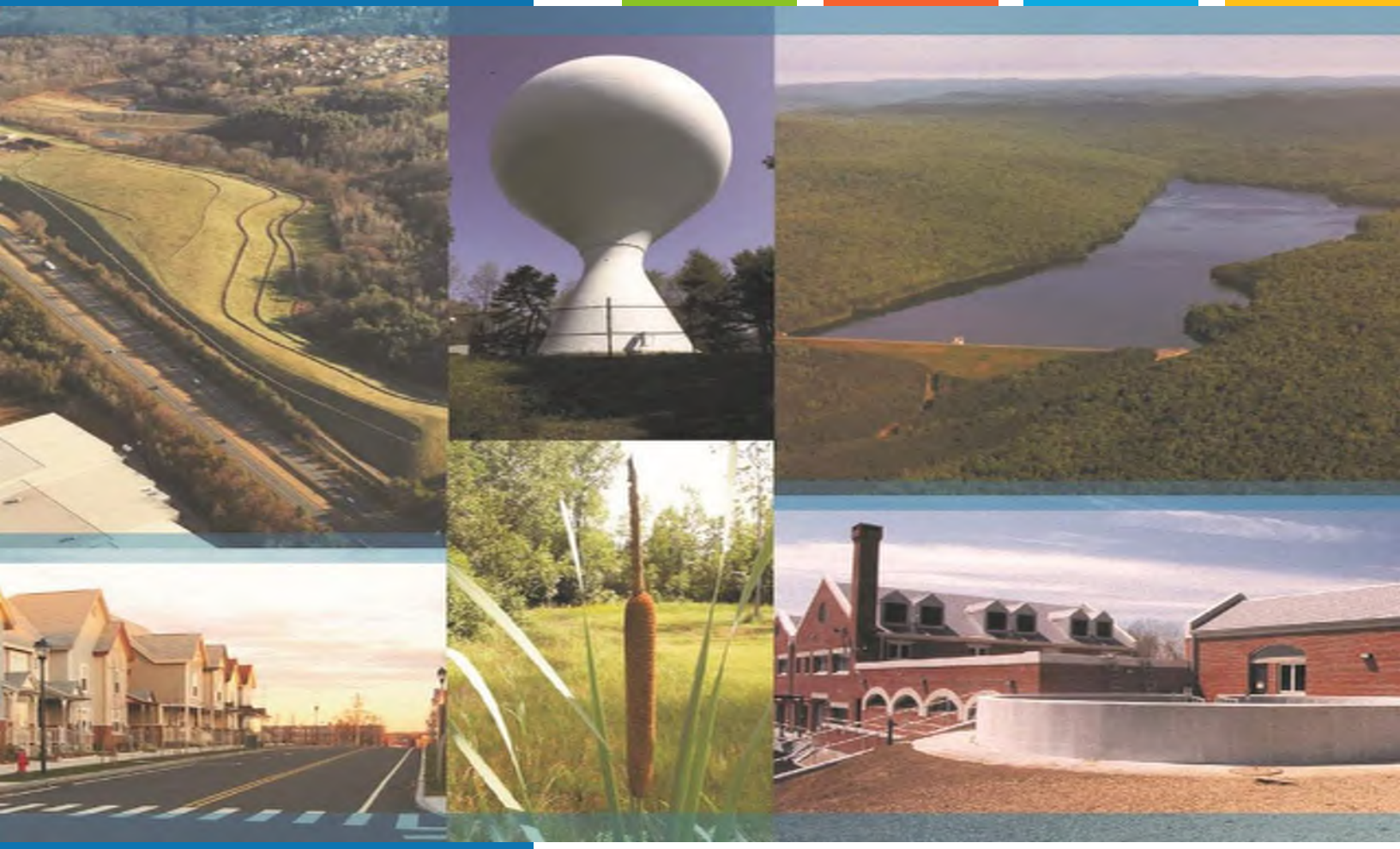


Shutesbury Road Culvert Replacement Project
Leverett, Massachusetts

NOTICE OF INTENT

Town of Leverett

July 2020

Tighe&Bond

100% Recyclable

L-0792002-02
July 27, 2020

Town of Leverett Conservation Commission
9 Montague Road
Leverett, MA 01054

Re: **Notice of Intent**
Shutesbury Road Culvert Replacement Project
Leverett, Massachusetts

Dear Members of the Commission:

On behalf of the Town of Leverett, Tighe & Bond respectfully submits this Notice of Intent (NOI) for the Shutesbury Road Culvert Replacement Project. The project involves the replacement of the existing 72-inch corrugated metal pipe (CMP) culvert that conveys a tributary stream to Roaring Brook beneath Shutesbury Road with a three-sided concrete box culvert.

The existing CMP culvert and a portion of roadway over the culvert are degraded and in need of replacement as evidenced by the occurrence of sinkholes within the roadway above the crossings. Additionally, the Town has growing concerns about the role of culverts in disrupting river and stream continuity, and therefore this replacement project will offer the best opportunity for improving continuity and long-term protection of the stream ecosystem. Replacement of the culvert requires work in areas subject to protection and jurisdiction under the Massachusetts Wetlands Protection Act (M.G.L. c. 131 § 40).

We look forward to discussing this project with the Leverett Conservation Commission at its next scheduled meeting. Should you have any questions or require any additional information, please contact Katy Wilkins at (413) 875-1305 or KLWilkins@tighebond.com or me at (413) 572-3279 or ZPChornyak@tighebond.com.

Very truly yours,

TIGHE & BOND, INC.

Zachariah P. Chornyak, PE
Project Manager

Enclosures
Copy: MassDEP (WERO) Division of Wetlands and Waterways
Marjorie McGinnis, Town of Leverett – Town Administrator

J:\L\L0792 Leverett\002 Shutesbury Road Culvert\Permitting\NOI\02 - Cover Letter.docx

WPA Form 3

Wetland Fee Transmittal Form

Section 1 Introduction

Section 2 Project Description

Section 3 Existing Environment

Section 4 Regulatory Compliance

Appendices

J:\L\L0792 Leverett\002 Shutesbury Road Culvert\Permitting\NOI\04 - Narrative.docx

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

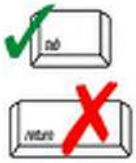
Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Leverett
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):

Shutesbury Road (a. Street Address) | Leverett (b. City/Town) | 01054 (c. Zip Code)

Latitude and Longitude: 42.448460 (d. Latitude) | -72.468116 (e. Longitude)

8 and roadway right-of-way (f. Assessors Map/Plat Number) | 16 and 51 (g. Parcel /Lot Number)

2. Applicant:

Marjorie (a. First Name) | McGinnis (b. Last Name)

Town of Leverett - Town Administrator (c. Organization)

9 Montague Road PO Box 300 (d. Street Address)

Leverett (e. City/Town) | MA (f. State) | 01054 (g. Zip Code)

413-548-9699 (h. Phone Number) | 413-548-1035 (i. Fax Number) | townadministrator@leverett.ma.us (j. Email Address)

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

Refer to Table 1-1 (Summary of Parcels) (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):

Zachariah (a. First Name) | Chornyak (b. Last Name)

Tighe & Bond, Inc. (c. Company)

53 Southampton Road (d. Street Address)

Westfield (e. City/Town) | MA (f. State) | 01085 (g. Zip Code)

413-572-3279 (h. Phone Number) | 413-562-5317 (i. Fax Number) | ZPChornyak@tighebond.com (j. Email address)

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

Exempt - Municipal Project (a. Total Fee Paid) | -- (b. State Fee Paid) | -- (c. City/Town Fee Paid)

A. General Information (continued)

6. General Project Description:

Refer to the NOI Narrative for further details.

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

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

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

1. ☒ Yes ☐ No

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

310 CMR 10.53(3)(i) - culvert replacement
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:

Franklin
a. County

b. Certificate # (if registered land)

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.

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	240 (1. linear feet)	240 (2. linear feet)
b. ☐ Bordering Vegetated Wetland	(1. square feet)	(2. square feet)
c. ☒ Land Under Waterbodies and Waterways	700 (1. square feet); 0 (3. cubic yards dredged)	700 (2. square feet)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☐ Bordering Land Subject to Flooding	(1. square feet); (3. cubic feet of flood storage lost)	(2. square feet); (4. cubic feet replaced)
e. ☐ Isolated Land Subject to Flooding	(1. square feet); (2. cubic feet of flood storage lost)	(3. cubic feet replaced)
f. ☒ Riverfront Area	Unnamed stream (inland) (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: 330,329 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.
5,330	5,330	0

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

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

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

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

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

0
a. number of new stream crossings

1
b. number of replacement stream crossings

C. Other Applicable Standards and Requirements

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

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

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

   a. ☐ Yes ☒ No

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

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

   August 1, 2017
   b. Date of map

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

   c. Submit Supplemental Information for Endangered Species Review*

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

         (a) within wetland Resource Area _____ percentage/acreage

         (b) outside Resource Area _____ percentage/acreage

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

2. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed 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 http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** 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.

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

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

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

(d) ☐ Vegetation cover type map of site

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

(f) OR Check One of the Following

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

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

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

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

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

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

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

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

North Shore - Hull to New Hampshire border:

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

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

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

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: N/A – No point source or stormwater discharge

      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.

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.

Town of Leverett Shutesbury Road Culvert Replacement Project
a. Plan Title

Tighe & Bond, Inc.
b. Prepared By

c. Signed and Stamped by

June 2020
d. Final Revision Date

Varies - as noted
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

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 (Marjorie McGinnis – Town of Leverett)	2. Date 6/19/20
3. Signature of Property Owner (if different)	4. Date 7/17/20
5. Signature of Property Owner (if different)	6. Date
7. Signature of Representative (Zachariah Chornyak, PE-Tighe & Bond)	8. 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.

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).

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1. Signature of Applicant (Marjorie McGinnis – Town of Leverett)	2. Date 6/19/20
3. Signature of Property Owner (if different)	4. Date 7/18/20
5. Signature of Property Owner (if different)	6. Date 7/18/20
7. Signature of Representative (Zachariah Chornyak, PE-Tighe & Bond)	8. Date

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

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

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

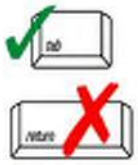
The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

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

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



A. Applicant Information

1. Location of Project:

Shutesbury Road	Leverett
a. Street Address	b. City/Town
--	$0 (municipal project; fee-exempt)
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Marjorie	McGinnis	
a. First Name	b. Last Name	
Town of Leverett		
c. Organization		
PO Box 300		
d. Mailing Address		
Leverett	MA	01054
e. City/Town	f. State	g. Zip Code
413-548-1035		townadministrator@leverett.ma.us
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

Refer to Table 1-1 (Summary of Parcels)		
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
NA - Municipal project (fee-exempt)			

Step 5/Total Project Fee: $0

Step 6/Fee Payments:

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

C. Submittal Requirements

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

Department of Environmental Protection
Box 4062
Boston, MA 02211

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

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

Town of Leverett
Shutesbury Road Culvert Replacement Project
List of Property Owners

Map/Lot	Owner	Address
8 / 16	Malulani Sherlock	4 Number Six Road Leverett, MA 01054
8 / 51	Andrew G. Barto	253 Shutesbury Road Leverett, MA 01054

Section 1
Introduction

1.1 Background and Purpose

The existing stream crossing is located at coordinates 42.448460, -72.468116 on Shutesbury Road, between Number Six Road and Old Mountain Road in the Town of Leverett, Franklin County, Massachusetts. The existing stream crossing consists of one 72-inch diameter corrugated metal pipe (CMP) culvert. The culvert conveys an unnamed stream, tributary to Roaring Brook, under Shutesbury Road.

The original CMP and portions of the roadway surface over the existing culvert are degraded, causing a sinkhole in Shutesbury Road. The culvert needs immediate replacement due to it being a main roadway between Leverett and Shutesbury. Closure of the roadway would impact local residence and create a greater distance for emergencies vehicles to travel.

1.2 Project Locus

The Project Locus consists of the Shutesbury Road culvert in the public roadway right-of-way (ROW) and two (2) parcels of land adjacent thereto, which are summarized below in Table 1-1 and shown on Figure 3 in Appendix A of this NOI.

TABLE 1-1
Summary of Parcels[1] within the Project Locus

Map, Lot	Location	Owner	Deed Reference
8, 16	4 Number Six Road	Malulani Sherlock 4 Number Six Road Leverett, MA 01054	Bk. 7326, Pg. 230
8, 51	253 Shutesbury Road	Andrew G. Barto 253 Shutesbury Road Leverett, MA 01054	Bk. 2842, Pg. 319

[1] Parcel ownership information is based on survey data provided by Northeast Survey and confirmed by the Town of Leverett Assessors Office records.

Note that the Town will obtain access agreements from the property owners listed in Table 1-1.

1.2.1 Project Site

The Project Site, or Limits of Work, consists of approximately 5,575 square feet (sf) of land within the Project Locus. The Project Site is illustrated on Figure 3 and the Project Drawings in Appendix A of this NOI.

Section 2
Project Description

2.1 Proposed Activities

The unnamed stream is conveyed from north to south of Shutesbury Road via a degraded CMP culvert. Construction of the replacement culvert will require the installation of a temporary coffer dam upstream and downstream of the culvert and associated flow diversions, removal of the existing CMP culvert, relocation of the exiting water main under the new culvert, replacement of the culvert with a 9' 6" W by 8' H precast three-sided concrete box culvert, and site restoration and stabilization after the open-bottom culvert is installed and the coffer dam is removed. A comparison of existing and proposed culvert dimensions is provided below in Table 2-1.

TABLE 2-1
Summary of Existing and Proposed Culvert Conditions[1]

Standard	Existing	Proposed
Structure Type	72" Corrugated Metal Culvert	9'-6" x 8' Precast Concrete Open-Bottom Box Culvert
Length	35 LF	41 LF
Cross-Sectional Area	28.27 SF	35.25 SF
Embedment	Unknown[2]	Natural Streambed Embedment
Crossing span	6'	9' 6"
Substrate	Gravel and corrugated metal pipe	Natural stone and gravel streambed
Openness Ratio (0.82 [ft])	0.81	0.86
Banks	Natural stream bank with areas f erosion	Coir logs and plantings and loam and seed over a temporary biodegradable erosion control blanket

[1] Based on Massachusetts River and Stream Crossings Standards (revised March 1, 2011) for culvert replacement projects.
[2] Assumed to be little to no natural material.

As noted in Table 2-1, the proposed culvert will introduce natural streambed material through the open-bottom box culvert and improve the openness ratio of the crossing in keeping with the goals of Massachusetts River and Stream Crossing Standards (2011). As shown above, the proposed culvert replacement will result in an improved openness ratio over existing conditions and will provide natural streambed materials within the crossing that are likely absent under current conditions.

2.1.1 Construction Period BMPs

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 Project Drawings. Typical details are shown on Sheet C-104 of the Project Drawings in Appendix A.

2.1.1.1 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 Project 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 after significant precipitation events. Maintenance and repairs will be conducted, as necessary.

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

2.1.1.2 Coffer Dams

Temporary coffer dams will be installed at the upstream and downstream limits of work within the unnamed stream to create an isolated (i.e. dry) work area. The isolated work area will be dewatered as depicted in Section 2.1.1.4 below. The locations of the coffer dams are shown on the Project Drawings in Appendix A.

2.1.1.3 Stream Flow Bypass

Due to the nature of the proposed project and the space constrictions of the site, it is unavoidable to maintain normal stream flows within the stream channel during construction. In short, the bypass will likely be accomplished by pumping or gravity from immediately above the upstream coffer dam to immediately downstream of the isolated work area.

Due to the depth of excavation within the roadway (10 feet), the culvert will be replaced in segments, eliminating the ability to place the bypass piping within the trench. The bypass piping may need to be routed from the upstream coffer dam, over the roadway, to a discharge point adjacent to the downstream coffer dam for the duration of the work. A temporary velocity dissipation pad (e.g., sheet of plywood) will be placed in the area of the stream immediately adjacent to the downstream coffer dam to minimize potential for scour. The dissipation pad will be tethered to the shoreline to provide a stable surface.

The weather will be frequently monitored to determine if adjustments to the bypass pumping system need to be made in order 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.

2.1.1.4 Dewatering Measures

When necessary, standard dewatering measures will be employed during construction of the replacement culvert. Excess water within the coffer-dammed area will be pumped with trash pumps and discharged to an appropriate treatment system in an upland location. A temporary sediment trap is depicted on Sheet C-104 of the Project Drawings in Appendix A. This trap will consist of a filter bag surrounded with straw bales. Upon

completion of construction, the area disturbed for the temporary sediment trap will be restored to pre-existing or improved conditions.

2.1.1.5 Other Protective Measures

The following general measures will be employed to minimize impacts to the resource areas:

- Access into the stream channel will only be by foot. No vehicles or construction equipment will enter the stream channel
- Protective measures will be inspected weekly during construction and after significant precipitation events, and repaired, as necessary
- The work will be scheduled when no precipitation events are anticipated, and the stream flow is as low as practicable. If a heavy rain event is predicted which may overwhelm the temporary bypass system, all equipment and supplies will be removed from the stream prior to the rain event
- The use of hay bales or mulch is strictly prohibited

2.1.2 Anticipated Sequence of Construction

No work will be conducted in open or flowing water. The actual sequence of construction will be left to the discretion of the selected contractor. Based on similar projects, the proposed construction sequence includes the following:

1. Notify pertinent regulatory agencies of the construction schedule.
2. Site preparation including, but not limited to, the following activities:
    a. Post MassDEP File # sign
    b. Install erosion and sedimentation controls, including dewatering basin
    c. Remove existing guardrails
3. Implement phased temporary road closure. Construction will be phased to allow access, alternating traffic at the culvert location, along Shutesbury Road.
4. Install upstream and downstream coffer dams to isolate the work area, as well as the temporary streamflow bypass system and other Best Management Practices (BMPs).
5. Schedule and conduct site walks with pertinent regulatory agencies to inspect construction-phase BMPs.
6. Remove the existing culvert.
7. Furnish and install the 9’ 6” wide (W) by 8’ high (H) by 41’ long (L) open bottom culvert and integral wingwalls.
8. Install modified rockfill and natural substrate in the bottom of the culvert.
9. Install coir logs to reestablish the stream banks at the inlet and outlet of the new culvert.
10. Remove coffer dams; restore normal stream flows through new culvert.
11. Excavate temporary hot mix asphalt trench repair, install new roadway section, and install new guardrail on the north and south sides of Shutesbury Road.

12. Install new guardrails.
13. Remove sediment and erosion control barriers once the site has stabilized and regulatory agencies have authorized the actions.

The Town's contractor(s) will be required to submit project-specific construction sequences prior to commencement of work. The above sequence may change, and some tasks may be performed concurrently. The contractor who performs the work will determine the actual sequencing based on their means and methods of construction.

2.2 Alternatives Analysis

In addition to the preferred alternative, Tighe & Bond evaluated other stream crossing options during the planning and design phase of this project. Alternatives range from an in-kind replacement (i.e., 6-foot diameter CMP) to lining the existing culvert. While considering these alternatives, which are described further in Table 2-2 and Section 2.2.2, the process also factored in design considerations based on existing site conditions (i.e., site constraints) that are described in Section 2.2.1.

2.2.1 Design Considerations and Site Constraints

Maintenance and improvement of existing infrastructure requires understanding and consideration of design alternatives, the environmental regulatory environment, and site constraints. The culvert at Shutesbury Road consists of a degraded 72-inch diameter CMP culvert, with no embedment material approximately 35 feet in length.

Tighe & Bond performed an H&H analysis to determine the size of the proposed concrete box culvert. The box culvert increases bankfull width by approximately 156%. Upstream and downstream width of MAHW and LUWW area at the will both increase.

2.2.2 Summary of Design Alternatives

Three (3) alternative designs were evaluated for the Shutesbury Road crossing of the unnamed stream. Though technically an option, the alternative of "no action," which would result in the potential closure of a public roadway and main road between the towns of Leverett and Shutesbury, was deemed unacceptable and eliminated from further consideration. These alternates are described below and compared to existing conditions, each other, and the Massachusetts River and Stream Crossing Standards in Table 2-2.

Alternate 1 consists of replacement of the existing 72-inch CMP culvert in-kind, which does not comply with the Massachusetts River and Stream Crossing Standards. Replacement of the culvert in-kind would result in a slightly less impact to the Land Under Waterbodies and Waterways and associated Buffer Zone areas. The impacts are reduced mostly due to the limited re-grading necessary to install the same size pipe and size of excavation. Coffer dams and dewatering would be necessary to facilitate the installation. The current pipe does not provide passable area adjacent to the steam through the crossing and the cross-sectional geometry within the culvert is not preferred when compared to an open-bottom culvert.

Alternative 2 consists of keeping the existing culvert under Shutesbury Road and installing a cured in place pipe lining. This alternative would result in less impact, as excavation and grading would not be necessary. Impacts to Land Under Water and Waterways would result from the need for dewatering the area of the culvert to install the lining. A lined pipe does not provide passable area adjacent to the stream and the cross-

sectional geometry within the culvert is the least preferred when compared to the other alternatives.

Alternate 3 (preferred) consists of replacing the existing 72-inch CMP culvert with a three-sided 9' 6" W by 8' H pre-cast concrete box culvert. This option has an open bottom and will have a similar substrate as the stream to provide a seamless transition from upstream to downstream of the crossing without creating a plunge pool or removal of the ponded area at the outlet. This preferred replacement improves hydraulic capacity, culvert bankfull width, openness, and substrate which is designed to meet the Massachusetts River and Stream Crossing Standards. For these reasons, this is the preferred alternative.

TABLE 2-2
Comparison of Conditions to the Massachusetts River and Stream Crossing Standards[1]

General Standards[2]	**Existing Conditions[3]** 72" CMP Culvert	**Alt. No. 2** Cured in Place Liner	**Alt. No. 3 (Preferred)** 9'6" x 8' 3-sided Pre-Cast Concrete Box Culvert
Open-bottom span (preferred)	No	No	Yes
Embedment (if a culvert):			
• Min. 2' for all culverts	No	No	Natural Streambed Material
• Min. 2' and at least 25% for round pipe	No	No	N/A
• When embedment material includes elements > 15" diam., embedment depths should be at least 2x the D_{84} of the embedment material	No	No	N/A
Min. 1.2x bankfull width (existing = 5.5 ft)	No (6')	No (5')	Yes (9.5')
Substrate (matches streambed)	No, the CMP culvert has a closed bottom with exposed CMP	No, the lined culvert would have a non-native bottom	Yes
Water Depth & Velocity:	Stream channel narrows as it enters the culvert impacting water velocity	Stream channel narrows as it enters the culvert impacting water velocity	Matches water depth and velocity in natural stream over a range of flows
Openness (& height) (Goal: 0.82 & 6)	No 0.81 (5')	No 0.79 (5')	No 0.86 ft (3' 6")

	Existing Conditions[3]	Alt. No. 2	Alt. No. 3 (Preferred)
Banks:			
• On both sides of stream	Bank continues through the collapsed culvert	Bank continues through the lined culvert	Yes
• Match the horizontal profile of existing stream	No	No	Elevation is slightly lowered to account for inlet/outlet existing elevations
• Constructed so as not to hinder use by riverine wildlife	No	No	Yes

[1] Based on http://www.nae.usace.army.mil/Portals/74/docs/regulatory/StreamRiverContinuity/MA_RiverStreamCrossingStandards.pdf

[2] General standards for replacement of existing stream crossings.

[3] Existing Conditions represent the "in kind" replacement alternative.

Section 3
Existing Environment

This section provides a description of the general project area, as well as information pertaining to wetland resource areas and rare species.

3.1 Project Site Description

The Project Locus and Project Site are defined in Section 1 of this NOI. The Town of Leverett, including the Project Site and immediate surrounding area, is rural, with the majority of land forested with some low-density residential areas nearby the Project Site. The Project Site occupies an approximately 5,575 square foot (sf) area comprised of paved public roadway, roadway embankment, vegetated roadside, and the streambed of the unnamed tributary to Roaring Brook flowing under Shutesbury Road. Photographs of the Project Site and surrounding area are provided in Appendix B of this NOI.

3.1.1 Unnamed Tributary to Roaring Brook

The unnamed stream is shown as perennial on the most current USGS topographic map of the area (Shutesbury, Massachusetts 7.5-minute quadrangle, 2018). Tighe & Bond performed a USGS StreamStats[1] evaluation of the unnamed stream from a point upstream of the Site. According to StreamStats, the unnamed stream has a contributing drainage area of approximately 0.61 square miles. The drainage area is shown on the StreamStats report provided in Appendix C of this NOI.

The MAWPA regulations set forth the methodology for determining whether a stream identified on the most current USGS map shall be treated as though it is intermittent or perennial. This is outlined at 310 CMR 10.58(2)(a)(1)(b) and (c).

Per 310 CMR 10.58(2)(a)(1)(b):

> *A river or stream shown as perennial on the current USGS map or more recent map provided by the Department is perennial.*

As noted above, the unnamed stream is shown as perennial on the most current USGS map.

3.1.2 Hydrologic Setting

The unnamed stream generally flows north to south through the Site. It is a tributary to Roaring Brook, which flows into Doolittle Brook, then into Cushman Brook. Cushman Brook flows into the Mill River which eventually flows to the Connecticut River west of River Road in Hadley, Massachusetts. The drainage area of the unnamed tributary at the Site, as identified by StreamStats, is 0.61 square miles. The upgradient watershed of the unnamed stream consists of forest land and rural residential properties.

3.1.3 Coldwater Fishery Resource

This stream is **not** mapped as a Coldwater Fishery Resource (CFR) by the Massachusetts Division of Fisheries and Wildlife (MassWildlife) based on review of Oliver the MassGIS

[1] https://streamstats.usgs.gov/ss/

online mapping tool. However, Roaring Brook is mapped as a CFR. AS such, appropriate construction-period BMP's will be utilized.

3.1.4 Wild and Scenic Rivers

As noted above, this stream is a tributary to the Mill River which flows directly into the Connecticut River. The Connecticut River and its northern tributaries are **not** designated as a "Wild and Scenic River" by the National Park Service's Wild and Scenic Rivers program.

3.2 Wetland Resource Areas

On April 1, 2020, Tighe & Bond conducted wetland resource area investigations in general accordance with the Massachusetts Department of Environmental Protection (MassDEP) guidelines, 310 CMR 10.00, and the United States Army Corps of Engineers *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (January 2012).

The following wetland resource areas have been identified within the Project Site:

- Inland Bank
- Land Under Waterbodies and waterways (LUWW)
- Bordering Vegetated Wetland (BVW)
- Riverfront Area

The Project Site is also located within the 100-foot Buffer Zone of BVW and 200-foot Riverfront Area. These areas are associated with the unnamed perennial stream tributary to Roaring Brook. The section below provides a detailed description of wetland resource areas identified within the project area. A summary of wetland flag series is presented in Table 3-1.

TABLE 3-1
Summary of Wetland Delineation Flag Series

Flag Series	Flag Numbers	Resource Area Type
1	1A-1 through 1A-14	MAHW/Bank (east side - unnamed stream)
	1B-1 through 1B-14	MAHW/Bank (west side - unnamed stream)
	1C-1 through 1C-6	BVW
	2A-1 through 2A-6	BVW

3.2.1 Inland Bank and MAHW

The limits of Bank and MAHW associated with the unnamed stream are coincident and were demarcated with the 1A and 1B flag series. At this location, MAHW coincides with the top of Bank. MAHW was determined based on observations of changes in surficial conditions, vegetation composition, and bankfull indicators. Currently, stream flow is conveyed through the a degraded 72-inch diameter CMP culvert. Stream width near the culvert inlet and outlet is approximately four to six feet wide with a water depth ranging

between 6 to 12 inches. Substrate within the unnamed stream is primarily sandy sediment with coarse gravel and smaller amounts of cobble. Vegetation along both banks consists of eastern hemlock (*Tsuga canadensis*), red maple (*Acer rubrum*) and striped maple (*Acer pensylvanicum*).

The area upstream of the culvert was more disturbed, with increased sedimentation from the adjacent roadways and presence of invasive plant species such as Japanese barberry (*Berberis thunbergii*) and oriental bittersweet (*Celastrus orbiculatus).*

3.2.1.1 Bankfull Width

Bankfull width of the unnamed stream was measured at several locations upstream and downstream of the Shutesbury Road culvert. The unnamed stream is a relatively low gradient stream with a distinct channel and banks. Bankfull width along the unnamed stream was generally determined by the change from the vertical bank to the horizontal surface. The average bunkfull with along the unnamed stream is approximately eight feet. Table 2-2 outlines the bankfull widths taken along the stream channel and are identified on Figure 4 in Appendix A.

TABLE 3-2
Bankfull Widths Upstream and Downstream of the Shutesbury Road Culvert.

Bankfull Width Locations	Width (ft)	Distance from Culvert Headwall (ft)	Substrate
1 - Downstream	10.0	40	Sand/Gravel
2 - Downstream	9.6	69	Sand/Gravel/Cobble
3 - Downstream	8.0	107	Sand/Gravel/Cobble
4 - Downstream	8.0	120	Sand/Gravel/Cobble
5 - Downstream	8.4	143	Gravel/Cobble
6 - Downstream	7.5	165	Gravel/Cobble
7 - Downstream	6.7	186	Gravel/Cobble
8 - Downstream	7.4	200	Gravel/Cobble
9 - Downstream	8.0	230	Gravel/Cobble
10 - Downstream	6.4	245	Gravel/Cobble
1 - Upstream	6.4	0	Sand/Gravel
2 - Upstream	9.4	39	Sand/Gravel
3 – Upstream	6.2	58	Gravel/Cobble
4 – Upstream	7.4	67	Gravel/Cobble
5 – Upstream	8.2	84	Gravel/Cobble
6 – Upstream	7.8	119	Gravel/Cobble
7 – Upstream	7.6	129	Gravel/Cobble
8 – Upstream	10.1	146	Gravel/Cobble

TABLE 3-2
Bankfull Widths Upstream and Downstream of the Shutesbury Road Culvert.

Bankfull Width Locations	Width (ft)	Distance from Culvert Headwall (ft)	Substrate
9 – Upstream	6.6	183	Gravel/Cobble
10 – Upstream	8.9	197	Gravel/Cobble
11 – Upstream	7.5	215	Gravel/Cobble

3.2.2 Land Under Waterbodies and Waterways

Land Under Waterbodies and Waterways (LUWW) associated with the unnamed stream is present within the Project Site. Substrate both upstream and downstream is sand and gravel with cobble.

3.2.3 Bordering Vegetated Wetland

Two BVWs were observed and delineated within the Shutesbury Road Culvert Replacement project area. Wetland 1C was delineated adjacent to the OWH line on the northwest side of the unnamed stream and wetland 2A was located southeast of the unnamed stream and not bordering the stream channel within the Project Site.

Wetland 1C located north of the culvert is best classified as a Palustrine Forest/Scrub Shrub (PFO/SS). The wetland borders the stream along the north side of the channel in a low-lying depression. Soils within the wetland consisted of a loamy sand with a matrix colors of 10YR 3/1 and 10YR 4/2 with 10% redoximorphic concentrations within the matrix. Water was observed in the soil profile at six inched below the surface. Dominant vegetation observed consisted of green ash (*Fraxinus pennsylvanica*), red maple, bittersweet, cinnamon fern (*Osmunda cinnamomea*) and sensitive fern (*Onoclea sensibilis*).

Wetland 2A is located approximately 10 feet east of the southeastern bank of the unnamed stream. This wetland does not directly border the unnamed stream but appears to be connected to Roaring Brook east of the project area. The wetland is classified as a Palustrine Forested system that is seasonally saturated (PFO1B). Soils within the wetland consisted of a loamy sand with a matrix color of 10YR 4/2 with 5% redoximorphic concentrations within the matrix. Water was observed in the soil profile at eight inches below the surface. Dominant vegetation observed consisted of eastern hemlock, red maple, striped maple, and cinnamon fern.

3.2.4 Bordering Land Subject to Flooding

Bordering Land Subject to Flooding (BLSF) is defined at 310 CMR 10.57(2)(a) 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."*

Review of the FEMA Flood Insurance Rate Study (FIS) for the Town of Leverett dated December 1979 and the Flood Insurance Rate Map (FIRM) Community-Panel No. 250120 0007B for the Town of Leverett, Massachusetts (effective date June 4, 1980) indicates

that the entire subject site (within the aerial survey limits) is **not** located within the limits of Bordering Land Subject to Flooding (BLSF).

3.3 Rare Species

The Massachusetts Natural Heritage Atlas, 14th Edition (August 1, 2017) was consulted during the planning and design phases of this project. According to the Atlas, the project site is not situated within the limits of mapped *Priority Habitats of Rare Species* and *Estimated Habitats of Rare Wildlife.*

Section 4
Regulatory Compliance

The proposed project has been designed to avoid environmental impacts where possible, minimize unavoidable impacts when practicable, and provide mitigation that is commensurate with the proposed alterations. Descriptions of the project's compliance with the regulatory requirements of the WPA and other pertinent state and federal regulatory programs are provided in the following sections.

4.1 MA Wetlands Protection Act

4.1.1 Limited Project Status

The proposed culvert replacement at the unnamed stream which is tributary to Roaring Brook qualifies for consideration as a Limited Project per 310 CMR 10.53(3)(i):

> *"The maintenance, repair and improvement (but not substantial enlargement) of structures, including dams and reservoirs and appurtenant works to such dams and reservoirs…buildings, piers, towers, headwalls, bridges,* ***and culverts*** *which existed on the effective date of 310 CMR 10.51 through 10.60 (April 1, 1983).*

The existing culvert was installed around 1970 based on information provided by the Town of Leverett. Based on review of available online aerial photography and topographic maps there has been a stream crossing at this location since the late 1800s.

The discussion of design alternatives presented in Section 2.2 of this NOI is intended to serve as the alternatives analysis required of Limited Projects as set forth at 310 CMR 10.53(3).

On behalf of the Town, we respectfully request the Commission grant Limited Project Status relative to the following performance standards:

- 310 CMR 10.54(4)(a)(5) – Wildlife Habitat Evaluation (inland Bank)
- 310 CMR 10.56(5)(d) – Expansion of existing structures located outside the Riverfront Area (Riverfront Area)
- 310 CMR 10.56 (5)(c) – 100-foot area of undisturbed vegetation (Riverfront Area)

4.1.2 Stream Crossing Replacement

The Shutesbury Road culvert replacement has been designed to meet the Massachusetts River and Stream Crossing Standards to the maximum extent practicable, taking into consideration existing conditions, site constraints, and potential upstream and downstream impacts.

Per 310 CMR 10.53(8), *any person proposing the replacement of an existing stream crossing shall demonstrate to the Issuing Authority that the impacts of the crossing have been avoided where possible, and when not possible, have been minimized and that mitigation measures have been provided to contribute to the protection of the interested identified in M.G.L. c. 131, § 40. An applicant will be presumed to have made this showing if the project is designed as follows:*

(a.) If the project includes replacement of an existing non-tidal crossing, the applicant demonstrates to the satisfaction of the Issuing Authority that the crossing complies with the Massachusetts Stream Crossing Standards to the maximum extent practicable.

(b.) *If the project includes replacement of an existing tidal crossing that restricts tidal flow…* Not applicable. The unnamed perennial tributary to Roaring Brook is not a tidal stream.

At a minimum, in evaluating the potential to comply with the standards to the maximum extent practicable the applicant shall consider site constraints in meeting the standard, undesirable effects of risk in meeting the standard and the environmental benefit of meeting the standard compared to the cost by evaluating the following…

Table 4-1 presents the criteria for evaluating culvert replacement projects.

TABLE 4-1
Comparison of Alternatives and Evaluation Criteria for the Massachusetts River and Stream Crossing Standards

Evaluation Criteria	Alt. No. 1 Existing Conditions 72" CMP	Alt. No. 2 Cured in Place Pipe Lining	Alt. No. 3 (Preferred) 9.5' x 8' Open Bottom Concrete Box Culvert
Potential for downstream flooding(1)	Downstream flooding does not currently exist.	Downstream would remain the same as existing conditions.	Downstream flooding would remain the same as existing conditions, no flooding currently exists.
Upstream and downstream habitat (in-stream habitat, wetlands)	Upstream and downstream habitats currently fragmented.	Upstream and downstream habitats are temporarily impacted during installation. Migration between upstream and downstream may be impacted due to the reduced diameter of the culvert.	Upstream and downstream habitats are impacted. Potential in-stream habitat may be impacted by the increased storm-related flow events. The box culvert increases bank width by approximately 156%.
Potential for erosion and head-cutting	Potential erosion and head-cutting is possible based on the existing conditions.	Potential for erosion and head-cutting is similar to existing conditions. Water velocity through the narrower culvert may increase the potential for erosion and head cutting downstream.	Potential for erosion and head-cutting is reduced with the proposed concrete headwalls and grading because the longitudinal profile through the crossing matches the upstream channel.
Stream stability	Stream stability is not changed.	Stream stability is not changed.	Stream stability is anticipated to be positively impacted. The increased hydraulic capacity will reduce velocities through the culvert, therefore, reducing the potential for erosion and head-cutting.

TABLE 4-1
Comparison of Alternatives and Evaluation Criteria for the Massachusetts River and Stream Crossing Standards

Evaluation Criteria	Alt. No. 1 Existing Conditions 72" CMP	Alt. No. 2 Cured in Place Pipe Lining	Alt. No. 3 (Preferred) 9.5' x 8' Open Bottom Concrete Box Culvert
Habitat fragmentation caused by the crossing	No passable area is provided adjacent to the stream through the crossing.	No passable area is provided adjacent to the stream through the crossing and area within the culvert is reduced.	Terrestrial bench is provided adjacent to the stream through the crossing above MAHW.
The amount of stream mileage made accessible by the improvements	0/NA	0/NA	2.0 mi(5)
Storm flow conveyance (1)	Matches existing hydraulics.	Matches existing or slightly reduced hydraulics.	Stormwater conveyance is improved. Downstream flooding is not anticipated.
Engineering design constraints specific to the crossing	Requires extensive excavation.	Limited design and constructability constraints	Requires extensive excavation, deep cast-in-place pedestal footings, and grading around proposed headwall/wingwalls.
Hydrologic constraints specific to the crossing	None	Potential for increased upstream flooding may occur by reducing the openness of the culvert.	Downstream flooding is not anticipated.
Potential to affect property and infrastructure	The potential for increased erosion along the culvert and impacts to the roadway would remain the same.	Potential for increased upstream flooding may occur by reducing the openness of the culvert.	Downstream flooding is not anticipated since the storage volume on the upstream side is provides little reduction of peak flow rate. The downstream culvert will not be impacted.
Cost of replacement	$200,000(2)	$150,000(4)	$276,000(3)

(1) Potential for flooding is present based on the Hydraulic and Hydrologic analysis performed by Tighe & Bond using SewerGEMs model software.

(2) This is an order of magnitude cost based on the material costs, deep excavation costs, and estimated duration of construction.

(3) This cost is based on our opinion of probable construction costs developed for the specific design proposed.

(4) This is based on project of similar size and scale involving cured in place lining.

(5) Based on aerial photograph interpretation of stream length(s) between road crossings upstream and downstream of Shutesbury Road. Does not include field verification of stream conditions.

As outlined above, for reasons beyond basic costs of construction, Alternative No. 3 is the preferred alternative.

4.1.3 Summary of Jurisdictional Activities

A summary of jurisdictional alterations is presented below in Table 4-2.

TABLE 4-2
Summary of Jurisdictional Resource Area Alterations

Activity	Bank (lf)	LUWW (sf/cy)	Riverfront Area (sf)
Coffer Dam	--	10 cy[1]	--
Dewatered Work Area	--	225	--
Culvert Replacement	82	475	--
Grading	158	--	1,000
Roadway	--	--	4,575
Total:	**240**	**700**	**5,575**

[1]Square footage of the coffer dam was included in the calculated of the dewatered work area impact number.

A summary of how the project meets the pertinent General Performance Standards is presented in the following sections.

4.1.4 General Performance Standards

The following sections present discussions of the proposed activities relative to the pertinent General Performance Standards.

4.1.4.1 Inland Bank

As noted in Table 4-2, approximately 240 linear feet (lf) of inland Bank will be altered during the course of the proposed project. Approximately 84 lf is associated with the removal of the degraded culvert and 158 lf is associated with the restoration of Bank within footprint of the new culvert. The Performance Standards for inland Bank are set forth at 310 CMR 10.54(4)(a) and are addressed below.

(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;

The physical stability of the Bank in the Shutesbury Road culvert will either remain unchanged or improve as a result of the project. The existing CMP culvert is deteriorating, and replacement will end this process before the pipe fails.

2. The water carrying capacity of the existing channel within the bank;

The water carrying capacity of the culvert and the unnamed stream will be changed by the project. Increasing the cross-sectional area of the culvert will increase the hydraulic capacity of the culvert. Downstream flooding is not anticipated.

3. Ground and surface water quality;

Construction period protective measures (including stream flow bypass, dewatering, and erosion/sedimentation controls) have been incorporated into project design to limit impacts to ground and surface water quality. These are described in Section 2.1.1 and depicted on the Project Drawings.

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

The Bank at this location consists of poorly vegetated banks, providing some vegetative cover, breeding habitat, or escape cover or food for fisheries. The proposed Bank restoration includes native shrub plantings which will increase the available cover and potential breeding habitat along the stream.

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 land in 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. Additional alterations beyond the above threshold may be permitted if they will have no adverse effects on wildlife habitat, as determined by procedures established under 310 CMR 10.60.

As noted above, 240 lf of Bank alteration is proposed. Though the project impacts exceed the 50-foot threshold for performing a Wildlife Habitat Evaluation, approximately 158 lf is comprised of natural Bank. Therefore, the Town respectfully requests the Commission grant Limited Project Status and waive this requirement due to the minimal amount of wildlife habitat function and value present associated with the existing Bank and the proposed restoration of Bank with natural materials.

4.1.4.3 Land Under Water Bodies and Waterways

As noted in Table 4-2, approximately 700 sf of LUWW will be impacted during the course of the proposed project. Approximately 475 sf is associated with the replacement of the culvert and the other 225 sf is associated with the dewatered area within the coffer dams. All impacts to LUWW are temporary in nature. The Performance Standards for LUWW are set forth at 310 CMR 10.56(4) and are addressed below.

(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;

The water carrying capacity of the culvert and unnamed stream will be changed by the project. Enlarging the culvert will increase the hydraulic capacity within the defined channel; however, after review of the H&H analysis, this will not impair the function of LUWW within the culvert.

2. Ground and surface water quality;

Construction period protective measures (including stream flow bypass and erosion/sedimentation controls) have been incorporated into project design to limit

impacts to ground and surface water quality. These are described in Section 2.1.1 and depicted on the Project Drawings.

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

The LUWW within the existing culvert consists of an aging and deteriorated corrugated metal pipe. LUWW within the existing culvert has limited capacity to provide breeding habitat, escape cover, or food for fisheries.

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 files 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 in they will have no adverse effects on wildlife habitat, as determined by procedures established under 310 CMR 10.60.

Not applicable. The proposed is not anticipated to alter greater than 5,000 sf or up to 10% of land found to be significant to provide important wildlife habitat functions.

(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 area.

Not applicable.

(c) Notwithstanding the provisions of 310 CMR 10.56(4)(a) and (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.

Not applicable.

4.1.4.5 Riverfront Area

Approximately 5,575 sf of temporary and permanent impact will occur within the Riverfront Area of the unnamed tributary of Roaring Brook. The Riverfront Area within the Project Site is comprised of rural residential properties and vegetated/forest land, and roadway.

This section describes how the proposed project satisfies the Riverfront redevelopment provisions at 310 CMR 10.58(5). The performance standards are provided below in italics, while the details of project design follow.

(a) At a minimum, proposed work shall result in an improvement over existing conditions of the capacity of the riverfront area to protect the interests identified in M.G.L. c. 131 § 40. When a lot is previously developed but no portion of the riverfront area is degraded, the requirements of 310 CMR 10.58(4) shall be met.

The proposed project is located within an existing disturbed roadway and consists of improvement to the existing stream crossing. The replacement culvert has been designed to meet the Massachusetts River and Stream Crossing Standards to the maximum extent practicable and includes plantings of native woody species along the Banks of the stream. The area will be improved over existing conditions to the extent feasible while replacing the damaged infrastructure.

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

The proposed project will not generate additional stormwater runoff, increase impervious area, or create a new point source discharge. Per the Recommended Final Decision issued July 29, 2016 in the Matter of Berkshire Community College Docket No. WET-2015-023 from the MassDEP Office of Appeals and Dispute Resolution, it was ruled that 310 CMR 10.05(6)(k) through (q) do not apply to a project that does not proposed a "point source" or "stormwater discharge" within Resource Areas or their Buffer Zones. As such, this standard has been satisfied.

(c) Within 200 foot riverfront area, proposed work shall not be located closer to the river than existing conditions or 100 feet, whichever is less, or not closer than existing conditions within 25 foot riverfront areas, except in accordance with 310 CMR 10.58(5)(f) or (g).

The proposed culvert replacement will increase the width and openness ratio of the crossing, thus providing additional space for stream flows and wildlife movement. The culvert cannot be placed further from the resource area as it is conveying the resource under Shutesbury Road. We respectfully request that the Leverett Conservation Commission waive this requirement under Limited Project status.

(d) Proposed work, including expansion of existing structures, shall be located outside the riverfront area or toward the riverfront area boundary and away from the river, except in accordance with 310 CMR 10.58(5)(f) or (g).

The proposed culvert replacement will increase the width and openness ratio of the crossing, thus providing additional space for stream flows and wildlife movement. Due to the nature of the project, replacement of the culvert with the larger span, locating the work outside of Riverfront Areas is not practicable. We respectfully request that the Leverett Conservation Commission waive this requirement under Limited Project status.

(e) The area of proposed work shall not exceed the amount of degraded area, provided that the proposed work may alter up to 10% if the degraded area is less than 10% of the riverfront area, except in accordance with 310 CMR 10.58(5)(f) or (g).

The proposed culvert replacement project will not increase the amount of degraded area with the replacement of the culvert. The culvert is located within the same layout of the existing culvert. Native shrub species will be installed within and around the areas of restored bank to restore lost vegetation and further enhance Riverfront Area.

(f) When an applicant proposed restoration on-site of degraded riverfront area, alteration may be allowed notwithstanding the criteria of 310 CMR 10.58(c), (d) and (e) at a ratio in square feet of at least 1:1 of restored area to area of alteration not conforming to the criteria. Areas immediately along the river shall be selected for restoration. Alteration not conforming to the criteria shall begin at the riverfront area boundary. Restoration shall include

1. removal of all debris, but retaining any trees or other mature vegetation;

2. *grading to a topography which reduces runoff and increases infiltration;*
3. *coverage by topsoil at a depth consistent with natural conditions at the site; and*
4. *seeding and planting with an erosion control seed mixture, followed by plantings of herbaceous and woody species appropriate to the site.*

The area around the replacement culvert will be replanted, depending on the time of year and the availability of native nursery stock, to improve vegetation along the banks of the stream to the maximum extent practicable. Existing vegetation will be maintained to the extent feasible and topography will be graded to reduce runoff and increase infiltration.

(g) When an applicant proposes mitigation either on-site or in the riverfront area within the same general area of the river basin, alteration may be allowed notwithstanding the criteria of 310 CMR 10.58(c), (d), or (e) at a ratio in square feet of at least 2:1 mitigation area to area of alteration not conforming to the criteria or an equivalent level of environmental protection where square footage is not a relevant measure. Alteration not conforming to the criteria shall begin at the riverfront area boundary. Mitigation may include off-site restoration of riverfront areas, conservation restrictions under M.G.L. c. 184 §§ 31 to 33 to preserve undisturbed riverfront area that could otherwise be altered under 310 CMR 10.00, the purchase of development rights within the riverfront area, the restoration of bordering vegetated wetland, projects to remedy an existing adverse impact on the interests identified in M.G.L. c. 131 § 40 for which the applicant is not legally responsible, or similar activities undertaken voluntarily by the applicant which will support a determination by the issuing authority of no significant adverse impact. Preference shall be given to potential mitigation projects, if any, identified in a River Basin Plan approved by the Secretary of the Executive Office of Environmental Affairs.

As previously noted, Riverfront Area will be enhanced through the installation of native woody plant species.

4.1.5 Abutter Notification

Abutters have been notified in accordance with 310 CMR 10.05(4). Copies of the abutter notification form and list of abutters are provided in Appendix D.

4.1.6 Stormwater Management Standards

The proposed project will not generate additional stormwater runoff or increase impervious area, but it will alter the hydrology of the stream due to the increased culvert size. The proposed project will not generate additional stormwater runoff, increase impervious area, or create a new point source discharge. Per the Recommended Final Decision issued July 29, 2016 in the Matter of Berkshire Community College Docket No. WET-2015-023 from the MassDEP Office of Appeals and Dispute Resolution, it was ruled that 310 CMR 10.05(6)(k) through (q) do not apply to a project that does not proposed a "point source" or "stormwater discharge" within Resource Areas or their Buffer Zones.

4.2 Other Pertinent Regulatory Programs

4.2.1 Section 401 Water Quality

Culvert replacements and fill placed below the MAHW line of Waters of the United States and wetlands within the Commonwealth are subject to Massachusetts Department of

Environmental Protection (MassDEP) jurisdiction under Section 401 of the Clean Water Act. As summarized in Table 4-1, the proposed project will result in less than 5,000 square feet of impacts (temporary and permanent) to Land Under Water and will dredge and/or mobilize less than 100 cubic yards of sediment. As such, and per 314 CMR 9.03(1), the project is not categorically required to obtain an individual 401 Water Quality Certificate.

4.2.2 Section 404 of the Clean Water Act

Culvert replacements and fill placed below the Ordinary High Water (OHW) line of Waters and wetlands of the United States within the Commonwealth are subject to jurisdiction under Section 404 of the Clean Water Act as administered by the United States Army Corps of Engineers (Corps). The project is subject to review under the "Pre-Construction Notification" category of the Massachusetts General Permits (MA GPs) as the project meets the stream crossing standards to the maximum extent practicable.

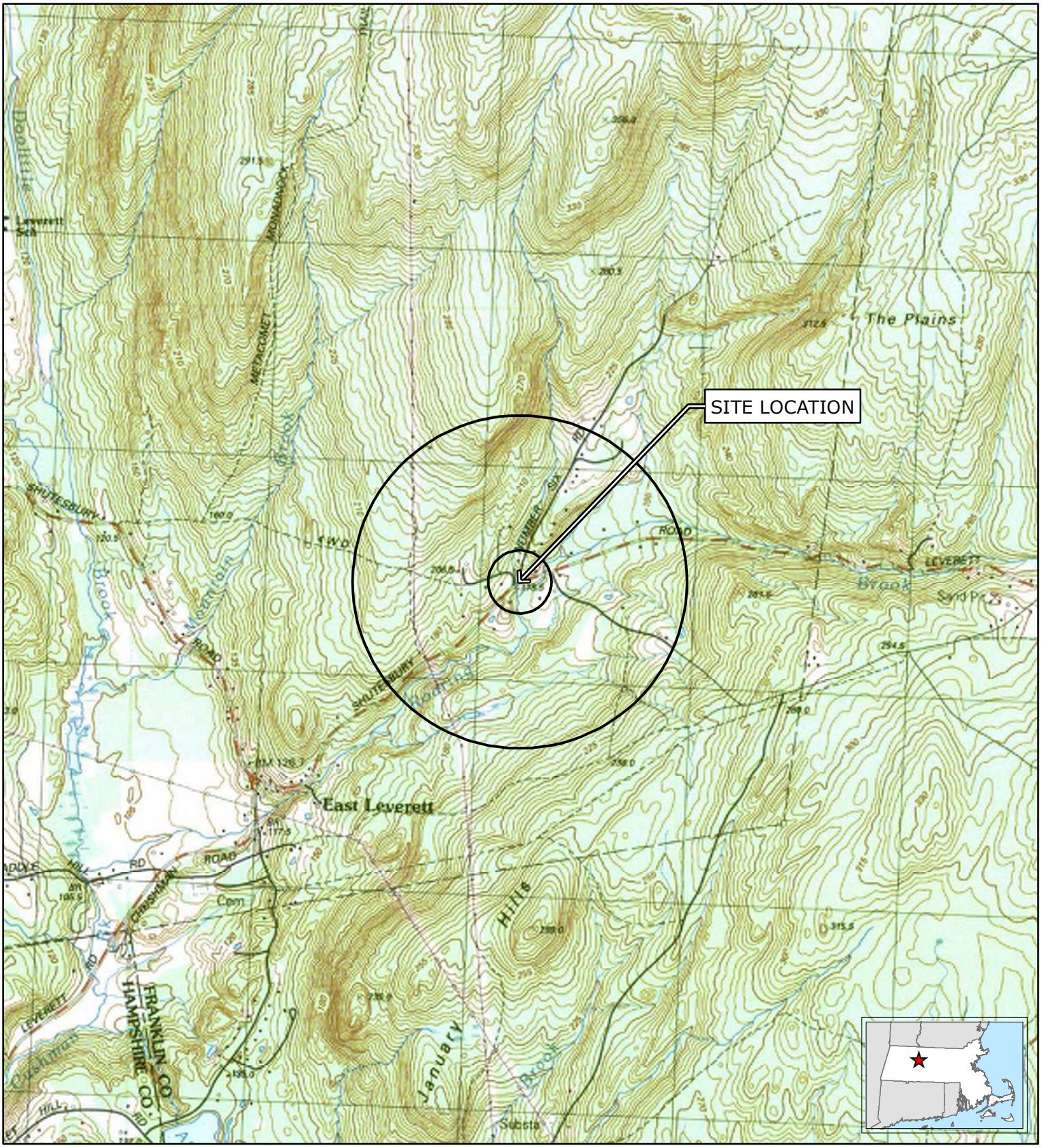
4.2.3 NPDES Construction General Permit

Construction activities will not result in the cumulative disturbance of one (1) or more acres of land. As such, the project does not require coverage under the NPDES Construction General Permit (CGP).

J:\L\L0792 Leverett\002 Shutesbury Road Culvert\Permitting\NOI\04 - Narrative.docx

Tighe&Bond

APPENDIX A



Tighe&Bond

Based on USGS Topographic Map for
Shutesbury, MA Revised 1990.
Contour Interval Equals 3-Meters.
Circles indicate 500-foot and half-mile radii

1:24,000

0 1,000 2,000

Feet

N

FIGURE 1
SITE LOCATION

Shutesbury Road
Culvert Replacement Project
Leverett, Massachusetts

March 2020

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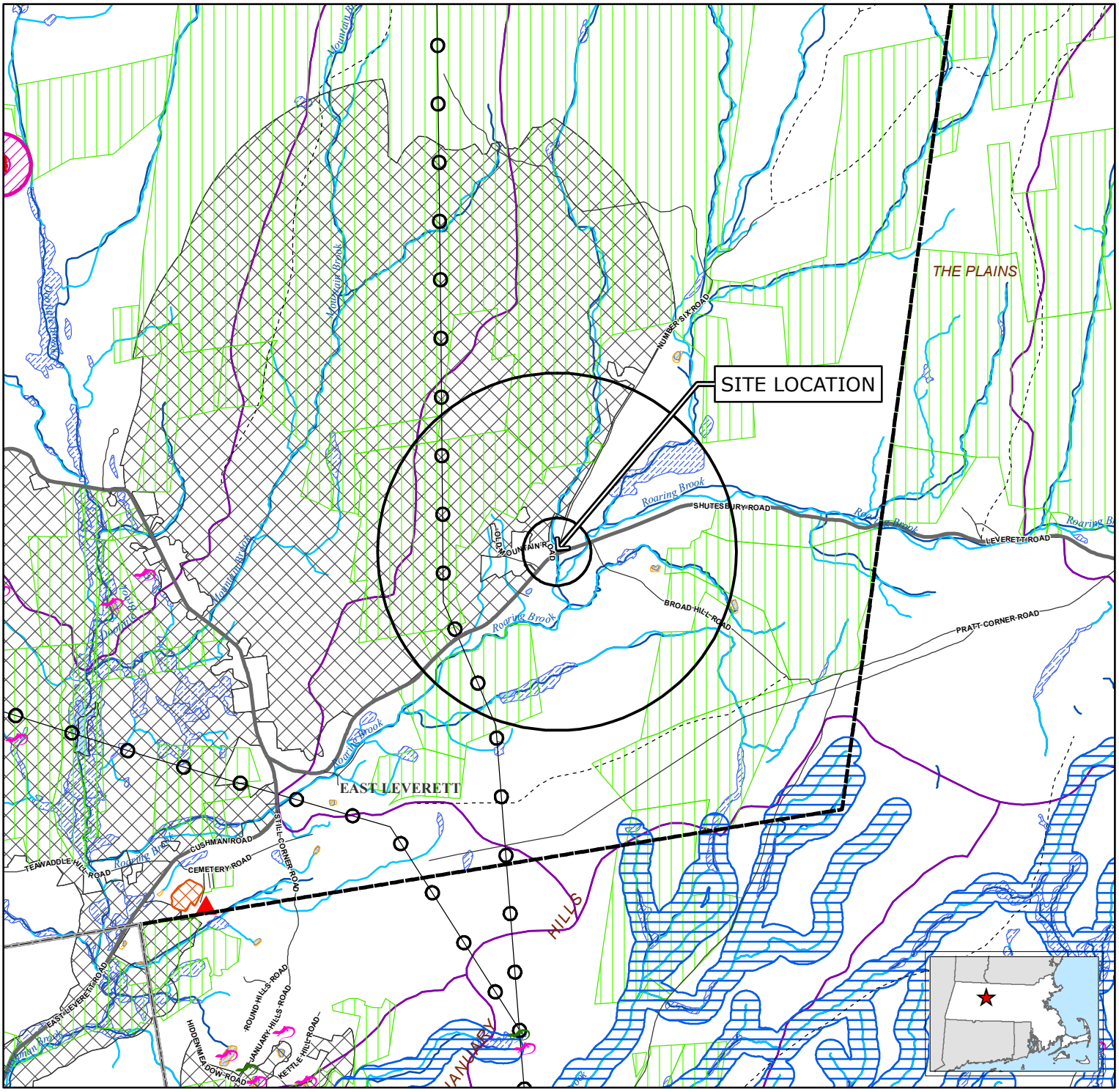

Legend

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

1:24,000

0 1,000 2,000

Feet

N

FIGURE 2
PRIORITY RESOURCES

Shutesbury Road
Culvert Replacement Project
Leverett, Massachusetts

Data source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology
Circles indicate 500-foot and half-mile radii.
Data valid as of March 2020.

March 2020

Tighe&Bond

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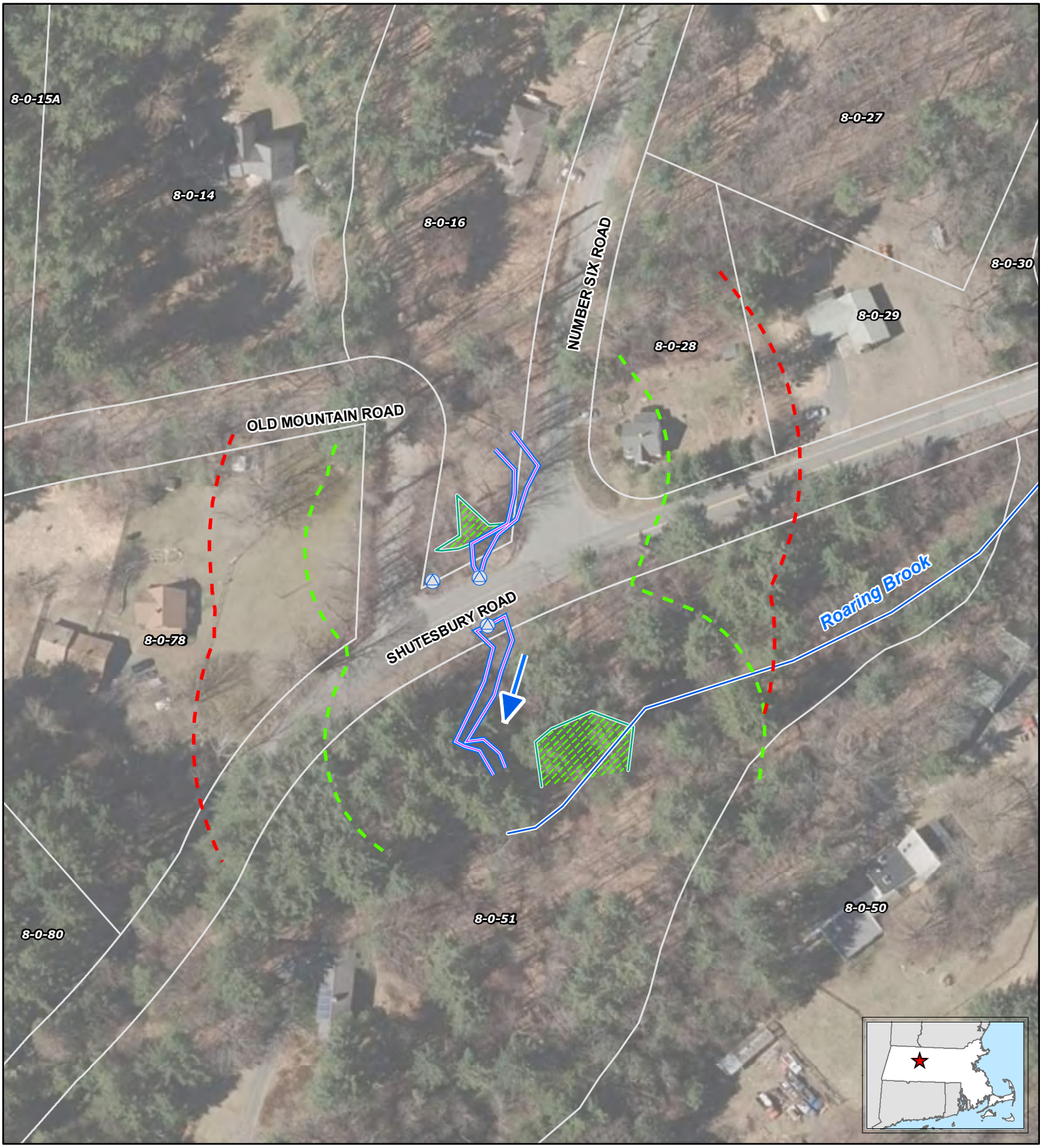

Legend

- Culvert
- Stream Centerline (Approximate)
- Mean High Water
- Wetland Boundary
- 100-foot Buffer Zone
- Riverfront Area
- Wetland Area
- Parcel Boundary

1:1,200

0 50 100

Feet

N

Tighe&Bond

Based on MassGIS Color Orthophotography (2019).
Parcels (FY2019) downloaded from MassGIS and are approximate.

FIGURE 3
SITE PLAN

Shutesbury Road
Culvert Replacement Project
Leverett, Massachusetts

June 2020

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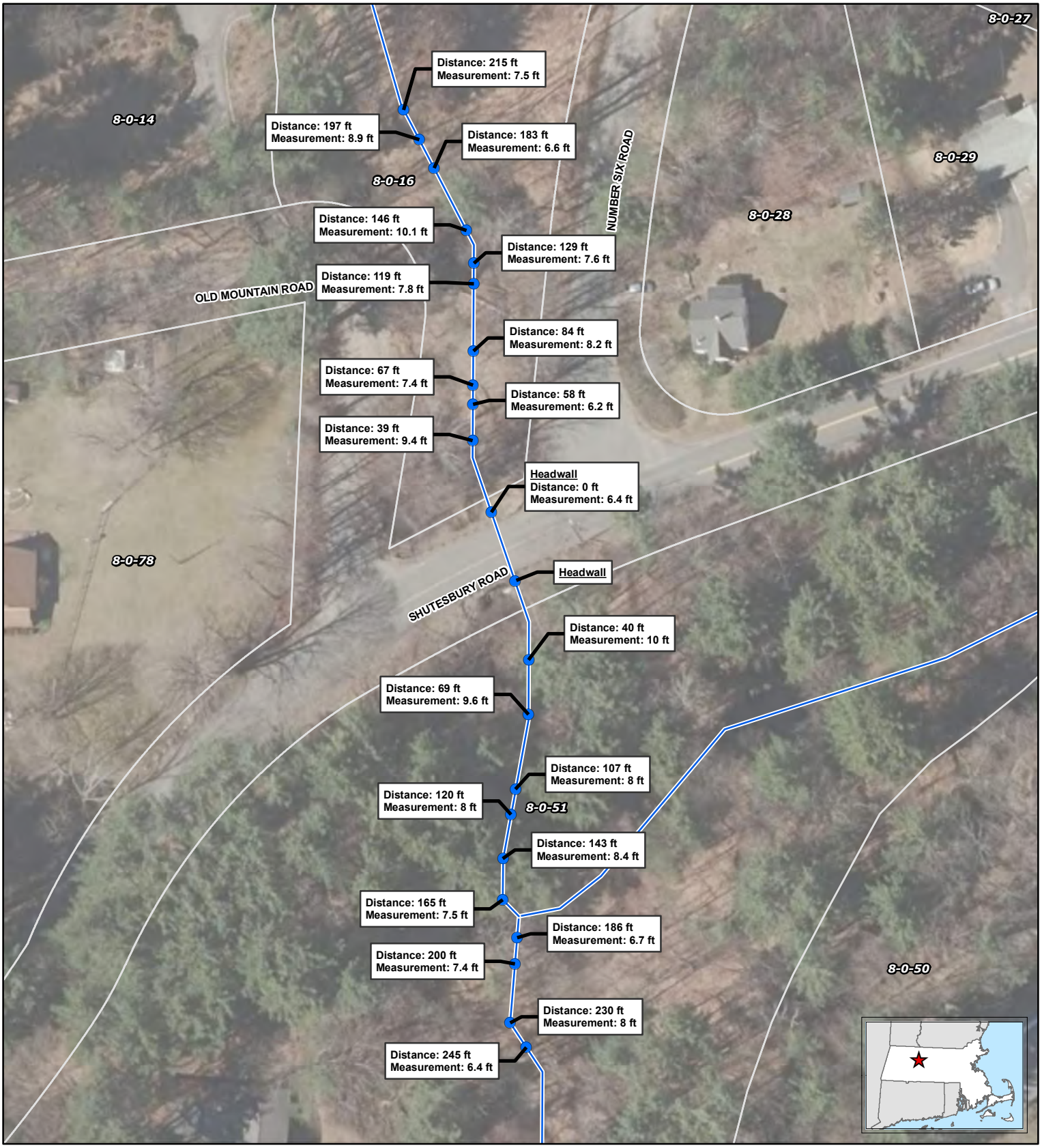

Legend

- Bank Full Width Measurement Location
- Parcel Boundary
- Stream

Tighe&Bond

Based on MassGIS Color Orthophotography (2019).
Parcels (FY2019) downloaded from MassGIS and are approximate.

1:800

0 50

Feet

N

FIGURE 4
BANK FULL WIDTH

Shutesbury Road
Culvert Replacement Project
Leverett, Massachusetts

March 2020

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L-0972

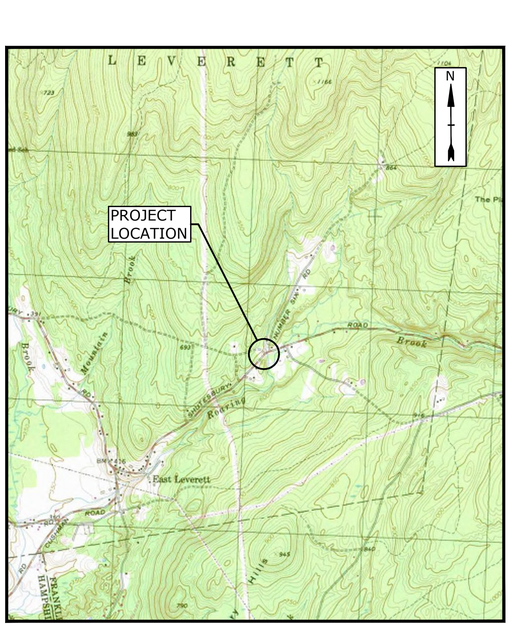
TOWN OF LEVERETT, MASSACHUSETTS

SHUTESBURY ROAD

CULVERT REPLACEMENT PROJECT

JUNE 2020

LIST OF DRAWINGS	
SHEET NO.	SHEET TITLE
G-001	COVER
G-002	LEGEND, ABBREVIATIONS AND GENERAL NOTES
C-101	EXISTING CONDITIONS PLAN
C-102	PROPOSED CONDITIONS PLAN
C-103	PROPOSED CONDITIONS PROFILE
C-104	WATER AND EROSION CONTROL DETAILS, ROADWAY AND CULVERT DETAILS
C-105	TEMPORARY TRAFFIC CONTROL



LOCATION MAP
SCALE: 1"=2000'

PREPARED BY:

Tighe&Bond

PETER M. VALINSKI, PE

ZACHARIAH P. CHORNYAK, PE

PREPARED FOR:

TOWN OF LEVERETT

MARJORIE McGINNIS, TOWN ADMINISTRATOR

COMPLETE SET 7 SHEETS

GENERAL NOTES

1. BASE PLAN PREPARED BY NORTHEAST SURVEY CONSULTANTS, INC. ON JANUARY 6, 2020. EXISTING PROPERTY LINES ARE BASED ON AN ASSESSORS PLAN, AND ARE APPROXIMATE AND FOR ORIENTATION PURPOSES ONLY.
2. THE HORIZONTAL DATUM IS BASED ON THE NORTH AMERICAN DATUM OF 1983 (NAD83). THE VERTICAL DATUM IS BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). BOTH WERE DERIVED FROM RTK GPS OBSERVATIONS TAKEN ON SITE.
3. BOLD TEXT AND LINES INDICATE PROPOSED WORK. LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS.
4. SOIL BORINGS WERE ADVANCED BY SEABOARD DRILLING, INC. ON 12/23/2019.
4. WETLAND RESOURCE AREAS WERE DELINEATED BY TIGHE & BOND ON 4/01/2020.
5. NOTIFY "DIGSAFE" AT 1-888-344-7233 TO ARRANGE FOR MARKING OUT EXISTING UNDERGROUND UTILITIES AT LEAST 72 HOURS (EXCLUDING SATURDAYS, SUNDAYS, AND HOLIDAYS) PRIOR TO BEGINNING EXCAVATION AT ANY GIVEN LOCATION. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR BE ALLOWED TO START ANY KIND OF EXCAVATION WORK PRIOR TO OBTAINING ALL THE NECESSARY INFORMATION REGARDING THE LOCATION OF UNDERGROUND UTILITIES AT THE SITE. ACCOMPLISH ALL EXCAVATION SO THAT UNDERGROUND UTILITIES OR STRUCTURES ARE NOT DAMAGED. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE INCURRED DURING EXCAVATION OPERATIONS. REPAIR ANY EXISTING PIPE OR UTILITY DAMAGED DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.
6. THE OWNER AND ENGINEER ASSUME NO RESPONSIBILITY FOR THE LOCATION OF EXISTING UTILITIES. THE ENGINEER AND OWNER MAKE NO GUARANTEE AS TO THE UNDERGROUND CONDITIONS THAT MAY BE ENCOUNTERED.
7. FIELD MEASURE TO VERIFY EXISTING AND CONTRACT INTERFACE DIMENSIONS, LOCATIONS, AND OTHER CONDITIONS.
8. TEST PITS TO LOCATE EXISTING UTILITIES ARE STRONGLY ENCOURAGED AND MAY BE ORDERED BY THE ENGINEER.
9. IF CHANGES TO THE DESIGN ARE PROPOSED, THE PROPOSED CHANGES SHALL BE SUBMITTED TO THE OWNER/ENGINEER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION (MAY REQUIRE PERMIT MODIFICATIONS OR NEW FORMAT(S).
10. NO OPEN TRENCHES WILL BE ALLOWED OVERNIGHT. THE USE OF ROAD PLATES TO PROTECT THE EXCAVATION WILL BE CONSIDERED UPON REQUEST, BUT BACKFILLING IS PREFERRED.
11. STORE FUEL, OIL, PAINT, OR OTHER HAZARDOUS MATERIALS IN A SECONDARY CONTAINER AND REMOVE FROM THE SITE TO A LOCKED INDOOR AREA WITH AN IMPERVIOUS FLOOR DURING NON-WORK HOURS.
12. IMMEDIATELY REPORT SPILLS OF OIL AND/OR HAZARDOUS MATERIALS (OHM) TO THE MASSDEP.
13. PROVIDE A SUFFICIENT SUPPLY OF ABSORBENT SPILL RESPONSE MATERIALS, SUCH AS BOOMS OR BLANKETS, AT THE CONSTRUCTION SITE AT ALL TIMES TO CLEAN UP POTENTIAL SPILLS OF HAZARDOUS MATERIALS.
14. FURNISH AND INSTALL TRAFFIC CONTROL/SAFETY DEVICES TO ENSURE SAFE VEHICULAR TRAFFIC THROUGH THE WORK AREA OR FOR SAFELY IMPLEMENTING DETOURS AROUND THE WORK AREA.
15. MAKE NECESSARY ARRANGEMENTS TO PERFORM ANY WORK NEAR THE OVERHEAD UTILITIES PRIOR TO THE START OF CONSTRUCTION.

SURFACE RESTORATION NOTES

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

LEGEND

EXISTING	NEW	
		EDGE OF PAVEMENT
		GRAVEL DRIVE
		FENCE
SD		STORM DRAIN
		APPROXIMATE PROPERTY LINE
OE		OVERHEAD UTILITY LINES
		TREELINE
		THALWEG
		GUARDRAIL
	490	INDEX CONTOUR
		INTERMEDIATE CONTOUR
		CONTROL POINT
B-1		BORING
345.4	351.3	PROFILE ELEVATIONS
		CATCH BASIN
		UTILITY POLE
		GUY WIRE
		SIGN
		PIPE OUTLET
		TEMPORARY COFFER DAM
		STONE HEADWALL
		EROSION CONTROL BARRIERS
		SURVEYED EDGE OF WATER (JANUARY 2020)
		MEAN ANNUAL HIGH WATER (MAHW)
		TOP OF BANK/ORDINARY HIGH WATER (OHW)
1C-4 1C-2 1C-1 1C-3		VEGETATED WETLANDS LIMIT
		100-FOOT BUFFER ZONE
		TEMPORARY BENCH MARK
		RIPRAP
		TREE

ABBREVIATIONS

APPROX	APPROXIMATE
BIT	BITUMINOUS
BVW	BORDERING VEGETATIVE WETLANDS
CFS	CUBIC FEET PER SECOND
CONC	CONCRETE
CMP	CORRUGATED METAL PIPE
D	DIAMETER
DPW	DEPARTMENT OF PUBLIC WORKS
EL/ELEV	ELEVATION
EXIST	EXISTING
FIN	FINISHED
'	FEET/FOOT
"	INCH
HDPE	HIGH DENSITY POLYETHYLENE
H	HEIGHT
HMA	HOT MIX ASPHALT
INV	INVERT ELEVATION
IP	IRON PIN
L	LENGTH
LF	LINEAR FEET
MASSDEP	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
MAX	MAXIMUM
MIN	MINIMUM
MISC	MISCELLANEOUS
N/F	NOW/FORMERLY
O.C.	ON CENTER
OE	OVERHEAD ELECTRIC
PROP	PROPOSED
RD	ROAD
SF	SQUARE FEET
STA	SURVEY STATION
T	TOP
TBM	TEMPORARY BENCH MARK
TYP	TYPICAL
UP	UTILITY POLE
W	WIDTH

Tighe&Bond

Town of Leverett

Shutesbury Road Culvert Replacement Project

Leverett, Massachusetts

MARK	DATE	DESCRIPTION

PROJECT NO:	L0792/002
DATE:	06/01/2020
FILE:	L0792-002-G-002.dwg
DRAWN BY:	
CHECKED:	DJP
APPROVED:	PMV, ZPC

LEGEND, ABBREVIATIONS AND GENERAL NOTES

SCALE: NO SCALE

G-002

SHEET 2 OF 7

Last Saved: 6/1/2020
Printed: Thursday, June 04, 2020, 10:51am By: TMP
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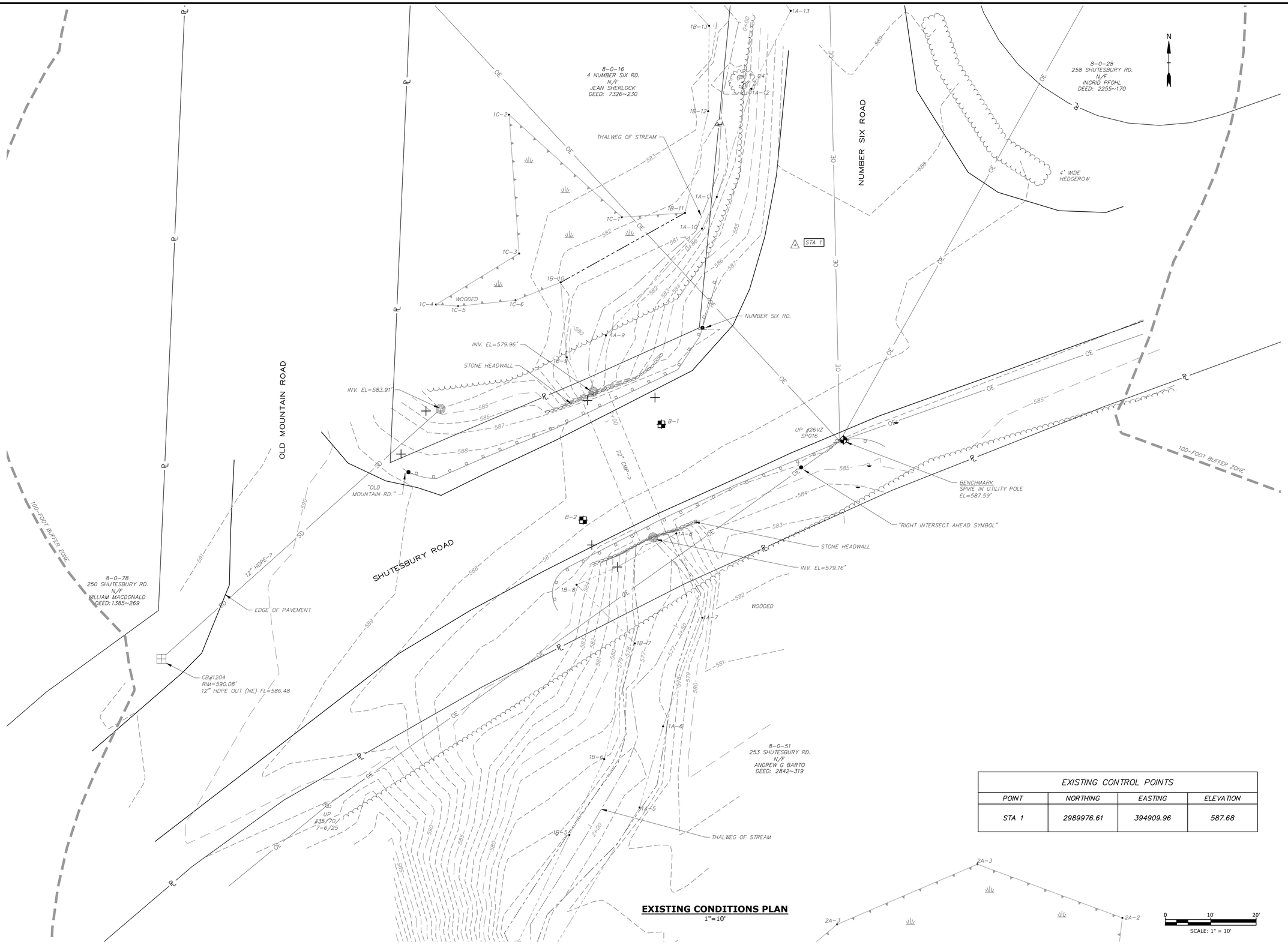


EXISTING CONDITIONS PLAN
1"=10'

EXISTING CONTROL POINTS			
POINT	NORTHING	EASTING	ELEVATION
STA 1	2989976.61	394909.96	587.68

Tighe&Bond

Town of Leverett

Shutesbury Road Culvert Replacement Project

Leverett, Massachusetts

MARK	DATE	DESCRIPTION

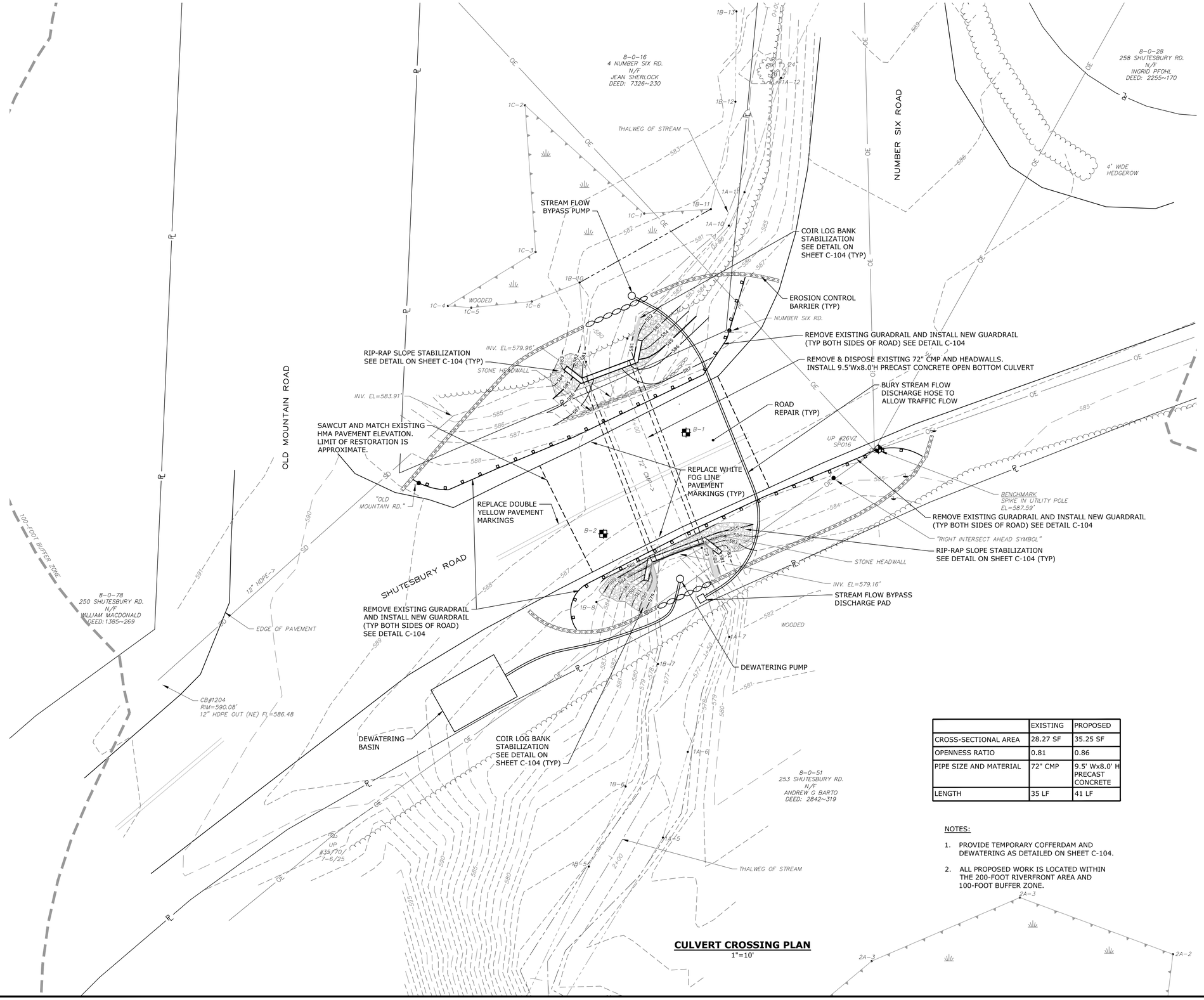
PROJECT NO:	L0792/002
DATE:	06/01/2020
FILE:	L0792-002-C-101.dwg
DRAWN BY:	TMP
CHECKED:	DJP
APPROVED:	PMV, ZPC

EXISTING CONDITIONS PLAN

SCALE: 1"=10'

C-101
SHEET 3 OF 7

Last Saved: 6/24/2020
Printed: Jun 24, 2020 - 10:51am By: TMP
Tighe & Bond: J:\L\L0792 Leverett\002 Shutesbury Road Culvert\Drawings Figures\AutoCAD\Sheet\L0792-002-C-101.dwg



	EXISTING	PROPOSED
CROSS-SECTIONAL AREA	28.27 SF	35.25 SF
OPENNESS RATIO	0.81	0.86
PIPE SIZE AND MATERIAL	72" CMP	9.5' Wx8.0' H PRECAST CONCRETE
LENGTH	35 LF	41 LF

NOTES:

1. PROVIDE TEMPORARY COFFERDAM AND DEWATERING AS DETAILED ON SHEET C-104.
2. ALL PROPOSED WORK IS LOCATED WITHIN THE 200-FOOT RIVERFRONT AREA AND 100-FOOT BUFFER ZONE.

CULVERT CROSSING PLAN
1"=10'

Tighe&Bond

Town of Leverett

Shutesbury Road Culvert Replacement Project

Leverett, Massachusetts

MARK	DATE	DESCRIPTION

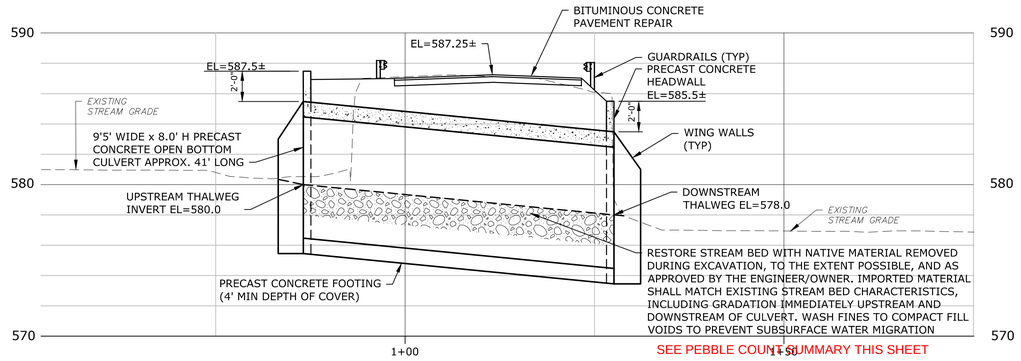
PROJECT NO:	L0792/002
DATE:	06/01/2020
FILE:	L0792-002-C-102.dwg
DRAWN BY:	TMP
CHECKED:	DJP
APPROVED:	PMV, ZPC

PROPOSED CONDITIONS PLAN

SCALE: 1"=10'

C-102
SHEET 4 OF 7

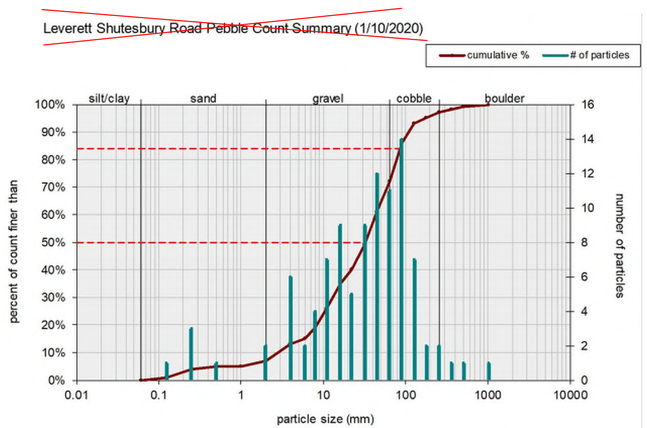
Last Saved: 6/22/2020
Plotted: Jun 24, 2020 - 10:53am By: TMP
Tighe & Bond: J:\L\L0792 Leverett\002 Shutesbury Road Culvert\Drawings, Figures\AutoCAD\Sheet\L0792-002-C-102.dwg



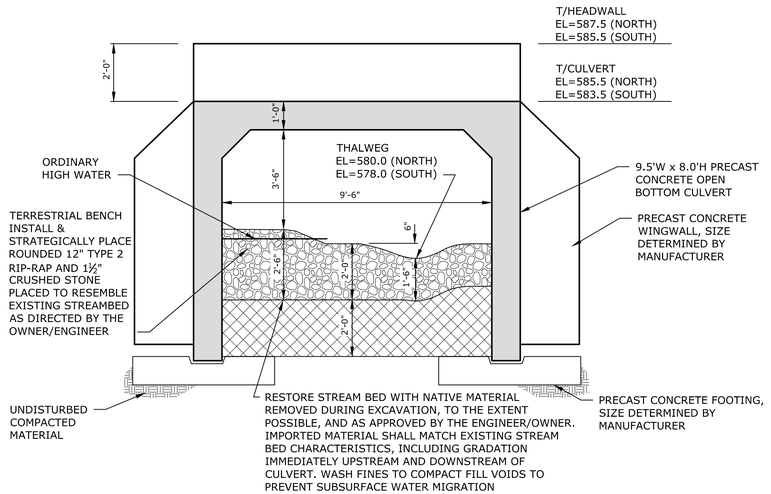
SEE PEBBLE COUNT SUMMARY THIS SHEET

CULVERT CROSSING PROFILE

1"=10' H ; 1"=2' V



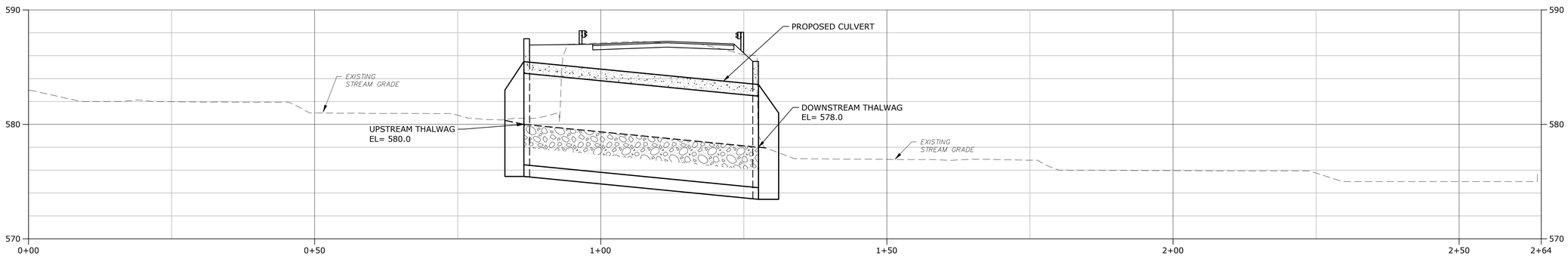
PEBBLE COUNT SUMMARY



SEE PEBBLE COUNT SUMMARY THIS SHEET

ELEVATION VIEW OF CULVERT

3/8"=1'-0"



CULVERT CROSSING PROFILE

1"=20' H ; 1"=2' V

Tighe&Bond

Town of Leverett

Shutesbury Road Culvert Replacement Project

Leverett, Massachusetts

MARK	DATE	DESCRIPTION

PROJECT NO:	L0792/002
DATE:	06/01/2020
FILE:	L0792-002-C-102.dwg
DRAWN BY:	TMP
CHECKED:	DJP
APPROVED:	PMV, ZPC

PROPOSED CONDITIONS PROFILE

SCALE: AS SHOWN

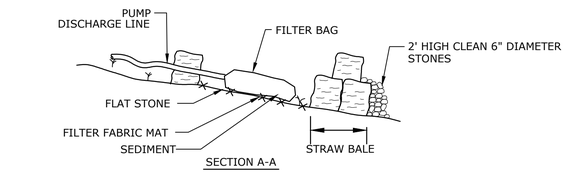
C-103

SHEET 5 OF 7

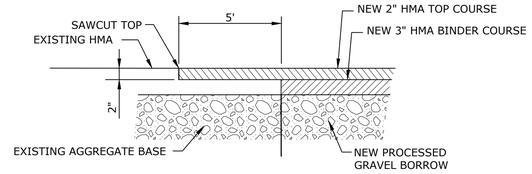
Last Saved: 6/22/2020
Plotted: Oct 01, 2020 - 10:53am By: TMP
Tighe & Bond: J:\L\L0792 Leverett\002 Shutesbury Road Culvert\Drawings Figures\AutoCAD\Sheet\L0792-002-C-102.dwg

EROSION CONTROL NOTES:

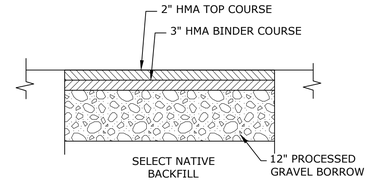
1. INSTALL ALL EROSION CONTROL MEASURES SHOWN, SPECIFIED AND REQUIRED BY THE ENGINEER PRIOR TO ANY CONSTRUCTION OR IMMEDIATELY UPON REQUEST. MAINTAIN ALL SUCH CONTROL MEASURES UNTIL FINAL SURFACE TREATMENTS ARE IN PLACE AND/OR UNTIL PERMANENT VEGETATION IS ESTABLISHED.
2. PRIOR TO STARING THE WORK, CLEARLY STAKE LIMIT WORK LINE(S). DO NOT DISTURB VEGETATION AND TOPSOIL BEYOND THE PROPOSED LIMIT LINE. COORDINATE WITH THE ENGINEER FOR THE LOCATIONS OF TEMPORARY STOCKPILING OF TOPSOIL DURING CONSTRUCTION.
3. SIDE SLOPES, SHOULDER AREAS AND DISTURBED VEGETATED AREAS TO BE A MAXIMUM GRADE OF 2:1. COMPACTED, STABILIZED, LOAMED AND SEEDED AS SHOWN ON THE DRAWINGS. IMMEDIATELY FINE GRADE AND SEED ALL SIDE SLOPES IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
4. REMOVE SILT TRAPPED AT BARRIERS AND DISPOSE OF IN UPLAND AREAS OUTSIDE BUFFER ZONES. REMOVE MATERIALS DEPOSITED IN ANY TEMPORARY SETTLING BASINS AT THE COMPLETION OF THE PROJECT. RESTORE ALL DISTURBED AREAS.
5. SETTLE OR FILTER (IN A SEDIMENTATION OR FILTER BAG) ALL SILT-LADEN WATER TO REMOVE SEDIMENTS PRIOR TO RELEASE TO THE WATERWAY.
6. DE-WATER AS NECESSARY TO KEEP CONSTRUCTION AREAS FREE OF WATER, DISCHARGE WATER FROM DE-WATERING TO APPROXIMATE UPLAND LOCATION WITHOUT CAUSING SEDIMENTATION OF WETLANDS OR WATERWAYS.
7. SWEEP AWAY ANY SEDIMENT TRACKED ONTO PUBLIC RIGHT-OF-WAYS AT THE END OF EACH DAY.
8. USE TEMPORARY DIVERSION BERMS AND SWALES TO CONTROL STORMWATER RUNOFF THROUGHOUT CONSTRUCTION. CONSTRUCT DIVERSION BERMS AND SWALES ACROSS STEEP SLOPES TO CONVEY RUNOFF TO A STABLE OUTLET LOCATION AT A NON-EROSIVE VELOCITY. INSTALL DIVERSION BERMS AT ALL PROPOSED STORMWATER OUTFALLS, BOTH PERMANENT AND TEMPORARY, TO INFILTRATION AND BIORETENTION BASINS TO PREVENT BASIN SIDE SLOPE WASH-OUT.



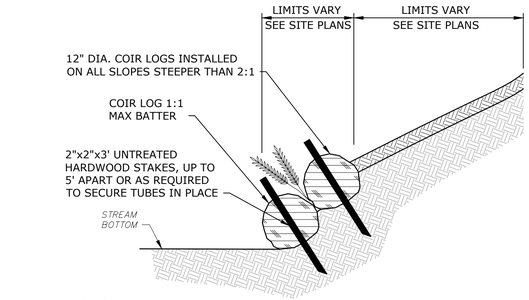
DEWATERING TREATMENT SEDIMENT TRAP
NO SCALE



TYPICAL BUTT JOINT TO EXISTING PAVEMENT
NO SCALE



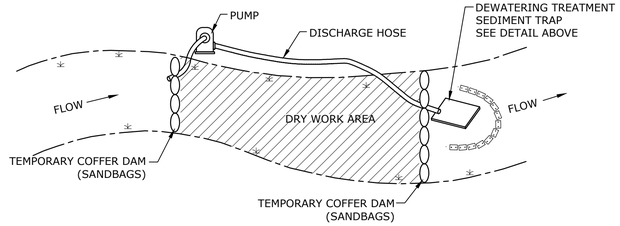
PERMANENT ROADWAY REPAIR
NO SCALE



NOTES:
1. DETAIL SHOWN DIAGRAMATICALLY. STABILIZATION IMPROVEMENTS TO BE INSTALLED PER SITE PLAN GRADING.

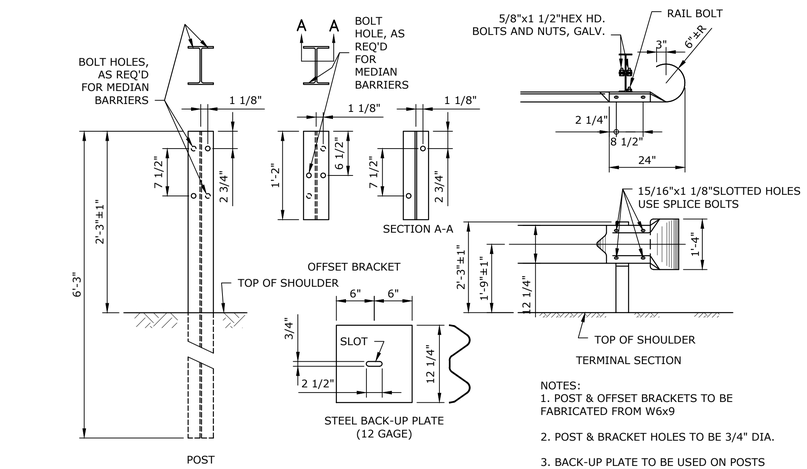
2. SLOPE AREAS
   SLOPES STEEPER THAN 2:1:
   COIR LOGS AND LIVE STAKINGS
   SLOPES FLATTER THAN 2:1:
   4" LOAM BORROW, FINISH WITH HYDROSEED AND BONDED FIBER MATRIX.

BANK STABILIZATION
NO SCALE



PLAN VIEW - PUMP COFFERDAM

COFFER DAM AND STREAMFLOW BYPASS
NO SCALE



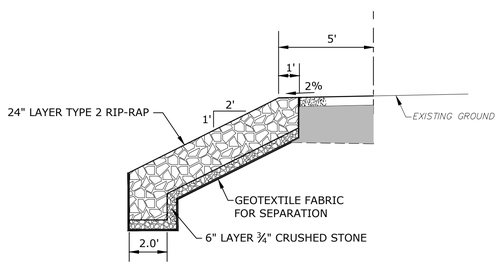
NOTES:
1. POST & OFFSET BRACKETS TO BE FABRICATED FROM W6x9

2. POST & BRACKET HOLES TO BE 3/4" DIA.

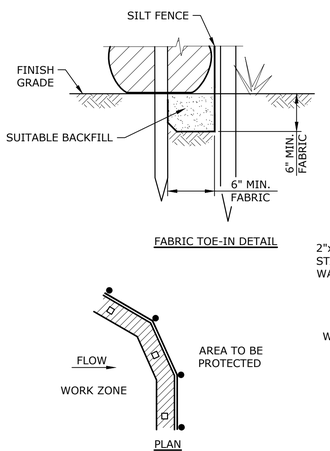
3. BACK-UP PLATE TO BE USED ON POSTS WHERE NO SPLICE OCCURS

4. FABRICATION DIMENSIONS ALSO APPLY TO "C" POSTS & BRACKETS.

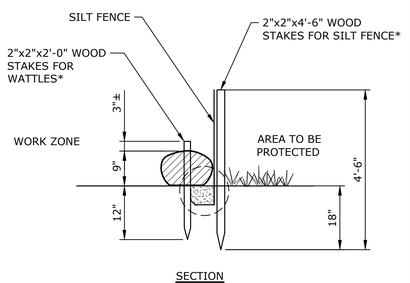
STEEL BEAM HIGHWAY GUARD TYPE SS - W RAIL POST & OFFSET BRACKET DETAILS
NO SCALE



RIPRAP SLOPE TYPICAL SECTION
NOT TO SCALE



*-STAKES TO BE SPACED AT 4'-5' O.C. STAGGER STAKES BETWEEN STRAW WATTLES AND SILT FENCE



STRAW WATTLE & SILTATION FENCE
NO SCALE

Tighe&Bond

Town of Leverett

Shutesbury Road Culvert Replacement Project

Leverett, Massachusetts

MARK	DATE	DESCRIPTION

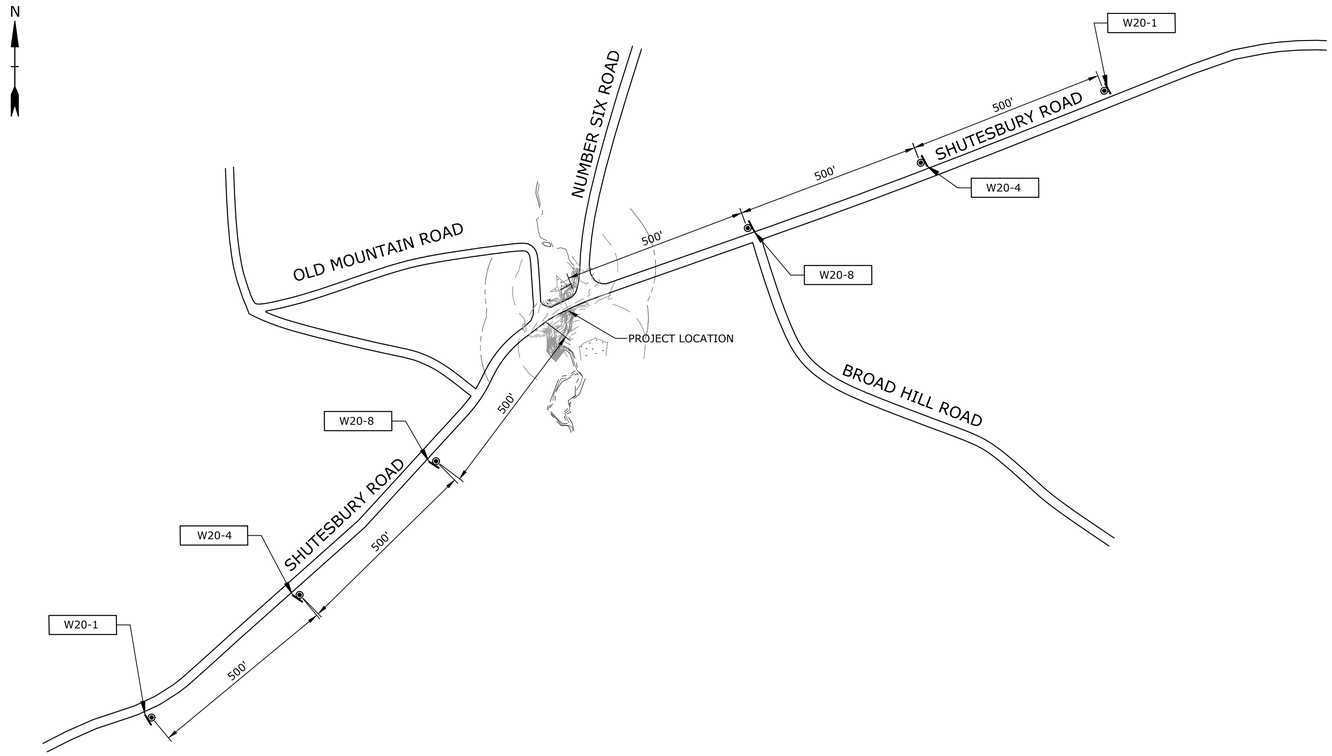
PROJECT NO:	L0792/002
DATE:	06/01/2020
FILE:	L0792-002-DTLS.dwg
DRAWN BY:	TMP
CHECKED:	DJP
APPROVED:	PMV, ZPC

WATER AND EROSION CONTROL DETAILS, ROADWAY AND CULVERT DETAILS

SCALE: NO SCALE

C-104
SHEET 6 OF 7

Last Saved: 6/22/2020
Printed On: Jun 24, 2020 - 10:53am By: TMP
Tighe & Bond J:\L\L0792 Leverett\002 Shutesbury Road Culvert\Drawings, Figures\AutoCAD\Sheet\L0792-002-DTLS.dwg



ADVANCE WARNING SIGN & TRAFFIC PLAN
1" = 200'

IDENTIFICATION NUMBER	SIZE OF SIGN (IN)		TEXT	NUMBER OF SIGNS REQUIRED	AREA IN SQ. FT.
	WIDTH	HEIGHT			
W20-1	48	48	ROAD CONSTRUCTION 1500 FT	2	32
W20-4	48	48	ONE LANE ROAD AHEAD	2	32
W20-8	48	48	POLICE OFFICER AHEAD	2	32
			TOTAL =	6	96

TEMPORARY TRAFFIC CONTROL NOTES:

1. TEMPORARY FENCING AND BARRIERS SHALL BE DEPLOYED ON SITE DURING THE ROADWAY CLOSURE TO PREVENT ACCESS TO THE CROSSING.
2. ALTERNATIVE ONE WAY TRAFFIC SHALL BE MAINTAINED DURING THE WORK.
3. ALL SIGNAGE SHALL BE PLACED PRIOR TO THE START OF CONSTRUCTION AND REMOVED IMMEDIATELY FOLLOWING COMPLETION OF THE WORK.
4. PLACEMENT OF SIGNS SHALL BE COORDINATED WITH THE ENGINEER AND THE LOCAL POLICE DEPARTMENT (LEVERETT, MASSACHUSETTS).

Tighe&Bond

Town of Leverett

Shutesbury Road Culvert Replacement Project

Leverett, Massachusetts

MARK	DATE	DESCRIPTION

PROJECT NO:	L0792/002
DATE:	06/01/2020
FILE:	L0792-002-DTLS.dwg
DRAWN BY:	TMP
CHECKED:	DJP
APPROVED:	PMV, ZPC

TEMPORARY TRAFFIC CONTROL

SCALE: AS SHOWN

C-105
SHEET 7 OF 7

Last Saved: 6/22/2020
Plotted On: Jun 24, 2020 - 10:53am By: TMP
Tighe & Bond:J:\L0792 Leverett\002 Shutesbury Road Culvert\Drawings_Figures\AutoCAD\Sheet\L0792-002-DTLS.dwg

Tighe&Bond

APPENDIX B

Photographic Log

Client: Town of Leverett **Job Numbers:** 210792-002

Site: Shutesbury Road, Leverett Massachusetts

Photograph No.: 1	**Date:** 4/1/2020	**Direction Taken:** North
Description: View of the Shutesbury Road Culvert outlet located on the south side of Shutesbury Road.		

Photograph No.: 2	**Date:** 4/1/2020	**Direction Taken:** Northeast
Description: View, looking upstream towards Shutesbury Road, of the tributary to Roaring Brook just south of the Shutesbury Road Culvert (blue arrow).		

Client: Town of Leverett **Job Numbers:** 210792-002

Site: Shutesbury Road, Leverett Massachusetts

Photograph No.: 3	**Date:** 4/1/2020	**Direction Taken:** Northeast
Description: View of the Shutesbury Road culvert outlet looking northeast toward Number Six Road.		

Photograph No.: 4	**Date:** 4/1/2020	**Direction Taken:** Southeast
Description: View of the Shutesbury Road culvert inlet (orange arrow) and outlet (blue arrow) along Shutesbury Road.		

Client: Town of Leverett **Job Numbers:** 210792-002

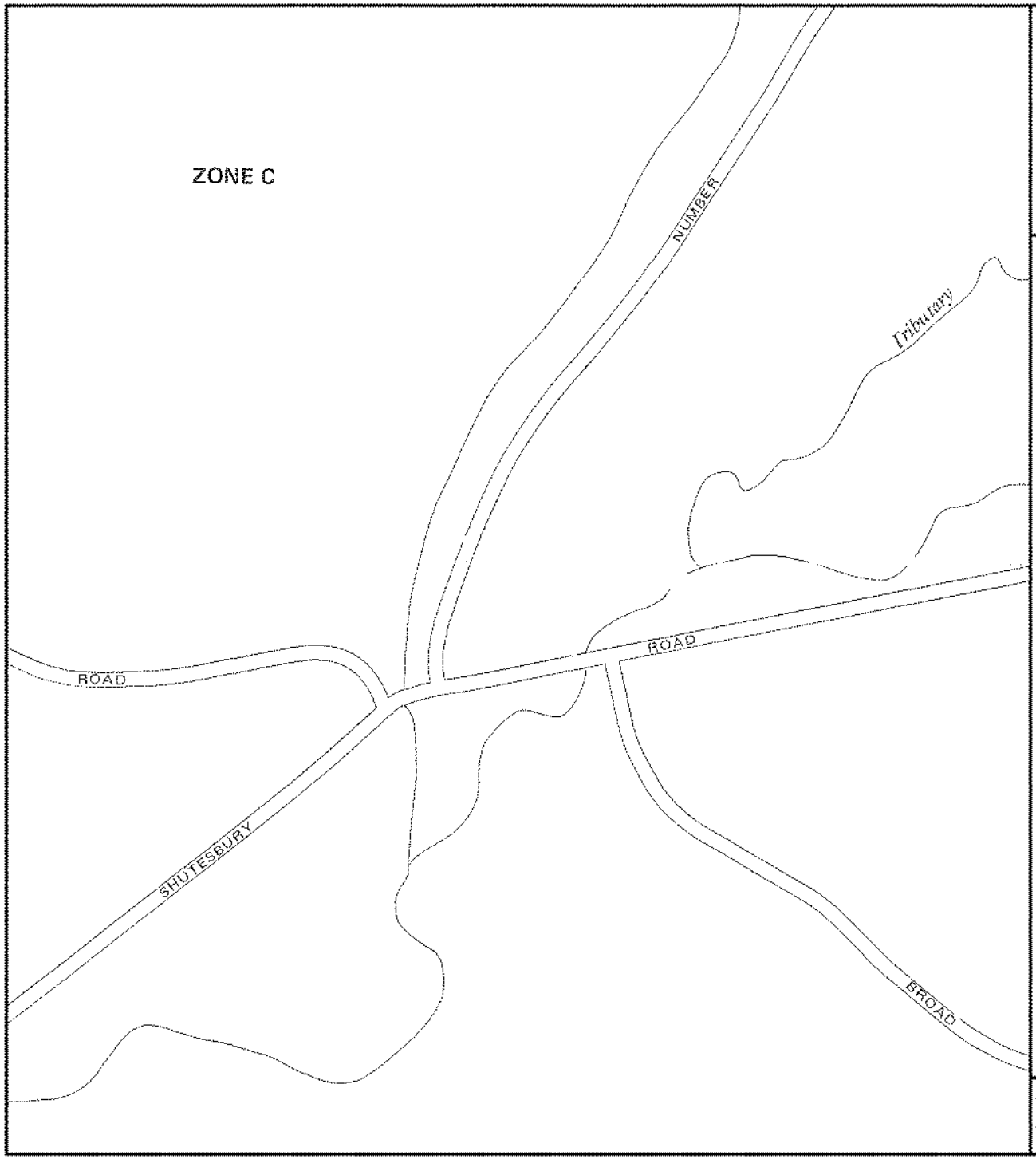
Site: Shutesbury Road, Leverett Massachusetts

Photograph No.: 5	**Date:** 4/1/2020	**Direction Taken:** South
Description: View of the tributary to Roaring Brook upstream of the culvert inlet on the north side of Shutesbury Road.		

Photograph No.: 6	**Date:** 4/1/2020	**Direction Taken:** Northwest
Description: View of the Shutesbury Road Culvert inlet located along the north side of Shutesbury Road between Number Six Road and Old Mountain Road.		

Tighe&Bond

APPENDIX C



N

APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
LEVERETT, MASSACHUSETTS
FRANKLIN COUNTY

PANEL 7 OF 7
(SEE MAP INDEX FOR PANELS NOT PRINTED)

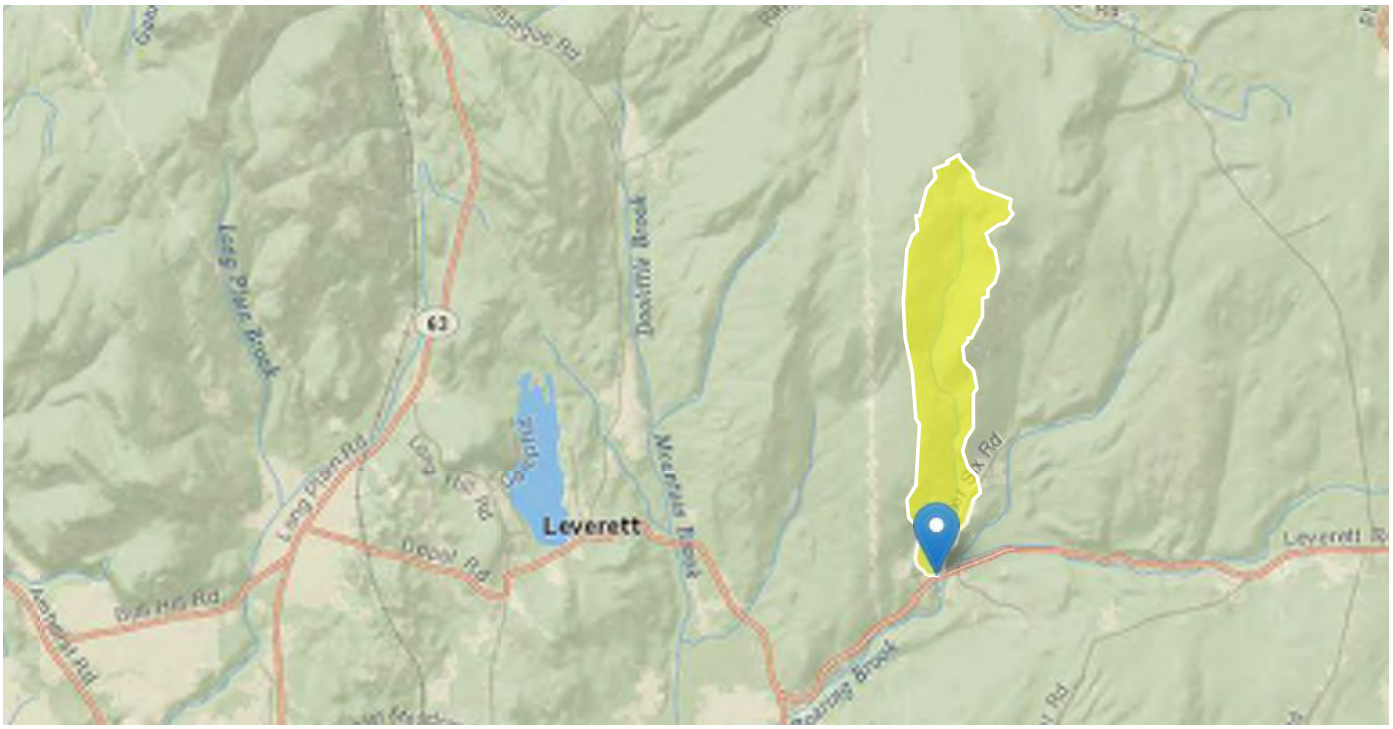
COMMUNITY-PANEL NUMBER
250120 0007 B

EFFECTIVE DATE:
JUNE 4, 1980

U.S. DEPARTMENT OF HOUSING
AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION

StreamStats Report

Region ID: MA
Workspace ID: MA20200113165605725000
Clicked Point (Latitude, Longitude): 42.44857, -72.46818
Time: 2020-01-13 11:56:21 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.61	square miles
DRFTPERSTR	Area of stratified drift per unit of stream length	0.0327	square mile per mile
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	1	dimensionless
BSLDEM250	Mean basin slope computed from 1:250K DEM	7.996	percent
PCTSNDGRV	Percentage of land surface underlain by sand and gravel deposits	11.11	percent
FOREST	Percentage of area covered by forest	95.84	percent
BSLDEM10M	Mean basin slope computed from 10 m DEM	12.795	percent
ELEV	Mean Basin Elevation	994	feet
LC06STOR	Percentage of water bodies and wetlands determined from the NLCD 2006	2	percent

Parameter Code	Parameter Description	Value	Unit
ACRSDFT	Area underlain by stratified drift	0.0658	square miles
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	120459.3	meters
CENTROIDY	Basin centroid vertical (y) location in state plane units	913127.2	meters
CRSDFT	Percentage of area of coarse-grained stratified drift	11.11	percent
LAKEAREA	Percentage of Lakes and Ponds	0	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	1.84	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.13	percent
MAXTEMPC	Mean annual maximum air temperature over basin area, in degrees Centigrade	13.4	feet per mi
OUTLETX	Basin outlet horizontal (x) location in state plane coordinates	120355	feet
OUTLETY	Basin outlet vertical (y) location in state plane coordinates	911345	feet
PRECPRIS00	Basin average mean annual precipitation for 1971 to 2000 from PRISM	49.1	inches
STRMTOT	total length of all mapped streams (1:24,000-scale) in the basin	2.01	miles
WETLAND	Percentage of Wetlands	2.47	percent

Flow-Duration Statistics Parameters[Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.61	square miles	1.61	149
DRFTPERSTR	Stratified Drift per Stream Length	0.0327	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1
BSLDEM250	Mean Basin Slope from 250K DEM	7.996	percent	0.32	24.6

Flow-Duration Statistics Flow Report[Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit

Flow-Duration Statistics Citations

Low-Flow Statistics Parameters[Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.61	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	7.996	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0.0327	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1

Low-Flow Statistics Flow Report[Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit

Low-Flow Statistics Citations

August Flow-Duration Statistics Parameters[Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.61	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	7.996	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0.0327	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1

August Flow-Duration Statistics Flow Report[Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit

August Flow-Duration Statistics Citations

Probability Statistics Parameters[Perennial Flow Probability]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.61	square miles	0.01	1.99
PCTSNDGRV	Percent Underlain By Sand And Gravel	11.11	percent	0	100
FOREST	Percent Forest	95.84	percent	0	100

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
MAREGION	Massachusetts Region	1	dimensionless	0	1

Probability Statistics Flow Report[Perennial Flow Probability]

Statistic	Value	Unit

Probability Statistics Citations

Bankfull Statistics Parameters[Bankfull Statewide SIR2013 5155]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.61	square miles	0.6	329
BSLDEM10M	Mean Basin Slope from 10m DEM	12.795	percent	2.2	23.9

Bankfull Statistics Flow Report[Bankfull Statewide SIR2013 5155]

Statistic	Value	Unit

Bankfull Statistics Citations

Peak-Flow Statistics Parameters[Peak Statewide 2016 5156]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.61	square miles	0.16	512
ELEV	Mean Basin Elevation	994	feet	80.6	1948
LC06STOR	Percent Storage from NLCD2006	2	percent	0	32.3

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

Statistic	Value	Unit

Peak-Flow Statistics Citations

Application Version: 4.3.11

Tighe&Bond

APPENDIX D

8-0-50
LEVERETT
KATZ MICHAEL L
1 BROAD HILL RD
LEVERETT, MA 01054

8-0-16
LEVERETT
MCINTIRE DANIEL
4 NUMBER SIX RD
LEVERETT, MA 01054

8-0-27
LEVERETT
SHEEDY KRISTIN
9 NUMBER SIX RD
LEVERETT, MA 01054

8-0-17
LEVERETT
PRODIS JOHN
112 OLD MOUNTAIN RD
LEVERETT, MA 01054

8-0-14
LEVERETT
CINNER PETER G
116 OLD MOUNTAIN RD
LEVERETT, MA 01054

8-0-55
LEVERETT
DONOVAN JOHN + PRUDENCE
1006 SOUTH 26TH ST
ARLINGTON, VA 22202

8-0-54
LEVERETT
HWANG-CARLOS LEO L
6 DEWOLF RD
MONTAGUE, MA 01351

8-0-80
LEVERETT
MACDONALD ROBERT A
242 SHUTESBURY RD
LEVERETT, MA 01054

8-0-78
LEVERETT
MACDONALD WILLIAM
250 SHUTESBURY RD
LEVERETT, MA 01054

8-0-51
LEVERETT
BARTO ANDREW G
253 SHUTESBURY RD
LEVERETT, MA 01054

8-0-28
LEVERETT
PFOHL INGRID
258 SHUTESBURY RD
LEVERETT, MA 01054

8-0-29
LEVERETT
ALLEN: WILLIAM, CHARLES +
262 SHUTESBURY RD
LEVERETT, MA 01054

8-0-30
LEVERETT
MORUZZI JOHN
266 SHUTESBURY RD
LEVERETT, MA 01054

Town of Leverett

Massachusetts

Legend

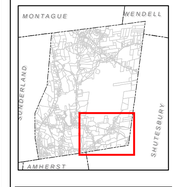
- Parcels on Current Map
- Parcels on Other Maps
- Parcel Outside Town
- Discontinued ROW
- ROW
- Tax Map Boundary
- Easements
- 57 Lot Number
- 1.23 AC Lot Size
- # 16 Address Number
- 120.00 Lot Dimensions
- Historic Lines
- Rail Roads
- Tie Lines
- Buildings
- Streams
- Waterbodies
- Wetlands

N W E S

0 200 400 600 800

Feet

1 inch = 400 feet



Disclaimer:

This map is for assessment purposes only. It is not valid to use as a survey or for conveyance.

Classification, zoning, and site dimensions on this map are used for assessment purposes only. Specific data as listed above should be verified with the proper authority and/or department.

Map: 8

January 2016

Tighe&Bond
Consulting Engineers
Environmental Specialists

NOTIFICATION TO ABUTTERS

Under the Massachusetts Wetlands Protection Act

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40 you are hereby notified of the following:

A. The name of the applicant is the: **Town of Leverett**

B. The applicant has filed a Notice of Intent (NOI) with the Conservation Commission for the municipality of the **Town of Leverett** seeking permission to remove, fill, dredge or alter an Area Subject to Protection or within 100 feet of an area subject to protection under the Wetlands Protection Act (General Laws Chapter 131, Section 40).

C. The location the proposed activity subject to Conservation Commission jurisdiction is **at a culvert under Shutesbury Road between Number Six Road and Old Mountain Road in Leverett, MA.**

The proposed project involves the replacement of a degraded corrugated metal pipe culvert. Work includes site restoration and stabilization.

D. Copies of the NOI may be examined at the **Leverett Conservation Commission Office, 9 Montague Road Leverett, MA 01054** between the hours of 9:00A.M. and 4:00P.M. on Monday through Friday.

For more information on the filing or proposed work, call: **413-875-1305 Attn: Katy Wilkins)**

Check One: This is the applicant ☐, **representative** ☑, or other☐ (specify):

E. Copies of the NOI may be obtained from either (check one) the applicant ☐, or the **applicant's representative** ☑, by calling this telephone number: **413-875-1305 Attn: Katy Wilkins** between the hours of 8:00 A.M. and 5:00 P.M. on the following days of the week: Monday through Friday.

F. Information regarding the date, time and place of the public hearing may be obtained from the **Leverett Conservation Commission**, by calling the following telephone number: **(413) 584-1022 ext. 3** between the hours of 9:00A.M. and 4:00P.M. on Monday to Friday.

---

[1] **Copies of the NOI may be requested for an additional cost. Please contact the applicant's representative for more information.**

[2] **You also may contact the Department of Environmental Protection Western Regional Office for more information about this application or the Wetlands Protection Act at: (413) 784-1100**

[3] **Notice of the public meeting, listing all hearings, including the date, time and place, will be posted in the Leverett Town Hall not less than forty-eight (48) hours in advance of the meeting date.**

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