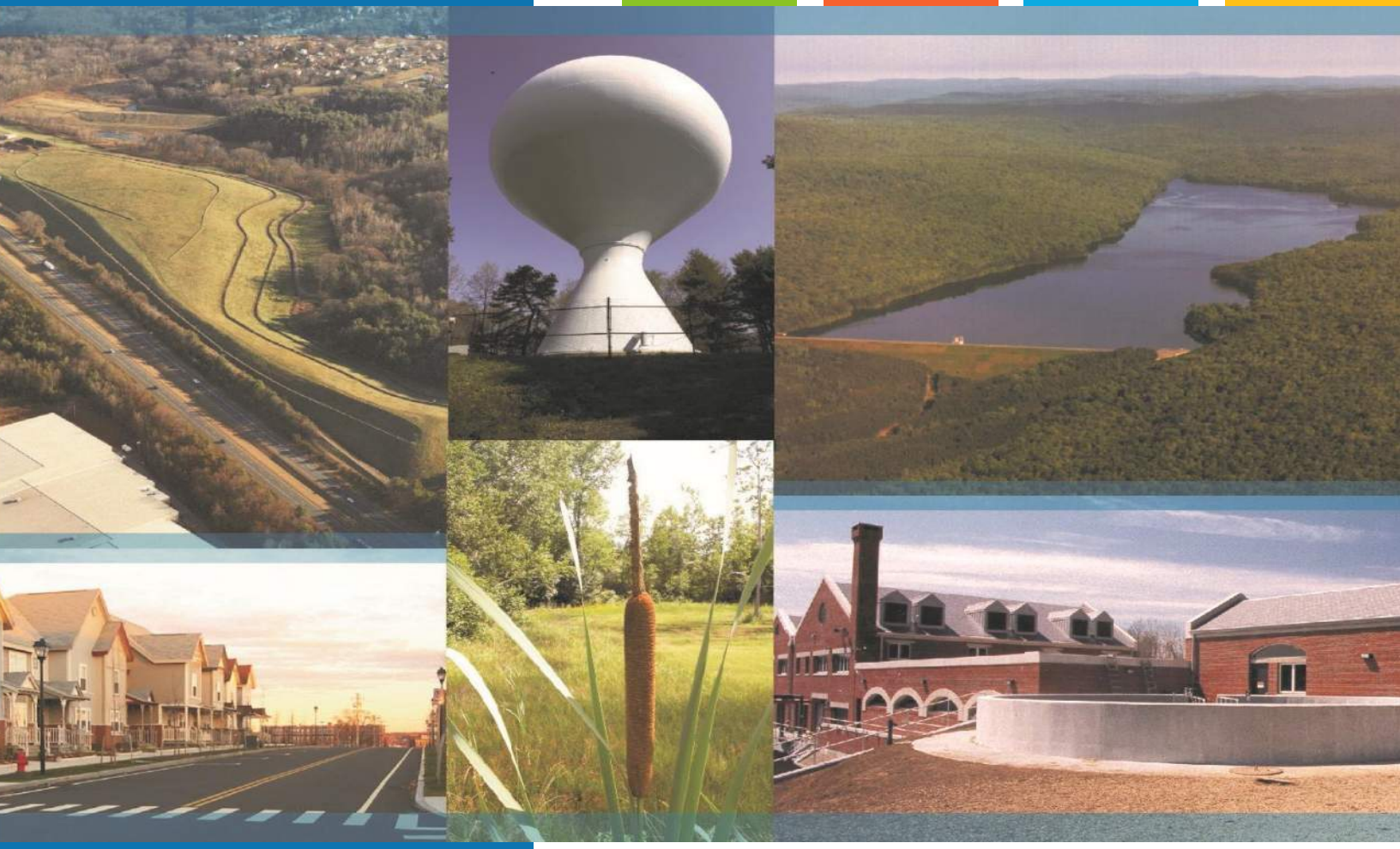

Frog Pond Rehabilitation
Littleton, Massachusetts

NOTICE OF INTENT

Town of Littleton Highway Department

June 2025

Tighe&Bond

L-0783-024
June 30, 2025

Littleton Conservation Commission
Attn: Mr. Tim Pearson
37 Shattuck Street
Littleton, Massachusetts 01460

Re: **Notice of Intent – Frog Pond Rehabilitation**
0 Lake Shore Drive & 0 Lake Drive, Littleton, Massachusetts

Dear Members of the Commission:

On behalf of the Town of Littleton Department of Public Works, Tighe & Bond respectfully submits this Notice of Intent (NOI) for the rehabilitation of the stormwater wetland known as Frog Pond at 0 Lake Shore Drive and 0 Lake Drive in Littleton, Massachusetts. The proposed rehabilitation of Frog Pond will improve its ability to effectively treat stormwater runoff before it enters Long Pond. The project includes removal of sediment that has accumulated since the installation of the wetland in 2003. Additionally, the existing paver walkway which is in poor condition will be reinstalled.

Work is proposed within Bordering Vegetated Wetlands (BVW), Bank, Land Under Water and Waterways, and the 100-foot buffer zone associated with BVW and Bank. Therefore, this NOI is being filed under the Massachusetts Wetlands Protection Act (WPA; M.G.L. c. 131 § 40) and its associated regulations (310 CMR 10.00) and the Town of Littleton Wetlands Protection Bylaw (Wetlands Bylaw; Chapter 171) and its associated regulations.

Enclosed, please find a completed application for your review, along with a project narrative, project figures and drawings, and other required materials. As this is a municipal project proposed by the Littleton Highway Department, the project is exempt from WPA and local filing fees.

We look forward to discussing this project with you at the Littleton Conservation Commission's next meeting on July 22, 2025. If you have any questions or require any additional information, please contact me at (508) 380-7022 or via email at MJohnsenberg@tighebond.com, or contact Natalie Koncki at (508) 304-6360 or ngkoncki@tighebond.com.

Very truly yours,

TIGHE & BOND, INC.

Maria Johnsenberg
Project Manager

Copy: MassDEP, (NERO) Division of Wetlands and Waterways
Stehpen Jahnle, Littleton Department of Public Works

Tighe&Bond

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WPA Form 3

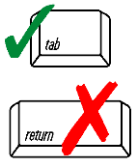
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:
MassDEP File Number
Document Transaction Number
Littleton
City/Town

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



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

A. General Information

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

0 Lake Drive (Parcel1) & 0 Lake Shore Drive (Parcel 2) — a. Street Address
Littleton — b. City/Town
01460 — c. Zip Code
Latitude and Longitude:
42.53364 — d. Latitude
-71.46639 — e. Longitude
Parcel 1: Map U12, Lot 22 — f. Assessors Map/Plat Number
Parcel 2: Map U12, Lot 15 — g. Parcel /Lot Number

2. Applicant:

Stephen — a. First Name
Jahnle — b. Last Name
Littleton Department of Public Works — c. Organization
39 Ayer Road — d. Street Address
Littleton — e. City/Town
MA — f. State
01460 — g. Zip Code
h. Phone Number
i. Fax Number
j. Email Address

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

N/A — 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):

Maria — a. First Name
Johnsenberg — b. Last Name
Tighe & Bond, Inc. — c. Company
120 Front Street, Suite 700 — d. Street Address
Worcester — e. City/Town
MA — f. State
01608 — g. Zip Code
508-380-7022 — h. Phone Number
i. Fax Number
mjohnsenberg@tighebond.com — j. Email address

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

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

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Littleton
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A. General Information (continued)

6. General Project Description:

Rehabilitate the stormwater wetland ("Frog Pond") to improve its ability to effectively treat stormwater runoff before it enters Long Pond and re-install the existing paver walkway.

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)

2. Limited Project Type

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

8. Property recorded at the Registry of Deeds for:

Middlesex	
a. County	b. Certificate # (if registered land)
Parcel 1: Book 14695, Page 9	Parcel 2: Book 12718, Page 688
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.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

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

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

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☒ Bank	235 (temporary) — 1. linear feet	235 (in situ) — 2. linear feet
b. ☒ Bordering Vegetated Wetland	1,460 (temporary) — 1. square feet	1,460 (in situ) — 2. square feet
c. ☒ Land Under Waterbodies and Waterways	3,315 (temporary) — 1. square feet 99 — 3. cubic yards dredged	3,315 (in situ) — 2. square feet

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

4. Proposed alteration of the Riverfront Area:

a. total square feet _____ b. square feet within 100 ft. _____ c. square feet between 100 ft. and 200 ft. _____

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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Provided by MassDEP:

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City/Town

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

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

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

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

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

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

a. square feet of BVW

b. square feet of Salt Marsh

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings

b. number of replacement stream crossings

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C. Other Applicable Standards and Requirements

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

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

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

   a. ☐ Yes ☒ No

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

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

   August 1, 2021
   b. Date of map

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

   c. Submit Supplemental Information for Endangered Species Review*

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

         (a) within wetland Resource Area _____ percentage/acreage

         (b) outside Resource Area _____ percentage/acreage

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

2. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

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

   (b) ☐ Photographs representative of the site

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

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

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

(c) ☐ MESA filing fee (fee information available at https://www.mass.gov/how-to/how-to-file-for-a-mesa-project-review).
Make check payable to "Commonwealth of Massachusetts - NHESP" and ***mail to NHESP*** at above address

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

(d) ☐ Vegetation cover type map of site

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

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, https://www.mass.gov/service-details/exemptions-from-review-for-projectsactivities-in-priority-habitat; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

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

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

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

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

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

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

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: dmf.envreview-south@mass.gov

North Shore - Plymouth to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: dmf.envreview-north@mass.gov

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

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

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

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

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Littleton
City/Town

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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Provided by MassDEP:
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Littleton
City/Town

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.

Constructed Wetland Rehabilitation Assistance
a. Plan Title

Tighe & Bond, Inc. | Brian S. Huntley & Jean Christy
b. Prepared By | c. Signed and Stamped by

June 2025 | 1" = 20'
d. Final Revision Date | e. Scale

f. Additional Plan or Document Title | g. Date

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

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

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

8. ☒ Attach NOI Wetland Fee Transmittal Form

9. ☒ Attach Stormwater Report, if needed.

E. Fees

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

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

2. Municipal Check Number | 3. Check date

4. State Check Number | 5. Check date

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

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Littleton
City/Town

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: 6/30/25

3. Signature of Property Owner (if different) Maria Johnsenberg — 4. Date: 6/30/2025

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

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

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

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

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

Tighe&Bond

Filing Fee Documentation

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

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

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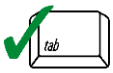


A. Applicant Information

1. Location of Project:

0 Lake Drive & 0 Lake Shore Drive	Littleton
a. Street Address	b. City/Town
N/A - Fee Exempt	N/A - Fee Exempt
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Stephen	Jahnle
a. First Name	b. Last Name

Littleton Highway Departmnet
c. Organization

39 Ayer Road
d. Mailing Address

Littleton	MA	01460
e. City/Town	f. State	g. Zip Code

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

3. Property Owner (if different):

N/A	
a. First Name	b. Last Name

c. Organization

d. Mailing Address

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

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

B. Fees

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

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

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

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

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

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

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

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

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

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

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
N/A - Fee Exempt			$0.00

Step 5/Total Project Fee: $0.00

Step 6/Fee Payments:

Total Project Fee:	$0.00 a. Total Fee from Step 5
State share of filing Fee:	$0.00 b. 1/2 Total Fee **less $**12.50
City/Town share of filling Fee:	$0.00 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.)

Tighe&Bond

Narrative

Section 1
Introduction

This Notice of Intent (NOI) is being submitted on behalf of the Littleton Department of Public Works (Littleton DPW) for the rehabilitation of the stormwater wetland known as "Frog Pond" at 0 Lake Shore Drive and 0 Lake Drive in Littleton, Massachusetts (Figure 1 in Appendix A). The proposed rehabilitation of Frog Pond will improve its ability to effectively treat stormwater runoff before it enters Long Pond. The project includes removal of sediment that has accumulated since the installation of the wetland in 2003. Additionally, the existing paver walkway which is in poor condition will be re-installed.

Since the proposed project is within Bank, Bordering Vegetated Wetlands (BVW), Land Under Water Bodies and Waterways (LUW), and the 100-foot buffer zone associated with BVW, it requires permitting under the Massachusetts Wetlands Protection Act (WPA; M.G.L. c. 131 § 40) and its associated regulations (310 CMR 10.00) and the Town of Littleton Wetlands Protection Bylaw (Wetlands Bylaw; Chapter 171) and its associated regulations.

1.1 Background and Purpose

1.1.1 Frog Pond Stormwater Wetland

Using funding obtained through the Section 319 Nonpoint Source Competitive Grants Program, a constructed stormwater wetland was installed northeast of Long Pond at the intersection of Lake Drive and Lake Shore Drive in 2002-2003 to treat stormwater runoff and reduce the nutrient load entering Long Pond. Since its installation, the stormwater management system's ability to effectively treat runoff has declined due to lack of maintenance. Tighe & Bond has been retained by the Town of Littleton to restore the constructed stormwater wetland to allow it to function as originally intended.

The sediment forebay has been particularly impacted by the lack of routine maintenance. Acting as a pretreatment device for all stormwater runoff entering the constructed wetland system, the sediment forebay has seen an accumulation of debris and sediment over time. Based on a 2022 study conducted by Geosyntec, sediment depths in the forebay vary between 3 and 28 inches. Operation and maintenance guidance provided by Geosyntec states that "removal of accumulated sediment should be undertaken once depths reach 1 foot in depth". It is understood that to restore the forebay to its intended operable condition, sediment must be removed as part of routine maintenance activities.

1.1.2 Frog Pond Walkway

In addition to the sediment forebay rehabilitation, funding for replacing the existing paver walkway around Frog Pond was approved during the Town of Littleton's Spring 2025 Town Meeting. The project seeks to improve the walkway conditions by replacing the deteriorating pathway with more durable pavers, address ongoing flooding issues by adding boardwalk sections, and generally bring the walkway more into compliance with Americans with Disabilities Act (ADA) standards. This effort is proposed to take place immediately following the sediment forebay rehabilitation work. Refer to the funding application in Appendix F for further details.

1.1.3 Frog Pond Invasive Plant Management

In addition to the sediment forebay rehabilitation and walkway re-installation, funding for an invasive plant management program around Frog Pond was approved during the Town of Littleton's Spring 2025 Town Meeting. The project seeks to restore and preserve the natural habitat at the Frog Pond site and will target multiple invasive plant species. This effort will not be discussed further in this NOI, but will begin in conjunction with the site restoration work described in Section 3.4. Refer to the funding application in Appendix F for further details.

1.2 Stormwater Management Systems Under the WPA

Per 310 CMR 10.02(2)(c):

> *… stormwater management systems designed, constructed, installed, operated, maintained, and/or improved as defined in 310 CMR 10.04 in accordance with the* Stormwater Management Standards *… do not by themselves constitute Areas Subject to Protection…*

Although they may not constitute jurisdictional areas, with appropriate permitting, stormwater management systems can be constructed within jurisdictional areas and, for the purposes of this NOI, the Frog Pond stormwater wetland is considered jurisdictional.

Per 310 CMR 10.02(3), the maintenance of such a system, provided that the work meets certain requirements, "*is not subject to regulation under M.G.L. c. 131, § 40.*" Per 310 CMR 10.04, maintenance of a stormwater management system is defined as "*work to keep a stormwater management system functional and in good repair so that it may continue to operate as originally designed.*" As previously discussed, sediment removal (up to 1 foot in depth) from the forebay is part of the recommended routine maintenance of the Frog Pond stormwater wetland. Therefore, the proposed work would typically not require an Order of Conditions (OOC) from the Littleton Conservation Commission. However, in this instance, since more than one foot of sediment has been allowed to accumulate, the proposed work is no longer simply routine maintenance and the Littleton DPW is seeking an OOC to perform the work.

Section 2
Existing Environment

This section provides a site description and jurisdictional resources characterization for the project area at 0 Lake Shore Drive and 0 Lake Drive. Land use in the general vicinity of the project area was determined based on direct observations made during site inspections and a review of information available through the Massachusetts Geographic Information System (MassGIS) and the USDA Natural Resources Conservation Service (NRCS).

2.1 Project Locus

The proposed project is located at 0 Lake Shore Drive and 0 Lake Drive, comprising approximately 1.22 acres owned by the Town of Littleton, in Littleton, Massachusetts (identified by the Littleton Assessor as Map U12, Lots 15 and 22, respectively). The project parcels are bounded by residential land use to the north, east, and west, and by Long Pond to the south. The project area encompasses Frog Pond and the existing paver walkway that extends from Lake Drive around the northeastern edge of Frog Pond to Lake Shore Drive. Refer to the figures in Appendix A and the photographs in Appendix B for further details.

2.2 Methodology of Resource Area Investigations

Tighe & Bond has conducted a desktop evaluation of jurisdictional wetland resource areas surrounding the proposed work with MassGIS and available Littleton GIS datalayers. Upon a review of available GIS datalayers, Tighe & Bond has identified multiple jurisdictional resource areas at and in proximity to the proposed replacement well including Bank, BVW, LUW, Bordering Land Subject to Flooding (BLSF), and 100-foot Buffer Zone associated with BVW and Bank.

Tighe & Bond also completed a field delineation of BVW on March 13, 2025, with additional data collected on May 2, 2025, and additional field delineation on May 14, 2025. The delineation was performed following the methodologies outlined in the *Massachusetts Handbook for Delineation of Bordering Vegetated Wetlands* (September 2022), the Corps of Engineers *Wetlands Delineation Manual, Technical Report Y-87-1* (January 1987), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (Version 2.0, January 2012). Sequentially numbered flags were placed along the wetland to demarcate jurisdictional limits as shown on the Permit Drawings in Appendix A. Wetland delineation forms are included in Appendix C.

2.3 Jurisdictional Resource Areas

Wetland resource areas at and near the project area consist of Bank, BVW, LUW, BLSF, and 100-foot Buffer Zone associated with BVW and Bank. A description of each resource area is provided in the following sections.

2.3.1 Bank

Per 310 CMR 10.54(2)(a), Bank is defined as "*the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a vegetated bordering wetland and adjacent flood plain, or, in the absence of these, it occurs between a water body and an upland*."

Bank near the project site is associated with Long Pond and Bank at the project site is associated with the stormwater wetland, Frog Pond. Refer to the photographs in Appendix B for further details.

2.3.2 Bordering Vegetated Wetlands

Per 310 CMR 10.55(2), BVW are defined as "*freshwater wetlands which border on creeks, rivers, streams, ponds and lakes... Bordering Vegetated Wetlands are areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants*."

BVW is present at the project site around Frog Pond. Refer to the photographs in Appendix B and the delineation forms in Appendix C for further details.

2.3.3 Land Under Water Bodies and Waterways

Per 310 CMR 10.56(2), LUW is defined as "*the land beneath any creek, river, stream, pond or lake*."

LUW is present at the project site within Frog Pond and is bounded by the Bank of Frog Pond.

2.3.4 Bordering Land Subject to Flooding

Per 310 CMR 10.57(2)(a), BLSF is defined as "*an area with low, flat topography adjacent to and inundated by flood waters rising from creeks, rivers, streams, ponds or lakes. It extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetland*." Its boundary is further defined as "*the estimated maximum lateral extent of flood water which will theoretically result from the statistical 100-year frequency storm*" which is determined by "*reference to the most recently available flood profile data prepared for the community within which the work is proposed under the National Flood Insurance Program (NFIP, currently administered by the Federal Emergency Management Agency, successor to the U.S. Department of Housing and Urban Development)*."

According to the Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Map ("FIRM") Panel No. 25017C0237F, effective July 7, 2014, a Zone A flood zone with no base flood elevation is associated with Long Pond immediately south of the project parcels. Therefore, BLSF is present near but not within the proposed project area.

BLSF is separated from the project site by Lake Shore Drive. Refer to Figure 3 in Appendix A and the photographs in Appendix B for further details.

2.3.5 Buffer Zone

Per 310 CMR 10.02, a 100-foot Buffer Zone is associated with BVW and Banks. Additionally, per Section 4.2(2) of the Wetland Bylaw, the inner 50 feet of the Buffer Zone is defined as a "No-Disturbance Area."

Buffer Zone near and within the proposed project area is associated with the previously described BVW and Long Pond Bank. Refer to the photographs in Appendix B for further details.

2.4 Rare Species

The Massachusetts Natural Heritage and Endangered Species Program ("NHESP") Atlas and MassGIS (August 2021) were consulted during the preparation of this application. According to these sources, the project area is not located within the limits of mapped *Estimated Habitats of Rare Wildlife*, *Priority Habitats of Rare Species,* or certified or potential vernal pools.

Section 3
Project Description

This section provides a description of the proposed sediment removal and walkway re-installation, proposed site stabilization measures, Best Management Practices (BMPs), and post-construction site restoration and stabilization.

3.1 Proposed Activities

The proposed project involves removing the accumulated sediment within Frog Pond and re-installing the existing paver walkway around Frog Pond.

3.1.1 Sediment Removal

Following the installation of erosion and sediment controls and the coffer dam, the forebay will be dewatered as described in Section 3.2.2.

Once dewatering is complete, removal of the accumulated sediment will commence. The depth of sediment to be removed varies from approximately 3 to 23 inches as shown on Sheet C-201 of the Permit Drawings in Appendix A. Sediment removal will be carried out manually to the extent practicable to minimize impacts to resource areas, although a small excavator may be utilized for at least some of the work.

Due to site constraints, removed sediment will be stockpiled outside of BVW but within the No-Disturbance Area of the Buffer Zone. See sheet C-501 of the Permit Drawings in Appendix A for a detail of the temporary stockpile. A geotextile fabric layer will be used to separate the sediment from the ground surface. Sediment will be disposed of appropriately offsite.

Upon completion of the sediment removal, the dewatering system will be disengaged and the coffer dam uninstalled to allow water to flow through the forebay again.

3.1.2 Walkway Re-Installation

Following the sediment removal work, the existing walkway pavers and underlying gravel will be removed. New gravel will be added within the existing walkway footprint and compacted before new pavers are added. Loam will be added as needed to back up the walkway edges. Walkway removal and re-installation will be carried out manually within BVW to the extent practicable to avoid and minimize impacts to the BVW. If machine access is required, plastic construction matting will be used to minimize equipment rutting in the BVW.

3.1.3 Access

The project area will be accessed from Lake Drive slightly north of the existing paver walkway entrance. A second access area is planned from Lake Shore Drive at the southern terminus of the existing paver walkway; this second access is intended to reduce disturbance to BVW during the walkway re-installation.

3.2 Protective Measures & Best Management Practices

The following Best Management Practices (BMPs) will be implemented during construction to minimize the potential for erosion and sedimentation to downgradient wetland resource areas. Erosion control locations are provided on the Permit Drawings. Typical details are shown on Sheet C-501 of the Permit Drawings in Appendix A.

3.2.1 Erosion Control Barriers

Wetland resource areas at and near the proposed Project Site will be protected with a row of erosion control barriers. The erosion control barriers will consist of straw bales and siltation fence or other similarly effective devices. The proposed locations of these barriers are shown on the Permit Drawings. In addition:

- The Contractor will be required to maintain a reserve supply of erosion control barriers on-site to make repairs, as necessary.
- Protective measures will be inspected regularly and after significant precipitation events. Maintenance and repairs will be conducted, as necessary.
- Natural fiber erosion control blankets will be installed, as necessary, on slopes for protection during vegetation grow-in.

Following the stabilization of disturbed areas and Conservation Commission authorization, the erosion control barriers will be removed and properly disposed of off-site.

3.2.2 Dewatering and Flow Bypass

Due to the nature of the proposed project and the space restrictions of the site, it will be necessary to dewater the stormwater wetland forebay and to bypass flow through the forebay to perform work in the dry.

A coffer dam will be installed at the inlet to the forebay, allowing the forebay to drain. When necessary, flow from the inlet will be redirected to downstream of the forebay outlet via a bypass pump or gravity system. Water will flow through a dewatering filter bag before reentering the stormwater wetland downstream of the forebay outlet as shown on the Permit Drawings in Appendix A.

The weather will be frequently monitored to determine if adjustments to the bypass system need to be made to work in the dry. The contactor will be required to prepare and provide a contingency plan, including response to significant wet weather events, prior to the commencement of work.

3.2.3 Additional Protective Measures

The following general protective measures will also be employed:

- Construction vehicles will be washed prior to entering and existing the project area to avoid the potential spread of invasive plant species.
- Trees within the proposed staging areas will be protected during construction activities.
- Swamp mats will be used as necessary to minimize disturbance to resource areas.

3.3 Anticipated Construction Sequence

The following anticipated sequence of construction is based on Tighe & Bond's experience with past similar projects. Certain aspects of the anticipated sequence may be altered by the contractor with approval from the Littleton DPW, except as required by permit conditions and instructions contained within the project specifications:

- Install sedimentation and erosion controls
- Install temporary coffer dam and dewatering measures
- Remove sediment from forebay
- Remove coffer dam and dewatering measures
- Remove and re-install paver walkway
- Restore and stabilize project area
- Remove sedimentation and erosion controls following stabilization

Please note that the above sequence may change, and some tasks may be done concurrently. The contractor who performs the work will ultimately determine the sequencing based on their means and methods of construction.

3.4 Project Site Restoration

Upon completion of work, disturbed areas will be stabilized to match pre-construction conditions to the extent practicable, including reinstallation of the paver walkway. Wetland areas will be seeded with New England Wetmix or another appropriate wetland seed mix approved by the Littleton Conservation Commission. Buffer zone areas will be seeded with New England Conservation/Wildlife Mix or another appropriate upland seed mix approved by the Littleton Conservation Commission.

Section 4
Regulatory Compliance

This section summarizes the project's relationship to and compliance with the WPA and its implementing regulations and the Wetlands Bylaw and its implementing regulations. A summary of other pertinent environmental regulations is also included.

Work associated with the proposed stormwater wetland rehabilitation project occurs within Bank, BVW, LUW, and the 100-foot buffer zone and will result in temporary and permanent alterations to these jurisdictional areas. Since no impacts to BLSF are proposed, that resource area will not be discussed further. Table 4-1 below summarizes the proposed alterations.

TABLE 4-1
Summary of Approximate Jurisdictional Alterations by Resource Area

Resource Area	Proposed Temporary Alteration	Proposed Permanent Alteration
Bank	235 lf	--
BVW	1,460 sf	--
LUW	3,315 sf (dewatering)	99 cy (dredge)
100-foot Buffer Zone	10,545 sf	--
50-foot No Disturbance Area	10,425 sf	--

4.1 Massachusetts Wetlands Protection Act

The following sections summarize the project's compliance with the General Performance Standards (provided in italics) established in the WPA regulations for each resource area.

4.1.1 Stormwater Management System Repair

Per 310 CMR 10.02(4):

… work other than maintenance that may alter or affect a stormwater management system (including work to repair or replace the stormwater management system…) that was designed, constructed, installed and/or improved after November 18, 1996, as defined in 310 CMR 10.04, and if constructed in an Area Subject to Protection under M.G.L. c. 131, § 40 or Buffer Zone, as described in 310 CMR 10.02(1) and (2)(a) through (d), the system was constructed in accordance with all applicable provisions of 310 CMR 10.00, solely for the purpose of stormwater management, in accordance with the Stormwater Management Standards as provided in the Stormwater Management Policy (1996) or 310 CMR 10.05(6)(k) through (q), may be permitted through an Order of Conditions, or Negative Determination of Applicability provided that the work:

(a) at a minimum provides the same capacity as the original design to attenuate peak discharge rates, recharge the ground water, and remove total suspended solids;

The proposed work will restore the original capacity of the Frog Pond forebay area so that it can function as designed, primarily, to remove total suspended solids before infiltrating through the main portion of Frog Pond.

(b) complies with the Stormwater Management Standards as provided in 310 CMR 10.05(6)(k) through (q); and

As a redevelopment project, the proposed work complies with the Stormwater Management Standards to the extent practicable. Refer to Section 4.2 and the memorandum in Appendix A for further details. A Stormwater Checklist is also included in the memorandum in Appendix E.

(c) meets all the applicable performance standards for any work that expands the existing stormwater management system into an Area Subject to Protection under M.G.L. c. 131, § 40 or Buffer Zone as described in 310 CMR 10.02(1) and (2)(a) through (d).

The proposed project meets all applicable performance standards to the maximum extent practicable as described in Sections 4.1.2 though 4.1.4.

4.1.2 Bank

The Performance Standards for Bank are set forth at 310 CMR 10.54(4):

(a) Where the presumption set forth in 310 CMR 10.54(3) is not overcome, any proposed work on a Bank shall not impair the following:

1. *the physical stability of the Bank;*
2. *the water carrying capacity of the existing channel within the Bank;*
3. *ground water and surface water quality;*
4. *the capacity of the Bank to provide breeding habitat, escape cover and food for fisheries;*
5. *the capacity of the Bank 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 50 feet (whichever is less) of the length of the bank found to be significant to the protection of wildlife habitat, shall not be deemed to impair its capacity to provide important wildlife habitat functions. In the case of a bank of a river or an intermittent stream, the impact shall be measured on each side of the stream or river. Additional alterations beyond the above threshold may be permitted if they will have no adverse effects on wildlife habitat, as determined by procedures contained in 310 CMR 10.60.*
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 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 proposed work will result in only temporary impacts to Bank at the site. Any disturbance of the Bank during construction will be stabilized with seed and erosion control protections as needed. No impacts to the physical stability of the Bank, the capacity of the Bank to provide breeding habitat, escape cover and food for fisheries, or to the capacity of the Bank to provide wildlife habitat functions are anticipated. The proposed sediment removal will improve the carrying capacity of the existing channel (forebay area). This improved capacity will allow Frog Pond as a whole to better infiltrate stormwater and, therefore, improve ground water and surface water quality.

The proposed project does not include a stream crossing, so that portion of the performance standard is not applicable.

(b) Notwithstanding the provisions of 310 CMR 10.54(4)(a), structures may be permitted in or on a Bank when required to prevent flood damage to facilities, buildings and roads constructed prior to the effective date of 310 CMR 10.51 through 10.60 or constructed pursuant to a Notice of Intent filed prior to the effective date of 310 CMR 10.51 through 10.60 (April 1, 1983), including the renovation or reconstruction (but not substantial enlargement) of such facilities, buildings and roads, provided that the following requirements are met:

1. *The proposed protective structure, renovation or reconstruction is designed and constructed using best practical measures so as to minimize adverse effects on the characteristics and functions of the resource area;*
2. *The applicant demonstrates that there is no reasonable method of protecting, renovating or rebuilding the facility in question other than the one proposed.*

No new structures are proposed within or on the Bank and the proposed impacts to the Bank are temporary in nature. Therefore, this performance standard is not applicable.

(c) Notwithstanding the provisions of 310 CMR 10.54(4)(a) or (b), no project may be permitted which will have any adverse effect on specified habitat sites of Rare Species, as identified by procedures established under 310 CMR 10.59.

As previously described in Section 2.4, the project area is not located within Estimated Habitat of Rare Wildlife, Priority Habitat of Rare Species, or certified or potential vernal pools and, therefore, will not adversely affect rare species or their specified habitat.

4.1.3 Bordering Vegetated Wetlands

The Performance Standards for BVW are set forth at 310 CMR 10.55(4):

(a) Where the presumption set forth in 310 CMR 10.55(3) is not overcome, any proposed work in a Bordering Vegetated Wetland shall not destroy or otherwise impair any portion of said area.

The proposed work within BVW at the site is temporary in nature and appropriate BMPs will be followed as previously described in Section 3.2. Additionally, temporarily disturbed areas of BVW will be restored *in situ* as previously described in Section 3.4. Therefore, permanent impairments to BVW at the site are not anticipated.

(b) Notwithstanding the provisions of 310 CMR 10.55(4)(a), the issuing authority may issue an Order of Conditions permitting work which results in the loss of up to 5000 square feet of Bordering Vegetated Wetland when said area is replaced in accordance with the following general conditions and any additional, specific conditions the issuing authority deems necessary to ensure that the replacement area will function in a manner similar to the area that will be lost:

1. *the surface of the replacement area to be created ("the replacement area") shall be equal to that of the area that will be lost ("the lost area");*
2. *the ground water and surface elevation of the replacement area shall be approximately equal to that of the lost area;*
3. *The overall horizontal configuration and location of the replacement area with respect to the bank shall be similar to that of the lost area;*
4. *the replacement area shall have an unrestricted hydraulic connection to the same water body or waterway associated with the lost area;*
5. *the replacement area shall be located within the same general area of the water body or reach of the waterway as the lost area;*
6. *at least 75% of the surface of the replacement area shall be reestablished with indigenous wetland plant species within two growing seasons, and prior to said vegetative reestablishment any exposed soil in the replacement area shall be temporarily stabilized to prevent erosion in accordance with standard U.S. Soil Conservation Service methods; and*
7. *the replacement area shall be provided in a manner which is consistent with all other General Performance Standards for each resource area in Part III of 310 CMR 10.00. In the exercise of this discretion, the issuing authority shall consider the magnitude of the alteration and the significance of the project site to the interests identified in M.G.L. c. 131, § 40, the extent to which adverse impacts can be avoided, the extent to which adverse impacts are minimized, and the extent to which mitigation measures, including replication or restoration, are provided to contribute to the protection of the interests identified in M.G.L. c. 131, § 40.*

Since the proposed impacts to BVW are temporary in nature, wetland replication is not required. Therefore, this performance standard is not applicable.

(c) Notwithstanding the provisions of 310 CMR 10.55(4)(a), the issuing authority may issue an Order of Conditions permitting work which results in the loss of a portion of Bordering Vegetated Wetland when;

1. *said portion has a surface area less than 500 square feet;*
2. *said portion extends in a distinct linear configuration ("finger-like") into adjacent uplands; and*
3. *in the judgment of the issuing authority it is not reasonable to scale down, redesign or otherwise change the proposed work so that it could be completed without loss of said wetland.*

Since the proposed impacts to BVW are temporary in nature, no loss of BVW is anticipated. Therefore, this performance standard is not applicable.

(d) Notwithstanding the provisions of 310 CMR 10.55(4)(a),(b) and (c), 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.

As previously described in Section 2.4, the project area is not located within Estimated Habitat of Rare Wildlife, Priority Habitat of Rare Species, or certified or potential vernal pools and, therefore, will not adversely affect rare species or their specified habitat.

(e) Any proposed work shall not destroy or otherwise impair any portion of a Bordering Vegetated Wetland that is within an Area of Critical Environmental Concern designated by the Secretary of Energy and Environmental Affairs under M.G.L. c. 21A, § 2(7) and 301 CMR 12.00: Areas of Critical Environmental Concern. 310 CMR 10.55(4)(e):

1. *supersedes the provisions of 310 CMR 10.55(4)(b) and (c);*
2. *shall not apply if the presumption set forth at 310 CMR 10.55(3) is overcome;*
3. *shall not apply to work proposed under 310 CMR 10.53(3)(l); and*
4. *shall not apply to maintenance of stormwater detention, retention, or sedimentation ponds, or to maintenance of stormwater energy dissipating structures, that have been constructed in accordance with a valid order of conditions.*

The proposed work is not within an Area of Critical Environmental Concern (ACEC) and, therefore, the project will not impair a BVW within an ACEC.

4.1.4 Land Under Water Bodies and Waterways

The Performance Standards for BVW are set forth at 310 CMR 10.56(4):

(a) Where the presumption set forth in 310 CMR 10.56(3) is not overcome, any proposed work within 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;*
2. *Ground and surface water quality;*
3. *The capacity of said land to provide breeding habitat, escape cover and food for fisheries; and*
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.*
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 will result temporary impacts from dewatering and in removal of 99 cubic yards of sediment from LUW at the site. The proposed sediment removal will improve the carrying capacity of the existing channel (forebay area). This improved capacity will allow Frog Pond as a whole to better infiltrate stormwater and, therefore, improve ground water and surface water quality.

No impacts to the capacity of the LUW to provide breeding habitat, escape cover and food for fisheries, or to the capacity of the LUW to provide wildlife habitat functions are anticipated.

The proposed project does not include a stream crossing, so that portion of the performance standard is not applicable.

(b) Notwithstanding the provisions of 310 CMR 10.56(4)(a), the issuing authority may issue an Order in accordance with M.G.L. c. 131, § 40 to maintain or improve boat channels within Land under Water Bodies and Waterways when said work is designed and carried out using the best practical measures so as to minimize adverse effects such as the suspension or transport of pollutants, increases in turbidity, the smothering of bottom organisms, the accumulation of pollutants by organisms or the destruction of fisheries habitat or nutrient source areas.

The proposed project does not include boat channels. Therefore, this performance standard is not applicable.

(c) Notwithstanding the provisions of 310 CMR 10.56(4)(a) or (b), 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.

As previously described in Section 2.4, the project area is not located within Estimated Habitat of Rare Wildlife, Priority Habitat of Rare Species, or certified or potential vernal pools and, therefore, will not adversely affect rare species or their specified habitat.

4.1.5 Buffer Zone

The WPA does not provide specific performance standards for work within the 100-foot Buffer Zone. Section 4.3 of the Wetlands Bylaw regulations do, however, provide the following performance standards for work within the Buffer Zone:

(1) The activity shall not significantly impair the values and functions of the adjacent Areas Subject to Protection. The quantity and quality of resource values and functions, as well as pre-project conditions, such as ground slope, soil conditions, vegetation, and prior disturbance of the site should be considered explicitly in making this determination. Any offsetting mitigation provided shall also be considered, including the inclusion of

pedestrian and bicycle access rights-of-way in the project (which can reduce the pollutant runoff and climate change contribution associated with the project).

The proposed impacts within the Buffer Zone are temporary in nature. Appropriate BMPs will be followed as previously described in Section 3.2 and temporarily disturbed areas of the Buffer Zone will be restored *in situ* as previously described in Section 3.4. Therefore, the Buffer Zone at the site is being protected. Additionally, as previously described in Sections 4.1.2 through 4.1.4, the proposed work meets the performance standards for adjacent resource areas as applicable and to the extent practicable.

(2) The amount of net additional impervious coverage created in the Buffer Zone shall be minimized to the extent feasible (including by use of pervious alternatives).

No new imperious coverage within the Buffer Zone is proposed; the re-installed paver walkway will be within the existing walkway footprint.

(3) Land owners shall minimize application of fertilizers containing nitrogen and phosphorus, other than for agricultural uses.

No changes to the current use of fertilizers (or lack thereof) at the project location are proposed.

4.2 Stormwater Management

As previously described in Section 1, the proposed project will improve the functionality of Frog Pond as a stormwater wetland. It has been designed in accordance with the recommendations in the MassDEP Stormwater Handbook and meets the Stormwater Standards as described in the memorandum in Appendix E. A Stormwater Checklist is also included in Appendix E.

4.3 Littleton Wetlands Bylaw Waiver Request

The proposed activities are also subject to the Wetlands Bylaw and its associated regulations. Per Section 1.4 of the regulations:

> *1. Strict compliance with these Regulations may be waived when, in the judgment of the Commission, such action is*
>
> > *a) in the public interest, necessary to avoid a taking, necessary to prevent a safety hazard, or water dependent; and*
> >
> > *b) consistent with the intent and purpose of the Bylaw; and*
> >
> > *c) the least environmentally damaging practicable alternative.*
>
> *Actions that are in the public interest may include (but are not limited to) those that would result in a significant net environmental improvement in the conditions of the Buffer Zone or an Area Subject to Protection by the Bylaw so as to promote the Interests Protected by the Bylaw. Such net environmental improvement may be achieved by measures such as restoration of disturbed areas to a natural condition, invasive species control, improvement of existing stormwater conditions to the maximum extent practicable including exceeding MassDEP stormwater management*

standards, permanent protection of Buffer Zone or Areas Subject to Protection, or similar significant net environmental improvement.

As previously described in Section 1, the proposed sediment removal from the Frog Pond forebay is necessary to improve the functionality of Frog Pond as a stormwater wetland to treat water before it enters Long Pond and is, therefore, in the public interest and consistent with the intent and purpose of the Wetlands Bylaw. Due to the constrained size of the site, temporary impacts to multiple resource areas and the No-Disturbance Zone are necessary and unavoidable to access and perform the proposed work. These temporary impacts have been minimized to the extent practicable. Therefore, we request that the Littleton Conservation Commission waive the prohibition on work within the No-Disturbance Zone and strict compliance with the Wetlands Bylaw for this project.

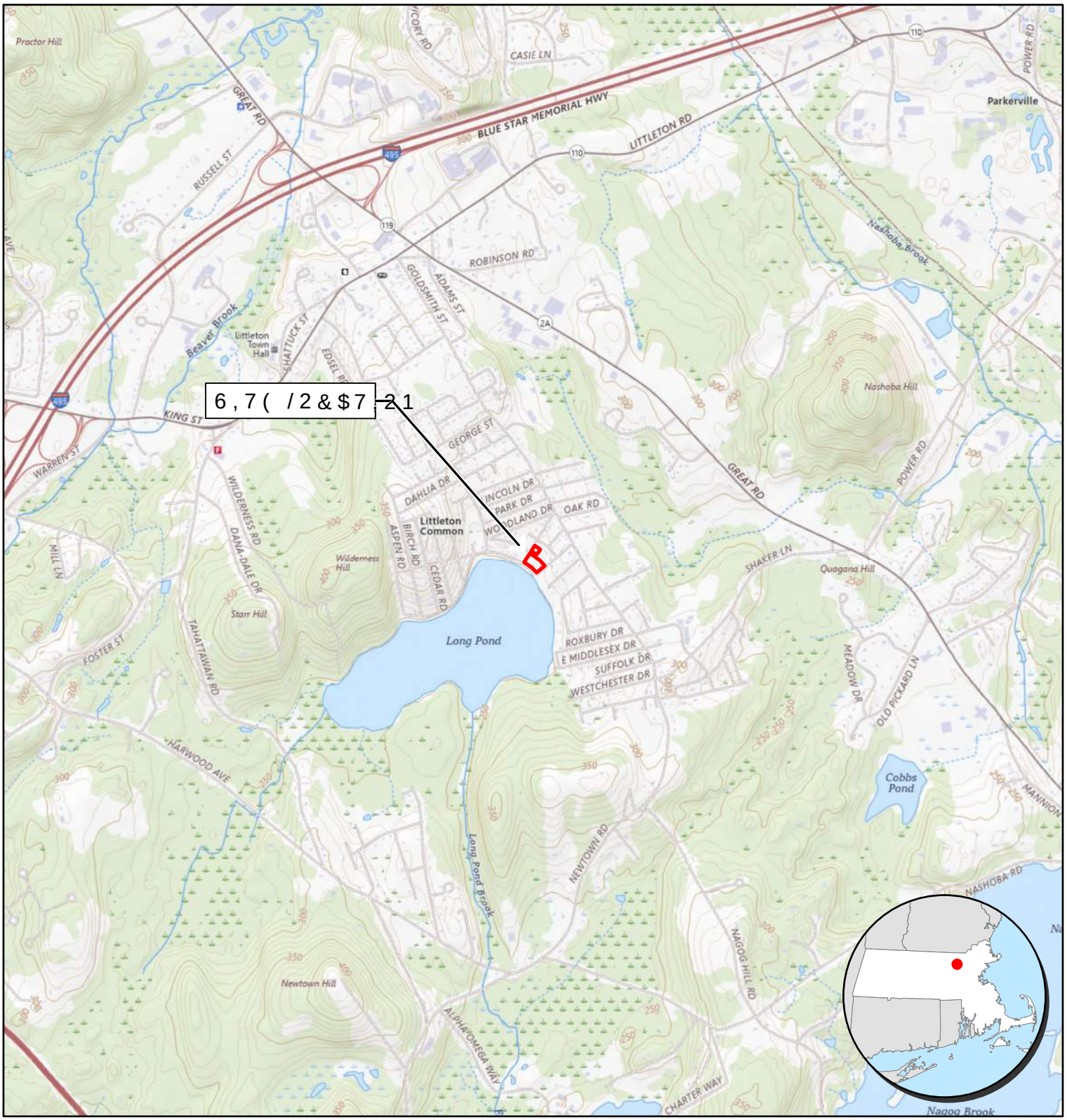
4.4 Other Pertinent Regulatory Programs

In addition to the WPA and Wetland Bylaw, the proposed project will require a Self-Verification Notification Form to the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act.

Since the proposed project will result in the cumulative disturbance of less than 5,000 square feet of BVW and LUW and will not exceed 100 cy of dredge, the WPA Order of Conditions will serve as the necessary permit under Section 401 of the Clean Water Act.

Since the proposed project will not result in the cumulative disturbance of one or more acres of land, a NPDES Construction General Permit will not be required.

Appendix A



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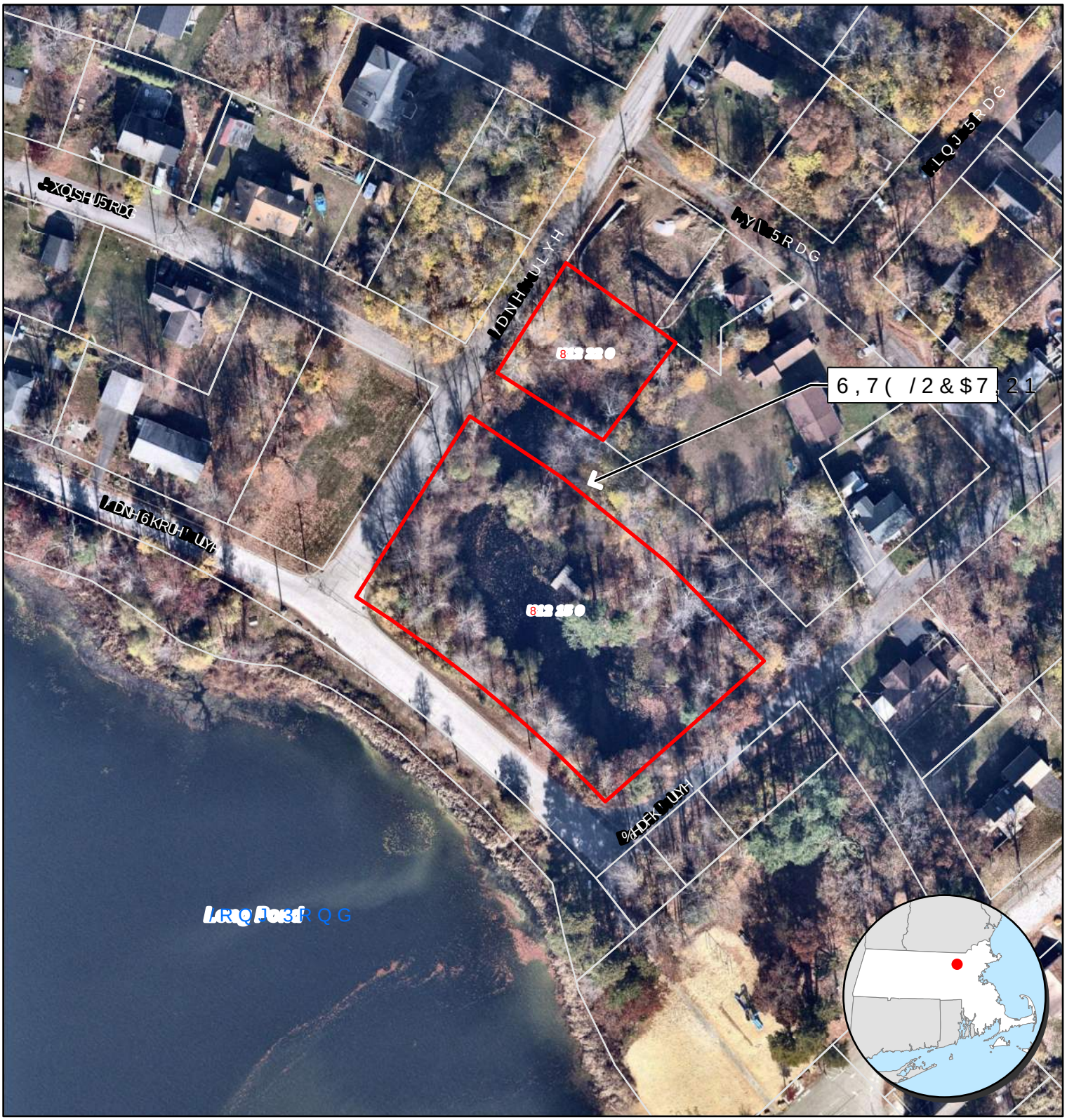

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$SSUR[LPDWH 3DUFHO %RXQGDU\

Tighe&Bond

%DVHG RQ ODWHVW 1HDUPDS ,PDJHU\
3DUFHOV GRZQORDGHG IURP 0DVV*,6 DQG ERXQGDULHV DUH DSSUR[LPDWH

1
)HHW

* ?*,6?0$?6LWH/RFV?/LWWOHWRQ?/ B)URJ3RQG:HWODQG5HKDE?/ B)URJ3RQG:HWODQG5HKDE DSU[?)LJ B$HULDO >([SRUWHG %\ ,'H 6RX]D %UERVD $0@ /

,QWHUPLWWHQW 6WUHDPV'(3 ,QODQG :HWODQG
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)RRW 1R 'LVWXUEDQFH $=RQH
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$SSUR[LPDWH 3DUFHO %RXQG

%DVHG RQ ODWHVW 1HDUPS ,PDJHU\
3DUFHOV GRZQORDGHG IURP 0DVV*,6 DQG ERXQGDULHV DSSUR[LPDWH
)(0$)ORRG 'DWD LV FRUUHFW RI PVF IHPD JRY
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&RPPRQZHDOWK RI 0DVVDFKXVHWWV ([HFXWLYH 2IILFH RI
'DWD YDOLG DV RI $SULO

See Permit Drawings for field delineated BVW.

Tighe&Bond

%DVHG RQ ODWHVW 1HDUPS ,PDJHU\
3DUFHOV GRZQORDGHG IURP 0DVV*,6 DQG ERXQGDULHV DSSUR[LPDWH
)(0$)ORRG 'DWD LV FRUUHFW RI PVF IHPD JRY
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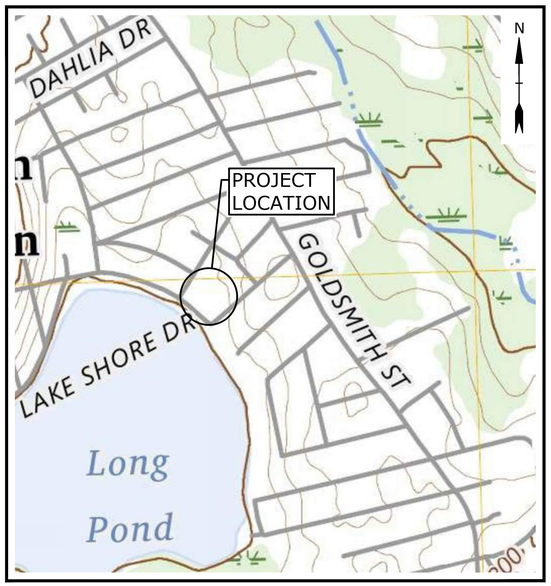
1
)HHW

TOWN OF LITTLETON, MASSACHUSETTS
CONSTRUCTED WETLAND REHABILITATION ASSISTANCE

PERMIT DRAWINGS
JUNE 2025

LIST OF DRAWINGS	
DRAWING NO.	DRAWING TITLE
G-001	COVER SHEET
G-002	LEGEND, ABBREVIATIONS & GENERAL NOTES
G-003	GENERAL NOTES
C-101	EXISTING CONDITIONS & SITE PREPARATION PLAN
C-201	FOREBAY EXCAVATION PLAN
C-501	DETAILS



LOCATION MAP
SCALE: 1" = 500'

PREPARED BY:
Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
BRIAN S. HUNTLEY
CIVIL
No. 45273
REGISTERED PROFESSIONAL ENGINEER
6-30-25

COMMONWEALTH OF MASSACHUSETTS
JEAN CHRISTY
CIVIL
No. 47080
REGISTERED PROFESSIONAL ENGINEER
06/30/2025

PREPARED FOR:
TOWN OF LITTLETON

NOT FOR CONSTRUCTION

COMPLETE SET 6 SHEETS

LEGEND

DESCRIPTION	EXISTING	PROPOSED
PROPERTY LINE		
LIMITS OF WORK		
INTERMEDIATE CONTOURS		
INDEX CONTOURS	25	
SPOT GRADE	X 141.2	
STORM DRAIN	SD SD	
OVERHEAD ELECTRIC	OE OE	
CURB		
EDGE OF PAVEMENT		
SIDEWALK		
RETAINING WALL		
FENCE - WOOD POST		
STORM DRAIN STRUCTURES	CATCH BASIN	
ELECTRIC SERVICE STRUCTURES	UTILITY POLE	
TREE	CONIFEROUS DECIDUOUS	
EROSION & SEDIMENT CONTROL		
COFFERDAM		
ITEM TO BE DEMOLISHED		
CONSTRUCTION ENTRANCE		
CONSTRUCTION ACCESS ROUTE		
CONC PAVER WALKWAY		
BOARDWALK		

LEGEND

RESOURCE AREAS	
VEGETATED WETLAND LIMIT	
BORDERING LAND SUBJECT TO FLOODING	
50-FOOT NO DISTURBANCE BUFFER ZONE	
100-FOOT BUFFER ZONE	
EDGE OF WATER	
WETLAND FLAG	WF

GENERAL NOTES

1. NOTIFY DIGSAFE AT 1-888-344-7233 AND OTHER UTILITY OWNERS IN THE AREA NOT ON THE DIGSAFE LIST AT LEAST 72 HOURS PRIOR TO ANY DIGGING, TRENCHING, ROCK REMOVAL, DEMOLITION, BORING, BACKFILLING, GRADING, LANDSCAPING, OR ANY OTHER EARTH MOVING OPERATIONS.
2. THE CONTRACTOR IS RESPONSIBLE FOR SUPPORT OF EXISTING UTILITIES AND REPAIR OR REPLACEMENT COSTS OF UTILITIES DAMAGED DURING CONSTRUCTION, WHETHER ABOVE OR BELOW GRADE. REPLACE DAMAGED UTILITIES IMMEDIATELY AT NO ADDITIONAL COST TO THE OWNER AND AT NO COST TO THE PROPERTY OWNER
3. BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.
4. TIGHE & BOND ASSUMES NO RESPONSIBILITY FOR ANY ISSUES, LEGAL OR OTHERWISE, RESULTING FROM CHANGES MADE TO THESE DRAWINGS WITHOUT WRITTEN AUTHORIZATION FROM TIGHE & BOND.
5. EXCAVATE ADDITIONAL TEST PITS TO LOCATE EXISTING UTILITIES AS DIRECTED OR APPROVED BY THE ENGINEER.
6. NOTIFY THE ENGINEER OF ANY UTILITIES IDENTIFIED DURING CONSTRUCTION THAT ARE NOT SHOWN ON THE DRAWINGS OR THAT DIFFER IN SIZE OR MATERIAL.
7. THE CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY; COORDINATION WITH THE OWNER, ALL SUBCONTRACTORS, AND WITH OTHER CONTRACTORS WORKING WITHIN THE LIMITS OF WORK, THE MEANS AND METHODS OF CONSTRUCTING THE PROPOSED WORK.
8. OBTAIN, PAY FOR AND COMPLY WITH PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK. ARRANGE AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE JURISDICTIONAL AUTHORITIES.
9. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION. IF FIELD CONDITIONS ARE OBSERVED THAT VARY SIGNIFICANTLY FROM THOSE SHOWN ON THE DRAWINGS, IMMEDIATELY NOTIFY THE ENGINEER IN WRITING FOR RESOLUTION OF THE CONFLICTING INFORMATION.
10. PROTECT AND MAINTAIN ALL UTILITIES IN THE AREAS UNDER CONSTRUCTION DURING THE WORK. LEAVE ALL PIPES AND STRUCTURES WITHIN THE LIMITS OF THE CONTRACT IN A CLEAN AND OPERABLE CONDITION AT THE COMPLETION OF THE WORK. TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SAND AND SILT FROM DISTURBED AREAS FROM ENTERING THE DRAINAGE SYSTEM.
11. NOTIFY THE ENGINEER IN WRITING OF ANY CONFLICT, ERROR, AMBIGUITY, OR DISCREPANCY WITH THE PLANS OR BETWEEN THE PLANS AND ANY APPLICABLE LAW, REGULATION, CODE, STANDARD SPECIFICATION, OR MANUFACTURER'S INSTRUCTIONS.
12. EXCAVATE WITH EQUIPMENT SELECTED TO MINIMIZE DAMAGE TO EXISTING UTILITIES OR OTHER FACILITIES. HAND EXCAVATE AS NECESSARY TO LOCATE UTILITIES AND AVOID DAMAGE.
13. TAKE NECESSARY MEASURES AND PROVIDE CONTINUOUS BARRIERS OF SUFFICIENT TYPE, SIZE, AND STRENGTH TO PREVENT ACCESS TO ALL WORK AND STAGING AREAS AT THE COMPLETION OF EACH DAYS WORK.
14. NO OPEN TRENCHES WILL BE ALLOWED OVER NIGHT. THE USE OF ROAD PLATES TO PROTECT THE EXCAVATION WILL BE CONSIDERED UPON REQUEST, BUT BACKFILLING IS PREFERRED.
15. THE CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY TRAFFIC CONTROL/SAFETY DEVICES TO ENSURE SAFE VEHICULAR AND PEDESTRIAN ACCESS THROUGH THE WORK AREA, OR FOR SAFELY IMPLEMENTING DETOURS AROUND THE WORK AREA. PERFORM TRAFFIC CONTROL IN ACCORDANCE WITH THE CONTRACTOR'S APPROVED TRAFFIC CONTROL PLAN.
16. MAINTAIN EMERGENCY ACCESS TO ALL PROPERTIES WITHIN THE PROJECT AREA AT ALL TIMES DURING CONSTRUCTION.
17. WHEN WORKING IN THE ROAD, PROVIDE THE OWNER AND LOCAL FIRE/POLICE/SCHOOL AUTHORITIES A DETAILED PLAN OF APPROACH INDICATING METHODS OF PROPOSED TRAFFIC ROUTING ON A DAILY BASIS. PROVIDE COORDINATION TO ENSURE COMMUNICATION AND COORDINATION BETWEEN THE OWNER, CONTRACTOR AND LOCAL FIRE/POLICE/SCHOOL AUTHORITIES THROUGHOUT THE CONSTRUCTION PERIOD.
18. REMOVE AND DISPOSE OF ALL CONSTRUCTION-RELATED WASTE MATERIALS AND DEBRIS IN STRICT ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL LAWS.
19. THE TERM "DEMOLISH" USED ON THE DRAWINGS MEANS TO REMOVE AND DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS.
20. THE TERM "ABANDON" USED ON THE DRAWINGS MEANS TO LEAVE IN PLACE AND TAKE APPROPRIATE MEASURES TO DECOMMISSION AS SPECIFIED OR NOTED ON THE DRAWINGS.
21. ALL PROPOSED WORK MAY BE ADJUSTED IN THE FIELD BY THE OWNER'S PROJECT REPRESENTATIVE TO MEET EXISTING CONDITIONS.

ABBREVIATIONS

BIT	BITUMINOUS
BK	BOOK
CB	CATCH BASIN
CONC	CONCRETE
ELEV	ELEVATION
IN	INCHES
INV	INVERT
MH	MANHOLE
MIN	MINIMUM
PG	PAGE
RCP	REINFORCED CONCRETE PIPE
TBM	TEMPORARY BENCHMARK
UP	UTILITY POLE
WD	WOOD

BASE PLAN NOTES

1. THE EXISTING CONDITIONS INFORMATION SHOWN ON THE DRAWINGS IS BASED ON THE FOLLOWING:
   - SURVEY DRAWINGS PROVIDED BY SHERMAN & FRYDRYK TITLED EXISTING CONDITIONS PLAN AND DATED APRIL 8, 2025.
   - THE RESOURCE AREA BOUNDARIES DEPICTED ON THE DRAWINGS WERE DELINEATED BY TIGHE & BOND, INC. ON MARCH 13, 2025.
2. THE ACCURACY AND COMPLETENESS OF SUBSURFACE INFORMATION (E.G., EXISTING UTILITIES) SHOWN ON THESE DRAWINGS IS NOT GUARANTEED AND SOME SUBSURFACE INFORMATION MAY NOT BE SHOWN. DETERMINE THE LOCATIONS AND ELEVATIONS OF ALL SUBSURFACE FEATURES WHICH MAY AFFECT CONSTRUCTION OPERATIONS BY TEST PIT OR OTHER METHODS, AS NECESSARY TO PREVENT DAMAGE TO UTILITIES AND OTHER SUBSURFACE FEATURES, AND/OR INTERRUPTIONS IN UTILITY SERVICE. PROVIDE DATA COLLECTED THROUGH THESE INVESTIGATIONS TO THE ENGINEER PRIOR TO CONSTRUCTING THE PROPOSED IMPROVEMENTS.
3. THE DRAWINGS ARE BASED ON THE FOLLOWING DATUMS: HORIZONTAL-NAD83; VERTICAL-NAVD88
4. THE EXISTING CONDITIONS SHOWN ARE APPROXIMATE. FIELD VERIFY EXISTING CONDITIONS.
5. THE PROPERTY LINES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND ARE NOT BASED ON DEED OR PLAN RESEARCH.

EROSION CONTROL AND RESOURCE AREA PROTECTION NOTES

1. PROVIDE ALL EROSION CONTROL MEASURES SHOWN, SPECIFIED, REQUIRED BY PERMIT, AND/OR REQUIRED BY THE ENGINEER PRIOR TO ANY CONSTRUCTION OR IMMEDIATELY UPON REQUEST. MAINTAIN SUCH CONTROL MEASURES UNTIL FINAL SURFACE TREATMENTS ARE IN PLACE AND/OR UNTIL PERMANENT VEGETATION IS ESTABLISHED. INSPECT AFTER EACH RAINSTORM AND DURING MAJOR STORM EVENTS TO CONFIRM THAT ALL SEDIMENTATION AND EROSION CONTROL MEASURES REQUIRED ARE IN PLACE AND EFFECTIVE.
2. PRIOR TO STARTING WORK, CLEARLY STAKE WORK LIMITS. DO NOT DISTURB VEGETATION AND TOPSOIL BEYOND THE PROPOSED LIMITS. COORDINATE WITH THE ENGINEER FOR LOCATIONS OF TEMPORARY STOCKPILING OF TOPSOIL DURING CONSTRUCTION.
3. INSTALL SILT SACKS OR OTHER APPROVED SEDIMENTATION BARRIERS IN/AT ALL CATCH BASINS IN THE PROJECT AREA.
4. COMPACT, STABILIZE, AND LOAM AND SEED SIDE SLOPES, SHOULDER AREAS AND DISTURBED VEGETATED AREAS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND AS REQUIRED BY PERMITS. GRADE SIDE SLOPES, SHOULDER AREAS AND DISTURBED VEGETATED AREAS TO A MAXIMUM SLOPE OF 3 HORIZONTAL TO 1 VERTICAL (3H:1V), WHERE POSSIBLE. PROVIDE BIODEGRADABLE EROSION CONTROL BLANKETS TO PREVENT EROSION WHERE SLOPES ARE STEEPER THAN 3H:1V.
5. SETTLE OR FILTER ALL SILT-LADEN WATER FROM DEWATERING ACTIVITIES IN A SEDIMENTATION OR FILTER BAG TO REMOVE SEDIMENTS PRIOR TO RELEASE USING A SEDIMENTATION OR FILTER BAG LOCATED DOWN-GRADIENT OF THE DEWATERED AREA.
6. REMOVE AND PROPERLY DISPOSE OF SILT TRAPPED AT BARRIERS IN UPLAND AREAS OUTSIDE BUFFER ZONES. REMOVE MATERIALS DEPOSITED IN ANY TEMPORARY SETTLING BASINS AT THE COMPLETION OF THE PROJECT. RESTORE ALL DISTURBED AREAS TO THEIR PRECONSTRUCTION CONDITION.
7. SWEEP, COLLECT, REMOVE AND DISPOSE OF ANY SEDIMENT TRACKED ONTO PUBLIC RIGHT-OF-WAYS AT THE END OF EACH DAY.
8. LOAM AND SEED ALL DISTURBED VEGETATED AREAS TO ESTABLISH COVER AND STABILIZATION AS SOON AS POSSIBLE FOLLOWING DISTURBANCE.
9. MAINTAIN AN ADDITIONAL SUPPLY OF EROSION CONTROL MEASURES ON-SITE FOR EMERGENCY REPAIRS.
10. STORE FUEL, OIL, PAINT, OR OTHER HAZARDOUS MATERIALS IN A SECONDARY CONTAINER AND REMOVE TO A SECURE LOCKED AND COVERED AREA DURING NON-WORK HOURS.
11. PROVIDE A SUPPLY OF ABSORBENT SPILL RESPONSE MATERIALS SUCH AS BOOMS, BLANKETS, AND OIL ABSORBENT MATERIALS AT THE CONSTRUCTION SITE AT ALL TIMES TO CLEAN UP POTENTIAL SPILLS OF HAZARDOUS MATERIALS. IMMEDIATELY REPORT SPILLS OF HAZARDOUS MATERIALS TO THE STATE ENVIRONMENTAL AGENCY AND THE MUNICIPALITY WHERE THE WORK IS OCCURRING.

SURFACE RESTORATION NOTES

1. ALL PAVEMENT DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
2. PROVIDE SITE GRADING AT ACCESSIBLE SIDEWALK RAMPS, SIDEWALKS, AND BUILDING ENTRANCES THAT IS CONSISTENT WITH THE RELEVANT ACCESS REQUIREMENTS OF THE ARCHITECTURAL BARRIERS ACT (ABA), THE AMERICANS WITH DISABILITIES ACT (ADA), AND MA ARCHITECTURAL ACCESS BOARD REQUIREMENTS (AAB). SMALL CHANGES IN GRADE OVER RELATIVELY SHORT DISTANCES (E.G. AT PARKING SPACES, ACCESSIBLE ROUTES, AND RAMPS) MIGHT NOT BE CLEARLY DEPICTED WITHIN THE CONTOUR INTERVAL SHOWN. COMPLY WITH THE CRITERIA IN THESE STANDARDS. SELECT MAXIMUM SLOPE CRITERIA ARE REPRODUCED BELOW:

   - ACCESSIBLE PARKING STALL AND PASSENGER LOADING ZONE (ANY DIRECTION) SLOPE < 2.0%
   - LONGITUDINAL SLOPE ALONG ACCESSIBLE ROUTES < 5.0%
   - CROSS SLOPE ALONG ACCESSIBLE ROUTES < 2.0%

3. PROTECT PROJECT FEATURES (E.G., WALLS, FENCES, MAIL BOXES, SIGNS, SIDEWALKS, CURBING, STAIRS, WALKWAYS, TREES, ETC.) FROM DAMAGE DURING CONSTRUCTION, INCLUDING PROVIDING TEMPORARY SUPPORTS, WHEN APPROPRIATE.
4. IF REMOVAL OF PROJECT FEATURES IS REQUIRED IN ORDER TO PERFORM THE PROPOSED WORK, REMOVE THOSE SITE FEATURES ONLY UPON APPROVAL OF ENGINEER. REPLACE ALL REMOVED PROJECT FEATURES; NEW ITEMS SHALL BE EQUAL OR BETTER IN QUALITY AND CONDITION TO THE ITEMS REMOVED.
5. EXISTING SURVEY MONUMENTS DISTURBED BY THE CONTRACTOR SHALL BE REPLACED BY A LAND SURVEYOR LICENSED IN THE STATE IN WHICH THE WORK IS PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
6. COORDINATE THE ADJUSTMENT OF EXISTING UTILITY STRUCTURES WITH EACH RESPONSIBLE UTILITY OWNER PRIOR TO RECONSTRUCTION AND/OR PAVING OPERATIONS. RAISE ALL STRUCTURES TO FINISHED GRADES PRIOR TO THE END OF THE CONSTRUCTION SEASON AND PRIOR TO FINISHED PAVING.
7. REPAIR DISTURBED PAVED SURFACES AT THE END OF EACH WORK WEEK, UNLESS OTHERWISE APPROVED/REQUIRED BY THE OWNER.
8. PLACE TEMPORARY BITUMINOUS CONCRETE PAVEMENT AT DISTURBED PORTLAND CEMENT CONCRETE SIDEWALKS AND DRIVEWAYS AT THE END OF EACH WORK WEEK, UNLESS OTHERWISE APPROVED/REQUIRED BY THE OWNER.
9. TRANSFER ALL TEMPORARY BENCHMARKS, AS NECESSARY.
10. ACCOMMODATE PEDESTRIAN TRAFFIC WHERE A SIDEWALK IS TO BE CLOSED FOR SAFETY. "SIDEWALK CLOSED HERE" SIGNS SHALL BE USED AT THE NEAREST SAFE INTERSECTION. SEE TRAFFIC CONTROL DETAILS FOR SIGN INFORMATION.
11. RESTORE ALL AREAS DISTURBED BY THE CONTRACTOR BEYOND THE PAYLINE LIMITS TO ORIGINAL CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.
12. REGRADE ALL UNPAVED AREAS DISTURBED BY THE WORK AS REQUIRED. REPAIR/REPLACE PAVED SURFACES DISTURBED BY THE WORK IN-KIND, UNLESS OTHERWISE NOTED. RESTORE SURFACES TO EXISTING OR PROPOSED CONDITIONS AS INDICATED ON THE DRAWINGS.
13. PROVIDE A SMOOTH, FLUSH TRANSITION BETWEEN ALL NEW AND EXISTING PAVEMENTS AND WALKING SURFACES.

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
BRIAN S. HUNTLEY
CIVIL
No. 45273
REGISTERED PROFESSIONAL ENGINEER
6-30-25

COMMONWEALTH OF MASSACHUSETTS
JEAN CHRISTY
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No. 47080
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06/30/2025

PERMIT DRAWINGS

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Constructed Wetland Rehabilitation Assistance

Town of Littleton

Littleton, Massachusetts

MARK	DATE	DESCRIPTION

PROJECT NO:	L0783-024
DATE:	06/2025
FILE:	L0783-024-G-NOTE.dwg
DRAWN BY:	THM
DESIGNED/CHECKED BY:	TAL
APPROVED BY:	JEC

LEGEND, ABBREVIATIONS & GENERAL NOTES

SCALE: AS SHOWN

G-002

TEMPORARY WATER CONTROL AND DEWATERING NOTES

SUBMIT TO THE OWNER AND ENGINEER A DETAILED METHOD OF DEWATERING, TO BE APPROVED BY THE OWNER AND ENGINEER PRIOR TO THE START OF CONSTRUCTION. AS A MINIMUM, THE CONTRACTOR'S DEWATERING PLAN SHALL ADDRESS THE FOLLOWING CONCERNS AND ADHERE TO THE FOLLOWING REQUIREMENTS:

1. THE CONTRACTOR SHALL PROVIDE, OPERATE AND MAINTAIN ADEQUATE PUMPING, DIVERSION AND DRAINAGE FACILITIES TO MAINTAIN THE EXCAVATED AREA SUFFICIENTLY DRY FROM GROUNDWATER AND/OR SURFACE RUNOFF SO AS NOT TO ADVERSELY AFFECT CONSTRUCTION PROCEDURES NOR CAUSE EXCESSIVE DISTURBANCE OF UNDERLYING OR SURROUNDING NATURAL GROUND.

2. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS REQUIRED FOR DE-WATERING ACTIVITIES AND TAKE ACTIONS NECESSARY TO ENSURE THAT DE-WATERING DISCHARGES COMPLY WITH PERMITS APPLICABLE TO THE PROJECT. THE CONTRACTOR SHALL DISPOSE OF WATER FROM THE TRENCHES AND EXCAVATIONS IN SUCH A MANNER AS TO AVOID PUBLIC NUISANCE, INJURY TO PUBLIC HEALTH OR THE ENVIRONMENT, DAMAGE TO PUBLIC OR PRIVATE PROPERTY, OR DAMAGE TO THE WORK COMPLETED OR IN PROGRESS.

3. THE CONTRACTOR SHALL BRACE OR OTHERWISE PROTECT PIPELINES AND STRUCTURES NOT STABLE AGAINST UPLIFT DURING CONSTRUCTION.

4. THE CONTRACTOR SHALL NOT EXCAVATE UNTIL THE DE-WATERING SYSTEM IS OPERATIONAL AND THE EXCAVATION MAY PROCEED WITHOUT DISTURBANCE TO THE FINAL SUBGRADE OR SURROUNDING AREAS.

5. THE CONTRACTOR SHALL CONTINUE DE-WATERING UNINTERRUPTED UNTIL THE STRUCTURES, PIPES AND APPURTENANCES TO BE INSTALLED HAVE BEEN COMPLETED SUCH THAT THEY WILL NOT FLOAT OR BE OTHERWISE DAMAGED BY AN INCREASE IN GROUNDWATER ELEVATION.

6. DE-WATERING DISCHARGE:

   6.A. INSTALL SAND AND GRAVEL, OR CRUSHED STONE, FILTERS IN CONJUNCTION WITH SUMPS, WELL POINTS, AND/OR DEEP WELLS TO PREVENT THE MIGRATION OF FINES FROM THE EXISTING SOIL DURING THE DE-WATERING OPERATION.

   6.B. WATER PUMPED FROM EXCAVATIONS MUST BE PASSED THROUGH A SILT FILTER BAG OR OTHER SUCH BEST MANAGEMENT PRACTICE (BMP) FEATURE PRIOR TO BEING DISCHARGED BACK TO A SURFACE WATER BODY.

   6.C. DO NOT DISCHARGE WATER INTO ANY SANITARY SEWER SYSTEM.

   6.D. ALL DE-WATERING DISCHARGES SHALL BE OUTSIDE OF ANY WETLAND SYSTEMS.

   6.E. FOLLOWING TREATMENT IN AN APPROPRIATE BMP, WATER PUMPED FROM EXCAVATIONS SHOULD GENERALLY BE DISCHARGED ON THE DOWNSTREAM SIDE OF THE WORK AREA.

   6.F. THE DISCHARGE AREA FOR THE PUMP OR SIPHON OUTLET MUST BE PROPERLY PROTECTED TO PREVENT EROSION BY HIGH VELOCITY FLOW.

   6.G. DISCHARGE FLOW VELOCITY FROM PUMPS OR SIPHONS OVER UNPROTECTED, VEGETATED GROUND MUST NOT EXCEED A MAXIMUM OF 1 FOOT PER SECOND. DISCHARGE FLOW VELOCITY FROM PUMPS OR SIPHONS WITHIN THE UNPROTECTED NATURAL STREAM CHANNEL SHALL NOT EXCEED A MAXIMUM OF 3 FEET PER SECOND. IN THE EVENT EROSION RESULTS FROM VELOCITIES OF THE MAGNITUDES, THE CONTRACTOR SHALL TAKE STEPS TO MITIGATE THE EROSION OR SHALL REDUCE DISCHARGE FLOW VELOCITY.

7. THE CONTRACTOR SHALL INSTALL TEMPORARY COFFERDAMS AS REQUIRED. THE EXACT CONSTRUCTION DETAILS OF THE COFFERDAM SHALL BE DETERMINED BY THE CONTRACTOR PERFORMING THE WORK.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY WATER CONTROL, SURFACE WATER AND GROUNDWATER, NECESSARY TO EXECUTE AND COMPLETE THE WORK, SUBJECT TO THE RESTRICTIONS CONTAINED IN THE PROJECT PERMITS.

9. ALL TEMPORARY WATER CONTROL MEASURES SHALL BE IMPLEMENTED IN CONJUNCTION WITH APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES SO AS TO MITIGATE TO THE GREATEST EXTENT POSSIBLE RELEASE OF SEDIMENT INTO WATER BODIES AND POTENTIAL EROSION OF SOIL.

10. PUMPS OR GENERATORS WHICH UTILIZE LIQUID FUEL MUST BE PLACED WITHIN AN IMPERMEABLE SECONDARY CONTAINMENT AREA WITH SUFFICIENT CAPACITY TO CONTAIN THE FULL VOLUME OF THE FUEL TANK.

11. PUMP OR SIPHON INTAKES SHALL BE PLACED SUCH THAT SEDIMENT AND DEBRIS ENTRAINMENT IS MINIMIZED.

12. THE TEMPORARY COFFERDAM SHALL NOT BE CONSTRUCTED OF UNCONTAINED FILL (SOIL, ROCK, OR ANY OTHER LOOSE MATERIAL). THESE TYPES OF COFFERDAMS ARE SPECIFICALLY DISALLOWED FOR ENVIRONMENTAL PROTECTION REASONS.

CONSTRUCTION SEQUENCE

1. INSTALL ALL EROSION AND SEDIMENT CONTROL BARRIERS AS FIRST ORDER OF WORK.

2. CONSTRUCT ANY REQUIRED COFFERDAMS AND/OR DE-WATERING PRACTICES REQUIRED FOR THE REMOVAL OF SEDIMENT FROM THE FOREBAY.

3. REMOVE SEDIMENT FROM THE FOREBAY AND REMOVE ANY COFFERDAMS AND/OR DE-WATERING MEASURES.

4. REMOVE EXISTING PAVER WALKWAY AND INSTALL NEW PAVER WALKWAY AND BOARDWALK.

5. WHEN THE AREA IS COMPLETELY STABILIZED, REMOVE THE EROSION AND SEDIMENT CONTROL BARRIERS.

Tighe&Bond

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APPROVED BY:	JEC

GENERAL NOTES

SCALE: AS SHOWN

G-003

SOIL STOCKPILE/
SEDIMENT DEWATERING
CONTAINMENT AREA

STABILIZED CONSTRUCTION ENTRANCE (TYP)

CONSTRUCTION ACCESS

LIMIT OF WORK

CONSTRUCTION
ACCESS ROUTE

STAGING AREA SHOWN FOR PATH
RECONSTRUCTION. DETAILS AND
DESIGN BY OTHERS.
AREA DOES NOT INCLUDE TREE
REMOVAL, ALL TREES MUST REMAIN

COFFERDAM

STRAWBALE & SILT FENCE (TYP)

APPROX TEMP DEWATERING
BAG/SPLASH PAD LOCATION
(SEE NOTE 1)

PUMPED WATER OUTLET TO
DEWATERING FILTER BAG

50-FOOT NO DISTURBANCE
BUFFER ZONE

100-FOOT BUFFER ZONE

TOWN OF LITTLETON
BK. 14695 PG. 9
PL. BK. 356 P-46
LAKE DRIVE
PARCEL ID: 1701

FRANCES MAZZONE
BK. 15612 PG. 439
PL. BK. 356 P-46
JUNIPER ROAD
PARCEL ID: 2158

ROBERT E. HALL
BK. 29440 PG. 399
8 IVY ROAD
PARCEL ID: 3921

HOLLY A. GRAUSTEIN
BK. 55490 PG. 331
PL. BK. 362 PG. 26
34 BEACH DRIVE
PARCEL ID: 1655

TOWN OF LITTLETON
BK. 12718 PG. 688
PL. BK. 356 PG. 46
LAKE SHORE DRIVE
PARCEL ID: 2148

TOWN OF LITTLETON
BK. 12718 PG. 688
PL. BK. 356 PG. 46
LAKE SHORE DRIVE
PARCEL ID: 1685

TOWN OF LITTLETON
BK. 12718 PG. 688
PL. BK. 356 PG. 46
BEACH DRIVE
PARCEL ID: 3863

TOWN OF LITTLETON
BK. 12718 PG. 688
PL. BK. 356 PG. 46
BEACH DRIVE
PARCEL ID: 3864

TOWN OF LITTLETON
BK. 12718 PG. 688
PL. BK. 356 PG. 46
BEACH DRIVE
PARCEL ID: 3865

TOWN OF LITTLETON
BK. 12718 PG. 688
PL. BK. 356 PG. 46
LAKE SHORE DRIVE
PARCEL ID: 3894

LAKE DRIVE

BEACH DRIVE

LAKE SHORE DRIVE

JUNIPER ROAD
(NOT CONSTRUCTED)

EXISTING PAVER WALKWAY (TYP)

MH LOCKED
RAISED RIM
RIM=255.10

CB 6
RIM=254.45
INV. (A)=N.V.P.
INV. (B)=250.6
WATER=251.0

CB 5
RIM=254.22
INV. (A)=250.8
INV. (B)=250.6

CB 4
RIM=251.91
INV. (A)=249.1
INV. (B)=248.4

CB 3
RIM=250.81
INV. (A)=247.2
INV. (B)=247.4
WATER=248.9

CB 2
RIM=250.98
INV. (A)=247.8
INV. (B)=247.7
WATER=249.0

CB 1
RIM=251.97
INV. =249.1

TBM
PUNCH IN CB FRAME
ELEV=254.43'

TBM
DH IN STONE HEADWALL
ELEV=253.46'

INV. =248.39
12" RCP

TOP OF METAL WEIR=251.0'
TOP OF METAL BRACKET=252.1'

FLOW SPLITTER

WATER ELEVATION
AS OF 02/04/2025
(TOP OF ICE)
=±250.8'

WATER ELEVATION
AS OF 02/04/2025
(TOP OF ICE)
=±251.1'

TOP OF METAL WEIR=251.1'
TOP OF BRACKET=251.3'

BORDERING
VEGETATED
WETLAND LIMIT

BORDERING LAND
SUBJECT TO FLOODING

EDGE OF WATER

CONC HEADWALL

CONC STONE HEADWALL

6' WD FENCE

DOCK

INFO
KIOSK

"PERMIT ONLY"

"NO PARKING"

BIT. CURB

STOP LOG ADJUSTMENT

INVERT INACCESSIBLE

TOP OF 12" RCP
ELEV =253.68
(BURIED)

TOP OF 12" RCP
ELEV =253.21
(BURIED)

INV.=247.24'

LONG POND

CONSTRUCTION ACCESS

NOTE:

1. THE DEWATERING LAYOUT IS SHOWN FOR SCHEMATIC PURPOSES ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MEANS AND METHODS AND SHALL SUBMIT A DEWATERING PLAN FOR APPROVAL PRIOR TO CONSTRUCTION.

SCALE: 1" = 20'

Last Saved: 6/24/2025
Plotted: Jun 24, 2025-11:46am By: TMcSparren
Tighe & Bond:\\tighebond.com\data\Data\Projects\L\L0783 Town of Littleton Stormwater\024 Frog Pond Assistance\Drawings\AutoCAD\Sheet\L0783-024-C-EXST.dwg

Tighe&Bond

BRIAN S. HUNTLEY
CIVIL
No. 46273
REGISTERED
PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
6-30-25

JEAN CHRISTY
CIVIL
No. 47080
REGISTERED
PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
06/30/2025

PERMIT DRAWINGS

THIS DOCUMENT IS RELEASED TEMPORARILY FOR PROGRESS REVIEW ONLY. IT IS NOT INTENDED FOR BIDDING OR CONSTRUCTION PURPOSES.

Constructed Wetland Rehabilitation Assistance

Town of Littleton

Littleton, Massachusetts

MARK	DATE	DESCRIPTION

PROJECT NO:	L0783-024
DATE:	06/2025
FILE:	L0783-024-C-EXST.dwg
DRAWN BY:	THM
DESIGNED/CHECKED BY:	TAL
APPROVED BY:	JEC

EXISTING CONDITIONS &
SITE PREPARATION PLAN

C-101

SOIL STOCKPILE/
SEDIMENT DEWATERING
CONTAINMENT AREA

STRAWBALE & SILT FENCE (TYP)

CONSTRUCTION ACCESS

STABILIZED CONSTRUCTION ENTRANCE (TYP)

LIMIT OF WORK

99 CUBIC YARDS OF SEDIMENT TO BE REMOVED FROM SEDIMENT FOREBAY. SEDIMENT TO EXCAVATED IN A MANNER WHICH LEAVES BOTTOM OF FOREBAY LEVEL. SEE LEGEND FOR APPROXIMATE DEPTHS OF SEDIMENT TO BE REMOVED IN CORRESPONDING AREAS

CONSTRUCTION ACCESS ROUTE

STAGING AREA SHOWN FOR PATH RECONSTRUCTION. DETAILS AND DESIGN BY OTHERS. AREA DOES NOT INCLUDE TREE REMOVAL, ALL TREES MUST REMAIN

NEW PAVER WALKWAY MATERIALS TO MATCH EXISTING WALKWAY, DESIGN BY OTHERS

APPROXIMATE BOARDWALK OVER WETLAND CROSSING, DESIGN BY OTHERS

COFFERDAM

APPROX TEMP DEWATERING BAG/SPLASH PAD LOCATION

STAGING AREA SHOWN FOR PATH RECONSTRUCTION. DETAILS AND DESIGN BY OTHERS. AREA DOES NOT INCLUDE TREE REMOVAL, ALL TREES MUST REMAIN

CONSTRUCTION ACCESS

LEGEND
SEDIMENT DEPTHS TO BE REMOVED

- 3 INCHES
- 6 INCHES
- 9 INCHES
- 16 INCHES
- 23 INCHES

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

Last Saved: 6/24/2025
Plot Date: 6/24/2025 11:47am By: TMcSharren
Tighe & Bond:\\tighebond.com\data\Data\Projects\LL\L0783 Town of Littleton Stormwater\024 Frog Pond Assistance\Drawings\AutoCAD\Sheet\L0783-024-C-PROP.dwg

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
BRIAN S. HUNTLEY
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PERMIT DRAWINGS

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Constructed Wetland Rehabilitation Assistance

Town of Littleton

Littleton, Massachusetts

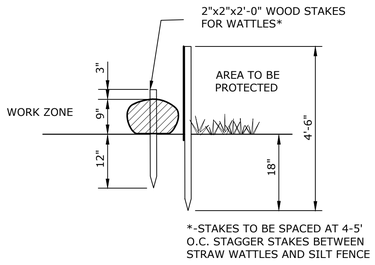
MARK	DATE	DESCRIPTION

PROJECT NO:	L0783-024
DATE:	06/2025
FILE:	L0783-024-C-PROP.dwg
DRAWN BY:	THM
DESIGNED/CHECKED BY:	TAL
APPROVED BY:	JEC

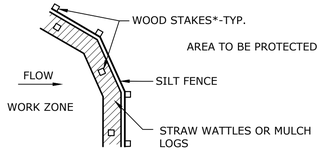
FOREBAY EXCAVATION PLAN

SCALE: 1" = 20'

C-201

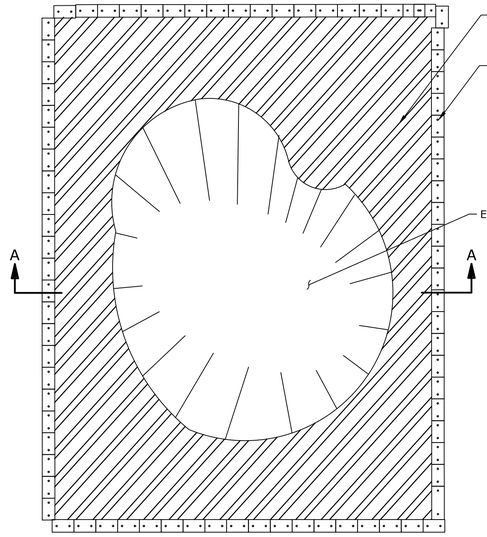


SECTION

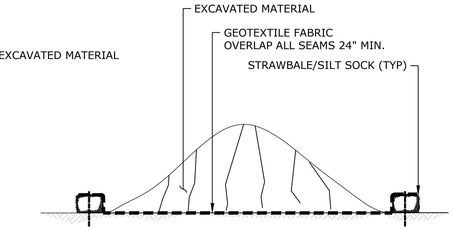


PLAN

EROSION CONTROL BARRIER
NO SCALE

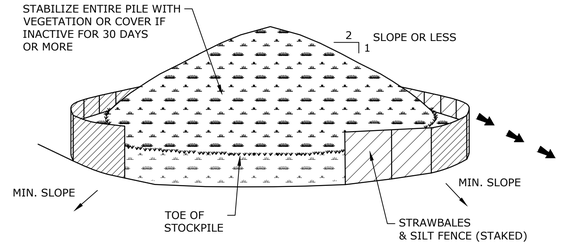


PLAN



SECTION A-A

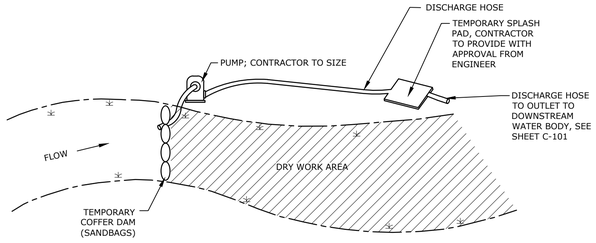
SEDIMENT DEWATERING CONTAINMENT
NO SCALE



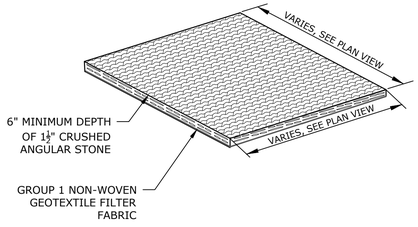
INSTALLATION NOTES:

1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 2H:1V.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH EITHER SILT FENCING OR STRAW BALES, THEN STABILIZED WITH VEGETATION OR COVERED.

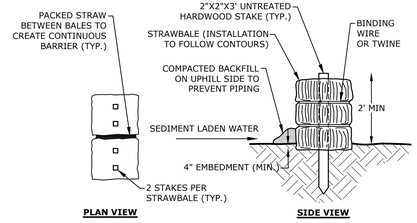
SOIL STOCKPILING
NO SCALE



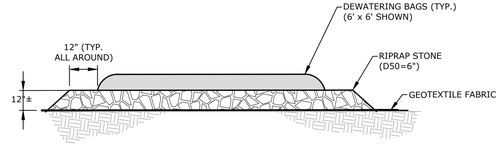
COFFERDAM DETAIL
NO SCALE



CONSTRUCTION ENTRANCE
NO SCALE



STRAWBALE BARRIER
NO SCALE



NOTES:
1. SIZE AND LOCATION OF DEWATERING BAG(S) TO BE DETERMINED THE IN FIELD.
2. REMOVE DEWATERING BAGS, RIPRAP, AND GEOTEXTILE FABRIC IN THEIR ENTIRETY AT COMPLETION.

DEWATERING BAG
NO SCALE

Tighe&Bond

COMMONWEALTH OF MASSACHUSETTS
BRIAN S. HUNTLEY
CIVIL
No. 46273
REGISTERED PROFESSIONAL ENGINEER
6-30-25

COMMONWEALTH OF MASSACHUSETTS
JEAN CHRISTY
CIVIL
No. 47080
REGISTERED PROFESSIONAL ENGINEER
06/30/2025

PERMIT DRAWINGS

Constructed Wetland Rehabilitation Assistance

Town of Littleton

Littleton, Massachusetts

MARK	DATE	DESCRIPTION

PROJECT NO:	L0783-024
DATE:	06/2025
FILE:	L0783-024-C-DETL.dwg
DRAWN BY:	THM
DESIGNED/CHECKED BY:	TAL
APPROVED BY:	JEC

DETAILS

SCALE: AS SHOWN

C-501

Last Saved: 6/11/2025
Printed/Plotted: Jun 24, 2025 - 11:47am By: TMcSparren
Tighe & Bond:\\tighebond.com\data\Data\Projects\L\L0783 Town of Littleton Stormwater\024 Frog Pond Assistance\Drawings\AutoCAD\Sheet\L0783-024-C-DETL.dwg

Appendix B

Photographic Log

Client: Town of Littleton, MA **Job Number:** L-0783-024

Site: Frog Pond Assistance

Photograph No.: 1	**Date:** 03/14/2025	**Direction Taken:** South
Description: Typical View of the northern edge of Frog Pond. BVW extends from the bank of the pond across the existing paver path.		

Photograph No.: 2	**Date:** 03/14/2025	**Direction Taken:** North
Description: Typical view of the southern edge of Frog Pond and outlet drainage.		

Photographic Log

Client: Town of Littleton, MA **Job Number:** L-0783-024
Site: Frog Pond Assistance

Photograph No.: 3	**Date:** 03/14/2025	**Direction Taken:** North
Description: Typical view of the existing paver path east of Frog Pond. BVW is present on both side of the path.		

Photograph No.: 4	**Date:** 05/14/2025	**Direction Taken:** South
Description: View of the existing paver path crossing a flooded wetland area, located on the eastern side of Frog Pond.		

Photographic Log

Client: Town of Littleton, MA **Job Number:** L-0783-024
Site: Frog Pond Assistance

Photograph No.: 5	**Date:** 05/14/2025	**Direction Taken:** Southeast
Description: View of BVW extending to the east of Frog Pond.		

Photograph No.: 6	**Date:** 05/14/2025	**Direction Taken:** North
Description: Alternate view of the existing wooden plank path, crossing the BVW.		

Tighe&Bond

Appendix C

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Frog Pond Assistance City/County: Littleton Sampling Date: 03/13/2025

Applicant/Owner: Town of Littleton Department of Public Works State: MA Sampling Point: 1

Investigator(s): Rick Lipinski Section, Township, Range:

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 2

Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.533965 Long: -71.466217 Datum:

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

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area**	
Hydric Soil Present?	Yes X	No	**within a Wetland?**	**Yes** X **No**
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)
This wetland exists on the northern edge of Frog Pond, containing soil saturation, dark surface, and dominant hydrophytic vegetation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):
Water Table Present?	Yes X	No	Depth (inches): 16
Saturation Present? (includes capillary fringe)	Yes X	No	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hydrologic indicators are met.

VEGETATION – Use scientific names of plants.

Sampling Point: 1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus rubra*	25	Yes	FACU
2. *Alnus incana*	20	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	45	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Celastrus scandens*	15	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	15	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Microstegium vimineum*	65	Yes	FAC
2. *Onoclea sensibilis*	15	No	FACW
3. *Juncus effusus*	10	No	OBL
4. *Epilobium ciliatum*	10	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	=Total Cover	
Woody Vine Stratum (Plot size:)			
1. *Toxicodendron radicans*	10	Yes	FAC
2.			
3.			
4.			
	10	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	45	x 2 =	90
FAC species	75	x 3 =	225
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	170 (A)		485 (B)

Prevalence Index = B/A = 2.85

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

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

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

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

Remarks: (Include photo numbers here or on a separate sheet.)
Vegetation meets wetland criteria.

SOIL

Sampling Point: 1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	100					Muck	saturated
16-20	10YR 2/1	95	10YR 6/1	5	C	M	Mucky Sand	mixed matrix
20-24	10YR 6/1	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol (A1)
- X Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- 1 Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to reflect the NRCS Field Indicators of Hydric Soils version 7.0 March 2013 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Frog Pond Assistance City/County: Littleton Sampling Date: 03/13/2025

Applicant/Owner: State: MA Sampling Point: Upland TP2

Investigator(s): Rick Lipinski Section, Township, Range:

Landform (hillside, terrace, etc.): flat Local relief (concave, convex, none): convex Slope (%): 1

Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.533177 Long: -71.466188 Datum:

Soil Map Unit Name: Woodbridge-Urban land complex, 3 to 15 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area**		
Hydric Soil Present?	Yes	No X	**within a Wetland?**	**Yes**	**No** X
Wetland Hydrology Present?	Yes	No X	If yes, optional Wetland Site ID:		

Remarks: (Explain alternative procedures here or in a separate report.)
This upland plot exists on the southern edge of Frog pond, with no hydrologic indicators or wetland vegetation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

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

Wetland Hydrology Present? **Yes** **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydrologic indicators are present.

VEGETATION – Use scientific names of plants.

Sampling Point: Upland TP2

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer nigrum*	10	Yes	FACU
2. *Pinus strobus*	10	Yes	FACU
3. *Ulmus americana*	5	No	FACW
4. *Picea abies*	5	No	UPL
5.			
6.			
7.			
	30	=Total Cover	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	

Herb Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		=Total Cover	

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	0	x 3 =	0
FACU species	20	x 4 =	80
UPL species	5	x 5 =	25
Column Totals:	30 (A)		115 (B)
Prevalence Index = B/A =			3.83

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

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

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

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

Remarks: (Include photo numbers here or on a separate sheet.)
Vegetation does not meet wetland criteria. Upland data point taken on outskirts of Frog Pond with no herbaceaous vegetation

SOIL

Sampling Point: Upland TP2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: hard bottom

Depth (inches): 4

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

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to reflect the NRCS Field Indicators of Hydric Soils version 7.0 March 2013 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

No hydrologic soil indicators present at this upland point.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Frog Pond Assistance City/County: Littleton Sampling Date: 03/13/2025

Applicant/Owner: Town of Littleton Department of Public Works State: MA Sampling Point: Upland TP3

Investigator(s): Rick Lipinski Section, Township, Range:

Landform (hillside, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.533752 Long: -71.466296 Datum:

Soil Map Unit Name: Woodbridge-Urban land complex, 3 to 15 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area**		
Hydric Soil Present?	Yes X	No	**within a Wetland?**	**Yes**	**No** X
Wetland Hydrology Present?	Yes	No X	If yes, optional Wetland Site ID:		

Remarks: (Explain alternative procedures here or in a separate report.)
This upland plot exists on the eastern edge ouside of Frog Pond, with no hydrologic indicators and marginal wetland vegetation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

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

Wetland Hydrology Present? **Yes** **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydrologic indicators are present.

VEGETATION – Use scientific names of plants.

Sampling Point: Upland TP3

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer nigrum*	10	Yes	FACU
2. *Fraxinus nigra*	5	Yes	FACW
3. *Ulmus americana*	5	Yes	FACW
4.			
5.			
6.			
7.			
	20	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Reynoutria japonica*	35	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	35	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Dennstaedtia punctilobula*	20	Yes	UPL
2. *Euonymus fortunei*	20	Yes	UPL
3. *Onoclea sensibilis*	5	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	45	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	0	x 3 =	0
FACU species	45	x 4 =	180
UPL species	40	x 5 =	200
Column Totals:	100 (A)		410 (B)

Prevalence Index = B/A = 4.10

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

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

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

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

Remarks: (Include photo numbers here or on a separate sheet.)
Vegetation does not meet wetland criteria.

SOIL

Sampling Point: Upland TP3

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 3/1	100					Loamy/Clayey	sandy loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to reflect the NRCS Field Indicators of Hydric Soils version 7.0 March 2013 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

Soils only contain S7 indicators. No redox was found in soil profile.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Frog Pond Assistance City/County: Littleton Sampling Date: 05/02/2025

Applicant/Owner: Town o fLittleton Department of Public Works State: MA Sampling Point: Wetland 5/2

Investigator(s): Rick Lipinski Section, Township, Range:

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.534078 Long: -71.46624 Datum:

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

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area**	
Hydric Soil Present?	Yes X	No	**within a Wetland?**	**Yes** X **No**
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)
This wetland exists on the northern edge of Frog pond, containing soil saturation, dark surface, and dominant hydrophytic vegetation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- X Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):	
Water Table Present?	Yes	No X	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes X	No	Depth (inches): 0	**Wetland Hydrology Present?** **Yes** X **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hydrologic indicators are met.

VEGETATION – Use scientific names of plants.

Sampling Point: Wetland 5/2

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus rubra*	10	Yes	FACU
2. *Prunus serotina*	10	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	20	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Reynoutria japonica*	15	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	15	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Osmunda claytoniana*	35	Yes	FAC
2. *Onoclea sensibilis*	35	Yes	FACW
3. *Athyrium angustum*	10	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	35	x 2 =	70
FAC species	45	x 3 =	135
FACU species	35	x 4 =	140
UPL species	0	x 5 =	0
Column Totals:	115 (A)		345 (B)
Prevalence Index = B/A =			3.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

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

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

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

Remarks: (Include photo numbers here or on a separate sheet.)
Vegetation meets wetland criteria.

SOIL

Sampling Point: Wetland 5/2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1	100					Loamy/Clayey	silt loam
18-22	10YR 2/1	80	10YR 4/6	20	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to reflect the NRCS Field Indicators of Hydric Soils version 7.0 March 2013 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Frog Pond Assistance City/County: Littleton Sampling Date: 05/02/2025

Applicant/Owner: Town of Littleton Department of Public Works State: MA Sampling Point: Upland 5/2

Investigator(s): Rick Lipinski Section, Township, Range:

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR or MLRA): LRR R, MLRA 144A Lat: 42.534083 Long: -71.466168 Datum:

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

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area**	
Hydric Soil Present?	Yes	No X	**within a Wetland?**	**Yes** **No** X
Wetland Hydrology Present?	Yes	No X	If yes, optional Wetland Site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)
This upland exists on the northern edge of Frog pond, just outside of the wetland boundary. No sources of hydrology are found and minimal hydrophytic vegetation was observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

Wetland Hydrology Present? **Yes** **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hydrologic indicators are not met.

VEGETATION – Use scientific names of plants.

Sampling Point: Upland 5/2

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus alba*	10	Yes	FACU
2. *Acer platanoides*	10	Yes	UPL
3.			
4.			
5.			
6.			
7.			
	20	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Euonymus atropurpureus*	30	Yes	FACU
2. *Reynoutria japonica*	15	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	45	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Euonymus fortunei*	20	Yes	FAC
2. *Osmundastrum cinnamomeum*	5	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	25	=Total Cover	
Woody Vine Stratum (Plot size:)			
1. *Toxicodendron radicans*	30	Yes	FACU
2.			
3.			
4.			
	30	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 28.6% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	20	x 3 =	60
FACU species	85	x 4 =	340
UPL species	10	x 5 =	50
Column Totals:	120 (A)		460 (B)

Prevalence Index = B/A = 3.83

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

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

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

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

Remarks: (Include photo numbers here or on a separate sheet.)
Vegetation does not meet wetland criteria.

SOIL

Sampling Point: Upland 5/2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 2/2	100					Loamy/Clayey	silt loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to reflect the NRCS Field Indicators of Hydric Soils version 7.0 March 2013 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

No hydric soil indicators were present at the time of sampling.

Tighe&Bond

Appendix D

TOWN OF LITTLETON
BOARD OF ASSESSORS
P.O. BOX 1305
LITTLETON, MA 01460
(978) 540-2410
FAX: (978) 952-2321

Date: April 17, 2025

Re: Certified List of Abutters Conservation Commission

Applicant**:** Maria Johsenberg

Name of Firm: Tighe & Bond, Inc

Mailing Address: 120 Front St Ste 700 Worcester MA 01608

Subject Parcel Location: 0 Lake Dr & 0 Lake Shore

Subject Parcel No.: U12-22-0 and U12-15-0

Subject Owner Name: Town of Littleton

M.G.L. Chapter 131: Section 40 …… "Any person filing a notice of intention with a conservation commission shall at the same time give written notification thereof, by delivery in hand or certified mail, return receipt requested, to all abutters within one hundred feet of the property line of the land where the activity is proposed, but not limited to, owners of land directly opposite said proposed activity on any public or private street or way, and in another municipality or across a body of water. When a notice of intent proposes activities on land under water bodies and waterways or on a tract of land greater than 50 acres, written notification shall be given to all abutters within 100 feet of the proposed project site. For the purposes of this action, "project site" shall mean lands where the following activities are proposed to take place: dredging, excavating, filling, grading, the erection, reconstruction or expansion of a building or structure, the driving of pilings, the construction or improvement of roads or other ways and the installation of drainage, sewerage and water systems, and "land under water bodies and waterways" shall mean the bottom of, or land under, the surface of the ocean or an estuary, creek, river stream, pond or lake. When a notice of intent proposes activity on a linear shaped project site longer than 1,000 feet in length, notification shall be given to all abutters within 1,000 feet of the proposed project site. If the linear project site takes place wholly within an easement through another person's land, notice shall also be given to the landowner**.** Said notification shall be at the applicant's expense, and shall state where copies of the notice of intention may be examined and obtained and where information regarding the date, time and place of the public hearing may be obtained. Proof of such notification, with a copy of the notice mailed or delivered, shall be filed with the conservation commission."…….

I hereby certify the attached list of abutter (s) as stated in the M.G.L. Chapter 131, Section 40.

Number of Abutter(s) 14 including the subject parcels + 1 Applicant Requesting Abutter's List. ***Certified by:***

Name: Kim Prehl

Title: Office Assistant/Field Lister

TOWN RD U12 1 0

LUC: 930

LITTLETON TOWN OF

PARK DEPARTMENT

PO BOX 1305

LITTLETON, MA 01460

34 BEACH DR U12 10 0

LUC: 101

GRAUSTEIN HOLLY A

34 BEACH DR

LITTLETON, MA 01460

BEACH DR U12 11 0

LUC: 932

LITTLETON TOWN OF

CONSERVATION COMMISSION

PO BOX 1305

LITTLETON, MA 01460

BEACH DR U12 12 0

LUC: 932

LITTLETON TOWN OF

CONSERVATION COMMISSION

PO BOX 1305

LITTLETON, MA 01460

BEACH DR U12 13 0

LUC: 932

LITTLETON TOWN OF

CONSERVATION COMMISSION

PO BOX 1305

LITTLETON, MA 01460

LAKE SHORE DR U12 14 0

LUC: 932

LITTLETON TOWN OF

CONSERVATION COMMISSION

PO BOX 1305

LITTLETON, MA 01460

LAKE SHORE DR U12 15 0

LUC: 932

LITTLETON TOWN OF

CONSERVATION COMMISSION

PO BOX 1305

LITTLETON, MA 01460

8 IVY RD U12 18 0

LUC: 109

HALL ROBERT E

8 IVY RD

LITTLETON, MA 01460

10 IVY RD U12 19 0

LUC: 101

ROSADO VICTORIA

LOPEZ MICHAEL

10 IVY RD

LITTLETON, MA 01460

12 IVY RD U12 21 0

LUC: 130

RAFFI RONALD J SR

170 KING ST

LITTLETON, MA 01460

LAKE DR U12 22 0

LUC: 932

LITTLETON TOWN OF

CONSERVATION COMMISSION

PO BOX 1305

LITTLETON, MA 01460

LAKE SHORE DR U17 208 0

LUC: 932

LITTLETON TOWN OF

CONSERVATION COMMISSION

PO BOX 1305

LITTLETON, MA 01460

JUNIPER RD U17 225 0

LUC: 132

MAZZONE FRANCES

P.O. BOX 647

LITTLETON, MA 01460

IVY RD U17 226 0

LUC: 132

MAZZONE GENE E

18 IVY RD

LITTLETON, MA 01460

NOTIFICATION TO ABUTTERS

Pick one:

_X_Notice of Intent/Abbreviated NOI

_____Abbreviated Notice of Resource Area Delineation

_____Request for Determination of Applicability

_____Request to Amend an Order of Conditions (MADEP File # 204_____)

Modification for Virtual Meetings

Under MA Wetlands Protection Act and Littleton Wetlands Protection ByLaw (Chapter 171), this form must be completed and mailed, certified mail return receipt requested, to all abutters at their mailing addresses shown on the most recent Town Assessor's records as well as the owner (if not applicant).

In accordance with the MA Wetlands Protection Act and Littleton Wetlands Protection ByLaw Chapter 171-2D, you are hearby notified of a public hearing on the matter described below:

A. The applicant has filed a permit application with the Littleton Conservation Commission for work in an area subject to protection under the Massachusetts Wetlands Protection Act and Littleton Wetlands Protection ByLaw.

B. The name of the applicant is _Town of Littleton Department of Public Works_____

C. The address of the land where the activity is proposed is _Lake Shore Dr & Lake Dr_____
(Assessor Map U12, Lots 15 & 22)

D. The work proposed is _removal of accumulated sediment to rehabilitate the "Frog Pond"_____
stormwater wetland which treats water before it enters Long Pond and re-install the existing paver walkway around the stormwater wetland.

E. Copies of the filing may be examined at the Conservation Commission office at 37 Shattuck Street Monday through Thursday; 9:00 – 1:00 (please call first to ensure the Conservation Agent is available and not out on site visits). The office phone number is 978-540-2428.

F. Copies of the filing may be obtained electronically from (check one) the ____applicant or _X_ the applicant's representative by calling _508_-_380_-_7022__ during the following times: _8:00 AM to 5:00 PM Monday through Friday_____

G. The public hearing/meeting will be held on 7/22/25. Information regarding the date and time of the public hearing/meeting may be obtained from the Littleton Conservation Commission (see contact info at the end of this notice).

H. Notice of the public hearing/meeting, including date and time will be published at least five business days in advance in a paper of local circulation. The agenda, noting times will be posted at Town Hall and at https://ma-littleton.civicplus.com/AgendaCenter/Search/?term=&CIDs=13,&startDate=&endDate=&dateRange=&dateSelector= at least 48 hours in advance of the meeting. It is currently anticipated that this meeting will be held entirely remotely, pursuant to "An Act Relative to Extending Certain State of Emergency Accommodations" (July 16, 2022) and the extension of that Act through March 21, 2025. If the meeting is held remotely, instructions for remote viewing of, and participation in, the meeting will be included in the agenda and may also be obtained from the Littleton Conservation Commission.

You may contact the Littleton Conservation Commission staff (Conservation@littletonma.org; 978-540-2428), or the Massachusetts Department of Environmental Protection/ Central Region (508-792-7650) at 8 New Bond Street, Worcester, MA 01606) for information about this application

9-14-2023

Tighe&Bond

Appendix E

Frog Pond Stormwater Management Design Memorandum

TO: Stephen Jahnle, Director
Department of Public Works

FROM: Jean E. Christy, PE; Taylor Labbe, PE

DATE: May 27, 2025

Introduction

On behalf of the Littleton Department of Public Works (the "Applicant"), Tighe & Bond has prepared the following Stormwater Management Memorandum to support local permitting efforts for the Constructed Wetland Rehabilitation Assistance Project located near 11 Lake Shore Drive in Littleton, Massachusetts.

Using funding obtained through the Section 319 Nonpoint Source Competitive Grants Program, a constructed stormwater wetland was installed northeast of Long Pond at the intersection of Lake Drive and Lake Shore Drive in 2002-2003 to treat stormwater runoff and reduce the nutrient load entering Long Pond. Since its installation, the stormwater management system's ability to effectively treat runoff has declined due to lack of maintenance. Tighe & Bond has been retained by the Town of Littleton to restore the constructed stormwater wetland to allow it to function as originally intended. Additionally, the Town of Littleton plans to reconstruct the concrete paver walk that runs along the constructed stormwater wetland and construct a boardwalk that will cross a portion of the wetland. The design of the reconstructed concrete paver walk and boardwalk is not part of the work Tighe & Bond has performed.

A United States Geological Survey (USGS) Site Location figure, Orthophotograph, and Priority Resource figure of the Project site are provided in Appendix A as Figures 1-3 (respectively). Project plans are provided separately.

Existing Conditions

Under existing conditions, stormwater runoff flows toward the site from the north-west through both overland flow and stormwater management infrastructure, including catch basins, drainage manholes, and conveyance piping. Runoff from the approximately 46-acre watershed is captured by catch basins within the upgradient roadways and discharged through multiple outfalls to wooded areas abutting residential properties within the subcatchment. A drainage manhole located near the intersection of Juniper Road and Lake Drive features two outlet pipes, with one discharging to the constructed wetland and the other to Long Pond. Once runoff enters the constructed wetland, a "wetlands water control structure" conveys overflow to Long Pond through a 12" reinforced concrete pipe beneath Lake Shore Drive, according to the design plans titled "Contract Plans Constructed Wetland Long Lake" and dated April 2002, as prepared by GeoSyntec Consultants (Geosyntec). Refer to Appendix B for record plans. An approximately 500 linear-foot paver walking path

surrounds the constructed wetland along the eastern edge. It is understood that portions of this pathway are overgrown with vegetation.

As previously mentioned, the stormwater management system's ability to effectively treat runoff has declined since its installation due to lack of routine maintenance. One component of the system which may be most impacted by lack of routine maintenance is the sediment forebay. Acting as a pretreatment device for all stormwater runoff entering the constructed wetland system, the sediment forebay has seen an accumulation of debris and sediment over time. A sediment depth figure titled "Field Data" prepared by Geosyntec and dated May 2022 highlights the approximate depths of sediment throughout various locations within the forebay. As demonstrated by the figure, provided as Figure 5 in Appendix B, sediment depths vary between 3 and 28 inches. Operation and maintenance guidance provided by Geosyntec states that "removal of accumulated sediment should be undertaken once depths reach 1 foot in depth". It is understood that in order to restore the forebay to its intended operable condition, sediment must be removed as part of routine maintenance activities.

The Federal Emergency Management Agency's Flood Insurance Rate Map (FIRM) Community Panel Number 25017C0237F, effective July 7, 2014 shows the project site outside of any floodways or floodplains, as attached in Appendix A. Therefore, no floodplain is identified on this site.

Proposed Improvements

The proposed project involves both the reconstruction of approximately 500 linear feet of concrete paver walkway along the eastern edge of the constructed wetland and improvements to the wetland's sediment forebay. In addition, a boardwalk will be constructed over a portion of the wetland. 99 cubic yards of sediment from the system's sediment forebay, located near the intersection of Lake Shore Drive and Lake Drive to the north of Long Pond, are proposed to be excavated from the area in order to improve the pretreatment functionality of the forebay. Sediment forebays are a pretreatment best management practice (BMP) which consist of an excavated pit or bermed area with a weir, designed to slow incoming stormwater runoff and facilitate the gravity separation of suspended solids. Regular removal of accumulated sediment from the forebay may reduce the maintenance burden on the constructed wetland system over time by improving pretreatment functionality and extending the lifespan of the flow-through system. Because improvements are limited to forebay rehabilitation, and design alterations are not proposed as part of this work, drainage patterns will remain as they exist under current conditions.

These improvements have been prepared in accordance with recommendations in the MassDEP Stormwater Handbook.

The existing stormwater management system was designed to treat stormwater runoff from the contributory area for nutrient loading. The system includes BMPs such as deep-sump, hooded catch basins, a sediment forebay, and a constructed wetland. A dry swale was also designed and constructed as part of the original project in 2002-2003, and is located along the edge of Long Pond, running parallel to Lake Shore Drive. Although improvements to the dry swale are not included as part of this work, general operation

and maintenance recommendations relative to the feature are included for the Town's reference and records.

A brief description of the existing stormwater management BMPs are as follows:

Deep-Sump, Hooded Catch Basins: Catch basins provided throughout the site collect stormwater runoff from the upgradient roadways and are connected to the project's stormwater collection system. The deep-sump and hooded outlet provide runoff an opportunity to separate from solids and floatable pollutants prior to discharge and are used as a pretreatment device throughout the project.

Dry Swale: A dry swale was installed as a means of conveyance and pretreatment of stormwater runoff from the Lake Shore Drive prior to its entry into Long Pond.

Sediment Forebay: The existing sediment forebay serves as a pretreatment device for the constructed wetland. Sediment forebays are designed to slow incoming stormwater runoff and facilitate the gravity separation of suspended solids. Regular maintenance is important to ensure proper forebay function.

Constructed Wetland: The constructed wetland serves as a treatment feature for stormwater runoff from the approximately 46-acre subcatchment upgradient of Long Pond. Constructed wetlands are stormwater treatment systems designed to maximize the removal of pollutants from stormwater runoff through wetland vegetation uptake, runoff retention, and the gravity settling of suspended solids. Constructed stormwater wetlands temporarily store runoff in shallow, excavated depressions planted with wetland vegetation. They are generally considered some of the most effective stormwater BMPs for pollutant removal. The constructed wetland is designed with an outlet control feature to regulate the quantity of water discharging to Long Pond. The constructed wetland is also equipped with an overflow spillway to minimize the potential for flooding during extreme storm events.

Regulatory Compliance

The project is required to comply with the ten MassDEP Massachusetts Stormwater Management Standards (Standards) under the Massachusetts Wetlands Protection. The Massachusetts Stormwater Checklist is provided in Appendix C. The proposed work is exempt from additional regulations and permit requirements mandated by the Littleton Stormwater Bylaw as a project disturbing less than one acre of land.

Standard 1: No New Untreated Discharges

The project will not result in any new stormwater conveyance discharging untreated stormwater directly to the Waters of the Commonwealth. It is not anticipated that erosive stormwater velocities will be encountered post-improvements, and subsequent erosion and siltation to Waters of the Commonwealth is not anticipated. Proposed improvements to the existing sediment forebay are anticipated to improve the overall quality of stormwater runoff entering Long Pond by ensuring adequate pretreatment and suspended solid settlement.

Standard 2: Peak Discharge Rate Attenuation

The proposed improvements to the existing sediment forebay constitute a redevelopment project. As such, the proposed work is required to demonstrate compliance with Standard 2 to the maximum extent practicable. The project will not alter existing drainage patterns, and the proposed improvements are anticipated to provide an additional 99 cubic yards of storage capacity within the sediment forebay. Therefore, peak rates are expected to remain the same as compared to pre-construction conditions.

Standard 3: Groundwater Recharge

The required recharge volume is a function of the proposed impervious area for the project. The project does not propose a change in impervious area; therefore, designed infiltration of stormwater runoff from the proposed project to groundwater is not required. No alterations are proposed to the constructed wetland system, which provides groundwater recharge under existing conditions.

Standard 4: Water Quality

Standard 4 of the Massachusetts Stormwater Standards addresses stormwater quality requirements. This standard requires that new stormwater management systems be designed to achieve an 80% Total Suspended Solids (TSS) removal rate prior to discharge. MassDEP has published presumed removal rates for each of the BMP's featured in their design guidelines. Additionally, this standard addresses the required volume of stormwater runoff that is to be treated by the BMPs, as well as components of a long-term source control and pollution prevention plan.

The water quality volume is a function of the proposed impervious area for the project. The project does not propose any change in impervious surface; therefore, additional treatment of stormwater runoff from the proposed project prior to discharge is not required. Under existing conditions, TSS removal is provided through the pretreatment

and treatment features of this system, including deep-sump, hooded catch basins, a sediment forebay and a constructed wetland. The maintenance to the existing sediment forebay will result in increased functionality of the existing infrastructure. This work is expected to provide an improvement over existing conditions in terms of pretreatment efficacy. TSS removal calculations are provided in Appendix G.

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

The proposed use is not considered a LUHPPL. Therefore, compliance with the additional requirements of Standard 5 is not required.

Standard 6: Critical Areas

The site discharges runoff to Long Pond. Long Pond and its contributory watershed were the subjects of a Phase I Diagnostic/Feasibility Study conducted under MGL Chapter 628 Clean Lakes Program in 1990. Results of this study indicate that Long Pond is undergoing cultural eutrophication, and that Phosphorus is the limiting nutrient for primary production in the pond.

Constructed wetlands, such as presently exists in the Lakeshore Drive/Lake Drive area, are stormwater treatment systems designed to maximize the removal of pollutants from stormwater runoff through wetland vegetation uptake, runoff retention, and the gravity settling of suspended solids. They are generally considered some of the most effective stormwater BMPs for pollutant removal. Proposed improvements to the existing sediment forebay are anticipated to improve the overall quality of stormwater runoff entering Long Pond by ensuring adequate pretreatment and suspended solid settlement prior to the treatment of runoff within the constructed wetland.

Other Critical Areas, as defined in the Massachusetts Stormwater Handbook, are shown on Figure 2 in Appendix A.

Standard 7: Redevelopment Projects

The project is considered a redevelopment; therefore, the project has been designed to comply to the maximum extent practicable with Standards 2, 3 and 4. The project has been designed to fully comply with the remaining Standards.

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

A construction period Soil Erosion and Sediment Control Plan (SESCP) is provided in Appendix D. The SESCP presents the minimum soil erosion a sediment control practices to be used during forebay improvements.

Standard 9: Long-Term Operation and Maintenance Plan

A Long-Term Stormwater Operations and Maintenance Plan is included in Appendix E of this report. The O&M plan indicates the responsible parties for the existing BMPs, routine

and non-routine maintenance tasks and inspection criteria. The O&M Plan also provides guidance on long-term pollution prevention practices for existing features.

Standard 10: Prohibition of Illicit Discharges

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

Appendices:

A Figures

B Design Plans Titled "Contract Plans Constructed Wetland Long Lake" and Dated "April 2002", as Prepared by GeoSyntec Consultants

C Massachusetts Stormwater Checklist

D Soil Erosion and Sediment Control Plan

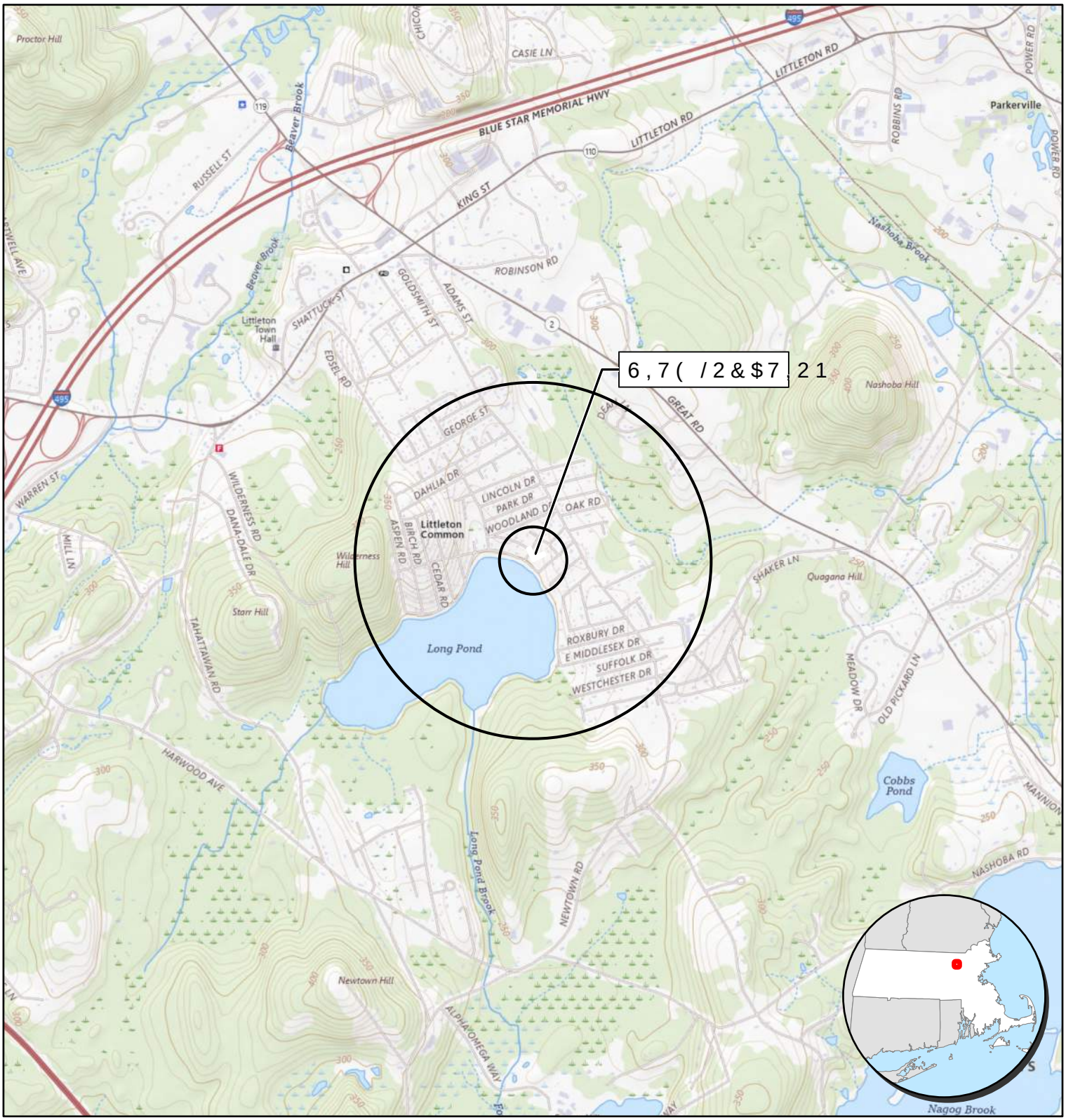
E Operation and Maintenance Plan

F Illicit Discharge Statement

G TSS Removal Calculations

Tighe&Bond

APPENDIX A



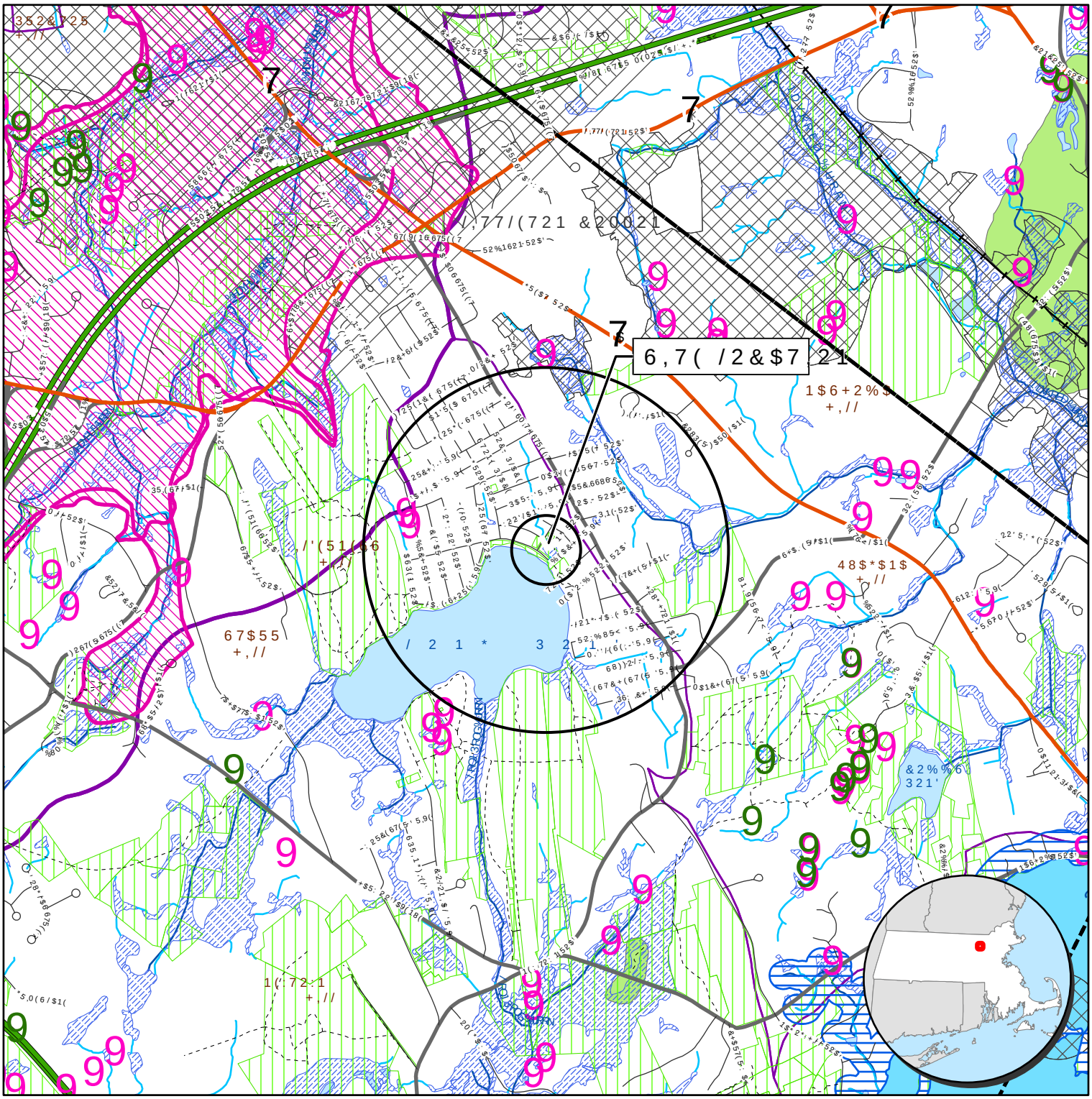
Tighe&Bond

%DVHG RQ 86*6 7KH 1DWLRQDO 0DS 7RSR %DVHPDS
&RQWRXU ,QWHUYDO (TXDOV)HHW
&LUFOHV LQGLFDWH IRRW DQG KDOI PLOH UDGLL

1)HHW

),*85(
35,25,7< 5(6285&(
-DQXDU\

)URJ 3RQG &RQVWUXFWHG :HWODQ
/DNH 6KRUH '
/LWWOHWRQ 0DV



Tighe&Bond

%DVHG RQ ODWHVW 1HDUPDS ,PDJHU\

1

)HHW

%DVHPDS ,PDJHU\ 6RXUFH 86*6 1DWLRQDO 0DS

FIGURE 4

Sediment Depth (in)

- 3 - 6 in.
- 6 - 9 in.
- 9 - 13 in.
- 13 - 22 in.
- 22 - 28 in.

- Wetland Flags
- Wetland Delineation
- Tree Removal

Sediment Volume = 3,200 CF or 118 CY

40 20 0 40 Feet

Field Data - May 2022

Long Lake, Littleton, MA

Geosyntec consultants

Acton, MA | June 2022

Figure 5

Z:\GIS\Projects\18K626_LongLake\MXD\Field_Data_Collection\Field Data May 2022.mxd; author: dd.mmm.yyyy; ProjNum-Task-Phase; Document Number, etc.

Tighe&Bond

APPENDIX B

Constructed Wetland Grading Plan

Legend

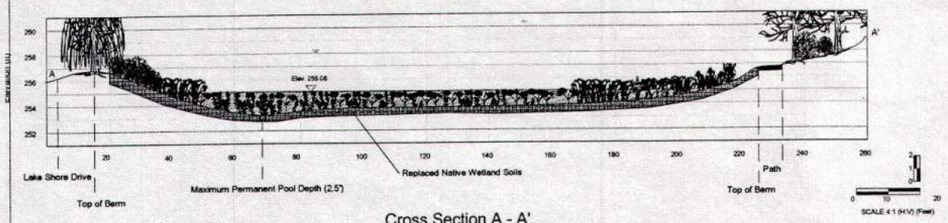
- 256 — Existing Grade Contour (feet, MSL)
- 256 — Proposed Final Grade Contour (feet, MSL)
- × 253.8 — Existing Spot Elevations
- 255.4 — Proposed Spot Elevations
- Guard Rail
- Silt Fence
- Existing Drainge Structures
- Proposed Drainage Structures

Trash Rack
Boulder Bollards
24" RCP
Flow Splitter
Dissipater Gate
Rip Rap Outlet Protection
INV. IN 256.3
INV. IN 256.0
INV. IN 255.9
INV. OUT 255.8
INV. OUT 255.4
12" RCP
1% Slope
Dry Stockpile Staging Area
Prop. Standard Catch Basin (no sump)
INV. IN 255.34
252.4
Forebay Water
Control Structure
2:1 (H:V) Typ.
257.7
Highest Overflow Elevation 256.4
12" RCP 300'
5% Slope
Dewatering Staging Area
253.9
256.75
INV. OUT 253.0
258.0
255.5
258.2
Metal Apron and Rip Rap Outlet Protection
12" RCP 1% Slope
Prop. Deep Sump Catch Basin
Abandon Existing Pipe
Highest Overflow Elevation 258.9
INV. OUT 252.5
252.75
Wetlands Water
Control Structure
Guard Rail
12" RCP
35' @5% Slope
INV. OUT 220
Boulder Bollards
Metal Apron and Rip Rap Outlet Protection
Swale Headwall
12" RCP
RD.
LAKE DR.
LAKE SHORE DR.
BEACH

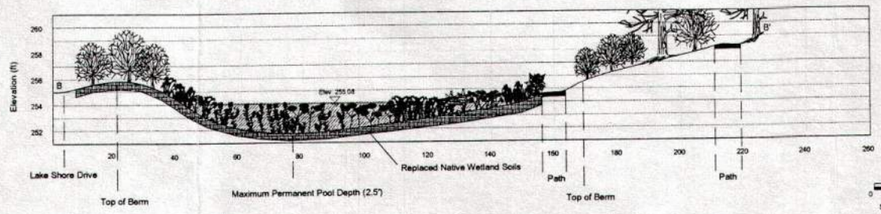
0 50 100

GeoSyntec Consultants
BOXBOROUGH, MASSACHUSETTS

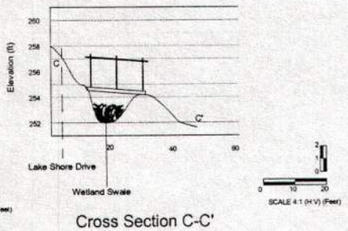
PROJECT	BR0027	FIGURE	3
DOCUMENT		FILE	PROPOSED_ELEVATIONS



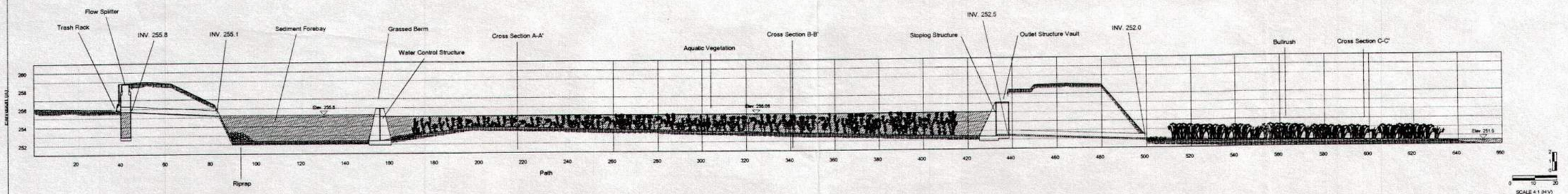
Cross Section A - A'



Cross Section B - B'



Cross Section C-C'



Water Profile Along Flow Path

LITTLETON LELWD ELECTRIC LIGHT & WATER DEPARTMENTS

Proposed Constructed Wetland Cross Sections

GeoSyntec Consultants
BOXBOROUGH, MASSACHUSETTS

PROJECT	BR0027	DRAWING	4
DOCUMENT		FILE	CROSS_SECTIONS

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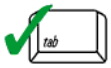
APPENDIX C

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

Checklist for Stormwater Report

A. Introduction

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



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

The Stormwater Report must include:

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

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

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

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

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

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

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

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

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

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

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

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

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

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

Standard 3: Recharge

☐ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

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

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

☐ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

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

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

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

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

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

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

☐ Solid Waste Landfill pursuant to 310 CMR 19.000

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

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

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

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[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.

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APPENDIX D

CONSTRUCTION PERIOD EROSION AND SEDIMENTATION CONTROL PLAN

Constructed Wetland Rehabilitation Assistance
Littleton, Massachusetts

May 2025

Prepared for:

Littleton Department of Public Works

Section 1 Introduction

Section 2 Project Information

Section 3 Erosion and Sediment Controls

Section 4 Pollution Prevention Standards

\\Tighebond.com\data\Data\Projects\L\L0783 Town of Littleton Stormwater\024 Frog Pond Assistance\Permitting\Stormwater\Memo\Appendix C - Construction Period LTPPP and Erosion Controls\Construction Period PPP and Erosion and Sediment Controls.doc

Section 1
Introduction

Stormwater runoff from construction activities can have a significant impact on water quality. As stormwater flows over a construction site, it can pick up pollutants like sediment, debris, and chemicals and transport these to a nearby storm sewer system or directly to a river, lake, or coastal water. Polluted stormwater runoff can harm or kill fish and other wildlife. Sedimentation can destroy aquatic habitat, and high volumes of runoff can cause stream bank erosion. Debris can clog waterways and potentially reach the ocean where it can kill marine wildlife and impact habitat.

Standard 8 of the Massachusetts Stormwater Standards requires:

> "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 following Erosion and Sediment Control Plan (ESCP) identifies the requirements to comply with Standard 8.

Section 2
Project Information

2.1 Plan Contents

This ESCP was developed for the Constructed Wetland Rehabilitation Assistance Project in Littleton, Massachusetts. This ESCP provides permit-related information to satisfy the requirements of Standard 8 of the Massachusetts Stormwater Handbook.

2.2 Project/ Site Information

Project Name and Address

Project/Site Name:	Constructed Wetland Rehabilitation Assistance
Project Street/Location:	Intersection of Lake Drive & Lake Shore Drive
City:	Littleton
State:	Massachusetts
ZIP Code:	01460
County or Similar Subdivision:	Middlesex

2.3 Nature of the Construction Activity

General Description of Project

The project site consists of a constructed wetland and sediment forebay. The constructed wetland was installed to receive and treat stormwater runoff to reduce the amount of nutrients entering Long Pond. Since its installation, the stormwater management system's ability to effectively treat runoff has declined due to lack of maintenance and buildup of excess sediment. The project proposes the removal of 99 cubic yards of sediment from the forebay to allow the constructed wetland to function as originally intended.

Size of Construction Project

Total size of the property: 0.99 acres (Parcel 1685)
0.21 acres (Parcel 1701)

Total area expected to be disturbed by the construction activities: 0.214 acres

The maximum area expected to be disturbed at any one time (in acres): 0.214 acres

TABLE 2-4

Pollutant-Generating Activities

Pollutant-Generating Activity	Pollutants or Pollutant Constituents (that could be discharged if exposed to stormwater)
Site work	Soil particles and fines
Construction areas	Petroleum, concrete, vehicle fluids

Pollutant-Generating Activity	Pollutants or Pollutant Constituents (that could be discharged if exposed to stormwater)
Equipment use	Hydraulic Oils/fluids
Equipment use	Antifreeze/coolant
Staging areas	Sediment, gasoline, fuel oil, concrete, vehicle fluids, paints, solvents, fertilizers, adhesives, antifreeze/coolant, hydraulic oil/fluid, etc.

2.4 Sequence and Estimated Dates of Construction Activities

The following is an anticipated construction sequence identifying the major components of construction for the project.

2.4.1 Construction Sequence

Estimated Start Date of Construction Activities	Summer 2025
Estimated End Date of Construction Activities for this Phase	Summer 2025
Estimated Date(s) of Application of Stabilization Measures for Areas of the Site Required to be Stabilized	Summer 2025

2.5 Allowable Non-Stormwater Discharges

Water from non-stormwater sources are allowed when properly managed. The following identifies discharge sources anticipated with the project.

TABLE 2-5

List of Allowable Non-Stormwater Discharges Present at the Site

Type of Allowable Non-Stormwater Discharge	Likely to be Present at Your Site?	Location on Site
Discharges from emergency fire-fighting activities	☐ YES ☒ NO	
Fire hydrant flushings	☐ YES ☒ NO	
Landscape irrigation	☐ YES ☒ NO	

Waters used to wash vehicles and equipment[1]	☐ YES ☒ NO	
Water used to control dust	☐ YES ☒ NO	
Potable water including uncontaminated water line flushings	☐ YES ☒ NO	
External building wash down, provided soaps, solvents, and detergents are not used, and external surfaces do not contain hazardous substances (e.g. see Appendix A) (e.g. paint or caulk containing PCBs)	☐ YES ☒ NO	
Pavement wash waters[2]	☐ YES ☒ NO	
Uncontaminated air conditioning or compressor condensate	☐ YES ☒ NO	
Uncontaminated, non-turbid discharges of ground water or spring water	☐ YES ☒ NO	
Foundation or footing drains[3]	☐ YES ☒ NO	
Construction dewatering water[4]	☒ YES ☐ NO	

[1]provided that there is no discharge of soaps, solvents, or detergents used for such purposes

[2]provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used. You are prohibited from directing pavement wash waters directly into any water of the U.S., storm drain inlet, or stormwater conveyance, unless the conveyance is connected to a sediment basin, sediment trap, or similarly effective control;

[3]where flows are not contaminated with process materials sucks as solvents or contaminated ground water

[4]discharged in accordance with applicable regulations

* **No** untreated or contaminated groundwater will be discharged to wetlands or waterways. Excess water will be discharged overland in upland areas and allowed to naturally infiltrate in well-drained soils, or discharged to wetlands or streams only after passing through filtration sacks or similar devices.

Section 3
Erosion and Sediment Controls

The Contractor must implement erosion and sediment controls in accordance with the following requirements to minimize the discharge of pollutants in stormwater from construction activities. This project also includes site specific controls and permit conditions which may take precedent and are not included in the following descriptions. The Contractor shall also comply with the requirements in the project's permits.

3.1 Sediment Track-Out

General

It is the Contractor's responsibility to take measures to prevent tracking of sediment from the project site. It is also the Contractor's responsibility to take measures to prevent tracking of sediment from any staging and material storage area. A stone tracking pad and street sweeping apparatus shall be used as necessary to minimize the track-out of sediment onto adjacent streets, other paved areas, and sidewalks from vehicles exiting the construction site.

Specific Track-Out Controls

Track-Out Controls Description

- Stone aggregate tracking pad
- Street sweeping

Installation

- Sediment track out controls to be installed by the Contractor include a stone aggregate tracking pad with an underlying geotextile fabric. The pad shall be constructed in accordance with the ESCP.

Maintenance Requirements

- The site exit shall be maintained in a condition which will prevent tracking of sediment onto public right-of-way. When washing is required, it shall be done in an area stabilized with aggregate which drains into a sediment trapping controls.
- If sediment is tracked out from the site to the surface of off-site streets, other paved areas, and sidewalks, the Contractor shall remove the deposited sediment by the end of the same work day in which the track-out occurs.

3.2 Minimize Dust

General

The Contactor shall be responsible for the control of dust throughout the construction period. Dust control methods shall include, but be not limited to, sprinkling water or calcium chloride on exposed areas, covering loaded dump trucks leaving the site, and temporary mulching exposed soil areas. Dust control measures shall be utilized to prevent the migration of dust from the site to abutting areas.

Specific Dust Controls

Description

- Prevent dust from becoming a nuisance or hazard. During construction, excavated material and open or stripped areas are to be policed and controlled to prevent spreading of the material.
- Dust control measures shall be utilized to prevent the migration of dust from the site to abutting areas.
- Ensure that the existing equipment, facilities, and occupied space adjacent to or nearby areas of the work do not come in contact with dust or debris as a result of concrete demolition, excavation or surface preparation.

Installation

- Dust control methods shall include, but be not limited to, sprinkling water on exposed areas, using calcium chloride, covering loaded dump trucks leaving the site, and temporary mulching.
- Use a mechanical street sweeper daily.

Maintenance Requirements

- During the work on-site, daily all paved road and driveway surfaces shall be scraped and broomed free of excavated materials on a daily basis. Prior to sweeping, or as needed during the work day, the surfaces shall be hosed down or otherwise treated to eliminate active or potential dust conditions and the natural road or wearing surface shall be exposed.

3.3 Minimize the Disturbance of Steep Slopes

General

All slopes greater than 15% during the regular construction season are to have slope stabilization measures. This applies to all slopes greater than 8% after October 1st.

Specific Steep Slope Controls

- Where slopes greater than 3:1 will be created, synthetic erosion control fabric is to be utilized in these areas to prevent erosion until permanent vegetation is established.

3.4 Storm Drain Inlets

General

Provide catch basin inlet protection in all catch basins within the vicinity of the earth disturbing activities to protect the stormwater management system from high sediment loads and high velocities, while disturbance due to construction is occurring in the drainage area.

Specific Storm Drain Inlet Controls

Description

- Storm Drain Inlet Controls include the installation of Silt Sacks

Installation

- Refer to manufacturer recommended specifications and instillation instructions.

Maintenance Requirements

- Silt sacks shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired or replaced as needed immediately.
- Sediment deposits should be removed after each storm event. They must be cleaned when deposits reach approximated 1/3 the height of the barrier.
- The Contractor shall remove the deposited sediment and make any repairs by the end of the same work day in which the sediment is observed or by the end of the next work day if observation occurs on a non-work day.

3.5 Site Stabilization

General

Initiate site stabilization measures immediately whenever earth-disturbing activities have permanently ceased or will be temporarily suspended on any portion of the site for more than 14 days.

Complete the stabilization activities within 14 days after the permanent or temporary cessation of earth-disturbing activities. Temporary paving of disturbed areas of existing roads should be completed at a minimum at the end of each week.

Use the following stabilization practices to protect exposed soil from erosion and prevent sediment movement.

3.5.1 Seeding

Installation

- When construction has temporarily or permanently ceased, seeding shall occur immediately in accordance with the project specifications.

Maintenance Requirements

- Periodic inspections shall occur once a week and after every rainstorm of 0.25 inches or greater until a minimum of 70% of the soil surface is covered by vegetation.

3.5.2 Mulching

Installation

- When construction has temprorarily or permanently ceased, mulching shall occur immediately, as required, for erosion control while vegetation is being established.

Maintenance Requirements

- Periodic inspections shall occur once a week and after every rainstorm 0.25 inches or greater.

3.5.3 Erosion Control Mats or Blankets

Installation

- When construction has temprorarily or permanently ceased, erosion control blanket installation shall occur immediately on slopes greater than 3:1, or as required, for erosion control while vegetation is being established.

Maintenance Requirements

- Periodic inspections shall occur once a week and after every rainstorm 0.25 inches or greater.

3.6 Dewatering Practices

General

Dewatering is anticipated for this project. Standard dewatering measures will be employed. No untreated groundwater will be discharged to wetlands or waterways. Excess water will be discharged overland in upgradient areas and allowed to naturally infiltrate, or discharged to the drainage system only after passing through filtration sacks or similar devices.

Specific Dewatering Practices

Dewatering Practice Description

- Provide, operate and maintain adequate pumping, diversion and drainage facilities in accordance with the approved dewatering plan to maintain the excavated area sufficiently dry from groundwater and/or surface runoff so as not to adversely affect construction procedures nor cause excessive disturbance of underlying natural ground. Locate dewatering system components so that they do not interfere with construction under this or other contracts.
- Install erosion/sedimentation controls for velocity dissipation at point discharges onto non-paved surfaces.

Installation

- Install sand and gravel, or crushed stone, filters in conjunction with sumps, well points, and/or deep wells to prevent the migration of fines from the existing soil during the dewatering operation.
- Transport pumped or drained water without interference to other work, damage to pavement, other surfaces, or property. Pump water through a silt filter bag prior to discharge to grade or drainage system.
- Do not discharge water into any separated sanitary sewer system.

Maintenance Requirements

- Repair any damage resulting from the failure of the dewatering operations and any damage resulting from the failure to maintain all the areas of work in a suitable dry condition.
- Take actions necessary to ensure that dewatering discharges comply with permits applicable to the Project. Dispose of water from the trenches and excavations in such a manner as to avoid public nuisance, injury to public health or the environment, damage to public or private property, or damage to the work completed or in progress.

Section 4
Pollution Prevention Standards

A clean and orderly construction site will reduce the opportunity for pollutants to enter the stormwater runoff stream. The following identifies sources of pollution anticipated on a typical construction site and preventative measures to avoid pollution.

4.1 Potential Sources of Pollution

TABLE 4-1

Construction Site Pollutants

Pollutant-Generating Activity	Pollutants or Pollutant Constituents	Location on Site
Site work	Soil particles and fines	Where disturbance is proposed
Construction areas	Petroleum, vehicle fluids	Where construction is proposed
Equipment use	Hydraulic Oils/fluids	Leaks/broken hoses from equipment
Equipment use	Antifreeze/coolant	Leaks/broken hoses from equipment
Staging areas	Sediment, gasoline, fuel oil, concrete, vehicle fluids, paints, solvents, fertilizers, adhesives, antifreeze/coolant, hydraulic oil/fluid, etc.	

4.2 Spill Prevention and Response

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

- The site superintendent responsible for day to day operations will be the Spill Response Coordinator (SRC). The SRC is responsible for decisive actions in the event of a spill at the facility. The SRC will supervise efforts to provide immediate containment of the spill to prevent a more difficult cleanup situation. Cleanup crews will utilize proper spill cleanup materials and employ safe work practices.

4.2.1 Federal and State Spill Notification

In accordance with 310 CMR 40.0333, the SRC shall notify the Massachusetts Department of Environmental Protection (Central Region) - (508)-792-7650, the Local Emergency Planning Committee (LEPC) and any other authorities or agencies within two hours if an accident or other type of incident results in a release to:

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

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

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

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

4.2.2 Local Notification

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

TABLE 4-2

Emergency Assistance Notification

Fire Department 911 or (978) 540-2302	Police Department 911 or (978) 540-2300
Hospital: Emerson Hospital (978) 369-1400	Department of Public Works: (978) 540-2670

4.3 Fueling and Maintenance of Equipment or Vehicles

General

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

Specific Pollution Prevention Practices

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

4.4 Washing of Equipment and Vehicles

General

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

Specific Pollution Prevention Practices

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

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

4.5.1 Building Products

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

- During the demolition phase of construction, provide extra containers and schedule more frequent pickups.
- Collect, remove, and dispose of all construction site wastes at authorized disposal areas.

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

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

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

- Store new and used petroleum products for vehicles in a neat, orderly manner in their appropriate containers in a covered area. If storage in a covered area is not possible, the materials shall be covered with polyethylene or polypropylene sheeting to protect them from the elements.
- Storage area should include precautions to contain any potential spills.
- Immediately contain and clean up any spills with absorbent material.
- Have equipment available in fuel storage areas and in vehicles to contain and clean up any spills that occur.

4.5.4 Hazardous or Toxic Waste

- Store new and used materials in a neat, orderly manner in their appropriate containers in a covered area. If storage in a covered area is not possible, the materials shall be covered with polyethylene or polypropylene sheeting to protect them from the elements.
- Storage areas should include precautions to contain any potential spills.
- Immediately contain and clean up any spills with absorbent materials.
- Have equipment available in fuel storage areas and in vehicles to contain and clean up any spills that occur.
- To prevent leaks, empty and clean hazerdous waste containers before disposing of them.
- Never remove the original product label from the container because it contains important safety information. Follow the manufacturer's recommended method of disposal, which should be printed on the label.
- Never mix excess products when disposing of them, unless specifically recommended by the manufacturer.

4.5.5 Construction and Domestic Waste

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

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

- The contractors should be encouraged where possible, to use washout facilities at their own plant or dispatch facility from stucco, paint, concrete, form release oils, curing compounds, and other construction materials.
- If washout of these materials in done on site:
  - Direct all washwater into a leak-proof container or leak-proof pit. The container or pit must be designed so that no overflows can occur due to inadequate sizing or precipitation.
  - Handle washout or cleanout wastes as follows:
    - Do not dump liquid wastes in the storm sewers
    - Dispose of liquid wastes in accordance with applicable regulations
    - Remove and dispose of hardened concrete waste consistent with your handling of other construction wastes in Section 5.5.
  - Attempts should be made to locate washout area as far away as possible from surface waters and storwmater inlets or conveyances, and to the extend practicable, designate areas to buse for these activities and conduct such activities only in these areas.
- Inspect washout facilities daily to detect leaks or tears and to identify when materials need to be removed.

4.7 Fertilizers

If fertilizers are to be used on site, the following requirements shall be followed:

- Store new and used materials in a neat, orderly manner in their appropriate containers in a covered area. If storage in a covered area is not possible, the materials shall be covered with polyethylene or polypropylene sheeting to protect them from the elements.
- Storage area should include precautions to contain any potential spills.
- Immediately contain and clean up any spills with absorbent materials.
- Apply at a rate and in amounts consistent with manufacturer's specifications, or document departures from the manufacturer's specifications.
- Apply at the appropriate time of year for the site, and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth
- Avoid applying before heavy rains that could cause excessive nutrients to be discharged

- Never apply to frozen ground
- Never apply to stormwater conveyance channels with flowing water
- Follow all federal, state, tribal, and local requirements regarding fertilizer application.

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APPENDIX E

LONG-TERM POLLUTION PREVENTION AND STORMWATER MANAGEMENT SYSTEM OPERATION AND MAINTENANCE PLAN

Constructed Wetland Rehabilitation Assistance
Littleton, Massachusetts

May 2025

Prepared for:

Littleton Department of Public Works

Table of Contents

Section 1
Introduction and Purpose

The following Long-Term Pollution Prevention and Stormwater Operations and Maintenance (O&M) Plan has been prepared for the stormwater management system relative to the Constructed Wetland Rehabilitation Assistance project in Littleton, Massachusetts. The purpose of the plan is to provide guidance and procedures for proper long-term pollution prevention and stormwater management system maintenance.

The proposed recommendations are made in compliance with the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Handbook maintain or improve stormwater runoff quality and quantity.

Section 2
Responsible Parties

The Town of Littleton is responsible for maintaining the stormwater management facilities. The property is owned by The Town of Littleton. During completion of proposed work, the contractor will be responsible for stormwater management system maintenance.

Property Owner:

Town of Littleton
39 Ayer Road
Littleton, MA 01460

Owner Signature, date: _____

Maintenance Contact:

Stephen Jahnle
39 Ayer Road
Littleton, MA 01460
978-540-2670

Maintenance Contact
Signature, date: _____

Section 3
Long Term Pollution Prevention Plan

3.1 Good Housekeeping

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

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

- Promptly clean and remove any spills or contamination from vehicles or other services.
- Perform preventative maintenance on the structural components of the stormwater system.
- Properly dispose of refuse.

3.2 Potential Sources of Pollution

The following sources of pollution are anticipated as part of the long-term use of the project.

Pollutant-Generating Activity	**Pollutants or Pollutant Constituents** (that could be discharged if exposed to stormwater)
Vehicular Access	Petroleum, concrete, vehicle fluids, paints, solvents
Solid waste storage	Construction debris, trash
Landscaping Activites	Fertilizers, pesticides, herbcides
Equipment use	Hydraulic oils, fluids, antifreeze, coolant

3.3 General Spill Prevention and Response

In the event of a spill, the following procedures shall be followed by the Maintenance Contact or their authorized representative:

- Manufacturer's recommended methods for cleanup will be clearly posted and facility personnel will be made aware of the procedures and the location of the information and clean up supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage areas at the facility. Equipment and materials will include but not be limited to brooms, dustpans, mops, rags, gloves, goggles, kitty litter, sand, sawdust and plastic or metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery.

- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with hazardous substances.
- Spills of toxic or hazardous material will be reported to the appropriate state or local government agency regardless of size.
- The Spill Prevention Plan will be adjusted to include measures to prevent this type of spill from recurring and how to cleanup the spill if it recurs. A description of the spill, its cause and the cleanup measures will be included.
- The Maintenance Contact is responsible for day to day operations will be the spill prevention and cleanup coordinator.

3.3.1 Federal and State Spill Notification

In accordance with 310 CMR 40.0333, the Maintenance Contact shall notify the Massachusetts Department of Environmental Protection (Central Region) – (508) 792-7650 the Local Emergency Planning Committee (LEPC) (if applicable) and any other authorities or agencies within two hours if an accident or other type of incident results in a release to:

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

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

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

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

3.3.2 Local Notification

The following local agencies will be called to provide emergency assistance at the facility on the judgment of the Maintenance Contact:

Fire Department 911 or (978) 540-2302	Police Department 911 or (978) 540-2300
Hospital: Emerson Hospital (978) 369-1400	Department of Public Works: (978) 540-2670

3.4 Storage, Handling, and Disposal of Materials and Wastes

The following procedures shall be followed throughout the facility when storing, handling and disposing of various materials.

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

- Store new and used materials in a neat, orderly manner in their appropriate containers in a covered area. If storage in a covered area is not possible, the materials shall be covered with polyethylene or polypropylene sheeting to protect them from the elements.
- Storage area should include precautions to contain any potential spills.
- Immediately contain and clean up any spills with absorbent materials.
- Apply at a rate and in amounts consistent with manufacturer's specifications, or document departures from the manufacturer's specifications.
- Apply at the appropriate time of year for the site, and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth
- Avoid applying before heavy rains that could cause excessive nutrients to be discharged
- Never apply to frozen ground
- Never apply to stormwater conveyance channels with flowing water
- Follow all federal, state, tribal, and local requirements regarding fertilizer application.

3.4.2 Hazardous or Toxic Waste

- Store new and used materials in a neat, orderly manner in their appropriate containers in a covered area. If storage in a covered area is not possible, the materials shall be covered with polyethylene or polypropylene sheeting to protect them from the elements.
- Storage areas should include precautions to contain any potential spills.
- Immediately contain and clean up any spills with absorbent materials.
- Have equipment available in fuel storage areas and in vehicles to contain and clean up any spills that occur.
- To prevent leaks, empty and clean hazerdous waste containers before disposing of them.
- Never remove the original product label from the container because it contains important safety information. Follow the manufacturer's recommended method of disposal, which should be printed on the label.
- Never mix excess products when disposing of them, unless specifically recommended by the manufacturer.

3.4.3 Domestic Waste

- Site property manager shall designate a waste collection area on the site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a water body.
- Ensure that containers have lids so they can be covered before periods of rain and keep containers in a covered area whenever possible.
- Schedule waste collection to prevent the containers from overfilling.
- Clean up spills immediately. For hazardous materials, follow cleanup instructions on the package. Use an absorbent material such as sawdust or kitty litter to contain the spill.

Section 4
Stormwater Management System

The on-site stormwater management system is comprised of catch basins, manholes, a sediment forebay, a constructed wetland, and a stormwater outfall. In general, runoff from the approximately 46-acre contributory area is collected and piped to the sediment forebay, where it received pretreatment for suspended solids. From the forebay, stormwater runoff enters the constructed wetland through an overflow weir, where it is treated for water quality through nutrient uptake within the wetland. Following treatment within the constructed wetland, runoff is discharged to Long Pond through an outlet control structure and 12" reinforced concrete culvert beneath Lake Shore Drive.

The area also features a dry swale that was designed and constructed during the period of wetland installation. Although improvements to the dry swale are not proposed as part of this work, operation and maintenance recommendations are included as part of this plan for the Town's reference.

See the attached Figure 1 in Appendix A for the location of the various described components of the Stormwater Management System.

4.1 Constructed Wetland Operation

The following describes procedures for the operation of various flow-control features associated with the constructed wetland system at Lake Shore Drive.

4.1.1 Flow Splitter Adjustment

An existing flow splitter, located within an existing catch basin structure within Lake Drive, has an adjustable weir plate that allows the overflow height for stormwater runoff to be altered as necessary. This allows the peak flow rate of stormwater runoff to the wetland to be adjusted without use of the diversion gate, described below in Section 4.1.2.

Per recommendations set forth by the design engineer, GeoSyntec Consultants, the overflow weir should be set such that when the diversion gate is fully open, the peak flow rate to the wetland system does not exceed the maximum design flow rate of 2.4 cubic feet per second. The setting is dependent on the overflow elevation of the downstream stop log structure, as described in Section 4.1.3. If the stop logs are set to their maximum overflow elevation, the flow rate over the flow splitter weir may be in excess of the desired setting, and thus the weir may need to be adjusted to a higher position. Operational settings for controls should be determined using ASTM and ASCE hydraulic flow measurement procedures.

4.1.2 Diversion Gate Adjustment

A diversion gate is available to adjust flows to the wetland from the flow splitter. The purpose of the diversion gate is to provide a means of adjusting flow to the wetland without adjusting the height of the overflow weir in the flow splitter. In addition, the diversion gate can be closed to force flows to bypass the wetland and discharge completely to the bypass culvert that drains to Long Pond.

Once the flow splitter is properly adjusted, the diversion gate and stop logs are the primary means of controlling flow rates in the wetland system.

When the diversion gate is partially closed it can cause backwater conditions in the drainage pipe that leads from the flow splitter to the sediment forebay of the wetland. This, in turn, decreases the peak flow rate to the wetland system and increases flow to the bypass.

4.1.3 Stop Log Adjustment

The two existing stop log water control structures were designed by GeoSyntec Consultants to provide a means of controlling water elevations through the addition or removal of individual or multiple stop logs. Two heights of logs are available for the water control structures. These two sizes can be used in numerous combinations to provide a range of overflow depths.

To gain access to the stop logs, it is necessary to unbolt the cover grate that prevents removal of the stop logs. The stop logs have eyebolts attached to them that allow for attachment of lifting lines to each side of a single log. Logs are removed individually and replaced in the same manner in which they are removed. Care should be taken to not damage the logs, neoprene seals, or the guide channels while removing or replacing logs.

Under normal operating conditions the downstream stop log structure should be set to have an overflow elevation greater than 6" below the overflow elevation of the upstream structure. This setting allows for proper flows through the wetland system and prevents backwater conditions in the sediment forebay.

4.2 Inspections

Inspections should be performed in accordance with the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Handbook. Figure 1, provided in Appendix A, identifies the location of each BMP to be inspected and maintained as described in this Section. All inspections should be logged using the Inspection Forms provided in Section 5.

The following stormwater management system features will be evaluated during each inspection:

4.2.1 Vegetated Surfaces

Inspection Frequency: Bi-annually in Summer and Winter

Special Inspection Event(s): Spring Snow Melt

All vegetative surfaces will be observed to identify locations of settlement, erosion and other impacts from the proposed work. Areas of settlement and erosion that may result in a discharge of sediment into Waters of the Commonwealth shall be repaired and restored to a vegetated condition.

4.2.2 Deep-Sump, Hooded Catch Basins

Inspection Frequency: Quarterly

Special Inspection Event(s): Rainfall greater than 0.5 inches

Deep sump catch basins should be inspected at least four times per year. The Visual inspection should ascertain that the catch basin is functioning properly (i.e. no blockages or obstructions to the outlet and/or hood) and to measure the amount of solid materials that have accumulated in the sump. This can be done with a calibrated dipstick, tape measure or other measuring instrument so that the depth of deposition in the sump can be tracked. Inspections should be completed visually from the ground level.

If further investigation is warranted that requires entering the structure, all applicable Confined Space Entry safety regulations and procedures must be followed per 29 CFR 1910.146. Deep sump catch basins should be cleaned four times per year or whenever the depth of the sediment is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the basin. Cleanings should also be conducted at the end of the foliage and snow-removal seasons. Clamshell buckets can be used to remove sediment. However, vacuum trucks will remove more trapped sediment, are more expedient, and are less likely to damage hoods on outlet pipes. Disposal of sediment removed from catch basins must be disposed of in accordance with local, state and federal requirements.

4.2.3 Sediment Forebay

Inspection Frequency: Monthly

Special Inspection Event(s): Rainfall greater than 0.5 inches

At a minimum, the sediment forebay should be inspected monthly and cleaned out four times per year. When maintaining grasses, grass height should be kept at no greater than 6 inches. The sediment forebay should be checked for signs of rilling and gullying regularly and repaired as needed. When sediment is removed from the basin, any vegetation damaged during the clean-out should be replaced through reseeding or resodding.

4.2.4 Constructed Wetland

Inspection Frequency: Bi-annually

Special Inspection Event(s): Rainfall greater than 0.5 inches

Unlike conventional stormwater basins that require sediment removal at infrequent intervals, constructed stormwater wetlands require smaller-scale maintenance at regular, frequent intervals to evaluate the health and condition of plantings.

During these inspections, the following should be observed and recorded:

- Quality, quantity and distribution of wetland plants within the system
- Presence and quantity of invasive wetland plant species (invasives must be removed)
- Percentage of standing water that is unvegetated
- Accumulation of sediment within the wetland forebay
- The maximum water elevation
- The stability of original depth zones

Sediment should be cleaned out in the wetland once every 10 years. The sediment forebay should still be cleaned out every year.

Routine mowing of maintained areas adjacent to the outlet wetland swale will be required. Planted trees and shrubs that are adjacent to city streets and along pathways shall be pruned on a regular basis (twice per season) to maintain viewing of the wetland and wetland channel from these areas.

4.2.5 Flow Splitter

Inspection Frequency: Monthly

Special Inspection Event(s): Melt water conditions

Proper function of the wetland system is predicated on maintenance of the flow splitter. Although the splitter is designed to require minimal maintenance, sediment accumulation can seriously impair the splitters functionality. Sediment accumulation is of particular concern under circumstances where long periods of medium flows with high sediment content are prevalent (e.g., under melt water conditions). The flow splitter should be inspected monthly and any accumulated debris should be removed. Refer to Appendix B for additional information regarding the existing flow splitter.

4.2.6 Dry Swale

Inspection Frequency: Bi-annually

Special Inspection Event(s): Rainfall greater than 0.5 inches

Inspect the dry swale twice a year for slope integrity, soil moisture, vegetative health, soil stability, soil compaction, soil erosion, ponding and sedimentation. Regular maintenance includes mowing, fertilizing, liming, watering, pruning, and weed and pest control. Mow swales at least once per year. Do not cut the grass shorter than three to four inches, otherwise the effectiveness of the vegetation in reducing flow velocity and removing pollutants may be reduced. Do not let grass height exceed 6 inches.

Manually remove sediment and debris at least once per year, and periodically re-seed, if necessary, to maintain a dense growth of vegetation. Take care to protect swales from snow removal and disposal practices and off-street parking.

In addition, since dry swales rely partially on infiltration for removal of pollutants, periodic rehabilitation of surface soils may be required to restore infiltration capacity of the trench soils. This involves removing and replacing the top 4-6" of soils. This activity can be simplified by including a filter fabric layer between the topsoil layer and the sub-soils on the trench.

4.2.7 Outlet Control Structure

Inspection Frequency: Quarterly

Special Inspection Event(s): Rainfall greater than 0.5 inches

Outlet control structures shall be inspected a minimum of four times per year for the buildup of sediment in/at the outlet control structure. Any buildup of sediment or other debris shall be removed by flushing out the outlet control structure. Remove trash and

vegetation as needed. Restabilize area near inlets/outlets as applicable. Refer to Appendix B for additional information regarding the existing outlet control structure.

4.2.8 Culverts and Stone End Protection (Outfalls)

Inspection Frequency: Bi-annually

Special Inspection Event(s): Rainfall greater than 0.5 inches

System outfalls should be inspected twice a year as well as after every major storm, for slope integrity, soil moisture, vegetated health, soil stability, soil compaction, soil erosion, ponding and sediment accumulation. If the rip rap has been displaced, undermined or damaged, it should be replaced immediately. The channel immediately below the outlet should be checked to see that erosion is not occurring. The downstream channel will be kept clear of obstructions, such as fallen trees, debris, leaves and sediment that could change flow patterns and/or tail water depths in pipes. Repairs must be carried out immediately to avoid additional damage to the outlet protection apron.

Section 5 Operation and Maintenance Log Form

Date: _____

Person conducting Inspection: _____

Reason for Inspection (Routine / Significant Rainfall): _____

Stormwater Management System Components:

Vegetated Surface

Component inspected during this inspection_____

Any Repair Necessary_____

Other Comments_____

Walkway Sweeping

Component inspected during this inspection_____

Any Repair Necessary_____

Other Comments_____

Deep-Sump Hooded Catch Basins

Component inspected during this inspection_____

Any Repair Necessary_____

Other Comments_____

Sediment Forebay

Component inspected during this inspection_____

Any Repair Necessary_____

Other Comments_____

Constructed Wetland

Component inspected during this inspection_____

Any Repair Necessary_____

Other Comments_____

Flow Splitter

Component inspected during this inspection_____

Any Repair Necessary_____

Other Comments_____

Dry Swale

Component inspected during this inspection_____

Any Repair Necessary_____

Other Comments_____

Outlet Control Structure

Component inspected during this inspection_____

Any Repair Necessary_____

Other Comments_____

Culvert and Stone End Protection

Component inspected during this inspection_____

Any Repair Necessary_____

Other Comments_____

Section 6
Snow Management & De-Icing

Snow removal will occur along Lake Drive and Lake Shore Drive. Snow storage should not be in or adjacent to wetland areas nor block drainage to surface inlets (e.g. catch basins).

Applications of chemical de-icing may be applied along with sand for the roads, main entrances, stop sign areas, and sidewalks. Apply only as needed using minimum quantities. Small quantities of deicers may be mixed with sand or sprayed on hard to maintain areas.

Sweep or clean up accumulated sand, sidewalks, steps, and roads as soon as possible after the road surface clears.

Section 7
Estimated O&M Budget

The following estimated O&M Budget includes the inspections and maintenance activities previously described on an annual basis.

Maintenance Component	Quantity	Frequency (per year)	Unit Cost	Annual Cost
Vegetated Surfaces	-	4	$100	$400
Catch Basin Inspection	52	4	$50	$10,400
Catch Basin Sediment Removal	52	2	$100	$10,400
Sediment Forebay	1	12	$100	$1,200
Constructed Wetland	1	2	$500	$1,000
Flow Splitter	1	12	$250	$3,000
Dry Swale	1	2	$500	$1,000
Outlet Control Structure	1	2	$250	$500
System Outfalls	4	2	$250	$2,000
Total Annual Estimated Budget				**$29,900**

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APPENDIX A

Stormwater BMP Location Map

CATCH BASIN WITH FLOW SPLITTER

SEDIMENT FOREBAY

MANHOLE WITH STOP LOG FEATURE

OUTFALL

CONSTRUCTED WETLAND

OUTLET CONTROL STRUCTURE

DEEP-SUMP, HOODED CATCH BASIN (TYP)

OUTFALL

APPROXIMATE AREA OF DRY SWALE

OUTFALL

MH LOCKED
RAISED RIM
RIM=255.10

CB 6
RIM=254.45

CB 5
RIM=254.22

INV. =248.39

TOP OF 12" RCP
ELEV. =253.21
(BURIED)

TOP OF 12" RCP
ELEV. =253.68
(BURIED)

CB 1
RIM=251.97

CB 4
RIM=251.91

CB 2
RIM=250.98

CB 3
RIM=250.81

INV. =247.44

LAKE DRIVE

LAKE SHORE DRIVE

BEACH DRIVE

N

CONSTRUCTED WETLAND
REHABILITATION ASSISTANCE
LITTLETON, MASSACHUSETTS

CONSTRUCTED WETLAND
BMP LOCATION PLAN

DATE: 04/2025
SCALE: 1"=40'
FIGURE 1

Tighe&Bond

Tighe&Bond

APPENDIX F

Illicit Discharge Compliance Statement

Project Location: Constructed Wetland Rehabilitation Assistance Project

Littleton, MA

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

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

Signature: _____

Printed Name & Title: _____

\\Tighebond.com\data\Data\Projects\L\L0783 Town of Littleton Stormwater\024 Frog Pond Assistance\Permitting\Stormwater\Memo\Appendix G - Illicit Discharge\Illicit Discharge Statement.doc

Tighe&Bond

APPENDIX G

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Pretreatment Train

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Sediment Forebay	**0.25**	**0.75**	**0.19**	**0.56**
	0.00	**0.56**	**0.00**	**0.56**
	0.00	**0.56**	**0.00**	**0.56**
	0.00	**0.56**	**0.00**	**0.56**

Total TSS Removal = **44%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Constructed Wetland Rehabilitation Assistance**
Prepared By: **THM**
Date: **Apr-25**

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Existing Treatment Train

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Constructed Stormwater Wetland	**0.80**	**1.00**	**0.80**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**

Total TSS Removal = **80%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Constructed Wetland Rehabilitation Assistance**
Prepared By: **THM**
Date: **Apr-25**

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

Tighe&Bond

Appendix F

Community Preservation Committee
Littleton, Massachusetts

The CPC was established by Town Meeting in 2007. The CPC has the powers and responsibilities specified by Massachusetts General Law Chapter 44B, section 5(b), the Community Preservation Act.

Community Preservation Application for Funding

Date: March 17, 2025

Project Title: Long Lake Frog Pond Walkway Improvements

Name of Applicant: Littleton Conservation Commission

Name of Organization: Town of Littleton

Address: P.O. Box 1305 - Littleton, MA

Telephone: 978-540-2403 **Email**: andrew_sammarco@yahoo.com

CPA Category (circle all that apply): **Open Space** **Historic Preservation** **Recreation** **Community Housing**

CPA Funding Requested: $ $88,880.00 **Total Project Cost**: $ $88,880.00

Please attach answers to the following questions. Include supporting materials as necessary.

1. **Project Description:** Please give a detailed project description, including specific objectives.
2. **Goals:** How does this project accomplish the goals of the Community Preservation Plan for Littleton? (See Guidelines for Project Submission for general criteria)
3. **Timeline**: What is the schedule for project implementation, including a timeline for all critical milestones? Will this be a multi-year project?
4. **Budget**: Please provide a full budget including the following information, as applicable. (NOTE: CPA funds may not be used for maintenance):
    a. Total amount of the project cost, with itemization of major components.
    b. Additional funding sources. Please include those that are available, committed, or under consideration.
    c. Describe the basis for your budget and the sources of information you used.
5. **Support:** Have the appropriate Town Boards and Commissions expressed support and/or approved the project? What is the nature and level of community support for this project?

Project Description:

The Littleton Conservation Commission proposes replacing the existing cobblestone walkway at the Long Lake Frog Pond, located between Lake Drive, Beach Drive, and Lake Shore Drive, next to Long Lake. The current pathway, installed over 20 years ago, has significantly deteriorated, creating serious hazards due to uneven, shifting stones, surface erosion, and frequent flooding. The goal of this project is to improve public safety and accessibility by constructing a durable, ADA-compliant walkway that provides a stable, long-term solution for residents and visitors.

This project will also complement ongoing improvement efforts on site, aligning and working collaboratively with the Invasive Plant Control Proposal and the DPW's Dredging Initiative at Frog Pond to improve overall conditions in the area.

Specific Objectives:

• Remove the deteriorating cobblestone walkway.

• Install a new, safer pathway using durable, low-maintenance pavers on a stable, well-compacted base.

• Improve accessibility to meet ADA (Americans with Disabilities Act) standards, ensuring usability for all community members, including individuals with mobility challenges.

• Address ongoing flooding and erosion issues, stabilizing the path to ensure long-term sustainability.

• Incorporate boardwalk sections in wetter areas to enhance stability and accessibility.

The new walkway will be approximately 0.10 miles (528 feet) long and 4 feet wide, providing a safe and enjoyable route through the 1.3-acre Frog Pond area.

Project Goals:

• Enhancing Public Safety and Accessibility: The improved walkway will eliminate hazardous conditions and ensure compliance with ADA standards, making the area safer and more accessible for all users.

• Supporting Public Recreation: Walkers, joggers, and nature enthusiasts will benefit from a stable, well-maintained pathway.

• Preserving and Enhancing Open Space: The project will upgrade infrastructure while maintaining the natural character of Frog Pond and Long Lake.

• Mitigating Flooding and Erosion: Site improvements will prevent water damage, ensuring a longer-lasting and more resilient pathway.

• Aligning with Conservation and Infrastructure Improvements: This project complements the Invasive Plant Control Proposal and the DPW's Dredging Initiative, contributing to broader environmental restoration and infrastructure enhancement efforts.

Project Timeline:

The project is contingent on funding approval at Town Meeting in Spring 2025, with funds becoming available on July 1, 2025. Construction will begin after the DPW Frog Pond Dredging Project is completed, which is projected to be performed in the summer months, to avoid disruption from heavy machinery.

Proposed Timeline:

Milestone	Estimated Completion
Finalization of walkway design	July 2025
Permitting process	Summer 2025
Procurement of materials and labor	Late Summer 2025
Removal of existing cobblestone path	Early Fall 2025

Site work	Mid-Fall 2025
Installation of new paver path and boardwalk sections	Late Fall 2025
Inspection and public opening	Late Fall 2025

Project Budget:

Total Project Cost (Approximate):

Project Component	Estimated Cost
Walkway Installation (2,200 sq. ft.) – Dig and install paver walkway on 10 inches of ¾-inch stone, compacted in layers with 1 inch of chipstone. Includes poly sand and mortar edging. Base excavation depth estimated at 12 inches (deeper excavation or filter fabric may incur additional costs).	$65,500
Boardwalk Sections (Three 10’ x 4’ sections on helical piles, with ends set in concrete)	$5,500
Silt Fence Installation (approximately 800 feet)	$5,300
Demolition of Existing Walkway (approximately 40 tons of material removed and disposed of)	$4,500
Subtotal	$80,800
10% Construction Contingency	$8,080
Total Estimated Project Cost	$88,880

Note: The estimated project cost includes $500 for permitting and is based on professional contractor quotes.

Project Support:

- Littleton Conservation Commission
- Littleton Disability Commission
- Long Lake Neighborhood Association

Photos Demonstrating Walkway Degradation/Flooding (Courtesy of Rob Rounce):

Community Preservation Committee
Littleton, Massachusetts

The CPC was established by Town Meeting in 2007. The CPC has the powers and responsibilities specified by Massachusetts General Law Chapter 44B, section 5(b), the Community Preservation Act.

Community Preservation Application for Funding

Date: 2/13/2025

Project Title: Long Lake Frog Pond Invasive Plant Control

Name of Applicant: Littleton Conservation Commission

Name of Organization: Town of Littleton

Address: P.O. Box 1305 - Littleton, MA 01460

Telephone: 978-540-2403 **Email**: andrew_sammarco@yahoo.com

CPA Category (circle all that apply): **Open Space** **Historic Preservation** **Recreation** **Community Housing**

CPA Funding Requested: $ 30,000 **Total Project Cost**: $ 30,000

Please attach answers to the following questions. Include supporting materials as necessary.

1. **Project Description:** Please give a detailed project description, including specific objectives.
2. **Goals:** How does this project accomplish the goals of the Community Preservation Plan for Littleton? (See Guidelines for Project Submission for general criteria)
3. **Timeline**: What is the schedule for project implementation, including a timeline for all critical milestones? Will this be a multi-year project?
4. **Budget**: Please provide a full budget including the following information, as applicable. (NOTE: CPA funds may not be used for maintenance):
    a. Total amount of the project cost, with itemization of major components.
    b. Additional funding sources. Please include those that are available, committed, or under consideration.
    c. Describe the basis for your budget and the sources of information you used.
5. **Support:** Have the appropriate Town Boards and Commissions expressed support and/or approved the project? What is the nature and level of community support for this project?

1. Project Description

The proposed project seeks to restore and preserve the natural habitat at the 1.3-acre Long Lake-Frog Pond site through a phased approach to invasive plant management. This effort aligns with open space preservation objectives and will be coordinated with ongoing site improvements, including the Department of Public Works (DPW) dredging project for Frog Pond and a walkway replacement project.

Key Activities:

- Conducting an initial assessment and inventory of invasive plant species.
- Developing and implementing a multi-phase invasive plant management plan.
- Removing invasive plants using mechanical methods and targeted herbicide applications.

Target Invasive Plant Species:

- Glossy Buckthorn
- Bittersweet
- Japanese Knotweed
- Burning Bush
- Japanese Barberry
- Multi-Flora Rose
- Autumn Olive

Efforts will focus on affected areas across the site surrounding the Frog Pond, ensuring long-term ecological stability and supporting native plant and wildlife species.

Specific Objectives:

1. Assess the extent and impact of invasive species.
2. Develop a comprehensive, phased management plan for invasive species control.
3. Execute initial and follow-up removal efforts to restore ecological health.
4. Coordinate with DPW dredging and walkway projects to maximize efficiency.
5. Reintroduce native vegetation to promote biodiversity and improve public access.

2. Goals

- **Preserving Open Space:** Protect native habitats and maintain the site's ecological value.
- **Protecting Natural Resources:** Restore native ecosystems to support wildlife, enhance biodiversity, and improve water quality.
- **Promoting Community Use:** Enhance the natural landscape to encourage public engagement and recreational use.

3. Timeline

The project will begin upon funding approval at the 2025 Spring Town Meeting, with funds available on July 1, 2025. Work will occur in coordination with concurrent dredging and walkway improvement efforts.

Proposed Milestones:

Objective	Estimated Completion/Cost
Phase 1: Site Assessment and Planning	Summer 2025
Invasive species survey and inventory	~$2,500
Drafting of invasive plant management plan	
Phase 2: Initial Removal Efforts	Summer–Fall 2025
Mechanical removal of invasive plants	~$10,000
Herbicide application (cut-stem/fall treatment)	~$5,000
Phase 4/5: Ongoing Follow-Up Treatments	
	Summer-Fall / 2026–2027
Targeted herbicide application	~$4,750/year

Permitting Fees: Approximately $300 is allocated for associated permitting.

Long-Term Vision:
This multi-year project will include follow-up treatments and monitoring to ensure sustained ecological health. Strategies will adapt based on ongoing assessments and progress.

4. Budget

Total Estimated Cost: ~$30,000

Breakdown:

- **Assessment and Planning:** ~$2,500
- **Mechanical Removal/Cutting (2025):** ~$10,000
- **Initial Herbicide Applications (2025):** ~$5,000
- **Follow-Up Treatments (2026–2027):** ~$9,500 (total for two years)
- **Permitting Fees:** ~$300
- **Contingency (10%):** ~$2,700

Funding Sources:

- CPA funding (primary source).
- Additional grants and partnerships with environmental organizations will be pursued to support follow-up phases.

5. Support

Littleton Conservation Commission

Long Lake Neighborhood Association

Site Overview of the Long Lake Frog Pond (Parcels 15 and 22)

Examples of Invasive Plant Thickets Surrounding the Frog Pond (Photos Courtesy of Rob Rounce.)

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