

Notice of Intent

Bridge Replacement Lockwood Lane over Fish Brook



**Boxford
July 2019**

Prepared by:



600 Unicorn Park Drive
Woburn, MA 01801

781-932-3201

www.baysideengineering.com



Bree Sullivan

Applicant:

Town of Boxford – Department of
Public Works
7B Spofford Road
Boxford, MA 01921

eDEP#1120434

NOTICE OF INTENT (NOI) – TABLE OF CONTENTS

BRIDGE REPLACEMENT LOCKWOOD LANE OVER FISH BROOK BOXFORD, MA

The following NOI items are included to assist in the review of this project.

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Attachment 1	USGS Map with Project Location
Attachment 2	Orthophoto with Project Location
Attachment 3	Natural Resource and NHESP Habitat Map
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Massachusetts Department of Environmental Protection

Bureau of Resource Protection - Wetlands

WPA Form 3 - Notice of Intent

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

Provided by MassDEP:
MassDEP File #:
eDEP Transaction #:1120434
City/Town:BOXFORD

A.General Information

1. Project Location:

a. Street Address 24 LOCKWOOD LANE
b. City/Town BOXFORD c. Zip Code 01921
d. Latitude 42.64518N e. Longitude 70.98904W
f. Map/Plat # N/A g.Parcel/Lot # N/A

2. Applicant:

Individual Organization

a. First Name CHRISTOPHER b.Last Name OLBROT
c. Organization TOWN OF BOXFORD DEPARTMENT OF PUBLIC WORKS
d. Mailing Address 7B SPOFFORD RD
e. City/Town BOXFORD f. State MA g. Zip Code 01921
h. Phone Number 978-325-6555 i. Fax 978-352-5558 j. Email colbrot@town.boxford.ma.us

3.Property Owner:

more than one owner

a. First Name b. Last Name
c. Organization TOWN OF BOXFORD DEPARTMENT OF PUBLIC WORKS
d. Mailing Address 7B SPOFFORD RD
e. City/Town BOXFORD f.State MA g. Zip Code 01921
h. Phone Number 978-325-6555 i. Fax 978-352-5558 j.Email colbrot@town.boxford.ma.us

4.Representative:

a. First Name BREE b. Last Name SULLIVAN
c. Organization BAYSIDE ENGINEERING, INC.
d. Mailing Address 600 UNICORN PARK DRIVE
e. City/Town WOBURN f. State MA g. Zip Code 01801
h.Phone Number i.Fax j.Email

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

a.Total Fee Paid 0.00 b.State Fee Paid 0.00 c.City/Town Fee Paid 0.00

6.General Project Description:

LOCKWOOD LANE OVER FISH BROOK/MILL RACE BRIDGE REPLACEMENT

7a.Project Type:

- 1. Single Family Home 2. Residential Subdivision
3. Limited Project Driveway Crossing 4. Commercial/Industrial
5. Dock/Pier 6. Utilities
7. Coastal Engineering Structure 8. Agriculture (eg., cranberries, forestry)
9. Transportation 10. Other

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

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1. Yes No If yes, describe which limited project applies to this project:
 2. Limited Project

8. Property recorded at the Registry of Deeds for:

a. County: **b. Certificate:** **c. Book:** **d. Page:**

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

1. Buffer Zone & Resource Area Impacts (temporary & permanent):

This is a Buffer Zone only project - 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)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. <input checked="" type="checkbox"/> Bank	30 1. linear feet	82 2. linear feet
b. <input checked="" type="checkbox"/> Bordering Vegetated Wetland	21 1. square feet	53 2. square feet
c. <input checked="" type="checkbox"/> Land under Waterbodies and Waterways	618 1. Square feet	645 2. square feet
	0 3. cubic yards dredged	
d. <input type="checkbox"/> Bordering Land Subject to Flooding	1. square feet	2. square feet
	3. cubic feet of flood storage lost	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	Fish Brook 1. Name of Waterway (if any)	
2. Width of Riverfront Area (check one)	<input type="checkbox"/> 25 ft. - Designated Densely Developed Areas only <input type="checkbox"/> 100 ft. - New agricultural projects only <input checked="" type="checkbox"/> 200 ft. - All other projects	
3. Total area of Riverfront Area on the site of the proposed project		10000 square feet
4. Proposed Alteration of the Riverfront Area:		
4815	4815	
a. total square feet	b. square feet within 100 ft.	c. square feet between 100 ft. and 200 ft.
5. Has an alternatives analysis been done and is it attached to this NOI?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6. Was the lot where the activity is proposed created prior to August 1, 1996?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

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

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
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 Beaches	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
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, crea.
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

Restoration/Replacement

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 entered the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

5.Projects Involves Stream Crossings

Project Involves Streams Crossings

If the project involves Stream Crossings, please enter the number of new stream crossings/number of replacement stream crossings.

□ **Massachusetts Department of Environmental Protection**

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Provided by MassDEP:

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a. number of new stream crossings

b. number of replacement stream crossings

C. Other Applicable Standards and Requirements

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 of Endangered Species program (NHESP)?

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

b. Date of map:2017 PRIORITY HABITAT

If yes, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18)...

c. Submit Supplemental Information for Endangered Species Review * (Check boxes as they apply)

1. Percentage/acreage of property to be altered:

(a) within Wetland Resource Area

.1 ACRE
percentage/acreage

(b) outside Resource Area

0
percentage/acreage

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

3. Project plans for entire project site, including wetland resource areas and areas outside of wetland 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

c. MESA filing fee (fee information available at: <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/mass-endangered-species-act-mesa/mesa-fee-schedule.html>)

Make check payable to "Natural Heritage & Endangered Species Fund" 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

d. OR Check One of the following

1. Project is exempt from MESA review. Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, <http://www.mass.gov/eea/agencies/dfg/dfw/laws-regulations/cmr/321-cmr-1000-massachusetts-endangered-species-act.html#10.14>; 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 Number

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.

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* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review...

2. For coastal projects only, is any portion of the proposed project located below the mean high waterline or in a fish run?
a. Not applicable - project is in inland resource area only

b. Yes No

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

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

North Shore - Hull to New Hampshire:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 S. Rodney French Blvd
New Bedford, MA 02744

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930

If yes, it 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.

3. 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 DEP Website for ACEC locations). **Note:** electronic filers click on Website.

b. ACEC Name

4. 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

5. 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

6. 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, Explain why the project is exempt:

1. Single Family Home

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

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housing project) with no discharge to Critical Areas.

D. Additional Information

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 by regular mail delivery.

- 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.
- 3. Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s)).
- 4. List the titles and dates for all plans and other materials submitted with this NOI.

a. Plan Title:	b. Plan Prepared By:	c. Plan Signed/Stamped By:	c. Revised Final Date:	e. Scale:
BRIDGE REPLACEMENT - LOCKWOOD LANE OVER FISH BROOK	BREE D. SULLIVAN	BAYSIDE ENGINEERING	July 10, 2019	SCALE VARIES
NOTICE OF INTENT SUPPORTING DOCUMENTATION	BREE D. SULLIVAN	BAYSIDE ENGINEERING, INC.	July 2019	

- 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.

□ **Massachusetts Department of Environmental Protection**
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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. Payer name on check: First Name	7. Payer name on check: Last Name

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

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 Section C, Items 1-3, above, refer to that section and the Instructions for additional submittal requirements.

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

Massachusetts Department of Environmental Protection
 Bureau of Resource Protection - Wetlands
WPA Form 3 - Notice of Wetland Fee Transmittal
Form
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
 MassDEP File #:
 eDEP Transaction #:1120434
 City/Town:BOXFORD

A. Applicant Information

1. Applicant:

a. First Name	CHRISTOPHER	b. Last Name	OLBROT		
c. Organization	TOWN OF BOXFORD DEPARTMENT OF PUBLIC WORKS				
d. Mailing Address	7B SPOFFORD RD				
e. City/Town	BOXFORD	f. State	MA	g. Zip Code	01921
h. Phone Number	9783256555	i. Fax	9783525558	j. Email	colbrot@town.boxford.ma.us

2. Property Owner:(if different)

a. First Name		b. Last Name			
c. Organization	TOWN OF BOXFORD DEPARTMENT OF PUBLIC WORKS				
d. Mailing Address	7B SPOFFORD RD				
e. City/Town	BOXFORD	f. State	MA	g. Zip Code	01921
h. Phone Number	9783256555	i. Fax	9783525558	j. Email	colbrot@town.boxford.ma.us

3. Project Location:

a. Street Address	24 LOCKWOOD LANE	b. City/Town	BOXFORD
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Are you exempted from Fee? (YOU HAVE SELECTED 'YES')

Note: Fee will be exempted if you are one of the following:

- City/Town/County/District
- Municipal Housing Authority
- Indian Tribe Housing Authority
- MBTA

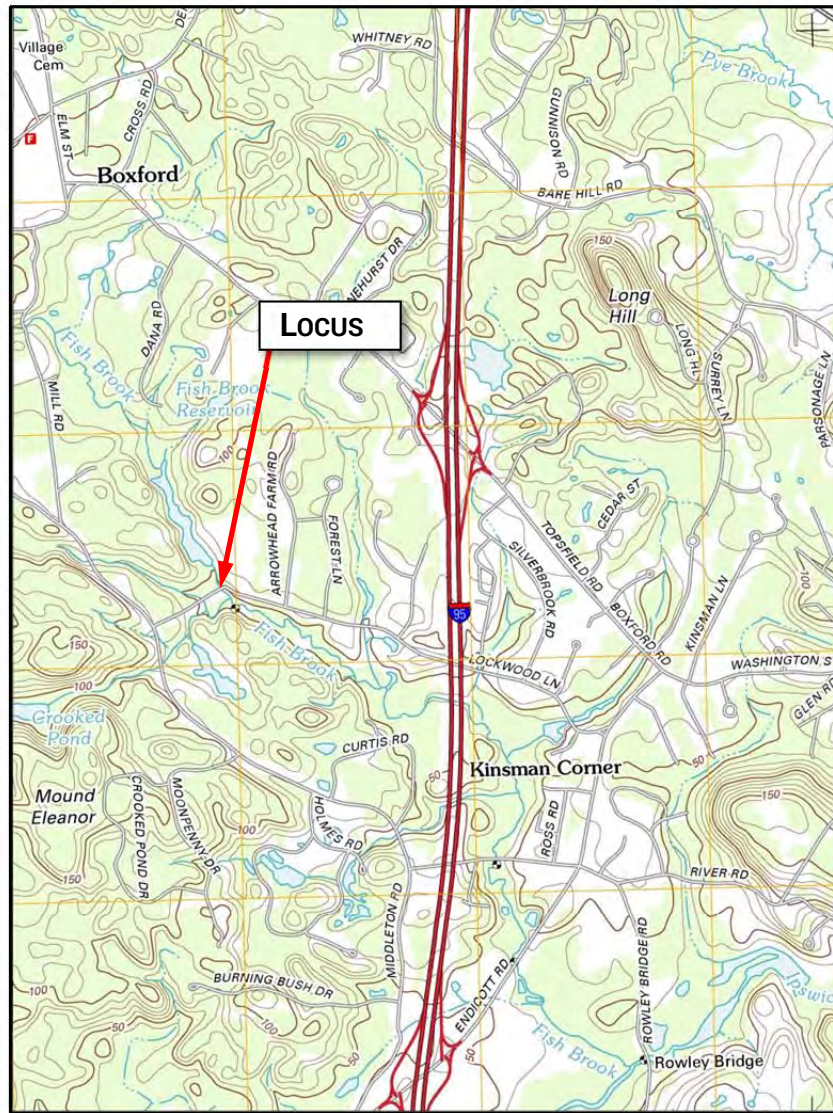
State agencies are only exempt if the fee is less than \$100

B. Fees

Activity Type	Activity Number	Activity Fee	RF Multiplier	Sub Total
		City/Town share of filling fee	State share of filing fee	Total Project Fee
		\$0.00	\$0.00	\$0.00

PROJECT LOCUS MAP

BRIDGE REPLACEMENT LOCKWOOD LANE OVER FISH BROOK BOXFORD, MA



Reference: USGS TopoQuad – Georgetown Quadrangle

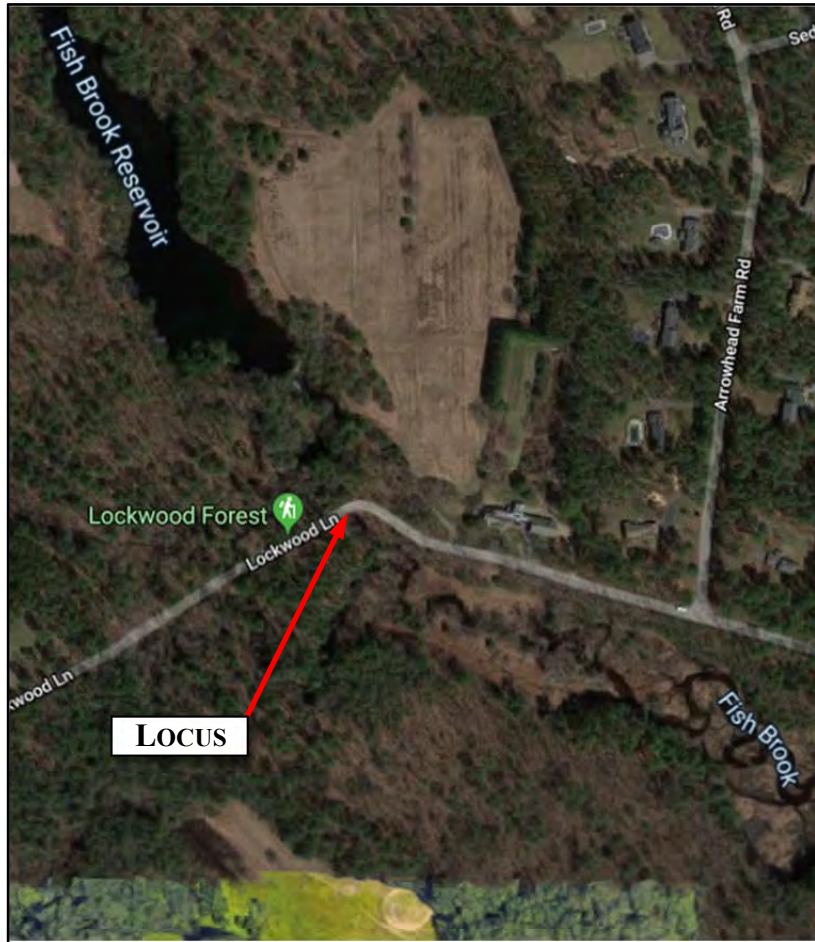


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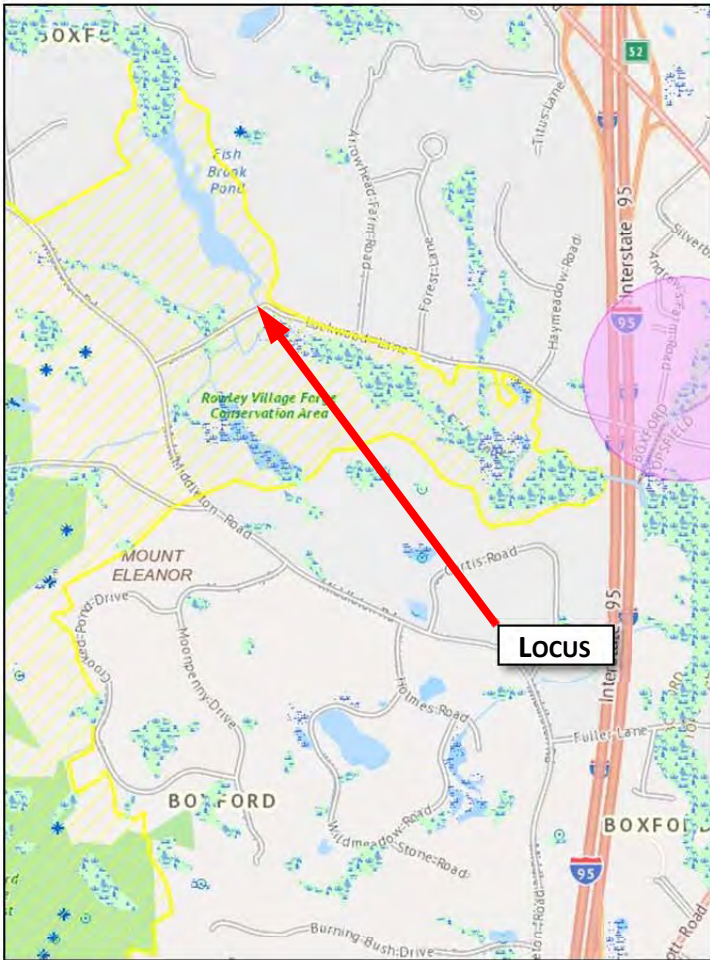
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BRIDGE REPLACEMENT LOCKWOOD LANE OVER FISH BROOK BOXFORD, MA







ENVIRONMENTAL RESOURCES

BRIDGE REPLACEMENT LOCKWOOD LANE OVER FISH BROOK BOXFORD, MA



Data Source: MassGIS OLIVER Data Viewer



NHESP Data

-  NHESP Priority Habitat of Rare Species
-  NHESP Estimated Habitat of Rare Wildlife
-  Certified Vernal Pool
-  Potential Vernal Pool




Wetlands

-  Marsh/Bog
-  Wooded Marsh
-  Cranberry Bog
-  Salt Marsh
-  Open Water
-  Reservoir w/PWSID
-  Tidal Flats
-  Beach/Dune

Regulated Areas

-  Zone II Well Area
-  IWPA

Outstanding Resource Waters (ORW)

-  ORW for ACEC
-  PWS Contributor
-  ORW for PWS and Other

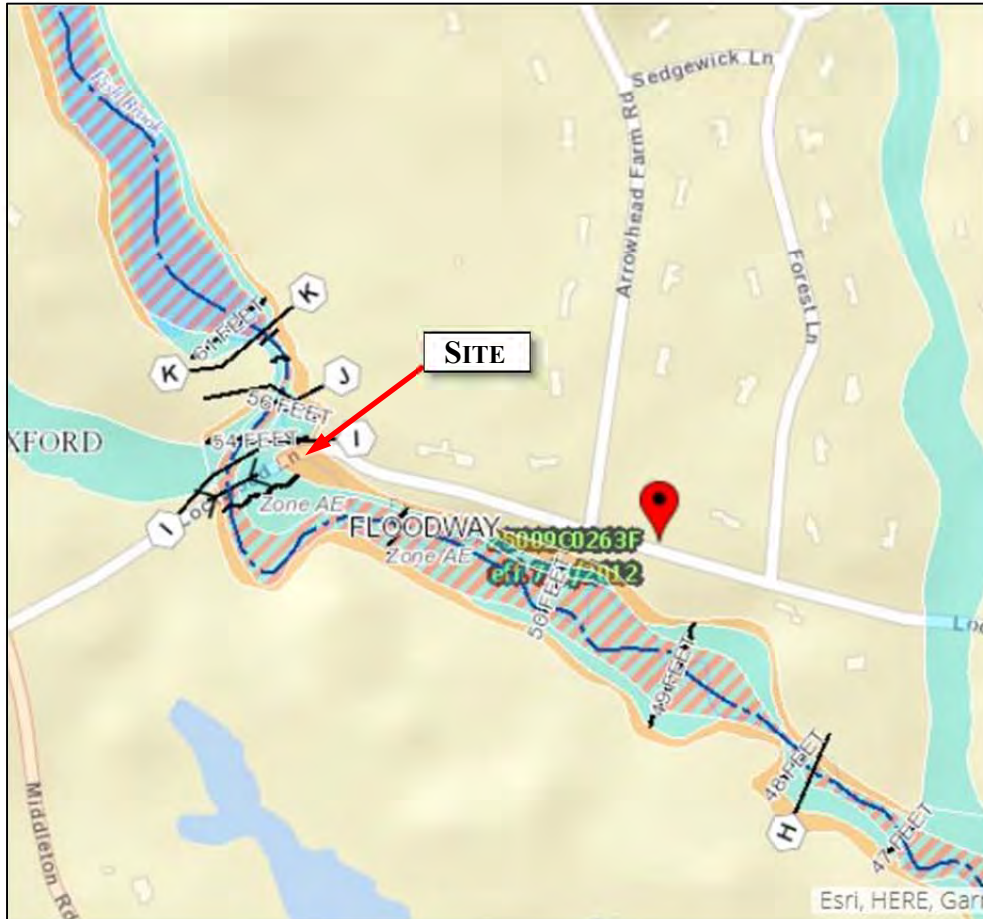


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FLOOD HAZARD ZONES

BRIDGE REPLACEMENT LOCKWOOD LANE OVER FISH BROOK BOXFORD, MA



Legend

-  1% Annual Chance Flood (100-year)
-  0.2% Annual Chance Flood (500-year)
-  Regulatory Floodway

Site Photos
Lockwood Lane over Fish Brook Bridge Replacement – Boxford



Photo No. 1 – Lockwood Lane looking East



Photo No. 2 – Lockwood Lane looking west

Site Photos
Lockwood Lane over Fish Brook Bridge Replacement – Boxford



Photo No. 3 – Looking north at upstream channel



Photo No. 4 – Looking south at downstream channel

Site Photos
Lockwood Lane over Fish Brook Bridge Replacement – Boxford



Photo No. 5 – North elevation



Photo No. 6 – South elevation

Site Photos
Lockwood Lane over Fish Brook Bridge Replacement – Boxford



Photo No. 7 – Downstream reference channel reach



Photo No. 8 – Upstream mill race dike/bank of main Fish Brook channel

Site Photos
Lockwood Lane over Fish Brook Bridge Replacement – Boxford



Photo No. 9 – Southwest bridge quadrant – 4 inch steel gas main



Photo No. 10 – Main Fish Brook Channel looking upstream

PROJECT DESCRIPTION

BRIDGE REPLACEMENT LOCKWOOD LANE OVER FISH BROOK BOXFORD, MA

Introduction

The Town of Boxford is planning to replace a bridge on Lockwood Lane over Fish Brook. The bridge is closed to vehicular traffic after a recent inspection revealed a serious condition that compromised the bridge structure. The replacement bridge will have a 21-foot span and meet the Massachusetts River and Stream Crossing Standards.

Existing Site Conditions

The crossing is located in Boxford on Lockwood Lane west of 28 Lockwood Lane. The existing bridge is constructed of prestressed concrete deck beams on fieldstone masonry abutments and has a 13-foot (approximate) clear span. The bridge currently has no wingwalls. The northeast bridge quadrant connects to a fieldstone masonry channel wall. A portion of the east abutment has collapsed as a result of channel scour. As a result, the bridge has been closed to vehicular traffic since December 21, 2018.

Fieldwork was performed to document existing site conditions including bordering vegetated wetland delineation, mean annual high water/ordinary high water, topographic survey, stream bankfull width measurements, stream grade control elements, streambed elements, and streambed material documentation.

A topographic survey of the site and surroundings was performed including 150 feet along the road to the north and 150 feet to the south. The stream was surveyed 250 feet upstream and downstream.

Existing Resource Areas

A wetland resource evaluation was performed by Rimmer Environmental Consulting, LLC on January 2, 2019. Based on this evaluation, the site includes following resource areas:

Riverfront Area - The bridge is located adjacent to an historic mill site and the resources are associated with a mill race. The main stem of Fish Brook is located approximately 200 feet west of the project site. The stream flows southwest from Fish Brook Pond through the project site.

With the exception of the upstream east bank, Bordering Vegetated Wetland (BVW) are located adjacent to the bank.

Bordering Land Subject to Flooding (BLSF) – The project is located within the 100-year floodplain, and as such is regulated under the state and local wetland regulations (see attachment 4).

NHESP Habitat – land south of Lockwood Lane includes mapped Estimated Habitat of Rare Wildlife or Priority Habitat according to the most recent MassGIS MDFW/NHESP data layer (see attachment 3).

For a detailed description of these areas, please refer to the Wetland Resource Evaluation in attachment 11.

Proposed Replacement

The project will include the following:

- Replacement of the existing bridge with a 21 foot span bridge consisting of cast-in-place concrete deck with spread deck beams and gravity abutments
- Installation of cast-in-place concrete wingwalls on all 3 of the corners of the new box culvert.
- Replacement of 150 feet of existing asphalt wearing course that spans over the culvert and into both roadway approaches.
- Installation of MASH performance-tested bridge and approach guardrails.
- Channel reconstruction under the bridge to correct scour.

Performance Standards

Commonwealth of Massachusetts

General

The following sections include how the project will comply with pertinent performance standards.

310 CMR 10.54 - Bank

- 4(a)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 accordance 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 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 existing channel has a measured bankfull width of 16 feet. The proposed culvert replacement has a clear span of 19.7 feet, which is greater than 1.2x the channel width. The existing bank is approximately 1 foot above the channel thalweg elevation. The proposed culvert lower chord is approximately 5 feet above the channel bottom. The proposed culvert replacement meets the performance standards.

310 CMR 10.55 - Bordering Vegetated Wetlands

- 4(a) *any proposed work in a Bordering Vegetated Wetland shall not destroy or otherwise impair any portion of said area.*

The project will include temporary impacts to BVW. The project will result in a 32 square foot increase in BVW.

- 2(d) *no project may be permitted which will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.59.*

The project occurs entirely within NHESP mapped habitat. Construction will occur in the fall which is usually a period of low flow. If necessary, the construction special provisions will include accommodation for the species of

concern in this area. The project has been filed and will be reviewed under MESA for impacts. Since the project will meet the stream crossing standards, the presumption is that it will not result in a “take” of habitat.

310 CMR 10.56 – Land Under Water Bodies and Waterways

4(a)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 existing channel has a measured bankfull width of 16 feet. The proposed culvert replacement has a clear span of 19.7 feet, which is greater than 1.2x the channel width. The existing bank is approximately 1 foot above the channel thalweg elevation. The proposed culvert lower chord is approximately 5 feet above the channel bottom. The proposed culvert replacement meets the performance standards.

310 CMR 10.57 – Land Subject to Flooding

(4)(a) Bordering Land Subject to Flooding

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.*

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.*

The land upstream (north) of the bridge site is within the 100-year flood zone (below elevation 56.3). The proposed replacement bridge hydraulic opening is substantially larger than the existing structure. This includes a reduction in historic roadway fill within the jurisdictional resource area. As such, the project will not restrict flow or adversely affect BLSF areas.

310 CMR 10.58 – Riverfront Area

- 4(a) Protection of Other Resource Areas. *The work shall meet the performance standards for all other resource areas within the riverfront area, as identified in 310 CMR 10.30 (Coastal Bank), 10.32 (Salt Marsh), 10.55 (Bordering Vegetated Wetland), and 10.57 (Land Subject to Flooding). When work in the riverfront area is also within the buffer zone to another resource area, the performance standards for the riverfront area shall contribute to the protection of the interests of M.G.L. c. 131, § 40 in lieu of any additional requirements that might otherwise be imposed on work in the buffer zone within the riverfront area.*
- 4(b) Protection of Rare Species. *No project may be permitted within the riverfront area which will have any adverse effect on specified habitat sites of rare wetland or upland, vertebrate or invertebrate species, as identified by the procedures established under 310 CMR 10.59 or 10.37, or which will have any adverse effect on vernal pool habitat certified prior to the filing of the Notice of Intent.*

The project occurs entirely within NHESP mapped habitat. Construction will occur in the fall which is usually a period of low flow. If necessary, the construction special provisions will include accommodation for the species of concern in this area. The project has been filed and will be reviewed under MESA for impacts. Since the project will meet the stream crossing standards, the presumption is that it will not result in a “take” of habitat.

- 4(c) Practicable and Substantially Equivalent Economic Alternatives. *There must be no practicable and substantially equivalent economic alternative to the proposed project with less adverse effects on the interests identified in M.G.L. c. 131 § 40.*

The alternatives evaluated for replacing the existing culvert include the following:

1. Do nothing;
2. Repair the abutments, replace the bridge superstructure and add channel armoring to prevent additional scour.
3. Replace the existing bridge with a new superstructure and abutments that meets the stream crossing general standards.

The evaluation of the above three alternates has resulted in the follow findings, respectively:

1. The “Do Nothing” option is not desirable because the existing bridge is closed to vehicular traffic. Because of structural deterioration, this option is likely to have additional impacts to resource areas with continued failures. The structure is currently a barrier to wildlife connectivity. The do

nothing option does not provide additional wildlife connectivity or storm resiliency.

2. Option 2 does not fully meet the stream crossing general standards. Overall this option would have less impact to the resource areas, in that it would require much less excavation, less pavement replacement and less slope grading. This option would also have a lower construction cost. It will also provide no change to wildlife connectivity. Because of these factors, this option is not desirable.
3. The “Replace the existing bridge with a new superstructure and abutments that meets the stream crossing general standards.” will allow the crossing to be opened to vehicular traffic, however, it will require greater work within wetlands, waterway, and buffer zones. This option would be the highest construction cost, but would provide for better wildlife connectivity compared to the preceding 2 options. The incremental cost associated with this option is negligible when compared to the benefits of providing a stream crossing that fully meets the General Standards.

Preferred Alternative

The alternatives analysis for this project based on the above factors has indicated that the “Replace the existing bridge with a new superstructure and abutments that meets the stream crossing general standards.” (Option 3) will meet the project objective and provide for increased wildlife connectivity. Overall, this option has a greater temporary resource area impact, however the benefits achieved by meeting the stream crossing general standards make it the option with the lowest overall adverse effects.

- 4(d) *No Significant Adverse Impact. The work, including proposed mitigation measures, must have no significant adverse impact on the riverfront area to protect the interests identified in M.G.L. c. 131, § 40.*
- (5) *Redevelopment within Previously Developed Riverfront Areas; Restoration and Mitigation. Notwithstanding the provisions of 310 CMR 10.58(4)(c) and (d), the issuing authority may allow work to redevelop a previously developed riverfront area, provided the proposed work improves existing conditions. Redevelopment means replacement, rehabilitation or expansion of existing structures, improvement of existing roads, or reuse of degraded or previously developed areas. A previously developed riverfront area contains areas degraded prior to August 7, 1996 by impervious surfaces from existing structures or pavement, absence of topsoil, junkyards, or abandoned dumping grounds.*
- 5(a) *At a minimum, proposed work shall 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 § 40. When a lot is previously developed but no portion of the riverfront area is degraded, the requirements of 310 CMR 10.58(4) shall be met.

Since the proposed work includes replacement of a stream crossing that is a barrier to wildlife with a stream crossing that meets the general standards, and the proposed work will be performed entirely on a previously developed area, thereby making conditions better, it can be presumed that the project will have no significant adverse impact.

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

Stormwater Management will be unchanged by the repairs. The stormwater management standards applicability is included in the notice of intent supporting documentation.

- 5(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, or not closer than existing conditions within 25 foot riverfront areas, except in accordance with 310 CMR10.58(5)(f) or (g).*

- 5(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, except in accordance with 310 CMR 10.58(5)(f) or (g).*

- 5(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, except in accordance with 310 CMR 10.58(5)(f) or (g).*

With the exception of minor embankment regrading, all proposed work occurs entirely within the existing roadway fill structure.

Town of Boxford Wetland Protection Regulations

§375-55 Freshwater wetlands

- E. *General performance standards. Any proposed work in a freshwater wetland shall not destroy or otherwise impair any portion of said area. The cutting of vegetation within a freshwater wetland in order to maintain a specific successional stage, such as a wet meadow, may be permitted at the Conservation Commission's sole discretion through the filing of a notice of intent and subsequent order of conditions, or as part of a management plan approved by the Commission for a Town-owned conservation property. In addition,*

and at its sole discretion, the Commission may issue an order of conditions allowing work which results in the loss of up to 5000 square feet of freshwater wetlands when said area is replaced in accordance with the following conditions and any additional, specific conditions the Commission deems necessary to ensure that the replacement area will function in a manner similar to the area that will be lost.

The project will result in no net loss of BVW.

- G. *Notwithstanding the provisions of § 375-55E(1) through (7) and § 375-55F, no project may be permitted which will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species as identified on the Natural Heritage and Endangered Species Program "Estimated Habitat Maps" on file with the Commission and identified under Section 10.59 of 310 CMR 10.00, as they may be amended.*

The project occurs entirely within NHESP mapped habitat. Construction will occur in the fall which is usually a period of low flow. If necessary, the construction special provisions will include accommodation for the species of concern in this area. The project has been filed and will be reviewed under MESA for impacts. Since the project will meet the stream crossing standards, the presumption is that it will not result in a "take" of habitat.

§375-58 *Riverfront area.*

- D. *Performance standards. Riverfront areas in Boxford are regulated by the same performance standards as those listed in the Massachusetts Wetlands Protection Act Regulations 310 CMR 10.58.4 through .6. In determining whether a river, stream, or brook should have riverfront area, no single criterion shall rule. The Conservation Commission shall weigh all criteria when designating riverfront area. The Conservation Commission has determined that riverfront areas can be designated and can be significant on rivers, streams or brooks even if water does not flow in said rivers, streams, or brooks throughout every year.*

See performance standards for 310 CMR 10.58.

Resource Area Impacts

The total maximum impacts from this project are anticipated to be as follows:

Bank/Riverfront

Riverfront Impact (4,815 s.f. 0'-100', 0 s.f. 100'-200')	4,815 s.f.
River bank added	52 l.f.
Temp river bank impact	30 l.f.
Replacement Bank	82 l.f.
Total riverfront impact (all occurs in previously altered riverfront)	4,815 s.f.

Bordering Vegetated Wetlands (BVW)

BVW Lost	1 s.f.
Temporary BVW Impact	20 s.f.
Total Temporary and Permanent BVW Impacts	21 s.f.
Replacement BVW	53 s.f.
NET Impact	+ 32 s.f.
Replication Ratio	2.5:1

Land Under Water (LUW)

LUW Lost	33 s.f.
LUW to BVW	10 s.f.
Temporary LUW Impacts	575 s.f.
Total Temporary and Permanent LUW Impacts	618 s.f.
Replacement LUW area	645 s.f.
NET Impact	+ 27 s.f.

Mitigation Measures

Mitigation measures are included with the project to protect the resource areas from damage during and after construction. Sediment and erosion control (BMPs) for this project include the following:

1. Sedimentation barriers shall be placed between proposed work and river.
2. Equipment refueling will not occur in areas where a spill might reach the resource areas.
3. Areas disturbed during construction will be stabilized to minimize erosion. Plantings and erosion control measures will be checked following each rain event up to one full year following construction, or until vegetation has been established.
4. Sediment and debris collected behind compost filter tubes logs, straw bales or silt fence will be removed from the site before such BMPs are removed.
5. Sedimentation barriers will not become de facto retaining walls during construction.
6. Construction work areas shall be restored to pre-existing conditions upon completion.

Stormwater Standards Applicability

The repair project is subject to the stormwater standards, however, all of the work occurs within existing developed areas, and no there will be no adverse effect on existing runoff characteristics. A completed stormwater checklist is included.

1. No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

There is no work proposed on any drainage systems, therefore, there are no new untreated stormwater outfalls proposed as part of this project.

2. Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.

There are no significant changes proposed to the impervious cover. As such, stormwater runoff peak discharge rates from the proposed development will not exceed pre-development rates.

3. Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

The post infiltration rates will be unchanged.

4. Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:

- a. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;*
- b. Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and*
- c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.*

There are no proposed changes to the impervious cover. There will be no change in TSS at the site.

5. For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated there under at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

This project is not a land use associated with higher potential pollutant loads.

6. *Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.*

The project is not located within a Zone II or Interim wellhead protection zone.

7. *A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

The entire project is a redevelopment. All existing stormwater discharges will remain unchanged.

8. *A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.*

The proposed design includes erosion and sediment controls to minimize the potential for sedimentation in down-gradient resource areas as outlined in this document and the construction plans.

9. *A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

An Operation and Maintenance Plan has been attached this document.

10. *All illicit discharges to the stormwater management system are prohibited.*
No known illicit discharges exist or are proposed on the site.

Abutter Notification

A Notification to Abutters form has been sent to all abutters within 250 feet of the project limits.



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



Bree Sullivan

Signature and Date

7/10/2019

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.

OPERATION AND MAINTENANCE AND POLLUTION PREVENTION PLAN

Construction Operations

The operation and maintenance plan for construction operations outlines the installation, inspection, cleaning, and upkeep necessary to keep the siltation and erosion control system in good repair and operating efficiently. It is a critical component to the success of the stormwater best management practices designed for construction work on the site. Construction erosion controls minimize the potential for sedimentation in downstream gradient resource areas and abutting properties.

Construction erosion controls cover a wide range of practices, including stabilizing the construction entrance roadway, installing compost filter tubes, and controlling erosion at catch basins (if applicable). The guiding principle for construction erosion control for this development is to minimize the volume of runoff and to minimize contact of stormwater with potential pollutants. Accepted construction management practices can reduce these stormwater pollutant loads and quantities.

The following construction best management practices (BMPs) for sediment and erosion control are included in this operation and maintenance plan.

1. Install compost filter tubes as shown on the plans and as required in the field to prevent sediment from leaving the limits of work.
2. Material stockpiles shall be stabilized with erosion control matting or temporary seeding whenever necessary.
3. Inspect and maintain BMPs at least weekly and after every major rainfall event.
4. Erosion control measures shall be maintained, repaired or replaced as required or at the direction of the Department of Public Works Director.
5. During periodic inspections, if sediment is found to be exiting the site, measures shall be taken to ensure sediment does not reach the resource areas.
6. The contractor shall comply with the General and Erosion Control Notes show on the plans and in the contract documents.
7. Measures shall be taken to control dust during construction.
8. Stabilize unvegetated areas, particularly slopes, which may be prone to erosion by using matting or an erosion control seed mixture.
9. Sediment shall be removed from barriers periodically. Silt fence, straw bales and/or filter tubes shall not be used as *de facto* retaining walls.
10. Remove and properly dispose of straw bales, silt fencing, and accumulated sediment following construction operations.

Developed Facilities

The Town of Boxford will assume responsibility for the maintenance and upkeep of the culvert location in accordance with their planned maintenance and inspection schedule. The operation and maintenance plan outlines the regular inspection and cleaning schedule necessary to keep the area in good repair and operating efficiently, and is a critical component of the success of the stormwater runoff erosion control for the proposed development.

Source controls reduce the types and concentrations of contaminants in stormwater runoff, which, in turn, improve water quality. Source controls cover a wide range of practices, including local bylaws and regulations, fertilizer management in residential areas, reduced road salting in winter, erosion and sediment controls at construction sites, and comprehensive snow management. The guiding principle for pollution prevention and control is to minimize the volume of runoff and to minimize contact of stormwater with potential pollutants.

Source Control

Sweeping

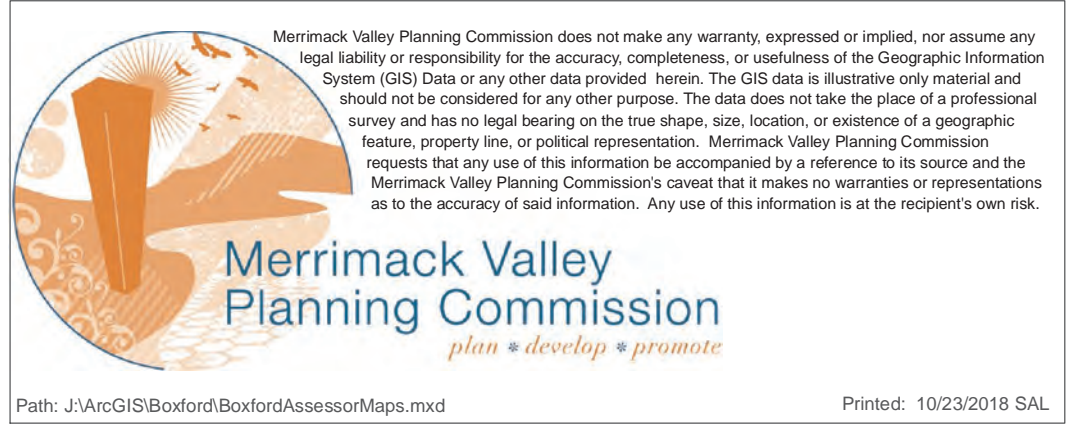
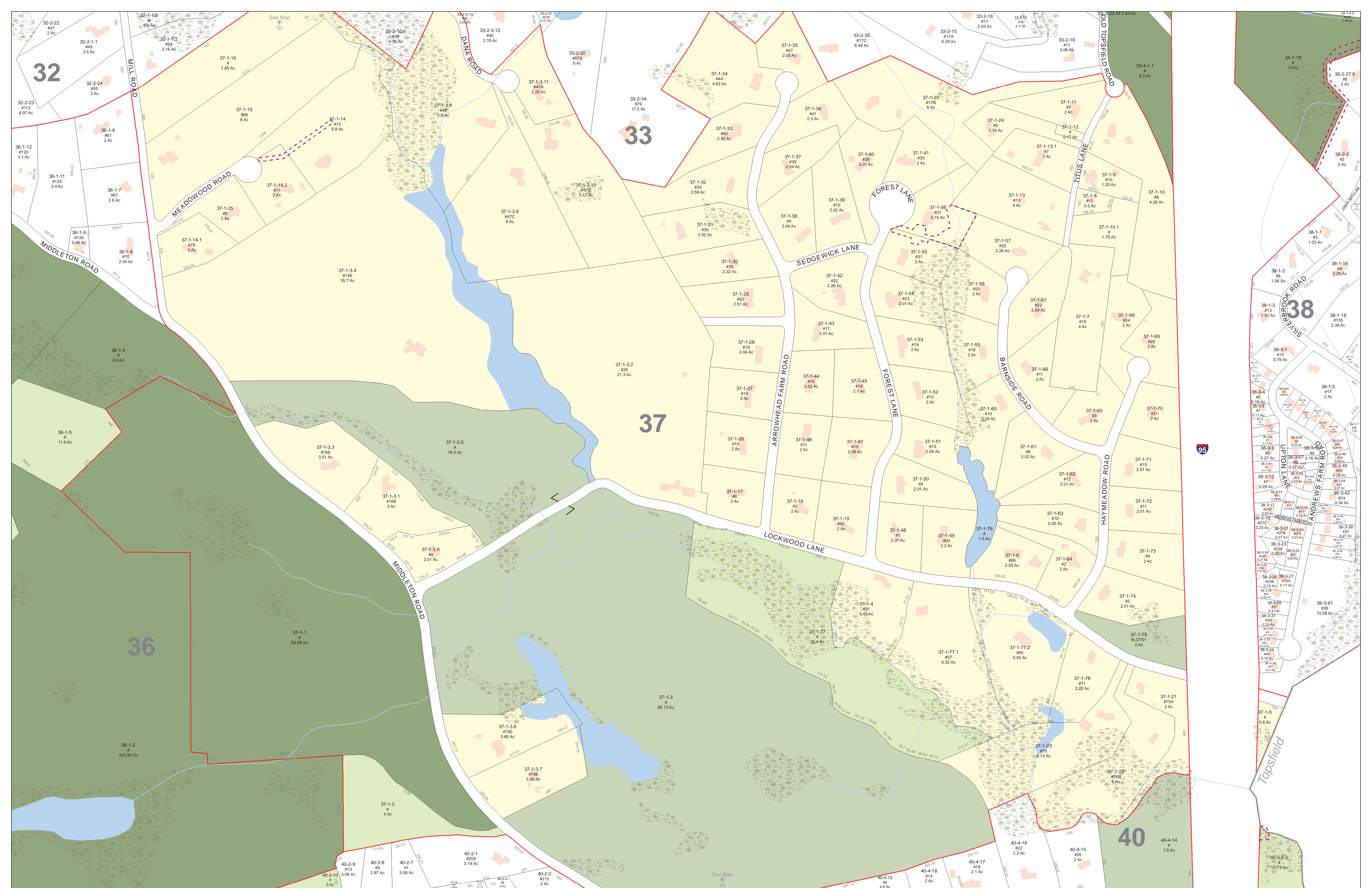
Street sweeping are an effective source control, and are implemented on an annual basis. Sweeping efforts are performed during the period immediately following winter snowmelt, when road sand and other accumulated sediment are washed off.

Snow and Snow Melt Management

Proper management of snow and snow melt, snow removal and storage, use of deicing compounds, and other practices can minimize major runoff and pollutant loading impacts. Use of alternative deicing compounds, such as calcium chloride and calcium magnesium acetate, can be investigated to further reduce the pollutant loading impacts. Groundcover shall be evaluated at least twice per year and reseeded if necessary.

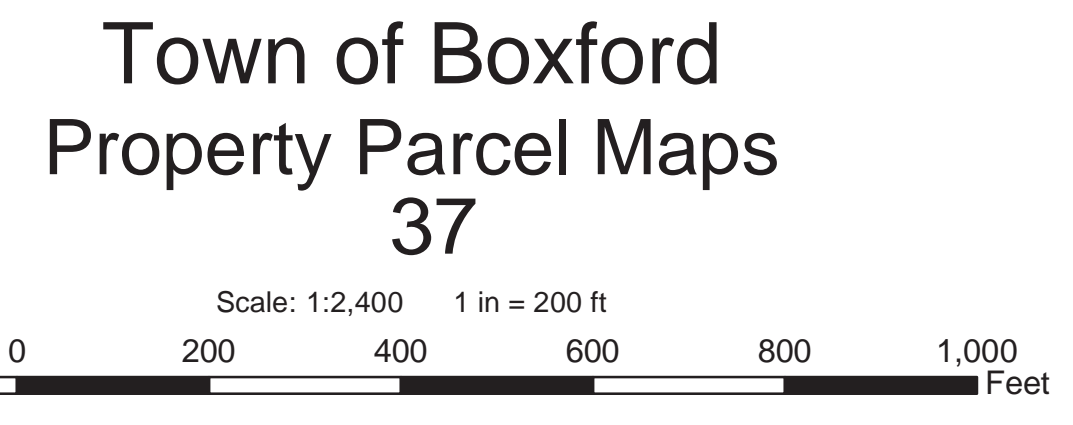
Vegetation Management

Proper management of roadway side slope vegetation is critical to ensuring the longevity of the roadway and to prevent erosion from developing in the vicinity of resource areas. Vegetated areas shall be inspected annually at a minimum. Areas found to be unstable shall be reseeded with a salt tolerant grass mix (for upland areas), or other seed mix appropriate for the soil structure and location.



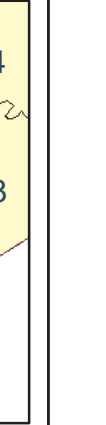
Notes
 This map is for assessment purposes only. It is not a valid document for legal description or conveyance. Lot dimensions were compiled from existing assessor maps and survey based plans. For legal determination please refer to parcel specific deeds or the Town of Boxford Assessor Office.
 * Wetlands Note: The wetlands shown on the map do not depict their actual extent or boundary. A wetlands scientist should be consulted if a delineation is required.

Town of Boxford
Property Parcel Maps
37



Legend

- Adjacent Maps
- Town Boundaries
- Map Boundaries
- Property Parcels
- Easements
- Building Footprint
- Hydrographic Features
- Streams
- Wetlands
- Commercial Land Use
- Industrial Land Use
- State
- County
- Municipal
- Private



TOWN OF BOXFORD

ABUTTER LIST

**PARCEL #37-1-3.2 (28 LOCKWOOD LANE) 250' and DIRECT POND ABUTTERS TO FISH BROOK
PREPARED FOR CONSERVATION COMMISSION**

PARCEL ID	PARCEL ADDRESS	OWNER 1	OWNER 2	MAILING ADDRESS	CITY/TOWN	STATE	ZIP CODE
37-01-03-10	47B DANA RD EXT	DEMARTINIS SALVATORE		47B DANA RD EXT	BOXFORD	MA	01921
37-01-03-2	28 LOCKWOOD LANE	MOORE BENJAMIN H		28 LOCKWOOD LANE	BOXFORD	MA	01921
37-01-03-4	146 MIDDLETON RD	LANGER MARY H TR	LANGER NOMINEE TRUST	146 MIDDLETON RD	BOXFORD	MA	01921
37-01-03-5	MIDDLETON RD	TOWN OF BOXFORD	CONS COM	7A SPOFFORD RD	BOXFORD	MA	01921
37-01-03-8	45 DANA RD EXT	VAZ JR ALFRED TE	VAZ HEATHER N	45 DANA RD	BOXFORD	MA	01921
37-01-03-9	47C DANA RD EXT	NOMINEE TRUST SERVICES, LLC TRUSTEE		47C DANA RD EXT	BOXFORD	MA	01921
37-01-03	MIDDLETON & LCKWD	TOWN OF BOXFORD	CONS COMM	7A SPOFFORD RD	BOXFORD	MA	01921
37-01-17	6 ARROWHEAD FARM RD	SOUCY CHARLES W	SUSAN C SOUCY	6 ARROWHEAD FARM RD	BOXFORD	MA	01921
37-01-26	10 ARROWHEAD FARM RD	CROWTHER ROBERT E TE	CROWTHER DOROTHEA H	10 ARROWHEAD FARM RD	BOXFORD	MA	01921
37-01-27	14 ARROWHEAD FARM RD	BARRY PATRICK G TR	BARRY BRENDA M	14 ARROWHEAD FARM RD	BOXFORD	MA	01921
37-01-28	18 ARROWHEAD FARM RD	FISCHER JANE K TRUSTEE		PO BOX 342	BOXFORD	MA	01921
37-01-29	20 ARROWHEAD FARM RD	KEARNEY CHRISTOPHER T TR	KEARNEY AMIE B TR	20 ARROWHEAD FARM RD	BOXFORD	MA	01921
37-01-30	26 ARROWHEAD FARM RD	FRANKLIN MEREK S	FRANKLIN JULIANNE	26 ARROWHEAD FARM RD	BOXFORD	MA	01921
37-01-31	30 ARROWHEAD FARM RD	CARNES BARRY S TRUSTEE	ARROWHEAD FARM ROAD RLTY TR	30 ARROWHEAD FARM RD	BOXFORD	MA	01921
37-01-32	34 ARROWHEAD FARM RD	HERR NATHAN R	PLUNKETT KARA C	34 ARROWHEAD FARM RD	BOXFORD	MA	01921
37-01-77	LOCKWOOD LANE	BTA/BOLT INC		7 ELM STREET	BOXFORD	MA	01921

CERTIFIED COPY


JULY 8, 2019



Wetland Resource Evaluation Lockwood Lane Culvert Boxford, MA January 11, 2019

Rimmer Environmental Consulting, LLC (REC) conducted field investigations on January 2, 2019 to evaluate and delineate the location and extent of wetland resources subject to jurisdiction under the Massachusetts Wetlands Protection Act (MGL Ch. 131 s. 40) and the Town of Boxford Wetlands Protection Bylaw in the vicinity of a closed bridge over a tributary of Fish Brook on Lockwood Lane. The location of the project site is indicated in Figure 1 below.

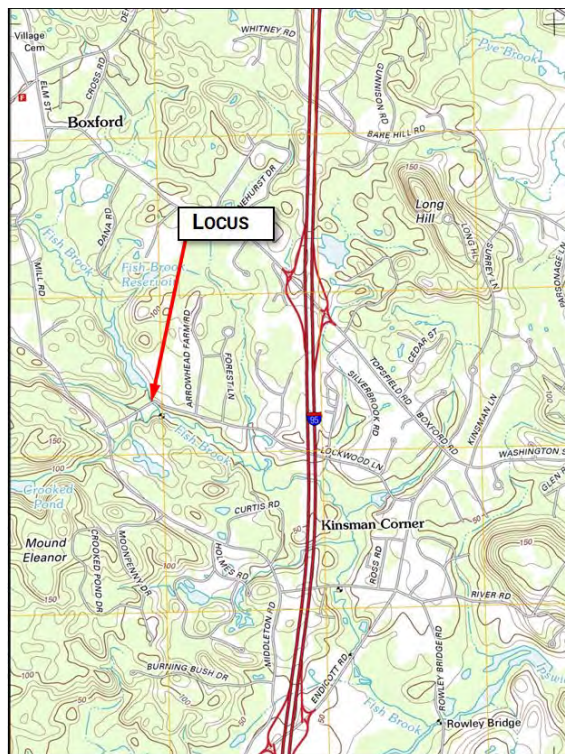


Fig. 1: USGS Topo Site Locus

Wetlands were evaluated in accordance with the procedures established in the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) and the Town of Boxford Wetlands Bylaw Regulations. Numbered sequences of flags were placed in the field to delineate the boundary of vegetated wetlands. The presence of 50% or more

wetland plant species and other indicators of hydrology, including hydric soils, were used to establish the wetland boundary.

The following wetland resources were determined to be present within the project site:

Riverfront Area:

The bridge is located adjacent to an historic mill site and the resources are associated with a mill race. The main stem of Fish Brook is located approximately 200 feet west of the project site. The stream flows southwest from Fish Brook Pond through the project site. Wetland flags MHW1-MHW10 and MHW20-MHW24 delineate the limits of mean annual high water and Bank resource on the downstream side of the bridge, west and east banks respectively. Flags E1-E10 and D1-D4 delineate mean annual high water and Bank on the upstream west and east Banks. Mean annual high water was identified through observation of bankfull conditions, including changes in slope, scour marks, water marks and changes in vegetation, in accordance with the methods established in 310 CMR 10.58 (2). The stream was flowing at the time of observation.

Bordering Vegetated Wetland (BVW):

Wetland Flags A1-A13 and C1-C13 delineate the limits of BVW extending from the west and east banks respectively on the downstream side of the bridge while flags A14-A24 delineate wetlands on the west bank upstream side of the culvert. There was no BVW on the east bank upstream side. The wetland consists of a forested swamp containing green ash (*Fraxinus pennsylvanica*) and hemlock (*Tsuga canadensis*) with an understory of highbush blueberry (*Vaccinium corymbosum*), speckled alder (*Alnus rugosa*), silky dogwood (*Cornus amomum*), and glossy buckthorn (*Frangula alnus*) with cinnamon fern (*Osmunda cinnamomea*) as groundcover. The adjacent upland is a forested community of shagbark hickory (*Carya ovata*), red oak (*Quercus rubra*), white pine (*Pinus strobus*) with multiflora rose (*Rosa multiflora*) and asiatic bittersweet (*Celastrus orbiculatus*) in the understory.

Bordering Land Subject to Flooding (BLSF):

FEMA maps indicate the project site is within a Zone A, 100-year floodplain as indicated in Figure 2 below. No elevation is provided, but the portion of this floodplain that extends horizontally beyond the delineated BVW described above is regulated under state and local wetland regulations as BLSF.



Fig. 2: FEMA Flood Map

Other Resources:

The south side of Lockwood Lane is located within Estimated Habitat of Rare Wetlands Wildlife and Priority Habitat as determined by reference to the most recently available data from the Massachusetts Division of Fisheries and Wildlife – Natural Heritage and Endangered Species Program (NHESP) available on MassGIS and as indicated in Figure 3 below. Prior notification to NHESP is required prior to alterations of this area.

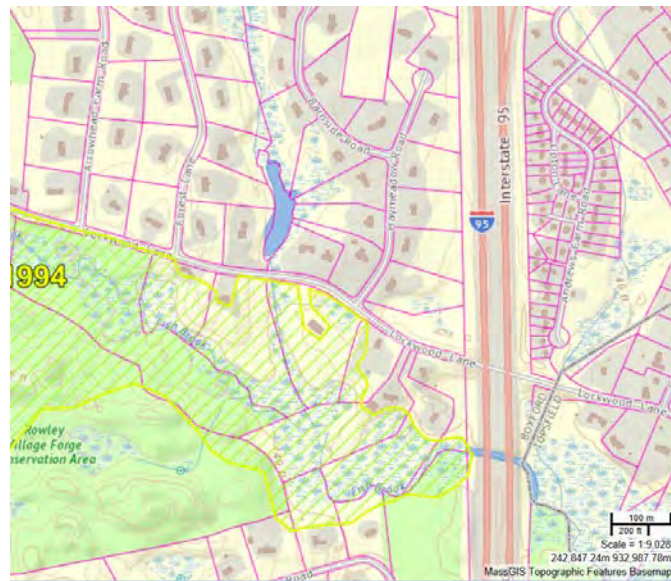


Fig. 3: NHESP Priority Habitat Map