NOTICE OF INTENT

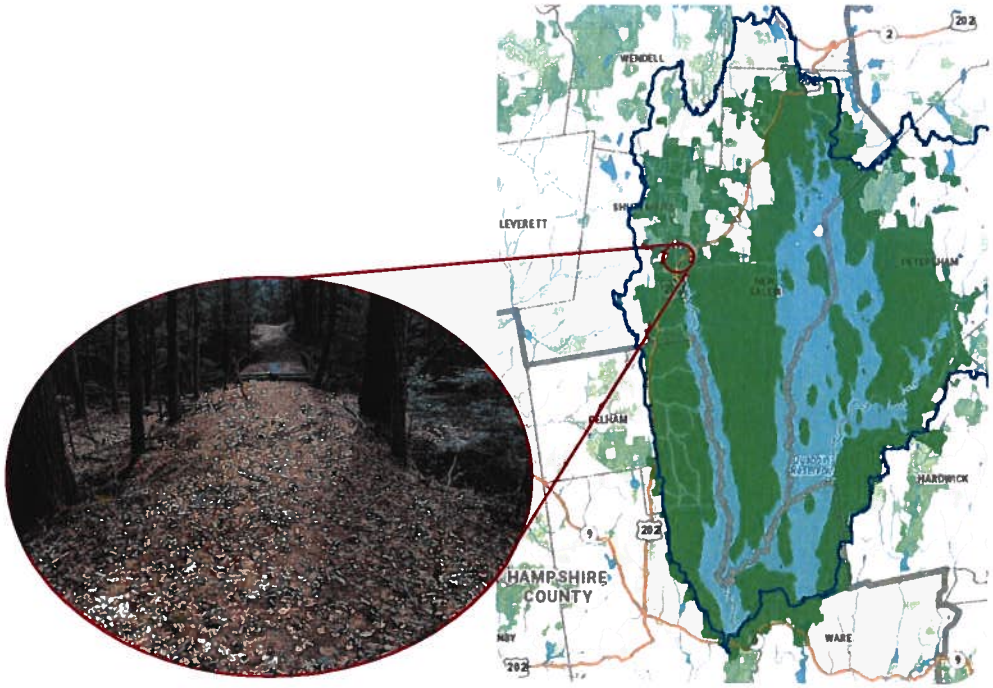
April 28, 2023

Under the Massachusetts Wetlands Protection Act
(MGL Chapter 131, Section 40)
and
Town of Shutesbury, Massachusetts
General Wetlands Protection Bylaw

PROJECT:

Camel Brook Bridge Repairs

(SH4-00-B1)
Cornwell Road
Shutesbury, MA



APPLICANT:

Dan Clark, PhD
Regional Director, Quabbin/Ware Regions
DCR, Division of Water Supply Protection
485 Ware Road
Belchertown, MA
dan.clark@mass.gov
(413) 213-7903 (office)

REPRESENTATIVE:

Jeffrey D. Gagner, P.E.
Project Engineer
DCR, Division of Water Supply Protection
485 Ware Road
Belchertown, MA
jeffrey.d.gagner@mass.gov
(413) 213-7925 (office)

dcr
Massachusetts

OWNER:

Priscilla Geigis, Deputy Commissioner
DCR, Division of Water Supply Protection
251 Causeway Street, STE 600
Boston, MA 02114
priscilla.geigis@mass.gov
617-626-4986

dcr
Massachusetts

May 8, 2023

Town of Shutesbury
Conservation Commission
P.O. Box 276
1 Cooleyville Rd.
Shutesbury, MA 01072-0276

RE: DCR – Quabbin Reservoir
Camel Brook Bridge Repairs (SH4-00-B1)
Cornwell Road
Shutesbury, MA

Dear Commission Members:

The Department of Conservation and Recreation, Division of Water Supply Protection is submitting this Notice of Intent for the Camel Brook Bridge Repairs located in the Quabbin Watershed in Shutesbury, MA. Please find enclosed the original and one (1) copy of the Notice of Intent prepared in accordance with the requirements of the Massachusetts Wetlands Protection Act (WPA; M.G.L. Chapter 131, Section 40). A copy of this Notice of Intent will be sent to The Department of Environmental Protection, Western Regional Office.

The objective of this project is to improve the approaches to the existing steel bridge over Camel Brook, along Cornwell Road. The portable bridge was set in place in 2018, but the approaches were never prepared for vehicular passage. Improving the access to this area will provide the DCR, Division of Water Supply Protection more access to manage and protect the watershed and resources.

Thank you for your help with this project. Please contact me, Dan Clark, Regional Director Quabbin/Ware Regions (413-213-7903 or dan.clark@mass.gov) if you have any questions or need any additional information. We look forward to meeting with you to discuss this project in greater detail.

Very truly yours,

Dan Clark, PhD
Regional Director Quabbin/Ware Regions

Enc.
C MA DEP/WERO 436 Dwight Street, Springfield, MA 01103

COMMONWEALTH OF MASSACHUSETTS · EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
Department of Conservation and Recreation
251 Causeway Street, Suite 600
Boston, MA 02114-2199
617-626-1250 617-626-1351 Fax
www.mass.gov/dcr

Maura T. Healey
Governor

Kimberley Driscoll
Lt. Governor

Rebecca L. Tepper, Secretary
Executive Office of Energy & Environmental Affairs

Brian Arrigo, Commissioner
Department of Conservation & Recreation

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Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:
MassDEP File Number
Document Transaction Number
Shutesbury
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):

Cornwell Road (a. Street Address) | Shutesbury (b. City/Town) | 01072 (c. Zip Code)

Latitude and Longitude: N 42.457822 (d. Latitude) | W 72.386413 (e. Longitude)

Map N (f. Assessors Map/Plat Number) | Lot 88 (Parcel ID: N-88 aka ID 428) (g. Parcel /Lot Number)

2. Applicant:

Dan (a. First Name) | Clark (b. Last Name)

Regional Director Quabbin/Ware Regions, DCR - Division of Water Supply Protection (c. Organization)

485 Ware Road (d. Street Address)

Belchertown (e. City/Town) | MA (f. State) | 01007 (g. Zip Code)

(413) 213-7903 (h. Phone Number) | (413) 213-7914 (i. Fax Number) | dan.clark@mass.gov (j. Email Address)

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

Priscilla (a. First Name) | Geigis (b. Last Name)

Deputy Commissioner DCR (c. Organization)

251 Causeway Street, STE 600 (d. Street Address)

Boston (e. City/Town) | MA (f. State) | 02114 (g. Zip Code)

(617) 626-4986 (h. Phone Number) | (i. Fax Number) | priscilla.geigis@mass.gov (j. Email address)

4. Representative (if any):

Jeffrey (a. First Name) | Gagner (b. Last Name)

Project Engineer, DCR - Division of Water Supply Protection (c. Company)

485 Ware Road (d. Street Address)

Belchertown (e. City/Town) | MA (f. State) | 01007 (g. Zip Code)

(413) 213-7925 (h. Phone Number) | (i. Fax Number) | jeffrey.d.gagner@mass.gov (j. Email address)

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

$ 725.00 (a. Total Fee Paid) | $ 350.00 (b. State Fee Paid) | $ 375.00 (c. City/Town Fee Paid)

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A. General Information (continued)

6. General Project Description:

A portable prefabricated steel bridge was placed at this site in 2018, spanning the existing abutments over Camel Brook along Cornwell Road in Shutesbury. This project is to improve approaches on both the north and the south of the bridge in order to provide vehicular access over this bridge for more efficient managment of the DCR Watershed lands.

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) (f) - Maintenance improvement of existing roadways.
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:

Hampshire a. County	b. Certificate # (if registered land)
932 c. Book	1 d. Page Number

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

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

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

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

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

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☒ Bank	40 (temporary) 1. linear feet	40 2. linear feet
b. ☒ Bordering Vegetated Wetland	25 (temporary) 1. square feet	25 2. square feet
c. ☐ Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☐ Bordering Land Subject to Flooding	1. square feet 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	Camel Brook (inland stream) 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: 15,000 along road 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.
13,000	7,780	5,220

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

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

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

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

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

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

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

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

	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

Zero (0) — a. number of new stream crossings
One (1) — b. number of replacement stream crossings

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C. Other Applicable Standards and Requirements

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

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

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

   a. ☐ Yes ☒ No **If yes, include proof of mailing or hand delivery of NOI to:**

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

   2017 - MassMapper
   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

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

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

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

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

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

(d) ☐ Vegetation cover type map of site

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

(f) OR Check One of the Following

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

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

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

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

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

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

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

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

North Shore - Hull to New Hampshire border:

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

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

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

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

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

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

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

b. ACEC

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

a. ☒ Yes ☐ No

6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

a. ☐ Yes ☒ No

7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

a. ☒ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)
2. ☒ A portion of the site constitutes redevelopment
3. ☐ Proprietary BMPs are included in the Stormwater Management System.

b. ☐ No. Check why the project is exempt:

1. ☐ Single-family house
2. ☐ Emergency road repair
3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

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D. Additional Information (cont'd)

3. ☒ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

Camel Brook (SH4-00-B1) Bridge and Road Repairs (6 sheets)
a. Plan Title

DCR-DWSP
b. Prepared By

Scott Campbell, P.E.
c. Signed and Stamped by

4/28/2023
d. Final Revision Date

See Plans
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

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F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

1. Signature of Applicant Priscilla Geigis	2. Date 5/5/23
3. Signature of Property Owner (if different)	4. Date 05/02/2023
5. Signature of Representative (if any)	6. Date

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

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

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

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

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NOI Wetland Fee Transmittal Form

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

A. Applicant Information

1. Location of Project:

Cornwell Road	Shutesbury
a. Street Address	b. City/Town
	$ 725.00 total ($350 state; $375 town)
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Dan	Clark	
a. First Name	b. Last Name	
Regional Director Quabbin/Ware Regions, DCR - Division of Water Supply Protection		
c. Organization		
485 Ware Road		
d. Mailing Address		
Belchertown	MA	01007
e. City/Town	f. State	g. Zip Code
(413) 213-7903	(413) 213-7914	dan.clark@mass.gov
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

Priscilla	Geigis	
a. First Name	b. Last Name	
Deputy Commissioner DCR		
c. Organization		
251 Causeway Street, STE 600		
d. Mailing Address		
Boston	MA	02114
e. City/Town	f. State	g. Zip Code
617-626-4986		priscilla.geigis@mass.gov
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.

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B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Any other activity not in Category 1, 2, 3, 4, 5, or 6 (Category 3 - Item J)	1	$ 500	$ 500
Riverfront (add 50%)	1	$ 250	$ 250

Step 5/Total Project Fee: $ 725.00

Step 6/Fee Payments:

	Total Project Fee:	$ 725.00 a. Total Fee from Step 5
MassDEP, Western MA Regional Office	State share of filing Fee:	$ 350.00 b. 1/2 Total Fee **less** $12.50
Town of Shutesbury Conservation Commission	City/Town share of filling Fee:	$ 375.00 c. 1/2 Total Fee **plus** $12.50

C. Submittal Requirements

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

Department of Environmental Protection
Box 4062
Boston, MA 02211

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

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

Section 1

Introduction and Background

1.1 Introductory Statement

The Department of Conservation and Recreation, Division of Water Supply Protection (DCR-DWSP), is proposing to improve conditions of Cornwell Road (located in Shutesbury, MA) leading to and from an existing portable bridge spanning Camel Brook. Fortification of the abutments and bridge bearing area will be included in the effort to restore safe roadway passage. The road will require minor widening and restoration near the crossing, which will involve the construction of a gabion basket retaining wall. No new impacts will be created with this project, which takes place within the drinking water supply watershed.

1.2 Background

The Quabbin Reservoir offers drinking water to approximately 40% of the state's population. The DCR-DWSP manages and protects drinking water supply watersheds to protect, preserve and enhance the environment of the Commonwealth and to assure the availability of pure water for future generations.

In July 2017, the DCR-DWSP prepared and presented a Request for Determination of Applicability to the Town of Shutesbury Conservation Commission for the replacement of the deteriorated timber bridge with a prefabricated steel bridge. Following the submission, the Conservation Commission approved the work by providing a "Negative 3" Determination in August 2017. As a result of the determination, the DCR maneuvered the bridge to span the abutments in June 2018, which restored pedestrian access over the brook. The prefabricated bridge remains in this configuration today – which means that the current approaches cannot accommodate vehicular access.

Throughout the procurement and install of the prefabricated bridge in 2018, the DCR-DWSP always intended to restore vehicular access over Camel Brook in a safe and stable manner, meanwhile protecting the resource areas. This Notice of Intent provides the vision for the next step (vehicle access) in this process and will ultimately provide a net-benefit for resource and watershed management.

1.3 Statement of Need

Cornwell Road (at Gate SH4) is a gated woods road off Route 202 that offers access to remote areas within Quabbin watershed and additionally allows for emergency and spill response, selective logging, and seasonal visitor access for nature walks. With the completion of this project, the DCR-DWSP will restore vehicular navigation over Camel Brook, which was historically achieved with a timber bridge that has since been deemed unsafe. Re-establishment of vehicle access for DWSP staff is important to provide critical access for fire protection, security monitoring, land management and visitor safety. The existing portable bridge was placed over the timber bridge remnants in 2018.

Current hazard conditions include narrow road width, steep vertical curves, poor abutment conditions, and the absence of a ramp leading to the top of the existing portable bridge.

The Camel Brook crossing offers a primary entry point for access to approximately 4 square miles on the northwest quadrant of the Quabbin Reservoir watershed, all of which surround the West Branch Swift River. In order to effectively manage this large land area, the DWSP is proposing to develop this crossing to restore it for vehicle passage.

Limitations of nearby public roadways prompts heavy vehicles to use the Camel Brook bridge crossing for watershed access from as far south as Cornwell Road (at Route 202) to as far north as Cooleyville Road (at Jennison Road). Without this critical roadway, heavy vehicles and equipment would not be able to access remote locations. Examples of the types of vehicles and activities that depend on this entry point are:

- Emergency and spill response
- Land Management such as Internal Forestry/Harvesting Operations
- Trucks and trailers for roadway and watershed maintenance
- Seasonal visitor (pedestrian) access to nature trails

The DCR-DWSP recognizes that public safety is an essential aspect of this project. Cornwell Road is open to the public for a variety of activities. The proposed improvements will be mutually beneficial to both the DCR-DWSP for watershed management purposes and to the public for safety and accessibility.

The proposed improvements will allow the Camel Brook watercourse flow to continue to pass between the abutments in their current state. Some temporary in-stream work will be completed to restore the abutment and ensure structural stability of the bridge. These minor adjustments will not alter but improve the overall conditions of the site. The crossing will continue to meet the high water demands. The project will create no noticeable change to Camel Brook and will adhere to the stream crossing guidelines to the maximum practical extent. The improved road will provide safe and stable access for DCR-DWSP staff, the public, emergency response and heavy machinery.

Section 2
Existing Information

2.1 Project Site

Cornwell Road is located on the northwest side of Route 202 and is accessible through DCR-DWSP Gate SH4. The gate is on the west side of Route 202, approximately 0.5 miles north of Prescott Road, and 0.75 miles south of the Cooleyville Road – Route 202 intersection. The Project Site is approximately 1,000 feet northwest of the parking area adjacent to Route 202. The project is located on a large parcel (Parcel # N-88) owned by the DCR-DWSP, acquired at the time of the General Taking of Land approximately 85 years ago. This road previously accommodated vehicle access; however, due to a deteriorating timber bridge, the road was closed for safety concerns. After acquiring the portable bridge in 2018, the DCR is prepared to restore the site back to previous operating conditions meanwhile providing structural and safety assurances.

The project location is shown on the USGS Locus Map provided in Appendix D.

Photographs of the project site and surrounding area are provided in Appendix E of this Report.

2.1.1 Massachusetts Endangered Species

A review of the MassGIS data layer for the Massachusetts Natural Heritage Atlas (effective August 1, 2021) under the Natural Heritage and Endangered Species Program (NHESP) indicates that no portion of the project site is located within Estimated Habitat of Rare Wildlife or Priority Habitat of Rare Species. Additionally, no Certified or Potential Vernal Pools were identified within the project site.

The project location is shown on the NHESP Locus Map in Appendix D.

2.1.2 FEMA Flood Insurance Rate Maps

Based on the Flood Insurance Rate Maps (FIRM) Community Panel Number 250128 0020 A, effective June 18, 1980 the project site is located within "Zone C", which is classified as "areas of minimal flooding." Based on this information, Bordering Land Subject to Flooding (100-year floodplain) does not exist within the project site.

The project location is shown on a FIRM Map Index Locus Map in Appendix D.

2.1.3 Area of Critical Environmental Concern (ACEC)

The project site is not located within an ACEC or a MassDEP Wellhead Protection Area. Camel Brook is designated as a Cold-Water Fishery by MassDEP.

2.1.4 Outstanding Resource Water (ORW)

According to the Massachusetts Surface Water Quality Standards, 314 CMR 4.00, the project site is located within an ORW watershed and a Zone A Surface Water Protection Area as it relates to the tributaries of the Quabbin Reservoir.

2.2 Wetland Resource Areas

In August 2021, an Environmental Analyst from DCR-DWSP conducted an investigation at the project site. The purpose of the investigation was to identify wetlands, watercourses and other regulated wetland and special resources that may exist at the location. The full Wetland Report is included in Appendix B.

Camel Brook flows in a southeasterly direction, through the project site, to the confluence of the West Branch of the Swift River approximately 0.35 miles away. The West Branch of the Swift River is a primary tributary of Quabbin Reservoir.

A small amount of temporary disturbance is anticipated as part of this project. Refer to the table of disturbance areas in Section 2.2.2 of this Report (below).

2.2.1 310 CMR 10.54 – Inland Bank

The locations of the Banks were delineated by DCR-DWSP with blue survey flagging, numbered and displayed as shown on the plans. The channel upstream of the project site splits off in two directions and reconvenes approximately 10 feet ahead of the bridge location. The land between the two defined channels is an elevated area of vegetation. The bank on the upstream western & eastern sides are gradual and vegetated, with scattered stones and cobbles at various points. The bank downstream is similarly gradual and vegetated.

It is anticipated as part of this project that approximately 40 linear feet of bank will be temporarily disturbed to effectively fortify the bridge abutments and provide a stable structural base for the road and bridge.

2.2.2 310 CMR 10.55 – Bordering Vegetated Wetlands (BVW)

The BVW was identified and delineated by DCR-DWSP with pink survey flagging, numbered and displayed as shown on the plans. The proposed project scope will temporarily disturb a limited area of BVW which will ultimately result in a net benefit.

In order to upgrade the site, the following table summarizes the temporary disturbances anticipated as it related to the bordering vegetated wetland and the associated buffer zone:

Table of Disturbance Areas
(Wetland Resource and Buffers)

Area Description	Area (Square Feet)
Bordering Vegetated Wetland (BVW)	25±
100-Foot Buffer Zone (0-100')	11,200±
50-Foot Buffer Offset (0-50')	9,000±

2.2.3 310 CMR 10.56 – Land under Water Bodies and Waterways (LUWW)

LUWW is present at the project site, within Camel Brook. The proposed improvements will not disturb the LUWW; The natural streambed will remain unchanged. The two bridge abutments will be restored and measures will be taken to protect the LUWW.

2.2.4 310 CMR 10.58 – Riverfront Area

The Mean Annual High Water (MAHW) line of Camel Brook was delineated in the field and was coincident with the top of Inland Bank.

This project includes temporary disturbance to approximately 13,000 square feet within the Riverfront Area (i.e. within 200-feet of the delineated bank limits). Of that area, approximately 5,220 square feet is expected to come between the 100-foot inner and 200-foot outer riparian area. The balance of the disturbance, as summarized in the table below, is anticipated within 100-feet of the bank limits. The primary road widening, and improvements is proposed on the southern approach, on the southeast side slope. The remaining work focuses on improvements to the northern approach, southern approach, and stone abutments can be described as rehabilitation or reconstruction of existing developed area. Side slopes off the portable bridge at the abutments will be stabilized with armor stone and configured to transition into existing grades.

An Alternatives Analysis has been performed and is included in Section 5 of this narrative.

Table of Disturbance Areas
(Bank and Riverfront Areas)

Area Description	Area/Length
Bank Disturbance (Temporary)	40 LF
LUWW	0 SF
Inner Riparian Area (0-100')	7,780± SF
Outer Riparian Area (100-200')	5,220± SF

Section 3
Project Description

3.1 Proposed Activities

The proposed project entails the preparation of Cornwell Road for restoration of safe passage across the Camel Brook stream crossing. Activities to improve the road conditions include fortification of the stone abutments and portable bridge bearing area, widening of the road at various locations, and adjusting the vertical grade of the southern approach to produce a more manageable roadway slope. A gradual slope leading to the bridge from either approach will be built as part of the design.

The use of stone gabion baskets on the southeast portion of road will provide the necessary width and stabilization to satisfy the maximum vehicle size expected to drive through upon project completion. Geotextile reinforcing grid will be used in conjunction with the gabion baskets to provide the necessary stabilization, whilst encouraging sufficient stormwater drainage to limit erosion. The downstream headwall of a stone culvert located across the northern approach will require fortification with fieldstone available onsite in response to the proposed widening at that station.

Limited vegetation removal is anticipated as part of this project to improve the road safely and efficiently. Upland tree and vegetation removal is detailed on the Existing Conditions and Demo Plan.

The roadway is currently unpaved, consisting of gravel and aggregate material. After the improvements to allow for vehicle passage, the road will remain unpaved and will consist of gravel and aggregate material. There is not an increase in impervious area as a result of this redevelopment project.

3.2 Anticipated Construction Sequence

A general description of the anticipated construction sequence is as follows:

1. MOBILIZATION.
2. INSTALL EROSION AND SEDIMENT CONTROLS, AS NECESSARY.
3. REMOVE AND DISPOSE HAZARD TREES, SHRUBS, WOODY DEBRIS TO ENSURE A SAFE AND CLEAN WORK ENVIRONMENT.
4. ESTABLISH ACCESS, PARKING AND STOCKPILE AREAS.

4.1. PROTECT AREAS WITH ADDITIONAL EROSION CONTROLS, AS NECESSARY.

5. INSTALL RIP RAP SPREADERS ON EAST AND WEST SIDES OF THE ROAD AND PLACE RIP RAP ON SLOPES AS INDICATED ON THE PROPOSED SITE PLAN.
6. REMOVE AND STORE EXISTING 30' STEEL PORTABLE BRIDGE.
7. INSPECT AND EVALUATE EXISTING TIMBERS AND ABUTMENTS.
8. REMOVE AND DISPOSE EXISTING TIMBER SUPER- AND SUB-STRUCTURE.

9. INSPECT AND FORTIFY EXISTING ABUTMENT WALLS, AS NECESSARY.
10. CONSTRUCT GABION BASKET RETAINING WALL AND RELATED COMPONENTS. DISPLACED NATURAL STONES SHALL BE RETAINED AND REUSED ON THE SITE, IF POSSIBLE.
11. EXTEND THE NATURAL STONE RETAINING WALL AT THE STONE DRAIN, TO THE NORTH OF THE BRIDGE CROSSING.
12. BACKFILL THE GABION BASKET WALL AND ROUGHLY GRADE THE ROAD WITH THE APPROPRIATE BASE MATERIALS.
13. PREPARE LEVEL STRUCTURAL BEARING PADS ON BOTH THE NORTHERN AND SOUTHERN ABUTMENTS FOR THE PORTABLE BRIDGE.
14. RE-INSTALL THE 30' STEEL PORTABLE BRIDGE.
15. RESTORE ROADWAY APPROACHES AND TRANSITIONS WITH FINAL GRADING.
16. REMOVE EROSION AND SEDIMENT CONTROLS UPON COMPLETION.
17. DEMOBILIZATION.

Construction sequence is subject to change, based on the conditions of the site and the contractor mobilization. Once a contractor's schedule and availability is determined the sequence will be finalized.

3.3 Access, Staging and Stockpiling

Access to the site can be achieved from the southeast (Route 202), through DCR-DWSP Gate SH-4. Stockpiles are to be located along Cornwell Road on gravel landings south of the Camel Brook crossing. The landings remain from past forestry operations that were completed in the last year. The landing locations range from approximately 300-600 feet south of the crossing.

3.4 Temporary Access

The project site will be closed off to any public use throughout the length of the project. Proper signage will be provided to indicate areas of authorized personnel only and construction areas.

DCR-DWSP staff shall ensure that measures are taken to secure the project site, materials, and equipment at the end of each day. The Quabbin 'Gate SH4' shall be locked after entry or departure to and from the site.

3.5 Construction Period Measures

Prior to work starting, erosion and sediment control measures shall be installed throughout the work area, as indicated on the plans, in order to minimize the impacts to the resource areas. Any erosion and sediment controls installed will be removed properly and disposed of off-site once construction and stabilization activities are complete.

During active construction, the site shall be fully inspected at least once every week and within 24 hours of the end of a storm event that produces 0.5-inch or greater of precipitation. Weekly inspections will be completed by a nominated primary or secondary compliance monitor and a summary or report is to be provided to the contractor following the inspection. The contractor will be responsible for any repairs, maintenance, or upgrades required to stabilize the site.

3.6 Site Restoration

Site restoration will take place upon completion of the project. The proposed disturbed areas, including staging, stockpile areas, access routes shall be properly graded to match their original condition or better.

3.7 Operation and Maintenance

After final stabilization site inspections shall continue at least once per month for three months. Any repairs needed shall be addressed immediately to ensure continued stabilization of the site. The following are general operation and maintenance considerations for road improvements, as proposed:

Frequency	Action
Annually	Check for debris/obstructions on each side of Camel Brook.
Annually	Check for scour surrounding the bridge abutments.
Bi-annually	Check surface for subsidence, erosion of backfill or riprap and mitigate or re-grade if necessary.
Every 5 years	Check structural condition of the portable bridge structure.

Proper operational oversight and ongoing maintenance will warrant the significant useful life of the crossing.

Section 4
Regulatory Compliance

4.1 Massachusetts Wetlands Protection Act

The proposed activities – outlined in Section 3 of this Narrative – will occur within areas subject to protection and jurisdiction under the Massachusetts Wetlands Protection Act. These areas include the 200-foot Riverfront Area to Camel Brook and the associated bank and bordering vegetated wetlands (BVW).

4.1.1 Limited Project Status

According 310 CMR 10.53 (general provisions and regulations for inland wetlands), this project is classified as a limited project pursuant to 310 CMR 10.53 (3)(f):

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

This project proposes widening (less than a single lane) and stabilizing roadway shoulders. The project is considered a re-development as the DCR is proposing to restore the road back to the original intent of vehicle accessibility. There is no closed-loop drainage system at the site as it relies on natural topography and country drainage. Although this is a restoration, the applicant is proposing several BMP's to mitigate stormwater runoff and limit potential erosion issues.

4.1.2 Performance Standards

4.1.2.1 Bordering Vegetated Wetland

(a) ...Any proposed work in a Bordering Vegetated Wetland shall not destroy or otherwise impart any portion of said area.

The resource area will not be permanently impacted. Minimal temporary disturbances are anticipated as it related to the restoration of the abutments. Resource area impacts will be protected throughout this project, including the bordering vegetated wetland, as described above.

(b) ...The issuing authority may issue an Order of Conditions permitting work in the loss of up to 5000 square feet of Bordering Vegetated Wetland when said area is to be replaced...

Not applicable. Minimal, temporary, BVW disturbance is anticipated as part of the project scope. See table of disturbance areas in Section 2 of this Narrative.

(c) ...The issuing authority may issue an Order of Conditions permitting work which results in the loss of a portion of Bordering vegetated wetlands...

Not applicable. No permanent BVW loss is anticipated as part of the project scope.

4.1.2.2 Riverfront Area

The performance standards are provided below in italics, with the details of the project immediately following.

(a) Protection of Other Resource Areas

All resource area impacts will be protected throughout this project, including the bordering vegetated wetland, as described above.

(b) Protection of Rare Species

As noted in Section 2 of this Narrative, the project is not located within Estimated, or Priority Habitat as mapped by NHESP.

(c) Practicable and Substantially Equivalent Economic Alternatives

A detailed alternatives analysis has been prepared and is provided in Section 5 of this Narrative.

(d) No Significant Adverse Impact

The proposed project will not generate additional stormwater runoff, increase impervious area, or create a new point source discharge. The proposed design integrates controls to help mitigate high stormwater runoff velocities – a net benefit to the site.

4.2 Wildlife Habitat Evaluation

According to 310 CMR 10.54 (4)(a)5 and 310 CMR 10.60(1), a habitat evaluation must be completed to evaluate if the threshold limits are met and the project will have an adverse effect on the wildlife habitat. The threshold limits for this project are 10% or 50 feet of bank disturbance, whichever is less. Based on the table of disturbances in Section 2 of this Narrative, this project is below the threshold. Furthermore, this project will result in a net benefit for wildlife by preserving the existing bridge crossing that meets Stream Crossing Standards. As a result, DCR-DWSP did not complete a Wildlife Habitat Evaluation as there will be no adverse effects.

4.3 Cultural Resources – MA Historical Commission

A review of the Massachusetts Inventory of historic properties and MassGIS data layer of mapped MDC Cultural Resources indicates that no portion of the project site is located within an area of known historic or cultural significance. The closest property of cultural or historical interest lies approximately 1,500 linear feet south of the project site. The site is identified as an agrarian property consisting of a cluster of small outbuildings formerly owned by Frank Maisner.

The project location is shown on the MA Historical Commission Locus Map in Appendix H.

4.4 Stream Crossing Standards

For information on the Stream Crossing Standards, please refer to Appendix C-2.

4.5 Stormwater Management

The project consists of maintenance and improvement of an existing road. The project scope proposes widening / additional shoulder; thus, the project is classified as a limited project per 310 CMR 10.53 (3)(f) maintenance and improvement of a public roadway, but limited to widening less than a single lane. In addition, per the Massachusetts Stormwater Handbook, the project is classified as a redevelopment project.

The limited and redevelopment project will not result in any new point source discharges or increase in impervious area within the project area. In addition, the project area is limited in size due to the location of the resource areas and the existing tree coverage. Due to the nature of the project, stormwater management is met to the maximum extent practicable, meanwhile improving upon the existing site conditions by using BMP's and erosion mitigation measures.

Erosion and sedimentation controls will be installed prior to the start of construction. Erosion controls will be monitored throughout construction and repaired, as required. Erosion and sedimentation controls will be removed once construction is complete, and the site is fully stabilized.

Section 5
Alternatives Analysis

5.1 Overview

An alternatives analysis has been provided in accordance with 310 CMR 10.58(4) and 310 CMR 10.55(4) based on the anticipated disturbances. The DCR-DWSP has considered several alternatives for this project and prepared this analysis to summarize the considerations. While performing the alternatives analysis each option was evaluated as a comprehensive solution. The preferred alternative is a balance of all desired criteria to satisfy the project needs. The criteria includes: project costs, constructability, duration of install, useful life and long-term maintenance needs.

5.2 Assumptions

In any road improvement scenario, the design standards shall be met to the best practical ability. Additionally, at the conclusion of any improvement it is understood that the DCR would like to have vehicular access to this remote area for watershed protection and land management. It is assumed that erosion and sediment controls would be consistent efforts for all alternatives.

Assume use of gabion basket walls on the southeast side of the Camel Brook crossing to provide necessary stability for the proposed road widening.

Site access, material stockpiles, and seasonal construction constraints would be the same in all repair alternatives.

5.3 Alternative 1 – Portable Bridge **(Preferred)**

With the portable bridge structure already onsite, there is no initial purchase or transportation cost to be incurred. The ability of the portable bridge to be folded / manipulated offers a viable method for preparing the abutment to match the proposed design. This method of installation is anticipated to be the least invasive to resources and also offers quickest restoration of the roadway.

Engineered portable timber bridges are ideal for their ability to be relocated and reused, only requiring typical construction methods and equipment for installation. These systems are designed to be easily transportable with a tractor-trailer.

The Camel Brook crossing is an optimal site for installation, having the attributes that encourage its use. The bank height from the underside of the proposed bridge deck to the stream bed is at least 6-feet, which is well over the 2-foot requirement from the bridge manufacture's specifications. The bridge span (or clear span) will not exceed the 20 ft distance between the abutments over which the bridge will be unsupported, whilst still achieving the required minimum 5 ft of direct contact bearing length on each stable abutment. Installation is intended to span over and limit/avoid disturbance within the wetland resource areas.

With the completion of the proposed road alignment improvements (achieved through widening), the approach will be straight onto to the bridge for the required minimum of 1-1/2 total truck lengths so as to allow trucks to be aligned perpendicular to the stream and parallel to the bridge before moving onto the single-laned bridge. The distance proposed is sufficient to meet to the needs of forestry operation vehicles.

The approach grade leading to the portable bridge on each side is proposed as a 1 percent slope, which is within the requirement to not exceed 10 percent. The bridge is to be installed as near to level as possible, and under no circumstances will the bridge slope from end-to-end exceed 2 percent.

Daily visual inspections of the structure are recommended prior to use post project completion. Items to inspect include the stressing rods, welds on the steel channel surrounding each bridge module, individual board deformation, welds at each paint-labeled lift eye, shear keys and welds, and end connector plates.

Yearly bridge restressing requirements are to be met. Additional restressing requirements every 5-10 years will also be accounted for.

The useful life of a portable bridge will depend on both the use and level of care taken to maintain the structure. Providing adequate drainage around the structure will be critical to the longevity of the bridge.

5.4 Alternative 2 – Concrete Box Culvert

It is anticipated that the initial direct cost for the precast material will be moderate to high. Precast materials will require heavy machinery to maneuver and set the components in place during construction. Fabrication of a culvert would require ample lead time; however, the culvert would arrive at the site ready to be set in place. This open-bottom solution requires site work and construction within the wetland resource area including footings, wing walls and headwalls to stabilize the structure and slopes. Total duration of install is anticipated to be around 3-4 months, excluding manufacturing time.

A concrete box typically has an extremely long useful life, estimated up to 100 years, with the proper maintenance. Although the annual demand for maintenance is relatively low, the concrete box still requires periodic cleaning and joint sealing. Providing adequate drainage on and around the structure will be critical to the longevity of the concrete. Additionally, low salt application will provide extended useful life.

The installation of a concrete box would require significant temporary disturbance to the resource areas. Along with these disturbances comes a dewatering schedule, streambed restoration effort, and other unnecessary and costly site work for a gated park road.

Based on the significantly higher cost, install time, and resource area disturbances, the DCR-DWSP has determined that this alternative was not best suited for this project.

5.5 Alternative 3 – "Do Nothing"

With no feasible alternative routes to access DCR-DWSP land for forestry management, fire protection, security and maintenance needs, a "Do Nothing" alternative is not considered a practical approach.

Access to either Cornwell Road or New Boston Road from routes further north are not viable options due to the inadequate road conditions including but not limited to insufficient width, alignment, and grade to meet the needs of the projected oversized service and emergency vehicles projected to utilize the road.

Alternative means to access the site through municipal roads, such as Cooleyville Road, are limited to the weight restrictions on two bridges. It is our understanding that municipal bridges are not currently suitable for the heavy loads that are required to access the DCR's land.

https://massgov.sharepoint.com/:w:/r/sites/DCR-Teams-DWSP-QUAB-CE/Shared%20Documents/Road%20Infrastructure/Bridges/Camel%20Brook/CamelBrook_NOI/CamelBrook_NOI_Narrative.docx?d=w408dc0c9e2ba4b6cbd5b26fca91e287c&csf=1&web=1&e=iL7jJN

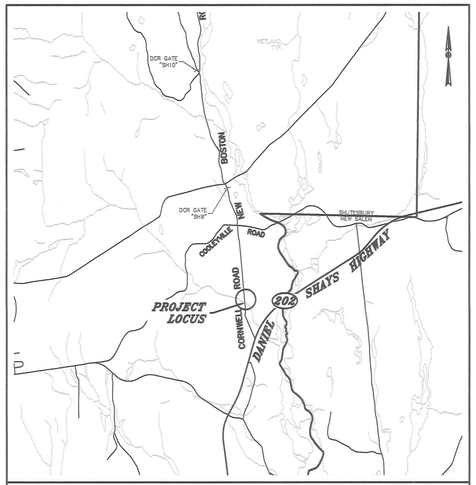
APPENDIX A

Design Plans

CAMEL BROOK - BRIDGE REPAIRS

OWNER / APPLICANT:

DEPARTMENT OF CONSERVATION AND RECREATION
DIVISION OF WATER SUPPLY PROTECTION
485 WARE ROAD
BELCHERTOWN, MA 01007



LOCUS PLAN
SCALE: 1"=2000'

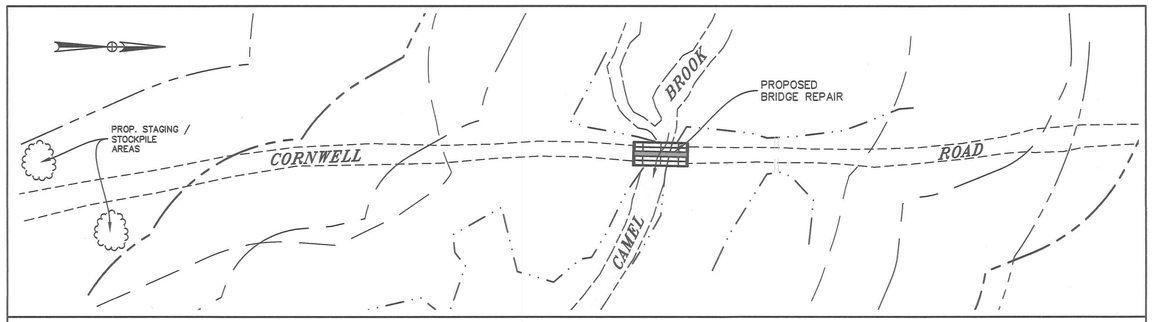
SHEET INDEX:

LEGEND

EXISTING CONTOUR (INDEX)	95	WETLAND LIMIT & FLAG	A4
EXISTING CONTOUR (INTERMEDIATE)	96	BANK LIMIT & FLAG	BA8
PROPOSED CONTOUR (INDEX)	100	WETLAND BUFFER (100')	
PROPOSED CONTOUR (INTERMEDIATE)	99	WETLAND OFFSET (50')	
EDGE OF VEGETATION		INNER RIPARIAN AREA (100')	
EROSION CONTROL / LIMIT OF WORK		OUTER RIPARIAN AREA (200')	
LIMIT OF WORK			
STONEWALL			
EDGE OF GRAVEL			
EDGE OF PATH			

PLAN NOTES:

1. THIS PLAN IS BASED ON A FIELD SURVEY COMPLETED BY THE DCR–DWSP ON 6/16/21 AND 8/31/21.
2. THIS PLAN IS BASED ON FIELD SURVEYS COMPLETED BY THE DCR–DWSP. LOCATIONS OF UTILITIES SHOWN HEREON ARE THE RESULT OF SURFACE EVIDENCE AS LOCATED BY FIELD SURVEY, PLANS OF RECORD AND OTHER AVAILABLE SOURCES. THIS PLAN DOES NOT NECESSARILY DEPICT THE EXACT LOCATION OF ALL UTILITIES WHICH MAY EXIST AT THIS TIME WITHIN THE PREMISES.
3. WETLAND AND BANK LIMITS SHOWN HEREON AS DELINEATED BY DCR–DWSP IN AUGUST OF 2021. WETLAND FLAGS LOCATED BY TRADITIONAL SURVEY.
4. HORIZONTAL DATUM IS NAD83, ESTABLISHED ON SITE BY DCR–DWSP WITH AN EOS–ARROW100 GPS. LOCAL TOPOGRAPHIC/DETAIL SURVEY COMPLETED ON SITE WITH SOKKIA TOTAL STATION.
5. VERTICAL DATUM IS NAVD88, ESTABLISHED ON SITE BY DCR–DWSP WITH AN EOS–ARROW100 GPS. LOCAL TOPOGRAPHIC/DETAIL SURVEY COMPLETED ON SITE WITH SOKKIA TOTAL STATION.
6. NO PROPERTY LINES ARE SHOWN ON THIS PLAN. PROPERTY RESEARCH WAS NOT CONDUCTED AS THE PROJECT LOCUS IS 1000'± TO NEAREST PROPERTY LINE.
7. THE CONTRACTOR SHOULD VERIFY THE EXISTING CONDITIONS TO HIS SATISFACTION PRIOR TO BEGINNING ANY EXCAVATION. "DIG SAFE" SHALL BE NOTIFIED AT LEAST 72 HOURS PRIOR TO BEGINNING ANY WORK.



SITE OVERVIEW
SCALE: 1"=40'

NO.	DATE	BY	CHK'D	REVISIONS

DATE: 4/28/2023
SCALE:
HORIZ: AS SHOWN
VERT: N/A

COMMONWEALTH OF MASSACHUSETTS — SCOTT A. CAMPBELL, CIVIL, No. 41721 — REGISTERED PROFESSIONAL ENGINEER
5/8/23

DESIGN: SAC
DRAFTING: JDG, DPF
CHECKED: JDG
APPROVED: SAC

dcr Massachusetts

DEPARTMENT OF CONSERVATION AND RECREATION
Division of Water Supply Protection
Quabbin Reservoir ~ Civil Engineering
485 Ware Road
Belchertown, MA 01007

PROJECT:
SH4-00-B1 "CAMEL BROOK" BRIDGE REPAIR

LOCATION:
CORNWELL ROAD (CAMEL BROOK)
SHUTESBURY, MA

SHEET NUMBER
1 OF 6
COVER SHEET

CAMELBROOK-SP.DWG

NAD83 – MA STATE PLANE

T.B.M. #1
NAIL IN 24" PINE
ELEV.=596.09

T.B.M. #2
NAIL IN 14" PINE
ELEV.=593.86

BANK LIMITS

CAMEL BROOK

100' WETLAND BUFFER

50' WETLAND OFFSET

50'

ROW OF POSTS (5 TOTAL)

PROP. LIMIT OF WORK, TYP.

EXISTING PORTABLE TEMPORARY BRIDGE TO BE REMOVED AND RESET

WETLAND LIMIT (SEE NOTE 3 ON PAGE 1)

PROP. EROSION CONTROL / LIMIT OF WORK, TYP.

CORNWELL ROAD

EDGE OF GRAVEL ROAD

900'± TO ROUTE 202

100' INNER RIPARIAN

SHRUBS, TREES AND OTHER VEGETATION TO BE REMOVED, TYP.

NATURAL STONES THAT ARE DISPLACED SHALL BE RETAINED AND REUSED ON SITE, IF POSSIBLE.

EDGE OF STONE ABUTMENT

ABUTMENTS TO BE INSPECTED AND REPAIRED AS NECESSARY.

TREES TO BE REMOVED, TYP.

10" MAPLE

16" HW

36" PINE

60" HW

28" PINE

26" PINE

14" PINE

STONE DRAIN

PLAN VIEW

SCALE: 1"=10'

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 INCH = TEN FEET

NO.	DATE	BY	CHK'D	REVISIONS

DATE: 4/28/2023

SCALE:
HORIZ: 1"=10'
VERT: N/A

COMMONWEALTH OF MASSACHUSETTS
SCOTT A. CAMPBELL
CIVIL
No. 41721
REGISTERED PROFESSIONAL ENGINEER
5/8/23

DESIGN: SAC
DRAFTING: JDG, DPF
CHECKED: JDG
APPROVED: SAC

dcr Massachusetts

DEPARTMENT OF CONSERVATION AND RECREATION
Division of Water Supply Protection
Quabbin Reservoir ~ Civil Engineering
485 Ware Road
Belchertown, MA 01007

PROJECT:
SH4-00-B1 "CAMEL BROOK" BRIDGE REPAIR

LOCATION:
CORNWELL ROAD (CAMEL BROOK)
SHUTESBURY, MA

SHEET NUMBER
2 OF 6
EXISTING & DEMO

CAMELBROOK-EP.DWG

NAD83 – MA STATE PLANE

T.B.M. #1
NAIL IN 24" PINE
ELEV.=596.09

T.B.M. #2
NAIL IN 14" PINE
ELEV.=593.86

100' WETLAND BUFFER

50' WETLAND OFFSET

50'

BANK LIMITS

CAMEL BROOK

APPROXIMATELY 300'± TO PROP. STAGING / STOCKPILE AREA

ROW OF POSTS (5 TOTAL)

PROP. LIMIT OF WORK, TYP.

PROP. GRAVEL ROADWAY IMPROVEMENT & WIDENING

PROP. LEVEL SPREADER

PROP. RIP RAP SLOPE

CORNWELL ROAD

EDGE OF GRAVEL ROAD

900'± TO ROUTE 202

100' INNER RIPARIAN

PROP. TIMBER GUARD RAIL W/ PVC SLEEVE (SEE DETAIL)

PROP. GABION BASKET RETAINING WALL

PROP. EROSION CONTROL / LIMIT OF WORK, TYP.

EXISTING PORTABLE TEMPORARY BRIDGE TO BE REMOVED AND RESET

PROPOSED RIPRAP, TYP.

EDGE OF STONE ABUTMENT

APPROXIMATELY 13,000± SF OF TOTAL DISTURBANCE AREA

WETLAND LIMIT (SEE NOTE 3 ON PAGE 1)

STONE DRAIN

EXTEND EXISTING STONE RETAINING WALL FROM NATIVE MATERIAL ON SITE

10" MAPLE

36" PINE

14" PINE

597.2

597.5

597.1

12.5'

9.5'

PLAN VIEW

SCALE: 1"=10'

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 INCH = TEN FEET

NO.	DATE	BY	CHK'D	REVISIONS

DATE: 4/28/2023

SCALE:
HORIZ: 1"=10'
VERT: N/A

COMMONWEALTH OF MASSACHUSETTS
SCOTT A. CAMPBELL
CIVIL
No. 41721
REGISTERED PROFESSIONAL ENGINEER

5/2/23

DESIGN: JDG
DRAFTING: JDG, DPF
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APPROVED: SAC

dcr Massachusetts

DEPARTMENT OF CONSERVATION AND RECREATION
Division of Water Supply Protection
Quabbin Reservoir ~ Civil Engineering
485 Ware Road
Belchertown, MA 01007

PROJECT:
SH4-00-B1 "CAMEL BROOK"

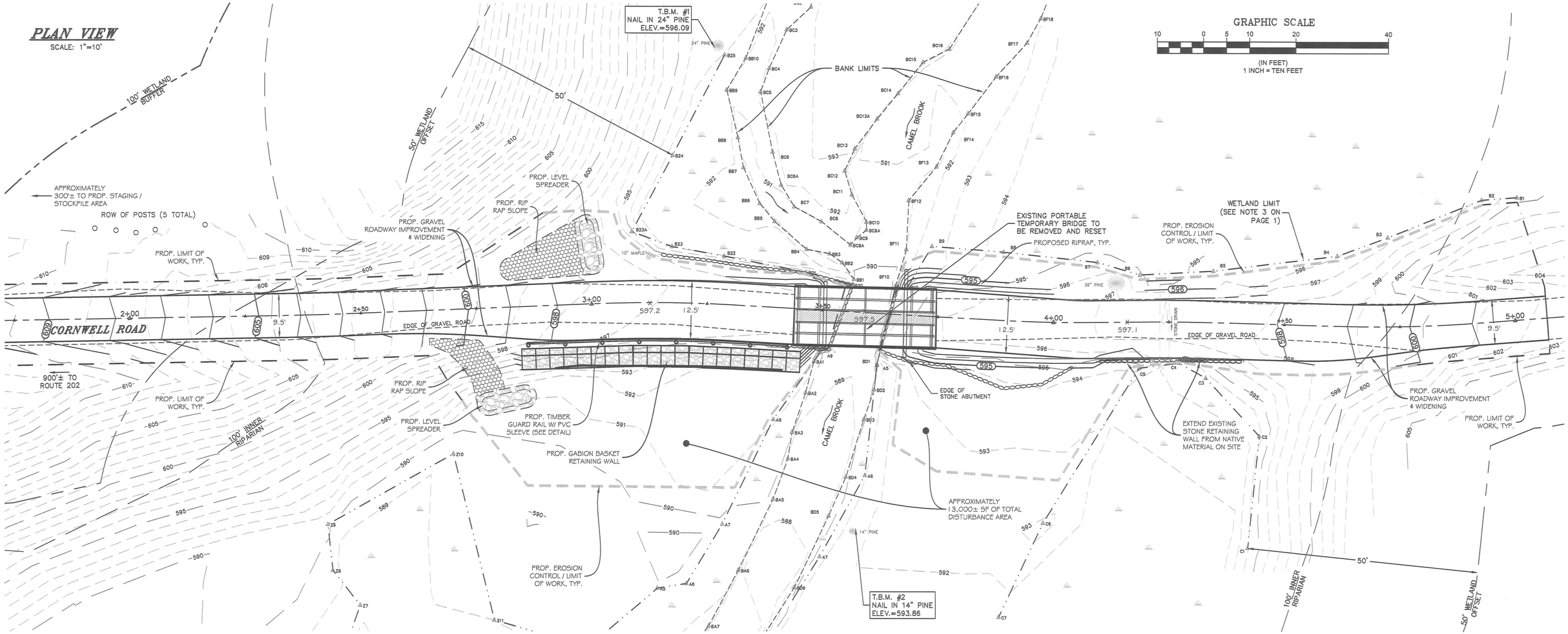
LOCATION:
CORNWELL ROAD (CAMEL BROOK)
SHUTESBURY, MA

SHEET NUMBER
3 OF 6
SITE PLAN

CAMELBROOK-SP.DWG

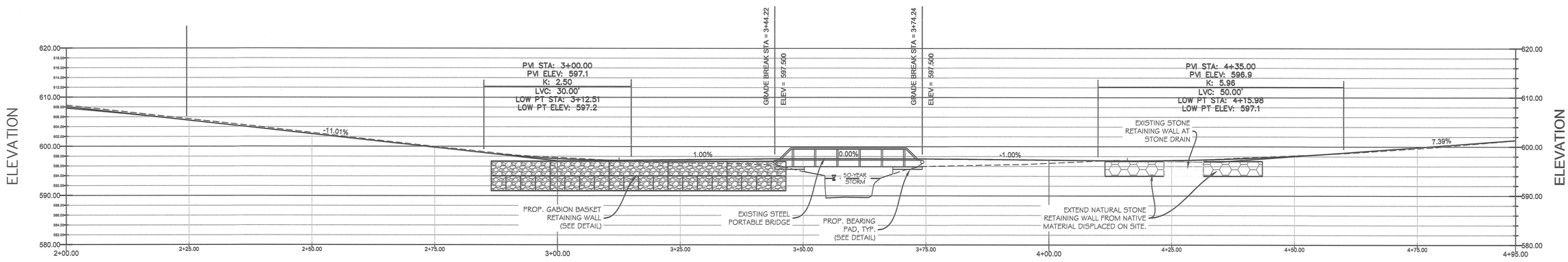
PLAN VIEW

SCALE: 1"=10'



PROFILE VIEW

SCALE: HORIZONTAL 1"=10'
VERTICAL 1"=10'



Profile View of P-GRAV-CL-R1

NO.	DATE	BY	CHK'D	REVISIONS

DATE: 4/28/2023
SCALE:
HORIZ: AS SHOWN
VERT: AS SHOWN

COMMONWEALTH OF MASSACHUSETTS — SCOTT A. CAMPBELL — CIVIL — No. 41721 — REGISTERED PROFESSIONAL ENGINEER — 4/28/23

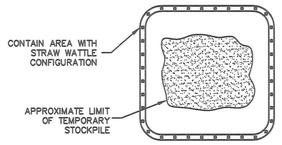
DESIGN: JDG
DRAFTING: JDG, DPF
CHECKED: JDG
APPROVED: SAC

dcr Massachusetts

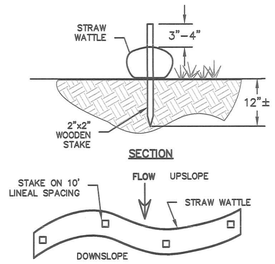
DEPARTMENT OF CONSERVATION AND RECREATION
Division of Water Supply Protection
Quabbin Reservoir ~ Civil Engineering
485 Ware Road
Belchertown, MA 01007

PROJECT: SH4-00-B1 "CAMEL BROOK"
LOCATION: CORNWELL ROAD (CAMEL BROOK) SHUTESBURY, MA

SHEET NUMBER 4 OF 6
PLAN AND PROFILE
CAMELBROOK-BP.DWG



TEMPORARY STOCKPILE AREA
N.T.S.



STRAW WATTLE DETAIL
N.T.S.

EROSION CONTROL NOTES:

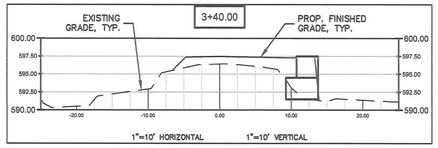
1. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF CONSTRUCTION. STABILIZATION OF ALL REGRADED AND SOIL STOCKPILE AREAS WILL BE INITIATED AND MAINTAINED DURING ALL PHASES OF CONSTRUCTION.
2. ALL EROSION CONTROL MEASURES ARE TO BE MAINTAINED AND UPGRADED AS REQUIRED TO ACHIEVE PROPER SEDIMENT CONTROL DURING CONSTRUCTION.
3. STOCKPILES OF SOIL SHALL BE SURROUNDED BY STRAW WATTLES.
4. ALL DISTURBED AREAS SHALL BE GRADED AND COVERED WITH 4" OF LOAM AND SEEDED. SLOPES GREATER THAN 4:1 SHALL BE MULCHED.
5. EXCESS SOCK MATERIAL TO BE DRAWN IN AND TIED OFF TO STAKE AT BOTH ENDS.
6. WATTLES SHALL BE OVERLAPPED BY AT LEAST ONE FOOT.
7. ERORION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL ALL AREAS HAVE BEEN STABILIZED AND SHALL NOT BE REMOVED UNTIL THE REMOVAL IS APPROVED BY THE SHUTESBURY CONSERVATION COMISSION AND THE DCR–DWSP.

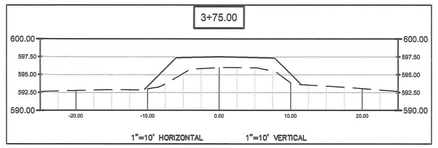
OPERATION AND MAINTENANCE DURING CONSTRUCTION

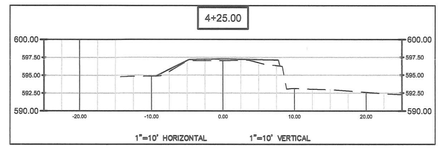
A SUGGESTED OPERATION AND MAINTENANCE (O&M) PLAN FOR DURING CONSTRUCTION IS DESCRIBED AS FOLLOWS:

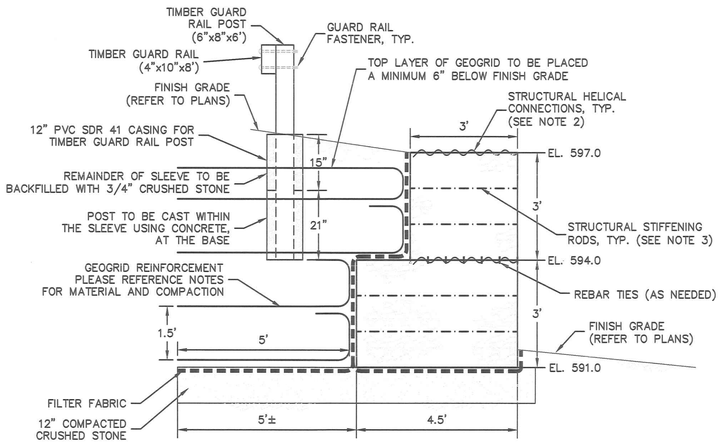
1. OWNER (DCR) SHALL BE RESPONSIBLE FOR ALL OPERATION AND MAINTENANCE OF THE SITE.
2. NO EARTHWORK ACTIVITIES SHALL COMMENCE UNTIL STRAW WATTLES HAVE BEEN INSTALLED. STRAW WATTLES SHALL BE INSTALLED AS SHOWN ON THE PLANS.
3. AREAS LEFT EXPOSED TO EROSION FOR MORE THAN SEVEN DAYS SHALL BE ROUGH GRADED AND TEMPORARILY STABILIZED. AREAS DISTURBED BUT INACTIVE FOR MORE THAN THIRTY DAYS SHALL BE TEMPORARILY SEEDED.
4. EROSION AND SEDIMENTATION CONTROLS SHALL BE MAINTAINED UNTIL SUCCESSFUL ESTABLISHMENT OF GROUND COVER.
5. NO STAGING OF MATERIALS OR LAY DOWN AREAS SHALL BE LOCATED WITHIN THE BORDERING VEGETATED WETLAND.
6. TEMPORARY SOIL STOCKPILES SHALL BE LOCATED WITHIN AREAS CONSISTING OF FORMERLY PAVED OR DEVELOPED SURFACES AND WILL BE MOVED AS NECESSARY TO ACCOMMODATE ONGOING WORK.
7. SEDIMENT STOCKPILES SHALL HAVE A SIDE SLOPE OF NO GREATER THAN 2:1. ALL STOCKPILES SHALL BE ROUGH GRADED OR MAINTAIN A ROUGHENED SURFACE TO PREVENT EROSION. STOCKPILES THAT ARE NOT TO BE USED WITHIN SEVEN DAYS SHALL BE SEEDED AFTER FORMATION OF STOCKPILE AS TO PREVENT EROSION. A STRAW WATTLE BARRIER SHALL INSTALLED AROUND STOCKPILE AREA APPROXIMATELY 10 FEET FROM TOE OF SLOPE.
8. THE CONTRACTOR IS RESPONSIBLE TO INSPECT AND REPAIR EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED TO PREVENT DAMAGE OR SEDIMENTATION.
9. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, REMOVE AND DISPOSE OF TEMPORARY EROSION CONTROL MEASURES. CLEAN SEDIMENT AND DEBRIS FROM TEMPORARY MEASURES AND FROM PERMANENT STORM DRAINAGE SYSTEMS.
10. DURING ACTIVE CONSTRUCTION, THE SITE SHALL BE FULLY INSPECTED WITHIN 24–HOURS OF THE END OF A STORM EVENT THAT PRODUCES 0.5–INCH OR GREATER OF PRECIPITATION, OR MINIMALLY ONCE PER WEEK TO ENSURE COMPLIANCE WITH PERMITS AND REGULATIONS.

CROSS SECTION VIEWS





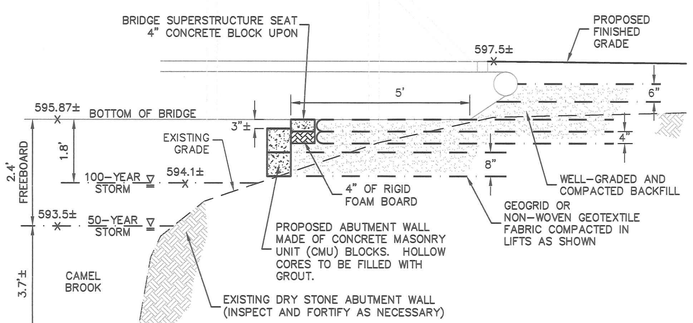




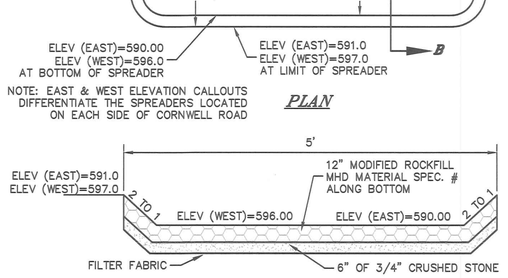
GABION BASKET RETAINING WALL & GUARD RAIL
N.T.S.

GABION BASKET NOTES:

1. GABIONS ARE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. ALL GABION BASKETS SHALL BE JOINED USING AT INTERFACES WITH HELICAL SPIRAL CONNECTORS, PRIOR TO FILLING WITH AGGREGATE.
3. STRUCTURAL STIFFENING RODS SHOULD BE USED INSIDE THE BASKETS TO KEEP THE BASKET FROM BOWING. STIFFENING RODS TO BE INSTALLED AS NEEDED, BUT AT MINIMUM AT THE MID–HEIGHT IN BOTH LATERAL DIRECTIONS. RODS SHOULD NOT BE PRE INSTALLED, BUT RATHER INSTALLED AS THE BASKETS ARE FILLED TO AVOID DAMAGE.
4. ROCKS TO FILL GABIONS SHALL BE LARGE ENOUGH TO PREVENT INDIVIDUAL PIECES FROM PASSING THROUGH THE MESH OPENINGS. GABION BASKET MESH OPENINGS ARE APPROXIMATELY 3" X 4.5" WIDE.
5. ROCKS TO FILL GABIONS SHALL BE HARD, ANGULAR TO ROUND, DURABLE, AND OF SUCH QUALITY THAT THEY SHALL NOT DISINTEGRATE ON EXPOSURE TO WATER OR WEATHERING DURING THE LIFE OF THE STRUCTURE.
6. GEOGRID – COMPACT GRAVEL BACKFILL MATERIAL EVERY 9" DURING INSTALL.



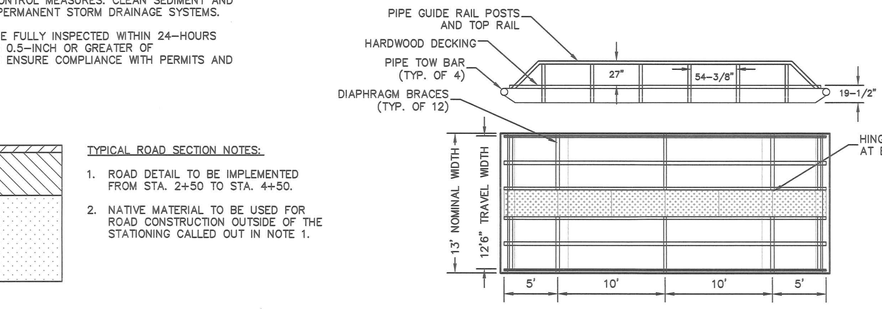
BRIDGE BEARING PAD
N.T.S.



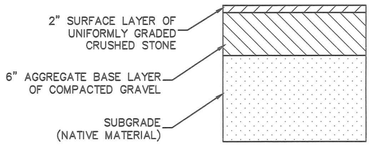
PLAN

SECTION B–B

RIP RAP SPREADER DETAIL
N.T.S.



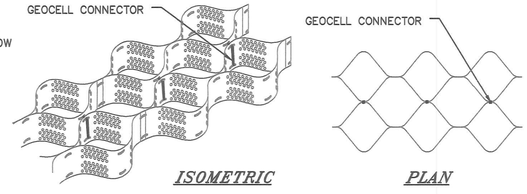
30' PORTABLE BRIDGE
N.T.S.



TYPICAL ROAD SECTION NOTES:

1. ROAD DETAIL TO BE IMPLEMENTED FROM STA. 2+50 TO STA. 4+50.
2. NATIVE MATERIAL TO BE USED FOR ROAD CONSTRUCTION OUTSIDE OF THE STATIONING CALLED OUT IN NOTE 1.

TYPICAL IMPROVED ROAD SECTION
N.T.S.



ISOMETRIC *PLAN*

BASELOK GEOCELL
N.T.S.

PROPOSED CONSTRUCTION SEQUENCE:

1. MOBILIZATION.
2. INSTALL EROSION AND SEDIMENT CONTROLS, AS NECESSARY.
3. REMOVE AND DISPOSE HAZARD TREES, SHRUBS, WOODY DEBRIS TO ENSURE A SAFE AND CLEAN WORK ENVIRONMENT.
4. ESTABLISH ACCESS, PARKING AND STOCKPILE AREAS.
   4.1. PROTECT AREAS WITH ADDITIONAL EROSION CONTROLS, AS NECESSARY.
5. INSTALL RIP RAP SPREADERS ON EAST AND WEST SIDES OF THE ROAD AND PLACE RIP RAP ON SLOPES AS INDICATED ON THE PROPOSED SITE PLAN.
6. REMOVE AND STORE EXISTING 30' STEEL PORTABLE BRIDGE.
7. INSPECT AND EVALUATE EXISTING TIMBERS AND ABUTMENTS.
8. REMOVE AND DISPOSE EXISTING TIMBER SUPER– AND SUB–STRUCTURE.
9. INSPECT AND FORTIFY EXISTING ABUTMENT WALLS, AS NECESSARY.
10. CONSTRUCT GABION BASKET RETAINING WALL AND RELATED COMPONENTS. DISPLACED NATURAL STONES SHALL BE RETAINED AND REUSED ON THE SITE, IF POSSIBLE.
11. EXTEND THE NATURAL STONE RETAINING WALL AT THE STONE DRAIN, TO THE NORTH OF THE BRIDGE CROSSING.
12. BACKFILL THE GABION BASKET WALL AND ROUGHLY GRADE THE ROAD WITH THE APPROPRIATE BASE MATERIALS.
13. PREPARE LEVEL STRUCTURAL BEARING PADS ON BOTH THE NORTHERN AND SOUTHERN ABUTMENTS FOR THE PORTABLE BRIDGE.
14. RE–INSTALL THE 30' STEEL PORTABLE BRIDGE.
15. RESTORE ROADWAY APPROACHES AND TRANSITIONS WITH FINAL GRADING.
16. REMOVE EROSION AND SEDIMENT CONTROLS UPON COMPLETION.
17. DEMOBILIZATION.

GENERAL NOTES:

1. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SHOWN ON THE DRAWINGS TO SCALE OR TO THEIR ACTUAL DIMENSION OR LOCATION. COORDINATE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.
2. DO NOT RELY ON ELECTRONIC VERSIONS OF DRAWINGS, SPECIFICATIONS, AND DATA FILES THAT ARE PROVIDED BY THE ENGINEER. FIELD VERIFY LOCATION OF PROJECT FEATURES.
3. PERFORM NECESSARY CONSTRUCTION NOTIFICATIONS, APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK AS REQUIRED BY THE CONTRACT DOCUMENTS.
4. LOCATION AND INVERTS OF EXISTING UTILITIES SHALL BE VERIFIED WITH THE ENGINEER PRIOR TO CONSTRUCTION. ALL FIELD CHANGES MUST BE APPROVED BY THE ENGINEER.

REGULATORY REQUIREMENTS:

1. CONTRACTOR SHALL NOTIFY SHUTESBURY CONSERVATION COMMISSION A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL NOTIFY FIELD INSPECTOR SHALL BE NOTIFIED 48 HOURS PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL INSTALL DEP SIGN NUMBER ASSIGNED IN ACCORDANCE WITH THE ORDER OF CONDITIONS.
4. APPROVED PLANS SHALL BE ON SITE AT ALL TIMES.
5. THE CONTRACTOR IS RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. PERFORM CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
6. DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.

EARTHWORK:

1. CALL DIG–SAFE 811 OR 1–888–DIG–SAFE A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.
2. STOP WORK IN THE VICINITY OF SUSPECTED CONTAMINATED SOIL, GROUNDWATER OR OTHER MEDIA. IMMEDIATELY NOTIFY THE OWNER SO THAT APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN. RESUME WORK IN THE IMMEDIATE VICINITY ONLY UPON DIRECTION BY THE OWNER.

DEMOLITION:

1. TREES, BRUSH, AND STUMPS REMOVED BY CLEARING & GRUBBING OPERATIONS SHALL BE TRANSPORTED OFF THE PROJECT SITE TO AN APPROVED DISPOSAL LOCATION.
2. ITEMS TO BE STOCKPILED ON–SITE FOR REUSE OR TO BE RELOCATED SHALL BE PROTECTED FROM CONSTRUCTION OPERATIONS. IF DAMAGED DURING CONSTRUCTION THEY SHALL BE REPLACED IN–KIND AT NO ADDITIONAL COST TO THE OWNER.
3. LOCATION OF CONSTRUCTION STAGING AREA IS DEPENDENT ON CONSTRUCTION ACTIVITY. LOCATION MUST BE REVIEWED AND DISCUSSED WITH PROJECT TEAM AND SITE OWNER. STAGING AREA MUST NOT BE LOCATED WITHIN RESOURCE AREAS.
4. NO EQUIPMENT SHALL BE LEFT IN THE 100–FOOT BUFFER ZONE WHEN NOT IN USE.
5. STONES REMOVED DURING EXCAVATION SHALL BE RETAINED AND RE–USED IN OTHER AREAS OF THE SITE, IF POSSIBLE.

GEOCELL NOTES:

1. DESIGN & INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
2. SUGGESTED INFILL MATERIALS: ANGULAR ROCK, SANDY SOIL AND/OR NON–CLAY BASED SOIL, RECYCLED ASPHALT OR CONCRETE. (NOT LIMITED TO THESE)
3. FOR WET NATIVE SOIL TYPICAL SUB–BASE IS 6 TO 12 INCH OF CLEAN STONE.
4. BASED ON THE APPLICATION, THE CELL DEPTH CAN BE 3", 4", 6" OR 8".
5. CROWN IS NOT NEEDED. WATER WILL FLOW THROUGH BASELOK.
6. CONNECTIONS TO BE MADE BY GALVANIZED STAPLES OR BASELOK CABLE LOKS.
7. DO NOT SCALE DETAIL DRAWING.
8. TO BE INSTALLED AT SELECT LOCATIONS IF DEEMED NECESSARY.

NO.	DATE	BY	CHK'D	REVISIONS

DATE: 4/28/2023
SCALE:
HORIZ: AS SHOWN
VERT: AS SHOWN

COMMONWEALTH OF MASSACHUSETTS — SCOTT A CAMPBELL, CIVIL, No. 41721, REGISTERED PROFESSIONAL ENGINEER — 5/8/23

DESIGN: JDG
DRAFTING: JDG, DPF
CHECKED: JDG
APPROVED: SAC

dcr Massachusetts

DEPARTMENT OF CONSERVATION AND RECREATION
Division of Water Supply Protection
Quabbin Reservoir ~ Civil Engineering
485 Ware Road
Belchertown, MA 01007

PROJECT:
SH4–00–B1 "CAMEL BROOK" SITE PHOTOGRAPHS

LOCATION:
NEW BOSTON ROAD (CAMEL BROOK)
SHUTESBURY, MA

SHEET NUMBER
5 OF 6
DETAILS

CAMELBROOK-SP.DWG

① NORTHERN BRIDGE APPROACH (LOOKING S)

② NORTHWEST BRIDGE CORNER (LOOKING SE)

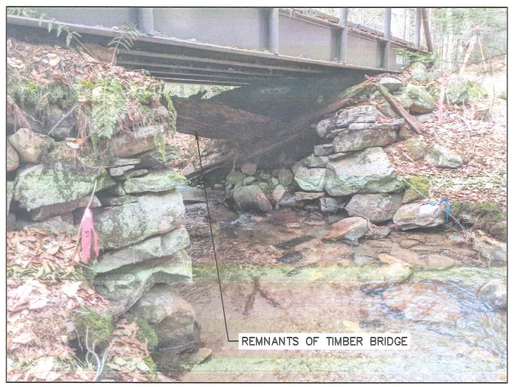
③ SOUTHWEST BRIDGE CORNER (LOOKING NE)

④ UPSTREAM BRIDGE VIEW (LOOKING E)

⑤ SOUTHWEST BRIDGE CORNER (LOOKING S)

⑥ SOUTHERN BRIDGE APPROACH (LOOKING NE)

⑦ SOUTHEAST SIDE SLOPE AND WALL (LOOKING N)



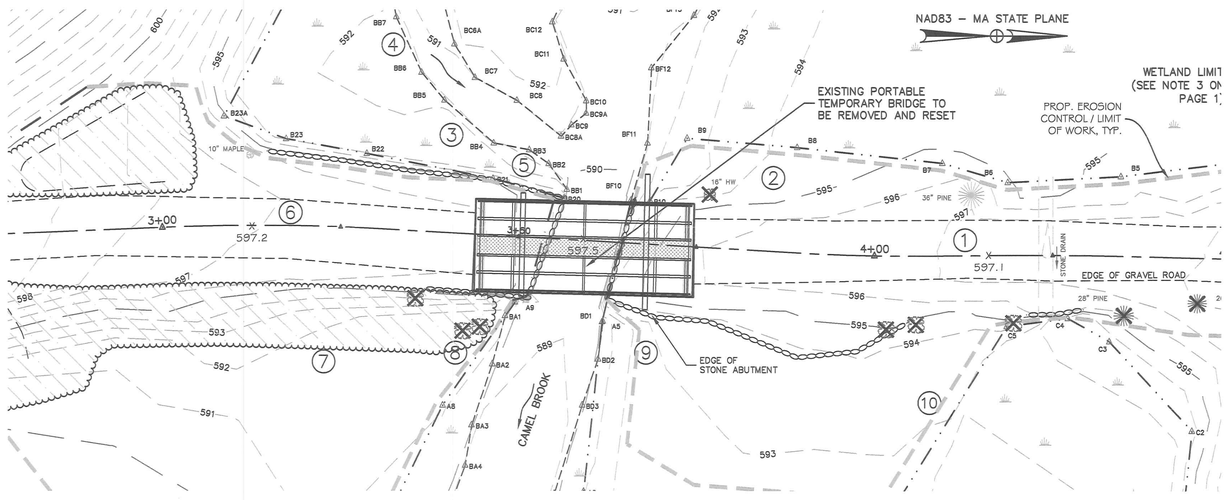
⑧ NORTHERN BRIDGE ABUTMENT (LOOKING NW)

⑨ NORTHEAST SIDE SLOPE AND WALL (LOOKING NW)

⑩ NORTHERN APPROACH CULVERT UPSTREAM (LOOKING W)

NOTE: CAMEL BROOK APPEAREANCE IN PHOTOS REPRESENTATIVE OF CONDITIONS AT THE TIME, DATED 3–23–2022

PHOTO NUMBER REFERENCE MAP



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COMMONWEALTH OF MASSACHUSETTS

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DEPARTMENT OF CONSERVATION AND RECREATION
Division of Water Supply Protection
Quabbin Reservoir ~ Civil Engineering
485 Ware Road
Belchertown, MA 01007

PROJECT:
SH4–00–B1 "CAMEL BROOK" SITE PHOTOGRAPHS

LOCATION:
NEW BOSTON ROAD (CAMEL BROOK)
SHUTESBURY, MA

SHEET NUMBER
6 OF 6
PHOTOGRAPHS

CAMELBROOK-SP.DWG

APPENDIX B

Wetland Report

dcr
Massachusetts

Wetland Report

DCR staff conducted site evaluations in June, August, and September of 2021 to identify and delineate wetland resources areas along Camel Brook and the associated Cornwell Road. Wetlands were delineated using the "Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act Handbook", March 1996 by Massachusetts Department of Environmental Protection. As defined in 310CMR10.55(3)…The boundary of the BVW is the line within which 50% or more of the vegetated community consists of wetland indicators plants and saturated or inundated conditions exist.

Camel Brook is a perennial stream, Coldwater Fishery, and an Outstanding Resource Water (ORW). The Land Under Water (LUW) consist mostly of sand, and gravel with little to no vegetation. The wooded forested wetland around the brook consists mostly of mature trees of Eastern Hemlock, Red Maple, and Eastern White Pine. Ground cover was primarily Cinnamon Fern and Sensitive Fern in the wetland area. Soils at the site consist of Walpole Sandy Loam and Hinckley Loam Sand. Based on our observations, the site contains, bordering vegetated wetland (BVW), bank (Bank), LUW, and riverfront (RF). Bank was delineated according to 310 CMR 10.54(2) "The upper boundary of the Bank is the first observable break in slope or the mean annual flood level, whichever is lower".

The wetland upstream of Camel Brook (west side of Cornwell Road) is marked with "B Series" flags. The upstream side has two channel that flow around an upland area and merge prior to flowing under the roadway. The left (southern) channel south bank is marked with "BB Series" flags, while the northern channel bank flags are "BF Series". The bank along the upland area is marked with the "BC Series".

On the downstream side of Camel Brook, flag "A Series" delineates the wetland. Bank Flag "BA Series" marks the bank on the south side of Camel Brook, while flag "BD Series" marks the bank on the north side.

South of Camel Brook of Cornwell Road, a "Z Series" wetland meanders in a swale like fashion. This wetland merges into the "A Series" wetland as they are hydrologically connected outside of our project area.

North of Camel Brook along Cornwell Road, a stone drain connects wetland "B Series" to "Wetland C Series" on the east. The "C Series" most likely connects to the "A Series" outside of project area. For the purposes of this project, we consider the "C Series" BVW as it most likely connects to "A Series" that borders on Camel Brook and the stone drain creates a hydrological connect between the wetlands.

MassDEP Bordering Vegetated Wetland Delineation Field Data Forms are attached.

Appendix G

Wetland

June 2021

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Delineating Bordering Vegetated Wetlands

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: DCR - DWSP Prepared by: J. McGuinness Project Location: Camel Brook DEP File #:

Check all that apply:

- [X] Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- [ ] Vegetation and other indications of hydrology used to delineate BVW boundary: fill out Sections I and II
- [ ] Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: 1 Transect Number: 1 Date of Delineation: June 2021

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Trees				
Eastern Hemlock (Tsuga canadensis)	20.5	31.7%	Yes	FACU *
Red maple (Acer rubrum)	28.0	58.9%	Yes	Fac *
Eastern white Cedar (Thuja occidentalis)	3.0	4%	No	FACW
Shrubs / Saplings	3.0	4%	No	FACU.
Red maple (Acer rubrum)	38.0	73.7%	Yes	FAC *
Eastern white pine (Pinus strobus)	2.0	5.8%	No	FACU
Ground	10.5	20.3%	Yes	FACW *
Cinn. Fern (Osmunastrum cinnamomeum)	20.5	50%	Yes	FACW *
Sensitive Fern (Onoclea Sensibilis)	20.50	50%	Yes	FACW *

* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40) ; plants in the genus Sphagnum; plants listed as FAC, FAC+, FAC-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: 6 Number of dominant non-wetland indicator plants: 6

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? (yes) no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent. MA DEP: 3/95

Appendix G

81

Delineating Bordering Vegetated Wetlands

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: DCR Prepared by: Nashoba Project location: Camel Brook DEP File #:

Check all that apply:

- [x] Vegetation alone presumed adequate to delineate BW boundary: fill out Section I only
- [ ] Vegetation and other indicators of hydrology used to delineate BW boundary: fill out Sections I and II
- [ ] Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: 1 Transect Number: 1 Date of Delineation: June 2021

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Trees				
Hemlock (Tsuga canadensis)	10.5	26.9%	Yes	FACU
White Pine (Pinus strobus)	38.0	55.0%	yes	FACU (FAC) *
Red oak (Quercus rubra)	20.5	29.7%	yes	FACU
Shrubs				FACU -
White Pine Saplings	3.0	6.9%	Yes	
Red oak (Quercus rubra)	2.5	3.1 %	yes	FACU
Ground				FACU
Tea berry (Gaultheria procumbens)	10.5	12.5%	no	
Princess Pine (Lycopodium obscurum)	10.5	12.5%	no	
Canada mayflower (Maianthemum canadense)	6.0	7.5%	Yes	FAC -

* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FAC-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: 1 Number of dominant non-wetland indicator plants: 5

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? yes (no)

If vegetation alone is presumed adequate to delineate the BW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent. MA DEP: 3/95

APPENDIX C-1

Hydrologic and Hydraulic Summary

dcr
Massachusetts

Hydraulic and Hydrologic Summary

Background

The DCR-DWSP is proposing to restore a bridge on an internal gated road that offers access to remote areas within the Quabbin watershed. An existing portable bridge is configured over the abutments allowing for pedestrian traffic only. This project is intended to continue the improvement of the site to allow for vehicular traffic to traverse the stream over the same bridge, by improving the approaches on both the north and south side of the bridge.

For safety and constructability, the existing bridge will be removed, stockpiled, and then reset when the appurtenant structures are adequately prepared. The DCR intends that the bridge will be sited back in a very similar location, both horizontally and vertically. By doing so, the clear height of the bridge will be unchanged from existing to proposed conditions. In order to verify the site can manage certain flows, an analysis is provided here.

Technical Approach

The Manning's Equation, which is an empirical equation that applies to uniform flow in open channels, is used for analysis. This method of analysis uses the geometry of the channel and the peak flows from various storms. This approach coupled with a USGS generated hydraulic report, called the StreamStats Report, found in Appendix C-3. Using the peak flows of various storms provided in the StreamStats Report, and assuming a rectangular cross-section, we are able to calculate the depth of the water and furthermore the amount of height below the bridge to the water level (known as freeboard).

Analysis

$$Q = V * A \qquad V = \frac{1.49}{n} * R^{\frac{2}{3}} * \sqrt{S} \qquad R = \frac{d*B}{B+2d}$$

Assumptions: Rectangular cross section, uniform flow.

Given: Slope=0.01; n=0.03; B(width)= 9 ft;

Key Elevations: Bottom of Bridge = 595.87 ft; Bottom of Stream = 589.80 ft

The following table is a summary of the calculations made, to determine the water elevation and freeboard during the respective storm events. Below that is a representative cross-section of the bridge, indicating the water level relative to the bridge.

Storm Event	Flow (Q) (cfs)	Width (B) (ft)	Depth (d) (ft)	Area (A) (ft^2)	Velocity (V) (ft/s)	Water Elevation (ft)	Freeboard (ft)
5-year	**114**	**9**	**2.03**	**18.3**	**6.2**	**591.83**	**4.0**
10-year	**154**	**9**	**2.51**	**22.6**	**6.8**	**592.31**	**3.6**
25-year	**214**	**9**	**3.17**	**28.5**	**7.5**	**592.97**	**2.9**
50-year	**266**	**9**	**3.71**	**33.4**	**8.0**	**593.51**	**2.4**
100-year	**322**	**9**	**4.27**	**38.4**	**8.4**	**594.07**	**1.8**

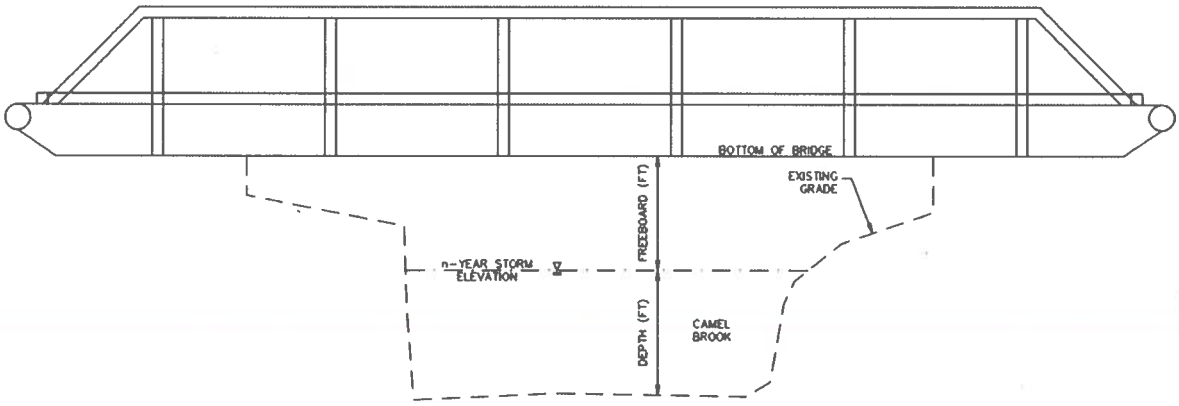


Figure 1 – Using the analysis from the above table, the figure can be used to represent the water depth and freeboard during the various storms.

Conclusion

As a result of this project, the improvements to the road will not negatively impact the water capacity of crossing. As the calculations indicate, even during the 100-year storm, there is still conservatively 1.8' between the water level and the bottom of the bridge.

https://massgov.sharepoint.com/sites/DCR-Teams-DWSP-QUAB-CE/Shared Documents/Road Infrastructure/Bridges/Camel Brook/CamelBrook_NOI/CamelBrook_NOI_H&HSummary.docx

APPENDIX C-2

Stream Crossing Standards

dcr
Massachusetts

Stream Crossing Standards

Background

The DCR-DWSP is proposing to restore a bridge on an internal gated road that offers access to remote areas within the Quabbin watershed. Since this road is gated, the vehicular traffic is at a minimum – only available for DCR staff for the purposes of watershed protection and emergency access.

The importance of the Stream Crossings Handbook and associated guidance is to ensure there is ample ways for wildlife and aquatic life to pass in natural and reasonable means. With this being a wooded – low traffic – park road, wildlife has unique ability to navigate more freely than a typical municipal setting. With no proposed disruption of the stream flow aquatic life will maintain the ability to pass as currently presented. Furthermore, this has historically been a bridge crossing site and it will be restored to that function with a more reliable and structurally sound bridge for a longer useful life. Bridges are preferred as the optimal type of stream crossing, as described below.

Standard 1

Type of Crossing

This crossing is a bridge crossing, which is listed as the optimum type of crossing. Existing today is a portable, prefabricated steel bridge placed over the top of a deteriorated timber bridge. The portable bridge spans to both the north and south abutments

Standard 2

Embedment

Since this is a bridge, there is no embedment associated with this project.

Standard 3

Crossing Span

This is a redevelopment project that will restore the span to its original design intent. The portable bridge will span the abutments to provide a sufficient bearing area on both the north and south sides. The bridge will span over the streambed and the bank limits. The existing width at the crossing is 9-feet. According to optimal standard, the span should be as follows:

$$Span\ Required\ (ft) = 1.2\ x\ Bankfull\ width = 1.2\ x\ 9' = 10.8\ ft\ (minimum)$$

In order to provide sufficient bearing area, the bridge must be supported by at least 5 linear feet of road below it, on both the northern and southern approaches. The total length of the bridge is 30-feet. With the layout and orientation of the bridge and abutments, the bridge will provide a total span of approximately 17-feet.

Standard 4

Openness

This is a redevelopment project that will improve the height of the opening, meanwhile retaining the total length of the structure. As shown in the calculation below, the Openness Ratio exceeds the optimum conditions. Additionally, the optimal height (minimum of 6-feet) is also met.

$$Openness\ Ratio\ (ft) = \frac{A\ (sf)}{L\ (lf)} = \frac{6'height\ x\ 9'wide}{14'long} = \frac{45\ sf}{14\ ft} = 3.85\ ft$$

Note:
Minimum Openness Ratio > 0.82 ft
Optimal Openness Ratio > 1.64 ft

Standard 5

Substrate

Existing natural bottom substrate will be maintained, as work for this project is proposed on the abutments and roadway approaches. Efforts to structurally restore the abutments will cause a minimal and temporary disturbance; however, as a result of this work the substrate will be able to withstand displacement during high flows.

Standard 6

Water Depth and Velocity

Water depth and velocity will go unchanged as part of this redevelopment project. The majority of the improvement for this repair focused on roadway approaches to and from the portable bridge. Temporary disturbance for the purpose of structurally stabilizing the abutment will be a net-benefit when it comes to water depth and velocity.

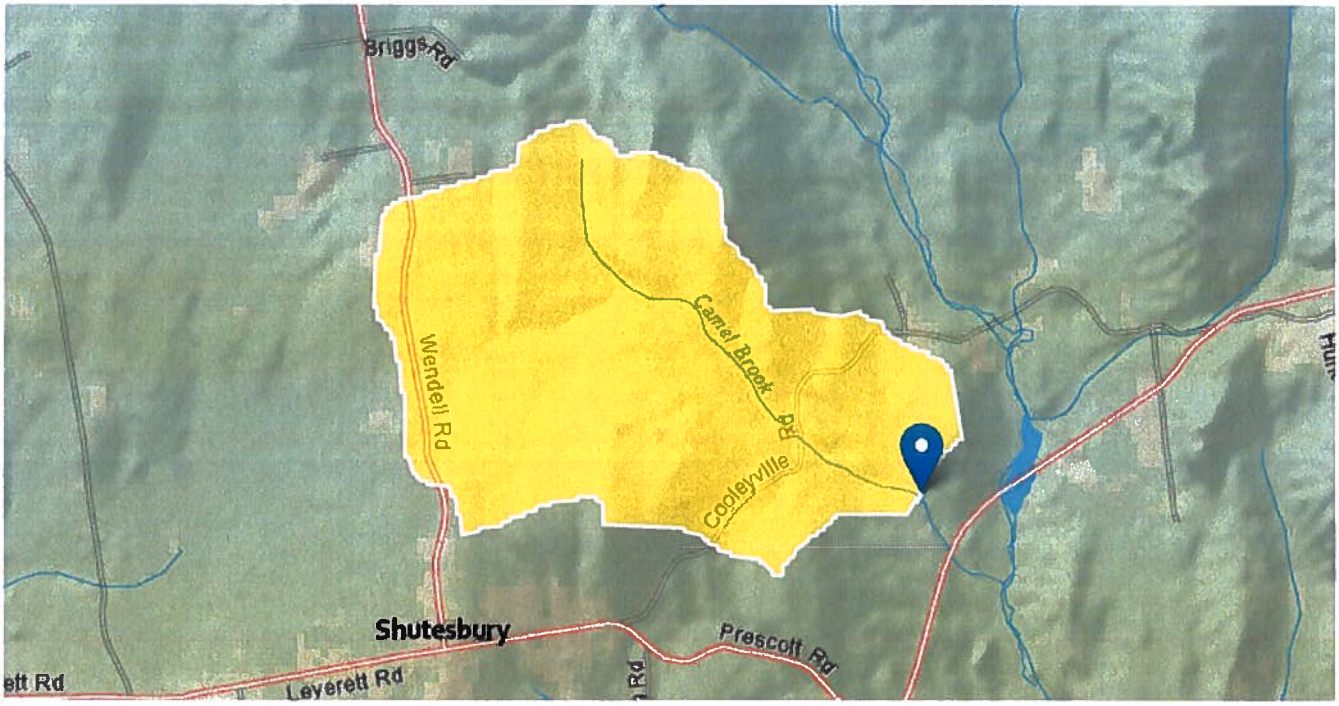
APPENDIX C-3

USGS – StreamStats Report

dcr
Massachusetts

Camel Brook @ Cornwell Road StreamStats Report

Region ID: MA
Workspace ID: MA20220426183921089000
Clicked Point (Latitude, Longitude): 42.45784, -72.38643
Time: 2022-04-26 14:32:10 -0400



This report was generated by StreamStats by DCR-DWSP Staff on 4/26/2022.

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLDEM10M	Mean basin slope computed from 10 m DEM	13.146	percent
BSLDEM250	Mean basin slope computed from 1:250K DEM	8.691	percent
DRFTPERSTR	Area of stratified drift per unit of stream length	0.00915	square mile per mile
DRNAREA	Area that drains to a point on a stream	1.05	square miles
ELEV	Mean Basin Elevation	998	feet
FOREST	Percentage of area covered by forest	97.09	percent
LC06STOR	Percentage of water bodies and wetlands determined from the NLCD 2006	0.46	percent
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	1	dimensionless

Parameter Code	Parameter Description	Value	Unit
PCTSNDGRV	Percentage of land surface underlain by sand and gravel deposits	1.93	percent

Peak-Flow Statistics Parameters [Peak Statewide 2016 5156]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.05	square miles	0.16	512
ELEV	Mean Basin Elevation	998	feet	80.6	1948
LC06STOR	Percent Storage from NLCD2006	0.46	percent	0	32.3

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

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

Statistic	Value	Unit	PII	PIu	ASEp
50-percent AEP flood	66.4	ft^3/s	33	134	42.3
20-percent AEP flood	114	ft^3/s	55.8	233	43.4
10-percent AEP flood	154	ft^3/s	73.5	323	44.7
4-percent AEP flood	214	ft^3/s	98.3	466	47.1
2-percent AEP flood	266	ft^3/s	118	599	49.4
1-percent AEP flood	322	ft^3/s	138	750	51.8
0.5-percent AEP flood	384	ft^3/s	160	924	54.1
0.2-percent AEP flood	475	ft^3/s	188	1200	57.6

Peak-Flow Statistics Citations

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

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

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.05	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	8.691	percent	0.32	24.6

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRFTPERSTR	Stratified Drift per Stream Length	0.00915	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1

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

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

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

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.0778	ft^3/s
7 Day 10 Year Low Flow	0.0343	ft^3/s

Low-Flow Statistics Citations

Ries, K.G., III,2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (http://pubs.usgs.gov/wri/wri004135/)

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

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.05	square miles	1.61	149
DRFTPERSTR	Stratified Drift per Stream Length	0.00915	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1
BSLDEM250	Mean Basin Slope from 250K DEM	8.691	percent	0.32	24.6

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

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

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

Statistic	Value	Unit
50 Percent Duration	1	ft^3/s
60 Percent Duration	0.612	ft^3/s

Statistic	Value	Unit
70 Percent Duration	0.383	ft^3/s
75 Percent Duration	0.297	ft^3/s
80 Percent Duration	0.243	ft^3/s
85 Percent Duration	0.185	ft^3/s
90 Percent Duration	0.133	ft^3/s
95 Percent Duration	0.0822	ft^3/s
98 Percent Duration	0.0539	ft^3/s
99 Percent Duration	0.0384	ft^3/s

Flow-Duration Statistics Citations

Ries, K.G., III,2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (http://pubs.usgs.gov/wri/wri004135/)

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

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.05	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	8.691	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0.00915	square mile per mile	0	1.29
MAREGION	Massachusetts Region	1	dimensionless	0	1

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

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

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

Statistic	Value	Unit
August 50 Percent Duration	0.192	ft^3/s

August Flow-Duration Statistics Citations

Ries, K.G., III,2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (http://pubs.usgs.gov/wri/wri004135/)

Bankfull Statistics Parameters [Bankfull Statewide SIR2013 5155]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.05	square miles	0.6	329
BSLDEM10M	Mean Basin Slope from 10m DEM	13.146	percent	2.2	23.9

Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.05	square miles	0.07722	940.1535

Bankfull Statistics Parameters [New England P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.05	square miles	3.799224	138.999861

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.05	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report [Bankfull Statewide SIR2013 5155]

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

Statistic	Value	Unit	ASEp
Bankfull Width	17.1	ft	21.3
Bankfull Depth	1.05	ft	19.8
Bankfull Area	17.6	ft^2	29
Bankfull Streamflow	61.6	ft^3/s	55

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	15.5	ft
Bieger_D_channel_depth	1.14	ft
Bieger_D_channel_cross_sectional_area	17.8	ft^2

Bankfull Statistics Disclaimers [New England P Bieger 2015]

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

Bankfull Statistics Flow Report [New England P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	25.6	ft
Bieger_P_channel_depth	1.39	ft
Bieger_P_channel_cross_sectional_area	35.5	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	12.6	ft
Bieger_USA_channel_depth	1.22	ft
Bieger_USA_channel_cross_sectional_area	17.5	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

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

Statistic	Value	Unit	ASEp
Bankfull Width	17.1	ft	21.3
Bankfull Depth	1.05	ft	19.8
Bankfull Area	17.6	ft^2	29
Bankfull Streamflow	61.6	ft^3/s	55
Bieger_D_channel_width	15.5	ft	
Bieger_D_channel_depth	1.14	ft	
Bieger_D_channel_cross_sectional_area	17.8	ft^2	
Bieger_P_channel_width	25.6	ft	
Bieger_P_channel_depth	1.39	ft	
Bieger_P_channel_cross_sectional_area	35.5	ft^2	
Bieger_USA_channel_width	12.6	ft	
Bieger_USA_channel_depth	1.22	ft	
Bieger_USA_channel_cross_sectional_area	17.5	ft^2	

Bankfull Statistics Citations

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

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p.

(https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDF

Probability Statistics Parameters [Perennial Flow Probability]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.05	square miles	0.01	1.99
PCTSNDGRV	Percent Underlain By Sand And Gravel	1.93	percent	0	100
FOREST	Percent Forest	97.09	percent	0	100
MAREGION	Massachusetts Region	1	dimensionless	0	1

Probability Statistics Flow Report [Perennial Flow Probability]

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

Statistic	Value	Unit	PC
Probability Stream Flowing Perennially	0.797	dim	71

Probability Statistics Citations

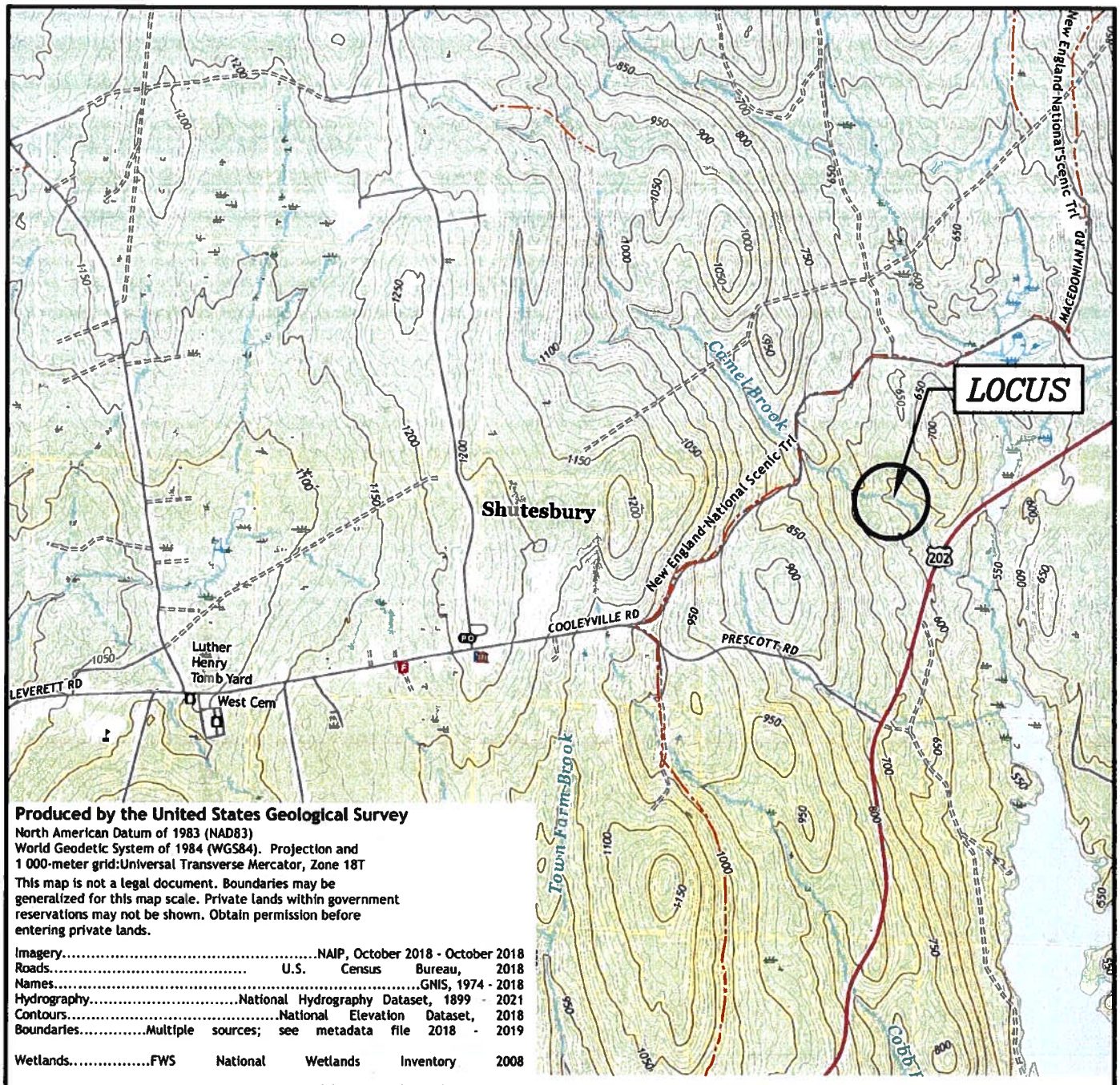
Bent, G.C., and Steeves, P.A.,2006, A revised logistic regression equation and an automated procedure for mapping the probability of a stream flowing perennially in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2006–5031, 107 p. (http://pubs.usgs.gov/sir/2006/5031/pdfs/SIR_2006-5031rev.pdf)

Application Version: 4.8.1
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2

APPENDIX D

Site Locus Plans

dcr
Massachusetts



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid:Universal Transverse Mercator, Zone 18T

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, October 2018 - October 2018
Roads.....U.S. Census Bureau, 2018
Names.....GNIS, 1974 - 2018
Hydrography.....National Hydrography Dataset, 1899 - 2021
Contours.....National Elevation Dataset, 2018
Boundaries.....Multiple sources; see metadata file 2018 - 2019

Wetlands.....FWS National Wetlands Inventory 2008

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

SHUTESBURY QUADRANGLE
MASSACHUSETTS
7.5-MINUTE SERIES

SHUTESBURY, MA
2021

dcr
Massachusetts

PROJECT: *APPENDIX D–1: USGS LOCUS MAP*
QUABBIN RESERVOIR – GATE SH–4
CORNWELL RD "CAMEL BROOK" CROSSING
SHUTESBURY, MA

CAMELBROOK_LOCUS.DWG

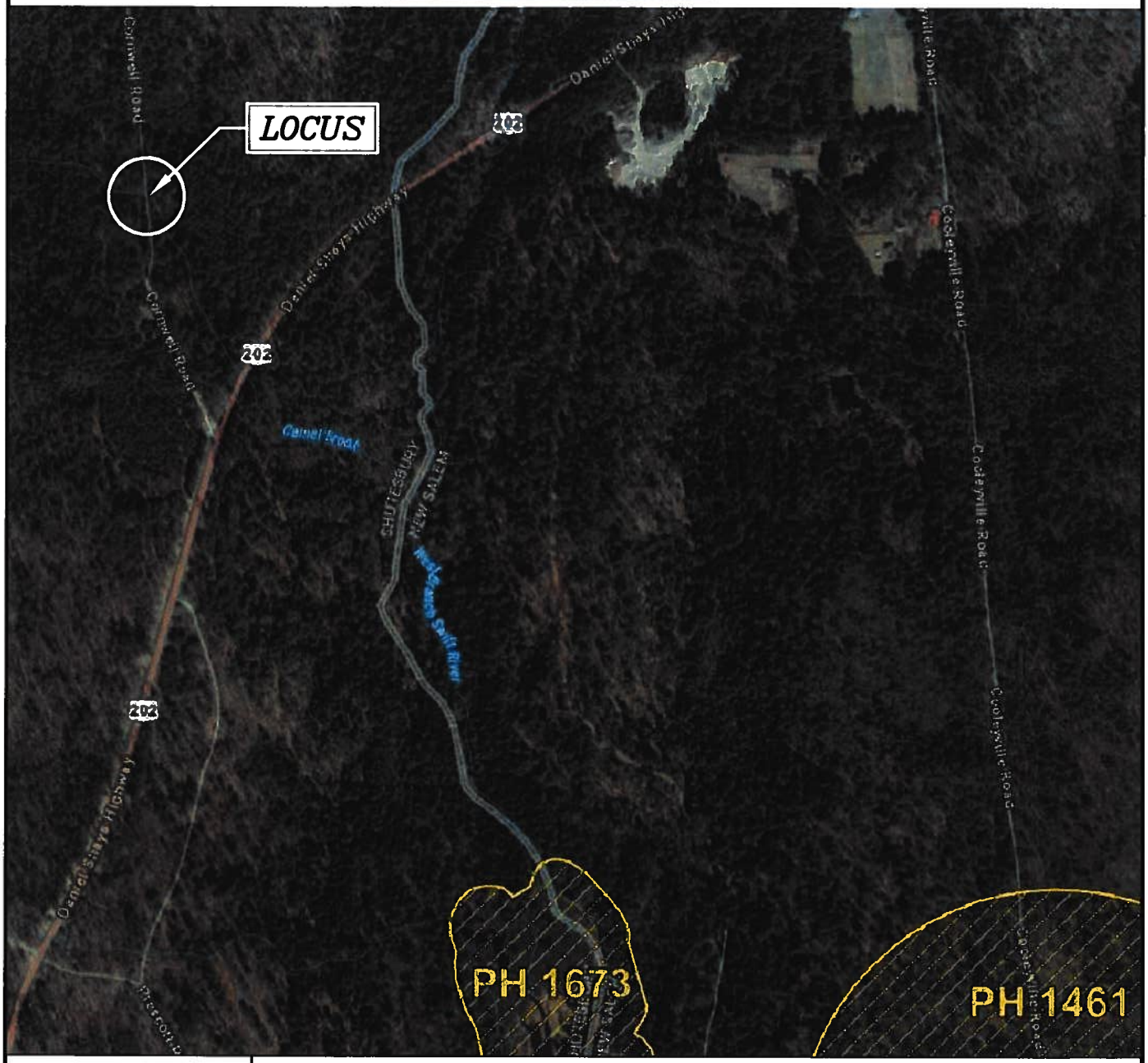
DATE: 3/17/2022	*SCALE:* AS SHOWN	*SHEET:* 1 OF 1
DESIGN:	*DRAWN:* DPF	*APPROVED:*

Natural Heritage & Endangered Species Program

SHUTESBURY
Priority Habitats and Estimated Habitats

Priority Habitats, for use with the MA Endangered Species Act Regulations (321 CMR 10)
Estimated Habitats, for use with the MA Wetlands Protection Act Regulations (310 CMR 10)
Effective August 1, 2021

Priority Habitat of Rare Species
Priority Habitat of Rare Species and also Estimated Habitat of Rare Wildlife
Certified Vernal Pools (as of July 20, 2021)
Town Boundary

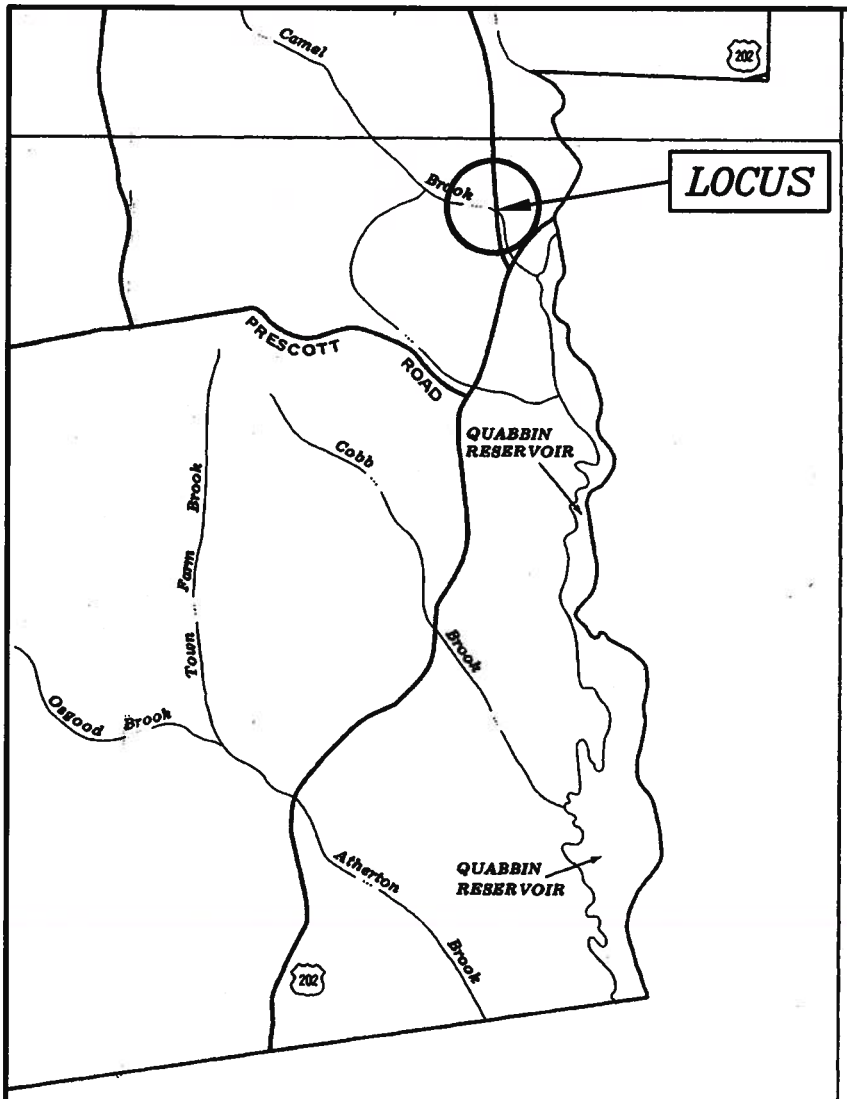


dcr Massachusetts

PROJECT: *APPENDIX D–2: NHESP LOCUS MAP*
QUABBIN RESERVOIR – GATE SH–4
CORNWELL RD "CAMEL BROOK" CROSSING
SHUTESBURY, MA

CAMELBROOK_LOCUS.DWG

DATE: 3/17/2022	*SCALE:* N.T.S.	*SHEET:* 1 OF 1
DESIGN:	*DRAWN:* DPF	*APPROVED:*



NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
SHUTESBURY,
MASSACHUSETTS
FRANKLIN COUNTY

MAP INDEX

PANELS PRINTED: 5, 10, 15

COMMUNITY-PANEL NUMBERS
250128 0001-0020

EFFECTIVE DATE:
JUNE 18, 1980

*250128 0020 A

*PANEL NOT PRINTED – AREA IN ZONE C

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

dcr
Massachusetts

PROJECT: *APPENDIX D–3: FEMA LOCUS MAP*
QUABBIN RESERVOIR – GATE SH–4
CORNWELL RD "CAMEL BROOK" CROSSING
SHUTESBURY, MA

CAMELBROOK_LOCUS.DWG

DATE: 3/16/2022	SCALE: NTS	SHEET: 1 OF 1
DESIGN:	DRAWN: DPF	APPROVED:

APPENDIX E

Site Photographs

dcr
Massachusetts

Appendix E
Site Photographs

Photo 1: 3/23/22 – View southerly along Cornwell Road.

Photo 2: 3/23/22 – View northerly along Cornwell Road.

Photo 3: 3/23/22 – View from the southwest looking at existing portable bridge.

Photo 4: 3/23/22 – View of the southern approach from the existing bridge.

Photo 5: 3/23/22 – Former timber bridge under portable bridge (from upstream).

Photo 6: 3/23/22 – View of the stream channel and abutments (from downstream).

Photo 7: 3/23/22 – View of the shoulder on the north approach.

Photo 8: View of the woods road northern approach.

Photo 9: 3/23/22 – View from the south of Camel Brook Crossing.

Photo 10: 3/23/22 – Southeastern shoulder and wall.

Photo 11: 3/23/22 – Headwall and drainage structure to the north of Camel Brook (downstream).

Photo 12: 3/23/22 – Upstream of the apparent drainage structure (north of Camel Brook).

9/3/2022

Photo 13: 9/3/22 – View from the east, under the bridge.

Photo 14: 9/3/22 – Northern Abutment.

Photo 15: 3/23/22 – Upstream of Camel Brook Crossing.

APPENDIX F-1

Certified Abutters List

dcr
Massachusetts

TOWN OF SHUTESBURY CERTIFIED 100' ABUTTERS LIST FOR JEFFREY D. GAGNER (OWNER MA DCR), PRESCOTT RD, MAP N PARCEL 88

MAP	LOT	OWNER	CO-OWNER	MAILING ADDRESS	TOWN	ST	ZIP	LOCATION
N	88	DCR - DIV. WSP	OFFICE OF WATERSHED MGMT	251 CAUSEWAY ST	BOSTON	MA	02114	PRESCOTT RD
L	1	DCR - DIV. WSP	OFFICE OF WATERSHED MGMT	251 CAUSEWAY ST	BOSTON	MA	02114	COOLEYVILLE RD
L	4	DCR - DIV. WSP	OFFICE OF WATERSHED MGMT	251 CAUSEWAY ST	BOSTON	MA	02114	COOLEYVILLE RD
M	17	DCR - DIV. WSP	OFFICE OF WATERSHED MGMT	251 CAUSEWAY ST	BOSTON	MA	02114	COOLEYVILLE RD
M	18	SMITH CHARLES KAY	CONWAY KATHERINE	62 ECHO LAKE RD	LEVERETT	MA	01054	COOLEYVILLE RD
M	19	DCR - DIV. WSP	OFFICE OF WATERSHED MGMT	251 CAUSEWAY ST	BOSTON	MA	02114	COOLEYVILLE RD
M	20	VOGES FORREST		46 FLORENCE STREET	SPRINGFIELD	MA	01105	206 COOLEYVILLE RD
M	33	MASSACHUSETTS DEPARTMENT OF	CONSERVATION & RECREATION	251 CAUSEWAY ST	BOSTON	MA	02114	COOLEYVILLE RD
M	80	SMITH MIRANDA K		50 DRUM HILL RD	CONCORD	MA	01742	COOLEYVILLE RD
M	82	REHORKA GARY A	REHORKA RACHEL A SCHWAB	P O BOX 601	SHUTESBURY	MA	01072	86 COOLEYVILLE RD
N	2	CHOUINARD, PHYLLIS		387 COOLEYVILLE RD	NEW SALEM	MA	01355	383 COOLEYVILLE RD
N	3	FROST CHARLES F	C/O FROST LOUISE	354 AMHERST RD	PELHAM	MA	01002	COOLEYVILLE RD
N	4	CHOUINARD PHYLLIS		387 COOLEYVILLE RD	NEW SALEM	MA	01355	387 COOLEYVILLE RD
N	5	CHOUINARD PHYLLIS D		387 COOLEYVILLE RD	NEW SALEM	MA	01355	COOLEYVILLE RD
N	8	DCR - DIV. WSP	OFFICE OF WATERSHED MGMT	251 CAUSEWAY ST	BOSTON	MA	02114	COOLEYVILLE RD
N	12	DCR - DIV. WSP	OFFICE OF WATERSHED MGMT	251 CAUSEWAY ST	BOSTON	MA	02114	COOLEYVILLE RD
N	72	FLETCHER DONALD J		P O BOX 54	SHUTESBURY	MA	01072	16 CORNWALL RD
N	75	DCR - DIV. WSP	OFFICE OF WATERSHED MGMT	251 CAUSEWAY ST	BOSTON	MA	02114	COOLEYVILLE RD
N	76	MOSHER DAVID E	MOSHER SUSAN	PO BOX 644	SHUTESBURY	MA	01072	360 COOLEYVILLE RD
N	83	MOSHER DAVID	MOSHER SUSIE	PO BOX 644	SHUTESBURY	MA	01072	COOLEYVILLE RD
O	1	O'BRIEN TIMOTHY	O'BRIEN DEBORAH	P O BOX 74	SHUTESBURY	MA	01072	TOWN FARM RD
O	21	ORMSBY GREGORY TRUSTEE	TRUSTEE OF CHEILE AGUS MAOIRSEAR(	158 PELHAM HILL RD	SHUTESBURY	MA	01072	158 PELHAM HILL RD
O	33	MCCAHON DAVID J	MCCAHON CYNTHIA D	922 UNIVERSITY BAY D	MADISON	WI	53705	LEVERETT RD
O	40	DAVIES JENNIFER A	DAVIES GEORGE C JR	24 LEVERETT RD	SHUTESBURY	MA	01072	24 LEVERETT RD
O	49	WILSON FREDERICK R JR	WILSON PAT H	PO BOX 543	SHUTESBURY	MA	01072	COOLEYVILLE RD
O	65	O'BRIEN TIMOTHY	O'BRIEN DEBORAH A	P O BOX 74	SHUTESBURY	MA	01072	7 TOWN FARM RD
O	80	LOGAN TIMOTHY R & NANCY E TRUSTEE	NANCY & TIM LOGAN 2019 TRUST	P O BOX 624	SHUTESBURY	MA	01072	15 TOWN FARM RD
O	82	GNATEK RONALD A		PO BOX 551	SHUTESBURY	MA	01072	1 PRESCOTT RD
O	86	WILDMAN KENNETH G	LYON SUZANNE M	P O BOX 101	SHUTESBURY	MA	01072	89 COOLEYVILLE RD
O	114	WALTON JAMES P		PO BOX 503	SHUTESBURY	MA	01072	75 TOWN FARM RD
O	115	KENNEY ANTHONY S	DOLAN KATHLEEN C	P O BOX 612	SHUTESBURY	MA	01072	23 TOWN FARM RD
O	118	LAUDER DAVID M	LAUDER VICKIE	P O BOX 514	SHUTESBURY	MA	01072	COOLEYVILLE RD
O	120	LONGCOPE NATHANIEL C	LONGCOPE EMILY B	71 TOWN FARM RD	SHUTESBURY	MA	01072	71 TOWN FARM RD
ZM	15	KEILY ROSS		3011 NE HOYT ST APT I	PORTLAND	OR	97232	70 COOLEYVILLE RD
ZO	3	W D COWLS INC		P O BOX 9677	N AMHERST	MA	01059	PELHAM HILL RD
ZO	6	W D COWLS INC		PO BOX 9677	NORTH AMHERST	MA	01059	PELHAM HILL RD
ZO	43	TOWN OF SHUTESBURY		P O BOX 276	SHUTESBURY	MA	01072	LEVERETT RD
ZO	89	VASSALLO ROBERT W	VASSALLO LYNDA L	P O BOX 572	SHUTESBURY	MA	01072	33 TOWN FARM RD

FOR: Jeffrey Gagner
MA Department of Conservation & Recreation
413.668.8471
JEFFREY.D.GAGNER@MASS.GOV

Respectfully submitted,

Leslie Bracebridge

Leslie Bracebridge, Shutesbury Assessors Clerk
For Shutesbury Board of Assessors
4/12/2023

230411 N-88 100 FT abutters

Shutesbury, MA

1 inch = 2223 Feet

April 11, 2023

0 2223 4447 6671

CAI Technologies
Precision Mapping Geospatial Solutions

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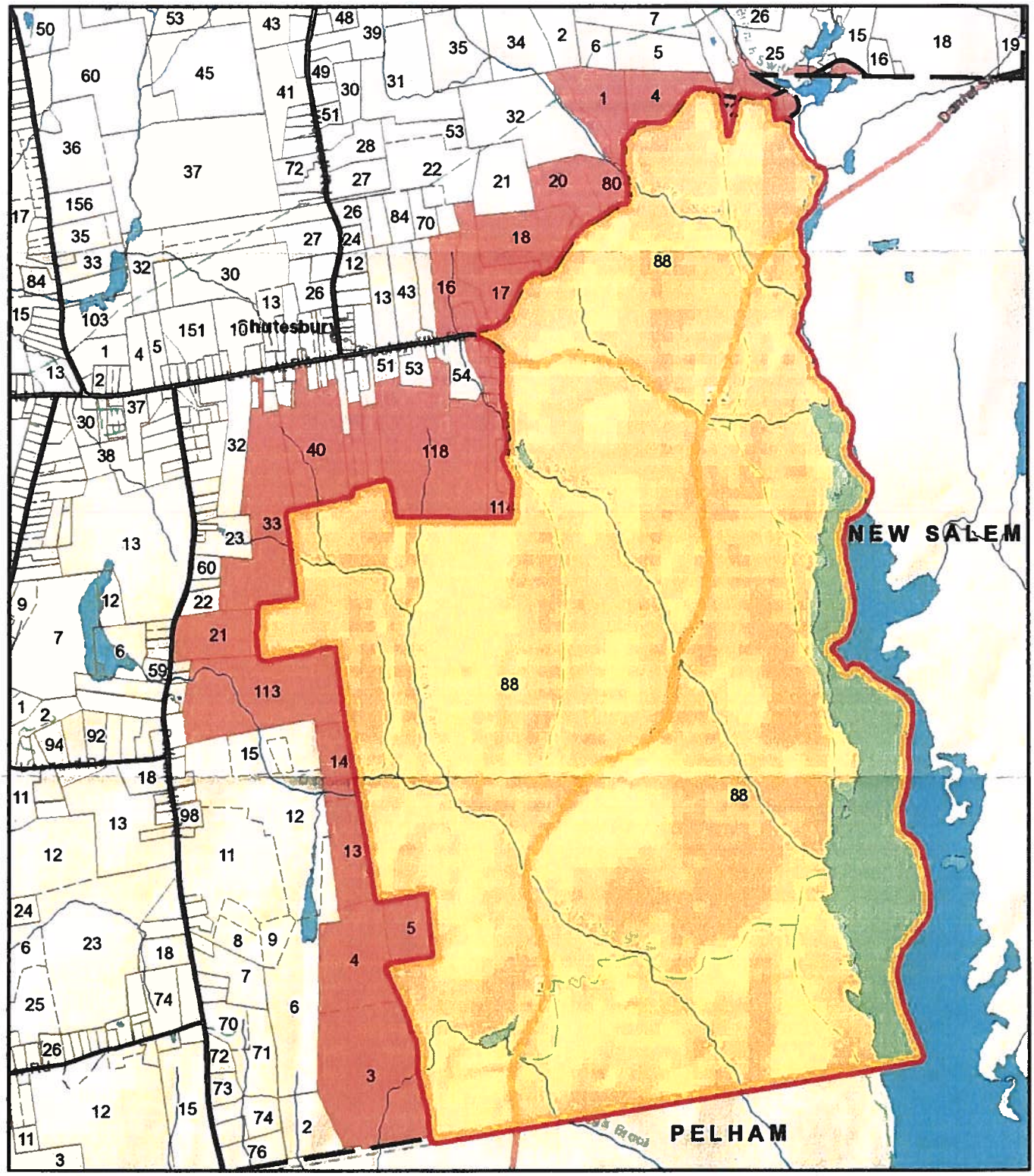


Data shown on this map is provided for planning and informational purposes only. The municipality and CAI Technologies are not responsible for any use for other purposes or misuse or misrepresentation of this map.

PARCEL: N-2, N-4, N-5,
CHOUINARD PHYLLIS
387 COOLEYVILLE RD
NEW SALEM, MA 01355

PARCEL: N-72
FLETCHER DONALD J TRUSTEE
DONALD J FLETCHER INDENTURE OF TRUST
P O BOX 54
SHUTESBURY, MA 01072

PARCEL: O-115
KENNEY ANTHONY S
DOLAN KATHLEEN C
P O BOX 612
SHUTESBURY, MA 01072

PARCEL: O-120
LONGCOPE NATHANIEL C
LONGCOPE EMILY B
71 TOWN FARM RD
SHUTESBURY, MA 01002

PARCEL: O-21
ORMSBY GREGORY TRUSTEE
CHEILE AGUS MAOIRSEARCHT AGROFORESTRY TRUST
158 PELHAM HILL RD
SHUTESBURY, MA 01072

PARCEL: M-18
SMITH CHARLES KAY
CONWAY KATHERINE
62 ECHO LAKE RD
LEVERETT, MA 01054

PARCEL: ZO-89
VASSALLO ROBERT W
VASSALLO LYNDA L
P O BOX 572
SHUTESBURY, MA 01072

PARCEL: O-114
WALTON JAMES P
P O BOX 503
SHUTESBURY, MA 01072

PARCEL: M-33,
MASSACHUSETTS DEPARTMENT OF
CONSERVATION & RECREATION
251 CAUSEWAY ST
BOSTON, MA 02114

PARCEL:

PARCEL: O-40
DAVIES JENNIFER A
DAVIES JR GEORGE C
24 LEVERETT RD
SHUTESBURY, MA 01072

PARCEL: N-3
FROST CHARLES F
C/O FROST LOUISE
354 AMHERST RD
PELHAM, MA 01002

PARCEL: O-118
LAUDER DAVID M
LAUDER VICKIE
P O BOX 514
SHUTESBURY, MA 01072

PARCEL: N-76, N-83
MOSHER DAVID
MOSHER SUSAN
PO BOX 644
SHUTESBURY, MA 01072

PARCEL: ZM-15
KEILY ROSS
3011 NE HOYT ST APT B
PORTLAND OR 97232

PARCEL: M-80
SMITH MIRANDA K
50 DRUM HILL RD
CONCORD, MA 01742

PARCEL: M-20
VOGES FORREST
46 FLORENCE STREET
SPRINGFIELD, MA 01105

PARCEL: O-86
WILDMAN KENNETH G
LYON SUZANNE M
P O BOX 101
SHUTESBURY, MA 01072

PARCEL: O-33
MCCAHON DAVID J
MCCAHON CYNTHIA D
922 UNIVERSITY BAY DR
MADISON WI 53705

PARCEL:

PARCEL: L-1, L-4, M-17, M-19, N-8, N-12, N-75,
DCR - DIV. WSP
251 CAUSEWAY ST
BOSTON, MA 02114

PARCEL: O-82
GNATEK RONALD A.
PO BOX 551
SHUTESBURY, MA 01072

PARCEL: O-80
LOGAN NANCY E & TIMOTHY R TRUSTEES
NANCY & TIM LOGAN 2019 TRUST
P O BOX 624
SHUTESBURY, MA 01072

PARCEL: O-1, O-65
O'BRIEN TIMOTHY
O'BRIEN DEBORAH
P O BOX 74
SHUTESBURY, MA 01072

PARCEL: M-82
REHORKA GARY A
REHORKA RACHEL A SCHWAB
P O BOX 601
SHUTESBURY, MA 01072

PARCEL: ZO-43
TOWN OF SHUTESBURY
P O BOX 276
SHUTESBURY, MA 01072

PARCEL: ZO-3, ZO-6
D COWLS INC
P O BOX 9677
N AMHERST, MA 01059

PARCEL: O-49
WILSON FREDERICK R JR
WILSONPAT H
PO BOX 543
SHUTESBURY, MA 01072

PARCEL:

PARCEL:

APPENDIX F-2

Abutter Notification Form Template

dcr
Massachusetts

SHUTESBURY CONSERVATION COMMISSION
NOTIFICATION TO ABUTTERS

In accordance with the second paragraph of the Massachusetts Wetlands Protection Act (G.L. Ch. 131 §40), §10.05(4)(a) of 310 CMR 10.00 of the Wetlands Regulations, and the Shutesbury General Wetlands Protection Bylaw and Regulations, you are hereby notified as the owner of land abutting another parcel for which certain activities are proposed. A Public Hearing on the matter is described below.

A. A Notice of Intent was filed with the Shutesbury Conservation Commission on (date) ___/ /2023___ seeking permission to remove, fill, dredge or alter an area subject to protection (Wetland Resource Area and/or Protected Buffer Zone) under the Massachusetts Wetlands Protection Act (General Laws Ch. 131 §40) and the Shutesbury General Wetlands Protection Bylaw.

B. Name of the applicant(s): Dan Clark, Ph.D. Regional Director Quabbin/Ware Regions

C. Address/Parcel Number of the project site: Parcel ID: N-88

D. The proposed activity is: Camel Brook Bridge and Road Repairs

E. A Public Hearing regarding this Notice of Intent will be held on: ____/____ / 2023

F. **Public Participation will be via Virtual Means Only:** This meeting of the Shutesbury Conservation Commission will be conducted via remote participation. Instructions for participating in the virtual Public Hearing will be listed on the meeting agenda posted on the Town calendar at least 48 hours in advance of the meeting. The Public Hearing may be rescheduled due to unforeseen circumstances. Remote access information will be published on the Shutesbury meeting calendar: www.shutesbury.org/calendars. Click on the agenda for the meeting you wish to attend.

G. The Notice of Intent may be examined on the Shutesbury Conservation Commission website: shutesbury.org/other-concom-projects and at the Conservation Commission office on Tuesdays and Thursdays from 10-1 by appointment. A paper copy may be obtained, for a fee, from the Shutesbury Town Clerk: townclerk@shutesbury.org or 413-259-1204. Copies may also be obtained from the applicant or the applicant's representative.

H. Notice of the Public Hearing, including date, time, and place will be published at least five business days in advance in _____ Greenfield Recorder _____ (newspaper).

For more information, contact the Shutesbury Conservation Commission (concom@shutesbury.org or 413-259-3792) or the Massachusetts Department of Environmental Protection (MassDEP) Western Region Office at (413-784-1100).

APPENDIX F-3

Affidavit of Service

dcr
Massachusetts

AFFIDAVIT OF SERVICE

Under the Massachusetts Wetlands Protection Act

I, Dan Clark, Ph.D., hereby certify under the pains and penalties of perjury that on __ _____, 2023, I.gave notification to abutters in compliance with the second paragraph of Massachusetts General Laws Chapter 131, section 40, and the DEP Guide to Abutter Notification dated April 8, 1994, in connection with the following matter:

A Notice of Intent filed under the Massachusetts Wetlands Protection Act by the Department of Conservation and Recreation, Division of Water Supply Protection with the Shutesbury Conservation Commission for the Camel Brook Bridge Repairs located on Cornwell Road, Shutesbury, MA.

The form of the notification, and a list of the abutters to whom it was given and their addresses are attached to this Affidavit of Service.

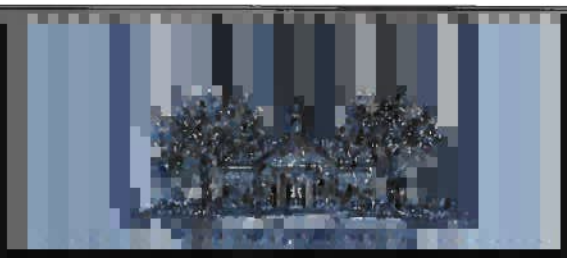
_____ _____

Name Date

APPENDIX F-4

Site Access Form for Shutesbury ConCom

dcr
Massachusetts



APPENDIX G

Stormwater Management Checklist and Report

dcr
Massachusetts

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

Checklist for Stormwater Report

A. Introduction

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

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

The Stormwater Report must include:

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

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

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

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

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

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

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

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature

5/8/23

Signature and Date

Checklist

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

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

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

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

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

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

Standard 3: Recharge

☐ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

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

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

☐ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

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

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

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

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

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

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

☐ Solid Waste Landfill pursuant to 310 CMR 19.000

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

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

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

Standard 4: Water Quality

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

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

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

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

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

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

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

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

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

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

☐ All exposure has been eliminated.

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

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

Standard 6: Critical Areas

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

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

Checklist for Stormwater Report

Checklist (continued)

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

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

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

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

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

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

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

Standard 9: Operation and Maintenance Plan

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

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

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

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

Standard 10: Prohibition of Illicit Discharges

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

☒ An Illicit Discharge Compliance Statement is attached;

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

Stormwater Report

Standard 1

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

There are no new stormwater conveyances as a result of this project. This standard has been met, as required, for this redevelopment project.

Standard 2

Peak Attenuation Rate

This is a redevelopment project and full compliance is not required. This standard has been met to the maximum extent practicable, meanwhile improving upon the existing site conditions.

Standard 3

Stormwater Recharge

This is a redevelopment project and full compliance is not required. This standard has been met to the maximum extent practicable, meanwhile improving upon the existing site conditions.

Standard 4

Water Quality

This is a redevelopment project and full compliance is not required. This standard has been met to the maximum extent practicable, meanwhile improving upon the existing site conditions.

Standard 5

Land Uses with Higher Potential Pollutant Loads (LUHPPL)

This is a redevelopment project and full compliance is not required. This standard has been met to the maximum extent practicable, meanwhile improving upon the existing site conditions.

Standard 6

Critical Areas

According to the Massachusetts Surface Water Quality Standards, 314 CMR 4.00, the project site is located within an ORW watershed and a Zone A Surface Water Protection Area as it relates to the tributaries of the Quabbin Reservoir.

This is a redevelopment project and full compliance is not required. This standard has been met to the maximum extent practicable, meanwhile improving upon the existing site conditions.

Standard 7

Redevelopment

The project consists of maintenance and improvement of an existing road. The project does not propose any widening or additional shoulder, thus the project is classified as a limited project per 310 CMR 10.53 (3)(f) maintenance and improvement of a public roadway, but limited to widening less than a single lane. In addition, per the Massachusetts Stormwater Handbook, the project is classified as a redevelopment project.

The limited and redevelopment project will not result in any new point source discharges or increase in impervious area within the project area. In addition, the project area is limited in size due to the location of the resource areas and the existing tree coverage.

Due to the nature of the project, stormwater management is met to the maximum extent practicable, meanwhile improving upon the existing site conditions.

Standard 8

Construction Period Controls

Construction Period Measures are proposed as indicated on the plans in Appendix A and as described in Section 3.5 of the Notice of Intent Narrative. Erosion, sedimentation and pollution prevention plans will be enforced and monitored throughout the construction period.

This standard has been met, as required, for this redevelopment project.

Standard 9

Operation and Maintenance Plan

An Operation and Maintenance Plan has been provided in Section 3.7 of the Notice of Intent Narrative, to ensure a stable site and long useful life.

This standard has been met, as required, for this redevelopment project.

Standard 10

Illicit Discharges to Drainage System

This statement is provided in accordance with the provisions of the Massachusetts Stormwater Management Standard 10 and of the Massachusetts Stormwater Management Handbook:

Note the following:

- All stormwater management systems contain no connection to the site's wastewater sewer system or to any other non-stormwater collection system.
- Groundwater collection systems, if provided, are not connected to the site's wastewater sewer system or to any other non-stormwater collection system.
- The facility's Operation and Maintenance Plan is designed to prevent any discharge of non-stormwater to the drainage system.
- Any illicit discharged identified during or after construction will be immediately disconnected.

Signed

5/8/23

Date

https://massgov.sharepoint.com/sites/DCR-Teams-DWSP-QUAB-CE/Shared Documents/Road Infrastructure/Bridges/Camel Brook/CamelBrook_NOI/CamelBrook_NOI_SWreport.docx

APPENDIX H

Historic Locus Maps and Photographs

dcr
Massachusetts

Appendix H
MA Historical Commission Evaluation

Photo 1: 6/25/2009 – View of wooden bridge deck along Cornwell Road.

Photo 2: 6/09/2017 – View of wooden bridge crossing at Cornwell Road.

Photo 3: 6/25/2009 – View from upstream approach to crossing at Cornwell Road bridge.

Note channel undermining and erosion of northwest abutment.

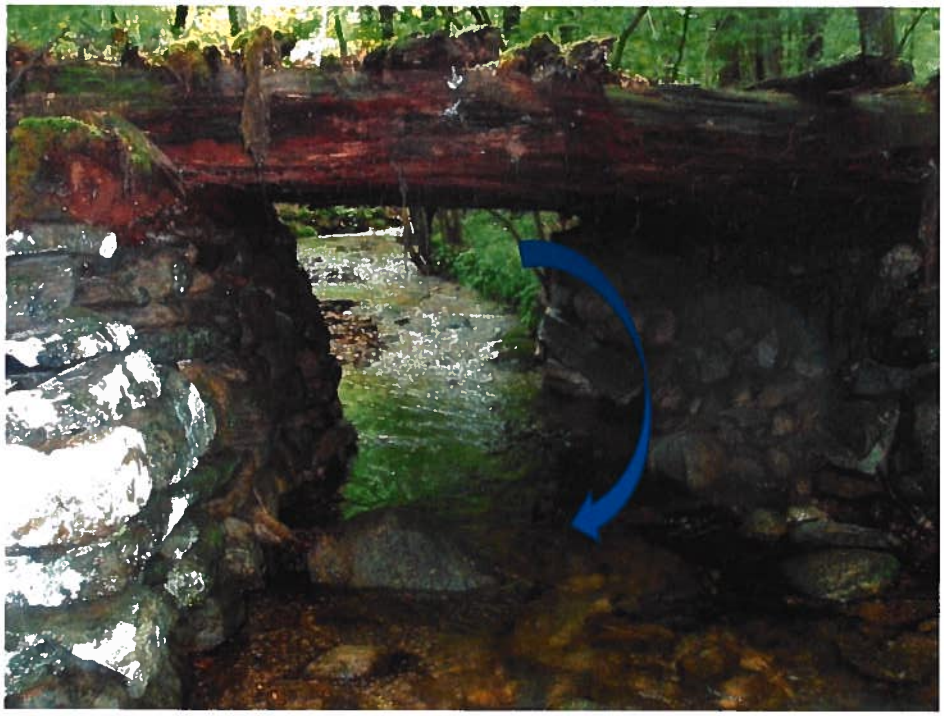


Photo 4: 6/25/2009 – View from downstream from the original wooden bridge.

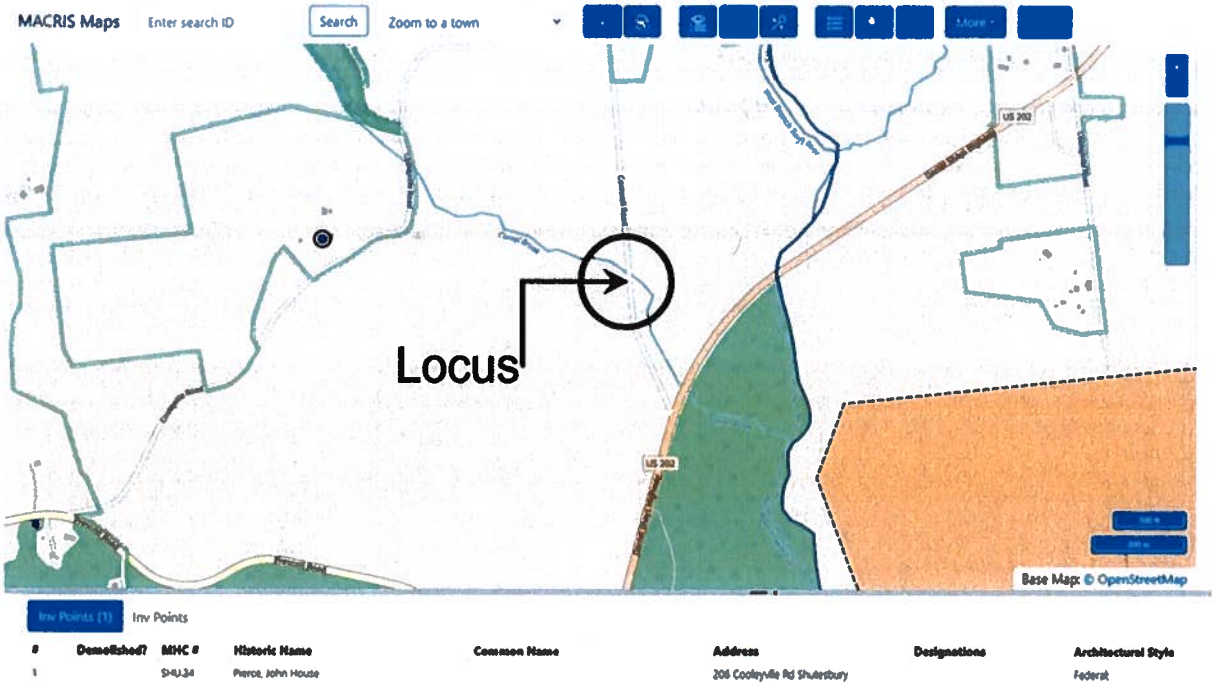


Photo 5: 3/21/23 – MACRIS Inventory Map – Cornwell Road, Shutesbury, MA

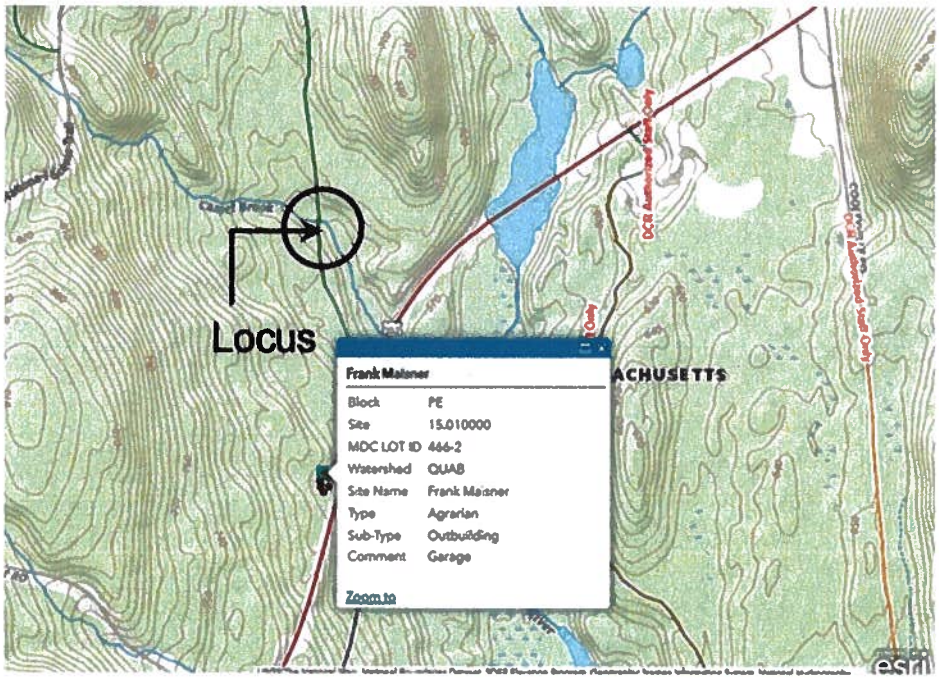


Photo 6: 3/21/23 – ArcGIS MDC Cultural Resources Inventory Map – Cornwell Road, Shutesbury, MA.

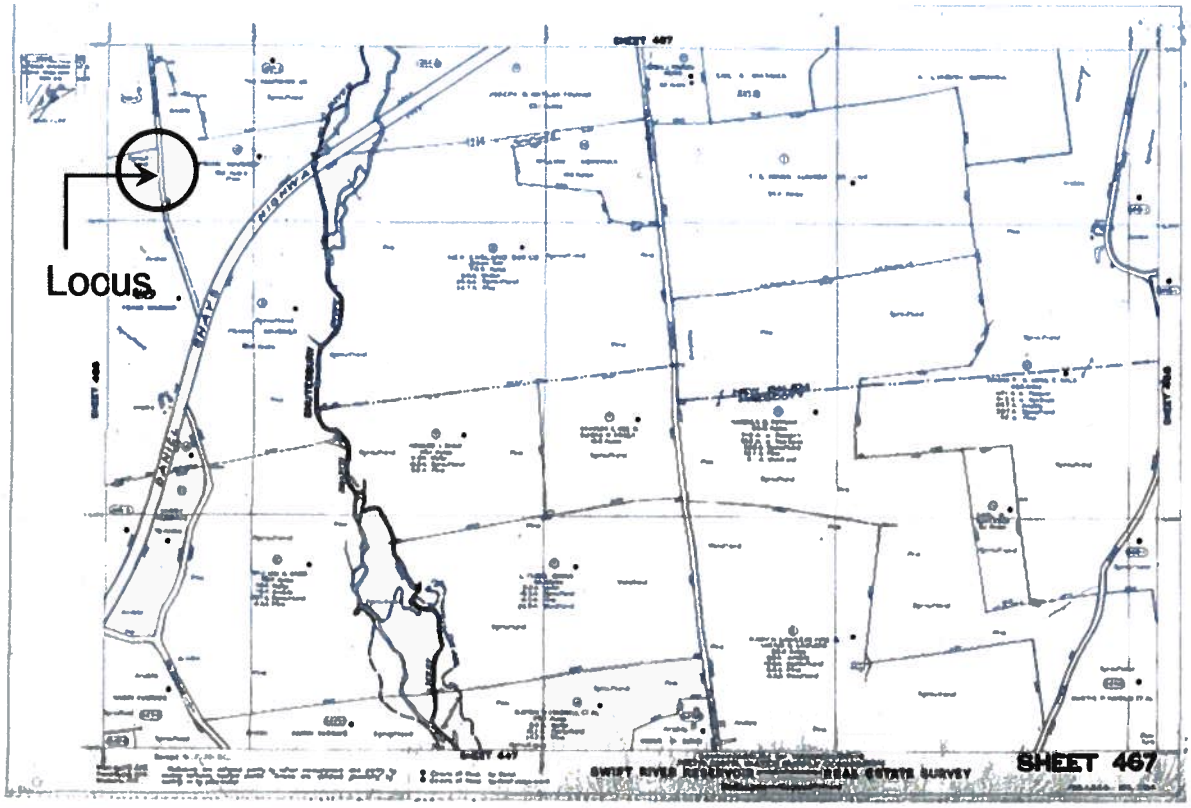


Photo 7: Real Estate Survey Sheet 467 – MDWSC