridge and roadway, and constraints imposed by numerous utilities on the site.

3.1.1 No Action

The no action scenario would result in no immediate direct impacts or costs, but will result in increasing safety and functionality concerns over time, if deterioration of the bridge and tide gate is allowed to continue at the current pace. Impacts from flooding associated with the tide gate would continue to negatively affect adjacent property owners and rainbow smelt spawning conditions. As the no action alternative does not meet project goals of addressing failing infrastructure, reducing flooding and increasing resiliency, and improving habitat conditions and possibility for rainbow smelt, it is not preferred.

3.1.2 Rehabilitate Bridge and Culvert Structure, Remove Tide Gate

Rehabilitating the existing bridge and culvert structure and removing the tide gate structure is anticipated to result in improved hydraulic capacity, habitat restoration, improvements to aesthetics and water quality, and a reduction in upstream flooding due to the removal of the tide gate.

However, rehabilitation would only provide a temporary solution to the continued deterioration of the bridge and culvert structure, would not allow for implementation of pedestrian and traffic safety improvements, and would not maximize the bridge opening for the brook.

3.1.3 Replace Culvert with Bridge, Remove Tide Gate (Preferred)

The Town has identified the existing narrow roadway width of the Central Street bridge as a safety issue with respect to pedestrian, bicycle, and automobile traffic. Although options to widen the roadway are limited due to abutting businesses, even a modest increase in roadway width will improve safety. Concerns with the replacement alternative include temporary water quality impacts, a change in hydrology and increased tidal range relative to existing conditions, a shift in species, and temporary water quality impacts.

Replacing the existing culvert with a precast concrete bridge structure and removing the existing tide gate is anticipated to result in improved hydraulic capacity, habitat restoration, improvements to aesthetics and water quality, improvements to roadway safety, and a reduction in upstream flooding.

3.2 Proposed Activities

The proposed condition improvements include removing the tide gate and replacing the existing Central Street culvert with a 20-foot wide arch culvert. The proposed culvert would maintain the existing upstream and downstream invert elevations (-0.2 feet NAVD88, and -4 feet NAVD88, respectively), and provide a constant low chord elevation of 6 feet NAVD88.

Removal of the tide gate and enlargement of the culvert will improve fish passage and increase the hydraulic capacity of Sawmill Brook reducing upstream flooding. Removing the tide gate will also limit the hydraulic pressure behind the seawall and reduce safety concerns. Restoration of the seawall and guard rail will improve traffic safety. Stream restoration will improve habitat and aesthetics in the downtown area. The public location is also ideal for educational signage about Sawmill Brook's natural history.

The proposed project includes:

- **Removal of the tide gate.** This work will include demolition of the concrete tide gate structure, slide gate, catwalk, and associated infrastructure to restore the unrestricted flow of Sawmill Brook into Manchester Harbor.
- **Replacement of the Central Street Bridge.** The existing bridge, including the concrete beam span section on the downstream side and upstream stone arch culvert, with be demolished and replaced with a concrete arch culvert with a span of approximately 20 feet, which will have greater capacity than the existing structure. The visible elements of the replacement structure and street furnishings will have a stone appearance in keeping with the aesthetic of the adjacent stone sea wall.
- **Central Street roadway improvements.** The roadway portion of this project is an isolated bridge reconstruction and not part of larger corridor improvement. Conscious effort was made to minimize the overall footprint of the work to limit impacts and cost. The existing horizontal and vertical alignments were matched to the extent practicable, roadway function was matched, and drainage patterns were preserved. Minor improvements were made to curb line geometry to improve overall traffic operation.

  The proposed roadway section matches with the objectives of the Town of Manchester-by-the-Sea to have a more pedestrian friendly downtown village environment. The Town has taken a "complete streets" approach to the downtown

area including recent corridor improvement studies. The proposed roadway cross-section is consistent with the overall plan for the area and will interface well with future improvements. The design includes new ADA compliant sidewalks and curb ramps to enhance the walkability and accessibility of downtown. The design also includes a curb extension ("bump-out") on the bridge to enhance pedestrian safety and provide traffic calming along the corridor. Given the limited right-of-way, bicycle accommodation is provided in the travel lane. A "take-the-lane" cycling approach is appropriate through the downtown due to low motor vehicle speeds and ample sight distance.

The proposed project will be performed with measures to minimize potential construction disturbances. As noted below, in some instances specific construction means and methods will be determined by the contractor. Due to construction safety concerns, the contractor will be responsible for providing public safety protection measures, including safety signage and observation to ensure that the public stays at a safe distance from active equipment and does not enter potentially unsafe active work areas.

3.3 Site Access and Construction Staging

Access to the proposed work area will be from Central Street. Staging of equipment and materials will likely be handled in the municipal parking lot along Church Street. Should this happen, existing parking on Church Street will be impacted temporarily. Staging areas will 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 swept free of excavated materials on a daily basis. Final location of staging and material handling will be further defined during later stages of design development.

3.4 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
- Install coffer dams, turbidity curtain, and oil booms for water control for phased construction at one abutment then the other
- Construct temporary Elm Street roadway and establish detours and road closures
- Provide temporary utilities as necessary for demolition
- Remove tide gate and existing bridge structure with demolition shielding
- Reconstruct Central Street bridge with roadway improvements
- Remove coffer dam, temporary stream access points and in-channel BMPs
- Restore disturbed areas in-kind

- Remove erosion and sedimentation controls pending approval from the Manchester-by-the-Sea Conservation Commission

3.5 Construction-Period Best Management Practices

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. Additional details are provided on the Project Plans provided in Appendix A.

3.5.1 Limits of Work

The upgradient boundary of work areas will be lined with orange safety fencing before the start of site clearing activities, except where chain link fencing is required to restrict public access.

3.5.2 Catch Basin Protection

Silt sacks will be installed in existing catch basins during construction.

3.5.3 Erosion Control Barriers

Wetland resource areas at the site will be protected by compost filter tubes, or the approved equivalent. Protective measures will be placed in a fashion that restricts the contractor to the areas necessary to conduct the work and will define the limits of work. The locations of these barriers are illustrated on the Project Drawings provided in Appendix A and will also be used as staging and stockpile areas where appropriate. The Contractor will be required to maintain a reserve supply of compost filter tubes on-site to make repairs as necessary. Protective measures will be inspected after significant precipitation events and repaired as necessary.

3.5.4 Cofferdams

Cofferdams constructed of supersacks wrapped in impervious plastic liner with native alluvium backfill on the isolated side of the cofferdam are proposed to be placed upstream and downstream of the bridge replacement work area as shown on Sheets C-005 in the Project Plans provided in Appendix A. Dewatering pump discharge from within cofferdam work areas shall be released into sediment traps away from Sawmill Brook and construction activities, all return flows must meet permit requirements for turbidity, and pump intakes will be screened for fish protection. The cofferdam placement will be staged with demolition and construction work occurring at one of the bridge abutments and then switching to the opposite side. This will allow for continuous flow of Sawmill Brook throughout construction. The contractor will be required to submit a staging and dewatering plan for engineering review to ensure that adequate areas for flow in the channel are maintained. Additional cofferdam details are provided on Sheet C-504 in the Project Plans.

3.5.5 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 work will seek to minimize dewatering through the use of the cofferdams and avoiding work at high tides.

3.5.6 Stockpile Management

Stockpiles of materials removed during construction activities will 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 will be seeded or covered.

3.5.7 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 provided in Appendix A. Restoration of upland areas will 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. Disturbed upland areas shall then be hydroseeded with an approved dry site restoration seed mix at the rate recommended by the manufacturer. 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.

Tighe&Bond

SECTION 4

Section 4
Regulatory Compliance

The proposed project has been designed to avoid environmental impacts when possible, minimize unavoidable impacts when practicable, and provide mitigation that is commensurate with the proposed alterations. Descriptions of the project's compliance with the regulatory requirements of the WPA and the Manchester-by-the-Sea Wetlands Bylaw and Regulations (Article 17) are provided in the following sections.

4.1 Massachusetts Wetlands Protection Act

4.1.1 Limited Project Status

The proposed bridge replacement qualifies for consideration as a Limited Project in accordance with 310 CMR 10.24(7)(c)(2):

> *The maintenance, repair and improvement (but not substantial enlargement except when necessary to reduce or eliminate a tidal restriction) of structures, including buildings, piers, towers, headwalls, bridges and culverts which existed on November 1, 1987.*

The proposed roadwork replacement qualifies for consideration as a Limited Project in accordance with 310 CMR 10.24(7)(c)(1):

> *The maintenance and improvement of existing roadways, but limited to widening less than a single lane, adding shoulders, correcting substandard intersections, and improving inadequate drainage systems.*

4.1.2 WPA Riverfront Area Exemption

The proposed bridge 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.

4.1.3 Summary of WPA Jurisdictional Alterations

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.

Resource Area	Activity	Temporary Impacts (sf)	Permanent Impacts (sf)	Total Disturbance (sf)
Coastal Bank [a]	Bridge Replacement	80 lf	10 lf	90 lf
Land Under Ocean	Tide gate removal	0	+353	353
Coastal Beach	Temporary cofferdam area	900	0	900
Riverfront Area – Inner 100 ft	Limits-of-work	4,414	0	4,414
LSCSF [b]	Tide gate removal, limits-of-work	6,058	0	6,058
Total [c]		7,372	353	7,725

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

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

[c] Total impacts are in sf and therefore do not include lf of Coastal Bank impacts

Wetland resource area impacts are primarily associated with temporary construction-period impacts during the bridge reconstruction. Construction-period impacts to existing, disturbed buffer zone to Coastal Bank are also anticipated. The Coastal Bank buffer zone is located within LSCSF and Riverfront Area. The work will only occur within the first 100 feet of Riverfront Area. As discussed previously, the tide gate and bridge at Central Street is the mouth of the coastal river and end of Riverfront Area.

As the proposed bridge reconstruction is located within the overall footprint of the existing bridge and roadway, there are minimal anticipated permanent impacts associated with that phase of the project. The permanent impacts associated with the tide gate removal result in a net increase in resource areas size for LUO and Coastal Beach.

4.1.4 Performance Standards Compliance

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.

4.1.4.1 Land Under Ocean

The proposed tide gate removal and bridge replacement will result in permanent impacts to LUO, totaling approximately 353 square feet (sf). LUO will be restored in an approximately 353 sf area with the tide gate is removal. In addition, approcimately 35 cubic yards (cy) will be dredged in order to install the bridge footings and remove the tide gate. 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 remove the existing tide gate and to install the footings for the replacement bridge. The project involves the excavation of material to replace the existing bridge. These temporary impacts are necessary in order to reduce storm damage within the project area and within the riverine system. In addition, the bottom topography will be restored following the completion of construction.

(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. The goal of the project is to improve natural tidal flow conditions in the project area by removing the existing tide gate to facilitate ecological restoration within the riverine system. 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 3.5 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 and fish passage within Sawmill Brook by removing the existing tide gate and restoring the tidal flow within the Brook. The impacts to the resource area are temporary and necessary to accomplish this goal. In addition, this area is not located within *Estimated Habitat of Rare Wildlife* or *Priority Habitat of Rare Species*.

4.1.4.2 Coastal Beach

The proposed bridge replacement and tide gate removal will result in temporary impacts to Coastal Beach, totaling approximately 900 sf. Approximately 900 sf of Coastal Beach will be temporarily impacted as a result of the coffer dam placement which will facilitate the bridge replacement. 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 project's alteration of Coastal Beach is limited and is a result of the temporary installation of cofferdams to facilitate work in the dry for the bridge replacement and the tide gate removal.

(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 re-dredged 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.

4.1.4.3 Coastal Bank

The proposed tide gate removal and bridge replacement will result in both temporary and permanent impacts to Coastal Bank, totaling approximately 90 linear feet (lf). Approximately 80 lf of Coastal Bank will be temporarily impacted as a result of the bridge replacement. Coastal Bank will be permanently impacted by a loss of approximately 10 lf as the replacement bridge has a wider span. 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 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 with a wall above and below the Central Street bridge. The proposed work will protect physical stability of the bank within these areas by maintaining the existing walls. The bank stability within the project area is not anticipated to be adversely affected by the bridge replacement or tide gate removal.

(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. The expansion of the existing hydraulic opening of the bridge is intended to improve the flood conditions within the area. As this Coastal Bank is not a sediment supply to a beach and is a structural bank, the replacement of the bridge and the tide gate removal are 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. As mentioned above, this area is not located within *Estimated Habitat of Rare Wildlife* or *Priority Habitat of Rare Species*.

4.1.5 Abutter Notification

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.

4.1.6 Stormwater Management

As described in the Stormwater Checklist and Report provided in Appendix D, the proposed redevelopment project does not create any new point source discharge of stormwater runoff to Sawmill Brook, and will not result in a net change in impervious ground surface over existing conditions. The project is not considered to be a Land Use with Higher Potential Pollutant Loads (LUHPPL). The project design includes conveyance of runoff from the proposed roadway improvement areas to a stormwater treatment unit prior to discharge, as described in the Long-Term Pollution Prevention Plan in Appendix D. Construction-period erosion and sedimentation controls are identified on the Project Plans provided in Appendix A.

4.2 Manchester-by-the-Sea Wetlands Bylaw

The proposed activities are also subject to the Town of Manchester-by-the-Sea Wetlands Protection By-law (Article XVII of the General By-laws) and Town of Manchester-by-the-Sea Wetlands Regulations. The proposed work will occur within Riverfront Area, Coastal Bank, LUO, Coastal Beach, the No Disturb 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.

4.2.1 Coastal Bank

Section 9.6 of the Town of Manchester-by-the-Sea Wetlands Regulations establishes additional Coastal Bank performance standards from the WPA as follows:

Prior to the issuance of a permit for work or activity which Alters a Coastal Bank, the Applicant shall demonstrate by Clear and Convincing Evidence as set forth in an Alternatives Analysis that there is no Practicable Alternative to the work or activity proposed.

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.

The preferred stabilization methods for coastal banks include, but are not limited to, protective plantings and other non-structural stabilization techniques. Any Alteration which includes new, or the expansion of existing, coastal engineering structures such as, but not limited to, bulkheads, revetments, seawalls, or groins shall not be permitted without Clear and Convincing Evidence that:

9.6.1 the structure can be constructed to maintain structural integrity and stability for at least twenty-five (25) years at the locus; and 9.6.2 there is no other technically feasible method of protecting a building or property other than the proposed coastal engineering structure and that any such structure shall not have an adverse impact on adjacent or nearby coastal banks, beaches or dunes.

and

9.6.2 there is no other technically feasible method of protecting a building or property other than the proposed coastal engineering structure and that any such structure shall not have an adverse impact on adjacent or nearby coastal banks, beaches or dunes

The proposed project involves the replacement of an existing bridge located in downtown Manchester-by-the-Sea. The replacement bridge will be located within the footprint of the old bridge, so no new structure is proposed. The new bridge will have an increase hydraulic capacity so will improve the in-stream resource conditions. The anticipated design life of the bridge is approximately 75 years. Due to the location of existing buildings east and west of the bridge and the existing ecology of the stream, plantings and non-structural stabilization techniques are not feasible within this area. As stated above, the Coastal Bank serves as a structural Bank and the replacement of it in-kind is not anticipated to have any adverse impact on the Coastal Beach or other resource areas.

4.2.2 Riverfront Area

Section 9.8 of Article XVII establishes additional Riverfront Area performance standards from the WPA.

9.8.1 there is no practicable alternative to the proposed project with less adverse effects; and

9.8.2 such activities, including proposed mitigation measures, will have no significant adverse impact on the areas or values protected by this By-Law.

Section 3.1 details the alternative analysis for Riverfront Area. As stated previously, due to the location of the existing infrastructure, the project cannot be moved to another location. The only practical alternative to address the current condition of the infrastructure is to replace the current bridge. In addition, the removal of the tide gate will improve the ecological conditions within the Sawmill Brook.

4.2.3 No Disturb Zone

Section 10.1 of Article XVII establishes a 30-foot No Disturb Zone (NDZ). The NDZ consists of residential and commercial buildings, paved roadways and commercial parking lots, and commercial lawns. The proposed bridge replacement and roadway improvements.

4.2.3.1 No Disturb 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 current conditions involve frequent flooding of the nearby infrastructure, including the Fire Department. The replacement of the bridge includes design elements to improve conditions relating to flooding, fish passage, and roadway safety. The temporary disturbance would be negligible compared to the continued deterioration of the bridge and roadway. Therefore, the Town respectfully requests a variance to conduct work within the NDZ.

4.2.4 No Build Zone

The No Build Zone (NBZ) is defined as the 50-foot area landward of resource areas, in accordance with Section 10.1 of Article XVII. The NBZ consists of residential and commercial buildings with maintained lawns, and paved roadways and commercial parking lots. The project proposes to replace the existing bridge and conduct roadway improvements within the NBZ.

4.2.4.1 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 Town respectfully requests a variance to conduct work within the No Build Zone.

J:\M\M1476 Manchester MA Hydro Study\011-Central Street Bridge\Permitting\NOI\Word Docs\3 - Draft Central Street Bridge NOI Narrative.docx

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

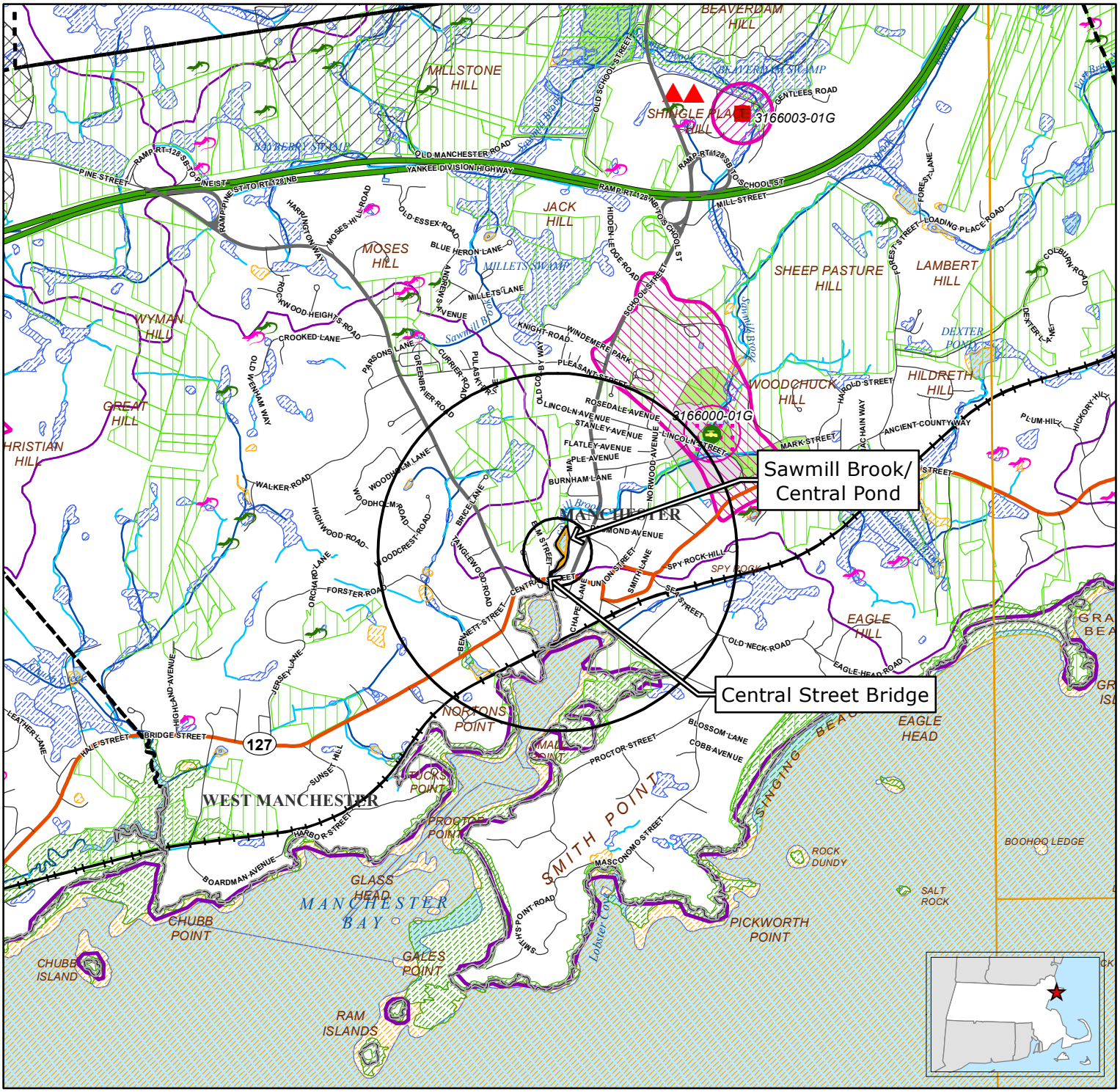
FIGURE 1
SITE LOCATION

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

September 2019

V:\Projects\M\m1476\CentralSt_Bridge_MA\Maps\CentralSt_Bridge_MA_Topo.mxd [Exported By: kjw, 9/19/2019, 1:15:59 PM]

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

1:24,000

0 1,000 2,000

Feet

N

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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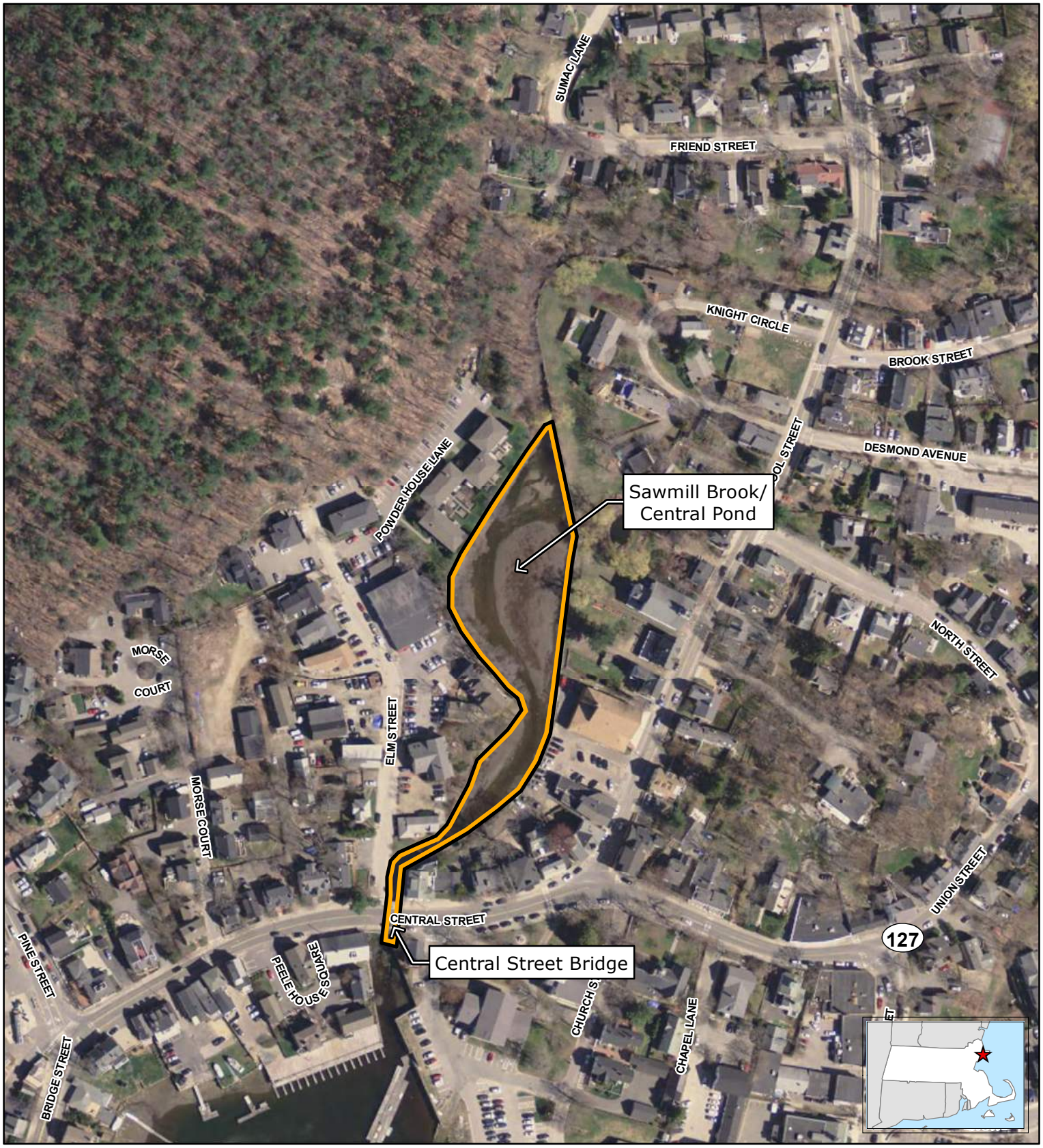


Legend

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

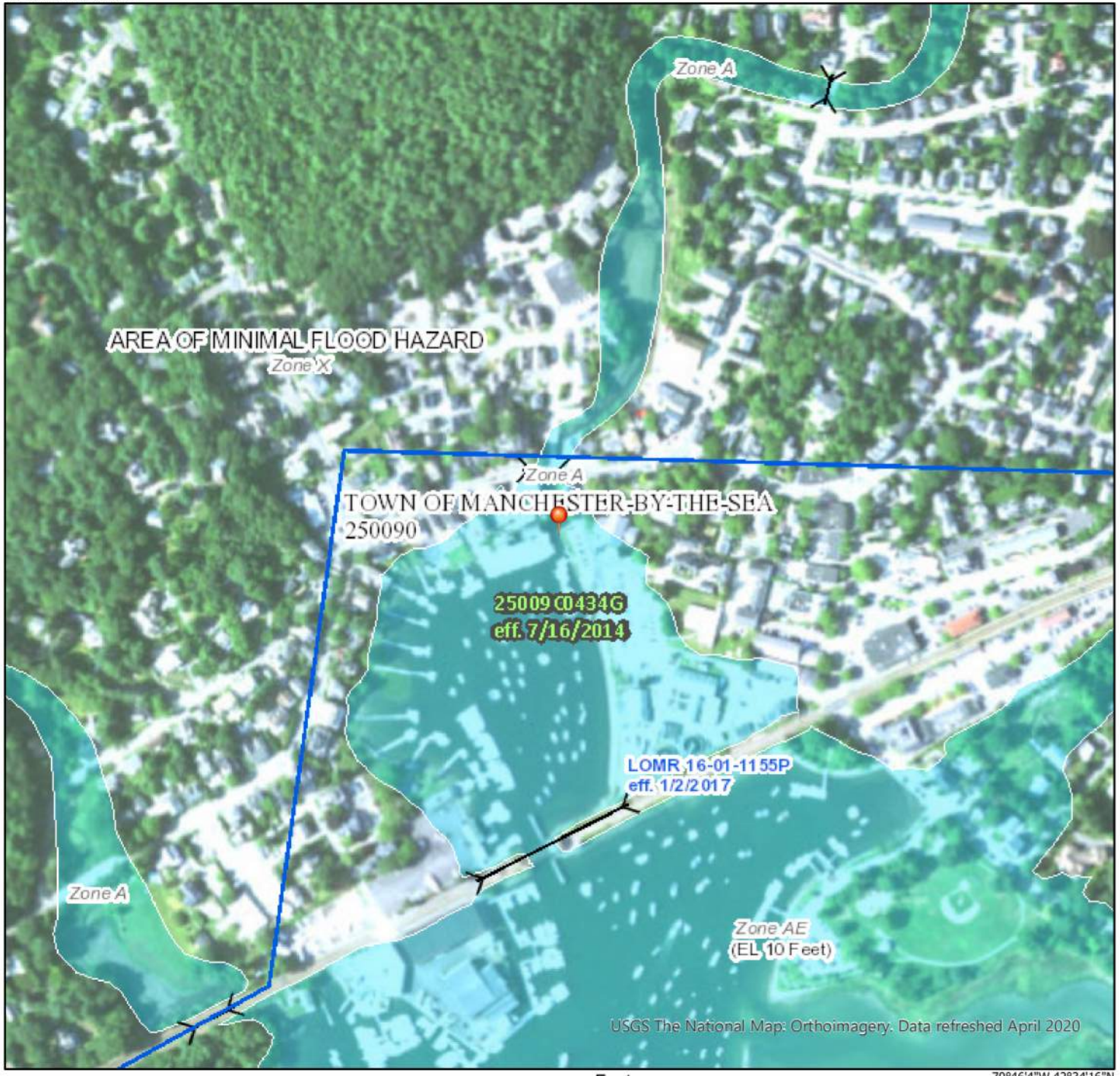
V:\Projects\M\m1476\CentralSt_Bridge_MA\Maps\CentralSt_Bridge_MA_Aerial.mxd [Exported By: kjw, 9/19/2019, 1:15:21 PM]

M-1476

National Flood Hazard Layer FIRMette

FEMA

70°46'41"W 42°34'42"N



70°46'4"W 42°34'16"N

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

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 8/31/2020 at 4:54 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.

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

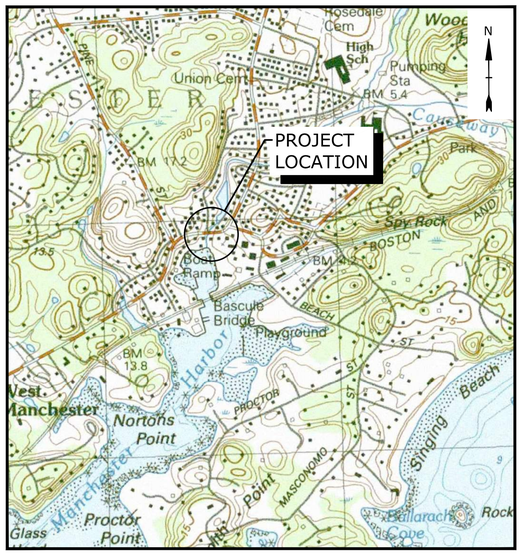
TOWN OF MANCHESTER-BY-THE-SEA, MASSACHUSETTS

CENTRAL STREET BRIDGE RECONSTRUCTION

PROJECT NO: M1476-011

SEPTEMBER 2020

LIST OF DRAWINGS	
SHEET NO.	SHEET TITLE
	COVER
G-001	LEGEND, ABBREVIATIONS, AND GENERAL NOTES
C-001	CENTRAL STREET SURVEY 1 OF 4
C-002	CENTRAL STREET SURVEY 2 OF 4
C-003	CENTRAL STREET SURVEY 3 OF 4
C-004	CENTRAL STREET SURVEY 4 0F 4
C-005	DEMOLITION PLAN & SITE PREPARATION PLAN
C-101	SITE PLAN AND PROFILE
C-102	UTILITY PLAN
C-103	TEMPORARY ROAD & UTILITY PLAN
C-501 TO C-502	CONSTRUCTION DETAILS
C-503	COASTAL BANK PLAN
C-504 TO C-505	CONTROL OF WATER NOTES AND DETAILS
C-701	TEMPORARY TRAFFIC CONTROL PLAN - GENERAL
C-702	TEMPORARY TRAFFIC CONTROL PLAN - DETOUR
S-001 TO S-103	BRIDGE DRAWINGS



LOCATION MAP
SCALE: 1" = 2000'

PREPARED FOR:

TOWN OF MANCHESTER-BY-THE-SEA
DEPARTMENT OF PUBLIC WORKS
CHUCK DAM, DIRECTOR

BOARD OF SELECTMEN
ELI BOLING, CHAIR
JEFFERY BODMER-TURNER, VICE CHAIR
ANN HARRISON
BECKY JAQUES
JOHN ROUND

PREPARED BY:

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
CIVIL
No. 39818
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Loring
Date: 2020.09.09
15:26:24 -04'00'
DAVID L. LORING P.E.

PERMIT SET
NOT FOR CONSTRUCTION

COMPLETE SET 23 SHEETS

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Tighe & Bond J:\M\M1476 Manchester MA Hydro Study\011-Central Street Bridge\Drawings_Figures\AutoCAD\Sheet\M1476-011-G-000.dwg

GENERAL NOTES

1. BASE PLAN ENTITLED "MASSACHUSETTS DEPARTMENT OF TRANSPORTAION PLAN OF TOPOGRAPHIC SURVEY OF CENTRAL STREET, MANCHESTER BY THE SEA" PREPARED BY DOUCET SURVEY INC. ON NOVEMBER 9, 2018.
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 APRIL 18, 2018.
5. SOIL BORINGS WERE PERFORMED BY NEW ENGLAND BORING CONTRACTORS ON AUGUST 9, 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 THE 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.

LEGEND

EXISTING	NEW	
○		IRON PIPE FOUND
UP		UTILITY POLE
		BURIED DRAIN PIPE
OE		OVERHEAD UTILITY WIRES
		FENCE (SIZE AND TYPE NOTED)
		GUARDRAIL
		APPROXIMATE PROPERTY LINE
		SIGN AND POST
		TREE LINE
	490	INDEX CONTOUR
		INTERMEDIATE CONTOUR
		STONEWALL
B-1		BORING
345.4	351.3	PROFILE ELEVATIONS
⁎1B-6		WETLAND FLAGS
		WETLAND SYMBOL
		LAND SUBJECT TO COASTAL STORM FLOWAGE
		100-FOOT BUFFER ZONE
		200-FOOT RIVERFRONT AREA
		30-FOOT NO DISTURBANCE ZONE
		50-FOOT NO BUILD ZONE
		COASTAL BANK
		TEMPORARY COFFER DAM
		EROSION CONTROL BARRIERS
		SURVEYED EDGE OF WATER (APRIL 2018)

ABBREVIATIONS

GENERAL

ABAN	ABANDON
ADJ	ADJUST
APPROX	APPROXIMATE
ASTM	AMERICAN SOCIETY OF TESTING MATERIALS
BIT	BITUMINOUS
BOS	BOTTOM OF SLOPE
BVW	BORDERING VEGETATIVE WETLANDS
CC	CONCRETE CURB
CCW	CEMENT CONCRETE WALK
CEM	CEMENT
CLF	CHAIN LINK FENCE
CMP	CORRUGATED METAL PIPE
CONC	CONCRETE
CS	CUT SPIKE
CW	CONCRETE WALK
DIM	DIMENSION
DPW	DEPARTMENT OF PUBLIC WORKS
EOP	EDGE OF PAVEMENT
EXIST	EXISTING
'	FEET/FOOT
FDN	FOUNDATION
FND	FOUND
GC	GRANITE CURB
GE	GRANITE EDGING
GRAN	GRANITE
HMA	HOT MIX ASPHALT
"	INCH
IFO	IN FRONT OF
IP	IRON PIN
LSCSF	LAND SUBJECT TO COASTAL STORM FLOWAGE
MASSDEP	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
MAX	MAXIMUM
MIN	MINIMUM
MHD	MASSACHUSETTS HIGHWAY DEPARTMENT
M	MHD MATERIAL REFERENCE
MISC	MISCELLANEOUS
N/F	NOW/FORMERLY
NTS	NOT TO SCALE
PREF	PREFERRED
PROP	PROPOSED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PVMT	PAVEMENT
QTY	QUANTITY
REMOD	REMODEL
REM	REMOVE
REQD	REQUIRED
RET	RETAIN
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
SB	STONE BOUND
SF	SQUARE FEET
SPKS	SURVEY SPIKE
TOS	TOP OF SLOPE
TYP	TYPICAL
VGC	VERTICAL GRANITE CURB
WCR	WHEELCHAIR RAMP
YD	YARD

UTILITIES

AC	ASBESTOS CEMENT PIPE
ACCMP	ASPHALT COATED CORRUGATED METAL PIPE
CAP	CORRUGATED ALUMINUM PIPE
CB	CATCH BASIN
CI	CAST IRON PIPE
CIT	CHANGE IN TYPE
CMP	CORRUGATED METAL PIPE
CNO	COULD NOT OPEN
COND	CONDUIT
CPP	CORRUGATED PLASTIC PIPE
CS	CURB STOP
DIA	DIAMETER
DI	DUCTILE IRON PIPE
DMH	DRAIN MANHOLE
EMH	ELECTRIC MANHOLE
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
GSO	GAS SHUT OFF
HH	HANDHOLE
HYD	HYDRANT
INV	INVERT ELEVATION
MJ	MECHANICAL JOINT
MW	MONITORING WELL
PVC	POLYVINYLCHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
RP	RECORD PLAN
SC	STORM WATER TREATMENT UNIT
SD	STORM DRAIN LINE
SMH	SEWER MANHOLE
TSV&B	TAPPING SLEEVE, VALVE AND BOX
UP	UTILITY POLE
WG	WATER GATE
WSO	WATER SHUT OFF

ALIGNMENT/PROFILE

AD	ALGEBRAIC DIFFERENCE
℄	CONSTRUCTION BASELINE
CC	CENTER OF CURVE
E	EAST
EL/ELEV	ELEVATION
GB	GRANITE BOUND
K	RATE OF VERTICAL CURVATURE
L	LENGTH
LT	LEFT
N	NORTH
OC	ON CENTER
PC	POINT OF CURVE
PCC	POINT OF COMPOUND CURVE
PK/SPIKE	SURVEY NAIL
℄	PROPERTY LINE
PRC	POINT OF REVERSE CURVE
PT	POINT OF TANGENT
PVC	POINT OF VERTICAL CURVE
PVI	POINT OF VERTICAL INTERSECTION
PVCC	POINT OF VERTICAL COMPOUND CURVE
PVRC	POINT OF VERTICAL REVERSE CURVE
PVT	POINT OF VERTICAL TANGENT
R	RADIUS
ROW	RIGHT OF WAY
RT	RIGHT
S	SOUTH
STA	STATION
VC	VERTICAL CURVE
W	WEST

SURFACE RESTORATION NOTES

1. RESTORE ALL AREAS DISTURBED BY THE CONTRACTOR BEYOND THE LIMITS OF WORK TO ORIGINAL CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.
2. ALL PAVEMENT DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. PROTECT SURFACE FEATURES (E.G., WALLS, FENCES, MAIL BOXES, SIGNS, SIDEWALKS, CURBING, STAIRS, WALKWAYS, TREES, ECT.) FROM DAMAGE DURING CONSTRUCTION, INCLDING PROVIDING TEMPORARY SUPPORTS, WHEN APPROPRIATE.
4. IF REMOVAL OF SURFACE FEATURES IS REQUIRED IN ORDER TO PERFORM THE PROPOSED WORK, REMOVE THOSE SITE FEATURES ONLY UPON APPROVAL OF ENGINEER. REPLACE ALL REMOVED SITE FEATURES; NEW ITEMS SHALL BE EQUAL OR BETTER IN QUALITY AND CONDITION TO THE ITEMS REMOVED.
5. EXISTING SURVEY MONUMENTS DISTURBED BY THE CONTRACTOR SHALL BE REPLACED BY A LAND SURVEYOR LICENSED IN THE STATE IN WHICH THE WORK IS PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
6. REPAIR DISTURBED PAVED SURFACES AT THE END OF EACH WORK WEEK, UNLESS OTHERWISE APROVED/REQURIED BY THE OWNER.

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
CIVIL
No. 39818
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Loring
Date: 2020.09.09 15:53:58-04'00'

Permit Set Not For Construction

Central Street Bridge Replacement

Department of Public Works

MassDOT Bridge No. M-02-001, BIN 8AM

Town of Manchester-By-The-Sea, Massachusetts

MARK	DATE	DESCRIPTION
0	6/20/2019	DRAFT 25% PLANS

PROJECT NO:	M1476 - 011
DATE:	06/20/2019
FILE:	M1476-011-G-001.dwg
DRAWN BY:	DWB
CHECKED:	ADF
APPROVED:	DLL

LEGEND, ABBREVIATIONS, AND GENERAL NOTES

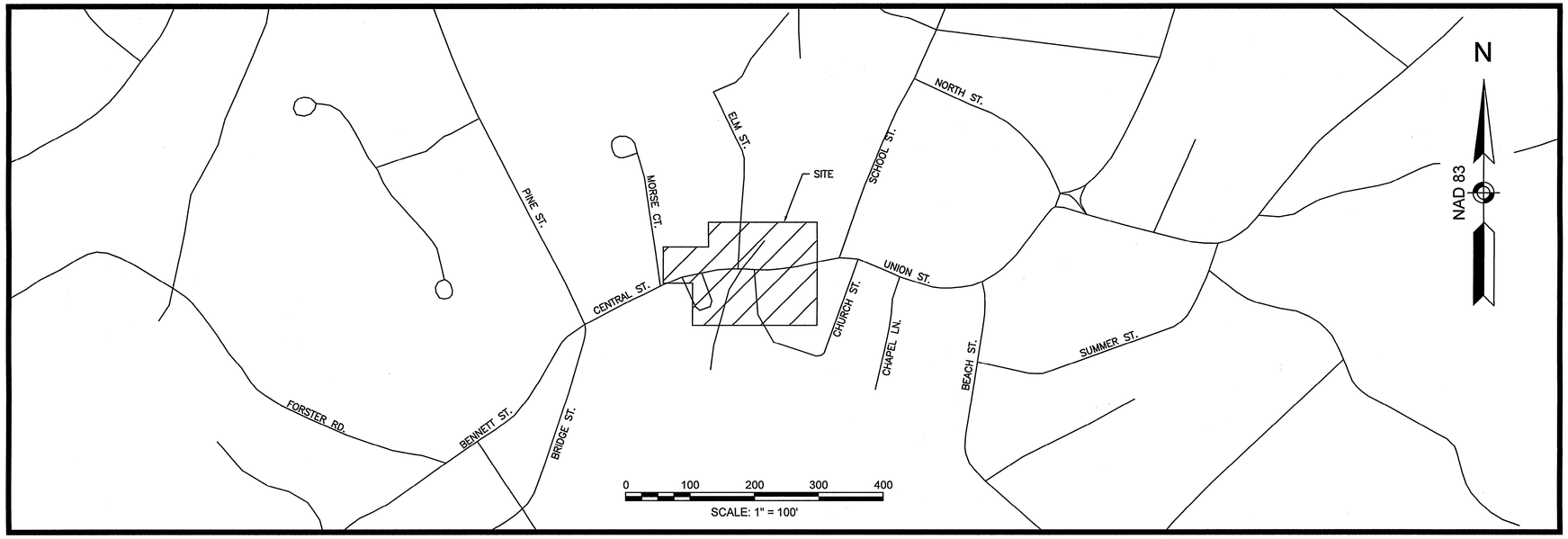
SCALE: NO SCALE

G-001

CITY/TOWN
STREET/ROUTE # OR NAME

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	4	X
PROJECT FILE NO.	XXXXXX		

TITLE SHEET, LEGEND & ABBREVIATIONS



LEGEND

	APPROX. ABUTTERS LOT LINE (SEE NOTE 9)
	GAS LINE
	SEWER LINE
	TELEPHONE LINE
	WATER LINE
	UNDERGROUND ELECTRIC LINE
	SHRUB LINE
	OVERHEAD WIRE
x	CHAIN-LINK FENCE
x	HAND RAIL
x	OTHER FENCE
10'	MAJOR CONTOUR LINE
8'	MINOR CONTOUR LINE
10'	RIVER BED MAJOR CONTOUR LINE (SEE NOTE 10)
8'	RIVER BED MINOR CONTOUR LINE (SEE NOTE 10)
	BRICK
	CONCRETE
	CRUSHED STONE
	LANDSCAPED AREA
CB	CATCH BASIN - SQUARE
	CLEANOUT
DSK	DISK (CA/T, USC&GS, LAND COURT, ETC.)
	DRAIN MANHOLE
EHH	ELECTRIC HANDHOLE
E	ELECTRIC MANHOLE
EM	ELECTRIC METER
FP	FLAG POLE
GG	GAS GATE
GM	GAS METER
	GAS SHUTOFF VALVE
	FIRE HYDRANT
	LIGHT POLE
M	OTHER MANHOLE
POST	SQUARE POST
S	SEWER MANHOLE
T	TELEPONE MANHOLE
22"M	TREE
	SIGN
UPL#	UTILITY POLE
WG	WATER GATE
WSO	WATER SHUTOFF
BB	BITUMINOUS BERM
CIP	CAST IRON PIPE
CONC	CONCRETE
CS	COBBLESTONE
DBYL	DOUBLE YELLOW LINE
DMH	DRAIN MANHOLE
DS	DOWN SPOUT
DSK	DISK
EL	ELEVATION
EP	EDGE OF PAVEMENT
ETW	EDGE OF TRAVELED WAY
FF	FINISHED FLOOR
GRAN	GRANITE
HDW	HEADWALL
PLUG	LEAD PLUG WITH ESCUTCHEON PIN
RET	RETAINING
SWL	SOLID WHITE LINE
TYP	TYPICAL
VGC	VERTICAL GRANITE CURB

NOTES:

1. REFERENCE: TOWN OF MANCHESTER-BY-THE-SEA. CENTRAL STREET BRIDGE OVER SAWMILL BROOK.
2. FIELD SURVEY PERFORMED BY B.T. & T.M.M. DURING AUGUST 2018 USING A TRIMBLE S6 TOTAL STATION WITH A TRIMBLE TSC3 DATA COLLECTOR AND A SOKKIA B21 AUTO LEVEL. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS. ADDITIONAL FIELD SURVEY PERFORMED BY M.J.C. IN AUGUST 2018 USING A LEICA P40 HDS SCANNER. REGISTRATION ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.
3. THIS MAP WAS PREPARED FROM RECORD RESEARCH, OTHER MAPS, LIMITED FIELD MEASUREMENTS AND OTHER SOURCES. IT IS NOT TO BE CONSTRUED AS A PROPERTY / BOUNDARY SURVEY AND IS SUBJECT TO SUCH FACTS AS SAID SURVEYS MAY DISCLOSE.
4. HORIZONTAL DATUM BASED ON MASSACHUSETTS MAINLAND ZONE NAD83(2011) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.
5. VERTICAL DATUM IS BASED ON NAVD88 DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK AND CALIBRATED TO THREE MASSDOT GEODETIC CONTROL STATIONS (REF. DSI PROJECT 4536).
6. PROPER FIELD PROCEDURES WERE FOLLOWED IN ORDER TO GENERATE CONTOURS AT (1') INTERVALS. ANY MODIFICATION OF THIS INTERVAL WILL DIMINISH THE INTEGRITY OF THE DATA, AND DOUCET SURVEY, INC. WILL NOT BE RESPONSIBLE FOR ANY SUCH ALTERATION PERFORMED BY THE USER.
7. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES/TYPES IS SUBJECT TO NUMEROUS FIELD CONDITIONS, INCLUDING; THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS, MANHOLE CONFIGURATION, ETC.
8. ALL ELECTRIC, GAS, TEL. WATER, SEWER AND DRAIN SERVICES ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN ON THIS SITE USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG-SAFE AT 1-888-DIG-SAFE.
9. ABUTTER AND RIGHT OF WAY LINES SHOWN HEREON ARE FROM MASS.GOV OFFICE OF GEOGRAPHIC INFORMATION (MASSGIS) ONLY.THE REFERENCE PLANS LISTED HEREON ARE PROVIDED AS A COURTESY ONLY; THE SCOPE OF THIS TOPOGRAPHIC SURVEY DID NOT INCLUDE BOUNDARY ANALYSIS OR FIELD SURVEY EFFORTS TO UNCOVER RECORD MONUMENTS.
10. ELEVATIONS AND LOCATIONS SHOWN DEPICTING SPRING LINE ARE BASED ON DATA FROM LASER SCAN POINT CLOUD OF STONE ARCH CULVERT.
11. VISIBLE UTILITIY STRUCTURES (MANHOLES, CATCH BASINS, GAS & WATER VALVES, ETC.) WERE LOCATED BY INSTRUMENT SURVEY BY THIS OFFICE. THE CORRESPONDING STORMWATER DRAIN & SANITARY SEWER INVERT SIZE & ELEVATION IS PER SURVEY DONE BY THIS OFFICE. THE LOCATIONS OF THE REMAINING UNDERGROUND UTILITIES ARE BASED ON THE LOCATIONS OF S.U.E. PAINT MARKS (BY OTHERS - UNKNOWN) OBSERVED ON SITE AT THE TIME OF OUR SURVEY.

COMMONWEALTH OF MASSACHUSETTS
DOUCET & DOUCET No. 46709 PROFESSIONAL LAND SURVEYOR

massDOT
Massachusetts Department of Transportation
Highway Division

PREPARED BY:
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REVISIONS		
REV.	COMMENTS	DATE
01	SMH INVERTS, ADD MISC. FEATURES	10/18/18
02	ADD REF. PLAN 19, MISC. UPDATES	11/09/18

SCALE: 10 FEET TO THE INCH

FILE NAME: 5521A_SV
FIELD BOOK. NO: XXXX
DRAWN BY: W.D.C. CHECKED BY: W.J.D.
FIELD CHIEF: XXX PARS. NO: XXXXXXX
DATE:

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
PLAN OF TOPOGRAPHIC SURVEY OF

CENTRAL STREET

(BRIDGE NO. X-XX-XXX)
IN THE (T/C) OF

MANCHESTER BY THE SEA

AS ORDERED BY
THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION

SHEET 1 OF 4

5521A_SV.DWG Plotted on 14-Dec-2018 9:06 AM

CITY/TOWN
STREET/ROUTE # OR NAME

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	4	X
PROJECT FILE NO.	XXXXXX		

TITLE SHEET, LEGEND & ABBREVIATIONS

REFERENCE PLANS:

1. "PLAN OF A PORTION OF THE MAIN ROAD IN MANCHESTER SHOWING THE PROPOSED WIDENINGS" DONE BY CHARLES A. PUTNAM, DATED NOVEMBER 23, 1871. COUNTY OF ESSEX RECORD #1230.
2. "PLAN OF A PORTION OF CENTRAL STREET AT THE JUNCTION OF SCHOOL STREET AND UNION STREET IN THE TOWN OF MANCEHSTER AS ALTERED" DONE BY CLINTON C. BARKER COUNTY ENGINEER DATED SEPTEMBER 1947. S.E.D.R.D. PLAN #76-35.
3. "PLAN OF A PORTION OF CENTRAL STREET FROM ELM STREET TO SCHOOL STREET IN THE TOWN OF MANCEHSTER AS ALTERED" BY JOHN O. MARMAALA COUNTY ENGINEER DATED SEPTEMBER 1953. S.E.D.R.D. PLAN #84-8.
4. "PLAN OF LAND IN MANCHESER, MASS FOR JEAN E. GRELET" DATED MARCH 20, 1959 BY DANA F. PERKINS & SONS, INC. S.E.D.R.D. PLAN #92-74.
5. "PLAN OF A PORTION OF ELM STREET FROM CENTRAL STREET 700 FEET NORTHERLY IN THE TOWN OF MANCHESTER AS LAID OUT" BY EARL H. PAGE DATED OCTOBER 25, 1966. S.E.D.R.D. PLAN #107-91.
6. "PLAN OF LAND IN MANCHESTER, MASSACHUSETTS COUNTY OF ESSEX FOR ANN N. KILEY & DOROTHY B. KILEY" DATED FEBRUARY 14, 1985. DONE BY W. C. CAMMETT ENGINEERING, INC. S.E.D.R.D. PLAN #233-32.
7. "SITE PLAN 27 CENTRAL ST. CONDOMINIUMS" DONE BY W. C. CAMMETT ENGINEERING, INC. DATED FEBRUARY 1985. S.E.D.R.D. PLAN #233-33.
8. "PLAN OF LAND BELONGING TO SAMUEL KNIGHT SONS CO." DATED SEPTEMBER 27, 1946 BY RICHARD A. WIRLING. S.E.D.R.D. PLAN #1946-824.
9. "PLAN OF LAND IN MANCHESTER OT BE CONVEYED FROM F. J. MERRILL TO THE CRICKET PRESS, INC." FEBRUARY 15, 1923. BY RAYMOND C. ALLEN. S.E.D.R.D. PLAN #2549-181.
10. "LAND OF JOHN W. MARSHALL HEIRS" DATED OCTOBER 28, 1944 BY WARREN A. CROMBIE. S.E.D.R.D. PLAN #3465-1.
11. "PLAN OF LAND BELONGING TO SAMUEL KNIGHT SONS, CO." DATED DECEMBER 10, 1946 BYRICHARD A. WIRLING. S.E.D.R.D. PLAN #3521-600.
12. "PROPERTY OF JEAN E. GRELET, CENTRAL ST, MANCHESTER MASS" DATED NOVEMBER 8, 1952 S.E.D.R.D. PLAN #3925-1.
13. "PLAN OF LAND IN MANCHESTER PROPERTY OF SEA ROCK ESTATE, INC." DATED DECEMBER 18, 1970. BY ESSEX SURVEY SERVICE, INC. S.E.D.R.D. PLAN #5765-800.
14. "PLAN OF LAND IN MANCHESTER PROPERTY OF SEA ROCK ESTATE, INC." DATED MAY 3, 1971 BY ESSEX SURVEY SERVICE, INC. S.E.D.R.D. PLAN #5835-1.
15. "PLAN OF LAND IN MANCHESTER PEELE HOUSE SQUARE" FOR SEA ROCK ESTATE, INC. DATED JULY 11, 1972 BY ESSEX SURVEY SERVICE, INC. S.E.D.R.D. PLAN #5961-297.
16. "PLAN OF LAND IN MANCHESTER PEELE HOUSE SQUARE" FOR SEA ROCK ESTATE, INC. DATED MAY 8, 1973. BY ESSEX SURVEY SERVICE, INC. S.E.D.R.D. PLAN #6025-1.
17. "PLAN OF LAND IN MANCHESTER PROPERTY OF ARTHUR A. & MARJOIRE SECHER" DATED JUNE 11, 1984. BY ESSEX SURVEY SERVICE, INC. S.E.D.R.D. PLAN #7688-133.
18. "PLAN TO ACCOMPANY PETITION OF THE TOWN OF MANCHESTER. TO CONSTRUCT A RETAINING WALL AND FILL SOLID MANCHESTER HARBOR" DATED NOVEMBER 3, 1921. BY RAYMOND C. ALLEN. S.E.D.R.D. PLAN #36-31.
19. PLAN TITLED "MANCHESTER-BY-THE-SEA DOWNTOWN ATLAS, MANCHESTER-BY-THE-SEA, MASSACHUSETTS, ESSEX COUNTY" PREPARED BY DGT SURVEY GROUP DATED 6-10-2015.

DRAINAGE STRUCTURES

CB 1104
RIM ELEV.=14.2'
(A) 4" CIP INV.=12.1' (4" METAL**)
(B) 10" CMP INV.=10.5' (8"**)

CB 1153
RIM ELEV.=10.1'
SUMP ELEV.=7.8'
CONC. CHANNEL TO OUTFALL

CB 1196
RIM ELEV.=9.2'
(OUTFALL) 12" CLAY INV.=5.3' (10" CONC**)
(A) 12" CLAY INV.=5.2' (12"**)

CB 1215
RIM ELEV.=9.2'
(1228) 15" CMP INV.=2.6'
(A) 8" METAL INV.=1.6'
(B) 8" METAL INV.=1.5'

DMH 1228
RIM ELEV.=10.1'
(1245) 10" CLAY INV.=6.4' (10" CLAY**)
(1215) 15" CMP INV.=5.5'

DMH 1245
RIM ELEV.=11.5'
(1215) 12" PVC INV.=9.3' (12" PVC**)
(A) VERY RECESSED (12" CLARY FROM CB 1246**)
WATER ELEV.=9.3'
SUMP ELEV.=8.3'

CB 1246
RIM ELEV.=11.2'
(A) 12" UNKN INV.=9.6'
(10" OR 12" CLAY TO DMH 1245**)

**INDICATES PIPE SIZE/DIA. INFO. IS PER REF. PLAN 19

SEWER STRUCTURES

SMH 1081
RIM ELEV.=12.4'
CC=-1.1'
(1155) UNKN BC=-1.2' (12" PIPE**)
(1109) UNKN BC=-1.3' (15" PIPE**)

SMH 1109
RIM ELEV.=14.6'
(1081) 15" UNKN INV.=-2.1' (15" PIPE**)
(A) 15" UNKN INV.=-2.6'
(B) 15" UNKN INV.=-2.7' (18" PIPE**)

SMH 1155
RIM ELEV.=10.2'
(A) 4" PVC INV.=4.7'
(B) 4" PVC INV.=0'
(C) UNKN INV.=-0.3' (6" PIPE**)
(1248) UNKN INV.=-0.6' (15" PIPE**)
(1081) UNKN INV.=-0.6' (12" PIPE**)
CC=-0.6'

SMH 1248
RIM ELEV.=13.7'
(A) 8" UNKN INV.=6.7'
(B) 8" UNKN INV.=0.1'
(1155) 12" UNKN INV.=-0.3' (15" PIPE**)
(C) 12" UNKN INV.=-0.4' (12" PIPE**)
(D) 12" UNKN INV.=-0.4'

**INDICATES PIPE SIZE/DIA. INFO. IS PER REF. PLAN 19

OTHER STRUCTURES

MH 1063
RIM ELEV.=11.5'
SUMP ELEV.=6.8'
DRY NO PIPES W/ WATER SHUT OFF

MH 1550
RIM ELEV.=13.8'
SUMP ELEV.=9.9'
DRY NO PIPES W/ ELECTRIC METER AND CHANNEL TO FOUNTAIN

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WILLIAM J. DOUCET
No. 45709
PROFESSIONAL LAND SURVEYOR

REVISIONS

REV.	COMMENTS	DATE
01	SMH INVERTS, ADD MISC. FEATURES	10/18/18
02	ADD REF. PLAN 19, MISC. UPDATES	11/09/18

SCALE: 10 FEET TO THE INCH

FILE NAME: 5521A_SV
FIELD BOOK. NO: XXXX
DRAWN BY: W.D.C. CHECKED BY: W.J.D.
FIELD CHIEF: XXX PARS. NO: XXXXXXX

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
PLAN OF TOPOGRAPHIC SURVEY OF
CENTRAL STREET
(BRIDGE NO. X-XX-XXX)
IN THE (T/C) OF
MANCHESTER BY THE SEA
AS ORDERED BY
THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION

DATE:

INSET
(SCALE 1"=10')

BENCHMARK: 5521B
"X" CUT ON BOLT OPPOSITE MAIN ON HYDRANT
EL=15.52'

SMH 1248
RIM=13.70'

N

NAD 83

TAX MAP 53, LOT 18
27 CENTRAL STEET CONDOMINIUM
0 ELM ST,
MANCHESER, MA 01944
S.E.D.R.D. BOOK 9295, PAGE 343

TAX MAP 53, LOT 17
29 CENTRAL STREET CONDOMINIUM
40 BEACH ST
MANCHESTER, MA 01944
S.E.D.R.D. BOOK 9744, PAGE 483

TAX MAP 53, LOT 24
TOWN OF MANCHESTER
10 CENTRAL ST
MANCHESTER, MA 01944

TAX MAP 53, LOT 30
ASHLAND AVE LTD PARTNERHSIP
C/O ROLANDA STURTEVANT
PO BOX 1522
MANCHESTER, MA 01944
S.E.D.R.D. 22522, PAGE 466

TAX MAP 53, LOT 41
19 CENTRAL ST. LLC
C/O CHARLES BENEVENTO
PO BOX 85 PRIDES CORSSING
MANCHESTER, MA 01965
S.E.D.R.D. BOOK 29008, PAGE 552

TAX MAP 45, LOT 3
DAVID N. & MARYANN A. WOOD
6 HIGHWOOD RD
MANCHESTER, MA 01944
S.E.D.R.D. BOOK 31834, PAGE 53

CITY/TOWN
STREET/ROUTE # OR NAME

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	4	X
PROJECT FILE NO.	XXXXXX		

SURVEY BASEPLAN

ELM STREET
CENTRAL STREET
~PAVED AREA~
~GRASS~
STONE RET WALL
STOCKADE FENCE
BRICK & FLAGSTONE DECK
BRICK STEPS & DECK
GRAN. RET WALL
GRAN. STEPS
WOODEN PORCH
WOODEN SIGN POST
BRICK STEPS
HOUSE
BUILDING
CONC. RET. WALL
GRAN. RET. WALL IN DISREPAIR
PILE OF DEBRIS
GRAN. HDWL W/10 CIP"
PILE OF STONES
GRAN. BLOCK
WOODEN PORCH
BRICK RET. WALL
COBBLESTONE RET. WALL
COBBLESTONE
COBBLESTONE BORDER
W/PARKING SIGN
"ELM STREET" SIGN
WATER EL. ROD
DISK FND. MASS. GEODETIC SURVEY "411C"
APPROX. SPRING EDGE
CONC. PAD BLENDS INTO LEDGE OUTCROP
APPROX. SPRING LINE (SEE NOTE 10)
CONC. W/TIMBER STEP UP
POSSIBLE ELECTRIC OUTLET
CHAIN-LINK FENCE
RET. WALL
RAMP
HANDRAIL
GRAN. BENCH
WOODEN POST
METAL LIP
SAFETY RAIL
CONC. STEP UP
METAL GRATE DECK W/EQUIP.
CONC. STRUCTURE
TIMBER IN CANAL
PIPE COMING OUT OF RET. WALL
VERTICAL 4" PVC
12"X12" GRAN. POST
ROPE & POST FENCE
WATERLINE PER DPW PLAN
(SEE NOTE 11)
W/2 HR PARKING SIGN
W/POLICE STATION SIGN
MEMORIAL BOULDER W/PLAQUE
BENCHMARK: 5521A
"X" CUT ON BOLT OVER MAIN ON HYDRANT
EL=13.81'

DMH 1245 RIM=11.52'
CB 1246 RIM=11.19'
DMH 1228 RIM=10.08'
CB 1196 RIM=9.23'
CB 1153 RIM=10.12'
SMH 1155 RIM=10.16'
CB 1215 RIM=9.18'
SMH 1081 RIM=12.36'

SEE INSET
CONTINUED ON SHEET NO. 4
CONTINUED ON SHEET NO. 4
SHEET 3
SHEET 4

0 10 20 30 40
SCALE: 1" = 10'

REVISIONS		
REV.	COMMENTS	DATE
01	SMH INVERTS, ADD MISC. FEATURES	10/18/18
02	ADD REF. PLAN 19, MISC. UPDATES	11/09/18

SCALE: 10 FEET TO THE INCH

FILE NAME: 5521A_SV
FIELD BOOK NO: XXXX
DRAWN BY: W.D.C. CHECKED BY: W.J.D.
FIELD CHIEF: XXX PARS. NO: XXXXXXX
DATE: SEPTEMBER 10, 2018 SHEET 3 OF 4

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COMMONWEALTH OF MASSACHUSETTS
WILLIAM J. DOUCET
No. 45709
REGISTERED LAND SURVEYOR

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
PLAN OF TOPOGRAPHIC SURVEY OF
CENTRAL STREET
(BRIDGE NO. X-XX-XXX)
IN THE (T/C) OF
MANCHESTER BY THE SEA
AS ORDERED BY
THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION

5521A_SV.DWG Plotted on 14-Dec-2018 8:21 AM

CITY/TOWN
STREET/ROUTE # OR NAME

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	4	X
PROJECT FILE NO.	XXXXXX		

SURVEY BASEPLAN

N

NAD 83

CONTINUED ON SHEET NO. 3

CENTRAL STREET

CB 1215
RIM=9.18'

APPROX. SPRING LINE
(SEE NOTE 10)

(SEE NOTE 10)

(SEE NOTE 11)

(SEE NOTE 11)

CONTINUED ON SHEET NO. 3

12"X12" GRAN. POST

ROPE & POST FENCE

TH=10.40'
TH=10.89'
TH=10.31'
TH=11.06'
TH=11.06'
TH=11.06'

10" INSIDE 15"
EL=0.86'

PLUG

2 TIMBER IN CANAL

TIMBER IN CANAL

CONC. STRUCTURE

4"
EL=4.13'

2"
TOP OF PIPE=-2.04'

METAL LIP
SAFETY RAIL
CONC. STEP UP
METAL GRATE DECK
W/EQUIP.

"NP"
CONC. W/TIMBER STEP UP

16"

POSSIBLE
ELECTRIC OUTLET

TH=11.82'

CHAIN-LINK
FENCE
RET. WALL
RAMP
FF=12.26'

FF=12.35'

WOODEN POST

HANDRAIL

BUILDING

GRAN. BENCH

VERTICAL 4" PVC

PIPE COMING
OUT OF RET. WALL

BUILDING
TAX MAP 45, LOT 3
DAVID N. & MARYANN A. WOOD
6 HIGHWOOD RD
MANCHESTER, MA 01944
S.E.D.R.D. BOOK 31834, PAGE 53

TH=10.25'

10"X10" GRAN. POST

HOUSE

FF=10.11'

4"
EL=4.53'

4"
EL=3.63'

EL=4.40'

GATE

4" DRAIN
EL=7.26'

RIVER BED CONTOURS

4" DRAIN
EL=7.03'

4" DRAIN
EL=2.96'

4" DRAIN
EL=6.83'

4" CAPPED
TOP OF PIPE=4.56'

CONC. RET. WALL

4" DRAIN
EL=6.99'

CONC. RET. WALL

4" DRAIN
EL=6.94'

4" DRAIN
EL=4.31'

4" DRAIN
EL=1.10'

4" DRAIN
EL=6.89'

4" DRAIN
EL=6.96'

4" DRAIN
EL=-0.82'

4" DRAIN
EL=6.87'

PAD MOUNTED
A/C

FF=12.15'

(2)GM

ML

WOODEN POST
"SEASIDE 1 GARDEN"
GRAN. MEMORIAL

MW

~PAVED AREA~

CHAIN-LINK
FENCE

(3) 30 MIN.
PARKING

MEMORIAL
GRAN. BENCH

14"

BENCHMARK: 5521A
"X" CUT ON BOLT OVER MAIN
ON HYDRANT
EL=13.81'

W/POLICE STATION
SIGN

MEMORIAL BOULDER
W/PLAQUE

#28

#14

26"

SHEET 3
SHEET 4

#15

OMH 1063

DISK FND. MASS DEPT.
PUBLIC WORKS "AH52"
CONC. FLAG BASE

#16

18"

W/POLICE & HP
ENTRANCE SIGN

GL SOLAR PANEL

BRICK STEPS

EHH W/SWITCH &
COND. DOWN TO AC

FF=19.00'

26"

CHURCH STREET

TAX MAP 45, LOT 2
SEA ROCK ESTATE, INC
5C PEELE HOUSE SQUARE
MANCHESTER, MA 01944
S.E.D.R.D. BOOK 5696, PAGE 116

TAX MAP 45, LOT 37
SEA ROCK ESTATE, INC
5C PEELE HOUSE SQUARE
MANCHESTER, MA 01944
S.E.D.R.D. BOOK 9397, PAGE 574

TAX MAP 45, LOT 23
TOWN OF MANCHESTER
10 CENTRAL ST
MANCHESTER, MA 01944

BUILDING

BUILDING

0 10 20 30 40

SCALE: 1" = 10'

COMMONWEALTH OF MASSACHUSETTS
WILLIAM J. DOUCET
No. 45709
PROFESSIONAL LAND SURVEYOR

massDOT
Massachusetts Department of Transportation
Highway Division

PREPARED BY:
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REVISIONS		
REV.	COMMENTS	DATE
01	SMH INVERTS, ADD MISC. FEATURES	10/18/18
02	ADD REF. PLAN 19, MISC. UPDATES	11/09/18

SCALE: 10 FEET TO THE INCH

FILE NAME: 5521A_SV
FIELD BOOK. NO: XXXX
DRAWN BY: W.D.C. CHECKED BY: W.J.D.
FIELD CHIEF: XXX PARS. NO: XXXXXXX

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
PLAN OF TOPOGRAPHIC SURVEY OF

CENTRAL STREET

(BRIDGE NO. X-XX-XXX)

IN THE (T/C) OF

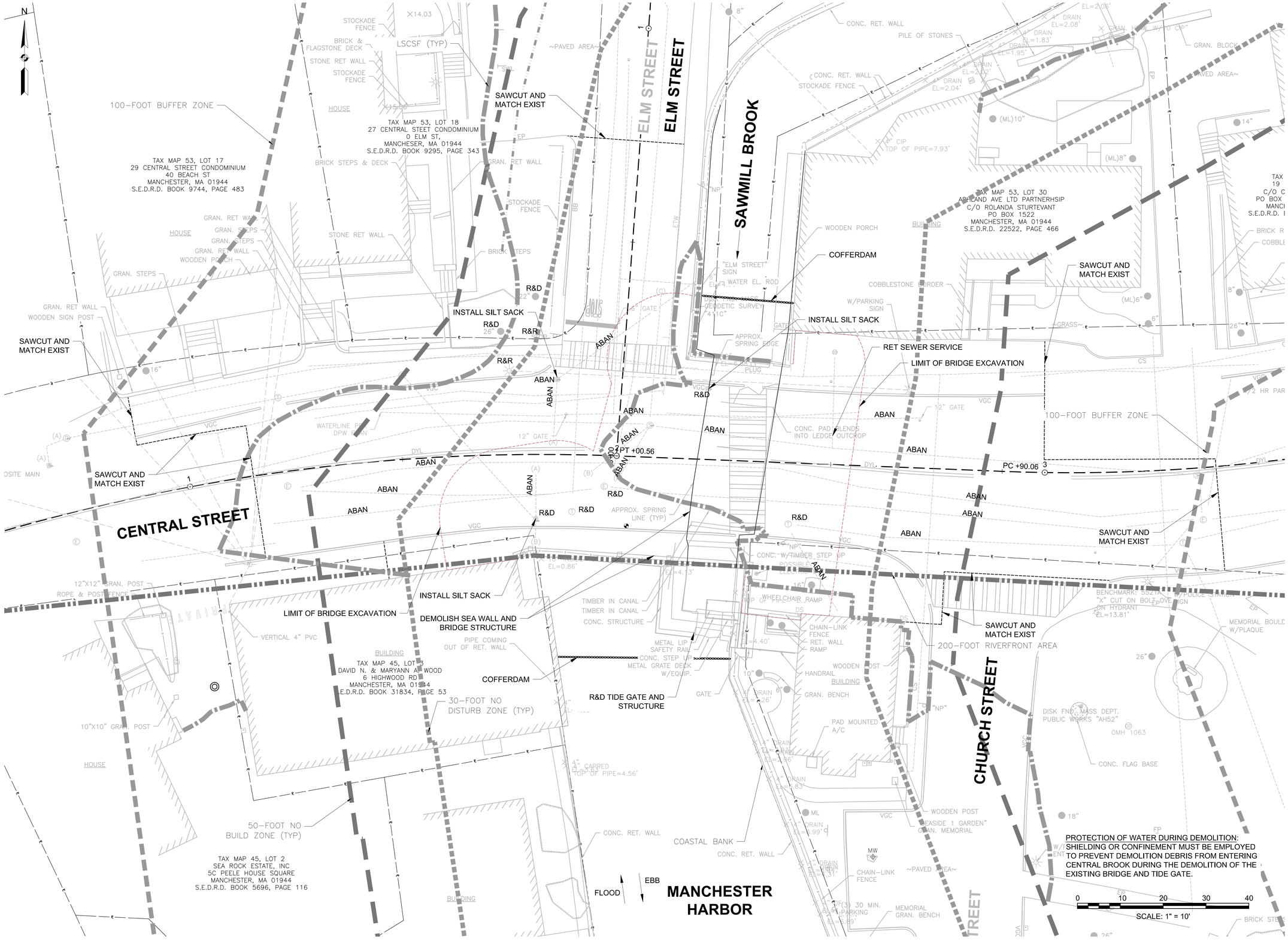
MANCHESTER BY THE SEA

AS ORDERED BY
THE MASSACHUSETTS DEPARTMENT OF
TRANSPORTATION, HIGHWAY DIVISION

DATE:

SHEET 4 OF 4

5521A_SV.DWG Plotted on 14-Dec-2018 9:09 AM



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Tighe & Bond: J:\M\1476 Manchester MA Hydro Study\011-Central Street Bridge\Drawings_Figures\AutoCAD\Sheet\M1476-011-C-005.dwg

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
CIVIL
No. 39818
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Loring
Date: 2020.09.09 15:54:33-04'00'

Permit Set Not For Construction

Central Street Bridge Replacement

Department of Public Works

MassDOT Bridge No. M-02-001, BIN 8AM

Town of Manchester-By-The-Sea, Massachusetts

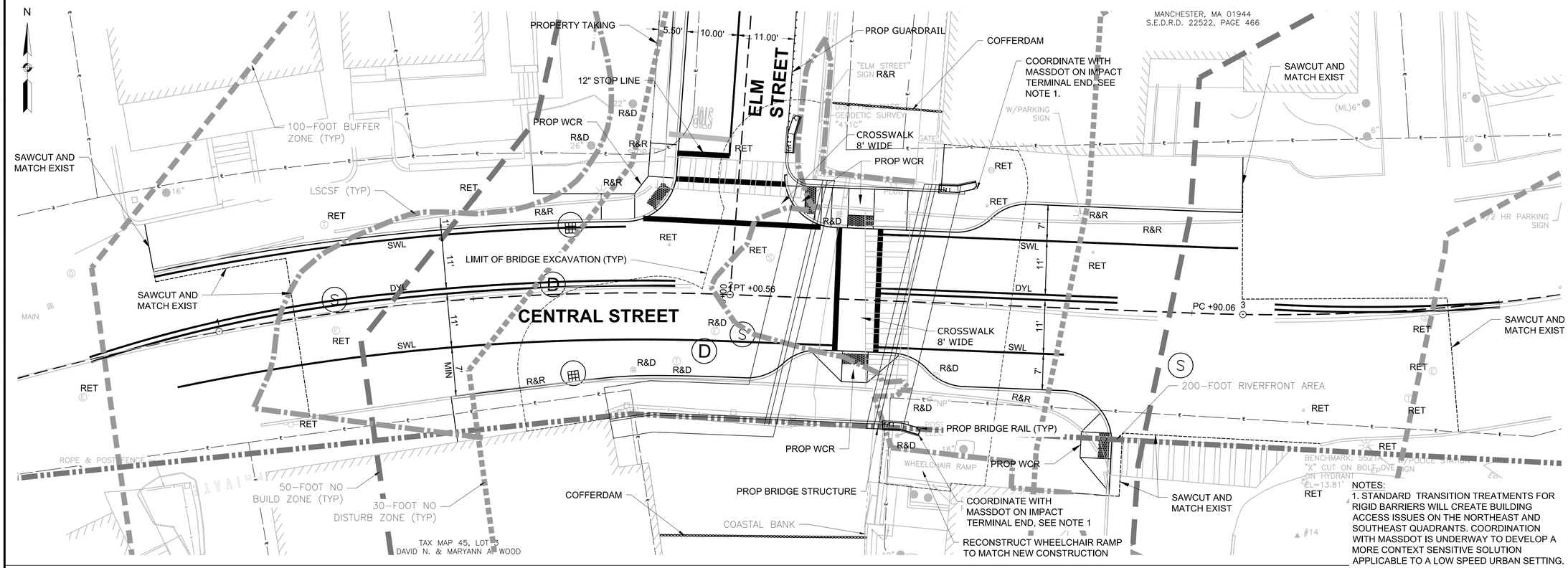
MARK	DATE	DESCRIPTION
0	6/20/2019	DRAFT 25% PLANS

PROJECT NO:	M1476 - 011
DATE:	06/20/2019
FILE:	M1476-011-C-005.dwg
DRAWN BY:	DWB
CHECKED:	ADF
APPROVED:	DLL

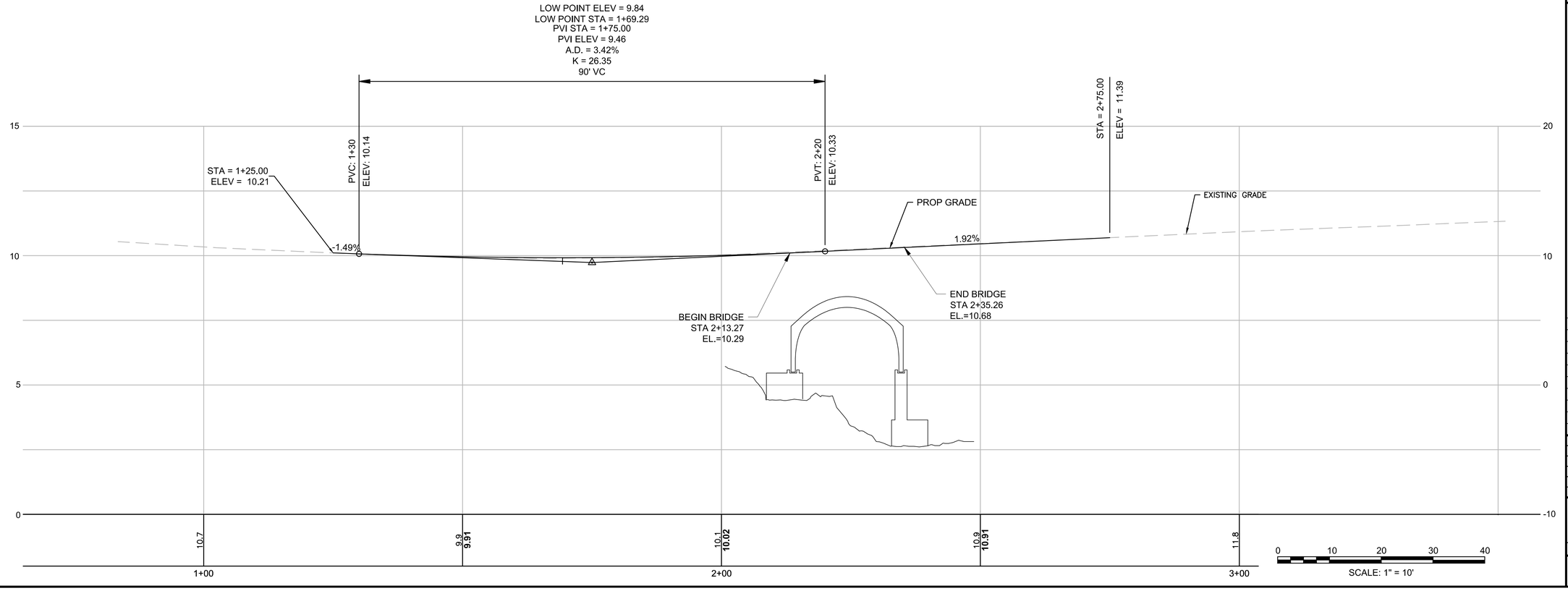
DEMOLITION AND SITE PREPARATION PLAN

SCALE: 1" = 10'

C-005



NOTES:
1. STANDARD TRANSITION TREATMENTS FOR RIGID BARRIERS WILL CREATE BUILDING ACCESS ISSUES ON THE NORTHEAST AND SOUTHEAST QUADRANTS. COORDINATION WITH MASSDOT IS UNDERWAY TO DEVELOP A MORE CONTEXT SENSITIVE SOLUTION APPLICABLE TO A LOW SPEED URBAN SETTING.



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Town of Manchester-By-The-Sea, Massachusetts

MARK	DATE	DESCRIPTION
0	6/20/2019	DRAFT 25% PLANS

PROJECT NO:	M1476 - 011
DATE:	06/20/2019
FILE:	M1476-011-C-101.dwg
DRAWN BY:	DWB
CHECKED:	ADF
APPROVED:	DLL

SITE PLAN AND PROFILE

SCALE: 1"=10' HORIZ, 1"=4' VERT

C-101

N

STOCKADE FENCE

STOCKADE FENCE

LSCSF (TYP)

STOCKADE FENCE

100-FOOT BUFFER ZONE (TYP)

TAX MAP 53, LOT 17
29 CENTRAL STREET CONDOMINIUM
40 BEACH ST
MANCHESTER, MA 01944
S.E.D.R.D. BOOK 9744, PAGE 483

TAX MAP 53, LOT 18
27 CENTRAL STEET CONDOMINIUM
0 ELM ST.
MANCHESER, MA 01944
S.E.D.R.D. BOOK 9295, PAGE 343

ELM STREET

TAX MAP 53, LOT 24
TOWN OF MANCHESTER
10 CENTRAL ST
MANCHESTER, MA 01944

STOCKADE FENCE

STOCKADE FENCE

TAX MAP 53, LOT 30
ASHLAND AVE LTD PARTNERHSIP
C/O ROLANDA STURTEVANT
PO BOX 1522
MANCHESTER, MA 01944
S.E.D.R.D. 22522, PAGE 466

20 LF 6" DIP WATER MAIN

COFFERDAM

"ELM STREET" SIGN

DISK GEODETIC SURVEY "411C"

W/PARKING SIGN

84 LF 12" DIP WATER MAIN

CONNECT PIPE TO EXISTING SMH
INV OUT = -0.60

LOCATE EXISTING SEWER SERVICE AND CONNECT SERVICE TO PROPOSED SEWER MAIN (TYP)

CONNECT EXISTING PIPE TO DMH-1

CB-1
RIM = 9.51
INV OUT = 5.00

8 LF 12" RCP
S=4.1%

WATERLINE PER DPW PLAN

12" GATE

12 LF 15" RCP
S=1.7%

CONNECT PROPOSED WATER MAIN AT EXISTING GATE VALVE (TYP)

SMH-1
RIM = 10.17
INV IN (NW) = 0.55±
INV OUT = 0.45

BENCHMARK: 5521B
"X" CUT ON BOLT OPPOSITE MAIN ON HYDRANT
EL=15.52'

CENTRAL STREET

DMH-1
RIM = 9.77
INV IN (NW) = 4.10
INV IN (N) = 4.50
INV IN (S) = 4.10
INV OUT = 4.00

76 LF 15" RCP
S=0.5%

14 LF 12" RCP
S=1.3%

28 LF 15" RCP
S=0.7%

PT +00.56

SMH-2
RIM = 9.96
INV IN (N) = -0.80
INV IN (W) = -0.80
INV OUT = -0.80

9 LF 15" RCP
S=0.9%

PC +90.06

SMH-3
RIM = 11.43
INV IN = -1.05
INV OUT = -1.05

45 LF 15" RCP
S=0.3%

82 LF 15" RCP
S=0.3%

CONNECT TO EXISTING ELECTRIC MANHOLE (BO)

ROPE & POST FENCE

CB-2
RIM = 9.18
INV OUT = 4.43

CONNECT TO EXISTING TELEPHONE MANHOLE (BO)

CONNECT TO EXISTING TELEPHONE CONDUIT (BO)

PROP ELECTRIC CONDUIT (TYP) (BO)

PIPE OUTLET = 3.57

SWTU-1
RIM = 9.64
INV IN = 3.77
INV OUT = 3.67

PROP TELEPHONE CONDUIT (TYP) (BO)

PROP ELECTRIC CONDUIT (TYP) (BO)

CONNECT PIPE TO EXISTING SMH
INV IN = -2.50

CONNECT TO EXISTING TELEPHONE MANHOLE (BO)

CONNECT TO EXISTING ELECTRIC MANHOLE (BO)

200-FOOT RIVERFRONT AREA

TAX MAP 45, LOT 3
DAVID N. & MARYANN A. WOOD
6 HIGHWOOD RD
MANCHESTER, MA 01944
E.D.R.D. BOOK 31834, PAGE 53

30-FOOT NO DISTURB ZONE (TYP)

50-FOOT NO BUILD ZONE (TYP)

COFFERDAM

COASTAL BANK

BENCHMARK: 5521A
"X" CUT ON BOLT OVER MAIN ON HYDRANT
EL=13.81'

DISK FND, MASS DEPT. PUBLIC WORKS "AH52"

OMH 1063

0 10 20 30 40

SCALE: 1" = 10'

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
CIVIL
No. 39818
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Loring
Date: 2020.09.09 15:55:14-04'00'

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Department of Public Works

MassDOT Bridge No. M-02-001, BIN 8AM

Town of Manchester-By-The-Sea, Massachusetts

MARK	DATE	DESCRIPTION
0	6/20/2019	DRAFT 25% PLANS

PROJECT NO:	M1476 - 011
DATE:	06/20/2019
FILE:	M1476-011-C-102.dwg
DRAWN BY:	DWB
CHECKED:	ADF
APPROVED:	DLL

UTILITY PLAN

SCALE: 1" = 10'

C-102

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N

STOCKADE FENCE

STOCKADE FENCE

LSCSF (TYP)

STOCKADE FENCE

100-FOOT BUFFER ZONE (TYP)

TAX MAP 53, LOT 17
29 CENTRAL STREET CONDOMINIUM
40 BEACH ST
MANCHESTER, MA 01944
S.E.D.R.D. BOOK 9744, PAGE 483

TAX MAP 53, LOT 18
27 CENTRAL STEET CONDOMINIUM
0 ELM ST.
MANCHESER, MA 01944
S.E.D.R.D. BOOK 9295, PAGE 343

STOCKADE FENCE

STOP BAR

ELM STREET

TAX MAP 53, LOT 24
TOWN OF MANCHESTER
10 CENTRAL ST
MANCHESTER, MA 01944

STOCKADE FENCE

TEMPORARY TRAFFIC SIGNAL

TRAFFIC BARRIER

TAX MAP 53, LOT 30
ASHLAND AVE LTD PARTNERHSIP
C/O ROLANDA STURTEVANT
PO BOX 1522
MANCHESTER, MA 01944
S.E.D.R.D. 22522, PAGE 466

"ELM STREET" SIGN

R&R SIGN

DISK FND. MASS. GEODETIC SURVEY "411C"

W/PARKING SIGN

GATE

11' MIN

PLUG

12" GATE

WATERLINE DPW PLAN

12" GATE

PT +00.56

PC +90.06

BENCHMARK: 5521B
"X" CUT ON BOLT OPPOSITE MAIN
ON HYDRANT
EL=15.52'

CENTRAL STREET

ROPE & POST FENCE

STOP BAR

TEMPORARY TRAFFIC SIGNAL

BRIDGE EXCAVATION LIMITS (TYP)

TAX MAP 45, LOT 3
DAVID N. & MARYANN A. WOOD
6 HIGHWOOD RD
MANCHESTER, MA 01944
E.D.R.D. BOOK 31834, PAGE 53

30-FOOT NO DISTURB ZONE (TYP)

50-FOOT NO BUILD ZONE (TYP)

COASTAL BANK

POSSIBLE

WHEELCHAIR RAMP

CHAIN-LINK FENCE

200-FOOT RIVERFRONT AREA

BENCHMARK: 5521A
"X" CUT ON BOLT OVER MAIN
ON HYDRANT
EL=13.81'

DISK FND. MASS DEPT. PUBLIC WORKS "AH52"

OMH 1063

PROVIDE TEMPORARY ADA BUILDING ACCESS AT EASTERN DOORWAY DURING CONSTRUCTION

0 10 20 30 40

SCALE: 1" = 10'

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COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
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Town of Manchester-By-The-Sea, Massachusetts

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PROJECT NO:	M1476 - 011
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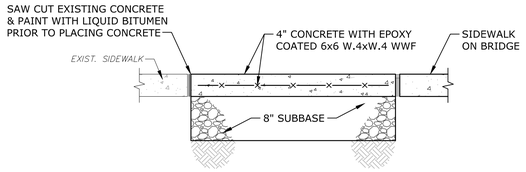
FILE:	M1476-011-C-103.dwg
DRAWN BY:	DWB
CHECKED:	ADF
APPROVED:	DLL

TEMPORARY ROADWAY AND UTILITY PLAN

SCALE: 1" = 10'

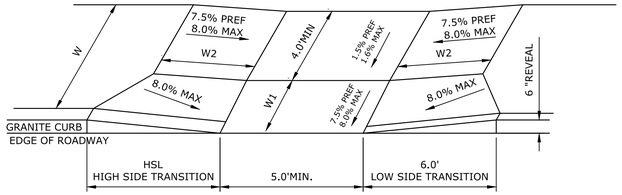
C-103



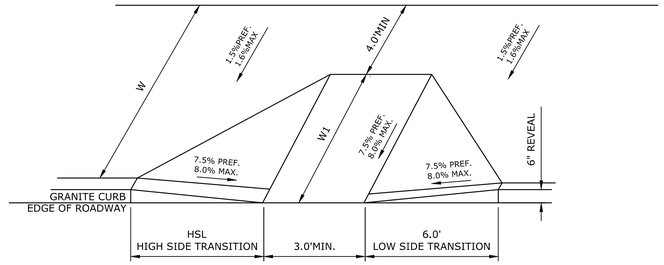
NOTES:

1. ALL CONCRETE, AGGREGATE, STABILIZED COURSE, SUBBASE AND LIQUID BITUMEN SHALL CONFORM TO THE MATERIALS EQUIPMENT AND CONSTRUCTION REQUIREMENTS AS PER STATE SPECIFICATIONS.
2. PROVIDE A 1" CONSTRUCTION JOINT BETWEEN BRIDGE AND APPROACH SIDEWALK. FILL JOINT WITH COMPRESSIBLE FILLER MATERIAL AND SEAL WITH 1" WIDE x 1/2" DEEP SILICONE JOINT SEALANT.
3. MATCH FINISH GRADE AND WIDTH OF EXISTING SIDEWALK.

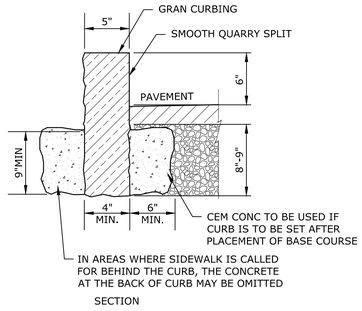
APPROACH SIDEWALK
NO SCALE

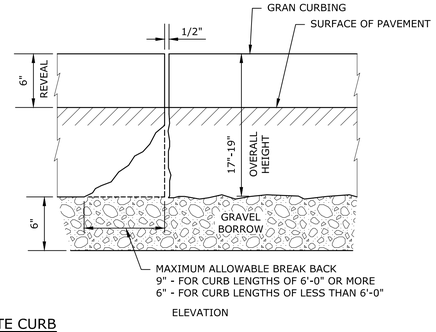


HANDICAP RAMP FOR
LESSTHAN 11.5' SIDEWALK
NO SCALE

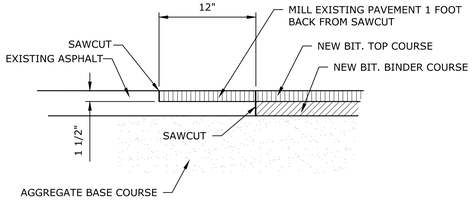


HANDICAP RAMP FOR
WIDER THAN 11.5' SIDEWALK
NO SCALE

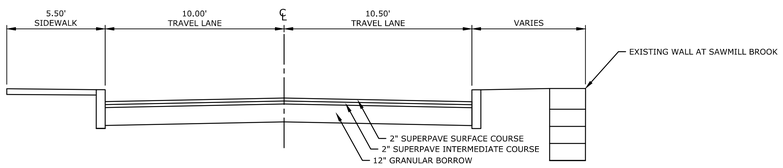




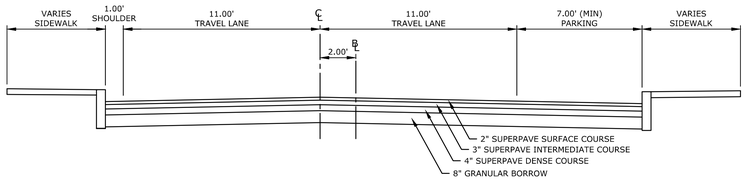
GRANITE CURB
NO SCALE



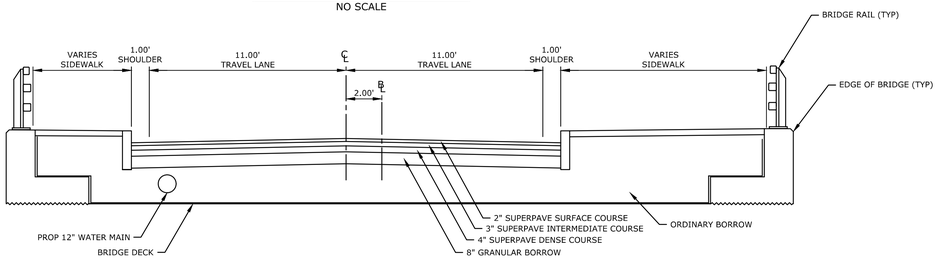
TYPICAL BUTT JOINT
TO EXISTING PAVEMENT
NO SCALE



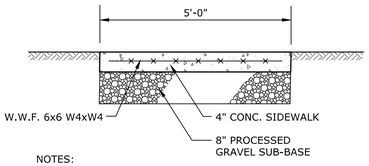
ELM STREET TYPICAL SECTION
NO SCALE



CENTRAL STREET TYPICAL SECTION
NO SCALE



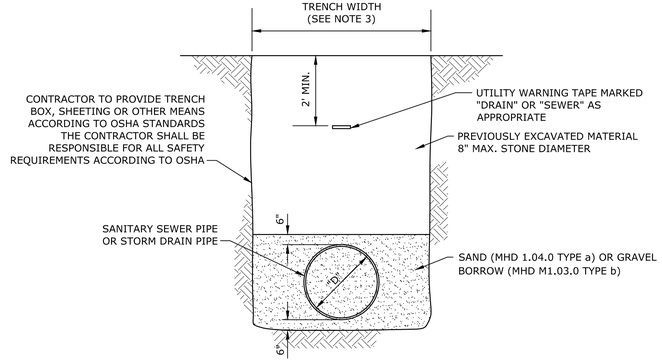
CENTRAL STREET BRIDGE TYPICAL SECTION
NO SCALE



NOTES:

1. WALK TO HAVE 1/4" RADIUS TOOLED DUMMY JOINT 1/4 OF THE THICKNESS OF THE SIDEWALK IN DEPTH EVERY 5 L.F. OF WALK.
2. WALK TO HAVE 1/2" WIDE NON-EXTRUDING PREFORMED EXPANSION JOINT EVERY 20 L.F. OF WALK.

CONCRETE SIDEWALK
NO SCALE



TYPICAL DRAIN LINE AND
SEWER TRENCH SECTION
NO SCALE

NOTES:

1. COMPACT ALL BACKFILL MATERIAL WITH VIBRATORY PLATE EQUIPMENT (MINIMUM TWO PASSES) TO A MINIMUM DENSITY OF 95 PERCENT OF THE STANDARD PROCTOR DENSITY AS DETERMINED BY ASTM D698.
2. PLACE BACKFILL MATERIAL IN MAXIMUM ONE FOOT LIFTS.
3. FOR PIPES LESS THAN 24" IN DIAMETER THE TRENCH WIDTH SHALL BE 5.0'. FOR PIPES 24" IN DIAMETER AND GREATER, TRENCH WIDTH SHALL BE THE PIPE DIAMETER PLUS 3.0'.

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
CIVIL
No. 39818
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Loring
Date: 2020.09.09
15:55:59-04'00'

Permit Set Not For Construction

Central Street Bridge Replacement

Department of Public Works

MassDOT Bridge No. M-02-001, BIN 8AM

Town of Manchester-By-The-Sea, Massachusetts

MARK	DATE	DESCRIPTION
0	6/20/2019	DRAFT 25% PLANS

PROJECT NO:	M1476 - 011
DATE:	06/20/2019
FILE:	M1476-011-C-501.dwg
DRAWN BY:	DWB
CHECKED:	ADF
APPROVED:	DLL

CONSTRUCTION DETAILS

SCALE: AS NOTED

C-501

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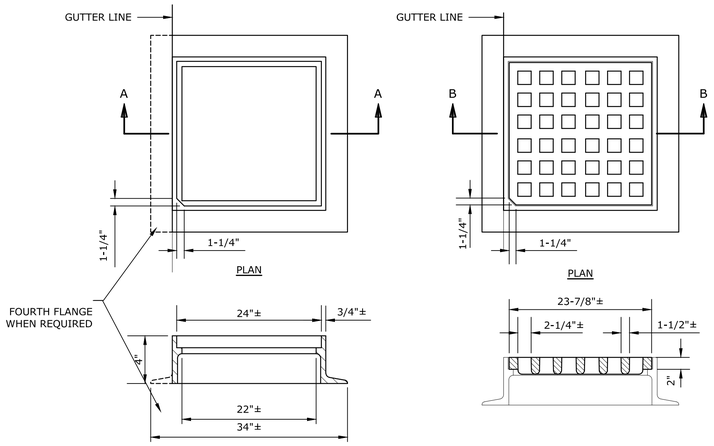
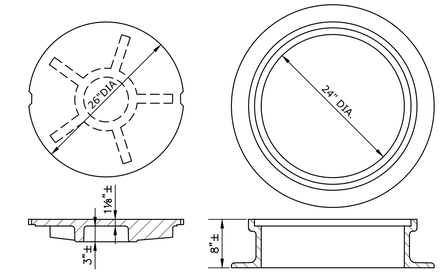


CATCH BASIN FRAME
NO SCALE

CATCH BASIN GRATE
NO SCALE

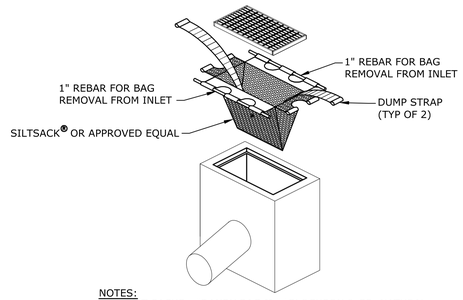


STANDARD MANHOLE COVER

STANDARD MANHOLE FRAME

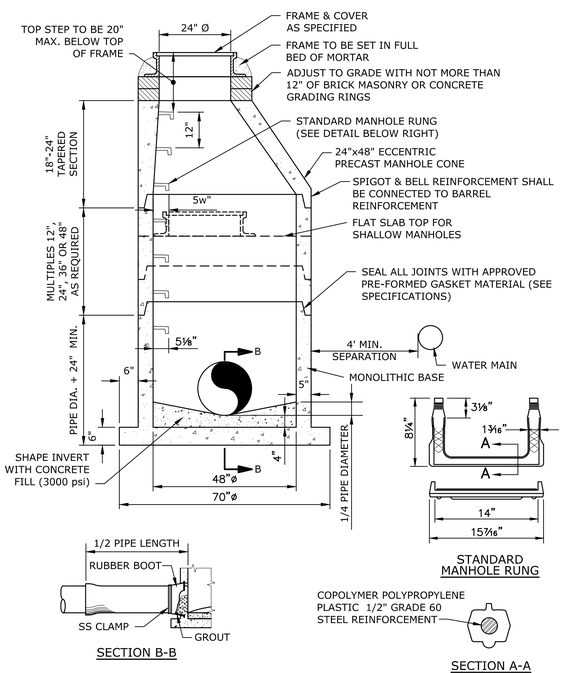
NOTES:
1. FRAME AND COVER PROVIDED FROM THE SAME MANUFACTURER.
2. LETTERING PROVIDED ON COVERS AS SPECIFIED.

MANHOLE FRAME & COVER
NO SCALE

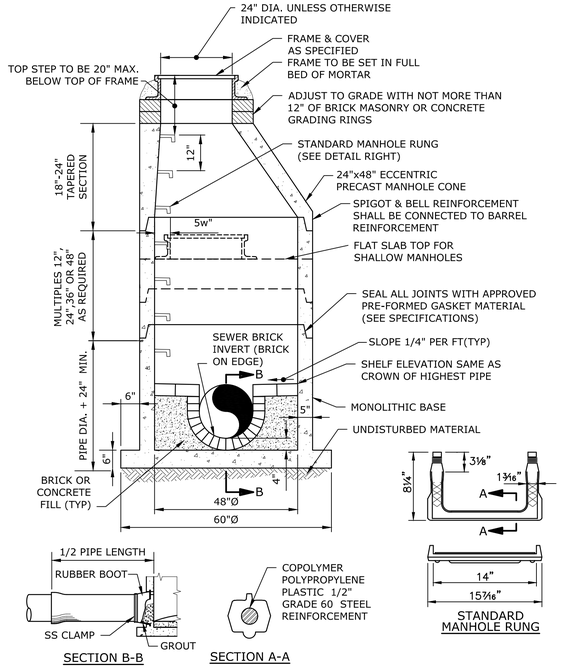


NOTES:
1. "SILT SACKS", "DANDY BAG II," "BLOCKSON & CO. NATURAL FIBER INLET FILTER MAT" OR OTHER SIMILAR SILT RETENTION DEVICE SHALL BE INSTALLED IN LIEU OF HAY BALES FOR CATCH BASINS LOCATED IN EXISTING PAVED AREAS.

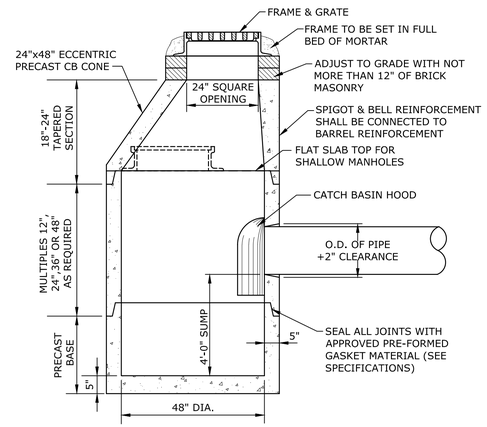
CATCH BASIN INLET SEDIMENTATION PROTECTION
NO SCALE



48" PRECAST DRAIN MANHOLE
NO SCALE



48" PRECAST SANITARY SEWER MANHOLE
NO SCALE



NOTES:
1. FOR USE WITH PVC PIPE, PROVIDE RUBBER BOOT SIMILAR TO MANHOLE DETAIL.
2. FOR USE WITH OTHER TYPES OF PIPE, SEAL JOINT BETWEEN PIPE AND CATCH BASIN WITH GROUT.
3. SEE SHEET 3 FOR CURB INLET LOCATIONS AND SHEET 5 FOR CURB INLET DETAIL.

PRECAST CONCRETE CATCH BASIN
NO SCALE

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
CIVIL
No. 39818
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Loring
Date: 2020.09.09 15:56:20-04'00'

Permit Set Not For Construction

Central Street Bridge Replacement

Department of Public Works

MassDOT Bridge No. M-02-001, BIN 8AM

Town of Manchester-By-The-Sea, Massachusetts

MARK	DATE	DESCRIPTION
0	6/20/2019	DRAFT 25% PLANS

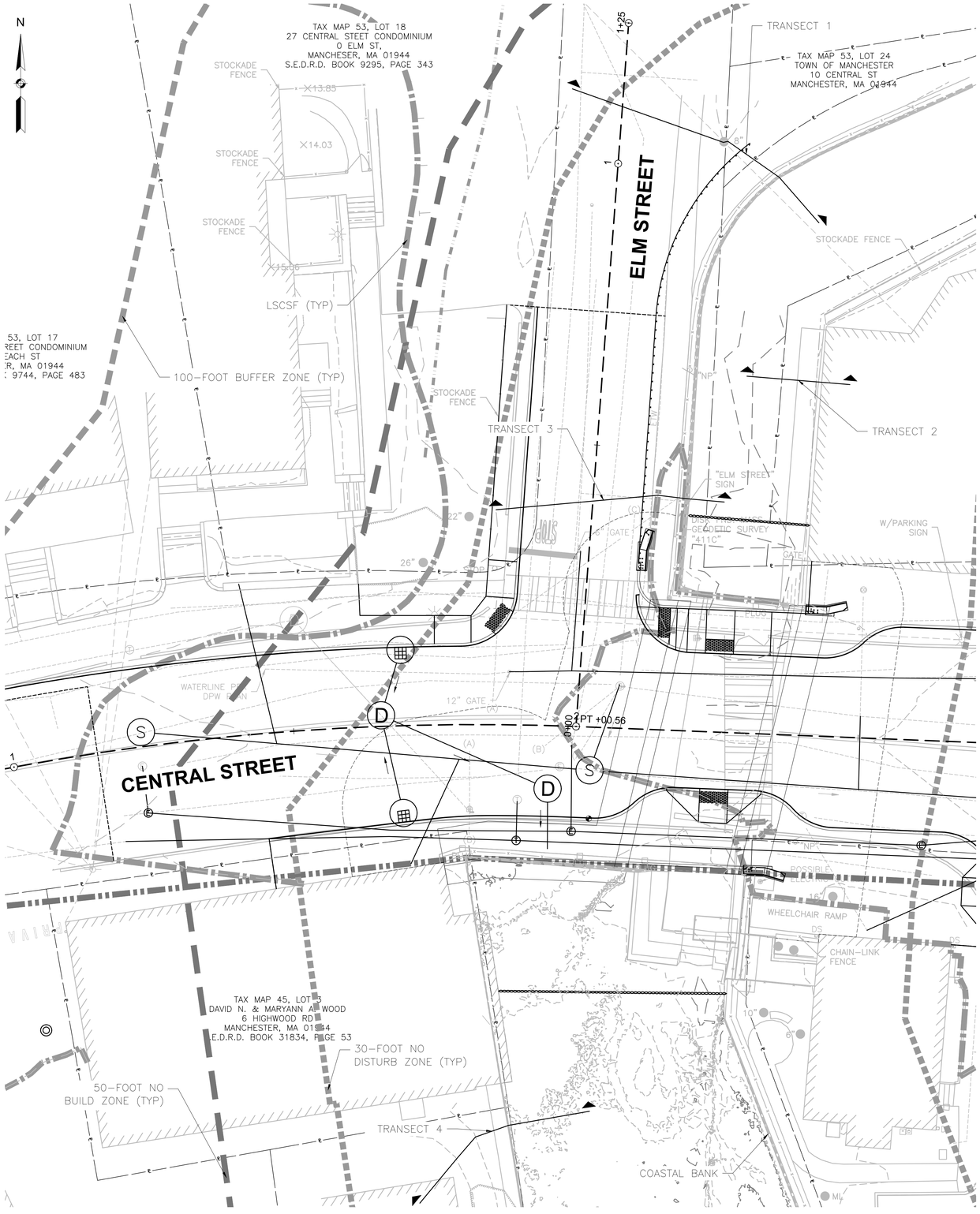
PROJECT NO:	M1476 - 011
DATE:	06/20/2019
FILE:	M1476-011-C-501.dwg
DRAWN BY:	DWB
CHECKED:	ADF
APPROVED:	DLL

CONSTRUCTION DETAILS

SCALE: AS NOTED

C-502

Last Saved: 8/31/2020
Plotted On: Sep 02, 2020-1:08pm By: DWBradshaw
Tighe & Bond: J:\M\M1476 Manchester MA Hydro Study\011-Central Street Bridge\Drawings_Figures\AutoCAD\Sheet\M1476-011-C-501.dwg



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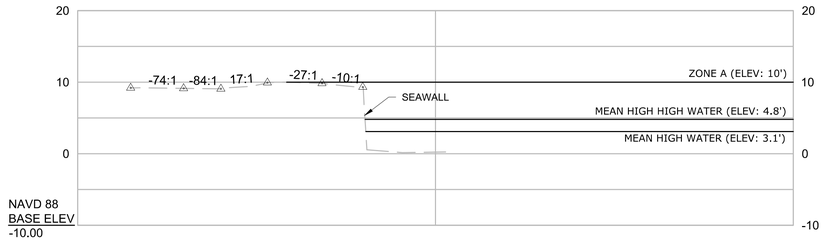

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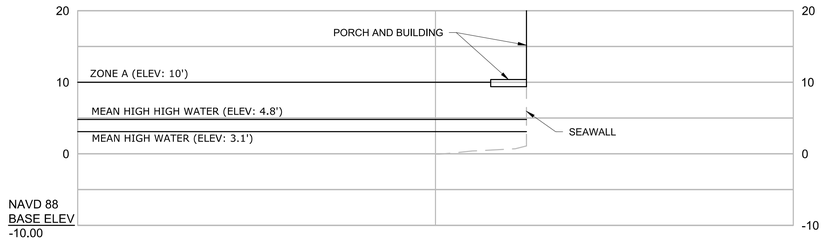

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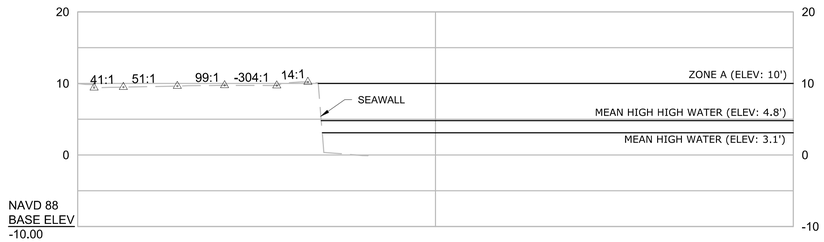

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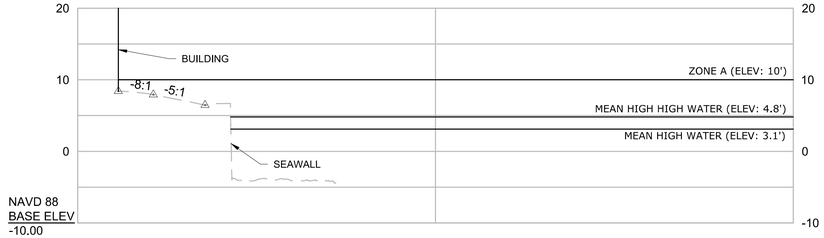

0 10 20 30 40

SCALE: 1" = 10'

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
CIVIL
No. 39818
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Department of Public Works

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Town of Manchester-By-The-Sea, Massachusetts

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FILE:	M1476-011-C-503.dwg
DRAWN BY:	DWB
CHECKED:	ADF
APPROVED:	DLL

COASTAL BANK PLAN

SCALE: HORIZ, VERT: 1" = 10'

C-503

Last Saved: 8/31/2020
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Tighe & Bond J:\M\M1476 Manchester MA Hydro Study\011-Central Street Bridge\Drawings_Figures\AutoCAD\Sheet\M1476-011-C-503.dwg

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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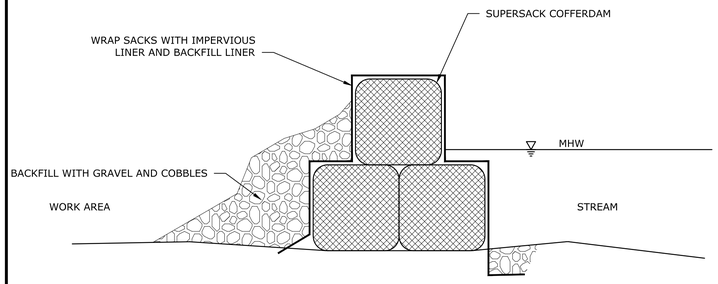
CONTROL OF WATER NOTES

SCALE: AS NOTED

C-504

Last Saved: 8/31/2020
Plotted On: Sep 02, 2020-1:08pm By: DWBradshaw
Tighe & Bond: J:\M\M1476 Manchester MA Hydro Study\011-Central Street Bridge\Drawings_Figures\AutoCAD\Sheet\M1476-011-C-501.dwg

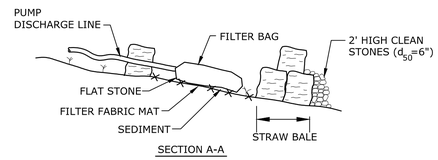


COFFERDAMS NOTES:
1. WRAP "SUPER SACKS" WITH IMPERVIOUS PLASTIC LINER TO PREVENT SEEPAGE.
2. BACKFILL THE ISOLATED SIDE OF THE COFFERDAM WITH NATIVE ALLUVIUM.
3. USE "SUPER SACKS" AS A BUTRESS AS REQUIRED.

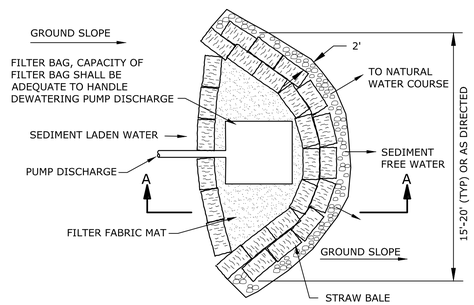
COFFERDAM SECTION
NO SCALE

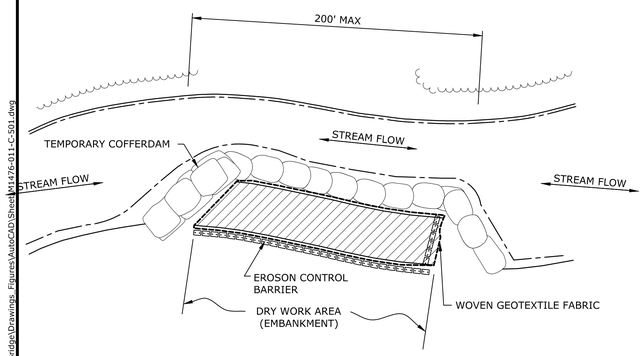
COFFERDAMS, PUMPING, DEWATERING, AND STREAM BYPASS NOTES:

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 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 STRUCTURE CONSTRUCTION WITHIN THE ORDINARY HIGH WATER CHANNEL SHALL CONFORM TO THE WATER QUALITY STANDARDS ESTABLISHED BY REGULATORY AGENCY PERMITS FOR THIS PROJECT.

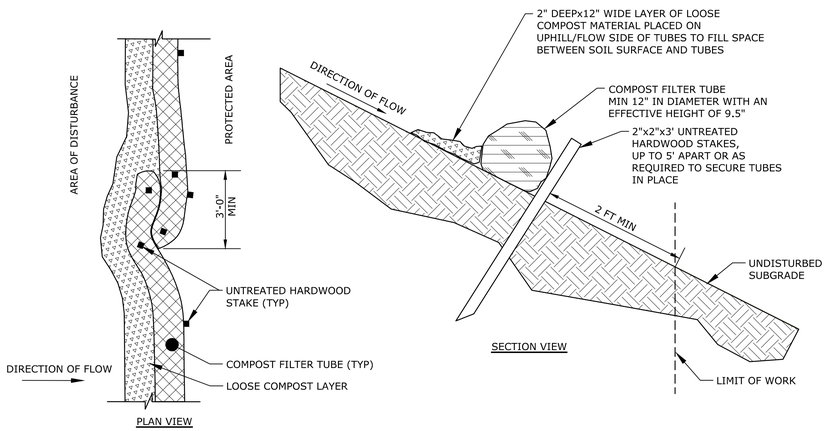


SECTION A-A

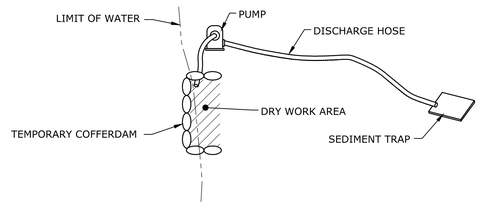




DIVERSION DETAIL
NO SCALE



COMPOST FILTER TUBE
NO SCALE



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

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
CIVIL
No. 39818
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Loring
Date: 2020.09.09 15:57:25-04'00'

Permit Set Not For Construction

Central Street Bridge Replacement

Department of Public Works

MassDOT Bridge No. M-02-001, BIN 8AM

Town of Manchester-By-The-Sea, Massachusetts

MARK	DATE	DESCRIPTION
0	6/20/2019	DRAFT 25% PLANS

PROJECT NO:	M1476 - 011
DATE:	06/20/2019
FILE:	M1476-011-C-501.dwg
DRAWN BY:	DWB
CHECKED:	ADF
APPROVED:	DLL

CONTROL OF WATER DETAILS

SCALE: AS NOTED

C-505

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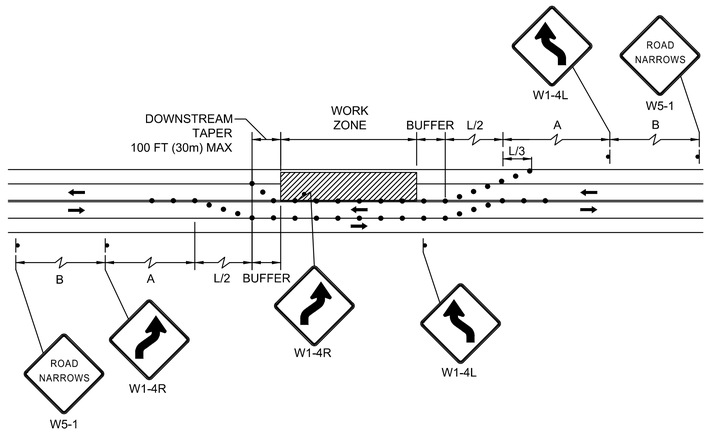
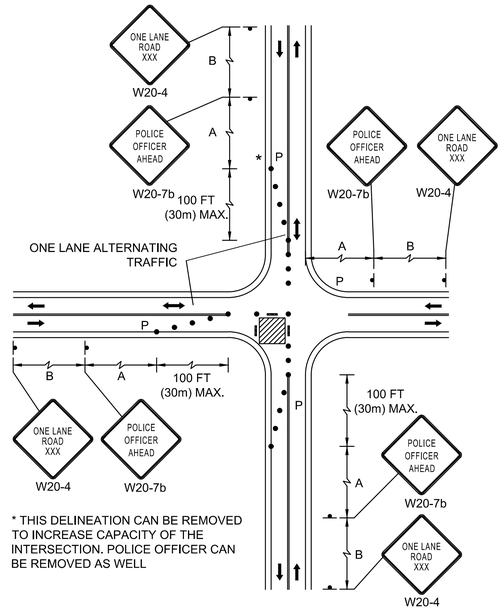
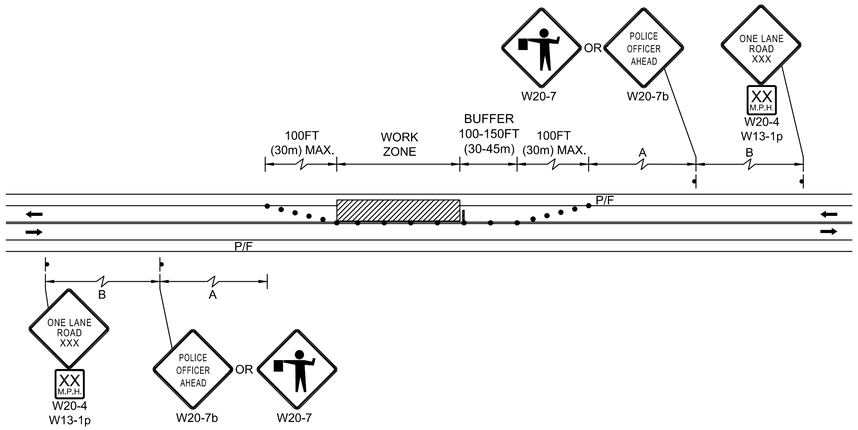


TWO LANE ROAD
PARKING AND TRAVEL LANE CLOSED
NO SCALE

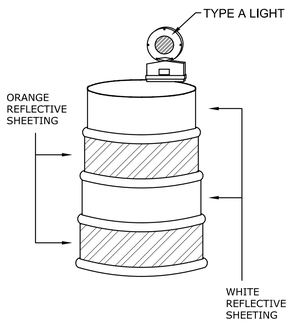


* THIS DELINEATION CAN BE REMOVED TO INCREASE CAPACITY OF THE INTERSECTION. POLICE OFFICER CAN BE REMOVED AS WELL

SINGLE LANE APPROACH
ONE QUADRANT CLOSURE
NO SCALE



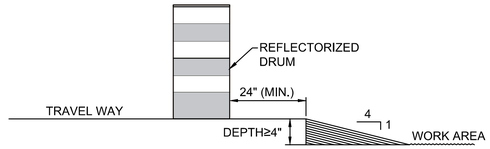
TWO LANE ROAD
ONE LANE ALTERNATING TRAFFIC
NO SCALE



NOTES:

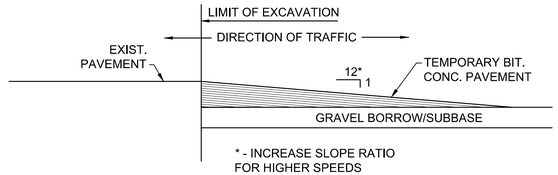
1. DRUM DESIGN AND APPLICATION SHALL BE AS PER THE CURRENT EDITION OF THE MUTCD.
2. DRUMS SHALL BE APPROXIMATELY 36" IN HEIGHT, HAVING A MINIMUM WALL THICKNESS OF 3/32" AND A MINIMUM DIAMETER OF 18" REGARDLESS OF ORIENTATION.
3. DRUM MATERIAL MUST BE APPROVED UV RESISTANT, LOW DENSITY, IMPACT RESISTANT, LINEAR POLYETHYLENE (OR APPROVED EQUIVALENT).
4. SHEETING SHALL BE APPROVED ORANGE AND WHITE TYPE IV REFLECTORIZED SHEETING CONFORMING TO M9.30.0.
5. ALL DRUMS SHALL BE WELL MAINTAINED INCLUDING REMOVAL OF DUST OR ROAD FILM, SO AS NOT TO REDUCE REFLECTIVE EFFICIENCY. WHEN A DRUM LOSES TARGET VALUE IT SHALL BE REPLACED.
6. STORE UNUSED DRUMS IN ONE LOCATION, AWAY FROM ALL TRAFFIC, OR REMOVE FROM SITE ENTIRELY.

PLASTIC DRUMS



IF "D" IS GREATER THAN 4" THE CONTRACTOR SHALL PLACE FILL MATERIAL AT A 4:1 SLOPE AT THE EDGE OF THE EXCAVATED AREA. SUPPLYING, PLACING AND REMOVING THIS FILL MATERIAL SHALL BE INCIDENTAL TO THE PROJECT AND NOT SEPARATELY MEASURED OR PAID FOR.

LATERAL DROP-OFF DETAIL
NO SCALE



* - INCREASE SLOPE RATIO FOR HIGHER SPEEDS

LONGITUDINAL DROP-OFF DETAIL
NO SCALE

FORMULAS FOR DETERMINING TAPER LENGTHS

SPEED LIMIT (S)	TAPER LENGTH (L) FEET
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR MORE	L = WS

WHERE:
L = TAPER LENGTH IN FEET

W = WIDTH OF OFFSET IN FEET

S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH

NOTES:

1. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS, UNLESS SUPERCEDED BY THESE PLANS.
2. ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
3. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
4. TEMPORARY CONSTRUCTION SIGNING, BARRICADES, AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
5. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, "RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES" AND/OR "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
6. NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT, AND SIMILAR OPERATIONS.
7. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
8. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
9. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
10. MINIMUM LANE WIDTH IS TO BE 11 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
11. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.
12. TEMPORARY PEDESTRIAN WALKWAY LOCATION TO BE DETERMINED IN THE FIELD. CONTRACTOR AND ENGINEER TO DETERMINE TREE REMOVAL ALONG DETOUR PATH.
13. TEMPORARY PEDESTRIAN WALKWAY TO CONFORM WITH ADA STANDARDS.
14. TEMPORARY PEDESTRIAN WALKWAY TO BE RETURNED TO PRECONSTRUCTION CONDITIONS. REPLACE TREES IN KIND.
15. CURB RAMPS SHALL BE 60 IN. MINIMUM WIDTH WITH A FIRM, STABLE AND NON-SLIP SURFACE.
16. PROTECTIVE EDGING WITH A 2 IN. MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6 IN. OR GREATER OR HAS A SIDE APRON SLOP STEEPER THAN 1:3 (33%). PROTECTIVE EDGING SHOULD BE CONSIDERED WHEN THE CURB RAMPS OR LANDING PLATFORMS HAVE A VERTICAL DROP OF 3 IN. OR MORE.
17. DETECTABLE EDGING WITH 6 IN. MINIMUM HEIGHT AND CONTRASTING COLOR SHALL BE INSTALLED ON ALL CURB RAMP LANDINGS WHERE THE WALKWAY CHANGES DIRECTION (TURNS).
18. CURB RAMPS AND LANDINGS SHOULD HAVE A 1:50 (2%) MAX CROSS-SLOPE.
19. CLEAR SPACE OF 48x48 IN. MINIMUM SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
20. THE CURB RAMP WALKWAY EDGE SHALL BE MARKED WITH A CONTRASTING COLOR 2 TO 4 IN. WIDE MARKING. THE MARKING IS OPTIONAL WHERE COLOR CONTRASTING EDGING IS USED.
21. WATER FLOW IN THE GUTTER SYSTEM SHALL HAVE MINIMAL RESTRICTION.
22. LATERAL JOINTS OR GAPS BETWEEN SURFACES SHALL BE LESS THAN 0.5 IN. WIDTH.
23. CHANGES BETWEEN SURFACE HEIGHTS SHOULD NOT EXCEED 0.5 IN. LATERAL EDGES SHOULD BE VERTICAL UP TO 0.25 IN. HIGH, AND BEVELED AT 1:2 BETWEEN 0.25 IN. AND 0.5 IN. HEIGHT.

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
CIVIL
No. 39818
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Loring
Date: 2020.09.09
15:57:47-04'00'

Permit Set Not For Construction

Central Street Bridge Replacement

Department of Public Works

MassDOT Bridge No. M-02-001, BIN 8AM

Town of Manchester-By-The-Sea, Massachusetts

MARK	DATE	DESCRIPTION
0	6/20/2019	DRAFT 25% PLANS

PROJECT NO:	M1476 - 011
DATE:	06/20/2019
FILE:	M1476-011-C-701.dwg
DRAWN BY:	DWB
CHECKED:	ADF
APPROVED:	DLL

TEMPORARY TRAFFIC CONTROL PLAN - GENERAL

SCALE: AS NOTED

C-701

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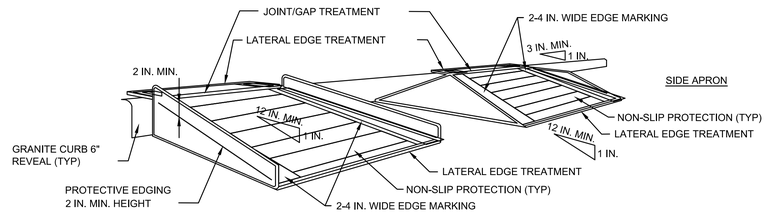
W20-1-a

DETOUR PLAN
SCALE 1"=500'

LEGEND

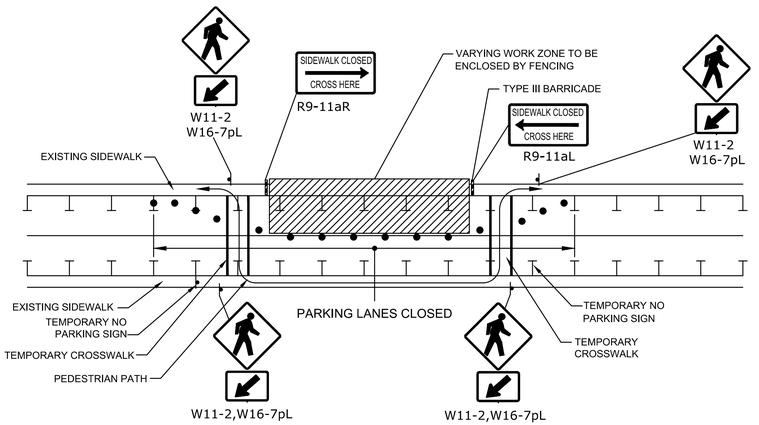
- REFLECTORIZED PLASTIC DRUM OR 36" CONE
- TYPE III BARRICADE
- CHANGEABLE MESSAGE SIGN
- WORK ZONE
- DIRECTION OF TRAFFIC
- SIGN

SIGN LEGEND					
CODE	DESCRIPTION	SIZE	AREA	NO.	TOTAL AREA
W20-1-a	ROAD WORK AHEAD	36"x36"	9 SF	2	18 SF
W20-3	ROAD CLOSED AHEAD	36"x36"	9 SF	2	18 SF
R11-2	ROAD CLOSED	48"x30"	10 SF	2	20 SF
R11-4	ROAD CLOSED TO THRU TRAFFIC	60"x30"	12.5 SF	2	25 SF
M4-10L	DETOUR	48"x18"	6 SF	1	6 SF
M4-10R	DETOUR	48"x18"	6 SF	1	6 SF
M4-9L	DETOUR	30"x24"	5 SF	5	25 SF
M4-9R	DETOUR	30"x24"	5 SF	5	25 SF
M4-8a	END DETOUR	30"x24"	5 SF	2	10 SF
					TOTAL = 153 SF



PROTECTIVE EDGE

PEDESTRIAN DETOUR RAMPS
SCALE 1"=200'



NOTES

1. ADDITIONAL ADVANCE WARNING MAY BE NECESSARY.
2. CONTROLS ONLY FOR PEDESTRIAN TRAFFIC ARE SHOWN. VEHICULAR TRAFFIC SHOULD BE HANDLED AS SHOWN ELSEWHERE.
3. STREET LIGHTING SHOULD BE CONSIDERED WHEN LOCATING CONTROL DEVICES.
4. TEMPORARY CROSSWALKS WITH APPROPRIATE SIGNS SHOULD BE INSTALLED TO CROSS PEDESTRIANS TO THE OPPOSITE SIDE OF THE STREET AS SHOWN IN PEDESTRIAN BYPASS, AND AS DIRECTED BY THE ENGINEER. TEMPORARY CURB RAMPS WILL BE REQUIRED AT ALL TEMPORARY CROSSWALK LOCATIONS.
5. BYPASS IS TO BE USED IN CONJUCTION WITH THE PROPOSED LANE CLOSURE DETAILS AND DURING CONSTRUCTION STAGING, AS DIRECTED BY THE ENGINEER.
6. THE TEMPORARY SIDEWALK SHOULD BE A MINIMUM OF 4 FEET WIDE. IF THIS WALKWAY EXCEEDS 200 FEET THEN A 5 FOOT X 5 FOOT PASSING ZONE. (FOR SHORT TERM SETUPS < 10 HOURS, THIS CONDITION MAY BE WAIVED. A NOTE WOULD NEED TO BE INCLUDED IN THE TTCP THAT STATES HOW THE CONTRACTOR SHOULD ADDRESS THIS ISSUE.)

PEDESTRIAN DETOUR
NO SCALE

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
CIVIL
No. 39818
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Loring
Date: 2020.09.09 15:58:16-04'00'

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Department of Public Works

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Town of Manchester-By-The-Sea, Massachusetts

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FILE:	M1476-011-C-702.dwg
DRAWN BY:	DWB
CHECKED:	ADF
APPROVED:	DLL

TEMPORARY TRAFFIC CONTROL PLAN - DETOUR

SCALE: AS NOTED

C-702

Last Saved: 9/26/2020
Plotted On: Sep 09, 2020 - 1:09pm By: DWBrailshaw
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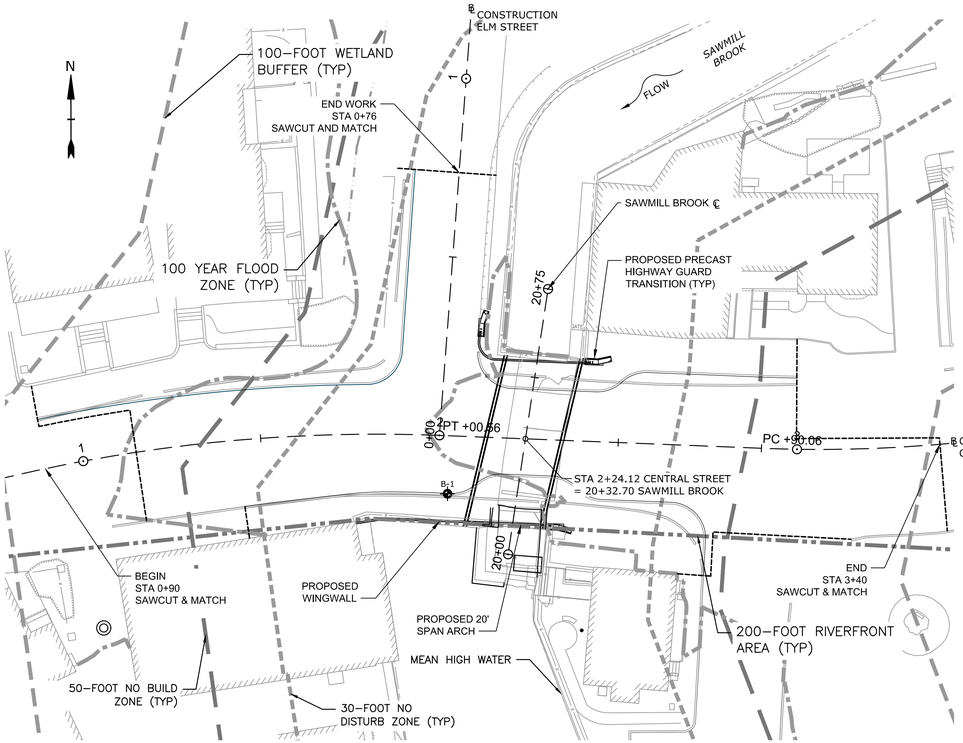
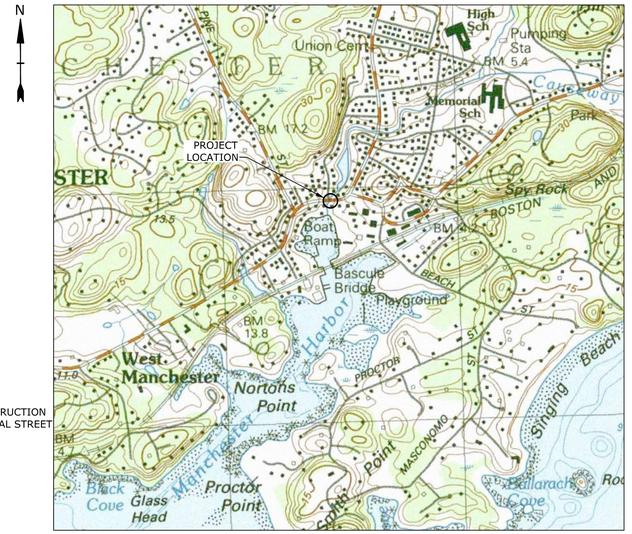


KEY PLAN
1" = 20'

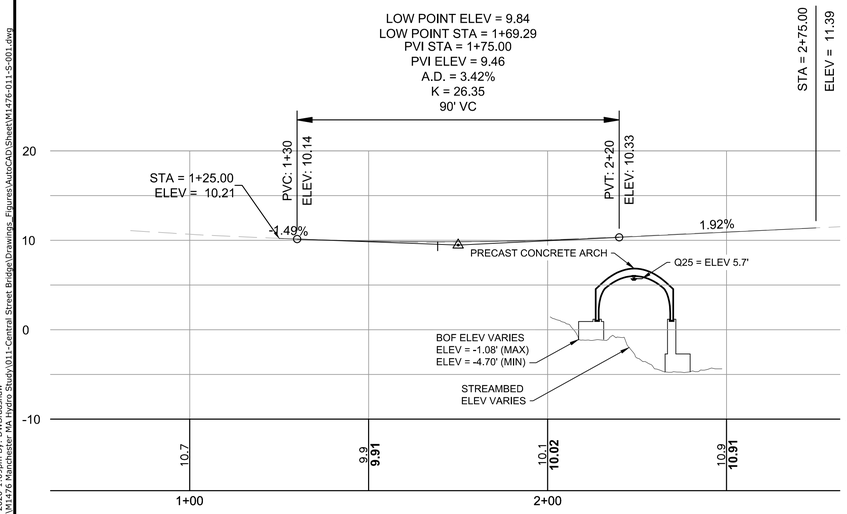


LOCUS PLAN
SCALE: 1"=1000'

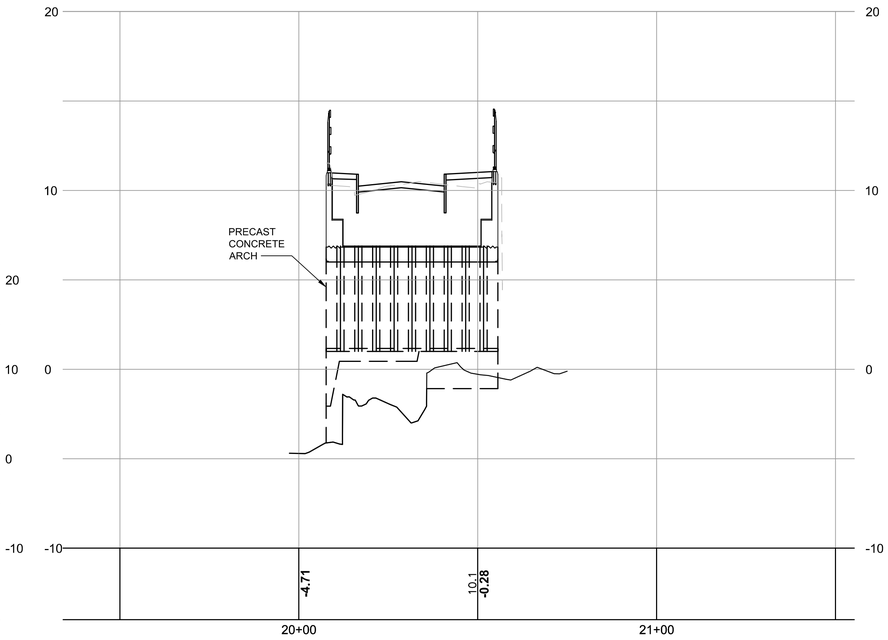
BRIDGE DRAWING INDEX

HYDRAULIC DATA	
DRAINAGE AREA	5.0 SQ. MILES
WATER CONTROL FLOOD DISCHARGE (2 YR)	254 CFS
DESIGN FLOOD DISCHARGE (25 YR)	1,363 CFS
DESIGN FLOOD ANNUAL CHANCE (RETURN FREQUENCY)	4% (25-YEARS)
DESIGN FLOOD VELOCITY (25 YR)	7.5 FPS
DESIGN FLOOD ELEVATION (25 YR)	5.7 FEET
BASE (100-YR) FLOOD DATA	
BASE FLOOD DISCHARGE (100 YR)	2,267 CFS
BASE FLOOD ELEVATION (100 YR)	*7.7 FEET
DESIGN AND CHECK SCOUR DATA	
SCOUR DESIGN FLOOD ANNUAL CHANCE (RETURN FREQUENCY)	2% (50-YEARS)
DESIGN FLOOD ABUTMENT SCOUR DEPTH	LEFT: 2 FT RIGHT: 2 FT
SCOUR CHECK FLOOD ANNUAL CHANCE (RETURN FREQUENCY)	1% (100-YEARS)
CHECK FLOOD ABUTMENT SCOUR DEPTH	LEFT: 2 FT RIGHT: 2 FT
FLOOD OF RECORD	
DISCHARGE	UNKNOWN
FREQUENCY (IF KNOWN)	N/A
MAXIMUM ELEVATION	N/A
DATE	N/A
HISTORY OF ICE FLOES	UNKNOWN
EVIDENCE OF SCOUR AND EROSION	UNKNOWN

* THE 7.7' ELEVATION IS THE MODELED 100-YEAR PRECIPITATION EVENT DISCHARGE ELEVATION AT THE BRIDGE



PROFILE - CENTRAL STREET
SCALE: 1" = 20'H, 1"=8'V



PROFILE - SAWMILL BROOK
SCALE: 1" = 20'H, 1"=4'V

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
CONCEPTUAL DESIGN IS ACCEPTABLE TO MASSDOT FOR CONTRACTING

DISTRICT BRIDGE ENGINEER _____ DATE _____

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
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Town of Manchester-By-The-Sea, Massachusetts

MARK	DATE	DESCRIPTION

PROJECT NO:	M1476 - 011
DATE:	JUNE 2019
FILE:	M1476-011-S-001.dwg
DRAWN BY:	D.BISHOP
CHECKED:	EAO
APPROVED:	DLL

BRIDGE KEY PLAN, PROFILES, LOCUS AND INDEX

SCALE: AS NOTED

S-001

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Tighe & Bond: J:\M\M1476 Manchester MA Hydro Study\011-Central Street Bridge\Drawings_Figures\AutoCAD\Sheet\M1476-011-S-001.dwg

DESIGN LOADS AND SPECIFICATIONS:

1. DESIGN LOADING: HL-93
2. DESIGN: LOAD AND RESISTANCE FACTOR DESIGN (LRFD) IN ACCORDANCE WITH:
   AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH ED., 2017 AS AMENDED
   MASSDOT 2013 LRFD BRIDGE DESIGN MANUAL, AS AMENDED
3. SPECIFICATIONS: MASSDOT 1988 STANDARD SPECIFICATIONS AS AMENDED
4. FOUNDATION DATA: ABUTMENTS AND U-WINGWALL:
   SPREAD FOOTINGS SUPPORTED ON SOUND BEDROCK WITH A NOMINAL BEARING CAPACITY OF 100.0 TSF IN COMBINATION WITH A RESISTANCE FACTOR OF 0.45.
   PRECAST GUARD TRANSITION:
   TRANSITION BASE ON CONTROLLED DENSITY FILL (NON EXCAVATABLE) ON COMPACTED GRAVEL BORROW OR UNDISTURBED SOIL.
5. REINFORCING STEEL: AASHTO M31 (ASTM A 615) GRADE 60
   ALL BARS SHALL BE HOT-DIPPED GALVANIZED (ASTM A767 & ASTM A1094)
6. CONCRETE: PRECAST ACRH, PEDESTAL FOOTINGS, CURBS/HEADWALLS, GUARD TRANSITIONS, U-WINGWALL, AND U-WINGWALL FOOTINGS:
   5000 PSI, ¾", 685 HP CEMENT CONCRETE
7. SEISMIC: PEAK GROUND ACCELERATION (PGA) = 0.125g
   SITE CLASS = C
   SEISMIC DESIGN CATEGORY = A

GENERAL NOTES:

1. PLANS OF THE EXISTING BRIDGE ARE NOT AVAILABLE.
2. BORINGS WERE MADE BY NEW ENGLAND BORING CONTRACTORS ON 9/8/2018.
3. ALL EXISTING BRONZE DISCS REPRESENTING STATE BENCHMARKS OR SURVEY TRIANGULATION POINTS MUST NOT BE DISTURBED. WHEN THE WORK CALLED FOR INVOLVES DISTURBING A BRONZE DISC THE CONTRACTOR SHALL NOTIFY THE ENGINEER SUFFICIENTLY IN ADVANCE OF THE WORK TO PERMIT THE STATE TO TEMPORARILY RELOCATE THE AFFECTED MARKER.
4. ALL WORK SHALL COMPLY WITH OSHA'S LATEST STANDARDS. ALL REQUIREMENTS OF OSHA'S EXCAVATION STANDARDS SHALL BE PROVIDED BY THE CONTRACTOR INCLUDING, BUT NOT LIMITED TO, THE PROVISION FOR A COMPETENT PERSON ON SITE AND ANY REQUIRED DOCUMENTATION THAT MAY REQUIRE CERTIFICATION BY A PROFESSIONAL ENGINEER.
5. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ALL UTILITIES FUNCTIONING PROPERLY IN THE AREAS UNDER CONSTRUCTION PRIOR TO COMPLETION OF THE PROJECT. ALL PIPES AND STRUCTURES WITHIN THE LIMITS OF THIS CONTRACT SHALL BE LEFT IN A CLEAN AND OPERABLE CONDITION AT THE COMPLETION OF THE WORK. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SAND AND SILT FROM DISTURBED AREAS FROM ENTERING THE SYSTEM. CONTRACTOR IS RESPONSIBLE FOR DAMAGE SUSTAINED TO ANY EXISTING UTILITIES AND IT IS HIS RESPONSIBILITY TO MAKE REPAIRS TO THE REQUIREMENTS OF THE TOWN OR RESPECTIVE UTILITY COMPANY.
6. ANY AND ALL DEMOLISHED BUILDING MATERIALS, STRUCTURES, PIPES, PAVEMENT, CURBING, SURPLUS MATERIAL, AND SITE RUBBLE SHALL BE DISPOSED OF BY THE CONTRACTOR OFF-SITE AT HIS EXPENSE AND IN ACCORDANCE WITH ALL APPLICABLE STATE AND FEDERAL ENVIRONMENTAL REGULATIONS.
7. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO ENSURE THAT DEBRIS DOES NOT FALL ON ANY ROADWAY, RAILROAD, OR WATERWAY BELOW THE EXISTING STRUCTURE. ALL COSTS INCLUDING ERECTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURES OR OTHER SUCH APPROVED METHODS, SHALL BE SUBSIDIARY TO THE APPROPRIATE ITEMS OF WORK BEING PERFORMED.
8. ALL MATERIALS AND METHODS ARE TO COMPLY WITH THE MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, DATED 1988, AND ITS LATEST REVISIONS.
9. ALL DISTURBED AREAS SHALL BE LOAMED & SEEDED UNLESS OTHERWISE SPECIFIED. OVER EXCAVATE LOAM & SEED AREAS AS REQUIRED TO MEET GRADE.
10. IF THERE ARE REVISIONS TO APPROVED PLANS, THE CONTRACTOR SHALL SUBMIT THESE CHANGES TO THE DESIGNER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. ONCE THESE REVISIONS ARE APPROVED BY THE MUNICIPALITY'S DESIGNER OF RECORD, THEY SHALL THEN BE SUBMITTED TO MASSDOT FOR FILING.
11. ALL DIMENSIONS ARE HORIZONTAL AND VERTICAL, AND ARE GIVEN AT 68 DEGREES FAHRENHEIT.
12. ALL WORK PERFORMED BY THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS AND REQUIREMENTS.
13. THE CONTRACTOR SHALL REVIEW AND UNDERSTAND ALL APPLICABLE ENVIRONMENTAL PERMITS AND ENSURE THAT ALL CONSTRUCTION CONDITIONS ARE MET.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION SAFETY, AND MEANS AND METHODS TO PERFORM AND COMPLETE THE WORK.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO PRIVATE OR PUBLIC PROPERTY OUTSIDE THE LIMITS OF CONSTRUCTION SHOWN ON THE PLANS CAUSED BY THE CONTRACTOR, AT THE SOLE COST TO THE CONTRACTOR.
16. THE CONTRACTOR MUST COORDINATE ALL WORK WITH THE TOWN OF MANCHESTER-BY-THE-SEA, ALL UTILITY COMPANIES, THE ENGINEER, AND ANY AFFECTED ABUTTERS. WORK SHALL NOT PROCEED WITHOUT WRITTEN APPROVAL FROM THE TOWN OF MANCHESTER-BY-THE-SEA.
17. THE CONTRACTOR SHALL SUBMIT LITERATURE (MANUFACTURER'S LITERATURE, CUT SHEETS, APPLICATION PROCEDURES, ETC.) FOR ALL PRODUCTS PROPOSED FOR USE ON THE PROJECT, FOR APPROVAL BY THE ENGINEER. APPROVAL OF MATERIALS SHALL BE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION AS AMENDED, SUBSECTION 5.03 AND SECTION 6.00, CONTROL OF MATERIALS.
18. DETAIL OR SHOP DRAWINGS SHALL BE SUBMITTED AND APPROVED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION AS AMENDED, SUBSECTION 5.02, PLANS AND DETAIL DRAWINGS.
19. TAKE ALL NECESSARY MEASURES AND PROVIDE ALL NECESSARY CONTINUOUS BARRIERS OF SUFFICIENT TYPE, SIZE AND STRENGTH TO PREVENT ACCESS TO ALL OPEN EXCAVATIONS AT THE COMPLETION OF EACH DAY'S WORK.
20. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4", UNLESS OTHERWISE NOTED.
21. SHEAR KEYS SHALL BE 3" HIGH BY ONE-THIRD THE WIDTH OF THE CONCRETE ELEMENT, CENTERED, WITH 3" MIN. CLEAR EACH SIDE.
22. PEEL AND STICK BARRIER MEMBRANE SHALL BE 2' WIDE WITH PROTECTION BOARD (SUBSIDIARY) AND PLACED CENTERED OVER ALL HORIZONTAL AND VERTICAL EXPANSION AND CONSTRUCTION JOINTS.
23. APPLY PAVEMENT JOINT ADHESIVE ALONG ALL LONGITUDINAL JOINTS BETWEEN PAVEMENT PASSES AND ALONG BRIDGE CURB LINES AND EXPANSION JOINT ARMORING PRIOR TO PLACING ALL PAVEMENT COURSES.
24. FOR SURVEY CONTROLS SEE SHEETS C-001 TO C-004 (CIVIL SHEETS).
25. FOR BORING NOTES SEE SHEET S-003.
26. FOR HYDRAULIC DATA SEE SHEET S-001.
27. FOR ROAD CLOSURE TRAFFIC MANAGEMENT PLAN SEE SHEET C-702 (CIVIL SHEETS).

BRIDGE REMOVAL NOTES:

1. THE CONTRACTOR'S METHOD FOR REMOVAL OF THE EXISTING BRIDGE SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND ACCEPTANCE PRIOR TO THE COMMENCEMENT OF ANY REMOVAL OPERATIONS.
2. REMOVAL OF EXISTING BRIDGE STRUCTURE SHALL INCLUDE THE COMPLETE REMOVAL OF THE ARCH, FOOTINGS, HEADWALLS, AND WINGWALL. REFER TO SHEET C-005 (CIVIL SHEETS) FOR DEMOLITION PLAN.
3. REFER TO SHEET [FILL-IN FOR FINAL DESIGN] (CIVIL SHEETS) FOR WATER CONTROL SEQUENCING.

FOUNDATION NOTES:

1. FOUNDATION MAY BE ALTERED, IF NECESSARY, TO SUIT CONDITIONS ENCOUNTERED DURING CONSTRUCTION, WITH THE APPROVAL OF THE ENGINEER.
2. CONCRETE SHALL NOT BE PLACED IN WATER OR ON FROZEN GROUND.
3. BOTTOM OF FOUNDATION ELEVATIONS PROVIDED ON DRAWINGS SHALL BE CONSIDERED MINIMUM DEPTHS. CONTRACTOR SHALL REMOVE UNSUITABLE MATERIAL AS REQUIRED.
4. ALL FINISHED EXCAVATIONS SHALL BE VERIFIED AND APPROVED BY THE ENGINEER PRIOR TO PLACEMENT OF FORMWORK FOR CONCRETE FOUNDATION.
5. ALL EXCAVATIONS FOR FOOTINGS SHALL BE FINISHED BY HAND FOR THE LAST 6". ALL FINISHED EXCAVATIONS SHALL BE INSPECTED BY THE ENGINEER PRIOR TO ANY CONCRETE PLACEMENT.
6. ALL BACKFILL UNDER OR ADJACENT TO ANY PORTION OF THE STRUCTURE SHALL BE PLACED IN ACCORDANCE WITH MASSDOT STANDARD SPECIFICATIONS.
7. PRIOR TO PLACEMENT OF FOOTINGS, REVIEW IN-SITU CONDITIONS WITH THE OWNER'S DESIGNATED ENGINEER.

GEOTECHNICAL DESIGN PARAMETERS

1. MINIMUM EMBEDMENT FOR FROST PROTECTION = 4 FEET BELOW ADJACENT GROUND SURFACE.
2. FACTORED STRENGTH LIMIT STATE BEARING RESISTANCE = 45.0 TONS PER SQUARE FOOT
   a. THE BRIDGE DESIGNER SHALL VERIFY THE BEARING RESISTANCE BASED ON THE FINAL BRIDGE AND WINGWALL FOUNDATION DIMENSIONS AND EMBEDMENT
3. MAXIMUM ALLOWABLE SETTLEMENT = 1 INCH TOTAL, ½ INCH DIFFERENTIAL
4. MINIMUM LATERAL EARTH PRESSURES FOR RESTRAINED ARCH WALLS:
   a. STATIC = 61 POUNDS PER SQUARE FOOT PER FOOT (PSF/FT) AS AN EQUIVALENT FLUID PRESSURE, 200 PSF/FT MINIMUM
   b. SURCHARGE = 0.5 TIMES THE VERTICAL SURCHARGE LOAD UNIFORMLY DISTRIBUTED OVER THE HEIGHT OF THE WALL. THE MINIMUM VERTICAL SURCHARGE SHALL BE AN AASHTO HL-93 VEHICULAR LOAD.
   c. SEISMIC = $3.9H^2$ DISTRIBUTED AS AN INVERSE TRIANGLE OVER THE HEIGHT OF THE WALL
5. MINIMUM LATERAL EARTH PRESSURES FOR UNRESTRAINED WING WALLS:
   a. STATIC = 35 PSF/FT AS AN EQUIVALENT FLUID PRESSURE, 200 PSF/FT MINIMUM
   b. SURCHARGE = 0.28 TIMES THE VERTICAL SURCHARGE LOAD UNIFORMLY DISTRIBUTED OVER THE HEIGHT OF THE WALL. THE MINIMUM VERTICAL SURCHARGE SHALL BE AN AASHTO HL-93 VEHICULAR LOAD. THE DESIGN SHALL ACCOUNT FOR SLOPING GROUND SURFACE ABOVE THE WALLS.
   c. SEISMIC = $3.9H^2$ DISTRIBUTED AS AN INVERSE TRIANGLE OVER THE HEIGHT OF THE WALL
6. MINIMUM BACKFILL UNIT WEIGHT = 130 POUNDS PER CUBIC FOOT (PCF)
7. MAXIMUM BACKFILL ANGLE OF INTERNAL FRICTION = 32 DEGREES
8. MAXIMUM COEFFICIENT OF FRICTION FOR CONCRETE ON CLEAN, SOUND BEDROCK = 0.70 (DELTA= 35 DEGREES)
9. SITE CLASS = C
10. DESIGN PEAK SEISMIC GROUND ACCELERATION MODIFIED BY THE SHORT-PERIOD SITE FACTOR (A_S) = 0.103
11. DESIGN SPECTRAL RESPONSE ACCELERATION AT 0.2-SECOND PERIODS (S_{DS}) = 0.202
12. DESIGN SPECTRAL RESPONSE ACCELERATION AT 1-SECOND PERIODS (S_{D1}) = 0.068

PRECAST CONCRETE BRIDGE STRUCTURE NOTES:

1. ITEM 995.01, BRIDGE STRUCTURE - STRUCTURE NO. 1, SHALL INCLUDE THE PRECAST CONCRETE ARCH, CURBS/HEADWALLS, PEDESTAL FOOTINGS USED TO SUPPORT THE RIGID FRAME, U-WINGWALL, AND WINGWALL FOOTING. JOINT MATERIALS, MEMBRANE, AND ANY OTHER MATERIALS REQUIRED FOR INSTALLATION OF THE PRECAST CONCRETE BRIDGE OR WINGWALL STRUCTURE SHALL BE SUBSIDIARY.
2. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND DESIGN CALCULATIONS, SEALED AND SIGNED BY A CURRENTLY REGISTERED MASSACHUSETTS PROFESSIONAL ENGINEER TO THE MUNICIPALITY'S DESIGNER OF RECORD FOR REVIEW AND ACCEPTANCE FOR REVIEW TO ENSURE CONFORMANCE WITH THE CONTRACT DOCUMENTS. SHOP DRAWINGS AND CALCULATIONS SHALL BE SUBMITTED PRIOR TO FABRICATION FOR ALL PRECAST CONCRETE ELEMENTS. SHOP DRAWINGS SHALL SHOW JOINT DETAILS AND REINFORCEMENT SIZE AND LOCATION.
3. CHANGES OR MODIFICATIONS DURING THE FABRICATION PROCESS MUST BE SUBMITTED TO THE MUNICIPALITY'S DESIGNER OF RECORD FOR ACCEPTANCE AND INCORPORATED INTO THE FINAL AS-BUILT DRAWINGS.
4. DIMENSIONS SHOWN FOR THE PRECAST CONCRETE ELEMENTS ARE ASSUMED AND ARE BELIEVED TO BE PRACTICABLE. NO ADJUSTMENTS TO QUANTITIES OR PAYMENTS WILL BE MADE AS A RESULT OF PROVIDING PRECAST UNITS SIZED DIFFERENTLY THAN SHOWN ON THE PLANS.
5. THE QUALITY OF MATERIALS, THE PROCESS OF MANUFACTURE, AND THE FINISHED PRECAST UNITS SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE ENGINEER.
6. JOINTS BETWEEN ABUTTING PRECAST UNITS SHALL BE MECHANICALLY CONNECTED, WATERTIGHT, GROUTED, AND MEMBRANED.
7. JOINTS BETWEEN ABUTTING PRECAST ARCH, WINGWALL, AND CURB/HEADWALL ELEMENTS SHALL BE MECHANICALLY CONNECTED, WATER TIGHT, AND MEMBRANED.
8. WATERPROOF MEMBRANE SHALL BE PROVIDED OVER THE STRUCTURE ACROSS THE ENTIRE ROADWAY WIDTH.
9. MEMBRANED SURFACES TO BE BACKFILLED AGAINST SHALL BE PROTECTED BY A PROTECTION BOARD.
10. EXPOSED CONCRETE SURFACES SHALL BE TREATED WITH WATER REPELLENT (SILANE/SILOXANE).
11. PRECAST CONCRETE CURB/HEADWALL ANCHORAGES, CURB, U-WINGWALL, AND ARCH SECTIONS SHALL BE DESIGNED TO ACCOUNT FOR ALL EARTH PRESSURE, LIVE LOAD SURCHARGES, AND BRIDGE RAILING LIVE LOAD AS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR NCHRP 350 TL-2 TEST LEVEL.
12. WEEP HOLES SHALL BE PLACED 1'-0" (TYP.) ABOVE THE TOP OF THE PEDESTAL FOOTING AND ONE (1) WEEP PROVIDED ON BOTH SIDES OF EACH ARCH OR WINGWALL UNIT OR 10'-0" (MAX.) SPACING ALONG FOOTING.
13. FOOTINGS SHALL HAVE A KEYWAY WITH THE SPECIFIED DIMENSIONS. GROUT SHALL BE PLACED AROUND THE BOTTOM OF THE ARCH OR WINGWALL AND TO THE TOP OF THE KEYWAY.
14. TOP SURFACES OF FOOTING UNITS SHALL BE SET UNIFORMLY TRUE & LEVEL TO A TOLERANCE OF +/- 1/8". PRECAST UNITS SHALL UNIFORMLY BEAR ON SUPPORTING MATERIAL.
15. ANY UNSUITABLE MATERIALS SUCH AS BOULDERS, ROOTS, ORGANIC SOILS, SILT/CLAY, OR FRACTURED BEDROCK ENCOUNTERED AT THE PROPOSED BOTTOM OF EXCAVATION ELEVATION SHALL BE REMOVED AND REPLACED WITH CONCRETE, AS DIRECTED BY THE ENGINEER.
16. DEWATERING SHALL BE REQUIRED AT EACH FOUNDATION LOCATION TO CONTROL THE WATER INFLOW AND ADEQUATELY DEWATER THE FOOTING EXCAVATION. SUMP PUMPING AREAS AROUND THE ENTIRE PERIMETER SHALL BE REQUIRED TO ADEQUATELY CONTROL THE GROUNDWATER WITHIN THE EXCAVATION AREAS. DEWATERING SHALL BE CONTINUOUS UNTIL THE PRECAST CONCRETE ARCH AND WINGWALLS ARE BACKFILLED EVENLY ON BOTH SIDES TO THE ELEVATIONS OF THE SURROUNDING WATER TABLE, UNLESS OTHERWISE DIRECTED.
17. ANY PROPOSED DEWATERING AND SHORING PROCEDURES SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND ACCEPTANCE.
18. WATER PUMPED FROM DEWATERING LOCATIONS SHALL BE FILTERED ADEQUATELY TO REMOVE FINE MATERIALS PRIOR TO RETURNING THE WATER TO THE RIVER/BROOK. ACTUAL LOCATION OF SEDIMENTATION BASIN TO BE DETERMINED BY CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
19. ANY FOUNDATION MATERIALS WEAKENED AS A RESULT OF INSUFFICIENT CARE WHILE MAINTAINING A DEWATERED CONDITION SHALL BE REMOVED AND REPLACED WITH CONCRETE AT NO EXPENSE TO THE OWNER.
20. REINFORCEMENT SHALL HAVE A 2" MINIMUM CLEAR COVER.
21. A CORROSION INHIBITOR CONCRETE ADDITIVE SHALL BE USED FOR ALL CONCRETE.
22. DATE TO BE PLACED ON THE INSIDE NORTHEAST FACE AND INSIDE SOUTHWEST FACE HIGHWAY GUARDRAIL TRANSITIONS. A SHEET SHOWING SIZE AND CHARACTER OF NUMERALS WILL BE FURNISHED. THE DATE USED SHALL BE THE LATEST YEAR OF CONTRACT COMPLETION AS OF THE DATE THE FIRST HIGHWAY GUARDRAIL TRANSITION IS CONSTRUCTED. ALL HIGHWAY GUARDRAIL TRANSITIONS SHALL FEATURE THE SAME DATE.

CHAPTER 85 SECTION 35 REVIEW AND APPROVAL NOTES:

1. IN ACCORDANCE AND COMPLIANCE WITH THE REQUIREMENTS OF CHAPTER 85 SECTION 35 OF THE MASSACHUSETTS GENERAL LAWS, THE CONTRACTOR SHALL SUBMIT TO THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION ALL CONSTRUCTION DRAWINGS AND DESIGN CALCULATIONS THAT SHALL BE USED TO FABRICATE AND CONSTRUCT THE STRUCTURE DENOTED ON THESE PLANS FOR REVIEW AND APPROVAL. THIS APPROVAL SHALL CONSTITUTE THE FINAL APPROVAL AS STIPULATED BY CHAPTER 85 SECTION 35 OF THE MASSACHUSETTS GENERAL LAWS.

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
CONCEPTUAL DESIGN IS ACCEPTABLE TO MASSDOT FOR CONTRACTING

DISTRICT BRIDGE ENGINEER _____ DATE _____

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
CIVIL
No. 39818
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Loring
Date: 2020.09.09 15:58:56-04'00'

Permit Set Not For Construction

Central Street Bridge Replacement

Department of Public Works

MassDOT Bridge No. M-02-001, BIN 8AM

Town of Manchester-By-The-Sea, Massachusetts

MARK	DATE	DESCRIPTION

PROJECT NO:	M1476 - 011
DATE:	JUNE 2019
FILE:	M1476-011-S-002.dwg
DRAWN BY:	D.BISHOP
CHECKED:	EAO
APPROVED:	DLL

BRIDGE NOTES

SCALE: AS NOTED

S-002

Tighe&Bond
Engineers | Environmental Specialists

Project: Central Street Bridge
Location: Central Street, Manchester-by-the-Sea, MA
Client: Town of Manchester-by-the-Sea

Boring No. B-1
Page 1 of 1
File No. M-1476011
Checked by: C. Halker

Drilling Co.: New England Boring Contractors
Foreman: Mike Porter
T&B Rep.: M. Trovato
Date Start: 08/09/18 End: 08/09/18
Location See Exploration Location Plan
GS. Elev. 9.45' Datum: NAVD88

Type	Casing	Sampler
I.D./O.D.	4"/4.5"	1-3/8"/2"
Hammer Wt.		140#
Hammer Fall		30"
Other		Auto hammer

Groundwater Readings				
Date	Time	Depth	Casing	Sta. Time
8/9/2018	13:45	6.3'		End of Boring

Depth (ft.)	Casing Blows Per Ft.	Sample No. / Rec. (in)	Sample Depth (ft.)	Blows Per 6"	Sample Description	General Stratigraphy	Notes	Well Construction
		S-1/-	0-2	--	14-inches of Asphalt, over brown, fine to coarse SAND, some Gravel, trace Silt	ASPHALT 1.2'	1	No Well Installed
				--				
		S-2/-	2-4	--	Brown, fine to coarse SAND and GRAVEL, little Silt			
				--				
5						FILL		
		S-3/8	5-7	9 - 12	Medium dense, brown, GRAVEL, some fine to coarse Sand, trace Silt			
				2 - 13			2	
		S-4/4	8-10	50/6"	Very dense, brown, GRAVEL, little fine to coarse Sand, little Silt	9.9'	3	
10				--				
		C-1/58	10.5-15.5	2:04	Very hard to hard, moderate to slightly weathered, slightly fractured to sound, very coarse to coarse-grained GRANITE, with close to moderately close, horizontal to moderately dipping fractures; RQD = 95%	BEDROCK		
				1:37				
				1:53				
				2:09				
15				2:12				
		C-2/60	15.5-20.5	2:17	Very hard to hard, slight to very slightly weathered, slightly fractured to sound, very coarse to coarse-grained GRANITE, with close to moderately close, horizontal to shallow fractures; RQD = 98%			
				2:09				
				1:44				
				2:12				
20				3:09				
					Bottom of exploration at 20.5'			
25								
30								

Notes:
1) Vacuum excavated to approximately 5 feet below grade. Samples S-1 and S-2 were collected by hand.
2) Boulder encountered from approximately 7 to 8 feet below grade.
2) Refusal encountered at approximately 9.9 feet below grade, telescoped 3-inch casing in an attempt to advance the boring.

Proportions Used

TRACE (TR.)	0 - <10%
LITTLE (LI.)	10 - <20%
SOME (SO.)	20 - <35%
AND	35 - <50%

Density/Consistency

VERY LOOSE	0-4	VERY SOFT	<2
LOOSE	4-10	SOFT	2-4
MEDIUM DENSE	10-30	MEDIUM	4-8
DENSE	30-50	STIFF	8-15
VERY DENSE	>50	VERY STIFF	15-30
		HARD	>30

BORING LOG B-1

BORING LOCATIONS		
BORING	STATION	OFFSET
B-1	0+52.3	RT. 16.2'

BORING NOTES:

1. LOCATION OF BORINGS SHOWN ON SHEET S-001 THUS: B–1
2. BORINGS WERE TAKEN FOR PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
3. WATER LEVELS SHOWN ON THE BORING LOGS WERE OBSERVED AT THE TIME OF TAKING BORINGS AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.
4. FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A $1\frac{3}{8}$" I.D. SPLIT SPOON SAMPLER 6" USING A 140 POUND WEIGHT FALLING 30".
5. BORING SAMPLES ARE STORED AT TIGHE & BOND'S OFFICE, 53 SOUTHAMPTON ROAD, WESTFIELD, MA 01085. THE CONTRACTOR MAY EXAMINE THE SOIL AND ROCK SAMPLES BY CONTACTING THE DESIGN ENGINEER.
6. ALL BORINGS WERE MADE IN SEPTEMBER 2018.
7. BORINGS WERE MADE BY NEW ENGLAND BORING CONTRACTORS OF DERRY, NEW HAMPSHIRE.
8. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.
9. THE SURFACE ELEVATION ON EACH BORING LOG IS THE ELEVATION OF THE EXISTING GROUND AT THE TIME THE BORING WAS TAKEN.
10. SEE SHEET S-002 FOR GEOTECHNICAL DESIGN PARAMETERS.
11. ENGINEERING JUDGEMENT WAS EXERCISED IN PREPARING THE SUBSURFACE INFORMATION PRESENTED HEREIN. ANALYSIS AND INTERPRETATION OF SUBSURFACE DATA WAS PERFORMED FOR DESIGN AND ESTIMATING PURPOSES. PRESENTATION OF THE INFORMATION IN THE CONTRACT IS INTENDED TO PROVIDE THE CONTRACTOR ACCESS TO THE SAME DATA AVAILABLE TO THE OWNER. THE SUBSURFACE INFORMATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION, INDEPENDENT INTERPRETATION, INDEPENDENT ANALYSIS OR JUDGEMENT BY THE CONTRACTOR.

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
CONCEPTUAL DESIGN IS ACCEPTABLE TO MASSDOT FOR CONTRACTING

DISTRICT BRIDGE ENGINEER _____ DATE _____

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
CIVIL
No. 39818
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Loring
Date: 2020.09.09 15:59:16-04'00'

Permit Set Not For Construction

Central Street Bridge Replacement

Department of Public Works

MassDOT Bridge No. M-02-001, BIN 8AM

Town of Manchester-By-The-Sea, Massachusetts

MARK	DATE	DESCRIPTION

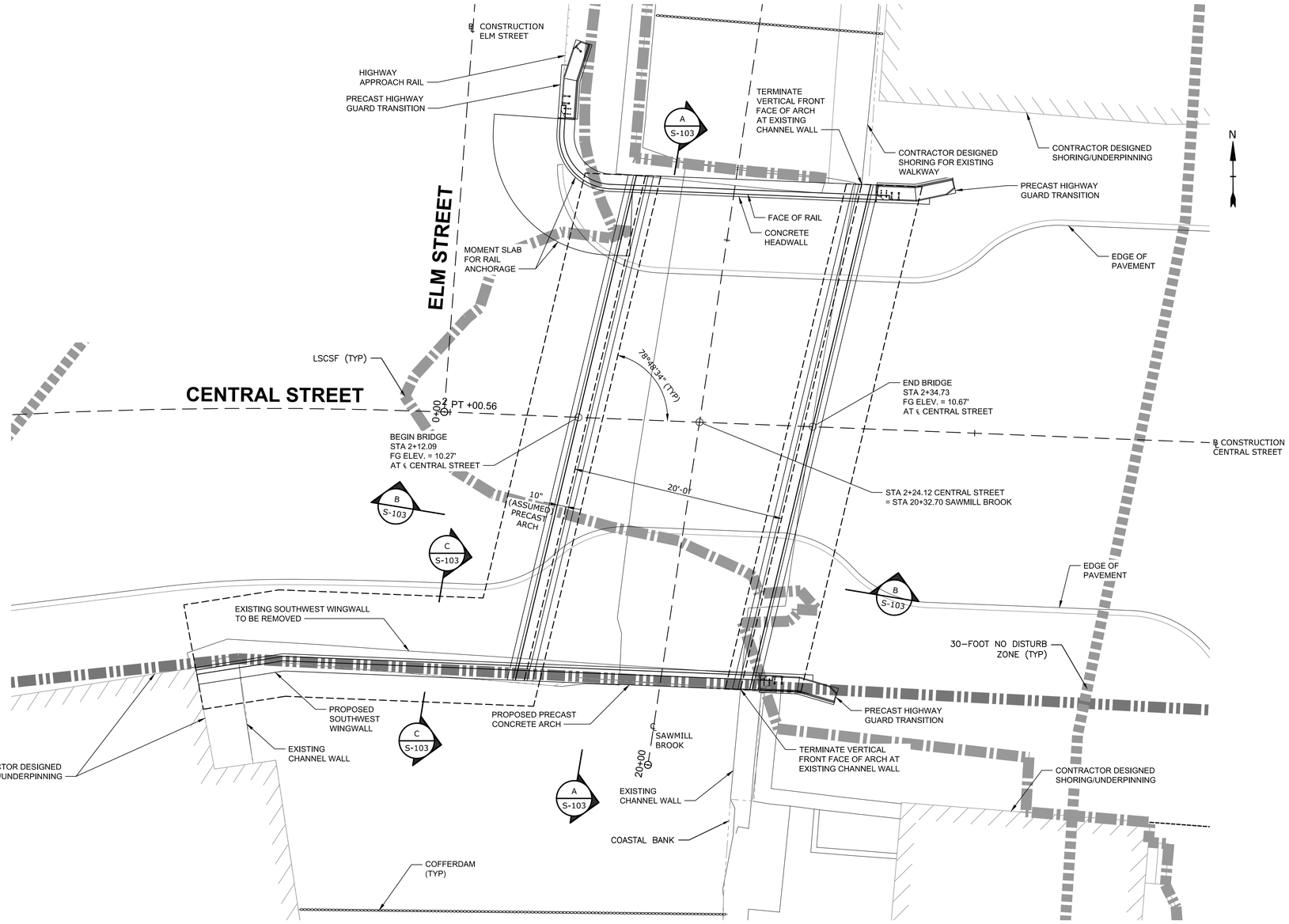
PROJECT NO:	M1476 - 011
DATE:	JUNE 2019
FILE:	M1476-011-S-003.dwg
DRAWN BY:	D.BISHOP
CHECKED:	EAO
APPROVED:	DLL

BORING LOGS AND BORING NOTES

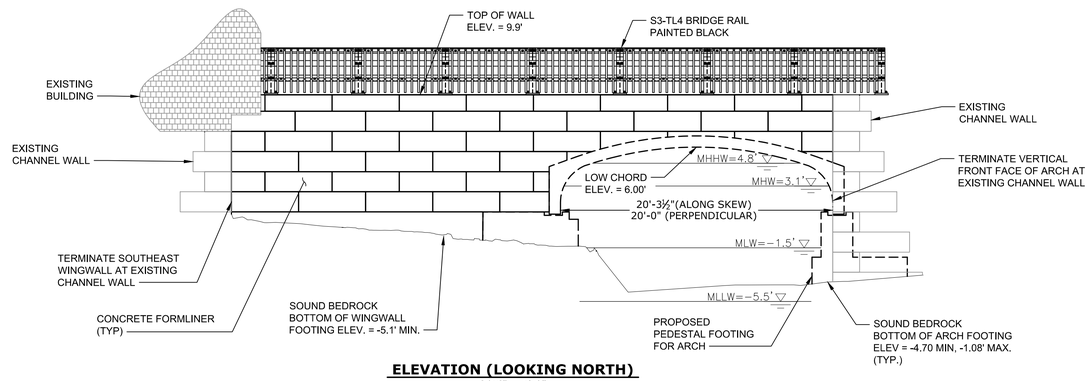
SCALE: AS NOTED

S-003

Last Saved: 8/26/2020
Plotted On: Sep 02, 2020 - 1:10pm By: DWBradshaw
Tighe & Bond - J:\M\M1476 Manchester MA Hydro Study\011-Central Street Bridge\Drawings_Figures\AutoCAD\Sheet\M1476-011-S-003.dwg



GENERAL BRIDGE PLAN
3/16" = 1'-0"



ELEVATION (LOOKING NORTH)
3/16" = 1'-0"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
CONCEPTUAL DESIGN IS ACCEPTABLE TO MASSDOT FOR CONTRACTING

DISTRICT BRIDGE ENGINEER _____ DATE _____

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
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No. 39818
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Loring
Date: 2020.09.09
15:59:36-04'00'

Permit Set Not For Construction

Central Street Bridge Replacement

Department of Public Works

MassDOT Bridge No. M-02-001, BIN 8AM

Town of Manchester-By-The-Sea, Massachusetts

MARK	DATE	DESCRIPTION

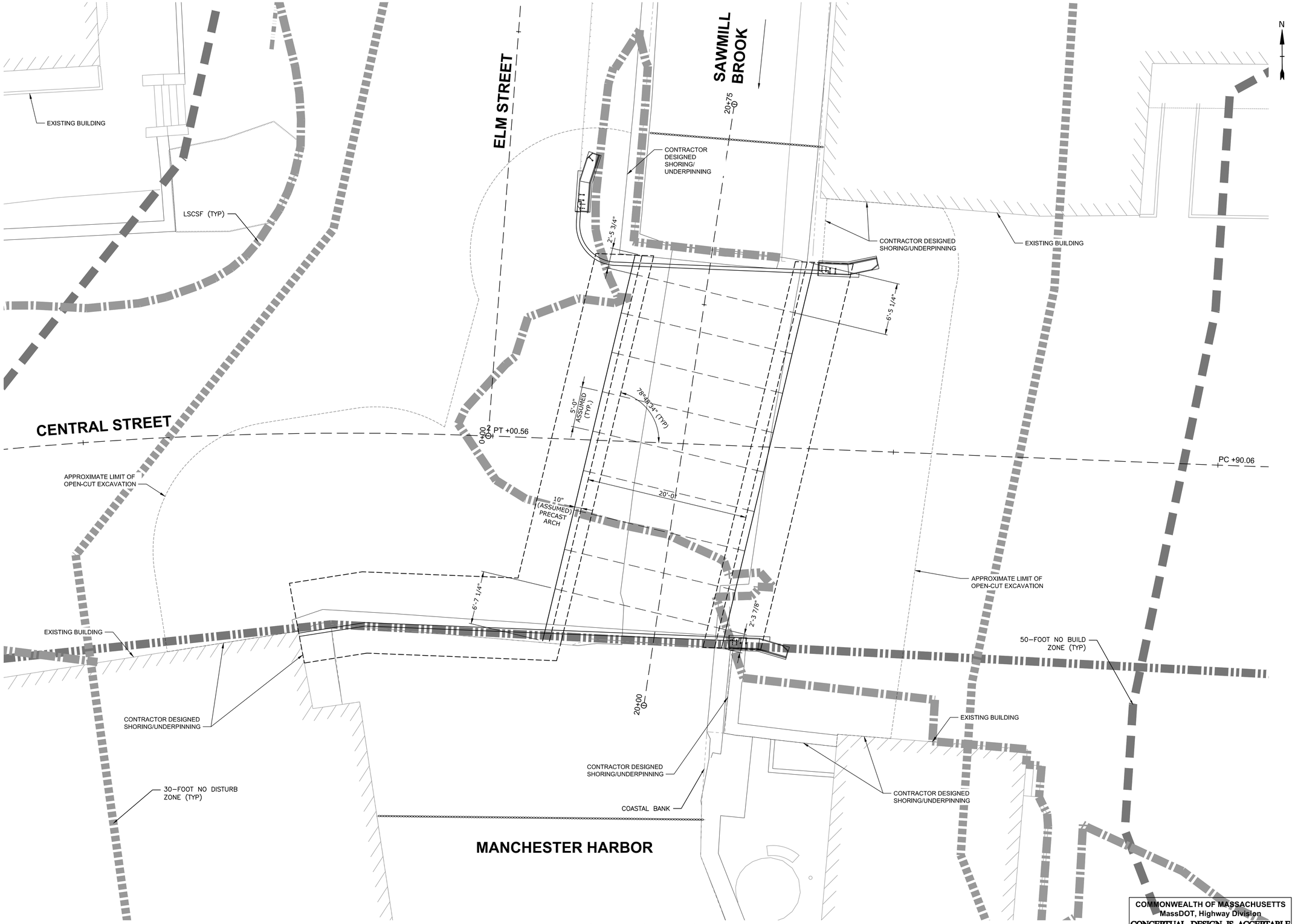
PROJECT NO:	M1476 - 011
DATE:	JUNE 2019
FILE:	M1476-011-S-101_102.dwg
DRAWN BY:	D.BISHOP
CHECKED:	EAO
APPROVED:	DLL

GENERAL BRIDGE PLAN AND ELEVATION

SCALE: AS NOTED

S-101

Last Saved: 9/27/2020
Plotted On: Sep 02, 2020-1:10pm By: DWBradshaw
Tighe & Bond: J:\M\M1476 Manchester MA Hydro Study\011-Central Street Bridge\Drawings_Figures\AutoCAD\Sheet\M1476-011-S-101_102.dwg



BRIDGE FRAMING AND LAYOUT PLAN
3/16" = 1'-0"

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
CONCEPTUAL DESIGN IS ACCEPTABLE TO MASSDOT FOR CONTRACTING

DISTRICT BRIDGE ENGINEER _____ DATE _____

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
CIVIL
No. 39818
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Loring
Date: 2020.09.09
15:59:56-04'00'

Permit Set Not For Construction

Central Street Bridge Replacement

Department of Public Works

MassDOT Bridge No. M-02-001, BIN 8AM

Town of Manchester-By-The-Sea, Massachusetts

MARK	DATE	DESCRIPTION

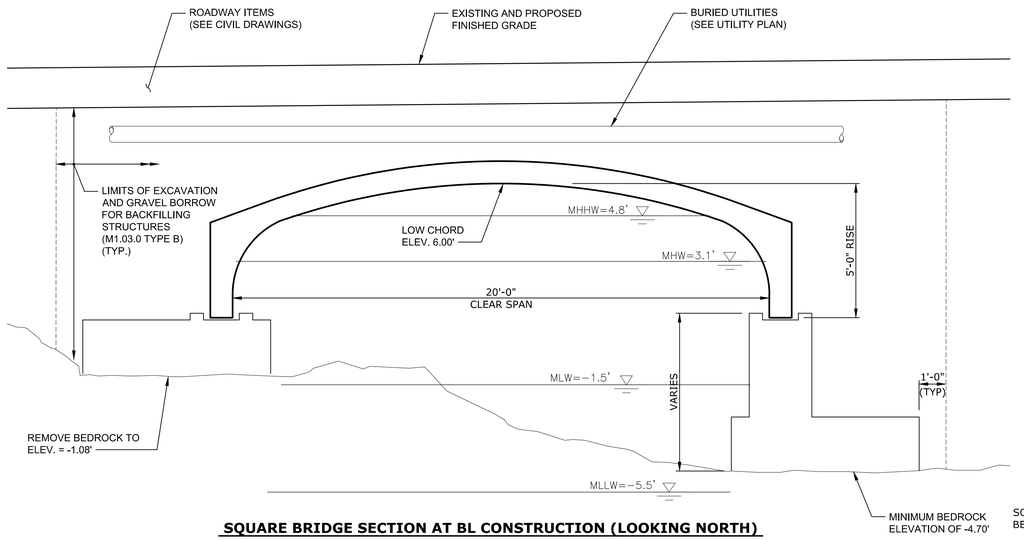
PROJECT NO:	M1476 - 011
DATE:	JUNE 2019
FILE:	M1476-011-S-101_102.dwg
DRAWN BY:	D.BISHOP
CHECKED:	EAO
APPROVED:	DLL

BRIDGE FRAMING AND LAYOUT PLAN

SCALE: AS NOTED

S-102

Last Saved: 9/27/2020
Plotted On: Sep 02, 2020–1:10pm By: DWBradshaw
Tighe & Bond: J:\M\M1476 Manchester MA Hydro Study\011–Central Street Bridge\Drawings_Figures\AutoCAD\Sheet\M1476-011-S-101_102.dwg

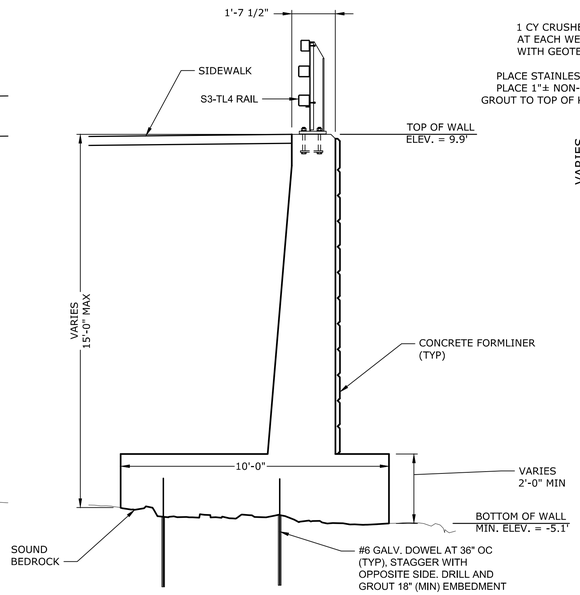


SQUARE BRIDGE SECTION AT BL CONSTRUCTION (LOOKING NORTH)

SECTION B / S-101
3/8" = 1'-0"

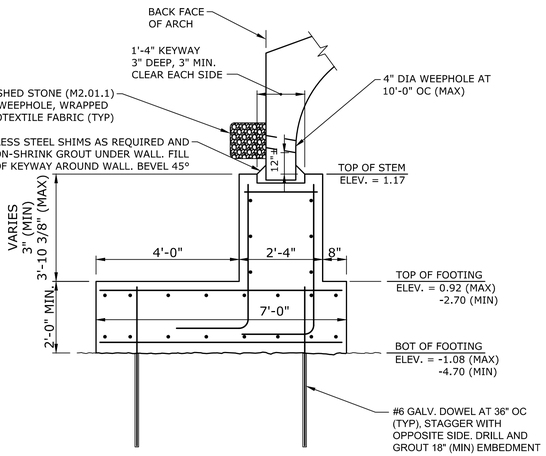
NOTE:

1. SECTION REFLECTS MAXIMUM AND MINIMUM ANTICIPATED BEDROCK ELEVATIONS. CONTRACTOR TO EVALUATE FIELD CONDITIONS AFTER DEMOLITION OF EXISTING BRIDGE AND REPORT TO ENGINEER PRIOR TO CASTING OF ARCH FOOTINGS.

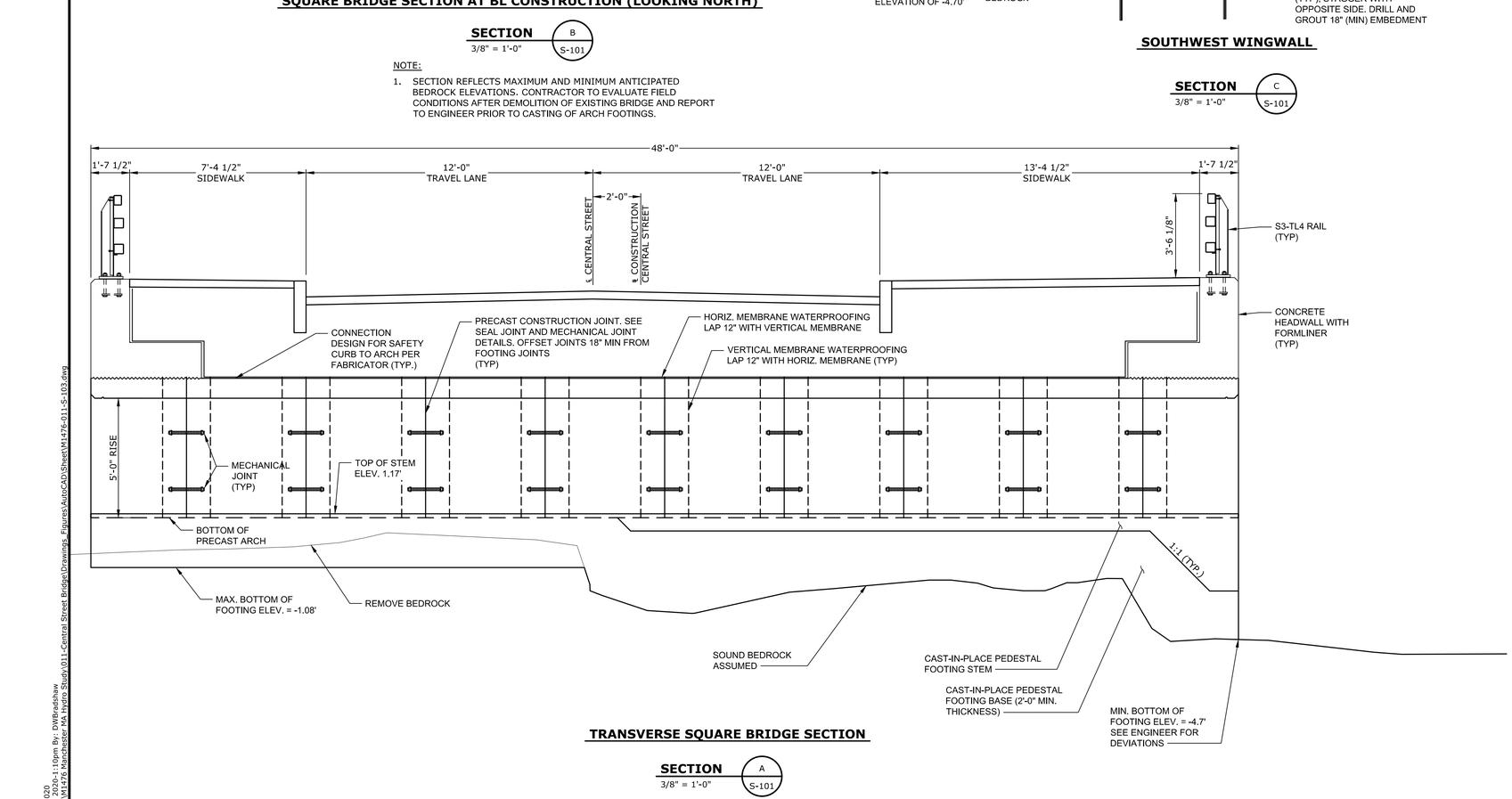


SOUTHWEST WINGWALL

SECTION C / S-101
3/8" = 1'-0"

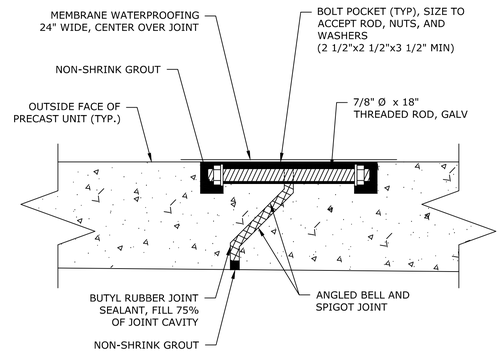


TYPICAL PRECAST ABUTMENT SECTION
1/2" = 1'-0"

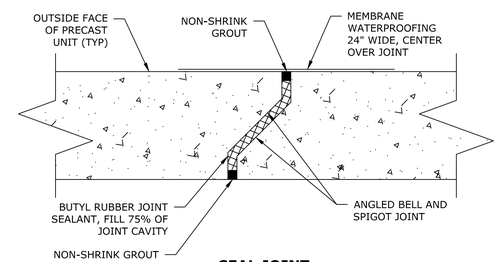


TRANSVERSE SQUARE BRIDGE SECTION

SECTION A / S-101
3/8" = 1'-0"



MECHANICAL JOINT
NO SCALE



SEAL JOINT
NO SCALE

JOINT SEALANT NOTES:

1. PROVIDE BUTYL RUBBER JOINT SEALANT (ASTM C-990 & AASHTO M-198) BETWEEN PRECAST CONCRETE UNITS.
2. PROVIDE A MINIMUM OF 7 MECHANICAL CONNECTORS BETWEEN EACH ARCH UNIT (3 ON TOP AND 2 ON EACH SIDE).
3. ALL BOLT POCKETS SHALL BE FILLED WITH NON-SHRINK GROUT.
4. PEEL AND STICK BARRIER MEMBRANE SHALL BE PLACED IN 2-FOOT WIDE STRIPS, CENTERED OVER THE TOP AND/OR SIDES OF EACH JOINT.

COMMONWEALTH OF MASSACHUSETTS
MassDOT, Highway Division
CONCEPTUAL DESIGN IS ACCEPTABLE TO MASSDOT FOR CONTRACTING

DISTRICT BRIDGE ENGINEER _____ DATE _____

Tighe&Bond
Engineers | Environmental Specialists

COMMONWEALTH OF MASSACHUSETTS
DAVID L. LORING
CIVIL
No. 39818
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Loring
Date: 2020.09.09
16:00:18-04'00'

Permit Set Not For Construction

Central Street Bridge Replacement

Department of Public Works

MassDOT Bridge No. M-02-001, BIN 8AM

Town of Manchester-By-The-Sea, Massachusetts

MARK	DATE	DESCRIPTION

PROJECT NO:	M1476 - 011
DATE:	JUNE 2019
FILE:	M1476-011-S-103.dwg
DRAWN BY:	D.BISHOP
CHECKED:	EAO
APPROVED:	DLL

BRIDGE SECTION AND DETAILS

SCALE: AS NOTED

S-103

Last Saved: 8/31/2020
Plotted On: Sep 02, 2020-1:10pm By: DWBradshaw
Tighe & Bond: J:\MM\1476 Manchester MA Hydro Study\011-Central Street Bridge\Drawings_Figures\AutoCAD\Sheet\M1476-011-S-103.dwg

APPENDIX B

SITE PHOTOGRAPHS

Appendix B - Photographic Log

Client: Town of Manchester-by-the-Sea **Job Number:** M-1476-011

Site: Central Street Bridge

Photograph No.: 1	**Date:** 8/13/2018	**Direction Taken:** North
Description: Roadway view of Central Street bridge and Elm Street from the Manchester Harbor side of the bridge.		

Photograph No.: 2	**Date:** 8/13/2018	**Direction Taken:** East
Description: Roadway view of Central Street bridge. Elm Street is on the bottom left.		

Photograph No.: 3	**Date:** 8/13/2018	**Direction Taken:** West
Description: A view of the downstream (Manchester Harbor) side of the bridge from Central Street.		

Photograph No.: 4	**Date:** 8/13/2018	**Direction Taken:** West
Description: View of the tide gate structure and bridge wall on the downstream side of Central Street Bridge.		

Client: Town of Manchester-by-the-Sea **Job Number:** M-1476-011

Site: Central Street Bridge

Photograph No.: 5	**Date:** 8/13/2018	**Direction Taken:** East
Description: View of the tide gate on the downstream side of Central Street Bridge.		

Photograph No.: 6	**Date:** 8/13/2018	**Direction Taken:** South
Description: View of the underside of the porch adjacent to the upstream side of Central Street Bridge.		

Client: Town of Manchester-by-the-Sea **Job Number:** M-1476-011

Site: Central Street Bridge

Photograph No.: 7	**Date:** 8/13/2018	**Direction Taken:** South
Description: Looking downstream at the tide gate structure from within the bridge opening.		

Photograph No.: 8	**Date:** 8/13/2018	**Direction Taken:** North
Description: Looking upstream from within the bridge opening.		

Client: Town of Manchester-by-the-Sea **Job Number:** M-1476-011

Site: Central Street Bridge

Photograph No.: 9	**Date:** 5/3/2018	**Direction Taken:** North

Description: View of Sawmill Brook upstream of the Central Street Bridge.

Photograph No.: 10	**Date:** 9/26/2018	**Direction Taken:** South

Description: View of the Central Street Bridge and Manchester Harbor from Elm Street.

APPENDIX C

ABUTTER NOTIFICATION INFORMATION

Town of ManchesterByTheSea
Abutters List

53-18
Central Pond Area

Subject Parcel ID:

Subject Property Location:

ParcelID	Location	Owner	Co-Owner	Mailing Address	City	State	Zip
44 0 19	48 CENTRAL ST	HAWLEY ANDREW J.		P.O.BOX 537	MANCHESTER	MA	01944
44 0 20	44 CENTRAL ST	MAESTRANZI MAUREEN A	OBRIEN MICHAEL J	4 SIAS LN	WENHAM	MA	01984
44 0 21A	40 42A CENTRAL ST	RICE KIMBERLY ANNE		40 42 CENTRAL ST, UNIT 1	MANCHESTER	MA	01944
44 0 21B	40 42B CENTRAL ST	BARTSCH LAURA	BARTSCH JEFFREY	40 42 CENTRAL ST, UNIT B	MANCHESTER	MAD	01944
44 0 21C	40 42C CENTRAL ST	BARTLETT JOHN A	BARTLETT LISA SKINNER	40 42 CENTRL ST. UNIT 3	MANCHESTER	MAD	01944
44 0 22	38 CENTRAL ST	BARCLAY PAUL		38 CENTRAL STREET	MANCHESTER	MA	01944
45 0 1	1 PEELE HOUSE SQ	SEA ROCK ESTATE INC		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 36	2 PEELE HOUSE SQ	SEA ROCK ESTATE INC		5C PEELE HOUSE SQUARE	MANCHESTER	MA	01944
45 0 37	4 PEELE HOUSE SQ	SEA ROCK ESTATE INC		5C PEELE HOUSE SQUARE	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
53 0 1	MORSE CT	SR ESTATE LLC	SERIES MORSE CT EXT	5C PEELE HOUSE SQUARE	MANCHESTER	MA	01944
53 0 10A	12 MORSE CT 1	MUNKHOLM CHRISTIANE		12 MORSE COURT, UNIT 2	MANCHESTER	MA	01944
53 0 10B	12 MORSE CT 2	MUNKHOLM CHRISTIANE		12 MORSE COURT, UNIT 2	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 (	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 16	5 7 SAW MILL CR	MANCHESTER SAW MILL REALTY	ADAM M ZAIGER, CHOATE,	40 BEACH ST, UNIT 304	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	0 ELM 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

Town of ManchesterByTheSea
Abutters List

Subject Parcel ID:

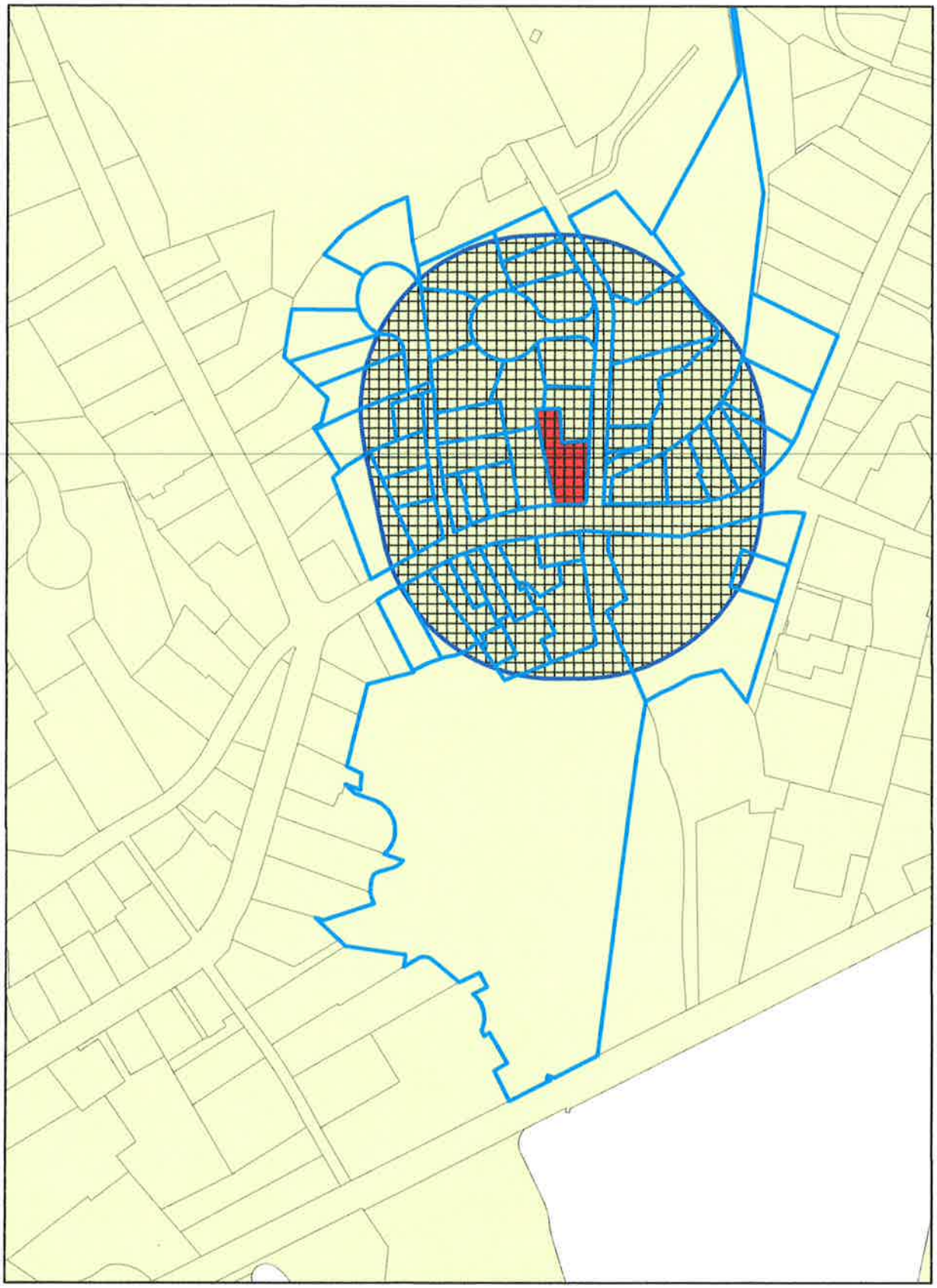
Subject Property Location:

ParcelID	Location	Owner	Co-Owner	Mailing Address	City	State	Zip
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 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
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 49	16 MORSE CT	SR ESTATE LLC	SERIES 16 MORSE CT	5C PEELE HOUSE SQ	MANCHESTER	MA	01944
53 0 5	39 CENTRAL ST	LEVENDUSKY JASON	LEVENDUSKY ABIGAIL	39 CENTRAL ST	MANCHESTER	MA	01944
53 0 50	18 MORSE CT	SR ESTATE LLC	SERIES 18 MORSE CT	5C PEELE HOUSE SQUARE	MANCHESTER	MA	01944
53 0 51	20 MORSE CT	SR ESTATE LLC	SERIES 20 MORSE CT	5C PEELE HOUSE SQUARE	MANCHESTER	MA	01944
53 0 53	24 MORSE CT	SR ESTATE LLC	SERIES 24 MORSE CT	5C PEELE HOUSE SQUARE	MANCHESTER	MA	01944
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
53 0 6	37 CENTRAL ST	BUSSONE ANTONIO		37 CENTRAL ST	MANCHESTER	MA	01944
53 0 7	6 MORSE CT	CARPENTER WILLIAM J	CARPENTER JEANNE T	7 VINE ST	MANCHESTER	MA	01944
53 0 8	8 MORSE CT	SEA ROCK ESTATE INC		5C PEELE HOUSE SQUARE	MANCHESTER	MA	01944
53 0 9	14 MORSE CT	FINNERTY MARK J	FINNERTY LORA P	14 MORSE CT	MANCHESTER	MA	01944

Parcel Count: **63**

End of Report

Certified Abutters within 300' of Central Pond area, as of September 3, 2020, for Conservation Commission.
Virginia N. Thurber, MAA
Principal Assessor



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 Street Bridge

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

The Town of Manchester-by-the-Sea proposed to remove the tide gate structure, replace the existing Central Street culvert with a 20-foot span bridge and conduct minor roadway improvements on Central Street.

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 __X__, by calling this telephone number (413) 875-1622 between the hours of 8:00 AM and 4:00 PM, on the following days of the week: Monday through Friday.

F. The Public Hearing will be held on October 13, 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 September 14, 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 X 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 September 28, 2020 for property located at:

Central Street Bridge.

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.

Signature

September 28, 2020

Date

APPENDIX D

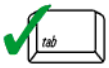
STORMWATER CHECKLIST

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

Checklist for Stormwater Report

A. Introduction

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



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

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

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

8/27/2020
Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☐ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of “country drainage” versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☒ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☐ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☐ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☐ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

☐ Site is comprised solely of C and D soils and/or bedrock at the land surface

☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000

☐ Solid Waste Landfill pursuant to 310 CMR 19.000

☒ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☐ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☐ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☐ The BMP is sized (and calculations provided) based on:

- ☐ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☒ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☒ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☒ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☒ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☐ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☒ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☐ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☐ Name of the stormwater management system owners;
- ☐ Party responsible for operation and maintenance;
- ☐ Schedule for implementation of routine and non-routine maintenance tasks;
- ☐ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☐ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Section 1
Regulatory Compliance

The project is required to comply with the ten Massachusetts Department of Environmental Protection (MassDEP) Massachusetts Stormwater Standards (Standards) under the Massachusetts Wetlands Protection Act. The Massachusetts Stormwater Checklist is attached.

1.1 LID Measures

MassDEP allows for reductions in structural stormwater Best Management Practice (BMP) requirements for water quantity and quality when certain criteria are met. TSS removal at the bridges will be improved by use of curbing on the bridge structure. The curbing will eliminate direct discharges from the bridge into Sawmill Brook. The flow from the bridge will collected in a closed storm drain system and conveyed through a stormwater management unit prior to discharge, thus improving the existing TSS conditions on the bridge.

1.2 Standard 1: No New Untreated Discharges

The project does not create any new point source discharges of stormwater runoff to jurisdictional areas.

The project will not result in any new stormwater conveyance discharging untreated stormwater directly to the waters of the Commonwealth. The project includes one new outfall will be connected to new deep sump catch basins and a stormwater treatment unit before discharging through the outfall. There no proposed changes in the impervious areas within this congested, fully developed, downtown project area. This outfall is designed to avoid erosive stormwater velocities at the outlet

1.3 Standard 2: Peak Discharge Rate Attenuation

The proposed project matches the existing average roadway width and the impervious surface of the bridge. It can be assumed that peak discharge rates from the project are not measurably altered under proposed conditions. No further analysis has been provided. By the installation of catch basins and a new outfall, the water will be contained and treated prior to discharge

1.4 Standard 3: Groundwater Recharge

The proposed project does not result in a change in impervious ground surface; therefore, groundwater recharge is not required.

1.5 Standard 4: Water Quality

The proposed project does not result in a change in impervious ground surface; therefore, water quality provisions are not required. The project adds deep sump catch basins to help remove sediment from stormwater. The project otherwise generally maintains the existing roadway configuration. The project will improve hydraulic conditions in Sawmill Brook which may improve water quality by increasing the hydraulic

opening at the bridge to reduce velocity and scour downstream of the bridge. A Long-Term Pollution Prevention Plan is attached.

1.6 Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

The project is not considered a LUHPPL; therefore, the more stringent requirements of Standard 5 are not applicable.

1.7 Standard 6: Critical Areas

The project will not result in any new untreated stormwater discharges to Sawmill Brook. Existing drainage patterns will be maintained and stormwater quality will not be impacted a result of the project.

1.8 Standard 7: Redevelopment Projects

The project is considered a redevelopment, therefore Standards 2, 3 and the pretreatment and structural stormwater best management practices of Standards 4, 5, and 6 are met to the maximum extent practicable.

1.9 Standard 8: Construction Period Pollution Prevention, Erosion and Sedimentation Control

Construction-period erosion and sedimentation controls are identified on the Site Plans and include straw wattles of mulch logs at a minimum. The project will not disturb more than one acre of land during construction; therefore, an EPA National Pollutant Discharge System (NPDES) Construction General Permit does not apply.

1.10 Standard 9: Long-Term Operation and Maintenance Plan

A site specific Operations and Maintenance Plan will not be created for this bridge. The maintenance of the project area will fall under the general plan of maintenance for local roads by the Manchester DPW.

1.11 Standard 10: Prohibition of Illicit Discharges

Illicit discharges to the stormwater management system are discharges that are not entirely comprised of stormwater. Illicit discharge does not include discharges from the following activities or facilities: firefighting, water line flushing, landscape irrigation, uncontaminated groundwater, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated water from swimming pools, water used for street washing, and water used to clean residential buildings without detergents.

The Owner is not aware of any existing illicit discharges at the Site and is not proposing any illicit discharges as part of the Project. If any illicit connections are found during construction of the Site, these connections will be abandoned and removed. A signed Illicit Discharge Statement is attached.

Illicit Discharge Compliance Statement

Project Location: Central Street Bridge (Bridge M-02-001)

Central Street

Manchester, MA 01944

Illicit discharges to the stormwater management system are discharges that are not entirely comprised of stormwater. Illicit discharge does not include discharges from the following activities or facilities: firefighting, water line flushing, landscape irrigation, uncontaminated groundwater, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated water from swimming pools, water used for street washing, and water used to clean residential buildings without detergents.

To the best of my knowledge, I am not aware of any existing illicit discharges located at the Project Location and will abandon or remove such illicit discharges/connections in the future, if found.

Signature: 

Printed Name & Title: Charles Dam, Director of Public Works

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Section 1
Introduction and Purpose

The following Long-Term Pollution Prevention Plan (LTPPP) has been prepared for the proposed Central Street Bridge Over Sawmill Brook in Manchester-by-the-Sea, Massachusetts. The purpose of the plan is to provide guidance and procedures for proper pollution prevention following construction completion.

The proposed project has been designed in compliance with the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Standard to maintain or improve stormwater runoff quality and quantity.

Section 2
Responsible Parties

The Manchester Department of Public Works is responsible for maintaining and servicing the proposed Central Street Bridge including road surface, vegetated surfaces, utilities, and bridge structure components post construction. During construction, the contractor will be responsible for stormwater management system maintenance.

Property Owner:

Manchester, Town of
10 Central Street
Manchester, MA 01944

Maintenance Contact:

Manchester, Town of
10 Central Street
Manchester, MA 01944

Subcontractor(s):

Company or Organization Name: _____
Name: _____
Address: _____
City, State, Zip: _____
Telephone Number: _____
Fax/Email: _____
Area of Control: _____

Subcontractor(s):

Company or Organization Name: _____
Name: _____
Address: _____
City, State, Zip: _____
Telephone Number: _____
Fax/Email: _____
Area of Control: _____

Section 3
Long Term Pollution Prevention Plan

3.1 Good Housekeeping

The goal of the good housekeeping policy is to keep the site in a clean orderly condition. A disorderly site can lead to improper materials management, and can reduce the efficiency of any response to potential pollution problems.

The following good housekeeping measures will be followed at the site to aid in pollution prevention:

- Promptly clean and remove any spills or contamination from vehicles
- Perform preventative maintenance on all equipment and on the structural components of the stormwater system

3.2 Potential Sources of Pollution

Construction Site Pollutants

Pollutant-Generating Activity	Pollutants or Pollutant Constituents (that could be discharged if exposed to stormwater)	Location on Site
Site work	Soil particals and fines	Where disturbance is proposed
Paving and construction areas	Petroleum, concrete, vehicle fluids, paints, solvents	Where paving and construction is proposed
General Construction Areas	Petroleum, concrete, vehicle fluids, paints, solvents	Where construction is proposed
Solid waste storage	Construction debris, trash	In dumpster locations
Fertilizing	Fertilizers	Prohibited on-site
Equipment use	Hydraulic Oils/fluids	Leaks/broken hoses from equipment
Equipment use	Antifreeze/coolant	Leaks/broken hoses from equipment
Portable toilets	Sewage	Where portable toilets are located
Staging areas	Sediment, gasoline, fuel oil, concrete, vehicle fluids, paints, solvents, fertilizers, adhesives, antifreeze/coolant, hydraulic oil/fluid, etc.	
Concrete Wash Out	Particles and Fines	Concrete wash out area

3.3 Spill Prevention and Response

- Manufacturer's recommended methods for cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and clean up supplies
- Materials and equipment necessary for spill cleanup will be kept in the material storage areas on site. Equipment and materials will include but not be limited to brooms, dustpans, mops, rags, gloves, goggles, kitty litter, sand, sawdust and plastic or metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with hazardous substances
- Spills of toxic or hazardous material will be reported to the appropriate state or local government agency regardless of size
- The Spill Prevention Plan will be adjusted to include measures to prevent this type of spill from recurring and how to cleanup the spill if it recurs. A description of the spill, its cause and the cleanup measures will be included.
- The site superintendent responsible for day to day operations will be the spill prevention and cleanup coordinator

3.3.1 Federal and State Spill Notification

In accordance with 310 CMR 40.0333, the superintendent shall notify the Massachusetts Department of Environmental Protection (Northeast Region) - (978) 694-3200, the Local Emergency Planning Committee (LEPC) and any other authorities or agencies within two hours if an accident or other type of incident results in a release to:

- land
  - 10 Gallons for more Oils (PCB<500 ppm)
  - 1 Gallons or more Oils (PCB ≥500 ppm)
- waterways
  - Any quantity of Oils
- Or, triggers the exposure to toxic chemical levels as listed in 301 CMR 40.1600, Revised Massachusetts Contingency Plan

The superintendent shall notify the National Response Center (NRC) at **(800) 424-8802** where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity consistent with Part 2.3.3.4c and established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302, occurs during a 24-hour period.

In either event, the NRC will work with state and federal agencies to ensure that all appropriate forms and reports are submitted in a timely manner.

- Note: Trigger volumes for other chemical spills vary. Contact the MassDEP or a Licensed Site Professional (LSP) for specific guidance on reporting thresholds and requirements for other chemicals.

3.3.2 Local Notification

The following local agencies will be called to provide emergency assistance at the site on the judgment of the NRC:

Fire Department: 911 or (978) 526-4040	Police Department: 911 or (978) 526-1212
Department of Public Works (978) 526-1242	

3.4 Fueling and Maintenance of Equipment or Vehicles

General

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.

Specific Pollution Prevention Practices

- Site contractor/project manager shall provide an onsite vehicle fueling and maintenance area that is clean and dry.
- If possible keep area covered.
- Keep a spill kit at the fueling and maintenance area.
- Vehicles shall be inspected regularly for leaks and damage.
- Use drip pans, drip cloths or absorbent pads when replacing spent fluid.

3.5 Washing of Equipment and Vehicles

General

Efforts shall be made to perform equipment/vehicle washing and maintenance off-site. If washing of equipment and vehicles is performed on site, the following pollution prevention practices must be provided to minimize the discharge of pollutants.

Specific Pollution Prevention Practices

- Site contractor/project manager shall provide a proper washing area.
- Discharges from washing areas shall be infiltrated or diverted into sanitary sewer system unless no soaps or detergents are used.
- If soaps, detergents or solvents are stored onsite over must be provided to prevent these detergents from coming into contact with rainwater.
- Vehicles and equipment should be washed and/or maintained off-site.

3.6 Storage, Handling, and Disposal of Construction Products, Materials, and Wastes

3.6.1 Building Products

- Site contractor/project manager shall designate a waste collection area on the site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a water body.
- Ensure that containers have lids so they can be covered before periods of rain, and keep containers in a covered area whenever possible.
- Schedule waste collection to prevent the containers from overfilling.
- Clean up spills immediately. For hazardous materials, follow cleanup instructions on the package. Use an absorbent material such as sawdust or kitty litter to contain the spill.
- During the demolition phase of construction, provide extra containers and schedule more frequent pickups.
- Collect, remove, and dispose of all construction site wastes at authorized disposal areas.

3.6.2 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscaping Materials

- Store new and used materials in a neat, orderly manner in their appropriate containers in a covered area. If storage in a covered area is not possible, the materials shall be covered with polyethylene or polypropylene sheeting to protect them from the elements. These materials should only be on-site in very limited quantities and should not be stored on-site overnight.
- Storage area should include precautions to contain any potential spills.
- Immediately contain and clean up any spills with absorbent materials.

3.6.3 Diesel Fuel, Oil, Hydraulic Fluids, Other Petroleum Products, and Other Chemicals

- Diesel fuel, oil, hydraulic fluids, petroleum products and other liquid hazardous materials should be stored off-site and not be stored on-site.
- Immediately contain and clean up any spills with absorbent material and notify appropriate authorities.
- Have equipment available in fuel storage areas and in vehicles to contain and clean up any spills that occur.

3.6.4 Hazardous or Toxic Waste

- Hazardous and toxic waste should also be stored off-site with no overnight storage allowed within the project area.
- Immediately contain and clean up any spills with absorbent materials.
- Have equipment available in fuel storage areas and in vehicles to contain and clean up any spills that occur.

- To prevent leaks, empty and clean hazerdous waste containers before disposing of them.
- Never remove the original product label from the container because it contains important safety information. Follow the manufacturer's recommended method of disposal, which should be printed on the label.
- Never mix excess products when disposing of them, unless specifically recommended by the manufacturer.

3.6.5 Construction and Domestic Waste

- All materials shall be collected and stored in securely lidded receptacles, no construction waste materials will be buried. Clean up immediately if containers overflow.

3.6.6 Sanitary Waste

- Portable sanitary units will be provided throughout the course of the project for use by the site contractor/project manager's employees. A licensed sanitary waste management contractor will regularly collect all sanitary waste from the portable units. Position portable toilets so that they are secure and will not be tipped or knocked over.
- Sanitary waste facilities should be located as far away from waterbodies as possible. At a minimum, portable sanitary units should be situated more than 400' from the reservoir and more than 200' from tributaries to the reservoir.

3.7 Washing of Applicators and Containers used for Paint, Concrete or Other Materials

- The contractors should be encouraged where possible, to use washout facilities at their own plant or dispatch facility from stucco, paint, concrete, form release oils, curing compounds, and other construction materials.
- Washing of application and containers used for paint, concrete, and other materials should not occur on-site, as this runoff may enter Sawmill Brook.
- Washout area shall be located as far from the reservoir and reservoir tributaries as possible.
- Inspect washout facilities daily to detect leaks or tears and to identify when materials need to be removed.

3.8 Standard 7: Redevelopment Projects

The project is considered a redevelopment, therefore Standards 2, 3 and the pretreatment and structural stormwater best management practices of Standards 4, 5, and 6 are met to the maximum extent practicable.

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