

Bridge Replacement Project
Middle Street / Plummer Spring Road
over Upper Artichoke Reservoir
West Newbury, and Newburyport, Massachusetts

Notice of Intent

City of Newburyport
Conservation Commission
January 2021

Prepared for:
City of Newburyport
16C Perry Way
Newburyport, MA 01950

BSC Project No. 28395.00

Prepared by:



803 Summer Street
Boston, MA 02127

January 11, 2021

City of Newburyport
Conservation Commission
60 Pleasant Street
Newburyport, MA 01950

**RE: Bridge Replacement Project
Plummer Spring Road over Upper Artichoke Reservoir
Newburyport, Massachusetts
Notice of Intent**

Dear Members of the Newburyport Conservation Commission:

BSC Group Inc., on behalf of The City of Newburyport (“the Applicant”), is pleased to submit this Notice of Intent (NOI) to the Newburyport Conservation Commission for project activities associated with the replacement of the structurally deficient bridge (Bridge No. N-11-007) which carries Plummer Spring Road in Newburyport, MA over the Upper Artichoke Reservoir (hereby referred to as “the bridge”). The Applicant is seeking an Order of Conditions to authorize the replacement. The bridge is in poor condition and the road is currently closed due to structural deficiencies. Therefore, the applicant proposes to replace the bridge structure with a new structure on a similar horizontal and vertical alignment. The proposed bridge will expand the hydraulic opening of this stream crossing while also improving roadway safety.

This NOI has been prepared in accordance with the Massachusetts Wetland Protection Act, M.G.L. c.131 s. 40 (the Act) and implementing regulations (310 CMR 10.00), as well as the City of Newburyport Wetlands Protection Ordinance (Article II). Additionally, this project is being proposed as a Limited Project, per 310 CMR 10.53(3)(i) which allows for (in part) maintenance, repair and improvement of bridges, 310 CMR 10.53(3)(l) which allows for the construction, reconstruction, operation or maintenance of water dependent uses, and 310 CMR 10.53(8) which allows for the replacement of an existing stream crossing while avoiding impacts where possible and minimizing / mitigating impacts when not. Because the bridge lies within both the City of Newburyport and the Town of West Newbury, an NOI is being concurrently filed in West Newbury for this bridge replacement project.

Notification to abutters within 100 feet of the project site has been made by certified mail. A copy of the abutter notification, affidavit of service, and a list of abutters are provided in the NOI. As a municipal project, the City is exempt from filing fees.

Engineers

Environmental
Scientists

Custom Software
Developers

Landscape
Architects

Planners

Surveyors



We respectfully request that you place this project on the next regularly scheduled Conservation Commission public hearing. Please do not hesitate to contact me at 617-896-4579, or skreisel@bscgroup.com with any inquiries you may have.

Sincerely,
BSC Group, Inc.

Sara Kreisel, PWS
Ecological Project Manager

cc: Jon-Eric White, City of Newburyport
MassDEP Northeast Regional Office
Similar version to West Newbury Conservation Commission for adjacent work

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Provided by MassDEP:

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Important:

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



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

A. General Information

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

Plummer Spring Road over Upper Artichoke Reservoir
Latitude and Longitude:
N/A - Town Roadway Layout
f. Assessors Map/Plat Number

Newburyport
b. City/Town
42.802999
d. Latitude
N/A
g. Parcel /Lot Number

01950
c. Zip Code
-70.931053
e. Longitude

2. Applicant:

Jon-Eric
a. First Name
City Engineer, City of Newburyport
c. Organization
16 C Perry Way
d. Street Address
Newburyport
e. City/Town
978-465-4464
x1710
i. Fax Number

White
b. Last Name
MA
f. State
01950
g. Zip Code
jewhite@cityofnewburyport.com
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):

Sara
a. First Name
BSC Group, Inc.
c. Company
803 Summer Street
d. Street Address
Boston
e. City/Town
617-896-4579
h. Phone Number

Kreisel
b. Last Name
MA
f. State
02127
g. Zip Code
skreisel@bscgroup.com
j. Email address

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

Fee Exempt
a. Total Fee Paid

Fee Exempt
b. State Fee Paid

Fee Exempt
c. City/Town Fee Paid



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A. General Information (continued)

6. General Project Description:

The project proposes the replacement of the bridge carrying Middle Street, West Newbury / Plummer Spring Road, Newburyport over the Upper Artichoke Reservoir in a similar horizontal and vertical alignment. Please refer to the Project Narrative for additional details.

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 10.53(3)(i):...improvement...bridges...existed prior to 4/1/83; 10.53(3)(l):...construction...of water dependent uses & 10.53(8)(a): Replace...existing stream crossing in a non-tidal crossing.

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:

a. County	b. Certificate # (if registered land)
N/A Town Roadway Layout	
c. Book	d. Page Number

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

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

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



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

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

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. <input checked="" type="checkbox"/> Bank	<u>54 lf (Perm), 14 lf (Temp)</u> 1. linear feet	<u>14 lf (Restore)</u> 2. linear feet
b. <input type="checkbox"/> Bordering Vegetated Wetland	_____ 1. square feet	_____ 2. square feet
c. <input checked="" type="checkbox"/> Land Under Waterbodies and Waterways	<u>431 sf (Perm), 198 sf (Temp)</u> 1. square feet <u>9 cy (Perm), 22 cy (Temp)</u> 3. cubic yards dredged	<u>198 sf (Restore), 449 sf (Gain)</u> 2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. <input checked="" type="checkbox"/> Bordering Land Subject to Flooding	<u>44 sf</u> 1. square feet <u>132 cf</u> 3. cubic feet of flood storage lost	<u>344 sf</u> 2. square feet <u>1,857 cf</u> 4. cubic feet replaced
e. <input type="checkbox"/> Isolated Land Subject to Flooding	_____ 1. square feet _____ 2. cubic feet of flood storage lost	_____ 3. cubic feet replaced
f. <input checked="" type="checkbox"/> Riverfront Area	<u>Upper Artichoke Reservoir - Inland Waterway</u> 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: 13,158 sf
square feet

4. Proposed alteration of the Riverfront Area:

2,669 sf (Redev.), 1,217 sf (Perm), 548 sf (Temp) 2,669 sf (Redev.), 1,217 sf (Perm), 548 sf (Temp) 0 sf
c. square feet between 100 ft. and 200 ft.

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

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

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

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



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

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

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

<u>Resource Area</u>	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
a. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. <input type="checkbox"/> Land Under the Ocean	_____	
	1. square feet	

	2. cubic yards dredged	
c. <input type="checkbox"/> Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. <input type="checkbox"/> Coastal Beaches	_____	_____
	1. square feet	2. cubic yards beach nourishment
e. <input type="checkbox"/> Coastal Dunes	_____	_____
	1. square feet	2. cubic yards dune nourishment

	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
f. <input type="checkbox"/> Coastal Banks	_____	
	1. linear feet	
g. <input type="checkbox"/> Rocky Intertidal Shores	_____	
	1. square feet	
h. <input type="checkbox"/> Salt Marshes	_____	_____
	1. square feet	2. sq ft restoration, rehab., creation
i. <input type="checkbox"/> Land Under Salt Ponds	_____	
	1. square feet	

	2. cubic yards dredged	
j. <input type="checkbox"/> Land Containing Shellfish	_____	
	1. square feet	
k. <input type="checkbox"/> 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. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	_____	
	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

0 _____ 1 _____
 a. number of new stream crossings 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**

MassGIS 2020

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/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:

North Shore - Hull to New Hampshire border:

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

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).



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

Online Users:

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

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
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.



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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.

Project Site Plans

a. Plan Title

BSC Group, Inc

b. Prepared By

December 2020

d. Final Revision Date

c. Signed and Stamped by

Varies

e. Scale

Environmental Resource Map

f. Additional Plan or Document Title

October 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



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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

3. Signature of Property Owner (if different)

4. Date

5. Signature of Representative (if any)

6. Date

1-7-21

1/7/2021

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:

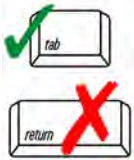
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

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.



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NOI Wetland Fee Transmittal Form
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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



A. Applicant Information

1. Location of Project:

Plummer Spring Road over Upper Artichoke Reservoir Newburyport
 b. City/Town
 N/A - Fee Exempt Fee Exempt
 c. Check number d. Fee amount

2. Applicant Mailing Address:

Jon-Eric White
 a. First Name b. Last Name
 City Engineer, City of Newburyport
 c. Organization
 16 C Perry Way
 d. Mailing Address
 Newburyport MA 01950
 e. City/Town f. State g. Zip Code
 978-465-4464 x1710 jewhite@cityofnewburyport.com
 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

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.

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



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B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
N/A - Fee Exempt			

Step 5/Total Project Fee: 0

Step 6/Fee Payments:

Total Project Fee:	0
	a. Total Fee from Step 5
State share of filing Fee:	0
	b. 1/2 Total Fee less \$12.50
City/Town share of filing Fee:	0
	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.)

Attachment A

Bridge Replacement Project
Middle Street / Plummer Spring Road
over Upper Artichoke Reservoir
Notice of Intent Application

PROJECT NARRATIVE
WETLANDS PROTECTION ORDINANCE VARIANCE REQUEST

1.0 Introduction

The BSC Group Inc., on behalf of The City of Newburyport (“the Applicant”) is seeking an Order of Conditions from the Newburyport Conservation Commission to authorize project activities associated with the replacement of the structurally deficient, undersized bridge (Bridge No. N-11-007) over the Artichoke River / Upper Artichoke Reservoir (hereby referred to as “the bridge”) located on Plummer Spring Road, Newburyport / Middle Street, West Newbury, MA (See Attachment B for Site Location Maps and Photos). The bridge is structurally deficient due to undermining of the existing roadway foundation. The Applicant proposes to replace the bridge structure with a new bridge in a similar horizontal and vertical alignment. The project involves mitigation measures intended to address existing structural and hydraulic deficiencies, while also minimizing disturbances to the surrounding environment and improving openness.

This Notice of Intent has been prepared in accordance with the Massachusetts Wetlands Protection Act (WPA), M.G.L. c.131 S.40 (the Act), its implementing regulations (310 CMR 10.00). Additionally, this project is being proposed as a Limited Project, per 310 CMR 10.53(3)(i) which allows for maintenance, repair and improvement (but not substantial enlargement) of (in part) bridges and culverts which existed prior to April 1, 1983, 310 CMR 10.53(3)(l) which allows for the construction, reconstruction, operation or maintenance of water dependent uses, and 310 CMR 10.53(8) which allows for the replacement of an existing stream crossing while avoiding impacts where possible, and minimizing / mitigating impacts when not. A Notice of Intent is also being filed concurrently in West Newbury for bridge replacement activities occurring within the Town limits.

This Notice of Intent has also been prepared in accordance with the City of Newburyport Wetlands Protection Ordinance (Chapter 6.5, Article II) which provides performance standards for the Wetland Buffer Zone. Due to the nature of the proposed project, the design is unable to meet the regulatory requirements under the City Ordinance for a 25-foot No Disturbance Buffer Zone, and work within the Buffer Zone to the Upper Artichoke Reservoir. As such, while impacts to the Buffer Zone will be minimized to the extent practicable, the Applicant requests a waiver for working in this locally regulated resource area.

Due to the nature of the bridge replacement activities, impacts are proposed to Bank, Land Under Water (LUW), Bordering Land Subject to Flooding (BLSF), the 200-foot Riverfront Area (RFA), and the locally regulated 100-foot Buffer Zone / 25-foot No Disturbance Zone to Bank. However, mitigation measures will be implemented to minimize disturbances to the surrounding environment during construction. The following project components detail the proposed project activities. Please refer to Project Site Plans (Attachment G) for additional detail. The project has been designed to be in compliance with the Massachusetts Stream Crossing Standards to the maximum extent practicable and improves openness and habitat connectivity.

2.0 Existing Conditions

West Newbury is located on the northwestern side of the bridge, and Newburyport is on the eastern side. Plummer Spring Road, Newburyport turns into Middle Street upon entering West Newbury. The project site is approximately 2,000 feet west of the intersection with Turkey Hill Road, Newburyport and approximately 0.7 mile east of the intersection with Garden Street, West Newbury. The crossing occurs within the Upper Artichoke Reservoir, a public water supply. The surrounding area is comprised of Article 97 lands, reserved for water supply protection. Beyond that, the area is generally characterized by low-density residential development. The bridge predates and divides the existing Upper Artichoke Reservoir, through which the Artichoke River flows. The Reservoir was originally

formed by damming the Artichoke River which flows north to the Merrimack River. While the majority of the surrounding area consists of residential development and forested land, the project area is limited to previously disturbed Riverfront Area and other resource areas encumbered by the existing bridge.

The existing crossing structure consists of a 14.3-foot (span) by 13.2-foot (rise) by 24.2-foot (long) single span earth-filled stone arch, set at an approximate slope of 0%. The road and stone arch bridge were constructed in 1891 before the Upper Artichoke Reservoir was built. The low chord on the existing arch is set at an elevation of 16.20 feet. The paved roadway consists of two travel lanes that vary in width from 8.5 feet to 10-feet for a total roadway width of approximately 17-feet to 20-feet. There are no sidewalks on the bridge. The bridge was closed in 2018 to vehicular traffic due to the collapse of portions of the bridge, stone headwall, and southeast approach roadway, and is currently considered structurally deficient due to undermining of the paved roadway foundation. The project area consists of country drainage, whereby runoff travels to the approach roadway and informally runs off down the side slopes. Plummer Spring Road / Middle Street is functionally classified as a Rural Local road.

2.1 Wetland Resource Areas

BSC wetland scientists delineated the boundary of existing wetland resource areas within and in the immediate vicinity of the bridge in December 2019. Wetlands were delineated in accordance with the methods developed by the Massachusetts Department of Environmental Protection's (MassDEP) Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act, dated 1995, as well as definitions set forth in the Wetlands Regulations 310 CMR 10.00 (Wetlands Protection Act Regulations). Existing conditions, wetland resource areas, and buffer zones in relation to the proposed activities are shown in the figures and photos in Attachment B.

The wetland resource areas at the site include the Bank, Land Under Waterbodies and Waterways (LUW), Bordering Land Subject to Flooding (BLSF), the 200-foot Riverfront Area (RFA), and the 100-foot Buffer Zone to Bank.

Watershed

The Artichoke River generally flows in a south-to-north orientation in the Upper Artichoke Reservoirs before discharging into the Merrimack River, 1.3 miles north of the project area. The Artichoke River connects the Upper Artichoke Reservoir, the Lower Artichoke Reservoir, and the Merrimack River, by two dams. According to the USGS Stream Stats Report for this area, the drainage area at the Plummer Spring Road / bridge crossing is approximately 5.48 square miles.

Bank

As defined in the WPA regulations 310 CMR 10.54 (2), Bank is a portion of land surface that normally abuts and confines a water body. The upper boundary of Bank is the first observable break in slope. The natural banks of the Reservoir have gradual slopes vegetated mainly by deciduous and occasionally coniferous trees. The banks are littered with leaf detritus as a result. The roadway is steeply sloped, and the banks are vegetated with shrubs and trees growing over a riprap substrate. A 100-foot buffer zone extends from the delineated Bank.

Bordering Vegetated Wetlands

As defined in the WPA regulations 310 CMR 10.55 (2)(a): Bordering Vegetated Wetlands (BVW) are freshwater wetlands which border on creeks, rivers, streams, ponds and lakes where soils are saturated or inundated as a result of a specific hydrology (M.G.L. c. 131, § 40), which results in the predominance of hydrophytic vegetation. No vegetated wetlands were identified within the project site.

Land Under Waterbodies and Waterways

As defined in the WPA regulations 310 CMR 10.56 (2)(a): Land under Water Bodies and Waterways (LUW) is the land beneath any creek, river, stream, pond or lake, which may be composed of organic muck or peat, fine sediments, rocks or bedrock; the boundary of which is the mean annual low water level. The entire bed of the Reservoir upstream and downstream of the existing crossing, and within the existing bridge crossing constitutes LUW. The streambed near the crossing is characterized by sand and cobbles with trace amounts of silt and gravel.

Bordering Land Subject to Flooding

As defined in the WPA regulations 310 CMR 10.57 (2)(a): Bordering Land Subject to Flooding (BLSF) is an area with low, flat topography adjacent to and inundated by flood waters, which extends from the banks of waterways and waterbodies. BLSF is the estimated maximum lateral extent of flood water which will theoretically result from the statistical 100-year frequency storm. According to the FEMA Flood Insurance Rate Maps for Newburyport / West Newbury (Community Panel Number 25009C0116F dated July 2012), the project occurs within the 100-year floodplain (Zone AE). The bridge is located within Zone AE for the 100-year storm event at, and below the 13-foot base flood elevation.

Riverfront Area

As defined in the WPA regulations 310 CMR 10.58 (2)(a): Riverfront Area (RFA) is the area of land between a river's mean annual high water (MAHW) line and a parallel line measured [200-feet] horizontally. The RFA consists of the approximately 14-foot wide paved Middle Street / Plummer Spring Road. Relatively steep slopes extend down towards the water on either side of the road. The slopes consist mainly of rip rap and trees and shrubs with minimal detrital ground cover beneath. All upland portions of the project area occur within the first 100 feet of the RFA.

Buffer Zone

A 100-foot Buffer Zone extends outward from the limit of Bank into the project site. All upland project areas and activities are located within the Buffer Zone associated with the Bank of the Upper Artichoke Reservoir.

2.2 NHESP Mapped Habitat

According to the most-recently published (2017-2020) information using MassGIS data layers, there are no Natural Heritage Endangered Species Program (NHESP) Priority Habitats of Rare Species, Estimated Habitats of Rare Wildlife, potential or certified vernal pools within the vicinity of the proposed project.

2.3 Other Environmental Resources

According to MassGIS data layers and classifications provided in 314 CMR 4.00, the entire project area occurs within an Outstanding Resource Water (ORW) and Surface Water Protection Zone associated with the Upper Artichoke Reservoir, which is an Article 97, municipal land, and a public water supply watershed. According to MassGIS data layers and classifications provided in 301 CMR 12.00, the project area does not fall within an Area of Critical Environmental Concern (ACEC). According to MassGIS data layers, neither the Upper Artichoke Reservoir nor the river are EPA impaired waterways, nor Coldwater Fisheries (CFR).

3.0 Alternative Analysis

The existing bridge over the Upper Artichoke Reservoir has already partially collapsed which has resulted in the road being permanently closed to traffic in its current state. In order to reduce the risk of injury from any further collapse, and to reopen the roadway, it is necessary to replace the bridge. The design of the bridge has been analyzed by engineers with four possible alternatives: a No-build, a Three-sided Open Bottom Bridge with a precast concrete rigid frame (Alternative 1), an Open Bottom Arch Bridge with precast concrete arch (Alternative 2), and a Three-sided Open Bottom Bridge with a precast concrete beam (Alternative 3, preferred alternative). Please refer to Attachment C for a detailed analysis of the different stream crossing alternatives and their abilities to meet Stream Crossing Standards.

4.0 Proposed Project

The purpose of the project is to replace a structurally deficient, undersized bridge with a new bridge along a similar horizontal and vertical alignment. The project activities include the replacement of the bridge over the Upper Artichoke Reservoir in its entirety. The full sequence of project construction activities will take approximately twelve months to complete. The project involves mitigation measures intended to address existing structural deficiencies, while also minimizing disturbances to the surrounding environment and improving openness. The proposed replacement bridge will carry two lanes of traffic on Middle Street/Plummer Spring Road. The roadway width will increase by approximately 4 feet to include safety improvements to the existing alignment. A safety sidewalk will be added to the south side of the bridge. Roadway reconstruction of Middle Street will occur 160-feet to the west of the bridge and 115-feet to the east on Plummer Spring Road for improved roadway approaches. The total length of the project is approximately 320-feet. The following project components detail the proposed project activities. Please refer to Project Site Plans (Attachment E) for additional details.

- **Proposed Bridge** – The proposed bridge is a high strength precast concrete structure that will follow a similar horizontal and vertical alignment as the existing bridge. The proposed span length will increase from the 14-feet to 45-feet. The overall width of the bridge will be 32.5-feet to accommodate safety improvements, including the sidewalk. In addition to substantially increasing the openness ratio, the increased span eliminates the need for the bridge’s substructure to be located in the deep portion of the reservoir. In accordance with the MassDOT Bridge Manual for a Rural Local road, the proposed bridge has been designed to meet the 10-year flood frequency storm event. Based on hydraulic analysis, the proposed bridge can also accommodate the 100-year flood frequency storm event. The proposed bridge increases the hydraulic opening by a factor of two compared to the existing condition.
- **Riprap Scour Protection** –With the increased span, to achieve a 1:1.5 vertical: horizontal ratio from the elevation of the existing streambed to the elevation at the new bridge abutments, slope stabilization is required. The slope stabilization will consist of 36-inches of variable sized riprap (10- to 22-inch stones) placed below the natural streambed material. In addition, 6-inches of natural streambed material is proposed on top of the riprap. Prior to streambed excavation, natural streambed material will be removed and stockpiled on site for use during restoration to ensure the sizing and arrangement of materials under pre- and post-construction conditions. Upon completion of the proposed bridge replacement activities, the streambed elevation will be restored to its natural condition.
- **Roadway Reconstruction** – At the approaches of the existing bridge the roadway is narrow and the slopes adjacent to the roadway are steep making the existing guardrail ineffective. To meet current roadway geometric and safety requirements, portions of the road will be widened and the slopes reduced

and/or retaining walls installed. To limit impacts to the reservoir, retaining walls will be installed where applicable. However, in areas where slopes with a 1:1.5 vertical: horizontal ratio or less exist, they will be regraded (without impacting the reservoir),

- **Installation of Guardrail and Repaving Activity** – Bridge replacement activities provide an opportunity to make safety improvements to existing conditions surrounding the bridge. The existing functional roadway width will expand from approximately 20-feet to 24-feet wide over the bridge. The widened roadway will meet the existing roadway width at the limits of the project. The approaches to the bridge will be repaved following the completion of project activities. Extended steel guardrail is proposed along the approaches to the bridge to replace existing non-functioning guardrail posts. While these activities will occur within the limits of RFA and BLSF, these areas are currently disturbed and the work within these areas will not adversely affect the resource areas.

Work in Wetland Resource Areas

The bridge replacement project is considered a redevelopment project. As previously stated, portions of the project qualify as a Limited Project. Impacts to wetland resource areas are unavoidable, however upon completion of the project, slopes will be stabilized and the streambed will be restored to match the natural stream channel. The outcome will result in an improvement over existing conditions. Impacts to Bank, Land Under Water, Bordering Land Subject to Flooding, Riverfront Area and buffer zones are anticipated. There will be no BVW impacts as a result of this project.

Impacts denoted below are represented as those occurring within the City of Newburyport, and then the project as a whole within the City of Newburyport and the Town of West Newbury. Table 1 provides an overview of impacts with regard to each WPA wetland resource area.

Bank

The existing Bank along all four quadrants of the bridge will be impacted to some extent as a result of the proposed project. Retaining walls have been proposed in order to better stabilize the proposed bridge structure. Approximately 14 linear feet (lf) (61 lf project-wide) of temporary Bank impacts are proposed in Newburyport to allow for access to the structures through the dewatering structure installation. Approximately 54 lf (182 lf project-wide) of permanent impacts to Bank are proposed in Newburyport as a result of the placement of the retaining walls and riprap for scour protection to the bridge abutments. Additional bank will be created where it previously did not exist, within the crossing itself. Some smaller trees along the roadway are proposed to be removed as a result of this work (<0.1 acres). Upon completion of the bridge and retaining wall construction, the embankment will be installed to tie into elevations and contours to the extent practicable. Bank above Ordinary High Water (OHW) will be restored where appropriate by installing 12-inches of compost mulch and seeded with a native seed mix. Please refer to Project Specs and Project Site Plans (Attachments F and G) for additional detail.

Land Under Waterbodies and Waterways

Approximately 431 square feet (sf) of permanent impacts (984 sf project-wide) to LUW will occur within the Reservoir and stream channel with the installation of riprap, retaining walls, and the new bridge wingwalls and abutments. The majority of LUW within the existing crossing will not be disturbed. Steel plates will be inserted in the channel abutting the existing structure to allow for its safe removal and to allow water to continue to flow. No other impacts are proposed within the channel itself. In order to protect the new bridge structure, riprap will be installed at the crossing inlet/outlet which will also constitute a permanent impact. A total of 449 sf of new LUW (885 sf project-wide) will be created with the increased openness of the expanded crossing. The new crossing will have a natural streambed installed, similar to what occurs within the existing crossing (Attachments F & G). Additionally, approximately 198 sf of temporary impacts (641 sf project-wide) at the inlet and outlet of the bridge

will occur as a result of dewatering the channel for construction. All temporary impacts will be restored to preconstruction conditions. Please refer to Project Site Plans (Attachment G) for additional detail.

Bordering Vegetated Wetlands

No impacts to Bordering Vegetated Wetlands are proposed.

Riverfront Area

As the project is situated directly over the Upper Artichoke Reservoir, and given that the project area is relatively small, all upland portions of the project area are within the 200-foot RFA. A majority of work within the RFA constitutes a redevelopment project. Nearly all of the work will be within existing roadway, shoulders, or side slopes. Approximately 2,669 sf (5,872 sf project-wide) of RFA impacts constitutes redevelopment and will occur within the previously paved / degraded existing roadway. Approximately 1,217 sf (3,203 sf project-wide) of RFA permanent impacts will result from the construction of the new bridge. These include the installation of the bridge footings and abutments, riprap for scour protection, pavement milling mulch for the shoulders, and drainage structures. Approximately 548 sf (1,118 sf project-wide) of temporary impacts are anticipated during the construction phase of the project as a result of the installation of erosion and sedimentation controls and water diversion.

Upland areas adjacent to the Upper Artichoke Reservoir that are temporarily disturbed by construction activities will be restored through a combination of grading, stabilization, and seeding activities. Some smaller trees along the roadway are proposed to be removed as a result of this work (< 0.1 acres). Any fill introduced to the site for the purposes of re-establishing vegetation will be clean fill, and disturbed areas will be stabilized and restored through the planting of native species as soon as practicable to reduce the likelihood that invasive species become established at the site.

Bordering Land Subject to Flooding

All upland within the project area is also Bordering Land Subject to Flooding (BLSF). Generally, all of the work proposed within BLSF will be temporary in nature. However, there will be some permanent impacts to BLSF as a result of the proposed retaining walls. This work will be compensated for, with the opening-up of the bridge crossing.

Approximately 44 sf (211 sf project-wide) of BLSF will be altered within the project area; however, approximately 344 sf (655 sf project-wide) will be replaced as additional storage capacity. A total of 132 cf (525 cf project-wide) of storage will be lost; however, approximately 1,857 cf (3,295 cf project-wide) will be replaced. Additional work along the roadway is entirely above the 13-foot flood elevation, and remaining work within this resource area will be restored in-kind.

Table 2 provides an overview of cut and fill in BLSF by foot of elevation.

Work within Buffer Zone

The majority of the project site and proposed activities will be located within the 100-foot Buffer Zone to Bank. Vegetation will be maintained whenever possible within the project vicinity, and the area will be returned to preconstruction conditions whenever possible.

Table 1 below provides an overview of impacts with regard to each WPA wetland resource area:

Table 1 – Summary of Wetland Resource Area Impacts

Resource Area	Impact Type	West Newbury	Newburyport	TOTAL
Land Under Water (LUW)	Permanent	553 sf	431 sf	984 sf
	Permanent Dredge / Fill	39 cy / 17 cy	9 cy / 2 cy	48 cy / 19 cy
	Temporary	443 sf	198 sf	641 sf
	Temporary Dredge / Fill	28 cy / 0 cy	22 cy / 0 cy	50 cy / 0 cy
Bank	Permanent	128 lf	54 lf	182 lf
	Temporary	47 lf	14 lf	61 lf
200-foot Riverfront Area (RFA)	Redevelopment	3,203 sf	2,669 sf	5,872 sf
	Permanent	1,986 sf	1,217 sf	3,203 sf
	Temporary	570 sf	548 sf	1,118 sf
Bordering Land Subject to Flooding (BLSF)	Proposed Alteration (sf)	167 sf	44 sf	211 sf
	Proposed Replacement	311 sf	344 sf	655 sf
	Flood Storage Lost (cf)	393 cf	132 cf	525 cf
	Flood Storage Replaced	1,438 cf	1,857 cf	3,295 cf

Table 2 – Summary of Cut and Fill in BLSF By Foot of Elevation

Elevation (ft)	Floodplain Impact (cf)		Floodplain Mitigation (cf)		Floodplain Net (cf)		
	West Newbury	Newburyport	West Newbury	Newburyport	West Newbury	Newburyport	Total
3-4	-	-	-	10.1	No Change	+10.1	+10
4-5	-	-	6.1	46.5	+6.1	+46.5	+53
5-6	-	-	40.4	84.3	+40.4	+84.3	+125
6-7	-	-	78.3	122.2	+78.3	+122.2	+201
7-8	-	-	116.2	160.1	+116.2	+160.1	+276
8-9	0.8	-	154.0	198.0	+153.3	+198.0	+351
9-10	-	24.5	192.9	236.8	+192.9	+212.4	+405
10-11	165.5	43.0	234.3	278.3	+68.8	+235.3	+304
11-12	140.6	38.6	279.8	354.5	+139.2	+315.9	+455
12-13	85.6	25.5	334.3	365.6	+248.7	+340.1	+589
TOTAL	392	131	1,436	1,856	+1,044	+1,725	+2,769

5.0 Stormwater Management

The Project area currently exhibits country drainage whereby runoff travels to the approach roadway and informally runs off down the side slopes. The proposed bridge replacement is considered a redevelopment project, and while the widened roadway will increase impervious area at the site, mitigation measures are not feasible to reduce runoff rates due to site limitations. As a redevelopment project, the proposed design meets the stormwater standard to the maximum extent practicable. As such, a formal Stormwater Management Report has not been prepared for this project, but a streamlined one is included in Attachment E.

To provide stormwater drainage improvements, it's proposed that runoff will be captured at the low points on either side of the roadway via two deep sump catch basins. The deep sump catch basins flow to a manhole on the north side of the roadway. From there the runoff is directed northwest to a flared end section that discharges towards the reservoir into stone for pipe ends. Like the existing conditions, all other runoff within the project limits will continue

to flow via country drainage. Please refer to Attachment E for Stormwater Report.

6.0 Construction Considerations and Sequencing

Installation of the recommended foundation system will require control of water during construction and the use of a temporary excavation support system. Control of water during construction, which typically includes water diversion and dewatering operations to maintain dry conditions during foundation placement, is the responsibility of the Contractor. Typical systems for water diversion primarily include cofferdams, which can incorporate steel sheet piling, large sandbags, or other proprietary systems. Based on site constraints, actual flowrates during construction and specific project permitting requirements, cofferdams can be combined with temporary diversion pipes to completely redirect flows around the work area. Final means and methods are up to the contractor.

The temporary excavation support system will be selected by the Contractor, but typical installations for use with the existing subsurface conditions include cantilevered, or braced steel sheet piling systems. The Contractor will select the support of excavation based on site constraints, traffic control plan and other methods of construction.

Following the excavation, proper subgrade preparation must be completed prior to installation of the recommended foundation system. Proper treatment includes the installation of an approved geotextile fabric over the subgrade, followed by the placement and compaction of crushed stone.

The construction is generally proposed as outlined below:

- Additional signage to fully close existing roadway (closed for pedestrian traffic, already closed to vehicles).
- Installation of erosion controls.
- Water handling and dewatering.
- Removal of existing bridge
- Excavation of soils.
- Installation of new bridge structure.
- Placement of riprap for scour protection / placement natural substrate in streambed.
- Construction and pavement of roadway approaches and related work.
- Open new bridge to traffic.
- Site restoration including stabilization and seeding.
- Remove erosion and sedimentation controls.

7.0 Mitigation Measures

The proposed project will occur within the jurisdictional limits of Bank, Land Under Water, BLSF, the 100-foot buffer area and the 200-foot Riverfront Area. The project has therefore been designed to incorporate construction Best Management Practices (BMPs) to ensure adequate protection to wetland resource areas within proximity of the project location.

Disturbed areas within affected resources will be stabilized and restored following the completion of project activities. This will be achieved specifically by limiting alteration within resource areas to the maximum extent practicable. This will also be accomplished through project phasing activities that minimize work within resources to the maximum extent practicable.

Erosion and Sedimentation Controls

Siltation barriers composed of compost filter tubes will be installed at the downgradient limits of work. Sedimentation barriers will be checked on a weekly basis and following significant storm events. Sediment controls will remain in-place during all phases of the project and will be removed once the area is sufficiently stabilized. Please refer to Attachment G (Site Plans) for erosion and sedimentation control details and the proposed locations of controls.

Construction Stockpiling Locations and Staging Areas

All stockpile locations and staging areas will be located within the existing roadway; and while locations are to be determined by the Contractor, they will need to be approved by the City prior to use. In the event stockpiled materials must be left on site overnight, the piles will be covered with tarps and surrounded by erosion control measures (e.g. compost filter tubes). Stockpiled streambed material will be stored at a location within the existing roadway. Staging and storage areas will be outside of all jurisdictional environmental resource areas where feasible and practicable.

Water Control Measures and Dewatering

Prior to in-water work, cofferdams will be installed for construction activities to occur in dry conditions. As such, work will require dewatering. The contractor will be required to develop and maintain a Construction Water Management Plan that is prepared in accordance with the contract design documents, and generally, the means and methods will be determined by the contractor. Flow will be maintained within the existing channel; the dewatered construction area can be maintained by pumping the water out of the work areas.

All discharge resulting from dewatering activities shall be directed to temporary sedimentation/retention basins as specified by the contractor to control turbidity. At no time shall the discharge be directly released into adjacent resource areas, nor will any settling tank/basin be located within a wetland resource area. If stone or other erosion control is utilized at the outlet of the settling tank/basin, this material will be removed, and the area will be restored to existing conditions prior to the completion of the project. Please refer to Attachment G, Project Site Plans for additional detail on proposed water control measures.

8.0 Regulatory Compliance

The project has been designed to comply with the General Performance Standards listed in 310 CMR 10.00. As previously stated, portions of the project qualify as a Limited Project. A comparison of the alternatives considered for this bridge replacement project is in Attachment C – Alternatives Analysis. Table 1 provides an analysis of proposed wetland resource area impacts. The proposed project includes measures to maximize compliance with the applicable performance standards with the WPA and the City of Newburyport Wetlands Protection Ordinance (Chapter 6.5 Article II) for each jurisdictional wetland resource area as discussed below.

According to the Wetlands Protection Act and City of Newburyport Wetlands Protection Ordinance, wetland resource areas are presumed significant in varying capacities to flood control, storm damage prevention, prevention of pollution, wildlife habitat, fisheries habitat, protection of public water supply, and protection of groundwater supply. The City Ordinance also provides performance standards for the Wetland Buffer Zone. Due to the nature of the proposed project, the design is unable to meet the regulatory requirements under the City Ordinance for a 25-foot No Disturbance Buffer Zone, and work within the Buffer Zone to the Upper Artichoke Reservoir. As such, the Applicant requests a waiver for working in this locally regulated resource area per Chapter 6.5 Article II Section 9A of the Ordinance since the intent has been met, and that avoidance, minimization, and mitigation have been employed to the maximum extent feasible.

The following section describes how the project will minimize and mitigate wetland resource area impacts to the maximum extent practicable by complying with the general performance standards established for each area:

General Performance Standards

Bank, 310 CMR 10.54 (4)(a)

Work impacting approximately 68 linear feet (243 lf project-wide) of Bank is associated with the Upper Artichoke Reservoir. As indicated in the Wetlands Protection Act 310 CMR 10.54 (4)(a), the proposed work shall not impair the following:

1. *the physical stability of the Bank*

The proposed work will improve the stability of the Bank by replacing the deteriorating bridge structure and the partially collapsed roadway side-slopes. This, in turn, will reduce scouring and erosion along the adjacent slopes and sedimentation in the waterway. At the completion of construction, the restored Bank will be stabilized by loaming and seeding.

2. *the water carrying capacity of the existing channel within the Bank*

The project will replace a structurally deficient and hydraulically restricted bridge. The proposed design will expand the existing hydraulic opening of the bridge, thereby improving flow conditions and reducing bridge scour and erosion issues. Hydraulic modeling has confirmed that widening the bridge span will not significantly increase upstream or downstream flooding.

3. *ground water and surface water quality*

The proposed project consists of rebuilding the existing bridge structure in the dry and will not result in discharge of sediment to the waterway. Therefore, it will not result in the degradation of groundwater and surface water quality.

4. *the capacity of the Bank to provide breeding habitat, escape cover and food for fisheries.*

The replacement of the existing bridge, with a new, wider bridge structure, will improve fish and wildlife habitat within the vicinity of the bridge as well as up and downgradient of the bridge. The project will minimize disturbance to the vegetation to the maximum extent practical and utilize erosion controls throughout the duration of construction to prevent sedimentation into the waterway.

5. *the capacity of the Bank to provide important wildlife habitat functions.*

The project site is not located within rare species habitat. There will be no permanent adverse effects as a result of the proposed work. The proposed work along the Bank will improve its physical stability which in turn, will improve habitat.

6. *Work on a stream crossing shall be presumed to meet the performance standard set forth in 310 CMR 10.54(4)(a) provided the work is performed in compliance with the Massachusetts Stream Crossing Standards.... Notwithstanding the requirement of 310 CMR 10.54(4)(a)5., the impact on bank caused by the installation of a stream crossing is exempt from the requirement to perform a habitat evaluation in accordance with the procedures contained in 310 CMR 10.60.*

The project site is not located within rare species habitat. There will be no permanent adverse effects as a

result of the proposed work. However, the proposed bridge replacement project will improve the site habitat connectivity. The project meets the Stream Crossing Standards to the maximum extent practicable.

Land Under Water Bodies and Waterways, 310 CMR 10.56 (4)(a)

Work impacting approximately 629 square feet (1,625 sf project-wide) of LUW is associated with the Upper Artichoke Reservoir. Where the presumption set forth in 310 CMR 10.56(3) is not overcome, any proposed work within the Land Under Water Bodies and Waterways shall not impair the following:

1. *The water carrying capacity within the defined channel, which is provided by said land in conjunction with the banks;*

Temporary and permanent impacts to LUW are required to remove and replace the existing bridge, and to apply the proposed scour protection measures at the proposed bridge footings. Local scour effects at the inlet and outlet of the existing crossing were evident, and as such, it is important to protect the new bridge installation. The proposed bridge will have an increased hydraulic opening, thereby improving flow conditions, reducing bridge scour/erosive conditions, and improving water quality. Unabated channel flow and a phased construction approach will allow stream flow to be maintained throughout the duration of project activities. The surface area of LUW provided by the existing bridge will be replaced and expanded (885 sf of LUW will be created) over natural substrate. The project falls within the 100-year FEMA floodplain (Zone AE); however, the project will not adversely affect the floodplain as there will be a net-gain of storage capacity.

2. *Ground and surface water quality;*

Construction will be performed using appropriate erosion and sedimentation controls as previously stated, as well as general BMPs designed to prevent spills, turbidity, or debris generation. Upon completion of this work, flow will function more appropriately at this crossing. Therefore, it will not result in the degradation of groundwater and surface water quality.

3. *The capacity of said land to provide breeding habitat, escape cover and food for fisheries;*

The proposed work will improve the existing habitat by removing the existing bridge and installing a wider span bridge structure with natural streambed material that will better mimic natural conditions.

4. *The capacity of said land to provide important wildlife habitat functions. A project or projects on a single lot, for which Notice(s) of intent is filed on or after November 1, 1987, that (cumulatively) alter(s) up to 10% or 5,000 square feet (whichever is less) of land in this resource area found to be significant to the protection of wildlife habitat, shall not be deemed to impair its capacity to provide important wildlife habitat functions. Additional alterations beyond the above threshold may be permitted if they will have no adverse effects on wildlife habitat, as determined by procedures established under 310 CMR 10.60.*

As described above, the project involves comparatively minimal new impacts to LUW in order to replace the failing bridge structure. A majority of permanent impacts will occur within the footprint of the existing crossing and as a result of the installation of the new retaining walls to protect the road and proposed bridge structure from scour. Many of the new impacts will be temporary in nature (641 square feet of 1,625 sf project-wide) for construction and dewatering purposes only and will be returned to preconstruction conditions. The new permanent impacts account for 11.8% of the total LUW in the project area. The new bridge will have a wider, natural streambed bottom which will provide environmental benefits such as improved wildlife passage and connectivity. Per 310 CMR 10.56(a)5., this project is exempt from the requirement to perform a wildlife habitat evaluation.

5. *Work on a stream crossing shall be presumed to meet the performance standard set forth in 310 CMR 10.56(4)(a) provided the work is performed in compliance with the Massachusetts Stream Crossing Standards by consisting of a span or embedded culvert in which, at a minimum, the bottom of a span structure or the upper surface of an embedded culvert is above the elevation of the top of the bank, and the structure spans the channel width by a minimum of 1.2 times the bankfull width. This presumption is rebuttable and may be overcome by the submittal of credible evidence from a competent source. Notwithstanding the requirements of 310 CMR 10.56(4)(a)4., the impact on Land under Water Bodies and Waterways caused by the installation of a stream crossing is exempt from the requirement to perform a habitat evaluation in accordance with the procedures established under 310 CMR 10.60.*

The proposed work is designed to the greatest extent practicable to the Massachusetts Stream Crossing Standards. Please refer to the Stream Crossing Evaluation Worksheet in Attachment C and the Stream Crossing Standards Compliance section below.

Bordering Land Subject to Flooding, 310 CMR 10.57 (4)(a)

Work impacting approximately 388 square feet (866 sf project-wide) of BLSF is associated with the Upper Artichoke Reservoir. Where the presumption set forth in 310 CMR 10.57(3) is not overcome, any proposed work within the Bordering Land Subject to Flooding shall not impair the following:

1. *Compensatory storage shall be provided for all flood storage volume that will be lost as the result of a proposed project within Bordering Land Subject to Flooding, when in the judgment of the issuing authority said loss will cause an increase or will contribute incrementally to an increase in the horizontal extent and level of flood waters during peak flows.*

Flood storage will be temporarily altered from the bridge excavation and construction. Riprap is proposed in areas previously unencumbered by the bridge structure and areas with existing riprap, namely, to prevent scour at the openings, but material is also being removed from elevations within, and at the existing bridge opening.

The bridge is located within Zone AE for the 100-year storm event at and below the 13-foot base flood elevation. The retaining walls proposed at each quadrant of the bridge will permanently impact flood storage in these areas. However, a significant amount of roadway will be removed with the replacement of the earth-filled stone arch with a span-bridge which will triple the width of the existing channel, thereby increasing the hydraulic opening and overall flood storage capacity. Slopes will also generally be restored to the extent practicable. The proposed loss will not cause an increase, nor will contribute incrementally to an increase in the horizontal extent and level of flood waters during peak flows. As a result, compensatory storage mitigation is not proposed.

2. *Work within Bordering Land Subject to Flooding, including that work required to provide the above-specified compensatory storage, shall not restrict flows so as to cause an increase in flood stage or velocity.*

In accordance with the MassDOT Bridge Manual for a Rural Local road the proposed bridge has been designed to meet the 10-year flood frequency storm event. Based on hydraulic analysis, the proposed bridge can also accommodate the 100-year flood frequency storm event. The proposed bridge increases the hydraulic opening by a factor of two compared to the existing conditions. This will allow for greater volume and flow passage at the crossing, while decreasing peak flow velocity by 30% over current conditions.

Flow will be maintained during construction through the existing channel. While final methodology is up to the contractor, the proposed system meets MassDOT required design standards for a temporary water control system, designed to maintain channel flow.

3. *Work in those portions of bordering land subject to flooding found to be significant to the protection of wildlife habitat shall not impair its capacity to provide important wildlife habitat functions. Except for work which would adversely affect vernal pool habitat, a project or projects on a single lot, for which Notice(s) of Intent is filed on or after November 1, 1987, that (cumulatively) alter(s) up to 10% or 5,000 square feet (whichever is less) of land in this resource area found to be significant to the protection of wildlife habitat, shall not be deemed to impair its capacity to provide important wildlife habitat functions. Additional alterations beyond the above threshold, or altering vernal pool habitat, may be permitted if they will have no adverse effects on wildlife habitat, as determined by procedures contained in 310 CMR 10.60.*

Generally, impacts to Middle Street / Plummer Spring Road and the adjoining slopes will be temporary in nature and will not impair the capacity of BLSF to provide important wildlife habitat functions. Permanent effects of the project will be to protect the existing bridge structure with retaining walls, and to triple the width of the existing channel width. Widening the span, opening the crossing, and bank restoration efforts, all proposed by this project will promote improvements to wildlife habitat. Additionally, since the proposed project involves a stream crossing, the project is exempt from the requirement to perform a wildlife habitat evaluation.

Riverfront Area (RFA), 310 CMR 10.58(5)

The proposed work is considered a Redevelopment Project in RFA in accordance with 310 CMR 10.58(5), because the project involves the replacement, rehabilitation or expansion of existing bridge structures and the improvement of existing roads, but will preserve undisturbed areas adjacent to the bridge as much as possible in accordance with 310 CMR 10.58 (4)(d)(1)(a). Work impacting approximately 4,434 square feet (10,193 sf project-wide) of RFA is associated with the Upper Artichoke Reservoir. All Redevelopment projects must comply with the following standards cited under 310 CMR 10.58(5).

- a) *At a minimum, the proposed work [must] result in an improvement over existing conditions of the capacity of the riverfront area to protect the interests identified in M.G.L.c.131 Section 40*

The proposed bridge structure will result in an improvement over existing conditions. The existing bridge is undermined and collapsing which has already resulted in the closing of the roadway. The new bridge will widen the opening, thereby providing improved wildlife passage and habitat connectivity.

- b) *Stormwater management is provided according to standards established by the Department*

The Project area currently exhibits country drainage system whereby runoff travels to the approach roadway and informally runs off down the side slopes. The proposed bridge replacement is considered a redevelopment project, and while the widened roadway will increase impervious area at the site, mitigation measures are not feasible to reduce runoff rates due to site limitations. As a redevelopment project, the proposed design meets the stormwater standard to the maximum extent practicable. As such, a formal Stormwater Management Report has not been prepared for this project, but a streamlined one is included in Attachment E.

- c) *Within 200 foot riverfront areas, proposed work shall not be located closer to the river than existing conditions or 100 feet, whichever is less*

The proposed project involves the redevelopment of an existing crossing. Proposed redevelopment activities are located entirely within previously disturbed RFA to the extent practicable. Due to the water-dependent nature of the project, it is not possible to locate the entire bridge structure further from the Reservoir than is currently proposed. Only minimal encroachment into non-altered areas is required, and only to the extent required for the most practicable and substantially equivalent economical bridge design.

- d) *Proposed work, including expansion of existing structures, shall be located outside the riverfront area or toward the riverfront area boundary and away from the river*

The proposed project involves the redevelopment of an existing stream crossing. Proposed redevelopment activities are located entirely within previously disturbed RFA to the extent practicable. The proposed activities will result in an increase in size relative to the existing overall bridge footprint, but the design proposes to locate the bridge footings at a greater distance from one another than the existing crossing. This will result in a much more open crossing than the existing structure. Due to the water-dependent nature of the project, it is not possible to locate the bridge further from the water than is currently proposed. Additional required work within the RFA includes the bridge scour protection and riprapped slope, which are required to prevent erosion.

- e) *The area of proposed work shall not exceed the amount of degraded area, provided that the proposed work may alter up to 10% if the degraded area is less than 10% of the riverfront area*

The proposed project will be located within previously disturbed or degraded areas. The project involves the replacement of an existing bridge. As stated above, all major redevelopment components of the project are located within the limits of previously disturbed or degraded areas. The total RFA on the subject property is equal to approximately 13,158 sf. The total degraded RFA on the roadway site, 5,872 sf is equal to approximately 44.6%. The new scour protection at the bridge footings and the retaining walls will expand approximately 3,203 sf into non-degraded areas of the lot. While this represents an approximate 24.3% increase in proposed new impervious area within the RFA on the small project site, these improvements ensure the stability of the new bridge structure and prevent degradation of the newly improved site. Riprap above OHW will be loam and seeded with a native grass seed mixture.

- f) *When an applicant proposes restoration on-site of degraded riverfront area, alteration may be allowed notwithstanding the criteria of 310 CMR 10.58(5)(c), (d), and (e) at a ratio in square feet of at least 1:1 of restored area to area of alteration not conforming to the criteria*

All disturbed areas will be restored to pre-existing conditions or better. The proposed bridge will increase openness and increase connectivity.

- g) *Riverfront area mitigation.*

The bridge replacement will serve as an improvement to the RFA and will not have no adverse impact on the Riverfront Area. At the completion of construction, and riprap above OHW within the RA will be loam and seeded with a native grass seed mixture.

Stream Crossing General Standards

The proposed project design complies with the Massachusetts Stream Crossing Standards to the extent practicable, as required for a limited project under the WPA. The proposed project meets all Stream Crossing Standards. The proposed design mitigates for the existing scouring, flow contraction, outlet perching, and inlet drops and will not act as a physical barrier to fish and wildlife passage.

The following outlines compliance with the Stream Crossing General Standards:

1. *Spans (bridges, 3-sided box culverts, open-bottom culverts or arches) that preserve the natural stream channel are strongly preferred.*

Meets standard. The width of the existing span earth filled stone arch is 14.3 feet, while the width of the proposed bridge is 23.4 feet. The replacement structure will mimic natural stream channel conditions.

2. *If a culvert, then it should be embedded:*

- *a minimum of 2 feet for all culverts,*
- *a minimum of 2 feet and at least 25 percent for round pipe culverts*
- *When embedment material includes elements > 15 inches in diameter, embedment depths should be at least twice the D84 (particle width larger than 84 % of particles) of the embedment material.*

Meets Standard. Span bridge proposed with a natural stream bottom.

3. *Spans channel width (a minimum of 1.2 times the bankfull width).*

Meets Standard. According to Stream Stats, the bankfull width is 28.4 feet. To meet the Standard, the minimum bankfull width would need to be 34.0 feet wide. The structure opening is proposed to be 41.5 feet wide.

4. *Natural bottom substrate within the structure.*

Meets Standard. Natural material will remain within the existing channel, and stream material removed during construction will be reused on top of bank scour protection.

5. *Designed with appropriate bed forms and streambed characteristics so that water depths and velocities are comparable to those found in the natural channel at a variety of flows.*

Meets Standard. Hydraulic Report prepared for the project indicates the post-construction water depth is approximately the same as existing conditions.

6. *Openness > 0.82 feet (0.25 meters).*

Meets Standard. The proposed openness ratio is 11.7.

7. *Banks should be present on each side of the stream matching the horizontal profile of the existing stream and banks.*

Meets Standard. The proposed design will match the horizontal profile of the existing stream and associated banks.

***If it is not possible to meet all of the applicable standards, replacement crossings should be designed to avoid or mitigate the following problems.*

- *Inlet drops*
- *Outlet drops*
- *Flow contraction that produces significant turbulence*
- *Tailwater armoring*
- *Tailwater scour pools*
- *Physical barriers to fish and wildlife passage*

Please refer to Attachment C – Alternative Analysis for further stream crossing alternate analysis and compliance with Stream Crossing Standards.

9.0 Summary

The Applicant, the City of Newburyport, has filed this Notice of Intent under the Massachusetts Wetlands Protection Act and the City of Newburyport's Wetlands Protection Ordinance for the replacement of the existing bridge on Middle Street / Plummer Spring Road over the Upper Artichoke Reservoir in Newburyport, MA. The information contained in this Notice of Intent application sufficiently describes the site, proposed work, and the effect of said work on the interests identified in the Wetlands Protection Act. Further, as both a limited project, and a project proposed in the public interest, consistent with the intent and purpose of the Ordinance, the bridge replacement is eligible for permitting under the City of Newburyport's Wetlands Protection Ordinance with waiver and approval by the Conservation Commission. The design approach taken was to first avoid wetland resources impacts where feasible, and where unavoidable, to minimize the impacts to the extent practicable and mitigate where applicable. The application further demonstrates that the project can be constructed in accordance with the applicable general performance standards for the affected resource areas, or as a limited project where applicable. The Applicant therefore respectfully requests that the Newburyport Conservation Commission issue an Order of Conditions and waiver with appropriate conditions for work to proceed as described in this narrative and as shown on the project plans.

January 8, 2021

City of Newburyport
Conservation Commission
60 Pleasant Street
Newburyport, MA 01950

**RE: Bridge Replacement Project
Plummer Spring Road over Upper Artichoke Reservoir
Newburyport, Massachusetts
Request for a Variance, Newburyport Wetlands Protection Ordinance**

Dear Members of the Newburyport Conservation Commission:

BSC Group Inc., on behalf of The City of Newburyport (“the Applicant”), is pleased to submit this request for a variance to the Newburyport Conservation Commission for project activities associated with the replacement of the structurally deficient bridge (Bridge No. N-11-007) which carries Plummer Spring Road in Newburyport, MA over the Upper Artichoke Reservoir (hereby referred to as “the bridge”). The bridge is in poor condition and the road is currently closed due to structural deficiencies. Therefore, the City/Applicant proposes to replace the bridge structure with a new structure on a similar horizontal and vertical alignment. The proposed bridge will expand the hydraulic opening of the crossing while also improving roadway safety. The Project will be funded by grants and public funds.

Section X of the Newburyport Code of Ordinances, Chapter 6.5, Article II, § 9 (the “Ordinance”), denotes that applicants may request a variance from the requirements of the Ordinance or the Commission’s Wetlands Protection Regulations (the “Regulations”). The Commission may grant a variance if it finds after hearing that: 1) there are no reasonable conditions or alternatives that would allow the project to proceed in compliance with the Ordinance or Regulations; 2) mitigating measures are proposed that will allow the project to be conditioned so as to contribute to the protection of the wetland values protected by the Ordinance; and 3) the project is necessary to accommodate an overriding public interest or that it is necessary to avoid a decision that so restricts the use of the property as to constitute an unconstitutional taking without compensation. The Applicant requests a Variance to Section 8.A.4. as follows:

A. The Buffer Zone

The Regulations under §6.5-8.A.4. prohibit disturbance in the 25-foot No-Disturbance zone and limit impacts in the Buffer Zone. While the Ordinance provides exemptions in § 6.5-3.4.B.2.(b). for existing roads, it excludes existing bridges. The proposed project purpose is for the replacement of a deteriorating, existing bridge within the roadway layout.

The Project has been designed to avoid, minimize, and mitigate project-related impacts to the maximum extent practicable. Due to the water-dependent nature of the project, it is not possible

Engineers

Environmental
Scientists

Custom Software
Developers

Landscape
Architects

Planners

Surveyors



to locate the bridge structure further from the Reservoir than is currently proposed. Additionally, since the existing, narrow roadway abuts the Upper Artichoke Reservoir to the north and south, all work is proposed to occur within the Buffer Zone and 25-foot No-Disturbance Zone. Given that this proposed project is for the redevelopment of an existing, deteriorating bridge, most of the work will occur within the footprint of the existing crossing and all work will occur within the existing roadway layout. Only minimal encroachment into non-altered areas is required, and only to the extent required for the most practicable and substantially equivalent economical bridge design.

1. Public Interest

The public roadway was closed in 2018 to vehicular traffic due to the collapse of portions of the bridge, stone headwall, and southeast approach roadway, and is currently considered structurally deficient due to undermining of the paved roadway foundation. The road closure forces emergency vehicles to detour to roads around the Reservoir rather than be able to cross through. The paved roadway consists of two travel lanes that vary in width from 8.5 feet to 10-feet, there is no pedestrian sidewalk, and due to various site conditions, the existing guardrail is ineffective.

The proposed replacement bridge will re-open this public roadway, continue to carry two lanes of traffic, and will add safety improvements such as a safety sidewalk on the south side of the bridge so Pedestrians may enjoy viewing the Reservoir as well. To meet current roadway geometric and safety requirements, portions of the road will be widened to meet the existing roadway width at the limits of the project, and the side-slopes will either be reduced and/or retaining walls will be installed to limit impacts to the reservoir where applicable.

2. Project Alternatives

The design of the bridge has been analyzed by engineers with four possible alternatives: a No-build, a Three-sided Open Bottom Bridge with a precast concrete rigid frame (Alternative 1), an Open Bottom Arch Bridge with precast concrete arch (Alternative 2), and a Three-sided Open Bottom Bridge with a precast concrete beam (Alternative 3, preferred alternative).

Again, due to the water-dependent nature of the project, it is not possible to locate the bridge structure further from the Reservoir than is currently proposed. Either the Applicant must pursue a No-Build to not impact the Buffer Zone, nor realize any benefits from this project, or work must occur within the Buffer Zone, including the 25-foot No-Disturbance Zone. In order to reduce the risk of injury from any further collapse, halt further erosion, and to reopen the roadway, it is necessary to replace the bridge.

All replacement options will include a wider span, greater openness, increased habitat connectivity and improved wildlife passage, all seen as typically beneficial outcomes for stream crossing replacements. To address the replacement of the existing bridge, project impacts to wetland resource areas cannot be avoided. However, proposed project activities and associated mitigation measures have been designed to avoid and minimize adverse impacts for work within wetland resource areas, and meet the MA Stream Crossing Standards to the extent practicable.

No-Build Alternative

The No Build Alternative assumes that the proposed bridge replacement project would not be constructed, and the existing bridge would remain in place. Due to the deteriorating nature of the existing structure that has resulted in the closing of the roadway, this alternative is not considered feasible.



Alternative 1: Three-sided Open Bottom Bridge, Precast Frame

This alternative proposes a three-sided open bottom bridge with a precast concrete 22-foot clear span rigid frame. The structure would include a 24-foot roadway with no sidewalks and continuous guardrail. It would have an overall width of 27'-3", have spread footing, and the preliminary estimate is \$2.4M.

Advantages

- Prefabricated
- Low maintenance cost

Disadvantages

- Higher Cost
- No pedestrian access
- Deep excavation required
- Wetland resource area impact

Alternative 2: Open Bottom Arch Bridge, Precast Concrete Arch

This alternative proposes an open bottom arch bridge with precast concrete 30'-8" span arch. The structure would include a 24-foot roadway with no sidewalks and S3-TL4 bridge rail. It would have an overall width of 27'-3", have pile footings, and the preliminary estimate is \$2.3M.

Advantages

- Prefabricated
- Continues arch style

Disadvantages

- Higher Cost
- No pedestrian access
- Higher construction duration
- High wetland resource area impact

Alternative 3 (Preferred Alternative): Three-sided Open Bottom Bridge, Precast Beam

This alternative proposes a three-sided open bottom bridge with a precast concrete 45-foot span spread box beam. The structure would include a 24-foot roadway with one sidewalk and S3-TL4 bridge rail. It would have an overall width of 32'-6", there would be integral abutments on piles, and the preliminary estimate is \$2.6M.

Advantages

- Pedestrian Access / Safety
- Low maintenance cost

Disadvantages

- Higher Cost
- Construction duration
- Increased permitting requirements
- Greater wetland resource area impact

3. Impact Minimization

The Project was designed with mitigation measures intended to address existing structural deficiencies, with construction Best Management Practices (BMPs) incorporated, and while also minimizing disturbances to the surrounding environment and improving openness. The proposed bridge is a high strength precast concrete structure that will follow a similar horizontal and vertical alignment as the existing bridge. In addition to substantially increasing the openness ratio and increasing the hydraulic opening by a factor of two, the increased span (from the 14-foot to 45-foot) eliminates the need for the bridge's substructure to be located in the deep portion of the reservoir.

To meet current roadway geometric and safety requirements, portions of the road will be widened to meet the existing roadway width at the limits of the project, and the side-slopes will either be reduced and/or retaining walls will be installed to limit impacts to the reservoir.



The proposed construction methodology will not only allow flow to continue in the channel during construction, but the majority of Land Under Water (LUW) within the existing channel crossing will not be disturbed. Proposed disturbances to LUW have been minimized to the extent practicable for safe construction and infrastructure protection, and the proposed design will create a nearly 1:1 replacement of altered LUW across the Project¹ (> 1:1 in Newburyport²) with the increased openness of the expanded crossing.

Vegetation along the bank will be maintained whenever possible. Disturbed areas within affected resources will be stabilized and restored where appropriate by installing 12-inches of compost mulch and seeded with a native seed mix following the completion of project activities. Additionally, all temporary impacts will be restored to preconstruction conditions.

a. Erosion and Sedimentation Controls

Siltation barriers composed of compost filter tubes will be installed at the downgradient limits of work and will be checked weekly and following significant storm events. Sediment controls will remain in-place during all phases of the project and removed once the area is sufficiently stabilized.

b. Construction Stockpiling Locations

All stockpile locations and staging areas will be located within the existing roadway; and while locations are to be determined by the Contractor, they will need to be approved by the City prior to use. In the event stockpiled materials must be left on site overnight, the piles will be covered with tarps and surrounded by erosion control measures (e.g. compost filter tubes). Stockpiled streambed material will be stored at a location within the existing roadway. Staging and storage areas will be outside of all jurisdictional environmental resource areas where feasible and practicable.

c. Water Control Measures and Dewatering

Prior to work, cofferdams will be installed for construction activities to occur in dry conditions. As such, work will require dewatering. The contractor will be required to develop and maintain a Construction Water Management Plan that is prepared in accordance with the contract design documents, and generally, the means and methods will be determined by the contractor. Flow will be maintained within the existing channel; the dewatered construction area will be maintained by pumping the water out of the work areas.

All discharge resulting from dewatering activities shall be directed to temporary sedimentation/retention basins to control turbidity. At no time shall the discharge be directly released into adjacent resource areas, nor will any settling tank/basin be located within a wetland resource area. If stone or other erosion control is utilized at the outlet of the settling tank/basin, this material will be removed, and the area will be restored to existing conditions prior to the completion of the project.

B. Conclusion

The proposed redevelopment of the public roadway and bridge is in the public's interest for both vehicles and pedestrians and includes safety measures not in the existing configuration. The proposed work will both improve and enhance the natural capacities of the resource area to achieve the values and interests protected by the Ordinance.

¹ A total of 984 sf of permanent impacts to LUW are proposed Project-wide, as is a gain of 885 sf in the channel.

² A total of 431 sf of permanent impacts to LUW are proposed in Newburyport, as is a gain of 449 sf of LUW.



The design approach taken was to first avoid wetland resources impacts where feasible, and where unavoidable, to minimize the impacts to the extent practicable and mitigate where applicable. The Applicant therefore respectfully requests that the Newburyport Conservation Commission issue a Variance under the City of Newburyport's Wetlands Protection Ordinance with appropriate conditions for work to proceed as described in the narrative and as shown on the project plans.

Attachment B

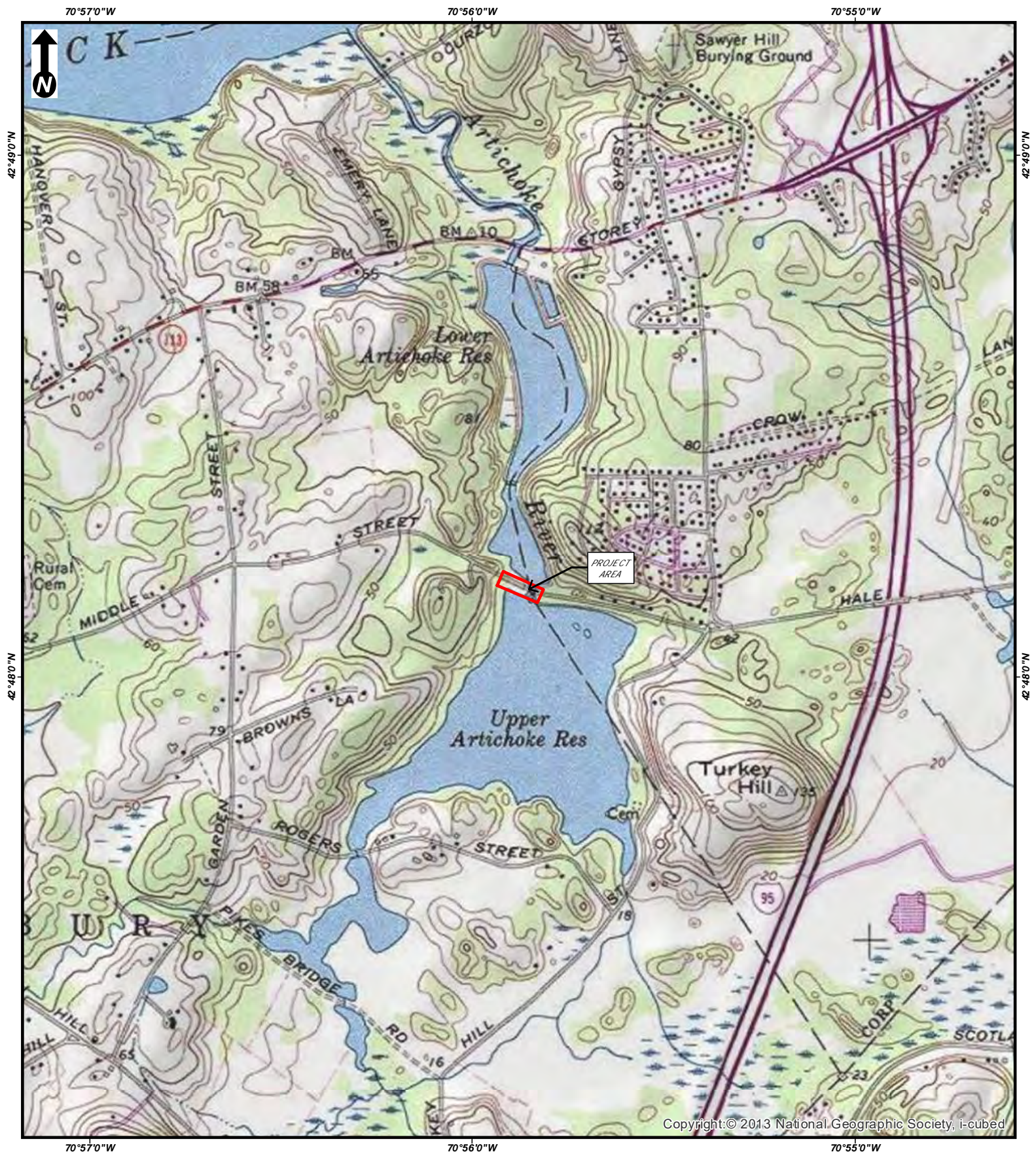
Bridge Replacement Project
Middle Street / Plummer Spring Road
over Upper Artichoke Reservoir
Notice of Intent Application

SITE FIGURES

USGS Locus Map
Environmental Resources Map
FEMA FIRM Map

PHOTOGRAPHS

USGS STREAM STATS



Scale:
1 inch = 2,000 feet
(page size: 8.5 X 11)

0 1,000 2,000
Feet

**MIDDLE ST / PLUMMER SPRING RD OVER UPPER ARTICHOKE RESERVOIR
BRIDGE REPLACEMENT PROJECT**

**USGS Site Location Map
West Newbury & Newburyport, MA**

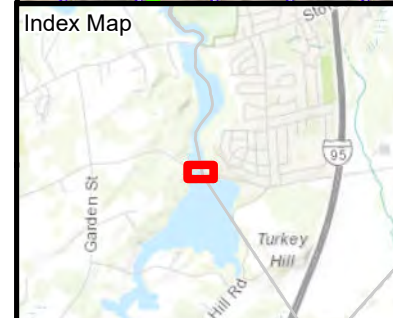
Source: 2013
National Geographic
Society, i-cubed





Resource Areas Reviewed:
 MADEP Tier Classified Oil and/or Hazardous Material Sites (21E);
 MADEP Oil and/or Hazardous Material Sites with Activity and Use Limitations;
 NHESP Certified & Potential Vernal Pools;
 NHESP Priority & Estimated Habitats;
 NHESP Restricted Data; Hydrography;
 Public Water Supply;
 Zone II Wellhead Protection Area;
 Interim Wellhead Protection Area;
 Areas of Critical Environmental Concern;
 Watershed Protection Act Zones;
 Ch. 91 Tidelands Jurisdiction;
 Landfills ([Not]Capped, [Un]Lined, [In]Active, Closed)

**ENTIRE VIEW EXTENT IS WITHIN
 OUTSTANDING RESOURCE
 WATER AREA**



Legend

Project Area	100ft Buffer to Wetlands & Streams	Article 97 Lands
Existing Bridge Structure	200ft Riverfront Area	Municipal
Field Delineated Bank Flags	FEMA 100yr Floodplain (Zone AE)*	Surface Water Protection Zone
Field Delineated Edge of Bank	Town Boundary	
Field Delineated Waterbody		
MADEP Hydrologic Connections		

1 inch = 50 feet
 0 25 50
 Feet
 *Indicates Layers Set to Transparency

**MIDDLE STREET / PLUMMER SPRING ROAD
 OVER THE UPPER ARTICHOKE RESERVOIR
 BRIDGE REPLACEMENT PROJECT**

Environmental Resources Map

West Newbury & Newburyport, MA

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

National Flood Hazard Layer FIRMMette



70°56'9"W 42°48'23"N



Legend

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
		With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
		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 <i>Zone X</i>
		Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
		Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
		Area with Flood Risk due to Levee <i>Zone D</i>
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard <i>Zone D</i>
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
OTHER FEATURES		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
OTHER FEATURES		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
OTHER FEATURES		Hydrographic Feature
		Digital Data Available
MAP PANELS		No Digital Data Available
		Unmapped

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 **9/9/2020 at 5:01 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.

USGS The National Map: Orthoimagery. Data refreshed April 2020



Photo #1: View northwest of Plummer Spring Rd, Newburyport facing Middle St, West Newbury over the Upper Artichoke Reservoir. Arrow indicates the failed section at the southern end of the roadway, directly over the bridge which is closed for public safety.



Photo #2: View northwest of Plummer Spring Rd, Newburyport facing Middle St, West Newbury over the Upper Artichoke Reservoir. Arrow indicates the failed section at the southern end of the roadway, directly over the bridge which is closed for public safety.



Photo #3: View northwest of Plummer Spring Rd, Newburyport facing Middle St, West Newbury over the Upper Artichoke Reservoir. View of the failed section at the southern end of the roadway, directly over the bridge which is closed for public safety.



Photo #4: View northwest of Plummer Spring Rd, Newburyport facing Middle St, West Newbury over the Upper Artichoke Reservoir.. Up close view of the bridge in disrepair.



Photo #5: View southeast of Middle St, West Newbury facing Plummer Spring Rd, Newburyport over the Upper Artichoke Reservoir. Arrow indicates the failed section at the southern end of the roadway, directly over the bridge which is closed for public safety.



Photo #6: View southwest of the northern side of the roadway and bridge over the Upper Artichoke Reservoir.

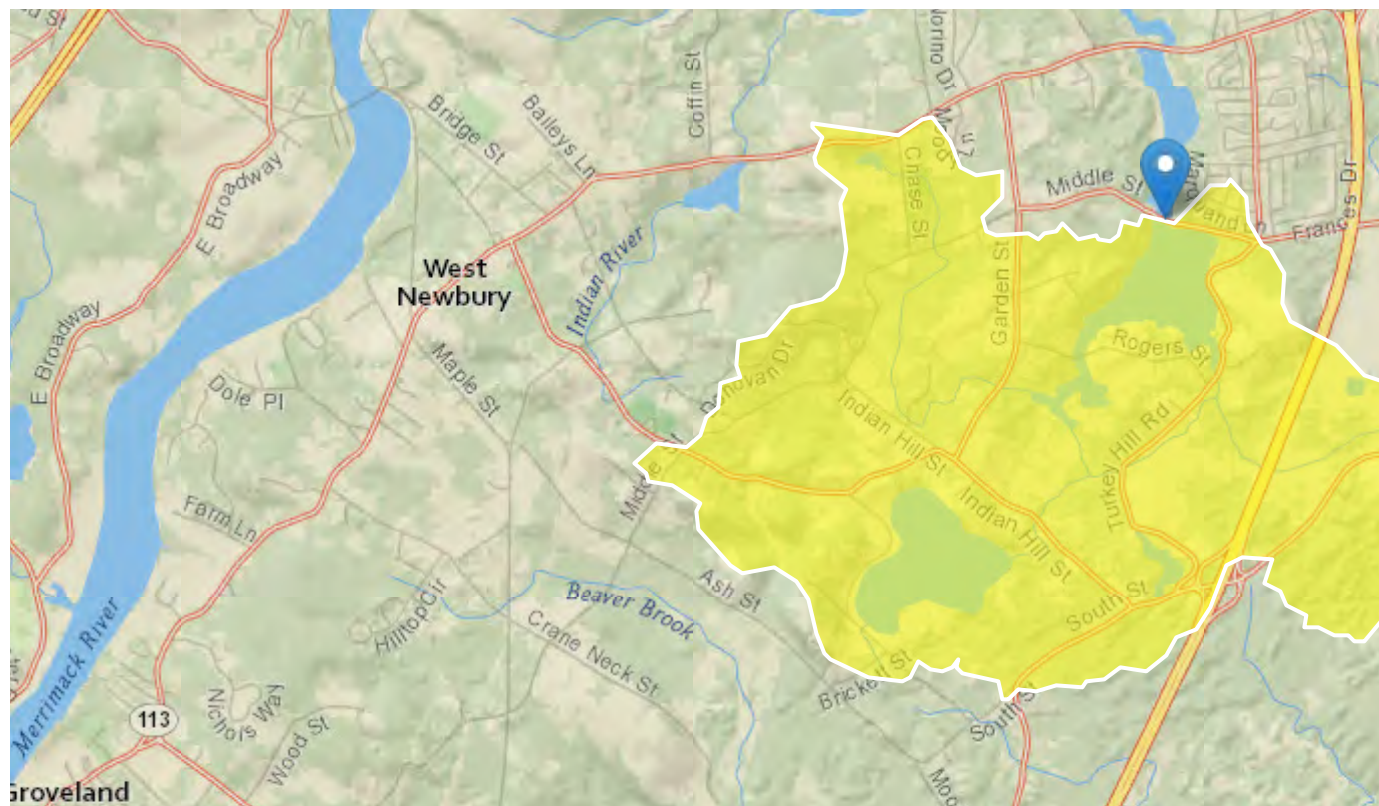
Upper Artichoke Reservoir

Region ID: MA

Workspace ID: MA20181113205234897000

Clicked Point (Latitude, Longitude): 42.80304, -70.93112

Time: 2018-11-13 15:52:50 -0500



Middle Street - West Newbury/Plummer Spring Road - Newburyport

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	5.48	square miles
ELEV	Mean Basin Elevation	62.2	feet
LC06STOR	Percentage of water bodies and wetlands determined from the NLCD 2006	26.59	percent
BSLDEM10M	Mean basin slope computed from 10 m DEM	5.845	percent

Peak-Flow Statistics Parameters [Peak Statewide 2016 5156]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.48	square miles	0.16	512
ELEV	Mean Basin Elevation	62.2	feet	80.6	1948
LC06STOR	Percent Storage from NLCD2006	26.59	percent	0	32.3

Peak-Flow Statistics Disclaimers [Peak Statewide 2016 5156]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Peak-Flow Statistics Flow Report [Peak Statewide 2016 5156]

Statistic	Value	Unit
2 Year Peak Flood	85.4	ft ³ /s
5 Year Peak Flood	140	ft ³ /s
10 Year Peak Flood	182	ft ³ /s
25 Year Peak Flood	242	ft ³ /s
50 Year Peak Flood	291	ft ³ /s
100 Year Peak Flood	343	ft ³ /s
200 Year Peak Flood	398	ft ³ /s
500 Year Peak Flood	476	ft ³ /s

Peak-Flow Statistics Citations

Zarriello, P.J.,2017, Magnitude of flood flows at selected annual exceedance probabilities for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2016–5156, 99 p. (<https://dx.doi.org/10.3133/sir20165156>)

Bankfull Statistics Parameters [Bankfull Statewide SIR2013 5155]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
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Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.48	square miles	0.6	329
BSLDEM10M	Mean Basin Slope from 10m DEM	5.845	percent	2.2	23.9

Bankfull Statistics Flow Report [Bankfull Statewide SIR2013 5155]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SEp
Bankfull Width	28.4	ft	21.3
Bankfull Depth	1.51	ft	19.8
Bankfull Area	42.5	ft ²	29
Bankfull Streamflow	115	ft ³ /s	55

Bankfull Statistics Citations

Bent, G.C., and Waite, A.M., 2013, Equations for estimating bankfull channel geometry and discharge for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2013–5155, 62 p., (<http://pubs.usgs.gov/sir/2013/5155/>)

USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. Although these data and associated metadata have been reviewed for accuracy and completeness and approved for release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

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Attachment C

Bridge Replacement Project
Middle Street / Plummer Spring Road
over Upper Artichoke Reservoir
Notice of Intent Application

ALTERNATIVES ANALYSIS

MassDEP Wetlands Program: 10.53(8) Replacement Stream Crossing Evaluation Worksheet

Bridge Replacement Project –Plummer Spring Road/Middle Street over Artichoke Reservoir– Alternatives Analysis

Due to existing site conditions, the proposed project was not able to reach full compliance with the Massachusetts Stream Crossing Standards. However, the project is considered a Limited Project under 310 CMR 10.53(3)(i): the maintenance, repair, and improvement...bridges which existed prior to April 1, 1983, 310 CMR 10.53(3)(l): construction, reconstruction...or maintenance of water dependent uses, and 10.53(8)(a): Replace...existing stream crossing in a non-tidal crossing.

Therefore, it has been designed to meet the Stream Crossing Standards to the maximum extent practicable per the provisions at 310 CMR 10.53(8). The following description provides an overview of the bridge design and is followed by an Alternatives Analysis and an evaluation of compliance with the Stream Crossing Standards.

Table 1.0 – Existing Crossing Data

Stream Crossing Standard	Existing Conditions
Type of Crossing	Single span earth filled stone arch
Size	Width: 14.3-feet Height: 13.2-feet Crossing Length: 24.2-feet Cross Sectional Area: 138 sq. ft.
Bankfull Width (Reported by StreamStats)	28.4-feet (Reported by StreamStats, drainage area = 5.48 square miles). The existing stone arch bridge was built in 1891 before the Upper Artichoke dam was installed to create the Upper Artichoke Reservoir
Openness Ratio	5.7
Water Level	Observed Water Elevation (10/1/2018): 12.5± OHW Elevation 12.6 ± Streambed Elevation 3.0±

MassDEP Wetlands Program: 10.53(8) Replacement Stream Crossing Evaluation Worksheet

Table 2.0 – Proposed Crossing Conditions

Alternative 1		
Stream Crossing Standard	Meets Standard?	Comment
Type of Crossing – Precast Concrete 3-Sided Rigid Frame (open bottom)	Yes	Proposed Concrete Rigid Frame (open bottom) Width: 22-feet Height: 13.2-feet (Measured from top of proposed streambed to low chord of bridge) Crossing Length: 27.25-feet Cross Sectional Area: 241 sq. ft.
Embedment	Yes	The proposed bridge footings will be embedded a minimum of 4-foot below the streambed. This design will have approximately 13.2-feet of available clearance throughout the full length of the bridge
Crossing Span (1.2 Bankfull Width)	No	Bankfull Width: 28.4-feet Minimum Bankfull Width for Compliance: 34.0-feet The clear span of the bridge measures 22-feet . The design intent is to provide a ‘Roughened Channel Embedded Culvert’ in accordance with the MassDOT publication ‘Design of Bridges and Culverts for Wildlife Passage at Freshwater Streams’, December 2010, which allow waiver of the bankfull width requirement provided target openness values are met and a stable substrate is provided within the proposed bridge.
Openness Ratio (Cross Sectional Area / Crossing Length) General = 0.82 feet Optimum = 1.64 feet	Yes	Proposed Cross Sectional Area: 241 sq. ft. Proposed Openness Ratio: 8.8
Substrate	Yes	Natural stream bottom will be placed over riprap throughout the full length of the bridge. Constructed stream grades will match existing (pre-construction) conditions.
Water Depth and Velocity	Yes	Approximately the same as pre-construction conditions. Limited change from current;

MassDEP Wetlands Program: 10.53(8) Replacement Stream Crossing Evaluation Worksheet

Alternative 2		
Stream Crossing Standard	Meets Standard?	Comment
Type of Crossing – Precast Concrete Arch Bridge (open bottom)	Yes	Proposed Precast Concrete Arch Bridge with Pile Supported Footings (open bottom) Width: 30.7-feet Height: 13.2-feet (Measured from top of proposed streambed to center of arch) Crossing Length: 27.3-feet Cross Sectional Area: 246 sq. ft.
Embedment	Yes	The proposed bridge footings will be embedded a minimum of 4-foot below the streambed. This design will have a maximum of 13.2-feet clearance throughout the length of the bridge
Crossing Span (1.2 Bankfull Width)	No	Bankfull Width: 28.4-feet Minimum Bankfull Width for Compliance: 34.0-feet The clear span of the bridge measures 30.7-feet . The design intent is to provide a ‘Roughened Channel Embedded Culvert’ in accordance with the MassDOT publication ‘Design of Bridges and Culverts for Wildlife Passage at Freshwater Streams’, December 2010, which allow waiver of the bankfull width requirement provided target openness values are met and a stable substrate is provided within the proposed bridge.
Openness Ratio (Cross Sectional Area / Crossing Length) General = 0.82 feet Optimum = 1.64 feet	Yes	Proposed Cross Sectional Area: 246 sq. ft. Proposed Openness Ratio: 9.0
Substrate	Yes	Natural stream bottom will be placed over riprap throughout the full length of the bridge. Constructed stream grades will match existing (pre-construction) conditions.
Water Depth and Velocity	Yes	Approximately the same as pre-construction conditions. Limited change from current;

MassDEP Wetlands Program: 10.53(8) Replacement Stream Crossing Evaluation Worksheet

Alternative 3 (Proposed Bridge Replacement)		
Stream Crossing Standard	Meets Standard?	Comment
Type of Crossing – Precast Concrete Beams 3-Sided Bridge (open bottom)	Yes	Proposed Precast Concrete Beam Bridge with Pile Supported Abutments (open bottom) Width: 41.5-feet (Measured between inside faces of bridge sidewalls) Height: 13.2-feet (Measured from top of proposed streambed to low chord of bridge) Crossing Length: 32.5-feet Cross Sectional Area: 380 sq. ft.
Embedment	Yes	The proposed bridge footings will be embedded a minimum of 4-foot below the streambed. This design will have approximately 13.2-feet of available clearance throughout the full length of the bridge
Crossing Span (1.2 Bankfull Width)	Yes	Bankfull Width: 28.4-feet Minimum Bankfull Width for Compliance: 34.0-feet The clear span of the bridge measures 41.5-feet.
Openness Ratio (Cross Sectional Area / Crossing Length) General = 0.82 feet Optimum = 1.64 feet	Yes	Proposed Cross Sectional Area: 380 sq. ft. Proposed Openness Ratio: 11.7
Substrate	Yes	Natural stream bottom will be placed over riprap throughout the full length of the bridge. Constructed stream grades will match existing (pre-construction) conditions.
Water Depth and Velocity	Yes	Approximately the same as pre-construction conditions. Limited change from current;

MassDEP Wetlands Program: 10.53(8) Replacement Stream Crossing Evaluation Worksheet

Evaluation Criteria	No Build Alternative: Stone Arch Open Bottom Bridge Stone blocks & field stone 14.4'W X 13.2'H X 24.2'L (dimensions)	Alternative 1: Three-sided Open Bottom Bridge Precast concrete rigid frame 22'W X 13.2'H X 27.3'L (dimensions)	Alternative 2: Meet General Open Bottom Arch Bridge Precast concrete arch 30.8'W X 13.2'H X 27.3'L (dimensions)	Alternative 3: Stream Crossing Standards 1.2 x bankfull width ² (Proposed Alternative) Three-sided Open Bottom Bridge Precast concrete beam 41.5'W X 13.2'H X 32.5'L (dimensions)
1) potential for downstream flooding	No change	No change	No change	No change
2) upstream and downstream habitat	No improvement.	The design intent provides a 'Roughened Channel Embedded Culvert' in accordance with <i>'Design of Bridges and Culverts for Wildlife Passage at Freshwater Streams'</i> and increased habitat connectivity from increased openness.	The design intent provides a 'Roughened Channel Embedded Culvert' in accordance with <i>'Design of Bridges and Culverts for Wildlife Passage at Freshwater Streams'</i> and increased habitat connectivity from increased openness.	The design intent provides a 'Roughened Channel Embedded Culvert' in accordance with <i>'Design of Bridges and Culverts for Wildlife Passage at Freshwater Streams'</i> and increased habitat connectivity from increased openness.
3) potential for erosion and head-cutting	No change	Erosion and head-cutting issues improved.	Erosion and head-cutting issues improved.	Erosion and head-cutting issues improved.
4) stream stability	No change	Scour and slope stability issues addressed. Scour protection material sized for stability at the design event, is provided (below top layer of natural material) through the full length of the proposed bridge.	Scour and slope stability issues addressed. Scour protection material sized for stability at the design event, is provided (below top layer of natural material) through the full length of the proposed bridge.	Scour and slope stability issues addressed. Scour protection material sized for stability at the design event, is provided (below top layer of natural material) through the full length of the proposed bridge.
5) habitat fragmentation caused by the crossing	No change	Increased openness	Increased openness	Increased openness
6) amount of stream mileage made accessible	No change	Improved stream continuity.	Improved stream continuity.	Improved stream continuity

MassDEP Wetlands Program: 10.53(8) Replacement Stream Crossing Evaluation Worksheet

Evaluation Criteria	No Build Alternative:	Alternative 1:	Alternative 2: Meet General	Alternative 3: Stream Crossing Standards 1.2 x bankfull width²
	Stone Arch Open Bottom Bridge Stone blocks & field stone 14.4'W X 13.2'H X 24.2'L (dimensions)	Three-sided Open Bottom Bridge Precast concrete rigid frame 22'W X 13.2'H X 27.3'L (dimensions)	Open Bottom Arch Bridge Precast concrete arch 30.8'W X 13.2'H X 27.3'L (dimensions)	Three-sided Open Bottom Bridge Precast concrete beam 41.5'W X 13.2'H X 32.5'L (dimensions)
7) storm flow conveyance	100-year event water Cross Sectional Area: 111 sq. ft.	100-year event water Cross Sectional Area: 171 sq. ft.	100-year event water Cross Sectional Area: 201 sq. ft.	100-year event water Cross Sectional Area: 242 sq. ft.
8) engineering design constraints	No change, no improvements. Bridge remains closed and roadway width remains inadequate.	The poor soil conditions require large deep footings to distribute the bridge loads. Due to the depth of water and relatively short span extensive retaining walls are required to replace the existing failed stone retaining walls.	The weight of the soil over the arch requires an extensive amount of piles. Installation of heavy arch units would likely require temporary fill to provide a stable work platform for a large crane.	The addition of a sidewalk on the bridge requires widening and retaining of the road at the approaches.
9) hydrologic constraints	No change (water elevation regulated by dam downstream)	No change (water elevation regulated by dam downstream)	No change (water elevation regulated by dam downstream)	No change (water elevation regulated by dam downstream)
10) impacts to wetlands that would occur	No construction impacts to adjacent wetland resource areas.	Permanent impacts to adjacent wetland resource areas due extensive retaining walls and deep excavation for footings.	Permanent impacts to adjacent wetland resource areas are minimized by use of pile supported footing.	Permanent impacts to adjacent wetland resource areas are minimized by use of pile supported footing.
11) potential to affect property and infrastructure	Bridge has failed. Emergency evacuation route remains closed.	None	None	None
12) cost of replacement	N/A	Proposed Replacement Cost: \$2,400,000	Proposed Replacement Cost: \$2,300,000	Proposed Replacement Cost: \$2,600,000

¹ Bank Standards at 310 CMR 10.54 and LUWW Standards at 310 CMR 10.56 (LUWW = Land Under Water Bodies & Waterways)² Per the *Massachusetts River &*

²*Stream Crossing Standards* (March 1, 2011, Revised March 8, 2012), Page 18, Item #2 - If it is not possible to meet all of the applicable standards, replacement crossings should be designed to avoid or mitigate the following problems: (1) Inlet drops; (2) Outlet drops; (3) Flow contraction that produces significant turbulence; (4) Tailwater armoring; (5) Tailwater scour pools; (6) Physical barriers to fish and wildlife passage.

Attachment D

Bridge Replacement Project
Middle Street / Plummer Spring Road
over Upper Artichoke Reservoir
Notice of Intent Application

AFFIDAVIT OF SERVICE
ABUTTER NOTIFICATION LETTER
LIST OF ABUTTERS

AFFIDAVIT OF SERVICE

Under the Massachusetts Wetlands Protection Act

(to be submitted to the Massachusetts Department of Environmental Protection and the Conservation Commission when filing a Notice of Intent)

I, Sara Kreisel, hereby certify under the pains and penalties of perjury that on January 11, 2021 I gave notification to abutters in compliance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, and the **DEP Guide to Abutter Notification** dated April 8, 1994, in connection with the following matter:

A Notice of Intent filed under the Massachusetts Wetlands Protection Act and the Newburyport Wetlands Ordinance by City of Newburyport with the City of Newburyport on January 11, 2021 for property located at Plummer Spring Road over Upper Artichoke Reservoir (42.802999, -70.931053)

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

January 11, 2021

Date

**Notification to Abutters Under the
Massachusetts Wetlands Protection Act and the
Newburyport Wetlands Ordinance**

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40 and the City of Newburyport's Wetlands Ordinance, you are hereby notified of the following.

- A. The name of the applicant is City of Newburyport
- B. The applicant has filed a Notice of Intent with the Conservation Commission for the City of Newburyport seeking permission to remove, fill, dredge, or alter an Area subject to Protection under the Wetlands Protection Act (General Laws Chapter 131, Section 40) and the City of Newburyport's Wetlands Ordinance.
- C. The address of the lot where the activity is proposed is:
Plummer Spring Road over Upper Artichoke Reservoir (42.802999, -70.931053).
- D. The Public Hearing will be held on February 2, 2021 at 7 pm. Said hearing shall be located either in the Senior/Community Center or online via remote participation with confirmation and access information to be posted on the City Website meetings calendar at www.cityofnewburyport.com/calendar. All interested parties should look to the meetings calendar on the City website as the hearing date approaches.
- E. Copies of the Notice of Intent may be examined by visiting www.cityofnewburyport.com/conservation-commission and selecting the meeting agenda.
- F. Copies of the Notice of Intent may be obtained from either (check one) the applicant _____ or the applicant's representative X, by calling this telephone number (617) 896 - 4579 between the hours of 9am and 4pm, on the following days of the week: Monday- Friday.

NOTE: Notice of the public hearing, including its date, time, and place, will be published at least five (5) days in advance in the Newburyport Daily News.

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

NOTE: You also may contact the Newburyport Conservation Commission or the Department of Environmental Protection Northeast Regional Office for more information about this application or the Wetlands Protection Act. To contact the Newburyport Conservation Commission, please email jgodtfredsen@cityofnewburyport.com.



City of Newburyport
Office of the Assessor
60 Pleasant Street / P.O. Box 550
Newburyport, MA 01950
Ph 978-465-4403 / Fax 978-462-8495

September 29, 2020

To: Newburyport Conservation Commission
From: Newburyport Board of Assessors
Re: Abutters List: Plummer Spring Road (42.802999,-70.931053)
100' from project area marked on attached map

Newburyport Map: n/a Lot: n/a

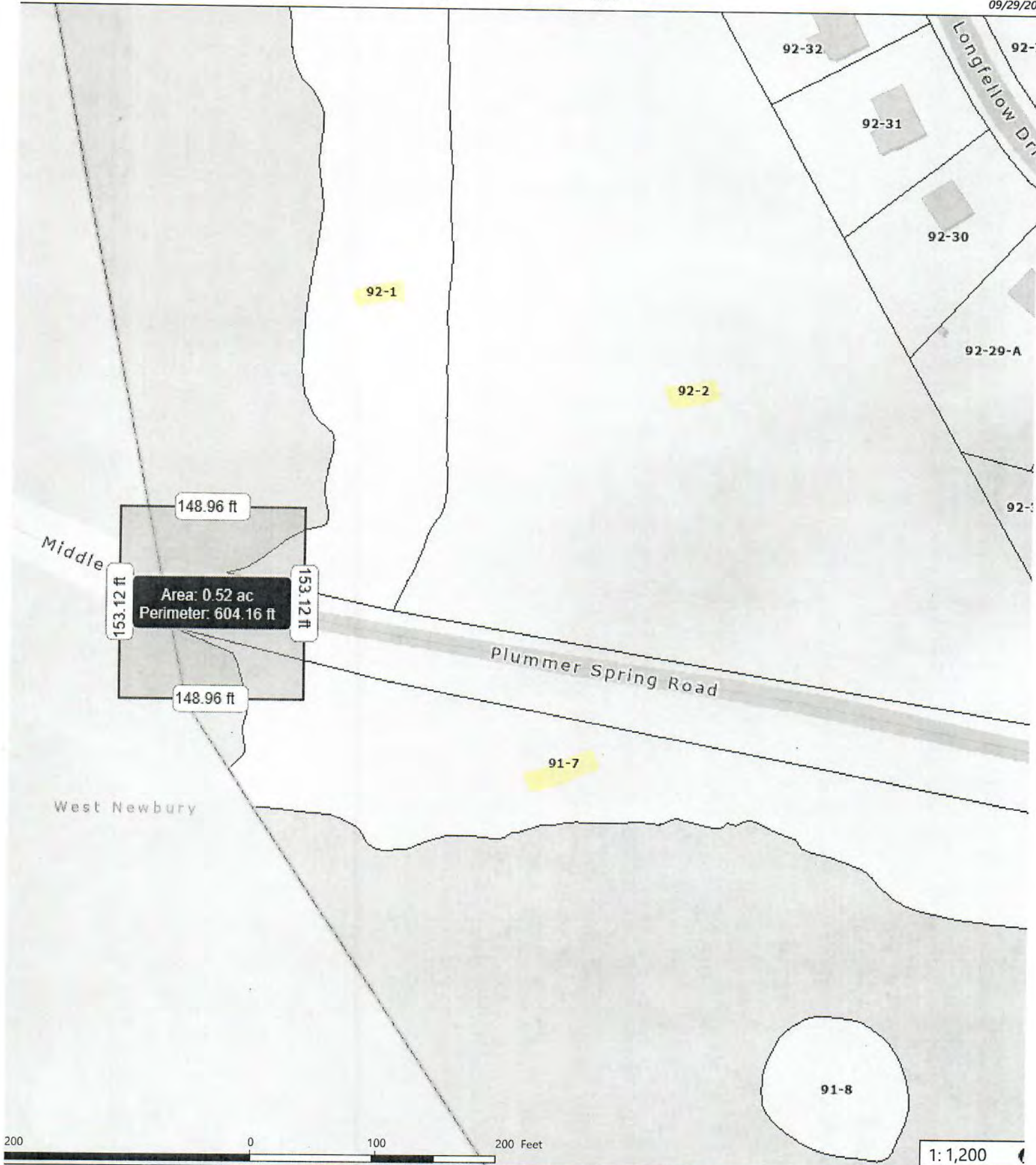
The following are the abutters of the above mentioned property:

Board of Assessors

The Assessors Office is certifying that the persons listed in the foregoing list of abutters are the owners of record of the foregoing properties as of January 1st, 2020. The city Assessor is not certifying that the persons so listed are the persons who are required to receive notification under applicable law.

City of Newburyport

09/29/2021



1:1,200

Data Sources: Produced by Merrimack Valley Planning Commission (MVPC) using data provided by the City of Newburyport & MassGIS. MVPC AND THE CITY OF NEWBURYPORT MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, CONCERNING THE ACCURACY, COMPLETENESS, RELIABILITY, OR SUITABILITY OF THESE DATA. THE CITY OF NEWBURYPORT AND MVPC DOES NOT ASSUME ANY LIABILITY ASSOCIATED WITH THE USE OR MISUSE OF THIS INFORMATION.



Legend

Municipal Boundary	Road Right of Way	Interstate	Major Road	Local Road	Parcels
Stream	Intermittent Stream	Paved	Unpaved	Hydrographic Features	Streams

91/ 7/ / /
CITY OF NEWBURYPORT
WATER DEPARTMENT
16C PERRY WAY
NEWBURYPORT, MA 01950

92/ 1/ / /
CITY OF NEWBURYPORT
WATER DEPARTMENT
16C PERRY WAY
NEWBURYPORT, MA 01950

92/ 2/ / /
CITY OF NEWBURYPORT
WATER DEPARTMENT
16C PERRY WAY
NEWBURYPORT, MA 01950

Attachment E

Bridge Replacement Project
Middle Street / Plummer Spring Road
over Upper Artichoke Reservoir
Notice of Intent Application

STREAMLINED STORMWATER MANAGEMENT REPORT

Streamlined Stormwater Management Report

According to the Massachusetts Department of Environmental Protection Stormwater Management Regulations, the project is considered a redevelopment project. As such, the project has been designed to meet all applicable standards of the MassDEP Stormwater Management Handbook to the maximum extent practicable. In accordance with the DEP Stormwater Management Handbook, Standards 1, 8, 9, and 10 must be met fully, while the remaining standards must be met to the maximum extent practicable.

Standard 1: New Stormwater Conveyances

Per Massachusetts Stormwater Management Standard #1, no new outfalls may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth. To capture runoff at the low point in the road, two deep sump catch basins, on either side of the roadway, are proposed. The deep sump catch basins flow to a manhole on the north side of the roadway. From there the runoff is directed northwest to a flared end section that discharges towards the reservoir into stone for pipe ends. Like the existing conditions, all other runoff within the project limits will continue to flow via country drainage.

Standard 2: Stormwater Runoff Rates

The proposed widening of the roadway over the new bridge will result in an increase in impervious area over existing conditions. Due to site limitations, mitigation measures are not feasible to reduce runoff rates. As a redevelopment project, this standard is not applicable, however, the proposed design meets this standard to the maximum extent practicable.

Standard 3: Groundwater Recharge

As a redevelopment project, this standard is not applicable. Due to site limitations, implementing groundwater recharge measures are not feasible. As a redevelopment project, this standard has been met to the maximum extent practicable.

Standard 4: Water Quality

As a redevelopment project, this standard is not applicable. Due to site limitations, implementing improved water quality measures are not feasible. As a redevelopment project, this standard has been met to the maximum extent practicable.

Standard 5: Land Uses with Higher Pollutant Loads (LUHPPL)

The Project is not a land use with higher potential pollutant loads.

Standard 6: Stormwater Discharges to a Critical Area

The project is not located within a Critical Area.

Standard 7: Redevelopment Projects

This project is a redevelopment project. In accordance with the DEP Stormwater Management Handbook, standards 1, 8, 9 and 10 have been fully met. In addition, the project has met all other standards (Standards 2, 3, 4, 5, 6, and 7) to the maximum extent practicable.

Standard 8: Sedimentation and Erosion Control Plan

Erosion control measures, including compost filter tubes and sediment control barriers will be placed at the bottom of proposed slopes and limits of work.

Standard 9: Long Term Operations and Maintenance Plan

Temporarily impacted areas associated with project construction activities will be restored following the completion of project work and will result in an overall improvement over existing conditions. Proposed project activities will not be considered complete until the areas disturbed as part of project activities are considered adequately stabilized, as determined by the Winchendon Conservation Commission.

Standard 10: Illicit Discharges to the Stormwater Management System are Prohibited

There are no known illicit discharges to the proposed Stormwater Management System.



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 8²
- 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.



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



Kath Eagan

12/29/20

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 Field¹
- 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.

Attachment F

Bridge Replacement Project
Middle Street / Plummer Spring Road
over Upper Artichoke Reservoir
Notice of Intent Application

CONSTRUCTION SPECIFICATIONS

ITEM 765.3**SEED FOR EROSION CONTROL****ACRE**

The work under this item shall conform to the relevant provisions of Section 765 and M6.03.0 of the Standard Specifications and the following:

The work shall consist of planting and establishing a stand of grass in the areas shown on the plans or as required by the Engineer or listed in this document.

For the purposes of these specifications, the term “grass” shall apply to all the forbs, grasses, sedges, and rushes included in the materials.

All seeding shall be done by a company having a minimum of five years of experience with native grass establishment. Prior to beginning work, the applicator shall furnish proof of qualifications to the Engineer for approval. Proof of qualifications includes providing documentation to demonstrate knowledge and expertise with native seeding and proof of having completed successful native seeding projects.

SEEDING SEASON

Seeding seasons shall be April 1 through May 15 and October 1 through November 15 for dormant seeding. For seeding that occurs outside of these periods, the seed rate shall be increased by 50%.

MATERIALS**Samples and Submittals**

- 1) Certificate of Materials. Prior to ordering, the Contractor shall submit to the Engineer the manufacturer or supplier’s notarized Certificate of Materials. This document shall not be used as proof of purchase, proof of material delivered, or proof of material seeded, but simply to verify supplier availability of seed listed on the date certified. The species listed shall match those specified on the plans or herein, however, cultivars may vary due to availability.
- 2) Seed Tag Certification. All seed lots have a seed analysis tag as required by State and Federal law. The contractor shall submit seed tags for each bag of seed used on the project site or ensure that each tag is photo documented by the Engineer. Number of tags shall match number of bags sent by the supplier to meet rate of Pure Live Seed specified on the plans. Tag must include: kind and variety of seed; lot number; origin of seed; net weight; % purity; germination; dormant seed; germination test date; inert matter; weed, noxious and other crop seed; and name and address of company responsible for the analysis. Seeding may be considered unacceptable for payment if no tags are submitted.
- 3) Certificate of Compliance. Prior to payment, contractor shall submit a signed, dated and notarized Certificate of Compliance from the Supplier that serves as proof of purchase or bill of lading. This document shall include kind and variety of seed, lot

number, net weight shipped, date of sale, invoice number under which seed was purchased, and name and address of Supplier or Manufacturer. All information must be included on the notarized form, including lot number and net weight shipped for specified job. This information shall match Seed Tag Certification and quantity of seed applied on the job. Seeding may be considered unacceptable for payment if information is incomplete.

- 4) Seed Sample. Contractor may be asked, prior to seeding, to submit a seed sample for testing. Testing shall be incidental to this item.

Quantities specified are Pure Live Seed (PLS). Greater quantities of ordered seed may be required to achieve actual specified seeding rates. Pure Live Seed is defined as the fraction of pure seed species within the mix that, by standard seed testing practices, will germinate. This is determined by multiplying the percent of seed purity by the percent of seed germination.

Seed mix shall be a custom blend as shown on the plans or shall be as specified below. Seed cultivars shall be those that are as regional to New England or the local ecotype as possible.

Any species substitutions shall be with a species having similar characteristics and native to New England.

Seed Mix

	<u>Botanical Name</u>	<u>Common Name</u>	<u>% PLS By Weight</u>
Grass	Festuca rubra	Creeping Red Fescue	69.5%
	Panicum virgatum 'Shelter'	Switchgrass 'Shelter'	5.0%
	Panicum clandestinum 'Tioga'	Deer Tongue 'Tioga'	5.0%
	Elymus virginicus	Virginia Wild Rye	4.0%
	Elymus canadensis	Canada Wild Rye	4.0%
	Schizachyrium scoparium	Little Bluestem 'Albany	4.0%
	'Albany Pine'	Pine'	
	Agrostis perennans	Upland Bentgrass	4.0%
		<u>Subtotal</u>	<hr/> 95.5%
Herb/Forb	Chamaecrista fasciculata	Partridge Pea	1.5%
	Rudbeckia hirta	Black-eyed Susan	1.2%
	Aster laevis	Smooth Aster	0.8%
	Solidago bicolor	White Goldenrod	0.4%
	Monarda fistulosa	Wild Bergamot	0.4%
	Asclepias syriaca	Common Milkweed	0.2%
		<u>Subtotal</u>	<hr/> 4.5%
		<u>Total</u>	<hr/> 100.00%

Seeding Rate:

Apply this mix at **50 lbs PLS/acre** on areas of less than 3:1 slope and 150 lbs PLS on areas of greater than 3:1 slope. Add 30 lbs/acre of a cover crop. For a cover crop use either grain oats (1 Jan to 31 July) or grain rye (1 Aug to 31 Dec). Cover crop shall be incidental to seeding item.

Fertilizer

No fertilizers shall be applied.

Water

Water, including hose and all other watering equipment required for the work, shall be furnished by the Contractor to the site at no additional cost. Water shall be suitable for irrigation and free from ingredients harmful to plant life. All plants injured or work damaged due to the lack of water or the use of too much water shall be the Contractor's responsibility to correct.

Mulch

Seed areas shall be separately mulched with hydromulch, straw or as specified below when incorporated with compost topsoil.

Photo Documentation

Contractor shall submit photo documentation to the Engineer

Each photo shall be date stamped. Photos shall be submitted after the following stages of construction:

- Soil preparation
- Seed and hydromulch/Compost topsoil and seed
- Germination
- Grass establishment after one full growing season (June-September)

CONSTRUCTION

Surface Preparation

Soil preparation and seeding shall occur only when the bed is in a friable condition, not muddy or hard. Bare soils shall be raked to remove large stiff clods, lumps, brush, roots, stumps, litter and other foreign matter. All ruts and any depressions caused by settlement, erosion or rolling shall be filled with additional loam or compost and the soil shall be re-graded to a smooth and even finish corresponding to the required grades. No tracking or rolling shall be done on wet soil.

Prior to seeding, site preparation shall be approved by the Engineer.

Seeding Methods

Seeding on Loam

Seeding application shall be by broadcast methods followed by hydromulching. Seed may be broadcast by using a cyclone or whirlwind seeder, or by hand.

If spread by hand, small or light-seeded species such as bluestem may be mixed with approved filler (e.g., sawdust, rice, kitty litter, or clean damp sand) to achieve an even distribution. Broadcast seeding shall be undertaken in two separate passes at ninety degrees to each other. One-half the seeding rate shall be applied in each direction. Seed shall be incorporated 1/8 to 1/4-inch deep by raking or dragging, culti-packing, or tracking with heavy machinery. Raked areas shall be rolled with a weighted roller to provide good seed to soil contact. Do not roll or track the seed if the soil is wet.

Immediately following completion of broadcast seeding and packing, area shall be hydromulched. Hydromulch shall be per the Standard Specifications and per the manufacturer's directions. Mulch for hydroseeding shall be wood fiber only.

Seeding in Combination with Compost Topsoil

If proposed in the contract, compost topsoil shall be as specified under Item 751.7 Compost Topsoil.

Seeding shall be done as a second operation after placement of compost has been approved by the Engineer. Seeding shall be broadcast followed by hydro-mulching.

Contractor shall notify Engineer prior to seeding operation to obtain written approval of site preparation and compost topsoil application.

Irrigation

After seeding and mulching, water seeded areas to moisten soil to a depth of at least 2 inches.

No seeding shall be done if soils are muddy or dry and compacted.

Care during Seed Germination

Contractor shall care for seeded areas as required. Care shall include irrigation and weed removal as necessary for germination and healthy growth.

Over-seeding

If there are numerous areas of bare ground greater than 10-12 inches, these areas shall be over-seeded. Areas where seed fails to germinate and that become invaded by weeds shall be mowed as low as possible and over-seeded. Soil that is compacted shall be raked or roughened prior to seeding to ensure seed to soil contact.

Over-seeding application rates and methods shall be the same as those listed above. After seeding, areas shall be mulched with straw mulch or 1/4 - 1/2 inch compost topsoil and watered with a fine mist to moisten soil to a depth of at least 2 inches.

Over-seeding shall be incidental and shall not be paid for separately.

Care during Grass Establishment

Following germination of seeded species, the contractor shall maintain the stand of grasses to ensure healthy growth.

Work shall include mowing or weed-whacking for weed control, irrigation if necessary, and monitoring for invasive plants. Watering shall provide uniform coverage without eroding soil or grassed surfaces. Treatment of invasive plants shall be per the requirements of the Engineer.

The Contractor shall provide all labor, equipment, materials, and water required for establishment. Contractor shall water all seeded areas as necessary to a depth of 2 inches or greater.

EXPECTATIONS OF ESTABLISHMENT

Native upland grasses and forbs will not look like turf grass. Many of the native grasses are bunch type grasses and will not form a uniform growth or have a sod-type appearance. However, seeded area shall show general uniform growth of the seeded species throughout the area. Areas with gaps of bare soil greater than 10-12 inches will be considered unacceptable and shall be over-seeded.

A well-established stand of grasses at the end of one full growing season (June-September), as determined by the Engineer, will be required for acceptance. At least 80-90 percent of the grass established shall be the seeded species and any invasive or aggressive weeds (mugwort, ragweed, or knapweed) shall have been cut or otherwise managed.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Measurement for Item 765.3 shall be by the ACRE of material installed, approved, and maintained in place as listed. Payment shall be the bid price and shall be compensation for all labor and materials necessary to complete the work specified above and under item 765.3 in the Standard Specifications.

This price shall include surface preparation prior to seeding as specified under Surface Preparation, and as required by the Engineer, seeding, reseeding, irrigation, care during germination and establishment, labor materials, equipment, photo documentation, and all incidental costs required to complete the work to spread the seed mix.

ITEM 983.12**RIPRAP WITH GRAVEL PACKED VOIDS****CUBIC YARD****DESCRIPTION**

The cost of the following items is incidental to the unit price of Riprap with Gravel Packed Voids: Excavation to install Riprap including any chipping and removal of bedrock or boulders, Geotextile Fabric, Crushed Stone, Riprap, Gravel to pack Riprap voids and Natural Streambed Material excavated during the installation of the Riprap shall be stockpiled for reuse as a 6" layer of material on top of the Riprap. Any remaining streambed material shall be removed from the site and become the property of the contractor unless otherwise directed by the Town. If any excavated material is unsuitable natural streambed material as determined by the town, natural streambed material shall be pre-blended outside the project area. The cost of the pre-blended natural streambed, if necessary shall be considered incidental to this item.

The work under this Item shall conform to the relevant provisions of Section 983 and the following:

The work under this item includes furnishing and placing new Riprap to the location and limits as shown on the Plans, and as directed in the field by the Engineer. The Riprap shall be placed to stabilize and protect the embankments and armor the streambed against scour.

Stone for Riprap shall be placed on the prepared slopes or areas in a manner that will produce a well-graded mass of stone with the minimum practicable percentage of voids and thickness as depicted on the contract drawings. Riprap protection shall be placed to its full thickness in one operation in such a manner to avoid displacing the underlying material. Placing of Riprap in layers or by dumping into chutes or by placing by similar methods that are likely to cause segregation will not be permitted.

Riprap shall consist of stones that conform to M2.02.0 as described in Section M2 of the Standard Specifications "*Riprap shall be sound, durable rock which is angular in shape. Rounded stones, boulders, sandstone or similar soft stone or relatively thin slabs will not be acceptable. Each stone shall weigh not less than 50 pounds and at least 75% of the volume shall consist of stones weighing not less than 500 pounds each. The remainder of the stones shall be so graded that when placed with the larger stones the entire mass will be compact.*" All material going into the Riprap protection shall be so placed and distributed that there will be no large accumulations of either the larger or smaller sizes of stone.

It is the intent of this specification to produce compact Riprap aprons and slopes in which all sizes of material are placed in their proper proportions. Hand placing or rearranging of individual stones by mechanical equipment shall be required to the extent necessary to secure the specified results.

Unless otherwise authorized by the Engineer, the Riprap protection shall be placed in conjunction with the reconstruction of the embankment slopes. The lag time between the placement of the Riprap protection and the reconstruction of the embankment slope shall be minimized to prevent mixture of the embankment and Riprap material.

A geotextile fabric shall be placed under the crushed stone bedding M2.01.4 prior to placement of the Riprap. The geotextile fabric shall meet the requirements of Section M9.50.0 of the relevant provisions and AASHTO M288, Class 2.

DESCRIPTION – GEOTEXTILE

Atmospheric exposure of the geotextile fabric to the elements following lay down shall be a maximum of 14 days. If laid under water, the covering crushed stone or Riprap shall be placed on the same day as the geotextile fabric.

For seams that are sewn in the field, the contractor shall provide at least a six-foot length of sample sewn seam for the approval of the Engineer before the geotextile fabric is installed. The seams sewn for sampling shall be sewn using the same type of equipment and procedures as will be used for the production seams. If seams are sewn in both the machine and cross machine direction, samples of seams for both directions shall be provided. The seam assembly description shall be submitted by the Contractor along with the seam samples. This description shall include the seam type, stitch type, sewing thread, and stitch density.

The geotextile shall be placed in intimate contact with the soils without wrinkles or folds, and it shall be anchored on a smooth graded surface approved by the Engineer. The geotextile shall be placed in such a manner that placement of the overlaying materials, when applicable, will not excessively stretch or tear the geotextile.

Adjacent geotextile sheets shall be joined by either sewing or overlapping. Overlapped seams at roll ends shall be overlapped a minimum of 18 inches, except when placed under water. In such instances, the overlap shall be a minimum of 3 feet. Overlaps of adjacent rolls shall be a minimum of 18 inches in all instances.

Care shall be taken during installation so as to avoid damage to the geotextile as a result of the installation process. Should the geotextile be damaged during installation, a geotextile patch shall be placed over the damaged area extending a minimum of 3 feet beyond the limits of the damage.

When stone or Riprap is placed over Geotextile Fabric for Separation, the stone placement shall begin at the toe of slope and proceed up the slope. Placement shall take place so as to avoid stretching and subsequent tearing of the geotextile. Stone shall not be dropped from a height exceeding 12 inches.

Field monitoring shall be performed to verify that the crushed stone or Riprap placement does not damage the geotextile. Any geotextile damaged during backfill placement shall be replaced as directed by the Engineer, at the Contractor's expense.

DESCRIPTION – GRAVEL

The finished surface shall be free of voids and shall be approved by the Engineer as it will serve as bedding for natural streambed material. Gravel shall conform to MassDOT Standard Specification Item 151 [Gravel Borrow M1.03.0].

STOCKPILE NATURAL STREAMBED MATERIAL

Natural streambed material is to be stockpiled on site. It shall be contained within an area approved of by the Town with containment methods acceptable to the Town. The excavated streambed material will be placed on a tarp or impervious surface. The stockpiled material will be covered with a tarp and surrounded by sediment barriers until its reuse. Any stone excavated from the existing streambed can be stockpiled and reused for streambed restoration, provided the excavated stone is characteristic of the existing stream material upstream and downstream of the work area. Any material not reused shall become the property of the Contractor.

PRE-BLENDED NATURAL STREAMBED MATERIAL (IF NECESSARY)

The streambed material shall be comprised of two primary components.

1. Stone 4 inches and under shall meet the following gradation:

<u>Sieve opening</u>	<u>Percent by Mass Passing Through</u>
4"	95
2"	55 – 65
¾"	30 – 45
#4	0 – 5

2. Stone 6 inches to 2.5 foot in diameter:

<u>Stone Size</u>	<u>Percent Passing</u>
2.0'	80
1.5'	25
0.5'	0

The streambed/bank stone for all two components shall be native cobbles and boulders similar in shape and size of streambed/bank stone adjacent to the work area. Partially angular rock is preferred over round and shall be able to lock together to prevent movement during high flows. Crushed Stone will not be accepted for any of the two components. Any stone excavated from the existing streambed can be stockpiled and reused for natural streambed, provided the excavated stone is characteristic of the existing stream material upstream and downstream of the work area, or meets the above criteria. The elevations and conditions of the existing streambed shall be maintained to the maximum extent practicable.

Components one and two shall be pre-blended outside the project area at a volume ratio of 30% and 70% respectively. The pre-blending shall be done in a way that will prevent the mass from being contaminated by work-place soils. The pre-blended mass shall be placed over areas of proposed Riprap as shown on the plans.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Riprap with Gravel Packed voids will be measured and paid for per cubic yard completed in place. Crushed stone, gravel, geotextile fabric, excavation, and all work related natural streambed material shall be included in the bid price for Riprap with Gravel Packed Voids. Said price shall be considered full compensation for all labor, tools, equipment and materials necessary for the completion of the work.

ITEM 991.1 CONTROL OF WATER-STRUCTURE NO. N-11-007= LUMP SUM

W-20-001

The cost for all excavation (except for within the limits of Bridge Excavation shown on the contract drawings) to install the control of water system shall be included in the bid price for Item 991.1. The environmental permits contained in the contract documents depict a suggested control of water system. Any modification of existing or new permits are at the contractor's expense and the contract completion date will not be altered.

The contractor is alerted to the requirements imposed by the environmental permits contained in the contract documents.

DESCRIPTION

The work to be performed under this Item shall include all pumping, sandbagging, sheeting, for sufficient water control to accomplish the removal of the existing bridge, construction of the proposed bridge and Riprap installation "*in the dry*". Work under this Item shall consist of dewatering within the work limits as shown on the plans. Water within the work area shall be discharged as specified in the contract documents, environmental permits obtained for this project and as directed by the Municipalities. No direct discharge will be allowed into waterways, or the adjacent wetlands during the dewatering operations.

Dewatering shall be conducted to ensure that all bridge components are placed and cured in the dry. For demolition purposes, dewatering shall be conducted for demolition of the existing bridge. Proposed methods of dewatering for the bridge are included in the contract documents. However, it is the responsibility of the Contractor to determine the need and extent of additional dewatering required, sedimentation and dewatering techniques and controls and submit method and materials he/she proposes to use for approval by the Engineer.

Plans and calculations for all the sandbagging, sheeting and other water control measures shall be developed by the Contractor. These plans and calculations shall be prepared and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts and shall be submitted for review prior to the start of construction.

All dewatering and related earthwork shall be conducted in such a manner as to prevent siltation or contamination of the waterway and wetlands. The pumping discharge shall not be allowed to enter the Artichoke Reservoir or the wetland resource areas. The water from the work areas shall be pumped either to a filter bag, temporary settling tank, forebay basin, or other approved containment structure conforming to MassDOT's "*Guidelines for Soil Erosion & Sediment Control*". The containment structure shall be constructed so as to allow for the pumped water to pass through the structure with sediments settling out before outletting to an area enclosed by a concrete barrier siltation basin with a clean layer of crushed stone. Water filtering thorough the containment structure shall not cause erosion of the surrounding area.

An approved method of controlling erosion, such as an erosion control blanket, stone, etc. shall be used at the outlet.

The control of water containment structure shall be maintained as follows:

1. Inspect at least twice daily during dewatering operations.
2. Repair any damage immediately.
3. Clean containment structure daily. Remove any debris immediately.
4. Remove sediments as needed.

The Contractor shall inspect compost filter tubes and sedimentation fence that surround the outlet daily and shall immediately replace any that are damaged.

Placement of the dewatering containment structure will be as approved by the Municipalities and the Engineer based on specific site conditions and staging operations of the Contractor.

The Contractor shall investigate and verify existing conditions and evaluate the need for protection and the type of facilities required. Before commencing construction, the Contractor shall furnish the Engineer with details of the plan and methods he/she proposes to use for handling water including details for material, equipment and pumping based on actual needs to accomplish the work. The Contractor may use barriers, sandbags, sheeting, portadams or other types of protective facilities as approved by the Engineer. The furnishings of such plans and methods shall not relieve the Contractor of his responsibility for the safety of the work and for the successful completion of the project.

All such temporary structures or facilities shall be safely designed, extended to sufficient depth and be of such dimensions and water-tightness so as to assure construction of the permanent work in the dry. Water control structures shall not interfere with the proper performance of the work. Their construction shall be such as to permit excavation for the permanent work and any conflicts shall be corrected at the sole expense of the Contractor.

Any pumping from within the areas of construction shall be done in such a manner as to prevent the possibility of movement of water through any fresh concrete.

Unless otherwise provided or directed by the Engineer, all such temporary protective work shall be removed and disposed of in an approved manner when no longer required.

The Engineer/Municipalities have the right to order the Contractor to stop all work when in his judgment the Contractor's water control operations are failing to produce adequate results or are posing a threat to the environment.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Payment for work under this Item shall be paid at the lump sum contract bid price, complete.

Payment for all water control work, including design for the dewatering operations used to maintain a water free excavation, shall include all labor, tools and equipment materials and installation, piping, pumping, stone ends for pipes, maintenance, subsequent removal of all related materials and equipment all as outlined above; and restoration of site shall be included in the lump sum contract price bid under this Item.

Eighty-five (85%) percent of the Lump Sum Price Bid for this Item will be paid after the approved installation of the water control system. The final fifteen (15%) percent of the Lump Sum Price Bid for this Item will be paid upon the complete removal of the water control system from the project site at the completion of the work.

Compost filter tubes and sedimentation fence provided specifically for the outlet from the sedimentation containment structure shall be included in the lump sum bid price for this Item.

Attachment G

Bridge Replacement Project
Middle Street / Plummer Spring Road
over Upper Artichoke Reservoir
Notice of Intent Application

PROJECT PLANS
CONSTRUCTION DETAILS

INDEX	
SHEET NO.	DESCRIPTION
1	INDEX
2	LOCUS MAP
3	EXISTING CONDITIONS
4	PROPOSED CONDITIONS
5-6	PROPOSED WALL ELEVATION
7	EXISTING SOUTH ELEVATION
8	PROPOSED SOUTH ELEVATION
9	IMPACTS
10-15	CONTROL OF WATER

IMPACTS TO WETLAND AND WATERBODY RESOURCES AND WATERS OF THE UNITED STATES					
		WEST NEWBURY	NEWBURYPORT	TOTAL	
LAND UNDER WATERS OF THE US (LUW) / WATERBODY	PERMANENT IMPACT	553	431	984	SF
	TEMPORARY IMPACT	443	198	641	SF
	PERMANENT IMPACT - DREDGE / FILL	39 / 17	9 / 2	48 / 19	CY
	TEMPORARY IMPACT - DREDGE / FILL	28 / 0	22 / 0	50 / 0	CY
INLAND BANK / ORDINARY HIGH WATER (OHW)	PERMANENT IMPACT	128	54	182	LF
	TEMPORARY IMPACT	47	14	61	LF
200-FOOT RIVERFRONT AREA (RFA)	REDEVELOPMENT	3,203	2,669	5,872	SF
	PERMANENT IMPACT	1,986	1,217	3,203	SF
	TEMPORARY IMPACT	570	548	1,118	SF
BORDERING LAND SUBJECT TO FLOODING (BLSF)	PROPOSED ALTERATION	167	44	211	SF
	PROPOSED REPLACEMENT	311	344	655	SF
	FLOOD STORAGE LOST	393	132	525	CF
	FLOOD STORAGE REPLACED	1,438	1,857	3,295	CF

NOTES:

- HORIZONTAL DATUM IS BASED OFF OF THE NORTH AMERICAN DATUM (NAD) 1983
- ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

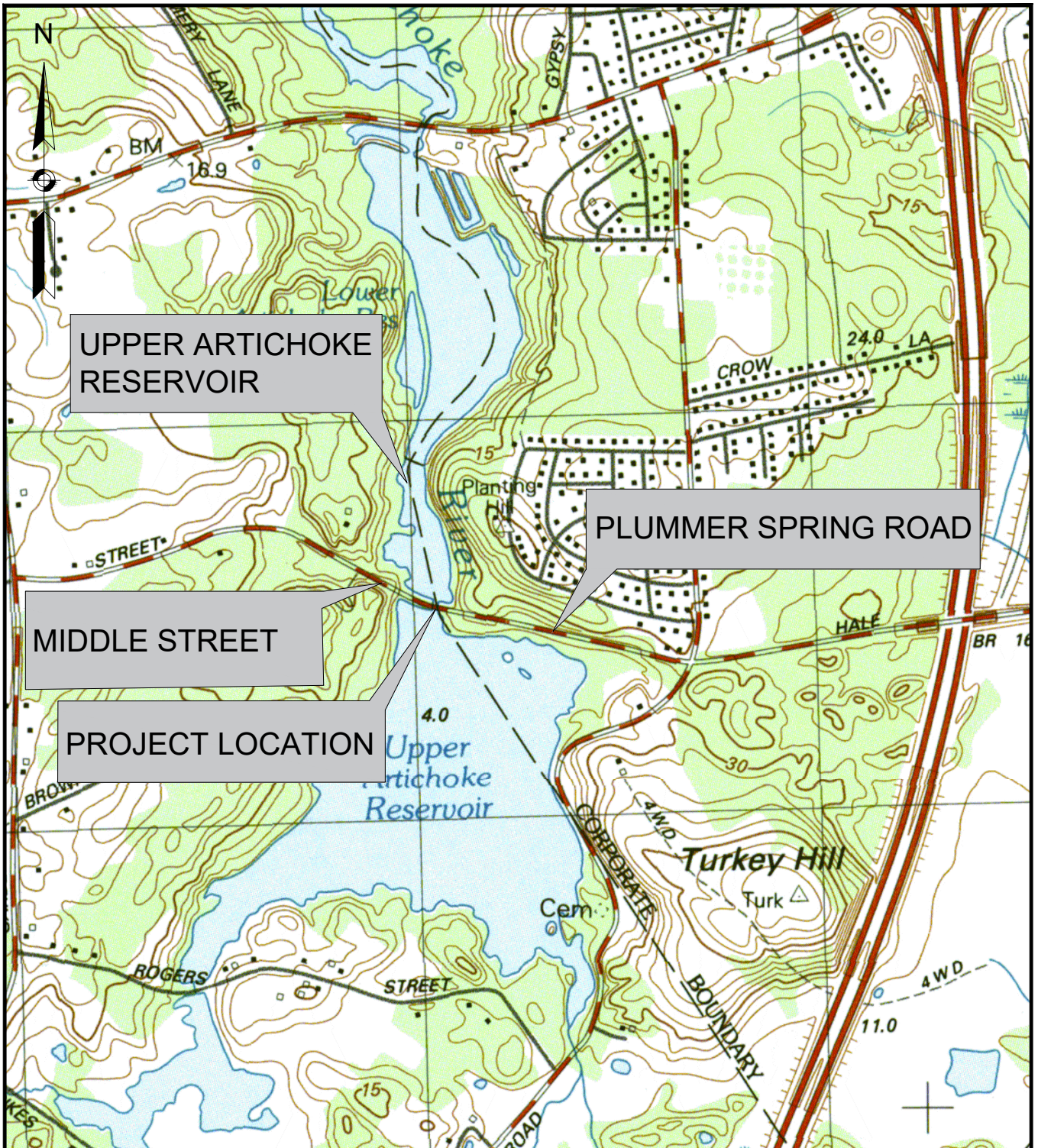
PREPARED FOR:
CITY OF NEWBURYPORT
 60 PLEASANT ST NEWBURYPORT,
 MA 01950
TOWN OF WEST NEWBURY
 381 MAIN ST, WEST NEWBURY,
 MA 01985

INDEX

Source:
 BRIDGE REPLACEMENT PROJECT
 MIDDLE STREET/PLUMMER SPRING ROAD OVER
 UPPER ARTICHOKE RESERVOIR, WEST NEWBURY/NEWBURYPORT, MA
 ESSEX COUNTY

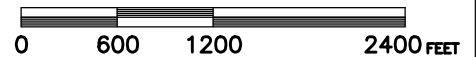
Job No.: 28395.00 Date: 12/21/2020
 Scale: N/A Revised: _____
 Description: INDEX Figure: 1 OF 15

 **BSC GROUP**
 803 Summer Street
 Boston, Massachusetts
 02127
 617 896 4300



LATITUDE: 42°48'10.7"N
 LONGITUDE: -70°55'51.5"W

SCALE: 1" = 1200'



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 CITY OF
 NEWBURYPORT
 60 PLEASANT ST
 NEWBURYPORT, MA 01950
 TOWN OF
 WEST NEWBURY
 381 MAIN ST, WEST
 NEWBURY, MA 01985

LOCUS MAP

Source:

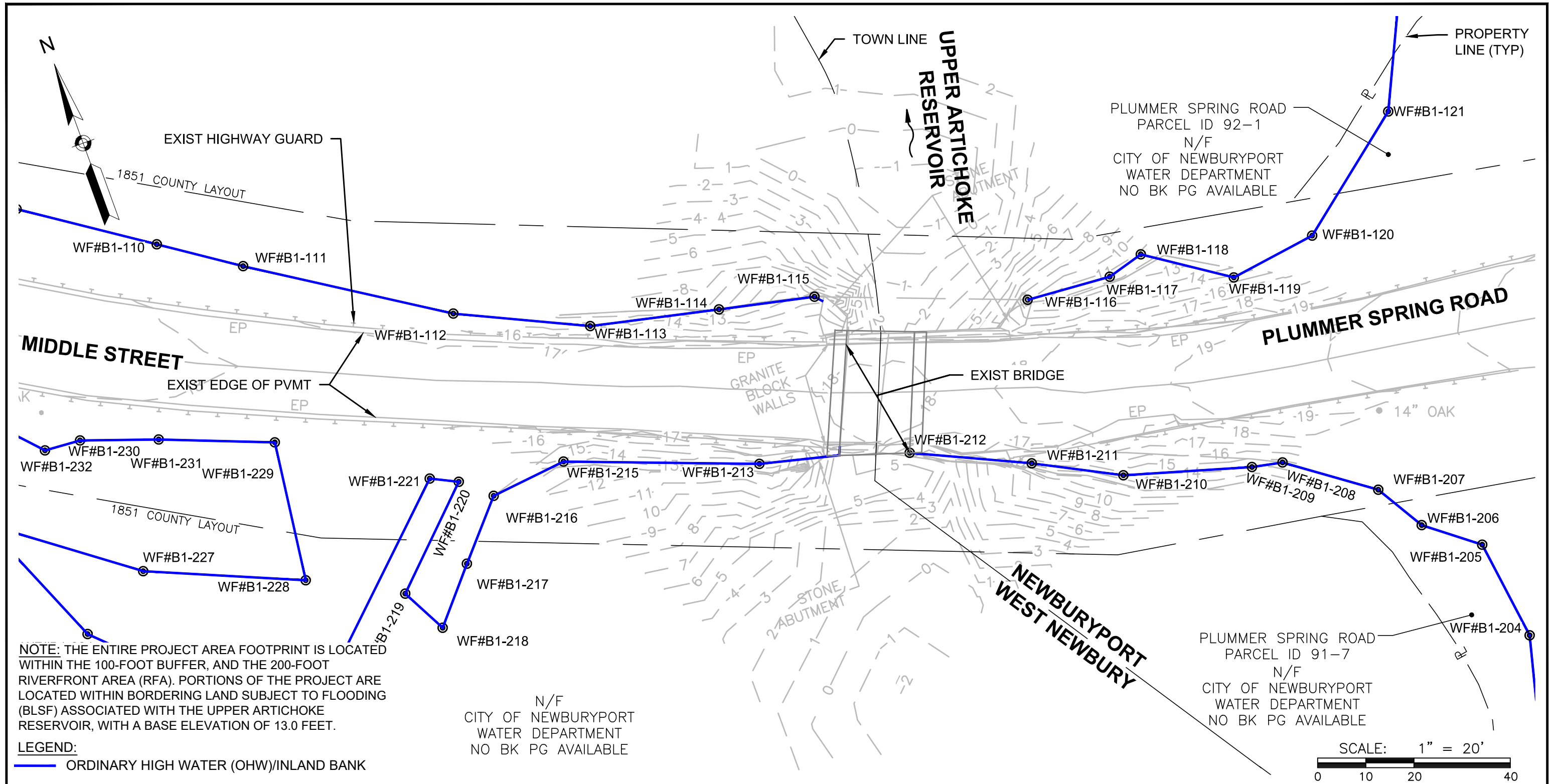
BRIDGE REPLACEMENT PROJECT
 MIDDLE STREET/PLUMMER SPRING
 ROAD OVER UPPER ARTICHOKE
 RESERVOIR, WEST NEWBURY/
 NEWBURYPORT, MA, ESSEX COUNTY



803 Summer Street
 Boston, Massachusetts
 02127

617 896 4300

Job No.:	28395.00	Date:	12/21/2020
Scale:	1"=1200'	Revised:	
Dwg. No.:	Locus	Figure:	2 OF 15



NOTE: THE ENTIRE PROJECT AREA FOOTPRINT IS LOCATED WITHIN THE 100-FOOT BUFFER, AND THE 200-FOOT RIVERFRONT AREA (RFA). PORTIONS OF THE PROJECT ARE LOCATED WITHIN BORDERING LAND SUBJECT TO FLOODING (BLSF) ASSOCIATED WITH THE UPPER ARTICHOKE RESERVOIR, WITH A BASE ELEVATION OF 13.0 FEET.

LEGEND:
 — ORDINARY HIGH WATER (OHW)/INLAND BANK

N/F
 CITY OF NEWBURYPORT
 WATER DEPARTMENT
 NO BK PG AVAILABLE

PLUMMER SPRING ROAD
 PARCEL ID 91-7
 N/F
 CITY OF NEWBURYPORT
 WATER DEPARTMENT
 NO BK PG AVAILABLE

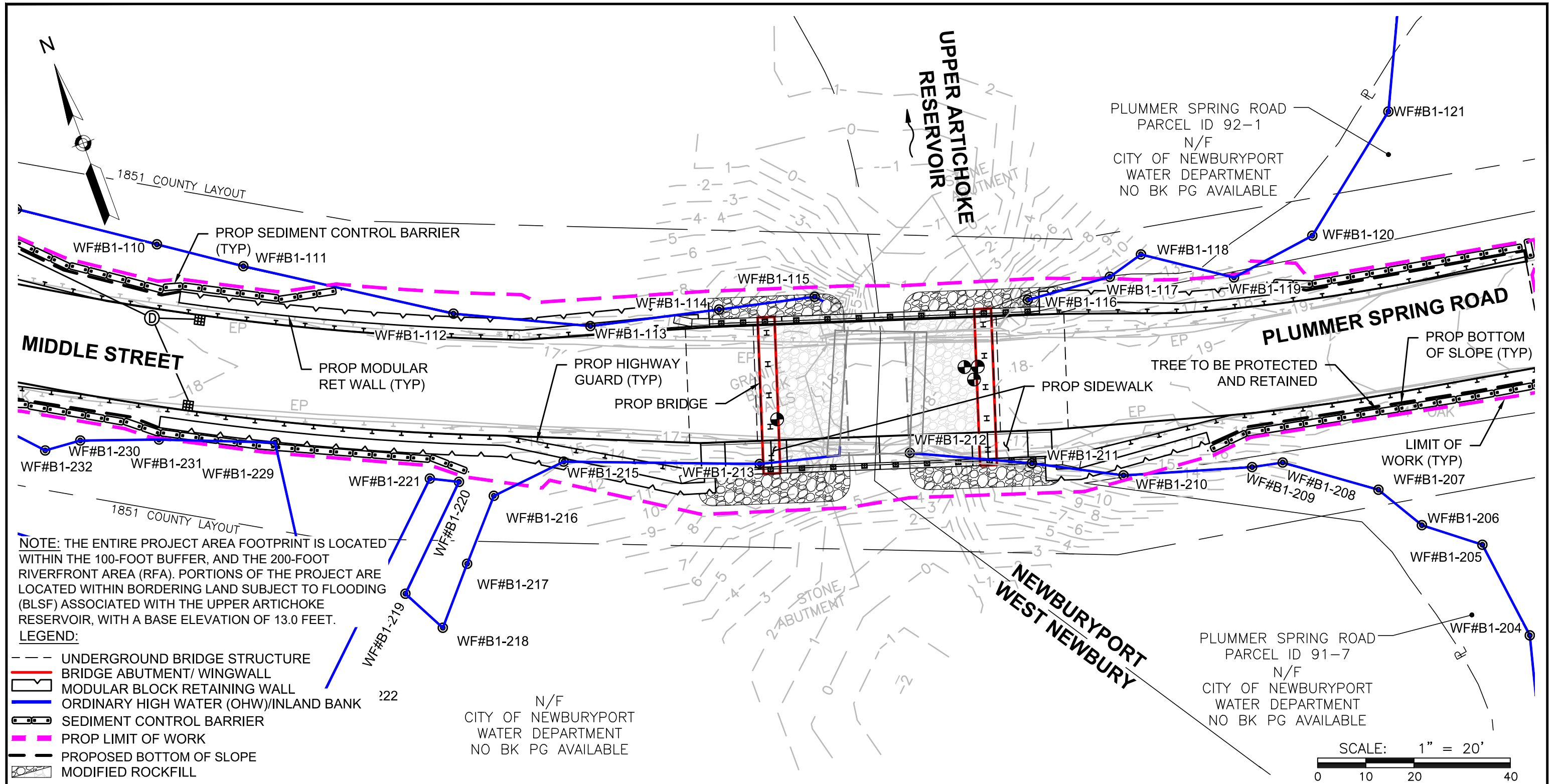
SCALE: 1" = 20'
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PREPARED FOR:
 CITY OF NEWBURYPORT
 60 PLEASANT ST NEWBURYPORT,
 MA 01950
 TOWN OF WEST NEWBURY
 381 MAIN ST, WEST NEWBURY,
 MA 01985

Source:
EXISTING CONDITIONS
 BRIDGE REPLACEMENT PROJECT
 MIDDLE STREET/PLUMMER SPRING ROAD OVER
 UPPER ARTICHOKE RESERVOIR, WEST NEWBURY/NEWBURYPORT, MA
 ESSEX COUNTY

Job No.: 28395.00 Date: 12/21/2020
 Scale: 1" = 20' Revised: _____
 Description: EX COND Figure: 3 OF 15

BSC GROUP
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CITY OF NEWBURYPORT
 60 PLEASANT ST NEWBURYPORT,
 MA 01950
 TOWN OF WEST NEWBURY
 381 MAIN ST, WEST NEWBURY,
 MA 01985

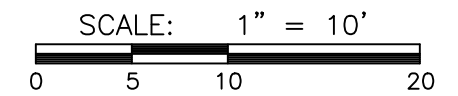
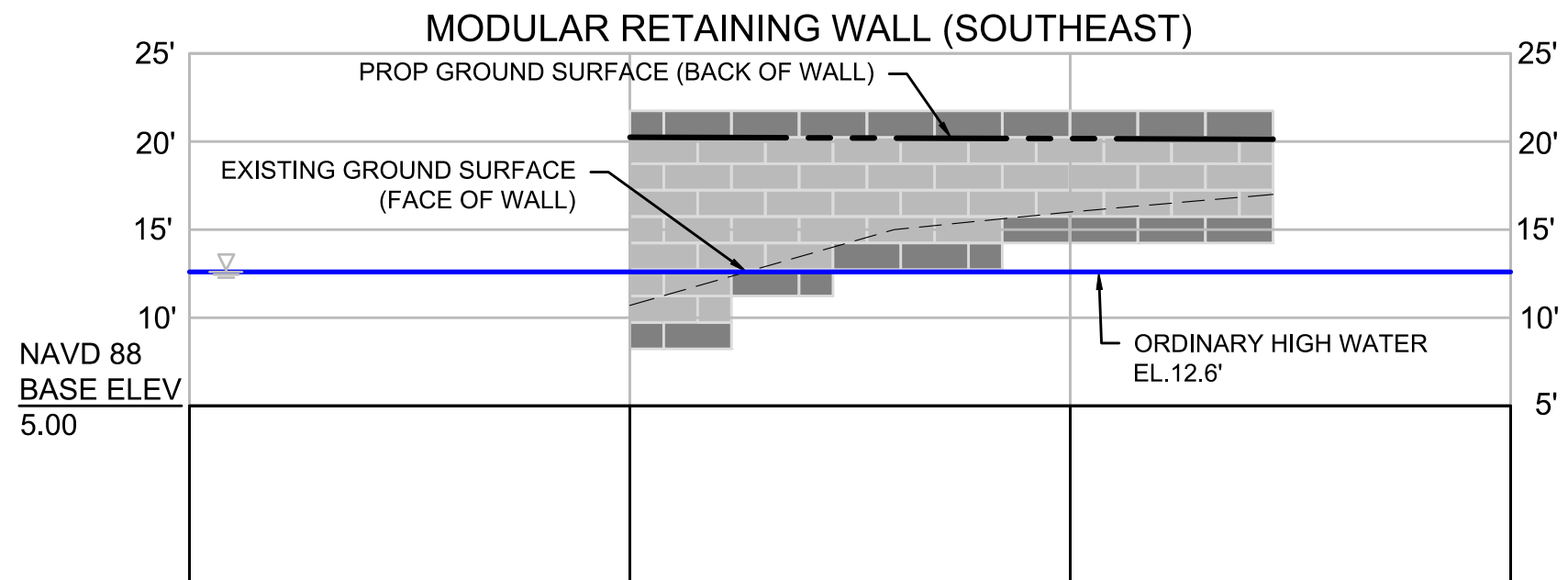
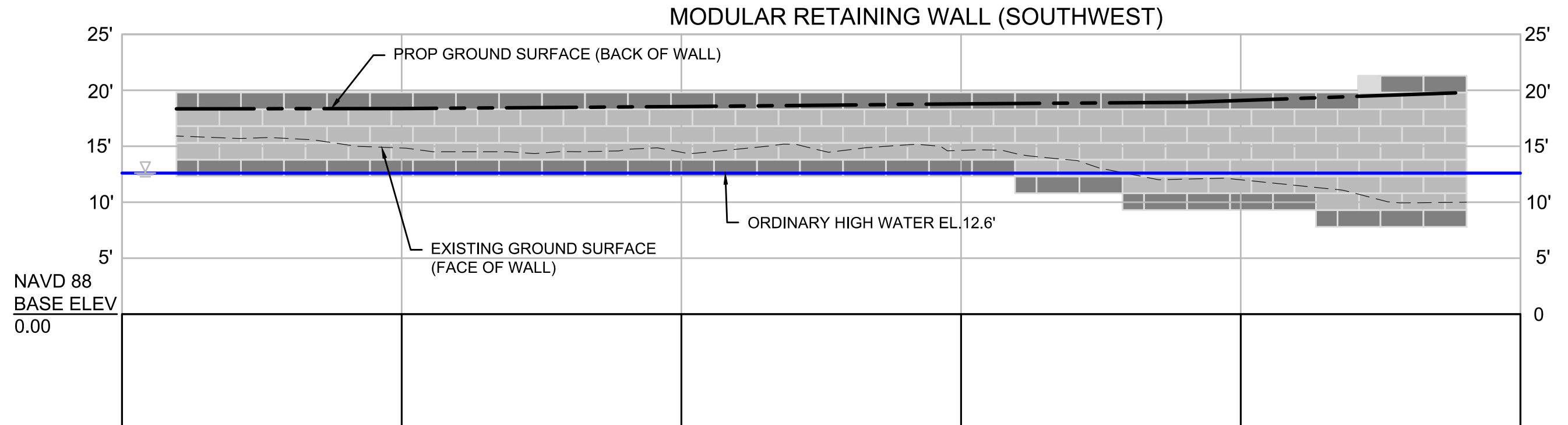
Source:

PROPOSED CONDITIONS

BRIDGE REPLACEMENT PROJECT
 MIDDLE STREET/PLUMMER SPRING ROAD OVER
 UPPER ARTICHOKE RESERVOIR, WEST NEWBURY/NEWBURYPORT, MA
 ESSEX COUNTY

Job No.: 28395.00 Date: 12/21/2020
 Scale: 1" = 20' Revised: _____
 Description: PROP COND Figure: 4 OF 15

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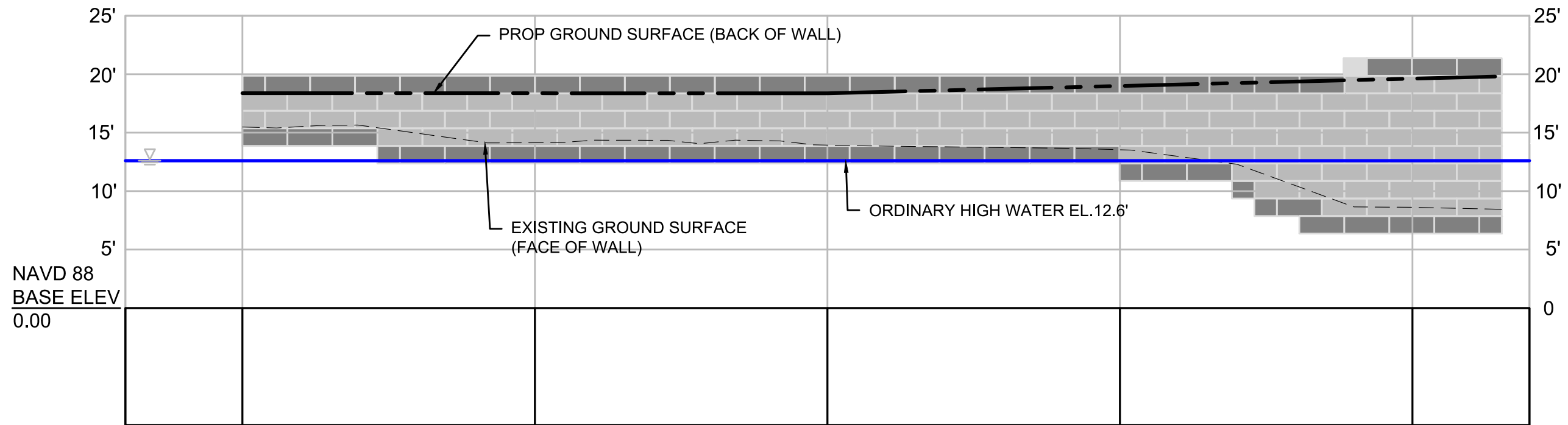
PROPOSED WALL PROFILE

Source:
 BRIDGE REPLACEMENT PROJECT
 MIDDLE STREET/PLUMMER SPRING ROAD OVER
 UPPER ARTICHOKE RESERVOIR, WEST NEWBURY/NEWBURYPORT, MA
 ESSEX COUNTY

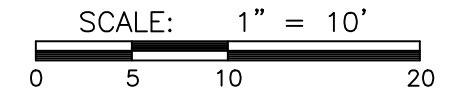
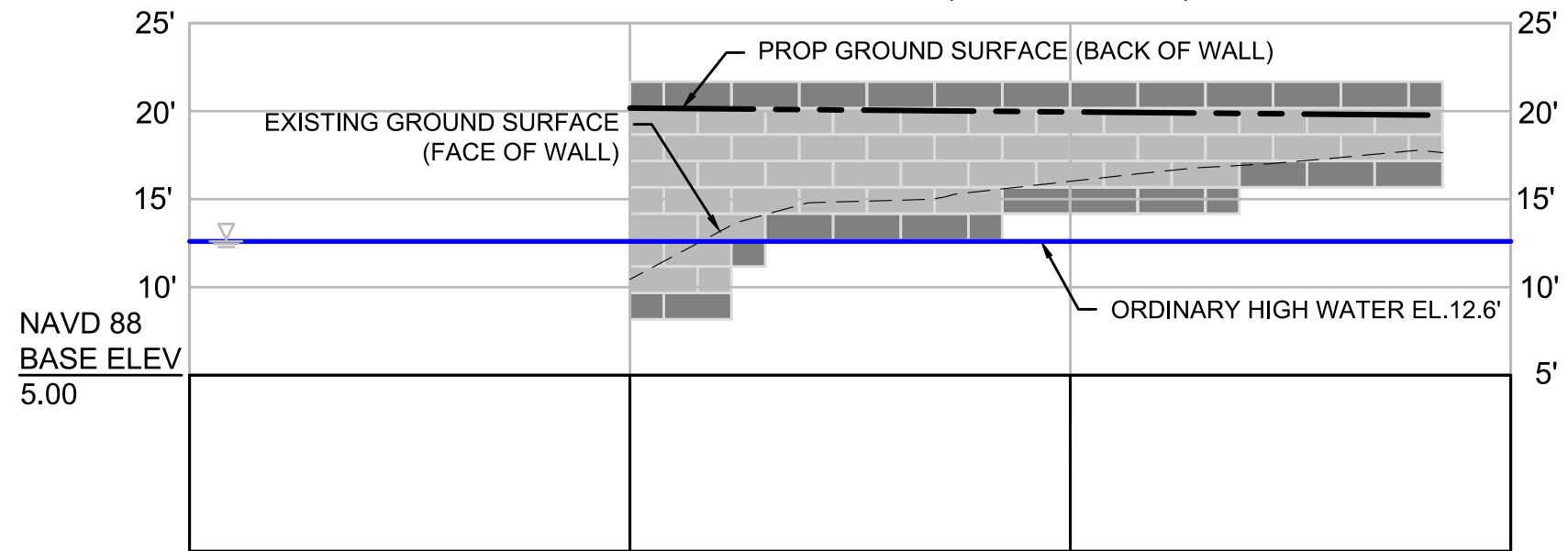
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 Scale: 1" = 10' Revised: _____
 Description: PR WALL Figure: 5 OF 15

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MODULAR RETAINING WALL (NORTHWEST)



MODULAR RETAINING WALL (NORTHEAST)

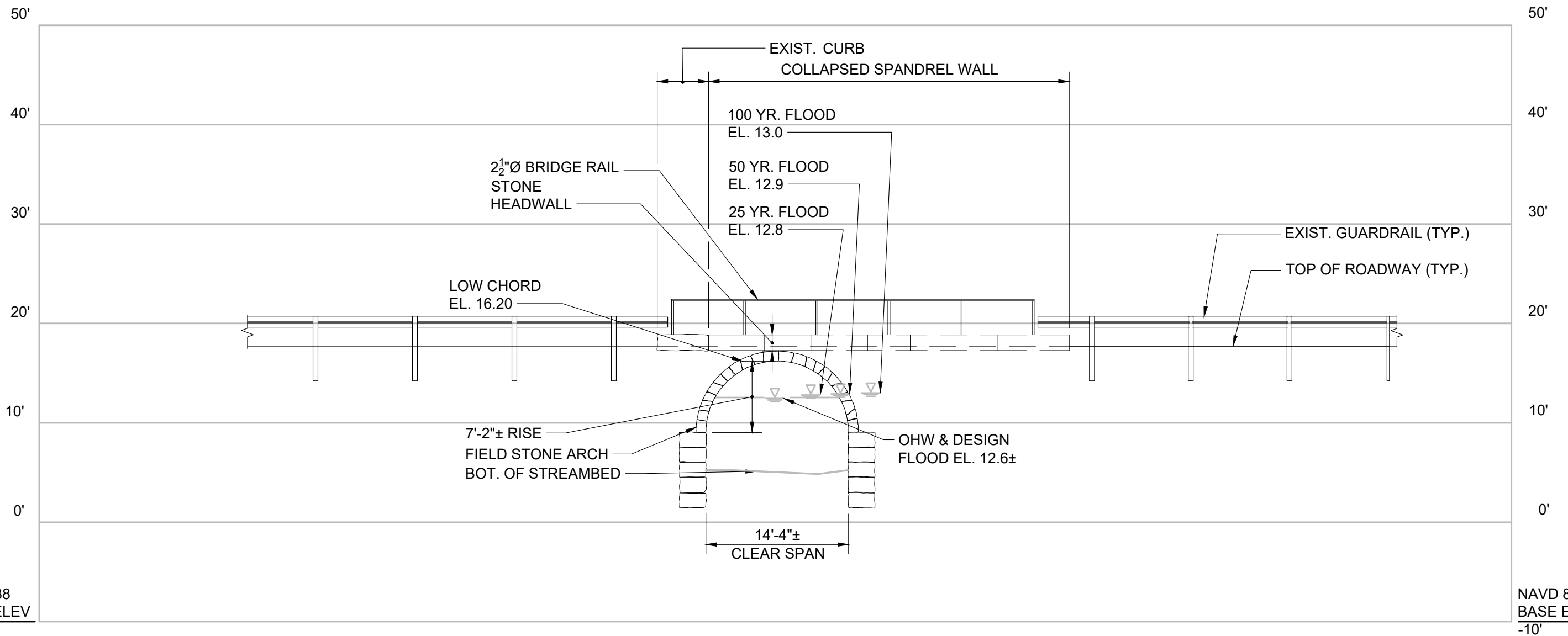


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60 PLEASANT ST NEWBURYPORT,
MA 01950
TOWN OF WEST NEWBURY
381 MAIN ST, WEST NEWBURY,
MA 01985

PROPOSED WALL PROFILE
Source:
BRIDGE REPLACEMENT PROJECT
MIDDLE STREET/PLUMMER SPRING ROAD OVER
UPPER ARTICHOKE RESERVOIR, WEST NEWBURY/NEWBURYPORT, MA
ESSEX COUNTY

Job No.: 28395.00 Date: 12/21/2020
Scale: 1" = 10' Revised: _____
Description: PR WALL Figure: 6 OF 15
PROF

BSC GROUP
803 Summer Street
Boston, Massachusetts
02127
617 896 4300



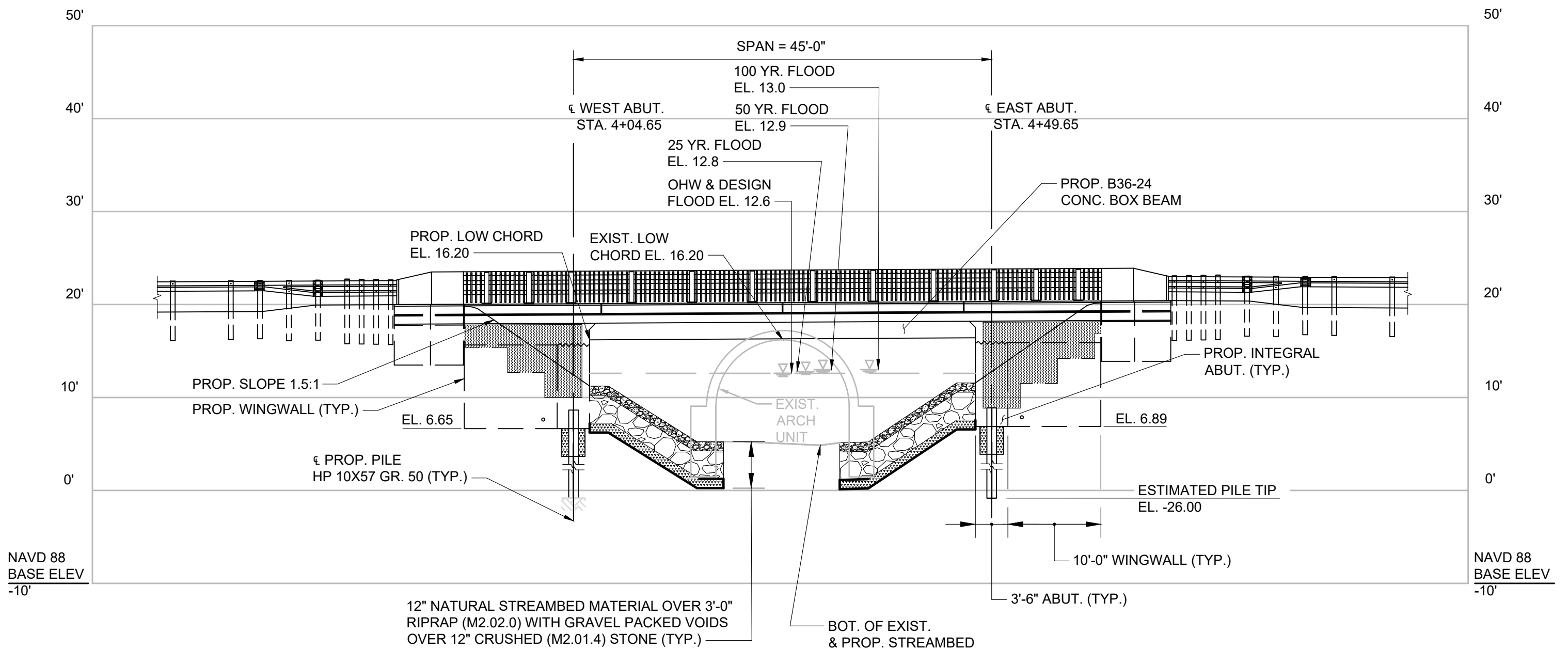
EXISTING ELEVATION
SCALE: 3/32" = 1'-0"

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CITY OF NEWBURYPORT
60 PLEASANT ST NEWBURYPORT,
MA 01950
TOWN OF WEST NEWBURY
381 MAIN ST, WEST NEWBURY,
MA 01985

Source: **EXISTING - SOUTH ELEVATION**
BRIDGE REPLACEMENT PROJECT
MIDDLE STREET/PLUMMER SPRING ROAD OVER
UPPER ARTICHOKE RESERVOIR, WEST NEWBURY/NEWBURYPORT, MA
ESSEX COUNTY

Job No.: 28395.00 Date: 12/21/2020
Scale: 3/32" = 1'-0" Revised: _____
Description: EXIST. EL. Figure: 7 OF 15

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617 896 4300



NOTE: EXISTING STRUCTURE TO BE REMOVED IN ITS ENTIRETY

PROPOSED SOUTH ELEVATION
SCALE: 3/32" = 1'-0"

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TOWN OF WEST NEWBURY
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 MA 01985

PROPOSED - SOUTH ELEVATION

Source:

BRIDGE REPLACEMENT PROJECT
MIDDLE STREET/PLUMMER SPRING ROAD OVER
UPPER ARTICHOKE RESERVOIR, WEST NEWBURY/NEWBURYPORT, MA
ESSEX COUNTY

Job No.: 28395.00 Date: 12/21/2020

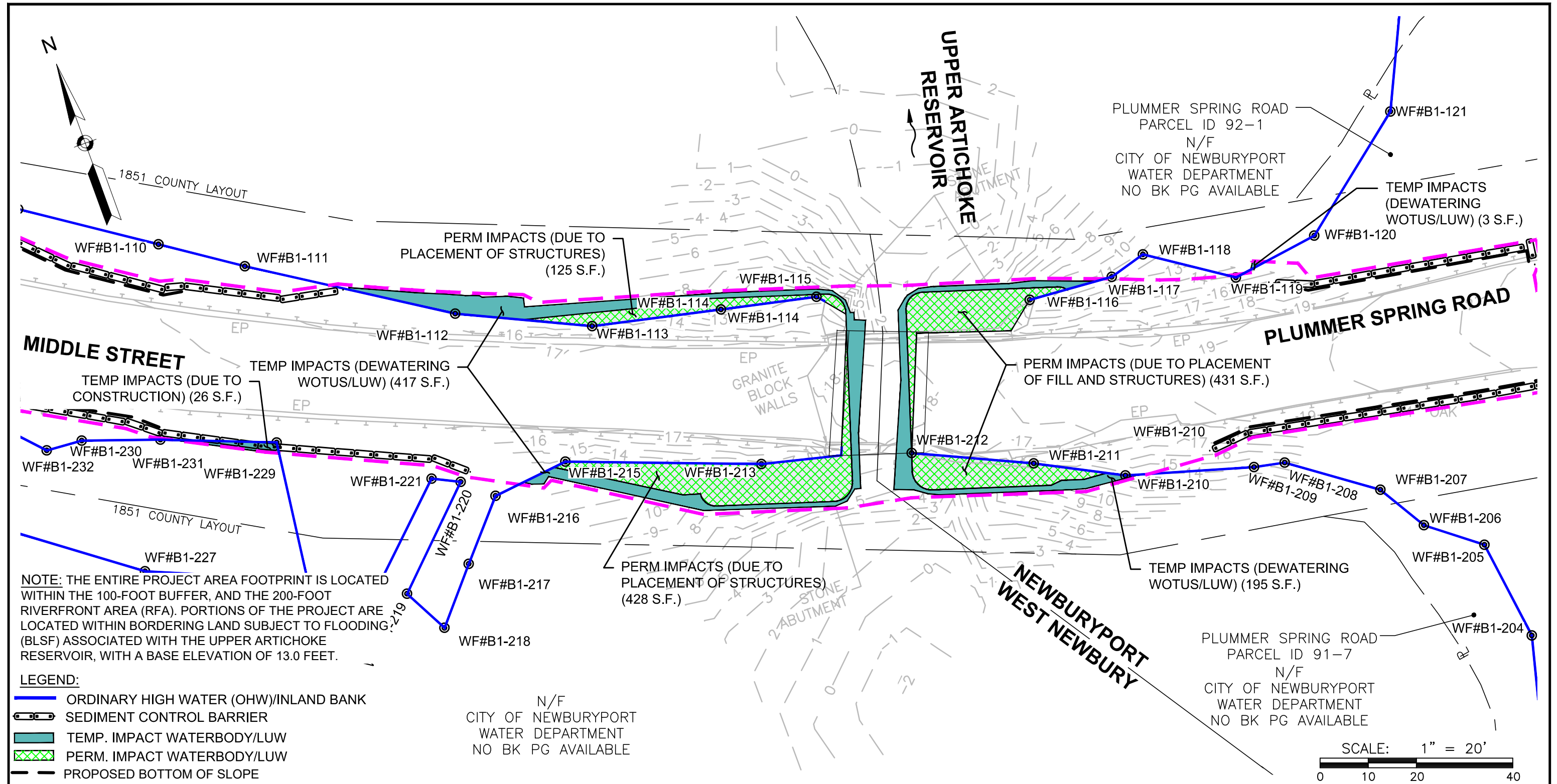
Scale: 3/32" = 1'-0" Revised: _____

Description: PROP. EL. Figure: 8 OF 15



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803 Summer Street
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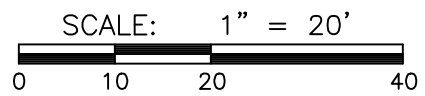


NOTE: THE ENTIRE PROJECT AREA FOOTPRINT IS LOCATED WITHIN THE 100-FOOT BUFFER, AND THE 200-FOOT RIVERFRONT AREA (RFA). PORTIONS OF THE PROJECT ARE LOCATED WITHIN BORDERING LAND SUBJECT TO FLOODING (BLSF) ASSOCIATED WITH THE UPPER ARTICHOKE RESERVOIR, WITH A BASE ELEVATION OF 13.0 FEET.

- LEGEND:**
- ORDINARY HIGH WATER (OHW)/INLAND BANK
 - SEDIMENT CONTROL BARRIER
 - TEMP. IMPACT WATERBODY/LUW
 - PERM. IMPACT WATERBODY/LUW
 - PROPOSED BOTTOM OF SLOPE

N/F
CITY OF NEWBURYPORT
WATER DEPARTMENT
NO BK PG AVAILABLE

PLUMMER SPRING ROAD
PARCEL ID 91-7
N/F
CITY OF NEWBURYPORT
WATER DEPARTMENT
NO BK PG AVAILABLE



PREPARED FOR:
CITY OF NEWBURYPORT
60 PLEASANT ST NEWBURYPORT,
MA 01950
TOWN OF WEST NEWBURY
381 MAIN ST, WEST NEWBURY,
MA 01985

IMPACTS

BRIDGE REPLACEMENT PROJECT
MIDDLE STREET/PLUMMER SPRING ROAD OVER
UPPER ARTICHOKE RESERVOIR, WEST NEWBURY/NEWBURYPORT, MA
ESSEX COUNTY

Job No.: 28395.00 Date: 12/21/2020
Scale: 1" = 20' Revised: _____
Description: IMPACTS Figure: 9 OF 15

BSC GROUP
803 Summer Street
Boston, Massachusetts
02127
617 896 4300

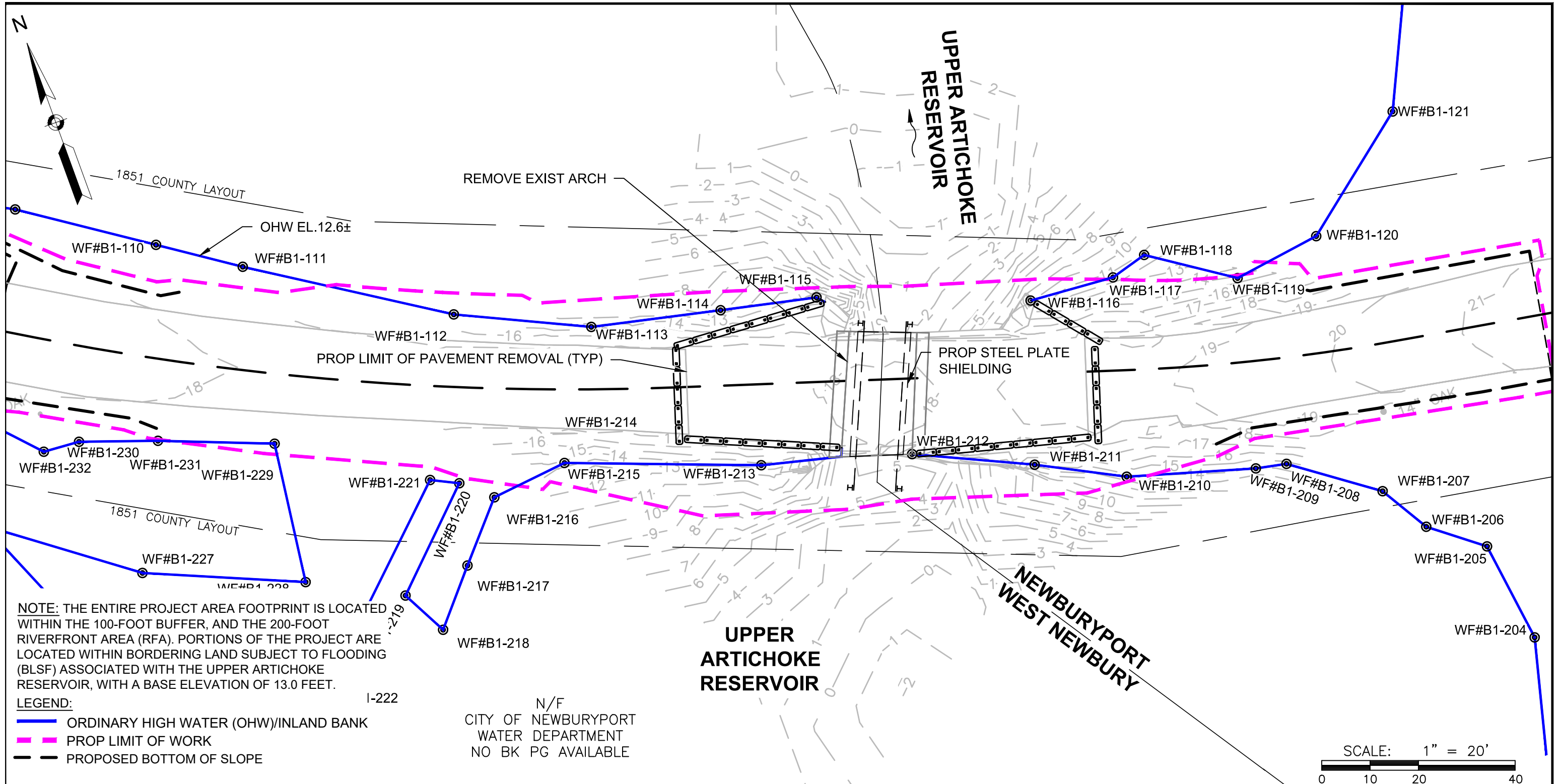
FLOODPLAIN IMPACT AND MITIGATION SUMMARY							
ELEVATION (FT)	FLOODPLAIN IMPACT (CF)		FLOODPLAIN MITIGATION (CF)		FLOODPLAIN NET (CF)		
	WEST NEWBURY	NEWBURYPORT	WEST NEWBURY	NEWBURYPORT	WEST NEWBURY	NEWBURYPORT	TOTAL
3-4	-	-	-	10.1	NO CHANGE	+10.1	+10
4-5	-	-	6.1	46.5	+6.1	+46.5	+53
5-6	-	-	40.4	84.3	+40.4	+84.3	+125
6-7	-	-	78.3	122.2	+78.3	+122.2	+201
7-8	-	-	116.2	160.1	+116.2	+160.1	+276
8-9	0.8	-	154.0	198.0	+153.3	+198.0	+351
9-10	-	24.5	192.9	236.8	+192.9	+212.4	+405
10-11	165.5	43.0	234.3	278.3	+68.8	+235.3	+304
11-12	140.6	38.6	279.8	354.5	+139.2	+315.9	+455
12-13	85.6	25.5	334.3	365.6	+248.7	+340.1	+589
TOTAL	392	131	1,436	1,856	1,044	1,725	<u>2,769</u>

PREPARED FOR:
 CITY OF NEWBURYPORT
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 MA 01950
 TOWN OF WEST NEWBURY
 381 MAIN ST, WEST NEWBURY,
 MA 01985

FLOODPLAIN IMPACT AND MITIGATION SUMMARY
 Source:
 BRIDGE REPLACEMENT PROJECT
 MIDDLE STREET/PLUMMER SPRING ROAD OVER
 UPPER ARTICHOKE RESERVOIR, WEST NEWBURY/NEWBURYPORT, MA
 ESSEX COUNTY

Job No.: 28395.00 Date: 12/21/2020
 Scale: N/A Revised: _____
 Description: BLSF TABLE Figure: 10 OF 15

 **BSC GROUP**
 803 Summer Street
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 02127
 617 896 4300



NOTE: THE ENTIRE PROJECT AREA FOOTPRINT IS LOCATED WITHIN THE 100-FOOT BUFFER, AND THE 200-FOOT RIVERFRONT AREA (RFA). PORTIONS OF THE PROJECT ARE LOCATED WITHIN BORDERING LAND SUBJECT TO FLOODING (BLSF) ASSOCIATED WITH THE UPPER ARTICHOKE RESERVOIR, WITH A BASE ELEVATION OF 13.0 FEET.

LEGEND:
 — ORDINARY HIGH WATER (OHW)/INLAND BANK
 — PROP LIMIT OF WORK
 - - - PROPOSED BOTTOM OF SLOPE

N/F
 CITY OF NEWBURYPORT
 WATER DEPARTMENT
 NO BK PG AVAILABLE

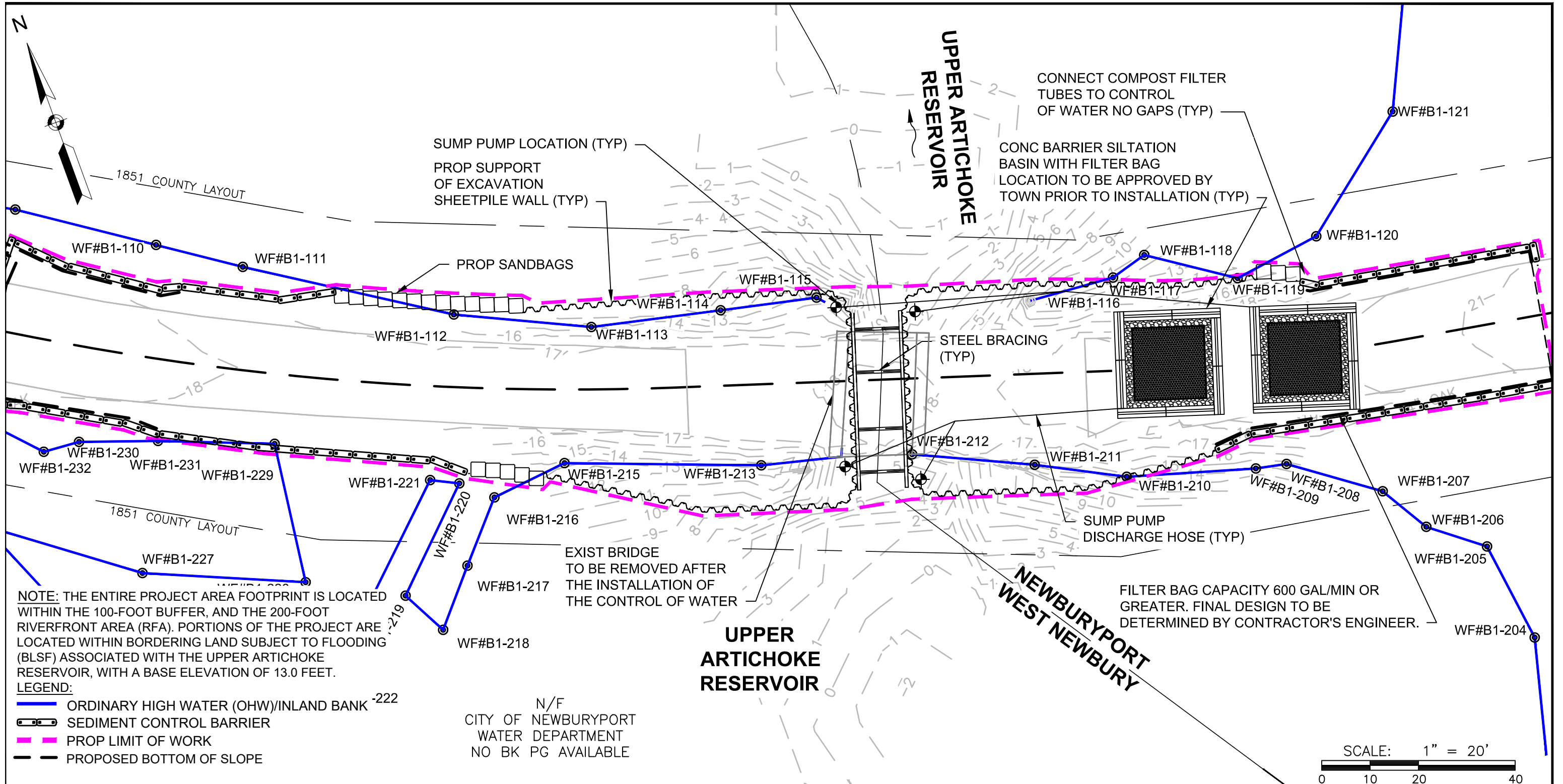
SCALE: 1" = 20'
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PREPARED FOR:
 CITY OF NEWBURYPORT
 60 PLEASANT ST NEWBURYPORT,
 MA 01950
 TOWN OF WEST NEWBURY
 381 MAIN ST, WEST NEWBURY,
 MA 01985

SHIELDING PLAN - UPPER ARCH REMOVAL
 BRIDGE REPLACEMENT PROJECT
 MIDDLE STREET/PLUMMER SPRING ROAD OVER
 UPPER ARTICHOKE RESERVOIR, WEST NEWBURY/NEWBURYPORT, MA
 ESSEX COUNTY

Job No.: 28395.00 Date: 12/21/2020
 Scale: 1" = 20' Revised: _____
 Description: COW Figure: 11 OF 15

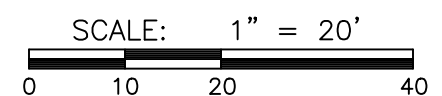
BSC GROUP
 803 Summer Street
 Boston, Massachusetts
 02127
 617 896 4300



NOTE: THE ENTIRE PROJECT AREA FOOTPRINT IS LOCATED WITHIN THE 100-FOOT BUFFER, AND THE 200-FOOT RIVERFRONT AREA (RFA). PORTIONS OF THE PROJECT ARE LOCATED WITHIN BORDERING LAND SUBJECT TO FLOODING (BLSF) ASSOCIATED WITH THE UPPER ARTICHOKE RESERVOIR, WITH A BASE ELEVATION OF 13.0 FEET.

- LEGEND:
- ORDINARY HIGH WATER (OHW)/INLAND BANK -222
 - SEDIMENT CONTROL BARRIER
 - PROP LIMIT OF WORK
 - PROPOSED BOTTOM OF SLOPE

N/F
CITY OF NEWBURYPORT
WATER DEPARTMENT
NO BK PG AVAILABLE



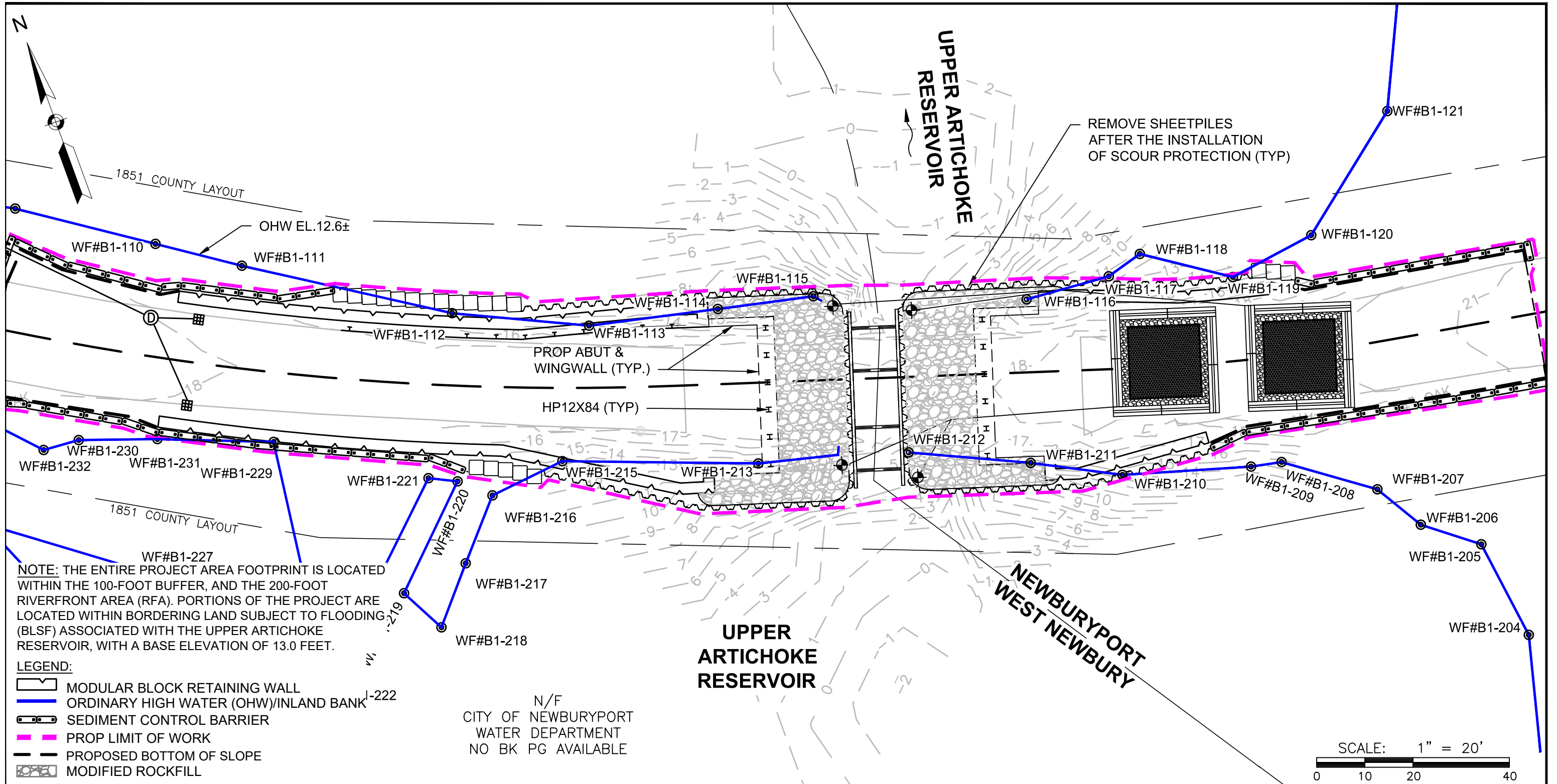
PREPARED FOR:
CITY OF NEWBURYPORT
60 PLEASANT ST NEWBURYPORT,
MA 01950
TOWN OF WEST NEWBURY
381 MAIN ST, WEST NEWBURY,
MA 01985

CONTROL OF WATER - PHASE 1 - PLAN

BRIDGE REPLACEMENT PROJECT
MIDDLE STREET/PLUMMER SPRING ROAD OVER
UPPER ARTICHOKE RESERVOIR, WEST NEWBURY/NEWBURYPORT, MA
ESSEX COUNTY

Job No.: 28395.00 Date: 12/21/2020
Scale: 1" = 20' Revised: _____
Description: COW Figure: 12 OF 15

BSC GROUP
803 Summer Street
Boston, Massachusetts
02127
617 896 4300



NOTE: THE ENTIRE PROJECT AREA FOOTPRINT IS LOCATED WITHIN THE 100-FOOT BUFFER, AND THE 200-FOOT RIVERFRONT AREA (RFA). PORTIONS OF THE PROJECT ARE LOCATED WITHIN BORDERING LAND SUBJECT TO FLOODING (BLSF) ASSOCIATED WITH THE UPPER ARTICHOKE RESERVOIR, WITH A BASE ELEVATION OF 13.0 FEET.

- LEGEND:
- MODULAR BLOCK RETAINING WALL
 - ORDINARY HIGH WATER (OHW)/INLAND BANK
 - SEDIMENT CONTROL BARRIER
 - PROP LIMIT OF WORK
 - PROPOSED BOTTOM OF SLOPE
 - MODIFIED ROCKFILL

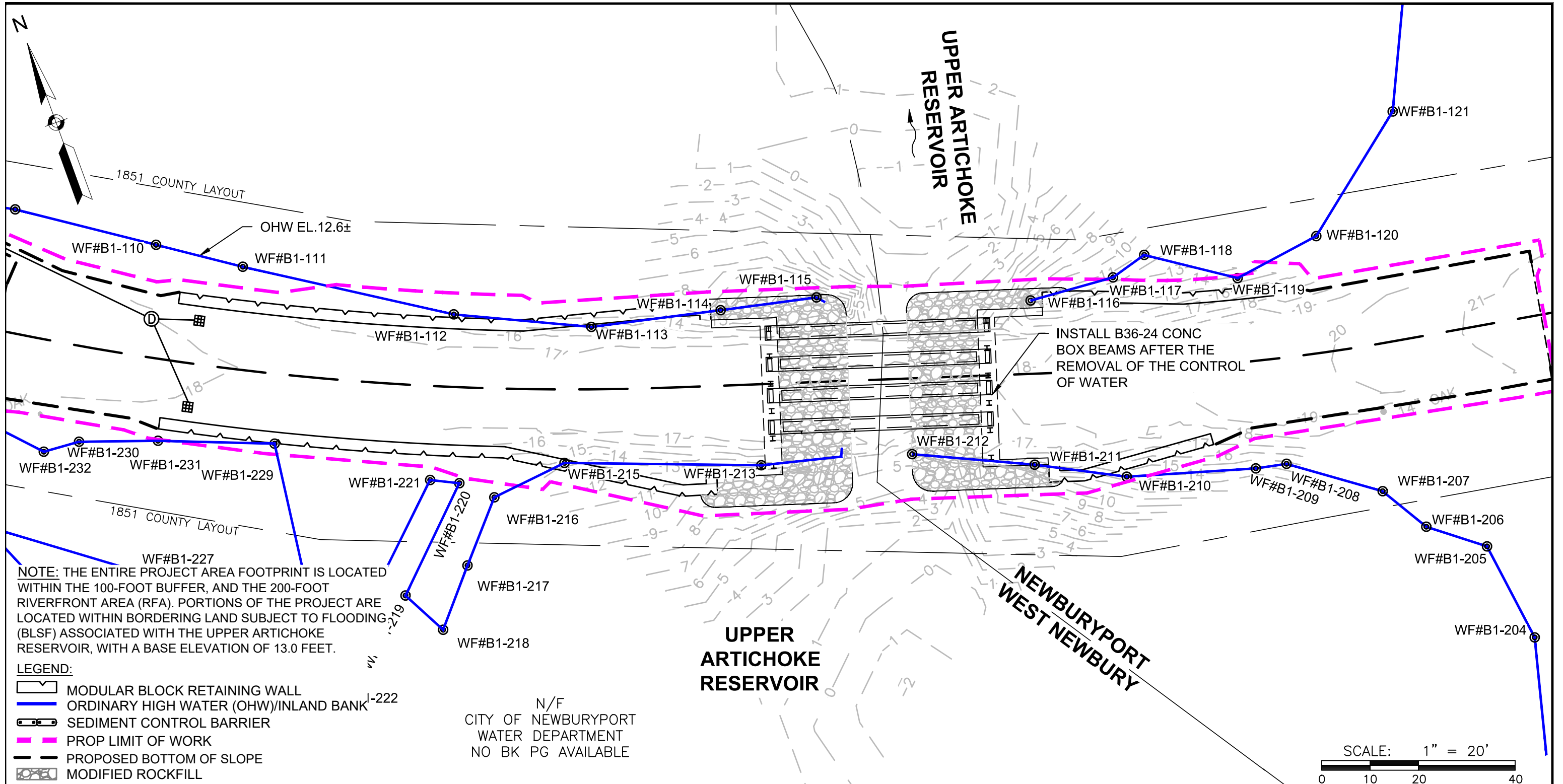
PREPARED FOR:
CITY OF NEWBURYPORT
 60 PLEASANT ST NEWBURYPORT,
 MA 01950
TOWN OF WEST NEWBURY
 381 MAIN ST, WEST NEWBURY,
 MA 01985

Source: **CONTROL OF WATER - PHASE 2 - PLAN**

BRIDGE REPLACEMENT PROJECT
 MIDDLE STREET/PLUMMER SPRING ROAD OVER
 UPPER ARTICHOKE RESERVOIR, WEST NEWBURY/NEWBURYPORT, MA
 ESSEX COUNTY

Job No.: 28395.00 Date: 12/21/2020
 Scale: 1" = 20' Revised: _____
 Description: COW Figure: 13 OF 15

BSC GROUP
 803 Summer Street
 Boston, Massachusetts
 02127
 617 896 4300



NOTE: THE ENTIRE PROJECT AREA FOOTPRINT IS LOCATED WITHIN THE 100-FOOT BUFFER, AND THE 200-FOOT RIVERFRONT AREA (RFA). PORTIONS OF THE PROJECT ARE LOCATED WITHIN BORDERING LAND SUBJECT TO FLOODING (BLSF) ASSOCIATED WITH THE UPPER ARTICHOKE RESERVOIR, WITH A BASE ELEVATION OF 13.0 FEET.

- LEGEND:
- MODULAR BLOCK RETAINING WALL
 - ORDINARY HIGH WATER (OHW)/INLAND BANK
 - SEDIMENT CONTROL BARRIER
 - PROP LIMIT OF WORK
 - PROPOSED BOTTOM OF SLOPE
 - MODIFIED ROCKFILL

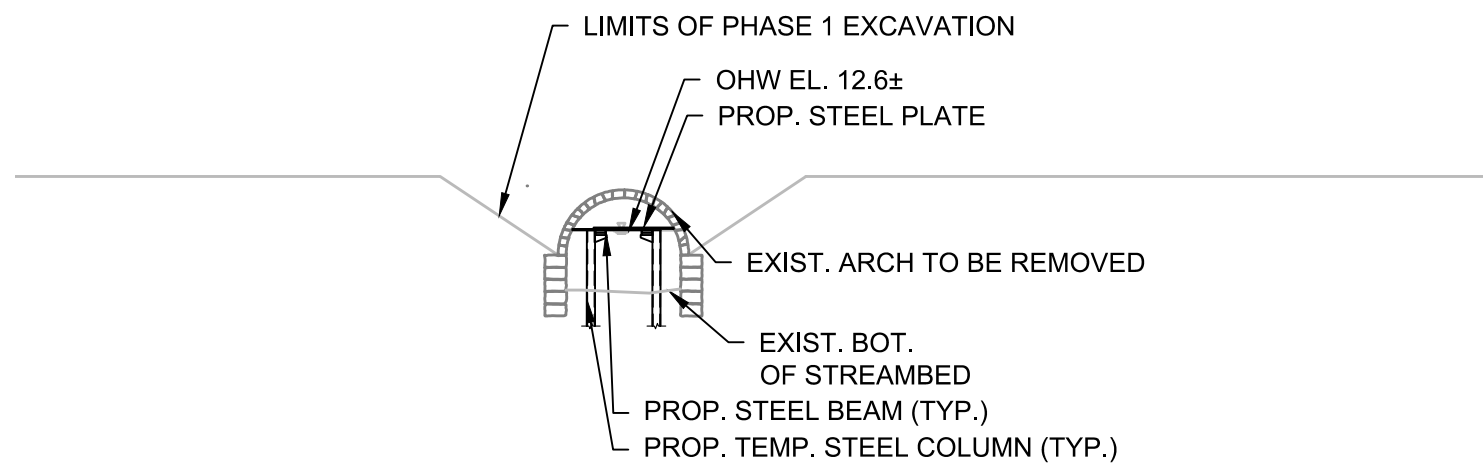
N/F
CITY OF NEWBURYPORT
WATER DEPARTMENT
NO BK PG AVAILABLE

PREPARED FOR:
CITY OF NEWBURYPORT
60 PLEASANT ST NEWBURYPORT,
MA 01950
TOWN OF WEST NEWBURY
381 MAIN ST, WEST NEWBURY,
MA 01985

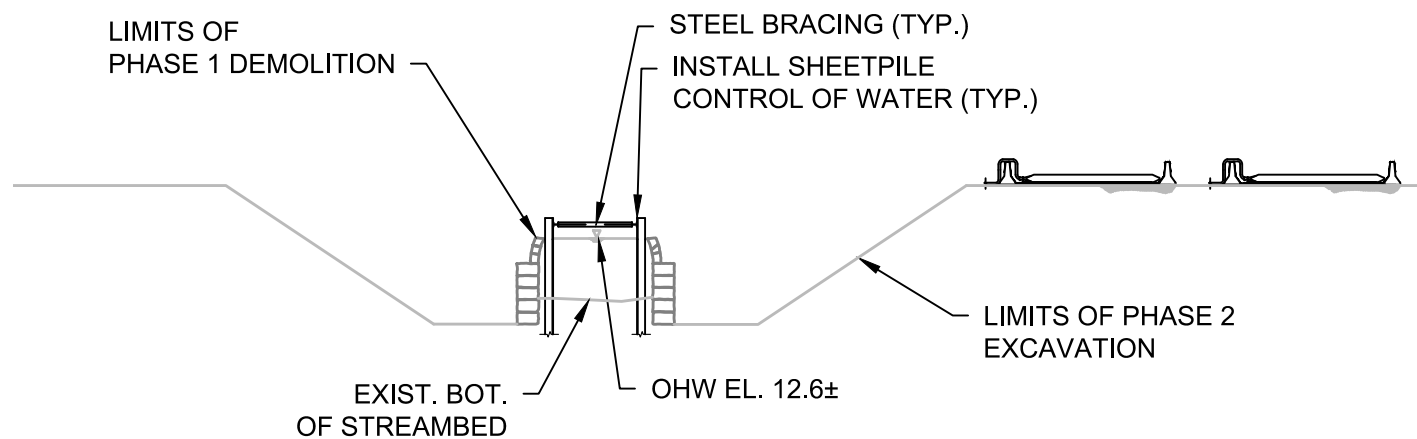
Source: **CONTROL OF WATER - PHASE 3 - PLAN**
BRIDGE REPLACEMENT PROJECT
MIDDLE STREET/PLUMMER SPRING ROAD OVER
UPPER ARTICHOKE RESERVOIR, WEST NEWBURY/NEWBURYPORT, MA
ESSEX COUNTY

Job No.: 28395.00 Date: 12/21/2020
Scale: 1" = 20' Revised: _____
Description: COW Figure: 14 OF 15

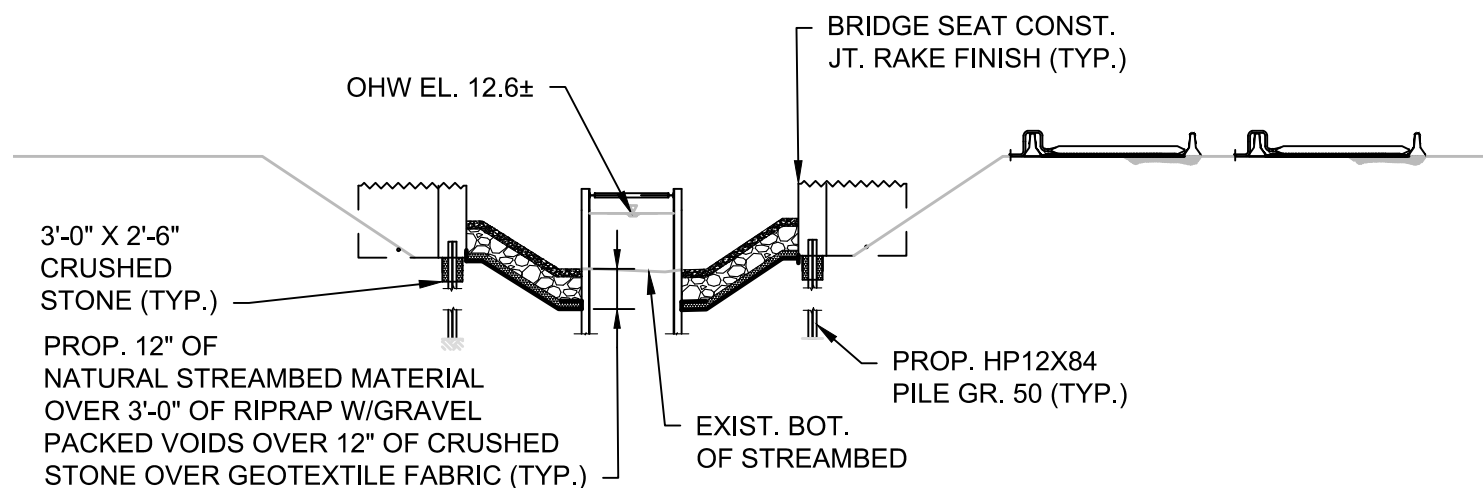
BSC GROUP
803 Summer Street
Boston, Massachusetts
02127
617 896 4300



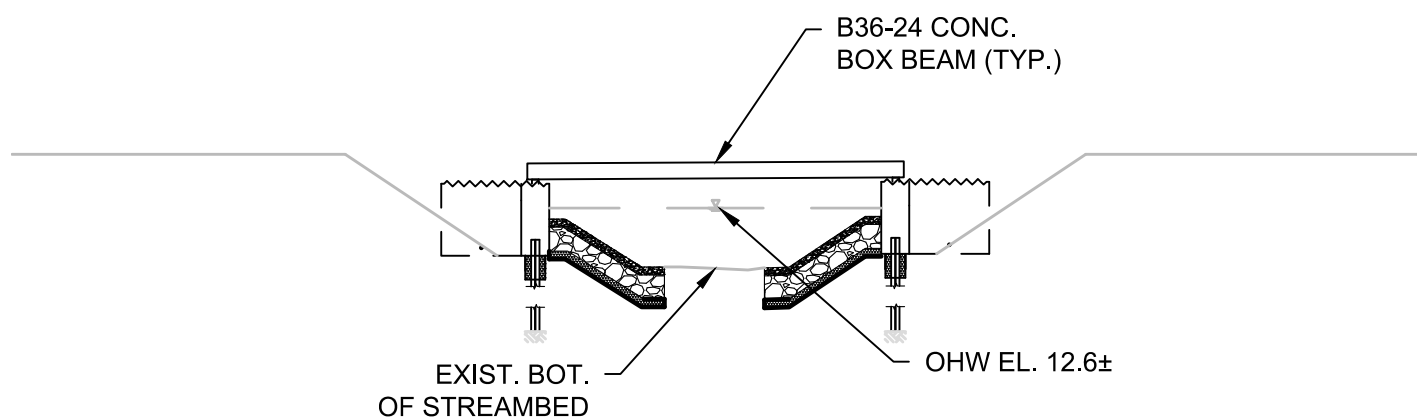
SHIELDING PLAN - UPPER ARCH REMOVAL
SCALE: 1/2" = 1'-0"



CONTROL OF WATER - PHASE 1 - ELEVATION
SCALE: 1/2" = 1'-0"



CONTROL OF WATER - PHASE 2 - ELEVATION
SCALE: 1/2" = 1'-0"



CONTROL OF WATER - PHASE 3 - ELEVATION
SCALE: 1/2" = 1'-0"

PREPARED FOR:
CITY OF NEWBURYPORT
60 PLEASANT ST NEWBURYPORT,
MA 01950
TOWN OF WEST NEWBURY
381 MAIN ST, WEST NEWBURY,
MA 01985

SHIELDING AND CONTROL OF WATER - ELEVATION

Source:
BRIDGE REPLACEMENT PROJECT
MIDDLE STREET/PLUMMER SPRING ROAD OVER
UPPER ARTICHOKE RESERVOIR, WEST NEWBURY/NEWBURYPORT, MA
ESSEX COUNTY

Job No.: 28395.00 Date: 12/21/2020
Scale: 1/2" = 1'-0" Revised: _____
Description: COW Figure: 15 OF 15

BSC GROUP
803 Summer Street
Boston, Massachusetts
02127
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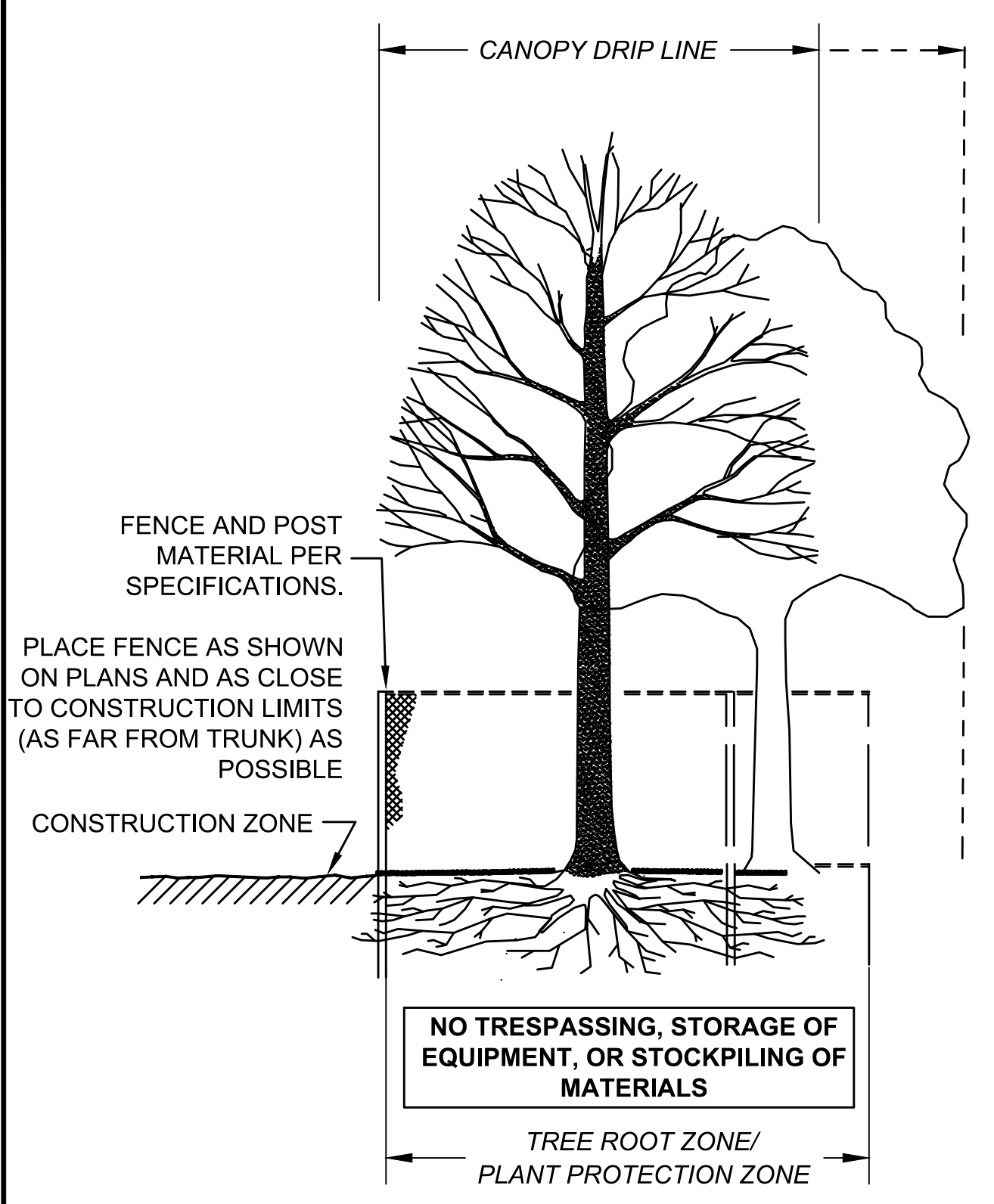
**SHEFFIELD
LIME KILN ROAD**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	9	25
PROJECT FILE NO.		-	

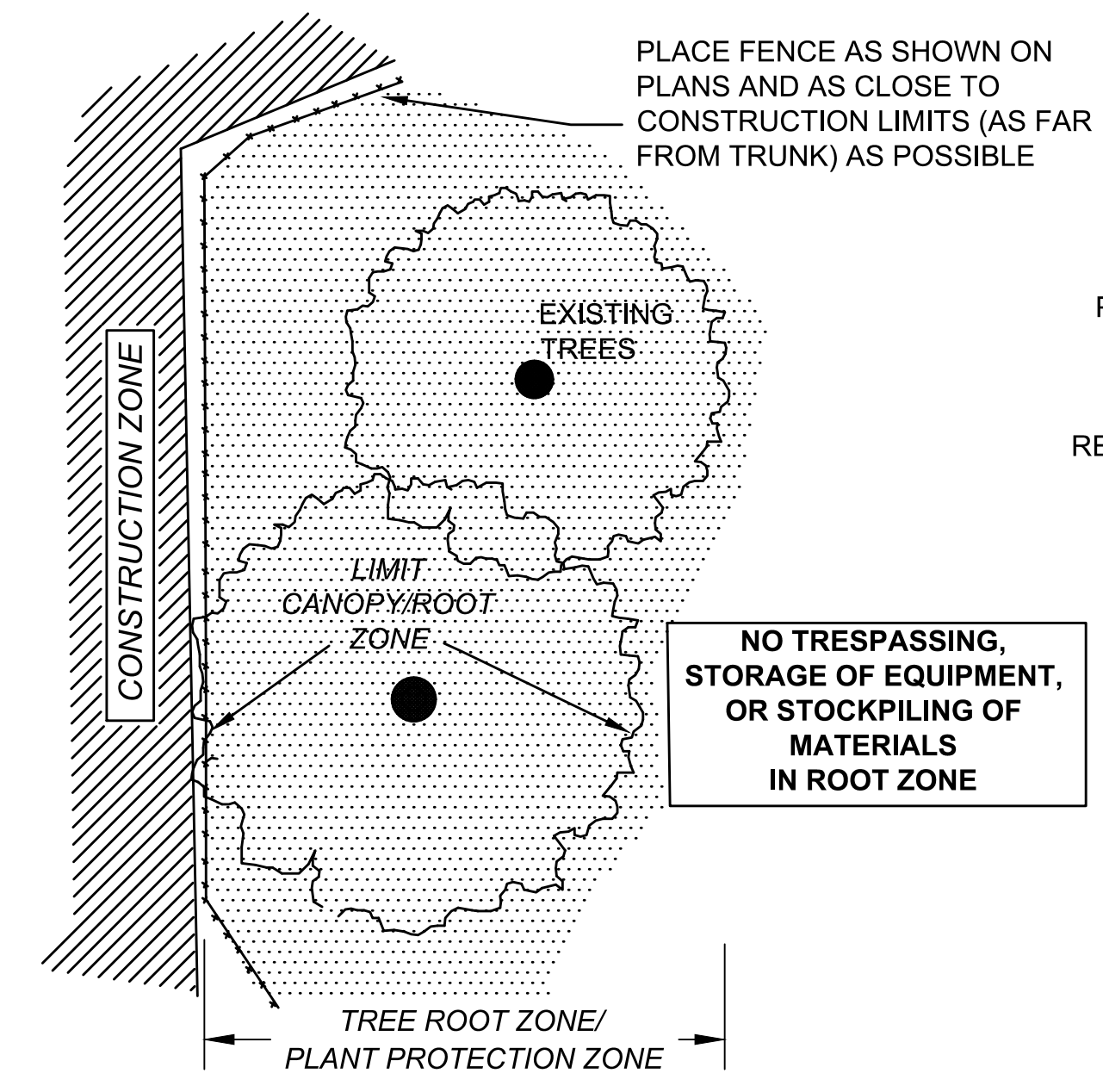
CONSTRUCTION DETAILS

PLACE TUBE AS CLOSE TO LIMIT OF SOIL DISTURBANCE AS POSSIBLE, ALONG CONTOURS, AND PERPENDICULAR TO FLOW.

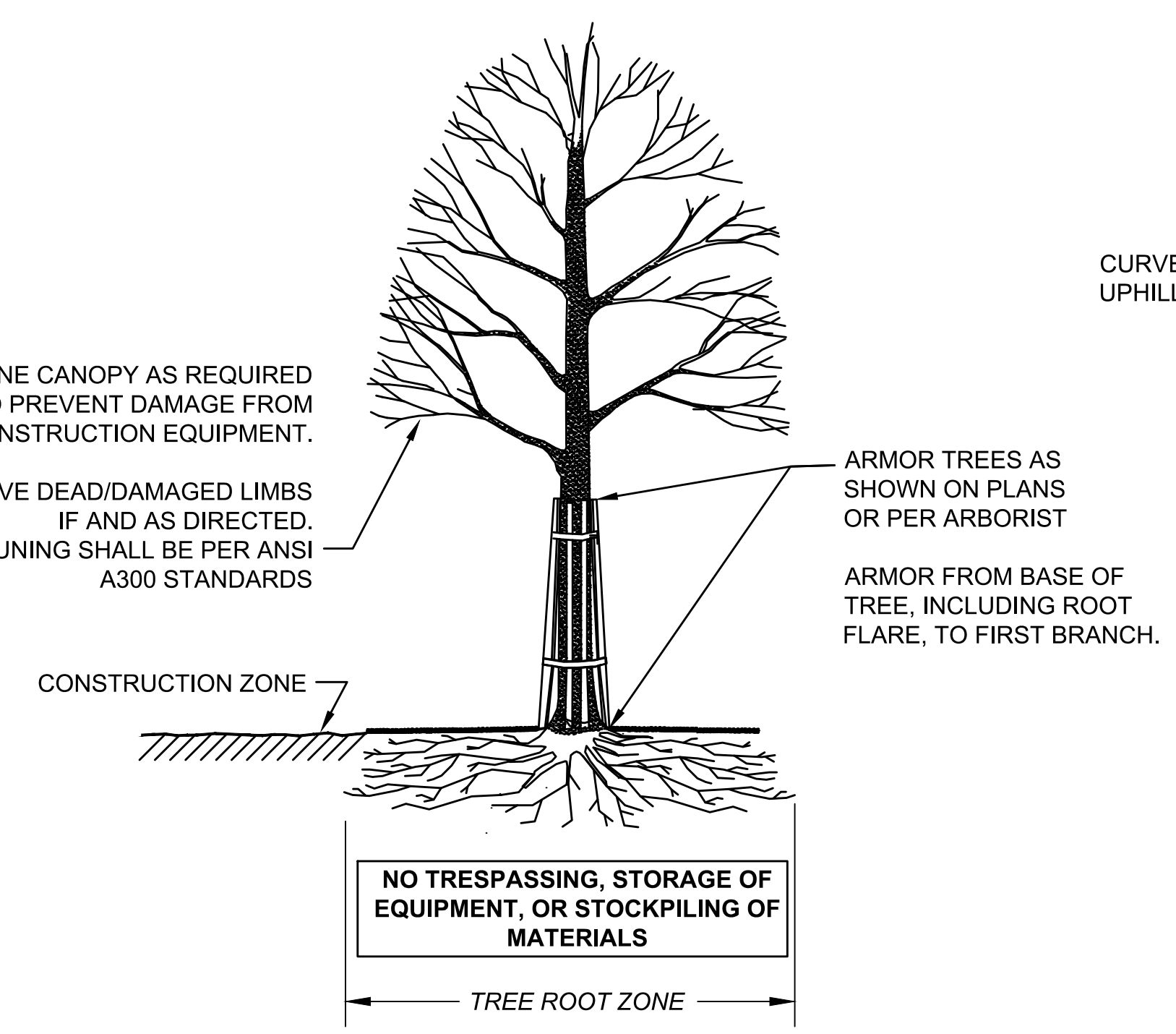
ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.



SECTION - FENCE PROTECTION OF ROOT ZONE

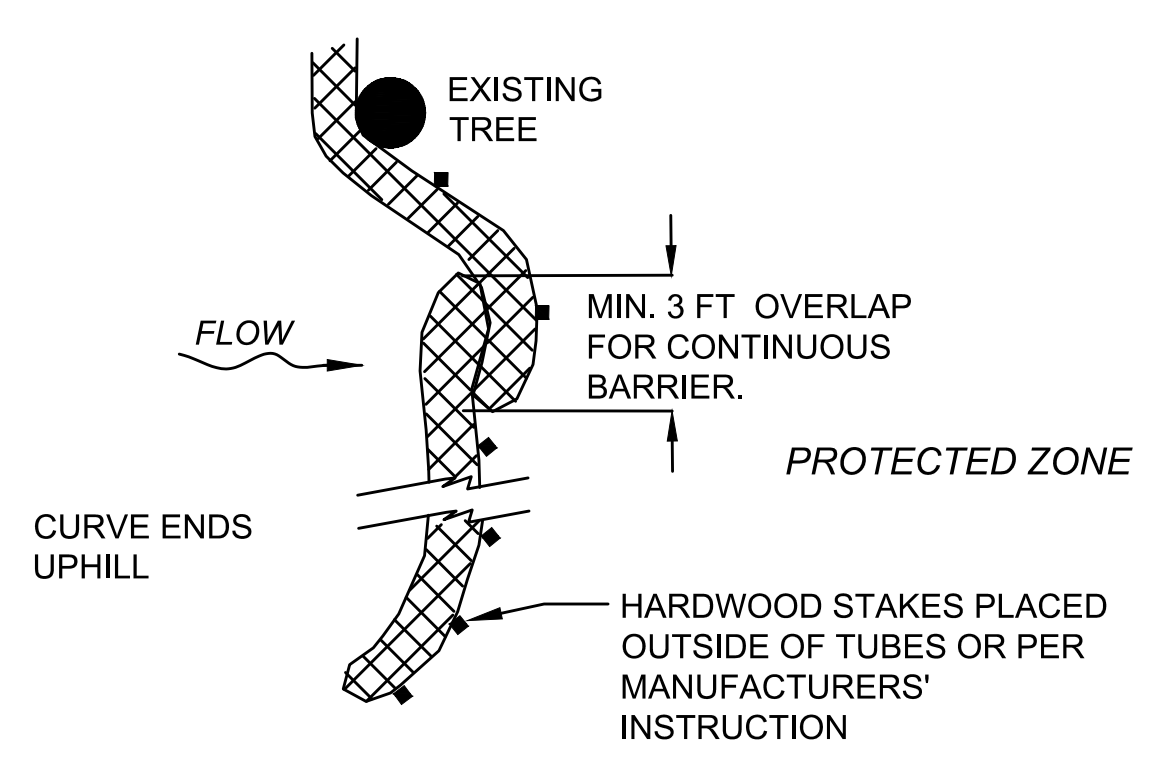


PLAN VIEW - FENCE PROTECTION OF ROOT ZONE

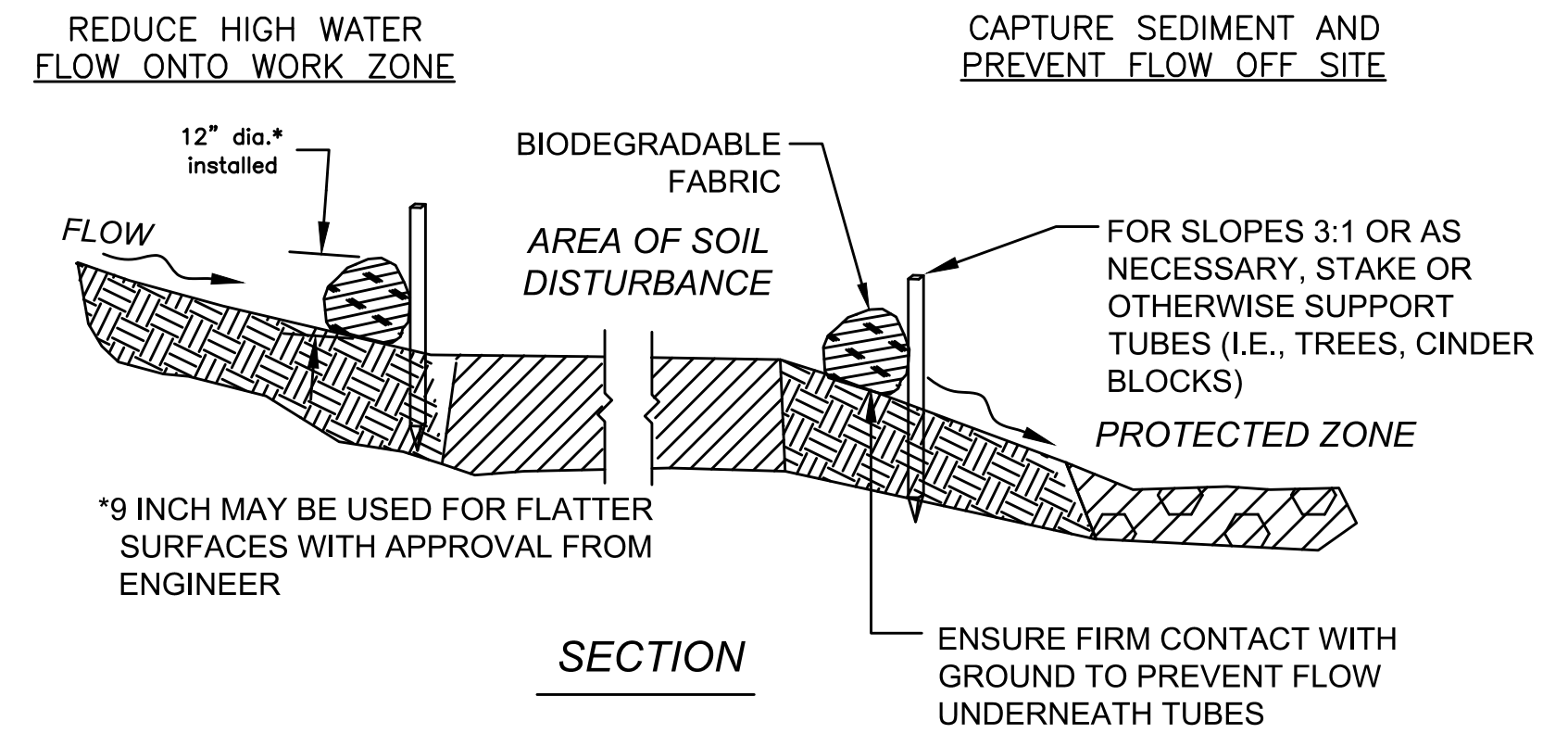


SECTION - TRUNK ARMORING & PRUNING

TREE PROTECTION - TRUNK



PLAN VIEW

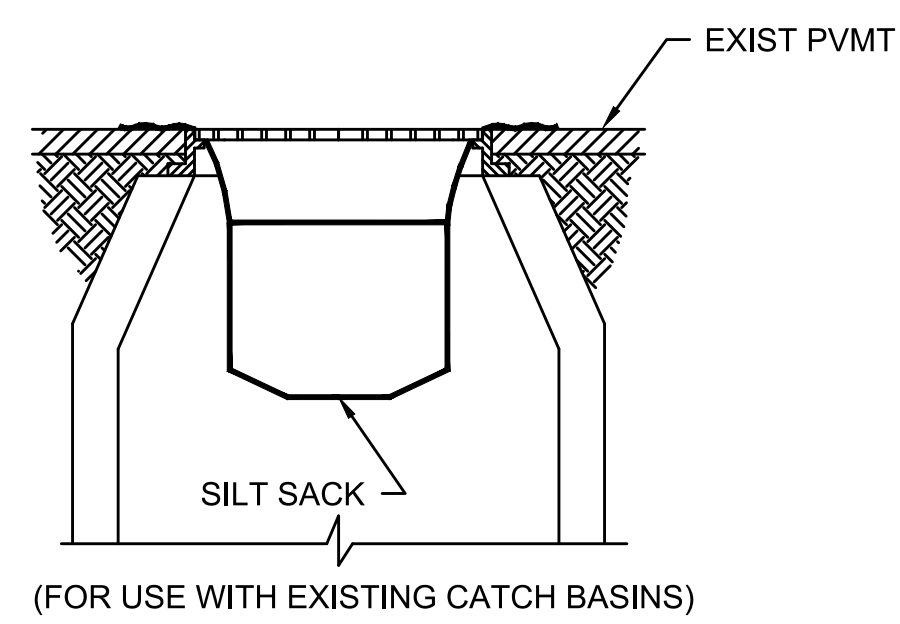


SECTION

SEDIMENT BARRIER - COMPOST FILTER TUBE

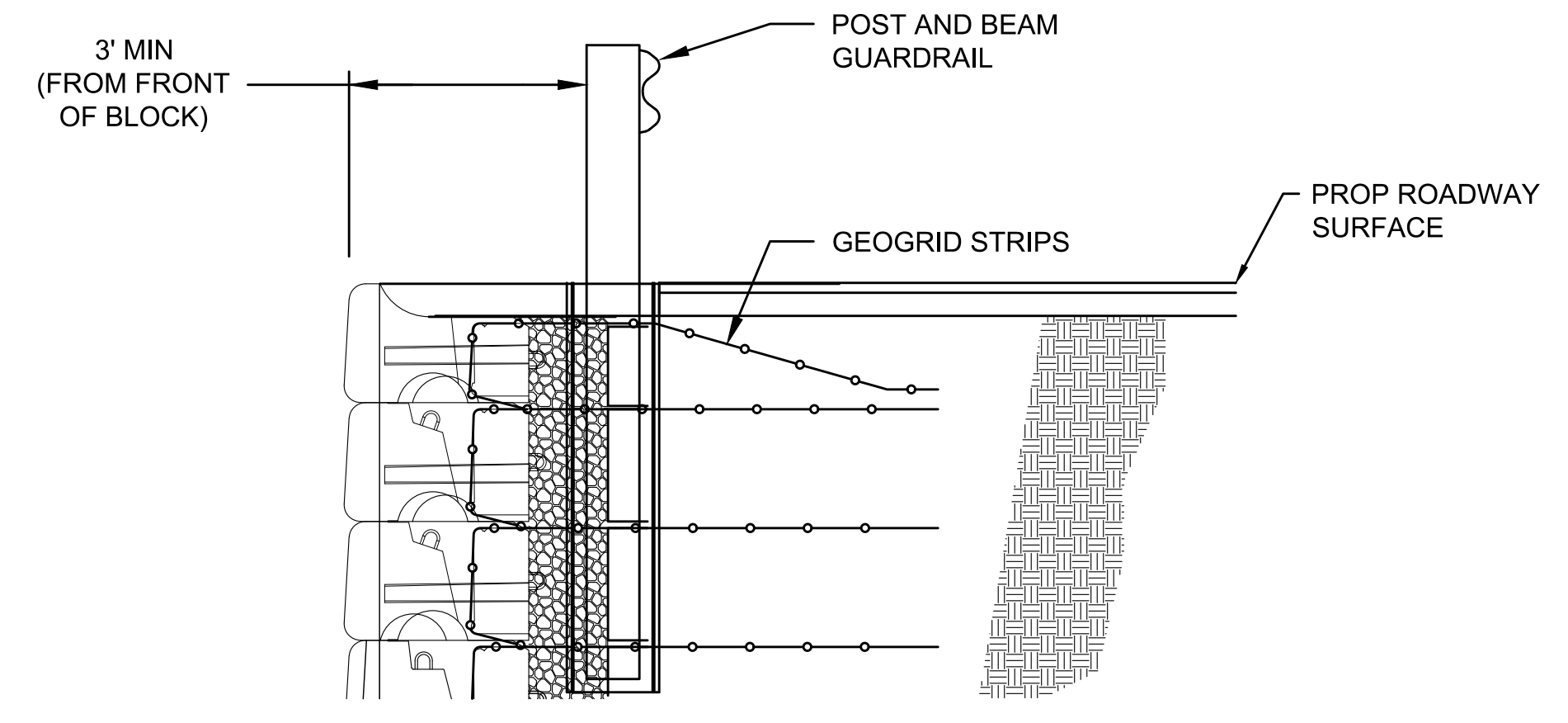
NOT TO SCALE

NOTES:
SILT SACKS SHALL BE PLACED IN ALL CATCH BASINS IN THE VICINITY OF NEW CONSTRUCTION. CATCH BASINS SHALL BE PROTECTED AS SHOWN, WITH MINIMUM WEEKLY MAINTENANCE, OR AS REQUIRED, AND REPLACED IF NECESSARY.



SILT SACK INLET PROTECTION

NOT TO SCALE



POST AND BEAM GUARDRAIL - SECTION VIEW

NOT TO SCALE