Orr&Reno

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May 21, 2015

Via Hand Delivery
Martin P. Honigberg, Chairman
New Hampshire Site Evaluation Committee
21 South Fruit Street, Suite 10
Concord, NH 03301

Re: Groton Wind Project – Bridge Replacement

Dear Chairman Honigberg:

Enclosed please find a copy of a Dredge and Fill Application which is being submitted to the New Hampshire Department of Environmental Services ("NHDES") and a Request for Project Review which is being submitted to the New Hampshire Division of Historical Resources ("NHDHR") on behalf of Groton Wind, LLC. These documents concern the replacement of a bridge that is located within the boundaries of the Groton Wind Project site in Groton, New Hampshire. The owner of the land leased by Groton Wind for its wind project (i.e., Green Acre Woodlands, Inc.) had installed the bridge many years ago as a forestry crossing for use as part of its forestry management activities. Currently, the bridge provides the primary means of access to Groton Wind's wind turbines. Because the bridge has been damaged by high flow events, it needs to be replaced as soon as possible. Groton Wind is coordinating its work on this bridge replacement project with NHDES and NHDHR and makes this filing with the New Hampshire Site Evaluation Committee ("SEC" or "Committee") for informational purposes.

Groton Wind believes that the bridge replacement does not constitute a sizeable change or addition to existing "facilities" within the meaning of RSA 162-H:5, I, and therefore no action need be taken by the SEC to review or certificate the bridge replacement project. The width and load rating of the new bridge will remain the same as the old one and the new span will increase by only 10.5 feet (in order to meet new NHDES stream crossing rules which encourage longer

spans over streams). In these circumstances, the new bridge cannot be viewed as a sizeable change or addition. However, Groton Wind is mindful of the several factors the SEC considers in determining whether a change or additional to an existing facility is sizeable: "(i) the size of the energy facility and the size of the proposed change; (ii) whether the proposed change will require the acquisition of new land; (iii) whether the proposed change will change the capacity of the existing facility; (iv) whether the proposed change is merely a replacement of existing facility components or an expansion/increase in component size; and (v) whether the proposed addition or change will cause disruption in the existing environment." *Re: Motion of Granite State Gas Transmission Company,* SEC Docket No. 2014-01, Order Granting Motion for Declaratory Ruling (Aug. 20, 2014) at 9-10. As indicated below, when these factors are applied to the instant project, it is clear that the replacement bridge does not constitute a sizeable change or addition to the Groton Wind facility.

(i) Size: The entire Groton Wind project comprises over 4,000 acres. The width of the new bridge will remain the same as the old one and the new span will increase by only 10.5 feet. The increase in span is required by NHDES rules intended to minimize stream impacts.
(ii) The replacement bridge will not require additional land.
(iii) The replacement bridge will not change the Groton Wind facility's capacity.
(iv) The project is a replacement of an existing project component with the same width and load rating.
(v) The project will not cause "disruption in the existing environment." The bridge project's environmental impacts are described in the enclosed application and could be characterized as rather minimal. Although there is an expected permanent impact to 430 square feet of wetlands, compensatory mitigation is not required. There are no vernal pools in this area and there are no known rare or exemplary plant, animal or natural communities near the project location. NHDES will review environmental impacts in connection with its Wetlands Permit review.

In view of the foregoing, Groton Wind respectfully requests that this matter be placed on file by the SEC for informational purposes only. If the Committee has any questions or concerns, please contact me. Thank you for your assistance with this matter.

Very truly yours,

Susan S. Geiger

Enclosures
cc: Michael Iacopino, Esq.
1315154_1

Please mail the completed form and required material to:

New Hampshire Division of Historical Resources
State Historic Preservation Office
Attention: Review & Compliance
19 Pillsbury Street, Concord, NH 03301-3570

DHR Use Only	
R&C #	_____
Log In Date	____ / ____ / ____
Response Date	____ / ____ / ____
Sent Date	____ / ____ / ____

Request for Project Review by the New Hampshire Division of Historical Resources

☒ This is a new submittal
☐ This is additional information relating to DHR Review & Compliance (R&C) #:

GENERAL PROJECT INFORMATION

Project Title **Groton Wind Farm - Upper Bridge Replacement**

Project Location **Groton Hollow Road**

City/Town **Groton** Tax Map **9** Lot # **2**

NH State Plane - Feet Geographic Coordinates: Easting **946034** Northing **457290**
(See RPR Instructions and R&C FAQs for guidance.)

Lead Federal Agency and Contact *(if applicable)* **US Army Corps of Engineers**
(Agency providing funds, licenses, or permits)
Permit Type and Permit or Job Reference # **Wetland Permit – Not Yet Submitted**

State Agency and Contact *(if applicable)* **NHDES Wetlands Bureau**

Permit Type and Permit or Job Reference # **2014-03346 (Previous Emergency Authorization)**

APPLICANT INFORMATION

Applicant Name **Groton Wind, LLC c/o Iberdrola Renewables, Inc.**

Mailing Address **1125 NW Couch Street, Suite 700** Phone Number **(610) 230-0356**

City **Portland** State **OR** Zip **97209** Email **doren.emmett@iberdrolausa.com**

CONTACT PERSON TO RECEIVE RESPONSE

Name/Company **Peter J. Walker, VHB**

Mailing Address **2 Bedford Farms Drive, Suite 200** Phone Number **(603) 391-3900**

City **Bedford** State **NH** Zip **03110** Email **pwalker@vhb.com**

This form is updated periodically. Please download the current form at www.nh.gov/nhdhr/review. *Please refer to the Request for Project Review Instructions for direction on completing this form.* Submit one copy of this project review form for each project for which review is requested. Include a self-addressed stamped envelope to expedite review response. Project submissions will not be accepted via facsimile or e-mail. This form is required. Review request form must be complete for review to begin. Incomplete forms will be sent back to the applicant without comment. Please be aware that this form may only initiate consultation. For some projects, additional information will be needed to complete the Section 106 review. All items and supporting documentation submitted with a review request, including photographs and publications, will be retained by the DHR as part of its review records. Items to be kept confidential should be clearly identified. For questions regarding the DHR review process and the DHR's role in it, please visit our website at: www.nh.gov/nhdhr/review or contact the R&C Specialist at christina.st.louis@dcr.nh.gov or 603.271.3558.

PROJECTS CANNOT BE PROCESSED WITHOUT THIS INFORMATION

Project Boundaries and Description

- ☒ Attach the relevant portion of a 7.5' USGS Map (photocopied or computer-generated) ***indicating the defined project boundary.*** *(See RPR Instructions and R&C FAQs for guidance.)*
- ☒ Attach a detailed narrative description of the proposed project.
- ☒ Attach a site plan. The site plan should include the project boundaries and areas of proposed excavation.
- ☒ Attach photos of the project area (overview of project location and area adjacent to project location, and specific areas of proposed impacts and disturbances.) *(Informative photo captions are requested.)*
- ☒ A DHR file review must be conducted to identify properties within or adjacent to the project area. Provide file review results in **Table 1**. *(Blank table forms are available on the DHR website.)* File review conducted on **05/08/2015**.

Architecture

Are there any buildings, structures (bridges, walls, culverts, etc.) objects, districts or landscapes within the project area? ☒ Yes ☐ No **(Note: Only the existing "Upper Bridge" is present; no other structures.)** If no, skip to Archaeology section. If yes, submit all of the following information:

Approximate age(s): **+/- 25 years**

- ☒ Photographs of ***each*** resource or streetscape located within the project area, with captions, along with a mapped photo key. (Digital photographs are accepted. All photographs must be clear, crisp and focused.)
- ☐ If the project involves rehabilitation, demolition, additions, or alterations to existing buildings or structures, provide additional photographs showing detailed project work locations. (i.e. Detail photo of windows if window replacement is proposed.)

Archaeology

Does the proposed undertaking involve ground-disturbing activity? ☒ Yes ☐ No
If yes, submit all of the following information:

- ☒ Description of current and previous land use and disturbances.
- ☒ Available information concerning known or suspected archaeological resources within the project area (such as cellar holes, wells, foundations, dams, etc.)

Please note that for many projects an architectural and/or archaeological survey or other additional information may be needed to complete the Section 106 process.

DHR Comment/Finding Recommendation *This Space for Division of Historical Resources Use Only*

☐ Insufficient information to initiate review. ☐ Additional information is needed in order to complete review.

☐ No Potential to cause Effects ☐ No Historic Properties Affected ☐ No Adverse Effect ☐ Adverse Effect

Comments:_____

_____

_____

_____

_____

_____

_____

_____

If plans change or resources are discovered in the course of this project, you must contact the Division of Historical Resources as required by federal law and regulation.

Authorized Signature: _____ Date: _____

Attachment 1
Request for Project Review by the New Hampshire Division of Historical Resources

Groton Wind Farm Upper Bridge Replacement
May 2015

A. Project Boundaries and Description

(1) Project Description

The proposed project involves the replacement of the "Upper Bridge" that crosses over Clark Brook on Groton Hollow Road at the Groton Wind Farm. The proposed project is located on Tax Map 9 Lot 2, which is owned by Green Acre Woodlands, Inc. c/o Foreco, LLC. Groton Wind, LLC leases a portion of this lot on which it operates a 48-MW wind farm.

The Upper Bridge was installed and maintained as a forestry crossing by the property owner, Green Acre Woodlands, as part of its forestry management activities. The bridge was used during the construction of the Groton Wind Farm in 2011-2012, and it provides the primary means of access to the 24 turbine array located on the adjacent ridgelines. The bridge has been damaged by recent high flow events, with severe scouring at the abutments. In assessing solutions to this problem, Groton Wind has determined that complete replacement of the bridge is appropriate.

The existing bridge consists of precast slab superstructure supported by stacked "waste-block" concrete blocks. The minimum clear span is approximately 8.5 feet over Clark Brook and the roadway grade is between eight (8) and nine (9) feet above the average elevation of the brook. The bridge is approximately 16.6 feet wide measured between guardrail faces and approximately 18 feet wide measured from the outside face of slab. The exact age of the Upper Bridge is not known, but it was apparently installed within the last few decades, and has been previously repaired. A new concrete deck was installed during the construction of the wind farm in 2011.

The abutment foundations are completely undermined from scour. The precast concrete footing sections (approximately 1 ft thick) are completely exposed with a significant loss of foundation soil support along the entire length of each abutment. Several concrete blocks have shifted and fallen out of place at the upstream and downstream end leading to a loss of roadway embankment along the guardrails behind the abutments. No channel armament or riprap along the abutments or at the inlet and outlet of the bridge is present.

The existing crossing appears to be undersized and constricting the natural bankfull channel and floodplain. The constriction of the stream flow has likely resulted in the observed scour that had moved or loosened several of the abutment blocks.

NHDES issued an emergency authorization to stabilize the failing abutment on November 25, 2014 (NHDES File Number: 2014-03346). The bridge was compromised due to a storm event which dislodged and moved several abutment blocks. The work that was completed at that time consisted of:

- Installing temporary erosion/sedimentation control measures
- Remove concrete abutment block that had become disengaged from the bridge support structure
- Inserted boulder to act as temporary support for bridge structure
- Attach chain from top of concrete block(s) to guard rail to hold in place
- Remove temporary erosion/sedimentation control measures

These measures were only taken to provide a temporary fix since the abutment blocks had been compromised to such a large degree. The proposed project is a complete reconstruction of the bridge.

The proposed project work involves the following:

- Carefully removing the existing bridge in its entirety including concrete blocks, footings, substructure slabs, and railings. The existing components will be removed and stockpiled at a suitable location on the property approved by Iberdrola Renewables.
- A new precast concrete frame, footings and wing walls for the proposed bridge would be put in place. The frame will have a wider opening span to properly accommodate the flow of Clark Brook.
- Streambed restoration is proposed to restore disturbed areas to their original condition.
- Temporary water diversions will be installed to complete the work and removed once the project is completed.

(2) Engineering Plans

Figure 1 shows the approximate limits of the Project Area on a USGS Topographic Map, while the engineering plans provided in **Appendix A** show the proposed limits of grading.

(3) Photos of the Project Area

See attached photograph log and photo location map (**Appendix B**).

(4) DHR File Review

A site file review was conducted on May 8, 2015 by Peter J. Walker of VHB. Town files for Groton were reviewed, as well as the project-specific technical file for the previous Groton Wind Farm project (RPR# 1422), including the project area form for the wind farm project (MLT-GWP).

(5) Previously Recorded Properties

Berger (2010a and 2010b) reported archaeological site 27-GR-225 near, but not within, the Upper Bridge Area of Potential Effects (APE). See below for more discussion.

B. <u>Architecture: Are there any buildings, structures (bridges, walls, culverts, etc.) objects, districts, or landscapes within the project area?</u>

Except for the existing bridge itself, there are no other buildings, structures, objects, districts or landscapes within the project's area of potential effects (APE). The project area is limited to the bridge footprint and adjacent side slopes, and there are no standing structures visible from this area. The parcel that the project is located on is a large parcel and is not visible from the public roads.

C. <u>Archaeology: Does the proposed undertaking involve ground-disturbing activity?</u>

Yes. The proposed reconstruction of the Upper Bridge will require earthwork and ground disturbance to the project area. The existing bridge will need to be removed and excavation will be necessary to install the new footings for the proposed bridge. The disturbance will be mostly limited to the existing disturbed roadway and adjacent fill slopes, but work would also occur within the streambed of Clark Brook, as well

as its adjacent banks for a short distance up- and downstream of the bridge. Because the work is limited to the streambed and areas previously disturbed by roadway construction, no impacts to archaeologically sensitive resources are anticipated.

Description of current and previous land use and disturbances

The project is located in an area that was previously disturbed by the construction of the original Groton Hollow Road, as well as by timber harvesting of the adjacent property and the upgrades to Groton Hollow Road that occurred during the construction of the Groton Wind Farm.

According to the Phase IA Archaeological Survey conducted by The Louis Berger Group, Inc. for the Groton Wind Project, portions of the APE of the larger wind project site were classified as archaeologically sensitive, along with most of the primary access for the wind farm project. (Berger 2010a) Berger subsequently conducted a Phase IB investigation, which was reported to NHDHR on October 5, 2010. (Berger 2010b) The Phase IB included 923 shovel test pits (STPs), including 341 STPs along the "Primary Access Road" (i.e., Groton Hollow Road). Positive STPs were reported at a site designated as 27-GR-225, which is located several hundred feet to the southeast of the Upper Bridge project area. The Upper Bridge project area does not include any positive shovel test pits. Rather, negative STPs were documented within and near the Upper Bridge APE (*i.e.*, STPs PAR 9-1, PAR 9-2, and PAR 9-3, *etc*.).

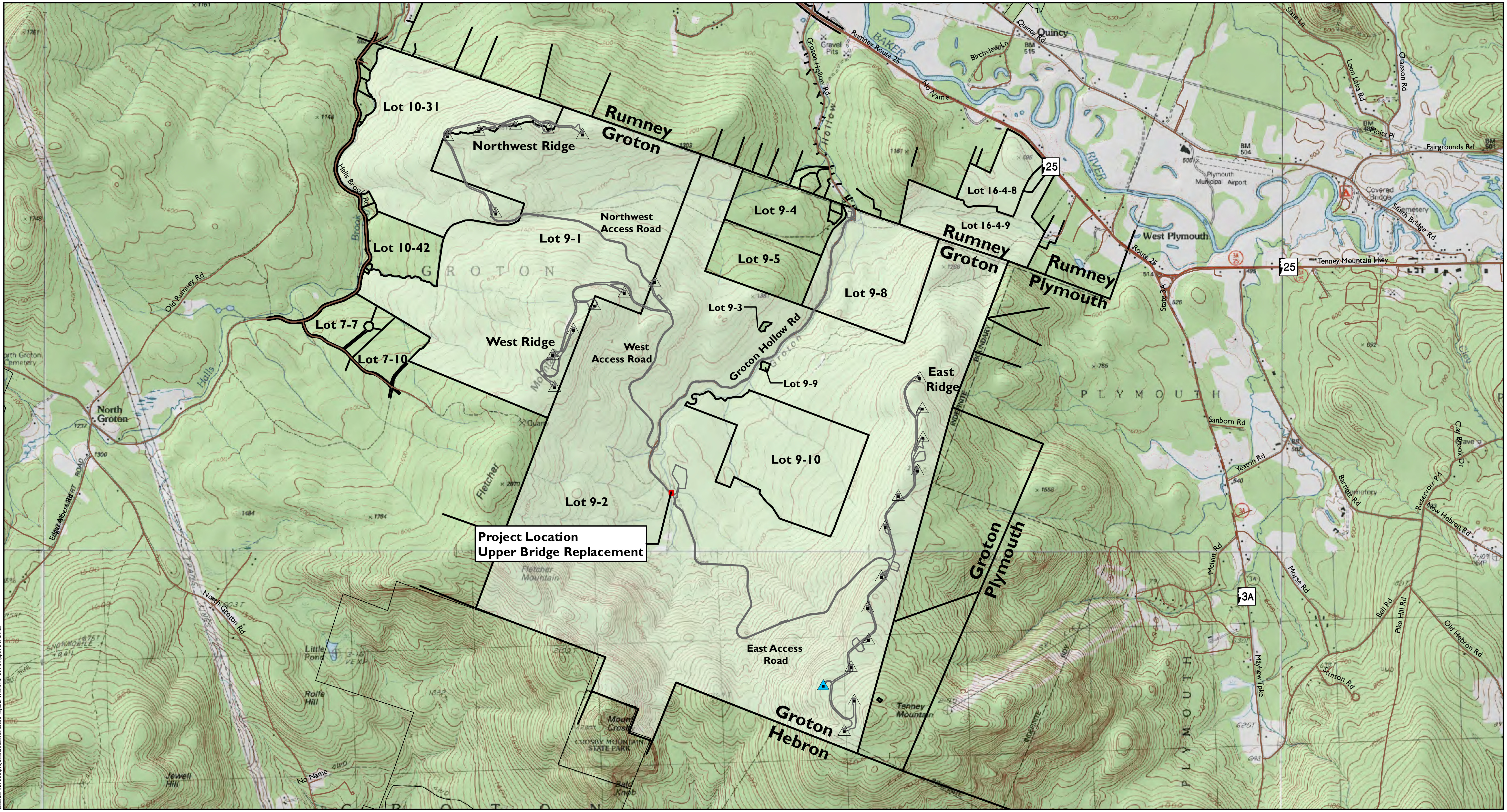
Available information concerning known or suspected archaeological resources within the project area (such as cellar holes, wells, foundations, dams, etc.)

Site 27-GR-225 consists of two cellar holes which were identified by Berger (2010a) and subsequently further defined in Berger (2010b). These cellar holes are located several hundred feet south east of the Upper Bridge APE. A cut granite foundation, most likely of a house, was identified on the east side of the former Groton Hollow Road and a more rudimentary stone foundation, most likely a carriage house or barn, was identified on the west side of the road. These foundations are not within the Upper Bridge APE. Note also, that the reconstructed Groton Hollow Road was relocated to avoid this site during the construction of the wind farm.

D. References

The Louis Berger Group, Inc.
2010a *Phase IA Archaeological Survey, Groton Wind Project, Grafton County, New Hampshire*. Report prepared on behalf of Groton Wind, LLC, by the Louis Berger Group, Inc., Albany, New York.

The Louis Berger Group, Inc.
2010a *End-of-Field Letter, Phase IB Archaeological Survey, Groton Wind LLC, Proposed Groton Wind Project, Grafton County, New Hampshire (Berger Reference CXE-4684)*. Report prepared on behalf of Groton Wind, LLC, by the Louis Berger Group, Inc., Albany, New York.



Legend

- Upper Bridge Site
- Turbine
- Permanent Met Tower
- Project Location (Shaded White)
- Gravel Areas
- Lake/Pond
- Property Line
- River/Stream
- Roads (NHDOT)
- Project Location (Shaded White)

0 2,500 5,000 Feet

Source: USGS Quadrangle: Ashland, Mt. Cardigan, Newfound Lake, Plymouth, Rumney, Wentworth
Property Lines based on multiple sources of data including ground survey, and assessing tax maps.
Conservation Lands, Roads, and hydrography data taken from the archives on NHGRANIT.

Vanasse Hangen Brustlin, Inc.

Figure 1

Site Location Map

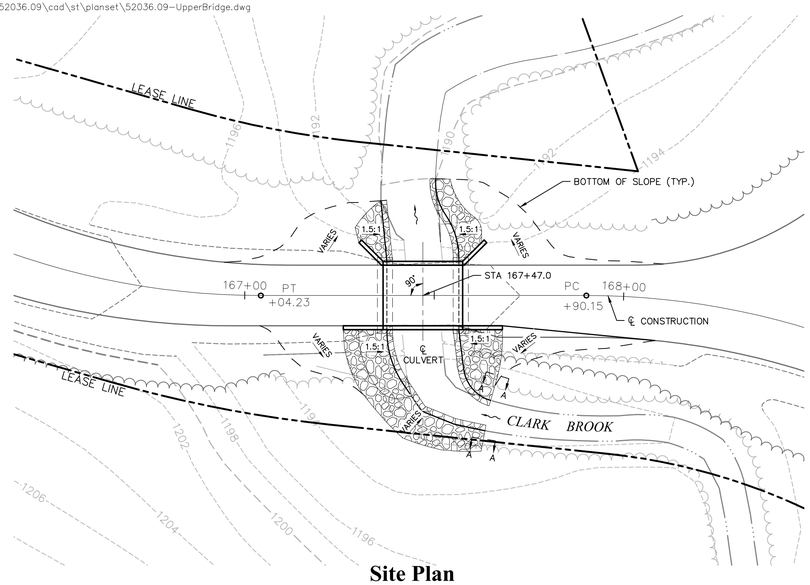
Upper Bridge Replacement

Groton Hollow Road
Groton, NH

IBERDROLA RENEWABLES

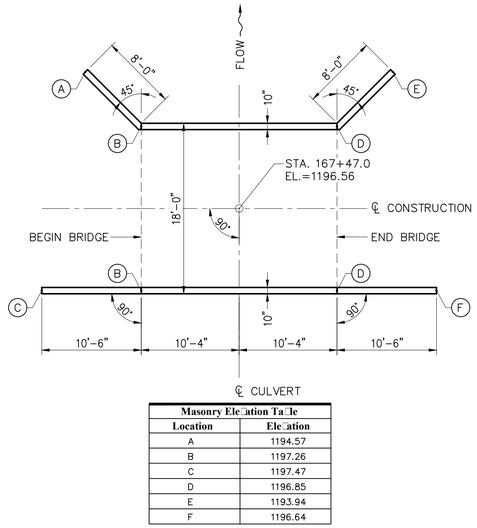
Appendix A

Project Plans



Site Plan

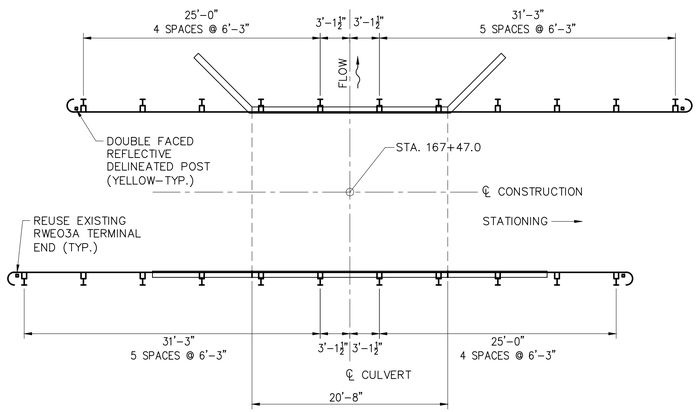
0 10 20 40 Feet



Masonry Elevation Table	
Location	Elevation
A	1194.57
B	1197.26
C	1197.47
D	1196.85
E	1193.94
F	1196.64

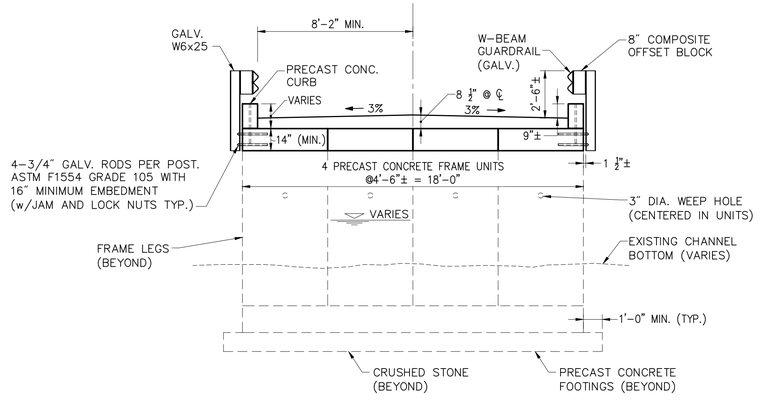
Bridge Layout & Elevations

N.T.S.



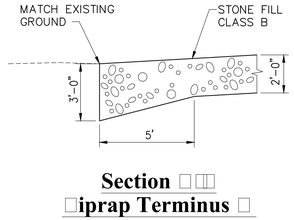
Guardrail Layout

N.T.S.



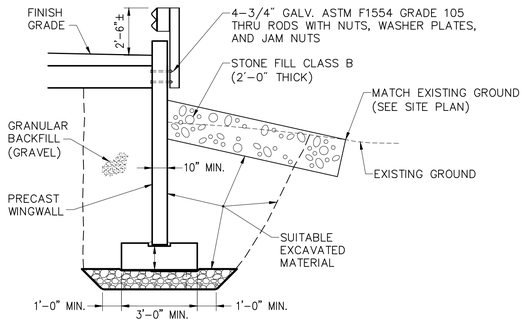
Transverse Bridge Section

N.T.S.



Section Through Riprap Terminus Upstream Slopes

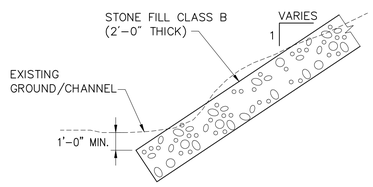
N.T.S.



Back Wingwall

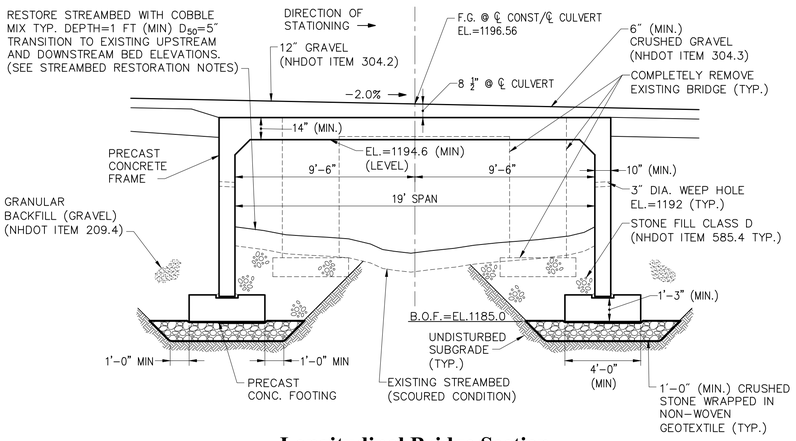
(OTHER WINGWALLS SIMILAR, NO RAIL ATTACHMENT)

N.T.S.



Channel Stabilization Detail

N.T.S.



Longitudinal Bridge Section

N.T.S.

Notes:

Construction Specification

NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION (NHDOT) STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION, 2010, WITH LATEST SUPPLEMENTS.

Design Specifications

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LRFD BRIDGE DESIGN SPECIFICATIONS, SEVENTH EDITION, 2014, WITH 2015 INTERIM REVISIONS.

Design and Material Notes

1. FUNCTIONAL CLASSIFICATION: VERY LOW VOLUME, LIMITED ACCESS ROAD, PRIVATE.
2. LIVE LOAD = HL-93, MODIFIED WITH 25% INCREASE IN TRUCK OR TANDEM PORTION OF LOADING.
3. BACKFILL UNIT WEIGHT = 125 PCF (COMPACTED NHDOT 209.2.1.2 GRAVEL BACKFILL)
4. SERVICE LIMIT STATE BEARING PRESSURE = 4.0 KSF MAXIMUM
5. AT-REST LATERAL EARTH PRESSURE COEFFICIENT = 0.5
6. INTERNAL FRICTION ANGLE OF BACKFILL = 30 DEGREES
7. MINIMUM CONCRETE 28-DAY CONCRETE STRENGTHS:
   A. PRECAST ELEMENTS = 5 KSI
   B. CAST-IN-PLACE ELEMENTS = 3 KSI
8. REINFORCING STEEL SHALL CONFORM TO AASHTO M 31 (ASTM A615) GRADE 60. PRECAST CULVERT REINFORCING STEEL SHALL BE EPOXY COATED (ASTM A775).
9. CONCRETE COVER FOR REINFORCING STEEL: 1.5"MINIMUM EXCEPT 3"MINIMUM FOR FOOTINGS AND 2"MINIMUM FOR TOP MAT REINFORCEMENT IN THE TOP SLAB OF THE CULVERT.
10. HYDRAULIC DATA:
    A. DRAINAGE AREA = 0.83 SQUARE MILES
    B. Q2 = 69 CFS; Q10 = 172 CFS; Q25 = 239 CFS; Q100 = 362 CFS
    C. MINIMUM CLEAR SPAN = 19 FEET (BANKFULL WIDTH X 1.2 PLUS 2 FEET)
    D. DESIGN VELOCITY = 6 FPS
    E. DESIGN FLOOD = 25 YEAR; CHECK FLOOD (SCOUR) = 100 YEAR
    F. DESIGN SCOUR = 2 FEET
    G. DESIGN FREEBOARD (Q25) = 2 FEET MINIMUM
    H. Q25 ELEVATION = 1192.2; Q100 ELEVATION = 1193.1
11. FROST DEPTH = 5.5 FEET
12. A GEOTECHNICAL REPORT WAS PREPARED FOR THIS PROJECT BY S.W.COLE ENGINEERING, INC. DATED MARCH 6, 2015.

Construction Notes

1. THE EXISTING BRIDGE SHALL BE CAREFULLY REMOVED IN ITS ENTIRETY INCLUDING CONCRETE BLOCKS, FOOTINGS, SUPERSTRUCTURE SLABS AND RAILINGS. COMPONENTS SHALL BE TRANSPORTED AND NEATLY STOCKPILED AT A SUITABLE LOCATION ON THE PROPERTY APPROVED BY IBERDROLA RENEWABLES. GUARDRAIL END UNITS AND GUARDRAIL BEAM SHALL BE SALVAGED AND INCORPORATED INTO THE REPLACEMENT BRIDGE.
2. WATER DIVERSION AND FOUNDATION DEWATERING IS ANTICIPATED FOR THIS PROJECT. THE WORK SHALL BE PERFORMED DURING LOW-FLOW PERIODS. THE WATERWAY OF THE BROOK SHALL BE MAINTAINED AT ALL TIMES WITH A MINIMUM CROSS-SECTIONAL AREA OF 9 SF AND A SPILL-WAY OR FLOOD ELEVATION OF 1192.
3. DEBRIS CONTAINMENT, SEDIMENT AND TURBIDITY CONTROL MEASURES SHALL BE EMPLOYED AT ALL TIMES TO ENSURE WATER QUALITY OF CLARK BROOK.
4. CULVERT AND WINGWALL FOOTINGS SHALL BE PLACED ON AT LEAST 12 INCHES OF COMPACTED CLEAN, CRUSHED STONE (ASTM #57) WRAPPED IN MIRAFI 180N NON-WOVEN GEOTEXTILE.
5. ALL UNCONTROLLED FILLS, RELIC STRUCTURES, ORGANICS, AND WOOD DEBRIS SHALL BE COMPLETELY REMOVED BENEATH PROPOSED FOUNDATIONS. THE EXTENT OF REMOVAL SHALL BE 1-FOOT LATERALLY FOR EVERY 1-FOOT OF EXCAVATION OUTSIDE THE PERIMETER OF ALL FOOTINGS.
6. EXCAVATION TO BEARING SURFACES SHALL BE COMPLETED WITH A SMOOTH-EDGED BUCKET TO MINIMIZE DISTURBANCE OF SENSITIVE GLACIAL TILL. DISTURBED AREAS THAT BECOME YIELDING SHALL BE FURTHER DEWATERED, EXCAVATED, AND BACKFILLED WITH CONTROLLED LIFTS OF COMPACTED GRAVEL BACKFILL.
7. CONTROL OF WATER WITHIN THE EXCAVATION SHALL BE CONDUCTED IN SUCH A MANNER AS TO PREVENT DISTURBANCE OF THE BEARING SOIL. WELL POINTS, SUMPS OR OTHER PUMPING AREAS SHALL BE LOCATED OUTSIDE THE FOOTING LIMITS AND PROPERLY FILTERED TO PREVENT PUMPING OF THE SOIL MATERIALS BELOW THE EXCAVATION SUBGRADE.
8. THE CONTRACTOR SHALL RESTORE DISTURBED AREAS TO THEIR ORIGINAL CONDITION, UNLESS OTHERWISE SHOWN ON THE PLANS. THE CONTRACTOR SHALL USE 2 FEET OF CLASS B STONE FILL WITH AN UNDERLYING GEOTEXTILE TO RESTORE DISTURBED STREAM EMBANKMENTS.

Concrete Culvert Notes

1. THE PRECAST CULVERT, WINGWALLS, AND FOOTINGS SHALL MEET THE DESIGN AND MANUFACTURING REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS EXCEPT AS OTHERWISE SPECIFIED ON THE PLANS.
2. ALL CONCRETE MIX DESIGNS SHALL BE SIMILAR TO THAT PROVIDED AND APPROVED BY NHDOT WITHIN THE LAST 5 YEARS. VARIATIONS IN THE MIX DESIGN SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. CONCRETE USED IN PRE-CAST MEMBERS SHALL BE CLASS AAA WITH THE FOLLWING:
   A. 28-DAY STRENGTH = 5 KSI
   B. MINIMUM CEMENT PER CY OF CONCRETE = 8 BAGS
   C. MAXIMUM WATER/CEMENT RATIO = 0.38
   D. SLUMP = 5 TO 7 INCHES WITH HIGH RANGE WATER REDUCING ADMIXTURE
   E. AIR ENTRAINMENT = 5 TO 7 PERCENT
   F. MAXIMUM SIZE COARSE AGGREGATE = ¾"
3. CALCULATIONS FOR THE DESIGN OF THE CULVERT SECTIONS, FOOTINGS, CONNECTIONS, AND WINGWALLS SHALL BE PREPARED AND STAMPED BY A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF NEW HAMPSHIRE. CALCULATIONS SHALL BE INCLUDED WITH THE DETAILED SHOP DRAWINGS THAT MUST BE SUBMITTED FOR APPROVAL. DRAWINGS SHALL BE APPROVED PRIOR TO FABRICATION.
4. DETAILS AND LOCATIONS OF ALL ITEMS TO BE EMBEDDED IN THE SECTIONS, METHOD OF CURING, HANDLING, STORING, TRANSPORTING, AND ERECTING SECTIONS SHALL BE INCLUDED IN THE SHOP DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR THE PROPER CASTING, HANDLING, LIFTING, STORING, TRANSPORTING, AND ERECTION OF ALL COMPONENTS SO THAT THEY CAN BE PLACED IN THE COMPLETED STRUCTURE WITHOUT DAMAGE.
5. THE FOLLOWING ARE CONSIDERED DEFECTS WHICH MAY CONSTITUTE CAUSE FOR REJECTION: ANY CRACKS WHICH EXTEND TO THE REINFORCING STEEL; HONEYCOMBS OVER 6 SQUARE INCHES IN AREA AND OVER 1 INCH DEEP; ANY DISCONTINUITY OF THE CONCRETE WHICH MAY PERMIT MOISTURE TO REACH THE REINFORCING STEEL, EDGE OR CORNER BREAKS EXCEEDING 12 INCHES IN LENGTH OR OVER 1 INCH IN DEPTH, DAMAGED ENDS THAT PREVENT MAKING A SATISFACTORY JOINT, EXTENSIVE HAIRLINE CRACKS OR CHECKS, RACKED OR UN-SQUARE SECTIONS. THE ENGINEER MAY APPROVE REPAIRS TO OCCASIONAL, NON-RECURRING, AND ISOLATED DEFECTS.
6. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED ¾" UNLESS OTHERWISE NOTED.
7. ALL PRECAST JOINTS SHALL BE SEALED AND COVERED AS RECOMMENDED BY THE MANUFACTURER AND PRIOR TO BACKFILL PLACEMENT.
8. A SILANE SEALANT WATER REPELLENT SHALL BE APPLIED TO ALL EXPOSED SURFACES OF THE PRECAST CULVERT, HEADWALL, AND WINGWALL SURFACES TO 12 INCHES BELOW FINISHED GRADE. SEALANT SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

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Groton Wind Farm

Groton Hollow Road
Groton, New Hampshire

No.	Revision	Date	Appvd.

Designed by S. Hodgdon | Checked by J. Whitmore

Issued for

Date: April 24, 2015

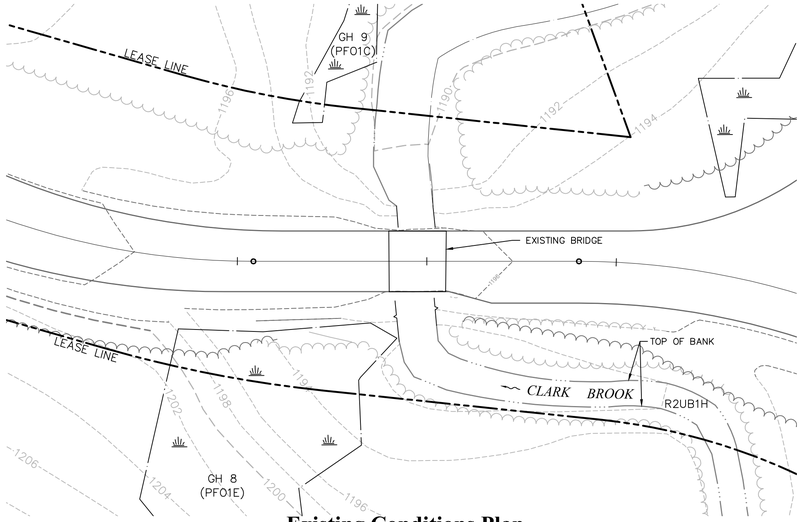
Not For Construction

Drawing Title: Upper Bridge Reconstruction

Drawing Number

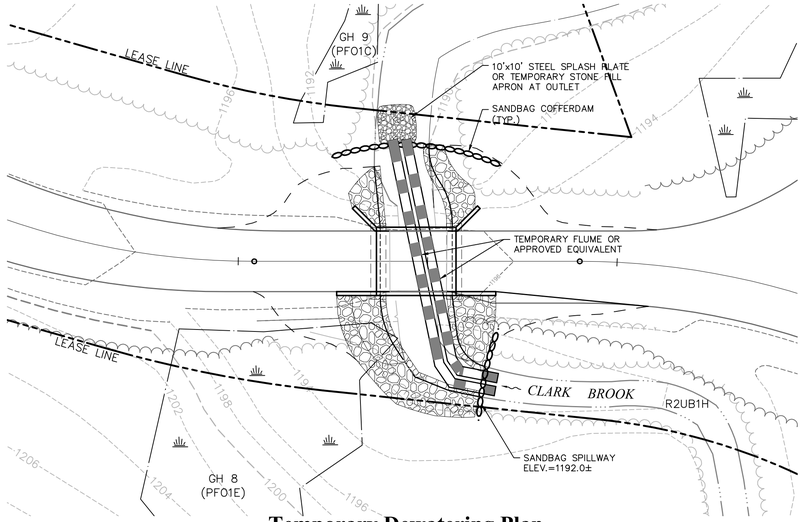
Sheet 1 of 2

Project Number: 52036.09



Existing Conditions Plan

0 10 20 40 Feet



Temporary Dewatering Plan

0 10 20 40 Feet

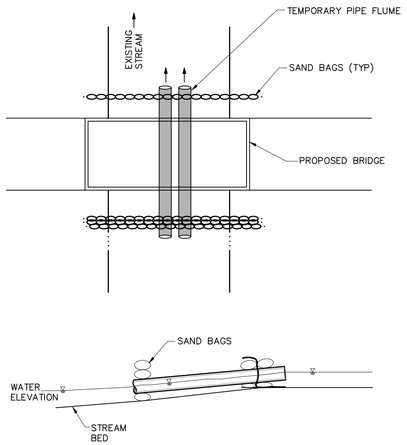
Wetland Classification Codes

PF01E	PALUSTRINE, FORESTED, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED/SATURATED
R2UB1H	RIVERINE, LOWER PERENNIAL, UNCONSOLIDATED BOTTOM, COBBLE-GRAVEL, PERMANENTLY FLOODED

Wetland Impact Summary

Resource	USFWS Wetland Classification	Impact Location	Area (sf)			
			Permanent Impacts		Temporary Impacts	
			(sf)	(lf)	(sf)	(lf)
WETLAND	PF01E	A	140			
STREAMBED / BANK	R2UB1H	B			330	30
		C	290	30		
		D			270	30
TOTAL			430	30	600	60

PERMANENT IMPACTS:	430 SF
TEMPORARY IMPACTS:	600 SF
	TOTAL IMPACTS = 1030 SF



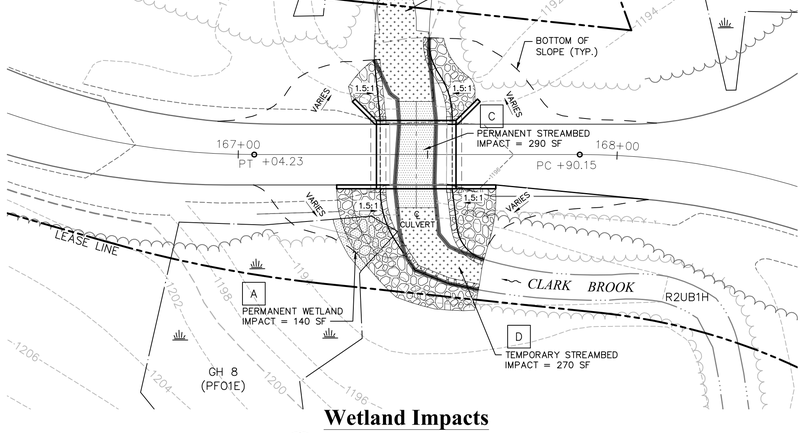
Dam and Flume For Bridge Construction

N.T.S.

Source: VHB

Notes:

1. CONSTRUCTION ACTIVITIES IN STREAMS WILL BE SCHEDULED FOR PERIODS WHEN FLOWS ARE ANTICIPATED TO BE AT A MINIMUM. IF THERE IS FLOWING WATER DURING CONSTRUCTION THE FLOW SHALL BE DIVERTED AROUND THE WORK SITE IN A STABLE MANNER USING METHODS APPROVED BY THE ENGINEER.
2. ONCE SANDBAGS ARE IN PLACE, A TEMPORARY FLUME WILL BE PLACED TO CONVEY ANY FLOW AROUND THE WORK SITE, AS NEEDED.
3. COFFERDAMS AND FLUME WILL BE REMOVED AFTER BRIDGE IS INSTALLED. COMPLETE REMOVAL IMMEDIATELY AFTER BRIDGE INSTALLATION, WITHIN ONE DAY WHENEVER POSSIBLE.
4. TREES SHALL BE SELECTIVELY TRIMMED ALONG BANKS (IF APPLICABLE) OR CLEARED TO ALLOW EQUIPMENT TO OPERATE. GRUBBING OF ROOTS SHALL BE KEPT TO A MINIMUM.
5. DETAIL PROVIDED FOR GENERAL INFORMATION ONLY. THE CONTRACTOR SHALL MODIFY AS NECESSARY TO ACHIEVE REQUIRED DEWATERING OF WORK AREA.



Wetland Impacts

0 10 20 40 Feet

Streambed Restoration Notes

1. FOLLOWING INSTALLATION OF THE BRIDGE, THE CONTRACTOR SHALL RESTORE A NATURAL STREAMBED USING COBBLE-GRAVEL-SAND MIX PLACED APPROXIMATELY 1 FT THICK TO THE SATISFACTION OF THE ENGINEER. THE FINAL ELEVATIONS OF THE STREAMBED SHALL BLEND INTO UPSTREAM AND DOWNSTREAM ELEVATIONS.
2. COBBLE-GRAVEL-SAND MIX SHALL CONSIST OF NATURAL FIELD STONE, BANK RUN GRAVEL OR NATURAL RIVER ROCK. CRUSHED STONE FROM A QUARRY OR OTHER SOURCES WILL NOT BE PERMITTED. STONE GRADATION WILL APPROXIMATE THE FOLLOWING SIZE DISTRIBUTION; AMOUNTS FINER THAN EACH LABORATORY SIEVE (SQUARE OPENINGS) (PERCENT BY WEIGHT):

CUMULATIVE PERCENT FINER	PARTICLE SIZE (IN) MIN	MAX
D_{15}	0.5	1.5
D_{35}	2.0	3.0
D_{50}	5.0	7.0
D_{85}	10.0	12.0
D_{100}		14.0

3. COBBLE-GRAVEL-SAND FILL MAY CONTAIN SMALL AMOUNTS OF FINE AGGREGATE BUT SHALL CONTAIN NO AMOUNTS OF SOIL MATERIAL.
4. COBBLE-GRAVEL-SAND MIX WILL BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT.

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Notes:

1. ANY TURBID DEWATERING EFFLUENT SHALL BE PLACED IN AN UPLAND CATCHMENT / SETTLEMENT BASIN AS REQUIRED PRIOR TO DISCHARGING INTO BROOK.
2. CONSTRUCTION SHALL BE LIMITED TO LOW FLOW CONDITIONS.

Legend

- EDGE OF WATER (PHOTOGRAMETRY)
- LIMIT OF WETLAND (SURVEY)
- PF01E — WETLAND CLASSIFICATION
- A — WETLAND IMPACT LOCATION
- PERMANENT IMPACT
- TEMPORARY STREAMBED IMPACT

Groton Wind Farm
Upper Bridge Reconstruction

Groton Hollow Road
Groton, New Hampshire

No.	Revision	Date	Appvd.

Designed by: PGG / RRL
Checked by: PJW

Issued for

Date: April 24, 2015

Not For Construction

Drawing Title
Wetland Impact Plan

Drawing Number

Sheet 2 of 2

Project Number
52036.09

Appendix B

Photo Location Map & Site Photos

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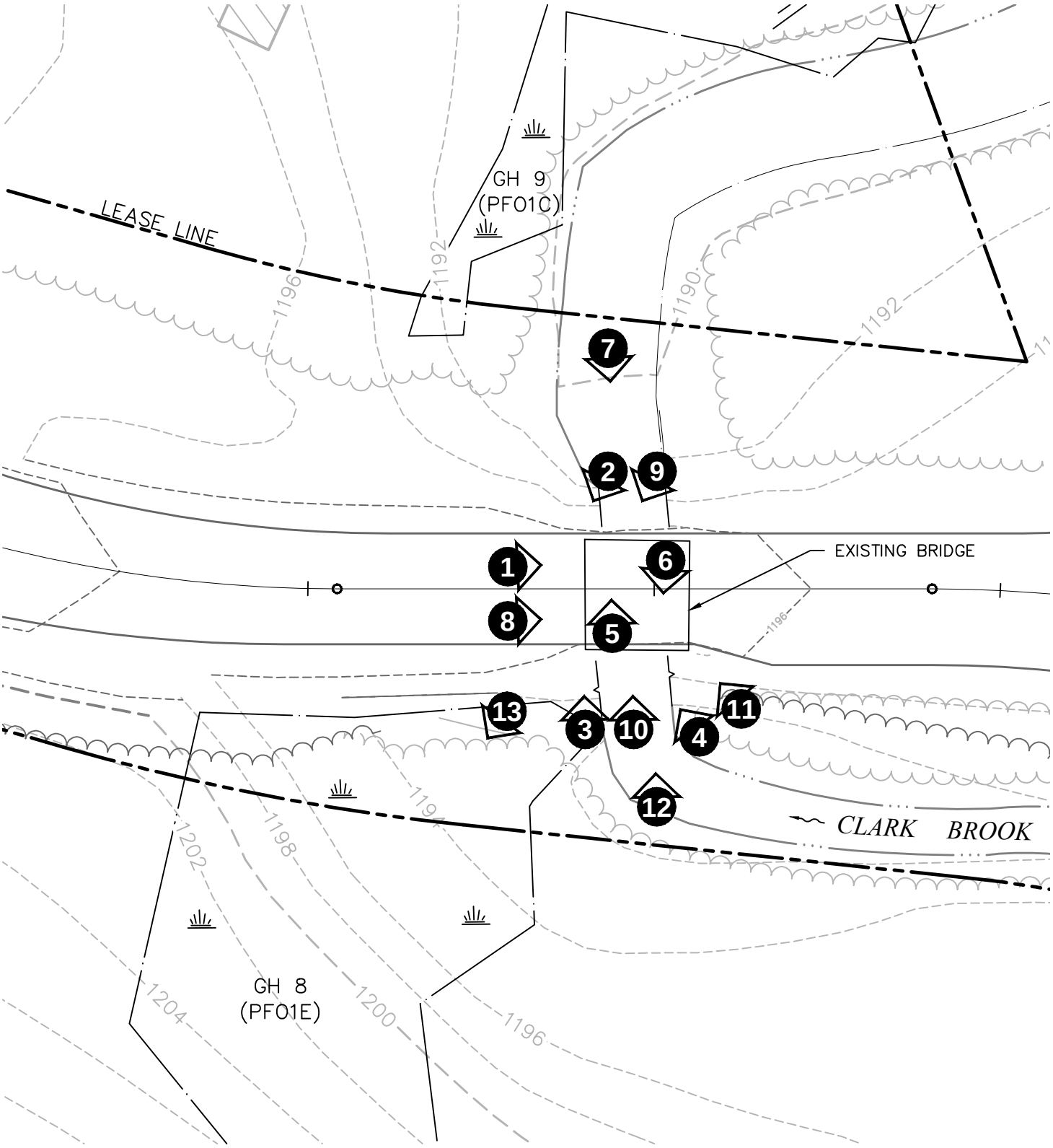

0 10 20 Feet

May 11, 2015

Photo Location
Groton Wind Farm
Upper Bridge Replacement
Groton, New Hampshire

Appendix B
Representative Site Photographs
Upper Bridge Replacement, Groton, NH

Photo 1: Pre-Emergency Authorization- Looking southeast along Groton Hollow Road, Upper Bridge Crossing of Clark Brook.

Photo 2: Pre-Emergency Authorization - Looking west at Northwest corner of abutment #1 (downstream side)

Appendix B
Representative Site Photographs
Upper Bridge Replacement, Groton, NH

Photo 3. Pre- Emergency Authorization - Looking north at the southwest corner of abutment #1 (upstream side)

Photo 4. Pre- Emergency Authorization - Looking downstream along abutment #2

Appendix B
Representative Site Photographs
Upper Bridge Replacement, Groton, NH

Photo 5. Pre- Emergency Authorization - Looking downstream from bridge.

Photo 6. Pre- Emergency Authorization - Looking upstream from bridge.

Appendix B
Representative Site Photographs
Upper Bridge Replacement, Groton, NH

Photo 7. Pre- Emergency Authorization - Looking upstream toward bridge.

Photo 8. Post- Emergency Authorization - Looking southeast along Groton Hollow Road, Upper Bridge Crossing of Clark Brook

Appendix B
Representative Site Photographs
Upper Bridge Replacement, Groton, NH

Photo 9. Post- Emergency Authorization - Looking west at Northwest corner of abutment #1 (downstream side).

Photo 10. Post- Emergency Authorization - Looking north at the southwest corner of abutment #1 (upstream side)

Appendix B
Representative Site Photographs
Upper Bridge Replacement, Groton, NH

Photo 11. Post- Emergency Authorization - Looking downstream along abutment #2

Photo 12. Post- Emergency Authorization – Looking downstream along abutment #1

Appendix B
Representative Site Photographs
Upper Bridge Replacement, Groton, NH

Photo 13: Wetland GH-8 (PFO1E), located within the project area to the southwest of the existing bridge. 140 square feet of permanent impact area proposed in this area.